



# Geospatial Analysis



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# Chapter 1

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## Geospatial Widget

### Topics:

- [About Geospatial Data and Patterns](#)
- [About the OPM Geospatial Widget](#)
- [Configure the OPM Geospatial Widget](#)
- [Delete a Layer from the OPM Geospatial Widget](#)
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## About Geospatial Data and Patterns

Geospatial data or spatial data is information that identifies the geographical location of features and boundaries on Earth, such as natural features like oceans, rivers, mountains, or human-constructed features. Geospatial data is information about a physical object in a map that can be represented by numerical values in a geographic coordinate system. Spatial data is stored using longitudinal and latitudinal coordinates.

Geospatial data has become an integral element in how organizations maintain their operations. Study and analysis of geospatial data enables organizations to manage their physical assets effectively. Geospatial information is essential in visualizing data and provides an advanced level of insights into different types of data. For example:

- Analyze weather patterns for local weather changes in a site
- Identify different soil types in a site by studying soil patterns
- Study traffic patterns to make logistics and transportation decisions
- Improve knowledge about the terrain surface on which a site is located

Geospatial information enables an organization to make informed and correct decisions in optimizing their operations.

## About the OPM Geospatial Widget

The Geospatial widget provides a powerful way to visualize asset information on maps by which you can derive locational intelligence of your assets.

The Geospatial widget renders your assets on a map as per the configuration of the relative performance index, which is based on asset criticality, alerts, and open cases. The widget automatically plots the asset on the map using the geographical location information of the assets.

Using the widget, you can configure (that is, by specifying the URL or the link to the specific type of map) custom layers that depict spatial patterns on the map. This helps you explore and analyze asset information, to identify relationships and patterns in your data. You can also load a simplified map of your plant and the widget will plot the assets on it, enabling you to make better and more informed decisions on the logistics planning in your plants.

**Note:** The widget will plot an asset on the map only if the asset has its location information: longitude and latitude coordinates.

**Tip:** You can access the location information in the **Location Information** section of the asset instance view.

You can perform the following tasks using the Geospatial widget:

- Configure multiple custom layers based on how you want to analyze the assets. For example, you can configure a layer to depict the climate zones in the location, another layer for different soil types, and so on.
- Configure and create multiple asset layers by selecting and classifying the assets. Set the priority in which different layers on the map are rendered.
- Order the layers as needed, and choose if you want to display or hide a layer.
- View and monitor the assets.

You can select the Map Service that is used to provide the geographical background for the widget. The map rendered by the Map Service is called the basemap. You can view the map in one of the following views:

- **Road View:** In this view, the roads in the location are outlined on the map.
- **Satellite View:** In this view, the satellite image of the location, overlaid with the outlines of roads, appears on the map.

Based on the type of analysis you want to perform, you can create custom layers that overlay the basemap. To create these layers, you can create and save geographic data for the layer in a geographic data serving format, and provide the URL in the widget.

## Configure the OPM Geospatial Widget



### Before You Begin

- Configure geolocation information for the assets that you want to plot on the map.
- Create geographic data for the custom layer in one of the following geographic data formats:
  - Web Map Service (WMS)
  - Web Map Tile Service (WMTS)
  - Web Feature Service (WFS)
  - GeoJSON format

### About This Task

This topic describes how to add the Geospatial widget to the dashboard of a segment, and then configure the widget with the asset layers.

### Procedure

1. Access the card for the segment for which you want to add the widget.
2. In the card, select , and then select **Edit Card**.  
In the card, the **Add Widget** button appears.
3. Select **Add Widget**.  
The widget library appears, displaying a list of widgets.
4. Navigate to the OPM Geospatial Widget, and then select **Add**.  
The widget is added to the card.
5. In the widget, select .  
The **Configure Widget** page appears, displaying the map and the options for configuring the widget.
6. If you want to change the title for the widget, in the **Title** box, delete the existing title, and then enter a title for the widget.
7. Set the Refresh Rate for the widget as needed, at the following intervals:

Refresh Rate	Description
<b>1 Minute</b>	Widget is refreshed after an interval of 1 minute.
<b>5 Minutes</b>	Widget is refreshed after an interval of 5 minutes.
<b>10 Minutes</b>	Widget is refreshed after an interval of 10 minutes.
<b>Off</b>	Widget is not automatically refreshed.

8. In the **Map Layer** section, enter values in the following fields:

Field	Description
<b>Map Service</b>	You can select a value from the following options: <ul style="list-style-type: none"> <li>• <b>BingMap</b></li> <li>• <b>GoogleMap</b></li> </ul>
<b>Road View</b>	You can switch the toggle to enable or disable Road View on the map. When you enable the Road View, the Satellite View is automatically disabled.
<b>Satellite View</b>	This is the default view for the widget. You can switch the toggle to enable or disable Satellite View on the map. When you enable the Satellite View, the Road View is automatically disabled.

9. If you want to add a custom layer, perform the following steps:

- Next to the heading **Custom Layers**, select **+**.  
A section for configuring the new custom layer appears.
- As needed, enter values in the following fields, and then select **Save**.

Field	Description
<b>Type</b>	Select a value from the following geographic data format options: <ul style="list-style-type: none"> <li>• <b>WMS</b></li> <li>• <b>WMTS</b></li> <li>• <b>WFS</b></li> <li>• <b>GeoJSON</b></li> </ul>
<b>Layer Sequence</b>	Enter or select a positive number to indicate the sequence in which the layer will appear on the map. You must specify a unique number for each custom layer that you create.  A layer with a lower number in this box overlays all other layers with a higher layer sequence. For example, a layer that has a value of 1 in this box overlays all other layers with higher layer sequence. If you do not specify a value in this box, the layer appears below other custom layers that have an associated layer sequence.
<b>Title</b>	Enter a title for the layer.
<b>Data Source</b>	Specify the URL containing the geographic data for the custom layer.  <b>Important:</b> For the custom layer to be rendered correctly, you must ensure that the URL containing the geographic data is configured as per the specification for the selected format.

The custom layer appears on the map. In the section for configuring the layer, the **Visibility** toggle appears. You can switch the toggle to display or hide the layer on the map. By default, the layer is visible on the map.

10. For each custom layer that you want to add, repeat step 9.

11. If you want to add an asset layer, perform the following steps:

- Next to the heading **Asset Layer**, select **+**.  
In the pane, a section for configuring the new asset layer appears.
- Select the assets that you want to include in the layer.



c) As needed, in the section for configuring the layer, enter values in the following fields:

Field	Description
<b>Layer Sequence</b>	Enter or select a positive number to indicate the sequence in which the layer will appear on the map. You must specify a unique number for each asset layer that you create.  A layer with a lower number in this box overlays all other layers with a higher layer sequence. For example, a layer that has a value of 1 in this box overlays all other layer with higher layer sequence. If you do not specify a value in this box, the layer appears below other asset layers that have an associated layer sequence.
<b>Title</b>	Enter a title for the layer.

12. Select the search box.

A drop-down list box appears, displaying the list of assets associated with the selected segment.

Assets that do not have a geolocation do not appear in the list. A check box appears next to each asset in the list. By default, all the assets are selected.

13. Select the assets that you want to associate with the asset layer, and then, in the asset layer settings section, select **Save**.

**Note:** Each asset can be associated with only one asset layer. The assets that are already associated with a layer are not available for selection in the search results when you create additional asset layers.

The asset layer appears on the map, displaying markers for each asset that you selected in the layer.

In the section for configuring the layer, the **Visibility** toggle appears. You can switch the toggle to display or hide the layer on the map. By default, the layer is visible on the map. In place of the search box, the list of assets you selected appears in a list box. After you save the asset layer, you cannot modify the list of assets that belong to the layer.

14. For each asset layer that you want to add, repeat steps 11 through 13.

The assets in each asset layer are plotted using markers of a [unique color](#).

**Note:** The asset layers are rendered above the custom layers.

**Tip:** When you add multiple Geospatial widgets to the same custom card, for better data visibility, add each widget in a different row on the custom card.

15. In the **Configure Widget** page, select **Done**.

The card to which you added the widget appears, displaying the map based on the configuration of layers.

16. In the card, select **Save**.

The configuration for the widget is saved.




## Delete a Layer from the OPM Geospatial Widget

### About This Task

You can delete a custom layer or an asset layer from the Geospatial widget.

### Procedure


1. Access the Geospatial widget from which you want to delete a layer.

2. In the widget, select  .  
The **Configure Widget** page appears, displaying the map and the options for configuring the widget.
3. If you want to delete a custom layer, in the section for the custom layer that you want to delete, select  .  
The custom layer is deleted. The layer is removed from the map.
4. If you want to delete an asset layer, in the section for the asset layer that you want to delete, select  .  
The asset layer is deleted. The assets are removed from the map. When you create a new asset layer, the assets that belonged to the layer which you deleted are available for selection in the new layer.
5. In the **Configure Widget** page, select **Done**.  
The card to which you added the widget appears, displaying the map based on the configuration of layers.
6. In the card, select **Save**.  
The changes to the widget configuration are saved.



## Access the OPM Geospatial Widget

You can access and use the widget to visually explore and analyze the asset conditions in the site, after the Geospatial widget has been configured according to the requirements.

### Procedure

1. In the module navigation menu, select **Dashboards**.  
The **Dashboards** page appears.
2. Select the **All Dashboards** tab.  
All the available dashboards appear.
3. Select the dashboard where the Geospatial widget has been configured and added.  
**Tip:** You can add this dashboard to your favorites by selecting  . Recently opened dashboards are available in the **Recently Opened** section.
4. Use the context browser to navigate to the site for which the Geospatial widget has been configured, and then select **Open**.  
The widget renders the assets and plots them on the map using the geospatial data. The assets are grouped together using spatial patterns.

**Note:** You can perform the following tasks in the map:

- You can select a marker to view the name of an asset plotted on the map.
- When you select a marker on the map, a tooltip appears, displaying the number of alerts and cases for the asset. You can select the link in the **Alerts** or **Cases** column, to access the **Alerts** page or the **Cases** page, respectively. You can view more details on the alerts and cases of the specific asset in the **Alerts** or the **Cases** pages.
- You can select  or  to zoom in or zoom out of the map, respectively. When you zoom out of a geographic location in the map, the assets are grouped together into clusters. Instead of multiple markers, a single disc-shaped marker appears. On the disc-shaped marker, the colors to which each asset in the cluster belongs appear.

## Color Codes used in the OPM Geospatial Widget

The Geospatial widget allows you to visually ascertain the asset conditions in a site, by using unique colors for various asset conditions like number of open cases, asset status and criticality, and different priority levels of the alerts.

### Asset Criticality and Alert Priority Conditions

Each marker on the global map represents a site in your organization and appears in one of the following colors based on the asset conditions in the site. Using the widget, you can find out the following:

- Asset status
- Asset criticality
- Recent alerts (opened in last twenty-four hours) and their priority
- Open cases and their criticality

### Asset Color Codes

The assets are classified into different colors based on the following business logic:

Color	Asset Conditions
Red	The asset appears in red when one of the following asset conditions are met: <ul style="list-style-type: none"><li>• A highly critical active asset, with two high priority alerts opened in the last twenty-four hours</li><li>• At least one high critical case pending resolution for the asset</li></ul>
Orange	The asset appears in orange when one of the following asset conditions are met: <ul style="list-style-type: none"><li>• A medium to highly critical active asset, with one high and one medium priority alert opened in the last twenty-four hours</li><li>• At least one medium critical case pending resolution for the asset</li></ul>
Blue	The asset appears in blue when one of the following asset conditions are met: <ul style="list-style-type: none"><li>• A low to highly critical active asset, with no high or medium priority alert opened in the last twenty-four hours</li><li>• No high and medium cases in open state for the asset</li><li>• No alerts or cases for the asset</li></ul>
Gray	The asset appears in gray when the asset is offline or asset data is not available