



Working with Maps

Maps provide a summary view of all your managed systems on campuses, buildings, outdoor areas, and floors.

This chapter contains the following sections:

- [About Maps, page 1](#)
- [Adding a Campus Map, page 7](#)
- [Configuring Buildings, page 7](#)
- [Adding Floor Areas, page 12](#)
- [Monitoring the Floor Area, page 30](#)
- [Using the Automatic Hierarchy to Create Maps, page 33](#)
- [Using the Map Editor, page 36](#)
- [Using Chokepoints to Enhance Tag Location Reporting, page 42](#)

About Maps

The Next Generation Maps feature is enabled by default.

The Next Generation Maps feature provides you the following benefits:

- Displays large amount of information on the map. When you have various clients, interferers, and access points, they may clutter the display on the Prime Infrastructure map pages and sometimes pages load slowly. The Release 7.3 introduces clustering and layering of information. Information cluster reduces clutter at the high level and reveals more information when you click an object. For details, see the [Monitoring the Floor Area, on page 30](#).
- Simplifies and accelerates the process of adding APs to the map. In the legacy maps, the process of adding access points to maps was manual and tedious. With Release 7.3, you can use the automated hierarchy creation to add and name the access points. For details, see the [Using the Automatic Hierarchy to Create Maps, on page 33](#).
- Provides high quality map images with easy navigation and zoom/pan controls. In the legacy maps, the map image quality was low and the navigating, zooming, and panning was slow. With Release 7.3, you can use the next-generation tile-aware map engine to load maps faster and zoom/pan easily. The Next

Generation Maps enables you to load high resolution maps faster and navigate around the map easily. For details, see the [Planning and Zooming with Next Generation Maps](#).

This section contains the following topics:

- [Adding a Building to a Campus Map](#), on page 2
- [Adding Floor Areas](#), on page 3

Adding a Building to a Campus Map

To add a building to a campus map in the Prime Infrastructure database, follow these steps:

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- Step 1** Choose **Design > Site Maps** to display the Maps page.
- Step 2** Click the desired campus. The Site Maps > Campus Name page appears.
- Step 3** From the Select a command drop-down list, choose **New Building**, and click **Go**.
- Step 4** In the Campus Name > New Building page, follow these steps to create a virtual building in which you can organize related floor plan maps:
- 1 Enter the building name.
 - 2 Enter the building contact name.
 - 3 Enter the number of floors and basements.
 - 4 Enter the horizontal position (distance from the corner of the building rectangle to the left edge of the campus map) and the vertical position (distance from the corner of the building rectangle to the top edge of the campus map) in feet.

Note To change the unit of measurement (feet or meters), choose **Design > Site Maps**, and choose **Properties** from the Select a command drop-down list.
 - 5 Enter an approximate building horizontal span and vertical span (width and depth on the map) in feet.

Note The horizontal and vertical span should be larger than or the same size as any floors that you might add later.

Tip You can also use **Ctrl-click** to resize the bounding area in the upper-left corner of the campus map. As you change the size of the bounding area, the horizontal span and the vertical span parameters of the building change to match your actions.
 - 6 Click **Place** to put the building on the campus map. The Prime Infrastructure creates a building rectangle scaled to the size of the campus map.
 - 7 Click the building rectangle and drag it to the desired position on the campus map.

Note After adding a new building, you can move it from one campus to another without having to recreate it.
 - 8 Click **Save** to save this building and its campus location to the database. The Prime Infrastructure saves the building name in the rectangle on the campus map.

Note A hyperlink associated with the building takes you to the corresponding Map page.
- Step 5** (Optional) To assign location presence information for the new outdoor area, do the following:

- 1 Choose **Edit Location Presence Info** from the Select a command drop-down list. Click **Go**. The Location Presence page appears.
- 2 Click the **Civic Address** or **Advanced** tab.
 - Civic Address identifies the campus by name, street, house number, house number suffix, city (address line2), state, postal code, and country.
 - Advanced identifies the campus with expanded civic information such as neighborhood, city division, country, and postal community name.

Note Each selected field is inclusive of all of those above it. For example, if you choose Advanced, it can also provide civic location information upon client demand. The selected setting must match what is set on the location server level (Services > Mobility Services).
- 3 By default, the Override Child's Presence Information check box is selected. There is no need to alter this setting for standalone buildings.

Step 6 Click **Save**.

Adding Floor Areas

This section describes how to add floor plans to either a campus building or a standalone building in the Prime Infrastructure database.

This section contains the following topics:

- [Adding Floor Areas to a Campus Building](#)
- [Adding Floor Plans to a Standalone Building](#)
- [Configuring Floor Settings, on page 16](#)
- [Import Map and AP Location Data, on page 29](#)

Adding Floor Areas to a Campus Building



Note Use the zoom controls at the top of the campus image to enlarge or decrease the size of the map view and to hide or show the map grid (which displays the map size in feet or meters).

To add a floor area to a campus building, follow these steps:

Step 1 Save your plan maps in .PNG, .JPG, .JPEG, or .GIF format.

Note The maps can be of any size because Prime Infrastructure automatically resizes the maps to fit the workspace.

Note If there are problems converting the auto-cad file, an error message is displayed. The Prime Infrastructure uses a native image conversion library to convert auto-cad files into raster formats like .png. If the native library cannot be loaded, the Prime Infrastructure displays an “unable to convert the auto-cad file” message. If you receive this error, make sure all the required dependencies are met for the native library. To find any dependency problems, use ldd on Linux platforms. The following DLLs must be present under the /webnms/rfdlls Prime Infrastructure installation directory: LIBGFL254.DLL, MFC71.DLL, MSVCR71.DLL, and MSVCP71.DLL. If dependency problems occurs, you have to install the required libraries and restart Prime Infrastructure.

Note The floor map image is enhanced for zooming and panning. The floor image is not visible completely until this operation is complete. You can zoom in and out to view the complete map image. For example, if you have a high resolution image (near 181 megapixels) whose size is approximately 60 megabytes, it may take two minutes to appear on the map.

Step 2 Choose **Design > Site Maps**.

Step 3 From the Maps Tree View or the Design > Site Maps list, choose the applicable campus building to open the Building View page.

Step 4 Hover your mouse cursor over the name within an existing building rectangle to highlight it.

Note You can also access the building from the Campus View page. In the Campus View page, click the building name to open the Building View page.

Step 5 From the Select a command drop-down list, choose **New Floor Area**.

Step 6 Click **Go**. The New Floor Area page appears.

Step 7 In the New Floor Area page, follow these steps to add floors to a building in which to organize related floor plan maps:

1 Enter the floor area and contact names.

2 Choose the floor or basement number from the Floor drop-down list.

3 Choose the floor or basement type (RF Model).

4 Enter the floor-to-floor height in feet.

Note To change the unit of measurement (feet or meters), choose **Design > Site Maps**, and choose **Properties** from the Select a command drop-down list.

5 Select the **Image or CAD File** check box.

6 Browse to and choose the desired floor or basement image or CAD filename, and click **Open**.

Note If you are importing a CAD file, use the Convert CAD File drop-down list to determine the image file for conversion.

Tip We do not recommend a .JPEG (.JPG) format for an auto-cad conversion. Unless a JPEG is specifically required, use .PNG or .GIF format for higher quality images.

7 Click **Next**. At this point, if a CAF file was specified, a default image preview is generated and loaded.

Note The Prime Infrastructure uses a native image conversion library to convert auto-cad files into raster formats like .PNG. When there are issues loading the native library, Prime Infrastructure displays the following error: "Unable to convert the auto-cad file. Reason: Error while loading the auto-cad image conversion library." For more information see Prime Infrastructure online help or Prime Infrastructure documentation.

The names of the CAD file layers are listed with check boxes to the right side of the image indicating which are enabled.

Note When you choose the floor or basement image filename, the Prime Infrastructure displays the image in the building-sized grid.

Note The maps can be of any size because the Prime Infrastructure automatically resizes the maps to fit the workspace.

Note The map must be saved in .PNG, .JPG, .JPEG, or .GIF format.

- 8 If you have CAD file layers, you can select or deselect as many as you want and click **Preview** to view an updated image. Click **Next** when you are ready to proceed with the selected layers.

Enter the remaining parameters for the floor area.

- 9 Either leave the **Maintain Aspect Ratio** check box selected to preserve the original image aspect ratio or unselect the check box to change the image aspect ratio.

- 10 Enter an approximate floor or basement horizontal and vertical span (width and depth on the map) in feet.

Note The horizontal and vertical spans should be smaller than or the same size as the building horizontal and vertical spans in the Prime Infrastructure database.

- 11 If applicable, enter the horizontal position (distance from the corner of the outdoor area rectangle to the left edge of the campus map) and vertical position (distance from the corner of the outdoor area rectangle to the top edge of the campus map) in feet or meters.

Tip Use **Ctrl-click** to resize the image within the building-sized grid.

- 12 If desired, select the **Launch Map Editor after floor creation** check box to rescale the floor and draw walls.

- 13 Click **OK** to save this floor plan to the database. The floor is added to the Maps Tree View and the Design > Site Maps list.

Note Use different floor names in each building. If you are adding more than one building to the campus map, do not use a floor name that exists in another building. This overlap causes incorrect mapping information between a floor and a building.

- 14 Click any of the floor or basement images to view the floor plan or basement map.

Note You can zoom in or out to view the map at different sizes and you can add access points.

Adding Floor Plans to a Standalone Building

To add floor plans to a standalone building, follow these steps:

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- Step 1** Save your floor plan maps in .PNG, .JPG, or .GIF format.
- Note** The maps can be of any size because the Prime Infrastructure automatically resizes the maps to fit the workspace.
- Step 2** Browse to and import the floor plan maps from anywhere in your file system. You can import CAD files in DXF or DWG formats or any of the formats you created in Step 1.
- Note** If there are problems converting the auto-cad file, an error message is displayed. The Prime Infrastructure uses a native image conversion library to convert auto-cad files into raster formats like .PNG. If the native library cannot be loaded, the Prime Infrastructure displays an “unable to convert the auto-cad file” message. If you receive this error, make sure all the required dependencies are met for the native library. To find any dependency problems, use ldd on Linux platforms. The following DLLs must be present under the /webnms/rfdlls the Prime Infrastructure installation directory: LIBGFL254.DLL, MFC71.DLL, MSVCR71.DLL, and MSVCP71.DLL. If dependency problems occurs, you must install the required libraries and restart the Prime Infrastructure.

Step 3 Choose **Design > Site Maps**.

Step 4 From the Maps Tree View or the Design > Site Maps left sidebar menu, choose the desired building to display the Building View page.

Step 5 From the Select a command drop-down list, choose **New Floor Area**.

Step 6 Click **Go**.

Step 7 In the New Floor Area page, add the following information:

- Enter the floor area and contact names.
- Choose the floor or basement number from the Floor drop-down list.
- Choose the floor or basement type (RF Model).
- Enter the floor-to-floor height in feet
- Select the **Image or CAD File** check box.
- Browse to and choose the desired floor or basement Image or CAD file, and click **Open**.

Note If you are importing a CAD file, use the Convert CAD File drop-down list to determine the image file for conversion.

Tip A .JPEG (.JPG) format is not recommended for an auto-cad conversion. Unless a .JPEG is specifically required, use a .PNG or .GIF format for higher quality images.

Step 8 Click **Next**. At this point, if a CAD file was specified, a default image preview is generated and loaded.

Note The Prime Infrastructure uses a native image conversion library to convert auto-cad files into raster formats like .PNG. When there are issues loading the native library, the Prime Infrastructure displays the following error: “Unable to convert the auto-cad file. Reason: Error while loading the auto-cad image conversion library. For more information, see the Prime Infrastructure online help or the Prime Infrastructure documentation”.

The names of the CAD file layers are listed with check boxes to the right side of the image indicating which are enabled.

Note When you choose the floor or basement image filename, the Prime Infrastructure displays the image in the building-sized grid.

Note The maps can be any size because the Prime Infrastructure automatically resizes the maps to fit the workspace.

Note The map must be saved in .PNG, .JPG, .JPEG, or .GIF format.

If you have CAD file layers, you can select or deselect as many as you want and click **Preview** to view an updated image. Click **Next** when you are ready to proceed with the selected layers.

Step 9 Enter the remaining parameters for the floor area.

- Either leave the **Maintain Aspect Ratio** check box selected to preserve the original image aspect ratio or unselect the check box to change the image aspect ratio
- Enter an approximate floor or basement horizontal and vertical span (width and depth on the map) in feet.
 - Note** The horizontal and vertical spans should be smaller than or the same size as the building horizontal and vertical spans in the Prime Infrastructure Prime Infrastructure database.
- If applicable, enter the horizontal position (distance from the corner of the outdoor area rectangle to the left edge of the campus map) and vertical position (distance from the corner of the outdoor area rectangle to the top edge of the campus map) in feet or meters.
 - Note** Use **Ctrl-click** to resize the image within the building-sized grid.

- Adjust the floor characteristics with the Prime Infrastructure map editor by selecting the check box next to Launch Map Editor. See the “Using the Map Editor” section on page 10-17 for more information regarding the map editor feature.

- Step 10** Click **OK** to save this floor plan to the database. The floor is added to the Maps Tree View and the Design > Site Maps list.
- Step 11** Click any of the floor or basement images to view the floor plan or basement map.
- Note** You can zoom in or out to view the map at different sizes and you can add access points.
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Adding a Campus Map

To add a single campus map to the Prime Infrastructure database, follow these steps:

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- Step 1** Save the map in .PNG, .JPG, .JPEG, or .GIF format.
- Note** The map can be of any size because the Prime Infrastructure automatically resizes the map to fit the working areas.
- Step 2** Browse to and import the map from anywhere in your file system.
- Step 3** Choose **Design > Site Maps** to display the Maps page.
- Step 4** From the Select a command drop-down list, choose **New Campus**, and click **Go**.
- Step 5** In the Maps > New Campus page, enter the campus name and campus contact name.
- Step 6** Browse to and choose the image filename containing the map of the campus, and click **Open**.
- Step 7** Select the **Maintain Aspect Ratio** check box to prevent length and width distortion when the Prime Infrastructure resizes the map.
- Step 8** Enter the horizontal and vertical span of the map in feet.
- Note** To change the unit of measurement (feet or meters), choose **Design > Site Maps** and choose **Properties** from the Select a command drop-down list. The horizontal and vertical span should be larger than any building or floor plan to be added to the campus.
- Step 9** Click **OK** to add this campus map to the Prime Infrastructure database. The Prime Infrastructure displays the Maps page, which lists maps in the database, map types, and campus status.
- Step 10** (Optional) To assign location presence information, click the newly created campus link in the Design > Site Maps page.
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Configuring Buildings

You can add buildings to the Prime Infrastructure database regardless of whether you have added campus maps to the database. This section describes how to add a building to a campus map or a standalone building (one that is not part of a campus) to the Prime Infrastructure database.

This section contains the following topics:

- [Adding a Building to a Campus Map](#)
- [Viewing a Building, on page 10](#)
- [Editing a Building, on page 11](#)
- [Deleting a Building, on page 11](#)
- [Moving a Building, on page 12](#)

Adding a Building to a Campus Map

To add a building to a campus map in the NCS database, follow these steps:

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- Step 1** Choose **Monitor > Site Maps** to display the Maps page.
- Step 2** Click the desired campus. The Site Maps > Campus Name page appears.
- Step 3** From the Select a command drop-down list, choose New Building, and click **Go**.
- Step 4** In the Campus Name > New Building page, follow these steps to create a virtual building in which to organize related floor plan maps:
- a) Enter the building name.
 - b) Enter the building contact name.
 - c) Enter the number of floors and basements.
 - d) Enter the horizontal position (distance from the corner of the building rectangle to the left edge of the campus map) and the vertical position (distance from the corner of the building rectangle to the top edge of the campus map) in feet.

Note To change the unit of measurement (feet or meters), choose Monitor > Site Maps, and choose Properties from the Select a command drop-down list.
 - e) Enter an approximate building horizontal span and vertical span (width and depth on the map) in feet.

Note The horizontal and vertical span should be larger than or the same size as any floors that you might add later.

Tip You can also use Ctrl-click to resize the bounding area in the upper-left corner of the campus map. As you change the size of the bounding area, the Horizontal Span and Vertical Span parameters of the building change to match your actions.
 - f) Click **Place** to put the building on the campus map. The NCS creates a building rectangle scaled to the size of the campus map.
 - g) Click the building rectangle and drag it to the desired position on the campus map.

Note After adding a new building, you can move it from one campus to another without having to recreate it.
 - h) Click **Save** to save this building and its campus location to the database. The NCS saves the building name in the building rectangle on the campus map.

Note A hyperlink associated with the building takes you to the corresponding Map page.
- Step 5** (*Optional*) To assign location presence information for the new outdoor area, do the following:
- a) Choose **Edit Location Presence Info** from the Select a command drop-down list. Click **Go**. The Location Presence page appears.

Note By default, the Presence Info check box of the Override Child Element is selected. This option should remain selected if you want to propagate the campus location to all buildings and floors on that campus. When adding buildings to the campus map, you can import the campus location information. The campus address cannot be imported to a building if the check box is unselected. This option should be unselected if you want to assign building-specific addresses to buildings on its campus rather than one campus address to all.

b) Click the **Civic Address**, **GPS Markers**, or **Advanced** tab.

- Civic Address identifies the campus by name, street, house number, house number suffix, city (address line2), state, postal code, and country.
- GPS Markers identify the campus by longitude and latitude.
- Advanced identifies the campus with expanded civic information such as neighborhood, city division, country, and postal community name.

Note Each selected field is inclusive of all of those above it. For example, if you choose Advanced, it can also provide GPS and Civic location information upon client demand. The selected setting must match what is set on the location server level (Services > Mobility Services).

Note If a client requests location information such as GPS Markers for a campus, building, floor, or outdoor area that is not configured for that field, an error message is returned.

c) By default, the **Override Child's Presence Information** check box is selected. There is no need to alter this setting for standalone buildings.

Step 6 Click **Save**.

Adding a Standalone Building

To add a standalone building to the Prime Infrastructure database, follow these steps:

Step 1 Choose **Monitor > Site Maps** to display the Maps page.

Step 2 From the Select a command drop-down list, choose **New Building**, and click **Go**

Step 3 In the Maps > New Building page, follow these steps to create a virtual building in which to organize related floor plan maps:

a) Enter the building name.

b) Enter the building contact name.

Note After adding a new building, you can move it from one campus to another without having to recreate it.

c) Enter the number of floors and basements.

d) Enter an approximate building horizontal span and vertical span (width and depth on the map) in feet.

Note To change the unit of measurement (feet or meters), choose **Monitor > Site Maps**, and choose **Properties** from the Select a command drop-down list.

Note The horizontal and vertical span should be larger than or the same size as any floors that you might add later.

e) Click OK to save this building to the database.

Step 4

(Optional) To assign location presence information for the new building, do the following:

- a) Choose **Location Presence** from the Select a command drop-down list. Click **Go**. The Location Presence page appears.
 - b) Click the **Civic**, **GPS Markers**, or **Advanced** tab.
 - Civic Address identifies the campus by name, street, house number, house number suffix, city (address line2), state, postal code, and country.
 - GPS Markers identify the campus by longitude and latitude.
 - Advanced identifies the campus with expanded civic information such as neighborhood, city division, county, and postal community name.
- Note** Each selected field is inclusive of all of those above it. For example, if you select Advanced, it can also provide GPS and Civic location information upon client demand. The selected setting must match what is set on the location server level (Services > Mobility Services).
- Note** If a client requests location information such as GPS Markers for a campus, building, floor, or outdoor area that is not configured for that field, an error message is returned.
- c) By default, the Presence Info check box of the Override Child Element is selected. This option should remain selected if you want to propagate the campus location to all buildings and floors on that campus. When adding buildings to the campus map, you can import the location information. The campus address cannot be imported to a building if the check box is unselected. This option should be deselected if you want to assign building-specific addresses to buildings on its campus rather than one campus address to all.

Step 5

Click **Save**.

Note The standalone buildings are automatically placed in System Campus.

Viewing a Building

To view a current building map, follow these steps:

Step 1

Choose **Monitor > Site Maps**.

Step 2

Click the name of the building map to open its details page. The Building View page provides a list of floor maps and map details for each floor.

Note From the Building View page, you can click the Floor column heading to sort the list ascending or descending by floor.

The map details include the following:

- Floor area
- Floor index—Indicates the floor level. A negative number indicates a basement floor level.
- Contact
- Status—Indicates the most serious level of alarm on an access point located on this map or one of its children.

- Number of total access points located on the map.
- Number of 802.11a/n and 802.11b/g/n radios located on the map.
- Number of out of service (OOS) radios.
- Number of clients—Click the number link to view the Monitor > Clients page.

Step 3 The Select a command drop-down list provides the following options:

- New Floor Area—See the [Adding a Building to a Campus Map](#) for more information.
 - Edit Building—See the [Editing a Building, on page 11](#) for more information.
 - Delete Building—See the [Deleting a Building, on page 11](#) for more information.
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Editing a Building

To edit a current building map, follow these steps:

Step 1 Choose **Monitor > Site Maps**.

Step 2 Click the name of the building map to open its details page.

Step 3 From the Select a command drop-down list, choose **Edit Building**.

Step 4 Make any necessary changes to Building Name, Contact, Number of Floors, Number of Basements, and Dimensions (feet).

Note To change the unit of measurement (feet or meters), choose **Monitor > Site Maps**, and choose **Properties** from the Select a command drop-down list.

Step 5 Click **OK**.

Deleting a Building

To delete a current building map, follow these steps:

Step 1 Choose **Monitor > Site Maps**.

Step 2 Select the check box for the building that you want to delete.

Step 3 Click **Delete** at the bottom of the map list (or choose **Delete Maps** from the Select a command drop-down list, and click **Go**).

Step 4 Click **OK** to confirm the deletion.

Note Deleting a building also deletes all of its container maps. The access points from all deleted maps are moved to an Unassigned state.

Moving a Building

To move a building to a different campus, follow these steps:

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- Step 1** Choose **Monitor > Site Maps**.
 - Step 2** Select the check box of the applicable building.
 - Step 3** From the Select a command drop-down list, choose **Move Buildings**.
 - Step 4** Click **Go**.
 - Step 5** Choose the **Target Campus** from the drop-down list.
 - Step 6** Select the buildings that you want to move. Unselect any buildings that remain in their current location.
 - Step 7** Click **OK**.
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Adding Floor Areas

This section describes how to add floor plans to either a campus building or a standalone building in the Prime Infrastructure database.

This section contains the following topics:

- [Adding Floor Areas to a Campus Building](#)
- [Adding Floor Plans to a Standalone Building](#)
- [Configuring Floor Settings](#), on page 16
- [Import Map and AP Location Data](#), on page 29

Adding Floor Areas to a Campus Building



Note Use the zoom controls at the top of the campus image to enlarge or decrease the size of the map view and to hide or show the map grid (which displays the map size in feet or meters).

To add a floor area to a campus building, follow these steps:

-
- Step 1** Save your plan maps in .PNG, .JPG, .JPEG, or .GIF format.
Note The maps can be of any size because Prime Infrastructure automatically resizes the maps to fit the workspace.

Note If there are problems converting the auto-cad file, an error message is displayed. The Prime Infrastructure uses a native image conversion library to convert auto-cad files into raster formats like .png. If the native library cannot be loaded, the Prime Infrastructure displays an “unable to convert the auto-cad file” message. If you receive this error, make sure all the required dependencies are met for the native library. To find any dependency problems, use ldd on Linux platforms. The following DLLs must be present under the /webnms/rfdlls Prime Infrastructure installation directory: LIBGFL254.DLL, MFC71.DLL, MSVCR71.DLL, and MSVCP71.DLL. If dependency problems occurs, you have to install the required libraries and restart Prime Infrastructure.

Note The floor map image is enhanced for zooming and panning. The floor image is not visible completely until this operation is complete. You can zoom in and out to view the complete map image. For example, if you have a high resolution image (near 181 megapixels) whose size is approximately 60 megabytes, it may take two minutes to appear on the map.

Step 2 Choose **Design > Site Maps**.

Step 3 From the Maps Tree View or the Design > Site Maps list, choose the applicable campus building to open the Building View page.

Step 4 Hover your mouse cursor over the name within an existing building rectangle to highlight it.

Note You can also access the building from the Campus View page. In the Campus View page, click the building name to open the Building View page.

Step 5 From the Select a command drop-down list, choose **New Floor Area**.

Step 6 Click **Go**. The New Floor Area page appears.

Step 7 In the New Floor Area page, follow these steps to add floors to a building in which to organize related floor plan maps:

1 Enter the floor area and contact names.

2 Choose the floor or basement number from the Floor drop-down list.

3 Choose the floor or basement type (RF Model).

4 Enter the floor-to-floor height in feet.

Note To change the unit of measurement (feet or meters), choose **Design > Site Maps**, and choose **Properties** from the Select a command drop-down list.

5 Select the **Image or CAD File** check box.

6 Browse to and choose the desired floor or basement image or CAD filename, and click **Open**.

Note If you are importing a CAD file, use the Convert CAD File drop-down list to determine the image file for conversion.

Tip We do not recommend a .JPEG (.JPG) format for an auto-cad conversion. Unless a JPEG is specifically required, use .PNG or .GIF format for higher quality images.

7 Click **Next**. At this point, if a CAF file was specified, a default image preview is generated and loaded.

Note The Prime Infrastructure uses a native image conversion library to convert auto-cad files into raster formats like .PNG. When there are issues loading the native library, Prime Infrastructure displays the following error: "Unable to convert the auto-cad file. Reason: Error while loading the auto-cad image conversion library." For more information see Prime Infrastructure online help or Prime Infrastructure documentation.

The names of the CAD file layers are listed with check boxes to the right side of the image indicating which are enabled.

Note When you choose the floor or basement image filename, the Prime Infrastructure displays the image in the building-sized grid.

Note The maps can be of any size because the Prime Infrastructure automatically resizes the maps to fit the workspace.

- Note** The map must be saved in .PNG, .JPG, .JPEG, or .GIF format.
- 8 If you have CAD file layers, you can select or deselect as many as you want and click **Preview** to view an updated image. Click **Next** when you are ready to proceed with the selected layers.
- Enter the remaining parameters for the floor area.
- 9 Either leave the **Maintain Aspect Ratio** check box selected to preserve the original image aspect ratio or unselect the check box to change the image aspect ratio.
- 10 Enter an approximate floor or basement horizontal and vertical span (width and depth on the map) in feet.
- Note** The horizontal and vertical spans should be smaller than or the same size as the building horizontal and vertical spans in the Prime Infrastructure database.
- 11 If applicable, enter the horizontal position (distance from the corner of the outdoor area rectangle to the left edge of the campus map) and vertical position (distance from the corner of the outdoor area rectangle to the top edge of the campus map) in feet or meters.
- Tip** Use **Ctrl-click** to resize the image within the building-sized grid.
- 12 If desired, select the **Launch Map Editor after floor creation** check box to rescale the floor and draw walls.
- 13 Click **OK** to save this floor plan to the database. The floor is added to the Maps Tree View and the Design > Site Maps list.
- Note** Use different floor names in each building. If you are adding more than one building to the campus map, do not use a floor name that exists in another building. This overlap causes incorrect mapping information between a floor and a building.
- 14 Click any of the floor or basement images to view the floor plan or basement map.
- Note** You can zoom in or out to view the map at different sizes and you can add access points.
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Adding Floor Plans to a Standalone Building

To add floor plans to a standalone building, follow these steps:

-
- Step 1** Save your floor plan maps in .PNG, .JPG, or .GIF format.
- Note** The maps can be of any size because the Prime Infrastructure automatically resizes the maps to fit the workspace.
- Step 2** Browse to and import the floor plan maps from anywhere in your file system. You can import CAD files in DXF or DWG formats or any of the formats you created in Step 1.
- Note** If there are problems converting the auto-cad file, an error message is displayed. the Prime Infrastructure uses a native image conversion library to convert auto-cad files into raster formats like .PNG. If the native library cannot be loaded, the Prime Infrastructure displays an “unable to convert the auto-cad file” message. If you receive this error, make sure all the required dependencies are met for the native library. To find any dependency problems, use ldd on Linux platforms. The following DLLs must be present under the /webnms/rfdlls the Prime Infrastructure installation directory: LIBGFL254.DLL, MFC71.DLL, MSVCR71.DLL, and MSVCP71.DLL. If dependency problems occurs, you must install the required libraries and restart the Prime Infrastructure.

Step 3 Choose **Design > Site Maps**.

Step 4 From the Maps Tree View or the Design > Site Maps left sidebar menu, choose the desired building to display the Building View page.

Step 5 From the Select a command drop-down list, choose **New Floor Area**.

Step 6 Click **Go**.

Step 7 In the New Floor Area page, add the following information:

- Enter the floor area and contact names.
- Choose the floor or basement number from the Floor drop-down list.
- Choose the floor or basement type (RF Model).
- Enter the floor-to-floor height in feet
- Select the **Image or CAD File** check box.
- Browse to and choose the desired floor or basement Image or CAD file, and click **Open**.

Note If you are importing a CAD file, use the Convert CAD File drop-down list to determine the image file for conversion.

Tip A .JPEG (.JPG) format is not recommended for an auto-cad conversion. Unless a .JPEG is specifically required, use a .PNG or .GIF format for higher quality images.

Step 8 Click **Next**. At this point, if a CAD file was specified, a default image preview is generated and loaded.

Note The Prime Infrastructure uses a native image conversion library to convert auto-cad files into raster formats like .PNG. When there are issues loading the native library, the Prime Infrastructure displays the following error: "Unable to convert the auto-cad file. Reason: Error while loading the auto-cad image conversion library. For more information, see the Prime Infrastructure online help or the Prime Infrastructure documentation".

The names of the CAD file layers are listed with check boxes to the right side of the image indicating which are enabled.

Note When you choose the floor or basement image filename, the Prime Infrastructure displays the image in the building-sized grid.

Note The maps can be any size because the Prime Infrastructure automatically resizes the maps to fit the workspace.

Note The map must be saved in .PNG, .JPG, .JPEG, or .GIF format.

If you have CAD file layers, you can select or deselect as many as you want and click **Preview** to view an updated image. Click **Next** when you are ready to proceed with the selected layers.

Step 9 Enter the remaining parameters for the floor area.

- Either leave the **Maintain Aspect Ratio** check box selected to preserve the original image aspect ratio or unselect the check box to change the image aspect ratio
- Enter an approximate floor or basement horizontal and vertical span (width and depth on the map) in feet.

Note The horizontal and vertical spans should be smaller than or the same size as the building horizontal and vertical spans in the Prime Infrastructure Prime Infrastructure database.
- If applicable, enter the horizontal position (distance from the corner of the outdoor area rectangle to the left edge of the campus map) and vertical position (distance from the corner of the outdoor area rectangle to the top edge of the campus map) in feet or meters.

Note Use **Ctrl-click** to resize the image within the building-sized grid.

- Adjust the floor characteristics with the Prime Infrastructure map editor by selecting the check box next to Launch Map Editor. See the “Using the Map Editor” section on page 10-17 for more information regarding the map editor feature.

Step 10 Click **OK** to save this floor plan to the database. The floor is added to the Maps Tree View and the Design > Site Maps list.

Step 11 Click any of the floor or basement images to view the floor plan or basement map.

Note You can zoom in or out to view the map at different sizes and you can add access points.

Configuring Floor Settings

You can modify the appearance of the floor map by selecting or unselecting various floor settings check boxes. The selected floor settings appears in the map image.



Note

Depending on whether or not a Mobility Services Engine is present in the Prime Infrastructure, some of the floor settings might not be displayed. Clients, 802.11 Tags, Rogue APs, Adhoc Rogues, Rouge Clients, and Interferers are visible only if an MSE is present in the Prime Infrastructure

The Floor Settings options include the following:

- Access Points—See the [Filtering Access Point Floor Settings](#) for more information.
- AP Heatmaps—See the [Filtering Access Point Heatmap Floor Settings](#) for more information.
- AP Mesh Info—See the [Filtering AP Mesh Info Floor Settings](#) for more information.
- Clients—See the [Filtering Client Floor Settings](#) for more information.
- 802.11 Tags—See the [Filtering 802.11 Tag Floor Settings](#) for more information.
- Rogue APs—See the [Filtering Rogue AP Floor Settings](#) for more information.
- Rogue Adhocs—See the [Filtering Rogue Adhoc Floor Settings](#) for more information.
- Rogue Clients—See the [Filtering Rogue Client Floor Settings](#) for more information.
- Coverage Areas
- Location Regions
- Rails
- Markers
- Chokepoints
- Wi-Fi TDOA Receivers
- Interferers—See the [Filtering Interferer Settings](#) for more information.
- wIPS Attackers—See the [Filtering wIPS Attacker Floor Settings](#), on page 27 for more information.

Use the blue arrows to access floor setting filters for access points, access point heatmaps, clients, 802.11 tags, rogue access points, rogue adhoc, and rogue clients. When filtering options are selected, click OK.

Use the Show MSE data within last drop-down list to choose the timeframe for Mobility Services Engine data. Choose to view Mobility Services Engine data from a range including the past two minutes up to the past 24 hours. This option only appears if a Mobility Services Engine is present on the Prime Infrastructure.

Click **Save Settings** to make the current view and filter settings your new default for all maps.

Defining Inclusion and Exclusion Regions on a Floor

To further refine location calculations on a floor, you can define the areas that are included (inclusion areas) in the calculations and those areas that are not included (exclusion areas).

For example, you might want to exclude areas such as an atrium or stairwell within a building but include a work area (such as cubicles, labs, or manufacturing floors).

Cisco 1000 Series Lightweight Access Point Icons

The icons indicate the present status of an access point. The circular part of the icon can be split in half horizontally. The more severe of the two Cisco Radio colors determines the color of the large triangular pointer.















Note


When the icon is representing 802.11a/n and 802.11b/n, the top half displays the 802.11a/n status, and the bottom half displays the 802.11b/g/n status. When the icon is representing only 802.11b/g/n, the whole icon displays the 802.11b/g/n status. The triangle indicates the more severe color.

The below table shows the icons used in the Prime Infrastructure user interface Map displays.

Table 1: Access Points Icons Description

| Icon | Description |
|---|--|
|  | The green icon indicates an access point (AP) with no faults. The top half of the circle represents the optional 802.11a Cisco Radio. The bottom half of the circle represents the state of the 802.11b/g Cisco Radio. |
|  | The yellow icon indicates an access point with a minor fault. The top half of the circle represents the optional 802.11a Cisco Radio. The bottom half of the circle represents the state of the 802.11b/g Cisco Radio. Note A flashing yellow icon indicates that there has been an 802.11a or 802.11b/g interference, noise, coverage, or load Profile Failure. A flashing yellow icon indicates that there have been 802.11a and 802.11b/g profile failures. |
|  | The red icon indicates an access point (AP) with a major or critical fault. The top half of the circle represents the optional 802.11a Cisco Radio. The bottom half of the circle represents the state of the 802.11b/g Cisco Radio. |



| Icon | Description |
|---|--|
|  | The dimmed icon with a question mark in the middle represents an unreachable access point. It is gray because its status cannot be determined. |
|  | The dimmed icon with no question mark in the middle represents an unassociated access point. |
|  | The icon with a red "x" in the center of the circle represents an access point that has been administratively disabled. |
|  | The icon with the top half green and the lower half yellow indicates that the optional 802.11a Cisco Radio (top) has no faults, and the 802.11b/g Cisco Radio (bottom) has a minor fault. The more severe of the two Cisco Radio colors determines the color of the large triangular pointer. |
|  | The icon with the top half green and the lower half red indicates that the optional 802.11a Cisco Radio (top) is operational with no faults, and the 802.11b/g Cisco Radio (bottom) has a major or critical fault. The more severe of the two Cisco Radio colors determines the color of the large triangular pointer. |
|  | The icon with the top half yellow and the lower half red indicates that the optional 802.11a Cisco Radio (top) has a minor fault, and the 802.11b/g Cisco Radio (bottom) has a major or critical fault. The more severe of the two Cisco Radio colors determines the color of the large triangular pointer. |
|  | The icon with the top half yellow and the lower half green indicates that the optional 802.11a Cisco Radio (top) has a minor fault, and the 802.11b/g Cisco Radio (bottom) is operational with no faults. The more severe of the two Cisco Radio colors determines the color of the large triangular pointer. |
|  | The icon with the top half red and the lower half green indicates that the optional 802.11a Cisco Radio (top) has a major or critical fault, and the 802.11b/g Cisco Radio (bottom) is operational with no faults. The more severe of the two Cisco Radio colors determines the color of the large triangular pointer. |
|  | The icon with the top half red and the lower half yellow indicates that the optional 802.11a Cisco Radio (top) has major or critical faults, and the 802.11b/g Cisco Radio (bottom) has a minor fault. The more severe of the two Cisco Radio colors determines the color of the large triangular pointer. |


| Icon | Description |
|--|---|
|  | <p>The icon with a red "x" on the top half (optional 802.11a) shows that the indicated Cisco Radio has been administratively disabled. There are six color coding possibilities as shown.</p> |

Each of the access point icons includes a small black arrow that indicates the direction in which the internal Side A antenna points.

The below table shows some arrow examples used in the Prime Infrastructure user interface map displays.

Table 2: Arrows

| Arrow Examples | Direction |
|---|---|
|  | Zero degrees, or to the right on the map. |
|  | 45 degrees, or to the lower right on the map. |

| Arrow Examples | Direction |
|--|---------------------------------|
|  | 90 degrees, or down on the map. |
| These examples show the first three 45-degree increments allowed, with an additional five at 45-degree increments. | |

Filtering Access Point Floor Settings

If you enable the access point floor setting and then click the blue arrow to the right of the floor settings, the Access Point Filter dialog box appears with filtering options.

Access point filtering options include the following:

- Show—Select this radio button to display the radio status or the access point status.



Note Because the access point icon color is based on the access point status, the icon color might vary depending on the status selected. The default on floor maps is radio status.

- Protocol—From the drop-down list, choose which radio types to display (802.11a/n, 802.11b/g/n, or both).



Note The displayed heatmaps correspond to the selected radio type(s).

- Display—From the drop-down list, choose what identifying information is displayed for the access points on the map image.
 - Channels—Displays the Cisco Radio channel number or Unavailable (if the access point is not connected).



Note The available channels are defined by the country code setting and are regulated by country. See the following URL for more information: http://www.cisco.com/en/US/prod/collateral/wireless/ps5679/ps5861/product_data_sheet0900aecd80537b6a_ps430_Products_Data_Sheet.html

- TX Power Level—Displays the current Cisco Radio transmit power level (with 1 being high) or Unavailable (if the access point is not connected).

**Note**

The power levels differ depending on the type of access point. The 1000 series access points accept a value between 1 and 5, the 1230 access points accept a value between 1 and 7, and the 1240 and 1100 series access points accept a value between 1 and 8.

The below table lists the transmit power level numbers and their corresponding power setting.

Table 3: Transmit Power Level Values

| Transmit Power?Level Number | Power Setting |
|-----------------------------|--|
| 1 | Maximum power allowed per country code setting |
| 2 | 50% power |
| 3 | 25% power |
| 4 | 12.5 to 6.25% power |
| 5 | 6.25 to 0.195% power |

**Note**

The power levels are defined by the country code setting and are regulated by country. See the following URL for more information: http://www.cisco.com/en/US/prod/collateral/wireless/ps5679/ps5861/product_data_sheet0900aecd80537b6a_ps430_Products_Data_Sheet.html

- Channel and Tx Power—Displays both the channel and transmit power level (or Unavailable if the access point is not connected).
- Coverage Holes—Displays a percentage of clients whose signal has become weaker until the client lost its connection, Unavailable for unconnected access points, or MonitorOnly for access points in monitor-only mode.

**Note**

Coverage holes are areas in which clients cannot receive a signal from the wireless network. When you deploy a wireless network, you must consider the cost of the initial network deployment and the percentage of coverage hole areas. A reasonable coverage hole criterion for launch is between 2 and 10 percent. This means that between two and ten test locations out of 100 random test locations might receive marginal service. After launch, Cisco Unified Wireless Network Solution Radio Resource Management (RRM) identifies these coverage hole areas and reports them to the IT manager, who can fill holes based on user demand.

- **MAC Addresses**—Displays the MAC address of the access point, whether or not the access point is associated to a controller.
- **Names**—Displays the access point name. This is the default value.
- **Controller IP**—Displays the IP address of the controller to which the access point is associated or Not Associated for disassociated access points.
- **Utilization**—Displays the percentage of bandwidth used by the associated client devices (including receiving, transmitting, and channel utilization). Displays Unavailable for disassociated access points and MonitorOnly for access points in monitor-only mode.
- **Profiles**—Displays the load, noise, interference, and coverage components of the corresponding operator-defined thresholds. Displays Okay for thresholds not exceeded, Issue for exceeded thresholds, or Unavailable for unconnected access points.



Note Use the Profile Type drop-down list to choose Load, Noise, Interference, or Coverage.

- **CleanAir Status**—Displays the CleanAir status of the access point and whether or not CleanAir is enabled on the access point.
- **Average Air Quality**—Displays the average air quality on this access point. The details include the band and the average air quality.
- **Minimum Air Quality**—Displays the minimum air quality on this access point. The details include the band and the minimum air quality.
- **Average and Minimum Air Quality**—Displays the average and minimum air quality on this access point. The details include the band, average air quality, and minimum air quality.
- **Associated Clients**—Displays the number of associated clients, Unavailable for unconnected access points or MonitorOnly for access points in monitor-only mode.



Note

- **Bridge Group Names**
- **RSSI Cutoff**—From the drop-down list, choose the RSSI cutoff level. The RSSI cutoff ranges from -60 dBm to -90 dBm.
- **Show Detected Interferers**—Select the check box to display all interferers detected by the access point.
- **Max. Interferers/label**—Choose the maximum number of interferers to be displayed per label from the drop-down list.

Click **OK** when all applicable filtering criteria are selected.

Filtering Access Point Heatmap Floor Settings

An RF heatmap is a graphical representation of RF wireless data where the values taken by variables are represented in maps as colors. The current heatmap is computed based on the RSSI prediction model, Antenna Orientation, and AP transmit power.

If you enable the Access Point Heatmap floor setting and click the blue arrow to the right of the Floor Settings, the Contributing APs dialog appears with heatmap filtering options. See the [Understanding RF Heatmap Calculation](#) for more information.

The Prime Infrastructure introduces dynamic heatmaps. When dynamic heatmaps are enabled, the Prime Infrastructure recomputes the heatmaps to represent changed RSSI values. To configure the dynamic heatmaps, see the [Editing Map Properties](#) for more information.

Access point heatmap filtering options include the following:

- **Heatmap Type**—Select Coverage, or Air Quality. If you choose Air Quality, you can further filter the heat map type for access points with average air quality or minimum air quality. Select the appropriate radio button.



Note If you have monitor mode access points on the floor plan, you have a choice between IDS or coverage heatmap types. A coverage heatmap excludes monitor mode access points.



Note Only APs in Local, FlexConnect, or Bridge mode can contribute to the Coverage and Air Quality Heatmap.

- **Total APs**—Displays the number of access points positioned on the map.
- Select the access point check box(es) to determine which heatmaps are displayed on the image map.

Click OK when all applicable filtering criteria are selected.

Filtering AP Mesh Info Floor Settings



Note The AP Mesh Info check box only appears when bridging access points are added to the floor.

When this check box is selected, the Prime Infrastructure initiates a contact with the controllers and displays information about bridging access points. The following information is displayed:

- Link between the child and the parent access point.
- An arrow that indicates the direction from the child to parent access point.
- A color-coded link that indicates the signal-to-noise ratio (SNR). A green link represents a high SNR (above 25 dB), an amber link represents an acceptable SNR (20-25 dB), and a red link represents a very low SNR (below 20 dB).

If you enable the AP Mesh Info floor setting and click the blue arrow to the right of the floor settings, the Mesh Parent-Child Hierarchical View page appears with mesh filtering options.

You can update the map view by choosing the access points you want to see on the map. From the Quick Selections drop-down list, choose to select only root access point, various hops between the first and the fourth, or select all access points.

**Note**

For a child access point to be visible, its parent must also be selected.

Click OK when all applicable filtering criteria are selected.

Filtering Client Floor Settings

**Note**

The Clients option only appears if a mobility server is added in the Prime Infrastructure.

If you enable the Clients floor setting and click the blue arrow to the right, the Client Filter dialog box appears.

Client filtering options include the following:

- Show All Clients—Select the check box to display all clients on the map.
- Small Icons—Select the check box to display icons for each client on the map.

**Note**

If you select the Show All Clients check box and Small Icons check box, all other drop-down list options are dimmed. If you unselect the Small Icons check box, you can choose if you want the label to display the MAC address, IP address, username, asset name, asset group, or asset category. If you unselect the Show All Clients check box, you can specify how you want the clients filtered and enter a particular SSID.

- Display—Choose the client identifier (IP address, username, MAC address, asset name, asset group, or asset category) to display on the map.
- Filter By—Choose the parameter by which you want to filter the clients (IP address, username, MAC address, asset name, asset group, asset category, or controller). Once selected, type the specific device in the text box.
- SSID—Enter the client SSID in the available text box.
- Protocol—Choose All, 802.11a/n, or 802.11b/g/n from the drop-down list.
 - All—Displays all the access points in the area.
 - 802.11a/n—Displays a colored overlay depicting the coverage patterns for the clients with 802.11a/n radios. The colors show the received signal strength from red (–35 dBm) through dark blue (–85 dBm).
 - 802.11b/g/n—Displays a colored overlay depicting the coverage patterns for the clients with 802.11b/g/n radios. The colors show the received signal strength from red (–35 dBm) through dark blue (–85 dBm). This is the default value.
- State—Choose All, Idle, Authenticated, Probing, or Associated from the drop-down list.

Click OK when all applicable filtering criteria are selected.

Filtering 802.11 Tag Floor Settings

If you enable the 802.11 Tags floor setting and then click the blue arrow to the right, the Tag Filter dialog appears.

Tag filtering options include the following:

- Show All Tags—Select the check box to display all tags on the map.
- Small Icons—Select the check box to display icons for each tag on the map.



Note

If you select the Show All Tags check box and Small Icons check box, all other drop-down list options are dimmed. If you unselect the Small Icons check box, you can choose if you want the label to display MAC address, asset name, asset group, or asset category. If you unselect the Show All Tags check box, you can specify how you want the tags filtered.

- Display—Choose the tag identifier (MAC address, asset name, asset group, or asset category) to display on the map.
- Filter By—Choose the parameter by which you want to filter the clients (MAC address, asset name, asset group, asset category, or controller). Once selected, type the specific device in the text box.

Click OK when all applicable filtering criteria are selected.

Filtering Rogue AP Floor Settings

If you enable the Rogue APs floor setting and then click the blue arrow to the right, the Rogue AP filter dialog box appears.

Rogue AP filtering options include the following:

- Show All Rogue APs—Select the check box to display all rogue access points on the map.
- Small Icons—Select the check box to display icons for each rogue access point on the map.



Note

If you select the Show All Rogue APs check box and Small Icons check box, all other drop-down list options are dimmed. If you unselect the Show All Rogue APs check box, you can specify how you want the rogue access points filtered.

- Show Rogue AP Zone of Impact—Select the check box to display the zone of impact for rogues. The rogue impact zone is determined by the transmission power of the Rogue AP and the number of clients associated with the rogue AP.
 - The number of clients associated with the rogue AP determines the intensity of the color of the zone on the map.
 - The radius of the zone of impact is determined by using the following transmission powers of the rogue AP.

Table 4: Transmission Powers

| Band | Transmission Power | Assumes Tx Power |
|---------|--------------------|------------------|
| 2.5 Ghz | 20 dBm | 18 dBm |
| 5 Ghz | 17 dBm | 15 dBm |

- **MAC Address**—If you want to view a particular MAC address, enter it in the MAC Address text box.
- **State**—Use the drop-down list to choose from Alert, Known, Acknowledged, Contained, Threat, or Unknown contained states.
- **On Network**—Use the drop-down list to specify whether or not you want to display rogue access points on the network.

Click OK when all applicable filtering criteria are selected.

Filtering Rogue Adhoc Floor Settings

If you enable the Rogue Adhocs floor setting and then click the blue arrow to the right, the Rogue Adhoc filter dialog appears.

Rogue Adhoc filtering options include the following:

- **Show All Rogue Adhocs**—Select the check box to display all rogue adhoc on the map.
- **Small Icons**—Select the check box to display icons for each rogue adhoc on the map.



Note If you select the Show All Rogue Adhocs check box and Small Icons check box, all other drop-down list options are dimmed. If you unselect the Show All Rogue Adhocs check box, you can specify how you want the rogue adhocs filtered.

- **MAC Address**—If you want to view a particular MAC address, enter it in the MAC Address text box.
- **State**—Use the drop-down list to select from Alert, Known, Acknowledged, Contained, Threat, or Unknown contained states.
- **On Network**—Use the drop-down list to specify whether or not you want to display rogue adhocs on the network.

Click OK when all applicable filtering criteria are selected.

Filtering Rogue Client Floor Settings

If you enable the Rogue Clients floor setting and then click the blue arrow to the right, the Rogue Clients filter dialog appears.

Rogue Clients filtering options include the following:

- **Show All Rogue Clients**—Select the check box to display all rogue clients on the map.

- **Small Icons**—Select the check box to display icons for each rogue client on the map.



Note If you select the **Show All Rogue Clients** check box and **Small Icons** check box, all other drop-down list options are dimmed. If you unselect the **Show All Rogue Clients** check box, you can specify how you want the rogue clients filtered.

- **Assoc. Rogue AP MAC Address**—If you want to view a particular MAC address, enter it in the **MAC Address** text box.
- **State**—Use the drop-down list to choose from **Alert**, **Contained**, **Threat**, or **Unknown** contained states.

Click **OK** when all applicable filtering criteria are selected.

Filtering Interferer Settings

If you enable **Interferer** floor setting and then click the blue arrow to the right, the **Interferers** filter dialog box appears.

Interferer filtering options include the following:

- **Show active interferers only**—Select the check box to display all active interferers.
- **Small Icons**—Select the check box to display icons for each interferer on the map.
- **Show Zone of Impact**—Displays the approximate interference impact area. The opacity of the circle denotes its severity. A solid red circle represents a very strong interferer that likely disrupts Wi-Fi communications, a light pink circle represents a weak interferer.
- Click **OK** when all applicable filtering criteria are selected.

Filtering wIPS Attacker Floor Settings

If you enable the **wIPS Attacker** floor setting and then click the blue arrow to the right, the **wIPS Attack Filter** dialog box appears.

wIPS Attack filtering options include the following:

- **Show All wIPS Attacks**—Select the check box to display all wIPS attacks on the map.
- **Small Icons**—Select the check box to display icons for each wIPS attacks on the map.



Note If you select the **Show All wIPS Attacks** check box and **Small Icons** check box, all other drop-down list options are dimmed. If you unselect the **Small Icons** check box, you can choose if you want the label to display the MAC address, Alarm Category, and Alarm Name. If you unselect the **Show All wIPS Attacks** check box, you can specify how you want the wIPS attacks to be filtered.

- **Filter By**—Choose the parameter by which you want to filter the wIPS attacks.

- MAC Address—If you want to view a particular MAC address, enter it in the MAC Address text box.
- Alarm Category—Choose the category of the alarm from the Alarm Category drop-down list. The possible categories are: **All Types, Security Penetration, User Authentication and Encryption, DoS, Performance Violation and Channel or Device overload.**

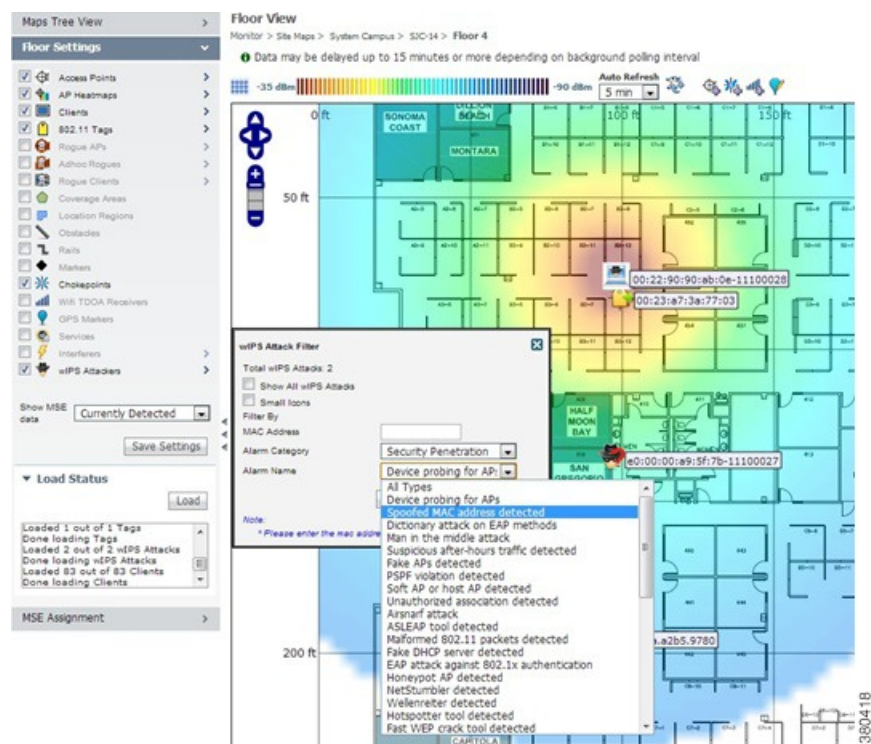


Note The alarm name is populated bases on the alarm category selected.

- Alarm Name—Choose the alarm name from the Alarm Name drop-down list.

Click **OK** when all applicable filtering criteria are selected.

Figure 1: wIPS Attack Name Filtering



The following icons are used to distinguish between devices displayed on the map.

Figure 2: Icons

Attacker:



Victim



Unknown Device



Import Map and AP Location Data

When converting from autonomous to lightweight access points and from WLSE to the Prime Infrastructure, one of the conversion steps is to manually reenter the access point-related information into the Prime Infrastructure. To speed up this process, you can export the information about access points from the WLSE and import it into the Prime Infrastructure.



Note The Prime Infrastructure expects a .tar file and checks for a .tar extension before importing the file. If the file you are trying to import is not a .tar file, the Prime Infrastructure displays an error message and prompts you to import a different file.



Note For more information on the WLSE data export functionality (WLSE Version 2.15), see the following URL: http://<WLSE_IP_ADDRESS>:1741/debug/export/exportSite.jsp.

To map properties and import a tar file containing WLSE data using the Prime Infrastructure web interface, follow these steps:

Step 1 Choose Monitor > Site Maps.

Step 2 From the Select a command drop-down list, choose Import Maps, and click Go.

Step 3 Choose the WLSE Map and AP Location Data option, and click Next.

Step 4 In the Import WLSE Map and AP Location Data page, click Browse to select the file to import.

Step 5 Find and select the .tar file to import and click Open.

The Prime Infrastructure displays the name of the file in the Import From text box.

Step 6 Click **Import**.

The CS uploads the file and temporarily saves it into a local directory while it is being processed. If the file contains data that cannot be processed, the Prime Infrastructure prompts you to correct the problem and retry. Once the file has been loaded, the Prime Infrastructure displays a report of what is added to the Prime Infrastructure. The report also specifies what cannot be added and why.

If some of the data to be imported already exists, the Prime Infrastructure either uses the existing data in the case of campuses or overwrites the existing data using the imported data in the cases of buildings and floors.

Note If there are duplicate names between a WLSE site and building combination and an Prime Infrastructure campus (or top-level building) and building combination, the Prime Infrastructure displays a message in the Pre Execute Import Report indicating that it will delete the existing building.

Step 7 Click Import to import the WLSE data.

The Prime Infrastructure displays a report indicating what was imported.

Step 8 Choose Monitor > Site Maps to view the imported data.

Monitoring the Floor Area

The floor area is the area of each floor of the building measured to the outer surface of the outer walls. This includes the area of lobbies, cellars, elevator shafts, and in multi-dwelling buildings it includes all the common spaces.

This section contains the following topics:

- [Planning and Zooming with Next Generation Maps](#)
- [Adding Access Points to a Floor Area, on page 31](#)
- [Placing Access Points, on page 32](#)

Planning and Zooming with Next Generation Maps

Planning

To move the map, click and hold the left mouse button and drag the map to a new place. You can also move the map North, South, East, or West using the pan arrows. These can be found on the top left-hand corner of the map.



Note You can also perform the panning operations using the arrow keys on a keyboard.

Zooming in and out - changing the scale

The zooming levels depend upon the resolution of an image. A high resolution image may provide more zoom levels. Each zoom level is made of a different style map shown at different scales, each one showing more or less detail. Some maps will be of the same style, but at a smaller or larger scale.

To see a map with more detail you need to zoom in. You can do this using the zoom bar on the left hand side of the map. Click the + sign on the top of the zoom bar. To center and zoom in on a location, double-click the location. To see a map with less detail you need to zoom out. To do this, click the - sign on the bottom of the zoom bar.



Note You can perform zooming operations using the mouse or keyboard. With the keyboard, click the + or - signs to zoom in or zoom out. With the mouse, use the mouse scroll wheel to zoom in or zoom out or double-click to zoom in.

Adding Access Points to a Floor Area

After you add the .PNG, .JPG, .JPEG, or .GIF format floor plan and outdoor area maps to the Prime Infrastructure database, you can position lightweight access point icons on the maps to show where they are installed in the buildings. To add access points to a floor area and outdoor area, follow these steps:



Note There is no limit on the number of APs supported per floor by the MSE but there could be performance issues if you add more than 100 APs per floor on the Prime Infrastructure.

- Step 1** Choose **Design > Site Maps**.
- Step 2** From the Maps Tree View or the Design > Site Maps left sidebar menu, choose the applicable floor to open the Floor View page.
- Step 3** From the Select a command drop-down list, choose **Add Access Points**, and click **Go**.
- Step 4** In the Add Access Points page, select the check boxes of the access points that you want to add to the floor area.
- Note** If you want to search for access points, enter AP name or MAC address (Ethernet/Radio)/IP in the Search AP [Name/Mac Address (Ethernet/Radio)/IP] text box, and then click **Search**. The search is case-insensitive.
- Note** Only access points that are not yet assigned to any floor or outdoor area appear in the list.
- Note** Select the check box at the top of the list to select all access points.
- Step 5** When all of the applicable access points are selected, click **OK** located at the bottom of the access point list. The Position Access Points page appears.
- Each access point you have chosen to add to the floor map is represented by a gray circle (differentiated by access point name or MAC address) and is lined up in the upper left part of the floor map.
- Step 6** Click and drag each access point to the appropriate location. Access points turn blue when selected.
- Note** When you drag an access point on the map, its horizontal and vertical position appears in the Horizontal and Vertical text boxes.
- Note** The small black arrow at the side of each access point represents Side A of each access point, and each access point arrow must correspond with the direction in which the access points were installed. Side A is clearly noted on each 1000 series access point and has no relevance to the 802.11a/n radio. To adjust the directional arrow, choose the appropriate orientation from the Antenna Angle drop-down list.
- When selected, the access point details are displayed on the left side of the page. Access point details include the following:
- AP Model—Indicates the model type of the selected access point.
 - Protocol—Choose the protocol for this access point from the drop-down list.
 - Antenna—Choose the appropriate antenna type for this access point from the drop-down list.
 - Antenna/AP Image—The antenna image reflects the antenna selected from the Antenna drop-down list. Click the arrow at the top right of the antenna image to expand the image size.
 - Antenna Orientation—Depending on the antenna type, enter the Azimuth and the Elevation orientations in degrees.
- Note** The Azimuth option does not appear for Omnidirectional antennas because their pattern is non directional in azimuth.

Note For internal antennas, the same elevation angle applies to both radios.

The antenna angle is relative to the map X axis. Because the origin of the X (horizontal) and Y (vertical) axes is in the upper left corner of the map, 0 degrees points side A of the access point to the right, 90 degrees points side A down, 180 degrees points side A to the left, and so on.

The antenna elevation is used to move the antenna vertically, up or down, to a maximum of 90 degrees.

Note Make sure each access point is in the correct location on the map and has the correct antenna orientation. Accurate access point positioning is critical when you use the maps to find coverage holes and rogue access points.

See the following URL for further information about the antenna elevation and azimuth patterns: http://www.cisco.com/en/US/products/hw/wireless/ps469/tsd_products_support_series_home.html

Step 7 When you are finished placing and adjusting each access point, click **Save**.

Note Clicking Save causes the antenna gain on the access point to correspond to the selected antenna. This might cause the radio to reset.

The Prime Infrastructure computes the RF prediction for the coverage area. These RF predictions are popularly known as *heat maps* because they show the relative intensity of the RF signals on the coverage area map.

Note Note

This display is only an approximation of the actual RF signal intensity because it does not take into account the attenuation of various building materials, such as drywall or metal objects, nor does it display the effects of RF signals bouncing off obstructions.

Note See the “Placing Access Points” section on page 10-14 for more information on placing access points on a map.

Note You can change the position of access points by importing or exporting a file. See the “Positioning Wi-Fi TDOA Receivers” section on page 10-30 for more information.

Placing Access Points

To determine the best location of all devices in the wireless LAN coverage areas, you need to consider the access point density and location.

Ensure that no fewer than 3 access points, and preferably 4 or 5, provide coverage to every area where device location is required. The more access points that detect a device, the better. This high level guideline translates into the following best practices, ordered by priority:

- 1 Most importantly, access points should surround the desired location.
- 2 One access point should be placed roughly every 50 to 70 linear feet (about 17 to 20 meters). This translates into one access point every 2,500 to 5000 square feet (about 230 to 450 square meters).



Note The access point must be mounted so that it is under 20 feet high. For best performance, a mounting at 10 feet would be ideal.

Following these guidelines makes it more likely that access points detect tracked devices. Rarely do two physical environments have the same RF characteristics. Users might need to adjust these parameters to their specific environment and requirements.



Note Devices must be detected at signals greater than -75 dBm for the controllers to forward information to the location appliance. No fewer than three access points should be able to detect any device at signals below -75 dBm.



Note If you have a ceiling-mounted AP with an integrated omni-directional antenna, the antenna orientation does not really need to be set in the Prime Infrastructure. However, if you mount that same AP on the wall, you must set the antenna orientation to 90 degrees. See [Placing Access Points, on page 32](#) for information on orientation of the access points.

Table 5: Antenna Orientation of the Access Points

| Access Point | Antenna Orientation |
|-----------------------------|--|
| 1140 mounted on the ceiling | The Cisco logo should be pointing to the floor. Elevation: 0 degrees. |
| 1240 mounted on the ceiling | The antenna should be perpendicular to the access point. Elevation: 0 degrees. |
| 1240 mounted on the wall | The antenna should be parallel to the access point. Elevation: 0 degrees. If the antenna is perpendicular to the AP then the angle is 90 degrees (up or down does not matter as the dipole is omni). |

Using the Automatic Hierarchy to Create Maps

Automatic Hierarchy Creation is a way for you to quickly create maps and assign access points to maps in Prime Infrastructure. You can use Automatic Hierarchy Creation to create maps, once you have added wireless LAN controllers to Prime Infrastructure and named your access points. Also, you can use it after adding access points to your network to assign access points to maps in Prime Infrastructure.



Note To use the Automatic Hierarchy Creation feature, you must have an established naming pattern for your wireless access points that provides the campus, building, floor, or outdoor area names for the maps. For example, San Jose-01-GroundFloor-AP3500i1.

To create maps using the automatic hierarchy, follow these steps:

-
- Step 1** Choose **Design > Automatic Hierarchy Creation** to display the Automatic Hierarchy Creation page.
- Step 2** In the text box, enter the name of an access point on your system. Or, you can choose one from the list. This name is used to create a regular expression to create your maps.
- Note** To update a previously created regular expression, select **Load and Continue** next to the expression and update the expression accordingly.
To delete a regular expression, select **Delete** next to the expression.
- Step 3** Click **Next**.
- Step 4** If your access point's name has a delimiter, enter it in the text box and click **Generate**. The system generates a regular expression that matches your access point's name based on the delimiter.
For example, using the dash (-) delimiter in the access point name San Jose-01-GroundFloor-AP3500i1, produces the regular expression `/(.*)-(.*)-(.*)-(.*)/`.
If you have a more complicated access point name, you can manually enter the regular expression.
- Note** You are not required to enter the leading and trailing slashes.
- Step 5** Click **Test**. The system displays the maps that will be created for the access point name and the regular expression entered.
- Step 6** Using the Group fields, assign matching groups to hierarchy types.
For example, if your access point is named: SJC14-4-AP-BREAK-ROOM
In this example, the campus name is SJC, the building name is 14, the floor name is 4, and the AP name is AP-BREAK-ROOM.
Use the regular expression: `/([A-Z]+)(\d+)-(\d+)-(.*)/`
From the AP name, the following groups are extracted:
- 1 SJC
 - 2 14
 - 3 4
 - 4 AP-BREAK-ROOM
- The matching groups are assigned from left to right, starting at 1. To make the matching groups match the hierarchy elements, use the drop-down list for each group number to select the appropriate hierarchy element.
This enables you to have almost any ordering of locations in your access point names.
For example, if your access point is named: EastLab-Atrium2-3-San Francisco
If you use the regular expression: `/(.*)-(.*)-(.*)-(.*)/` with the following group mapping:
- 1 Building
 - 2 Device Name
 - 3 Floor
 - 4 Campus

Automatic Hierarchy Creation produces campus named San Francisco, a building under that campus named EastLab, and a floor in EastLab named 3.

Note The two hierarchy types, Not in device name and Device have no effect, but enable you to skip groups in case you need to use a matching group for some other purpose.

Automatic Hierarchy Creation requires the following groups to be mapped in order to compute a map on which to place the access point:

Table 6: Groups

| Campus group present in match | Building group present in match | Floor group present in match | Resulting location |
|-------------------------------|---------------------------------|------------------------------|---|
| Yes | Yes | Yes | Campus > Building > Floor |
| Yes | Yes | No | Failed match |
| Yes | No | Yes | Campus > Floor (where Floor is an outdoor area) |
| Yes | No | No | Failed match |
| No | Yes | Yes | System Campus > Building > Floor |
| no | yes | no | failed match |
| no | yes | no | failed match |
| no | no | yes | failed match |
| no | no | no | failed match |

Automatic Hierarchy Creation attempts to guess the floor index from the floor name. If the floor name is a number, AHC will assign the floor a positive floor index. If the floor name is a negative number or starts with the letter B (for example, b1, -4, or B2), AHC assigns the floor a negative floor index. This indicates that the floor is a basement.

When searching for an existing map on which to place the access point, AHC considers floors in the access point's building with the same floor index as the access point's name.

For example, if the map SF > MarketStreet > Sublevel1 exists and has a floor index of -1, then the access point SF-MarketStreet-b1-MON1 will be assigned to that floor."

Step 7

Click **Next**. You can test against more access points. You may test your regular expression and matching group mapping against more access points by entering the access point's names in the Add more device names to test against field, and clicking the **Add** button.

You then click the **Test** button to test each of the access points names in the table. The result of each test is displayed in the table.

If required, return to the previous step to edit the regular expression or group mapping for the current regular expression.

Step 8 Click **Next**, then click **Save** and **Apply**. This applies the regular expression to the system. The system processes all the access points that are not assigned to a map.

Note You can edit the maps to include floor images, correct dimensions, and so on. When Automatic Hierarchy Creation creates a map, it uses the default dimensions of 20 feet by 20 feet. You will need to edit the created maps to specify the correct dimensions and other attributes. Maps created using Automatic Hierarchy Creation appear in the maps list with an incomplete icon. Once you have edited a map, the incomplete icon disappears. You may hide the column for incomplete maps by clicking the **Edit View** link.

Using the Map Editor

You use the Map Editor to define, draw, and enhance floor plan information. The map editor allows you to create obstacles so that they can be taken into consideration while computing RF prediction heatmaps for access points. You can also add coverage areas for location appliances that locate clients and tags in that particular area.

This section contains the following topics:

- [Guidelines for Using the Map Editor](#), on page 36
- [Guidelines for Inclusion and Exclusion Areas on a Floor](#), on page 37
- [Opening the Map Editor](#), on page 37
- [Using the Map Editor to Draw Coverage Areas](#), on page 37
- [Defining an Inclusion Region on a Floor](#), on page 38
- [Defining an Exclusion Region on a Floor](#), on page 39
- [Defining a Rail Line on a Floor](#), on page 39

Guidelines for Using the Map Editor

Consider the following when modifying a building or floor map using the map editor:



Note

We recommend that you use the map editor to draw walls and other obstacles rather than importing a .FPE file from the legacy floor plan editor. If required, you can still import .FPE files. To do so, navigate to the desired floor area, choose **Edit Floor Area** from the Select a command drop-down list, click **Go**, select the **FPE File** check box, and browse to choose the .FPE file.

- You can add any number of walls to a floor plan with the map editor; however, the processing power and memory of a client workstation might limit the refresh and rendering aspects of the Prime Infrastructure.

**Note**

We recommend a practical limit of 400 walls per floor for machines with 1GB RAM or less.

- All walls are used by the Prime Infrastructure when generating RF coverage heatmaps.

Guidelines for Inclusion and Exclusion Areas on a Floor

Inclusion and exclusion areas can be of any polygon shape having at least three points.

You can only define one inclusion region on a floor. By default, an inclusion region is defined for each floor when it is added to the Prime Infrastructure. The inclusion region is indicated by a solid aqua color line, and generally outlines the region.

You can define multiple exclusion regions on a floor.

Newly defined inclusion and exclusion regions appear on heatmaps only after the Mobility Services Engine recalculates location on the floor.

Opening the Map Editor

To open the map editor, follow these steps:

-
- Step 1** Choose **Design > Site Map Design**.
 - Step 2** Click the desired campus. The Site Maps > Campus Name page appears.
 - Step 3** Click a campus and then click a building.
 - Step 4** Click the desired floor area. The Site Maps > Campus Name > Building Name > Floor Area Name page appears.
 - Step 5** From the Select a command drop-down list, choose **Map Editor**, and click **Go**. The Map Editor page appears.
-

Using the Map Editor to Draw Coverage Areas

If you have a building that is non-rectangular or you want to mark a non-rectangular area within a floor, you can use the map editor to draw a coverage area.

To draw coverage areas using the map editor, follow these steps:

-
- Step 1** Add the floor plan if it is not already represented in the Prime Infrastructure.
 - Step 2** Choose **Monitor > Site Maps**.
 - Step 3** Click the Map Name that corresponds to the outdoor area, campus, building, or floor you want to edit.
 - Step 4** From the Select a command drop-down list, choose **Map Editor**, and click **Go**.
 - Step 5** In the Map Editor page, click the **Draw Coverage Area** icon on the toolbar.

A pop-up menu appears.

- Step 6** Enter the name of the area that you are defining. Click **OK**.
A drawing tool appears.
- Step 7** Move the drawing tool to the area you want to outline.
- Click the left mouse button to begin and end drawing a line.
 - When you have completely outlined the area, double-click the left mouse button and the area is highlighted in the page.
- The outlined area must be a closed object to appear highlighted on the map.
- Step 8** Click the **disk** icon on the toolbar to save the newly drawn area.
-

Defining an Inclusion Region on a Floor

To define an inclusion area, follow these steps:

-
- Step 1** Choose **Design > Site Maps**.
- Step 2** Click the name of the appropriate floor area.
- Step 3** From the Select a command drop-down list, choose **Map Editor**.
- Step 4** Click **Go**.
- Step 5** At the map, click the aqua box on the toolbar.
- Note** A message box appears reminding you that only one inclusion area can be defined at a time. Defining a new inclusion region automatically removes the previously defined inclusion region. By default, an inclusion region is defined for each floor when it is added to the Prime Infrastructure. The inclusion region is indicated by a solid aqua line and generally outlines the region.
- Step 6** Click **OK** in the message box that appears. A drawing icon appears to outline the inclusion area.
- Step 7** To begin defining the inclusion area, move the drawing icon to a starting point on the map and click once.
- Step 8** Move the cursor along the boundary of the area you want to include and click to end a border line. Click again to define the next boundary line.
- Step 9** Repeat [Defining an Inclusion Region on a Floor](#) until the area is outlined and then double-click the drawing icon. A solid aqua line defines the inclusion area.
- Step 10** Choose **Save** from the Command menu or click the **disk** icon on the toolbar to save the inclusion region.
- Note** If you made an error in defining the inclusion area, click the area. The selected area is outlined by a dashed aqua line. Next, click the **X** icon on the toolbar. The area is removed from the floor map.
- Step 11** Select the **Location Regions** check box if it is not already selected. If you want it to apply to all floor maps, click **Save settings**. Close the Layers configuration page.
- Step 12** To resynchronize the Prime Infrastructure and MSE databases, choose **Services > Synchronize Services**.
- Note** If the two databases are already synchronized then a resynchronization happens automatically every time there is a change. There is no need for an explicit resynch.
- Step 13** In the Synchronize page, choose **Network Designs** from the Synchronize drop-down list and then click **Synchronize**.

You can confirm that the synchronization is successful by viewing two green arrows in the Sync. Status column.

Note Newly defined inclusion and exclusion regions are included in location calculation only after the Mobility Services Engine recalculates location for existing devices.

Defining an Exclusion Region on a Floor

To further refine location calculations on a floor, you can define areas exclusion areas in the calculations. For example, you might want to exclude areas such as an atrium or stairwell within a building. As a rule, exclusion areas are generally defined within the borders of an inclusion area.

To define an exclusion area, follow these steps:

-
- Step 1** Choose **Design > Site Maps**.
 - Step 2** Click the name of the appropriate floor area.
 - Step 3** From the Select a command drop-down list, choose **Map Editor**.
 - Step 4** Click **Go**.
 - Step 5** On the map, click the purple box on the toolbar.
 - Step 6** Click **OK** in the message box that appears. A drawing icon appears to outline the exclusion area.
 - Step 7** To begin defining the exclusion area, move the drawing icon to a starting point on the map and click once.
 - Step 8** Move the drawing icon along the boundary of the area you want to exclude. Click once to start a boundary line, and click again to end the boundary line.
 - Step 9** Repeat [Defining an Exclusion Region on a Floor](#) until the area is outlined and then double-click the drawing icon. The defined exclusion area is shaded in purple when the area is completely defined. The excluded area is shaded in purple.
 - Step 10** When all exclusion areas are defined, choose **Save** from the Command menu or click the **disk** icon on the toolbar to save the exclusion region.
 - Note** To delete an exclusion area, click the area to be deleted. The selected area is outlined by a dashed purple line. Next, click the **X** icon on the toolbar. The area is removed from the floor map.
 - Step 11** Select the **Location Regions** check box if it is not already selected. If you want it to apply to all floor maps, click **Save settings**. Close the Layers configuration page when complete.
 - Step 12** To resynchronize the Prime Infrastructure and MSE databases, choose **Services > Synchronize Services**.
 - Note** If the two DBs are already synchronized then a resynchronization happens automatically every time there is a change. There is no need for an explicit resynch.
 - Step 13** In the Synchronize page, choose **Network Designs** from the Synchronize drop-down list and then click **Synchronize**. You can confirm that the synchronization is successful by viewing two green arrows in the Sync. Status column.
-

Defining a Rail Line on a Floor

You can define a rail line on a floor that represents a conveyor belt. Additionally, you can define an area around the rail area known as the snap-width to further assist location calculations. This represents the area

in which you expect clients to appear. Any client located within the snap-width area is plotted on the rail line (majority) or just outside of the snap-width area (minority).



Note Rail line configurations do not apply to tags.

The snap-width area is defined in feet or meters (user-defined) and represents the distance that is monitored on either side (east and west or north and south) of the rail.

To define a rail with a floor, follow these steps:

-
- Step 1** Choose **Design > Site Maps**.
 - Step 2** Click the name of the appropriate floor area.
 - Step 3** Choose **Map Editor** from the Select a command drop-down list.
 - Step 4** Click **Go**.
 - Step 5** In the map, click the **rail** icon (to the right of the purple exclusion icon) on the toolbar.
 - Step 6** In the message dialog box that appears, enter a snap-width (feet or meters) for the rail and then click **OK**. A drawing icon appears.
 - Step 7** Click the **drawing** icon at the starting point of the rail line. Click again when you want to stop drawing the line or change the direction of the line.
 - Step 8** Click the **drawing** icon twice when the rail line is completely drawn on the floor map. The rail line appears on the map and is bordered on either side by the defined snap-width region.
 - Note** To delete a rail line, click the area to be deleted. The selected area is outlined by a dashed purple line. Next, click the **X** icon on the toolbar. The area is removed from the floor map.
 - Step 9** At the floor map, choose the **Layers** drop-down list.
 - Step 10** Select the **Rails** check box for if it is not already selected, click **Save settings**, and close the Layers configuration panel when complete.
 - Step 11** To resynchronize the Prime Infrastructure and Mobility Services Engine, choose **Services > Synchronize Services**.
 - Step 12** In the Synchronize page, choose **Network Designs** from the Synchronize drop-down list and then click **Synchronize**. You can confirm that the synchronization is successful by viewing two green arrows in the Sync. Status column.
-

Adding an Outdoor Area



Note You can add an outdoor area to a campus map in the Prime Infrastructure database regardless of whether you have added outdoor area maps to the database.

To add an outdoor area to a campus map, follow these steps:

-
- Step 1** If you want to add a map of the outdoor area to the database, save the map in .PNG, .JPG, .JPEG, or .GIF format. Then browse to and import the map from anywhere in your file system.
- Note** You do not need a map to add an outdoor area. You can simply define the dimensions of the area to add it to the database. The map can be any size because the Prime Infrastructure automatically resizes the map to fit the workspace.
- Step 2** Choose **Design > Site Maps**.
- Step 3** Click the desired campus to display the Design > Site Maps > Campus View page.
- Step 4** From the Select a command drop-down list, choose **New Outdoor Area**.
- Step 5** Click **Go**. The Create New Area page appears.
- Step 6** In the New Outdoor Area page, enter the following information:
- Name—The user-defined name of the new outdoor area.
 - Contact—The user-defined contact name.
 - Area Type (RF Model)—Cubes And Walled Offices, Drywall Office Only, Outdoor Open Space (default).
 - AP Height (feet)—Enter the height of the access point
 - Image File—Name of the file containing the outdoor area map. Click **Browse** to find the file.
- Step 7** Click **Next**.
- Step 8** Click **Place** to put the outdoor area on the campus map. the Prime Infrastructure creates an outdoor area rectangle scaled to the size of the campus map.
- Step 9** Click and drag the outdoor area rectangle to the desired position on the campus map.
- Step 10** Click **Save** to save this outdoor area and its campus location to the database.
- Note** A hyperlink associated with the outdoor area takes you to the corresponding Maps page.
- Step 11** (Optional) To assign location presence information for the new outdoor area, choose **Edit Location Presence Info**, and click **Go**.
- Note** By default, the Override Child Element Presence Info check box is selected. There is no need to alter this setting for outdoor areas.
-

Using Planning Mode

The planning mode opens the map editor in the browser window from which the planning tool is launched. If the original browser window has navigated away from the floor page, you need to navigate back to the floor page to launch the map editor.

You can calculate the recommended number and location of access points based on whether data and/or voice traffic and/or location are active.

**Note**

Based on the throughput specified for each protocol (802.11a or 802.11 b/g), planning mode calculates the total number of access points required that would provide optimum coverage in your network.

Planning Mode options:

- Add APs—Enables you to add access points on a map. See the “Adding Access Points to a Floor Area” section on page 10-11 for details.
- Delete APs—Deletes the selected access points.
- Map Editor—Opens the Map Editor window.
- Synchronize with Deployment—Synchronizes your planning mode access points with the current deployment scenario.
- Generate Proposal—View a planning summary of the current access points deployment.
- Planned AP Association Tool—Allows you to add, delete, or import an AP Association from an Excel or CSV file. Once an access point is defined, it can be associated to a base radio MAC address using the Planned AP Association Tool. If the AP is not discovered, then the APs gets pushed into a standby bucket and get associated when discovered.

**Note**

AP association is subjected to a limitation that AP should not belong to any floor or outdoor area. If the AP is already assigned to a floor or outdoor area, then the standby bucket holds the AP, and when removed from the floor or outdoor area, get positioned to the given floor. One MAC address cannot be put into a bucket for multiple floor or outdoor areas.

**Note**

The map synchronization works only if the AP is associated to a base radio MAC address and not to its Ethernet MAC address.

Using Chokepoints to Enhance Tag Location Reporting

Chokepoints are installed and configured as recommended by the Chokepoint vendor. After the chokepoint installation is complete and operational, the chokepoint can be entered into the location database and plotted on the Prime Infrastructure map.

Using chokepoints in conjunction with active Cisco CX compliant tags provides immediate location information on a tag and its asset. When a Cisco CX tag moves out of the range of a chokepoint, its subsequent beacon frames do not contain any identifying chokepoint information. Location determination of the tag defaults to the standard calculation methods based on RSSIs reported by access points associated with the tag.

This section contains the following topics:

- [Adding Chokepoints to the Prime Infrastructure, on page 43](#)
- [Adding a Chokepoint to a Prime Infrastructure Map, on page 43](#)

- [Removing Chokepoints from the Prime Infrastructure](#), on page 44

Adding Chokepoints to the Prime Infrastructure

To add a chokepoint to the Prime Infrastructure database, follow these steps:

-
- Step 1** Choose **Configure > Chokepoints**.
- Step 2** From the Select a command drop-down list, choose **Add Chokepoints**.
- Step 3** Click **Go**.
- Step 4** Enter the MAC address and name for the chokepoint.
- Step 5** Select the **Entry/Exit Chokepoint** check box.
- Step 6** Enter the coverage range for the chokepoint.
Note The Chokepoint range is a visual representation only. It is product-specific. The actual range must be configured separately using the applicable chokepoint vendor software.
- Step 7** Click **OK**.
Note After the chokepoint is added to the database, it can be placed on the appropriate the Prime Infrastructure floor map.
-

Adding a Chokepoint to a Prime Infrastructure Map

To add the chokepoint to a map, follow these steps:

-
- Step 1** Choose **Design > Site Maps**.
- Step 2** In the Maps page, choose the link that corresponds to the floor location of the chokepoint.
- Step 3** From the Select a command drop-down list, choose **Add Chokepoints**.
- Step 4** Click **Go**.
Note The Add Chokepoints summary page lists all recently added chokepoints that are in the database but are not yet mapped.
- Step 5** Select the check box next to the chokepoint that you want to place on the map.
- Step 6** Click **OK**.
A map appears with a chokepoint icon located in the top left-hand corner. You are now ready to place the chokepoint on the map.
- Step 7** Left-click the chokepoint icon and drag it to the proper location.
Note The MAC address, name, and coverage range of the chokepoint appear in the dialog box in the left when you click the chokepoint icon for placement.
- Step 8** Click **Save**.
The floor map page reappears and the added chokepoint appears on the map.
Note The newly created chokepoint icon might or might not appear on the map depending on the display settings for that floor.

Note The rings around the chokepoint icon indicate the coverage area. When a CCX tag and its asset passes within the coverage area, location details are broadcast, and the tag is automatically mapped on the chokepoint coverage circle. When the tag moves out of the chokepoint range, its location is calculated as before and is no longer mapped on the chokepoint rings.

Note The MAC address, name, entry or exit chokepoint, static IP address, and range of the chokepoint appear when you hover your mouse cursor over its map icon.

Step 9 If the chokepoint does not appear on the map, select the **Chokepoints** check box located in the Floor Settings menu.

Note Do not click **Save Settings** unless you want to save this display criteria for all maps.

Note You must synchronize network design to the Mobility Services Engine or location server to push chokepoint information.

Removing Chokepoints from the Prime Infrastructure

You can remove one or more chokepoints at a time. To delete a chokepoint, follow these steps:

Step 1 Choose **Configure > Chokepoints**. The Chokepoints page appears.

Step 2 Select the check box next to the chokepoint to be deleted.

Step 3 From the Select a command drop-down list, choose **Remove Chokepoints**, and click **Go**.

Step 4 To confirm the chokepoint deletion, click **OK** in the dialog box that appears. The Chokepoints page reappears and confirms the deletion of the chokepoints. The deleted chokepoints are no longer listed in the page.
