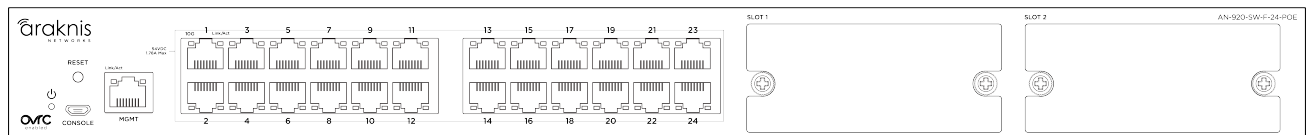


AN-920-SW

920 Series Managed Switch Quick Start Guide

Welcome to Araknis Networks™

Thank you for choosing an Araknis 920 series managed switch. With multi-gigabit connectivity on all network ports, updated modern aesthetics, and a managed interface, the Araknis 920 series switch is a sleek and highly capable addition to any network.



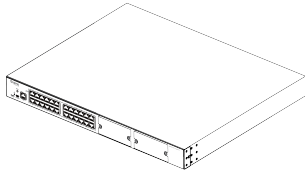
Series overview

Each 920 series switch comes with a power module in the box. QSFP28 and additional power modules are sold separately.

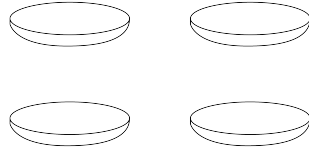
Model	Ethernet ports	Total possible QSFP28 ports	Total possible PoE budget (Watts)
AN-920-SW-F-12-POE	12	1 with QSFP28 module (sold separately)	750 with 1 power module 1080 with 2 power modules
AN-920-SW-F-24-POE	24	2 with QSFP28 modules (sold separately)	750 with 1 power module 1650 with 2 power modules

Unboxing

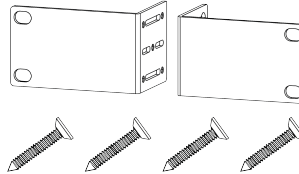
The package contains:



Switch



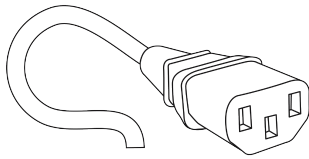
Rubber feet for flat surfaces (4)



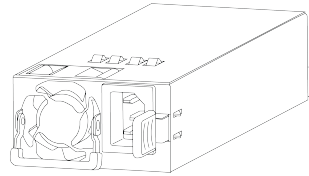
Rack mount kit:
ears (2), screws
(8)



Quick Start
QR card



AC power cord

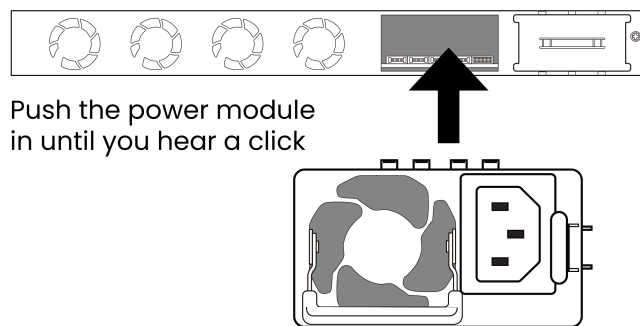
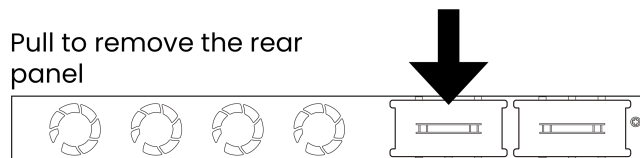


Power module

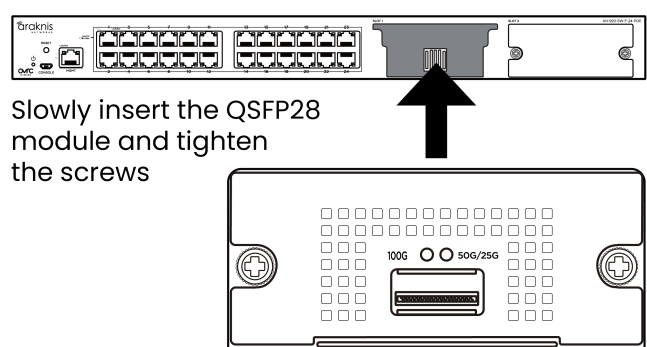
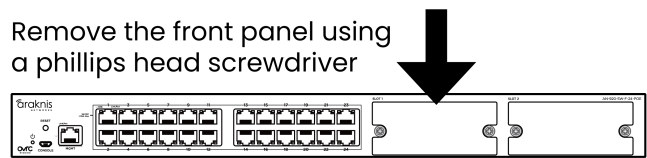
Install the modules

Caution: The switch must be powered off when installing QSFP28 modules.

Power module



QSFP28 module



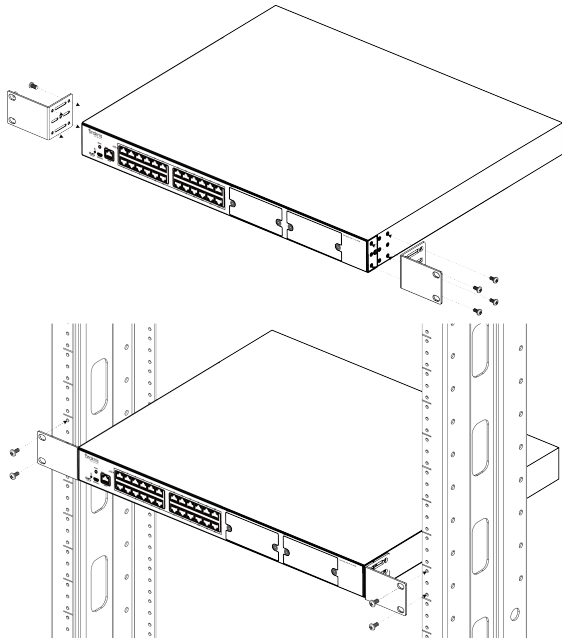
Note: To remove the power module, push the tab toward the handle and pull the module straight back.

Caution: Do not use a Y power cable. Sometimes called a Y splitter cable.

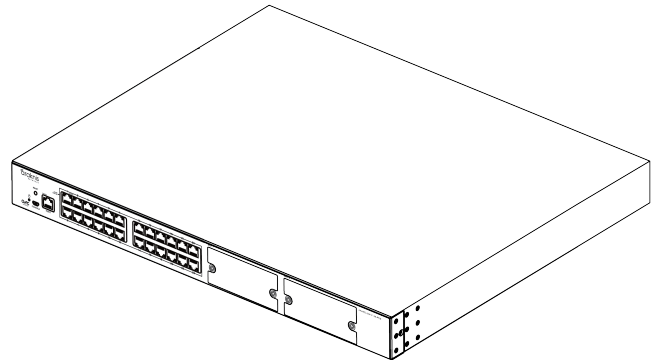
Pro Tip: Connect each power module to separate circuits in the same phase. Use a separate UPS for each power cable.

Installing the switch

Rack mount



Shelf mount



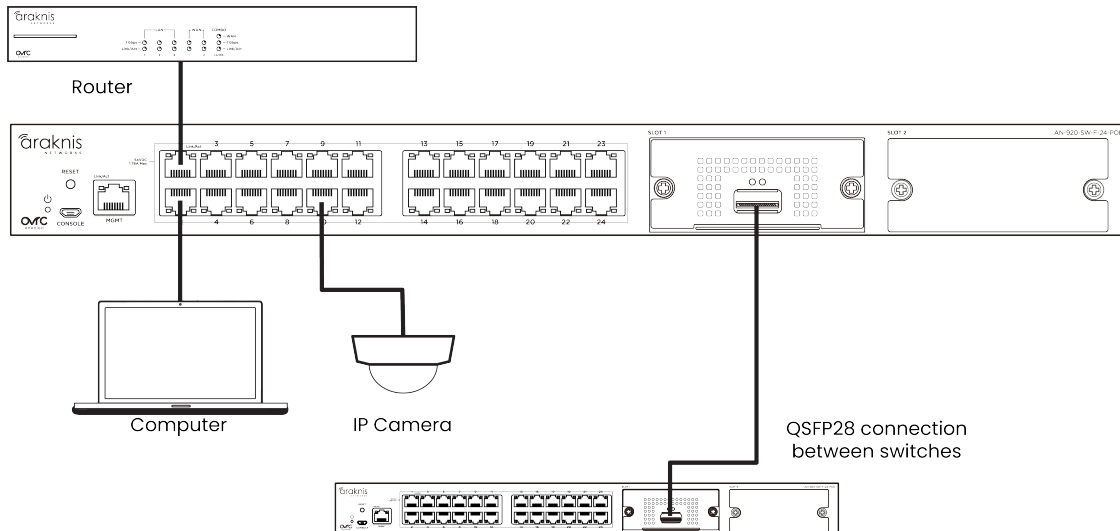
Caution: To avoid possible interference or damage, do not stack equipment on top of the switch.

Rack mounting guidelines

- The maximum ambient temperature of the space the switch is installed in should not exceed 122°F/50°C.
- There should be air flowing through the rack.
- Make sure all the leveling feet or casters are adjusted correctly and they come in contact with the supporting surface. Always load heavier equipment at the bottom of the rack.
- Make sure the rack is grounded and the equipment is surge protected.

- Do not overload the power equipment or the switch. Read our [WattBox Best Practices](#) for more information.

Connections

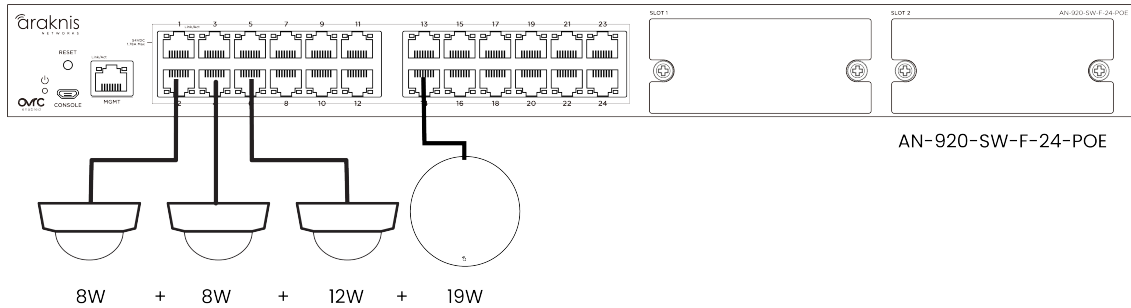


Caution: All router and switch connections should be on network ports. Not the management port.

QSFP28 ports

The QSFP28 (Quad Small Form-Factor Pluggable Plus) ports support up to a 100Gbps connection and are typically used to connect switches.

PoE Budgeting

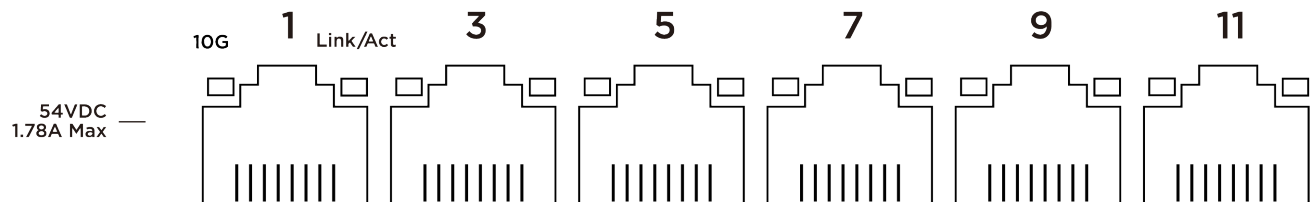


Total PoE device consumption = 47

Model	Total PoE budget (Watts)	Remaining PoE budget (Watts)
AN-920-SW-R-12-POE	750 with 1 power module	703
	1080 with 2 power modules	1033
AN-920-SW-R-24-POE	750 with 1 power module	703
	1650 with 2 power modules	1603

LED States

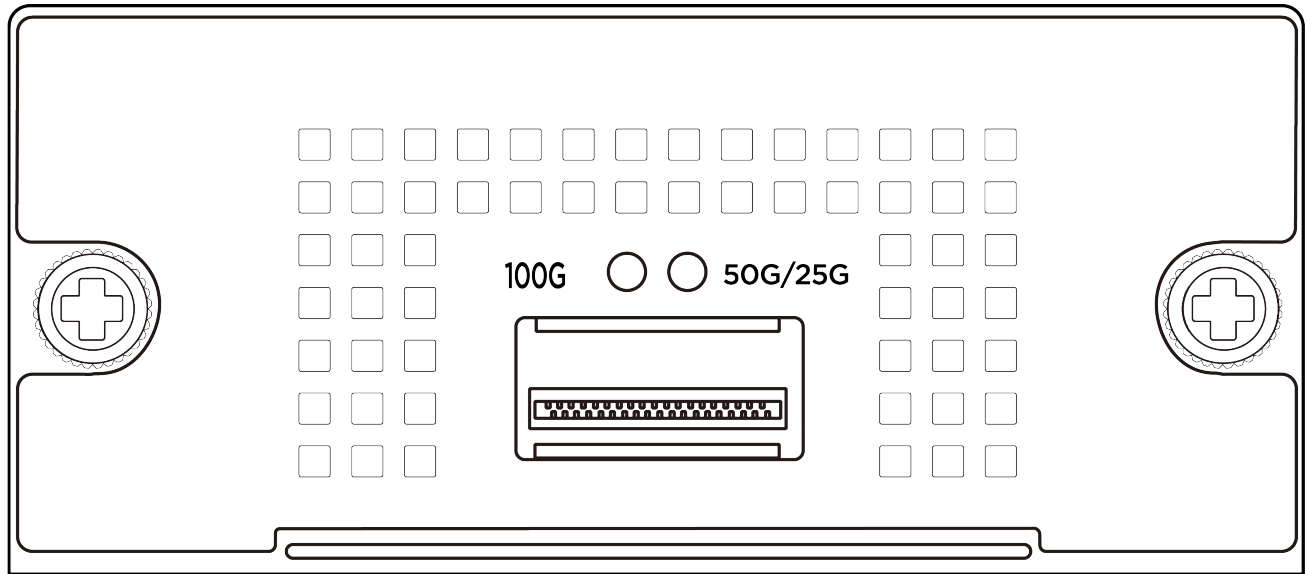
RJ45 ports



LED	LED state	Description
10G/PoE	Blinking	The port is negotiated at 10 Gbps and/or providing PoE*
	Off	The port is not negotiated at 10 Gbps and/or providing PoE*
Link/Act	Blinking	Packets are flowing through the port
	Off	The port does not detect connection or the port is disabled

*Configurable in the web interface

QSFP28 module LEDs



LED	LED state	Description
100G	Blinking	The port is negotiating at 100 Gbps and passing traffic
	Off	The port does not detect a connection or is disabled
50/25G	Blinking	The port is negotiating at 50-25 Gbps and passing traffic
	Off	The port does not detect a connection or is disabled

Configuration

Araknis switches can be configured through OvrC or the local interface. The local interface is accessible using OvrC's WebConnect feature, typing the switch's DHCP address into your browser's address bar, or using the switch's default IP address.

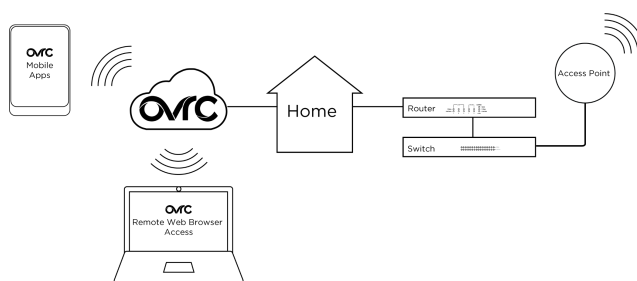
Note: Only features in the local UI are supported by Snap One.

Configuring the switch in OvrC

OvrC provides Wi-Fi management, remote device management, real-time notifications, and intuitive customer management, using your computer or mobile device. Setup is plug-and-play, with no port forwarding or DDNS address required.

To add this device to your OvrC account:

1. Connect the switch to the internet.
2. Log into OvrC (www.ovrc.com).
3. Scan the site using an OvrC Pro device or add the switch manually by entering the MAC address and Service Tag.



Logging in to the local interface

Log into the switch using the default credentials. You must update the credentials after initial login.

Username	araknis
Password	araknis

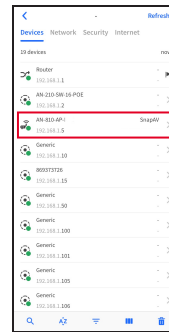
Other access methods: DHCP IP address

The switch is configured to DHCP by default so that the DHCP server can assign an IP address when the switch is connected to the network (the DHCP server is usually the router). This address can be used for accessing the web interface.

Use one of these methods to find the IP address of the switch:

- Check the device list in OvrC.
- Check the client table on your router.
- Use a network scanner (e.g. Fing) to scan the network. The Araknis switch manufacturer field displays **SnapAV**.

See the highlighted field in the Fing screenshot to the right for an example of an Araknis device being identified.

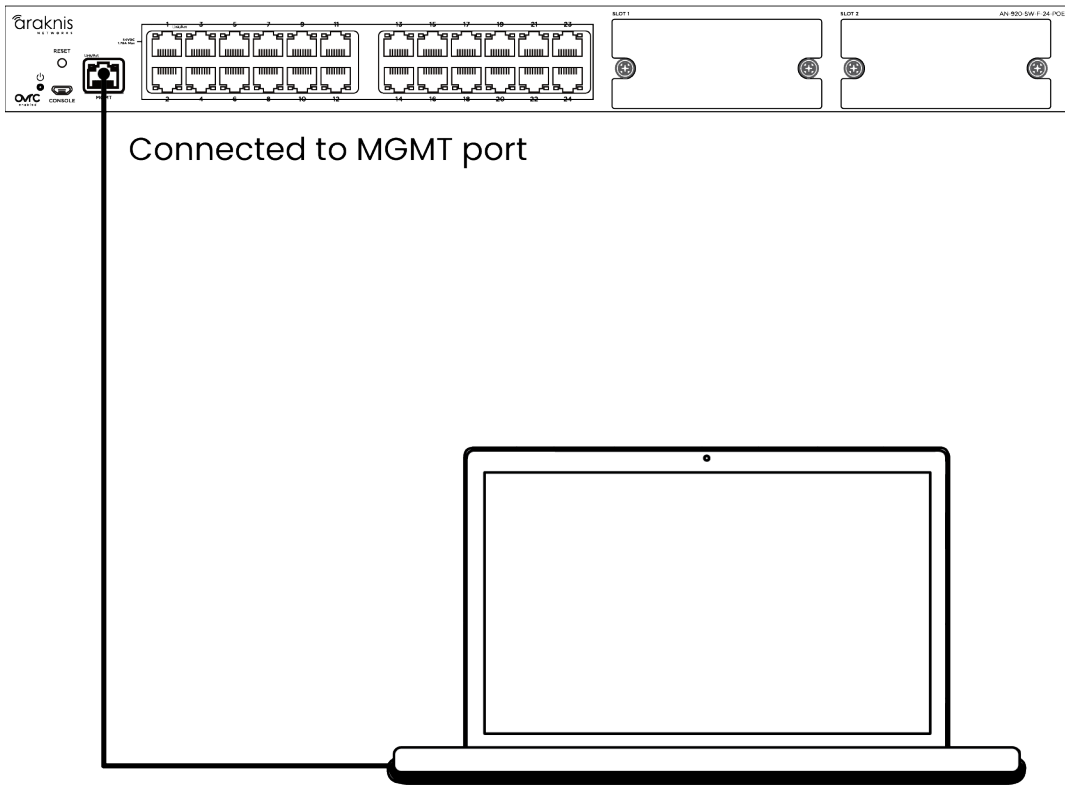


Accessing the switch using the default IP Address

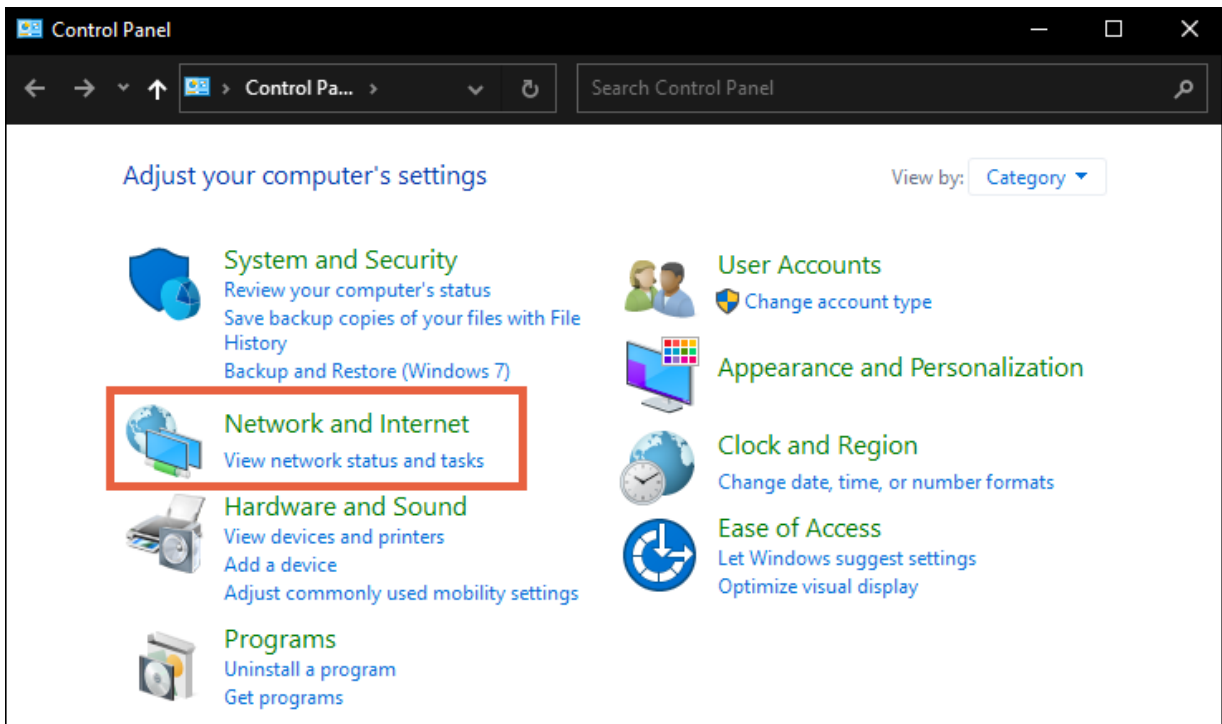
If the switch is not given an IP address on the network or needs to be accessed while not connected to a network, you can configure your computer's network connection to access the switch using the default IP address, **192.168.20.254**, while connected to the **MGMT** port.

Note: You must connect your computer to the MGMT port to connect to the switch using its default IP address.

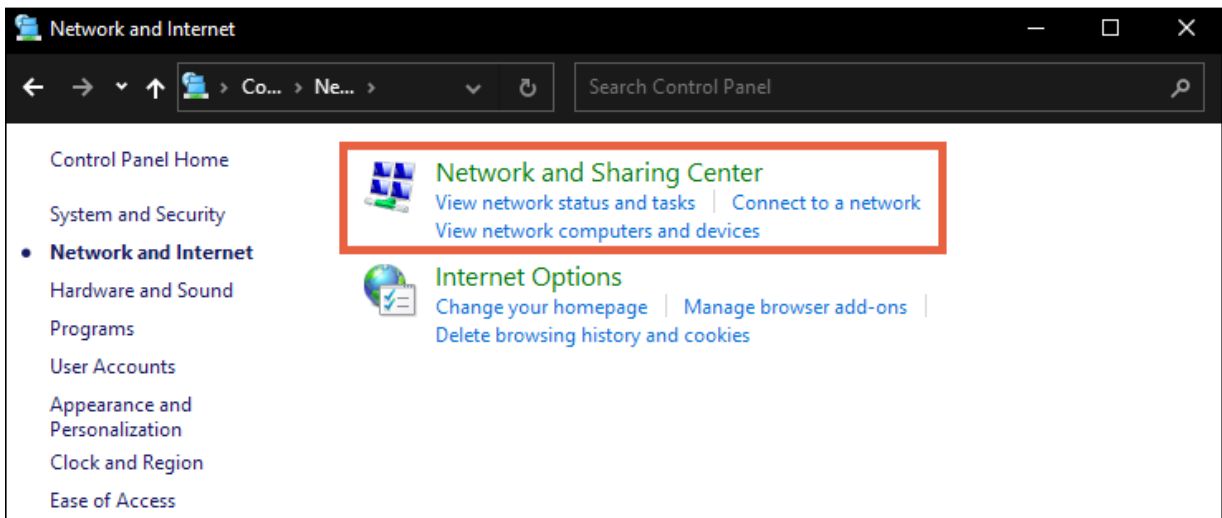
1. Connect your PC to the switch using an Ethernet cable.



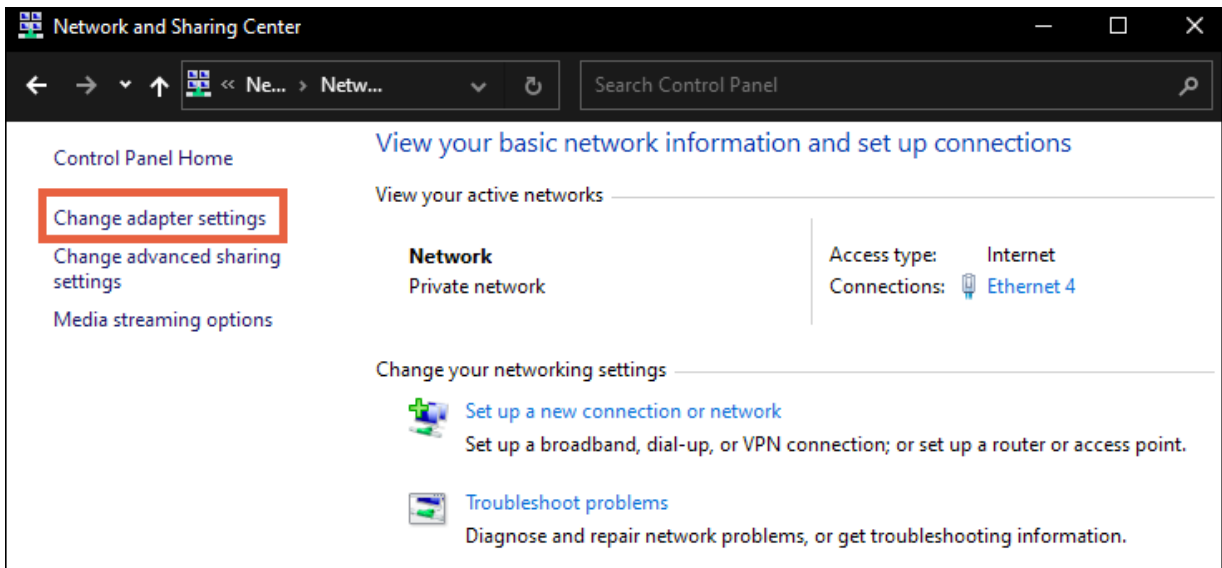
2. Open the Control Panel and click **Network and Internet**.



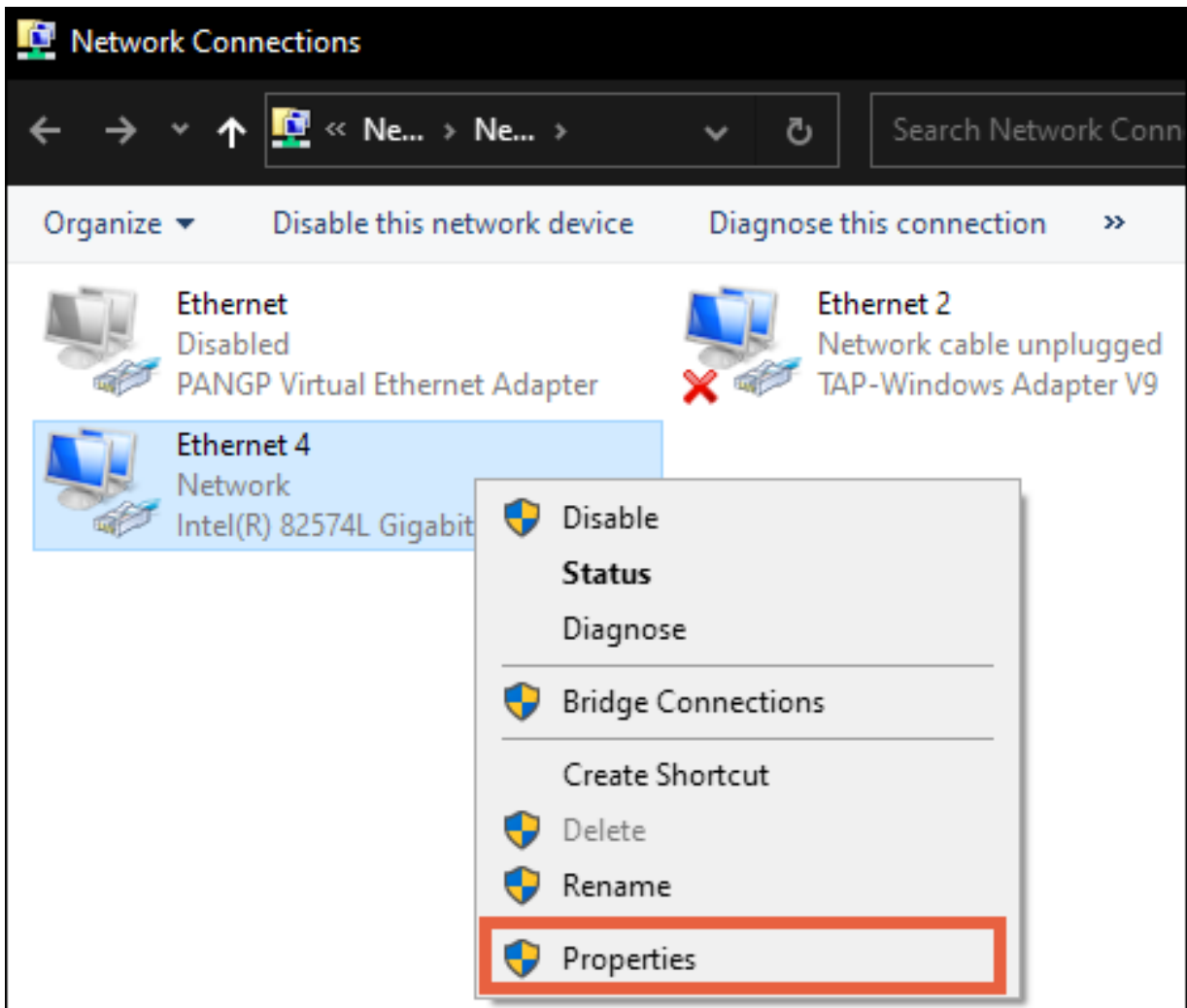
3. Click **Network and Sharing Center**.



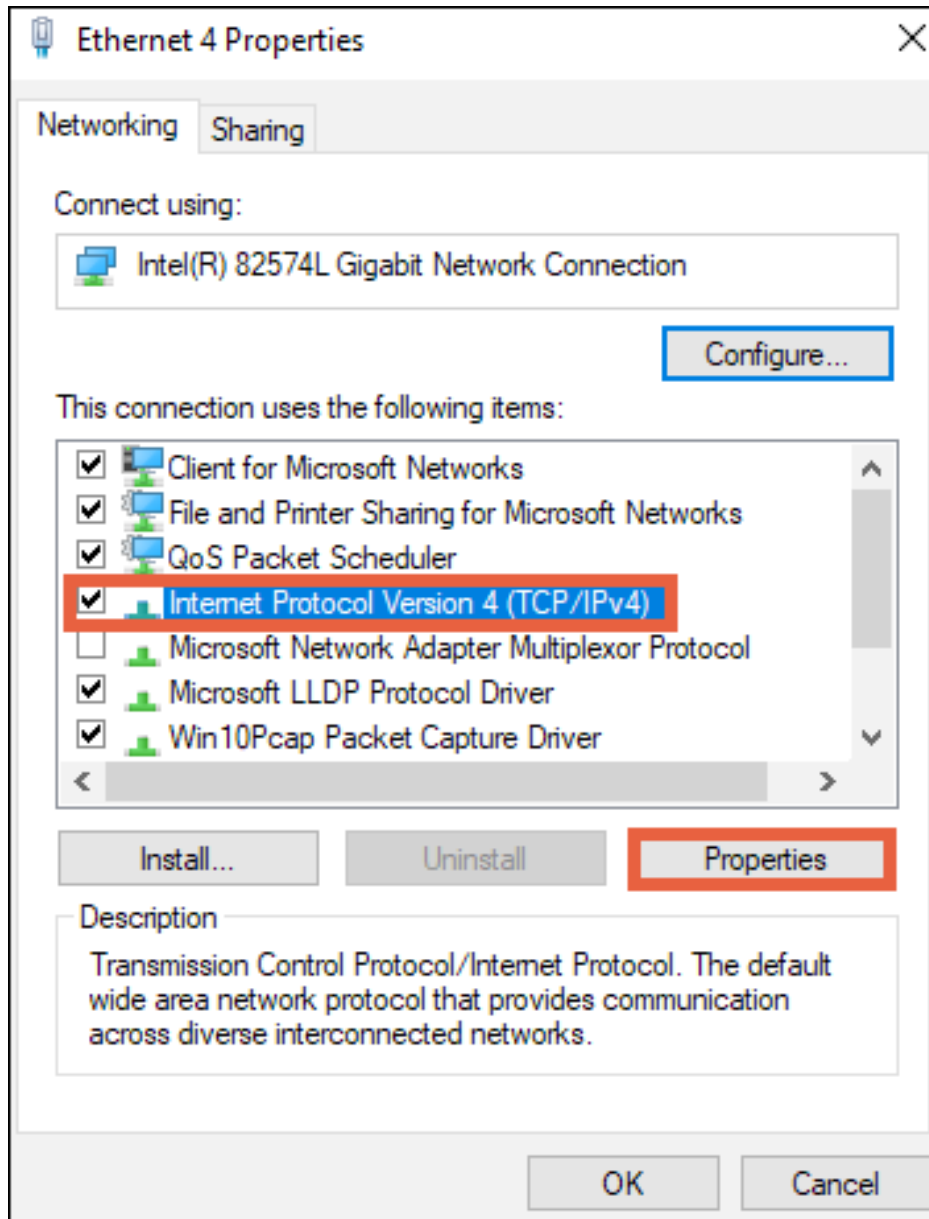
4. Click **Change adapter settings**.



5. Right-click the icon for the wired network connection, then left-click **Properties**.

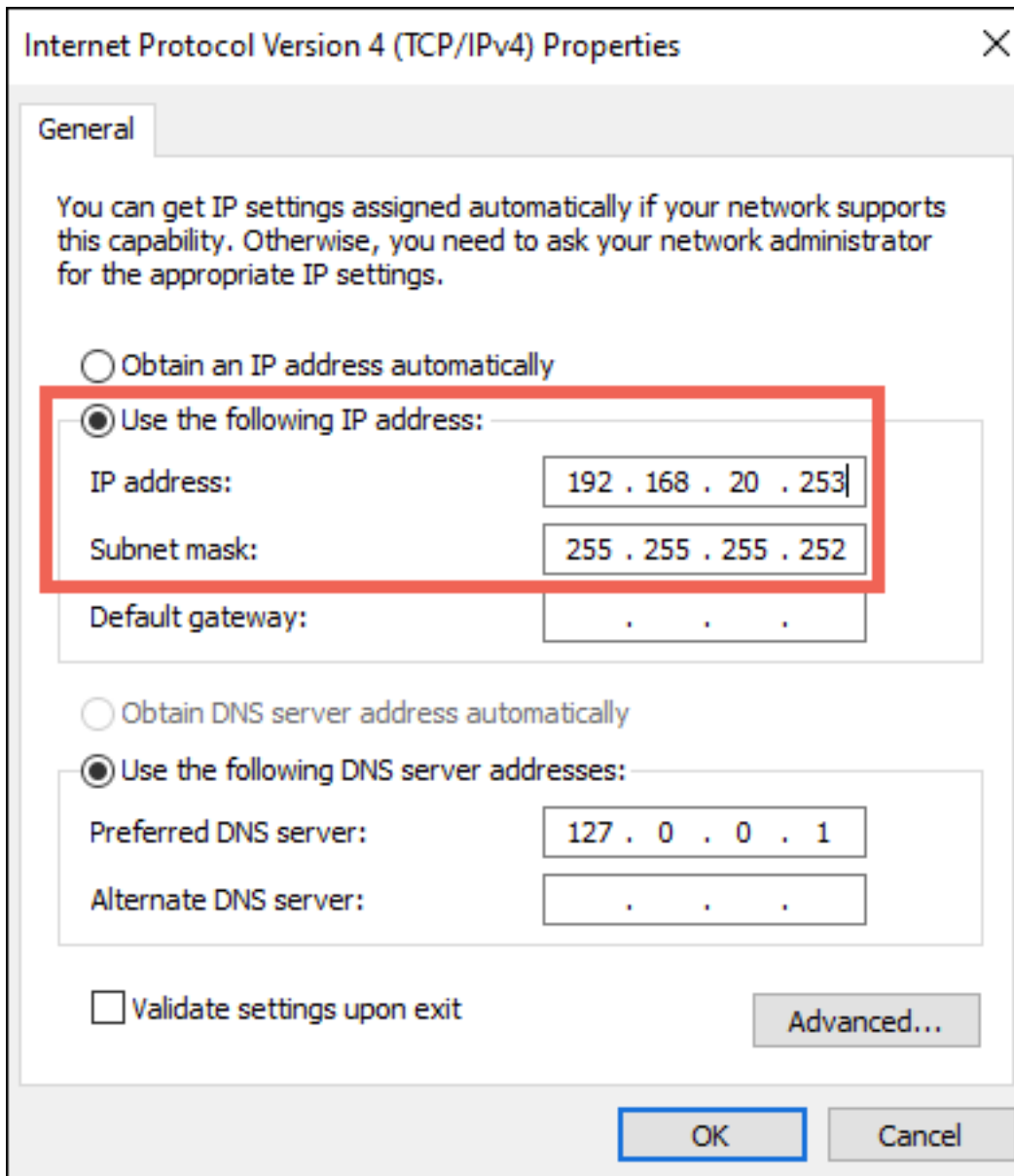


6. Select **Internet Protocol Version 4 (TCP/IPv4)**, then click **Properties**.



7. In the **General** tab, click **Use the following IP address:** and enter the IP address and subnet mask, then click **OK**.

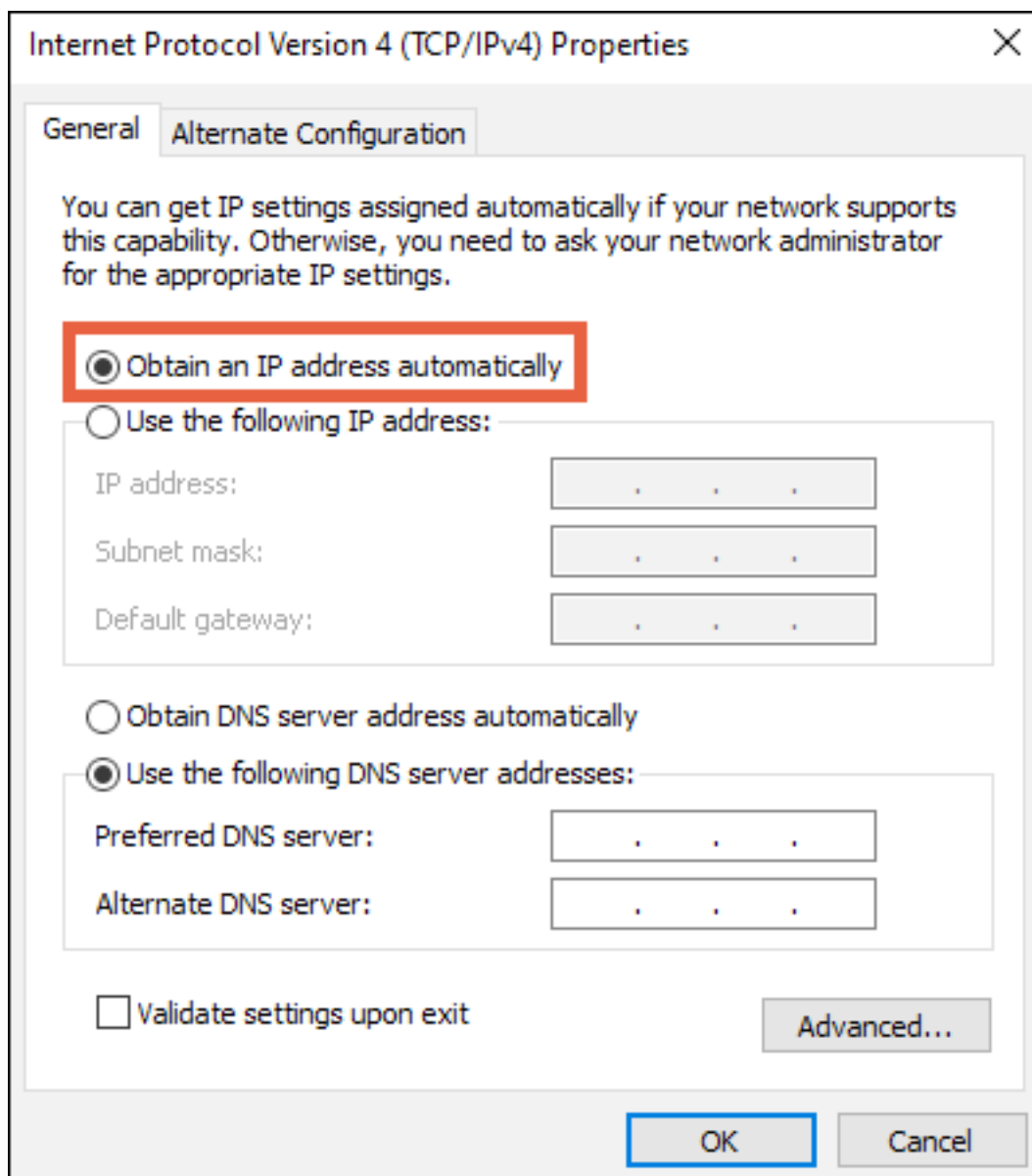
IP Address	192.168.20.253
Subnet Mask	255.255.255.252



- Open a browser and navigate to <https://192.168.20.254/>. Log in using the default credentials:

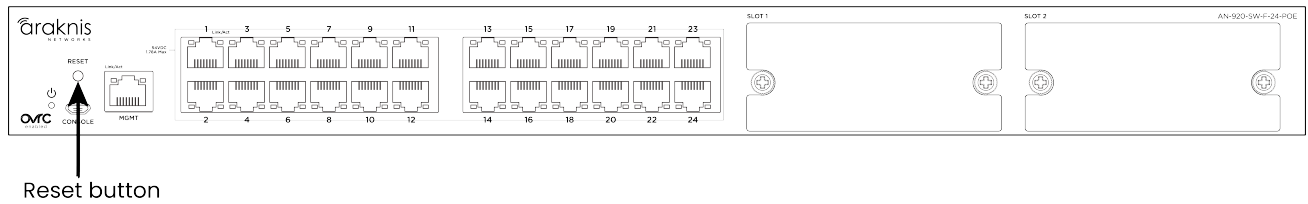
Username	araknis
Password	araknis

- After configuring the switch, set your computer's IPv4 Properties back to **Obtain an IP address automatically**, then click **OK**.



Reset Procedures

The reset button is on the front of the switch.



Reset button action	Front LED State	Description
Hold for 1-9 seconds	Blinking slowly	Restarts the switch
Hold for 10-19 seconds	Blinking moderately	Resets the login credentials to defaults
Hold for more than 20 seconds	Blinking rapidly	Resets the switch to factory defaults

Status

System

This page provides an overview of the switch's configuration.

System Information	
System Name	AN-920-SW-F-12-POE-0020D4
Model Number	AN-920-SW-F-12-POE
Service Tag	ST [REDACTED]
Firmware Version	1.00.40 (Jan 10 2023 09:38:02)
MAC Address	[REDACTED]
Device IP Address	192.168.20.254, 192.168.1.8 (Service Port, Network Port)
Gateway	0.0.0.0, 192.168.1.1 (Service Port, Network Port)
VLANs in Database	1
Active Interface	1/13
PSU State	PS-1: Not present, PS-2: Operational
PoE Budget	0W of 840W(0.0% utilized)
Chassis Fans	4000RPM(Low)
STP	Root Status: True; BridgeID: [REDACTED]
IGMP	
L3 Interfaces	

Field descriptions:

- **System Name** – This is the name that the switch appears under when it is identified on the network. This field can be changed under **Settings > System**.
- **Model Number** – Use this field to verify the switch’s model number. Notated as AN (Araknis) – SW (switch) – R/F (rear or front-facing ports) – X (the number of RJ-45 ports the switch has) –POE (Power-over-Ethernet).
- **Service Tag** – A unique identifying number that is used to add the switch to OvrC, manually.
- **Firmware Version** – Displays the firmware version installed on the switch. Use OvrC to verify if the switch is up to date and update the switch if it isn’t.
- **MAC Address** – A unique identifier that appears in network scans. This address is required if the switch is being manually added to OvrC.
- **Device IP Address** – Displays the IP address of the switch.
- **Gateway** – Displays the IP address of the router.
- **Active Interface** – The number of ports that detect a connection compared to the total number of ports on the switch.

- **PoE Budget** — The amount of Power-over-Ethernet being currently used on the switch.

Pro Tip: Do not use more than 80% of the total budget. When calculating the budget, use the total possible amount of power the connected devices may draw.

- **Chassis Fans** — Shows the rotations per minute (RPM) of the fan and gauge how high the use of the fans is, in parenthesis. Low, Medium, High, Max, or OTP (Over Temperature Protection). The switch stays in OTP until the system temperature falls within the normal range.
- **VLANs in Database** — Displays the number of VLANs that are configured on the switch.
- **STP** — Provides details about the Spanning Tree Protocol (STP) configuration on the switch. See **Switching > Spanning Tree Protocol** for more information.
- **IGMP** — Provides details about the Internet Group Management Protocol (IGMP) configuration on the switch. See **Switching > IGMP Snooping** for more information.
- **L3 Interfaces** — Displays the DHCP servers the switch is interacting with.

Ports

This page provides information about specific switchport configurations. Refresh the page to update the page.

Physically Connected Clients									
Interface	Name	Link Status	IP Address (LLDP)	MAC Address	Up Time (D:H:M)	PoE	VLAN	TX/s	RX/s
0/1	Port 1	1Gbps			00:17:46		1	138.4 B	647.5 B
0/2	Port 2	down			00:00:00		1	0.0 B	0.0 B
0/3	Port 3	down			00:00:00		1	0.0 B	0.0 B
0/4	Port 4	down			00:00:00		1	0.0 B	0.0 B
0/5	Port 5	down			00:00:00		1	0.0 B	0.0 B
0/6	Port 6	down			00:00:00		1	0.0 B	0.0 B
0/7	Port 7	1Gbps			00:00:02	4W	1	895.0 B	52.7 B
0/8	Port 8	down			00:00:00		1	0.0 B	0.0 B
0/9	Port 9	down			00:00:00	Not Supported	1	0.0 B	0.0 B
0/10	Port 10	down			00:00:00	Not Supported	1	0.0 B	0.0 B

- **Interface** – The number assigned to the port of the switch. The SFP ports are always the last two ports.
- **Name** – The assignable name for the port. Edit the name at **Settings > Ports > General**.
- **Link Status** – Displays the connection speed between the switch and the connected device. If there is no connection status is “down.”
- **IP Address (LLDP)** – The IP address of the connected device, learned using LLDP.
- **MAC Address** – The MAC address of the device connected to the port.
- **Up Time (D:H:M)** – The amount of time the switch has detected a connection to the device in Days:Hours:Minutes.
- **PoE** – The amount of PoE power the switch is delivering to the connected device.
- **VLAN** – The VLAN ID assigned to the port.

- **TX/s** – The number of bytes, in seconds, being transmitted on the port.
- **RX/s** – The number of bytes, in seconds, being received on the port.

Settings


System


Use this page to update the general configuration of the switch. Below are the configurable settings and best practices.



Click the **Apply** button at the top of the page to save changes.



Edit Password

Edit Password

Current Password 



New Password  Confirm Password 

Pro Tip: Strong passwords are long and unrelated to the client’s public details. For example, thepepperonipizzas is stronger and easier to remember than P@ssword or thesmiths.

Edit Username




Edit Username


New Username 

There is only one configurable user for switch access. The username should be unique and standardized across all devices.

General Device Information

General Device Information

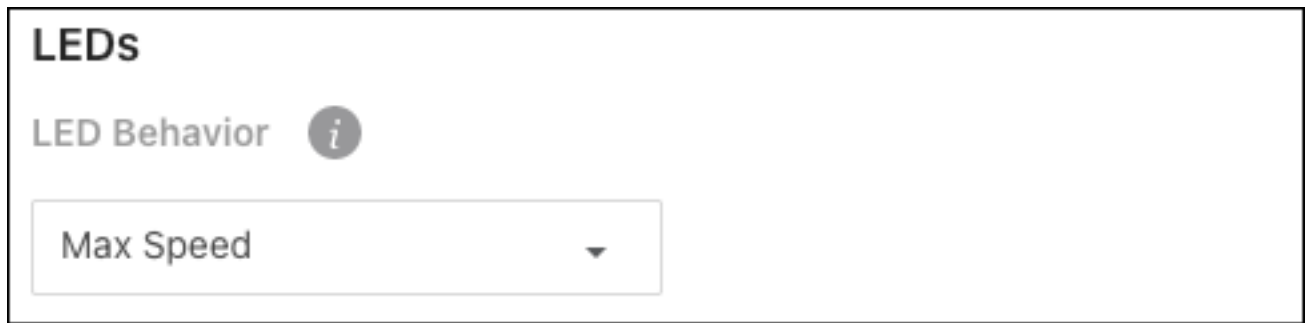
Friendly Name 	Device Location 	System Name 
<input type="text" value="AN-920-SW-F-12-POE"/>	<input type="text"/>	<input type="text" value="AN-920-SW-F-12-POE-0020D"/>

Device Notes 

- **Friendly Name** — Give a name that makes the switch easily identifiable. Such as “Core Switch - Rack.”
- **Device Location** — Enter where the switch is located.
- **System Name** — This is the name that the switch appears under during network scans by other applications. This name should be unique to the switch.
- **Device Notes** — Enter additional configuration notes that wouldn't be displayed on the **Status > System** page. Such as what a VLAN is being used for on this switch.

Pro Tip: If you're using OvrC, these notes should be entered there as well.

LEDs



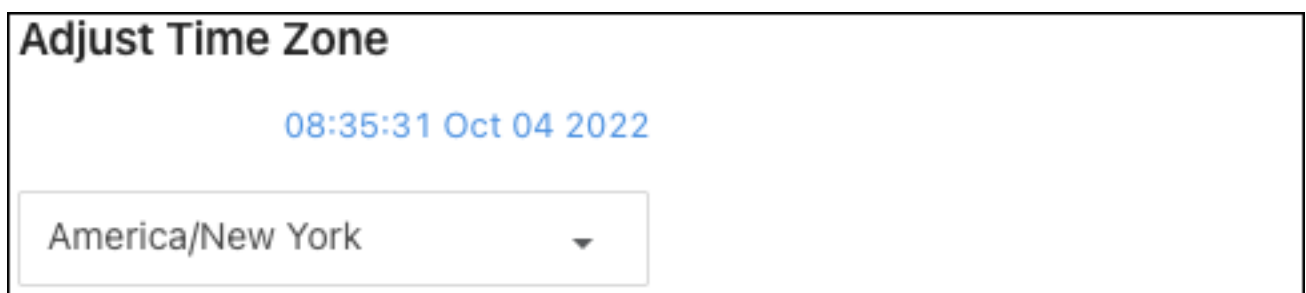
This setting determines the behavior of the **10G/PoE** LED on the front of the switch.

Options include:

- **Max Speed** – Illuminates if the connection to the device is at the maximum possible speed.
- **PoE** – Illuminates if the switch is providing power to the connected device.
- **Disabled** – Turns the LED off.

Pro Tip: The LED Behavior should be standardized across all switch installations. Be sure to leave notes about the LED Behavior if it's not standardized.

Adjust Time Zone



Configure the Time Zone that the switch is physically installed under.

LAN

Pro Tip: Leave the switch as DHCP and make a MAC or IP reservation in the router.

Use the **Mode** drop-down to set the switch to a **Static** IP address.

LAN

Mode ⓘ

DHCP ▾

IP Address ⓘ Subnet Mask ⓘ Gateway ⓘ

192.168.1.150 255.255.255.0 192.168.1.1

Primary DNS Server ⓘ

8.8.8.8

Service Port

These settings allow you to change the IP address of the 920 switch's Service Port. Use the Service Port to access the switch's local user interface if you can no longer reach it from the LAN.

Service Port

Mode ⓘ

Static ▾

IP Address ⓘ Subnet Mask ⓘ Gateway ⓘ

192.168.20.254 255.255.255.252 0.0.0.0

The default settings are:

- **IP Address** – 192.168.20.254
- **Subnet Mask** – 255.255.255.252
- **Gateway** – 0.0.0.0

Pro Tip: If you change these settings make sure you notate them in a secure and easy-to-remember location. Like OvrC Notes.

Ports

Port Summary

Use this page to quickly edit port settings.

Note: EEE (Energy Efficient Ethernet) is turned off by default and cannot be turned on via local UI.

Port Summary										
Filter By <input type="text"/>										
Enable	Interface	Name	Type	Physical Mode	Physical Status	Auto-Negotiate Capabilities	STP Mode	LACP Mode	Link Status	Action
<input checked="" type="checkbox"/>	1/0/1	Port 1	Normal	Auto	1Gbps	100f, 1G, 2.5G, 5G, 10G	Enabled	Enabled	Link Up	...
<input checked="" type="checkbox"/>	1/0/2	Port 2	Normal	Auto	Not Connected	100f, 1G, 2.5G, 5G, 10G	Enabled	Enabled	Link Down	...

Click the **Enable** toggle to enable or disable a port.

Use the **Options** (...) button to select multiple ports for configuration or the **Action** button to edit an individual port. Configurable settings appear in the Edit Port Configuration window.

Edit Port Configuration

Port Configuration Selected: 1

Enable *i*

Name *i*

Port 1

Physical Mode *i*

Auto Negotiate Speed

Click the **Apply** button at the top of the page to save changes.

Configurable settings include:

- **Enable** – Toggle to allow traffic to pass through the port. Disable the port to prevent someone from plugging additional devices into the switch or to troubleshoot potential issues with a connected device.
- **Name** – Enter an easily identifiable name for the device connected to the port.
- **Physical Mode** – Configure the port speed and duplex mode.
 - **Auto Negotiate** – Advertises the duplex mode and speed for an auto-negotiation process with the device connected to the port. Click the “x” on the speed and duplex modes you do not want the switch to advertise.
 - **Speed** – Select speed to force the port to 100 Mbps half or full duplex.
- **STP Mode** – Toggle to enable or disable STP on the port.
- **LACP Mode** – Toggle to enable or disable LACP on the port.
- **LACP Interface Mode** – Configures the interface action when LACP is enabled and the interface is added to a Link Aggregation Group (LAG).
 - **Active** – The interface always attempts to negotiate an LACP connection by sending the LACPDU frames.
 - **Passive** – The interface waits to see a LACPDU frame.
- **Link Trap** – Toggle to enable or disable the port from broadcasting if it has a connection or not.
- **MTU (Maximum Transmission Unit)** – Enter the value for the largest possible packet size, in bytes, that a port can transmit.
- **Broadcast Storm Recovery Level** – Enable to limit the amount of broadcast frames accepted and forwarded by the port by percentage, BPS (bits per second), or PPS (packets per second).
- **Multicast Storm Recovery Level** – Enable to limit the amount of multicast frames accepted and forwarded by the port by percentage, BPS (bits per second), or PPS (packets per second).

- **Unicast Storm Recovery Level** – Enable to limit the amount of unicast frames accepted and forwarded by the switch by percentage, BPS (bits per second), or PPS (packets per second).

Port Details

Use this page to quickly view port information such as Physical Address, Port List Bit Offset, and the Interface Index. Use the **Options** (⋮) button to refresh the page.

Port Summary		Port Details	Mirror	Mirror Summary	Link Aggregation	Link Aggregation Statistics
Filter By <input type="text"/>						⋮ OPTIONS
Interface	Name	Physical Address	PortList Bit Offset	Interface Index		
0/1	Port 1	XXXXXXXXXX	1	1		
0/2	Port 2	XXXXXXXXXX	2	2		
0/3	Port 3	XXXXXXXXXX	3	3		

Note: The physical address is the MAC address for the individual port.

Mirror

Use port mirroring to mimic the traffic flowing through one port to another. Port mirroring is typically used to capture a recording of network traffic for troubleshooting purposes.

To configure port mirroring:

1. Select a **Session ID**. You cannot have multiple sessions with the same ID. If you have no current port mirroring sessions, use Session ID 1.

Note: You do not have to click Enable. This toggle is automatically enabled after you save the session settings.

2. Select a **Destination Type**. This is typically **Interface**.
3. Enter the **Port** number to receive transmit/receive data from the **Source Ports**. For example, if port 3 has a PC running Wireshark for packet capture, enter 3 in the Port field.

4. Click the **Options** (⋮) button and select **Add** to select the port(s) you want to mirror.

5. In the new window, select **Interface** as the Type.
6. Use the **Available Source Port(s)** dropdown to select the port(s) to mirror.

- For **Direction**, select whether you want to mirror the packets being received (Rx), transmitted (Tx), or both (Tx/Rx), then click **Add**.

Add Source Configuration

Type ⓘ

None Remote VLAN Interface 5

Available Source Port(s) ⓘ

x 0/4 x 0/5 6

Direction ⓘ

Tx/Rx Rx Tx 7

Cancel Add

- Click **Apply** at the top of the page. After the page refreshes Enable will be toggled on.

To disable a port mirroring session:

Select the **Session ID** you wish to end and click the **Clear Session** checkbox. Then click **Apply** at the top of the page.

AN-920-SW-F-12-POE Cancel Apply

Port Summary Port Details **Mirror** Mirror Summary Link Aggregation Link Aggregation Statistics

Multiple Port Mirroring

Session ID 1

Clear Session ⓘ

Mirror Summary

Use this page to view configured port mirroring sessions. Use the **Options** (☰) button to refresh the page.

Port Summary	Port Details	Mirror	Mirror Summary	Link Aggregation	Link Aggregation Statistics				
Port Mirroring Summary									
Filter By <input type="text"/>					☰ OPTIONS				
Session ID	Enable	Probe Port	Remove RSPAN Tag	Src VLAN	Mirrored Port	Reflector Port	Src RVLAN	Dst RVLAN	Direction
1	Disabled		False	0			0	0	
2	Disabled		False	0			0	0	

Link Aggregation

Use Link Aggregation Groups (LAG) to combine the throughput of multiple ports.

To configure a LAG:

1. Click the **Options** (☰) button to select multiple LAGs or use the **Action** button to configure a single LAG.
2. Verify **Enabled** is toggled on.
3. Enable or disable STP based on the networking needs.
4. Select a Link Aggregation Type. LACP is recommended.
 - **LACP** (Link Aggregation Control Protocol) broadcasts that the connection type is a LAG to the switch you're connecting to for automatic configuration.
 - **Manual** requires manual LAG configuration on the switch you're connecting to.

5. Enable or disable **Link Trap** based on the network's needs.
6. Leave **Load Balance** at the default (Source/Destination MAC, VLAN, Incoming Port), unless you have specific requirements.

Note: The selections are the information the switch uses to determine how to load balance the throughput of the LAG.

Edit Port Channel

Port Channel Selected: 1

Port Channel Name ⓘ

LAG 1

Enable ⓘ

2

STP Mode ⓘ

3

Link Aggregation Type ⓘ

LACP Manual Disabled 4

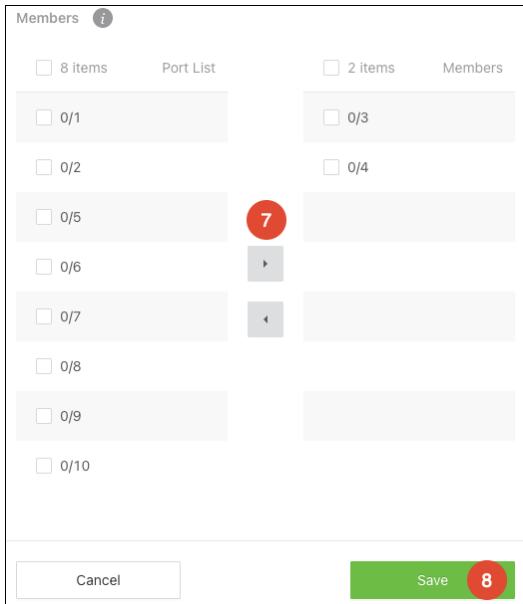
Link Trap ⓘ

5

Load Balance ⓘ

Source/Destination MAC, VLAN, Incoming Port 6

7. Adjust the members of the port channel (ports 3 and 4 used in the example). Use the checkboxes to select a port and the directional arrows to add/remove ports.



8. Click **Save** to close the window, then **Apply**.

Link Aggregation Statistics

Use this page to view information about configured LAGs. Use the **Options** (⋮) button to refresh the page.

Port Summary	Port Details	Mirror	Mirror Summary	Link Aggregation	Link Aggregation Statistics																									
<p>Link Aggregation Statistics</p> <p>Filter By <input type="text"/> <input type="button" value="Q"/></p> <p style="text-align: right;"><input type="button" value="⋮"/> OPTIONS</p> <table border="1"> <thead> <tr> <th>Interface</th> <th>Name</th> <th>Channel Name</th> <th>Type</th> <th>Flap Count</th> </tr> </thead> <tbody> <tr> <td>po1</td> <td>LAG 1</td> <td>po1</td> <td>Port Channel</td> <td>1</td> </tr> <tr> <td>po2</td> <td>LAG 2</td> <td>po2</td> <td>Port Channel</td> <td>1</td> </tr> <tr> <td>po3</td> <td>LAG 3</td> <td>po3</td> <td>Port Channel</td> <td>1</td> </tr> <tr> <td>po4</td> <td>LAG 4</td> <td>po4</td> <td>Port Channel</td> <td>1</td> </tr> </tbody> </table>						Interface	Name	Channel Name	Type	Flap Count	po1	LAG 1	po1	Port Channel	1	po2	LAG 2	po2	Port Channel	1	po3	LAG 3	po3	Port Channel	1	po4	LAG 4	po4	Port Channel	1
Interface	Name	Channel Name	Type	Flap Count																										
po1	LAG 1	po1	Port Channel	1																										
po2	LAG 2	po2	Port Channel	1																										
po3	LAG 3	po3	Port Channel	1																										
po4	LAG 4	po4	Port Channel	1																										

VLANs

Database

Use this page to add and view VLANs that have been configured on the switch, and to enable or disable **Remote Switched Port Analyzer (RSPAN)**.

Note: VLANs must still be applied to ports on the VLANs >Switchport Configuration page.

RSPAN allows you to mirror traffic from multiple source ports (or from all ports that are members of a VLAN) from different network devices and send the mirrored traffic to a destination port (a probe port connected to a network analyzer) on a remote device. The mirrored traffic is tagged with the RSPAN VLAN ID and transmitted over trunk ports in the RSPAN VLAN.

VLAN ID	Name	RSPAN	Action
1	default	<input type="checkbox"/>	...

You can use the RSPAN toggle to enable or disable the feature or use the **Options** button to select multiple VLANs to enable RSPAN on.

Use the **Actions** (⋮) button to select an individual VLAN and give it a meaningful **Name**.

Use the **Options** (⋮) button to add a new VLAN ID to the switch.

Note: Configure the VLAN in the router before configuring the VLAN in the switch.

To add a VLAN(s) to the switch:

1. Click the **Options** (⋮) button, then click **Add**.
2. Enter the **VLAN ID**, within the range of 2-4093. Use "-" between numbers to indicate a range. Use "," to enter multiple VLAN IDs not adjacent to each other.
3. You can a meaningful **Name** for the VLAN or leave the field blank.
4. **Append** and/or **Add Zeros** in front of the VLAN ID. This allows the switch to quickly create identifiers if you're adding multiple VLANs at once.
 - **Append VLAN ID** - Checking this appends the VLAN ID after the name. For example, VLAN -> VLAN2.
 - **Add Zero in Front of ID** - Checking this adds zeroes in front of the VLAN ID, up to a total of 4 digits. For example, VLAN2 -> VLAN0002, VLAN123 -> VLAN0123. This only works when Append VLAN ID is selected.
5. Enable **RSPAN**, if desired.
6. Click **Add**, then **Apply** at the top of the page.

The screenshot shows the 'Add VLAN' dialog box with the following elements and callouts:

- 1**: A close button (⊗) in the top right corner.
- 2**: The 'VLAN ID or Range' input field containing '2,3'.
- 3**: The 'Name' input field, which is currently empty.
- 4**: A red box highlights the 'Append VLAN ID' and 'Add Zero In Front of ID' options, both of which are checked.
- 5**: The 'RSPAN' toggle switch, which is currently turned off.
- 6**: The 'Add' button at the bottom right, which is green.

Switchport Configuration

Use this page to quickly view and configure VLANs on specific ports. Use the **Options** (⋮) button to modify multiple ports at once, or the **Action** button to edit a specific port.

Note: VLAN IDs must be configured on the **VLANs > Database** page.

Database		Switchport Configuration		MAC Based VLAN		Reset						
Switchport Configuration												
Filter By <input type="text"/>											⋮	
											OPTIONS	
Interface	Name	Switchport Mode	Access VLAN(U)	Trunk Native VLAN(U)	Allow Trunk VLANs(T)	Acceptable Frame Type	Ingress Filtering	Port VLAN ID	Untagged VLANs	Tagged VLANs	Action	
0/1	Port 1	Trunk	-	1	1-3	Admit All	Disabled	-	-	-	⋮	
0/2	Port 2	Access	2	-	-	Only Untagged	Disabled	-	-	-	⋮	
0/3	Port 3	Access	3	-	-	Only Untagged	Disabled	-	-	-	⋮	

Simple configuration

To quickly configure a port(s) for VLANs, set the **Switchport Mode** to **Trunk** or **Access**.

Selecting Trunk automatically allows all the VLAN IDs configured in the switch to pass through the port. Connections to other switches are typically trunk ports.

Edit Switchport Configuration ⓧ

Switchport Configuration Selected: 1

Switchport Mode ⓘ

Trunk

Trunk Native VLAN (Untagged) ⓘ

1

Allow Trunk VLANs (Tagged) ⓘ

1-3

Priority ⓘ

0

Cancel Save

Selecting Access requires you to select a single VLAN ID as the **Access VLAN (Untagged)**. This means that only packets tagged with the selected VLAN ID can pass through this switchport.

Edit Switchport Configuration ⓧ

Switchport Configuration Selected: 2

Switchport Mode ⓘ

Access

Access VLAN (Untagged) ⓘ

2

Priority ⓘ

0

Cancel Save

Complex configuration

If the port must pass multiple VLANs but not all, select **General** as the switchport mode.

Configurable settings include:

- **Port VLAN ID (PVID)** – Select the VLAN ID assigned to untagged, or priority tagged frames received on this port.
- **Acceptable Frame Type** – Tell the port how to handle traffic with tagged frames. All tagged VLAN frames are forwarded in accordance with the IEEE 802.1Q VLAN standard. Options include:
 - **Admit All** – The port accepts priority tagged and untagged frames and assigns them the value of the PVID assigned to the interface.
 - **Only Tagged** – The port discards any untagged or priority tagged frames it receives.
 - **Only Untagged** – The port discards any tagged frames it receives.

- **Ingress Filtering** – Enable to discard tagged frames that aren't members of the VLAN ID assigned to the port. Leave this feature disabled to accept all tagged frames.
- **Untagged VLANs** – Enter a VLAN ID in the range 1 to 4093. Use '-' to specify a range and ',' to separate VLAN IDs or VLAN ranges in the list.
- **Tagged VLANs** – Enter a VLAN ID in the range 1 to 4093. Use '-' to specify a range and ',' to separate VLAN IDs or VLAN ranges in the list.
- **Priority** – The default 802.1p priority assigned to untagged packets arriving at the interface. 802.1p is a Quality of Service (QoS) value used to differentiate traffic.

Edit Switchport Configuration ⊗

Switchport Configuration Selected: 3

Switchport Mode ⓘ
 General ▾

Port VLAN ID ⓘ
 1 ▾

Acceptable Frame Type ⓘ
 Admit All Only Tagged Only Untagged

Ingress Filtering ⓘ

Untagged VLANs ⓘ
 1

Tagged VLANs ⓘ
 2,3

Priority ⓘ
 0

Cancel Save

MAC Based VLAN

Use this page to bind traffic from a MAC address to a VLAN ID.

To configure a MAC based VLAN:

1. Click the **Options** (☰) button, then **Add**.
2. Enter the **MAC address** you wish to bind to a VLAN ID, then select the **VLAN ID** to bind it to. Click **Add**.

3. The MAC Based VLAN appears at the bottom of the page.

MAC	VLAN	Action
D4:6A:91:...	2	☰

Reset

Click the **Reset** button to reset all the VLAN settings on the switch.

PoE

Port Configuration

Use this page to quickly enable, disable, or restart PoE on ports and view the PoE configuration on each port.

Use the **Options** (☰) button to select multiple ports for configuration or the **Action** button to edit an individual port.

Port Configuration									
General Statistics Details									
Filter By <input type="text"/>									
Enable	Interface	Name	Priority	Power Mode	Power Limit Type	Power Limit (Watts)	Delay Time	PoE Restart	Action
<input checked="" type="checkbox"/>	1/0/1	Port 1	Low	bt90W	User	90	10		
<input checked="" type="checkbox"/>	1/0/2	Port 2	Low	bt90W	User	90	10		

Configurable settings include:

- **Enable** – Toggle to enable/disable PoE on the port.
- **Priority** – Set a priority level for PoE power allocation. Higher priority levels should be reserved for devices that are critical for the system to operate, such as access points.
- **Power Mode** – Set the PoE power standard for the port. Selecting a PoE class supports the PoE+ power standard, which provides up to 90W of power. Legacy supports 12.95W – 30W of power. Supported power modes include:
 - bt90W (default)
 - bt60W
 - at30W
 - af15W
 - Legacy
- **Power Limit Type** – Select the type of power limiting for the port. Options include:
 - **Class (default)** – Follows the negotiated PoE class limitations.
 - **User** – Follows the Power Limit (Watts) setting.
 - **None** – No power limit.
- **Power Limit (Watts)** – Enter the maximum amount of watts that the port can support. This field only works when the Power Limit Type is set to User.

- **Detection Type**— Select a detection protocol for the port to use. Options include:
 - 4Pt-Dot3af (default)
 - 4Pt-Dot3af+Legacy
 - Legacy
- **Timer Schedule** —The only option is None.
- **Delay Time (secs)** — The amount of time (in seconds) before power is applied to the port after the switch starts up.

General

Use this page to configure global PoE settings for the switch. The top of the page displays PoE totals.

Port Configuration	General	Statistics	Details
Firmware Version	1.3.0.9		
Operational Status	Off		
Total Power Available:	840.0 Watts		
Threshold Power:	756.0 Watts		
Consumed Power:	0.0 Watts		
System Usage Threshold	<input type="text" value="90%"/>		
Power Management Mode	<input type="text" value="Dynamic"/>		
Port Auto Reset Mode	<input type="checkbox"/> Port Auto Reset Mode		
Traps	<input checked="" type="checkbox"/>		
Fast PoE Mode	<input type="checkbox"/>		
Perpetual PoE Mode	<input type="checkbox"/>		

Configurable features include:

- **System Usage Threshold** – Enter the total percentage of the switch’s usable PoE budget. For example, setting the threshold to 90% means that only 90% of the switch’s total PoE budget can be used. This prevents the switch from being overloaded.
- **Power Management Mode** – Select the method that the switch determines PoE. By default, the switch decides PoE power dynamically, but you can set it to static. Doing so requires manual wattage entry on the Port Configuration page.
- **Port Auto Reset Mode** – Enable or disable the ability for the switch to automatically reset a port.
- **Traps** – Enable to allow the switch to send alerts about PoE statuses, such as PoE being enabled or disabled on a port.
- **Fast PoE Mode** – Enable Fast PoE for the switch to provide PoE power before the boot process completes.
- **Perpetual PoE Mode** – Enable to allow the switch to continue providing PoE power if the switch is restarting.

Statistics

Use this page to view PoE error counts when troubleshooting potential PoE issues.

Note: An error on the switch confirms there is a PoE issue, but it does not mean the issue is caused by the switch. Troubleshoot the connected device and Ethernet cable.

Port Configuration		General	Statistics	Details				
Filter By <input type="text"/>								OPTIONS
Interface	Name	Overload Counter	Short Counter	Power Denied Counter	MPS Absent Counter	Invalid Signature Counter		
1/0/1	Port 1	0	0	0	0	0		
1/0/2	Port 2	0	0	0	0	0		

Counter explanations:

- **Overload Counter** – The number of times there has been a power overload.
- **Short Counter** – The number of times there has been a short-circuit condition.
- **Power Denied Counter** – The number of times the connected device has been denied power.
- **MPS Absent Counter** – The number of times power has stopped because the powered device couldn't be detected.
- **Invalid Signature Counter** – The number of times an invalid signature was received.

Signature detection is used to detect the presence of a powered device, where a resistance value on the connected device is expected to be found within a particular range.

Details

Use the details page to gather information about the PoE status of each port. Click **Options** (⋮), then **Refresh** to update the page.

Port Configuration		General	Statistics	Details							
Interface	Name	High Power	Max Power (Watts)	Class	Output Voltage (Volts)	Output Current (mAmps)	Output Power (Watts)	Temperature (C)	Status	Fault Status	
1/0/1	Port 1	Enabled	90.0	Unknown	0	0	0.0	32	Searching	No Error	
1/0/2	Port 2	Enabled	90.0	Unknown	0	0	0.0	31	Searching	No Error	

Tools

Firmware Management

Use this page to manually update the firmware on the switch. The image selected when loading the page is the active image. If the firmware fails to boot, the switch uses the other image as a failsafe.

Pro Tip: Use OvrC to confirm if the switch is up to date. If not, click the Update button for OvrC to update the switch to the latest firmware. OvrC automatically switches between the active and backup images when performing upgrades.

Dual Image

Name	Version	Size (Byte)	Created Time
<input checked="" type="radio"/> image1	1.00.10.000000	29762556	Sep 16 2022 03:43:32
<input type="radio"/> image2	1.00.00.000000	29770617	

Manual Update

Choose File *No File Selected* Upload

Note: You can use either image to update the switch. OvrC always updates the inactive partition.

Configuration Management

Use this page to save a backup of the switch’s configuration or to reset the switch to the default settings.

Create Backup

Save Configuration

Restore Configuration File

Choose File

No File Selected

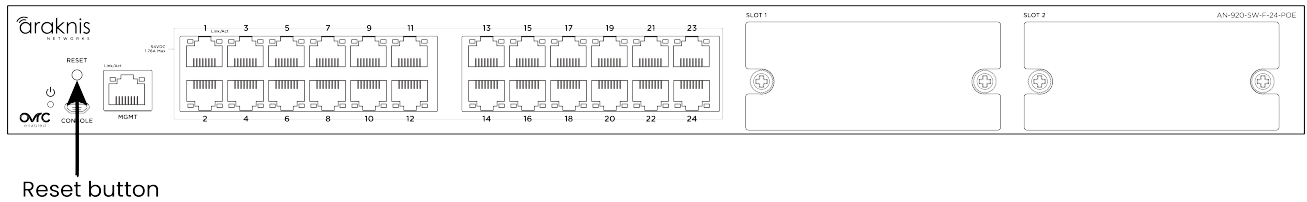
Restore

Reset to Default

Reset to Default

Hardware reset

The reset button is on the front of the switch.



Reset button action	Front LED State	Description
Hold for 1-9 seconds	Blinking slowly	Restarts the switch
Hold for 10-19 seconds	Blinking moderately	Resets the login credentials to defaults

Reset button action	Front LED State	Description
Hold for more than 20 seconds	Blinking rapidly	Resets the switch to factory defaults

Diagnostic Utilities

Ping

Use a ping test to measure the amount of time it takes to reach an address on the local network or the internet. You can enter the IP address or the hostname, such as www.wikipedia.com.

Pro Tip: Before selecting a DNS server, use a ping test to measure the fastest response time.

[Ping](#) [Trace Route](#) [IP Address Conflict](#)

Host Name or IP Address:

Count: Interval: Size:

Source: Interface:

Results

```

Pinging 8.8.8.8 with 36 bytes of data:
Reply from 8.8.8.8: icmp_seq=0 time=22 ms.
Reply from 8.8.8.8: icmp_seq=1 time=18 ms.
Reply from 8.8.8.8: icmp_seq=2 time=14 ms.

---8.8.8.8 ping statistics---
3 packets transmitted, 3 packets received, 0% packet loss
round-trip (msec) min/avg/max = 14/18/22

```

Traceroute

Use a traceroute to diagnose network interruptions between the switch and an address on the local network or the internet. You can enter an IP address or a hostname, such as `www.youtube.com`.

The screenshot shows a configuration page for Traceroute. At the top, there are three tabs: 'Ping', 'Trace Route' (which is selected and underlined in blue), and 'IP Address Conflict'. Below the tabs, there are several input fields and dropdown menus:

- Host Name or IP Address:** A text input field containing 'www.youtube.com'.
- Probes Per Hop:** A dropdown menu set to '3'.
- MaxTTL:** A text input field containing '30'.
- InitTTL:** A text input field containing '1'.
- MaxFail:** A text input field containing '5'.
- Interval:** A text input field containing '3'.
- Port:** A text input field containing '33434'.
- Size:** A text input field containing '0'.
- Source:** A dropdown menu set to 'None'.
- interface:** A dropdown menu set to 'Network Port'.

At the bottom right of the configuration area, there is a green 'Start' button.

IP Address Conflict

Use this page to detect an IP conflict with the switch.

Note: You'll most likely have to connect to the switch's MGMT port to use this feature when there's an IP conflict.

The screenshot shows the 'IP Address Conflict' page, which is selected in the top navigation bar. The page is divided into two main sections:

- Status:** A section with the text 'IP Address Conflict Currently Exists: False'.
- History:** A section with the following labels:
 - Last Conflicting IP Address:
 - Last Conflicting MAC Address:
 - Time Since Conflict Detected:

At the bottom right of the page, there are two buttons: a green 'Run Detection' button and a red 'Clear History' button.

Advanced

System

Management Access

System Connectivity

Use the System Connectivity page to quickly manage connections to the switch. More defined connection settings are on the specific protocol tabs.

Configurable settings include:

- **Telnet** – Enable to allow telnet connections on port 23. Enable **Allow New Sessions** to allow new outbound telnet sessions. Disabling new sessions does not terminate existing sessions.
- **Outbound Telnet** – Enable **Allow New Sessions** to allow new outbound telnet sessions. Disabling new sessions does not terminate existing sessions.
- **HTTP Redirect to HTTPS** – Enable to redirect HTTP logins to the HTTPS port.
- **HTTPS** – Enable to require an HTTPS connection for the switch's local interface. When enabled, you must type https:// before the IP address in your browser's address bar.
- **SSH** – Enable to allow SSH connections. You can specify the **port** to use and The **Session Timeout**, in seconds.
- **Management VLAN** – Use the drop-down to select which VLAN the switch's user interface can be accessed on.

Telnet

Use this page for more defined telnet connection settings. Changes made on this page affect the **System Connectivity** page.

System Connectivity	Telnet	Outbound Telnet	Serial Port	CLI Banner	HTTPS Connection	SSH
Enable i <input type="checkbox"/>						
Port i Session Timeout i Max Number of Sessions i Allow New Sessions i						
<input type="text" value="23"/> <input type="text" value="5"/> <input type="text" value="4"/> <input checked="" type="checkbox"/> Allow New Sessions						

Configurable settings include:

- **Enable** – Allows telnet connections on the specified port. Port 23 is the default.
- **Port** – The port used to make telnet connections to the switch. 23 is the default.

Note: Changing this value does not affect current connections. New sessions must use the new value.

- **Session Timeout** – The amount of time (in minutes) that the switch detects inactivity before ending the session. Configurable between 0 – 160 minutes. The default is 5.
- **Max Number of Sessions** – The number of simultaneous telnet sessions (0-4) the switch allows.
- **Allow New Sessions** – Enable to allow new outbound telnet sessions. Disabling new sessions does not terminate existing sessions.

Outbound Telnet

Use this page for more defined outbound telnet connection settings. Changes made on this page affect the **System Connectivity** page.

System Connectivity	Telnet	Outbound Telnet	Serial Port	CLI Banner	HTTPS Connection	SSH
Session Timeout <i>i</i>	Max Number of Sessions <i>i</i>	Allow New Sessions <i>i</i>				
<input type="text" value="5"/>	<input type="text" value="4"/>	<input checked="" type="checkbox"/> Allow New Sessions				

Configurable settings include:

- **Session Timeout** – The amount of time (in minutes) that the switch detects inactivity before ending the session. Configurable between 0 – 160 minutes. The default is 5.
- **Max Number of Sessions** – The number of simultaneous telnet sessions (0-4) the switch allows.
- **Allow New Sessions** – Enable to allow new outbound telnet sessions. Disabling new sessions does not terminate existing sessions.

Serial Port

Use this page for more defined serial port connection settings. Changes made on this page affect the **System Connectivity** page.

System Connectivity	Telnet	Outbound Telnet	Serial Port	CLI Banner	HTTPS Connection	SSH
Serial Timeout <i>i</i>	Baud Rate <i>i</i>					
<input type="text" value="5"/>	<input type="text" value="115200"/>					
Character Size: 8	Parity: None					
Stop Bits: 1	Flow Control: Disabled					

Configurable settings include:

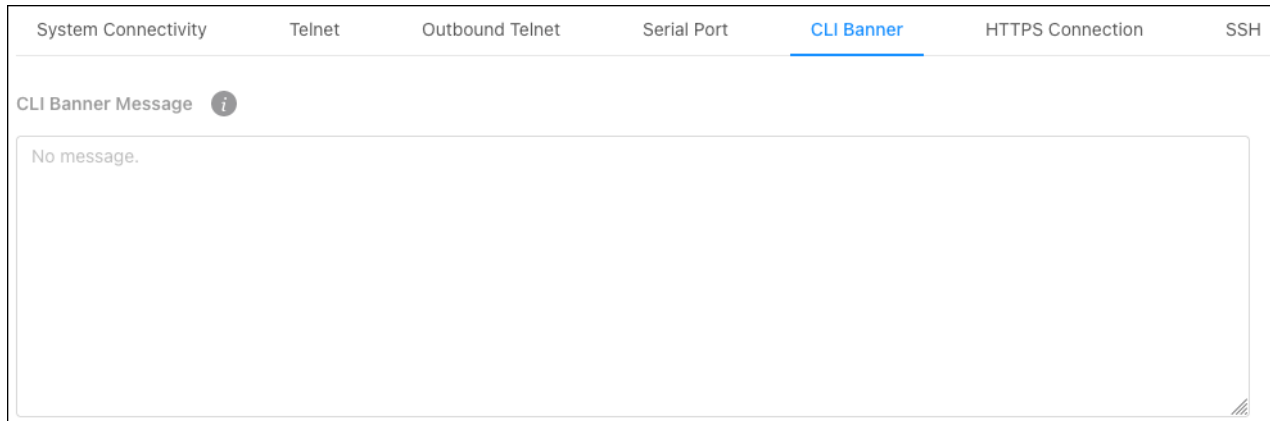
- **Serial Timeout** – The amount of time (in minutes) that the switch detects inactivity before ending the session. Configurable between 0 – 160 minutes. The default is 5.
- **Baud Rate** – The number of signals per second transmitted over the physical medium, measured in bits per second.

Non-configurable connection settings:

- **Character Size:** 8
- **Parity:** None
- **Stop Bits:** 1
- **Flow Control:** Disabled

CLI Banner

Use this page to type the desired message in the text area to create the CLI (Command Line Interface) banner message.



System Connectivity Telnet Outbound Telnet Serial Port **CLI Banner** HTTPS Connection SSH

CLI Banner Message ⓘ

No message.

Note: If you reach the end of the line, the text wraps to the next line. The line might not wrap at the same location in the CLI. To create a line break (carriage return) in the message, press the Enter key on the keyboard. The line break in the text area will be at the same location in the banner message when viewed through the CLI.

HTTPS Connection

Use this page for more defined HTTPS connection settings. Changes made on this page affect the **System Connectivity** page.

The screenshot shows the 'HTTPS Connection' configuration page. At the top, there are tabs for 'System Connectivity', 'Telnet', 'Outbound Telnet', 'Serial Port', 'CLI Banner', 'HTTPS Connection' (which is selected), and 'SSH'. The main content area includes:

- Enable**: A green toggle switch is turned on.
- TLS Version 1**: A green toggle switch is turned on.
- Port**: A text input field containing '443'.
- Session Soft Time Out**: A text input field containing '5'.
- Session Hard Time Out**: A text input field containing '24'.
- Max Number of Sessions**: A text input field containing '8'.
- Certificate Status**: A dropdown menu currently showing 'Present'.
- Below the dropdown are four buttons: 'Download', 'Generate', and 'Delete' (all disabled), and 'Present' (active).

Configurable settings include:

- **Enable** – Allows HTTPS connections on the specified port. Port 443 is the default.
- **TLS Version 1** – Enables or disables (TLS Transport Layer Security) Version 1.0.
- **Port** – The TCP port used to make HTTPS connections to the switch. 443 is the default.

Note: Changing this value does not affect current connections. New sessions must use the new value.

- **Session Soft Time Out** – The amount of time (in minutes) that the switch detects inactivity before re-checking authentication. 5 is the default.
- **Session Hard Time Out** – The amount of time (in minutes) that the switch detects inactivity before ending the session. 24 is the default.
- **Max Number of Sessions** – The number of simultaneous HTTPS sessions the switch allows. 8 is the default.

- **Allow New Sessions** – Enable to allow new outbound telnet sessions. Disabling new sessions does not terminate existing sessions.

This page also displays the status of the SSL certificate generation process and allows you to **Download**, **Generate**, or **Delete** the certificate.

Certificate Status states:

- **Present** – The certificate has been generated and is present on the device.
- **Absent** – A certificate is not available on the device.
- **Generation In Progress** – An SSL certificate is currently being generated.

SSH

Use this page for more defined SSH connection settings. Changes made on this page affect the **System Connectivity** page.

The screenshot shows the SSH configuration page with the following settings:

- Enable:** A green toggle switch is turned on.
- Port:** A text input field contains the value "22".
- SSH Version 2:** A checkbox is checked.
- Connections Currently in Use:** A text input field contains the value "0".
- Max Number of Sessions:** A text input field contains the value "2".
- Session Timeout:** A text input field contains the value "5".
- RSA Key Status:** A text input field contains "Present", with buttons for "Download", "Generate", and "Delete".
- DSA Key Status:** A text input field contains "Present", with buttons for "Download", "Generate", and "Delete".

Configurable settings include:

- **Enable** — Allows SSH connections on the specified port. Port 22 is the default.
- **SSH Version 2** — Enables or disables SSH version 2.
- **Port** — The TCP port used to make HTTPS connections to the switch. 22 is the default.

Note: Changing this value does not affect current connections. New sessions must use the new value.

- **Max Number of Sessions** — The number of simultaneous HTTPS sessions the switch allows. 8 is the default.
- **Session Timeout** — The amount of time (in minutes) that the switch detects inactivity before ending the session. 5 is the default

This page also displays the status of the RSA (Rivest-Shamir-Adleman algorithm) and DSA (Digital Signature Algorithm) certificate generation process and allows you to **Download**, **Generate**, or **Delete** the certificate.

Certificate Status states:

- **Present** – The certificate has been generated and is present on the device.
- **Absent** – A certificate is not available on the device.
- **Generation In Progress** – An SSL certificate is currently being generated.

SNTP

Simple Network Time Protocol (SNTP) assures the switch's clock time is accurate to the millisecond, by synchronizing to an SNTP server.

Time sources are established by stratum, which define the accuracy of the reference clock. The higher the stratum (zero being the highest) the more accurate the clock. The switch receives time from stratum 1 and above because the switch itself is a stratum 2 device.

Examples of stratum:

- **Stratum 0** – An actual time clock, such as a GPS system, is used as the time source.
- **Stratum 1** – A server directly linked to a stratum 0 source is used. Stratum 1 time servers provide primary network time standards.
- **Stratum 2** – A time source connected to a stratum 1 server over a network. Such as stratum 2 server receiving time over the network, via NTP, from a stratum 1 server.

SNTP time definitions are determined by the following time levels:

- **T1** – The time that the original request was sent by the client.
- **T2** – The time that the original request was received by the server.

- **T3** – The time that the server sent a reply.
- **T4** – The time that the client received the server's reply.

The switch can poll unicast and broadcast server types for the server time.

Unicast information is used for polling a server with a known IP address. SNTP servers configured on the switch are the only servers polled for synchronization information. This is the most secure method for synchronization. When selected, SNTP information is only accepted from SNTP servers defined on the **SNTP Server Configuration** page.

Global Configuration

Use this page to configure the **Simple Network Time Protocol (SNTP)** to make the switch's clock time accurate to the millisecond.

Note: The SNTP server the switch synchronizes to is configured on the Server Configuration tab.


Configurable settings include:

- **Client Mode** – Use the dropdown to determine how SNTP operates. Options include:
 - **Unicast** – Makes STNP operate in a point-to-point fashion. A unicast client sends a request to a designated server at its unicast address and expects a reply to determine the time, and potential round-trip delays to calculate an offset from the local time.
 - **Broadcast** – SNTP operates like it's multicast but uses a local broadcast address instead of a multicast address. The broadcast address has a single subnet scope, while a multicast address has an internet-wide scope.
 - **Disable** – Disables the SNTP protocol on the switch.
- **Port** – Enter a local UDP port to listen for responses and/or broadcasts. 123 is the default.

- **Unicast Poll Interval (Seconds)** – Enter the number of seconds between unicast poll requests, expressed as a power of two when configured in unicast mode.
- **Broadcast Poll Interval (Seconds)** – Enter the number of seconds between broadcast poll requests, expressed as a power of two when configured in broadcast mode.
- **Unicast Poll Timeout (Seconds)** – Enter the number of seconds between broadcast poll requests, expressed as a power of two when configured in unicast mode. Broadcasts received prior to the expiry of the interval are discarded.
- **Unicast Poll Retry** – Enter the number of times to retry a request to an SNTP server after the first time-out before attempting to use the next configured server when configured in unicast mode.
- **Number of Servers Configured** – Displays the number of SNTP servers configured on the Server Configuration tab.

Global Status

Use this page to view the SNTP server configuration of the switch.

Global Configuration	Global Status	Server Configuration	Server Status	Source Interface Configuration
SNTP Global Status				
Version	4			
Supported Mode	Disabled Unicast Broadcast			
Last Update Time	Apr 10 10:24:00 2023 America/Los_Angeles(UTC-7:00)			
Last Attempt Time	Apr 10 11:07:48 2023 America/Los_Angeles(UTC-7:00)			
Last Attempt Status	Success			
Server IP Address	216.239.35.8			
Address Type	IPv4			
Server Stratum	1			
Reference Clock ID	SNTP Ref: GOOG			
Server Mode	Server			
Unicast Server Max Entries	3			
Unicast Server Current Entries	1			
Broadcast Count	0			

Server Configuration

Use this page to add SNTP servers and configure the priority of which server should be used first, and which should be used in case the servers with a higher priority cannot be contacted.

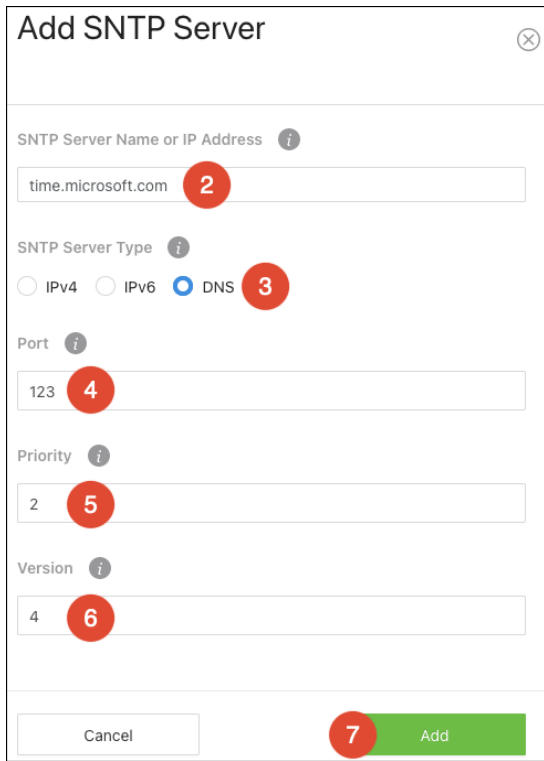
Use the **Options** (⋮) button to refresh the page, add, or select multiple servers to configure. Use the **Action** button to edit or delete an existing SNTP server.

SNTP Server	Type	Port	Priority	Version	Action
time.google.com	DNS	123	3	4	⋮

To add an SNTP server:

1. Click **Options** (⋮), then **Add**.
2. Enter an **SNTP Server Name** or **IP Address**.
3. Select an **SNTP Server Type**, meaning whether it's an IPv4, IPv6, or DNS address.
4. Enter a UDP **Port** the SNTP server to communicate on.
5. Enter the **Priority** level that the SNTP server should be used. If it's a fallback address in case the default SNTP server fails, enter 2.
6. Enter the protocol **Version** number. The default is 4.

- Click **Add**, then **Apply** at the top of the page.



Add SNTP Server

SNTP Server Name or IP Address ⓘ
time.microsoft.com 2

SNTP Server Type ⓘ
 IPv4 IPv6 DNS 3

Port ⓘ
123 4

Priority ⓘ
2 5

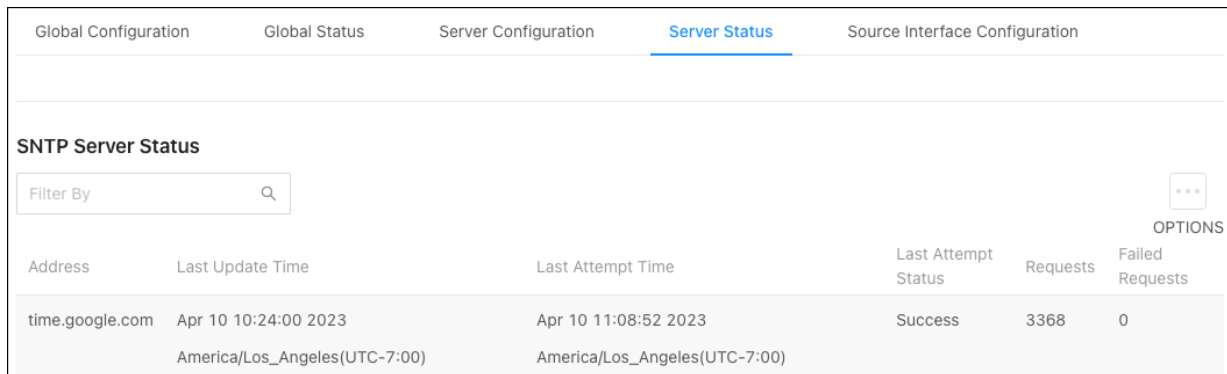
Version ⓘ
4 6

Cancel 7 Add 7

Server Status

Use this page to see the last updated time the switch has received from the configured SNTP server(s) and how many requests the switch has made to the server(s).

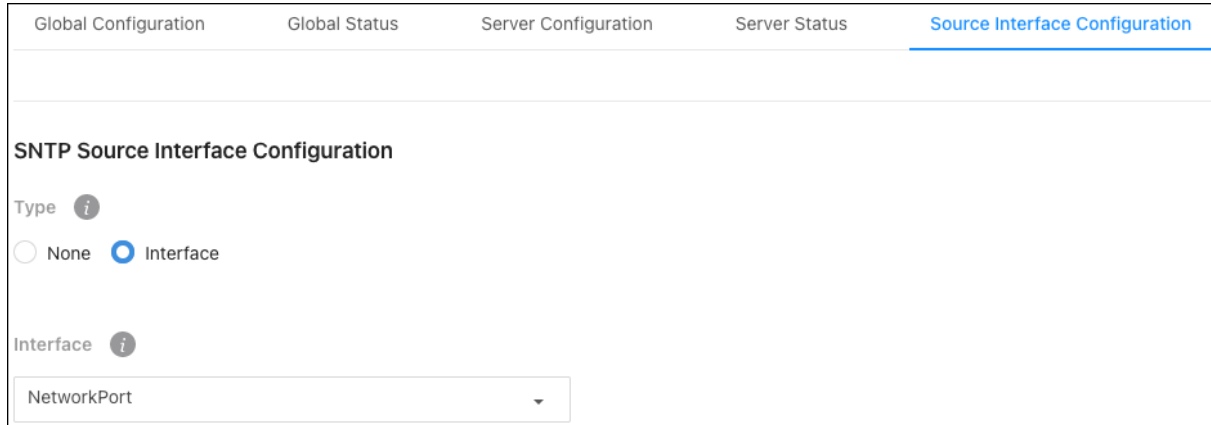
Click **Options** (...) > **Refresh** to gather the latest data.



Address	Last Update Time	Last Attempt Time	Last Attempt Status	Requests	Failed Requests
time.google.com	Apr 10 10:24:00 2023 America/Los_Angeles(UTC-7:00)	Apr 10 11:08:52 2023 America/Los_Angeles(UTC-7:00)	Success	3368	0

Source Interface Configuration

Use this page to select the **Type** of **Interface** to use as the SNMP source. Interface options include **NetworkPort** or **ServicePort**. The default Type is None.



The screenshot shows a web interface with a navigation bar at the top containing five tabs: "Global Configuration", "Global Status", "Server Configuration", "Server Status", and "Source Interface Configuration". The "Source Interface Configuration" tab is selected and highlighted in blue. Below the navigation bar, the page title is "SNTP Source Interface Configuration". Underneath, there is a "Type" section with an information icon (i) and two radio button options: "None" (unselected) and "Interface" (selected). Below the "Type" section is an "Interface" section with an information icon (i) and a dropdown menu currently displaying "NetworkPort".

SNMP

Simple Network Management Protocol (SNMP) provides a method for managing network devices. The Araknis 920 switch supports SNMP versions 1, 2, and 3.

SNMP Versions 1 and 2

The SNMP agent maintains a list of variables used to manage the switch, which are defined in the **Management Information Base (MIB)**. The SNMP agent defines the MIB specification format, and the format used to access information over the network. Access rights to the SNMP agent are controlled by access strings.

SNMP Version 3

SNMP v3 adds access control and trap mechanisms. The **User Security Model (USM)** for SNMP v3 includes:

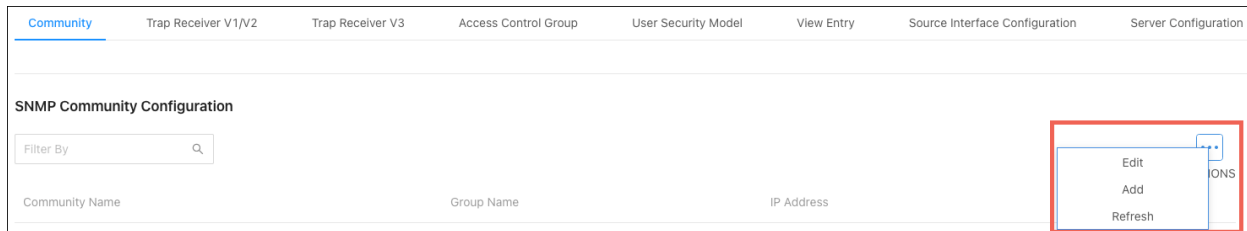
- **Authentication** – Provides data integrity and data origin authentication.
- **Privacy** – Protects against the exposure of message content by encrypting the information with Cipher-Block Chaining (CBC). Authentication and privacy is enabled on an SNMP message.
- **Timeliness** – Protects against message delay and redundancy by comparing incoming messages with their time information.
- **Key Management** – Defines key generation, updates, and use.

Community

Use this page to manage access rights by creating **Communities** for SNMP v1 and 2, or **Groups** for SNMP v3.

Note: Changing community names also changes the access rights.

Use the **Options** (⋮) button to refresh the page, add, or select multiple communities to configure. Use the **Action** button to edit or delete an existing community server.



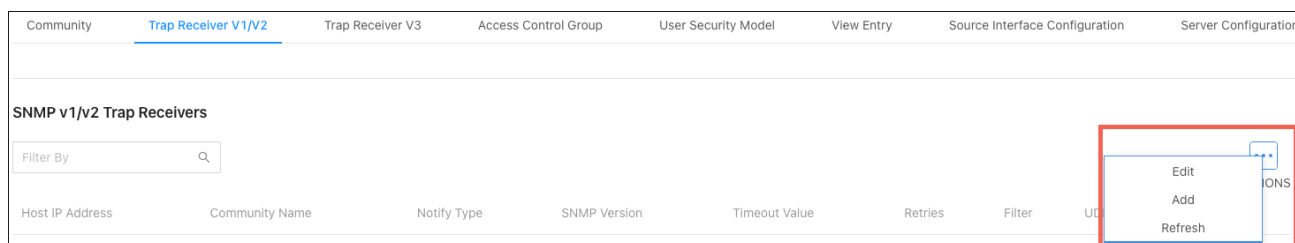
Configurable settings include:

- **Mode** – Use **Community** for SNMPv1/2 or **Group** for v3.
- **Community Name** – Community name used in SNMPv1/v2 packets. This is configured in the client device and determines the access the user may connect with.
- **IP Address** – Enter the IP address of the device that can connect to the Community or Group.
- **Community Access** – Select the permissions given to the Community or Group.
- **Community View** – Enter a community view. No access is granted if this field is left empty.

Trap Receiver V1/V2

Use this page to configure the SNMP v1 or 2 trap receiver (sometimes known as a management host) that's receiving notifications about traps generated by the switch.

Use the **Options** (⋮) button to refresh the page, add, or select multiple trap receivers to configure. Use the **Action** button to edit or delete an existing trap receiver.



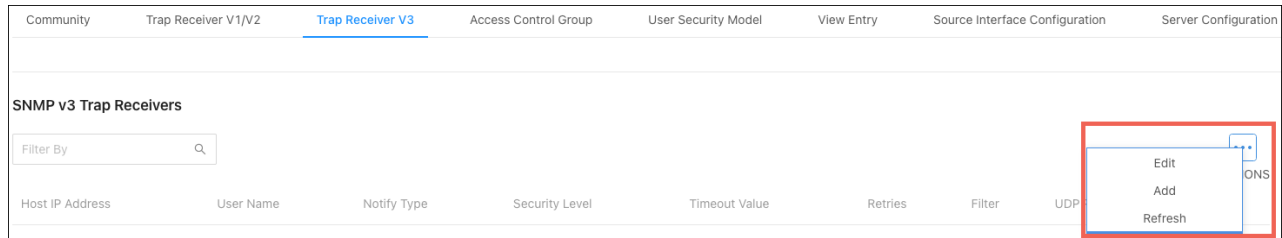
Configurable settings include:

- **Host IP Address** – The IP address of the device that is going to receive the traps generated by the switch.
- **Community Name** – The SNMP community name that includes the trap receiver and the SNMP agent on the switch.
- **Notify Type** – Select the notification type to send to the trap receiver.
 - **Trap** – An SNMP message that notifies the trap receiver when a certain event has occurred on the device. The message is not acknowledged by the SNMP management host.
 - **Inform** – An SNMP message that notifies the trap receiver when a certain event has occurred on the device. The message is acknowledged by the SNMP management host. This type of notification is not available for SNMPv1.
- **SNMP Version** – Select the SNMP version being used.
- **Filter** – This field is optional. Enter the name of the filter configured on the trap receiver. The filter is configured using the CLI and defines which MIB objects to include or exclude from the community view.
- **UDP Port** – The UDP port on the trap receiver that is receiving the SNMP notifications. The default UDP port value (162) is used if no value is specified when configuring a receiver.

Trap Receiver V3

Use this page to configure the SNMP v3 trap receiver (sometimes known as a management host) that's receiving notifications about traps generated by the switch.

Use the **Options** (☰) button to refresh the page, add, or select multiple trap receivers to configure. Use the **Action** button to edit or delete an existing trap receiver.



Configurable settings include:

- **Host IP Address** – The IP address of the device that is going to receive the traps generated by the switch.
- **User Name** – The name of the SNMP user that is authorized to receive the SNMP notification.
- **Notify Type** – Select the notification type to send to the trap receiver.
 - **Trap** – An SNMP message that notifies the trap receiver when a certain event has occurred on the device. The message is not acknowledged by the SNMP management host.
 - **Inform** – An SNMP message that notifies the trap receiver when a certain event has occurred on the device. The message is acknowledged by the SNMP management host. This type of notification is not available for SNMPv1.
- **Security Level** – Select one of the following security levels for the NSMP user:
 - **No Auth No Priv** – No authentication and no data encryption (no security).
 - **Auth No Priv** – Authentication with no data encryption. With this security level, users send SNMP messages using an MD5 key/password for authentication. It does not send a DES key/password for encryption.
 - **Auth Priv** – Authentication and data encryption. With this security level, users send an MD5 key/password for authentication and a DES key/password for encryption.

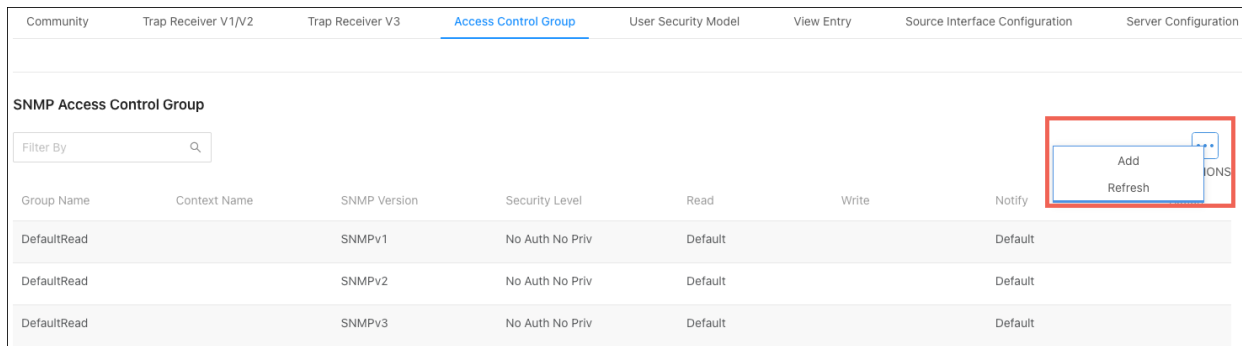
- **Filter** – This field is optional. Enter the name of the filter configured on the trap receiver. The filter is configured using the CLI and defines which MIB objects to include or exclude from the community view.
- **UDP Port** – The UDP port on the trap receiver that is receiving the SNMP notifications. The default UDP port value (162) is used if no value is specified when configuring a receiver.

Access Control Group

Use this page to configure **SNMP Access Control Groups** and view a summary of all the configured groups. These SNMP groups allow network managers to assign different authorization levels and access rights to specific switch features and attributes. The switch is preconfigured with several default SNMP groups.

The SNMP community can reference an SNMP group to provide security and context for agents receiving requests, initiating traps, and management system tasks. An SNMP agent cannot respond to a request from a management system outside the group or groups it's configured for.

Use the **Options** (☰) button to refresh the page or add a new Access Control Group.



Group Name	Context Name	SNMP Version	Security Level	Read	Write	Notify
DefaultRead		SNMPv1	No Auth No Priv	Default		Default
DefaultRead		SNMPv2	No Auth No Priv	Default		Default
DefaultRead		SNMPv3	No Auth No Priv	Default		Default

Configurable settings include:

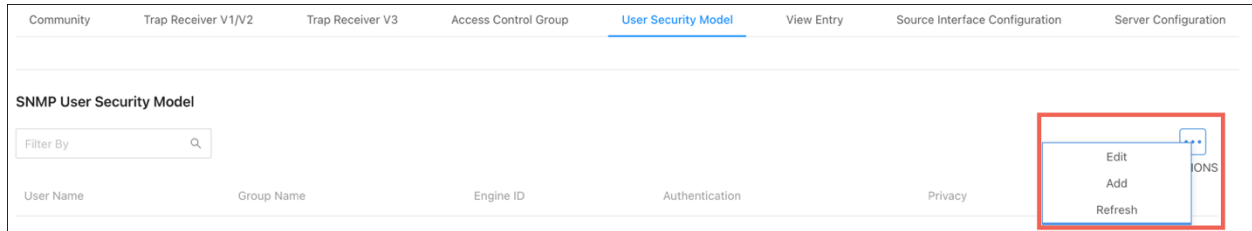
- **Group Name** – Enter an easily identifiable name for the Access Control Group.
- **SNMP Version** – Select the SNMP version for the Access Control Group.
- **Security Level** – Select one of the following security levels for the NSMP user:
 - **No Auth No Priv** – No authentication and no data encryption (no security). This is only available to SNMP v1 or 2 groups.
 - **Auth No Priv** – Authentication with no data encryption. With this security level, users send SNMP messages using an MD5 key/password for authentication. It does not send a DES key/password for encryption.

- **Auth Priv** – Authentication and data encryption. With this security level, users send an MD5 key/password for authentication and a DES key/password for encryption.
- **Context Name** – Enter the SNMP context associated with the SNMP group and its views. A user or a management application specifies the context name to get the performance information from the MIB objects associated with that context name. The Context EngineID identifies the SNMP entity that should process the request (the physical router), and the Context Name tells the agent in which context it should search for the objects requested by the user or the management application.
- **Group Access Rights Read** – Select the level of read access rights for the group. The menu includes the available SNMP views. When adding a group.
- **Group Access Rights Write** – Select the level of write access rights for the group. The menu includes the available SNMP views. When adding a group.
- **Group Access Rights Notify** – Select the level of notify access rights for the group. The menu includes the available SNMP views. When adding a group.

User Security Model

Use this page to configure SNMP v3 users.

Click the **Options** (⋮) button to refresh the page, add, or edit a new SNMP user.



Configurable settings include:

- **Engine ID Type** – Select the Engine ID type being used. **Local** or **Remote**. Each SNMP v3 agent has an engine ID as a unique identifier for the device.
- **User Name** – A unique identifier for the user. Leading or embedded blanks cannot be used.
- **Group Name** – The SNMP group name to associate the user with.
- **Authentication Method** – Select one of the following options:
 - **None** – No authentication is used.
 - **MD5** – This protocol requires a password of 1-32 hexadecimal characters.
 - **SHA** – This protocol requires a password of 1-32 hexadecimal characters.
 - **MD5-Key** – This protocol requires a pre-generated MD5 authentication key of 32 hexadecimal characters.
 - **SHA-Key** – This protocol requires a pre-generated SHA authentication key of 40 hexadecimal characters.

View Entry

An **SNMP View** is a mapping between SNMP scalar and tabular objects and the access rights configured for the view. Use this page to configure access to one or more **MIB OID** (MIB Object Identifier) nodes for an **SNMP View Name**.

Note: An SNVMP View Entry must be configured for an SNMP v3 agent to work.

Click the **Options** (☰) button to refresh the page or add a new View Entry.

View Name	OID Tree	View Type
Default	1	Included
Default	1.3.6.1.6.3.15.1.2	Excluded
Default	1.3.6.1.6.3.16	Excluded
DefaultSuper	1	Included

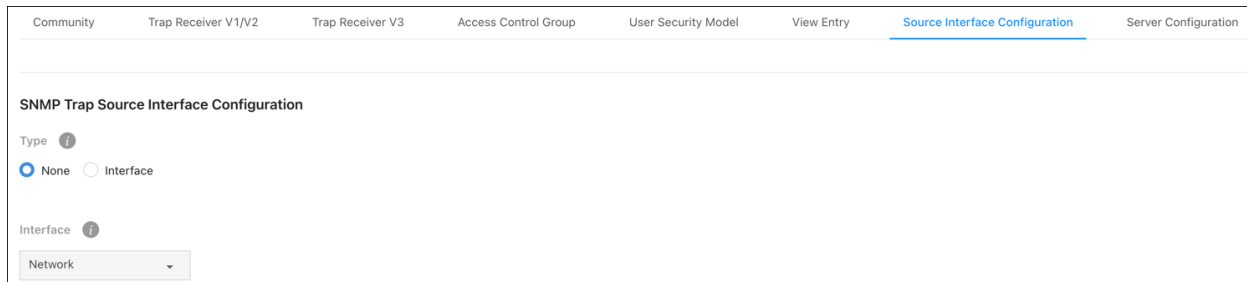
Configurable settings include:

- **View Name** – Enter a unique name to identify the SNMP view.
- **View Type** – Select an View Type to use. Options include:
 - **Included** – Grants access to the OID subtree.
 - **Excluded** – Denies access to the OID subtree.
- **OID Tree** – The ASN.1 subtree to grant or deny access to.

Source Interface Configuration

Use this page to specify the physical or logical interface to use as the SNMP client source interface. When an IP address is configured on the source interface, the IP address is used in the IP header of SNMP management packets for all SNMP communications between the local SNMP client and the remote SNMP server.

This allows security devices, like firewalls, to identify incoming source packets from a specific device.



The screenshot shows a web interface with a navigation bar at the top containing the following tabs: Community, Trap Receiver V1/V2, Trap Receiver V3, Access Control Group, User Security Model, View Entry, Source Interface Configuration (which is highlighted with a blue underline), and Server Configuration. Below the navigation bar, the main content area is titled "SNMP Trap Source Interface Configuration". Under the "Type" label, there are two radio button options: "None" (which is selected) and "Interface". Below the "Interface" label, there is a dropdown menu currently showing "Network".

Configurable settings include:

- **Type** – Select a source interface type. Options include:
 - **None** – The primary IP address of the origination (outbound) interface is used as the source address.
 - **Interface** – The primary IP address of the physical switchport is used as the source address.

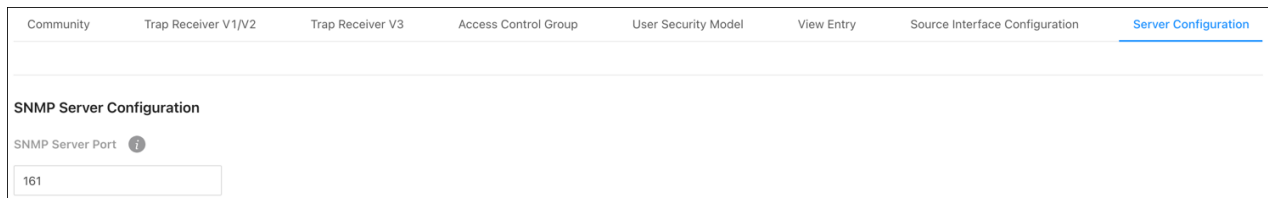
The **Interface** drop-down can only be set to **Network**. This option includes the physical port, VLAN routing interface, and the network source IP.

Click **Apply** at the top of the page to save changes.

Server Configuration

Use this page to specify the UDP port number the SNMP server uses to listen for requests.

Caution: Changing this value may cause existing SNMP transactions to cease communicating with the device until the client applications are reconfigured to use the new port number.



The screenshot shows a web-based configuration interface. At the top, there is a navigation bar with several tabs: Community, Trap Receiver V1/V2, Trap Receiver V3, Access Control Group, User Security Model, View Entry, Source Interface Configuration, and Server Configuration (which is currently selected and underlined). Below the navigation bar, the main content area is titled "SNMP Server Configuration". Under this title, there is a label "SNMP Server Port" followed by a small information icon (i). Below the label is a text input field containing the number "161".

Click **Apply** to save changes.

Time Ranges

Use these pages to configure time ranges for **Access Command Lists (ACLs)**. Time ranges can be set for one or more rules within an ACL using a periodic or absolute time, except for the deny all rule each ACL has.

Time ranges must have a name before they can be referenced by an ACL rule.

Configuration

Click the **Options** (⋮) button to add or edit a named Time Range or refresh the page.

Use the **Action** button to delete a Time Range.

Click **Enable** to make Time Ranges active.

Time Ranges

Configuration Entry Configuration

Time Range Summary

Enable

Filter By

Time Range Name	Time Range Status	Periodic Entry Count	Absolute Entry	Action
Test_Range	Inactive	1	Does not exist	⋮

Table field descriptions:

- **Time Range Name** – The unique name entered to identify the Time Range.
- **Time Range Status** – Displays whether the Time Range is active.
- **Periodic Entry Count** – The number of periodic time range entries currently configured with the Time Range.

- **Absolute Entry** – The number of absolute time range entries currently configured with the Time Range.

Entry Configuration

Use this page to add periodic and absolute time range entries.

To add an entry, select a **Time Range Name**, then click the **Options** (...) button > **Add**.

The screenshot shows the 'Entry Configuration' interface. At the top, there are tabs for 'Configuration' and 'Entry Configuration'. Below this is a 'Time Range Entry Summary' section. A 'Time Range Name' dropdown menu is set to 'Test_Range'. To the right of this is a search filter labeled 'Filter By'. Below the filter is a table with columns 'Entry Type', 'Starts', and 'Ends'. On the right side of the table, there is an 'Options' menu (indicated by a red box) with three items: 'Edit', 'Add', and 'Refresh'.

The Configurable settings depend on which **Entry Type** you select. The below table describes these settings.

Entry Type	Field	Description
Periodic	Start Days	Select the day the time range entry begins. If more than one day is selected, they must match the End Days field.
	Starting Time of Day	Enter the time of day the entry begins. Uses a 24-hour format.
	End Days	The day, or days, the entry ends. If multiple days are selected, they must match the Start Days field.
	Ending Time of Day	The time of day the entry ends. Uses a 24-hour format.
Absolute	Starts	The calendar day the entry begins.
	Ends	The calendar day the entry ends.

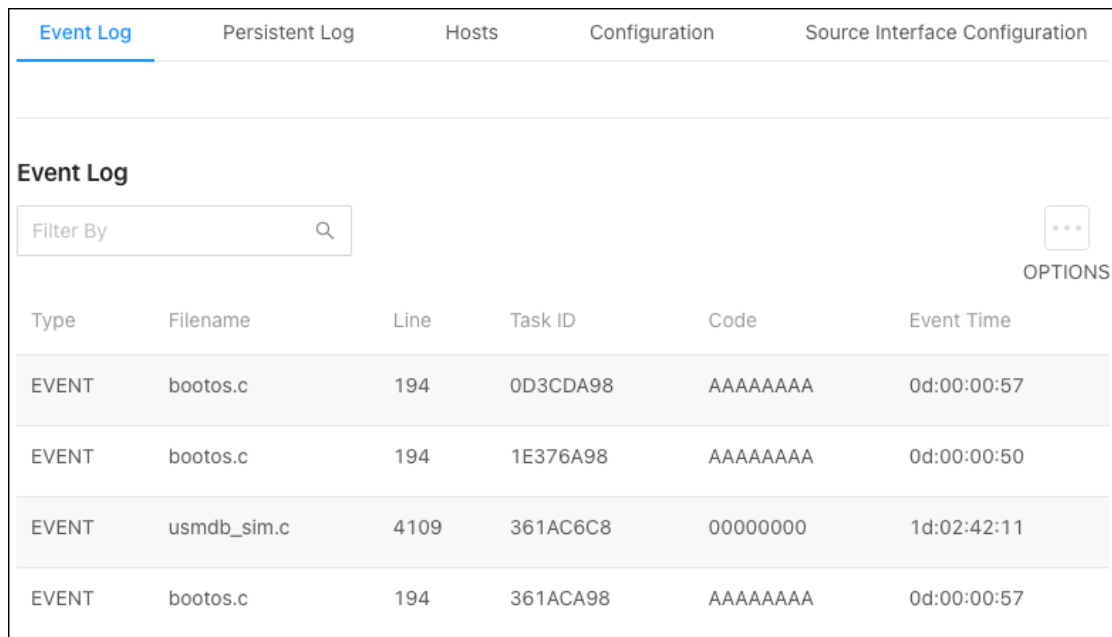
To delete a Time Range Entry, click the **Action** button next to the entry.

Logs

The logs display a record of system events and can be configured to only display the most pertinent system information.

Event Log

Use this page to view system events recorded since the last restart of the switch. Refresh the page to see new events. The **Options** (⋮) button gives you the ability to display a specified number of rows, and to **Refresh** the logs.



The screenshot shows a web interface with a navigation bar at the top containing 'Event Log', 'Persistent Log', 'Hosts', 'Configuration', and 'Source Interface Configuration'. The 'Event Log' tab is selected. Below the navigation bar is a section titled 'Event Log' containing a 'Filter By' search box and an 'OPTIONS' button (⋮). Below this is a table with the following data:

Type	Filename	Line	Task ID	Code	Event Time
EVENT	bootos.c	194	0D3CDA98	AAAAAAAA	0d:00:00:57
EVENT	bootos.c	194	1E376A98	AAAAAAAA	0d:00:00:50
EVENT	usmdb_sim.c	4109	361AC6C8	00000000	1d:02:42:11
EVENT	bootos.c	194	361ACA98	AAAAAAAA	0d:00:00:57

Table field descriptions:

- **Type** – The incident category of the log entry. Event, Error, etc.
- **Filename** – The source code file name of the event’s origin.
- **Line** – The line number of the event within the source code.
- **Task ID** – The system identifier of the task that was running when the event occurred.
- **Code** – An event-specific code assigned to the event.

- **Event Time** – A time stamp (days:hours:minutes:seconds) that indicates when the event occurred in reference to the system’s uptime.

Persistent Log

This page shows current events, and events recorded before the last system restart. Refresh the page to see new events. The **Options** (⋮) button gives you the ability to display a specified number of rows, and to **Refresh** the logs.

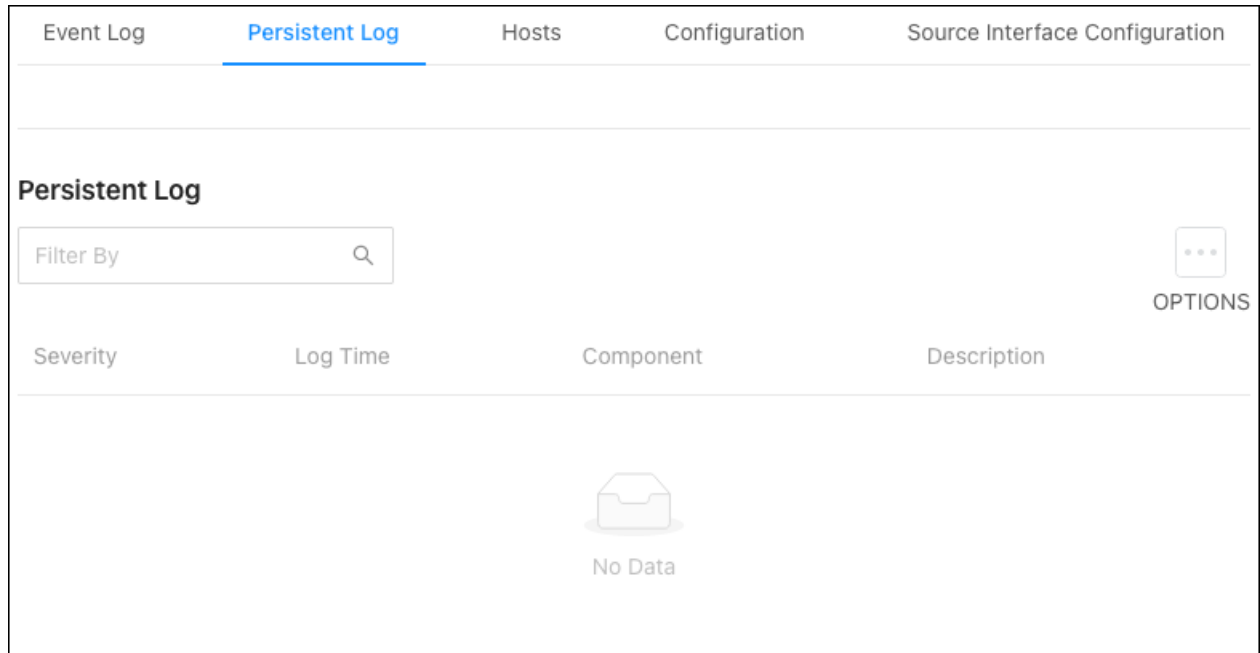


Table field descriptions:

- **Severity** – The severity level of the log entry. The severity levels displayed can be configured under **Advanced** > **System** > **Logs** > **Configuration** tab.
- **Log Time** – A time stamp (days:hours:minutes:seconds) that indicates when the event occurred.
- **Component** – The component that issued the log entry.
- **Description** – A text description of the log entry.

Hosts

Use this page to configure remote hosts for the switch to send and capture logs to. Click the **Options** (⋮) button to **Edit**, **Add** a new host, or **Refresh** the list.

The screenshot shows a web interface with a navigation bar at the top containing five tabs: "Event Log", "Persistent Log", "Hosts" (which is selected and underlined in blue), "Configuration", and "Source Interface Configuration". Below the navigation bar is a section titled "Logging Hosts". On the left side of this section is a search box labeled "Filter By" with a magnifying glass icon. On the right side is an "OPTIONS" button represented by a square icon with three dots. Below these elements is a table header with the following columns: "Host", "Status", "Port", "Severity Filter", "Transport Mode", "Authentication Mode", "CertificateIndex", and "Action". The table area below the header is empty and contains a "No Data" message with a folder icon.

Table field descriptions:

- **Host** – The IP address or DNS-resolvable host name of the remote host that is receiving log messages.
- **Status** – Indicates if the host is configured to actively log or not.
- **Port** – The UDP port on the logging host that the syslog messages are being sent.
- **Severity Filter** – Severity level threshold for log messages, configured under **Advanced > System > Logs > Configuration** tab. All log messages with a severity level at and above the configured threshold are sent to the logging host.
- **Transport Mode** – UDP or TLS. If TLS is not configured the default transport mode is UDP.

- **Authentication Mode** – Using TLS, the security user can configure an anonymous authentication mode, where no client authentication is done by the syslog server. Using x509/name authentication mode, two-way authentication is done by the syslog client and the syslog server.
- **Certificate Index** – Index used to identify corresponding certificate files.
- **Action** – Edit or remove a logging host.

Configuration

Use these fields to configure the behavior and data for the switch to log.

Buffered Log Configuration:

- **Enable** – Enabled by default, this feature logs data to the buffered (RAM) file.
- **Behavior** – Specifies what happens when the buffered log is full.
 - **Wrap:** Deletes the oldest messages.
 - **Stop on Full:** Stops writing new messages.

Command Logger Configuration:

Enable or **Disable** logging of command-line interface (CLI) commands issued to the switch. This setting is disabled by default.

Console Log Configuration:

- **Enable** – Enable or disable logging to any serial device attached to the switch.
- **Severity Filter** – Sets the severity of the messages to log. All messages at or above the selected severity level are logged to the console.

Persistent Log Configuration:

- **Enable** – Enable or disable logging to the persistent log. These messages are not deleted when the switch restarts.
- **Severity Filter** – Sets the severity of the messages to log. All messages at or above the selected severity level are logged to the switch.

Syslog Configuration:

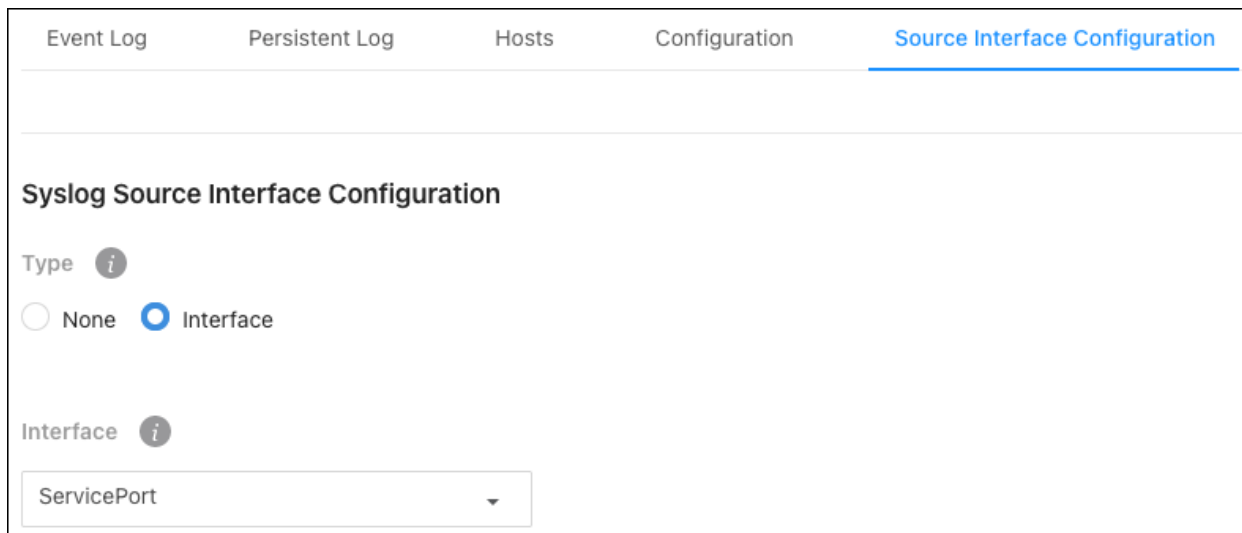
- **Enable** – Enable or disable logging to the configured syslog hosts. When disabled, the switch does not relay logs to syslog hosts and no messages are sent to any collector/relay.

When enabled messages are sent to the collectors/relays using the values configured for each collector/relay.

- **Protocol Version** – The RFC version of the syslog protocol.
- **Local UDP Port** – The UDP port the switch sends syslog messages from.

Source Interface Configuration

Use this page to configure the port that the Syslog host is connected to.



The screenshot shows a web interface with a navigation bar at the top containing tabs: Event Log, Persistent Log, Hosts, Configuration, and Source Interface Configuration (which is highlighted with a blue underline). Below the navigation bar is a section titled "Syslog Source Interface Configuration". Under this title, there is a "Type" label with an information icon (i). Below the label are two radio button options: "None" (unselected) and "Interface" (selected). Below the radio buttons is an "Interface" label with an information icon (i). Underneath the label is a dropdown menu currently displaying "ServicePort".

Configurable settings include:

- **Type** – Select **Interface** to configure a Syslog Source Interface. Default is None.
- **Interface** – Use the dropdown to select the type of interface to use. Service port or Network port.

System Statistics

Pages in the Statistics section contain information about the amount and types of traffic the switch is transmitting and receiving.


Switch

Use the **Options** (☰) button to refresh the statics for a specific heading or click the **Clear Counters** button to clear all the statistics information on the page.

Switch	Port Summary	Port Detailed
System		
Interface		385
Time Since Counters Last Cleared		27d:08:17:29


System counters descriptions:

- **Interface** – The interface index object value of the interface table entry associated with the switch’s processor. Use this value to identify the interface when managing the switch with SNMP.
- **Time Since Counters Last Cleared** – The amount of time in days:hours:minutes:seconds since the statistics for the switch have been reset.

Statistics		
Filter By <input type="text"/>		 OPTIONS
Statistics	Transmit	Receive
Octets Without Error	248838037	1472377251
Packets Without Errors	1585440	15539054
Packets Discarded	0	0
Unicast Packets	598465	662271
Multicast Packets	986957	1818446
Broadcast Packets	18	13058337

Statistics counters descriptions:

- **Octets Without Error** – The total number of octets (bytes) successfully transmitted or received data by the processor. This number includes FCS octets but excludes framing bits.
- **Packets Without Errors** – The total number of packets successfully transmitted or received by the processor. Includes unicast, broadcast, and multicast packets.
- **Packets Discarded** – The number of packets chosen to be discarded to prevent them from being deliverable to a higher-layer protocol. Such as discarding packets to free up buffer space.
- **Unicast Packets** – The number of subnetwork-unicast packets transmitted or received from a higher-layer protocol.
- **Multicast Packets** – The number of packets transmitted or received being directed to a multicast address.
- **Broadcast Packets** – The number of packets transmitted or received being directed to a broadcast address.

Status		
Filter By <input type="text"/>		 OPTIONS
Status	FDB Entries	VLANs
Current Usage	15	1
Peak Usage	29	1
Maximum Allowed	16384	255
Static Entries	0	1
Dynamic Entries	15	0
Total Entries Deleted	N/A	0

Status counters descriptions:

- **Current Usage** – In the FDB entries column, the value is the number of learned and static entries in the MAC address table. In the VLANs column, the number shows the number of static and dynamic VLANs that exist in the VLAN database.
- **Peak Usage** – The highest number of entries in the MAC address table or VLAN database that an admin statically configured.
- **Maximum Allowed** – The maximum number of statically configured or dynamically learned entries allowed in the MAC address table or VLAN database.
- **Static Entries** – The current number of statically configured entries in the MAC address table or VLAN database that an admin configured.
- **Dynamic Entries** – The current number of dynamically learned entries in the MAC address table or VLAN database that an admin configured.
- **Total Entries Deleted** – The number of VLANs created and deleted since the last time the switch was restarted. This field is not applicable to MAC address table entries.

Port Summary

This table shows statistics about the packets transmitted and received for individual interfaces (switchports and LAGs).

Use the **Options** (☰) button to **Refresh** or **Clear** the statistics in the table.

Interface	Name	Rx Good	Rx Errors	Rx Bcast	Tx Good	Tx Errors	Tx Collisions
1/0/1	Port 1	16684403	0	13128389	2159988	0	0
1/0/2	Port 2	0	0	0	0	0	0
1/0/3	Port 3	0	0	0	0	0	0

Column descriptions:

- **Interface** – The interface (switchport or LAG) number.
- **Name** – The name given to the interface.
- **RX Good** – The total number of inbound packets received by the interface without error.
- **RX Errors** – The total number of inbound packets containing errors, preventing them from being deliverable on the interface.
- **RX Bcast** – The total number of inbound packets received by the interface directed to a broadcast address. This does not include multicast packets.
- **TX Good** – The total number of outbound packets received by the interface without error.
- **TX Errors** – The total number of outbound packets containing errors, preventing them from being deliverable on the interface.
- **TX Collisions** – The best estimate of the total number of collisions on the interface.

Port Detailed

This page allows you to select an interface and view detailed statistics about it, such as the **Maximum Frame Size, MTU**, and the **Packet Lengths Received and Transmitted**.

Use the **Interface** dropdown to select a switchport or LAG. Click the **Options** (⋮) button to Refresh the page for the most current statistics.


Switch Port Summary Port Detailed


System

Interface:

Maximum Frame Size 1518
MTU 1500
Time Since Counters Last Cleared 27d:10:04:18

Packet Lengths Received and Transmitted

Filter By 

 **OPTIONS**

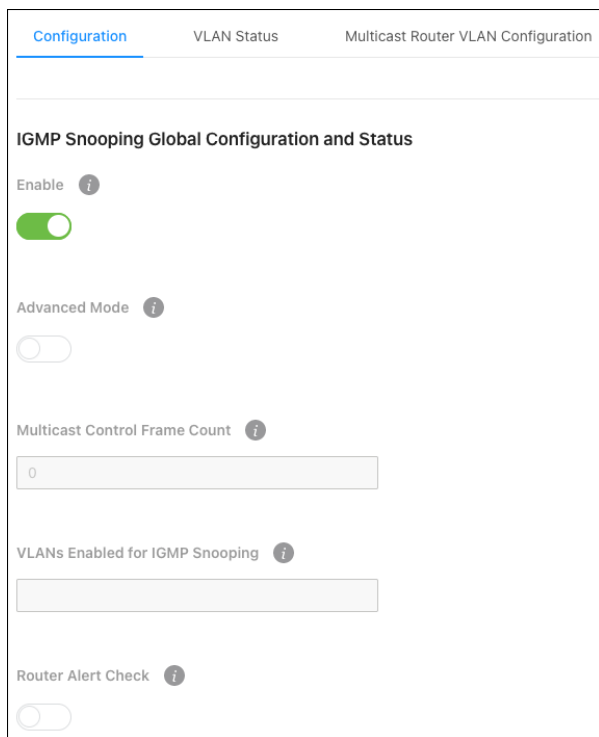
64 Octets	13692578
65-127 Octets	2210413
128-255 Octets	966839

Switching

IGMP Snooping

Configuration

Use this page to enable IGMP Snooping on the switch and view related counts.



Configurable settings:

- **Enable** - Enables/disables IGMP snooping on the switch.
- **Advanced Mode** - Enabled Advanced mode if the IGMP environment which is likely to have large bursts of IGMP messages. The switch's CPU has a buffer shared by all kinds of packets. When there is a burst of IGMP snooping packets, some would be dropped. To prevent this, Advanced Mode increases the buffer size for IGMP snooping packets, sacrificing the buffer size allocated for other kinds of packets. These "other" packets may be dropped.

- **Router Alert Check** – Enable for the switch to inspect packets when they are being forwarded, even though the packet is not directly addressed to this switch.

Read-only fields:

- **Multicast Control Frame Count** – The number of multicast frames the switch has processed.
- **VLANs Enabled for IGMP Snooping** – The number of VLANs configured on the switch for IGMP snooping.

VLAN Status

Use this page to enable IGMP snooping on VLANs configured on the switch.

Click the **Options** (☰) button to **Refresh** or **Clear** the statistics in the table.

Configurable settings include:

- **VLAN ID** – Select a VLAN ID that's been configured on the switch. You can only select a VLAN that hasn't already been configured for IGMP Snooping.
- **Fast Leave** – Enable to remove the multicast group specified in an IGMP Leave report without sending an IGMP query message and waiting for a response.
- **Group Membership Interval (Seconds)** – The number of seconds the VLAN waits for a report for a particular multicast group on the VLAN before the IGMP snooping feature deletes the VLAN from the group.
- **Max Response Time (Seconds)** – The number of seconds the VLAN waits after sending a query if it does not receive a report for a particular multicast group. The specified value should be less than the Group Membership Interval.
- **Multicast Router Expiration Timer (Seconds)** – The number of seconds the VLAN waits to receive a query before it is removed from the list of VLANs with multicast routers attached.

- Report Suppression Mode** – The IGMPv1 and IGMPv2 report suppression mode. The device uses IGMP report suppression to limit the membership report traffic sent to multicast-capable routers. When this mode is enabled, the device does not send duplicate reports to the multicast router. Note that this mode is supported only when the multicast query has IGMPv1 and IGMPv2 reports. This feature is not supported when the query includes IGMPv3 reports. The options are as follows:
 - Enabled** – Only the first IGMP report from all hosts for a group IGMP report is forwarded to the multicast routers.
 - Disabled** – The device forwards all IGMP reports from all hosts in a multicast group to the multicast routers.

Configuration		VLAN Status		Multicast Router VLAN Configuration				
IGMP Snooping VLAN Status								
Filter By <input type="text"/>								...
VLAN ID	Enable	Fast Leave Enabled	Group Membership Interval (Seconds)	Max Response Time (Seconds)	Multicast Router Expiration Time (Seconds)	Report Suppression Mode	OPTIONS	
1	<input checked="" type="checkbox"/>	Disabled	260	10	0	Disabled	...	

Multicast Router VLAN Configuration

Use this page to configure VLANs for multicast routing. When enabled, multicast routers learn which multicast groups are active by periodically checking with each member of the multicast group. Read [Understanding Multicast & IGMP](#) for more information about multicast groups.

MRouter Learning	Interface	Name	VLAN IDs	Learned VLAN IDs	Action
<input checked="" type="checkbox"/>	1/0/1	Port 1			Options
<input checked="" type="checkbox"/>	1/0/2	Port 2			Options
<input checked="" type="checkbox"/>	1/0/3	Port 3			Options

To configure multicast routing:




1. Use the **Options** button to configure multiple ports or the **Actions** button to edit a single port.
2. Select the **VLAN ID(s)** you want the port to act as the multicast router for, then click the **right arrow** to add them.

3. Click **Save**, then **Apply** at the top of the page.

Edit Multicast Router VLAN Configuration

Multicast Router VLAN Configuration Selected: 2

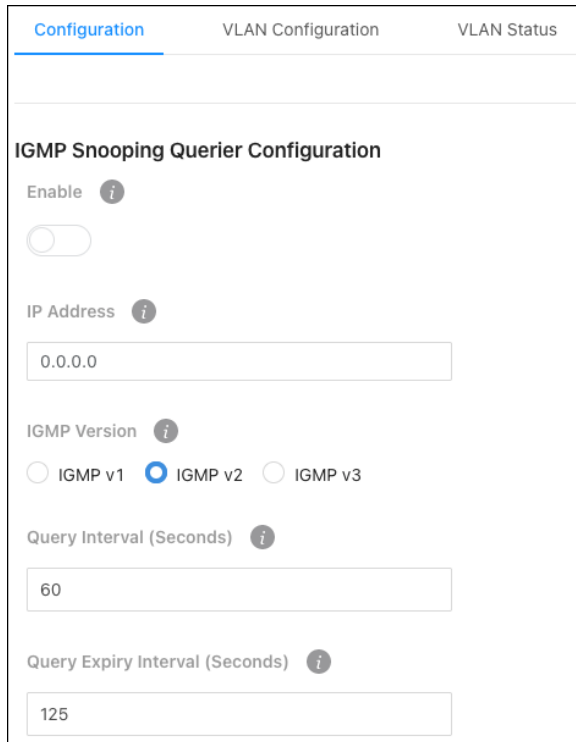
VLAN IDs ⓘ

<input checked="" type="checkbox"/> 1/3 items	VLAN List	<input type="checkbox"/> 0 item	Members
<input checked="" type="checkbox"/>	2		
<input type="checkbox"/>	1		
<input type="checkbox"/>	3		
			 No Data
			

IGMP Snooping Querier

Configuration

Use this page for IGMP Snooping Querier administration.



The screenshot shows a web-based configuration interface for IGMP Snooping Querier. At the top, there are three tabs: 'Configuration' (selected), 'VLAN Configuration', and 'VLAN Status'. Below the tabs, the main heading is 'IGMP Snooping Querier Configuration'. The configuration options are as follows:

- Enable:** A toggle switch is currently turned off. An information icon (i) is next to it.
- IP Address:** A text input field contains '0.0.0.0'. An information icon (i) is next to it.
- IGMP Version:** Three radio buttons are present: 'IGMP v1' (unselected), 'IGMP v2' (selected), and 'IGMP v3' (unselected). An information icon (i) is next to the 'IGMP v2' option.
- Query Interval (Seconds):** A text input field contains '60'. An information icon (i) is next to it.
- Query Expiry Interval (Seconds):** A text input field contains '125'. An information icon (i) is next to it.

Configurable settings include:

- **Enable** - Enable to allow the switch to send periodic IGMP queries that trigger IGMP report messages from the switches that want to receive IP multicast traffic. IGMP snooping listens to these IGMP reports to establish appropriate forwarding.
- **IP Address** - The address to be used as the source address in periodic IGMP queries when no IP address is configured on the VLAN on which the query is being sent.
- **IGMP Version** - Select the IGMP version to use in the queries.
- **Query Interval (Seconds)** - The amount of time between queries.

- **Query Expiry Interval (Seconds)** – The amount of time the device remains in non-querier mode after it discovers that there is a multicast querier on the network.

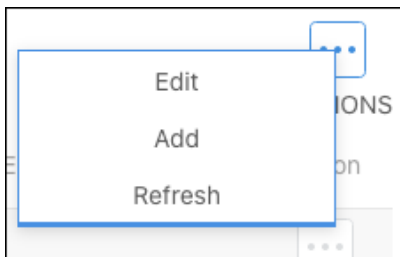
VLAN Configuration

Use this page to add VLANs that the switch should act as the IGMP querier for. To learn more about IGMP queriers, read [Understanding Multicast & IGMP](#).

Caution: Only enable **IGMP Snooping Querier** on the switch where your IGMP topology starts, called the **core IGMP switch**. This IGMP querying switch asks each device on the network which multicast traffic they want.

To add a VLAN to the switch's IGMP snooping querier configuration:

1. Click the **Options** button, then **Add**.



2. Select a **VLAN ID**.
3. Enable **Querier Election Participation** if the VLAN should participate in the IGMP querier Election process.
4. If desired, enter a **Querier VLAN IP Address**.

5. Click **Add**, then **Apply** at the top of the page.

Add IGMP Snooping Querier VLAN Configuration ⓧ

VLAN ID i
1 2

Querier Election Participation i
 3

Querier VLAN IP Address i
0.0.0.0 4

Cancel 5 Add

Configured VLANs are listed at the bottom of the page.

VLAN Configuration		VLAN Status			
IGMP Snooping Querier VLAN Configuration					
Filter By <input type="text"/>					⋮
					OPTIONS
VLAN ID	Querier VLAN IP Address	IGMP Version	Query Interval	Querier Expiry Interval	Action
2	0.0.0.0	IGMP v2	125	255	⋮

VLAN Status

Use this page to view information about the IGMP snooping querier status for all VLANs that have the snooping querier enabled.

VLAN Configuration		VLAN Status		
IGMP Snooping Querier VLAN Status				
Filter By <input type="text"/>				...
				OPTIONS
VLAN ID	State	Elected Querier	Version	Max Response Time (Seconds)
2	Querier	12.0.0.1	2	10.00

Spanning Tree Protocol

Switch

Use this page to configure global **Spanning Tree Protocol (STP)** settings for the switch.

STP is a Layer 2 protocol that decides the best path for LAN traffic when multiple options exist, preventing network loops while guaranteeing redundancy in case of link failure.

For more information about STP, read [Understanding Spanning Tree Protocol \(STP\) & Best Practices](#).

The screenshot shows the 'Spanning Tree Switch Configuration' page. At the top, there are navigation tabs: 'Switch' (selected), 'MST', 'MST Port', 'CST', 'CST Port', and 'Statistics'. The main content area is titled 'Spanning Tree Switch Configuration' and includes the following settings:

- Enable:** A green toggle switch is turned on.
- Force Protocol Version:** Three radio buttons are present: 'IEEE802.1d(STP)', 'IEEE802.1w(RSTP)', and 'IEEE802.1s(MSTP)'. The 'IEEE802.1s(MSTP)' option is selected.
- Configuration Name:** A text input field contains the value '14-3F-C3-00-20-D4'.
- Configuration Revision Level:** A text input field contains the value '0'.
- Configuration Digest Key:** Displayed as '0xAC36177F50283CD4B83821D8AB26DE62'.
- Configuration Format Selector:** Displayed as '0'.

Configurable settings include:

- **Enable** — Enables STP on the switch.
- **Force Protocol Version** — Select the STP version for the switch to use.
- **Configuration Name** — Typically left alone, you can enter the name of the MSTP region. Each switch that participates in the same MSTP region must share the same Configuration Name, Configuration Revision Level, and MST-to-VLAN

mappings.

- **Configuration Revision Level** – This number must be the same on all switches participating in the MSTP region.

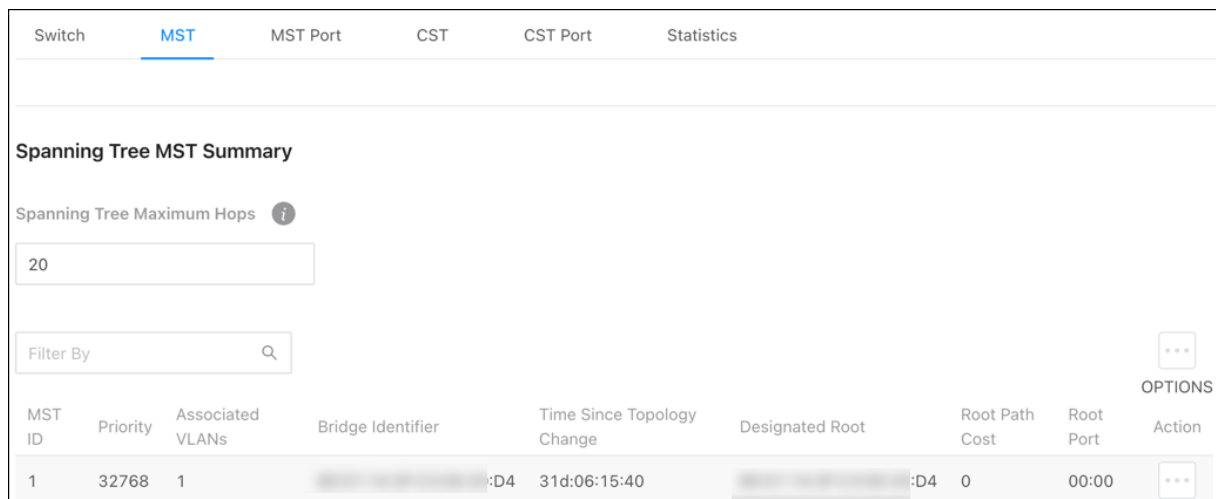
MST

Use the MST Summary page to view the Multiple Spanning Tree Instances (MSTIs) on the device.

Multiple Spanning Tree Protocol (MSTP) allows the creation of MSTIs based upon a VLAN or groups of VLANs. Configuring MSTIs creates an active topology with a better distribution of network traffic and an increase in available bandwidth when compared to classic STP MST Port.

The **Spanning Tree Maximum Hops** field displays the maximum number of hops a Bridge Protocol Data Unit (BPDU) is allowed to traverse within the spanning tree region before it is discarded. The default value is 20.

MST instances appear in the table at the bottom of the page.



MST ID	Priority	Associated VLANs	Bridge Identifier	Time Since Topology Change	Designated Root	Root Path Cost	Root Port	Options
1	32768	1	...	31d:06:15:40	...	0	00:00	...

Table field descriptions:

- **MST ID** – Identifies the MST instance.
- **Priority** – The bridge priority for the spanning-tree instance. This value affects the likelihood that the bridge is selected as the root bridge. A lower value increases the probability that the bridge is selected as the root bridge.

- **Associated VLANs** – The number of VLANs that are mapped to the MSTI. This number does not contain any information about the VLAN IDs that are mapped to the instance.
- **Bridge Identifier** – A unique value that is automatically generated based on the bridge priority value of the MSTI and the base MAC address of the bridge. When electing the root bridge for an MST instance, if the bridge priorities for multiple bridges are equal, the bridge with the lowest MAC address is elected as the root bridge.
- **Time Since Topology Change** – The amount of time that has passed since the topology of the MSTI changed.
- **Designated Root** – The bridge identifier of the root bridge for the MST instance. The identifier is made up of the bridge priority and the base MAC address.
- **Root Path Cost** – The path cost to the designated root for this MST instance. Traffic from a connected device to the root bridge takes the least-cost path to the bridge. If the value is 0, the cost is automatically calculated based on port speed.
- **Root Port** – The port on the bridge with the least-cost path to the designated root for the MST instance.

MST Port

Use this page to view and configure the Multiple Spanning Tree (MST) settings for each interface on the switch.

Use the **MST ID** dropdown to view its configuration on each switch interface.

Note: An MST instance must first be created under the MST tab before an MST ID can be selected.

Click the **Options** (⋮) button to **Refresh** the statistics in the table, or to **Edit** multiple interfaces at once. Click **Action** to edit the MST ID on an individual interface.

Switch	MST	MST Port	CST	CST Port	Statistics		
Spanning Tree MST Port Summary							
MST ID <input type="text" value="1"/>							
Filter By <input type="text" value=""/>							
Interface	Name	Port Role	Port Forwarding State	Port Priority	Port Path Cost	Description	Options
1/0/1	Port 1	Designated	Forwarding	128	0		⋮
1/0/2	Port 2	Disabled	Disabled	128	0		⋮
1/0/3	Port 3	Disabled	Disabled	128	0		⋮

Configurable options include:

- **Port Priority** – The priority for the port within the MSTI. This value is used to determine which interface becomes the root port when two ports have the same least-cost path to the root. The port with the lower priority value becomes the root port. If the priority values are the same, the port with the lower interface index becomes the root port.
- **Port Patch Cost** – The path cost from the port to the root bridge.

Edit MST Port ✕

MST Port Selected: 1

Port Priority i

128

Port Path Cost i

0

Auto-calculate Port Path Cost:

Port ID:	80:01
Port Up Time Since Counters Last Cleared:	0d 00h 01m 52s
Port Forwarding State:	Forwarding
Port Role:	Designated
Designated Root:	80:01:14:3F:C3:00:20:D4
Designated Cost:	0
Designated Bridge:	80:01:14:3F:C3:00:20:D4
Designated Port:	80:01
Loop Inconsistent State:	False
Transitions Into LoopInconsistentState:	0
Transitions Out Of LoopInconsistentState:	0

Cancel

Save

Table field descriptions:

- **Auto-calculate Port Path Cost** – Shows whether the path cost from the port to the CIST root is automatically determined by the speed of the interface (Enabled) or configured manually (Disabled).
- **Port ID** – A unique value that is automatically generated based on the port priority value and the interface index.
- **Port Up Time Since Counters Last Cleared** – The amount of time that the port has been up since the counters were cleared.

- **Port Forwarding State** – How traffic is flowing through the port. States include:
 - **Blocking** – Blocks the flow of traffic. When a device is first connected to a port, it enters the blocking state.
 - **Learning** – The port is relaying information from a high-priority BPDU to the other ports on the switch.
 - **Disabled** – Disables the port.
 - **Err-disabled** – Allows STP to block the flow of traffic when it detects a loop, or forward traffic to a port if the connection changes.
- **Port Role** – The role of the port within the CST, which is one of the following:
 - **Root** – A port on the non-root bridge that has the least-cost path to the root bridge.
 - **Designated** – A port that has the least-cost path to the root bridge on its segment.
 - **Alternate** – A blocked port that has an alternate path to the root bridge.
 - **Backup** – A blocked port that has a redundant path to the same network segment as another port on the bridge.
 - **Master** – The port on a bridge within an MST instance that links the MST instance to other STP regions.
 - **Disabled** – The port is administratively disabled and is not part of the spanning.
- **Designated Root** – The bridge ID of the root bridge for the CST.
- **Designated Cost** – The path cost offered to the LAN by the designated port.
- **Designated Bridge** – The bridge ID of the bridge with the designated port.
- **Designated Port** – The port ID of the designated port.

- **Loop Inconsistent State** – Identifies whether the interface is currently in a loop-inconsistent state. An interface transitions to a loop-inconsistent state if Loop Guard is enabled and the port stops receiving BPDUs. In this state, the interface does not transmit frames.
- **Transitions Into Loop Inconsistent State** – The number of times this interface has transitioned into loop-inconsistent state.
- **Transitions Out Of Loop Inconsistent State** – The number of times this interface has transitioned out of loop-inconsistent state.

CST

Use the CST Configuration page to configure the Common Spanning Tree (CST) settings. The settings and information on this page define the device within the spanning tree topology that connects all STP/RSTP bridges and MSTP regions.

Configurable settings include:

- **Bridge Priority** – This value affects the likelihood that the bridge is selected as the root bridge. A lower value increases the probability that the bridge is selected as the root bridge. For more information, read [Understanding Spanning Tree Protocol \(STP\) & Best Practices](#) for more information.
- **Bridge Max Age** – The amount of time a bridge waits before implementing a topological change.
- **Bridge Forward Delay** – The amount of time a bridge remains in a listening and learning state before forwarding packets.
- **BPDU Filter** – When enabled, this feature filters the BPDU traffic on the switch's edge ports. When spanning tree is disabled on a port, BPDU filtering allows BPDU packets received on that port to be dropped.
- **BPDU Guard** – When enabled, this feature can disable edge ports that receive BPDU packets. This prevents a new device from entering the existing STP topology,

so devices that were originally not a part of STP are not allowed to influence the STP topology.

Pro Tip: Do not enable this feature unless there's a specific use case for it.

- **Spanning Tree TX Hold Count** – The maximum number of BPDUs that a bridge is allowed to send within a hello time window.

The bottom of the page provides general CST information.

Bridge Hello Time:	2
Bridge Identifier:	80:00:14:3F:C3:00:20:D4
Time Since Topology Change:	31d:08:05:27
Topology Change Count:	0
Topology Change:	False
Designated Root:	80:00:14:3F:C3:00:20:D4
Root Path Cost:	0
Root Port:	00:00
Max Age:	20
Forward Delay:	15
Hold Time:	6
CST Regional Root:	80:00:14:3F:C3:00:20:D4
CST Path Cost:	0

CST Port

Use the CST Port page to view and configure the Common Spanning Tree (CST) settings for each port on the switch.

Click the **Options** (⋮) button to **Refresh** the statistics in the table, or to **Edit** multiple interfaces at once. Click **Action** to edit an individual interface.

Configurable settings include:

- **Port Priority** – The priority for the port within the CST.
- **Admin Edge Port** – Enable to force the interface to act as an edge port. An edge port is an interface that is directly connected to a host and is not at risk of causing a loop.
- **Port Path Cost** – The path cost from the port to the root bridge.
- **External Port Path Cost** – The cost of the path from the port to the CIST root. This value is important if the network includes multiple regions.
- **Port Mode** – Select whether STP should be enabled or disabled on the interface.
- **Auto Edge** – Enable to allow the interface to become an edge port if it does not receive any BPDUs within a given amount of time.
- **Root Guard** – Enable to allow the interface to discard any superior information it receives to protect the root of the device from changing by entering a discarding state, so it does not forward any frames.
- **Loop Guard** – Enable to prevent an interface from erroneously transitioning from blocking state to forwarding when the interface stops receiving BPDUs. The interface is marked as being in a loop-inconsistent state, which does not forward frames.
- **TCN Guard** – When enabled, TCN Guard restricts the interface from propagating any topology change information received through the interface.
- **BPDU Filter** – When enabled, BPDU traffic is filtered on the edge ports. Edge ports do not need to participate in the spanning tree, so BPDU filtering allows BPDU packets received on edge ports to be dropped.

Switch	MST	MST Port	CST	<u>CST Port</u>	Statistics			
Spanning Tree CST Port Summary								
Filter By <input type="text"/>					<input type="button" value="..."/>			
Interface	Name	Port Mode	Port Role	Port Forwarding State	Port Priority	Port Path Cost	Description	Options
1/0/1	Port 1	Enabled	Designated	Forwarding	128	20000		<input type="button" value="..."/>
1/0/2	Port 2	Enabled	Disabled	Disabled	128	0		<input type="button" value="..."/>
1/0/3	Port 3	Enabled	Disabled	Disabled	128	0		<input type="button" value="..."/>

Table field descriptions:

- **Interface** – The port number.
- **Name** – The name given to the port. Configurable on **Settings > Ports > General > Port Summary** page.
- **Port Mode** – The role of the port within the CST, which is one of the following:
 - **Root** – A port on the non-root bridge that has the least-cost path to the root bridge.
 - **Designated** – A port that has the least-cost path to the root bridge on its segment.
 - **Alternate** – A blocked port that has an alternate path to the root bridge.
 - **Backup** – A blocked port that has a redundant path to the same network segment as another port on the bridge.
 - **Master** – The port on a bridge within an MST instance that links the MST instance to other STP regions.
 - **Disabled** – The port is administratively disabled and is not part of the spanning.
- **Port Forwarding State** – How traffic is flowing through the port. States include:

- **Blocking** – Blocks the flow of traffic. When a device is first connected to a port, it enters the blocking state.
- **Learning** – The port is relaying information from a high-priority BPDU to the other ports on the switch.
- **Disabled** – Disables the port.
- **Err-disabled** – Allows STP to block the flow of traffic when it detects a loop, or forward traffic to a port if the connection changes.
- **Port Priority** – The port’s location in the network topology and how well it’s situated to pass traffic.
- **Port Path Cost** – The path cost from the interface to the CST regional root.
- **Description** – Whether the port is permitting or denying traffic.

Statistics

Use this page to view how many BPDUS have been transmitted and received on individual ports. Click the **Options** button, then **Refresh** to get the latest statistics.

Switch	MST	MST Port	CST	CST Port	Statistics				
Spanning Tree Statistics									
Filter By <input type="text"/>					OPTIONS				
Interface	Name	STP BPDUs Rx	STP BPDUs Tx	RSTP BPDUs Rx	RSTP BPDUs Tx	MSTP BPDUs Rx	MSTP BPDUs Tx	SSTP BPDUs Rx	SSTP BPDUs Tx
1/0/1	Port 1	0	0	0	0	0	1351126	0	0
1/0/2	Port 2	0	0	0	0	0	0	0	0
1/0/3	Port 3	0	0	0	0	0	0	0	0
1/0/4	Port 4	0	0	0	0	0	0	0	0

Unregistered Multicast Behavior

Configuration

Use this page to configure how the switch should handle unregistered multicast traffic.

Unregistered Multicast Action options include:

- **Drop** – The switch does not forward unregistered multicast packets to the interfaces.
- **Forward** – Unregistered multicast packets are forwarded to all active interfaces on the switch but not to the CPU, to reduce overhead.
- **Forward Including CPU** – Unregistered multicast packets are forwarded to all active interfaces on the switch and the CPU.

The screenshot shows a web interface with three tabs: "Configuration" (selected), "Exception Details", and "Interface Configuration". The main content area is titled "Unregistered Multicast Behavior Configuration". It features a section for "Unregistered Multicast Action" with a dropdown menu currently set to "Forward". Below this is a section for "Control Frames Exception Lists" containing a search box labeled "Filter By" and a table with columns for "Exception List Name" and "Action". An "OPTIONS" button is visible in the bottom right corner of the configuration area.

Exception Lists display the default ACL exception list available on the switch.

Exception Details

Use this page to configure which Multicast addresses and destination ports should be allowed to continue flooding while the Unregistered Multicast Behavior is set to **Drop**.

Use the **Exception List Name** dropdown to select the list you'd like to edit on the page.

Configuration **Exception Details** Interface Configuration

Unregistered Multicast Behavior Exception Details

Exception List Name

Deny IGMP any any ⓘ

Add permit IP any any ⓘ


Filter By

Seq. no Multicast Address Destination Port Action

OPTIONS

Configurable settings include:

- **Deny IGMP any any** – Deny every IGMP packet.
- **Add permit IP any any** – Add a permit any any rule at the latest sequence.

Click the **Options** () button to **Edit** the lists configured in the switch or **Refresh** the page.

Options include:

- **Seq. no** – The ACL rule number for each exception entry.
- **Multicast Address** – The multicast address allowed to flood.
- **Destination Port** – The optional destination port for traffic destined for the multicast address. This can be left blank to specify any port, a single port, or a range of ports using “-”.

Interface Configuration

Use this page to configure which Exception Lists are applied to each port.

Click the **Options** (...) button to **Edit** multiple ports at once or to **Refresh** the page.

Click the **Action** button to edit a single port at a time.

Edit Interface Configuration

Interface Configuration Selected: 1

Exception Lists ⓘ

Multicast Forwarding Database

Summary

Use this page for a summary of the multicast data collected by the switch. Click

Options, then **Refresh** to get the latest information.

Summary	IGMP Snooping	Group Address	Statistics		
<h4>Multicast Forwarding Database Summary</h4>					
Filter By <input type="text"/>			...		
			OPTIONS		
VLAN ID	MAC Address	Component	Type	Interface(s)	Forwarding Interface(s)
1	01:00:5e:7f:ff:fa	IGMP Snooping	Dynamic	0/1	0/1
2	01:00:5e:7f:ff:fa	IGMP Snooping	Dynamic	0/1	0/1

IGMP Snooping

Use this table to gather information about the IGMP snooping traffic collected by the switch.

Click **Options** (⋮), then **Refresh** to get the latest information or click **Clear** to reset the table.

Note: Not all multicast traffic is handled by IGMP snooping. Read [Understanding Spanning Tree Protocol \(STP\) & Best Practices for](#) more information.

Summary	IGMP Snooping	Group Address	Statistics
Multicast Forwarding Database IGMP Snooping Table			
Filter By <input type="text"/>		⋮ OPTIONS	
VLAN ID	MAC Address	Type	Interface(s)
1	01:00:5e:7f:ff:fa	Dynamic	0/1
2	01:00:5e:7f:ff:fa	Dynamic	0/1

Group Address

Use this table to see the multicast group addresses the switch has recorded. Click **Options** (⋮), then **Refresh** to get the latest information.

Summary	IGMP Snooping	Group Address	Statistics
IGMP Snooping Group Addresses			
Filter By <input type="text"/>		⋮ OPTIONS	
VLAN ID	Group Address	Interfaces List	
1	239.255.255.250	0/1	
2	239.255.255.250	0/1	

Statistics

Use this page to view multicast statistics the switch has gathered.

Summary	IGMP Snooping	Group Address	Statistics
Multicast Forwarding Database Statistics			
MFDB Max Table Entries:		1000	
MFDB Most Entries Since Last Reset:		0	
MFDB Current Entries:		2	

Loop Protection

Loop Protection detects loops in downstream switches that do not have spanning tree configured. When a loop-protected interface detects a loop, it can disable itself.

Caution: Do not use Loop Protection on uplink ports between switches with spanning tree enabled. Loop Protection is designed for unmanaged switches that drop spanning tree BPDUs.

Loop Protection Configuration

Loop Protection sends loop protection protocol data units (PDUs) to the multicast address 01:80:C2:00:00:08. When an interface receives a PDU, it compares the source MAC address with the switch's. If the MAC address matches a loop is detected and a configured action is taken. **Shutdown Port, Shutdown Port and Log, or Log Only.**

To configure Loop Protection:

1. **Enable** Loop Protection globally for the switch.
2. Enter a **Transmission Time** (in seconds) that the switch sends PDU packets on Loop Protected interfaces. The default is 5.
3. Enter an amount for the **Maximum PDU Received** that the interface can receive before taking the configured action. The default is 1.
4. Enter the **Shutdown Time** (in seconds) that the interface shuts down when a loop is detected. The default is 0.

Configuration

Loop Protection Configuration

Loop Protection i

Transmission Time (Seconds) i

Maximum PDU Received i

Shutdown Time (Seconds) i

- Click the **Action** (⋮) button for the interface you'd like to configure or use the **Options** button > **Edit** to select multiple interfaces to configure at once.

Note: You can quickly enable Loop Protection using the toggle in each row.

Interface	Name	Loop Protection	Action	Status	Loop	Loop Count	Time of Last Loop	Action
1/0/1	Port 1	<input type="checkbox"/>	Shutdown	Link Up		0	May 9 00:55:38 2023	⋮
			Port				America/Los_Angeles(UTC-7:00)	

- A new window appears with configurable options. Enable **Loop Protection** on the interface, then select an **Action** to take. **Shutdown Port**, **Shutdown Port and Log**, or **Log Only**. Then, click **Save**.

Edit Loop Protection Configuration ✕

Loop Protection Configuration Selected: 1

Loop Protection i

Action i

Shutdown Port ▼

7. The window closes and you return to the Loop Protection Configuration table. Click **Apply** at the top of the page.

The Loop Protection Configuration table gives an overview of what interfaces have Loop Protection enabled, how they're configured, and the **Time of Last Loop**.

Filter By 🔍								⋮
Interface	Name	Loop Protection	Action	Status	Loop	Loop Count	Time of Last Loop	OPTIONS
1/0/1	Port 1	<input type="checkbox"/>	Shutdown Port	Link Up		0	May 9 00:55:38 2023 America/Los_Angeles(UTC-7:00)	⋮
1/0/2	Port 2	<input checked="" type="checkbox"/>	Shutdown Port	Link Down		0	May 9 00:55:38 2023 America/Los_Angeles(UTC-7:00)	⋮
1/0/3	Port 3	<input checked="" type="checkbox"/>	Shutdown Port	Link Down		0	May 9 00:55:38 2023 America/Los_Angeles(UTC-7:00)	⋮

Table field descriptions:

- **Interface** – The switchport or LAG number.
- **Name** – The name configured for the switchport or LAG.
- **Loop Protection** – Displays if Loop Protection is enabled or disabled on the port. Click to toggle this setting.
- **Action** – The action taken when a loop is detected on the interface.
- **Status** – Displays if the interface link is up or down.

- **Loop** – Indicates if there is a loop currently detected. The field is blank when there is no loop detected.
- **Loop Count** – The number of loops that have been detected on the interface.
- **Time of Last Loop** – The date and time of the last loop detected on the interface.

Private VLAN

Private VLANs provide port-based security and isolation between ports within the assigned VLAN. Traffic on ports assigned to a private VLAN can only be forwarded to and from uplink ports.

Configuration

Click the **Options** (⋮) button to **Edit** multiple VLAN IDs at once or to **Refresh** the page.

Click the **Action** button to configure a single VLAN.

Configuration			Association	Interface
Private VLAN Configuration				
Filter By <input type="text"/>			⋮ OPTIONS	
VLAN ID	Type	Action		
2	Unconfigured	⋮		
3	Unconfigured	⋮		

A VLAN can be one of the following Types:

- **Unconfigured** – The VLAN is not configured as a private VLAN.
- **Primary** – A private VLAN that forwards the traffic from the promiscuous ports to isolated ports, community ports, and other promiscuous ports in the same private VLAN. Only one primary VLAN can be configured per private VLAN. All ports within a private VLAN share the same primary VLAN.
- **Isolated** – A secondary VLAN that carries traffic from isolated ports to promiscuous ports. Only one isolated VLAN can be configured per private VLAN.
- **Community** – A secondary VLAN that forwards traffic between ports that belong to the same community and to the promiscuous ports. Multiple community VLANs can be configured per private VLAN.

Association

Use the Association page to assign an Isolated or Community VLAN to a Primary VLAN.

Configuration		Association		Interface	
Private VLAN Association					
Filter By <input type="text"/>				OPTIONS <input type="button" value="⋮"/>	
VLAN ID	Isolated VLAN	Community VLAN		Action	
2	3			<input type="button" value="⋮"/>	

Click the **Options** () button to **Edit** multiple VLAN IDs at once or to **Refresh** the page.

Click the **Action** button to configure a single VLAN.

Edit Private VLAN Association

Private VLAN Association Selected: 1

VLAN ID

Isolated VLAN

Community VLAN

Interface

Use this page to configure the private VLAN mode for each interface.

Configuration														Association		Interface	
Private VLAN Interface																	
Filter By <input type="text"/>																...	
Interface	Mode	Host Primary VLAN	Host Secondary VLAN	Promiscuous Primary VLAN	Promiscuous Secondary VLAN	Promiscuous Trunk Primary VLAN	Promiscuous Trunk Secondary VLAN	Isolated Trunk Primary VLAN	Isolated Trunk Secondary VLAN	Trunk Native VLAN	Trunk Allowed VLANs	Operational Private VLAN	Action				
1/0/1	Promiscuous			2	3								...				
1/0/2	Isolated Trunk							2	3	2			...				

Click the **Options** (⋮) button to **Edit** multiple VLAN IDs at once or to **Refresh** the page.

Click the **Action** button to configure a single VLAN.

The interface(s) can be set to one of the following modes:

- **General** – The interface is not a member of a private VLAN.
- **Promiscuous** – The interface belongs to a primary VLAN and can communicate with all interfaces in the private VLAN, including other promiscuous ports, community ports, and isolated ports.
- **Isolated Trunk** – The interface also belongs to a primary VLAN. It carries traffic from isolated ports to promiscuous ports. Only one isolated VLAN can be configured per private VLAN. An isolated trunk port carries tagged traffic of multiple isolated VLANs and normal VLANs.
- **Promiscuous Trunk** – The interface belongs to a primary VLAN and can communicate with all interfaces in the private VLAN, including other promiscuous trunk ports, community ports, and isolated ports.
- **Host** – The interface belongs to a secondary VLAN and, depending upon the type of secondary VLAN, can either communicate with other ports in the same community (if the secondary VLAN is a community VLAN) and with the

promiscuous ports or is able to communicate only with the promiscuous ports (if the secondary VLAN is an isolated VLAN).

Neighbors

LLDP

Global

Use this page to configure global **Link Layer Discovery Protocol (LLDP)** settings for the switch. LLDP is a generic protocol used to advertise the device's capabilities to other devices on the network.

Global | Interface Summary | Local Devices | Remote Devices | Statistics

LLDP Global Configuration

Transmit Interval (Seconds) ⓘ
30

Transmit Hold Multiplier ⓘ
4

Re-Initialization Delay (Seconds) ⓘ
2

Notification Interval (Seconds) ⓘ
30

Configurable settings include:

- **Transmit Interval (Seconds)** – The number of seconds between LLDP transmissions.
- **Transmit Hold Multiplier** – Multiply the value entered with the Transmit interval to determine the Time to Live (TTL) value that the switch advertises.

The TTL value is the number of network hops that a packet can take before it's discarded by the router.

- **Re-Initialization Delay (Seconds)** – The number of seconds to wait before attempting to reinitialize LLDP on a port after the port's LLDP operating mode changes.
- **Notification Interval (Seconds)** – The minimum number of seconds to wait between transmissions of SNMP trap notifications on the switch.

Interface Summary

Use this page to configure LLDP settings on individual ports.

Interface	Name	Port ID Subtype	Link Status	Transmit	Receive	Notify	Optional TLV (s)	Transmit Management Information	Action
1/0/1	Port 1	MAC Address	Up	Enabled	Enabled	Disabled	0,1,2,3	Yes	...
1/0/2	Port 2	MAC Address	Down	Enabled	Enabled	Disabled	0,1,2,3	Yes	...
1/0/3	Port 3	MAC Address	Down	Enabled	Enabled	Disabled	0,1,2,3	Yes	...

To configure LLDP on a port(s):

1. Click the **Options** button to edit multiple ports, or the **Action** button to edit an individual port.
2. For **Port ID Subtype**, select if you'd like LLDP to advertise the port's **MAC address** or the **Interface Name**.
3. Enable or disable if the port can Transmit or Receive LLDP advertisements.
4. Toggle **Receive** on so the device can receive LLDPDUs from other devices.
5. Toggle **Notify** on for the interface to send SNMP notifications when a link partner device is added or removed.

6. Enable **Transmit Management Information** so other remote management devices on the network can locate the switch.
7. Select **Optional TLV(s)** for the switch to advertise.
8. Click **Save**, then **Apply** at the top of the page.

Edit LLDP Interface Configuration (Close icon)

LLDP Interface Configuration Selected: 1

Port ID Subtype ⓘ

MAC Address Interface Name **2**

Transmit ⓘ

3

Receive ⓘ

4

Notify ⓘ

5

Transmit Management Information ⓘ

6

Optional TLV(s) ⓘ **7**

0 - Port Description 1 - System Name
 2 - System Description 3 - System Capabilities

Cancel **8** Save

Local Devices

Use this page to gather LLDP information about the switchports.

Global	Interface Summary	Local Devices	Remote Devices	Statistics
LLDP Local Device Summary				
Filter By <input type="text"/>				⋮ OPTIONS
Interface	Name	Port ID	Action	
0/1	Port 1	14:3F:C3: [REDACTED]	⋮	
0/2	Port 2	14:3F:C3: [REDACTED]	⋮	

Click the **Actions** (⋮) button to get more information about the port.

Local Devices

Local Devices Selected: 1

Interface: 1/0/1
Name: Port 1
Chassis ID Subtype: MAC address
Chassis ID: [REDACTED]:D4
Port ID Subtype: MAC address
Port ID: [REDACTED]:D6
System Name: AN-920-SW-F-12-POE-[REDACTED]
System Description: Broadcom Helix5 56371 Development System - 12x10G + POEBT,VIM1:QSFP28(1x100G), 1.00.40.000000, Linux 4.14.138
System Capabilities Supported: bridge, router
System Capabilities Enabled: bridge
Management Address: 192.168.1.8
Management Address Type: IPv4

Close

Remote Devices

Use this page to view LLDP information collected by the device connected to the switch's port.

Global	Interface Summary	Local Devices	Remote Devices	Statistics		
LLDP Remote Device Summary						
Filter By <input type="text"/>						
... OPTIONS						
Interface	Name	Remote ID	Chassis ID	Port ID	System Name	Action
1/0/1	Port 1	1	...:3C	0/23	Pakedge-MS-...	...

Click the **Actions** button to get more information about the connected device.

Remote Devices

Remote Devices Selected: 1

Remote ID: 1

Chassis ID Subtype: MAC address

Chassis ID: ...:3C

Port ID Subtype: Interface name

Port ID: 0/23

System Name: Pakedge-MS-...

System Description: MS-2416 Gigabit Ethernet POE Switch(24 GE + 2 XE +16 POE), 1.03.0.100139, Linux 3.6.5

Port Description: 920 switch uplink

System Capabilities Supported: bridge, router

System Capabilities Enabled: bridge

Time To Live: 110

Close

Statistics

Use this page to view LLDP counts. Click **Options** (⋮), then **Refresh** to get the most up-to-date information. Click **Clear** to reset the table.

Global Interface Summary Local Devices Remote Devices **Statistics**

LLDP Statistics

Last Update: 0d:00:01:15
Total Inserts: 1
Total Deletes: 0
Total Drops: 0
Total Ageouts: 0

Filter By

⋮
OPTIONS

Interface	Name	Transmit Total	Receive Total	Discards	errors	Ageouts	TLV Discards	TLV Unknowns	TLV MED	TLV 802.1	TLV 802.3
1/0/1	Port 1	300	300	0	0	0	0	0	0	0	0
1/0/2	Port 2	0	0	0	0	0	0	0	0	0	0

LLDP-MED

Global

LLDP-MED is an extension of LLDP. MED stands for Media Endpoint Device and is typically used for voice over IP (VoIP).

Note: LLDP and LLDP-MED cannot operate simultaneously. If a device receives LLDP packets it cannot send LLDP-MED packets until it receives LLDP-MED packets. Likewise, for LLDP.

Use this page to enter a value for the **Fast Start Repeat Count**. This is the number of LLDP-MED Protocol Data Units (PDUs) that can be transmitted.

Click **Apply** to save changes.

Global	Interface Summary	Local Devices	Remote Devices
<h3>LLDP-MED Global Configuration</h3>			
Fast Start Repeat Count i			
<input type="text" value="3"/>			
Device Class: Network Connectivity			

Interface Summary

Use this page to configure LLDP-MED settings on individual ports.

Global	Interface Summary	Local Devices	Remote Devices				
LLDP-MED Interface Summary							
Filter By <input type="text"/>							...
							OPTIONS
Interface	Name	Link Status	MED Status	Notification Status	Transmit TLVs	Operational Status	Action
1/0/1	Port 1	Up	Enabled	Disabled	0,1	Disabled	...
1/0/2	Port 2	Down	Enabled	Disabled	0,1	Disabled	...

To configure LLDP-MED on a port(s):

1. Click the **Options** (⋮) button to edit multiple ports, or the **Action** button to edit an individual port.
2. Enable or disable **LLDP-MED** on the port.
3. Enable or disable **Notification Mode** to be notified of topology changes.
4. Select optional **Transmit TLVs** to advertise.

5. Click **Save**, then **Apply** at the top of the page.

Edit LLDP-MED Interface

LLDP-MED Interface Selected: 1

LLDP-MED Mode ⓘ

2

Notification Mode ⓘ

3




Transmit TLVs ⓘ


0 - Capabilities 1 - Network Policy 3 - Extended PSE 4

Cancel Save 5

Local Devices

Use this page to gather LLDP-MED information about the switchports.

Global	Interface Summary	Local Devices	Remote Devices
LLDP-MED Local Devices Summary			
Filter By <input type="text"/>			OPTIONS 
Interface	Port ID		Action
1/0/1	...:D6		
1/0/2	...:D7		

Click the **Actions** () button to get more information about the port.


LLDP-MED Local Devices Information

LLDP-MED Local Devices Information Selected: 1

Interface

1/0/1

Network Policy Information

Media Application Type	VLAN ID	Priority	DSCP	Unknown Bit Status	Tagged Bit Status
 No Data					

Extended PoE

Items	Value
Device Type	

Extended PoE PSE

Items	Value
Available	
Source	
Priority	

Remote Devices

Use this page to view LLDP-MED information collected by the device connected to the switch's port.

Global	Interface Summary	Local Devices	Remote Devices	
LLDP-MED Remote Devices Summary				
Filter By <input type="text"/>				
... OPTIONS				
Interface	Name	Remote ID	Device Class	Action
1/0/1	Port 1	1		...

Click the **Actions** (...) button to get more information about the port.

LLDP-MED Remote Device Information						
LLDP-MED Remote Device Information Selected: 1						
Interface						
<input type="text" value="1/0/1"/>						
Remote ID						
<input type="text" value="1"/>						
Capability Information						
Items Value						
Supported Capabilities						
Enabled Capabilities						
Device Class						
Network Policy Information						
Media	VLAN	Priority	DSCP	Unknown Bit	Tagged Bit	
Application	ID			Status	Status	
Type						
No Data						

Inventory Information	
Items	Value
Hardware Revision	
Firmware Revision	
Software Revision	
Serial Number	
Manufacturer Name	
Model Name	
Asset ID	
Location Information	
Sub-Type	Information
Coordinate Based	
Civic Address	
ELIN	
Extended POE	
Items	Value
Device Type	
Extended POE PD	
Items	Value
Required	
Source	
Priority	

MAC Address Table

Use the page to see which MAC addresses the switch has recorded traffic from on a port(s) and which VLAN they're a member of. Use the Options button to refresh the page, or to select how many rows to display.

Pro Tip: Use the **Filter By** field to search for MAC addresses.

VLAN ID	MAC Address	Interface	Name	Interface Index	Status
1	XXXXXXXXXX:DC	1/0/1	Port 1	1	Learned
1	XXXXXXXXXX:77	1/0/1	Port 1	1	Learned
1	XXXXXXXXXX:FD	1/0/1	Port 1	1	Learned
1	XXXXXXXXXX:46	1/0/1	Port 1	1	Learned
1	XXXXXXXXXX:D4	CPU Interface: 0/5/1	Port 385	385	Management

L2 ARP

This page displays the learned IP and MAC address of connected devices on each interface.

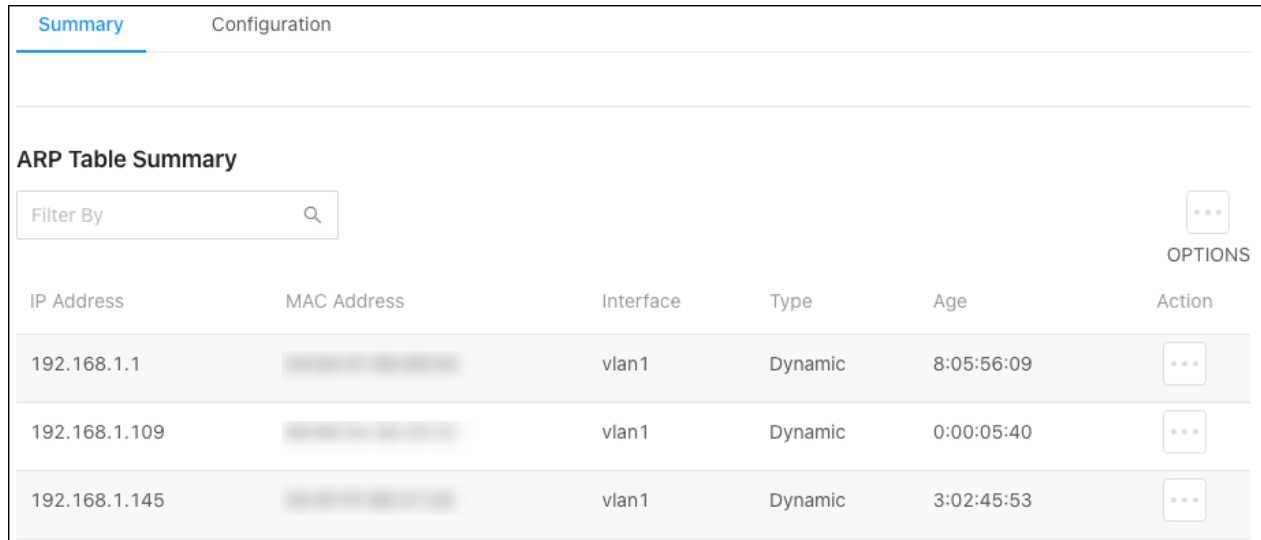
IP Address	MAC Address	Interface	Name
192.168.1.1	XXXXXXXXXX:46	1/0/1	Port 1

ARP Table

Summary

The ARP table displays MAC and IP address of devices that have communicated with the switch.

Use the **Options** (⋮) button to refresh the page or clear the table. Use the **Action** button to delete an individual entry.



IP Address	MAC Address	Interface	Type	Age	Action
192.168.1.1	██████████	vlan1	Dynamic	8:05:56:09	⋮
192.168.1.109	██████████	vlan1	Dynamic	0:00:05:40	⋮
192.168.1.145	██████████	vlan1	Dynamic	3:02:45:53	⋮

Table fields include:

- **IP Address** – The IP address of the device.
- **MAC Address** – The MAC address of the device.
- **Interface** - The VLAN ID associated with the device.
- **Type** – The type of IP address the device is broadcasting. Dynamic or static.

Note: Devices with MAC reservations appear as dynamic.

- **Age** – How long the switch has seen the connection to the device.
(Days:Hours:Minutes:Seconds)

Configuration

Use this page to configure the ARP Table's settings.

Summary [Configuration](#)

ARP Table Configuration

Age Time (Seconds) ⓘ

Response Time (Seconds) ⓘ

Retries ⓘ

Cache Size ⓘ

Dynamic Renew ⓘ

Configurable settings include:

- **Age Time (Seconds)** – The amount of time that a dynamic ARP entry remains in the ARP table before aging out.
- **Response Time (Seconds)** – The amount of time, that the device waits for an ARP response to an ARP request that it sends.
- **Retries** – The number of attempts the switch will send an ARP request if an ARP response isn't received. This number includes the initial ARP request.
- **Cache Size** – The maximum number of entries allowed in the ARP table. This number includes all static and dynamic ARP entries.

- **Dynamic Renew** – Enable to allow the switch to automatically renew dynamic ARP entries when they age out.

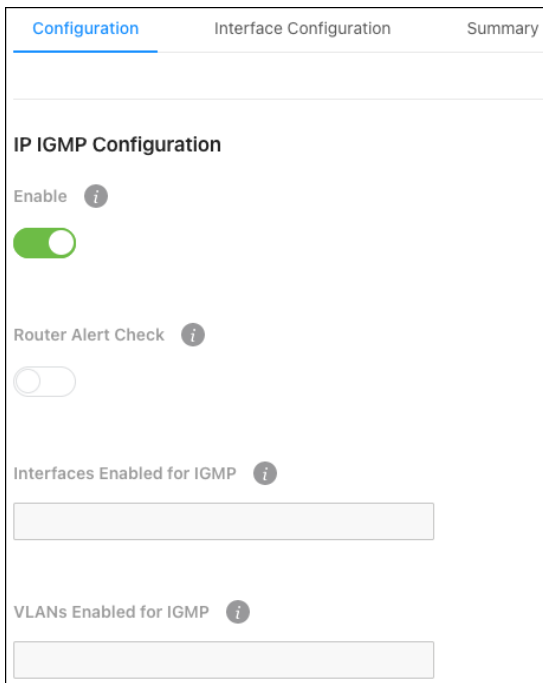
Routing

Araknis 920 switches support layer 3 routing to create routes between interfaces and PIM-SM (sparse mode) for multicast traffic.

IP IGMP Interface

Configuration

Use this page to enable IGMP routing.



The screenshot shows a web-based configuration page for IP IGMP. At the top, there are three tabs: 'Configuration' (selected), 'Interface Configuration', and 'Summary'. Below the tabs, the page is titled 'IP IGMP Configuration'. It features four main sections: 1. 'Enable' with a green toggle switch and an information icon. 2. 'Router Alert Check' with a grey toggle switch and an information icon. 3. 'Interfaces Enabled for IGMP' with a text input field and an information icon. 4. 'VLANs Enabled for IGMP' with a text input field and an information icon.

Configurable options include:

- **Enable** – Enables IGMP on the device.
- **Router Alert Check** – Enable for the switch to inspect packets when they are being forwarded, even though the packet is not directly addressed to this switch.
- **Interfaces Enabled for IGMP** – Displays the interfaces with IGMP administratively enabled.
- **VLANs Enabled for IGMP** – Displays the VLANs with IGMP administratively enabled.

Interface Configuration

Use this page to configure IGMP on a per-interface level.

Click the **Options** (⋮) button to edit multiple interfaces at once, or the **Action** button to edit a single interface. There's also a toggle to quickly enable or disable the IGMP settings on the interface.

Configuration		Interface Configuration												Summary	
IP IGMP Interface Configuration															
Filter By <input type="text"/>															
															⋮
Enable	Interface	Name	IP Address	Subnet Mask	Version	Query Interval	Max Response Time	Robustness	Startup Query Interval	Startup Query Count	Last Member Query Count	Last Member Query Interval	Operational Status	Action	
<input type="checkbox"/>	1/0/1	Port 1	0.0.0.0	0.0.0.0	3	125	100	2	31	2	2	10	Non-Operational	⋮	
<input type="checkbox"/>	1/0/2	Port 2	0.0.0.0	0.0.0.0	3	125	100	2	31	2	2	10	Non-Operational	⋮	

Configurable options include:

- **Enable** – Enables the administrative IGMP settings on the interface.
- **Version** – Select the IGMP version being used.
- **Query Interval** – Enter the amount of time the IGMP snooping querier on the device should wait between sending periodic IGMP queries.
- **Max Response Time** – Enter the number of seconds the interface should wait after sending a query if it does not receive a report for a particular group. The value should be less than the Group Membership Interval.
- **Robustness** – Enter the number of times an IGMP query should be sent in case of packet loss. A higher value increases the timeout time for multicast groups.
- **Startup Query Interval** – Enter an interval for the IGMP querier to send general inquiries at startup.
- **Startup Query Count** – Enter the number of queries to send at startup.

- **Last Member Query Count** – For IGMPv2, this is the number of group-specific queries a querier sends after receiving a leave message. For IGMPv3, this is the number of group-and-source-specific queries that a querier sends after receiving a report that changes multicast source and group mappings.
- **Last Member Query Interval** – For IGMPv2, this is the interval a querier sends group-specific queries after receiving a leave message. For IGMPv3, this is the interval a querier sends group-and-source-specific queries after receiving a report that changes multicast source and group mappings.

Summary

This page displays a summary of the IGMP settings configured on each interface. Use the **Options** (⋮) button to refresh the table.

Configuration		Interface Configuration		Summary					
IP IGMP Summary									
Filter By <input type="text"/>									⋮
Interface	Name	Mcast IP Address	Last Reporter	Up Time	Expiry Time	Version1 Host Timer	Version2 Host Timer	Group Compatible Mode	Options Querier

IP Multicast

Configuration

Use this page to administratively enable IP multicast routing globally.

[Configuration](#) [PIM Configuration](#) [Candidate Bootstrap Router](#) [Candidate RP Configuration](#)

IP Multicast Configuration

Enable i

Protocol: UNASSIGNED

Multicast Forwarding Cache Entry Count: 0

Table Max Size: 8

Protocol State: Non-Operational

PIM Configuration

Use this page to administratively enable **Protocol Independent Multicast (PIM)** globally.

[Configuration](#) [PIM Configuration](#) [Candidate Bootstrap Router](#) [Candidate RP Configuration](#) [Static RP Configuration](#) [Source Specific Multicast Configuration](#)

IP Multicast PIM Configuration

PIM SM Mode i

Interface	Name	Interface Mode	Operational Status
1/0/5	Port 5	Disabled	Non-Operational

Candidate Bootstrap Router

Use this page to configure the **Bootstrap Router (BSR)**.

Configuration PIM Configuration Candidate Bootstrap Router

IP Multicast Candidate Bootstrap Router

Interface ⓘ

1/0/5 ▾

Hash Mask ⓘ

BSR Priority ⓘ

0

C-BSR Adv. Interval ⓘ

60

Configurable settings include:

- **Interface** – Select the interface to configure.
- **Hash Mask** – Specify the hash mask length to use in BSR messages.
- **BSR Priority** – Specify the BSR priority to use in BSR messages.
- **C-BSR Adv. Interval** – Enter the BSR message transmission interval in seconds.

Candidate RP Configuration

Use this page to configure a **Candidate RP (Rendezvous Point)**. Select an **Interface** from the dropdown, then click **Options** (⋮), then **Add** to configure an RP.

The screenshot shows the 'Candidate RP Configuration' page. At the top, there is a navigation bar with tabs: Configuration, PIM Configuration, Candidate Bootstrap Router, Candidate RP Configuration (selected), Static RP Configuration, Source Specific Multicast Configuration, and Interface Configuration. Below the navigation bar, the page title is 'IP Multicast Candidate RP Configuration'. There is an 'Interface' dropdown menu with '1/0/5' selected. Below that is a 'Filter By' search box. At the bottom, there are four columns: 'Group Address', 'Group Mask', 'C-RP Adv. Interval', and 'Action'. An 'OPTIONS' button (⋮) is located on the right side of the page.

Settings include:

- **Group Address** — Enter the IP address of router interface.
- **Group Mask** — Enter the subnet mask for the router interface.
- **C-RP Adv. Interval** — Enter the BSR message transmission interval in seconds.

Static RP Configuration

Use this page to configure a **Static RP (Rendezvous Point)**. Click **Options** (⋮), then **Add** to configure an RP.

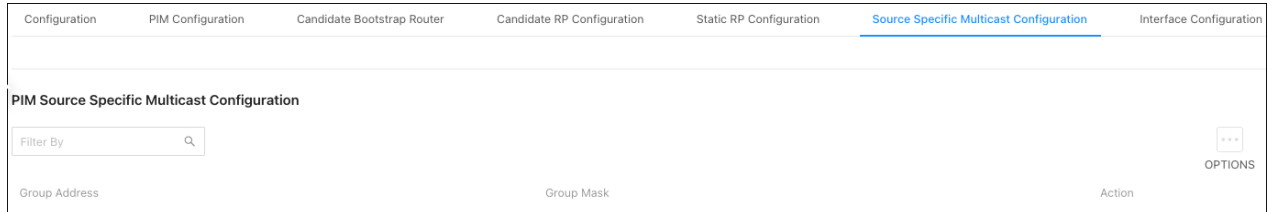
The screenshot shows the 'Static RP Configuration' page. At the top, there is a navigation bar with tabs: Configuration, PIM Configuration, Candidate Bootstrap Router, Candidate RP Configuration, Static RP Configuration (selected), Source Specific Multicast Configuration, and Interface Configuration. Below the navigation bar, the page title is 'IP Multicast static RP Configuration'. There is a 'Filter By' search box. At the bottom, there are five columns: 'RP Address', 'Group Address', 'Group Mask', 'Override', and 'Action'. An 'OPTIONS' button (⋮) is located on the right side of the page.

Settings include:

- **RR Address** — Enter the IP address of the router acting as the RP for a group range.
- **Group Address** — Enter the IP address of the router interface.
- **Group Mask** — Enter the subnet mask of the router interface.
- **Override** — Enable to allow the static RP to take precedence over auto-RP for the group range.

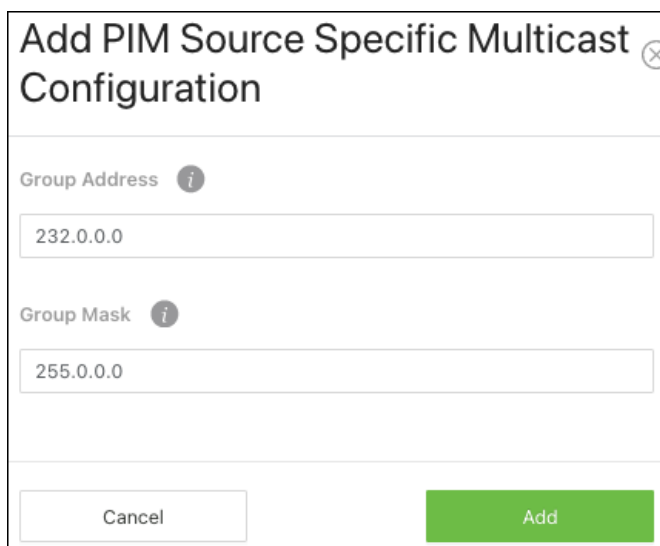
Source Specific Multicast Configuration

Use this page to configure a **PIM Source Specific Multicast Group**. Click **Options** , then **Add** to configure a group.



The screenshot shows a navigation bar with tabs: Configuration, PIM Configuration, Candidate Bootstrap Router, Candidate RP Configuration, Static RP Configuration, Source Specific Multicast Configuration (active), and Interface Configuration. Below the navigation bar is a section titled "PIM Source Specific Multicast Configuration". It features a "Filter By" search box with a magnifying glass icon. Below the search box is a table with columns for "Group Address", "Group Mask", and "Action". An "OPTIONS" button with a three-dot menu icon is located to the right of the table.

The new window asks for a **Group Address** and **Group Mask**.



The dialog box is titled "Add PIM Source Specific Multicast Configuration" and has a close button (X) in the top right corner. It contains two input fields: "Group Address" with a value of "232.0.0.0" and "Group Mask" with a value of "255.0.0.0". Both fields have an information icon (i) to their right. At the bottom of the dialog, there are two buttons: "Cancel" and "Add".

Interface Configuration

Use this page to configure multicast on a per-interface level.

Click the **Options** (⋮) button to edit multiple interfaces at once, or the **Action** button to edit a single interface. There's also a toggle to quickly enable or disable the IGMP settings on the interface.

Configuration	PIM Configuration	Candidate Bootstrap Router	Candidate RP Configuration	Static RP Configuration	Source Specific Multicast Configuration	Interface Configuration			
IP Multicast Interface Configuration									
Filter By <input type="text"/>									
Enable	Interface	Name	Operational Status	DR Priority	Hello Interval	Join Prune Interval	BSR Border	Designated Router	OPTIONS Action
<input type="checkbox"/>	1/0/1	Port 1	Non-Operational	1	30	60	Disabled		⋮
<input type="checkbox"/>	1/0/2	Port 2	Non-Operational	1	30	60	Disabled		⋮

Configurable options include:

- **Enable** — Enables the PIM on the interface.
- **BSR Border** — Enable to prevent BSR messages from being sent or received through the interface.
- **DR Priority** — Enter a **Designated Router (DR)** priority for the interface. The interface with the highest priority is elected DR.
- **Hello Interval** — Enter the frequency that PIM hello messages are sent on the interface in seconds.
- **Join Prune Interval** — Enter a Join/Prune Interval for the specified interface.

IP Multicast Information

Elected Bootstrap Router

This page displays information about the elected Bootstrap Router (BSR).

The screenshot shows a web interface with three tabs: "Elected Bootstrap Router" (selected), "RP Mapping", and "Multicast Route Table". Below the tabs is a section titled "IP Multicast Information Elected Bootstrap Router". It contains three input fields, each with an information icon (i) to its right: "BSR Address", "Hash Mask", and "Priority".

RP Mapping

This page displays information about the RP (Rendezvous Points) on the switch. Use the **Options** (⋮) button to refresh the page.

The screenshot shows a web interface with three tabs: "Elected Bootstrap Router", "RP Mapping" (selected), and "Multicast Route Table". Below the tabs is a section titled "IP Multicast Information RP Mapping". It features a "Filter By" search box with a magnifying glass icon. To the right of the search box is an "OPTIONS" button with a three-dot menu icon (⋮).

RP Address	Group Address	Group Mask	Origin	Expiry Time
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Multicast Route Table

This page displays information about the multicast routes on the switch. Use the **Options** (⋮) button to refresh the page.

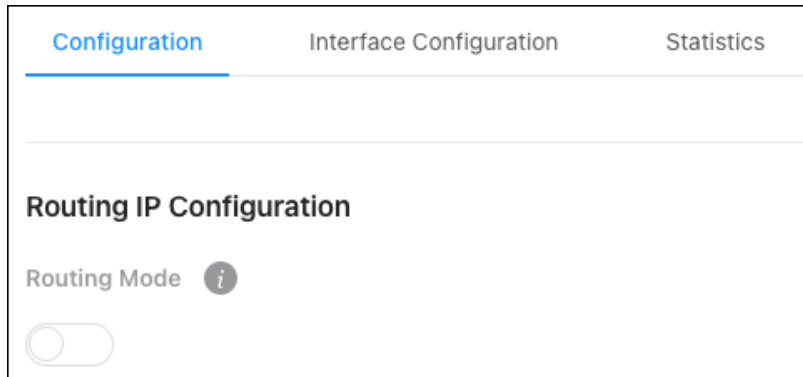
The screenshot shows a web interface with three tabs: "Elected Bootstrap Router", "RP Mapping", and "Multicast Route Table" (selected). Below the tabs is a section titled "IP Multicast Information Multicast Route Table". It features a "Filter By" search box with a magnifying glass icon. To the right of the search box is an "OPTIONS" button with a three-dot menu icon (⋮).

Source IP	Group Address	Protocol	Incoming Interface	Outgoing Interfaces
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Router

Configuration

Use this page to enable or disable the routing feature of the switch.



Configurable settings include:

- **Routing Mode** – Enable for the switch to act as a Layer 3 device by routing packets between interfaces configured for IP routing.
- **ICMP Echo Replies** – Enable to allow the device to send ICMP Echo Reply messages in response to ICMP Echo Request (ping) messages it receives.
- **ICMP Redirects** – Enable to allow the device to send ICMP Redirect messages to hosts. An ICMP Redirect message notifies a host when a better route to a particular destination is available on the network segment.
- **ICMP Rate Limit Interval** – Enter the maximum burst interval for ICMP error messages transmitted by the switch. The rate limit for ICMP error messages is configured as a token bucket. The ICMP Rate Limit Interval specifies how often the token bucket is initialized with tokens of the size configured in the ICMP Rate Limit Burst Size field.
- **ICMP Rate Limit Burst Size** – Enter the number of ICMP error messages that can be sent during the burst interval configured in the ICMP Rate Limit Interval field.

- **Static Route Preference** – The default distance (preference) for static routes. Lower route-distance values are preferred when determining the best route. This value is used when using the CLI to configure a static route and no preference is specified. Changing the Static Route Preference does not update the preference of existing static routes.
- **Global Default Gateway** – The gateway IP address that the switch uses. If the destination IP address in a packet does not match any routes in the routing table, the packet is sent to the default gateway. The gateway specified in this field is preferable to a default gateway learned from a DHCP server.

Interface Configuration

Use this page to enable and configure routing on specific interfaces. Each interface is disabled by default.

Use the **Options** (⋮) button to add a VLAN, or the **Action** button in an interface row to configure routing features.

Each row has a toggle to quickly enable or disable the interface.

Configuration		Interface Configuration		Statistics							
Port/VLAN IP Interface Configuration											
Filter By <input type="text"/>											⋮ OPTIONS
Enable	Routing Mode	Interface	Name	IP Address	Subnet Mask	MAC Address	Status	State	IP MTU	Action	
<input checked="" type="checkbox"/>	Disabled	1/0/1	Port 1	0.0.0.0	0.0.0.0	14:3F:C3:00:20:D6	Down	active	1500	⋮	
<input checked="" type="checkbox"/>	Disabled	1/0/2	Port 2	0.0.0.0	0.0.0.0	14:3F:C3:00:20:D7	Down	inactive	1500	⋮	

Configurable options include:

- **Type** – The type of interface being configured.
- **Interface** – The type of interface being configured. VLAN or Interface (port).
- **Routing Mode** – Enable to use the routing feature on the interface.
- **Enable** – Enables the port to forward traffic.
- **IP Address Configuration Method** – Select the method that the interfaces obtain an IP Address. Options include:
 - **None** – The interface does not receive an IP address.
 - **Manual** – Select this option to use the fields below to configure the interface's IP address and subnet mask.
 - **DHCP** – The interface automatically obtains an IP address from the DHCP server.

- **DHCP Client Identifier** – Also known as Option 61, is used by DHCP clients to specify their unique identifier. DHCP servers use this value to index their database of address bindings. This value is expected to be unique for all clients in an administrative domain. The Client Identifier string is displayed beside the check box when DHCP is enabled on the port with the Client Identifier option enabled. This web page must be refreshed once this change is made.
- **IP Address** – Only available when the interface IP Address Configuration Method is set to Manual.
- **Subnet Mask** – Only available when the interface IP Address Configuration Method is set to Manual.
- **IP MTU** – Enter the largest IP packet size the interface can transmit, in bytes. The Maximum Transmission Unit (MTU) is the maximum frame size minus the length of the Layer 2 header.
- **Bandwidth** – Configure the bandwidth on the interface. This setting communicates the speed of the interface to higher-level protocols.
- **Encapsulation Type** – The link layer encapsulation type for packets transmitted from the interface. **Ethernet** is the only option.
- **Forward Net Directed Broadcasts** – Enable to forward network-directed broadcasts. If this option is clear, network-directed broadcasts are dropped. A network-directed broadcast is a broadcast directed to a specific subnet.
- **Destination Unreachables** – When enabled, the interface is allowed to send ICMP Destination Unreachable message to a host if the intended destination cannot be reached. If this option is clear, the interface does not send ICMP Destination Unreachable messages.
- **ICMP Redirects** – When enabled, the interface is allowed to send ICMP Redirect messages to notify a host when a better route to a particular destination is available on the network segment. ICMP Redirects must be enabled both globally, and on the interface, to work.

- **Proxy ARP** – Enable for the interface to be able to respond to an ARP request for a host other than itself. An interface can act as an ARP proxy if it is aware of the destination and can route packets to the intended host, which is on a different subnet than the host that sent the ARP request.
- **Local Proxy ARP** – When enabled, the interface can respond to an ARP request for a host other than itself. Unlike proxy ARP, local proxy ARP allows the interface to respond to ARP requests for a host that is on the same subnet as the host that sent the ARP request. This is useful when a host is not permitted to reply to an ARP request from another host in the same subnet, like when using the protected ports feature.

Statistics

This page displays IP traffic counters.

IP Routing

Route Table

This table displays information about routes on the switch. Use the **Options** (⋮) button to refresh the table.

The screenshot shows a web interface for the Route Table. At the top, there are three tabs: "Route Table" (selected), "Configured Routes", and "IP Route Summary". Below the tabs is a "Route Table Summary" section. It features a "Filter By" search box with a magnifying glass icon. To the right of the search box is an "OPTIONS" button with a three-dot menu icon. Below these elements is a table with the following columns: "Network Address", "Subnet Mask", "Protocol", "Next Hop IP Address", "Next Hop Interface", and "Best Route".

Configured Routes

Use this page to view and configure routes on the switch. Click the **Options** (⋮) button to add a new route.

Route Table	Configured Routes	IP Route Summary			
<p>Configured Routes Summary</p> <p>Filter By <input type="text"/> <input type="button" value="Q"/></p> <p style="text-align: right;"><input type="button" value="..."/> OPTIONS</p>					
Network Address	Subnet Mask	Next Hop IP Address	Next Hop Interface	Preference	Action

Configurable settings include:

- **Route Type** – Select one of the following routes to configure:
 - **Default** – The route the device uses to send a packet if the routing table does not contain a longer matching prefix for the packet's destination. The routing table can contain only one default route.
 - **Static** – A manually added route.
 - **Static Reject** – A route where packets that match the route are discarded instead of forwarded. The device might send an ICMP Destination Unreachable message.
- **Network Address** – Enter the IP route prefix for the destination network. This IP address must contain only the network portion of the address and not the host bits. When adding a default route, this field must be 0.0.0.0.
- **Subnet Mask** – Enter the IP subnet mask (also known as the network mask or netmask) associated with the network address. The subnet mask defines which portion of an IP address belongs to the network prefix, and which portion belongs to the host identifier. When adding a default route, this field must be 0.0.0.0.
- **Next Hop IP Address** – Enter the outgoing router IP address to use when forwarding traffic to the next router (if any) in the path toward the destination. The next router is always an adjacent neighbor or the IP address of the local interface for a directly attached network. When adding a static reject route, this field must be 0.0.0.0 because the packets are dropped rather than forwarded.

- **Preference** – Enter a preference value for the route. A lower preference value is a more preferred route. When the routing table has more than one route to the same network, the device selects the route with the lowest route preference.

IP Route Summary

This page displays a summary of the IP routes and route table counters the switch has collected.

Route Table	Configured Routes	IP Route Summary
IP Route Summary		
Route Types		
Connected Routes:	0	
Static Routes:	0	
OSPF Routes:	0	
OSPF Intra Area Routes:	0	
OSPF Inter Area Routes:	0	
OSPF External Type-1 Routes:	0	
OSPF External Type-2 Routes:	0	
Total Routes:	0	
Route Table Counters		
Best Routes (High):	0 (0)	
Alternate Routes:	0	
Route Adds:	0	
Route Modifies:	0	
Route Deletes:	0	
Unresolved Route Adds:	0	
Invalid Route Adds:	0	
Failed Route Adds:	0	
Reserved Locals:	0	
Unique Next Hops (High):	0 (0)	

QoS

Class of Service

Class of Service (CoS) allows you to directly configure certain aspects of switch queuing, which allows you to configure Quality of Service (QoS) behavior when the complexities of DiffServ aren't required. The priority of a packet arriving at an interface

can be steered to the appropriate outbound CoS queue through a mapping table. The CoS queue characteristics, such as minimum guaranteed bandwidth and transmission rate shaping, are configurable at the queue or port level.

IP DSCP

Use the IP DSCP Mapping Table to map an **IP DSCP value** to a **Traffic Class**.

IP DSCP	Traffic Class	Action
0	1	...
1	1	...

Click the **Action** (⋮) button to assign individual IP DSCP values to a Traffic Class, or the **Options** button to assign multiple IP DSCP values to the same Traffic Class.

Click **Apply**, at the top of the page, when done.

Interface

Use the table to apply an interface shaping rate to individual interfaces or to all at once.

Interface	Name	Trust Mode	Shaping Rate	Action
1/0/1	Port 1	Trust dot1p	0	...
1/0/2	Port 2	Trust dot1p	0	...

Click the **Action** (⋮) button to edit individual interfaces, or the **Options** button to edit multiple interfaces at once.

Configurable settings include:

- **Trust Mode** – Select the **Trust Mode** for ingress traffic on the interface. The options are:
 - **Untrusted** – The interface ignores all priority designations in incoming packets and sends them to a traffic queue based on the ingress port’s default priority.
 - **Trust dot1p** – The port accepts the designated 802.1p priority encoded in the arriving packets.
 - **Trust IP – DSCP**: The port accepts the designated IP DSCP priority encoded in the arriving packets.
- **Shaping Rate** – The maximum amount of traffic that can leave an interface. The specified value is a percentage of the maximum negotiated bandwidth.

Queue

Use this page to designate what a queue does by configuring switch egress queues. Configurable queue parameters include bandwidth allocations and the scheduling of packet transmissions from the set of all queues on a port.

The **Total Minimum Bandwidth Allocation** is displayed as a percentage at the top of the page.

Use the **Restore Default** toggle or click **Options** (⋮), then **Refresh** to clear all configurations.

The screenshot shows the 'CoS Interface Queue Configuration' page. At the top, the 'Interface' is set to '1/0/3'. Below it, the 'Total Minimum Bandwidth Allocation (%)' is shown as '0'. There is a 'Restore Default' toggle switch which is currently off. A 'Filter By' search box is present. On the right side, there is an 'OPTIONS' menu icon (⋮). Below these elements is a table with the following data:

Queue ID	Minimum Bandwidth	Scheduler Type	Queue Management Type	Action
0	0	Weighted	Taildrop	⋮
1	0	Weighted	Taildrop	⋮

To configure CoS interface queues:

1. Select an **Interface**. This can be an individual switchport or LAG.

This screenshot shows the 'CoS Interface Queue Configuration' page with the 'Interface' dropdown menu open. The dropdown menu lists the following options: 'All', '1/0/1', '1/0/2', '1/0/3', '1/0/4', '1/0/5', '1/0/6', and '1/0/7'. The 'All' option is highlighted in blue.

2. Select an individual **Queue ID** by clicking the **Action** (⋮) button in the corresponding row or click the **Options** button to select multiple Queue IDs to configure.
3. Enter a **Minimum Bandwidth** to allocate to the queue. Setting this value higher than the maximum bandwidth automatically increases the maximum to the same value. A value of zero means there is no guaranteed minimum.

Note: The sum of individual **Minimum Bandwidth** values for all queues in the selected interface cannot exceed 100.

4. Select one of the following options for **Scheduler Type**:
 - **Weighted** – Weighted round robin associates a weight to each queue.
 - **Strict** – Services traffic with the queue's highest priority first.
5. Select one of the following **Queue Management Types**:
 - **Taildrop** – All packets on a queue are safe until congestion occurs. At this point, any additional packets queued are dropped.
 - **WRED** – Weighted Random Early Detection (WRED) drops packets selectively

based their drop precedence level.

The screenshot shows a dialog box titled "Edit CoS Interface Queue Configuration". It contains the following fields and controls:

- CoS Interface Queue Configuration Selected: 1**
- Queue ID**: Input field with value "0".
- Minimum Bandwidth**: Input field with value "0".
- Scheduler Type**: Dropdown menu with value "Weighted".
- Queue Management Type**: Dropdown menu with value "Taildrop".
- Buttons**: "Cancel" and "Save" buttons.

Red circles with numbers 3, 4, 5, and 6 are overlaid on the Minimum Bandwidth, Scheduler Type, Queue Management Type, and Save button respectively.

6. Click **Save** and when the window closes, click the **Apply** button to save changes.

ACL Rules

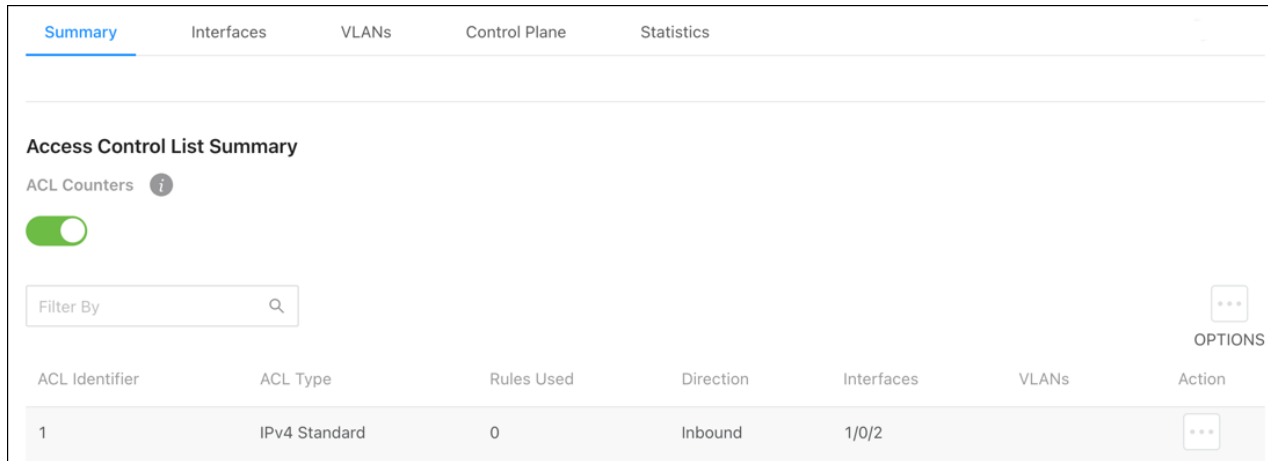
Access Control Lists (ACLs) make sure that only authorized users have access to specific resources and block unwanted attempts by filtering packets based on rules. ACLs are used to control traffic flow, restrict the contents of routing updates, decide which types of traffic to block or forward, and provide network security. Pagedge MS switches support IPv4 and MAC ACLs.

To create an ACL, you must:

1. Create an **ACL rule** with an **identifier** (ACL ID) on the Summary page.
2. Define the ACL rule.
3. Assign the ACL ID to a switch port or VLAN interface.

Summary

Use this page to configure **Access Command List (ACL)** Rules and enable **ACL Counters**.



The screenshot shows the 'Access Control List Summary' page. At the top, there are tabs for 'Summary', 'Interfaces', 'VLANs', 'Control Plane', and 'Statistics'. Below the tabs, the 'Access Control List Summary' section is visible. It includes a toggle for 'ACL Counters' which is currently turned on. There is a 'Filter By' search box. Below this is a table with the following columns: 'ACL Identifier', 'ACL Type', 'Rules Used', 'Direction', 'Interfaces', 'VLANs', and 'Action'. The table contains one row with the following data: '1', 'IPv4 Standard', '0', 'Inbound', '1/0/2', and an 'Action' button (represented by three dots).

ACL Identifier	ACL Type	Rules Used	Direction	Interfaces	VLANs	Action
1	IPv4 Standard	0	Inbound	1/0/2		...

To add an ACL rule:

1. Click **Options** (...), then **Add**.
2. Select an **ACL Type**:
 - **IPv4 Standard** – Match criteria is based on the source address of IPv4 packets.
 - **IPv4 Extended** – Match criteria can be based on the source and destination addresses, source and destination Layer 4 ports, and protocol type of IPv4 packets. The ACL identifier can be an alphanumeric name instead of a number, known as IPv4 Named in other switches.
 - **IPv6 Named** – Match criteria can be based on information including the source and destination IPv6 addresses, source and destination Layer 4 ports, and protocol type within IPv6 packets.
 - **Extended MAC** – Match criteria can be based on the source and destination MAC addresses, 802.1p user priority, VLAN ID, and EtherType value within Ethernet frames.

3. Enter a number for the **ACL Identifier**.
4. Click **Add**, then **Apply** at the top of the page.

Interfaces

Use this page to add an ACL rule to an interface (port).

Interface	Name	Direction	Sequence Number	ACL Type	ACL Identifier	Action
1/0/2	Port 2	Inbound	1	IPv4 Standard	1	...

To add an ACL rule to a port:

1. Click **Options** (...), then **Add**.
2. Select the **Interface** (port) to apply the ACL rule to.
3. Select a **Direction** for the packets to be checked against. If the packets should be checked against the ACL rules when the port(s) receives it, select **Inbound**. Select **Outbound** if the packets should be checked when the packets are exiting the port (s).

4. Enter a **Sequence Number** between 1 to 4294967295. Typing 0 auto-generates a sequence number. The order the ACL is applied to traffic on the interface relative to other ACLs associated with the interface in the same direction. When multiple ACLs are applied to the same interface in the same direction, the ACL with the lowest sequence number is applied first, and the other ACLs are applied in ascending numerical order.
5. Select the **ACL Identifier** of the ACL rule to apply to the port(s).
6. Click **Add**, then **Apply** at the top of the page.

Add ACL Interface Configuration ⊗

Interface i 2

Direction i 3

Inbound Outbound

Sequence Number i 4

ACL Identifier i 5

6

VLANs

Use this page to associate one or more ACLs with one or more VLANs configured on the switch.

VLAN ID	Direction	Sequence Number	ACL Type	ACL Identifier	Action
3	Outbound	0			

To Apply an ACL to a VLAN:

1. Click the **Options** (⋮) button, then **Add**.
2. Select the **VLAN ID** or **VLAN ID range** to apply the ACL rule to.
3. Select a **Direction** for the packets to be checked against. If the packets should be checked against the ACL rules when the port(s) receives it, select **Inbound**. Select **Outbound** if the packets should be checked when the packets are exiting the port (s).
4. Enter a **Sequence Number** between 1 to 4294967295. Typing 0 auto-generates a sequence number. The order the ACL is applied to traffic on the interface relative to other ACLs associated with the interface in the same direction. When multiple ACLs are applied to the same interface in the same direction, the ACL with the lowest sequence number is applied first, and the other ACLs are applied in ascending numerical order.
5. Select the **ACL Identifier** of the ACL rule to apply to the port(s).
6. Click **Add**, then **Apply** at the top of the page.

Control Plane

Use this page to assign Sequence Numbers to ACLs.

To assign a Sequence Number to an ACL:

1. Click **Options** (⋮), then **Add** to add open a new Control Plane window.
2. Enter a **Sequence Number** between 1 and 4294967295 to indicate the position of the rule in the ACL. Type in 0 to auto-generate a sequence number.
3. Select an **ACL Identifier** to apply the **Sequence Number** to.

After a Control Plane has been added you can use the **Action** button to edit or delete an entry from the table.

Statistics

Use this page to view how many packets an ACL has forwarded or discarded until the number reaches the rollover value of the counter. ACL counters do not interact with DiffServ policies or policy-based routing counters.

To Clear the Counters:

1. Click the **Options** (⋮) button, then **Clear**.

2. Select a **Clear Counter Mode**.

If **Rule** counter is selected, ACL Identifier and Sequence Number must be provided.

If clear **ACL** counter is selected, the user can provide ACL Type to clear the hit count of all ACLs in that type or provide an ACL Identifier to clear the hit count of that ACL.

3. Click **OK**.

Sequence Number	Perform Action	Match Conditions	Rule Attributes	Hit Count
10	Permit	Match all: False Protocol: UDP Destination L4 Port: 9998 Destination IP: 239.254.3.3 Destination Mask: 0.0.0.0		0
20	Permit	Match all: False Protocol: UDP Destination IP: 239.255.255.250 Destination Mask: 0.0.0.0		1412926

Table field descriptions:

- **Sequence Number** – The number that indicates the rule position within the ACL.
- **Perform Action** – Whether the rule permits or denies traffic.
- **Match Conditions** – The criteria used to determine if the network traffic matches the ACL rule.

- **Rule Attributes** – Each action the ACL rule performs.
- **Hit Count** – The number of packets that match the ACL rule.
If a rule does not have a rate limit, the hit count is the number of matched packets the port forwarded or discarded.

If a rule has a rate limit, and the sent traffic exceeds the configured rate, the hit count displays the matched packet count equal to the sent rate.

If the sent traffic rate is less than the configured rate, the hit count displays only the matched packet count.

ACL Configuration

IPv4 Standard

Use this page to configure IPv4 Standard ACLs. Select an ACL Identifier from the dropdown, then click the **Options** (⋮) button to edit or **Resequence** multiple ACLs or the **Actions** button to edit a single ACL.

Configurable settings include:

- **Perform Action** – The action to take when a packet or frame matches the criteria in the rule:
 - **Permit** – The packet or frame is forwarded.
 - **Deny** – The packet or frame is dropped.
- **Remark** – Accepts alpha-numeric and special characters (-, _, and space) and is also case-sensitive. It can have 1 to 100 characters.

- **Every** – When selected, all packets will match the rule and are either permitted or denied. This option is exclusive to all other match criteria and no other match criteria can be configured. To configure specific match criteria, do not enable Every.
- **Source IP Address** – The source port IP address in the packet and source IP wildcard mask (in the next field) to compare to the IP address in a packet header.
- **Source Wildcard Mask** – Wildcard masks determine which bits in the IP address are used and which are ignored. A wildcard mask of 255.255.255.255 indicates that no bit is important. A wildcard of 0.0.0.0 indicates that all the bits are important.

Wildcard masking for ACLs operates like the inverse of a subnet mask. With a subnet mask, the mask has ones (1's) in the bit positions used for the network address, and zeros (0's) for the bit positions that are not used. In contrast, a wildcard mask has (0's) in a bit position that must be checked. A '1' in a bit position of the ACL mask indicates the corresponding bit can be ignored. This field is required when you configure a source IP address.

- **Assign Queue** – The number that identifies the hardware egress queue that will handle all packets that match this rule.
- **Interface** – Select an interface (port) to associate with the rule.
- **Interface Action** – Select one of the following options:
 - **Redirect** – Redirects traffic that meets the rule to the selected interface instead of being processed on the original port.
 - **Mirror** – Mirrors (copies) traffic that matches the rule to the selected interface.
- **Log** – Enables logging for the ACL rule (subject to resource availability in the device). If the Access List Trap Flag is also enabled, periodic traps are generated indicating the number of times this rule went into effect during the current report interval. A fixed five-minute report interval is used for the entire system. A trap is

not issued if the current interval's ACL rule hit count is zero.

- **Time Range Name** – The name of the time range that imposes a time limitation on the ACL rule, up to 31 characters. If a time range with the specified name does not exist, and the ACL containing this ACL rule is associated with an interface, the ACL rule is applied immediately. If a time range with the specified name exists, and the ACL containing this ACL rule is associated with an interface, the ACL rule is applied when the time range with the specified name becomes active. The ACL rule is removed when the time range with the specified name becomes inactive.
- **Committed Rate** – The allowed transmission rate for packets on the interface.
- **Burst Size** – The number of bytes allowed in a temporary traffic burst.

IPv4 Extended

Use this page to configure IPv4 Extended ACLs. Select an **ACL Identifier** from the dropdown, then click the **Options** (⋮) button to edit or **Resequence** multiple ACLs or the **Actions** button to edit a single ACL.

Sequence Number	Status	Perform Action	Match Conditions	Rule Attributes	Remarks	Action
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Configurable settings include:

- **Sequence** – The position of a rule within the ACL. If the sequence number is not specified during rule creation, the rule is automatically assigned a sequence number after it is added to the ACL. The rules are displayed based on their position within the ACL, which can be renumbered. Packets are checked against the rule criteria in order, from the lowest-numbered rule to the highest. When the packet matches the criteria in a rule, it is handled according to the rule action and attributes. If no rule matches a packet, the packet is discarded based on the implicit deny all rule, which is the final rule in every ACL.
- **Perform Action** – The action to take when a packet or frame matches the criteria in the rule:
 - **Permit** – The packet or frame is forwarded.
 - **Deny** – The packet or frame is dropped.
- **Remark** – Accepts alpha-numeric and special characters (-, _, and space) and is also case-sensitive. It can have 1 to 100 characters.
- **Every** – When selected, all packets will match the rule and are either permitted or denied. This option is exclusive to all other match criteria and no other match criteria can be configured. To configure specific match criteria, do not enable

Every.

- **Protocol** – The IANA-assigned protocol to match within the IP packet.
- **Fragments** – IP ACL rule to match on fragmented IP packets.
- **Source IP Address** – The source port IP address in the packet and source IP wildcard mask (in the next field) to compare to the IP address in a packet header.
- **Source Wildcard Mask** – Wildcard masks determine which bits in the IP address are used and which are ignored. A wildcard mask of 255.255.255.255 indicates that no bit is important. A wildcard of 0.0.0.0 indicates that all the bits are important.

Wildcard masking for ACLs operates like the inverse of a subnet mask. With a subnet mask, the mask has ones (1's) in the bit positions used for the network address, and zeros (0's) for the bit positions that are not used. In contrast, a wildcard mask has (0's) in a bit position that must be checked. A '1' in a bit position of the ACL mask indicates the corresponding bit can be ignored. This field is required when you configure a source IP address.

- **Source L4 Port Option** – The TCP/UDP source port to match in the packet header. Select Equal, Not Equal, Less Than, Greater Than, or Range and specify the port number or keyword in Source L4 Port Value.
- **Source L4 Port Value** – TCP port keywords include BGP, Domain, Echo, FTP, FTP Data, HTTP, SMTP, Telnet, POP2, and POP3. UDP port keywords include Domain, Echo, NTP, RIP, SNMP, TFTP, TIME, and WHO. If it is not a keyword, it must be a string between 0 and 65535.
- **Source L4 Port Range Upper Bound** – TCP port keywords include BGP, Domain, Echo, FTP, FTP Data, HTTP, SMTP, Telnet, POP2, and POP3. UDP port keywords include Domain, Echo, NTP, RIP, SNMP, TFTP, TIME, and WHO. If it is not a keyword, it must be a string between 0 and 65535.

- **Destination IP Address** – The destination port IP address in the packet and destination IP wildcard mask (in the next field) to compare to the IP address in a packet header.
- **Destination Wildcard Mask** – Wildcard masks determine which bits in the IP address are used and which are ignored. A wildcard mask of 255.255.255.255 indicates that no bit is important. A wildcard of 0.0.0.0 indicates that all the bits are important.

Wildcard masking for ACLs operates like the inverse of a subnet mask. With a subnet mask, the mask has ones (1's) in the bit positions used for the network address, and zeros (0's) for the bit positions that are not used. In contrast, a wildcard mask has (0's) in a bit position that must be checked. A '1' in a bit position of the ACL mask indicates the corresponding bit can be ignored. This field is required when you configure a source IP address.

- **Destination L4 Port Option** – The TCP/UDP destination port to match in the packet header. Select Equal, Not Equal, Less Than, Greater Than, or Range and specify the port number or keyword in Source L4 Port Value.
- **Destination L4 Port Value** – TCP port keywords include BGP, Domain, Echo, FTP, FTP Data, HTTP, SMTP, Telnet, POP2, and POP3. UDP port keywords include Domain, Echo, NTP, RIP, SNMP, TFTP, TIME, and WHO. If it is not a keyword, it must be a string between 0 and 65535.
- **DestinationL4 Port Range Upper Bound** – TCP port keywords include BGP, Domain, Echo, FTP, FTP Data, HTTP, SMTP, Telnet, POP2, and POP3. UDP port keywords include Domain, Echo, NTP, RIP, SNMP, TFTP, TIME, and WHO. If it is not a keyword, it must be a string between 0 and 65535.
- **TTL Field Value** – IP ACL rule to match on the specified TTL field value.
- **IGMP Type** – The IP ACL rule to match on the specified IGMP type. This option is available only if the protocol is IGMP.

- **ICMP Type** — The IP ACL rule to match on the specified ICMP type. This option is available only if the protocol is ICMP.
- **ICMP Code** — The IP ACL rule to match on the specified ICMP code. This option is available only if the protocol is ICMP.
- **ICMP Message** — IP ACL rule to match on the ICMP message type and code. Select one of the following supported ICMP messages: Echo, Echo-Reply, Host-Redirect, Mobile-Redirect, Net-Redirect, Net-Unreachable, Redirect, Packet-Too-Big, Port-Unreachable, Source-Quench, Router-Solicitation, Router-Advertisement, Time-Exceeded, TTL-Exceeded, and Unreachable. This option is available only if the protocol is ICMP.
- **TCP Flags** — The IP ACL rule to match on the TCP flags. When a + flag is specified, a match occurs if the flag is set in the TCP header. When a - flag is specified, a match occurs if the flag is not set in the TCP header. When Established is specified, a match occurs if either RST or ACK bits are set in the TCP header. This option is available only if the protocol is TCP.
- **IP DSCP** — Matches the packet IP DiffServ Code Point (DSCP) value to the rule. The DSCP value is defined as the high-order six bits of the Service Type octet in the IP header. This field can be a keyword or a string between 0 - 63.
- **IP Precedence** — Matches the IP Precedence value to the rule. The IP Precedence field in a packet is defined as the high-order three bits of the Service Type octet in the IP header.
- **IP TOS Bits** — Matches on the Type of Service (TOS) bits in the IP header. The IP TOS field in a packet is defined as all eight bits of the Service Type octet in the IP header. For example, to check for an IP TOS value having bits 7 and 5 set and bit 1 clear, where bit 7 is most significant, use a TOS Bits value of 0xA0 and a TOS Mask of 0xFF. Requires the bits in a packet's TOS field to match the two-digit hexadecimal number entered in this field.

- **IP TOS Wildcard Mask** – The bit positions that are used for comparison against the IP TOS field in a packet. Specifying TOS Mask is optional. The format would be the same as IP TOS Bits: two-digit hexadecimal numbers.
- **Assign Queue** – The number that identifies the hardware egress queue that will handle all packets matching this rule.
- **Interface** – Select an interface (port) to associate with the rule.
- **Interface Action** – Select one of the following options:
 - **Redirect** – Redirects traffic that meets the rule to the selected interface instead of being processed on the original port.
 - **Mirror** – Mirrors (copies) traffic that matches the rule to the selected interface.
- **Log** – Enables logging for the ACL rule (subject to resource availability in the device). If the Access List Trap Flag is also enabled, periodic traps are generated indicating the number of times this rule went into effect during the current report interval. A fixed five-minute report interval is used for the entire system. A trap is not issued if the current interval's ACL rule hit count is zero.
- **Time Range Name** – The name of the time range that imposes a time limitation on the ACL rule, up to 31 characters. If a time range with the specified name does not exist, and the ACL containing this ACL rule is associated with an interface, the ACL rule is applied immediately. If a time range with the specified name exists, and the ACL containing this ACL rule is associated with an interface, the ACL rule is applied when the time range with the specified name becomes active. The ACL rule is removed when the time range with the specified name becomes inactive.
- **Committed Rate** – The allowed transmission rate for packets on the interface.
- **Burst Size** – The number of bytes allowed in a temporary traffic burst.

IPv6 Named

Use this page to configure IPv6 Extended ACLs. Select an **ACL Identifier** from the dropdown, then click the **Options** (⋮) button to edit or **Resequence** multiple ACLs or the **Actions** button to edit a single ACL.

Sequence Number	Status	Perform Action	Match Conditions	Rule Attributes	Remarks	Action
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Configurable options include:

- **Sequence** – The position of a rule within the ACL. If the sequence number is not specified during rule creation, the rule is automatically assigned a sequence number after it is added to the ACL. The rules are displayed based on their position within the ACL, which can be renumbered. Packets are checked against the rule criteria in order, from the lowest-numbered rule to the highest. When the packet matches the criteria in a rule, it is handled according to the rule action and attributes. If no rule matches a packet, the packet is discarded based on the implicit deny all rule, which is the final rule in every ACL.
- **Perform Action** – The action to take when a packet or frame matches the criteria in the rule:
 - **Permit** – The packet or frame is forwarded.
 - **Deny** – The packet or frame is dropped.
- **Remark** – Accepts alpha-numeric and special characters (-, _, and space) and is also case-sensitive. It can have 1 to 100 characters.
- **Every** – When selected, all packets will match the rule and are either permitted or denied. This option is exclusive to all other match criteria and no other match criteria can be configured. To configure specific match criteria, do not enable

Every.

- **Protocol** – Enter the IANA-assigned protocol to match within the IP packet.
- **Fragments** – IP ACL rule to match on fragmented IP packets.
- **Source Prefix** – The IPv6 prefix combined with IPv6 prefix length of the network or host from which the packet is being sent.
- **Source Prefix Length** – To indicate a destination host, specify an IPv6 prefix length of 128.
- **Source L4 Port Option** – The TCP/UDP destination port to match in the packet header. Select Equal, Not Equal, Less Than, Greater Than, or Range and specify the port number or keyword in Source L4 Port Value.
- **Source L4 Port Value** – TCP port keywords include BGP, Domain, Echo, FTP, FTP Data, HTTP, SMTP, Telnet, POP2, and POP3. UDP port keywords include Domain, Echo, NTP, RIP, SNMP, TFTP, TIME, and WHO. If it is not a keyword, it must be a string between 0 and 65535.
- **Source L4 Port Range Upper Bound** – TCP port keywords include BGP, Domain, Echo, FTP, FTP Data, HTTP, SMTP, Telnet, POP2, and POP3. UDP port keywords include Domain, Echo, NTP, RIP, SNMP, TFTP, TIME, and WHO. If it is not a keyword, it must be a string between 0 and 65535.
- **Destination Prefix** – The IPv6 prefix combined with the IPv6 prefix length to compare to a packet's destination IPv6 address as a match criteria for the IPv6 ACL rule.
- **Destination Prefix Length** – To indicate a destination host, specify an IPv6 prefix length of 128.
- **Destination L4 Port Option** – The TCP/UDP destination port to match in the packet header. Select Equal, Not Equal, Less Than, Greater Than, or Range and specify the port number or keyword in Source L4 Port Value.

- **Destination L4 Port Value** — TCP port keywords include BGP, Domain, Echo, FTP, FTP Data, HTTP, SMTP, Telnet, POP2, and POP3. UDP port keywords include Domain, Echo, NTP, RIP, SNMP, TFTP, TIME, and WHO. If it is not a keyword, it must be a string between 0 and 65535.
- **DestinationL4 Port Range Upper Bound** — TCP port keywords include BGP, Domain, Echo, FTP, FTP Data, HTTP, SMTP, Telnet, POP2, and POP3. UDP port keywords include Domain, Echo, NTP, RIP, SNMP, TFTP, TIME, and WHO. If it is not a keyword, it must be a string between 0 and 65535.
- **TTL Field Value** — IP ACL rule to match on the specified TTL field value.
- **ICMP Type** — The IP ACL rule to match on the specified ICMP type. This option is available only if the protocol is ICMP.
- **ICMP Code** — The IP ACL rule to match on the specified ICMP code. This option is available only if the protocol is ICMP.
- **ICMP Message** — IP ACL rule to match on the ICMP message type and code. Select one of the following supported ICMP messages: Echo, Echo-Reply, Host-Redirect, Mobile-Redirect, Net-Redirect, Net-Unreachable, Redirect, Packet-Too-Big, Port-Unreachable, Source-Quench, Router-Solicitation, Router-Advertisement, Time-Exceeded, TTL-Exceeded, and Unreachable. This option is available only if the protocol is ICMP.
- **TCP Flags** — The IP ACL rule to match on the TCP flags. When a + flag is specified, a match occurs if the flag is set in the TCP header. When a - flag is specified, a match occurs if the flag is not set in the TCP header. When Established is specified, a match occurs if either RST or ACK bits are set in the TCP header. This option is available only if the protocol is TCP.
- **Flow Label** — A 20-bit number that is unique to an IPv6 packet, used by end stations to signify quality-of-service handling in routers. This value must be between 0 - 1048575.

- **IP DSCP** – Matches the packet IP DiffServ Code Point (DSCP) value to the rule. The DSCP value is defined as the high-order six bits of the Service Type octet in the IP header. This field can be a keyword or a string between 0 - 63.
- **Routing** – IPv6 ACL rule to match on routed packets.
- **Assign Queue** – The number that identifies the hardware egress queue that will handle all packets matching this rule.
- **Interface** – Select an interface (port) to associate with the rule.
- **Interface Action** – Select one of the following options:
 - **Redirect** – Redirects traffic that meets the rule to the selected interface instead of being processed on the original port.
 - **Mirror** – Mirrors (copies) traffic that matches the rule to the selected interface.
- **Log** – Enables logging for the ACL rule (subject to resource availability in the device). If the Access List Trap Flag is also enabled, periodic traps are generated indicating the number of times this rule went into effect during the current report interval. A fixed five-minute report interval is used for the entire system. A trap is not issued if the current interval's ACL rule hit count is zero.
- **Time Range Name** – The name of the time range that imposes a time limitation on the ACL rule, up to 31 characters. If a time range with the specified name does not exist, and the ACL containing this ACL rule is associated with an interface, the ACL rule is applied immediately. If a time range with the specified name exists, and the ACL containing this ACL rule is associated with an interface, the ACL rule is applied when the time range with the specified name becomes active. The ACL rule is removed when the time range with the specified name becomes inactive.
- **Committed Rate** – The allowed transmission rate for packets on the interface.
- **Burst Size** – The number of bytes allowed in a temporary traffic burst.

Extended MAC

Use this page to configure MACExtended ACLs. Select an **ACL Identifier** from the dropdown, then click the **Options** (⋮) button to edit or **Resequence** multiple ACLs or the **Actions** button to edit a single ACL.

IPv4 Standard IPv4 Extended IPv6 Named **Extended MAC**

ACL Extended MAC Configuration

ACL Identifier TestMAC

Filter By

OPTIONS

Sequence Number Status Perform Action Match Conditions Rule Attributes Remarks Action

Configurable options include:

- **Sequence Number** – The position of a rule within the ACL. If the sequence number is not specified during rule creation, the rule is automatically assigned a sequence number after it is added to the ACL. The rules are displayed based on their position within the ACL, which can be renumbered. Packets are checked against the rule criteria in order, from the lowest-numbered rule to the highest. When the packet matches the criteria in a rule, it is handled according to the rule action and attributes. If no rule matches a packet, the packet is discarded based on the implicit deny all rule, which is the final rule in every ACL.
- **Perform Action** – The action to take when a packet or frame matches the criteria in the rule:
 - **Permit** – The packet or frame is forwarded.
 - **Deny** – The packet or frame is dropped.
- **Remark** – Accepts alpha-numeric and special characters (-, _, and space) and is also case-sensitive. It can have 1 to 100 characters.
- **Every** – When selected, all packets will match the rule and are either permitted or denied. This option is exclusive to all other match criteria and no other match criteria can be configured. To configure specific match criteria, do not enable

Every.

- **Class of Service** — The 802.1p user priority value to match within the Ethernet frame.
- **EtherType** — The EtherType value to match in an Ethernet frame. Specify the number associated with the EtherType or specify one of the following keywords: appletalk, arp, ibmsna, ipv4, ipv6, IPX, mplsmlcast, mplsucast, netbios, novell, pppoe, or rarp.
- **Source MAC Address** — The MAC address to match to an Ethernet frame's source port MAC address. If desired, enter the MAC Mask associated with the source MAC to match.
- **Source MAC Mask** — The MAC address mask specifies which bits in the source MAC to compare against an Ethernet frame. Use F's and zeros in the MAC mask, which is in a wildcard format. An F means that the bit is not checked, and a zero in a bit position means that the data must equal the value given for that bit. For example, if the MAC address is aa:bb:cc:dd:ee:ff, and the mask is 00:00:ff:ff:ff:ff, all MAC addresses with aa:bb:xx:xx:xx:xx result in a match (where x is any hexadecimal number).
- **Destination MAC Address** — The MAC address to match to an Ethernet frame's destination port MAC address. If desired, enter the MAC Mask associated with the destination MAC to match.
- **Destination MAC Mask** — The MAC address mask specifies which bits in the destination MAC to compare against an Ethernet frame. Use F's and zeros in the MAC mask, which is in a wildcard format. An F means that the bit is not checked, and a zero in a bit position means that the data must equal the value given for that bit. For example, if the MAC address is aa:bb:cc:dd:ee:ff, and the mask is 00:00:ff:ff:ff:ff, all MAC addresses with aa:bb:xx:xx:xx:xx result in a match (where x is any hexadecimal number).
- **VLAN** — The VLAN ID to match within the Ethernet frame.
- **Secondary VLAN** — The secondary VLAN ID to match within the Ethernet frame.

- **Assign Queue** – The number that identifies the hardware egress queue that will handle all packets matching this rule.
- **Interface** – Select an interface (port) to associate with the rule.
- **Interface Action** – Select one of the following options:
 - **Redirect** – Redirects traffic that meets the rule to the selected interface instead of being processed on the original port.
 - **Mirror** – Mirrors (copies) traffic that matches the rule to the selected interface.
- **Log** – Enables logging for the ACL rule (subject to resource availability in the device). If the Access List Trap Flag is also enabled, periodic traps are generated indicating the number of times this rule went into effect during the current report interval. A fixed five-minute report interval is used for the entire system. A trap is not issued if the current interval's ACL rule hit count is zero.
- **Time Range Name** – The name of the time range that imposes a time limitation on the ACL rule, up to 31 characters. If a time range with the specified name does not exist, and the ACL containing this ACL rule is associated with an interface, the ACL rule is applied immediately. If a time range with the specified name exists, and the ACL containing this ACL rule is associated with an interface, the ACL rule is applied when the time range with the specified name becomes active. The ACL rule is removed when the time range with the specified name becomes inactive.
- **Committed Rate** – The allowed transmission rate for packets on the interface.
- **Burst Size** – The number of bytes allowed in a temporary traffic burst.

Diffserv

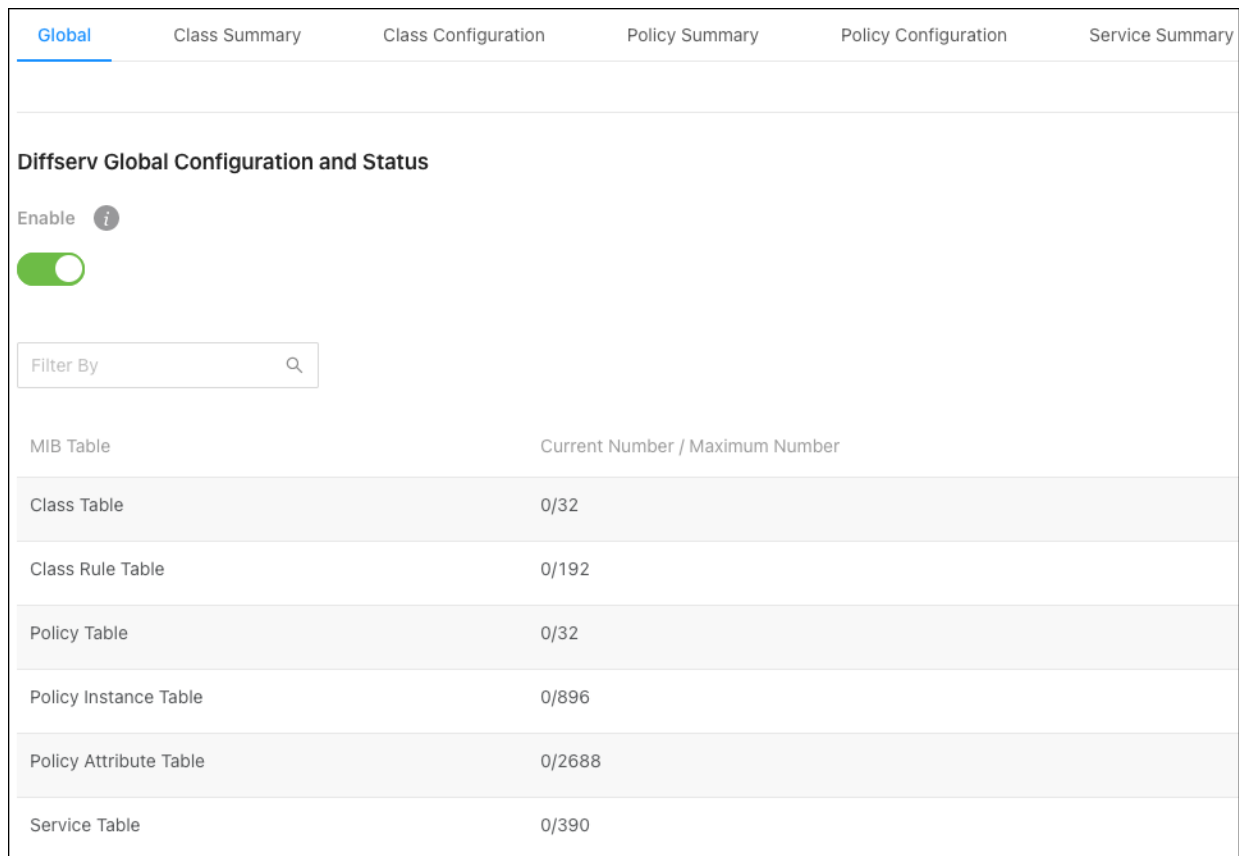
DiffServ (Differentiated Services) allows traffic to be classified into streams and given QoS treatment with defined per-hop behaviors. Packets are classified and processed by specified criteria that's defined by a class.

Policy attributes may be defined on a per-class instance basis and are applied when a match occurs. A policy can contain multiples classes. When the policy is active, the actions taken depend on which class matches the packet.

Global

Use this page to enable DiffServ and view the MIB table.

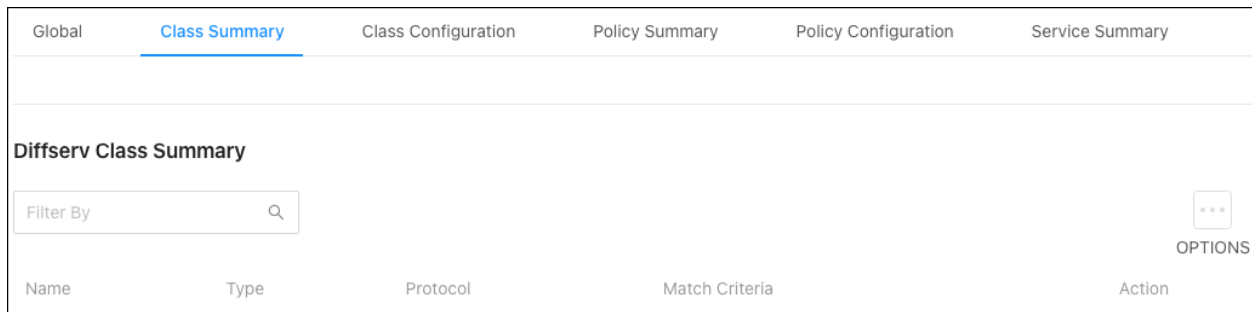
Note: If disabled, the DiffServ configuration is retained and can be changed.



MIB Table	Current Number / Maximum Number
Class Table	0/32
Class Rule Table	0/192
Policy Table	0/32
Policy Instance Table	0/896
Policy Attribute Table	0/2688
Service Table	0/390

Class Summary

Use this page to create or remove DiffServ classes and to view a summary of each class on the switch. The **Action** (⋮) button can be used to **Edit** or **Delete** an existing class.



To Add a DiffServ Class:

1. Click the **Options** (⋮) button , then **Add**.
2. Specify a **Class Type**:
 - **All**: All the DiffServ Class criteria must be met for a packet match.
 - **Any**: If any of the DiffServ Class criteria are met there is a packet match.
3. Select the layer 3 **Protocol** to use for filtering class types, which is either IPv4, IPv6, or you can select None.
4. Click **Add** to close the window, then click **Apply** at the top of the page.

Add Class ✕

Class Name ?

Type ?

All Any

Protocol ?

IPv4 IPv6 None

Cancel
Add

Class Configuration

Use this page to add Match Criteria to a DiffServ class.

Global Class Summary **Class Configuration** Policy Summary Policy Configuration Service Summary

Diffserv Class Configuration

Class: Test

Type ⓘ
All

L3 Protocol ⓘ
IPv4

Filter By 🔍

OPTIONS

Match Criteria	Value	Action
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To add **Match Criteria** to a DiffServ Class, use the **Class** dropdown to select a previously created class, then click the **Options** (⋮) button, then **Add**, for the **Add Match Criteria** window to appear.

Configurable options include:

- **Any** — Enable for all packets to be considered to match the specified class. Configuring additional match criteria is unnecessary if Any is selected because a match will occur on all packets.
- **Reference ACL** — Use the dropdown to select a previously configured ACL to match the criteria to.
- **Reference Class** — Select this option to reference a class for match criteria. A class can reference at most one other class of the same type.
- **Class of Service** — This option requires the Class of Service (CoS) value in an Ethernet frame header to match the specified CoS value.
- **Secondary Class of Service** — Select a secondary CoS value in an Ethernet frame header to match.

- **EtherType Keyword** – Use the dropdown to select a common protocol to require the EtherType value in the Ethernet frame header to match.
- **EtherType Value** – This field accepts custom EtherType values.
- **VLAN ID** – Enter a VLAN ID to require a packet's VLAN ID to match or a VLAN ID within a continuous range. If you configure a range, a match occurs if a packet's VLAN ID is the same as any VLAN ID within the range.
- **Secondary VLAN ID** – Enter a secondary VLAN ID to match or a secondary VLAN ID within a continuous range. If you configure a range, a match occurs if a packet's secondary VLAN ID is the same as any secondary VLAN ID within the range.
- **Source MAC Address** – Enter a MAC address to require a packet's source MAC address to match.
- **Source MAC Mask** – The MAC address mask specifies which bits in the destination MAC to compare against an Ethernet frame. Use F's and zeros in the MAC mask, which is in a wildcard format. An F means that the bit is not checked, and a zero in a bit position means that the data must equal the value given for that bit. For example, if the MAC address is aa:bb:cc:dd:ee:ff, and the mask is 00:00:ff:ff:ff:ff, all MAC addresses with aa:bb:xx:xx:xx:xx result in a match (where x is any hexadecimal number).

Note: This is not a wildcard mask like ACLs use.

- **Destination MAC Address** – Enter a MAC address to require a packet's destination MAC address to match.
- **Destination MAC Mask** – The MAC address mask specifies which bits in the destination MAC to compare against an Ethernet frame. Use F's and zeros in the MAC mask, which is in a wildcard format. An F means that the bit is not checked, and a zero in a bit position means that the data must equal the value given for that bit. For example, if the MAC address is aa:bb:cc:dd:ee:ff, and the mask is 00:00:ff:ff:ff:ff, all MAC addresses with aa:bb:xx:xx:xx:xx result in a match (where x is any hexadecimal number).

Note: This is not a wildcard mask like ACLs use.

- **Source IP Address** – The source port IP address in the packet and source IP to compare to the IP address in a packet header.
- **Source IP Mask** – A valid subnet mask, which determines the bits in the IP address that are significant.

Note: This is not a wildcard mask like ACLs use.

- **Destination IP Address** – The destination port IP address in the packet and destination IP to compare to the IP address in a packet header.
- **Destination IP Mask** – A valid subnet mask, which determines the bits in the IP address that are significant.

Note: This is not a wildcard mask like ACLs use.

- **IP Precedence** – Use the dropdown to select a packet's IP Precedence value to match. The IP Precedence field in a packet is defined as the high-order three bits of the Service Type octet in the IP header.
- **IP Type of Service Bits** – Enter a two-digit hexadecimal number to match the bits in a packet's ToS field. The IP ToS field in a packet is defined as all eight bits of the Service Type octet in the IP header.
- **IP Type of Service Mask** – Specify the bit positions that are used for comparison against the IP ToS field in a packet.
- **Protocol** – Use the dropdown to select an L4 keyword to require a packet header's Layer 4 protocol to match the specified value. If you select a keyword you cannot configure a Protocol Value.
- **Protocol Value** – Enter the IANA L4 protocol number value to match.
- **Source L4 Protocol** – Use the dropdown to select the desired L4 keyword from the list on which the match is based. If you select a keyword, you cannot enter a Source L4 Port value.

- **Source L4 Port** — Enter a source port, or port range, to add to the criteria. If you configure a range, a match occurs if a packet's source port number is the same as any destination port number within the range.
- **Destination L4 Protocol** — Select an L4 keyword from the list to add to the criteria. If you select a keyword, you cannot enter a Destination L4 Port value.
- **Destination L4 Port** — Enter a destination port, or port range, to add to the criteria. If you configure a range, a match occurs if a packet's destination port number is the same as any destination port number within the range.
- **IP DSCP Keyword** — Select a IP DSCP keyword code to add to the criteria. If you select a keyword, you cannot configure an IP DSCP Value.

Note: be and cs0 are identical.

- **IP DSCP Value** — Enter an IP DSCP Value to add to the criteria.

Policy Summary

Use this page to create or remove DiffServ policies. The table summarizes information about the policies configured on the switch.

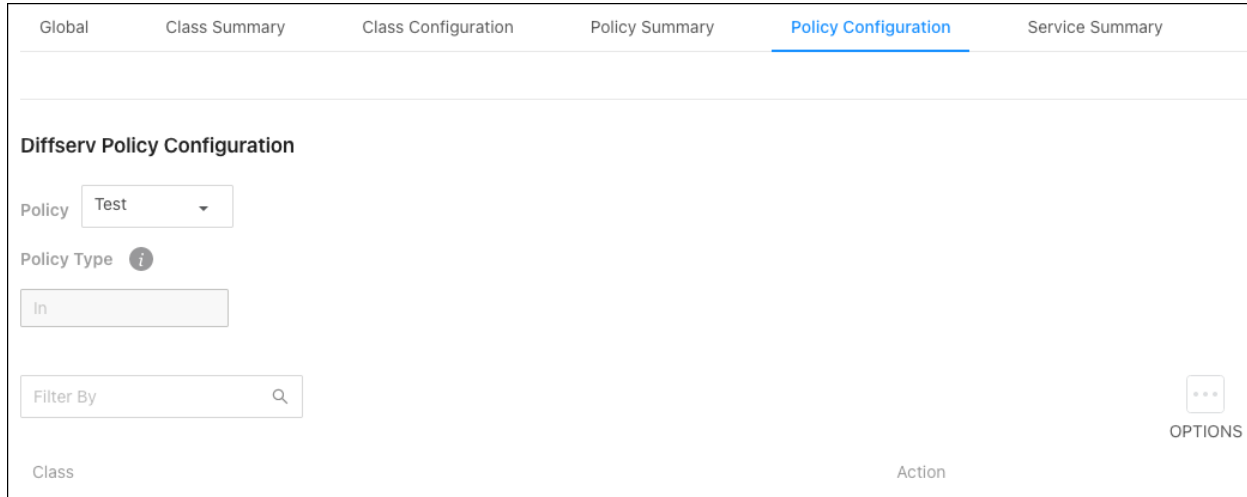
Global	Class Summary	Class Configuration	Policy Summary	Policy Configuration	Service Summary
Diffserv Policy Summary					
Filter By <input type="text"/> <input type="button" value="Q"/>					
<input type="button" value="..."/> OPTIONS					
Name	Type	Member Classes	Action		

To add a Policy:

1. Click the **Options** () button, then **Add**.
2. Enter a **Policy Name**.
3. The **Type** field has one option to enable. Select **In**, to apply the policy to inbound traffic, or **Out** to apply it to outbound traffic. Click **Add** when finished.

Policy Configuration

Use this page to configure policy attributes. The policy attributes identify the action or actions taken when a packet matches a class rule.



The screenshot shows a web interface with a navigation bar at the top containing tabs: Global, Class Summary, Class Configuration, Policy Summary, Policy Configuration (highlighted in blue), and Service Summary. Below the navigation bar is a section titled "Diffserv Policy Configuration". This section includes a "Policy" dropdown menu with "Test" selected, a "Policy Type" field with an information icon and the value "In", and a "Filter By" search box. At the bottom of the configuration area, there are two columns: "Class" and "Action". On the right side of the configuration area, there is an "OPTIONS" button with a three-dot menu icon.

To add **Policy Attributes**, use the **Policy** dropdown to select a previously created policy, then click the **Options** (⋮) button, then **Add**, for the **Add Policy Attribute** window to appear.

Configurable options include:

- **Class** — The DiffServ class associated with the policy. The policy is applied to a packet when a class match within that policy-class is found.
- **Assign Queue** — Select a Queue ID Value to which the packets of this policy-class are assigned.
- **Drop** — Enable to drop packets that match the policy class.
- **Mark Class of Service** — Use this field to mark all packets in a traffic stream with the specified Class of Service (CoS) queue value. Enter a value (0 to 7) to mark in the priority field of the 802.1p header (the only tag in a single tagged packet or the first or outer 802.1Q tag of a double VLAN tagged packet). If the packet does not already contain this header, one is inserted.

- **Mark CoS as secondary CoS** – Enable to mark the priority field of the 802.1p header in the outer tag of a double-VLAN tagged packet with the same CoS value that is included in the inner tag. Determine whether to support mark COS as secondary COS according to the chip.
- **Mark IP DSCP** – Enter a value (1 through 7) to mark packets in the policy's associated traffic stream.
- **Mark IP Precedence** – Enter a value (1 through 7) to mark packets in a traffic stream that matches the policy. The Mark IP Precedence field is then selectable in other fields.
- **Mirror Interface** – Use the dropdown to select a specified egress port (physical or LAG) to copy the traffic stream to without bypassing normal packet forwarding. This action can occur in addition to any marking or policing action. It may also be specified along with a QoS queue assignment. Use the dropdown to select the interface to mirror traffic to.
- **Police Simple Color Mode** – Select this option to enable simple traffic policing. Simple policing uses a single data rate and burst size, resulting in either a **conform** or **violate** action.
- **Police Simple Committed Rate (Kbps)** – Enter the maximum arrival rate of incoming packets for the policy, in Kbps.
- **Police Simple Committed Burst Size (Kbytes)** – Enter the maximum amount of conforming traffic allowed in a burst.
- **Police Simple Conform Action** – Select the action to take on packets below the committed rate **conforms**.
- **Police Simple Violate Action** – Select the action to take on packets above the committed rate **violates**.
- **Police Single Rate Color Mode** – Select an option to enable single-rate traffic policing. Single-rate policing uses a single data rate and two burst sizes, resulting in a **conform**, **violate**, or **exceed** action.

- **Police Single Rate Committed Rate (Kbps)** – Enter the maximum arrival rate of incoming packets for the policy, in Kbps.
- **Police Single Rate Committed Burst Size (Kbytes)** – Enter the amount of packets allowed in a burst when the arrival rate is under **conforms to the Single Rate Committed Rate value**.
- **Police Single Rate Excess Burst Size (Kbytes)** – Enter the amount of conforming traffic allowed to accumulate beyond the Committed Burst Size (Kbytes) value during long idle times. This value allows for occasional bursting.
- **Police Single Rate Conform Action** – Select the action to take on packets below the committed rate **conforms**.
- **Police Single Rate Exceed Action** – Select the action to take when a burst of packets **exceeds** the **Police Single Rate Committed Burst Rate**.
- **Police Single Rate Violate Action** – Select the action to take on packets above the committed rate **violates**.
- **Police Two Rate Color Mode** – Select an option to enable simple traffic policing. Two-rate policing uses two data rates and burst sizes, resulting in either a **conform, violate, or exceed** action.
- **Police Two Rate Committed Rate (Kbps)** – Enter the maximum arrival rate of incoming packets for the policy, in Kbps.
- **Police Two Rate Committed Burst Size (Kbytes)** – Enter the amount of packets allowed in a burst when the arrival rate is under **conforms to the Two Rate Committed Rate value**.
- **Police Two Rate Peak Rate (Kbps)** – Enter the maximum (peak) information rate for the arrival of incoming packets for this class.
- **Police Two Rate Excess Burst Size (Kbytes)** – Enter the amount of conforming traffic allowed to accumulate beyond the Committed Burst Size (Kbytes) value during long idle times. This value allows for occasional bursting.

- **Police Two Rate Conform Action** – Select the action to take on packets below the committed rate **conforms**.
- **Police Two Rate Exceed Action** – Select the action to take when a burst of packets **exceeds** the **Police Two Rate Committed Burst Rate**.
- **Police Two Rate Violate Action** – Select the action to take on packets above the committed rate **violates**.
- **Redirect Interface** – Select an interface (switchport or LAG) to force a classified traffic stream to.

Service Summary

Use this page to add or remove DiffServ policies to interfaces or edit the policy mappings, by clicking the **Options** (⋮) button.

Global	Class Summary	Class Configuration	Policy Summary	Policy Configuration	Service Summary
Diffserv Service Summary					
Filter By <input type="text"/>					⋮ OPTIONS
Interface	Direction	Status	Policy	Action	
1/0/1	Inbound		Test	⋮	
1/0/2	Inbound		Test	⋮	

VoIP

Voice over Internet Protocol (VoIP) allows telephone calls over a data network, like the internet. With the network acting as the backbone for many multimedia applications, it's important to properly configure the switch to prioritize VoIP traffic to make sure the application runs smoothly.

The **Auto VoIP** feature detects VoIP streams in the switch and provides them a better class of service. Interfaces with Auto VoIP configuration scan incoming traffic for the following protocols:

- Session Initiation Protocol (SIP)
- H.323
- Skinny Client Control Protocol (SCCP)

When the switch detects a call-control protocol it assigns that session's traffic to the highest CoS queue, generally used for time-sensitive traffic.

Global

Use this page to assign a VLAN to segregate the VoIP traffic from non-VoIP traffic. This feature does not rely on LLDP-MED support from the connected devices.

Enter the VLAN ID to assign the VoIP traffic to.

Global	OUI Table	OUI Based Auto VoIP	Protocol Based Auto VoIP
<h3>Auto VoIP Global Switch Configuration</h3> <p>Auto VoIP VLAN(0 to reset) i</p> <input style="width: 100%; height: 20px;" type="text" value="0"/>			

OUI Table

Use this page to add **Organizationally Unique Identifiers (OUIs)** that a connected device may have in their OUI database. Device manufacturers can include OUIs in a network adapter to help identify it. OUI's are a unique 24-bit number assigned by the IEEE registration authority. The switch comes with some preconfigured OUIs.

To add an OUI to the table, click the **Options** (⋮) button. To remove an OUI, click the **Action** button next to its entry.

Global	<u>OUI Table</u>	OUI Based Auto VoIP	Protocol Based Auto VoIP
OUI Table Summary			
Filter By <input type="text"/>			⋮ OPTIONS
Telephony OUI	Status	Description	Action
00:01:E3	Default	SIEMENS	
00:03:6B	Default	CISCO1	
00:12:43	Default	CISCO2	

OUI Based Auto VoIP

Use this page to enter a **Priority** value for traffic that matches a configured OUI.

Global	OUI Table	<u>OUI Based Auto VoIP</u>	Protocol Based Auto VoIP
OUI Based Auto VoIP			
Auto VoIP VLAN i			
<input type="text" value="Not Configured"/>			
Priority i			
<input type="text" value="7"/>			

The OUI Table allows you to enable Auto VoIP on interfaces and view their operational status.

OUI-based Auto VoIP can be enabled on an interface by:

- Clicking the toggles next to an interface.
- Clicking the **Action** (⋮) button on the far right of the interface row, or the **Options** button above the table to select multiple interfaces.

Enable	Interface	Name	Operational Status	Action
<input checked="" type="checkbox"/>	1/0/1	Port 1	Down	⋮
<input type="checkbox"/>	1/0/2	Port 2	Down	⋮
<input checked="" type="checkbox"/>	1/0/3	Port 3	Down	⋮

No matter how you select an interface, click the **Apply** button at the top of the page to confirm the selection.

Protocol Based Auto VoIP

Use this page to configure protocol-based Auto VoIP settings and to enable or disable Auto VoIP on an interface.

Global OUI Table OUI Based Auto VoIP **Protocol Based Auto VoIP**

Protocol Based Auto VoIP

Auto VoIP VLAN i

Not Configured

Prioritization Type i

Remark Traffic Class

802.1p Priority i

Traffic Class i

6

Select a **Prioritization Type** for VoIP traffic when a call-control protocol is detected.

Options are:

- **Remark** – Remark the voice traffic with the specified 802.1p priority value at the ingress interface.
- **Traffic Class** – Assign VoIP traffic to the specified traffic class when egressing the interface.

Protocol-based Auto VoIP can be enabled on an interface by:

- Clicking the toggles next to an interface.
- Clicking the **Action** (...) button on the far right of the interface row, or the **Options** button above the table to select multiple interfaces.

Enable	Interface	Name	Operational Status	Action
<input checked="" type="checkbox"/>	1/0/1	Port 1	Down	...
<input type="checkbox"/>	1/0/2	Port 2	Down	...
<input checked="" type="checkbox"/>	1/0/3	Port 3	Down	...

802.1p

The priority mapping feature allows traffic prioritization at the MAC level by using the 802.1p tag attached to the layer 2 frame. Each switch port has multiple queues to give preference to distinct packets based on the class of service (CoS) criteria specified. The rate at which a packet is sent to a port depends on how the queue is configured and the amount of traffic in other queues for the port. If there must be a delay, packets are held in the queue until the scheduler authorizes the transmission.

Use the **Options** (...) button to edit the priority values for multiple ports, or the **Action** button to edit an individual port.

Interface	Name	Priority 0	Priority 1	Priority 2	Priority 3	Priority 4	Priority 5	Priority 6	Priority 7	Action
1/0/1	Port 1	1	0	0	1	2	2	3	3	...
1/0/2	Port 2	1	0	0	1	2	2	3	3	...
1/0/3	Port 3	1	0	0	1	2	2	3	3	...
1/0/4	Port 4	1	0	0	1	2	2	3	3	...

Table field descriptions:

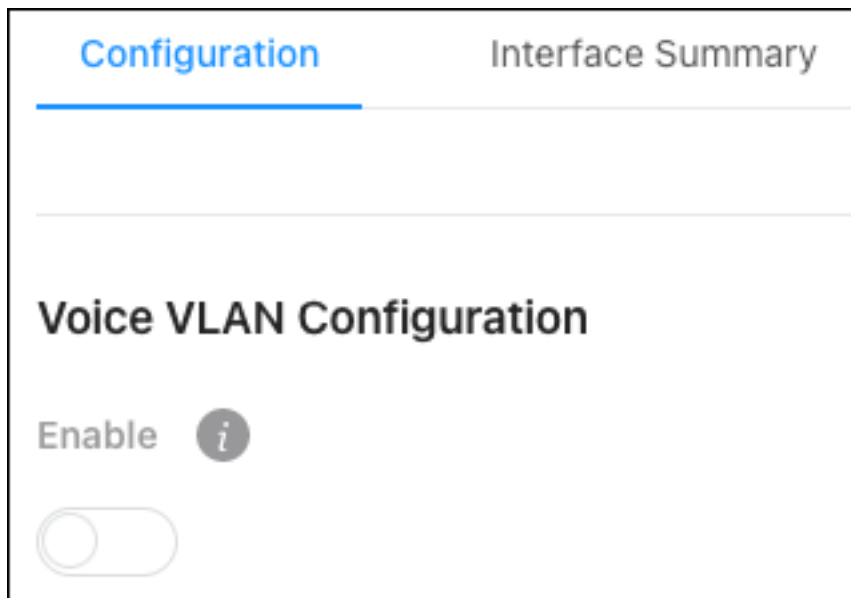
- **Interface** – The user-configured name of the port or link aggregation group (LAG).
- **Priority** – The heading row of the table that lists the 802.1p priority level (0-7). Incoming frames with an assigned 802.1p priority value are mapped to the corresponding traffic class in the device.
- **Traffic Class** – Traffic class is the data displayed in the table, which is the internal traffic class corresponding to the 802.1p priority level.

Voice VLAN

Enable Voice VLAN on interfaces that carry voice traffic to ensure that the sound quality of an IP phone does not deteriorate when there is high data traffic on the interface.

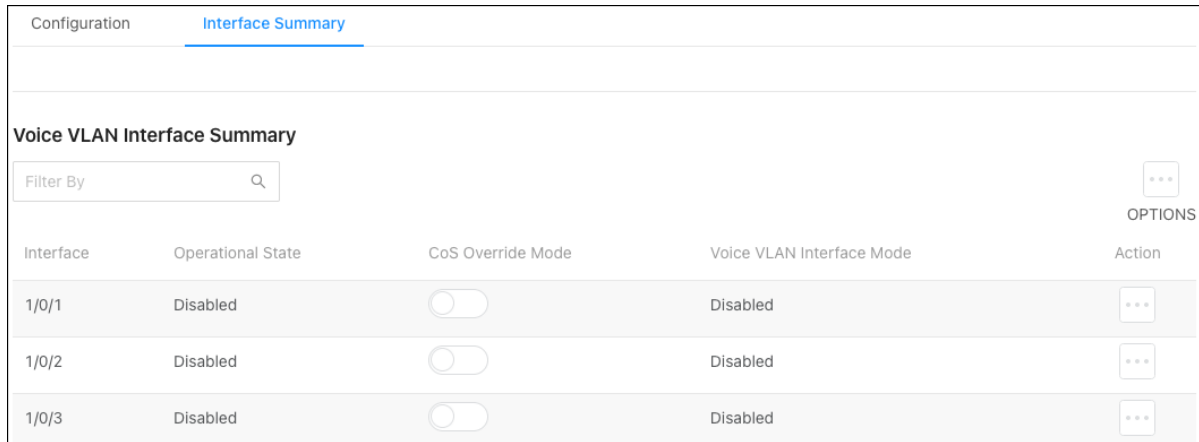
Configuration

Use this page to **Enable** the Voice VLAN feature globally.



Interface Summary

Use this page to configure Voice VLAN features per interface by clicking the **Action** (⋮) button on the interface row. Click the **Options** button to refresh the page.



The screenshot shows a web interface for configuring Voice VLAN features. At the top, there are tabs for 'Configuration' and 'Interface Summary'. Below the tabs is a section titled 'Voice VLAN Interface Summary' with a 'Filter By' search box and an 'OPTIONS' button. The main content is a table with the following columns: Interface, Operational State, CoS Override Mode, Voice VLAN Interface Mode, and Action. The table lists three interfaces: 1/0/1, 1/0/2, and 1/0/3, all with 'Disabled' operational and interface modes. The 'CoS Override Mode' column contains toggle switches, and the 'Action' column contains three-dot menu icons.

Interface	Operational State	CoS Override Mode	Voice VLAN Interface Mode	Action
1/0/1	Disabled	<input type="checkbox"/>	Disabled	⋮
1/0/2	Disabled	<input type="checkbox"/>	Disabled	⋮
1/0/3	Disabled	<input type="checkbox"/>	Disabled	⋮

Configurable options include:

- **CoS Override Mode** – When enabled, the port ignores the 802.1p priority value in the Ethernet frames it receives from connected devices.
- **Voice VLAN Interface Mode** – Use the dropdown to select how an IP phone connected to the interface should send the voice traffic. Options are:
 - **VLAN ID** – Forward voice traffic in the specified voice VLAN.
 - **Dot1p** – Tag voice traffic with the specified 802.1p priority value.
 - **None** – Use the settings configured on the IP phone to send untagged voice traffic.
 - **Untagged** – Send untagged voice traffic.
 - **Disable** – Disables the Voice VLAN feature on the interface.

System Log

Use the system log page to view and download events recorded by the switch. Click the **Options** (...) button to refresh the page, choose how many rows to display, or download the logs.

Pro Tip: Use the Filter by field to quickly find the event types you're looking for, like "critical", "poe", or "vlan."

Severity	Log Time	Component	Detail
info	Oct 7 08:08:13	PoeT	PoE Hw Init Done
info	Oct 7 08:08:13	PoeT	==> mode_pins: 0x2 port_map: 0 hw_ver: 0xe131 sw_ver: 0x13 eeprom: 0 config: 0xa sw_ver_ext: 9
info	Oct 7 08:08:22	CFA	Slot0/1 Link Status [DOWN]
info	Oct 7 08:08:22	CFA	vlan1 Link Status [DOWN]
info	Oct 7 08:08:23	CFA	Slot0/1 Link Status [UP]
info	Oct 7 08:08:24	CFA	vlan1 Link Status [UP]
critical	Oct 7 08:08:32	FM	[FM - MSR] : Configuration restored successfully.

Firmware release notes

Version 1.1.05

This firmware release adds functionality for flawless MoIP v3 operation, enabled setting static routes from the management VLAN, added functionality for future uplink modules, and general bug fixes.

Improvements

- Set the Acceptable Frame Type default value to Untagged Only.
- Fast Leave is now configurable on a per port basis.
- Updated the password prompt to include an upper case letter, lower case letter, numeric character, and special character.

Fixes

- Multicast Management Frames were sent to all ports. They now only send to MRouter ports.
- Resolved an issue where we were unable to get 25G/50G link speed using a 100G module.
- Fixed an issue where setting a manual IP on IP Interface Configuration gave a bad request.
- Resolved an issue where you'd lose access to the user interface when setting the routing interface to DHCP on the MGMT VLAN.
- EXC_default_list now appears under **Advanced** > **ACL Rules** and can be deleted.
- Fixed an issue where restoring a configuration file would not work.

- Fixed an issue where defaulting the switch would revert to a previous configuration instead of the factory defaults.

Version 1.1.03

- Initial release

Technical Support

For chat and telephone, visit snpl.co/techsupport • Email:

TechSupport@SnapOne.com. Visit snpl.co/tc for discussions, instructional videos, news, and more.

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