Visualizing a WAE Network

WAE Design creates a simple default layout for newly discovered networks using one site per node, and each site name is based on the node name. Once the plan is opened in the WAE Design GUI, you typically rename and rearrange objects in the newly discovered network using a sequence of steps outlined in the following sections:

- Remove Suffixes from Node Names, on page 1
- Assign Sites to Nodes, on page 1
- Site Assignment Rules, on page 2
- Arrange Sites and Nodes, on page 6
- Set Circuit and Interface Appearance, on page 13
- Set Plot Backgrounds, on page 18
- Traffic Utilization Colors, on page 21
- Set Plot Option Defaults, on page 27

Remove Suffixes from Node Names

Node names collected from the network often have long suffixes that are the same for all nodes. The Rename Nodes tool removes suffixes from node names, making them easier to read in the plot and tables.

Step 1   Choose **Initializers** > **Rename Nodes**.

Step 2   Enter the suffix that you want to remove from the node names.

For example, if all nodes in the network have a .mycompany.net suffix, you can remove this suffix by entering `.mycompany.net`.

Step 3   To also remove this suffix from sites, check the **Also remove from containing sites** check box.

Step 4   Click **OK**.
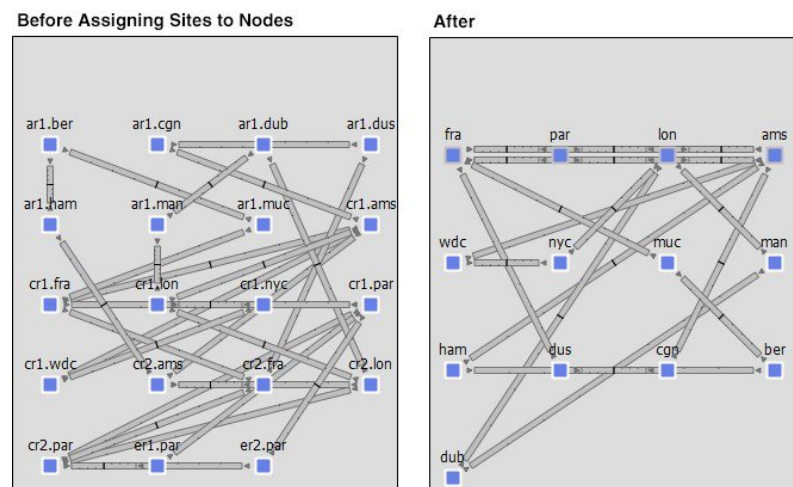
Assign Sites to Nodes

Although nodes do not have to be contained in sites, adding them to sites can simplify and improve the visualization of the network. To reorganize your network by changing the node-to-site mappings, choose

Initializers > **Assign Sites to Nodes**. For example, you would typically place all nodes in the same geographic location or point-of-presence (PoP) into a single site. You have two options:

- You can create a node-to-site association based on a simple mapping rule that applies to all nodes. This creates a temporary mapping that is not stored in the plan file.

- You can create or customize a Node-to-Site Mapping table, which uses rules to map nodes to sites based on regular expression substitutions. Because the table is stored in the plan file (as a <NodeSiteMappingRules> table), you can maintain and reuse it.

The following figure shows a network plot before and after assigning sites to nodes. Before, there were 19 sites; after, there were 13. Notice the new site names that were generated.

Figure 1: Example Before and After Assigning Sites to Nodes

| **Note** | To assign sites to L1 nodes, choose **Initializers** > **Assign Sites to L1 Nodes** when in L1 view. |

Site Assignment Rules

The **Assign Sites to Nodes** tool assigns sites as follows:

- If a node is not in an external AS and is not a pseudo-node (PSN), WAE Design assigns nodes to sites based on the Simple Mapping Rules or on the Node-to-Site Mapping Rules, depending on what you choose in the **Assign Sites to Nodes** dialog box.

- If the node is in an external AS, WAE Design assigns it to a site named after the AS name. If the AS name does not exist, WAE Design assigns the node to a site named after its ASN.

- If the node is not in an external AS and it is a PSN, WAE Design assigns it to the site that contains the most nodes connected to the PSN. In case of a tie, WAE Design assigns the node to the site with the lowest lexicographic name.

Simple Mapping Rules

To create temporary node-to-site mappings that are not stored in the plan file, click the **Use simple mapping rule** radio button in the **Assign Sites to Nodes** dialog box. The mapping is created using two fields: **Node name delimiter(s)** and **Site name**.

✎

Note In **Assign Sites to Layer 1 Nodes** dialog box, the corresponding fields to map sites to L1 nodes are **Layer 1 Node name delimiter(s)** and **Site name** respectively.

- Node name delimiter(s)—WAE Design uses this field to identify which sections of the node names to use in the assignments. By default, these are a period, a hyphen, and a colon (.-:). New site names are based on the sections between these characters. For example, by default WAE Design parses the node name of acme.router into two sections: *acme* and *router*.

| Node name delimiter(s): | .-: |
| Site name: | $2 |

- Site name—WAE Design uses this field to determine how to create the site names based on the node names. In the following list, # equals any integer.

  - $#—Specifies the section reading left to right. For example, $1 matches *chicago* in *chicago.isp*. Note that $0 specifies the entire node name.

  - [#:#]—Specifies the character range reading left to right. For example, $1[1:3] matches *chi* in *chicago.isp*.

  - $-#—Specifies the section name reading right to left. For example, $-1 matches *jose* in *san.jose*.

  - [-#:-#]—Specifies the character range reading right to left. For example, both $2[-4:-1] and $-2[-4,-1] match *jose* in *san.jose.cr1*.

Node-to-Site Mapping Rules

To create a Node-to-Site Mapping <NodeSiteMappingRules> table in the plan file, particularly for use by the template, click the **Use # rules in Node-to-Site Mapping Table** radio button in the **Assign Sites to Nodes** dialog box. An attempt is made to match the node name to expressions in the Node Matches column. If a match is found, the node is assigned to the site as defined by the corresponding Site Expression.

✎

Note In **Assign Sites to Layer 1 Nodes** dialog box, click **Use # rules in L1Node-to-Site Mapping Table** radio button.

The following graphical example matches cr1.lax into lax-core and er1.lax into lax-edge:

Order	Node Matches	Site Expression
1	cr.\.(.*)..*	$1-core
2	er.\.(.*)..*	$1-edge

The order in which these matches are attempted is defined by the Order column.

Column	Description
Order	Identifies the order in which rules are applied.
Node Matches	Regular expression matching the node names.
Site Expression	Site name expression, which can use references in the Node Matches rule.

Examples

Node Matches	Site Expression	Result
cr1.chi.isp.net	chi	Map node cr1.chi.isp.net to site chi.
.*\.(.*)\..*	$1	Map node cr1.chi.isp.net to site chi as above, but also maps node cr1.okc.isp.net to site okc.
..(.)\.(.*)..*	$2-$1	Map node cr1.par.isp.net to site par-1.

Assign Sites to Nodes Dialog Box

Step 1 Choose one or more nodes if you want to assign sites to specific nodes. If you do not choose nodes, WAE Design assigns sites for all nodes in the plan file for that view.

Step 2 Do one of the following:

- Right-click one of the selected nodes and choose **Assign Sites to Nodes**.

- Choose **Initializers** > **Assign Sites to Nodes**.

Step 3 Choose which method of node-to-site mappings to use:

- To use a temporary node-to-site mapping that is not stored in the plan file, click **Use simple mapping rule**.

- To use a Node-to-Site Mapping table that is saved in the file, click **Use # rules in Node-to-Site Mapping Table**. To edit those rules, click **Edit Table**.

    - To add a new rule, choose an existing rule (if applicable) from the list, and then click **Insert Before** or **Insert After** to determine where the new rule goes sequentially. This opens a dialog box for adding a new rule.

Node Matches:	.*\.(.*)\..*
Site Expression:	nyc

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- To edit an existing rule, choose it from the list and click **Edit**.

- To delete an existing rule, choose it from the list and click **Delete**.

Step 4   For those nodes that the node-to-site definition does not find or cannot create a matching site, you have the option to keep the nodes in their current sites (if applicable) or to remove them from sites. To keep them in their current sites, check the **Keep unmatched nodes in current sites** check box.

Step 5   Choose options based on whether you are in the Layer 3 or Layer 1 view, as follows.

Description	GUI Selection

Layer 3
 	
• For nodes that are in external ASes, assign them to sites according to one of the following options:
 	
  • AS name, then ASN if the name is empty
 	
  • ASN
 	
  • Using the same rules as other sites
 	
• Choose whether to assign PSN nodes and all remaining nodes to sites with most connections.
	Assign nodes in external AS's to sites with name equal to
	⦿ AS Name, then ASN if Name is empty
	○ ASN
	○ Same rule as other Sites
	
	☑ Assign PSN nodes to sites with most connections
	☐ Assign all remaining nodes to sites with most connections

Layer 1: Choose whether to assign remaining nodes to sites with most connections.	☐ Assign all remaining nodes to sites with most connections

Step 6   To verify assignments, click **Update Preview**.

Step 7   When you are satisfied with the mappings, click **OK**.

Assign Sites to Layer 1 Nodes Dialog Box

Step 1   Choose one or more L1 nodes if you want to assign sites to specific L1 nodes. If you do not choose L1 nodes, WAE Design assigns sites for all L1 nodes in the plan file for that view.

Step 2   Do one of the following:

- Right-click one of the selected nodes and choose **Assign Sites to L1 Nodes**.

- Choose **Initializers** > **Assign Sites to L1 Nodes**.

Step 3   Choose which method of L1 node-to-site mappings to use:

- To use a temporary L1 node-to-site mapping that is not stored in the plan file, click **Use simple mapping rule**.

- To use a L1 Node-to-Site Mapping table that is saved in the file, click **Use # rules in L1Node-to-Site Mapping Table**. To edit those rules, click **Edit Table**.

    - To add a new rule, choose an existing rule (if applicable) from the list, and then click **Insert Before** or **Insert After** to determine where the new rule goes sequentially. This opens a dialog box for adding a new rule.

    - To edit an existing rule, choose it from the list and click **Edit**.

    - To delete an existing rule, choose it from the list and click **Delete**.

Step 4   For those L1 nodes that the node-to-site definition does not find or cannot create a matching site, you have the option to keep the L1 nodes in their current sites (if applicable) or to remove them from sites. To keep them in their current sites, check the **Keep unmatched Layer 1 nodes in current sites** check box.

Step 5   Choose whether to assign remaining layer 1 nodes to sites with most connections.

Step 6   Choose whether to keep unmatched layer 1 nodes in current sites.

Step 7   To verify assignments, click **Update Preview**.

Step 8   When you are satisfied with the mappings, click **OK**.

Arrange Sites and Nodes

You can arrange sites and nodes using the following methods:

- Schematically:

    - Align sites and nodes automatically through using the Arrange palette.

    - Click and drag them to the desired location.

    - Sites: Enter values in the Screen X and Screen Y fields of a site Properties dialog box.

    - Nodes: Enter values in the X and Y fields of a node Properties dialog box.

    All schematic (X and Y) properties are relevant to the network plot, not to a parent site.

- Geographically—WAE Design uses geographic longitude and latitude for calculating distances and latencies between nodes that are used in various analyses.

    - Automatically assign sites to locations by choosing **Initializers** > **Assign Locations to Sites**.

    - Click and drag them to the desired location.

    - Enter values in the Longitude and Latitude fields of a site or nodes Properties dialog box.

Helpful tips:

- Moving nodes and sites can often change the visibility of objects within a site plot. Use the Fit-to-Plot (four arrows) icon in the site plot to bring all objects into view.

- Ensure you are in the correct plot background (Schematic or Geographic) for making the type of change you want to make. If you are using a geographic background and you move an object, this changes the geographic coordinates, but not the schematic ones. Conversely, if you are using a schematic background and you move an object, this changes the schematic coordinates, but not the geographic ones. To change the schematic or geographic background, click the **Plot Options** icon on the Visualization toolbar.

- If you are using multiple layouts, arranging sites and nodes maintains the position of these sites in all layouts within the plan file. However, all changes made using the **Plot Options** dialog box are set on a per-layout basis so before making such changes, ensure you are in the correct layout.

- Topology changes, such as adding, duplicating, and deleting objects, affect simulation results. After making these types of changes, you should rerun the initializers and optimization tools if you have been using them. For example, you might want to rerun Metric Optimization to optimize the undifferentiated traffic, or if modeling an MPLS network, you might want to rerun the FRR LSPs initializer.

Assign Geographic Locations to Sites

WAE Design includes a database of worldwide city names and airport codes that identify the longitude and latitude of major cities. Using the **Initializers** > **Assign Locations to Sites** tool that accesses this database lets you quickly lay out sites within a network with geographic precision.

You can quickly assign multiple sites to these locations following these steps. Changing the geographic location of a site does not change the location of its children sites.
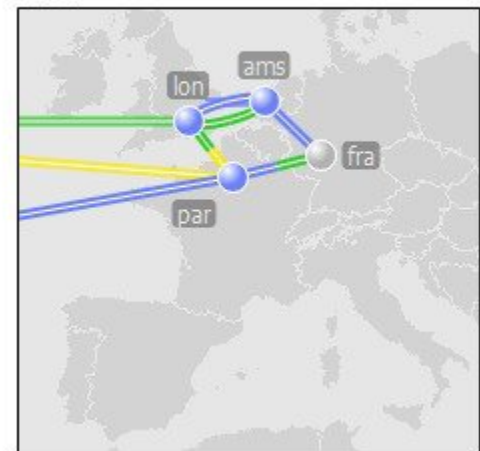
Note   To see the effects of geographic moves, you must be using a geographic background. To enable a geographic background, click the **Plot Options** icon on the Visualization toolbar.
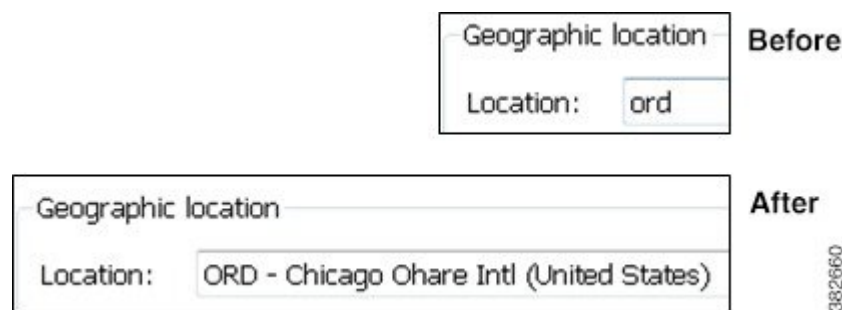
Step 1   (Optional) Choose one or more sites. If you do not make a selection, a table containing airport codes for all sites is populated.

Step 2   Open the tool in one of these ways:

- Right-click a selected site and choose **Assign Location to Sites**.

- Choose **Initializers** > **Assign Locations to Sites**.

Step 3   Set the longitude and latitude values using one of the following methods:

- Enter longitude and latitude values directly into the table cells.

- In each of these two methods, WAE Design fills in the fields with the most closely associated airport or city code in its database, thereby assigning longitude and latitude. If desired, click one or more rows from the table. If you do not choose rows, WAE Design fills in the longitude and latitude values for all sites.

   - Click **Best Match**.

   - Press **Enter**. *(Do not click OK.)*

- Click a cell in the table, and click **All Matches**. WAE Design finds all airport or city codes that might be applicable to that site or location. Choose the one you want, and click **OK**.

Step 4   If using an automated way of assigning locations, choose whether to match the longitude and latitude values based on the sites or on the locations.

Match by ◉ Site name   ○ Location

You can directly enter location information in the Location column. If you then match by site, locations might change based on the match. If you match by location, the site names do not change.

Step 5   Click **OK** to accept the newly assigned locations.

Initialize Site Location

As an alternative to using the **Assign Locations to Sites** initializer, you can set a location from the Properties dialog box. (For best results, use airport codes.)

Geographic location   **Before**

Location: ord

Geographic location   **After**

Location: ORD - Chicago Ohare Intl (United States)

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Step 1   Right-click a site and choose **Properties**.

Step 2   In the Location field, enter a geographic name, such as a city, or enter an airport code.

       • To replace the location with the best match in the WAE Design database, press **Enter**.

       • To look up the best location, press Alt-Enter. (On a Mac, press Option-Return.) A **Lookup Location** dialog box opens.

       WAE Design fills in the **Location** fields with the most closely associated airport or city code in its database. Choose a location and click **OK**.

Step 3   Click **OK** to accept the newly assigned location.

Align Sites and Nodes Schematically

The Arrange palette offers a number of options for aligning sites or nodes within the network plot and on a per-site basis. Although the schematic X and Y properties are in relationship to the network plot, the tools within the Arrange palette operate within the container, where the container can be the network plot or one or more sites, depending on which nodes or sites you select.
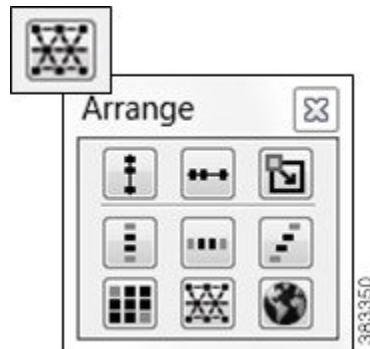
To see the effects of schematic moves, you must be using a schematic background. To enable a schematic background, click the **Plot Options** icon on the Visualization toolbar.

Step 1   Choose multiple nodes or sites. If the selected nodes or sites are within different parent sites, they are arranged on a site-by-site basis, if applicable.

Step 2   To open the Arrange palette, either right-click in an empty area of the network plot and choose **Arrange**, or click the **Arrange** icon in the Visualization toolbar.

Step 3   Choose objects to reposition in one of the following ways:

       • Choose sites or nodes either by selecting them individually (Shift-click) or by dragging the cursor around them. This is a good way to choose a group of objects based on location or connectivity.

       • Choose sites or nodes by selecting rows in the Sites or Nodes table. Both tables can be filtered and sorted, so this is a good way to choose a group of objects based on their name or other site properties.

Step 4   Arrange the selected sites or nodes.

• To arrange sites or nodes within a plot, click the desired alignment icon.

• To arrange sites or nodes within a specific boundary, set the boundary box and then click the desired icon.

A user-defined *boundary box* sets the borders within which the sites or nodes are arranged. To create a boundary box, press and hold the Ctrl key (Cmd on a Mac), click the alignment icon, and drag the cursor to form a box. When you release the Ctrl (Cmd) key, the sites or nodes are arranged to positions within that boundary box.

Icon	Description
	Align selected objects vertically without changing their horizontal location.
	Align selected objects horizontally without changing their vertical location.
	Align selected objects vertically, horizontally, or diagonally. The objects are evenly positioned between the outermost selections. You can use boundary boxes.
	Scale and move objects to a new location within an area that is created by clicking-dragging the cursor to form a rectangle. Horizontal and vertical scaling is independent, so the objects can be stretched or compressed in either direction.
	Distribute to a grid determined by upper left and lower right of the selected items. You can use boundary boxes.
	Arrange objects in an orderly way based on connections between them. You can use boundary boxes.
	Arrange selected objects proportional to their longitudes and latitudes, either within their original boundary box or within a new one. Any selected objects that do not contain longitudes and latitudes are arranged in an orderly way based on connections between them.

Edge Groups

Large, complex networks often contain a limited number of core sites that form the network backbone, with many edge sites that connect locally to one or more of the core sites.

• A core site contains at least one core node, and an edge site contains only edge nodes.

• An edge group is the collection of edge sites that attach to core sites in the same way. A common example of an edge group is a topology where several edge sites have redundant connections to the core sites. If each edge site has the same redundant connections to the same core sites, they are in the same edge group.

Arrange Edge Sites

The Arrange palette has special features for arranging edge sites. To access this palette, right-click in an empty area and choose **Arrange**.

Initializers > Edge Group	Description
Select	• Choose all sites in all edge groups. • Choose all sites within an edge group, choose one site within it, and then choose this menu.
Separate	To separate one or more sites from the network, choose those sites and then choose this menu. Note this does not separate the entire edge group. It only separates the selected sites.

The following figure shows an example network with edge sites that have been arranged to separate them from the core. Both sites on the left are in the same edge group because they each have two connections to the same two core sites. The site at the top of the diagram is in a separate edge group because it has different connections to the core sites. Edge sites can have a more complex topology, because they can also connect to a core site through another edge site.

Figure 2: Example Network with Edge Groups
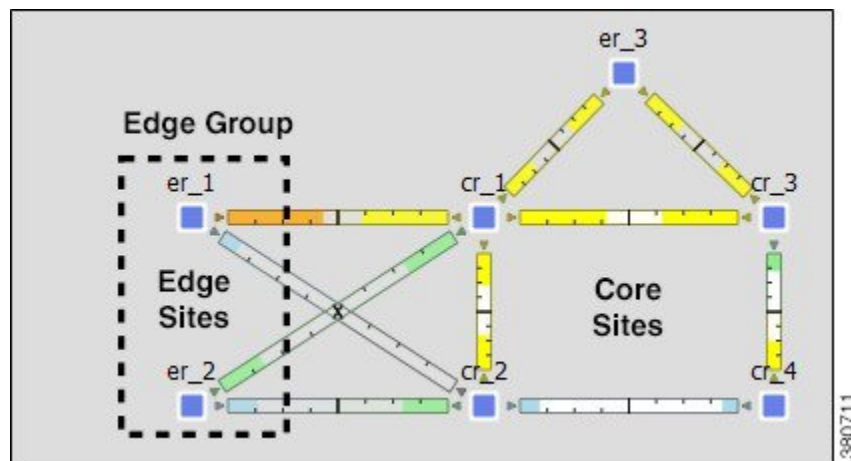
Define Nodes as Edge or Core

Follow these steps to define nodes as core or edge. By default, all nodes are core nodes.

Step 1 Choose one or more nodes. Typically, in a large network with hundreds of nodes, filtering to the edge nodes is the fastest way to find and choose them. For information on how to filter table entries, see the Cisco WAE Design User Guide.

Step 2 Right-click one of the nodes and choose **Properties**.

Step 3 From the Function drop-down list, choose core or edge, and click **OK**.

Show, Hide and Collapse Nodes or Sites

By default, nodes and sites are visible in the network plot. You can hide nodes and sites and their connecting circuits on a per-layout basis, though they still exist in the plan file and tables.

Hiding a site also hides all of its contained objects.

Nodes and sites can be grouped to build a hierarchy of sites which can be used to scale a plot that contains many objects. When a site is expanded, its contents are shown (instead of the site itself). When a site is collapsed, the site itself is shown.

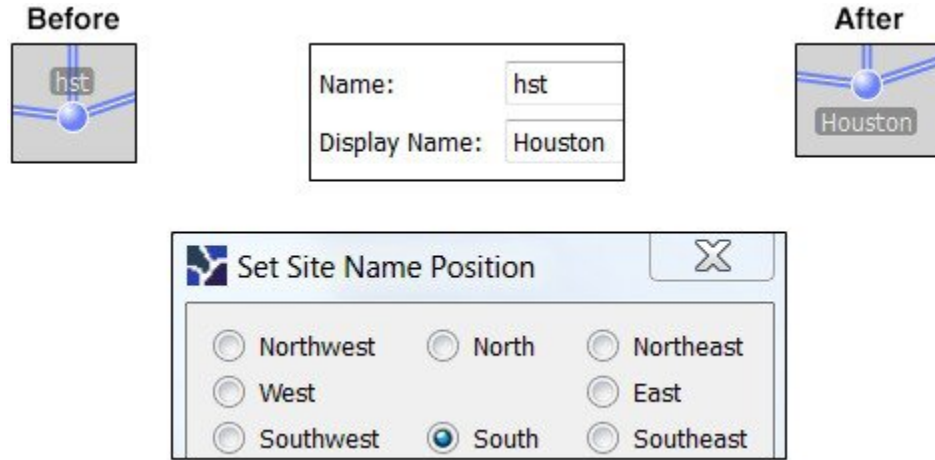| To...	Do This...

Hide nodes or sites	1. Choose one or more L3 or L1 nodes or sites from the plot, or choose them from their respective Nodes, L1 Nodes, or Sites table.
	
	2. Right-click one of the selected objects and choose the desired option:
	
	  • **Layout** > **Hide Node**
	
	  • **Layout** > **Hide L1 Node**
	
	  • **Layout** > **Hide Site**

Find hidden nodes or sites	1. Use the Shown column of the Nodes table or Sites table.

Show nodes or sites	1. Choose one or more L3 or L1 nodes or sites from their respective Nodes, L1 Nodes, or Sites table.
	
	2. Right-click one of the objects and choose the desired option:
	
	  • **Layout** > **Show Node**
	
	  • **Layout** > **Show L1 Node**
	
	  • **Layout** > **Show Site**

Expand sites	1. Choose one or more sites from the Sites table. 2. Right-click one of the sites and choose: • **Layout** > **Expand Site**
Collapse sites	1. Choose one or more sites from the Sites table. 2. Right-click one of the sites and choose: • **Layout** > **Collapse Site** **Note** Whether a site is expanded or collapsed can be set on a per-layout basis.

Site Relationships to L3 and L1 Nodes

The WAE Design network plot supports the visualization of both L1 and L3 topologies. By default, sites containing L3 nodes appear in the L3 view and sites containing L1 nodes appear in the L1 view. Empty sites and sites containing both L3 and L1 nodes appear in both views. To toggle whether to show or hide sites per view based on whether they contain L3 or L1 nodes, use the **Layer 1** tab in the **Plot Options** dialog box.

Set and Position Display Name

By default, site and node names appear above the object; you can change this positioning. Also, rather than showing the site names, you can set a different display name that can be internationalized. The following figure shows an example of changing both for a site.

Figure 3: Example of Changing the Site Display Name and Position

To...	Do This...
Set the site display name	1. Either double-click a site in the Sites table, or right-click a site and choose **Properties**. 2. Enter a name in the Display Name field, and click **OK**.
Change where site names are positioned	1. Right-click one or more selected sites and choose **Layout** > **Set Site Name Position**. 2. Choose the direction in which you want the site name to appear in relation to the site, and click **OK**.
Change where L3 and L1 node names are positioned	1. Right-click one or more selected L3 or L1 nodes and choose **Layout** > **Set Node Name Position** or **Layout** > **Set L1 Node Name Position**. 2. Choose the direction in which you want the node name to appear in relation to the site, and click **OK**.

Set Circuit and Interface Appearance

You can change how circuits are displayed by clicking the **Plot Options** icon in the Visualization toolbar. Alternatively, choose **Edit** > **Plot** > **Plot Options** > **Edit Options**.

The **Design Circuits** tab has the following options:

- Circuit Width—The circuit width is based on its capacity (the higher the capacity, the wider the circuit). Using these options, you can set the minimum width and the capacity it represents, as well as how fast the width grows as the capacity grows.

- Interface Text—Lets you display the percentage of interface filled with traffic, or the interface name, IP address, IGP metric, or SID.

- Parallel Grouping—Simplifies the representation of parallel circuits into a single circuit. By default, there is no grouping.

- Show QoS Bounds—Lets you toggle on or off the display of QoS bounds, which is the maximum interface capacity available without violating the QoS requirements. The default is On. For QoS bound information, see the Cisco WAE Design User Guide.

The **Other** tab lets you toggle on or off the following settings:

- Show pointers to remote nodes in site plots—Whether remote node names appear in the site plot.

- Anti-aliased lines—Whether to use anti-aliased lines. Turning off this option reduces the smoothness of lines in the plot, but speeds up the plot updates on some platforms.

- Transparency effects—Whether transparency effects are used when plotting some circuits on top of others. Turning off this option speeds up the plot updates on some platforms.
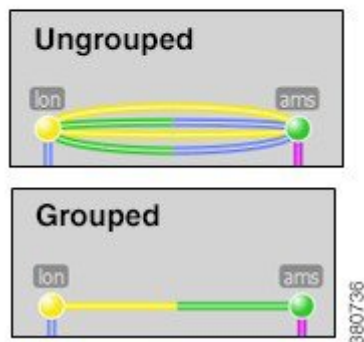
Set How Parallel Circuits Appear

By default, WAE Design displays all circuits individually. For example, if you have parallel site circuits, they are displayed in a stacked manner.

To simplify the visual display of a plan, you can group parallel circuits. The grouped circuits show capacity and outbound utilization in the network plot and if applicable, in the site plots as follows. If the circuits are between sites, the utilization includes the utilization of nested interfaces, if applicable.

- The capacity of the grouped circuit is the sum of the individual circuits.

- The utilization of the grouped circuit is the average of the utilizations (weighted by capacity) of the individual circuits. The color fill of the grouped circuit shows this average.

- In the Design layout, each side of the grouped circuit is divided lengthwise into its constituent interfaces that are individually selectable. Each interface within a grouped circuit has a thin colored border showing the utilization of that interface. Each interface continues to show textual information, such as IGP metric, if enabled.

Note Parallel groupings change the visual representation of the layout, but do not affect the plan itself. If you want to actually merge parallel circuits (rather than just change the appearance), see the Cisco WAE Design User Guide.

Step 1 Click the **Plot Options** icon in the Visualization toolbar.

Step 2 Click the **Design Circuits** tab.

Step 3 From the **Parallel Grouping** drop-down list, choose one of the following methods:

- None—Each parallel circuit is displayed as a separate circuit (default).

- Node—Groups parallel circuits between two nodes.

- Metric—Groups parallel circuits between two nodes whose interfaces have the same IGP metric.

- Site—Groups parallel circuits between two sites.

- SRLG—Groups parallel circuits that belong to the same SRLG.

- Group Name—Groups circuits belonging to a user-specified group set in the **Parallel Group Name** field of the circuit **Properties** dialog box.

Step 4 Set the maximum display width for parallel circuits.

Step 5 Click **OK**.

Figure 4: Ungrouped and Grouped Parallel Circuits by Site in a Design Layout
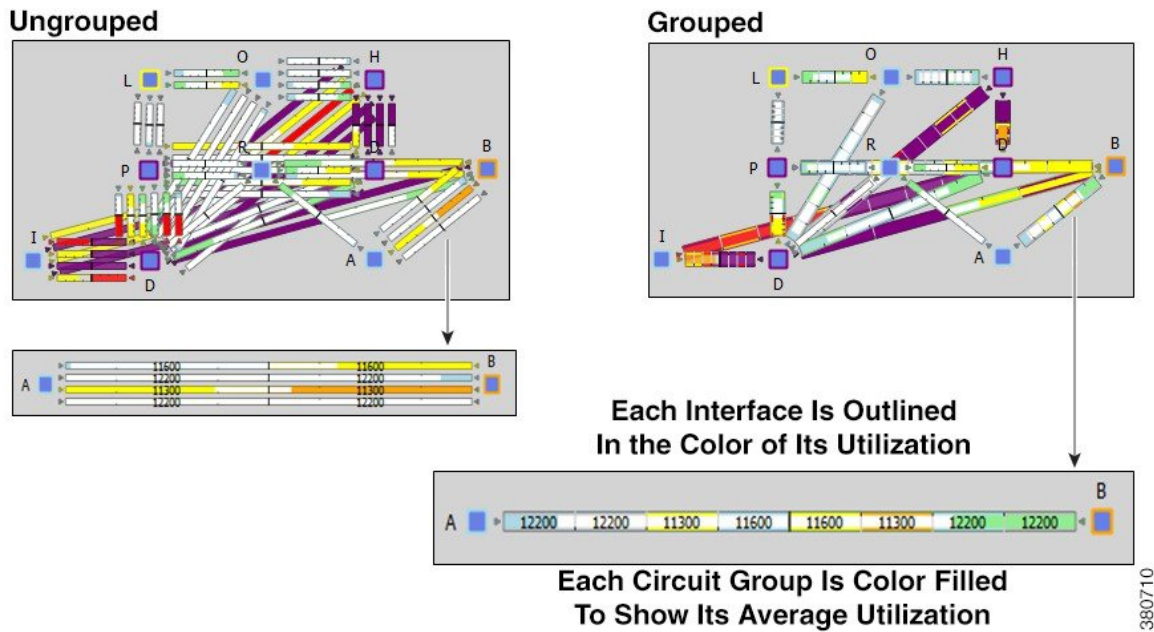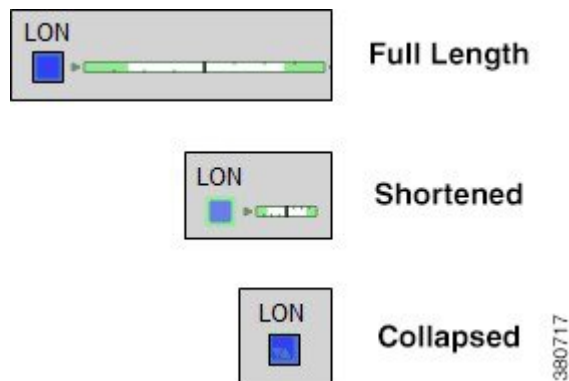

Set Interface Style

By default, two interfaces are represented in the plot as two sides of a full-length circuit drawn from one site to another. However, circuits connected to internal or external ASes are shortened.

This full-length model works well when the sites are close together, but if they are far apart full-length circuits can clutter the plot. You might want to display the sites as regions by shortening circuits between them.

Interfaces between the same two sites or between the same two nodes have the same interface style. If you change the style for any one of these interfaces, the style of all associated interfaces changes also.

**Step 1**   Choose one or more interfaces or circuits.

Step 2   Right-click one of the selections and choose **Layout** > **Set Interface Style**, and then one of the following choices:

- Full Length—The entire interface is displayed.

- Shortened—A short portion of each interface is shown attached to the node containing the outward-bound interface.

- Collapsed—The interfaces are not shown on either side of the node or site. The remote interface on the circuit does not appear.

- Default—If the circuit connects two nodes in the same internal AS, the interfaces appear as full length; if it connects two nodes in different ASes, the interfaces appear as shortened.
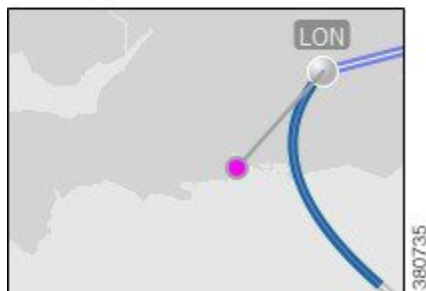
Curved Weathermap Circuits

Follow these steps to move and curve the circuits in a Weathermap layout.
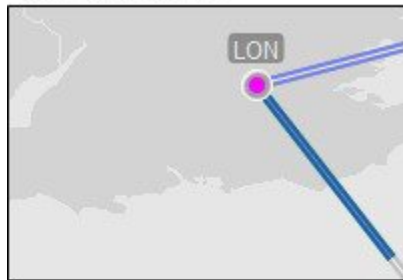
Step 1   Click the circuit to see a circular pink icon.

Step 2   Drag the pink circle in any direction, which creates curved circuit lines.

To move circuits such that the sites or peers stay in horizontal or vertical alignment, press and hold the Shift key while dragging the circular icon.

Reset Curves

One way to simplify a Weathermap layout is to reset the circuits' curves. Doing so changes the curves so they are more similar to ones that exist, and removes circuit overlap.
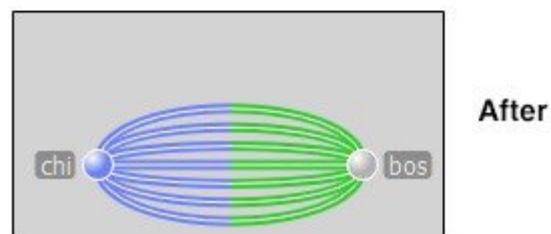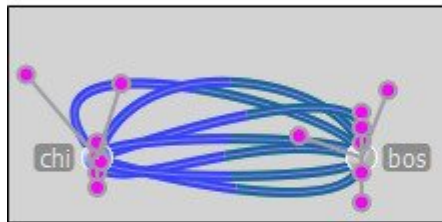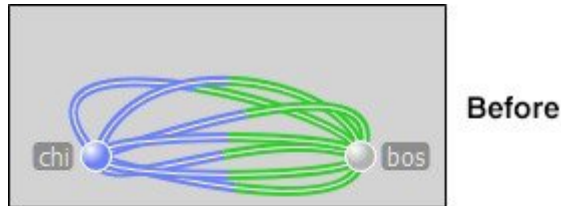
Step 1   Choose all circuits that you want to reset.

Step 2   Right-click one of the selected circuits and choose **Layout** > **Reset Curves**.

Set Plot Backgrounds

Choose **Edit** > **Plot** > **Plot Options** > **Edit Options** and click the **General Options** tab.

- Schematic views show the network based on the X,Y properties of the nodes and sites.

  Additionally, you can choose or add a static background image in .png format. If the image is a background map, the topology likely will not map to an imported image, so you must rearrange the sites accordingly. Images can be saved in .pln or .db formats, but not in .txt format.

- Geographic views show the network based on the longitude and latitude of the nodes and sites.

  - Outline Background Map—Geographic map with outline of countries and if applicable, U.S. states.

  - Detailed Background Map—Geographic map with streets. Click the zoom icon (magnifying glass icon in the Visualization toolbar) to see the level of desired detail. This option requires Internet connectivity to access the online map server. If connectivity is unavailable, use the outline

background, or download a map image and import it as a background image. To access a different online map server, see the Cisco WAE Design Integration and Development Guide.

• Longitude Boundary—Measurement in degrees that specifies the east-west position of a point on the Earth's surface. The default is –180 degrees, but could be changed, for example, to provide a continuous view of the Pacific.

• Site Canvas—If you are using the schematic view for the network plot, all sites show only the schematic view and you cannot further configure the site view. If you are using either of the geographic views, you can specify how to view the sites using the Site Canvas options. These options apply to all sites, regardless of whether they contain L3 nodes, L1 nodes, or both. This option does not affect the placement of nodes that are not in sites.

Schematic view—Shows nodes and sites network based on the X,Y properties of the nodes and sites.

Geographic view—Shows the same background as the geographic view for the network plot (outline or detailed).

Schematic view when site contains only nodes—Use this option to visualize nodes that have the same geographic coordinates within the same site. Using the geographic view results in these nodes being placed on top of each other.

Figure 5: Backgrounds for WAE Design Network Plot
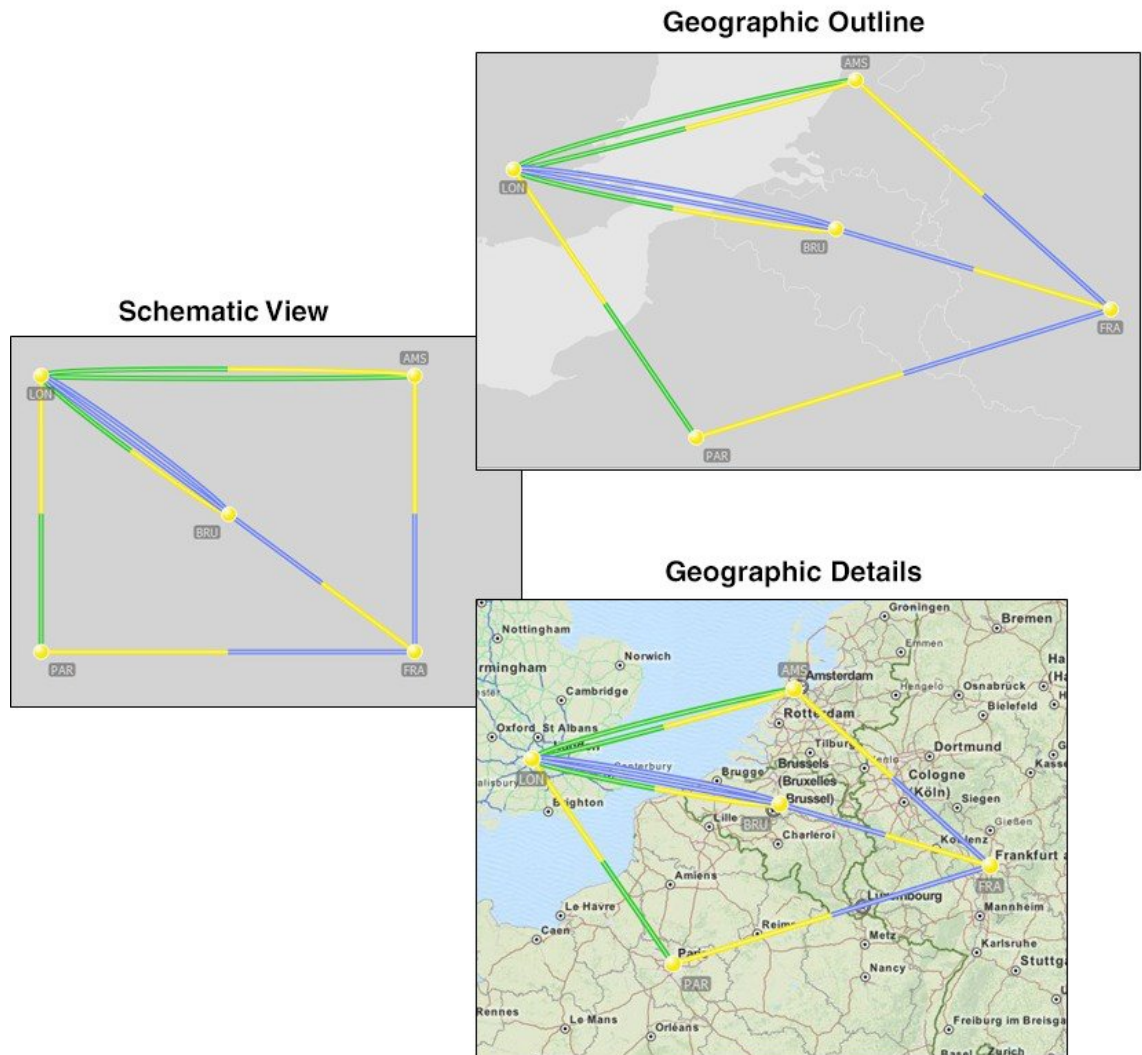
Create Static Background Map

You can use a static .png image as a background.

| Add Static Background Map Through Plot Options	Add Static Background Map Through Edit Menu

1. Choose **Edit** > **Plot** > **Plot Options** > **Edit Options**.
 	
2. In the **General Options** tab, click **Schematic**.
 	
3. Click the **New** button next to the Background Image list.
 	
   a. Enter the name of the map as it will appear for selection from the GUI.
 	
   b. Enter or browse to the name of the .png file that is the static image you are uploading.
 	
   c. Click **OK**.
 	
4. Click **OK** in the **Plot Options** dialog box.
	1. Choose **Edit** > **Plot** > **Background Images**.
	
	2. Click the **New** button.
	
	   a. Enter the name of the map as it will appear for selection in the GUI.
	
	   b. Enter or browse to the name of the .png file that is the static image you are uploading.
	
	   c. Click **OK**.
	
	3. Click **OK** in the **Edit Background Images** dialog box.

Traffic Utilization Colors

Interfaces have both measured and simulated traffic (in Mbps). This traffic appears on the interfaces as color fills that represent the percentage of outbound traffic in comparison to its capacity. The default colors for these representations appear in the Utilization Color menu, which is a set of color-coded drop-down lists in the Visualization toolbar. There are six default colors representing thresholds from 0% to 100%.

Default Utilization Colors

Design Layout   Weathermap Layout

Example Interface Traffic Utilization

30 – 50 %

80 - 90 %
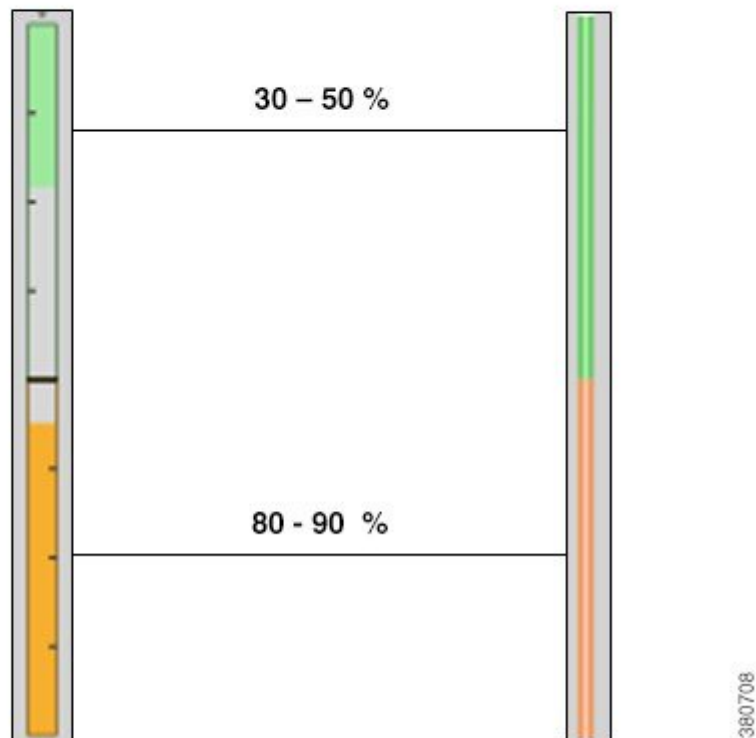
Note that in the L1 view, only the Failure Impact view shows colors, and those colors are related to L3 interface utilization.

Each default utilization color has a menu whose numbers correspond with their values in the **Design Colors** tab of the **Plot Options** dialog box. It is from this **Edit Colors** dialog box that you edit the colors used for traffic utilization.

You can edit the utilization values, add and remove colors, and locate interfaces that meet utilizations levels of special concern. Edits to these colors are saved to the plan file when the file is saved. You can also create and save a set of user defaults that can be applied to other plan files. Different utilization colors can be set for different layouts in a plan.

Figure 6: Relationship of Edit Colors Dialog Box to Traffic Utilization Color Menu
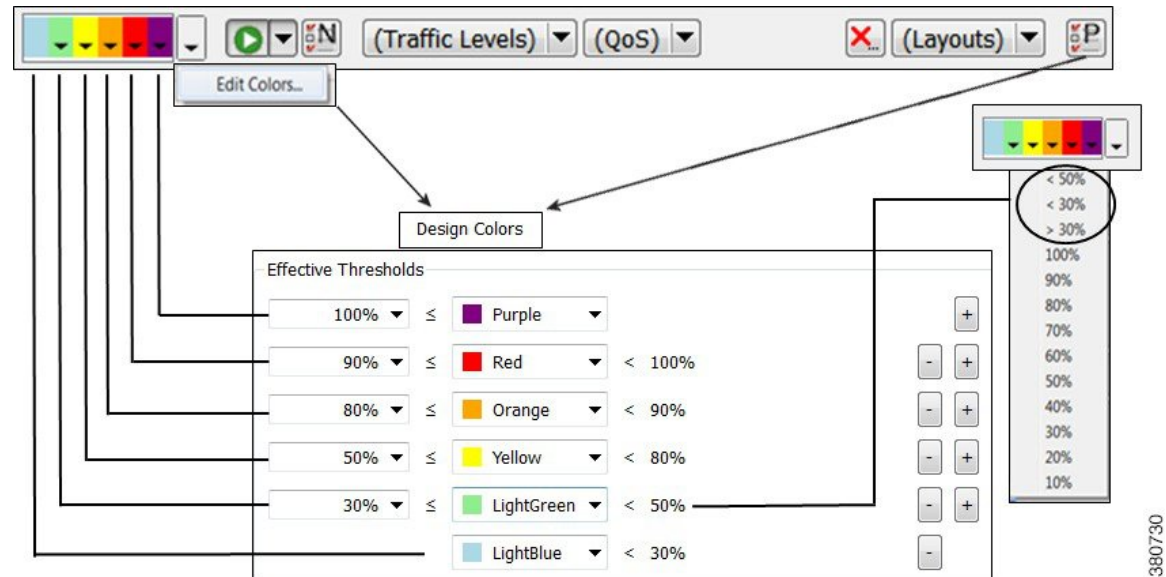
Find and Set Maximum Traffic Utilization Values

• From the purple drop-down list, choose **Max**. WAE Design finds the most utilized interface and sets the minimum utilization for purple to that value. As a result, that interface (and only that interface) is highlighted in the plot with purple. This method offers a quick way to determine the most highly utilized interface.

• From the Utilization Color menu, click the far right, gray drop-down arrow and choose **Edit Colors**. The **Plot Options** box opens; click the **Design Colors** tab. Enter a new value or choose a value from the drop-down list in the top, purple row. Click **OK** to save the changes.

Change Minimum Traffic Utilization Values

If you set a minimum value that imposes on an existing utilization value, WAE Design calculates a new percentage for that existing utilization or calculates that it cannot be used.

Example: The default for red is 90-100%, and the default for orange is 80-90%. If you set red to mean 80-100% utilization, orange is not used in the plot to show utilization. If you set red, however, to mean 85-100%, WAE Design adjusts the orange value to the remaining amount available, which in this example is 80-85%.

To change minimum utilization values, use either the color drop-down list or the **Plot Options** > **Design Colors** dialog box. Both options behave the same way. Modifications in the drop-down list appear in the **Design Color** dialog box and vice versa.

Step 1   If using the dialog box, open it using one of these methods:

• Click the **Plot Options** icon and click the **Design Colors** tab.

• Click the far right, gray drop-down list from the Utilization Color menu.

• Choose **Edit** > **Plot** > **Plot Options** > **Edit Options** and click the **Design Colors** tab.

Step 2   Change the minimum value using one of these methods:

• If you choose an exact value, that value becomes the new minimum.

• If you choose a number with a greater-than sign (>) next to it, WAE Design finds the interface that is closest to and greater than that value.

Example: By default, yellow is 50-80%. If you choose >50%, WAE Design finds the interface with a utilization that is closest to and greater than 50%.

• If you choose a number with a less-than sign (<) next to it, WAE Design finds the interface that is closest to and less than that value.

Example: By default, light green is 30-50%. If you choose <50%, WAE Design finds the interface with a utilization that is closest to and less than 50%.

• If in the dialog box, you can enter a value directly into the field.

Step 3   If in the dialog box, click **OK** to save the changes.

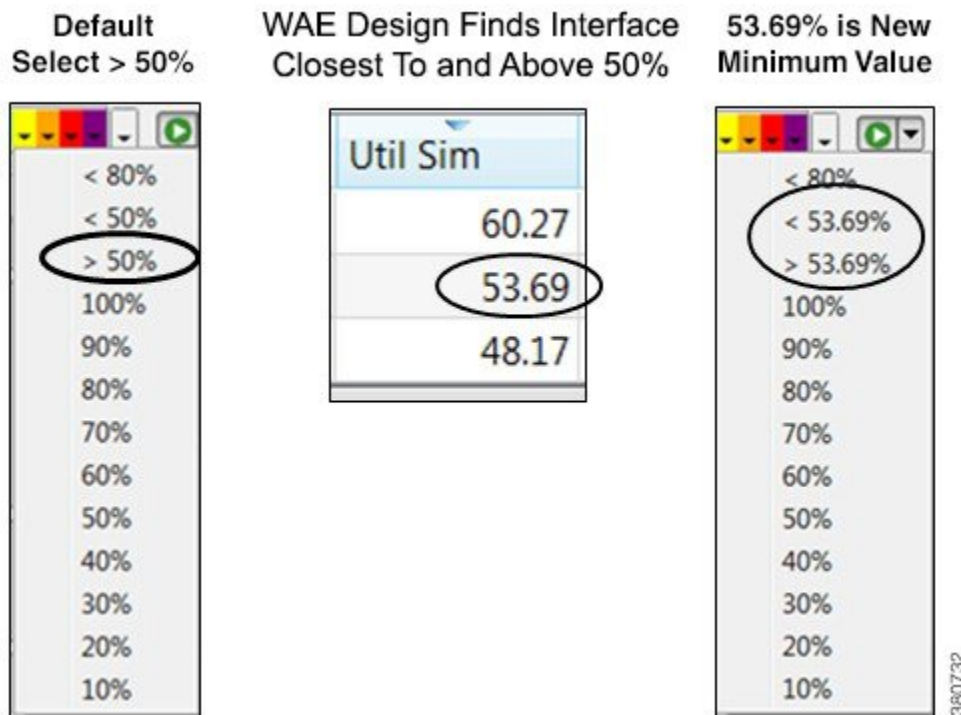*Figure 7: Example of Changing a Minimum Utilization Value Using the Color Drop-Down List*

Figure 8: Example of Changing a Minimum Utilization Value in the Plot Options, Design Colors Dialog Box
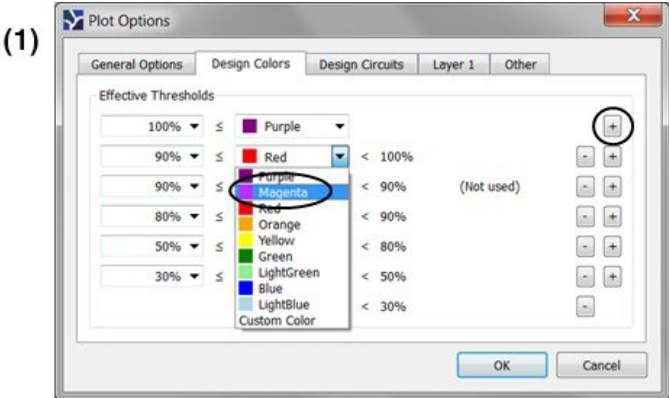

Add a Utilization Color

After adding a color, the maximum utilization value for it is based on the minimum value above it. When you assign the new color a minimum utilization value, it always imposes on the utilization range below it (unless the utilization value you are adding is the lowest). Because this minimum value imposes on an existing one, WAE Design recalculates a new percentage for that existing utilization or calculates that it cannot be used.

After a utilization color is added, it appears in the Utilization Color menu.

Step 1   Open the **Design Colors** dialog box using one of these methods:

- Click the **Plot Options** icon and click the **Design Colors** tab.

- Click the far right, gray drop-down list from the Utilization Color menu.

- Choose **Edit** > **Plot** > **Plot Options** > **Edit Options** and click the **Design Colors** tab.

Step 2   Click the plus (+) button to the right of the color below which you are adding a new color. The row is replicated below it and is marked as *Not used*. For example, to add a utilization color below red, click the + button on the same row as red.

Step 3   In the new row, either enter a new minimum value or choose it from the list, and then click **OK**.

Example: The following figure demonstrates adding a magenta utilization color with a range of 95-100%.

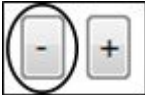*Figure 9: Example of Adding a Magenta Utilization Color with a Range of 95-100%*
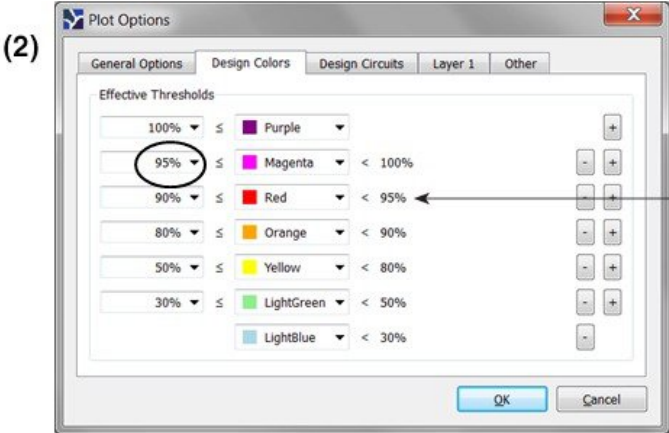
Delete a Utilization Color

Although you can delete a default color so that it is not represented on the plot, doing so does not remove that color from the Utilization Color menu. Deleting a color that you previously added, however, removes it from the toolbar.

Step 1   Click the far right, gray drop-down list from the Utilization Colors toolbar and choose **Edit Colors**.

Step 2   Click the minus (-) button associated with the row you want delete. Then click **OK**.

Set Plot Option Defaults

Each time you modify one or more plot options, they are saved in the plan file for the current layout. When you save the file, these plot options are saved per layout.

There are two types of plot option defaults:

- User Defaults—A set of customized plot options that you can create, set, and apply to other plan files. Each time you set a user default, it overrides the previous version. If you open a previously unopened plan file, its default plot options are the user defaults if they exist.

  Example: If you set the user defaults for plan A, you can then open plan B and apply these user defaults to it.

- System Defaults—The set of plot option defaults that comes with WAE Design. These are not configurable, and can always be applied.

  System defaults are applied to a previously unopened plan file if no user defaults have yet been defined.

To...	Choose...
Apply system defaults.	**Edit** > **Plot** > **Plot Options** > **Apply System Defaults**
Save current plot options to user defaults. You cannot cancel the result of having saved the user defaults.	**Edit** > **Plot** > **Plot Options** > **Save User Defaults**
Apply user defaults.	**Edit** > **Plot** > **Plot Options** > **Apply User Defaults**