Managing IPv6 Networks

In Grid Manager, you can use the IPv6 Net Map (network map) and List panels to manage your IPv6 network infrastructure. After you select a network container from the IPAM tab, Grid Manager displays it in the Net Map panel, by default. The Net Map panel provides a graphical view of your networks and has a number of features that simplify network management. The List panel displays the networks in table format.

You can always switch your view of a network container between the Net Map and List panels. Grid Manager keeps track of which panel you last used. When you select a network container, Grid Manager displays it in the Net Map or List panel, depending on which one you last used. For information about each panel, see IPv4 Network Map and IPAM Home.

You can use Grid Manager to manage IPv6 networks and their AAAA, PTR and host resource records. You can configure IPv6 networks and track IP address usage in those networks. You can also split and join IPv6 networks, when necessary.

IPv6 Network Map

After you select an IPv6 network container from the IPAM tab, Grid Manager displays it in the IPv6 Net Map (network map) panel, by default. Just like the IPv4 Net Map, the IPv6 Net Map provides a high-level view of the network address space. You can use Net Map to design and plan your network infrastructure, and to configure and manage individual networks.

The Net Map panel presents a complete view of the network space, including the different types of networks that are in it and its unused address space. IP addresses that belong to a network are blocked off. Each color-coded block represents a network container, a leaf network, or a block of networks that are too small to be displayed individually in the map. For example, in a /64 or /96 network, networks smaller than /76 or /108 respectively and that are beside each other are represented as a multiple network block. In addition, the fill pattern of the blocks indicates their utilization. Therefore, you can quickly evaluate how many networks are in a network container, their relative sizes, utilization, and how much space you have left.

As you mouse over areas of the map, it displays IP information about the area. Net Map also has a zoom feature that allows you to enlarge or reduce your view of a particular area. Figure 13.9 displays the network map of a 1111::/16 network, which is a network container that has network containers and leaf networks.

Figure 13.9 IPv6 Network Map
Displaying Network Information
As shown in Figure 13.9, as you mouse over the map, Net Map displays IP information about the area. When you mouse over an unused area, Net Map displays the following information:

- The start and end IP address
- The largest possible network
- The number of /64 networks that can fit in that space

When you mouse over a network container, Net Map displays the following information:

- Network address and netmask
- The first and last IP address of the network
- The number of networks in that block
- IPAM utilization

When you mouse over a network, Net Map displays the following information:

- Network address and netmask
- The first and last IP address of the network

When you mouse over a block of multiple networks, Net Map displays the following information:

- The start and end IP address of that block of networks
- The number of networks in that block

Zooming In and Out
Use the zoom function to enlarge and reduce your view of a selected area. You can zoom in on any area in your network. You can zoom in on an area until it displays 128 addresses per row, for a total of 1024 addresses for the map. When you reach the last possible zoom level, the Zoom In icon in the Net Map task bar and the menu item are disabled. After you zoom in on an area, you can click the Zoom Controller icon to track where you zoomed in. The Zoom Controller lists all the areas that you zoomed in and updates its list dynamically. You can click an item on the list to view that area again. Click the Zoom Controller again to close it.

To select an area and zoom in:

1. Right-click and select Zoom In, or click the Zoom In icon in the Net Map task bar. The pointer changes to the zoom in selector.
2. Select a starting point and drag to the end point. The starting point can be anywhere in the map. It does not have to be at the beginning of a network.
   - Net Map displays a magnified view of the selected area after you release the mouse button. As you mouse over the zoomed in area, Net Map displays IP information about it.
3. You can do the following:
   - Select an area and zoom in again.
   - Add a network. If you zoom in on an area and click Add without selecting an open area first, Net Map selects the area where it can create the biggest possible network in that magnified area.
   - Select a network and perform any of the following operations:
     - Edit its properties.
     - Open it to display its IP List.
     - Delete it immediately, or schedule its deletion.
   - Right-click and select Zoom Out, or click the Zoom Out icon in the Net Map task bar. Each time you click Zoom Out, Net Map zooms out one level and the Zoom Controller is updated accordingly.

Net Map Tasks

From Net Map, you can create IPv6 networks, and evaluate and manage your network resources according to the needs of your organization. You can do the following:

- Zoom in on specific areas, as described in Zooming In and Out.
- Use the Go to function to find a network in the current zoom level of Net Map.
- Add a network, as described in Adding a Network from Net Map.
- Select a network and view IP address list, as described in Viewing IPv6 Data.
- Select a network and edit its properties, as described in Modifying IPv4 and IPv6 Network Containers and Networks.
- Split a network, as described in Splitting IPv6 Networks into Subnets.
- Join networks, as described in Joining IPv6 Networks.
- Delete one or multiple networks, as described in Discovering Networks (Under Network Insight only).
- Switch to the List view of the network. For information, see IPv6 Network List.
  - When you select one or more networks in Net Map and then switch to the List view, the list displays the page with the first selected network.
  - If you select one or more networks in the List view and then switch to the Net Map view, the first network is also selected in Net Map. Although, if you select a network in the List view that is part of a Multiple Networks block in Net Map, it is not selected when you switch to the Net Map view.

Adding a Network from Net Map

When you create networks from Net Map, you can view the address space to which you are adding a network, so you can determine how much space is available and which IP addresses are not in use. When you mouse over an open area, Net Map displays useful information, such as the largest possible network that fits in that area. In addition, you can create networks without having to calculate anything. When you add a network, Net Map displays a netmask slider so you can determine the appropriate netmask for the size of the network that you need. As you move the slider, it displays network information, including the total number of addresses. After you select the netmask, you can even move the new network around the open area to select another valid start address.

To add a network from the Net Map panel:

1. Do one of the following:
   - Click the Add icon.
     - Net Map displays the netmask slider and outlines the open area that can accommodate the largest network.
   - Select an open area, and then click the Add icon.
     - Net Map displays the netmask slider and outlines the largest network that you can create in the open area that you selected.
   - Move the slider to the desired netmask. You can move the slider to the netmask of the largest network that can be created in the open area. You can also move the slider to the smallest network that can be placed in the current zoom level of Net Map.
     - As you move the slider, Net Map displays the netmask. The outline in the network map also adjusts as you move the slider. When you mouse over the outline, it displays the start and end address of the network.
   - After you set the slider to the desired netmask, you can drag the new network block around the open area to select a new valid starting address.
     - You cannot move the block to a starting address that is invalid.
   - Click Launch Wizard to create the network.
     - The Add Network wizard displays the selected network address and netmask.
   - You can add comments, automatically create reverse mapping zones, and edit the extensible attributes. (For information, see Adding IPv6 Networks.)
   - Save the configuration and click Restart if it appears at the top of the screen. Grid Manager updates Net Map with the newly created network.

Viewing Network Details

From Net Map, you can focus on a specific network or area and view additional information about it. If you have a network hierarchy of networks within network containers, you can drill down to individual leaf networks and view their IP address usage.
1. Select a network or area.
2. Click the Open icon.
   - If you selected a network container, Grid Manager displays it in the Net Map panel. You can drill down further by selecting a network or open area and clicking the Open icon again.
   - If you selected a block of multiple networks, Grid Manager displays the individual networks in the Net Map panel. You can then select a network or open area for viewing.
   - If you selected a leaf network, Grid Manager displays it in the Network List panel.
   - If you selected an open area, Grid Manager displays an enlarged view of that area in the Net Map panel.
   This is useful when you are creating small networks in an open area.

IPv6 Network List

The Network list panel is an alternative view of an IPv6 network hierarchy. For a given network, the panel shows all the networks of a selected network view in table format. A network list displays only the first-level subnets. It does not show further descendant or child subnets. You can open a subnet to view its child subnets. Subnets that contain child subnets are displayed as network containers. If the number of subnets in a network exceeds the maximum page size of the table, the network list displays the subnets on multiple pages. You can use the page navigation buttons at the bottom of the table to navigate through the pages of subnets.

The IPAM home panel displays the following:

- **Network**: The network address.
- **Comment**: Information you entered about the network.
- **IPAM Utilization**: For a network, this is the percentage based on the IP addresses in use divided by the total addresses in the network. You can use this information to verify if there is a sufficient number of available addresses in a network. The IPAM utilization is calculated approximately every 15 minutes.
- **Site**: The site to which the IP address belongs. This is a predefined extensible attribute.
- **Active Users**: The number of active users on the selected network. You can select the following columns for display:
- **Disabled**: Indicates whether the network is disabled.
- **Leaf Network**: Indicates whether or not the network is a leaf network.
- **Other available extensible attributes**

You can sort the list of subnets in ascending or descending order by columns. For information about customizing tables in Grid Manager, see *Customizing Tables*.

You can also modify some of the data in the table. Double click a row of data, and either edit the data in the field or select an item from a drop-down list. Note that some fields are read-only. For more information about this feature, see *Modifying Data in Tables*.

Tip: If you select a network from the list and switch to the Net Map panel, the network is also selected in the network map.

Filtering the Network List

You can filter the network list, so it displays only the networks you need. You can filter the list based on certain parameters, such as network addresses, comments and extensible attributes. When you expand the list of available fields you can use for the filter, note that the extensible attributes are those with a gray background.

Splitting IPv6 Networks into Subnets

You can create smaller subnets simultaneously within a network by splitting it. You do not have to configure each subnet individually. You can create smaller subnets with larger netmasks. A larger netmask defines a larger number of network addresses and a smaller number of IP addresses.

Note that you cannot split a network that is part of a shared network. To split an IPv6 network:

1. From the Data Management tab, select the IPAM tab -> network check box, and then click Split from the Toolbar.
2. In the Split Network editor, do the following:
   - **Address**: Displays the network address. You cannot modify this field.
   - **Net mask**: Specify the appropriate netmask for each subnet.
   - **IPv6 Prefix Collector Network**: If you split a network with prefix delegations that are not tied to specific addresses, specify the network in which all prefix delegations are assigned. If you leave this field blank, the server assigns all prefix delegations that are not tied to specific addresses to the first network.
   - **Immediately create**: Select one of the following:
     - **Only networks with ranges and fixed addresses**: Adds only the networks that have DHCP ranges and fixed addresses.
     - **All possible networks**: Adds all networks that are within the selected netmasks. You can select this option only when you automatically increase the CIDR by 8 bits.
   - **Automatically create reverse-mapping zone**: Select this check box to have the appliance automatically create reverse-mapping zones for the subnets. This function is enabled if the netmask of the network is a multiple of four, such as 4, 12 or 16.
3. Click OK.

Joining IPv6 Networks
Joining multiple networks into a larger network is the opposite of splitting a network. You can select a network and expand it into a larger network with a smaller netmask. A smaller netmask defines fewer networks while accommodating a larger number of IP addresses. Joining or expanding a network allows you to consolidate all of the adjacent networks into the expanded network. Adjacent networks are all networks that fall under the netmask of the newly-expanded network.

To join or expand a network:

1. From the **Data Management** tab, select the **IPAM** tab -> network check box, and then click **Join** from the Toolbar.
2. In the **Join Network** editor, do the following:
   - **Address**: Displays the network address. You cannot modify this field.
   - **Netmask**: Enter the netmask of the expanded network.
   - **Automatically create reverse-mapping zones**: Select this check box to configure the expanded network to support reverse-mapping zones. The appliance automatically creates reverse-mapping zones only if the netmask is between /4 through /128, in increments of 4 (that is, /4, /8, /12, and so on until /128).
3. Click **OK**.