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Preface

This guide describes how to use Oracle Communications Unified Topology for Inventory and Automation (UTIA) to view and analyze network data that is collected from Unified Inventory Management (UIM).

Audience

This document is intended for the operations and planning personnel who use the UTIA application to view and analyze the network data that is collected from UIM.

Before reading this guide, you should have a basic understanding of UIM. See *UIM Concepts* for more information.

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1

About UTIA

Oracle Communications Unified Topology for Inventory and Automation (UTIA) is a web application that collects network and service data from UIM and displays the data in the form of topology graphs.

Use UTIA to:

- View networks, services, corresponding resources, and their inter-relationships in the form of topology graphs and geographical maps.
- Plan network capacity.
- Track networks.
- Identify problematic hotspots within networks.
- Filter topology graphs to retrieve the desired information using various search criteria.

2

Setting Up UTIA

This chapter describes how to set up and configure UTIA.

Prerequisites for Setting Up UTIA

Before you set up UTIA, you need to install all the prerequisite software. See *Unified Inventory and Topology Deployment Guide* for installing the prerequisite software.

From Oracle E-delivery site, download the Common Cloud Native Toolkit (Common CNTK) and create an instance for UTIA. See the **Unified Inventory and Topology Toolkit** chapter from *Unified Inventory and Topology Deployment Guide* for more information.

Setting Up UTIA

To set up UTIA:

1. Set up Graph DB by following the instructions mentioned in Oracle Database Graph Developer's Guide for Property Graph.
2. Install or upgrade UIM. See *UIM Cloud Native Deployment Guide* for UIM cloud native deployment or *UIM Installation Guide* for UIM traditional deployment.
3. Configure the Unified Operations Message Bus microservice. See the **Unified Operations Message Bus** chapter in *Unified Inventory and Topology Deployment Guide* for more information.
4. Configure the Oracle Access Manager microservice. See the **Common Authentication Service** chapter in *Unified Inventory and Topology Deployment Guide* for more information.
5. Configure the Unified Topology for Inventory and Automation microservice and create an instance. See the **Unified Topology for Inventory and Automation Service** chapter in *Unified Inventory and Topology Deployment Guide*
   A UTIA instance is created and a URL is generated. Use this URL to access the UTIA application. Alternatively, you can open the UTIA home page from UIM. See "Accessing UTIA" for more information.

3

Getting Started with UTIA

UTIA helps you with a pictorial representation of the topology information that you collect from UIM. You can customize the layouts and other display settings according to your choice. You can customize your search, view and analyze each topology component, its associated resources, and its capacity consumed.

Accessing UTIA

Access the UTIA home page using any of the following options:

- Use the UTIA application's URL that is generated after configuring the UTIA microservice in a Kubernetes environment. See *Unified Inventory and Topology Deployment Guide* for more information.

  > **Note:**
  >
  > You require SSO credentials to access UTIA. If you have already logged into UIM using SSO credentials, you do not have to log in again to access UTIA.

- On the UIM home page, in the left navigation pane, click **Topology**. This opens the UTIA application's home page in a new tab or browser window. See *UIM Online Help* for more information.
- Within UIM, open the summary page of a network, and then navigate to the **Associated Resources** tab. Click **View Topology** for a resource. This opens the UTIA application and displays the topology graph for the corresponding resource. See *UIM Online Help* for more information.
- Within UIM, click **Topology** on the corresponding summary page of any of the following entities:
  - Pipe
  - Connectivity
  - Equipment
  - Physical Device
  - Logical Device
  - Service

About the UTIA Home Page

On the top-right corner of the UTIA home page, you can find a user profile drop-down list with some options. You can use these options for:

- Opening the UTIA user's guide using **Help**.
- Logging out of UTIA using **Sign Out**. This action logs you out of the application and displays the UTIA login page.

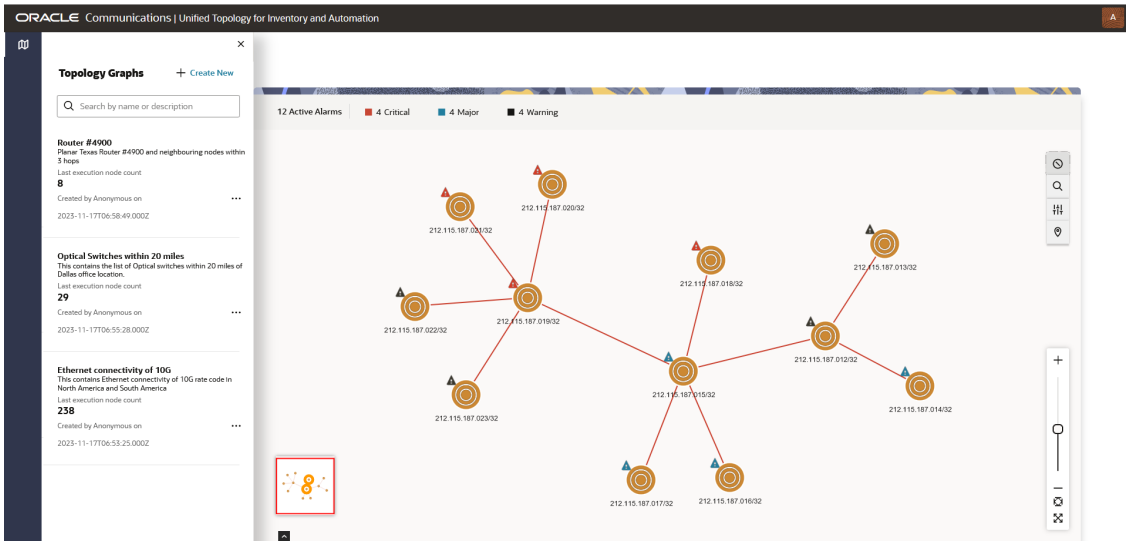
You can also access UIM from the **General Information** tab of a topology component's summary page. See "Accessing UIM from UTIA" for more information.

About the Topology Graph

On the home page, you can search for a topology graph and view it.

Figure 3-1 shows the UTIA home page with the topology graph of a network.

Figure 3-1 UTIA Home Page showing the topology graph of a network



The topology graph shows the following:

- The diagram canvas on which all the topology components are depicted.
- The **Alarm Details** pane shows the number of active alarms. Clicking the icon above the **Search** option at the right side of the screen toggles its visibility.
- An **Overview** pane that shows the overview information of a node or edge of any selected topology component within the topology graph.
- A legend in the left-bottom corner (below the **Overview** pane) that opens when clicked. It describes the custom colors and icons that represent the corresponding specifications in the topology graph along with the corresponding device count. The default and custom icon preferences are grouped as separate lists, as are specifications. Clicking on any of the specifications or icons or edges highlights all the respective nodes and edges on the graph.
- A zoom scroll bar on the right-end corner that helps you to change the zoom settings. You can change the zoom settings by scrolling the mouse or by using these controls.
- A **Settings** icon that opens the **Settings** pane to change the display and advanced settings to customize the graph as per your choice. See "Changing the Topology Graph Settings" for more information.
- A **Search** text box to search for a specific topology component within the topology graph.

On the topology graph, you can select a topology component, and view its details. A topology component can be a node or an edge. If the selected component is a node, you can isolate,

expand, or collapse the node by right-clicking on the node and selecting the corresponding option. See "Viewing the Details of Topology Components" for more information.

4

Searching for Topology Graphs

This chapter describes how to search for topology graphs and customize the search.

Searching for a Topology Graph

To search for a topology graph:

1. On the UTIA home page, click the **Networks** icon in the top-left corner.

   This opens the **Topology Graphs** search pane with a list of topology graph records that you have saved (if any). These topology graph records show the corresponding names, descriptions, and the number of components. See "Customizing a Topology Graph Search" for more information.

2. (Optional) Type the name or description of a topology graph in the Search field.

   A list of related search results appears.

3. Choose a topology graph and click on it or select **Render Map** in the ellipsis options.

4. (Optional) Select **Edit** or **Discard** to edit or discard the topology graph search.

5. (Optional) Click **Create New** to customize a new topology graph search.

   A **Create New** pane appears. See "Customizing a Topology Graph Search" for more information.

Customizing a Topology Graph Search

You can customize your topology graph search in the **Create New** search pane. You can use this customized topology graph search for quickly accessing and monitoring the topology graph without selecting the attributes every time.

To customize your topology graph search:

1. Enter a name and a description for the topology graph.

2. Select a condition from the dropdown list.

3. In the **Attributes** side pane, click the '**=**' icon of an entity to drag and drop the corresponding attributes to the topology graph. See "Selecting Attributes while Customizing a Topology Graph Search" for more information on the list of supported entities and the corresponding attributes.

4. (Optional) To add only a specific attribute within an entity, expand the entity and drag and drop the specific attribute to the list.

   > **Note:**
   >
   > If you add a specific attribute to the list, the corresponding entity gets added to the list.

5. (Optional) Click the '**+** ' icon of the required attribute to add it to the list.

6. To remove an attribute or entity, click the Remove icon from the list of added attributes.

> **Note:**
>
> Removing an entity removes all corresponding attributes from the list.

7. After you add all attributes, click **Save & Search**.

   The customized topology graph search is saved and the corresponding topology graph appears. You can use this customized search from the list of saved searches for quickly accessing it.

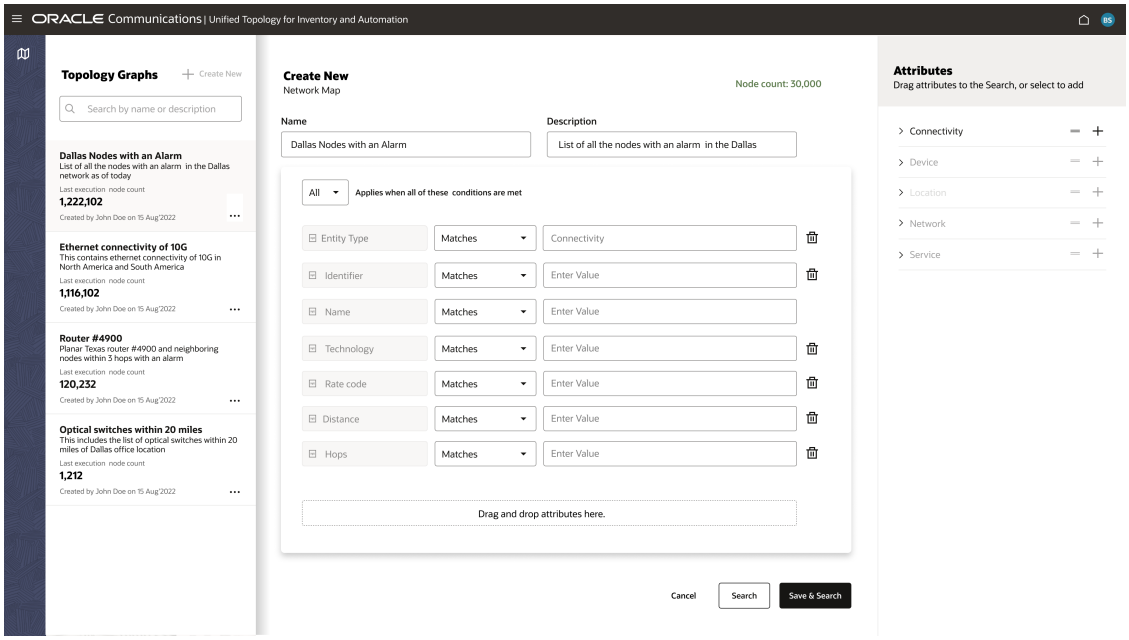
8. (Optional) Click **Search** to open the topology graph without saving the search.

   The topology graph that contains all the selected attributes appears.

9. (Optional) Click **Cancel** to cancel the search.

Figure 4-1 shows the **Create New** search pane.

Figure 4-1 Customizing Network Search



Selecting Attributes while Customizing a Topology Graph Search

You can select an entity and its corresponding attributes to customize a topology graph search. Select or enter the corresponding values of these attributes to customize your search. The search returns results with a topology graph that contains only the selected entity types.

You can add only one entity from the list of entities. Adding an entity adds all the corresponding attributes to the search.

The list of supported entities are:

- Connectivity
- Device
- Location
- Network
- Service

Each entity has a list of attributes. You can select all or a few of these attributes. By selecting a set of attributes, you can customize your topology graph to display only the corresponding information.

Except for **Service**, all other entities have both generic and entity-specific attributes. The list of these specific attributes varies with the entity that you select. The **Service** entity has only two attributes, **Name** and **Version**.

Table 4-1 lists the generic attributes.

Table 4-1 Generic Attributes

Attribute	Description
Identifier	The identifier of the topology component. You can enter an identifier or select from the list of identifiers.
Name	The name of the topology component. You can enter a name or select from the list of names.
Technology	Enter the technology to search for the topology components operating under the technology.
Rate Code	Enter the rate code to view the topology components that are associated with it.
Hops	Enter the number of hops or select from the list, to search for the topology components within that number.
Vendor	Enter the name of the vendor to search for all the topology components of the vendor.
Category	Enter a category for **Network** or a device category for **Connectivity**, **Device**, and **Location**. The values for category can be **National**, **Regional**, **CircleCore**, **Aggregate**, **Pre-Aggregate**, and **Access**.

Table 4-2 lists the entity-specific attributes.

Table 4-2 Entity-Specific Attributes

Attribute	Description
Domain	Enter the network address domain. This attribute is specific to **Connectivity** and **Device**.
Specification	Enter the specification that is used to create the entity. This attribute is specific to **Connectivity** and **Device**.
Node Type	Enter the node type.
Distance	Enter the distance to search for all the topology components available within the given distance from the location or device. Select the distance unit from the list beside this field. You can select **Meter**, **Kilometer**, or **Mile** as distance unit. This attribute is specific to **Location** and **Device**.

Table 4-2 (Cont.) Entity-Specific Attributes

Attribute	Description
Device Specification	Enter the device specification that is used to create the entity. This attribute is specific to **Location** and **Network**.
Area	Enter the location area to search for all topology components available within that area. This attribute is specific to **Location**.
Circle	Enter the circle to search for all topology components within the circle. This attribute is specific to **Location**.
SubCategory	Enter the subcategory to search for all subnetworks with the specified types. See "Viewing Networks and Subnetworks" for more information. This attribute is specific to **Network**.
Topology Type	Enter the topology type. This attribute is specific to **Network**.
Sub Type	Enter the topology sub type. This attribute is specific to **Network**.

Viewing Networks and Subnetworks

You can view multiple layers of a network by navigating up or down the network hierarchy. This can be achieved using the **Category** attribute in the **Create New** Topology Graph search page.

An example of a network hierarchy is:

National > **Regional** > **CircleCore** > **Aggregate** > **Pre-Aggregate** > **Access**

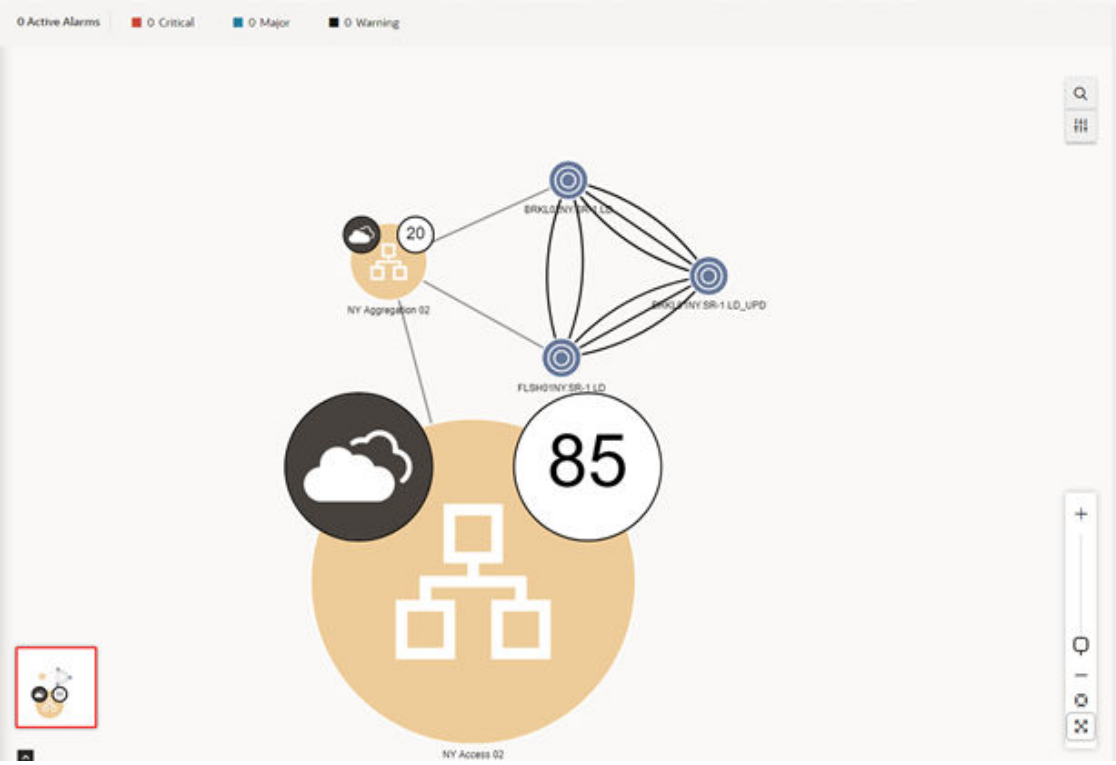
You can have either of the following types of networks:

- Multiple layers within a single network that follows the network hierarchy. For example: A **Regional** network has few nodes and one **Aggregate** subnetwork. You can see the subnetworks within the **Aggregate** subnetwork by clicking on it.
- Different types of subnetworks within a single parent network. For example: You can have a **Regional** network that in turn has its own nodes along with **Aggregate** and the corresponding **Access** networks. The nodes within the **Access** network can connect to the nodes within the **Regional** network through the **Aggregate** network. Figure 4-2 shows a network having different types of subnetworks.
- All the devices and connectivities exist within a single network. Oracle does not recommend this approach.

> **Note:**
>
> Setting a device category attribute is supported on device or connectivity search.

To open any specific subnetwork, you need to enter the corresponding parent network name attribute in **Name** and the subnetwork type attribute in **Category** in the **Create New** Topology Graph search page.

Figure 4-2 Subnetworks within a Single Network



Adding Advanced Filters for Searching Topology Graphs

You can use the advanced filtering option while searching the topology graph to filter search results. The **Search** icon at the right corner of the canvas opens the **Advanced Filter** panel on the left side of the screen. In this panel, you can choose between the **Search and Filter Topology** or **Ring Search** options by selecting corresponding option from the dropdown list. The **Search and Filter Topology** option appears by default. See "Using Search and Filter Topology" and "Using Ring Search" for information on using the two options.

The list of filters supported are:

- Location
- Network Type
- Device Type
- Technology

Using Search and Filter Topology

The **Search and Filter Topology** panel has a search bar with filter options under it. Each filter option represents one filter type, such as **Location** or **Network Type**. Each option has a value chosen by default. To see the list of filters supported, see "Adding Advanced Filters for Searching Topology Graphs". Below the search bar is a list of all the nodes and edges in a

topology graph. The nodes are grouped into categories by **Location**, while the edges are grouped separately.

You can search for nodes/edges by applying filters.

To search for nodes/edges using filters:

1. Select a filter option below the search bar. You may select any number of filter options.

   The selected filter option appears inside the search bar. When you choose a filter option, a list of related filters appears below the search bar. You can scroll horizontally and view more filters by selecting the 'More' option.

2. To change the value of the selected filter, click on it and select any number of values from the list.

   The filter option changes to reflect the value chosen.

3. The topology graph on the canvas only shows the nodes/edges matching the search criteria.

> **Note:**
>
> When filters are applied:
>
> - The corresponding nodes/edges appear in the panel.
> - The highlighted nodes appear along with their associated edges in the canvas. When filters are removed, the entire topology appears.
> - For edge search, the terminal nodes of the matching edges appear on the canvas.

Using Ring Search

The Ring Search option allows you to search for rings in a network topology. For very large graphs the calculation of rings is limited, but you can choose to calculate all rings for a moderate graph. When you switch to this option, a pop-up message prompts you to proceed with the calculation of limited rings and the list of rings in the graph appears on the left side of the screen.

You can view ring information by selecting a ring from the list. The chosen ring is highlighted on the canvas, and the **Ring Capacity** panel appears on the right side of the canvas. This panel provides details on the **Total Capacity** and **Capacity Consumed** by the ring, as well as information about the nodes and edges within the ring.

You can choose any number of rings to view on the topology. You can also filter ring search by applying filters using the filter options below the search bar. See "Using Search and Filter Topology" to learn about applying filters. Further, you can view only the rings, nodes or edges of the graph by choosing from the dropdown menu above the list of rings. If the list of nodes/edges/rings is too long, then it is divided into different pages that can be viewed by clicking the page numbers listed next to the dropdown menu.

5

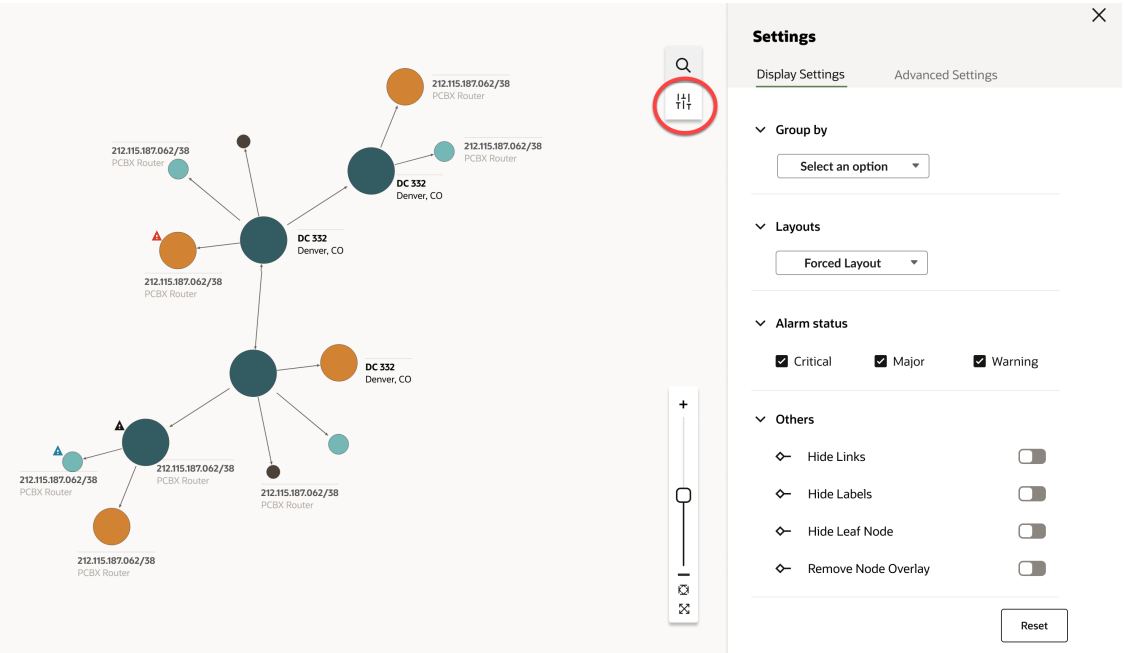
Changing the Topology Graph Settings

This chapter describes how to change topology graph settings.

Opening the Settings Pane

Use the **Settings** icon from the quick navigation bar to open the Settings pane as shown in Figure 5-1:

Figure 5-1 Display Settings panel in UTIA



The **Settings** pane helps you to change the display and advanced settings.

Changing the Display Settings

You can change the display settings of the topology graph using the options under the Display Settings tab.

The following table provides the list of options you can use to change the display settings.

Table 5-1 Display Settings

Setting Name	Description
Group by	Select an option to group the topology components. You can group the components by state, city, postal code, district, province, location code, and circle. Each option you select provides the number of components present in each group.
Layouts	Select an option to change the layout of the topology graph. Forced Layout is the default layout. See "Changing the Topology Graph Layout" for more information.
Alarm Status	Select the required alarm status types to view the corresponding details in the topology graph. You can select one or more alarm status types. The available alarm status types are **Critical**, **Major**, and **Warning**.
Others	Enable an option to change the corresponding setting. You can hide the links, labels, and leaf nodes and remove the node overlaps by enabling the corresponding option.
Reset	Click **Reset** to change the display settings back to the default options.

Changing the Topology Graph Layout

You can change the layout of a topology graph into any of the layouts listed in the following table:

Table 5-2 Topology Graph Layouts

Layout	Description
Forced Layout	Displays the topology components in an aesthetically pleasing way. This is the default layout.
Geo Map Layout	Displays the topology graph in a geographical map view. See "Working with the Geo Map Layout" for more information.
Circular Layout	Displays the topology components in a circle.
Grid Layout	Displays the topology components in the form of a grid.
Hierarchical Layout	Displays the topology components according to the hierarchy and without any overlaps.

> **Note:**
>
> If you isolate a node or open its summary, the layout resets to the default option.

Working with the Geo Map Layout

You can view the topology graph in a geographic map layout. In a Geo Map layout, all the topology components appear according to their geographic locations.

You can zoom in to view a specific component. If you want to view all the components in that topology graph, you can zoom out to the original settings or you can click the **Fit to Zoom** icon in the zoom settings bar.

A mini-map, on the left-bottom corner, shows the position of a selected topology component in the whole graph.

A collapsible legend, below the mini-map, opens if you click on it. This legend shows a list of specifications and their corresponding icons and colors that are available within the topology graph.

You can view the details of a topology component by clicking on it. This action opens an **Overview** tab that includes the alarm details associated with the component. See Viewing the Details of Topology Components for more information.

You can change the geographical map type on the **Advanced Settings** tab. See "Adding Advanced Settings" for more information.

Adding Advanced Settings

You can further customize the topology graph by adding the following advanced settings:

- Using the **Icons & Colors** option, you can enable or disable icons for topology components.
- You can change the type of geographical map using the **Geo Maps** option.
- You can change the opacity percentage for the selected geographical map.

Customizing Node Icons in the Topology

You can customize node icons in the topology graph by choosing from a predetermined or uploaded range of icons. You can add multiple customizations by filtering nodes according to specification and network type.

To customize node icons:

1. Select **Customize Icons** from **Advanced Settings**.

   The **Custom Icons** pop-up window opens.
2. Select the specification and network type of the nodes you want to customize. Then click the **Select Icon** menu to select an icon.
3. Click **Add** to add your customization as a preference. You can edit or delete this customized entry anytime.
4. Click **Apply**.

   The customization is applied to the topology.

> **Note:**
>
> You can upload a custom icon by clicking on **Upload From Computer**. You can also delete each uploaded icon or all of them by using the **Delete** or **Delete All** buttons. Deletion operation is only applicable for uploaded custom icons, and only when it is not being used to represent any devices on the graph.

Customizing Edge Colors in the Topology

You can customize edge colors in the topology graph.

To customize edge colors:

1. Select **Customize Colors** from **Advanced Settings**.

   The **Custom Colors** pop-up window opens.

2. Select the technology and rate code of the edges you want to customize. Then click the **Select Style** menu.

   In the pop-up window, you can select any color from the gradient palette or input a specific RGBA value. You can also adjust **Line Styling** according to your preferences.

3. Click **Add** to add your customization as a preference. You can edit or delete this customized entry anytime.

4. Click **Apply**.

   The customization is applied to the topology.

6

Viewing the Details of Topology Components

This chapter describes how to view the details of topology components.

Viewing the Details of a Topology Component

In a topology graph, you can view the details of a topology component by clicking on it. The details appear in a side pane that contains the **Overview** and **Alarm Details** tabs. To view more information about the topology component, click **More Info** on the details side pane. See "Viewing Additional Information About a Topology Component" for more information.

The **Overview** tab displays the corresponding details of the topology component such as ID, Inventory Status, location details, entity category, subnet type, Created Date, and so on. These details vary from component to component.

The **Alarm Details** tab displays the list of active alarms present in the topology graph. You can see the corresponding severities of the alarms such as, **Critical**, **Major**, and **Warning**. You can expand each alarm to view the details.

Viewing Additional Information About a Topology Component

You can view the additional information about a selected topology component by clicking **More Info** on the overview details side bar that opens a summary page.

The topology component's summary page has the following:

- **General Information** tab: This tab shows the details such as ID, name, specification, location, and so on. It also shows the total capacity available, the capacity consumed, and the percentage of the capacity consumed. You can view the characteristics of the component (if any) in the **Characteristics** side pane.

  > **Note:**
  >
  > For pipe and connectivity, clicking on the ID field will take you to the corresponding summary page within UIM.

- **Device Interfaces** tab: This tab's label shows the number of device interfaces that the logical device is associated with. After you open the tab, a list of all the device interfaces (if any) appears. From the list, you can view the name, specification, inventory status, assigned status, and alarm status of the device interfaces. You can select a device interface and view its summary in the **Summary for DI <ID>** side pane. If a device interface has sub-interfaces in a channelized connectivity, you can view the hierarchy of the device interface by expanding it.

> **Note:**
>
> Physical device and equipment do not have Device Interfaces associated with them and therefore, the **Device Interfaces** tab does not appear for either of these entities.

- **Associated Resources** tab: The label of this tab shows the number of associated resources that the topology component has.

  For example: If a Logical Device and Equipment are associated with a Physical Device, the **Associated Resources** tab of the Physical Device shows the Logical Device and Equipment associated with it.

  After you open the tab, a list of all the associated resources (if any) appears. You can filter this list with the entity type. From the list, select a resource to view the details in the side pane. You can also view the summary of the resource from the **Summary for <resource ID>** side pane.

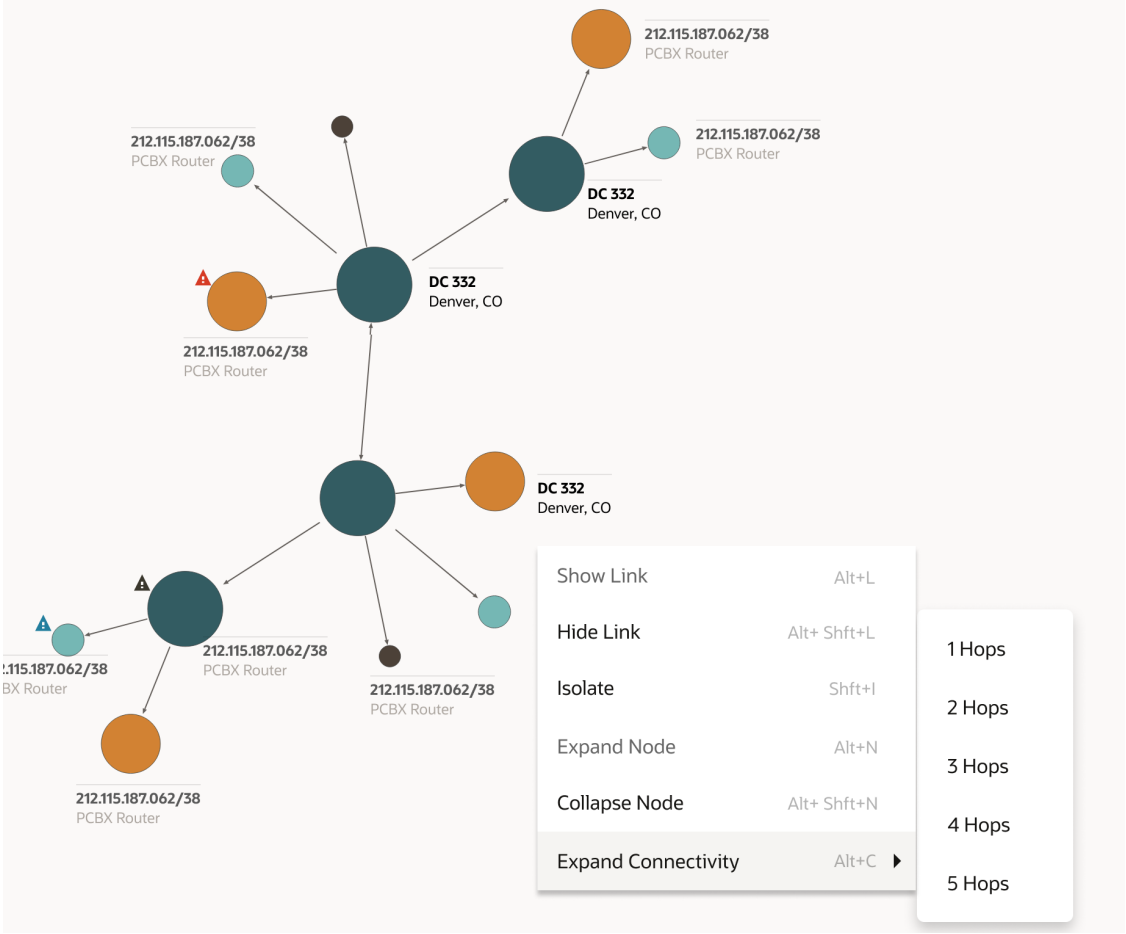
- **Back** button: Click this button to go back to the topology graph.

Adding Settings from a Context Menu

You can select a topology component and add settings using the context menu, which opens when you right-click on the component. You can also use the keyboard shortcuts for adding these settings.

Figure 6-1 shows the context menu options and the corresponding keyboard shortcuts.

Figure 6-1 Context menu options in UTIA



You can add the following settings:

- **Show Link**: Displays the links that are connected to the selected component.
- **Disable Link**: Disables all the links that are connected to the selected component.
- **Isolate**: Isolates the selected component from the rest of the topology graph. You can go back to the original topology graph by clicking ×.
- **Expand Node**: Displays all the subnetworks within the network.
- **CollapseNode**: Collapses all the subnetworks of the network.
- **Expand Connectivity**: Expands the connectivity by the number of hops that you further select.

Accessing UIM from UTIA

To access UIM from UTIA:

1. Open the required topology graph and select a topology component.

   The overview pane of the component appears.

2. Click **More Info**.

   The summary page of the component appears.

3. Under the **General Information** tab, click on the **ID** link.

   The corresponding component's summary page in UIM appears.