SonicWall™ Global Management System Switching

Administration Guide

Contents

1

Configuring VLAN Trunking

ⓘ **NOTE:** This section describes advanced switching in GMS, which is different from managing a Dell X-Series switch or N-Series switch from a SonicWall Security Appliance.

ⓘ **NOTE:** Switching is available on all NSA 2650 and above and SuperMassive appliances.

What is Switching?

GMS provides Layer 2 (data link layer) switching functionality that supports these switching features:

- **VLAN Trunking** – Provides the ability to trunk different VLANs between multiple switches.
- **Layer 2 Network Discovery** – Uses IEEE 802.1AB (LLDP) and Microsoft LLTD protocols and switch forwarding table to discover devices visible from a port.
- **Link Aggregation** – Provides the ability to aggregate ports for increased performance and redundancy.

  ⓘ **NOTE:** Link Aggregation is supported on NSA 3600 and higher Security Appliances. On the NSA 2600, Link Aggregation for Network Interfaces is a separate feature from Link Aggregation for Switching. The NSA 2600 does support Link Aggregation for Network Interfaces, but the NSA 2600 does not support Switching and, therefore, does not support Link Aggregation for Switching.

- **Port Mirroring** – Allows you to assign a mirror port to mirror ingress, egress or bidirectional packets coming from a group of ports.
- **Jumbo Frames** – Supporting jumbo frames allows GMS to process Ethernet frames with payloads ranging from 1500-9000 bytes.

  ⓘ **NOTE:** Jumbo frames are supported on NSA 3600 and higher appliances.

Benefits of Switching

GMS provides a combined security and switching solution. Layer 2 switching features enhance the deployment and interoperability of SonicWall devices within existing Layer 2 networks.

ⓘ **NOTE:** Advanced switching is supported on NSA 3600 and higher appliances.

The advanced switching features on a network Security Appliance provide these benefits:

- **Increased port density** – With one appliance providing up to 26 interfaces, including up to 24 switch ports, you can decrease the number of devices on your internal network.
- **Increased security across multiple switch ports** – The PortShield architecture provides the flexibility to configure all LAN switch ports into separate security zones such as LANs, WLANs and DMZs, providing protection not only from the WAN and DMZ, but also between devices inside the LAN. Effectively, each security zone has its own wire-speed “mini-switch” that benefits from the protection of a dedicated deep packet inspection firewall.

- **VLAN Trunking** – Simplifies VLAN management and configuration by reducing the need to configure VLAN information on every switch; provides the ability to trunk different VLANs between multiple switches.
- **Layer 2 Network Discovery** – Provides Layer 2 network information for all devices attached to the appliance; uses IEEE 802.1AB (LLDP) and Microsoft LLTD protocols and switch forwarding table to discover devices visible from a port.
- **Link Aggregation** – Aggregated ports provide increased performance through load balancing when connected to a switch that supports aggregation, and provide redundancy when connected to a switch or server that supports aggregation.
- **Port Mirroring** – Allows you to easily monitor and inspect network traffic on one or more ports and to assign a mirror port to mirror ingress, egress or bidirectional packets coming from a group of ports.
- **Jumbo Frames** – Allows increased throughput and reduces the number of Ethernet frames to be processed by allowing GMS to process Ethernet frames with payloads ranging from 1500-9000 bytes. Throughput increase may not be seen in some cases. However, there are some improvement in throughput if the packets traversing are really jumbo size.

  ⓘ **NOTE:** Jumbo frames are supported on NSA 3600 and higher appliances.

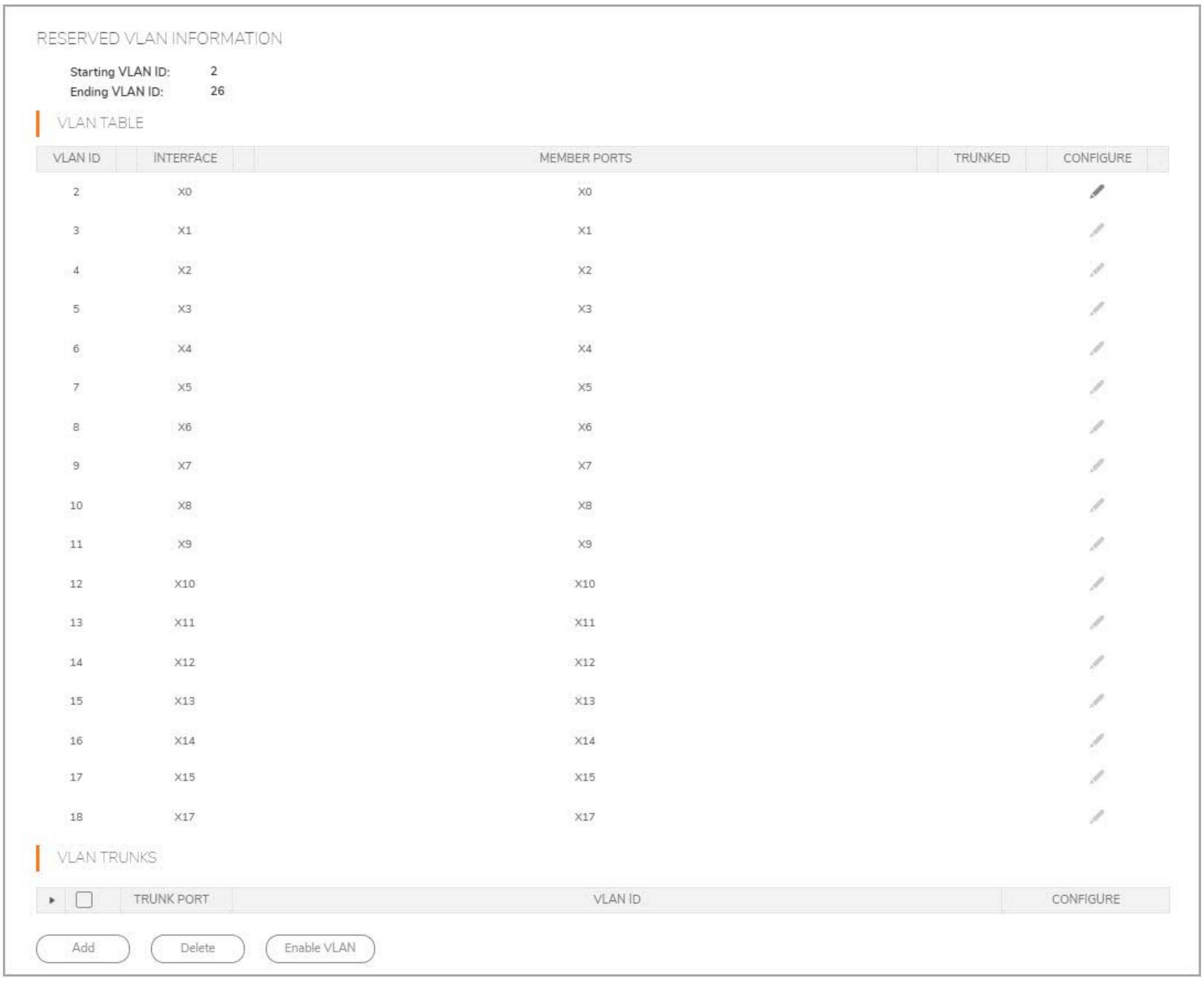
Some switching features operate on PortShield Groups and require preliminary configuration on the **Network > PortShield Groups** page. Some operate on existing **Network > Interfaces** configurations.

For details about the operation of each switching feature, see:

- Switching > VLAN Trunking
- Managing Layer 2 Discovery and LLDP/LLTD
- Configuring Link Aggregation
- Configuring Port Mirroring

Switching > VLAN Trunking

VLAN Trunking simplifies VLAN management and configuration by reducing the need to configure VLAN information on every switch. Unassigned switch ports can function as VLAN trunk ports.



RESERVED VLAN INFORMATION

Starting VLAN ID: 2
Ending VLAN ID: 26

VLAN TABLE

VLAN ID	INTERFACE	MEMBER PORTS	TRUNKED	CONFIGURE
2	X0	X0		✎
3	X1	X1		✎
4	X2	X2		✎
5	X3	X3		✎
6	X4	X4		✎
7	X5	X5		✎
8	X6	X6		✎
9	X7	X7		✎
10	X8	X8		✎
11	X9	X9		✎
12	X10	X10		✎
13	X11	X11		✎
14	X12	X12		✎
15	X13	X13		✎
16	X14	X14		✎
17	X15	X15		✎
18	X17	X17		✎

VLAN TRUNKS

▸ □	TRUNK PORT	VLAN ID	CONFIGURE

About Trunking

Unassigned switch ports can function as VLAN trunk ports. You can enable or disable VLANs on the trunk ports, allowing the existing VLANs to be bridged to respective VLANs on another switch connected through the trunk port. 802.1Q encapsulation is supported on the trunk ports. A maximum of 25 VLANs can be enabled on each trunk port.

The VLAN trunking feature provides the following functions:

- Change VLAN ID’s of existing PortShield groups
- Add/delete VLAN trunk ports
- Enable/disable VLANs on the trunk ports

The allowed VLAN ID range is 1-4094. Some VLAN IDs are reserved for PortShield use. The reserved range is displayed in the management interface at **Switching > VLAN Trunking**.

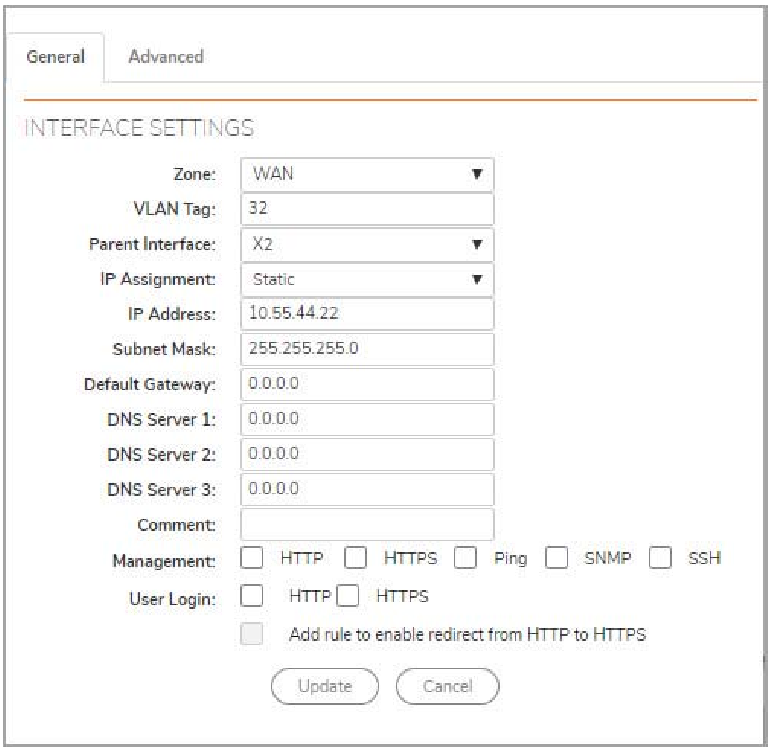
You can mark certain PortShield groups as “Trunked.” After the PortShield group is dismantled, the associated VLAN is automatically disabled on the trunk ports. VLANs can exist locally in the form of PortShield groups or can be totally remote VLANs. You can change the VLAN ID of PortShield groups on the SonicWall appliance. This allows easy integration with existing VLAN numbering.

Unlike traditional Layer 2 switches, SonicWall appliances do not allow changing port VLAN membership in an ad-hoc manner. VLAN membership of a port must be configured through PortShield configuration. For more information about configuring PortShield groups, see Configuring PortShield Groups.

A virtual interface (called the VLAN Trunk Interface) is automatically created for remote VLANs. When the same remote VLAN is enabled on another trunk port, no new interfaces are created. All packets with the same VLAN tag ingressing on different trunk ports are handled by the same virtual interface. This is a key difference between VLAN subinterfaces and VLAN trunk interfaces.

The **Network > Interfaces** page displays the VLAN Trunk Interfaces for the VLAN trunks.

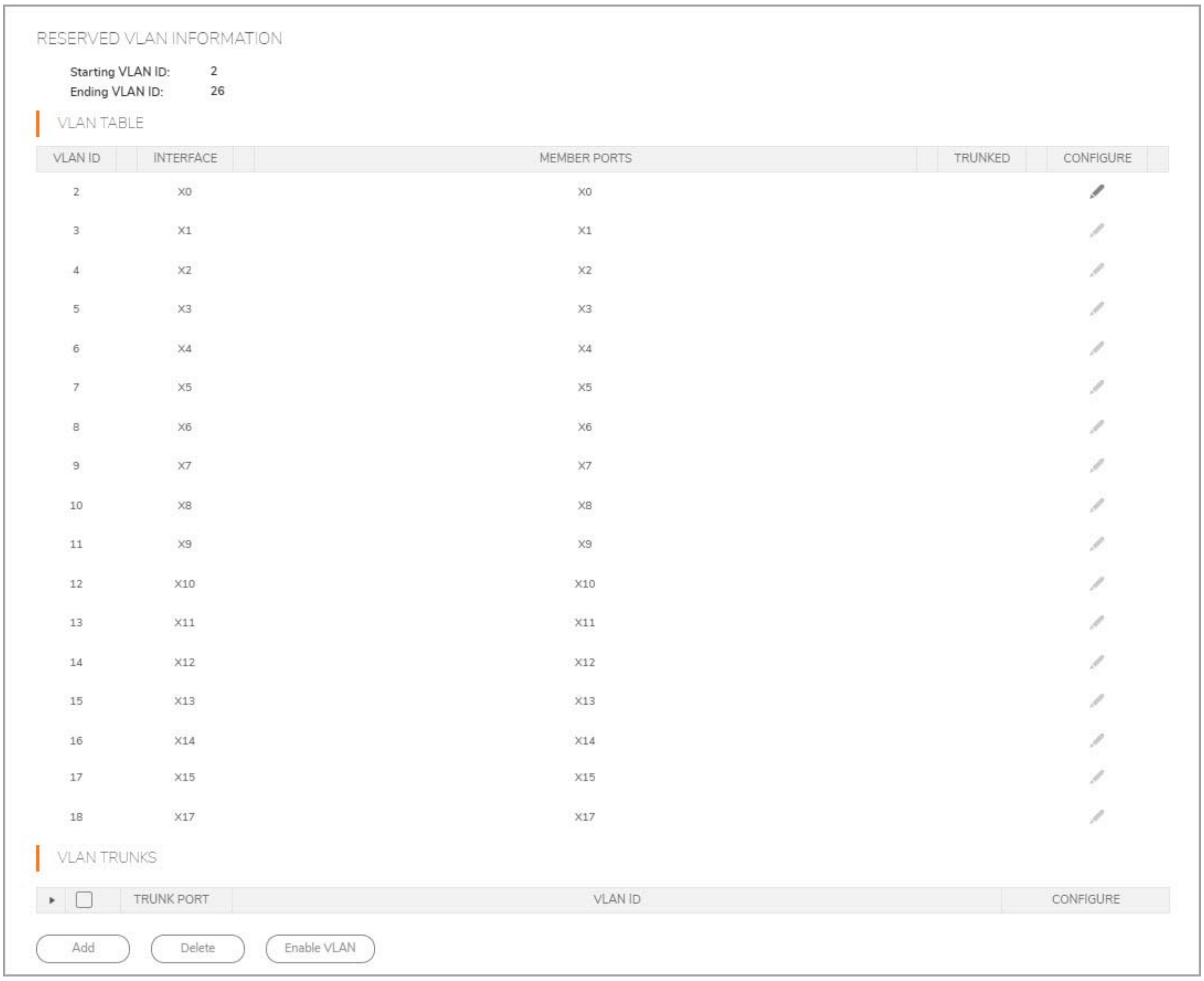
You can enable any VLAN, local or remote, on a VLAN trunk to allow bridging to respective VLANs on another switch on the **Edit VLAN Interface** dialog.



INTERFACE SETTINGS

Zone:	WAN ▼
VLAN Tag:	32
Parent Interface:	X2 ▼
IP Assignment:	Static ▼
IP Address:	10.55.44.22
Subnet Mask:	255.255.255.0
Default Gateway:	0.0.0.0
DNS Server 1:	0.0.0.0
DNS Server 2:	0.0.0.0
DNS Server 3:	0.0.0.0
Comment:	
Management:	□ HTTP □ HTTPS □ Ping □ SNMP □ SSH
User Login:	□ HTTP □ HTTPS
	□ Add rule to enable redirect from HTTP to HTTPS

The **VLAN Table** on the **Switching > VLAN Trunking** page displays the trunk port after the VLAN is enabled on the VLAN trunk.



RESERVED VLAN INFORMATION

Starting VLAN ID: 2
Ending VLAN ID: 26

VLAN TABLE

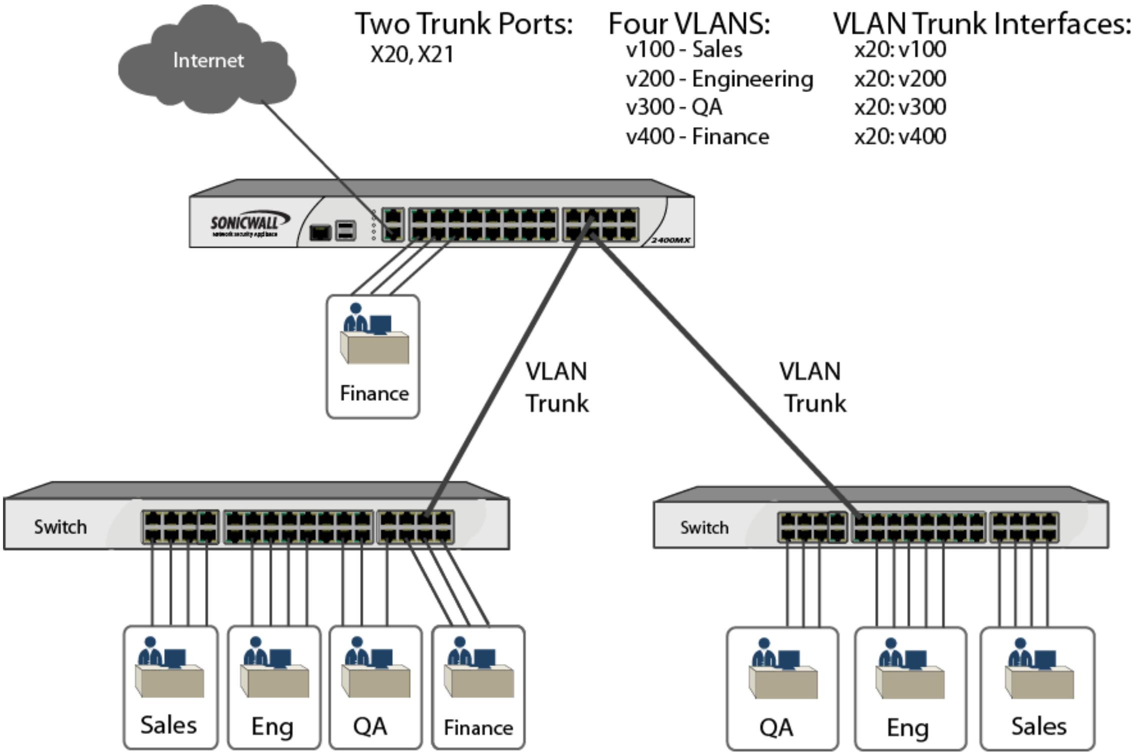
VLAN ID	INTERFACE	MEMBER PORTS	TRUNKED	CONFIGURE
2	X0	X0		✎
3	X1	X1		✎
4	X2	X2		✎
5	X3	X3		✎
6	X4	X4		✎
7	X5	X5		✎
8	X6	X6		✎
9	X7	X7		✎
10	X8	X8		✎
11	X9	X9		✎
12	X10	X10		✎
13	X11	X11		✎
14	X12	X12		✎
15	X13	X13		✎
16	X14	X14		✎
17	X15	X15		✎
18	X17	X17		✎

VLAN TRUNKS

▸ ☐	TRUNK PORT	VLAN ID	CONFIGURE

VLAN Trunk with Two Trunk Ports illustrates a VLAN trunk with two trunk ports, bridging the Sales, Engineering, QA, and Finance VLANs through an NSA 2400MX. Each remote VLAN was enabled on VLAN trunk port X20 initially, causing the creation of four virtual VLAN trunk interfaces. When these VLANs were also enabled on trunk port X21, no new virtual interfaces were created.

VLAN Trunk with Two Trunk Ports



VLAN trunking interoperates with Rapid Spanning Tree Protocol (RSTP), Link Aggregation and Port Mirroring features. A VLAN trunk port can be mirrored, but cannot act as a mirror port itself. You cannot enable Static port security on the VLAN trunk port.

Ports configured as VLAN trunks cannot be used for any other function and are reserved for use in Layer 2 only. For example, you cannot configure an IP Address for the trunk ports.

When a Trunk VLAN interface has been configured on a particular trunk port, that trunk port cannot be deleted until the VLAN interface is removed, even though the VLAN is enabled on multiple trunk ports.

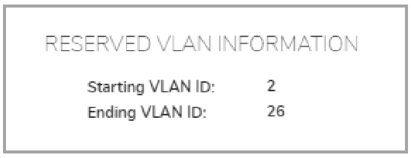
Topics:

- Viewing Reserved VLAN IDs
- Editing VLANs
- Adding VLAN Trunk Ports
- Deleting VLAN Trunk Ports
- Enabling VLANs on a Trunk Port
- Viewing Enabled VLANs
- Deleting Enabled VLANs

Viewing Reserved VLAN IDs

The **Reserved VLAN Information** table lists the range of reserved VLAN IDs:

- **Starting VLAN ID**
- **Ending VLAN ID**


RESERVED VLAN INFORMATION

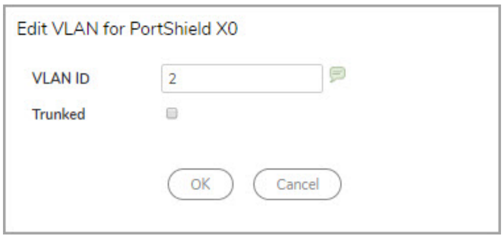
Starting VLAN ID: 2

Ending VLAN ID: 26

Editing VLANs

To edit a VLAN:

1 On the **Switching > VLAN Trunking** page, click the **Configure** icon in the **VLAN Table** row for the VLAN ID you want to edit. The **Edit VLAN for PortShield** dialog displays.


Edit VLAN for PortShield X0

VLAN ID: 2

Trunked: □

2 Do one of the following:

- Type a different VLAN ID into the **VLAN ID** field. You can enter any VLAN ID except the original system-specified VLAN ID or any others in the **Reserved VLAN Information** section.
- Use the VLAN ID number in the **VLAN ID** field that matches the one for which you clicked the **Configure** icon.

3 To enable trunking for this VLAN, select **Trunked**. This option is not selected by default. To disable trunking for this VLAN, clear the option.

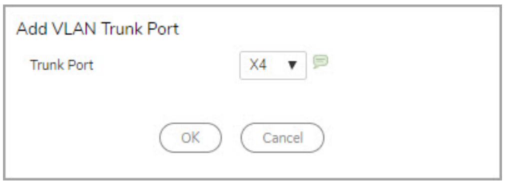
4 Click **OK**.

Adding VLAN Trunk Ports

To add a VLAN trunk port:

1 On the **Switching > VLAN Trunking** page, scroll to the VLAN Trunks section.

2 Click **Add**. The **Add VLAN Truck Port** dialog displays.


Add VLAN Trunk Port

Trunk Port: X4

3 Select the port to add from **Trunk Port**.

NOTE: This port cannot be a mirror port.

4 Click **OK**.

Deleting VLAN Trunk Ports

Topics:

- Deleting a VLAN Trunk Port
- Deleting Multiple VLAN Trunk Ports

Deleting a VLAN Trunk Port

To delete a VLAN trunk port:

1. On the **Switching > VLAN Trunking** page, scroll to the **VLAN Trunks** section.
2. Select the checkbox next to the VLAN Trunk you would like to remove.
3. Click the **Trash** icon in the **Configure** column.

Deleting Multiple VLAN Trunk Ports

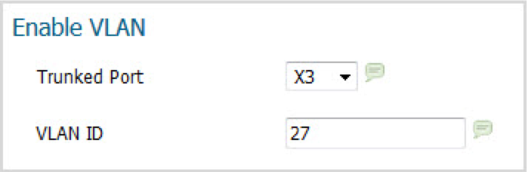
To delete multiple VLAN trunk ports:

1. On the **Switching > VLAN Trunking** page scroll to the VLAN Trunks section.
2. Select the VLAN trunk ports you want to delete, or to delete ALL VLAN trunk ports, select the checkbox at the top of the VLAN Trunks table. All VLAN ports are selected.
3. Click **Delete**. A confirmation message displays.
4. Click **OK**.

Enabling VLANs on a Trunk Port

To enable a custom VLAN ID on a specific trunk port:

1. Navigate to the **Switching > VLAN Trunking** page.
2. Scroll to the **VLAN Trunks** section.
3. Click **Enable VLAN**. The **Enable VLAN** dialog displays.



Enable VLAN

Trunked Port: X3

VLAN ID: 27

4. Select a trunked port from **Trunked Por**t. This is the port that you want to use to trunk the VLAN ID indicated in the next field.
5. In the **VLAN ID** field, type in the VLAN ID to be trunked. Usually, it is a VLAN ID configured on another switch.
6. Click **OK**. The **Modify Task Description and Schedule** dialog displays.

7 Optionally, enter a description of the task in the **Description** field.

8 Choose a schedule:

- **Default** (default)
- **Immediate**
- **At:**

9 Click **Accept**. The VLAN is added to the trunk port in the **VLAN Trunks** table.

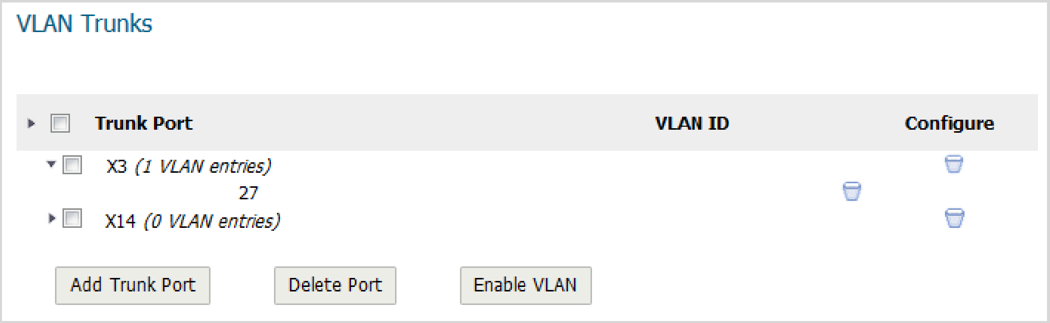
Viewing Enabled VLANs

To view enabled VLANs:

1 Navigate to the **Switching > VLAN Trunking** page.

2 Scroll to the **VLAN Trunks** section.

3 Click the small triangle of the trunk port that has VLAN entries. The display expands.



□ Trunk Port	VLAN ID	Configure
□ X3 *(1 VLAN entries)*		🗑
27	🗑	
□ X14 *(0 VLAN entries)*		🗑

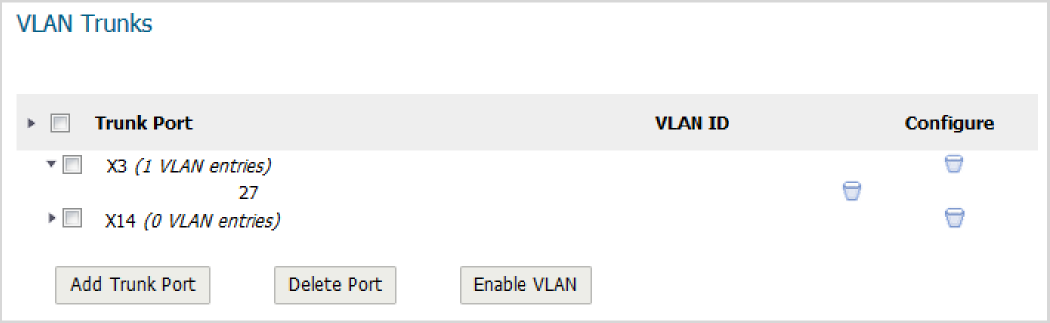
Deleting Enabled VLANs

To delete an enabled VLAN:

1 Navigate to the **Switching > VLAN Trunking** page.

2 Scroll to the **VLAN Trunks** section.

3 Click the small triangle of the trunk port that has VLAN entries. The display expands.



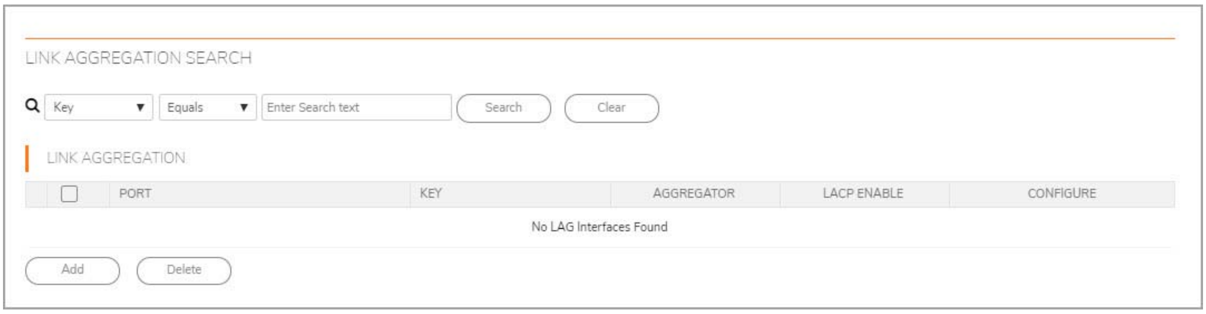
□ Trunk Port	VLAN ID	Configure
□ X3 *(1 VLAN entries)*		🗑
27	🗑	
□ X14 *(0 VLAN entries)*		🗑

4 Click the **Trash** icon of the VLAN to delete.

2

Configuring Link Aggregation

Aggregated ports provide increased performance through load balancing when connected to a switch that supports aggregation, and provide redundancy when connected to a switch or server that supports aggregation.



□	PORT	KEY	AGGREGATOR	LACP ENABLE	CONFIGURE
No LAG Interfaces Found					

Link Aggregation allows port redundancy and load balancing in Layer 2 networks. Load balancing is controlled by the hardware, based on source and destination MAC address pairs. The **Switching > Link Aggregation** page provides information and statistics, and allows configuration of interfaces for aggregation.

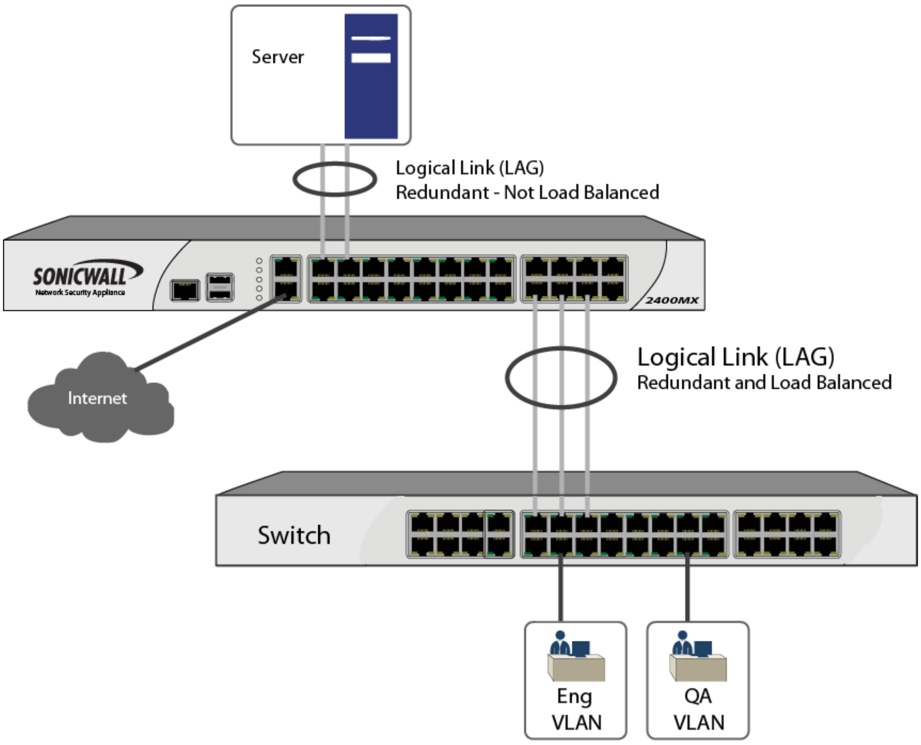
Static and Dynamic Link Aggregation are supported. Dynamic Link Aggregation is supported with the use of LACP (IEEE 802.1AX). Ports that are in the same VLAN (same PortShield Group) or are VLAN trunk ports are eligible for link aggregation. Up to four ports can be aggregated in a logical group and there can be four Logical Links (LAGs) configured.

Two main types of usage are enabled by this feature:

- **Firewall to Server** – This is implemented by enabling Link Aggregation on ports within the same VLAN (same PortShield Group). This configuration allows port redundancy, but does not support load balancing in the Firewall-to-Server direction because of a hardware limitation.
- **Firewall to Switch** – This is allowed by enabling Link Aggregation on VLAN trunk ports. Load balancing is automatically done by the hardware. The Firewall supports one load balancing algorithm based on source and destination MAC address pairs.

Link Aggregation Configuration shows LAGs to a server and to a switch.

Link Aggregation Configuration



Similarly to PortShield configuration, you select an interface that represents the aggregated group. This port is called an aggregator. The aggregator port must be assigned a unique key. By default, the aggregator port key is the same as its interface number. Non-aggregator ports can be optionally configured with a key that can help prevent an erroneous LAG if the switch connections are wired incorrectly.

Ports bond together if connected to the same link partner and their keys match. If there is no key configured for a port (if the port is in auto mode), it bonds with an aggregator that is connected to the same link partner. The link partner is discovered through LACP messages. A link partner cannot be discovered for Static link aggregation. In this case, ports aggregate based on keys alone.

Like a PortShield host, the aggregator port cannot be removed from the LAG because it represents the LAG in the system.

NOTE: After link aggregation has been enabled on VLAN trunk ports, additional VLANs cannot be added or deleted on the LAG.

NOTE: If you need to enable RSTP on the LAG, first enable RSTP on the individual members and then enable link aggregation.

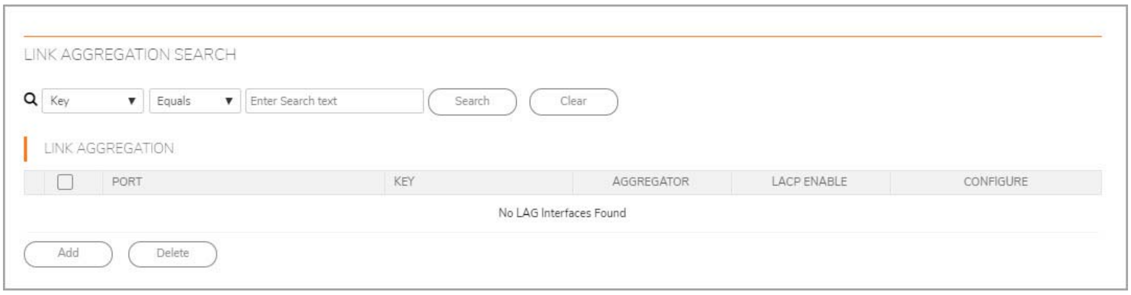
Topics:

- Creating a Logical Link (LAG)
- Editing LAG Ports
- Deleting LAG Ports
- Searching the Link Aggregation Table

Creating a Logical Link (LAG)

To create a Logical Link (LAG):

1 Navigate to the **Switching > Link Aggregation** page.

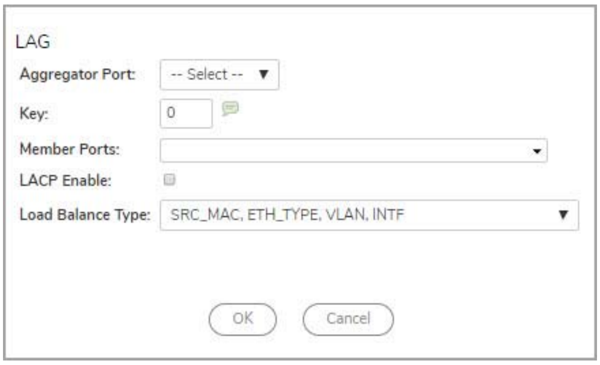


Key ▼ | Equals ▼ | Enter Search text

LINK AGGREGATION

□	PORT	KEY	AGGREGATOR	LACP ENABLE	CONFIGURE
No LAG Interfaces Found					

2 Under the **Link Aggregation** table, click **Add**. The **Add LAG Port** dialog displays.



LAG

Aggregator Port: -- Select -- ▼

Key: 0

Member Ports:

LACP Enable: □

Load Balance Type: SRC_MAC, ETH_TYPE, VLAN, INTF ▼

3 Select the aggregator interface from **Aggregate Port**. Only one interface can be an aggregator for a LAG.

4 To manually define port membership to an LAG group, enter the membership key in the **Key** field. The range is 1 to 255.

5 Select one or more member ports to be aggregated from **Member Ports**.

6 To enable LACP, select **LACP Enable**. Dynamic Link Aggregation is supported with the use of LACP. The link partner is discovered through LACP messages. This option is not selected by default.

7 Select the type of load balancing from **Load Balance Type**:

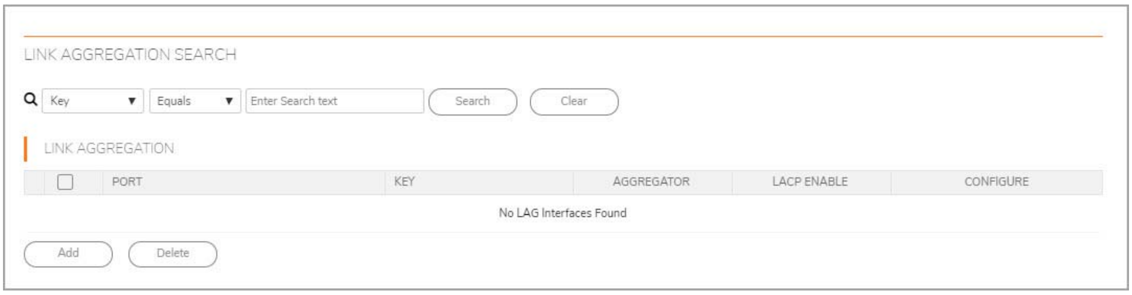
- **SRC_MAC, ETH_TYPE, VLAN, INTF** (default)
- **DST_MAC, ETH_TYPE, VLAN, INTF**
- **SRC_MAC, DST_MAC, ETH_TYPE, VLAN, INTF**
- **SRC_IP, SRC_PORT**
- **DST_IP, DST_PORT**
- **SRC_IP, SRC_PORT, DST_IP, DST_PORT**

8 Click **OK**. The Link Aggregation table is updated.

Editing LAG Ports

To edit a LAG port:

1 Navigate to the **Switching > Link Aggregation** page.



☐	PORT	KEY	AGGREGATOR	LACP ENABLE	CONFIGURE
No LAG Interfaces Found					

2 In the **Link Aggregation** table, click the **Edit** icon for the LAG port to edit. The **Edit LAG Port** dialog displays.

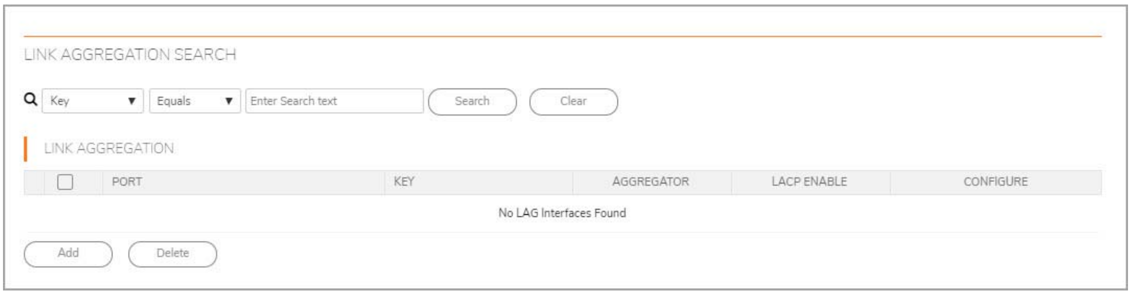
3 All the options except **Member Ports** are dimmed. Add or delete ports from **Member Ports**.

4 Click **OK**.

Deleting LAG Ports

To delete a LAG port:

1 Navigate to the **Switching > Link Aggregation** page.

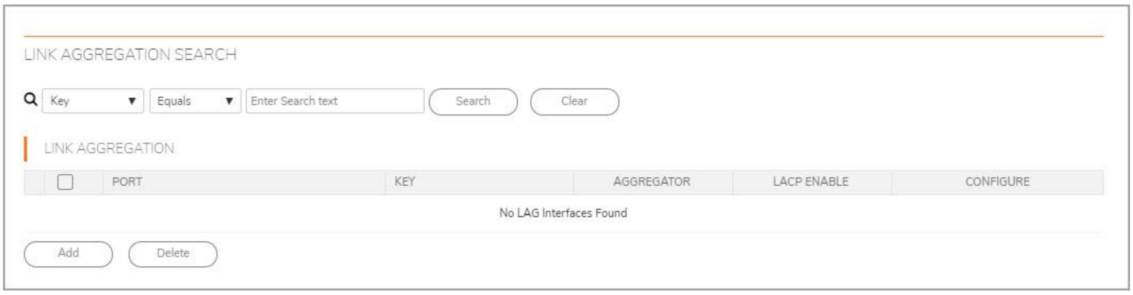


☐	PORT	KEY	AGGREGATOR	LACP ENABLE	CONFIGURE
No LAG Interfaces Found					

2 In the **Link Aggregation** table, click the **Trash** icon for the LAG port to delete.

To delete one or more LAG ports:

1 Navigate to the **Switching > Link Aggregation** page.



☐	PORT	KEY	AGGREGATOR	LACP ENABLE	CONFIGURE
No LAG Interfaces Found					

2 In the **Link Aggregation** table, select the LAG port(s) to delete or select the checkbox at the top of the left column to select all LAG ports.

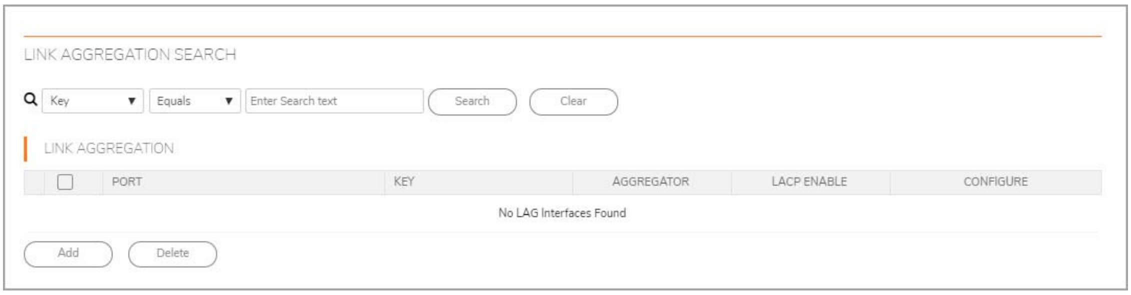
3 Click **Delete**.

Searching the Link Aggregation Table

You can restrict the display of the **Link Aggregation** table to only those ports of interest.

To search for a particular port:

1 Navigate to the **Switching > Link Aggregation** page.



☐	PORT	KEY	AGGREGATOR	LACP ENABLE	CONFIGURE

No LAG Interfaces Found

2 In the **Search** fields of the **Link Aggregation Search** section,

- Select:
  - **Key** (default)
  - **Aggregator**
  - **LACP Enable**
- Select the search operator:
  - **Equals**
  - **Starts with**
  - **Ends with**
  - **Contains**
- Enter the search criterion to match the operator.

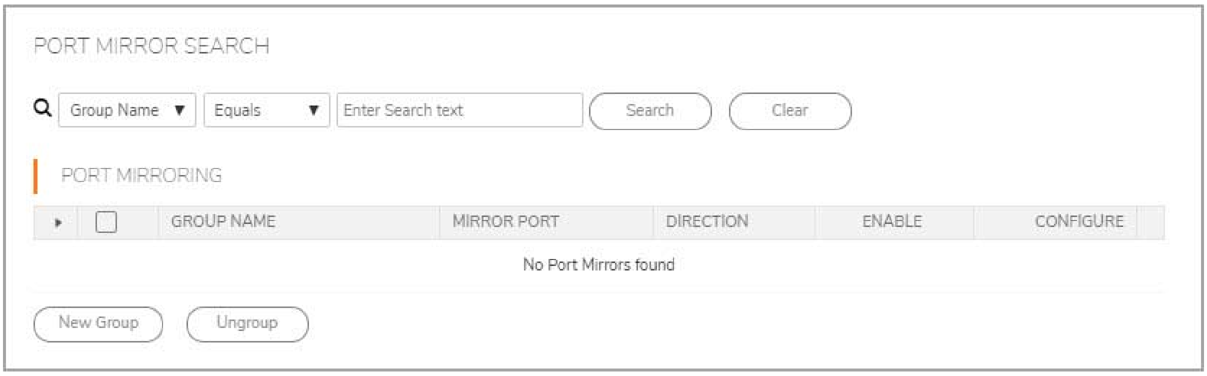
3 Click **Search**. The **Link Aggregation** table displays only those ports that match the search criteria.

4 To return the **Link Aggregation** table to its regular display, click **Clear**.

3

Configuring Port Mirroring

Port Mirroring allows you to easily monitor and inspect network traffic on one or more ports.



PORT MIRROR SEARCH

PORT MIRRORING

▸	□	GROUP NAME	MIRROR PORT	DIRECTION	ENABLE	CONFIGURE

No Port Mirrors found

You can configure Port Mirroring on the SonicWall appliance to send a copy of network packets seen on one or more switch ports (or on a VLAN) to another switch port called the mirror port. By connecting to the mirror port, you can monitor the traffic passing through the mirrored port(s).

A VLAN trunk port can be mirrored, but cannot act as a mirror port itself.

The **Switching > Port Mirroring** page allows you to assign mirror ports to mirror ingress, egress or bidirectional packets coming from a group of ports.

Topics:

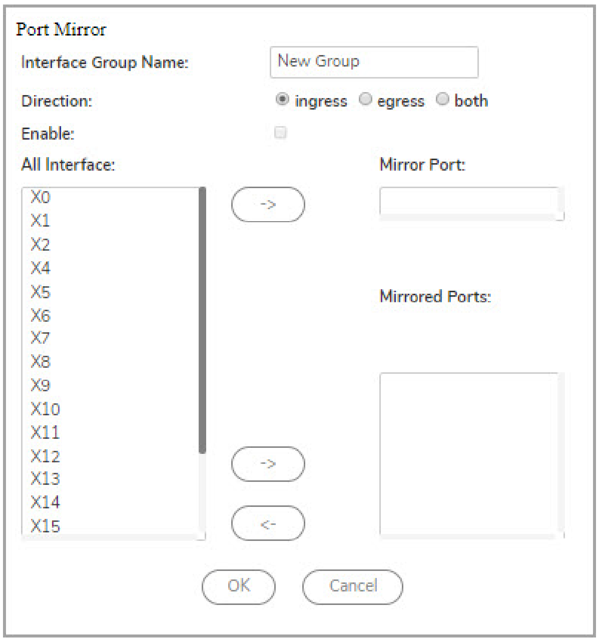
- Configuring a Port Mirroring Group
- Enabling the Mirror Group
- Searching the Port Mirroring Table
- Deleting a Port Mirroring Group

Configuring a Port Mirroring Group

To create a new port mirroring group:

1 Navigate to the **Switching > Port Mirroring** page.

2 Click **New Group**. The **Add Mirror Group** dialog displays.



Port Mirror

Interface Group Name: New Group

Direction: ● ingress ○ egress ○ both

Enable: □

All Interface:

3 Type a descriptive name for the group into the **Interface Group Name** field. The default is **New Group**.

4 For the **Direction**, choose one of the following:

- **ingress** (default) – Monitor traffic arriving on the mirrored port(s).
- **egress** – Monitor traffic being sent out on the mirrored port(s).
- **both** – Monitor traffic in both directions on the mirrored port(s).

5 Select **Enable** to enable the port mirror.

6 In the **All Interfaces** list:

a Select the port to mirror the traffic to.

b Click the top right-arrow to move it to the **Mirror Port** field. You must use an unassigned port as the mirror port.

7 In the **All Interfaces** list:

a Select one or more ports to be monitored.

b Click the lower right-arrow to move it/them to the **Mirrored Ports** field. You are able to monitor traffic on the mirrored port(s) by connecting to the mirror port.

8 Click **OK**. The **Modify Task Description and Schedule** dialog displays.

9 Optionally, enter a description of the task in the **Description** field. The default is **Add New Port Mirroring Group**.

10 Choose a schedule:

- **Default** (default)
- **Immediate**
- **At:**

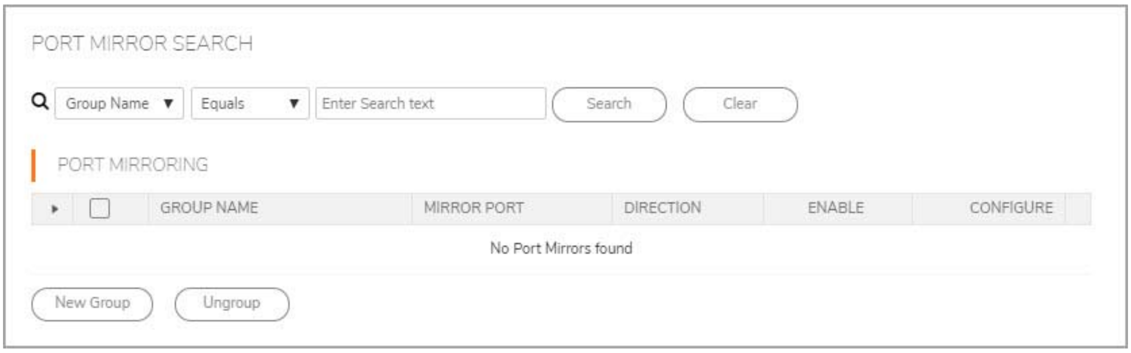
11 Click **Accept**. The group is added to the trunk port in the **Port Mirroring** table.

Enabling the Mirror Group

To enable a mirrored group:

1 Navigate to the **Switching > Port Mirroring** page.

2 Scroll to the **Port Mirroring** section.



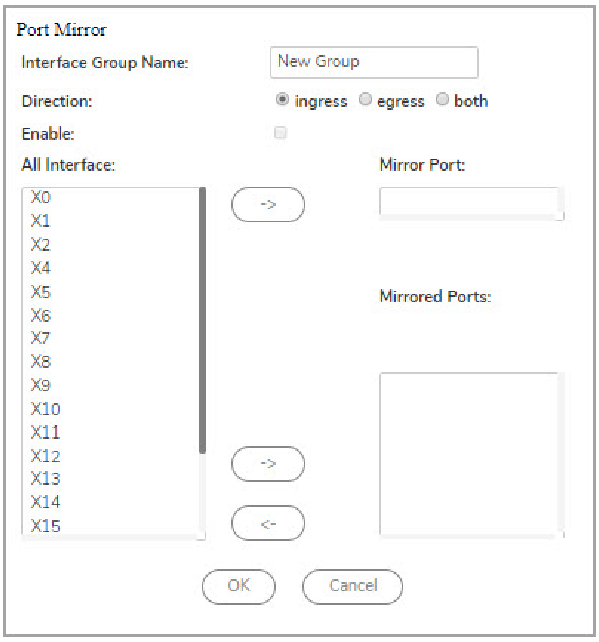
PORT MIRROR SEARCH

Group Name ▼ Equals ▼ Enter Search text

PORT MIRRORING

▸	□	GROUP NAME	MIRROR PORT	DIRECTION	ENABLE	CONFIGURE
			No Port Mirrors found			

3 Use the **Edit** icon in the **Configure** column to edit an existing Port Mirroring Group, or click **New Group**. The **Edit/Add Mirror Group** dialog displays.



Port Mirror

Interface Group Name: New Group

Direction: ● ingress ○ egress ○ both

Enable: □

All Interface:

X0
X1
X2
X4
X5
X6
X7
X8
X9
X10
X11
X12
X13
X14
X15

Mirror Port:

Mirrored Ports:

4 Select the checkbox for **Enable**.

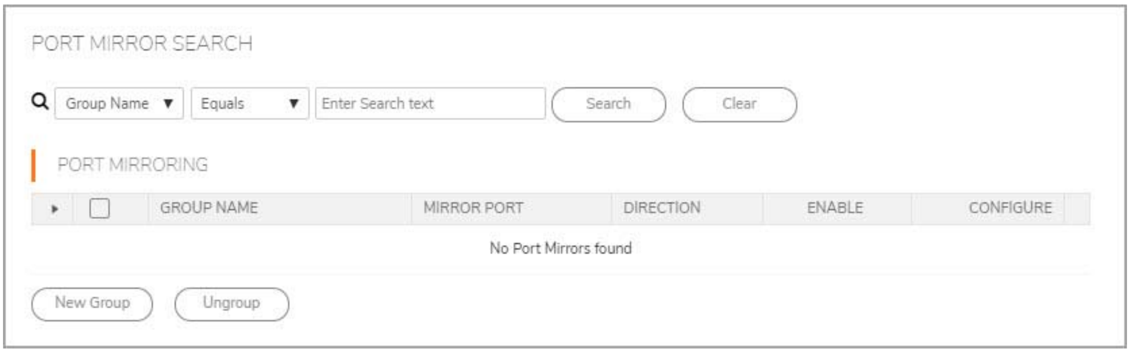
5 Click **OK**.

Searching the Port Mirroring Table

You can restrict the display of the **Port Mirroring** table to only those ports of interest.

To search for a particular mirror port group:

1 Navigate to the **Switching > Port Mirroring** page.


PORT MIRROR SEARCH

Group Name ▼ | Equals ▼ | Enter Search text | Search | Clear

PORT MIRRORING

▸	□	GROUP NAME	MIRROR PORT	DIRECTION	ENABLE	CONFIGURE
		No Port Mirrors found				

New Group | Ungroup

2 In the **Search** fields of the **Port Mirror Search** section,

- Select:
  - **Group Name** (default)
  - **Direction**
- Select the search operator:
  - **Equals**
  - **Starts with**
  - **Ends with**
  - **Contains**
- Enter the search criterion to match the operator.

3 Click **Search**. The **Port Mirroring** table displays only those ports that match the search criteria.

4 To return the **Port Mirroring** table to its regular display, click **Clear**.

Deleting a Port Mirroring Group

To remove a port mirroring group:

1 Navigate to the **Switching > Port Mirroring** page.

2 Select the checkbox next to the port mirroring group that you want to delete.

3 Click either:

- **Ungroup**.
- The **Trash** icon for the group.

A confirmation dialog displays.

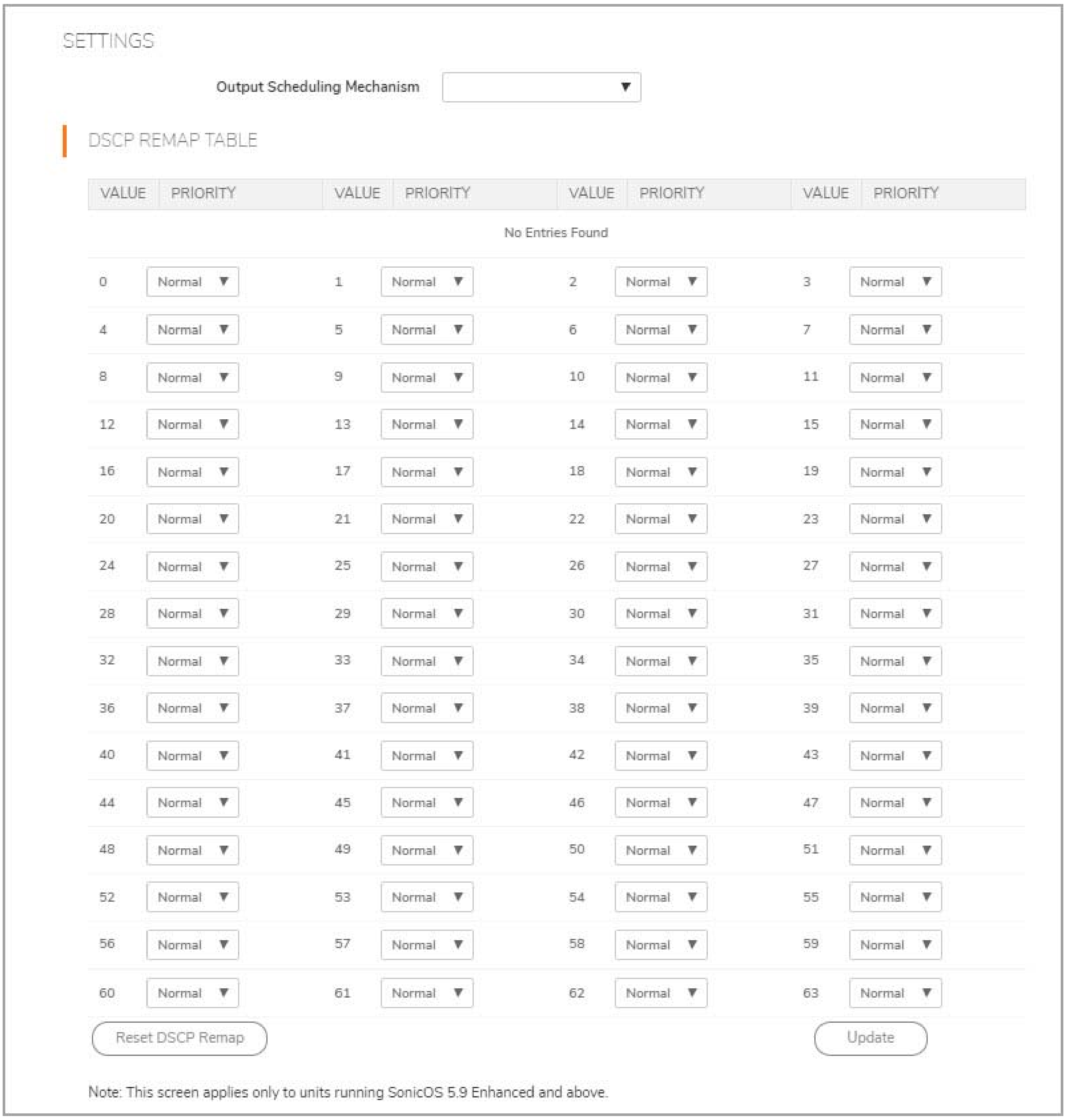
4 Click **OK**.

4

Configuring Layer 2 QoS

Layer 2 Quality of Service (QoS) allows for traffic prioritization and bandwidth management to minimize network delay using Cost of Service (CoS) classification, and DSCP marking.

From the GlobalView, navigate to **Switching > Layer 2 QoS**.



SETTINGS

Output Scheduling Mechanism

DSCP REMAP TABLE

VALUE	PRIORITY	VALUE	PRIORITY	VALUE	PRIORITY	VALUE	PRIORITY
No Entries Found							
0	Normal	1	Normal	2	Normal	3	Normal
4	Normal	5	Normal	6	Normal	7	Normal
8	Normal	9	Normal	10	Normal	11	Normal
12	Normal	13	Normal	14	Normal	15	Normal
16	Normal	17	Normal	18	Normal	19	Normal
20	Normal	21	Normal	22	Normal	23	Normal
24	Normal	25	Normal	26	Normal	27	Normal
28	Normal	29	Normal	30	Normal	31	Normal
32	Normal	33	Normal	34	Normal	35	Normal
36	Normal	37	Normal	38	Normal	39	Normal
40	Normal	41	Normal	42	Normal	43	Normal
44	Normal	45	Normal	46	Normal	47	Normal
48	Normal	49	Normal	50	Normal	51	Normal
52	Normal	53	Normal	54	Normal	55	Normal
56	Normal	57	Normal	58	Normal	59	Normal
60	Normal	61	Normal	62	Normal	63	Normal

Note: This screen applies only to units running SonicOS 5.9 Enhanced and above.

A SonicWall appliance can be configured to trust Class of Service (CoS) (IEEE 802.1p) and/or trust Differentiated Services Code Point (DSCP) per port and treat the frames appropriately.

The **Switching > Layer 2 QoS** page allows you to configure QoS settings per interface.

ⓘ **NOTE:** The X1 interface on the NSA 2400MX cannot be configured for switching.

Four queues with different priority levels (low, normal, high, highest) are supported; see Supported Queues with Different Priority Levels. These are mapped to the eight levels defined in IEEE 802.1p and cannot be changed:

Supported Queues with Different Priority Levels

User Priority	Traffic Type	Queue Priority
0	Best Effort	Normal
1	Background	Low
2	Spare	Low
3	Excellent Effort	Normal
4	Controlled Load	High
5	Video	High
6	Voice	Highest
7	Network Control	Highest

The DSCP mapping can be configured. Frames received on ports configured to trust CoS or DSCP are queued appropriately according to the mapping table. An option is provided to select the field to use when both the 802.1p tag field and the DSCP field are present in ingressing frames.

For QoS settings, ports can be assigned a default priority. The default priority is used when **Trust CoS** or **Trust DSCP** is enabled, but the information is absent. When **Fixed Priority** is enabled, the 802.1p tag field and DSCP field are ignored and the default priority is used.

Topics:

- Configuring the Scheduling Mechanism
- Configuring DSCP Mapping
- Resetting to Default Values

Configuring the Scheduling Mechanism

To configure Weighted Round-Robin or Strict Priority Queue as the output scheduling mechanism:

1 In GlobalView, on the **Switching > Layer 2 QoS** page, select one of the following from **Output Scheduling Mechanism**:

- **Weighted Round-Robin** – The weighting factors are 8:4:2:1.
- **Strict Priority Queue** – The 802.1p tag field and DSCP field are ignored and the default priority is used.

2 Click **Update**. The **Modify Task Description and Schedule** dialog displays.

3 Optionally, enter a description of the task in the **Description** field. The default is **Edit QoS Settings : Output Scheduling Mechanism : Strict Priority Queue** or **Edit QoS Settings : Output Scheduling Mechanism : Weighted Round-Robin**.

4 Choose a schedule:

- **Default** (default)
- **Immediate**
- **At:**

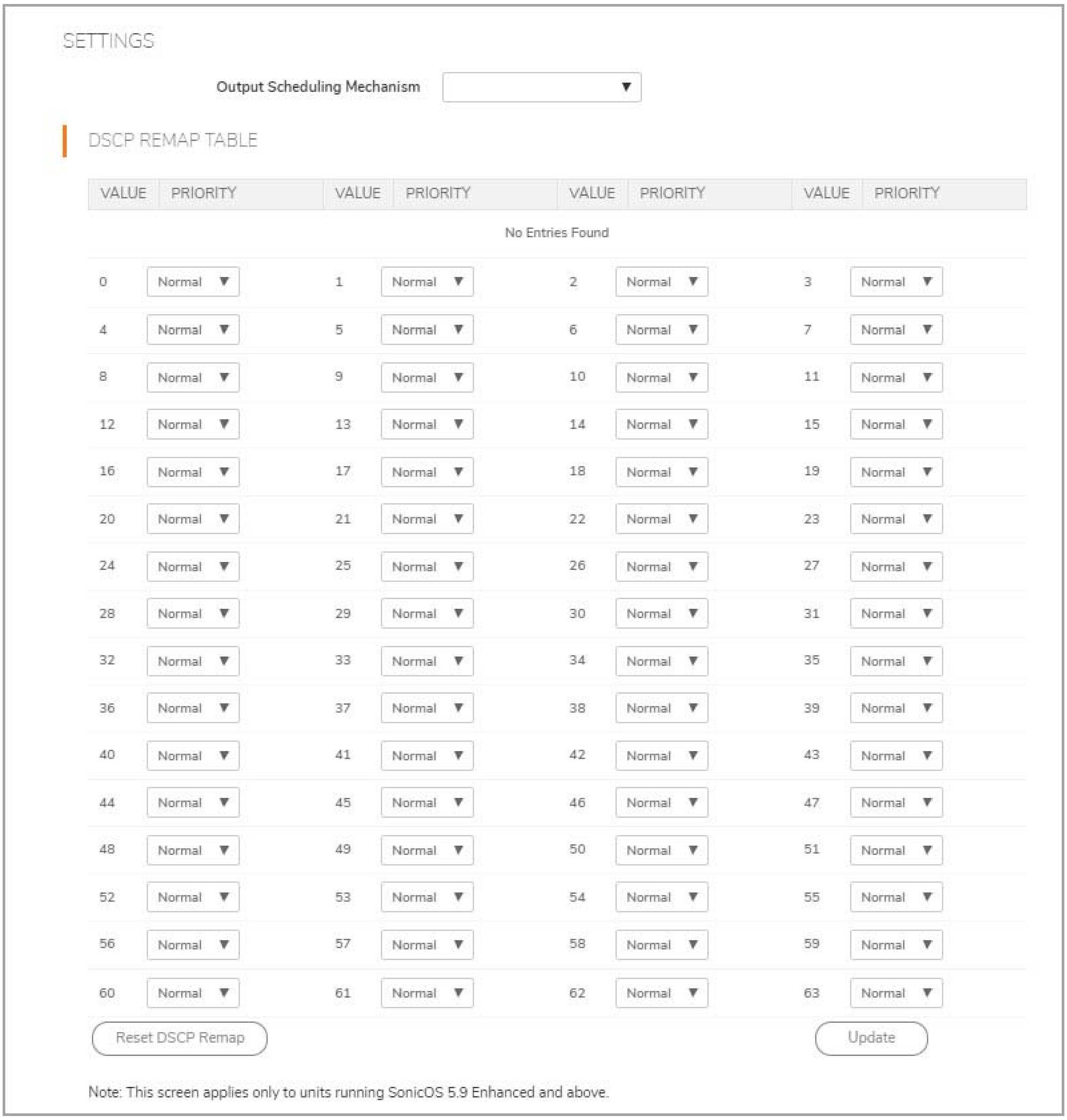
5 Click **Accept**.

Configuring DSCP Mapping

You can configure the DSCP mapping by setting the priority levels for DSCP values 0 through 63. The **Switching > Layer 2 QoS** page also provides **Reset DSCP Remap** to reset the priority levels back to the default, which is **Normal**.

To configure DSCP mapping:

1 In GlobalView, navigate to **Switching > Layer 2 QoS**. The priority settings for all DSCP values, 0 - 63, are displayed.



SETTINGS

Output Scheduling Mechanism

DSCP REMAP TABLE

VALUE	PRIORITY	VALUE	PRIORITY	VALUE	PRIORITY	VALUE	PRIORITY
No Entries Found							
0	Normal ▼	1	Normal ▼	2	Normal ▼	3	Normal ▼
4	Normal ▼	5	Normal ▼	6	Normal ▼	7	Normal ▼
8	Normal ▼	9	Normal ▼	10	Normal ▼	11	Normal ▼
12	Normal ▼	13	Normal ▼	14	Normal ▼	15	Normal ▼
16	Normal ▼	17	Normal ▼	18	Normal ▼	19	Normal ▼
20	Normal ▼	21	Normal ▼	22	Normal ▼	23	Normal ▼
24	Normal ▼	25	Normal ▼	26	Normal ▼	27	Normal ▼
28	Normal ▼	29	Normal ▼	30	Normal ▼	31	Normal ▼
32	Normal ▼	33	Normal ▼	34	Normal ▼	35	Normal ▼
36	Normal ▼	37	Normal ▼	38	Normal ▼	39	Normal ▼
40	Normal ▼	41	Normal ▼	42	Normal ▼	43	Normal ▼
44	Normal ▼	45	Normal ▼	46	Normal ▼	47	Normal ▼
48	Normal ▼	49	Normal ▼	50	Normal ▼	51	Normal ▼
52	Normal ▼	53	Normal ▼	54	Normal ▼	55	Normal ▼
56	Normal ▼	57	Normal ▼	58	Normal ▼	59	Normal ▼
60	Normal ▼	61	Normal ▼	62	Normal ▼	63	Normal ▼

Note: This screen applies only to units running SonicOS 5.9 Enhanced and above.

2 For each DSCP value (0 - 63) that you want to change, select one of the following from **Priority**:

- **Low**
- **Normal** (default)
- **High**
- **Highest**

3 Click **Update**. The **Modify Task Description and Schedule** dialog displays.

4 Optionally, enter a description of the task in the **Description** field. The default is **Edit QoS Settings : Output Scheduling Mechanism : Strict Priority Queue** or **Edit QoS Settings : Output Scheduling Mechanism : Weighted Round-Robin**.

5 Choose a schedule:

- **Default** (default)
- **Immediate**
- **At:**

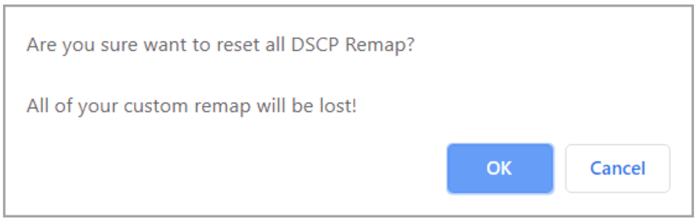
6 Click **Accept**. The priorities are added to the **DSCP Remap Table**. The **DSCP Remap Table** is hidden when updated, but if you show it again, the updated priority settings are displayed.

Resetting to Default Values

To reset all DSCP Remap values to default, Normal:

1 In GlobalView, navigate to **Switching > Layer 2 QoS**.

2 Click **Reset DSCP Remap**. A confirmation dialog displays.



Are you sure want to reset all DSCP Remap?

All of your custom remap will be lost!

3 Click **OK**. The **Modify Task Description and Schedule** dialog displays.

4 Optionally, enter a description of the task in the **Description** field. The default is **Edit QoS Settings : reset DSCP Remap values to Default**.

5 Choose a schedule:

- **Default** (default)
- **Immediate**
- **At:**

6 Click **Accept**. The priorities are reset to **Normal** in the **DSCP Remap Table.** The **DSCP Remap Table** is hidden when updated, but if you show it again, the updated priority settings are displayed.

5

Managing Layer 2 Discovery and LLDP/LLTD

ⓘ **NOTE:** Switching is available on all security appliances except the SM 9800, NSA 2600, TZ series, and SOHO W security appliances.
LLDP is supported on the NSA 3600 and higher security appliances and is also supported when High Availability is enabled.

About L2 Discovery and LLDP

To discover neighboring devices and their capabilities, the SonicWall Security Appliance uses:

- IEEE 802.1AB (LLDP: Link Layer Discovery Protocol)/Microsoft LLTD (Link Layer Topology Discovery)
- IEEE 802.3-2012 protocols
- A switch-forwarding table

LLDP operates at Layer 2 and exchanges LLDP Protocol Data Units (LLDPDUs) between the neighbors containing a sequence of variable length information elements that include type-length-values (TLV). The information is stored in the SNMP MIBs. These Layer 2 protocols are used by networking devices to advertise their identities and capabilities and to identify their directly connected Layer 2 neighbors/peers on wired Ethernet networks; they do not cross a broadcast domain.

More information about these protocols is available at:

- https://en.wikipedia.org/wiki/Link_Layer_Topology_Discovery
- https://en.wikipedia.org/wiki/Link_Layer_Discovery_Protocol

  ⓘ **TIP:** GMS supports LLDP Transmit and Transmit-Receive Modes.

- https://msdn.microsoft.com/en-us/library/windows/desktop/dn594471(v=vs.85).aspx

LLDP makes troubleshooting easier, especially in cases where peers are not detected by ping or traceroute.

Topics:

- Supported LLDP Modes
- Type-Length-Values
- Effect of Interface Link on LLDP Functions

Supported LLDP Modes

These LLDP modes are supported:

- LLDP-receive

- LLDP-transmit
- LLDP-transmit-receive
- LLDP-disabled

You can create custom LLDP profiles for individual interfaces.

These interface types and modes support LLDP:

L2 Interface	If the physical port is configured in L2 Mode.
L3 Interface	If the physical port is configured in L3 Mode.
Wire-Mode Interface	Supported for secure and inspect mode for wire-mode interfaces, but not for VLAN interfaces.
L2 Bridge Interface	Supported for the physical interface, but not for VLAN interfaces.
VLAN Sub-Interface	Not supported.
LAG/LACP	Supported for learn only on the aggregate port and not a member, but is supported for send on individual interfaces. An aggregate port shows neighbor information for both itself and its members.

Type-Length-Values

Each LLDP frame starts with three mandatory type-length-values TLVs: Chassis ID, Port ID and TTL. The mandatory TLVs are followed by any number of optional TLVs. The LLDP frame ends with a mandatory End-of-frame TLV.

Topics:

- Mandatory TLVs
- Optional TLVs

Mandatory TLVs

The following table describes the mandatory LLDP TLVs supported for both transmit and receive.

Mandatory TLVs

TLV Name	TLV Type	Description	GMS Usage
Chassis ID TLV	1	Identifies the firewall chassis. Each firewall must have exactly one unique Chassis ID.	GMS sends the MAC address of the security appliance in the Chassis ID field. The MAC address is same as the security appliance serial number.
Port ID TLV	2	Identifies the port from which the LLDPDU is sent. The security appliance uses the interface's *ifname* as the Port ID. For example, Port ID can be X1, X2, X3.	The Port ID subtype 5 (interface name) is used to identify the transmitting port.

Mandatory TLVs (Continued)

TLV Name	TLV Type	Description	GMS Usage
Time-to-live (TTL) TLV	3	Specifies how long (in seconds) LLDPDU information received from the peer is retained as valid in the local security appliance (range is 0-65535). The value is a multiple of the LLDP Hold Time Multiplier. When the TTL value is 0, the information associated with the device is no longer valid and GMS removes that entry from the database.	Calculated internally.
End of LLDPDU frame TLV	0	Indicates the end of the TLVs in the LLDP Ethernet frame.	

Optional TLVs

The following table describes the optional LLDP TLVs supported for both transmit and receive.

Optional TLVs

TLV Name	TLV Type	Description	GMS Usage
Port Description	4	The port description in alpha-numeric format.	Advertises the values/string added in the comment section of the network interface field.
System Name	5	The security appliance name in alphanumeric format.	Advertises the Firewall Name.
System Description	6	The full name and version identification of the system's hardware type, software operating system, and networking software in alpha-numeric format.	Advertised as Firewall in this field.

Optional TLVs (Continued)

TLV Name	TLV Type	Description	GMS Usage
System Capabilities	7	This field contains a bit-map of the capabilities that define primary functions of the system. Describes the deployment mode of the interface: • An L3 interface is advertised with router (bit 6) capability and the “other” bit (bit 1). • An L2 interface is advertised with MAC Bridge (bit 3) capability and the “other” bit (bit 1). A virtual wire interface is advertised with Repeater (bit 2) capability and the “other” bit (bit 1).	Advertises the features supported by the security appliance and the enabled features.
Management Address	8	One or more IP addresses used for the management of the device: • IP address of the management (MGT) interface. • IPv4 and/or IPv6 address of the interfaceLoopback address. • User-defined address entered in the management address field; If no management IP address is provided, the default is the MAC address of the transmitting interface. The interface number of the specified management address is included. Also included is the OID of the hardware interface with the specified management address (if applicable). If more than one management address is specified, they are sent in the order they are specified, starting at the top of the list. One Management Address is supported. This is an optional parameter and can be left disabled.	Advertises the management IP address of an interface if it is configured. **NOTE:** IPv6 is not supported.

Effect of Interface Link on LLDP Functions

LLDP only functions when the interface link is up. When the mode is changed:

- From Receive to Transmit
- From Transmit-Only to Receive-Only
- To Disabled

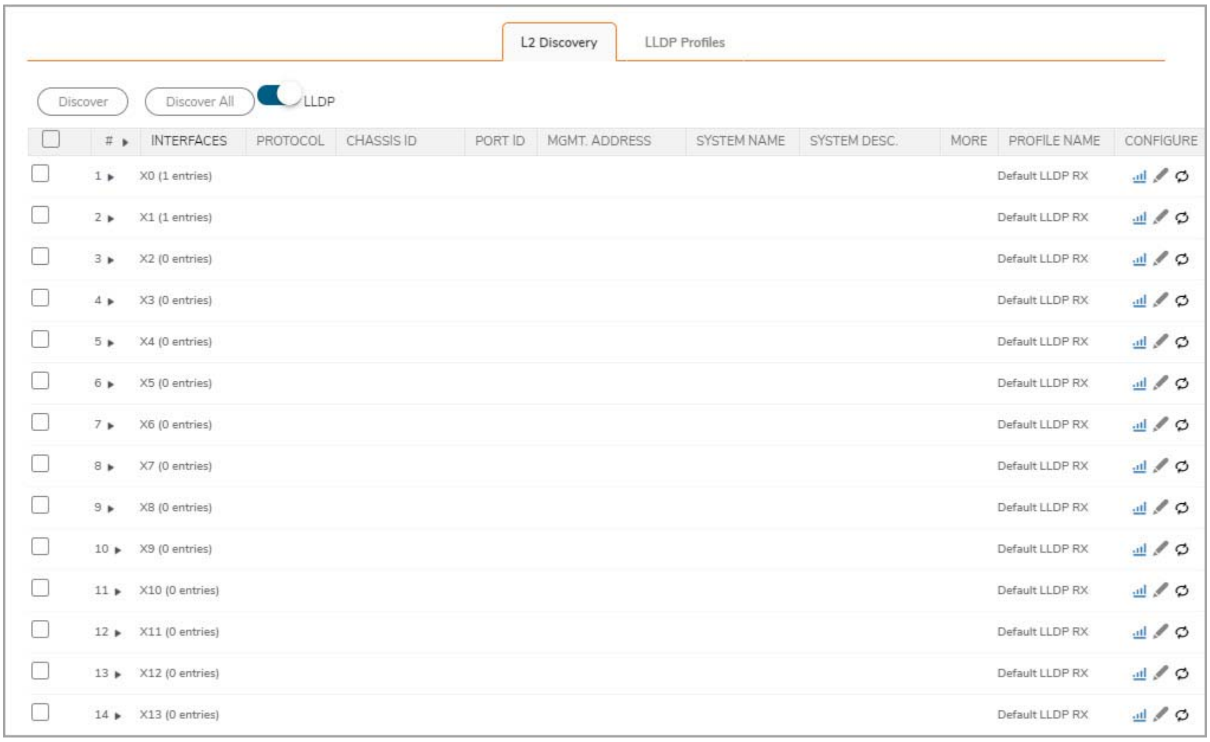
A final LLDP shutdown LLDPDU is sent with these mandatory TLVs:

- Chassis ID TLV
- Port ID TLV

- TTL TLV
- End of LLDPDU TLV

The statistics counters are reset after the link goes down.

Viewing L2 Discovery and LLDP/LLTD Interfaces



☐	#	INTERFACES	PROTOCOL	CHASSIS ID	PORT ID	MGMT. ADDRESS	SYSTEM NAME	SYSTEM DESC.	MORE	PROFILE NAME	CONFIGURE
☐	1	X0 (1 entries)								Default LLDP RX	
☐	2	X1 (1 entries)								Default LLDP RX	
☐	3	X2 (0 entries)								Default LLDP RX	
☐	4	X3 (0 entries)								Default LLDP RX	
☐	5	X4 (0 entries)								Default LLDP RX	
☐	6	X5 (0 entries)								Default LLDP RX	
☐	7	X6 (0 entries)								Default LLDP RX	
☐	8	X7 (0 entries)								Default LLDP RX	
☐	9	X8 (0 entries)								Default LLDP RX	
☐	10	X9 (0 entries)								Default LLDP RX	
☐	11	X10 (0 entries)								Default LLDP RX	
☐	12	X11 (0 entries)								Default LLDP RX	
☐	13	X12 (0 entries)								Default LLDP RX	
☐	14	X13 (0 entries)								Default LLDP RX	

Topics:

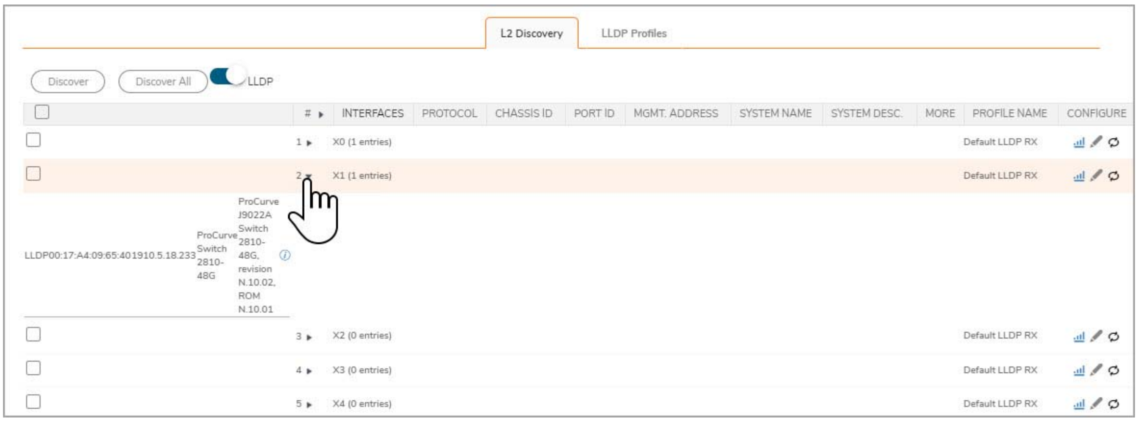
- Displaying Peer Information
- Displaying Statistics

Displaying Peer Information

To display L2 discovery information:

1 Navigate to **Switching > L2 Discovery**.

2 In the **L2 Discovery** table, click the **Expand** icon for the desired interface. Information about the nodes (entries) discovered for the interface are displayed.



☐	# ▸	INTERFACES	PROTOCOL	CHASSIS ID	PORT ID	MGMT. ADDRESS	SYSTEM NAME	SYSTEM DESC.	MORE	PROFILE NAME	CONFIGURE
☐	1 ▸	X0 (1 entries)								Default LLDP RX	
☐	2 ▾	X1 (1 entries)								Default LLDP RX	
LLDP00:17:A4:09:65:401910.5.18.233							ProCurve Switch 2810-48G	ProCurve J9022A Switch 2810-48G, revision N.10.02, ROM N.10.01	ⓘ		
☐	3 ▸	X2 (0 entries)								Default LLDP RX	
☐	4 ▸	X3 (0 entries)								Default LLDP RX	
☐	5 ▸	X4 (0 entries)								Default LLDP RX	

Interfaces Lists the Security Appliance’s interfaces along with either the number of entries.

Protocol Uses IEEE 802.1AB (LLDP) and Microsoft LLTD protocols and a switch forwarding table to discover devices visible from a port.

Chassis ID Identifies the security appliance’s chassis. Each security appliance must have exactly one unique Chassis ID that is a string value consisting of mostly the MAC address of the peer.

Port ID Identifies the port from which the LLDPDU is sent and is a string value of the port name or number. The security appliance uses the interface's `ifname` as the Port ID. For example, Port ID can be X1, X2, X3.

Mgmt. Address Lists the IP or MAC address of the peer used for the management of the device. If multiple management addresses are returned, only the first address is shown.

System Name Name of the security appliance, in alpha-numeric format.

System Desc. Full name and version identification of the security appliance's hardware type, software operating system, and networking software, in alpha-numeric format.

More Contains an Information icon that displays additional peer information.

Profile Name Name of the default or custom profile name.

Configure Contains the **Statistics**, **Edit**, and **Refresh** icons for the interfaces.

3 To display additional peer information for a peer entry, mouse over the **Information** icon in the **More** column for that peer. A pop-up displays.

MAC Address MAC address of the peer.

Vendor Vendor name from the main menu.

Port Description String value from the Comments field for the interface on SonicWall security appliances.

System Capabilities String value representing the list of capabilities supported by the peer device.

Displaying Statistics

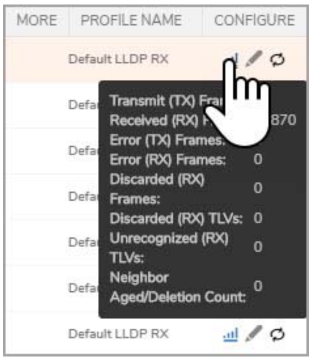
For each interface, you can display the number of:

- Transmitted, received, erroneous, and discarded frames.
- Discarded and unrecognized TLVs.
- Aged or deleted neighbors.

To display an interface's statistics:

1 Navigate to **Switching > L2 Discovery**.

2 In the **L2 Discovery** table, mouse over the **Statistics** icon for the interface. The Statistics pop-up displays.



MORE	PROFILE NAME	CONFIGURE
	Default LLDP RX	
	Defa	
	Defa	
	Defa	
	Defa	
	Defa	
	Default LLDP RX	

Transmit (TX) Fra

Received (RX) F 870

Error (TX) Frames:

Error (RX) Frames: 0

Discarded (RX) Frames: 0

Discarded (RX) TLVs: 0

Unrecognized (RX) TLVs: 0

Neighbor Aged/Deletion Count: 0

Discovering Neighbors

You can discover neighbors for:

- A single interface.
- Multiple interfaces.
- All interfaces.

TIP: For LAG with trunk mode, all ports can discover neighbors; LAG with PortShield mode learns neighbors only under the aggregator port.

To discover neighbors for single or multiple interfaces:

1 Navigate to **Switching > L2 Discovery**.

2 Select the interface or interfaces you would like to discover in the **L2 Discovery** table.

3 Click **Discover**.

4 A change notification appears. You are alerted when the latest data is available after Discovery is complete and the interfaces are updated.

To discover neighbors for all interfaces:

1 Navigate to **Switching > L2 Discovery**.

2 Click **Discover All**.

3 A change notification appears. After the change order is approved, all interfaces are updated.

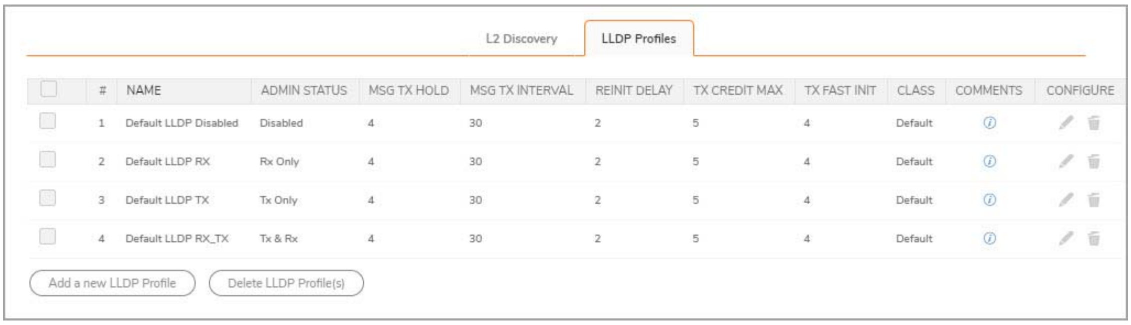
Adding an LLDP Custom Profile

IMPORTANT: Changing default values affects the duration and the number of frames transmitted during each cycle.

To add an LLDP custom profile:

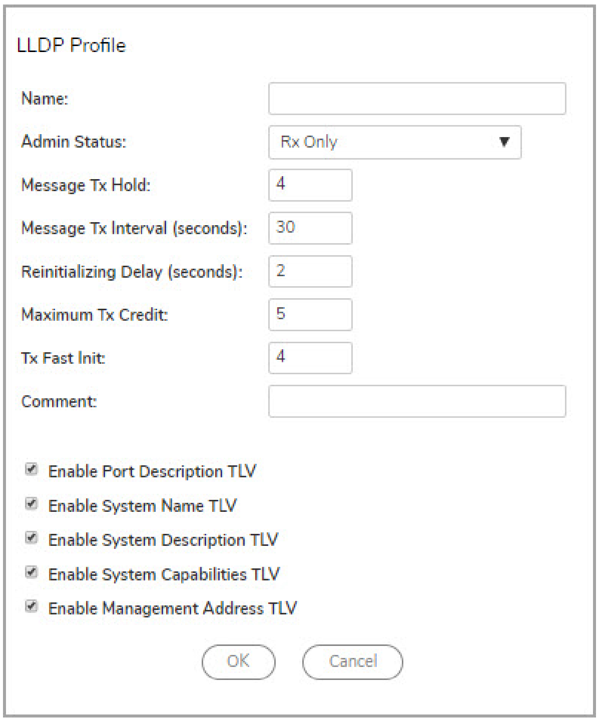
1 Navigate to **Switching > L2 Discovery**.

2 Click the **LLDP Profiles** view for the interface.



□	#	NAME	ADMIN STATUS	MSG TX HOLD	MSG TX INTERVAL	REINIT DELAY	TX CREDIT MAX	TX FAST INIT	CLASS	COMMENTS	CONFIGURE
□	1	Default LLDP Disabled	Disabled	4	30	2	5	4	Default	ⓘ	
□	2	Default LLDP RX	Rx Only	4	30	2	5	4	Default	ⓘ	
□	3	Default LLDP TX	Tx Only	4	30	2	5	4	Default	ⓘ	
□	4	Default LLDP RX_TX	Tx & Rx	4	30	2	5	4	Default	ⓘ	

3 Click **Add a new LLDP Profile**. The **Add LLDP Profile** dialog displays.



LLDP Profile

Name:	
Admin Status:	Rx Only ▼
Message Tx Hold:	4
Message Tx Interval (seconds):	30
Reinitializing Delay (seconds):	2
Maximum Tx Credit:	5
Tx Fast Init:	4
Comment:	

☑ Enable Port Description TLV

☑ Enable System Name TLV

☑ Enable System Description TLV

☑ Enable System Capabilities TLV

☑ Enable Management Address TLV

4 In the **Name** field, enter a descriptive name for the LLDP profile.

5 From **Admin Status**, select transmission mode for the LLDP profile:

- **Disabled**
- **Rx Only** (default)
- **Tx Only**
- **Tx & Rx**

6 To change the message transmission interval to determine the value of the TTL value of the LLDP frames transmitted by the LLDP agent, enter a multiplier in the **Message Tx Hold** field. The minimum value is 1, the maximum is 100, and the default value is **4**.

7 To define the time interval, in timer ticks, between transmissions during normal transmission periods, enter the interval, in seconds, in the **Message Tx Interval** field. The minimum is 1 second, the maximum is 3600 seconds, and the default is **30** seconds.

8 To specify the amount of delay from when Admin Status becomes Disabled until reinitialization can be attempted again for the profile, enter the delay, in seconds, in the **Reinitializing Delay** field. The

minimum is **1** second, the maximum is 10 seconds, and the default, and recommended delay, is **2** seconds.

9 To specify the maximum number of LLDPDUs that can be transmitted at any time for the LLDP profile, enter the number in the **Maximum Tx Credit** field. The minimum is 1, the maximum is 10, and the default is **5**.

10 To specify an initial number of LLDPDUs transmitted during a fast transmission period, enter the number in the **Tx Fast Init** field. The minimum is 1, the maximum is 8, and the default is **4**.

11 Enter an optional comment in the **Comment** field. What you enter here displays when you mouse-over the **Information** icon in the **Comments** column of the **LLDP Profile** table.

12 To include the port description of the Security Appliance in the optional TLV of a LLDPDU message, select **Enable Port Description TLV**. This option is selected by default.

13 To include the configured Firewall Name of the Security Appliance in the optional TLV if a LLDPDU message, select **Enable System Name TLV**. This option is selected by default.

14 To include **Firewall** as the identification of the Security Appliance in the optional TLV if a LLDPDU message, select **Enable System Description TLV**. This option is selected by default.

15 To include an IPv4 or MAC address used for managing an interface of the Security Appliance in the optional TLV if a LLDPDU message, select **Enable Management Address TLV**. This option is selected by default.

16 Click **OK**. The name of the profile displays in the **Profile Name** column of the L2 Discovery table.

Editing a Custom LLDP Profile

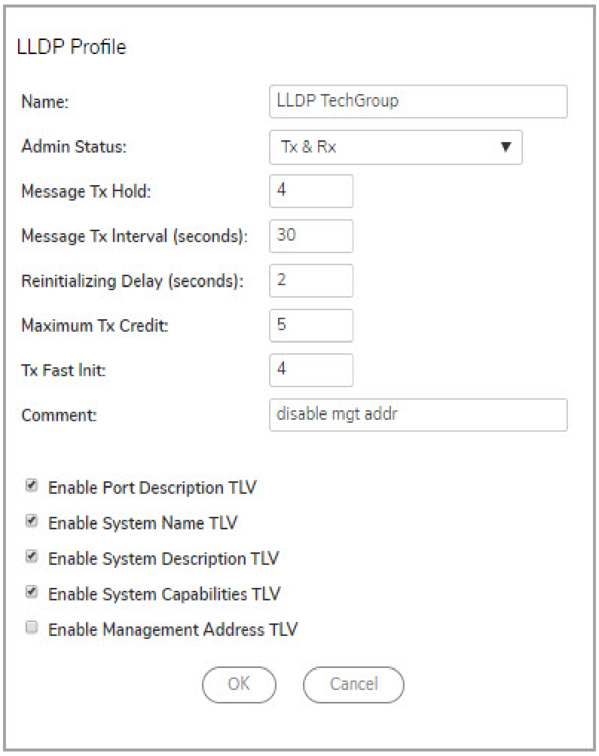
ⓘ **TIP:** Default LLDP Profiles cannot be edited.

To edit a custom LLDP profile:

1 Navigate to **Switching > L2 Discovery**.

2 Click **LLDP Profile**.

3 Click the **Edit** icon for the profile. The **Edit LLDP Profile** dialog displays.



LLDP Profile

Name:	LLDP TechGroup
Admin Status:	Tx & Rx
Message Tx Hold:	4
Message Tx Interval (seconds):	30
Reinitializing Delay (seconds):	2
Maximum Tx Credit:	5
Tx Fast Init:	4
Comment:	disable mgt addr

☑ Enable Port Description TLV

☑ Enable System Name TLV

☑ Enable System Description TLV

☑ Enable System Capabilities TLV

□ Enable Management Address TLV

4 Make changes as necessary. For information about the options, see Adding an LLDP Custom Profile.

5 Click **OK**.

Deleting Custom Profiles

ⓘ | **TIP:** Default profiles cannot be deleted.

To delete a custom profile:

1 Navigate to **Switching > L2 Discovery**.

2 Click the **LLDP Profile** view.

3 Click the **Delete** icon for the profile. A confirmation message displays.

4 Click OK.

To delete one or more custom profiles:

1 Navigate to **Switching > L2 Discovery**.

2 Click the **LLDP Profile** view.

3 Select the profiles to be deleted.

4 Click **Delete LLDP Profile(s)**. A confirmation message displays.

5 Click **OK**.

To delete all custom profiles:

1 Navigate to **Switching > L2 Discovery**.

2 Click the **LLDP Profile** view.

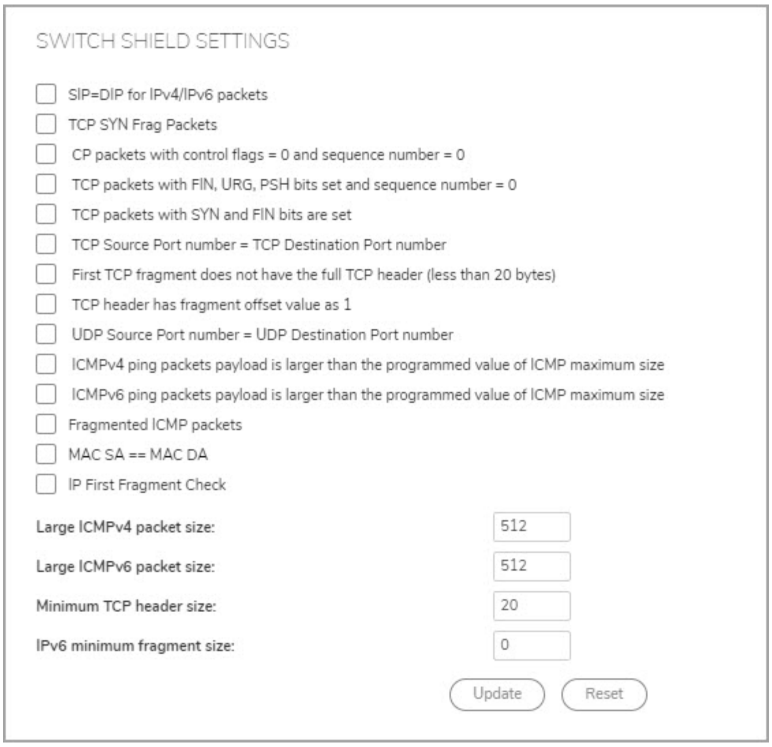
3 Click the top checkbox in the left column heading. All custom profiles are selected.

4 Click **Delete LLDP Profile(s)**. A confirmation message displays.

5 Click **OK**.

Configuring Switch Shield

ⓘ | **NOTE:** Switching is available on all NSA 2650 and above firewalls.



SWITCH SHIELD SETTINGS

☐ SIP=DIP for IPv4/IPv6 packets

☐ TCP SYN Frag Packets

☐ CP packets with control flags = 0 and sequence number = 0

☐ TCP packets with FIN, URG, PSH bits set and sequence number = 0

☐ TCP packets with SYN and FIN bits are set

☐ TCP Source Port number = TCP Destination Port number

☐ First TCP fragment does not have the full TCP header (less than 20 bytes)

☐ TCP header has fragment offset value as 1

☐ UDP Source Port number = UDP Destination Port number

☐ ICMPv4 ping packets payload is larger than the programmed value of ICMP maximum size

☐ ICMPv6 ping packets payload is larger than the programmed value of ICMP maximum size

☐ Fragmented ICMP packets

☐ MAC SA == MAC DA

☐ IP First Fragment Check

Large ICMPv4 packet size:	512
Large ICMPv6 packet size:	512
Minimum TCP header size:	20
IPv6 minimum fragment size:	0

To configure Switch Shield settings:

1. Navigate to **Switching > Switch Shield**.
2. Select the options for DDOS protection using switch capabilities. None of the options are selected by default.
3. Click **Update**.

7

SonicWall Support

Technical support is available to customers who have purchased SonicWall products with a valid maintenance contract.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. To access the Support Portal, go to https://www.sonicwall.com/support.

The Support Portal enables you to:

- View knowledge base articles and technical documentation
- View and participate in the Community forum discussions at https://community.sonicwall.com/technology-and-support.
- View video tutorials
- Access MySonicWall
- Learn about SonicWall professional services
- Review SonicWall Support services and warranty information
- Register for training and certification
- Request technical support or customer service

To contact SonicWall Support, visit https://www.sonicwall.com/support/contact-support.

About This Document

Legend

ⓘ **NOTE:** A NOTE icon indicates supporting information.

ⓘ **IMPORTANT:** An IMPORTANT icon indicates supporting information that may need a little extra attention.

ⓘ **TIP:** A TIP indicates helpful information.

△ **CAUTION: A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.**

⚠ **WARNING: A WARNING icon indicates a potential for property damage, personal injury, or death.**

GMS Administration Guide
Updated - January 2021
Software Version - 9.3
232-005144-00 Rev B

The information in this document is provided in connection with SonicWall and/or its affiliates' products. No license, express or implied, by estoppel or otherwise, to any intellectual property right is granted by this document or in connection with the sale of products. EXCEPT AS SET FORTH IN THE TERMS AND CONDITIONS AS SPECIFIED IN THE LICENSE AGREEMENT FOR THIS PRODUCT, SONICWALL AND/OR ITS AFFILIATES ASSUME NO LIABILITY WHATSOEVER AND DISCLAIMS ANY EXPRESS, IMPLIED OR STATUTORY WARRANTY RELATING TO ITS PRODUCTS INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NON-INFRINGEMENT. IN NO EVENT SHALL SONICWALL AND/OR ITS AFFILIATES BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL, PUNITIVE, SPECIAL OR INCIDENTAL DAMAGES (INCLUDING, WITHOUT LIMITATION, DAMAGES FOR LOSS OF PROFITS, BUSINESS INTERRUPTION OR LOSS OF INFORMATION) ARISING OUT OF THE USE OR INABILITY TO USE THIS DOCUMENT, EVEN IF SONICWALL AND/OR ITS AFFILIATES HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. SonicWall and/or its affiliates make no representations or warranties with respect to the accuracy or completeness of the contents of this document and reserves the right to make changes to specifications and product descriptions at any time without notice. and/or its affiliates do not make any commitment to update the information contained in this document.

For more information, visit https://www.sonicwall.com/legal.

End User Product Agreement

To view the SonicWall End User Product Agreement, go to: https://www.sonicwall.com/legal/end-user-product-agreements/

Open Source Code

SonicWall is able to provide a machine-readable copy of open source code with restrictive licenses such as GPL, LGPL, AGPL when applicable per license requirements. To obtain a complete machine-readable copy, send your written requests, along with certified check or money order in the amount of USD 25.00 payable to "SonicWall Inc.", to:

General Public License Source Code Request
SonicWall Inc. Attn: Jennifer Anderson
1033 McCarthy Blvd

Milpitas, CA 95035