



Maps

SL1 version 8.14.0 Beta

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Chapter

1



Introduction to Maps

Overview

NOTE: Maps are considered experimental and will be released for general availability in a later release. If you want to enable Maps, contact your Customer Success Manager.

This manual describes how to create and manage relationship maps for the various elements, also called **nodes**, in SL1.

Use the following menu options to navigate the SL1 user interface:


- To view a pop-out list of menu options, click the menu icon ().
- To view a page containing all of the menu options, click the Advanced menu icon (.

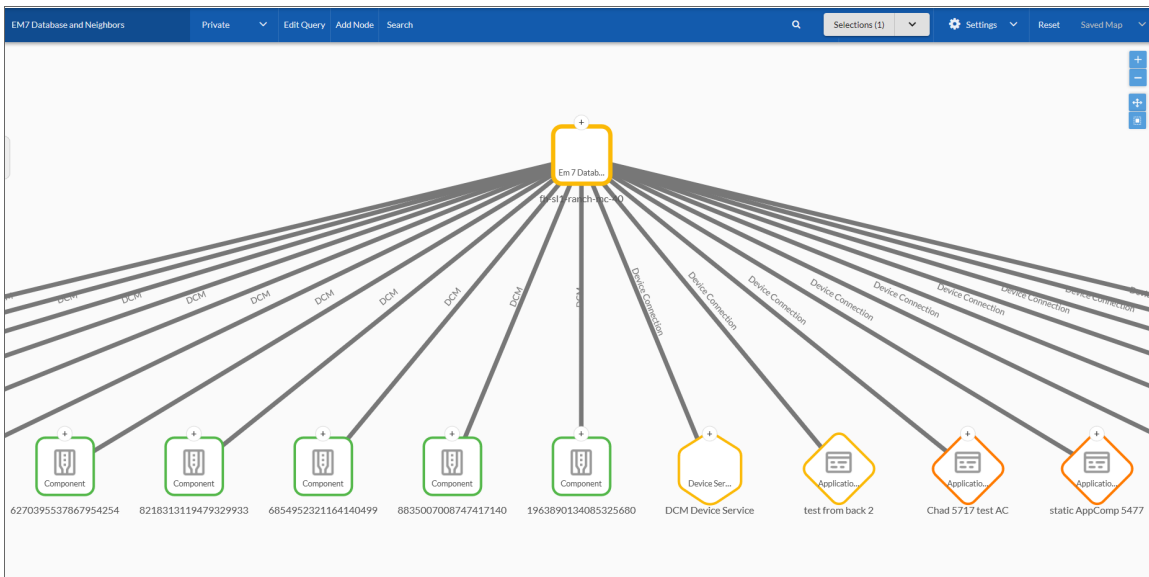
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What is a Map?

A **map** is a visual representation of the various devices and related elements, also called **nodes**, in your environment that have been discovered by SL1. A map displays the important details and relationships associated with those nodes.

To navigate to the **Maps** page, click the Maps icon (). The following is an example of a map:



A map includes the following graphical elements:

- **Nodes.** Shapes that represent Devices, Topology Elements, Applications, Application Components, and Business Services defined in SL1. The shape of the node represents its type, and the color of the outline specifies the current state of the node.
- **Edges.** Lines with or without arrows that represent the relationships and hierarchies between nodes. All device relationships are displayed as child and parent relationships. If the nodes on a map contain arrows, then the arrows represent the direction of the relationship, pointing from the child node to its parent node. If a node does not contain an arrow, then the relationship is bi-directional, or *undirected*.

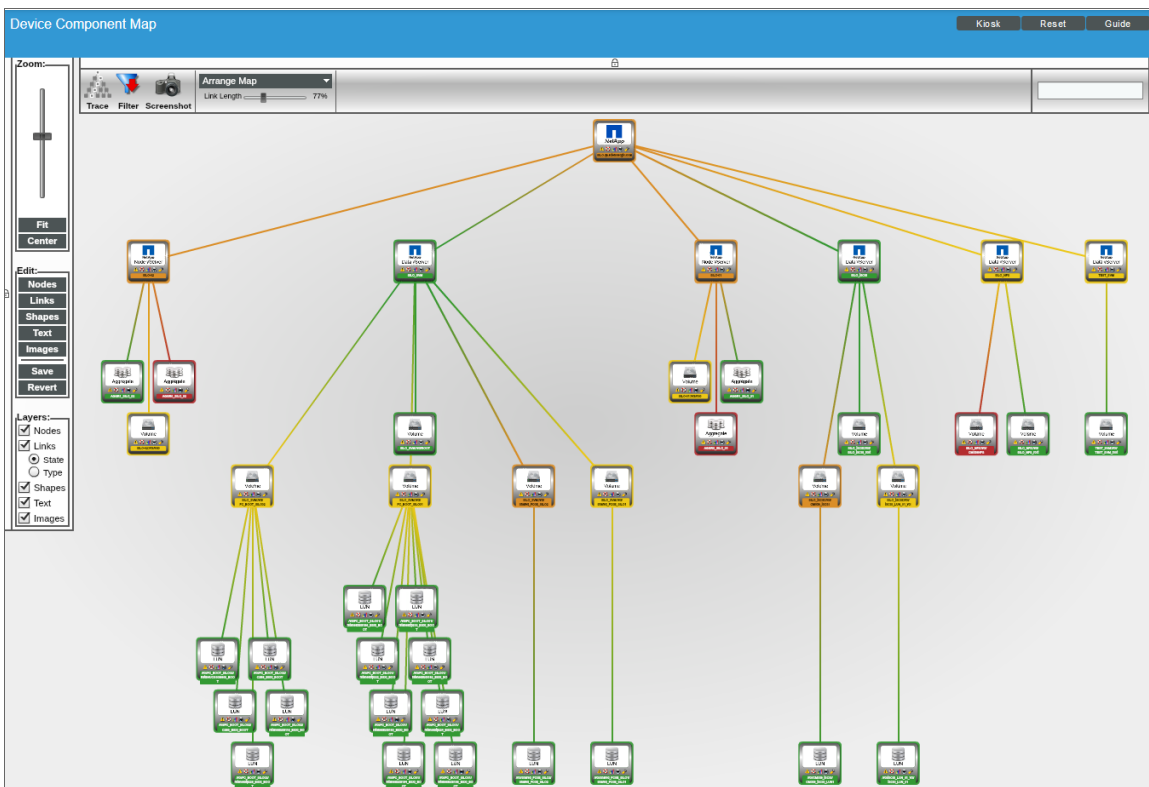
For more information, see [Viewing a Map](#).

What is a Classic Map?

A **Classic Map** is the same as a **View** in the classic user interface.

A **View** is a graphical representation of a group of devices. The **[Views]** tab (Maps > Classic Views) allows you to view, edit, and create maps and relationships between devices and virtual infrastructure. In SL1, views are organized by device group, organization, device category, component maps, Layer-2 topology, CDP topology, LLDP topology, Layer-3 topology, or Virtual Infrastructure (VMware and virtual machines). You can also create your own maps with your most important devices, and add images, text, links, and shapes to customize your maps.

To navigate to the **Classic Maps** page, go to Maps > Classic Maps. The following is an example of a classic map or view:



For more information, see the **Views** manual.



Installing SL1 Maps on the Database Server

Overview

This chapter describes how to install and run *SL1 Maps on a Database Server*. This configuration is also called "Maps on CDB". Another way to enable maps is to use the *SL1 Extended* architecture, which is designed for devices that use SL1 agents. The "Maps on CDB" architecture uses the SL1 Maps images bundle installed on the Central Database appliance, while the "Extended" architecture uses a Central Database appliance and multiple storage and data nodes. For more information, see the *Installation* manual.

NOTE: If you have already installed SL1 Maps and want to get the latest update, see [Updating SL1 Maps](#).

Use the following menu options to navigate the SL1 user interface:

- To view a pop-out list of menu options, click the menu icon (.
- To view a page containing all of the menu options, click the Advanced menu icon (.

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Before You Install

Review the following questions before installing SL1 Maps on the Database Server:

1. Verify that Docker is enabled and running on the Database Server by starting an SSH session into the Database Server and running the following command on the Database Server:

```
systemctl status docker
```

If Docker is not running on the Database Server, run the following commands:

```
sudo systemctl enable docker.service
sudo systemctl start docker.service
```

NOTE: Docker runs by default on an All-In-One Appliance, but not on a distributed appliance.

2. Verify that you are running SL1 8.12.0 or later, which is required for SL1 Maps. To locate the version number, launch SL1, click your username in the top navigation bar, and select *About*; the SL1 version appears in the **Platform** section. If 8.12.0 is not the initial version of SL1, determine the SL1 upgrade path and the initial version of SL1.

NOTE: If you have upgraded from a version of SL1 earlier than 8.8.0, you might run into an issue where the file system type and storage driver are not compatible with newer versions of SL1. As a result, the Docker containers might run out of space, and the SL1 Maps service will fail to start. For more information, see the following Knowledge Base article: [SL1 Map Containers Out of Space](#).

3. Determine the file system type of the partition where `/var/lib/docker/` is located by running the following command on the Database Server:

```
xfs_info /dev/sda1 | grep ftype
```

NOTE: If `ftype=0`, see the following Knowledge Base article to update the file system type: [SL1 Map Containers Out of Space](#). If `ftype=1`, you do not need to do anything further for this step.

4. Determine the storage driver the SL1 system is using by running `docker info` on the Database Server, and then searching for *Storage Driver* and *Backing Filesystem*.

NOTE: The Docker *devicemapper* storage driver is not a recommended Docker setup, and it can cause issues with SL1 Maps. The *devicemapper* storage driver is deprecated in Docker Engine 18.09, and it will be removed in a future release. ScienceLogic recommends that users of the *devicemapper* storage driver migrate to the *overlay2* storage driver. For more information, see [Use the OverlayFS storage driver](#).

5. Verify that the `/var` partition of the Database Server is set to at least 15 GB, if possible. Older installations of SL1 set the `/var` partition to only 3 GB, which is not sufficient for SL1 Maps.

If you are installing SL1 Maps for the first time using the *images bundle* from version 8.14.0 of SL1, then the `/var` partition will be set to the following size, based on the size of your Database Server:

- 20 GB if the Database Server is 1 TB or larger. You do not need to do anything further for this step.
- 15 GB if the Database Server is 500 GB to 1 TB. You do not need to do anything further for this step.
- 9 GB if the Database Server is 300 GB to 500 GB. You might want to expand the `/var` partition, or you might experience a Maps outage of five minutes or less about every week.
- 6 GB if the Database Server is under 300 GB. You should expand the `/var` partition to avoid a Maps outage of five minutes or less every week.

NOTE: For more information about expanding the `/var` partition, see [The Maps Page is Not Available Because the /var Partition is Full](#) in the *Troubleshooting* chapter.

NOTE: To prevent the `/var` partition from filling up when you use SL1 Maps, SL1 will monitor the size of the partition. When the size of the partition exceeds 80%, SL1 will restart the SL1 Maps service to free up space in the `/var` partition. Please note that the **Maps** page will be unavailable for a short period while the Maps service restarts.

6. If your SL1 system is configured for High Availability and/or Disaster Recovery, see [Special Configuration Considerations](#).

NOTE: Remote database configuration for SL1 Maps is not supported at this time.

Downloading the SL1 Maps Images Bundle

To download the SL1 Maps images bundle:

1. Access the [ScienceLogic Customer Portal](#).
2. Go to the **Miscellaneous Downloads** page (Downloads > Miscellaneous).
3. Click the name of the SL1 Maps image bundle to download the bundle, such as "sl1-maps-images-bundle-1.1.0-3.1.tar.gz".

Transferring the SL1 Maps Images Bundle to the Database Server

CAUTION: This and subsequent sections use the IP address 10.2.17.188 as an example to represent the IP address of the Database Server. When completing these steps, replace 10.2.17.188 with the IP address of your own Database Server.

If you did not download the SL1 Maps images bundle directly onto the Database Server, you must transfer it to a directory on the Database Server with at least 500 MB of free space, such as /tmp.

Using a tool like secure copy (SCP), copy the file from the directory on your local computer to the /tmp directory on the Database Server. For example:

```
scp Downloads/sl1-maps-images-bundle-1.1.0-3.1.tar.gz em7admin@10.2.17.188:/tmp/
```

Loading the Images into Docker on the Database Server

To load the SL1 Maps images into Docker on the Database Server:

1. Start an SSH session into the Database Server.
2. Start the Docker service on the Database Server by running the following commands on the Database Server:

```
sudo systemctl enable docker.service
sudo systemctl start docker.service
```

3. Change directory to the /tmp directory (or the directory where you saved the tar.gz file in the previous step):

```
cd /tmp
```

4. Load the images into Docker on the Database Server by running the following command on the Database Server:

```
gzip -dc /tmp/sl1-maps-images-bundle-1.1.0-3.1.tar.gz | sudo docker load
```

The list of loaded images from the bundle appears; the following list is an example:

```
sciencelogic-docker.jfrog.io/pipeline:0.3.80
sciencelogic-docker.jfrog.io/pipeline:latest
sciencelogic-docker.jfrog.io/pipeline:sl1-8.14.0
sciencelogic-docker.jfrog.io/afqueue:0.2.22
sciencelogic-docker.jfrog.io/afqueue:latest
sciencelogic-docker.jfrog.io/afqueue:sl1-8.14.0
sciencelogic-docker.jfrog.io/responder:0.2.58
sciencelogic-docker.jfrog.io/responder:latest
sciencelogic-docker.jfrog.io/responder:sl1-8.14.0
nginx:latest
dgraph/dgraph:latest
dgraph/dgraph:v1.1.0
redis:4.0.10
```

Editing the MySQL Database and SL1 User API Passwords

The SL1 Maps service requires authentication credentials to both MySQL and the SL1 API. If the MySQL username and password value are not "root" and "em7admin", respectively, or if "em7admin" cannot be used as both the username and password to access the SL1 API, then you must update the associated "key" files in the `creds-mdb` or `creds-node-gql` directories with the current password.

NOTE: If you specify an alternate SL1 username and password, that user must have access to all devices on the system.

To edit the MySQL database and the SL1 User API passwords:

1. Start an SSH session into the Database Server.
2. At the shell prompt, type the following:

```
cd /opt/insight/maps_cdb/
```

3. View the list of credentials:

```
ls -l creds-*/*
```

You will see something like the following list of keys and users, which you can use as reference if you need to know which key or user name to change:

```
creds-cass/key
creds-cass/user
creds-mdb/key
creds-mdb/user
creds-node-gql/key
creds-node-gql/user
```

NOTE: In the credentials, "mdb" refers to the active MySQL database and "node-gql" refers to the NodeJS GraphQL API, which requires access to the SL1 API. The file that is named "user" refers to the user name, and "key" refers to the password.

- Using the vi editor (or another text editor), edit the `creds-mdb/key` or `creds-node-gql/key` values as necessary, and enter the correct password.

TIP: The file **must not include** a trailing newline (`\n`) character at its end. For example, if editing in vim, be sure to use both `:set binary` and `:set noeol` before editing; otherwise, the pipeline containers will fail to read the password. This can be done at a later time as well, if passwords change or if the password was forgotten after deployment.

Starting the SL1 Maps Service

After you have loaded the images into Docker on the Database Server and, if necessary, edited the MySQL database and the SL1 API passwords, you must enable and start the SL1 Maps service.

To start the SL1 Maps service:

- Start an SSH session into the Database Server.
- At the shell prompt, type the following:

```
sudo systemctl enable s11-maps.service
sudo systemctl start s11-maps.service
```

You can use standard `systemctl` commands to verify that the SL1 Maps service is running and to view its logs. For example, you can type the following at the shell prompt:

```
sudo systemctl status s11-maps.service
```

You should see results like this:

```
s11-maps.service - SL1 Maps on DB
  Loaded: loaded (/usr/lib/systemd/system/s11-maps.service; disabled; vendor preset:
  disabled)
  Active: active (running) since Wed 2019-03-27 18:06:47 UTC; 4 days ago
  Process: 11477 ExecStartPre=/opt/insight/maps_cdb/ensure-responder-proxy-certs
  (code=exited, status=0/SUCCESS)
  Process: 11471 ExecStartPre=/opt/insight/maps_cdb/docker-compose rm -fsv
  (code=exited, status=0/SUCCESS)
  Process: 11468 ExecStartPre=/opt/insight/maps_cdb/set-db-ip (code=exited,
  status=0/SUCCESS)
  Main PID: 11486 (docker-compose)
```

Editing the NextUI Environment File

After starting the SL1 Maps service, you must edit the NextUI environment file so that it connects to the API proxy over HTTPS. To accomplish this, verify that the `API_PROXY_HOST` value is `https://localhost` (the default value), and set the `RESPONDER` value to `<IP address of the local Database Server>:8443`. For example, `RESPONDER=10.2.17.188:8443`.

NOTE: To access the **Maps** page on an Administrator Portal on the Database Server stack, perform the following steps for *each* Administrator Portal.

To edit the nextui.env file:

1. Start an SSH session into the Database Server.
2. Using vi or another text editor, edit the /opt/em7/nextui/nextui.env file. To do so, enter the following at the shell prompt:

```
sudo vi /opt/em7/nextui/nextui.env
```

3. In the NextUI environment file, make sure that the API_PROXY_HOST value is set to https://localhost:

```
API_PROXY_HOST=https://localhost
```

4. In the NextUI environment file, add the following line at the bottom:

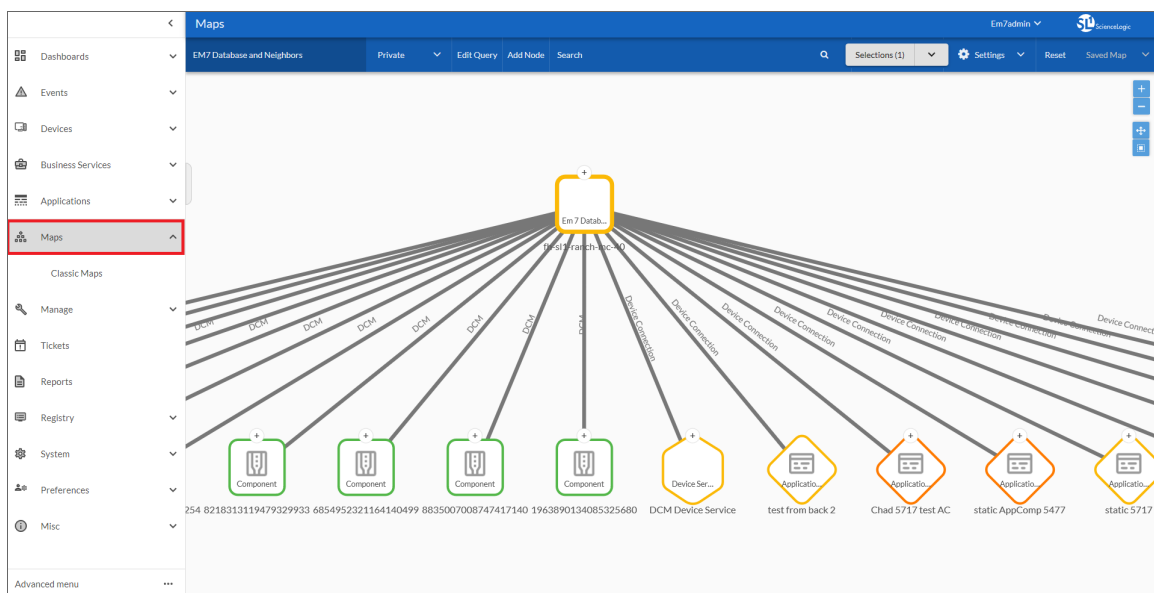
```
RESPONDER=<IP address of the local Database Server>:8443
```

TIP: You do not need to add http:// or https:// at the start of the IP address.

5. Restart the NextUI service by running the following command:

```
sudo systemctl restart nextui.service
```

6. If all of the preceding steps have been successful, when you log in to SL1, you will be able to **view** and **create maps** from the **Maps** page:



For troubleshooting information related to installing SL1 Maps, see the [Troubleshooting chapter](#).

Updating SL1 Maps

This topic describes how to get the latest version of SL1 Maps if you have already installed SL1 Maps using the above procedures. The updated SL1 Maps are included with the latest version of the SL1 Product Update file.

To update SL1 Maps with the latest SL1 update:

1. Run the most recent SL1 Product Update file. For more information, see the "Updating, Monitoring, and Maintaining SL1" chapter in the **System Management** manual.
2. Stop the `sl1-maps` service by running the following command on the Database Servers:

```
sudo systemctl stop sl1-maps.service
```

3. Remove any old Docker images by running the following command and collecting the IDs for the image you want to delete:

```
docker images
```

4. To delete the images, run the following command:

```
docker rmi <list of images separated by spaces>
```

Delete the following images from the previous images bundle:

- `sciencelogic-docker.jfrog.io/responder`
- `sciencelogic-docker.jfrog.io/pipeline`
- `sciencelogic-docker.jfrog.io/queue_manager`
- `nginx`
- `dgraph/dgraph`
- `redis`

Be sure to remove *all* versions of each image, as some images have a latest version and one or two numbered versions as well. For example:

```
docker rmi sciencelogic-docker.jfrog.io/responder:latest sciencelogic-docker.jfrog.io/responder:sl1-8.14.0 sciencelogic-docker.jfrog.io/responder:0.2.58
```

5. Import or download the new image bundle and add it to the Database Server: `sl1-maps-images-bundle-1.1.0-3.1.tar.gz`.
6. Change directory to the location on the Database Server where you placed the image bundle, and then load the image bundle:

```
gzip -dc /tmp/sl1-maps-images-bundle-1.1.0-3.1.tar.gz | sudo docker load
```

7. When the image bundle is done loading, open the `/opt/em7/nextui/nextui.env` file:

```
sudo vi /opt/em7/nextui/nextui.env
```

8. If needed, update or add the **API_PROXY_HOST** and **RESPONDER** lines again in the `nextui.env` file. For more information, see [Editing the NextUI Environment File](#).

- Restart the NextUI service:

```
sudo systemctl restart nextui.service
```

- Restart the sl1-maps service:

```
sudo systemctl restart sl1-maps.service
```

- Launch SL1 to view the updated **Maps** page.

Special Configuration Considerations

This section covers how to install SL1 Maps in certain configurations.

NOTE: Remote database configuration for SL1 Maps is not supported at this time.

High Availability and Disaster Recovery

The following special considerations are for High Availability and Disaster Recovery configurations:

- Make sure that the databases are synced; otherwise failover will not work properly, and the **Maps** page will not show up on failover.
- Install SL1 Maps on both Database Servers using the procedures above.
- If this is an upgrade from a previous version of SL1 Maps, perform the following steps on the Administration Portal:
 - Open the `/opt/em7/nextui/nextui.env` file on the Administration Portal:

```
sudo vi /opt/em7/nextui/nextui.env
```
 - In the NextUI environment file, verify that the `API_PROXY_HOST` value is set to `https://localhost/`.
 - In the NextUI environment file, update the `RESPONDER` value to use the HA/DR virtual IP.
- Restart the NextUI service on the Administration Portal:



```
sudo systemctl restart nextui.service
```
- Verify that the `sl1-maps` service is running on both Database Servers.
- Test failover and verify that the secondary database (now the new primary) displays previously created maps.
- When failing back, verify that the primary database also displays any maps created on the former primary database.

Viewing and Configuring Maps

Overview

This chapter describes how to view and work with relationship maps for the various nodes in SL1.

Use the following menu options to navigate the SL1 user interface:

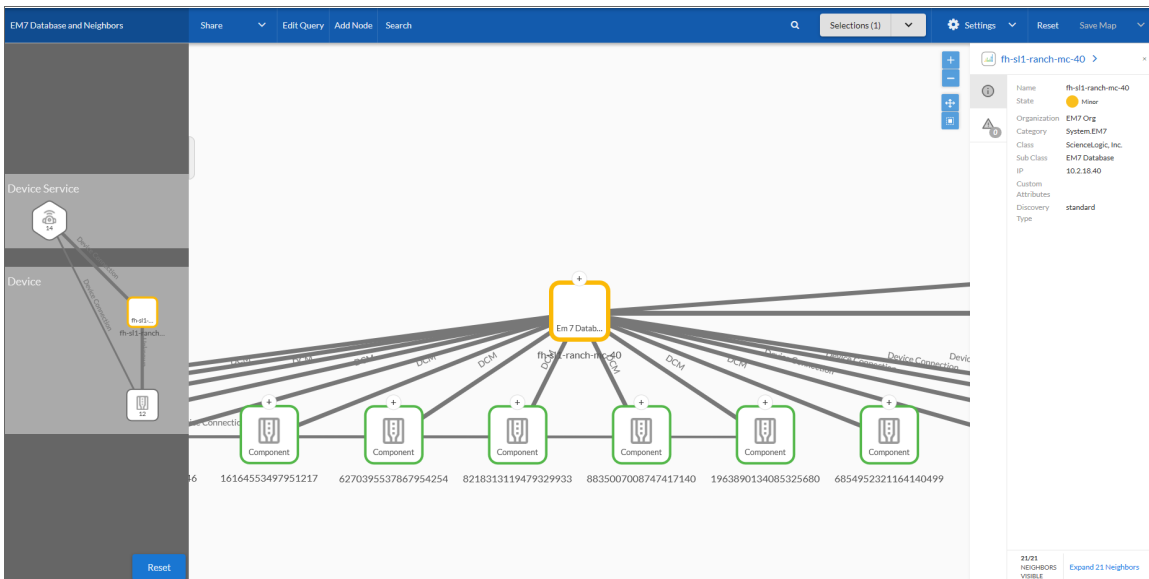
- To view a pop-out list of menu options, click the menu icon ().
- To view a page containing all of the menu options, click the Advanced menu icon (.

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Viewing a Map

To view a map, click the Maps icon (🗺️) and click the name of the map from the **Maps** page. The **Map** window for that map appears:



The **Map** window includes the following user interface features:

- A **navigation bar** at the top
- A **viewing pane** in the middle
- A **interactive legend** on the left
- A **Properties pane** on the right

The interactive legend and the **Properties** pane can be hidden to allow more space for the viewing pane.

Navigation Bar

The blue navigation bar at the top of a **Map** window includes the following:

- **Map Name**. The name of the current map. You can change the name by clicking on it and entering a new name.
- **Private/Public/Share**. Select the visibility for a map that you created. The default for a new map is *Private*. Your options include:
 - **Private**. The map is viewable only to you.
 - **Public**. The map can be shared with users in all organizations that are using SL1.

- **Specific Organizations.** The map can be viewed only by the organizations that you search for and select from this menu.
- **[Edit Query].** Click this button to edit the "seed query" (the initial search that the map creator used to find nodes for the map). For more information, see [Editing a Query for a Map](#).
- **[Add Node].** Click this button to add another node to the map. Nodes can represent Devices, Topology Elements, Applications, Application Components, and Services. For more information, see [Adding a Node to a Map](#).
- **Search.** Type some or all of a node name in this field to search for specific nodes on the current map. Nodes that do *not* match the search criteria are grayed out in the map. Delete the search text to clear the search.
- **[Selections].** After you select one or more nodes, you can click this button to show the details of that node or nodes in a **Properties** pane to the right of the map. If you have more than one node selected, click the down arrow icon to select the node for which you want to view the **Properties** pane. You can view any events and neighbors associated with that node on the **Properties** pane. For more information, see [Viewing Node Details](#).


NOTE: The number in parentheses after **Selections** on the button shows how many items are currently selected. If you selected more than one node, use the **[Previous]** and **[Next]** buttons at the bottom of the **Properties** pane to view properties for the other nodes.


- **Settings.** Click this dropdown to select from the following options:
 - *Design.* Opens the **Design** pane, where you can edit the appearance of the map. For more information, see [Changing the Design of Map](#).
 - *Filters.* Opens the **Filters** pane, which lets you select and deselect filters that affect which nodes and edges appear in your map. For more information, see [Changing the Filters for a Map](#).
- **[Reset].** Click this button to revert any unsaved changes you have made to your map.
- **[Save Map].** Click this button to save any changes you have made to your map. The text of the button is grayed out if no changes have been made or if you have already saved your changes. To make a copy of the current map, click the drop-down arrow and select *Save As Copy*.


You can reposition the components of a map, change the design of a map, and filter the contents of a map. For more information, see [Changing the Appearance of a Map](#).


Viewing Pane

Under the blue navigation bar is the **viewing pane** for the map. Use the following buttons to manipulate the map on the viewing pane:

: Zoom in on the map.

: Zoom out on the map.

: Fit all elements of a map into the viewing pane.

: Center all selected elements of a map in the viewing pane.

The viewing pane displays the following two types of graphical elements:

1. **Nodes** that represent Devices, Topology Elements, Applications, Application Components, and Business Services defined in SL1. The shape of the node represents its type, and the color of the outline specifies the current state of the node:

- *Devices* are represented by squares:



- *Applications and Application Components* are represented by diamonds:



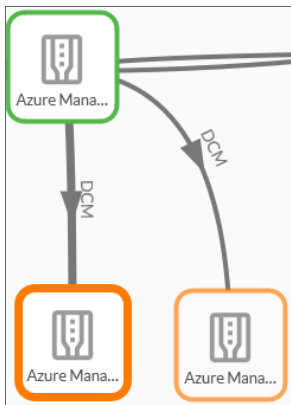
- Services, such as business services, IT services, or device services, are represented by hexagons:



TIP: If a node has a plus sign (+) on it, then the node has multiple "neighbors" that are not currently being shown. Double-click that node to show or "expand" its neighbors.

NOTE: When you select a node, the border for the node icon thickens and brightens, and any nodes directly connected to that node are also highlighted. Any nodes *not* directly connected to the selected node appear in a less bright color than their usual color. Also, if you enable history tracking, any nodes that you previously selected will also have a slightly brighter border. For more information about history tracking, see [Changing the Design of a Map](#).

2. **Edges** are lines that represent the relationships and hierarchies between nodes:

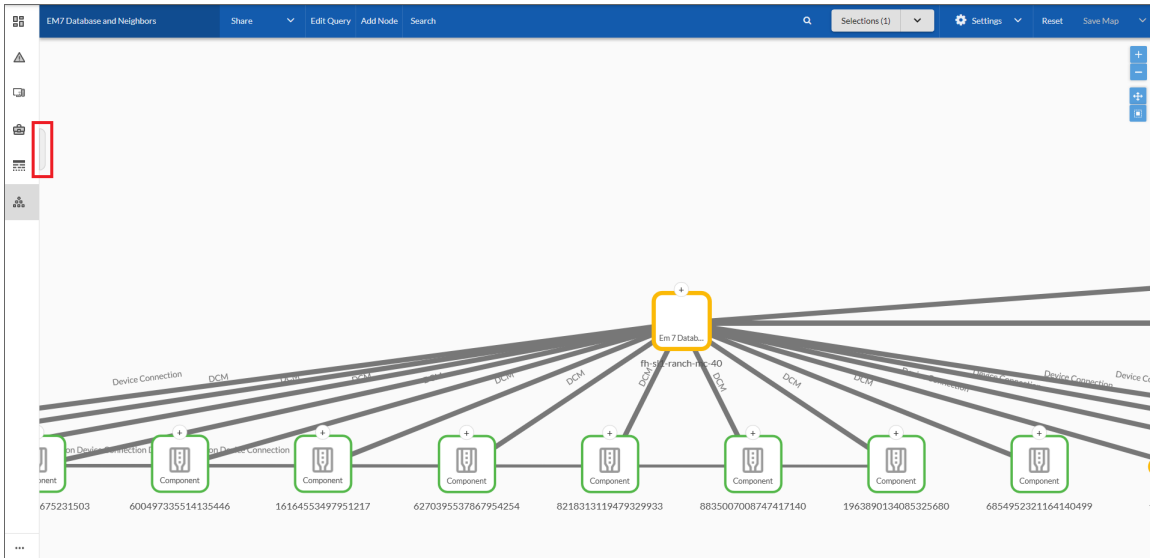


NOTE: SL1 automatically updates the map as new nodes are discovered. SL1 also updates the map with the latest status and event information.

Interactive Legend

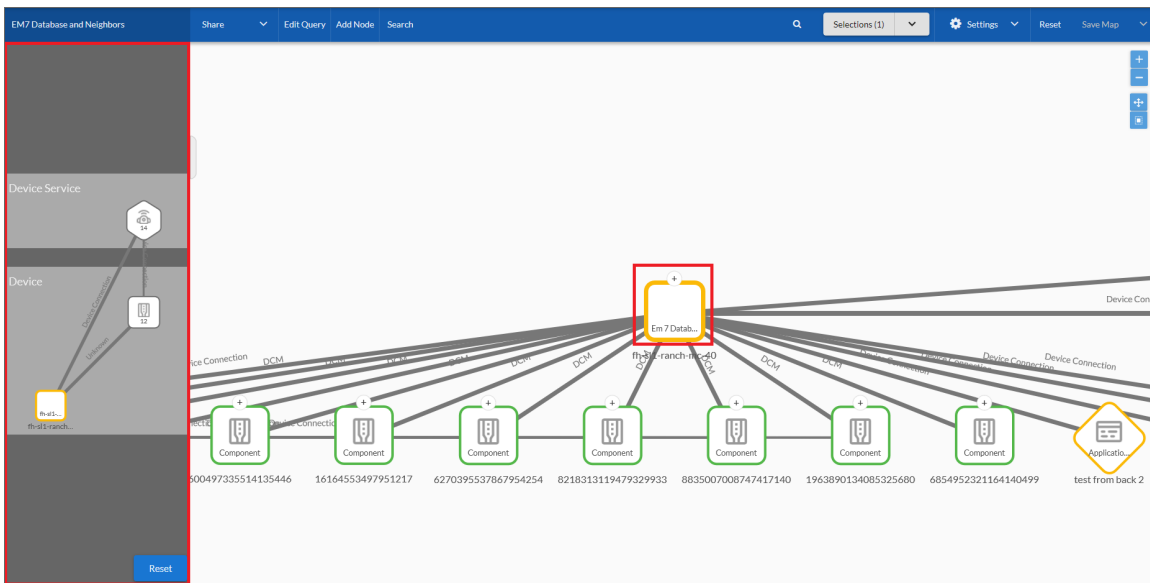
The **interactive legend** is available from the left-hand side of a **Map** window. The interactive legend lets you view the hierarchical layout for a single node up close so that you can see clearly how that node relates to other nodes.

By default the legend is collapsed, but you can click the gray button next to the left-hand navigation bar to open the legend:

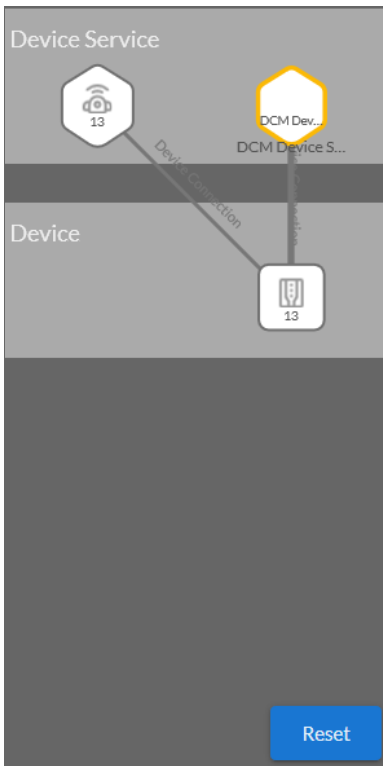


When you select a node on the viewing pane of the map with the legend open, the legend shows a detailed view of that node and the immediate connections for that node. The legend gives you a quick close-up of the hierarchy and context for the selected node.

In the example below, the selected device is connected to a group of device nodes and a group of device services. The numbers on the other nodes represent the number of other connected devices (12) and the number of connected device services (14):



To view details about another node, select that node in the viewing pane. The legend updates with the details for the selected node:



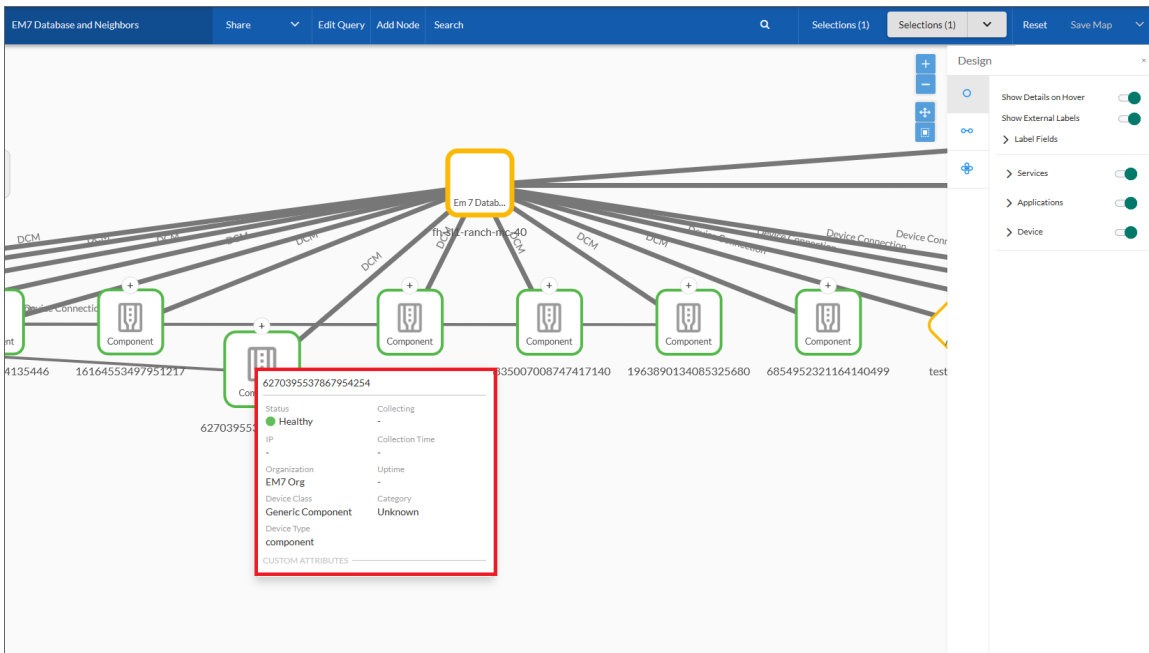
TIP: Click the **[Reset]** button to return the node to its original grouping.

The Properties Pane

There are a variety of ways you can view the properties or **metadata** for a specific node on a map.

To enable the ability to hover over a node in a map to view metadata:

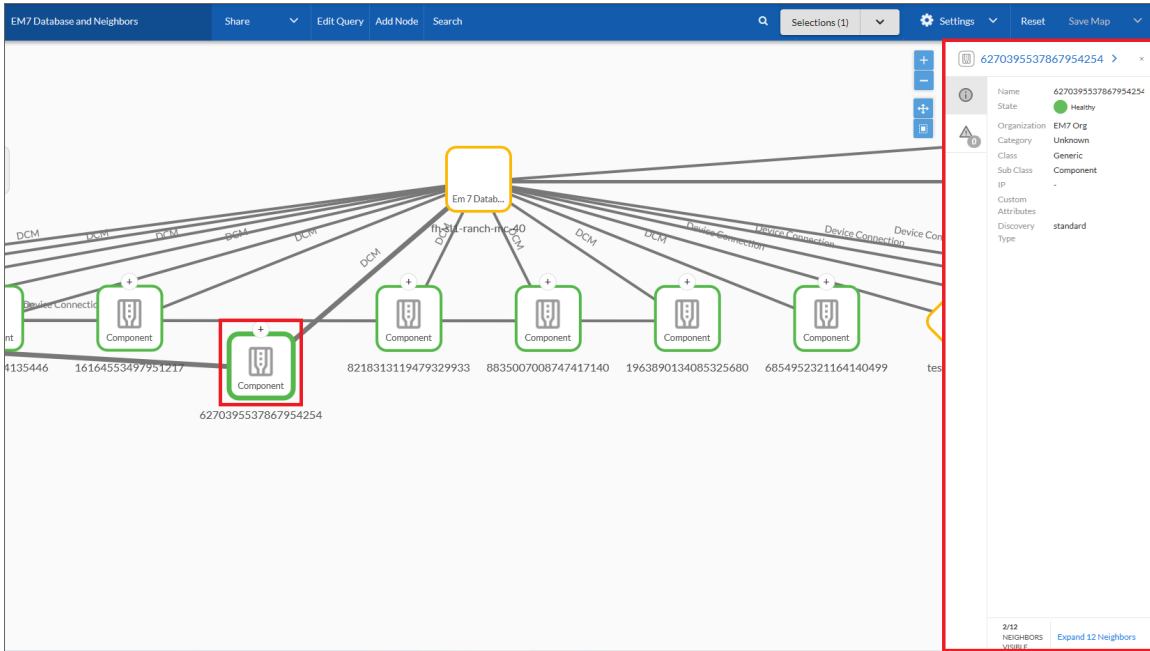
1. From a **Map** window, click the **Settings** drop-down and select **Design**.
2. Enable the **Show Details on Hover** option on the **Nodes** menu. When you hover over a node in the viewing pane of a Map window, a pop-up **Properties** pane appears with the metadata for that node:



NOTE: If you do not have edit rights for maps, or if the map is in a dashboard or a Device Investigator page, hover is on by default.

To view metadata in the **Properties** pane:

1. Select a node and then click the **[Selections]** button. The metadata displays in a new **Properties** pane to the right of the map:





2. To close the **Properties** pane, click the Close icon () to the right of the node name at the top of the pane.

The following items appear in the **Properties** pane to the right of the map:

- **Name of the node.** Displays the name of the node. If the node is a device, you can click the name of the node to open the **Investigator** page for that node.

WARNING: To avoid losing any edits you made to the map, click the **[Save Map]** button before clicking the device name and leaving the **Map** window.

- **[Properties] tab** (). Displays the name, state, organization, and other "metadata" for the selected node, including any Custom Attributes you created for the node. For a Service node or an Application node, the latest Availability, Health, and Risk values appear on this tab. The pop-up **Properties** pane displays a similar set of metadata.
- **[Events] tab** (). Displays a list of each event associated with the node.
- **Neighbors Visible.** Indicates how many out of the total number of neighbors are visible, such as "1/2 Neighbors Visible".
- **Expand/Contract # Neighbors.** Clicking this link expands or contracts the neighbors of the selected node. Alternatively, double-clicking the node will expand and contract the neighbors of the node.

NOTE: If you selected more than one node, use the **[Previous]** and **[Next]** buttons at the bottom of the **Properties** pane to view properties for the other nodes.

Repositioning Nodes on a Map

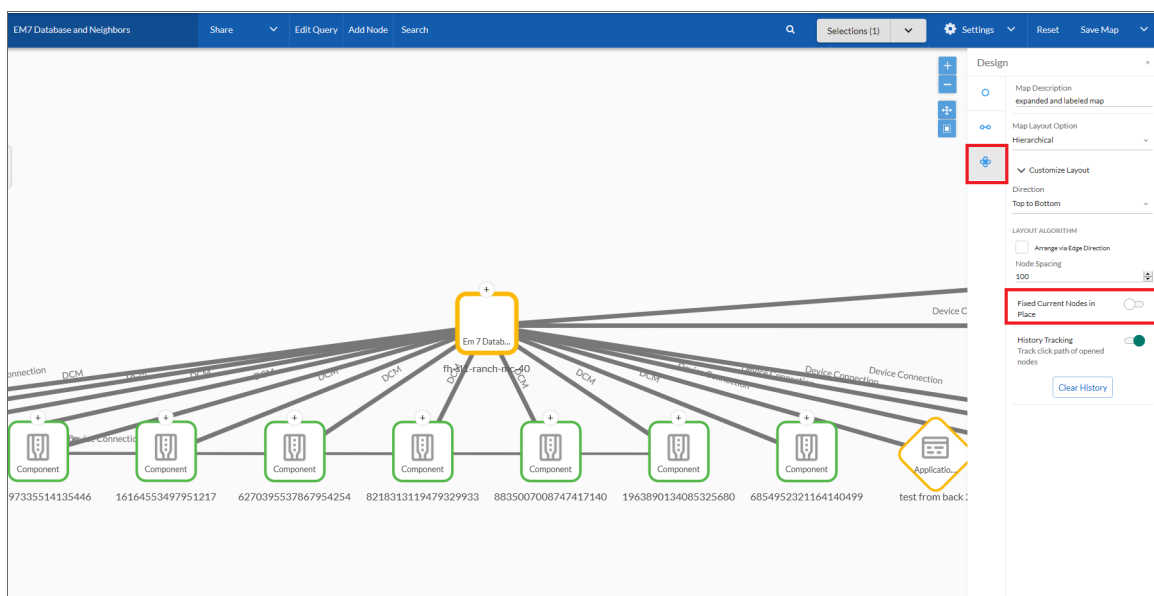
You can drag and drop nodes to reposition them on the map to make viewing and managing them easier. When you reposition a node, it retains its links to other nodes.


You can also rearrange a map in the following ways:

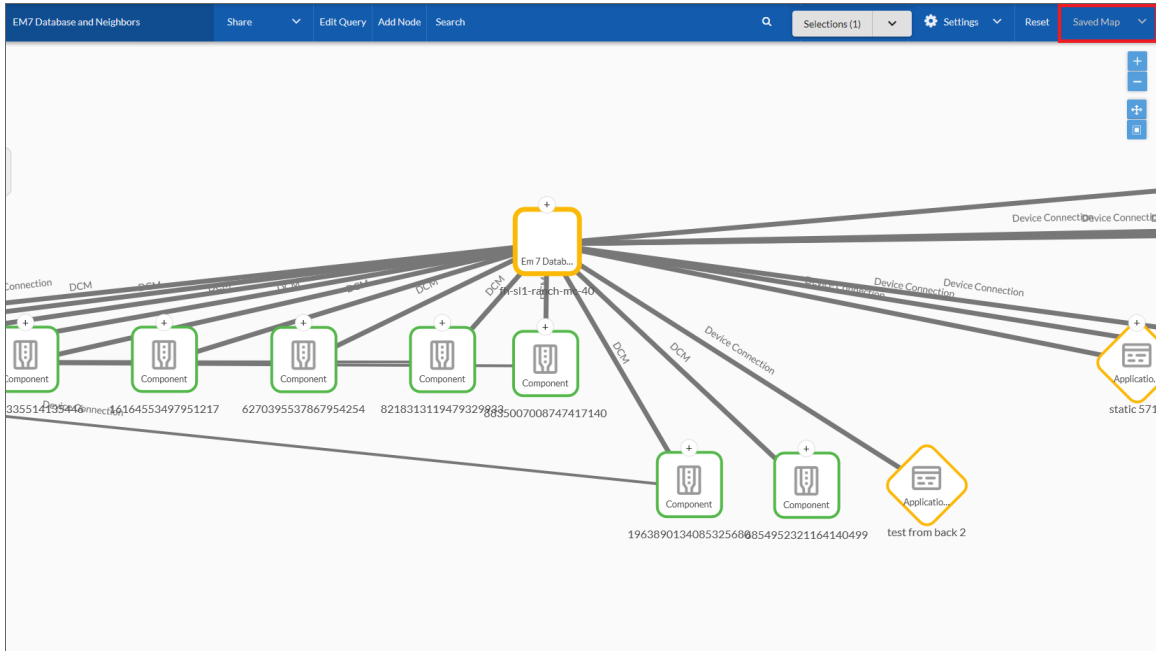
- **To move the entire map**, click in any spot in the background, hold down the mouse button, and drag the mouse to the new location.
- **To zoom in and out**, use the wheel of your mouse or two fingers on a Trackpad. You can also click the Zoom In (+) and Zoom Out (-) icons.
- **To move a node**, drag and drop the node to the new location.

To save the new layout:

1. Click the **[Settings]** button and select *Design*. The **Design** pane appears.



2. Click the [Map] tab () on the **Design** pane and select the **Fixed Current Nodes in Place** toggle.
3. After you finish moving the map and its nodes, or zooming in or out, click the [Save Map] button. The next time you open the map, the nodes will display in the same layout.



Chapter



4

Creating and Editing Maps

Overview

This manual describes how to create and edit relationship maps for the various nodes in SL1 .

Use the following menu options to navigate the SL1 user interface:

- To view a pop-out list of menu options, click the menu icon ().
- To view a page containing all of the menu options, click the Advanced menu icon ().

This chapter includes the following topics:

<i>Creating a Map</i>	27
<i>Editing a Query for a Map</i>	29
<i>Adding a Node to a Map</i>	30
<i>Changing the Appearance of a Map</i>	31
<i>Changing the Design of a Map</i>	31
<i>Changing the Filters for a Map</i>	34
<i>Exporting a Map</i>	35
<i>Installing a Map from a PowerPack</i>	37

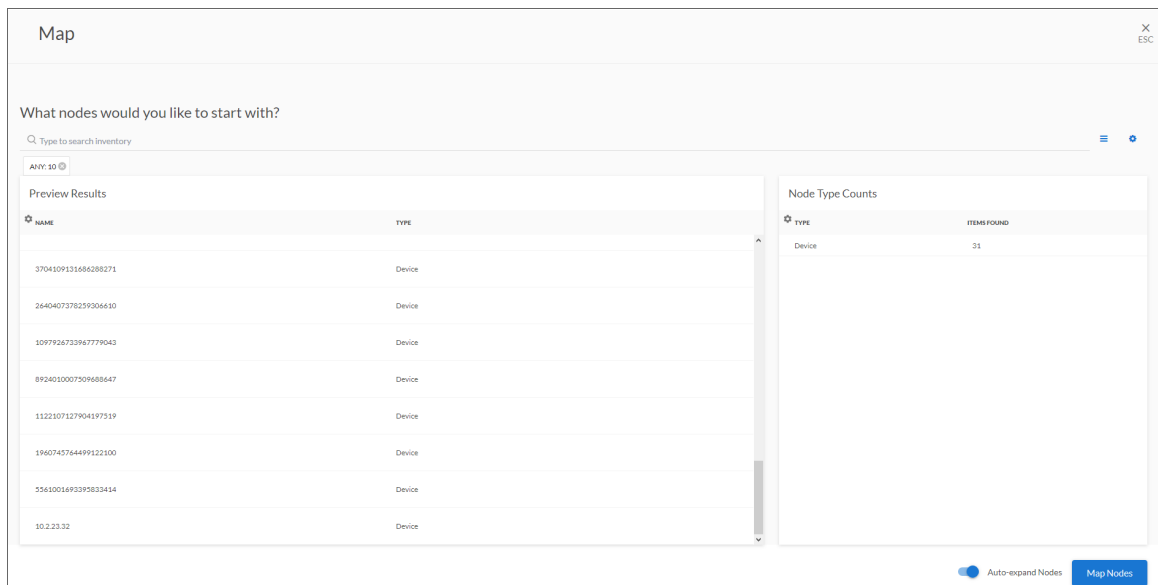
Creating a Map

Depending on the permissions assigned to users, some users will be able to create and edit maps and select the default layout. Meanwhile, other users will only be able to view and filter existing maps and update the layout of existing maps. If you do not see the **[Create Map]** button at the top right of the **Maps** page, then you do not have the permissions needed to create a map.

TIP: To create a copy of an existing map, select the map you want to copy from the **Maps** page, click the **[Actions]** button (⋮), and select *Duplicate*. If you are already in a **Map** window for a map, you can click the **Save Map** drop-down and select *Save As Copy*.

To create a map:

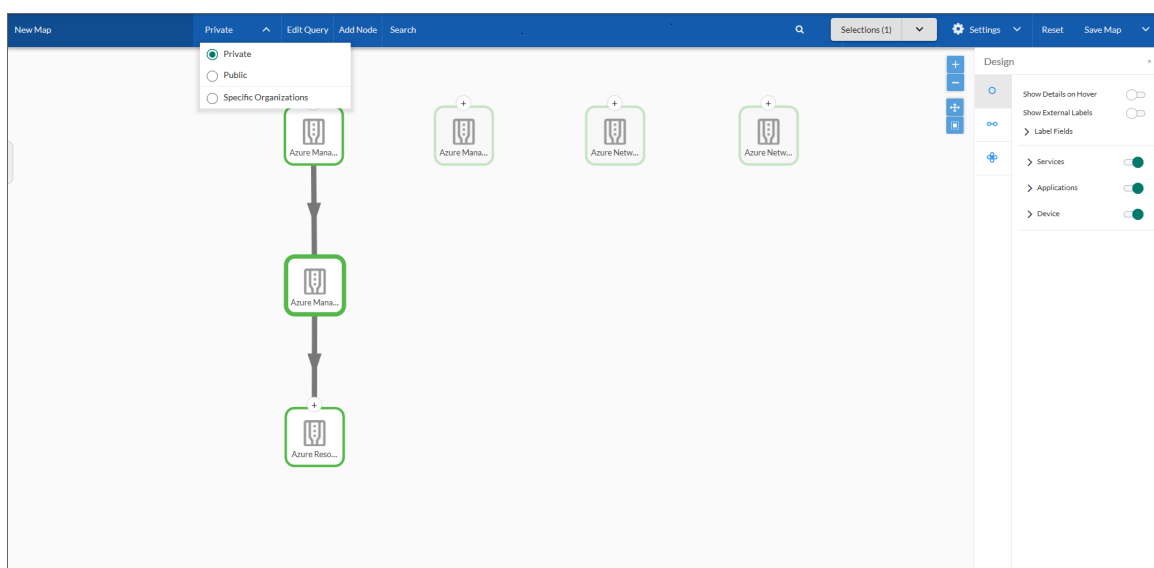
1. Click the Maps icon (🗺️) to go to the **Maps** page.
2. Click the **[Create Map]** button. A **New Map** window appears:



3. In the **Search** field, type search criteria for nodes using a "seed query" in Basic or Advanced mode. You can search for Devices, Topology Elements, Relationship Types, Applications, Application Components, and Business Services. The nodes that fit your search display in the **Preview Results** pane, and the number of each type of node displays in the **Node Type Counts** pane.

TIP: If you are looking for a very specific set of nodes, click the gear icon (⚙️) to the right of the **Search** field and select *Advanced*. In this mode you can create an advanced search using AND or OR for multiple search criteria. For more information, see the "Advanced Search" chapter in the *Introduction to SL1* manual.

4. Select the **Auto-expand Nodes** option to show nodes already expanded and showing all of their neighbors. If a node is not expanded, a (+) appears at the top of the node, and you need to double-click that node to expand it. This option is selected by default.
5. After you define a seed query, click the **[Map Nodes]** button. The nodes that match your seed query appear in the map:




TIP: If a node has a plus sign (+) on it, then the node has multiple "neighbors" that are not currently being shown. Double-click that node to show or "expand" its neighbors.

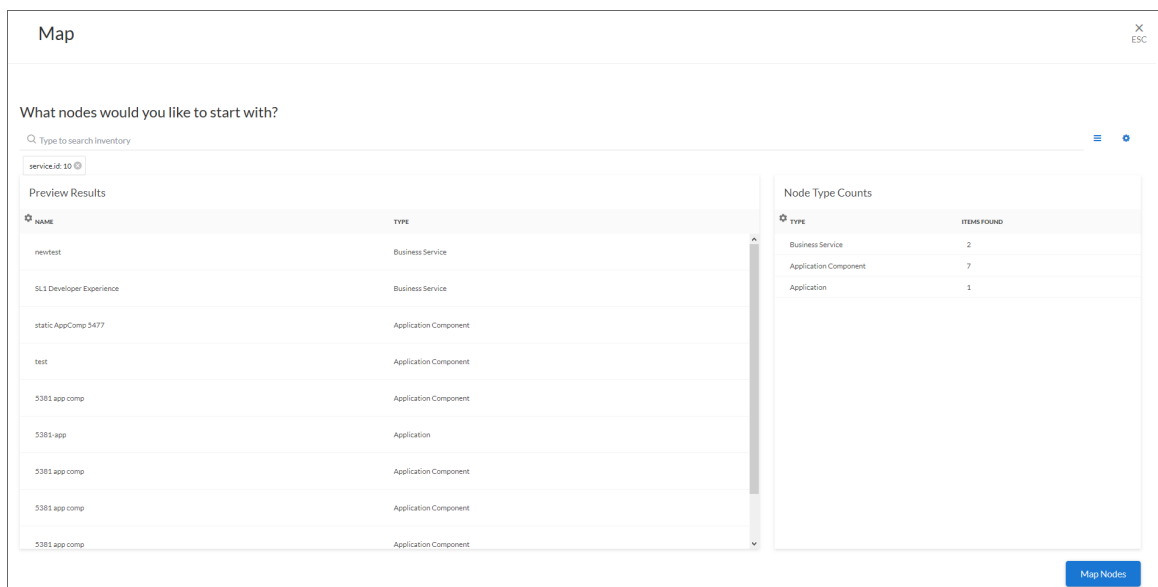
6. Click the map name (*New Map*) in the upper-left corner and type a new name.
7. The default visibility for the new map is *Private*, which means only you can view it. You can change the visibility by clicking the **Private** drop-down and selecting *Public* or *Specific Organizations*.
8. Update the appearance of the map by clicking the **Settings** drop-down and selecting *Design*. For more information, see [Changing the Appearance of a Map](#).
9. Click the **[Save Map]** button to save the map.


Editing a Query for a Map


If a map does not display the nodes and relationships you need, you can edit the "seed query" for a map by changing the nodes used by the map.

To edit a seed query:

1. Click the Maps icon () to go to the **Maps** page.
2. Select the map you want to edit and then click the **[Edit Query]** button on the **Map** window. The **Edit Map** window appears:



3. Edit the existing search criteria by clicking the criteria button that appears under the **Search** field and updating the existing criteria. Click the Close icon () on the criteria button to remove that search criteria altogether.
4. In the **Search** field, type new search criteria in Basic or Advanced mode. You can search for Devices, Topology Elements, Applications, Application Components, and Business Services. The nodes that fit your search display in the **Preview Results** pane, and the number of each type of node displays in the **Node Type Counts** pane.


TIP: If you are looking for a very specific set of nodes, click the gear icon () to the right of the **Search** field and select *Advanced*. In this mode you can create an advanced search using AND or OR for multiple search criteria. For more information, see the "Advanced Search" chapter in the *Introduction to SL1* manual.

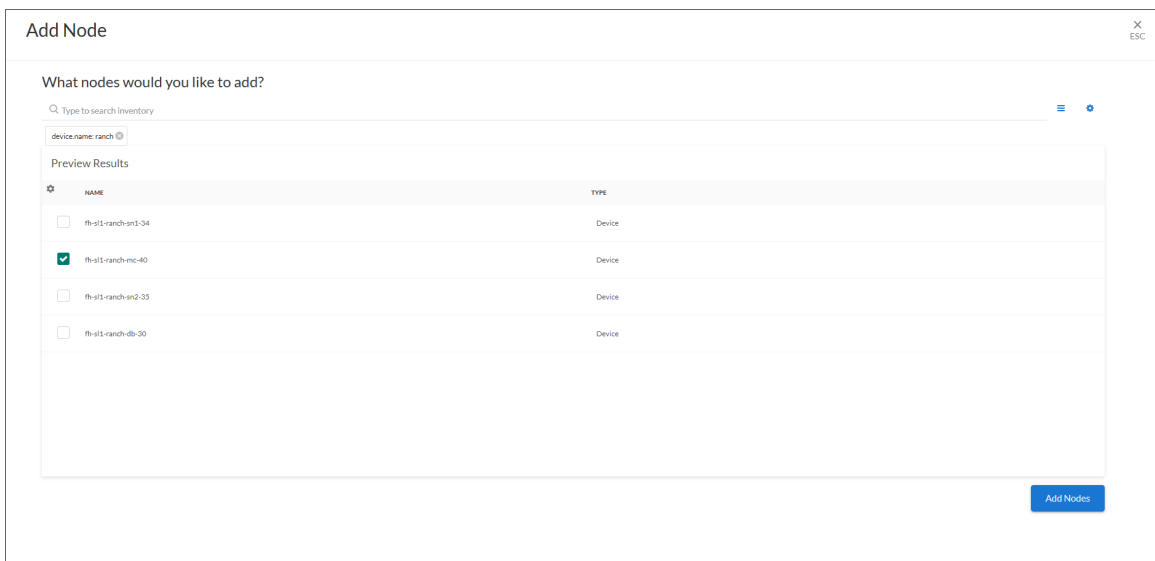
5. After you update your seed query, click the **[Map Nodes]** button. The nodes that match your seed query appear in the **Map** window.
6. Update the appearance of the map by clicking the **Settings** drop-down and selecting *Design*. For more information, see [Changing the Appearance of a Map](#).
7. Click the **[Save Map]** button to save the map.

Adding a Node to a Map

If you want to quickly add one or more nodes to map without [editing the query](#) for the map, you can simply click the **[Add Node]** button on a **Map** window.


To add a node to a map:

1. Click the Maps icon () to go to the **Maps** page.
2. Select the map you want to edit and then click the **[Add Node]** button on the **Map** window. The **Add Node** window appears.



NAME	TYPE
<input type="checkbox"/> fh-sl1-ranch-in1-34	Device
<input checked="" type="checkbox"/> fh-sl1-ranch-mc-40	Device
<input type="checkbox"/> fh-sl1-ranch-in2-35	Device
<input type="checkbox"/> fh-sl1-ranch-db-30	Device

3. In the **Search** field, type search criteria using a "seed query" in Basic or Advanced mode. You can search for Devices, Topology Elements, Applications, Application Components, and Business Services. The nodes that fit your search display in the **Preview Results** pane.

TIP: If you are looking for a very specific set of nodes, click the gear icon () to the right of the **Search** field and select *Advanced*. In this mode you can create an advanced search using AND or OR for multiple search criteria. For more information, see the "Advanced Search" chapter in the *Introduction to SL1* manual.

4. Select one or more nodes to add to the map and click the **[Map Nodes]** button. The node or nodes are added to the **Map** window.
5. Update the appearance of the map by clicking the **Settings** drop-down and selecting *Design*. For more information, see [Changing the Appearance of a Map](#).
6. Click the **[Save Map]** button to save the map.

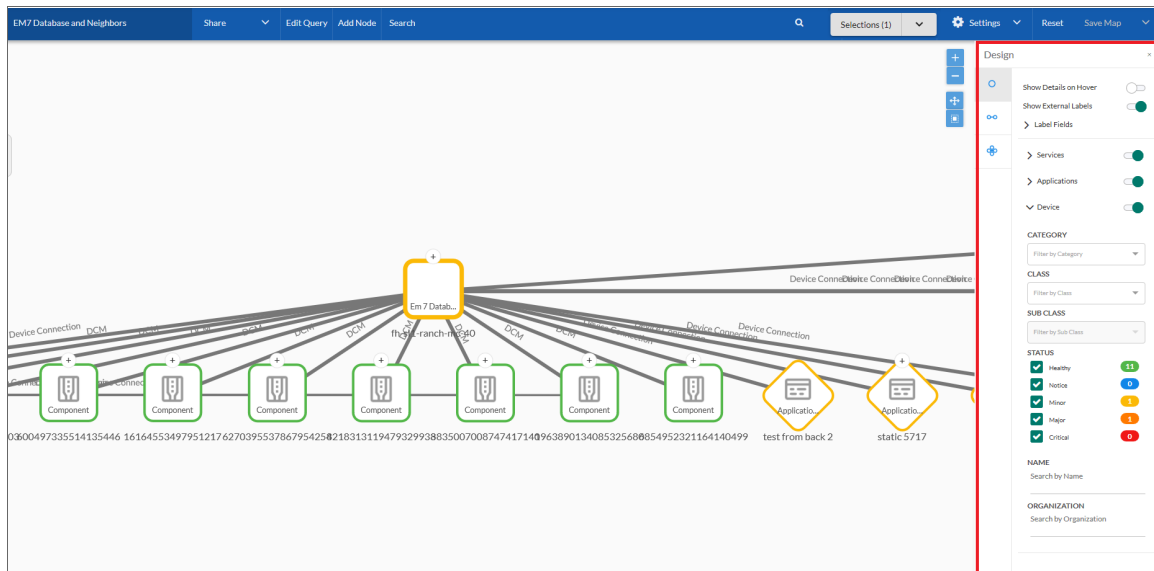
Changing the Appearance of a Map

You can use the **Design** pane and the **Filters** pane on a **Map** window to change the appearance of a map.

Changing the Design of a Map

To use the **Design** pane for a map:

1. Select the map from the **Maps** page. The **Map** window appears.
2. Click the **Settings** drop-down and select *Design*. The **Design** pane appears to the right of the viewing pane for the map:




The **Design** pane contains three tabs: **[Nodes]**, **[Edges]**, and **[Map]**.

3. On the **[Nodes]** tab (), you can edit the following options related to nodes:

- **Show Details on Hover Labels.** Toggle this option to enable or disable the pop-up **Properties** pane that appears when you hover over a node in the map.
- **Show External Labels.** Toggle this option to show or hide a user-defined label field for the node. If you enable this option, the external label appears *under* the node icon in the map.
- **Label Fields.** If you selected the **Show External Labels** toggle, you can expand this section and edit the type of label that displays under each node type: devices, services (sometimes called "Har providers" in the user interface), applications, and topology elements. For example, you could edit the external labels to display the device class or organization name under each device node.


Pre-filters. The three expandable sections below let you show or hide specific types of nodes based on service, application, and device options, depending on what you wanted to see in your map.

- **Services.** You can toggle off services to hide services in the map. You can also expand this section to filter the map by Service Type, Name, Organization, Availability, Health, and Risk.
- **Applications.** You can toggle off applications to hide applications in the map. You can also expand this section to filter the map by Application Type, Name, and Organization.
- **Device.** You can toggle off devices to hide devices in the map. You can also expand this section to filter the map by Category, Class, Sub-class, Status, Name, and Organization.

4. On the **[Edges]** tab (), you can edit the following options related to edges:

- **Labels.** Lets you show or hide the labels for the type of relation next to the edge.
- **Arrowheads.** Lets you show or hide arrows to represent the direction of the relationships, such as a child node pointing to a parent node.
- **Arrow Spacing Ratio.** If you selected the **Arrowheads** toggle, you can use this option to set where you want the arrows to appear on the edges. For example, a ratio setting of ".5" would place the arrow at the halfway point between two connected nodes. A ratio setting of ".7" (or 70%) is the maximum.
- **Curved Edges.** Lets you show curved lines or straight lines connecting nodes.

TIP: The options below the **Curved Edges** option let you view the number of various node types along with a toggle button you can use to show or hide that specific node type. These options are the same as the options on the **[Edges]** tab of the **Filters** pane.

5. On the **[Maps]** tab (), you can edit the following options related to maps in general:

- **Map Description.** Type a description of the map. When you save this map, this description appears in the **Description** column of the **[Maps]** tab.
- **Map Layout Option.** Select the layout for your map from the following options:
 - **Hierarchical.** This top-to-bottom layout works best for a map that flows in a single direction. You can further customize this layout by clicking **Customize Layout** to show more options. These options

include:

- **Direction**. Select the direction in which you want your hierarchy to flow. Your options include *Top to Bottom*, *Bottom to Top*, *Left to Right*, and *Right to Left*.
- **Arrange via Edge Direction** Select this option to arrange nodes based on the direction of the edges connecting the nodes. If this option is selected, the direction of the edges is from right to left.
- **Node Spacing**. Increase this value to create more white space to the left and right of each node. Decrease this value to lessen the white space between nodes. The default is 100.
- **Tiered Hierarchical**. This layout explicitly calls out the different tiers of a hierarchy in a map using labels.
- **Force Atlas**. This is a force-directed layout close to other algorithms used for network spatialization that integrates different techniques, including the Barnes Hut simulation. You can further customize this layout by clicking **Customize Layout**. An option is updated in the map as soon as you change that option. These options include:
 - **Node Spacing**. Increase this value to create more white space around each node. Decrease this value to lessen the white space between nodes. The default is 10.
 - **Force Type**: Select one of the following options to specify the type of gravitational force to apply to the nodes:
 - **Directed Tree**. This layout works best for hierarchical or semi-hierarchical data. It attempts to fan out the nodes like branches of a tree.
 - **Disjoint**. This layout works best with disconnected data, as it attempts to pull disconnected data together in a cluster. With highly connected data, this layout clusters groups of nodes into circles and spreads them out.
 - **Central Force**. This layout applies a central gravitational force to all the nodes, pulling them toward a unified center point.
- **Fixed Current Nodes in Place**. When this option is toggled off, all nodes can be dragged. When it is toggled on, only **new** nodes can be dragged.
- **History Tracking**. When this option is enabled, SL1 tracks the click path of opened or expanded nodes. History tracking provides context for the actions that you and other users have taken in the maps in SL1. If you enable history tracking, any nodes that you previously selected will have a slightly brighter border than usual. Click the **[Clear History]** button to clear the click path history.

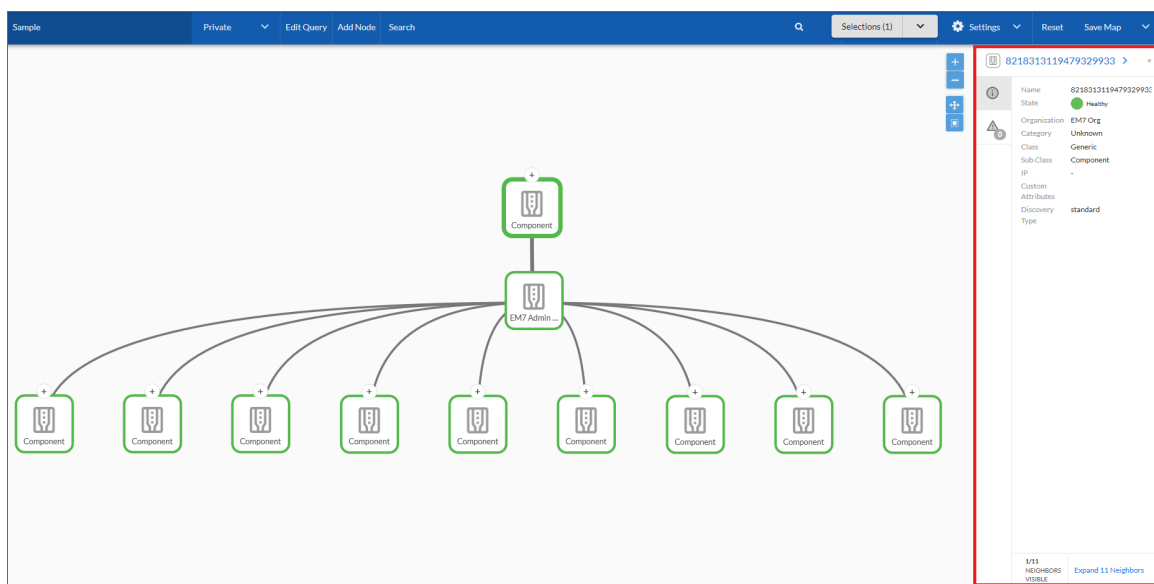
6. Click the **[Save Map]** button on the top navigation bar to save the map.

NOTE: For more information on map layouts, see <http://visjs.org/docs/network/index.html> and https://en.wikipedia.org/wiki/Force-directed_graph_drawing.




Changing the Filters for a Map

To use the **Filters** pane for a map:

1. Select the map from the **Maps** page. The **Map** window appears.
2. Click the **Settings** drop-down and select **Filters**. The **Filter** pane appears to the right of the map:



NOTE: The counts for each node type display in a badge on each tab.

3. On the **[Devices]** tab (), you can toggle off devices to hide devices in the map. You can also expand this section to filter the map by Category, Class, Sub-class, Status, Name, and Organization. This tab does not display if you do not have devices in the current map.
4. On the **[Services]** tab (), you can toggle off services to hide services in the map. You can also expand this section to filter the map by Service Type, Name, Organization, Availability, Health, and Risk. This tab does not display if you do not have services in the current map.
5. On the **[Edges]** tab (), you can edit a variety of display options related to edges. These options are the same as the options on the **[Edges]** tab of the **Design** pane.
6. Click the **[Save Map]** button to save the map.

Exporting a Map

If you want to use maps on another SL1 system, you can package one or maps into a PowerPack and export it to the other system. Make sure that the map or maps you want to export are set to *Specific Organizations*, and you have selected the organization to which you want to export the maps.

All of the settings, designs, and filters that are selected for the map or maps at the time of the export will be saved in the PowerPack. Some tips for successfully exporting maps:

- Set the map or maps you want to export to **Shared** by opening the map, clicking the **Private/Public/Share** drop-down on the top navigation bar, and selecting *Specific Organizations*.
- Turn off the **Auto-expand Nodes** option when creating a map you want to export. This will prevent the map from including information about nodes that are not present on other SL1 systems.
- You should only create maps for *dynamic* groups of devices, such as relationships or service types, and not static groups of devices or services. The static devices will not have the same device IDs from one SL1 system to the next. As a result, if an exported map contains static groups, the map will fail as it searches for those static devices on the other SL1 Systems.

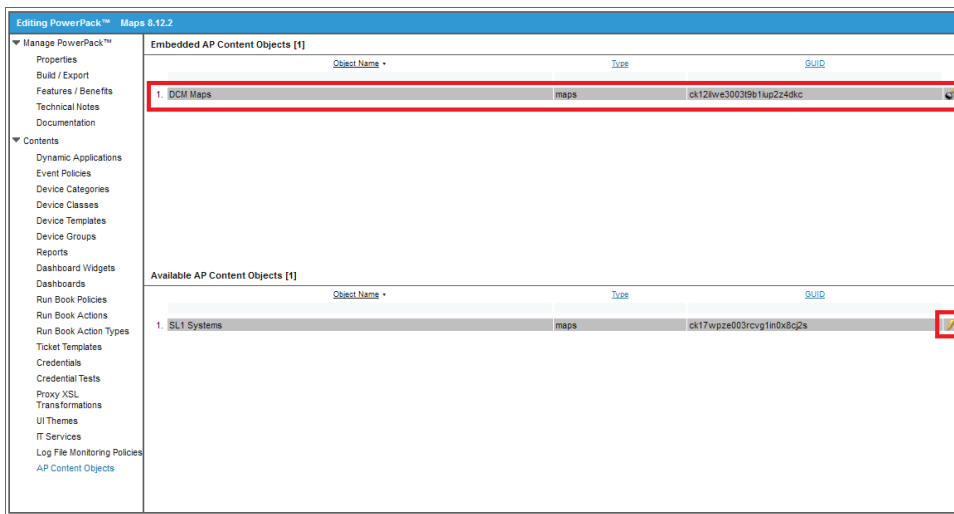
To package and export maps:

1. Go to **The PowerPack Manager** page (System > Manage > PowerPacks).
2. Click the **[Actions]** button and select *Create a New PowerPack*.
3. On the **PowerPack Properties** page, type a name for the PowerPack in the **Name** field and click **[Save]**.

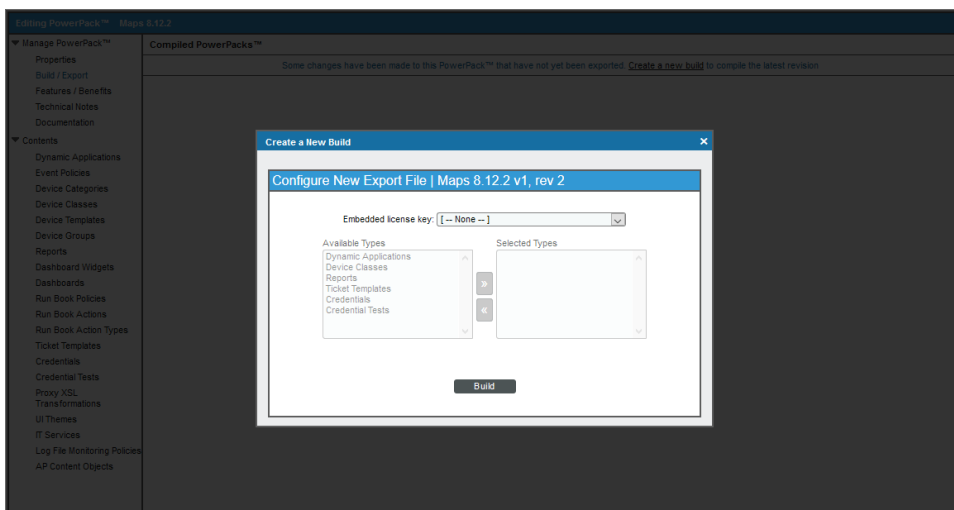
The screenshot shows the 'Editing PowerPack™ Maps 8.12.2' interface. The main content area is titled 'Properties' and contains several input fields: 'Name' (containing 'Maps 8.12.2'), 'Version' (set to '1'), 'Publisher', 'License Key' (containing a long alphanumeric string), 'Description', 'Creation' (2019-10-01 09:53:50), 'Modification' (2019-10-01 09:53:50), 'Revision' (set to '0'), and 'ID' (set to '168'). There are also fields for 'Vendor(s) Supported', 'Model(s) Supported', 'Version(s) Supported', and 'Minimum EMT Version'. Below the 'Properties' section is a 'Release Notes and Change Log' section with a rich text editor. The left navigation pane includes categories like 'Properties', 'Build / Export', 'Features / Benefits', 'Technical Notes', 'Documentation', 'Contents', 'Dynamic Applications', 'Event Policies', 'Device Categories', 'Device Classes', 'Device Templates', 'Device Groups', 'Reports', 'Dashboard Widgets', 'Dashboards', 'Run Book Policies', 'Run Book Actions', 'Run Book Action Types', 'Ticket Templates', 'Credentials', 'Credential Tests', 'Proxy XSL', 'Transformations', 'UI Themes', 'IT Services', 'Log File Monitoring Policies', and 'AP Content Objects'. The 'AP Content Objects' item is highlighted with a red box. At the bottom of the main content area, there is a 'Save' button, also highlighted with a red box.

4. Select *AP Content Objects* from the left-nav on the **PowerPack Properties** page. Your maps appear in the **Available AP Content Objects** pane.

- Click the lightning bolt icon (⚡) next to the maps to add them to the PowerPack. The selected map or maps move up to the **Embedded AP Content Objects** pane:



- Select **Build/Export** from the left-nav to open the **Compiled PowerPacks** window, and then click the **Create a new build** link:



- In the **Configure New Export File** window, select **Administrative (including export & license)** from the **Embedded license key** drop-down list. Click **[Build]**.
- When the PowerPack finishes building, you can download the build with the download icon (📄) and use that file to upload the map to a new SL1 system.

Installing a Map from a PowerPack

1. On the SL1 system where you want to install the maps, go to the **PowerPack Manager** page (System > Manage > PowerPacks).
2. To import the PowerPack, click the **[Actions]** button and select *Import PowerPack*.
3. After the PowerPack is done importing, click **[Install]**. After you install the PowerPack, you can access the maps on the **Maps** page.



NOTE: The map will be set to **Public** after you import it from the PowerPack.

Troubleshooting SL1 Maps on the Database Server

Overview

SL1 Maps on a Database Server (or "Maps on CDB") are managed with Docker and docker-compose commands. This chapter contains troubleshooting processes that you can use to address issues with SL1 Maps on a Database Server.

Use the following menu options to navigate the SL1 user interface:

- To view a pop-out list of menu options, click the menu icon (.
- To view a page containing all of the menu options, click the Advanced menu icon (.

This chapter includes steps to troubleshoot the following issues:

<i>Initial Troubleshooting Steps</i>	39
<i>The Maps Page is Not Available Because the /var Partition is Full</i>	40
<i>The Maps Page Does Not Display in SL1</i>	42
<i>The Maps Page Does Not Display Maps</i>	44
<i>The Maps Page Displays Incorrect Data</i>	44
<i>Maps Service Issue After System Became Unresponsive</i>	46
<i>Issues in the Graph Database: Names/Keys with Trailing Characters</i>	47
<i>SL1 Maps Manager Graph ETL Log Messages</i>	48

Initial Troubleshooting Steps

The first step you should take when troubleshooting SL1 Maps is to verify the configuration values in the `/etc/sysconfig/s11-maps` file. In most cases, the issue is that the **CDB_IP** value is not correct for the containers.

To troubleshoot SL1 Maps:

1. Run `cat /etc/sysconfig/s11-maps` on the Database Server and verify that the following values are accurate in the `/etc/sysconfig/s11-maps` file:
 - **SL1_REGISTRY=sciencelogic-docker.jfrog.io**
 - **CDB_IP= <IP Address of the Database Server>**
 - **NODE_GQL= <IP Address of the GraphQL node>**

If you updated any of the values in `/etc/sysconfig/s11-maps`, restart the NextUI and SL1 Maps services (see steps 4 and 5, below).

2. Verify that the **API_PROXY_HOST** in `/usr/local/silo/nextui/nextui.env` is set to **http://localhost**.
3. Verify that the **RESPONDER** value is correct in `/usr/local/silo/nextui/nextui.env`. Correct this value as needed.
4. To make sure that any lingering connections are stopped, restart the user interface with the following command:

```
systemctl restart nextui.service
```
5. Restart the `s11-maps` service with the following command:

```
systemctl restart s11-maps.service
```
6. Wait five to ten minutes to allow the Graph database to populate, and then use the SL1 user interface to validate that the **Maps** page is working as intended.

TIP: Restart the `s11-maps` service as needed if you continue to encounter issues. Running this command clears the Graph database and kills any stale connections that might exist. The maps data will always attempt to re-populate within five to ten minutes of a restart.

If the steps above do not address your issue, gather the following logs and information:

- SL1 Maps sysconfig:

```
cat /etc/sysconfig/s11-maps
```

- Docker compose file:

```
cat /opt/insight/maps_cdb/docker-compose.yml
```

- Docker logs:

```
docker-compose -f /opt/insight/maps_cdb/docker-compose.yml logs --tail 500 > /home/em7admin/docker_log
```

NOTE: The following commands are executed in Docker containers.

- Database Server user and password:

```
docker exec -it maps_cdb_graph-manager_1 cat /opt/insight/creds-mdb/user
docker exec -it maps_cdb_graph-manager_1 cat /opt/insight/creds-mdb/key
```

- Node GQL user /password (only applies to SL1 version 8.12.0 and later):

```
docker exec -it maps_cdb_graph-manager_1 cat /opt/insight/creds-node-gql/user
docker exec -it maps_cdb_graph-manager_1 cat /opt/insight/creds-node-gql/key
```

- Verify that the containers can actually reach the Database Server and node GQL (this only applies to SL1 version 8.12.0 and later):

```
docker exec -it maps_cdb_graph-manager_1 bash
apt-get update && apt-get install -y dnsutils
ping s11-mdb
ping s11-node-gql
```

- Gather the ap2 logs:

```
journalctl -u nextui
```

NOTE: Use these logs and related information to help you troubleshoot the remaining situations in this section.

The Maps Page is Not Available Because the /var Partition is Full

In some situations, the `/var` partition might run out of space, causing the SL1 Maps service to stop. As a result, the **Maps** page will no longer appear in SL1. To ensure that the `/var` partition has enough space, you can add a new Logical Volume Management (LVM) volume group for Docker. This procedure addresses both of the following problems:

NOTE: If you have upgraded from a version of SL1 earlier than 8.8.0, you might run into an issue where the file system type and storage driver are not compatible with newer versions of SL1. As a result, the Docker containers might run out of space and the SL1 Maps service will fail to start. For more information, see the following Knowledge Base article: [SL1 Map Containers Out of Space](#).

NOTE: The following steps assume the new drive is `/dev/sdb`.

To add a new LVM volume group:

1. Verify that you have at least 9 GB of free space in the Physical volume Group on the Database Server by running the following command:

```
pvs
```

NOTE: If the `PFree` value is less than 9 GB, you cannot create a new partition on this Database Server. For more options, see the following Knowledge Base article: [Increasing System Resources on Appliances](#).

2. Create the new LVM partition by running the following command:

```
lvcreate -n var_lib_docker -L 9G em7vg
```

3. To view details about the new partition, run the following command:

```
lvdisplay em7vg/var_lib_docker
```

4. Format the LVM partition:

```
mkfs.xfs -f -n ftype=1 /dev/em7vg/var_lib_docker
```

5. Update `/etc/fstab`:

```
cp /etc/fstab /root/fstab_org  
vi /etc/fstab
```

6. Add the following line to `/etc/fstab`:

```
/dev/mapper/em7vg-var_lib_docker /var/lib/docker
```

7. Stop the `s11-maps` service:

```
systemctl stop s11-maps.service
```

8. Stop the Docker service:

```
systemctl stop docker
```

9. Remove the old files:

```
mv /var/lib/docker /var/lib/docker-old  
mkdir /var/lib/docker
```

10. Mount the new drive and verify that it is mounted:

```
mount -a  
df -h
```

11. Copy the existing data into the new drive:

```
rsync -av /var/lib/docker-old/ /var/lib/docker/
```

12. Start the Docker service:

```
systemctl start docker
```

13. If needed, start the `s11-maps` service:

```
systemctl start s11-maps.service
```

The Maps Page Does Not Display in SL1

If the **Maps** page does not show up in the SL1 user interface:

1. Check the status of the `s11-maps` service:

```
sudo systemctl status s11-maps
```

2. Make sure the responder and graphdb containers are running:

```
docker ps -a
```

3. If the status of the containers is "ended":

- Remove the old containers by running: `docker rm -f $(docker ps -qa)`
- `cd` to `/opt/insight/maps_cdb/`
- Set the **CDB_IP** parameter: `export CDB_IP=IP Address of the Database Server`
- Start the containers again by running: `docker-compose up -d`

4. Check the logs for errors. The output is color-coded based on container:

```
source /etc/sysconfig/s11-maps
cd /opt/insight/maps_cdb
sudo CDB_IP=$CDB_IP docker-compose logs --tail=20 --follow
```

5. You can `grep` on this command output to look specifically for responder or graph containers.

6. Open the `nextui.env` file for editing:

```
sudo vi /opt/em7/nextui/nextui.env
```

7. Verify the following settings is in `nextui.env`. Edit and restart the nextui service if the settings are not correct:

- **API_PROXY_HOST=https://localhost**
- **RESPONDER=IP Address of the Database Server:8443**

8. Ports 8080 and 8443 must be available for the Maps service to run. If Responder fails to start, check the logs with the following command:

```
journalctl -xeu s11-maps
```

Below are examples of logs from this command:

```
May 10 22:03:45 guardians-75 docker-compose[27762]: ERROR: for maps_cdb_responder-
proxy_1 Cannot start service responder-proxy: driver failed programming external
connectivity on endpoint maps_cdb_responder-proxy_1
(972064f617f57a863df5dbf52730634d5aaa546e0f4cae675716f5d6d325acc6): Error starting
userland proxy: listen tcp 0.0.0.0:8443: bind: address already in use
```

```
May 10 22:03:45 guardians-75 docker-compose[27762]: ERROR: for alpha Cannot start
service alpha: driver failed programming external connectivity on endpoint maps_
cdb_alpha_1 (4fd6c1ab71c45a81298c60ca56e7359da683f3c6e802a598ce84a39b140a5aa0):
Error starting userland proxy: listen tcp 0.0.0.0:8080: bind: address already in
use
```

```
May 10 22:03:45 guardians-75 docker-compose[27762]: ERROR: for responder-proxy
Cannot start service responder-proxy: driver failed programming external
connectivity on endpoint maps_cdb_responder-proxy_1
(972064f617f57a863df5dbf52730634d5aaa546e0f4cae675716f5d6d325acc6): Error starting
userland proxy: listen tcp 0.0.0.0:8443: bind: address already in use
(972064f617f57a863df5dbf52730634d5aaa546e0f4cae675716
```

```
May 10 22:03:45 guardians-75 docker-compose[27762]: Encountered errors while
bringing up the project.
```

```
May 10 22:03:45 guardians-75 systemd[1]: sll-maps.service: main process exited,
code=exited, status=1/FAILURE
```

9. Disable anything that is listening on ports 8080 and 8443, and restart sll-maps:

```
cd /opt/em7/share/config/nginx.d
for f in agentil_api*.conf; do mv $f $f.ORIG; done
systemctl restart nginx
systemctl start sll-maps
```

10. In some cases, the /var partition can reach 100% utilization, which can cause SL1 Maps to fail. Check disk usage with the following commands:

```
cd /var/lib/docker/
sudo du -h --max-depth=1
```

TIP: For more information, see [The /var Partition is at 100% After Enabling Maps.](#)

11. Add the following to `/etc/docker/daemon.json`:

```
{
  "log-driver": "json-file",
  "log-opts": {
    "max-size": "10m",
    "max-file": "5"
  }
}
```

NOTE: The daemon.json file must contain well-formed JSON, so if there is already content in the file, you need to merge the content. You can use a tool like "jq" to verify the syntax.

12. Restart the Docker service:

```
systemctl restart docker.service
```

13. Restart the sll-maps service:

```
systemctl stop sll-maps.service
journalctl -xeu sll-maps.service -f
(...wait for
...logs to
...show it's down)
^C
systemctl start sll-maps.service
```

14. Re-check disk usage to make sure the utilization percentage was reduced, which will mostly be in **/containers**.

The Maps Page Does Not Display Maps

If no maps are displayed on the **Maps** page, perform the following steps:

1. Check the settings in the **nextui.env** file on the Admin Portal and ensure that the settings are correct:
 - `API_PROXY_HOST=https://localhost`
 - `RESPONDER=<IP address of the local Database Server>:8443`
 - `NODE_TLS_REJECT_UNAUTHORIZED=0` (add this line if it is not already in the file)
2. Restart the NextUI service by running the following command:

```
sudo systemctl restart nextui.service
```

3. Launch SL1 and go to the **Maps** page.

Also, if error messages in the logs include an `[object Object]` response similar to the following, then the **nextui.env** entry for **API_PROXY_HOST** might not be configured correctly:

```
| 20190430:160908|IN_MGE:1|logger:log_error:132|ERROR|GQL Exception: [{'path':
['devices'], 'message': '[object Object]'}]
graph-manager_1 |
```

The Maps Page Displays Incorrect Data

If a map on the **Maps** page displays incorrect data, check the graphql and dgraph user interfaces for the correct responses:

1. Go to the graphql user interface at **http://IP Address of the Database Server/gql** and run the following query:

```
{
  deviceRelationships(first: 500) {
    edges {
      node {
        id
        override
        parentDevice {
```

```

    id
    ip
    name
  }
  parentInterface {
    id
  }
  childDevice {
    id
    ip
    name
  }
  childInterface {
    id
  }
  deviceRelationshipType {
    type
    description
  }
  dcmrRelationshipType {
    id
  }
}
}
}

```

TIP: When reviewing a map in the SL1 user interface, you can double-click on individual device icons on a map to expose its relationships.

2. Go to the dgraph user interface at <http://<IP Address of the Database Server>:8000/?dev>.
3. Update the dgraph server URL in the **Enter Dgraph server URL** field on the left. Use the following format: **http://<IP Address of the Database Server>:8080/**.
4. Click **[Update]** to get to the console.
5. Run the following device query:

```

query Devices {
  devices(func: has(Device)) {
    name
    device_id
    org_id
    time
    uid
  }
}

```

6. If data is incorrect or not available in either the graphql or dgraph user interfaces, gather information about any errors found when querying, and errors in responder and graph logs.

For example, with an error message like the following:

```
graph-manager_1 | 20190503:184609|IN_MGE:1|logger:log_
error:132|ERROR|AF.BE.AGG.UNCAUGHT:etl_trigger_message#!# ::: *** EXCEPTION:
Traceback (most recent call last): - File "/opt/insight/apl_topology/loaders/cdb_
data_loader.py", line 691, in __read_dynamic_app_name - return raw_data[2] -
TypeError: 'NoneType' object is not subscriptable -
```

NoneType usually happens when the code does not know how to handle a NULL response.

Maps Service Issue After System Became Unresponsive

If an SL1 system becomes unresponsive and requires a reboot, the Docker cleanup process might fail. In that situation, the `sll-maps` service will not start, and the following messages will appear when you check the status:

```
sll-maps.service - SL1 Maps on DB
Loaded: loaded (/usr/lib/systemd/system/sll-maps.service; enabled; vendor preset:
disabled)
Active: failed (Result: exit-code) since Wed 2019-05-22 14:40:27 UTC; 32min ago
```

...

```
May 22 14:40:26 em7-setest docker-compose[2896]: ERROR: for maps_cdb_queue-manager_1
driver "devicemapper" failed to remove root filesystem for
ae3987fad8c3b6ab919358b8fba536...
May 22 14:40:26 em7-setest docker-compose[2896]: ERROR: for maps_cdb_responder_1
driver "devicemapper" failed to remove root filesystem for
2de55c30e7a5bac8cc464308e063e36c79...
```

The same error appears for each container. When you check the containers using `docker ps -a`, the containers appear to be stuck at a "Removal In Process" status.

The `/var/log/messages` reports the following error for each container:

```
ERROR: for maps_cdb_zero_1 driver "devicemapper" failed to remove root filesystem for
bf64eeca094d709c22c4f5794b35d93360944bb9908a4ecbbcab70823613066d: failed to remove
device 94a8cc4d7ba2503b7537523bae3a83c33504ec52e5e4ae1babe2d43d9482c72c: devicemapper:
Error running DeleteDevice dm_task_run failed
```

In this case, running `docker system prune` will not recover any space.

To address this issue, run the following commands:

```
systemctl stop docker
thin_check /var/lib/docker/devicemapper/devicemapper/metadata
thin_check --clear-needs-check-flag /var/lib/docker/devicemapper/devicemapper/metadata
systemctl start docker
docker system prune
systemctl start sll-maps
```

For more information, see <https://stackoverflow.com/questions/30719896/docker-dm-task-run-failed-error>.

Issues in the Graph Database: Names/Keys with Trailing Characters

To avoid issues with the Graph database used for SL1 Maps, ScienceLogic strongly recommends that you closely follow the [steps for changing usernames or passwords](#) in the Installation chapter. If the Graph database keeps restarting when you check it with `ps -a`, or if you see Graph database errors in the logs, you might have extraneous characters in the username or password.

To address this issue:

1. `cd` to `/opt/insight/maps_cdb`.
2. Run the following commands for the relevant key file, depending on the error:

```
xxd /opt/insight/maps_cdb/creds-node-gql/key
```

You might see results like the following:

```
[root@ip-172-31-20-172 maps_cdb]# xxd /opt/insight/maps_cdb/creds-node-gql/key
0000000: 6433 6d30 7379 7331 3233 0a d3m0sys123.
```

In this example, `0a` is a quote character, which is causing the issue.

The correct entry would look like this:

```
[root@ip-172-31-20-172 maps_cdb]# xxd /opt/insight/maps_cdb/creds-node-gql/key
0000000: 6433 6d30 7379 7331 3233 d3m0sys123
```

3. Run the following command to remove extraneous characters:

```
echo -n d3m0sys123 > /opt/insight/maps_cdb/creds-node-gql/key
```

Adding the `-n` option to `echo` prevents writing a newline character at the end. Run the `xxd` command from step 2 again to verify that the incorrect characters were removed.

4. Check all of the credential files using the following command:

```
for f in creds*/*; do xxd $f; done
```

The output will look similar to the following:

```
[root@ip-172-31-20-172 maps_cdb]# for f in creds*/*; do xxd $f; done
0000000: 656d 3761 646d 696e em7admin
0000000: 656d 3761 646d 696e em7admin
0000000: 656d 3761 646d 696e em7admin
0000000: 726f 6f74 root
0000000: 6433 6d30 7379 7331 3233 d3m0sys123
0000000: 6771 6c75 7365 720a gqluser
```

SL1 Maps Manager Graph ETL Log Messages

The logging errors related to SL1 Maps might be misleading if you are unfamiliar with the SL1 Maps Manager Graph ETL container, also called the manager-graph-etl container. This container is responsible for collecting data and populating the graph. If this container is not functioning correctly, due to application issues or external issues such as incorrect credentials, those problems will show up in the SL1 Maps Manager Graph ETL logs.

This topic explains how to gather logs from the main processes for SL1 Maps, and it also summarizes common log issues.

Retrieving the Logs

To get a list of all containers:

```
docker ps -a
```

From this list, review the NAMES column, which you will use when running specific commands on the Docker container. For example: **maps_cdb_graph-manager_1** and **maps_cdb_responder_1**.

To get the logs from the graph manager, run the following command on the Database Server:

```
docker logs maps_cdb_graph-manager_1
```

To get the logs from the responder, run the following command on the Database Server:

```
docker logs maps_cdb_responder_1
```

Reviewing Common Text in the maps_cdb_graph-manager Container

If you see the following text in the logs, then this issue is related to querying AP2 GraphQL:

- `_read_all_ad_hoc_relationships`
- `_read_all_har_providers`

If you see the following text, then the issue is related to querying MariaDB:

- `_read_all_agents`
- `_read_all_application_components`
- `_read_all_devices`
- `_read_all_device_relationships`
- `_read_all_topology_elements`
- `_read_vmware_uuid_map`
- `__read_dynamic_app_name`

Log Messages

The following log messages are specific to the manager-graph-etl container:

```
Failed to translate device relationship; skipping. Parameters: <a list of ids>. Error:
unknown r-type.
```

This logging message is due to an unknown maps relationship type in EM7. You can ignore this error, as the container is just logging the information.

```
Failed to translate topology elements; skipping. Parameters: <a list of name+ids>.
Error: Could not resolve element type ID.
```

This message states that the graph manager is receiving unexpected values. You can ignore this error, as it is simply being logged, and the graph manager will still continue to function.

```
Missing data from cdb: dynamic_app_data_<int>.dev_config_<int> does not contain
object=<uuid>
```

(pipeline version \geq 0.3.70)

or

```
cdb_data_loader.py; E Line: 654; E: 'NoneType' object is not subscriptable ]
```

(pipeline version $<$ 0.3.70)

These messages state that graph manager is expecting data in MariaDB, but that data is currently missing. You should escalate this issue to ScienceLogic Technical Support for a temporary fix. If you are running an older version of SL1 Maps, you need to upgrade to the latest version, if possible.

```
Could not find an entry for dynamic app: <dynamic app id>
```

This message states that a specific Dynamic Application ID is missing from the master.dynamic_app_objects table. You should escalate this issue to ScienceLogic Technical Support.

```
Agent with duplicated device ID found while building agent map. DID: <device id>.
```

This message states that there are duplicate Device IDs when building the graph. You should escalate this issue to ScienceLogic Technical Support.

```
E File: cdb_data_loader.py; E Line: 535; E: [ E Type: <class
'json.decoder.JSONDecodeError'>; E File: gql_utilities.py; E Line: 110; E: Expecting
value: line 1 column 1 (char 0) ]
```

or

```
GqlUtilities: Loading result failed. Result: <Response [401]>, Unauthorized
```

or

GQL Exception: Unauthorized

These errors state that the graph manager is having issues with AP2 GraphQL. You should check /opt/insight/maps_cdb/creds-node-gql and verify if the user/key are correct (these should match the AP2 GraphQL login credentials).

```
Traceback (most recent call last):
File "/opt/insight/apl_dgraph/dao/dgraph_graph_store_dao.py", line 310, in get_read_
nodes_command
raise ExceptionUtilities.get_full_exception()
Exception: [ E Type: <class 'grpc._channel._Rendezvous'>; E File: dgraph_graph_store_
dao.py; E Line: 305; E: <_Rendezvous of RPC that terminated with:
status = StatusCode.INTERNAL
details = "grpc: error unmarshalling request: proto: wrong wireType = 2 for field
StartTs"
debug_error_string = "{\"created\":\"@1569876077.744153782\",\"description\":\"Error received
from peer ipv4:10.43.201.168:9080\",\"file\":\"src/core/lib/surface/call.cc\",\"file_
line\":1046,\"grpc_message\":\"grpc: error unmarshalling request: proto: wrong wireType =
2 for field StartTs\",\"grpc_status\":13}"]
```

This message is related using an outdated driver for dgraph. You should update to the latest version of SL1 Maps.

```
check_process_policies_match(): app_comp_id <app comp id> Caught exception:
"Process regex: {0}, Args regex: {1}"
```

This message is related to matching processes that are part of application components. You should double-check that the regular expressions are valid in the Application Component Policy for the specified Application Component ID

```
20191002:145823|IN_MGE:1|logger:log_error:132|ERROR|GqlUtilities: Loading result
failed. Result: <Response [502]>
```

This message states that the AP2 interface is not available. You should verify that the AP2 interface is running.

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800-SCI-LOGIC (1-800-724-5644)

International: +1-703-354-1010