



grass valley

A **BELDEN** BRAND

# ***GV CONVERGENT***

Version 2.0.0

## **User's Manual**

13-00952-030 AG

2019-05-16

[www.grassvalley.com](http://www.grassvalley.com)

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# 1 Introduction

The purpose of this guide is to provide a brief introduction to GV Convergent Client and its features.

When you log in to GV Convergent Client you open the Stage.

The GV Convergent Client Stage presents a series of tiles, which are arranged in the order you would perform the tasks if you were to configure a GV Convergent system from start to finish. Each task builds on the last. It all begins by defining one or more areas. Once you have area, you can add logical levels. Then, you can create a topology.

These tasks are described in the chapters that follow.

## **GV Convergent Documentation**

Other GV Convergent Client guides include:

- *GV Convergent Release Notes*
- *GV Convergent, A Quick Tour of the Admin Tasks*





# Getting Started With GV Convergent Client



This chapter describes the following tasks:

- [Launching GV Convergent Client](#), on page 9
- [Logging In To GV Convergent Client](#), on page 9
- [Navigating Back to Stage](#), on page 10
- [Switching User Profiles](#), on page 11
- [Viewing Notifications](#), on page 12

## Launching GV Convergent Client

Once GV Convergent Client is installed on your computer, the shortcut icon appears on your desktop.

For details on installing GV Convergent Client for the first time, refer to *A Quick Tour of GV Convergent Admin tasks*.

## Logging In To GV Convergent Client

**Tip:** Before logging in to GV Convergent Client ensure that you have a valid **user name** and **password**, as well as the **Management IP address** of GV Convergent Admin.

**To log in to GV Convergent Client**

- 1 Click the GV Convergent Client icon on your PC.  
The GV Convergent Client login screen appears.



- 2 Enter your user name and password in the **User name** and **password** text boxes.
- 3 Enter the Management IP address of the GV Convergent Admin in the **Server** text box.
- 4 Click **Log in**.

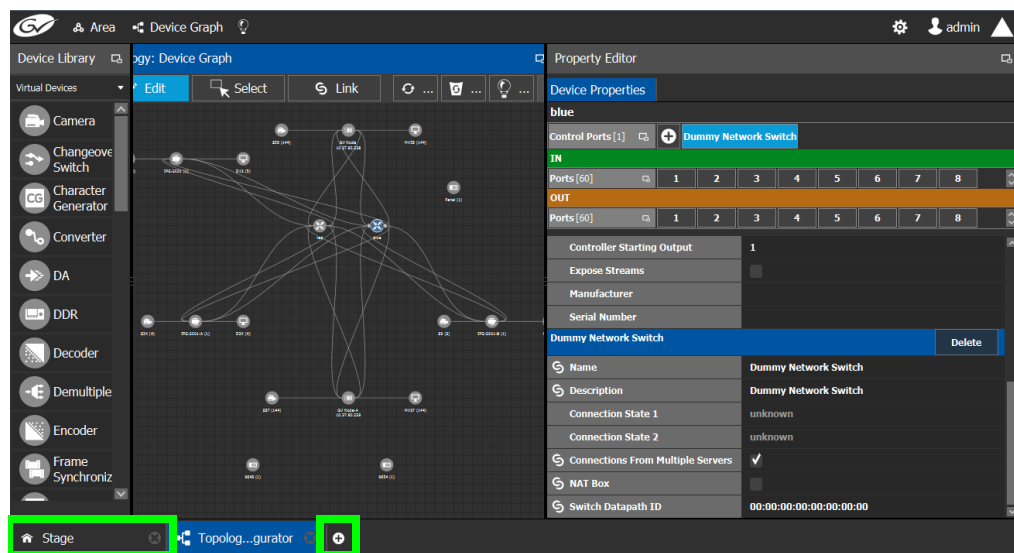
## Navigating Back to Stage

The Stage is the main entry point to configure GV Convergent. At any time, you can return to the Stage view.

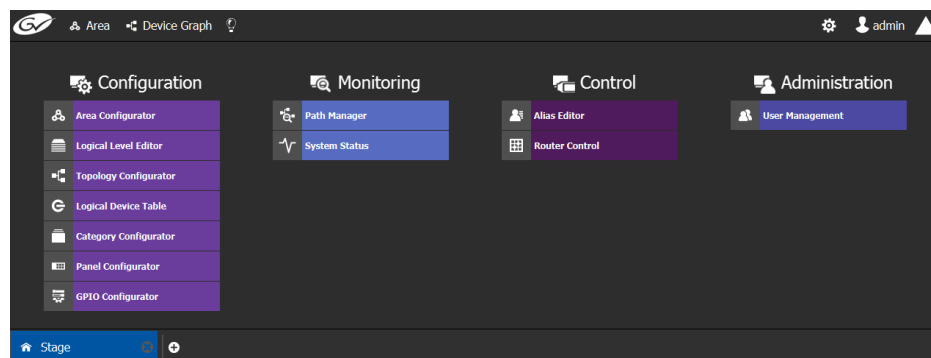
### To navigate back to Stage

- 1 Open GV Convergent Client to any task.
- 2 Do one of the following:
  - Click the Stage tab at the bottom of the UI.
  - Click the plus button at the bottom of the UI.

**Tip:** The second option is useful, if you have a lot of tasks open.



The home or **Stage** view appears.



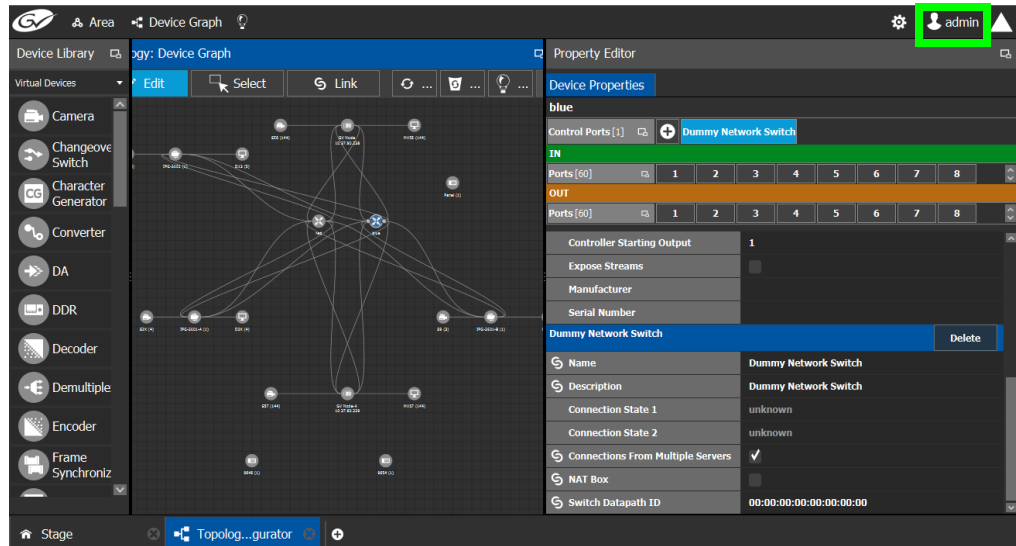
## Switching User Profiles

From the Stage or any open task, you can change to another user profile.

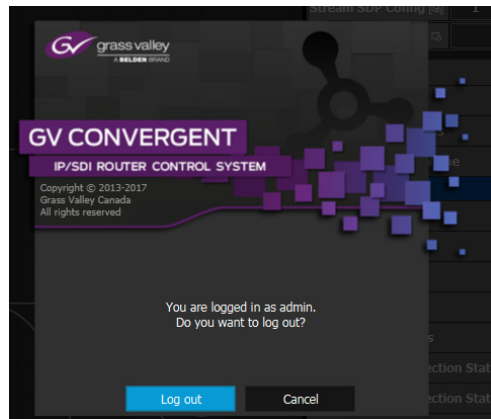
**Note:** Before switching to another user profile, ensure that you have the required user name, password, and Management IP address.

### To switch to another user profile

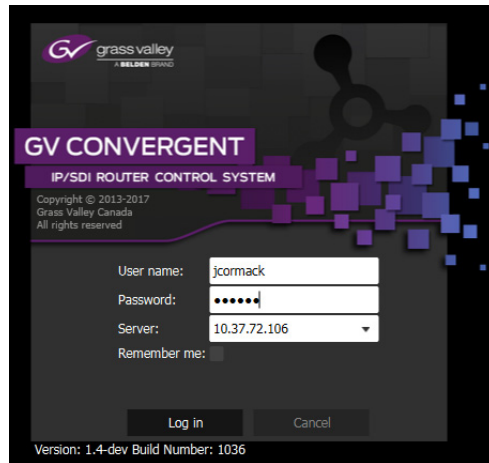
- 1 Click on the user profile name at the top right of GV Convergent Client.



A confirmation message appears.

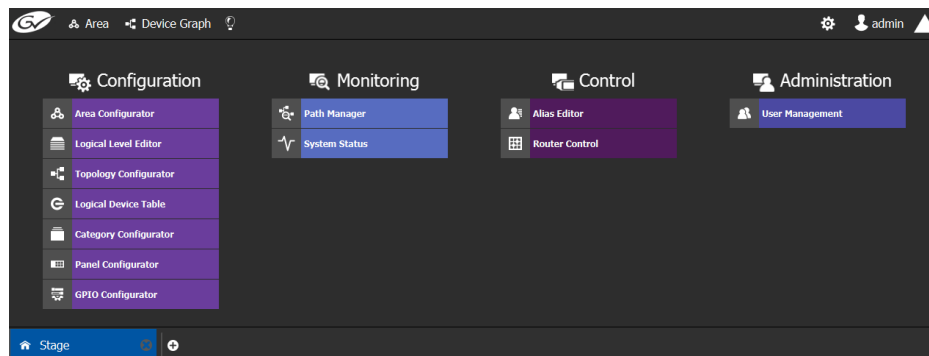


- 2 Click **Log out** to continue.  
The Log in screen appears.



- 3 Enter your login credentials in the **User name** and **Password** text boxes.
- 4 Enter the Management IP address of the GV Convergent server you are connecting to in the **Server** field.
- 5 Click **Log in**.

GV Convergent Client opens to the view applicable to the user.



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**Note:** Access permissions vary according to the permissions granted to the user's role. For further information, see [Administration Tasks](#), on page 195.

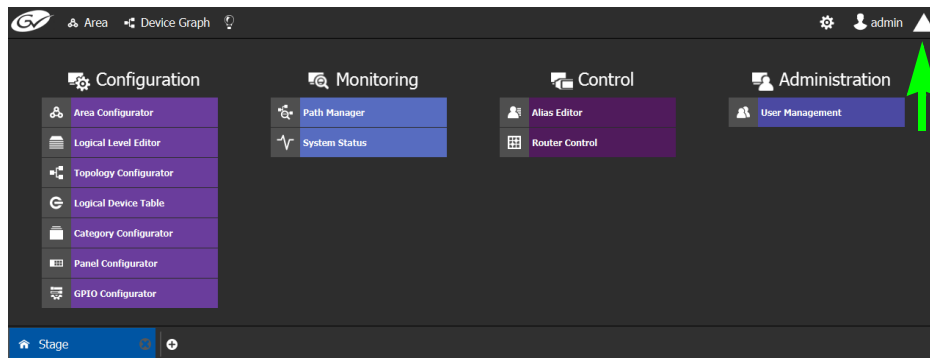
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## Viewing Notifications

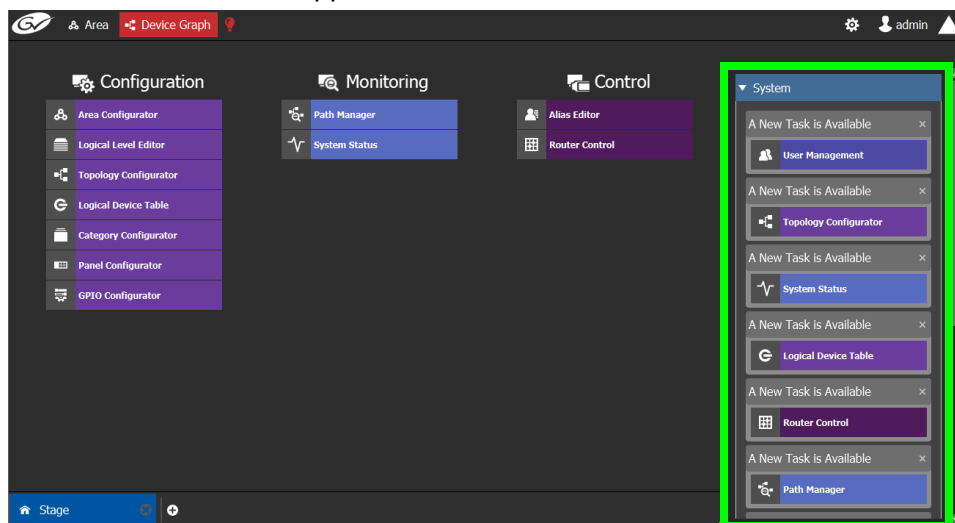
A notification is an indicator that an event has occurred.

### To view your notifications

- 1 Log in to GV Convergent Client.



- 2 Click on the up arrow in the top right corner of the UI.  
The Notification window appears.

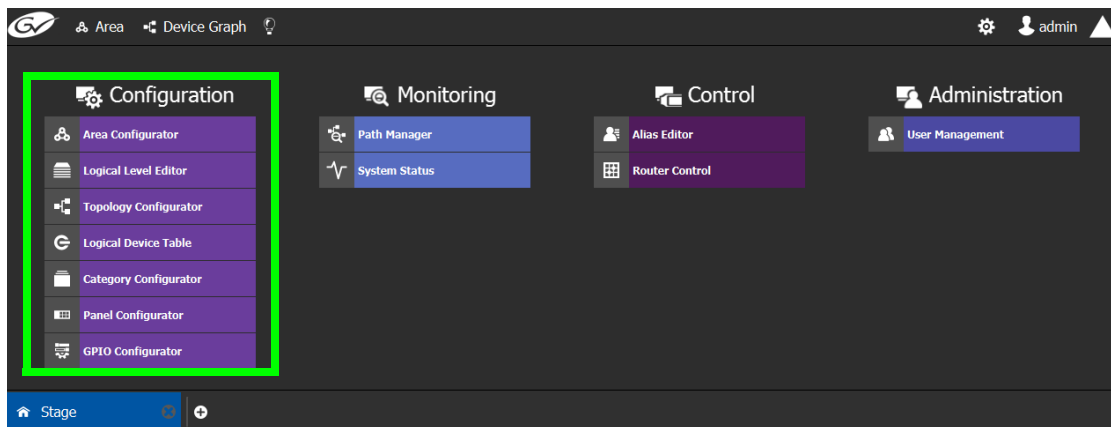


- 3 Expand the **System** list. The list of new events appears.
- 4 Click on a listed event on the right to view it in the UI.



# 3 Configuration Tasks

The Configuration tasks in GV Convergent Client are used for creating and maintaining areas, topologies, categories, and panels.



The Configuration Tasks are described under the following headings:

- [Area Configurator Tasks](#), on page 16
- [Logical Level Editor Tasks](#), on page 24
- [Topology Configurator Tasks](#), on page 33
- [Logical Device Table Tasks](#), on page 56
- [Category Configurator Tasks](#), on page 75
- [Panel Configurator Tasks](#), on page 80
- [GPIO Configurator Tasks](#), on page 93

## Required Permissions

Only users who are assigned to the Administrators role have View, Edit, and Delete permissions in the Area task. All other configuration tasks are accessible to users with either Administrator or Engineer rights only. For more information, see [Viewing Permissions by Role](#), on page 202.

## Area Configurator Tasks

The Area Configurator task is used for configuring the *Areas* and controllers in GV Convergent.

An *Area* is container that is used for grouping together a subset of resources within a system. Typically, these resources are closely related, by physical location, functionality, ownership, and/or logical organization. An area is managed by a single controller group, which is made up of:

- a single controller
- or optionally, two redundant controllers to provide 1:1 failover protection

This section describes the following:

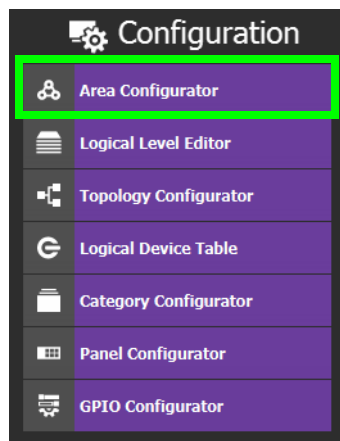
- [Accessing Areas in the GV Convergent Client](#), on page 16
- [Adding an Area](#), on page 17
- [Configuring a Controller Group](#), on page 18
- [Selecting an Area](#), on page 22
- [Deleting an Area](#), on page 22

## Accessing Areas in the GV Convergent Client

All configuration in GV Convergent Client begins by creating one or more areas. Once you have the areas defined, you can add the logical levels, the topologies, and so on.

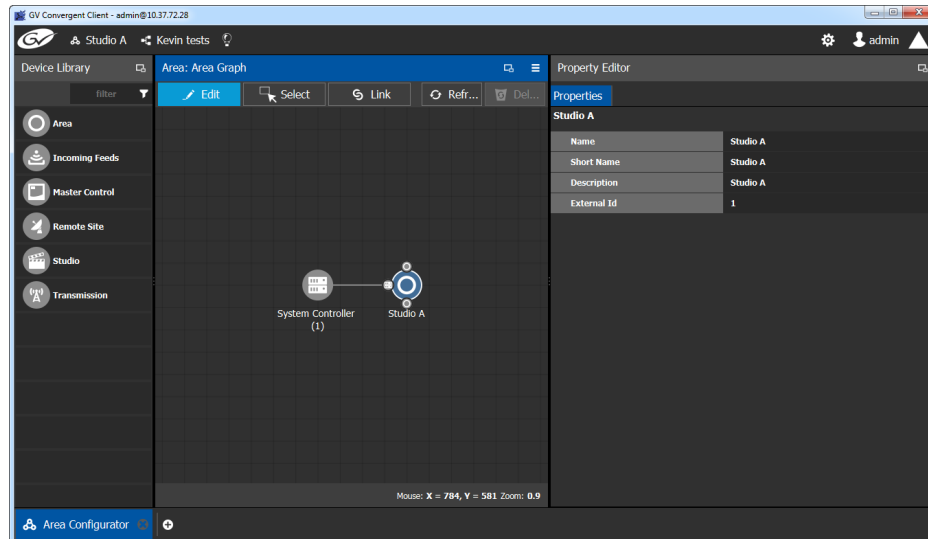
**To configure the area in GV Convergent Client**

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select **Configuration > Area Configurator**.



The Area Graph appears.





By default, there is one area, called Area. Use the **Property Editor** on the right to rename it and make it easy to identify within your system.

- 3 Select the Area to access the **Property Editor**.  
You are automatically in Edit mode. **Edit** is highlighted in the bar at the top.
- 4 Enter the required information in the **Name**, **Short Name**, **Description**, and **External ID** fields to identify the area.
- 5 Repeat the procedure for each area in your system.

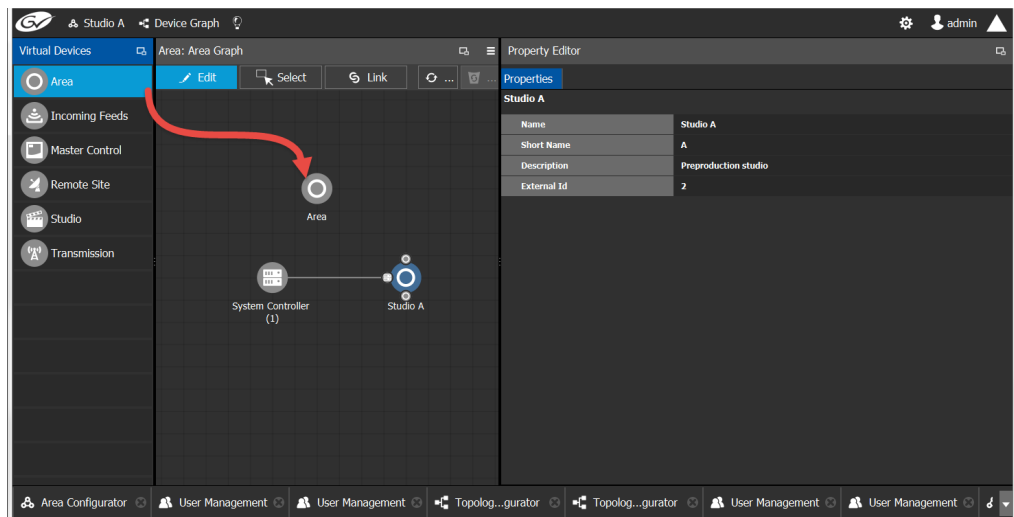
## Adding an Area

You can create multiple areas for your system. This can facilitate configuration and control tasks. Smaller subsets are easier to bring into focus and manage.

### To add an area

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select **Configuration > Area Configurator**. See [Accessing Areas in the GV Convergent Client](#), on page 16.

This opens the Area Graph.



- 3 Select the area tile on the left.
- 4 Drag it to the Area Graph.
- 5 Repeat the procedure as many times as required to add all the areas you require.

## Configuring a Controller Group

By default, there is one area and one System Controller group on the Area Configurator Device Graph.

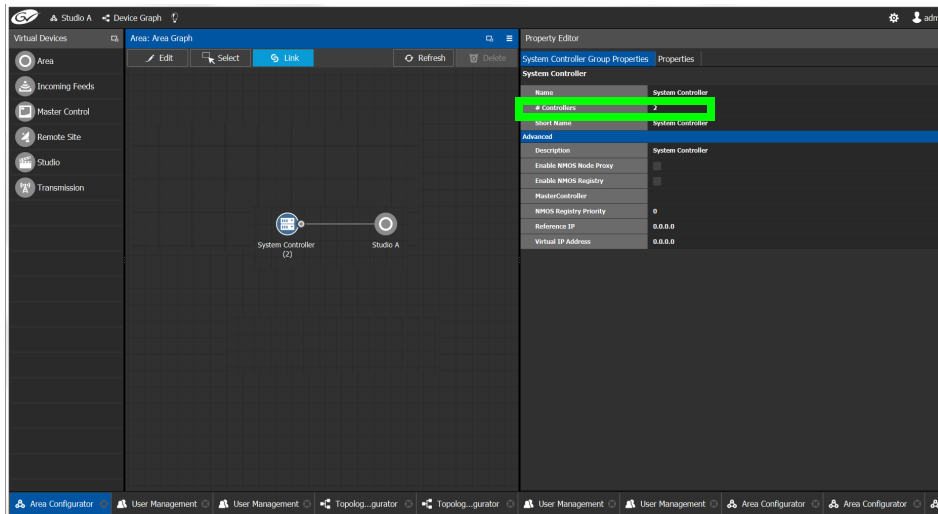
A controller group can have one or more areas. The controller is a physical or virtual server that runs the GV Convergent software.

A Controller group can be made up of either one or two controllers. You need two controllers to implement redundancy or failover protection. In the redundant configuration, one controller is active and the other is on standby. If there is a problem, such as a network connection loss, the standby controller becomes the active controller, automatically. In addition, you can force the standby controller to become the active controller by performing a manual failover operation, at any time.

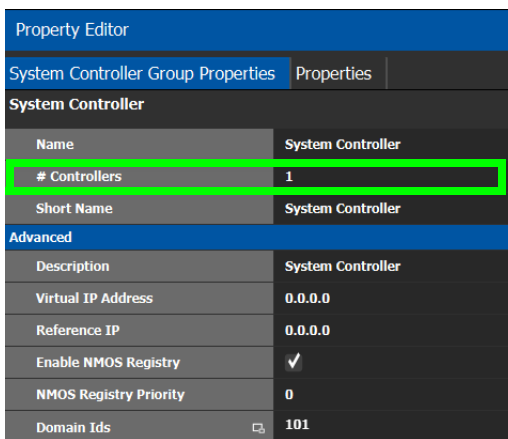
### To configure a controller group

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select **Configuration > Area Configurator**. See [Accessing Areas in the GV Convergent Client](#), on page 16.

By default, there is one controller and one area on the graph.



- 3 Select the bubble for the **System Controller** you are configuring.
- 4 Select the **System Controller Group Properties**.

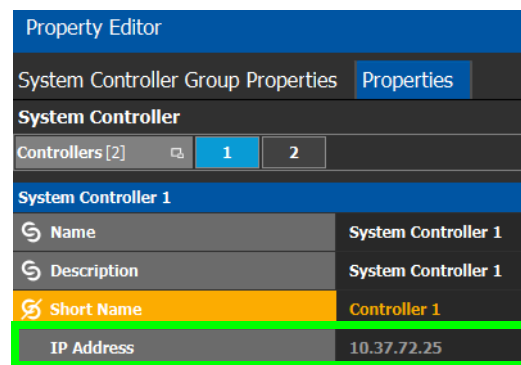


The following properties can be configured for the panel. See also [Description of Common Device Properties](#), on page 104.

| Parameter          | Description  |
|--------------------|--|
| Name               | The name or identifier for this system controller group.   |
| # Controllers      | Enter <b>2</b> in the field if you are setting up redundancy. Otherwise, enter <b>1</b> . You can only have one or two system controllers in a group.  |
| Description        | An optional description for this system controller group.  |
| Virtual IP Address | Set the IP that is configured for the master and allows for transparent failover for third party control systems. For example, in a cluster configuration, a soft panel can be configured to point to the virtual IP. When a failover happens, the control is maintained through the panel using the virtual IP. |
| Reference IP       | Set the IP of a machine that is always on. After a failover the server that can connect first to this IP will become the master.   |

| Parameter              | Description   |
|------------------------|---|
| Enable NMOS Registry   | Starts an NMOS registry on the GV Convergent controller. For more information about how to configure and use GV Convergent's NMOS registry, see <a href="#">To use GV Convergent's built-in NMOS Registry</a> , on page 141.  |
| NMOS Registry Priority | Sets the priority of GV Convergent's built-in registry that is started when the <i>Enable NMOS Registry</i> option is enabled.  |
| Domain Ids             | Only applications / devices that use the same Domain IDs can communicate with each other on the network. For example, this parameter is used by SAM devices.<br>This is a comma separated list of domain IDs on which you want to discover devices and communicate with them. The default value for Grass Valley equipment is <b>101</b> .<br>Valid range: <b>0</b> to <b>232</b> . |

- 5 Select the **Properties** tab.
- 6 Select **1** under **System Controller** to configure the first controller.

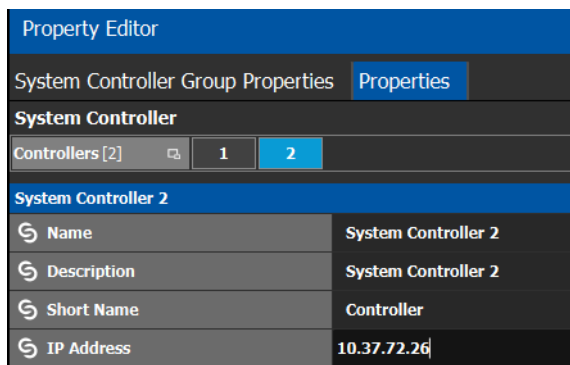


The following properties can be configured for the individual system controller that form the system controller group. See also [Description of Common Device Properties](#), on page 104.

| Parameter   | Description  |
|-------------|--|
| Name        | The name or identifier for this system controller instance.  |
| Description | An optional description for this system controller instance. |

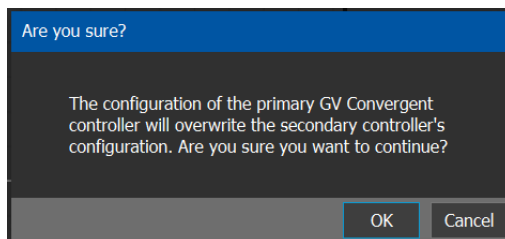
| Parameter  | Description   |
|------------|---|
| Short Name | A nickname used wherever the controller is specified. This name should be limited to 8 characters or less in length. This requirement is important if you are using NVISION panels as they use the Short Name to display device names and NVISION hardware can display a maximum of 8 characters for a device name. Otherwise, a longer nickname can be used. |
| IP Address | The network IP address for this system controller instance. This field for <b>System Controller 1</b> is populated automatically with this system controller's Management IP address. This cannot be changed. When system controller redundancy is used ( <b>System Controller 2</b> is available), set the network IP address for System Controller 2.       |

- 7 Select tab **2** under **System Controller** to configure the second controller.



- 8 Update the identification fields for the second controller: see the table above.

A confirmation message is displayed:



- 9 Click **OK** to continue.

### Notes

When redundancy has been configured, System Controller 2 joins the Controller group automatically as the standby controller. It becomes the active controller in the event of an automatic or manual failover.

When you click OK, the database from Controller 1 is copied to Controller 2

You can view the health of both controllers on the System Status task. The System Status Task page will show the status of the controllers at all times, and the right hand section

shows the health of devices specific to a topology. However, you must create your areas and topologies first. See [System Status Task](#), on page 180.

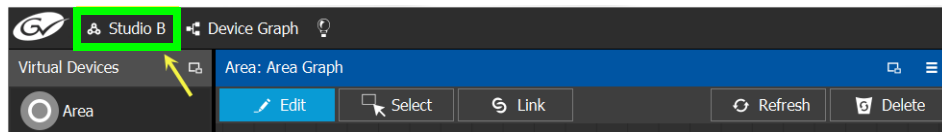
## Selecting an Area

You must select an area before you can create or maintain a topology within it. Only one area can be selected at a time.

### To switch from one selected area to another

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.

The currently selected Area is displayed at the top of the interface.



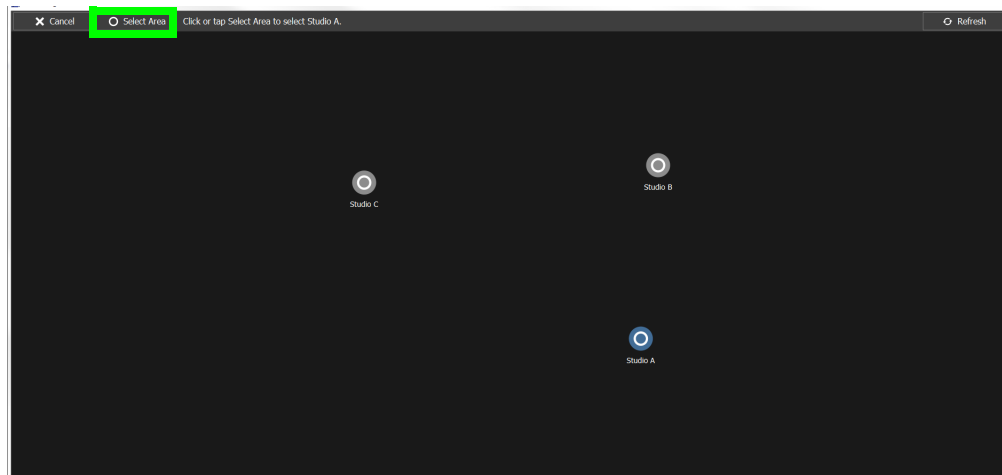
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**Note:** You can perform this procedure from Stage or from any open task. You can always select an area.

---

- 2 Click on this area.

A secondary window appears.



- 3 Click on the area that you to select.  
In the screen shot above, this is Studio A.
- 4 Click **Select Area** at the top of the window.

## Deleting an Area


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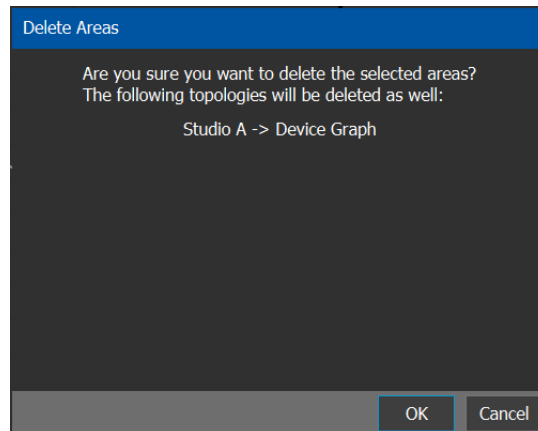
**Note:** You cannot delete the currently selected Area. If necessary, make another Area active first. See [Selecting an Area](#), on page 22.

---

### To delete an area

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.

- 2 Select **Configuration > Area Configurator**. See [Accessing Areas in the GV Convergent Client](#), on page 16.
- 3 Click on the Area you want to delete.
- 4 Click **Delete**  at the top of the logical level editor.
- 5 A confirmation message appears. It lists the topologies created in the Area.



- 6 Click **OK** to continue.

## Logical Level Editor Tasks

This section describes the following:

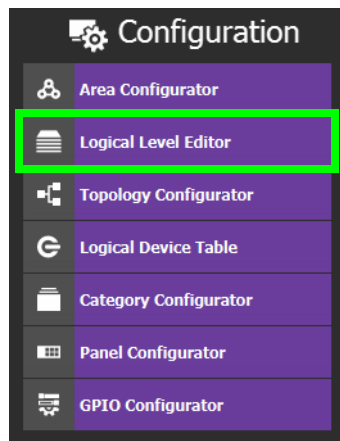
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- [Configuring a New Logical Level](#), on page 30
- [Configuring the Logical Levels of the Devices in a Topology](#), on page 31

### Accessing the Logical Level Editor

Use the Logical Level Editor to define new logical levels and to view the compatibility of the default levels.

#### To access the Logical Level Editor Task

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select an area.
- 3 Select **Configuration > Logical Level Editor**.



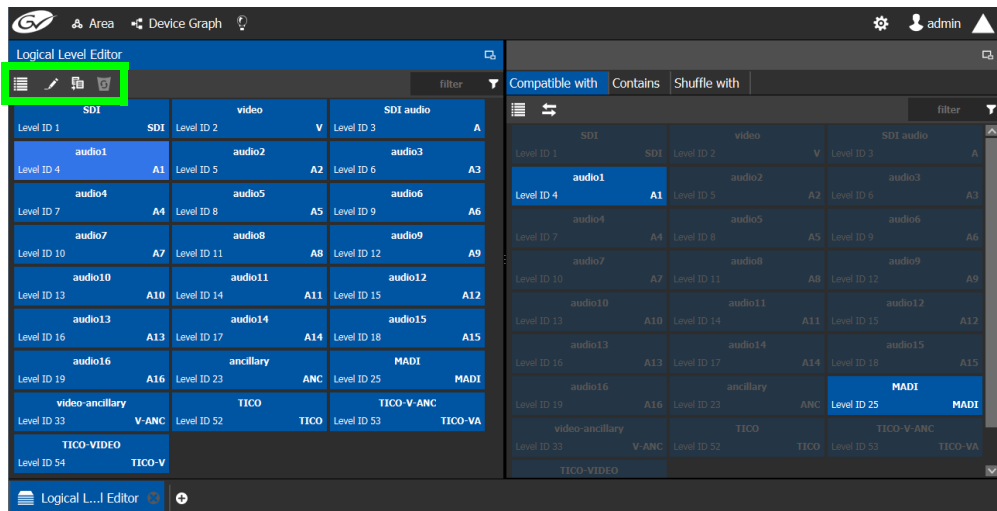
The Logical Level Editor appears.

---

**Note:** Only users who are assigned to the Administrators or Engineers role in the selected area have View, Edit, and Delete permissions in the Logical Level Editor task. See [Viewing Permissions by Role](#), on page 202.

---








**Note:** Before you can open the Logical Level Editor, you must open an Area and a Topology. Logical levels are defined specifically for each topology.

The Logical Level Editor has two columns:

- The first column contains tiles for all default logical levels along with the logical levels you have added.
- The second column has three tabs: *compatible with*, *contains* and *shuffle with*. The *shuffle with* allows a user to configure which audio levels can be shuffled with which.

## Logical Level Editor Menu

The Logical Level Editor menu has the following menu options.

| Icon  | Description |
|---|-------------|
|  | Edit        |
|  | Duplicate   |
|  | Delete      |

## Viewing the Default Logical Levels

The default logical levels are represented by the first tiles displayed in the left and center columns, beginning with video, then audio, and finally ancillary. When you create new logical levels, they are added after these.

You can change the Short Label and Level ID of a default Logical Level, but not the Name. Also, you cannot delete a default level.

The Audio Live device uses AES67 audio levels. See [Logical Levels that specifically support Audio Live](#), on page 168 for more information.

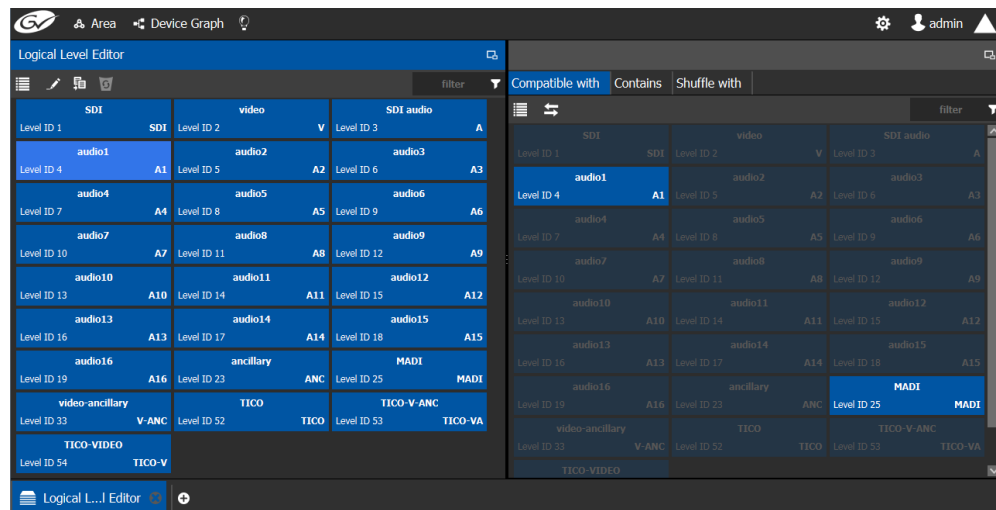
## Verifying the Compatibility of the Default Logical Levels

However, you always modify the compatibility of the logical levels you create. The rule applies to the signal types.

### To verify the compatibility of Logical Levels

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select **Configuration > Logical Level Editor**. See [Accessing the Logical Level Editor](#), on page 24.

The Logical Level Editor appears.



- 3 Select a logical level tile on the left.  
The tiles for the logical levels it is compatible with are highlighted in the right column.

---

**Note:** A logical level is always compatible with itself.

---

## Verifying the Signal Type of the Default Logical Levels

Like the compatibility, the signal types of the default logical levels is predefined and cannot be changed. However, you always modify the signal type for the logical levels you create.

### To verify the signal types of the default logical levels

- 1 Follow the procedure under [Verifying the Signal Type of the Default Logical Levels](#), on page 26.
- 2 When you select a tile for a logical level in the left hand column, the compatibility is highlighted in the **Contains** tab.

## Duplicating a Logical Level

A pre-existing logical level can be copied to reuse that logical level's configuration properties and then you only need to modify the necessary logical level properties as required for the new application.

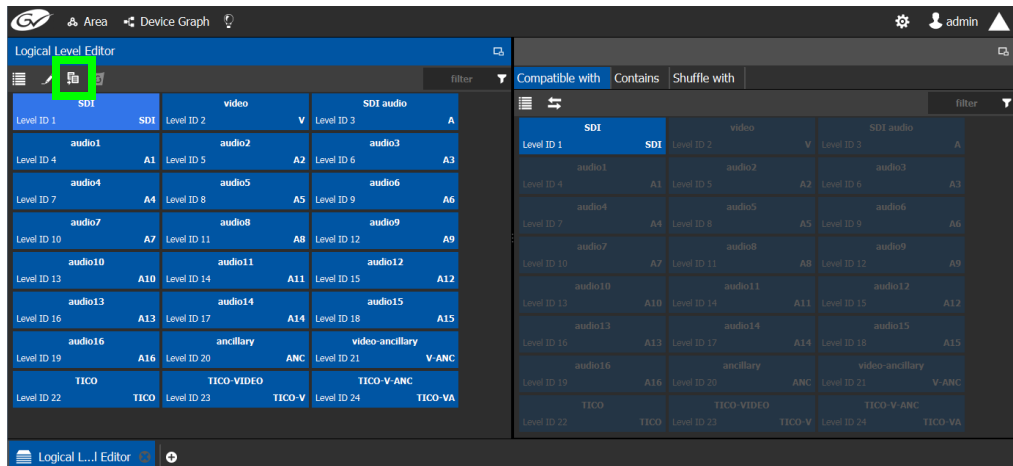
### Notes


Logical levels are specific to topologies. In another topology, you won't see the logical levels you create in the currently selected topology.

Only SDI and TICO levels can be duplicated.

### To duplicate a logical level

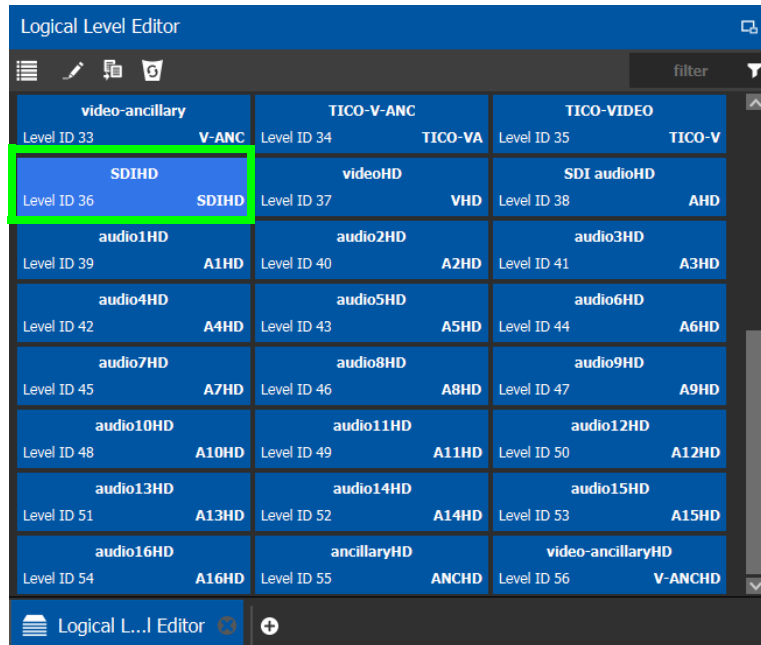
- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select **Configuration > Logical Level Editor**. See [Accessing the Logical Level Editor](#), on page 24.
- 3 Select a pre-existing level on the left-hand panel that you want to duplicate.



- 4 Click **Duplicate**  at the top of the interface. The Logical Level configuration window opens.

|   |     |
|---|-----|
| Level To Duplicate  | SDI |
| Name Prefix   |     |
| Name Suffix   | HD  |
| Short Label Prefix  |     |
| Short Label Suffix  | HD  |
| Starting Level ID   | 36  |
| <input type="button" value="Ok"/> <input type="button" value="Cancel"/> |     |

- 5 Enter meaningful names to identify the level in the **Name Prefix**, **Name Suffix**, **Short Label Prefix**, and **Short Label Suffix** text boxes.
- 6 Enter a unique identifier in the **Starting Level ID** text box.
- 7 Click **OK**.  
A tile for your new logical level is displayed in the left hand column.



See [Configuring the Logical Levels of the Devices in a Topology](#), on page 31.

## Creating the Logical Levels for a 4K / UHD Switching Setup

For an example of how to create the logical levels for 4K / UHD switching when a quad-link (square division) signal path is used, see [Configuring 4K / UHD Streams for use with an IQMix or IQUCP25 Device](#), on page 125.

### Editing a Logical Level

Use the following procedure to modify the identification information of a logical level. The audio setting signals that the level is an audio level.

#### To edit a logical level

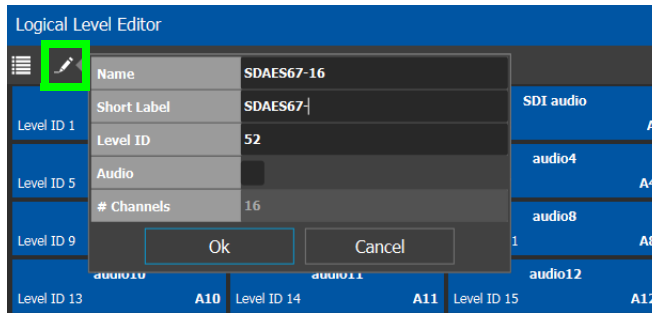
- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select **Configuration > Logical Level Editor**. See [Accessing the Logical Level Editor](#), on page 24.
- 3 Select a level on the left-hand panel that you want to edit.

---

**Note:** For the default logical levels, you can modify the Short Label and Level ID. You cannot modify the Name.

---

- 4 Click **Edit** at the top of the logical level editor.



5 Modify the properties as required.

| Parameter   | Description   |
|-------------|---|
| Name        | The level's name.   |
| Short Label | A shortened name for the level.   |
| Level ID    | A unique identifier for this level.   |
| Audio       | When set, this level will appear in the <b>Shuffle with</b> tab of the right pane for shuffling rules. See <a href="#">Create Logical Devices with Shuffled Audio</a> , on page 64.   |
| # Channels  | When available, this shows the number of audio channels supported by this level. The Audio Live device uses a range of levels, each one supporting a different number of audio channels. See <a href="#">Configuring a Device that Supports Audio Breakaway/Shuffling such as Audio Live</a> , on page 164. |

6 Click **OK**.

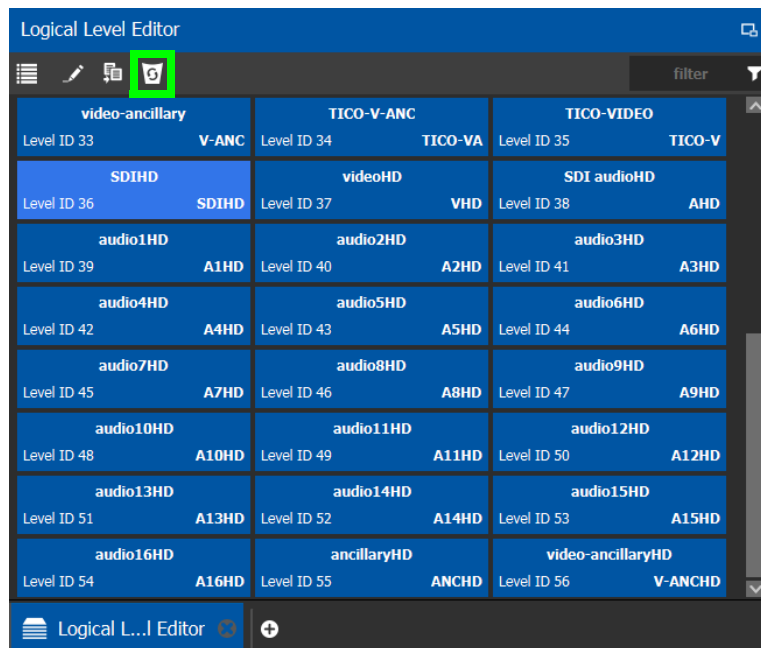
## Deleting a Logical Level

Use the following procedure to delete a logical level that is not required in the selected topology.

**Note:** You cannot delete the default logical levels. The Delete button is disabled when you click on these levels

### To configure a new logical level

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select **Configuration > Logical Level Editor**. See [Accessing the Logical Level Editor](#), on page 24.
- 3 Select the tile for the logical level you want to delete.



- 4 Click **Delete** at the top of the logical level editor.

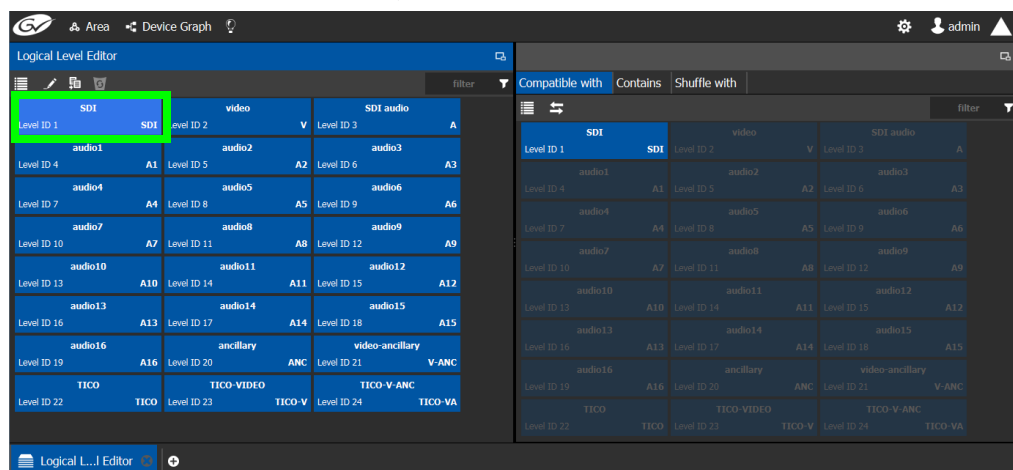
**Note:** There is no confirmation for the deletion.

## Configuring a New Logical Level

Use the following procedure to configure your new logical level. This determines which signal types are compatible with this level.

### To configure a new logical level

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select **Configuration > Logical Level Editor**. See [Accessing the Logical Level Editor](#), on page 24.
- 3 Select the tile for the logical level you want to configure.



The tile for your new logical level is automatically highlighted in the right hand column.

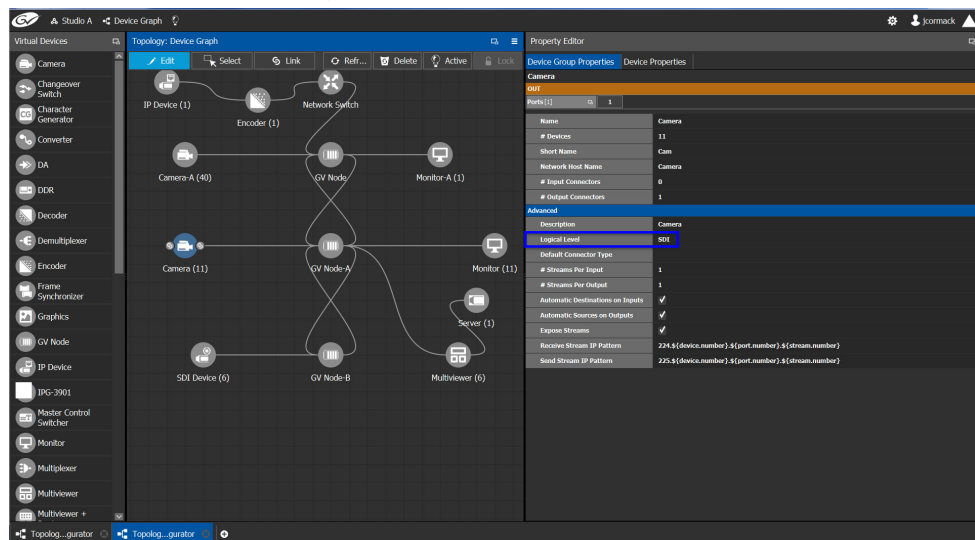
- 4 Select the tiles for the signal types in the right hand column that are compatible. Click a tile a second time to deselect it.

## Configuring the Logical Levels of the Devices in a Topology

Use the following procedure to add logical levels to the devices in your topology.

### To configuring an area in GV Convergent Client

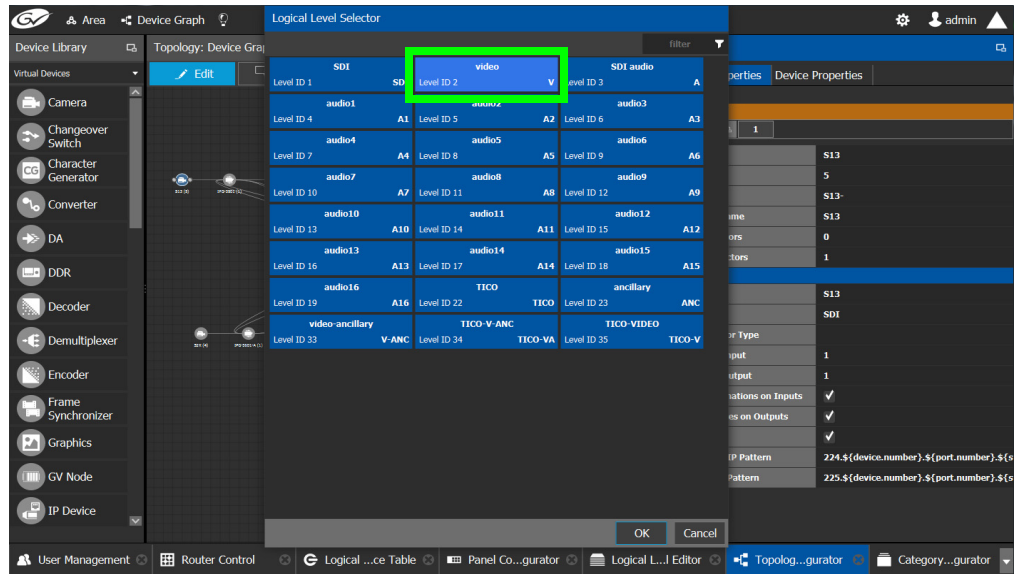
- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select **Configuration > Topology Configurator**.
- 3 Select the required Area. See [Selecting an Area](#), on page 22.
- 4 Select the required topology in the area.



- 5 Select the device for which you are configuring a logical level.  
In the example, shown in the screen shot above, the camera is selected.  
SDI is the default logical level for cameras.
- 6 Select Device Group Properties.
- 7 Select the **Logical Level** parameter in the **Property Editor**.  
This opens the Logical Level list.

## Configuration Tasks

### Configuring the Logical Levels of the Devices in a Topology



8 Select the required logical level for the device group.



## Topology Configurator Tasks

In the previous task, the Area Configurator, you defined the various Areas in your system. Within each Area, you can create multiple *Topologies*. The topologies show how the various physical and logical devices are arranged within the broadcasting facility.

See [Area Configurator Tasks](#), on page 16.

These sections describes the following:

- [Accessing the Topology Configurator](#), on page 33
- [Selecting a Topology](#), on page 34
- [Refreshing the Device Graph](#), on page 36
- [Creating a Topology](#), on page 38
- [Adding Devices to a Topology](#), on page 40
- [Linking the Devices in a Topology](#), on page 41
- [Defining Device Properties](#), on page 46
- [Deleting a Device From a Topology](#), on page 49
- [Activating a Topology](#), on page 50
- [Making an Active Topology Inactive](#), on page 52
- [Unlocking / Relocking a Topology](#), on page 53
- [Locking an Unlocked Topology](#), on page 54

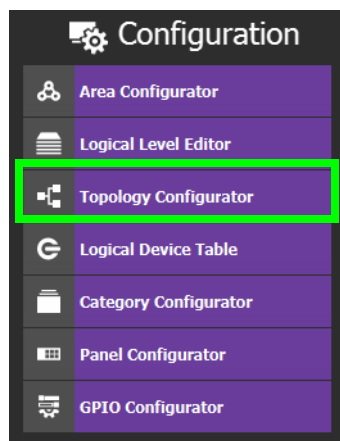
Certain devices require a detailed procedure to configure them; see [Special Device Configuration Tasks](#), on page 103 for more information about these devices.

## Accessing the Topology Configurator

You can access the Topology Configurator from Stage or from any open task. Access permissions are required. See also [Selecting a Topology](#), on page 34.

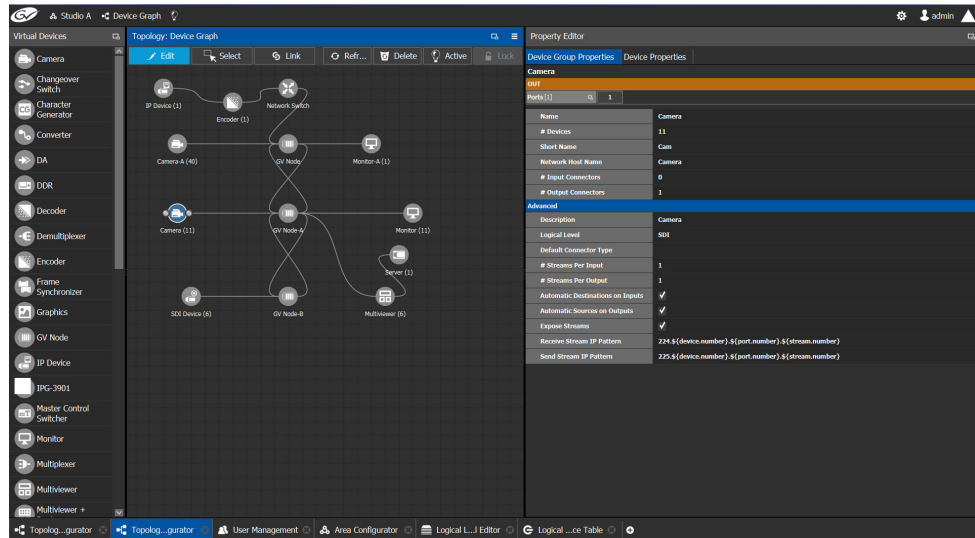
### To access the Topology Configurator from Stage

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select **Configuration > Topology Configurator**.



The Topology Configurator appears. The Topology Configurator comprises three sections. The left hand column has a list of bubbles, representing the device groups,

such as cameras, routers, and monitors. You drag these onto to a Device Graph and create connections between them. Then, you can configure the properties for the Device Groups in the **Property Editor**.



If an Area is open, the Topology Configurator opens in that area. You can switch areas from anywhere in GV Convergent Client. See [Selecting an Area](#), on page 22.

## Access Permissions

Access permissions to the Topology Configurator vary according to role. Only users who are assigned to the Administrators or Engineers role can View, Edit, and Delete topologies and device properties. Operators have the right to view topologies and device properties. Maintenance staff and Guests have no access. See [Viewing Permissions by Role](#), on page 202.

## Selecting a Topology


To work on a topology, you need to select it so that it is open in the Topology Configurator. You can work on only one topology at a time.

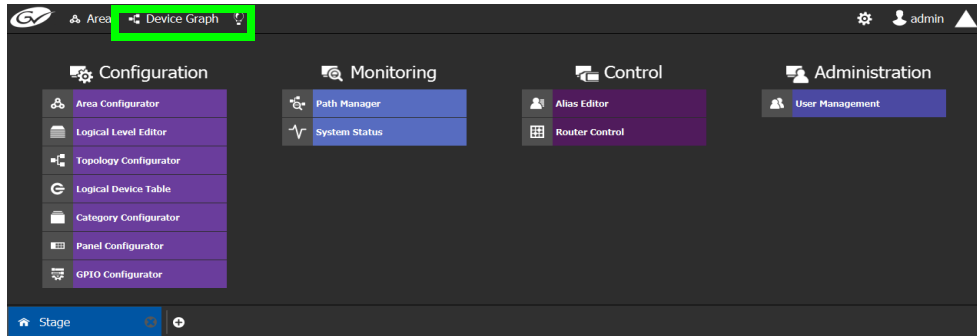
### To select a topology

---

**Note:** A topology must be created in an area. Then, it is available only in the area where it was created.

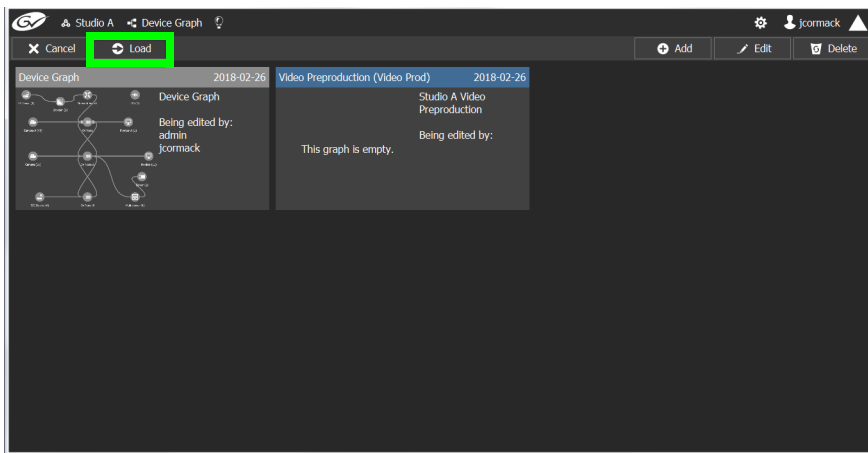
---

- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Click on the  icon for the currently selected topology at the top left of GV Convergent Client.

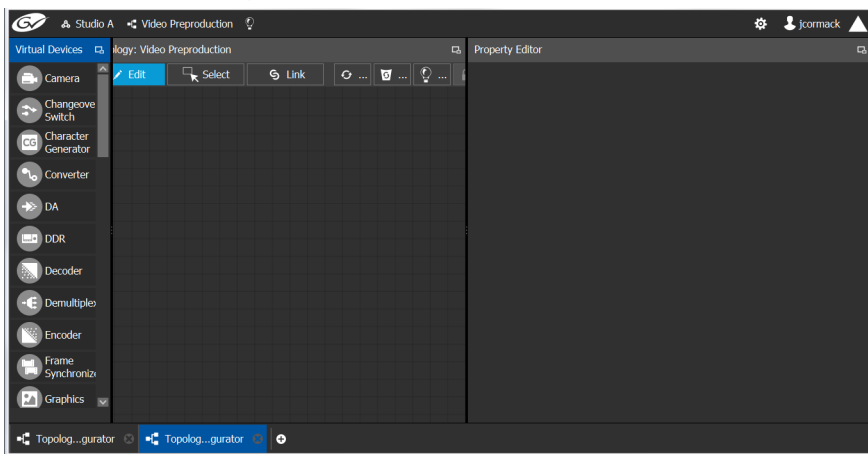


This opens a secondary window.

- 3 Double-click the topology you want to update or select the topology you want to update and then click **Load**.



The selected topology is opened in the Device Graph.



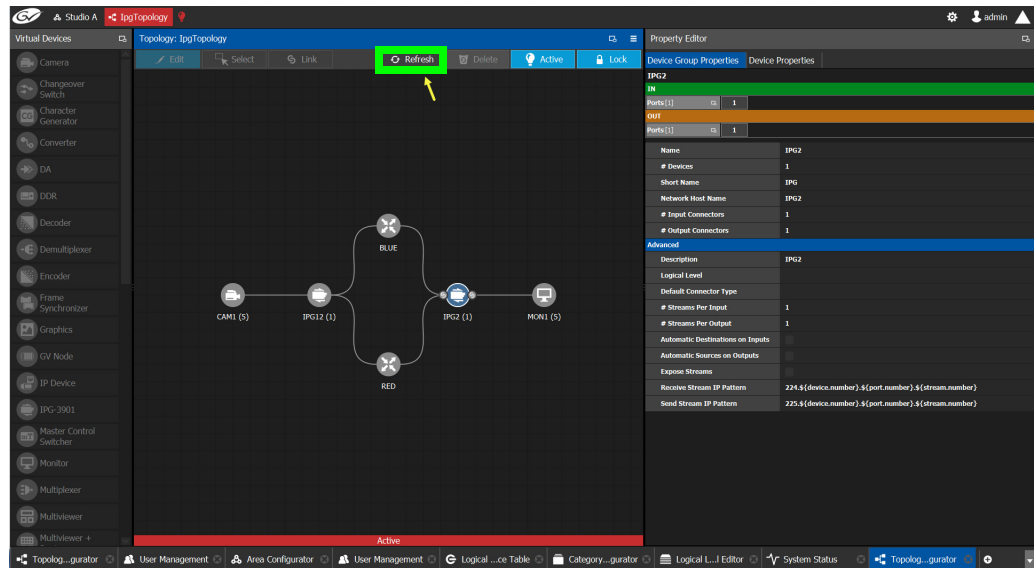
If the topology is new, the Device Graph is blank. The next step is to begin adding devices. See [Adding Devices to a Topology](#), on page 40.

## Refreshing the Device Graph

If you have added a lot of devices to a topology in the Device Graph or made many other modifications to it, you may need to refresh the Device Graph. You can refresh topology regardless of whether it is active or inactive.

### To refresh the Device Graph

- 1 Open a topology in the Topology Configurator.



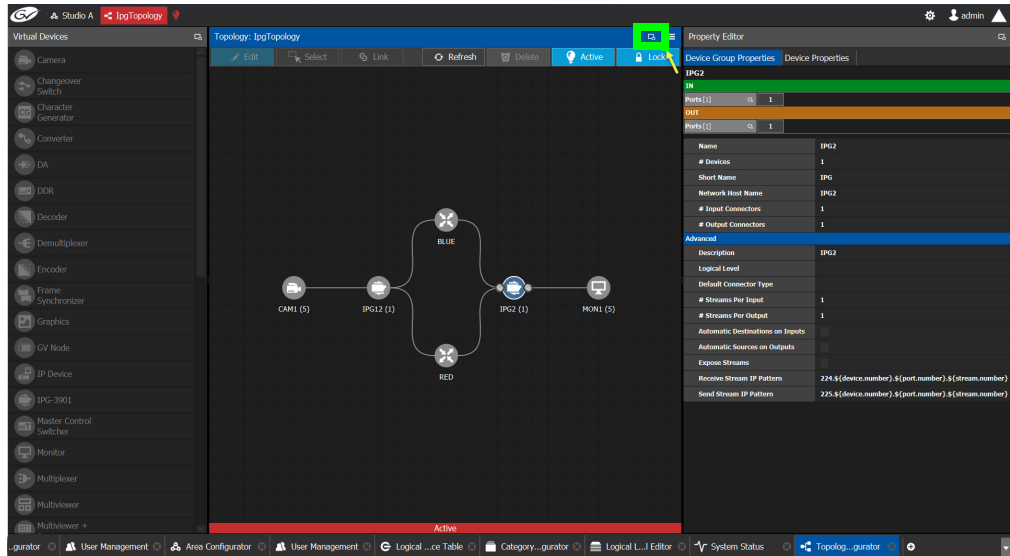
- 2 Click the Refresh button at the top of the interface.  
The topology is inaccessible during the brief time it takes to refresh the window.

## Viewing the Topology in Full Screen Mode

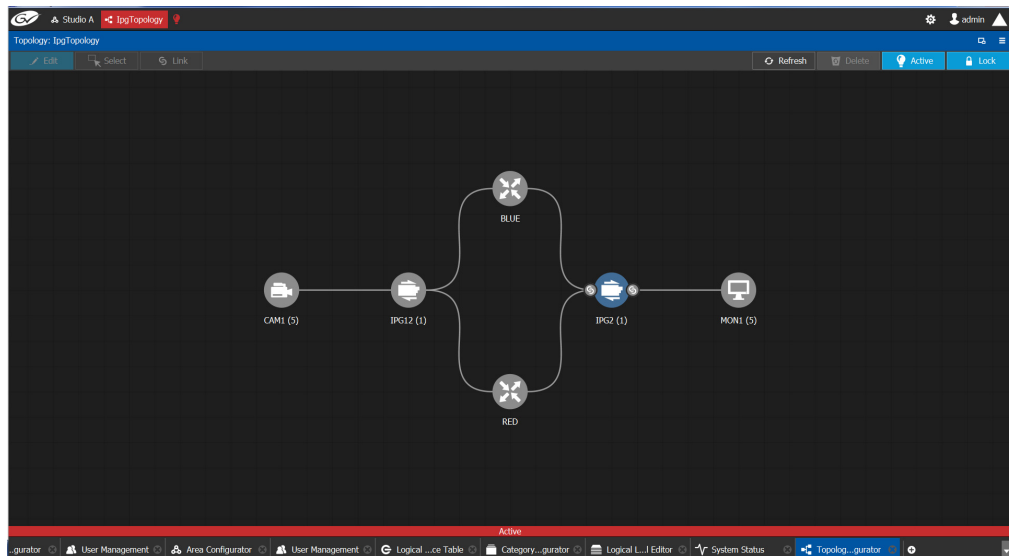
By default, the selected topology is displayed in the Device Graph in the center of the Topology Configurator task. The devices are displayed on the left and the **Property Editor** is displayed on the right.

### To view the topology in fullscreen mode

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select the required Area. See [Selecting an Area](#), on page 22.
- 3 Select the required topology. See [Selecting a Topology](#), on page 34.



- 4 Click the Fullscreen toggle button at the top of the interface.  
The Device Graph expands across all three columns in the Topology Configurator.



#### TIP

To zoom and center the topology view:

- click the Refresh button.
- double-click an empty space.

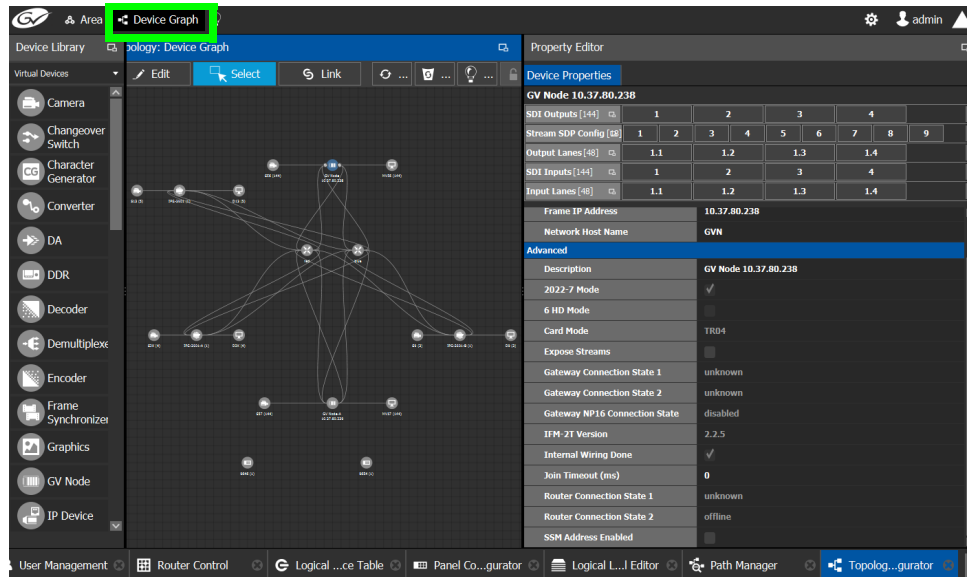
#### To return to default mode


- 1 When the Device Graph is in fullscreen mode, click the Fullscreen button to toggle the display back to the default mode.

## Creating a Topology

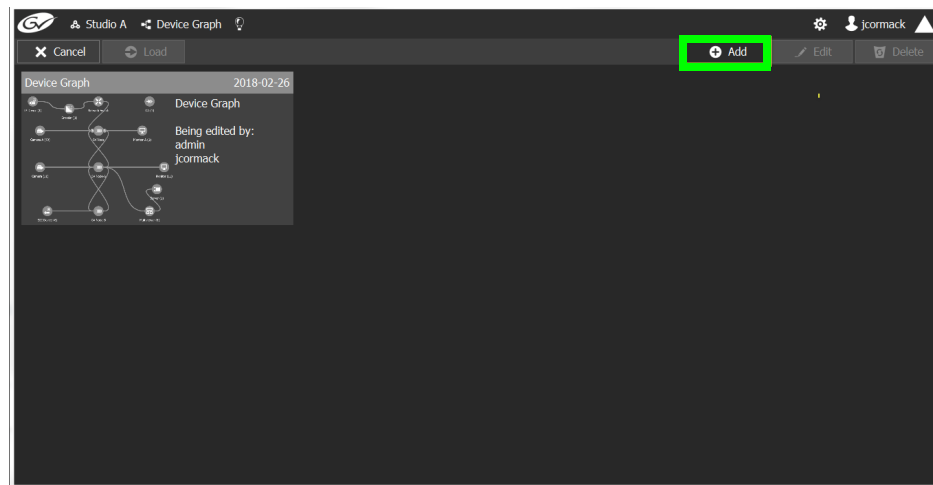
To create a new topology

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select the required Area. See [Selecting an Area](#), on page 22.

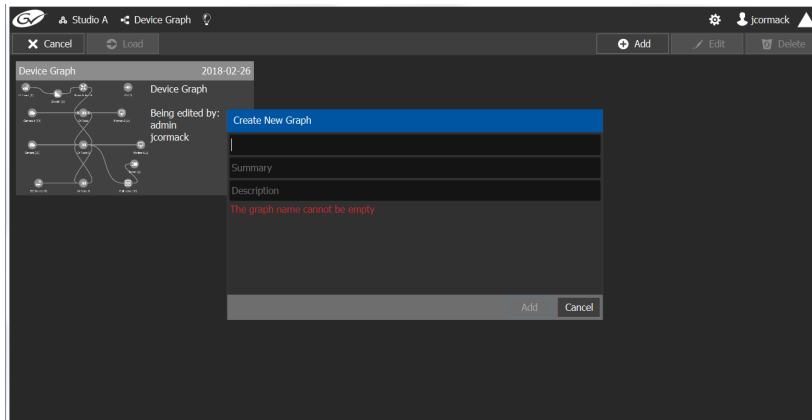


- 3 Click the topology icon . This is located beside **Device Graph** or the name of the open topology at to the top of the Topology Configurator.

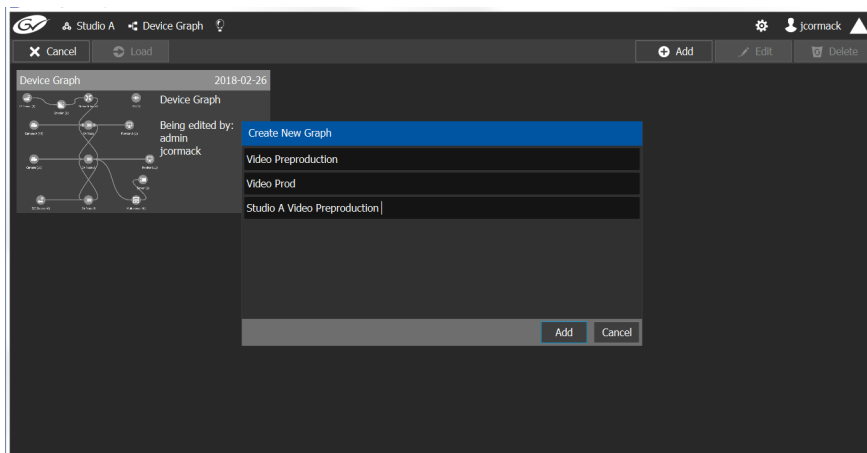
This opens a secondary window.



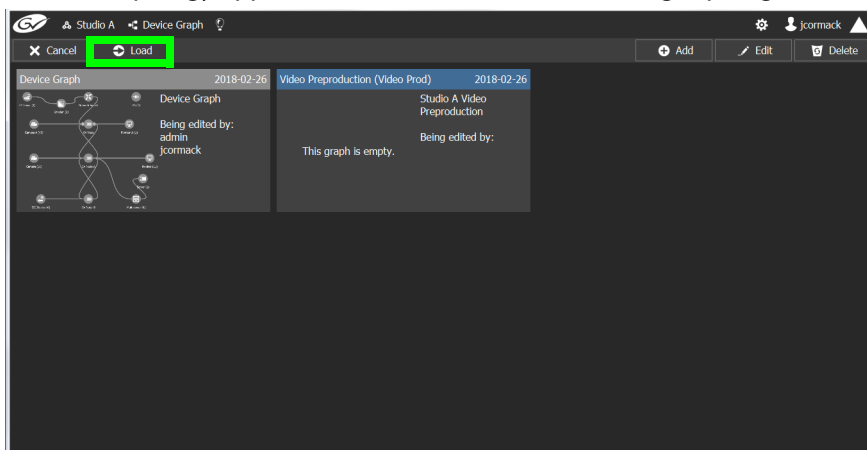
- 4 Click **Add** .
- The Create New Graph window appears.



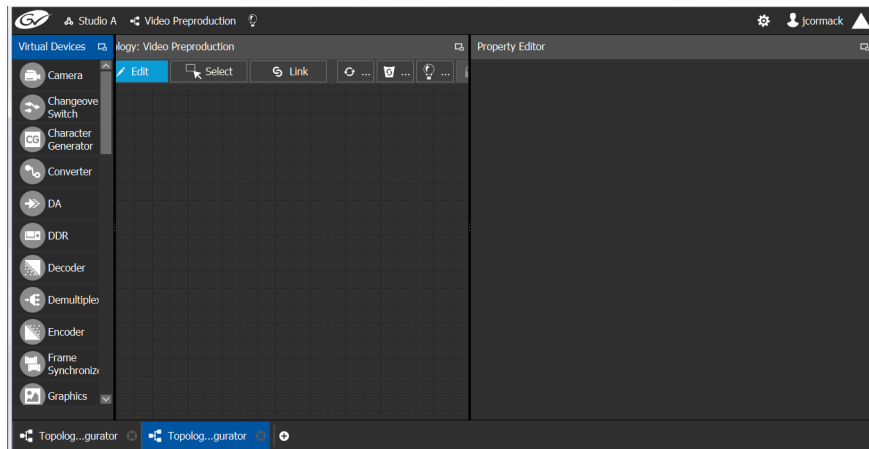
- 5 Enter a name for the new topology and enter meaningful text in the **Summary** and **Description** fields for easy identification.



- 6 Click **Add** on the Create New Graph window.  
The new topology appears in the list box with the existing topologies.



- 7 Select the new topology and click **Load**. Or double-click the topology.  
The selected topology is opened in the Device Graph.



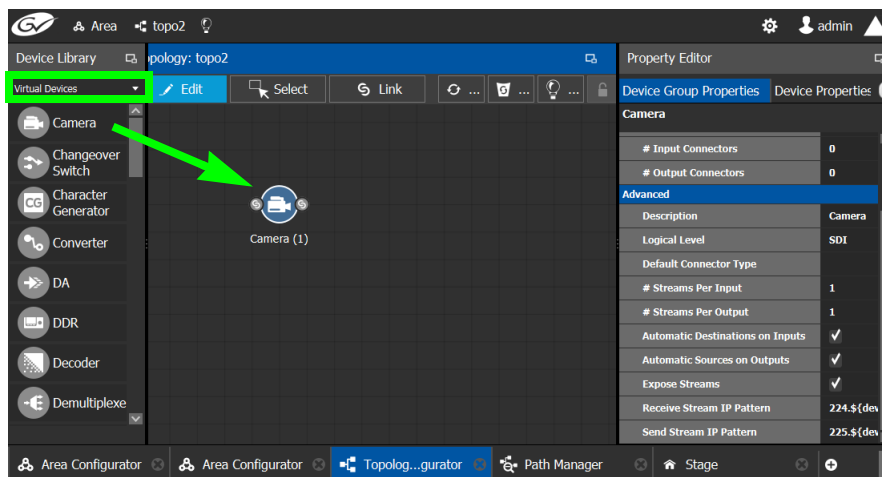
If the topology is new, the Device Graph is blank. The next step is to begin adding devices. See [Adding Devices to a Topology](#), on page 40.

## Adding Devices to a Topology

By adding devices to a topology, you are making a representation in GV Convergent of the real world equipment you are using, and the physical interconnections made between this equipment.

### To add a device to a topology

- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.
- 3 From the **Device Library**, **Virtual Device** on the left, select **Virtual Devices** from the drop-down list.



- 4 From the **Device Library**, **Virtual Device** find devices that represents a piece of equipment you want to control: select the device bubble and drag it into position on the Device Graph and release the mouse button.

Initially, the device bubble represents a single device, such as a single camera. However, a bubble is a device group that can represent one or more devices.

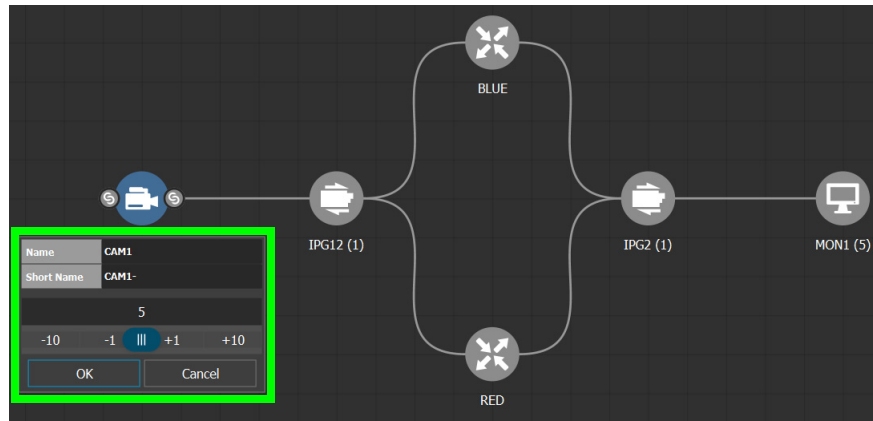


- 5 Repeat [step 4](#) to and the following procedure until you have added all the required devices to the topology.

### To name a device and set the number of devices in the group

A device group is a collection of devices of the same type that can be configured together. All bubbles in a graph are automatically device groups; the exceptions are routers, network switches, IQMIX / IQUCP25, MV-820-IP, Kahuna, K-Frame, and GV Nodes.

- 1 Click on the name of the device underneath the bubble to create a device group.  
The Device Group configuration window appears.



- 2 Enter meaningful names to identify the device group in the **Name** and **Short Name** fields.

In this case, the Camera device group is named CAM1 to identify the cameras controlled by Controller 1. These parameters can also be set in the **Property Editor**.

- 3 Use the plus and minus buttons to enter the number of device instances are in the group.
- 4 Click **OK**.

Each device instance is shown and can be individually configured in the **Property Editor**, under **Devices**, by clicking an instance.

In the above example, five monitors, two IPGs, two network switches, and five cameras have been added to the Device Graph.

## Linking the Devices in a Topology

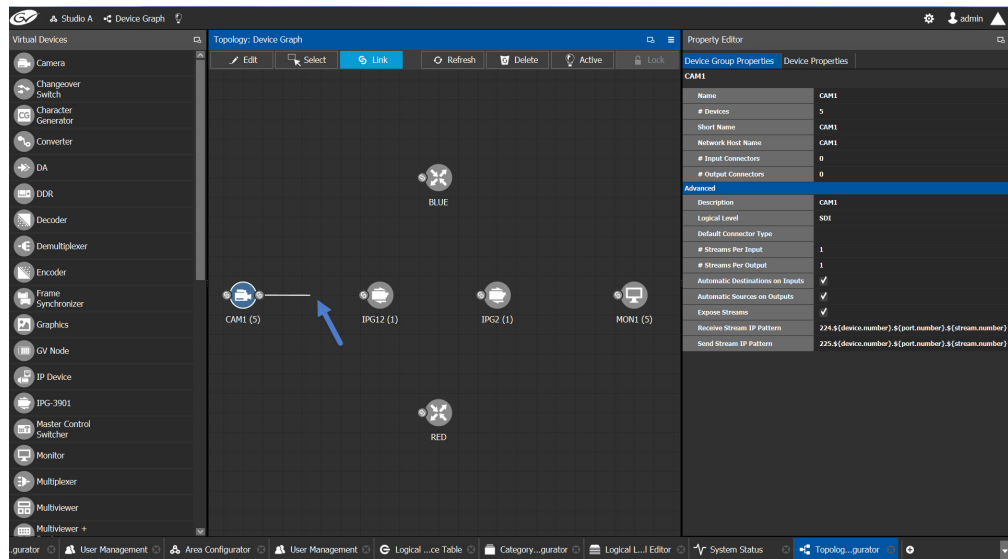
Once the device groups are added to the Device Graph, the next step is to create links between them using the Link mode which allows you to link bubbles with a touch-based device. Otherwise, if you are using a mouse and keyboard interface, you can link devices together using the following procedure while in the Edit mode as well.

### To link devices or device groups in a topology

- 1 Open the required topology in the Device Graph.
- 2 Select the required Area. See [Selecting an Area](#), on page 22.
- 3 Select the required topology. See [Selecting a Topology](#), on page 34.

## Configuration Tasks

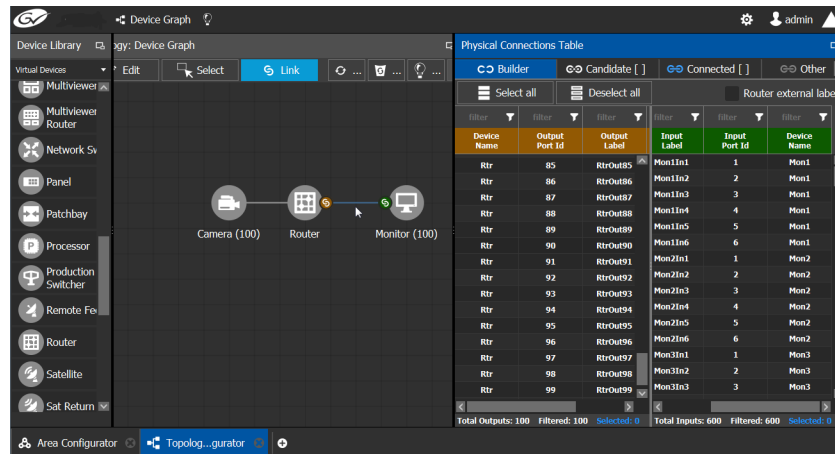
### Setting the Link's Physical Connection Parameters (Sources and Destinations)



- 4 Click the **Link** button at the top of the interface.
- 5 Select the first bubble in the pair you want to connect.  
When the bubble is selected, the device is highlighted in blue and both the bubble's input and outputs ports become available. Input ports are on the left side of the bubble. Output ports are on the right side of the bubble.
- 6 Select an input or output port on the bubble.  
If the input port was selected, the output ports of all the available devices appear. If the output port was selected, the input ports of all the available devices appear.
- 7 Draw a line, with your mouse, between the ports of the two devices to make the connection between them. Or if you are using a touch-based device, the Link mode allows you to link bubbles together by dragging a bubble over others so that the connectors touch each other and then pull them apart to their final position.

### Setting the Link's Physical Connection Parameters (Sources and Destinations)

When a link is selected, the **Physical Connection Table** appears. It is in this table where you create the connections between device ports. When you draw a topology graph and you link two devices, you are indicating that the two devices in two groups are virtually connected. Therefore, you need a place to specify how these devices are actually (physically) connected. This is achieved through the Physical Connections Table. It is in this table where you will actually specify that port1 of device1 that is part of group1 is connected physically with port1 of device1 of group2, for example.



To make a connection, you must start in the Builder tab, and then complete the action in the Candidate tab.

The **Physical Connection Table** uses connection icons as follows.

| Icon | State (status)  | Action   |
|------|---|--|
|      | The stream is ready to be connected as it has been selected in the Builder tab. | —  |
|      | The stream is connected.  | Connect: make the connection between the source and destination devices.     |
|      | —   | Disconnect: break the connection between the source and destination devices. |

The **Physical Connection Table** uses port type icons as follows. A source's output port type must be linked to the same input port type at the destination.

| Port Type Icon | Description                  |
|----------------|------------------------------|
|                | The connection type is SDI.  |
|                | The connection type is IP.   |
|                | The connection type is MADI. |

In the **Physical Connection Table**, more than one table row can be selected at a time; to add to a selection, use *Shift* or *Ctrl* to select a range of table rows or to add another row to the selection.

## Builder Tab

The Builder tab shows all the outputs and the inputs available for connections. The output streams are shown on the left and the inputs are shown on the right for the selected link. By selecting streams in the Builder tab makes them available in the Candidate tab where they

## Configuration Tasks

### Setting the Link's Physical Connection Parameters (Sources and Destinations)

are then linked. For extra information about an input or output, set **Router external labels**. The Router external labels are only available for router ports and not all device ports.

| Device Name | Output Port Id | Output Label | Input Label | Input Port Id | Device Name |
|-------------|----------------|--------------|-------------|---------------|-------------|
| Rtr         | 85             | RtrOut85     | Men1In1     | 1             | Mon1        |
| Rtr         | 86             | RtrOut86     | Men1In2     | 2             | Mon1        |
| Rtr         | 87             | RtrOut87     | Men1In3     | 3             | Mon1        |
| Rtr         | 88             | RtrOut88     | Men1In4     | 4             | Mon1        |
| Rtr         | 89             | RtrOut89     | Men1In5     | 5             | Mon1        |
| Rtr         | 90             | RtrOut90     | Men1In6     | 6             | Mon1        |
| Rtr         | 91             | RtrOut91     | Men2In1     | 1             | Mon2        |
| Rtr         | 92             | RtrOut92     | Men2In2     | 2             | Mon2        |
| Rtr         | 93             | RtrOut93     | Men2In3     | 3             | Mon2        |
| Rtr         | 94             | RtrOut94     | Men2In4     | 4             | Mon2        |
| Rtr         | 95             | RtrOut95     | Men2In5     | 5             | Mon2        |
| Rtr         | 96             | RtrOut96     | Men2In6     | 6             | Mon2        |
| Rtr         | 97             | RtrOut97     | Men3In1     | 1             | Mon3        |
| Rtr         | 98             | RtrOut98     | Men3In2     | 2             | Mon3        |
| Rtr         | 99             | RtrOut99     | Men3In3     | 3             | Mon3        |

#### To associate a device's output stream to another device's input

- 1 Select one or more source output stream table rows that you want to link to destination's input.
- 2 Drag the source output stream table rows onto the destination input(s).  
The selected items become available in the Candidate tab.

You can bypass the Candidate tab as follows: you select all your destination, and all your sources and then with your right mouse button held down you drag the destinations over the sources. With this method, the only way to review your connections is by going into the Connected tab and disconnecting the wrong/unwanted ones.

#### Candidate Tab

Once a device's output stream has been associated to another device's input in the Builder tab, you can review these associations to then select the ones you want to link together.

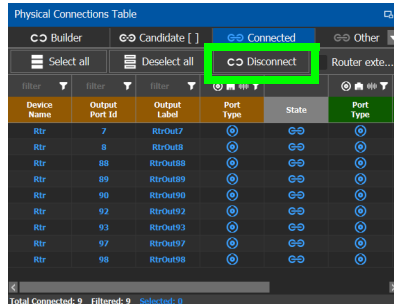
| Device Name | Output Port Id | Output Label | Port Type | State | Port Type |
|-------------|----------------|--------------|-----------|-------|-----------|
| Rtr         | 1              | RtrOut1      |           |       |           |
| Rtr         | 2              | RtrOut2      |           |       |           |
| Rtr         | 3              | RtrOut3      |           |       |           |
| Rtr         | 4              | RtrOut4      |           |       |           |
| Rtr         | 5              | RtrOut5      |           |       |           |
| Rtr         | 6              | RtrOut6      |           |       |           |
| Rtr         | 9              | RtrOut9      |           |       |           |
| Rtr         | 10             | RtrOut10     |           |       |           |
| Rtr         | 11             | RtrOut11     |           |       |           |
| Rtr         | 12             | RtrOut12     |           |       |           |
| Rtr         | 13             | RtrOut13     |           |       |           |
| Rtr         | 14             | RtrOut14     |           |       |           |
| Rtr         | 15             | RtrOut15     |           |       |           |
| Rtr         | 16             | RtrOut16     |           |       |           |
| Rtr         | 17             | RtrOut17     |           |       |           |

#### To link a device's output stream to another device's input

- 1 Select one or more table rows that you want to link the source's output stream to the destination's input.
- 2 When satisfied with your selection, click Connect at the top of the table.

## Connected Tab

This tab shows the currently linked streams between the source's output and the destination's input. Links can be disconnected in this tab.



### To disconnect a device's output stream from another device's input

- 1 Select one or more table rows that you want to disconnect the source's output stream to the destination's input.
- 2 When satisfied with your selection, click Disconnect at the top of the table.

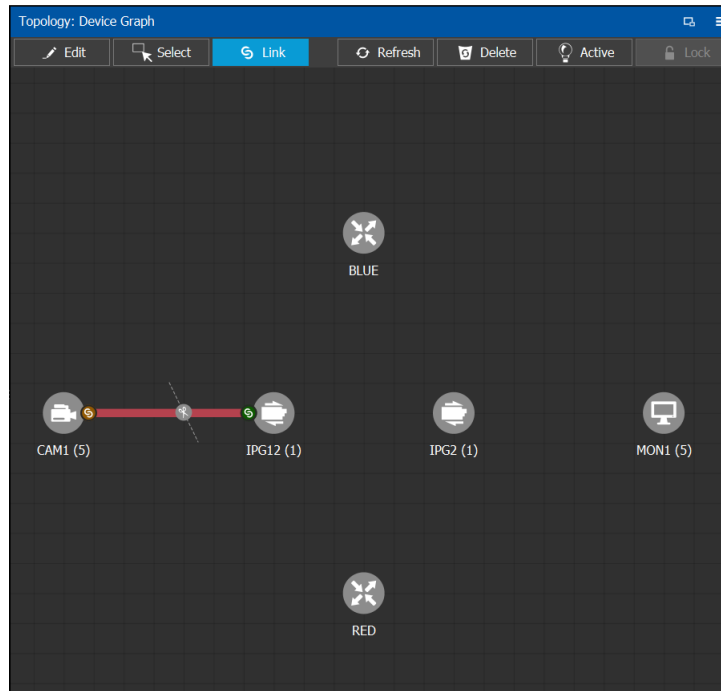
## Other Tab

This tab will show you all the other connections that a device's ports has on another links. For example, you have device1 with 20 ports, 10 are connected to device2 and 10 to device3. You select the first link and you connect the 10 ports. You select the second link on the Other tab you will see the first 10 ports that you connected.

## Deleting the Connection Between Device Groups

### To delete the connection between devices

- 1 Open the required topology in the Device Graph.
- 2 Select the required Area. See [Selecting an Area](#), on page 22.
- 3 Select the required topology. See [Adding Devices to a Topology](#), on page 40.



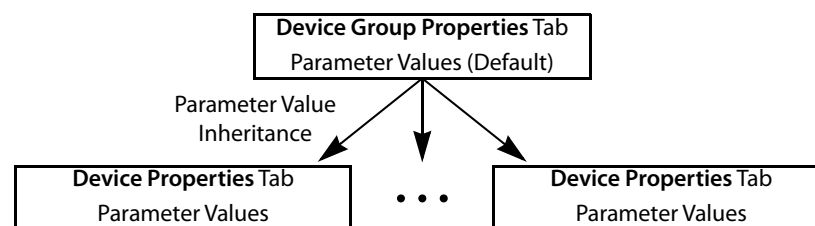
- 4 Select the **Link** button at the top of the interface.
- 5 Draw a line across the connection.  
The scissor icon appears on the line and the link turns red.
- 6 Release the mouse.  
The connection link is removed.

## Defining Device Properties

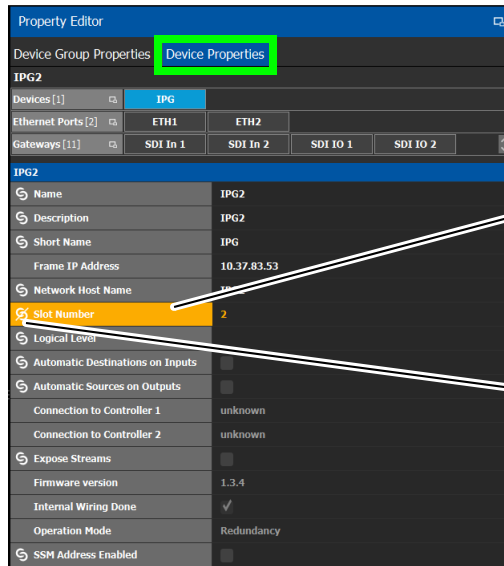
You set the parameters for the selected device in the **Property Editor**. The configuration parameters for most devices is intuitive and no further explanation is required. However, the configuration of certain devices requires advanced knowledge; see [Special Device Configuration Tasks](#), on page 103 for more information about these devices.

### Inheritance of Property Values from the Device Group Properties Tab

Certain parameter values in the **Device Properties** tab inherit their values from the corresponding parameter values in the **Device Group Properties** tab. This allows you to configure common parameters for a large number of devices at once with a default value.



When you change the value of a parameter in the **Device Properties** tab such that it is now different from the corresponding value set in the **Device Group Properties** tab, the parameter will be displayed with an orange background. This is shown below.



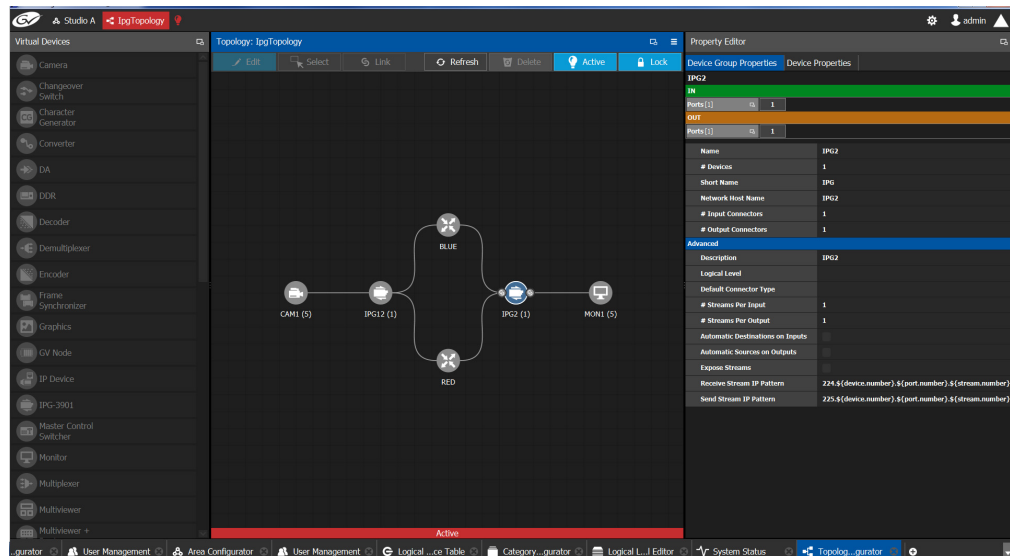
The parameter's value is a non-default value (indicated by the orange highlight)

Click to reset the parameter's value back to the default value set in the **Device Group Properties**

### To define properties for a device

- 1 Open the required topology in the Device Graph. See [Selecting a Topology](#), on page 34.
- 2 Select the device you want to configure.

The **Property Editor** is displayed on the right.



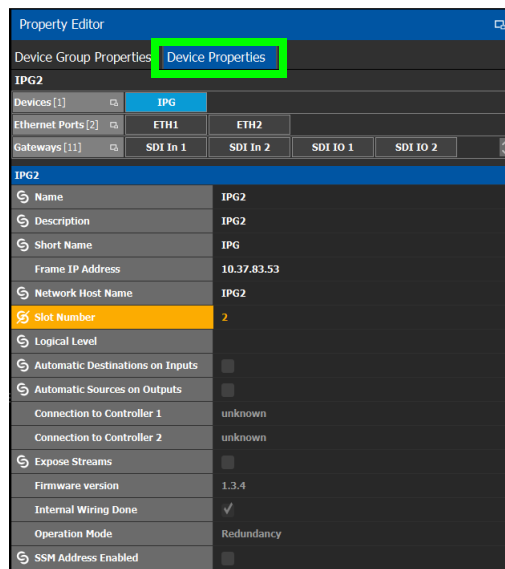
In this case, the IPG2 bubble is selected and the Device Group Properties tab is selected in the **Property Editor**.

- 3 Select the **Device Properties** tab to view the properties for the individual device. See also [Description of Common Device Properties](#), on page 104.

## Configuration Tasks

### Defining Device Properties

---

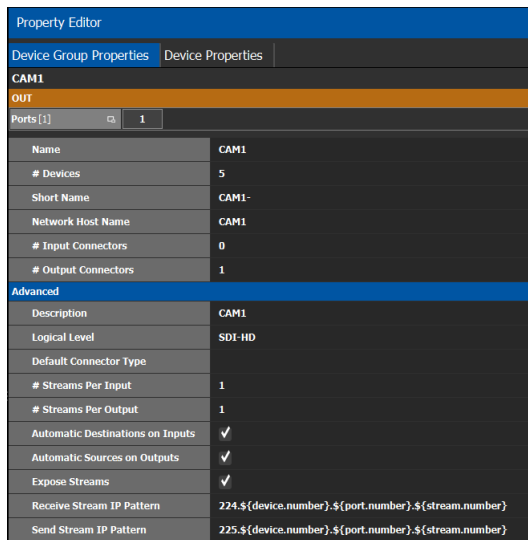




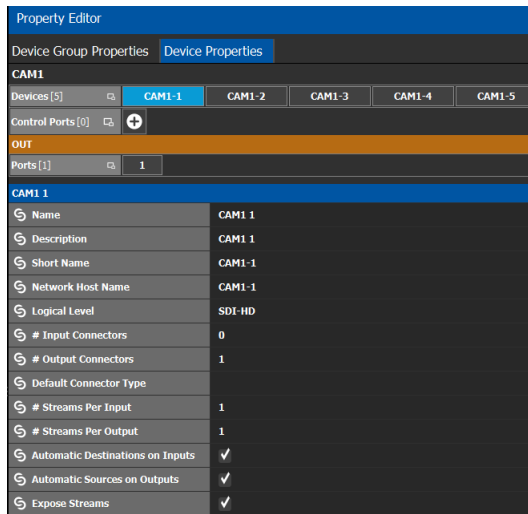
For example, for the Cameras, there is a **Device Group Properties** tab for the camera group and a **Device Properties** tab for each of the five cameras.

### Camera Device Group Properties

The **Device Group Properties** tab sets the default parameter values to be passed down to each individual device in the **Device Properties** tab to save time. These default values can be overridden in the at the device level in the **Device Properties** tab.



### Camera Device Properties



**Note:** All devices, device groups, and connections have properties.

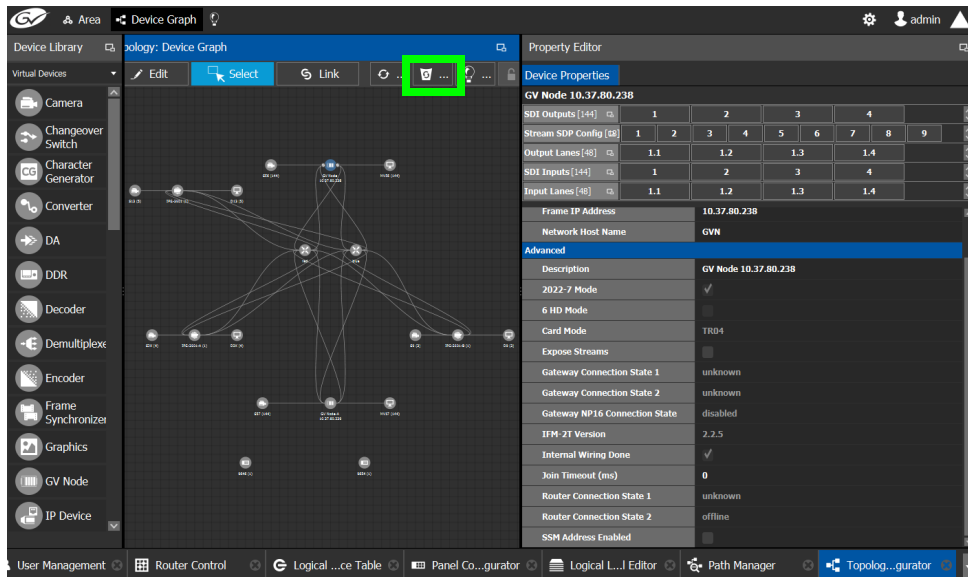
## Deleting a Device From a Topology

You must open a topology in the Topology Configurator before you can delete it.

### To delete a topology

- 1 Select the Area. See [Selecting an Area](#), on page 22.

- 2 Select the topology. See [Selecting a Topology](#), on page 34.



- 3 Select the device you want to remove.  
The device is highlighted on the graph.
- 4 Click **Delete**.

## Activating a Topology

By activating a topology makes GV Convergent connect to and activate all drivers to devices in the topology. For example, for a GV Node it means initiating the Densité and NP0016 connections and being able to control them. By activating a topology, panels will become active and light up.

You must select a topology and open it in the Topology Configurator before you can make it active.

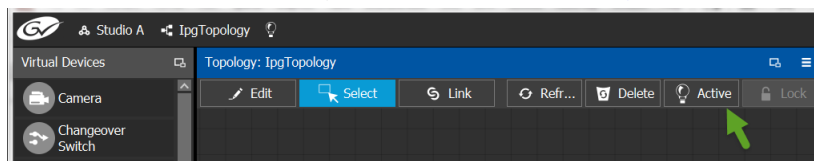
---

**Note:** Only one topology can be active at a time for each area.

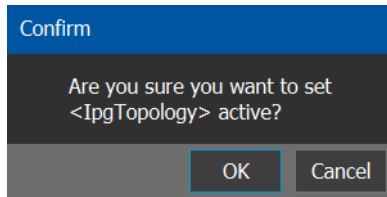
---

### To make a topology active

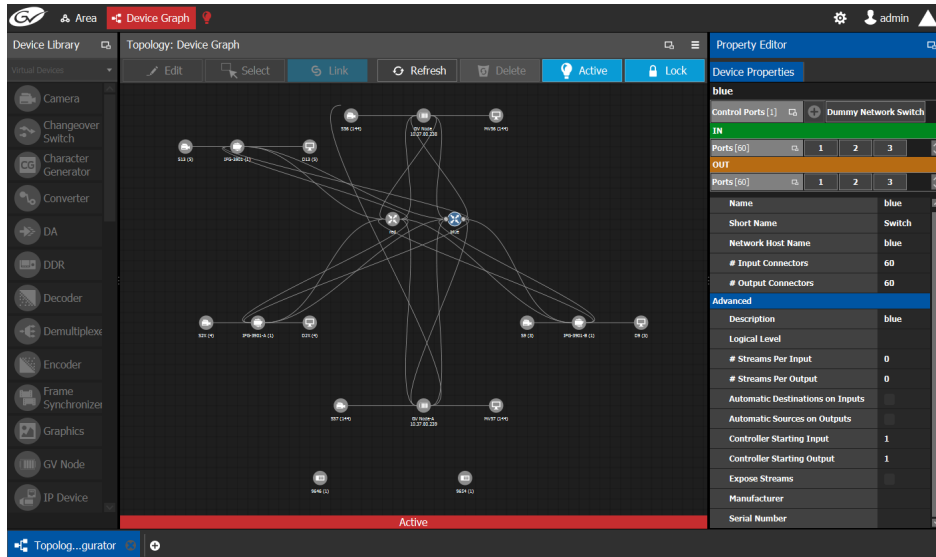
- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.



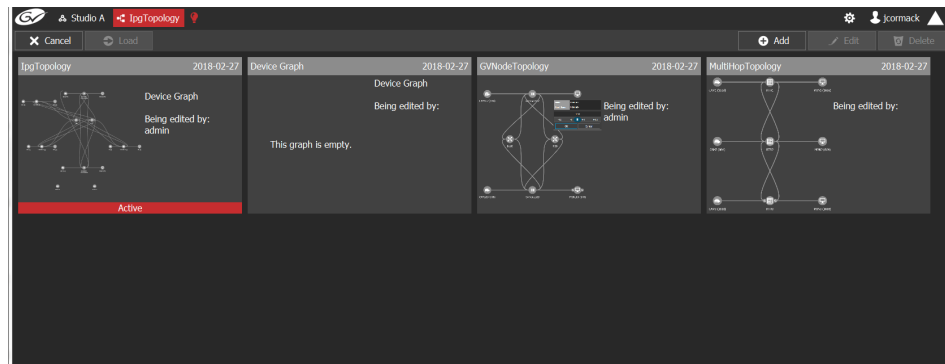
- 3 Click **Active** at the top of the Topology Configurator.  
A confirmation message appears.



- 4 Click **OK** to continue.  
The following changes occur.



- The topology name is displayed in red at the top of the Topology Configurator.
- A red lightbulb is displayed beside the topology name.
- A red bar is displayed at the base of the Device Graph.
- Active is written on the bar.
- The topology is locked.
- The red Active bar is displayed on the thumbnail for the active topology.

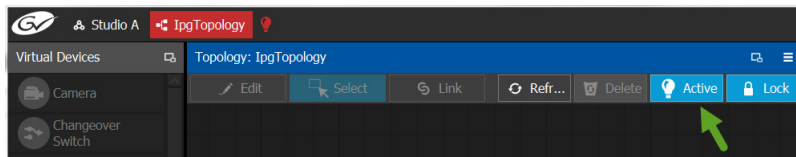


## Making an Active Topology Inactive

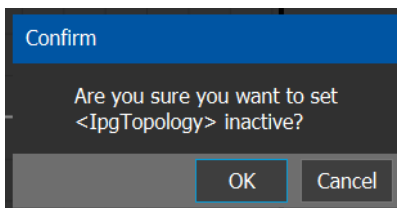
Only one topology can be active at a time for each area. You must open the active topology in the Topology Configurator before you can make it inactive.

### To make an active topology inactive

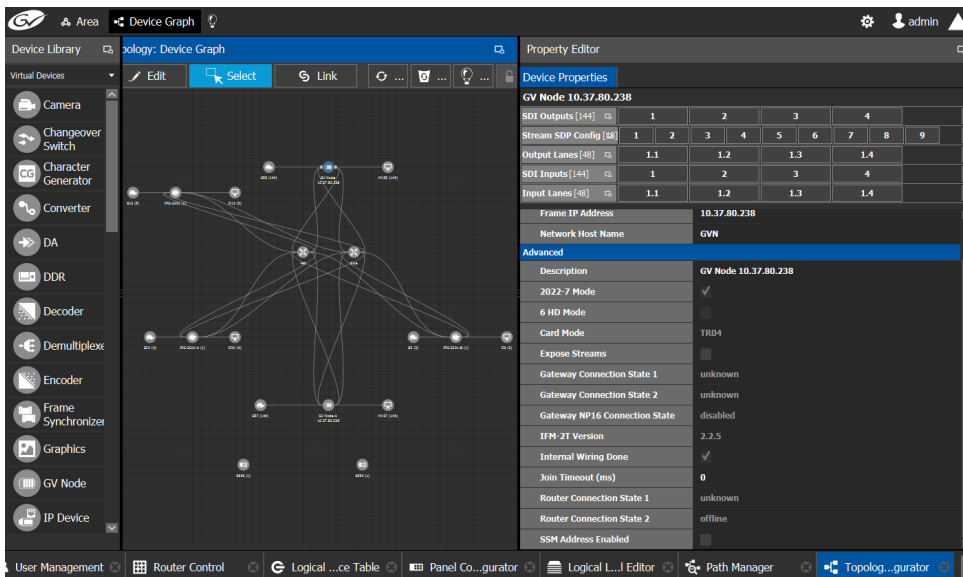
- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Adding Devices to a Topology](#), on page 40.



- 3 Click the **Active** button at the top of the Topology Configurator.  
A confirmation message appears.



- 4 Click **OK** to continue.  
The following changes occur.



- The topology name no longer appears in red at the top of the Topology Configurator.
- The red bar no longer appears at the base of the Device Graph.
- The topology is unlocked.
- The red Active bar is no longer displayed on the thumbnail for the active topology in the secondary window.

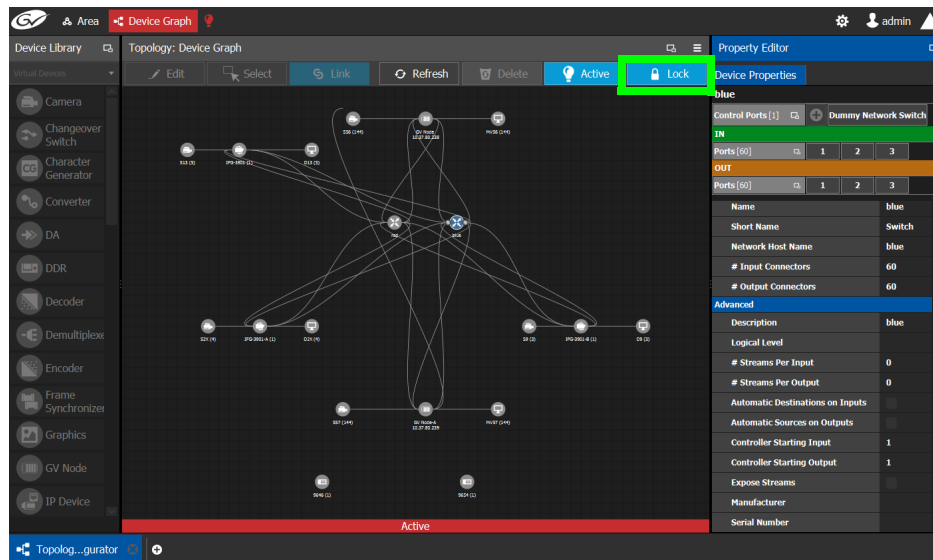
## Unlocking / Relocking a Topology

A topology is locked automatically when you make it active. The lock only affects the current GV Convergent Client application. If multiple users have the same topology open, then each user can lock/unlock their client to do edits; this setting is not global to all open clients.

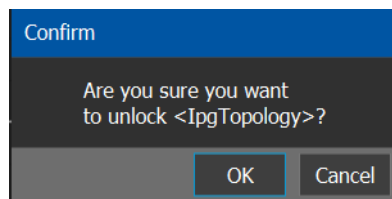
### To unlock an active topology

- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.

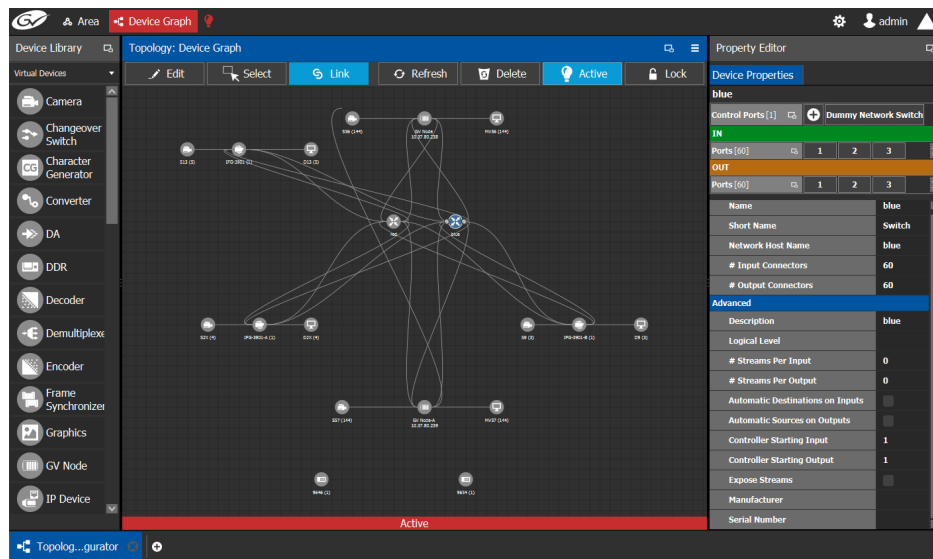
This opens the topology in the Topology Configurator.



- 3 Click the **Lock** button.  
A confirmation message appears.



- 4 Click **OK** to continue.



When a topology is unlocked

- The Lock icon is no longer highlighted in blue.
- The lock icon is unlocked.
- If you have Edit permissions to the Topology Configurator for the selected area, you can modify the active topology.

## Locking an Unlocked Topology

It is recommended to relock an unlocked topology, when you have finished your edits. This prevents you from inadvertently making edits on an active topology, such as selecting an object and pressing delete by accident.

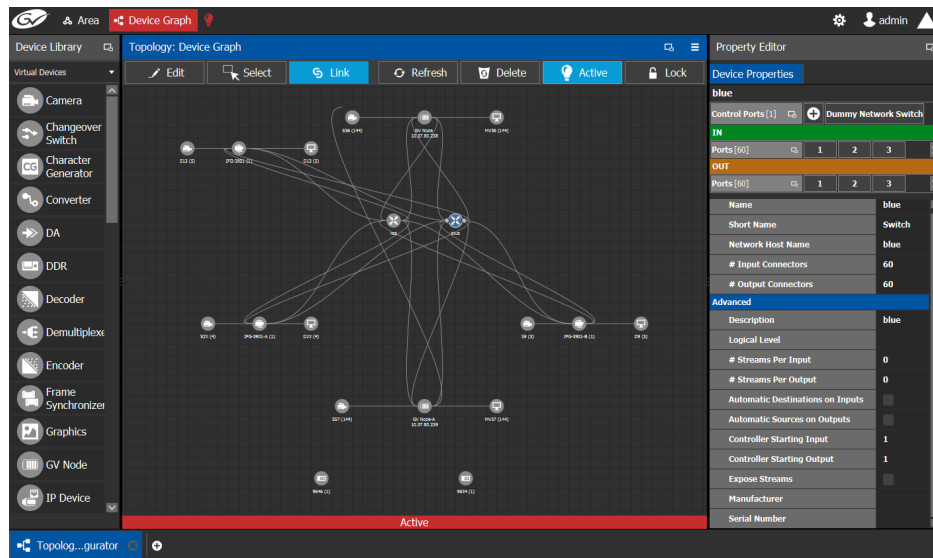
---

**Note:** You can only lock an unlocked active topology. Inactive topologies cannot be locked or unlocked.

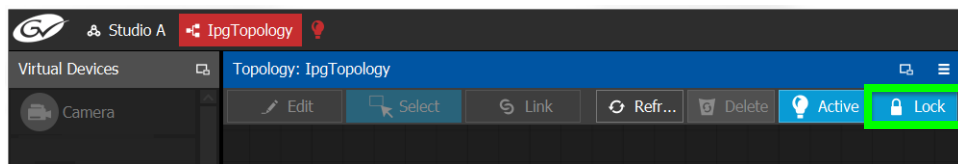
---

### To lock a unlocked active topology

- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.  
This opens the topology in the Topology Configurator.



- 3 Click the unlocked Lock button at the top of the Topology Configurator.  
No confirmation message appears.



The **Lock** icon switches to the locked state.  
No one can edit the topology.

## Logical Device Table Tasks

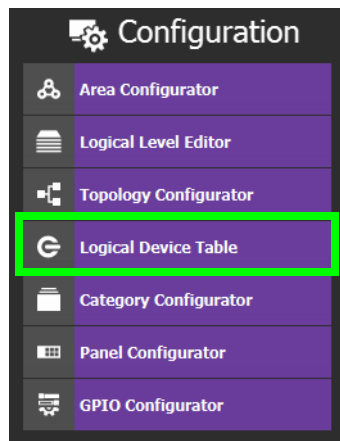
Use the Logical Device Table task to view and configure the streams for the logical levels. Audio shuffling and breakaway can also be configured to create multiple streams with different audio channels (multi-language support) for example.

The Logical Device Table task is also where you create virtual crosspoints (XPTs) and to configure logical destination devices that are related to these virtual XPTs. See [Configuring Virtual Crosspoints \(XPTs\)](#), on page 65.

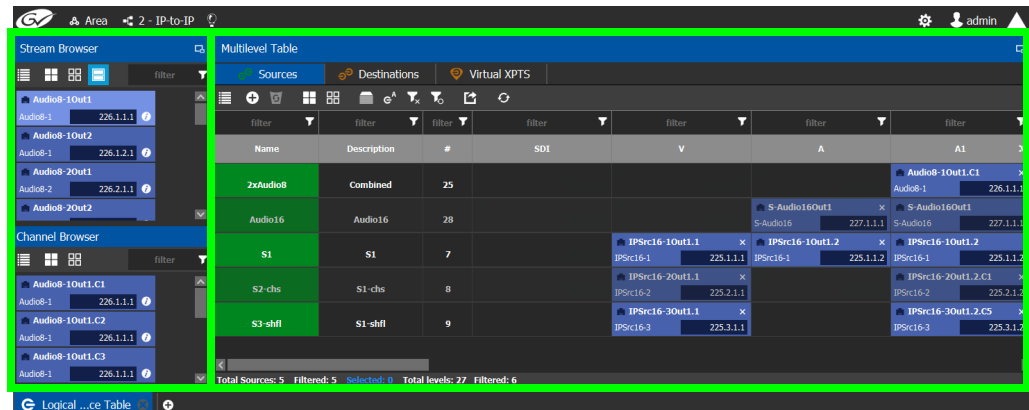
### Accessing the Logical Device Table task

#### To access the Logical Device Table Task

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select an area. See [Selecting an Area](#), on page 22.
- 3 Select a topology. See [Selecting a Topology](#), on page 34.
- 4 Select **Configuration > Logical Device Table**.



The Logical Device Table task appears.



The default streams for your topology, are displayed in the left hand column under **Stream Browser**.



The following tabs are found in the right hand column under **Multilevel Table**.

| Tab          | Description   |
|--------------|---|
| Sources      | Show the currently configured sources. See <a href="#">Adding a Source to the Logical Level Table</a> , on page 59.         |
| Destinations | Show the currently configured destinations. See <a href="#">Adding and Configuring a Destination</a> , on page 63.          |
| Virtual XPTS | Show the currently configured virtual crosspoints. See <a href="#">Configuring Virtual Crosspoints (XPTs)</a> , on page 65. |

- 5 Select the **Sources** tab to view the streams from the sources.  
The Logical Level associated with the source are displayed. For information on the logical levels, see [Logical Level Editor Tasks](#), on page 24.
- 6 Scroll down in the **Sources** view to see all the levels for the selected source.

### Stream Browser / Channel Browser

The Stream Browser shows all currently available streams. When a stream has two or more channels, the Channel Browser gives you access to the individual audio channels in a stream thereby allowing you to implement audio breakaway and audio shuffle for independent audio routing. See [Create Logical Devices with Shuffled Audio](#), on page 64.

To make use of this feature, streams will need to pass through a device that supports audio breakaway/shuffling, such as GV Node or Audio Live. See [Configuring a GV Node Device](#), on page 105 and [Configuring a Device that Supports Audio Breakaway/Shuffling such as Audio Live](#), on page 164.

The selected stream



The Channel Browser shows the available audio channels for the selected stream

Each audio channel can be dragged onto a different level in the Multilevel table to shuffle the source's audio

**Note:** if more than one stream is selected in the Stream Browser, then the Channel Browser shows all channels derived from the selected streams











The Stream Browser and Channel Browser menu have the following menu options.

| Icon | Description                             |
|------|---|
|      | Select All                              |
|      | Select all items in the Stream Browser. |

| Icon  | Description   |
|---|---|
|  Clear All       | De-select all items in the Stream Browser.                    |
|  Channel Browser | Shows the Channel Browser (found in the Stream Browser only). |

### Multilevel Table Menu

The Multilevel Table menu has the following menu options.

| Icon   | Description  |
|--|--|
|  New                      | Create a new Source / Destination / Virtual XPTS in the Logical Device Table. See <a href="#">Adding a Source to the Logical Level Table</a> , on page 59, <a href="#">Adding and Configuring a Destination</a> , on page 63, and <a href="#">Configuring Virtual Crosspoints (XPTS)</a> , on page 65. |
|  Delete                   | Remove the currently-selected Source / Destination / Virtual XPTS in the Logical Device Table. See <a href="#">Deleting a Source, Destination, or Virtual XPTS</a> , on page 63.   |
|  Select All               | Select all rows in the Multilevel table.   |
|  Clear All                | De-select all rows in the Multilevel table.  |
|  Levels                   | Show the Logical Level Selector. This allows you to set the logical levels that are to be shown in the Multilevel Table. See <a href="#">Modifying the Default Levels in the Logical Level Table</a> , on page 58.   |
|  Hide automatic sources | Show or hide automatic sources in the Logical Device Table.  |
|  Reset all filters      | The columns of the Logical Device Table have filters. These buttons clear all filters and restores the previous filters. See <a href="#">Filtering Lists, Table Columns, Sources, and Destinations</a> , on page 74  |
|  Reload all filters     |  |
|  Export                 | Export the Logical Device Table to a CSV file. See <a href="#">Exporting a Logical Device Table</a> , on page 63 or <a href="#">Selecting all Devices in the Logical Device Table for Export</a> , on page 64.   |
|  Refresh                | Reloads the content of the Logical Device Table.   |


## Modifying the Default Levels in the Logical Level Table

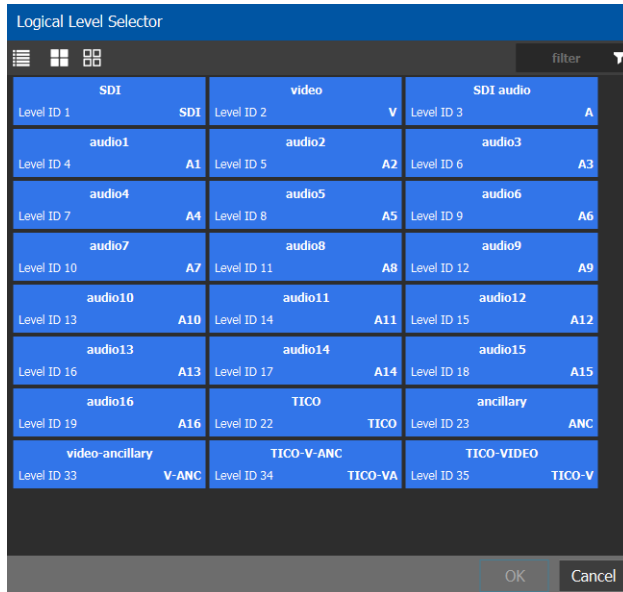
**Note:** You cannot delete a default source from the Logical Level Table. However, you can modify the levels associated with the source. Also, you can modify or delete the sources that you create.

If you try to delete a default level from the Logical Level Table, the following message is displayed at the bottom of the task.

The selected sources are automatically generated, and cannot be deleted. **OK**

**To modify the logical levels associated with a source**

- 1 Select a Source in the Logical Device Table. See [Accessing the Logical Device Table task](#), on page 56.
- 2 Click the Logical Levels icon  at the top of the table.  
A secondary window opens displaying the levels for the selected source.



- 3 Select one or more levels you want to use for the selected source.
- 4 Click **OK**.

**Adding a Source to the Logical Level Table**

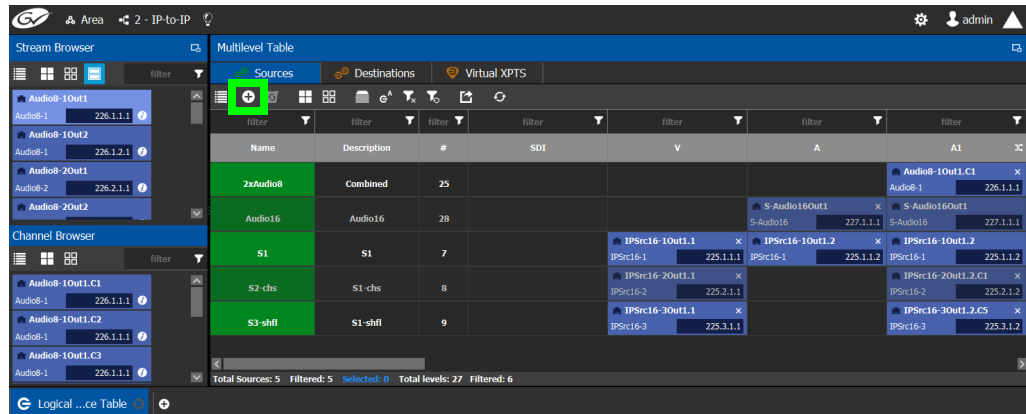
By default, the logical device table displays the sources in the selected topology. You can add a logical device to the table that is not in the topology. You would then have the option of switching to the new logical device in place of the existing device.


**To add a source to the logical level table**

- 1 Open the logical level table for the required topology.

## Configuration Tasks

### Adding a Source to the Logical Level Table



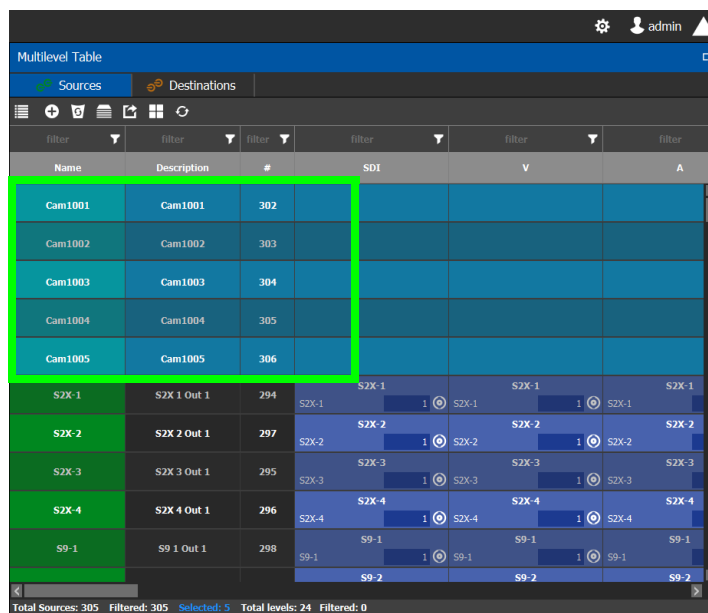
- 2 Click **New**  at the top of the table.

A secondary window appears.

|   |        |
|---|--------|
| Base Name:  | CAM100 |
| Start Index:  | 1      |
| Count (Max 200):  | 5      |
| <input type="button" value="OK"/> <input type="button" value="Cancel"/> |        |

- 3 Enter the required information in the **Base Name**, **Start Index**, and **Count** fields.
- 4 Click **OK**.

New sources are created. The **Base Name** is displayed under the **Name** and **Description** fields. The number of new sources created corresponds to the number you enter in the **Count** field.

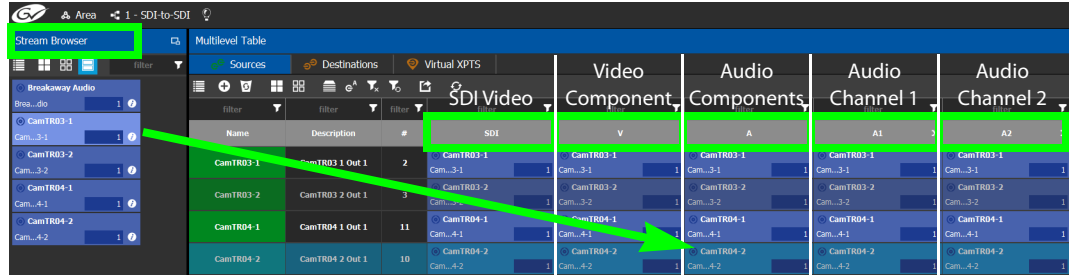


In the example, five new sources are created. The name for each device begins with the base name CAM100. A number is appended to the base name. This begins with the starting index and increases by one for every number in the count.

## Configuring Streams for New Sources

After creating new sources, the next step is to configure the streams for them. Different streams can be assigned to different levels, so that a source is composed of streams from different devices (to do implicit breakaway).

For example, the column you drop a stream on in the Multilevel table selects the part of the stream to use to create the logical device. This is shown below for a stream from the Stream Browser.



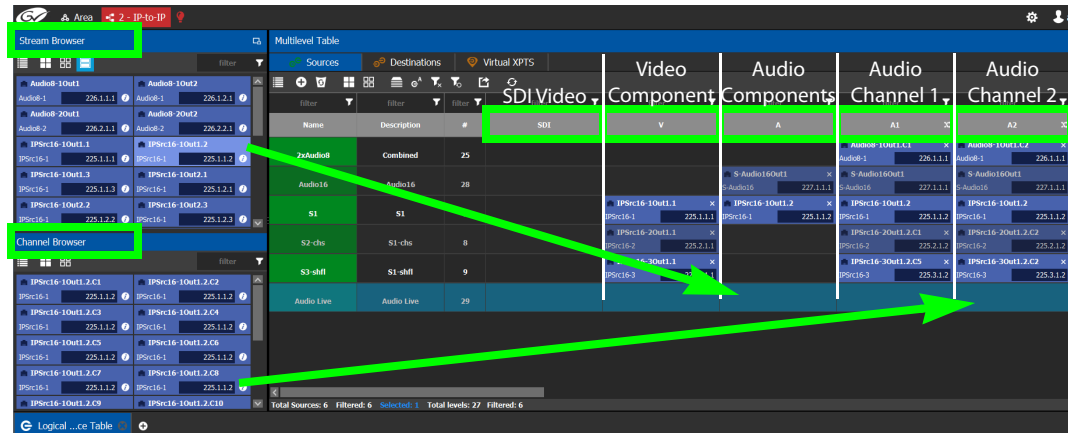
| Stream Drop onto Multilevel Table Column | Description   |
|--|---|
| SDI                                      | This fills all levels (video, 16 audio channels (A1 to A16), ANC, and V-ANC) with the levels equivalent levels from the SDI video stream. |
| V  | This takes the video level only from the SDI stream.  |
| A  | This takes the audio levels only from the SDI or audio stream for all 16 audio channels (A1 to A16).                                      |
| A1 to A16                                | This takes the first audio channel from the SDI or audio stream.  |
| ANC                                      | This takes the ANC level only from the SDI stream.  |
| V-ANC                                    | This takes the V-ANC level only from the SDI stream.  |

For instance, you could create a source with Video from a GV Node and the audio from an IPG-3901, or IPG-4901. You do this by assigning the GV Node stream under the **SDI** column, and the IPG-3901, or IPG-4901 stream under the **Audio (A)** column. If audio breakaway/shuffling is required to complete the path, GV Convergent will automatically choose a route through Audio Live for example.

### Configuring Streams for Audio Live Audio Channels

When using Audio Live in your topology (see [Configuring a Device that Supports Audio Breakaway/Shuffling such as Audio Live](#), on page 164), you can:



- From the Stream Browser, drop the audio stream onto the audio (**A**) column. This is shown above.
- From the Channel Browser, drop one or more audio channels from the stream onto the A1 to A16 column(s). To open the Channel Browser, see [Stream Browser / Channel Browser](#), on page 57.



### Symbols for currently active Audio Breakaway and Shuffle

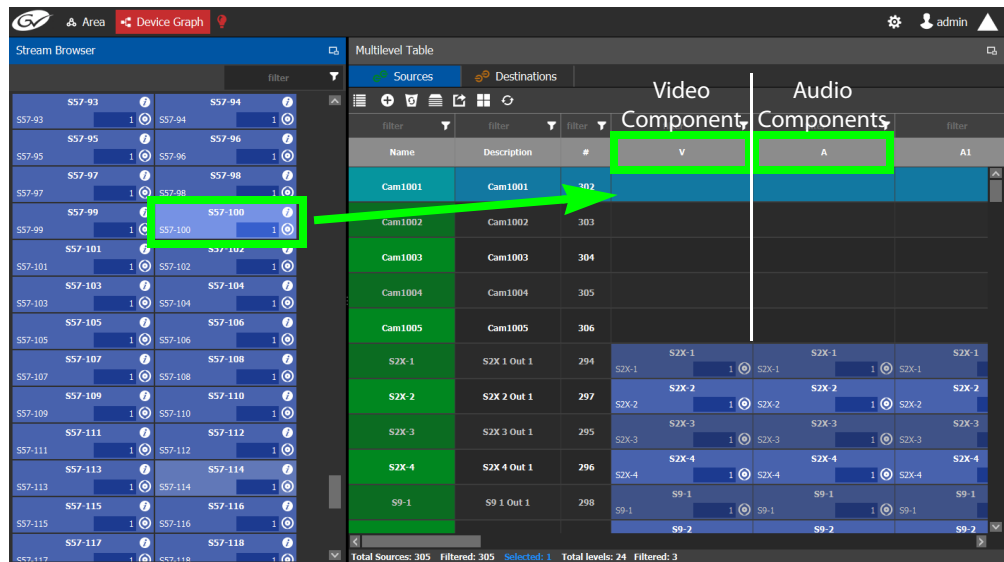
Symbols are used in the name of a logical device to identify if the audio has been shuffled or there is an audio breakaway currently active.



| Symbol   | Description   |
|--|---|
|  Breakaway | This icon will appear next to the name for the row to indicate that the audio comes from another stream source.   |
|  Shuffle  | This icon will appear next to the name for the row to indicate that one or more audio levels have been exchanged for another audio level from the same stream. To shuffle the audio, see <a href="#">Create Logical Devices with Shuffled Audio</a> , on page 64. |

### To configure streams for the new sources

- 1 Open the logical level table for the required topology.  
In the left hand column under **Stream Browser**, the default streams for your topology are displayed.
- 2 Add sources to the Logical Level Table. See [Adding a Source to the Logical Level Table](#), on page 59.
- 3 Select a source's row to which you want to add stream.
- 4 Drag a stream onto the source.



In the above image, a stream is added to a source for its video component. Drag the same stream or another stream from the **Stream Browser** to a source to add its audio components.

## Adding and Configuring a Destination

The procedures for adding and configuring destinations are the same as for adding and configuring sources. For details, see [Adding a Source to the Logical Level Table](#), on page 59 and [Configuring Streams for New Sources](#), on page 61.

## Deleting a Source, Destination, or Virtual XPTS

You can delete any source, destination, or virtual XPTS that you have created.

### To delete a source, destination, or virtual XPTS

- 1 Open the Logical Device Table task for the required topology.
- 2 Select the Sources tab, the Destination tab, or virtual XPTS tab according to what you are deleting.
- 3 Select the sources, destinations, or virtual XPTS in the table.

---

**Note:** You can delete one or more sources or destinations at the same time.

---


- 4 Click the **Delete** icon .

## Exporting a Logical Device Table

You can export the data in your logical device table in a csv file.

### To export a logical device table



- 1 Open the Logical Device Table task for the required topology.
- 2 Select the rows you want to export.

- 3 Click the **Export** icon .
- 4 Navigate to the folder where you want to save the file.
- 5 Click **Save**.

## Selecting all Devices in the Logical Device Table for Export

You can select all devices in the logical device table, for example, to export the Device Table's configuration data to a csv file.

### To select all the devices and save their configuration data

- 1 Open the Logical Device Table task for the required topology.
- 2 Click the **Select All** icon .
- 3 Click the **Export** icon .
- 4 Navigate to the folder where you want to save the file.
- 5 Click **Save**.

## Create Logical Devices with Shuffled Audio

You can define the audio configurations for logical sources by selecting any audio sub-stream (from a MADl stream or an Audio Live device for example) in the Logical Device Table and change its pre-assigned level directly in the table.

Audio live permits the breakaway of audio feeds. To do this, add an Audio Live device to your network and to your topology. See [Configuring a Device that Supports Audio Breakaway/Shuffling such as Audio Live](#), on page 164. The audio channels for the sources become available under the Channel Browser for those streams (see [Stream Browser / Channel Browser](#), on page 57).

For example:

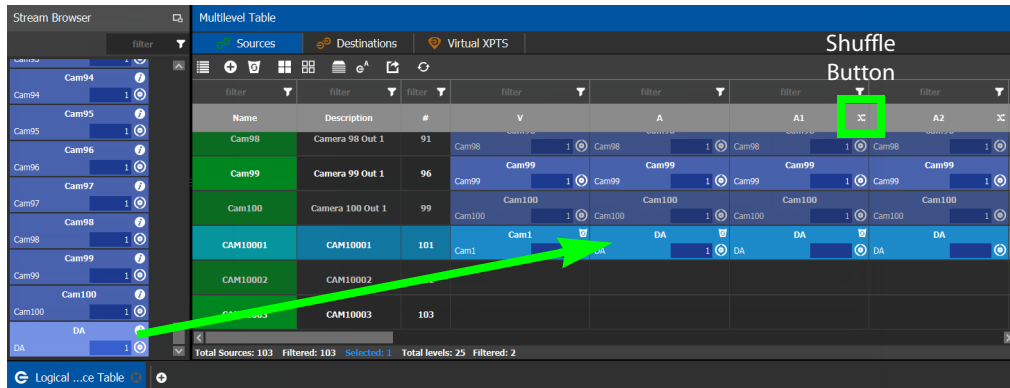
- You may have audio embedded on the first 8 audio channels for English-language program and the last eight channels for French-language program. In this scenario, the first logical source would have the implicit stream for audio in only the first 8 audio logical levels (that is, associated to audio levels 1 to 8) and the second logical source would have those same first 8 logical levels of audio explicitly defined with the same stream, but the audio logical levels are associated to audio levels 9 to 16.
- A user defined destination logical device may include MADl audio. In order to define the destination as utilizing the logical source audio from logical levels audio 1 and audio 2 onto logical levels audio 11 and audio 12, it is necessary to place the destination device stream under logical levels audio 11 and audio 12, but define the source audio of the stream as coming from source logical levels audio 1 and audio 2, respectively.


### To create logical devices with shuffled audio

- 1 Create one or more new logical devices. See [Adding a Source to the Logical Level Table](#), on page 59.
- 2 Drag a stream from the stream browser (for example, an audio stream) and drop it on its corresponding level on the newly created logical device (audio level, **A**). Once the stream is dropped on its level, all the corresponding sub-levels will be automatically

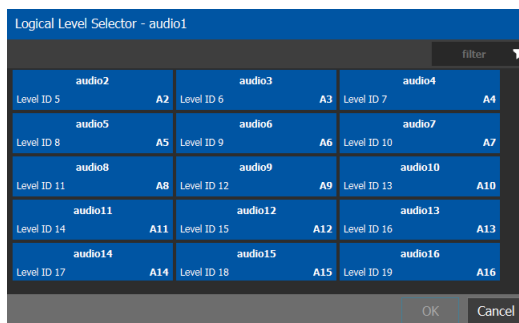


filled in (A1 to A16). The table will show the main stream on the audio level and up to 16 other sub-levels contained in this level.



If the selected row/cell is eligible for shuffling, a shuffle button  will appear in the column header.

- 3 Select the row and click the shuffle button to open a logical level selector with the filtered compatible levels available for selection.

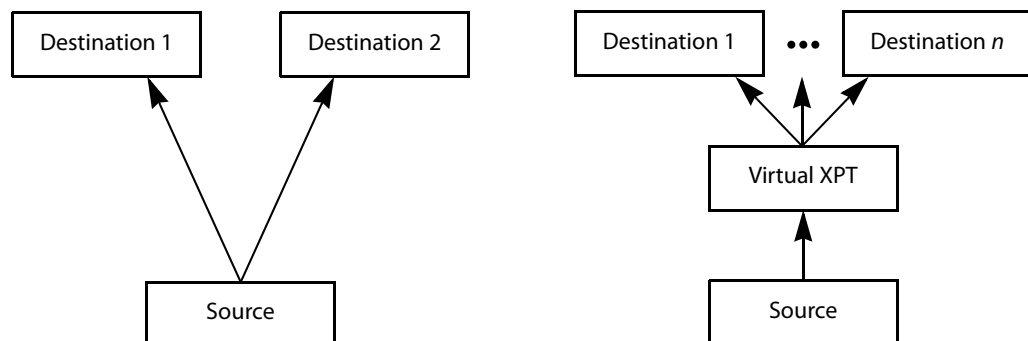


- 4 Select a new level to assign to the stream. If for example, the stream is on audio1 and you want to change it to audio9, select the **audio9** level from the stream. Click **OK**.

See also [Symbols for currently active Audio Breakaway and Shuffle](#), on page 62.

## Configuring Virtual Crosspoints (XPTs)

Without virtual XPTs, only one route can be made for each task. Virtual XPTs are used when multiple outputs are required to be switched to the same source *in a single take*.



Virtual XPTs can be used to:

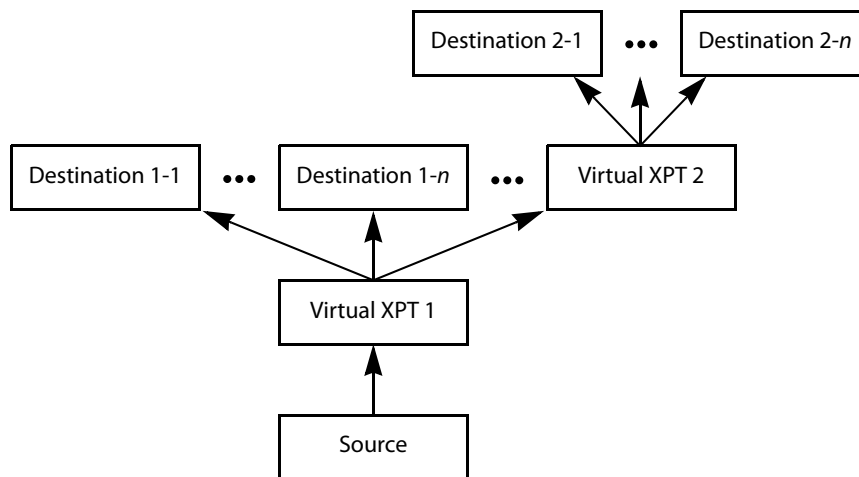
- Show user-friendly device names on the operators' control panels. For example, the name of the virtual XPT is shown on control panels when used.
- Hide implementation details from the operator(s). For example, in a transparent fashion, an output signal is also sent to a monitor.

Virtual XPTs are used for the following two primary applications:

- Monitoring: to follow the source routed to a given destination and to route that same source to other destinations as needed.
- Utility DA (distribution and amplifier): to allow for a configurable virtual destination/source that can be routed to other real destinations.

The following virtual XPT functional behaviors are by design:

- A take with a virtual XPT will fail if the path to the source does not exist and as a consequence the virtual source will fail. The status (Tally) will not reflect this.
- A take with a virtual XPT's destination will be ignored if the take fails.
- A logical destination can only be added to one virtual XPT destination at a time. Once a real destination has been added to a virtual XPT, it is no longer available to be used with other virtual destinations. A pop-up message is shown if you try to add a logical destination that has already been added to another virtual XPT. Click **OK** to remove the logical destination from the previous virtual XPT and add to it the new virtual XPT.
- You can only route virtual sources to unrelated virtual destinations that are not associated with the same virtual XPT. This allows you to increase the number of logical destination devices that can be switched with a single route. Routing a logical source device to the virtual destination of another virtual XPT will route said source to all logical destination devices that the virtual source is routed to. Routing that virtual source to another virtual destination, will mean routing the original logical source device to all destination devices that the corresponding virtual source was routed to, as well.



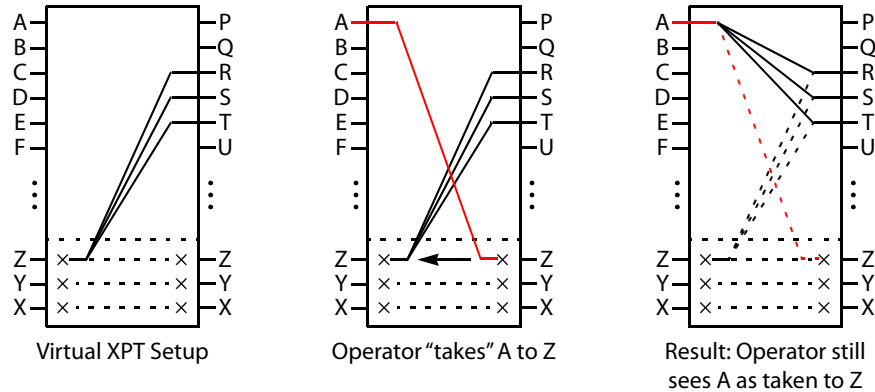
*Routing a logical source device to the virtual destination of another virtual XPT*

- A virtual XPT can have up to 100 real logical destinations.
- The status of a virtual XPT is shown in the Path Manager. See [Accessing the Path Manager](#), on page 175.

- Adding a logical destination device to a virtual XPT changes the status of the destination to the virtual source - with the logical source device content being routed to the logical destination device(s). Removing the logical destination device from a virtual XPT, will change the status of that destination to the logical source device.

### Virtual XPT Use Scenario 1

In this scenario, the physical level is set up so that any source routed to destination Z will be taken to the following destinations: R, S, and T.



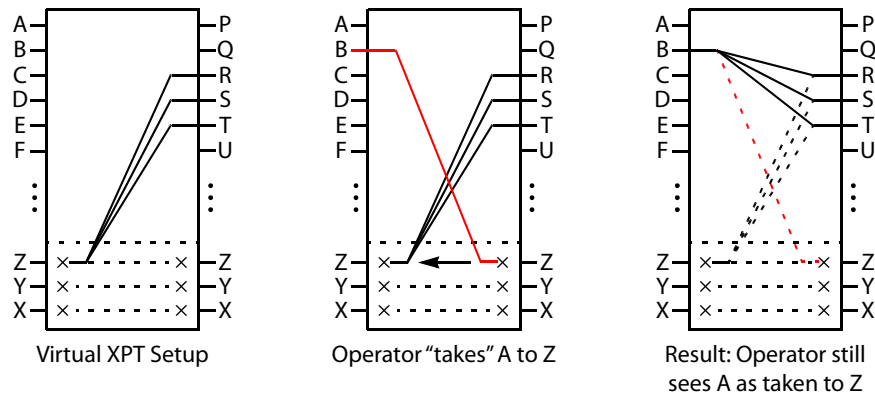
If the operator takes A to Z, the software "discovers" that source Z is virtually routed to R, S, and T. Therefore, it routes A to R, S, and T as real routes.

Here, a source was taken to multiple destinations with a single take, and that fact was concealed from the operator. The operator's control panel reports that A was taken to Z. The Path Manager can be used to know the actual path that was internally used by the router; see the [Path Manager Tasks](#), on page 174.

Other inputs can be taken to Z with a similar result: that source will be taken to destinations R, S, and T.

### Virtual XPT Use Scenario 2

In this scenario, the virtual XPT setup is the same as for scenario 2.



If the operator takes B to Z, the software "discovers" that source Z is virtually routed to R, S, and T. Therefore, it routes B to R, S, and T as real routes.

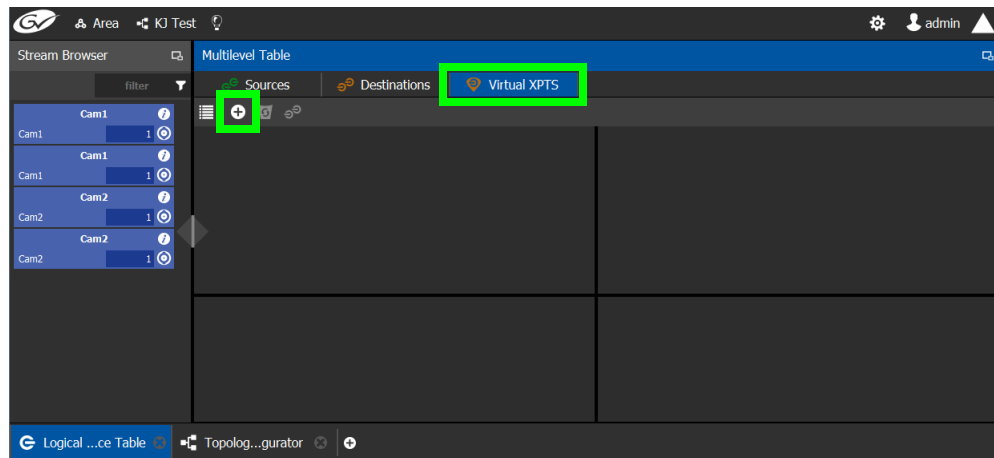
The operator's control panel reports that A was taken to Z. The operator executed a single take.

This scenario illustrates that any time an operator takes a source to virtual XPT destination *n*, the router actually takes the source to the real destinations "connected" to virtual XPT source *n*.

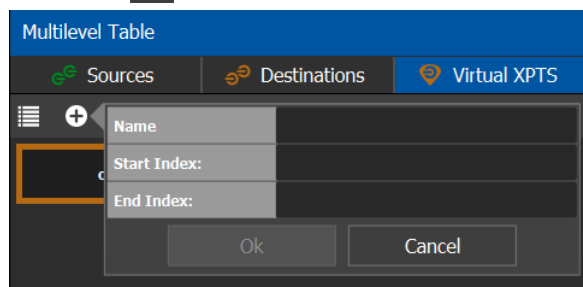
### To create Virtual XPTs

Virtual XPTs are created in the Logical Device Table task.

- 1 In the Topology Configurator, activate the topology. See [Activating a Topology](#), on page 50.
- 2 Open the Logical Device Table task. See [Accessing the Logical Device Table task](#), on page 56.
- 3 Select the **Virtual XPTs** tab.



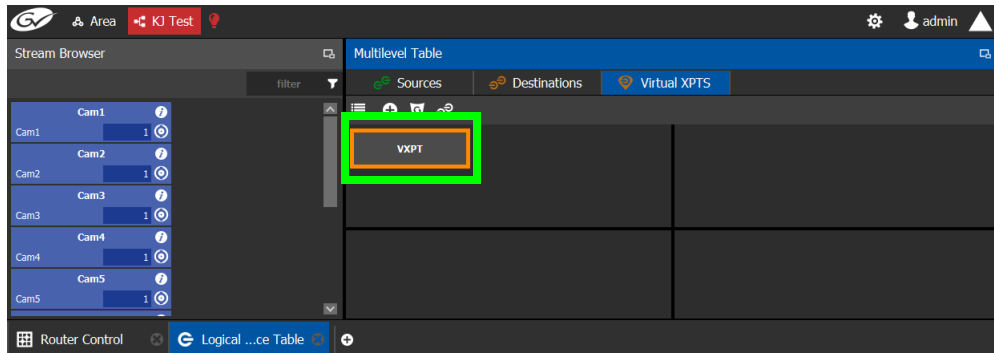
- 4 Click **New** 



- 5 Enter a name for the new virtual XPT and click **OK**.

Optionally, a range of virtual XPTs can be created: The **Name** parameter is the prefix for the generated virtual XPTs. The **Start Index** is the index starting value, and the **End Index** is the last index value for the virtual XPT range.


The new virtual XPT is added to the **Multilevel Table** under the **Virtual XPTs** tab.

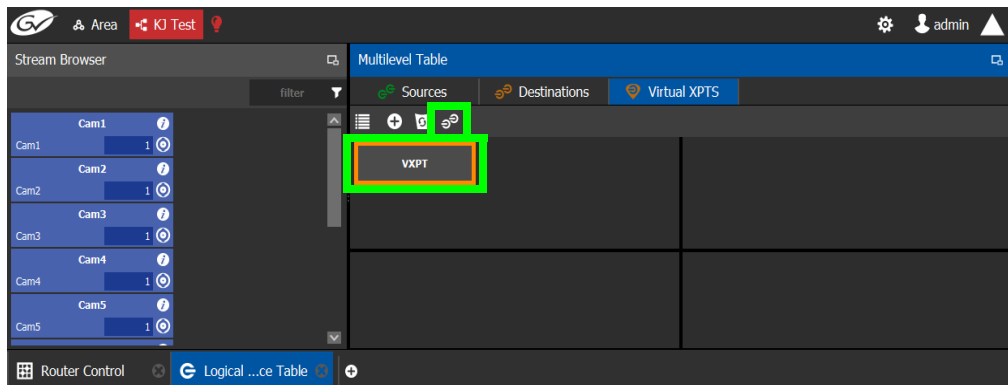


A new logical source and a new logical destination are created automatically in the system with the name of the virtual XPT.



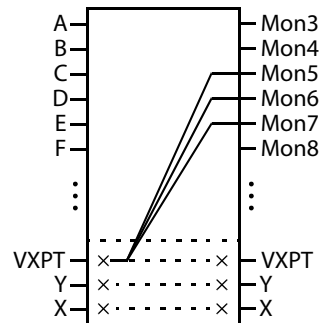
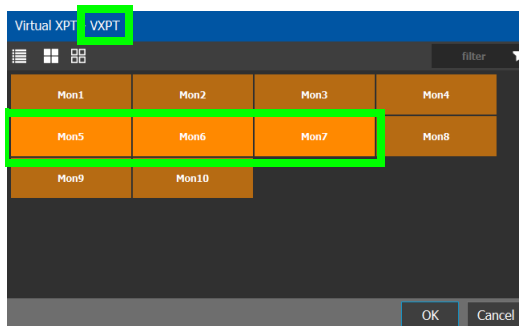
Virtual source and destination filters are available for you to filter on virtual XPTs when configuring the panel, categories, and router control user interfaces. See [Filtering Lists, Table Columns, Sources, and Destinations](#), on page 74

- 6 Add the default destinations for the virtual XPT. Select the virtual XPT and then click Destinations .



A list of all currently available destinations appears.

- 7 Select the default destinations the virtual XPT will use and click OK.



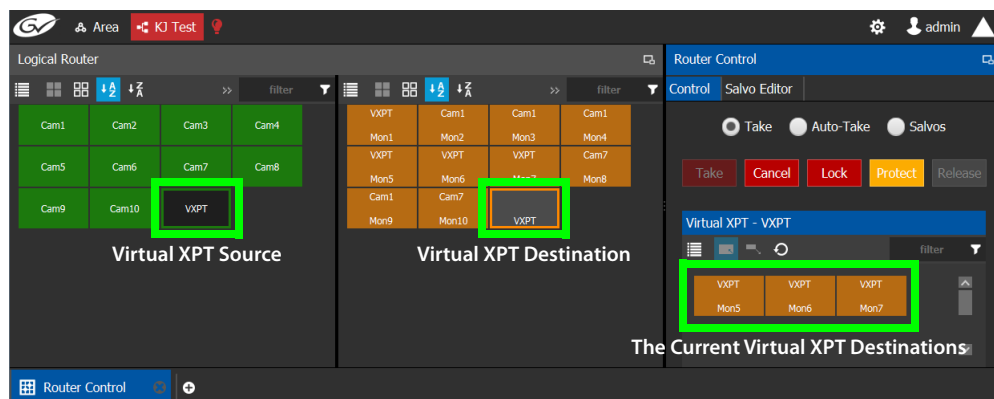
In this scenario, the physical level is set up so that any source routed to destination **VXPT** will be taken to the following destinations: **Mon5, Mon6, and Mon7**.

Once you have created one or more Virtual XPTs, you can start using them in Router Control.

### To perform a take with a Virtual XPT

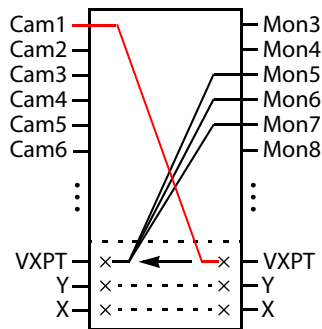
You must first create and activate the topology in the Topology Configurator. You perform takes with a Virtual XPT in Router Control. See also [Performing a Take in Router Control](#), on page 190.

- 1 In the Topology Configurator, activate the topology. See [Activating a Topology](#), on page 50.
- 2 Create a virtual XPT in the Logical Device Table task. See [To create Virtual XPTs](#), on page 68. As an example, in this procedure, the name of the virtual XPT is **VXPT**.
- 3 Open Router Control. See [Accessing the Router Control Task](#), on page 190.

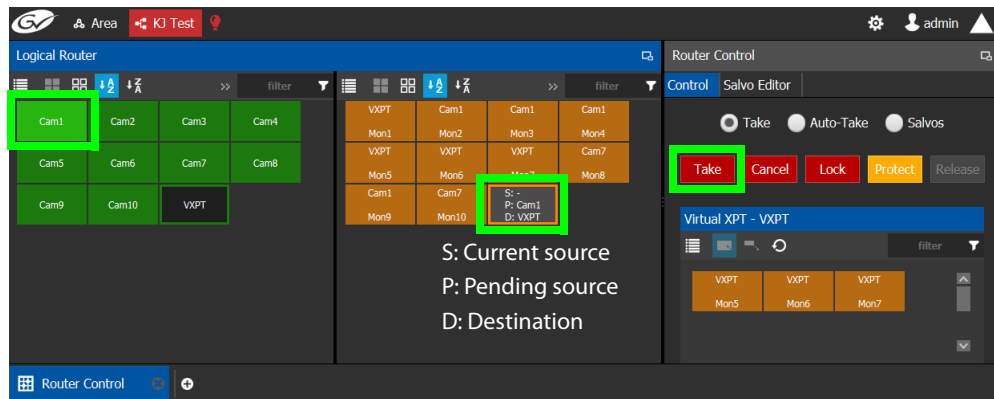


The default virtual XPT destinations that were configured in the Logical Device Table are shown by selecting the virtual XPT destination. See [To create Virtual XPTs](#), on page 68.

- 4 To route Cam1 to Mon5, Mon6, and Mon7 using the virtual XPT **VXPT**, perform a take **Cam1** to destination **VXPT**.



First click the destination virtual XPT **VXPT** and then click **Cam1** and finally click **Take**.



The destination virtual XPT **VXPT** button shows the current source.

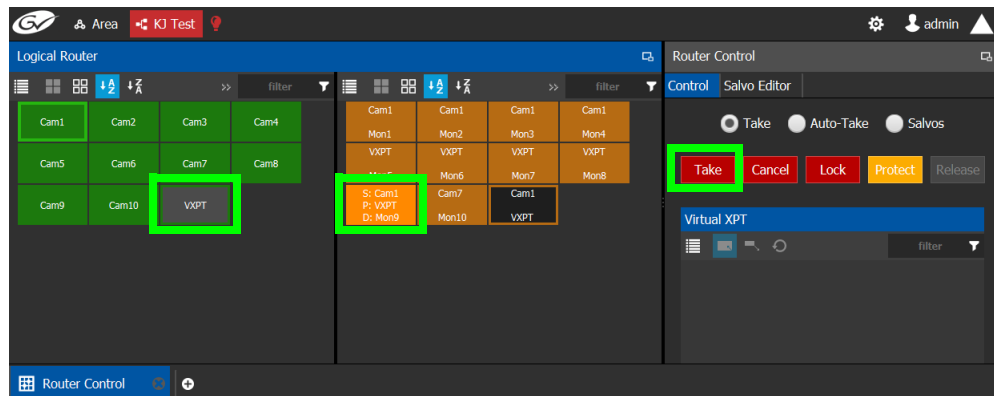


The Path Manager can be used to know the actual path that was internally used by the router; see the [Path Manager Tasks](#), on page 174.

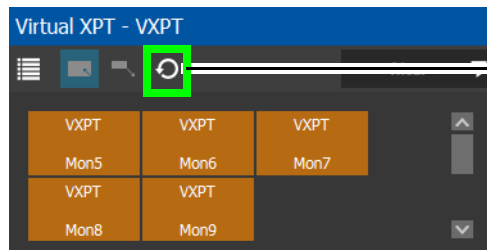
### To dynamically add a Virtual XPT destination

Destinations can dynamically be added to a virtual XPT. In this example, **Mon8**, and **Mon9** are added to the virtual XPT **VXPT**'s destination.

- 1 In the Topology Configurator, activate the topology. See [Activating a Topology](#), on page 50.
- 2 First click the source virtual XPT and then click **Mon8** and finally click **Take**.
- 3 First click the source virtual XPT and then click **Mon9** and finally click **Take**.



The current destinations for the selected virtual XPT are updated.



Click to revert to the default virtual XPT destinations configured in the Logical Device Table

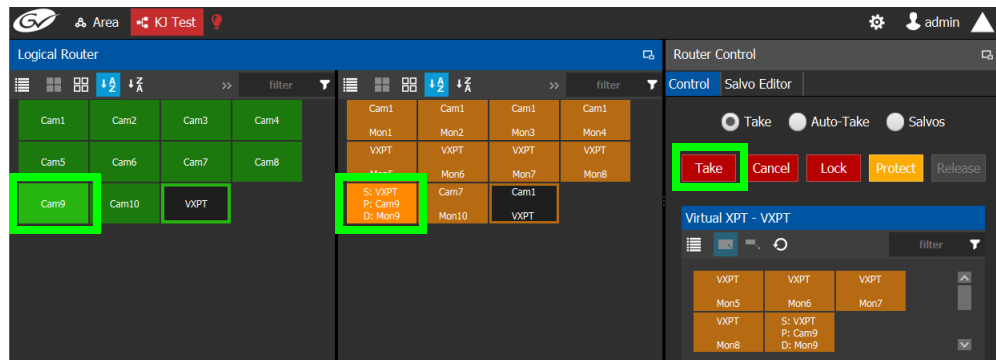
See also [Performing a Take in Router Control](#), on page 190 for more information about how to use the controls available in this window. The Path Manager can be used to

know the actual path that was internally used by the router; see the [Path Manager Tasks](#), on page 174.

### To dynamically remove a Virtual XPT destination

Destinations can dynamically be removed from a virtual XPT. In this example, **Mon9** is removed from the virtual XPT **VXPT**'s destinations. This is done by assigning the destination to be removed to another source.

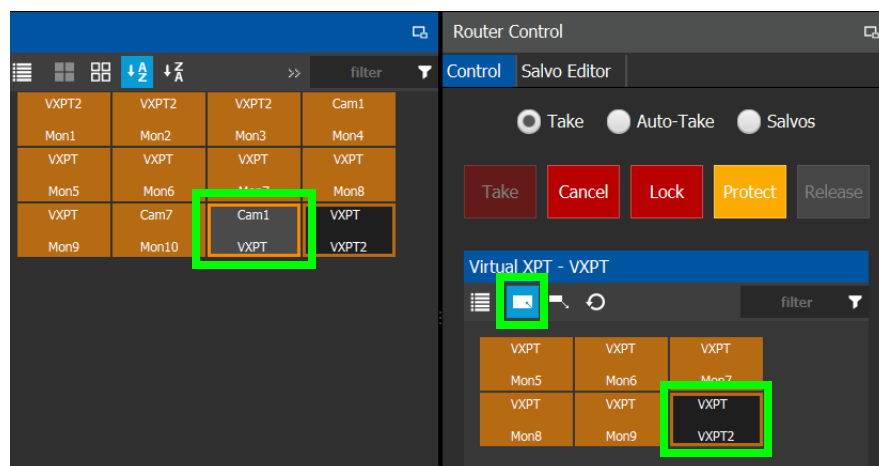
- 1 In the Topology Configurator, activate the topology. See [Activating a Topology](#), on page 50.
- 2 First click the destination **Mon9** then click **Cam9** and finally click **Take**.



### Minimize and Expand Virtual XPT Destinations

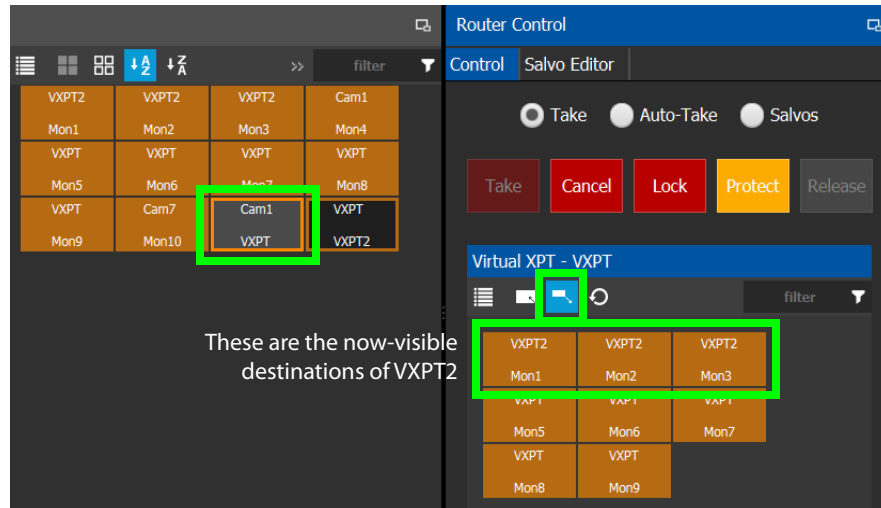
In the Router Control Task, when a virtual XPT is routed to another virtual XPT, the second virtual source is nested in the first virtual XPT. See [Routing a logical source device to the virtual destination of another virtual XPT](#), on page 66.

As shown below, when **Minimize Virtual XPT**  is selected, the VXPT2 virtual XPT is shown minimized.



As shown below, when **Expand Virtual XPT**  is selected, all destinations are shown, including the nested destinations of all other virtual XPTs.

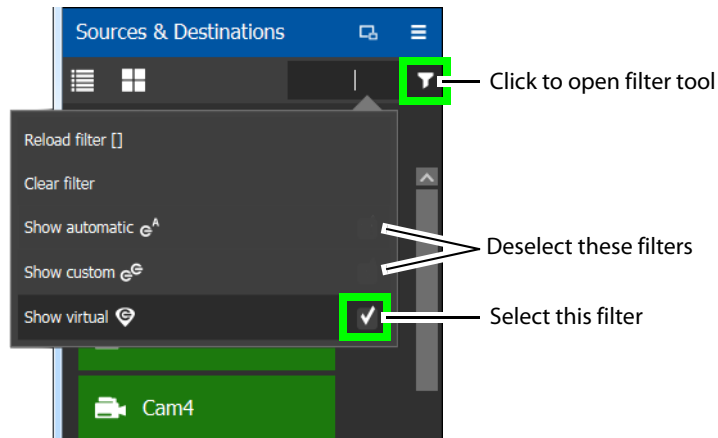




See also [Performing a Take in Router Control](#), on page 190 for more information about how to use the other controls available in this window.

## Filtering Lists, Table Columns, Sources, and Destinations

Virtual source and destination filters are available for you to filter on virtual XPTs when configuring the panel and category configurator user interfaces. To show virtual XPT sources or destinations only, enable the **Show virtual** setting in the filters dialog only.



## Category Configurator Tasks

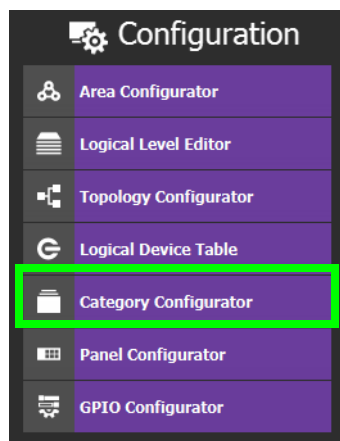
Use the Category Configurator to make it easier to manage the sources in your topologies. Creating groups or categories, based on type or use, is useful when you have multiple resources.

Categories are used to group sources and destinations together thereby allowing them to be accessed quickly on a panel, either by adding a category button or by using keyboard shortcuts.

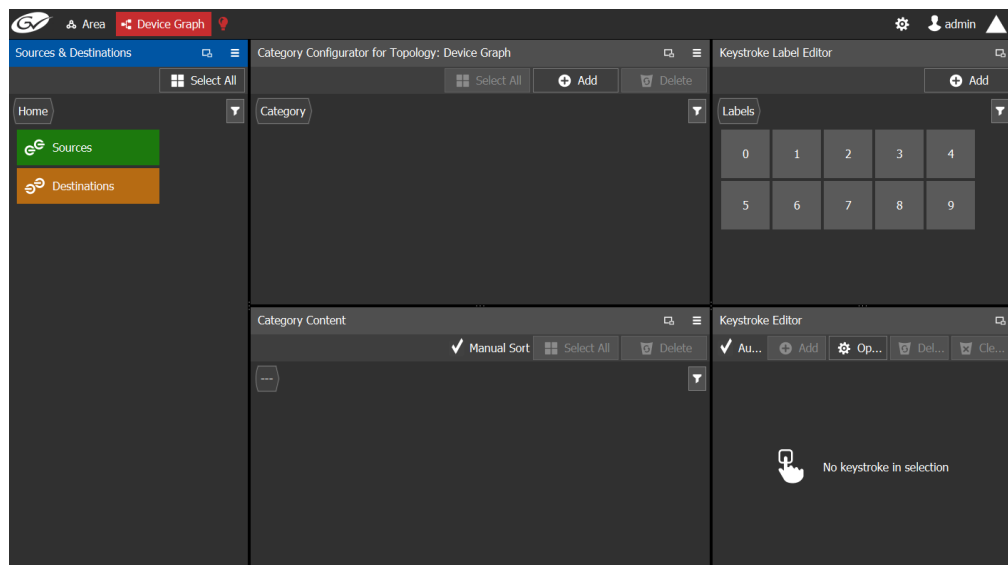
### Accessing the Category Configurator

#### To access the Category Configurator Task

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select an area. See [Selecting an Area](#), on page 22.
- 3 Select a topology. See [Selecting a Topology](#), on page 34.
- 4 Select **Configuration > Category Configurator**.



The Category Configurator task opens:



The Category Configurator has three columns and two rows. The Sources and Destinations column on the left. See:


- [Creating a Category for the Sources in Your Topology](#), on page 76
- [Assigning a Keystroke Label to a Source or Destination](#), on page 78
- [Creating a Keystroke Label](#), on page 79

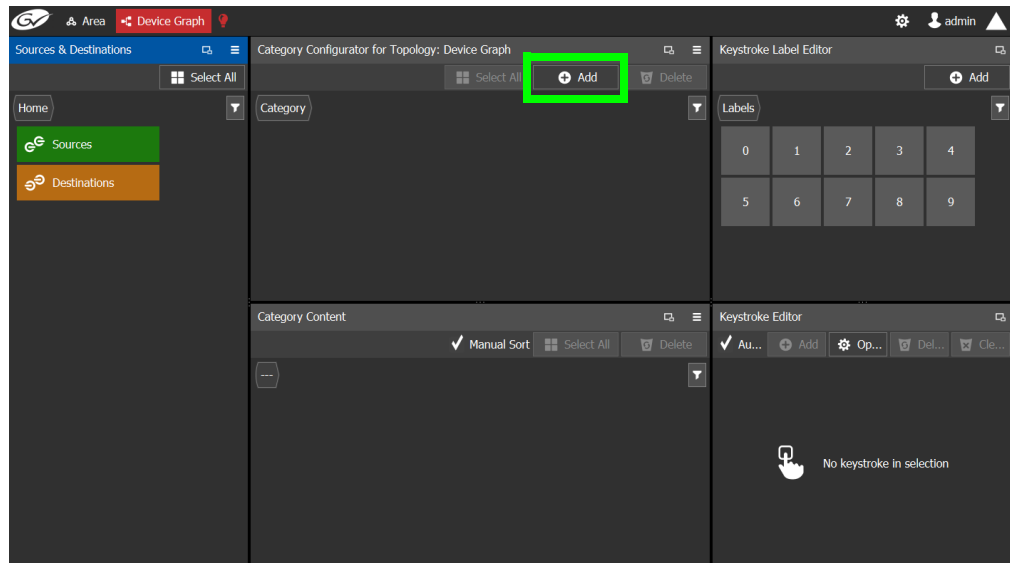
## Creating a Category for the Sources in Your Topology

When you first open the Category Configurator, the Home tab appears in the Sources and Destinations tab.

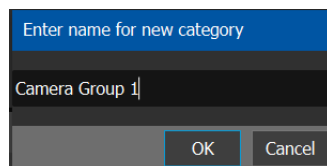


### To create a category for your sources

- 1 Open the Category Configurator task for the required topology. See [Accessing the Category Configurator](#), on page 75.
- 2 Click **Add** .



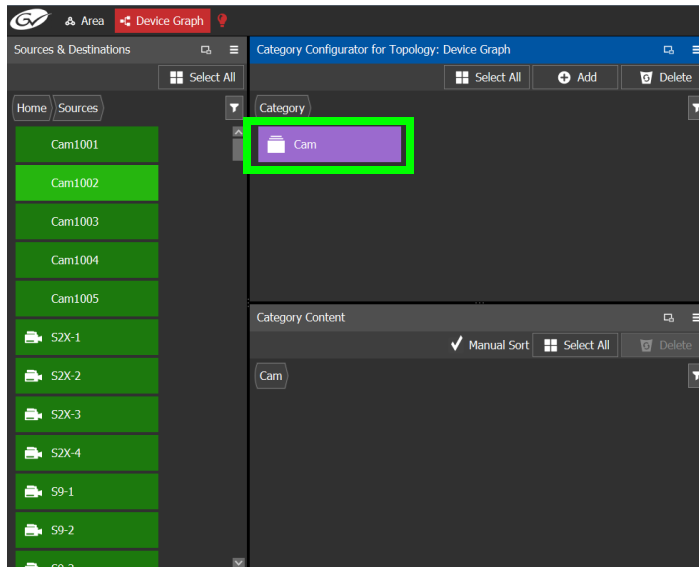
- 3 The **Enter a name for the new category** window appears:



- 4 Enter a name for the new category and click **OK**.  
The new category is added to the top of the **Category Configurator** column.
- 5 Click **Sources** or **Destinations** to view the available sources / destinations.

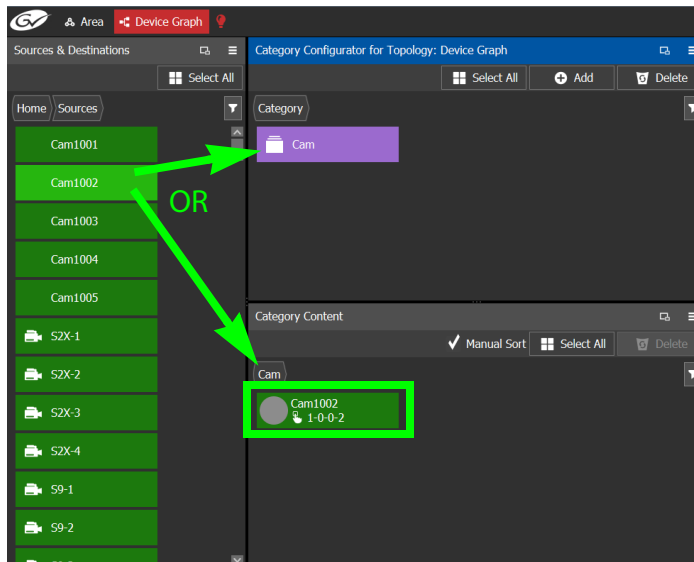
All the sources / destinations in the selected topology are displayed. This includes the logical sources you created in the Logical Device Table task. See [Logical Device Table Tasks](#), on page 56.

- 6 Select the newly created category.



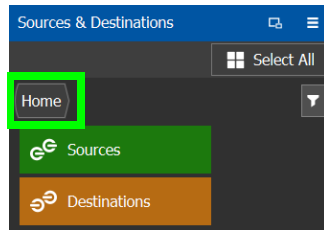
The category is added to the lower part of the center column under Category Content.

- 7 Drag the sources / destinations from the **Sources & Destinations** column to the **Category Content** area.



Alternatively, you can drag a source/destination to the created Category button.

- 8 Click Home to toggle between **Sources** (Green) or **Destinations** (Orange) as necessary.

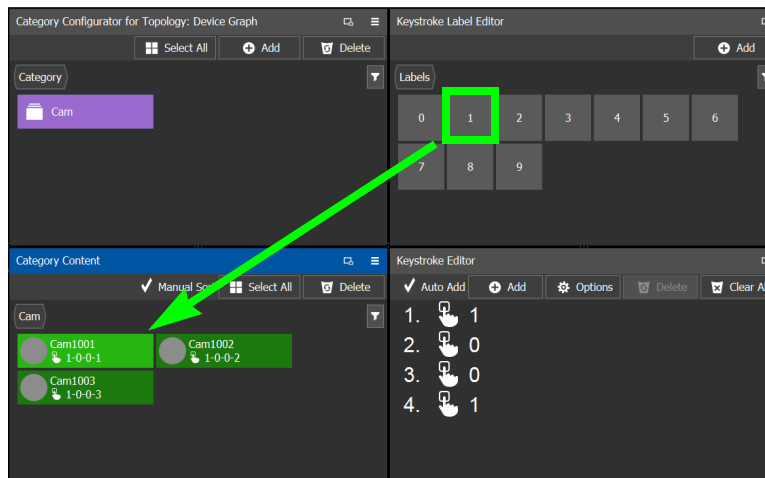


## Assigning a Keystroke Label to a Source or Destination

A keystroke label can be added to sources and destinations once they have been added to a category. Assigning a keystroke label to a source or destination allows a user to bring up categories by using a keypad on a panel. For example, if you have 100 categories in your system, a panel can bring up category 37 by pressing 3 then 7 instead of browsing through dozens of panel pages. This also applies to selecting sources or destinations. For instance, Cam17 can be directly accessed by pressing 1 then 7 on the panel instead of searching for the Cam17 button.

### To add a keystroke label to a source or destination

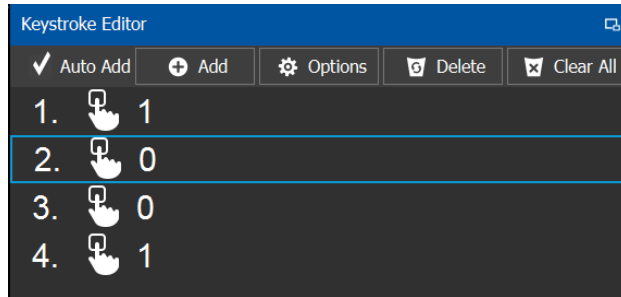
- 1 Open the Category Configurator task for the required topology. See [Accessing the Category Configurator](#), on page 75.
- 2 Click a **Category** to show sources and destinations that have been configured for that category, shown in **Category Content**.
- 3 From the Keystroke Label Editor drag one or more labels onto a source or destination to create a unique sequence for that source or destination.



The **Keystroke Editor** shows the current keystroke label for the selected source or destination.

### Edit a Source or Destination Keystroke Sequence

The **Keystroke Editor** allows you to change the selected source or destination's keystroke label. Setting for automatically assigning keystroke labels to a source or destination can also be set.



Set **Auto Add** to automatically assign a keystroke to a source or destination as it is added to a category. Click **Options** to configure this feature.

Proceed as follows to delete a keystroke.

- 1 Select a source or destination shown in **Category Content**.
- 2 Select a keystroke in the **Keystroke Editor** and click Delete.


Proceed as follows to delete all keystrokes.

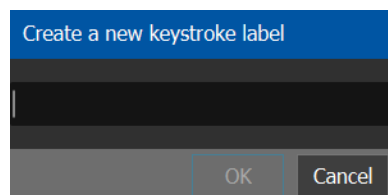
- 3 Select a source or destination shown in **Category Content**.
- 4 Click **Clear All** in the **Keystroke Editor**.

## Creating a Keystroke Label

You can assign custom keystrokes to a source or destination. Create a keystroke label to do so.

### To creating a keystroke label

- 1 Open the Category Configurator task for the required topology. See [Accessing the Category Configurator](#), on page 75.
- 2 In the Keystroke Label Editor, click **New** .  
The Create a new keystroke label window opens.



- 3 Set the keystroke label as required and click **OK**.

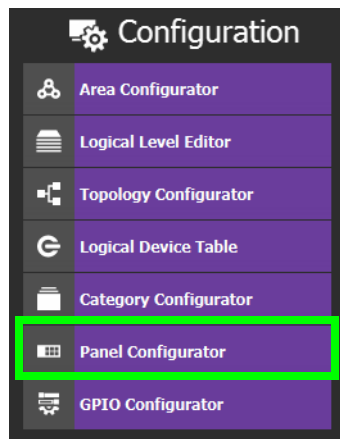
## Panel Configurator Tasks

This allows you to add buttons and behaviors to a panel. Those buttons represent sources, destinations, levels, groups and various operations that can be saved under specific configurations and then pushed to a software or hardware panel.

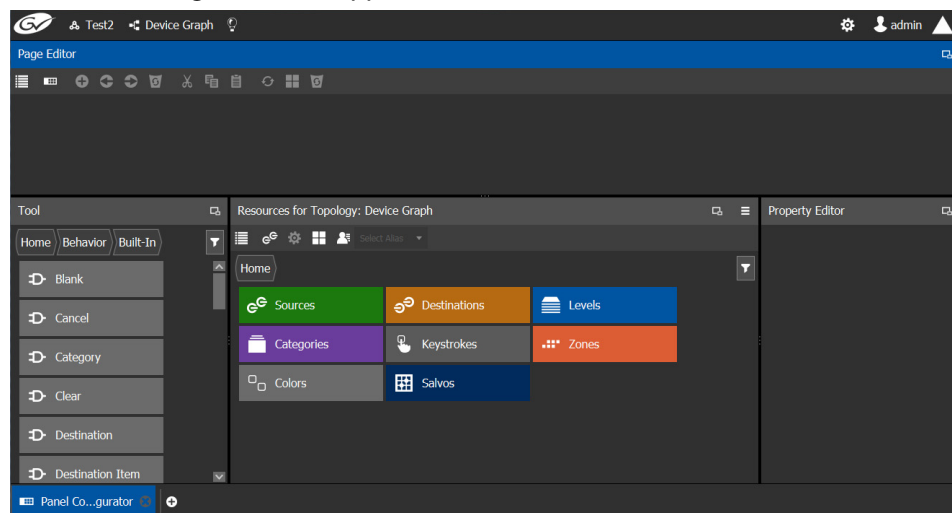
### Accessing the Panel Configurator

#### To access the Panel Configurator Task

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select an area. See [Selecting an Area](#), on page 22.
- 3 Select a topology. See [Selecting a Topology](#), on page 34.
- 4 Select **Configuration > Panel Configurator**.



The Panel Configurator task appears:



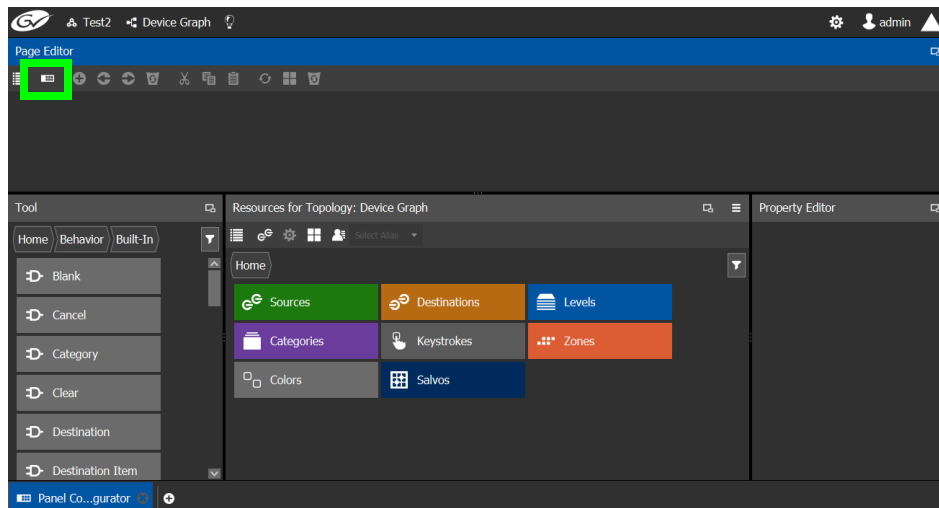


## Creating a New Panel

You can create multiple templates for hardware or software panels of various models. Then, you can add the template to a panel that you have added to the topology. A pre-existing panel can be duplicated; see [Duplicating a Pre-Existing Panel](#), on page 82.

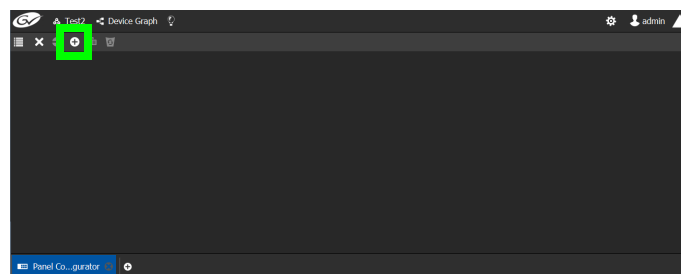
### To create a new panel

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select an area. See [Selecting an Area](#), on page 22.
- 3 Select a topology. See [Selecting a Topology](#), on page 34.
- 4 Select **Configuration > Panel Configurator**.



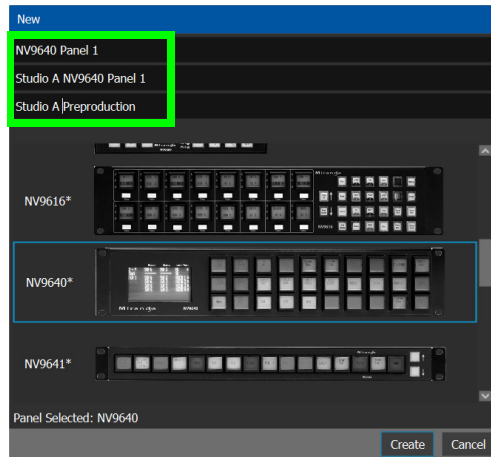
- 5 Click **Manage**.

A secondary window opens.



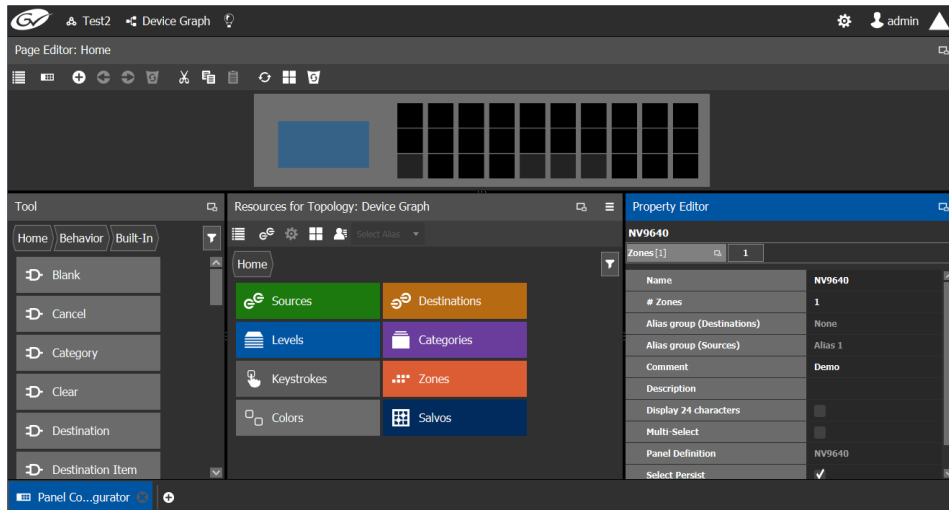
- 6 Click **New** .

The **New** window appears.



- 7 Enter meaningful text in the **Name**, **Summary**, and **Description** fields to identify the panel.
- 8 Select the required model from the list.
- 9 Click **Create**.

The new panel is added to GV Convergent.



- 10 Configure the panel's properties; see [Configuring a Panel's Properties](#), on page 84.

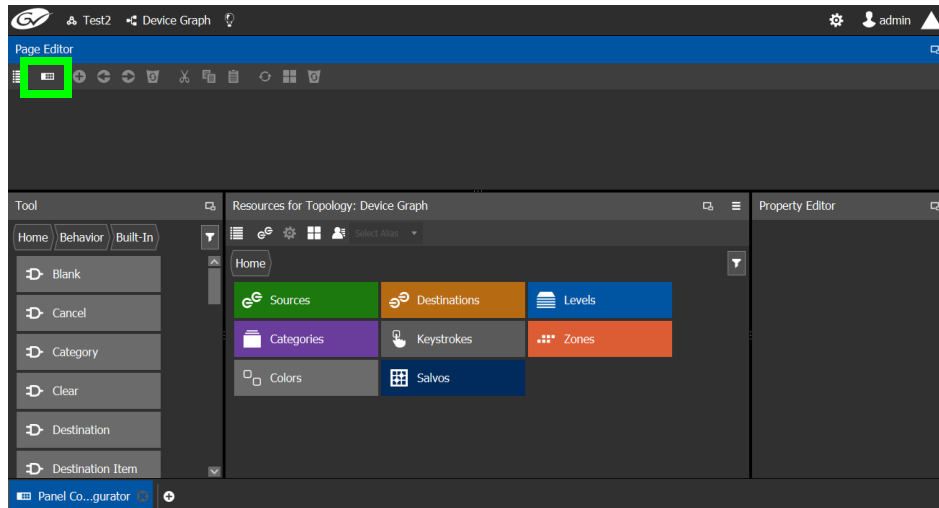
## Duplicating a Pre-Existing Panel

A pre-existing panel can be copied to reuse that panel's configuration properties and then you only need to modify the necessary panel properties as required for the new application. The new panel configuration will have a new name and any changes to that configuration will not affect the original panel configuration that you chose to base its configuration on.

### To duplicate a Pre-Existing Panel

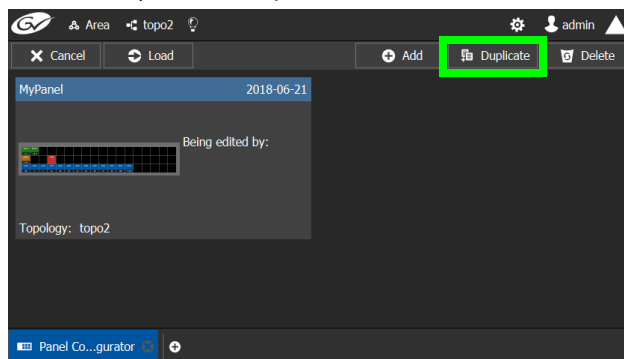
- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select an area. See [Selecting an Area](#), on page 22.
- 3 Select a topology. See [Selecting a Topology](#), on page 34.

4 Select **Configuration > Panel Configurator**.



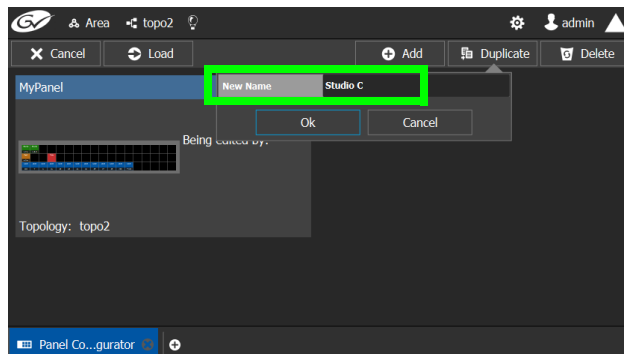
5 Click **Manage**.

A secondary window opens.



6 Click on a pre-existing panel that you want to duplicate and then click **Duplicate**.

The **New Name** window appears.



7 Enter a name to identify the panel.

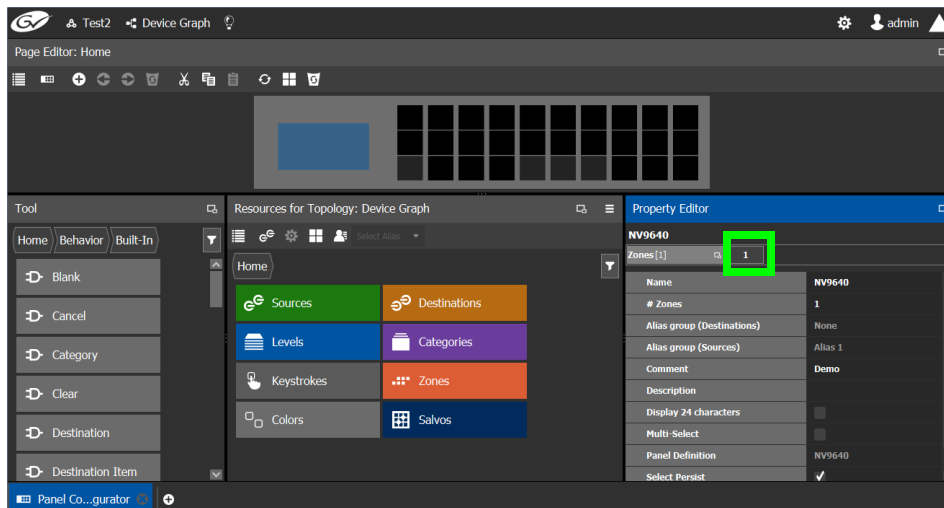
8 Click **Ok**.

9 Configure the panel's properties; see [Configuring a Panel's Properties](#), on page 84.

## Configuring a Panel's Properties

Set the basic parameters to configure the panel.

### To Configure a Panel's Properties



- 1 Click 1 next to **Zones [1]**.

The following properties can be configured for the panel. See also [Description of Common Device Properties](#), on page 104.

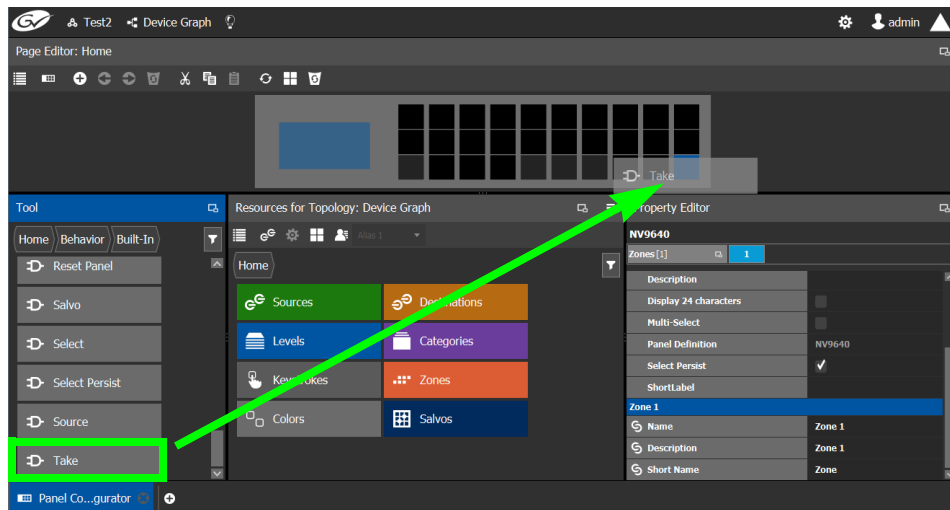
| Parameter                  | Description  |
|----------------------------|--|
| Name                       | The name or identifier for this panel  |
| # Zones                    | Sets the number of zones available for the selected panel. The default is 1, however you can add more as needed.   |
| Alias group (Destinations) | Shows the currently selected destination / source alias to use on the panel button's / interface to use in place of the short labels. See <a href="#">Using Source and Destination Aliases with a Panel</a> , on page 87.  |
| Alias group (Sources)      |  |
| Comment                    | An optional comment about this panel.  |
| Description                | An optional description for this panel.  |
| Display 24 characters      | When deselected, panel button labels are limited to a maximum length of 8 characters.<br>When selected, panel button labels are limited to a maximum length of 24 characters. This option is useful when using source / destination aliases that usually are longer than 8 characters. This will disable the destination status on the destination buttons. The display will only show the system names. The level buttons will only show the system names. To create source / destination aliases, see <a href="#">Alias Editor Tasks</a> , on page 188. See also <a href="#">Using Source and Destination Aliases with a Panel</a> , on page 87. |
| Multi-select               | When deselected, the panel will allow multiple selection of destination buttons. This enables an operator to take a single source to multiple destinations at once.<br>When selected, only one destination can be selected at a time.  |

| Parameter        | Description  |
|------------------|--|
| Panel Definition | The current panel's model number that was added in <a href="#">step 6</a> on page 81.  |
| Select Persist   | When deselected, the source and destination selections are cleared when a take is complete.<br>When selected, the source and destination selections are maintained when a take is complete.<br>This parameter is selected by default. This parameter is not zone-specific. |

## Adding Actions to a Panel

A panel can support a number of actions that must be added to it before the action becomes available to the user. For example, add a Take button to a panel as follows.

- 1 Open the Panel Configurator task for the required topology. See [Creating a New Panel](#), on page 81.
- 2 Select the required Panel.
- 3 Drag the **Take** tool from the **Tools** column onto a panel button.



- 4 If the panel has a display, drag the **Page Up** and **Page Down** tools from the **Tools** column onto panel buttons (some panels have two dedicated buttons set apart for this purpose next to the display).

## Adding Resources to the Panel

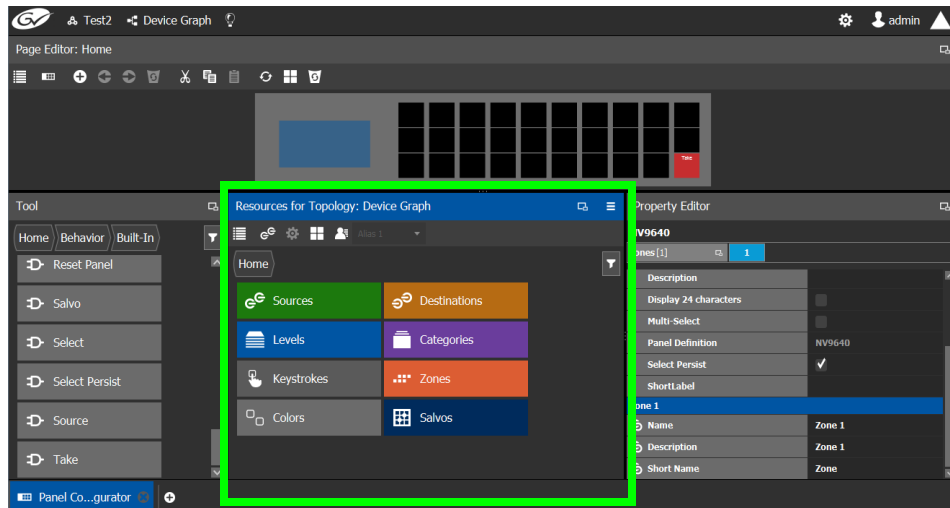
Now add the resources to the panel.

### To add panel resources

- 1 Open the Panel Configurator task for the required topology. See [Creating a New Panel](#), on page 81.
- 2 Select the required Panel.

## Configuration Tasks

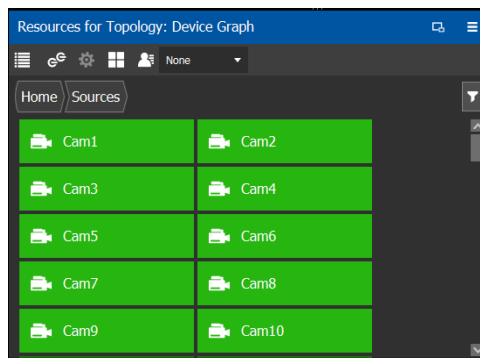
### Adding Resources to the Panel



The resources that can be added to the panel are displayed in the lower section of the center column under **Resources for Topology**.

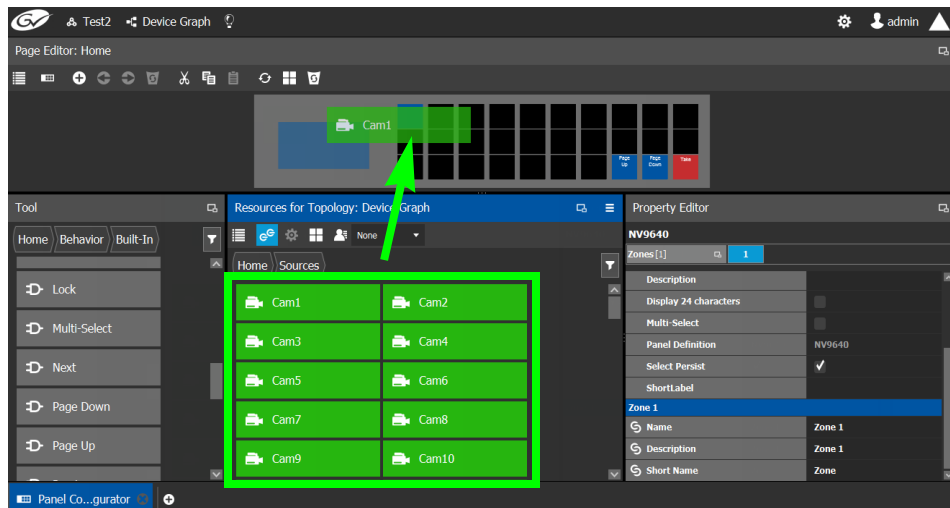
- 3 Click on resource type to begin adding individual resources to the panel such as **Sources**, **Destinations**, or **Levels**.

For example, click **Sources** to add cameras and other types of sources.



All the sources available in the topology are listed. This includes the logical sources you created in the Logical Device Table task. See [Logical Device Table Tasks](#), on page 56.

- 4 Select a resource and drag it to one of the panel buttons at the top of the column. More than one resource can be added at a time; to add to a selection, use *Shift* or *Ctrl* to select a range of resources or to add another resource to the selection.



5 Add resources from **Destinations**, **Levels**, and **Keystrokes** to the panel as required.

**Note:**

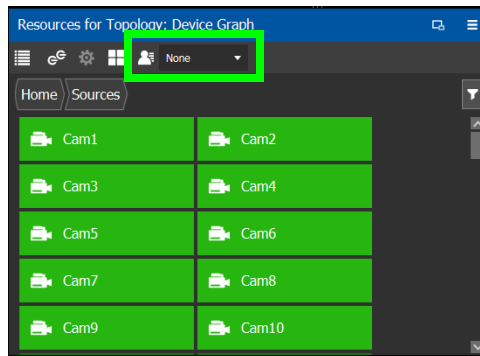
Only use the video+ancillary (V-ANC) logical level button unless you are switching in SMPTE ST 2110 mode. For SMPTE ST 2110 mode, you can individually use the Video or the Ancillary logical level buttons.

To directly control a GV Node's internal matrix, you must use the video + ancillary logical level button for video breakaway.

### Using Source and Destination Aliases with a Panel

Aliases can be used for a panel to change the name of sources and destinations from short labels to the labels of the corresponding alias. First you must create one or more source and destination aliases; to create an alias, see [Alias Editor Tasks](#), on page 188.

- 1 Under **Resources for Topology**, click **Sources** or **Destinations**.
- 2 Select from the **Select Alias** drop-down list the alias to use for this panel instance.

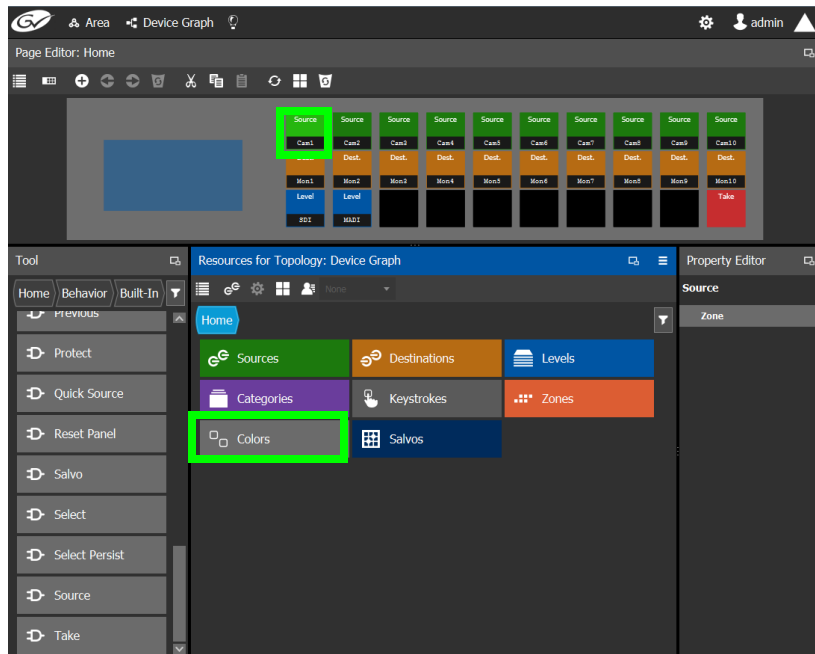


- 3 If the aliases are longer than 8 characters, consider setting the **Display 24 characters** option for the panel in the Panel's **Property Editor**. See [Creating a New Panel](#), on page 81.

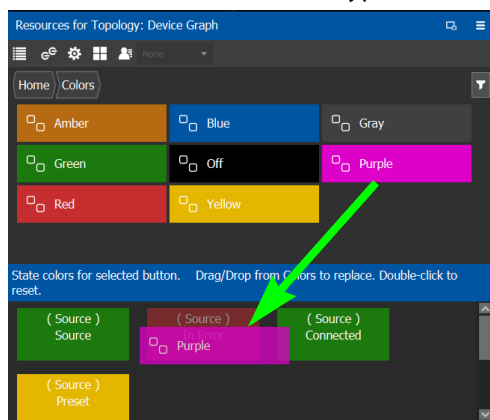
## Changing a Button's Color used to Represent a State

Some panel buttons support the display of more than one color. For buttons that support colors, the button's color is used to show the current operating state. The color used for a button to represent any one of the given states can be changed as follows.

- 1 Click a button that has a behavior previously associated to it (a blank button will not work). See [Adding Actions to a Panel](#), on page 85 and [Adding Resources to the Panel](#), on page 85.

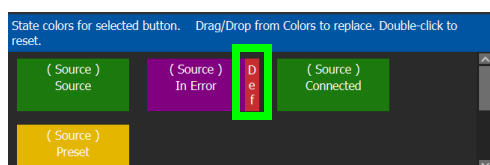


- 2 Click on the **Colors** resource type.



All available state colors for the selected button are shown on the lower half.

- 3 Drag a color from the color pallet (shown on the upper half) onto any one the state colors on the lower half.




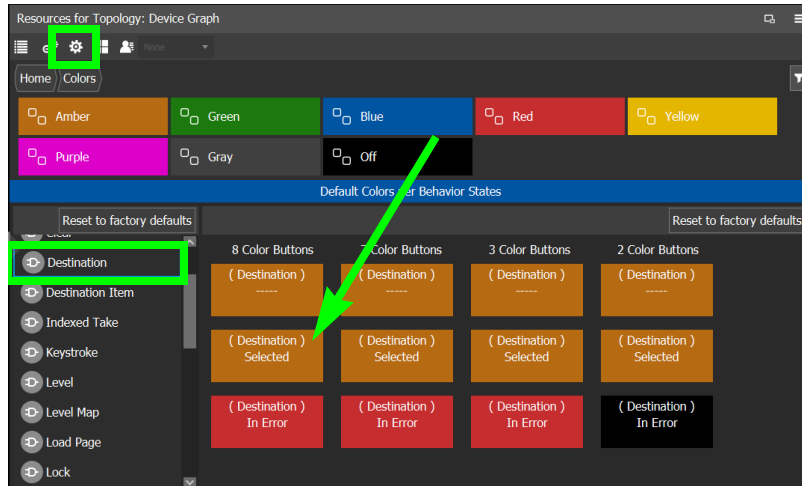


A *Def* bar appears on the state color which indicates the default color. Double-click the state color to revert to this default color.

## Changing a Button's Default Color used to Represent a State

The default color used by all buttons for a behavior state can be changed when an across the system change is necessary.

- 1 Click the Custom Color Settings icon .
- 2 Click a behavior that you want to configure, for example, *Destination*.



- 3 Drag a color from the color pallet (shown on the upper half) onto any one the state colors on the lower half.

Certain panel buttons support fewer colors. The 7, 3, and 2 Color Buttons columns will show how your color choice will be implemented for these reduced color-range buttons.

## Adding the New Panel to the Topology

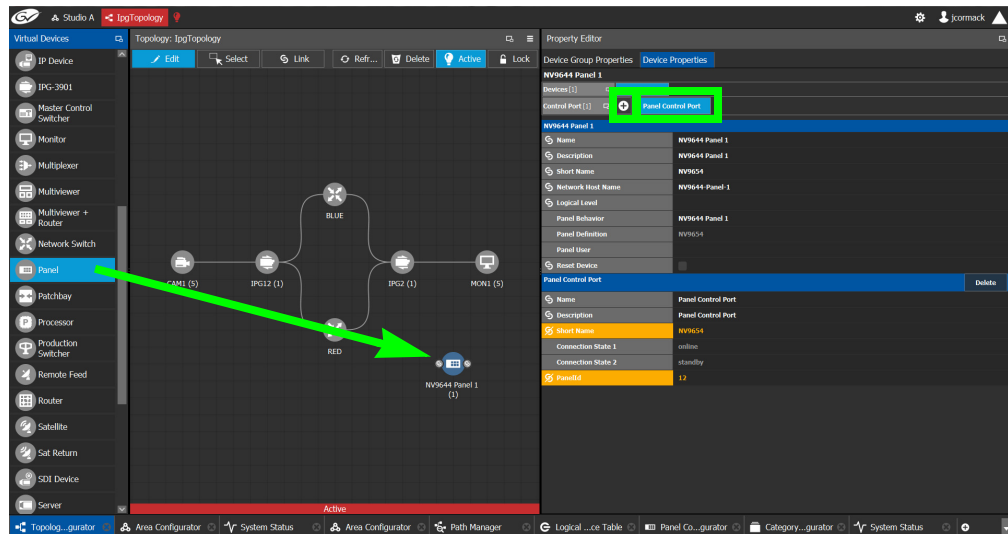
After you have configured one or more templates for your software or hardware panels, you can add a panel to your topology.

### To add a panel to the topology

- 1 Open the Topology Configurator task for the selected panel. See [Selecting a Topology](#), on page 34.


## Configuration Tasks

### Adding the New Panel to the Topology



- 2 Select the **Panel** from the **Virtual Devices** on the left and drag it to the Device Graph.
- 3 Select the bubble for the panel device to configure the panel's Device Group Properties in the **Property Editor**. See also [Description of Common Device Properties](#), on page 104.

| Parameter                         | Description  |
|-----------------------------------|--|
| Name                              | The name or identifier for this panel instance.  |
| # Devices                         | The number of panel instances in this device group.  |
| Network Host Name                 | When one or more panels are managed by DCNM through the media network, set a unique network identifier for these panels so as to be able to push policies to them. |
| Advanced > Description            | An optional description for this panel's control port.   |
| Advanced > Logical Level          | The logical level for this panel. See <a href="#">Logical Level Editor Tasks</a> , on page 24.   |
| Advanced > Default Connector Type | The panel's connector type.  |

- 4 Select **Device Properties** and click **New**  next to **Control Port** at the top of the **Property Editor** and select **NV96XX Panel Control** from the list.  
The **Panel Control Port** tab appears. See also [Description of Common Device Properties](#), on page 104.

| Parameter     | Required <sup>a</sup> | Description  |
|---------------|-----------------------|--|
| Name          |                       | The name or identifier for this panel instance.  |
| Description   |                       | An optional description for this panel instance.   |
| Logical Level |                       | The logical level for this panel. See <a href="#">Logical Level Editor Tasks</a> , on page 24. |

| Parameter        | Required <sup>a</sup> | Description   |
|------------------|-----------------------|---|
| Panel Behavior   | •                     | Select the name of the panel you used when you created the panel (see <a href="#">Creating a New Panel</a> , on page 81) from the drop-down list.           |
| Panel Definition |                       | When you have selected the <i>Panel Behavior</i> parameter, this is the panel's model number that was selected when you created the panel. It is read-only. |
| Panel User       | •                     | Select the panel's user name from the drop-down list. For further information, see <a href="#">Administration Tasks</a> , on page 195.                      |
| Reset Device     |                       | When the topology is inactive (see <a href="#">Making an Active Topology Inactive</a> , on page 52), click to reset the device.                             |

a. This parameter must be configured in order for the panel to become functional.

- 5 Select **Panel Control Port** tab to make the following properties visible. See also [Description of Common Device Properties](#), on page 104.

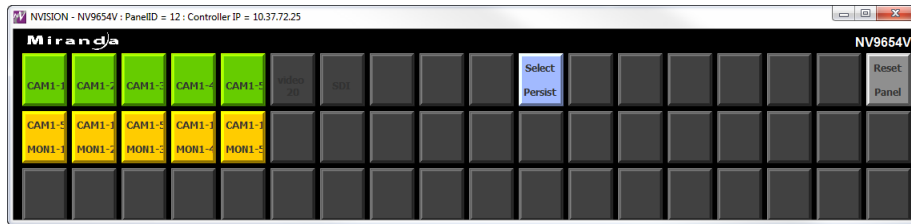
| Parameter                                   | Required <sup>a</sup> | Description  |
|---|-----------------------|--|
| Panel Control Port > Name                   |                       | The panel's control port name.   |
| Panel Control Port > Description            |                       | An optional description for this panel's control port.   |
| Panel Control Port > Connection State 1 / 2 |                       | Connection State 1 shows the connection status of the panel with the primary server of a server group. Connection State 2 shows the connection status of the panel with the secondary server of a server group. See <a href="#">Configuring a Controller Group</a> , on page 18.<br><b>unknown:</b> the topology is inactive (see <a href="#">Activating a Topology</a> , on page 50) or the panel does not have network connectivity to the GV Convergent server(s).<br><b>offline:</b> the panel does not have network connectivity to the GV Convergent server(s).<br><b>online:</b> the panel is connected to the GV Convergent server(s). |
| Panel Control Port > PanelID                | •                     | Each control panel must have been configured with a unique Panel ID number. Enter the Panel ID that corresponds with the physical panel that is to be used with this panel instance.   |

a. This parameter must be configured in order for the panel to become functional.

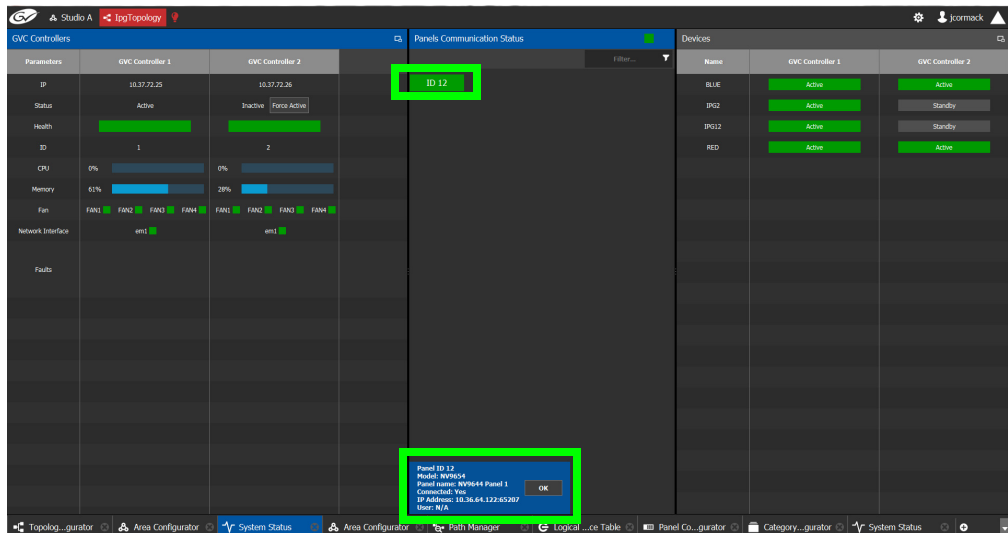
- 6 In the hardware or software panel, ensure you have configured the Panel ID number and the Controller 1 IP address.  
When the panel is online, you can control GV Convergent from the panel.

## Configuration Tasks

### Adding the New Panel to the Topology



You can view the health of the panel in the System Status task. See [System Status Task](#), on page 180.



The green bar indicates the health of the panel is good.

- 7 Click the Panel ID at the top of Panel Communication Status column to view data on the panel. This appears at the bottom of the interface.

## GPIO Configurator Tasks

Tally devices you connect to the panel's inputs can trigger events in the router control system such as a salvo or it can route a source to a destination.

In reaction to pressing a panel button, to a GPI input, or to a XPT status, the router control system can trigger events through the panel's relay outputs to switch your tally devices.

**SUPPORTED PANELS:** the following panels that support GPIO; NV9605, NV9606, NV9607, NV9609, NV9646, NV9649 (configured as a NV9609 panel model), NV9640, and NV9642.

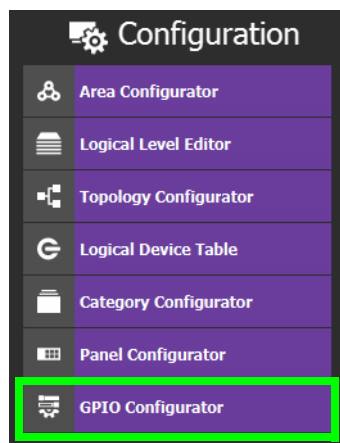
**PREREQUISITES:** The following must have been configured:

- a Topology ([Topology Configurator Tasks](#), on page 33) including:
  - Panel Configuration: see [Panel Configurator Tasks](#), on page 80
  - Sources and destinations: see [Setting the Link's Physical Connection Parameters \(Sources and Destinations\)](#), on page 42.
- a router: see [Configuring Router Devices](#), on page 157

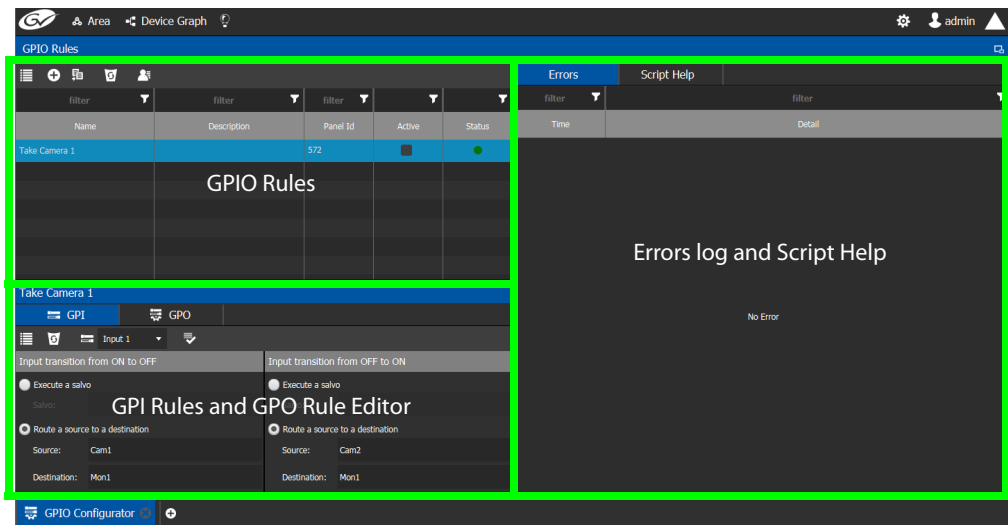
## Accessing the GPIO Configurator

### To access the Panel Configurator Task

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select an area. See [Selecting an Area](#), on page 22.
- 3 Select a topology. See [Selecting a Topology](#), on page 34.
- 4 Create and configure a Panel. See [Creating a New Panel](#), on page 81, [Configuring a Panel's Properties](#), on page 84, [Adding Actions to a Panel](#), on page 85, and [Adding Resources to the Panel](#), on page 85.
- 5 If a salvo is to be triggered by a GPI, create one or more salvos. See [Creating Salvos](#), on page 191.
- 6 If aliases are to be used, create them. See [Adding Aliases](#), on page 189.
- 7 Add a panel to the topology. See [Adding the New Panel to the Topology](#), on page 89.
- 8 Select **Configuration > GPIO Configurator**.



The GPIO Configurator task appears:



The GPIO Configurator has the following main sections shown above:

- GPIO Rules
- GPI Rules and GPO Rule Editor
- Errors log and Script Help

### GPIO Rules Menu

The GPIO rules menu has the following menu options.

| Icon | Description  |
|------|--|
|      | New<br>Create a new rule in the rules list. See <a href="#">Adding a GPIO Rule</a> , on page 95.                   |
|      | Duplicate<br>Make a copy of the currently-selected rule. See <a href="#">Duplicating a Rule</a> , on page 100.     |
|      | Delete<br>Remove the currently-selected rule. See <a href="#">Deleting a Rule</a> , on page 101.                   |
|      | Alias<br>Select the Alias to use for all rules. See <a href="#">Choosing an Alias for all Rules</a> , on page 101. |

### GPI / GPO Rule Editor Menu

The GPIO rule editor has the following menu options.

| Icon | Description   |
|------|---|
|      | Delete<br>Remove the configuration for this rule.   |
|      | Select GPI<br>Select the GPI input to be configured. See <a href="#">Configuring a GPI to Trigger an Event</a> , on page 96.  |
|      | Select GPO<br>Select the GPO output to be configured. See <a href="#">Configuring a Script to Trigger a GPO</a> , on page 97. |
|      | Validate<br>Verifies if the rule is valid   |

## Adding a GPIO Rule

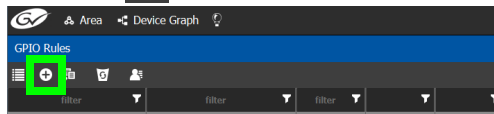
Create one or more rules to control your tallies. Rules can be enabled and disabled as needed.

### Note:

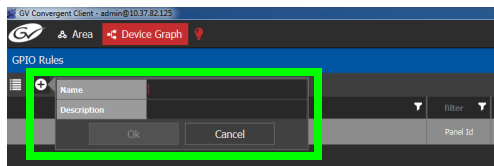
It is possible to create two or more rules that act upon the same GPO, thereby creating a conflict. No error or warning will be flagged in this case. When two or more rules conflict, you must deactivate rule(s) such that only one rule controls a GPO at a time. See [Activating / Deactivating a Rule](#), on page 100.

### To add a rule

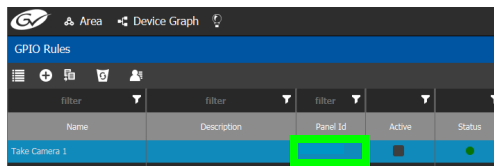
- 1 Click **New** .



- 2 Enter meaningful text in the **Name** and **Description** fields to identify the rule.

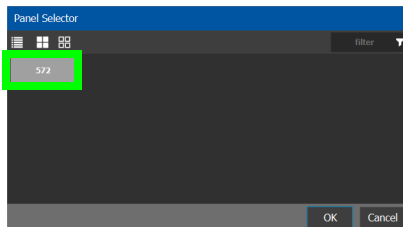


- 3 For the new row, click the cell for the Panel ID column.



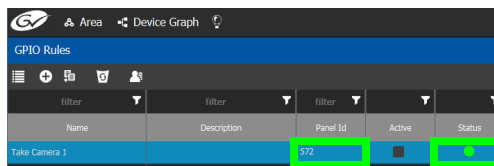
The **Panel Selector** window appears showing the panels that have been previously configured. See [Panel Configurator Tasks](#), on page 80.

- 4 Select the panel which has GPIO connections made to it that you want to configure.



- 5 Click **OK**.

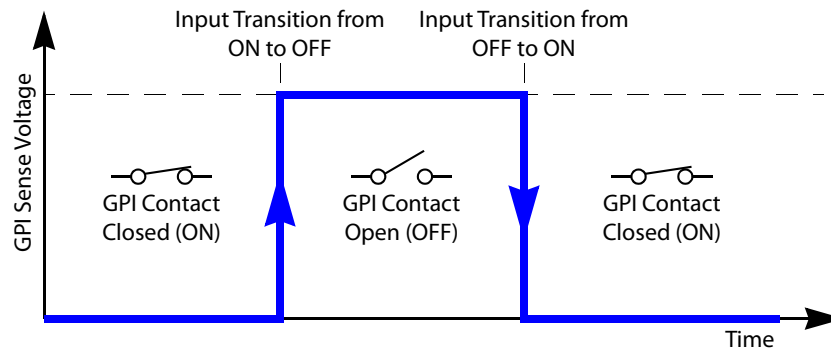
The Panel Id is shown for the GPIO rule and the Status is green.



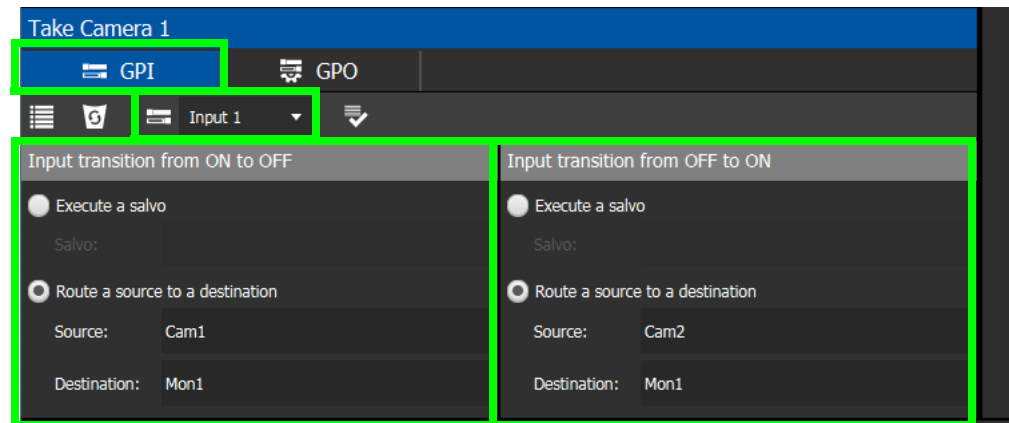
## Configuring a GPI to Trigger an Event

Tally inputs (called GPIs) can be configured to trigger an event when the input transitions from OFF to ON and to trigger another event on a transition from ON to OFF. Events include:

- Execute a salvo. The salvo must have been previously created. See [Creating Salvos](#), on page 191.
- Route a source to a destination. The source and destination must have been previously created. See [Logical Device Table Tasks](#), on page 56.

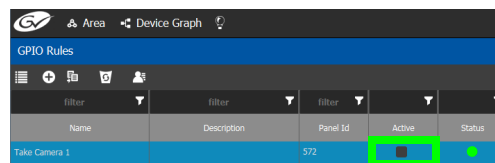


Separate actions are triggered depending on whether the transition is from ON to OFF or the transition is OFF to ON as shown above.




To configure a GPI state transition to route a source to a destination or trigger a salvo

- 1 Add a Rule if necessary. See [To add a rule](#), on page 95. Select the rule you want to configure. Ensure the rule is de-activated.



- 2 Click the GPI tab.
- 3 Select the panel's GPI input to be used as a trigger.
- 4 Select the action to execute when this input transitions from ON to OFF:
  - **Execute a salvo:** select the salvo to be executed from the list.
  - **Route a source to a destination:** select a source and a destination from the lists.

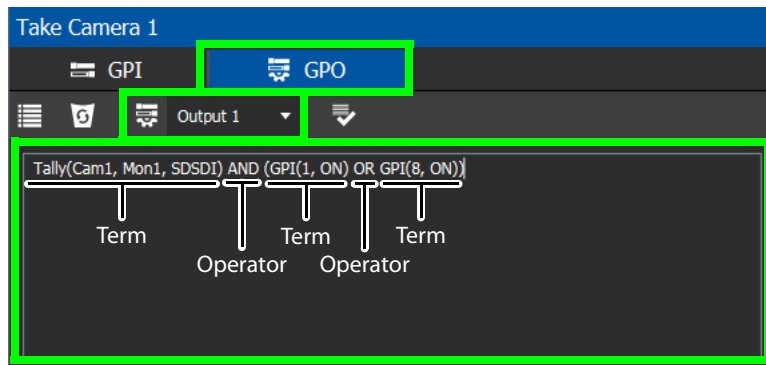


- 5 Select the action to execute when this input transitions from OFF to ON:
  - **Execute a salvo:** select the salvo to be executed from the list.
  - **Route a source to a destination:** select a source and a destination from the lists.
- 6 Repeat for the remaining GPI inputs to be used as a trigger for an action.
- 7 Click **Validate**  to check the syntax and semantics with respect to the current configuration and it then saves the script.
- 8 Activate the rule. See [To activate a rule](#), on page 100.

## Configuring a Script to Trigger a GPO

Relay outputs can be configured to activate on a number of Boolean true or false conditions that form a script:

- One or more routes occurring on specific levels.
- Conditions involving output ports (destination, level).
- A transition on one or more of the panel's tally inputs.



In this dialog, you create a Boolean script involving sources, port status, and GPI (input) status. When the conditions of the entire Boolean script evaluates as true, the relay output closes. When the conditions are not met, the relay output opens. Names of sources, destinations, levels and so on are case sensitive.

Boolean expressions comprise terms and operators. The operators include those shown under the **Script Help** tab. Expressions can be parenthesized to control the order of evaluation. Operator precedence is normally NOT > AND > OR. All parenthesized expressions are evaluated first; expressions in nested parentheses are evaluated before those in outer parentheses.

| Function             | Description   |
|----------------------|---|
| AND,OR, NOT,( )      | Logical AND, OR, NOT, and precedence. Note that && (AND),    (OR), ! (NOT) are also supported.          |
| Tally(SRC,DST)       | Returns true when the specified source is tallied on the specified destination for the SDI level.       |
| Tally(SRC,DST,Level) | Returns true when the specified source is tallied on the specified destination for the specified level. |

## Configuration Tasks

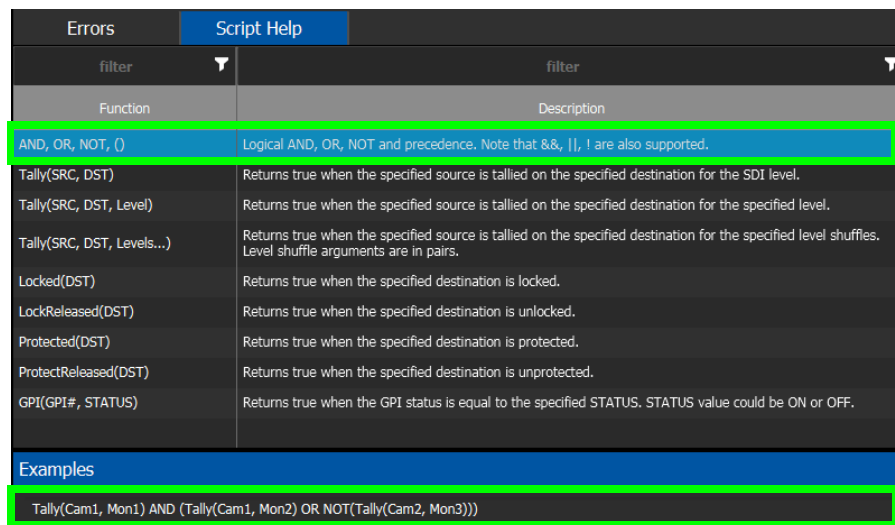
### Configuring a Script to Trigger a GPO

| Function                 | Description  |
|--------------------------|--|
| Tally(SRC,DST,Levels...) | Returns true when the specified source is tallied on the specified destination for the specified level shuffles. Level shuffle arguments are in pairs. |
| Locked(DST)              | Returns true when the specified destination is locked.   |
| LockReleased(DST)        | Returns true when the specified destination is unlocked.   |
| Protected(DST)           | Returns true when the specified destination is protected.  |
| ProtectReleased(DST)     | Returns true when the specified destination is unprotected.  |
| GPI(GPI#, STATUS)        | Returns true when the GPI status is equal to the specified STATUS. STATUS value could be ON or OFF.  |

For example, the following script is true when Cam1 is tallied on Mon1 for the SDSDI level and GPI1 input is on or GPI8 input is on:

```
Tally(Cam1, Mon1, SDSDI) AND (GPI(1, ON) OR GPI(8, ON))
```

Click a function to see an example script of how to use the function under **Example**.



Errors Script Help

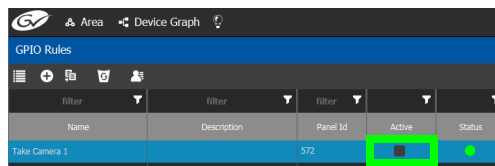
| filter                     | filter   |
|----------------------------|--|
| Function                   | Description  |
| AND, OR, NOT, ()           | Logical AND, OR, NOT and precedence. Note that &&,   , ! are also supported.   |
| Tally(SRC, DST)            | Returns true when the specified source is tallied on the specified destination for the SDI level.  |
| Tally(SRC, DST, Level)     | Returns true when the specified source is tallied on the specified destination for the specified level.  |
| Tally(SRC, DST, Levels...) | Returns true when the specified source is tallied on the specified destination for the specified level shuffles. Level shuffle arguments are in pairs. |
| Locked(DST)                | Returns true when the specified destination is locked.   |
| LockReleased(DST)          | Returns true when the specified destination is unlocked.   |
| Protected(DST)             | Returns true when the specified destination is protected.  |
| ProtectReleased(DST)       | Returns true when the specified destination is unprotected.  |
| GPI(GPI#, STATUS)          | Returns true when the GPI status is equal to the specified STATUS. STATUS value could be ON or OFF.  |

Examples

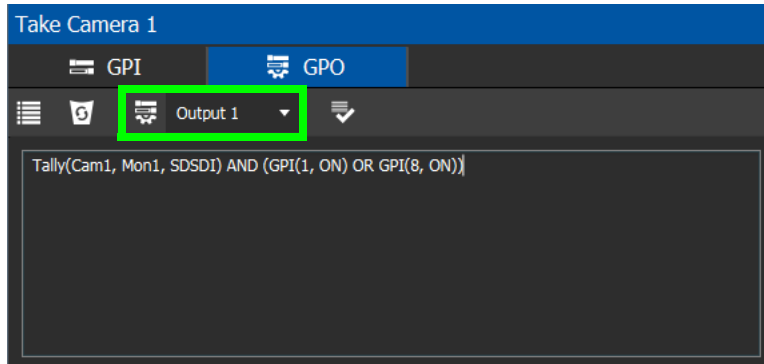
```
Tally(Cam1, Mon1) AND (Tally(Cam1, Mon2) OR NOT(Tally(Cam2, Mon3)))
```

### To configure a script to control GPOs

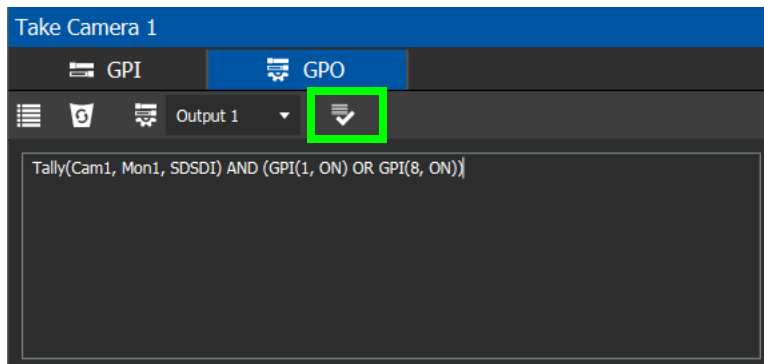
- 1 Add a Rule if necessary. See [To add a rule](#), on page 95. Select the rule you want to configure. Ensure the rule is de-activated.




- 2 Click the **GPO** tab.
- 3 Select the panel's GPO output to be used as a trigger.



- 4 Create a script that when true will close the output relay's contact.



- 5 Click **Validate**  to check the script's syntax.

Any errors are shown in the **Errors** tab. Correct the script as necessary. Click the **Script Help** tab for how to use script arguments.

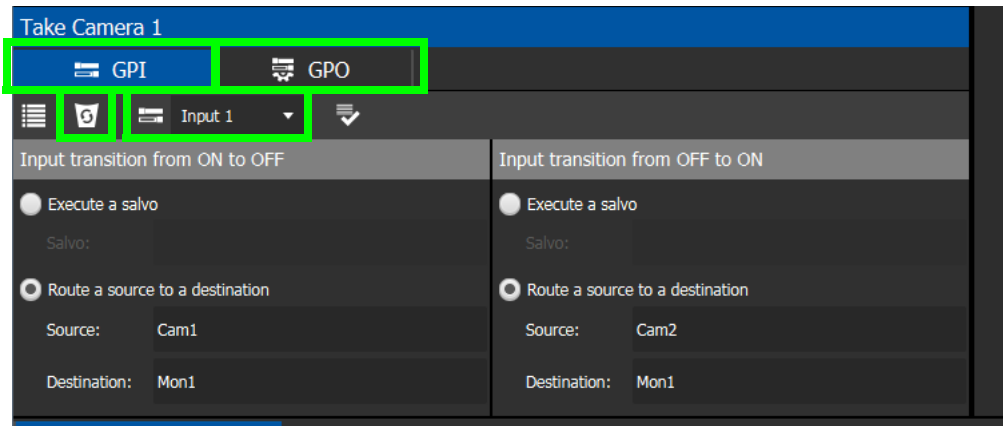
| Errors              |  | Script Help  |  |
|---------------------|--|--|--|
| filter              |  | filter   |  |
| Time                |  | Detail   |  |
| 2019-03-06 10:52:09 |  | GPO 1 - Panel 67 - Tally(Cam1, Mon1, SDDSDI1) : Unknown level: SDDSDI1     |  |
| 2019-03-06 10:52:09 |  | GPO 1 - Panel 67 - GPI(12, ON) : Expected gpi number from 1 to 8. Got: 12  |  |
| 2019-03-06 10:52:09 |  | GPO 1 - Panel 222 - Tally(Cam1, Mon1, SDDSDI1) : Unknown level: SDDSDI1    |  |
| 2019-03-06 10:52:09 |  | GPO 1 - Panel 222 - GPI(12, ON) : Expected gpi number from 1 to 8. Got: 12 |  |
| 2019-03-06 10:52:09 |  | GPO 1 - Panel 223 - Tally(Cam1, Mon1, SDDSDI1) : Unknown level: SDDSDI1    |  |
| 2019-03-06 10:52:09 |  | GPO 1 - Panel 223 - GPI(12, ON) : Expected gpi number from 1 to 8. Got: 12 |  |

- 6 Activate the rule. See [To activate a rule](#), on page 100.

## Deleting a GPI or GPO Action Configuration

To delete a GPI or GPO action configuration

- 1 Click the GPI or GPO tab.



- 2 Select an **Input** or **Output** to be deleted.
- 3 Click **Delete** .

## Activating / Deactivating a Rule

### To activate a rule

- 1 Set **Active** in the rule's row.

| filter        | filter      | filter       | filter                              | filter                               |
|---------------|-------------|--------------|-------------------------------------|--------------------------------------|
| Name          | Description | Panel Id     | Active                              | Status                               |
| Take Camera 1 |             | 223, 67, 222 | <input checked="" type="checkbox"/> | <span style="color: green;">●</span> |


The rule's configuration becomes read only and cannot be modified. The rule's status becomes a green circle to indicate that the rule is valid.

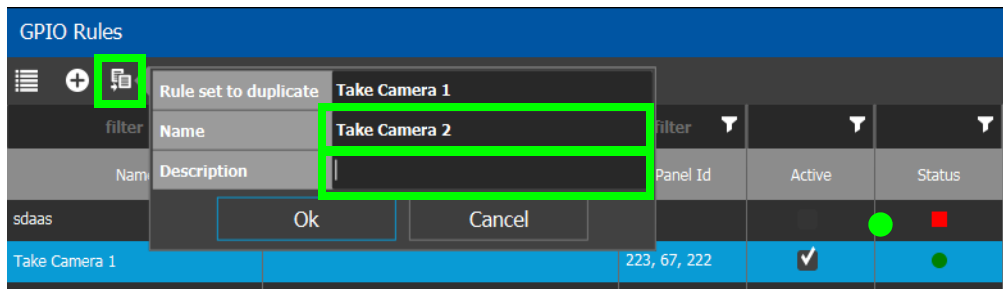
### To deactivate a rule

- 1 Deselect **Active** in the rule's row.

## Duplicating a Rule

### To duplicate a rule

- 1 Select the rule to be duplicated.
- 2 Click **Duplicate**  .

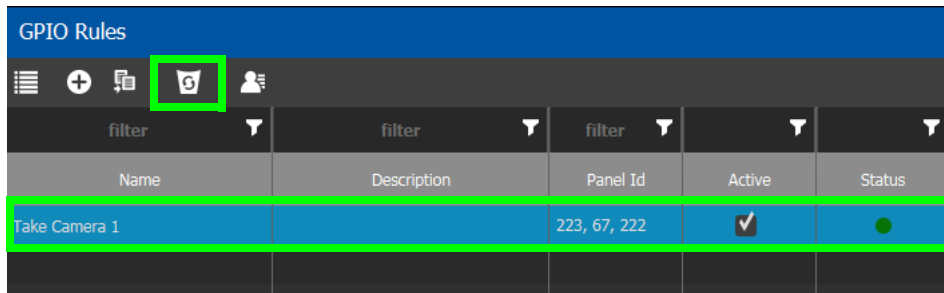


- 3 Set the name and description of the new rule.
- 4 Click **OK**.

## Deleting a Rule

### To delete a rule

- 1 Select the GPIO rule to be deleted.



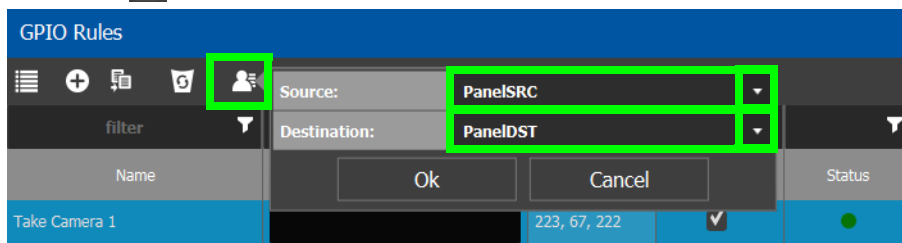
- 2 Click **Delete** .

## Choosing an Alias for all Rules

The source and destination aliases must have been previously created. See [Adding Aliases](#), on page 189. The alias selection applies to all current rules.

### To set an alias

- 1 Click **Alias** .



- 2 Set the **Source** and **Destination** aliases to use for all rules.
- 3 Click **OK**.



# 4 Special Device Configuration Tasks

The configuration of certain features for a specific device require an in depth explanation which is provided here.

These special device are described under the following headings:

- [Configuring a GV Node Device](#), on page 105
- [Configuring an IPG-3901 / IPG-4901 Device](#), on page 116
- [Configuring an IQMix or IQUCP25 Device](#), on page 122
- [Configuring 4K / UHD Streams for use with an IQMix or IQUCP25 Device](#), on page 125
- [Configuring an MV-820-IP Multiviewer Device](#), on page 128
- [Configuring a Kahuna IP Production Switcher Device](#), on page 132
- [Configuring a K-Frame Production Switcher](#), on page 135
- [Adding NMOS Devices to a Topology](#), on page 141
- [Using SDP Parameters to Take a Stream from a non-NMOS Device to an NMOS Device](#), on page 145
- [Configuring Cisco DCNM Network Switch Devices](#), on page 148
- [Configuring Network Switch Redundancy to Support SMPTE 2022-7](#), on page 153
- [Configuring Router Devices](#), on page 157
- [Configuring a Device that Supports Audio Breakaway/Shuffling such as Audio Live](#), on page 164

## Description of Common Device Properties

The description for certain device properties are universal.

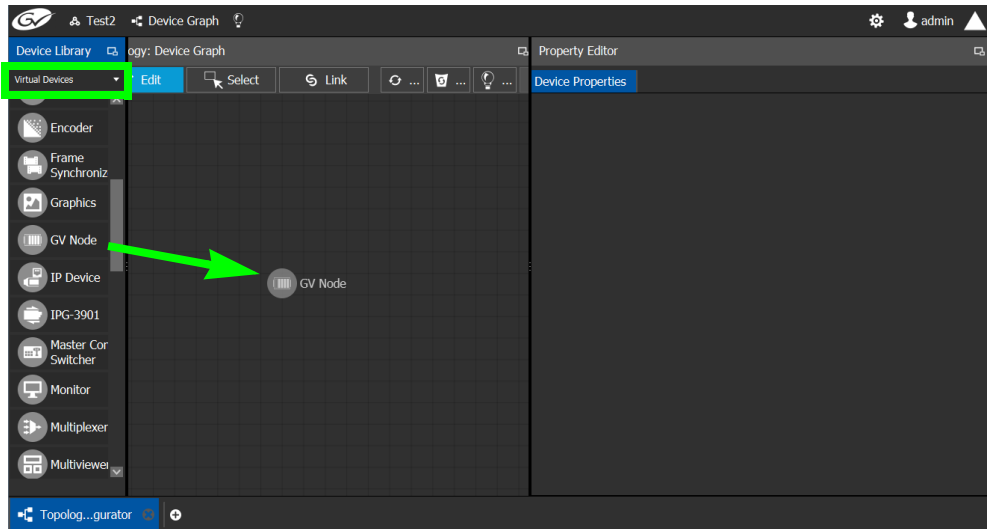
| Parameter  | Description  |
|--|--|
| # Input Connectors   | The number of physical input port connections made to the device. This shows the current status for information purposes.                          |
| # Output Connectors  | The number of physical output port connections made to the device. This shows the current status for information purposes.                         |
| # Streams Per Input  | The typical number of streams available on each physical input connection. This shows the current status for information purposes.                 |
| # Streams Per Output   | The typical number of streams available on each physical output connection. This shows the current status for information purposes.                |
| # Streams  | The actual number of streams available on the selected physical input / output connection. This shows the current status for information purposes. |
| Automatic Destination<br>Automatic Destinations on Inputs<br>Automatic Destinations on Outputs | Set to automatically create a destination by the system using the specified stream.  |
| Automatic Source<br>Automatic Sources on Outputs<br>Automatic Sources on Inputs                | Set to automatically create a source by the system using the specified stream.   |
| Description  | An optional description for the related input, output, or device.  |
| Enabled  | This shows the current status for information purposes.  |
| Expose Streams   | When set, it displays the streams of this device in the Logical Device Table. See <a href="#">Logical Device Table Tasks</a> , on page 56.         |
| Logical Level  | The logical level for this input or output. See <a href="#">Logical Level Editor Tasks</a> , on page 24.   |
| Name   | The name or identifier for this device instance.<br>The name or identifier for this input or output port.  |
| Short Name   | The nickname by which the input, output, or device is referred to everywhere in the system.  |
| SSM Address Enabled  | Shows if the source specific multicast address is enabled.   |
| SDP  | See <a href="#">Using SDP Parameters to Take a Stream from a non-NMOS Device to an NMOS Device</a> , on page 145.                                  |



## Configuring a GV Node Device

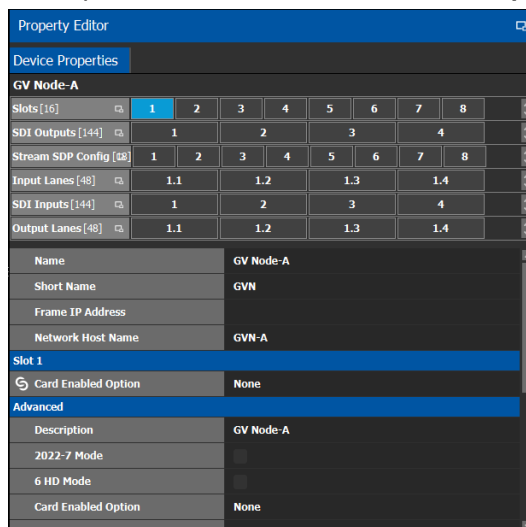
To configure a GV node Device

- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.
- 3 From the **Device Library**, on the left, select **Virtual Device** from the drop-down list.



- 4 From the **Device Library**, **Virtual Device** select the GV Node device bubble and drag it into position on the Device Graph and release the mouse button.
- 5 Click on the name of the device underneath the bubble to enter a meaningful name to identify this device in the **Name** field. See [To name a device and set the number of devices in the group](#), on page 41.

These parameters can also be set in the **Property Editor**.

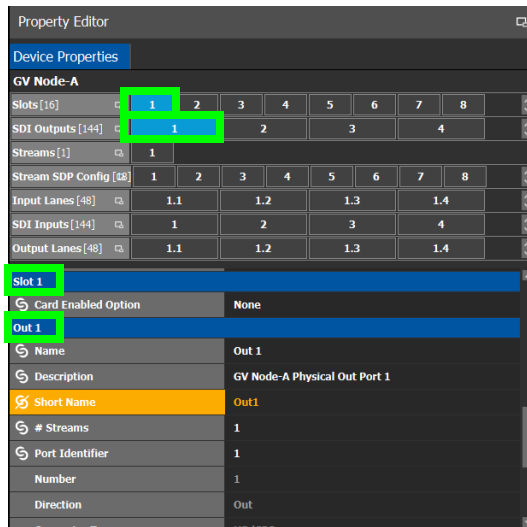


- 6 Select the GV Node bubble and configure the Device Properties in the **Property Editor**. See also [Description of Common Device Properties](#), on page 104.

| Parameter                             | Description  |
|---------------------------------------|--|
| Frame IP Address                      | The network IP address for the associated GV Node frame.   |
| Network Host Name                     | The hostname is the unique name by which the associated GV Node CPU-ETH3 is known on the network.  |
| Advanced > Description                | An optional description for this GV Node's control port.   |
| Advanced > 2022-7 Mode                | When the IFM-2T-OPT-40G-6 option is active, you can choose to enable 2022-7 Low Latency redundant, high-bit-rate streams on the aggregation ports, using the GV Node manager.<br>If this option has been enabled in the GV Node Manager, then enable it here.  |
| Advanced > 6 HD Mode                  | This no redundancy, low bitrate option reduces each channel from 3Gbps to 1.5Gbps, allowing all 144 channels to be sent on aggregation ports 1-6, and leaving aggregation ports 7-12 unused.<br>If this option has been enabled in the GV Node Manager, then enable it here.   |
| Advanced > Card Enabled Option        | This option controls audio embedding / de-embedding.<br>For example, the XIO-4901 3G/HD/SD SDI input/output card supports audio embedding/de-embedding, as a software option (MDX):<br><b>MDX:</b> the GV Node Manager allows you to enable or disable audio embedding/de-embedding on a card's SDI inputs and outputs.<br><b>None:</b> if your system is monitoring MADI signals (supported at the XIO-4901 card's inputs/outputs 8 and 9), then disabling the MDX option lets you select MADI at the inputs and outputs matching your physical configuration. See <a href="#">Configuring MADI support with a GV Node Device</a> , on page 112 for more information. |
| Advanced > Card Mode                  | Set the signal type.   |
| Advanced > Gateway Connection State 1 | Gateway Connection State 1 shows the connection status of the GV Node frame with the primary server of a server group.   |
| Advanced > Gateway Connection State 2 | Gateway Connection State 2 shows the connection status of the GV Node frame with the secondary server of a server group. See <a href="#">Configuring a Controller Group</a> , on page 18.<br><b>unknown:</b> the topology is inactive (see <a href="#">Activating a Topology</a> , on page 50) or the GV Node frame does not have network connectivity to the GV Convergent server(s).<br><b>offline:</b> the GV Node frame does not have network connectivity to the GV Convergent server(s).<br><b>online:</b> the GV Node frame is connected to the GV Convergent server(s).  |

| Parameter                                | Description  |
|--|--|
| Advanced > Gateway NP16 Connection State | This shows the NP16 connection status of the GV Node frame with a server of a server group.<br><b>unknown:</b> the topology is inactive (see <a href="#">Activating a Topology</a> , on page 50) or the GV Node frame does not have network connectivity to the GV Convergent server(s).<br><b>offline:</b> the GV Node frame does not have network connectivity to the GV Convergent server(s).<br><b>online:</b> the GV Node frame is connected to the GV Convergent server(s).  |
| Advanced > IFM-2T Version                | The IFM-2T Fabric Module User Interface version number.  |
| Advanced > Internal Wiring Done          | Shows if the internal modeling of the GV Node is complete.   |
| Advanced > Join Timeout (ms)             | When GV Convergent is used with a GV Node version 1.3.0, to allow a clean switch that will not be reported as a fail, we recommend this parameter to be set to 2 ms.   |
| Advanced > Router Connection State 1     | Router Connection State 1 shows the connection status of the router with the primary server of a server group.   |
| Advanced > Router Connection State 2     | Router Connection State 2 shows the connection status of the router with the secondary server of a server group. See <a href="#">Configuring a Controller Group</a> , on page 18.<br><b>unknown:</b> the topology is inactive (see <a href="#">Activating a Topology</a> , on page 50) or the router does not have network connectivity to the GV Convergent server(s).<br><b>offline:</b> the router does not have network connectivity to the GV Convergent server(s).<br><b>online:</b> the router is connected to the GV Convergent server(s). |

- 7 Configure the card in each slot and configure the inputs and outputs for each card by making a selection at the top to make the related parameters become available below.



| Select the  | To configure the properties exposed below under                   |
|---|---|
| Card by its slot number in <b>Slots</b>   | <b>Slot #</b>   |
| Card's SDI output number in <b>SDI Outputs</b> .<br>Then select the Card's SDI Output Stream Configuration number in <b>Streams</b> | <b>Out #</b><br><b>GV Node-[instance] Out #</b>                   |
| Card's Stream SDP Configuration number in <b>Stream SDP Config</b>  | <b>IP Stream Prototype #</b>                                      |
| Card's Input Lanes number in <b>Input Lanes</b> .<br>Then select the card's stream number in <b>Streams</b> .                       | <b>Eth In #.#</b><br><b>GV Node-[instance] Eth In#.# Stream #</b> |
| Card's SDI Input number in <b>SDI Inputs</b> .<br>Then select the card's stream number in <b>Streams</b> .                          | <b>In#</b><br><b>GV Node-[instance] In#</b>                       |
| Card's Output Lanes number in <b>Output Lanes</b> .<br>Then select the card's stream number in <b>Streams</b> .                     | <b>Eth Out #.#</b><br><b>GV Node-[instance] Out#.# Stream #</b>   |

Configure the GV Node Card Properties in the **Property Editor**. See also [Description of Common Device Properties](#), on page 104.

| Parameter                | Description   |
|--------------------------|---|
| Slot #                   |   |
| Card Enabled Option      | This option controls audio embedding / de-embedding.<br>For example, the XIO-4901 3G/HD/SD SDI input/output card supports audio embedding/de-embedding, as a software option (MDX):<br><b>MDX:</b> the GV Node Manager allows you to enable or disable audio embedding/de-embedding on a card's SDI inputs and outputs.<br><b>None:</b> if your system is monitoring MADi signals (supported at the card's inputs/outputs 8 and 9), then disabling the MDX option lets you select MADi at the inputs and outputs matching your physical configuration. See <a href="#">Configuring MADi support with a GV Node Device</a> , on page 112 for more information. |
| Out #                    |   |
| Name                     | The name or identifier for this SDI output.   |
| # Streams                | The number of streams for this SDI output.  |
| Port Identifier          | An input lane is specified as QSPFport.lane which in turn corresponds to a physical port on the router. The number property specifies which physical port it is. The port identifier is how you name it so that you can refer to it.  |
| Number                   | Set the port number on the router.  |
| Direction                | This shows the current status for information purposes.   |
| Connector Type           |   |
| Capacity (bps)           | The stream's data rate.   |
| IP Address               | The stream's network IP address.  |
| Mods-Out to IFM          | This option sets the expected output signal type:<br><b>SDI:</b> the output signal is a standard SDI video signal with embedded audio.<br><b>MADI:</b> the output signal is a MADi signal (supports 64 audio channels). See <a href="#">Configuring MADi support with a GV Node Device</a> , on page 112 for more information.  |
| Redundancy Port          | This output can be duplicated onto another output port for redundancy.  |
| GV Node-[instance] Out # |   |
| Name                     | The name or identifier for this SDI output.   |
| Automatic Source         | Set to automatically create a source by the system using the specified stream.  |
| Bandwidth (bps)          | The stream's data rate.   |
| IGMPv3 SSM Address       | Source Specific Multicast address as per IGMPv3 (Internet Group Management Protocol) protocol.  |

| Parameter                             | Description  |
|---------------------------------------|--|
| IP Stream Prototype #                 |  |
| Name                                  | The name or identifier for this SDI output.  |
| Flow Type                             | Set the content type for this stream: <b>Audio</b> , <b>Data</b> , or <b>Video</b> .   |
| SDP                                   | The Session Description Protocol is a format for describing streaming media communications parameters.   |
| Eth In #.#                            |  |
| Name                                  | The name or identifier for this IP input.  |
| # Streams                             | The number of streams for this IP input.   |
| Port Identifier                       | An input lane is specified as QSPFport.lane which in turn corresponds to a physical port on the router. The number property specifies which physical port it is. The port identifier is how you name it so that you can refer to it. |
| Number                                | Set the port number on the router.   |
| Direction                             | This shows the current status for information purposes.  |
| Connector Type                        |  |
| Capacity (bps)                        | The stream's data rate.  |
| GV Node-[instance] Eth In#.# Stream # |  |
| Name                                  | The name or identifier for this IP input.  |
| Flow Type                             | Set the content type for this stream: <b>Audio</b> , <b>Data</b> , or <b>Video</b> .   |
| Automatic Source                      | Set to automatically create a source by the system using the specified stream.   |
| SDP                                   | The Session Description Protocol is a format for describing streaming media communications parameters.   |
| IGMPv3 SSM Address                    | Source Specific Multicast address as per IGMPv3 (Internet Group Management Protocol) protocol.   |
| IP Address                            | The stream's network IP address.   |
| IP Port                               | Port number for the stream.  |
| In#                                   |  |
| Name                                  | The name or identifier for this IP input.  |
| # Streams                             | The number of streams for this IP input.   |
| Port Identifier                       | An input lane is specified as QSPFport.lane which in turn corresponds to a physical port on the router. The number property specifies which physical port it is. The port identifier is how you name it so that you can refer to it. |
| Number                                | Set the port number on the router.   |
| Direction                             | This shows the current status for information purposes.  |
| Connector Type                        |  |
| Capacity (bps)                        | The stream's data rate.  |

| Parameter                          | Description   |
|------------------------------------|---|
| Bandwidth Usage (bps)              | The stream's data rate.   |
| IP Address                         | The stream's network IP address.  |
| Mods-In to IFM                     | This option sets the expected input signal type:<br><b>SDI:</b> the input signal is a standard SDI video signal with embedded audio.<br><b>MADI:</b> the input signal is a MADI signal (supports 64 audio channels). See <a href="#">Configuring MADI support with a GV Node Device</a> , on page 112 for more information. |
| Redundancy Port                    | This input can be received on a second input port for redundancy.   |
| GV Node-[instance] In#             |   |
| Name                               | The name or identifier for this IP input.   |
| Automatic Source                   | Set to automatically create a source by the system using the specified stream.  |
| IGMPv3 SSM Address                 | Source Specific Multicast address as per IGMPv3 (Internet Group Management Protocol) protocol.  |
| Eth Out #.#                        |   |
| Name                               | The name or identifier for this IP input.   |
| # Streams                          | The number of streams for this IP input.  |
| Port Identifier                    | An input lane is specified as QSPFport.lane which in turn corresponds to a physical port on the router. The number property specifies which physical port it is. The port identifier is how you name it so that you can refer to it.  |
| Number                             | Set the port number on the router.  |
| Direction                          | This shows the current status for information purposes.   |
| Connector Type                     |   |
| Capacity (bps)                     | The stream's data rate.   |
| Bandwidth Usage (bps)              | The stream's data rate.   |
| IP Address                         | The stream's network IP address.  |
| Redundancy Port                    | This input can be received on a second input port for redundancy.   |
| GV Node-[instance] Out#.# Stream # |   |
| Name                               | The name or identifier for this IP input.   |
| IP Address                         | The stream's network IP address.  |
| IP Port                            | Port number for the stream.   |
| Flow Type                          | Set the content type for this stream: <b>Audio</b> , <b>Data</b> , or <b>Video</b> .  |
| Automatic Source                   | Set to automatically create a source by the system using the specified stream.  |

| Parameter          | Description  |
|--------------------|--|
| SDP                | The Session Description Protocol is a format for describing streaming media communications parameters. |
| Bandwidth (bps)    | The stream's data rate.  |
| IGMPv3 SSM Address | Source Specific Multicast address as per IGMPv3 (Internet Group Management Protocol) protocol.         |

### Configuring MADi support with a GV Node Device

To support a MADi input on a GV Node frame, this option must be configured both in GV Convergent and the MADi input must have been previously configured in iControl Navigator; locate the GV Node Manager associated with your GV Node and double-click its icon. For example, the following figure shows the 9<sup>th</sup> input XIO-4901 card in slot 16 is set to accept a MADi input. Within GV Convergent, the same setting must be made wherever a MADi input has been configured in iControl Navigator for a GV Node frame.

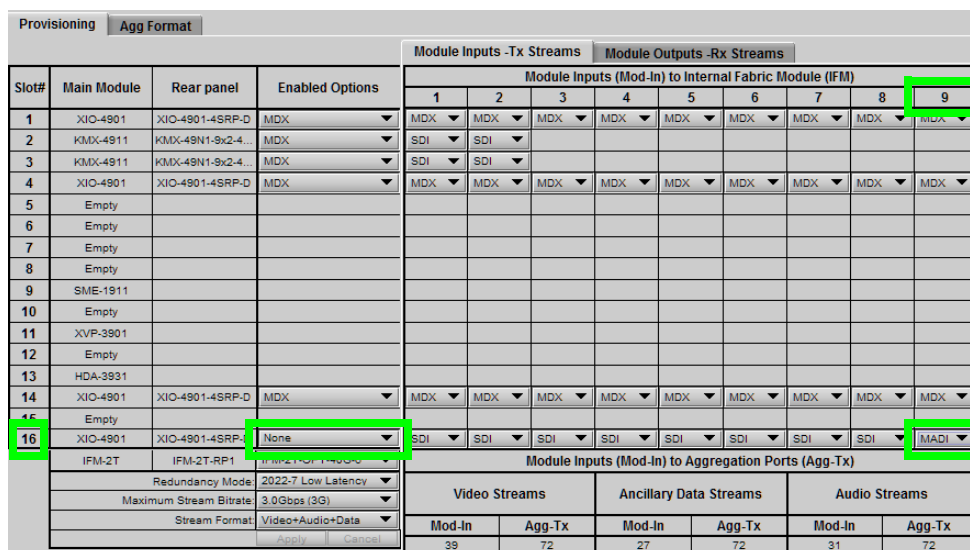


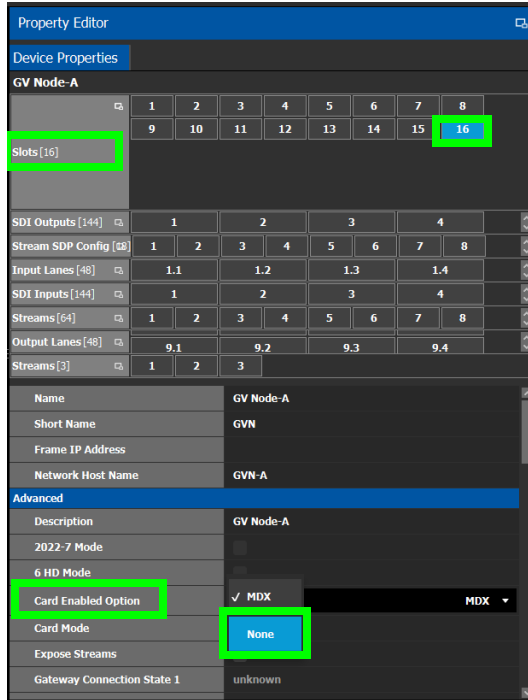
Fig. 4-1: A GV Node in iControl Navigator

The above iControl Navigator configuration is used as an example configuration for the following procedure.

#### To configure a GV node MADi input in GV Convergent

- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.
- 3 Add and configure a GV Node device. See [Configuring a GV Node Device](#), on page 105.
- 4 In the **Property Editor** for the GV Node device, make the same setting as in GV Node Manager for **Enabled Options** for the card: in the GV Node's properties, in **Slots**, select **16**, then set **None** in **Card Enabled Option**.





- Use the following table to identify the SDI input number used by GV Convergent from the card's slot and input number for the next step. Only the eighth and ninth inputs of each slot support MADI input signals. For example, the ninth input of the card in slot 16 is 144.

**Matrix Input from Fabric Number for each GV Node Frame Slot**

| Card's Input from GV Node Fabric | GV Node Frame Slot Number |    |    |    |    |    |    |    |    |    |    |     |     |     |     |     |
|----------------------------------|---------------------------|----|----|----|----|----|----|----|----|----|----|-----|-----|-----|-----|-----|
|                                  | 1                         | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12  | 13  | 14  | 15  | 16  |
| First Input                      | 1                         | 10 | 19 | 28 | 37 | 46 | 55 | 64 | 73 | 82 | 91 | 100 | 109 | 118 | 127 | 136 |
| Second Input                     | 2                         | 11 | 20 | 29 | 38 | 47 | 56 | 65 | 74 | 83 | 92 | 101 | 110 | 119 | 128 | 137 |
| Third Input                      | 3                         | 12 | 21 | 30 | 39 | 48 | 57 | 66 | 75 | 84 | 93 | 102 | 111 | 120 | 129 | 138 |
| Fourth Input                     | 4                         | 13 | 22 | 31 | 40 | 49 | 58 | 67 | 76 | 85 | 94 | 103 | 112 | 121 | 130 | 139 |
| Fifth Input                      | 5                         | 14 | 23 | 32 | 41 | 50 | 59 | 68 | 77 | 86 | 95 | 104 | 113 | 122 | 131 | 140 |
| Sixth Input                      | 6                         | 15 | 24 | 33 | 42 | 51 | 60 | 69 | 78 | 87 | 96 | 105 | 114 | 123 | 132 | 141 |
| Seventh Input                    | 7                         | 16 | 25 | 34 | 43 | 52 | 61 | 70 | 79 | 88 | 97 | 106 | 115 | 124 | 133 | 142 |
| Eighth Input                     | 8                         | 17 | 26 | 35 | 44 | 53 | 62 | 71 | 80 | 89 | 98 | 107 | 116 | 125 | 134 | 143 |
| Ninth Input                      | 9                         | 18 | 27 | 36 | 45 | 54 | 63 | 72 | 81 | 90 | 99 | 108 | 117 | 126 | 135 | 144 |

- In the **Property Editor** for the GV Node device, make the same setting as in GV Node Manager for the card's input: in the GV Node's properties, in **SDI Inputs**, select 144, then set **MADI in Mods-In** to **IFM**.

## Special Device Configuration Tasks

### Configuring a GV Node Device

The screenshot shows the 'Property Editor' for a 'GV Node-A' device. It features several configuration tables and a detailed view of a specific port.

**Configuration Tables:**

- Slots [16]:** A grid with columns 9-16 and rows 1-4. Slot 16 is highlighted in blue.
- SDI Outputs [144]:** A grid with columns 1-4 and rows 1-4.
- Stream SDP Config [48]:** A grid with columns 1-8 and rows 1-6.
- Input Lanes [48]:** A grid with columns 1.1-1.4 and rows 1-6.
- SDI Inputs [144]:** A grid with columns 1-4 and rows 1-6. Cell (1, 4) containing '144' is highlighted in blue.
- Streams [1]:** A single row with column 1.
- Output Lanes [48]:** A grid with columns 9.1-9.4 and rows 1-6.
- Streams [3]:** A grid with columns 1-3 and rows 1-3.

**Port 144 Details:**

- Port Identifier:** 144
- Number:** 144
- Direction:** In
- Connector Type:** HD/SDI
- Capacity (bps):** 1,485M
- Bandwidth Usage (bps):** 1,485M
- Enabled:**
- Expose Streams:**  **MIDI** (highlighted in blue)
- IP Address:**
- Mods-In to IFM:**  **SDI** (highlighted in orange)
- Redundancy Port:**
- SSM Address Enabled:**

For each MAD I input, 64 audio streams are shown in **Streams** and the logical level is MAD I for each stream. These 64 streams are made available within the Logical Device Table for use on manually created logical devices. If you choose the Automatic source/destination option for the MAD I, then 4 devices of 16 channels of audio are created in the Logical Device Table on the appropriate tab. See [Logical Device Table Tasks](#), on page 56.

Property Editor

Device Properties

GV Node-A 10.37.73.211

|                        |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Slots [16]             | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   |
| Stream SDP Config [48] | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   |
| SDI Outputs [144]      | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   |
| Input Lanes [48]       | 1.1  | 1.2  | 1.3  | 1.4  | 2.1  | 2.2  | 2.3  | 2.4  | 3.1  | 3.2  | 3.3  | 3.4  | 4.1  | 4.2  | 4.3  | 4.4  |
| SDI Inputs [144]       | 100  | 101  | 102  | 103  | 104  | 105  | 106  | 107  | 108  | 109  | 110  | 111  | 112  | 113  | 114  | 115  |
|                        | 118  | 119  | 120  | 121  | 122  | 123  | 124  | 125  | 126  | 127  | 128  | 129  | 130  | 131  | 132  | 133  |
|                        | 136  | 137  | 138  | 139  | 140  | 141  | 142  | 143  | 144  | 145  | 146  | 147  | 148  | 149  | 150  | 151  |
|                        | 158  | 159  | 160  | 161  | 162  | 163  | 164  | 165  | 166  | 167  | 168  | 169  | 170  | 171  | 172  | 173  |
|                        | 180  | 181  | 182  | 183  | 184  | 185  | 186  | 187  | 188  | 189  | 190  | 191  | 192  | 193  | 194  | 195  |
| Streams [64]           | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   |
| Output Lanes [48]      | 3.2  | 3.3  | 3.4  | 4.1  | 4.2  | 4.3  | 4.4  | 5.1  | 5.2  | 5.3  | 5.4  | 6.1  | 6.2  | 6.3  | 6.4  | 7.1  |
|                        | 7.4  | 8.1  | 8.2  | 8.3  | 8.4  | 9.1  | 9.2  | 9.3  | 9.4  | 10.1 | 10.2 | 10.3 | 10.4 | 11.1 | 11.2 | 11.3 |
|                        | 11.4 | 12.1 | 12.2 | 12.3 | 12.4 | 13.1 | 13.2 | 13.3 | 13.4 | 14.1 | 14.2 | 14.3 | 14.4 | 15.1 | 15.2 | 15.3 |
|                        | 15.4 | 16.1 | 16.2 | 16.3 | 16.4 | 17.1 | 17.2 | 17.3 | 17.4 | 18.1 | 18.2 | 18.3 | 18.4 | 19.1 | 19.2 | 19.3 |
|                        | 19.4 | 20.1 | 20.2 | 20.3 | 20.4 | 21.1 | 21.2 | 21.3 | 21.4 | 22.1 | 22.2 | 22.3 | 22.4 | 23.1 | 23.2 | 23.3 |

Redundancy Port

SSM Address Enabled

GV Node-A 10.37.73.211 In 144 Stream 1

Name: GV Node-A 10.37.73.211 In 144 Stream 1

Description: GV Node-A 10.37.73.211 In 144 Stream 1

Stream Name: 10.37.73.211

Logical Level: MADI

Automatic Source

Automatic Destination

Enabled:

Expose Stream

IGMPv3 SSM Address: 0.0.0.0

SSM Address Enabled

## Configuring an IPG-3901 / IPG-4901 Device

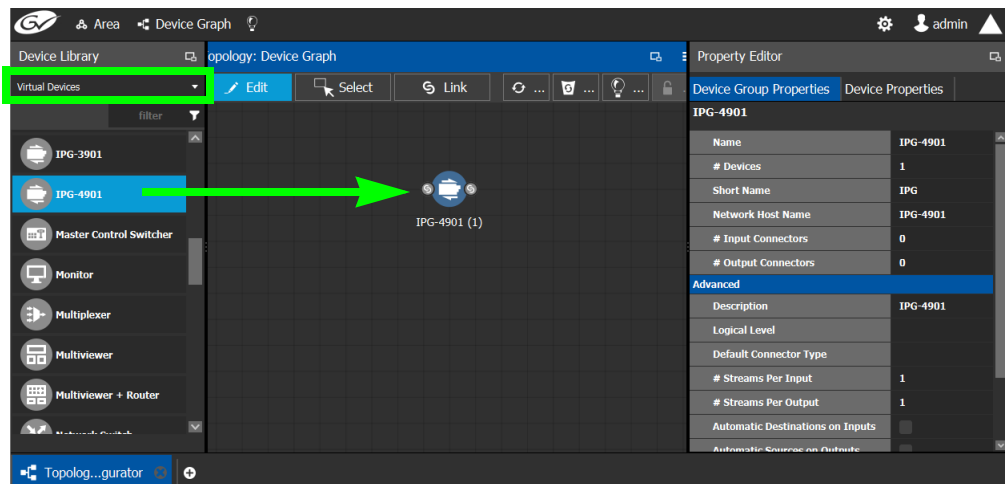
The Densité IP Gateway (IPG-3901) plug-and-play module is a 3 RU module for the Densité 3 frame, which provides bidirectional IP/SDI conversion. The Gateway operates with 10 GigE audio/video video-over-IP, supporting 4K UHD/3G/HD/SD-SDI formats.

The GV Node IP Gateway (IPG-4901) plug-and-play module is a 3 RU single slot module for the GV Node frame, which provides bidirectional fiber IP connectivity to provide conversion to and from other equipment that cannot be handled directly by the GV Node aggregation ports (GV Node's receivers and transmitters). This card allows the user to expand the receivers available on the GV Node, as well as it brings more flexibility to the allowed audio profiles that can be accepted through the IPG-4901

**PREREQUISITES:** All IPG-3901 and IPG-4901 devices must have been previously configured in iControl Navigator. GV Convergent reads this configuration information from iControl through the GV Node / Densité Manager.

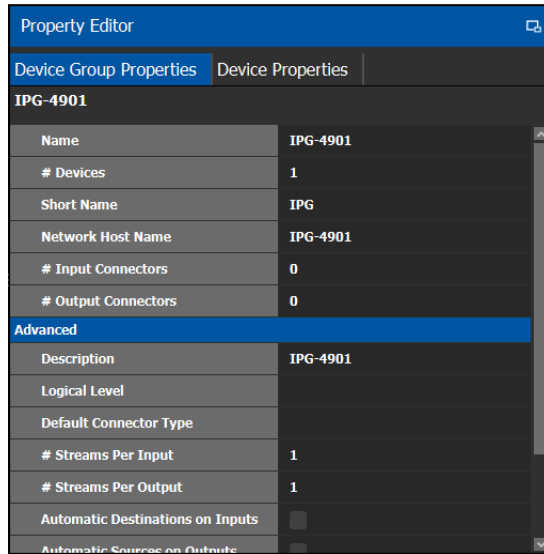
### To configure an IPG-3901 / IPG-4901 Device

- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.
- 3 From the **Device Library**, on the left, select **Virtual Device** from the drop-down list.



- 4 From the **Device Library**, **Virtual Device** select an IPG-3901 or IPG-4901 device bubble and drag it into position on the Device Graph and release the mouse button.
- 5 Click on the name of the device underneath the bubble to enter a meaningful name to identify this device in the **Name** field. See [To name a device and set the number of devices in the group](#), on page 41.

These parameters can also be set in the **Property Editor**.



- 6 Select **Device Group Properties**. Configure the **GV Node IP Address / Frame IP Address** and **Slot Number** properties. See also [Description of Common Device Properties](#), on page 104.

| Parameter                            | Description   |
|--------------------------------------|---|
| # Devices                            | The number of panel instances in this device group.   |
| Network Host Name                    | The hostname is the unique name by which the associated IPG-3901 or IPG-4901 is known on the network.   |
| # Input Connections                  | The current status for information purposes, once the <b>GV Node IP Address</b> and <b>Slot Number</b> parameters are configured and the topology is activated. See <a href="#">Activating a Topology</a> , on page 50. |
| # Output Connections                 |   |
| Advanced > Default Connector Type    |   |
| Advanced > # Streams Per Input       |   |
| Advanced > # Streams Per Output      |   |
| Advanced > Receive Stream IP Pattern |   |
| Advanced > Send Stream IP Pattern    |   |

- 7 Activate the topology. See [Activating a Topology](#), on page 50.  
The card configuration is read from Densite Manager and applied to the device.

8 Select the **Device Properties** tab and then select **IPG** next to **Devices**. See also [Description of Common Device Properties](#), on page 104.

| Parameter                  | Applies to |          | Description   |
|----------------------------|------------|----------|---|
|                            | IPG-3901   | IPG-4901 |   |
| Network Host Name          | •          | •        | The hostname is the unique name by which the associated IPG-3901 or IPG-4901 is known on the network.   |
| GV Node IP Address         |            | •        | IP Address of the CPU-ETH3 for the GV Node frame into which the IPG-4901 card is installed.   |
| Frame IP Address           | •          |          | IP Address of the CPU-ETH3 for the Densité frame into which the IPG-3901 card is installed.   |
| Slot Number                | •          | •        | The slot in which the IPG-3901 or IPG-4901 device is located in the GV Node frame.  |
| Connection to Controller 1 | •          | •        | Connection to Controller 1 shows the connection status of the IPG device with the primary server of a server group.   |
| Connection to controller 2 | •          | •        | Connection to Controller 2 shows the connection status of the IPG device with the secondary server of a server group. See <a href="#">Configuring a Controller Group</a> , on page 18.<br><b>unknown:</b> the topology is inactive (see <a href="#">Activating a Topology</a> , on page 50) or the IPG device does not have network connectivity to the GV Convergent server(s).<br><b>offline:</b> the IPG device does not have network connectivity to the GV Convergent server(s).<br><b>online:</b> the IPG device is connected to the GV Convergent server(s). |
| Firmware Version           | •          | •        | Shows the firmware version installed on the IPG-3901 or IPG-4901 card. This shows the current status for information purposes.  |
| Internal Wiring Done       | •          | •        | Shows if the internal modeling of the IPG-3901 or IPG-4901 is complete.   |
| Operation Mode             | •          | •        | Shows the operation mode of the ETH2 port of the IPG-3901 or IPG-4901 card for information purposes:<br><b>Redundancy:</b> ETH 2 is redundant to ETH 1.<br><b>Aggregation:</b> Both ETH 1 and ETH 2 are available simultaneously.<br><b>OFF:</b> ETH 2 is disabled.   |

- 9 Select **ETH#** next to **Ethernet Ports**. These are the network configuration parameters for the IPG-3901 or IPG-4901 card's Ethernet ports. See also [Description of Common Device Properties](#), on page 104.

| Parameter   | Description                                    |
|-------------|--|
| IP Address  | The network IP address for this Ethernet port. |
| Gateway     | The network gateway IP address.                |
| Subnet Mask | The IP network's subnet mask.                  |

- 10 Select one of the streams next to **Gateways** (by default labelled as **OUT#** or **IN#**). See also [Description of Common Device Properties](#), on page 104.

| Parameter                   | Description  |
|-----------------------------|--|
| Direction                   | This shows the current status for information purposes.  |
| Logical Level on SDI Stream | To force a stream to use the IPG-3901 or IPG-4901 device, create a new level (see <a href="#">Duplicating a Logical Level</a> , on page 27) that you will use to select these specific streams at the source and destination ports. Set the logical level that will be used for this here.<br><br>For example, create a logical level called IPG-SDI from the SDI logical level. Now use this level to send and receive streams to and from this device. |

- 11 Select **1** or **2** next to **Streams**. See also [Description of Common Device Properties](#), on page 104.

| Parameter                   | Description  |
|-----------------------------|--|
| Ethernet Port               | The Ethernet port this gateway is assigned to (ETH 1 or ETH 2). This shows the current status for information purposes.  |
| Format                      | The gateway format: SD, HD, or 3G for video streams, or AES67 profile for audio streams. This shows the current status for information purposes.                             |
| IGMPv3 Source               | For a receiver gateway, this is the address of the joined stream's port when SSM Address is enabled on the device.   |
| IP Address                  | The stream's network IP address.   |
| Logical Level on ETH stream | The Logical level to apply on the ETH side of the gateway. By default for the video stream, this value is SDI and for the audio stream, this value is SDI audio.             |
| Port                        | The stream's network port.   |
| Redundant IGMPv3 Source     | When the IPG-3901 or IPG-4901 card is in Redundancy mode: for a receiver gateway, this is the address of the joined stream's port when SSM Address is enabled on the device. |

| Parameter            | Description  |
|----------------------|--|
| Redundant IP Address | When the IPG-3901 or IPG-4901 card is in Redundancy mode: the stream's network IP address. |
| Redundant Port       | When the IPG-3901 or IPG-4901 card is in Redundancy mode: the stream's network port.       |

## Connecting an IPG-4901 device

The IPG 4901 has 9 SDI input ports, 9 SDI output ports, and 2 bidirectional ETH ports. The SDI ports must be connected to the SDI ports of the GV Node in which the IPG-4901 is slotted in. This rule is not enforced in GV Convergent. GV Convergent allows you to use an IPG-4901 like an IPG-3901, however this is not a valid use case and will not work.

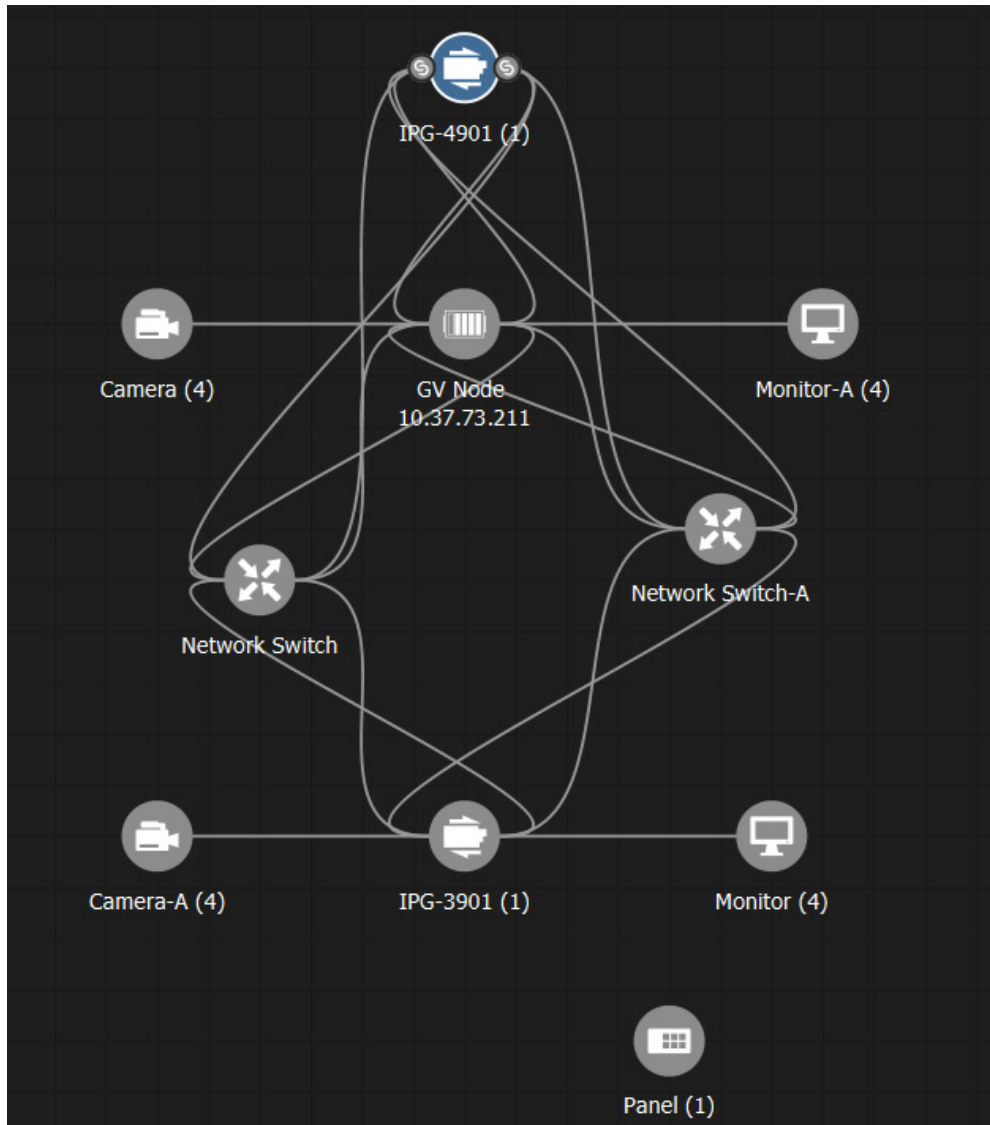
The 9 SDI input ports short labels are called OUT for OUT from fabric, and the 9 SDI output ports short labels are called IN for In to fabric to follow iControl's behavior.

## Device properties

- It is possible to assign a logical level to SDI ports by changing the Logical Level of SDI stream at the Gateway level.
- It is possible to assign a logical level to IP streams by changing the Logical Level on ETH stream on Stream level, under the Gateway.
- It is possible to change the multicast address for SDI to IP gateways (called OUT) by changing the IP Address, Port, Redundant IP Address and Redundant Port properties on Stream level, under Gateway. These changes are propagated to iControl.
- In OFF or Redundancy mode, gateways OUT 6 to 9 and IN 6 to 9 are disabled and not visible in **Property Editor**. They become visible only if card is in Aggregation mode.



## Example Topology Using an IPG-4901



## Configuring an IQMix or IQUCP25 Device

The IQMIX / IQUCP25 series is a range of multi-channel video over IP transceiver modules developed for use within low latency, high bandwidth Ethernet IP networks, capable of encoding / decoding multiple SDI signals. They provide both compressed and uncompressed modes of operation.

The inputs and outputs of an IQMIX / IQUCP25 are called *spigots*. There are a variety of spigot configurations that are available; for example, 6 inputs / 6 outputs, 12 inputs / 0 outputs, 0 inputs / 12 outputs, 8 inputs / 0 outputs. See also [How to Know if a Spigot is an Input or an Output](#), on page 124.

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### WARNING

The spigot configuration is set through Orbit and then GV Convergent reads it from the IQMIX / IQUCP25 card. For any given spigot, you must know which mode (input or output) has been configured to connect the spigots correctly in GV Convergent.

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There is no offline configuration of the IQMIX / IQUCP25 device. It must first be discovered on the network by GV Convergent.

The IQMIX / IQUCP25 device must have been previously configured with Orbit before being integrated into GV Convergent as most configuration parameters shown in GV Convergent are for information purposes only (GV Convergent reads it from the IQMIX / IQUCP25 devices). See the IQMIX / IQUCP25 User Manual for more information.

**PREREQUISITES:** The Domain ID of the IQMIX / IQUCP25 device(s) must be set in the System Controller Group Properties under **Domain Ids**. See [Configuring a Controller Group](#), on page 18. These devices must be on the same subnet that the GV Convergent server is connected to.

---

**Note:** An IQMix using VC2 video compression format is not currently supported by GV Convergent.

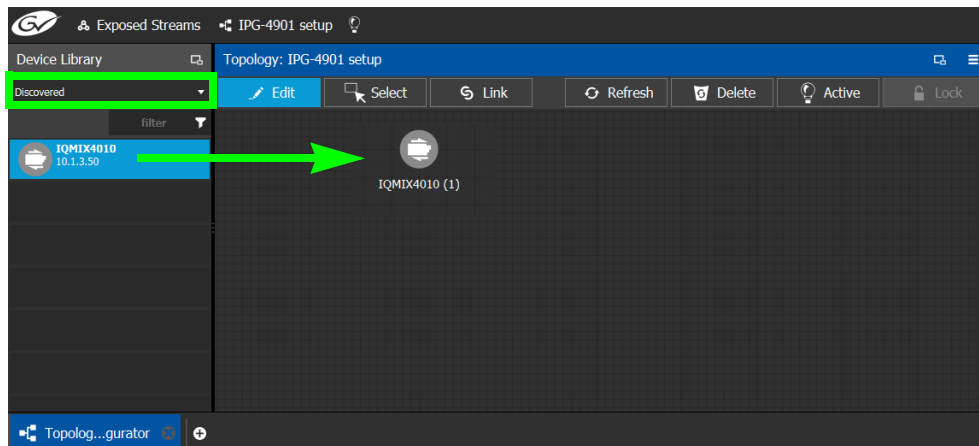
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### Related Topics

- [How to Know if a Spigot is an Input or an Output](#), on page 124
- [Configuring 4K / UHD Streams for use with an IQMix or IQUCP25 Device](#), on page 125

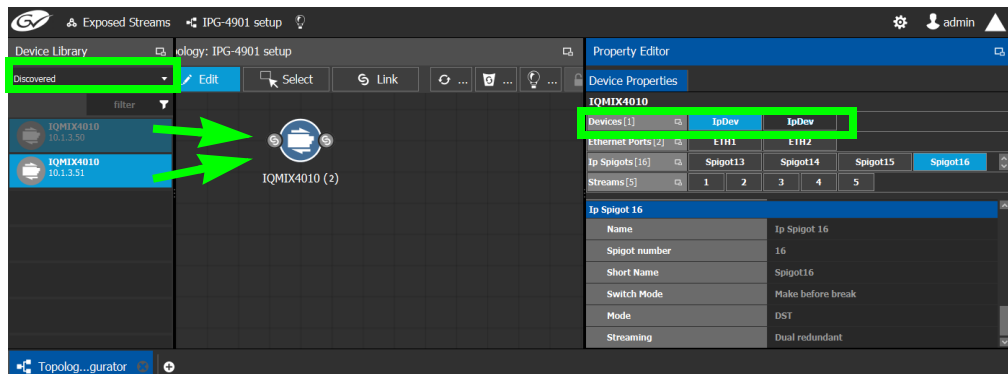
### To configure an IQMIX / IQUCP25 Device

- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.
- 3 From the **Device Library**, on the left, select **Discovered** from the drop-down list.



- 4 From the **Device Library, Discovered** find an IQMIX / IQUCP25 device that you want to control: select the device bubble and drag it into position on the Device Graph and release the mouse button.

The device pulled from the **Device Library, Discovered** becomes greyed out and another instance of the same device instance cannot be added again to the Device Graph. However, multiple device instances found in the Device Library can be used to create a device group.



- 5 To create a device group:
  - a From the **Device Library, Discovered** find an IQMIX / IQUCP25 device that you want to control: select the device bubble and drag it into position on the Device Graph and release the mouse button.
  - b From the **Device Library, Discovered** find another IQMIX / IQUCP25 device that you want to control: select the device bubble and drag it on top of the first device instance already on the Device Graph and release the mouse button.

The two device instances are shown and can be individually configured in the **Property Editor**, under **Devices**, by clicking an instance.

- 6 Click on the name of the device underneath the bubble to name the device or device group. See [To name a device and set the number of devices in the group](#), on page 41.
- 7 Configure the IQMIX / IQUCP25 properties. See also [Description of Common Device Properties](#), on page 104. The IQMIX / IQUCP25 device should be first configured with

Orbit before being integrated into GV Convergent as most configuration parameters shown in GV Convergent are shown for information purposes only.

| Parameter         | Description   |
|-------------------|---|
| Network Host Name | The hostname is the unique name by which the associated IQMIX / IQUCP25 is known on the network.  |
| Domain ID         | Set the same Domain IDs on all IQMIX / IQUCP25 devices that are to communicate with each other on the network.<br>The default value for Grass Valley equipment is <b>101</b> .<br>Valid range: 0 to 232.<br>See also <a href="#">Configuring a Controller Group</a> , on page 18. |
| Internal wiring   | Shows if the internal modeling of the IQMIX / IQUCP25 is complete.  |

- 8 Create and connect the edge devices (SDI and IP devices) that are connected to the IQMIX / IQUCP25. See [Linking the Devices in a Topology](#), on page 41.

## How to Know if a Spigot is an Input or an Output

To know if a spigot in GV Convergent is an input or output, proceed as follows:

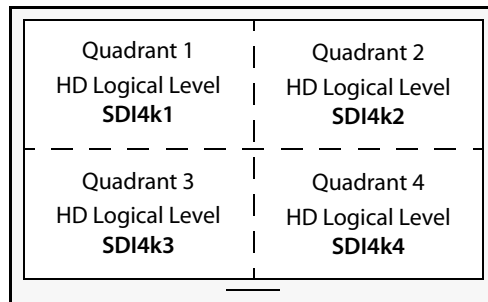
- 1 Select the device bubble on the Topology Configurator. See [Selecting a Topology](#), on page 34.
- 2 Expand **Ip Spigots** in **Device Properties** and select a spigot from the list.
- 3 For each spigot, interpret the **Mode** property as follows:
  - SRC = Output
  - DST = Input

## Configuring 4K / UHD Streams for use with an IQMix or IQUCP25 Device

To support 4K streams, a quad-link (square division) configuration is used. That is, the 4K image is divided into four HD quadrants, and each quadrant is sent as four separate streams. These four streams must:

- each be individually represented by four logical levels; one level for each quadrant. For example, **SDI4k1**, **SDI4k2**, **SDI4k3** and **SDI4k4**.
- be logically linked together so that they are switched together at once ensuring that there is no switching delay between the four streams that would create visible glitches between the four quadrants.

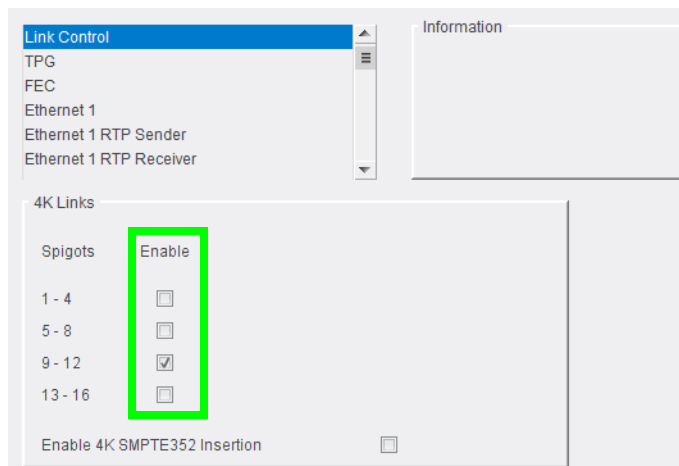
The following shows the typical video stream composition of a 4K quad-link display with the associated logical levels used in this procedure.



4K / UHD Composite Image

### PREREQUISITES:

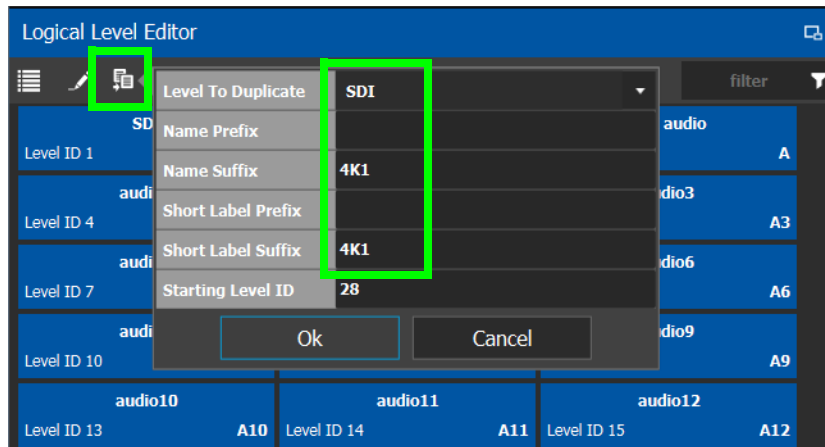
- The IQMix / IQUCP device(s) must already be configured in GV Convergent. See [Configuring an IQMix or IQUCP25 Device](#), on page 122.
- Configure the IQMix / IQUCP device spigots to be used for 4K in Orbit by enabling the **4K Links** parameter in the **Link Control Page** for all quad-link signal spigots.



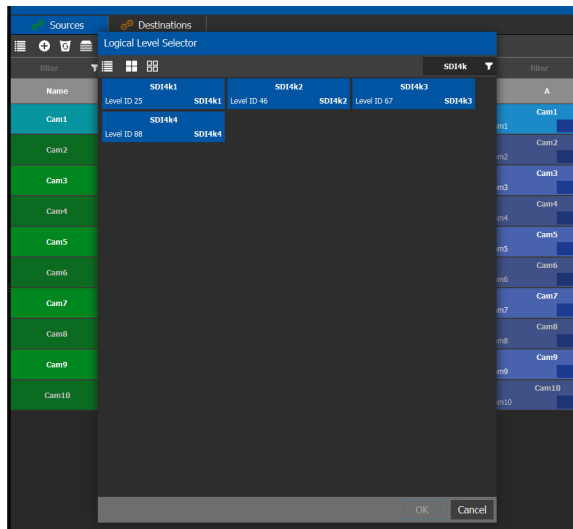
### To configure 4K / UHD Streams

- 1 Create the logical levels necessary to support quad-link sources and destinations:  
Create the following 4K logical levels from the Logical Level Editor from the pre-

existing SDI logical level: SDI4k1, SDI4k2, SDI4k3 and SDI4k4. See [Duplicating a Logical Level](#), on page 27.



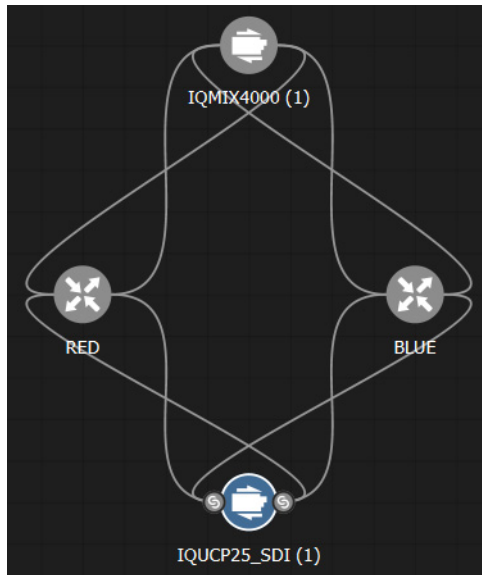
- From the logical device table, click the Levels icon . See [Accessing the Logical Device Table](#) task, on page 56.
- Select the levels you want to display in the table. As shown below, a filter SDI4k was applied and then you can select the 4 SDI 4k levels.



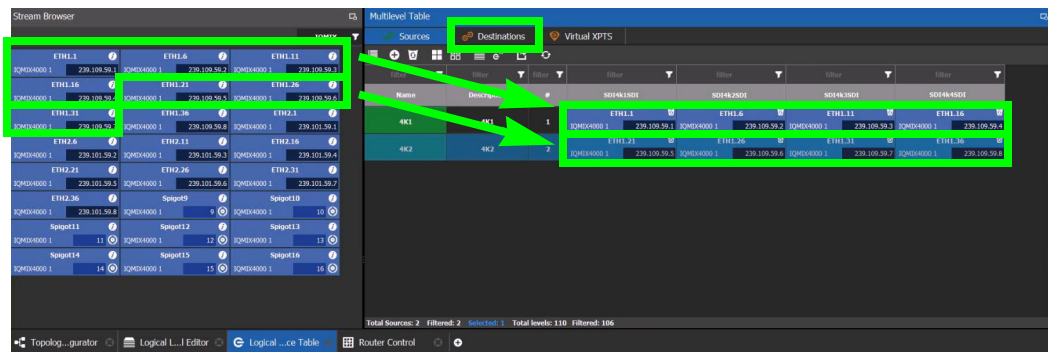
The logical device table will show 4 items (SDI4k1, SDI4k2, SDI4k3, and SDI4k4), each with a 4K level representing one quadrant of a of a quad-link signal.

- Add IQMix / IQUCP device(s) to the topology and configure them in GV Convergent. See [Configuring an IQMix or IQUCP25 Device](#), on page 122.
- Link the IQMix / IQUCP device(s) to the logical sources and destinations in GV Convergent. See [Linking the Devices in a Topology](#), on page 41 and [Setting the Link's Physical Connection Parameters \(Sources and Destinations\)](#), on page 42.

The following topology will be used as an example, where the IQMix is used as the 4K stream sources (called 4K1 and 4K2) and the IQUCP is used as the 4K stream destination (called DEST-4K).



6 In the Logical Device Table, map streams with levels: Configure the 4K sources and destinations by assigning quad-link IP streams to each level.



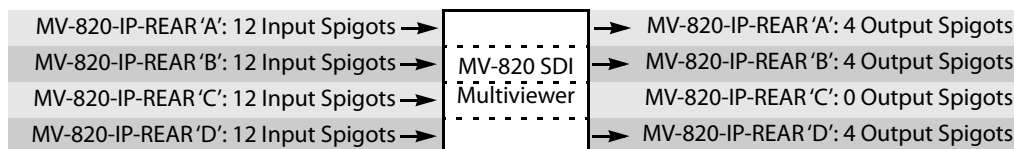
7 Repeat step 6 for destinations.

8 Test the configuration by making takes between a logical source and destination that use the quad-level link streams. See [Performing a Take in Router Control](#), on page 190.

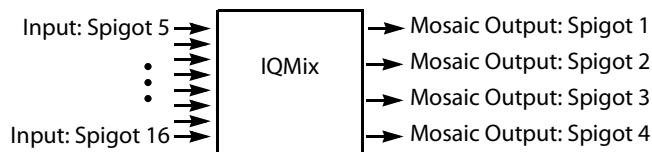
## Configuring an MV-820-IP Multiviewer Device

The MV-820-IP multiviewer has 48 IP inputs and 12 IP outputs in a 2 RU chassis, making it ideal for high-density IP monitoring applications. Internally, the MV-820-IP multiviewer is an MV-820 SDI multiviewer wrapped inside four IQMix cards to provide IP connectivity through a rear panel that supports the QSFP network interface adapters (refer to the MV-820 Multiviewer User Manual, where this is referred to as the *Video IP Circuitry*). These four IQMix cards are used to convert the IP network input streams to feed the 48 × SDI inputs of the MV-820 cards, and uses three of the four same IQMix cards to also convert the 12 × SDI mosaic outputs of the MV-820 cards into IP stream outputs. These IQMix cards are labelled as *MV-820-IP-REAR* in Orbit and GV Convergent. See [Configuring an IQMix or IQUCP25 Device](#), on page 122 for more information about how to configure an IQMix.

The inputs and outputs of an MV-820-IP are called spigots that, within GV Convergent, are provided by four MV-820-IP-REAR devices with the following spigot configuration: 48 input spigots across four MV-820-IP-REAR devices and 12 mosaic output spigots across three MV-820-IP-REAR devices. The third MV-820-IP-REAR device has no output spigots.



For each MV-820-IP-REAR device, the spigots are used as follows. The third MV-820-IP-REAR device has no output spigots. See also [How to Know if a Spigot is an Input or an Output](#), on page 124.



There is no offline configuration of the MV-820-IP device. It must first be discovered on the network by GV Convergent.

The MV-820-IP multiviewer must have been previously configured with Orbit before being integrated into GV Convergent as most configuration parameters shown in GV Convergent are for information purposes only (GV Convergent reads it from the MV-820-IP cards). See the MV-820-IP User Guide for more information.

For example, in Orbit 2.5 the MV-820-IP is shown as 4 × MV-820-IP-REAR.

| Device GUID                            | Device Name                            | Device Type    | Software | Firmware | Primary IP Address | Secondary IP Address | Control IP Address | Primary Link |
|--|--|----------------|----------|----------|--------------------|----------------------|--------------------|--------------|
| (139F7C1E-1D02-1182-8748-002370008A8C) | (139F7C1E-1D02-1182-8748-002370008A8C) | IQMIX4010      | 11.58.71 | B24CA1E  | 190.108.2.109      | 192.102.2.125        |                    | 10 Gb        |
| (139F7C1E-1D02-1182-8748-002370008A8D) | (139F7C1E-1D02-1182-8748-002370008A8D) | IQMIX4010      | 11.58.71 | B24CA1E  | 190.108.2.110      | 192.102.2.126        |                    | 10 Gb        |
| (13A0690D-1D02-1182-8E0F-002370008FC4) | (13A0690D-1D02-1182-8E0F-002370008FC4) | MV-820-IP-REAR | 11.54.71 | ABA505AC | 190.107.34.2       | 192.105.34.2         |                    | 50 Gb        |
| (13A087D0-1D02-1182-8B38-002370006D66) | (13A087D0-1D02-1182-8B38-002370006D66) | MV-820-IP-REAR | 11.54.71 | ABA505AC | 190.107.35.2       | 192.105.35.2         |                    | 50 Gb        |
| (13A087D0-1D02-1182-8B38-002370006D69) | (13A087D0-1D02-1182-8B38-002370006D69) | MV-820-IP-REAR | 11.54.71 | ABA505AC | 190.107.36.2       | 192.105.36.2         |                    | 50 Gb        |
| (13A087D0-1D02-1182-8B38-002370008FC1) | (13A087D0-1D02-1182-8B38-002370008FC1) | MV-820-IP-REAR | 11.54.71 | ABA505AC | 190.107.34.6       | 192.105.34.6         |                    | 50 Gb        |

**PREREQUISITES:** The Domain ID of the MV-820-IP devices must be set in the System Controller Group Properties under **Domain Ids**. See [Configuring a Controller Group](#), on page 18. These devices must be on the same subnet that the GV Convergent server is connected to.



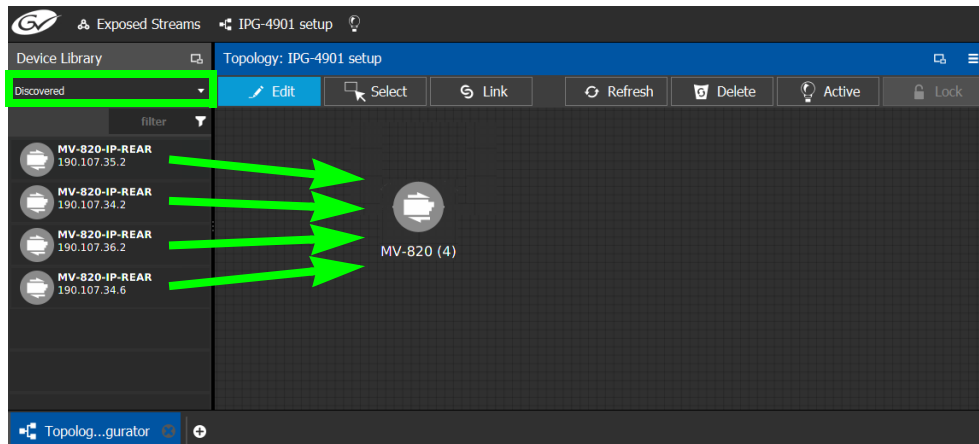
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**Note:** An MV-820-IP using VC2 video compression format is not currently supported by GV Convergent.

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### To configure an MV-820-IP Multiviewer

- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.
- 3 From the **Device Library**, on the left, select **Discovered** from the drop-down list.



- 4 From the **Device Library**, **Discovered** find the four MV-820-IP-REAR devices with the IP addresses that correspond with those for the MV-820-IP multiviewer on your network: select one of the MV-820-IP-REAR device bubbles and drag it into position on the Device Graph and release the mouse button.

The device pulled from the **Device Library**, **Discovered** becomes greyed out and another instance of the same device instance cannot be added again to the Device Graph.

- 5 Now create a device group by adding the remaining three MV-820-IP-REAR device bubbles on top of the MV-820-IP-REAR already on the Device Graph:
  - a Select another MV-820-IP-REAR device bubble from the **Device Library** and drag it on top of the first MV-820-IP-REAR device instance already on the Device Graph and release the mouse button.
  - b Repeat this action for the third and fourth MV-820-IP-REAR device bubble in the **Device Library**.

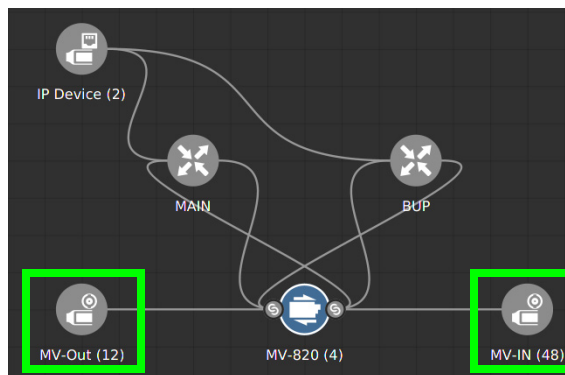
The four MV-820-IP-REAR device instances are shown as a single device on the Device Graph and can be individually configured in the **Property Editor**, under **Devices**, by clicking an instance.

- 6 Click on the name of the device underneath the bubble to name the device or device group. See [To name a device and set the number of devices in the group](#), on page 41.
- 7 Configure the MV-820-IP multiviewer's properties. See also [Description of Common Device Properties](#), on page 104. The MV-820-IP device should be first configured with

Orbit before being integrated into GV Convergent as most configuration parameters shown in GV Convergent are shown for information purposes only.

| Parameter         | Description   |
|-------------------|---|
| Network Host Name | The hostname is the unique name by which the associated MV-820-IP is known on the network.  |
| Domain ID         | Set the same Domain IDs on all MV-820-IP devices that are to communicate with each other on the network.<br>The default value for Grass Valley equipment is <b>101</b> .<br>Valid range: 0 to 232.<br>See also <a href="#">Configuring a Controller Group</a> , on page 18. |
| Internal wiring   | Shows if the internal modeling of the MV-820-IP is complete.  |

- 8 Create the logical sources and destinations in GV Convergent for the MV-820-IP by adding SDI devices to the topology and then linking them. See [Linking the Devices in a Topology](#), on page 41 and [Setting the Link's Physical Connection Parameters \(Sources and Destinations\)](#), on page 42. An example is shown below.

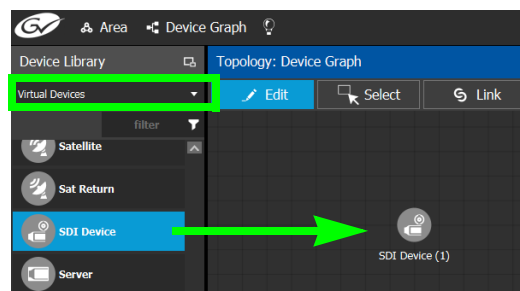


Logical Sources  
 Represent the  
 Multiviewer's SDI  
 Mosaic Outputs

Logical  
 Destinations  
 Represent the  
 Multiviewer's SDI  
 Inputs

These logical sources and destinations represent the SDI inputs and outputs of the MV-820 multiviewer that will be used when making a take.

- a From the **Device Library, Virtual Devices** find the SDI Device bubble and drag it into position on the Device Graph and release the mouse button.



- b Click on the name of the device underneath the bubble to name the device or device group. See [To name a device and set the number of devices in the group](#), on

page 41. For example, Enter *MV-Out* in both the **Name** and **Short Name** fields, then enter 12 for the number of device instances. These parameters can also be set in the **Property Editor**.

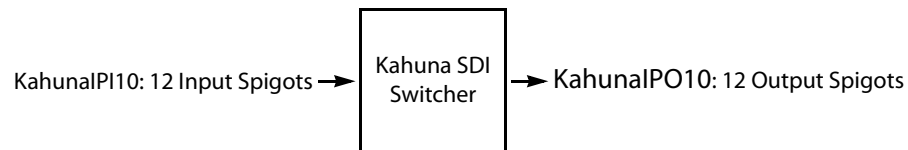
- c From the **Device Library, Virtual Devices** find the SDI Device bubble and drag it into position on the Device Graph and release the mouse button.
- d Click on the name of the device underneath the bubble to name the device or device group. For example, Enter *MV-In* in both the **Name** and **Short Name** fields, then enter 48 for the number of device instances.
- e Interconnect the SDI source and destination devices to the proper IQMix spigot SDI inputs and outputs as shown above.

If needed, contact support for more information as how to configure this device. See [Grass Valley Technical Support](#), on page 206.

## Configuring a Kahuna IP Production Switcher Device

The Kahuna IP is a production switcher. Internally, the Kahuna IP production switcher is an Kahuna SDI production switcher wrapped inside two IQMix cards to provide IP connectivity. These two IQMix cards are used to convert the IP network input streams to feed the 12 × SDI inputs of the Kahuna, and the other IQMix card to convert the 12 × SDI outputs of the Kahuna into IP stream outputs. These IQMix cards are labelled as *KahunaIP10* and *KahunaPO10* in GV Convergent. See [Configuring an IQMix or IQUCP25 Device](#), on page 122 for more information about how to configure an IQMix.

The inputs and outputs of a Kahuna IP are called *spigots*. There are 12 input and 12 output spigots. In the GV Convergent Device Library, the Kahuna IP switcher is discovered as two separate IP devices: the first represents the IP inputs (device type: KahunaIP10) and the second represents the IP outputs (device type: KahunaPO10).



See also [How to Know if a Spigot is an Input or an Output](#), on page 124.

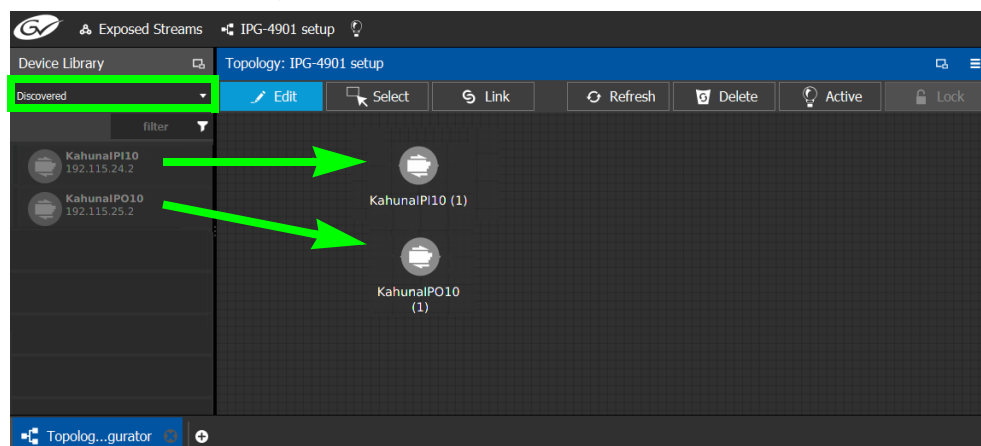
There is no offline configuration of the Kahuna IP device. It must first be discovered on the network by GV Convergent.

The Kahuna IP device must have been previously configured with Orbit before being integrated into GV Convergent as most configuration parameters shown in GV Convergent are for information purposes only (GV Convergent reads it from the Kahuna IP device). See the Kahuna IP User Guide for more information.

**PREREQUISITES:** The Domain ID of the Kahuna IP device(s) must be set in the System Controller Group Properties under **Domain Ids**. See [Configuring a Controller Group](#), on page 18. These devices must be on the same subnet that the GV Convergent server is connected to.

### To configure a Kahuna IP Device

- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.
- 3 From the **Device Library**, on the left, select **Discovered** from the drop-down list.



The Kahuna IP is discovered as two separate IP devices: the first represents the IP inputs (device type: KahunaPI10) and the second represents the IP outputs (device type: KahunaPO10).

- 4 From the **Device Library, Discovered** find the Kahuna IP input device that you want to control: select the KahunaPI10 device bubble and drag it into position on the Device Graph and release the mouse button.

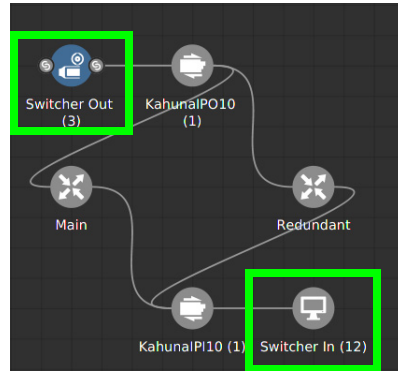
The device pulled from the **Device Library, Discovered** becomes greyed out and another instance of the same device instance cannot be added again to the Device Graph.

- 5 From the **Device Library, Discovered** find the matching KahunaPO10 device bubble and drag it into position on the Device Graph and release the mouse button.
- 6 For each Kahuna IP device (IP inputs device type: **KahunaPI10** and IP outputs device type: **KahunaPO10**) Click on the name of the device underneath the bubble to name the device. See [To name a device and set the number of devices in the group](#), on page 41.
- 7 Configure the Kahuna IP properties. See also [Description of Common Device Properties](#), on page 104. The Kahuna IP device should be first configured with Orbit before being integrated into GV Convergent as most configuration parameters shown in GV Convergent are shown for information purposes only.

| Parameter         | Description   |
|-------------------|---|
| Network Host Name | The hostname is the unique name by which the associated Kahuna IP is known on the network.  |
| Domain ID         | Set the same Domain IDs on all Kahuna IP devices that are to communicate with each other on the network.<br>The default value for Grass Valley equipment is <b>101</b> .<br>Valid range: 0 to 232.<br>See also <a href="#">Configuring a Controller Group</a> , on page 18. |
| Internal wiring   | Shows if the internal modeling of the Kahuna IP is complete.  |

- 8 Create and connect the edge devices (SDI and IP devices) that are connected to the Kahuna IP. See [Linking the Devices in a Topology](#), on page 41. An example is shown below.

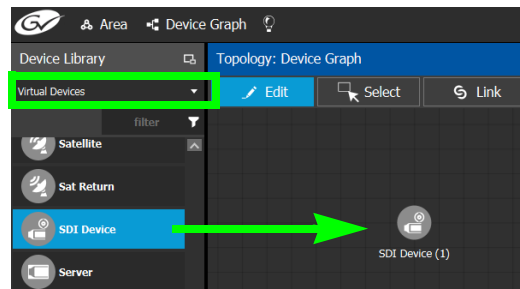
Logical Sources  
Represent the  
Switcher's SDI  
Mosaic Outputs



Logical Destinations  
Represent the  
Switcher's SDI Inputs

These logical sources and destinations represent the SDI inputs and outputs of the Kahuna switcher that will be used when making a take.

- a From the **Device Library, Virtual Devices** find the SDI Device bubble and drag it into position on the Device Graph and release the mouse button.



- b Click on the name of the device underneath the bubble to name the device or device group. See [To name a device and set the number of devices in the group](#), on page 41. For example, Enter *Switcher-Out* in both the **Name** and **Short Name** fields, then enter 3 for the number of device instances. These parameters can also be set in the **Property Editor**.
- c From the **Device Library, Virtual Devices** find the Monitor Device bubble and drag it into position on the Device Graph and release the mouse button.
- d Click on the name of the device underneath the bubble to name the device or device group. For example, Enter *Switcher-In* in both the **Name** and **Short Name** fields, then enter 12 for the number of device instances.
- e Interconnect the SDI source and destination devices to the proper IQMix spigot SDI inputs and outputs as shown above.

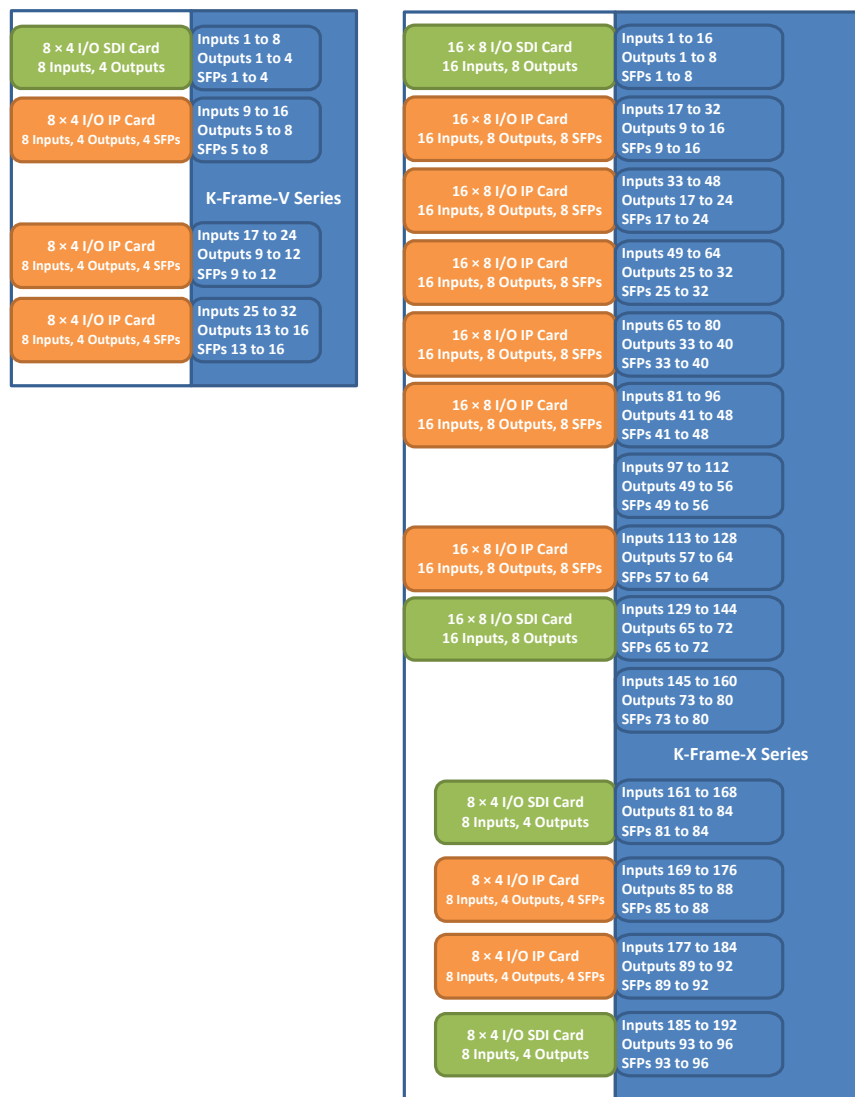
If needed, contact support for more information as how to configure this device. See [Grass Valley Technical Support](#), on page 206.

## Configuring a K-Frame Production Switcher

The K-Frame is a series of production switchers, and certain models support IP connectivity. The following frames are supported:

- K-Frame-V Production Switcher has 4 slots each providing 8 inputs and 4 outputs to the switcher, for a total of 32 inputs x 16 outputs.
- K-Frame-X Production Switcher has 14 slots. 10 slots each providing 16 inputs and 8 outputs to the switcher, followed by 4 slots each providing 8 inputs and 4 outputs of the switcher, for a total of 192 inputs x 96 outputs.

The following diagram shows a K-Frame-V / K-Frame-X Production Switchers populated with a typical assortment of I/O cards.



There are two types of modules which can be used in the K-Frame Production Switcher slots:

- SDI only card, equipped with BNC connectors.

- IP only card, equipped with SFP connectors.

Here are some details about IP cards you will need to know to model your K-Frame Production Switcher in GV Convergent:

- An SFP can receive two streams and transmit one. A stream is a group of the essence flows (a 2022-6 stream has a single flow, a TR-04 stream has two flows and a 2110 stream has three flows)
- Each SFP stream maps directly to a switcher input or output of the slot. For example: the IP card in the second slot of the K-Frame-V Production Switcher has 4 SFP pairs (for redundancy) providing signals to inputs 9-16 of the switcher. The first SFP provides streams for inputs 9-10, the second SFP provides streams for inputs 11-12 and so on.
- IP cards support SMPTE 2022-6, SMPTE 2110, and TICO.
- Redundancy in SMPTE 2022 and SMPTE 2110 is supported.
- For SMPTE 2110-30, the following profiles are supported: L16/48K/125us, L16/48K/1ms, L24/48K/125us, L24/48K/1ms.

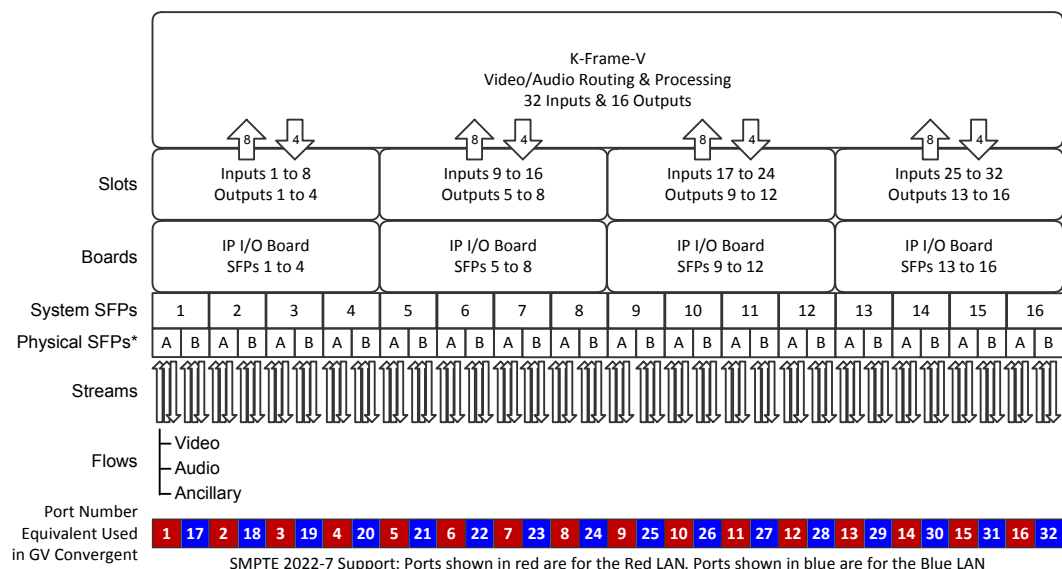
Note that GV Convergent only controls the K-Frame Production Switcher’s IP receivers and transmitters. In consequence, The K-Frame Production Switcher must have been previously setup and configured before being integrated into GV Convergent. See the *K-Frame Installation & Service Manual* for more information.

PREREQUISITES: GV Convergent must have IP connectivity to the K-Frame Production Switcher:

- to automatically detect the K-Frame Production Switcher’s model (K-Frame-V / K-Frame-X) and its current configuration parameters that are needed by GV Convergent.
- before making connections to the *Production Switcher* bubble in GV Convergent. See [To configure a K-Frame Production Switcher](#), on page 137.

### K-Frame Production Switcher Nomenclature used in GV Convergent

The following diagram shows the nomenclature used in GV Convergent for the K-Frame-V Production Switcher signal flow. A K-Frame-X Production Switcher’s signal flow uses a similar architecture, with more inputs and outputs.





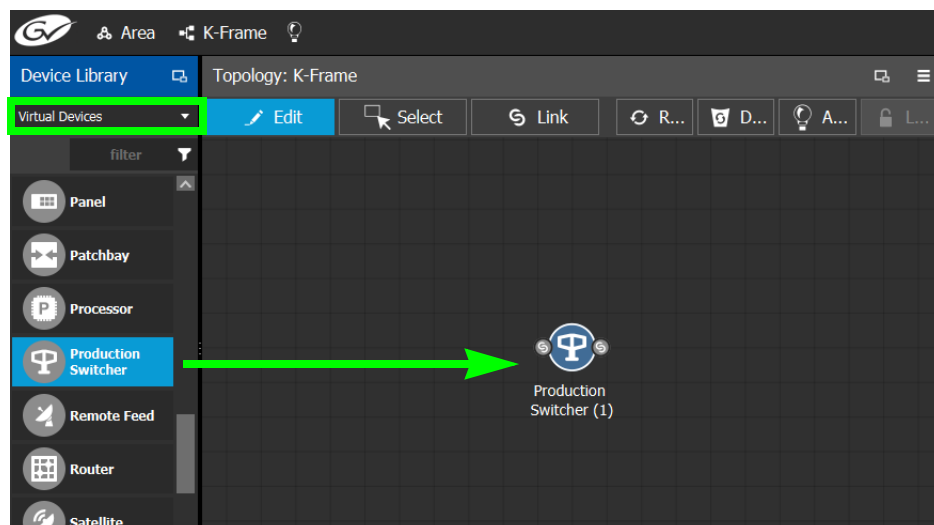
\* Note that GV Convergent's **Short Name** property for a port is composed of a combination of the System SFP number and the Physical SFP letter in the following format:  
SFP-[System SFP number][Physical SFP letter]  
For example, **SFP-1A** is the first input port. This port is shown below in the K-Frame Menu for reference.



When *Redundancy Mode* is *Enabled* in the K-Frame Menu, you must use a SMPTE 2022-7 network setup; see [Configuring Network Switch Redundancy to Support SMPTE 2022-7](#), on page 153.

### To configure a K-Frame Production Switcher

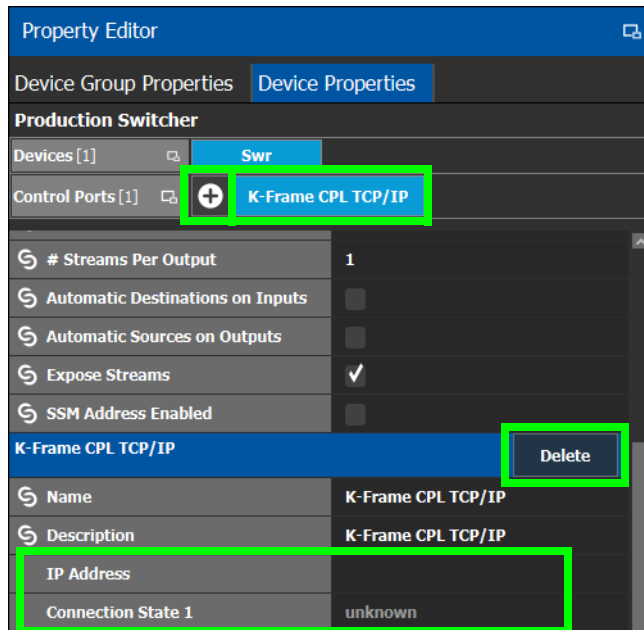
- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.
- 3 From the **Device Library**, on the left, select **Virtual Devices** from the drop-down list.



- 4 From the **Device Library, Virtual Device** select a **Production Switcher** device bubble and drag it into position on the Device Graph and release the mouse button.
- 5 Click on the name of the device underneath the bubble to enter a meaningful name to identify this device in the **Name** field. See [To name a device and set the number of devices in the group](#), on page 41.

These parameters can also be set in the **Property Editor**.

- 6 Select **Device Properties** and click **New**  next to **Control Port** at the top of the **Property Editor** and select **K-Frame CPL TCP/IP** from the list.



The **K-Frame CPL TCP/IP** tab appears. To remove the control port, click **Delete**.

- 7 Configure the K-Frame Production Switcher properties. See also [Description of Common Device Properties](#), on page 104.

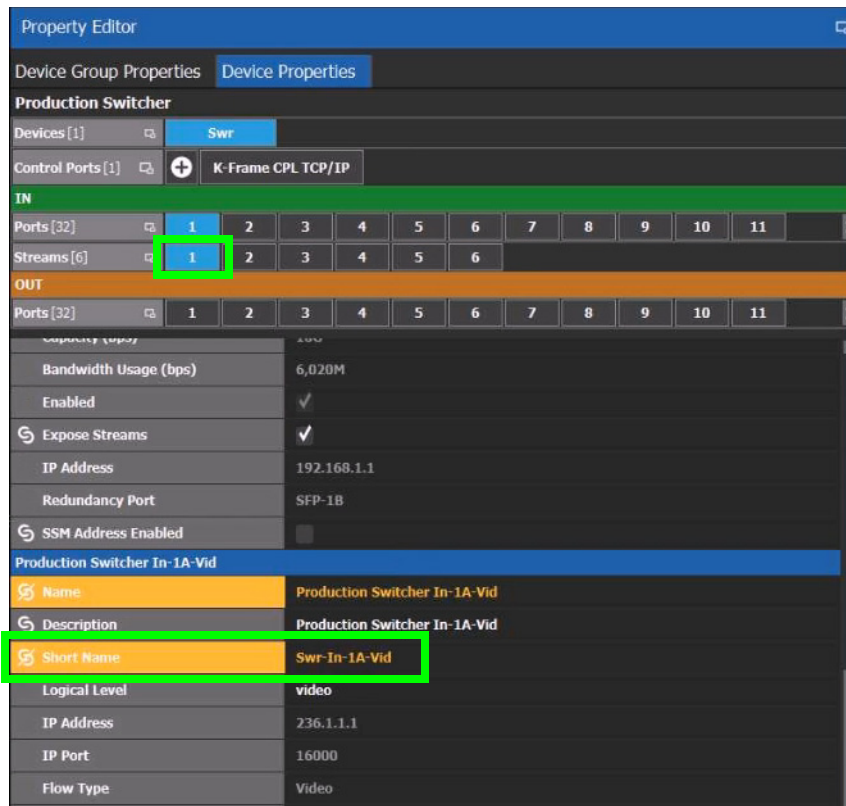
| Parameter         | Description  |
|-------------------|--|
| Network Host Name | The hostname is the unique name by which the associated K-Frame Production Switcher is known on the network.   |
| IP Address        | The IP address of the K-Frame Production Switcher to be controlled. Once connected, GV Convergent automatically detects the K-Frame Production Switcher's model (K-Frame-V / K-Frame-X) and K-Frame Production Switcher's configuration parameters that are needed by GV Convergent. |

| Parameter                                | Description   |
|--|---|
| Connection State 1<br>Connection State 2 | <p>K-Frame Production Switcher Connection State 1 shows the connection status of the K-Frame Production Switcher with the primary server of a server group.</p> <p>K-Frame Production Switcher Connection State 2 shows the connection status of the K-Frame Production Switcher with the secondary server of a server group. See <a href="#">Configuring a Controller Group</a>, on page 18.</p> <p><b>unknown:</b> the topology is inactive (see <a href="#">Activating a Topology</a>, on page 50) or the K-Frame Production Switcher does not have network connectivity to the GV Convergent server(s).</p> <p><b>Reconnecting:</b> the topology has been activated and GV Convergent is learning the K-Frame Production Switcher's current configuration.</p> <p><b>offline:</b> the K-Frame Production Switcher does not have network connectivity to the GV Convergent server(s).</p> <p><b>online:</b> the K-Frame Production Switcher is connected to the GV Convergent server(s).</p> |
| Frame Model                              | <p>Once the topology has been activated, this shows the frame model. This is shown for information purposes only.</p>   |

8 Activate the topology. See [Activating a Topology](#), on page 50.

The current K-Frame Production Switcher input and output ports are read into GV Convergent and become available to be connected within GV Convergent. According to the type of streams configured in K-Frame Production Switcher, the corresponding logical levels are created in the Logical Device Table. See [Logical Device Table Tasks](#), on page 56 for more information.

When a port is selected, see the **Short Name** property to see the K-Frame Production Switcher's internal port reference. For more information, see [K-Frame Production Switcher Nomenclature used in GV Convergent](#), on page 136.



Each input port supports two sources. When a stream is selected, see the **Short Name** property to see the stream type currently configured in the K-Frame Production Switcher.

| Streams | Description   | Short Name    |
|---------|---|---------------|
| 1       | This is the video stream for the first source.                    | Swr-In-1A-Vid |
| 2       | This is the audio stream for the first source <sup>a</sup> .      | Swr-In-1A-Aud |
| 3       | This is the Ancillary stream for the first source <sup>a</sup> .  | Swr-In-1A-Anc |
| 4       | This is the video stream for the second source.                   | Swr-In-2A-Vid |
| 5       | This is the audio stream for the second source <sup>a</sup> .     | Swr-In-1A-Aud |
| 6       | This is the Ancillary stream for the second source <sup>a</sup> . | Swr-In-1A-Anc |

a. This stream is not shown if the selected port is configured as SMPTE 2022-6.

The K-Frame Production Switcher can now be used to make takes. See [Router Control Tasks](#), on page 190 for more information.

## Adding NMOS Devices to a Topology

GV Convergent supports Networked Media Open Specifications (NMOS) AMWA IS-04 for device discovery and registration and IS-05 for connection management. Furthermore, it supports AMWA BCP-002-01 for the natural grouping of NMOS resources.

GV Convergent has a built-in NMOS registry (see below) that can be used to register NMOS devices. To be able to discover NMOS devices, you must point GV Convergent to use its internal NMOS registry, or you must point GV Convergent to an external NMOS registry. Contact technical support for more information for how to do so.

### PREREQUISITES:

- A working NMOS registry must be available on the same subnet that the GV Convergent server is connected to. If multiple NMOS registries are found, then the registry with highest priority (the lowest number) is used.
- GV Convergent's automatic discovery of the NMOS registry is disabled by default. Contact technical support for more information for how to enable this configuration. If the NMOS media server is not on the same subnet as the GV Convergent server, contact technical support for more information for how to support this configuration.

---

### Notes

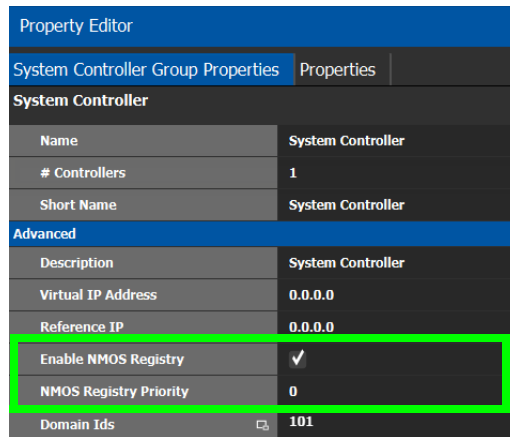
- GV Convergent listens for changes to any of the nodes in the registry. As it receives updates, it automatically updates any device that is dropped onto any topology that is associated with that node.
  - If the registry is shut down, or the node is stopped and is removed from the registry, the devices will disappear from the device list. The devices you already have dropped will remain on the topology, but will no longer receive updates.
  - If the registry is restarted or the node is restarted, GV Convergent will continue to update the devices on the topology (assuming the devices have the same UUID).
- 

### To use GV Convergent's built-in NMOS Registry

To use GV Convergent's built-in NMOS registry, you must first enable it.

- 1 Open the **System Controller Group Properties**. See [Configuring a Controller Group](#), on page 18.

2 Set the following parameters.



| Parameter              | Description   |
|------------------------|---|
| Enable NMOS Registry   | Set to start GV Convergent's NMOS registry located on the system controller.<br>Once enabled, this NMOS registry is available at the current system controller's IP address <sup>a</sup> , on port <b>4041</b> . If redundancy has been configured for GV Convergent, use the Virtual IP Address, port <b>4041</b> to access the NMOS registry. |
| NMOS Registry Priority | Sets the priority of GV Convergent's built-in registry that is started when the <i>Enable NMOS Registry</i> option is enabled. If GV Convergent's built-in registry is going to be the primary NMOS registry, set this value to <b>0</b> . Avoid having more than one registry on your network with the same priority level.                    |

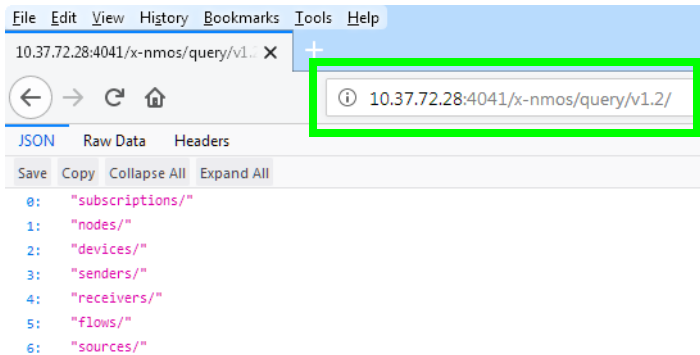
a. This is the same IP address as for GV Convergent's administration interface. This is shown as **IP Address** in [step 6](#) on page 20.

3 To be able to discover NMOS devices in GV Convergent, you must point GV Convergent to use its internal NMOS registry, or you must point GV Convergent to an external NMOS registry. Contact technical support for more information for how to do so.

### How to test the NMOS registry

Test the registry as follows: in a web browser, enter the following address into the browser's address bar: `http://XXX.XXX.XXX.XXX:4041/x-nmos/query/v1.2/`

Where `XXX.XXX.XXX.XXX` is the IP address of GV Convergent's NMOS registry. This can be either GV Convergent's system controller IP address (for its internal NMOS registry), or the query API IP address of an external NMOS registry, if available. For external NMOS registries, see the NMOS registry's documentation as it may use a number of different IP addresses; one for the query API and another for the registration API for example.



The following NMOS registry switches show the current NMOS registry's content:

```
subscriptions
nodes
devices
senders
receivers
flows
sources
```

This is accessible by, for example, entering the following address into the browser's address bar: `http://XXX.XXX.XXX.XXX:4041/x-nmos/query/v1.2/nodes`

As the NMOS registry has just been started, it is normal that it is empty of content. Wait for devices to discover the NMOS registry and to publish their resources to the registry.

### About the grouphint tag

AMWA BCP-002-01 makes use of the *grouphint* tags to identify senders and receivers. When a discovered device publishes grouphint tag information in senders / receivers to the NMOS registry, GV Convergent will automatically create the related logical sources and destinations for the device, once the NMOS device has been added to the topology. If a discovered device does not publish grouphint tags to the NMOS registry, then you will have to create the logical sources and destinations for the device manually in GV Convergent.

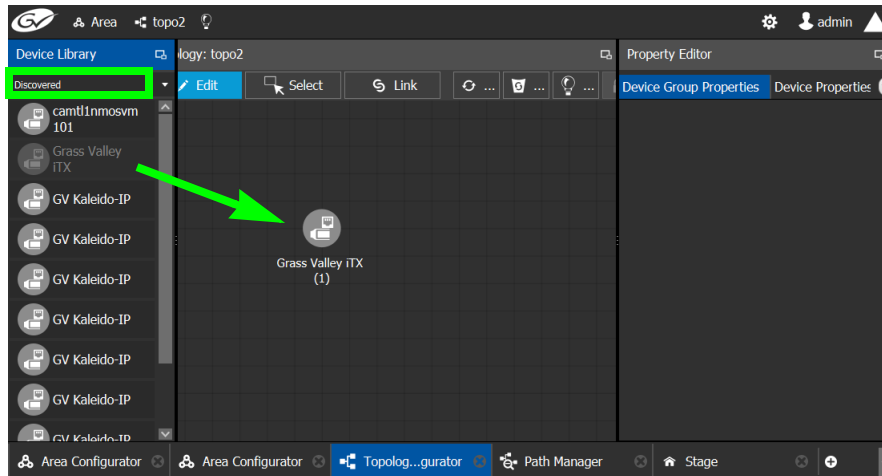
### To add an NMOS device to a topology

PREREQUISITES:

- There is an operational NMOS registry on GV Convergent's subnet.
- This NMOS registry has been configured for use by GV Convergent.

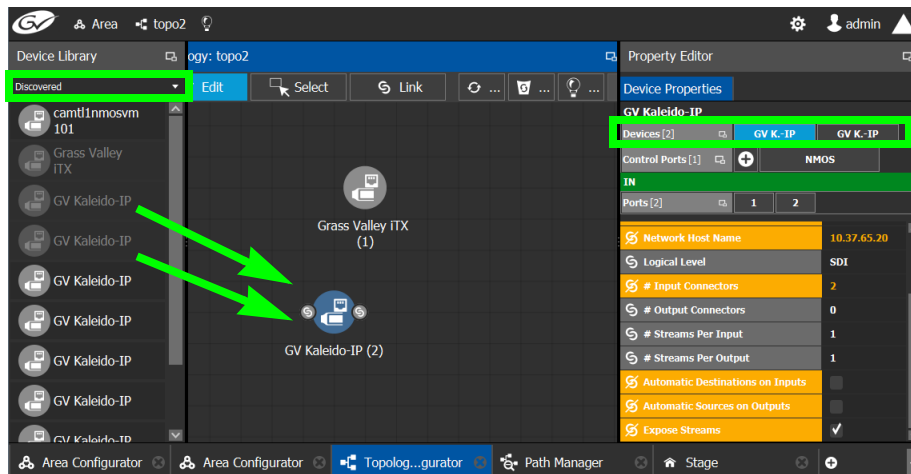
Proceed as follows.

- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.
- 3 From the **Device Library** on the left, select **Discovered** from the drop-down list.



- 4 From the **Device Library, Discovered** find an NMOS device that you want to control: select the device bubble and drag it into position on the Device Graph and release the mouse button.

The device pulled from the **Device Library, Discovered** becomes greyed out and another instance of the same device instance cannot be added again to the Device Graph. However, multiple device instances found in the Device Library can be used to create a device group.



- 5 To create a device group:
  - a From the **Device Library, Discovered** find an NMOS device that you want to control: select the device bubble and drag it into position on the Device Graph and release the mouse button.
  - b From the **Device Library, Discovered** find another NMOS device that you want to control: select the device bubble and drag it on top of the first device instance already on the Device Graph and release the mouse button.

The two device instances are shown and can be individually configured in the **Property Editor**, under **Devices**, by clicking an instance.

- 6 Click on the name of the device underneath the bubble to name the device or device group. See [To name a device and set the number of devices in the group](#), on page 41.



## Using SDP Parameters to Take a Stream from a non-NMOS Device to an NMOS Device

In order to use IS-05 connection management, Session Description Protocol (SDP) information is required to be sent as part of the command. GV Convergent can create SDP type parameters that a receiving NMOS device requires in order to successfully complete a take made from devices that do not generate and publish their own information.

The SDP information is now generated by GV Convergent and is included in the connection management commands to allow discovered AMWA NMOS receivers to join non-discovered senders, or source devices created within the GV Convergent client. This SDP information is not currently published to the AMWA NMOS registry.

Within GV Convergent, a number of default SDP parameter templates are built-in and are selected according to the stream's **Logical Level** parameter. The SDP parameters can be tweaked if necessary as these SDP parameters must represent the current details and specifications of the source's stream.

The following device bubbles support SDP parameters:

- IP Device
- GV Node

**PREREQUISITES:** To customize the SDP parameter, you must know how to form a valid SDP. This is beyond the scope of this document. For more information about SDP specific parameters, see [RFC 4566](#). See also [SDP](#).

The SDP parameters are configured in the device's Property Editor, under the **Device Group Properties** tab and in the **Device Properties** tab. See [Defining Device Properties](#), on page 46 for more information about these tabs.

The screenshot shows the 'Property Editor' window with the 'Device Properties' tab selected. It displays configuration for an IP device, including a table of streams and a text area for the SDP parameter.

| Streams [3]              | 1  | 2 | 3 |
|--------------------------|--|---|---|
| Expose Streams           | <input checked="" type="checkbox"/>  |   |   |
| IP Address               | 192.168.1.10   |   |   |
| Redundancy Port          | Out 2  |   |   |
| <b>IP Out 1 Stream 1</b> |  |   |   |
| Name                     | IP Out 1 Stream 1  |   |   |
| Description              | IP Out 1 Stream  |   |   |
| Short Name               | IP-Out1.1  |   |   |
| Logical Level            | video  |   |   |
| IP Address               | 239.10.10.7  |   |   |
| IP Port                  | 10000  |   |   |
| Flow Type                | Video  |   |   |
| Automatic Source         | <input checked="" type="checkbox"/>  |   |   |
| Automatic Destination    | <input type="checkbox"/>   |   |   |
| SDP                      | <pre>v=0 o=- \${sequence} 1 IN IP4 \${portIpAddress} s=grassview1 t=0 0 a=ts:refclk; p=1; 1588-2008-08-00-11-ff-fe-21-cf-ee:domain-nmbr=0 a=media: rtp a=clock-domain:PT:0 a=group:DUP main redundant m=video \${streamPortNumber} RTP/AVP 112 c=IN IP4 \${streamIpAddress}/1 a=rtpmap:112 raw/90000</pre> |   |   |
| Bandwidth (bps)          | 3,333,333,333  |   |   |

Certain SDP parameters have been enhanced with new GV Convergent variables which allows for better device control integration within GV Convergent. These variables are available for **SDP** parameters configured under the **Device Group Properties** and the **Device Properties** tab, output stream property. Variables always start with a dollar sign (\$) and are enclosed in curly brackets {} as shown in the example below.

See [Defining Device Properties](#), on page 46 to know more about how parameter values in the **Device Properties** tab inherit their values from the corresponding parameter values in the **Device Group Properties** tab.

### Example of SDP parameters used in GV Convergent

The following is a typical example of the SDP parameters used in GV Convergent.

```
v=0
o=- ${sequence} 0 IN IP4 ${portIpAddress}
s=grassvalley 1
t=0 0
a=recvonly
a=ts-refclk:ptp=IEEE1588-2008:08-00-11-FF-FE-22-04-00:127
a=mediaclk:direct
m=video ${streamPortNumber} RTP/AVP 98
c=IN IP4 ${streamIpAddress}/1
a=rtptime:98 SMPTE2022-6/27000000
```

### Special GV Convergent SDP Variables

The following table lists the supported special GV Convergent variables for use anywhere within the SDP parameter. These variables reference parameters that are configured elsewhere in GV Convergent, thereby automatically keeping stream information up-to-date.

| GV Convergent SDP Variable | Description  |
|----------------------------|--|
| \${sequence}               | This SDP file's ID   |
| \${portIpAddress}          | The sending port's IP address.<br>The source for this variable comes from the Port's <b>IP Address</b> parameter for this stream.          |
| \${streamIpAddress}        | The transmit (sending) stream's multicast IP address.<br>The source for this variable comes from the stream's <b>IP Address</b> parameter. |
| \${streamPortNumber}       | The transmit (sending) stream's IP port number.<br>The source for this variable comes from the stream's <b>IP Port</b> parameter.          |

| GV Convergent SDP Variable           | Description  |
|--------------------------------------|--|
| <code>\${redundantIpAddress}</code>  | The transmit (sending) stream's redundant multicast IP address. The source for this variable comes from the stream's <b>IP Address</b> parameter used for the redundancy port. See the <b>Redundancy Port</b> parameter to identify the current redundancy port. |
| <code>\${redundantPortNumber}</code> | The transmit (sending) stream's redundant IP port number. The source for this variable comes from the stream's <b>IP Port</b> parameter used for the redundancy port. See the <b>Redundancy Port</b> parameter to identify the current redundancy port.          |

### Editing SDP Parameters

Any of the above variables can be substituted with a fixed equivalent value so that it is hard coded. For example, the variable `${portIpAddress}` represents a multicast IP address and it can be replaced with an IP address such as *230.1.1.1*.

When you edit any SDP parameter:

- The SDP becomes fixed and will no longer automatically update when you make a change elsewhere in the Property Editor. For example, changing the logical level parameter will not update the SDP parameters with the logical level change. You will have to further edit the SDP to adapt it to any such change.
- The SDP becomes orange to indicate that its default value has been overridden. See [Defining Device Properties](#), on page 46 to know more about how to reset a parameter to its default value.

## Configuring Cisco DCNM Network Switch Devices

Networks that use Cisco Data Center Network Manager (DCNM) to manage LAN fabric can be controlled by GV Convergent.

### PREREQUISITES:

- GV Convergent v1.8 or higher
- DCNM build 11.0(1) or higher
- Switch's firmware: NXOS 9.2(1) or higher for 9200, 9300-EX, and 9500-R switches.
- Switch's BIOS: version 07.64, compile time: 05/17/2018
- Configure the required DCNM network switch's flow policies. See below.

## Configuring the Network Switch's Flow Policies

If you are using a network switch with DCNM control port, flow policies must be manually set in the DCNM web interface, before you configure GV Convergent to use the network switch.

Each flow policy sets the maximum bandwidth that can be allocated to a type of traffic flow. See the table below. **Only the flow policies for bandwidths you will use in your network need to be created.**

Each flow policy must have a multicast IP address range associated to it, according to your network addressing pattern, as GV Convergent uses a different multicast IP range for each type of traffic flow and bandwidth (audio, video 3G, Video HD, ANC / metadata, and so on). Class D IP addresses are multicast addresses. By default, IP address 239.255.0.1 may be reserved for use by certain Grass Valley equipment for DDS discovery and should not be allocated for any other purpose.

Review documentation for all equipment you are going to use on your network for any specific IP addressing and bandwidth requirements.

### Establish the Customer Multicast IP Addressing Pattern

All network IP devices must be assigned an IP address, and each network traffic type is assigned to a IP address range according to its bandwidth requirement.

For example, the following table shows a typical multicast IP addressing pattern and the bandwidth allocation required by traffic flow type.

| Traffic Flow Type | Flow Policy       | Typical IP address range |                 | Recommended Bandwidth Allocation |
|-------------------|-------------------|--------------------------|-----------------|----------------------------------|
|                   |                   | From                     | To              |                                  |
| Video             | SMPTE2022-6(3G)   | 230.1.1.1                | 230.255.255.255 | 3.2Gbps                          |
|                   | SMPTE2022-6(HD)   | 229.1.1.1                | 229.255.255.255 | 1.601Gbps                        |
|                   | SMPTE2022-6(SD)   | 228.1.1.1                | 228.255.255.255 | 0.27Gbps                         |
|                   | SMPTE2110-20(3G)  | 238.1.1.1                | 238.255.255.255 | 2.703Gbps                        |
|                   | SMPTE2110-20(HD)  | 237.1.1.1                | 237.255.255.255 | 1.401Gbps                        |
|                   | SMPTE2110-20(SD)  | 236.1.1.1                | 236.255.255.255 | 0.23Gbps                         |
| Audio             | SMPTE2110-30(AES) | 234.1.1.1                | 234.255.255.255 | 61Mbps                           |

| Traffic Flow Type    | Flow Policy       | Typical IP address range |                 | Recommended Bandwidth Allocation |
|----------------------|-------------------|--------------------------|-----------------|----------------------------------|
|                      |                   | From                     | To              |                                  |
| ANC (metadata)       | SMPTE2110-40(ANC) | 235.1.1.1                | 235.255.255.255 | 2Mbps                            |
| Default <sup>a</sup> |                   | *                        |                 | 150Kbps                          |

a. This allows any general network management data to pass through the network while guaranteeing that it will not take up any significant amount of total network bandwidth. When needed, this bandwidth allocation is also used for DDS discovery when such equipment uses a multicast address that is outside of any other pre-existing flow policy you have created (this must be the case).

## Delete Pre-existing Flow Policies

If your switch has been previously configured, you may need to remove any pre-existing flow policies. These flow policies have the status **Create** under **Deployment Action**.

| Policy Name | Multicast IP Range   | Bandwidth | QoS/DSCP | Deployment Action | Deployment Status | In Use | Last Updated           |
|-------------|----------------------|-----------|----------|-------------------|-------------------|--------|------------------------|
| Audio       | <a href="#">View</a> | 61 Mbps   | CS1      | Create            | ✓ Success (4/4)   | true   | Tue Sep 25 2018 22:... |
| Default     | *                    | 150 Kbps  | CS1      | Create            | ✓ Success (4/4)   | false  | Mon Sep 17 2018 19:... |
| Metadata    | <a href="#">View</a> | 2 Mbps    | CS1      | Create            | ✓ Success (4/4)   | true   | Tue Sep 25 2018 22:... |
| Video3G     | <a href="#">View</a> | 3.2 Gbps  | CS1      | Create            | ✓ Success (4/4)   | true   | Tue Sep 25 2018 22:... |

### To delete pre-existing current flow policies

- 1 In the **Deployment** drop menu, select **Undeploy All Custom Policies**.

| Policy Name | Multicast IP Range   | Bandwidth | QoS/DSCP | Deployment Action | Deployment Status | In Use | Last Updated           |
|-------------|----------------------|-----------|----------|-------------------|-------------------|--------|------------------------|
| Audio       | <a href="#">View</a> | 61 Mbps   | CS1      | Create            | ✓ Success (4/4)   | true   | Tue Sep 25 2018 22:... |
| Default     | *                    | 150 Kbps  | CS1      | Create            | ✓ Success (4/4)   | false  | Mon Sep 17 2018 19:... |
| Metadata    | <a href="#">View</a> | 2 Mbps    | CS1      | Create            | ✓ Success (4/4)   | true   | Tue Sep 25 2018 22:... |
| Video3G     | <a href="#">View</a> | 3.2 Gbps  | CS1      | Create            | ✓ Success (4/4)   | true   | Tue Sep 25 2018 22:... |

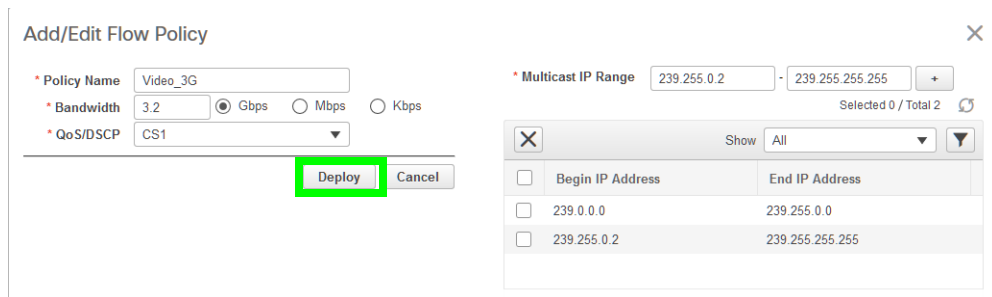
- 2 The **Deployment Action** column will show **Delete** instead of **Create**.
- 3 Select all flow policies from the list, but exclude the **Default** flow policy: do not remove the **Default** flow policy as it will be needed.
- 4 Use the delete (X) button to delete the selected flow policies.

## Add New Flow Policies Using Your IP Addressing Pattern

According to the IP addressing pattern shown in the above table, create the new flow policies for each traffic flow type you are going to use.

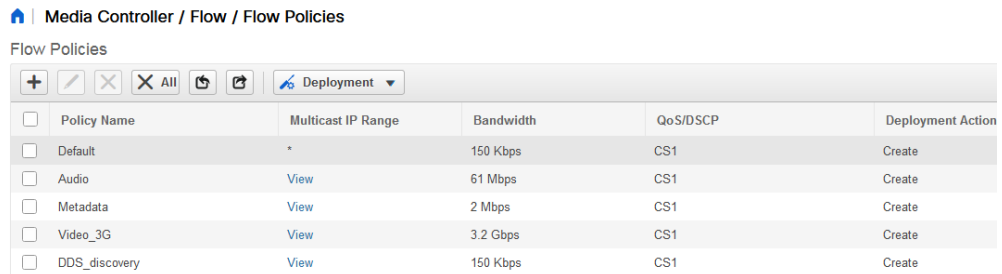
### To add new flow policies

- 1 Click New (+).



- 2 Set the parameters for the flow policy. The setting for QoS/DSCP is CS1.
- 3 Click Deploy.
- 4 Repeat to create all necessary flow policies.
- 5 In the **Deployment** drop menu, select **Deploy All Custom Policies**.

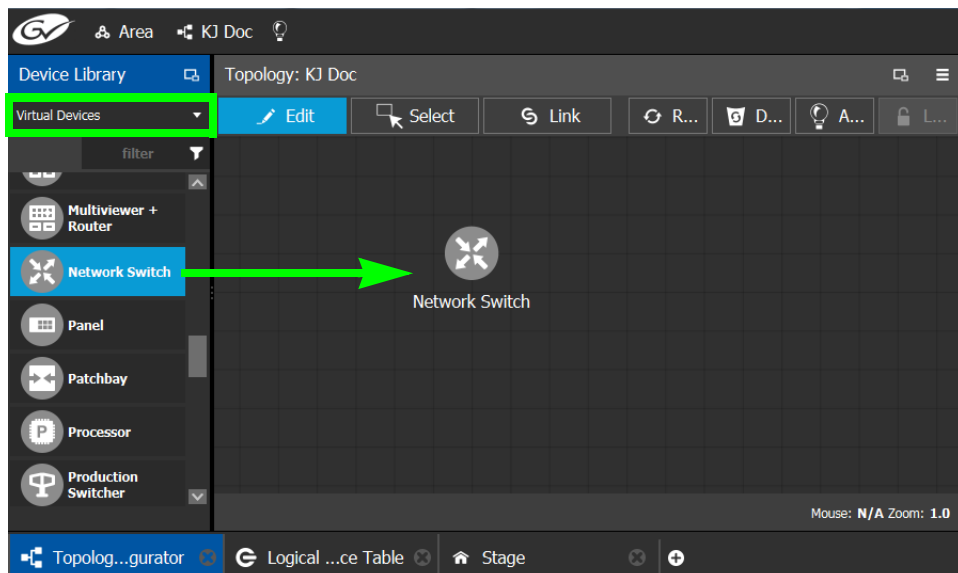
The status under **Deployment Action** becomes **Create** and the **Deployment Status** becomes **Success**.



## Configuring a DCNM Network Switch Device

### To configure a DCNM Network Switch Device

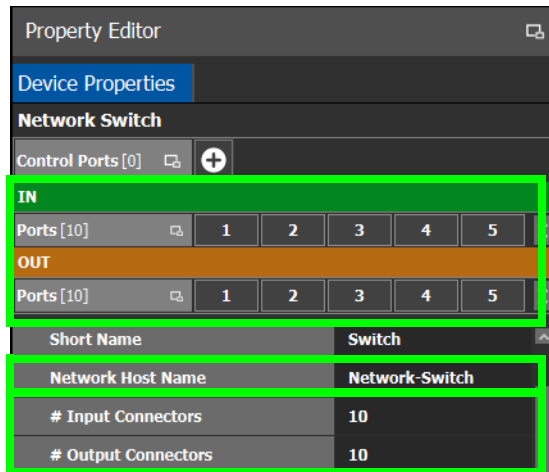
- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.
- 3 From the **Device Library** on the left, select **Virtual Devices** from the drop-down list.



- 4 From the **Device Library, Virtual Device** select the **Network Switch** device bubble and drag it into position on the Device Graph and release the mouse button.
- 5 Click on the name of the device underneath the bubble to enter a meaningful name to identify this device in the **Name** field. See [To name a device and set the number of devices in the group](#), on page 41.

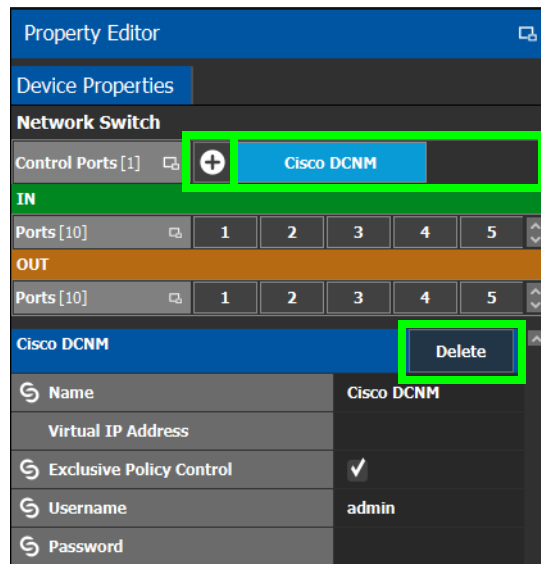
These parameters can also be set in the **Property Editor**.

- 6 Set the number of physical input and output connectors being used on the network switch in **# Input Connectors** and **# Output Connectors**.



The configuration for these ports become available as **Ports** under **IN** and **OUT**.

- 7 Select **Device Properties** and click **New** next to **Control Port** at the top of the **Property Editor** and select **Cisco DCNM** from the list. **Dummy Network Switch** should be used when the DCNM network manager is not being used for the network switch.



The **Cisco DCNM** tab appears. To remove the control port, click Delete.

- 8 Select **Cisco DCNM** tab (next to **Control Port** at the top of the **Property Editor**) to configure the Device Properties in the **Property Editor**. Only the properties shown

below should be used. See also [Description of Common Device Properties](#), on page 104.

| Parameter  | Description   |
|--|---|
| Network Host Name  | This the unique name by which the Network Switch is identified within GV Convergent. This value is used to construct the input/output port label.   |
| Cisco DCNM parameters  |   |
| Virtual IP Address   | This is the virtual IP address to communicate with DCNM cluster. This IP is used to address any active member of the two nodes that are operating in High Availability (HA) mode. If DCNM is not operating in HA mode, use the DCNM node IP address.  |
| Exclusive Policy Control   | When set, GV Convergent operates in exclusive mode: any change to the host aliases, host policies or flow policies (through DCNM web interface for example) will be overwritten and restored by GV Convergent. This is the supported mode to be used.<br>Only deselect this parameter under the guidance of Grass Valley Technical Support.                       |
| Username   | Set the administrator's username to access the DCNM network.  |
| Password   | Set the administrator's password to access the DCNM network.  |
| Connection State 1 / 2<br><b>Note:</b> Connection State 2 is not used. | This shows the current status for information purposes.<br><b>Unknown:</b> The Virtual IP is not configured yet or the topology is inactive.<br><b>Online:</b> GV Convergent is connected to DCNM.<br><b>Offline:</b> The topology is active and GV Convergent is unable to communicate with DCNM.<br><b>Reconnecting:</b> GV Convergent is trying to reach DCNM. |
| Active Host Name   | In a redundant High Availability network architecture, one node (in standby mode) provides failover protection to another node (currently active).<br><b>Host Name:</b> The hostname is the unique name by which the active / standby node is known on the network.<br><b>IP Address:</b> The network IP address for the active / standby node.                   |
| Active IP Address  |   |
| Standby Host Name  |   |
| Standby IP Address   |   |

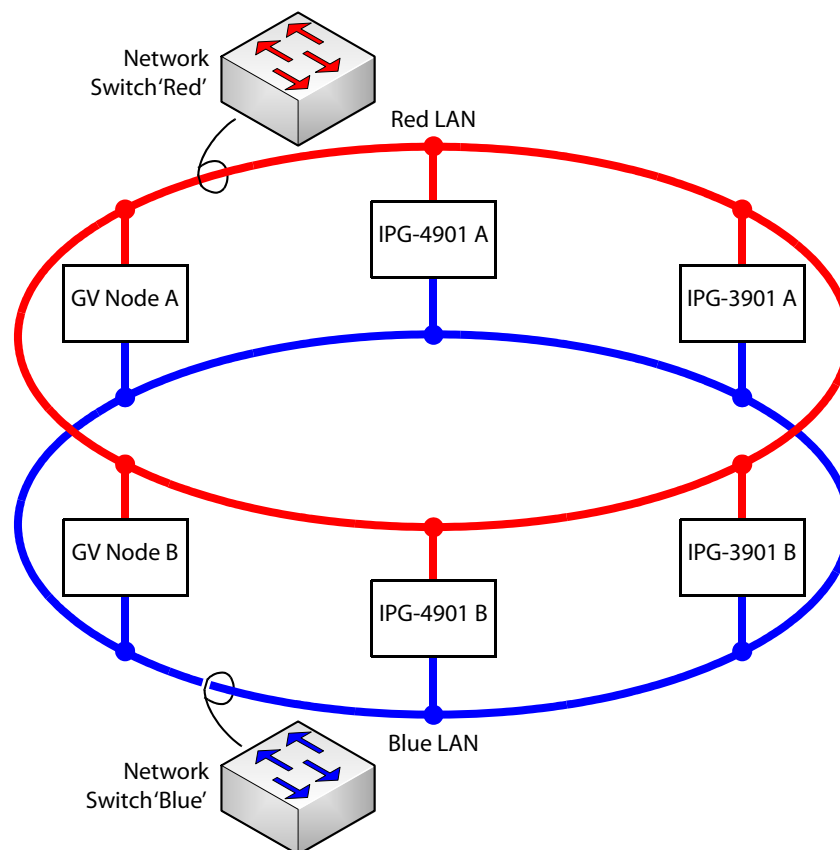
9 Do not configure any parameters found under Ports or Streams. These are shown for information purposes only.



## Configuring Network Switch Redundancy to Support SMPTE 2022-7

This topic describes the theory of how to implement network redundancy, and as such, information is provided as an example that can be used for any SMPTE 2022-7 compatible equipment.

To make streaming more reliable over an IP network, the implementation of SMPTE 2022-7 seamless protection switching depends on stream redundancy. This protection scheme transmits two identical packet streams over physically separate network routes (shown as Red LAN and Blue LAN in the figure below), so that if packets from one route are lost, the data can be reconstructed using packets from the second stream. This process is seamless because switching between the streams is instantaneous and does not impact content.



### PREREQUISITES:

- At least two DCNM-compliant switches must be used for this application. Contact Grass Valley for more information about switch compatibility. See [Grass Valley Technical Support](#), on page 206.
- For any GV Node frame:
  - a In iControl's GV Node Manager, make sure to set **redundancy** to ON. See the GV Node User Manual for more information.
  - b In GV Convergent, set **2022-7 Mode** and configure the **Redundancy Port** parameter. See [Configuring a GV Node Device](#), on page 105.

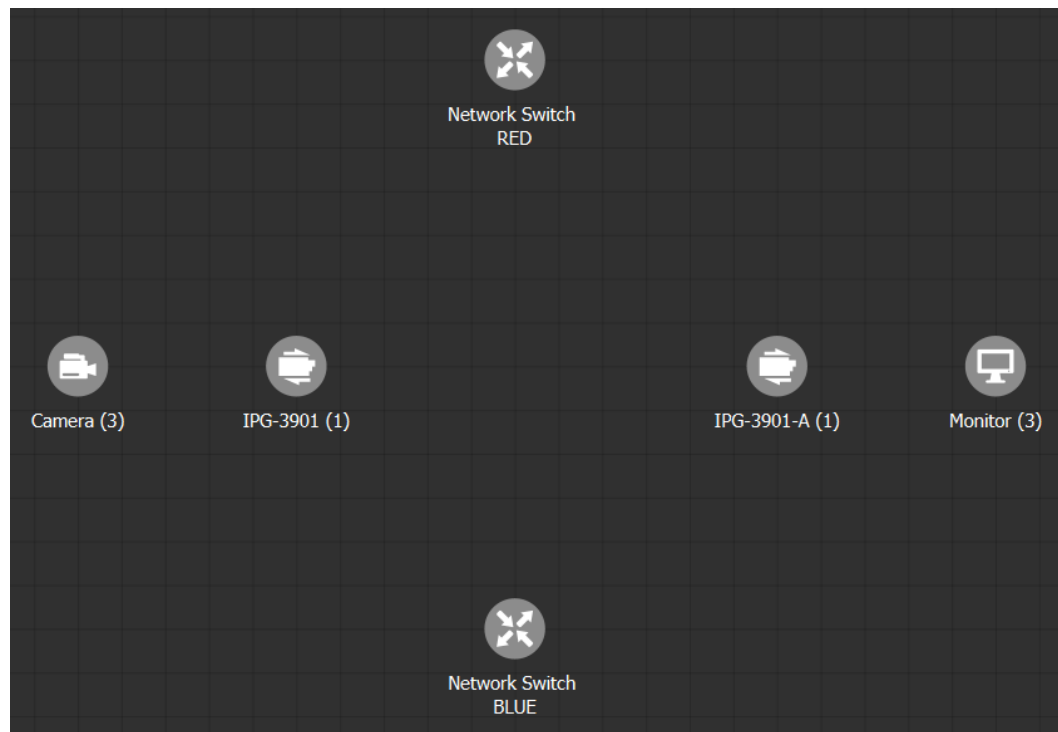
- For any IPG-4901 / IPG-3901 card
  - a In iControl's **Network panel, Settings** tab, for the **ETH 2 Port**, make sure to set the Operation Mode to **Redundancy**. See the IPG-4901 Guide to Installation and Operation for more information.
  - b In GV Convergent, set the **Operation Mode** to **Redundancy**. See [Configuring an IPG-3901 / IPG-4901 Device](#), on page 116.

**To configure SMPTE 2022-7 example**

- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.
- 3 From the **Device Library** on the left, select **Virtual Devices** from the drop-down list.
- 4 From the **Device Library**, add the following devices to the Device Graph.

| Quantity                   | Device         |
|----------------------------|----------------|
| 2                          | Network Switch |
| 2                          | IPG-3901       |
| 2 × 3 instances in a group | Camera         |
| 2 × 3 instances in a group | Monitor        |

Arrange the devices on the Device Graph as shown below.

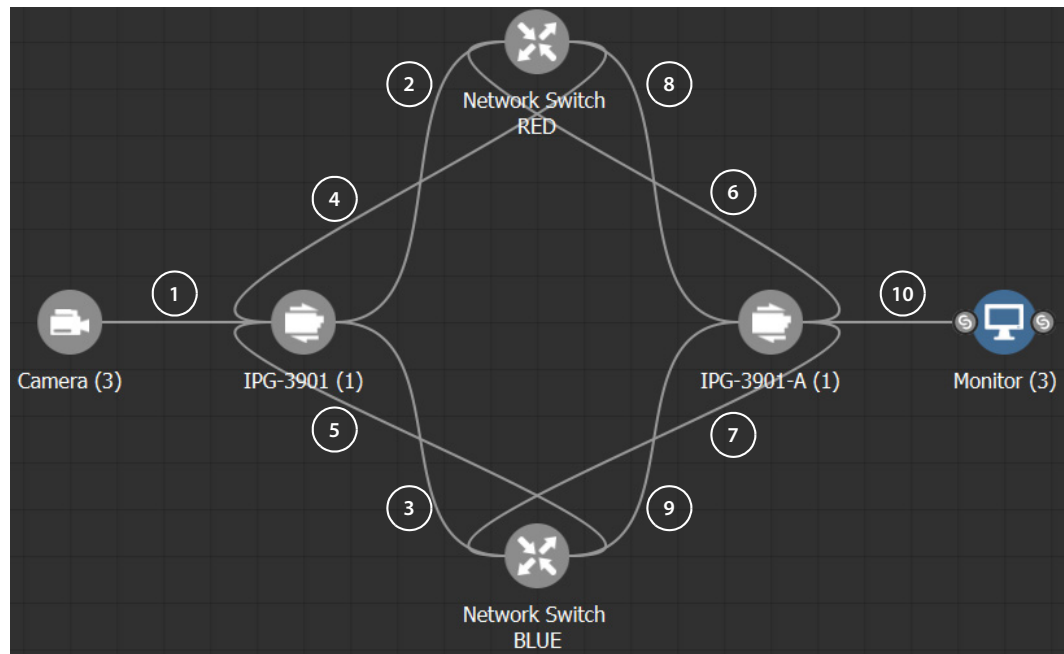


- 5 Activate the topology. See [Activating a Topology](#), on page 50.

6 Configure the devices on the Device Graph:

| Device                           | To configure the device, see  |
|----------------------------------|---|
| GV Node                          | <a href="#">Configuring a GV Node Device</a> , on page 105  |
| IPG- 3901<br>IPG-4901            | <a href="#">Configuring an IPG-3901 / IPG-4901 Device</a> , on page 116   |
| IQMix<br>IQUCP25                 | <a href="#">Configuring an IQMix or IQUCP25 Device</a> , on page 122  |
| MV-820-IP                        | <a href="#">Configuring an MV-820-IP Multiviewer Device</a> , on page 128   |
| Kahuna IP Production<br>Switcher | <a href="#">Configuring a Kahuna IP Production Switcher Device</a> , on page 132  |
| K-Frame Production<br>Switcher   | <a href="#">Configuring a K-Frame Production Switcher</a> , on page 135   |
| NMOS                             | <a href="#">Adding NMOS Devices to a Topology</a> , on page 141<br><a href="#">Using SDP Parameters to Take a Stream from a non-NMOS Device to an NMOS Device</a> , on page 145 |
| Cisco Network Switch             | <a href="#">Configuring Cisco DCNM Network Switch Devices</a> , on page 148   |
| Routers                          | <a href="#">Configuring Router Devices</a> , on page 157  |
| Audio Live                       | <a href="#">Configuring a Device that Supports Audio Breakaway/Shuffling such as Audio Live</a> , on page 164   |
| Any other device                 | <a href="#">Adding Devices to a Topology</a> , on page 40   |

7 Link the devices as shown below. See [Linking the Devices in a Topology](#), on page 41.



Much more elaborate systems can be configured. The objective is to connect all SMPTE 2022-7 IP devices (#2 to #9) to both network switches (RED and BLUE).

- 8 Select the links between devices, one at a time, to make the connections between devices as shown below. See also [Setting the Link's Physical Connection Parameters \(Sources and Destinations\)](#), on page 42.

| Link |                     |                     | Make the following connections   |   |
|------|---------------------|---------------------|--|---|
| #    | From                | To                  | From   | To  |
| 1    | Camera              | IPG-3901            | Cam1<br>Cam2<br>Cam3   | SDI to 1 (Input Port Id: 3)<br>SDI to 2 (Input Port Id: 4)<br>SDI to 3 (Input Port Id: 5) |
| 2    | IPG-3901            | Network Switch RED  | ETH1   | SwitchIn1   |
| 3    | IPG-3901            | Network Switch BLUE | ETH2   | SwitchIn1   |
| 4    | Network Switch RED  | IPG-3901            | SwitchOut1   | ETH1  |
| 5    | Network Switch BLUE | IPG-3901            | SwitchOut1   | ETH2  |
| 6    | IPG-3901-A          | Network Switch RED  | ETH1   | SwitchIn2   |
| 7    | IPG-3901-A          | Network Switch BLUE | ETH2   | SwitchIn2   |
| 8    | Network Switch RED  | IPG-3901-A          | SwitchOut2   | ETH1  |
| 9    | Network Switch BLUE | IPG-3901-A          | SwitchOut2   | ETH2  |
| 10   | IPG-3901            | Camera              | SDI to 1 (Output Port Id: 3)<br>SDI to 2 (Output Port Id: 4)<br>SDI to 3 (Output Port Id: 5) | Mon1<br>Mon2<br>Mon3  |

## Configuring Router Devices

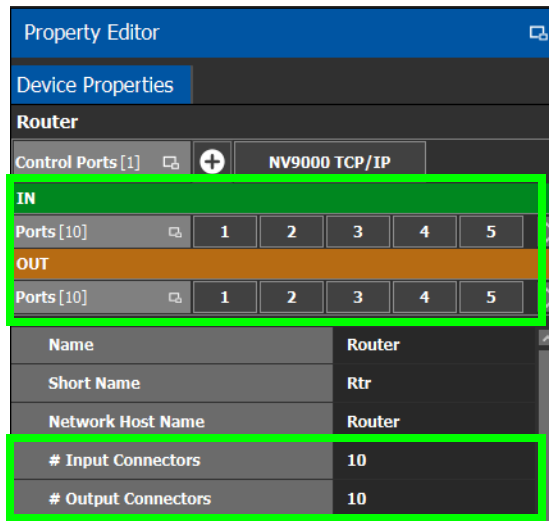
The following procedure configures a router device. Routers use a range of control protocols that GV Convergent uses to control the router. Each router control protocol is individually covered in follow up procedures: see also [Configuring a Router's Control Port](#), on page 160.

### To configure a Router Device

- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.
- 3 From the **Device Library** on the left, select **Virtual Devices** from the drop-down list.
- 4 From the **Device Library**, select the **Router** device bubble and drag it into position on the Device Graph and release the mouse button. See also [Adding Devices to a Topology](#), on page 40.
- 5 Add and configure router control port(s) according to the router model you want to control. Control port(s) must be configured to allow communication with the router thereby permitting GV Convergent to control the router; see [Configuring a Router's Control Port](#), on page 160.
- 6 Select the router's tab (next to **Control Port** at the top of the **Property Editor**) to configure the Device Properties in the **Property Editor**. See also [Description of Common Device Properties](#), on page 104.

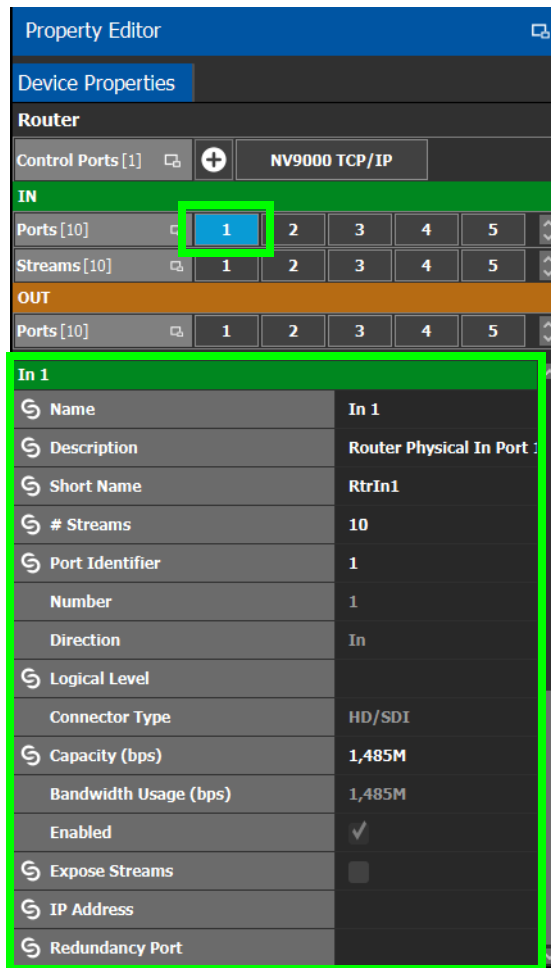
| Parameter                         | Description  |
|-----------------------------------|--|
| Network Host Name                 | The hostname is the unique name by which the associated router is known on the network.  |
| Physical Level ID                 | Set the Physical Level ID value that has been configured for the corresponding router to be controlled by this device instance. To obtain this value, use the router's native configuration interface. |
| Advanced > Default Connector Type | The router's physical interface port connector: <b>HD/SDI, IP/RJ-45, MADI</b> .  |
| Controller Starting Input         | The starting input port number from which you want to control the router's physical level.   |
| Controller Starting Output        | The starting output port number from which you want to control the router's physical level.  |

- 7 Set the number of physical input and output connectors being used on the on the router in # **Input Connectors** and # **Output Connectors**.



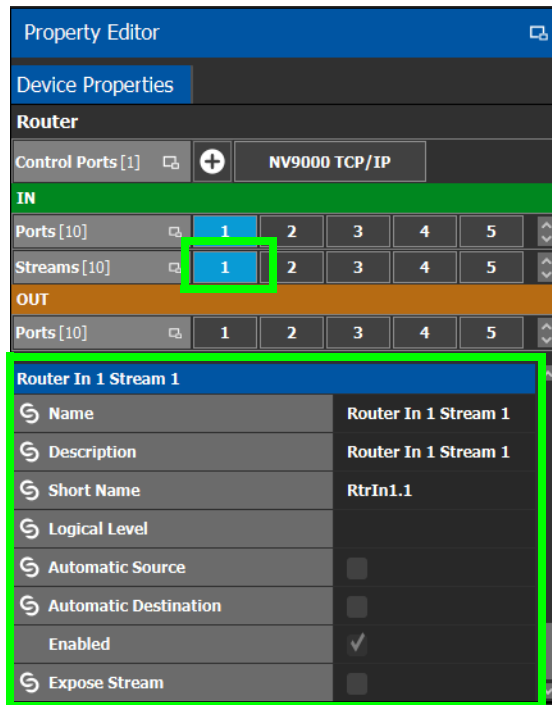
The configuration for these ports become available as **Ports** under **IN** and **OUT**.

- 8 Select each input or output port to configure it. These are the configuration parameters for each of the router's ports. See also [Description of Common Device Properties](#), on page 104.



| Parameter             | Description  |
|-----------------------|--|
| Port Identifier       | This is the generic identifier of the port within GV Convergent.   |
| Number                | This shows the current status for information purposes.  |
| Direction             |  |
| Connector Type        |  |
| Capacity (bps)        | The stream's data rate.  |
| Bandwidth Usage (bps) | This shows the current status for information purposes.  |
| IP Address            | This is the interface IP address of the selected port. This is currently not used in the router virtual device.  |
| Redundancy Port       | Associate this port with another port to create a redundant network traffic flow path for failover protection. The associated port will not be available to carry other traffic. |

- 9 Select each steam found under each port to configure it. These are the configuration parameters for the individual streams carried on a network port. See also [Description of Common Device Properties](#), on page 104.




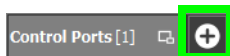
## Configuring a Router's Control Port

Control port(s) must be configured to allow communication with the router thereby permitting GV Convergent to control the router. There are many types of control ports suited to the router's individual model or control protocol. First, you must add a control port to the router's configuration in GV Convergent and then configure it.

PREREQUISITE: Add a router device to the Topology Configurator. See [To configure a Router Device](#), on page 157.

### To add a router control port

- 1 Select the **Router** bubble on the Topology Configurator and then select **Device Properties** and click **New**  next to **Control Port** at the top of the **Property Editor** and select the router's model / control protocol from the list. **Dummy** can be used for testing purposes (or pre-deployment) when the actual router model is unknown.



A tab for the selected router model appears. The control port(s) must be configured to allow communication with the router thereby permitting GV Convergent to control the router.

To delete a control port, scroll-down the router's **Device Properties** list to the control port and click **Delete**.

- 2 Configure the control port. See below.



## Supported router control protocols

The following router control protocols are supported.

| Router Control Protocol  | See  |
|--------------------------|--|
| NP0016 Compact Router    | <a href="#">NP0016 Compact Router Control Port Configuration Parameters</a> , on page 161    |
| NP0016 Enterprise Router | <a href="#">NP0016 Enterprise Router Control Port Configuration Parameters</a> , on page 161 |
| NS-BUS                   | <a href="#">NS-BUS Control Port Configuration Parameters</a> , on page 162                   |
| NV9000 TCP/IP            | <a href="#">NV9000 TCP/IP Control Port Configuration Parameters</a> , on page 163            |
| SAM SW-P-08 TCP/IP       | <a href="#">SAM SW-P-08 TCP/IP Control Port Configuration Parameters</a> , on page 163       |

## NP0016 Compact Router Control Port Configuration Parameters

See also [Description of Common Device Properties](#), on page 104.

| Parameter                         | Description   |
|-----------------------------------|---|
| IP Address                        | The network IP address for the associated router.   |
| Connection State 1                | <p>Connection State 1 shows the connection status of the router with the primary server of a server group.</p> <p>Connection State 2 shows the connection status of the router with the secondary server of a server group. See <a href="#">Configuring a Controller Group</a>, on page 18.</p> <p><b>unknown:</b> the topology is inactive (see <a href="#">Activating a Topology</a>, on page 50) or the router does not have network connectivity to the GV Convergent server(s).</p> <p><b>offline:</b> the router does not have network connectivity to the GV Convergent server(s).</p> <p><b>online:</b> the router is connected to the GV Convergent server(s).</p> |
| Connection State 2                |   |
| Connections From Multiple Servers | Set this if the router supports multiple concurrent connections to it. When set, this allows GV Convergent main and backup servers to connect at the same time to the router, thereby increasing system availability.   |
| IP Port                           | Port number for the control port stream used by the router. The default is 5194.  |

## NP0016 Enterprise Router Control Port Configuration Parameters

See also [Description of Common Device Properties](#), on page 104.

| Parameter  | Description                                       |
|------------|---|
| IP Address | The network IP address for the associated router. |

| Parameter                         | Description  |
|-----------------------------------|--|
| Connection State 1                | Connection State 1 shows the connection status of the router with the primary server of a server group.<br>Connection State 2 shows the connection status of the router with the secondary server of a server group. See <a href="#">Configuring a Controller Group</a> , on page 18.<br><b>unknown:</b> the topology is inactive (see <a href="#">Activating a Topology</a> , on page 50) or the router does not have network connectivity to the GV Convergent server(s).<br><b>offline:</b> the router does not have network connectivity to the GV Convergent server(s).<br><b>online:</b> the router is connected to the GV Convergent server(s). |
| Connection State 2                |  |
| Connections From Multiple Servers | Set this if the router supports multiple concurrent connections to it. When set, this allows GV Convergent main and backup servers to connect at the same time to the router, thereby increasing system availability.  |
| IP Port                           | Port number for the control port stream used by the router. The default is 5194.   |
| Use Coherent Take Message         | Set for GV Convergent to use the protocol's 'Coherent take' command when performing multiple crosspoint changes at the same time for this router.  |

### NS-BUS Control Port Configuration Parameters

See also [Description of Common Device Properties](#), on page 104.

| Parameter                    | Description  |
|------------------------------|--|
| Connection State 1           | Connection State 1 shows the connection status of the router with the primary server of a server group.<br>Connection State 2 shows the connection status of the router with the secondary server of a server group. See <a href="#">Configuring a Controller Group</a> , on page 18.<br><b>unknown:</b> the topology is inactive (see <a href="#">Activating a Topology</a> , on page 50) or the router does not have network connectivity to the GV Convergent server(s).<br><b>offline:</b> the router does not have network connectivity to the GV Convergent server(s).<br><b>online:</b> the router is connected to the GV Convergent server(s). |
| Connection State 2           |  |
| IP Address                   | The network IP address for the associated router.  |
| IP Port                      | Port number for the control port stream used by the router. The default is 37800.  |
| Multiple Connections Capable | Set this if the router supports multiple concurrent connections to it. When set, this allows GV Convergent main and backup servers to connect at the same time to the router, thereby increasing system availability.  |

## NV9000 TCP/IP Control Port Configuration Parameters

See also [Description of Common Device Properties](#), on page 104.

| Parameter                         | Description  |
|-----------------------------------|--|
| IP Address                        | The network IP address for the associated router.  |
| Connection State 1                | Connection State 1 shows the connection status of the router with the primary server of a server group.<br>Connection State 2 shows the connection status of the router with the secondary server of a server group. See <a href="#">Configuring a Controller Group</a> , on page 18.<br><b>unknown:</b> the topology is inactive (see <a href="#">Activating a Topology</a> , on page 50) or the router does not have network connectivity to the GV Convergent server(s).<br><b>offline:</b> the router does not have network connectivity to the GV Convergent server(s).<br><b>online:</b> the router is connected to the GV Convergent server(s). |
| Connection State 2                |  |
| Connections From Multiple Servers | Set this if the router supports multiple concurrent connections to it. When set, this allows GV Convergent main and backup servers to connect at the same time to the router, thereby increasing system availability.  |
| Protocol                          | The IP connection protocol.<br><b>TCP:</b> a point-to-point connection protocol.<br><b>UDP:</b> a stateless connection protocol that can also broadcast data to more than one device.  |

## SAM SW-P-08 TCP/IP Control Port Configuration Parameters

Grass Valley/Pro Bel devices including the Sirius router that use the Pro Bel SW-P-08 switcher protocol can be controlled by GV Convergent through an IP network. These devices use two control ports to control them.

LIMITATION: GV Convergent control of a Sirius router is limited to a maximum of 1152<sup>2</sup> crosspoints using single-level X-Y control.

### To connect the GV Convergent server to the router

- 1 Add two control ports in GV Convergent. See [To add a router control port](#), on page 160.
- 2 Configure both control port configuration parameters. See also [Description of Common Device Properties](#), on page 104.

| Parameter  | Description                                       |
|------------|---|
| IP Address | The network IP address for the associated router. |

| Parameter                         | Description   |
|-----------------------------------|---|
| Connection State 1                | Connection State 1 shows the connection status of the router with the primary server of a server group.   |
| Connection State 2                | Connection State 2 shows the connection status of the router with the secondary server of a server group. See <a href="#">Configuring a Controller Group</a> , on page 18.<br><b>unknown:</b> the topology is inactive (see <a href="#">Activating a Topology</a> , on page 50) or the router does not have network connectivity to the GV Convergent server(s).<br><b>offline:</b> the router does not have network connectivity to the GV Convergent server(s).<br><b>online:</b> the router is connected to the GV Convergent server(s). |
| Connections From Multiple Servers | Set this if the router supports multiple concurrent connections to it. When set, this allows GV Convergent main and backup servers to connect at the same time to the router, thereby increasing system availability.   |
| IP Port                           | Port number for the control port stream used by the router. The default is 14000.   |
| Matrix ID                         | A SW-P-08 device can have multiple matrices, each with multiple physical levels. Set the Matrix ID value that has been configured for the corresponding router to be controlled by this device instance. To obtain this value, use the router's native configuration interface. Refer to your router's documentation for more information about this parameter.   |
| Polling                           | Set this to poll the crosspoint status at regular intervals.  |
| Protocol                          | The IP connection protocol.<br><b>TCP:</b> a point-to-point connection protocol.<br><b>UDP:</b> a stateless connection protocol that can also broadcast data to more than one device.   |
| Use Extended Mode                 | Set this for GV Convergent to try to use the <i>extended</i> command set of the SW-P-08 protocol with the router first. Extended commands allow routers larger than 1023 × 1023 to be controlled. If the router does not support extended commands, the GV Convergent will fallback to the standard command set and with it, the associated control limitations.  |

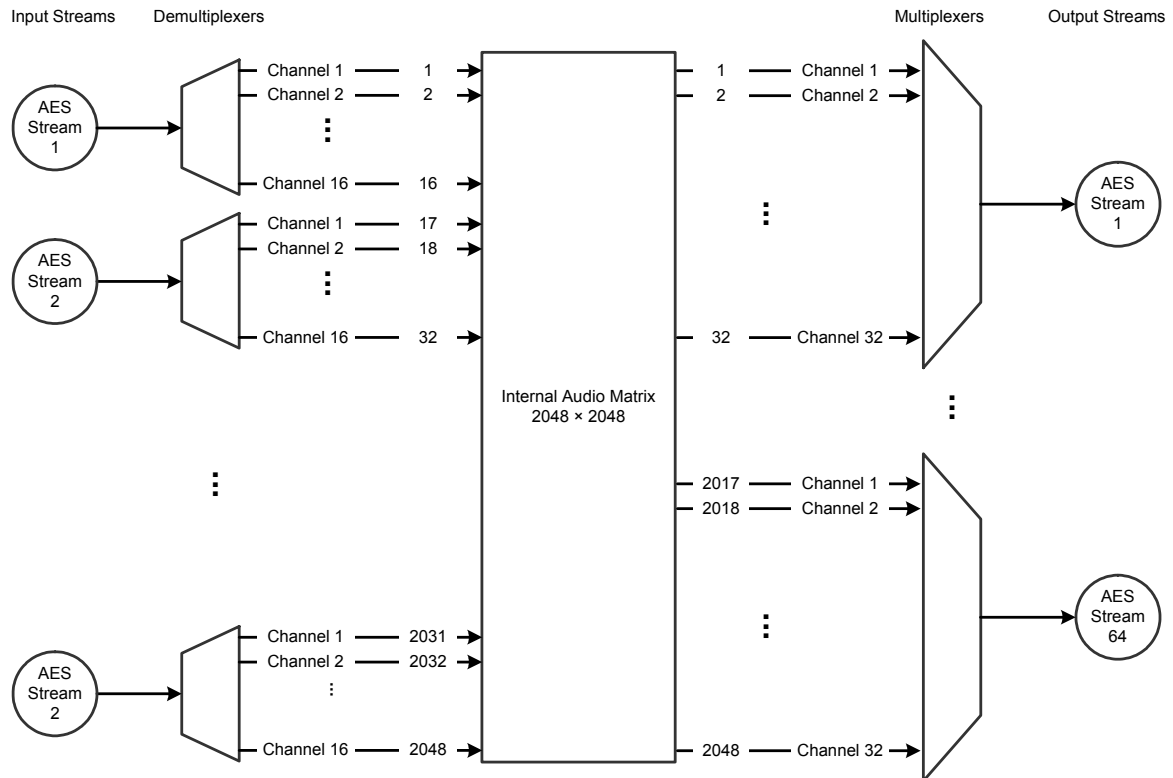
## Configuring a Device that Supports Audio Breakaway/Shuffling such as Audio Live

Audio breakaway and shuffling can be done by Audio Live and by GV Node. Audio Live is designed specifically for audio processing.

### About Audio Live

Audio Live is an IP-only device that manages audio feeds only. It accepts a number of AES67 streams as inputs. Internally, it demultiplexes these inputs to obtain a series of mono PCM audio channels which then go through an audio router. Outputs from the router get

multiplexed in accordance with the required output configuration. This allows Audio Live to perform breakaway and/or shuffling of mono channel audio feeds, in addition to audio format conversion.



*Example Audio Live configuration with 128 x 16 matrix for the input and 64 x 32 matrix for the output*

The inputs and outputs of an Audio Live are called *spigots*. There are a variety of spigot configurations that are available. See also [How to Know if a Spigot is an Input or an Output](#), on page 124.

GV Convergent is able to detect the number of channels in the input spigots and will assign one of the AES67 levels to the input stream for each spigot (for example, AES67-4, AES67-8, AES67-16, AES67-32 or AES67-64). This is conditional on having configured the input spigots in Rollcall to not use the **Auto** setting for the number channels. This is shown in the procedure below ([Required Audio Live Configuration in the RollCall Control Panel](#), on page 166).

GV Convergent will detect the number of channels in the output spigots and one of the AES67 logical levels will be automatically assigned to the output stream of each output spigot (for example, AES67-4, AES67-8, AES67-16, AES67-32 or AES67-64).

Audio Live can accept audio packets with any packet time on the input. Audio Live can convert audio packet times as well as the number of channels in the streams. For example, an input spigot accepts an AES67 stream with 8 channels and packet time of 1 millisecond, and route the signals to an output spigot with 16 channels and packet time of 250 microseconds. When using audio streams with different packet times however, extra configuration steps are required: see [Required Configuration for Audio Streams with Different Packet Times](#), on page 169.

## About the Routing Path of Audio Channels

If there are multiple devices on the topology that can perform audio shuffling, Audio Live will not necessarily always do the shuffle. For example, if the first device reached along the path (from destination to source) is a GV Node, then the GV Node may do the shuffle. It is GV Convergent that determines whether and when Audio Live is required for a given route. To know if an Audio Live or GV Node device is currently in use for a given route, use the Path Manager to see if there are tie-line connections to the Audio Live / GV Node device. See [Path Manager Tasks](#), on page 174.

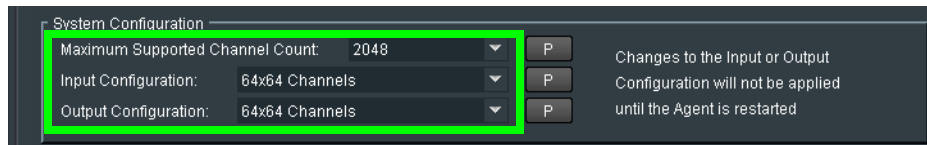
## Prerequisites

Audio Live v1.5 or higher must be connected to the network, licensed, and has been previously configured with RollCall Lite.

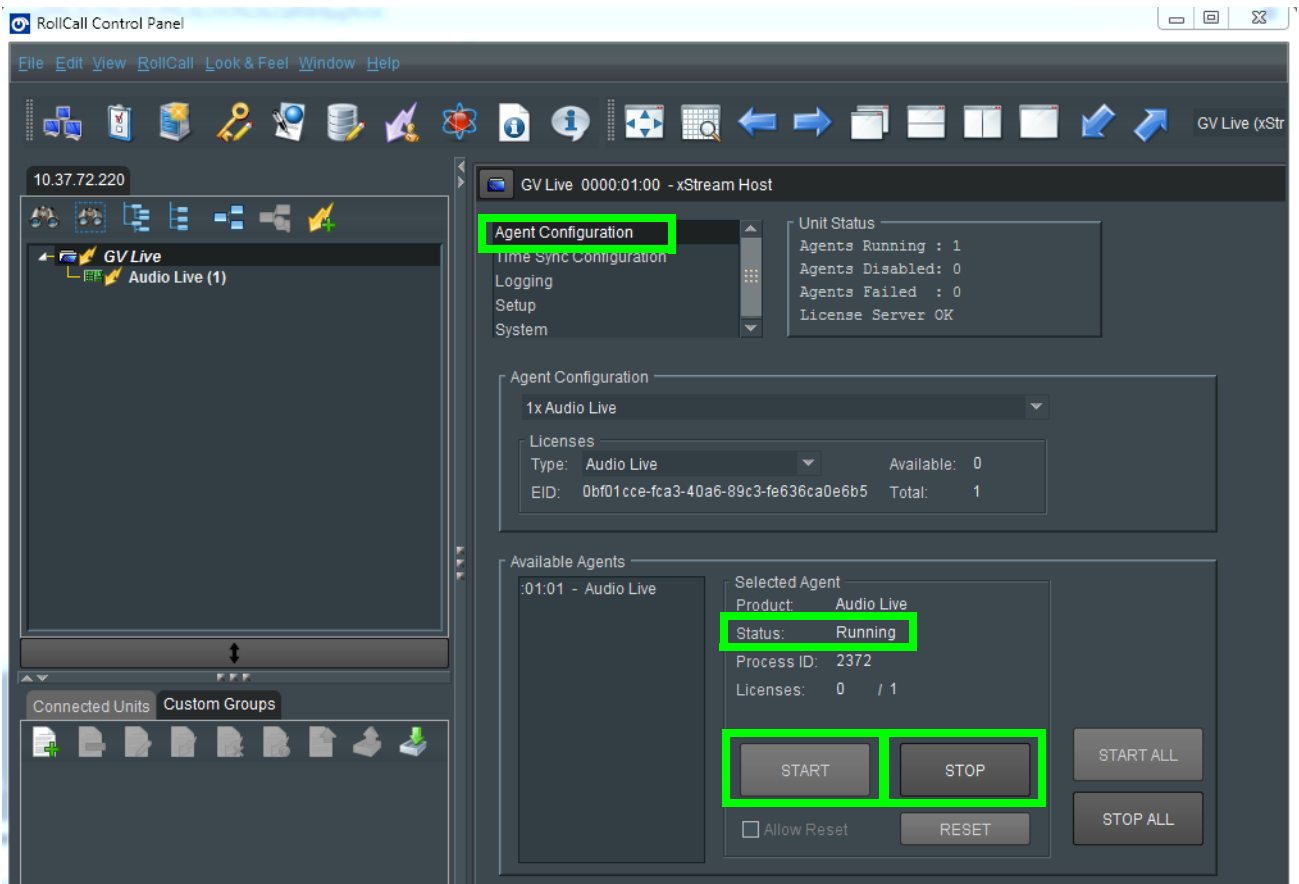
### Required Audio Live Configuration in the RollCall Control Panel

In the *Audio Live User Guide*, see the following topics that must be configured according to your needs.

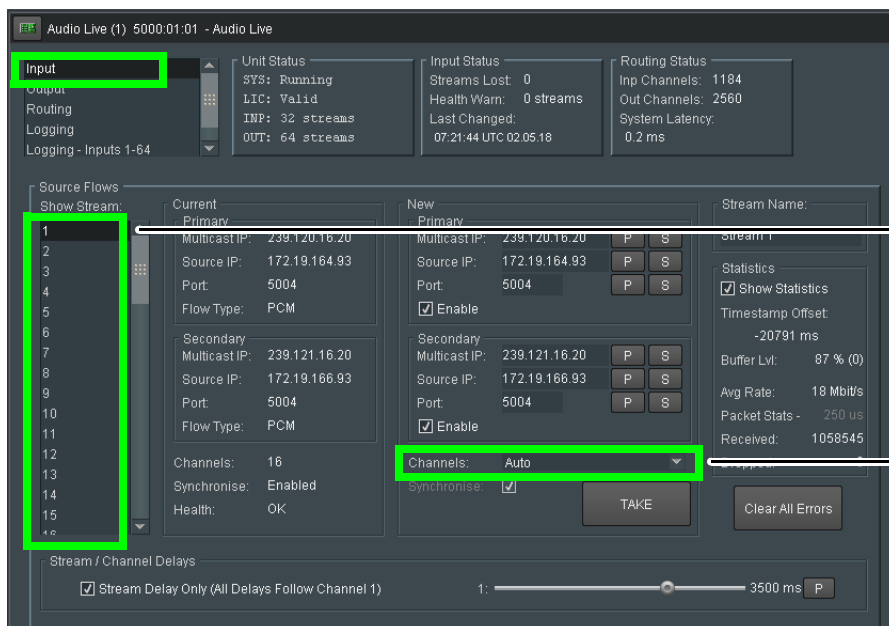
- 1 In RollCall, set the size of Audio Live's audio matrix (**Maximum Supported Channel Count**) and the number of channels per AES input and output streams. This setting is found under **Audio Live > Setup > System Configuration > Input Configuration and Output Configuration**.



- 2 Stop the Audio Live server in **Agent Configuration**; under **Available Agents**, select **Audio Live** and click **Stop**.



- 3 Once the **Status** under **Selected Agent** becomes **Stopped**, click **Start**.
- 4 In RollCall, set the **Channels** parameter to the maximum number of channels available for *each stream*. This setting is found under **Audio Live > Input > Source Flows > Channels**.



For each available stream, you must...

Set the number of channels to the maximum available in this dropdown. **Note:** the default **Auto** setting will not work.

Setting the maximum number of channels is necessary as GV Convergent expects that all channels be available for it to use at any time.

5 Click **Take**.

6 In RollCall under **Audio Live > Output> Dest Flows**:

- Set the **Channels** parameter to the maximum number of channels available for *each stream*. This setting is found under **Audio Live > Output> Dest Flows**.
- Set the **Packet Time** parameter according to the number of channels configured for *each stream*. See table below. This setting is found under **Audio Live > Output> Dest Flows**.

| <b>Packet Time</b> | <b>Maximum number of channels that the stream can carry</b> |
|--------------------|---|
| 125us              | up to 64 channels   |
| 250us              | up to 32 channels   |
| 500us              | up to 16 channels   |
| 1ms                | up to 8 channels  |
| 4 ms               | up to 2 channels  |

7 Click **Take**.

#### **Logical Levels that specifically support Audio Live**

To support Audio Live's ability to support a range of audio channels per AES stream, the following logical levels are used according to the number of channels in the AES stream. See also [Logical Level Editor Tasks](#), on page 24 and [Modifying the Default Levels in the Logical Level Table](#), on page 58.





| Logical Level | Description  |
|---------------|--|
| AES67-4       | 4 mono audio channels  |
| AES67-8       | 8 mono audio channels  |
| AES67-16      | 16 mono audio channels<br>This logical level is interchangeable with the <b>SDI audio</b> logical level. |
| AES67-32      | 32 mono audio channels   |
| AES67-64      | 64 mono audio channels   |

To see the number of audio channels a given logical level supports, see [Editing a Logical Level](#), on page 28.

### Required Configuration for Audio Streams with Different Packet Times

If for a given topology, all audio streams have the same packet time, then the automatically assigned levels to the output spigots will work. If the topology has audio streams with different packet times, you will have to configure the packet times on Audio Live's output spigots. Currently GV Convergent is unaware of these settings in Rollcall, so you must proceed as follows: duplicate the SDI audio level as many times as there are different packet times. To duplicate an SDI audio level, see [Duplicating a Logical Level](#), on page 27.

For example, to accommodate a 1 microsecond audio packet time, you duplicate the SDI audio level with the **-1** suffix. To accommodate a 250 microseconds audio packet time, you again duplicate the SDI audio level with the **-250** suffix.

You also need to set the proper AES67 levels on the Audio Live output streams in GV Convergent. For example:

- If output spigot 1 has been configured with 16 channels at 250 microseconds, then the streams for output spigot 1 should be assigned the **AES67-16-250** level.
- If the output spigot has been configured with 8 channels at 1 ms, then the streams for that spigot should be assigned the **AES67-8-1** level.

---

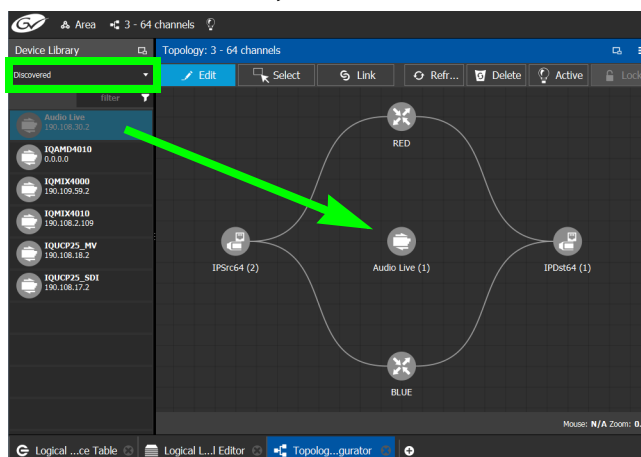
**Note:** You will need to set the level on all output streams of the Audio Live configuration in GV Convergent if your topology uses more than one packet time value.

---

## Configuring an Audio Live device in GV Convergent

### To add an Audio Live device to a topology

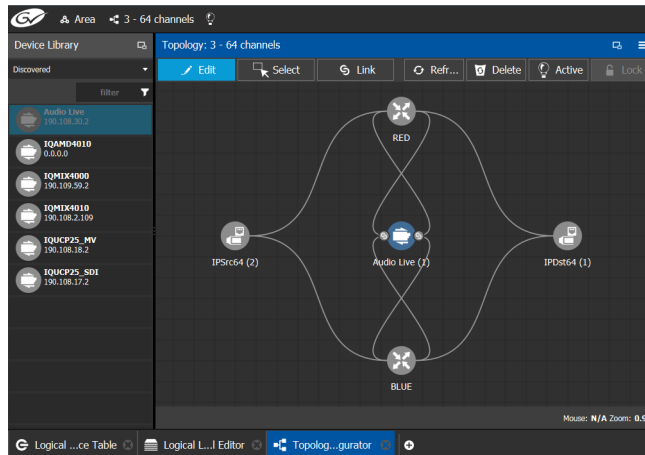
- 1 Select the required Area. See [Selecting an Area](#), on page 22.
- 2 Select the required topology. See [Selecting a Topology](#), on page 34.
- 3 From the **Device Library** on the left, select **Discovered** from the drop-down list.



- 4 From the **Device Library**, **Discovered** find an Audio Live device to add to the topology: select the device bubble and drag it into position on the Device Graph and release the mouse button.

The device pulled from the Device Library, **Discovered** becomes greyed out and another instance of the same device instance cannot be added again to the Device Graph.

- 5 Click on the name of the device underneath the bubble to name the device or device group. See [To name a device and set the number of devices in the group](#), on page 41.
- 6 Connect the Audio Live device to the network switches. See [Linking the Devices in a Topology](#), on page 41 and [Setting the Link's Physical Connection Parameters \(Sources and Destinations\)](#), on page 42.



By default, the Audio Live device is created according to the configuration defined in RollCall. The streams are assigned the appropriate AES67 levels, based on the number of channels. The Audio Live can be used as is, without a need to modify the device properties in the Property Editor, unless you need to modify the streams to use custom levels.

- 7 Test the configuration by making takes between a logical source and destination that use the AES67 audio levels. See [Performing a Take in Router Control](#), on page 190.

## Known Audio Live limitations

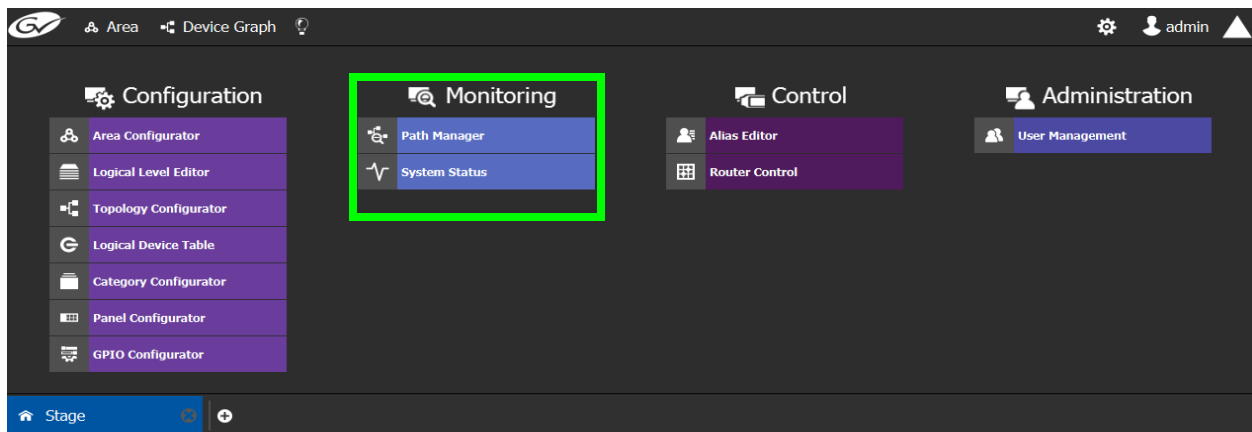
- When choosing an Audio Live spigot to use for the take, GV Convergent will only use an output spigot that has the same number of channels as the destination, and only use an input spigot that has the same number of channels as the source. If no such spigot is available, the take will fail. It will not try to use multiple spigots (for example, if the source/destination is 16 channels, it will not try to use 2 spigots, each with 8 channels), and it will not try to use part of a spigot (for example, if the source/destination is 8 channels, it would not try to use the first 8 channels of a 16 channel spigot).
- In the Audio Live configuration, the channel count of an **Input Configuration** and **Output Configuration** cannot be set to **Auto** as GV Convergent does not support this setting. See [Required Audio Live Configuration in the RollCall Control Panel](#), on page 166.
- The number of channels on the input stream must match the number of channels on the source stream, and the number of channels on the output stream must match the number of channels on the destination stream.
- For streams that have an AES67-X level, the logical source/destination that is automatically created is not usable. Instead, you must create custom logical sources and destinations, and place the streams in the SDI Audio or audio1 to audio16 level columns instead. See [Required Configuration for Audio Streams with Different Packet Times](#), on page 169.



# 5 Monitoring Tasks

## Overview

The Monitoring tasks in GV Convergent Client are used to view information about tie line use and the source to destination path of the streams and to monitor the health of the GV Convergent Controllers and the devices in the selected topology.



The GV Convergent Monitoring Tasks include:

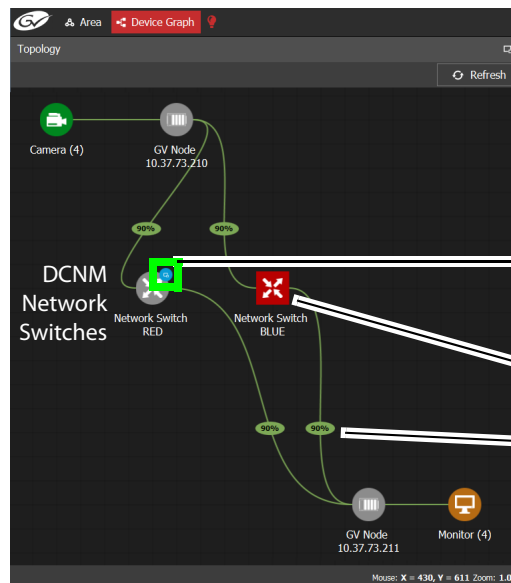
- [Path Manager Tasks](#), on page 174
- [System Status Task](#), on page 180

## Path Manager Tasks

Use the Path Manager task to view information about the tie-line use and the source to destination path of the streams. Tie-lines also show the current percentage of bandwidth used.

When a topology includes a DCNM Network Switch, the Path Manager shows:

- Technical information that can be used to help diagnose network connectivity and path issues (no signal or wrong signal at the destination).
- The overall health status of each Network Switch device.

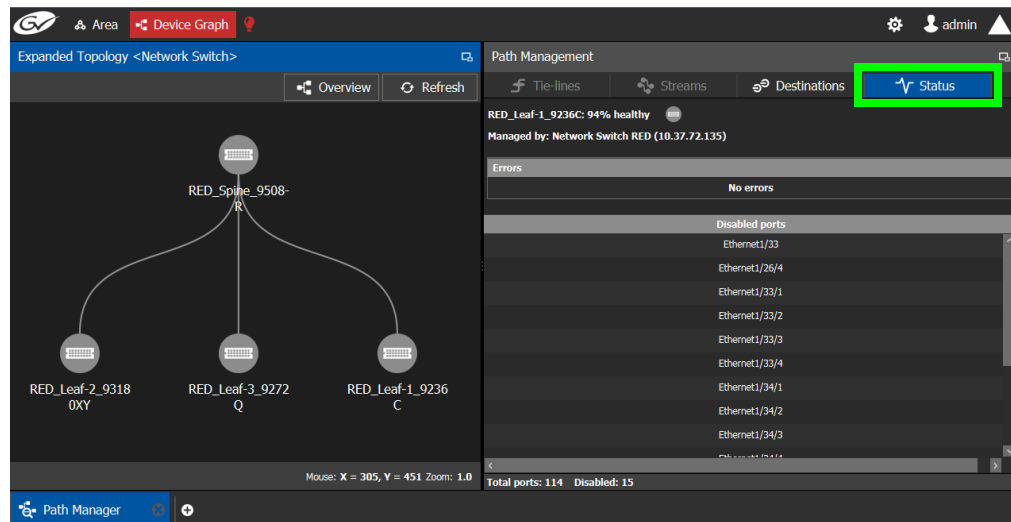


Click to view more DCNM Network Switch device detail

The DCNM Network Switch is currently offline



Percent of currently-used bandwidth

Network Switch devices have a blue bubble that when clicked provides more information about the internal status of the DCNM Network Switch that is shown in the Status tab.



## Interpreting DCNM Network Switch Symbols

The following DCNM network switch symbols are used to represent the Network Switch device's health.

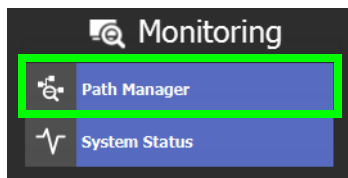
| Symbol  | Description   |
|---|---|
|  | The DCNM network switch device is healthy.  |
|  | Connection to the DCNM network switch device is offline.<br>To diagnose: Select this device and select the <b>Status</b> tab to view more technical information that can be used to troubleshoot the issue in the DCNM Web interface (by looking at the host policy / flow policy / flow status). |

For a system-level health status, see [System Status Task](#), on page 180.

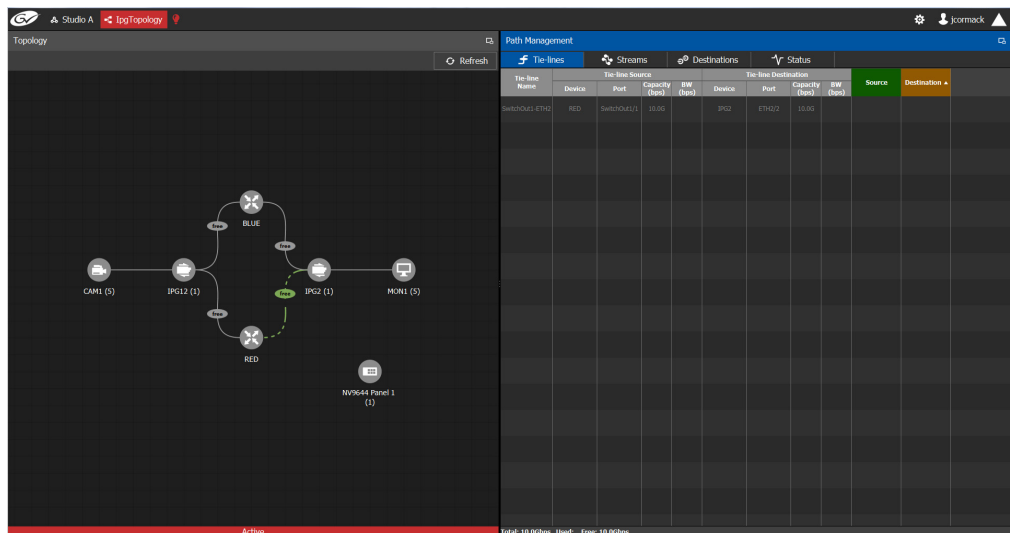
## Accessing the Path Manager

### To access the Path Manager Task

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select the required Area. See [Selecting an Area](#), on page 22.
- 3 Select the required topology. See [Selecting a Topology](#), on page 34.
- 4 Make the topology active. See [Activating a Topology](#), on page 50.
- 5 Select **Monitoring** > **Path Manager**.



The Path Manager task opens:



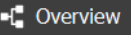
The screenshot displays the Path Manager interface. On the left, a network topology diagram shows several nodes: CAM1 (5), JRG12 (1), BLUE, RED, IPC2 (1), MON1 (5), and NV5644 Panel 1 (1). On the right, a table titled 'Tie-line Management' is visible, showing columns for Tie-line Name, Device, Port, Capacity (bps), File (bps), Device, Port, Capacity (bps), BW (bps), Source, and Destination. The table is currently empty.

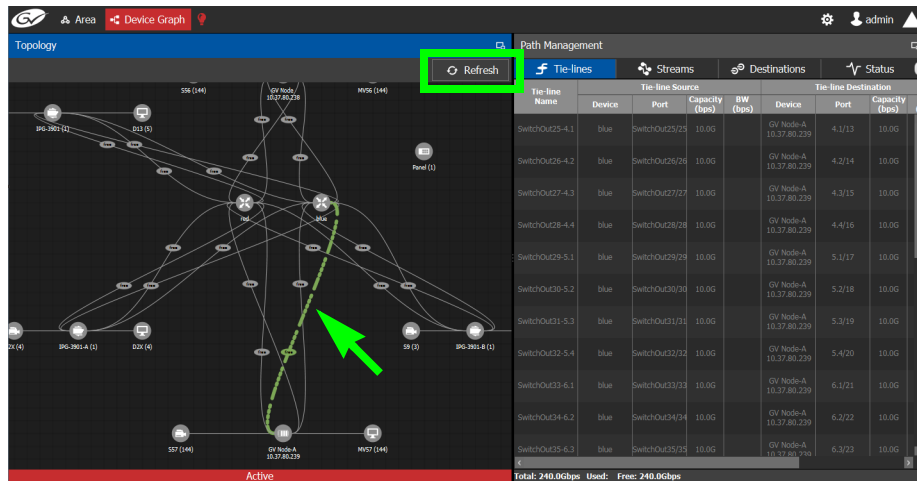
Under Path Management, click any of the following tabs for more information:

- Tie-lines
- Streams
- Destinations
- Status

## Viewing Information about the Tie-lines

To view information about the tie-lines

- 1 Open the Path Manager for the selected topology. See [Accessing the Path Manager](#), on page 175.
- 2 Click Overview  if available.  
The tie-lines show their currently-used capacity in percent.
- 3 Select a tie line in the topology on the Device Graph.




| Tie-line Name  | Device | Port          | Capacity (bps) | BW (bps) | Device                    | Port   | Capacity (bps) |
|----------------|--------|---------------|----------------|----------|---------------------------|--------|----------------|
| SwitchOU25-4.1 | blue   | SwitchOU25/25 | 10.0G          |          | GF Node-A<br>10.37.80.229 | 4.1/13 | 10.0G          |
| SwitchOU26-4.2 | blue   | SwitchOU26/26 | 10.0G          |          | GF Node-A<br>10.37.80.229 | 4.2/14 | 10.0G          |
| SwitchOU27-4.3 | blue   | SwitchOU27/27 | 10.0G          |          | GF Node-A<br>10.37.80.229 | 4.3/15 | 10.0G          |
| SwitchOU28-4.4 | blue   | SwitchOU28/28 | 10.0G          |          | GF Node-A<br>10.37.80.229 | 4.4/16 | 10.0G          |
| SwitchOU29-5.1 | blue   | SwitchOU29/29 | 10.0G          |          | GF Node-A<br>10.37.80.229 | 5.1/17 | 10.0G          |
| SwitchOU30-5.2 | blue   | SwitchOU30/30 | 10.0G          |          | GF Node-A<br>10.37.80.229 | 5.2/18 | 10.0G          |
| SwitchOU31-5.3 | blue   | SwitchOU31/31 | 10.0G          |          | GF Node-A<br>10.37.80.229 | 5.3/19 | 10.0G          |
| SwitchOU32-5.4 | blue   | SwitchOU32/32 | 10.0G          |          | GF Node-A<br>10.37.80.229 | 5.4/20 | 10.0G          |
| SwitchOU33-6.1 | blue   | SwitchOU33/33 | 10.0G          |          | GF Node-A<br>10.37.80.229 | 6.1/21 | 10.0G          |
| SwitchOU34-6.2 | blue   | SwitchOU34/34 | 10.0G          |          | GF Node-A<br>10.37.80.229 | 6.2/22 | 10.0G          |
| SwitchOU35-6.3 | blue   | SwitchOU35/35 | 10.0G          |          | GF Node-A<br>10.37.80.229 | 6.3/23 | 10.0G          |

In the **Tie-lines** tab, the source and destination information is displayed under the following headings:

- Tie line Name
- Tie line Source: Device, Port, Capacity (bps), BW (bps)
- Tie line Destination: Device, Port, Capacity (bps), BW (bps)
- Source
- Destination

## Viewing Information about the Streams

To view information about the streams

- 1 Open the Path Manager for the selected topology. See [Accessing the Path Manager](#), on page 175.
- 2 Click Overview  if available.
- 3 Select a tie line in the topology on the Device Graph.
- 4 Select the **Streams** tab.



5 In Tie-lines, select a tie-line that you want more information on its streams.

The stream information is displayed under the following headings:

- Stream
- IP address
- BW (bps)
- Source
- Destination

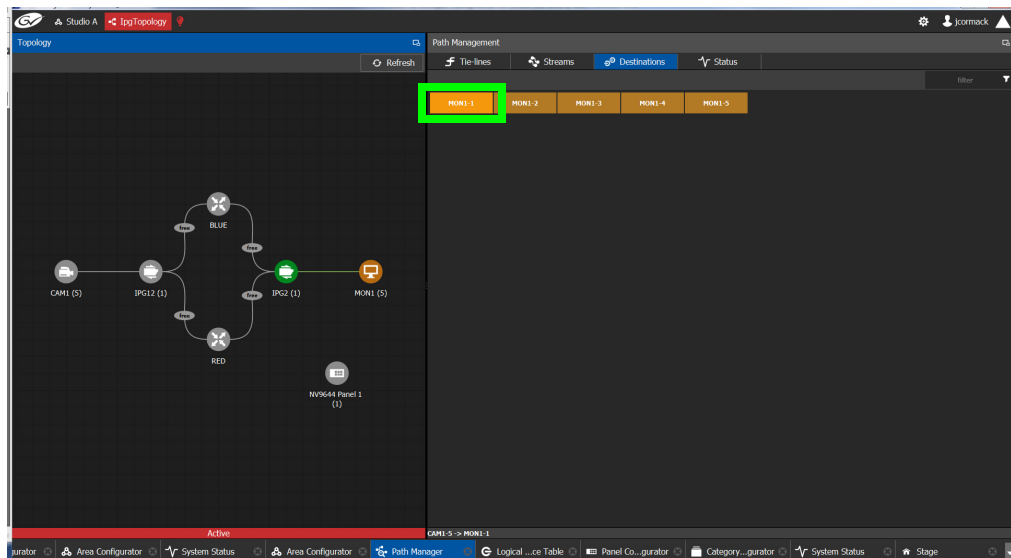
## Viewing Information about the Destinations

This tab shows the path for a signal to a destination. If a destination is showing the wrong signal, use this tab to trace the destination signal back to the source or to start fault-finding.

When a topology includes a DCNM Network Switch, this tab shows operational status information about the path used by a signal to a destination through the DCNM Network Switches, GV Node senders and receivers for example. When you select a Network Switch device that is in alarm, more information about the internal status of the DCNM Network Switch is shown in the Status tab.

To view information about the destinations

- 1 Open the Path Manager for the selected topology. See [Accessing the Path Manager](#), on page 175.
- 2 Select the **Destinations** tab.

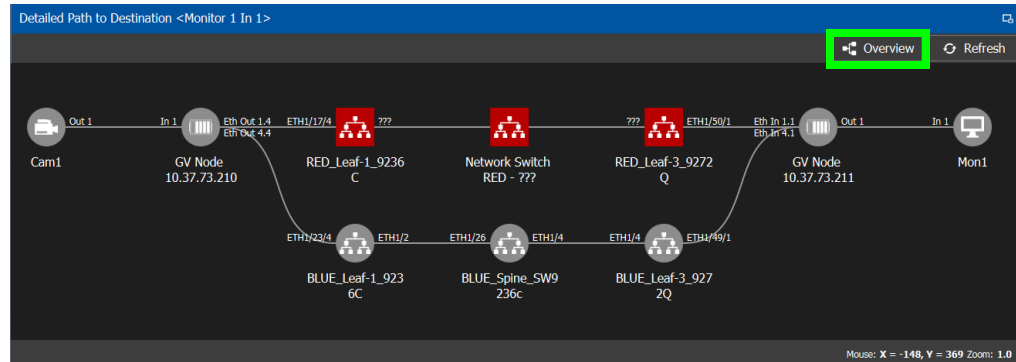


All the destinations are listed on the right.

- 3 Select a destination. The path details to that destination are shown.

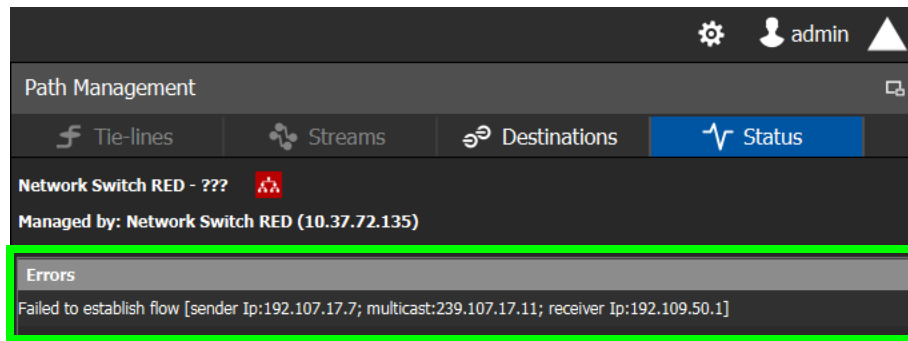
If the topology includes a DCNM Network Switch, the path details will include the spine and leaf connections within the DCNM network. This can be used to diagnose issues with the DCNM network switch or any other signal path issue. For example, the figure

below shows that the RED network is in alarm and as such no signal is passing through this part of the switch's fabric.



To know more about the DCNM Network switch symbols that are used for health monitoring, see [Interpreting DCNM Network Switch Symbols](#), on page 175

- 4 If a DCNM network switch is in alarm, select it and more specific diagnostic information for the related flow shown under the **Path Management, Status** tab.



Use this information to diagnose path issues, for example, through the switch's or GV Node's native configuration interface.

- 5 Click **Overview** to view a highlighted path between the source, shown in green, and the destination, shown in brown.

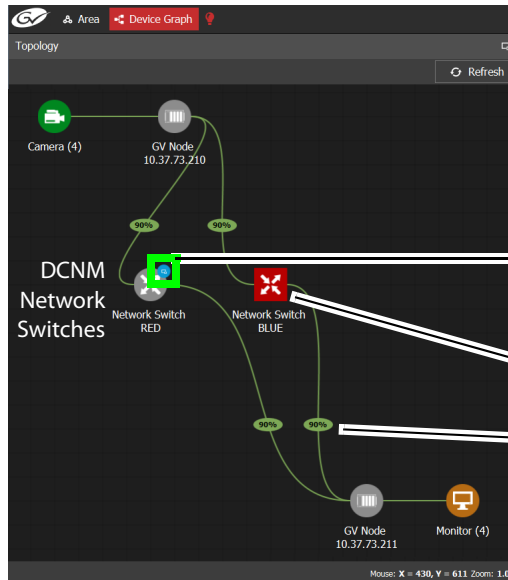
## Viewing Information about the Status

When a topology includes a DCNM Network Switch, this tab shows more technical information about the DCNM Network Switches such as the Network Switch device's operational status that can be used to diagnose the issue in the path issue, for example, through the switch's or GV Node's native configuration interface.

### To view information about the status

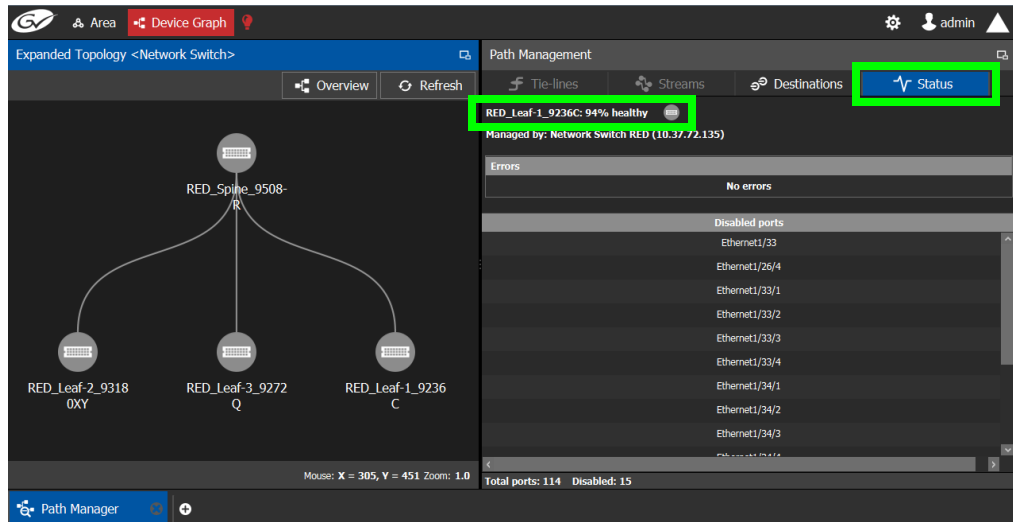
- 1 Open the Path Manager for the selected topology. See [Accessing the Path Manager](#), on page 175.
- 2 Select the **Status** tab.

The flow status of the DCNM Network Switches are displayed, if applicable.



- Click to view more DCNM Network Switch device detail
- The DCNM Network Switch is currently offline
- Percent of currently-used bandwidth

Network Switch devices have a link icon that when clicked shows the exploded network switch showing more information about spine and leaves, and the bandwidth capacity for each specific link.



Click each switch to see its health of the switch (as report by the switch itself).

**Disabled Ports** shows a list of all the switch's disconnected or unused ports that are currently disabled by the switch.

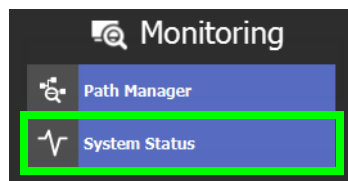
## System Status Task

Use the System Status Task to monitor the health of the GV Convergent Controllers and the devices in the selected topology. You can also perform a manual failover from this task.

### Accessing the System Status Task

To access the System Status Task

- 1 Open GV Convergent Client Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select the required Area. See [Selecting an Area](#), on page 22.
- 3 Select the required topology. See [Selecting a Topology](#), on page 34.
- 4 Select **Monitoring > System Status**.



The System Status task opens

A screenshot of the System Status task interface. The top bar shows 'Area', 'Device Graph', and 'admin'. The main content is divided into two panels: 'GVC Controllers' and 'Devices'.  

| Parameters        | GVC Controller 1  | GVC Controller 2  |
|-------------------|---|---|
| IP                | 10.37.72.107  | 10.37.72.111  |
| Status            | Active  | Inactive <input type="button" value="Force Active"/>                                |
| Health            | <div style="width: 100%; height: 10px; background-color: green;"></div>             | <div style="width: 100%; height: 10px; background-color: green;"></div>             |
| ID                | 1   | 1   |
| CPU               | 0% <div style="width: 100%; height: 10px; background-color: blue;"></div>           | 0% <div style="width: 100%; height: 10px; background-color: blue;"></div>           |
| Actual Memory     | 42% <div style="width: 42%; height: 10px; background-color: blue;"></div>           | 42% <div style="width: 42%; height: 10px; background-color: blue;"></div>           |
| Reserved Memory   | 2% <div style="width: 2%; height: 10px; background-color: blue;"></div>             | 2% <div style="width: 2%; height: 10px; background-color: blue;"></div>             |
| Fan               |   |   |
| Network Interface | eth0 <span style="color: green;">■</span> eth1 <span style="color: green;">■</span> | eth0 <span style="color: green;">■</span> eth1 <span style="color: green;">■</span> |
| Faults            |   |   |

| Name                                | GVC Controller 1   | GVC Controller 2   |
|-------------------------------------|--|--|
| BLUE                                | <span style="background-color: green; color: white;">Active</span> | <span style="background-color: gray; color: white;">Standby</span> |
| GV Node 10.37.73.210 IFM-2T Gateway | <span style="background-color: green; color: white;">Active</span> | <span style="background-color: gray; color: white;">Standby</span> |
| GV Node 10.37.73.210 Router         | <span style="background-color: green; color: white;">Active</span> | <span style="background-color: gray; color: white;">Standby</span> |
| GV Node 10.37.73.211 IFM-2T Gateway | <span style="background-color: green; color: white;">Active</span> | <span style="background-color: gray; color: white;">Standby</span> |
| GV Node 10.37.73.211 Router         | <span style="background-color: green; color: white;">Active</span> | <span style="background-color: gray; color: white;">Standby</span> |
| Network Switch-B                    | <span style="background-color: gray; color: white;">Unknown</span> | <span style="background-color: gray; color: white;">Unknown</span> |
| RED                                 | <span style="background-color: green; color: white;">Active</span> | <span style="background-color: gray; color: white;">Standby</span> |

Active : 10.37.72.133  
Standby : 10.37.72.134  
HA Status : OK

In this configuration, Controller 1 is the active controller and Controller 2 is not present.

The System Status task displays the following information for both GV Convergent controllers: **GVC Controller 1** and **GVC Controller 2**.

| Parameter         | Description  |
|-------------------|--|
| IP                | The current controller's IP address.   |
| Status            | The current status of GV Convergent <b>GVC Controller 1</b> and <b>GVC Controller 2</b> (if equipped):<br><b>Active:</b> All GV Convergent task are being processed by this controller.<br><b>Inactive:</b> This controller is in hot standby. It is ready to take over from the active controller.<br><b>Force Active:</b> Make this controller the active controller. See <a href="#">Forcing the Inactive Controller to be the Active Controller</a> , on page 181. |
| Health            | The current controller's health metric:<br>A <b>green bar</b> indicates that the controller's overall health is good.  |
| CPU and Memory    | The current controller's CPU and memory usage show the current level of controller activity.   |
| Fans              | The current controller's cooling fan health:<br>A <b>green</b> box indicates that the controller's fans are operating correctly.   |
| Network Interface | The current controller's Ethernet interface names and health:<br>A <b>green</b> box indicates that the controller's Ethernet interfaces are operating correctly.   |
| Devices           | The current status of the devices:<br><b>Active:</b> This device is in active operation.<br><b>Standby:</b> This device is in hot standby. It is ready to take over from the active device.  |
| Faults            | A list of any current faults.  |

For more information about the health status of a DCNM Network Switch device, see [Path Manager Tasks](#), on page 174.

## Forcing the Inactive Controller to be the Active Controller

If two controllers are configured in a redundant configuration, then during the normal course of operations, one controller is active and the other is inactive at all times.

If a problem occurs, such as network loss or connectivity issues, the inactive controller (Controller 2) becomes the active controller. The controller that was formerly active (Controller 1) reboots. This is an automatic failover. You can perform a manual failover if you have administrator rights in the selected Area. See [Viewing Permissions by Role](#), on page 202.

**To perform a manual failover**

- 1 Open the System Status task for the required topology. See [Accessing the System Status Task](#), on page 180.

The screenshot displays the 'System Status' interface. On the left, under 'GVC Controllers', there are two columns: 'GVC Controller 1' and 'GVC Controller 2'. Controller 1 is 'Active' with a green health bar, while Controller 2 is 'Inactive' with a grey health bar and a 'Force Active' button. Below these are resource usage metrics for CPU, Actual Memory (42%), Reserved Memory (2%), Fan, Network Interface (eth0, eth1), and Faults. On the right, under 'Devices', a table lists various nodes and their status for both controllers. For example, 'BLUE' is 'Active' on Controller 1 and 'Standby' on Controller 2. 'RED' is 'Active' on Controller 1 and 'Standby' on Controller 2. The HA Status is 'OK'.

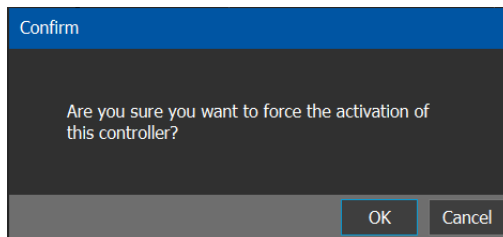
| Parameters        | GVC Controller 1 | GVC Controller 2             |
|-------------------|------------------|------------------------------|
| IP                | 10.37.72.107     | 10.37.72.111                 |
| Status            | Active           | Inactive <b>Force Active</b> |
| Health            |                  |                              |
| ID                | 1                | 1                            |
| CPU               | 0%               | 0%                           |
| Actual Memory     | 42%              | 42%                          |
| Reserved Memory   | 2%               | 2%                           |
| Fan               |                  |                              |
| Network Interface | eth0  eth1       | eth0  eth1                   |
| Faults            |                  |                              |

| Name                                | GVC Controller 1 | GVC Controller 2 |
|-------------------------------------|------------------|------------------|
| BLUE                                | <b>Active</b>    | Standby          |
| GV Node 10.37.73.210 IFM-2T Gateway | <b>Active</b>    | Standby          |
| GV Node 10.37.73.210 Router         | <b>Active</b>    | Standby          |
| GV Node 10.37.73.211 IFM-2T Gateway | <b>Active</b>    | Standby          |
| GV Node 10.37.73.211 Router         | <b>Active</b>    | Standby          |
| Network Switch-B                    | Unknown          | Unknown          |
| RED                                 | <b>Active</b>    | Standby          |

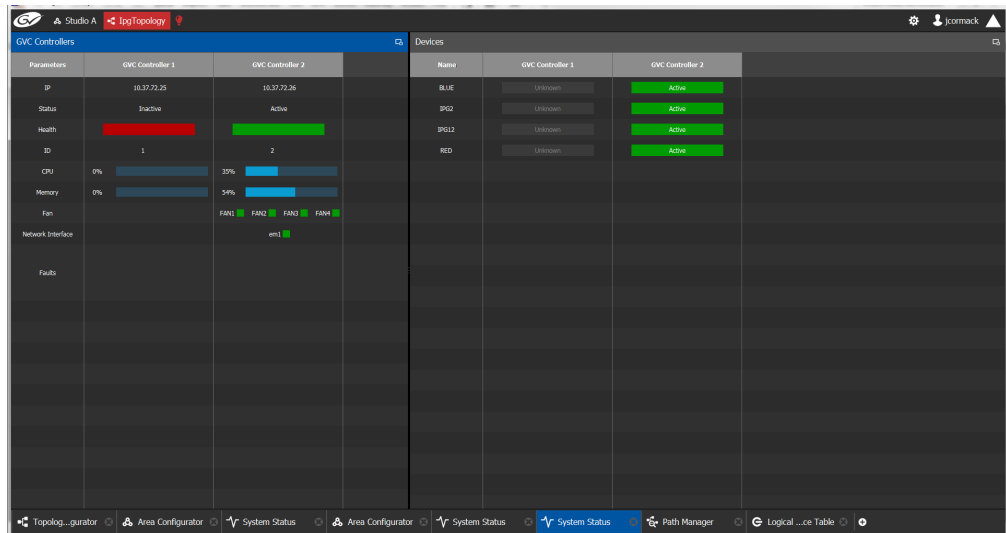
- 2 Click the **Force Active** button for the Inactive Controller.

A confirmation message appears.



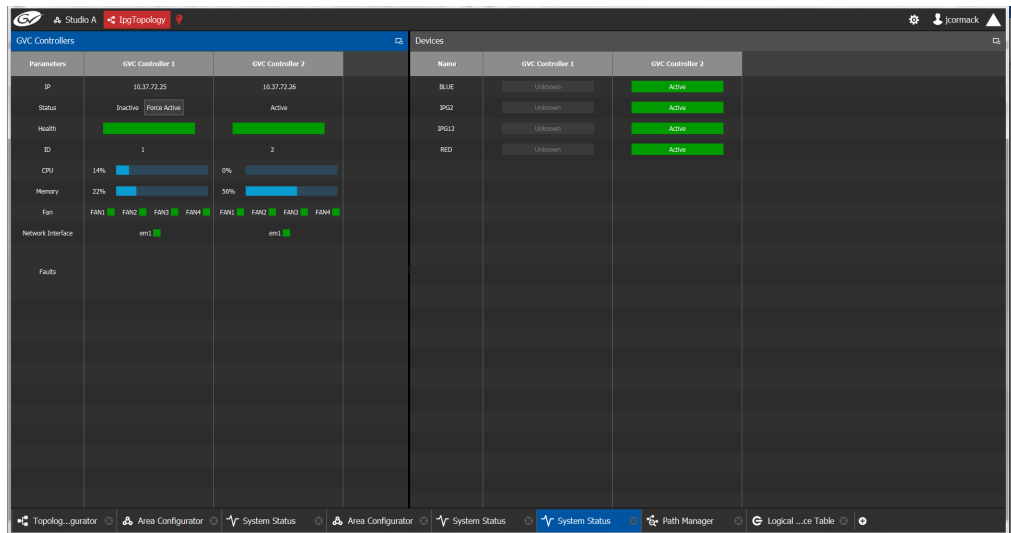
- 3 Click **OK** to continue.

The controllers switch states. The formerly inactive controller (Controller 2) becomes active. The formerly active controller (Controller 1) reboots. As it shuts down, the following changes occur and are reflected on the System Status task.



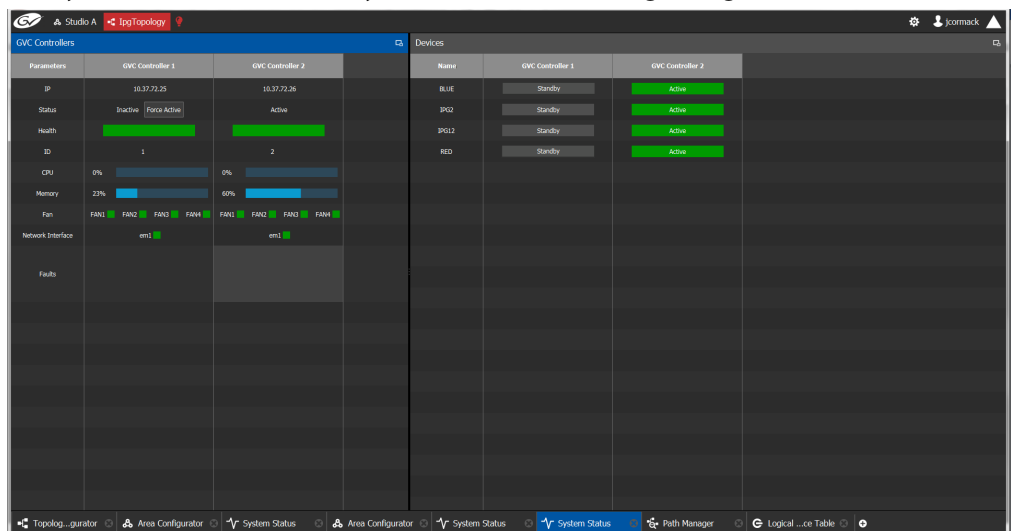
- The **Status** of the **Controller 1** is now **Inactive**.
- A **red bar** is displayed for the **Health** of Controller 1, indicating it is not good.
- The **CPU** and **Memory** are at **0%**.
- The **Fans** and **Network Interface** are blank.
- The **Status** of the **Controller 2** is now **Active**.
- A **green bar** is displayed for the **Health** of Controller 2, indicating it is good.
- The **CPU** and **Memory** fields show their level of activity.
- The **Fans** are green, indicating health.
- The **Network Interface** displays the Management Interface port name (em1).
- The status of all **devices** controlled by **Controller 1** is **unknown**.
- The status of all **devices** controlled by **Controller 2** is **active**.

When Controller 1 comes back, the following changes occur and are reflected in the interface.



- The **status** of **Controller 1** is now **Inactive**.
- The **health** field for Controller 1 displays a **green bar** indicating it is good.
- The **CPU** and **Memory** fields for both controllers show the current level of activity.
- The **fans** for both controllers show **green** boxes indicating health.
- The **Network Interface** port of both controllers is displayed, **em1**.
- The **status** of the devices on **Controller 1** is **unknown**.
- The **status** of the devices on **Controller 2** is **active**.

Finally, when Controller 1 is fully rebooted, the following changes occur:



- The **status** of the devices on **Controller 1** is **standby**.



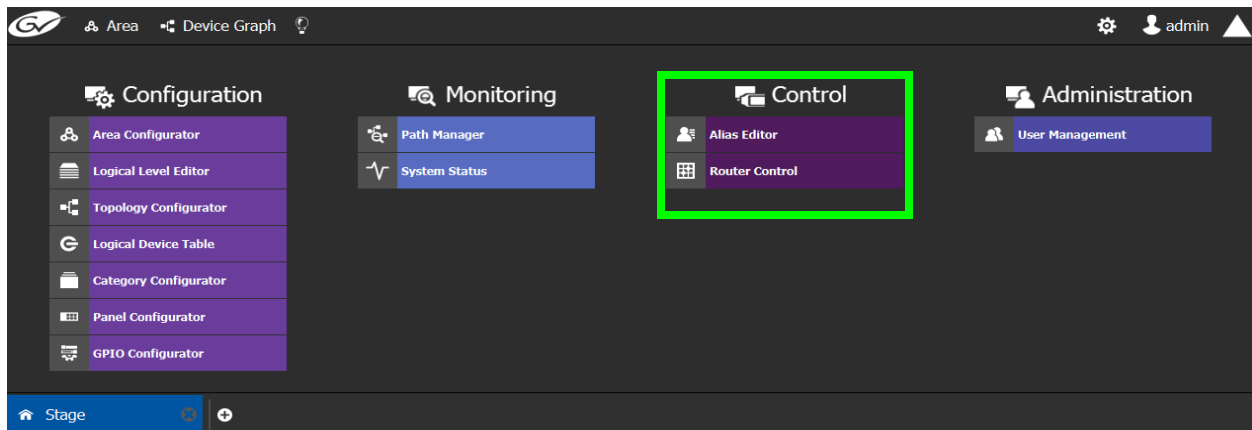
## Permissions

Only users who are assigned to Administrators role in the selected area have View, Edit, and Delete permissions in the System Status task. Users who are assigned to Engineers, Operators, and Maintenance roles have view rights only. See [Viewing Permissions by Role](#), on page 202.



# 6 Control Tasks

## Overview



The GV Convergent Monitoring Tasks include:

- [Alias Editor Tasks](#), on page 188
- [Router Control Tasks](#), on page 190

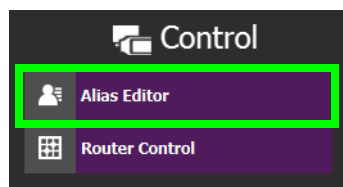
## Alias Editor Tasks

Use the Alias Editor to assign aliases to sources and destinations. More than one set of aliases can be created to allow the source / destination naming conventions to be changed on the fly, for example, to change the interface for different programmes or production staff, or to support another language(s).

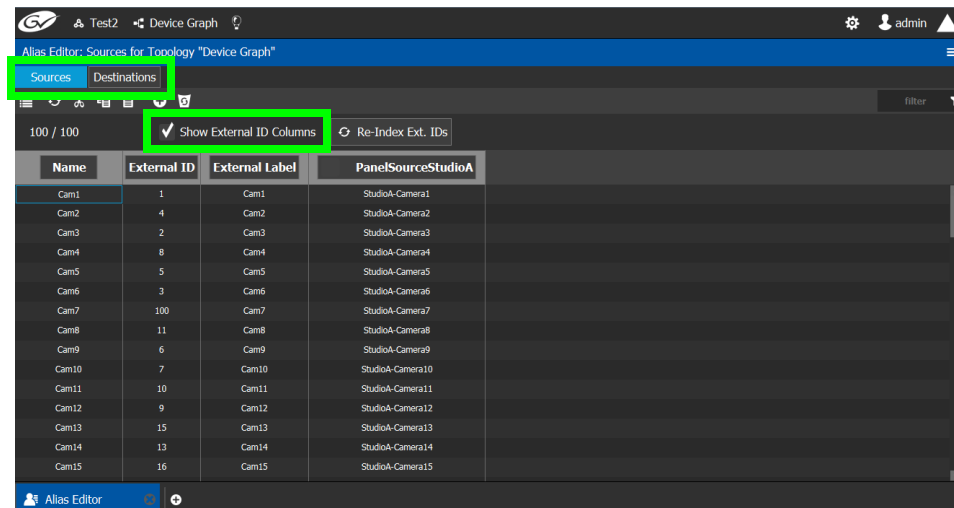
### Accessing Alias Editor Tasks

#### To access the Alias Editor

- 1 Open GV Convergent Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select the required Area. See [Selecting an Area](#), on page 22.
- 3 Select the required topology. See [Selecting a Topology](#), on page 34.
- 4 Select **Control** > **Alias Editor**.



The Alias Editor task opens.



The Alias Editor has tabs for Source and Destination IDs.

### About External IDs and Northbound Control Interfaces

External IDs are shown by setting **Show External ID Columns**. External IDs are used for Northbound control interfaces that use ID-based protocols.

Certain control protocols require that the numbering of external IDs must be contiguous. In this case, if they are not sequential, click **Re-Index Ext. IDs**.

External IDs that are larger than the total number of sources or destinations will not status northbound.

GV Convergent must have status for all destinations within GV Convergent or they will not report northbound for that external ID. For example, if a take has never been made to a destination, that destination will not have its status set. This behavior is different from a physical router where all destinations have a status set by default.

## Adding Aliases

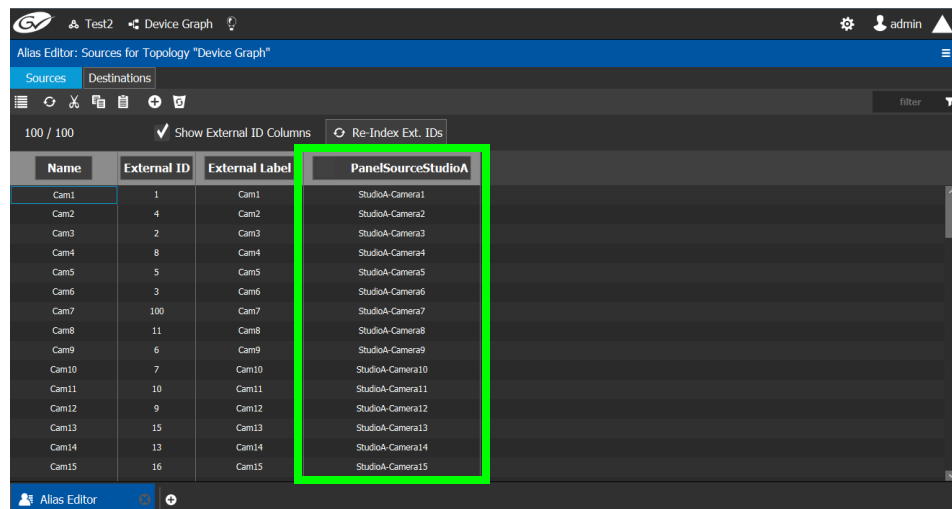
These aliases can be used in router control to change the name of sources and destinations from short labels to the labels of the corresponding alias. The alias can be composed of up to 24 characters to create a more descriptive name than its equivalent short label. Aliases can also be used with panels; see [Creating a New Panel](#), on page 81. See also [Using Source and Destination Aliases with a Panel](#), on page 87.

Once an alias column has been added, you can also copy/paste a list of values from an Microsoft Excel spreadsheet column into the alias column to bulk name the sources and destinations.


### To Add Aliases

- 1 Open the Alias Editor. See [Accessing Alias Editor Tasks](#), on page 188.

The Alias Editor task opens.



The Alias Editor has tabs for Source and Destination IDs.

- 2 Select **Show External ID Columns** columns if necessary.
- 3 You can add one or more columns to create an aliases for the sources. Click **New**  at the top of the UI to add a column for the aliases. Enter the corresponding aliases in this column or paste a list of values from an Microsoft Excel spreadsheet column into the alias column to bulk name the sources.

The aliases are now available to be used with router control and panels. If aliases are used with a panel and they are longer than 8 characters, consider setting the **Display 24 characters** option for the panel in the Panel's **Property Editor**. See [Creating a New Panel](#), on page 81.

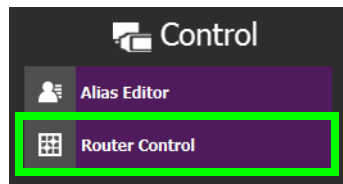
## Router Control Tasks

Use the Router Control task to control the sources and destination in an active topology.

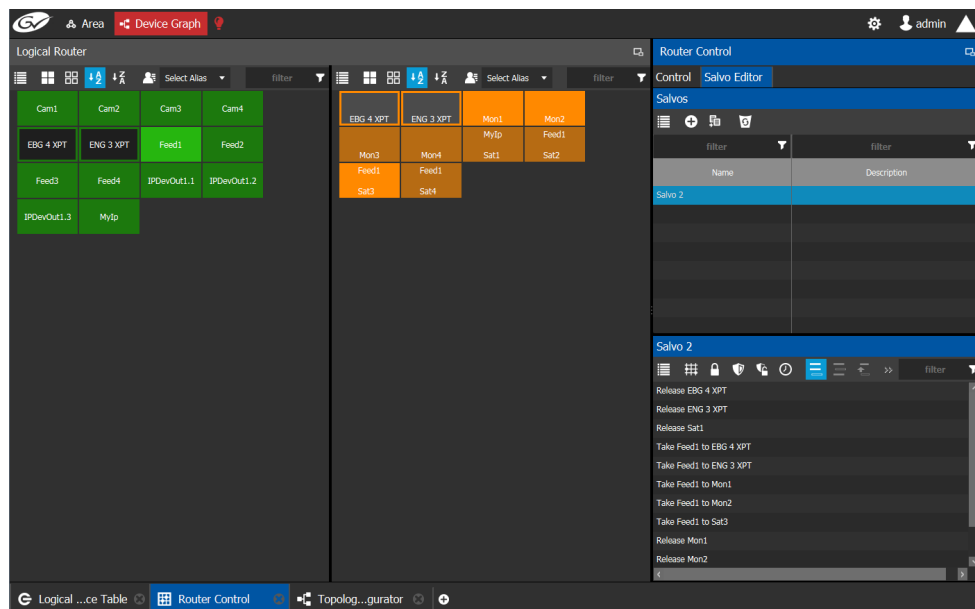
### Accessing the Router Control Task

To access the Router Control task

- 1 Open GV Convergent Stage. See [Navigating Back to Stage](#), on page 10.
- 2 Select the required Area. See [Selecting an Area](#), on page 22.
- 3 Select the required topology. See [Selecting a Topology](#), on page 34.
- 4 Select **Control** > **Router Control**.



The Router Control task opens

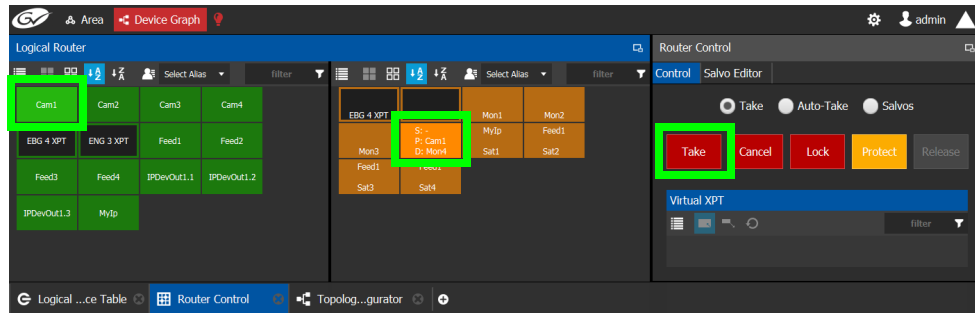


The sources are listed on the left under Logical Router. The destinations are listed in the center. The right hand column displays the actions you can perform.

### Performing a Take in Router Control

You can perform a take in Router Control as follows.

- 1 Under **Logical Router**, select a source, shown in green.
- 2 Select a destination, shown in brown.
- 3 Under **Router Control**, **Control** tab, click **Take**.




| Parameter                                       | Description   |
|---|---|
| Take / Auto-Take / Salvos radio buttons         | Sets the router control mode: <ul style="list-style-type: none"> <li><b>Take:</b> Once the source and destination has been selected, you then click <b>Take</b> to make the take.</li> <li><b>Auto-Take:</b> Once the source and destination has been selected, the take is automatically made.</li> <li><b>Salvos:</b> Trigger previously-configured salvos. See also <a href="#">Creating Salvos</a>, on page 191.</li> </ul> |
| Take button                                     | Makes the connection between the currently selected source and destination. In salvo mode, it triggers the selected salvo.  |
| Cancel button                                   | Cancels the current selection.  |
| Lock button                                     | Will lock the current destination to not allow the source to be changed by any user. High Tally when enabled on selected destination.   |
| Protect button                                  | Will protect the current destination to not allow the source to be changed by a user other than the current user. High Tally when enabled on selected destination.  |
| Release button                                  | Releases lock or protect on the selected destination.   |
| Virtual XPT > Minimize Virtual XPT <sup>a</sup> | To minimize the destinations within the selected virtual XPT <sup>b</sup> .   |
| Virtual XPT > Expand Virtual XPT <sup>a</sup>   | To show all the destinations within the selected virtual XPT, including the nested destinations of all other virtual XPTs <sup>b</sup> .  |
| Virtual XPT > Reset XPT <sup>a</sup>            | Initialize the selected virtual XPT. This will route the appropriate virtual source to the logical destinations that were configured for the virtual XPT in the logical device table.   |

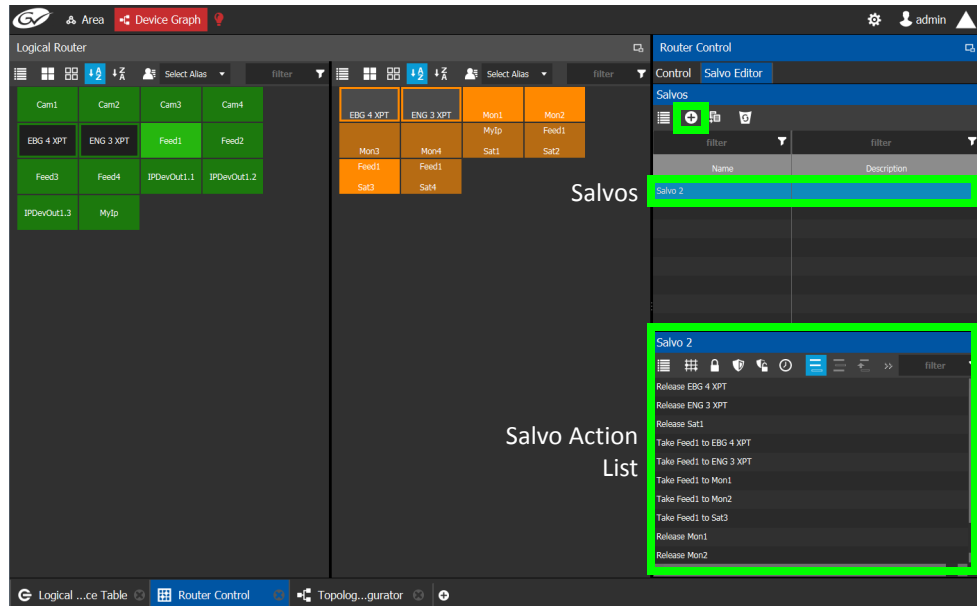
a. This becomes available when virtual XPTs have been previously configured (see [Configuring Virtual Crosspoints \(XPTs\)](#), on page 65). You must select a destination that is part of a virtual destination in the router control grid or select a virtual destination in the router control grid.

b. See [Minimize and Expand Virtual XPT Destinations](#), on page 72 for more information.

## Creating Salvos




When a salvo is triggered, it executes a list of pre-configured actions. You can create a salvo as follows.

- 1 Under **Router Control, Salvo Editor** tab, click **New** .
- 2 Enter a name and description for the salvo in the **Salvos** list.



| Icon | Description  |
|------|--|
|      | New<br>Create a new salvo and associated salvo action list.  |
|      | Duplicate<br>Make a copy of the currently-selected salvo.  |
|      | Delete<br>Remove the currently-selected salvo / take.  |
|      | Take<br>Add the currently-selected source and destination as a take action to the salvo list. The following functional behaviors are by design: <ul style="list-style-type: none"> <li>• If multiple destinations are selected, then there will be multiple take actions added to the salvo list.</li> <li>• If there is only one source and multiple destinations selected, then that source is routed to all destinations.</li> <li>• If multiple sources are selected (for example, Source1, Source2, Source3) and multiple destinations are selected (for example, Destination1, Destination2, Destination3, and Destination4), then the takes added to the salvo list are Source1 to Destination1, Source2 to Destination2, Source3 to Destination3.</li> </ul> |
|      | Lock<br>Lock the currently select destination.   |
|      | Protect<br>Protect the currently select destination.   |
|      | Release<br>Release the currently select destination.   |
|      | Pause<br>The wait time in milliseconds that can be added to the list of operations.  |
|      | Append<br>In this mode, any new salvo operation will be added to the end of the salvo action list.   |
|      | Insert<br>In this mode, any new salvo operation will be inserted at the currently selected spot in the salvo action list.  |



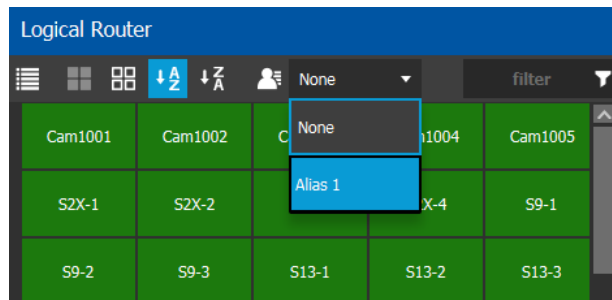
| Icon  | Description   |
|---|---|
|  | Replace<br>In this mode, any new salvo operation will replace the currently-selected salvo action from the salvo action list. |
|  | Move Up<br>Move the selected salvo action up in the salvo action list.  |
|  | Move Down<br>Move the selected salvo action down in the salvo action list.  |

- 3 Under **Logical Router**, select a source, shown in green.
- 4 Select a destination, shown in brown.
- 5 Under the salvo action list, click **Take**.

## Selecting the Name of Sources and Destinations

When a source or destination has been assigned an alias, you can select the alias to be shown through the Alias drop-down menu. To create aliases, see [Alias Editor Tasks](#), on page 188.

- 1 Select a source or destination under **Logical Router**.
- 2 Click the alias drop-down menu and select an alias option.

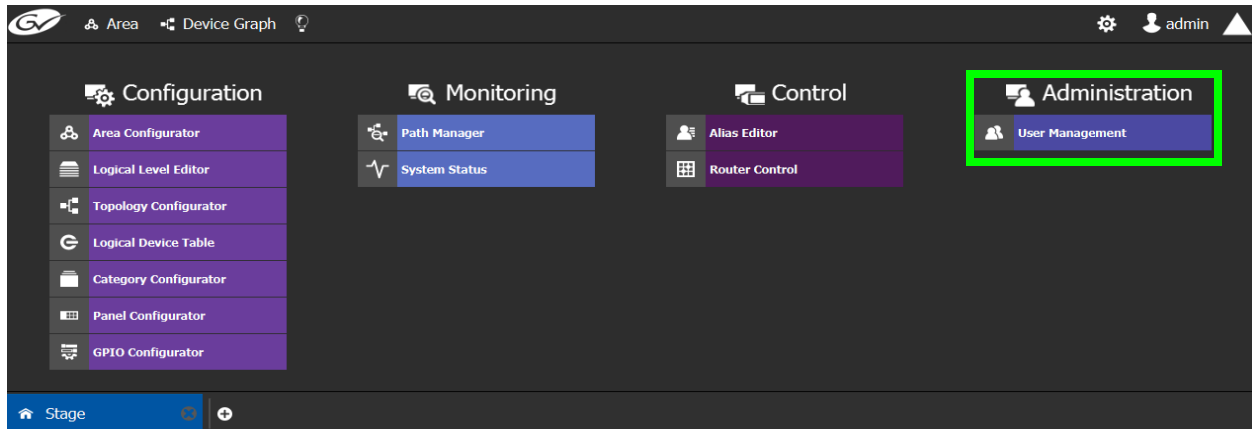


The label for the selected source or destination changes to the selected option.



# Administration Tasks

User Management is the only Administration task. Only administrators have access to it.



## User Management Task

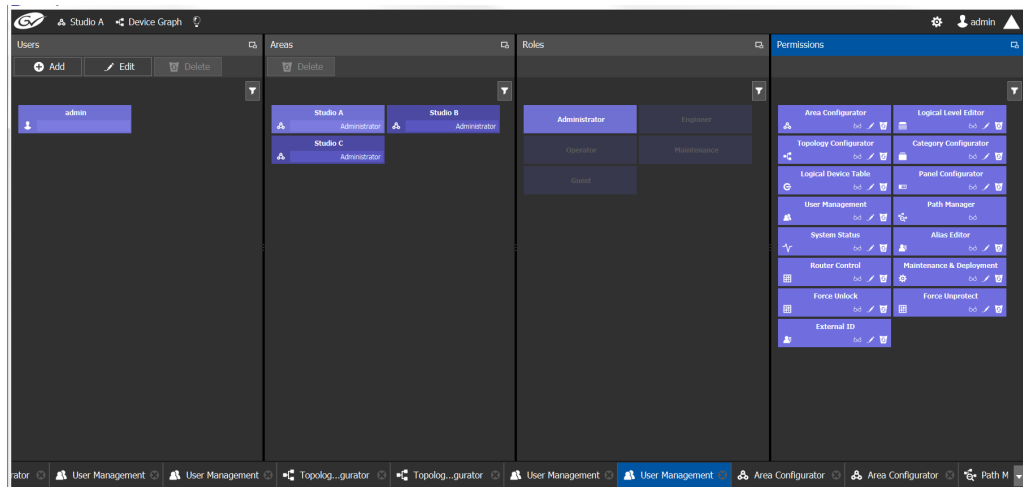
As an administrator, you have access to the User Management Task. This is used for:

- Creating, editing, and deleting user profiles. See [Creating User Profiles](#), on page 197.
- Managing access rights to the areas in your system. See [Granting Access Permissions to an Area](#), on page 199.
- Viewing and assigning permissions according to predefined user roles. See [Viewing Permissions by Role](#), on page 202.

## The User Management Task Overview

**Note:** Before you assign access permissions, you must create areas in your system. For details, see [Area Configurator Tasks](#), on page 16.

When you first log in to the User Management Task, the admin tile appears in the **Users** section.



The User Management Task UI has four columns:

- **Users:** The column displays a tile for each user who has access to your system. See [Creating User Profiles](#), on page 197.
- **Areas:** The column displays a tile for each area defined in your system. See [Granting Access Permissions to an Area](#), on page 199.
- **Roles:** The column displays a tile for each of the predefined roles: Administrator, Engineer, Operator, Maintenance, and Guest. Permissions to view, edit, and delete within each client task vary by role. These permissions can be seen when you select the role in the Roles column; i.e., **Administrator** is selected in the screen shot above. The permissions granted to the administrator role are shown in the **Permissions** column. (Members of the administrator role have full access permissions to all areas in the system). See [Viewing Permissions by Role](#), on page 202 for a list of the permissions available to each role.
- **Permissions:** The column displays a tile for the tasks that users can perform within the areas in your system according to the selected User, Area, and Role. View, edit and delete icons show the current user's rights for the task.

## Creating User Profiles

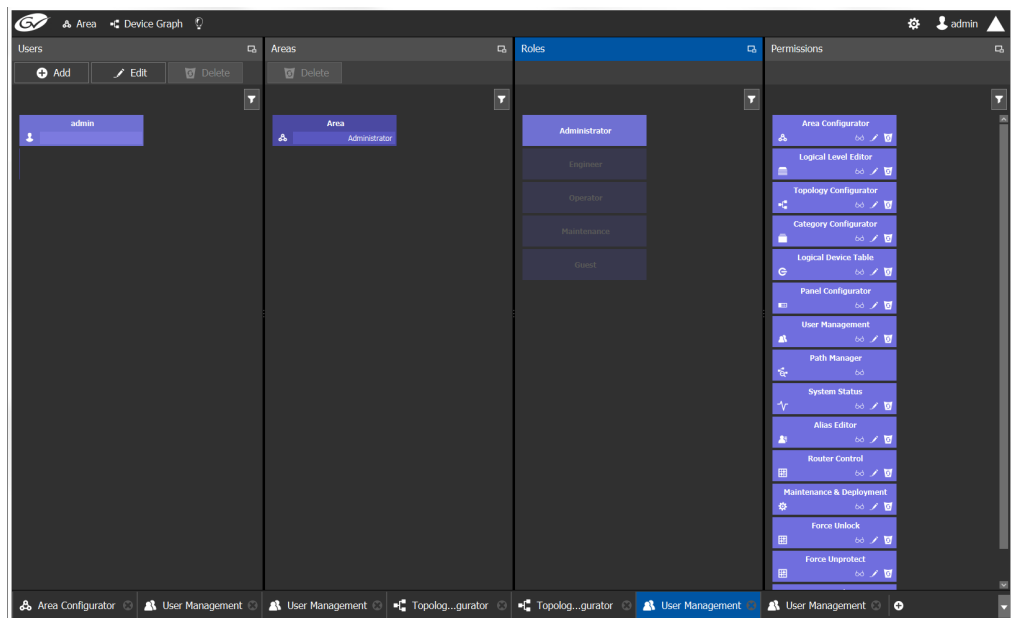
The first step is to create your user profiles.

**Note:** To access the user profiles, you must belong to the administrator role. Otherwise, Administration tasks are not visible in GV Convergent Client Stage.

### To create a new user account:

- 1 Launch GV Convergent Client.
- 2 Log in as an administrator.
- 3 Select **Administration > User Management**.

The User Management window appears.



- 4 Click the **Add** button  in the top left corner.

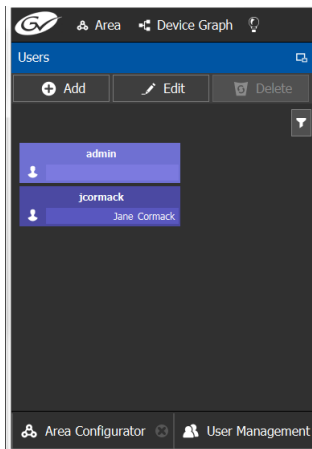
The user configuration window appears.

|   |           |
|---|-----------|
| User ID   | jocormack |
| First Name  | Jane      |
| Last Name   | Cormack   |
| Password  | •••••     |
| Confirm Password  | •••••     |
| <input type="button" value="Ok"/> <input type="button" value="Cancel"/> |           |

- 5 Enter the required information in the **User ID**, **First Name**, **Last Name**, **Password**, and **Confirm Password** fields.

- 6 Click **OK**.

A new tile representing the new user account appears in the **Users** section.



In addition, you can perform the following procedures in the **Users** section:

- **Edit:** Select the icon for the user and click **Edit** to modify the user's credentials.
- **Delete:** Select the icon for the user and click **Delete** to remove the user account. There is no confirmation when you click **Delete**. The user profile is immediately removed.

**See also**

- [Switching User Profiles](#), on page 11

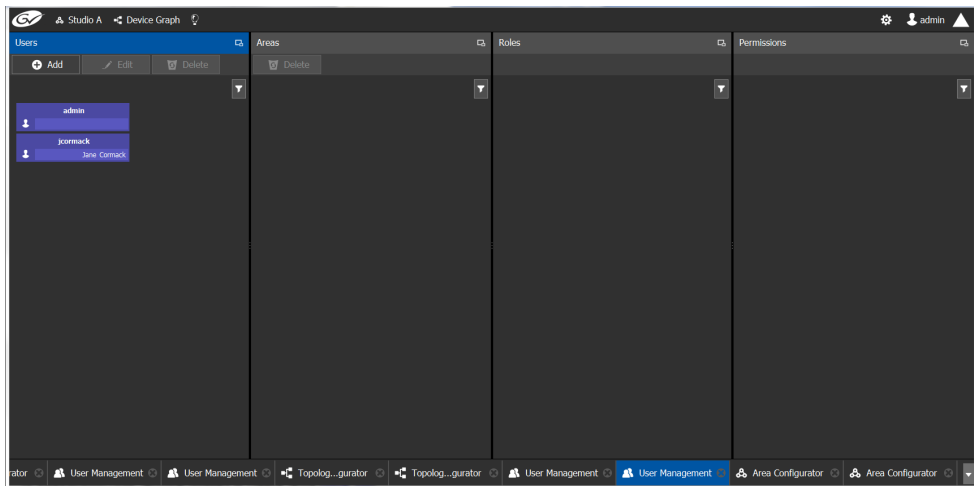
## Granting Access Permissions to an Area

Users are granted access to each area via a predefined role. The procedure is as follows:

### To grant access to an area

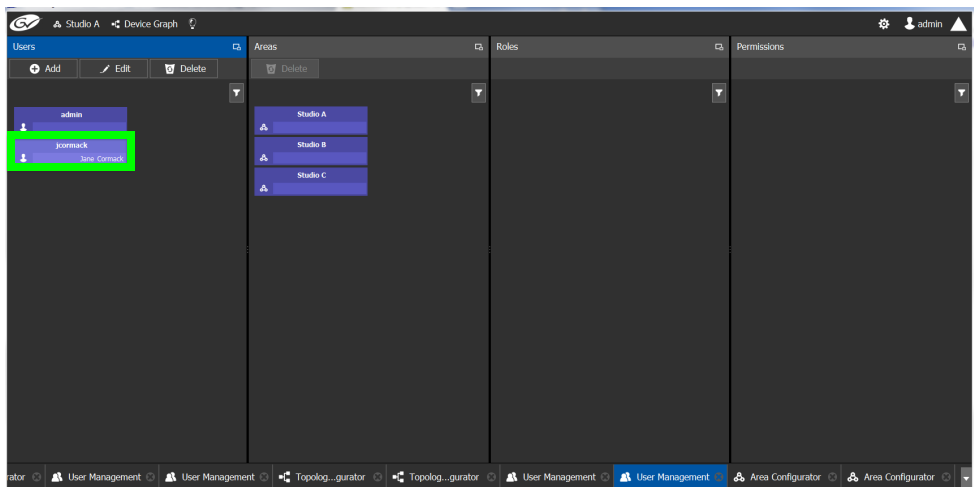
- 1 Launch GV Convergent Client.
- 2 Log in as an administrator.
- 3 Select **Administration > User Management**.

The User Management task appears.



The **Users** column displays tiles for all the users who have access to the system.

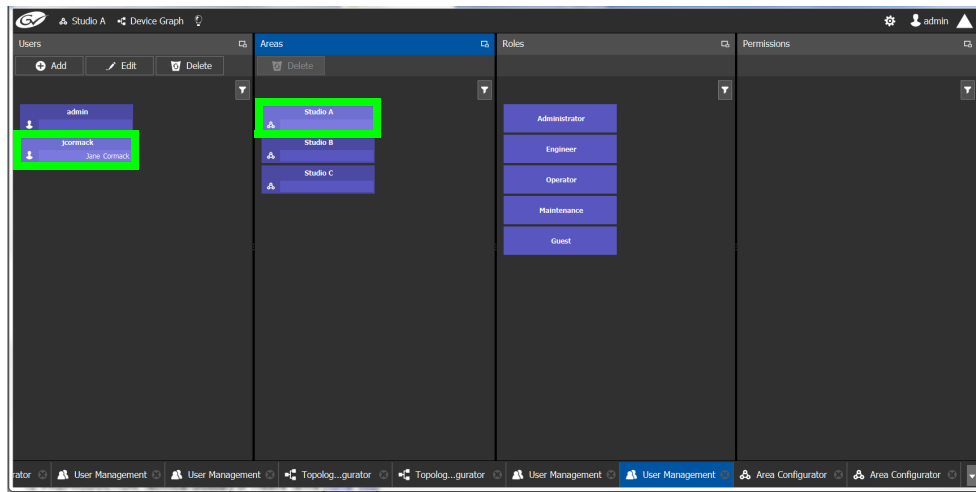
- 4 Select the applicable user tile in the **Users** section.



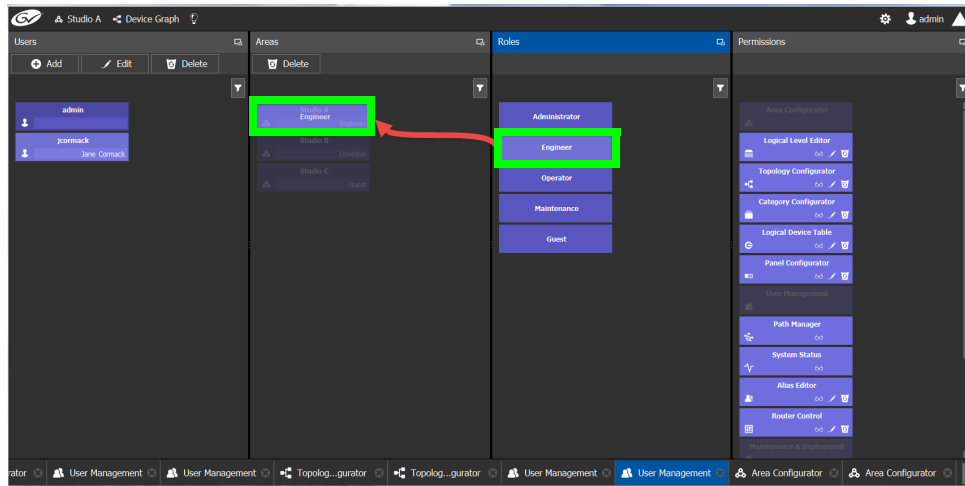
The **Areas** column displays tiles for all the areas defined in your system.

## Administration Tasks

### Granting Access Permissions to an Area

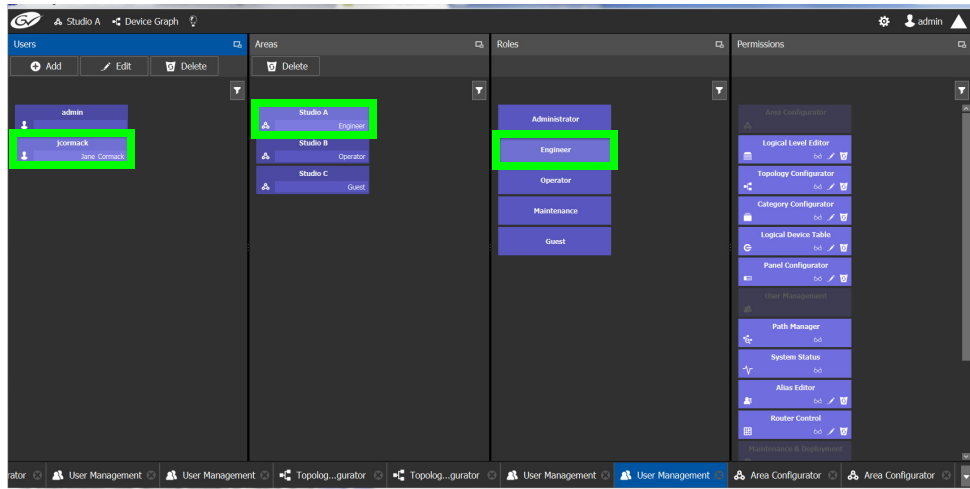


- 5 Select an area tile in the **Areas** section while keeping the user tile selected.  
The **Roles** column displays tiles for all the roles when both the user tile and the area tile are selected, at the same time.
- 6 Select a role tile and drag it on top of the area tile.

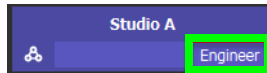


This action gives the user all the permissions defined for the role in the selected area.

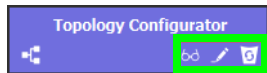




When you select the user tile in the Users section, the user's role in the area is displayed at the bottom right of the Area tile.



The permissions granted to the selected role; i.e., view, edit, delete, are displayed on the Permissions tile in the **Permissions** column.



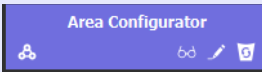

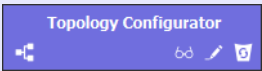
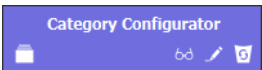
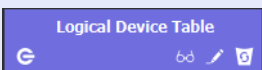
These are listed in the next section.

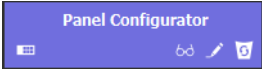
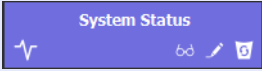
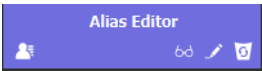
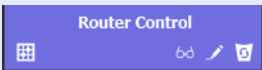
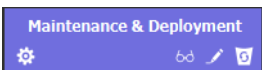
## Viewing Permissions by Role

Users are granted access to the areas in the system via their assigned roles. The following rules apply:

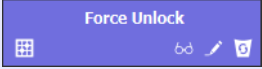
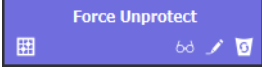
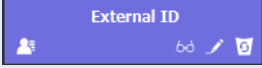
- Users can be assigned to different roles in different areas.
- Users cannot be granted permissions as individuals, only according to role.
- The roles are predefined, as follows: Administrator, Engineer, Operator, Maintenance, and Guest. The roles cannot be modified.
- Administrators have full access to all tasks in all areas. Guests have the least permissions. The Engineer, Operator, and Maintenance roles have various permissions, as listed in the following table:

The permissions granted to each role can be viewed on the tiles in the Permissions list book of the User Management task. These can be viewed when the user, the area, and the role are all selected at the same time.

| Task  | Role          | Permissions        |
|---|---------------|--------------------|
| <b>Area configurator</b><br>       | Administrator | View, Edit, Delete |
|   | Engineer      | No access          |
|   | Operator      | No access          |
|   | Maintenance   | No access          |
|   | Guest         | No access          |
| <b>Logical Level Editor</b><br>  | Administrator | View, Edit, Delete |
|   | Engineer      | View, Edit, Delete |
|   | Operator      | No access          |
|   | Maintenance   | No access          |
|   | Guest         | No access          |
| <b>Topology Configurator</b><br> | Administrator | View, Edit, Delete |
|   | Engineer      | View, Edit, Delete |
|   | Operator      | View               |
|   | Maintenance   | No access          |
|   | Guest         | No access          |
| <b>Category Configurator</b><br> | Administrator | View, Edit, Delete |
|   | Engineer      | View, Edit, Delete |
|   | Operator      | No access          |
|   | Maintenance   | No access          |
|   | Guest         | No access          |
| <b>Logical Device Table</b><br>  | Administrator | View, Edit, Delete |
|   | Engineer      | View, Edit, Delete |
|   | Operator      | No access          |
|   | Maintenance   | No access          |
|   | Guest         | No access          |

| Task   | Role          | Permissions        |
|--|---------------|--------------------|
| <b>Panel Configurator</b><br>             | Administrator | View, Edit, Delete |
|  | Engineer      | View, Edit, Delete |
|  | Operator      | No access          |
|  | Maintenance   | No access          |
|  | Guest         | No access          |
| <b>User Management</b><br>                | Administrator | View, Edit, Delete |
|  | Engineer      | No access          |
|  | Operator      | No access          |
|  | Maintenance   | No access          |
|  | Guest         | No access          |
| <b>Path Manager</b><br>                   | Administrator | View               |
|  | Engineer      | View               |
|  | Operator      | View               |
|  | Maintenance   | No access          |
|  | Guest         | No access          |
| <b>System Status</b><br>                 | Administrator | View, Edit, Delete |
|  | Engineer      | View               |
|  | Operator      | View               |
|  | Maintenance   | View               |
|  | Guest         | No access          |
| <b>Alias Editor</b><br>                 | Administrator | View, Edit, Delete |
|  | Engineer      | View, Edit, Delete |
|  | Operator      | View, Edit, Delete |
|  | Maintenance   | No access          |
|  | Guest         | No access          |
| <b>Router Control</b><br>               | Administrator | View, Edit, Delete |
|  | Engineer      | View, Edit, Delete |
|  | Operator      | View               |
|  | Maintenance   | No access          |
|  | Guest         | No access          |
| <b>Maintenance &amp; Deployment</b><br> | Administrator | View, Edit, Delete |
|  | Engineer      | No access          |
|  | Operator      | No access          |
|  | Maintenance   | View               |
|  | Guest         | No access          |

Administration Tasks  
Viewing Permissions by Role

| Task   | Role          | Permissions        |
|--|---------------|--------------------|
| <b>Router Force Unlock</b><br>    | Administrator | View, Edit, Delete |
|  | Engineer      | No access          |
|  | Operator      | View, Edit, Delete |
|  | Maintenance   | No access          |
|  | Guest         | No access          |
| <b>Router Force Unprotect</b><br> | Administrator | View, Edit, Delete |
|  | Engineer      | No access          |
|  | Operator      | View, Edit, Delete |
|  | Maintenance   | No access          |
|  | Guest         | No access          |
| <b>External ID</b><br>            | Administrator | View, Edit, Delete |
|  | Engineer      | View, Edit, Delete |
|  | Operator      | No access          |
|  | Maintenance   | No access          |
|  | Guest         | No access          |





## **Grass Valley Technical Support**

For technical assistance, contact our international support center, at 1-800-547-8949 (US and Canada) or +1-530-478-4148.

To obtain a local phone number for the support center nearest you, consult the Contact Us section of Grass Valley's website ([www.grassvalley.com](http://www.grassvalley.com)).

An online form for e-mail contact is also available from the website.

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