



# Geocortex Essentials 4.8

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Administrator Guide



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# 1 Welcome to Geocortex Essentials

Engineered from the ground up to work with Esri ArcGIS, Geocortex Essentials provides cutting edge tools, processes, and features that dramatically reduce the time and effort it takes to create and maintain quality ArcGIS applications.

The Geocortex Viewer for HTML5 that ships with Essentials enables you to create working, configurable, web mapping applications with a few clicks.

## 1.1 Assumptions

This document assumes that:

- The server that Geocortex Essentials is installed on is a Windows server with the IIS web server application installed and running. The host server must be properly configured in terms of security and desired functionality as an Internet or intranet web server.
- You have a level of knowledge and comfort with the platform and related technologies used by Geocortex Essentials, specifically, knowledge of Microsoft® Windows® with basic administration skills, like assigning user rights to files and folders.
- You have a basic understanding of GIS concepts.

## 1.2 About this Guide

This guide is for **Geocortex Essentials 4.8**. Although much of the information in this guide also applies to other versions of Essentials, some of the information is specific to version 4.8. To obtain the Administrator Guide for a different version of Essentials, download the guide from the [Geocortex Support Center](#).

### 1.2.1 Who Should Read this Guide?

This guide is written for an administrator who is responsible for configuring and maintaining one or more Geocortex Essentials installations.

This guide provides instructions for configuring and maintaining Geocortex software only. For help installing or configuring third-party software, consult the documentation provided by the third-party vendor.



The configuration instructions provided in this guide are also available in the Geocortex Essentials Manager help. To open the help system, launch Manager, and then click the Help hyperlink at the top of the page.

### 1.2.2 Conventions Used in this Guide

This guide uses the following conventions:

- **User input and interface references:** In procedural sections, when you are instructed to do something in the user interface, the UI components are in bold typeface to stand out from the rest of the text, for example:

On the **Data Links** tab, click **Import Data Link**.

- **Shorthand notation:** Shorthand notation is used to refer to the locations of Geocortex Essentials files and folders. For example, the location in your file system where Essentials is installed is represented as:

<GE\_INSTALL>

A complete list of the shorthand notation is given in [Locations of Essentials Files and Folders on page 507](#).

- **Cross-references:** Cross-references refer you to related documentation. Different conventions are used depending on what is being referred to:
  - **Section in the same publication:** Cross-references to sections within the publication are hyperlinks. If you view the publication online, you can click the title or page number to navigate to the referenced section. The following example shows how cross-references to a section are represented:  
For instructions on creating sites, see [Create a Site on page 57](#).
  - **Another publication:** Cross-references to entire publications are represented as follows:  
Refer to the *Geocortex Essentials Installation Guide* for instructions on migrating sites.
  - **Section in another publication:** References to a section in another publication are represented as follows:  
Refer to "Installation Options" in the *Geocortex Viewer for HTML5 Installation Guide*.
- **Code examples:** Code snippets are presented in a different typeface and may have background shading, for example:

```
<ElementName ID="1" DisplayName="My Component" />
```

- **Cautions, Notes, and Tips:** Information that is useful or important is set apart and emphasized by adding an icon to draw attention to it and identify what type of information it is. There are three levels of information:



**Cautions** are indicated by the exclamation icon on a yellow background. Cautions indicate information that could cause you to lose data or damage software or hardware if you do not follow the instructions.



**Notes** are indicated by the sticky note icon. Notes include information that is important for you to notice and pay attention to.



**Tips** are indicated by the light bulb icon. Tips contain information that makes a task easier or provides extra information that is useful but not critical.

## 1.3 Getting Help

### 1.3.1 Related Resources

The following documentation is provided to support Geocortex Essentials installations. The documentation is organized by intended audience. Some publications are directed at both administrators and developers.

#### For Administrators

- **Geocortex Essentials Installation Guide:** Provides instructions for installing Essentials and performing post-installation configuration, including activation, configuring IIS settings for Essentials web components, adding viewer templates, migrating sites, and re-licensing the software.
- **Geocortex Essentials Administrator Guide:** (this guide) Describes the key concepts that administrators need to be familiar with to use Essentials effectively, provides instructions for configuring and managing sites, and discusses how to extend Essentials with custom development.  
The Administrator Guide is installed with Essentials.
- **Geocortex Essentials Manager Help System:** A web version of the Geocortex Essentials Administrator Guide, excluding the information about extending Essentials with custom development. To open the help system, launch Manager, and then click the Help hyperlink at the top of the page.
- **Geocortex Viewer for HTML5 Administrator and Developer Guide:** Contains information about the installation and configuration of the HTML5 Viewer, as well as information about extending viewers with custom development.
- **Geocortex SDK for HTML5 API Reference:** Contains information about the commands and events available in the Geocortex Viewer for HTML5, as well as other information about the two APIs upon which the HTML5 Viewer is built: Geocortex Essentials JavaScript API and Geocortex HTML5 Framework API.  
The Geocortex SDK for HTML5 API Reference is included in the Geocortex Viewer for HTML5 installation package from the [Geocortex Support Center](#).

#### For Developers

- **Geocortex Workflow Designer Help System:** Provides conceptual information about workflows and instructions for creating workflows.
- **Geocortex Viewer for HTML5 Administrator and Developer Guide:** Contains information about the installation and configuration of the HTML5 Viewer, as well as information about extending viewers with custom development.
- **Site XML Reference:** Provides a reference for the XML documents that contain the site configuration, which are called `Site.xml`. `Site.xml` files are consumed by Geocortex Essentials and exposed to the Essentials REST API. All elements and attributes allowable within the `Site.xml` document are described in the Site XML Reference. Because all aspects of a site except for custom site extensions are configured using Essentials Manager, you will only need to refer to this reference if you are implementing custom site extensions.  
The Site XML Reference is installed with Essentials, in the `Docs` folder. In the default installation, the `Docs` folder is here:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST  
Elements\Docs
```



- **REST Resources XML Reference:** Provides a reference for configuring the `RestResources.xml` document that defines a site's custom REST endpoints. All elements and attributes that are allowed in the `RestResources.xml` document are described in the REST Resources XML Reference. Since custom REST endpoints are optional, you will only need to use this reference if you are setting up a site that has custom endpoints.

The REST Resources XML Reference is installed with Essentials, in the `Docs` folder. In the default installation, the `Docs` folder is here:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\Docs
```

- **Essentials REST API Reference:** The primary source for information on the Geocortex Essentials API, Essentials's general-purpose, server-side API for building GIS applications. Advanced developers can use the API to extend the Geocortex Essentials REST API and provide more advanced server-side functionality to end users.

The Essentials REST API Reference is installed with Essentials, in the `Docs` folder. In the default installation, the `Docs` folder is here:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\Docs
```

- **Geocortex SDK for HTML5 API Reference:** Provides information about the namespaces, objects, methods, properties, parameters, commands and events available in the Geocortex Viewer for HTML5 and the two APIs upon which the HTML5 Viewer is built: Geocortex Essentials JavaScript API and Geocortex HTML5 Framework API.

The Geocortex SDK for HTML5 API Reference is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

### 1.3.2 Use the Discussion Forum

The [Geocortex Support Center](#) has an [Essentials discussion forum](#) where you can post questions about Geocortex Essentials. The forum is a great place to get answers from the Geocortex community.

### 1.3.3 Communicate by Email

If you have a question that is not suitable for posting to the forum, and you have an active Support agreement, send an email message to the Geocortex Support team at [support@geocortex.com](mailto:support@geocortex.com). The Support team will respond by email.

### 1.3.4 Provide Feedback on Documentation

Send comments, suggestions, and requests regarding Geocortex product documentation to [documentation@geocortex.com](mailto:documentation@geocortex.com).

## 1.4 Disclaimer

Essentials works with other licensed software products. You are responsible for ensuring that all the required software licenses are in place and appropriate for your chosen system configuration.

Any software installation involves some risk to your system. Make sure you back up all software and data before you install any Essentials components.

Please refer to your Essentials software license agreement for information about limitations on liability and other legal considerations.

## 2 Quick Start for Administrators

The Quick Start for Administrators describes two different ways to get started with Essentials:

- **Create and View a Simple Site:** Create and deploy a simple web mapping application in Essentials.
- **Explore the Sample Sites:** Use the sample sites that ship with Essentials to see how particular features are configured, and then launch the viewer to see what the features look like to the end user.

These two approaches demonstrate different aspects of Essentials, so you may want to do both parts of the Quick Start. They are independent of each other, so the order that you do them does not matter.

The Quick Start uses public map services that are available on the Internet. This means that you can do the Quick Start without having published any services yourself—all you need is an Internet connection.

### 2.1 Create and View a Simple Site

This part of the Quick Start shows you how to create and deploy a simple web mapping application in Essentials. The site that you create will reference the ArcGIS Online web map of your choice. When you have finished, you will be able to launch the application in a browser, navigate the map, identify and search for features, create markup, export the map, and more.

The main steps to create and view a site are:

1. **Create the Site:** A site is a technology-neutral (XML) configuration of a web mapping application. Creating a site in Essentials gives you a ready-to-use configuration for a web mapping application.
2. **Add a Viewer to the Site:** Viewers are the web applications that end users run to interact with the site and its map. Viewers use the configuration defined in the site. In this step, you add one of Geocortex's out-of-the-box viewers to the site.
3. **Launch the Viewer:** In this step, you launch the viewer in a web browser. This enables you to see and interact with the map and the other out-of-the-box features that are configured in the site.

You can create the Quick Start site just for the practice and delete it later, or you can use the site as the basis of an actual site that you plan to develop. You can expand and modify the site's configuration at any time. This includes changing the map services and web maps that the site uses.



If you encounter a problem creating your site, refer to Manager's log files for possible causes. See [Locations of Essentials Files and Folders on page 507](#) for information on where to find the log files.

## 2.1.1 Create a Site


### To create a site:

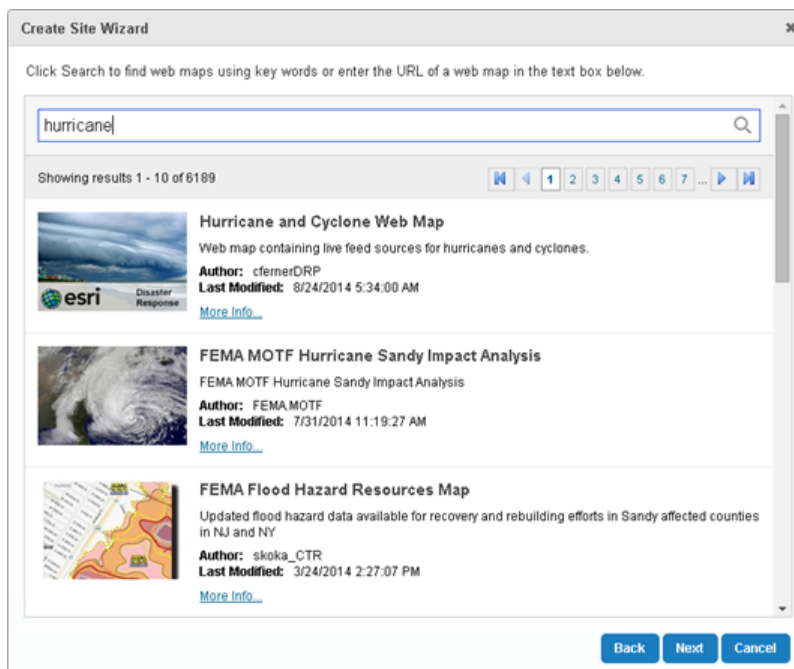
1. Launch Essentials Manager.

You can launch Essentials from your Start Menu. In the applications list, select the Latitude Geographics folder and the Geocortex Essentials Manager item inside.



Essentials Manager is the mechanism used to change the state of the Essentials instance. In order to ensure that state changes are executed consistently, only one browser tab should be used to interact with Essentials Manager.

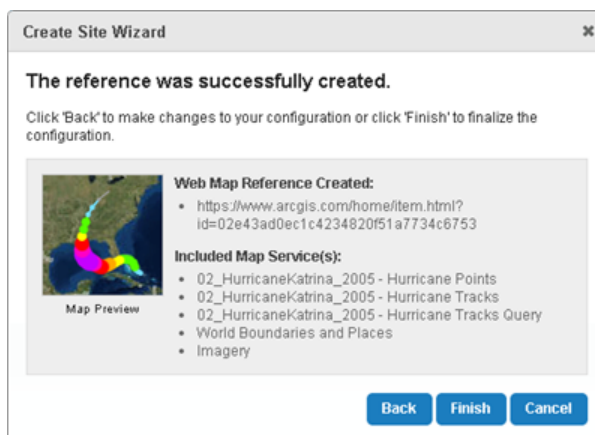
2. If you are prompted to sign in, enter your user name and password.  
Depending on how Essentials is configured in the Post Installer, you either sign in using an ArcGIS account or a Windows account.
3. Click the **Sites** tab. If a site is open for editing, click **Save Site**, and then click **Close Site**.  
The Site List displays.
4. Click  **Add New Site**.
5. Type a display name for your site, for example **Quick Start**, and then click **Next**.
6. Select **Reference a web map from ArcGIS Online or Portal for ArcGIS**, and then click **Next**.
7. Type a search term, for example, **hurricane**.  
The search results start to display while you are typing the search term.



### Search ArcGIS Online from Manager

8. Select one of the search results, and then click **Next**.

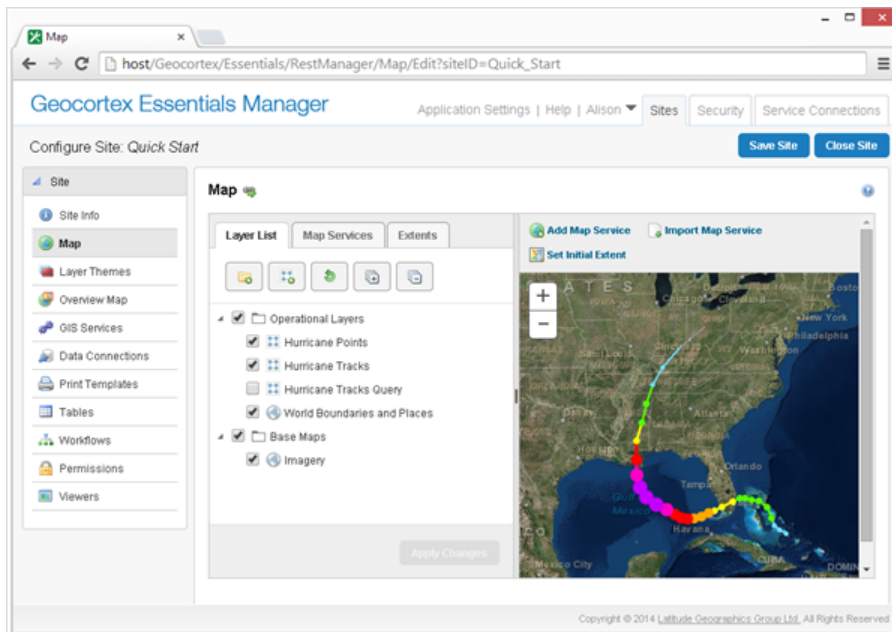
The wizard displays a success message when it connects to the web map.



The final panel summarizes the web map's services

9. Click **Finish**.

You have successfully created a site. Manager's Map page opens.



New site open for editing at the Map page

## 2.1.2 Add a Viewer to the Site

Before you can configure a Geocortex viewer for your site, you must install the viewer template. HTML5 Viewer templates enable you to add HTML5 viewers to your sites. Viewer templates are installed using the Geocortex Post-Installation Configuration tool.

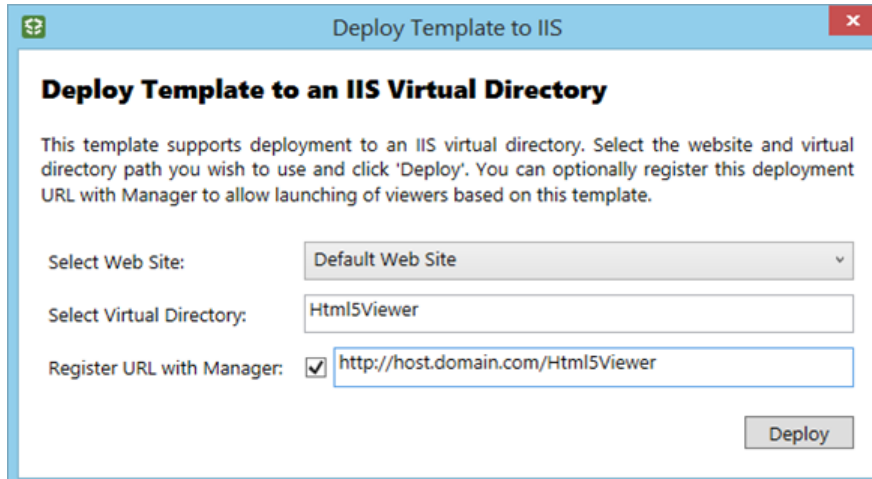
If you have not yet installed the viewer templates, follow the instructions below to download and install the templates.

### ► To download a viewer template:

1. Open the [Geocortex Essentials Downloads](#) page in the Geocortex Support Center.
2. Download the most recent Geocortex viewer template.  
The downloads are ZIP archives.
3. Extract the files from the archive.  
The file with the .vte extension is the viewer template. You will use the viewer template to install the viewer framework.

► **To install a viewer template:**

1. Launch the Post Installer.
  - **Windows Server 2012 or Windows 8, and Newer Versions:**  
On the **Start** screen, type **Post Install**, and then click **Post Installer**.
  - **Windows Server 2008 or Windows 7, and Older Versions:**  
In the **Start** menu, click **All Programs | Latitude Geographics | Geocortex Essentials [Version] [Instance] | Post Installer**.  
[Version] is the Essentials version number. [Instance] is the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.
2. Click **Configure Templates** in the side panel.
3. Click **Add**.
4. Browse to the folder where you extracted the files from the installation package.
5. Select the template file (.vte file), and then click **Open**.  
You are prompted to install the Management Pack.
6. Click **Yes**.  
You are prompted to deploy the template to an IIS virtual directory.
7. Click **Yes**.  
The Deploy Template to IIS dialog box opens.



Deploy Template to IIS dialog box



8. If the virtual directory listed in the **Select Virtual Directory** box already exists, type a name for a new virtual directory.  
Each viewer template must be deployed to a virtual directory that does not yet exist in the selected website.
9. Click **Deploy**, and then close the success message that displays.  
The template is listed in the Installed Templates area.
10. Click **Finish**. If prompted to review your settings, click **OK**, and then click **OK** again to close the Post Installer.

▶ **To add a viewer to the site:**

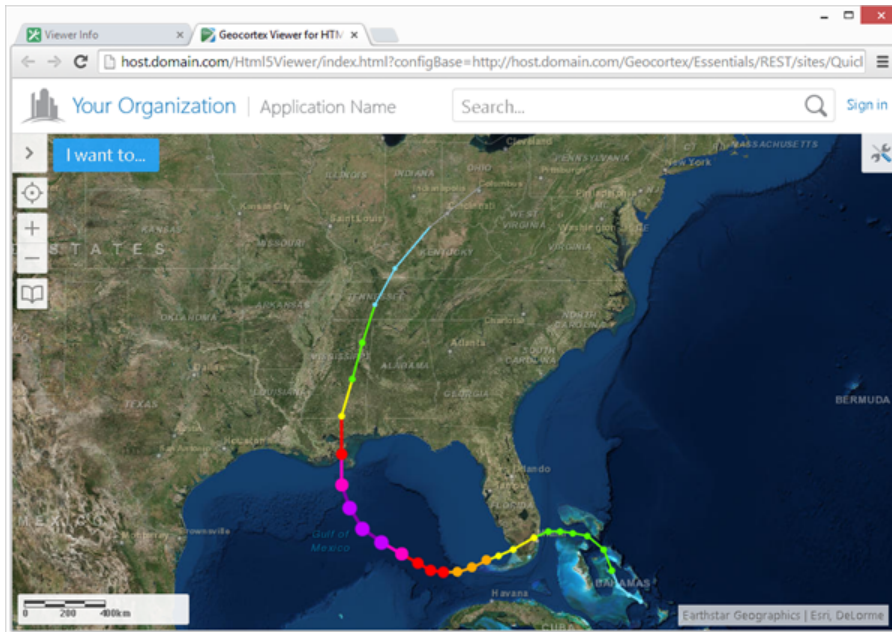
1. If your Essentials session has timed out, re-open Essentials and make sure the site is open for editing.
2. In Essentials' side panel, click **Viewers**.  
The Viewers page opens.
3. Click **Add Viewer**.
4. In the **Display Name** box, type a name for the viewer.  
Display names can have spaces and special characters in them.
5. In the **Template** box, select the desired viewer template.  
The Template box only lists viewer templates that are installed.
6. Click **OK**.  
You have successfully created a viewer. The Viewer Info page opens.

## 2.1.3 Launch the Viewer

▶ **To launch the viewer:**

1. There are several ways to launch a viewer in Manager:
  - **On the Viewer Info Page:**  
Click the **Launch in Browser** hyperlink in the **Launch Links** area.
  - **On the Viewers Page:**  
Click the viewer's hyperlink in the **Launch URL** column.
  - **In the Site List:**  
Click the viewer's hyperlink in the **Site Summary**. To show the Site Summary, click the down arrow  beside the site's name in Tiled View. In List View, click the plus sign .

The viewer opens in a new browser tab.



The new site in an HTML5 viewer



If you added an HTML5 viewer that you want to use in a production system, you must set up a proxy page. Refer to "Set up a Proxy Page" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

## 2.2 Explore a Sample Site

One way to learn about Essentials is to experiment with an existing site. The LA County sample site that ships with Essentials gives you a place to start.

The LA County site includes examples of many Essentials features, such as different service types, print templates, workflows, and more. Use the LA County site to see how particular features are configured, and then launch a viewer to see what the features look like to the end user.

After you have explored the LA County site's default configuration, try modifying the configuration. Each time you make some modifications, save the site and reload the viewer so you can see the effect of your changes in the viewer.

### 2.2.1 Deploy a Sample Site

In order to see a sample site in Manager, you must deploy it. To deploy a sample site, you copy the site's folder from the Sample Sites folder to the Sites folder.

#### ► To deploy a sample site:

1. In the file system, navigate to the **REST Elements** folder.

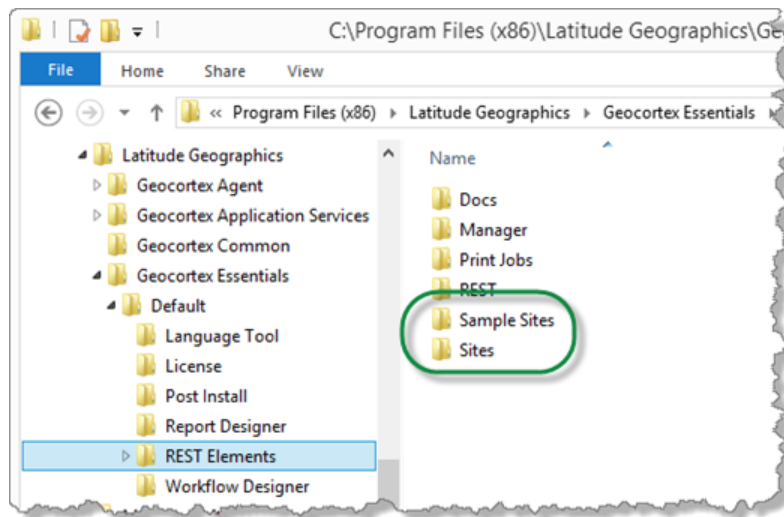
By default, the REST Elements folder is in:

```
Program Files (x86)/Latitude Geographics/Geocortex Essentials/[instance]/
```



where [instance] is the name of the Essentials instance. If you did not specify an instance name when you installed Essentials, then [instance] is Default.

The REST Elements folder contains a Sites folder and a Sample Sites folder.




Sample Sites folder and Sites folder in the default installation

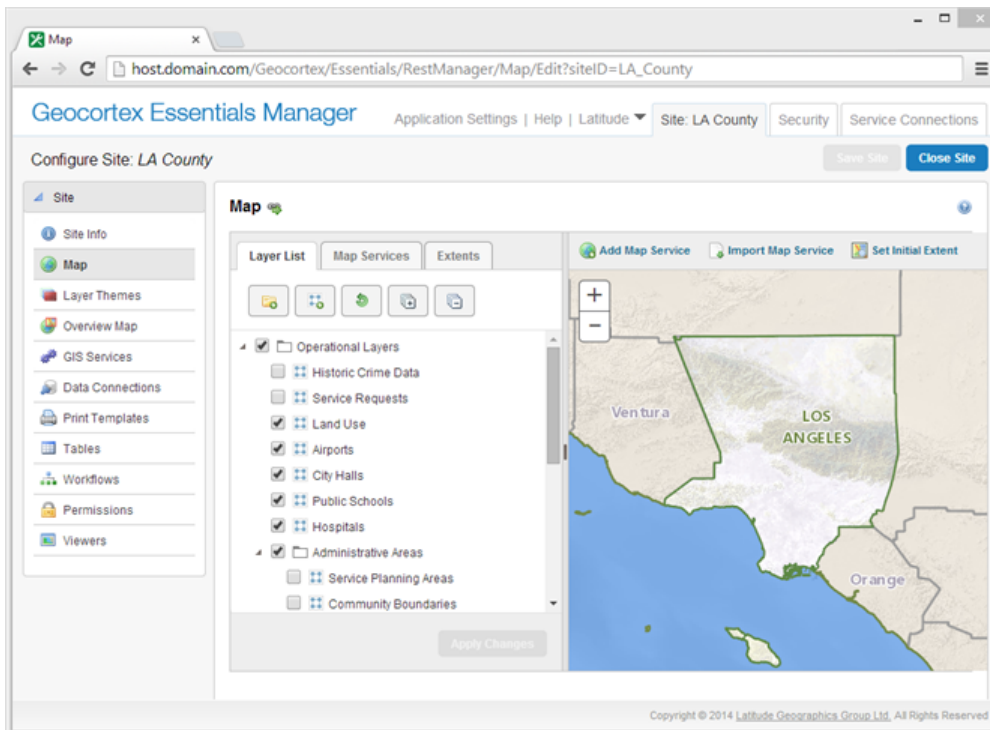
2. Open the **Sample Sites** folder.
3. Copy the folder for a sample site in the **Sample Sites** folder to the **Sites** folder.  
To deploy the LA County sample site, copy the LA\_County folder from Sample Sites to Sites.  
You have now deployed the sample site.

## 2.2.2 Explore a Sample Site's Configuration


Editing a site in Manager enables you to explore the site's configuration.

### ▶ To explore a sample site's configuration:

1. Launch Geocortex Essentials Manager.  
You can launch Essentials from your Start Menu. In the applications list, select the Latitude Geographics folder and the Geocortex Essentials Manager item inside.
2. If you are prompted to sign in, enter your user name and password.  
Depending on how Essentials is configured in the Post Installer, you either sign in using an ArcGIS account or a Windows account.
3. Click the **Sites** tab.
4. If Manager is not open at the Site List, click **Close Site**.
5. Click the **Edit** icon  beside the sample site that you want to edit.



Example of a sample site that is open for editing in Manager

6. Click items in Manager's side panel to go to different pages of the site's configuration.  
Click Edit icons  to see the configuration of individual components and features.

## 2.2.3 Launch a Sample Site's Viewer

If the sample site already has one or more viewers configured, and you have already installed the (required version of the) viewer templates, you can launch the viewer.

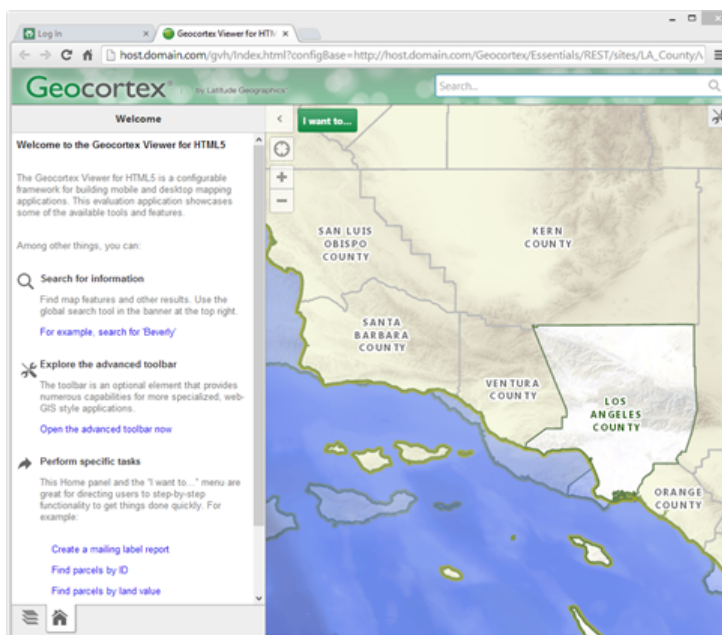
### ▶ To launch the viewer if the site already has a working viewer:

1. If you are no longer editing the site in Manager, edit it now.
2. In Manager's side panel, click **Viewers**.
3. If the Viewers page lists one or more viewers and each viewer has its template, you do not need to do anything—the viewers are ready to launch.

Viewers			
+ Add Viewer			
Display Name	Launch URL	Template	
LA SLV	<a href="http://host.domain.com/qvs">http://host.domain.com/qvs</a>	Viewer for Silverlight 1.11	
LA_HTML	<a href="http://host.domain.com/qvh">http://host.domain.com/qvh</a>	Viewer for HTML5 1.4	

Two viewers configured and ready to launch

- Click the **Launch URL** hyperlink for the viewer that you want to launch. The viewer opens in a new browser window or tab. You can now explore the sample site in the viewer.



Example of a sample site in a viewer

## 2.2.4 If the Sample Site Does Not Have a Working Viewer

Before you can configure a Geocortex viewer for your site, you must install the viewer template. HTML5 Viewer templates enable you to add HTML5 viewers to your sites. Viewer templates are installed using the Geocortex Post-Installation Configuration tool.

The next steps to take depend on whether the sample site already has one or more viewers configured, and whether you have installed the viewer templates yet.

► **To determine what you have to do to configure a working viewer:**

1. Look at the Viewers page to see which of the following situations applies to you:

- **Template is Not Found**

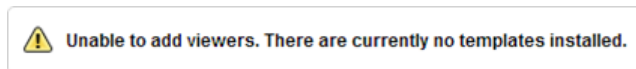
If the Viewers page lists a viewer but the template is not found, you must install the viewer template to be able to use the viewer. Follow the instructions below to download and install the template. After you have installed the template, reload the Viewers page in Manager—the Template Not Found message should be replaced by the name of the viewer template.

Display Name	Launch URL	Template	
LA_SLV		Template not found (SilverlightViewer_1_11)	
LA_HTML	<a href="http://amarchant-pc.latitudegeo.com/qv/">http://amarchant-pc.latitudegeo.com/qv/</a>	Viewer for HTML5 1.4	

Viewer that is missing its template

- **No Templates are Installed**

If the Viewers page displays a warning that there are no templates installed, you must download and install at least one viewer framework, and then add a viewer. Follow the instructions below to download and install a viewer framework, and then add a viewer.



Warning that displays when no viewer templates are installed

- **No Viewers are Configured**

If the Viewers page displays a message that no viewers are configured, at least one viewer framework is installed but no viewers have been configured. Follow the instructions below to add a viewer.



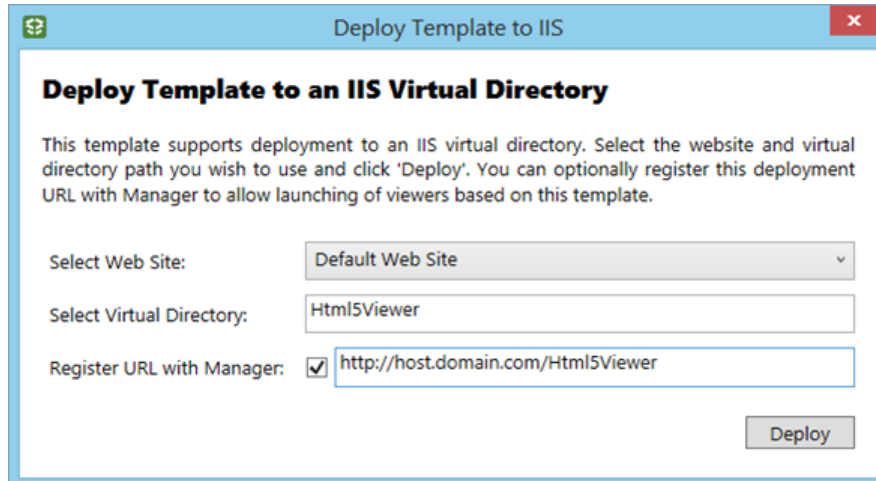
No viewers are configured yet, but at least one viewer framework is installed

► **To download a viewer template:**

1. Open the [Geocortex Essentials Downloads](#) page in the Geocortex Support Center.
2. Download the most recent Geocortex viewer template.  
The downloads are ZIP archives.
3. Extract the files from the archive.  
The file with the `.vte` extension is the viewer template. You will use the viewer template to install the viewer framework.

► **To install a viewer template:**

1. Launch the Post Installer.
  - **Windows Server 2012 or Windows 8, and Newer Versions:**  
On the **Start** screen, type **Post Install**, and then click **Post Installer**.
  - **Windows Server 2008 or Windows 7, and Older Versions:**  
In the **Start** menu, click **All Programs | Latitude Geographics | Geocortex Essentials [Version] [Instance] | Post Installer**.  
[Version] is the Essentials version number. [Instance] is the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.
2. Click **Configure Templates** in the side panel.
3. Click **Add**.
4. Browse to the folder where you extracted the files from the installation package.
5. Select the template file (.vte file), and then click **Open**.  
You are prompted to install the Management Pack.
6. Click **Yes**.  
You are prompted to deploy the template to an IIS virtual directory.
7. Click **Yes**.  
The Deploy Template to IIS dialog box opens.





Deploy Template to IIS dialog box

8. If the virtual directory listed in the **Select Virtual Directory** box already exists, type a name for a new virtual directory.  
Each viewer template must be deployed to a virtual directory that does not yet exist in the selected website.
9. Click **Deploy**, and then close the success message that displays.  
The template is listed in the Installed Templates area.
10. Click **Finish**. If prompted to review your settings, click **OK**, and then click **OK** again to close the Post Installer.

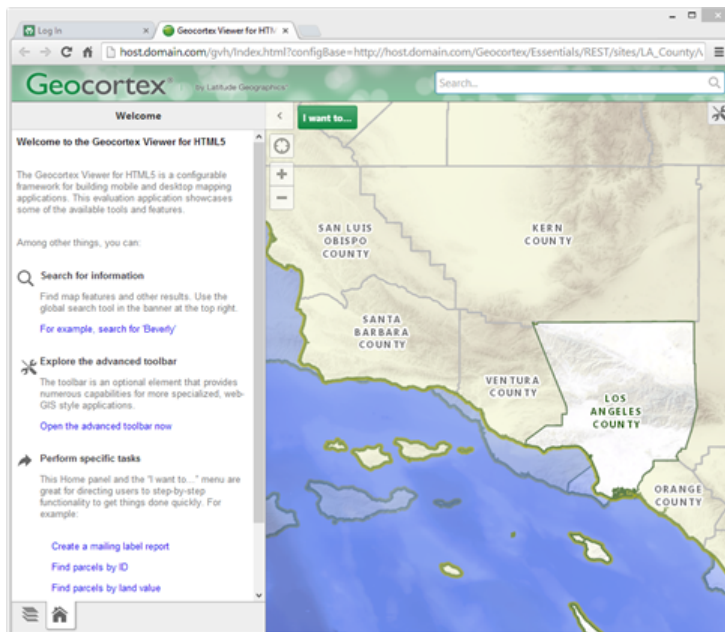
▶ **To add a viewer to the site:**

1. If your Essentials session has timed out, re-open Essentials and make sure the site is open for editing.
2. In Essentials' side panel, click **Viewers**.  
The Viewers page opens.
3. Click **Add Viewer**.
4. In the **Display Name** box, type a name for the viewer.  
Display names can have spaces and special characters in them.
5. In the **Template** box, select the desired viewer template.  
The Template box only lists viewer templates that are installed.
6. Click **OK**.  
You have successfully created a viewer. The Viewer Info page opens.

▶ **To launch the viewer:**

1. There are several ways to launch a viewer in Manager:
  - **On the Viewer Info Page:**  
Click the **Launch in Browser** hyperlink in the **Launch Links** area.
  - **On the Viewers Page:**  
Click the viewer's hyperlink in the **Launch URL** column.
  - **In the Site List:**  
Click the viewer's hyperlink in the **Site Summary**. To show the Site Summary, click the down arrow  beside the site's name in Tiled View. In List View, click the plus sign .

The viewer opens in a new browser window or tab. You can now explore the sample site in the viewer.



Example of a sample site in a viewer

## 2.3 After the Quick Start

After you have finished the Quick Start, we recommend that you add service connections for the services that you use frequently. For example, if your organization runs ArcGIS Server, add a service connection for the ArcGIS Server catalog. Service connections enable you to search for services to add to sites. If a service is secured, you must add a service connection before you can search for the service or add the service to the map. Service connections also serve as bookmarks to your favorite services and catalogs.

For more information, see [Service Connections on page 127](#).

## 3 Overview of Geocortex Essentials

Geocortex Essentials is a framework for designing, developing, and maintaining web mapping applications. Built to work with Esri's REST technology, Essentials enhances and extends the ArcGIS platform with the addition of a number of powerful features for building real-world GIS applications:

- **Workflows:** Workflows provide a quick way to program complex, interactive, GIS and business procedures. Workflow Designer's drag-and-drop interface, library of activities, and built-in simulator accelerate development and free the programmer from handling low-level details like client-server communications.
- **Instant Search:** Instant Search is a very fast, indexed search engine that enables users to search for attributes from multiple map services and feature services. Instant Search provides search suggestions to users as they type. The search results are sorted by relevance and search results are plotted on the map instantly.
- **Data Linking:** Data linking provides the ability to retrieve non-spatial data from external data sources such as databases and spreadsheets, and link the external data to attributes of spatial data.

- **Reporting:** Template-based reporting allows the user to generate reports based on templates configured by an administrator. Each template defines a standard layout for reporting on a layer's features, attributes, and data (both linked and computed).
- **Printing:** Configured by the administrator, print templates enable the user to create printable maps, including large-format output, using standard layouts.
- **Charting:** Charting enables users to view graphs of attribute data. Essentials supports bar charts, pie charts, and a variety of line charts. Charts update dynamically depending on the features that the user has selected.

Central to Essentials is the notion of a **site**. A site is a technology-neutral configuration of a web mapping application. Sites supply the configuration of the services and other components that are available in your web applications. Complex sites may have many services with hundreds of layers, as well as any number of the other components.

Essentials provides the HTML5 Viewer framework to enable you to add fully functioning viewers to your sites with a few clicks. Viewers created using the HTML5 Viewer framework are implemented in HTML5 and JavaScript. HTML5 viewers can run in a browser, or they can run as a native iOS application or Windows application in the Geocortex Mobile App Framework. The HTML5 Viewer is designed to run on different types of device—desktop computers, tablets, and handheld devices like smart phones.

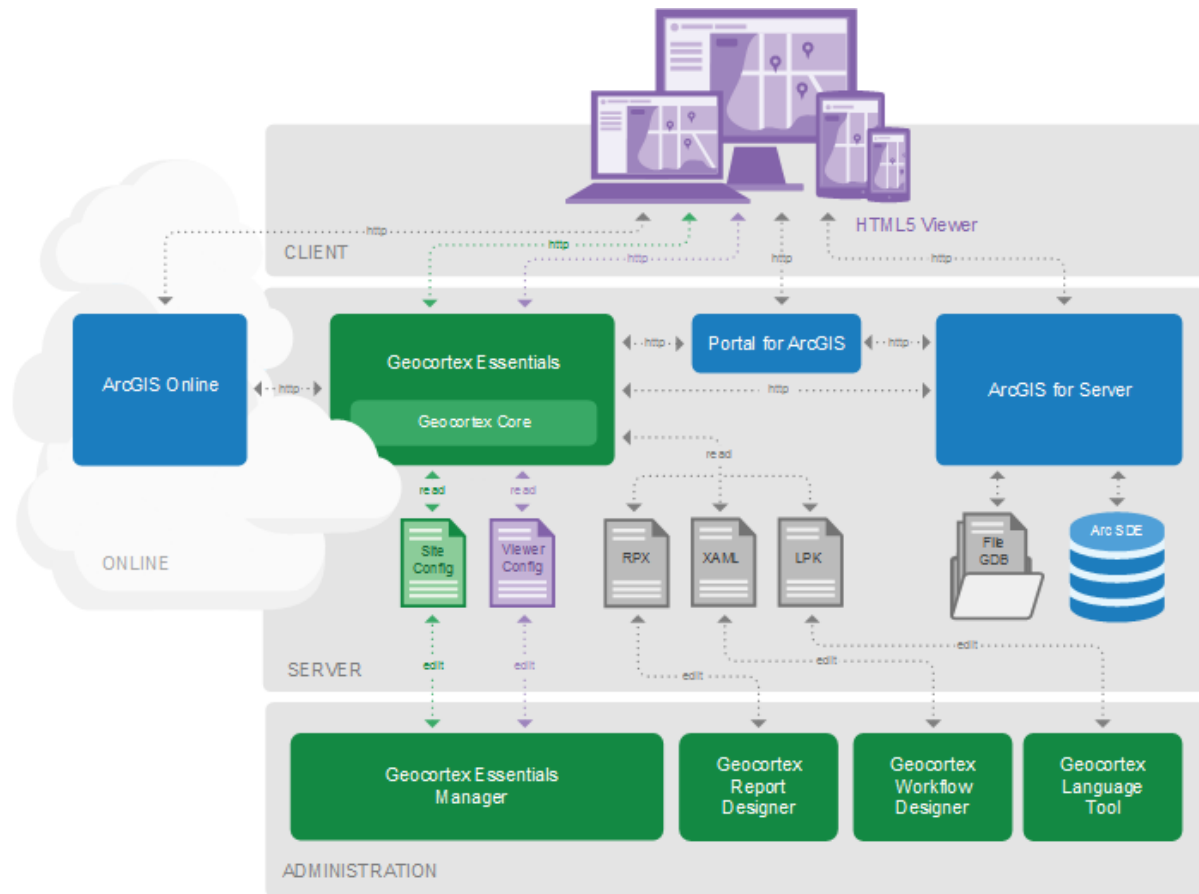
The viewer frameworks are built on the Geocortex Essentials client APIs and the JavaScript API. The client APIs work in conjunction with Esri's JavaScript API. Geocortex Essentials is the server-side architecture that supports the Essentials client APIs.

## 3.1 Architecture

The term **architecture** refers to the structure or organization of a software system. Architecture focuses on the system's major components and how they interact with each other.



The diagram below shows the architecture of Geocortex Essentials.



### Geocortex Essentials architecture

Like all web-based systems, Geocortex Essentials follows the **client-server** architectural model. The client-server model describes a run-time system in which servers provide resources or services to clients over a network:

1. A client sends a request to a server.
2. The server performs the processing required to generate the result.
3. The server sends the response to the client.
4. The client processes the response.

The architecture diagram shows the **Client** tier, the **Server** tier (which includes the Online cloud), and also a layer that is labelled **Administration**.

### Client Tier

In the world of web mapping, clients are called **viewers**. Viewers are run by **end users** on a wide variety of devices and platforms. Viewers that are based on the Geocortex Viewer for HTML5 framework work on desktop computers, laptops, smart phones, and tablets running different operating systems. This is represented in the diagram by the variety of devices in the Client tier.



### HTML5 viewers running on a variety of devices

The HTML5 Viewer framework enables you to create viewers that are implemented using HTML5 and JavaScript.

In the diagram, the viewers are shown communicating with the Server-tier components via HTTP. If a server enforces Secure Socket Layer (SSL), viewers communicate with the server via HTTPS instead of HTTP. For more detailed information about how viewers communicate with Essentials and ArcGIS, see [APIs on page 23](#).

## Server Tier

The Server tier provides services and data for the Client tier. At the heart of the Server tier is Geocortex Essentials itself. Geocortex Essentials runs on Geocortex Core—installing Essentials also installs Geocortex Core.

Essentials provides access to your **sites**. A site is a technology-neutral configuration of the resources that are available in your viewers. These resources can include map services, workflows, report and print templates, and so on.

Essentials itself is not a map server. Rather, Essentials draws on the power of the ArcGIS platform. Sites provide the connection information that viewers require to connect to map services and other GIS-related services, like geocoding services. This is illustrated in the architecture diagram by the connections between Essentials and ArcGIS Online, Portal for ArcGIS, and ArcGIS Server.

In the diagram, Essentials is shown communicating with the ArcGIS components via HTTP. If a component enforces SSL, HTTPS would be used. For detailed information about how Essentials communicates with ArcGIS, see [APIs on page 23](#).

An Essentials installation can have more than one Essentials server. For information, see "Deployment" in the *Geocortex Essentials Installation Guide*.



You cannot change the name of the server after installing and running Geocortex Essentials.

## Administration

The Administration layer provides tools for customizing Essentials sites and viewers. The administrative tools are not part of the run-time system described by the client-server model. The tools underlie the Server tier—they are the means by which administrators create the client and server components that comprise the run-time system.

The administrative tools are:

- Geocortex Essentials Manager:** Essentials Manager is a web-based application that you use to create and configure Essentials sites and viewers. Each site is defined in its own configuration file, `Site.xml`, that is created when you create the site. In the diagram, the **Site Config** box represents site configuration files. The Site Config box is colored green to associate it with the Essentials server. Similarly, each viewer has its own configuration file that is created when you add a viewer to a site. The **Viewer Config** box represents the viewer configuration files and is colored purple to associate it with the viewers.
- Geocortex Report Designer:** Geocortex Report Designer is a desktop application that you use to create report

templates and print templates. The box in the diagram that represents report and print templates is labelled **RPX** because report and print templates are `.rpx` files. For a viewer to generate output based on a template, the template must be referenced in the configuration for the site that the viewer belongs to.

- **Geocortex Workflow Designer:** Geocortex Workflow Designer is a desktop application that you use to create and maintain Geocortex workflows. The box in the diagram that represents workflows is labelled **XAML** because workflows are `.xaml` files. For a viewer to run a workflow, the workflow must be referenced in the configuration for the site that the viewer belongs to.
- **Geocortex Language Tool:** The Geocortex Language Tool is a desktop application that enables you to internationalize Geocortex Essentials Manager. The box in the diagram that represents language files is labelled **LPK** because language files are `.lpk` (language pack) files.

## 3.2 REST

**REST** is an architectural style used in the design of network applications. Geocortex Essentials is based on REST. The ArcGIS platform—ArcGIS Server, Portal for ArcGIS, and ArcGIS Online—also uses REST.


Most REST applications are implemented as a hierarchy of **resources**, with increasingly specific resources lower in the hierarchy. A REST **endpoint** is a URL to a REST resource. Every resource is located at a unique URL. A **REST API** is a web interface to a set of REST resources. Like most REST applications, Essentials clients and servers use HTTP to communicate.

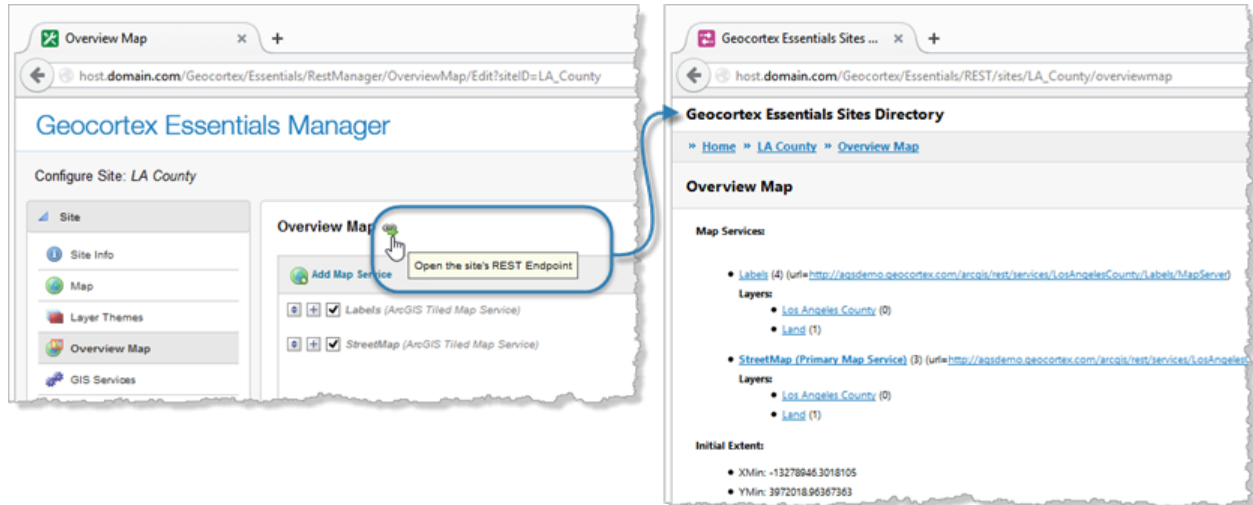
In an Essentials REST API, the top-level resource is a list of sites. Each **site** is a technology-neutral configuration of a GIS application. The next level has individual sites, followed by each site's top-level components, and so on. Other resources in the REST API include map services, layers, print templates, and workflows. REST resources can also be properties, for example, a layer's default visibility, or operations, for example, an operation to export the map.

You can think of REST resources as the business objects in your sites and the operations that operate on them. When you save the configuration for a site, Essentials translates the configuration to a form that can be consumed by REST-based applications and then deploys the translated configuration to the REST API. Viewers obtain information about the site and its components by making web requests (HTTP requests) to specific URLs in the REST API.

### 3.2.1 Browse the REST API

The Geocortex Essentials REST API makes Essentials **sites** available to **viewers** through the REST API. The **Geocortex Essentials Sites Directory** is a human-readable representation of the REST API. The Sites Directory shows a detailed breakdown of every site and viewer that you have configured. Browsing the Geocortex Essentials Sites Directory is analogous to browsing the ArcGIS Server Services Directory to find information about ArcGIS Server services.

You can open the Sites Directory from Essentials Manager. To open the Sites Directory, click the **Open the Site's REST Endpoint** icon  anywhere that it appears in Manager (usually at the top of the center panel).



### Geocortex Essentials Sites Directory opened from Manager's Overview Map page

To browse down in the Sites Directory, click hyperlinks. Use the breadcrumbs at the top of the page to go up one or more levels. You can navigate from any site to any other site, provided the sites are configured in the same instance of Essentials.

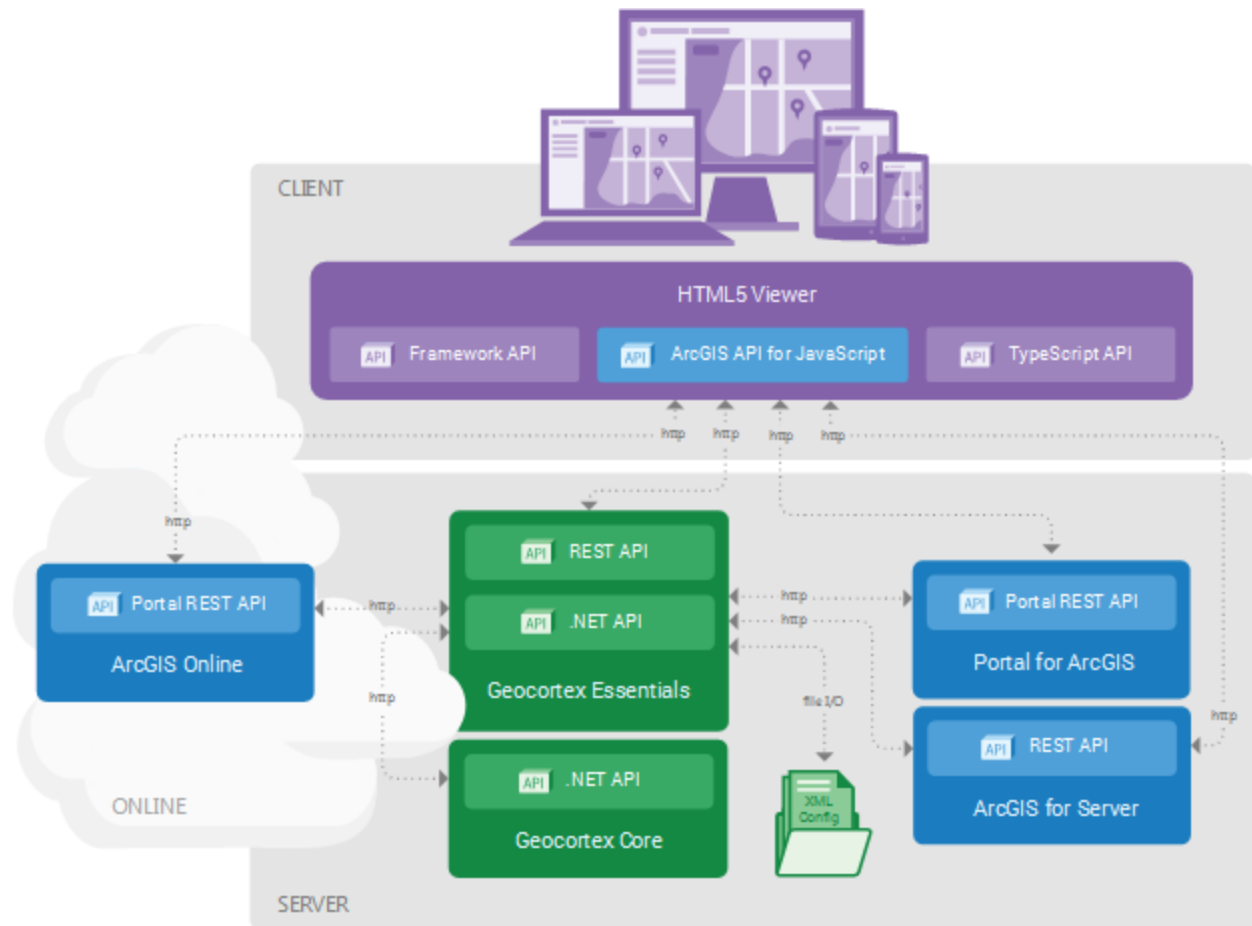


If you configured a site but the site does not appear in the REST API Sites Directory, then the site did not deploy. You can use this fact to test for successful deployment.

## 3.3 APIs

If you are extending Geocortex Essentials or the HTML5 Viewer with custom development, you need to know how components in an Essentials installation communicate with each other. Essentials, viewers, and ArcGIS communicate with each other using Application Programming Interfaces (**APIs**). An API is the interface that an application provides to allow other applications to access it.

The diagram below shows the most important APIs in an Essentials system.



### APIs used by Geocortex Essentials and ArcGIS

Geocortex Essentials communicates with the ArcGIS platform using the **Geocortex Essentials REST API**:

- **ArcGIS Server:** To obtain information about map services and layers from ArcGIS Server, the Essentials REST API makes requests to the ArcGIS Server REST API, which in turn obtains information from ArcGIS Server.
- **Portal for ArcGIS:** To obtain information about services and web maps and other items from Portal for ArcGIS, the Essentials REST API makes requests to the Portal for ArcGIS REST API, which in turn obtains information from Portal for ArcGIS.
- **ArcGIS Online:** To obtain information about services and web maps and other items from ArcGIS Online, the Essentials REST API makes requests to the Portal for ArcGIS REST API hosted at ArcGIS Online, which in turn obtains information from ArcGIS Online.

Geocortex Essentials and Geocortex Core communicate via their respective **.NET APIs**.

In the API diagram, the HTML5 Viewer has three APIs. The ArcGIS API for JavaScript and the **Geocortex TypeScript API** are used to obtain information from Essentials, ArcGIS Server, Portal for ArcGIS, and ArcGIS Online via their respective REST APIs. The Geocortex **Framework API** is used for creating modules and views, which structure HTML5 viewer applications. For more information about the architecture of HTML5 viewers, refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

## 3.4 Overview of Security

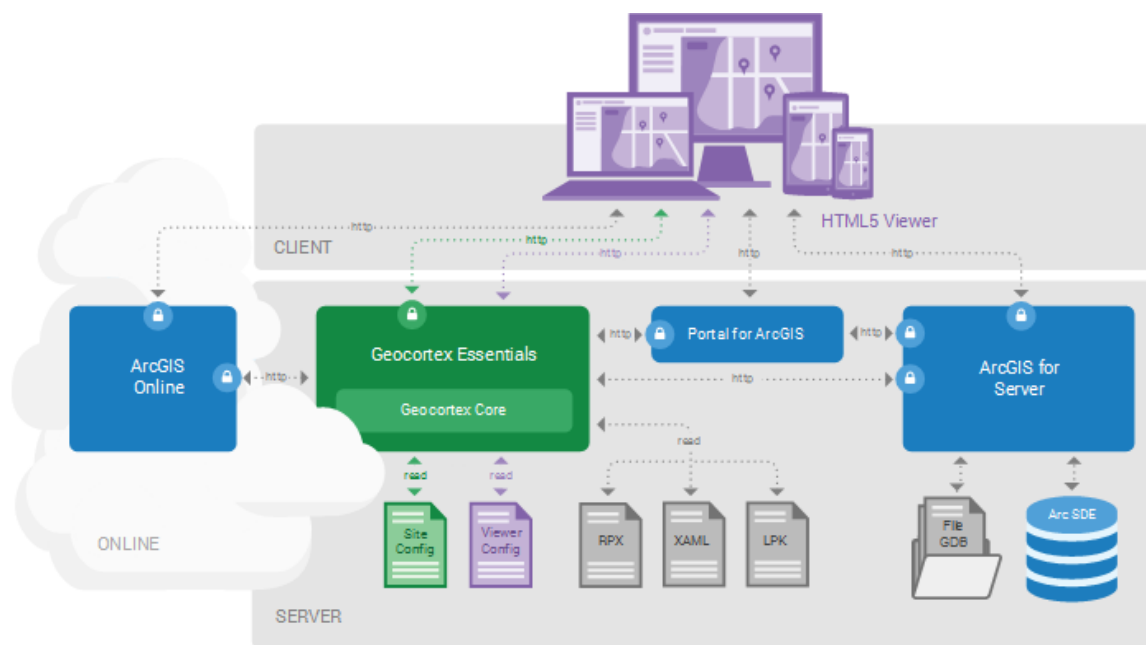
Many web applications that are created using Essentials contain sensitive information. Security is concerned with protecting your data, while still making the data available to specific users.

There are two sides to security:

- **Essentials Security:** Essentials security controls who accesses your Essentials sites and their components. You can secure an entire site, or individual components in a site, including services, layers, workflows, and more. You must add the components to your site before you can secure the components. See [Essentials Security on page 417](#) for instructions on configuring security for sites and their components.
- **External Security:** Essentials and the viewers can access secured map services, including ArcGIS Server map services, OGC map services, and ArcGIS web maps. Before you can add a secured service to a site, you must configure the service's connection information in Essentials so Essentials can connect to the service. For more information, see [Service Connections on page 127](#). Essentials can also access external [ADO.NET](#) data sources that are secured. See [Data Links on page 257](#) for information.

Essentials security is one part of the security solution for a site that references ArcGIS Server or OGC services. Essentials security and external security work together to secure your Essentials sites. If you are the owner of a service that contains sensitive information, we recommend that you secure the service.

The diagram below shows an Essentials installation with ArcGIS Server. The padlocks in the diagram indicate points at which access is secured.



Points to secure in an Essentials installation with ArcGIS

The diagram illustrates security for:

- **ArcGIS Online:** Secure your organization's sensitive content in ArcGIS Online.  
For information on using ArcGIS Online content in Essentials, see [ArcGIS Online on page 101](#).
- **Geocortex Essentials:** Secure your sites and individual components within your sites.  
For information, see [Essentials Security on page 417](#).
- **Portal for ArcGIS:** Secure your Portal for ArcGIS web maps.  
For information on using Portal for ArcGIS content in Essentials, see [Portal for ArcGIS on page 99](#).
- **ArcGIS Server:** Secure your sensitive ArcGIS Server services.  
For instructions on configuring access to secured ArcGIS Server services for Essentials, see [ArcGIS Server Service Connections on page 130](#).

You can use different security methods for Essentials security and external security. For example, you could use Integrated Windows Authentication to secure your services, and SQL Server security providers for Essentials security. The fact that you use Integrated Windows Authentication to secure your services does not mean you have to use Integrated Windows Authentication for Essentials security.



You can use either secured ArcGIS Online content or secured Portal for ArcGIS content with an instance of Essentials, but not both.

### 3.4.1 ArcGIS Server Security

Web applications like Essentials access ArcGIS Server via a REST endpoint. To prevent malicious users from accessing the endpoint directly by typing the address into a browser's address bar, you must secure the REST endpoint.

ArcGIS Server has a token security service that you can use to secure the REST endpoint. If you do not enable the token security service, ArcGIS Server defers authentication to IIS. This is called Web Tier authentication. Depending on how you configure IIS, IIS uses one or more of the following authentication methods: Digest, Basic, or Integrated Windows Authentication. In ArcGIS Server 10.1 and higher, Web Tier authentication is handled by the ArcGIS Web Adapter.

Both Essentials and the end user's web browser need to have access to ArcGIS Server. If ArcGIS Server is secured, you must configure the connection information in Essentials so Essentials can access ArcGIS Server.

### 3.4.2 ArcGIS Server and Essentials Security Compared

#### Essentials Security

- Essentials security secures the REST API.
- End users must authenticate to access the REST API. To access a particular endpoint in the REST API, the user must have permission.

- Essentials security supports the following authentication methods:
  - **Integrated Windows Authentication:** Authenticates using Windows users and groups.
  - **Geocortex Identity Server:** Uses dedicated security software that is installed with Essentials. Authenticates using whatever membership provider Geocortex Identity Server is configured to use.
  - **ArcGIS:** Authenticates using Portal for ArcGIS or ArcGIS Online.

## ArcGIS Server Security

- You must use a security method for Internet connections, because Essentials accesses ArcGIS Server via the ArcGIS Server REST endpoint.
- Both Essentials and the end user's browser need to have access to ArcGIS Server.
- ArcGIS Server security applies to a folder or a service—you cannot secure individual layers or features in ArcGIS Server. In Essentials, you can filter individual layers and features so they do not appear in the viewer. To complete the security provided by filtering, you must secure the ArcGIS Server REST endpoint.

### 3.4.3 Frequently Asked Questions

#### Can I use my Windows Authentication-secured ArcGIS Server with Essentials?

Yes, you can. Configure the Essentials web applications in IIS to use an application pool that uses an identity with access to ArcGIS Server.

#### Can I use my Active Directory users for Essentials security?

Yes, there are two ways this can work.

If Essentials is configured to use Integrated Windows Authentication, integration with Active Directory is automatic. Whenever you type a user or role in Manager, specify the network domain.

If Essentials is not configured to use Integrated Windows Authentication, you can use a .NET Active Directory membership provider and Geocortex Active Directory role provider. This enables Essentials to connect to Active Directory over LDAP to validate users and roles. This method does not support single sign-on, and is usually used only if Integrated Windows Authentication is not available.

#### Can I use Active Directory Federation Services (ADFS) for Essentials security?

Yes, using Active Directory Federation Services (ADFS) to provide authentication to your site is supported in Essentials 3.10 and higher.

#### Can I use my non-Active Directory LDAP server's users for Essentials security?

Yes, you can use any LDAP server that has a .NET membership and role provider. However, you must use token security with those providers. This method does not support single sign-on.



## Does Essentials support Kerberos or NTLM authentication?

Kerberos authentication is a part of Integrated Windows Authentication. Essentials security uses Kerberos if possible, or NTLM authentication if Kerberos is not available.

# 4 About Configuration

## 4.1 Geocortex Essentials Configuration Tools

Geocortex Essentials ships with the following configuration tools:

- **Geocortex Essentials Manager:** Geocortex Essentials Manager is a web-based application that you use to create and manage Essentials [sites](#) and [viewers](#).
- **Geocortex Workflow Designer:** Geocortex Workflow Designer is a desktop application that you use to create and maintain [Geocortex workflows](#). Workflow Designer has a built-in help system with instructions for creating workflows.
- **Geocortex Report Designer:** Geocortex Report Designer is a desktop application that you use to create [report templates](#) and [print templates](#). Report Designer has a built-in help system with instructions for creating templates.
- **Geocortex Post Installer:** The Geocortex Post Installer is a desktop application that you use to activate the Essentials software, configure the web server that hosts the Essentials web applications, configure the method for signing in to Manager, and more. The *Geocortex Essentials Installation Guide* includes documentation for post-installation configuration.

You need a user name and password to run Manager. You do not need a user name and password to run the Post Installer, Report Designer, or Workflow Designer.

In addition to the configuration tools, Geocortex has a Language Tool. The Geocortex Language Tool enables you to internationalize Geocortex Essentials Manager. The Language Tool is installed when you install Essentials.

### 4.1.1 Launch Manager and Sign In

To run Manager, you require a user name and password. The type of account that you use to sign in to Manager depends on the sign-in method that is configured in the Post Installer. There are three sign-in methods:

- **Portal for ArcGIS:** Use a Portal for ArcGIS account to sign in to Essentials. Portal for ArcGIS performs the authentication.
- **ArcGIS Online:** Use an ArcGIS Online account to sign in to Essentials. ArcGIS Online performs the authentication.
- **Windows:** Use a Windows account to sign in to Essentials. Windows performs the authentication. Windows supports single sign-on. To be signed in to Essentials automatically, the administrator must already be signed in to Windows and the browser's security settings must have automatic authentication enabled under the current user name and password, for the appropriate zone. If one or more of these conditions is not met, the administrator will be prompted to sign in.

Windows supports single sign-on. If the Windows feature **Windows Authentication** is enabled, you may be signed in automatically when you launch Manager. For information, see "Configure Single Sign-On to Manager" in the *Geocortex Essentials Installation Guide*.




Geocortex Essentials Manager uses cookies. To use Essentials, cookies must be enabled in your web browser.




Do not edit a site in more than one location at one time or you will lose some of your changes. For example, do not edit a site in two different browsers or browser tabs at one time. Similarly, do not edit a site's configuration file manually at the same time that you edit the site in Essentials—always close one before you open the other.

#### ▶ To launch Geocortex Essentials Manager and sign in:


1. Launch the Geocortex Essentials Manager application on your computer.  
You can launch Essentials from your Start Menu. In the applications list, select the Latitude Geographics folder and the Geocortex Essentials Manager item inside.
2. If you are prompted to sign in, enter your user name and password, and then click **Sign In**.  
Depending on how Essentials is configured in the Post Installer, you either sign in using an ArcGIS account or a Windows account.

When you are signed in, the user icon  appears in Manager's banner. You can click the user icon to see the identity of the current user.

The first time you sign in to Manager, the [Site List](#) opens. The Site List lists all of your configured sites.

3. To open Manager's help system at the default topic, click the **Help** link in Manager's banner.  
To open the help system directly to the topic for Manager's current page, click the help icon .
- Manager's help system contains the same content as the *Geocortex Essentials Administrator Guide*.

#### ▶ To sign out of Manager:

1. Click the down arrow ▼ beside the user icon  in the banner area.
2. Click **Sign Out**.  
You are signed out immediately.


## 4.1.2 Launch Report Designer

### To launch Geocortex Report Designer:

1. Follow the instructions for the operating system you are using:
  - **Windows Server 2012 or Windows 8, and Newer Versions:**  
On the **Start** screen, type **Geocortex**, and then click **Geocortex Report Designer**.
  - **Windows Server 2008 or Windows 7, and Older Versions:**  
In the **Start** menu, select **All Programs | Latitude Geographics | Geocortex Essentials [Version] [Instance] | Geocortex Report Designer**.  
[Version] is the Essentials version number. [Instance] is the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.
2. To open Report Designer's help system, click **Open Help** in the **Help** menu.

## 4.1.3 Launch Workflow Designer

### To launch Geocortex Workflow Designer:

1. Follow the instructions for the operating system you are using:
  - **Windows Server 2012 or Windows 8, and Newer Versions:**  
On the **Start** screen, type **Geocortex**, and then click **Geocortex Workflow Designer**.
  - **Windows Server 2008 or Windows 7, and Older Versions:**  
In the **Start** menu, select **All Programs | Latitude Geographics | Geocortex Essentials [Version] [Instance] | Geocortex Workflow Designer**.  
[Version] is the Essentials version number. [Instance] is the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.
2. To open Workflow Designer's help system, click the help icon .

## 4.1.4 Launch the Post Installer

You can launch the Post Installer from the Windows Start screen or Start menu at any time after Essentials is installed.

► **To launch the Post Installer:**

1. Follow the instructions for the operating system that you are using:
  - **Windows Server 2012 or Windows 8, and Newer Versions:**  
On the **Start** screen, type **Post Install**, and then click **Post Installer**.
  - **Windows Server 2008 or Windows 7, and Older Versions:**  
In the **Start** menu, click **All Programs | Latitude Geographics | Geocortex Essentials [Version] [Instance] | Post Installer**.  
[Version] is the Essentials version number. [Instance] is the instance name, if Essentials is installed as a named instance. The default installation does not have an instance name.

The *Geocortex Essentials Installation Guide* includes documentation for the Post Installer. You can download the Installation Guide from the [Geocortex Support Center](#).

## 4.1.5 Launch the Geocortex Language Tool

The Geocortex Language Tool is installed when you install Essentials.

► **To launch the Geocortex Language Tool:**

1. On the Essentials server, locate `Geocortex.Globalization.LanguageTool.exe` in the file system.  
In the default installation, the Language Tool is here:  
`C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\Language Tool\Geocortex.Globalization.LanguageTool.exe`
2. Run `Geocortex.Globalization.LanguageTool.exe`.
3. To find the Language Tool's user guide, search for `Language Tool Guide.pdf` in the Essentials installation folder.  
In the default installation, the *Geocortex Language Tool User Guide* is here:  
`C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\Docs\Language Tool Guide.pdf`

## 4.2 Ways to Add Components to a Site

Manager has three methods of adding components to a site:

- Add
- Import
- Inherit (reference)

### 4.2.1 Add Components

Adding a component to a site adds the component with its default configuration.

In most cases, Manager uses wizards to add components to your site. The purpose of wizards is to step you through the configuration of a particular component's required settings or most important settings.

Some components have less important or optional settings that are not included in the wizard. Any setting that is not in the Add wizard is assigned a default value which you can modify after you finish the wizard.

Editing an item after you have added it to your site enables you to:

- Change the values of settings that you configured in the Add wizard.
- Change the values of settings that the wizard did not allow you to set.
- Add sub components, if the item you added supports any.

## 4.2.2 Import Components

After you have configured a component in one site using the Add function, you can import the component into as many other sites as you want. Importing a component copies the component and its configuration from the other site.

After you have imported the component, you can change its configuration. The original component and the imported copy are independent of each other—changing the configuration of one has no effect on the other.

Importing is often quicker and easier than adding, because it saves you from having to configure all of the component's settings. Also, you can import multiple components of a particular type at one time, as long as they are configured in the same site.

## 4.2.3 Inherit (Reference) Components

Referencing has two purposes:

- **Site Inheritance:** It enables a site to inherit the configuration of another site so you do not have to reconfigure components in multiple sites. See [Inherit Components from Another Site on page 60](#) for information.
- **ArcGIS Web Maps:** It enables you to include ArcGIS web maps in your sites. The web map can be from ArcGIS Online or Portal for ArcGIS. See [About ArcGIS Online Web Maps on page 102](#) for information.

**See Also...**

[References on page 187](#)

## 4.3 Ways to Configure Sites

There are two ways to configure sites:

- **Use Manager:** Essentials ships with a web-based tool for authoring and managing Essentials sites, Manager for Geocortex Essentials. This is the recommended method for configuring sites. For most applications, you can do all your configuration in Manager.
- **Edit the Site Configuration File:** You can edit site configuration file (`site.xml`) in a text editor. This method is recommended for advanced users only. You can introduce errors into the configuration by mistake. If you are developing a [custom extension](#), you must use this method.



If the configuration file contains invalid markup, the site will not work. You will not be able to edit the site in Essentials or load the site in a viewer.

## 4.4 Virtual Directories

Essentials supports the use of virtual directories to serve static content, such as images or other data files. For example, you could use a virtual directory for the images that you use in your viewers.

Virtual directories improve site portability and ease of deployment:

- **Portability:** Using a virtual directory enables you to keep your static content with the site configuration file, so you can put all the files needed for your site in a single zip file, port the zip file, and then extract the files directly to their correct locations.
- **Ease of deployment:** Using a virtual directory saves you from having to set up a web server to serve static content.



Do not put files containing sensitive content in virtual directories—security does not apply to virtual directories.



If Internet Information Services (IIS) is configured to deny anonymous access for either Essentials or the HTML5 Viewer, Geocortex Mobile App Framework may not work properly.



Essentials does not serve a site configuration file.




Essentials supports three levels of virtual directories:

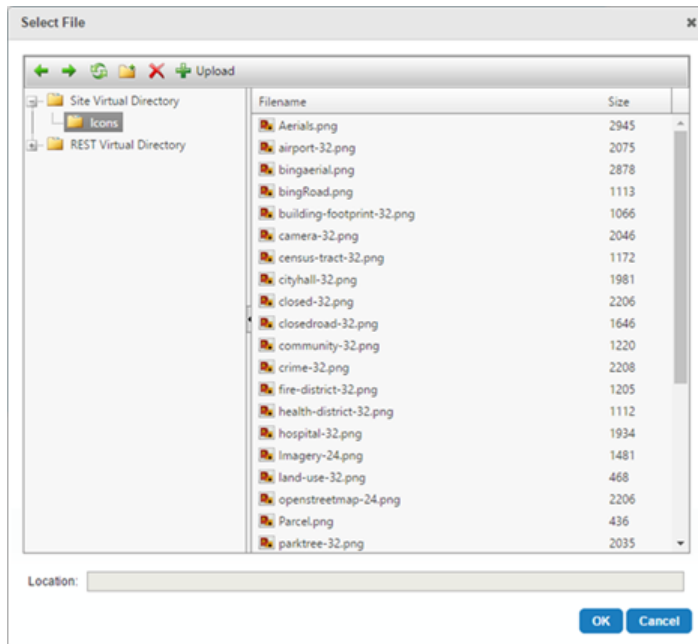
- Essentials's global virtual directory
- An Essentials site's virtual directory
- A viewer's virtual directory

### The Global Virtual Directory

Essentials provides a predefined, global virtual directory, the REST Virtual Directory. The global virtual directory is used to store content that is shared between sites.

The global virtual directory is called `VirtualDirectory` and is located in the `Sites` folder.

In Manager, there is a Browse button anywhere that you can configure a URI to static content, for example, where you select the icon to represent a layer in the viewer. Click the Browse button to open a dialog box for selecting and managing virtual directory files. The management tools include tools to create new folders , upload files , and delete files and folders .



### Dialog box to work with the global (REST) virtual directory and the site's virtual directory

When you select a file, Manager displays the file's location in the Location box. The location contains a [client token](#) in the file path, which represents the URL of the selected virtual directory.

In the default Essentials deployment, the global virtual directory's URL is:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST
Elements\Sites\VirtualDirectory
```

## Virtual Directories for Sites

Each site can have a virtual directory. A site's virtual directory is used for content that is specific to the site.

A site's virtual directory can have subdirectories. This means you can keep the static content for your sites organized according to the standard scheme for websites.

Unlike the global virtual directory and viewer virtual directories, which are created by Essentials, you must add the virtual directories for sites. See [Create a Virtual Directory for a Site on page 35](#) for instructions.

By convention, virtual directories for sites are named `VirtualDirectory` in the file system, like the global and viewer virtual directories. If you use a different name for a site's virtual directory, the virtual directory is still referred to as `virtualdirectory` in URLs—virtual directories for sites are always referred to as `virtualdirectory` in URLs, no matter what name you have given the folder in the file system.

For a site with the name LA County in a default Essentials deployment, the URL for a site's virtual directory is:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\Sites\LA_
County\VirtualDirectory
```

## Virtual Directories for Viewers

Essentials creates a virtual directory for each Geocortex viewer that you add to a site. When you configure a viewer in

Manager, there is a Browse button anywhere that you can configure a URI to static content, for example, where you select the viewer's banner images. Click the Browse button to open a dialog box for selecting and managing files in the viewer's virtual directory.

For a viewer with the name Html5Viewer which belongs to a site with the name LA County, the URL for a viewer's virtual directory in a typical Essentials deployment is:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\Sites\LA_
County\Viewers\Html5Viewer\VirtualDirectory
```

## 4.4.1 Create a Virtual Directory for a Site

### To create a virtual directory for a site:

1. If you already have a folder that contains the site's static content, move the folder to the site's folder. Otherwise, create a new subfolder in the site's folder. By convention, the folders for virtual directories are named `VirtualDirectory`.

By default, the site's folder is:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\Sites\
[site name]
```

2. In Essentials, edit the site that you want to configure, and then select **Site Info** from the side panel.
3. In the **Additional Information** area, click the **Select** hyperlink near **Virtual Directory**.
4. Select the folder that you want to use as the virtual directory.  
The folder's location appears in the Selected Path box. The path uses the {RootPath} [server token](#).
5. Click **OK**.
6. Click **Save Site**.

## 4.5 Replacement Tokens

Replacement tokens are placeholders that represent different aspects of a site and its data.

- **Server and Client Tokens:** Represent file locations and URIs in your Essentials installation. Manager uses tokens when displaying file locations, and you can use tokens when you configure file paths and URIs in Manager. Using server and client tokens improves the portability of your site—it makes it possible to migrate your site from one installation of Essentials to another without having to update file paths or URIs. It also reduces the possibility of spelling and typing errors.  
The Essentials server replaces server and client tokens with the values that they represent. Viewers never process server and client tokens.
- **Map Service, Layer, Field, Object, and Data Link Tokens:** Represent aspects of the item that is currently being processed. These tokens are replaced by the viewer, not the Essentials server.  
For example, suppose an end user performs an identify operation that finds several features. They find a hospital, a county, and so on. You have used layer tokens, map service tokens, and field tokens in the feature descriptions.



When the viewer displays the hospital feature in the Results List, the viewer interprets the layer tokens in the feature description to represent aspects of the **Hospitals** layer. When the viewer displays the county feature, the viewer interprets layer tokens to represent aspects of the **Counties** layer.

Similarly, for the hospital feature, map service tokens represent the map service that the **Hospitals** layer belongs to, and field tokens represent the hospital feature's fields. For the county feature, map service tokens represent the map service that the **Counties** layer belongs to, and field tokens represent the county feature's fields.

Using map service, layer, field, object, and data link tokens make it easier to maintain your site. They also improve the usability of your viewers.



Replacement tokens are case sensitive. To ensure you use the correct capitalization, use the [Rich Text Editor](#) to insert replacement tokens into the configuration.

## 4.5.1 Server Replacement Tokens

Server tokens are values that are replaced on the server. Server tokens allow you to substitute server paths and URIs with actual values, without having to know where Essentials is installed on the disk. When a site is loaded, Essentials replaces any server tokens that appear in the site configuration with the actual values that the tokens represent.

Server tokens are usually used to reference resources which reside on the server and are not publicly accessible.

Essentials supports the following server tokens:

- **{RootPath}**: Represents the fully qualified path of the Geocortex Essentials sites folder, using file path notation.  
Example: `{RootPath}\Viewers\Html5Viewer`
- **{SitePath}**: Represents the fully qualified path to the directory containing the site configuration file.  
Example: `{SitePath}\Resources`
- **{RootUri}**: Represents the URI to the REST API Sites directory in the file system (not the HTTP-based URL to the root REST endpoint).  
Example: `{RootUri}Workflows/SearchForSchools.xml`
- **{SiteUri}**: Represents the URI to the site within the REST API Sites directory in the file system (not the HTTP-based URL to the site's REST endpoint).  
Example: `{SiteUri}/Resources/TemplateReports/LowIncome.rpx`

Use the `{RootUri}` and `{SiteUri}` tokens when the property requires a web URI, such as when using print templates. The URIs generated by these tokens are not publicly accessible web URLs.

Use the `{RootPath}` and `{SitePath}` tokens when a file system path is required.

## 4.5.2 Client Tokens

Client tokens are values that are replaced on the client (the viewer) at runtime. They are usually used to represent publicly accessible resources such as images needed for a viewer application.

Essentials supports the following client tokens:

- **{VirtualDirectoryUrl}**: Represents the URL to the site's virtual directory.
- **{SiteRestUrl}**: Represents the URL to the site.

- **{RestVirtualDirectoryUrl}**: Represents the URL to the global virtual directory of the Essentials REST application.
- **{HostUri}**: Represents the URL of the web application or website that is hosting the viewer, or the file system root URL of the application if you are consuming the site through a WPF application.
- **{RestToken}**: Represents the Essentials access token. Applications must supply the access token to access Essentials when [Layer Security](#) is in force and [Anonymous Access](#) is disabled. Use **{RestToken}** with the token URL parameter to configure URLs that point back to the Essentials server from a viewer.  
For example, if the layer is secured and Anonymous Access is disabled, the URL that a viewer would use to access a feature attachment might look like this:  

```
http://server.domain.com/sites/mysite/map/mapservices/0/MapServer/26/attachments/3601?token={RestToken}
```

**See also...**

Example 1 in [Layer Tokens on page 39](#)

## 4.5.3 Map Service Tokens

Map service tokens are placeholders that represent properties of the map service that the current layer belongs to. They enable you to configure text and hyperlinks that Essentials interprets differently for different map services, even though the configuration is identical. Map service tokens can be used in [feature labels and feature descriptions](#), [feature hyperlinks](#), and [layer hyperlinks](#).

Essentials supports the following map service tokens:

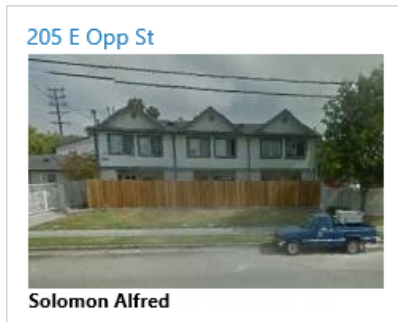
- **{MapServiceDisplayName}**: Represents the display name that is configured for the current map service. The display name is configured in the Display Name box on the map service's [Details tab](#).  
The **{MapServiceDisplayName}** token is useful if you are presenting information about the map service to the end user.
- **{MapServiceId}**: Represents the ID of the current map service. The ID is shown on the map service's [Details tab](#).  
The **{MapServiceId}** token is useful for operating on the current map service.
- **{MapServiceUrl}**: Represents the URL for the current map service, without the protocol (`http` or `https`). For example, if an ArcGIS Server map service called MapServer is deployed to the default location in ArcGIS Server, then **{MapServiceURL}** represents `server.domain.com/arcgis/rest/services/MapServer`.  
The URL is configured in the Service URL box when you [edit the map service's connection settings](#).
- **{MapServiceToken}**: Represents the security token for the current map service.  
The **{MapServiceToken}** replacement token is useful for accessing the current service when the service is secured using [ArcGIS token security](#).

**Example: Show Images from a Token-Secured Service**

Suppose you have a site that includes a token-secured ArcGIS Server map service with a Tax Parcels layer. Each feature in the Tax Parcels layer has a photo that is configured as a feature attachment. You want the photo to be displayed in search and identify results, so end users can easily scan the results.

- You want the parcel's address to appear at the top.
- The photo should appear underneath the parcel address.

- The owner's name should appear underneath the photo.



### Desired appearance of a Tax Parcels feature in search and identify results

To configure this, you use the Tax Parcels layer's Feature Label and Feature Description settings.

The Feature Label appears above the Feature Description in search and identify results, so you use the Feature Label for the parcel's address. To show the address for the current feature, you use a [field token](#). The field in the Tax Parcels layer that contains the address is called SITEADDRESS, so you enter `{SITEADDRESS}` as the Feature Label.

The Feature Description has two parts: the photo and the owner's name. For the photo, you define an HTML image tag (`<img>`) that specifies the URL for the attachment file that contains the photo. You use a combination of map service tokens, [layer tokens](#), and [field tokens](#).

The image tag looks like this:

```

```

Here is the definition for each map service token:

- `{MapServiceUrl}` is the map service token that represents the map service's URL, for example, `server.domain.com/arcgis/rest/services/MyCity/MapServer`.
- `{LayerId}` is the layer token that represents the ID of the current layer, in this case, the Tax Parcels layer.
- `{OBJECTID}` is the field token that represents the OBJECTID field. Each feature in the Tax Parcels layer has a unique OBJECTID. The `{OBJECTID}` token identifies the current feature.
- `{PHOTOID}` is the field token that represents the PHOTOID field, which contains the ID of the attachment to display in the feature description.
- `{MapServiceToken}` is the security token that Essentials uses to access the map service in ArcGIS Server.

To display the owner's name, you use the `{OWNERFIRSTNAME}` and `{OWNERLASTNAME}` field tokens.

Feature Label:	<input type="text" value="{SITEADDRESS}"/>	<input type="button" value="Edit..."/>
Feature Description:	<pre>&lt;img src="https://{MapServiceUrl}/{Layerid}/{OBJECTID}/attachments/{PHOTOID}?token={MapServiceToken}" alt="Image" height="200" width="300"&gt;&lt;br/&gt;&lt;span style="font-style: normal; font-weight: bold; line-height: 150%"&gt;{OWNERFIRSTNAME}&amp;nbsp;{OWNERLASTNAME}&lt;/span&gt;</pre>	<input type="button" value="Edit..."/>

### Configuration that controls the content and appearance of search and identify results

By default, the HTML5 Viewer shows the Feature Long Description in search and identify results, not the Feature Description. To make the viewer show the Feature Description instead of the Feature Long Description, you [set the Results List Content Field setting](#) for the viewer to **Feature Description**.

▶ **To insert map service tokens using the Rich Text Editor:**



If you know the name of the map service token you want to insert, you can simply type it in. Make sure you use the correct capitalization when you type in a map service token. Essentials does not recognize the token if the capitalization is wrong.

1. Click the **Edit...** button beside the item that you are configuring.  
Every configuration item that can contain map service tokens has an Edit button beside it.
2. In the bottom box, type as much of the item's configuration as you can, omitting the map service tokens.
3. Position the cursor where you want to insert a map service token.
4. Use the **Replacement Token** drop-down menu to select a map service token.
5. Click **Insert**.  
The map service token is inserted at the cursor position.
6. Continue to insert as many map service tokens as you want.
7. Click **OK**.

**See also...**

[About Feature Descriptions on page 191](#)

[Feature Hyperlinks on page 233](#)

[Layer Hyperlinks on page 230](#)

[Custom Properties on page 471](#)

## 4.5.4 Layer Tokens

Layer tokens are placeholders that represent properties of the current layer, including any [custom properties](#) that you have defined. They enable you to configure text and hyperlinks that viewers interpret differently for different layers, even though the configuration is identical. Layer tokens can be used in [feature labels and feature descriptions](#), [feature hyperlinks](#), and [layer hyperlinks](#).

For example, suppose you configure the feature descriptions in both the Cities layer and the Streams layer to say **This feature is in the {LayerDisplayName} layer**. In a viewer, a city's feature description appears as **This feature is in the Cities layer**. A stream's feature description appears as **This feature is in the Streams layer**. Now suppose you change the display name of the Cities layer to **Urban Areas** in Essentials. When a user selects a feature on the Cities layer, the feature description now appears as **This feature is in the Urban Areas layer**.

Essentials supports the following predefined layer tokens:

- **{LayerDisplayName}**: Represents the display name that is configured for the current layer. The display name is configured in the Display Name box on the layer's [Details tab](#).  
The **{LayerDisplayName}** token is useful if you are presenting information about the layer to the end user.
- **{LayerId}**: Represents the ID of the current layer. The Layer ID is shown on the layer's [Details tab](#).  
The **{LayerId}** token is useful for operating on the current layer.

- **{LayerName}**: Represents the current layer's name in the underlying map service. The Layer Name is shown on the layer's [Details tab](#).
- **{LayerDescription}**: Represents the description that is configured for the current layer. The description is configured in the Description box on the layer's [Details tab](#).  
The {LayerDescription} token is useful if you are presenting information about the layer to the end user.

### Example 1: Use Layer Tokens to Construct URLs and User Interface Text

This example uses layer tokens to construct a hyperlink that points to the metadata for the current layer.

1. To start, name each metadata file after its layer.  
For example, the metadata for the Airports layer is in a file called `Airports.html`. You create a `Metadata` folder in the site's virtual directory where you place the metadata files. You also have an `Icons` folder in the virtual directory, where you place the image file for the hyperlink's icon.
2. Edit the Airports layer in Manager and add a layer hyperlink.
3. Use the {LayerDisplayName} token in the hyperlink text and the tooltip.
4. Use the {LayerName} token in the hyperlink's URI and the icon's URI.  
To construct the URIs, you use the {VirtualDirectoryUrl} [client token](#) to point to the site's [virtual directory](#), and the {LayerName} layer token to construct the file names:

- **Hyperlink URI:** {VirtualDirectoryUrl}/Metadata/{LayerName}.html
- **Icon URI:** {VirtualDirectoryUrl}/Icons/{LayerName}.png

The screenshot shows a dialog box titled "Create/Edit Layer Hyperlink". It contains the following fields and controls:

- Hyperlink Text:**
- URI:**
- Encode Replacement Values:**
- Tool Tip:**
- Icon URI:**
- Target:**

At the bottom right, there are  and  buttons.

Layer hyperlink configuration containing layer tokens

### Example 2: Use a Layer Token as a Workflow Argument

This example uses a layer token as a workflow argument.

Suppose you are creating a workflow that operates on a layer. You name the workflow **OperateOnLayer**. To allow the workflow to operate on different layers, you define an input parameter that takes the ID of the layer to operate on. You name the parameter **LayerID**.

You could make the workflow operate on a specific layer by specifying the layer ID. For example, you could configure a hyperlink that makes the workflow operate on layer 19 by specifying **LayerId=19**, and then you could configure another hyperlink that makes the workflow operate on **LayerId=23**, and so on. You need to configure the hyperlink differently for each layer.

To create a single, generic, hyperlink that makes the workflow operate on the current layer, you use the `{LayerId}` token instead of a specific layer ID:

```
<a href="command:RunWorkflowWithArguments?workflowId=OperateOnLayer&LayerID={LayerId}">Run workflow on {LayerDisplayName} layer</a>
```

You could use a hyperlink like this in [feature descriptions](#).



If you know the name of the layer token you want to insert, you can simply type it in. Make sure you use the correct capitalization when you type in a layer token. Essentials does not recognize the token if the capitalization is wrong.

#### **To insert layer tokens using the Rich Text Editor:**

1. Click the **Edit** button beside the item that you are configuring.  
Every configuration item that can contain layer tokens has an Edit button beside it.
2. Use the **Replacement Token** drop-down menu to select a layer token.
3. Fill in the item's text box with rich-text content, omitting any field tokens.  
For multi-line text boxes, you can input rich text content using WYSIWYG toolbar to apply rich-text features like bold, italic, or colors.
4. Position the cursor where you want to insert the layer token that you selected.
5. Click **Insert**.  
The layer token is inserted at the cursor position.
6. Continue to insert as many layer tokens as you want.
7. Click **OK**.

#### **See also...**

Example in [Map Service Tokens on page 37](#)

[About Feature Descriptions on page 191](#)

[Feature Hyperlinks on page 233](#)

[Layer Hyperlinks on page 230](#)

[Custom Properties on page 471](#)

## 4.5.5 Field Tokens

Field tokens are placeholders that represent a layer's fields, in other words, feature attributes. They enable you to create text and hyperlinks that vary according to attributes of the current feature.


Field tokens can be embedded into the configuration of some text items and URIs. When the item is displayed in the viewer, the token is replaced with the field's value for the selected layer. For example, if the user selects Gastonia on the Cities layer, the `{CITY_WEBSITE}` field token is replaced by `http://www.cityofgastonia.com`.

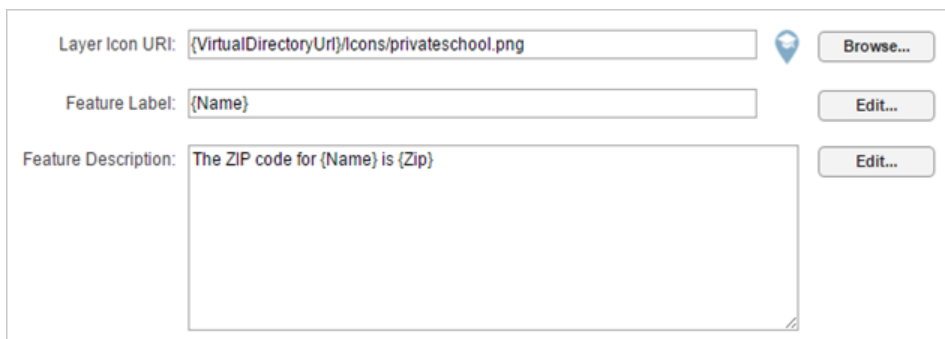
Field tokens can be used to configure [feature labels and feature descriptions](#), and in [feature hyperlinks](#).

### Example: Use Field Tokens to Display Feature Information

This example uses field tokens to display feature information for the LA County sample site's Public Schools layer. To set up the LA County sample site included with Essentials, see [Explore a Sample Site on page 11](#).

#### ► To apply field tokens to a layer's fields in Manager:

1. To start, navigate to the Maps page in Manager.
2. From the Layer List, select the  **Edit** icon next to the Public Schools layer.
3. From the Details tab, locate the Feature Label and Feature Description fields.
4. Use the **Edit...** button next to the Feature Label field to bring up the Edit Feature Label dialog.
5. Remove any existing text from the Feature Label field.
6. Use the **Replacement Token** drop-down menu and choose the Name field.
7. Use the **Insert** button to copy the Name field's replacement token into the Feature Label field.  
This inserts the replacement token `{Name}` into the Feature Label field. You can insert additional replacement tokens as well as plain text into this field.
8. Use the **OK** button to save your changes.
9. Use the **Edit...** button next to the Feature Description field to bring up the Edit Feature Description dialog.
10. Insert the Name and Zip replacement tokens into the Feature Description text box.  
For this example, embed the replacement tokens into a sentence format:  
The ZIP code for `{Name}` is `{Zip}`



The screenshot shows a configuration dialog with three main sections:

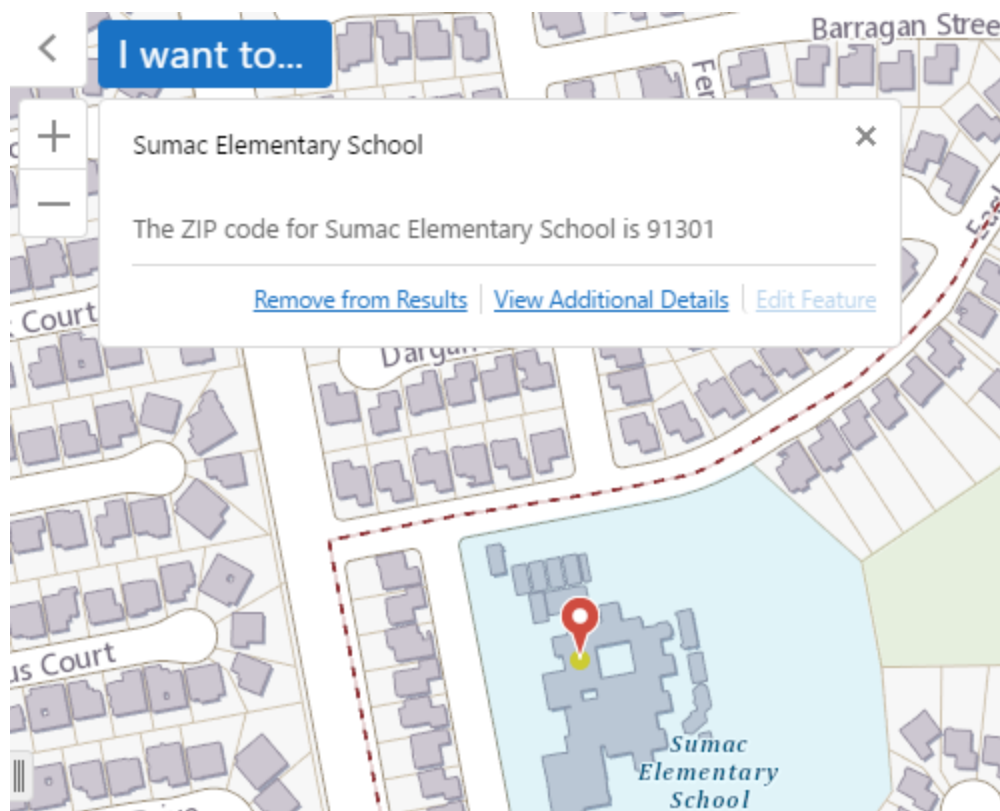
- Layer Icon URI:** A text input field containing `{VirtualDirectoryUri}/icons/privateschool.png` and a **Browse...** button.
- Feature Label:** A text input field containing `{Name}` and an **Edit...** button.
- Feature Description:** A larger text area containing `The ZIP code for {Name} is {Zip}` and an **Edit...** button.

The Feature Label and Feature Description fields configured with field tokens

11. Use the **OK** button to save your changes.
12. For the sake of quickly checking our changes in the viewer, scroll to the Supported Operations section of the Details tab and select the **Include in Global Search** checkbox.
13. Use the **Apply Changes** button at the top or bottom of the Details tab to apply these changes.
14. Use the **Save Site** button to save the changes to the site.

After applying your changes and saving the site, launch the viewer to verify your configuration. Search for "elementary school" and you should see your configured field tokens in the feature labels and feature descriptions on the results list. When you select a result, you can also see the configured field tokens in the label and description areas of the result view.

If you select a feature from the Public Schools layer on the map, you can also see your configured field tokens on the feature's map tip.



A Feature Label and Feature Description containing field tokens displayed on a map tip



If you know the names of the field tokens that you want to insert, you can simply type them in. Make sure you use the correct capitalization when you type in a field token—Essentials does not recognize the token if the capitalization is different than in the map service. For example, the field token for the CITY field is {CITY}, not {City} or {city}.



► **To insert field tokens using the Rich Text Editor:**

1. Select the **Edit...** button beside the item that you are configuring.  
Every configuration item that can contain field tokens has an Edit button beside it.
2. Use the **Replacement Token** drop-down menu to select a field token.
3. Fill in the item's text box with rich-text content, omitting any field tokens.  
For multi-line text boxes, you can input rich text content using WYSIWYG toolbar to apply rich-text features like bold, italic, or colors.
4. Position the cursor where you want to insert the field token that you selected.
5. Use the **Insert** button.  
The field token is inserted at the cursor position.
6. Continue to insert as many field tokens as you want.
7. Click **OK**.

**See also...**

Example in [Map Service Tokens on page 37](#)

[About Feature Descriptions on page 191](#)

[Feature Hyperlinks on page 233](#)

## 4.5.6 Object Tokens

Object tokens are placeholders that represent GIS objects, specifically features, graphics, and geometries. They enable you to define [hyperlinked viewer commands](#) that take objects related to the current feature as parameters.

In the viewer, each object token is replaced with the object that the token represents, for the current layer. For example, you could create a hyperlink that executes the `ZoomToFeature` command on the current feature when a user selects the hyperlink.

Essentials has three object tokens:

- `{ $Feature }`: Represents the current feature.
- `{ $Graphic }`: Represents the graphics object associated with the current feature.
- `{ $Geometry }`: Represents the geometry of the graphics object associated with the current feature.



You can use the `{ $Graphic }` and `{ $Geometry }` object tokens with the `RunWorkflowWithArguments` command. You cannot use the `{ $Feature }` object token with the `RunWorkflowWithArguments` command.



You cannot use the [Rich Text Editor](#) to enter object tokens. You must type object tokens into the HTML markup. Make sure you use the correct capitalization when you type in an object token. Essentials does not recognize the token if the capitalization is wrong.

## Example: {\$Geometry}

Because workflows can take geometries as parameters, the {\$Geometry} token is particularly useful for hyperlinks that run workflows. This example illustrates how to pass the geometry of the current feature to a workflow. The workflow is run using the `RunWorkflowWithArguments` command.

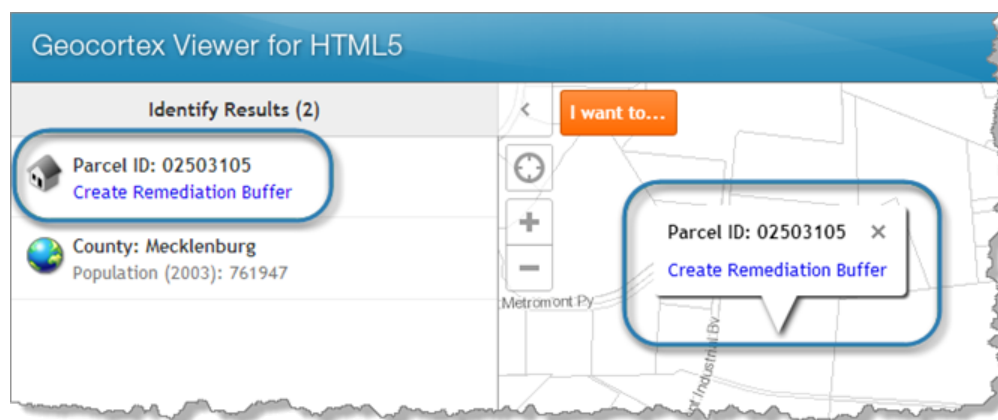
Suppose you are working on a project to remediate contaminated soil at an old industrial site. In addition to the parcel itself, you are responsible for an area surrounding the parcel where contaminants have seeped. To help you define the area to be remediated, you have a workflow that buffers the current parcel. The workflow takes the parcel's geometry as an argument.

You have already added the workflow to your site. The workflow's ID is `BufferParcel`.

To make the workflow available in the viewer, you edit the Parcels layer and define a hyperlink in the Feature Description that runs the workflow. The markup for the hyperlink is:

```
<a href="command:RunWorkflowWithArguments?workflowId=BufferParcel&ParcelGeometry={
  {$Geometry}">Create Remediation Buffer</a>
```

After applying your changes and saving the site, you launch the viewer to verify your configuration. You zoom in close enough to see individual parcels, and then you use an Identify tool to identify a parcel. You also click the parcel on the map to see its map tip. To test the workflow, you click one of the hyperlinks.




Hyperlink that runs a workflow, in the results list (left) and in a map tip

## 4.5.7 Data Link Tokens

Data link tokens are placeholders that represent the fields in a [data link](#). They are similar to [field tokens](#), except that they represent the fields in a data link instead of a layer.

Data link tokens enable you to create text and hyperlinks that vary according to the current feature. When an item that contains a data link token is displayed in a viewer, the viewer replaces the token with the value of the specified field in the specified data link. The data link must be configured for the layer that the current feature belongs to.

Like field tokens, you can embed data link tokens in the [Feature Description and Feature Long Description](#), and in [feature hyperlinks](#).

The form of a data link token is `{DataLinkId.FieldName}`. You can find out the data link ID from Manager. You can find out the field name by editing the data link in the  Advanced page.



You cannot use the Rich Text Editor to insert data link tokens. Instead, you must input them manually.

For example, suppose a user identifies a particular parcel on the **Parcels** layer. The Parcels layer does not have owner information in it. However, it has an **OwnerInfo** data link configured for it, which links to a database of owner information. If the feature description for the Parcels layer contains the `{OwnerInfo.OwnerName}` data link token, the token is replaced by the value of the **OwnerInfo** data link's **OwnerName** field when it is displayed in the Results List.

Suppose a parcel has many owners—this is a **one-to-many** relationship. In this case, the viewer would replace the `{OwnerInfo.OwnerName}` token with the **first** name found. Viewers always display the first value if there is more than one.

### 4.5.8 Relationship Tokens

Relationship tokens are placeholders that represent the fields in a layer or [table](#) related to another layer. They are similar to [field tokens](#), except that they represent the fields in a related layer or table.

Relationship tokens enable you to create text and hyperlinks that vary according to the current feature. When an item that contains a relationship token is displayed in a viewer, the viewer replaces the token with the value of the specified field in the specified related layer or table.

Like field tokens, you can embed relationship tokens in the [Feature Description and Feature Long Description](#). However, you cannot embed relationship tokens in the [Feature Label](#) or in [feature hyperlinks](#).

The form of a relationship token is `{RelationshipName.FieldName}`. To determine the relationship name, edit the [relationships](#) of a layer in Manager, or look at the ArcGIS Layer endpoint. You must get the field name from the data source itself, that is, the ArcGIS Layer or Table. Related layer or table field names are not available in Manager.



Because Manager does not know the field names in related layers or tables, you cannot use the Rich Text Editor to insert relationship tokens. You must insert them manually.

For example, suppose a user identifies a particular parcel on the **Parcels** layer. The Parcel layer does not have owner information in it, however, it has an **OwnerInfo** relationship configured for it, which links to the **OwnerInfo** table of owner information. If the feature description for the Parcels layer contains the `{OwnerInfo.OwnerName}` relationship token, the token is replaced by the value of the **OwnerInfo** table's **OwnerName** field when it is displayed in the Results List.

If a parcel has many owners, it has a **one-to-many** relationship. In this case, the viewer would replace the `{OwnerInfo.OwnerName}` token with the first name found. Viewers always display the first value if there is more than one.

## 4.6 Hyperlinks in the Viewer

Including hyperlinks in your application's user interface is a powerful way to improve the usability of the viewer. Whenever possible, Essentials creates hyperlinks out of configured URLs that are displayed in the viewer.

In addition, Essentials has a variety of features and tools for creating links in the viewer:

- **Layer Hyperlinks:** Links to web pages that are relevant to the layer. Layer hyperlinks appear in a layer's or map service's context menu in the Layer List. Layer hyperlinks can contain layer tokens. For more information, see [Layer Hyperlinks on page 230](#)

- **Feature Hyperlinks:** Links to web pages containing information that is relevant to the feature. Feature hyperlinks appear in the feature's details. Feature hyperlinks can contain field tokens. For more information, see [Feature Hyperlinks on page 233](#).
- **HTML anchor tags:** Some settings that you configure in Manager can contain HTML, including anchor (<a>) elements. Specifically, the Feature Label, Feature Description, and Feature Long Description text boxes on a layer's Details tab support HTML. Manager has a built-in [Rich Text Editor](#) that converts your configuration to HTML. To open a layer's Details tab, [edit the layer](#).
- **Viewer Commands in Hyperlinks:** Viewer commands can be embedded in HTML anchor (<a>) elements. The command executes when the user clicks the hyperlink. For more information, see [Viewer Commands in Hyperlinks on page 47](#).
- **Layer Tokens:** Placeholders that represent layer properties. Layer tokens enable you to define dynamically generated hyperlinks that depend on the current layer. For more information, see [Layer Tokens on page 39](#).
- **Field Tokens:** Placeholders that represent feature attributes. Field tokens enable you to define dynamically generated hyperlinks that depend on the current feature. For more information, see [Field Tokens on page 42](#).
- **Object Tokens:** Placeholders that represent objects. Object tokens let you pass an object representing the current feature to a viewer command. For more information, see [Object Tokens on page 44](#).
- **Data Link Tokens:** Placeholders that represent the fields in a data link. Data link tokens enable you to define dynamically generated hyperlinks that depend on the current feature's data links. For more information, see [Data Link Tokens on page 45](#).

See also...

[About Feature Descriptions on page 191](#)

## 4.6.1 Viewer Commands in Hyperlinks

Viewer commands can be embedded in HTML anchor <a> elements. When the user clicks the hyperlink, the command executes. For example, an anchor element with a call to the `ZoomToInitialExtent` command in it returns the map to its initial extent when the user selects the hyperlink.

Viewer commands can be used in the Feature Description and Feature Long Description text boxes on a layer's Details tab in Manager. These two text boxes can have HTML entered into them. To open a layer's Details tab, edit the layer.

You can use any viewer command in feature descriptions and feature long descriptions. For a complete list of available commands, refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

To configure a viewer command in an HTML anchor element, you put `command:CommandName` in the `href` attribute, where `CommandName` is the name of the viewer command. In its simplest form, an anchor element containing a viewer command looks like this:

```
<a href="command:CommandName">Hyperlink Text</a>.
```

In this case, the viewer command does not have any parameters.

For a command that takes parameters, the command name is followed by a question mark and a query string that specifies the parameters:

```
<a href="command:CommandName?QueryString">Hyperlink Text</a>.
```

Query strings:

- must be HTML-encoded and URL-encoded
- can contain [field tokens](#) and [object tokens](#)
- can use HTTP query string syntax or JSON encoding



You cannot use Manager's built-in Rich Text Editor to enter viewer commands. You must insert them manually.

Layer Icon URI:

Feature Label:

Feature Description:

Search Results: joshua memori...

Joshua Memorial Park  
Municipal Services | Cemeteries

[More Information...](#)

Map view showing Joshua Memorial Park location with a red pin and a blue callout box.

Hyperlinked viewer command in Manager (top) and in the viewer

## Examples

- **Commands with no parameters:**

```
<a href="command:OpenOverviewMap">Open Overview Map</a>
```

- **Commands with parameters:**

- **Parameter is a string:**

```
<a href="command:RunWorkflowById?Basic_Workflow">Basic Workflow</a>
```

- **Parameter contains an object token:**

```
<a href="command:ShowFeatureDetails?{$Feature}">Show Details</a>
```

- **Parameters for the RunWorkflowWithArguments command:**

The `RunWorkflowWithArguments` command is used to run workflows that take one or more arguments. In this case, the command parameters are key-value pairs, where the key is the argument's name that you defined in Workflow Designer.

In the following example, the workflow takes two arguments: `parcelId` and `geometry`. `{PID}` is a field token that represents the parcel ID of the currently selected parcel. `{Geometry}` is an object token that represents the geometry of the currently selected feature. In this context, the feature is a parcel.

```
<a href="command:RunWorkflowWithArguments?workflowId=Workflow1&parcelId={PID}&geometry={$Geometry}">Run Workflow</a>
```



To run a workflow, you must specify the workflow ID in addition to the workflow arguments.



You can use the `{Graphic}` and `{Geometry}` object tokens with the `RunWorkflowWithArguments` command. You cannot use the `{Feature}` object token with the `RunWorkflowWithArguments` command.

- **Parameters are JSON-encoded:**

```
<a href="command:ZoomToExtent?{"xmin": 1384615, "ymin": 460976, "xmax": 1536998, "ymax": 646328 }">Zoom to Extent</a>
```

#### See Also...

[Field Tokens on page 42](#)

[Object Tokens on page 44](#)

[About Feature Descriptions on page 191](#)

## 4.7 The Geocortex Services Enhancement Proxy



The Geocortex Services Enhancement Proxy is a legacy component that should only be enabled for applications that use the Geocortex Viewer for Silverlight or the Geocortex Viewer for HTML5 version 2.5.2 or older.

The Geocortex Services Enhancement Proxy is a reverse proxy that standardizes how map data is represented in Essentials, so the data can be consistently represented in the Silverlight viewers. The Services Enhancement Proxy offers the following enhancements:

- **Coded Value Domains:** Display values from coded value domains, and search for domain values using Global Search or any other type of query that returns features.
- **Date/Time Formatting:** Adjust date/time data to the user's time zone.
- **Number Formatting:** Format numeric data for the user's locale, for example, use commas instead of decimal points for French locales.
- **Pixel Tolerance:** Apply pixel tolerance to line and polygon identify operations.
- **Global Search Word Order:** Compensate for word order in Global Search.

Configuring the Services Enhancement Proxy provides all of these enhancements to Silverlight viewers. The HTML5 Viewer has built-in support for coded-value domains. To configure formatting for date/time and number data, follow the instructions in [Format Date/Time and Number Fields on page 329](#).



The Geocortex Services Enhancement Proxy works with ArcGIS Server map services only.

### 4.7.1 Coded Value Domains

The [Silverlight Viewer](#) and [HTML5 Viewer](#) provide different support for coded value domains. Both types of viewer are capable of displaying and searching on domain values, including domain values in subtypes.

You do not need to use the Services Enhancement Proxy to include domain values in reports. For information, see [Coded Value Domains in Reports on page 51](#).

#### Coded Value Domains in Silverlight Viewers

To display or query on domain values in Silverlight viewers, you must configure the Geocortex Services Enhancement Proxy. You can configure a map service to show only values, only codes, or both values and codes in Silverlight viewers.

When you enable the Services Enhancement Proxy, Essentials creates a field for the domain value. You can use the layer's [Fields](#) tab to configure the visibility and searchability of the field itself, which contains the code, and the field that Essentials creates, which contains the value. This allows you to configure settings for codes and values separately. You can also use the fields that Essentials creates in workflows.

By default, all of a layer's fields are visible and searchable. This means that, by default, Silverlight viewers show and search both the code and the value.



The fields that Essentials creates are local to Essentials—they are not added to the source map service.

For instructions on hiding codes, see [Hide Coded Value Domain Codes on page 337](#).

### Coded Value Domains in HTML5 Viewers

The HTML5 Viewer has built-in support for coded value domains. You do not need to configure the Geocortex Services Enhancement Proxy to show domain values in HTML5 viewers.

- HTML5 viewers display domain values in all contexts.
- To search for features with a particular domain value, users search on the value, not the code.

You cannot display or search on codes in an HTML5 viewer.

### Coded Value Domains in Reports

Reports have built-in support for coded value domains. You do not need to configure the Geocortex Services Enhancement Proxy to show domain values in reports.

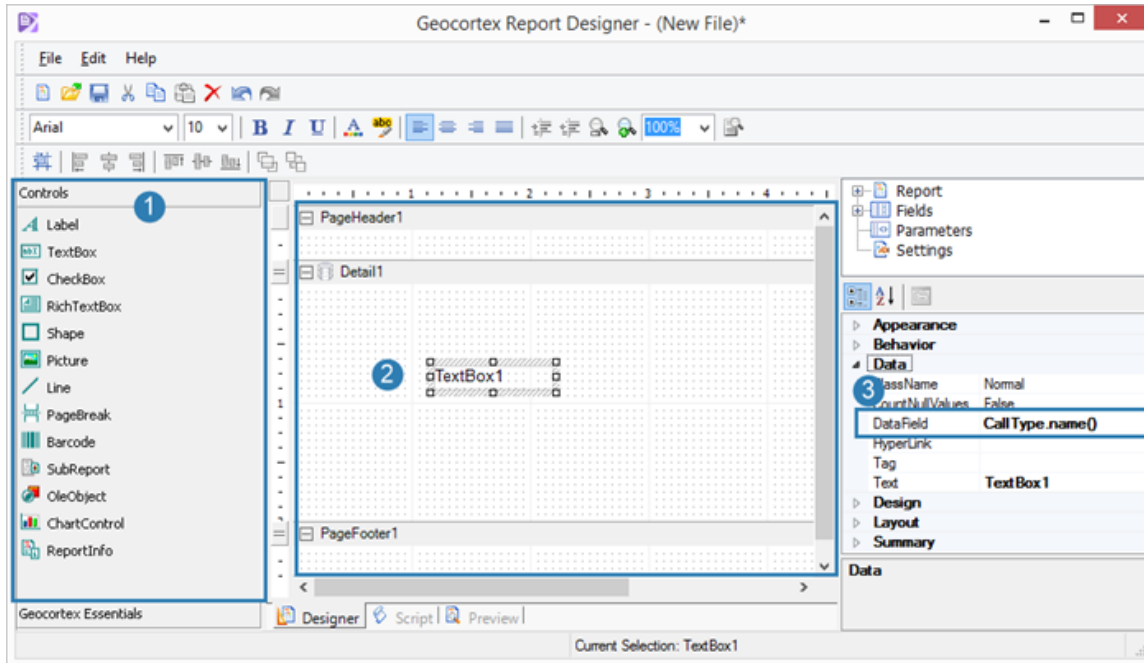
When you create a report template in Geocortex Report Designer, the DataField property for components that you drag from the Controls panel is initially blank. You must type in the name of the field that you want to show in that component:

- **Code:** To show a field's code in the component, type the ArcGIS Server field name in the DataField box.
- **Value:** To show the field's value in the component, type the ArcGIS Server field name in the DataField box and append **.name()** to the field name.

For example, suppose your site has an Emergency Calls layer. The layer has a **CallType** field with coded values **1: Fire, 2: Medical, 3: Police**. You want to show the values (Fire, Medical, Police) in the report. You drag a TextBox component from the Controls panel (1) in the screen capture below) to the design surface (2) and type **CallType.name()** in the text box's **DataField** box (3).

You can configure a report template to show only values, only codes, or both values and codes. To also show the code, you would drag another text box to the design surface and type **CallType** in the **DataField** box.





Report template that will show domain values from the CallType field

#### 4.7.2 Date/Time Formatting

When the Geocortex Services Enhancement Proxy is configured, Silverlight viewers adjust date and time data to the Silverlight plugin's locale.

#### 4.7.3 Number Formatting

When the Geocortex Services Enhancement Proxy is configured, Silverlight viewers format numeric data based on the Silverlight plugin's locale.

#### 4.7.4 Pixel Tolerance for Line and Polygon Identify Operations

The Geocortex Services Enhancement Proxy extends buffering for identify operations to lines and polygons in Silverlight viewers. This makes it easier for the user to identify features with a line or polygon geometry. When the Services Enhancement Proxy is not configured, pixel tolerance applies to point geometries only.

## 4.7.5 Word Order in Global Search

The Geocortex Services Enhancement Proxy enhances Global Search in two ways:

- In Silverlight viewers, the Services Enhancement Proxy extends Global Search to search different word orders. For example, suppose the user is trying to find properties owned by **Kim Bell**. If names are stored with the last name first (**Bell, Kim**) and the Services Enhancement Proxy is configured, Global Search will successfully match **Kim Bell** to **Bell, Kim**. If the Services Enhancement Proxy is not configured, Global Search will not find any features that match **Kim Bell**.
- In Silverlight viewers, the Services Enhancement Proxy enables users to search using the values in coded value domains. See [Coded Value Domains on page 50](#) for more information.

## 4.7.6 Configure the Services Enhancement Proxy



The Geocortex Services Enhancement Proxy is a legacy component that should only be enabled for applications that use the Geocortex Viewer for Silverlight or the Geocortex Viewer for HTML5 version 2.5.2 or older.

The Services Enhancement Proxy is configured at the map service level. This means you can use the Services Enhancement Proxy for some of a site's map services but not others.

When you turn on the Services Enhancement Proxy for a map service in Manager, two additional options become available:

- **Forward Requests Using Application Pool Identity:** You cannot use the Services Enhancement Proxy at the same time as a proxy page. If the map service is secured and you do not want users to be prompted for their credentials, select the Forward Requests Using Application Pool Identity checkbox. Essentials will use the Essentials application pool identity to access the map service.



Using a proxy to manage security is not recommended. For a map service to be truly secure, the security that is configured should be enforced.

- **Resolve Coded Domains:** Select this checkbox to turn on the enhancements—resolution of coded value domains, date and number formatting, pixel tolerance, and Global Search enhancements.

### Options related to the Geocortex Services Enhancement Proxy

There are two common ways to use the Services Enhancement Proxy:

- To enable the enhancements offered by the Services Enhancement Proxy, select **Geocortex Services Enhancement Proxy** and **Resolve Coded Domains**.
- To enable the enhancements offered by the Services Enhancement Proxy, and use the Proxy to manage access to the map service (like a proxy page), select **Geocortex Services Enhancement Proxy**, **Resolve Coded Domains**, and **Forward Requests using Application Pool Identity**.



If you are using the Services Enhancement Proxy with a token-secured ArcGIS Server map service, you must specify the Token URL when you configure the authentication settings for the map service.

► **To configure the Services Enhancement Proxy:**

1. In Manager, edit the map service that you want to configure.
2. Click the **Edit Connection Settings** button below the **Connection String** box.
3. Select **Geocortex Services Enhancement Proxy**.  
The Behaviors checkboxes display.
4. If the map service is secured and you do not want users to be prompted for their credentials, select the **Forward Requests Using Application Pool Identity** checkbox.
5. If you want to enable the enhancements offered by the Proxy, select the **Resolve Coded Domains** checkbox.
6. Click **OK**.
7. Click **Apply Details**.
8. Click **Save Site**.

## 5 Sites



A site is a technology-neutral configuration of a GIS application. A site's configuration can include any of the features and functions offered by Essentials, such as workflows, data links, and print templates. You can also extend Essentials with custom functionality.

The map is central to a site. The map can combine layers from different map services, including ArcGIS Server, Bing Maps, WMS, and others. Map services can be dynamic or cached, or you can combine the two. The map can also include [ArcGIS web maps](#), feature services, and image services.

This ability to mix and match layers from different services enables you to tailor a site to precisely what is needed for a particular application. An organization that delivers multiple applications usually has multiple sites, often one for each application.

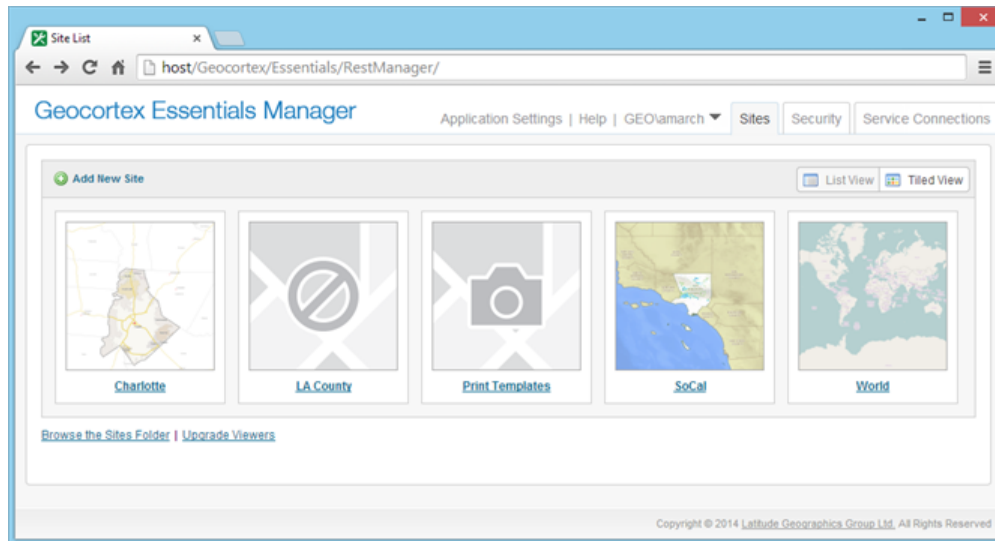
### 5.1 The Site List

The **Site List** is Manager's list of your configured sites. To show the Site List, click the leftmost tab in the banner area. If a site is open for editing, save and close the site to show the Site List.

The Site List has two views: **Tiled View** and **List View**. You can switch between the two views by clicking the  **List View** and  **Tiled View** buttons.

#### Tiled View

By default, the Site List displays in Tiled View. Tiled View shows a thumbnail image of each site's map.



### The Site List in Tiled View, showing five sites

In some cases, instead of an image of the map, you may see placeholder images:

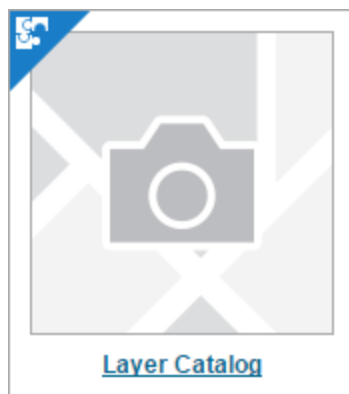


**No Thumbnail:** A placeholder map tile with the no symbol means that Manager has not yet created the thumbnail image or cannot create the image.



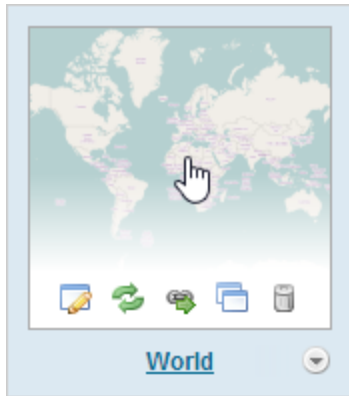
**No Map:** A placeholder map tile with a camera icon means that the site does not have a map (no map services have been added to the site).

If a site is a [Layer Catalog Sites on page 65](#), the site tile features a no thumbnail tile and layer catalog, differentiating it from the other sites.




### The site tile for a layer catalog site

To show icons to manage a site, hover over the site's thumbnail image.



Site management tools in Tiled View

► **To edit the site:**

- Click the map image, or
- Click the site's name, or
- Click the **Edit** icon .

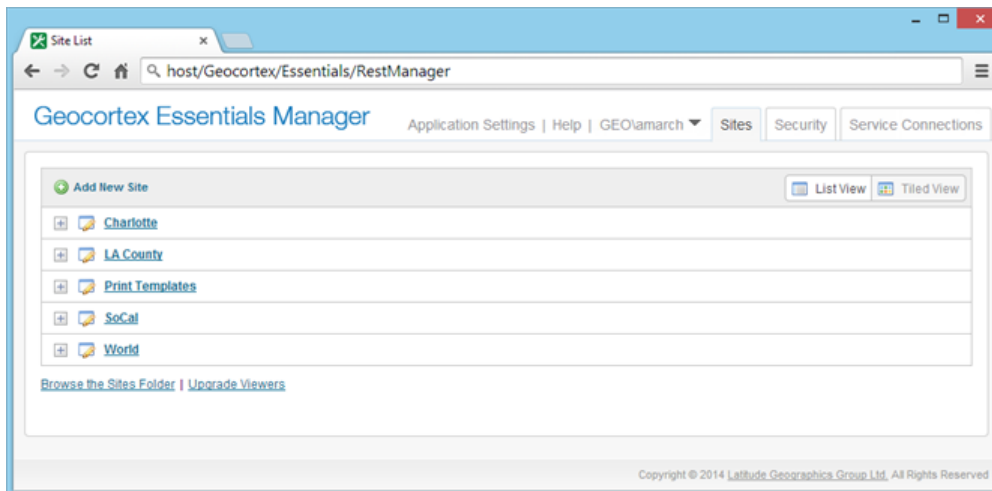
► **To show the Site Summary:**

Click the down arrow .


The Site Summary includes hyperlinks to launch the site's viewers.

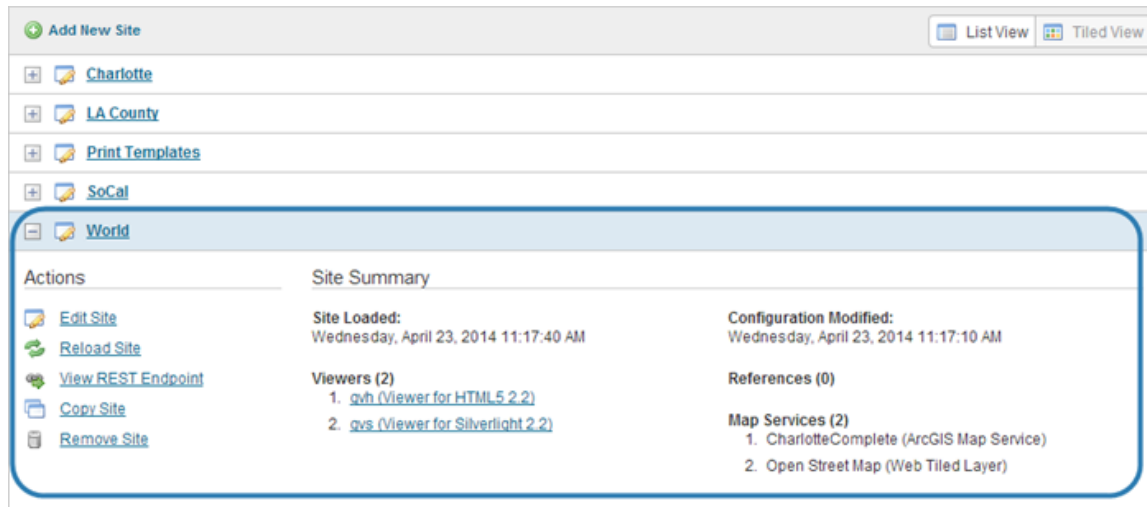
## List View

List View is more compact than Tiled View, so it is useful if you have a large number of sites. It is also useful if the maps for many of your sites look similar.



The Site List in List View, showing five sites

To show the Site Summary for a site, click the plus sign  beside the site.



Actions and Site Summary for a site called World

## 5.2 Create a Site

There are two ways to create a new site in Manager:

1. Use the Create Site wizard to create a simple site step-by-step that can be modified and extended later.
2. Create a copy of an existing site, and then modify the copy.  
This method is useful if you want to create a site that is similar to a site that you have already configured.



You can also create a site by copying an existing `Site.xml` file and saving the copy to a new subfolder in the `Sites` folder. Manager will detect the new site and include it in the Site List the next time the Site List loads.

### 5.2.1 Create a Site Using the Wizard

The Create Site wizard enables you to create:

- An empty site that does not have any map services or other components.  
Use this option when you want to build a site starting with nothing, or you want to create a site that other sites can reference. For example, to [create a Print Templates site](#), which contains print templates that are used by multiple sites, you would start with an empty site.
- A site that references an ArcGIS Only or Portal for ArcGIS web map.
- A site that references an existing site. The new site [inherits the configuration](#) of the referenced site.
- A layer catalog site.  
Use this option to create a site that other sites can reference. A layer catalog site does not have a map of its own. It contains only layers and map services that you want to use on other sites.

► **To create a site using the Create Site wizard:**

1. In Manager, choose the **Sites** tab. If another site is open for editing, press **Save Site** and then **Close Site** to return to the Sites list.
2. Press **Add New Site**.  
The Create Site wizard opens.
3. Enter a display name and optional description for your site.



The site's display name should be reasonably short. The site's initial name also generates the site ID and the Windows folder name. Windows file paths must be less than 260 characters.

4. Press **Next**.
5. Select the type of site you want to create:
  - [Create an empty site](#)
  - [Reference a web map from ArcGIS Online or Portal for ArcGIS](#)
  - [Reference another site](#)
  - [Create a layer catalog site](#)


## Create an empty site

When you have selected the **Create an empty site** option in the Create Site wizard, you are prompted to press **Finish** with no additional steps. Essentials generates an empty site, which you can then access from the Sites page.

## Reference a web map from ArcGIS Online or Portal for ArcGIS

When you select the **Reference a web map from ArcGIS Online or Portal for ArcGIS** option in the Create Site wizard, you can reference a web map in two ways:

- Enter a known web map URL into the box
- Enter a search term for a web map

Once you have entered a URL or a search term and press the  Search Service Connections button. If you have entered a search term, relevant search results from your configured service connections are returned. You can select the search result you want to add. For more information about service connections, see [Service Connections on page 127](#).

### Search for a Web Map

The web maps available by search depend on how your Essentials installation is registered. For example, if you did not connect your site to ArcGIS Online, your search results do not include public map services hosted on ArcGIS.com.

Enter a search term or web map URL

Organization content only

#### The web map search bar with exposed Organization content only checkbox


If Essentials is connected to multiple ArcGIS Online as well as Portal accounts, you can also change the scope of your search to a particular connection using the radiobuttons underneath the text input bar.

Enter a search term or web map URL

ArcGIS Online  Portal for ArcGIS (portal.domain.com)

#### The web map search bar with exposed radiobuttons for two connections



In search results, a  lock beside a web map means that the web map is private.

## Reference another site

You can reference your other Essentials sites when you select the **Reference another site** option in the Create Site wizard. Press Next and select the Essentials site that you want to reference. There are no further steps, and you can select **Finish** to reference the site.


## Create a layer catalog site

You can create a pared-down version of an Essentials site that acts as a layer catalog for your other Essentials sites. Select the **Create a layer catalog site** option in the Create Site wizard. There are no further steps, and you can select **Finish** to complete the creation of your layer catalog site.


If you have a large repository of layers and map services, using a layer catalog site can simplify the end user's experience with your Essentials sites, as well as improve load times. For more information about layer catalog sites, see [Layer Catalog Sites on page 65](#).

## 5.2.2 Create a Site by Copying an Existing Site

### To use Manager to create a site that is based on an existing site:

1. In Manager, choose the **Sites** tab. If another site is open for editing, press **Save Site** and then **Close Site** to return to the Sites list.
2. In the **Site List**, show the tools for the site that you want to copy.  
To show the tools in Tiled View, hover over the thumbnail image of the site that you want to copy. In List View, click the  Expand node beside the site.



3. Press the  **Copy Site** button.
4. Type a display name for your new site.



The site's display name should be reasonably short. The site's initial name also generates the site ID and the Windows folder name. Windows file paths must be less than 260 characters.

5. Click **OK**.  
The dialog box closes and your new site appears in the Site List. You can now edit the site and make whatever modifications you want.

#### See also...

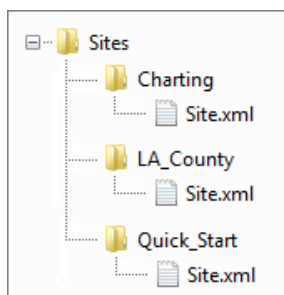
[Add a Map Service to the Map on page 108](#)

[Import Map Services from Another Site on page 111](#)

## 5.3 Configure Sites

Site configuration is the process of specifying the components that make up a site, and their behavior and availability. Essentials stores a site's configuration in an XML file called `Site.xml`. Each site has its own `Site.xml` file.

Site configuration files are kept in subfolders of the Geocortex Essentials Sites folder. For example, an Essentials installation with three sites might have the following folder structure (other Essentials files are not shown):



Example of a Sites folder

### 5.3.1 Inherit Components from Another Site



If you only wish to inherit layers and map services from another site, you can create a layer catalog site. A layer catalog site is only used to add, modify, and catalog layers and does not include the configuration settings and features that other Essentials sites have. See [Layer Catalog Sites on page 65](#) for more information.

Site inheritance is the ability to make one site inherit another site's configuration, including all its configured components and settings. If you want Site A to inherit Site B's configuration, you edit Site A and [add a reference](#) to Site B.

This example is used throughout this section: Site A contains a reference to Site B, so Site B is inherited.

### Site Information

#### Site Details

---

Site ID: Site\_A


Display Name:

Description:

---

#### References

+ Add Reference


Type	Name	ID	
Site	Site B	Site_B	

---

[Properties](#)

Site A references Site B, so A inherits B's components and settings

 **To create a reference to another site:**

1. Navigate to the **Site Info** page in Manager.
2. Locate the References section of the page.
3. Use the  **Add Reference** button.  
The Create Reference dialog appears.
4. Select the **Reference another site** option.
5. Select the site you want to reference from the Reference Site drop-down menu.
6. Use the **Finish** button to create the reference.

Usually, the components and settings in the inherited site (Site B) are added to the components and settings in the site that contains the reference (Site A).

For example, if Site A references Site B, Site A includes all its own configured components and settings, as well as all of Site B's components and settings.

If a particular component is configured in both sites, Site A will have two instances of that component. One instance of the component is configured in Site A and the other component is inherited from Site B.

## Inherited Components

The following table illustrates how adding a reference affects the components in a site. The leftmost column shows the components initially configured in Site A. The middle column shows the components configured in Site B. The last column shows the components in Site A after you configure a reference to Site B.

### Configured Components for Site A, Site B, and Site A after a Reference to Site B is Added

Site A	Site B	Site A with Reference to Site B
"Charlotte" ArcGIS map service	"Charlotte" ArcGIS map service	"Charlotte" ArcGIS map service
"Charlotte" HTML5 viewer	"Streets" Bing Maps map service	"Charlotte" HTML5 Viewer
	"Imagery" Bing Maps map service	"Charlotte" ArcGIS map service (inherited from Site B)
	"Ledger" Print Template	"Streets" Bing Maps map service (inherited from Site B)
	"CharlotteBing" HTML5 Viewer	"Imagery" Bing Maps map service (inherited from Site B)
		"Ledger" Print Template (inherited from Site B)
		"CharlotteBing" HTML5 Viewer (inherited from Site B) *

\* Inheritance works differently for viewers than for other components. See [Viewer Inheritance on page 64](#).



Note that the Charlotte map service appears twice in Site A. One instance is configured in Site A and the other is inherited from Site B. The two instances are separate and can be configured differently. For example, they could have different visibility settings for their layers, different settings for inclusion in global search, and so on.

## Chained Inheritance

References can be chained. Suppose Site A references Site B and Site B references two other sites, Site C and Site D. Then, Site A inherits the configuration of all three sites: Site B, Site C, and Site D.

### 5.3.1.1 Unique Components and Settings

Some components and settings can occur only once in a site. For example, a site can only have one initial extent for the map, one full extent, one north arrow, and one overview map. This means that Essentials cannot simply add these components and settings to the site that contains the reference. Special rules are required:

- If Site A's component or setting still has its default value but you have changed the component or setting in Site B, Essentials uses Site B's component or setting.
- In all other cases, Essentials would use Site A's component or setting.

The rules ensure that Essentials preserves any customization you have made to the component or setting, with preference given to Site A.



Note that these rules are for a simple, unchained scenario. In more complicated scenarios, where inheritance is chained, Essentials uses the last non-default value in the chain.

## Chained Inheritance of Unique Components

References	Site A	Site B	Site C	Site D	Site E
Site A Configuration		Reference			
Site B Configuration			Reference	Reference	
Site C Configuration					Reference
Site D Configuration					
Site E Configuration					

The table above illustrates an Essentials deployment with five sites. Each row shows a site's configured references, where each column shows the site that is being referenced. You can anticipate how Site A inherits the other site configurations:

- Site A inherits the configurations of sites B, C, D, and E.
- If Site A, Site B, and Site C use the default initial extent, and Site D and Site E have configured values for the initial extent, then Site D's value is used.  
Site E's value is not use because it is inherited as part of C's configuration, which comes before D's configuration.

### 5.3.1.2 Change the Inherited Configuration

You can modify or remove inherited components and settings. Modifications you make to inherited components and settings override the inherited configuration, but do not affect the source configuration.



Inheritance works differently for viewers than for other components. When you modify the configuration of an inherited viewer, the configuration of the source viewer is also modified. See [Viewer Inheritance](#) below.



To disambiguate multiple components with the same name or multiple copies of the same component, you might want to modify or remove the inherited component.

## Example: Modify an Inherited Component

- Site B has a map service with a layer called Navigable Waters.
- Site A references Site B. As a result, Site A inherits the layer called Navigable Waters.
- If you edit Site A and change the inherited layer's display name to Waterways, the layer appears as Waterways in Site A.  
In Site B the layer still appears as Navigable Waters.
- If you then edit Site B and change the Navigable Waters layer name to Navigation, the layer still appears as Waterways in Site A.

## Example: Remove an Inherited Component

- Sites A and B both have a map service called Land Use.
- When you add a reference from Site A to Site B, Site A now has two map services called Land Use.
- In Site A, you remove the inherited Land Use map service, so that Site A only has one instance of Land Use in it.

### 5.3.1.3 Viewer Inheritance



Inheritance works differently for viewers than for other components in one respect: When you modify the configuration of an inherited viewer, the configuration of the source viewer is also modified.

Deleting an inherited viewer does not affect the source viewer.

## Example: Modify an Inherited Viewer

- Site B has a viewer called B\_Viewer.
- Site A references Site B. As a result, Site A inherits B\_Viewer.
- You edit Site A and add an item to B\_Viewer's I Want To menu.
- B\_Viewer now has the new I Want To menu item in both Site A and Site B.

## Example: Delete an Inherited Viewer

- Site A inherits a viewer from Site B.
- You edit Site A and delete the inherited viewer.
- Site B's configured viewer is not deleted on Site B. It is only deleted from Site A.

### 5.3.1.4 Change the Source (Referenced) Configuration

When one site references another site, it remains linked to the referenced site. For example, if Site A references Site B, then Site A is linked to Site B. This means that if Site B's configuration changes, the changed configuration is reflected in Site A.

Changes made in Site B appear immediately in Site A in Essentials. In the REST API, there can be a short delay before the changes appear.

## Example: Modify the Referenced Configuration

- Site A inherits a viewer from Site B.
- If you edit Site B and add a Run Workflow item to the viewer's I Want To menu, the Run Workflow item is automatically added to the viewer's I Want To menu in Site A's configuration.
- If you change the title of the I Want To menu to "Tasks" in Site B, the menu's title is automatically changed to "Tasks" in Site A.

## Example: Delete a Component in the Referenced Configuration

- Site A inherits three map services from Site B, including one called Roadways.
- You edit Site B and remove Roadways from the map.

- You save Site B and edit Site A.
- Site A no longer has the Roadways map service in it.

#### See Also...

[References on page 187](#)

[Create a Dedicated Site for Print Templates on page 306](#)

## 5.3.2 Layer Catalog Sites


A layer catalog site is a pared-down version of an Essentials site. You can use a layer catalog site to organize large repositories of layers and map services. Users can then access the layers and map services using the layer catalog interface in the viewer.

Now, rather than placing hundreds of layers and dozens of map services into a site's layer list, you only need to include the most popular, important or universal base layers and services. The layer catalog site contains the rest. This can improve the responsiveness and performance of your applications. If your end users require additional layers, they can browse the catalog from the viewer and add any layers that they need.

Note that with a layer catalog, you cannot reference the same map service that is already present in the base site. Also, layer catalog layers do not support attachments, data links, instant search, and relationships.

See "LayerCatalog Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide* for viewer configuration information.

### Create a Layer Catalog Site

You can create a layer catalog site from your Essentials Sites list. Use  **Add New Site** button, set a display name and description, then choose the **Create a layer catalog site** option. For detailed instructions, see [Create a Site on page 57](#).

In the Site List, you can locate layer catalog sites with the layer catalog badge in the top-left corner.



The site tile for a layer catalog site

### Supported Features

Layer catalog sites support the following types of layers:


- ArcGIS Dynamic Map Service Layers
- ArcGIS Feature Service Layers
- ArcGIS Server Stream Layers
- ArcGIS Vector Tile Layers
- OGC WMS (Web Map Service) Layers
- OGC WFS (Web Feature Service) Layers
- OGC WMTS (Web Map Tile Service) Layers
- Bing Maps Layers
- Map Image Layers
- Web Tiled Layers
- Tiled Map Service Layers

### Tiled Services

Layer catalog sites support tiled map services. However, you must have a tiled map service enabled on the base site before you can reference tiled map services from the layer catalog site. If you do not have a tiled map service added to the base site, then levels of detail are not supplied to the map. As a result, tiled map services from the layer catalog site cannot be used. In most cases, basemaps are tiled map services and will suffice.

## Configure a Layer Catalog Site

Once you have created a layer catalog site, you can configure it in Manager like you would any other site. However, layer catalog sites only have four sections in Manager that you can configure:

- **Site Info:** Your site's global information.  
For more information, see [Edit Site Information on page 68](#).
- **Map:** Configure layers and map services.  
The layer catalog site's Map page is limited compared to other Essentials sites. For example, no map preview is available, and the  context menu next to each layer excludes site-specific options. Use the Map page to configure layers and map services for use with other Essentials sites. See [Add a Map Service to the Map](#) for more information.




We recommend that you use the same protocol (HTTP or HTTPS) for all the map services that you add to a site. Browsers might not display all of a site's content if you use different protocols within one site. The protocol that you use for map services should be the same as the protocol that you use for viewer URLs.

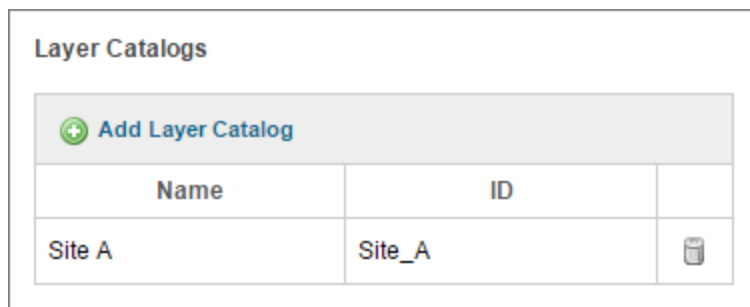
- **Data Connections:** Configure connections to external relational databases.  
For more information, see [Data Connections on page 250](#).
- **Permissions:** Set permissions for the layer catalog site's layers and map services.  
For more information, see [Permissions on page 452](#).

You can configure the layer catalog user interface in your viewer configuration files. This enables end users to search the layers in the layer catalog and use them in the viewer. For more information, see "LayerCatalog Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

## Reference a Layer Catalog Site


You can reference a layer catalog site from another Essentials site. From your Essentials Sites list, open the site you want to set up a reference for and select the **Site Info** page from the main menu.

Locate the Layer Catalogs section of the page and select the  **Add Layer Catalog** button. Choose an existing layer catalog site from the drop-down menu in the dialog and select **OK**.



### The Layer Catalog section of the Site Info page in Manager

Once you have created a reference, use the **Save Site** button to save your changes.

You can remove the reference to the layer catalog by using the  **Remove** button.



In order to load the site that references the layer catalog site, it must contain a basemap.

## 5.3.3 Edit a Site

You can only edit one site at a time.



Do not edit a site in more than one location at one time or you will lose some of your changes. For example, do not edit a site in two different browsers or browser tabs at one time. Similarly, do not edit a site's configuration file manually at the same time that you edit the site in Essentials—always close one before you open the other.



### To edit a site:

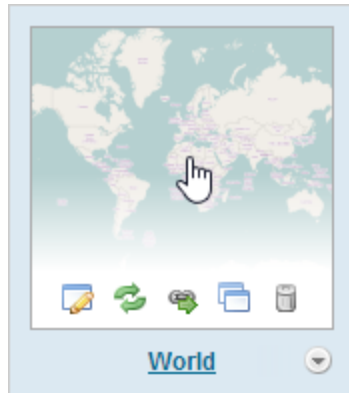
1. Launch Manager.

You can launch Essentials from your Start Menu. In the applications list, select the Latitude Geographics folder and the Geocortex Essentials Manager item inside.




2. Edit the site that you want to configure:
  - a. Go to the **Sites** tab.
  - b. If a different site is open for editing, click **Save Site**, and then click **Close Site**.
  - c. Follow the instructions for the view of the Site List that you are using:

- **Tiled View:**



World site in Tiled View

- Click the thumbnail image of the site that you want to edit, or
- Click the site's name, or
- Position the pointer over the thumbnail image of the site that you want to edit, and then use the  **Edit** icon.

- **List View:**



World site in List View

- Select the site's name or the  **Edit** icon .

See also...

[The Site List on page 54](#)

### 5.3.4 Edit Site Information

The Site Information page allows you to:

- Modify the site's display name and description.
- Specify the image to use in the HTML5 Viewer [splash screen](#).
- [Change the site's data provider](#).
- Open the [REST API Sites Directory](#).
- Select a [virtual directory](#) to serve the site's static content.
- Add [references](#) to other sites and to ArcGIS web maps.
- Define or modify [custom properties](#) for the site.

## Change a Site's Data Provider

**(Default) Data Provider:** (ArcGIS Server dynamic and tiled map services) The (Default) Data Provider is the type of data provider that you use to store feature data. This setting is used by the viewer. It enables the Query Builder and Filter Builder to construct queries using the correct syntax for your data provider.

You can configure this setting at the site level, the map service level, or the layer level.

- At the site and map service level, the setting is called **Default Data Provider**.
- At the layer level, it is called **Data Provider**.

Map services inherit the setting from the site, and layers inherit the setting from the map service that they belong to, or from the site if the setting is not configured at the map service level. For example, if all the site's services use the same data provider to store their feature data, you could configure the Default Data Provider at the site level. The map services and layers inherit the configuration. This saves you from having to configure the setting for every map service and layer in the site.

By default, the provider is Default. The Default provider uses the ANSI SQL default syntax. If the Default provider does not work in your system, delete Default from the Default Data Provider box to open a drop-down list of providers.

If the type of provider that you use appears in the list, select the provider. The Query and Filter Builders will use the well-known syntax for the provider that you select. If your provider does not appear in the list, re-enter Default in the Default Data Provider box, and configure the viewer's QueryBuilder Module. For instructions, refer to your Geocortex Viewer for HTML5 *Administrator and Developer Guide*.




If the map service only has one layer, the Default Data Provider setting is not available at the map service level. For example, feature services do not have a Default Data Provider setting, but feature layers do.


#### ▶ To open a site's Site Information page:

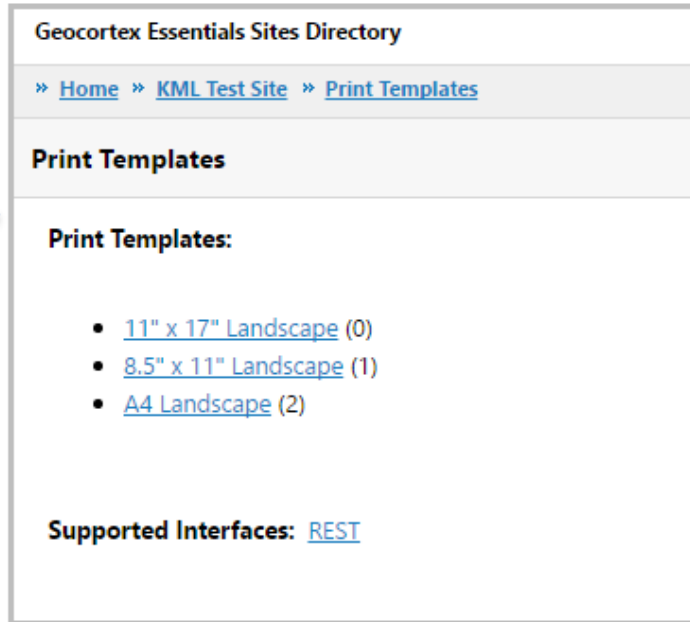
1. In Essentials, edit the site that you want to configure, and then select **Site Info** from the side panel.

## 5.3.5 Verify your Configuration

Manager provides an easy way to verify your configuration when you add elements to your site. If you have configured at least one component of a particular type, Manager displays an  icon that links to the page in the REST API Sites Directory. The directory page lists these components.

For example, if you select the icon on Manager's Print Templates page, the Sites Directory opens to the page that lists the print templates that are configured for that site.

**Print Templates** 



Select the icon to navigate to the Geocortex Essentials Sites Directory's corresponding page



Save your site before you open the Sites Directory. New components do not appear in the Sites Directory until the site is saved.




### 5.3.6 Delete a Site



When you delete a functioning site, users immediately lose access to the site. **Deletion is permanent.**



**To delete a site:**

1. In Manager, choose the **Sites** tab. If another site is open for editing, press **Save Site** and then **Close Site** to return to the Sites list.
2. Follow the instructions for the view of the Site List that you are using:
  - **Tiled View:** Position the pointer over the thumbnail image of the site that you want to delete, and then click the **Remove Site** icon .
  - **List View:** Click the  expand toggle beside the site that you want to delete, and then select  **Remove Site**. When you are prompted to confirm, click **OK**.

When a site is deleted, the site's root folder may not be deleted. A site folder is deleted only when every file in the site folder can be deleted.

Manager can only delete the following files and folders:

- Viewers folder
- `site.xml`
- `site_name.150x150.preview.png*`
- `site_name.preview.png*`

Manager cannot delete any resource folders, virtual directories, or files other than those in the list above.

\* Where `site_name` is your site folder's name.

## 5.4 Site Initialization and Loading

The site configuration that you define in Manager cannot be used directly by viewers. To prepare a site so it can be used by applications, Essentials performs the following steps ("loads" the site):

1. **Initialize:** Initialization converts the site configuration to a form that applications can work with (the "site object") and gathers information about the components in the site.  
See [Initialization on page 71](#) for more information.
2. **Cache:** Caching stores the site object on disk.  
See [Caching on page 73](#) for more information.  
The site is now ready to serve to applications.

The load sequence occurs when an application requests a site and the cached information about the site is out of date or does not exist. The request could come from a client application (a viewer), or from the server (Manager). When an application requests a site:

1. Essentials looks for the site in the cache for the current version of Essentials.
2. **Cache Missing:** If the cache for the current version of Essentials is missing, Essentials loads the site, which creates the cache.  
**Cache Found:** If the cache for the current version of Essentials exists, it performs the following actions:
  - a. Essentials checks to see if the `Site.xml` file has been modified since the cache was created.
  - b. If the site configuration has been modified, Essentials loads the site, which updates the cache.
3. Essentials serves a copy of the cached site to the application that made the request.

### Initialization

Initialization is the process of converting the site configuration defined in the `Site.xml` file into objects that viewer applications can work with. These objects are called business objects because they represent the entities in the business domain that the GIS system is designed to support.

Essentials provides a number of classes of business object out of the box, some of which are common GIS entities, like map services and layers. Others correspond to Essentials features, like workflows and data links.

When you configure a site, you are configuring instances of the business objects that you want to be included in your site. For example, if you configure a Zip Codes layer, you are instructing Essentials to create an instance of the Layer class (in other words, create a Layer business object) and name it Zip Codes.

As part of the initialization process, Essentials communicates with each component configured in the site to gather the information it requires about the component. This includes connecting to each service. For example, Essentials connects to each map service to get information about the service's layers, metadata, spatial reference, and so on.

If Essentials cannot connect to a service during initialization because the network or the service is down, Essentials attempts to perform the initialization using previously cached information about the service.

If a service is unavailable during initialization:

1. Essentials checks to see if the site was previously cached.
2. Essentials uses the cached information, if it exists.

### Previously Cached

If the site was previously cached, Essentials gets the information about the service from the most recent, valid copy of the cache.

To identify the service in the copy of the cache, Essentials looks for the service's:

- ID
- provider invariant name
- connection string

All three attributes must match. If you have changed one or more of these attributes in the configuration, Essentials does not find the service in the copy of the cache.

If Essentials finds the service in the copy of the cache, the information about the service is carried forward from the old cache to the new cache when the cache is updated, instead of getting fresh information from the service itself.

### Never Cached

If the site has never been cached, site initialization fails because Essentials has no information about the unavailable service, and no way to obtain the information. The first time a new site is initialized, Essentials must be able to connect to each service that is configured in the site.

You can configure a site (including its services) when its services are unavailable, provided the site has been initialized and cached at least once.



In Manager 3.13 and earlier versions, site initialization failed if a service was unavailable, regardless of whether cached information about the service was available. This prevented you from configuring a site when one or more of its services was unavailable.

To determine whether a service was available when a site was initialized, compare the Site Loaded time in the REST API Sites Directory to the Service Loaded time. If both load times are the same, the service was available when the site was initialized.



You can also get the Site Loaded time from the Site Summary in the [Site List](#).

In the following screen capture, the LA County map service last loaded at 10:21am and the site loaded over two hours later, at 12:53pm. This indicates that the map service was not available the last time the site loaded, so Essentials used cached information about the map service.

Geocortex Essentials Sites Directory	Geocortex Essentials Sites Directory
» <a href="#">Home</a> » <a href="#">LA County</a>	» <a href="#">Home</a> » <a href="#">LA County</a> » <a href="#">Map</a> » <a href="#">Map Services</a> » <a href="#">Service Requests</a>
<b>Site: LA County (ID: LA_County)</b>	<b>Feature Layer: Service Requests (ID: Service_Requests_FL)</b>
<b>Current Version:</b> 4.6 (4.06)	<b>Service Loaded:</b> Apr, 1 2016 10:21:32 AM PDT (UTC--07:00)
<b>Description:</b>	<b>Connection String:</b> url=http://example.com/arcgis/rest/services/la-county
<b>Site Loaded:</b> Apr, 1 2016 12:53:39 PM PDT (UTC--07:00)	<b>Short Display Name:</b> N/A
<b>Configuration Modified:</b> Apr, 1 2016 12:52:07 PM PDT (UTC--07:00)	<b>Description:</b> N/A
<b>Configuration Scanned:</b> Apr, 4 2016 03:59:26 PM PDT (UTC--07:00)	

The map service was not available when the site was last loaded

For instructions on opening the REST API Sites Directory, see [REST API Sites Directory on page 1](#).

## Caching

After a site is initialized, Essentials caches the site. Essentials uses copies of cached sites to fulfill site requests. This improves performance, because a site does not have to be converted from XML and initialized every time an application requests the site. The copies of cached sites that are served are kept in memory, which also improves performance.


Sites are cached in a file called `SiteCache.xml`. The information for a particular site is added to the file the first time the site is loaded.

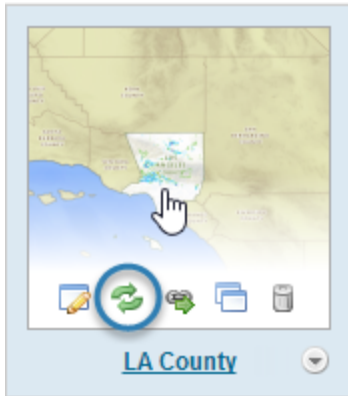
Essentials creates or updates `SiteCache.xml` as needed during the load sequence, specifically:

- If the site is missing from the cache because the site is new and has not yet been cached, or the `SiteCache.xml` file has been moved or deleted.
- If the `Site.xml` file has been modified since the site was cached.
- If one or more Essentials assemblies (.dll files) have been modified.  
Assemblies are modified when you upgrade Essentials  
Because the site cache is tied to a particular version of Essentials, the cache will be recreated after you upgrade.


Site caching is built into Essentials. You cannot disable caching.

You can force Essentials to refresh a site's cache. There are several ways to do this:

- Edit the site in Manager, make a change to the site, and then save the site.  
Changing the site's description on the Site Info page is an easy change to make that does not affect the content or behavior of the site.
- Edit the `Site.xml` file in a text editor and save it.
- Click the Reload Site icon  in the [Site List](#).

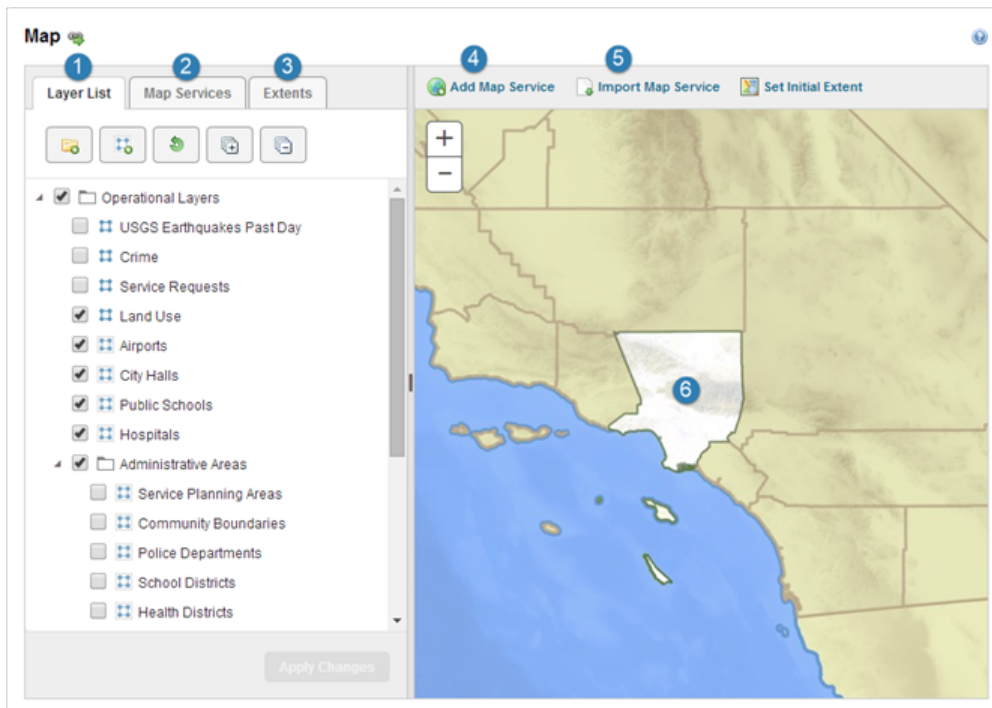


Location of Reload Site icon

 Before Essentials 3.5, the Sites folder contained `Site.cache` files, and the `web.config` file had a `CacheSitesToDisk` setting. These are no longer supported.

## 6 The Map

The map is configured on Manager's Map page. When you create an empty site, the Map page is initially empty. The map is created automatically when you add the first service.



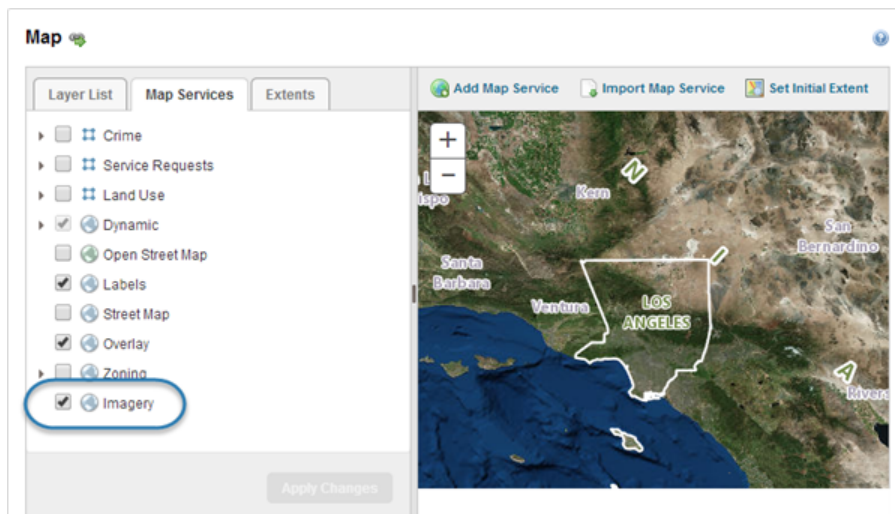
Manager's Map page, with the main parts numbered

The main parts of the Map page are:

- 1 **Layer List Tab** - The Layer List tab is used to configure the [Layer List](#) that appears in viewers. You can specify which services and layers you want to appear in the Layer List, reorder them, and organize them into folders. In addition, the Layer List tab gives you access to some common settings, and allows you to batch edit the settings for multiple layers at one time.
- 2 **Map Services Tab** - The Map Services tab lists all the services that you have added to the map, and their layers. You can reorder the services on the Map Services tab. The order of the services determines the [drawing order](#) and the map's [spatial reference](#). In addition, the Map Services tab gives you access to some common settings, and allows you to batch edit the settings for multiple layers at one time.
- 3 **Extents Tab** - The Extents tab is used to set the map's [initial extent](#) and [full extent](#), and to configure [bookmarks](#).
- 4 **Add Map Service** - The Add Map Service function allows you to [add map services and layers](#) to the map, and to create and manage [service connections](#).
- 5 **Import Map Service** - The Import Map Service function allows you to [import map services and layers](#) to the map from other sites where they are already configured.
- 6 **Map Preview** - The map preview shows a preview of what the map will look like in viewers. The preview is live—if you add or remove services from the map, or you change the visibility of layers, your changes appear immediately in the preview.

## 6.1 About the Map's Spatial Reference

The bottom-most service listed on the Map page's Map Services tab is the **primary service**. The primary service determines the map's spatial reference. If you move a service with a different spatial reference to the bottom of the Map Services list, the map's spatial reference changes.



The primary service



Each service in the map must be compatible with the primary service. For a service to be compatible, either the service has the same spatial reference as the primary service, or the service can be reprojected to the primary service's spatial reference. Essentials automatically reprojects services to the primary service's spatial reference when necessary. This ensures that all the services in the map display in the same spatial reference.



Manager will warn you if you add a service that cannot be reprojected to the primary service's spatial reference. If you save the site when it contains a service that is not compatible with the primary service, the incompatible service will not show on the map.


Because tiled services cannot be reprojected, tiled services are often placed at the bottom of the list on the Map Services tab. To move a service to a different position in the list, drag the service and drop it in its new position.

In addition to determining the map's spatial reference, the primary service's full extent and initial extent are used as the default for the map's full extent and initial extent. For instructions on overriding the default extents, see [Set the Map's Initial Extent on page 80](#) and [Set the Map's Full Extent on page 77](#).


### ► To find out the map's spatial reference using Manager:

There are several ways to find out the map's spatial reference using Manager.


#### Method 1: Edit the Primary Service

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.
2. Position the pointer over the primary service.  
The management tools show.
3. Click the **Edit** tool .  
The spatial reference is shown on the Details tab.

#### Method 2: Edit an Extent or Bookmark

1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Position the pointer over **Initial Extent**, or **Full Extent**, or a bookmark.  
The management tools show.
3. Click the **Edit** tool .  
The spatial reference is shown in the dialog box that opens.

#### Method 3: Look in the REST API Sites Directory

1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. Click the **View REST Endpoint** tool  beside **Map**.  
The spatial reference is labelled **Coordinate System**.

▶ **To change the primary service:**



If you change the primary service to a service with a different spatial reference, you will have to reconfigure the map's initial extent and full extent, and any bookmarks that you have configured.

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.
2. Click and hold the service that you want to be the primary service.
3. Drag the service to the bottom of the list.  
A guideline shows where the service can be placed.
4. Release the mouse button.  
The service is moved to the position where you dropped it.
5. Click **Apply Changes**.
6. Click **Save Site**.



If your organization uses spatial reference definitions that do not conform to Geocortex Essentials's built-in definitions, see [Define a Custom Spatial Reference](#).

## 6.2 Set the Map's Full Extent

The full extent is the extent that displays when an end user clicks a Full Extent tool in a viewer.

By default, the map's full extent is the full extent of the [primary service](#). You can change the full extent to show the part of the map that you want end users to see when they zoom to the full extent.



Setting the full extent to a subset of the primary service's full extent does not limit end users to working in that area. Users can pan the map beyond the full extent that you configure, search and query operations can return results from outside the full extent, and so on.

There are two approaches to configuring the map's full extent:

- Navigate the map preview to the desired extent.
- Enter the coordinates of the desired extent.

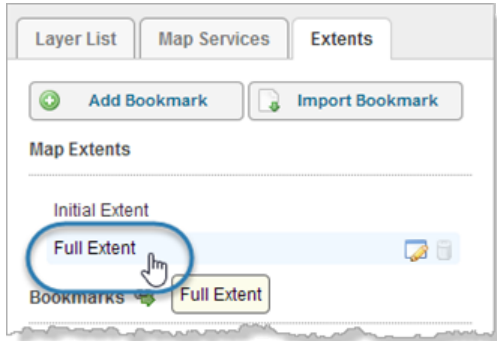
You can also [reset the full extent](#) to the default value.

Manager's Map page has an Extents tab where you configure the full extent.

▶ **To zoom the map preview to the full extent:**


1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.

2. Click **Full Extent**.




Zoom the map preview to the full extent

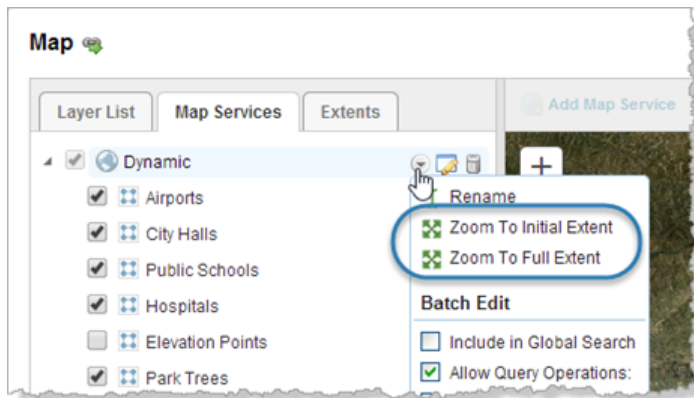
► **To set the map's full extent using the map preview:**

1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Pan and zoom the map preview to show the extent that you want to use as the full extent.
3. On the **Extents** tab, position the pointer over **Full Extent**.  
The management tools appear.
4. Click the **Edit** icon .
5. Click **Use Current View**.
6. Click **OK**.
7. Click **Apply Changes**.
8. Click **Save Site**.


► **To set the map's full extent to the extent of a map service or layer:**

This is a variation of using the map preview to configure the full extent.


1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.
2. Click the down arrow  beside the map service or layer whose extent you want to use.
3. To use the initial extent, click **Zoom to Initial Extent**. To use the full extent, click **Zoom to Full Extent**.  
The map preview zooms to the extent.



#### Zoom to an extent that is defined in the map service

4. Click the **Extents** tab.
5. Position the pointer over **Full Extent**.  
The management tools appear.
6. Click the **Edit** icon .
7. Click **Use Current View**.
8. Click **OK**.
9. Click **Apply Changes**.
10. Click **Save Site**.

#### ▶ To set the map's full extent using coordinates:

1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Position the pointer over **Full Extent**.  
The management tools appear.
3. Click the **Edit** icon .
4. Edit each coordinate that you want to change. To change a coordinate, click in the box and edit the value.  
The coordinates that you enter must be in the same spatial reference as the map.




You can edit all four coordinates at one time using copy and paste (Ctrl-C and Ctrl-V). Copy them as a comma-delimited list, for example, **-80, -160, 80, 160**. Paste them into any one of the boxes. Essentials will sort them into the correct boxes.

5. Click **OK**.
6. On the **Extents** tab, click **Full Extent**.  
The map preview updates to show the full extent, so you can verify it.

7. Click **Apply Changes**.
8. Click **Save Site**.

▶ **To reset the map's full extent to the default:**

1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Position the pointer over **Full Extent**.  
The management tools appear.
3. Click the **Edit** icon .
4. Click **Reset Default**.
5. Click **OK**.
6. On the **Extents** tab, click **Full Extent**.  
The map preview updates to show the default full extent.
7. Click **Apply Changes**.
8. Click **Save Site**.

## 6.3 Set the Map's Initial Extent

The initial extent is the extent that shows when the map first loads in a viewer. It is the first view of the map that end users see.

By default, the map's initial extent is the initial extent of the [primary map service](#). You can change the initial extent to show the part of the map that you want end users to see when the map loads.

The initial extent is configured on Manager's Map page. There are two approaches to configuring the initial extent:

- Navigate the map preview to the desired extent.
- Enter the coordinates of the desired extent.

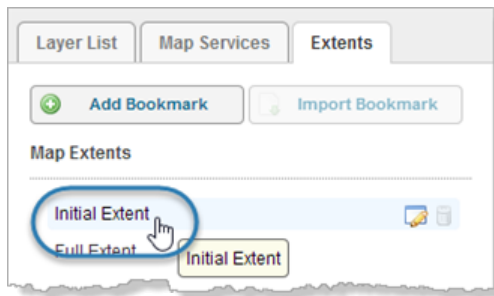
You can also [reset the initial extent](#) to the default value.



There are other ways to set the extent when the viewer loads, for example, by running a startup workflow that sets the extent, or by using the `extent` URL parameter. Using multiple methods of setting the extent may lead to unexpected results.


▶ **To zoom the map preview to the initial extent:**


1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Click **Initial Extent**.



Zoom the map preview to the initial extent


► **To set the map's initial extent using the map preview:**

This procedure explains how to set the initial extent using the  **Set Initial Extent** function on the Map page. You can also set the initial extent by editing the initial extent and clicking **Use Current View**.

1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Pan and zoom the map preview to show the extent that you want to use as the initial extent.
3. Click  **Set Initial Extent**.
4. Click **Save Site**.

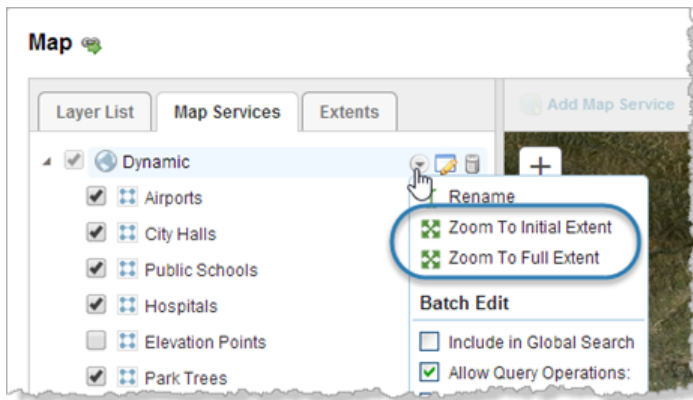
► **To set the map's initial extent to the extent of a map service or layer:**

This is a variation of using the map preview to configure the initial extent.


1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.
2. Click the down arrow  beside the map service or layer whose extent you want to use.
3. To use the initial extent, click **Zoom to Initial Extent**. To use the full extent, click **Zoom to Full Extent**. The map preview zooms to the extent.




Some layers do not have an initial extent. In this case, there is no Zoom to Initial Extent option.



Zoom to an extent that is defined in the map service

4. Click the **Extents** tab.
5. Position the pointer over **Initial Extent**.  
The management tools appear.
6. Click the **Edit** icon .
7. Click **Use Current View**.
8. Click **OK**.
9. Click **Apply Changes**.
10. Click **Save Site**.

 **To set the map's initial extent using coordinates:**

1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Position the pointer over **Initial Extent**.  
The management tools appear.
3. Click the **Edit** icon .
4. Edit each coordinate that you want to change. To change a coordinate, click in the box and edit the value.  
The coordinates that you enter must be in the same spatial reference as the map.




You can edit all four coordinates at one time using copy and paste (Ctrl-C and Ctrl-V). Copy them as a comma-delimited list, for example, **-80, -160, 80, 160**. Paste them into any one of the boxes. Essentials will sort them into the correct boxes.

5. Click **OK**.
6. On the **Extents** tab, click **Initial Extent**.  
The map preview updates to show the initial extent, so you can verify it.

7. Click **Apply Changes**.
8. Click **Save Site**.

► **To reset the map's initial extent to the default:**

1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Position the pointer over **Initial Extent**.  
The management tools appear.
3. Click the **Edit** icon .
4. Click **Reset Default**.
5. Click **OK**.
6. On the **Extents** tab, click **Initial Extent**.  
The map preview updates to show the default initial extent.
7. Click **Apply Changes**.
8. Click **Save Site**.

## 6.4 Create Bookmarks



Bookmarks used to be called named extents in Essentials.

A bookmark is a shortcut that enables end users to jump the map to a particular map extent.

For example, you could configure a bookmark named Downtown that encompasses the city center. When an end user selects the Downtown bookmark, the map automatically pans and zooms to the extent of Downtown.

If there are particular bookmarks that you want to make available to end users, you can configure them in Manager. This saves the bookmarks in the site configuration so that all users have access to them. In addition, end users can create their own bookmarks. Bookmarks that are created by an end user exist only for the duration of the session—when the user closes the viewer, the bookmarks disappear. To save bookmarks across sessions, a signed-in user can save a project, provided the viewer supports projects. For information about projects, see "Project Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

If you want a particular viewer to support bookmarks, you must make the Bookmarks tool or map widget available in the viewer.

The steps to configure bookmarks are:

- **Create Bookmarks in Manager:** See [Add or Import a Bookmark on page 84](#).
- **Configure Bookmarks in an HTML5 Viewer:** See [Configure Map Widgets for an HTML5 Viewer on page 377](#) for instructions. For more information, refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

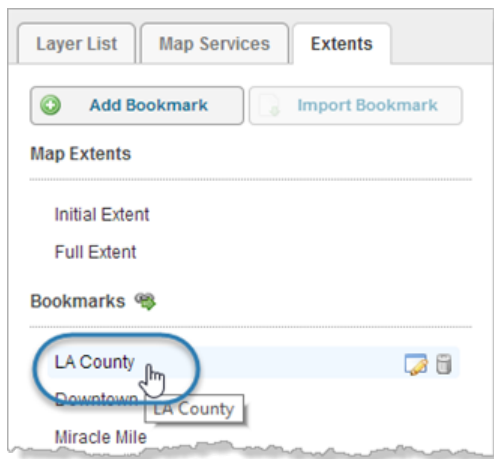


## 6.4.1 Add or Import a Bookmark

You can either add a new bookmark, or import bookmarks that are already configured in another site. There are two approaches to adding new bookmarks:

- Navigate the map preview to the desired extent.
- Enter the coordinates of the desired extent.

Manager's Map page has an Extents tab where you configure bookmarks. To zoom the map preview to a bookmark, click the bookmark on the **Extents** tab.




Zoom the map preview to the LA County bookmark

### ▶ To add a bookmark using the map preview:

1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Pan and zoom the map preview to show the extent that you want to add a bookmark for.
3. Click **Add Bookmark**.  
A new bookmark appears at the bottom of the list on the Extents tab. The new bookmark has the same extent as the map preview.
4. Type a name for the bookmark and press **Enter**.  
Bookmark names can contain spaces and special characters.
5. Click **Apply Changes**.
6. Click **Save Site**.

### ▶ To add a bookmark using coordinates:

1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Click **Add Bookmark**.  
A new bookmark appears at the bottom of the list on the Extents tab.

3. Type a name for the bookmark and press **Enter**.  
Bookmark names can contain spaces and special characters.
4. Click the **Edit** icon  beside the new bookmark.
5. Edit each coordinate that you want to change. To change a coordinate, click in the box and edit the value.



The coordinates that you enter must be in the same spatial reference as the map.



You can edit all four coordinates at one time using copy and paste (Ctrl-C and Ctrl-V). Copy them as a comma-delimited list, for example, **-80, -160, 80, 160**. Paste them into any one of the boxes. Essentials will sort them into the correct boxes.

6. Click **OK**.
7. On the **Extents** tab, click the new bookmark.  
The map preview updates to show the bookmark, so you can verify it.
8. Click **Apply Changes**.
9. Click **Save Site**.

#### **To import bookmarks:**



For an imported bookmark to work, it must be in the same spatial reference as the map.

1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab..
2. Click **Import Bookmark**.  
If the Import Bookmark button is grayed out, click Apply Changes to make the button available.
3. Select the site where the bookmarks are configured, and then click **Next**.
4. Select the bookmarks that you want to import.  
To select multiple bookmarks, hold the Ctrl key down while selecting.
5. Click **Finish**.  
The bookmarks are added to the bottom of the list on the Extents tab.
6. Click **Save Site**.


## 6.4.2 Change a Bookmark

#### **To change a bookmark's display name:**


This procedure explains how to change the bookmark's display name by editing the bookmark.




You can also change a bookmark's display name by double-clicking the bookmark on the Extents tab.

1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Position the pointer over the bookmark.  
The management tools show.
3. Click the **Edit** tool .
4. Click in the **Display Name** box and edit the name.
5. Click **OK**.
6. Click **Apply Changes**.
7. Click **Save Site**.

▶ **To change a bookmark's extent using the map preview:**

1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Pan and zoom the map preview to show the extent that you want to use.
3. On the **Extents** tab, position the pointer over the bookmark.  
The management tools appear.
4. Click the **Edit** tool .
5. Click **Use Current View**.
6. Click **OK**.
7. Click **Apply Changes**.
8. Click **Save Site**.

▶ **To change a bookmark's extent using coordinates:**

1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Position the pointer over the bookmark.  
The management tools show.
3. Click the **Edit** icon .
4. Edit each coordinate that you want to change. To change a coordinate, click in the box and edit the value.



The coordinates that you enter must be in the same spatial reference as the map.




You can edit all four coordinates at one time using copy and paste (Ctrl-C and Ctrl-V). Copy them as a comma-delimited list, for example, **-80, -160, 80, 160**. Paste them into any one of the boxes. Essentials will sort them into the correct boxes.

5. Click **OK**.
6. On the **Extents** tab, click the bookmark.  
The map preview updates to show the bookmark, so you can verify it.
7. Click **Apply Changes**.
8. Click **Save Site**.

### 6.4.3 Remove a Bookmark

#### ▶ To remove a bookmark:

1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Position the pointer over the bookmark that you want to remove.  
The management tools show.
3. Click the  **Remove** tool.
4. You are prompted to confirm.
5. Click **OK**.

### 6.4.4 Reorder the List of Bookmarks

Bookmarks appear in the viewer in the same order that they appear on the Map page's Extents tab. You can change the list of bookmarks so they appear in a sensible order. For example, you could order the list with the bookmarks that you expect to be used the most at the top of the list. If the list is long, this saves the end user having to scroll the list.

#### ▶ To change the order of the list of bookmarks:

1. In Essentials, edit the site that you want to configure, click **Map** in the side panel, and then click the **Extents** tab.
2. Click and hold a bookmark that you want to move to a different position in the list.
3. Drag the bookmark to the desired position.  
A guideline shows where the bookmark can be placed.
4. Release the mouse button.
5. Continue to move bookmarks until the list is sorted the way that you want it.


6. Click **Apply Changes**.
7. Click **Save Site**.

## 6.5 Change the Map's Drawing Order

The map's drawing order is determined by the order of the services listed on the Map page's Map Services tab. When a service lies on top of other services, the upper service's layers may obscure the layers in the services underneath it.


 You can also [change the drawing order of dynamic layers](#).

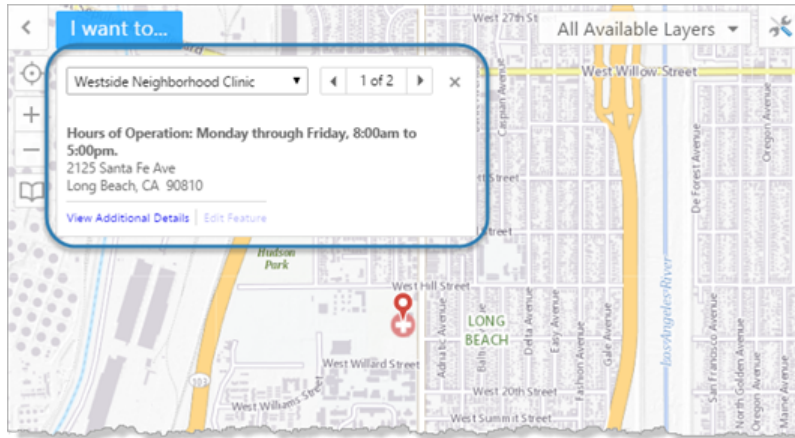
### To change the map's drawing order:

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.
2. Click the  icon beside each service to hide their layers.  
This makes it easier to see the list of services.
3. Click and hold a service you want to move in the list.
4. Drag the service to the desired position in the list.  
A guideline shows where the service can be placed.
5. Release the mouse button.  
The service is moved to the position where you dropped it.
6. Continue dragging and dropping services until the list is sorted the way you want it.
7. Click **Apply Changes**.

## 6.6 Configure Map Tips

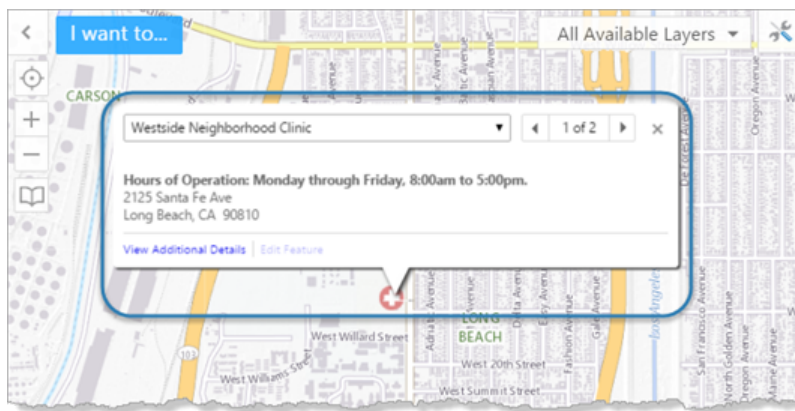
Map tips are pop-up windows that appear on the map when the user clicks on the map. If there are spatial features where the user clicked, the map tip contains information about the features. The features can belong to the same layer, or different layers.

Map tips can appear at a fixed location on the map (fixed-location map tips), or at the location where the user clicked (callout-style map tips). Fixed-location map tips appear in the top left corner of the map by default. The map tip's currently selected feature is either marked with a pushpin  or highlighted on the map, depending on the feature's geometry. In the screen capture below, the feature is marked with a pushpin because it is a point.



Example of a fixed-location map tip for a point feature, shown in an HTML5 viewer

Callout-style map tips point to where the user clicked.



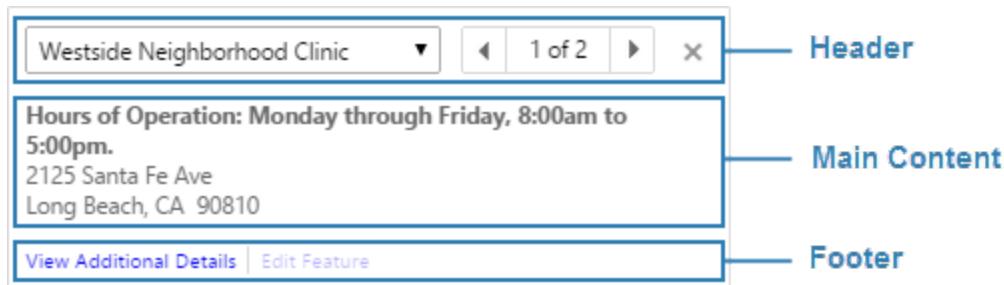
Example of a callout-style map tip shown in an HTML5 viewer



The HTML5 Viewer uses fixed-location map tips by default. You can configure HTML5 viewers to use callout-style map tips instead of fixed-location map tips.

Map tips have three parts:

- **Header:** The header contains the Feature Label, as well as components that allow the user to browse the features when more than one result is returned.
- **Main Content:** The main content area contains the Feature Description or Feature Long Description.
- **Footer:** The footer contains hyperlinks to related information and tasks.



### Parts of a map tip

The main steps to configure map tips for a layer are:

1. Enable map tips for the layer.  
The layer must belong to a dynamic map service.  
Follow the instructions given below to enable map tips.



For performance reasons, map tips are disabled by default for most types of map service. KML and GeoRSS layers are exceptions—map tips are always enabled for GeoRSS and KML layers.

2. Configure the header and main content that you want to show in the layer's map tips.  
For information, see [About Feature Descriptions on page 191](#).
3. Configure map tips in each of the site's viewers. For instructions, see "MapTips Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

### ▶ To enable map tips for a layer:




Map tips are always enabled for KML and GeoRSS layers. You cannot disable map tips for KML and GeoRSS layers.

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.



If the layer is in the Layer List, you can also enable map tips on the Layer List tab.

2. Position the pointer over the layer.  
The management tools show.
3. Select the down arrow .
4. Select the **Show Map Tips** checkbox.
5. Click **Apply Changes**.  
Map tips are enabled for the layer.

▶ **To enable map tips for all of a map service's layers at one time:**




Batch editing overwrites the existing configuration for every layer in the folder or service. The only way to restore the previous configuration after you click Apply Changes is to individually reconfigure each setting in each layer.

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.



If the map service is in the Layer List, you can also enable map tips using the map service's folder on the Layer List tab.

2. Position the pointer over the map service whose layers you want to configure. The management tools show.
3. Select the down arrow .
4. Select the **Show Map Tips** checkbox.
5. Click **Apply Changes**.  
Map tips are enabled for all the layers in the map service.

## 6.7 Configure Map Export

The Map Export feature allows end users to export the current map image to a file. Users can select the file format to export to. The following file formats can be exported:

- BMP
- JPEG
- PNG
- TIFF
- GeoTIFF
- PDF

You can allow users to export georeference data with BMP, JPEG, PNG, and TIFF images. GeoTIFF images always includes georeference data. Essentials does not support the export of georeference data with PDFs. The Export tool is available on all viewers's default toolbars, and it can be added or removed from the viewer's management pack. You can also create menu items, hyperlinks, or workflows that export the map image using the `ShowExportMapDialog` command.

### Map Export Settings

The Map Export feature has the following settings:

- **Allow Including Georeference Data:** When this checkbox is selected, the user has the option to include georeference data with the exported map image. Exporting georeference data allows the exported image to be



accurately positioned in GIS applications.

If you do not want the user to be able to export georeference data with the map image, clear the Allow Including Georeference Data checkbox.



iOS does not support ZIP files. To use Export features that produce ZIP files in iOS, you must install third-party software to handle ZIP files, such as iZip.

- **Default Map Output Format:** The file format that is initially selected when the user requests a map export. Users can change the file format. After a user has changed the output file format once, the viewer remembers the user's preference.

### ▶ To configure map export settings for HTML5 viewers:

1. In Manager, edit the site that you want to configure, click **GIS Services** in the side panel, and then click the **Export** tab.
2. Configure the [settings](#).
3. Click **Apply Changes**.  
Your configuration applies to all of the HTML5 viewers in the site.

## 6.8 Basemaps

Basemaps provide background and context in support of a map's operational layers. They help to orient users. Aerial imagery, terrain layers, and street maps are often used as basemaps.

In Essentials, a basemap can contain multiple map services. When a user selects a basemap in a viewer's [Basemap Switcher](#), the map services in that basemap turn on and the map services in the other basemaps turn off.

In addition to individual map services, a basemap can contain one sub-group of map services called a **transparency slider group**. [Transparency slider groups](#) present their map services in a slider that the user can drag to fade out one map service and fade in the next map service.

Basemaps are configured on Manager's Basemaps page. You can configure as many basemaps as you want, and a basemap can contain as many map services as you want. Each basemap can contain at most one transparency slider group. A map service can belong to more than one basemap.

To make a map service function as a basemap, you include the map service in at least one basemap on Manager's Basemaps page. Map services that are not included in a basemap are operational.

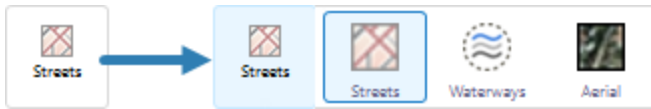


ArcGIS Server feature layers, KML layers, and GeorSS layers cannot be used in basemaps in Essentials.

### 6.8.1 Basemap Switcher

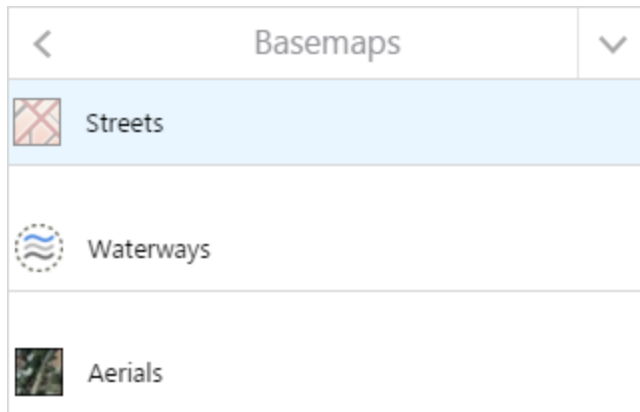
The Basemap Switcher provides a quick way for users to select a basemap to make visible. Selecting a basemap turns on the basemap's map services and turns off all other basemap services.

When the Basemap Switcher is closed, it shows the currently selected basemap. In the Desktop and Tablet interfaces, the user clicks or taps the Basemap Switcher to open the Switcher and select a different basemap. In the following images, the **Streets** basemap is selected.



Example of the Basemap Switcher in the Desktop and Tablet interfaces, shown closed (left) and open (right)

In the Handheld interface, the user opens the **I Want To** menu, taps **Select a Basemap** to open the Switcher and select a different basemap.



Example of the Basemap Switcher in the Handheld interface

By default, the Basemap Switcher shows in the viewer whenever two or more (non-empty) basemaps are configured in the site. You can configure the Basemap Switcher to show when a single basemap is configured. For information, see "Basemap Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

## Interaction Between the Basemap Switcher and the Layer List

If you include basemap services in the Layer List, then there are two ways for users to change the visibility of basemap services—by changing the visibility checkboxes in the Layer List, or by selecting a basemap in the Basemap Switcher.

The Layer List and Basemap Switcher are synchronized. When a user selects a basemap in the Basemap Switcher, the basemap's map services turn on in the Layer List and the other basemap services turn off in the Layer List. Conversely, if the user uses the Layer List to turn on exactly those map services that make up a particular basemap (and turn off all other basemap services), then the Basemap Switcher updates to show the basemap that the user turned on in the Layer List.

Any combination of visibilities that do not turn on exactly one basemap (for example, turning on map services from different basemaps, or turning on a subset of a basemap's map services) results in the Basemap Switcher displaying the default Basemaps icon. The default icon indicates that no single basemap is currently selected. Note that, to show a transparency slider, you must turn on exactly one of the map services in the slider group—the slider does not show when more than one of its map services are turned on in the Layer List.



Default icon shown in the Basemap Switcher

## Interaction Between the Basemap Switcher and Layer Themes

The particular basemaps that appear in the Basemap Switcher depend on the [layer theme](#) that is selected. If the built-in **All Available Layers** layer theme is selected, then the Basemap Switcher shows all the (non-empty) basemaps that are configured in the site. When a user selects a basemap in the Basemap Switcher, all of the map services in that basemap turn on, and all of the map services in all of the other basemaps turn off.

When the user changes the layer theme, the basemaps that are available in the new layer theme are loaded into the Basemap Switcher, replacing the basemaps from the previous layer theme. A basemap is available in a layer theme if one or more of its map services is included in the layer theme.

If all of a basemap's map services are excluded from a layer theme, then the basemap does not show in the Basemap Switcher.

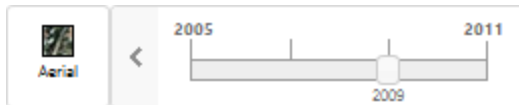
### 6.8.2 Transparency Slider Groups

Basemaps can contain transparency slider groups. These are groups of related map services whose relative transparency is controlled by a slider. Dragging the slider fades out one map service (increases the transparency) and simultaneously fades in the next map service (decreases the transparency). This provides a smooth transition from one map service to the next.



In the Handheld interface, the transparency slider only displays if the bottom panel is closed.

For example, suppose you have aerial photographs of your town that were taken every two years between 2005 and 2011. You publish the aerial photographs in four map services called **2005**, **2007**, **2009**, and **2011**. In Essentials, you put the four map services in a transparency slider group and add the slider group to a basemap. When an end user selects the basemap that contains the slider group, the slider opens.



#### Example of a transparency slider

In the screen capture, the **2009** map service is currently visible. If the user drags the slider to the right, 2009 starts to fade out and 2011 starts to fade in. 2011 becomes fully visible (0% transparency) at the same time that 2009's transparency reaches 100%. At this point, 2009's visibility checkbox is cleared.

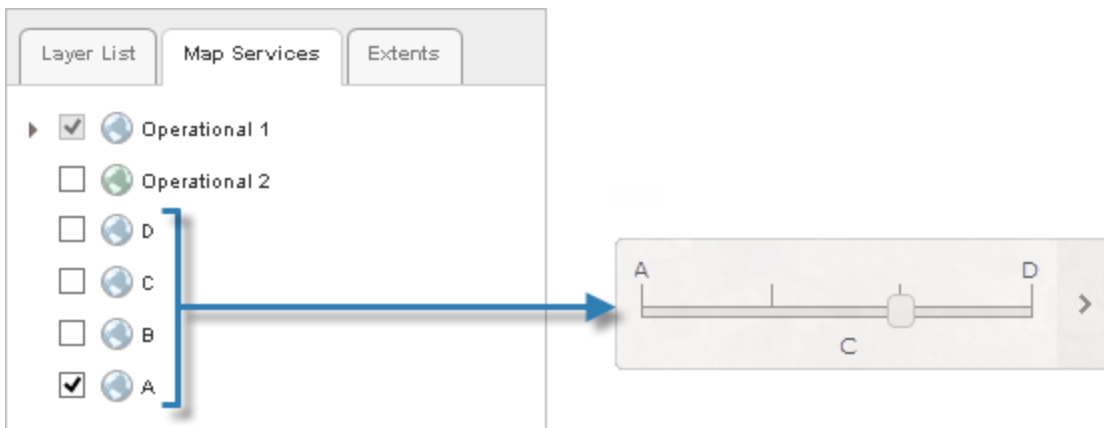
Transparency sliders have very little space to display the map service's names. For this reason, only the names of the first and last map service show in the slider. If you configure a map service's [Short Display Name](#), the short name is used in transparency sliders.



If a slider group's map services are in a folder and you set the [visibility behavior](#) to **Only One Visible at a Time**, the slider will snap from one map service to the next instead of transitioning smoothly.

► **To configure a basemap transparency slider group:**

1. Edit each map service that you want to include in the slider group:
  - a. On the map service's [Functional tab](#), set the **Basemap Transparency Slider Group** setting to the name of the slider group.  
To create a new slider group, type in the name. To select an existing group, click in the Basemap Transparency Slider Group box and select the group from the drop-down list.
  - b. On the map service's [Details tab](#), enter a **Short Display Name** for the map service (recommended).  
The short display name is used in the transparency slider.
2. [Change the map's drawing order](#) so that the map services are in reverse order on the Map Services tab.  
Reading down the Map Services tab, the slider group's map services are in right-to-left order.



Drawing order for the map services in a transparency slider group

3. [Add the slider group to a basemap](#).
4. Save the site.

► **To remove a basemap transparency slider group:**

When you remove all the map services from a basemap transparency slider group, the transparency group no longer exists in the site.

1. In Manager, edit one of the map services that belong to the transparency slider group, and then click the **Functional** tab.
2. Click in the **Basemap Transparency Slider Group** box and delete the name of the slider group.
3. Click **Apply Settings**.
4. Repeat the above steps for each map service that is in the slider group.
5. Click **Save Site**.

### 6.8.3 Configure Basemaps

#### To add a basemap:

1. In Essentials, edit the site that you want to configure, and then click **Basemaps** in the side panel.
2. Click **Add Basemap**.
3. In the **Map Services** area, select the checkbox for each map service that you want to include in the basemap. You can also include one [transparency slider group](#), if you have configured one.
4. In the **Display Name** box, type a name for the basemap.  
The display name appears in a viewer's Basemap Switcher, so keep the name short.
5. In the **Icon URI** box, type or paste the URI for the icon that will represent the basemap in the Basemap Switcher.
6. In the **Export Tiles Override** box, you can optionally override the basemap's URL for the ExportTiles operation. This setting is used to define Custom Offline Basemaps, and is only available for basemaps containing at least one ArcGIS Tiled Service. The site must contain the overriding ArcGIS Tiled Service that supports the ExportTiles operation. For more information, see the *Geocortex Mobile App Framework Administrator Guide*.
7. Click **OK**.
8. Click **Apply Changes**.
9. Click **Save Site**.

#### To edit a basemap:

1. In Essentials, edit the site that you want to configure, and then click **Basemaps** in the side panel.
2. In the list of basemaps, click the basemap that you want to edit, or hover the pointer over the basemap. The management tools appear.
3. Click the **Edit** tool.
4. Edit the settings as desired:
  - **Map Services:** Indicates which items are included in the basemap. A basemap can include any number of map services and at most one transparency slider group. To add an item to the basemap, select the item's checkbox. To exclude an item, clear the item's checkbox.  
The Map Services area lists every map service that can be used in a basemap. ArcGIS Server feature layers, KML layers, and GeorSS layers cannot be used in basemaps.
  - **Display Name:** The name that is used to refer to the basemap in viewers. The display name appears in the Basemap Switcher, so a short name is recommended.
  - **Icon URI:** The URI for the icon that will represent the basemap in a viewer's Basemap Switcher.

- **Export Tiles Override:** An optional URL of an ArcGIS Tiled Map Service supporting the Export Tiles operation. This service is used to override the basemap's ExportTiles operation. For example:

`http://MyServer.com/arcgis/rest/services/MyMapService/MapServer`

This setting is used to define Custom Offline Basemaps, and is only available for basemaps containing at least one ArcGIS Tiled Service. For more information, see the *Geocortex Mobile App Framework Administrator Guide*.

5. Click **OK**.
6. Click **Apply Changes**.
7. Click **Save Site**.

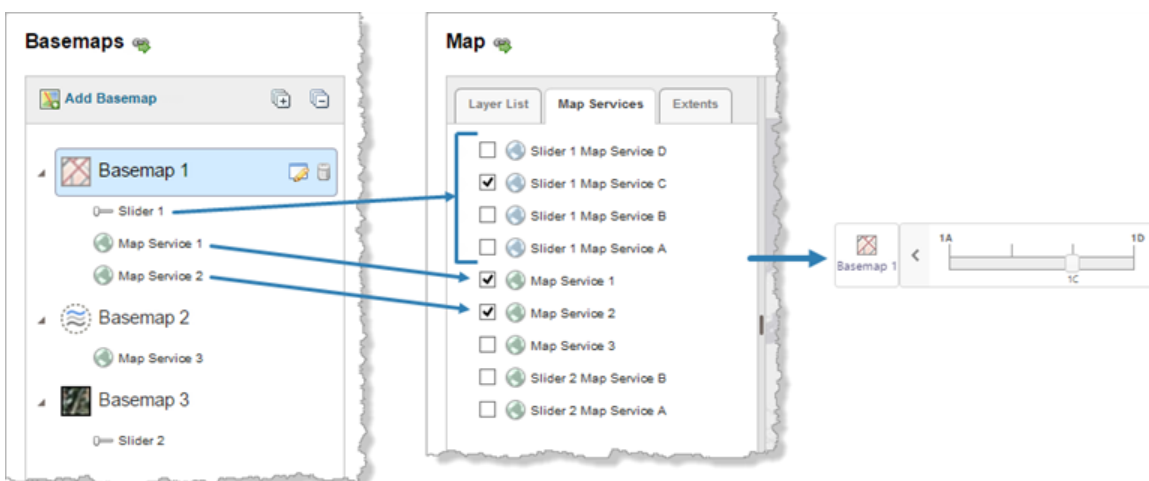
#### ▶ To create a basemap when you add a map service:

This procedure adds a map service to the map and creates a basemap that contains the map service.

1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. Click **Add Map Service**.
3. Search or browse for the map service that you want to add.
4. Select the **Add as Basemap** checkbox.  
The Add as Basemap checkbox appears when you have located the map service that you want to add.
5. Add the map service.
6. Click **Apply Changes**.
7. Click **Save Site**.

#### ▶ To configure a default basemap:

If each map service in a particular basemap is turned on by default, and all other basemap services are turned off by default, then the basemap is selected in the Basemap Switcher when the viewer launches. You can use this fact to configure a default basemap. For example, the following screen capture shows how to configure the default visibility to make Basemap 1 the default.

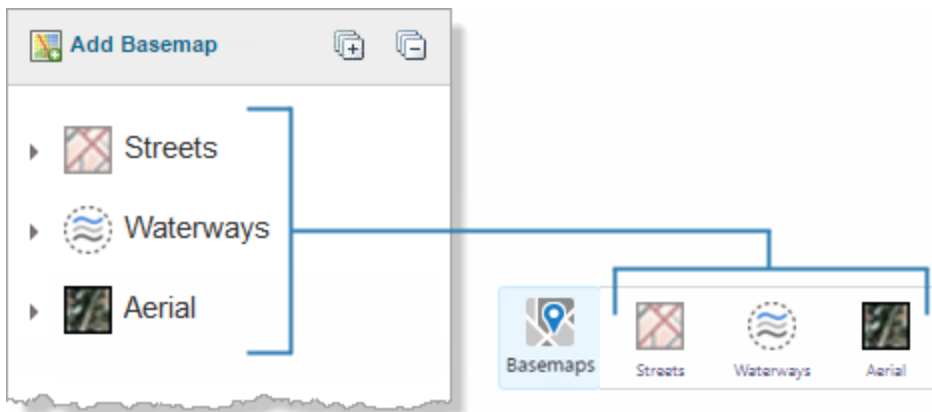


### Configuration to make Basemap 1 the default (left and middle), and the initial view of the Basemap Switcher in the viewer (right)

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.
2. Clear the visibility checkbox for each map service that is not in the default basemap.
3. Select the visibility checkbox for each map service that is in the default basemap, but is not in a transparency slider group.  
If the default basemap contains a transparency slider group, select the visibility for exactly one of the map services in the slider group. The map service that you select is the slider's default.
4. Click **OK**.
5. Click **Apply Changes**.
6. Click **Save Site**.

#### ▶ To re-order basemaps:

The order that basemaps appear on Essentials' Basemaps page determines the order that they appear in the Basemap Switcher. Top-to-bottom order in Manager corresponds to left-to-right order in the Basemap Switcher.



### Basemaps in Manager (left) and their order in the Basemap Switcher (right)

1. In Essentials, edit the site that you want to configure, and then click **Basemaps** in the side panel.
2. Select the **Collapse All** tool at the top of the list of basemaps.
3. Click the basemap that you want to appear left-most in the Basemap Switcher and drag it to the top of the list.  
As you drag the basemap, a marker shows you where the basemap will be placed when you release the mouse button.
4. Continue dragging basemaps until they are ordered the way you want.  
Top-to-bottom in Manager appears left-to-right in the Basemap Switcher.
5. Click **Apply Changes**.
6. Click **Save Site**.

 **To remove a basemap:**

1. In Essentials, edit the site that you want to configure, and then click **Basemaps** in the side panel.
2. In the list of basemaps, click the basemap that you want to remove, or hover the pointer over the basemap. The management tools show.
3. Click the **Remove** tool.
4. Click **OK** to confirm.
5. Click **Apply Changes**.
6. Click **Save Site**.

## 7 Portal for ArcGIS

You can add services and web maps that are hosted in an ArcGIS portal to Essentials sites. Essentials supports:

- **Public Portal for ArcGIS Content:** Web maps and services that are hosted in your Portal for ArcGIS portal and are shared with **Everyone (public)**.
- **Private Portal for ArcGIS Content:** Web maps and services that are hosted in your Portal for ArcGIS portal and are not shared with **Everyone (public)**.

In order to add private Portal for ArcGIS content, you must configure the Portal for ArcGIS sign-in method in the Post Installer. For more information, see "Choose a Method to Sign In to Manager" in the *Geocortex Essentials Installation Guide*.

See also...

[Add a Map Service to the Map on page 108](#)

[Add a Reference to an ArcGIS Web Map on page 188](#)

### 7.1 About Portal for ArcGIS Web Maps

Portal for ArcGIS web maps are web-based maps that you create in Portal for ArcGIS.



In Essentials, web maps created in Portal for ArcGIS behave the same as web maps created in ArcGIS Online. They are added the same way, the inheritance works the same, and so on. When you understand how one works, you also understand how the other works.

You can add Portal for ArcGIS web maps to your Essentials sites.



To add a private Portal for ArcGIS web map, or a web map that contains one or more private services, Essentials must be registered with Portal for ArcGIS. For instructions, see "Choose a Method to Sign In to Manager" in the *Geocortex Essentials Installation Guide*.



To add a Portal for ArcGIS web map to a site, you configure a [reference](#) to the web map. When a site references a web map, the site includes all its own configured components and settings, as well as components and settings that it inherits from the web map. The site inherits:

- **Map Services and Layers:** \*
  - ArcGIS Server tiled and dynamic map services, feature layers, and image services
  - OGC, WMS, and WMTS
  - KML
  - Bing Maps \*\*
  - Web tiled layers, including Open Street Maps
  - GeoRSS (Simple and GML)
  - Layers from shapefiles
  - Layers from CSV and TXT files
  - GPX waypoints, tracks, and routes
  - Routes, Route Stops, and Route Directions
  - Map notes
- **Bookmarks**
- **Pop-ups:** Pop-ups appear in the site as field settings for the layer. If the pop-up contains media links, the links are added to the layer as [feature hyperlinks](#).

\* Essentials does not support presentations in web maps.

\*\* In order to reference a web map that contains one or more Bing Maps layers, you must first [add a Bing Maps service connection](#).

## Override the Inherited Configuration

You can modify or remove components and settings that a site inherits from a Portal for ArcGIS web map.

For example, suppose a web map has a bookmark called **City Center**, and your site references the web map. If you edit your site and change the inherited bookmark's display name to **Downtown**, the bookmark will appear as **Downtown** in Essentials and in the site's viewers. If you then edit the source web map and change the bookmark's name from **City Center** to **Central Donville**, Essentials and the viewers will continue to refer to the bookmark as **Downtown**. Your change in the site is preserved.


Removing the bookmark from the source web map removes the bookmark from your site.

### See Also...

[References on page 187](#)

When the source web map changes, the changes are not automatically reflected in a site that references the web map. You must manually refresh web maps to see the changes in your site.

► **To refresh web maps:**

1. In Essentials, edit the site that you want to configure, and then select **Site Info** from the side panel.
2. In the **References** area, choose  **Refresh Web Maps**.  
Essentials updates the site with any changes that have been made in the source web maps that the site references.

## 7.2 Set Up Access to Private Portal for ArcGIS Content

When you create content in Portal for ArcGIS, by default only you can access it. If you share your content with **Everyone (public)**, then any person or application, including Essentials, can access it. No special setup is needed for Essentials to access public content.

If your content is not shared with Everyone (public), then it is considered to be private. For example, content that is shared with your organization or with one or more groups is considered to be private.

In order to add private Portal for ArcGIS content to an Essentials site, you must register Essentials with Portal for ArcGIS.

To register Essentials with Portal for ArcGIS, you configure the Portal for ArcGIS method of signing in to Essentials in the Post Installer. The Portal for ArcGIS sign-in method enables you to:

- Use your private Portal for ArcGIS content in your Essentials sites.
- Secure your Essentials sites using Portal for ArcGIS to authenticate end users.
- Sign in to Essentials using one of the following types of account:
  - Administrative accounts for your Portal for ArcGIS organization.
  - The account that you use to set up access to Portal for ArcGIS in the Post Installer.

You can change the Portal for ArcGIS account types that are allowed to sign in to Essentials. For instructions, refer to the *Geocortex Essentials Installation Guide*.

For information on configuring the sign-in method, refer to "Choose a Method to Sign In to Manager" in the *Geocortex Essentials Installation Guide*.

## 8 ArcGIS Online

You can add ArcGIS Online services and web maps to your Essentials sites. Essentials supports:

- **Public ArcGIS Online Content:** Public web maps, map services, and feature layers that are available at ArcGIS Online ([www.arcgis.com](http://www.arcgis.com)).
- **Private ArcGIS Online Content:** Private web maps, map services, and feature layers that are hosted by ArcGIS Online.

In order to add private ArcGIS Online content, you must configure the ArcGIS Online sign-in method in the Post Installer. For more information, see "Choose a Method to Sign In to Manager" in the *Geocortex Essentials Installation Guide*.

- **ArcGIS Online World Geocoding Service:** The geocoding service at:  
<http://geocode.arcgis.com/arcgis/rest/services/World/GeocodeServer>.

**See also...**

[ArcGIS Online Service Connections](#) on page 129

[Add a Map Service to the Map](#) on page 108

[Add a Reference to an ArcGIS Web Map](#) on page 188

[Add an ArcGIS Geocoding Service](#) on page 177

## 8.1 About ArcGIS Online Web Maps

ArcGIS Online web maps are web-based maps that you create in ArcGIS Online.



In Essentials, web maps created in Portal for ArcGIS behave the same as web maps created in ArcGIS Online. They are added the same way, the inheritance works the same, and so on. When you understand how one works, you also understand how the other works.

You can add ArcGIS Online web maps to your Essentials sites.



To add a private ArcGIS Online web map, or a web map that contains one or more private services, Essentials must be registered with ArcGIS Online. For instructions, see "Choose a Method to Sign In to Manager" in the *Geocortex Essentials Installation Guide*.

To add an ArcGIS Online web map to a site, you configure a [reference](#) to the web map. When a site references a web map, the site includes all its own configured components and settings, as well as components and settings that it inherits from the web map. The site inherits:

- **Map Services and Layers:** \*
  - ArcGIS Server tiled and dynamic map services, feature layers, and image services
  - OGC, WMS, and WMTS
  - KML
  - Bing Maps \*\*
  - Web tiled layers, including Open Street Maps
  - GeoRSS (Simple and GML)
  - Layers from shapefiles
  - Layers from CSV and TXT files
  - GPX waypoints, tracks, and routes
  - Routes, Route Stops, and Route Directions
  - Map notes
- **Bookmarks**
- **Pop-ups:** Pop-ups appear in the site as field settings for the layer. If the pop-up contains media links, the links are added to the layer as [feature hyperlinks](#).

\* Essentials does not support presentations in web maps.

\*\* In order to reference a web map that contains one or more Bing Maps layers, you must first [add a Bing Maps service connection](#).

## Override the Inherited Configuration

You can modify or remove components and settings that a site inherits from an ArcGIS Online web map.

For example, suppose a web map has a bookmark called **City Center**, and your site references the web map. If you edit your site and change the inherited bookmark's display name to **Downtown**, the bookmark will appear as **Downtown** in Essentials and in the site's viewers. If you then edit the source web map and change the bookmark's name from **City Center** to **Central Donville**, Essentials and the viewers will continue to refer to the bookmark as **Downtown**. Your change in the site is preserved.

Removing the bookmark from the source web map removes the bookmark from your site.


See Also...

[References on page 187](#)

### 8.1.1 Refresh Web Maps

When the source web map changes, the changes are not automatically reflected in a site that references the web map. You must manually refresh web maps to see the changes in your site.

#### To refresh web maps:

1. In Essentials, edit the site that you want to configure, and then select **Site Info** from the side panel.
2. In the **References** area, choose  **Refresh Web Maps**.  
Essentials updates the site with any changes that have been made in the source web maps that the site references.

## 8.2 Set Up Access to Private ArcGIS Online Content

When you create content in ArcGIS Online, by default only you can access it. If you share your content with **Everyone (public)**, then any person or application, including Essentials, can access it. No special setup is needed for Essentials to access public content.

If your content is not shared with Everyone (public), then it is considered to be private. For example, content that is shared with your organization or with one or more groups is considered to be private.

In order to add private ArcGIS Online content to an Essentials site, you must register Essentials with ArcGIS Online.

To register Essentials with ArcGIS Online, you configure the ArcGIS Online method of signing in to Essentials in the Post Installer. The ArcGIS Online sign-in method enables you to:

- Use your private ArcGIS Online content, such as web maps and services, in your Essentials sites.
- Secure your Essentials sites using ArcGIS Online to authenticate end users.
- Sign in to Essentials using one of the following types of account:

- Administrative accounts for your ArcGIS Online organization.
- The account that you use to set up access to ArcGIS Online in the Post Installer.

You can change the ArcGIS Online account types that are allowed to sign in to Essentials. For instructions, refer to the *Geocortex Essentials Installation Guide*.

For information on configuring the sign-in method, refer to "Choose a Method to Sign In to Manager" in the *Geocortex Essentials Installation Guide*.

## 9 Supported Types of Services

In the context of web mapping, services are GIS resources that are located on a server and accessed over a network.

Essentials supports the following types of service:

- **Map Services:**

You can add the following types of service to a site's map:

- **ArcGIS Server Services:**


- **Dynamic Map Services:** Dynamic map services render map images in response to map image requests from client mapping applications. Map images are rendered on the server and served to the client. ArcGIS Server dynamic map services can be queried.
- **Tiled (Cached) Map Services:** Tiled map services serve map images that are pre-rendered and cached on the server. ArcGIS Server tiled map services can be queried.
- **Feature Layers:** ArcGIS Server feature services serve feature attributes, geometry, and symbology. Geometries are rendered on the client. ArcGIS Server feature services can be queried.
- **Image Services:** ArcGIS Server image services serve raster and mosaic images that are pre-rendered on the server. Essentials supports identify operations on ArcGIS Server image services. Other forms of query are not supported.

- **Open Geospatial Consortium (OGC) Services:**

- **Web Map Service (WMS):** WMS is an OGC standard for dynamic map services. WMS services render map images in response to map image requests from client mapping applications. Map images are rendered on the server and served to the client. When used with a Web Feature Service (WFS), WMS services can be queried. Without a WFS service, WMS services support limited query.
- **Web Map Tiled Services (WMTS):** WMTS is an OGC standard for tiled map services. WMTS services serve map images that are usually pre-rendered and cached on the server. WMTS services support point Identify requests only. They do not support any other queries. Essentials does not support the use of WFS services with WMTS services.

- **Bing Maps:** Bing Maps are tiled map services. They serve map images that are pre-rendered and cached on the server. Essentials supports the Bing Maps **Road**, **Aerial**, and **Aerial with Labels** services. Bing Maps cannot be queried.
- **Web Tiled Layers:** Web tiled layers are tiled map services that use the Google tiling scheme. They serve map images that are pre-rendered and cached on the server. For example, Open Street Map (OSM) services can be added to the map as web tiled layers in Essentials.

- **KML Layers:** KML layers are defined using the XML-based Keyhole Markup Language, which is designed to store geographic data. Many mapping applications support KML, including ArcGIS Server, Google Earth, and Google Maps.
- **GeoRSS Services:** RSS is a technology for delivering text, audio, and media over the Internet. **Feeds** provide automatic notification of updated content. GeoRSS services provide geographic data in RSS feeds, so the data can be plotted by web mapping applications.
- **GIS Services:**  
You can add the following types of service to a site. These service types are configured separately from the map.
  - **Geometry Services:** Geometry services perform geometric calculations such as buffering, projection, and measurement. Essentials supports ArcGIS Server geometry services.
  - **Geocoding Services:** Geocoding services convert between addresses and spatial data. Essentials supports ArcGIS Server and Bing Maps geocoding services. Geocoding services are also known as address locators or geocoders.

 You cannot configure geoprocessing services in Essentials.

In order to add a service to your site or the site's map, the service must be one of the types listed above. The service must also be web-based, on a network that Essentials has access to. If the service is secured, you must configure the security information in Manager so Essentials knows how to access the service.

You can add services from your corporate network, from the Internet, or from other networks that your organization has access to. You can also add services from ArcGIS Online.

#### See also...

[Map Services on page 105](#)

[Geocoding Services on page 174](#)

[Geometry Services on page 185](#)

[Portal for ArcGIS on page 99](#)

[ArcGIS Online on page 101](#)

## 10 Map Services

A site's map can include:

- ArcGIS Server map services (tiled and dynamic)
- ArcGIS Server feature layers
- ArcGIS Server image services
- ArcGIS Server stream layers
- OGC WMS services
- OGC WMTS services

- OGC WFS services
- Bing Maps
- Web tiled layers, such as Open Street Maps
- KML layers
- GeoRSS feeds (Simple and GML)

You can combine different types of service in a single site, and you can combine dynamic and tiled map services.

Most Essentials sites have multiple services in the map, but this is not a requirement—a site's map can have a single service, or no services. Essentials does not place an upper limit on the number of services a site can have.

You can add an entire map service to the map at one time. This adds all the layers in the service to the map. You can then exclude individual layers if you want.

You can also add a single layer as a dynamic map service. This is useful for adding a single annotation layer or a single raster layer.

To add services to a site's map, you use Manager's Add Map Service function, which allows you to search for services and store connection information.

After you have added a service to the map, you can [edit the service](#) to configure the service's [settings](#).

#### See Also...

[Searching for Map Services to Add to a Site on page 106](#)

[Add a Map Service to the Map on page 108](#)

## 10.1 Accessing Secured Services

In order for Essentials to access a secured map service, Essentials needs to know how to access the service. Essentials needs access to a username and password or a security token. The specific information depends on the method that is used to secure the service.

Before you can add a secured service to a site, you must configure the connection information in Essentials. Similarly, if you add an unsecured service to a site and later secure the service, you must configure the connection information. The method that you use to configure the connection information depends on whether you are adding a secured service or changing the connection information for an existing service:

- **New Service:** Before you add the service, add a service connection and configure the connection information in the service connection. See [Service Connections on page 127](#).
- **Existing Service:** If you have already added a service to your site and later secure the site or change the security, edit the connection settings in the service. See [Edit a Map Service's Connection Settings on page 113](#).

## 10.2 Searching for Map Services to Add to a Site

Manager's Add Map Service dialog box provides a Search function that enables you to search for services that can be added to the map. To open the Add Map Service dialog box, select **Map** in the side panel, and then click **Add Map Service**.

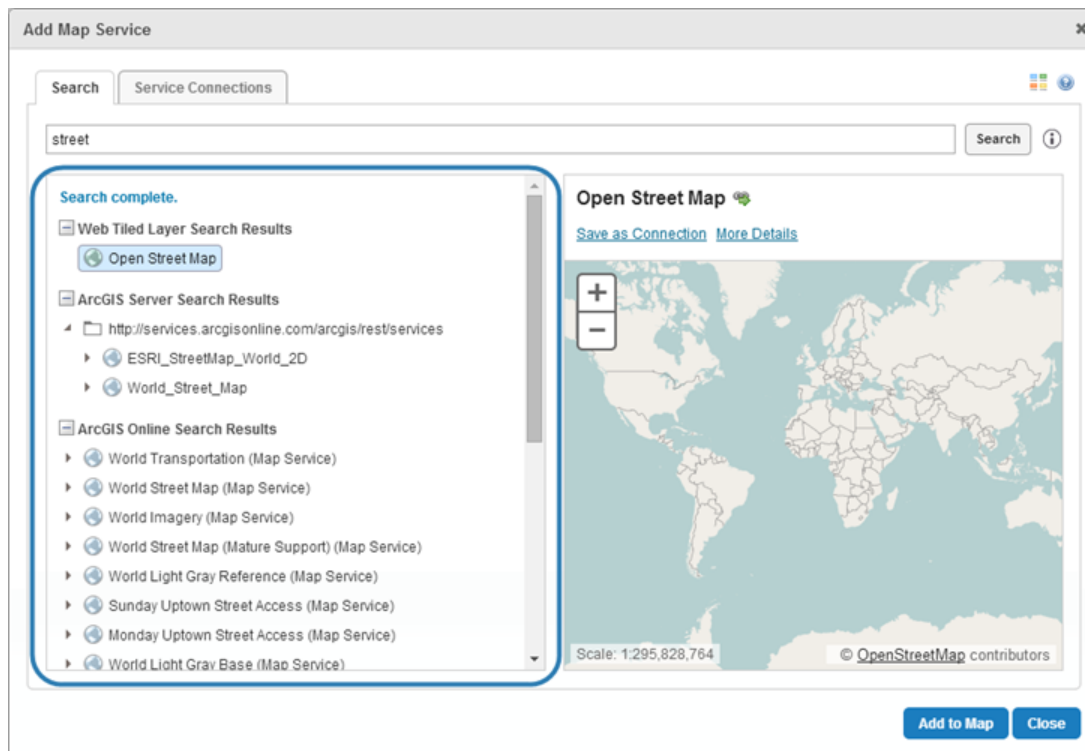
There are two ways to search:

- **Search by Location:** You can search by **URL** or by network address, such as the host name or IP address. This searches the specified location for all the services that you can add to the map. To search by location, you do not

need to have any service connections configured.

- **Search by Keyword:** If you have one or more [service connections](#) configured, you can enter a keyword to search for. This searches all the configured service connections for services whose display name or URL matches the search term.

The search results list the services that were found, and the layers in each service. You can browse the services and layers, view and navigate a preview of the selected service or layer, and view additional details such as the spatial reference and service type. To add a service or layer to the map, you select the service or layer in the search results and then use the Add button.



Add Map Service dialog box showing search results on the Search tab

The icons in the search results identify the type of service or layer. To show a legend that identifies what each icon represents, hover over the legend icon



In order to search for a **secured** service, you must first add a service connection for the service. The service connection contains the security information that enables Manager to connect to the service, such as the authentication method and credentials.

In order for the search function to return a service in the search results, Manager must be able to connect to the service. This means the service must be available when you perform the search. The exception is when the service connection has an index to search, such as ArcGIS Online has.

See also...

[Service Connections](#) on page 127



## 10.3 Add a Map Service to the Map

To add a map service to the map, Manager must be able to connect to the map service. You cannot add a map service when the map service is offline. The exception is when the service connection has an index to search, such as ArcGIS Online has. In this case, Manager searches the index, not the service.

If a map service is secured, you must add a [service connection](#) before you can add the map service to the map. Depending on the type of map service, the service connection can be for the service itself, for a catalog that contains the service, or for the server that hosts the service.




You cannot add service connections for KML layers or GeoRSS layers. Essentials supports public KML and GeoRSS layers only. To add a KML or GeoRSS layer to the map, you must enter the layer's URL.

You can add a map service to the map in two ways:

- [Browse service connections](#)
- [Search](#)


The search option allows you to enter the exact URL of the service that you want to add, or you can enter a keyword to search for in the service connections that you have configured.

### ▶ To add a map service to the map by searching:





1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. Select  **Add Map Service**, and then click the **Search** tab.
3. Type a URL or keyword in the **Search** box:
  - **URL:** Enter the URL for the map service, or for a catalog of map services.



If you manually enter a URL, ensure that you have removed any URL parameters. For example, the URL `http://mapservice.com/service/wfs?request=GetCapabilities` should be stripped of the parameter `?request=GetCapabilities`.

- **Keyword:** Enter the text that you want to search for, for example, the name of the service. The keyword search function searches service connections. You cannot use this method to add KML or GeoRSS layers to the map, because they do not have service connections.
4. Select the  **Search** tool.
  5. If Essentials is registered with ArcGIS Online, and you want to search only your organization's content, select the **Limit ArcGIS Online results to your organization** checkbox. If you clear the checkbox, Manager searches both your organization's content and public ArcGIS Online content belonging to other organizations.

## 6. Browse the search results:

- Select the  **Expand** node to show the search results from a particular type of service connection.  
Select the  **Collapse** node to hide the contents of an expanded node.
- Select the  **Expand** icon to show items within a search result. For example, you can show the layers in a map service.  
Select the  **Collapse** icon next to an expanded result to hide the items within.
- Select a service or layer in the search results to see a preview, if a preview is available.  
You can navigate the preview. Click and drag in the preview frame to pan the preview. To zoom, use your mouse's scroll wheel or the zoom control in the preview pane.



If there is nothing to display at the given scale, the preview is blank. You can still add the service to the map when the preview is blank. For WMS services, the preview is blank until you turn on some layers.

- Position the pointer over **More Details** to see additional details about the selected service or layer, such as the spatial reference.

## 7. When you find a map service, layer or table that you want to add to the map, select it in the search results. Depending on the type of service or layer you selected, one or two Add buttons will display.

If the Add button is not available, you have selected something that cannot be added to the map, such as a folder.



If you are adding a WMS map service, you can set the default visibility of the layers using the checkboxes in the search result. Alternatively, you can set the default visibility after you have added the service.

8. If you want to use the map service as a [basemap](#), select the **Add as Basemap** checkbox.

This creates a basemap containing the map service on Manager's Basemaps page.

To use the map service as an operational layer, clear the **Add as Basemap** checkbox.

If there is no Add as Basemap checkbox, the type of map service or layer that you are adding cannot be used as a basemap.

## 9. Do one of the following:




- If you selected a feature layer from an ArcGIS feature server, the button says **Add as Feature Layer**.  
Click the button.
- If you selected a feature layer from an ArcGIS map service, there are two buttons:
  - If you are not going to configure any of the additional features that are available only for feature layers, such as charting, clustering, or heat maps, select **Add as Map Service**.
  - If you want to be able to configure one or more of the additional features that are available only for feature layers, such as charting, clustering, or heat maps, select **Add as Feature Layer**.
- Otherwise, there is one button—**Add to Map**. Click the button.

The dialog box closes and the map service is added to the list of map services in the map. If you added the map service as a basemap, a basemap containing the map service is created on Manager's Basemaps page.

10. Click **Save Site**.

► **To add a map service to the map by browsing the service connections:**

You cannot use this method to add KML or GeorSS layers to the map.

1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. Press the  **Add Map Service** button and then select the **Service Connections** tab.
3. Browse the service connections:
  - Select the  **Expand** icon to show the contents of a service connection, including the layers within each service.  
Select the  **Hide** icon to hide the contents.
  - Select a map service or layer in the service connections to see a preview, if a preview is available. You can navigate the preview. Click and drag in the preview frame to pan the preview. To zoom, use your mouse's scroll wheel or the zoom control in the preview pane.



If there is nothing to display at the given scale, the preview is blank. You can still add the map service to the map when the preview is blank.

- Position the pointer over **More Details** to see additional details about the selected map service or layer, such as the spatial reference.



You can change the order of the connections listed on the Service Connections tab. To move a service connection to a different position in the list, drag the connection to its new position.

4. When you find a map service or layer that you want to add to the map, select it in the service connections. Depending on the type of map service or layer you selected, one or two Add buttons are displayed. If the Add button is not available, you have selected something that cannot be added to the map, such as a folder.



If you are adding a WMS, you can set the default visibility of the layers using the checkboxes in the service connection. Alternatively, you can set the default visibility after you have added the service.

5. If you want to use the map service as a [basemap](#), select the **Add as Basemap** checkbox. This creates a basemap containing the map service on Manager's Basemaps page. To use the map service as an operational layer, clear the **Add as Basemap** checkbox. If there is no Add as Basemap checkbox, the type of map service or layer that you are adding cannot be used as a basemap.

6. Do one of the following:
  - If you selected a layer from an ArcGIS feature server, select **Add as Feature Layer**.
  - If you selected a layer from an ArcGIS map service, you can add it as a map service or as a feature layer:
    - If you are not going to configure any of the additional features that are available only for feature layers, such as charting, clustering, or heat maps, select **Add as Map Service**.
    - If you want to be able to configure one or more of the additional features that are available only for feature layers, such as charting, clustering, or heat maps, select **Add as Feature Layer**.
  - Otherwise, there is only one **Add to Map** button. Select the button.

The dialog closes and the map service is added to the list of map services in the map. If you added the map service as a basemap, a base containing the map service is created on Manager's Basemaps page.

7. Click **Save Site**.


See also...

[Map Service Settings on page 113](#)

## 10.4 Import Map Services from Another Site

You can import multiple map services to the map at one time. The services can be different types. For example, you could import two ArcGIS map services, a GeoRSS service, and five feature layers at once.

### To import one or more services that are configured in another site:

1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. Press the  **Import Map Service** button.
3. Select the site that contains the services you want to import, and then press **Next**.
4. Select the services that you want to import.
 

To select a service, click on it in the **Services** list. To select multiple services, hold the **Ctrl** key down and click each service, or hold the **Shift** key down to select services that are beside each other in the list.
5. Click **Next**.
6. Click **Finish**.
7. Click **Apply Changes**.

## 10.5 Edit a Map Service

### To edit a service in the map:

1. Launch Manager.
 


You can launch Essentials from your Start Menu. In the applications list, select the Latitude Geographics folder and the Geocortex Essentials Manager item inside.

2. Edit the site that you want to configure:
  - a. Go to the **Sites** tab.
  - b. If a different site is open for editing, click **Save Site**, and then click **Close Site**.
  - c. Follow the instructions for the view of the Site List that you are using:

- **Tiled View:**



World site in Tiled View


- Click the thumbnail image of the site that you want to edit, or
- Click the site's name, or
- Position the pointer over the thumbnail image of the site that you want to edit, and then use the  **Edit** icon.


- **List View:**



World site in List View


- Select the site's name or the  **Edit** icon .

3. Select **Map** from the side panel.
4. Click the **Map Services** tab.
5. Click the  **Edit Map Service** icon beside the map service that you want to edit.

 Make sure you are editing the map service, not a layer. The tool tip should say **Edit Map Service**.

The map service opens for editing.

Map service settings are organized into tabs. The specific tabs and settings depend on the type of service.

 You can navigate between map services configured to your map with the ▲ **Previous Map Service** and ▼ **Next Map Service** buttons. These buttons appear next to the map service name when you are editing a map service.

**See also...**

[Map Service Details Tab on page 114](#)

[Map Service Display Settings Tab](#) on page 119

[Map Service Functional Tab](#) on page 122

[Layer Hyperlinks](#) on page 230

[Exclude Layers from a Dynamic Map Service](#) on page 126

[Instant Search](#) on page 219

[Layer Drawing Order](#) on page 241

[Add Clustering to a Feature Layer](#) on page 141

[Add Heat Maps](#) on page 145

[Filter a Layer's Features](#) on page 464

[ArcGIS Tables](#) on page 153

## 10.6 Edit a Map Service's Connection Settings

If a map service's URL or security settings changes, Essentials cannot access the service any more. You must edit the service and update the connection settings so Essentials can access the service.

 **To edit the connection settings for a service in the map:**

1. In Manager, [edit the map service](#) that you want to configure.
2. On the **Details** tab, scroll down and click the **Edit Connection Settings** button.
3. Update the settings.
4. Click **OK**.
5. Click **Apply Details**.

## 10.7 Map Service Settings



Modifying a service that has already been added to the map has no effect on existing service connections. See [Edit a Service Connection on page 139](#) for instructions on changing a service connection.


Editing a service opens a page with several tabs containing configurable settings. The specific tabs that are available depend on the type of service. The tabs are:

- **Details Tab:** See [Map Service Details Tab on page 114](#).
- **Display Settings Tab:** See [Map Service Display Settings Tab on page 119](#).
- **Functional Tab:** See [Map Service Functional Tab on page 122](#).
- **Add/Remove Layers Tab:** See [Exclude Layers from a Dynamic Map Service on page 126](#).

If the map service supports ArcGIS Server's Dynamic Layers feature, the Add/Remove Layers tab has additional functions for adding and importing dynamic layers. See [Dynamic Layers-Enabled Map Services on page 237](#) for information.

- **Drawing Order Tab:** See [Dynamic Layers-Enabled Map Services](#) on page 237.
- **Feature Clustering Tab:** See [Add Clustering to a Feature Layer](#) on page 141.
- **Feature Heat Maps Tab:** See [Add Heat Maps](#) on page 145.
- **Filtering Tab:** See [Filter a Layer's Features](#) on page 464.
- **Add/Remove Tables Tab:** See [ArcGIS Tables](#) on page 153.
- **Instant Search Tab:** See [Global Search](#) on page 216.
- **Layer Hyperlinks Tab:** See [Layer Hyperlinks](#) on page 230.



You can change a map service's display name without editing the service. Use the  icon beside the map service on the Map page's Map Services tab and select **Rename**.

## 10.7.1 Map Service Details Tab

All map services have a Details tab. The particular settings that show on the Details tab depend on the type of map service. To open the Details tab, [edit the map service](#).

The settings on the Details tab are:

- **ID:** (for information only) The unique identifier for this service in the REST API.
- **Display Name:** The name that is used to refer to this map service in Manager and in viewers. The Display Name can contain spaces and special characters.
- **Short Display Name:** The name that is used to refer to this map service in small spaces in the viewer, for example, in a [basemap transparency slider](#). If you do not configure the Short Display Name, the Display Name is used in small spaces. The Short Display Name can contain spaces and special characters.
- **Description:** A short description of the service. The description is optional.
- **Copyright:** Some organizations, such as [Open Street Map](#), require anyone using their data to credit the organization. Use the Copyright setting to configure the attribution. The copyright appears in the lower right corner of the map in Manager and in viewers.
  - **Include Copyright in Print/Export:** If you want the copyright for this map service to appear on the map image when the map is exported, select the Include Copyright in Print/Export checkbox. For printing, you must also add a **TextBox** to each print template, and set the TextBox's **DataField** property to `_CopyrightText`:
    1. Open the print template in Report Designer.
    2. Drag a TextBox onto the print template and position it.  
You may have to resize the TextBox to fit your needs.
    3. With the TextBox selected, scroll down the properties list on the lower right of Report Designer's interface. Select the Data section.
    4. Select the DataField property and add the text `_CopyrightText` in the empty field.
    5. Save the print template.

The copyright can include simple HTML markup, such as bold text and anchor elements. Using an anchor element (`<a>`) enables you to include a hyperlink to the organization's website, for example:

```
© <a href="http://www.openstreetmap.org/copyright" target="_blank">OpenStreetMap</a> contributors
```

This appears on the map as:


© [OpenStreetMap](#) contributors.

## Built-in Map Service Copyright Messages

If a map service has a copyright built into it, the built-in copyright appears in the copyright box by default. You can override the built-in copyright by adding a new copyright in the copyright box. To restore the default copyright, remove the custom copyright that you entered.

## Multiple Copyright Messages

If more than one map service in a site has a copyright (either built-in or configured in Manager), the copyrights appear one after another on the map.

- **Data Source Type:** (for information only) The type of service that provides the map data, for example, ArcGIS Server REST or OGC WMTS.
- **Service Type:** (ArcGIS Server tiled map services) If the service supports dynamic capabilities and you want the service to render dynamically, select **Dynamic**. This is useful if you have two tiled services with incompatible spatial references. When the Service Type setting is set to Dynamic, Essentials tries to reproject the service, and applications try to project the service, to a compatible spatial reference.
- **Spatial Reference:** The service's spatial reference.  
WMS services sometimes support more spatial references than are indicated in the service's metadata. If the service is not compatible with the map's spatial reference, you can try changing the service's spatial reference to see if a different spatial reference works. To change, select **Change Spatial Reference** and enter the spatial reference that you want to use. The format is usually an EPSG code, for example, **EPSG:4326**, but this depends on the service.  
For WMTS services, if the WMTS is the bottom-most service in the list of services on the Map page's Map Services tab, then changing the tile matrix set changes the spatial reference of the map. However, when the WMTS is displayed on top of another map service, the WMTS attempts to use the spatial reference of the bottom-most service, regardless of what you configure for the tile matrix set.
- **Supports Dynamic Layers:** (for information only) Indicates whether dynamic layers are enabled for this service in ArcMap.
- **Connection String:** (for information only) The connection string to connect to this service.  
To open the service's REST endpoint, click the  **REST Endpoint Link** icon beside the Connection String box.
- **Edit Connection Settings:** Select **Edit Connection Settings** and modify the settings as desired. The settings that are available depend on the type of map service.



After you have configured the connection settings, use the **Test Connection** button to verify the settings.



- **Service URL:** Type or paste the map service's URL.
- **Layer Mask(s)** (optional): If you add a single layer to the map, Essentials uses layer masks to mask the other layers in the map service. This is an advanced setting that requires a good understanding of layer masks.
- **Authentication Settings:** If the service is secured, select the authentication method for Essentials to use when connecting to the service.



If you are using a proxy page, Essentials uses the settings that you configure here to access the proxy page, rather than to access the service itself.

- **Web Tier (default or anonymous credentials):** Select this option in the following cases:
  - if the service is secured using Integrated Windows Authentication and you want Essentials to authenticate as the application pool user
  - if the service is not secured
- **Web Tier (configured credentials):** Select this option in the following cases:
  - if the service is secured using basic or digest authentication
  - if the service is secured using Integrated Windows Authentication and you want to configure the credentials for Essentials to use when authenticating

In the **Username** and **Password** text fields, enter the credentials that you want Essentials to use.

- **Token Security (by user):** Select this option if the service is secured using token security. In the **Username** and **Password** text fields, enter the credentials that you want Essentials to use when authenticating. If you have changed the location where tokens are issued, enter the URL of the location in the **Token URL** box.



By default, Essentials assumes the token duration of all your ArcGIS services is 60 minutes, which is the ArcGIS default. However, if the token duration of any of your ArcGIS services is lower, you must specify the lowest token duration in Essentials. To do so, open the Essentials `web.config` file and, within the `<appSettings>` element, add a new element with `ArcGisRestMapServiceBase.MaximumTokenDuration` as the key and set its value accordingly in minutes. For example, to set the maximum token duration to 20 minutes: `<add key="ArcGisRestMapServiceBase.MaximumTokenDuration" value="20" />`. The Essentials `web.config` file is located in `{GE_HOME}\REST\Web.config`.

- **Token Security (explicit tokens):** In the **Server Token** box, type or paste the long-lived server token that Essentials will use to authenticate. You can also optionally configure a long-lived client token.

Select this option if the service is secured using token security and you want to use long-lived tokens. This method stores the token(s) in the site.



This method is not practical for ArcGIS Server 10.1 and newer. In ArcGIS Server 10.1, the life span of long-lived tokens was shortened to 24 hours. This means you would have to configure a new token at least once a day.

- **Proxy Settings:** You can use a proxy page, or the Geocortex Services Enhancement Proxy, or neither. You cannot use both.
  - **No Proxy:** If you are not using a proxy page and you do not want to use the Geocortex Services Enhancement Proxy, select **No Proxy**.
  - **Geocortex Services Enhancement Proxy (Silverlight viewers only):** The Services Enhancement Proxy is a reverse proxy that supports a variety of enhancements that appear in legacy Silverlight viewers. For more information, see [The Geocortex Services Enhancement Proxy on page 50](#). If you do not use a proxy page and you want to use the Services Enhancement Proxy, select the Geocortex Services Enhancement Proxy checkbox. When the Services Enhancement Proxy is enabled, two additional settings are visible in Manager:
    - **Forward Requests using Application Pool Identity:** Select this checkbox to use the Essentials application pool's identity to access the service.
    - **Resolve Coded Domains:** Select this checkbox to turn on the full set of enhancements.
  - **Proxy URL:** If you are using a proxy page, type or paste the proxy page's URL. For example, `http://host.domain.com/MapServiceProxy/proxy.ashx`.
- **Get Map URL (optional):** Enter the URL to use if the WMS URL fails. WMS operations can be hosted at different locations, so this option attempts to connect to second location if the URL provided by the WMS is inaccurate or you want your `GetMap` requests to target another location for other reasons. This parameter makes it possible to override the URL used for `GetMap` requests to your preferred URL.



The `GetMap` parameter is optional. If you do not specify a URL, Essentials uses the URL from the capabilities of the WMS. Parameters from the service address are appended to `GetMap` requests.

The `GetMap` parameter is part of the connection string, for example:

```
ConnectionString="url=http://myserver/geoserver/wms;mapUrl=http://myserver/geoserver/wms/getmap"
```

- **WFS URL:** If you are using either the WFS: ArcGIS Server or WFS: Name Correlation query provider, you must provide the WFS's URL here. If you are using the WFS query provider, this URL will override the URL in the capabilities document.

The `WFSserver` parameter is part of the connection string parameter, for example:

```
ConnectionString="url=http://myserver/ArcGIS/services/myService/MapServer/WMServer;wfsUrl=http://myserver/ArcGIS/services/myService/MapServer/WFSserver"
```

- **WFS Version (optional):** Select the version of WFS to use. If you do not set a version of WFS, the system uses the most recent supported version of WFS (up to version 2.0).



If the map service you are connecting to does not support the version of WFS selected in this field, the system uses an earlier version of WFS.

- **Proxy URL:** If the map service is secured with a proxy, type or paste the proxy's URL. For example, `http://host.domain.com/MapServiceProxy/proxy.ashx`.
- **WMS Version (optional):** Select the version of the WMS specification to use in order to communicate to the server. If you do not set a version, the most recent supported version of WMS is used (up to version 1.3.0).
- **Authentication Settings:** If the service is secured, configure the credentials that you want Essentials to use when authenticating. If you want Essentials to authenticate as the application pool user, leave the Username and Password boxes blank.



If you are using a proxy page, Essentials uses the settings that you configure here to access the proxy page, rather than to access the service itself.

- **KVP Tile URL Override:** Use this option if the URL that is advertised by the service does not work or you want to use a different URL.
- **RESTful Tile URL Template Override:** Use this option if the URL that is advertised by the service does not work or you want to use a different URL.
- **Map Style:** Select the Bing Maps service that you want to connect to.
- **Key:** Type or paste your Bing Maps key.
- **URL Template:** Type the URL template for the tile server. The URL template must contain the `{level}`, `{col}`, and `{row}` tokens. For example, a URL template might have the following form:

`http://{subdomain}.server.domain.com/{level}/{col}/{row}.png`

See [Web Tiled Layers on page 156](#) for more information.



Some web tiled services use dollar signs (\$) in their URL templates. Dollar signs are optional in Essentials.

- **Subdomains:** If the URL template contains the `{subdomain}` token, list the subdomains that you want to submit tile requests to. Separate the subdomains in the list using commas.
- **Security Provider Name:** Controls how the layer security proxy authorizes layers. If left unset, the default map security provider is used, which respects the settings on the Permissions page.



In most cases, this setting should be left blank, as it only applies to advanced scenarios. Do not use this setting unless you're sure you need to.



To see a list of map service security providers, click the **Security Provider Name** box.

By default, the map service security providers include:

- **DefaultMapServiceSecurityProvider:** The default map service provider, which simply respects the settings on the Permissions page. This option is the same as leaving this setting blank. For a map service, users only have access to layers and tables included in the site. For a feature service, users have access to the configured layer as well as any related layers or tables.
  - **AllowUnknownDynamicLayersProvider:** Allows all dynamic layer requests. Allowing all dynamic layers can represent a security vulnerability. This should only be used in cases where the end users are trusted, or when security is simply used as a convenience to hide irrelevant data rather than to protect data.
  - **AllowUnknownLayersProvider:** Allows all layer and table requests. This provider does not secure any layers or tables.
  - **AllowUnknownRelatedLayersProvider:** Allows all related layer and table requests for map services that users are authorized to access. This setting is used to allow access to related layers and tables in a map service when an Administrator has not added those related layers and tables to the site. This emulates the default behavior in Essentials 4.4.
  - **ConterraMapServiceSecurityProvider:** Uses Con Terra's Web Security Service (WSS) to discover the permissions to be used for layers, rather than using the settings on the Permissions page.
  - **DenyUnknownRelatedLayersProvider:** Prevents feature services from automatically allowing access to related layers and tables.
- **Filter Workflow URI:** (ArcGIS Server dynamic map services that support dynamic layers) The URI of a workflow for filtering features in one or more of this map service's dynamic layers.  
Use this setting to configure a layer filter workflow that filters dynamic layers only. For filtering non-dynamic layers, configure the layer filter workflow at the layer level.  
See [Filter a Layer's Features on page 464](#) for more information.
  - **Allow Snapping:** To allow users to snap to features, select this checkbox; otherwise, clear this checkbox.
  - **Snapping Enabled:** To enable snapping by default for features in this layer, select this checkbox; otherwise, clear this checkbox.

## 10.7.2 Map Service Display Settings Tab

All map services have a Display Settings tab. The particular settings that show on the Display Settings tab depend on the type of map service. To open the Display Settings tab, [edit the map service](#).

The settings on the Display Settings tab are:

- **Icon URI:** The URI to the icon that you want to use to represent this service. Click **Browse** to navigate to the icon file, or **Upload** the file to the site.
- **Opacity:** Sets the map service's default opacity. For example, if you set the opacity to 30% in Manager, then end users initially see the map service at 30% opacity in the viewer, and the map service's opacity slider is initially set to 30%. End users can drag the opacity slider to change the map service's opacity.

- **Override Scale:** The Override Scale settings allow you to restrict the scale range of the map service in Essentials. These settings override the scale settings that are defined in the map service itself.
  - **Override Minimum Scale:** The minimum scale at which the map service is visible in viewers. If a user zooms out farther than the Override Minimum Scale setting, the map service no longer shows on the map. If the map service is in the Layer List, the map service's Visibility checkbox becomes grayed out to indicate that the map service is not visible at the current scale.

For example, if the minimum scale defined in the map service itself is 1:10,000,000, you could restrict the minimum scale to 1:5,000,000 in Essentials.

To configure the minimum scale, enter the scale's denominator, without commas or other punctuation. For example, to set the minimum scale to 1:5,000,000, enter **5000000** in the **Override Minimum Scale** box. If you leave the Override Minimum Scale box blank, Essentials uses the minimum scale that is defined in the map service itself.
  - **Override Maximum Scale:** The maximum scale at which the map service is visible in viewers. If a user zooms in closer than the Override Maximum Scale setting, the map service no longer shows on the map. If the map service is in the Layer List, the map service's Visibility checkbox becomes grayed out to indicate that the map service is not visible at the current scale.


For example, if the maximum scale defined in a map service is 1:500, you could restrict the maximum scale to 1:2,000 in Essentials.

To configure the maximum scale, enter the scale's denominator, without commas or other punctuation. For example, to set the maximum scale to 1:2,000, enter **2000** in the **Override Maximum Scale** box. If you leave the Override Maximum Scale box blank, Essentials uses the maximum scale that is defined in the map service itself.


A common use for the Override Scale settings is to make one basemap become visible when another loses visibility as the user zooms the map. To configure this, set Override Maximum Scale for one basemap to the same scale as Override Minimum Scale for the next basemap.



In addition to these settings, which control the scale range of a **map service**, the Geocortex viewers have settings that enable you to restrict or extend the scale range of the **map**. For information, refer to the "Map Module" section in the *Administrator and Developer Guide*.

- **Maximum Image Size:** ArcGIS Server has a default maximum size for the map images that it exports. ArcGIS Server provides settings to override the default size. If you have configured a **smaller** size for map images in ArcGIS Server, you must configure the size here. If you have configured the image size to be larger, or you are using ArcGIS Server's default size, you do not need to configure these settings.
  - **Maximum Image Width:** If the map image width that is configured in ArcGIS Server is smaller than ArcGIS Server's default map image width, enter the width in the Maximum Image Width box.
  - **Maximum Image Height:** If the map image height that is configured in ArcGIS Server is smaller than ArcGIS Server's default map image height, enter the height in the Maximum Image Height box.
- **Brush Color:** Select the color for markers and geometries in the layer. This color is also applied to shapes, if the GeoRSS feed has them.
- **Image Format:** Specifies the image format to use when displaying the map.
- **Color:** Specifies the color of a feature layer. Type in the hexadecimal value of the number or click the color picker  and select a color.

When the feature color is set, any renderer that is not a Simple renderer is replaced with a Simple renderer. So Class Break, Unique Value, or custom renderers are converted to Simple renderers. This means that properties assigned to the feature that require non-simple renderers will not display. For example, a city feature layer with points representing cities would show different point sizes based on the population of the city. If the feature color of the city points was then set to blue, the cities would be shown as blue dots of the same size.

- **Color Alpha:** Specifies the transparency/opacity of a feature. Move the slider to the left to increase the transparency of the feature.
- **Selection Color:** Specifies the color to use when the feature is selected. Type in the hex value of the number or click the color picker  and select a color. This setting only works within the context of editing.

## Field Formatting

You can also configure Field Formatting at the layer level and the field level. For information, see [Format Date/Time and Number Fields on page 329](#).



These settings do not work for GeoRSS layers—GeoRSS layers do not provide any information about the type of data that their fields contain, so viewers cannot format the data.

- **Number Format:** (numeric fields only) (does not apply to GeoRSS layers) The format to use to display the field's value in HTML5 viewers.  
You can configure the format at the map service level, the layer level, and the field level. The default value, **Default**, inherits the formatting from a higher level. If all three levels are set to Default, fixed-point formatting with up to four decimal digits is used.
  - **Currency:** (applies to the Currency and Accounting number formats only) The currency type of the stored data. For example, if the stored data is in euros, enter EUR. The default is USD (US Dollars). To see a complete list of currency codes, delete the default currency type—a drop-down list of currency codes will open. To find out what the codes stand for, refer to this list of [ISO 4217 currency codes](#).
  - **Decimal Places:** The number of decimal digits to display in viewers. To display integers, enter **0**. Alternatively, leave the Decimal Places setting blank to display up to four decimal digits (Number, Fixed-point, and Percentage formats) or the conventional number of decimal digits for the specified currency (Currency and Accounting formats).
  - **Custom Number Format:** The custom format string that you want to use to format numbers in the viewer. Essentials supports custom format strings based on the .NET Framework [Custom Numeric Format Strings](#). Do not put quotation marks around the custom format string.
- **Date Format:** (date/time fields only) (does not apply to GeoRSS layers) The format to use to display the field in the viewer.
  - **Custom Date Format:** The custom format string that you want to use to format dates in the viewer. For formatting instructions, see [Format Date/Time Fields on page 331](#). Do not put quotation marks around the custom format string.
- **Data Time Zone:** Choose a time zone for the selected layer. By default, the time zone is set to Default, which inherits the time zone from a higher level. For more information, see [Configure Time Zones for Date/Time Data on page 325](#).

### 10.7.3 Map Service Functional Tab

All map services have a Functional tab. The particular settings that show on the Functional tab depend on the type of map service. To open the Functional tab, [edit the map service](#).

The Functional tab's settings are:

- **Failure Action:** Specifies the behavior of the site's viewers if this service is not available when the site is loaded. The failure action does not affect user sessions that are already in progress when a service goes down. The possible failure actions are:
  - **Ignore:** The viewer does not warn the user that the service is not available. The user can proceed to use the application. (The service will not work).
  - **Warn:** The viewer displays a warning to the user that says the service is not available. The user can close the warning and proceed to use the application. (The service will not work). This is the default value.
  - **Error:** The viewer displays a warning to the user that says the service is not available. The user cannot close the warning, and cannot use the application.
- **Failure Timeout:** Sets the timeout in seconds. Once the timeout is reached, the map service no longer attempts to load and the configured failure action is performed. This setting accepts values between 1 and 600.
- **Default Allow Symbolization (Silverlight viewer only):** (ArcGIS Server map services with dynamic layer support) Specifies whether or not to allow symbolization of this map service.
- **(Default) Data Provider:** (ArcGIS Server dynamic and tiled map services) The (Default) Data Provider is the type of data provider that you use to store feature data. This setting is used by the viewer. It enables the Query Builder and Filter Builder to construct queries using the correct syntax for your data provider. You can configure this setting at the site level, the map service level, or the layer level.
  - At the site and map service level, the setting is called **Default Data Provider**.
  - At the layer level, it is called **Data Provider**.

Map services inherit the setting from the site, and layers inherit the setting from the map service that they belong to, or from the site if the setting is not configured at the map service level. For example, if all the site's services use the same data provider to store their feature data, you could configure the Default Data Provider at the site level. The map services and layers inherit the configuration. This saves you from having to configure the setting for every map service and layer in the site.

By default, the provider is Default. The Default provider uses the ANSI SQL default syntax. If the Default provider does not work in your system, delete Default from the Default Data Provider box to open a drop-down list of providers.

If the type of provider that you use appears in the list, select the provider. The Query and Filter Builders will use the well-known syntax for the provider that you select. If your provider does not appear in the list, re-enter Default in the Default Data Provider box, and configure the viewer's QueryBuilder Module. For instructions, refer to your Geocortex Viewer for HTML5 *Administrator and Developer Guide*.



If the map service only has one layer, the Default Data Provider setting is not available at the map service level. For example, feature services do not have a Default Data Provider setting, but feature layers do.

- **Tile Matrix Set:** (WMTS) Select the tile matrix set to use for the WMTS. The `TileMatrixSet` parameter sets the tile matrix set to use, for example, `TileMatrixSet="EPSG:900913"`.



If you add a second WMTS on top of another tiled service, Essentials attempts to find a tile matrix set that is compatible with the tiled service that is lowest in the list of services on Manager's Map page.

If you do not specify a tile matrix set for the primary service, Essentials uses the first matrix set for the configured layer that has a supported spatial reference.

- **Request Encoding:** (WMTS) Currently, only KVP (Key-Value Pairs) is supported.
- **Update interval:** The frequency for the viewer to refresh the map image, in seconds. If you do not set an interval, the map refreshes only when a user performs an action that forces the map to redraw, like pan or zoom.
- **Override Time Settings (Silverlight viewer only):** For ArcGIS Server time-aware map services. Specifies the time extent to use as the extent of the time-aware slider. The range that you configure here overrides the time extent that is set in the map service.
  - **Start Time and End Time:** The date for the time slider to start and end. Select the Start Time or End Time box to open a calendar for that setting.
- **Basemap Transparency Slider Group:** (does not apply to ArcGIS Server feature layers, KML layers, or GeoRSS layers) The name of the [basemap transparency slider group](#) for the map service to belong to, if you want the map service to appear in a transparency slider with other related map services. Entering a new slider group name creates the slider group. The slider group name appears in the [Basemap Switcher](#), so choose a name that is short, and also meaningful to end users. To add the map service to an existing slider group, click in the Basemap Transparency Slider Group box and select the group from the drop-down list. If you do not want to use the map service in a transparency slider, leave the Basemap Transparency Slider Group box empty.
- **Layer Catalog Provider Name:** (ArcGIS Server map services that support dynamic layers) The fully qualified type name of the layer catalog implementation, if there is one.



This method of adding layer catalogs is deprecated and requires custom development. See [Use a Layer Catalog to Add Dynamic Layers in Manager on page 241](#) for more information about this implementation.

## Queries

- **Query Provider:** (ArcGIS Server map services and feature layers, WMS and WMTS) For WMS services, select the data source that you want Essentials to query. You must configure this setting for WMS services regardless of whether you are using a WFS. See [OGC Query on page 169](#) for information about specific options. The `QueryProviderName` URL parameter specifies the query provider to use. For example, `QueryProviderName="WFS: ArcGIS"` or `QueryProviderName="WMS: text/plain"`. You do not need to change this setting for other types of service. This setting is used for server-side queries only.
- **Query Transform Workflow URI:** (WMS) If you created a Query Transform workflow to modify the results of WMS `GetFeatureInfo` requests, enter the workflow's location. For more information about Query Transform workflows, see "Create a Query Transform Workflow" in the Workflow Designer help system.



- **Search Non-Text Fields:** (ArcGIS Server feature layers) When this checkbox is selected, Global Search searches all types of field, instead of just text fields.
- **Disable Client Caching:** (ArcGIS Server dynamic map services and image services) When this checkbox is selected, map images and feature data are never loaded from the browser's cache. The data is always requested from the server. This is useful if the map service changes frequently and end users need to see the most up-to-date map data.



Client caching improves performance. If you disable client caching, performance will be slower.

- **Output Fields:** (ArcGIS Server feature layers) Output fields are the fields in a feature layer that are available in the viewer for client-side operations like editing.  
For example, suppose a feature layer has five fields and you configure two of the fields as output fields. When a viewer requests the feature layer, the server only sends the two output fields for each feature. This means the other three fields cannot be used in client-side operations like editing. The excluded fields are still available for server-side operations like search and identify.  
By default, all the fields in the layer are output fields. This is represented in Manager by an asterisk (\*) in the Output Fields box. If there are some fields that you do not want to be available in viewers, replace the asterisk with a comma-separated list of field names.
- **Query Mode:** (ArcGIS Server feature layers) The query mode determines when the viewer requests feature data from the server:
  - **Snapshot:** The viewer gets all the available features at one time. This is useful if the map extent does not change.
  - **Selection Only:** The viewer gets the currently selected feature. The viewer requests one feature at a time.
  - **On Demand:** The viewer gets the features for the current extent, as well as On Demand Cache Size additional features. The viewer requests more features as the map extent changes.  
The On Demand query mode has additional settings:
    - **On Demand Cache Size (Silverlight viewer only):** The number of features to cache, in addition to the features in the current extent.
    - **Tile Height** and **Tile Width:** If the feature layer takes a long time to load, adjusting the tile size may improve the performance. A layer whose features are sparsely distributed may load faster with a larger size. If the features are densely distributed, a smaller tile size may improve load times. The default tile size is 512px by 512px. For more information, refer to the ArcGIS documentation on [Vector Tiling](#).

## Editing

In order to be editable, a feature layer must have editing enabled in ArcGIS Server.

- **Auto Save (Silverlight viewer only):** (ArcGIS Server feature layers) When this checkbox is selected, an end user's editing changes are submitted immediately, without the user having to save the changes.
- **Move Enabled:** (ArcGIS Server feature layers) When this checkbox is selected, the end user can move the layer's features on the map.
- **Rotate Enabled:** (ArcGIS Server feature layers, excluding point layers) When this checkbox is selected, the end

user can rotate the layer's features.

- **Scale Enabled:** (ArcGIS Server feature layers, excluding point layers) When this checkbox is selected, the end user can scale the layer's features.
- **Edit Vertices Enabled:** (ArcGIS Server feature layers, excluding point layers) When this checkbox is selected, the end user can change feature geometries by moving a feature's vertices.


## 10.8 Set a Map Service's Default Visibility

A map service's visibility setting controls whether the map service is initially turned on in the Layer List when the end user launches a viewer. A map service must be turned on in the Layer List for the user to be able to see the map service's layers on the map. The layers only appear on the map if they are visible at the [initial extent](#)'s zoom level. The user may have to zoom in or out to see a layer's features on the map.

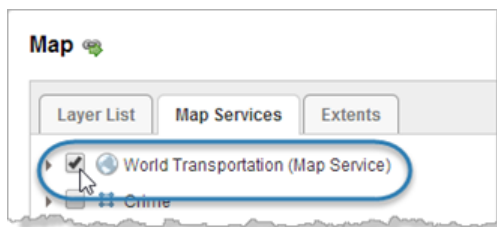
If you include a map service in the Layer List, the end user can change the visibility of the map service or its folder. See [Configure the Layer List on page 207](#) for instructions.

### ► To configure a map service's default visibility:

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.

 You cannot change the default visibility of dynamic map services on the Map Services tab. Instead, click the Layer List tab and set the default visibility for the map service's folder.

2. Configure the visibility:
  - To configure the map service to be turned on initially, select the checkbox to the left of the map service's name.
  - To configure the map service to be turned off initially, clear the checkbox to the left of the map service's name.



Set the initial visibility for the World Transportation map service

3. Click **Apply Changes**.
4. Click **Save Site**.

## 10.9 Exclude Layers from a Dynamic Map Service

In Essentials, you can exclude individual map layers that belong to dynamic services, such as ArcGIS Server dynamic map services and WMS services. If you exclude a layer, it cannot be accessed by client applications.

Excluding a layer does not remove it. You can re-include a layer that was previously excluded. By default, all layers are included.

### To exclude and re-include layers:

1. In Manager, edit the map service that you want to configure.
2. Click the **Add/Remove Layers** tab.
3. To exclude one or more layers, select the layers in the **Included Layers** column, and then click the « button. To re-include layers that have been excluded, select the layers in the **Excluded Layers** column, and then click the » button.  
To select multiple layers, hold the **Ctrl** key down while selecting layers.





You cannot include or exclude individual sub-layers within a group layer. You must include or exclude the entire group layer.

4. Click **Submit Layer Changes**.
5. Click **Save Site**.

## 10.10 Remove a Map Service

Removing a map service does not remove the map service's folder from the Layer List. This ensures that any other items in the folder are not affected when you remove the service. If there were no other items in the folder, the folder will be empty after you remove the map service. Empty folders do not show in viewers.

### To remove a map service from a site:

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.
2. Select  **Remove** next to the map service that you want to remove.  
You are prompted to confirm the removal.
3. Choose **OK** to remove the map service from the Map Services tab.
4. If you remove all of the map services from a folder in the Layer List, and you want to remove the folder:
  - a. Go to the **Layer List** tab.
  - b. Select  **Remove** next to the empty folder.  
You are prompted to confirm the removal.

- c. Choose **OK** to remove the folder from the Layer List.



Viewers do not display empty folders in the list of map layers.

5. Click **Apply Changes** and **Save Site**.

## 11 Service Connections

Service connections store the information that Essentials needs in order to connect to services. This information includes a service's URL, security information if the service is secured, and, depending on the service type, possibly some other information.

Service connections have three purposes:

- **Search by Keyword:** Service connections enable you to search for services using search terms (keywords) when you are adding services to the map. For example, searching for **Street** searches all your configured service connections for services that have "Street" in the service name or URL. If a service connection is configured to search for layers in addition to services, the search function also searches layer names.
- **Access Secured Services:** If a service is secured, you must add a service connection before you can search for the service or add the service to the map.
- **Bookmark Favorite Services:** Service connections enable you to save the connection information for services that you work with frequently. You can also sort your service connections, so you can put the connections that you use the most at the top of the list.

Service connections are shared by all the sites in an instance of Essentials. When you add a service connection to one site in an instance of Essentials, it becomes available in all the sites in that instance of Essentials. If you remove a service connection in one site, the service connection is removed from the other sites.



You cannot add service connections for GeoRSS layers. This means that you cannot search for GeoRSS layers by keyword in Manager. To add a GeoRSS layer to the map, you must enter the URL.

### 11.1 Access Service Connections in Manager

There are two places in Manager where you can manage service connections:

- **Main Service Connections Tab:** You can click the main Service Connections tab from any page in Manager.
- **Add Map Service Dialog Box:** The Add Map Service dialog has a Service Connections tab that provides access to the same list of service connections that appears on the main Service Connections tab.

Both Service Connections tabs are synchronized. When you change the service connections on one Service Connections tab, the change is reflected on the other Service Connections tab.

Both Service Connections tabs provide the same functions for managing service connections, such as adding new service connections and viewing layer previews. The Service Connections tab in the Add Map Service dialog has a unique function: It allows you to select a map service or layer and add it to the map.

 **To open the Add Map Service dialog box:**

1. In Manager, edit a site, and then click **Map** in the side panel.
2. Click **Add Map Service**.



We recommend that you use the same protocol (HTTP or HTTPS) for all the map services that you add to a site. Browsers might not display all of a site's content if you use different protocols within one site. The protocol that you use for map services should be the same as the protocol that you use for viewer URLs.

## 11.2 Add Service Connections

Follow the instructions for the type of service connection that you want to add.

### 11.2.1 Portal for ArcGIS Service Connections

Portal for ArcGIS service connections allow you to search Portal for ArcGIS portals for web maps to add to the map.

When Essentials is registered with Portal for ArcGIS, your Essentials installation has a built-in Portal for ArcGIS service connection which does not appear in the list of service connections. The built-in connection enables you to search your private Portal for ArcGIS content, as well as public Portal for ArcGIS content.

In addition, the built-in Portal for ArcGIS service connection can be searched from viewers that allow end users to add layers to the map.

The only way to use **private** Portal for ArcGIS content in Essentials sites is to register Essentials with Portal for ArcGIS. For information about registering Essentials with Portal for ArcGIS, see "Choose a Sign-In Method" in the *Geocortex Essentials Installation Guide*.


Regardless of whether Essentials is registered with Portal for ArcGIS, you can configure as many Portal for ArcGIS service connections as you want.

 **To add a Portal for ArcGIS service connection:**

1. In Manager, select the **Service Connections** tab.



You can also add service connections when you are adding a map service. The Add Map Service dialog box has a Service Connections tab where you can manage service connections.

2. Select  **Add Connection**.
3. In the **Connection Type** box, select **Portal for ArcGIS**.
4. In the **Display Name** text field, type a name for the service connection.

Manager uses the display name in the list of service connections on the Service Connections tab and in the Add Map Service dialog box. In addition, if you enable the end user to search this service connection when adding a layer to the map, the display name may appear in the viewer.

If you leave the Display Name box empty, the name is the service type followed by the service's URL.

5. **URL:** Type or paste the portal's URL.  
For example, `https://server.domain.com/sharing/rest/`, where `server.domain.com` is the Portal for ArcGIS host name.
6. **Service Discovery Settings:**
  - **Search In:** If you want the Search function to be able to search this service connection in Manager only, select **Manager**. If you also want viewers to be able to search this service connection, select **Manager and Viewers**. The ability to search service connections from a viewer is used by the User Layer Addition feature.
7. Click **OK**.  
Manager connects to the service using the settings that you have configured. The dialog closes and the service connection appears at the bottom of the list of connections.
8. In the list of connections, drag the new connection to the position in the list that you want it.

See also...

[Add a Map Service to the Map on page 108](#)

## 11.2.2 ArcGIS Online Service Connections

ArcGIS Online service connections allow you to search ArcGIS Online for services and web maps to add to the map.

When Essentials is registered with ArcGIS Online, your Essentials installation has a built-in service connection for your private ArcGIS Online content. The built-in connection enables you to search your private ArcGIS Online content. The only way to use private ArcGIS Online content in Essentials sites is to register Essentials with ArcGIS Online when you configure the method to sign in to Essentials.



The built-in ArcGIS Online service connection does not appear in the list of service connections in Essentials, and you cannot add an ArcGIS Online service connection when Essentials is registered with ArcGIS Online. There is no reason to add an ArcGIS Online service connection, because your Essentials instance has a built-in connection.

The built-in ArcGIS Online service connection can be searched from viewers that allow end users to add layers to the map.

If Essentials is not registered with ArcGIS Online, your Essentials installation has an ArcGIS Online service connection by default. If you remove the default ArcGIS Online connection, you can add it again the way you would add any other ArcGIS Online service connection.

### ▶ To add an ArcGIS Online service connection:

1. In Manager, select the **Service Connections** tab.



You can also add service connections when you are adding a map service. The Add Map Service dialog box has a Service Connections tab where you can manage service connections.

2. Select **Add Connection**.

3. In the **Connection Type** box, select **ArcGIS Online**.
4. **Service Discovery Settings:**
  - **Search In:** If you want the Search function to be able to search this service connection in Manager only, select **Manager**. If you also want viewers to be able to search this service connection, select **Manager and Viewers**. The ability to search service connections from a viewer is used by the User Layer Addition feature.
5. Click **OK**.

Manager connects to the service using the settings that you have configured. The dialog closes and the service connection appears at the bottom of the list of connections.
6. In the list of connections, drag the new connection to the position in the list that you want it.

See also...

[Add a Map Service to the Map on page 108](#)

### 11.2.3 ArcGIS Server Service Connections

Adding an ArcGIS Server service connection allows you to search ArcGIS Server catalogs and folders for services and layers to add to the map.




If the ArcGIS Server service is hosted on ArcGIS Online, you must add an ArcGIS Online service connection, not an ArcGIS Server service connection.

#### **To add an ArcGIS Server service connection:**

1. In Manager, select the **Service Connections** tab.



You can also add service connections when you are adding a map service. The Add Map Service dialog box has a Service Connections tab where you can manage service connections.

2. Select  **Add Connection**.
3. In the **Connection Type** box, select **ArcGIS Server**.
4. In the **Display Name** text field, type a name for the service connection.

Manager uses the display name in the list of service connections on the Service Connections tab and in the Add Map Service dialog box. In addition, if you enable the end user to search this service connection when adding a layer to the map, the display name may appear in the viewer.

If you leave the Display Name box empty, the name is the service type followed by the service's URL.
5. **URL:** Enter the URL for the service, catalog, or folder.

For example, `http://server.domain.com/arcgis/rest/services`, where `server.domain.com` is the ArcGIS Server host name.

6. **Authentication Settings:** If the map service is secured, select the authentication method for Essentials to use when connecting to the service.



If you are using a proxy page, Essentials uses the settings that you configure here to access the proxy page, rather than to access the service itself.

- **Web Tier (default or anonymous credentials):** Select this option in the following cases:
  - if the service is secured using Integrated Windows Authentication and you want Essentials to authenticate as the application pool user
  - if the service is not secured
- **Web Tier (configured credentials):** Select this option in the following cases:
  - if the service is secured using basic or digest authentication
  - if the service is secured using Integrated Windows Authentication and you want to configure the credentials for Essentials to use when authenticating

In the **Username** and **Password** text fields, enter the credentials that you want Essentials to use.

- **Token Security (by user):** Select this option if the service is secured using token security. In the **Username** and **Password** text fields, enter the credentials that you want Essentials to use when authenticating. If you have changed the location where tokens are issued, enter the URL of the location in the **Token URL** box.



By default, Essentials assumes the token duration of all your ArcGIS services is 60 minutes, which is the ArcGIS default. However, if the token duration of any of your ArcGIS services is lower, you must specify the lowest token duration in Essentials. To do so, open the Essentials `web.config` file and, within the `<appSettings>` element, add a new element with `ArcGisRestMapServiceBase.MaximumTokenDuration` as the key and set its value accordingly in minutes. For example, to set the maximum token duration to 20 minutes: `<add key="ArcGisRestMapServiceBase.MaximumTokenDuration" value="20" />`. The Essentials `web.config` file is located in `{GE_HOME}\REST\Web.config`.

7. **Proxy Settings:** If you are using a proxy page, enter the proxy page's URL in the **Proxy URL** box.

For example, `http://host.domain.com/MapServiceProxy/proxy.ashx`.

8. **Service Discovery Settings:**

- **Search In:** If you want the Search function to be able to search this service connection in Manager only, select **Manager**. If you also want viewers to be able to search this service connection, select **Manager and Viewers**. The ability to search service connections from a viewer is used by the User Layer Addition feature.



- **Search For:** If you want the Search function to search for services only, select **Map Services**. If you want the Search function to also search for layers, select **Map Services and Layers**.



Searching for layers affects the performance of the Search function. You should only enable searching for layers if the catalog is reasonably small.

9. Click **OK**.

Manager connects to the service using the settings that you have configured. The dialog closes and the service connection appears at the bottom of the list of connections.

10. In the list of connections, drag the new connection to the position in the list that you want it.

See also...

[Add a Map Service to the Map on page 108](#)

## 11.2.4 WMS Service Connections

### ▶ To add a WMS service connection:

1. In Manager, select the **Service Connections** tab.



You can also add service connections when you are adding a map service. The Add Map Service dialog box has a Service Connections tab where you can manage service connections.

2. Select **+ Add Connection**.
3. In the **Connection Type** box, select **WMS (Web Map Service)**.
4. In the **Display Name** text field, type a name for the service connection.  
Manager uses the display name in the list of service connections on the Service Connections tab and in the Add Map Service dialog box. In addition, if you enable the end user to search this service connection when adding a layer to the map, the display name may appear in the viewer.  
If you leave the Display Name box empty, the name is the service type followed by the service's URL.
5. **URL:** Type or paste the service's URL.  
For example, `http://server.domain.com/ows/wms`, where `server.domain.com` is the host name.
6. **Authentication Settings:** If the map service is secured, select the authentication method for Essentials to use when connecting to the service.



If you are using a proxy page, Essentials uses the settings that you configure here to access the proxy page, rather than to access the service itself.

- **Web Tier (default or anonymous credentials):** Select this option in the following cases:
  - if the service is secured using Integrated Windows Authentication and you want Essentials to authenticate as the application pool user
  - if the service is not secured
- **Web Tier (configured credentials):** Select this option in the following cases:
  - if the service is secured using basic or digest authentication
  - if the service is secured using Integrated Windows Authentication and you want to configure the credentials for Essentials to use when authenticating

In the **Username** and **Password** text fields, enter the credentials that you want Essentials to use.

7. **Proxy Settings:** If you are using a proxy page, enter the proxy page's URL in the **Proxy URL** box. For example, `http://host.domain.com/MapServiceProxy/proxy.ashx`.
8. **Service Discovery Settings:**
  - **Search In:** If you want the Search function to be able to search this service connection in Manager only, select **Manager**. If you also want viewers to be able to search this service connection, select **Manager and Viewers**. The ability to search service connections from a viewer is used by the User Layer Addition feature.
  - **Search For:** If you want the Search function to search for services only, select **Map Services**. If you want the Search function to also search for layers, select **Map Services and Layers**.



Searching for layers affects the performance of the Search function. You should only enable searching for layers if the catalog is reasonably small.

9. Click **OK**.  
Manager connects to the service using the settings that you have configured. The dialog closes and the service connection appears at the bottom of the list of connections.
10. In the list of connections, drag the new connection to the position in the list that you want it.



WMS service connections have checkboxes to set the default visibility for the layers. If you use the service connection to add the service, the service inherits the visibility settings from the service connection. You can also change the visibility settings for the service after you have added it.

See also...

[Add a Map Service to the Map on page 108](#)


## 11.2.5 WFS Service Connections

### To add a WFS service connection:

1. In Manager, select the **Service Connections** tab.



You can also add service connections when you are adding a map service. The Add Map Service dialog box has a Service Connections tab where you can manage service connections.

2. Select  **Add Connection**.
3. In the **Connection Type** box, select **WFS (Web Feature Service)**.
4. In the **Display Name** text field, type a name for the service connection.  
Manager uses the display name in the list of service connections on the Service Connections tab and in the Add Map Service dialog box. In addition, if you enable the end user to search this service connection when adding a layer to the map, the display name may appear in the viewer.  
If you leave the Display Name box empty, the name is the service type followed by the service's URL.
5. **URL:** Type or paste the service's URL.  
For example, `http://server.domain.com/ows/wfs`, where `server.domain.com` is the host name.
6. **Authentication Settings:** If the map service is secured, select the authentication method for Essentials to use when connecting to the service.



If you are using a proxy page, Essentials uses the settings that you configure here to access the proxy page, rather than to access the service itself.

- **Web Tier (default or anonymous credentials):** Select this option in the following cases:
  - if the service is secured using Integrated Windows Authentication and you want Essentials to authenticate as the application pool user
  - if the service is not secured
- **Web Tier (configured credentials):** Select this option in the following cases:
  - if the service is secured using basic or digest authentication
  - if the service is secured using Integrated Windows Authentication and you want to configure the credentials for Essentials to use when authenticating

In the **Username** and **Password** text fields, enter the credentials that you want Essentials to use.

7. **Proxy Settings:** If you are using a proxy page, enter the proxy page's URL in the **Proxy URL** box.  
For example, `http://host.domain.com/MapServiceProxy/proxy.ashx`.

8. **Service Discovery Settings:**

- **Search In:** If you want the Search function to be able to search this service connection in Manager only, select **Manager**. If you also want viewers to be able to search this service connection, select **Manager and Viewers**. The ability to search service connections from a viewer is used by the User Layer Addition feature.
- **Search For:** If you want the Search function to search for services only, select **Map Services**. If you want the Search function to also search for layers, select **Map Services and Layers**.



Searching for layers affects the performance of the Search function. You should only enable searching for layers if the catalog is reasonably small.

9. Click **OK**.

Manager connects to the service using the settings that you have configured. The dialog closes and the service connection appears at the bottom of the list of connections.

## 10. In the list of connections, drag the new connection to the position in the list that you want it.

**See also...**

[Add a Map Service to the Map on page 108](#)

## 11.2.6 WMTS Service Connections

▶ **To add a WMTS service connection:**1. In Manager, select the **Service Connections** tab.

You can also add service connections when you are adding a map service. The Add Map Service dialog box has a Service Connections tab where you can manage service connections.

2. Select  **Add Connection**.3. In the **Connection Type** box, select **WMTS (Web Map Tiled Service)**.4. In the **Display Name** text field, type a name for the service connection.

Manager uses the display name in the list of service connections on the Service Connections tab and in the Add Map Service dialog box. In addition, if you enable the end user to search this service connection when adding a layer to the map, the display name may appear in the viewer.

If you leave the Display Name box empty, the name is the service type followed by the service's URL.

5. **URL:** Type or paste the service's URL.

For example, `http://server.domain.com/ows/wms`, where `server.domain.com` is the host name.

6. **Authentication Settings:** If the map service is secured, select the authentication method for Essentials to use when connecting to the service.



If you are using a proxy page, Essentials uses the settings that you configure here to access the proxy page, rather than to access the service itself.

- **Web Tier (default or anonymous credentials):** Select this option in the following cases:
  - if the service is secured using Integrated Windows Authentication and you want Essentials to authenticate as the application pool user
  - if the service is not secured
- **Web Tier (configured credentials):** Select this option in the following cases:
  - if the service is secured using basic or digest authentication
  - if the service is secured using Integrated Windows Authentication and you want to configure the credentials for Essentials to use when authenticating

In the **Username** and **Password** text fields, enter the credentials that you want Essentials to use.

7. **Proxy Settings:** If you are using a proxy page, enter the proxy page's URL in the **Proxy URL** box. For example, `http://host.domain.com/MapServiceProxy/proxy.ashx`.

8. **Service Discovery Settings:**

- **Search In:** If you want the Search function to be able to search this service connection in Manager only, select **Manager**. If you also want viewers to be able to search this service connection, select **Manager and Viewers**. The ability to search service connections from a viewer is used by the User Layer Addition feature.
- **Search For:** If you want the Search function to search for services only, select **Map Services**. If you want the Search function to also search for layers, select **Map Services and Layers**.



Searching for layers affects the performance of the Search function. You should only enable searching for layers if the catalog is reasonably small.

9. Click **OK**.

Manager connects to the service using the settings that you have configured. The dialog closes and the service connection appears at the bottom of the list of connections.

10. In the list of connections, drag the new connection to the position in the list that you want it.

See also...

[Add a Map Service to the Map on page 108](#)

## 11.2.7 Bing Maps Service Connections


Adding a Bing Maps service connection allows you to search for Bing Maps layers, and ArcGIS web maps that contain Bing Maps layers, to add to the map.

### ▶ To add a Bing Maps service connection:

1. In Manager, select the **Service Connections** tab.



You can also add service connections when you are adding a map service. The Add Map Service dialog box has a Service Connections tab where you can manage service connections.

2. Select  **Add Connection**.
3. In the **Connection Type** box, select **Bing Maps**.
4. Enter your Bing Maps key in the **Bing Maps Key** text field.
5. **Service Discovery Settings:**
  - **Search In:** If you want the Search function to be able to search this service connection in Manager only, select **Manager**. If you also want viewers to be able to search this service connection, select **Manager and Viewers**. The ability to search service connections from a viewer is used by the User Layer Addition feature.
6. Click **OK**.

Manager connects to the service using the settings that you have configured. The dialog closes and the service connection appears at the bottom of the list of connections.
7. In the list of connections, drag the new connection to the position in the list that you want it.

### See also...

[Add a Map Service to the Map on page 108](#)


## 11.2.8 Web Tiled Layer Service Connections

### ▶ To add a web tiled layer service connection:

1. In Manager, select the **Service Connections** tab.




You can also add service connections when you are adding a map service. The Add Map Service dialog box has a Service Connections tab where you can manage service connections.

2. Select  **Add Connection**.
3. In the **Connection Type** box, select **Web Tiled Layer**.

4. In the **Display Name** text field, type a name for the service connection.  
Manager uses the display name in the list of service connections on the Service Connections tab and in the Add Map Service dialog box. In addition, if you enable the end user to search this service connection when adding a layer to the map, the display name may appear in the viewer.  
If you leave the Display Name box empty, the name is the service type followed by the service's URL.
  5. **Display Name:** Type a display name for the web tiled layer.  
The display name appears in Manager, and in the Layer List in the viewer. When you search for services by keyword, the display name is searched.
  6. **URL Template:** Type the URL template for the tile server.  
The URL template must contain the `{level}`, `{col}`, and `{row}` tokens.  
For example, a URL template might have the following form:  

```
http://{subdomain}.server.domain.com/{level}/{col}/{row}.png
```

  
See [Web Tiled Layers on page 156](#) for more information.
-  Some web tiled services use dollar signs (\$) in their URL templates. Dollar signs are optional in Essentials.
7. **Subdomains:** If the URL template contains the `{subdomain}` token, list the subdomains that you want to submit tile requests to. Separate the subdomains in the list using commas.
  8. **Copyright:** If you want to credit the organization that publishes the web tiled service, type the copyright statement in the Copyright box. The copyright appears in the lower right corner of the map.  
The copyright can include HTML markup. This means you can include a hyperlink to the organization's website.  
For example:  

```
© <a href="http://www.openstreetmap.org/copyright" target="_blank">OpenStreetMap</a> contributors
```

  
appears on the map as:  

```
© OpenStreetMap contributors
```
  9. **Service Discovery Settings:**
    - **Search In:** If you want the Search function to be able to search this service connection in Manager only, select **Manager**. If you also want viewers to be able to search this service connection, select **Manager and Viewers**. The ability to search service connections from a viewer is used by the User Layer Addition feature.
  10. Click **OK**.  
Manager connects to the service using the settings that you have configured. The dialog closes and the service connection appears at the bottom of the list of connections.
  11. In the list of connections, drag the new connection to the position in the list that you want it.

See also...

[Add a Map Service to the Map on page 108](#)

## 11.3 Edit a Service Connection



Modifying a service connection has no effect on services that have already been added to the map—the changes only affect newly added services and layers. To modify a service that has already been added to the map, [edit the service](#).

### ▶ To edit a service connection:

1. In Manager, click the **Service Connections** tab.
2. In the list of service connections, select the service connection that you want to edit.
3. Click the **Edit Connection** hyperlink.
4. Update the settings.  
Your changes take effect immediately.  
For information on individual settings, refer to the section on [adding a service connection](#).

### See also...

[Edit a Map Service on page 111](#)

## 11.4 Enable Searching a Service Connection from Viewers

The ability to search a service connection from a viewer is controlled by the service connection's **Search In** setting. By default, a service connection can be searched in Manager only. You can change the setting to search in **Manager and Viewers**.

When an end user performs a keyword search to add services, the viewer searches all the configured service connections that have the Search In setting set to **Manager and Viewers**. The user can select a service in the search results and add it to the map.

You can change the Search In setting at any time by editing the service connection. Follow the instructions below.

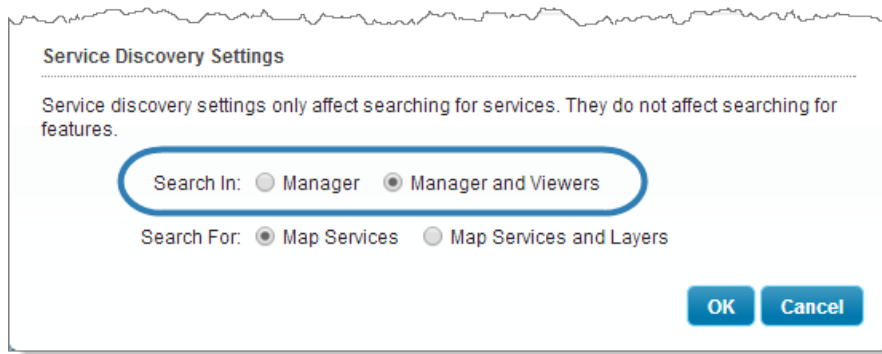
### ▶ To enable a service connection to be searched from viewers:

If Essentials is registered with Portal for ArcGIS, your Essentials installation has a built-in Portal for ArcGIS service connection. The built-in Portal for ArcGIS service connection can be searched from viewers. If you have configured additional Portal for ArcGIS service connections, you can configure whether they can be searched from viewers.

Similarly, if Essentials is registered with ArcGIS Online, your Essentials installation has a built-in ArcGIS Online service connection that can be searched by viewers.

1. In Manager, click the **Service Connections** tab.
2. In the list of service connections, select the service connection that you want to configure.
3. Click the **Edit Connection** hyperlink.
4. Select **Manager and Viewers** for the **Search In** setting.





### Enable searching the service connection in viewers

The change takes effect immediately.

## 12 ArcGIS Server Feature Layers

A feature layer is a special type of graphics layer that automatically retrieves data from an ArcGIS Server layer and then renders the geometry on the client.

Feature layers support rich client-side functionality, such as dynamic re-symbolization, [charts](#), [clustering](#), [heat maps](#), and client-side editing that can be applied back to the server.

Essentials supports feature layers from ArcGIS Server feature services and ArcGIS Server map services.

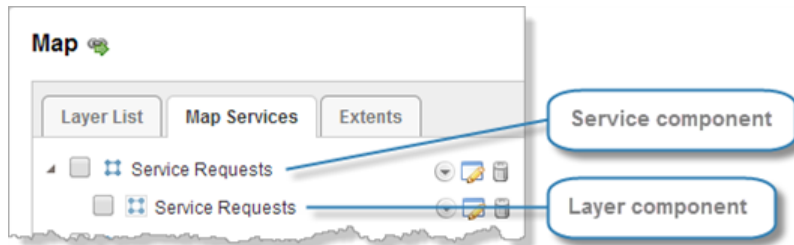
- **Feature Layer from Feature Service:**
  - Layers from feature services must be added to the map as feature layers.
  - You can only add one layer from a feature service at a time. To add multiple feature layers from a feature service, add them one at a time.
  - Feature layers from feature services can support the full range of client-side functionality, including client-side editing.
- **Feature Layer from Map Service:**
  - Layers from map services can be added to the map as feature layers, or as map services.
  - You can only add one layer from a map service as a feature layer at one time.
  - Feature layers from map services can support all the client-side functionality except editing.

### 12.1 Edit a Feature Layer

On the **Map Services** tab, feature layers have two parts:


- **Service Component:** The service component of a feature layer allows you to configure service settings, such as connection settings, and service-level features, such as clustering and heat maps.
- **Layer Component:** The layer component of a feature layer allows you to configure layer settings, such as the information to display in feature descriptions, and layer-level features such as charts, reports, and data links.

The service component does not appear on the Layer List tab. This makes the feature layer appear as a single item in a viewer's Layer List.



Feature layer shown on the Map Services tab on Manager's Map page

► **To edit the service component of a feature layer:**


1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.
2. Select the  **Edit Map Service** icon beside the service component of the feature layer you want to edit.

► **To edit the layer component of a feature layer:**

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.



You can also edit the layer component on the Layer List tab, if the feature layer is in the Layer List.

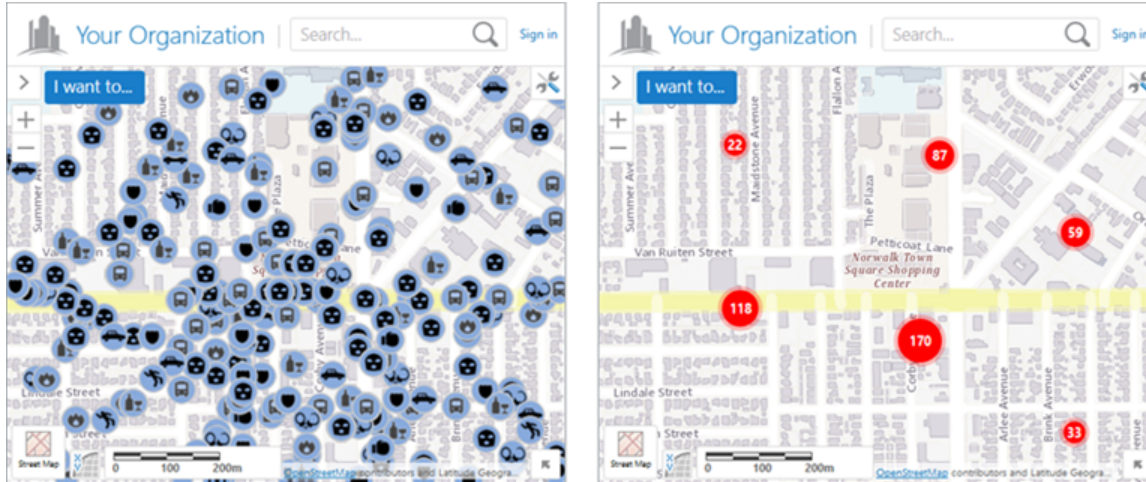
2. Select the  **Edit Layer** icon beside the layer component of the feature layer you want to edit.

See also...

[Map Service Settings on page 113](#)


## 12.2 Add Clustering to a Feature Layer

If the features in a feature layer are close together at the current zoom level, their symbols overlap. This makes the features difficult to distinguish. Clustering resolves this issue by using a single symbol to represent features that are close together. The cluster symbol displays the number of features that it represents. Users can click a cluster symbol to see the feature descriptions of the features in the cluster. Panning or zooming the map updates the clusters.



Crime data unclustered (left) and clustered (right)

You can configure the default visibility of clustering, and you can enable end users to turn clustering on and off.

 Clustering is one method of visualizing data. [Heat mapping](#) is another method.

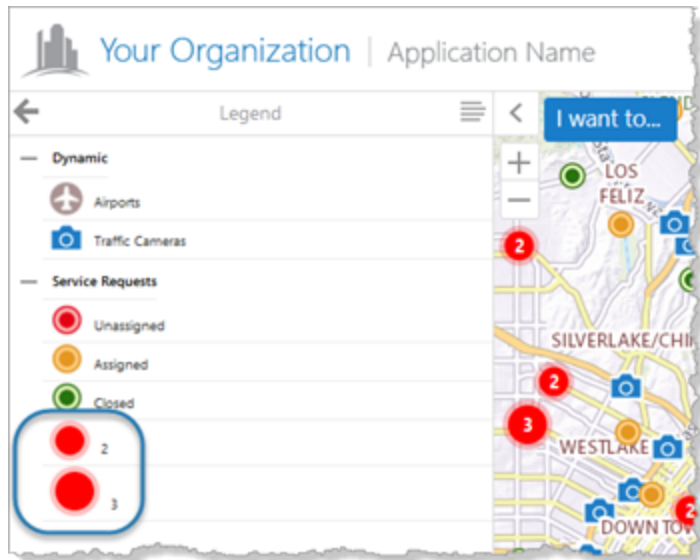
Clustering works for feature layers from feature services only. It does not work for feature layers from map services or for other types of service or layer.

When a user clicks a cluster symbol in an HTML5 viewer, the cluster symbol is replaced by the symbols for the individual features and a map tip that listing the cluster's features.



Clicking a cluster symbol (left) shows the individual features and a map tip (right)

Cluster symbols show in the map legend and in legend swatches in the Layer List. At most four cluster symbols show.



### Cluster symbols in the map legend

Viewers support exporting, printing, and reporting of map images with clusters. Exporting the map image when clusters show on the map produces an image that is nearly identical to the map image in the viewer. Map images in printouts and reports may not look exactly like the map in the viewer. The map image has to fit in the frame that is defined in the print or report template, and the frame's proportions may be different than the map's proportions in the viewer. As well, the scale in the viewer may be different than the scale that is used to produce the printout or report. Printing and reporting recalculate the clusters so the clusters are accurate for the scale and proportions used in the printout or report.

Viewers support clustering on point layers only. Viewers do not support clustering on line and polygon layers.



You may want to [remove clustering](#) from line and polygon feature layers. If you allow end users to turn on clustering for a line or polygon layer, it will not have any effect on the map.


## 12.2.1 Configure Clustering

### ► To configure clustering:


1. In Manager, edit the map service that you want to configure.  
Make sure you edit the feature layer's map service component, not the layer component.
2. Click the **Feature Clustering** tab.

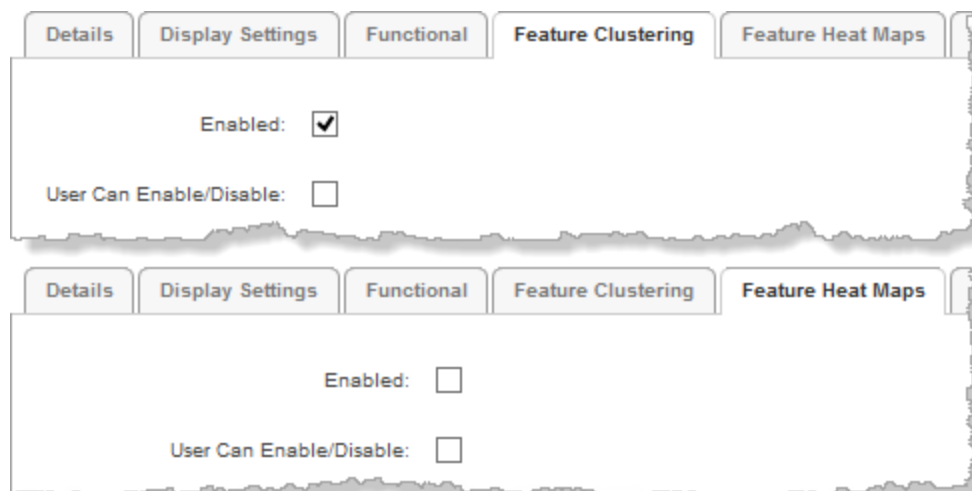
3. Configure the settings:

- **Enabled:** Specifies whether clustering is initially turned on or off. If you want features to be clustered when end users first view the layer, select the checkbox. By default, clustering is turned off initially.



 If you enable clustering, make sure that heat maps are disabled for this layer—clustering and heat maps cannot both show at the same time.

- **User Can Enable/Disable:** Specifies whether end users can turn clustering on and off. Enabling this setting also allows users to change the radius and maximum cluster size. By default, users can turn clustering on and off. If you do not want users to be able to turn clustering on and off, clear the checkbox.

 If you do not want users to be able to turn clustering off, you must clear the User Can Enable/Disable checkboxes for both clustering and heat maps. When a user turns on heat maps, clustering turns off, regardless of whether users can enable and disable clustering. The screen capture below shows the configuration to use if you do not want users to be able to turn clustering off by any means.



Settings to use if you want clustering always turned on

- **Background Color:** Sets the fill color of the cluster symbol. Click the color picker  to select a color, or type in the color's HTML name (for example, **red**) or hex value (for example, **#FF0000**). The default is red.
- **Label Color:** Sets the color of the number on cluster symbols. Click the color picker  to select a color, or type in the color's HTML name (for example, **white**) or hex value (for example, **#FFFFFF**). The default is white.
- **Radius:** Defines the maximum screen area within which features can be clustered in a single cluster. Increasing the radius can include more features in each cluster. Decreasing the radius can reduce the number of features in each cluster. If there is exactly one feature within the specified radius, the feature is represented on the map using the default symbol instead of a cluster symbol. The default radius is **20** pixels.
- **Cluster Size:** Specifies the maximum number of features that can be included in a cluster. If there are more

than Cluster Size features within the area defined by Radius, multiple cluster symbols show for that radius. If you set Cluster Size to **0** (zero), there is no upper limit on the number of features in a cluster. The default cluster size for HTML5 viewers is **0**.

4. Click **Apply Settings**.
5. Click **Save Site**.
6. Test your configuration in the viewer to make sure that the radius and cluster size are appropriate for the layer's visible scales.

The effectiveness of clustering depends on balancing the radius with the cluster size, so the clusters are dense enough but not too dense at the layer's visible scales.

► **To remove clustering from a layer:**



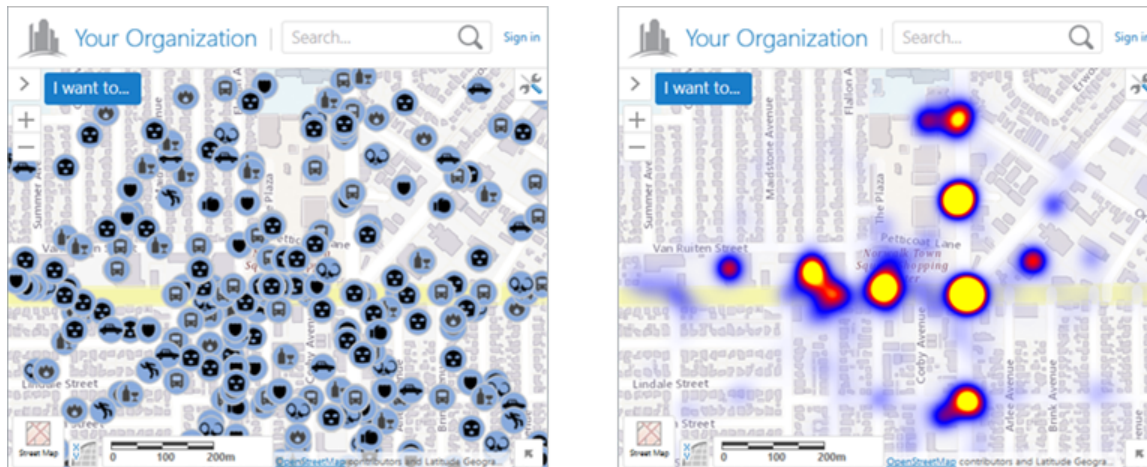
The HTML5 Viewer does not support clustering on line and polygon layers. You may want to remove clustering from line and polygon feature layers. If you do not remove clustering, users will be able to select clustering in the Visualization Options panel, but it will not have any effect.

1. In Manager, edit the map service that you want to configure.  
Make sure you edit the feature layer's map service component, not the layer component.
2. Click the **Feature Clustering** tab.
3. Clear the **Enabled** checkbox.
4. Clear the **User Can Enable/Disable** checkbox.
5. Click **Apply Settings**.
6. Click **Save Site**.  
Clustering will be turned off for this feature layer and users will not be able to turn clustering on.

## 12.3 Add Heat Maps

Large amounts of point data on a map tend to overlap and can be difficult to interpret. Heat maps resolve this issue by representing data densities instead of individual features.

In heat maps, different colors are used to represent different density ranges—the highest density, medium density, and lowest density. The colors are configurable. In the screen capture below, the heat map uses yellow to represent the highest density of features, red to represent medium density, and blue to represent the lowest (non-zero) density.



Crime data shown individually (left) and in a heat map (right)

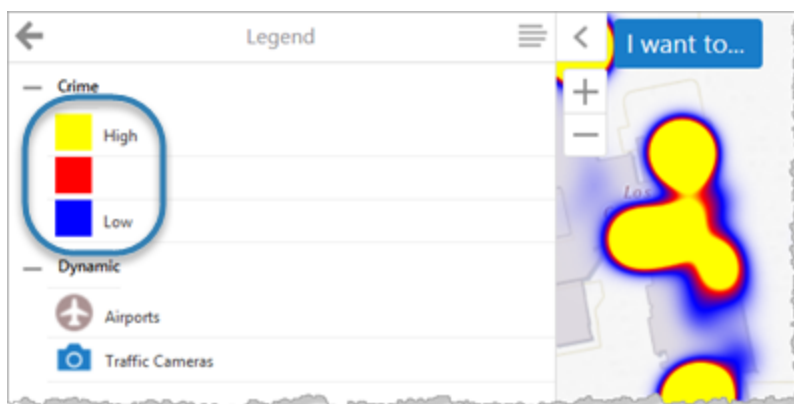
You can configure the default visibility of heat maps, and you can enable end users to turn heat maps on and off. You can also configure settings that control the appearance of hot areas on the map, such as the colors and intensity.



If you do not configure the appearance settings in Manager, viewers use the default settings that are defined in the viewer's heat maps module. For information, refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide*

Heat maps work for point layers only. You cannot display heat maps for line or polygon layers. Heat maps work for feature layers from feature services only.

The colors that are used for a layer's heat maps show in the map legend and in legend switches in the Layer List.



Heat mapping colors in the map legend


Heat mapping is one method of visualizing data. [Clustering](#) is another method.

► **To configure heat maps on a layer:**


1. In Manager, edit the map service that you want to configure.  
Make sure you edit the feature layer's map service component, not the layer component.
2. Click the **Feature Heat Maps** tab.

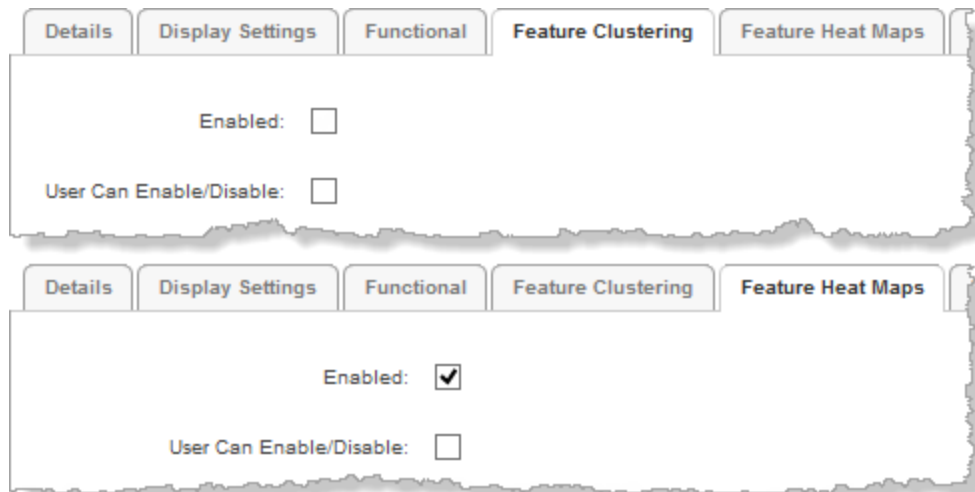
## 3. Configure the settings:

- **Enabled:** Specifies whether heat mapping is initially turned on or off. If you want features to be presented as a heat map when end users first view the layer, select the checkbox. By default, the checkbox is initially cleared.

 If you enable heat maps, you should disable clustering for this layer. Clustering and heat maps cannot both be displayed at the same time.


- **User Can Enable/Disable:** Specifies whether users can turn heat mapping on and off. Enabling this setting also allows users to change the intensity and intensity multiplier. By default, users can turn heat mapping on and off. If you do not want users to be able to turn heat mapping on and off, clear the checkbox.

 If you do not want users to be able to turn heat mapping off, you must clear the User Can Enable/Disable checkboxes for both clustering and heat maps. When a user turns on clustering, heat mapping turns off, regardless of whether users can enable and disable heat maps. The screen capture below shows the configuration to use if you do not want users to be able to turn heat mapping off by any means.



Settings to use if you want heat mapping always turned on

- **Respect Layer Scale Range:** If you want heat maps to show only when the layer is visible on the map, select the checkbox. If you want heat maps to show when the map is zoomed in or zoomed out beyond the layer's scale range, clear the checkbox. By default, the checkbox is cleared.

 This setting uses the scale range that is defined in the Esri layer, not the scale range defined by the Override Minimum Scale and Override Maximum Scale settings on the layer's Display Settings tab in Manager.

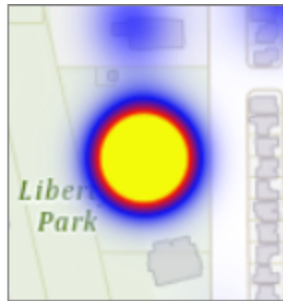
- **Intensity:** Controls the area that hot areas cover, in pixels. The greater the intensity, the larger the area of



coverage. Enter a number from 1 to 100. The default is **30** pixels.

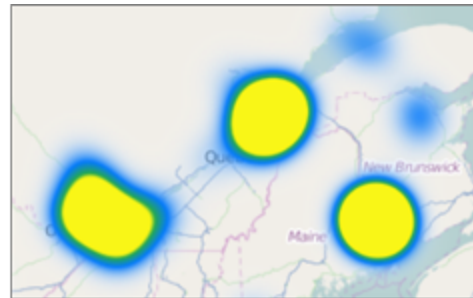
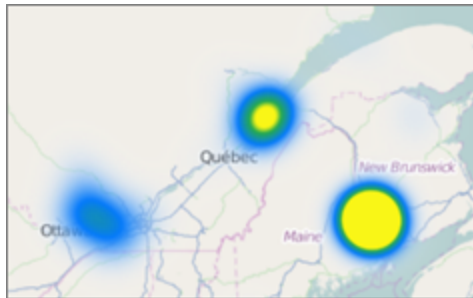


Use a lower intensity for feature layers with a high concentration of data and higher intensity for feature layers with sparse data.



Lower intensity (left) and increased intensity (right)

- **Field:** A numeric field in the feature layer to use to multiply the intensity. For example, you might want to multiply the intensity in an earthquakes layer by the magnitudes of the earthquakes. This increases the intensity of the hot areas proportionately, based on the magnitude.




Earthquakes heat map with no multiplier (left) and multiplied by the magnitude (right)

By default, the Field setting is blank, which means that the intensity is not multiplied. If you want to multiply the intensity, select the name of the field to multiply the intensity by.

- **Gradient Options:** Controls the colors that represent the hot areas on this layer. You can also configure the opacity for each color. The viewer creates gradients using the colors that you configure.



The default gradient: Transparent, blue, red, yellow

- **Color:** For each color that you want to use to represent hot areas on the map, use the color picker  to select a color, enter the color's HTML name (for example, **red**), or enter a hex value (for example, **#FF0000**). The color picker displays a preview of the color and opacity that you have selected. If the color picker for a setting does not show, drag the Color Alpha slider to the right.



The Lowest Density (Outermost Color) is completely transparent by default, to ensure that the outer color changes gradually. We recommend using the default value for the outermost color.

- **Color Alpha:** Controls the opacity of each color in the gradient. Drag the slider to the left to decrease the opacity.

4. Click **Apply Settings**.

5. Click **Save Site**.

#### ► To remove heat maps from a layer:

1. In Manager, edit the map service that you want to configure.  
Make sure you edit the feature layer's map service component, not the layer component.
2. Click the **Feature Heat Maps** tab.
3. Clear the **Enabled** checkbox.
4. Clear the **User Can Enable/Disable** checkbox.
5. Click **Apply Settings**.

6. Click **Save Site**.

Heat maps will be turned off for this feature layer and users will not be able to turn heat maps on.

## 13 ArcGIS Server Image Services

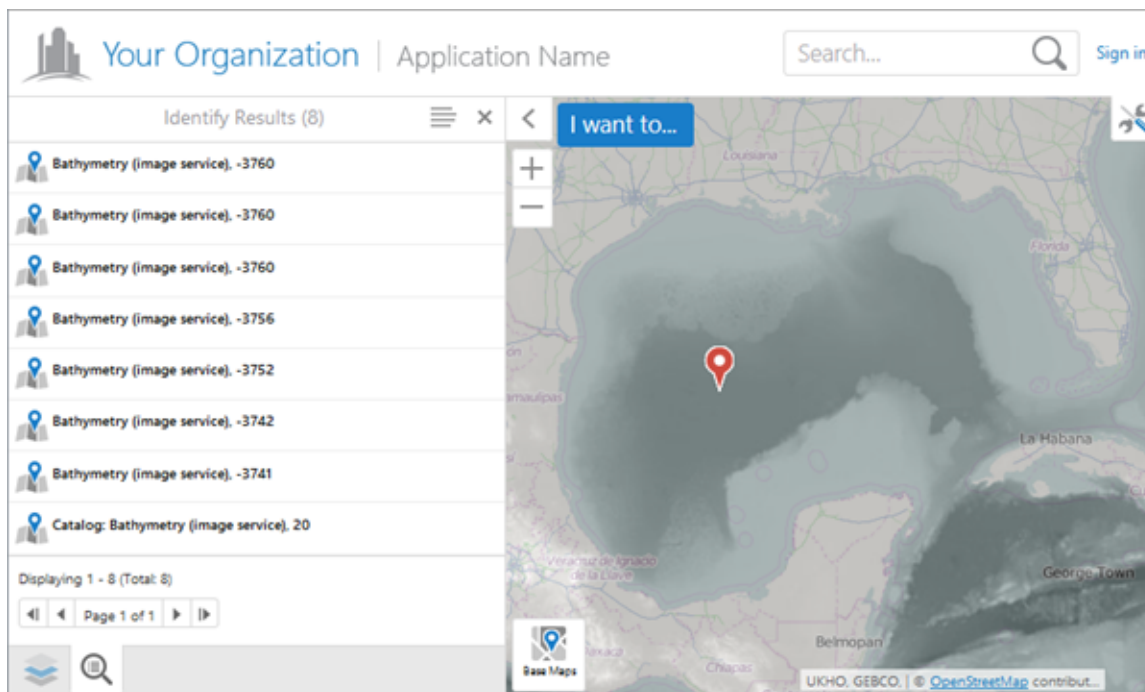
ArcGIS Server image services serve raster and mosaic images that are pre-rendered on the server. You can add ArcGIS Server image services to a site's map.

In Essentials, image services have a map service component, but no layer component. This means that you can configure [map service settings](#) for an image service, but there are no layer settings.

You can configure an image service to allow identify operations. Essentials does not support any other type of query besides identify on image services.

## 13.1 Identify Operations on ArcGIS Server Image Services

Geocortex Essentials and the HTML5 Viewer support identify operations on ArcGIS Server image services. At a minimum, identify operations return the value of the raster cell that is being identified. You can configure identify operations to also return the catalog information and, if the image service has a mosaic dataset, the dataset's individual values.



### Identify results for an image service

The screen capture above shows identify results on a bathymetry (water depth) image service that has a mosaic dataset. The topmost result is the result after the mosaic function is applied. The individual values that were used to calculate the mosaic function are next in the list. The catalog is the last result in the list. The pushpin marks the identified location, which is the location of the dataset values and function result. There is a second pushpin outside the current extent, which marks the catalog.

By default, users can identify by point only. If the user performs some other type of identify, such as a polygon identify, no results are returned from the image service. You can configure an HTML5 viewer to return image service results for line-based and polygon-based identify operations. The viewer's Identify Module has a property called `restrictRasterIdentifyToPoint` that controls this. For information, see "Identify Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

Performing identify operations on image services is disabled by default. Image services have an **Identify Settings** tab where you enable identify operations and configure any additional types of result that you want to show.

#### ► To configure identify operations for an image service:



1. In Manager, edit the map service that you want to configure.
2. Click the **Identify Settings** tab.

3. Configure the settings:
  - **Allow Identify Operations:** If you want end users to be able to perform identify operations on the image service, select the checkbox. By default, users cannot perform identify operations on image services.
  - **Include Mosaic Dataset Values:** If you want identify results to list the mosaic dataset's individual values, in addition to the mosaic function's result, select the checkbox. For this setting to work, **Allow Identify Operations** must be selected.  
The Include Mosaic Dataset Values setting only appears on the Identify Settings tab when the image service has a mosaic dataset.
  - **Include Catalog Items:** If you want identify results to list the catalog, select the checkbox. Users will be able to click the catalog item in the results list to show the catalog's properties and highlight the catalog on the map. For this setting to work, **Allow Identify Operations** must be selected.
4. Click **Apply Details**.
5. Click **Save Site**.

## 14 ArcGIS Server Stream Layers

You can add ArcGIS Server stream layer to a site's map, which provides real-time data from ArcGIS GeoEvent Extension for Server via HTML5 WebSocket technology. Browsers used for the HTML5 Viewer need to support this technology.

### To add a stream layer to the map:

1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. Click  **Add Map Service** to open the dialog.
3. Use one of the following methods to search for a stream layer:
  - a. On the **Search** tab, type a keyword or the URL of the stream layer in the **Search** field, then select the item you want to add to the map from the search results list.
  - b. On the **Service Connections** tab, click  **Add Connection** to open the dialog and enter the URL to the ArcGIS Server that contains the desired stream layer in the URL field. Complete the remaining fields and options in the dialog and click **OK**. Expand the connection and select the item you want to add to the map.
4. Click **Add to Map**.

See also...

[Add a Map Service to the Map on page 108](#)

[Map Service Settings on page 113](#)

## 15 ArcGIS Server Raster Layers

You can add ArcGIS Server raster layers to a site's map, either by adding the map service that the raster layer belongs to, or by adding the raster layer alone.

### 15.1 Identify Operations on ArcGIS Server Raster Layers

Geocortex Essentials and the HTML5 Viewer support identify operations on ArcGIS Server raster layers. Identify operations are enabled by default for all layer types. If you do not want users to be able to identify on a raster layer, clear the layer's Allow Identify Operations checkbox on Manager's Map Services tab.

By default, users can identify by point only. If the user performs some other type of identify, such as a polygon identify, no results are returned from the raster layer. You can configure an HTML5 viewer to return raster layer results for line-based and polygon-based identify operations. The viewer's Identify Module has a property called `restrictRasterIdentifyToPoint` that controls this. For information, see "Identify Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

ArcGIS Server raster layers have Feature Label, Feature Description, and Feature Long Description settings so you can configure the content and appearance of identify results. For information about these settings, see [About Feature Descriptions on page 191](#).



Although raster layers do not have fields, ArcGIS Server creates fields and returns them in query results. If you are comfortable with web inspection tools, you can use this fact to find out the field names and use them in [field tokens](#). To find out the field names, run your web inspection tool and perform an identify operation. The field names are displayed in the tool's console. For example, if a `count` field is returned, you can use a `{count}` field token in the feature description. You cannot use the Rich Text Editor to enter raster layer field tokens—you must manually enter them.

See also...

[ArcGIS Server Image Services on page 149](#)

## 16 ArcGIS Vector Tile Layers

ArcGIS vector tile layers are similar to image layers, except they store a vector representation of the data. Geocortex Essentials supports the use of vector tile layers for experimental purposes in development systems.



At the time of the Geocortex Essentials 4.5 release, vector tile layers are still in development at Esri. Do not use ArcGIS vector tile layers in a production Essentials system. For information about vector tile layer limitations, refer to the "Considerations for using vector tiles" section in ArcGIS Online's [Vector Tile Layers](#) article.



Geocortex Mobile App Framework does not support vector tile layers.

Vector tile layers can display in newer browsers only. To add a vector tile layer to a site's map, you must run Manager in a current browser such as Internet Explorer 11 or the current version of Chrome, Firefox, or Safari. Similarly, end users must run a current browser to be able to see vector tile layers in the viewer.

Vector tile layers are hosted in ArcGIS Online or Portal for ArcGIS. To add a vector tile layer to the map, you can either specify the layer's URL or you can search for the layer. See [Add a Map Service to the Map on page 108](#) for instructions. For more information about vector tile layers, see the ArcGIS article [Vector Tile Layers](#).

## 17 ArcGIS Tables



This section refers to ArcGIS tables, which are not to be confused with [search tables](#).

ArcGIS tables contain arbitrary data, and are associated with either an ArcGIS map service or feature service. An ArcGIS map service or feature service may contain multiple tables. Tables typically do not contain spatial data and therefore appear neither on the map nor in the layer list. However, tables are often related to other ArcGIS layers whose features have geometry. If you include a table in your site, you can then include the table in [Global Search](#), and the viewer displays details of tables related to other layers. As of Essentials 4.5, when you add a map service, its tables are automatically included by default. However, if you want to include the tables of existing map services, you must manually include them.

There are a few ways to include ArcGIS tables:

- [Add a table to an existing map service](#)  
Use this option if the table belongs to an existing map service in your site.
- [Add a table as a map service](#)  
Use this option if the table belongs to a map service that is not in your site.
- [Add a table as a feature layer](#)  
Use this option if the table belongs to a feature service.

You can also [edit a table](#) like a layer.



You can [set permissions](#) on tables, as you can on other layers.

See also...

[Configure Time Zones for Date/Time Data on page 325](#)

### 17.1 Add a Table to an Existing Map Service

In Essentials, you can include or exclude individual tables that belong to ArcGIS map services. If you exclude a table, it cannot be accessed by client applications.

Excluding a table does not remove the table altogether. You can re-include a table that was previously excluded.

► **To add a table to an existing map service:**

1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. Edit the map service that contains the table.
3. Click the **Add/Remove Tables** tab.
4. To include one or more tables, select the tables in the **Excluded Tables** column, and then click the » button. To exclude one or more tables, select the tables in the **Included Tables** column, and then click the « button.



To select multiple tables, hold the **Ctrl** key down while selecting tables.

5. Click **Submit Layer Changes**.
6. Click **Save Site**.

## 17.2 Add a Table as a Map Service

If an ArcGIS table belongs to a map service, you can add the table as a map service whose only layer is the table. The table can be edited like other layers.




Table entries do not typically contain spatial data and therefore do not appear as features on the map, or in the layer list. However, tables are often related to other layers whose features have geometry.

► **To add a table as a map service:**

1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. Click **Add Map Service**, and then click the **Search** tab.
3. In the **Search** box, type the URL of the ArcGIS table that belongs to a map service. The table URL is similar to an ArcGIS layer URL. For example, `http://MyServer.com/arcgis/rest/services/MyFolder/MyMapServiceWithTable/MapServer/6`.



If you don't know the table's URL, you can browse the map service to select one of its tables.

4. Click the  **Search** tool .
5. Click **Add to Map**.  
The dialog box closes and the table appears in the list of map services in the map.
6. Click **Save Site**.  
The map service containing the table is added to the list of map services, with the table as its only layer.

## 17.3 Add a Table as a Feature Layer

If an ArcGIS table belongs to a feature service, you can add the table as a feature layer whose only layer is the table. The table can be edited like other layers.



Table entries do not typically contain spatial data and therefore do not appear as features on the map, or in the layer list. However, tables are often related to other layers whose features have geometry.

### ▶ To add a table as a feature layer:

1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. Click **Add Map Service**, and then click the **Search** tab.
3. In the **Search** box, type the URL of the ArcGIS table that belongs to a feature service.  
The table URL is similar to an ArcGIS layer URL. For example,  
`http://MyServer.com/arcgis/rest/services/MyFolder/MyFeatureService/FeatureServer/9.`



If you don't know the table's URL, you can browse the feature service to select one of its tables.

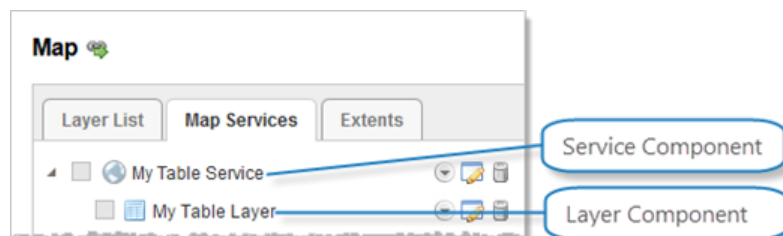
4. Click the **Search** tool .
5. Click **Add as Feature Layer**.  
The dialog box closes and the table appears in the list of map services in the map.
6. Click **Save Site**.  
The feature service containing the table is added to the list of map services, with the table as its only layer.

## 17.4 Edit a Table

On the **Map Services** tab, tables have two parts:

- **Service Component:** The service component of a table allows you to configure service settings, such as connection settings.
- **Layer Component:** The layer component of a table allows you to configure table settings, such as the information to display in feature descriptions, and layer-level features such as charts, reports, and data links.


Tables do not appear in the layer list, as table entries lack geometry.






### Table shown on the Map Services tab on Manager's Map page

#### ▶ To edit the service component of a table:

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.
2. Click the  **Edit Map Service** tool beside the service component of the table you want to edit.

#### ▶ To edit the layer component of a table:

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.
2. Click the  **Edit Layer** tool beside the layer component of the table you want to edit.

See also...

[Map Service Settings on page 113](#)

## 18 Web Tiled Layers

Web tiled layers are tiled map services that use the [Google Maps default tiling scheme](#).

To add a web tiled layer to a site's map, you must first add a [service connection](#) for the service. Essentials provides out-of-the-box connections for some popular Google Maps-compatible services, including [Open Street Maps](#). You are not limited to out-of-the-box services—you can add other web tiled services as well.

When you add a service connection for a web tiled service, you configure the service's location using a URL template, instead of the actual URL. URL templates contain placeholders that are substituted by the actual values when a tile is requested. In order to be able to use a web tiled service in Essentials, the service's URL must contain the `{level}`, `{col}`, and `{row}` tokens. These tokens are placeholders for the tile's zoom level, column, and row.

### Subdomains

Some web tiled services run multiple servers on different subdomains. This allows applications to make simultaneous tile requests without exceeding the conventional limit for a single domain.

Manager has a `{subdomain}` token that allows you to use multiple subdomains. To use the `{subdomain}` token, you insert the token in the URL template where the subdomain would normally go, and then you configure a list of the subdomains that you want to use.

For example, [openstreetmap.org](#) has three subdomains—a, b, and c. An application can send tile requests to any of the three following servers:

- a.tile.openstreetmap.org
- b.tile.openstreetmap.org
- c.tile.openstreetmap.org

To configure Essentials to send tile requests to all three servers, enter the URL template as `http://{subdomain}.tile.openstreetmap.org/{level}/{col}/{row}.png`, and then list the subdomains that you want to use in the Subdomains box.

Open Street Map service connection configured to use multiple subdomains

## Copyright

Some web tile services require that you display a copyright or other attribution on the map when you use the service in a web mapping application.

When you configure a service connection for a web tiled service, you can define the attribution that you want to appear on the map. The copyright can include HTML markup. This means you can include a hyperlink to the organization's website. For example:

```
© OpenStreetMap contributors
```

appears on the map as:

© [OpenStreetMap](#) contributors

The copyright appears in the lower right corner of the map.



Some services require attribution. For information, refer to the service's documentation.

## 18.1 Configure a Web Tiled Layer

To configure a web tiled layer:

- **Add a Web Tiled Layer Service Connection:** See [Web Tiled Layer Service Connections](#) on page 137.
- **Add a Web Tiled Layer to the Map:** See [Add a Map Service to the Map](#) on page 108.
- **Configure Web Tiled Layer Settings:** See [Map Service Settings](#) on page 113.

## 19 KML Layers

KML layers are defined using the XML-based Keyhole Markup Language, which is designed to store geographic data. Many mapping applications support KML, including Google Earth, Google Maps, and ArcGIS Server. For more information, see [the Open Geospatial Consortium's specification for KML](#).

To add a KML layer to an Essentials site, the file must have a `.kml` or `.kmz` file extension. In addition to adding KML layers to a site, sites can inherit KML layers from [web maps](#).

## Supported Features

Essentials uses Esri's JavaScript API to implement KML support. Esri's JavaScript API does not support all KML features. KML features that are not supported by the Esri JavaScript API are also not supported by Essentials. For a list of the API's supported features, see "Supported Features" at the ArcGIS API for JavaScript [KMLLayer documentation](#).

## If your System does not have Internet Access

By default, Essentials uses a KML utility service provided by ArcGIS.com to process KML layers. This requires Internet access. If your system does not have access to the Internet and you have Portal for ArcGIS, you can configure Essentials to use the KML utility service that is hosted by Portal for ArcGIS. For instructions, see [Override the Default KML Utility Service on page 165](#).

## KML Layers and the Map

In Essentials, KML layers have a map service component, but no layer component. If the KML definition contains folders (`<Folder>` elements), the folders show on the Layer List tab in Manager, but they do not show on the Map Services tab or in layer themes. You cannot edit KML folders or change their visibility in Manager; however, end users can turn the visibility of KML folders on and off in the viewer.

In the legend for a KML layer, viewers use the value of the style's ID (`<Style id="">`) to label the color swatches. If you own the KML layer, you can pick IDs that are meaningful representations of the style. For example, in a KML layer whose features are earthquakes classified by magnitude, you could set the IDs to `M1`, `M2`, `M3`, and so on, to represent Magnitude 1, Magnitude 2, Magnitude 3. (Note that style IDs cannot contain spaces or special characters.)

Map tips display the balloon (`<BalloonStyle>` element), if one is defined. If a balloon is not defined, then map tips display the `<description>`. You can [use the Snippet in map tips](#) instead of the `<description>`, if you want.

Similarly, the Results List displays the `<description>`, or you can [use the Snippet in the Results List](#) instead.

## Viewer Support

The viewer does not support the following features and use cases:

- Search, query, and filter operations
- Offline mode
- Printing KML ground overlays

Esri's JavaScript API does not support all KML features. KML features that are not supported by the Esri JavaScript API are also not supported by Essentials. For a list of the API's supported features, see "Supported Features" at the ArcGIS API for JavaScript [KMLLayer documentation](#).



Essentials does not validate the KML Service URL. If your KML service is not configured properly or is missing, and the viewer cannot connect to the utility service hosted at ArcGIS.com, KML layers do not appear on the map.

## 19.1 Add a KML Layer to the Map


To add a KML layer to the map, Manager must be able to connect to the layer—you cannot add a KML layer when the layer is unavailable.

### ▶ To add a KML layer to the map:

1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. Click **Add Map Service**.
3. Click the **Search** tab.
4. Type or paste the service's URL in the **Search** box.



We recommend that you use the same protocol (HTTP or HTTPS) for all the map services that you add to a site. Browsers might not display all of a site's content if you use different protocols within one site. The protocol that you use for map services should be the same as the protocol that you use for viewer URLs.

5. Click the **Search** tool .
6. Click **Add to Map**.  
The dialog box closes and the service is added to the list of services in the map.
7. Click **Apply Changes**.

## 19.2 Edit a KML Layer


In Essentials, KML layers have a map service component, but no layer component. To edit a KML layer, you edit the map service component.

### ▶ To edit a KML layer:

1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. Click the **Map Services** tab.



If the KML layer that you want to edit is in the Layer List, you can also edit the layer from the Layer List tab.

3. Click the **Edit Map Service** icon  beside the KML layer that you want to edit.  
The layer opens for editing.

## 19.3 Configuration Settings for KML Layers

### Details Tab Settings for KML Layers

To open the Details tab, [edit](#) the KML layer and click the Details tab.

KML layers have the following settings on the Details tab:

- **ID:** (for information only) The unique identifier for this service in the REST API.
- **Display Name:** The name that is used to refer to this map service in Manager and in viewers. The Display Name can contain spaces and special characters.
- **Short Display Name:** The name that is used to refer to this map service in small spaces in the viewer, for example, in a [basemap transparency slider](#). If you do not configure the Short Display Name, the Display Name is used in small spaces. The Short Display Name can contain spaces and special characters.
- **Description:** A short description of the service. The description is optional.
- **Copyright:** Some organizations, such as Open Street Map ([openstreetmap.org](http://openstreetmap.org)), require anyone using their data to credit the organization. Use the Copyright setting to configure the attribution. The copyright appears in the lower right corner of the map in Manager and in viewers. If you also want the copyright to appear in exported and printed map images, select the **Include Copyright in Print/Export** checkbox.

The copyright can include simple HTML markup, such as bold text and anchor elements. Using an anchor element enables you to include a hyperlink to the organization's website, for example:

```
© <a href="http://www.openstreetmap.org/copyright" target="_blank">OpenStreetMap</a> contributors
```

This appears on the map as: © [OpenStreetMap](#) contributors.

If a map service has a copyright built into it, the built-in copyright appears in the Copyright box by default. You can override the built-in copyright by typing a new copyright in the Copyright box. To restore the default copyright, delete the custom copyright that you entered.

If more than one map service in a site has a copyright (either built in or configured in Manager), the copyrights appear one after another on the map.

- **Include Copyright in Print/Export:** If you want the copyright for this map service to appear on the map image when the map is exported, select the Include Copyright in Print/Export checkbox. For printing, you must also add a **TextBox** to each print template, and set the TextBox's **DataField** property to **\_CopyrightText**:

Open the print template in Report Designer.

Drag a **TextBox** onto the print template and position it where you want it. You may also have to resize the TextBox to fit your needs.

With the TextBox selected, scroll down the properties list in the lower right corner of Report Designer until you see the **Data** section.

Click to the right of **DataField** and type **\_CopyrightText**.

Save the print template.

- **Data Source Type:** (for information only) The type of service that provides the map data, for example, ArcGIS Server REST or OGC WMTS.
- **Spatial Reference:** The service's spatial reference.
- **Connection String:** (for information only) The connection string to connect to this service.

- **Edit Connection Settings:** Click **Edit Connection Settings** and modify the settings as desired. The settings that are available depend on the type of map service.



After you have configured the connection settings, click the **Test Connection** button to verify the settings.

- **Service URL:** Type or paste the map service's URL.
- **Security Provider Name:** Controls how the layer security proxy authorizes layers. If left unset, the default map security provider is used, which respects the settings on the Permissions page.



In most cases, this setting should be left blank, as it only applies to advanced scenarios. Do not use this setting unless you're sure you need to.



To see a list of map service security providers, click the **Security Provider Name** box.

By default, the map service security providers include:

- **DefaultMapServiceSecurityProvider:** The default map service provider, which simply respects the settings on the Permissions page. This option is the same as leaving this setting blank. For a map service, users only have access to layers and tables included in the site. For a feature service, users have access to the configured layer as well as any related layers or tables.
- **AllowUnknownDynamicLayersProvider:** Allows all dynamic layer requests. Allowing all dynamic layers can represent a security vulnerability. This should only be used in cases where the end users are trusted, or when security is simply used as a convenience to hide irrelevant data rather than to protect data.
- **AllowUnknownLayersProvider:** Allows all layer and table requests. This provider does not secure any layers or tables.
- **AllowUnknownRelatedLayersProvider:** Allows all related layer and table requests for map services that users are authorized to access. This setting is used to allow access to related layers and tables in a map service when an Administrator has not added those related layers and tables to the site. This emulates the default behavior in Essentials 4.4.
- **ConterraMapServiceSecurityProvider:** Uses Con Terra's Web Security Service (WSS) to discover the permissions to be used for layers, rather than using the settings on the Permissions page.
- **DenyUnknownRelatedLayersProvider:** Prevents feature services from automatically allowing access to related layers and tables.

## Display Settings Tab for KML Layers

To open the Display Settings tab, [edit](#) the KML layer and click the Display Settings tab.

KML layers have the following settings on the Display Settings tab:

- **Icon URI:** The URI to the icon that you want to use to represent this service. Click **Browse** to navigate to the icon file, or **Upload** the file to the site.

- **Opacity:** Sets the map service's default opacity. For example, if you set the opacity to 30% in Manager, then end users initially see the map service at 30% opacity in the viewer, and the map service's opacity slider is initially set to 30%. End users can drag the opacity slider to change the map service's opacity.
- **Override Scale:** The Override Scale settings allow you to restrict the scale range of the map service in Essentials. These settings override the scale settings that are defined in the map service itself.
  - **Override Minimum Scale:** The minimum scale at which the map service is visible in viewers. If a user zooms out farther than the Override Minimum Scale setting, the map service no longer shows on the map. If the map service is in the Layer List, the map service's Visibility checkbox becomes grayed out to indicate that the map service is not visible at the current scale.

For example, if the minimum scale defined in the map service itself is 1:10,000,000, you could restrict the minimum scale to 1:5,000,000 in Essentials.

To configure the minimum scale, enter the scale's denominator, without commas or other punctuation. For example, to set the minimum scale to 1:5,000,000, enter **5000000** in the **Override Minimum Scale** box. If you leave the Override Minimum Scale box blank, Essentials uses the minimum scale that is defined in the map service itself.
  - **Override Maximum Scale:** The maximum scale at which the map service is visible in viewers. If a user zooms in closer than the Override Maximum Scale setting, the map service no longer shows on the map. If the map service is in the Layer List, the map service's Visibility checkbox becomes grayed out to indicate that the map service is not visible at the current scale.

For example, if the maximum scale defined in a map service is 1:500, you could restrict the maximum scale to 1:2,000 in Essentials.

To configure the maximum scale, enter the scale's denominator, without commas or other punctuation. For example, to set the maximum scale to 1:2,000, enter **2000** in the **Override Maximum Scale** box. If you leave the Override Maximum Scale box blank, Essentials uses the maximum scale that is defined in the map service itself.

A common use for the Override Scale settings is to make one basemap become visible when another loses visibility as the user zooms the map. To configure this, set Override Maximum Scale for one basemap to the same scale as Override Minimum Scale for the next basemap.



In addition to these settings, which control the scale range of a **map service**, the Geocortex viewers have settings that enable you to restrict or extend the scale range of the **map**. For information, refer to the "Map Module" section in the *Administrator and Developer Guide*.

## Field Formatting

You can also configure Field Formatting at the layer level and the field level. For information, see [Format Date/Time and Number Fields](#) on page 329.



These settings do not work for GeoRSS layers—GeoRSS layers do not provide any information about the type of data that their fields contain, so viewers cannot format the data.

- **Number Format:** (numeric fields only) (does not apply to GeoRSS layers) The format to use to display the field's value in HTML5 viewers.

You can configure the format at the map service level, the layer level, and the field level. The default value, **Default**, inherits the formatting from a higher level. If all three levels are set to Default, fixed-point formatting with up to four decimal digits is used.

- **Currency:** (applies to the Currency and Accounting number formats only) The currency type of the stored data. For example, if the stored data is in euros, enter EUR. The default is USD (US Dollars). To see a complete list of currency codes, delete the default currency type—a drop-down list of currency codes will open. To find out what the codes stand for, refer to this list of [ISO 4217 currency codes](#).
- **Decimal Places:** The number of decimal digits to display in viewers. To display integers, enter **0**. Alternatively, leave the Decimal Places setting blank to display up to four decimal digits (Number, Fixed-point, and Percentage formats) or the conventional number of decimal digits for the specified currency (Currency and Accounting formats).
- **Custom Number Format:** The custom format string that you want to use to format numbers in the viewer. Essentials supports custom format strings based on the .NET Framework [Custom Numeric Format Strings](#). Do not put quotation marks around the custom format string.
- **Date Format:** (date/time fields only) (does not apply to GeoRSS layers) The format to use to display the field in the viewer.
  - **Custom Date Format:** The custom format string that you want to use to format dates in the viewer. For formatting instructions, see [Format Date/Time Fields on page 331](#). Do not put quotation marks around the custom format string.
- **Data Time Zone:** Choose a time zone for the selected layer. By default, the time zone is set to Default, which inherits the time zone from a higher level. For more information, see [Configure Time Zones for Date/Time Data on page 325](#).

## Functional Tab Settings for KML Layers

To open the Functional tab, [edit](#) the KML layer and click the Functional tab.

KML layers have the following settings on the Functional tab:

- **Failure Action:** Specifies the behavior of the site's viewers if this service is not available when the site is loaded. The failure action does not affect user sessions that are already in progress when a service goes down. The possible failure actions are:
  - **Ignore:** The viewer does not warn the user that the service is not available. The user can proceed to use the application. (The service will not work).
  - **Warn:** The viewer displays a warning to the user that says the service is not available. The user can close the warning and proceed to use the application. (The service will not work). This is the default value.
  - **Error:** The viewer displays a warning to the user that says the service is not available. The user cannot close the warning, and cannot use the application.
- **Update interval:** The frequency for the viewer to refresh the map image, in seconds. If you do not set an interval, the map refreshes only when a user performs an action that forces the map to redraw, like pan or zoom.



## 19.4 Update the URL for a KML Layer

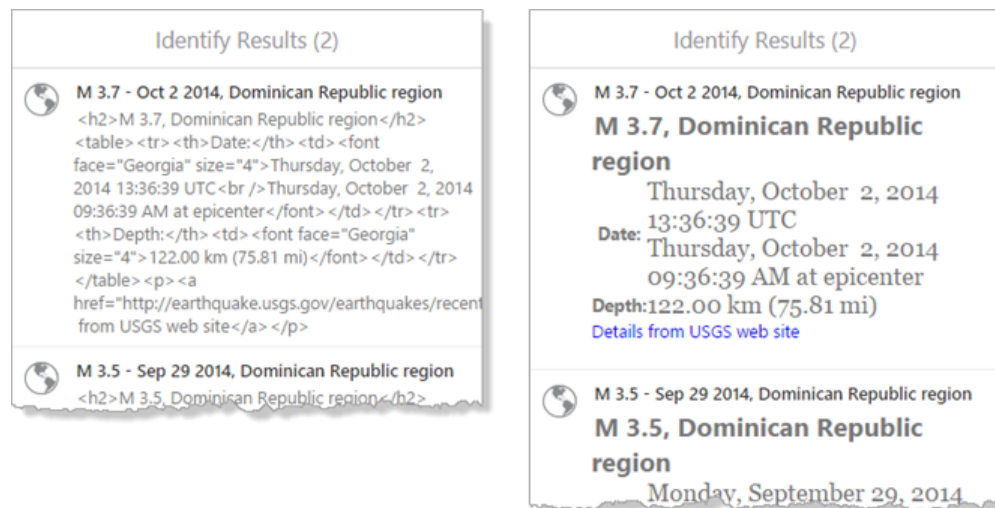
If the KML that defines a KML layer is moved to a new location, for example to a different server, you must update the layer's URL in Manager. Another reason to update the URL is to change the protocol (HTTP, HTTPS) that you use.

### ► To update the URL for a KML layer:

1. In Manager, [edit](#) the KML layer that you want to configure.
2. On the **Details** tab, scroll down and click the **Edit Connection Settings** button.
3. Update the URL.
4. Click **OK**.
5. Click **Apply Details**.

## 19.5 Enable HTML Rendering in an HTML5 Viewer

By default, viewers display the value of a KML feature's `<description>` element in the Results List and in map tips. KML `<description>` elements can contain HTML markup. For an HTML5 viewer to render the markup, the viewer's **Allow Unsafe Content** setting must be enabled. If Allow Unsafe Content is disabled, end users will see the markup, instead of what the markup represents.



Example of KML features without HTML rendering (left) and with HTML rendering (right)



If you use the `<Snippet>` element instead of the `<description>` element in the Results List and map tips, you do not need to enable HTML rendering, because the `<Snippet>` element cannot contain HTML markup. See [Use the Snippet Element in an HTML5 Viewer's Results List on page 165](#) and [Use the Snippet Element in an HTML5 Viewer's Map Tips on page 165](#).

### ► To enable HTML rendering in an HTML5 viewer:

Enabling HTML rendering in a viewer enables HTML rendering for **all** of the KML and GeorSS layers in the site that

the viewer belongs to.

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Application**.
3. Select the **Allow Unsafe Content** checkbox.
4. Click **Apply Changes**.

## 19.6 Use the Snippet Element in an HTML5 Viewer's Results List

By default, HTML5 viewers display the value of a KML feature's `<description>` element in the Results List. You can configure an HTML viewer to display a KML layer's `<Snippet>` element in the Results List, instead of the `<description>` element.

### ► To use the Snippet element in an HTML5 viewer's Results List:

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Look and Feel**.
3. In the **Results List** area, select **Feature Description** from the **Content Field** drop-down list.
4. Click **Apply Changes**.

## 19.7 Use the Snippet Element in an HTML5 Viewer's Map Tips

By default, HTML5 viewers display the value of a KML feature's `description` element in map tips. You can configure an HTML viewer to display a KML layer's `Snippet` element in map tips, instead of the `description` element.

### ► To use the Snippet element in an HTML5 viewer's map tips:

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Look and Feel**.
3. In the **Map Tips** area, select **Feature Description** from the **Content Field** drop-down list.
4. Click **Apply Changes**.

## 19.8 Override the Default KML Utility Service

By default, Essentials uses a KML service hosted at ArcGIS.com. Essentials accepts a KML Service URL if your site cannot access the hosted KML service. A configured KML service is only required in the following cases:

- You need to process KML layers that are not publicly accessible from the Internet.
- Your viewer cannot access the Internet.

If you use Portal for ArcGIS, you can set the KML Service URL to use its built-in KML service.

► **To configure a KML Service URL for Portal for ArcGIS:**

1. Select GIS Services from the site menu.
2. Go to the **KML** tab.
3. Specify your KML Service URL.

A typical Portal for ArcGIS installation's KML service URL is `http://your.portal-domain.com/arcgis/sharing/kml`.

**See also...**

[Import Map Services from Another Site on page 111](#)

[Add a Reference to an ArcGIS Web Map on page 188](#)

## 20 OGC Map Services (WMS, WFS, and WMTS)

Geocortex Essentials supports the following types of OGC (Open Geospatial Consortium) service:

- **WMS (Web Map Service):** WMS services provide dynamic map service capabilities.
- **WFS (Web Feature Service):** WFS provides querying for an associated WMS, or as a WFS-specific feature service.
- **WMTS (Web Map Tiled Service):** WMTS provides OGC-style tiled services.

From version 4.0 of Geocortex Essentials there is support for the following OGC specifications:

- WMS 1.0.0, 1.1.0, 1.1.1, 1.3.0
- WFS 1.0.0, 1.1.0, 2.0 (Get Feature operation)
- WMTS 1.0.0

### About WMS

To make full use of WMS capabilities, you need to associate the WMS with a WFS. With a WMS and associated WFS, it is possible to:

- Use data linking and reporting.
- Use legends and in print templates.
- Identify, search and query.
- Configure the image format.
- Configure the spatial reference.
- Add parameters to the map URL.
- Use HTTP (web tier) authentication.
- Operate without a proxy.

## Printing and Legends

A copy of the new `Legend.rpx` file can be found in the Sample Sites directory. The default location for the file is `C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\Sample Sites\Resources\PrintTemplates`.

## Identify, Query, Search, Data Links, and Reporting

To use identify, query, search, data links, and report features, your WMS must be associated with a WFS.

Limited querying may be possible without a WFS. See [OGC Query on page 169](#) for information.

Essentials will use an associated WFS provided:

- The WMS supports `DescribeLayer`, which Essentials uses to obtain the URL of the WFS.
- The WMS has layers that correspond to feature types on the WFS.
- For query and search, you configure a WFS query provider.  
See [OGC Query on page 169](#) for information about query providers.



ArcGIS Server WMSs do not support `DescribeLayer`. To associate an ArcGIS WMS with a WFS, edit the map service in Manager. On the Functional tab, select **WFS:ArcGIS** from the **Query Provider** drop-down list. On the Details tab, click **Edit Connection Settings** and enter the WFS's URL in the **WFS URL** box.

## WFS Requirements for an Associated WMS

To make full use of all the functionality available in the Geocortex viewers, the WFS must support:

- **Logical Operators:** And, Or.
- **Spatial Operators:** Intersects.
- **Other Operators:** `FeatureId`, `PropertyIsLike`, `PropertyIsEqualTo`.
- **Literal Types:** `xs:string`, `xs:integer`, `xs:double`.
- **Geometry Types:** Envelope, Point, MultiPoint, MultiPolygon, MultiLineString, LineString, Polygon.

## About WFS

Unlike WMS, which provides map services in the form of images, WFS services provide the geometry and attribute data that define features in map layers. The HTML5 Viewer queries that data and renders it in the viewer's browser for user interaction.

For information about adding a WFS service connection, see [WFS Service Connections on page 134](#).

## About WMTS

Currently WMTS:

- Can use KVP request encoding only.
- Cannot use SOAP.
- Cannot use legends.
- Can use only point-identify queries.
- Cannot use reports and data links.



The HTML5 Viewer does not support WMTS identifying, querying or searching.

## Proxies

Usually, when adding an OGC web service to your web application, you would need to use a proxy. This is because services are usually hosted on a different domain than the host mapping application and web browsers usually obey the single-origin policy. The single-origin policy stipulates that you cannot make cross-domain requests for XML data, such as service metadata. (Image requests in a browser are not subject to the same cross-domain restrictions.)

Geocortex Essentials is able to work around this stipulation by including all the necessary service metadata in the site response. This means that you do not need a proxy to access a WMS or WMTS. You can specify a proxy if you want to, but it is not necessary.

## Secured WMS, WFS, and WMTS

In order to add a secured WMS, WFS, or WMTS to an Essentials site, you must first add a service connection. The service connection stores the information that Essentials needs to be able to connect to the service, including the information that allows Essentials to authenticate. See [WMS Service Connections on page 132](#), [WFS Service Connections on page 134](#), or [WMTS Service Connections on page 135](#) for instructions.

Essentials is capable of accessing WMS, WFS, and WMTS that are secured using one of the following methods:

- **Web Tier (default or anonymous credentials):** Select this option in the following cases:
  - if the service is secured using Integrated Windows Authentication and you want Essentials to authenticate as the application pool user
  - if the service is not secured
- **Web Tier (configured credentials):** Select this option in the following cases:
  - if the service is secured using basic or digest authentication
  - if the service is secured using Integrated Windows Authentication and you want to configure the credentials for Essentials to use when authenticating

In the **Username** and **Password** text fields, enter the credentials that you want Essentials to use.

- **Proxy Settings:** If you are using a proxy page, enter the proxy page's URL in the **Proxy URL** box. For example, `http://host.domain.com/MapServiceProxy/proxy.ashx`.

## 20.1 OGC Query

### 20.1.1 Direct Query vs. WFS Query

Essentials supports two methods of querying a WMS:

- **Direct:** Query the WMS directly using a `GetFeatureInfo` operation.
- **WFS:** Send feature requests to a WFS that is associated with the WMS.

WFS is a more powerful way to query than direct query. WFS supports full text searches and complex spatial filtering, and searches and queries return full attribute data and metadata. WFS also supports data linking and reporting. Having full attribute data enables you to define rich feature descriptions to display in results lists, map tips, and reports.

If a WFS is not available for the WMS and the WMS supports the `GetFeatureInfo` operation, Essentials can query the WMS directly. Direct querying supports only limited spatial querying—the only identify operation that `GetFeatureInfo` supports is point identify. Direct querying does not support text search. As well, the output format is limited to display-only formats such as plain text or HTML in some cases.



WMS layers that are not associated with a WFS only support point identify, and do not support query or search, whereas WMS layers associated with a WFS support all types of identify, query and search operations.



When using direct query, use GML output if possible. GML output works well with Geocortex Essentials and Geocortex viewers.

Because you cannot use a WFS with a tiled service, WMTS query is direct—it uses `GetFeatureInfo`.

### 20.1.2 Query Providers

When you configure a WMS, you need to specify the query provider to use. This is required whether or not you are using a WFS. Essentials uses this information to query the WMS.

There are many options and your choice will depend on the WMS you are configuring. In Essentials, when you select an option that begins with WFS, Essentials attempts to use WFS for querying. If the WMS supports `GetFeatureInfo`, you will have options available that start with WMS. If you choose one of these options, Essentials will use WMS to query the WMS, using the specified information format. For example, if you choose "WMS: text/html", then Essentials will query the WMS and return the data in HTML format.

The query provider is configured on the map service's [Functional tab](#). For instructions on configuring the query provider, see [Configure a WMS Map Service on page 171](#) or [Configure a WMTS Map Service on page 172](#).

## WMS Query Providers

There are two categories of WMS query providers:

- **WFS:** When you select an option that begins with **WFS**, Essentials uses WFS for querying. WFS options are always available for you to configure.
- **WMS:** If the WMS supports `GetFeatureInfo`, you will have options that start with **WMS**. If you choose one of these options, Essentials queries the WMS directly, using the specified information format. For example, if you choose `WMS: text/plain`, then Essentials queries the WMS directly and returns the data in plain text format.



You can disable query and search by selecting **Disabled**. When the query provider is set to Disabled, the user can still perform queries and searches, but no results are returned.

The WFS query provider options and some common WMS query provider options are described below. The WFS query providers return equivalent data.

- **WFS:** Specifies that you want to use a fully compliant, non-ArcGIS WFS with your WMS. If the WMS correctly publishes the location of the WFS, then Essentials automatically connects your WMS to the WFS. In order to use this option:
  - The WMS must support `DescribeLayer`, which Essentials uses to obtain the URL of the WFS.
  - The WMS's layers must correspond to feature types on the WFS.
- **WFS: ArcGIS:** If your WMS layer is published via ArcGIS Server, you must use this option. You must also specify the WFS's URL. To specify the URL, edit the map service in Manager. On the Details tab, click **Edit Connection Settings** and enter the URL in the **WFS URL** box.  
The WFS: ArcGIS option uses the Title attribute to correlate WMS layers and WFS feature types.
- **WFS: Name Correlation:** Use this option if you are using a non-ArcGIS WMS that does not support `DescribeLayer` or has `DescribeLayer` disabled. You must also specify the WFS's URL. To specify the URL, edit the map service in Manager. On the Details tab, click **Edit Connection Settings** and enter the URL in the **WFS URL** box.



GeoServer does not support `DescribeLayer`.

The WFS: Name Correlation option uses the Name attribute to correlate WMS layers and WFS feature types.

- **WMS: application/vnd.ogc.gml:** Use this option if it is available and the WFS options do not work. This option returns results that are suitable for feature details and map tips.
- **WMS: text/html:** Returns the results in pre-formatted HTML.  
You can create a Query Transform workflow that modifies the results of a `WMS: text/html` query before the results are returned to the viewer. For example, when a `WMS: text/html` query returns non-GML data, Essentials adds the raw data as a column in the `DataSet`. This raw data appears as a single `ows:data` attribute. You could create a Query Transform workflow that converts the HTML text to attribute data in rows and columns. For more information, see "Create a Query Transform Workflow" in the Workflow Designer help system.
- **WMS: text/plain:** Returns the results in plain text.

You can create a Query Transform workflow that modifies the results of a WMS: text/plain query before the results are returned to the viewer. For example, when a WMS: text/plain query returns non-GML data, Essentials adds the raw data as a column in the `DataSet`. This raw data appears as a single `ows:data` attribute. You could create a Query Transform workflow that converts the HTML text to attribute data in rows and columns. For more information, see "Create a Query Transform Workflow" in the Workflow Designer help system.

### WMTS Query Providers

Some common WMTS query provider options are described below:

- **WMTS: application/vnd.ogc.gml:** Returns results in GML format.
- **WMTS: text/html:** Returns the results in pre-formatted HTML.
- **WMTS: text/plain:** Returns the results in plain text.

## 20.2 Configure a WMS Map Service

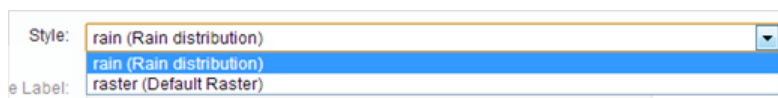
To configure a WMS map service:

- **Add a WMS Service Connection:** If the WMS is secured, you must add a service connection before you can add the service to the map. See [WMS Service Connections on page 132](#).
- **Add a WMS Service to the Map:** See [Add a Map Service to the Map on page 108](#).
- **Configure WMS Settings:** See [Map Service Settings on page 113](#).
- **Configure WMS Connection Settings:** See [Edit a Map Service's Connection Settings on page 113](#).
- **Exclude Layers from a WMS Service:** See [Exclude Layers from a Dynamic Map Service on page 126](#).
- **Configure WMS Layer Styles:** See [To configure the styles on a WMS layer: on page 171](#)

### ► To configure the styles on a WMS layer:

If different styles have been set up for a particular WMS layer, you can select the styles to use from a list of options.

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.
2. Expand the map service to show the sublayers, and then click **Edit Layer**.
3. To set the style to use on the layer, click the down arrow in the **Style** box and select the style you want to use.



4. Click **Apply Changes**.
5. Click **Save Site**.



## 20.3 Configure a WFS Map Service

To configure a WFS map service:

- **Add a WFS Service Connection:** If the WFS is secured, you must add a service connection before you can add the service to the map. See [WFS Service Connections on page 134](#).
- **Add a WFS Service to the Map:** See [Add a Map Service to the Map on page 108](#).
- **Configure WFS Settings:** See [Map Service Settings on page 113](#).
- **Configure WFS Connection Settings:** See [Edit a Map Service's Connection Settings on page 113](#).

## 20.4 Configure a WMTS Map Service


To configure a WMTS map service:

- **Add a WMTS Service Connection:** If the WMTS is secured, you must add a service connection before you can add the service to the map. See [WMTS Service Connections on page 135](#).
- **Add a WMTS Service to the Map:** See [Add a Map Service to the Map on page 108](#).
- **Configure WMTS Settings:** See [Map Service Settings on page 113](#).
- **Configure WMTS Connection Settings:** See [Edit a Map Service's Connection Settings on page 113](#).

## 21 GeoRSS Layers

GeoRSS services provide geographic data in RSS feeds, so the data can be plotted by web mapping applications running in RSS-enabled browsers. RSS is a technology for delivering text, audio, and media over the Internet. In Essentials, GeoRSS services are added to the map as layers. Each feed is a layer, and each feed item is a feature.

You can also add non-geographic RSS feeds to the map using a web service like [GeoNames](#). For information see [Convert RSS to GeoRSS](#).

You can configure GeoRSS layers to automatically update at regular time intervals in Manager. From the Map page, select  **Edit** next to the GeoRSS layer you wish to configure. Then, go to the **Functional** tab and configure the **Update Interval (seconds)** setting.

Essentials supports Simple GeoRSS and GeoRSS GML (Geography Markup Language) formats in RSS 1.0, RSS 2.0, and Atom. For more information, refer to <http://www.georss.org/>.



To view content from a KML or GeoRSS layer that contains HTML markup, you need to enable the Allow Unsafe Content setting for your viewer. By default, layers with external HTML are displayed as raw HTML and not formatted. For more information see [Configure Application-Wide Settings for an HTML5 Viewer on page 357](#).



The HTML5 Viewer supports point geometries only.

See also...

[Map Service Settings on page 113](#)

## 21.1 Convert RSS to GeoRSS

You can also add non-geographic RSS feeds to the map using a web service like [GeoNames](#). The web service converts RSS feeds into valid GeoRSS layers, which you can add as a map service in Essentials Manager.

Once you have a GeoNames account and have enabled web services, you can add an converted RSS feed using a GeoNames URL that includes their API parameters. The following is an example of a valid URL, where `youraccount` is the username of your activated GeoNames account:

```
http://api.geonames.org/rssToGeoRSS?feedUrl=http://feeds.reuters.com/reuters/worldNews&username=youraccount
```

## 21.2 Configure a GeoRSS Layer

To configure a GeoRSS layer, follow the instructions in the following sections:

- **Add a GeoRSS Layer to the Map:** See [Add a Map Service to the Map on page 108](#).
- **Configure GeoRSS Settings:** See [Map Service Settings on page 113](#).



You cannot add service connections for GeoRSS layers. This means that you cannot search for GeoRSS layers by keyword in Manager. To add a GeoRSS layer to the map, you must enter the URL.

## 22 GIS Services

Manager's GIS Services page allows you to configure:

- **Geocoding Services:** Add geocoding services to the site. Geocoding services convert between addresses and spatial data. See [Geocoding Services on page 174](#).
- **Geometry Service:** Add a geometry service to the site. Geometry services perform geometric calculations. See [Geometry Services on page 185](#).
- **Export Map Image:** Configure settings for the Export Map feature. See [Configure Map Export on page 91](#)
- **KML Service URL:** Configure a KML service if you are unable to use default configured service hosted by ArcGIS.com. See [Override the Default KML Utility Service on page 165](#).



You cannot configure geoprocessing services in Manager.

## 22.1 Geocoding Services

Geocoding services ("geocoders") convert between addresses and spatial data. Converting an address to spatial data enables the address to be shown on the map. This is called "forward geocoding". Converting from spatial data (a geographic location) to an address is called "reverse geocoding".

In order for a site's viewers to do operations that involve geocoding, you must configure at least one geocoding service in the site. Essentials supports unsecured and secured ArcGIS geocoding services, and the Bing Maps geocoding service.

### About Configuration Settings for Geocoding Services

After you have added a geocoding service to a site, you might need to configure additional settings. This depends on what type of viewer you are using and which geocoding-dependent features you configure.

Parameter	Display Name	Value	Required	Visible
Street	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
City	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
State	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Zip	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>

#### Additional geocoding service settings (other settings are omitted)

The settings are summarized in the table below. In the table, the geocoding service settings are identified by number. The numbers relate to the screen capture above.

To use the table, first look in the Feature column to find the feature that you want to configure. Now read across the row for that feature to find out which settings to configure. In addition to configuring the geocoding settings, you must configure the feature itself. Follow the link given in the Feature column to configure the feature.

The table uses the following values:

- **Yes:** You must configure the settings that say **Yes** for that feature.
- **Optional:** Settings that are **Optional** allow you to configure optional aspects of that feature. You do not need to configure Optional settings.
- **No Effect:** If you configure a setting that has **No effect**, the setting will not have any effect on the feature (it might affect other features, if you configure more than one of the features listed in the table). For example, configuring a Display Name for Global Search has no effect. You do not need to configure settings that have no effect, but there is no harm if you do.

For information about what the individual settings do, see [Configuration Settings for ArcGIS Geocoding Services on page 175](#) and [Configuration Settings for the Bing Maps Geocoding Service on page 177](#).

## Geocoding Service Settings to Configure Geocoding Features

Feature	1	2	3	4	5	6
More Information						
<b>Global Search (text search)</b> See <a href="#">Global Search on page 216</a> .	Yes	Yes	No effect	Optional	No effect	No effect
<b>Batch Geocoding</b> See "Configure Batch Geocoding" in the <i>Geocortex Viewer for HTML5 Administrator and Developer Guide</i> .	No effect	No effect	No effect	Optional	No effect	No effect

## 22.1.1 Configuration Settings for ArcGIS Geocoding Services

ArcGIS geocoding services have the following settings:

- **Service Type:** (for information only) The service type is **ArcGISGeocoder**.
- **Display Name:** The name that is used to refer to this geocoding service. Choose a display name that end users understand.
- **Service URL:** The geocoding service's URL. Features that use this geocoding service send geocode requests to this URL.
- **Default Batch Geocoder:** Makes this geocoder the default for batch geocoding. This setting only applies to one geocoder at any time.
- **Default Reverse Geocoder:** Makes this geocoder the default for reverse geocoding. Reverse geocoding is the process of determining the address of a given map point. This setting only applies to one geocoder at any time.
- **Icon URI:** Configures a custom icon for this geocoding service.
- **Authentication Settings:** If the geocoding service is secured, select the authentication method for Essentials to use when connecting to the service.
  - **Web Tier (default or anonymous credentials):** Select this option in the following cases:
    - if the service is secured using Integrated Windows Authentication and you want Essentials to authenticate as the application pool user
    - if the service is not secured
  - **Web Tier (configured credentials):** Select this option in the following cases:
    - if the service is secured using basic or digest authentication
    - if the service is secured using Integrated Windows Authentication and you want to configure the credentials for Essentials to use when authenticating

In the **Username** and **Password** text fields, enter the credentials that you want Essentials to use.

- **Token Security (by user):** Select this option if the service is secured using token security. In the **Username** and **Password** text fields, enter the credentials that you want Essentials to use when authenticating. If you have changed the location where tokens are issued, enter the URL of the location in the **Token URL** box.



By default, Essentials assumes the token duration of all your ArcGIS services is 60 minutes, which is the ArcGIS default. However, if the token duration of any of your ArcGIS services is lower, you must specify the lowest token duration in Essentials. To do so, open the Essentials `web.config` file and, within the `<appSettings>` element, add a new element with `ArcGisRestMapServiceBase.MaximumTokenDuration` as the key and set its value accordingly in minutes. For example, to set the maximum token duration to 20 minutes: `<add key="ArcGisRestMapServiceBase.MaximumTokenDuration" value="20" />`. The Essentials `web.config` file is located in `{GE_HOME}\REST\Web.config`.

- **Token Security (explicit tokens):** In the **Server Token** box, type or paste the long-lived server token that Essentials will use to authenticate. You can also optionally configure a long-lived client token. Select this option if the service is secured using token security and you want to use long-lived tokens. This method stores the token(s) in the site.



This method is not practical for ArcGIS Server 10.1 and newer. In ArcGIS Server 10.1, the life span of long-lived tokens was shortened to 24 hours. This means you would have to configure a new token at least once a day.

- **Include in Global Search:** When this checkbox is selected, the geocoding service can be searched in Global Search operations.
- **Global Search Key:** The attribute to search in Global Search. This setting is only available when the Include in Global Search checkbox is selected.
- **Parameters Table:** Use this table to configure the geocoding service to be used by features that perform forward geocoding.
  - **Parameter:** (for information only) The geocoding service's Address Fields.
  - **Display Name:** (used by Address Search) The label to display beside the box where the user enters the value for this parameter. For example, if the geocoding service has a Zip field, you could set the display name to "Zip/Postal Code".
  - **Value:** An optional setting used by Global Search, Address Search, and Batch Geocoding. The value to search for (Global Search) or to use in geocoding (Address Search, Batch Geocoding). HTML5 viewers only use Value if the end user does not specify a value. Legacy Silverlight viewers only use Value if the Required checkbox is selected and the end user does not specify a value.
  - **Required (Silverlight viewers only):** When this checkbox is selected, the parameter must have a value before an Address Search or Batch Geocode can be done. The value can either come from the configuration (the parameter's Value setting) or from the end user. If the end user specifies a value, it overrides the value that is configured in the site. This setting is optional.
  - **Visible:** When this checkbox is selected, the Address Search panel has a text box for the user to enter a value.

## 22.1.2 Configuration Settings for the Bing Maps Geocoding Service

The Bing Maps geocoding service has the following settings:

- **Service Type:** (for information only) The service type is **BingGeocoder**.
- **Display Name:** The display name that is used to refer to this geocoding service. Choose a display name that end users understand.
- **Service URL:** The URL for the Bing Maps geocoding service. If you leave this setting blank, the URL for the public Bing Maps geocoding service over HTTP is used.
- **Bing Maps Key:** Your Bing Maps Key.
- **Culture:** The culture to use to translate and prioritize the results.
- **Include in Global Search:** When this checkbox is selected, the geocoding service can be searched in Global Search operations.
- **Global Search Key (Silverlight viewers only):** The attribute to search in Global Search. This setting is only available when the Include in Global Search checkbox is selected.
- **Parameters Table (Silverlight viewers only):** Use this table to configure the geocoding service to be used by features that perform forward geocoding.
  - **Parameter:** (for information only) The geocoding service's Address Fields.
  - **Display Name:** (used by the Address Search Tool) The label to display beside the box where the user enters the value for that parameter. For example, if the geocoding service has a Zip field, you could set the display name to "Zip/Postal Code".
  - **Value:** (used by Global Search and Address Search) (optional) The value to search for (Global Search) or to use in geocoding (Address Search).
  - **Required:** (used by Address Search) (optional) When this checkbox is selected, the parameter must have a value before an Address Search can be done. The value can either come from the configuration (the parameter's Value setting) or from the user.
  - **Visible:** (used by Address Search) When this checkbox is selected, the Address Search panel has a text box for the user to enter a value.

## 22.1.3 Add an ArcGIS Geocoding Service



As of version 2.5, the HTML5 Viewer supports both single-line and multi-line ArcGIS geocoding services.



If you are using the HTML5 Viewer with a proxy page, you must register the geocoding service with the proxy. The proxy enables the proxy to forward requests to the geocoding service. For instructions, see "Set Up a Proxy Page" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

► **To add an ArcGIS geocoding service to a site:**

1. In Manager, edit the site that you want to configure, and then select **GIS Services** from the side panel.
2. On the **Geocoding** tab, click **Add Geocoding Service**.  
The Geocoding Service Wizard opens.
3. With **ArcGIS Geocoding Service** selected, click **Next**.
4. Type a **Display Name** for the geocoding service.  
Choose a display name that end users understand.
5. Click **Next**.
6. Type in the URL of the ArcGIS REST services endpoint. By default, this is:  
`http://[server.domain.com]/ArcGIS/rest/services`  
where `[server.domain.com]` is the fully qualified host where the service is located.



The URL for the ArcGIS Online World Geocoding Service is  
`http://geocode.arcgis.com/arcgis/rest/services/World/GeocodeServer.`

7. Click **Next**.  
Manager discovers the geocoding services at the specified URL.
8. Click **Finish**.  
The wizard closes and the Edit Geocoding Service page for the new geocoding service opens.
9. Click **Save Site**.

## 22.1.4 Configure an ArcGIS Geocoding Service

When you add an ArcGIS geocoding service to a site, the wizard prompts you to configure the Display Name and Service URL settings. Instructions for changing the Display Name and URL are given below.

Depending on which features you configure that use the geocoding service, you might need to configure additional settings after the wizard has completed. For information about which settings to configure, see [Geocoding Services on page 174](#).

Service URL:

Default Batch Geocoder:

Default Reverse Geocoder:

Icon URI:

---

**Authentication Settings**

Authentication Method:  Web Tier (default or anonymous credentials)  
 Web Tier (configured credentials)  
 Token Security (by user)  
 Token Security (explicit tokens)

Include in Global Search:

Global Search Key:


---

**Parameters**

Parameter	Display Name	Value	Required	Visible
Address	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Neighborhood	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
City	<input type="text"/>	<input type="text" value="Los Angeles"/>	<input type="checkbox"/>	<input type="checkbox"/>
Subregion	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
Region	<input type="text"/>	<input type="text" value="California"/>	<input type="checkbox"/>	<input type="checkbox"/>
Postal	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
PostalExt	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
CountryCode	<input type="text"/>	<input type="text" value="US"/>	<input type="checkbox"/>	<input type="checkbox"/>
SearchExtent	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>


This geocoding service is free to use for single item forward and reverse geocode operations. However, usage of this service for batch geocoding requires an ArcGIS Online subscription and for end-users to authenticate with ArcGIS Online.


Additional settings for ArcGIS geocoding services


 As of version 2.5, the HTML5 Viewer supports both single-line and multi-line ArcGIS geocoding services.





**To edit an ArcGIS geocoding service:**


1. In Manager, edit the site that you want to configure, and then select **GIS Services** from the side panel.
2. On the **Geocoding** tab, select  **Edit** beside the geocoding service that you want to edit.
3. In the **Display Name** box, change the geocoding service's name if you want. Choose a display name that end users understand.
4. In the **Service URL** box, change the geocoding service's URL if you want. Use a fully qualified URL.

 If you use a proxy page, update the geocoding service's URL in the `proxy.config` file.

Manager will connect to the URL. If the geocoding service's Address Fields are different than the Address Fields at the previous URL, Manager highlights the fields that do not exist at the current URL. You can remove the highlighted fields by selecting  Remove beside each field.

**Parameters**

Parameter	Display Name	Value	Required	Visible	
Street	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	
ZIP	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	
SearchExtent	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	
City	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	
State	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>	

 **The fields highlighted above no longer appear in the geocode service.**

Fields that are not present at the updated URL are highlighted

5. If you want to make this geocoder the default for batch geocoding, select **Default Batch Geocoder**. This setting only applies to one geocoder at any time.
6. If you want to make this geocoder the default for reverse geocoding, select **Default Reverse Geocoder**. Reverse geocoding is the process of determining the address of a given map point. This setting only applies to one geocoder at any time.
7. Select an **Authentication Method** to access the geocoder.
8. If you want to use this geocoding service in Global Search, select the **Include in Global Search** checkbox and then select the attribute to search on from the **Global Search Key** drop-down list.
9. Fill in the desired search parameters in the table.



For detailed information about the settings on the Edit Geocoding Service page, see [Geocoding Services on page 174](#).

10. Click **Apply Changes**.
11. Click **Save Site**.

## 22.1.5 Add a Bing Maps Geocoding Service



If you use a proxy page, you must register the geocoding service with the proxy. This enables the proxy to forward requests to the geocoding service. For instructions, see "Set Up a Proxy Page" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

### ▶ To add a Bing Maps geocoding service to a site:

1. In Manager, edit the site that you want to configure, and then select **GIS Services** from the side panel.
2. On the **Geocoding** tab, click **Add Geocoding Service**.  
The Geocoding Service Wizard opens.
3. Select **Bing Geocoding Service**, and then **Next**.
4. Type a **Display Name** for the geocoding service.  
Choose a display name that end users understand.
5. Click **Next**.
6. Enter your Bing Maps key in the **Bing Maps Key** text field.  
To obtain a key or to learn more about Bing Maps, see [Getting a Bing Maps Key](http://msdn.microsoft.com/en-us/library/ff428642.aspx) (<http://msdn.microsoft.com/en-us/library/ff428642.aspx>).
7. Click **Finish**.  
Manager validates the Bing Maps Key. If it returns as invalid, re-enter the key. The geocoding service is not added to the site if the key is not valid.  
When the key validates, the wizard closes and the Edit Geocoding Service page opens.


## 22.1.6 Configure a Bing Maps Geocoding Service

When you add a Bing Maps geocoding service to a site, the wizard prompts you to configure a display name and specify the Bing Maps Key.

You can also set a culture to attach to geocoding requests. The Bing Maps geocoding service uses the culture to translate and prioritize the results it returns. For information, refer to the Microsoft documentation on the [Culture Parameter](#).

Instructions on configuring the display name, service URL, key, and culture are given below.

Depending on which features you configure that use the geocoding service, you might need to configure additional settings.

[Geocoding Services](#) > **Edit Geocoding Service** 

ID: 1

Service Type: BingGeocoder

Display Name:

Service URL:   
If not specified, the public URL will be used.

Bing Maps Key:

Culture:

Icon URI:

Include in Global Search:

Global Search Key:

**Parameters**


Parameter	Display Name	Value	Required	Visible
addressLine	<input type="text" value="Address"/>	<input type="text"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
postalCode	<input type="text" value="Postal Code"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
locality	<input type="text" value="City"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
adminDistrict	<input type="text" value="State"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
countryRegion	<input type="text" value="Country"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>

Ensure that you comply with the [Microsoft® Bing™ Maps API Terms of Use](#)

**Additional settings for the Bing Maps geocoding service**

The HTML5 Viewer has only uses geocoding services for Global Search. To enable Global Search, add a geocoding service to your site. No additional configuration is required.

 **To edit the Bing Maps geocoding service:**

1. In Manager, edit the site that you want to configure, and then select **GIS Services** from the side panel.
2. On the **Geocoding** tab, select the  **Edit** icon beside the geocoding service that you want to configure.
3. In the **Display Name** box, change the geocoding service's name if you want.

Choose a display name that end users understand.

4. In the **Service URL** box, type or paste the URL for the Bing Maps geocoding service that you are using. You only need to configure the URL if you are hosting the Bing Maps geocoding service, or you want to enforce the use of SSL with the public Bing Maps service.
5. If you want to use this geocoding service in Global Search, select the **Include in Global Search** checkbox. and then select the attribute to search on from the **Global Search Key** drop-down list.
6. In the **Bing Maps Key** box, change the key if you want. Manager will verify the key when you apply the changes.
7. Enter a culture code if you want. For information, refer to the Microsoft documentation on [Supported Culture Codes](#).
8. Browse for an Icon URI to configure a custom icon for the geocoding service if you want.
9. The HTML5 Viewer does not use the remaining settings.
10. Click **Apply Changes**.
11. Click **Save Site**.

## 22.1.7 Troubleshooting Geocoders


### Limit the Geographic Area

Some geocoding services may not be able to find addresses unless you specify the geographic area to geocode within. If you find that features that do forward geocoding do not return the results you expect, try configuring the Value setting for one or more parameters.



The Configuring Value settings for a geocoding service's parameters affects all the configured features that use this service to do forward geocoding—the values are sent to the geocoding service as part of the geocoding request.

### ▶ To specify the geographic area for forward geocoding:

1. In Manager, edit the site that you want to configure, and then select **GIS Services** from the side panel.
2. On the **Geocoding** tab, select  **Edit** next to the geocoding service that you want to configure.
3. Enter values for one or more of the parameters in the parameter's **Value** text field. For example, in the screen capture below, the City and State are specified.

[Geocoding Services](#) > **Edit Geocoding Service**

Service Type: ArcGisGeocoder

Display Name:

Service URL:

Include in Global Search:

Global Search Key:

Parameter	Display Name	Value	Required	Visible
Street	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>
City	<input type="text"/>	<input type="text" value="Charlotte"/>	<input type="checkbox"/>	<input type="checkbox"/>
State	<input type="text"/>	<input type="text" value="NC"/>	<input type="checkbox"/>	<input type="checkbox"/>
Zip	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>	<input type="checkbox"/>

Specify the area to geocode within

4. Click **Apply Changes**.
5. Click **Save Site**.

Use the Geocoding Service's Fully Qualified URL

Make sure you have configured the geocoding service's fully qualified URL. To check, edit the geocoding service's **Service URL** text field. Note that the Service URL box is blank for public Bing Maps geocoding services. (In this case, the URL is provided by Essentials.)

Register the Geocoding Service with an HTML5 Viewer Proxy Page


If you are use a proxy page, you must register the geocoding service with the proxy. Otherwise, the proxy will not forward requests to the geocoding service. For instructions on adding the geocoding service's URL to the proxy, see "Set Up a Proxy Page" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

## 22.1.8 Remove a Geocoding Service



If you use a proxy page, you may want to remove the geocoding service from the `proxy.config` file after you have removed it form the site.


► **To remove a geocoding service:**


1. In Manager, edit the site that you want to configure, and then select **GIS Services** from the side panel.
2. On the **Geocoding** tab, select  **Remove** next to the geocoding service that you want to delete.  
You are prompted to confirm the deletion.
3. Click **OK**.
4. Click **Save Site**.

## 22.2 Geometry Services

Geometry services perform geometric calculations, such as buffering, projection, and measurement.

Essentials supports the configuration of a single ArcGIS geometry service. Other types of geometry service are not supported. The geometry service can be unsecured or secured.


 You can only configure one geometry service per site. If you had multiple geometry services configured before Essentials version 3.15, they continue to work until you edit the geometry service in Manager. Editing the geometry service replaces all the old geometry services with the new service, and you lose all the old geometry services.

 As of version 2.5 of the HTML5 Viewer, the geometry service configured in the site overrides the one configured in the viewer, and configuring the geometry service in the viewer has been deprecated.

### 22.2.1 Add an ArcGIS Geometry Service

► **To add an ArcGIS geometry service:**

1. In Manager, edit the site that you want to configure, and then select **GIS Services** from the side panel.
2. Click the **Geometry** tab.
3. In the **Service URL** box, enter the geometry service's URL.

 We recommend that you use your own geometry service instead of relying on the default [Esri sample geometry service](#), which may become unavailable without warning.

4. **Authentication Settings:** If the geometry service is secured, select the authentication method for Essentials to use when connecting to the service.

- **Web Tier (default or anonymous credentials):** Select this option in the following cases:
  - if the service is secured using Integrated Windows Authentication and you want Essentials to authenticate as the application pool user
  - if the service is not secured
- **Web Tier (configured credentials):** Select this option in the following cases:
  - if the service is secured using basic or digest authentication
  - if the service is secured using Integrated Windows Authentication and you want to configure the credentials for Essentials to use when authenticating

In the **Username** and **Password** text fields, enter the credentials that you want Essentials to use.

- **Token Security (by user):** Select this option if the service is secured using token security. In the **Username** and **Password** text fields, enter the credentials that you want Essentials to use when authenticating. If you have changed the location where tokens are issued, enter the URL of the location in the **Token URL** box.



By default, Essentials assumes the token duration of all your ArcGIS services is 60 minutes, which is the ArcGIS default. However, if the token duration of any of your ArcGIS services is lower, you must specify the lowest token duration in Essentials. To do so, open the Essentials `web.config` file and, within the `<appSettings>` element, add a new element with `ArcGisRestMapServiceBase.MaximumTokenDuration` as the key and set its value accordingly in minutes. For example, to set the maximum token duration to 20 minutes: `<add key="ArcGisRestMapServiceBase.MaximumTokenDuration" value="20" />`. The Essentials `web.config` file is located in `{GE_HOME}\REST\Web.config`.

- **Token Security (explicit tokens):** In the **Server Token** box, type or paste the long-lived server token that Essentials will use to authenticate. You can also optionally configure a long-lived client token. Select this option if the service is secured using token security and you want to use long-lived tokens. This method stores the token(s) in the site.



This method is not practical for ArcGIS Server 10.1 and newer. In ArcGIS Server 10.1, the life span of long-lived tokens was shortened to 24 hours. This means you would have to configure a new token at least once a day.

5. Click **Apply Changes**.  
Manager validates the configuration by connecting to the geometry service.
6. Click **Save Site**.

## 22.2.2 Remove the Geometry Service

### To remove the site's geometry service:

1. In Manager, edit the site that you want to configure, and then select **GIS Services** from the side panel.
2. Click the **Geometry** tab.
3. Delete the Service URL.  
The Service URL box is now blank.
4. Click **Apply Changes**.
5. Click **Save Site**.

## 23 References

References enable you to include other sites and ArcGIS web maps in a site. The web maps can be from ArcGIS Online or Portal for ArcGIS.

When a site references another Essentials site, the site inherits the other site's configuration. Similarly, a site with a reference to a web map inherits the web map's services, bookmarks, and pop-up windows.

You can modify the inherited configuration. Your changes override the inherited configuration.

Inherited components and settings are modified and removed in exactly the same way configured components and settings are modified and removed. For example, to modify the default visibility of an inherited map service, edit the map service, change the Visible setting, and save your change. Similarly, to remove an inherited workflow, go to Manager's Workflows page and remove the workflow, just as you would any other workflow.

When a site references another site, the site remains linked to the source. If the source site is modified, the change is reflected in the site that references it. Web map references behave differently: When a source web map changes, the change is not automatically reflected in the site. You must manually refresh the web to see the changes in your site. For instructions on refreshing web maps, see [About Portal for ArcGIS Web Maps on page 99](#) or [About ArcGIS Online Web Maps on page 102](#).

If a referenced site is removed, you are forced to remove the reference from your site the next time you edit the site. You cannot make any other changes to the site until you have removed the reference.

References can be chained. For example, if Site A references Site B and Site B references Web Map C and Site D, then A inherits B, C, and D.

### See Also...


[Inherit Components from Another Site on page 60](#)


[About Portal for ArcGIS Web Maps on page 99](#)

[About ArcGIS Online Web Maps on page 102](#)




## 23.1 Add a Reference to an ArcGIS Web Map

 To add a reference to a web map from Portal for ArcGIS, you must either know the URL or have a [service connection](#) configured for the portal. Configuring a service connection allows you to search the portal by keyword.

 To add a reference to an ArcGIS web map that contains one or more Bing Maps layers, you must first configure a Bing Maps service connection. The service connection stores the Bing Maps key that Essentials requires to access the layers. For instructions, see [Bing Maps Service Connections on page 137](#).

### To add a reference to a web map from ArcGIS Online or Portal for ArcGIS:

1. In Essentials, edit the site that you want to configure, and then select **Site Info** from the side panel.
2. In the **References** area, choose  **Add Reference**.
3. Select **Reference a web map from ArcGIS Online or Portal for ArcGIS**, and then **Next**.
4. Do one of the following:


#### Enter URL

- a. Enter the web map's URL into the box, and then click **Next**.

#### Search

- a. To limit the search to web maps that belong to your ArcGIS organization, select the **Organization content only** checkbox.  
If you clear the checkbox, the search includes your organization's content and public content from outside your organization.
- b. If Essentials is registered with ArcGIS Online and you have added a Portal for ArcGIS service connection, select the portal that you want to search—search **Portal for ArcGIS** (based on the service connection) or search **ArcGIS Online** (based on the ability to search that comes with registration).
- c. Enter the term that you want to search for.  
Search results display while you type. The more information that you provide, the smaller the list of search results. You can stop at any time and browse the results.




In the search results, a  padlock beside a web map indicates that the web map is private.

- d. In the search results, select the web map that you want to add.
  - e. Click **Next**.
5. Click **Finish**.
  6. Click **Save Site**.

## 23.2 Add a Reference to a Site

When you add a reference to another site, the site's map services are added to the Map Services and Layer List tabs on Manager's Map page. This can affect the Layer List and the map's drawing order. After you add the reference, you may want to [update the Layer List](#) and [drawing order](#).

### To add a reference to a site:

1. In Essentials, edit the site that you want to configure, and then select **Site Info** from the side panel.
2. In the **References** area, click  **Add Reference**.  
The Create Reference wizard opens.
3. Select **Reference another site**, and then **Next**.
4. Select the site you want to reference from the **Site** list, and then **Next**.
5. Click **Finish**.  
The wizard closes.
6. Click **Save Site**.


## 23.3 Modify the Inherited Configuration

Inherited components and settings are modified and removed in exactly the same way configured components and settings are modified and removed. For example, to modify the default visibility of an inherited map service, edit the map service, change the Visible setting, and save your change. To remove an inherited workflow, go to Manager's Workflows page and remove the workflow, just as you would any other workflow.

## 23.4 Refresh Web Maps


When the source web map changes, the changes are not automatically reflected in a site that references the web map. You must manually refresh web maps to see the changes in your site.

### To refresh web maps:

1. In Essentials, edit the site that you want to configure, and then select **Site Info** from the side panel.
2. In the **References** area, choose  **Refresh Web Maps**.  
Essentials updates the site with any changes that have been made in the source web maps that the site references.

## 23.5 Remove a Reference

### To remove a reference:

1. In Essentials, edit the site that you want to configure, and then select **Site Info** from the side panel.
2. In the **References** section, select  **Remove** next to the reference that you want to remove.  
You are prompted to confirm.
3. Click **OK**.
4. Click **Save Site**.

## 24 The Overview Map

An Overview Map is not recommended for most modern applications, as it is easy to zoom out for quick context. One exception is a map that opens to a specific feature of interest (for example, a property parcel) from a third-party system, where the user does not have any idea where the feature is located and has no other reason to zoom out.

The overview map is a small map that is inset in the main map. Often the overview map shows the main map in its larger context. The end user can show and hide the overview map.

The overview map is fully configurable. You can add and remove map services and feature layers, edit display settings, and add and remove layers, just as you do when you configure the main map.



The spatial reference of the overview map must match that of the primary service.

## 24.1 Configure the Overview Map

### To configure the overview map:

1. In Manager, edit the site that you want to configure.  
If you are already editing the site, click **Overview Map** in the side panel.  
The Overview Map page opens.
2. [Add](#) and [import](#) map services that you want to appear in the overview map.
3. [Reorder](#) the map services.
4. [Set the initial extent](#) and [full extent](#).
5. [Edit a map service or feature layer](#) to change its settings. See [Map Services on page 105](#) for a list of settings.
6. Pan and zoom the map image to the extent that you want to use for the overview map.
7. Click **Apply Changes**.
8. Click **Save Site**.

## 25 Layers

When you add a map service to your site, all the map service's layers are added. The Map Services tab on Manager's Map page lists the layers for each service.

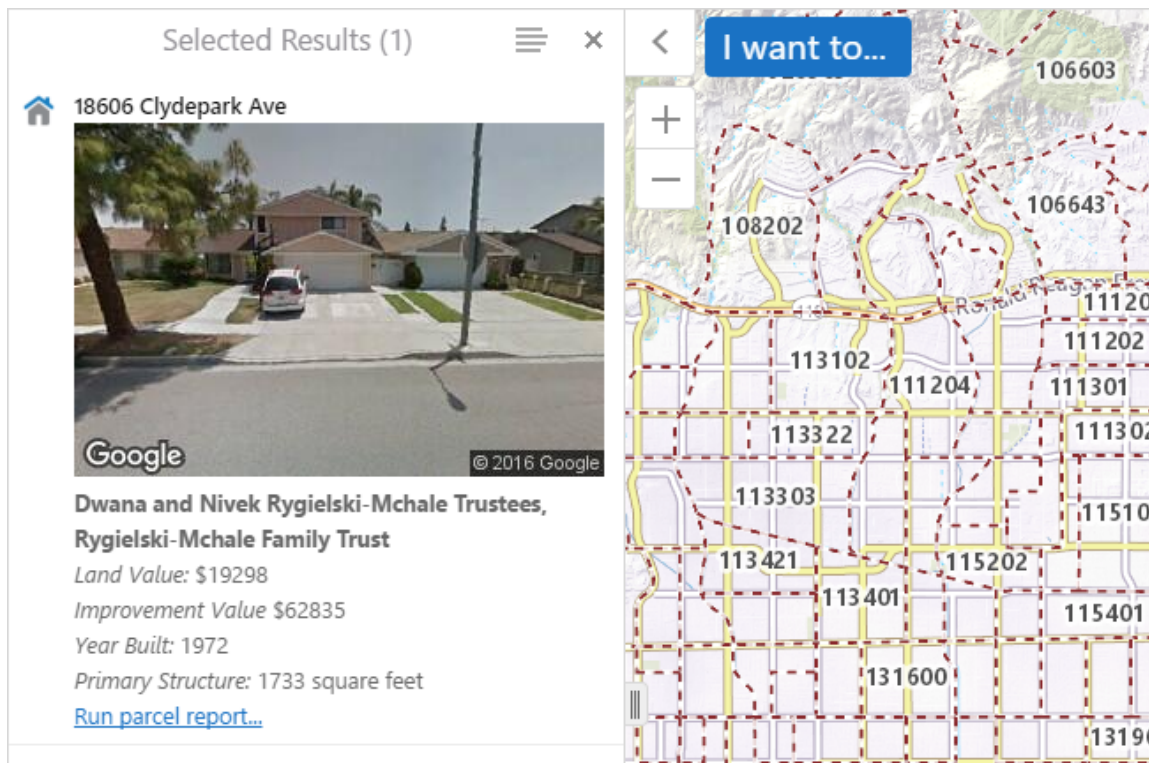
### ► To view a map service's layers In Manager:

1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. Click the **Map Services** tab.
3. Click the ► **Expand** icon beside the map service whose layers you want to see.

## 25.1 About Feature Descriptions

Feature descriptions present information about features to end users. They appear in search and identify results, in map tips, and in feature details.

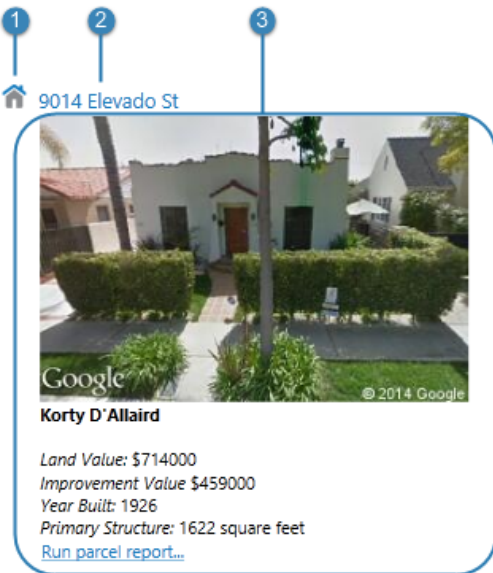
Feature descriptions are key to the usability of your site. A well-constructed description acts as a summary of the feature's most important attributes. Feature descriptions can also include images and hyperlinks to related information.



Example of the feature description for a parcel shown in the search results

## Feature Description Structure

There are several parts to a feature description, illustrated below.



**1 Icon** - The icon that represents the layer that the feature belongs to. The icon appears beside the feature's title in search and identify results when the results are listed in the viewer's side panel.

The icon is controlled by the **Layer Icon** setting.

**2 Header** - The title that appears at the top of the description. The header is controlled by the **Feature Label** setting.

**3 Main Content** - The main content that summarizes the feature. The main content typically includes important attributes, and can also include images and hyperlinks.

You can choose which setting you want to display as the main content—**Feature Description** or **Feature Long Description**.

Settings that control how this layer's features are presented in viewers

## Configure the Feature Description

Having two settings for the main content allows you to configure two different ways of presenting a feature's information to users. The settings are used in different contexts in viewers.

By default, the Feature Long Description setting is displayed. If the Feature Long Description setting is not configured, then the Feature Description is used. This applies to all of the following viewer elements:

- Search and Identify Results (in the List View)
- Map Tips
- Feature Details

However, the viewer allows you to further customize the behavior in each of these three contexts. See [Change the Look and Feel of an HTML5 Viewer on page 361](#).

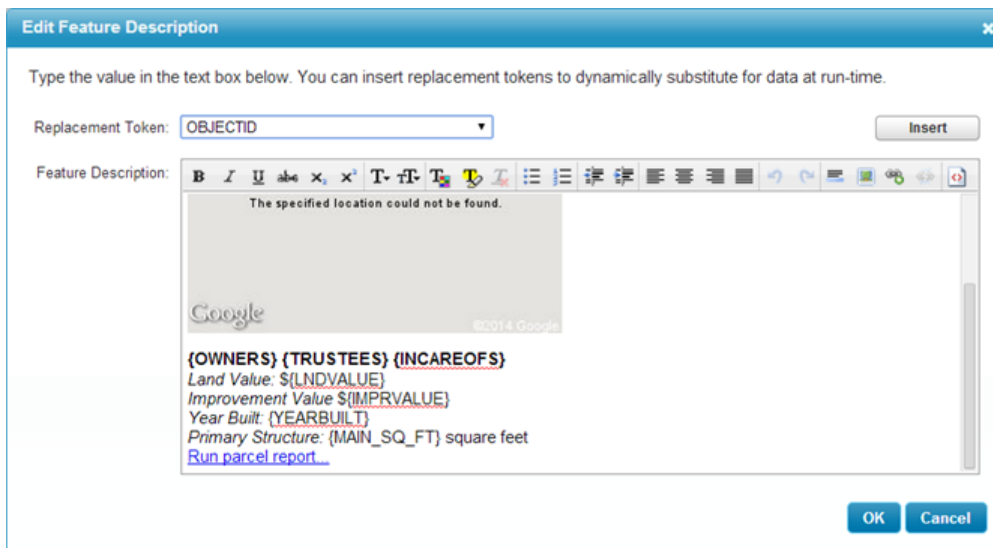
## Configure the Layer Details

The Layer Icon, Feature Label, Feature Description, and Feature Long Description are configured on the layer's Details tab. For information, see [Edit a Layer on page 194](#).


## Feature Description Markup and Styles


Essentials provides a variety of tools and functions to help you create effective feature descriptions:

- **Support for HTML markup:** The Feature Description and Feature Long Description settings support HTML markup, including anchor (<a>) elements (hyperlinks) and image elements. You can also configure HTML markup in the Feature Label.
- **Rich Text Editor:** Manager has a built-in Rich Text Editor that you can use to create and format most of the content for the description fields. The Editor converts your content into HTML markup, and also provides some error checking. To open the Editor, click the **Edit** button beside the setting that you want to configure.




### Rich Text Editor for creating feature descriptions

 The viewer examines HTML markup for potentially malicious code in feature data. For information about how this works, see "Protecting Against Malicious Code in Feature Data" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

If the Rich Text Editor does not have a particular tool that you want, or you prefer to work directly in the HTML markup, use the  **Show Source** icon at the end of the toolbar. This displays the HTML markup so you can edit the markup directly. To return to the Rich Text Editor, select the icon again.

- **Viewer Commands in Hyperlinks:** Viewer commands can be embedded in HTML anchor (<a>) elements. The command executes when the user selects the hyperlink. For more information, see [Viewer Commands in Hyperlinks on page 47](#).

 You cannot use the Rich Text Editor to enter viewer commands—you must type viewer commands into the HTML markup.

- **Field Tokens:** Field tokens are placeholders that represent feature attributes. Field tokens enable you to define dynamically generated hyperlinks that depend on the current feature. For more information, see [Field Tokens on](#)

[page 42](#).

- **Object Tokens:** Object tokens are placeholders that represent objects—feature objects, graphics objects, and geometry objects. Object tokens enable you to define hyperlinked viewer commands that execute a command that takes an object related to the current feature as a parameter. For more information, see [Object Tokens on page 44](#).

## 25.2 Edit a Layer

### ► To edit a layer:

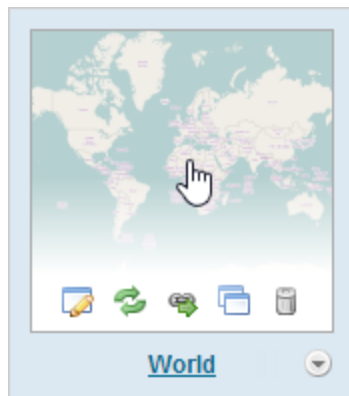
1. Launch Manager.

You can launch Essentials from your Start Menu. In the applications list, select the Latitude Geographics folder and the Geocortex Essentials Manager item inside.


2. Edit the site that you want to configure:

- a. Go to the **Sites** tab.
- b. If a different site is open for editing, click **Save Site**, and then click **Close Site**.
- c. Follow the instructions for the view of the Site List that you are using:

- **Tiled View:**



World site in Tiled View

- Click the thumbnail image of the site that you want to edit, or
- Click the site's name, or
- Position the pointer over the thumbnail image of the site that you want to edit, and then use the  **Edit** icon.


- **List View:**





World site in List View

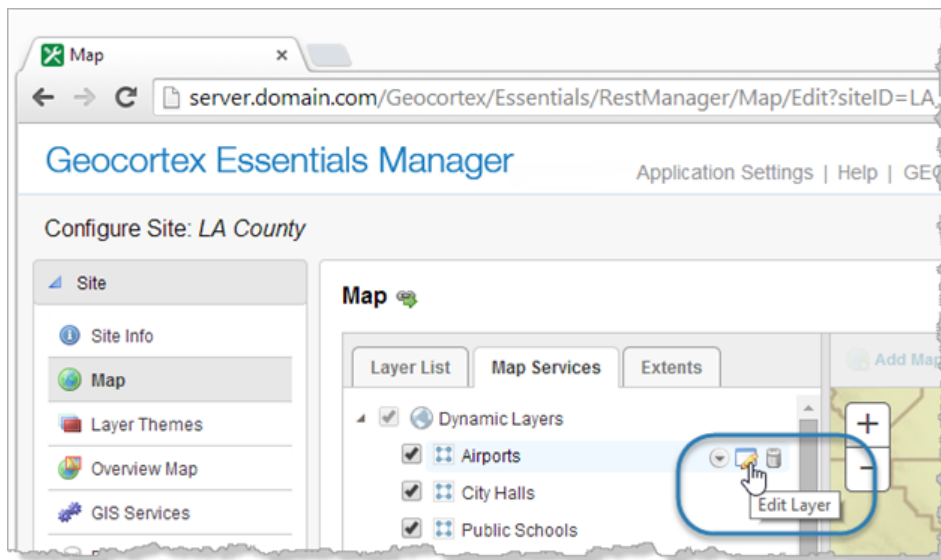
- Select the site's name or the  **Edit** icon.

3. Click **Map** in the side panel.
4. Click the **Map Services** tab.

 If the layer is in the Layer List, you can also edit the layer from the Layer List tab.

- Click the **Expand** icon beside the map service that the layer belongs to. The map service's layers show.
- Locate the layer that you want to configure and click the  **Edit** icon beside the layer.

 Make sure you are editing a layer, not a map service. The tool tip should say **Edit Layer**.



Edit Layer icon for the Airports layer

The layer opens for editing.

Layer settings are organized into tabs. The specific tabs and settings depend on the type of layer.

#### See also...

[Layer Details Tab](#) on page 199

[Layer Hyperlinks](#) on page 230

[Feature Hyperlinks](#) on page 233

[Data Links](#) on page 257

[Relationships](#) on page 339

[Reporting](#) on page 299

[Feature Maps](#) on page 314

[Fields](#) on page 318

[Charts](#) on page 274

[Create Layer Styles that End Users can Select](#) on page 244



## 25.3 Layer Settings

Editing a service opens a page with several tabs containing configurable settings. The specific tabs that are available depend on the type of service.

### 25.3.1 How to Configure Layer Settings

Manager offers several ways to configure a layer's settings:

- **Edit:** [Edit the layer](#). This method gives you access to all of the layer's settings.
- **Layer Drop-Down Menu:** Use the layer's drop-down menu on the Layer List tab or the Map Services tab to configure settings for that layer. This method gives you access to a subset of the layer's settings. The particular settings depend on the type of layer.
- **Batch Editing:** Use a folder or service's drop-down menu to edit the settings for all the layers in that folder or service. This method gives you access to a subset of layer settings, for multiple layers. The particular settings depend on the type of layer.



The different places in Manager where you can change settings are synchronized. If you change a setting in one place, it is automatically changed everywhere else that you can edit it.


## Layer Drop-Down Menu

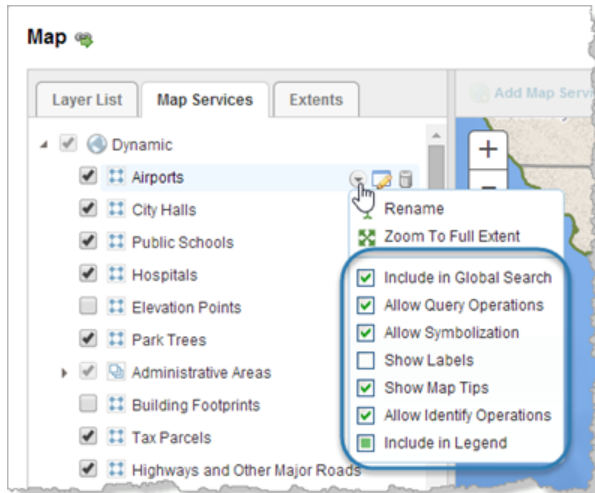
### ▶ To change the settings for a single layer using the layer's drop-down menu:

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.



If the layer is in the Layer List, you can also use the layer's drop-down menu on the Layer List tab.

2. Position the pointer over the layer that you want to configure.  
The management tools show.
3. Click the  down arrow.  
The menu opens.





#### Settings for the Airports layer


4. Select or clear the checkbox beside the setting that you want to configure.  
If the setting that you want to configure is not in the menu, you must [edit the layer](#) to configure that setting.
5. Repeat these steps to configure as many of the settings as you want.
6. Click **Apply Changes**.
7. Click **Save Site**.

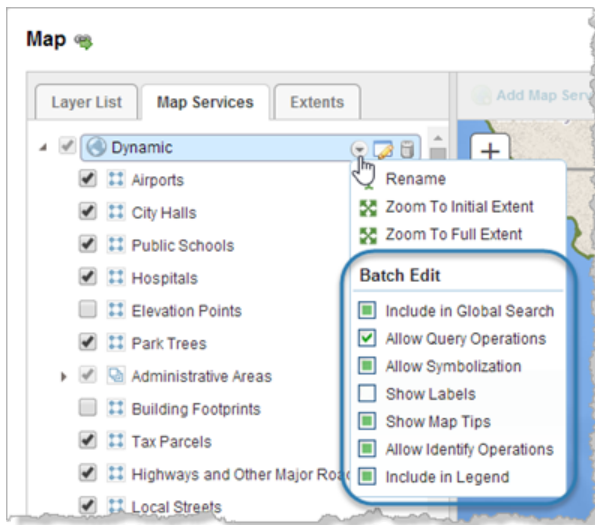
## Batch Editing

### ▶ To batch edit the settings for all the layers in a map service:

 Batch editing overwrites the existing configuration for every layer in the folder or service. The only way to restore the previous configuration after you click Apply Changes is to individually reconfigure each setting in each layer.

 Batch editing applies to all the layers in the map service, regardless of how deeply nested the layers are.

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.
2. Position the pointer over the map service whose layers you want to configure.  
The management tools show.
3. Click the  down arrow.  
The menu opens.



### Common settings for all the layers in the Dynamic map service

A selected checkbox  means that the setting is enabled for all the layers in the map service.

A cleared checkbox  means that the setting is disabled for all the layers.

If the setting is enabled for some layers and disabled for others, the checkbox is filled in instead of checked. It looks like this: .

4. Select or clear the checkbox beside the setting that you want to configure.
5. Repeat these steps to configure as many of the settings as you want.
6. Click **Apply Changes**.
7. Click **Save Site**.


### ▶ To batch edit the settings for all the layers in a folder:

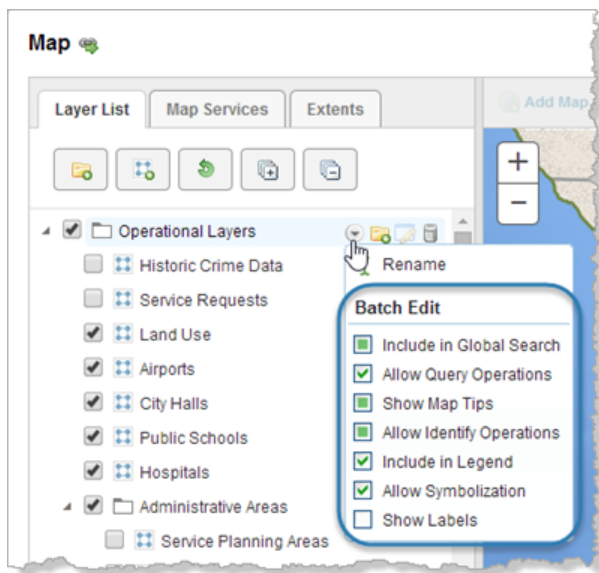


Batch editing overwrites the existing configuration for every layer in the folder or service. The only way to restore the previous configuration after you click Apply Changes is to individually reconfigure each setting in each layer.



Batch editing applies to all the layers in the folder, regardless of how deeply nested the layers are.

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Layer List** tab.
2. Position the pointer over the folder whose layers you want to configure.  
The management tools show.
3. Click the  down arrow.  
The menu opens.



#### Common settings for all the layers in the Operational Layers folder

A selected checkbox  means that the setting is enabled for all the layers in the map service.

A cleared checkbox  means that the setting is disabled for all the layers.

If the setting is enabled for some layers and disabled for others, the checkbox is filled in instead of checked. It looks like this: .

4. Select or clear the checkbox beside the setting that you want to configure.
5. Repeat these steps to configure as many of the settings as you want.
6. Click **Apply Changes**.
7. Click **Save Site**.

## 25.3.2 Layer Details Tab

In addition to configurable settings, the Details tab provides static information about the layer.



Different types of layer can have different information and settings.

Layers have the following settings on the Details tab:

- **Map Service:** The map service that the layer belongs to. When you add a map service to a site, all the map service's layers are added to the site.
- **Layer Name:** The name of the layer in the map service. By default, this is the name used in Manager and in the viewer. You can override this name using the Display Name setting.
- **Layer ID:** The layer's ID in the REST API. The ID is used to access the layer programmatically, for example, in a workflow, URL parameter, or custom-developed functionality.

- **Feature Type:** The type of geometry that features in this layer have—polygon, polyline, or point.
- **Visible:** When this checkbox is selected, the layer is initially turned on in the viewer, in other words, its visibility checkbox in the Layer List is selected. Users will be able to see the layer in the map image, provided the map is zoomed to a scale at which the layer's features can be seen. For example, parcels cannot be seen when the map is zoomed out very far, even though the Parcels layer is turned on.  
A quicker method of setting a layer's default visibility uses the layer's visibility checkbox on Manager's Map page. See [Set a Layer's Default Visibility on page 203](#) for instructions.
- **Display Name:** The name to use for the layer in Manager and in the viewer. For example, a layer called ZIP in the map service could appear as Zip/Postal Code in Manager and the viewer.  
If you leave the Display Name box blank, the name is inherited from the map service.



You can also define display names for a layer's fields. See [Fields on page 318](#) for information.

- **Description:** A description of the layer, to use as layer metadata. This overrides the layer description that is configured in the underlying map service, if there is one.
- **Dynamic Definition:** (dynamic layers only) The JSON code that identifies the dynamic layer and controls the appearance of the symbols that represent this layer on the map.
- **Layer Icon URI:** The URI of the icon that is used to represent the layer in viewers. The icon appears in the feature details. The URI can contain [client replacement tokens](#).
- **Style:** (WMS layers only) The style to select for a WMS layer, if the layer has styles configured for it.
- **Feature Label:** The text to display in the viewer to identify the feature. The feature label is used like a title—it appears at the top of feature details and in the title of map tips.  
You can use [field tokens](#) in the Feature Label box. Click **Edit** to select from a list of available tokens.  
You can also use HTML markup in the Feature Label.
- **Feature Description:** The text to display in the list of search or identify results. The Feature Description box can contain HTML markup that contains field tokens, object tokens, and hyperlinked viewer commands. Click the **Edit** button to open a Rich Text Editor that creates HTML markup. See [About Feature Descriptions on page 191](#) for more information.
- **Feature Long Description:** The text to display in map tips and feature details. The Feature Long Description box can contain HTML markup that contains field tokens, object tokens, and hyperlinked viewer commands. Click the **Edit** button to open a Rich Text Editor that creates HTML markup. See [About Feature Descriptions on page 191](#) for more information.
- **Feature Zoom Factor:** (polygon and polyline layers only) The factor to zoom in by when the user zooms to a feature on this layer. The smaller the zoom factor, the closer in to the feature you zoom. The larger the number, the farther out from the feature you zoom. At a zoom factor of 1, the feature touches the edges of the map viewport.
- **Feature Zoom Scale:** The scale to display the feature at when the user zooms to the feature. The scale is expressed as an integer, specifically, the scale's second term. For example, if you want the map to zoom to 1:20,000 when the user zooms to a feature on this layer, enter **20000** in the Feature Zoom Scale box.  
For polygon and polyline layers, you can use the Feature Zoom Factor or the Feature Zoom Scale setting (or neither), but not both.
- **Feature Border Color:** The border color used to highlight the features of a layer. The highlight outlines the

feature on the map when the user hovers the pointer over the feature in the Results list, hovers the pointer over the feature on the map to display its map tip, or adds a feature to their selection. You can enter a web color, a 6-digit hexadecimal color, or an 8-digit ARGB hexadecimal color with the alpha value at the beginning. For example, to make the fill blue, you can enter **blue** or **#0000FF** or **#FF0000FF**. This color setting takes precedence over any highlight color set in the Viewer Look and Feel settings.

- **Feature Border Width:** The width of the border of the highlight that outlines a feature on the map. Type in the number of pixels wide to display the polygon border or line width when a feature is highlighted.
- **Feature Fill Color:** For polygon layers only. The fill color used to highlight the features of a layer. The highlight color that fills the feature on the map when the user hovers the pointer over the feature in the Results list, hovers the pointer over the feature on the map to display its map tip, or adds a feature to their selection. You can enter a web color, a 6-digit hexadecimal color, or an 8-digit ARGB hexadecimal color with the alpha value at the beginning. For example, to make the fill turquoise, you can enter **turquoise** or **#40E0D0** or **#FF40E0D0**. This color setting takes precedence over any highlight color set in the Viewer Look and Feel settings.
- **(Default) Data Provider:** (ArcGIS Server dynamic and tiled map services) The (Default) Data Provider is the type of data provider that you use to store feature data. This setting is used by the viewer. It enables the Query Builder and Filter Builder to construct queries using the correct syntax for your data provider. You can configure this setting at the site level, the map service level, or the layer level.
  - At the site and map service level, the setting is called **Default Data Provider**.
  - At the layer level, it is called **Data Provider**.


Map services inherit the setting from the site, and layers inherit the setting from the map service that they belong to, or from the site if the setting is not configured at the map service level. For example, if all the site's services use the same data provider to store their feature data, you could configure the Default Data Provider at the site level. The map services and layers inherit the configuration. This saves you from having to configure the setting for every map service and layer in the site.



By default, the provider is Default. The Default provider uses the ANSI SQL default syntax. If the Default provider does not work in your system, delete Default from the Default Data Provider box to open a drop-down list of providers.

If the type of provider that you use appears in the list, select the provider. The Query and Filter Builders will use the well-known syntax for the provider that you select. If your provider does not appear in the list, re-enter Default in the Default Data Provider box, and configure the viewer's QueryBuilder Module. For instructions, refer to your Geocortex Viewer for HTML5 *Administrator and Developer Guide*.




If the map service only has one layer, the Default Data Provider setting is not available at the map service level. For example, feature services do not have a Default Data Provider setting, but feature layers do.

- **Include in Legend:** When this checkbox is selected, the layer appears in the legend in print templates. If you do not want this layer included in print template legends, clear the Include in Legend checkbox. By default, layers are included in print template legends. You can also configure this setting from the layer's  drop-down menu on the Map page's Map Services tab. To open the Map page, click Map in the sidebar.
- **Show Labels:** (ArcGIS Server dynamic map services with dynamic layers enabled only) When this checkbox is selected, the layer's labels show on the map, provided the layer has labels defined and enabled in the map service. If you do not want the labels to show, clear the Show Labels checkbox.

- **Include in Global Search:** When this checkbox is selected, the attributes of features in this layer are searched during global searches. If you do not want this layer's features to be searched when a global search is performed, clear the Include in Global Search checkbox. By default, layers are not included in global search operations.  
You can also configure this setting from the layer's  drop-down menu on the Map page's Map Services tab. To open the Map page, click Map in the sidebar.
- **Allow Identify Operations:** When this checkbox is selected, features in this layer can be identified. If you do not want the user to be able to identify features in this layer, clear the Allow Identify Operations checkbox. By default, identify operations are not allowed.  
You can also configure this setting from the layer's  drop-down menu on the Map page's Map Services tab. To open the Map page, click Map in the sidebar.
- **Allow Query Operations:** When this checkbox is selected, the attributes of the layer's features are searched during queries. If you do not want this layer's features to be searched when a query is performed, clear the Allow Query Operations checkbox. By default, layers are included in query operations.
- **Allow Symbolization:** (dynamic layers only) When this checkbox is selected, users can symbolize the layer in the viewer. If you do not want users to be able to symbolize the layer, clear the Allow Symbolization checkbox. You can set a default value for all the dynamic layers in this map service by configuring the Default Allow Symbolization setting on the map service's Details tab. To open the map service's Details tab, [edit the map service](#).



To save configuration effort, first set the Default Allow Symbolization setting to the value most of the dynamic layers in this map service will have. Then you only need to configure the Allow Symbolization setting for the remaining dynamic layers.

- **Show Map Tips:** When this checkbox is selected, map tips are enabled for this layer. You can also configure this setting from the layer's  drop-down menu on the Map page's Map Services tab. For information about additional map tips configuration, see [Configure Map Tips on page 88](#).
- **Filter Workflow URI (static layers only):** The URI of a workflow for filtering the layer's features. Use this setting to configure a layer filter workflow for a static layer. For dynamic layers, configure the layer filter workflow at the map service level.  
See [Filter a Layer's Features on page 464](#) for more information.
- **Features Can be Copied to Edit Layer (Silverlight Viewer only):** Select this checkbox if you want to allow features from this layer to be copied to the edit layer; otherwise, clear this checkbox. For more information about the editing tools, see the *Geocortex Viewer for Silverlight Administrator and Developer Guide*, which you can download from the [Geocortex Support Center](#).
- **Allow Snapping:** Select this checkbox if you want to allow snapping for features in this layer; otherwise, clear this checkbox.
- **Snapping Enabled:** Select this checkbox if you want snapping to apply to features in this layer by default; otherwise, clear this checkbox.

## 25.3.3 Group Layer Settings

Group layers have the following settings:



The following descriptions apply to the group layer only, not its sublayers. The settings for sublayers are the same as for other layers.

- **Display Name:** The name to use for the group layer in Manager and in the viewer. For example, a layer named "Streams" in the map service could appear as "Streams and Rivers" in Manager and the viewer. If you leave the Display Name box blank, the name is inherited from the map service.
- **Map Service:** (information only) The type of map service that the group layer belongs to.
- **Layer Name:** (information only) The layer's name that is defined in the underlying map service.
- **Layer ID:** (information only) The layer's ID in the REST API.
- **Layer Icon URI:** The URI of the icon that is used to represent the group layer in viewers. The icon appears in the feature details. The URI can contain [client replacement tokens](#).

See Also...

[Exclude Layers from a Dynamic Map Service on page 126](#)

## 25.4 Set a Layer's Default Visibility

A layer's visibility setting controls whether the layer is initially turned on in the Layer List when the end user launches a viewer. A layer must be turned on in the Layer List for the user to be able to see the layer on the map. The layer only shows on the map if it is visible at the [initial extent](#)'s zoom level. The user may have to zoom the map in or out to see the layer's features.

If you include a layer in the Layer List, the end user can change the layer's visibility. See [Configure the Layer List on page 207](#) for instructions.

### ► To configure a layer's default visibility:

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.



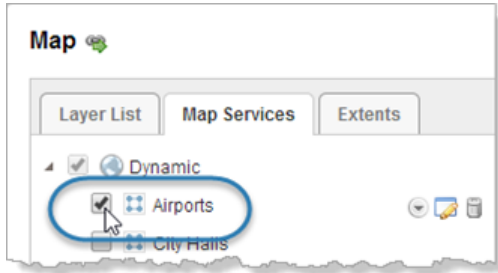
You cannot change the default visibility of group layers on the Map Services tab. Instead, click the Layer List tab and set the default visibility for the group layer's folder. You can set the default visibility for the group layer's sublayers on either tab.



For layers other than group layers, if the layer is included in the Layer List, you can also configure the layer's visibility on the Layer List tab, or you can [edit the layer](#) and set the Visible setting on the Details tab. When you change the visibility in one place, the change is reflected in the other places.



2. Configure the visibility:
  - To configure the layer to be turned on initially, select the checkbox to the left of the layer's name.
  - To configure the layer to be turned off initially, clear the checkbox to the left of the layer's name.

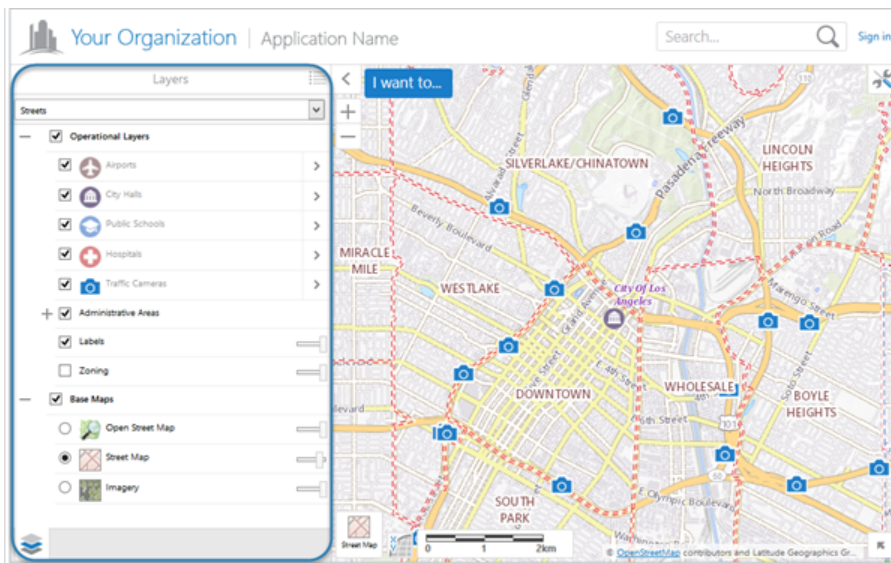


Set the initial visibility for the Airports layer

3. Click **Apply Changes**.
4. Click **Save Site**.

## 26 The Layer List

The Layer List is a list of map services and layers, which is displayed in viewers.



### Example of the Layer List

One of the main functions of the Layer List is to enable end users to turn layers on and off, in other words, control the visibility of layers. When a layer is turned off, it does not show on the map.

The Layer List also has other functions associated with it, like zooming the map to the extent of a layer, or adjusting the transparency of layers. The other functions that are available for a particular layer depend on the type of layer or map service. For information, see [Map Service Settings on page 113](#) and [Layer Settings on page 196](#). Also see [Set a Map Service's Default Visibility on page 125](#) and [Set a Layer's Default Visibility on page 203](#).



You can configure settings for multiple layers at one time in the Layer List. See [Batch Editing on page 197](#) for information.

## Layer List Configuration

The Layer List is configurable. You can specify which map services and layers to include in the Layer List, organize them into folders, and reorder them. By default, the Layer List contains all of the map services that you have added to the map, in the same order that they appear on the Map page's Map Services tab.

Usually, when you add a new map service to the map, it automatically appears in the Layer List. If you have changed the order extensively, Manager may not know where to add the new map service. In this case, you can manually include the map service in the Layer List.

Some types of layers and map services look and behave differently in the Layer List than on the Map Services tab. It is important to understand the differences:

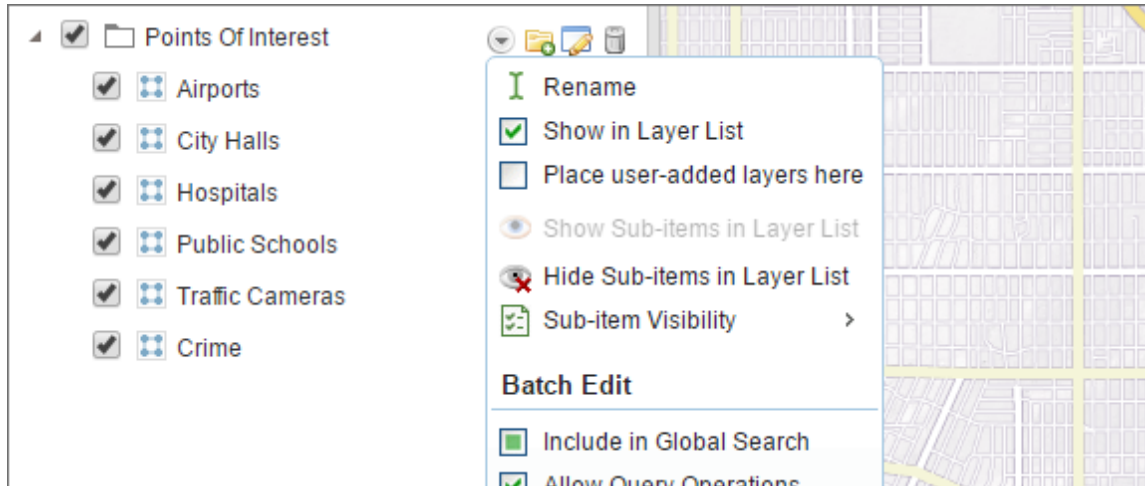
- **Dynamic Services:** Dynamic map services appear as folders in the Layer List.
- **Tiled Services:** By default, the layers in a tiled map service do not appear in the Layer List—only the map service appears. You can include the layers in the Layer List if you want. You can re-order tiled layers within the map service that they belong to. You cannot move the layers out of the map service. You can add other items such as folders to a tiled map service.
- **Feature Layers:** Only the layer component of a feature layer appears in the Layer List—the map service component does not appear in the Layer List. You cannot include the service component in the Layer List. This means that, to configure the service component, you must go to the Map Services tab.
- **Group Layers:** Group layers appear as folders in the Layer List. You can move the group layer's sublayers out of the group layer's folder if you want, and you can move other items in.
- **Annotation Layers:** Annotation layers look and behave the same in the Layer List as on the Map Services tab.
- **Raster Layers:** Raster layers look and behave the same in the Layer List as on the Map Services tab.
- **Image Services:** Image services look and behave the same in the Layer List as on the Map Services tab.
- **Web Tiled Layers:** Web tiled layers look and behave the same in the Layer List as on the Map Services tab.
- **Bing Maps:** Bing Maps look and behave the same in the Layer List as on the Map Services tab.
- **KML Layers:** KML Layers look and behave the same in the Layer List as on the Map Services tab.
- **GeoRSS Layers:** GeoRSS layers look and behave the same in the Layer List as on the Map Services tab.

You can configure different views of the Layer List called layer themes. For information, see [Layer Themes on page 211](#).

## Folders in the Layer List

Organizing layers into folders makes it easier for end users to find layers in the Layer List, especially if the Layer List is large. You can configure the contents of the Layer List from the Map page in Manager.

You can mix layers of different types and different map services within a single folder. You can nest folders within other folders, and you can configure folders to be hidden in the Layer List or be the folder where user-added layers are added.



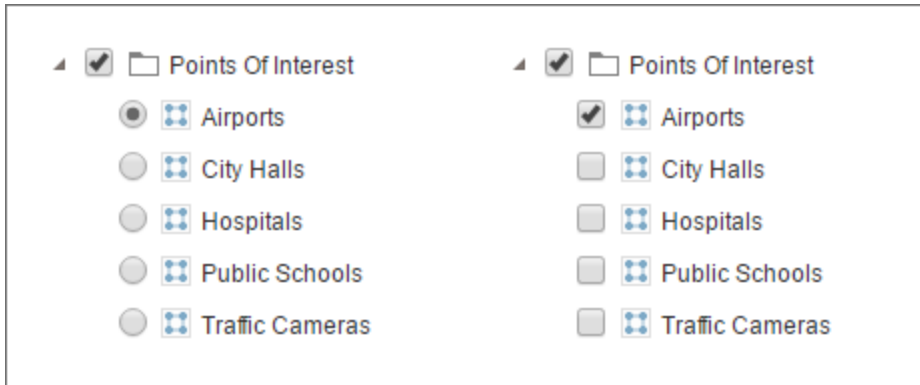
### A folder in the Layer List being edited on the Map page in Manager

In a viewer, folders look like any other item in the Layer List. Like layers and map services, folders have a visibility checkbox that the user can use to show and hide the folder's layers and map services on the map. You can configure a folder's default visibility in Manager, just as you would configure the default visibility for a layer or map service.

To appear in viewers, a folder must contain at least one item. If a folder is empty, viewers do not display the folder in the Layer List.

### Configuration Settings for Folders in the Layer List

- **Rename:** Opens a dialog and allows you to rename an existing folder.
- **Show in Layer List:** Select this checkbox to show the folder in the Layer List in viewers.
- **Place user-added layers here:** Select this checkbox to show user-added layers in this folder when layers are added in the viewer. You can only configure this setting for one folder at a time.  
We recommend that you only configure a visible, top-level folder to be where user-added layers are placed. This ensures that end users can find the list of user-added layers easily.
- **Show Sub-items in Layer List:** Shows folder contents in the viewer.
- **Hide Sub-items in Layer List:** Hides folder contents in the viewer.
- **Sub-item Visibility:** Set how folder sub-items are visible in the viewer's Layer List. For example, if you choose Only One Visible at a Time, only one layer can be selected and viewed at a time. This change is symbolized by changing the checkbox next to each layer name into a radiobutton, so that only one can be selected at once.



Sub-item visibility is configured to Only One Visible at a time (left) and Multiple Visible at a Time (right)

## 26.1 Configure the Layer List

You can customize the Layer List. Specifically, you can:

- Configure which map services and layers appear in the Layer List.
- Organize map services and layers into folders with meaningful names.
- Change the order of map services and layers in the Layer List.
- Change the display names of map services and layers.
- Change the names of folders.
- Configure a folder icon.
- Configure whether more than one of a folder's items can be visible at a time.
- Hide a folder's items, or hide the folder and its items.

If you are not satisfied with how you have customized the Layer List, you can [reset the Layer List](#) to its default configuration.

The Layer List is configured on the Layer List tab on Manager's Map page.

### ▶ To configure the Layer List:

1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Layer List** tab.
2. Customize the Layer List as desired:

#### Create a New Folder


- a. Select  **Add Folder**.

The Add Folder item appears in two locations on the Layer List tab. If you select Add Folder next to an existing item in the Layer List, the new folder is nested within that item. If you select the Add Folder button in the Layer List toolbar, the new folder is added to the root of the Layer List.

- b. Enter a name for the folder.
- c. Press the **Enter** key, or click away from the folder's name.  
After you add a folder, you can drag it to a new position in the Layer List if you want.

### Configure a Folder Icon

The icon that you configure appears to the left of the folder name in the Layer List.

- a. Select  **Edit** next to a folder.
- b. In the **Folder Icon URI** text field, enter the full path to the icon's image file, or select **Browse** to browse to the file.
- c. Click **Apply Changes**.
- d. Click **Map** in the side panel to return to the Layer List.

### Place Items in a Folder

- a. Click and hold a layer, map service, or folder that you want to place in a folder.
- b. Drag the item to the folder and release the mouse button.  
The Layer List prevents you from moving items to an invalid location.


### Configure a Folder's Default Visibility

If you hide the folder in the Layer List, end users will not be able to change the folder's visibility.

- a. Do one of the following:
  - To turn on the folder's default visibility, select the checkbox to the right of the folder in the Layer List.
  - To turn off the folder's by default, clear the checkbox to the right of the folder in the Layer List.

### Configure the Visibility Behavior of a Folder's Items


This controls how many of the folder's items can be visible at one time.

- a. Select the  drop-down menu beside a folder.
- b. Select **Sub-item Visibility**.
- c. Choose the behavior that you want:
  - **Multiple Visible at a Time:** The visibility of the folder items is controlled using checkboxes. This allows users to turn on as many of the folder's items as desired.
  - **Only One Visible at a Time:** The visibility of the folder items is controlled using radio buttons. Users can only turn on one item at a time.  
If the folder contains items that belong to a basemap group and you set the behavior to Only One Visible at a Time, the slider will snap from one basemap to the next instead of transitioning smoothly.

### Hide a Folder's Items in the Layer List


This controls whether the folder's items show in the Layer List. However, it does not affect the visibility of the items on the map.

When you hide a folder's items and at least one of the items has an opacity slider, then the folder will have an opacity slider that controls the opacity of the folder's items. The folder's opacity slider preserves the ratio of the opacities of the hidden items. For example, if the folder contains two layers, one with its opacity set to 25% and the other with its opacity set to 60%, decreasing the folder's opacity by 50% would decrease the opacity of the individual map services by 50% each, to 12.5% and 30% respectively.

- Select the  drop-down menu beside the folder.
- Choose **Hide Sub-items in Layer List**.

### Hide a Folder and its Items in the Layer List

This controls whether the folder and its items show in the Layer List—it does not affect the visibility of the items on the map.





- Select the  drop-down menu beside the folder.
- Select the **Show in Layer List** checkbox.

### Re-Order the Layer List


- Click and hold a layer, map service, or folder that you want to move.
- Drag the item to its new position.  
A guideline shows you where the item will be placed when you release the mouse button. If a guideline does not appear, you cannot place the item there.
- Release the mouse button.


### Expand/Collapse a Folder by Default

If a folder is expanded on the Layer List tab when you save the site, it will appear expanded in the viewer by default. If a folder is collapsed, it will appear collapsed by default.


- Use the  **Expand** icon to expand an individual folder.  
Use the  **Collapse** icon to collapse an individual folder.  
Alternatively, use the  **Expand** or  **Collapse** nodes to show or hide all of the folders at one time.

### Exclude a Layer or Map Service from the Layer List

- Select  **Remove from Layer List** next to the layer or map service.  
You can [re-include layers and map services](#) that you have excluded from the Layer List.

 Excluding a layer or map service from the Layer List does not remove it from the map.


### Re-Include Layers that were Previously Excluded

- Select the  **Include Layers and Map Services** button from Layer List toolbar on the Layer List tab.
- In the **Excluded Items** column, click and hold the item that you want to re-include in the Layer List.  
Layers and map services that are already included in the Layer List appear gray in the Excluded Items column. A layer can only appear once in the Layer List.
- Drag the item from the **Excluded Items** column to the **Layer List** column.

A guideline shows you where the item will be placed when you release the mouse button. If a guideline does not appear, you cannot place the item there.


- d. When the guideline is in the desired position, release the mouse button.
- e. Click **Close** when you are finished.

### Change the Display Name for a Layer or Map Service

You can also rename layers and map services by selecting the item's  drop-down menu and choosing **Rename**.

- a. Double-click the name of the layer or map service that you want to change.
- b. Edit the name, or enter a new name.
- c. Press the **Enter** key, or click away from the name.

### Change a Folder's Name

You can also rename folders by clicking the folder's  drop-down menu and selecting **Rename**, or by editing the folder and changing the **Display Name** setting.


- a. Double-click the folder's name that you want to change.
- b. Edit the name, or type a new name.
- c. Press **Enter**, or click away from the name.

### Remove a Folder and All of its Contents

- a. Select  **Remove from Layer List** next to the folder.
- b. Select **Remove Item and All Sub-Items**.

### Remove a Folder, but Keep its Contents

This moves the folder's items to the left one level and removes the folder.

- a. Select  **Remove from Layer List** next to the folder.
  - b. Select **Remove Item and Keep Sub-Items**.
3. When you are satisfied with your customization, click **Apply Changes**.


### To reset the Layer List to its default configuration:

By default, the Layer List contains all the layers and map services that you have added to the map, in the same order that they appear on the Map Services tab. If you upgraded the site from an older version of Essentials, the default Layer List configuration is the configuration that was carried forward when you upgraded Essentials.



If you reset the Layer List, you will lose all the customization that you have done.

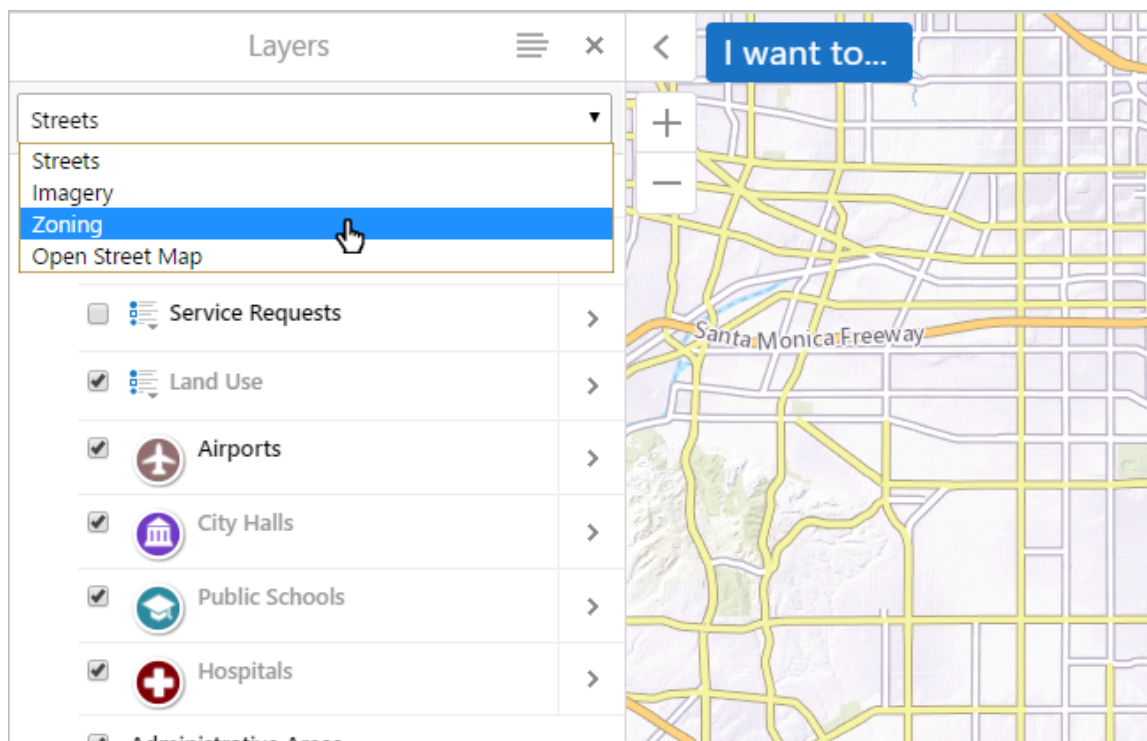
1. In Manager, edit the site that you want to configure, click **Map** in the side panel, and then click the **Layer List** tab.

2. Select  **Reset** at the top of the Layer List tab.  
You are prompted to confirm.
3. Choose **OK**.
4. Click **Apply Changes**.

## 27 Layer Themes

A layer theme is a subset of the Layer List, optionally with different visibility settings for the layers. The layers that are included in a layer theme usually have some theme in common. For example, you could define a Hydrography layer theme that turns on the map's water-related layers, such as layers for streams, lakes, and watersheds, and turns off layers that are not related to water.

Layer themes make it possible to quickly flip between sets of layers that are defined for different purposes. When a user selects a layer theme, the map redraws to show the layers in the layer theme, and the Layer List refreshes to list the layers that are included in the layer theme. This streamlines and specializes layer selection.



Switch quickly between different layer themes

### Layer Theme Permissions

Layer themes are securable. If the site is secured, you can give some users permission to use a particular theme, and deny permission to other users. For information, see [Essentials Security on page 417](#).



## 27.1 Common Uses of Layer Themes

Some common uses for layer themes are:

- To configure layer themes that display only those layers that are needed for a specific task, analysis, or business need. This eliminates unneeded layers and makes it easier for users to quickly flip between the layers that they need when performing a particular task.
- To group frequently used layers into the default theme. Group the other layers by specialized functions in order of priority or business needs. The reduction in the number of layers in the default theme provides performance benefits.
- To configure multiple layer themes with the same layers, but different visibility settings. In this case, toggling between themes changes the visibility settings of multiple layers simultaneously.
- To configure a set of layer themes that allow users to change the context of the map. This simplifies the viewer for users who are not familiar with the concept of map layers.

## 27.2 Layer Theme Configuration and Behavior

Layer themes are configured on Manager's Layer Themes page. A site must have at least one layer theme, which is the theme that loads when the viewer launches. Initially, the All Available Layers theme is the default theme.

If the user selects a different default layer theme, the map redraws and the list of layers changes to the layer theme's list. If there are search results, selections, markup, and user-added layers when the user changes the theme, these items may no longer be available. Their availability depends on whether the layer is included and visible in the new layer theme.

### All Available Layers

By default, every site has a layer theme called All Available Layers, which corresponds to the full Layer List.

The All Available Layers layer theme includes all the layers that the Layer List includes, with the same visibility settings as the Layer List. If you add or remove a layer from the Layer List or you change a visibility setting, your changes are reflected in the All Available layers theme.

You can hide the All Available Layers theme so it does not appear in viewers. For information see [Hide the "All Available Layers" Theme](#).

### Add and Edit Layer Themes

Initially, when you add a new layer theme, all the map services, layers, and folders that are included in the Layer List are also included in the theme. You can exclude any map services, layers, and folders that you want.

When you exclude a layer, the layer does not show in the map or in the list of layers, and the layer's data is not available for client-side operations like search. If you exclude an item that contains other items, all the contained items are also excluded. Layer themes automatically appear in the drop-down menu of available themes at the top of the Layer List.

### Layer Visibility

Each map service and layer that is included in a layer theme has a visibility setting in the theme. The visibility that you configure in the layer theme overrides the visibility that is configured in the Layer List.

## Layer Themes and the Basemap Switcher

The layer theme affects which basemaps show in the [Basemap Switcher](#). When the user changes the layer theme, the basemaps that are available in the new layer theme are loaded into the Basemap Switcher and replace the basemaps from the previous layer theme.

A basemap is available in a layer theme if one or more of its map services is included in the layer theme. When a user selects a basemap with a mix of included and excluded map services, only the map services that are included in the layer theme show on the map.

If all of a basemap's map services are excluded from a layer theme, then the basemap does not show in the Basemap Switcher when that layer theme is selected.

## 27.3 Layer Themes in the Viewer

Layer themes behave in the viewer in the following ways:

- When users save a project, the selected layer theme is saved. When the project is opened, the saved layer theme is displayed.
- It is possible to launch a viewer with a particular layer theme applied. This is done by adding the `layerTheme` parameter to the URL.

The URL parameter uses the ID or *Display Name* of the layer theme. For example, if the layer theme you want to apply when the viewer starts has an ID of **2**, you might use a URL similar to:


```
http://myserver/Html5Viewer/Index.html?configBase=http://myserver/Geocortex/Essentials/REST/sites/mysite/viewers/myviewer/virtualdirectory/Resources/Config/Default&layerTheme=2
```

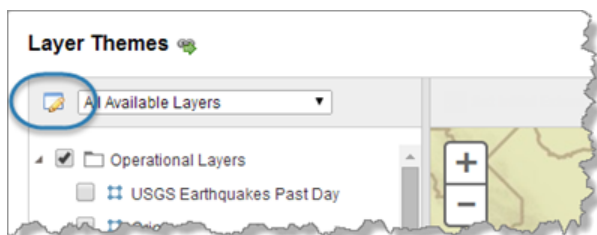
Alternatively, if the layer theme's *Display Name* is **Zoning**, you might use a URL similar to:

```
http://myserver/Html5Viewer/Index.html?configBase=http://myserver/Geocortex/Essentials/REST/sites/mysite/viewers/myviewer/virtualdirectory/Resources/Config/Default&layerTheme=Zoning
```

## 27.4 Add a Layer Theme

### ► To add a layer theme to a site:

1. In Manager, edit the site that you want to configure, and then select **Layer Themes** from the side panel.
2. Select  **Edit** from the Layer Themes toolbar on the Layer Themes page.



### Location of icon to add, edit, and remove layer themes


3. Click  **Add New Layer Theme**.

A new theme appears at the bottom of the list.

4. Type in a name for the layer theme.

Choose a name that is meaningful to end users. The name appears in the list of themes in the viewer.

5. If you want the new layer theme to load when the viewer is launched, select the **Default** button beside the theme.


6. If you want to move the layer theme to a different position in the list, grip the  **Sort Layer Theme** handle the theme and drag it to its new position in the list.

Layer themes appear in the viewer in the same order that they appear in Manager.

7. Click **OK**.



The layer theme is created.

8. Select the new theme in the drop-down list in the Layer Themes toolbar at the top of the Layer Themes page.

The  **Include** and **Exclude** toggles should also appear in the Layer Themes toolbar. If you do not see these toggles, make sure you have selected a custom layer theme. The toggles are not displayed when the predefined All Available Layers theme is selected.

9. Configure which map services, layers, and folders you want to have in the theme:



#### Exclude Items

- To exclude an item (and its nested items), deselect the  **Included** button next to the item. When you exclude an item, its text color appears dimmer than included items in the list.
- To exclude all items, use the  **Exclude** toggle in the Layer Themes toolbar.



If the list contains many items, most of which will be excluded, it is quicker to exclude them all and then re-include individual items than it is to exclude individual items.

#### Include Items


- To re-include an item that you have excluded, select the  **Included** button next to the item. If the item contains other items, the contained items will also be re-included.
  - To include all items, use the  **Include** toggle in the Layer Themes toolbar. By default, all items are included.
10. Configure the default visibility of the layers that are included in the layer theme:
    - Select the checkbox next to a layer to show it on the map when the layer theme loads.
    - Deselect the checkbox next to a layer to hide it on the map when the layer theme loads.
  11. Choose **Apply Changes** and **Save Site**.

## 27.5 Hide the "All Available Layers" Theme

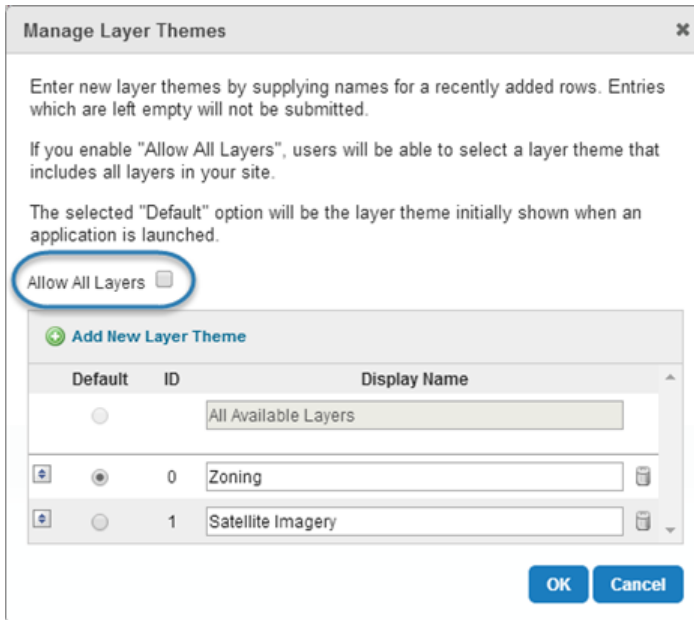
Every site has a layer theme called **All Available Layers**. The All Available Layers theme corresponds to the Layer List. It includes all the layers that the Layer List includes, with the same visibility settings as the Layer List. If you add or remove a layer from the Layer List or you change a visibility setting, your changes are reflected in the All Available Layers theme.

You cannot remove the All Available Layers theme, but you can hide it so that it does not appear in viewers. In order to hide the All Available Layers theme, the site must have at least one other layer theme configured.

### ► To hide the All Available Layers theme:

1. In Manager, edit the site that you want to configure, and then select **Layer Themes** from the side panel.
2. Select  **Edit** from the Layer Themes toolbar at the top of the page.
3. Clear the **Allow All Layers** checkbox.

When you clear the checkbox, the next layer theme in the list becomes the default layer theme.



Manage Layer Themes

Enter new layer themes by supplying names for a recently added rows. Entries which are left empty will not be submitted.

If you enable "Allow All Layers", users will be able to select a layer theme that includes all layers in your site.

The selected "Default" option will be the layer theme initially shown when an application is launched.

Allow All Layers

+ Add New Layer Theme

Default	ID	Display Name
<input type="radio"/>		All Available Layers
<input checked="" type="radio"/>	0	Zoning
<input type="radio"/>	1	Satellite Imagery

OK Cancel



Location of checkbox to clear

4. Select the **Default** button for the layer theme that you want to load when the viewer is launched.
5. Choose **OK** and **Save Site**.

## 27.6 Reorder the List of Layer Themes

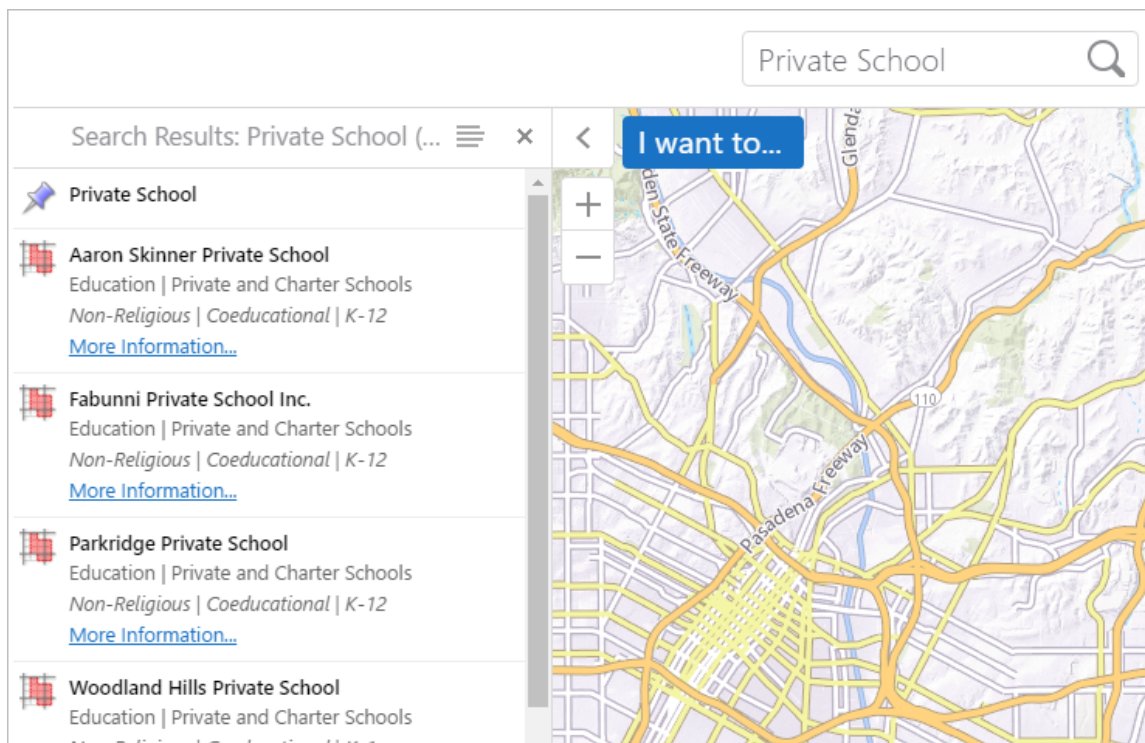
Layer themes appear in the viewer in the same order that they appear in Manager. You can reorder the list of layer themes by moving individual layer themes within the list.

► **To reorder the list of layer themes:**

1. In Manager, edit the site that you want to configure, and then select **Layer Themes** from the side panel.
2. Select  **Edit** from the Layer Themes toolbar at the top of the page.
3. Drag and drop the  **Sort Layer Theme** handle next to a layer theme to reorder it in the list of layer themes. Repeat this step until you are satisfied with the order of the layer themes.
4. Choose **OK** and **Save Site**.

## 28 Global Search

The Global Search feature enables end users to search for features. Global Search searches layers and tables that have Global Search enabled. It returns a list of the features with attributes that match the user's search text.



### The Global Search box and search results for a search term "Private School"

Global Search is capable of searching multiple sources, including both map services and geocoding services, if the site has geocoding services configured. If a particular feature is returned by more than one source, it appears more than once in the results list. Duplicates are not removed from the results list. For more information about searching geocoders, see [Geocoding Services on page 174](#).

## Layer Search and Instant Search

Global Search supports two methods for performing searches:

- **Use the Map Service's Search Feature (Layer Search):** Essentials sends a search request directly to the map service that is being searched, or to the map service's search service if it has one (for example, ArcGIS Search). The service performs the search, and then returns the search results to Essentials. This method is called **Layer Search**. Layer Search is the default method used for Global Search.
- **Maintain an Index to Search (Instant Search):** For ArcGIS map services only. Essentials maintains an index of feature data that Global Search searches. This method is called **Instant Search**. If you enable Instant Search for a particular map service, Essentials uses Instant Search to search that service, instead of Layer Search. If you want to use Instant Search to search a particular map service, you must turn it on for that map service.



Instant Search works with ArcGIS map services only. This includes ArcGIS Server, Portal for ArcGIS, and ArcGIS Online map services.

The results from the different search methods and services are aggregated. The results appear combined as a single results list. The viewer adds results to the list as the results are received. Because Instant Search is so fast compared to Layer Search, the results returned by Instant Search are usually at the top of the list. Layer Search results appear at the bottom of the list as the viewer receives them.

See also...

[Geocoding Services on page 174](#)

[Add an ArcGIS Geocoding Service on page 177](#)

[Add a Bing Maps Geocoding Service on page 181](#)

## 28.1 Configure Global Search

In order for end users to be able to search a layer's features, Global Search must be turned on for that layer. You must turn on Global Search for both Layer Search and Instant Search.

Global Search is turned off by default because not every layer has relevant search data. You must turn on Global Search for each layer that you want to be searchable. You must then activate Instant Search for each service that you want to use Instant Search rather than Layer Search.

When you turn on Global Search for a layer, by default, each field in the layer is searched. You can turn off Global Search for individual fields. If there are some fields that you do not want to be searched, turn off Global Search for those fields.



Global Search switches search on for both Layer Search and for Instant Search. If you are using Instant Search, and want to turn off search without disabling and then re-indexing the data, you can use Global Search to turn search on or off.



▶ **To enable Global Search for a single layer:**

1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. There are two ways to enable Global Search for a single layer:





**Shortcut Method**

- a. Click the layer's  drop-down menu .
- b. Select **Include in Global Search**.

**By Editing the Layer**

- a. In the list of map services, use the  **Expand** node as needed to show the layers that you want to configure.
  - b. Select  **Edit** next to the layer.  
For group layers, you must edit the sublayer, not the group layer.
  - c. On the **Details** tab, scroll to the **Supported Operations** section.
  - d. Select the **Include in Global Search** checkbox.
3. Choose **Apply Changes** and **Save Site**.

▶ **To disable Global Search for particular fields in a layer:**

1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. Go to the **Fields** tab.
3. Choose  **Add/Remove Fields**.
4. In the **Excluded Fields** column, select each field that you want to include in Global Search.  
To select multiple fields, hold the **Ctrl** key down while you select each field.
5. Select the **« Include** button between the two columns.
6. Click **OK**.  
Each field that you moved to the Included Fields column is listed individually and has the  Include in Global Search setting turned on . There is an <all other fields> item at the top of the list.
7. Press the  **Include in Global Search** icon beside <all other fields>.  
The Include in Global Search setting is turned off  for the fields that you left in the Excluded Fields column. these fields will not be searched by Global Search.
8. Choose **Submit Field Changes** and **Save Site**.

## 28.2 Instant Search

Instant Search creates and maintains an index of feature data. Instead of sending a search request to the service, Global Search searches the index, which results in search results appearing instantly. The results are sorted with the most relevant results at the top. Instant Search also supports searching for values in coded value domains.

You must enable Global Search for the layers and fields you wish to Instant Search. See [Configure Global Search on page 217](#) for instructions.

Instant Search must be enabled per map service. See [Configure Instant Search on page 225](#) for instructions.



Instant Search works with ArcGIS map services only. This includes ArcGIS Server, Portal for ArcGIS, and ArcGIS Online map services.



You can turn Global Search on or off at any time for layers and fields in an indexed map service, without having to rescan the service.

### The Difference Between Instant Search and Layer Search

If a map service has Instant Search enabled, searches are performed with the Instant Search method. If Instant Search is not enabled, [Layer Search](#) is used to send a search request to the map service. Layer Search and Instant Search are different methods.

### Search Hints

Instant Search provides search hints that help the user find features quickly. Search hints are suggested search terms that suggest what the user might be searching for.


san	
4233 N. <b>Santa</b> Anita Ave.	
<b>Santa</b> Monica	
<b>Santa</b> Monica Municipal Airport	
<b>San</b> Clemente Island	
<b>San</b> Clemente Island NALF	




#### Search hints shown in a viewer


For example, if a user enters `san` into the Global Search box, search hints suggests feature details with "san" in their Instant Search-enabled layers and fields. The user can select a search hint to search for the suggested term.



## Refine Search

Search hints include a  **Refine Search** button. When the user selects the Refine Search button, the search hint is sent to the Global Search box as a new search term. The user can then continue to refine the search. Because search hints are usually more complex than the search term, search hints refine the search. By successively choosing Refine Search, the user can build a refined search term without having to input it manually.

 Selecting a  Refine Search button does not search for the term. To perform the search, the user must select the  Search icon, or press the Enter key.

 You can navigate between search hints by pressing the **up arrow** (↑) or **down arrow** (↓) keys.

## Number Formatting

Instant Search recognizes numbers in one of the following formats:

- Number
- Fixed-point
- Percentage
- Currency
- Accounting

It only recognizes numbers formatted according to the rules of the locale configured in Essentials unless a locale uses white-space as a group separator. For example, a search for "123 456" always looks for features that have both 123 and 456. As a result, users need to use fixed-point notation in search terms, like "123456" or "123456.00".

See [Format Number Fields on page 334](#) for more information.

## Currency and Accounting

In the case of currency and accounting formats, Instant Search only recognizes the application's configured currency. This is configured in the viewer's configuration file by specifying an [ISO-4217 currency code](#) for the `defaultCurrency` setting of the application. When not specified, it defaults to USD.

For more information about viewer configuration, see "About Viewer Configuration" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

### 28.2.1 About the Instant Search Index

The Instant Search index includes all of the data on every layer in a map service. Before Instant Search can be used, you must scan that service to add its data to the index.

Essentials might not use all the data in the index as Essentials only searches those layers and fields that have Global Search turned on. You can enable or disable Global Search for layers and fields without having to update the index. Similarly, you can disable and re-enable Instant Search for a map service without having to rescan the service.

Instant Search is designed to create the index in the background so it does not affect the server that hosts the map service. For example, when the LA County demo site was indexed, it took 7.5 hours to index 5,867,896 features. The resulting index was 19GB in size. Based on this:

- Instant Search can conservatively index a 750,000 features per hour
- One gigabyte can store approximately 300,000 features

Features per hour and features per gigabyte depend on the size of a feature.



We recommend that you index the map service before you enable Instant Search. See [Configure Instant Search on page 225](#) for instructions.



Multiple map services can be processed at the same time. Only three map services on the same server can be indexed simultaneously. If this limit is reached, the remainder of the map services are queued until a slot is available for indexing. Queuing prevents excessive traffic to a single server.

## Index Updating

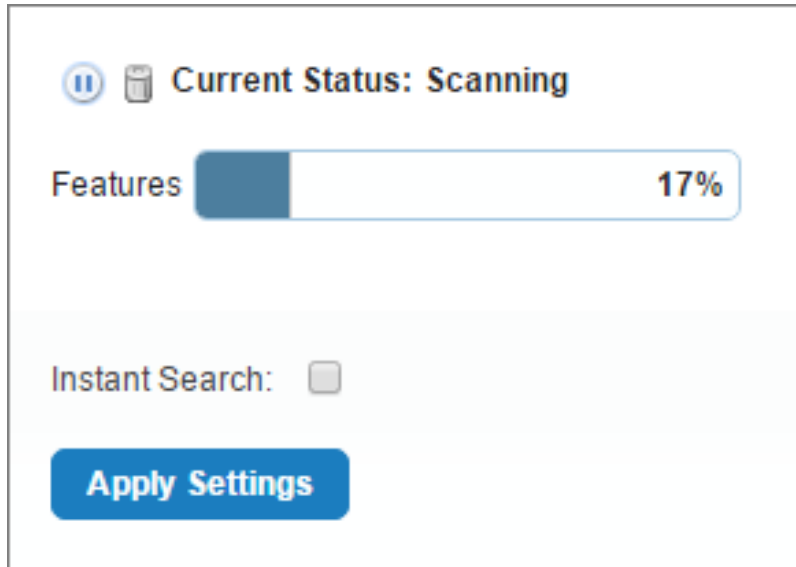
Instant Search keeps the index up to date by periodically scanning the services that are included in the index. The index is automatically updated once a week. When a scheduled process is halted manually, you have the option of restarting it manually or waiting until the next scheduled update.



When the data of a map service changes, for example, a parcel is sub-divided, there is a delay before Instant Search can find the updated features. For this reason, Instant Search is not suited to map services whose data changes frequently or if the data is used to generate reports based on search results.

## Progress Bar and Status Indicators

You can track the status of a scan with the progress bar and status indicators. The status and progress can be viewed from a map service's the Instant Search tab.



### A map service's current status and progress

The progress bar on the Instant Search tab indicates how many features are scanned and already in the database. It reaches 100% completion when all of a map service's features have been indexed.

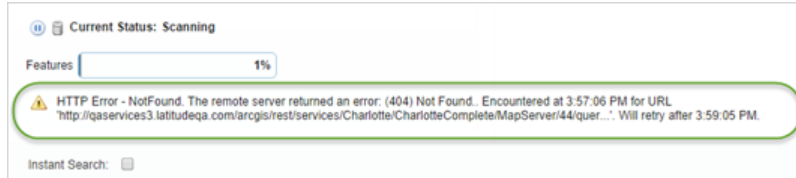
### Instant Search States

Each state is identified on the Instant Search tab. The status indicators include:

- **Idle:** The indexing process is inactive.
- **Pending:** The indexing process is starting up or queuing.
- **Scanning:** The indexing process is performing web requests to download feature data.
- **Indexing:** The indexing process is parsing feature data and storing it in the database.
- **Finished (Scheduled):** The indexing process is complete and the features will be re-indexed at the next scheduled time, approximately a week after the previous scan was started. You can start a scan manually at any time that the status indicates Finished (Scheduled).
- **Paused:** The indexing process has been paused manually. You can restart the process manually or leave it to start automatically at the next scheduled time.  
If a scanner process is unexpectedly terminated, Instant Search attempts to update the status to Paused in Essentials to reflect this change.
- **Error!:** The indexing process has been halted for a variety of reasons.

### Error Messages

If an error occurs because a map service is not available, an error message displays on the Instant Search tab of the map service.



There are two main types of errors that occur when a map service is being indexed:

- **ArcGIS Server is Unavailable:** The error occurs when the actual server is unavailable. The indexer retries the request in 5 minutes, then 15 minutes, 1 hour, 6 hours, 24 hours, after which it indicates Failure. When this error type occurs, all indexing pauses until the retry time has passed, after which the indexing resumes.
- **ArcGIS Server Element is Temporarily Unavailable:** The error occurs when a layer is not available or a single feature request fails. For example, this can happen if the SDE database used by a feature service is not available. The indexer retries the request in 2 minutes, then 15 minutes, 1 hour, 3 hours, 12 hours, after which it indicates Failure. When this error occurs, Indexing continues as normal for the remaining features, while only the problematic request is queued up so that it can be retried later.

There are different error formats for different error levels. A typical error message for credential issues would be:

```
HTTP Error - Unauthorized or Forbidden. Please check your credentials. Encountered at
9:50:10 AM for URL
'http://qaservices3.latitudeqa.com/arcgis/rest/services/Charlotte/MapServer?f=pjson'.
Will retry on 9:55:09 AM.
```

A typical error message for a fatal error would be:

```
HTTP Error - The service is unavailable. Encountered at 10:41:22 AM for URL '
http://qaservices3.latitudeqa.com/arcgis/rest/services/Charlotte/MapServer/0?f=pjson'.
Attempted maximum number of retries; index may be incomplete.
```

After a fatal error message, no more retries take place and the error remains until it is re-indexed.

Common Error Messages	
Message	Cause/Fix
HTTP Error – Error performing query operation.	An ArcGIS Server-related problem. The service may be temporarily unavailable, or a common issue is that the result set from the query may exceed the specified maximum. For more information see: <a href="#">Esri Knowledge Base: Error Performing Query Operation</a>
HTTP Error - Unauthorized or Forbidden. Please check your credentials.	The credentials supplied to Instant Search are not valid. Please change the user credentials in Essentials Manager and manually resume indexing on this service.
HTTP Error – The service is unavailable.	The ArcGIS server is offline or temporarily unavailable.

## 28.2.2 Supported Types of Map Service

Instant Search can search ArcGIS Server map services and feature services in hosted ArcGIS Server installations, as well as ArcGIS Online and Portal for ArcGIS.

For each hosted ArcGIS Server map service and feature layer in a site, you have the choice of enabling Instant Search for the service or layer, or allowing searches to use ArcGIS Search. The following table lists the differences between how ArcGIS Search and Instant Search work.

### Differences between Instant Search and ArcGIS Search

Instant Search	ArcGIS Search
The search is near instant—typically under 100 ms—often much faster. Search times do not increase appreciably as the number of features grows.	Search time is proportional to the number of features being searched, typically several seconds.
Searches all fields, regardless of the data type.	Searches text fields only, except when searching a feature layer with the Search Non-Text Fields setting enabled.
Compensates for word order when searching. For example, <b>Lee Burton</b> matches <b>Burton, Lee</b> .	Compensates for word order only if the <a href="#">Services Enhancement Proxy</a> is enabled for this map service.
Does exact and partial matches. For example, <b>dr</b> can match <b>Dr, Drew</b> or <b>Dresden</b> .	Does exact and partial matches.

## Secured Map Services

You can use Instant Search with unsecured services, as well as the following secured services:

- ArcGIS Online and Portal:** If Essentials is registered with Portal for ArcGIS or ArcGIS Online, then Instant Search can index private services from those resources with no further steps. For more information, see:
  - [The ArcGIS Security Provider on page 438](#)
  - [Portal for ArcGIS Service Connections on page 128](#)
  - [ArcGIS Online Service Connections on page 129](#)
- ArcGIS Server - Web Tier Configured Credentials:** A service on ArcGIS Server can be secured via web tier (configured credentials) if the service is secured using basic or digest authentication, or if the service is secured using integrated Windows Authentication. You must ensure that the **Username** and **Password** is specified for the service in one of the following:
  - On the Service Connections tab. See [ArcGIS Server Service Connections on page 130](#)
  - In the Connection Settings dialog for the Map Service Details tab. See [Edit a Map Service's Connection Settings on page 113](#).

- **ArcGIS Token Security:** A service on ArcGIS Server can be secured using token security. You must specify the **Username**, **Password**, and **Token URL** for the service in one of the following:
  - The Service Connections tab. See [ArcGIS Server Service Connections on page 130](#)
  - In the Connection Settings dialog for the Map Service Details tab. See [Edit a Map Service's Connection Settings on page 113](#).



User impersonation is not supported by Instant Search.

#### See also...

[Optimize Instant Search on page 227](#)

## 28.2.3 Configure Instant Search

You configure Instant Search for each map service you want indexed. Here is an overview of the main steps used to configure Instant Search:


1. Turn Global Search on for the layers and fields.




You can turn Global Search on or off at any time for layers and fields in an indexed map service, without having to rescan the service.

2. Build the Instant Search index for the first time.
3. Enable Instant Search.
4. If necessary, modify the Instant Search settings for individual viewers.  
For HTML5 viewers, follow the instructions in [Configure Instant Search in the HTML5 Viewer on page 389](#).



#### ► To build the Instant Search index for the first time:

1. In Manager, edit the map service that you want to configure.
2. Go to the **Instant Search** tab.
3. Select  **Scan** next to the Search Index progress bar.

If the service is secured, a prompt appears for you to confirm that you want the secure credentials passed to Core.

The Scan icon changes to a  **Pause** icon. Instant Search is now scanning the map service and adding its data to the search index.



You can  pause and  resume scanning.

4. Continue editing and scanning map services in this site until you are scanning each service that you want to

include in the index. You can scan multiple map services simultaneously.



Keep a record of the map services that you include in the Instant Search index. When the index is built, you will need to [enable Instant Search](#) for each service.

5. Continue editing sites and scanning map services until you are scanning each service that you want to include in the index.



If a particular map service appears in more than one site, you only need to start scanning in one site—the sites will share the index.

You must now wait for scanning to complete. Instant Search is designed to create the index slowly so it does not affect the servers that host the map services. Each map service has a progress bar on the map service's Instant Search tab.

Search Index:  44% 

#### Search Index progress bar for a map service that is being scanned



Indexing can take a long time—sometimes overnight and there may be extended periods of time where you may not see any visible progress.

### ► To enable Instant Search:

1. In Manager, edit the map service that you want to configure.
2. Click the **Instant Search** tab.
3. If the Search Index progress bar indicates that scanning is 100% complete, select the **Instant Search** checkbox.

Search Index:  100% 

#### Search Index progress bar when scanning is complete

4. Click **Apply Settings**.
5. Continue enabling Instant Search for map services in this site until you have enabled it for every service that you want to use Instant Search.
6. Click **Save Site**.
7. Continue editing sites and enabling Instant Search until you have enabled it for every service that you want to use Instant Search.

You can also modify the Instant Search settings for individual viewers. See [Configure Instant Search in the HTML5 Viewer on page 389](#) for more information.

## 28.2.4 Optimize Instant Search

Instant Search is I/O bound. When serving search requests, Instant Search accesses both system memory (RAM) and the storage drive. You can improve the performance of Instant Search by increasing RAM and upgrading the storage drive.



Instant Search is not CPU bound. An upgrade to the server's CPU does not significantly improve the performance of Instant Search.

To improve Instant Search performance:

- **Upgrade to a Solid-State Drive:** Instant Search reads from the storage drive where the index is stored. Reading from a solid-state drive (SSD) is much faster than reading from a hard disk drive. To ensure the quickest access times, set up the Geocortex Core data folder on a partition on a solid-state drive. To do this, change the location of the data folder to point to the SSD partition.

You can change the location of the data folder when you run the Geocortex Core installer with the Geocortex Core Management Application. For a typical installation, you can find this application at

```
C:\Program Files\Latitude Geographics\Geocortex
Core\Management\Geocortex.Platform.Management.exe
```

- **Increase Server RAM:** Increasing the server's RAM allows you to allocate more RAM to Instant Search, and have more RAM for the other processes that the server runs.
- **Increase the RAM Available to Instant Search:** Instant Search uses the amount of RAM that is configured for it in Geocortex Core. You can increase the amount of RAM that Geocortex Core allocates to Instant Search. Follow the instructions below.

### Increase the RAM that is Available to Instant Search

The more RAM that Instant Search has available to it, the faster it can serve search requests. By default, Geocortex Core dynamically allocates up to half the system RAM to Instant Search. This ensures adequate Instant Search performance and ensures that enough RAM is available for the other server processes. Allocating more than half of a system's RAM to Instant Search is not recommended.

#### ► To change the RAM allotment for Instant Search:

##### Step 1: Stop the Windows Service that Runs Geocortex Core

1. Open the Windows **Services** panel.  
To open the Services panel in Windows Server 2012, open Server Manager and select Services in the Tools menu.
2. Right-click the Geocortex Core service and select **Stop**.

##### Step 2: Modify the Memory Settings

1. Run a text editor or XML editor as an administrator.  
You can use Notepad, a text editor included with Windows.



2. Open the `role.config` file in the editor.

For a typical Geocortex Core installation, you can find the `role.config` file at the following path:

```
C:\Program Files\Latitude Geographics\Geocortex  
Core\NSRoot\Geocortex\Core\Roles\DocumentStore\3.x.x.xxxx\roles.config
```

Where `3.x.x.xxxx` is the version number of Core currently installed.

3. Locate the `MinMemory` and `MaxMemory` keys.

You should see the following lines in the `roles.config` file:

```
<!-- The minimum amount of memory to allocate to the elasticsearch vm. Defaults  
to 256MB -->  
<StartupSetting Key="MinMemory" Value="auto" />  
<!-- The maximum amount of memory to allocate to the elasticsearch vm. Defaults  
to 1/2 system RAM -->  
<StartupSetting Key="MaxMemory" Value="auto" />
```

4. Set the `Value` attributes to the minimum and maximum RAM that you want to allocate to Instant Search.

By default, these attributes are set to `Value="auto"`, where the minimum memory defaults to 256 MB and the maximum memory defaults to half of the system's RAM. If you want to explicitly set the minimum and maximum memory values, you can change the value attributes based on the amount of memory available on your server.

For example, if your server has 8 GB of available memory when the Geocortex Core service is stopped, you could set `MinMemory` and `MaxMemory` each to 4 GB. This is represented as `4g` in the `role.config` file:

```
<StartupSetting Key="MinMemory" Value="4g" />
```

```
<StartupSetting Key="MaxMemory" Value="4g" />
```

By giving the `MinMemory` and `MaxMemory` the same value, Core no longer dynamically allocates memory to Instant Search. Instead, it reserves at the minimum and maximum amount of memory specifically for Instant Search's use.

5. Save the file.

### Step 3: Restart the Windows Service that Runs Geocortex Core

1. In the Windows **Services** panel, right-click the Geocortex Core service and select **Start**.

### Step 4: Test that Instant Search is Working

1. Type `http://localhost:19201/` into your browser's address bar and press **Enter**.

If Instant Search is running, the browser loads a JSON file with information about your Core instance. Depending on the browser you use, you may be required to save the JSON file before you can view the information.

If the open or save message does not appear, verify that you made the configuration changes correctly. If you need to make corrections to the `role.config` file, repeat the steps starting at Step 1.

## 28.2.5 Disable Instant Search for a Map Service

If you want to return to using the default search method for a particular map service, you can disable Instant Search for that service.



If a particular map service appears in more than one site, you can use the default method for one instance of the service and Instant Search for another instance. They do not require the same search method.

### ▶ To disable Instant Search for a map service:

1. In Manager, edit the map service that you want to configure.
2. Go to the **Instant Search** tab.
3. Clear the **Instant Search** checkbox.
4. Choose **Apply Settings** and **Save Site**.

Global searches will now be performed using the default method, instead of Instant Search. You can re-enable Instant Search at any time by selecting the Instant Search checkbox.

## 28.2.6 Delete a Map Service from the Index

If you no longer want to use Instant Search for a map service, you can delete the map service from the index.




If you delete a map service from the index, and then you want to start using Instant Search again for that map service, you must re-scan the service to add it back to the index. It may be more than a week before your features are available again in Instant Search.



Instant Search indexes are shared between sites. If you delete the index for a map service from one site, the index is removed from all other sites that use that service.

### ▶ To delete a map service from the Instant Search index:

1. In Manager, edit the map service that you want to configure.
2. Go to the **Instant Search** tab.
3. Choose  **Delete** beside the **Search Index** progress bar.



If there is no Delete button beside the progress bar, the map service is not in the index.

4. Choose **Delete Index** when prompted.
5. Choose **Apply Settings** and **Save Site**.

The map service is deleted from the existing index and the Delete icon disappears. Instant Search will no longer scan this service when updating the index.

## 29 Layer Hyperlinks

Layer hyperlinks are links to web pages that are relevant to the layer. They give the end user easy access to information related to the current layer. For example, if a layer has a metadata URL, you could create a layer hyperlink that points to it.

Layer hyperlinks appear in the Layer Actions menu. To open the Layer Actions menu, the user chooses a **Layer Actions** button next to a layer in the Layer List.

Layer hyperlinks can be static URIs, or they can be generated at runtime in the viewer. Generating the URI at run time makes it possible to build URIs that contain values specific to the selected layer. This is done by including [layer tokens](#) into the configured URI. Layer tokens are replaced at runtime with the value of the property for the selected layer. Layer tokens can also be used in the hyperlink's text and tool tip.

Layer hyperlinks can be configured for individual layers (see [Example 1](#)), or they can be configured at the level of the parent map service (see [Example 2](#)). Adding a layer hyperlink to the map service makes the link available on each layer in the service.

### Example 1: Link to an Individual Layer's Metadata

Suppose your site's Parcels layer has metadata that you want to make available to end users. You configure a layer hyperlink like the one shown below.

**Create/Edit Layer Hyperlink**

Modify your layer hyperlink details below.

Hyperlink Text:

URI:

Encode Field Values:  ▼

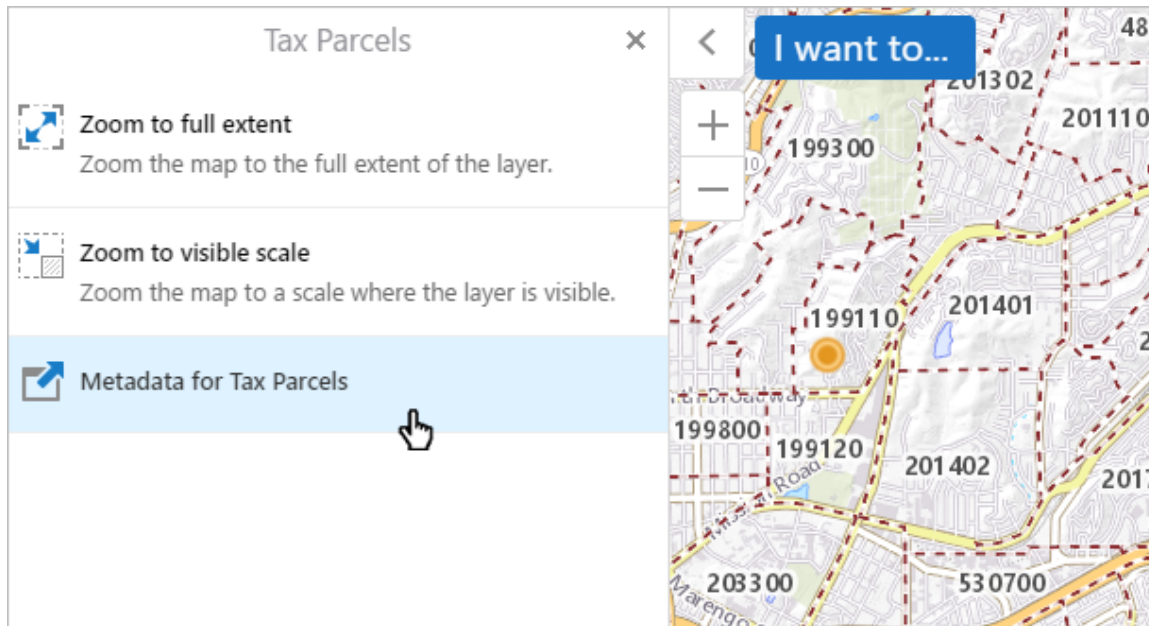
Tooltip:

Icon URI:

Target:

Configuration of a layer hyperlink to display layer metadata

The user clicks the Parcels layer in the Layer List to open the layer's context menu. The layer hyperlink is in the context menu with other layer-specific information and actions.




Layer hyperlink in the Parcels layer's context menu, and its metadata in a new window

## Example 2: Link to the Metadata for Every Layer in a Map Service

Suppose you want every layer in a map service to have a link to its metadata. Configuring a layer hyperlink for every layer is tedious and time consuming. Instead, add the layer hyperlink to the map service. This makes the hyperlink available on every layer in the map service and saves a lot of configuration.

The approach in this example requires consistency:

- The name of each metadata file should follow a pattern.  
For this example, the name of each file is simply the name of the corresponding layer. If the Tax Parcels layer metadata file is `TaxParcels.html`, then the Land Use layer metadata file should be `LandUse.html`.
- Each file should be placed in a common folder.  
In this case, the `{VirtualDirectoryUri}/Metadata/` folder.

 If you host the metadata folder in your site's virtual directory, you can use the `{VirtualDirectoryUri}` [client token](#) in the layer hyperlink's URI field. This streamlines configuration and maintains site portability.

See the configuration for the layer hyperlink is shown below. Each layer generates unique text, URIs, and other layer-specific values thanks to the configured client token `{LayerName}`.

### Configuration for a layer hyperlink that applies to all layers


As a result of this configuration, each layer links to an HTML file with the metadata for that layer. Here is a description of the result:

- In the user interface, the text for the Tax Parcels layer's hyperlink is generated as **Metadata for Tax Parcels**. The URI it links to ends with `Parcels.html`. The `{LayerName}` token has been replaced with "Tax Parcels" in the text throughout.
- Similarly, the text for the Land Use layer's hyperlink is generated as **Metadata for Land Use**. The URI it links to ends with `LandUse.html`. The `{LayerName}` token has been replaced with "Land Use" in the text throughout.

## Settings

Layer hyperlinks have the following settings:

- **Hyperlink Text:** (optional) The text for the link. You can use [layer tokens](#) in the Hyperlink Text box. Click **Edit** to select from a list of available tokens. If you leave the Hyperlink Text box blank, the URI is used.
- **URI:** The URI to link to. You can use layer tokens in the URI box. Click **Edit** to select from a list of available tokens.
- **Encode Replacement Values:** Specify whether to URL encode the values used to replace layer tokens. URL encoding replaces characters that are not valid in URLs with valid characters. The default setting, Automatic, URL encodes tokens when they are combined with text. If the URI box contains only a token (no text), the viewer does not URL encode the value—it assumes the token defines a complete URI that is already URL encoded.

- **Tool Tip:** (optional) The text to display when the mouse hovers over the hyperlink. You can use layer tokens in the Tool Tip box. Click **Edit** to select from a list of available tokens.
- **Icon URI:** (optional) The URI of the icon to display beside the hyperlink. If you leave the Icon URI box blank, the default icon (  ) appears beside the layer hyperlink.
- **Target:** The name of the browser window to open when the user clicks the hyperlink. To open the target in a new window, enter `_blank`.

#### See Also...

[Layer Tokens on page 39](#)

[Virtual Directories on page 33](#)


[Server Replacement Tokens on page 36](#)

## 29.1 Add a Layer Hyperlink

### ► To add a layer hyperlink:

1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. To add the hyperlink to all the layers in a map service, [edit the map service](#).  
To add the hyperlink to a single layer, [edit the layer](#).
3. Click the **Layer Hyperlinks** tab.
4. Click **Add Layer Hyperlink**.
5. Configure the settings.  
See [Settings on page 232](#) for information about the settings.
6. Click **OK**.  
The layer hyperlink is created.

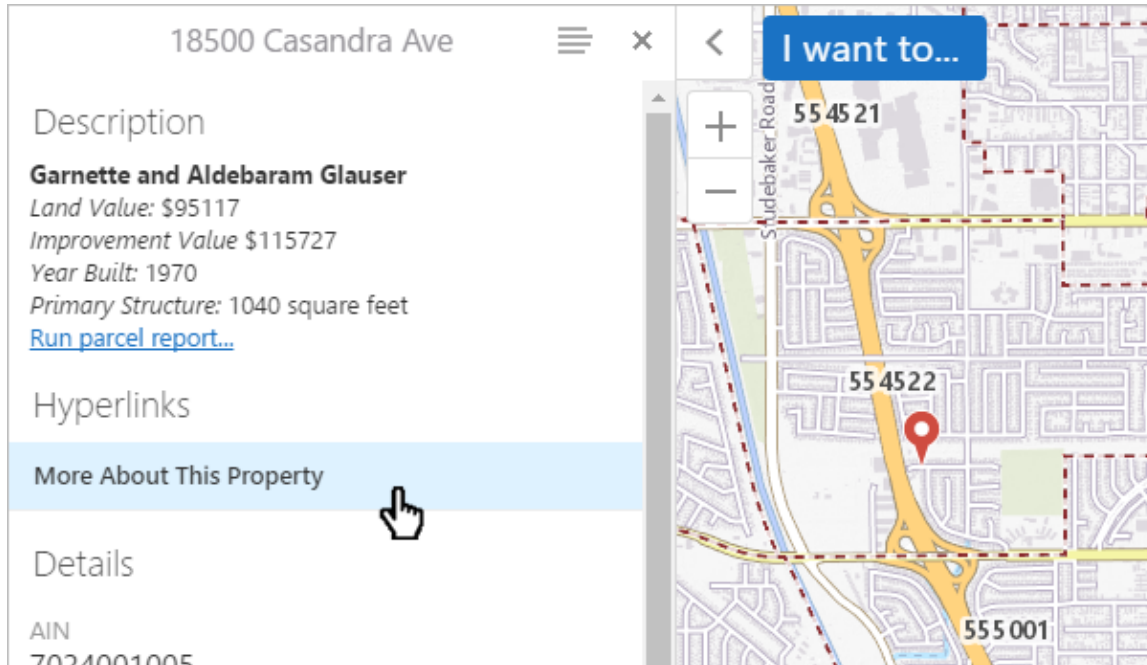


To reorder your items, click and drag the  **Sort** handle and click **Save Site**.

## 30 Feature Hyperlinks

Feature hyperlinks are links to web pages that are relevant to the current feature. They give the end user easy access to information related to the feature. For example, if a layer has fields for latitude and longitude, you could create a feature hyperlink that links to the feature's Google Street View.

In the viewer, feature hyperlinks appear as a section in the feature details.



#### A feature hyperlink in the viewer

Feature hyperlinks can be static URIs, or they can be generated at run time in the viewer. Generating the URI at run time makes it possible to build values that are specific to the current feature into the URI. This is done by including [field tokens](#) or [layer tokens](#) in the configured URI. Field tokens are replaced at run time with the field's value for the selected layer. Field tokens can also be used in the hyperlink's text and tool tip.

#### Example: Feature Hyperlink that Contains a Field Token

The feature hyperlink shown below is configured on the Zip Codes layer. It uses the {ZIP} field token in the hyperlink text, URI, and tool tip. The Icon URI also includes the {VirtualDirectoryUri} client token.

#### Configuration of a feature hyperlink using field tokens

If a user searched for the zip code 28269 and selected the 28269 feature from the Zip Code layer, the feature details would include the configured feature hyperlink. The feature hyperlink's text would appear as "28269 Census Data", where 28269 is the feature's {ZIP}. In the same way, the URI would point to `http://www.city-data.com/zips/28269.html`, where 28269 is the feature's {ZIP}.

## 30.1 Settings that Apply to All Feature Hyperlinks

- **Invalid/Broken Links:** You can configure whether the viewer should display feature hyperlinks that are invalid or broken. The viewer tests each feature hyperlink before displaying it to determine whether the hyperlink works.


There are three options:

- **Show:** Always show the feature hyperlinks for this layer. This is the default value. This option is useful when the feature hyperlinks point to your own servers.
- **Show Disabled:** If a feature hyperlink is invalid or broken, show the hyperlink as grayed out in the viewer. This option is useful when the layer's feature hyperlinks point to external resources that may be temporarily unavailable. The availability of the feature hyperlink depends on the availability of the resource when the user opens the feature details.
- **Hide:** If a feature hyperlink is invalid or broken, do not show the hyperlink in the viewer. This option is useful when the layer's feature hyperlinks contain [field tokens](#). If the field used in a feature hyperlink contains invalid data, or no data, the hyperlink will be invalid. The only way to fix the hyperlink for a feature with invalid or missing data is to fix the data.



## 30.2 Settings for Individual Hyperlinks

Individual feature hyperlinks have the following settings:

- **Hyperlink Text:** (optional) The text for the link. You can use [field tokens](#) and [layer tokens](#) in the Hyperlink Text box. Click **Edit** to select from a list of available tokens.  
If you leave the Hyperlink Text box blank, the URI is used.
- **URI:** The URI to link to. You can use [field tokens](#) and [layer tokens](#) in the URI text box. Click **Edit** to select from a list of available tokens.
- **Encode Field Values:** Specify whether to URL encode the values that replace field tokens. URL encoding replaces non-ASCII characters and reserved ASCII characters with safe, equivalent ASCII characters.  
The default setting, **Automatic**, URL encodes tokens when they are combined with text. If the URI box contains only a token (no text), the viewer does not URL encode the value. In this case, the viewer assumes the field contains a complete URI that is already URL encoded.
- **Tool Tip (optional):** The text to display when the mouse hovers over the hyperlink. You can use field tokens in the Tool Tip text box. Click **Edit** to select from a list of available tokens.
- **Icon URI (optional):** The URI of the icon to display beside the hyperlink. If you leave the Icon URI box blank, the default  link icon appears beside the feature hyperlink.
- **Target:** The browser window to open when the user clicks the hyperlink. If you leave the Target setting blank, the link opens in the current browser tab. To open the target in a new window, enter `_blank`.


See Also...

[Field Tokens on page 42](#)


[Server Replacement Tokens on page 36](#)

## 30.3 Add a Feature Hyperlink

 **To add a feature hyperlink:**

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click **Add Feature Hyperlink**.
3. Configure the settings.  
See [Settings for Individual Hyperlinks on page 236](#) for information about the settings.
4. Configure the settings.
5. Choose **OK**.  
The feature hyperlink is created.
6. Choose **Save Site**.



To reorder your items, click and drag the  **Sort** handle and click **Save Site**.

## 31 Dynamic Layers-Enabled Map Services

ArcGIS Server's Dynamic Layers feature enables other applications to change the appearance and behavior of the layers in the map service. Geocortex Essentials supports the Dynamic Layers feature.

Having Dynamic Layers enabled in a map service provides the following additional functions in Essentials:

- **Layer Drawing Order:** Change the drawing order of the map service's layers in Manager.
- **Symbolization:** Create layer styles that end users can select in a list. Enable end users to create new layer symbolization and turn the symbolization on and off.
- **Labels:** Change the default visibility of a layer's labels in Manager, and enable end users to turn labels on and off in the viewer and modify the font.
- **Dynamic Layers:** Add dynamic layers in Manager and enable end users to add dynamic layers in the viewer.

### 31.1 Map Service Requirements for Dynamic Layers

To use ArcGIS Server's Dynamic Layers feature in Essentials, the map service must be published and configured in a particular way in ArcGIS Server:

#### Publish the Map Service

- You must publish the map service as a Dynamic Map Service.
- If you want to be able to change the default visibility of a layer's labels, or you want the end user to be able to turn the layer's labels on and off, the default visibility of the layer's labels must be turned on when you publish the map service. In addition, the layer must have label data.

#### Enable Dynamic Layers

When you enable Dynamic Layers:

- Select **Allow per request modification of layer order and symbology**.
- If you want to be able to add dynamic layers in Manager or in the viewer, you must configure a Dynamic Workspace.

For detailed instructions on enabling Dynamic Layers, refer to Esri's [Dynamic Layers](#) documentation.

### 31.2 Verify that the Dynamic Layers Feature is Enabled

► **To verify that an ArcGIS dynamic map service that you have added to a site supports dynamic layers:**

1. In Manager, edit the map service that you want to configure, and then click the **Details** tab.
2. Locate the **Supports Dynamic Layers** setting.

If Supports Dynamic Layers is True, the map service supports the Dynamic Layers feature. You can use [Dynamic Layers functions](#) in Essentials.


If Supports Dynamic Layers is False, the map service does not support the Dynamic Layers feature and you cannot use Dynamic Layers functions in Essentials.



You can also verify Dynamic Layers support by looking at the Supports Dynamic Layers property in the Geocortex Essentials REST API Sites Directory.

## 31.3 Verify that a Layer has Labels

### ▶ To verify that a layer in an ArcGIS map service has labels:

1. Open the ArcGIS REST Services Directory for the map service that the layer belongs to.  
You can do this from Essentials Manager:
  - a. Edit the map service.
  - b. Select  **View REST Endpoint**.  
The Geocortex Essentials REST API Sites Directory opens.
  - c. Select the **Connection String** hyperlink.  
The ArcGIS REST Services Directory opens.
2. Select the hyperlink for the desired layer.
3. Locate the **Has Labels** property.  
If Has Labels is `True`, the layer has labels.  
If Has Labels is `False`, the layer does not have labels and you cannot use the label visibility functions in Essentials.

## 31.4 Dynamic Layers

A dynamic layer is a layer that is configured outside of the map service's ArcGIS Server configuration. (The layers that are configured in ArcGIS Server are static.) There are two ways to add dynamic layers in Essentials:

- **JSON:** Configure the JSON definition for the dynamic layers in Manager.
- **Legacy Layer Catalog:** Build a layer catalog that defines the dynamic layers, and then point Manager to the layer catalog. This method of building a layer catalog requires custom development to your Essentials installation and has been deprecated in favor of [Layer Catalog Sites on page 65](#).

Both these methods require that the map service meet the [requirements for Dynamic Layers](#).

Dynamic layers can be operated on in the viewer the same way as static layers—they can be searched, used in identify operations, printed, and so on.

## 31.4.1 Add Dynamic Layers Using JSON

In this method, you add a dynamic layer to a map service by pasting the JSON definition for the layer into Manager. The JSON definition must comply with the ArcGIS Server specification for dynamic layers. For information, refer to [ArcGIS REST API for 10.1, Dynamic Layer / Table](#). An example layer definition is given [below](#).

### ► To add a layer from a JSON definition:

1. In Manager, edit the map service that you want to configure.
2. Click the **Add/Remove Layers** tab.
3. Click the **+** **Add Dynamic Layer** icon at the top of the Included Layers list.  
If there is no Add Dynamic Layer icon, make sure the layer catalog has been added to the map service that you are editing. Follow the instructions to [add the layer catalog](#).
4. Select **Create a new Layer from a JSON definition**, and then **Next**.
5. In the **Layer Name** box, type the name that you want to display for this layer.
6. In the **Dynamic Definition** text box, paste the JSON definition for the layer.

**Add Dynamic Layer** ✕

Define a new dynamic layer by supplying a dynamic definition in JSON format.

Layer Name:

Dynamic Definition: 

```
{
  "id": 1234,
  "source": {
    "type": "dataLayer",
    "dataSource": {
      "type": "table",
      "workspaceId": "CharlotteFolder",
      "dataSourceName": "schools"
    }
  },
  "drawingInfo": {
    "renderer": {
      "type": "simple",
      "symbol": {
        "type": "esriSMS",
        "style": "esriSMSDiamond",
        "color": [255,255,0,255],
        "outline": {
          "color": [0,0,0,255],
          "width": 1
        }
      }
    }
  }
}
```

### Add a dynamic layer to a map service using the layer's JSON definition

7. Click **Finish**.

8. Click **Submit Layer Changes**.

9. Click **Save Site**.

The new layer is added to the map service. It appears at the top of the list on the Map Services tab.

By default, the layer's visibility is turned off. To see the layer in the map preview, select the checkbox beside the layer on the Map Services tab.

### Example JSON for a Dynamic Layer

```
{
  "id": 1234,
  "source": {
    "type": "dataLayer",
    "dataSource": {
      "type": "table",
      "workspaceId": "CharlotteFolder",
      "dataSourceName": "schools"
    }
  },
  "drawingInfo": {
    "renderer": {
      "type": "simple",
      "symbol": {
        "type": "esriSMS",
        "style": "esriSMSDiamond",
        "color": [255,255,0,255],
        "outline": {
          "color": [0,0,0,255],
          "width": 1
        }
      }
    }
  }
}
```

#### 31.4.2 Legacy Layer Catalogs



The Legacy Layer Catalogs feature requires custom development to your Essentials installation and has been deprecated in favor of [Layer Catalog Sites on page 65](#). Legacy layer catalogs only work with dynamic layers.


The Legacy Layer Catalog feature allows you to add a catalog of layer definitions that can be used to add dynamic layers to a map service. Layers are ordered automatically so that each layer has adequate visibility: polygon layers appear on the bottom, then lines, then points. Once the layer catalog is built, its custom assemblies are integrated into the Essentials REST API and Manager. The layer catalog is then configured in Manager following the procedure below.

► **To add a layer catalog to a map service in Manager:**

1. In Manager, edit the map service that you want to configure, and then click the **Functional** tab.
2. In the **Layer Catalog Provider Name** drop-down list, select the layer catalog.
3. Click **Apply Settings**.
4. Click **Save Site**.  
You can now add layers from the catalog using Manager, and enable end users to add layers from the catalog.

### 31.4.3 Use a Layer Catalog to Add Dynamic Layers in Manager

► **To add dynamic layers from a layer catalog using Manager:**

1. In Manager, edit the map service that you want to configure.
2. Click the **Add/Remove Layers** tab.
3. Click the  **Add Dynamic Layer** icon at the top of the Included Layers list.  
If there is no Add Dynamic Layer icon, make sure the layer catalog has been added to the map service that you are editing. Follow the instructions to [add the layer catalog](#).
4. Select **Select predefined layers from a catalog**, and then click **Next**.
5. Select the checkbox beside each layer that you want to add to the map service.
6. Click **OK**.
7. Click **Submit Layer Changes**.
8. Click **Save Site**.


## 31.5 Layer Drawing Order

### 31.5.1 Change the Layer Drawing Order in Manager

You can change the order that a map service's layers are represented on the map. When a layer lies on top of another layer, the upper layer may obscure part or all of the layer underneath. By default, the layers are drawn in the order that they appear in the map service.


The map service must meet the [map service requirements for Dynamic Layers](#).

▶ **To change the drawing order of layers in a Dynamic Layers-enabled map service:**

1. In Manager, edit the map service that you want to configure.
2. Click the **Drawing Order** tab.  
If there is no Drawing Order tab, the map service is not an ArcGIS Server dynamic map service with Dynamic Layers enabled.
3. Click and hold the  **Sort** handle beside a layer you want to move, and then drag the layer to the new position in the list.
4. Continue dragging and dropping layers until the layers are sorted the way you want them.
5. Click **Submit Layer Changes**.
6. Click **Save Site**.

▶ **To reset the drawing order to the default order:**

The default order is the order that the layers appear in the map service.

1. In Manager, edit the map service that you want to configure.
2. Go to the **Drawing Order** tab.  
If there is no Drawing Order tab, the map service is not an ArcGIS Server dynamic map service with Dynamic Layers enabled.
3. Click  **Reset**.
4. Click **Submit Layer Changes**.
5. Click **Save Site**.

## 31.6 Symbolization and Dynamic Layers

Map services with dynamic layers enabled give end users control of layer symbolization from the viewer. There are two ways you can give end users control of layer symbolization for feature layers or map services that have dynamic layers enabled:

- Create layer styles that end users can select in a list.
- Enable end users to create new layer symbolization and turn the symbolization on and off.



Symbolization can also be enabled for feature layers.

For symbolization configuration information, see [Symbolization on page 244](#).

## 31.7 Labels

### 31.7.1 Set the Default Visibility of Labels

You can configure the default visibility of a layer's labels. The layer must belong to a map service that meets the [map service requirements for Dynamic Layers](#).

If you turn on label visibility, by default users will see the labels when they zoom the map to show the layer's features. If you turn off the default visibility, the labels are initially hidden. Users can turn the labels on and off in the viewer, regardless of how the default visibility is configured.

#### ▶ To set the default visibility of a layer's labels:

1. In Manager, [edit the site](#) that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.
2. Select the ▶ expand icon beside the map service to show the map service's layers.
3. Use the ⌵ drop-down menu beside the layer and do one of the following:
  - **Show Labels Initially:** Select the Show Labels checkbox.
  - **Hide Labels Initially:** Clear the Show Labels checkbox.
4. Click **Apply Changes**.
5. Click **Save Site**.



You can also set the default visibility of a layer's labels using the Show Labels setting on the layer's Details tab.

#### ▶ To set the default visibility of the labels in every layer in a map service:



Batch editing overwrites the existing configuration for every layer in the folder or service. The only way to restore the previous configuration after you click Apply Changes is to individually reconfigure each setting in each layer.

1. In Manager, [edit the site](#) that you want to configure, click **Map** in the side panel, and then click the **Map Services** tab.
2. Use the ⌵ drop-down menu beside the map service.
3. In the **Batch Edit** area, do one of the following:
  - **Show Labels Initially:** Select the **Show Labels** checkbox.
  - **Hide Labels Initially:** Clear the **Show Labels** checkbox.



4. Click **Apply Changes**.
5. Click **Save Site**.

### 31.7.2 Enable End Users to Turn a Layer's Labels On and Off

You do not need to do any additional configuration to enable end users to turn a layer's labels on and off or change the font. If the layer belongs to a map service that meets the [map service requirements for dynamic layers](#), then working with labels is automatically available in viewers.

To turn a layer's labels on or off, the user clicks the layer in the Map Layers panel, and then toggles the Show Labels option in the Layer Actions Menu. To change attributes of the font, the user clicks the icon beside Show Labels.

You can configure additional font families for users to choose from when they change the font that is used for labels. For instructions, refer to "LabelOptions Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

## 32 Symbolization

There are two ways to give end users control of layer symbolization for feature layers or map services that have dynamic layers enabled:


- Create layer styles that end users can select in a list.
- Enable end users to create new layer symbolization and turn the symbolization on and off.

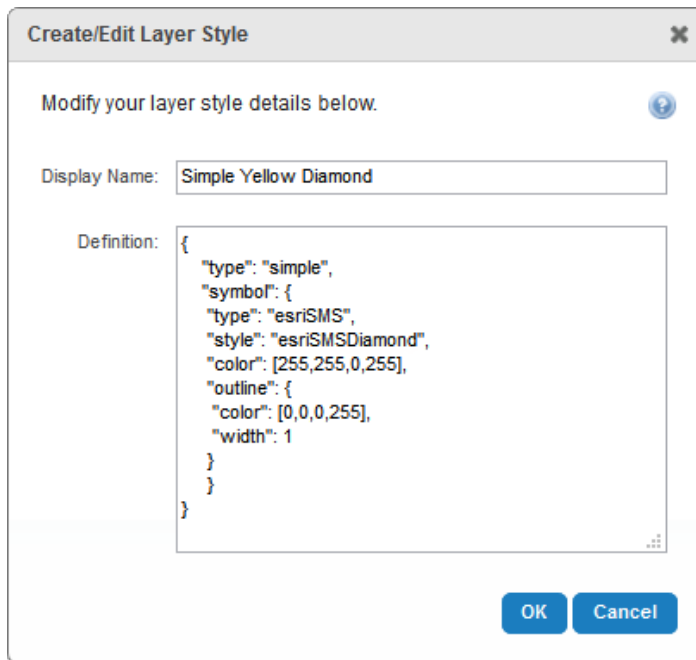
This article discusses symbolization configuration in Essentials. For viewer configuration information, see "LayerStyles Module" and "LabelOptions Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

### 32.1 Create Layer Styles that End Users can Select

A **layer style** is layer symbolization that you define in Manager. In the viewer, end users can select a style from the list of styles that are defined for a layer. The selected style replaces the layer's default symbolization.

#### To create a layer style:

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Styles** tab.
3. Click **Add Layer Style**.
4. In the **Display Name** text box, type a name for the layer style.  
The display name can include spaces and special characters. The display name appears in the list of layer styles that end users select from.
5. In the **Definition** text box, enter the JSON for an ArcGIS renderer.  
Essentials supports simple, unique value, and class breaks renderers. For information, refer to the ArcGIS documentation on [renderers](#) ([http://agsdemo.geocortex.com/arcgis/sdk/rest/index.html#/Renderer\\_objects/02ss000002v00000/](http://agsdemo.geocortex.com/arcgis/sdk/rest/index.html#/Renderer_objects/02ss000002v00000/)).




Example of a layer style definition

6. Click **Save Site**.

#### ▶ To re-order the list of layer styles:

Layer styles appear in the viewer in the same order that they appear on the Styles tab in Manager.

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Styles** tab.
3. In the list of layer styles, click and hold a layer style that you want to move to a different position in the list.
4. Drag and drop the layer style to its new position.
5. Continue to drag and drop layer styles until the list is ordered the way that you want it.
6. Click **Save Site**.

## 32.2 Enable End Users to Create New Layer Symbolization

To enable end users to create new symbolization for a layer and turn the symbolization on and off, turn on the layer's Allow Symbolization setting in Manager. The layer must be a feature layer or belong to a map service that meets the [map service requirements for Dynamic Layers](#).




For ArcGIS dynamic map service layers, we recommend that you do not use layer transparency for layers that users can re-symbolize. This is configured in the map service itself, not in Essentials. Layer transparency cannot be edited or removed by the user, and it may lead to a confusing user experience. For these services, use only symbol transparency.

When a user configures symbolization for a layer, the new symbol replaces the layer icon that is configured for the layer in Manager. The user can turn the symbolization on and off. When symbolization is on, the user's symbol shows. When symbolization is off, the layer icon shows.

To create new symbolization for a layer, the user clicks the layer in the layer list, and then clicks the Symbolization hyperlink in the Layer Actions Menu. This opens the Symbolize Layers panel, which has settings for the symbolization type (simple, class breaks, unique values), symbol shape, size, border and fill color, and transparency. To turn symbolization on and off, the user clicks the layer in the layer list, and then toggles the Symbolization checkbox in the Layer Actions Menu.


#### ▶ To enable end users to change a layer's symbolization:

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.
2. Click the ▶ icon beside the map service to show the map service's layers.
3. Click the  icon beside the layer and select the **Allow Symbolization** checkbox.  
If you clear the Allow Symbolization checkbox, end users will not be able to change the layer's symbolization.
4. Click **Apply Changes**.
5. Click **Save Site**.

#### ▶ To enable end users to change the symbolization for every layer in a map service:



Batch editing overwrites the existing configuration for every layer in the folder or service. The only way to restore the previous configuration after you click Apply Changes is to individually reconfigure each setting in each layer.

1. In Essentials, edit the site that you want to configure, select **Map** in the side panel, and then the **Map Services** tab.
2. Click the  icon beside the map service.
3. In the **Batch Edit** area, select the **Allow Symbolization** checkbox.  
If you clear the Allow Symbolization checkbox, end users will not be able to change the symbolization for any layer in the map service.
4. Click **Apply Changes**.
5. Click **Save Site**.

## 33 Time Sliders

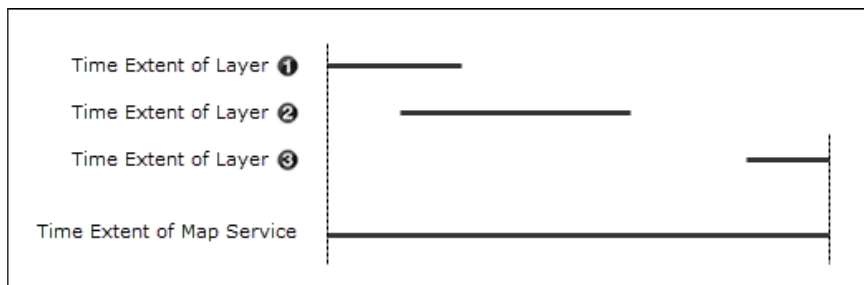
The Time Sliders feature in Essentials allows you to display time-aware map services and layers on the map. In the viewer, end users can use a configured time slider to visualize time-aware data. Time sliders show and hide features based on each feature's time data and the user's time selection on the timeline. Every time-aware layer that is visible on the map are visualized at once.

### 33.1 Time Extent

Time-aware map services and layers each have a time extent. The time of each data point lies within its layer's time extent. Each map also has a time extent, which is the full time extent of all the connected time-aware map services and layers.

#### Time Extent of a Map Service

The time extent of a map service with multiple time-aware layers spans the individual time extents of the layers. This is illustrated in the following figure. The top three horizontal lines represent the time extents of the map service's three time-aware layers. The bottom horizontal line is the time extent of the map service.



**The time extent of a map service spans the time extents of its time-aware layers**

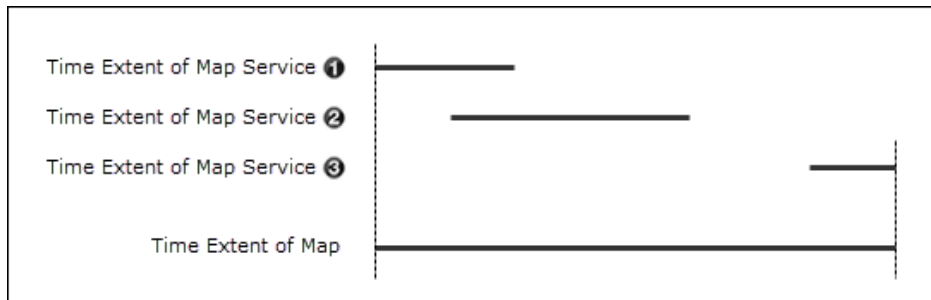
For example, suppose your site has a map service with two time-aware layers:

- **Hurricanes Layer:** Has data on hurricanes from March 12, 1950, to September 22, 2005.
- **Tsunamis Layer:** Has data on tsunamis from July 16, 1995, to February 3, 2011.

The map service's time extent is March 12, 1950, to February 3, 2011.

## Time Extent of the Map

The time extent of a site's map is determined similarly to how the time extent of a map service is determined, except in this case, it is the time extents of map services that are combined, instead of layers. The time extent of a site's map spans the time extents of all its time-aware map services.



The time extent of a map spans the time extents of its time-aware map services

## Override a Time-Aware Map Service's Time Extent


You can override a time-aware map service's time extent in Essentials. For example, if a map service provides 100 years of data, from January 1, 1900, to January 1, 2000, you can limit the data available in the viewer to be a portion of the 100 years of data. In this case, you could override the map service's time extent to start at January 1, 1980.

### ► To configure a time-aware map service's time extent:

1. In Manager, edit the map service that you want to configure.
2. On the **Functional** tab, select the **Override Time Settings** checkbox.  
If the Functional tab does not have settings for Override Time Settings, Start Time, and End Time, then the map service you are editing does not support time-aware layers.
3. Click in the **Start Time** box to open a calendar, and then click the date you want to use as the beginning of the time slider's time extent.  
The date must be in UTC (Coordinated Universal Time).
4. Click in the **End Time** box to open a calendar, and then click the date you want to use as the end of the time slider's time extent.  
The date must be in UTC (Coordinated Universal Time).
5. Click **Apply Details**.
6. Click **Save Site**.

## 33.2 Configure Time Sliders

In Manager, you can configure new time sliders from the **Time Sliders** page in the main menu. You can use the **+ Add Time Slider** button to create a new time slider configuration that users can choose in the viewer.

Alternatively, you can use the  **Import Time Sliders** button to add a time slider that is configured based on the map's current time-aware layers. The time slider's name and extent are generated from the layer information. If your map has multiple time-aware map services enabled, you can also create a preconfigured Aggregated Time Slider, which has a start time and end time that encompasses all of the map's time-aware layers.

Once you have configured time sliders in Manager, you can activate the time slider map widget in the viewer. For more information about configuring time sliders in the viewer, see "TimeSlider Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

## Configuration Settings

- **Display Name:** The display name. End users see this name in the viewer as the Time Profile when multiple time sliders are available.
- **Description:** The description of the time slider. End users see this description in the viewer.
- **Slider Minimum:** The earliest point for the period of time represented by the time slider.
- **Slider Maximum:** The latest point for the period of time represented by the time slider.
- **Extent Minimum:** The configured starting point of the time extent on the time slider.  
For example, while the Slider Minimum for a time slider may be set to 9:00am, the Extent Minimum could be set to 11:00am.
- **Extent Maximum:** The configured end point of the time extent on the time slider.  
For example, while the Slider Maximum for a time slider may be set to 11:59pm, the Extent Maximum could be set to 9:00pm.
- **Date Format:** The date and time format that the time slider displays in the viewer.  
For more information about date/time formats, see [Format Date/Time Fields on page 331](#).
- **Mode:** Configures the time slider time mode. The mode can be configured to the following settings:
  - **Time Extent:** Displays a range of time that can be manipulated. The range is defined by two draggable handles which mark the beginning and end of the time extent.
  - **Cumulative From Start:** Displays cumulative data over a time span. The slider's handle can be dragged to set the end of a time span. Unlike the Extent mode, there is no handle to set the beginning of the time span. The end user uses the handle to show more or less data as it accumulates over time.
  - **Time Instant:** Displays a particular instant in time. If the time-aware layer does not have data for that particular instant in time, the map renders no data.
- **Time Interval:** Chooses how many time interval units should be between each selectable position on the time line.  
For example, a time-aware layer has 12 months of changes and the Time Interval Unit is set to months. If the Time Interval is set to 1, then the timeline has twelve unique positions.
- **Time Interval Unit:** The unit of time that the timeline should display.



Each tick on a timeline represents an instant, as defined by the Time Interval and Time Interval Unit settings. The timeline shows a maximum of 50 instants. For example, even if the time interval is set to milliseconds and the time extent is set to 3 months, the timeline limits the selectable instants to 50. We recommend setting time intervals so that there are fewer than 50 instants on the timeline.

- **Snapping:** Select whether the time slider should snap to the configured time interval or ignore the configured time interval.

## 34 Data Connections

Data connections contain the information that Geocortex Essentials needs to connect to the data provider, execute commands, and retrieve data from external data sources. A data connection links Essentials to an RDBMS (relational database management system), such as SQL Server, Oracle, Excel spreadsheets, or Microsoft Access. Essentials uses [ADO.NET providers](#) to perform all linking operations.

Data connections enable the following functionality on your site:

- **Data Links:** Data links associate data from an RDBMS to a layer and can be viewed from within selected feature's details. For information, see [Data Links on page 257](#).
- **Search Tables:** Search tables allow users to use Global Search to find non-spatial data from an RDBMS. For information, see [Search Tables on page 263](#).

You must configure a data connection if you want to use data links or search tables on your site.

Select **Data Connections** in the Manager sidebar to view a list of existing data connections; to add or import new data connections; and to edit or remove existing data connections.

Data Connections				
Display Name	Connection String	Provider	Verify on Startup	
JobDataByZip	Driver={Microsoft Excel Driver (*.xls, *.xlsx, *.xlsm, *.xlsb)};Dbq=C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\Sites\LA_County\Resource s\Data\JobDataByZip.xlsx	System.Data.Odbc	False	
LAParkTrees	Driver={Microsoft Excel Driver (*.xls, *.xlsx, *.xlsm, *.xlsb)};Dbq=C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\Sites\LA_County\Resource s\Data\LAParkTrees.xlsx	System.Data.Odbc	False	
PoliceDeptInfo	Driver={Microsoft Excel Driver (*.xls, *.xlsx, *.xlsm, *.xlsb)};Dbq=C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\Sites\LA_County\Resource s\Data\PoliceDepartmentInfo.xlsx	System.Data.Odbc	False	

The Data Connections list with three configured data connections

## Supported Data Providers

Essentials uses [ADO.NET providers](#) to perform all linking operations. While you can use an ADO.NET provider of your choice, Geocortex Essentials supports the following data providers:

- ODBC connections to the following types of file:
  - Microsoft Excel (.xls, .xlsx)
  - Comma-Separated Values (.csv)
  - Microsoft Access (.mdb)
  - dBase (.db)
  - OLE DB
- Oracle Client
- SQL Client
- SQL Server CE

## Add an ODBC Connection

ODBC connections are used to connect to file-based data providers. Geocortex Essentials supports the following file-based providers:

- Microsoft Excel (.xls, .xlsx)
- Comma-Separated Values (.csv)
- Microsoft Access (.mdb)
- dBase (.db)

In order for Essentials to access an ODBC data file, the file must reside in your Sites folder or one of its subfolders. You can either copy the file to the Sites folder before you create the data connection, or you can use Manager's Upload function to copy the file over when you configure the connection.

When adding an ODBC connection, you are asked to choose between the Basic and Advanced methods of configuring the connection. If you choose the Basic option, Essentials creates the connection string for you. The Basic connection string uses the MS Access (\*.mdb) driver; the DBQ is the path to the database file. When you use the Basic option, all you have to do is browse to the MDB file so Manager knows the path and file name to specify as the DBQ.

Choose the **Advanced** option if:

- The connection is specified in a system DSN or file DSN.
- You want to select a different ODBC driver.
- You want to specify connection options in the connection string.

You can edit the connection string at any time after the data connection is created.

### To add an ODBC connection:

1. In Manager, edit the site that you want to configure.
2. Click **Data Connections** in the side panel



3. Click **Add Data Connection**.

The Create Data Connection wizard opens.

4. Type a display name for the data connection.
5. Select **ODBC** as the data provider.
6. If you want Essentials to test the connection whenever the site loads, select the **Verify on startup** checkbox.
7. Click **Next**.

The **Basic** option creates the connection string for you. Select the **Advanced** option if you want to select a particular driver, specify a DSN, or specify options in the connection string.

#### Basic

- a. With **Basic** selected, select **ODBC**.
- b. Click **Next**.
- c. If the database file is already in the Sites folder, browse to the file and select it.  
If the database file is located outside the Sites folder, **upload** the file.
- d. Click **Finish**.  
The wizard closes and the data connection appears on the Data Connections page.

#### Advanced

- a. Select **Advanced** and follow the instructions that apply to you:

##### DSN

- i. Select **Choose a DSN**, and then click **Next**.
- ii. Select the DSN from the list, and then click **Finish**.  
The wizard closes and the data connection appears on the Data Connections page.

##### ODBC Driver

- i. Select **Choose an ODBC driver**, and then click **Next**.
- ii. Select the driver from the list, and then click **Next**.
- iii. If the database file is already in the Sites folder, browse to the file and select it.  
If the database file is located outside the Sites folder, upload the file.
- iv. Click **Finish**.  
The wizard closes and the data connection appears on the Data Connections page.

##### Connection String

- i. Select **Specify a connection string**, and then click **Next**.
- ii. Type in the connections string.
- iii. Test the connection.
- iv. Click **Finish**.  
The wizard closes and the data connection appears on the Data Connections page.

8. Click **Save Site**.

---

Additional configuration settings are available once the data connection has been created. For information, see [Edit a Data Connection](#) on page 256.

## Add an OLE DB Connection


### ▶ To add an OLE DB data connection:

1. In Manager, edit the site that you want to configure.
2. Click **Data Connections** in the side panel
3. Click **Add Data Connection**.  
The Create Data Connection wizard opens.
4. Type a display name for the data connection.
5. Select **OLE DB** as the data provider.
6. If you want Essentials to test the connection whenever the site loads, select the **Verify on startup** checkbox.
7. Click **Next**.
8. Type in the connection string.
9. Test the connection.
10. Click **Finish**.  
The wizard closes and the data connection appears on the Data Connections page.
11. Click **Save Site**.

Additional configuration settings are available once the data connection has been created. For information, see [Edit a Data Connection](#) on page 256.

## Add a SQL Client Connection

### ▶ To add a SQL Client data connection:

1. In Manager, edit the site that you want to configure.
2. Click **Data Connections** in the side panel
3. Click **Add Data Connection**.  
The Create Data Connection wizard opens.
4. Type a display name for the data connection.
5. Select **SQL Client** as the data provider.
6. If you want Essentials to test the connection whenever the site loads, select the **Verify on startup** checkbox.
7. Click **Next**.
8. Type the server name or click the **Refresh Servers** icon  to select from a list of discovered servers.

9. Select the authentication method:
  - Integrated Windows Authentication
  - SQL Server Authentication.  
If you are using SQL Server Authentication, type the user name and password of a user configured in SQL Server.
10. Test the connection.
11. Click **Finish**.  
The wizard closes and the data connection appears on the Data Connections page.
12. Click **Save Site**.

Additional configuration settings are available once the data connection has been created. For information, see [Edit a Data Connection on page 256](#).

## Add a SQL Server CE Connection

### To add a SQL Server CE data connection:

1. In Manager, edit the site that you want to configure.
2. Click **Data Connections** in the side panel
3. Click **Add Data Connection**.  
The Create Data Connection wizard opens.
4. Type a display name for the data connection.
5. Select **SQL Server CE** as the data provider.
6. If you want Essentials to test the connection whenever the site loads, select the **Verify on startup** checkbox.
7. Click **Next**.
8. Type in the connections string.
9. Test the connection.
10. Click **Finish**.  
The wizard closes and the data connection appears on the Data Connections page.
11. Click **Save Site**.

Additional configuration settings are available once the data connection has been created. For information, see [Edit a Data Connection on page 256](#).

## Add an Oracle Client Connection



Before you can add an Oracle data connection, you must first have the Oracle Instant Client software installed on the server hosting Essentials.

### ▶ To add an Oracle Client data connection:

1. In Manager, edit the site that you want to configure.
2. Click **Data Connections** in the side panel.
3. Click **Add Data Connection**.  
The Create Data Connection wizard opens.
4. Type a display name for the data connection.
5. Select **Oracle Client** as the data provider.
6. If you want Essentials to test the connection whenever the site loads, select the **Verify on startup** checkbox.
7. Click **Next**.

You can now choose to create the connection using either the **Basic** option or the **Advanced** option.

The Basic option creates the connection string for you. Select the Advanced option if you want to manually specify a connection string.

#### Basic

- a. Select **Basic**.
- b. Enter at least the following:
  - **Server name:** The name or IP address of the machine running the Oracle database that you wish to connect to.
  - **Instance:** The name of the Oracle database instance to connect to.
  - **User name:** The name of the user to connect as.
  - **Password:** The password for that user.  
You can also enter the port number that the Oracle server is listening on. If you do not specify a port, the **default port of 1521** is used.

#### Advanced

- a. Select **Advanced**.
- b. Enter the full connection string to use for the connection. For example:

```
Data Source=[YourDataSource];User Id=[UserName];Password=[Password];
```

8. For both the Basic and Advanced options, press **Test Connection** to test the connection.
9. Click **Finish**.  
The wizard closes and the data connection appears on the Data Connections page.
10. Click **Save Site**.

Additional configuration settings are available once the data connection has been created. For information, see [Edit a Data Connection on page 256](#).

## Import a Data Connection


### To import one or more data links from a site:

1. In Manager, edit the site that you want to configure.
2. Click **Data Connections** in the side panel.
3. Click **Import Data Connection**.  
The Import Data Connection wizard opens.
4. Select the site in which the data connection is configured, and then click **Next**.
5. Select the data connections that you want to import. To select multiple data connections, hold the **Ctrl** key down while selecting.
6. Click **Finish**.  
The wizard closes and the data connection(s) appear on the Data Connections page.
7. Click **Save Site**.

Additional configuration settings are available once the data connection has been created. For information, see [Edit a Data Connection on page 256](#).

## Edit a Data Connection

### To edit a data connection:

1. Navigate to the Data Connections page from the sidebar in Manager.
2. Edit an existing data connection by selecting the  **Edit** icon next to it.
3. Configure the data connection's settings:
  - **Display Name:** The data connection's display name.
  - **Data Source Type:** The data connection's provider name.
  - **Connection String:** The data connection's string.  
The syntax of the connection string depends on which ADO.NET provider your data uses. For information, see [Connection Strings on page 257](#).
  - **Connection String Name:** The name of the connection string. This setting is optional.
  - **Test Connection on Startup:** If this checkbox is selected, the data connection is tested on startup.
  - **Act Like:** Selects the impersonation behavior. For information, see [Impersonation on page 257](#).
  - **SQL Dialect:** Select the SQL dialect used.
  - **Error Action:** Choose how to handle errors with the data connection.
4. Select Apply Changes and then Save Site.

## 34.1 Connection Strings

The key piece of information to configure is the connection string, which contains the information needed to create a connection to the data provider. The syntax of the connection string depends on which ADO.NET provider you use. Essentials attempts to connect using the connection string in the exact form that you configure it, without interpreting or parsing it. Therefore, it is important to consult the data provider's documentation to find out how to create the connection string. Another useful resource is The Connection String Reference at <http://www.connectionstrings.com>, which provides examples of the connection strings for numerous different providers.

To ensure you have entered the connection string correctly, use the Test Connection function provided by Geocortex Essentials Manager. When you click the Test button, Manager attempts to connect to the data provider using the connection string you have configured. If the connection is successfully established, Manager displays a Success message. If the connection fails, a Connection Failed message is displayed.

## 34.2 Impersonation

By default, Essentials accesses secured data sources using application credentials, which you configure in the connection string. Impersonation occurs when an application makes a request as a user instead of as the application—the application acts like the user.

You can configure Essentials to impersonate the connected user when connecting to a data connection. For Essentials to use impersonation:

- The site must be secured using Integrated Windows Authentication.  
See [Integrated Windows Authentication on page 423](#) for information.
- Windows impersonation must be enabled.  
See [Configure Global Security Settings on page 441](#) for instructions.
- The external data source must be secured using Integrated Windows Authentication.
- The connection string defined in the data connection must indicate to connect using Integrated Windows Authentication.
- Impersonation must be enabled for the data connection.  
To enable impersonation, edit the data connection and set **Act Like** to **Connected Windows User**.

## 35 Data Links

Data links connect your spatial layer attributes and the fields of a table or a view from a data connection. The data link submits your request to the selected data connection and receives the results. The data link does not attempt to interpret the request.




For information about data connections, see [Data Connections on page 250](#).




The `DataLink` command is executed for each distinct set of parameters in your layer selection set. For example, if you have selected 500 features from the Zip Code layer and the Zip Code layer has a custom data link that retrieves sales information by zip codes, it will execute the command for each of the 500 zip codes.

## Add a Data Link

### ▶ To add a data link:


1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Data Links** tab.
3. Click  **Add Data Link**.  
The Create Data Link wizard opens.
4. Type a display name for the data link.
5. Select the data source that you want to link to from the list.  
If the data source does not appear in the list, you must add the connection. See [Data Connections on page 250](#).
6. Select the Data Table and Columns from the table that you want to retrieve data from.  
To select multiple columns, hold down the **Ctrl** key while selecting.
7. Use  **Add Conditions** to create conditions to filter the retrieved data through.
8. Select the Relationship Type.  
The relationship can be either One to One or One to Many. This depends on how the features in the layer relates to the records from the selected data connection.
9. Click **Finish**.  
The wizard closes and the data link(s) appear on the Data Links tab.



To reorder your items, click and drag the  **Sort** handle and click **Save Site**.

## Import a Data Link

### ▶ To import data links:


1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Data Links** tab.
3. Click **Import Data Link**.  
The Import Data Link wizard opens.
4. Select the site in which the data link is configured, and then click **Next**.




You can only import Data Links from sites that contain the same map service that the current layer belongs to.

5. Select the data links that you want to import. To select multiple data links, hold the **Ctrl** key down while selecting.
6. Click **Finish**.  
The wizard closes and the data links appears on the Data Links tab.
7. Click **Save Site**.




To reorder your items, click and drag the  **Sort** handle and click **Save Site**.

## Edit a Data Link

For each layer, you can find a list of existing data links when you select the  **Edit** icon next to the layer and go to the Data Links tab.

To edit an existing data link's name or data connection settings, use the  **Edit** icon next to the data link.

To edit an existing data link's connection string, visibility, and other advanced settings, select the  **Advanced Settings** icon next to the data link. The following settings are configurable:

- **Display Name:** The configured display name. The display name is used in both Manager and viewers.
- **Command:** The command associated with this data link. A command is generated when you create a data link.



You can set up aliases for a data link's selected column using the SQL `as` statement. For example, notice the use of the statement in the following command:

```
SELECT COMMON_NAME as [Common Name], BOTANICAL_NAME as [Botanical Name],
DEVELOPMENT as [Development Type], Family, Genus, Nesting, Form, Type,
Canopy, Height FROM LAPARKTREES WHERE FACILITY = ?
```




- **Data Connection:** Define the connection parameters that allow Essentials to connect to the external data source. For information see [Data Connections on page 250](#).
- **Error Action:** Choose how to handle errors with the data connection.
- **Relationship Type:** The relationship can be either One to One or One to Many. This depends on how the features in the layer relates to the records from the selected data connection.
- **Visible:** Toggle a data link's visibility on or off.
- **Data Time Zone:** Set the time zone of the data.  
For information, see [Specify the Data Time Zone for a Data Link on page 260](#).



## Add Parameters to a Data Link

Parameters create a link between a data connection's field and a feature's field. For example, if you have a field in your database called Parcel\_ID, but on your feature layer the equivalent field is called PID, you can add a parameter to define the relationship that Parcel\_ID and PID have.

### To add a parameter to a data link:

1. From the Data Link tab of a layer's settings, select the  **Advanced Settings** icon next to a data link.
2. Use the  **Add Parameter** button to create a parameter.  
If the parameter already exists, you can edit it with the  **Edit** icon.
3. The following configuration options are available:
  - **Feature Field:** Choose the field from the layer that has the relationship to the linked data.
  - **Default Value:** If a record has no value, you can supply a default value.
  - **Name:** Choose a parameter name.
4. Select Apply Changes and Save Site.

## 35.1 Specify the Data Time Zone for a Data Link



This section describes how to specify the time zone in which a data link's date/time data is stored. For information on configuring the time zone for date/time data in feature attributes and ArcGIS tables, see [Configure Time Zones for Date/Time Data on page 325](#).

By default, Essentials assumes that a data link's date/time data is stored in the time zone of the Essentials server. This is different than date/time data from a feature attribute or ArcGIS table, which Essentials assumes is in Coordinated Universal Time ([UTC](#)) by default.

If you have data link data that is not stored in the Essentials server's local time, you can specify the data's time zone in the data link's advanced settings. This provides the information needed to adjust the values and display them correctly to users.



If your date/time data is not in the Essentials server's local time and you do not configure the time zone, the data may display incorrectly in viewers.

Like date/time data from feature attributes and ArcGIS tables, date/time data from data links is adjusted to the user's local time by the viewer by default. If you prefer to display date/time data in a specific time zone that you choose, you can configure the Display Time Zone setting. For information, see [Configure Time Zones for Date/Time Data on page 325](#).


## Contexts Where the Data Link's Time Zone Applies

The time zone that you configure for a data link applies in the following contexts:

- Map tips
- Feature details (compact and expanded)
- Results List and Results Table

### 35.1.1 Configure the Time Zone for a Data Link

 **To configure the time zone for date/time data in a data link:**

1. In Manager, edit the layer that the data link belongs to.
2. Click the **Data Links** tab.
3. Click the  **Advanced** tool for the data link that you want to configure.
4. In the **Time Zone** drop-down list, select the time zone that the data is stored in.  
Alternatively, you can select a city that is in the same time zone as the stored data.
5. Click **Apply Changes**.
6. Click **Save Site**.

### 35.2 About Data Link Search

Data link searches allow you to perform parameterized queries for data from a data connection. This enables you to link the non-spatial data from a search table to particular features on the map. Once you know which layer your search table relates to you can start to create a data link search.

Data link searches require a data connection, data link, and a search table with Global Search enabled. For information, see:

- [Data Connections on page 250](#)
- [Data Links on page 257](#)
- [Search Tables on page 263](#)

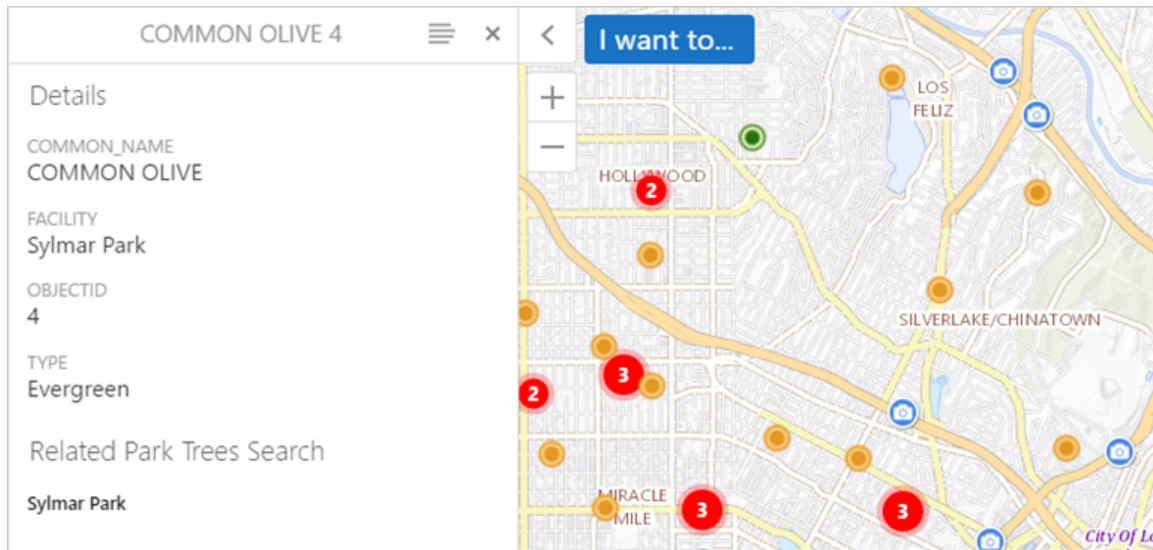
## How are Data Link Searches Different from Data Links?

Although data link searches and data links can both display data retrieved from a data connection, they cannot be used interchangeably:

- Data link search results appear when users view a search table record.  
The search results link to a spatial feature that is related to the search table record.
- Data link results, on the other hand, appear when users view a spatial feature.  
They can only be selected from within the feature details view.

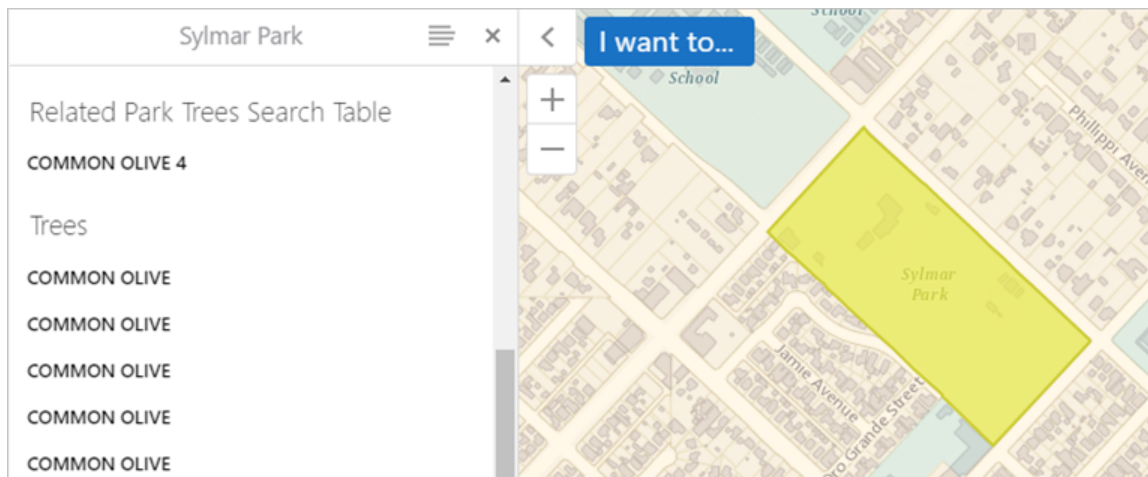
## Data Link Search Example

In the image below, the selected search table record, COMMON OLIVE 4, displays a data link search called Related Park Trees Search. The data link search results appear because the COMMON OLIVE 4 record and the configured data link search have Sylmar Park in common.








A search table record called COMMON OLIVE 4 is selected.

If the user selects the data link search result Sylmar Park, the Sylmar Park feature is selected and highlighted on the map. Notice that the search table record (COMMON OLIVE 4) that was previously selected appears in the feature details so the user can navigate back to the search table record.



A spatial feature called Sylmar Park is selected. The feature details include

► **To set up a data link search:**

1. Configure a data connection on the **Data Connections** section of Manager.  
Data connections define the connection parameters that allow Geocortex Essentials to connect to an external data source. For information see [Data Connections on page 250](#).
2. From the Tables section of Manager, select the  **Add a Search Table** button to configure a search table.  
Search tables define what data from the data connection should be retrieved. For information see [Search Tables on page 263](#).
3. From the Map section of Manager, select the Layer List tab.
4. Locate the layer that relates to the data in your search table and select the **Edit**  icon next to it.
5. Select the Data Links tab and select the  **Add Data Link** button to configure a new data link. If the data link already exists, you can edit it with the  **Edit** icon.  
Data links associate data in your layers with the data from the data connection. For information see [Data Links on page 257](#).
6. Select the  **Add Search** button to configure a search table as a data link search.  
The following settings can be configured:
  - **Display Name:** The display name for the data link search. This display name appears in feature details and should be specific.
  - **Search Table:** The search table that you want to use to perform searches into this data link from the list.
  - **Table Field:** The name of the search table field that links the search table records to the layer's feature details.
  - **Feature Field:** The layer field that relates to the selected Table Field.
7. Select **Apply Changes** and **Save Site**.

## 36 Search Tables



This section refers to search tables, which are not to be confused with [ArcGIS tables](#).

Search tables enable users to search for non-spatial data from a RDBMS (relational database management system) from the Global Search box in a viewer. Search table records appear in the list of search results and behave like features, but they do not return geometry on the map.

Search tables require a configured data connection and must be configured to use Global Search before records appear in results lists. For information, see:

- [Edit a Search Table](#) below
- [Data Connections on page 250](#)

- [Data Links on page 257](#)
- [Global Search on page 216](#)


## Data Link Searches


Data link searches enable you to create a reverse data link from search tables. This enables you to link the non-spatial data from a search table to particular features on the map. For setup information, see [About Data Link Search on page 261](#).

## Add a Search Table

When you define a search table, you specify what external data should be retrieved from the data source and which data can be queried. The search table is defined by an SQL command. The Add a Search Table wizard generates an SQL command for you, but Manager accepts any valid SQL command.


### To add a search table:

To add a new search table, use the  **Add a Search Table** button on the Tables page in Manager. A wizard guides you through the following configuration settings:

1. Navigate to the Tables page from the global sidebar in Manager.
2. Use the  **Add a Search Table** button to enter the wizard.
3. Configure a **Display Name**. The configured display name.  
The display name is used in both Manager and viewers.
4. Select a **Data Connection**.  
Define the connection parameters that allow Essentials to connect to the external data source. For information, see [Data Connections on page 250](#).  
If your data source is not already connected, use the **Add Data Connection** button to create one.
5. Select a table from the **Select a Table** drop-down menu.
6. From the selected table, choose the columns you wish to use with your search table.  
The columns that you select can be queried and displayed in results lists.
7. Use the **Add Condition** button to add data link conditions that filter the data being retrieved from the data connection.  
For information, see [Data Links on page 257](#).

Additional configuration is available when you edit an existing search table. For example, you can make search table records accessible via global search. For information, see [Edit a Search Table](#).


## Import a Search Table

To import a search table, use the  **Import a Search Table** button on the Tables page in Manager. The Import a Search Table Wizard allows you to pick a search table from another site and import it to the current site.

## Edit a Search Table

The list of existing search tables can be found on the Tables page in Manager.



### ▶ To edit an existing search table:


1. Navigate to the Tables page on the global sidebar in Manager.
2. Use the  **Edit** icon next to an existing search table entry.
3. Configure any of the following settings:
  - **Display Name:** The configured display name. The display name is used in both Manager and viewers.
  - **Data Connection:** Define the connection parameters that allow Essentials to connect to the external data source. For information see [Data Connections on page 250](#).
  - **Command:** The command associated with this search table. A command is generated when you create a search table.
  - **Maximum Records:** The maximum number of records returned by the search table. The default value is 1000.
  - **Table Search Icon URI:** The location of an icon file used to identify search table records in a results list. Use the Browse button to locate an icon in your site's virtual directory.
  - **Feature Label:** A feature label used for each search table record in the feature details. If this field is left empty, the default value from the data source is used.
  - **Feature Description:** A feature description used for each search table record in the feature details. If this field is left empty, the default value from the data source is used.
  - **Feature Long Description:** A feature long description used for each search table record in the feature details. If this field is left empty, the default value from the data source is used.
  - **Include in Global Search:** Select this checkbox to enable users to access search table records via the global search box. By default, search tables are not accessible via global search.
4. Select Apply Changes and Save Site.

## Add Parameters to a Search Table

Parameters add a @PARAMETER to a search table's SQL command. For example, if a user searches for "Smith," a search table of owner names with a set parameter named NAME uses the value "Smith" when it runs the SQL command. When the process completes, the user sees all of the entries from the search table that include the name "Smith."

### ▶ To add a parameter to a search table:

1. From the Tables page in Manager, select the  **Edit** icon next to a search table.
2. Use the  **Add Parameter** button to create a parameter.

If the parameter already exists, you can edit it with the  **Edit** icon.

3. The following configuration options are available:
  - **Name:** Choose a parameter name.
  - **Default Value:** If a record has no value, you can supply a default value.
4. Select Apply Changes and Save Site.

## 37 Workflows

Workflows provide a quick and easy way to program complex, interactive, GIS and business processes. You create workflows in the Workflow Designer, which has a drag-and-drop interface, a library of activities, and a built-in simulator to accelerate development and free you from handling low-level details like client-server communications.

At its simplest, a workflow is a sequence of activities. However, there are several factors that affect the power of a workflow. A simple workflow takes some inputs and performs a particular type of operation on them, from which it produces the output. Many GIS workflows fit this pattern. The set of inputs is fed in at the beginning of the workflow, the GIS operations are performed, and the outputs are available at the very end.

The Geocortex Essentials model of workflows goes well beyond this simple model. Geocortex workflows extend the model to general business processes, so your workflows can be made up of a combination of business activities and GIS activities. Furthermore, Geocortex workflows are interactive. They can pause and wait for input as many times as needed and for as long as needed to model your processes.

### 37.1 Workflow Designer


Essentials comes with a powerful designer for creating workflows, **Geocortex Workflow Designer**. Workflow Designer has a built-in help system with instructions for creating workflows.

Workflow Designer has an extensive collection of activities, including both GIS activities and general activities. In addition to using the built-in activities, you can create custom activities. Custom activities appear in Workflow Designer alongside the built-in activities. You work with custom activities in exactly the same way as built-in activities—Workflow Designer treats them like any other activity.

### 37.2 Get Help with Workflow

#### 37.2.0.1 Workflow Designer Help System

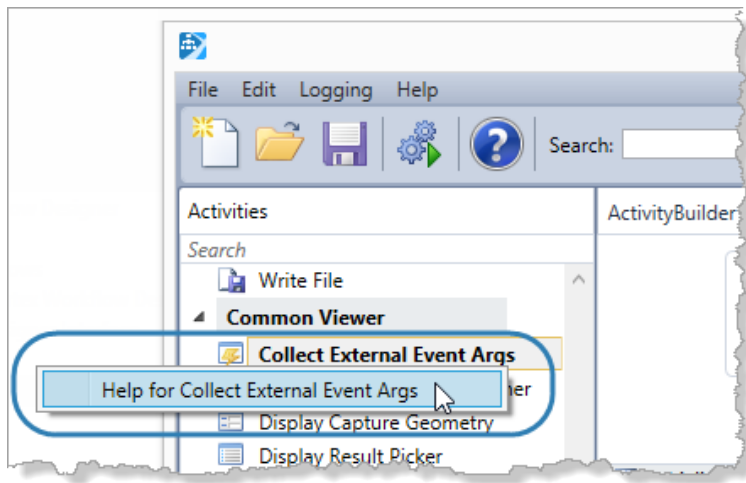
Workflow Designer has a built-in help system with instructions for creating workflows. The help system includes an Activity Library that describes each workflow activity in detail.

To open the help system at the beginning, [launch Workflow Designer](#) and click the help icon  in the banner. You can also open the help system to the page for a particular activity by right-clicking the activity in the Activities panel and selecting the Help option.

#### 37.2.0.2 Help for Individual Activities

Workflow Designer's Activities panel contains a complete list of the activities that ship with Workflow Designer. To find out what a particular activity does, position the pointer over the activity in the Activity panel—a tool tip describing the activity will display. To get additional information about the activity, right-click the activity and select the Help option.

This opens Workflow Designer's help system to the page that provides detailed information about the activity, including information about the activity's function and properties, and suggestions for how you might use the activity in a workflow.



Right-click an activity in the Activities panel to open help for that activity

#### 37.2.0.3 Sample Site

One way to learn about workflows is to experiment with the workflows in an existing site. The LA County sample site that ships with Essentials gives you a place to start. The LA County site has several workflows that you can run in the site's viewer. You can also open the workflows in Workflow Designer and examine their configuration. For more information, see [Explore a Sample Site on page 11](#).

#### 37.2.0.4 Sample Workflows

Geocortex Essentials ships with several sample workflows. In the default Geocortex Essentials installation, the sample workflows are in the following folder:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\Sites\Resources\Workflows
```

#### 37.2.0.5 Workflow Activity Samples

Geocortex Essentials ships with a **Workflow Samples** site that provides samples of individual workflow activities. You can use the sample workflows to learn how individual activities work. Each sample workflow demonstrates one activity. The Workflow Samples site does not contain samples for all activities.

#### ► To use the Workflow Samples site:

This procedure assumes that you are familiar with Geocortex Essentials Manager, the Geocortex Viewer for HTML5, and Workflow Designer.

1. Copy the `Workflow_Samples` folder from the `Sample Sites` folder to the `Sites` folder. This deploys the site.

By default, the `Sample Sites` and `Sites` folders are here:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\
```

2. Prepare to run the sample workflows:



- a. Launch the viewer for the Workflow Samples site.  
The viewer's Home Panel provides information and links to help you use the Workflow Samples site.
  - b. Open the viewer's toolbar.  
The toolbar contains a tool for each sample workflow. You will use these tools to run the sample workflows.
  - c. Open the viewer's Activity Glossary by clicking the link in the Home Panel.  
The Activity Glossary summarizes each activity that is available in Workflow Designer.
  - d. Launch Workflow Designer.  
You are now ready to run the sample workflows to learn about the activities that they demonstrate.
3. Run a sample workflow:
- a. Choose an activity from the toolbar or the Activity Glossary.
  - b. Open the sample workflow in Workflow Designer.  
By default, the sample workflows are here:  

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST  
Elements\Sites\Workflow_Samples\Resources
```

  
Viewing an activity's configuration in Workflow Designer at the same time that you run the activity's sample workflow will help you to understand how the activity works.
  - c. Select the activity on Workflow Designer's design surface.  
This shows the activity's properties in the Properties panel, so you can see how the activity is configured.
  - d. Run the sample workflow by clicking the tool in the viewer's toolbar.  
Follow the prompts that the workflow displays.
  - e. To open the help file for the activity, select the activity in the Activities panel and press F1.
4. Other things to try:
- Change the activity's configuration in Workflow Designer, save your changes, and then re-run the sample workflow to see the effect of your changes.
  - Add a new instance of the activity to the sample workflow, configure it, save your changes, and then re-run the sample workflow.

#### 37.2.0.6 Geocortex Support Center

The [Geocortex Support Center](#) has several resources to help you to learn about Workflow and share your ideas:

- **Community:** The Support Center has a [Workflow Community](#) where you can post questions about workflows.
- **Knowledge Base:** The Support Center's Knowledge Base has a [Workflow and Workflow Designer](#) area that contains articles about advanced Workflow topics.
- **Code Gallery:** The Support Center's Code Gallery has a [Workflows and Workflow Designer](#) area where you can download sample workflows that have been posted by Latitude Geographics or by Geocortex partners and customers.
- **Ideas:** The Support Center's [Ideas](#) area allows you to suggest improvements to Workflow and Forms.

- **Videos:** The Support Center's [Videos](#) area offers videos that show you how to use different activities and form elements.

## 37.3 Workflow Architecture

Geocortex Workflow is based on Microsoft Workflow Foundation 4.0, which is part of the .NET 4.0 stack. Being implemented in .NET on the server has many advantages. The main advantage is that it places the power of Windows Communication Foundation (WCF) and other .NET technologies at your command. Another advantage is having access to the libraries of the .NET Framework, which makes interaction with other systems straightforward. It also allows you to leverage existing knowledge in .NET programming for creating custom activities.

### 37.3.1 Workflow Files

Workflows are stored as `.xaml` files. When you create a workflow in Workflow Designer, you are actually creating a `.xaml` file. The `.xaml` file contains all the information needed to run the workflow.

Because they are based on XML, workflows are not compiled. This means that you can inspect and edit a workflow in a text editor or XML editor if you want to—there is no need to edit through the Workflow Designer, although the Designer does make it much easier to build and visualize the flow of activities.

### 37.3.2 Extensions to Microsoft Workflow Foundation

Geocortex Workflow extends Microsoft Workflow Foundation in several ways:

- **Interactivity:** Geocortex workflows are interactive. Because workflows are served through REST, which is stateless, the entire state of the workflow is packaged and sent to the client for execution of client-side activities. No server resources are tied up while the workflow is waiting for input or displaying alerts on the client.
- **Activities:** Many of the activities in the Workflow Designer's built-in library of activities complement out-of-the-box Microsoft Workflow. A minority are out-of-the-box Microsoft Workflow activities. The Workflow Designer's extended set of activities includes a wide variety of activities that work with ArcGIS Server and GIS objects and data types.
- **Simulation:** The Workflow Designer's built-in simulator enables you to run workflows in a simulated environment. Simulation saves you from having to deploy your workflow, which reduces the time and effort it takes to test your workflows.

To learn more about Microsoft Workflow Foundation, read the Microsoft article [A Developer's Introduction to Windows Workflow Foundation \(WF\) in .NET 4.](#)

## 37.4 Overview of Steps to Create and Use a Workflow

The main steps to create and use a workflow are:

1. **Create the workflow in Workflow Designer.**  
Refer to the [Workflow Designer](#) help system for help.
2. **Add the workflow to a site.**

As with other components in a site, saving the site deploys the site's workflows to the REST API for consumption by the Essentials client APIs.

See [Add a Workflow to a Site on page 270](#).

### 3. **Configure a method to run the workflow in a viewer.**

There are several different ways to do this:

- **Run on Startup:** Configure the workflow to run automatically whenever an end user launches one of the site's viewers.  
See [Configure a Workflow to Run on Startup on page 271](#).
- **Toolbar Item:** Add a tool that runs the workflow to a viewer's toolbar.  
See [Viewers on page 347](#), or refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.
- **Menu Item:** Add an item that runs the workflow to a viewer's I Want To menu.  
See [Viewers on page 347](#), or refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.
- **Hyperlink:** Configure a hyperlink that end users can click to run the workflow.  
See [Hyperlinks in the Viewer on page 46](#).

You can also run workflows from other workflows.

### 4. **Configure workflow containers.**

If the workflow uses one or more **Display** activities, configure the workflow containers that control presentation of the workflow in the viewer:

- **In Viewers:** In each viewer that will use the workflow, define the workflow containers that you want to use in the workflow.  
In the HTML5 Viewer, you define workflow containers in the configuration for the Workflow Module. See "Workflow Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.
- **In the Workflow:** In the workflow, set the **Workflow Container Name** property in **Display** and **ConfigureWorkflowContainer** activities.  
See "Configure Workflow Containers" in the Workflow Designer help system.

### 5. **Copy custom assemblies.**

If the workflow contains custom activities, you must copy the assemblies to the `<GE_INSTALL>\REST Elements\REST\bin` folder.

## 37.5 Add a Workflow to a Site

To add a workflow to your site, you must first create the workflow in [Workflow Designer](#).


### **To add a workflow to a site:**

1. In Manager, edit the site that you want to configure, and then click **Workflows** in the side panel.
2. Click **Add Workflow**.
3. Type a display name for the workflow.  
The display name can contain any characters, including spaces and special characters.

4. If you do not want to use the default ID, type an ID for the workflow in the **ID** box.  
The ID can contain letters, numbers, and underscores.
5. In the **URI** box, enter the location of the workflow's `.xaml` file.
6. If you want the workflow to run automatically whenever an end user launches one of the site's viewers, select the **Run On Startup** checkbox.
7. Click **Next**.
8. If you want to assign values to one or more of the workflow's input arguments, enter the values.  
To enter a string, you do not need to include the quotation marks.
9. Click **Next**.
10. Click **Finish**.  
The workflow is added to the site.

## 37.6 Import Workflows from Another Site

### To import workflows from another site:

1. In Manager, edit the site that you want to configure, and then click **Workflows** in the side panel.
2. Click **Import Workflow**.
3. Select the site where the workflows are configured, and then click **Next**.
4. Select the workflows that you want to import.  
To select multiple workflows, hold the Ctrl key down while selecting.
5. Click **Finish**.  
The workflows are added to the site.
6. If you want to change an imported workflow, click the **Edit** icon  beside the workflow and follow the steps in the wizard.  
The wizard allows you to change the workflow's display name, ID, and URI; configure the workflow to run automatically when an end user launches one of the site's viewers; and assign values to one or more of the workflow's input arguments,
7. Click **Save Site**.

## 37.7 Configure a Workflow to Run on Startup

You can configure a workflow to run automatically whenever a user launches one of the site's viewers.

Essentials does not place a limit on the number of workflows that can run when a viewer launches. Follow the instructions below for each workflow that you want to run when a viewer launches.

**To configure a workflow to run on startup:**

1. In Manager, edit the site that you want to configure, and then click **Workflows** in the side panel.
2. Click the **Edit** tool beside the workflow that you want to configure.
3. Select the **Run On Startup** checkbox.
4. Click **Next**
5. Click **Finish**.

## 37.8 Workflow Input Arguments

If a workflow takes input arguments, you can configure values for them in Manager. The Create/Edit Workflow Wizard allows you to set the values for any input arguments.

Name	Type	Value
ParcelIdField	String	AIN
ParcelLayerName	String	Tax Parcels
ParcelMapServiceId	String	StreetMap
ParcelId	String	

### The Workflow Create/Edit Wizard

For more information about creating and editing workflows, see [Add a Workflow to a Site on page 270](#).

You can change the values for an existing workflow by choosing **Edit** next to the workflow you wish to change and selecting the **Properties** link. The Custom Properties dialog displays the input arguments with configured values. It does not display any input arguments that are not configured with values.

The Workflow Custom Properties dialog

## Usage Example



If you wish to follow along with this example, this workflow is available to you as part of the LA County demonstration site that comes with Essentials. See [Explore a Sample Site on page 11](#) for information on deploying the LA County site.

In the following example, we have a workflow that searches for our Tax Parcels layer for tax parcel IDs. The workflow has four input arguments that require a string as a value. Although each of the arguments expects a string value, the strings we provide each function differently in the workflow. Let's go through how each argument functions one by one. These are the workflow's four arguments:

- ParcelMapServiceId
- ParcelLayerName
- ParcelId
- ParcelIdField

### ParcelMapServiceId

Similar to ParcelLayerName, the ParcelMapServiceId argument is used in the workflow's SelectFeatures activity. The argument appears in the Map Service Id activity property, which asks for the ID of the map service to use. Our Tax Parcels layer belongs to the map service StreetMap, so our input argument should be set to StreetMap.

### ParcelLayerName

The `ParcelLayerName` argument is used in the workflow's `SelectFeatures` activity. The argument appears in the `Layer Name` activity property, which asks for the Geocortex layer this feature set is related to. The layer name is `Tax Parcels`, so our input argument should be set to `Tax Parcels`.

## ParcelId

We do not want to assign a default value for the `ParcelId`. This argument is used for user input in the viewer and lets users search for a specific parcel ID themselves.

This becomes more clear as we see how the `ParcelIdField` argument functions.

## ParcelIdField

The `ParcelIdField` requires the field name associated with parcel IDs. In our `Tax Parcels` layer, the field associated with parcel IDs is called **AIN** (short for Assessor's Identification Number).

In the workflow, the `ParcelIdField` is used in a `QueryTask` activity with the label `Query Parcel Layer`.

The argument `ParcelIdField` appears in the `Where` activity property, which calls for an SQL `WHERE` clause. Here is the full `WHERE` clause:

```
ParcelIdField + " LIKE '" + ParcelId + "%'"
```

This `WHERE` clause looks for parcel IDs that are like the ID input by the user. We need to set `ParcelIdField` to `AIN` so it can actually find similar parcel IDs.

When configured correctly, the workflow would run a query like this:

```
AIN LIKE '"100963%'
```

This query returns a list of parcel IDs like the `ParcelId` argument input by the user.

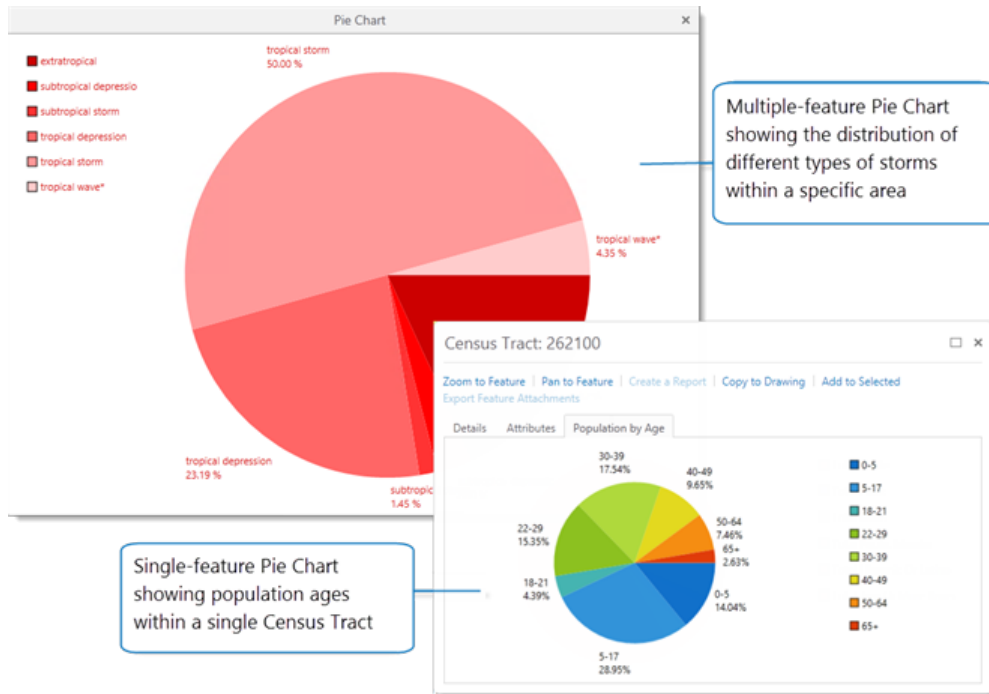
# 38 Charts

Charts represent feature data on a single feature layer. For example, you could have a chart for a layer containing data about hurricanes, or a different chart for a layer containing census data.

## 38.1 Chart Types

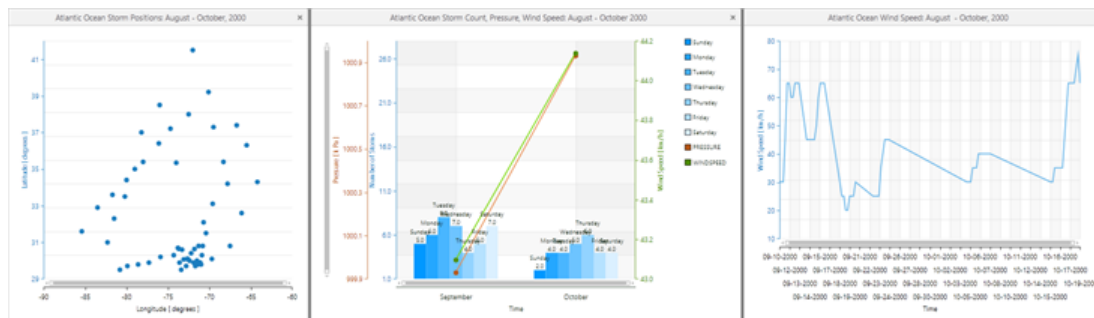
Charts are divided into two high-level types:

- **Pie charts** show the breakdown of data into divisions like slices of a pie. In Geocortex Essentials, you can configure pie charts to represent the data of multiple features on a map or to represent the data of a single feature.



- **Linear charts** visualize data by plotting data points onto a chart containing an X- and Y-axis. A linear chart contains a single horizontal axis (X-axis) but may contain multiple vertical Y-axes that represent different data sets. The data sets shown on the Y-axis are called **series**. Each series can be represented as a different chart type, including bar, line, area, and scatter charts.

You can also configure and display separate chart types side-by-side to compare data.



A scatter chart, multiple series chart (bar and two linear) and a line graph

## 38.2 Match the Chart Type to Your Data

To extract the most benefit from charting, you need to select the best chart type for your data. For example, bar charts are good for comparing data, line graphs are better for examining trends over time, but pie charts are useful for examining how different parts make up a whole.



### Chart Types

If you want to... ▼	For example... ▼	Use this chart type... ▼
Compare data	Compare one or more categories of data, particularly if each category has sub-categories.	Bar chart
Show <b>trends</b> in data	Examine trends over a period of time, particularly if the number of data points is high - like population trends.	Line chart or Area chart
Show the <b>composition</b> of data	Indicate several types of data (nominal or ordinal) and the percentage of the whole each represents - like the ethnicity breakdown within a census tract.	Pie chart for static data, column or area charts for data that changes over time.
Show the <b>distribution</b> or <b>relationships</b> between data	See the relationship between two different attributes, particularly if there are many data points – like the correlation between crime incidents in a city and average income per person.	Scatter chart to show relationships with two or three attributes.  Column or Bar charts for many data points.

## 38.3 About Series

A series in a chart is a way to represent a field or an attribute of one or more features on the map. In a pie chart, each series becomes another slice of the pie. In a linear chart, each series is added as a separate Y-axis and can be represented as a different chart type, for example, a bar or line graph. The X-axis represents the data set that is shared with the other features in the chart.

For example, the chart below contains three series that each use a different chart type. The blue bar chart shows the Total Population of each city. The brown area chart shows the area of each city in square miles. The green line chart shows the average family size in each city. While the X-axis, City ID, remains constant, the three series—**Average Family Size**, **Total Population** and **Area**—represent how these attributes change for different cities. Using multiple series and different chart types makes it easier to visualize and analyze the relationship between the given attributes of each city.

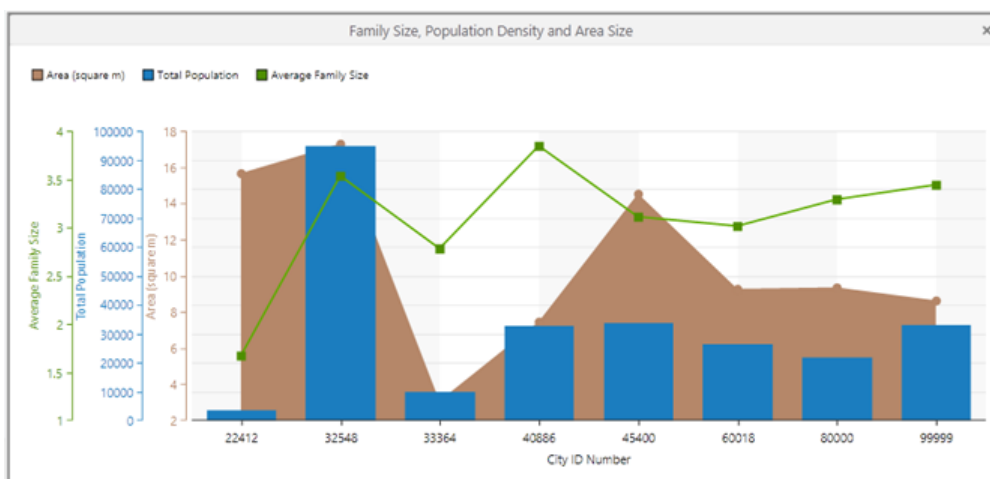
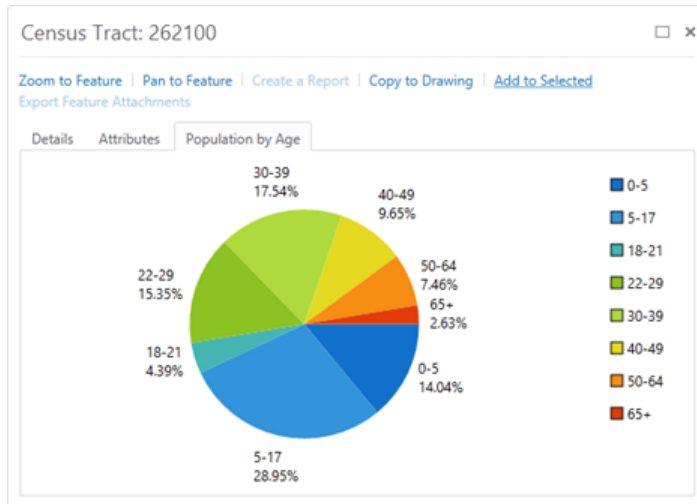


Chart with the X-axis Cities and a series of Y-axes for Family Size, Total Population and Area

You can also use multiple series in a single pie chart. For example, you could have a pie chart that contained a different series for each age group in the population. The chart would then display a slice for each age group, with the size of the slice indicating the relative number of individuals within the population for each given age. There is no limit to the number of series you can have in a pie chart, although too many might make the chart difficult to understand.



## 38.4 Data Sources for Charts

In Geocortex Essentials, you can use the fields in a layer or a datalink as source data for a chart.

### 38.4.1 Fields

The fields configured on a layer provide the data used to create charts. The charts you can make are therefore dependent on the field data for that layer, unless you configure data links to extend the layer data.

### 38.4.2 Datalinks

To use a datalink as a source for a chart, you would first need to set up the datalink for the layer. Once the data connection is set up and the data link is working, you can use these external data sources in charts. For example, you could incorporate data from a relational database into a chart.

#### See also...

[Add or Copy a Chart on page 284](#)

[Create a Single-Feature Chart on page 288](#)

[Data Links on page 257](#)

## 38.5 Chart Settings

When you configure a chart, the following settings are available. Some settings only appear when you select a particular chart type. For example, pie charts have fewer settings than linear charts, and single-feature charts have fewer settings than multiple-feature charts.

### 38.5.1 Chart Setup

- **Chart Title:** The name of the chart. This appears in drop-down menu, title bars, feature details, tabs, and dialogs to identify the chart to both administrators and end users.



The Chart Title is also labelled as the **Display Name** when you set up a new chart.

- **Type:** Sets whether the chart is a Linear or Pie chart. When you select **Linear** in this field, it activates options that allow you to set up Bar, Line, Spline, Area, Spline Area and Scatter Point charts. You configure the settings for linear charts under More Options, Category Setup (Horizontal Axis), and Series Setup (Vertical Axis).
- **Charts:** Determines whether the chart displays information about a single feature or multiple features.
  - **Single Feature:** A single-feature chart displays information about only one feature. A single-feature chart opens in a tab in the Feature Details dialog box when you select one feature in the Results List or when you click **View Additional Details** in a map tip.
  - **Multiple Features:** A multiple-feature chart displays information about any number of features in the Results List that you find using an Identify tool or Search. The chart region opens below the map when you click **Charting** at the top of the Results List. In the chart panel, you can use the **Chart Selector** to enable or disable the visibility of configured multiple-feature charts.
- **Visible:** Determines if the chart is visible in the viewer or not. The Visible setting makes it possible to disable a chart instead of deleting it permanently.

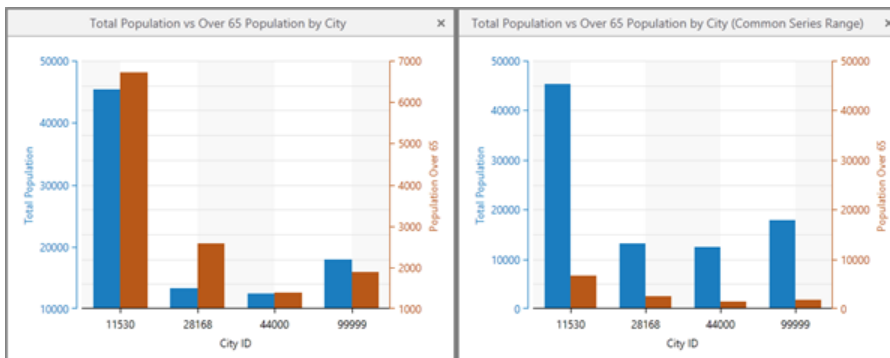
#### 38.5.1.1 More Options

These option are available when you select More Options.



When you select a pie chart, fewer options are available than when you select a linear chart.

- **Colors:** Determines the Background color of the chart and the Foreground color of text and lines in the chart.

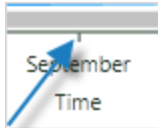


The effect on a chart of setting the Common Series Range unselected or selected

- **Gridlines:** For linear charts only. Adds Horizontal and Vertical grid lines to the background of a Linear chart.
- **Shading Strips:** For linear charts only. Adds translucent Horizontal and Vertical strips to the background of a

Linear chart.

- **Horizontal Axis:** For linear charts only.
  - **Visible:** Sets the visibility of the X-axis of the chart.
  - **Opposite Position:** Places the X-axis in the opposite position at the top of the chart rather than along the bottom.
  - **Sort Descending:** Sets whether to display data on the X-axis in ascending or descending order.
  - **Ticks:** Sets whether or not small lines appear on the X-axis to indicate key points along the axis.



- **Labels:** Sets whether or not the ticks should have labels to identify them on the X-axis. You can select either All Labels or Smart Labels, but not both.
  - **Smart Labels (Silverlight viewer only):** The number of labels adjusts intelligently to fit in the current view.



If you have **Plot Numerical** selected in Chart Setup, then Smart Labels are used.

- **All Labels:** All of the axis labels are displayed and stacked on top of each other if they overlap.
  - **Maximum:** Specifies the maximum value to use for the chart's horizontal axis. You can only set a maximum value if the horizontal axis's Field is numeric. If you leave the Maximum box blank, the maximum is intelligently determined based on the data.
  - **Minimum:** Specifies the minimum value to use for the chart's horizontal axis. You can only set a minimum value if the horizontal axis's Field is numeric. If you leave the Minimum box blank, the minimum is intelligently determined based on the data.
- **Chart and Map Synchronization:** Defines interactions between the chart and the map. When you click a data point on the chart, it performs all of the actions you enable in this section.
    - **Select:** Sets whether or not those features are added to **Selected** in the Results List when you click on a data point in the chart. When you have selected several features, you can then click View Selected to display only those features in the Results List.
    - **Pan:** Pans the map to show all the features clicked on the chart.
    - **Zoom:** Zooms the map in or out to show all the features clicked on the chart.
    - **Feature Details:** Opens the Feature Details dialog box, which displays details about a feature when that feature is clicked on the chart. If more than one feature is selected, details about only the first one display.
    - **Run Command:** Runs a command with the specified command parameter. When you select the Run Command option, the **Command Name** and **Command Parameter** boxes open for you to enter the

information.

Run Command

Command Name

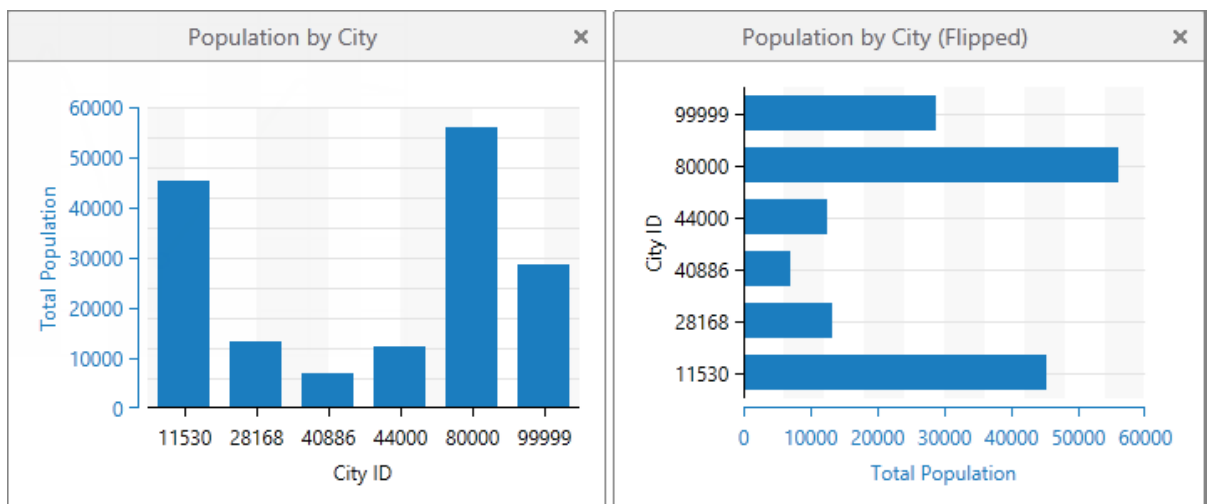
Command Parameter

• **Chart Area:**

- **Show Tooltips:** Sets whether a tooltip appears when you hover over data points on the chart.
- **Chart Zoom:** Sets whether the chart can be zoomed or panned horizontally.
- **Show Labels:** Available for pie charts only. Sets whether to show labels for chart data.
- **Common Series Range:** For linear charts only. Sets all chart series to use the same range. You can use this option when you have multiple series that you want to display with a common scale. The common series range is determined based on the overall minimum and maximum value found in all chart series.

• **Chart Orientation:** For linear charts only.

- **Swap Axes:** Swaps the X-axis and the Y-axis so that the information from the Y-axis is horizontal and the information from the X-axis is vertical.



Charts showing the effect of swapping the axes in a linear chart

### 38.5.2 Category Setup (Horizontal Axis)

These settings appear when you select **Linear** in the **Type** field under Category Setup. The Horizontal Axis settings determine the appearance and data sources for the X-axis in linear charts.

- **Category Title:** Sets the label that appears under the X-axis in the chart.
- **Data Source:** Sets the source of the data for the X-axis to be either a field on the layer or a data link. To use a data link, you would first need to set up the link to the database or spreadsheet and link it to the layer. For more information, see [Data Links on page 257](#).
- **Field:** Sets which field in the layer to use as the source of data for the X-axis. The data type of the field you select

affects which options appear in other settings. For example, if you select a time-based type in Field, a **Plot Continuous** option appears. If you select a numerical type in Field, a **Plot Numerical** option appears.

- **Value Format:** Sets the format to use when interpreting DateTime or Numeric values on the selected field. The options in the Value Format drop-down list change depending on the field type. For example, if you select a DateTime field, the list shows options to read the field value as Day, Month, or Year. If you select a Numeric field, the list shows options to read the field value as a decimal value, currency, or a percentage. Specifically, if you select Currency, data points display in the chart with a currency sign in front of them. If you select Percentage, the value is multiplied by 100 and displays with a percentage sign.
- **Decimal Places:** Sets the number of fractional digits to display. This setting appears when you select one of the predefined (non-custom) formatting options for the Value Format setting, like Currency or Number.



This precision setting cannot exceed the maximum representable IEEE 754 floating point. This is specified in the IEEE 754 standard. See [double-precision floating-point format](#) and [significant figures](#) for more information.

- **Currency:** Sets the currency type, such as United States Dollar (USD) or Euro Member Countries (EUR). The Currency setting appears when you select Currency for the Value Format setting. The currency type is specified using [ISO 4217 currency codes](#).
- **Display Format:** Activates when you select either the **Custom Number Format** or the **Custom Date Format** option in the Value Format drop-down list. You can then specify a custom DateTime or Numeric format to sort and interpret the field data. Custom formats must comply with the MSDN Formatting Types standards:
  - **DateTime:** [Custom Date and Time Format Strings](#)
  - **Numeric:** [Custom Numeric Format Strings](#)
- **Plot Continuous/Plot Numerical:** These options appear only if you select a particular type of data in the **Field** setting. For Example, for Plot Continuous to appear, you must select a time-based field type. For Plot Numerical to appear, you must select a numerical field type.
  - Select **Plot Continuous** if you want to plot the data to display chronologically and continuously over time.
  - Select **Plot Numerical** if you want to plot the data to display linearly and continuously.



To create a Scatter Point chart, you must select a numerical field for the category and then enable Plot Numerical. This is because a Scatter Point chart can only represent numerical values.

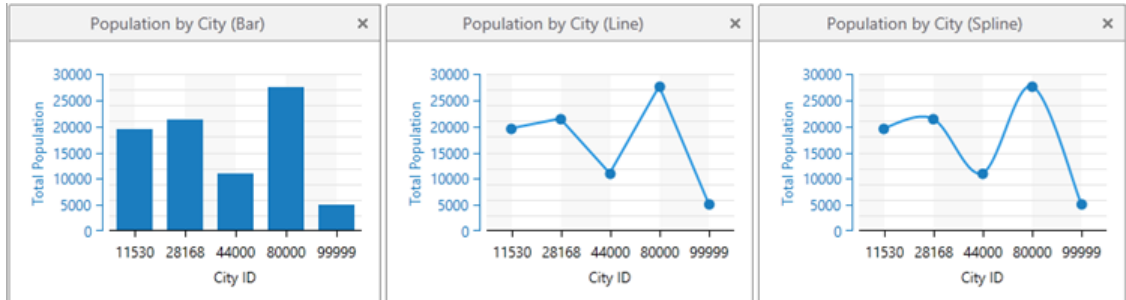
## 38.5.3 Series Setup (Vertical Axis)

These settings appear when you click **Add Series**. Use the series settings to define the Y-axes in a linear chart or the segments of a pie chart. You can have multiple series in both linear and pie charts.

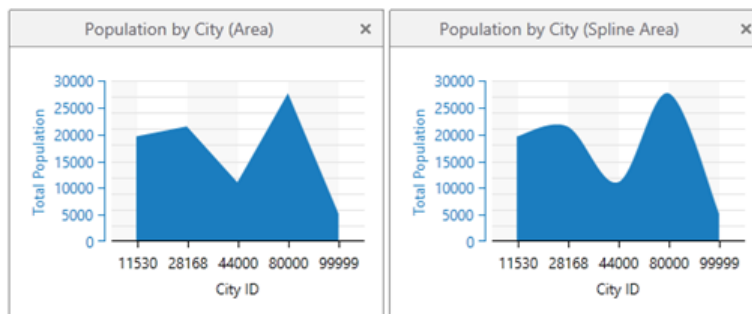


When you select **Linear** in the **Type** field in Category Setup, many more options are available under Series Setup than when you select **Pie**. Other options may appear or disappear based on the type of data source selected.

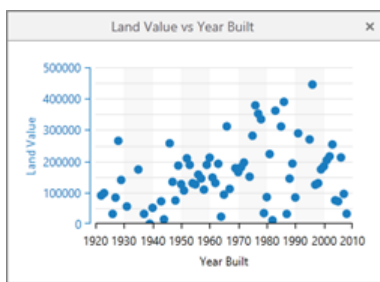
- **Series Setup:** Settings that control the type and appearance of a series.
  - **Name:** Sets the name of the series as it appears on the legend and the label of a segment in a pie chart.
  - **Type:** For linear charts only. Sets the type of series to display. Type choices include Bar, Line, Spline, Area, Spline Area, and Scatter Point.



A Bar, Line, and Spline chart showing the same population data



An Area and Spline Area chart showing the same population data



A Scatter Chart showing numerical data

- **Series Source:** Sets the source and format of the series data.
  - **Data Source:** Sets whether to use a Field on the layer or a Datalink as the data source for this series. If you want to use a data link, you would need to set it up before it can be available for selection here.
  - **Field:** Sets which field to use as the source of data for this series.

- **Value Format:** Sets the format to use based on the type of data you selected in the Field above. Use this setting to create a custom format for either Date/Time or Numeric values. For more information about Custom Formats, see the Value Format under [Category Setup](#).
- **Series Format:** Defines how a series is formatted.
  - **Data Aggregator:** Determines how to aggregate the cumulative values for this series. Choices include:
    - **Sum:** Calculates the total of all the values for the selected field. For example, the total population of the selected counties.
    - **Count:** Ignores the actual value of a field and simply counts the number of features. Use this aggregator when the field is a string and can take on multiple values. For example, the available census data of the selected counties.
    - **Min:** Finds the minimum value of all the selected features. For example, the lowest population of a single county within the selected counties.
    - **Max:** Finds the maximum value of all the selected features. For example, the highest population of a single county within the selected counties for a selected year.
    - **Average:** Calculates the average value of all the selected features. For example, the average population of the selected counties.
  - **Value Format:** Sets the format to use for the aggregated series value based on the type of data you selected in Field. Use this setting to create a custom format for either Date/Time or Numeric values. For example, a value of 20 be formatted as \$20 or 20%. For more information about Custom Formats, see *Value Format* under [Category Setup](#).
  - **Sort Descending:** For linear charts only. Sets whether to display data on the Y-axis in ascending or descending order.
- **Series Break:** For linear charts only. Sets whether or not to break apart the aggregated series data by the specified method. If you select the Unique Value method, it separates the data into groups based on unique values for the selected field.



Data broken apart by the unique value method is often best represented as a bar chart.

- **Series Style:** For linear charts only. Controls the appearance of the series markers and labels.
  - **Point Marker:** Sets the shape of the points used to represent nodes in this series. You can select either None, Circle, Square, Triangle, or Diamond.
  - **Point Labels:** Sets whether or not to display text labels for the nodes in this series. You can select either None, Smart or Smart with Collectors.
 

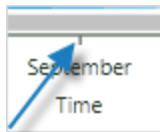
If you use Smart Labels, the labels are placed next to each node in the series so that the labels do not overlap. If you use Smart with Connectors, the labels are arranged so they do not overlap but each label is connected to its corresponding chart node with a thin line.



Smart Labels and Smart with Connectors for labelling the points in linear charts are only fully supported by the Silverlight Viewer. In the HTML5 Viewer, both Smart Labels and Smart with Connectors display point labels that may overlap, without connectors.



- **Color:** Sets the color of the nodes and lines on the Y-axis.
- **Series Axis:** For linear charts only.
  - **Axis Title:** Sets the title of this Y-axis.
  - **Maximum:** Manually sets the maximum value of the y-axis for this series. If you do not specify a Maximum, it is intelligently determined based on the data.
  - **Minimum:** Manually sets the minimum value of the y-axis for this series. If you do not specify a Minimum, it is intelligently determined based on the data.
  - **Ticks:** Sets whether or not to display ticks (small bars) to demarcate data points on the axis.
  - **Labels:** Sets whether or not to display labels for each of the ticks, which are small bars that designate key points on the axis.



- **Opposite Position:** Places the series Y-axis in the opposite position on the right side of the chart rather than the left side.
- **Visible:** Sets the visibility of the Y-axis for this series.

#### See also...

[Add or Copy a Chart on page 284](#)

[Create a Single-Feature Chart on page 288](#)

[Set a Default Chart to Open on page 294](#)

## 38.6 Add or Copy a Chart

Before you add a chart, examine the options and select the [chart type](#) you plan to use to view and analyze your data.

The **Charts** tab on the **Map > Layer** page in Manager is where you add and configure charts. Charts display the data of a single layer in the viewer. You add and configure a chart using the fields of a particular feature layer within a site.





If you have created a complex chart and want to add one that is similar, you may find it faster to copy an existing chart and then edit the settings rather than start from the beginning.

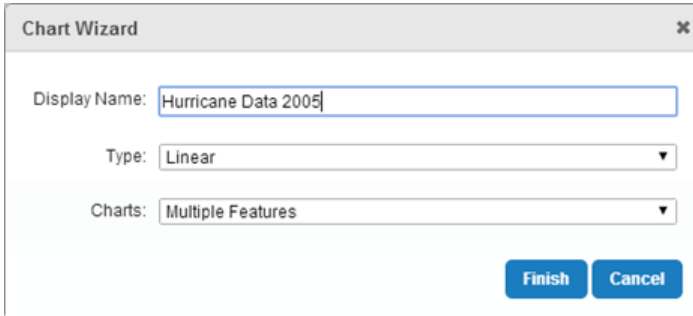
#### ▶ To add a chart to a layer in Manager:





You can add charts to feature layers only.

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Charts** tab.



- Click .
- In the Chart Wizard, type in a **Display Name** for this particular chart.  
The Display Name appears on this page in the list of charts, in the drop-down box in the viewer where end users select a chart to display and in the feature details dialog for single-feature charts. Choose a descriptive name that makes it clear what data the chart displays.





- From the **Type** drop-down list select **Pie** or **Linear**.
- From the **Charts** drop-down list select **Multiple Features** or **Single Feature**.  
A single-feature chart displays information about only one feature. A multiple-feature chart displays information about any number of features in the Results List.
- Click **Finish** to create the new chart and add it to the list of charts.  
You now need to [configure the chart](#).
- Click **Apply Changes** and **Save Site**.

 To reorder your items, click and drag the  **Sort** handle and click **Save Site**.

#### To copy a chart:

- In Manager, select the **Edit**  tool next to the layer that you want to configure.
- Select the **Charts** tab.
- Click the **Duplicate Chart** icon  beside the chart that you want to copy.  
An exact copy of the chart appears at the bottom of the list of charts with the word **Copy** added to the Display Name.

 You can only copy charts on the same layer. Currently, you cannot copy charts from a different layer or site.




- To edit the copied chart, click **Edit**  beside the copied chart and change the chart settings.
- Click **Apply Changes** and **Save Site**.

## 38.7 Add or Copy a Series


You can add series to both pie and linear charts. In Pie charts, each series is represented as a slice of the pie. In pie charts, the slice indicates what percentage of the overall pie that slice represents. In linear charts, series are represented on the Y-axis and can be rendered as many different chart types, for example, bar, line, spline, etc.

To make it easier to create multiple series that are relatively similar, you can copy an existing series and edit it rather than create each one from the beginning. You can also select a palette of colors to use to ensure that the colors used in multiple series contrast both contrast and blend with each other.



### ▶ To add a series:



1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Charts** tab.
3. Click  beside an existing chart.
4. If the chart does not contain an X-axis, define the X-axis in the [Category Setup \(Horizontal Axis\)](#) section.
5. In the **Series Setup (Vertical Axis)** section, click .
6. In the Edit Series dialog box, do at least the following:
  - Type a **Name** for this series. The name appears in the Series list.
  - If this is a linear chart, select the chart **Type** from the drop-down list.
  - Select a **Data Source** that is either a **Field** or a **Datalink**.
  - Select the layer **Field** to use as the data set for this series.
  - Select a **Data Aggregator** to indicate the aggregation method to use on the data.
  - Ensure that the **Axis Title** is the exact wording you want to appear as the label on the Y-axis.  
For more information on these settings, see [Series Setup \(Vertical Axis\)](#) in [Chart Settings](#).
7. Click **OK** to add the new series and add it to the Series list.
8. Click **Apply Changes** and **Save Site**.




To reorder your items, click and drag the  **Sort** handle and click **Save Site**.

### ▶ To copy a series:

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Charts** tab.
3. Click  beside the chart that contains the series you want to copy.

4. In the Series Setup section click the **Duplicate** icon  beside the series.  
A exact copy of the series appears at the bottom of the list of series.
5. To edit the copied series, click **Edit**  beside the copied series and change the Name and any other settings.
6. Click **Apply Changes** and **Save Site**.



To reorder your items, click and drag the  **Sort** handle and click **Save Site**.



#### See also...

[Create a Single-Feature Chart on page 288](#)



[Chart Settings on page 277](#)

## 38.8 Edit or Remove Charts

### ▶ To edit a chart:




1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Select the **Charts** tab.
3. To edit a chart, click the **Edit** icon  beside the chart and change any of the [Chart Settings](#).
4. Click **Apply Changes** and **Save Site**.

### ▶ To remove a chart:


1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Select the **Charts** tab.
3. Click the **Remove** icon  beside the chart you want to delete.
4. When the Delete Chart dialog box opens, click **OK** to confirm the removal of the chart.  
The chart disappears from the list.
5. Click **Apply Changes** and **Save Site**.

### 38.8.1 Edit or Remove Series

#### To edit a series:

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Select the **Charts** tab, and then click  beside the chart you want to edit.
3. In the Series Setup section, click  beside the series you want to change.
4. Edit the series by changing any of the Edit Series [settings](#).
5. Click **Apply Changes** and **Save Site**.

#### To remove a series:

1. On the **Charts** tab, in the Series Setup section, click **Remove**  beside the series you want to delete.  
The series disappears from the list.
2. Click **Apply Changes** and **Save Site**.

#### See also...

[Chart Settings](#) on page 277


### 38.9 Create a Single-Feature Chart

You can configure pie charts or linear charts as a single-feature chart. A single-feature chart opens in the feature details when the user clicks on a single feature in the Results List, or when the user views additional details from a map tip.




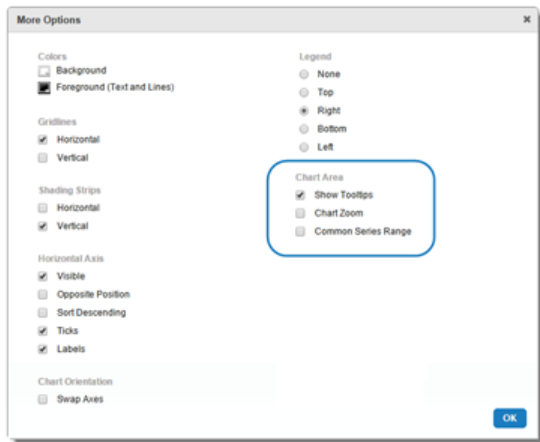
Although it is possible to create single-feature charts that are linear, it is more likely that you will use a datalink configured on the layer in order to populate a linear single-feature chart with meaningful data.

#### To create a single-feature pie chart:

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Go to the Charts tab and select the **Add Chart** button.
3. In the Chart Wizard, type in a Display Name for the chart.
4. In the Type drop-down menu, select **Pie** chart and then **Finish**.  
The new chart appears in the chart list.



5. Select the **Edit**  icon to open the chart settings page.
6. In the Charts drop-down menu, select **Single Feature**.
7. Open **More Options**, select the **Show Tooltips** checkbox, and then use OK button to save the configuration.



You can also change other elements of appearance of a chart, including the colors, gridlines, shading strips, horizontal axis, chart orientation, legend position, zoom, and common series range.

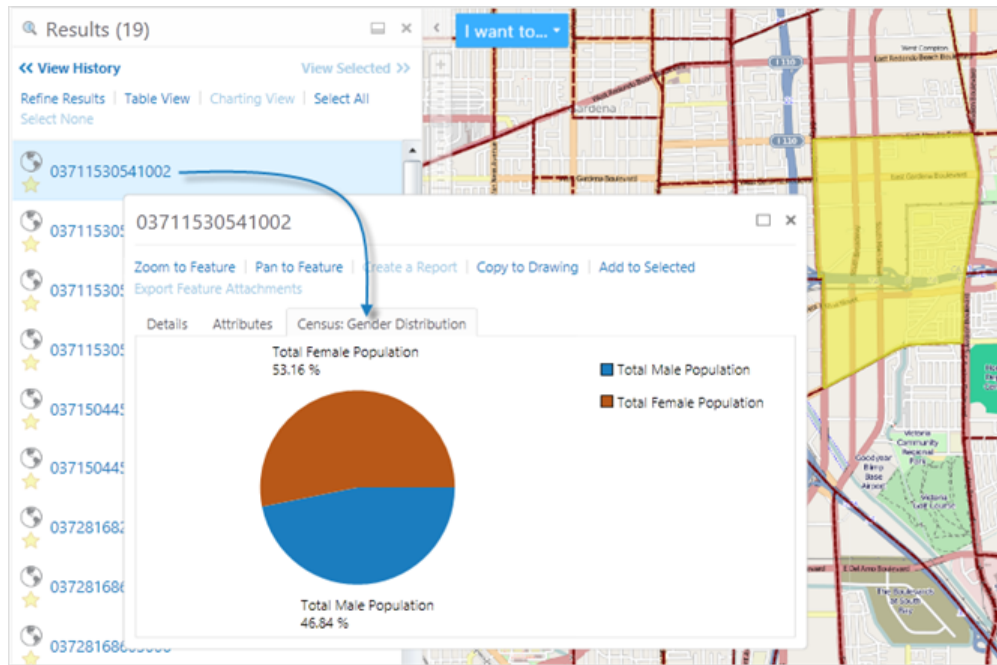
8. To choose a color palette for the chart series, select **Color Palette** in the Series Setup section and then **Enable Color Palette**.
9. Select a palette from the drop-down menu, and then **OK**.
10. Select **Add Series**.
11. To create a series, in the Edit Series window, set the following:
  - **Name:** The label you want to use as the name of this series.
  - **Data Source:** Whether the data source is a Field in the layer or a Datalink.
  - **Field:** The field on the layer to use as the source data for this series.
    - **Value Format:** What formatting to use when this field is sorted.
  - **Data Aggregator:** How to treat this data in the series.
    - **Value Format:** How to format each data point in this series.

For more information about these settings, please see [Series Setup \(Vertical Axis\) on page 281](#).

12. Create at least one more series.

13. Select **Apply Changes** and **Save Site**.

When you click on a single feature in the Results List, or View Additional Details in a map tip, the chart appears as a new tab in the Feature Details dialog box.




## 38.10 Create a Multiple-Feature Chart

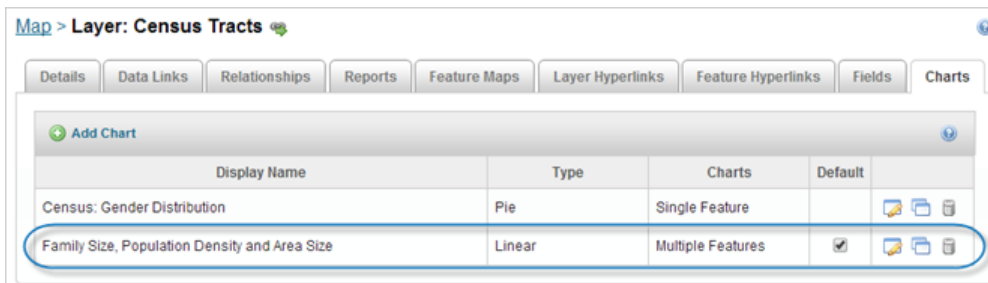
Multiple-feature charts display data about all the features currently in the Results List. When a chart is open, the user can search for or identify other features and the chart updates to show the new data.

You can create both pie and linear multiple-feature charts and in each case, they can have multiple series. In a linear chart, the series on the Y-axis can include multiple series using different chart types, for example, a mix of line, spline or bar types.


If you have several charts set up for a layer, you can set which charts open by default when a user views charts.

► **To create a multiple-feature chart:**

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Go to the Charts tab and select the **Add Chart** button.
3. In the Chart Wizard, type in a Display Name for the chart.  
Because both administrators and end users will use the Display Name, choose a descriptive name that states what data the chart displays.
4. In the Type drop-down menu, select **Linear** or **Pie**, and then select **Finish**.  
The new chart appears in the chart list.



The new chart is currently the only multiple-feature chart, so it is set as the default chart to open.

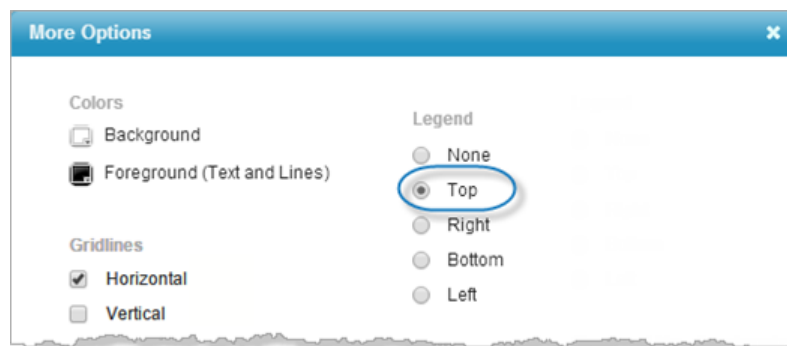
5. Select the **Edit**  icon beside the new chart to open the chart settings.
6. Set up the data to display on the X-axis:
 

In the **Category Setup** area:

  - **Category Title:** Type in the label to appear under the X-axis on the chart.
  - **Data Source:** Select whether to use a Field on the layer, or a Data Link as the source of data for this axis.
  - **Field:** If you selected Field as the Data Source, select the layer field you want to use as the data for this axis, for example, City ID.

In the **Chart Setup** area:

- a. Use the **More Options** button.
- b. In the Legend area, select **Top**.



- c. Select **OK**.
7. To use a color theme, select **Color Palette** in the Series Setup area, then **Enable Color Palette**, configure a palette, and press **OK**.
8. To add three series that use different chart types, in the Series Setup area do the following:
  - a. Select **Add Series** to add the first series as a bar type chart.
    1. In the **Name** field, type the label for this series, for example, Total Population.
    2. Set the **Type** to **Bar**.
    3. Set the **Data Source** to **Field**, and select the layer field, for example, Total Population.



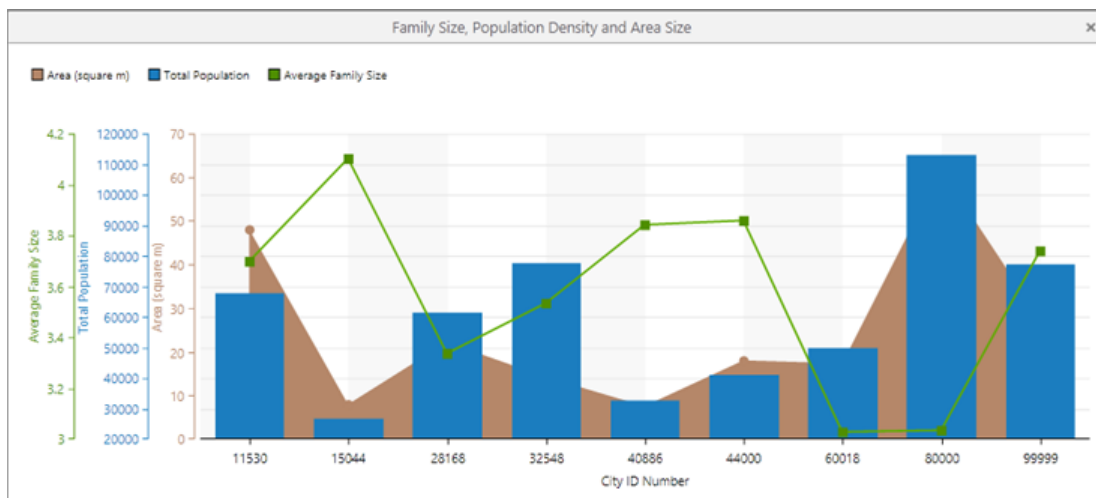
4. Set the **Data Aggregator** to **Sum**, so that all the values for the population fields are added together.  
Select OK.
5. Set **None** for the Point Marker as it is not visible with the Bar chart type.
6. Type in the **Axis Title**, for example, Total Population.

b. Select OK.

- c. Select **Add Series** to add the second series as an area chart type.
  1. In the **Name** field, type the label for this new series, for example, Area Size.
  2. Set the chart **Type** to **Area**.
  3. Set the **Data Source** to **Field**, and select the layer field, for example, Area (square m).
  4. Leave **Data Aggregator** on **Sum**.
  5. Set **Point Marker** to **None**.
- d. Select **OK**.

- e. Select **Add Series** to add the third series as a line chart type.
    1. In the **Name** field, type the label for this new series, for example, Average Family Size.
    2. Set the chart **Type** to **Line**.
    3. Set the **Data Source** to **Field**, and select the layer field, for example, Average Family Size.
    4. Set the aggregator to **Average**, so that the average value of all the selected features is calculated.
  - f. Select **OK**.
9. Click **Apply Changes** and **Save Site**.


When the end user select a group of features and views charts, the chart displays.

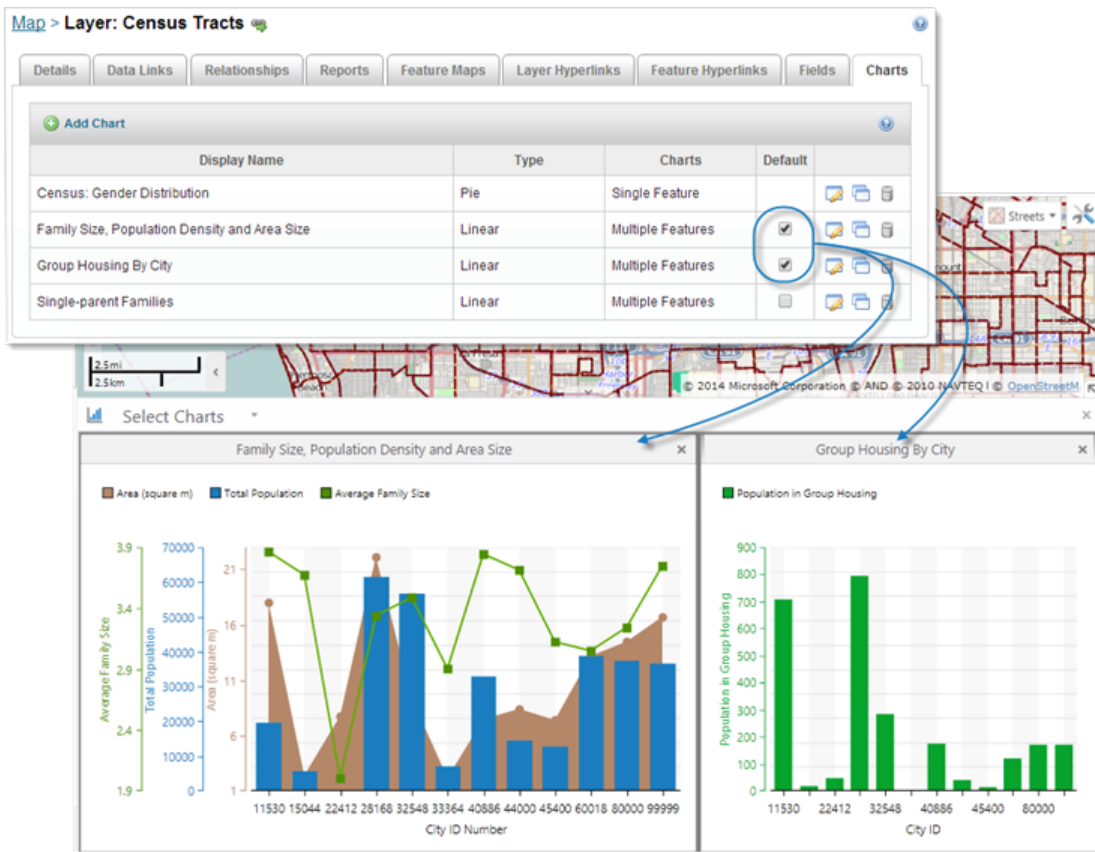


## 38.11 Set a Default Chart to Open

You can set one or more charts to open by default in the chart region of the map. In most cases, you would not set more than three charts to open by default.

► To set the default charts to open in the chart region.

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Select the **Charts** tab.
3. In the **Default** column, select each chart that you want to open when the user views charts.



The screenshot shows the 'Map > Layer: Census Tracts' configuration window. The 'Charts' tab is active, displaying a table of charts. The 'Default' column has checkboxes selected for 'Family Size, Population Density and Area Size' and 'Group Housing By City'. Below the table, two preview windows are shown. The first preview window, titled 'Family Size, Population Density and Area Size', displays a combined bar and line chart with three series: Area (square m) in brown, Total Population in blue, and Average Family Size in green. The second preview window, titled 'Group Housing By City', displays a bar chart with one series: Population in Group Housing in green.

Display Name	Type	Charts	Default
Census: Gender Distribution	Pie	Single Feature	<input type="checkbox"/>
Family Size, Population Density and Area Size	Linear	Multiple Features	<input checked="" type="checkbox"/>
Group Housing By City	Linear	Multiple Features	<input checked="" type="checkbox"/>
Single-parent Families	Linear	Multiple Features	<input type="checkbox"/>

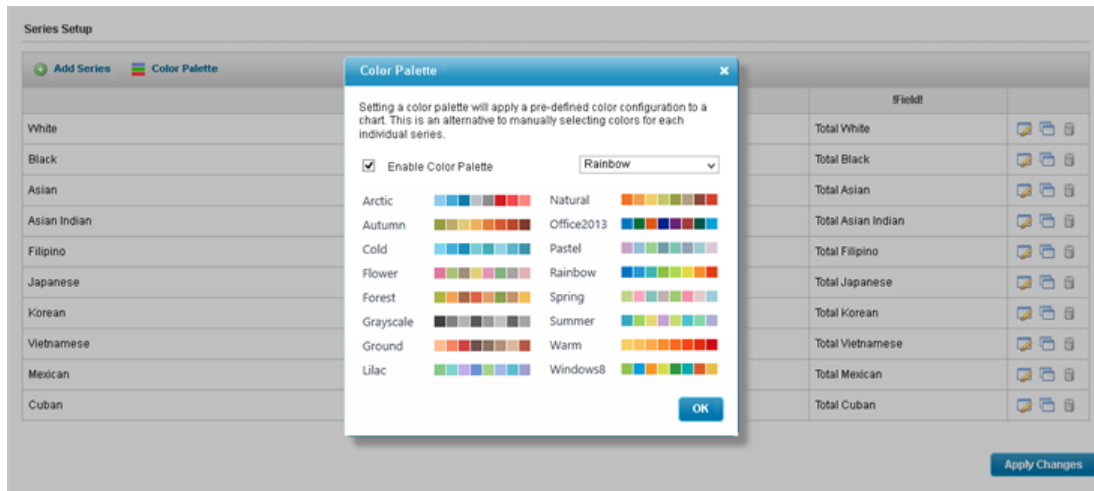
4. Click **Save Site**.

## 38.12 Use a Palette for Multiple Series


When you create charts, you can select the colors for each series individually. When you have multiple series within a chart, it can be difficult to ensure that the colors contrast well but also blend with each other. To make it easier to create series that contain multiple colors, you can enable palettes and then select one of the 8-color palettes to use in your series.



Once you have enabled palettes, the selection of individual series colors is disabled.

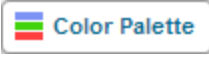


#### ▶ To use a color palette for multiple series:

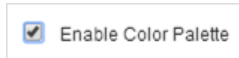
- In Manager, select the **Edit**  tool next to the layer that you want to configure. The layer must be a feature layer.
- Select the **Charts** tab.
- Do one of the following:
  - [Add a chart](#) to the layer.
  - [Edit the chart](#) of a layer.
- If the chart does not contain any series, add the series you want. As you add each series, they form a list in the Series Setup area.

Name	Field	Color	
Age 18-21	AGE_18_21		
Age 22-29	AGE_22_29		
Age 30-39	AGE_30_39		
Age 40-49	AGE_40_49		
Age 5-17	AGE_5_17		

List of series with individual colors selected.

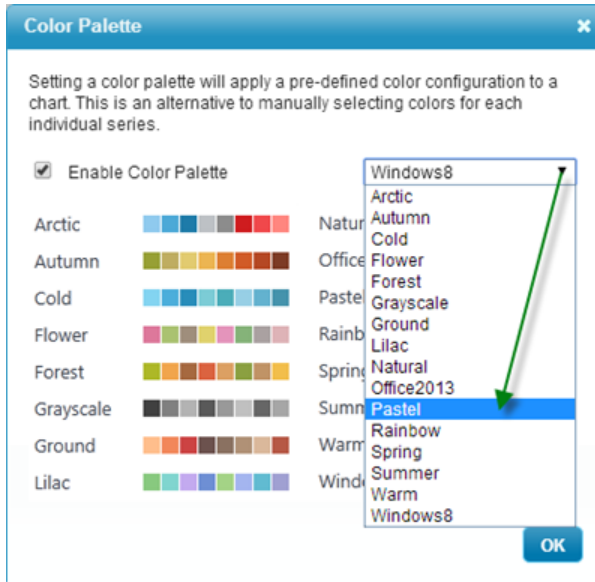
- To apply a color palette to all of the chart series, click  in the Series Setup section.

- Click the box to enable the Color Palette.



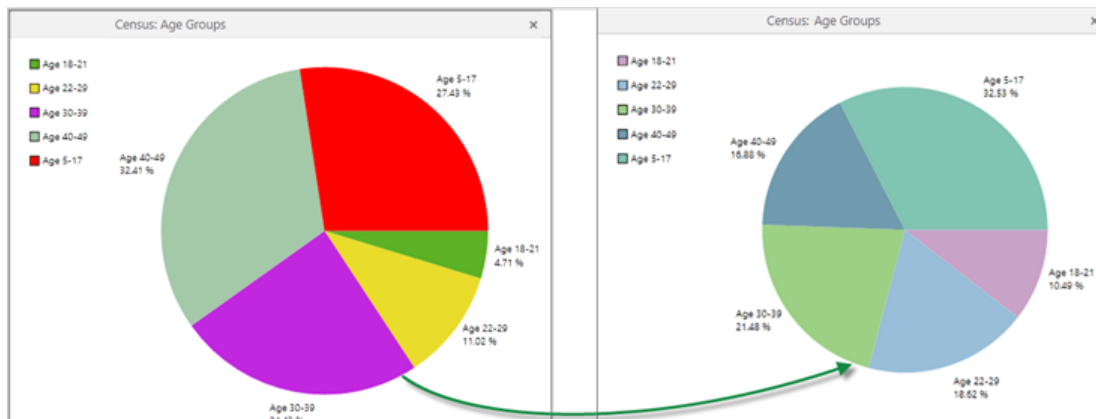
- From the drop-down list, select the palette you want to use.

The Color Palette dialog shows a preview of each palette. Colors are used in order from left to right.



- Click **OK**, **Apply Changes** and **Save Site**.


When you open the chart in a viewer, it displays the new set of colors from the selected palette.




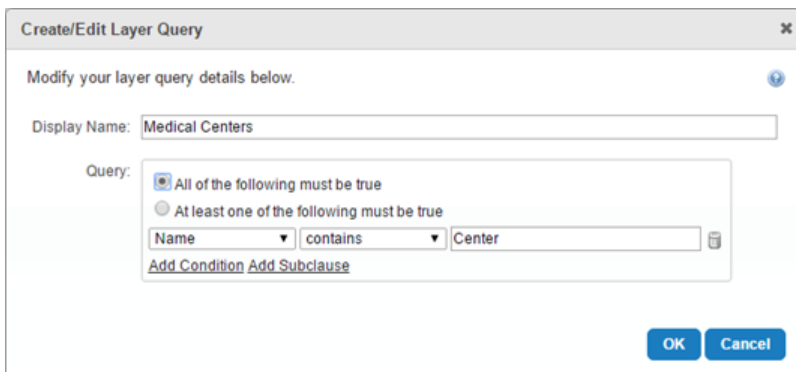
## 39 Queries

Queries are specific to each feature layer. You add and configure queries on the **Queries** tab on the **Map > Layer** page in Manager.

### ▶ To add a query to a layer in Manager:

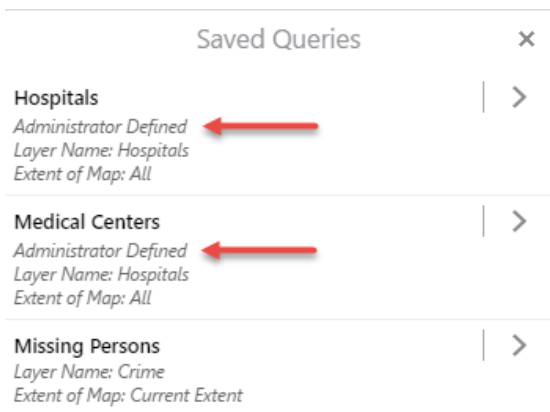
 You can add queries to feature layers only.

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Queries** tab.
3. Click **Add Layer Query** to open the Create/Edit Layer Query dialog.



Create/Edit Layer Query dialog

4. Type a display name for the query.  
When you create the query, it is identified in the **Display Name** column in the list of queries on this tab. It is also included in the Viewer in the **Saved Queries** panel, where it is identified by the display name and described as *Administrator Defined*.



Saved Queries in the Viewer


5. In the **Query** area:
  - a. Select **All of the following must be true** to use the **AND** operator in the query, or select **At least one of the following must be true** to use the **OR** operator in the query.
  - b. In the expression fields, select the query subject in the field on the left. Select the operator for the expression in the center field (the list of operators is dependent on whether the subject represents an alphanumeric or numeric value). Type the value being searched for in the field on the right.
  - c. Click **Add Condition** to add another expression clause to the query.
 

If **All of the following must be true** (the **AND** operator) is selected, **AND** expression fields are added to the query.

If **At least one of the following must be true** (the **OR** operator) is selected, **OR** expression fields are added to the query.
  - d. Click **Add Subclause** to nested an expression within the condition.
 



The subclause allows the user to nest an **AND** or **OR** expression by selecting the respective option.
6. Click **OK** to create the new query and add it to the list of queries on the tab.
7. Click **Save Site**.





To reorder your items, click and drag the  **Sort** handle and click **Save Site**.

## 39.1 Edit or Remove Queries

### ▶ To edit a query:

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Select the **Queries** tab.
3. To edit a query, click the **Edit** icon  beside the query name and change any of the settings described in [To add a query to a layer in Manager: on page 297](#).
4. Click **Apply Changes** and **Save Site**.

### ▶ To remove a query:

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Select the **Queries** tab.
3. Click the **Remove this item** icon  beside the query you want to delete.
4. When the Remove Layer Query dialog opens, click **OK** to confirm the removal of the query.
 

The query disappears from the list.
5. Click **Save Site**.

## 40 Reporting

Geocortex Essentials reports are used to publish information about the currently selected features in a particular layer. Reports can include attribute data, linked data, images, maps, charts, and more. The report shown below includes data related to the feature that the end user has identified (top), an aerial photo (bottom left), and a [feature map](#) (bottom right).

**Geocortex Demonstration Site Parcel Report**

Taxlot Information:
Report Generated: 6/3/2015 9:36:19 AM

AIN: 4423028001	
Legal Owner: Southern Deakin	
Site Address: 15005 W Sunset Blvd	Mailing Address: 15005 W Sunset Blvd
Los Angeles CA	Pacific Plsds CA
90272	90272
Property Value: \$81,376.00	Improvement Value: \$83,399.00
Year Built: 1936	
Taxlot Area: 1,387.82 square meters	Primary Structure Area: 612.34 square meters



Bing Here Image



\*Parcel highlighted in Blue

This map is a user generated static output from an internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

### Example of a report that reports on a tax parcel

Reports are generated from templates (.rpx files) that you create in [Geocortex Report Designer](#). Report Designer provides a design surface where you lay out the elements that you want in the report. In Manager, you must add the report template to the layer that you want the report to operate on. You can configure the output formats that users can select from, for example, PNG, PDF, or RTF.

## 40.1 Main Configuration Steps

The main steps to create a report template and make it available in a viewer are:

1. In [Geocortex Report Designer](#), design the report template.

You may want to adapt one of the reports that ships with the LA County sample site. By default, the sample site's reports are here: C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST Elements\Sample Sites\LA\_County\Resources\TemplateReports.



2. Save the report template to the `Sites` folder.
3. In Manager, add the report to the layer.
4. Edit the report and configure its [settings](#).  
For example, you can configure the output formats that users can select from.



If you want to prevent a particular report from being available in the viewer, edit the report and clear the **Visible** setting.

In the HTML5 Viewer, users can run reports via the **Run a Report** option in the Panel Actions menu of the results list, results table, or in map tips. For more information, see "Reporting Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*. This option is available by default.

## 40.2 Report Settings

Reports have the following settings:

- **ID:** (information only) The ID that uniquely identifies this report.  
The ID is automatically generated.
- **Display Name:** The report's display name.  
The display name can contain spaces and special characters.
- **Description:** An optional description of the report.
- **Location:** The URI to the report template (`.rpx` file). Click **Browse** to browse the `Sites` folder for the template.
- **Order By:** Specifies how to order the features when the report includes more than one feature. The features are ordered by the value of the specified field, in either ascending or descending order.  
For example, to order tax parcels by decreasing value (field name: "VALUE"), enter **VALUE DESC** in the Order By box. To order tax parcels in A to Z order by the owner's last name (field name: "OWNERLAST"), enter **OWNERLAST ASC**.  
To find out the field names, open the REST API Sites Directory and navigate to the layer that the report belongs to.
- **Perform Data Linking:** If the report template contains references to one or more [data links](#), select the **Perform Data Linking** checkbox. If the Perform Data Linking checkbox is cleared, external data will not appear in the report.



Do not select the Perform Data Linking checkbox if you do not need to, as it can affect performance.

- **Include Feature Maps:** If you have included one or more [feature maps](#) in the report template, select the **Include Feature Maps** checkbox. If the Include Feature Maps checkbox is cleared, the feature maps will not appear in the report.




Do not select the Include Feature Maps checkbox if you do not need to, as it can affect performance.

- **Output Formats:** The file formats that can be used for the report. Select the checkbox for each format that you want to be available to users. If you select more than one format, users must select which format they want to use before the report is created. Note that [print jobs](#) support PDF reports only.
- **Transform Workflow URI:** The URI of a Report DataSet Workflow that modifies the data set for the report before the report is created. If you have created a Report DataSet Transform workflow, enter the workflow's location. For more information, see "Create a Report DataSet Transform Workflow" in the Workflow Designer help system.
- **Visible:** Controls whether the report appears in the list of reports available to be run in the viewer. In the HTML5 Viewer, a user runs reports via the **Run a Report** option in the Panel Actions menu of the results list, results table, or in map tips.
- **Print Job Settings:** "Print jobs" allow background processing. When you enable print jobs for a report, the report is created in the background and the user is optionally notified of the job's status by email. If the report is large or contains a lot of data, enabling print jobs prevents report creation from timing out. Only PDF reports can be created in the background—the other output formats are not supported. See [Configure a Report to be Created in the Background on page 302](#) for instructions.

## 40.3 Add a Report to a Layer

Before you can add a report to a layer, you must create the report template in [Geocortex Report Designer](#).


### To add a report to a layer:

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Reports** tab.
3. Click **Add Report**.
4. **Display Name:** Type a display name for the report.  
The display name can contain spaces and special characters.
5. **Description:** Type a description for the report.
6. **Include Feature Maps:** If the report template includes one or more feature maps, select the **Include Feature Maps** checkbox.
7. **Perform Data Linking:** If the report template references one or more data links, select the **Perform Data Linking** checkbox.
8. Click **Next**.
9. If the report template (.rpx file) has not yet been placed somewhere within the `Sites` folder, upload it now:
  - a. In the **Filename** list, open the folder that you want to upload the file to.
  - b. Click **+ Upload**.
  - c. Click **Select**.

- d. Browse to the file that you want to upload and select it.
  - e. Click **Open**.
  - f. Click **Upload**.
10. Browse to the report template and select it.
  11. Click **Finish**.  
The report is added to the list of reports on the Reports tab.
  12. To configure additional [settings](#), edit the report.  
For example, you can configure the output formats that users can choose from.
  13. Click **Save Site**.

## 40.4 Import Reports from Another Site

### To import reports from another site:

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Reports** tab.
3. Click **Import Reports**.
4. Select the site where the reports are configured, and then click **Next**.
5. Select the map service that contains the layer where the reports are configured, and then click **Next**.
6. Select the layer where the report is configured, and then click **Next**.
7. Select the reports that you want to import.  
To select multiple reports, hold the **Ctrl** key down while selecting.
8. Click **Finish**.  
The reports are added to the list of reports on the Reports tab.
9. Click **Save Site**.

## 40.5 Configure a Report to be Created in the Background


Web servers and browsers place a time limit on web requests. Normally, reports run with a single request and complete within the time limit. However, reports that are particularly large or contain a lot of data can take much longer.

To ensure that a large or complex report does not time out, you can configure the report to be created in the background by clicking the **Edit Print Job Settings** button. When a report is configured for background creation, you can configure email settings to notify the user when report creation starts and ends.



Only PDF reports can be created in the background—the other output formats are not supported for background creation.

► **To configure a report to be created in the background:**

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Reports** tab.
3. Edit the report that you want to configure.
4. Click **Edit Print Job Settings**.
5. To turn on background report creation, select the **Enable Print Jobs** checkbox.
6. Select the **Email Settings** tab to manage email notifications and do any of the following:
  - To allow the user to be notified by email when report creation starts and ends, select the **Enable Email Notifications** checkbox.
  - **Sender Email Address** is the address that appears in the From field of notification emails to the user.
  - **Sender Name** is the name that appears in the From field of notification emails to the user.
7. Select Message Settings to modify the text of notification emails to the user:
  - **Printing Start Subject** is the text that appears in the subject field of notification emails to the user when report creation starts.
  - **Printing Start Message** is the text that appears as the message of notification emails to the user when report creation starts. A link to the status page is automatically appended to the message.
  - **Printing Success Subject** is the text that appears in the subject field of notification emails to the user if report creation succeeds.
  - **Printing Success Message** is the text that appears as the message of notification emails to the user if report creation succeeds. A link to the status page is automatically appended to the message.
  - **Printing Failure Subject** is the text that appears in the subject field of notification emails to the user if report creation fails.
  - **Printing Failure Message** is the text that appears as the message of notification emails to the user if report creation fails. A link to the status page is automatically appended to the message.
8. Select **SMTP Settings** to edit the SMTP server settings for sending status emails:
  - **SMTP Server Host** is the host name of the SMTP server.
  - **SMTP Server Port** is the port on the SMTP server. The default port is 25.
  - **SMTP Server Username** is the username used to access the SMTP server. If a username is not required, leave this setting blank.
  - **SMTP Server Password** is the password used to access the SMTP server. If a password is not required, leave this setting blank.
9. Click **OK**.
10. Click **Save Site**.

See also...

[Launch Report Designer on page 30](#)

[Feature Maps on page 314](#)

## 41 Printing

Print templates are used to generate maps in print-ready formats, such as PDF or JPG. Print templates are really a special type of [report](#) that has a map image as its content.

Like report templates, print templates are created in Geocortex Report Designer. In Report Designer, you can add elements like an overview map, title and description, north arrow, scale bar, legend, and charts to your print template. Report Designer has a built-in help system with instructions for creating templates.



**See also...**

[Launch Report Designer on page 30](#)

### 41.1 Add or Import a Print Template


You can either add a print template by locating the template in the file system or you can import print templates that are already configured in another site. If your site has more than one print template, you can select which template you want to be the default in the viewer.

#### **To add a print template:**

1. [Launch Geocortex Report Designer](#) and create the print template(s).  
For instructions on creating a print template, refer to Report Designer's built-in help.
2. In Manager, edit the site that you want to configure, and then click **Print Templates** in the side panel.
3. Click  **Add Print Template**.
4. Type a display name for the print template.
5. If you want, type a description for the print template.
6. Click **Next**.
7. If the print template (.rpx file) is not already somewhere in the **Sites** folder, upload it:
  - a. In the **Filename** list, open the folder that you want to upload the file to.
  - b. Click  **Upload**.
  - c. Click **Select**.
  - d. Browse to the file that you want to upload and select it.
  - e. Click **Open**.
  - f. Click **Upload**.
8. Select the print template.
9. Click **Finish**.  
The print template appears on the Print Templates page.

10. Click **Apply Changes**.
11. Click **Save Site**.




To reorder your items, click and drag the  **Sort** handle and click **Save Site**.




#### To import print templates:

This procedure assumes that you have already created one or more print templates and added them to a site.

1. In Manager, edit the site that you want to configure, and then click **Print Templates** in the side panel.
2. Click  **Import Print Template**.
3. Select the site where the print templates are configured, and then click **Next**.
4. Select the print templates that you want to import.  
To select multiple templates, hold the Ctrl key down while selecting.
5. Click **Finish**.  
The print templates appear on the Print Templates page.
6. Click **Apply Changes**.
7. Click **Save Site**.



To reorder your items, click and drag the  **Sort** handle and click **Save Site**.



#### To set the default print template:

The default print template is the print template that is initially selected in the drop-down list when the user makes a request to print the map.

1. In Manager, edit the site that you want to configure, and then click **Print Templates** in the side panel.
2. In the **Default Print Template** drop-down list, select the print template that you want to use as the default.
3. Click **Apply Changes**.
4. Click **Save Site**.

## 41.2 Configure Print Template Details

On a print templates Details tab, you can configure the essential information for a template. The following configuration settings are available:

- **ID:** (information only) The ID that uniquely identifies this report.  
The ID is automatically generated.

- **Display Name:** The report's display name.  
The display name can contain spaces and special characters.
- **Description:** An optional description of the report.
- **Location:** The URI to the print template (.rpx file). Click **Browse** to browse the `Sites` folder for the template.
- **Output Formats:** The file formats that can be used for the report. Select the checkbox for each format that you want to be available to users. If you select more than one format, users must select which format they want to use before the report is created. Note that [print jobs](#) support PDF reports only.
- **Default Output Format:** Choose the default output format that should be preselected when a user chooses to print.
- **Scale Bar Unit:** Select the unit of measurement that the print template should use.
- **Transform Workflow URI:** The URI of a Report DataSet Workflow that modifies the data set for the report before the report is created. If you have created a Report DataSet Transform workflow, enter the workflow's location. For more information, see "Create a Report DataSet Transform Workflow" in the Workflow Designer help system.
- **Visible:** Controls whether the report appears in the list of reports available to be run in the viewer. In the HTML5 Viewer, a user runs reports via the **Run a Report** option in the Panel Actions menu of the results list, results table, or in map tips.
- **Edit Print Job Settings:** Print jobs allow background processing. When you enable print jobs for a report, the report is created in the background and the user is optionally notified of the job's status by email. If the report is large or contains a lot of data, enabling print jobs prevents report creation from timing out. Only PDF reports can be created in the background—the other output formats are not supported. See [Configure Print Template Details on page 305](#) for instructions.

## 41.3 Create a Dedicated Site for Print Templates

One way to manage print templates is to configure them all in one site that you create especially for that purpose. This gives you a central location to manage your print templates. To use one or more of the print templates in another site, you can either import the templates, or create a reference and inherit them.

### Importing vs. Inheriting Print Templates

Importing creates a copy of the print template component that you import. The copy's configuration is independent of the original's configuration—you can change the configuration of one without affecting the other.



Importing does not create a copy of the print template (.rpx) file. The print template component in the dedicated Print Templates site and the copy both refer to the same .rpx file. If you modify the .rpx file, the changes appear in both the original and any imported copies.

Instead of importing print templates, you can create a reference to the Print Templates site. This creates a linked reference to each print template. You can change the inherited configuration without affecting the source configuration. This allows you to customize a print template for different sites.

However, if you change the configuration of the source site, the changes also appear in the site that references it, without overriding any changes you have made. For example, you could add a new print template to the Print Templates site and it would appear in the sites that reference Print Templates.

## Example

Suppose you want users to be able to use the County Roads print template in several different sites. You create an empty site called Print Templates and add the County Roads print template to it. Then you edit each of the sites that you want to have the County Roads template and add a reference to the Print Templates site. Each site inherits the County Roads template.

Now suppose you add a second print template, County Waterways, to the Print Templates site. All the sites that reference the Print Templates site automatically inherit the new County Waterways template. Note that if you had originally added or imported the County Roads template, instead of referencing the Print Templates site, you would now have to add or import the County Waterways template to each site.

Similarly, if you modify one of the templates on the Print Templates site, all the other sites will automatically inherit the changes.

## Overview of Steps to Create a Dedicated Site for Print Templates

### ► To use a dedicated site for print templates:

1. Create an empty site.  
See [Create a Site on page 57](#).
2. Add your print templates to the new site.  
See [Add or Import a Print Template on page 304](#).
3. Save the site.
4. Edit a site that you want to inherit the print templates.
5. Add a reference to the site that contains the print templates.  
See [Add a Reference to a Site on page 189](#).
6. Click **Print Templates** in Manager's side panel to see the inherited print templates.
7. Modify or remove print templates as desired.  
This does not affect the print templates in the dedicated print templates site.
8. Save the site.
9. Continue adding references until you have added a reference to each site that you want to inherit print templates.

### See also...




[Inherit Components from Another Site on page 60](#)

## 41.4 Change the North Arrow

You can configure the style and color of the north arrow to use in printouts. In order for the north arrow to appear on a printout, the print template must have a placeholder for the north arrow. The placeholder is added in Report Designer.







► **To edit the North arrow:**

1. In Manager, edit the site that you want to configure, and then click **Print Templates** in the side panel.
2. Click  **Edit North Arrow**.
3. To select a different image, click the image preview , browse the thumbnail images, and then double-click the image that you want to use.  
The image preview shows the currently selected style and color of north arrow.
4. To change the color, enter the hexadecimal value in the **Select Color** box, or click the **Color** icon  and select a new color.
5. Click **Apply Changes**.
6. Click **Save Site**.

## 41.5 Configure Map Scale Options for Printing

In the Geocortex Viewer for Silverlight, when you print a map, you can select from several options that determine the scale in which the map prints. You can configure the scale options that appear in the drop-down list within Print Templates in Geocortex Essentials. For more information, see the "Printing Module" documentation in *Geocortex Viewer for HTML5 Administrator and Developer Guide*

► **To configure the map scale options:**

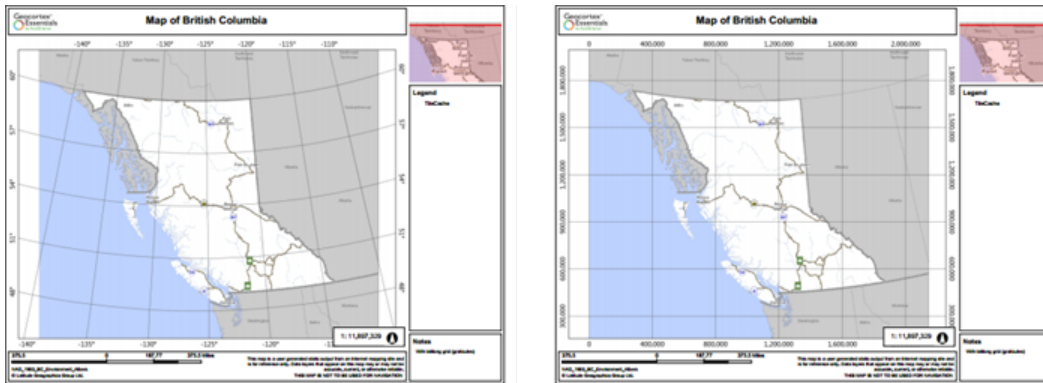
1. In Manager, edit the site that you want to configure, and then click **Print Templates** in the side panel.
2. Click the **Edit** icon  beside the print template that you want to configure.  
Scale option settings are part of a particular print template, so you need to make the edits individually in all the print templates where you want them to appear.
3. On the **Edit Print Template** page, select the **Map Scales** tab.
4. Do any of the following:
  - To add a specific scale, click  **Add Map Scale**, enter the denominator of the scale and a display name for the scale, and then click **OK**.
  - To change a scale's display name, click the **Edit** icon  beside the scale, type in the new name, and then click **OK**.
  - To remove a specific scale, click the **Remove** icon  beside the scale, and then click **OK**.
  - To override the default selection behavior of the Map Scale text box (by default set to Current Scale), use the **Default Map Scale** drop-down menu.
5. Click **Apply Changes** and then **Save Site**.

## 41.6 Configure Grids and Graticules

You can define grids that optionally print when the user makes a request to print the map. The grid coordinates print around the perimeter of the map image.


There are two types of grid:

- **Graticules:** Use latitude/longitude coordinates. You can specify the approximate number of intervals.
- **Measured Grids:** Use the map units of the basemap by default. You can override the default by configuring the Well Known ID (WKID) or Well Known Text (WKT) of a different projection. As with graticules, you can specify the approximate number of intervals to use.




Printed map with graticules (left) and measured grid (right)

You can configure as many measured grid and graticule definitions as you want for a template. The user also has the option to exclude the grid.

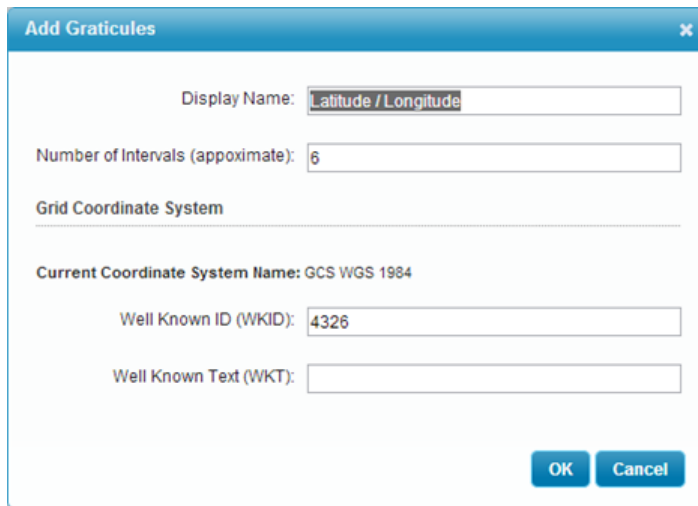
 The Geocortex Viewer for HTML5 does not support grids.

### ► To add a grid to a print template:

1. Launch Manager and edit the site that you want to configure.
2. Click **Print Templates** in the sidebar.  
The Print Templates page opens.
3. Click the **Edit** icon  for the template you want to configure.  
The Edit Print Template page opens.
4. Select the **Grids** tab.
5. Follow the instructions that apply to you:

#### Graticules:

- a. Click **Add Graticules**.  
The Add Graticules dialog box opens.



### Add graticules

- b. Type a display name for the grid.  
This is the name the end user will select to print this grid.
- c. Enter the number of intervals you want in the grid.
- d. If you do not want to use the default coordinate system, type the WKID or WKT of the coordinate system you want to use.
- e. Click **OK**.  
The dialog box closes. The graticules definition is listed on the Edit Print Template page.
- f. Click **Save Site**.



If you want to change a graticules definition into a measured grid, edit the graticules and enter the WKID or WKT for the projection you want to use.

### Measured Grid:

- a. Click **Add Measured Grid**.  
The Add Measured Grid dialog box opens.

### Add measured grid

- b. Type a display name for the grid.  
This is the name the end user will select to print this grid.
- c. Enter the number of intervals you want in the grid.
- d. If you want to use different units than the basemap's units, type the WKID or WKT of the projection you want to use.
- e. Click **OK**.  
The dialog box closes. The measured grid definition is listed on the Edit Print Template page.
- f. Save the site.



If you want to change a measured grid into graticules, edit the measured grid and enter 4326 in the WKID or WKT for the coordinate system you want to use. The default coordinate system for graticules is GCS WGS 4326.

### ▶ To set the default grid:

The default grid is the grid that is initially selected in the drop-down list when the user makes a request to print the map. The factory default is None (no grid).

1. In Manager, edit the site whose configuration you want to change.
2. Click **Print Templates** in the side panel.  
The Print Templates page opens.
3. Select the grid that you want to use as the default from the **Default Grid** drop-down list.
4. Save the site.

## 41.7 Large-Format Printing

The creation of printed output is memory intensive. To avoid performance issues, Essentials offers a large-format printing feature that stores the output on disk instead of in memory. Large-format printing enables you to create print templates for arbitrarily large output, including map images that are larger than the map service's maximum map image

size. This means you can create high-resolution output that is as large as your printer or plotter supports, regardless of map service constraints.

By default, large-format printing is disabled. Each print template in a site has its own setting, so you can enable large-format printing for some print templates and leave it disabled for others. The end user cannot turn large-format printing on or off.

The following table compares the default handling of print templates (left column) to large-format printing (right column). Use the information in this table as your guide when deciding whether a template should be configured to use large-format printing or not.

LARGE-FORMAT PRINTING DISABLED	LARGE-FORMAT PRINTING ENABLED
Output is kept in memory as it is being created and after it is complete.	Output is written to disk as it is being created and after it is complete.
Output is available for download for a few minutes after the output is created. No housekeeping is required.	Output is available for download for up to three months, after which Essentials deletes the output. Status files are permanent. When the output is deleted, the status becomes "No longer available".
Large and concurrent print template requests can affect server performance due to memory shortage.	Large and concurrent print template requests have much less effect on server performance.
The size, resolution and number of print operations that can run concurrently are limited by RAM and CPU.	Size and resolution of print operations are limited only by available disk space on the server. Print operations are queued, so there is virtually no limit to the number of print operations that can be started concurrently.
Turnaround is quick, provided the size and resolution of the images are small.	Turnaround depends on the size of the job and the number of jobs in the queue.
The user is notified on screen when creation of the output has started and completed. Email notification is not supported.	The user is notified on screen and also optionally via email when creation of the output has started and completed. In addition, the user can check the progress of the print job at any time.
Multiple output formats are supported: PDF, RTF, TIFF, BMP, GIF, JPEG, and PNG.	One output format is supported: PDF.
If the paper size is smaller than the image size defined in the RPX file, the printed image automatically breaks at page boundaries.	The image size defined in the RPX file must be at most the paper size minus the margins. Page boundaries are not handled.

### 41.7.1 Configure a Print Template for Large-Format Printing

 **To configure a print template for large-format printing:**

1. In Manager, edit the site that you want to configure, and then click **Print Templates** in the side panel.
2. Edit the print template that you want to configure.
3. Click **Edit Print Job Settings**.

4. To turn on large-format printing, select the **Enable Print Jobs** checkbox.
5. Select the **Print Job Settings** tab to edit the parameters for rendering the map:
  - **Tile Size** is the size (in pixels) of the square image tiles used to compose the map images. In most cases, a value between 512 and 2048 is ideal. Larger sizes consume more system memory.
  - **Maximum Workers** is the number of threads that will be used to render the map. A larger number of threads will increase the speed of the print job, but will consume more system resources. Select value between 1 and 3 to start to be safe, more if the system can handle it.
  - **Output File Time-to-Live** is the number of hours that the completed print job will persist on the server and be available for download.
6. Select the **Email Settings** tab to manage email notifications.
  - To allow the user to be notified by email when the user's print jobs start and end, select the **Enable Email Notifications** checkbox.
  - **Sender Email Address** is the address that appears in the From field of notification emails to the user.
  - **Sender Name** is the name that appears in the From field of notification emails to the user.
7. Select Message Settings to modify the text of notification emails to the user.
  - **Printing Start Subject** is the text that appears in the subject field of notification emails to the user when the print job starts.
  - **Printing Start Message** is the text that appears as the message of notification emails to the user when the print job starts. A link to the status page will be automatically appended to the message.
  - **Printing Success Subject** is the text that appears in the subject field of notification emails to the user if the print job succeeds.
  - **Printing Success Message** is the text that appears as the message of notification emails to the user if the print job succeeds. A link to the status page will be automatically appended to the message.
  - **Printing Failure Subject** is the text that appears in the subject field of notification emails to the user if the print job fails.
  - **Printing Failure Message** is the text that appears as the message of notification emails to the user if the print job fails. A link to the status page will be automatically appended to the message.
8. Select **SMTP Settings** to edit the SMTP server settings for sending status emails.
  - **Use SSL:** If you want emails related to print jobs to be sent using SSL (HTTPS), select the **Use SSL** checkbox. If the Use SSL checkbox is cleared, emails are sent using HTTP.
  - **SMTP Server Host** is the host name of the SMTP server.
  - **SMTP Server Port** is the port on the SMTP server. The standard port is 25.
  - **SMTP Server Username** is the username used to access the SMTP server. If a username is not required, leave empty.
  - **SMTP Server Password** is the password used to access the SMTP server. If a password is not required, leave empty.
9. Click **OK**.

## 42 Feature Maps

A feature map is an image that shows a particular feature on a feature layer. Feature maps are used in [reports](#). When an end user runs the report, a feature map of the currently selected feature is included in the report. The selected feature appears in the center of the map image. The map itself and any visible layers also appear on the feature map, just as they are configured in the Essentials site.

The following screen capture shows a feature map in a report for a tax parcel. The feature map is circled. The parcel in the feature map is highlighted cyan.

The screenshot displays a report titled "Geocortex Demonstration Site Parcel Report". It includes a table of tax information and a feature map. The feature map is circled in blue, showing a street grid with a specific parcel highlighted in cyan. To the left of the feature map is a satellite image of the same area.

Taxlot Information:		Report Generated: 6/1/2015 11:27:12 AM	
AIN:	5074031024		
Legal Owner:	GSS Investments LP		
Site Address:	2002 W Washington Blvd	Mailing Address:	4092 6 Pl Wilshire Blvd
	Los Angeles CA		Los Angeles CA
	90018		90019
Property Value:	\$421,757.00	Improvement Value:	\$935,752.00
Year Built:	1969		
Taxlot Area:	5,661.38 square meters	Primary Structure Area:	6,104.84 square meters


Geocortex®  
W Washington Blvd  
Big View Image  
Feature Map Legend in Use

This map is a user generated static output from an internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Parcel report with a feature map showing the currently selected parcel

### 42.1 Main Configuration Steps

The main steps to create a feature map and use it in a report are:

 Additional steps are required to configure the report. See [Reporting on page 299](#) for information.

1. In Manager, add a feature map to the layer that the report belongs to.  
See [Add a Feature Map to a Layer](#).
2. In Report Designer, add the feature map to the report template.  
See [Add a Feature Map to a Report Template](#).
3. In Manager, make sure that the report's **Include Feature Maps** checkbox is selected.

## 42.2 Feature Map Settings

Feature maps have the following settings:

- **ID:** (information only) The ID that uniquely identifies this feature map.  
The ID is based on the display name that you enter when you create the feature map. Special characters are removed and spaces are converted to underscores.
- **Display Name:** The feature map's display name.  
The display name can contain spaces and special characters.
- **Buffer Distance:** Controls how much of the surrounding area around the feature to show in the feature map, in other words, how far to zoom out from the feature. If the buffer distance is 0 (zero), the feature extends to the edges of the feature map. The higher the buffer distance, the farther out the feature map is zoomed.




Feature maps with a buffer distance of 0 (left), 50 m. (center), and 100 m.

The default buffer distance is 0 (zero). Using a buffer distance helps readers to orient themselves within the feature's larger context.





Click **Apply** to see a preview of the buffer distance that you have chosen. The preview also shows the highlight color and opacity.

- **Highlight Color:** The color to highlight the feature. Enter the highlight color using hexadecimal notation (for example, **#FFA500**) or the HTML color name (for example, **orange**). Alternatively, click the color picker  to select the color from a color map. The **Highlight Color** setting has no effect if **Highlight Feature** is disabled.
- **Opacity:** The opacity of the highlighting, on a scale of 0 (transparent) to 255 (fully opaque). Drag the slider to change the opacity. The color picker's opacity changes to reflect the opacity that you have selected. The **Opacity** setting has no effect if **Highlight Feature** is disabled.
- **Highlight Feature:** Controls whether the feature is highlighted in the feature map. If you do not want the feature to be highlighted, clear the Highlight Feature checkbox.
- **Resolution:** The resolution to use for the feature map image, in pixels per inch. The default resolution, 96 ppi, is appropriate for viewing the report on a computer. If you want to print the report, you may want to increase the resolution.




## 42.3 Add a Feature Map to a Layer

### To add a feature map to a layer:


1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Feature Maps** tab.
3. Click **Add Feature Map**.
4. **Display Name:** Type a display name for the feature map.  
The display name can contain spaces and special characters.
5. Click **Apply**.  
This generates the feature map's ID.
6. Take note of the feature map's **ID**.  
You will need the ID when you add the feature map to the report template.
7. **Buffer Distance:** If you want to zoom the feature map out from the feature, enter a buffer distance and select the units.
8. **Highlight Color:** If you want to change the highlight color, enter the color's hexadecimal value (for example, **#EE82EE**) or HTML color name (for example, **violet**).  
Alternatively, click the color picker  and select the new color from the color map.
9. **Opacity:** To adjust the opacity of the highlighting, drag the slider.
10. **Highlight Feature:** To turn off highlighting, clear the **Highlight Feature** checkbox.
11. **Resolution:** If you want, enter a new resolution for the feature map image, in pixels per inch.  
The default resolution is appropriate for viewing the report on screen.
12. To preview your settings, click **Apply**.  
The preview shows an example of a feature map that uses your configuration.
13. Click **OK**.  
The feature map is added to the list of feature maps on the Feature Maps tab.
14. Click **Save Site**.




To reorder your items, click and drag the  **Sort** handle and click **Save Site**.

## 42.4 Import Feature Maps from Another Site

### ▶ To import feature maps from another site:

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Feature Maps** tab.
3. Click **Import Feature Map**.
4. Select the site where the feature maps are configured, and then click **Next**.
5. Select the feature maps that you want to import.  
To select multiple feature maps, hold the **Ctrl** key down while selecting.
6. Click **Finish**.  
The feature maps are added to the list of feature maps on the Feature Maps tab.
7. Edit each imported feature map and adjust the settings as needed to make the imported settings work in this layer.  
For example, the buffer distance could exceed the scale range of the layer that you imported the feature map into.
8. Take note of each feature map's ID.  
You will need the IDs when you add the feature maps to report templates.
9. Click **Save Site**.



To reorder your items, click and drag the  **Sort** handle and click **Save Site**.

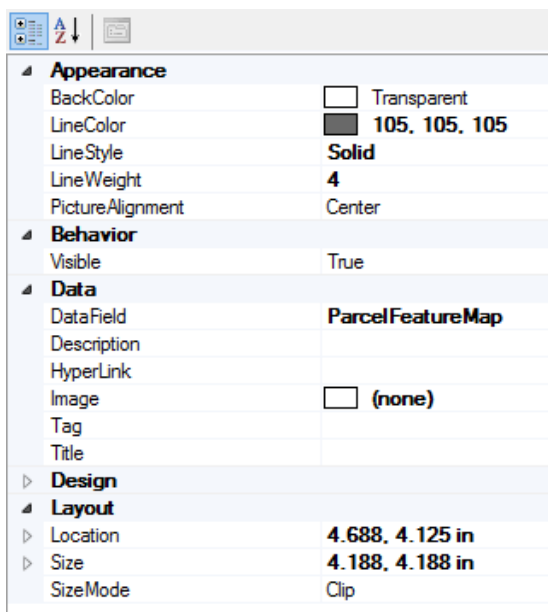
## 42.5 Add a Feature Map to a Report Template

### ▶ To add a feature map to a report template:

1. [Launch Report Designer](#).
2. Open the report that you want to add the feature map to:
  - **New Report:** If the report template does not exist yet, click **File | New**.
  - **Existing Report:** If the report template already exists, click **File | Open** and open the report template.  
Report templates are `.rpx` files. They are stored in the `Sites` folder.
3. Drag a **Picture** control from the left panel to the desired position on the design surface.  
If there is no Picture control, the Geocortex Essentials-specific controls may be open. Click **Controls** to open the standard controls.
4. Drag the Picture's handles to adjust its size to the size that you want the feature map.

5. Make sure that the Picture is selected on the drawing surface.  
This displays the Picture's properties in the right panel.
6. Configure the Picture's properties:
  - a. In the **Data** area, set **DataField** to the feature map's **ID**.  
This puts the feature map into the Picture control. If you do not know the feature map's ID, edit the layer in Manager and click the **Feature Maps** tab to see the ID.
  - b. In the **Behavior** area, make sure that **Visible** is set to **True**.  
If Visible is False, the feature map will not appear in the report.
  - c. If you want the feature map to have a border, configure the **LineColor**, **LineStyle** and **LineWeight** properties in the **Appearance** area.

The Picture's properties will look something like this:



Example configuration for a Picture that contains a feature map

7. To add a caption to the feature map, drag a **TextBox** control below the Picture on the design surface and set the **Text** property in the **Data** area to the caption's text.
8. Save the report template.

See also...

[Reporting on page 299](#)

## 43 Fields

Fields store feature attributes. For example, a Highways layer might have fields for the highway's name, shape, and ID attributes. This means that every feature in the Highways layer has a field for its name, a field for its shape, and a field for its ID.

Essentials allows you to configure settings for individual fields, including the field's visibility, whether the field can be searched by Global Search, how to format numeric and date fields in the viewer, and more.

In order to configure the settings for a particular field, you must first add the field to the list of fields that you want to configure individually. You can also batch configure **<all other fields>**—the fields that you have not added.

You can configure the order that fields appear in HTML5 viewers. This means that you can put the most important fields at the top in feature details, so users immediately see the most important fields. For instructions, see [Configure the Order of Fields](#) on page 323.

## 43.1 Field Settings

Fields have the following settings:

- **Display Name:** The name to use for the attribute in the viewer. The Display Name setting provides a way to define an alias that end users see. For example, a field named "ZIP" in the map service could appear as the "Zip or Postal Code" attribute in the viewer.

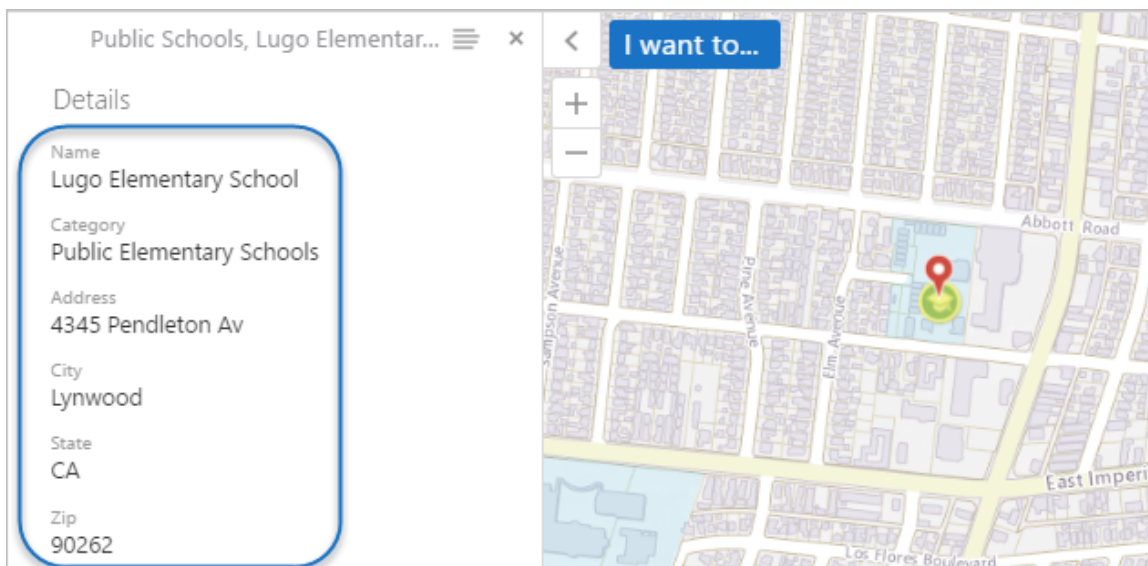
If you leave the Display Name box blank, the name is inherited from the map service.



You can also define display names for layers and map services. See [Layers](#) on page 191 and [Map Service Details Tab](#) on page 114 for information.

- **Visible:** When field visibility is turned on, the attribute shows in the feature details. If you turn off visibility, the attribute is hidden from the end user, and queries performed by the Essentials Query Builder do not search the field. By default, fields are visible.

In the following image, a school's Name, Category, and address-related fields are visible, but other fields like Enrollment



Visible fields listed in a feature's details



In addition to configuring which attributes are listed in the feature details, you can configure the attributes and other information that are used to describe features in search and identify results, map tips, and the Details tab of feature details. For information, see [About Feature Descriptions on page 191](#).

- **Include in Global Search:** If Include in Global Search is turned on, the field is searched when the user performs a global search. By default, fields are searchable. If you turn off this setting, global searches skip this field.







Global Search is independent of field visibility. You can search for fields that are not visible, and fields that are not visible can appear in the feature details.

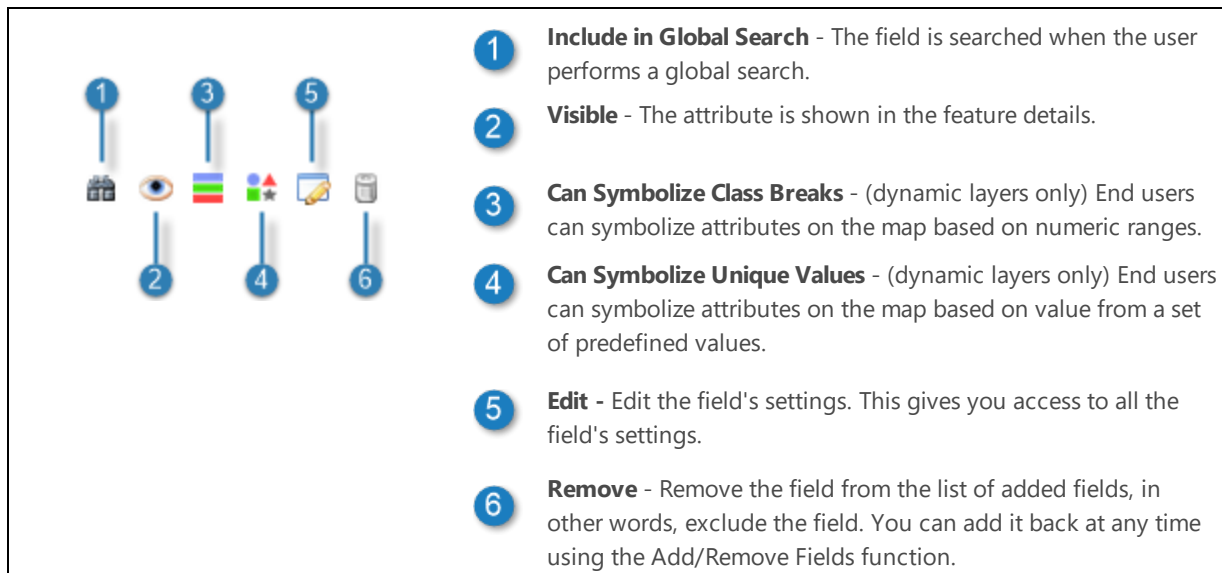
- **Can Symbolize Class Breaks (Silverlight Viewer only):** When this setting is enabled, the end user can symbolize dynamic layer attributes on the map based on numeric ranges. For example, the user could symbolize population ranges on a Population layer.  
For the Geocortex Viewer for HTML5, attribute-based symbology is always available as long as symbology is enabled for the layer.
- **Can Symbolize Unique Values (Silverlight Viewer only):** When this setting is enabled, the end user can symbolize dynamic layer attributes that get their value from a set of predefined values. For example, the user could symbolize schools based on their level—elementary, middle, or high school.  
For the Geocortex Viewer for HTML5, attribute-based symbology is always available as long as symbology is enabled for the layer.
- **Hyperlink Label:** If the field contains only a hyperlink (no text), viewers display the text specified in the Hyperlink Label box instead of the URL. This is particularly useful for long URLs. If you want viewers to display the URL, leave the box blank.
- **Number Format:** (numeric fields only) (does not apply to GeorSS layers) The format to use to display the field's value in HTML5 viewers.  
You can configure the format at the map service level, the layer level, and the field level. The default value, **Default**, inherits the formatting from a higher level. If all three levels are set to Default, fixed-point formatting with up to four decimal digits is used.
  - **Currency:** (applies to the Currency and Accounting number formats only) The currency type of the stored data. For example, if the stored data is in euros, enter EUR. The default is USD (US Dollars). To see a complete list of currency codes, delete the default currency type—a drop-down list of currency codes will open. To find out what the codes stand for, refer to this list of [ISO 4217 currency codes](#).
  - **Decimal Places:** The number of decimal digits to display in viewers. To display integers, enter **0**. Alternatively, leave the Decimal Places setting blank to display up to four decimal digits (Number, Fixed-point, and Percentage formats) or the conventional number of decimal digits for the specified currency (Currency and Accounting formats).
  - **Custom Number Format:** The custom format string that you want to use to format numbers in the viewer. Essentials supports custom format strings based on the .NET Framework [Custom Numeric Format Strings](#). Do not put quotation marks around the custom format string.

- **Date Format:** (date/time fields only) (does not apply to GeoRSS layers) The format to use to display the field in the viewer.
  - **Custom Date Format:** The custom format string that you want to use to format dates in the viewer. For formatting instructions, see [Format Date/Time Fields on page 331](#). Do not put quotation marks around the custom format string.

## 43.2 Configure an Individual Field's Settings

In order to configure an individual field's settings, you must first add the field. The fields that you do not add can be [configured as a batch](#).


The procedure below for configuring a field's settings gives you access to all of the field's settings. Several settings can also be modified by clicking the icon beside the field. When a setting is disabled, its icon either has a red X on it   or it is grayed out  .




- 1 Include in Global Search** - The field is searched when the user performs a global search.
- 2 Visible** - The attribute is shown in the feature details.
- 3 Can Symbolize Class Breaks** - (dynamic layers only) End users can symbolize attributes on the map based on numeric ranges.
- 4 Can Symbolize Unique Values** - (dynamic layers only) End users can symbolize attributes on the map based on value from a set of predefined values.
- 5 Edit** - Edit the field's settings. This gives you access to all the field's settings.
- 6 Remove** - Remove the field from the list of added fields, in other words, exclude the field. You can add it back at any time using the Add/Remove Fields function.



### Shortcut icons for configuring fields

#### ► To configure a field's settings:

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Fields** tab.
3. If you have not yet added the field, add the field now:  
Adding a field enables you to re-order the field and configure the field's settings separately from the other fields in the layer.
  - a. Click **Add/Remove Fields**.
  - b. To add one or more fields, select the fields in the **Excluded Fields** column, and then click the **Include** button (➡) that is between the two columns.


 To select multiple fields, hold the Ctrl key down while you select the fields.

- c. To remove fields that have been added, select the fields in the **Included Fields** column, and then click the **Exclude** button () that is between the two columns.

 You can also exclude fields after you close the Add/Remove Fields dialog box by clicking the Remove icon  beside the field that you want to exclude.

- d. Click **OK**.  
The Fields tab lists the fields that you have added. The **<all other fields>** item is at the top of the list. The **<all other fields>** item enables you to change the settings for the fields that you have not added.

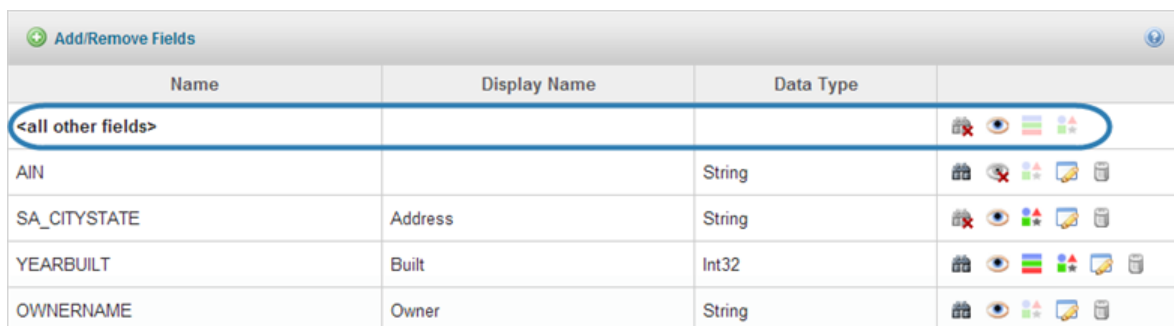
- e. Click **Submit Field Changes**.  
You can now individually re-order and change the settings of any added field, and batch change the settings of the excluded fields.






4. Use the [shortcut icons](#) to change settings, or click the **Edit** icon  beside the field that you want to edit.  
Editing the field gives you access to additional settings.
5. Change the field's settings as desired.  
See [Field Settings on page 319](#) for information.
6. Click **OK**.
7. Click **Submit Field Changes**.
8. Click **Save Site**.

### 43.3 Batch Configure Excluded Fields

In addition to [configuring individual fields](#) that you have added, you can configure the remaining fields as a batch. The **<all other fields>** item at the top of the list on the layer's Fields tab is used for this purpose.






For example, in the screen capture below, the layer has four fields that are configured individually. The remaining fields are visible but not searchable, and they cannot be symbolized using class breaks or unique values.



Name	Display Name	Data Type	
<all other fields>			
AIN		String	
SA_CITYSTATE	Address	String	
YEARBUILT	Built	Int32	
OWNERNAME	Owner	String	

Example of the list of fields on a layer's Fields tab, showing the **<all other fields>** item

► **To change the settings of the fields that are not added:**


1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Fields** tab.
3. To prevent excluded fields from being searched as part of a global search, disable  the **Include in Global Search** icon beside **<all other fields>**.
4. To prevent the excluded fields from showing in the viewer, disable  the **Visible** icon beside **<all other fields>**.
5. To prevent the end user from symbolizing the excluded fields using class breaks, disable  the **Can Symbolize Class Breaks** icon beside **<all other fields>**.
6. To prevent the end user from symbolizing the excluded fields using unique values, disable  the **Can Symbolize Unique Values** icon beside **<all other fields>**.
7. Click **Submit Field Changes**.
8. Click **Save Site**.

## 43.4 Configure the Order of Fields

You can configure the order that fields appear in viewers. This means that you can put the most important fields at the top in feature details, so users immediately see the most important fields. Re-ordering fields does not affect the fields in the underlying layer.

Note that the custom order is not reflected on Manager's Fields tab.

► **To configure the order that a layer's fields appear in viewers:**



1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Fields** tab.
3. Add the fields that you want to re-order.  
Adding a field enables you to re-order the field and configure the field's settings separately from the other fields in the layer.
  - a. Click **Add/Remove Fields**.
  - b. To add one or more fields, select the fields in the **Excluded Fields** column, and then click the **Include** button (**➤➤**) that is between the two columns.



To select multiple fields, hold the Ctrl key down while you select the fields.

- c. To remove fields that have been added, select the fields in the **Included Fields** column, and then click the **Exclude** button (**⏪**) that is between the two columns.




 You can also exclude fields after you close the Add/Remove Fields dialog box by clicking the Remove icon  beside the field that you want to exclude.












- d. Click **OK**.  
The Fields tab lists the fields that you have added. The **<all other fields>** item is at the top of the list. The **<all other fields>** item enables you to change the settings for the fields that you have not added.
- e. Click **Submit Field Changes**.  
You can now individually re-order and change the settings of any added field, and batch change the settings of the excluded fields.

4. Click  **Sort Fields**.

The Sort Fields dialog box opens. The Sort Fields dialog box lists all the fields in the layer. Fields that have been added appear in black and can be re-ordered. If the field name is gray, the field has not been added and cannot be re-ordered.


**Sort Fields** ✕

This list controls the order that fields are presented in the viewer. 

Name	Data Type
 created_date	DateTime
 CITY_WEBSITE	String
 POP_98	Int32
 IMAGEID	String
 Editable_Date	DateTime
 created_user	String
 DATE_	DateTime
 last_edited_user	String
 NAME	String
 last_edited_date	DateTime
 OBJECTID	Int32

OK
Reset to Default
Cancel



5. To change the position of a field in the list, drag the row and drop it in its new position.
6. Continue to drag and drop fields until the list is sorted the way you want it.

 While you are reordering the fields, if you want to return the fields to the order in the underlying layer, click Reset to Default.

7. When the fields are in the order that you want, click **OK**.  
The fields will display in the configured order in viewers.

8. Click **Save Site**.

► **To reset the field order to the order defined in the underlying layer:**

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Fields** tab.
3. Click  **Sort Fields**.
4. Click **Reset to Default**.
5. Click **OK**.
6. Click **Save Site**.

## 43.5 Configure Time Zones for Date/Time Data

Time zones are defined relative to Coordinated Universal Time (UTC), the primary time standard by which clocks and time are regulated. For example, Greenwich Mean Time is UTC+0, Central European Time is UTC+01:00 (one hour ahead of UTC), and Eastern Standard Time is UTC-05:00 (five hours behind UTC).

Geocortex Essentials provides settings that control how date/time data is interpreted and displayed in HTML5 viewers:

- **Data Time Zone:** The Data Time Zone setting specifies the time zone in which your data is stored.
- **Display Time Zone:** The Display Time Zone specifies the time zone to use for displaying date/time data.

### Contexts where Configured Time Zones Apply

The Data Time Zone and Display Time Zone apply in the following contexts:

- Map tips
- Feature details (compact and expanded)
- Results List and Results Table
- Field value pick lists in Query Builder and Filter Builder
- Populated field values and field value pick lists in edited features
- Edited features, including related features that the user has edited
- Features that are only available to the viewer through an ArcGIS Server relationship
- Reports

### Daylight Saving Time

Some regions use Daylight Saving Time during the summer. Daylight Saving Time is offset from UTC by an additional hour. For example, during the summer London uses British Summer Time, which is UTC+01:00.

Browsers use JavaScript to calculate Daylight Saving Time. JavaScript assumes that the current year's Daylight Saving Time dates apply to every year, including years before Daylight Saving Time was first introduced. For example, if

Daylight Saving Time is in effect in a particular region from March 13 to November 6 this year, then JavaScript outputs all date/time data between March 13 and November 6 in Daylight Saving Time. This can result in a misrepresentation of date/time data.

### 43.5.1 Specify the Time Zone that Date/Time Data is Stored In



This section describes how to configure the time zone for date/time data in feature attributes and ArcGIS tables. For information on configuring the time zone for data links, see [Specify the Data Time Zone for a Data Link on page 260](#).

Date/time data in geographic information systems is conventionally stored in UTC. This allows the data to be stored without time zone information. For example, before storing the value **June 12, 2010 6:00 PM** Pacific Standard Time, which is UTC-08:00, conventionally you would convert it to UTC by adding eight hours to the value, which makes it **June 13, 2010 2:00 AM**. Applications that use the data can then assume that the data is in UTC and convert it to other time zones as needed.

If you have date/time data that is not stored in UTC, you can specify the data's time zone in Manager using the **Data Time Zone** setting. This provides the information needed to adjust the values and display them correctly to users. Configuring the time zone does not affect the underlying data.



If your date/time data is not in UTC and you do not configure the Data Time Zone, the data may display incorrectly in viewers.



ArcGIS Server 10.4 has a time zone setting for date fields. If you are running ArcGIS Server 10.4 and you have set the time zone in ArcGIS Server, make sure that the Data Time Zone in Essentials is UTC. If you set the time zone in both places, the data will display incorrectly in viewers.



You do not need to configure the Data Time Zone for ArcGIS Server time-aware layers. Time-aware layers have their own time zone setting in ArcGIS Server. Essentials and HTML5 viewers use the ArcGIS Server time zone setting instead of the Essentials time zone setting when displaying date/time data from time-aware layers.

## Data Sources that the Data Time Zone Applies To

The Data Time Zone applies to:

- Date/time data in feature attributes
- Date/time data in ArcGIS tables

The configured time zone does not apply to:

- **Data from Data Links:** Data links have their own time zone setting in Essentials. For information, see [Specify the Data Time Zone for a Data Link on page 260](#).
- **Data from Time-Aware Layers:** Time-aware layers have their own time zone setting in ArcGIS. Essentials and HTML5 viewers use the ArcGIS time zone setting when displaying date/time data from time-aware layers.

- **Data from GeoRSS Layers:** GeoRSS layers do not provide information about the type of data that a field contains, so there is no way for the Geocortex software to know which fields contain date/time data.

## Configure the Data Time Zone

You can configure your data's time zone at the site level, the map service level, and the layer level. By default, the time zone is set to **Default**, which inherits the time zone from a higher level—layers inherit the time zone from the map service, and map services inherit the time zone from the site. If you leave a layer, the layer's map service, and the site all set to Default, UTC is assumed.

You can override inherited values by configuring a time zone at a lower level. For example, you could set a time zone for the site, but override it for a particular map service in the site, and override it again for a particular layer in the map service.



If your date/time data is stored in UTC, you do not need to configure the Data Time Zone.

To save yourself from doing more configuration than necessary, configure the time zone by starting at the site level and working down:

1. Configure the site to use the time zone that most date/time data is stored in.
2. Configure the time zone for map services that store their data in a different time zone than the site.  
A map service's time zone overrides the site's time zone.
3. Configure the time zone for layers that store their data in a different time zone than the map service.  
A layer's time zone overrides the map service's time zone.

### ► To specify the time zone that date/time data is stored in:

1. Follow the instructions that apply to you:


#### Configure the Site-Level Time Zone

- a. In Essentials, edit the site that you want to configure, and then select **Site Info** from the side panel.

#### Configure the Map Service-Level Time Zone

- a. In Manager, edit the map service that you want to configure, and then click the **Display Settings** tab.  
The Data Time Zone setting is in the Field Formatting area.

#### Configure the Layer-Level Time Zone

- a. In Manager, select the **Edit**  tool next to the layer that you want to configure.
- b. Click the **Fields** tab.  
The Data Time Zone setting is in the Default Formatting area.

2. In the **Data Time Zone** drop-down list, select the time zone that the data is stored in.  
Alternatively, you can select a city that is in the same time zone as the stored data.
3. Apply your changes.
4. Click **Save Site**.

## 43.5.2 Specify a Time Zone to Display Date/Time Data

By default, viewers display date/time data in the user's local time, which is determined from the device's time zone setting. Displaying the data in local time makes it easier for the user to work with the data in some situations.

For example, suppose that you host an application that shows the current location of trains in a rail network. The rail network crosses the continent, so individual date/time values may be in different time zones. Users see the all the values in their local time, without having to convert them, which makes travel planning easier.

In other situations, you may want your HTML5 viewers to always display date/time data in a particular time zone, instead of adjusting the displayed data to the end user's time zone.

For example, an organization with offices across the continental US may want date/time data to display in the time zone of the head office, no matter where the user is located. In this case, you can specify the **Display Time Zone** setting in Manager. When the Display Time Zone setting is configured, viewers do not adjust date/time data to the end user's time zone before displaying it. Instead, viewers adjust date/time data to the time zone specified in the Display Time Zone setting.

### Data Sources that the Display Time Zone Applies To

The Display Time Zone applies to:

- Date/time data in feature attributes
- Date/time data in ArcGIS tables
- Date/time data from data links
- Date/time data from time-aware layers
- Date/time data that a user has edited or created in a new feature
- Date/time data from GeorSS layers

### Configure the Display Time Zone

#### To specify the time zone to use to display date/time data:

1. In Essentials, edit the site that you want to configure, and then select **Site Info** from the side panel.
2. In the **Display Time Zone** drop-down list, select the time zone that you want all date/time data to be displayed in.
3. Click **Apply Details**.
4. Click **Save Site**.

### Configure Report Template Time Zones

By default, report templates that use date/time data output the source database's raw date/time data. However, you can configure report templates to display date/time data columns with either the time zone of the machine running Essentials or the configured Display Time Zone setting.

While editing a report template in Geocortex Report Designer, locate the date/time data you wish to configure and edit its DataField.

- To display the date/time data in the time zone of the machine running Essentials, append its DataField with `_ServTZ`.
- To display the date/time data in the configured Display Time Zone, append its DataField with `_DispTZ`.

For example, if your report template looks for date/time data from a field with the name `MyDate`, you can set the report DataField name to `MyDate_ServTZ` to use your Essentials server's time zone or `MyDate_DispTZ` to use the configured Display Time Zone.

## 43.6 Format Date/Time and Number Fields

The Field Formatting feature enables you to configure how dates, times, and numbers are formatted in the site's viewers. Field formatting ensures that data is displayed to end users using the format that you specified, localized to the user's locale. Essentials supports a number of common, predefined formats, as well as custom formats.



If you use the viewer's `locale` parameter in viewer launch URLs, it will override the user's locale, which is used to localize dates, times, and numbers in the viewer. All dates, times, and numbers will be in the locale that is specified in the URL parameter. For more information, see "URL Parameters Reference" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

### Background

There are many different formats that can be used for presenting dates, times, and numbers. Different locales use different conventions. For example, the USA uses a period as the decimal mark and commas to group the digits in large numbers—**12,345,678.9**—whereas the Netherlands uses a comma as the decimal mark and periods to group digits—**12.345.678,9**. Similarly, USA dates are written in month, day, year order and time is written using the 12-hour clock—**10/20/2015 8:45:07 PM**—whereas in the Netherlands, dates are written in day, month, year order and time is written using the 24-hour clock—**20-10-2015 20:45:07**.

Within a particular locale, there are options for how dates, times, and numbers can be formatted. For example, you might want to write out the month—**October 20, 2015** in the USA or **20 oktober 2015** in the Netherlands—or you might want to present numeric data as currency—**\$12,345,678.90** in the USA or **US\$12.345.678,90** in the Netherlands.

In some situations, the choice of formatting reflects what is significant in the context. For example, an application that maps major earthquakes through the ages might omit the day and time from dates—**Oct. 1707** in the USA or **okt. 1707** in the Netherlands.

### Contexts Where Field Formatting Applies

Field formatting is applied to feature data, data from [data links](#), and data from [ArcGIS tables](#). It applies to nearly all contexts, for example, search and identify results, measurements, map tips, and feature details.

There are a few contexts in which viewers do not apply the formatting:

- **Exported Data:** When an end user exports data to an Excel spreadsheet, comma-delimited (CSV) file, or shapefile, the full data is exported in a standard format. Exported dates follow the [ISO 8601](#) standard. Numbers are exported to the full precision of the stored data, using periods as the decimal marker, for example, 91623.1534.

- **Edited Data:** When an end user clicks in a numeric or date field to edit the value, the viewer removes the field formatting and displays the full, stored value. The user can enter values with more decimal places than the viewer displays, and the full value is stored. For example, a user could enter 0.4871 in a field that is formatted to display one decimal digit.
- **Reports:** The date/time and number formatting that you configure in Manager do not affect how data is presented in reports.
- **Charts:** Charts have their own settings for formatting dates and numbers in the X-axis and Y-axis. See [Category Setup \(Horizontal Axis\) on page 280](#) and [Series Setup \(Vertical Axis\) on page 281](#) for information.
- **GeoRSS Layers:** Viewers cannot apply field formatting to GeoRSS layers, because GeoRSS layers do not provide information about the type of data that a field contains.

Field formatting also applies to contexts in which users enter values, such as Global Search, Query Builder, and workflow forms. The viewer assumes that values entered by the user are in the notation of the user's locale. For example, a viewer would interpret 8-11-2015 as August 11, 2015 in locales that place the month before the day, or as November 8, 2015 in locales that place the day first.

Interpretation of numeric data also depends on the locale. For example, suppose a user in the Netherlands is looking at land values in the USA. The user creates a query in Query Builder to search for parcels valued at less than ninety-two thousand dollars. The user enters **value < 92.000**. Because the user's locale is nl-NL, the viewer interprets the value as ninety-two thousand, not ninety-two point zero zero zero.

If the viewer cannot interpret the value in the user's locale, the viewer tries to interpret it in en-US notation. For example, if the user enters **value < 92,000.00**, the viewer would not be able to interpret the value in the standard nl-NL notation, so the viewer would interpret it in en-US notation (the "invariant" location).

## About Configuring Field Formats

You can configure date/time and number formats at the map service level, the layer level, and the field level. By default, formatting is inherited from a higher level—fields inherit their formatting from the layer, and layers inherit their formatting from the map service.

You can use inheritance to reduce the amount of configuration you have to do. For example, suppose you have a Parcels layer with several fields related to the parcel's value—the assessed value, value of improvements, value at which the parcel last sold, and so on. Instead of configuring each field individually, you could configure the layer to use **Currency** formatting and let the fields inherit the formatting.

Initially, the formatting for map services, layers, and fields is set to **Default**, which inherits the formatting from a higher level. You can override inherited values by configuring a particular format at a lower level. For example, you could set a date format for a map service, but override it for a particular layer within the map service, and override it again for a particular date field in the layer.

If you leave the format for a field, its layer, and its map service all set to **Default**, the viewer uses the **Fixed-point** format with up to four decimal digits for numeric data and the **Date and Time** format for dates, adjusted for the user's locale.



Data links use the format that is configured for the layer that the data link belongs to—you cannot configure formatting for individual fields in data links.

## 43.6.1 Format Date/Time Fields

Essentials allows you to configure how date/time data is formatted in the site's viewers. This allows end users to see and enter date/time values in the notation of the user's locale. You can choose date/time formats from a list of predefined formats or you can define custom formats.

### 43.6.1.1 Predefined Date/Time Formats

The predefined date/time formats that Essentials supports are based on the .NET Framework [Standard Date and Time Format Strings](#). These formats use the notation and language of the user's locale. For example, dates are written in month, day, year order in the en-US locale and day, month, year order in nl-NL. Words are written in English in en-US and in Dutch in nl-NL.

The following table lists the predefined date/time formats and gives examples of how the different predefined formats display in three sample locales.

#### Examples of Predefined Date/Time Formats for 2015-03-11 22:37:15 in Different Locales

Format	User's Locale: en-US (USA)	User's Locale: nl-NL (Netherlands)	User's Locale: pt-PT (Portugal)
<b>Date and Time:</b> Uses an abbreviation to display the name of the month. Includes hours and minutes in the time, but omits the seconds.			
Date and Time formatting is the default formatting for date/time fields. If the Date Format setting is set to Default for a field, its layer, and its map service, the viewer uses Date and Time formatting.			
Example:	Mar 11, 2015 10:37 PM	11 mrt. 2015 22:37	11 de Mar de 2015 22:37
<b>Date and Time (Long):</b> Same as Date and Time, except it displays the full name of the month.			
Example:	March 11, 2015 10:37 PM	11 maart 2015 22:37	11 de Março de 2015 22:37
<b>Date:</b> Represents the month as a number, and omits the time.			
Example:	03/11/2015	11-03-2015	11/03/2015
<b>Date (Long):</b> Same as Date, except it displays the full name of the month.			
Example:	March 11, 2015	11 maart 2015	11 de Março de 2015
<b>Minutes, Hours:</b> Displays the time without the seconds. Omits the date.			
Example:	10:37 PM	22:37	22:37
<b>Minutes, Hours, Seconds:</b> Same as Minutes, Hours, but includes the seconds.			
Example:	10:37:15 PM	22:37:15	22:37:15
<b>Full:</b> Displays the full date and time, including the day of the week., with the name of the day and month displayed in full.			



Format	User's Locale: en-US (USA)	User's Locale: nl-NL (Netherlands)	User's Locale: pt-PT (Portugal)
Example:	Wednesday, March 11, 2015 10:37 PM	woensdag 11 maart 2015 22:37	Quarta-Feira, 11 de Março de 2015 22:37

## 43.6.12 Custom Date/Time Formats

Essentials supports the .NET Framework [Custom Date and Time Format Strings](#), with the following exceptions:

- Forward slashes "/" and colons ":" are treated as literal characters.
- The "y" format specifier is treated the same as "yy", and "yyy" is treated the same as "yyyy". This means that years are displayed using two digits or four digits.
- The "z" and "zz" format specifiers are treated the same as "zzz". This means that time-zone offsets from UTC are measured in hours and minutes. The format specifiers take the configured Display Time Zone setting into account.
- The "t" format specifier is treated the same as "tt". This means that times in the 12-hour clock use the full "AM" or "PM" designator.
- The "F" format specifier is treated the same as "f", "FF" is treated the same as "ff", and so on. This means that the viewer always displays trailing zeros in the fractions of a second.
- Viewers display a maximum of 3 digits in fractions of a second. This means that time can be represented to millisecond precision. Longer format specifiers, like "fffff", are truncated to 3 digits.
- The "g" and "gg" format specifiers are not supported. These specifiers represent the era, such as A.D. If you use these specifiers, they will be ignored.
- The "K" format specifier is not supported. This specifier represents the time zone. If you use this specifier, it will be ignored.

For information about custom date and time format strings, refer to the .NET Framework documentation for [Custom Date and Time Format Strings](#).



In custom date/time formats, the order of the format specifiers determines the order to display the day, month, and year—the order is not automatically localized. If your application may be viewed by users in locales that use a different order, make sure the format is unambiguous. You might want to use a format specifier that displays the name of the month, such as "MMM" or "MMMM".

## 43.6.13 Configure Date/Time Formatting

To save yourself from doing more configuration than necessary, configure date/time formatting by starting at the map service level and working down. First configure the map service to use the format that you want most of the date/time fields to use. Next, override the map service setting by configuring the layers that use a different format than the map service. Finally, override the layer setting by configuring the fields that use a different format than their layers.


► **To configure date/time formatting:**

1. Follow the instructions that apply to you:


**Configure the Map Service-Level Date/Time Format**

- a. In Manager, edit the map service that you want to configure, and then click the **Display Settings** tab. The formatting settings are in the Field Formatting area.

**Configure the Layer-Level Date/Time Format**

- a. In Manager, select the **Edit**  tool next to the layer that you want to configure.
- b. Click the **Fields** tab.  
The layer-level formatting settings are in the Default Formatting area.

**Configure the Field-Level Date/Time Format**


- a. In Manager, select the **Edit**  tool next to the layer that you want to configure.
- b. Click the **Fields** tab.
- c. If you have not yet added the field, add the field.  
This allows you to configure the field separately from the other fields in the layer.
  - a. Click **Add/Remove Fields**.
  - b. To add one or more fields, select the fields in the **Excluded Fields** column, and then click the **Include** button (➡) that is between the two columns.




To select multiple fields, hold the Ctrl key down while you select the fields.

- c. To remove fields that have been added, select the fields in the **Included Fields** column, and then click the **Exclude** button (⬅) that is between the two columns.



You can also exclude fields after you close the Add/Remove Fields dialog box by clicking the Remove icon  beside the field that you want to exclude.

- d. Click **OK**.  
The Fields tab lists the fields that you have added. The **<all other fields>** item is at the top of the list. The **<all other fields>** item enables you to change the settings for the fields that you have not added.
- e. Click **Submit Field Changes**.  
You can now individually re-order and change the settings of any added field, and batch change the settings of the excluded fields.
- d. Click the field's **Edit** tool .

2. In the **Date Format** box, select the format from the drop-down list.

3. If you selected **Custom Date Format** in the Date Format box, enter the custom format string that you want to use.  
Do not put quotation marks around the custom format string.
4. Apply your changes.
5. Click **Save Site**.

## 43.6.2 Format Number Fields

Essentials allows you to configure how numeric data is formatted in the site's viewers. This allows end users to see and enter numeric values in the notation of the user's locale. You can choose number formats from a list of predefined formats or you can define custom formats.



You do not need to configure formatting to fields with Esri's OID data type, such as ObjectID fields, Number formatting does not apply to OID fields, even though they have a numeric data type in Essentials.

### 43.6.2.1 Predefined Number Formats

The predefined number formats that Essentials supports are based on the .NET Framework [Standard Numeric Format Strings](#). These formats use the notation and language for the user's locale. For example, the decimal mark is a period in the en-US locale and a comma in nl-NL. Words are written in English in en-US and Dutch in nl-NL.

The predefined number formats allow you to specify the number of decimal digits to show in the viewer. If a stored value has more decimal digits than the format displays, then the value is rounded—0.5 and greater is rounded up, and less than 0.5 is rounded down. For example, **0.2576** displays as **0.26** when the Decimal Places setting is set to **2**. If a stored value has fewer decimal digits than the format displays, then the displayed value is padded with zeros. Setting the number of decimal places to **0** (zero) displays integers.

You do not have to configure the number of decimal digits to display. If you leave the Decimal Places setting blank for the Number, Fixed-point, or Percentage format, the viewer displays as many decimal digits as the stored value contains, to a maximum of four. For the Currency and Accounting formats, the viewer displays the conventional number of decimal digits for the specified currency, for example, two decimal digits for US dollars and euros, or zero decimal digits for Japanese yen.

The following table lists the predefined number formats and gives examples of how the different predefined formats display in three sample locales.

#### Examples of Predefined Number Formats in Different Locales

Format	Unformatted Value *	Decimal Places	Currency	User's Locale: en-US (USA)	User's Locale: nl-NL (Netherlands)	User's Locale: pt-PT (Portugal)
<b>Number:</b> Uses separators to separate groups of digits in large numbers.						
Examples:	6431.5238 -104.123456	3 not specified	n/a n/a	6,431.524 -104.1235	6.431,524 -104,1235	6.431,524 -104,1235
<b>Fixed-point:</b> The same as Number, except Fixed-point does not use separators in large numbers.						

Format	Unformatted Value *	Decimal Places	Currency	User's Locale: en-US (USA)	User's Locale: nl-NL (Netherlands)	User's Locale: pt-PT (Portugal)
Fixed-point formatting is the default formatting for number fields. If the Number Format setting is set to Default for a field, its layer, and its map service, the viewer uses fixed-point formatting with up to four decimal digits.						
Examples:	6431.5238 -0.91	3 not specified	n/a n/a	6431.524 -0.91	6431,524 -0,91	6431,524 -0,91
<b>Percentage:</b> Multiplies the stored value by 100 and presents it as a percentage.						
Examples:	0.19842 1.43	0 not specified	n/a n/a	20% 143%	20% 143%	20% 143%
<b>Currency:</b> Displays the currency symbol, and, if necessary for disambiguation, the type of currency. For example, if the data is in US dollars and the user's locale is en-CA (Canada), the viewer displays <b>US</b> before the value, as in <b>US\$42.99</b> . This prevents the user from misinterpreting the value as being in Canadian dollars. If the user's locale is in the USA, the viewer does not display the currency type.						
Examples:	-90871.5 1000000 4050.613	2 not specified not specified	USD EUR JPY	-\$90,871.50 €1,000,000.00 ¥4,051	US\$ -90.871,50 € 1.000.000,00 JP¥ 4.051	-US\$90.871,50 €1.000.000,00 JP¥4.051
<b>Accounting:</b> The same as Currency, except Accounting uses parentheses for negative values.						
Examples:	-90871.5 1000	2 4	USD EUR	(\$90,871.50) €1,000.0000	(US\$ 90.871,50) € 1.000,0000	(US\$90.871,50) €1.000,0000

\* The Unformatted Value column uses periods "." to represent the decimal mark.



Essentials recognizes numbers in both locale-specific formats (1,234,567.89) and invariant format used by en locales (1234567.89). In locales where the invariant format and locale-specific format conflict, it recognizes only the locale's interpretation. For example, the de locale uses periods as group separators (100.000), so the invariant format (100000) cannot be interpreted reliably.

#### 43.6.2.2 Custom Number Formats

Essentials supports the .NET Framework [Custom Numeric Format Strings](#), with the following exceptions:

- Essentials does not support the per mille placeholder.
- Essentials does not support exponential notation.
- Essentials does not support literal characters that appear in the middle of a number, for example, **000-0000**.

For information about custom numeric format strings, refer to the .NET Framework documentation.

## 43.6.2.3 Configure Number Formatting

To save yourself from doing more configuration than necessary, configure number formatting starting at the map service level and working down. First configure the map service to use the format that you want most of the number fields to use. Next, override the map service setting by configuring the layers that use a different format than the map service. Finally, override the layer setting by configuring the fields that use a different format than their layers.


► **To configure number formatting:**

1. Follow the instructions that apply to you:



#### Configure the Map Service-Level Number Format

- a. In Manager, edit the map service that you want to configure, and then click the **Display Settings** tab. The formatting settings are in the Field Formatting area.

#### Configure the Layer-Level Number Format


- a. In Manager, select the **Edit**  tool next to the layer that you want to configure.
- b. Click the **Fields** tab. The layer-level formatting settings are in the Default Formatting area.

#### Configure the Field-Level Number Format


- a. In Manager, select the **Edit**  tool next to the layer that you want to configure.
- b. Click the **Fields** tab.
- c. If you have not yet added the field, add the field. This allows you to configure the field separately from the other fields in the layer.
  - a. Click **Add/Remove Fields**.
  - b. To add one or more fields, select the fields in the **Excluded Fields** column, and then click the **Include** button () that is between the two columns.




To select multiple fields, hold the Ctrl key down while you select the fields.


- c. To remove fields that have been added, select the fields in the **Included Fields** column, and then click the **Exclude** button () that is between the two columns.



You can also exclude fields after you close the Add/Remove Fields dialog box by clicking the Remove icon  beside the field that you want to exclude.

- d. Click **OK**. The Fields tab lists the fields that you have added. The **<all other fields>** item is at the top of the list. The **<all other fields>** item enables you to change the settings for the fields that you have not added.

- e. Click **Submit Field Changes**.  
You can now individually re-order and change the settings of any added field, and batch change the settings of the excluded fields.
  - d. Click the field's **Edit** tool .
2. In the **Number Format** box, select the format from the drop-down list.
  3. **Currency:** If you selected the **Currency** or **Accounting** number format, enter the currency type of the stored data.  
For example, if the stored data is in euros, enter EUR. The default is USD (US Dollars).  
To see a complete list of currency codes, delete the default currency type—a drop-down list of currency codes will open. To find out what the codes stand for, refer to this list of [ISO 4217 currency codes](#).
  4. **Decimal Places:** If you selected one of the predefined formats, enter the number of decimal digits that you want to display.  
Alternatively, leave the Decimal Places setting blank to display up to four decimal digits (Number, Fixed-point, and Percentage formats) or the conventional number of decimal digits for the specified currency (Currency and Accounting formats). To display integers, enter **0**.
 

 This precision setting cannot exceed the maximum representable IEEE 754 floating point. This is specified in the IEEE 754 standard. See [double-precision floating-point format](#) and [significant figures](#) for more information.
  5. **Custom Number Format:** If you selected **Custom Number Format** in the Number Format box, enter the custom format string that you want to use.  
Do not put quotation marks around the custom format string.
  6. Apply your changes.
  7. Click **Save Site**.

## 43.7 Hide Coded Value Domain Codes



This section applies only to legacy Silverlight viewers from sites that have the [Geocortex Services Enhancement Proxy](#) configured. If you use an HTML5 viewer and coded value domains, you should clear the **Show Code Fields from Coded Domains** checkbox on the layer's Fields tab.


By default, Silverlight viewers show both the codes and the values from fields with coded value domains, provided the Geocortex Services Enhancement Proxy is configured. As well, users can search on code fields by default.

You can hide domain codes from end users if you want. There are two ways to hide codes:


- **Individual Fields:** Use the **Add/Remove Fields** function to configure the visibility and searchability (and other settings) of individual fields.
- **All Other Fields:** Use the **Show Code Fields from Coded Domains** setting to hide the codes for the fields that you have not added.

The fields that you have not added using the Add/Remove Fields function are represented as **<all other fields>** on Manager's Fields tab. The **<all other fields>** item enables you to change the settings for the fields that you have not added. The Show Code Fields from Coded Domains setting controls the visibility of **<all other fields>**. The setting has no effect on fields that you have added using the Add/Remove Fields function.





If you turn off the visibility for **<all other fields>**, the visibility setting () takes precedence over the Show Code Fields from Coded Domains setting.

▶ **To hide the codes for all of the fields in this layer that have coded value domains:**




1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Fields** tab.
3. Clear the **Show Code Fields from Coded Domains** checkbox.
4. Click **Submit Field Changes**.
5. Click **Save Site**.

▶ **To hide the codes for some fields and show the codes for other fields:**

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Fields** tab.
3. If the **Show Code Fields from Coded Domains** checkbox is cleared, select it.
4. Click **Add/Remove Fields**.
5. In the **Excluded Fields** column, select the fields that you want to hide, and then click the **Include** button () that is between the two columns.  
For example, if you want to hide the codes for the **CallType** field, select the **CallType (Code)** field in the Excluded Fields column.



To select multiple fields, hold the Ctrl key down while you select the fields in the Excluded Fields column.

6. Click **OK**.  
The Fields tab lists the fields that you have added. Note that the fields do not have **(Code)** after their names on the Fields tab.
7. Configure the visibility and searchability for the fields that you added:
  - a. To prevent a field's codes from showing in query results, click the **Visible** icon  beside the field.  
When a field's visibility is turned off, the icon has a red X on it: .
  - b. To prevent users from being able to search a field, click the **Include in global search** icon  beside the

field.

When a field's searchability is turned off, the icon has a red X on it: .

8. Click **Submit Field Changes**.

9. Click **Save Site**.

## 43.8 Control the Visibility of Configured Fields

The visibility of configured fields in the HTML5 Viewer can be controlled by applying permissions to override the default visibility.

The application of permissions to configured fields is a 2-step process:




- Add a field to a Layer via the layer's **Field** tab.
- Apply permissions to the field using the site **Permissions** page.


### ▶ To add a field to a Layer:

Follow the instructions for adding a field under [Configure an Individual Field's Settings on page 321](#).

### ▶ To apply permissions to a configured field:

1. In Manager, edit the site that you want to configure, and then click **Permissions** in the side panel.
2. On the **Permissions** tab, select the type of user or role that you want to configure the visibility for.
3. Locate the new field that you configured for the Layer.
4. Click the permission setting for the field.

Clicking the setting cycles the value from Inherit , to Deny , to Allow , and then back to Inherit again.

For example, if you do not want the configured field to be visible for the type of user or role you selected, set the permission to Deny .

5. Repeat these steps for each user and role where you want to control the visibility of the configured field.
6. Click **Apply Changes** and then click **Save Site**.

## 44 Relationships


A relationship represents a link between features of a layer and features or records in another layer or table. ArcGIS Server services can expose the relationships defined by relationship classes in a geodatabase. Viewers display the related data in feature details and map tips.




Starting in Essentials 4.5, you can add ArcGIS tables to a site's map. See [ArcGIS Tables on page 153](#) for information.




When you add a layer to your site, all of the layer's relationships (as defined in ArcGIS Server) are exposed through the Essentials REST API. If you wish to customize a given relationship (for example, you may want to change its visibility), you can add the relationship to your site configuration and edit the relationship's properties through Manager.

You can choose to show a layer's relationships by default. After selecting a layer's  **Edit** icon, navigate to the Relationships tab and select the **Show Relationships by Default** checkbox. When this checkbox is selected, any relationships of this layer that have not been explicitly configured are displayed to the end user.

 All of the relationships of your layers are exposed through the REST API whether or not you add them to the site configuration through Manager.


Relationships have the following configurable properties:


- **Display Name:** A user-friendly name for the relationship that can be used in an application's user interface. For example, a relationship with the name "**PARCEL\_2\_ZONE**" may have a display name of "**Zoning Data**".
- **Visible:** Specifies whether or not a viewer should display related data for a feature. The default is False.

 When adding layers and/or tables as a relationship to a site, all of the layers and tables within the relationship need to be added. In addition, permissions for a user needs to be set so that they have access to all of the layers and tables in the relationship, or that they have no access to the layers and tables. Otherwise, permissions are not honored for the user.



## 44.1 Add or Remove Relationships

### To add or remove relationships:

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Relationships** tab, and then click **Add/Remove Relationships**.
3. To add a relationship to your site, select the relationship in the **Excluded Relationships** column, and then click the « button.

 To select multiple relationships, hold the **Ctrl** key down while selecting relationships.


4. To remove a relationship from a site, select the relationship in the **Included Relationships** column, and then click the » button.
5. Click **OK**.
6. Click **Save Site**.

 To reorder your items, click and drag the  **Sort** handle and click **Save Site**.

## 44.2 Edit Relationships

You can change the display name and visibility of a relationship.


### To edit a relationship:

1. In Manager, select the **Edit**  tool next to the layer that you want to configure.
2. Click the **Relationships** tab.
3. Click the **Edit Relationship** icon beside the relationship that you want to edit.
4. Modify the **Display Name** and **Visible** properties of the relationship as desired.
5. Click **OK**.
6. Click **Save Site**.

## 45 Offline

Through the Geocortex Mobile App Framework, the Geocortex Viewer for HTML5 allows users to work in environments where connection to the Internet is sporadic or absent. Field workers and remote employees can venture into low-connectivity or no-connectivity areas, and continue to browse and edit spatial and non-spatial data—their normal GIS workflow is not interrupted.

As of version 2.0, to use the Geocortex Mobile App Framework offline, you must use Offline Maps. An Offline Map specifies the feature layers, map area, and offline basemaps that can be made available when the device lacks network connectivity. End users can download an Offline Map created by an administrator to suit their needs, or create their own.

A typical usage scenario would be a field worker who needs to use the Geocortex Mobile App Framework in a remote location lacking network connectivity. Before departing, the worker would download a suitable Offline Map. At the remote location, the worker would activate the Offline Map to continue working with the map, browsing and editing features. Upon returning to a place with network connectivity, the worker can use the Offline Map's **Sync** button  to synchronize any changes to the map with the server.

For a comprehensive list of which features are supported offline, see "Offline Support for Features" in the *Geocortex Mobile App Framework Administrator Guide*.



From version 2.0 of the Geocortex Viewer for HTML5, offline support requires the Geocortex Mobile App Framework. To download and install the Geocortex Mobile App Framework, visit the [Geocortex Support Center](#).



Geocortex Workflows are not supported offline.

## 45.1 Configure Offline Support

You configure offline support in Manager and the Geocortex Mobile App Framework. For more information, see the *Geocortex Mobile App Framework Administrator Guide*.

Manager's **Offline** page allows you to configure:

- **Pre-generated Offline Basemaps:** These pre-generated basemaps can be made available offline in the Geocortex Mobile App Framework by being used in an Offline Map. Each of these basemaps is associated with a tile package (TPK) file, and can be shared by multiple Offline Maps.
- **Offline Maps:** These maps define the map area, feature layers, and basemaps that can be made available offline in the Geocortex Mobile App Framework.

## 45.2 Pre-generated Offline Basemaps

A Pre-generated Offline Basemap can be added to an Offline Map, which allows end users of the Geocortex Mobile App Framework to view basemaps even without network connectivity. Each Pre-generated Offline Basemap is associated with a tile package (TPK) file, and can be shared by multiple Offline Maps. Since they are pre-generated, their extents and levels of detail cannot be changed after being downloaded by users.



An alternative type of offline basemap is a Custom Offline Basemap, the TPK file of which is generated when the end user first syncs an Offline Map. In Essentials, Custom Offline Basemaps are either ArcGIS basemaps that support the **ExportTiles** operation, or basemaps that have their **Export Tiles Override** property set.

### 45.2.1 Add a Pre-generated Offline Basemap

There are two ways to add a Pre-generated Offline Basemap:


- [Use an existing TPK](#)
- [Use a map service supporting the ExportTiles operation to generate a TPK file](#)

Once you have added a Pre-generated Offline Basemap, you can use it in an Offline Map.



Ensure that your tile package (TPK) files are hosted in a location that your users can access.

#### **To use an existing TPK:**

1. In Manager, edit the site you want to configure.
2. Click **Offline** in the side panel.
3. Click the **Offline Basemaps** tab.
4. Click  **Add Offline Basemap**.
5. Select **Use an existing TPK**, and click **Next**.

6. Select one of the following:

- **Use the URL of an existing TPK file available online:**

In the **TPK URL** box, type the URL of the tile package (TPK) file.



End users will download the TPK directly from the server specified. The TPK will not be copied to the Essentials server.

- **Use a TPK file already on the server:**

From **TPK File** menu, select the tile package (TPK) file on the server. By default, these files are located in: `{GE_Sites}\TPKs`.

7. Click **Next**.

8. In the **Display Name** box, type a display name for the Pre-generated Offline Basemap, and click **Finish**.

9. Click **Save Site**.

You can now add your Pre-generated Offline Basemap to an Offline Map.

► **To use a map service supporting the ExportTiles operation to generate a TPK file:**

1. In Manager, edit the site you want to configure.

2. Click **Offline** in the side panel.

3. Click the **Offline Basemaps** tab.

4. Click  **Add Offline Basemap**.

5. Select **Use a map service supporting the ExportTiles operation to generate a TPK file**, and click **Next**.

6. In the **Map Service URL** box, type the URL of the tile package (TPK) file, and click **Next**.

7. Click **Extent**, and pan and zoom the map to the extent you want to be available offline.

8. Click **Max Resolution**, and zoom the map to the maximum level of detail you want to be available offline.

9. Click **Next**.

10. In the **Display Name** box, type a display name for the Pre-generated Offline Basemap, and click **Finish**.


The TPK file representing the basemap will start being generated. When it is completed, its Status will become Ready. You do not need to wait for the TPK file to complete before moving to the next step. By default, the file will be located in: `{GE_Sites}\TPKs`.

11. Click **Save Site**.


You can now add your Pre-generated Offline Basemap to an Offline Map.


## 45.3 Offline Maps


To use the Geocortex Mobile App Framework offline, an end user must use an Offline Map. An Offline Map specifies the map area, feature layers, and basemaps that can be made available offline in the Geocortex Mobile App Framework.

End users can choose to download an Offline Map that suits their needs, or create their own. Once the end user has finished editing an Offline Map and has network connectivity again, they can use the Offline Map's **Sync** button  to synchronize any changes to the Offline Map with the server and vice versa.

When you use an Offline Map, the offline data on the device is preferred over that of the Essentials server even if the device has network connectivity. When a viewer is reloaded in the Geocortex Mobile App Framework, the previously-active Offline Map remains active. Because of this, if you want any changes in the site to be reflected in the Geocortex Mobile App Framework once you have regained network connectivity, you must use the **Offline Maps** tool to **Go Online**, return to the **Saved Viewers** page, and reload the viewer.

 If you want to allow users who are not signed in to view Offline Maps: in Manager, click **Security & Data**, click **Policies**, and select **Allow Public Read Access**. Anonymous users cannot edit Offline Maps.



 Deleting an Offline Map will also delete any associated Custom Offline Basemaps, but not Pre-generated Offline Basemaps.


 The `ZoomToOfflineMapExtent` command can be used to zoom the map to the extent of the Offline Map currently being used.

### 45.3.1 Add an Offline Map


You can add an Offline Map using either Essentials Manager or the Geocortex Mobile App Framework.

#### To add an Offline Map:

1. Do one of the following:
  - **In Manager:**
    - a. Edit the site you want to configure.
    - b. Click **Offline** in the side panel.
    - c. Click the **Offline Maps** tab.  
The Offline Maps section appears.
  - **In the Geocortex Mobile App Framework:**
    - a. Tap **Sign In**, and sign in with your user credentials.
    - b. Open the viewer to which you want to add an Offline Map.
    - c. If necessary, tap  to open the toolbar.
    - d. Tap **Offline Maps** .
    - The Offline Maps panel appears.

- e. In the Offline Maps panel, tap the **Panel Actions Menu** button .
 


The Panel Actions Menu opens.

- f. Tap  **Manage**.
 

The Manage Offline Maps panel appears.

2. Click/tap **New**.
 

The New Offline Map panel appears.
3. In the **Name** box, type a name for the Offline Map.



 After typing a name for the Offline Map, you can click/tap **Finish** at any time to accept the default settings for a new Offline Map. By default, the offline map area of interest is set to the initial extent, all feature layers and attachments are included for offline use, no offline basemaps are included, and the Offline Map is not shared.

4. Click/tap **Area of Interest**.
 

The Select Area of Interest panel appears.
5. Select one of the selection tools, and use it to select the area of the map that you want to use offline.
6. Click/tap **Back**.
 

The New Offline Map panel reappears.
7. Click/tap **Layers**.
 

The Select Layers panel appears.
8. Select the feature layers you want to be available offline.

 If you want restrict the number of features of a layer, click/tap  to set a definition expression for the layer. This is equivalent to a WHERE clause in SQL. For example, **TYPE = 'Residential'**.

9. If you want feature attachments to be included offline, select the **Include Attachments** checkbox.
10. Click/tap **Back**.
 

The New Offline Map panel reappears.
11. Click/tap **Basemaps**.
 

The Select Basemaps panel appears.
12. For each of your basemaps, select one of the following:
  - **None:** If you don't want to use a basemap offline.
  - **Pre-generated:** If you want to use a Pre-generated Offline Basemap from the **Offline Basemaps** page:
    - a. From the drop-down menu, select the Pre-generated Offline Basemap you want to use offline.

- **Custom:** If you want to use a Custom Offline Basemap from the **Basemaps** page:
    - a. Click/tap **Edit**.  
The Offline Basemap Detail panel opens.
    - b. Use the slider to select the level of detail you want to be available offline.
    - c. Click/tap **Done**.
    - d. In the **Days Between Refresh** box, type the period of days to wait until the TPK file should regenerate when the user syncs the Offline Map.
13. Click/tap **Back**.  
The New Offline Map panel reappears.
  14. Click/tap **Sharing**.  
The Sharing panel appears.
  15. To share the Offline Map with others, do one of the following:
    - **Share with an individual user:**
      - a. From the drop-down menu, select **Individuals**.
      - b. In the **Search** box, type the name of the user you want to share with.
      - c. Click/tap **Add**.  
The user is added to the list of those to share with.
    - **Share with a group of users:**
      - a. From the drop-down menu, select **Groups**.
      - b. In the **Search** box, type the name of the group of users you want to share with.
      - c. Click/tap **Add**.  
The group is added to the list of those to share with.

Repeat this step to share the Offline Map with as many users or groups as you want.
  16. For each user and group in the list, select one of the sharing options:
    - **None:** If you do not want to share the Offline Map with this user or group.
    - **View:** If you want this user or group to be able to view the Offline Map, but not edit it.
    - **Edit:** If you want this user or group to be able to view and edit the Offline Map.
  17. Click/tap **Back**.  
The New Offline Map panel reappears.
  18. Click/tap **Finish**.

## 46 Viewers

A viewer is a web application that enables users to view and work with a map and its data. The viewer's configuration determines the user interface's appearance and behavior.

In Essentials, a viewer is associated with a site. The site provides the viewer with the configuration of map services, layers, reports, and other features—the map-related content—in a technology-neutral way.

You can configure as many viewers for a site as you want. For example, a site might have two viewers: one rich client application and the other a mobile application for viewing the site on a smart phone. Although the viewers are for the same site, they look different, have different purposes and capabilities, and may be built on different technologies.

### 46.1 Viewer Templates and Management Packs

A viewer template is a file that contains a viewer framework—generic viewer functionality that you configure to create a viewer for a particular application. A viewer Management Pack makes a particular viewer framework configurable in Manager. In order to be able to use Manager to add and configure a viewer, you must first install the template and Management Pack.

Manager enables you to configure common viewer settings. You can configure additional settings by editing the viewer's configuration file(s) in a text editor or Integrated Development Environment (IDE).

For information about the Geocortex Viewer for HTML5 and Management Packs, the features they offer, how to install them, and how to configure viewers manually, refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide*. These guides can be downloaded from the [Geocortex Support Center](https://support.geocortex.com) (<https://support.geocortex.com>).

### 46.2 Verify your Configuration

When configuring a viewer, it is recommended that you verify the configuration frequently. Before verifying, apply your changes and save the site.

#### ► To verify your configuration changes:

1. If you have not yet launched the viewer, [edit the viewer](#) in Manager, click **Viewer Info** in the side panel, and then click a launch link.  
If you have already launched the viewer, reload the page.
2. Navigate to the part of the viewer you want to verify.
3. Test any new tools or functions you have added.

#### See Also...

[Viewer Commands in Hyperlinks](#) on page 47



## 46.3 Add a Viewer to a Site



In order to add a viewer using Manager, you must first install the viewer. For information on installing the HTML5 Viewer template, refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

### ▶ To add a viewer to your site:

1. In Manager, edit the site that you want to configure, and then click **Viewers** in the side panel.
2. Click **Add Viewer**.  
The Create New Viewer dialog box opens.



If the Add Viewer icon is not available, click **Save Site**.

3. In the **Display Name** text box, type a display name for the viewer.



Avoid long viewer display names. Display names affect Windows file paths, which must be less than 260 characters.

4. In the **Template** drop-down list, select the template to base the viewer on.  
If there are no options in the Template drop-down list, there are no templates installed. For information, refer to the "Installation" section of the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.
5. Click **OK**.  
The dialog box closes and the viewer is added to your site.

## 46.4 Edit a Viewer

### ▶ To edit a viewer:


1. Launch Manager.  
You can launch Essentials from your Start Menu. In the applications list, select the Latitude Geographics folder and the Geocortex Essentials Manager item inside.

2. Edit the site whose viewer you want to configure:
  - a. Go to the **Sites** tab.
  - b. If a different site is open for editing, click **Save Site**, and then click **Close Site**.
  - c. Follow the instructions for the view of the Site List that you are using:

- **Tiled View:**



World site in Tiled View


- Click the thumbnail image of the site that you want to edit, or
- Click the site's name, or
- Position the pointer over the thumbnail image of the site that you want to edit, and then use the  **Edit** icon.

- **List View:**



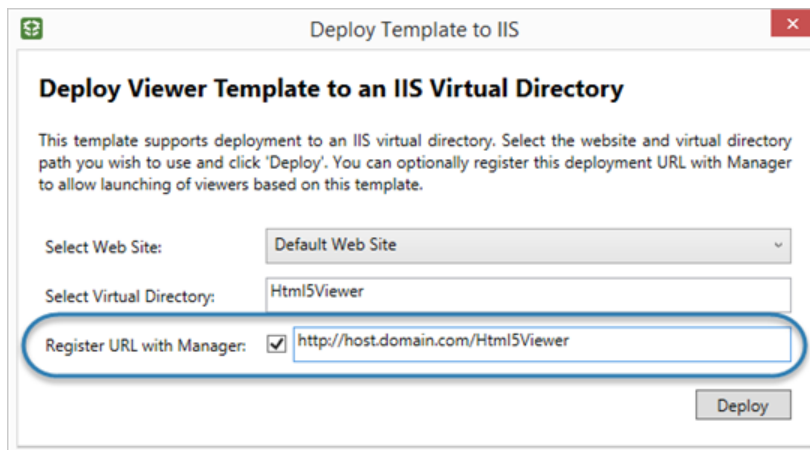
World site in List View

- Select the site's name or the  **Edit** icon .

3. Click **Viewers** in the side panel.
4. Click the **Edit** icon  beside the viewer that you want to configure.  
The viewer opens for editing.

## 46.5 Change Viewer URLs in Manager

When you install a viewer template in the Post Installer, you are prompted to enter the location to deploy the template. By default, the template's URL is registered with Manager. This enables Manager to create launch links for viewers that are based on this template. Manager's home page, the Viewers page, and the Viewer Info pages have launch links.




### Post Installer dialog box to register a template's URL with Manager

If you move the IIS virtual directory where a viewer template is deployed, or you change the name of the viewer's host, the viewer's launch links in Manager will no longer work because the template's URL has changed. All the viewers that are based on that template are affected by a change in the virtual directory or host name. You can make the launch links work again by editing the template's URL in Manager. Updating a template's URL updates the launch links for every viewer that is based on that template.

In addition to modifying viewer URLs, you can add viewer URLs. For example, if you add a host name that you want Manager to use to create viewer launch links, you would add a viewer URL.

### ▶ To update a viewer template's URL in Manager:

 Updating a template's URL overwrites the original URL.

1. In Manager, edit any site and click **Viewers** in the side panel.
2. Click **Edit Viewer URLs**.
3. Click the **Edit** tool  beside the URL that you want to update.
4. Update the URL to reflect the new virtual directory or host.
5. Click **OK**.

### ▶ To add a viewer URL in Manager:

1. In Manager, edit any site and click **Viewers** in the side panel.
2. Click **Add Viewer URL**.
3. Select the template that the new URL is for.
4. Type or paste the URL.
5. Click **OK**.
6. You can select which URL you want to use for the Online Launch Links on the Viewer Info page:

- a. Click **Viewers** in the side panel.
- b. Edit the HTML5 viewer that has multiple URLs.
- c. On the **Viewer Info** page, select the desired URL from the drop-down list.
- d. Click **Apply Changes**.

## 46.6 Configure an HTML5 Viewer

When configuring a viewer, it is recommended that you verify your configuration frequently. Before verifying, apply your changes and save the site.

### To verify your configuration changes:

1. If you have not yet launched the viewer, click **Viewer Info** in the side panel, and then click the launch link. If you have already launched the viewer, refresh the page.
2. Navigate to the part of the viewer you want to verify.
3. Test any new tools or functions you have added.

### 46.6.1 About Configuring Multiple Interfaces for HTML5 Viewers

The Geocortex Viewer for HTML5 is designed to work on different device types—desktop computers, tablets, and handheld devices like smartphones. The way the viewer does this is by allowing you to configure multiple user interfaces, one for each device type.

The configurations for the different user interfaces are in separate files. When you configure a particular aspect of an HTML5 viewer in Manager, you can choose between configuring all three interfaces together, or configuring them separately. Configuring the interfaces separately allows you to make them different from each other—configuring them together makes their configurable settings identical.

In Manager, HTML5 viewer configuration is divided into pages of related settings—I Want To menu settings, look and feel settings, and so on. The decision to configure the user interfaces together or separately only affects the settings on the current page. This means you can configure the interfaces together on one page but individually on another page. For example, you might want to always use the same banner (configure the interfaces together on Manager's Look and Feel page), but have a different I Want To menu for handheld devices (configure the interfaces separately on Manager's I Want To Menu page).



If you have configured the interfaces separately on a particular page in Manager, and then you change back to configuring the interfaces together, Manager prompts you to select which configuration you want to keep—you will lose any variations that exist in the other two interfaces.



It is always safe to switch from configuring the user interfaces together to configuring them separately—you never lose any changes. If you are not sure whether you want the interfaces to be the same or different, keep them the same by configuring them together—you can always configure them separately later.



The issue of configuring the interfaces together or separately does not apply to the Viewer Info page—the Viewer Info page contains metadata about the viewer, not viewer settings.

## Switch how you Configure the Interfaces

By default, the interfaces are configured together. In this case, there is only one tab, and its settings apply to all the interfaces.

### ▶ To switch to configuring the interfaces separately:

1. Click the **Configure Individually** hyperlink above the tab.  
A separate tab for each interface displays: Desktop, Tablet and Handheld. The hyperlink changes to say Configure Simultaneously.



If you are configuring the user interfaces individually, remember to click Apply Changes or Save Site before leaving a tab—otherwise, you will lose your changes.

2. To return to configuring the interfaces together, click **Configure Simultaneously**.  
You are prompted to select the interface whose configuration you want to keep.



Any changes that you made to the other two configurations will be lost.

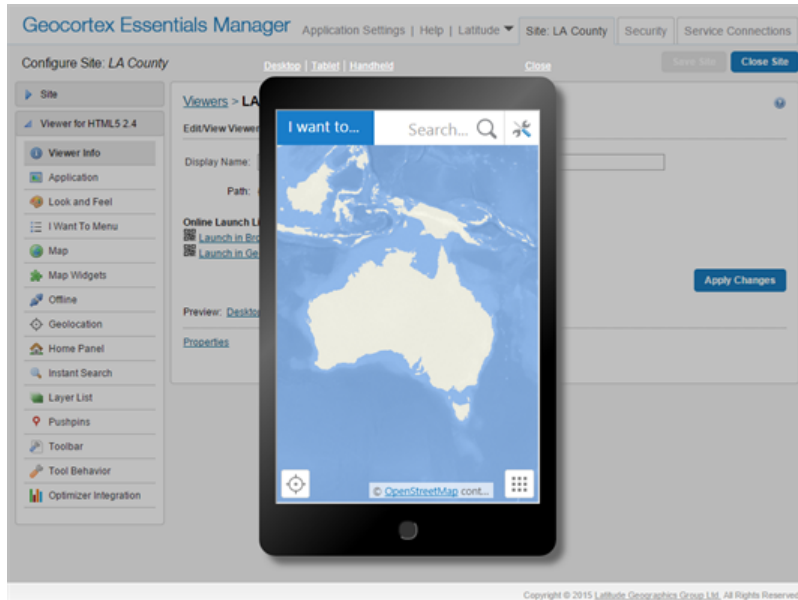
3. Select the interface whose configuration you want to keep from the drop-down list.
4. Click **OK**.  
The tabs are combined into one tab, and the configurations for this page's settings are made the same.

### 46.6.2 About the Live Preview for HTML5 Viewers

The Live Preview runs your viewer within a simulated desktop, tablet, or handheld device. You must click Apply Changes to run the current configuration, but you do not need to save the site. This enables you to test your configuration before you save the site.

You can use the viewer the same way in the Live Preview as in a browser—navigate the map, use menus and tools, search, run workflows, and so on.

To open the Live Preview, click **Apply Changes**, and then click one of the **Preview** links at the bottom of any HTML5 Viewer page in Manager. Use the links at the top of the Live Preview to switch between device types.



Live Preview for the Handheld interface

## 46.6.3 About User Interface Text in HTML5 Viewers

The HTML5 Viewer's user interface text is stored in language files, one for each library. Each text item in a language file is assigned to a placeholder called a "key". HTML5 viewers reference the keys, not the text. When the viewer runs in a browser, the viewer looks up the key in the appropriate language file and displays the text assigned to that key.

When you configure user interface text in Geocortex Essentials Manager, there are two ways you can specify the text. The method you use depends on how many languages the viewer will be available in.

- **Literal Text:** If your viewer is only going to be available in one language, type the text you want to use directly into Manager.
- **Text Key:** If you are going to make your viewer available in more than one language, type the key you want to use, or select it from the drop-down list that opens when you start typing. You must also create a language file for each language you are supporting.

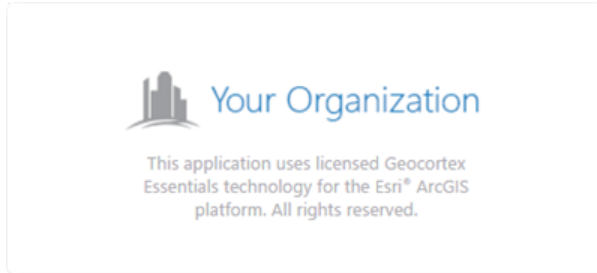


Type @ to see the complete list of keys in the drop-down list—all text keys begin with @.

For more information on translating the HTML5 viewer, refer to the "Translation" section of the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

## 46.6.4 Configure the Splash Screen

When a user launches an HTML5 viewer, the viewer displays a splash screen while the viewer loads. The splash screen contains an image and some licensing text. The default image contains a small graphic of a city and the words **Your Organization**.



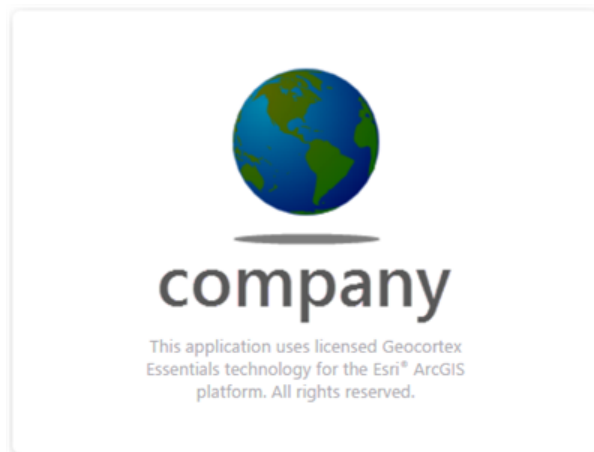
### Default splash screen

The default splash screen image is a placeholder that you can replace with a custom image. The splash screen has a built-in margin around the image, so the image does not touch the border or the licensing text. You cannot change the licensing text.

The default image is a 260 x 60 pixel PNG image of about 1.3 KB. To ensure reasonable performance, we recommend that you limit your image to about 4 KB, with dimensions no larger than 300 x 300 pixels. In the Handheld shell, if the image is larger than 260 x 260 pixels, the viewer resizes the image at run time so its dimensions are at most 260 x 260 pixels. This ensures that the image fits the smaller display area that handheld devices offer.



Animated images do not perform well in the splash screen, because the splash screen displays while the viewer is busy loading.



### Splash screen with a custom image

Manager's **Site Info** page has a **Splash Screen Image URL** setting where you configure the location of the image that the site's HTML5 viewers will use in the splash screen.



Before HTML5 Viewer 2.6, the splash screen image was configured by editing the `Index.html` file. We do not recommend this method, because changes to the `Index.html` file can be lost when you upgrade the Viewer.

The splash screen image can be stored anywhere, as long as the viewer can access the location. If you own the image, you can store it in a virtual directory with your other static content. In this case, you can use a relative URL when you configure the image's location. Alternatively, you can specify an absolute location, for example, a fully qualified URL to an image on the web.

► **To configure a custom splash screen image for a site's HTML5 viewers:**



If you configure a short URL in the viewer's `ViewerSettings.json.js` file, then you must configure the splash screen image in the `ViewerSettings.json.js` file with the short URL, instead of in Manager. For instructions, see "Short Viewer URLs" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

1. If you want to create your own image to use in the splash screen, create it now.  
We recommend that you limit the image to about 4 KB in size, with dimensions no larger than 300 x 300 pixels. Using a transparent background usually gives the best results. The HTML5 Viewer supports any image file format that web browsers support. We recommend PNG or JPG.
2. If you want to store the image locally, save the image to a virtual directory.  
If you are going to use the same splash screen image for more than one site, put the image in the Global virtual directory. Otherwise put the image in the site's virtual directory.
3. In Essentials, edit the site that you want to configure, and then select **Site Info** from the side panel.
4. Enter the image's URL in the **Splash Screen Image URL** box using one of the following methods:
  - **Browse a Virtual Directory:** If the image is in a virtual directory, click **Browse** and select the image file.
  - **Enter the Fully Qualified URL:** If the image is not located in a virtual directory, type or paste the image's full URL, for example:  
`http://host.domain.com/resources/images/myimage.png`
5. Click **Apply Details**.
6. Click **Save Site**.

## 46.6.5 Change Viewer Information for an HTML5 Viewer

The Viewer Info page in Manager has high-level settings and meta-information about the viewer, such as the viewer's display name, the location of its configuration file, and a link to launch the viewer.

► **To open an HTML5 viewer's Viewer Info page in Manager:**

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Viewer Info**.  
The Viewer Info page opens.

## Settings

The Viewer Info page has the following settings and information:

- **Display Name:** Used to refer to the viewer in Manager and in the REST API Sites Directory. The display name is not visible to the end user. However, the viewer ID is generated by the display name when the viewer is created and can appear in the viewer's URL.



Changing the display name after the viewer has been created does not change the ID.



Avoid long viewer display names. Display names affect Windows file paths, which must be less than 260 characters.

- **Global Unique ID:** A globally unique identifier for the viewer. It allows users to launch the viewer with a short launch URL. The value of the Global Unique ID is used for the `viewer` URL parameter. For example, if the value is `MyViewer`, you can launch the viewer with the following URL:

```
http://MyServer.com/Html5Viewer/index.html?viewer=MyViewer
```

The Global Unique ID cannot contain special characters such as `<`, `>`, `%`, `;`, `&`, `*`, `\`, `/`, and `?`.

For more information, see "Short Viewer URLs" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.



If you do not set the **Global Unique ID**, all viewers use the default Global Unique ID, which consists of the Site ID and the Viewer ID separated by a period character. For example,  

```
http://MyServer.com/Html5Viewer/index.html?viewer=MySiteID.MyViewerID
```

- **Path:** The path to the viewer's configuration. `{SitePath}` represents the path to the folder containing the site's configuration file.
- **URL:** If you have deployed the viewer template to IIS multiple times, you can select which deployment you want the launch links and QR codes to use. This option is only visible if the template is deployed more than once.
- **Publish to ArcGIS Online:** Publishes the selected viewer URL as an item in ArcGIS Online. This only works if you used an ArcGIS Online identity to sign into Manager, and the selected viewer URL is not already published. If the item is already published, a link to the item on ArcGIS Online is displayed. The item can then be shared and configured in ArcGIS Online. A thumbnail is added in ArcGIS Online if the Essentials REST API is publicly accessible.

You can remove the item using the Remove button next to the link.



Items can be orphaned if the viewer URL changes or the viewer is removed.

- **Publish to Portal:** Publishes the selected viewer URL as an item in Portal. This only works if you use a Portal for ArcGIS identity to sign into Manager, and the selected viewer URL is not already published. If the item is already published, a link to the item in Portal is displayed. The item can then be shared and configured in Portal. A thumbnail is added if Portal can access the Essentials REST API URL where the thumbnail exists.

You can remove the item using the Remove button next to the link.



Items can be orphaned if the viewer URL changes or the viewer is removed.

- **Launch Links:** Hyperlinks and Quick Response (QR) codes () that launch the viewer. Use the QR codes to launch the viewer in a device with a scanner, such as a smartphone. Hover the mouse pointer over a QR code to enlarge the code for scanning.

- **Launch in Browser:** Launches the viewer in a browser. The Launch in Browser link uses the `configBase` URL parameter, which automatically detects the type of device that the viewer is running on—desktop computer, tablet, or handheld device—and uses the appropriate configuration for that device type. For more information on `configBase`, refer to "URL Parameters" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.
- **Launch in Geocortex Mobile App Framework:** Launches the viewer in the Geocortex Mobile App Framework, provided you have purchased and installed the App.

If you did not deploy the viewer to IIS when you installed the viewer's template, the launch links and QR codes will be missing. Refer to the "First-Time Installation" section of the *Geocortex Viewer for HTML5 Administrator and Developer Guide* for instructions on using the Post Installer to deploy the viewer to IIS.

If the viewer is blank when you launch it, and the [Live Previews](#) are also blank, edit the URL in the address bar to make all the references to the server (including the port) identical. We recommend fully qualified URLs. To correct this permanently, upgrade to Geocortex Essentials 3.11.1 or newer and redeploy the viewer.



#### Recommended form for an HTML5 viewer URL

- **Preview:** Hyperlinks that launch the viewer within an image of the specified device type, so you can see what the viewer looks like in its target device type. You can preview anything that you can do in a live viewer.
- **Properties:** Allows you to [create a custom property](#) for the viewer.

#### ▶ Before you leave the Viewer Info page:

1. Click **Apply Changes**.
2. To save your changes, click **Save Site**.

## 46.6.6 Configure Application-Wide Settings for an HTML5 Viewer

The Application page in Manager has settings that apply to the viewer as a whole, such as the proxy page and geometry service to use.

You can configure additional application-wide settings in the configuration files. In particular, you can configure **datum transformations** to apply whenever the viewer performs an operation that requires projection, such as geocoding, measurement, or buffering. For information, see "Application-Wide Settings" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

#### ▶ To open an HTML5 viewer's Application page in Manager:

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Application**.  
The Application page opens.

#### ▶ Before you configure settings on the Application page:

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can always configure them separately later without losing any changes you have made.
- If you are sure you want the settings on the Application page to be different for one or more of the interfaces, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see [About Configuring Multiple Interfaces for HTML5 Viewers on page 351](#).

## Settings

The Application page has the following settings:

- **Proxy URI:** The URI to the proxy page, if you are using one. By default, the proxy URI is set to the ASP.NET proxy page that ships with the HTML5 Viewer, `proxy.ashx?`. The default URI is terminated with a question mark because the viewer attaches parameters to the URI. The question mark is optional—the viewer will add the question mark if necessary.  
If you do not want to use a proxy page, remove `proxy.ashx?` from the **Proxy URI** box.
- **Allow Unsafe Content:** If this checkbox is selected, content from a KML or GeorSS layer that contains HTML markup is interpreted by the viewer. If you want the viewer to display the actual markup rather than what it represents, clear the checkbox. By default, unsafe content is not allowed.  
If you have not added any KML or GeorSS layers to your site, this setting has no effect.
- **Geometry Service URI:** The URI of the geometry service to use for projection and other geometry operations.



As of version 2.5, the Geometry Service URI property of the HTML5 Viewer has been deprecated. To configure a geometry service, edit the site instead. If configured, the geometry service in the site overrides the one configured here. For more information, see [Geometry Services on page 185](#).

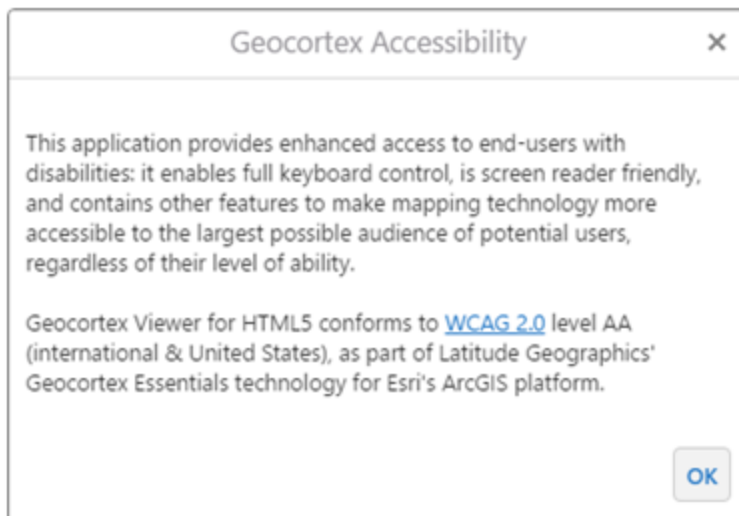
### ▶ Before you leave the Application page:

1. Click **Apply Changes**.
2. To save your changes, click **Save Site**.

## 46.6.7 Configure Accessibility for an HTML5 Viewer

The Accessibility Panel informs users of the accessibility features in the HTML5 Viewer. To open the Accessibility Panel in the Desktop or Tablet interfaces, the user presses the  **Accessibility Button** in the viewer's banner. In the Handheld interface, the user can press the **View the accessibility panel** option in the [I Want To Menu](#).

You can configure the viewer to show or hide the Accessibility Button. You can also customize the title and content of the Accessibility Panel. The content of the Accessibility Panel is defined using HTML markup. The content can include formatted text, images, and links.



### The Accessibility Panel

#### ▶ To open an HTML5 Viewer's Accessibility page in Manager:

1. In Manager, edit the viewer that you want to configure.
2. From the main menu, choose **Accessibility**.  
The Accessibility page opens.

#### ▶ Before you configure settings on the Accessibility page:


Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can always configure them separately later without losing any changes you have made.
- If you are sure you want the settings on the Home Panel page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see [About Configuring Multiple Interfaces for HTML5 Viewers on page 351](#).

## Settings

The Accessibility page has the following settings:

- **Include Enhanced Screen Reader Notifications:** When this checkbox is selected, map information is read out to users with screen readers. If you do not want map information to be read out to users with screen readers, clear the checkbox. By default, map information is read out to users with screen readers.
- **Include Accessibility Button:** In the Desktop and Tablet interfaces, when this checkbox is selected, the **Accessibility Button**  is available in the viewer. In the Handheld interface, when this checkbox is selected, the **View the accessibility panel** option is available in the [I Want To Menu](#). If you do not want the viewer to have an Accessibility option, clear the checkbox. By default, the Accessibility option is included.
- **Title:** The title that appears at the top of the Accessibility Panel.




If your viewer is going to be available in more than one language, enter the text key that the Accessibility Panel title is assigned to. For more information on using text keys, see [About User Interface Text in HTML5 Viewers on page 353](#).

The default title is **@language-accessibility-map-title**, which by default reads Geocortex Accessibility.

- **Content:** The HTML markup that defines the content of the Accessibility Panel. The Content box provides a Rich Text Editor with a toolbar at the top. By default, the Rich Text Editor is open in the Content box.

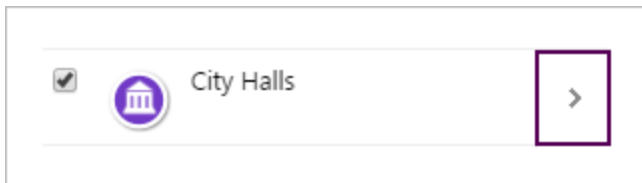


You can use a valid text key for the content as long as there are no spaces or HTML markup surrounding the text key. For more information on using text keys, see [About User Interface Text in HTML5 Viewers on page 353](#).

If the Rich Text Editor does not have a particular tool that you want, or you prefer to work directly in the HTML markup, use the  Show Source button at the end of the toolbar. This displays the HTML markup in the Content box, so you can edit the HTML markup directly.

To return to the Rich Text Editor, press Show Source  again.


- **Keyboard Focus Indicator Color:** Set the color for selected elements in the viewer with an RRGGBB hex code. For users who navigate the viewer using a keyboard, the focus indicator color outlines the selected HTML element so they can quickly find and interact with page elements. The default value is #550055.





A layer, City Halls, with the focus indicator color around the Actions menu button


- **Skip Links Menu:** The skip navigation function is supported in the Desktop shell. The items in the menu list define the links that open when initially tabbing in the Viewer. The first item in the list is the link that receives focus when the skip navigation links menu opens. Subsequent tabbing traverses each of the items in the menu. Users can quickly return to the skip navigation links menu by clicking the address field in the Viewer and then tabbing to open the menu. Users can also return to the initial item in the skip navigation links menu by

continuing to tab through the Viewer, or they can access the last link in the menu by tabbing back (SHIFT+TAB) through the Viewer.

To add a menu item, click **Add Menu Item**, update the fields, and click **OK**. You can see how to complete the fields by clicking the **Edit** icon  for an existing menu item.


To edit a menu item, click the **Edit** icon  for the item, update the fields in the dialog, and click **OK**.

To reorder the menu items, drag and drop the menu handle  to the new position in the list.

To remove a menu item, click the **Remove** icon  for the item.

Note that only 5 skip link items are supported in order to minimize the amount of tabbing required to access specific areas in the Viewer.

► **To configure the Accessibility options:**

1. On the **Accessibility** page, select the **Include Accessibility Button** checkbox.
2. In the **Title** box, type the title that you want to appear at the top of the Accessibility Panel. You can use a text key or the literal text.
3. In the **Content** box, create the content of the Accessibility Panel.  
Use the Rich Text Editor that displays by default, or click the Show Source icon  to work in the HTML markup.
4. Click **Apply Changes**.
5. Click **Save Site**.

**See Also...**

[Configure the I Want To Menu for an HTML5 Viewer on page 365](#)

[SkiLinks Module on page 1](#)

[About User Interface Text in HTML5 Viewers on page 353](#)

## 46.6.8 Change the Look and Feel of an HTML5 Viewer

The Look and Feel page in Manager has settings that control the appearance of various aspects of the viewer, specifically:

- [Browser Title](#)
- [Banner](#)
- [Highlights](#)
- [Highlight Modes](#)
- [Data Frame](#)
- [Bottom Panel](#)
- [Results List](#)
- [Map Tips](#)
- [Feature Details](#)
- [Results Views](#)

▶ **To open an HTML5 viewer's Look and Feel page in Manager:**

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Look and Feel**.  
The Look and Feel page opens.

▶ **Before you configure settings on the Look and Feel page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can configure them separately later without losing any changes you have made.
- If you are sure you want the settings on the Look and Feel page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see [About Configuring Multiple Interfaces for HTML5 Viewers on page 351](#).

## Settings

The Look and Feel page has the following settings:

### Browser:

- **Title:** The title to display in the browser's title bar or tab.



If your viewer is going to be available in more than one language, enter the text key that the browser's title is assigned to. See [About User Interface Text in HTML5 Viewers on page 353](#) for more information on using text keys.

The default text key is `@language-browser-title`. The text key's current value is shown below the Title box.

### Banner:

In the Desktop and Tablet interfaces, the banner is the area at the top of the viewer that optionally contains the title and logo. The Handheld interface does not have a banner.

- **Show Banner:** If this checkbox is selected, the banner shows in the viewer. If the checkbox is cleared, the viewer does not have a banner. By default, the viewer has a banner.
- **Title:** The text of the title to display in the banner. If you want control over the font and size, leave the Title box blank, create an image that contains the title, subtitle, and logo, and specify the image using one of the Image settings. You can use a text key or the literal text.
- **Title Color:** A valid HTML color to use for the title of the banner. For example, **red** or **#FF0000**.
- **Sub-Title:** The subtitle to display in the banner. The subtitle is the smaller text that appears under the title. The subtitle is optional. You can use a text key or the literal text.  
If you want control over the font and size, leave the Sub-Title box blank, create an image that contains the title, subtitle, and logo, and specify the image using one of the Image settings.
- **Sub-Title Color:** A valid HTML color to use for the subtitle of the banner. For example, **green** or **#00FF00**.

- **Background Color:** A valid HTML color to use for the background of the banner, for example, **blue** or **#0000FF**.
- **Background Image:** The URL to the banner's background image, if you want a background image. Use this setting to add texture to the background color. Click **Browse** to browse to the image file.
- **Left Image:** The URL to the image that forms the left side of the banner. This setting is often used for the image containing the logo, title, and sub-title. Click **Browse** to browse to the image file. The maximum image height and width is 60px by 500px.
- **Left Image Description:** The alternative (**alt**) text for the Left Image. The alt text is used by screen readers. It is also used if the image cannot be displayed.
- **Right Image:** The URL to the image that forms the right side of the banner. Click **Browse** to browse to the image file.
- **Right Image Description:** The alternative (**alt**) text for the Right Image. The alt text is used by screen readers. It is also used if the image cannot be displayed.
- **Height:** The height of the banner, in pixels. The default banner is 60 pixels high.

#### Highlights:

Change the color of features that have been selected on the map. For example, if a user selected or identified a feature on the map.

- **Fill:** The fill color specified for highlighting, represented as an RGBA color. The default color is pale yellow defined as "RGBA(236, 236, 58, 0.1)". The first set of digits (236) is for the red color value, the second set (236) is for the green color value, the third set (58) is for the blue color value, and the last value (0.1) is for opacity, where 0.0 is fully transparent, and 1.0 is fully opaque.
- **Border:** The border color specified for highlighting. The default color is yellow, defined as "RGBA(255, 255, 151, 1)".
- **Outer Border:** The outer border color specified for highlighting. The default color is dark yellow, defined as "RGBA(200, 200, 0, 1)".
- **Focused Fill:** The fill color specified when the highlighted feature has focus. The default color is pale cyan, defined as "RGBA(0, 255, 255, 0.2)".
- **Focused Border:** The border color specified when the highlighted feature has focus. The default color is cyan, defined as "RGBA(0, 255, 255, 1)".
- **Outer Focused Border:** The outer border color specified when the highlighted feature has focus. The default color is dark cyan, defined as "RGBA(87, 170, 255, 1)".
- **Border width:** The border width specified for highlighting. The default value is 2 pixels.
- **Outer Border Width:** The outer border width specified for highlighting. The default value is 5 pixels.
- **Highlight Line Opacity:** The opacity setting for a highlighted line feature. The default is 0.5 pixels

#### Highlight Modes:

- **Mode:** Used to indicate how highlighting of features on the map is related to features in the Results List.
  - **Highlight Features On Page:** Indicates that only the features on the current page of the Results List are highlighted on the map.
  - **Highlight All Features:** Indicates that all of the features on all of the pages in the Results List are



highlighted on the map.

- **Do Not Highlight Any Features:** Indicates the none of the features on the pages in the Results List are highlighted on the map.

#### Data Frame:

Only the Desktop and Tablet interfaces have a Data Frame—the Handheld interface does not have a Data Frame.

- **Open By Default:** When this checkbox is selected, the Data Frame opens when the user launches the viewer. If you do not want the Data Frame to be open initially, clear the checkbox. By default, the Data Frame is closed. If you want the [Home Panel](#) to be visible when the user launches the viewer in the Desktop or Tablet interface, you must check the **Open By Default** checkbox.
- **Default Width:** The width of the Data Frame in pixels. The default width is **350** pixels. Alternatively, you can specify the amount as a percentage, for example, **25%**.



Specifying the amount as a percentage string ensures the panel size remains in proportion to the browser window until the user resizes the panel.

- **Minimum Width:** The minimum width to which the Data Frame can be resized. The default width is **200** pixels. Alternatively, you can specify the amount as a percentage, for example, **10%**.
- **Maximum Width:** The maximum width to which the Data Frame can be resized. The default width is **500** pixels. Alternatively, you can specify the amount as a percentage, for example, **50%**.

#### Bottom Panel:

- **Default Height:** (Desktop and Tablet interfaces only) The default height of the Bottom Panel. The default height is **400** pixels. Alternatively, you can specify the amount as a percentage, for example, **25%**.



Specifying the amount as a percentage string ensures the panel size remains in proportion to the browser window until the user resizes the panel.



To specify the percentage height of the Bottom Panel in the Handheld interface, manually edit the `bottomPanelHeightPercent` property in the Handheld configuration file. For more information, see "Shells Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

#### Results List:

- **Content Field:** Specifies which setting to display for each feature in the Results List—the **Feature Description** or the **Feature Long Description**. The default is **Feature Long Description**.

#### Map Tips:

- **Content Field:** Specifies which setting to display as the main content of map tips—the **Feature Description** or the **Feature Long Description**. The default is **Feature Long Description**.

**Feature Details:**

- **Show Description:** The kind of description to display when viewing feature details, if any. Possible values include: **No Feature Description**, **Feature Description** and **Feature Long Description**. The default is **No Feature Description**.

**Results Views:**

- **Default View Type:** Specifies how results appear by default in the viewer. Possible values include **None**, **Results List**, and **Results Table**. For information about results views, see "Results Module" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

**Before you leave the Look and Feel page:**

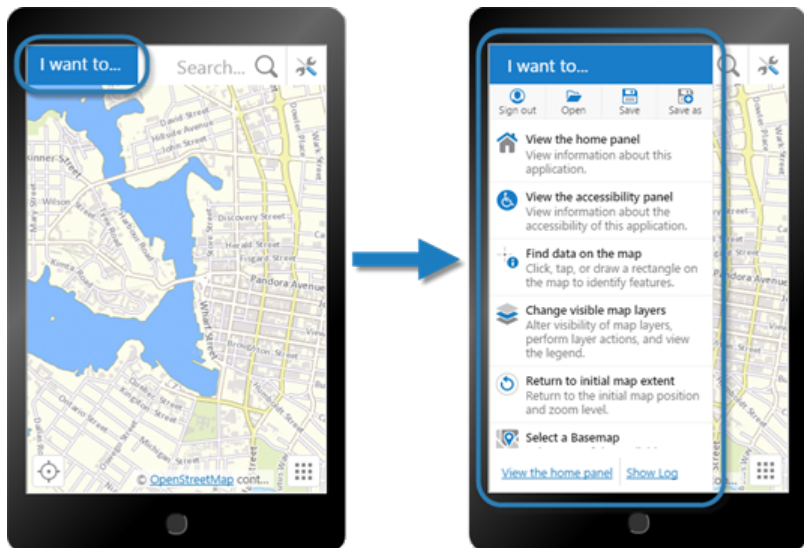
1. Click **Apply Changes**.
2. Use the Preview hyperlinks to see your configuration.  
See [About the Live Preview for HTML5 Viewers on page 352](#) for instructions.
3. To save your changes, click **Save Site**.

**See Also...**

- [About User Interface Text in HTML5 Viewers on page 353](#)
- [Configure the Home Panel for an HTML5 Viewer on page 386](#)

46.6.9 Configure the I Want To Menu for an HTML5 Viewer

The HTML5 Viewer's default configuration has a menu for common tasks, such as opening the list of map layers and returning to the initial extent. The menu is called the I Want To menu because the default text on the button that opens the menu is **I want to....** In the Desktop and Tablet interfaces, the I Want To button is in the top left corner of the map. In the Handheld interface, the button is at the top left of the screen.



I Want To menu shown in the Handheld preview

Each menu item is represented by some text and optionally a description and small image. You can modify or remove these items, create new items, and change the order that the items appear in the menu. A menu item can run any Geocortex Viewer for HTML5 command. For a list of commands, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

► **To open an HTML5 viewer's I Want To Menu page in Manager:**

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **I Want To Menu**.  
The I Want To Menu page opens.

► **Before you configure settings on the I Want To Menu page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

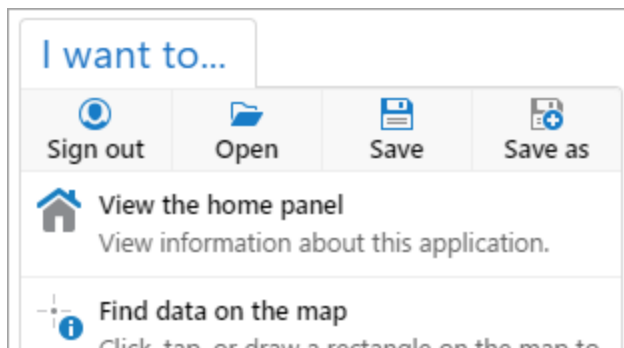
- If you are not sure, keep the settings the same by configuring the interfaces together—you can always configure them separately later without losing any changes you have made.
- If you are sure you want the settings on the I Want To Menu page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see [About Configuring Multiple Interfaces for HTML5 Viewers on page 351](#).

## Menu Configuration Settings

The I Want To Menu page has the following settings:

- **Show Menu:** If this checkbox is selected, the I Want To menu appears in the viewer.
- **Show Global Menu:** If this checkbox is selected, the Global Menu appears in the I Want To menu.  
The Global Menu allows users to sign into an account and save or load projects.

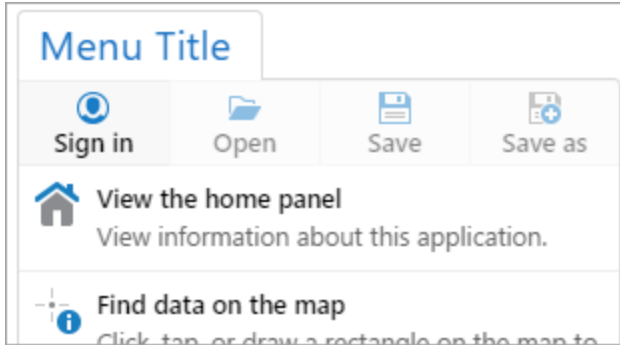


The I Want To menu with the Global Menu enabled and active

- **Title:** The name of the I Want To menu.

The default value is `@language-menu-title`, which populates the menu title with the default I Want To menu title for each included language. See [About User Interface Text in HTML5 Viewers on page 353](#) for more information on using text keys

Alternatively, you can manually enter another menu title.



The I Want To menu with the value "Menu Title" enter in the Title field

- **Primary Color of Button:** The color of the I Want To menu button as a RRGGBB hex code. The default value is #1A72C4.

## Menu Item Configuration Settings

You can add new menu items to the I Want To menu by selecting the **Add Menu Item** button. You can edit existing menu items by selecting the **Edit** button next to them. The following configuration settings are available for menu items:

- **Text:** The menu item's text.
- **Description:** (optional) A short description of what the menu item does.
- **Command:** The name of the command to run when the user selects the menu item. Click in the **Command** box to open a drop-down list of commands.
- **Command Parameter:** The parameter value to pass to the command when it runs. Parameters may either be simple strings or complex objects containing any number of parameters.
- **Icon URI:** (optional) The URI of the image to display next to the menu item. The image should be the size that you want it in the viewer. Valid file formats are PNG, BMP, JPG, and JPEG. The recommended image size is 24px by 24px.
- **Hide When Disabled:** If a menu item's functionality is unavailable or has been disabled, you can select this checkbox to hide the menu item in the viewer entirely. When this checkbox is not selected, the menu item is grayed out but still appears to users.

If you want to remove a menu item, use the **Remove** button next to the item.

You can reorder existing menu items by clicking and dragging the Sort handle next to each menu item.

► **Before you leave the I Want To Menu page:**

1. Click **Apply Changes**.
2. Use the Preview hyperlinks to see your configuration.  
See [About the Live Preview for HTML5 Viewers on page 352](#) for instructions.
3. To save your changes, click **Save Site**.

**See Also...**

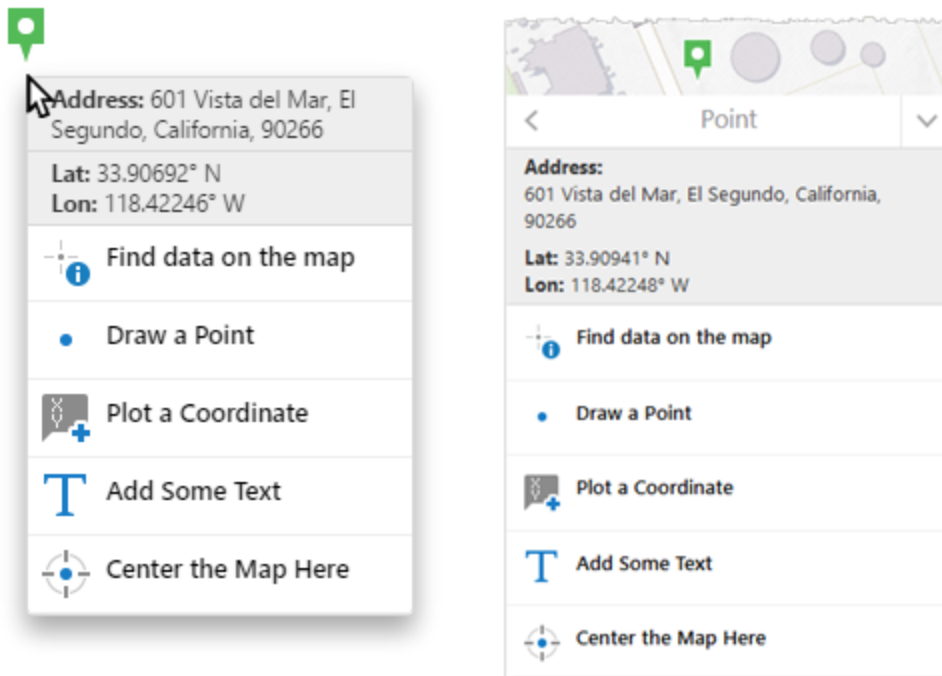
[About User Interface Text in HTML5 Viewers on page 353](#)

### 46.6.10 Configure the Context Menus

You can configure context-sensitive menus throughout the viewer interface. Context menus allow users to perform common tasks that relate to the selected viewer element. For example, right-clicking or long-pressing on the map activates the map context menu. The map context menu displays tasks that a user might want to perform at a location on the map, like plotting a coordinate.

► **To open an HTML5 viewer's Look and Feel page in Manager:**

1. In Manager, edit the viewer that you want to configure.
2. From the menu, select **Context Menus**.



The map context menu in a desktop (left) and handheld interface (right)

## Types of Context Menu


Context menus can appear in a number of circumstances. For example, users can access context menus when they

- right-click or long-press on the map or map objects
- open a ☰ Panel Actions menu
- use an > Actions button
- open a map tip

For a complete list of configurable context menus see [List of Context Menus](#).

## List of Context Menus

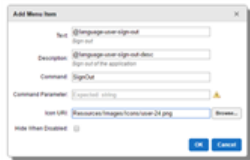
The following context menus are configurable. Users can access each context menu in the following way:

Menu	Description
Coordinate Actions	Select the ⋮ More button next to any plotted coordinate when Plot Coordinates is the active panel.
Coordinates List Actions	Open the ☰ Panel Actions menu when Plot Coordinates is the active panel.
Feature Actions	Open the ☰ Panel Actions menu when a feature is active in the navigation panel.
Global Menu	<p>Open the I Want To Menu. The Global Menu appears as four icons across the top of the open menu. The recommended image size is 24px by 24px.</p> <p>The default menu items included are for Sign In or Sign Out, Open Project, Save Project, and Save Project As.</p> <div style="border: 1px solid #ccc; padding: 10px; background-color: #f9f9f9;"> <p> The Global Menu is designed to hold a maximum of four items. Users are discouraged from configuring the menu in a manner that allows for more than four items to be visible at the same time.</p> </div>
Layer Actions	Open the > Actions menu next to a layer when Layers is the active panel.
Layer List Actions	Open the ☰ Panel Actions menu when Layers is the active panel.
Legend Actions	<p>Open the ☰ Panel Actions menu when Legend is the active panel.</p> <p>To show the Legend panel, open the Layers panel, open the ☰ Panel Actions menu and select Show Legend.</p>
Map Context Menu	<p>Right-click or long-press any point on the map.</p> <p>The Map Context Menu has additional features that you can enable or disable. For</p>



Menu	Description
	more information see <a href="#">Configure the Map Context Menu</a> .
Map Service Actions	Open the > Actions menu next to a map service when Layers is the active panel.
Map Tip Actions	Appear as a list of links on the active map tip.
Project Actions	Open the > Actions menu next to a project when Projects is the active panel.
Projects List Actions	Open the ☰ Panel Actions menu when Projects is the active panel.
Results List Actions	Open the ☰ Panel Actions menu when the Results List is the active panel.
Results Table Actions	Open the ☰ Panel Actions menu when the Results Table is activated.
Selection Actions	When the Results List is the active panel or the Results Table is activated, open the ☰ Panel Actions menu and select the Combine Results item. The Combine Results item activates the Selection Actions menus.

## Add and Modify Menu Items

From each configurable context menu, use the  **Add Menu Item** button to open the Add Menu Item dialog and create a new menu item.




### The Add Menu Item dialog

Choose  **Edit** or  **Remove** to edit or remove next to the menu item you want to edit or remove.



After you have added or edited menu items, select **Apply Changes** and **Save Site** to save your changes to the viewer settings.

## Reorder Menu Items

You can rearrange any existing menu items use the  sort handle and drag each menu item up or down in the list of items.

## Contextual Menu Items

Some menu items do not always appear in a context menu. For example, if a layer is not editable, then a feature's Panel Actions menu would not show the Edit Feature menu item. In the same way, some menu items are contextual based on the user's permissions level. If a user is not logged into their Identity Server identity or their ArcGIS Online account, menu may not appear.

## Context Menu Item Configuration

The following settings can be set for menu items:

- **Text:** The menu item's text.
- **Description:** Optional. A short description of what the menu item does.
- **Command:** The name of the command to run when the user selects the menu item. Available commands are suggested if you have the command text box selected.
- **Command Parameter:** The parameter value to pass to the command when it runs. Parameters may either be simple strings or complex objects containing any number of parameters.  
The Command Parameter setting is grayed out for commands that cannot take a parameter.
- **Icon URI:** Optional. The URI of the image to display next to the menu item. The image should be the size that you want it in the viewer. Valid file formats are PNG, BMP, JPG, and JPEG.  
Use the **Browse...** button to choose an icon that exists in your site's virtual directory.
- **Hide When Disabled:** Select this checkbox to hide menu items if they are disabled.  
For example, if a user does not have permission to edit a feature, the Edit Feature action would be hidden from the user.



The Command and Command Parameter settings are not available when a menu item uses multiple commands via the `batch` property. In this case, those settings are hidden. You must edit batch commands directly in the `Desktop.json.js`, `Tablet.json.js`, and `Handheld.json.js` configuration files.

### 46.6.10.1 Configure the Map Context Menu

The Map Context Menu page has the following settings:

- **Enable Context Menu:** To display the Map Context Menu when the user right-clicks or long-presses a point on the map, select this checkbox; otherwise, clear this checkbox. This checkbox is selected by default.
- **Show Coordinates:** To display the coordinates of the point right-clicked or long-pressed, select this checkbox; otherwise, clear this checkbox. This checkbox is selected by default.
- **Show Reverse Geocoder:** To display the address of the point right-clicked or long-pressed, select this checkbox; otherwise, clear this checkbox. This checkbox is selected by default.



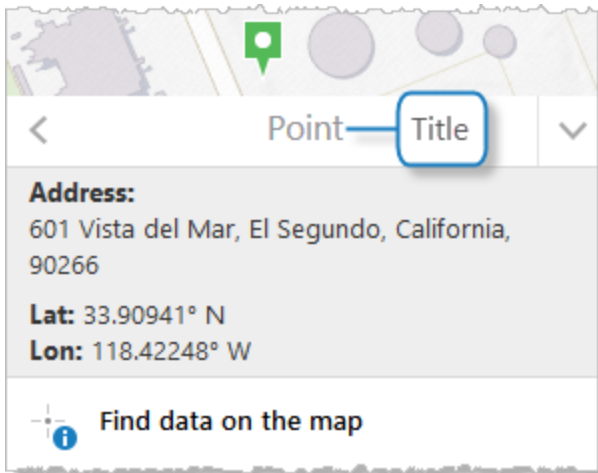


For this option to work, your site must have at least one Geocoder configured with the **Default Reverse Geocoder** setting selected. For more information, see [Geocoding Services](#).

- **Show Menu:** To display the menu items of the Map Context Menu, select this checkbox; otherwise, clear this checkbox. This checkbox is selected by default.
- **Title:** If your viewer is going to be available in one language only, type the menu title. This title appears in the Bottom Panel of the Handheld interface.



If your viewer is going to be available in more than one language, enter the text key that the menu title is assigned to. See [About User Interface Text in HTML5 Viewers on page 353](#) for more information on using text keys.



Title for the Map Context Menu

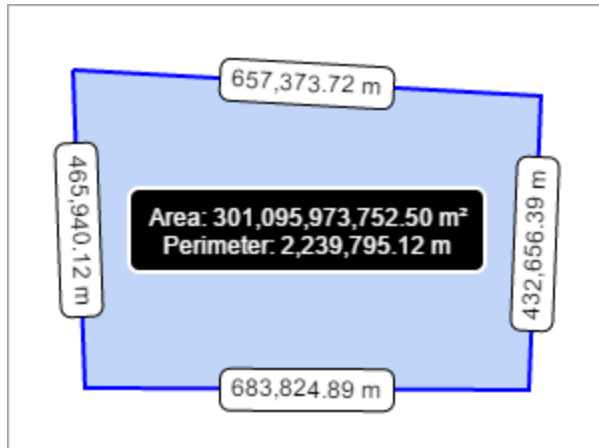
For more information about context menu configuration, and adding and modifying menu items, see [Configure the Context Menus on page 368](#).

See Also...

[About User Interface Text in HTML5 Viewers on page 353](#)

#### 46.6.11 Configure Measurement

The viewer includes default configuration for displaying measurements in the viewer. Whenever users create drawings on the map, the measurement configuration is used to display the measurement lines and text. The Measurement page in the Management Pack allows you to modify the configuration used.



An example of a polygon's area and line measurement

## General Properties

You can configure the lines, fill, and text for all measured markup objects. The following properties can be configured:

- **Markup Layer Name:** Set the name of the markup layer. The default value is `Drawings`.



The markup layer does not appear in the layer list. The Markup Layer Name is how Essentials references drawings in the viewer. Generally, there is no reason to change this setting.

- **Line Color:** The line color for markup objects, set in RGB hex format. The default value is `#0000FF`.
- **Fill Color:** The fill color for markup objects, set in RGB hex format. The default value is `#6495ED`.
- **Text Color:** The color of the line measurement text, set in RGB hex format. The default value is `#000000`.
- **Highlight Color:** The color behind the text on line measurements, set in RGB hex format. The default value is `#FFFFFF`.
- **Outline Color:** The color of the border around the text on line measurements, set in RGB hex format. The default value is `#000000`.
- **Outline Width:** The width of the border around the highlighted text on line measurements, set in pixels. The default value is 1.
- **Highlight Radius:** The border radius of the highlighted line measurement text, set in pixels. The default value is 5.  
If the highlight radius is set to 0, the highlighted border is square. Higher values, like 5 or 10, determine how round the border is.
- **Text Size:** The size of the text used for line measurements, set in pixels. The default value is 12.
- **Add Markup to Map By Default:** Select this checkbox to add markup to the map by default. This means that when users finish drawing and move on to another activity in the viewer, their drawings remain on the map. This checkbox is checked by default.

## Total Measurement Properties

You can configure the measurement display for polygon drawings. Total measure, like the area of a polygon, is displayed on top of the drawing. The following total measurement properties can be configured:

- **Total Measurement Text Color:** The color of text for the area measurements, set in RGB hex format. The default value is #FFFFFF.
- **Total Measurement Highlight Color:** The color behind the text on area measurements, set in RGB hex format. The default value is #000000.
- **Total Measurement Outline Color:** The color of the border around area measurements, set in RGB hex format. The default value is #FFFFFF.
- **Total Measurement Outline Width:** The width of the border around area measurements, set in pixels. The default value is 2.

### 46.6.12 Configure the Map for HTML5 Viewers

The Viewer's Map page in Manager has settings that enable you to extend or restrict the scale range of the map.

#### To open an HTML5 viewer's Map page in Manager:

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Map**.  
The Map page opens.

#### Before you configure settings on the Map page:

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can configure them separately later without losing any changes you have made.
- If you are sure you want the settings on the Map page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see [About Configuring Multiple Interfaces for HTML5 Viewers on page 351](#).

## Settings

The Map page has the following settings:

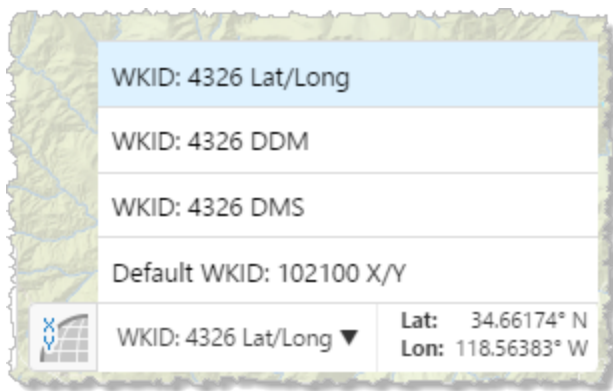
- Override Scale:** The Override Scale settings enable you to override the default scale range of the map. By default, the primary map service determines the scale range of the map. The map's Zoom control has the same range as the map's primary map service. Each level of detail in the primary map service is one zoom level in the Zoom control. Users cannot zoom in closer than the primary map service's minimum scale, or zoom out farther than the primary map service's maximum scale.
 

A site may contain a service, often a dynamic service, with a larger scale range than the primary map service. In this case, users will not be able to see the entire map service—they can only see the part that lies within the primary map service's scale range. The Override Scale settings enable you to extend the map's scale range so users can see the parts of the map service that lie outside the primary map service's scale range.

You can also use the Override Scale settings to restrict the map's scale range.

  - Override Minimum Scale:** The minimum scale at which the map is visible in viewers. For example, if the map's minimum scale is 1:5,000,000, you could extend the minimum scale to 1:10,000,000 in Essentials. To configure the minimum scale, enter the scale's denominator, without commas or other punctuation. For example, to set the minimum scale to 1:10,000,000, enter **10000000** in the **Override Minimum Scale** box.
  - Override Maximum Scale:** The maximum scale at which the map is visible in viewers. For example, if the map's maximum scale is 1:2,000, you could extend the maximum scale to 1:500 in Essentials. To configure the maximum scale, enter the scale's denominator, without commas or other punctuation. For example, to set the maximum scale to 1:500, enter **500** in the **Override Maximum Scale** box.
- Map Coordinate Systems:** The Map Coordinate Systems settings allow you to control how the map coordinates are displayed.

The map coordinates show the position of the mouse pointer. By default, the coordinates appear at the bottom left of the map, beside the scale bar:



Map coordinates with the coordinate system menu open

- Default Coordinate Display Types:**
  - Decimal Degrees (Lat/Long) - Default Geographic Coordinate System Spatial Reference:** To include the default geographic coordinate system displayed in latitude and longitude, select this checkbox; otherwise, clear this checkbox. By default, this checkbox is selected.

- **Degrees Decimal Minutes (DDM) - Default Geographic Coordinate System Spatial Reference:** To include the default geographic coordinate system displayed in decimal degrees and minutes, select this checkbox; otherwise, clear this checkbox. By default, this checkbox is selected.
- **Degrees Minutes Seconds (DMS) - Default Geographic Coordinate System Spatial Reference:** To include the default geographic coordinate system displayed in degrees, minutes and seconds, select this checkbox; otherwise, clear this checkbox. By default, this checkbox is selected.
- **Projected Coordinates (X/Y) - Primary Map Spatial Reference:** To include the primary map's projected coordinate system displayed in X and Y, select this checkbox; otherwise, clear this checkbox. By default, this checkbox is selected.
- **Default Geographic Coordinate System WKID:** The well-known ID of the default coordinate system. The default is **4326**.



For a list of WKIDs, see Esri's [Geographic Coordinate Systems](#) or [Projected Coordinate Systems](#) documentation.

- **Coordinate Decimal Precision:** The number of decimal places to use for coordinates. The default is **5**.



This precision setting cannot exceed the maximum representable IEEE 754 floating point. This is specified in the IEEE 754 standard. See [double-precision floating-point format](#) and [significant figures](#) for more information.

- **Alternate Coordinate Systems:** A list of coordinate systems to make available as options in the coordinates widget. To add a coordinate systems, click **Add** and configure the settings:
  - **Display Name:** The name to display in the coordinates widget.
  - **WKID:** The well-known ID of the coordinate system. Cannot be set if **WKT** is already specified.



For a list of WKIDs, see Esri's [Geographic Coordinate Systems](#) or [Projected Coordinate Systems](#) documentation.

- **WKT:** The well-known text of the coordinate system. Cannot be set if **WKID** is already specified.



For a list of WKTs, see Esri's [Geographic Coordinate Systems](#) or [Projected Coordinate Systems](#) documentation.

- **Output Labels:** The units to use for the coordinates. Possible values include:
  - **DDM:** Degrees, Decimal Minutes
  - **DMS:** Degrees, Minutes, Seconds
  - **Lat/Long:** Latitude, Longitude

- **X/Y:** X, Y (in the units of the coordinate system)
- **MGRS:** Military Grid Reference System, if configured
- **USNG:** United States National Grid, if configured



Note that:

- The MGRS and USNG coordinate systems require ArcGIS Server version 10.3 or later.
- MGRS and USNG are not supported in offline mode.

For example, to configure the MGRS coordinates:

- Click **Add** under the **Alternate Coordinate Systems** field to open the Add/Edit Coordinate System dialog.
- Type a name for display purposes in the **Display Name** field.
- Leave the **WKID** and **WKT** fields blank.
- Select **MGRS** in the **Output Type** list.
- Click **OK** to add MGRS as an alternate coordinate system.
- Click **Apply Changes** and then **Save Site**.
- Refresh the Viewer if it is open.

**MGRS** is now available as a selection in the list of coordinate systems.

#### ► Before you leave the Map page:

- Click **Apply Changes**.
- Use the Preview hyperlinks to see your configuration.  
See [About the Live Preview for HTML5 Viewers on page 352](#) for instructions.
- To save your changes, click **Save Site**.

## 46.6.13 Configure Map Widgets for an HTML5 Viewer

The Map Widgets page in Manager has settings for:

- [Bookmarks](#)
- [Scale Bar](#)
- [Scale Input Box](#)
- [Overview Map](#)
- [Map Coordinates](#)
- [Time Slider](#)

▶ **To open an HTML5 viewer's Map Widgets page in Manager:**

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Map Widgets**.  
The Map Widgets page opens.

▶ **Before you configure settings on the Map Widgets page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can configure them separately later without losing any changes you have made.
- If you are sure you want the settings on the Map Widgets page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see [About Configuring Multiple Interfaces for HTML5 Viewers on page 351](#).

## Bookmarks

- **Enabled:** When this checkbox is selected, the Bookmarks feature is enabled—you can add the Bookmarks map widget or Bookmarks tool, so users can open the Bookmarked Locations menu. The Bookmarked Locations menu allows users to jump to existing bookmarks and create new bookmarks to add to the menu.

To show the Bookmarks map widget, select the **Show Bookmarks Button** checkbox. When the widget is clicked, the Bookmarked Locations menu opens beside the widget.

To add the Bookmarks tool to the toolbar, follow the instructions to add a button in [Configure the Toolbar for an HTML5 Viewer on page 395](#). When the Bookmarks tool is clicked, the Bookmarked Locations menu opens next to the Bookmarks map widget if the widget shows on the map. If the widget does not show on the map, the Bookmarked Locations menu opens in a modal window.

By default, the Enabled checkbox is selected.

- **Show Bookmarks Button:** When this checkbox is selected, the Bookmarks map widget appears on the map, provided at least one bookmark is defined. When the widget is clicked, the Bookmarked Locations menu opens beside the widget.

When Show Bookmarks Button is selected, the viewer hides the Bookmarks map widget if there are no bookmarks defined. In this case, users can use the **Bookmark current map extent** I Want To menu item to create bookmarks. As soon as a user has created one bookmark, the Bookmarks widget shows on the map.

By default, the Show Bookmarks Button checkbox is cleared.



To select the **Show Bookmarks Button** checkbox, the **Enabled** checkbox must be selected.

## Scale Bar

The scale bar appears at the bottom left of the map.

- **Show Scale Bar:** To display the scale bar, select this checkbox; otherwise, clear this checkbox. It is selected by default.
- **Scale Bar Style:** Select a style for the scale bar from this drop-down menu. The possible choices are **Ruler** or **Line**. The default is **Ruler**.
- **Scale Bar Unit:** Select the units of measurement for the scale bar from this drop-down menu. The possible choices are **US Customary**, **Metric** or **Both (US Customary and Metric)**. The **Both (US Customary and Metric)** option can only be used with the **Line** scale bar style. The default is **Metric**.



Dual-unit Line scale bar (left) and metric Ruler scale bar (right)

- **Show Background:** To display a rectangular background for the scale bar, select the Show Background checkbox. The background prevents other widgets from overlapping the scale bar. In the screen capture above, both scale bars have a background. If you do not want the scale bar to have a background, clear the checkbox. It is selected by default.

## Scale Input Box

The scale input box allows users to choose the scale of the map.



### The scale input box

If it is enabled, the scale input box can be toggled by the scale input button at the bottom left of the map.



### The scale input button

- **Show Scale Input Box:** To show the scale input button that toggles the scale input box, select this checkbox.
- **Open By Default:** To show the expanded scale input box by default, select this checkbox.

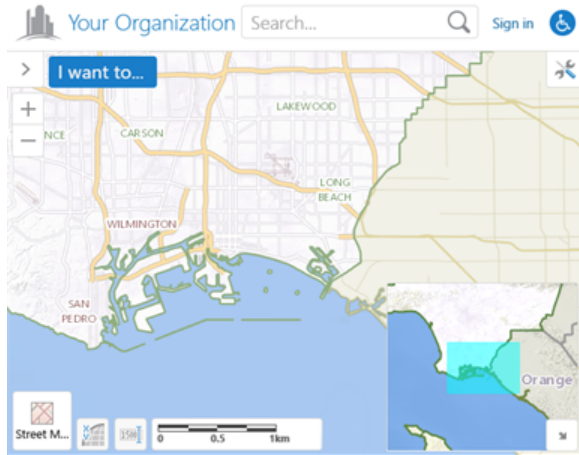


The scale input box is visible if both Show Scale Input Box and Open By Default checkboxes are selected. For example, if you select the Open By Default checkbox but leave the Show Scalebar Input Box deselected, the scale input box is hidden.



## Overview Map

The overview map appears at the bottom right of the map.

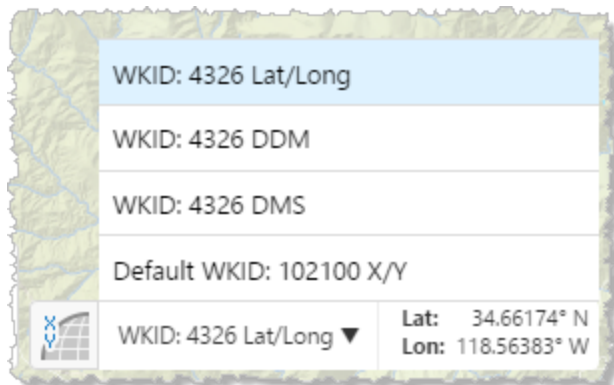


### Example of an overview map

- **Show Overview Map:** To enable the overview map, select this checkbox; otherwise, clear this checkbox. It is selected by default.
- **Open By Default:** To open the overview map when the viewer starts, select this checkbox; otherwise, clear this checkbox. It is cleared by default.
- **Extent Scale Factor:** The scale factor to use for the overview map in relation to the current map extent. The default is **2**.
- **Color of Visible Extent:** A valid HTML color to use for the rectangle that represents the current map extent. The default is **#00FFFF**.

## Map Coordinates

The map coordinates show the position of the mouse pointer. By default, the coordinates appear at the bottom left of the map, beside the scale bar:



Map coordinates with the coordinate system menu open

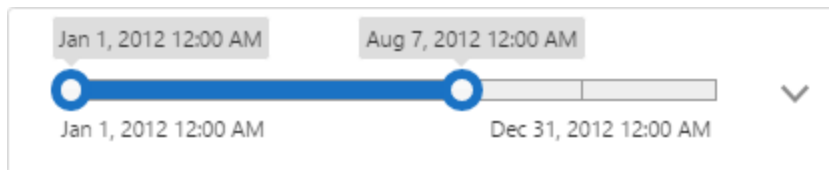
- **Show Map Coordinates:** To show the map coordinates widget on the map, select this checkbox. For the widget to display, at least one coordinate system must be specified—either Display Basemap's Coordinate System is enabled or at least one Alternate Coordinate System is configured, or both.  
If you do not want the coordinates widget to show, clear the Show Map Coordinates checkbox. The checkbox is selected by default.
- **Open By Default:** To open the map coordinates widget when the viewer starts, select this checkbox; otherwise, clear this checkbox. It is cleared by default.



The Map Coordinates widget is only available for the Desktop interface.

## Time Slider

The time slider map widget appears in the viewer when a time-aware layer has been configured in Manager. For more information, see [Time Sliders on page 247](#).



### The time slider map widget

- **Enable Time Slider:** Select this checkbox to enable the time slider map widget.
- **Animate Time Slider:** Select this checkbox to enable smoother time slider animations when playing a timeline or using the Step Back and Step Forward buttons.
- **Activate By Default:** Select this checkbox to activate the time slider map widget by default.

### ► Before you leave the Map Widgets page:

1. Click **Apply Changes**.
2. Use the Preview hyperlinks to see your configuration.  
See [About the Live Preview for HTML5 Viewers on page 352](#) for instructions.
3. To save your changes, click **Save Site**.

## 46.6.14 Configure an HTML5 Viewer for Offline Use

Through the Geocortex Mobile App Framework, the HTML5 viewer supports access to feature layers and basemaps when there is no network connection. In offline mode, users can navigate the feature layers, perform searches and identify operations, and if the layers are editable, create, modify, and remove features. When the viewer is connected again, they can upload the changes to the server.

As of Geocortex Viewer for HTML5 2.0, launching a viewer in offline mode requires the Geocortex Mobile App Framework. For more information, see **Offline** in the *Geocortex Mobile App Framework Administrator Guide*.

▶ **To open an HTML5 viewer's Offline page in Manager:**


1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Offline**.  
The Offline page opens.

## Settings

The Offline page has the following settings:



- **Add to List of Available Viewers:** Whether this viewer should be offered to be added in the Geocortex Mobile App Framework.
- **Automatically Download:** Whether this viewer should be automatically downloaded in the Geocortex Mobile App Framework.

▶ **To configure an HTML5 viewer for offline use:**

1. In Essentials Manager, edit the site that contains the viewer.
2. In the side panel, click **Viewers**, then click the **Edit** icon  beside the desired viewer.
3. In the **Viewer for HTML5** side panel, click **Offline**.
4. To offer this viewer to be added in the Geocortex Mobile App Framework, select the **Add to list of Available Viewers** checkbox.



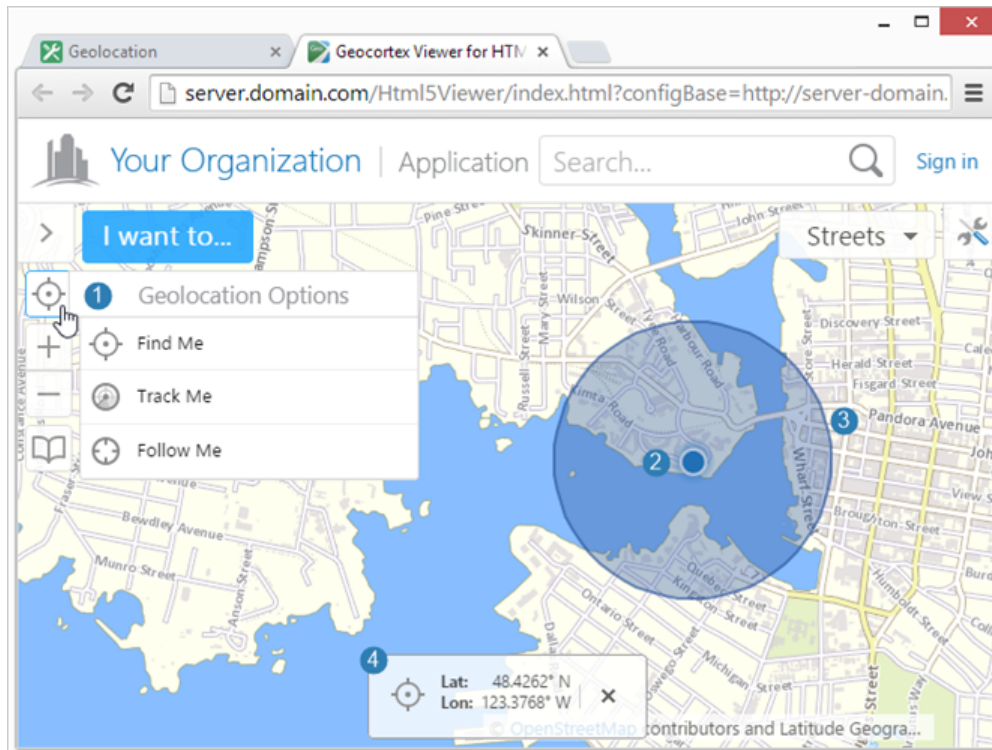
If the site is secured, the viewer will only appear in the Available Viewers list if the user has permission to access the viewer. For information on setting permissions on viewers, see "Permissions" in the *Geocortex Essentials Administrator Guide*.

5. To automatically download this viewer in the Geocortex Mobile App Framework, select the **Automatically download** checkbox.
6. Click **Apply Changes**.
7. In the **Viewer for HTML5** side panel, click **Toolbar**.
8. In the **Configured Toolbar** section, ensure the **Offline Maps** tool  is present. If not, drag the **Offline Maps** tool  from the **Available Tools** section to the **Configured Toolbar** section.
9. Click **Apply Changes**.
10. Click **Save Site**.

## 46.6.15 Configure Geolocation in an HTML5 Viewer

Geolocation locates the user on the map. The HTML5 Viewer supports the following geolocation options:

- **Find Me:** Pans the map to the user's location and marks the location with an indicator.
- **Track Me:** Tracks the user's location with an indicator, without panning the map.
- **Follow Me:** Follows the user's location with an indicator and pans the map as the user's location changes.



Geolocation menu (1), location indicator (2), accuracy circle (3), and geolocation coordinates (4)

## Browser Support

Web browsers return geolocation results in WGS 84. If your map is not in Web Mercator or WGS 84, you must configure an ArcGIS geometry service so the geolocation widget can project from latitude/longitude to the map's coordinates. For instructions on configuring a geometry service, see [Configure Application-Wide Settings for an HTML5 Viewer on page 357](#).

Each web browser handles geolocation differently. For example, as of Chrome 50.0, your site needs to be secured with HTTPS in order to use the Geolocation API. If you or your users intend to use geolocation, ensure that your preferred web browser uses geolocation and that it is compatible with your site. Here are two common scenarios where geolocation is not available to users:

- **Chrome 50+:** Your site needs to be secured with HTTPS in order to use the Geolocation API.
- **Internet Explorer 8:** Geolocation is not supported in Internet Explorer 8 or older.

If you use Internet Explorer Enterprise Mode, you may be emulating a version of Internet Explorer 8.



It is common for devices to ask permission before websites can use geolocation. If geolocation is not working, ensure that the viewer has been given sufficient geolocation privileges. Also ensure that the device's location services are enabled.

In order for an HTML5 viewer to perform geolocation operations, the user's device must have a built-in GPS (Global Positioning System), a Wi-Fi connection, or a wired connection. GPS provides the most accurate geolocation results. Wi-Fi is less accurate than GPS, and geolocation using a wired connection is less accurate than Wi-Fi.

Some devices use a mix of GPS and Wi-Fi to obtain a location. This can result in unpredictable readings. Accuracy is improved by setting the device to GPS-only mode, however, this drains the battery more quickly in some devices.

Geolocation is configured on the viewer's Geolocation page in Manager. You can configure additional geolocation settings in the viewer's configuration files. For information, see the "Geolocate Module" section in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

#### To open an HTML5 viewer's Geolocation page in Manager:

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Geolocation**.  
The Geolocation page opens.

## Settings



By default, the Geolocation page is set to configure the Desktop, Tablet, and Handheld interfaces separately. For more information, see [About Configuring Multiple Interfaces for HTML5 Viewers on page 351](#).

The Geolocation page has the following settings:

#### **Geolocation:**

- **Enable Single-Reading Geolocation:** Select this checkbox if you want to make single-reading geolocation (**Find Me**) available in the Geolocation Options menu; otherwise, clear this checkbox. The Find Me feature pans the map to the user's current location and marks the location with an indicator.  
By default, this setting is enabled for the Tablet and Handheld interfaces, and disabled for the Desktop interface.
- **Enable Geolocation Tracking:** Select this checkbox if you want to make tracking (**Track Me**) available in the Geolocation Options menu; otherwise, clear this checkbox. The Track me feature tracks the user's location with an indicator, without panning the map.  
By default, this setting is enabled for the Tablet and Handheld interfaces, and disabled for the Desktop interface.
- **Enable Geolocation Following:** Select this checkbox if you want to make following (**Follow Me**) available in the Geolocation Options menu; otherwise, clear this checkbox. The Follow Me feature follows the user's location with an indicator and pans the map as the user's location changes.  
By default, this setting is enabled for the Tablet and Handheld interfaces, and disabled for the Desktop interface.
- **Display Geolocation Accuracy Circle:** Select this checkbox if you want to display the geolocation accuracy circle; otherwise, clear this checkbox. It is checked by default. When checked, the indicator for the user's position

includes a surrounding circle that indicates the margin of error of the user's position; the user's actual position should lie somewhere within this circle.

- **Geolocation Indicator Image:** The URL to the image that represents the geolocation indicator. Type the URL in the text box. Alternatively, click **Browse** to use an image on the server; if necessary, upload an image to the server by clicking **Upload** and selecting an image file to upload. The default is an image of a blue dot located at **Resources/Images/Icons/geolocate-position-32.png**.
- **Zoom Upon Geolocation:** Select this checkbox if you want to zoom to the user's location upon single-reading geolocation (**Find Me**) or following (**Follow Me**); otherwise, clear this checkbox. It is checked by default.
- **Zoom Value:** The scale to which to zoom when **Zoom Upon Geolocation** is selected. The default is **50000** (to 1).

#### Geolocation Coordinates:

- **Display Coordinates for Single-Reading Geolocation:** Select this checkbox to display the coordinates of the user's location, in addition to showing the geolocation indicator, when the user performs a **Find Me** operation. If you do not want to show the coordinates for Find Me operations, clear the checkbox.
- **Display Coordinates for Geolocation Tracking:** Select this checkbox to display the coordinates of the user's location, in addition to showing the geolocation indicator, when the user performs a **Track Me** operation. If you do not want to show the coordinates for Track Me operations, clear the checkbox.
- **Display Coordinates for Geolocation Following:** Select this checkbox to display the coordinates of the user's location, in addition to showing the geolocation indicator, when the user performs a **Follow Me** operation. If you do not want to show the coordinates for Follow Me operations, clear the checkbox.
- **Coordinate Format:** Select the units to use for displaying the coordinates. The options are:
  - **DDM:** Degrees, Decimal Minutes
  - **DMS:** Degrees, Minutes, Seconds
  - **Lat/Long:** Latitude, Longitude
  - **X/Y:** X, Y (in the units of the coordinate system)
  - **MGRS:** Military Grid Reference System, if configured
  - **USNG:** United States National Grid, if configured

By default, X/Y coordinates are shown in the map's spatial reference. To change the spatial reference that is used for the coordinates, use the **WKID** setting to specify the well-known ID of the coordinate system that you want to use.



Note that:

- The MGRS and USNG coordinate systems require ArcGIS Server version 10.3 or later.
- MGRS and USNG are not supported in offline mode.

- **Coordinate Decimal Precision:** The number of decimal digits to show in the coordinates.



This precision setting cannot exceed the maximum representable IEEE 754 floating point. This is specified in the IEEE 754 standard. See [double-precision floating-point format](#) and [significant figures](#) for more information.

► **Before you leave the Geolocation page:**

1. Click **Apply Changes**.
2. Use the Preview hyperlinks to see your configuration.  
See [About the Live Preview for HTML5 Viewers on page 352](#) for instructions.
3. To save your changes, click **Save Site**.

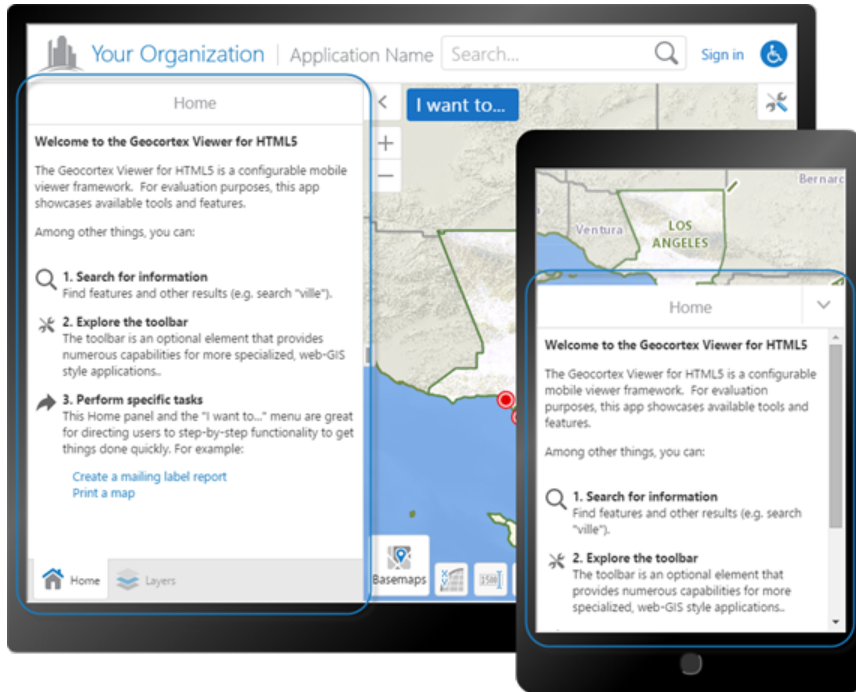
#### 46.6.16 Configure the Home Panel for an HTML5 Viewer

The Home Panel is a multipurpose panel with a variety of possible uses. You could use it to:

- Identify your organization.
- Publish a disclaimer.
- Introduce the application.
- Provide instructions for working with the application.
- Provide hyperlinks that run viewer commands or workflows. (See "Hyperlinks in the Viewer" in the *Manager Administrator Guide* for more information.)

You can configure the viewer to show the Home Panel when the user launches the viewer. In this case, the Panel serves as a welcome page.

The contents of the Home Panel are defined using HTML markup. The contents can include text, images, and UI elements like buttons and links that launch web pages, invoke commands, and run workflows. Initially, the Home Panel contains placeholder text to help give you ideas for how you might use the Panel.



Home Panel in the Desktop interface (rear), and in the Handheld interface

The Home Panel was introduced in version 1.3 of the HTML5 Viewer.

► **To open an HTML5 Viewer's Home Panel page in Manager:**

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Home Panel**.  
The Home Panel page opens.

► **Before you configure settings on the Home Panel page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can always configure them separately later without losing any changes you have made.
- If you are sure you want the settings on the Home Panel page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.



For more information, see [About Configuring Multiple Interfaces for HTML5 Viewers on page 351](#).

## Settings

The Home Panel page has the following settings:

- **Include Home Panel:** When this checkbox is selected, the Home Panel is available in the viewer. If you do not want the viewer to have a Home Panel, clear the checkbox. By default, the viewer has a Home Panel.
- **Open Home Panel by Default:** When this checkbox is selected:




- In the Handheld interface, the Home Panel displays instead of the map when the viewer launches.
- In the Desktop and Tablet interfaces, the Data Frame has a tab for the Home Panel when the viewer launches. The user can click  to see the Home Panel if the Data Frame is closed. Alternatively, the user can click the Home button  in the toolbar to see the Home Panel.



You can configure the Data Frame to open when the viewer launches by selecting the Open By Default checkbox on the Look and Feel page in Essentials.

By default, the Open Home Panel by Default checkbox is not selected.


If you clear the Open Home Panel by Default checkbox but leave the Include Home Panel checkbox selected, the user can click the Home button  in the toolbar to open the Home Panel.


- **Title:** The title that appears at the top of the Home Panel.



If your viewer is going to be available in more than one language, enter the text key that the Home Panel title is assigned to. See [About User Interface Text in HTML5 Viewers on page 353](#) for more information on using text keys.

The default title is `@language-common-welcome`.


- **Content:** The HTML markup that defines the contents of the Home Panel. The Content box provides a Rich Text Editor with a toolbar at the top. By default, the Rich Text Editor is open in the Content box. If the Rich Text Editor does not have a particular tool that you want, or you prefer to work directly in the HTML markup, click the Show Source icon  at the end of the toolbar. This displays the HTML markup in the Content box, so you can edit the HTML markup directly.

To return to the Rich Text Editor, click the  icon again. You can switch between the Rich Text Editor and the HTML markup as many times as you want.




You can use a valid text key for the content as long as there are no spaces or HTML markup surrounding the text key. For more information on using text keys, see [About User Interface Text in HTML5 Viewers on page 353](#).

### To configure the Home Panel:

1. On the **Home Panel** page, select the **Include Home Panel** checkbox.
2. If you want the Data Frame to have a tab for the Home Panel when the user launches the viewer, select the **Show Home Panel** checkbox.
3. In the **Title** box, type the title that you want to appear at the top of the Home Panel. You can use a text key or the literal text.
4. In the **Content** box, create the contents of the Home Panel.  
Use the Rich Text Editor that displays by default, or click the Show Source icon  to work in the HTML markup.

5. Click **Apply Changes**.
6. If you want the user to see the Home Panel when the Desktop or Tablet interface launches, you must configure the Data Frame to open:

 The Handheld interface does not have a Data Frame; if you want the Home Panel to be the first thing the user sees when the viewer launches, all you have to do is select Include Home Panel and Show Home Panel.

- a. Click **Look and Feel** in the side panel.  
The Look and Feel page opens.
  - b. In the **Data Frame** area, select the **Open By Default** checkbox.
  - c. Click **Apply Changes**.
7. Click **Save Site**.

**See Also...**

[About User Interface Text in HTML5 Viewers on page 353](#)

## 46.6.17 Configure Instant Search in the HTML5 Viewer

Before you configure Instant Search settings in a viewer, you should configure Instant Search in the site. For information, see [About Instant Search](#).

The Instant Search page allows you to configure Instant Search settings for a viewer. In general, you should not need to change these settings—the default values have been adjusted to work for the speed people usually type, the amount of information people can realistically work with, and so on. The only setting you might want to change is Maximum Results, which limits the number of search results that are shown.



You can navigate between search hints by pressing the **up arrow** (↑) or **down arrow** (↓) keys.

### **To open an HTML5 Viewer's Instant Search page in Manager:**

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Instant Search**.  
The Instant Search page opens.

### **Before you configure settings on the Instant Search page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can always configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the Instant Search page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see [About Configuring Multiple Interfaces for HTML5 Viewers on page 351](#).

## Settings

The Instant Search page has the following settings:

- **Search Hints:** When this checkbox is selected, the viewer suggests search terms to the user. The user can click a hint to search for the term given in that hint. By default, the Search Hints checkbox is selected.  
When the Search Hints checkbox is cleared, the viewer does not display search hints.
- **Give Precedence to Nearby Results:** To rank search results by how close they are to the center of the current map and relevance to search terms, check this checkbox. To rank search results only by relevance to search terms, uncheck this checkbox. By default, this checkbox is checked.
- **Autocomplete Delay (ms):** The number of milliseconds to wait after the user stops typing before search hints are displayed.
- **Minimum Prefix length:** The number of characters the user must type before search hints are displayed.
- **Maximum Search Hints:** The maximum number of search hints to display.
- **Maximum Results:** The maximum number of search results to show.

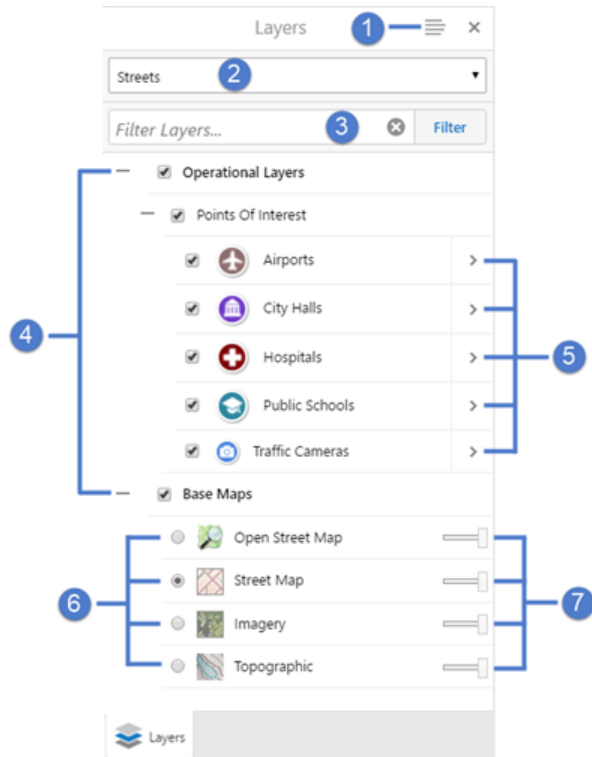
### ▶ Before you leave the Instant Search page:

1. Click **Apply Changes**.
2. Use the Preview hyperlinks to see your configuration.  
See [About the Live Preview for HTML5 Viewers on page 352](#) for instructions.
3. To save your changes, click **Save Site**.

## 46.6.18 Configure the Layer List for an HTML5 Viewer

The Layer List page in Manager has settings that control the appearance and behavior of the Map Layers panel that is displayed on the left side of the viewer. The Map Layers panel contains the configurable directory of folders, map services, layers and basemaps that are available in the viewer. It also contains a menu to select a layer theme.

You can use Manager to control which folders, map services and layers are initially turned on in the Map Layers panel when a user launches the map. For more information, see [The Layer List on page 204](#).



Layer List showing map services and layers

1	Panel Actions menu	2	Layer Theme selection	3	Layer List Filter input field
4	Folders	5	Opens Layer Actions menus	6	Visibility settings
7	Transparency sliders				

► **To open an HTML5 viewer's Layer List page in Manager:**

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Layer List**.  
The Layer List page opens.

► **Before you configure settings on the Layer List page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can configure them separately later without losing any changes you have made.
- If you are sure you want the settings on the Geolocation page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see [About Configuring Multiple Interfaces for HTML5 Viewers on page 351](#).

## Settings

The Layer List page has the following settings:

- **Show Transparency Slider:** Select this checkbox if you want to display transparency sliders for each map service; otherwise, clear this checkbox. It is checked by default.
- **Include Legend Swatches:** Select this checkbox if you want to enable the ability to display legend swatches within the layer list; otherwise, clear this checkbox. It is checked by default.
- **Auto Expand Swatches:** Select this checkbox if you want to automatically display all legend swatches for each layer within the layer list; otherwise, clear this checkbox. It is unchecked by default.
- **Show Swatches For Visible Layers Only:** Select this checkbox if you want to only display legend swatches for layers that are visible; otherwise, clear this checkbox. It is unchecked by default.

▶ **Before you leave the Layer List page:**

1. Click **Apply Changes**.
2. Use the Preview hyperlinks to see your configuration.  
See [About the Live Preview for HTML5 Viewers on page 352](#) for instructions.
3. To save your changes, click **Save Site**.

## 46.6.19 Configure Pushpins for an HTML5 Viewer



Pushpins are not currently supported in the Handheld interface. Adding pushpin configuration to the Handheld configuration file has no effect.

The Pushpins page in Manager includes settings that control the appearance of pushpins that appear on the map. When pushpins are visible, they are placed in the center of a feature, subject to any configured offset.

Pushpins are visible for a point feature when:

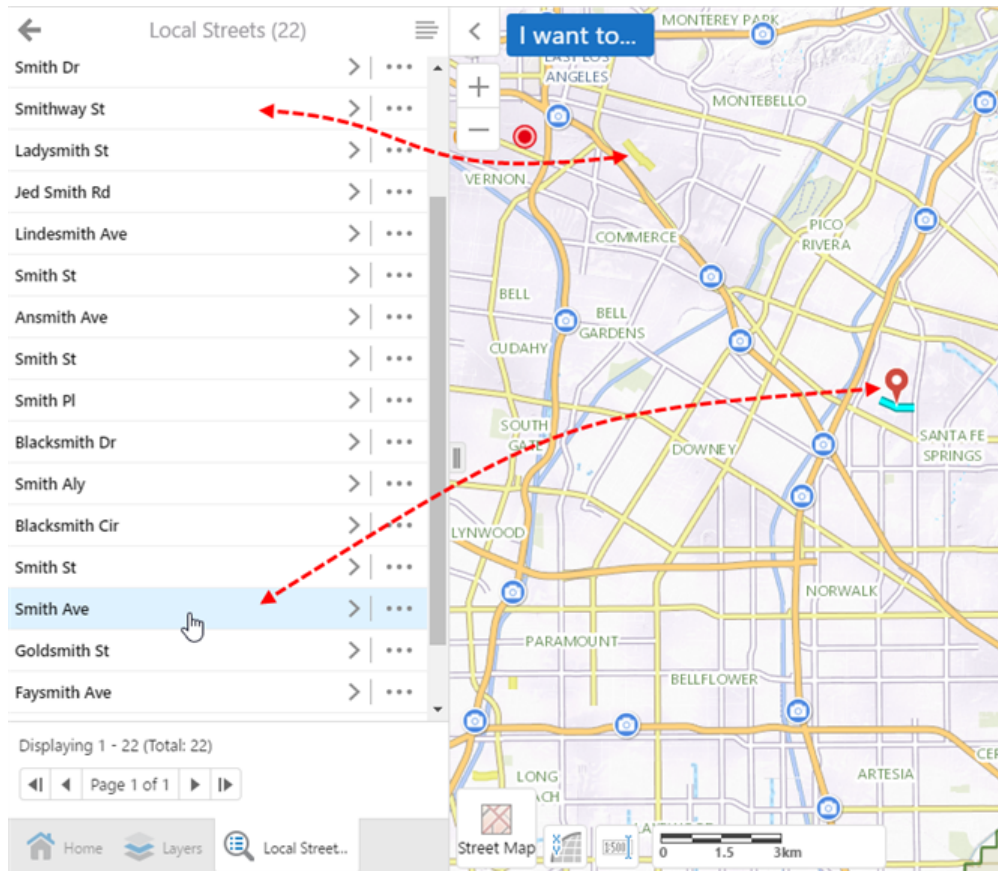
- The pointer is placed on the entry in the Results List.
- The feature details panel is open.
- A maptip for the feature is open.

Pushpins are visible for a line and/or polygon feature when:

- The feature is not visible in the current map scale and the pointer is placed on the entry in the Results List.
- The feature details panel is open.
- A maptip for the feature is open.

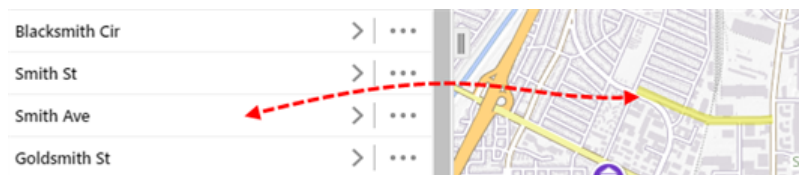
Otherwise, the feature is highlighted in yellow. If you place the pointer on a specific item in the list, the highlight color changes to blue on the map.

In the following example, a search for “smith” results in a list of street names, and their locations are highlighted in yellow on the map. Since the scale of the map does not show sufficient detail for the listed items, a pushpin identifies the location of the feature when the pointer is placed on that item in the list, and the highlight color changes to blue.

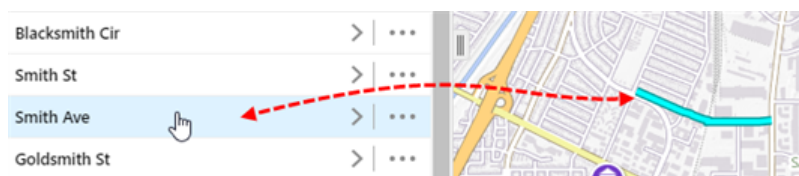


#### Highlighted line features and a pushpin on the map for the item in focus in the list

When the map zoom level is increased, the features remains highlighted in yellow. When focus is placed on the item in the list, the highlight color for that item changes to blue on the map, however a pushpin does not appear.




#### Feature on the map highlighted in yellow for the entry in the list



#### Feature on the map highlighted in blue when focus is on the entry in the list



If you add markup to a map that has pushpins displayed, the markup appears behind the pushpins by design.

 Pushpins are supported with geocoders and workflows.

▶ **To open an HTML5 viewer's Pushpins page in Manager:**

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Pushpins**.  
The Pushpins page opens.

▶ **Before you configure settings on the Pushpins page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can configure them separately later without losing any changes you have made.
- If you are sure you want the settings on the Pushpins page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see [About Configuring Multiple Interfaces for HTML5 Viewers on page 351](#).

## Settings

The Pushpins page has the following settings:

- **Enabled:** If you want pushpins to appear for each feature of the search results, select this checkbox; otherwise, clear it. By default, this checkbox is selected.
- **Pushpins Remain Visible When Results List Inactive:** If you want pushpins to remain visible when a view other than the Results List or Results Table activates, select this checkbox; otherwise, clear it. By default, this checkbox is selected.



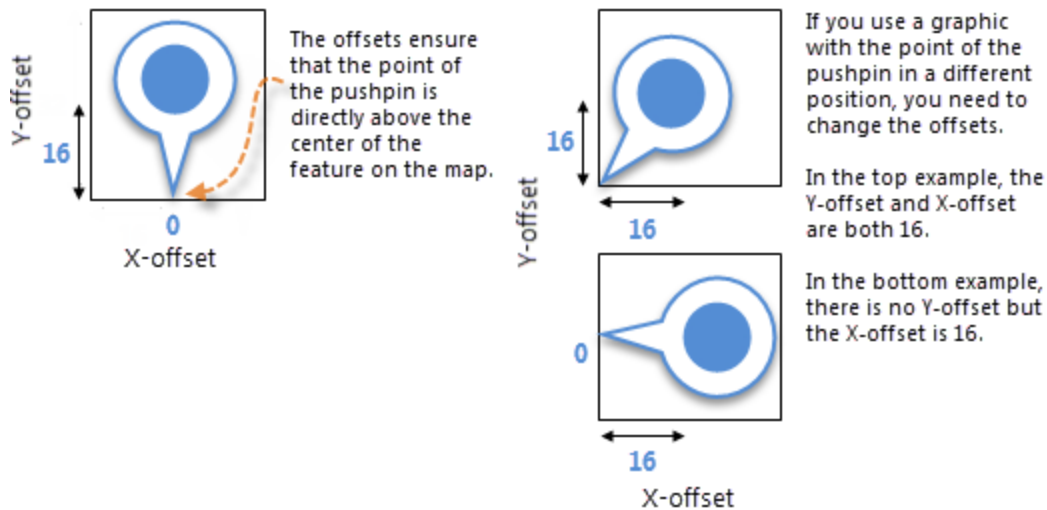
In versions prior to the HTML5 Viewer 2.6, the default behavior was to hide pushpins when a view other than the Results List or Results Table activates. If you want the previous default behavior, clear this checkbox.



This option has been deprecated effective with Essentials Manager 4.7 as a result of changes implemented in highlighting. For further information about highlighting, see the "Highlight Module" topic in the *HTML5 Viewer Administrator and Developer Guide*.

- **Pushpin Image:** The URL to the image that represents the pushpin. Type the URL in the text box. Alternatively, click **Browse** to use an image on the server; if necessary, upload an image to the server by clicking **Upload** and selecting an image file to upload. The default is a red pushpin image located at **Resources/Images/Pushpins/map-marker-red-32.png**. Other colors available out-of-the-box include blue, green, purple and yellow.
- **Pushpin Marker Width:** The width of the pushpin in pixels. This is typically set to the width of the pushpin image, otherwise the image will be scaled. The default is **32**.

- **Pushpin Marker Height:** The height of the pushpin in pixels. This is typically set to the height of the pushpin image, otherwise the image will be scaled. The default is **32**.
- **Offset X:** The number of pixels to horizontally offset the pushpin image. In other words, the distance along the X-axis between the center of the feature and the center of the pushpin image. Use a negative integer to place the pushpin to the left of the feature's center. The default is **0**.
- **Offset Y:** The number of pixels to vertically offset the pushpin image. In other words, the distance along the Y-axis between the center of the feature and the center of the pushpin image. Use a negative integer to place the pushpin below the feature's center. The default is **16**, because the pointer is at the bottom of the default image, which is 32 pixels high.



► **Before you leave the Pushpins page:**

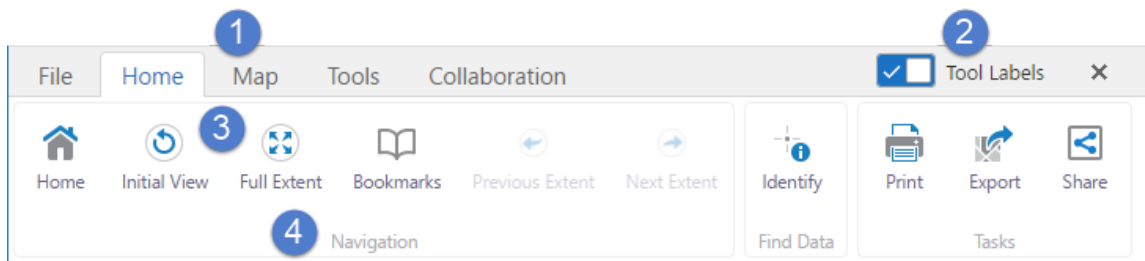
1. Click **Apply Changes**.
2. Use the Preview hyperlinks to see your configuration.  
See [About the Live Preview for HTML5 Viewers on page 352](#) for instructions.
3. To save your changes, click **Save Site**.

## 46.6.20 Configure the Toolbar for an HTML5 Viewer

By default, a toolbar has a few basic tools in it to navigate the map, identify features, and print the map.

Also included by default on the Tabbed Toolbar is a toggle that allows the user to show or hide tool labels. The toggle is in the desktop and tablet shells only. It is not included in the Compact Toolbar.



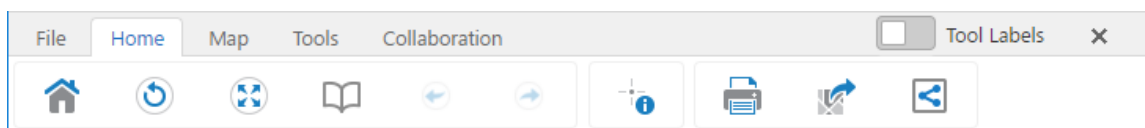


### Toolbar with the label toggle in the on position

1	Tab labels	2	Toolbar label toggle in the on position	3	Tool icons and labels	4	Tool group labels
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Toggling the labels off:

- Hides the labels identifying the tools.
- Hides tool group labels.
- Reduces the font size of the text on toolbar tabs.
- Increases the display area for the map.



### Toolbar with the label toggle in the off position

Note that for keyboard users, when the toggle control button has focus, the Space Bar is the keyboard shortcut that toggles the control on or off.

#### ► To open a viewer's Toolbar page in Manager:

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Toolbar**.  
The Toolbar page opens.

## Before You Configure Settings on the Toolbar Page

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can always configure them separately later without losing any changes you have made.
- If you are sure you want the settings on the Toolbar page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.



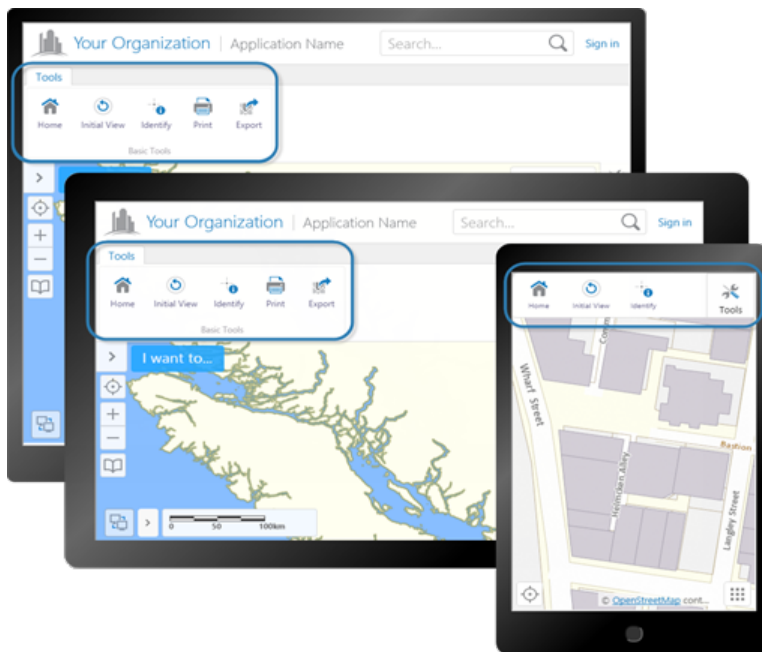
By default, the Toolbar is configured individually because the Tabbed Toolbar is the default for the Desktop and Tablet interfaces, while the Compact Toolbar is the default for the Handheld interface.

For more information, see [About Configuring Multiple Interfaces for HTML5 Viewers on page 351](#).

## Toolbar Types

There are two types of toolbars available:

- **Tabbed Toolbar:** Includes tabs and groups to organize tools in a particular order. This is the default toolbar for the Desktop and Tablet interfaces, and appears below the banner when activated. It may also be used in the Handheld interface.
- **Compact Toolbar:** Does not include tabs or groups and is designed to be simple and compact. This is the default toolbar for the Handheld interface, and appears at the top of the screen when activated. It may also be used in the Desktop and Tablet interfaces, where it appears below the banner.



The Tabbed Toolbar in the Desktop (back) and Tablet (middle) interfaces; and the Compact Toolbar in the Handheld interface


### ► To configure the type of toolbar to use:

1. Beside **Active Toolbar**, select either **Tabbed Toolbar** or **Compact Toolbar**.



To specify the number of tools to display at one time in the Compact Toolbar, type a number in **# of Tools to Display**.

## Toolbar Open/Closed State

By default, the toolbar is initially closed when the user launches the viewer. To open the toolbar, the user clicks the **Open toolbar** tool  in the upper right corner of the map. In the Handheld interface, if the map is not open, the user must open the map to see the toolbar icon. In the Desktop and Tablet interfaces, the user can also double-click the banner to open the toolbar.

### ▶ To open the toolbar when the viewer starts:


1. Check the **Open Toolbar by Default** checkbox.

## Tool Stickiness

Most tools in the HTML5 viewer are sticky by default—they remain active (selected) until deselected by the user. This allows the user to use a tool repeatedly without having to reselect it each time. You can turn off stickiness in the configuration. Each tool has a setting for stickiness, so you can make some tools sticky, and others not sticky.

### ▶ To disable or re-enable tool stickiness:

Stickiness applies to tools only. It does not apply to buttons.

1. Click the **Edit**  icon beside the tool.
2. To disable stickiness, clear the **Is Sticky** checkbox.
3. To re-enable stickiness, select the **Is Sticky** checkbox.

## Web GIS (Full) Preset Toolbar

The Web GIS toolbar contains a full set of tools grouped onto tabs that are designed for GIS implementations.

### ▶ To use a preset Tabbed Toolbar:

1. Click **Load Preset Toolbar**.
2. To use the default Tabbed Toolbar, click **Standard (Default)**. To use a comprehensive Tabbed Toolbar with nearly all tools, click **Web GIS (Full)**.



The **Web GIS (Full)** toolbar does not include Offline Management tools, as these tools require the Geocortex Mobile App Framework.


## Tool Types

You can add the following types of item to the toolbar:

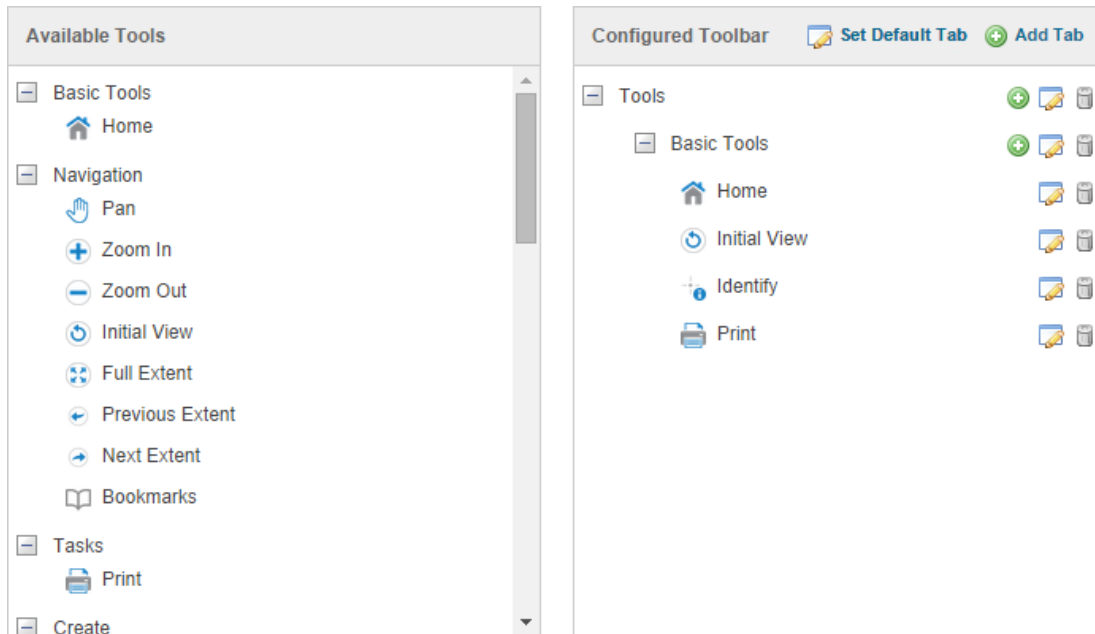
- **Buttons:** When clicked, a button immediately runs its command using the parameter that is configured for it, if it has one. For a list of HTML5 Viewer commands, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.
- **Toggle Buttons:** When clicked, a toggle button either turns on or off. Because of this, a toggle button can run two commands immediately when clicked: one when it is turned on, and another when it is turned off. When a toggle button is turned on, a selected checkbox will appear on the button. The commands may be different, or the commands may be identical but have different parameters. For a list of HTML5 Viewer commands, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center. A toggle button may optionally be associated with a toggle state.
- **Tools:** When clicked, a tool waits for the user to draw a shape on the map, and then runs its command using the geometry created by the user as its parameter. For a list of HTML5 Viewer commands, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.
- **Multitools:** A multitool offers the user a menu of various related tools or buttons to use.
- **Regions:** A region is an area in the toolbar that contains custom content. For information on adding custom content to a toolbar region, contact Geocortex Support (<https://support.geocortex.com/>).

## Toolbar Contents

You can use the toolbar in its default configuration, or customize it by adding, modifying, and removing tools. For the Tabbed Toolbar, you can also reorganize the toolbar by adding, modifying, and deleting groups and tabs, and by moving tools to different groups or tabs.

To configure the toolbar, edit the viewer in Manager and click Toolbar in the side panel. The Toolbar page has two lists—a list of Available Tools on the left, and a list of tools in the Configured Toolbar on the right. To add a tool to the toolbar, drag the tool from the Available Tools list and drop it where you want it on the Configured Toolbar. To remove a tool from the toolbar, click the Remove icon .


Additionally, the toolbar is optional. You can turn it off using the Remove Toolbar function.




**Drag and drop tools to customize the toolbar**


**▶ To limit the number of tools displayed at one time in the Compact Toolbar:**

1. Type a number in **# of Tools to Display**. The minimum is **3** and the maximum is **9**. The default is **4**.

 This only applies to the Desktop and Tablet interfaces; it does not apply to the Handheld interface.

**▶ To add a tab to the Tabbed Toolbar:**


1. In the **Configured Toolbar** area, click  **Add Tab**.  
The Add Tab dialog box opens.
2. In the **Display Name** box, type the text to appear on the tab.

 If your viewer is going to be available in more than one language, instead of typing the literal text, type the text key that the tab display name is assigned to. See [About User Interface Text in HTML5 Viewers on page 353](#) for more information on using text keys.


3. Click **OK**.  
The tab is added to the bottom of the Configured Toolbar area.
4. To move the tab to a different location in the toolbar, click the tab in the **Configured Toolbar** area and drag it to its new location.

► **To configure the Tabbed Toolbar's default tab:**

The first time in a user session that the user opens the toolbar, the toolbar opens to the default tab. If the user closes the toolbar and then reopens it, it opens to the tab that the user was last on.





1. In the **Configured Toolbar** area, click  **Set Default Tab**.
2. Select the tab that you want to open by default.
3. Click **OK**.

► **To add a group to a tab:**

1. In the **Configured Toolbar** area, click the  icon beside the tab to which you want to add the group.  
The Add Group dialog box opens.
2. In the **Display Name** box, type the name for the group. You can use a text key or the literal text.  
In the Desktop and Tablet interfaces, the name appears at the bottom of the group, under the group's buttons and tools. In the Handheld interface, the name appears at the top of the group.
3. Leave the **Multitool** checkbox cleared.
4. Click **OK**.  
The group is added as the last group in the tab.
5. To move the group to a different location in the toolbar, click the group in the **Configured Toolbar** area and drag it to its new location.

► **To add a multitool to a tab:**

A multitool acts as a menu of various related tools or buttons.

1. Use one of the following methods to add the multitool:
  - **Drag and Drop:**
    - a. Click the multitool  in the **Available Tools** panel, and then drag it to the **Configured Toolbar** panel. For example, the  **Draw** multitool.
    - b. Click the **Edit** button  beside the multitool in the **Configured Toolbar** panel.  
The Edit Multitool dialog box opens.
  - **Menu Option:**
    - a. In the **Configured Toolbar** area, click the  icon beside the tab to which you want to add the multitool.  
The Add Group dialog box opens.
2. In the **Display Name** box, type the name for the multitool. You can use a text key or the literal text.
3. Select the **Multitool** checkbox.




It is possible to convert the multitool into a group by unchecking the **Multitool** checkbox. While it is possible to include a multitool within a group, it is not possible to include a group within a group. A group can only be within a tab.

4. Click **OK**.

The multitool is added as the last item in the tab.

5. To move the multitool to a different location in the toolbar, click the multitool in the **Configured Toolbar** area and drag it to its new location.



To view and edit the items within a multitool, click the multitool icon .




A multitool cannot contain other multitools.

#### **To add a button to a group:**


A button runs its command immediately when the user clicks the button. If the user needs to draw a geometry for the command to operate on, you must [add a tool](#) instead of a button.

1. Use one of the following methods to add the button:

- **Drag and Drop:**

- a. Click the button in the **Available Tools** panel, and then drag it to the **Configured Toolbar** panel.
- b. Click the **Edit** button  beside the button in the **Configured Toolbar** panel.  
The Edit Button dialog box opens.

- **Menu Option:**

- a. In the **Configured Toolbar** area, click the  icon beside the group that you want to add the button to.
- b. Click **Add Button**.  
The Add Button dialog box opens.

2. Configure the button's settings:

- **Name:** The name that you want to appear on the button. You can use a text key or the literal text.  
For example, **@language-toolbar-markup-clear** or **Clear Markup**.
- **Tooltip:** The text for the tooltip that opens when the user positions the pointer over the button. You can use a text key or the literal text.  
For example, **@language-toolbar-markup-clear-tooltip** or **Clear all drawings from the map**.

- **Hide on Disable:** When this checkbox is selected and the button's command cannot run under the current configuration or run-time conditions, the button does not show in the toolbar.

For example, if the Include Home Panel checkbox is cleared, a command to show the Home Panel cannot run because the viewer does not have a Home Panel. In this case, selecting the Hide on Disable checkbox for the Home Panel button hides the button.

If the checkbox is cleared and the button's command cannot run, the button shows in the toolbar, but it is grayed out.

- **Image URI:** The URI for the icon that you want to appear on the button. The image must be an appropriate size to fit on the button; for example, 24 x 24 pixels. Valid file formats are PNG, BMP, JPG, and JPEG.

To browse to the image file:

- Click **Browse**.  
The Select File dialog box opens.
- Expand the hierarchy in the left panel. When you can see the folder where you keep images for this viewer, open the folder.
- If the file has not yet been uploaded to the folder, click **Upload** and upload the file.
- Select the file.
- Click **OK**.

- **Command:** The command that the button runs when the user clicks the button. Click in the **Command** box to open a drop-down list of commands, and then select a command from the list.

For more information, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

- **Command Parameter:** The value for the command to use as its parameter, if it has a parameter. Parameters may either be simple strings or complex objects containing any number of parameters.

For more information, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

- Click **OK**.

The button is added as the last button in the group.


- To move the button to a different location in the toolbar, click the button in the **Configured Toolbar** area and drag it to its new location.

#### **To add a toggle button to a group:**

A toggle button runs a command immediately when the user clicks it to turn it on, and a different command when the user clicks it to turn it off.


- Use one of the following methods to add the button:

- **Drag and Drop:**

- Click the button in the **Available Tools** panel, and then drag it to the **Configured Toolbar** panel.
- Click the **Edit** button  beside the button in the **Configured Toolbar** panel.  
The Edit Button dialog box opens.



- **Menu Option:**

- a. In the **Configured Toolbar** area, click the  icon beside the group that you want to add the button to.
- b. Click **Add Button**.  
The Add Button dialog box opens.

2. Configure the button's settings:

- **Toggle On Configuration:** Configures the toggle-on button, which turns the toggle button on.

- **Name:** The name that you want to appear on the toggle-on button. You can use a text key or the literal text.

For example, **@language-toolbar-home-sub** or **Home**.

- **Tooltip:** The text for the tooltip that opens when the user positions the pointer over the toggle-on button. You can use a text key or the literal text.

For example, **@language-toolbar-navigation-home-tooltip** or **Returns to introductory page**.

- **Hide on Disable:** When this checkbox is selected and the toggle-on button's command cannot run under the current configuration or run-time conditions, the toggle-on button does not show in the toolbar.

For example, if the Include Home Panel checkbox is cleared, a command to show the Home Panel cannot run because the viewer does not have a Home Panel. In this case, selecting the Hide on Disable checkbox for the toggle-on button hides the toggle-on button.

If the checkbox is cleared and the toggle-on button's command cannot run, the toggle-on button shows in the toolbar, but it is grayed out.

- **Image URI:** The URI for the icon that you want to appear on the toggle-on button. The image must be an appropriate size to fit on the toggle-on button; for example, 24 x 24 pixels. Valid file formats are PNG, BMP, JPG, and JPEG.

To browse to the image file:

- a. Click **Browse**.  
The Select File dialog box opens.
- b. Expand the hierarchy in the left panel. When you can see the folder where you keep images for this viewer, open the folder.
- c. If the file has not yet been uploaded to the folder, click **Upload** and upload the file.
- d. Select the file.
- e. Click **OK**.

- **Command:** The command that the toggle-on button runs when the user clicks the toggle button to turn it on. Click in the **Command** box to open a drop-down list of commands, and then select a command from the list.

For more information, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

- **Command Parameter:** The value for the command to use as its parameter, if it has a parameter.

Parameters may either be simple strings or complex objects containing any number of parameters. For more information, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

- **Toggle Off Configuration:** Configures the toggle-off button, which turns the toggle button off.
  - **Name:** The name that you want to appear on the toggle-off button. You can use a text key or the literal text.  
For example, `@language-toolbar-markup-clear` or **Clear Markup**.
  - **Tooltip:** The text for the tooltip that opens when the user positions the pointer over the toggle-off button. You can use a text key or the literal text.  
For example, `@language-toolbar-markup-clear-tooltip` or **Clear all drawings from the map**.
  - **Hide on Disable:** When this checkbox is selected and the toggle-off button's command cannot run under the current configuration or run-time conditions, the toggle-off button does not show in the toolbar.  
For example, if the user hasn't drawn any markup, a command to clear the markup cannot run because no markup exists. In this case, selecting the Hide on Disable checkbox for the toggle-off button hides the toggle-off button.  
If the checkbox is cleared and the toggle-off button's command cannot run, the toggle-off button shows in the toolbar, but it is grayed out.
  - **Image URI:** The URI for the icon that you want to appear on the toggle-off button. The image must be an appropriate size to fit on the toggle-off button; for example, 24 x 24 pixels. Valid file formats are PNG, BMP, JPG, and JPEG.  
To browse to the image file:
    - a. Click **Browse**.  
The Select File dialog box opens.
    - b. Expand the hierarchy in the left panel. When you can see the folder where you keep images for this viewer, open the folder.
    - c. If the file has not yet been uploaded to the folder, click **Upload** and upload the file.
    - d. Select the file.
    - e. Click **OK**.
  - **Command:** The command that the toggle-off button runs when the user clicks the toggle button to turn it off. Click in the **Command** box to open a drop-down list of commands, and then select a command from the list.  
For more information, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.
  - **Command Parameter:** The value for the command to use as its parameter, if it has a parameter. Parameters may either be simple strings or complex objects containing any number of parameters. For more information, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

- **Associated State (Optional):**
  - **Toggle State:** A optional toggle state to associate with the toggle button.





For a complete list of states, see "State Reference" in the *Geocortex Viewer for HTML5 Administrator and Developer Guide*.

3. Click **OK**.  
The toggle button is added as the last button in the group.
4. To move the toggle button to a different location in the toolbar, click the toggle button in the **Configured Toolbar** area and drag it to its new location.

### **To add a tool to a group:**

A tool prompts the user to draw a geometry for the tool's command to operate on. If you want the command to run immediately when the user clicks it, you must [add a button](#) instead of a tool.

1. Use one of the following methods to add the tool:
  - **Drag and Drop:**
    - a. Click the tool in the **Available Tools** panel, and then drag it to the **Configured Toolbar** panel.
    - b. Click the **Edit** button  beside the tool in the **Configured Toolbar** panel.  
The Edit Button dialog box opens.
  - **Menu Option:**
    - a. In the **Configured Toolbar** area, click the  icon beside the group that you want to add the tool to.
    - b. Click **Add Tool**.  
The Add Tool dialog box opens.
2. Configure the tool's settings:
  - **Name:** The name that you want to appear on the tool. You can use a text key or the literal text.  
For example, `@language-toolbar-markup-rectangle` or **Draw Rectangle**.
  - **Tooltip:** The text for the tooltip that opens when the user positions the pointer over the tool. You can use a text key or the literal text.  
For example, `@language-toolbar-markup-rectangle-tooltip` or **Draw a rectangle on the map**.
  - **Hide on Disable:** When this checkbox is selected and the tool's command cannot run, the tool does not show in the toolbar.  
If the checkbox is cleared and the tool's command cannot run, the tool shows in the toolbar, but it is grayed out.
  - **Image URI:** The URI for the icon that you want to appear on the tool. The icon should be sized to fit on the tool. The image must be an appropriate size to fit on the button. Valid file formats are PNG, BMP, JPG, and

JPEG.

To browse to the image file:

- a. Click **Browse**.  
The Select File dialog box opens.
- b. Expand the hierarchy in the left panel. When you can see the folder where you keep images for this viewer, open the folder.
- c. If the file has not yet been uploaded to the folder, click **Upload** and upload the file.
- d. Select the file.
- e. Click **OK**.

- **Command:** The command that the tool runs after the user has drawn the geometry for the command to operate on. Click in the **Command** box to open a drop-down list of commands, and then select a command from the list.

For more information, see "Commands" the Geocortex SDK for HTML5 API Reference, which is included in the Geocortex Viewer for HTML5 installation package from the Geocortex Support Center.

- **Draw Mode:** The type of geometry that the user will draw.
- **Status Text:** Optional text to display on the map to provide guidance to the user. You can use a text key or the literal text.  
For example, `@language-toolbar-markup-rectangle-desc` or **Click and drag on the map to draw a rectangle on the map**.
- **Is Sticky:** When this checkbox is selected, tools remain active (selected) until deselected by the user—the tools are "sticky". This allows the user to use a tool repeatedly without having to reselect it each time. If you do not want a tool to remain selected after it is used, clear the Is Sticky checkbox.

3. Click **OK**.


The tool is added as the last tool in the group.

4. To move the tool to a different location in the toolbar, click the tool in the **Configured Toolbar** area and drag it to its new location.

#### To add a region to the toolbar:




To add content to a region that you created in Manager, you must edit the viewer's configuration file. Refer to the *Geocortex Viewer for HTML5 Administrator and Developer Guide* for instructions.

1. In the **Configured Toolbar** area, click the **Add Toolbar Item** icon  beside the group that you want to add the region to.  
A drop-down list opens.
2. Click **Add Region**.  
The Add Region dialog box opens.

3. **Region Name:** Type a name for the region.  
The name is visible in Manager only—it is not visible in the viewer.
4. Click **OK**.  
The region appears at the bottom of the group.
5. To move the region to a different location in the toolbar, click and drag it.

▶ **To edit a tab, group, or toolbar item:**

1. Click the **Edit** icon  next to the item you want to modify.  
The Edit dialog box opens.
2. Edit the item as desired.
3. Click **OK**.

▶ **To change the order of items in the toolbar:**

You can move tabs, groups, buttons, tools and regions within the toolbar.

1. Click and hold the item you want to move.
2. Drag the item to its new location in the toolbar.

▶ **To revert to the default toolbar:**



Reverting to the default toolbar permanently deletes your custom toolbar.

Follow the instructions that apply to your type of toolbar:

• **Tabbed Toolbar:**

1. Click **Load Preset Toolbar**.
2. Click **Standard (Default)**.

• **Compact Toolbar:**

1. Click the **Revert to Default Toolbar** button.

The configuration for the default toolbar appears in the Configured Toolbar area.

▶ **To remove the toolbar:**

If you do not want the viewer to have a toolbar, you can remove the toolbar.



Removing the toolbar permanently deletes any customizations you have made to the toolbar.

1. Click the **Remove Toolbar** button.  
You are prompted to confirm.

2. Click **OK**.

▶ **To add back the toolbar if you have removed it:**

Follow the instructions that apply to your type of toolbar:

- **Tabbed Toolbar:**
  1. Click **Load Preset Toolbar**.
  2. Click **Standard (Default)**.
- **Compact Toolbar:**
  1. Click the **Revert to Default Toolbar** button.

The configuration for the default toolbar appears in the Configured Toolbar area.

▶ **Before you leave the Toolbar page:**

1. Click **Apply Changes**.
2. Use the Preview hyperlinks to see your configuration.  
See [About the Live Preview for HTML5 Viewers on page 352](#) for instructions.
3. To save your changes, click **Save Site**.

See Also...

[About User Interface Text in HTML5 Viewers on page 353](#)

## 46.6.21 Configure Tool Behavior in an HTML5 Viewer

The Tool Behavior page in Manager contains settings that define how the Identify, Buffer and Measurement Tools operate in each shells of the HTML5 Viewer. In addition to controlling which layers are affected by the Identify tool, you can set the projection ID and default units to use for buffering and measuring distances and areas. It is also possible to set the type of calculation to use for measurement, and select whether or not to add the markup to the map automatically, or to enable prediction.

▶ **To open the Tool Behavior page for the HTML5 viewer in Manager:**

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Tool Behavior**.  
The Tool Behavior page opens.

▶ **Before you configure settings on the Tool Behavior page:**

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can always configure them separately later without losing any changes you have made.

- If you are sure you want the settings on the Tool Behavior page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see [About Configuring Multiple Interfaces for HTML5 Viewers on page 351](#).

## Settings

The Tool Behavior page has the following settings:

### Identify Tools:

- **Pixel Tolerance:** The maximum number of pixels away from a feature the user can click with a point-based Identify tool in order to identify the feature. The default is **5**.



This does not apply to polygon-based identify operations, which can be manually modified via the `polygonPixelTolerance` property in the configuration file.

- **Visible Layers Only:** To only include layers marked as visible in identify operations, select this checkbox; otherwise, clear this checkbox. By default, this checkbox is selected.
- **Layers in Visible Scale Range Only:** To only include layers within the visible scale range in identify operations, select this checkbox; otherwise, clear this checkbox. By default, this checkbox is selected.

**Buffer:** The buffering tool performs geodesic buffering.



Buffering requires an ArcGIS Server 10.1 or newer geometry service.


- **Projection WKID:** Add the well-known ID (WKID) of the projection to use, or leave the field blank to disable projection. By default, projection is disabled.
- **Buffer Units:** Select the distance units to be available for buffering. Possible values include: **Feet (ft)**, **Yards (yd)**, **Meters (m)**, **Kilometers (km)**, **Miles (mi)**, and **Nautical Miles (NM)**. By default, all units are selected except for **Yards (yd)**.
- **Default Unit:** Select the default unit of distance to use for buffering. The default is **Kilometers (km)**.
- **Add as Drawing by Default:** If this checkbox is selected, any buffering is added to the map as markup by default.


### Measurement:

- **Projection WKID:** Add the WKID of projection for the Measurement module to use, or leave the field blank to disable projection. By default, projection is disabled. This setting only applies if the Calculation Type is set to Planar.
- **Default Length Unit:** Select the default unit of measurement to use for length. Possible values include **Feet (ft)**, **Yards (yd)**, **Meters (m)**, **Kilometers (km)**, **Miles (mi)**, and **Nautical Miles (NM)**.
- **Default Area Unit:** Select the default unit of measurement to use for area. Possible values include **Feet<sup>2</sup> (ft<sup>2</sup>)**, **Yard<sup>2</sup> (yd<sup>2</sup>)**, **Meter<sup>2</sup> (m<sup>2</sup>)**, **Kilometer<sup>2</sup> (km<sup>2</sup>)**, **Mile<sup>2</sup> (mi<sup>2</sup>)**, **Nautical Mile<sup>2</sup> (NM<sup>2</sup>)**, **Acres (ac)**, and **Hectares (ha)**.
- **Calculation Type:** Select the calculation type to use when calculating measurements.

 Geodesic measurement requires an ArcGIS Server 10.1 or newer geometry service.

- **Planar:** Use Planar if you want to specify a particular WKID and you want to ensure that this projection is used no matter where in the world the measurements are taken. Planar strictly enforces a particular WKID. If you enter the incorrect WKID for a particular area, you can get inaccurate measurements. Planar measurements use 2D Cartesian mathematics to calculate area and length.

 If you select the Planar calculation type and do not specify a Projection WKID, no projection takes place and measurements are computed in the default spatial reference of the site.

 Essentials only allows a Projection WKID to be selected for the Planar calculation type. A Projection WKID is not required for the Geodesic or Preserve Shape calculation types.

- **Geodesic:** Use Geodesic if you intend to measure very long distances that require accounting for the curvature of the earth. The Geodesic calculation type computes distances, areas and perimeters using only the vertices of the polygon to define the lines connecting the vertices as geodesic segments, independently of the actual shape of the polygon. A geodesic segment is the shortest path between two points on an ellipsoid. The results, when you use a geodesic calculation type, are independent of the input spatial reference.
- **Preserve Shape:** Use Preserve Shape if you are unsure about which calculation type to use, as it will provide the most accurate results for most users. This calculation type computes distances, areas and perimeters on the surface of the Earth ellipsoid, while preserving the shape of the geometry in its coordinate system. This means that the true area and length will be calculated for the geometry that is displayed on the map. This is the default calculation type.
- **Add as Drawing:** Defines whether or not markup is added to the map by default. The default is `true`.
- **Prediction Enabled:** Defines whether or not the current segment length, total segment length, perimeter, and area are predicted when the cursor hovers over the map for one second. When set to `false`, it disables predictive measurements. The default value is `true`. Prediction makes it possible to see approximately what measurements you would get if you clicked to plot a vertex at a given point.

 **Before you leave the Tool Behavior page:**

1. Click **Apply Changes**.
2. Use the Preview hyperlinks to see your configuration.  
See [About the Live Preview for HTML5 Viewers on page 352](#) for instructions.
3. To save your changes, click **Save Site**.

**See Also...**

[Configure the Toolbar for an HTML5 Viewer on page 395](#)



## 46.6.22 Configure Optimizer Integration in an HTML5 Viewer

Geocortex Optimizer captures and organizes information about your ArcGIS Server sites and infrastructure. If you have purchased a Geocortex Optimizer license, you can integrate your Geocortex viewers with Optimizer. When a viewer is integrated with Optimizer, the viewer sends usage data to Optimizer's Client API Relay collector. The data is then written to the Optimizer database so you can run reports against it. The data includes information about the viewer's users, the layers and regions that they look at, and the tools that they use.

The Optimizer Integration page in Manager enables you to configure the settings required to send data to Optimizer. If you have not purchased Geocortex Optimizer or you are not using the Client API Relay collector, skip this page. To find out more about Geocortex Optimizer, contact your Geocortex Account Manager.

### ► To open an HTML5 viewer's Optimizer Integration page in Manager:

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Optimizer Integration**.  
The Optimizer Integration page opens.

### ► Before you configure settings on the Optimizer Integration page:

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can configure them separately later without losing any changes you have made.
- If you are sure you want the settings on the Optimizer Integration page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see [About Configuring Multiple Interfaces for HTML5 Viewers on page 351](#).

## Settings

The Optimizer Integration page has the following settings:

- **Enabled:** When this checkbox is selected, the Viewer sends data to Optimizer. If you do not use Optimizer, clear this checkbox. By default, this checkbox is cleared.
- **Username:** A phrase indicating that the real username is not available because the user is not signed in. The default is **DefaultUser**.
- **Data Relay URI:** The URI to the Optimizer endpoint responsible for collecting data. If the endpoint is not specified, the Viewer attempts to log back to the same host that the Viewer application is launched from.

### ► Before you leave the Optimizer Integration page:

1. Click **Apply Changes**.
2. Use the Preview hyperlinks to see your configuration.

See [About the Live Preview for HTML5 Viewers on page 352](#) for instructions.

3. To save your changes, click **Save Site**.

## 46.6.23 Configure Analytics Integration

Geocortex Analytics collects data about and reports on GIS infrastructure. If you do not use Geocortex Analytics, skip this page.

If you are running Geocortex Analytics, you must configure your Viewer applications to send data to the Client Relay Collector in Analytics so it can report on viewer activity. The `InsightIntegration` module in Geocortex Viewer for HTML5 collects and sends usage and other data about the viewer to the Client Relay Collector at configurable intervals. The Analytics Integration page in Manager enables you to configure the settings required to send this data to Analytics.

### ▶ To open an HTML5 viewer's Analytics Integration page in Manager:

1. In Manager, edit the viewer that you want to configure.
2. In the side panel, click **Analytics Integration**.  
The Analytics Integration page opens.

### ▶ Before you configure settings on the Analytics Integration page:

Consider whether the settings will be the same for Desktop, Tablet, and Handheld interfaces:

- If you are not sure, keep the settings the same by configuring the interfaces together—you can configure them separately later without losing any changes you have made.
- If you are sure you want the settings on the Analytics Integration page to be different, click the **Configure Individually** hyperlink. You can switch back to configuring the interfaces together at any time, but you may lose some of the changes you have made.

For more information, see [About Configuring Multiple Interfaces for HTML5 Viewers on page 351](#).

## Settings

The Analytics Integration page has the following settings:

- **Enabled:** When this checkbox is selected, the Viewer sends data to Analytics. If you do not use Analytics, clear this checkbox. By default, this checkbox is cleared.
- **Data Relay URI:** The URI to the Analytics Client Relay Collector responsible for collecting data. Be sure to use the correct URI to the Client Relay, for example,  
`http://analyticshub.domainname.com/Geocortex/Analytics/ClientRelay`

### ▶ Before you leave the Analytics Integration page:

1. Click **Apply Changes**.
2. Use the Preview hyperlinks to see your configuration.

See [About the Live Preview for HTML5 Viewers on page 352](#) for instructions.

3. To save your changes, click **Save Site**.

## 46.6.24 Configure Collaboration

Collaboration helps an organization share text messages, images, and markup in real time, directly in their mapping applications.

You can enable the **Collaboration** tab in the Toolbar in the site's viewer by configuring the collaboration options in Manager.



Collaboration is not supported in Internet Explorer version 9. Use Internet Explorer version 10 or later.

### ▶ To enable Collaboration:

1. In Manager, edit the viewer that you want to configure.
2. Click **Toolbar** in the side panel:
3. Locate **Collaboration** in **Available Tools** list.
4. Drag it from **Available Tools** and drop it where you want it on the **Configured Toolbar** list.
5. Click **Apply Changes** and then **Save Site** to save the changes to the toolbar before proceeding.
6. In the side panel, click **Collaboration** and change the **Mode** option from **Disabled** to **Live Collaboration**.
7. Click **Apply Changes** and then **Save Site**.

### ▶ Complete the setup for Collaboration in the viewer:

1. Sign in to the viewer if you have not already done so.
2. Open the Toolbar:
  - a. If you added Collaboration to the toolbar as a tab, locate and click the **Collaboration** tab and then click the **Collaboration** icon to open the panel.
  - b. If you added Collaboration to an existing toolbar tab, locate and click the **Collaboration** icon on that tab to open the panel.

The **Collaboration** panel is initially empty.

3. Click the **Join a Room** drop down and then click **Create a Room**.  
Any user can create a room.
4. Type a name for the room.
5. Select a color identifier.  
The color identifier helps to distinguish which messages in the Collaboration panel apply to each room.
6. Under **Permissions**, select **Individuals** or **Groups**, begin typing an individual or group name in the **Search** field, select a user or group in the filtered list, then click **Add**.

The user or group is included in the list under the permission settings with the **View** permission set by default.

7. Select user permissions from among **None**, **View**, **Edit**, or **Admin**.

User permissions can be assigned to any users that sign in to the room (**Signed-in Users**), and also separately for individuals or groups that have been included in the room.

The user creating the room is automatically included in the list of users as the administrator for that room. An administrator cannot edit their permissions (set to **Admin** by default). Only another user with administrative privileges can edit permissions for other administrators.

8. Click **Save** to save the new room.

The room is immediately available for messages, drawings, or images.

#### ▶ To send a message to room participants:

1. Type your message in the message entry area.
2. Click **Send**.

See [Working with Multiple Rooms on page 416](#) for additional information about sending messages.

#### ▶ To add a drawing:

1. Click **Drawing** above the message entry area.
2. Select one of the available drawing tools.
3. To change the styling for the selected drawing tool, click **Style** and change any of the color, pattern, and other styling attributes.
4. Draw on the map.
5. Add any applicable comments in the message entry area.
6. To clear the drawing and/or the related message before sending it, click the **X** beside the **Drawing** heading. Click **OK** to confirm the action.
7. Click **Send** to post your drawing reference and text to the room for others to view.

To identify the drawing on the map associated with a message, click the message to pulse the drawing on the map. When you click a message for a drawing that is not in view or only partially visible on the map, the drawing on the map is centered. Depending on the zoom level for the map, the drawing is centered and zoomed in on, or it is centered without zooming.

#### ▶ To place an image:

1. Click **Image** above the message entry area.
2. Select an image to upload.  
The locate option is automatically enabled.
3. Click the location on the map to apply the image icon.
4. To move the image icon, click **Locate**, and then drag the icon to another location.
5. Add any applicable comments in the message entry area.
6. To clear the message and/or the image before sending it, click the **X** beside the **Image** heading above the message entry area. Click **OK** to confirm the action.

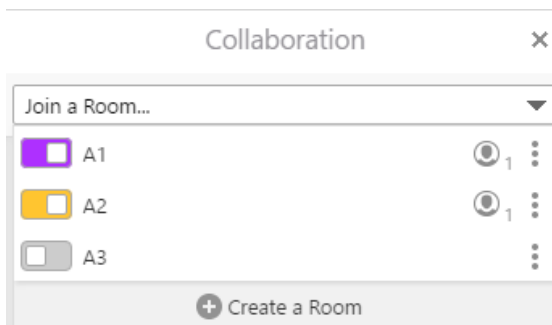
7. Click **Send** to post your image attachment and text for others to view.

To identify the image icon on the map associated with a message, click the message to pulse the image icon on the map. When you click a message for an image icon that is not in view on the map, the image icon is centered in the map view.

Depending on the type of message, the menu in the upper right includes one or more of the options to **Erase**, **Copy to another room**, or **Edit** the contents of the message.

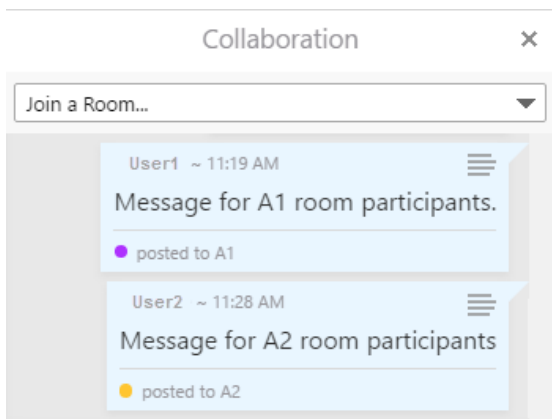
#### 46.6.24.1 Working with Multiple Rooms

Each user can view the rooms that they are members of when they click **Join a Room**. The slider beside the room names allows a user to display or hide messages for that room. Clicking anywhere on the line toggles the option on or off.



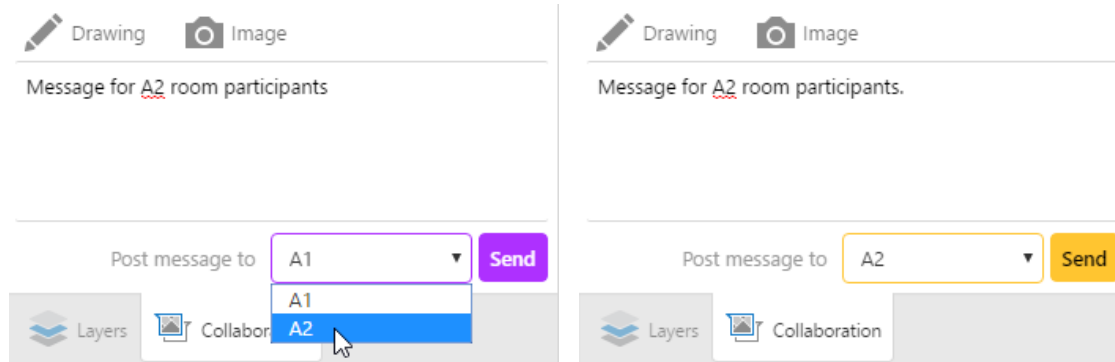
**Messages for rooms A1 and A2 are displayed. Messages for room A3 are not displayed**

When a user joins a room, the messages for that room are displayed. Each message contains a color identifier in the lower left to indicate the room that the message is associated with.



**Posted messages with the room color identifier in the lower left**

If the user joined multiple rooms, and has typed a message, they select the target room for the message from the **Post message to** list at the bottom of the message entry field. When the user selects a room, the color of the **Send** button changes to match the color identifier for the room. Note that only those rooms that the user has edit permissions for are in the **Post message to** list.



Selecting the room for the message

## 47 Essentials Security

The Security feature enables you to control access to your sites and protect your ArcGIS Server map services. You can control access to entire sites, and to individual parts of a site (map services, layers, workflows, reports, and more).

Security is implemented using **users**, **roles**, and [permissions](#). To view a secured site, a user must present valid credentials (**authenticate**) and the user must have permission to access the site (**authorize**). When a user launches a viewer, the user may have to sign in if the site or any of its sub components are secured.

[Security providers](#) store and manage the users and roles that are used for security. **Membership providers** are security providers that store users. **Role providers** are security providers that store roles. There are also two special, predefined [Global roles](#).

A **secured site** has at least one permission configured for at least one enabled security provider. It does not matter what the configuration is—the fact that at least one component has a permission set for it means that security is in force.

If you already have users and roles set up for some other purpose besides Essentials, you can configure Essentials to use these existing users and roles. This allows users to authenticate using the same credentials that they already use in some other context. For example, you could configure Essentials to use Windows users and groups.

You can configure more than one security provider. If you apply permissions to a site using more than one security provider, users choose which security provider to sign in with. Signing in with one security provider can give access to different parts of the site than signing in with a different security provider. Viewers have [Sign in and Sign out](#) hyperlinks that allow users to sign out of one security provider and sign in using a different security provider.

Security providers are configured globally—all the sites in an instance of Essentials have access to the same security providers. Enforcement of [SSL encryption](#) (HTTPS) is also set globally. (Before version 4.0 of Essentials, security providers and SSL were configured within each individual site.)

Manager has a [Security Health](#) function that evaluates your security configuration for potential weaknesses. Use the Security Health function to close gaps in your security configuration.



If Internet Information Services (IIS) is configured to deny anonymous access for either Essentials or the HTML5 Viewer, Geocortex Mobile App Framework may not work properly.

See also...

[Overview of Security on page 25](#)

## 47.1 Functions of Security

The purpose of Essentials Security is to control which users can access your data. Essentials Security has two effects:

- **Filtering:** Essentials Security filters which parts of the site users can see. You can prevent users from seeing an entire site, particular map services and layers, or other configured components like charts, reports, and workflows.
- **Layer Security (Proxy):** Essentials Security secures communications between the site's ArcGIS Server services and Geocortex viewers. This is done by proxying service requests through Essentials. Instead of seeing the service's URL in the browser's address bar, the user sees the URL of an Essentials endpoint.

### 47.1.1 Filtering

Filtering allows you to control which parts of a site users see in the viewer. The Filtering function of Essentials Security is useful for hiding parts of a site that are not relevant to the user.

When a user is denied permission to a particular component in a site, that component is not visible in the viewer, it cannot be queried, and it does not appear in map exports, reports, or printouts. For more information about the visibility of secured components, see [Permissions on page 452](#).



The Filtering function does not **secure** components—it does not hide the service's URL from the user. Filtering simply prevents components from appearing in the viewer.

Filtering also prevents unauthorized access to the site's REST API—an unauthorized user cannot view the site's REST endpoints in the REST API Sites Directory, and an unauthorized application cannot access the site programmatically.

Unlike the Layer Security function, filtering works for all the [types of service that you can add to the map](#).




You can exclude layers that you do not want anyone to see. For information, see [Exclude Layers from a Dynamic Map Service on page 126](#). If you want some users or applications to be able to access a layer, use the Security feature's filtering capability instead of excluding layers.


### 47.1.2 Layer Security (Proxy)

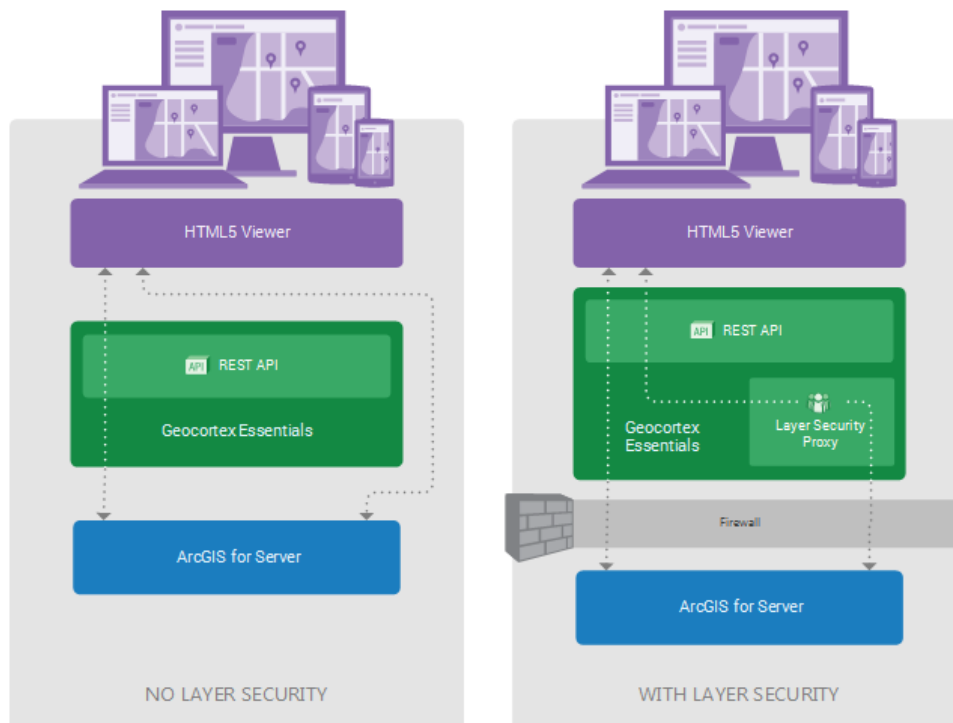
The Layer Security function of Essentials Security prevents a malicious user from using Essentials to access your ArcGIS Server services. It does this by proxying requests through Essentials.

As soon as you apply a permission to one layer in the service or you configure a [layer filter workflow](#) for one layer, all viewer requests that would previously have gone directly to ArcGIS Server now go through Essentials' built-in Layer Security proxy—the viewer no longer communicates directly with the service, and the user sees the URL of an Essentials REST endpoint instead of the URL of the service. This is illustrated [below](#).

The Layer Security proxy is specific to a map service. If your site has more than one ArcGIS Server map service, each map service with at least one secured layer or layer filter workflow has its own Layer Security proxy.

 The Layer Security function works for ArcGIS Server map services, feature services, and image services only. Requests to other types of service, such as WMS services and geocoding services, are not proxied.

 If you secure ArcGIS Server using a proxy page and you apply permissions to one or more layers, the Layer Security proxy takes precedence over your proxy page.




#### System without Layer Security (left) and with Layer Security (Right)

In the diagram on the left, labelled **No Layer Security**, viewers request map images and data directly from ArcGIS Server. This is represented by the right-hand arrow bypassing Geocortex Essentials.

The left-hand arrow represents Essentials REST API operations. Certain REST API operations, such as printing, require Essentials to make a request to ArcGIS Server. This is represented by the arrow continuing through Essentials to ArcGIS Server. Essentials can freely make requests to ArcGIS Server as needed, regardless of whether Layer Security is in force. This is why the left-hand arrow is the same in both diagrams.

In the diagram on the right, labelled **With Layer Security**, viewer requests for map images and data go to the Essentials Layer Security proxy before being forwarded to ArcGIS Server. Responses go back through the proxy.

 The ArcGIS Server services must be behind a firewall or otherwise secured. Otherwise, a malicious user could access the services directly, bypassing the Essentials Layer Security proxy.

The diagram has been simplified to show a single Layer Security proxy. This implies a single secured ArcGIS Server map service, because each secured ArcGIS Server map service has its own proxy. In the more general situation, there may be many ArcGIS Server map services, some of which are secured and others not. In this case, there would be many proxies—one for each secured service—and the unsecured services would communicate directly with the viewers.



## 47.2 SSL Encryption

Essentials Security does not protect a site's information while it is being transmitted across a network. In particular:

- When a user signs in, the user name and password are not encrypted.
- Feature data is not encrypted between the viewer and server.
- The authentication token that a viewer presents to gain access to a site is not encrypted between the viewer and server.

For this reason, we recommend that you enforce the use of Secure Socket Layer (SSL) for communications with Essentials. When the Security feature's Enforce SSL setting is turned on, viewers must use the HTTPS protocol to access sites. By default, SSL is enforced for all secured operations and requests.



The Identity Server security provider has a Require SSL setting in the Post Installer. The Require SSL setting enforces the use of SSL for communications with Identity Server. Refer to the *Geocortex Essentials Installation Guide* for information.

### SSL Version

If you use SSL encryption to secure Geocortex web applications, we recommend that you use a version that is **newer than SSL 3.0**.

SSL 3.0 contains a known [security vulnerability](#). Some web platforms and browsers have SSL 3.0 turned off by default or do not support SSL 3.0 at all. Depending on the security policy of your server, Essentials may not be able to consume services that use SSL 3.0. Similarly, depending on the security policy of your end user's web browsers, they may not be able to consume applications and services that use SSL 3.0.



Firefox and Chrome do not support SSL 3.0. Internet Explorer 11 has SSL 3.0 turned off by default.

### Turn SSL Enforcement Off or On

By default, SSL is enforced. This means that sites can only be accessed using HTTPS. When the Security feature's Enforce SSL setting is turned off, sites can be accessed using HTTP.



Turning off SSL enforcement is not recommended.

#### ▶ To change SSL enforcement:

1. In Manager, click the **Security & Data** tab, expand the **Security** area in the side panel, and then click **Settings**.
2. To enforce SSL encryption between the viewer and server, select the **Enforce SSL** checkbox.  
To allow unencrypted communications between the viewer and server, clear the **Enforce SSL** checkbox.
3. Click **Apply Details**.

## 47.3 TLS Support for Outbound Connections

Transport Layer Security (TLS) is the stronger successor to Secure Sockets Layer (SSL) encryption, although both are often referred to as SSL. TLS is handled by Windows and the .NET Framework. Connection problems can occur when a server communicates with another server that has more restrictive TLS requirements. For example, a server that hosts Essentials may fail to communicate with an ArcGIS Server that requires TLS 1.2, when the Essentials server does not. If the server that hosts Essentials is kept up-to-date with Windows updates and has .NET Framework 4.6 or newer, you should not encounter this problem. If your server is up-to-date but you still encounter this problem, contact your support channel.

## 47.4 Overview of Steps to Set Up Essentials Security

The procedure below outlines the main steps to secure Essentials.

### To set up Essentials security:

1. **SSL:** If you do not have a working SSL certificate, get one and install it.  
By default, the SSL is enforced in Essentials.



Turning off SSL enforcement is not recommended—SSL encryption is a critical part of the complete security picture.

See [SSL Encryption on page 420](#).

2. **Security Settings:** Configure the security settings.  
See [Configure Global Security Settings on page 441](#).
3. **Security Providers:** Configure the security provider(s) that you want to use:
  - [Integrated Windows Authentication on page 423](#)
  - [Anonymous Access on page 426](#)
  - [Geocortex Identity Server on page 426](#)
  - [The ArcGIS Security Provider on page 438](#)
4. **Sign-In Settings:** For each site, configure the settings that control sign-in and sign-out behavior.  
See [Configure Sign-In Settings on page 451](#).
5. **Permissions:** For each site and each security provider, apply permissions to users and roles.  
See [Permissions on page 452](#).
6. **Security Health Check:** Check for and correct potential weaknesses in your security configuration.  
See [Perform a Security Health Check on page 462](#).
7. **Filter Features:** If you want to restrict the particular features that different users see, configure feature filtering.  
See [Filter a Layer's Features on page 464](#).

See also...

[Common Problems on page 463](#)

## 47.5 Example: Windows Authentication and Identity Server

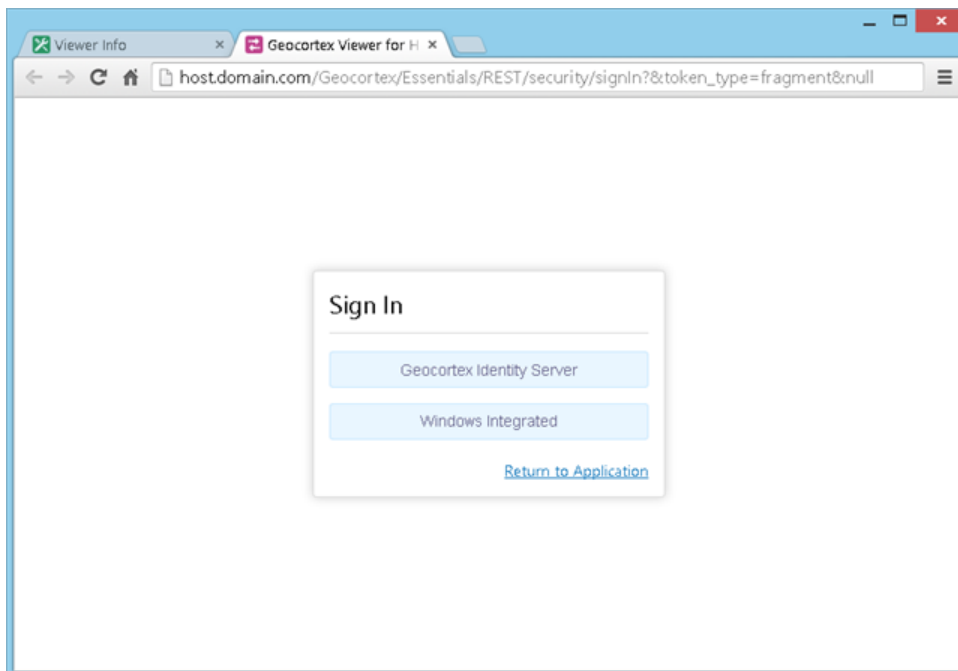
This example uses two security providers: the Windows Integrated security provider and Geocortex Identity Server.

Your company has Essentials sites that employees use regularly. In addition, the company sometimes hires outside contractors who need to access one or more of the sites. Essentials is secured. You use Integrated Windows Authentication to authenticate employees, and Geocortex Identity Server to authenticate contractors. Windows Authentication and Geocortex Identity Server are the only security providers that you use.

When a contractor is hired, you create a Geocortex Identity Server user for the contractor and apply permissions to the user. You change the security provider's name to **Contractors**, and then give the credentials to the contractor with instructions to sign in using Geocortex Identity Server.

When the contractor launches the viewer, the contractor is presented with a list of the enabled security providers, in this case, **Geocortex Identity Server** and **Windows Integrated** (shown below). The contractor selects Geocortex Identity Server. This opens the Identity Server sign-in dialog box and performs the authentication using Identity Server.

When employees launch the viewer, they select Windows Integrated. This authenticates them using Windows users and roles.



Sign-in page where the end user selects the security provider to sign in with

## 47.6 Security Providers

Security providers store and manage the users and roles that are used for security. Security providers may also provide the web page where users sign in.

The security providers that you use depend on your IT infrastructure and business needs. Different security providers are appropriate in different circumstances.

Essentials supports the following security providers:

- **Windows Integrated (Integrated Windows Authentication):** Integrated Windows Authentication (IWA) uses Windows users and roles. If you use Active Directory with IWA, Essentials automatically uses the Active Directory users and roles.
- **Anonymous Access:** Anonymous access gives users access to the site without being authenticated.
- **Geocortex Identity Server:** Geocortex Identity Server uses dedicated security software that is installed with Essentials. By default, Identity Server uses the membership and role providers that ship with Essentials. You can adapt Identity Server to use any ASP.NET-compatible membership and role providers. You can also adapt Identity Server to use legacy (Essentials 3.x) XML providers.
- **ArcGIS:** The ArcGIS security provider uses Portal for ArcGIS or ArcGIS Online to perform authentication.

You can use multiple security providers. You can also create custom security providers.

See also...

[The Global Roles on page 441](#)

### 47.6.1 Integrated Windows Authentication

Integrated Windows Authentication (IWA) uses Windows users and roles. IWA is appropriate for securing sites that will be used by members of your organization.

#### Windows Users and Roles

The Windows Integrated security provider allows you to apply permissions to the following types of users and roles:

- **Windows Integrated - All Users:** Permissions that you set for All Users apply to all users who authenticate using their Windows credentials when they launch the viewer.
- **Windows Integrated - Windows Account:** Permissions that you set for a particular Windows account only apply to that user account.
- **Windows Integrated - Windows Group:** Permissions that you set for a particular Windows group apply to users that belong to that group.

#### 47.6.1.1 Enable Windows Authentication

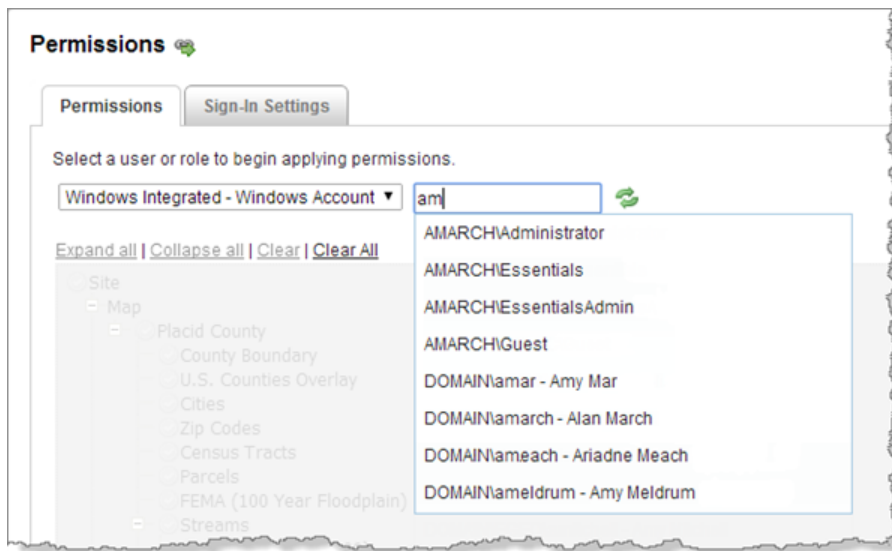
To use Integrated Windows Authentication for Essentials Security, Windows Authentication must be enabled. You can use the Post Installer to enable Windows Authentication. Turning on Windows Authentication in the Post Installer is equivalent to installing Windows Authentication in Internet Information Services (IIS) and enabling the **Windows Authentication** Windows feature.

**To enable Windows Authentication using the Post Installer:**

1. In the Post Installer, click **Configure Windows Features** in the side panel.
2. Select the **Windows Authentication** checkbox.  
If the checkbox is selected and grayed out, Windows Authentication is already installed and enabled.
3. Click **Finish**.  
You have now enabled Windows Authentication.

47.6.12 Windows Authentication with Active Directory

If you use Active Directory with Integrated Windows Authentication, Essentials automatically uses the Active Directory users and groups. To find a user or group, start to type in the name, and then select the user or group from the drop-down list.



**Example of accessing a Windows account from Active Directory**



In addition to using Active Directory with Windows Authentication, you can use standalone Active Directory membership and role providers with Geocortex Identity Server. For information, see [Geocortex Identity Server on page 426](#).

47.6.13 Single Sign-On

Integrated Windows Authentication supports single sign-on, which automatically signs in users using their Windows credentials.

In order for single sign-on to work, the user must already be signed in to Windows. In addition, the client browser's security settings must have automatic authentication enabled under the current user name and password, for the appropriate zone. If one or more of these conditions is not met, the user has to sign in.

For complete steps to set up single sign-on, refer to the Geocortex Knowledge Base article "[Configure single sign-on with Essentials Manager and viewers](#)".

If Windows Integrated is the only service provider that you are using, you may want to [configure a landing page](#) so the user's browser is directed to a different page after the user signs out. Otherwise, single sign-on will immediately sign the user back in. Alternatively, you can [disable sign-out](#).

#### 47.6.1.4 Windows Impersonation

Impersonation occurs when an application makes a request as a user instead of as the application—the application impersonates the user. Impersonation ensures that the resource receiving the request knows the identity of the user that originated the request.

For example, in Essentials, when a user prints the map, the viewer sends the print request to Essentials, and Essentials sends a map image request to the map service. Normally, the map image request is made as Essentials. When impersonation is enabled, the map image request is made as the user—Essentials impersonates the user.

To use Windows impersonation:

- The service must be an ArcGIS Server map service.
- Both the service and the Essentials site or component must be secured using Integrated Windows Authentication.
- The end user must be on the domain—impersonation does not work when the user connects over the Internet.
- The Essentials server must be on the domain.

Allowing Windows impersonation ensures that ArcGIS Server knows the identity of the user that made the request.

For instructions on enabling Windows impersonation, see [Configure Global Security Settings on page 441](#).

In addition to impersonating users when connecting to services, Essentials can impersonate users when connecting to data links. If you are using Windows impersonation and your sites use data links, see [Data Connections on page 250](#) for information.

#### 47.6.1.5 Configuration Checklist for Windows Authentication

The complete list of steps to configure security is given in [Overview of Steps to Set Up Essentials Security on page 421](#). Use this checklist in conjunction with the complete list of steps.

To use Integrated Windows Authentication for Essentials Security:

- [Windows Authentication](#) must be enabled.
- The Windows Integrated security provider must be [enabled](#). By default, it is enabled.
- You must [configure permissions](#) using one or more of the [Windows users and roles](#), in each site that you want to secure using Windows Authentication.
- If Windows Integrated is the only security provider you are using to secure a site, you might want to [configure the site's sign-in settings](#). To prevent single sign-on from immediately signing a user back in after signing out, you can either configure a landing page or disable sign-out.
- If you want, [change the name](#) of the security provider to something that is more meaningful to end users.
- If both ArcGIS Server and Essentials are secured using Windows Authentication and ArcGIS Server needs to know user identities, [enable Windows impersonation](#).
- If you are using Windows impersonation and you also want to use impersonation when connecting to data links, [enable impersonation on the data connections](#).

See also...

[The Global Roles on page 441](#)

## 47.6.2 Anonymous Access

Anonymous access gives users immediate access to a site without being authenticated. Anonymous access is also called guest access.

Anonymous Access is often used in conjunction with one or more other security providers. Typically, Anonymous Access gives access to a subset of the site, and the other security providers give access to additional parts of the site or to the entire site. When a user launches the viewer, the site loads immediately with Anonymous Access - Guest permissions. To see additional parts of the site, the user must sign in to one of the other security providers. When the user signs out, either the site reloads with Anonymous Access - Guest permissions, or the browser redirects to the [landing page](#) if you have configured one.

Another use for Anonymous Access is to [filter out components](#) that are irrelevant to users.

The Anonymous Access security provider has a single role that you can apply permissions to, called **Anonymous Access - Guest**.

### 47.6.2.1 Configuration Checklist for Anonymous Access

The complete list of steps to configure security is given in [Overview of Steps to Set Up Essentials Security on page 421](#). Use this checklist in conjunction with the complete list of steps.

To use Anonymous Access for Essentials Security:

- The Anonymous Access security provider must be [enabled](#). It is enabled by default.
- You must [configure permissions](#) using the **Anonymous Access - Guest** role in each site that uses Anonymous Access.

See also...

[Permissions on page 452](#)

## 47.6.3 Geocortex Identity Server

Geocortex Identity Server uses dedicated security software that is installed with Essentials. To authenticate with Identity Server, users must enter their credentials.

Identity Server is based on membership and role providers that are defined in the following two files:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Identity  
Server\Web\Configuration\membership.config
```

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Identity  
Server\Web\Configuration\roleManager.config
```

Essentials ships with membership and role providers that you can use to perform authentication and authorization. See MSDN's [DefaultMembershipProvider Class documentation](#) for more information about the configuration properties of this provider.

## Configure an Alternative ASP.NET Membership and Role Provider

Identity Server can use any ASP.NET-compatible membership and role providers that point to an existing database. Depending on the membership provider that you use, you may be able to configure password strength restrictions, the maximum number of sign-in attempts a user can have, lock-out procedures, and so on.

You can also adapt Identity Server to use legacy (Essentials 3.x) XML providers. See [Configure Identity Server to Use Legacy XML Providers on page 434](#).



Geocortex Identity Server requires SSL. By default, Identity Server's Require SSL setting in the Post Installer is enabled.

## Default Membership and Role Providers

In the default setup, authentication and authorization are against the membership and role providers that ship with Essentials. The default setup is appropriate when you do not have an existing database of users, or you want an easy way to create accounts for temporary users and you do not want to add them to your corporate database.



The default Identity Server membership and role providers must be used together. You cannot use the default membership provider with a custom role provider. Likewise, you cannot use the default role provider with a custom membership provider.

## Custom Membership and Role Providers

You can configure Geocortex Identity Server to use any ASP.NET-compatible membership and role providers that point to an existing database, such as SQL Server or Active Directory (when Active Directory is not being used with [Integrated Windows Authentication](#)). Using Identity Server with an existing database is appropriate when you already have a database of users who will be accessing Essentials.



Geocortex Identity Server can work with security providers like Google, Yahoo, or Facebook. Setting this up is an advanced scenario. Contact [Geocortex Support](#) for help.

## Geocortex Identity Server Users and Roles

The Geocortex Identity Server security provider allows you to apply permissions to the following types of users and roles:

- **Geocortex Identity Server - All Users:** Permissions that you set for All Users apply to all users who authenticate using credentials that are defined in the membership provider.
- **Geocortex Identity Server - Role:** Permissions that you set for a particular role apply to all the users with that role. The role is defined in the role provider that you are using.
- **Geocortex Identity Server - User:** Permissions that you set for a particular user only apply to that user. The user account is defined in the membership provider that you are using.



## 47.6.3.1 Configuration Checklist for Geocortex Identity Server

The complete list of steps to configure security is given in [Overview of Steps to Set Up Essentials Security on page 421](#). Use this checklist in conjunction with the complete list of steps.

To use Geocortex Identity Server for Essentials Security:


- The Geocortex Identity Server [security provider must be enabled](#). By default, it is disabled.
- If you want, [change the name](#) of the security provider to something that is more meaningful to end users.
- You must [configure permissions](#) using one or more of the [Identity Server users and roles](#), in each site that is secured using Geocortex Identity Server.
- If you want to use Geocortex Identity Server with the default membership and role providers, you must create the users and roles. See [Configure Users and Roles for the Default Setup on page 428](#).
- If you want to use Geocortex Identity Server with alternate membership and role providers, you must configure Identity Server to point to the providers. Follow the instructions that apply to you:
  - [Configure Identity Server to Use SQL Server on page 429](#)
  - [Configure Identity Server to Use Active Directory on page 432](#)
  - [Configure Identity Server to Use Active Directory Federation Services on page 434](#)
  - [Configure Identity Server to Use Legacy XML Providers on page 434](#)

## 47.6.3.2 Configure Users and Roles for the Default Setup

When you use Geocortex Identity Server with the default membership and role providers, users and roles are created and managed in Manager.

You can create users and roles in any order. If you create the roles first, you can assign roles to users at the same time you create the users. On the other hand, if you create the users first, you can assign users to the roles at the same time that you create the roles. Adding a role to a user is equivalent to adding a user to a role—you only need to define the relationship in one direction. Similarly, removing a user from a role is equivalent to removing a role from a user.

▶ **To configure users and roles to use with Geocortex Identity Server's default setup:**













1. In Manager, click the **Security & Data** tab, expand the **Security** area in the side panel, and then click **Providers**.
2. Click the **Users and Roles** icon  beside the **Geocortex Identity Server** security provider.

The Users and Roles dialog box opens.



If Identity Server's SSL setting is enabled in the Post Installer and you do not have a valid SSL certificate installed, Essentials will not be able to connect to Identity Server and you will get an error message. SSL is enabled by default. You must correct this before you can add users and roles.

3. Create users and roles, and add users to roles.

- **Add a User:** On the **Users** tab, click  **New User**, and enter the user name and password.
  - **Add a Role:** On the **Roles** tab, click  **New Role**, and enter the name for the role.
  - **Add a User to a Role:** On the **Roles** tab, click the **Edit** icon  beside the role, click  **Add User**, and then enter the user name.
  - **Add a Role to a User:** On the **Users** tab, click the **Edit** icon  beside the user, click  **Add Role**, and then enter the role name.
  - **Filter Users:** Filtering users is useful if the list of users is long. On the **Users** tab, enter the text that you want to match, and then click **Filter**. For example, **col** matches **coldenburg** and **jcollins**. To return to the full list of users, click **Clear**.
  - **Filter Roles:** Filtering roles is useful if the list of roles is long. On the **Roles** tab, enter the string that you want to match and click **Filter**. For example, **con** matches **Contractors** and **Quality Control**. To return to the full list of roles, click **Clear**.
  - **Remove a User from a Role:** On the **Roles** tab, click the **Edit** icon  beside the role that you want to remove the user from. Click the **Remove User** icon  beside the user that you want to remove.
  - **Remove a Role from a User:** On the **Users** tab, click the **Edit** icon  beside the user that you want to remove the role from. Click the **Remove Role** icon  beside the role that you want to remove.
  - **Delete a User:** On the **Users** tab, click the **Delete User** icon  beside the user that you want to delete.
  - **Delete a Role:** On the **Roles** tab, click the **Delete Role** icon  beside the role that you want to delete.
4. When you have finished configuring users and roles, click **Close**.  
The Users and Roles dialog box closes.
  5. Click **Apply Details**.

#### 47.6.3.3 Configure Identity Server to Use SQL Server



This section assumes that you already have a working SQL Server database that you want to use. For information, refer to [Creating the Membership Schema in SQL Server](http://www.asp.net/web-forms/tutorials/security/membership/creating-the-membership-schema-in-sql-server-cs) (<http://www.asp.net/web-forms/tutorials/security/membership/creating-the-membership-schema-in-sql-server-cs>).

When you use SQL Server with Geocortex Identity Server, you can create, modify and delete SQL Server users and roles in Manager. Alternatively, you can use the utilities provided by SQL Server to manage users and roles.

To use SQL Server membership and role providers with Identity Server, you must add the providers to the Identity Server configuration files and point Identity Server at the SQL Server providers. Follow the instructions below to configure Identity Server to use SQL Server providers.

► **To set up Identity Server to work with SQL Server:**

There are three files you must modify:

- `connectionStrings.config`
- `membership.config`
- `roleManager.config`

By default, these files are in the following folder:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Identity
Server\Web\Configuration
```

### Configure `connectionStrings.config`

1. Open `connectionStrings.config` in a text editor.
2. In the `connectionStrings` element, add the following markup as a sub element:

```
<add name="SqlConnString"
      connectionString="MY_CONNECTION_STRING">
```

3. Replace `MY_CONNECTION_STRING` with the connection string for your SQL Server.
4. Save `connectionStrings.config`.
5. Close the file.

### Configure `membership.config`

1. Open `membership.config` in a text editor.
2. In the `membership` element, set `defaultProvider` to `SqlMembershipProvider`.  
The first line of the file should look like this:

```
<membership defaultProvider="SqlMembershipProvider">
```

3. In the `providers` element, add the following markup as a sub element:

```
<add name="SqlMembershipProvider"
      type="System.Web.Security.SqlMembershipProvider, System.Web,
      Version=4.0.0.0, Culture=neutral, PublicKeyToken=b03f5f7f11d50a3a"
      connectionStringName="SqlConnString"
      enablePasswordRetrieval="false"
      enablePasswordReset="true"
      requiresQuestionAndAnswer="true"
      applicationName="/"
      requiresUniqueEmail="false"
      passwordFormat="Hashed"
      maxInvalidPasswordAttempts="5"
      minRequiredPasswordLength="7"
      minRequiredNonalphanumericCharacters="1"
      passwordAttemptWindow="10"
      passwordStrengthRegularExpression="" />
```

4. Save `membership.config`.
5. Close the file.

#### Configure `roleManager.config`

1. Open `roleManager.config` in a text editor.
2. In the `roleManager` element, set `defaultProvider` to `SqlRoleProvider`.  
The first line of the file should look like this:

```
<roleManager enabled="true" defaultProvider="SqlRoleProvider">
```

3. In the `providers` element, add the following markup as a sub element:

```
<add name="SqlRoleProvider"
      connectionStringName="SqlConnString"
      applicationName="/"
      type="System.Web.Security.SqlRoleProvider, System.Web, Version=4.0.0.0,
      Culture=neutral, PublicKeyToken=b03f5f7f11d50a3a" />
```

4. Save `roleManager.config`.
5. Close the file.

## 47.6.3.4 Configure Identity Server to Use Active Directory

If your organization uses Active Directory to store its domain users, normally you would use [Integrated Windows Authentication](#) to secure Essentials. When you secure Essentials using Windows Authentication, Essentials automatically uses your Active Directory users and groups for authentication.

If Windows Authentication will not work for you, you can set up Geocortex Identity Server to connect to Active Directory. This creates an LDAP connection to Active Directory that you can customize to your needs.



This method does not support single sign-on. For single sign-on to work, you must use Integrated Windows Authentication.

This section shows how to set up Geocortex Identity Server to connect to Active Directory. It assumes that you already have a working Active Directory database that you want to use.

► **To set up Identity Server to work with Active Directory:**

There are three files you must modify:

- `connectionStrings.config`
- `membership.config`
- `roleManager.config`

By default, these files are in the following folder:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Identity
Server\Web\Configuration
```

### Configure `connectionStrings.config`

1. Open `connectionStrings.config` in a text editor.
2. In the `connectionStrings` element, remove `<!--` and `-->` surrounding each of the following sub elements:

```
<!--
  <add name="ADConnString"
connectionString="LDAP://server.domain.com/cn=Users,dc=domain,dc=com"/>
-->
<!--
  <add name="ADRolesConnString"
connectionString="LDAP://server.domain.com/cn=Users,dc=domain,dc=com"/>
-->
```

3. In the `ADConnString` sub element, replace the value of the `connectionString` attribute with the connection string for your Active Directory membership provider.
4. In the `ADRolesConnString` sub element, replace the value of the `connectionString` attribute with the connection string for your Active Directory role provider.

5. Save `connectionStrings.config`.
6. Close the file.

### Configure `membership.config`

1. Open `membership.config` in a text editor.
2. In the `membership` element, set `defaultProvider` to `ActiveDirectoryMembershipProvider`.  
The first line of the file should look like this:

```
<membership defaultProvider="ActiveDirectoryMembershipProvider">
```

3. In the `providers` element, remove `<!--` and `-->` surrounding the following sub element:

```
<!--  
<add name="ActiveDirectory"  
    type="System.Web.Security.ActiveDirectoryMembershipProvider"  
    connectionStringName="ADConnString"  
    connectionUsername="username"  
    connectionPassword="*****"  
    attributeMapUsername="sAMAccountName"  
    enableSearchMethods="true" />  
-->
```

4. Configure the `connectionUsername` and `connectionPassword`, and other attributes as required for your Active Directory.
5. Save `membership.config`.
6. Close the file.

### Configure `roleManager.config`

1. Open `roleManager.config` in a text editor.
2. In the `roleManager` element, set `defaultProvider` to `ActiveDirectoryRoleProvider`.  
The first line of the file should look like this:

```
<roleManager enabled="true" defaultProvider="ActiveDirectoryRoleProvider">
```

3. In the `providers` element, remove `<!--` and `-->` surrounding the following sub element.

```
<!--  
  <add name="ActiveDirectoryRoleProvider"  
  
  type="Geocortex.IdentityServer.Integration.Membership.ActiveDirectoryRoleProvide  
r, Geocortex.IdentityServer.Integration"  
    activeDirectoryUsersConnectionString="ADConnString"  
    activeDirectoryGroupsConnectionString="ADRolesConnString"  
    securityGroupsOnly="false"  
    groupsToUse="*team;Ad*"/>  
-->
```

4. Replace the default `groupsToUse` value with a semicolon-delimited list of the Active Directory groups that you want Identity Server to use.  
You can use the `*` wildcard in group names. The `*` wildcard matches any string.  
If you want Identity Server to use all your Active Directory groups, either remove `groupsToUse="*team;Ad*"`, or make it empty (`groupsToUse=""`), or set it to the `*` wildcard (`groupsToUse="*"`).
5. If the application pool identity does not have sufficient permissions to query Active Directory, configure `connectionUsername` and `connectionPassword` attributes for the `add name="ActiveDirectoryRoleProvider"` element.



Usually, you do not have to configure `connectionUsername` and `connectionPassword`. Do not configure them unless you have to.

6. Save `roleManager.config`.
7. Close the file.

#### 47.6.3.5 Configure Identity Server to Use Active Directory Federation Services

Geocortex Identity Server supports Active Directory Federation Services (ADFS). Configuring Identity Server to use ADFS is an advanced scenario. Contact your Geocortex Account Manager to discuss Professional Service options.

#### 47.6.3.6 Configure Identity Server to Use Legacy XML Providers

This section describes how to configure Identity Server to use the XML-based membership and role providers that were available in Geocortex Essentials 3.x.



You should only use the legacy XML providers if you are upgrading from a 3.x version of Essentials and you have an existing Security Provider XML file that you wish to continue using.

When you use legacy XML providers with Geocortex Identity Server, you can create, modify and delete users and roles in Manager. Legacy users and roles are managed the same way as users and roles in the default Identity Server setup. See [Configure Users and Roles for the Default Setup on page 428](#) for instructions.

To use legacy XML membership and role providers with Identity Server, you must enable the providers in the Identity Server configuration files. Follow the instructions below to configure Identity Server to use legacy XML providers.

► **To set up Identity Server to work with the legacy XML providers:**

There are three files that you must modify:

- App\_Data\GlobalSecurityProvider.xml
- Configuration\membership.config
- Configuration\roleManager.config

By default, these files are in the following folder:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Identity Server\Web
```

#### Configure GlobalSecurityProvider.xml

1. Open **GlobalSecurityProvider.xml** in a text editor.
2. Replace the content of **GlobalSecurityProvider.xml** with the content of your existing Security Provider XML file:

- **Global Provider:** If you were using the global Geocortex security providers in Essentials 3.x, the default location of the legacy Security Provider XML file is:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Application  
Services\AppData
```

- **Site-Specific Provider:** If you were using site-specific Geocortex security providers in Essentials 3.x, the default location of the legacy Security Provider XML file is:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Sites
```

3. Save **GlobalSecurityProvider.xml**.
4. Close the file.

#### Configure membership.config

1. Open **membership.config** in a text editor.
2. In the **membership** element, set **defaultProvider** to **XmlMembershipProvider**.  
The first line of the file should look like this:

```
<membership defaultProvider="XmlMembershipProvider">
```

3. Save **membership.config**.
4. Close the file.

#### Configure roleManager.config

1. Open **roleManager.config** in a text editor.
2. In the **roleManager** element, set **defaultProvider** to **XmlRoleProvider**.



The first line of the file should look like this:


```
<roleManager enabled="true" defaultProvider="XmlRoleProvider">
```

3. Save `roleManager.config`.
4. Close the file.

#### 47.6.3.7 Edit an Identity Server Security Provider

There are circumstances when you may need to change Identity Server's URL, for example, to update the host name when you change to a production server. You can also change the security provider's display name.

##### **To edit a Geocortex Identity Server security provider:**


1. In Manager, click the **Security & Data** tab, expand the **Security** area in the side panel, and then click **Providers**.
2. Click the **Edit** icon  beside the security provider that you want to configure.
3. Edit the settings as desired:
  - **Display Name:** The name that is used to refer to this security provider in Manager and on the Sign In page, where the user selects the security provider to sign in with.
  - **URL:** Identity Server's URL. Type or paste the URL in the box.
4. Click **OK**.
5. If Manager displays a message that you need to enter Identity Server's secret:
  1. In the file system where Identity Server is installed, navigate to Identity Server's setup application. In the default installation, the setup application is here:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Identity Server\Web\bin\Geocortex.IdentityServer.Setup.exe
```
  2. Run the Identity Server setup application as an administrator. The results display in a Windows command window.
  3. Find `ServiceSecret` and copy the value. The value of `ServiceSecret` is Identity Server's secret.
  4. Close the command window.
  5. In Manager, paste the secret into the **Secret** box.
  6. Click **OK**.
6. Click **Apply Details**.

#### 47.6.3.8 Add an Identity Server Security Provider

Essentials ships with one Geocortex Identity Server security provider already configured. You can add Identity Server security providers in Manager. This is useful if you deleted the security provider and you want to add it back.

 **To add a Geocortex Identity Server security provider:**

1. In Manager, click the **Security & Data** tab, expand the **Security** area in the side panel, and then click **Providers**.
2. Click  **Add Identity Server**.
3. In the **Display Name** box, type a name for the security provider.  
The display name appears in the list of security providers that the end user selects from, if you configure multiple security providers.
4. In the **URL** box, type or paste Identity Server's URL.
5. Get Identity Server's secret:
  1. In the file system where Identity Server is installed, navigate to Identity Server's setup application. In the default installation, the setup application is here:  

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Identity Server\Web\bin\Geocortex.IdentityServer.Setup.exe
```
  2. Run the Identity Server setup application as an administrator.  
The results display in a Windows command window.
  3. Find `ServiceSecret` and copy the value.  
The value of `ServiceSecret` is Identity Server's secret.
  4. Close the command window.
6. In Manager, paste the secret into the **Secret** box.
7. If you want, enter an issuer seed in the **Issuer Seed** box.  
If you do not enter an issuer seed, Manager will create a seed for you.



Unless you have a specific reason to enter a seed, such as re-accessing a previously configured Identity Server that you deleted, we recommend that you let Manager create the seed.

8. Click **OK**.

#### 47.6.3.9 Find Identity Server's Secret

In Manager, you may need to enter the unique secret for your instance of Geocortex Identity Server, for example, some changes to Identity Server's URL may require the secret. Follow the instructions below to get Identity Server's secret.

 **To find Identity Server's secret:**

1. In the file system where Identity Server is installed, navigate to Identity Server's setup application. In the default installation, the setup application is here:  

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Identity Server\Web\bin\Geocortex.IdentityServer.Setup.exe
```
2. Run the Identity Server setup application as an administrator.  
The results display in a Windows command window.

3. Find `ServiceSecret` and copy the value.  
The value of `ServiceSecret` is Identity Server's secret.
4. Close the command window.
5. Paste the secret where it is needed.

#### 47.6.4 The ArcGIS Security Provider

When you register Essentials with Portal for ArcGIS or ArcGIS Online in the Post Installer, the Post Installer creates an **ArcGIS**-type security provider that you can use to secure your sites. If Essentials is registered with Portal for ArcGIS, end users can sign in using the credentials that they use to sign in to Portal for ArcGIS. Portal for ArcGIS performs the authentication. If Essentials is registered with ArcGIS Online, end users can sign in using the credentials that they use to sign in to ArcGIS Online. ArcGIS Online performs the authentication.



If you carried forward an existing **ArcGIS Online** security provider when you upgraded to Essentials 4.2 or newer, an **ArcGIS** security provider appears in place of the ArcGIS Online security provider in Manager. The ArcGIS security provider will use the permissions that you configured before 4.2. For more information, see "Upgrading Essentials" in the *Geocortex Essentials Installation Guide*.

You cannot create additional ArcGIS security providers—there is at most one. If the Windows sign-in method is configured in the Post Installer, then Manager does not have an ArcGIS security provider.

For information about registering Essentials, see "Choose a Method to Sign In to Manager" in the *Geocortex Essentials Installation Guide*.

### ArcGIS Users and Roles

The ArcGIS security provider allows you to apply permissions to the following types of users and roles:

- **User:** Permissions that you set for a particular Portal for ArcGIS or ArcGIS Online user only apply to that user.
- **All Users:** Permissions that you set for all Portal for ArcGIS or ArcGIS Online users apply to all users who authenticate using their Portal for ArcGIS credentials.



If you make your site accessible to Everyone (public) from your ArcGIS Online account, any user with an ArcGIS Online account can potentially access your site. To learn how to protect access to your site, see [Permissions on page 452](#).

- **ArcGIS Group:** Permissions that you set for a particular Portal for ArcGIS or ArcGIS Online group apply to all the users in that group.
- **ArcGIS Organization:** Permissions that you set for a particular Portal for ArcGIS or ArcGIS Online organization apply to all the users that belong to that organization.
- **ArcGIS Organization Role:** Permissions that you set for a particular Portal for ArcGIS or ArcGIS Online organization role apply to all the users with that role.

## Security Provider and Permission Names

The security provider's default name, and the user and role names that appear on Manager's Permissions page, depend on whether Essentials is registered with Portal for ArcGIS or with ArcGIS Online:

- **Portal for ArcGIS:** The security provider is named after your portal by default. The user and role names start with the name of your portal.  
For example, if the portal name configured in Portal for ArcGIS is **My Portal**, the security provider is called **My Portal**, and the users and roles are **My Portal- ArcGIS Group**, **My Portal- All Users**, and so on.
- **ArcGIS Online:** The names depend on the URL that is configured for the sign-in method in the Post Installer:
  - **Main ArcGIS Online URL:** If the main ArcGIS Online URL ([www.arcgis.com](http://www.arcgis.com)) is configured, the security provider's default name is **ArcGIS Online**. The user and role names start with **ArcGIS Online**, for example, **ArcGIS Online - ArcGIS Group**, **ArcGIS Online - All Users**, and so on.
  - **Organization URL:** If the URL for your organization's ArcGIS Online portal is configured, the security provider is named after your organization's ArcGIS Online portal by default. The user and role names start with the name of the portal.  
For example, if the portal is named **My Portal** in ArcGIS Online, the security provider is called **My Portal**, and the users and roles are **My Portal- ArcGIS Group**, **My Portal- All Users**, and so on.

### 47.6.4.1 Configuration Checklist for the ArcGIS Security Provider

The complete list of steps to configure security is given in [Overview of Steps to Set Up Essentials Security on page 421](#). Use this checklist in conjunction with the complete list of steps.

To use the ArcGIS security provider for Essentials Security:

- The ArcGIS security provider must be [enabled](#). By default, it is enabled.
- If you want, [change the name](#) of the security provider to something that is more meaningful to end users.
- You must [configure permissions](#) using one or more [ArcGIS users and roles](#), in each site that is secured using the ArcGIS security provider.

## 47.6.5 Enable and Disable Security Providers

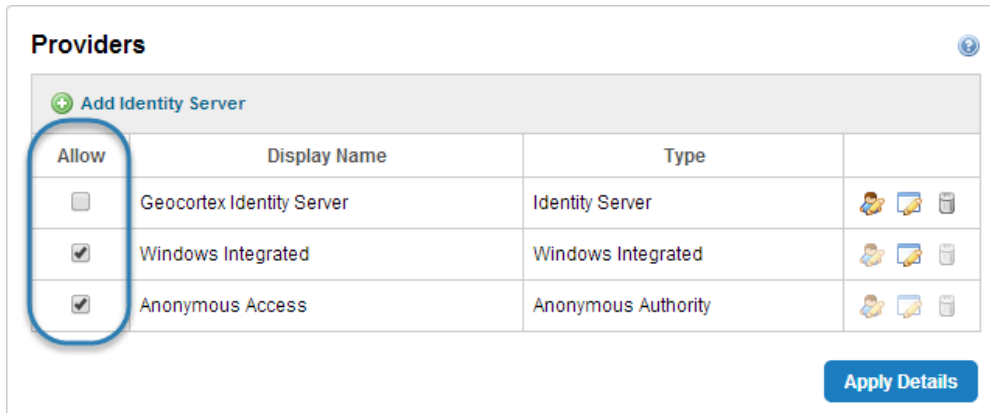
You must enable each security provider that you want to use to secure sites. Disable the providers that you do not use. The Windows Integrated and Anonymous Access security providers are enabled by default.

Having one or more security providers enabled does not secure your sites. You must also [configure permissions](#).

### To enable or disable a security provider:

1. In Manager, click the **Security & Data** tab, expand the **Security** area in the side panel, and then click **Providers**.

- To enable a security provider, select the **Allow** checkbox beside the security provider.  
To disable a security provider, clear the **Allow** checkbox beside the security provider.




Checkboxes to enable and disable security providers


- Click **Apply Details**.

#### 47.6.6 Edit a Security Provider

If you use more than one security provider, end users select which security provider to sign in with. Editing a security provider enables you to change the security provider's name to something that is meaningful to end users. Note that you cannot change the name of the Anonymous Access security provider. End users never see this name, so there is no reason to change it.

 Security providers have settings for the duration of security tokens, **Access Token Duration** and **Refresh Token Duration**. The default values for these settings are appropriate for most circumstances. Do not change these settings without first contacting [Geocortex Support](#) to discuss your needs. Make sure that you have adequate Support hours available.

#### To change a security provider's name:

- In Manager, click the **Security & Data** tab, expand the **Security** area in the side panel, and then click **Providers**.
- Click the **Edit** icon  beside the security provider that you want to configure.
- In the **Display Name** box, enter a name that is meaningful to end users.
- Click **OK**.
- Click **Apply Details**.

## 47.7 The Global Roles

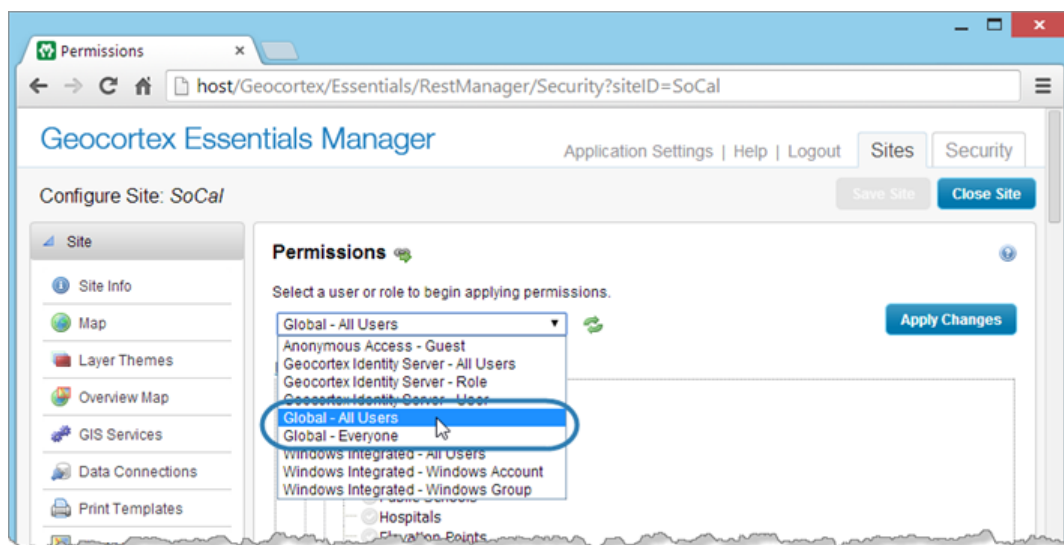
The Global roles are special roles that would otherwise be difficult or impossible to define. There are two Global roles:

- **Global - All Users:** This role is similar to the Windows **Authenticated Users** identity. Any user who is signed in through one of the enabled security providers belongs to the Global - All Users role.  
For example, suppose you have secured a site using ArcGIS Online. If you apply Allow permission to the World map service using the Global - All Users role, any user who is signed in to ArcGIS Online has access to the World map service.
- **Global - Everyone:** This role is similar to the Windows **Everyone** identity. Everyone belongs to the Global - Everyone role, whether they are signed in or not.



Permissions set for the **Global - Everyone** role take precedence over permissions set for the **Global - All Users** role.

To use a Global role, select the role from the drop-down list when you are applying permissions, the same way that you would select any other role.




Global - All Users and Global - Everyone roles on Manager's Permissions page

See also...

[Permissions on page 452](#)

## 47.8 Configure Global Security Settings


The global security settings include settings for SSL encryption, Windows impersonation, and URLs that Essentials requires to manage the user sign-in process. Configuration of the URLs is required as a security measure.

 If the URLs are incorrectly configured, the user's browser will not be able to redirect back to the viewer after the user has signed in and the user's session will fail.


 **To configure the global security settings:**


1. In Manager, click the **Security & Data** tab, expand the **Security** area in the side panel, and then click **Settings**.
2. Configure the security settings:

- **Enforce SSL:** When this checkbox is selected, communications between Essentials and viewers use SSL encryption (HTTPS).

 Turning off SSL enforcement is not recommended.

- **Windows Impersonation:** If you want requests to ArcGIS Server to be made as the user instead of as Essentials, select the checkbox. This ensures that ArcGIS Server knows the identity of the user that originated the request. For more information, see [Windows Impersonation on page 425](#).


 In order to use Windows impersonation, both ArcGIS Server and the Essentials site must be secured using Integrated Windows Authentication.

 Most deployments do not require Windows impersonation. We recommend that you leave the Windows Impersonation setting disabled, unless you need it for some specific purpose.

- **Allowable Redirect URLs:** After the user has signed in Essentials redirects the browser to a redirect URL, which returns the user to the viewer.


If your viewers are deployed on the same server as Essentials and the server uses the same host name internally and externally, you do not need to configure any redirect URLs—simply make sure the **Allow All Redirects** checkbox is selected.

If you have viewers deployed to other servers or the servers have different internal and external host names, add a redirect URL for each server that hosts viewers.

- To add a redirect URL, type or paste the server's URL in the **Allowable Redirect URLs** box, and then click **Add**.
- To remove a redirect URL, click the **Remove** icon  beside the URL.

3. Click **Apply Details**.


## 47.9 Set Up Cross-Origin Resource Sharing (CORS)

 Configuring CORS via Internet Information Services (IIS) Manager is still supported. However, if Essentials and a viewer are hosted on separate domains and you require the Geocortex Mobile App Framework, you must use the following method to configure CORS safely. If you configure CORS in both Essentials and IIS Manager, CORS functionality will break.

If Essentials and an HTML5 viewer run on different domains, they require [cross-origin resource sharing](#) (CORS) to be set up. For example, when your Essentials installation and a viewer are deployed to different domains, the viewer cannot load configuration from Essentials. This is because the browser does not allow cross-domain requests without CORS.

This article outlines how you can configure CORS for your Essentials installation. The configuration requires two steps:

1. Configure CORS in Essentials Manager.
2. Configure CORS for each viewer that requires access to Essentials.

 If you require cross-origin access to another domain that hosts resources used by Essentials or the viewer, you can configure a proxy page. See "Set Up a Proxy Page" in the Geocortex Viewer for HTML5 Administrator and Developer Guide.


### Browser Compatibility

Cross-origin resource sharing is not fully supported in Internet Explorer 8–10 or Opera Mini 8. If you need to support those browsers, you can configure a proxy page to allow cross-origin access. See "Set Up a Proxy Page" in the Geocortex Viewer for HTML5 Administrator and Developer Guide.

### Recommendations

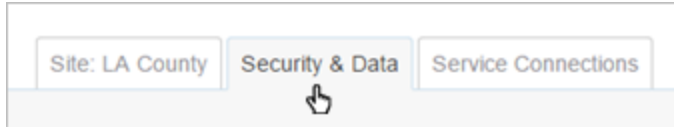
- Deploy Essentials and the viewer to the same domain to reduce management overhead and simplify Essentials upgrades.
- While the legacy method of configuring CORS is still supported, we recommend configuring CORS in Essentials Manager.

### Configure CORS in Manager

 If you have previously configured CORS in Internet Information Services (IIS) Manager, you need to manually remove the old configuration settings before configuring CORS in Essentials Manager. For more information, see [Remove the Previous CORS Configuration from Essentials](#).

You can configure cross-origin resource sharing for Essentials in Manager. From the Security & Data tab in Manager's header go to the **Security > CORS** page to configure CORS.





### The Security & Data tab in Manager

In most Essentials environments, you can configure CORS by adding the URL where your viewers are hosted using the **Allowed Origins** form. You can add URLs as fully qualified domain names or IP addresses. For example, add an entry for `https://viewer.domain.com` if that is the domain your viewer is hosted on.

If your URLs use both `http://` and `https://`, add both forms of the full URL as separate entries.



### The CORS Allowed Origins form

If your CORS setup requires custom HTTP request methods and headers, you can also configure them from the Allowed Methods and Allowed Headers forms on this page. These settings only require configuration in custom environments that require additional HTTP headers. For more information, see [Allowed Methods and Allowed Headers Configuration](#).



The entry `http://127.0.0.1:8181` points at localhost and is required in order to use the Geocortex Mobile App Framework.

### Add or Remove Values

You can add an allowed value by entering it in the form's text box and pressing the **Add** button. Existing entries are displayed below the input form. To remove an entry you can use the **Remove** button next to each entry.

Once you have added values, use the Apply Details button to save the configuration.

## Configure Your Essentials Domain in Your Viewers

To complete CORS configuration, you must configure each of your viewers to use the domain name where Essentials is hosted.

### ► To configure Essentials' trusted origin in your viewers:

1. Run a text editor as an administrator.  
Notepad is a text editor included with Windows.

2. Open the default viewer host file in the editor.

The default host page for HTML5 viewers is `Index.html`. For a typical HTML5 viewer deployment, the `Index.html` host file is located here:

```
C:\inetpub\wwwroot\Html5Viewer\Index.html
```

3. Find where the `viewerConfig` variable is defined:

```
var viewerConfig = {
    ...
}
```

4. Immediately before the section where the `viewerConfig` variable is defined, configure the Essentials origin to be a trusted origin. Use the `geocortex._configDomains` object to configure trusted origins.

For example, if Essentials is hosted at `http://myserver.mydomain.com`:

```
geocortex._configDomains = {
    "http://myserver.mydomain.com": true
};
```

5. Save the `Index.html` file.
6. Repeat Steps 1–5 for `Tablet.html`, `Handheld.html` and any other host files.
7. Repeat Steps 1–6 for each of your HTML5 viewers.

## Allowed Methods and Allowed Headers Configuration

In addition to the Allowed Origins forms, you can configure the Allowed Methods and Allowed Headers values for Essentials. The default values provided in these fields are sufficient for most Essentials environments.

- **Allowed Method:** Add or modify HTTP request methods that Essentials accepts from allowed origins. The default allowed methods for CORS are `GET`, `POST`, `HEAD`, and `OPTIONS`. Web browsers may not honor your additional configurations. See the W3C's [Method Definitions](#) specification for more information about methods.
- **Allowed Header:** Add or modify HTTP header fields that Essentials accepts from allowed origins. The default allowed headers for CORS are Content-Type and X-Requested-With. See the W3C's [Header Field Definitions](#) specification for more information about header fields.

## Cookies and Authorization Headers



In most cases, cookies and authorization headers are not a required configuration step. Please be aware that the following documentation applies to advanced deployments only.

In order to support CORS HTTP requests that include cookies and authorization headers, you must configure Essentials to use the `Access-Control-Allow-Credentials` CORS header.

## Configure Essentials

You must edit your Essentials's `RestAppSettings.xml` file.

For a typical Essentials installation, you can find this file at the following location:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST  
Elements\Sites\RestAppSettings.xml
```

Locate the opening of the `<Cors>` object in the file, and add `AllowCredentials="true"` to the XML tag as follows:

```
<Cors AllowCredentials="true">
```

With Essentials now accepting CORS requests with credentials, you can now configure your viewers to issue the CORS requests.

## Configure the Viewer to Make CORS Requests to Essentials

Before the viewer can make CORS requests to Essentials, it needs to be configured to make requests to the server running Essentials that you have enabled credentials for in the previous section.

In your viewer's `Index.html`, `Tablet.html`, and `Handheld.html`, add the following lines inside `<script>` tags at the bottom of the file:

```
<script>
  // Uncomment the below line to only use local copies of Esri API files. This is
  // done automatically in the Geocortex Mobile App Framework.
  //var geocortexUseLocalEsriApi = true;

  var viewerConfig = {
    "configurations": {
      "default": "Resources/Config/Default/" + shellName + ".json.js"
    },
    "viewerConfigUri": null
  };

  var enableCors = function(viewer,loader) {
    require(["esri/config"], function(esriConfig) {
      esriConfig.defaults.io.corsEnabledServers.push({
        host: "server.organization.com",
        withCredentials: true
      })
    });
  };

  new geocortex.essentialsHtmlViewer.ViewerLoader().loadAndInitialize({
    onInitialized: enableCors
  });
</script>
```

Where the `host` property points to the server to the Essentials instance that you have configured for cookies and authorization headers, and where the `withCredentials` property is set to `true`.

## Configure the Viewer to Make CORS Requests to Other Servers

You can duplicate the configuration that the viewer uses to make requests to Essentials for other servers that require CORS requests with credentials. In this case, assign the host to the URL of the server you need to make requests to. You must ensure that the server uses the `Access-Control-Allow-Credentials` CORS header and that it is set to `true`.

## Remove the Previous CORS Configuration from Essentials

If you have configured CORS for your Essentials installation in IIS Manager, you need to remove the previous CORS configuration before using the CORS settings in Essentials Manager.

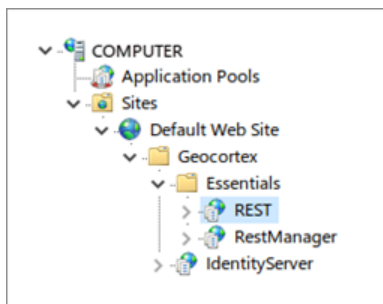
### ► To remove IIS Manager CORS configuration settings from Essentials:

1. Open Internet Information Services (IIS) Manager.
2. In the Connections panel, navigate to the site that hosts Essentials.
3. Locate the **REST** application.

For a typical Essentials installation, you can find the REST application within the following directory:

**Your Computer\Sites\Default Web Site\Geocortex\Essentials**

Once you have located it, select the REST application.



Default location of the REST application

4. In the REST application's Feature View, select the **HTTP Response Headers** section.  
Note any custom HTTP response headers you want to keep.
5. Remove every HTTP response header with following name:
  - `Access-Control-Allow-Origin`
  - `Access-Control-Allow-Methods`
  - `Access-Control-Allow-Headers`

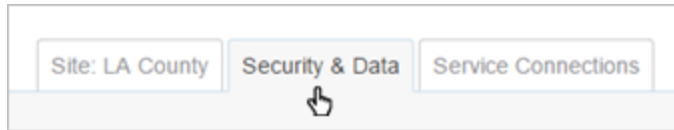
To remove an HTTP response header, right-click it and select **Remove** from the context menu.

## 47.10 Trusted URLs

You can allow all your sites to access content from a URL using the Trusted URLs security feature. By default, viewers prompts users to allow or deny content from unknown URLs. If you trust a domain or specific URLs, you can add them to a white list of URLs that the viewer should always trust. For example, your layer attribute data may contain URLs from


another one of your domains, and you want viewers to always trust links to that domain.

From the Security & Data tab in Essentials Manager's header go to the **Security > Trusted URLs** page to configure trusted URLs.



The Security & Data tab in Manager

## Add and Remove Trusted URLs

You can add an allowed value by entering it in the form's text box and pressing the **Add** button. Existing entries are displayed below the input form. To remove an entry you can use the  **Remove** button next to each entry.

Once you have added values, use the Apply Details button to save the configuration.

 A screenshot of the 'Security - Trusted URLs' configuration page. At the top, the title 'Security - Trusted URLs' is displayed. Below it is a form with a text input field containing 'http://server.domain.com/path/' and an 'Add' button to its right. Below the input field is a table with one row containing 'https://images.domain.com' and a trash icon to its right. At the bottom of the form is a blue 'Apply Details' button.

The Trusted URLs form

## Levels of Trust


The specificity of an added URL affects whether a URL is trusted as a domain, subdirectory, or a single file. For example, if you only trust files from `https://domain.com` that are in the `images/` subdirectory, you would enter the URL `https://domain.com/images/` into the form.

See the table below for example URLs and how the viewer trusts those URLs:

Input URL	Level of Trust
<code>https://domain.com</code>	Trusts any file at the domain <code>https://domain.com</code> . Note that <code>http://subdomain.domain.com</code> would still not be trusted.
<code>https://images.domain.com</code>	Trusts any file at the subdomain <code>https://images.domain.com</code> .
<code>https://domain.com/videos/</code>	Trusts any file at <code>https://domain.com</code> within the subdirectory <code>videos/</code> .
<code>https://domain.com/table.html</code>	Trusts only the file <code>table.html</code> at <code>https://domain.com</code>


 If a domain uses both `http://` and `https://`, add both forms of the full URL as separate entries.

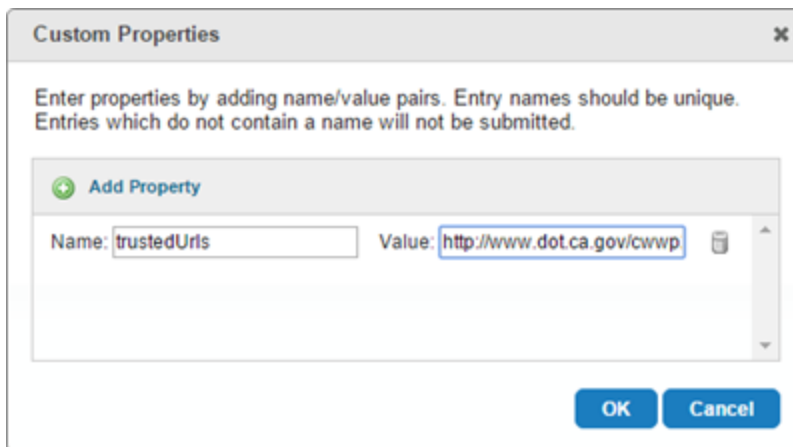
## Trusted URLs as a Custom Property

 This method of configuring trusted URLs is deprecated. We recommend that you remove any `trustedUrls` custom properties before adding URLs to the Trusted URLs interface in Manager.


You can add the URL as a `trustedUrls` property to the site.

### To add a `trustedUrls` property to a site:

1. In Essentials Manager, choose the **Site Info** page from the main menu.
2. At the bottom of the page, select the **Properties** link.
3. In the Custom Properties dialog, use the  **Add Property** button to add a new property.



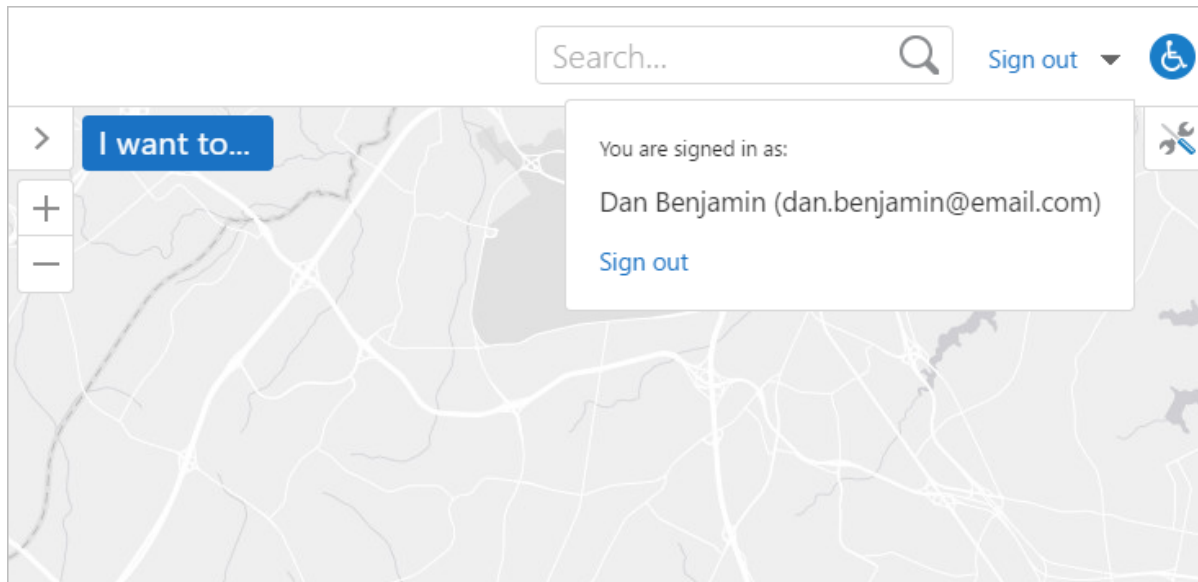
4. Add a name and value:
  - **Name:** Enter `trustedUrls`.
  - **Value:** Enter the URL you want to trust.
5. Press **OK**.
6. Select **Apply Details**, then **Save Site**.

You can remove `trustedUrls` properties by selecting the  **Remove** button next to an existing `trustedUrls` property.

## 47.11 Sign-In Settings

Sign-in settings control the appearance of sign-in and sign-out hyperlinks in viewers, and specify the page that the user's browser goes to after the user signs out (the landing page). Every site has its own sign-in settings, so different sites can have different sign-in behavior.

Clicking the icon ▼ beside the sign-out hyperlink shows the identity of the user that is signed in.



#### Identity of the current user

The sign-in and sign-out hyperlinks are useful for sites that are secured using multiple security providers. If you are using Anonymous Access and at least one other security provider, you should use both hyperlinks. When a user launches the viewer, the site loads with Anonymous Access - Guest permissions. The sign-in hyperlink allows the user to sign in to a security provider with access to additional parts of the site. The sign-out hyperlink allows the user to sign back out to Anonymous Access, or to the landing page if you have configured one.

If you are using multiple security providers, but not Anonymous Access, you only need the sign-out hyperlink. The only time the viewer is displayed in the browser is when the user is signed in. If the sign-in hyperlink is enabled, the user will never see it.

If you are using a single security provider, you might want to enable the sign-out hyperlink and configure a landing page. For example, if users launch the viewer by clicking a hyperlink in your company website, you might want to return users to the company website when they sign out.

In a situation where you configured a site for Windows Integrated authentication only, users can sign in to the Viewer for that site with their Windows credentials. However, when they sign out, if a sign-out landing page has not been specified, they are automatically returned to the Viewer and signed in with their Windows credentials. To prevent this from occurring, click **Permissions** in the side panel in Manager to open the Permissions page, and then click the **Sign-In Settings** tab. Add a landing page in the **Sign-Out Landing Page URL** field using the full URL format. Then, when users sign out, they are re-directed to the specified landing page rather than being signed back into the Viewer.

#### See also...

[Configure Sign-In Settings on page 451](#)

[Anonymous Access on page 426](#)

## 47.11.1 Configure Sign-In Settings

Each site has its own sign-in settings.



► **To configure a site's sign-in settings:**

1. In Manager, edit the site that you want to configure, and then click **Permissions** in the side panel.
2. Click the **Sign-In Settings** tab.
3. Configure the settings as desired:
  - **Enable Sign-In:** When this checkbox is selected, the site's viewers have a sign-in hyperlink that shows when the user is not signed in. This is useful for sites that are secured using Anonymous Access and at least one other security provider—it allows the user to sign in from Anonymous Access to a security provider that gives access to additional parts of the site. The Enable Sign-In setting is turned on by default.  
If you clear the Enable Sign-In checkbox, the sign-in hyperlink does not appear in the site's viewers.
  - **Enable Sign-Out:** When this checkbox is selected, the site's viewers have a sign-out hyperlink that shows when the user is signed in. Sign-out behavior depends on the landing page and security providers you are using. The Enable Sign-Out setting is turned on by default.  
If you clear the Enable Sign-Out checkbox, the sign-out hyperlink does not appear in the site's viewers.
  - **Sign-Out Landing Page URL:** The URL of the web page that loads after the user signs out. You can only configure a sign-out landing page when the Enable Sign-Out setting is turned on. For the landing page to work, the landing page URL must be configured as an [allowable redirect URL](#) on the Security & Data tab. If you leave the landing page URL blank, the sign-out behavior depends on which security providers you are using:
    - **Multiple Security Providers, Including Anonymous Access:** The site reloads using the Anonymous Access - Guest permissions.
    - **Multiple Security Providers, Without Anonymous Access:** The list of security providers displays, so the user can choose the security provider to log in with.
    - **Single Security Provider:** The sign-in dialog box displays.



To use the landing page with [Geocortex Identity Server](#), you must [enforce SSL](#).


4. Click **Apply Changes**.
5. Click **Save Site**.

## 47.12 Permissions

Permissions are used to authorize or deny access to a site or part of a site. Every securable component in a site has a permission setting.

Permissions are configured separately for each site. There is no way to simultaneously configure permissions for multiple sites.

## Allow, Deny, and Inherit Permissions


 This section does not apply to permissions that are assigned to viewers. Permissions work differently when they are applied to a viewer. For information on how viewer permissions work, see [Viewer Permissions on page 455](#).

Each component of a site has a permissions value. There are three possible permissions values each component can have:


 **Allow:** The Allow value allows access to the component.

 **Deny:** The Deny value prevents access to the component.

When a user is denied permission to a particular component in a site, that component is not visible in the viewer. The component cannot be searched for, identified, or queried, and it does not appear in map exports, reports, or printouts.

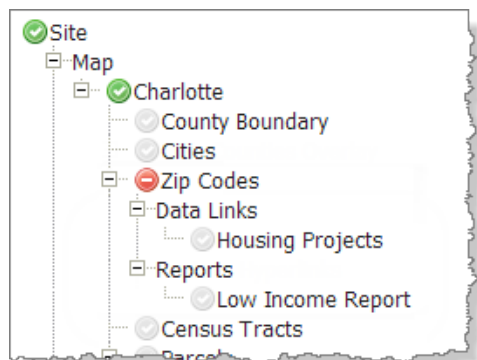
 **Inherit:** Permission is not set for this component.

The component inherits its value from a higher-level component in the Permissions hierarchy. One of the component's parents has an Allow or Deny permission configured.

 Whenever you configure permissions for a user or role, set the permission on the Site component. Do not leave the Site component's permission as Inherit.

By default, permissions are set to Inherit.

The following fragment of the Permissions hierarchy illustrates how permissions are inherited.



Access to the Charlotte map service is allowed. The County Boundary, Cities, and Census Tracts layers inherit Allow permission from the Charlotte service. The end user will be able to see and interact with these layers in the viewer.

Access to the Zip Codes layer is denied. The Housing Projects data link and Low Income Report inherit Deny permission from the Zip Codes layer. The end user will not see the Zip Codes layer, Housing Projects data link, or Low Income Report in the viewer.

### Inheritance of permissions

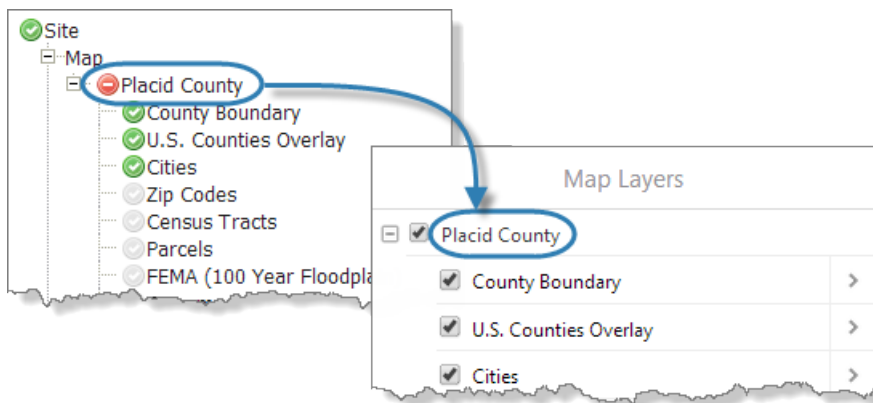
## Services and Group Layers

Normally, when a component is assigned or inherits Deny permission, the component does not appear in the viewer. However, child components of services and group layers appears in the viewer even though when the parent has been assigned the Deny permission.

### Services

If you configure Deny permission for a service in the map, but you allow at least one of the service's layers, the service appears in the Layer List as a container for its allowed layers.

For example, in the screen capture below, the Placid County service has Deny permission in Manager (rear), but it appears in the viewer's Map Layers list (front) as the container for the layers that have Allow permission.



Service denied in Manager (rear) shows in the viewer (front)

### Group Layers

If you assign Deny permission to a group layer, but you allow at least one of the sublayers, the group layer appears in the Layer List as a container for its allowed sublayers.



In tiled map services, it is not possible to prevent users from seeing secured layers, because the map images are pregenerated. However, layer operations and layer data in tiled map services are secured. For example, users cannot query a layer that they do not have permission to access.

## Deny Permissions Have Precedence Over Allow Permissions

It is possible for a user to have more than one permission for a particular component or site. For example, a user could belong to two groups, Group A and Group B.

If the Group A permissions for Component 1 are set to Allow and the Group B permissions for Component 1 are set to Deny, the user is denied access to Component 1. On the other hand, if the permissions for Component 2 are set to Allow in both Group A and Group B, the user is allowed access.

You can see the precedence of the Deny permission illustrated in the table below:


Group A Permissions	Group B Permissions	User in Groups A and B
✔ Component 1 (Allow)	✘ Component 1 (Deny)	✘ Denied access to Component 1
✔ Component 2 (Allow)	✔ Component 2 (Allow)	✔ Allowed access to Component 2

A single Deny permission has precedence over any number of Allow permissions.

## Viewer Permissions

When permissions are assigned to a viewer, the permissions function differently than permissions that are assigned to other components. Viewer permissions are used by the Geocortex Mobile App Framework to build the Available Viewers list. If the user has Allow permission for a viewer, the viewer shows in the list. If the user has Deny permission for the viewer, the viewer does not appear in the list.

For more information about the Geocortex Mobile App Framework, refer to the *Geocortex Mobile App Framework Administrator Guide*.

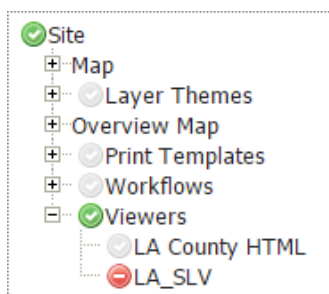
 The HTML5 Viewer does not use viewer permissions—only the Geocortex Mobile App Framework uses viewer permissions. This means that viewer permissions do not affect whether a user can launch an HTML5 viewer in a browser. In particular, Deny permission does not prevent users from launching the viewer in a browser.

Viewer permissions function as follows:

- ✔ **Allow:** Show the viewer in the list of viewers that appears when the user launches the Geocortex Mobile App Framework.
- ✘ **Deny:** Do not show the viewer in the list of viewers that appears when the user launches the Geocortex Mobile App Framework.
- ⊖ **Inherit:** Permission is not set for this viewer. The viewer inherits its value from the next higher component in the Permissions hierarchy that has Allow or Deny permission configured (the Viewers component or the Site component).

By default, viewer permissions are inherited.

The following fragment of the Permissions hierarchy illustrates how permissions are assigned and inherited.



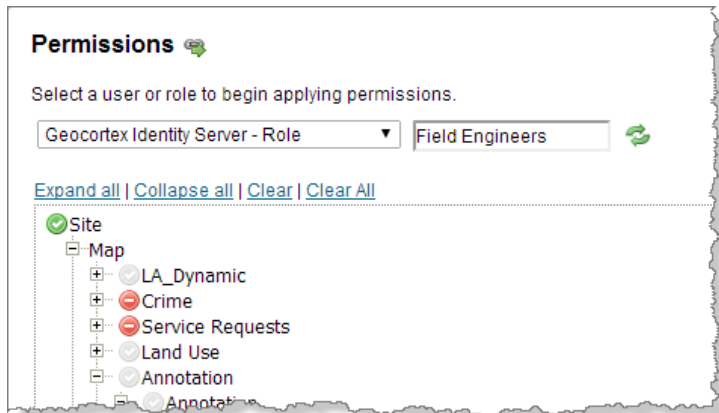
The LA County HTML viewer inherits Allow permission from the Viewers component. The Geocortex Mobile App Framework will show the LA County HTML viewer in the Available Viewers list.

The LA\_SLV viewer is assigned Deny permission. The Geocortex Mobile App Framework will not show the LA\_SLV viewer in the Available Viewers list.

### Inheritance of viewer permissions



## 47.12.1 Configure Permissions

To secure a site, you apply permissions to the site's securable components for the users and roles in each security provider that you want to use for the site. The security providers must be enabled. For example, if you have enabled Geocortex Identity Server and Anonymous Access, you would set permissions for Identity Server users and roles, and for the Anonymous Access - Guest role.



Permissions set for the Field Engineers role in the Geocortex Identity Server security provider

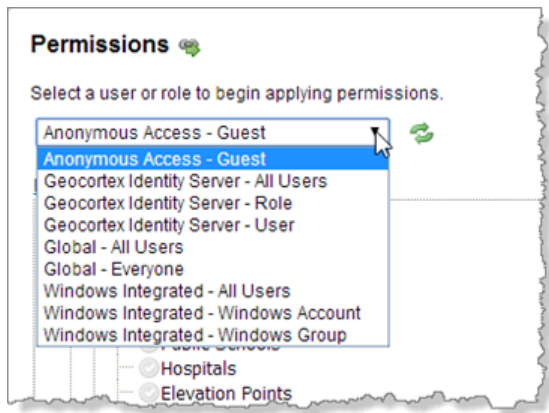
## Configuration Tips

- To locate components more easily in the Permissions hierarchy, use the **Expand All** and **Collapse All** hyperlinks immediately above the Permissions hierarchy.
- If you have already configured permissions for a particular user or role, click **Show Permission Entries** and click the **Edit** tool  to load the permissions that are configured for that user or role. This is often quicker than using the drop-down list.
- To remove all of the permissions for the currently selected user or role in this site, click the **Clear** hyperlink.
- To remove all of the permissions for a particular type of user or role, click **Show Permission Entries**, and then click the **Clear All** hyperlink beside the type or user or role.
- To remove all of the permissions for all users and roles in this site, click the **Clear All** hyperlink.
- If the hierarchy does not refresh when you select a new user or role, click the **Update Permissions** tool .
- You do not need to click **Apply Changes** for every user and role that you configure permissions for. For example, you could change the permissions for Role1, then for User1, then for Role1 again, and then click Apply Changes.


### To configure permissions:




You must configure permissions for each site that you want to secure.

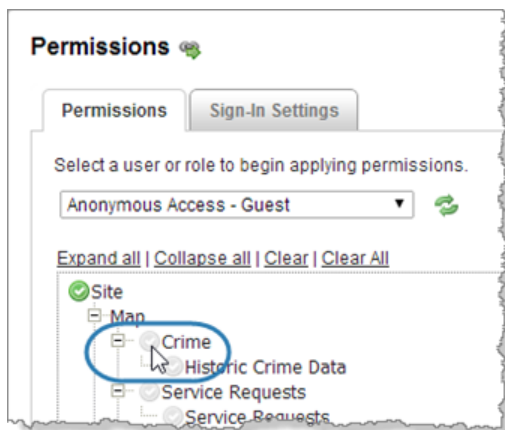
1. In Manager, edit the site that you want to configure, and then click **Permissions** in the side panel.
2. On the **Permissions** tab, select the type of user or role that you want to configure permissions for.



### Drop-down list of types of users and roles

3. If an additional box appears, type in the user name or role.
  - If you are using Integrated Windows Authentication, start to type the user or group name, and then select the user or group from the drop-down list that appears.
  - For Geocortex Identity Server's default setup, click in the box to open a drop-down list of users or roles.
  - If you have configured custom membership and role providers for Geocortex Identity Server, you may have to type in the user name or role in full. For some providers, like SQL Server, a drop-down list of user names and roles appears when you start typing. Select the user or role from the drop-down list.
4. Press **Enter**, or click the **Update Permissions** tool .
5. Click the permission setting beside each item in the hierarchy that you want to change.
 

Clicking the setting cycles the value from Inherit , to Deny , to Allow , and then back to Inherit again. In the screen capture below, the pointer is positioned to change the permission setting for the Crime service.



### Click the permission setting to change the value



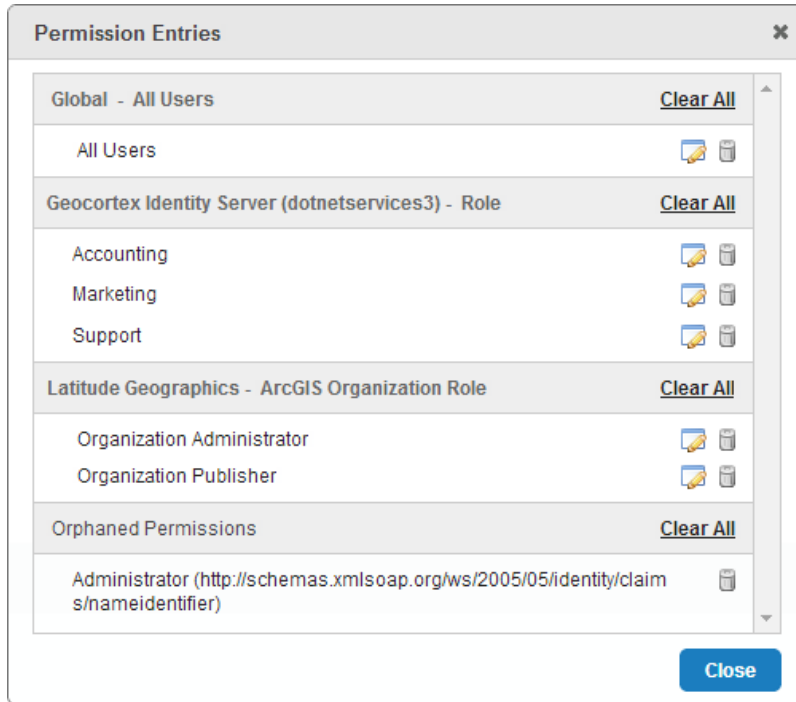
Make sure you set the permission for the Site component—do not leave it as Inherit.

6. Repeat these steps for each user and role that you want to set permissions for.

7. Click **Apply Changes**.
8. Click **Save Site**.

### 47.12.2 View a Summary of Permissions

The permissions summary lists all of the permissions that are currently configured for the site. The summary provides a quick way to load or remove the permissions that are configured for a user or role.



#### Summary of all the permissions that are configured

The permissions summary provides many of the same tools as the Permissions page, such as loading permissions into the Permissions hierarchy, and removing (clearing) permissions.



#### ▶ To load or remove permissions using the permissions summary:



Removing permissions is permanent. You cannot undo the deletion after you click Apply Changes.

1. In Manager, edit the site that you want to configure, and then click **Permissions** in the side panel.
2. Click **Show Permission Entries**.

3. Load or remove permissions:

- **Load Permissions:** To load the permissions that are configured for a particular user or role into the Permissions hierarchy, click the **Edit** tool .
- **Remove Permissions:** To remove the configured permissions for a particular user or role, click the **Remove Permission** tool  beside the user or role. Click **OK** to confirm.
- **Remove All Permissions:** To remove all of the configured permissions for a particular type of user or role, click the **Clear All** hyperlink beside the type of user or role. Click **OK** to confirm.



The Clear All function in the permissions summary is different than the Clear All function on the Permissions page. In the permissions summary, Clear All clears all the permissions for one type of user or role. On the Permissions page, Clear All clears all the permissions in the entire site.

4. Click **Apply Changes**.

## 47.12.3 Remove Orphaned Permissions

**Orphaned** permissions are permissions that are configured for a user or role that Essentials cannot locate in the security provider. There are two ways that permissions can become orphaned:

- The user or role was deleted in the security provider.
- The security provider was moved or deleted.

When a user or role is intentionally deleted in the security provider, you can use the permissions summary to remove the permissions that were configured for that user or role. Although the orphaned permissions do not do any harm, it is a good practice to remove orphaned permissions so they do not accumulate.

When a security provider is moved or deleted, Essentials cannot find any of the users and roles in the security provider. Depending on how many different users and roles had permissions configured, you may see a long list of orphaned permissions in the permissions summary. If moving or deleting the security provider was not intentional, this alerts you to the fact that there is a problem. When you restore the security provider, Essentials will again be able to locate the users and roles in the security provider and the permissions will no longer be orphaned.


### To remove permissions for a user or role that Essentials cannot locate:



Removing orphaned permissions is permanent. You cannot undo the deletion after you click Apply Changes.

1. In Manager, edit the site that you want to configure, and then click **Permissions** in the side panel.
2. Click **Show Permission Entries**.



3. In the **Orphaned Permissions** area:
  - **Remove Permissions:** To remove the orphaned permissions for a particular user or role, click the **Remove Permission** tool  beside the user or role.
  - **Remove All Permissions:** To remove all of the orphaned permissions in the site, click the **Clear All** hyperlink beside **Orphaned Permissions**.
4. Click **OK** to confirm.
5. Click **Apply Changes**.

#### 47.12.4 Configure Advanced Permissions

If you require solutions to your complex permissions systems, you may wish to manually set advanced permission settings that change the way that Allow and Deny permissions apply in Essentials.

Note that when you configure the advanced permissions settings described below, Essentials permissions function differently than described throughout the product documentation. You and other administrators should be careful to document your changes, as these settings complicate site permissions.


Before resorting to these settings, we recommend that you create additional roles to accommodate users who need special access to your sites.

### Set Precedence for Allow Permissions Over Deny Permissions




By default, Deny permissions take precedence over Allow permissions. See [Deny Permissions Have Precedence Over Allow Permissions](#) for more information.

If you require more granular permissions settings for users who belong to multiple roles, you can manually set the `Precedence` attribute on existing `<Permissions>` elements in the `Site.xml`.




When you manually set a `Precedence` attribute, you define whether an Allow or a Deny permissions setting should take precedence.

 Manually setting `Precedence` attributes complicates a site's permissions, and must be edited manually if changes are needed. If you need greater control over permissions, we recommend creating additional roles for users so that precedence is not required.

By default, if a user belongs to both Group A and Group B, and the Group A permissions for Component 1 are set to Deny, then even if the Group B permissions for Component 1 are set to Allow, the user will be denied access to Component 1. The table below shows the default behavior, without any `Precedence` settings changed:

Group A Permissions	Group B Permissions	User in Groups A and B
 Component 1 (Allow)	 Component 1 (Deny)	 Denied access to Component 1
No precedence settings defined for Component 1.		

When you set the `Precedence` attribute to `AllowBeforeDeny` on Component 1 or its parent, then the user in Group A and Group B is allowed access to Component 1:

Group A Permissions	Group B Permissions	User in Groups A and B
 Component 1 (Allow)	 Component 1 (Deny)	 Allowed access to Component 1
With the <code>Precedence="AllowBeforeDeny"</code> setting set.		

You can see a simplified version of this example in the code snippet below:

```
<Layer DisplayName="Component 1" Identifiable="false" IncludeInLayerList="true"
Visible="false">
  <Permissions Inherit="True" Precedence="AllowBeforeDeny">
    <Allow
Type="http://schemas.xmlsoap.org/ws/2005/05/identity/claims/nameidentifier" ... />
    <Deny Type="http://www.geocortex.net/security/claims/category/user" ... />
    <Deny Type="http://www.geocortex.net/security/claims/category/guest" ... />
  </Permissions>
</Layer>
```

The `Precedence` attribute has three possible settings:

- **AllowBeforeDeny:** Prioritizes Allow permissions for the component and its children.
- **DenyBeforeAllow:** Prioritizes Deny permissions for the component and its children. You should use this setting only if a parent component has `Precedence` set to `AllowBeforeDeny` and you need to override the behavior.
- **Inherit:** Ensures that precedence is inherited from parent components. This is the default behavior if `Precedence` is not explicitly set.

## Set User Permissions to Take Precedence Over Other Permissions




You may want to target a specific user who should be allowed to access resources even though they belong to roles do not have access to those resources.






Giving precedence to user permissions over role permissions is an advanced feature of Essentials. Essentials Manager's user interface does not acknowledge this feature. You must manually edit the REST API's `web.config` if changes are needed. If you need greater control over permissions, we recommend creating additional roles for users so that precedence is not required.

You can give additional access to a user regardless of their roles using the `gcx.security.userAllowBeforeDeny` app setting in the REST API. This setting gives precedence to Allow permissions set at the user level. Once you have set this app setting, you can then set permissions for individual users where Allow permissions shall override Deny permissions set in other roles that the user belongs to.

See how the app setting affects user permissions in the following table:

User Permissions	Group Permissions	User in Group
 Component 1 (Allow)	 Component 1 (Deny)	 Allowed access to Component 1

User Permissions	Group Permissions	User in Group
 Component 2 (Allow)	 Component 2 (Allow)	 Allowed access to Component 2
With the <code>gcx.security.userAllowBeforeDeny</code> app setting set in Essentials's <code>web.config</code> .		

► **To give a user additional access to resources beyond their roles:**

1. Locate the REST API `web.config` for your Essentials instance.  
The typical location for the file is at the following path:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST
Elements\REST\web.config
```

2. Open the `web.config` file in a text editor or XML editor.  
You can use Notepad, a text editor included with Windows.
3. In the file, place the new `gcx.security.userAllowBeforeDeny` app setting on a new line within the `<appSettings>` element.  
See the following code snippet as an example:


```
<appSettings>
  ...
  <add key="gcx.security.userAllowBeforeDeny" value="true" />
</appSettings>
```

4. Save the `web.config` file.

## 47.13 Perform a Security Health Check

Manager has a **Security Health** function that evaluates your security configuration for potential weaknesses. To strengthen your security setup, follow the recommendations in the Security Health panel.

► **To use the Security Health function:**

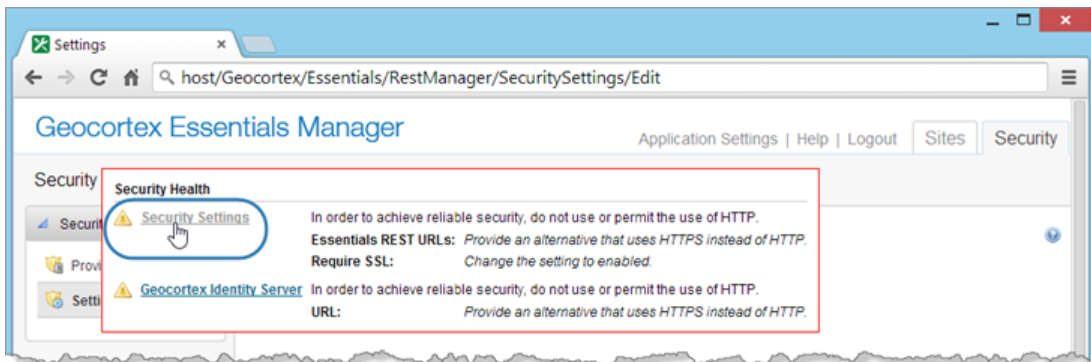
1. In Manager, click the **Security & Data** tab.  
It does not matter which Security page is open—Providers or Settings.
2. Click the **Security Health** icon .



#### Location of the Security Health icon

The Security Health panel opens. The Security Health panel lists recommendations for changes that you can make to your Essentials configuration to strengthen security.

3. To make a recommended change, click the hyperlink beside the setting that you want to change. This opens the page in Manager where the setting is configured.



#### Security Health panel, with hyperlinks to the pages where the settings are configured

4. Change the setting as recommended.
5. Continue making the recommended changes until you have done them all. You have now closed the gaps in your security configuration.

## 47.14 Common Problems


The following table lists some common errors related to Essentials security.


Error	Cause	Resolution
<b>Secret Required</b>	As a security measure, Identity Server requires you to enter its unique secret when you make some types of changes to its configuration.	Get the secret and enter it where required. See <a href="#">Find Identity Server's Secret on page 437</a> for instructions.
<b>Invalid Redirect URL</b>	The security provider completed the sign-in and redirected back to Essentials, but	Add the URL of the server that the viewer is hosted on to the list of <b>Allowable Redirect</b>

Error	Cause	Resolution
	Essentials could not redirect back to the viewer because the viewer is on a different server whose URL is not registered.	<b>URLs</b> in the security settings. See <a href="#">Configure Global Security Settings on page 441</a> for instructions.
<b>Digest Verification Error</b>	Identity Server completed the sign-in, but Essentials will not accept the security token because it has been modified. Sometimes a reverse proxy or network appliance rewrites responses, which marks the token as modified.	Reconfigure your reverse proxy or network appliance so it does not rewrite or modify Identity Server's responses.

## 47.15 Filter a Layer's Features

You can restrict the features that different users see by filtering the features. Filtering is based on the values of feature attributes. For example, you might want county inspectors to see only the parcels in the city where they work. In this case, filtering is based on the City attribute of the Parcels layer.


 Feature filtering can be used for ArcGIS Server map services and feature services only.

 ArcGIS Server should be behind a firewall. If ArcGIS Server is not behind a firewall, a user could bypass feature filtering by making requests directly to ArcGIS Server.

Essentials implements filtering by attaching a "where" clause to requests made to ArcGIS Server. Where clauses are used in queries and map image requests to filter the data returned by the query.

Each where clause is built by a workflow that is associated with a particular layer. Whenever a request is made to access a layer, Essentials runs the workflow for that layer, if there is one, and then attaches the where clause to the request. A workflow that filters features in a layer is called a **layer filter workflow**.

In order for a feature to be included in the response, it must satisfy the condition in the where clause. For example, a Parcels layer request with the where condition "City='Paris'" returns only parcels that have **Paris** as the value of the City attribute.

 In tiled map services, it is not possible to prevent users from seeing filtered features in the map image, because the tiles are pre generated. However, filtering applies to operations that access feature data, such as query and identify operations.

### Role of Essentials Security in Feature Filtering

When a site has a layer filter configured for at least one layer in an ArcGIS Server map service, requests to that map service get proxied through the [Layer Security proxy](#). The proxying of requests enables Essentials to intercept requests to ArcGIS Server so it can attach the where clause. This means that in order to filter one or more layers in a site, the site must have security enabled.

## Overview of Steps

### ▶ To set up filtering for a layer:

1. Configure Essentials Security.  
See [Essentials Security on page 417](#) for information.
2. Launch Workflow Designer and create a workflow that builds the where clause.  
For information, refer to "Create a Layer Filter Workflow" in Workflow Designer's help system.
3. Add the workflow to the layer.  
Follow the instructions below.

## Add a Layer Filter Workflow to a Layer

### ▶ To add a layer filter workflow to a layer:

Do this after you have created the workflow.

1. In Essentials, edit the site that you want to configure, and then click **Map** in the side panel.
2. Follow the instruction that applies to you:
  - **Feature Layer:** If the layer that you want to filter is from a feature service, [edit the layer](#).
  - **Map Service Static Layer:** If the layer that you want to filter is a static layer from a map service, [edit the layer](#).
  - **Map Service Dynamic Layer:** If the layer that you want to filter is a dynamic layer from a map service, [edit the map service](#).

Because dynamic layers are created at run time, the layer filter workflow is configured at the map service level instead of the layer level. Note that you do not have to add the workflow to Manager's Workflows page.

3. On the **Details** tab, click the **Browse** button beside the **Filter Workflow URI** box.
4. Locate the workflow (.xaml) file, select the file, and then click **OK**.
5. Click **Apply Changes**.
6. Click **Save Site**.

## 48 Geocortex Data Store

Geocortex Core provides a document storage service, the **Data Store**, to Geocortex Essentials and other Geocortex products. Essentials uses the Data Store for a variety of purposes, such as storing HTML5 Viewer projects and Geocortex Mobile App Framework offline maps.

Geocortex Essentials Manager's **Security & Data** tab allows you to set Data Store policies and manage the documents in the Data Store.

## 48.1 Configure Data Store Policies

Data Store policies control access to Data Store documents, such as projects and offline maps. You can select one of the following policies:

- **Deny Public Read Access:** When this policy is selected, users must be signed in to the viewer to load, modify, and create Data Store documents. Anonymous users cannot load, modify, or create Data Store documents. This is the default policy. This policy is appropriate in all scenarios.

- **Allow Public Read Access:** When this policy is selected, signed-in users can share Data Store documents with anonymous users. Anonymous users can load Data Store documents, but they cannot modify or create documents.

This policy is appropriate in the following scenarios:

- Your applications do not contain any sensitive information.
- Your applications are on an intranet and it is acceptable for all intranet users, including anonymous users, to load Data Store documents.

- **Allow Public Read Access and Public Edit Links:**



Enabling this policy may cause your applications to be at risk of malicious attacks, in particular cross-site scripting (XSS) attacks.

When this policy is selected:

- Signed-in users can share Data Store documents with anonymous users. Anonymous users can load Data Store documents, but they cannot modify or create documents.  
and
- Signed-in users can create links that allow anonymous users to load and modify existing Data Store documents. Anonymous users cannot create documents.

This policy is appropriate when your applications are on an intranet and it is acceptable for all intranet users, including anonymous users, to view and modify Data Store documents. Do not use this policy if your applications are on the Internet.

### To configure Data Store policies:

1. In Manager, click the **Security & Data** tab, expand the **Data Store** area in the side panel, and then click **Policies**.
2. Select the policy that you want to use.
3. Click **Apply Details**.

## 48.2 About Managing Data Store Documents

Manager's **Data Store - Documents** page allows you to view information about the documents in the Data Store, change document owners, and delete documents.

**Data Store - Documents**

Search

Delete Change Owner

	Title	File Type	Description	Created ▼	Last Access	Owner	Info
<input type="checkbox"/>	Waterfront (Offline)	offlinemap		Feb 16 2016 15:56:27	Feb 16 2016 15:56:27	Alan March (ama...	ⓘ
<input type="checkbox"/>	Downtown (Offline)	offlinemap		Feb 16 2016 15:55:10	Feb 16 2016 15:55:14	Alan March (ama...	ⓘ
<input type="checkbox"/>	Chestnut Place Sewa...	gvh-project	Preliminary plans for s...	Feb 16 2016 14:58:57	Feb 16 2016 14:58:57	Alan March (ama...	ⓘ
<input checked="" type="checkbox"/>	City Hall Repaving	gvh-project	Shows the extent of th...	Feb 16 2016 14:56:17	Feb 16 2016 14:56:17	Alan March (ama...	ⓘ
<input type="checkbox"/>	Downtown Waterfront ...	gvh-project	Outlines the traffic rout...	Feb 16 2016 14:54:35	Feb 16 2016 14:54:35	Alan March (ama...	ⓘ

Displaying 1 - 5 (Total: 5)

Page 1 of 1

### Example of Manager's page for managing Data Store documents

Because the Data Store may accumulate many documents over time, Manager provides tools to search for and sort documents. Sorting and searching operate on the entire Data Store, not only the page of documents that you currently have open, if there are multiple pages. To sort the documents, click the header for the column that you want to sort on. For example, to sort on the date that documents were added to the Data Store, click **Created**. Click the header again to sort in the opposite order.

You can search for any information that appears on the Data Store - Documents page except for dates—dates are not searchable. The Search function does not search document details.

### Example 1: Purge Old Data Store Documents

As a site administrator, you like to monitor the Data Store to make sure it does not contain a lot of documents that no one is using. You periodically purge old documents. To do this, you open Manager's Data Store - Documents page and sort the documents on the **Last Access** column. This sorts the documents in ascending order, which places the oldest documents at the top of the list. (If you click the header again, it will sort the documents in descending order.)

You want to delete all the projects that have not been accessed in over a year. None of the documents on the first page have been accessed in the past year, so you select the checkbox in the header row, which selects the checkboxes for all the documents on the page. You click **Delete**, and then **Yes** to confirm. This deletes all the documents on the page and displays the next page of documents. There are six projects on this page that have not been accessed in the last year, so you select the checkbox for each of these documents individually and delete them.

### Example 2: Give Someone Ownership of Someone Else's Documents

Leslie created many HTML5 viewer projects during her time as a project manager. She has now been promoted to a new position that does not involve working with projects. Thomas has been hired to fill her project management position.

As the site administrator, you want to change the ownership of Leslie's projects to Thomas. To do this, you first ask Thomas to sign in to an HTML5 viewer and open a project. This ensures that the Data Store recognizes Thomas as a potential document owner.

When Thomas has done this, you open the Data Store - Documents page in Manager and search for **Leslie**. This finds all of the Data Store documents that Leslie owns. You select each of Leslie's projects. You then click **Change Owner** and type **Thomas** in the dialog box. This opens a drop-down list of Data Store users named Thomas. You select the correct Thomas and click **OK**. Leslie is removed as the owner and replaced by Thomas. Thomas can now assign access privileges for the projects, change the project details, and perform the other actions that are reserved for project owners. Leslie can no longer perform ownership tasks.



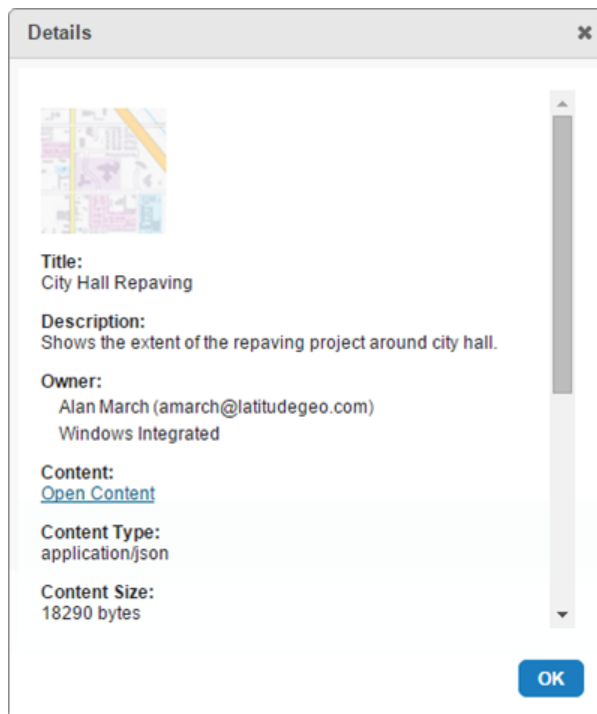
## 48.3 Manage Data Store Documents

### ▶ To view the documents in the Data Store:

1. In Manager, click the **Security & Data** tab, expand the **Data Store** area in the side panel, and then click **Documents**.

### ▶ To view additional information about a Data Store document:

1. In Manager, click the **Security & Data** tab, expand the **Data Store** area in the side panel, and then click **Documents**.
2. Click the **Document Information** tool ⓘ beside the document whose details you want to view.



Example of additional information about an HTML5 Viewer project

3. To view the document's content in JSON notation, click the **Open Content** hyperlink.

### ▶ To change the owner of one or more Data Store documents:

This procedure changes one or more documents to have a particular owner. To change documents to have different owners, you must repeat this procedure for each new owner.

1. Make sure that the document's new owner has accessed the Data Store at least once.  
You can only give ownership to users that have accessed the Data Store before. An easy way for a user to access the Data Store is:
  - a. Launch the viewer and sign in.
  - b. In the **I Want To** menu, click **Open**.
  - c. Load any project.
2. Change the owner:
  - a. In Manager, click the **Security & Data** tab, expand the **Data Store** area in the side panel, and then click **Documents**.
  - b. Select the checkbox beside each document that you want to change.  
This enables the Change Owner tool.
  - c. Click **Change Owner**.
  - d. Start to type the new owner's name or user name.  
A drop-down list of matching users opens.
  - e. Select the new owner from the list.
  - f. Click **OK**.

 **To delete one or more Data Store documents:**



Deleting Data Store documents is permanent. You cannot undo this action.

1. In Manager, click the **Security & Data** tab, expand the **Data Store** area in the side panel, and then click **Documents**.
2. Select the checkbox beside each document that you want to delete.  
This enables the Delete tool.
3. Click **Delete**.  
A confirmation dialog box displays.
4. Click **Yes**.  
The documents are permanently deleted from the Data Store.

## 49 Extend Essentials with Custom Functionality

A `Site.xml` file contains the configuration of a site. At run time, Essentials parses (deserializes) the site configuration into business objects. Business objects can be accessed (consumed) by client-side applications (viewers) or they can be accessed from the server.

Essentials provides a number of built-in classes of business object, for example, layers, reports, print templates, and data links. Essentials also allows you to create custom functionality that extends your sites, specifically, custom properties and custom site extensions. As well, you can create custom REST endpoints, which are independent of sites but can work with sites.

Custom properties are simple name/value pairs and as such, do not have any logic associated with them. Custom properties are configured using Geocortex Essentials Manager. Custom site extensions and custom REST endpoints have logic associated with them, which requires programming to implement.

Your Essentials installation can use any combination of custom properties, custom site extensions, and custom REST endpoints that you require.

Often a custom function can be implemented using either a custom site extension or a custom REST endpoint. From the site administrator's point of view, there are two important differences between the two:

- Unlike custom REST endpoints, custom site extensions and custom properties are configured in the site configuration file. This gives the administrator direct control over how custom site extensions and custom properties are used.
- Custom REST endpoints can have parameters, whereas custom site extensions cannot. In other words, custom REST endpoints can dynamically accept inputs that alter the behavior of the business logic. Depending on the situation, these inputs can come from an application or from the end user as part of the request URL path or the query string.  
Parameterization provides a means for the administrator to restrict the objects that a custom REST endpoint can operate on. For example, you might want to restrict a custom REST endpoint to operate on a particular layer.

If there is no administrative reason to choose one approach over the other when creating a particular function, it is often the application developer who makes the decision about which method to use. There may be software design reasons for selecting one approach over the other.

## 49.1 Visual Studio

We recommend using Visual Studio to customize the code, since it offers excellent support for editing XML documents, including IntelliSense. For example, when you begin to define a new element and the XSD is properly referenced, a list of possible child elements will display for you to select from, as illustrated in the following figure. Here, we see that the `site.xsd` file allows the `DataConnections` and `Map` child elements of the `Site` element.



### IntelliSense in Visual Studio

## 49.2 Custom Properties

Custom properties are arbitrary name/value pairs that provide a means to pass values from the server to the client application. For example, you might define a property for the site administrator's email address so the web application can display the address to the end user. Or you might define a property for the base URI of stored images so the client application can construct the full URIs for images on the fly.

One use of custom properties is to provide metadata about server-side objects. For example, if you configure a Boolean `CanSelect` property for a layer, the developer can use the property in an application to determine whether or not users can select the layer using a custom selection tool.

Because custom properties do not have any logic associated with them, no development work is required to create custom properties. Custom properties are configured in Manager. Every object that can have custom properties configured for it has a **Properties** hyperlink in Manager. For example, to create a custom property for a map service, edit the map service—the Properties hyperlink is at the bottom of the Details tab.

### 49.2.1 Create Custom Properties

 **To create a custom property:**

1. In Manager, edit the site that you want to configure and navigate to the object you want to define a custom property for.
2. Click the **Properties** hyperlink.
3. Click **Add Property**.
4. Type a name for the new property.



If the property name begins with "\_" the property will not be published by the REST API. It will only be accessible to server-side components.

5. Type the property's value.
6. Click **OK**.
7. Click **Save Site**.

## 49.3 Custom Site Extensions

Custom site extensions extend a site with custom logic that applies to an extensible object.

You can create custom site extensions for most Geocortex Essentials objects. To find out if you can extend a particular type of object, edit an object of that type in Manager and check whether it has a **Properties** hyperlink. If the object has a **Properties** hyperlink, you can create a custom site extension for the object. For example, to find out if you can extend print templates, edit a print template in Manager—you will see the **Properties** hyperlink at the bottom of the Edit Print Template page. This means that you can extend print templates.

### Example

Suppose you want to configure the visibility of the fields in a layer, as well as an alias for each field. You can do this using the following site extension:

```
<Layer Name="Zip Codes">
  <Extensions>
    <Extension Assembly="Extensions" ClassName="Extensions.FieldsCollection">
      <FieldsCollection>
        <Field Name="PO_Name" Alias="PO Name" Visible="true" />
        <Field Name="ZIPCODE" Alias="Zip Code" Visible="true" />
      </FieldsCollection>
    </Extension>
  </Extensions>
</Layer>
```

### 49.3.1 Create a Custom Site Extension

The procedure below outlines the main steps to create a custom site extension. Because creating a custom site extension involves both configuration and programming, each step in the procedure below is labeled either Administrator or Developer, to indicate who is responsible for performing that step. If you are filling both roles, ignore the labels.

#### To create custom a site extension:

1. **Administrator:** It is recommended that you create and verify the core part of your site before deploying the extended portion.
2. **Developer:** In your development environment:
  - a. Create a class for each extension.
  - b. Implement the extension's logic.
  - c. Compile the assembly or assemblies.

- d. Provide the administrator with the following:
  - A copy of each assembly.
  - The name of each class.
3. **Administrator:** The developer will provide you with one or more assemblies (DLL files) and the class name for each extension.



It is important to perform these steps in the order given. Site validation will fail if you deploy a site containing references to assemblies that do not exist.

- a. Copy the assemblies to anywhere within the `Sites` directory.



Deploying or redeploying a custom assembly causes all your sites to reload. The site is unavailable to users while Essentials loads the site.



Place assemblies that will be used by only one site in the site's directory. Create an `Extensions` directory up one level to deploy assemblies that will be used by more than one site.

- b. Open your `Site.xml` file for editing.
- c. Add an `Extensions` element immediately after the extensible element that the property applies to.
- d. Add an `Extension` element beneath the `Extensions` element.
  - i. Give the **Extension** element an **Assembly** attribute and assign it the name of the assembly provided by the developer for this extension.
  - ii. Give the **Extension** element a `ClassName` attribute and assign it the value of the class name provided by the developer for this extension.
- e. If you are configuring more than one extension, add a collection element beneath the **Extension** element. The collection element must be named after the class.

For example, if the class name provided by the developer is `AssemblyName.SomeCollection`, then the collection element must be named `SomeCollection`. Now add each element in the collection and give it a `Name` attribute, plus whatever other attributes you want it to have.

If you are configuring a single element, you do not need a collection element.
- f. Repeat these steps d - e for each extension the developer has created for this extensible element.
- g. Repeat steps c - f for each extension class the developer has created.
- h. Confirm your configuration by comparing it to the following example:

## Example Code

```
<Extensions>
  <Extension Assembly="Extensions"
  ClassName="Extensions.FieldsCollection">
    <FieldsCollection>
      <Field Name="PO_Name" Alias="PO Name" Visible="true" />
      <Field Name="ZIPCODE" Alias="Zip Code" Visible="true" />
    </FieldsCollection>
  </Extension>
</Extensions>
```

- i. Save the `Site.xml` file and browse the `Sites` directory to confirm the extensions.
- j. Inform the developer of the purposes of the extensions you have configured so the developer can use the extensions in applications.

## 49.4 Custom REST Endpoints

You can extend Essentials by implementing custom REST endpoints that provide functionality that is not built into Essentials.

Implementing a custom REST endpoint involves both programming and configuration. Custom REST endpoints are configured through their own configuration file, `RestResources.xml`, which can be deployed anywhere in the `Sites` folder. You can deploy multiple `RestResources.xml` files. As well, a single `RestResources.xml` file can be used to register and configure multiple endpoints.

Essentials automatically detects new `RestResources.xml` files, and also detects updates to existing `RestResources.xml` files. This means that you do not need to restart the Geocortex Essentials REST API web application to deploy or redeploy your custom REST endpoints, and you can update properties and parameters on the fly without interrupting service.

For detailed information about the elements and attributes that can appear in a `RestResources.xml` file, refer to the *REST Resources XML Reference*. The *REST Resources XML Reference* is installed with Essentials, in the `Docs` folder. In the default installation, the `Docs` folder is here:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\Docs
```

You can configure custom properties for custom REST endpoints and you can place constraints on the objects that a parameterized REST endpoint is permitted to operate on.



We recommend that you deploy and verify the core part of your site before you extend the site.

### 49.4.1 Example 1: Create a Custom REST Endpoint that Exports Feature Maps

This example shows how to create and deploy a custom REST endpoint that exports [feature maps](#).

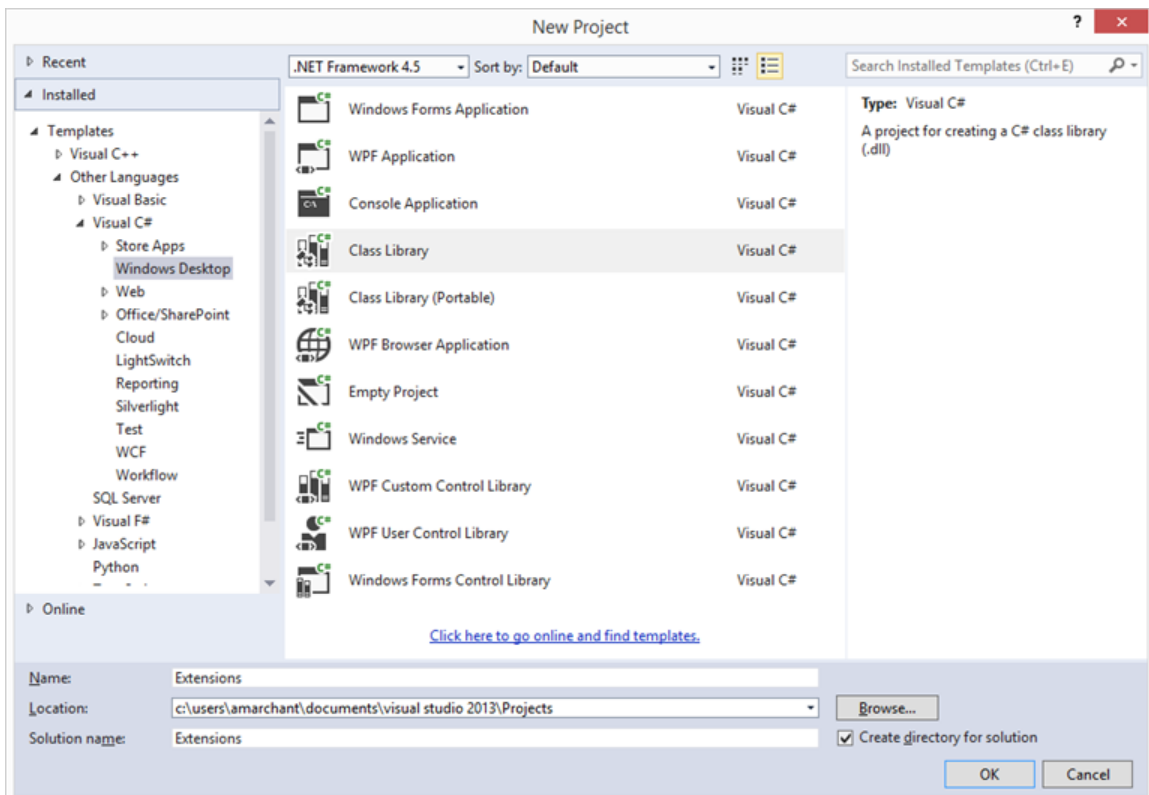


This example requires development knowledge and Geocortex Essentials knowledge.

## Step 1: Create a new project for Geocortex Essentials extensions

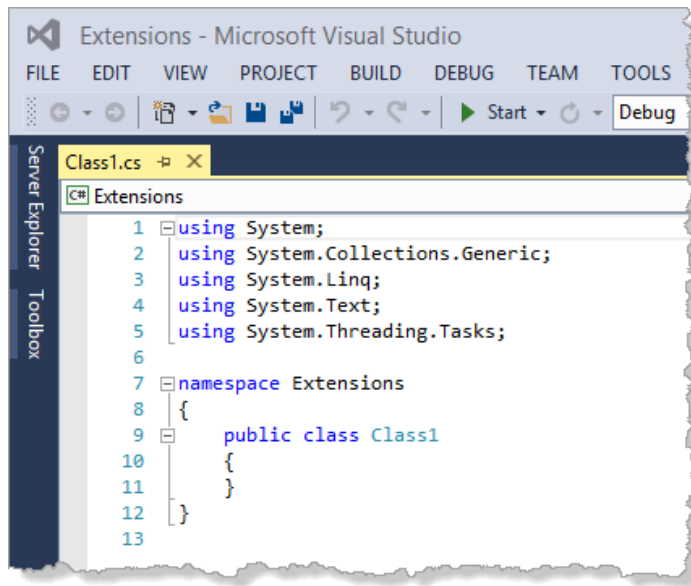
This step assumes that you do not already have a class library (assembly) for custom extensions. If you already have a class library for custom extensions, skip this step.

1. In Visual Studio, create a new class library project for custom extensions and give it a meaningful name, like **Extensions**.



Visual Studio will create a C# class file named `Class1.cs`.





2. Rename the C# class file to something meaningful, like `ExtractFeatureMapOperation`.  
In this example, the names of Geocortex Essentials REST endpoints end in `Resource` or `Operation` depending on what the REST endpoint does. Resources provide a representation of a server-side entity. Operations perform a task and execute some business logic to generate a response.

## Step 2: Add a class file

This step assumes that you did not create a new project in the previous step. If you created a new project in the previous step, skip this step.

1. In Visual Studio, create a new class file named `ExtractFeatureMapOperation`.  
In this example, the names of Geocortex Essentials REST endpoints end in `Resource` or `Operation` depending on what the REST endpoint does. Resources provide a representation of a server-side entity. Operations perform a task and execute some business logic to generate a response.
2. Edit `ExtractFeatureMapOperation` to match the following code:

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;

namespace Extensions
{
    public class ExtractFeatureMapOperation
    {
    }
}
```

### Step 3: Reference the required libraries

1. In Visual Studio, add references to the following libraries:

- `Geocortex.Essentials.Rest.dll`
- `Geocortex.Rest.dll`
- `Geocortex.Essentials.dll`

The assemblies are located in the Geocortex Essentials REST API `bin` folder. In the default Essentials installation, the `bin` folder is located here:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST
Elements\REST\bin
```

In order to create custom REST endpoints, the project must reference `Geocortex.Essentials.Rest.dll`, `Geocortex.Rest.dll` and any other assemblies that the endpoint will use. This example also uses `Geocortex.Essentials.dll`.

2. In the **References** section of the **Solution Explorer**, right-click one of the newly referenced assemblies and select **Properties**.
3. Set the assembly's **Copy Local** property to **False**.  
Because the class library project is not meant to be run by itself, you do not want the referenced assemblies to be copied to the project output directory during compilation.
4. Set **Copy Local** to **False** for the other newly referenced assemblies.

### Step 4: Add the REST attributes to the class

All REST endpoints in the Geocortex Essentials REST API must define the class-level `RestRoute` attribute. The `RestRoute` attribute specifies the URL that will be used to access the custom REST endpoint. The `RestRoute` attribute is defined in the `Geocortex.Rest.RestRouteAttribute` class.

The `RestRoute` URL is relative to the root of the REST API—it is not fully qualified. In the default installation, the root of the REST API is here:

```
http://[host]/geocortex/essentials/rest
```

In a named instance of Essentials that is installed in the default location, the root of the REST API is here:

```
http://[host]/geocortex/essentials/[instance]/rest
```

In this example, the URL will indicate that `ExportFeatureMapOperation` belongs to a feature map within a layer:

```
sites/{SiteID}/map/mapservices/{MapServiceID}/layers/{LayerID}/featuremaps/{FeatureMapID}/extract
```

This URL contains parameters (enclosed in curly brackets, like `{SiteID}`) that enable the REST endpoint to be used for any feature map, in any layer, in any site. When configuring the REST endpoint's deployment, the site administrator will be able to restrict the endpoint to, for example, a certain set of layers or a specific site.

1. Add the `RestRoute` attribute to the top of the `ExtractFeatureMapOperation` class and add a `using` directive so the class can make use of the `Geocortex.Rest` namespace.  
The `RestRoute` attribute contains an additional parameter called `IgnoreCase`. Setting `IgnoreCase` to `true` allows the REST endpoint to respond to requests no matter what capitalization is used.

```
...
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using Geocortex.Rest;

namespace Extensions
{
    [RestRoute("sites/{SiteID}/map/mapservices/{MapServiceID}/layers/
{LayerID}/featuremaps/{FeatureMapID}/extract", IgnoreCase = true)]
    public class ExtractFeatureMapOperation
    {
        ...
    }
}
```

2. Add an instance of the `RestRouteParameter` attribute to `ExtractFeatureMapOperation` for each of the parameters in the URL (`SiteID`, `MapServiceID`, `LayerID` and `FeatureMapID`).

The `RestRouteParameter` attribute describes parts of the `RestRoute` that are parameterized, such as `{SiteID}`. The parameters that you define here will be populated with the values provided in the URL when the REST endpoint is requested.

`RestRouteParameter`'s first parameter specifies the name that you want to use to refer to the parameter in code. `ResourceParameterName` is the string between curly brackets in the `RestRoute` that will be used to identify the parameter's value in the request's URL.

```
...
namespace Extensions
{
    [RestRoute("sites/{SiteID}/map/mapservices/{MapServiceID}/layers/
{LayerID}/featuremaps/{FeatureMapID}/extract", IgnoreCase = true)]
    [RestRouteParameter("SiteID", ResourceParameterName = "SiteID")]
    [RestRouteParameter("MapServiceID", ResourceParameterName =
"MapServiceID")]
    [RestRouteParameter("LayerID", ResourceParameterName = "LayerID")]
    [RestRouteParameter("FeatureMapID", ResourceParameterName =
"FeatureMapID")]
    public class ExtractFeatureMapOperation
    {
        ...
    }
}
```

3. Add any additional parameters that you want to use to customize `RestRouteParameter`'s behavior. The table below lists the additional parameters that you can use.

#### RestRouteParameter Parameters

Parameter	Data Type	Description
Constraint	String	Defines a pattern to use as a constraint on the parameter. The parameter will be populated with the value in the URL only if the constraint pattern is matched by the value in the URL.
Converter	Type	Transforms the string value in the URL to a <code>System.Type</code> of our choice. Used in conjunction with the <code>ValueType</code> parameter.
Default	String	The default value used when the parameter is not defined in the URL.
IgnoreCase	Boolean	Whether or not the parameter is case sensitive.
Required	Boolean	Whether or not the parameter is required.
Value	String	When using a pattern for the <code>Constraint</code> parameter, sets the replacement value.
ValueType	Type	Used in conjunction with the <code>Converter</code> parameter, sets the <code>System.Type</code> of the parameter.

### Step 5: Extend the abstract base class

1. Set `ExtensionResourceBase` as the base class and add a `using` directive for the `Geocortex.Essentials.Rest.Resources` namespace.

Custom REST endpoints extend the `Geocortex.Essentials.Rest.ExtensionResourceBase` abstract base class. This base class provides functionality that simplifies creation of JSON responses. For example, extending `ExtensionResourceBase` automatically makes the [Geocortex Essentials JSON formatter](#) available.

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using Geocortex.Rest;
using Geocortex.Essentials.Rest.Resources;

namespace Extensions
{
    [RestRoute("sites/{SiteID}/map/mapservices/{MapServiceID}/layers/
{LayerID}/featuremaps/{FeatureMapID}/extract", IgnoreCase = true)]
    [RestRouteParameter("SiteID", ResourceParameterName = "SiteID")]
    [RestRouteParameter("MapServiceID", ResourceParameterName =
"MapServiceID")]
    [RestRouteParameter("LayerID", ResourceParameterName = "LayerID")]
    [RestRouteParameter("FeatureMapID", ResourceParameterName =
"FeatureMapID")]

    public class ExtractFeatureMapOperation : ExtensionResourceBase
    {
    }
}
```

## 2. Add the `RepresentAsJson` method.

Implementing the `ExtensionResourceBase` abstract base class requires that you also implement the `RepresentAsJson` method. You will complete the implementation of this method when you implement the business logic that the REST endpoint will perform.

```
...
public class ExtractFeatureMapOperation : ExtensionResourceBase
{
    protected override System.Collections.Specialized.OrderedDictionary
RepresentAsJson()
    {
        throw new NotImplementedException();
    }
}
...
```

The `RepresentAsJson` method returns an `OrderedDictionary`. Ordered dictionaries are a convenient way to organize the components of a REST resource JSON response. Suppose that you have certain data that you want returned in the JSON response. Storing the data in an `OrderedDictionary` automatically serializes the data in the JSON response. For example, consider the following `OrderedDictionary` definition:

```
OrderedDictionary json = new OrderedDictionary
{
    { "name", "John" },
    { "age", 28 },
    { "dob", new DateTime(1981, 11, 04) }
};
```

This would be automatically serialized to JSON as follows:

```
{
  "name" : "John",
  "age" : 28,
  "dob" : "/Date(373708800000)/"
}
```

## Step 6: Prepare to implement the business logic

At this point, you have all of the components required for a custom REST endpoint—you have defined a class that will act as the endpoint, set the appropriate class-level attributes, and extended the `ExtensionResourceBase` abstract base class. You could deploy the endpoint to the Geocortex Essentials REST API now, but there would be no point without the logic that you want the endpoint to perform.

The custom REST endpoint in this example is responsible for generating a feature map image. To do this, the endpoint will take the `objectID` from the request's query string, discover the geometry of the feature represented by that `objectID`, and then use the geometry to generate the feature map.



For brevity, this example takes some shortcuts. Proper error handling and parameter checking are omitted, and the business logic is implemented within the REST endpoint. A better practice is to implement the business logic in classes external to the REST endpoint and use the REST endpoint as a facade to the business objects.

1. Add missing references to any .NET assemblies. This example requires the following references:

Geocortex.Core	System.Data
Geocortex.Essentials	System.Data.DataSetExtensions
Geocortex.Essentials.Rest	System.Drawing
Geocortex.Gis	System.Web
Geocortex.Rest	System.Xml
System	System.Xml.Linq
System.Core	WindowsBase

2. Update the list of `using` directives to match the list below.  
Alternatively, you could update the list as you program the business logic.

```

using System;
using System.Collections.Specialized;
using System.Drawing;
using System.IO;
using System.Web;
using Geocortex.Core.Imaging;
using Geocortex.Essentials;
using Geocortex.Essentials.Configuration.Rest;
using Geocortex.Essentials.Rest.Resources;
using Geocortex.Gis;
using Geocortex.Gis.Geometries;
using Geocortex.Rest;

namespace Extensions
{
    ...
    public class ExtractFeatureMapOperation : ExtensionResourceBase
    {
        ...
    }
}

```

3. At the top of the class, add convenience properties for each `RestRouteParameter` that you have defined (`SiteID`, `MapServiceID`, `LayerID`, and `FeatureMapID`).  
These convenience properties provide easy access to the `RestRouteParameter` values that are provided to the REST endpoint.

```
...
public class ExtractFeatureMapOperation : ExtensionResourceBase
{
    /// Gets or sets the site ID.
    /// </summary>
    /// <value>The site ID.</value>
    public virtual string SiteID { get; set; }

    /// <summary>
    /// Gets or sets the map service ID.
    /// </summary>
    /// <value>The map service ID.</value>
    public virtual string MapServiceID { get; set; }

    /// <summary>
    /// Gets or sets the layer ID.
    /// </summary>
    /// <value>The layer ID.</value>
    public virtual string LayerID { get; set; }

    /// <summary>
    /// Gets or sets the feature map ID.
    /// </summary>
    /// <value>The feature map ID.</value>
    public virtual string FeatureMapID { get; set; }
}
```

4. Add convenience properties for each of the objects that the `RestRouteParameter` attributes represent (`Site`, `MapService`, `FeatureLayer`, and `FeatureMapDefinition`). These objects are in the `Geocortex.Essentials` namespace.



```
    /// <summary>
    /// Gets the <see cref="Geocortex.Essentials.Site"/> to which this resource
    belongs.
    /// </summary>
    /// <returns>
    /// The <see cref="Geocortex.Essentials.Site"/>, or null if it cannot be
    determined.
    /// </returns>
    public virtual Site Site
    {
        get;
        private set;
    }

    /// <summary>
    /// Gets the <see cref="Geocortex.Essentials.MapService"/> to which this
    resource belongs.
    /// </summary>
    /// <value></value>
    /// <returns>
    /// The <see cref="Geocortex.Essentials.MapService"/>, or null if it cannot
    be determined.
    /// </returns>
    public virtual MapService MapService
    {
        get;
        private set;
    }

    /// <summary>
    /// Gets the <see cref="Geocortex.Essentials.FeatureLayer"/> to which this
    resource belongs.
    /// </summary>
    /// <returns>
    /// The <see cref="Geocortex.Essentials.FeatureLayer"/>, or null if it
    cannot be determined.
    /// </returns>
    public virtual FeatureLayer Layer
    {
        get;
        private set;
    }
}
```

```

    /// <summary>
    /// Gets the <see cref="Geocortex.Essentials.FeatureMapDefinition"/> to
    which this resource belongs.
    /// </summary>
    /// <returns>
    /// The <see cref="Geocortex.Essentials.FeatureMapDefinition"/>, or null
    if it cannot be determined.
    /// </returns>
    public virtual FeatureMapDefinition FeatureMap
    {
        get;
        private set;
    }

```

5. Add an `Init` method to initialize the values of the properties.

Whenever the custom REST endpoint receives a request, you will call the `Init` method immediately. The `Init` method is overridden from the `ExtensionResourceBase`.

Use the implicit `Controller` property to retrieve the `Site` object. The `Controller` represents the `EssentialsRestController`, which provides access to a number of properties about this request and the REST context. The `Controller` also maintains the collection of `Site` objects that are registered with the Geocortex Essentials REST API.

```

    /// <summary>
    /// Called before the formatter (the method for the format) to initialize
    the resource.
    /// </summary>
    public override void Init()
    {
        base.Init();

        SiteID = Request.Values["SiteID"] as string;
        MapServiceID = Request.Values["MapServiceID"] as string;
        LayerID = Request.Values["LayerID"] as string;
        FeatureMapID = Request.Values["FeatureMapID"] as string;

        Site = Controller.GetSite(SiteID);
        MapService = Site.Map.MapServices.FindByIDCaseInsensitive
        (MapServiceID);
        Layer = MapService.Layers.FindByIDCaseInsensitive(LayerID) as
        FeatureLayer;
        FeatureMap = Layer.FeatureMaps.FindByID(FeatureMapID);
    }

```

6. Complete the implementation of the **RepresentAsJson** method.

A call to the `GetFeatureMapOutputUrl` method, which you will write in Step 7, does most of the work. The `RepresentAsJson` method simply returns the HREF property representing the URL to a generated feature map image.

```
    /// <summary>
    /// Represents this resource as an ordered collection of name/value pairs that
    are
    /// used to format the JSON representation. Each "key" is represented as a
    property
    /// of an object whose value is "value". When the JSON object being formatted
    /// has properties that themselves are objects, they too should be formatted
    as
    /// <see cref="T:System.Collections.Specialized.OrderedDictionary"/> objects.
    /// </summary>
    /// <returns>
    /// An <see cref="T:System.Collections.Specialized.OrderedDictionary"/>.
    /// </returns>
    protected override OrderedDictionary RepresentAsJson()
    {
        OrderedDictionary json = new OrderedDictionary();
        json.Add("href", GetFeatureMapOutputUrl());
        return json;
    }
```

## Step 7: Implement business logic

1. Add the `GetFeatureMapOutputUrl` method.

The `GetFeatureMapOutputUrl` method does the following:

1. Retrieves the data representing the image as a byte array.
2. Stores the byte array in a temporary file in memory.
3. Makes the URL to the temporary file absolute.
4. Returns the URL.

The `GetFeatureMapOutputUrl` method is a wrapper for the endpoint's core logic. The core logic itself resides in the `Extract` method, which you will add in the next step.

```

    /// <summary>
    /// Gets the feature map output URL.
    /// </summary>
    /// <returns>A string representing a temporary URL for the feature map
    image.</returns>
    private string GetFeatureMapOutputUrl()
    {
        string url = string.Empty;

        // Get the data to store as a file in cache.
        byte[] data = Extract();

        if (data != null && data.Length > 0)
        {
            string filename = string.Format("{0}.jpg", FeatureMap.ID);

            // Determine the URL absolute of the application.
            string externalUrl = HttpContext.Current.Request.GetRestApplicationUri
        (
);

            // Cache the file contents and obtain a URL to it.
            // The file will be available for 4 minutes.
            using (Stream stream = TempFileHandler.CreateTempFile("image/jpeg",
filename, null, Guid.NewGuid(), 4, externalUrl, out url))
            {
                stream.Write(data, 0, data.Length);
            }
        }
        return url;
    }
}

```

## 2. Add the `Extract` method.

The `Extract` method is responsible for generating the feature map image. The steps to generate the feature map image are:

1. Make sure you have an `objectId` from the request.  
Assume that the REST endpoint was requested with the `objectId` GET or POST parameter. If the `objectId` is not there, the REST operation will throw an exception.
2. Use the `objectId` to build a filter.  
Create a `LayerQueryFilter` with a `where` clause using an equality operator on the `OBJECTID` field. To build the `where` clause, get the `objectId` parameter from the `Request.Values` collection. The `Request` property provides access to the `Geocortex.Rest.RestRequest` object, which stores a collection of all of the properties provided to our REST endpoint. This includes the parameters that you defined, such as `SiteID` and `MapServiceID`, as well as any query string or form post parameters.

3. Query the layer using the filter and get the geometry.  
Once you have constructed the filter, you query the layer to get the result. There should be a single result, because the feature is specified by an `OBJECTID`. Use the `GeometryFromRow` convenience method of the `FeatureDataTable` to get the geometry from the first result.
4. Set up a clone of the feature map.  
Clone the feature map belonging to the `Layer` object and then construct and initialize the `FeatureMapDefinition` object using the clone. Cloning ensures that the underlying object is not altered for other users requesting the same object in the REST API. Assign some default values for the feature map, such as a default buffer distance and highlight color. These values could also be parameterized in the request.
5. Generate the image.  
The two null parameter values in the `GenerateFeatureMapImage` call represent the list of visible layers and the map service transparencies. Setting the parameters to null allows them to assume the default values.
6. Convert the image to a byte array and return the byte array.  
Use the `ConvertToByteArray` convenience method to translate the image into a byte array. We will write `ConvertToByteArray` in the next step. Finally, return the byte array.

```
/// <summary>
/// Extracts the Feature Map given the parameters of the REST operation.
/// </summary>
/// <returns>A byte[] array representing the feature map.</returns>
/// <exception cref="System.InvalidOperationException">If extract is
attempted without an objectid parameter.</exception>
private byte[] Extract()
{
    // Make sure we have an object ID
    if (Request.Values["objectid"] == null)
    {
        throw new InvalidOperationException("ExtractFeatureMapOperation
requires an 'objectid' parameter.");
    }

    // First, discover the geometry representing this feature.
    // Build a filter using the OBJECTID.
    LayerQueryFilter filter = new LayerQueryFilter();
    filter.ReturnGeometries = true;
    filter.OutputSpatialReference = MapService.SpatialReference;
    filter.WhereClause = String.Format("OBJECTID = {0}", Request.Values
["objectid"]);

    // Query the layer.
    FeatureDataTable results = Layer.Query(filter);

    // Grab the geometry.
    Geometry featureGeom = results.GeometryFromRow(results.Rows[0]);
    GeometryCollection geometries = new GeometryCollection();
    geometries.Add(featureGeom);

    // Set up our feature map. First, clone it so as not to modify the state
on the server.
    FeatureMapDefinition featureMap = FeatureMap.Clone() as
FeatureMapDefinition;
    featureMap.BufferDistance = 300;
    featureMap.BufferUnit = DistanceUnit.Feet;
    featureMap.HighlightColor = Color.Cyan;
    featureMap.ImageDescriptor = new ImageDescriptor
    {
        Dpi = 96,
        Height = 300,
```

```
        Width = 300,
        ImageFormat = ImageFormat.Jpg
    };

    // Draw.
    MapImage mapImage = featureMap.GenerateFeatureMapImage(Layer, geometries,
null, null);

    // Get a byte array from the image.
    byte[] data = ConvertToByteArray(mapImage.Bitmap);

    return data;
}
```

### 3. Add the `ConvertToByteArray` method.

The `ConvertToByteArray` method translates a bitmap image into a byte array so the image can be streamed.

```
/// <summary>
/// Converts the image to a byte array.
/// </summary>
/// <param name="image">The image.</param>
/// <returns>The byte array.</returns>
private byte[] ConvertToByteArray(Bitmap image)
{
    byte[] data = null;

    using (MemoryStream stream = new MemoryStream())
    {
        image.Save(stream, System.Drawing.Imaging.ImageFormat.Jpeg);
        data = stream.ToArray();
    }

    return data;
}
```

## Step 8: Compile the assembly

The implementation of the custom REST endpoint is now complete.

1. Compile the **Extensions** assembly and resolve any errors.  
The compiled assembly should be called `Extensions.dll`.

## Step 9: Deploy and register the custom REST endpoint

1. Copy the compiled `Extensions.dll` assembly from the `bin` subfolder of the Extensions solution to the Geocortex Essentials REST API `bin` folder.

In the default Essentials installation, the REST API `bin` folder is here:

```
C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials\Default\REST
Elements\REST\bin
```

2. Create a new XML file called `RestResources.xml` and save the file anywhere within the `Sites` folder.
3. Add a reference to the XML schema definition (`.xsd`) file that ships with Geocortex Essentials. The following code assumes that you saved `RestResources.xml` to the root `Sites` folder, where the XSD file is located.

```
<?xml version="1.0" encoding="utf-8" ?>
  <RestResources
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:noNamespaceSchemaLocation="RestResources.xsd">
    ...
  </RestResources>
```

4. Add a `<Resource>` tag with `Assembly` and `ClassName` attributes that reflect the assembly and fully qualified class name used in the custom REST endpoint.

```
<?xml version="1.0" encoding="utf-8" ?>
  <RestResources
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:noNamespaceSchemaLocation="RestResources.xsd">
    <Resource Assembly="Extensions"
      ClassName="Extensions.ExtractFeatureMapOperation" />
  </RestResources>
```

5. Save the file.
6. Browse to the Geocortex Essentials REST API `Sites` directory to ensure that the deployment of the custom REST endpoint did not cause any problems.

In the default Essentials installation, the URL will look like this:

```
http://[host]/geocortex/essentials/rest/sites/
```

In a named instance of Essentials that is installed in the default location, the URL will look like this:

```
http://[host]/geocortex/essentials/[instance]/rest/sites/
```



## Step 10: Run the custom REST endpoint

Custom REST endpoints, like all endpoints in the REST API, are accessed via requests to URLs. To test a custom REST endpoint, you construct a URL to the endpoint. This example uses a site called **CharlotteDemo** to illustrate how to test the endpoint. Assume that the site has a map service called **Charlotte** with a **Zip Codes** layer that has a feature map configured for it. The feature map is identified using the ID **ZipCodeFeatureMap**.

When requesting a (non-custom) Geocortex Essentials REST endpoint, the default response format is HTML. In this example, you have not configured an HTML response for the custom REST endpoint, so you will have to explicitly request the endpoint using the JSON or PJSON (pretty JSON) format parameter.

Recall that the custom REST endpoint created in this example requires an `objectId` parameter. The URL that you use to run the endpoint must provide the OBJECTID of the Zip Code that you want to generate an image for.

In the default Essentials installation, the URL request will look something like this:

```
http://
[host]/geocortex/essentials/rest/sites/CharlotteDemo/map/mapservices/Charlotte/layers/0/featuremaps/ZipCodeFeatureMap/extract?objectId=2&f=pjson
```

In a named instance of Essentials that is installed in the default location, the URL request will look something like this:

```
http://[host]/geocortex/essentials/
[instance]/rest/sites/CharlotteDemo/map/mapservices/Charlotte/layers/0/featuremaps/ZipCodeFeatureMap/
extract?objectId=2&f=pjson
```

Compare the URL to the `RestRoute` attribute that you defined in Step 4 above:

```
sites/{SiteID}/map/mapservices/{MapServiceID}/layers/{LayerID}/featuremaps/{FeatureMapID}/extract
```

When the `RestRouteParameter` attributes are populated in the above request, `{SiteID}` is set to **CharlotteDemo**, `{MapServiceID}` is set to **Charlotte**, `{LayerID}` is set to **0**, and `{FeatureMapID}` is set to **ZipCodeFeatureMap**.

Browse to the URL. The response should look something like this:

```
{
  "href" :
  "http://host/geocortex/essentials/rest/TempFiles/FeatureMap.jpg?guid=3335a3c8-de04-45a1-a7cc-cf5af889c22a&contentType=image%2Fjpeg"
}
```

A client application that uses the Geocortex Essentials JavaScript API can now consume this REST endpoint and create a hyperlink to the feature map image.

### 49.4.2 Example 2: Add Custom Formatters to a Custom REST Endpoint

This example builds on [Example 1](#), which creates and deploys a custom REST endpoint that returns a JSON response containing a URL to a feature map image. This example uses the same site to test the formatters—a site called **CharlotteDemo** with a map service called **Charlotte** that has a **Zip Codes** layer with a feature map. The feature map is identified using the ID **ZipCodeFeatureMap**.

Suppose that you want to stream the image back to the calling application, rather than just returning the URL to it. To satisfy this requirement, you will add a custom formatter to the REST endpoint. Formatters allow REST endpoints to respond to different format requests.

You have seen three formats so far in this example—HTML (the default format for Geocortex Essentials built-in REST endpoints) and the two formats that the custom REST endpoint accepts, JSON and PJSON (pretty JSON). Extending the `ExtensionResourceBase` abstract base class automatically makes the [Geocortex Essentials JSON formatter](#) available. [Example 1: Create a Custom REST Endpoint that Exports Feature Maps on page 474](#) uses the Geocortex Essentials JSON formatter.

New formats are added to a REST endpoint by creating a parameterless public method that returns `void` and decorating the method with REST attributes that specify which types of request the formatter will handle. The method can be named anything that you want. The attributes of interest are:

- **RestFormat:** Specifies the supported format to which this formatter responds, for example, `json`, `pjson`, or `file`.
- **RestRequestType:** Specifies the request type to which this formatter responds, for example, `GET` or `POST`.
- **RestResponseContentType:** Specifies the MIME content type which should be used when generating the output response to the caller, for example, `text/plain`, `image/jpeg`, or `application/pdf`.

The format is specified by appending the `f` parameter and its value to the REST request URL, for example, `f=json`.

In this example, you will modify the custom REST endpoint to accept a format parameter called `file` that will stream the binary image content to the caller instead of returning JSON. You could also adapt these steps to create an HTML formatter for the custom REST endpoint so that it can return HTML responses.

## Implement a Custom Formatter

You want to implement a custom formatter that will stream binary image content back to the calling application. To do this, you will create a formatter that responds to `GET` and `POST` requests that have the `file` format parameter. The response MIME content type will be `image/jpeg`.

The formatter's method, call it `WriteFile`, should write the response using the `OutputStream` property of the `Response` object. Note that this is different than the JSON formatter described in [Geocortex Essentials JSON Formatter](#), which uses the `Output` property.

To implement the custom formatter:

1. In Visual Studio, open the Extensions project and the `ExtractFeatureMapOperation` class.
2. Add a method called `WriteFile` to the `ExtractFeatureMapOperation` class.

The code should look like this:

```

/// <summary>
/// Writes the binary representation of the resource to the response output.
/// </summary>
[RestFormat("file")]
[RestRequestType("GET")]
[RestRequestType("POST")]
[RestResponseContentType("image/jpeg")]
public void WriteFile()
{
    byte[] data = Extract();
    Response.OutputStream.Write(data, 0, data.Length);
}

```

3. Recompile the **Extensions** assembly.
4. Redeploy the custom **Extensions** library.
5. Test the formatter by pointing your browser to the URL with the `file` format parameter appended, for example:

```
http://  
[host]/geocortex/essentials/rest/sites/CharlotteDemo/map/mapservices/Charlotte/layers/0/featuremaps/ZipCodeFeatureMap/extract?objectid=2&f=file
```

You should see the feature map image.

## Geocortex Essentials JSON Formatter

When you created the custom REST endpoint in the first example, you did not have to specify a JSON formatter because extending the `ExtensionResourceBase` abstract base class automatically makes the Geocortex Essentials JSON formatter available. The code snippet below shows the definition of the Geocortex Essentials JSON formatter.

```
/// <summary>  
/// Writes the JSON representation of the resource to the response output.  
/// </summary>  
[RestFormat("json")]  
[RestRequestType("GET")]  
[RestRequestType("POST")]  
[RestResponseContentType("text/plain")]  
[RestRequestContentType("")]  
[RestRequestContentType("application/x-www-form-urlencoded")]  
public void WriteJson()  
{  
    Response.Output.Write(JsonSerializer.Serialize(RepresentAsJson()));  
}
```

In this code snippet, the `RestFormat` attribute accepts the value `json`, meaning the formatter accepts requests where the format parameter, `f`, is equal to `json`—`f=json`. The two `RestRequestType` attributes specify that the formatter accepts both GET and POST requests. JSON responses are textual, so the `RestResponseContentType` attribute is set to `text/plain`. The `RestRequestContentType` attributes are used to specify what type of requests this formatter will respond to.

This implementation of a JSON formatter calls a utility serializer, `JsonSerializer`, to serialize the `OrderedDictionary` returned by the `RepresentAsJson` method. The `Response` property accessed in this method represents the `Geocortex.Rest.RestResponse` object belonging to the context of the request. The `Response` property is capable of writing a value directly to the HTTP response stream, which allows the serialized dictionary to be written directly to the response output.

### 49.4.3 Example 3: Add Properties to a Custom REST Endpoint

This section builds on [Example 1](#) and [Example 2](#). This example uses the same site to test the properties—a site called **CharlotteDemo** with a map service called **Charlotte** that has a **Zip Codes** layer with a feature map. The feature map is identified using the ID **ZipCodeFeatureMap**.

There may be circumstances in which you want to create a generic REST endpoint that can operate using default values for some of the settings. For example, the `ExtractFeatureMapOperation` class creates a feature map image that is 300 x 300. You might want these values to be dynamic so the application consuming the endpoint can request images of any dimensions by providing width and height values in query string parameters or in a form post. You might also want the dimensions to be configurable by a site administrator.

When you created the custom REST endpoint, you interrogated the `Request.Values` collection to gain access to the `objectId` parameter passed in by the calling application. This example shows how to make the custom endpoint's behavior configurable by an administrator. Specifically, you will modify the endpoint so an administrator can control the width and height of the generated feature map image.

These principles can be extended to configure or manipulate the behavior of any custom REST endpoint.

## Step 1: Add properties to the REST resource configuration

1. Open the `RestResources.xml` file that registers the custom REST endpoint.
2. Add properties called `ImageWidth` and `ImageHeight` to the `Resource` element and set their values to **500** to override the default values of 300:

```
<?xml version="1.0" encoding="utf-8" ?>
  <RestResources
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:noNamespaceSchemaLocation="RestResources.xsd">
    <Resource Assembly="Extensions"
      ClassName="Extensions.ExtractFeatureMapOperation">
      <Properties>
        <Property Name="ImageWidth" Value="500"/>
        <Property Name="ImageHeight" Value="500"/>
      </Properties>
    </Resource>
  </RestResources>
```

3. Save the file.

## Step 2: Modify the custom REST endpoint to honor the configured properties

You must now modify the custom REST endpoint to allow properties defined by the administrator to override the default values. To do this, you will modify the `Extract` method that you created in Step 7 of [Example 1](#). The `Extract` method hard-coded the values of the height and width in the `ImageDescriptor`:

```
featureMap.ImageDescriptor = new ImageDescriptor
{
    Dpi = 96,
    Height = 300,
    Width = 300,
    ImageFormat = ImageFormat.Jpg
};
```

To modify the custom REST endpoint:

1. In Visual Studio, open the **Extensions** project and the `ExtractFeatureMapOperation`.
2. In the `Extract` method, set the default values for the width and height to **300**.
3. Interrogate the `ExtensionProperties` property to see if valid `ImageHeight` and `ImageWidth` properties have been configured.  
`ExtensionProperties` is an intrinsic property of the `ExtensionResourceBase` abstract base class that the `ExtractFeatureMapOperation` class extends from.
4. If valid properties are configured, apply the configured height and width.  
Your code should look like this:

```
private byte[] Extract()
{
    ...
    // Set up our feature map. First, clone it so as not to modify the
    state on the server.
    FeatureMapDefinition featureMap = FeatureMap.Clone() as
FeatureMapDefinition;
    featureMap.BufferDistance = 300;
    featureMap.BufferUnit = DistanceUnit.Feet;
    featureMap.HighlightColor = Color.Cyan;

    // Set the height and width defaults.
    int height = 300;
    int width = 300;

    // Look for configured values to override height and width defaults.
    if (ExtensionProperties["ImageHeight"] != null)
    {
        int h;
        if (int.TryParse(ExtensionProperties["ImageHeight"], out h) && h >
0)
        {
            height = h;
        }
    }

    if (ExtensionProperties["ImageWidth"] != null)
    {
        int w;
        if (int.TryParse(ExtensionProperties["ImageWidth"], out w) && w > 0)
        {
            width = w;
        }
    }

    featureMap.ImageDescriptor = new ImageDescriptor
    {
        Dpi = 96,
        Height = height,
        Width = width,
        ImageFormat = ImageFormat.Jpg
    };
}
```

```
        // Draw.
        MapImage mapImage = featureMap.GenerateFeatureMapImage(Layer,
            geometries, null, null);

        // Get a byte array from the image.
        byte[] data = ConvertToByteArray(mapImage.Bitmap);

        return data;
    }
```

5. Recompile the **Extensions** assembly.

### Step 3: Redeploy the endpoint, restart the application and test the properties

1. Redeploy your custom REST endpoint.
2. Test the configured properties by pointing your browser to the URL with the `file` format parameter appended, for example:

```
http://
[host]/geocortex/essentials/rest/sites/CharlotteDemo/map/mapservices/Charlotte/layers/0/featur
emaps/ZipCodeFeatureMap/extract?objectid=2&f=file
```

The feature map image should appear two thirds larger than in [Example 2](#).

#### 49.4.4 Example 4: Add Parameter Constraints to a Custom REST Endpoint

This section builds on [Example 1](#) and [Example 2](#). You do not need to do [Example 3](#) before you add parameter constraints. This example uses the same site to test the parameter constraints—a site called **CharlotteDemo** with a map service called **Charlotte** that has a **Zip Codes** layer with a feature map. The feature map is identified using the ID **ZipCodeFeatureMap**.

Ideally, REST endpoints should be as generic and reusable as possible. For example, in this example you created an `ExtractFeatureMapOperation` REST endpoint that can be used by any layer in any map service in any site.

In some circumstances, generic endpoints need to be restricted so that they can only operate when the request for the endpoint meets certain criteria. For example, suppose you have created a generic REST endpoint that enables spatial editing on a layer. Because it is generic, you could stand up the REST endpoint and immediately allow editing on all layers of all map services in all sites deployed on the server. However, there may be reasons to exclude some layers from being edited.

Parameter constraints enable administrators to constrain request parameters to matching a value or regular expression. They can apply to `GET` or `POST` parameters, as well as to parameterized `RestRoute` path components. When a custom REST endpoint receives a request and the request's parameter values do not match the constraints, an error is returned to the caller. This behavior is built in. You do not need to modify your endpoint to honor the constraints.

This example describes how to use parameter constraints to constrain your `ExtractFeatureMapOperation` endpoint to working only for layers that have feature maps configured for them. As an additional exercise, you could also constrain the IDs of feature maps.

## Step 1: Configure parameter constraints

Parameter constraints are implemented using the `ParameterConstraints` element in the `RestResources.xml` file. The `Parameter` sub element specifies the name of the parameter that you want to constrain and the constraint to apply.

A constraint can be expressed as a simple value or as a regular expression. If the constraint is a simple value, a request will execute only if the value of its parameter matches the constraint exactly. Complex constraints are defined using [.NET Framework Regular Expressions](#).

For example, to allow an operation to be performed only on the layer with ID 7:

```
<Parameter Name="LayerID" Constraint="7" UseRegularExpression="false" />
```

To allow an operation to be performed only on layer 12 or layer 3:

```
<Parameter Name="LayerID" Constraint="^(12|3)$" UseRegularExpression="true" />
```

To allow an operation to be performed on any layer except layer 5, layer 9, or layer 23:

```
<Parameter Name="LayerID" Constraint="^(?!(\b5\b|\b9\b|\b23\b)).*$"
UseRegularExpression="true" />
```

Define constraints on your `ExtractFeatureMapOperation` endpoint as follows:

1. Open the `RestResources.xml` file that registers your endpoint.
2. Add a parameter constraint called `SiteID` to the `Resource` element. Set the constraint to `CharlotteDemo`.



3. Add a parameter constraint called **LayerID**. Set the **UseRegularExpression** attribute to **true** and specify a constraint that will allow requests to execute against the Zip Codes layer (layer 0) and the Parcels layer (layer 7). Your code should look like this:

```
<?xml version="1.0" encoding="utf-8" ?>
<RestResources
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:noNamespaceSchemaLocation="RestResources.xsd">
  <Resource Assembly="Extensions"
    ClassName="Extensions.ExtractFeatureMapOperation">
    <Properties>
      <Property Name="ImageWidth" Value="500"/>
      <Property Name="ImageHeight" Value="500"/>
    </Properties>
    <ParameterConstraints>
      <Parameter Name="SiteID" Constraint="CharlotteDemo"/>
      <Parameter Name="LayerID" Constraint="^(0|7)$" UseRegularExpression="true"
    />
    </ParameterConstraints>
  </Resource>
</RestResources>
```

4. Save the file.

## Step 2: Test the constraints

1. Test the parameter constraints by pointing your browser to a layer that has a feature map, and verify that the feature map image is returned as expected.

The URL should look something like this:

```
http://
[host]/geocortex/essentials/rest/sites/CharlotteDemo/map/mapservices/Charlotte/layers/0/featuremaps/ZipCodeFeatureMap/extract?objectid=2&f=file
```

2. Now modify the URL to something that should be blocked by the parameter constraints, for example, change the layer ID from **0** to **1**.

If you leave the format parameter as `file`, you should get an ASP error. Changing the format parameter to

pson allows you to see the reason for the error, as shown below.

```
{
  "error" : {
    "code" : 500,
    "message" : "The request is invalid: The value '1' specified for the parameter,
'LayerID' does not match the constraint, '^([0-7])$'. Underlying validation error: The
value does not conform to the validation regex string '^([0-7])$'..",
    "details" : [ "The request is invalid: The value '1' specified for the parameter,
'LayerID' does not match the constraint, '^([0-7])$'. Underlying validation error: The
value does not conform to the validation regex string '^([0-7])$'.." ]
  }
}
```

## 49.5 Define a Custom Spatial Reference



If you define a custom spatial reference, it overrides how Core and Essentials project geographical values. Custom spatial references are only necessary if your organization uses spatial reference definitions that do not conform to the software's built-in definitions.

In some scenarios, you may want to define a custom spatial reference for Essentials:

- **Define a new spatial reference:** There is a new spatial reference that is not known to Essentials and you want to add a definition for it.
- **Override an existing spatial reference:** There is an existing spatial reference that Essentials is aware of, but you want to change the definition for it. This is most commonly done to change the datum transformation parameters of a spatial reference.

### Example of Usage

The "S-JTSK / Krovak East North" (WKID 5514) spatial reference can be used for both the Czech Republic and Slovakia. The default datum transformation parameters are specific to the Czech Republic and use the following well-known text (WKT):

```
PROJCS["S-JTSK_Krovak_East_North",GEOGCS["GCS_S_JTSK",DATUM["D_S_JTSK",SPHEROID["Bessel_1841",6377397.155,299.1528128],TOWGS84[570.8,85.7,462.8,4.998,1.587,5.261,3.56]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]],PROJECTION["Krovak"],PARAMETER["False_Easting",0.0],PARAMETER["False_Northing",0.0],PARAMETER["Pseudo_Standard_Parallel_1",78.5],PARAMETER["Scale_Factor",0.9999],PARAMETER["Azimuth",30.28813975277778],PARAMETER["Longitude_Of_Center",24.83333333333333],PARAMETER["Latitude_Of_Center",49.5],PARAMETER["X_Scale",-1.0],PARAMETER["Y_Scale",1.0],PARAMETER["XY_Plane_Rotation",90.0],UNIT["Meter",1.0]]
```

To get accurate datum transformation results in Slovakia, you need to use different parameters of the same well-known ID (WKID):

```
PROJCS["S-JTSK_Krovak_East_North",GEOGCS["GCS_S_JTSK",DATUM["D_S_JTSK",SPHEROID["Bessel_1841",6377397.155,299.1528128],TOWGS84[485,169.5,483.8,7.786,4.398,4.103,0]],PRIMEM["Greenwich",0.0],UNIT["Degree",0.0174532925199433]],PROJECTION["Krovak"],PARAMETER["False_Easting",0.0],PARAMETER["False_Northing",0.0],PARAMETER["Pseudo_Standard_Parallel_1",78.5],PARAMETER["Scale_Factor",0.9999],PARAMETER["Azimuth",30.28813975277778],PARAMETER["Longitude_Of_Center",24.83333333333333],PARAMETER["Latitude_Of_Center",49.5],PARAMETER["X_Scale",-1.0],PARAMETER["Y_Scale",1.0],PARAMETER["XY_Plane_Rotation",90.0],UNIT["Meter",1.0]]
```

In the above examples, you can see that the parameters differ at TOWGS84[ ].

### 49.5.1 Define a Custom Spatial Reference in CoordinateSystems.xml

If you need to create or override Essentials' existing spatial references, you can modify the `CoordinateSystems.xml` to use the well-known ID and well-known text of your coordinate system. For a typical installation, the `CoordinateSystems.xml` can be found at:

```
C:\ProgramData\Latitude Geographics\CoordinateSystems.xml
```

Open the XML with a text editor and add a `<CoordinateSystem>` element in which you define the custom coordinate system.

```
<CoordinateSystems>
  <CoordinateSystem>
    <Wkid>YOUR-WKID</Wkid>
    <Wkt>YOUR-WKT</Wkt>
  </CoordinateSystem>
</CoordinateSystems>
```

Replace `YOUR-WKID` with your spatial reference well-known ID, and `YOUR-WKT` with a well-known text definition of the spatial reference.

The custom spatial reference loads once when Essentials starts. To enable your changes, you must restart the REST API, Essentials Manager, and Core. The `CoordinateSystems.xml` and `CoordinateSystems.xsd` are not modified when you upgrade Essentials.

### 49.5.2 Override Essentials's Default Projection Library

By default, Essentials performs spatial operations using the external projection library [Proj.NET](#). Functionality such as buffering or the generation of new spatial features when extracting shapefiles require a spatial projection library like Proj.NET.

If the projection operation for the spatial reference you use is not supported by Proj.NET, you can configure Essentials to use the PROJ.4 library instead. For example, if you use the `Double_Stereographic/Oblique_Stereographic` projection that "Amersfoort RD New" (WKID 28992) uses, you need to change your projection library to PROJ.4.

You can change the projection library to PROJ.4 from the `CoordinateSystems.xml`. For a typical installation, `CoordinateSystems.xml` can be found at the following location:

C:\ProgramData\Latitude Geographics\CoordinateSystems.xml

Add the `DefaultLibrary="Proj4"` attribute to the root `<CoordinateSystems>` element:

```
<CoordinateSystems DefaultLibrary="Proj4">  
</CoordinateSystems>
```

## Appendix A: Glossary

**API (Application Programming Interface).** An interface to an application which allows other applications to communicate with it. Essentials creates an API out of your site configuration so the site's viewers can interact with the configuration. See also: [REST API](#).

**Authentication.** When Essentials is secured and a user launches a viewer, the user must sign in. Essentials uses the credentials the user enters to ensure they are a recognized user (the authentication step), and that they have permission to use the site (the authorization step).

**Authorization.** When a user launches a viewer and Essentials is secured, the user must sign in. Essentials uses the credentials the user enters to ensure they are a recognized user (the authentication step), and that they have permission to use the site (the authorization step).

**ArcGIS Server.** Software that makes it possible to create GIS services over the web for web mapping applications.

**Base 64.** A way of encoding binary data as text so that it can be transmitted over a network. If you do not encode binary data, the network protocol might misinterpret the data. The World Wide Web has many free base 64 converters.

**Basemap.** A group of map services that supplies background and contextual information. Basemaps usually contain information about features or structures that do not change often, like highways, rivers, or borders.

**Basemap service.** A map service that is included in at least one basemap.

**Cluster.** A group of computers that work together to behave like a single system. An Essentials deployment with multiple Essentials servers is a cluster. Each server in a cluster uses the same server-side configuration (sites) and client-side web applications (viewers).

**Endpoint.** See [REST Endpoint](#).

**Epoch Time.** See [Unix Time](#).

**Feature Service.** Feature services serve feature attributes, geometry, and symbology over a network. Map images are rendered on the client, not the server. Feature services support client-side editing that can be applied back to the server.

**Firewall.** A network security system that controls incoming and outgoing network traffic.

**Framework.** Software that provides generic functionality, which you can customize for different applications. For example, the HTML5 Viewer framework enables you to add HTML5 viewers that are customizable.

**GeoRSS Service.** RSS is a technology for delivering text, audio, and media over the Internet. GeoRSS services provide geographic data in RSS feeds, so the data can be plotted by web mapping applications.

**GIS (Geographic Information System).** A system that captures, analyzes, or manages data that is linked to a location on a map.

**GML (Geography Markup Language).** An XML format for geographical information, developed by the [OGC](#).

**Host Name.** A human-readable name that stands for an [IP address](#). For example, `www.geocortex.com` and `support.geocortex.com` are host names.

**Image Service.** Image services serve raster images that can be displayed by mapping applications.

**IP Address (Internet Protocol Address).** A numeric label that uniquely identifies a computer or other device connected to a network that uses Internet Protocol. For example, 192.168.1.1 is an IP address. See also: [Host Name](#).

**KML (Keyhole Markup Language).** An XML-based schema for rendering geographic markup on web maps, developed by the [OGC](#).

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**Layer.** The data in web maps is usually represented in layers, for example roads would be on a separate layer from rivers and waterways and political boundaries would be on a separate layer from national parks. A **Group Layer** is group of several layers that look and behave like a single layer.


**Map.** In the context of Geocortex Essentials, maps are web-based. Web-based maps are fundamentally different from paper-based maps in that they are both interactive and searchable. Web-based maps contain data in many forms, which can be searched and annotated.

**Map Service.** Map services render maps that can be displayed and queried by mapping applications. Map images are rendered on the server and served to the client. **Dynamic** map services render map images on demand. **Tiled** (cached) map services pre-render map images at specific scales and cache the images ("tiles"). Essentials supports both dynamic and tiled map services.

**OGC.** The Open Geospatial Consortium is an international organization that sets standards for geospatial services and content, data sharing and GIS data processing. They have issued over 30 standards including [GML](#), [KML](#), [WFS](#), [WMS](#), and [WMTS](#).

**Origin.** The protocol, host, and port that defines how a web resource is accessed. For example, if you have a viewer that is deployed to `mymaps.mydomain.com/Html5Viewer` and you use SSL and the default port, then the viewer's origin is `https://mymaps.mydomain.com`.

**Primary Service.** The bottom-most service listed on the Map page's Map Services tab in Manager. The primary service determines the map's spatial reference. The primary service also determines the map's default initial and full extent.

**QR Code (Quick Response Code).** A square bar code  used to encode web addresses. Mobile devices with an integrated camera app or scanner can read a QR code and open the web page whose address is encoded, so the user does not have to type the address.

**Regions.** Areas within a viewer's UI (in the shell or within views) in which views are displayed. Regions allow the layout of the application's UI to be updated without requiring changes to the application logic. Many common controls can be used as a region, allowing views to be automatically displayed within controls, such as a `ContentControl`, `ItemsControl`, `ListBox`, or `TabControl`. Views can be displayed within a region programmatically or automatically. Regions can be located by other components through the `RegionManager` component.

**Registration.** The act of setting up access. For example, in order for Essentials to be able to access your private ArcGIS Online content, you must register Essentials with ArcGIS Online. Minimally, registration information includes the URL to access. It may also include security information such as a user name and password.

**REST (Representational State Transfer).** An architectural style used for network applications. Communication between the Essentials server, viewers, and ArcGIS Server is done using REST.

**REST API.** A web-based, REST-compatible representation of the configuration of one or more web mapping applications. The REST API is organized as a hierarchy (a [tree](#)). Each site in an Essentials installation has a branch in the hierarchy that represents the configuration of that site. Viewers obtain configuration information by making HTTP requests to the REST API.

**REST Endpoint.** The items in a REST API's hierarchy are called "endpoints". Each endpoint represents the configuration of a particular resource or operation in the site. Each endpoint has a unique [URL](#), which enables viewers to identify individual endpoints.

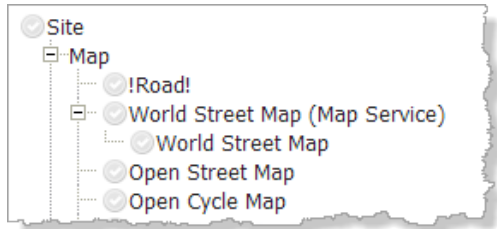
**Service.** In the context of web mapping, services are GIS resources that are located on a server and accessed over a network. Types of service include map services, feature services, and geocoding services.

**Site.** A technology-neutral configuration of a GIS application. A site's configuration is stored in XML format. Each site has its own configuration file called `Site.xml`.

**Symbology.** Conventions or rules that define how symbols represent geographic features on a map. In some applications, the size, color, or shape of a symbol is influenced by characteristics of the feature it represents. For example, symbols that represent the epicenter of an earthquake could be larger or more intensely colored the larger the magnitude of the earthquake.

**Symbolization.** The assignment of symbols to map features.

**Tree.** A hierarchy, called a "tree" because it looks like an upside-down tree when represented graphically. The items in a tree are called "nodes". In a [REST API](#), the nodes are called "endpoints". See also: [REST Endpoint](#).



**Example of a tree structure in Manager**

**Unix Time.** The number of milliseconds since the "epoch"—Jan. 1, 1970 at midnight (UTC). Unix time is a common way for software to store times internally. To convert between human-readable times and Unix time, use a converter like <http://www.epochconverter.com/>.

**URI (Uniform Resource Identifier).** A string of characters used to identify a resource on a computer or computer network. URIs enable interactions over the Internet using protocols.

**URL (Uniform Resource Locator).** A type of [URI](#). Commonly known as a **web address**.

**UTC (Coordinated Universal Time).** Closely related to Greenwich Mean Time, UTC is the primary time standard by which clocks and time are regulated. Viewed as a time zone, the United Kingdom is UTC+0, the Netherlands is UTC+01:00 (one hour ahead of UTC), and New York is UTC-05:00 (five hours behind UTC).

**UTM (Universal Transverse Mercator).** A geographic coordinate system which orients the equator north-south through the poles, providing a north-south swath with little distortion.

**Viewer.** In the context of Geocortex Essentials, viewers are the web applications that end users run to interact with a site and its map.

**WFS (Web Feature Service).** A standard for the discovery, querying of, and operations for the transformation of data, developed by the [OGC](#).

**Widget.** An interactive element that is created and controlled through scripting. Any controls that is not native to HTML, or that is greatly enhanced by scripting, is a widget. For example, sliders, fly-out menus, tree systems, and drag-and-drop controls are widgets.

**WMS (Web Map Service).** A standard for web-based maps, developed by the [OGC](#).

**WMTS (Web Map Tile Service).** A standard for implementing servers to deliver tiled maps, developed by the [OGC](#).

## Appendix B: Locations of Essentials Files and Folders

All the files and folders listed in this table are created automatically by Essentials, either when Essentials is installed, or when you configure something that requires that file or folder.

Curly brackets represent a file path. For example, {GE\_INSTALL} is the path of the Essentials installation folder.

Square brackets represent the name of the particular item. For example, in {GE\_HOME}\Sites\[site], [site] stands for the name of a particular site.

### Default File and Folder Locations

File or Folder	Shorthand	Default Location
Geocortex Essentials installation folder	{GE_INSTALL}	C:\Program Files (x86)\Latitude Geographics\Geocortex Essentials
Geocortex Essentials REST	{GE_HOME}	Unnamed instance of Essentials: {GE_INSTALL}\Default\REST Elements Named instances of Essentials: {GE_INSTALL}\[instance]\REST Elements
Sites folder	{GE_SITES}	{GE_HOME}\Sites
Tile package (TPK) files folder		{GE_SITES}\TPKs
Folder for a particular site		{GE_SITES}\[site]
Site configuration file		{GE_SITES}\[site]\Site.xml
Essentials Web.config files		{GE_HOME}\REST\Web.config {GE_HOME}\Manager\Web.config
Geocortex Core	{CORE}	C:\Program Files\Latitude Geographics\Geocortex Core
Instant Search index		{CORE}\Data
Geocortex Identity Server	{IdServer}	C:\Program Files (x86)\Latitude Geographics\Geocortex Identity Server



File or Folder	Shorthand	Default Location
Identity Server connections file		{IdServer}\Web\Configuration\Settings\connectionStrings.config
Identity Server membership provider		{IdServer}\Web\Configuration\Settings\membership.config
Identity Server role provider		{IdServer}\Web\Configuration\Settings\roleManager.config
Site cache		{GE_HOME}\REST\App_Data\SiteCache\SiteCache.xml
Global virtual directory		{GE_HOME}\Sites\VirtualDirectory
Virtual directory for a site*		{GE_SITES}\[site]\[virtual directory]
Geocortex viewers	{G_VIEWERS}	{GE_SITES}\[site]\Viewers
Viewers		{G_VIEWERS}\[viewer]
Viewer virtual directory		{G_VIEWERS}\[viewer]\VirtualDirectory
HTML5 viewer configuration files		{G_VIEWERS}\[viewer]\VirtualDirectory\Resources\Config\Default
HTML5 viewer custom images		{G_VIEWERS}\[viewer]\VirtualDirectory\Resources\Images\Custom
HTML5 viewer styles		{G_VIEWERS}\[viewer]\VirtualDirectory\Resources\Styles\Custom
HTML5 viewer language files		C:\inetpub\wwwroot\[viewer]\Resources\Locales
Silverlight viewer configuration file		{G_VIEWERS}\[viewer]\VirtualDirectory\Config\Viewer.xml
Viewer backups created by the upgrader		Unnamed instance of Essentials: {GE_INSTALL}\Default\Backups Named instances of Essentials: {GE_INSTALL}\[instance]\Backups
Resources directory		{GE_HOME}\Sites\Resources
Print templates		{GE_HOME}\Sites\Resources\PrintTemplates

File or Folder	Shorthand	Default Location
Large-format print jobs (during creation)		{GE_HOME}\Print Jobs
Workflows		{GE_HOME}\Sites\Resources\Workflows
REST settings		{GE_HOME}\Sites\RestAppSettings.xml
Documentation		{GE_HOME}\Docs
Essentials assemblies (DLL files)		{GE_HOME}\REST\bin {GE_HOME}\Manager\bin
Essentials log files		{GE_HOME}\REST\App_Data\Logs {GE_HOME}\Manager\App_Data\Logs

\* A site's virtual directory can be anywhere in the site's folder. Usually, it is a subfolder of the site's folder, as shown in the table, but it can also be more deeply nested.

## Appendix C: Essentials Logging and Log Levels

Geocortex Essentials creates two types of log: system logs and access logs. Log levels control how much information is recorded in the log files. Essentials logs the events and activities for the level configured at the application level and all the less verbose levels.

Essentials supports the following log levels:

**Off > Error > Warn > Info > Debug**

The farther to the right a level is, the more information is logged.

Log levels are configured in Manager. There are separate settings for the system and access log levels.

### **To change the log levels:**

1. In Manager, click the **Application Settings** hyperlink in the banner area.
2. Select a system log level, if desired.
3. Select an access log level, if desired.
4. Click **OK**.
5. Click **Save Site**.

The new log levels take effect immediately.

# Appendix D: Geocortex Core Ports and Firewall Access

Geocortex Core provides software services that Geocortex applications use. For example, Geocortex Core has a distributed database that Essentials Security uses for the Security Store.

The services provided by Geocortex Core make it possible to build scalable components for Geocortex software. Instant Search is one such component.

## D.1 Default Ports Used by Geocortex Core

By default, Geocortex Core's services use the TCP network ports listed in the table below. These ports must not be used by any other application on the server, or restricted in any way.



Do not expose any ports other than 80 and 443 to the Internet. Ports reserved for Core are only used internally.

### Default TCP Network Ports to Reserve for Geocortex Core

Geocortex Core Service	Ports
Geocortex Core (Internet)	80
Document Store Role and Elasticsearch/Clustering	19201 and 19300
Discovery Role (Installation)	3702
Printing	4731
Web Service Proxy	10080

You can use the information in the table below to recreate a Firewall rule that has been deleted in error:

Rule Name	Program or Port	Scope	Profiles
Geocortex Core Discovery	UDP:3702	Any computer	Domain, Private
Geocortex Core Document Store	TCP:19201	Any computer	Domain, Private
Geocortex Core Document Store	TCP:19300	Any computer	Domain, Private
Geocortex Core Web Service Proxy	TCP:10080	Any computer	Domain, Private



If your cluster is on a network that is configured to use a public profile, you need to set the above firewall rules to use a public profile as well.

## D.2 Change the Data Store's Port

The Geocortex Data Store provides document storage services for Geocortex products. It uses the Document Store role in Core. By default, the Document Store role uses port 19201 to provide HTTP access to your data. Many organizations change this port for security reasons.

If you need to change other ports besides the Data Store's port 19201, contact [Geocortex Support](#) for help.



Before you change the Document Store's 19201 port or any other port, it is your responsibility to ensure that the new port is not being used by another application.

### ▶ To change the Data Store's default port 19201:

#### Step 1: Change the Port Number

1. In Windows Explorer, locate Geocortex Core's `Geocortex.Platform.Host.exe.config` file.  
If Geocortex Core is installed in the default location, the file can be found at the following location:  
`C:\Program Files\Latitude Geographics\Geocortex Core\Bin\Geocortex.Platform.Host.exe.config`
2. Open `Geocortex.Platform.Host.exe.config` in a text or XML editor as an administrator.  
If you do not have a plain text editor, you can use Notepad, which is built into Windows.
3. In the file, locate the following line:

```
<add key="DocumentStoreUri" value="http://localhost:19201/" />
```

4. Change the value for the `DocumentStoreUri` key to include your preferred port.  
For example, if you wanted to use the port 12345, you would change the default value from `http://localhost:19201/` to `http://localhost:12345/`.
5. Save and exit the file.

#### Step 2: Update the Firewall Rule

In addition to changing the port number in the `Geocortex.Platform.Host.exe.config` file, you must manually change the firewall's inbound rule to match. During installation, Core sets up a rule for the Geocortex Core Document Store to match the software's default configured port, 19201.



You may notice a second firewall rule with the name Geocortex Core Document Store that uses the local port 19300. This rule is used specifically for clustering in multi-server environments. You do not need to modify this firewall rule to change the Data Store's port.

If you use Windows Firewall, you can use the following instructions to change the firewall's inbound rule for the Geocortex Core Document Store role.

► **To change the Windows Firewall inbound rule for the Geocortex Core Document Store role:**

1. On the server running an instance of Geocortex Core, open Windows's Control Panel.
2. Open **Windows Firewall**.
3. In the side panel, click **Advanced settings**.  
The Windows Firewall with Advanced Security window opens.
4. In the side panel, navigate to **Inbound Rules**.
5. Locate the **Name** column, find the **Geocortex Core Document Store** rule with the Local Port set to **19201**.
6. Right-click the rule and select **Properties**.
7. On the **Protocols and Ports** tab, change the **Local port** to the port number that you want to use.
8. Click **OK**.

**Step 3: Restart the Geocortex Core Server**

1. Restart the Geocortex Core server.  
The updated firewall rule takes effect.

## D.3 Firewall Access for Geocortex Core

Geocortex Core requires access through the firewall. During the Core installation process, the required rules are added to Windows Firewall.

By default, the Geocortex Data Store uses port 19201 to access your Data Store data. Many organizations prefer to change this port for security reasons. To change this port in Windows Firewall, follow the instructions in [Change the Data Store's Port on page 512](#).

If you use some other firewall besides Windows Firewall, you need to manually set the inbound firewall rules based on the rules set in Windows Firewall.

- **Override:** No
- **All Other Settings:** Any

To see the entire rules, view them in Windows Firewall.

► **To view the Windows Firewall's inbound rules:**

1. Open Windows Control Panel.
2. Click **Windows Firewall**.
3. In the side panel, click **Advanced settings**.
4. In the side panel, click **Inbound Rules**.

# Appendix E: Run Essentials Behind a Reverse Proxy

One way to make an Essentials deployment publicly available is to use a reverse proxy. In this deployment scenario, incoming requests from the Internet go to the reverse proxy. The reverse proxy forwards the request to the server that hosts Essentials. Responses from Essentials go back through the reverse proxy.



[Microsoft Application Request Routing \(ARR\)](#) works well with Geocortex Essentials.

There are two main steps to configure Essentials to run behind a reverse proxy:

1. Register the reverse proxy's URL with Essentials.  
This tells Essentials to accept requests that come from the reverse proxy.
2. Configure the REST API's external URL. (optional)  
You only need to do this if you use different internal and external URLs for your servers.



The external URL that you configure in Step 2 is used for operations that return a URL, such as reporting and printing. For example, when an end user runs a report, Essentials returns the URL to the report. The viewer displays a hyperlink to the URL, which the user clicks to download the report.







Suppose your Essentials server is `essentialserver.internal.com` and your reverse proxy is `myreverseproxy.public.com`. The URL that Essentials creates is based on `internal.com`, which the end user is not allowed to access. Configuring the external URL enables Essentials to convert the URL to the external form, `public.com`, which the user can access.

## ► To configure Essentials to run behind a reverse proxy:

### Step 1: Register the Reverse Proxy with Essentials

1. In the Post Installer, click **Configure Geocortex Essentials REST API** in the side panel.
2. Click **Hosts**.
3. In the empty text box at the bottom of the list, add the fully qualified host name for the reverse proxy, for example, `myreverseproxy.domain.com`.  
If you are not using the default port (port 80 for HTTP, port 443 for HTTPS), make sure to include the port, for example, `myreverseproxy.domain.com:7630`.
4. If the reverse proxy uses SSL, make sure that `https://` is selected in the **Type** drop-down menu.  
If the reverse proxy does not use SSL, select `http://` from the Type drop-down menu.

 If you want the reverse proxy to accept both HTTP and HTTPS, without upgrading HTTP to HTTPS, register both versions of the URL and make sure that the HTTP version is higher in the list than the HTTPS version. However, HTTPS protects data exchanged between Essentials and users and we recommend upgrading to use HTTPS. Select the  sort handle to drag an entry up or down in the list.

Type	Host[:Port]/[Path ...]	
 http://	host.domain.com	
 http://	host	
 https://	myreverseproxy.domain.com	
https://		

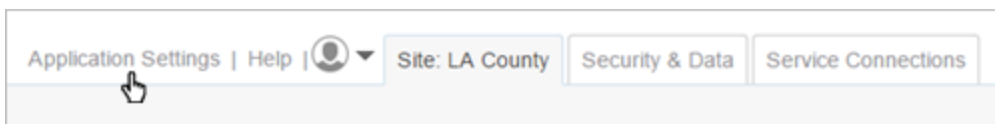
Example of a reverse proxy host name configured in the Post Installer

5. Select **OK**.
6. Select **Finish**.

## Step 2: Configure the REST API's External URL (optional)

Do this step if you use different internal and external URLs for your servers.

1. In Manager, choose the **Application Settings** from Manager's header actions at the top of the page.



Location of Application Settings hyperlink

2. In the External REST URL text box, enter the URL to the REST API's root, for example:  
`https://myreverseproxy.public.com/Geocortex/Essentials/REST`
3. Press **OK**.  
 The setting takes effect immediately.