# Configuring Link Aggregation Groups on the SG350XG and SG550XG

## Objective

A Link Aggregation Group (LAG) is a collection of network connections that have been combined in parallel into one logical connection. Creating a LAG can allow for redundancy: if one link in the LAG fails, other links can be used as backups. LAGs can also greatly increase throughput by using all of its links to transmit data simultaneously.

Here's how it works: Link Aggregation Control Protocol (LACP) is a part of IEEE specification (802.3az) that can control the bundling of several physical ports together to form a single logical channel (LAG). Traffic load balancing over the active member ports of a LAG is managed by a hash-based distribution function that distributes unicast and multicast traffic based on Layer 2 or Layer 3 packet header information. LACP helps to form one single LAG by bundling many physical ports. It is also responsible for bandwidth multiplication, increase in port flexibility, and in providing redundancy on links between any 2 devices. Additionally this helps in changing the LAG speed, advertisement, flow control, and also protection which can be easily identified in LAG settings table.

The objective of this document is to show you how to configure LAGs on the SG350XG and SG550XG.

## Applicable Devices

- SG350XG
- SG550XG

## Software Version

- 2.0.0.73

## LAG Management

Step 1. Log in to the web configuration utility and choose **Port Management > Link Aggregation > LAG Management**. The *LAG Management* page opens.

# LAG Management

Load Balance Algorithm: (•) MAC Address
( ) IP/MAC Address

Apply Cancel

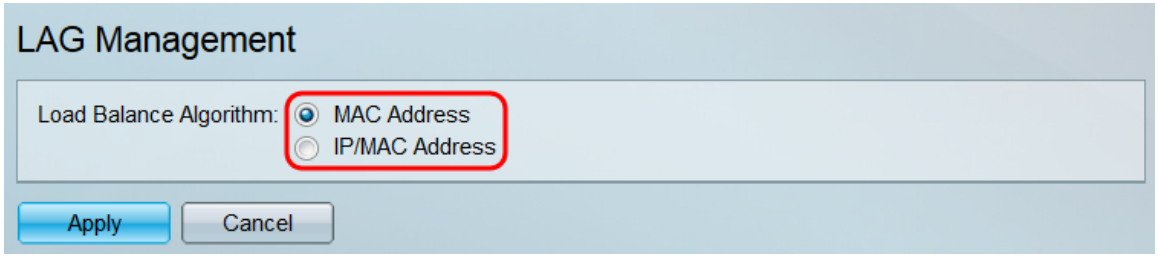
**LAG Management Table**

| | LAG | Name | LACP | Link State | Active Member | Standby Member |
|---|---|---|---|---|---|---|
| ( ) | LAG 1 | | | Link Not Present | | |
| ( ) | LAG 2 | | | Link Not Present | | |
| ( ) | LAG 3 | | | Link Not Present | | |
| ( ) | LAG 4 | | | Link Not Present | | |
| ( ) | LAG 5 | | | Link Not Present | | |
| ( ) | LAG 6 | | | Link Not Present | | |
| ( ) | LAG 7 | | | Link Not Present | | |
| ( ) | LAG 8 | | | Link Not Present | | |
| ( ) | LAG 9 | | | Link Not Present | | |
| ( ) | LAG 10 | | | Link Not Present | | |
| ( ) | LAG 11 | | | Link Not Present | | |
| ( ) | LAG 12 | | | Link Not Present | | |
| ( ) | LAG 13 | | | Link Not Present | | |
| ( ) | LAG 14 | | | Link Not Present | | |
| ( ) | LAG 15 | | | Link Not Present | | |
| ( ) | LAG 16 | | | Link Not Present | | |
| ( ) | LAG 17 | | | Link Not Present | | |
| ( ) | LAG 18 | | | Link Not Present | | |
| ( ) | LAG 19 | | | Link Not Present | | |
| ( ) | LAG 20 | | | Link Not Present | | |
| ( ) | LAG 21 | | | Link Not Present | | |
| ( ) | LAG 22 | | | Link Not Present | | |
| ( ) | LAG 23 | | | Link Not Present | | |
| ( ) | LAG 24 | | | Link Not Present | | |
| ( ) | LAG 25 | | | Link Not Present | | |
| ( ) | LAG 26 | | | Link Not Present | | |
| ( ) | LAG 27 | | | Link Not Present | | |
| ( ) | LAG 28 | | | Link Not Present | | |
| ( ) | LAG 29 | | | Link Not Present | | |
| ( ) | LAG 30 | | | Link Not Present | | |
| ( ) | LAG 31 | | | Link Not Present | | |
| ( ) | LAG 32 | | | Link Not Present | | |

Edit...

**Note:** The above screenshot is taken from the SG550XG, which has 32 different LAGs. The SG350XG only has 8 LAGs.

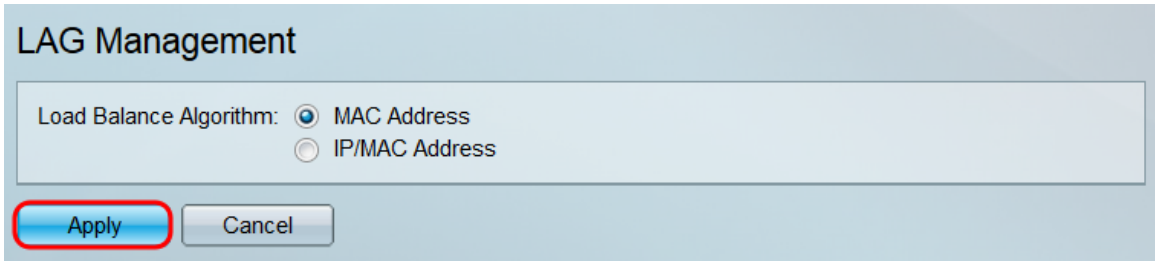
Step 2. In the *Load Balance Algorithm* field, choose a radio button to determine how the switch will handle load balancing on each LAG. Load balancing is used to send data across all links in a LAG, increasing throughput. Using the MAC Address has been found to be more effective in some networks.




The options are:

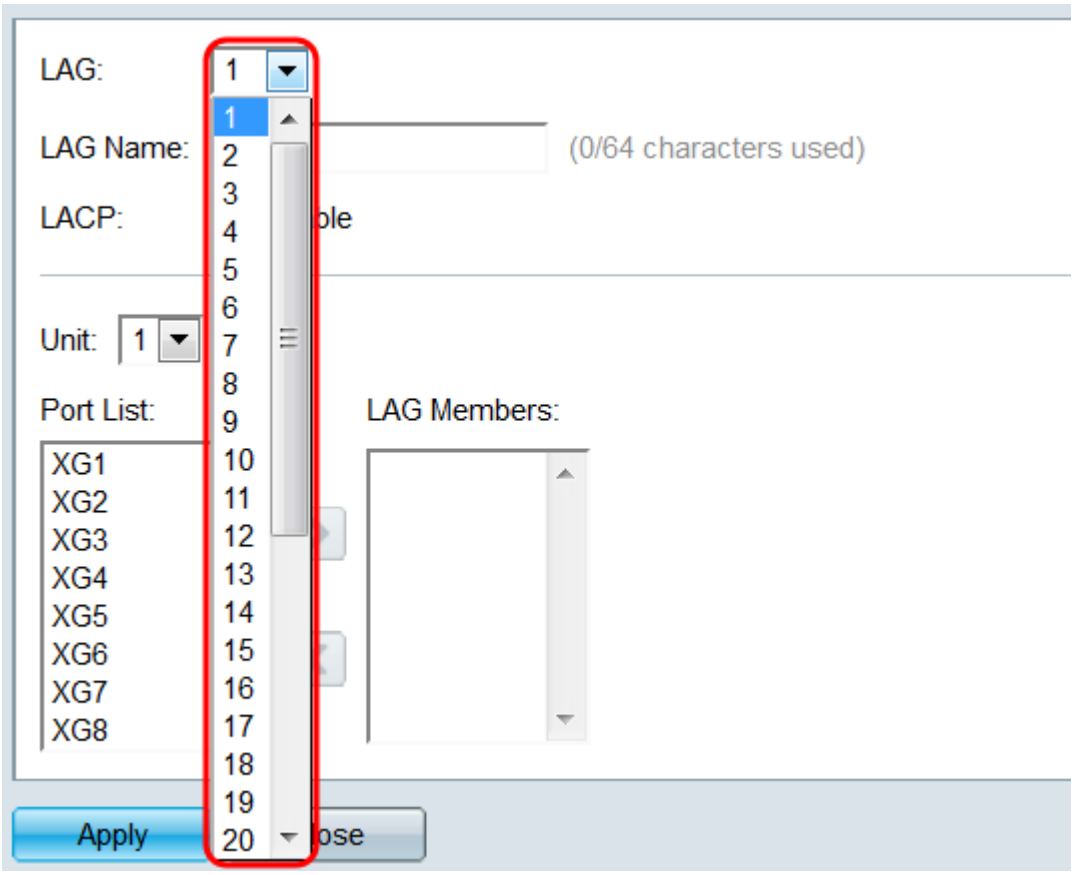
- MAC Address – Perform load balancing by using the source and destination MAC address on all packets.
- IP/MAC Address – Perform load balancing by using the source and destination IP address on IP packets, and the source and destination MAC address on all non-IP packets.

Step 3. Click **Apply**. The load balancing setting is saved to the running configuration file.

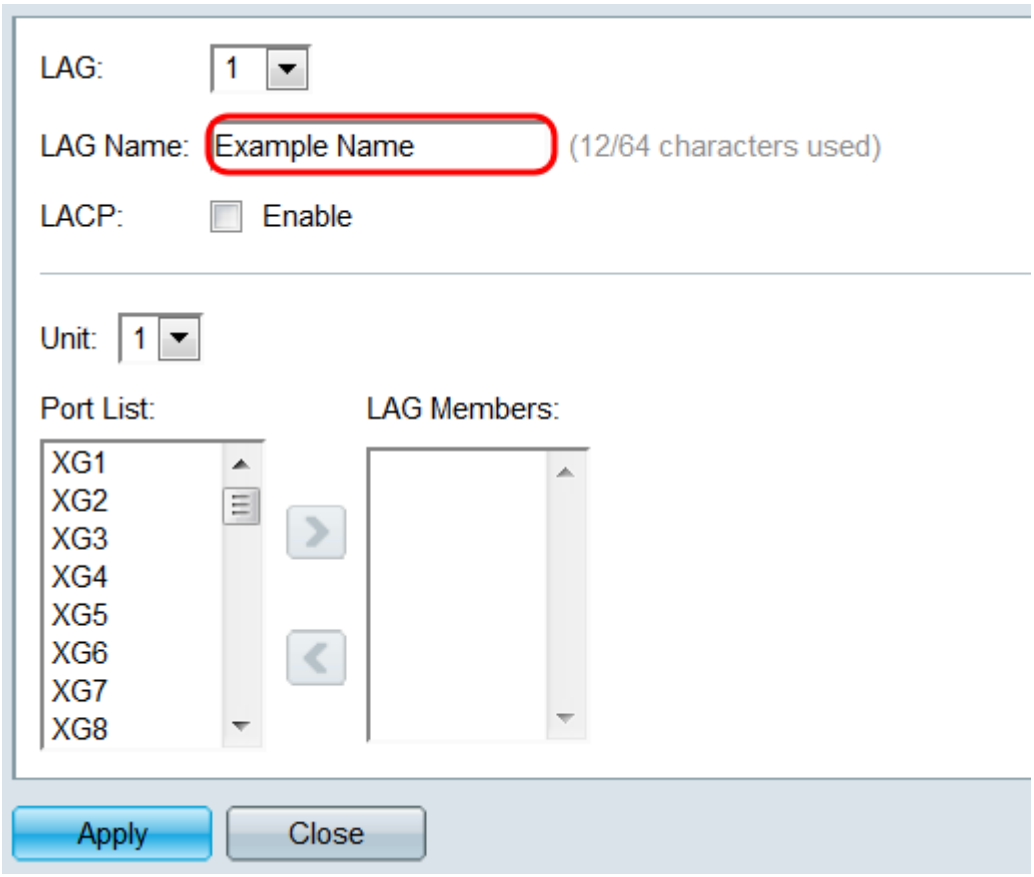



Step 4. The *LAG Management Table* displays information on all of the LAGs currently configured on the switch. Select a LAG's radio button and click **Edit…** to edit its settings in the *Edit LAG Membership* window that appears.


Step 5. In the *LAG* drop-down list, select the LAG whose settings you want to configure. The LAG you selected in the *LAG Management Table* will automatically be selected here. This field can be used for switching between LAGs and configuring their settings without returning to the *LAG Management* page.

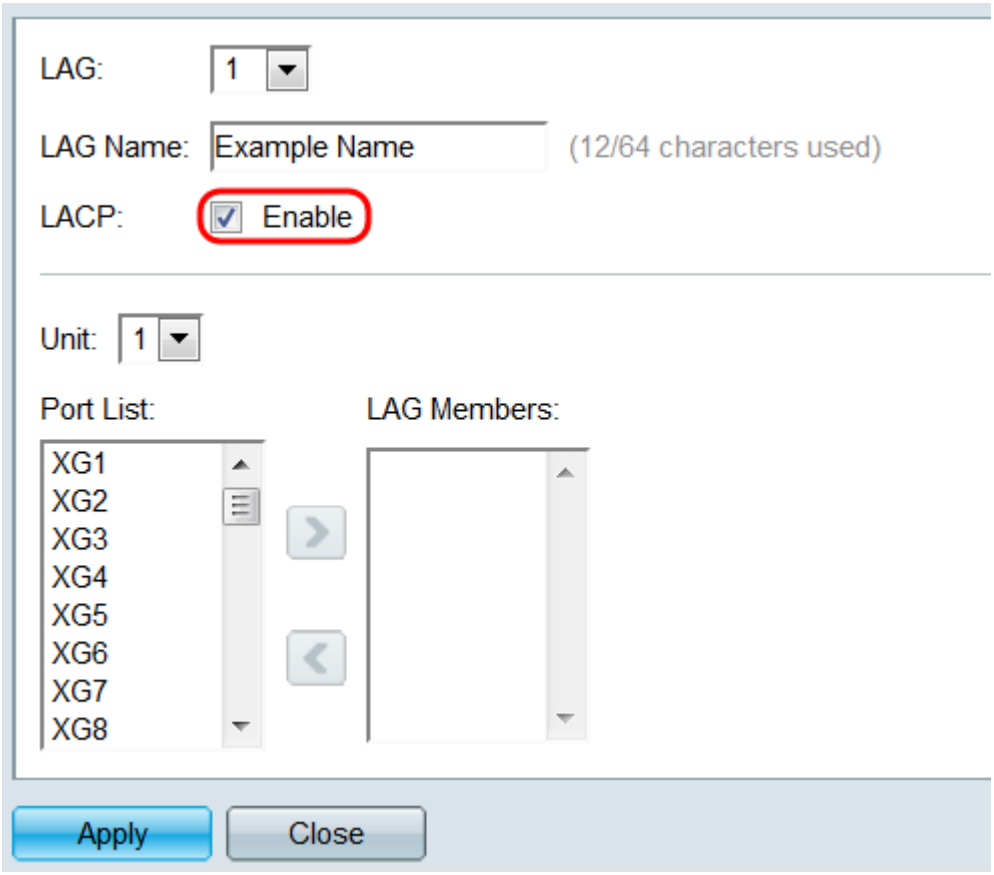



Step 6. In the *LAG Name* field, enter in a name or description of the LAG. This name will not impact the operation of the LAG, as it is only for easy identification.

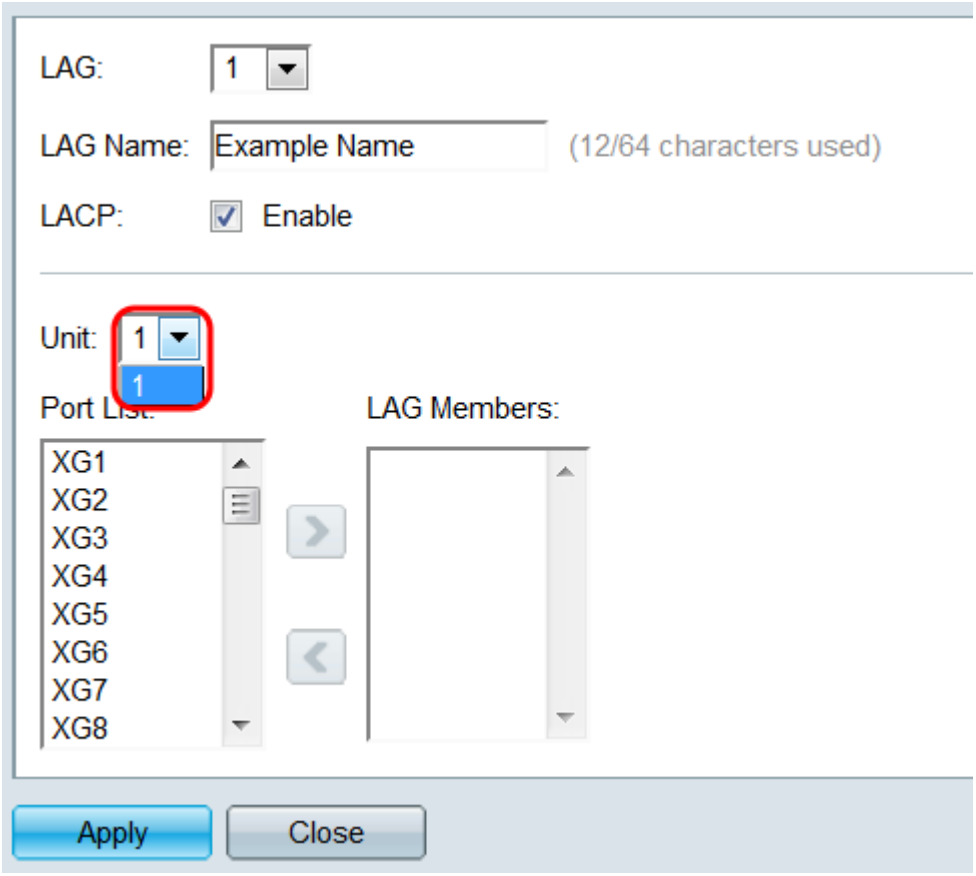



Step 7. In the *LACP* field, check the **Enable** checkbox to enable the Link Aggregation Control Protocol (LACP) for the LAG. The switch uses LACP to communicate with the other connected device (that also uses LACP) and coordinate LAG information, creating a

dynamic LAG. Once ports have been added to a LAG, this field becomes unavailable; removing all ports from a LAG will allow this setting to be available again.

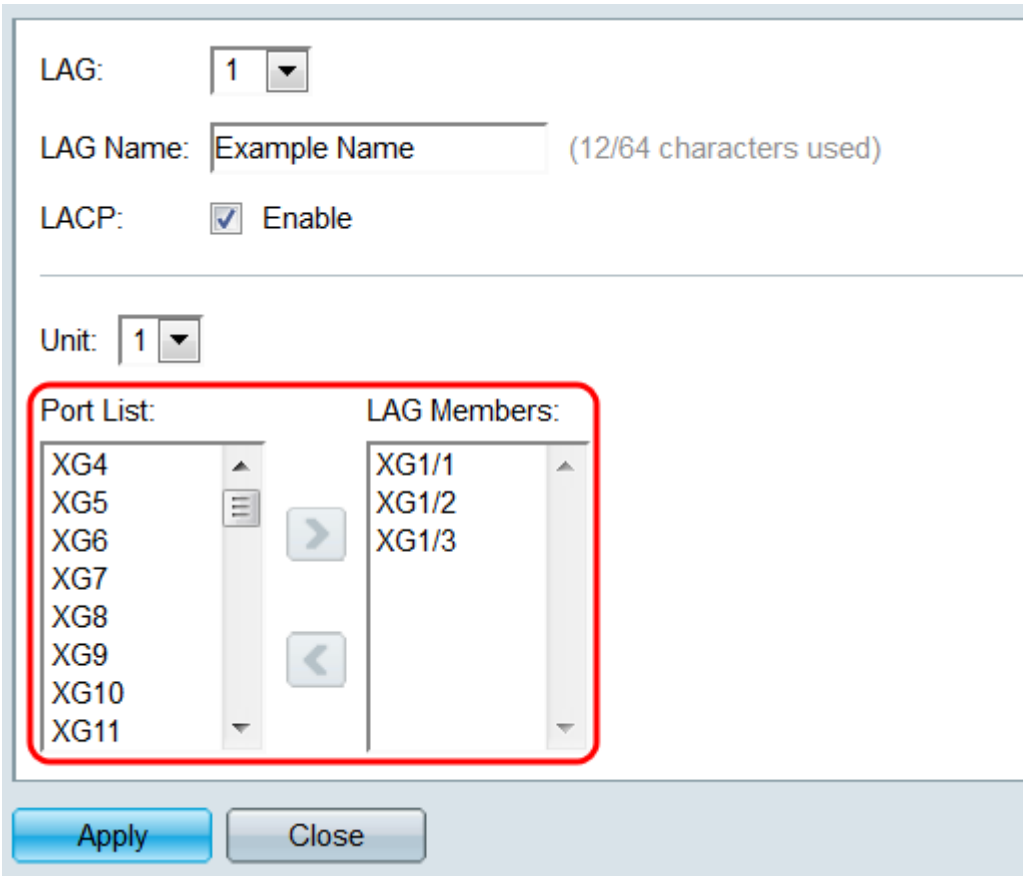



Step 8. In the *Unit* drop-down list, select the switch in the stack that contains the ports you want to add to the LAG. If the switch is not part of a stack, only **1** will be available.

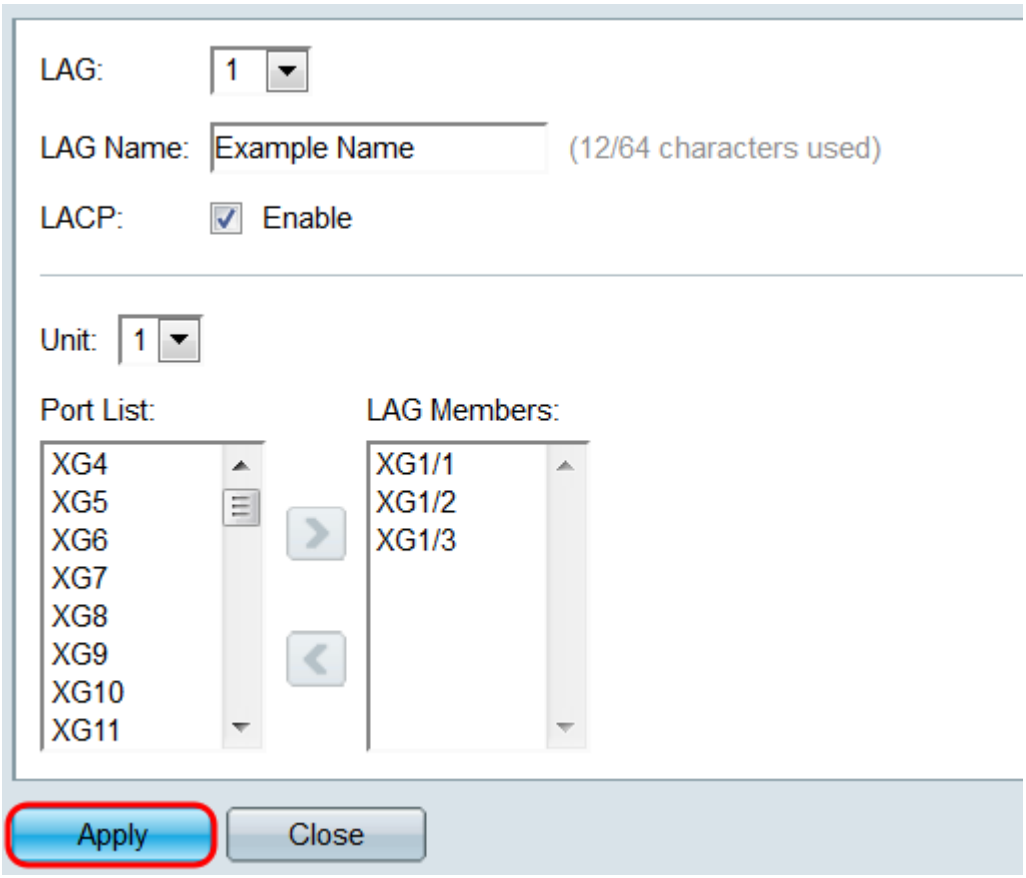



Step 9. Using the arrow buttons, select a port from the *Port List* and move it to the *LAG*

*Members* area, or vice versa.



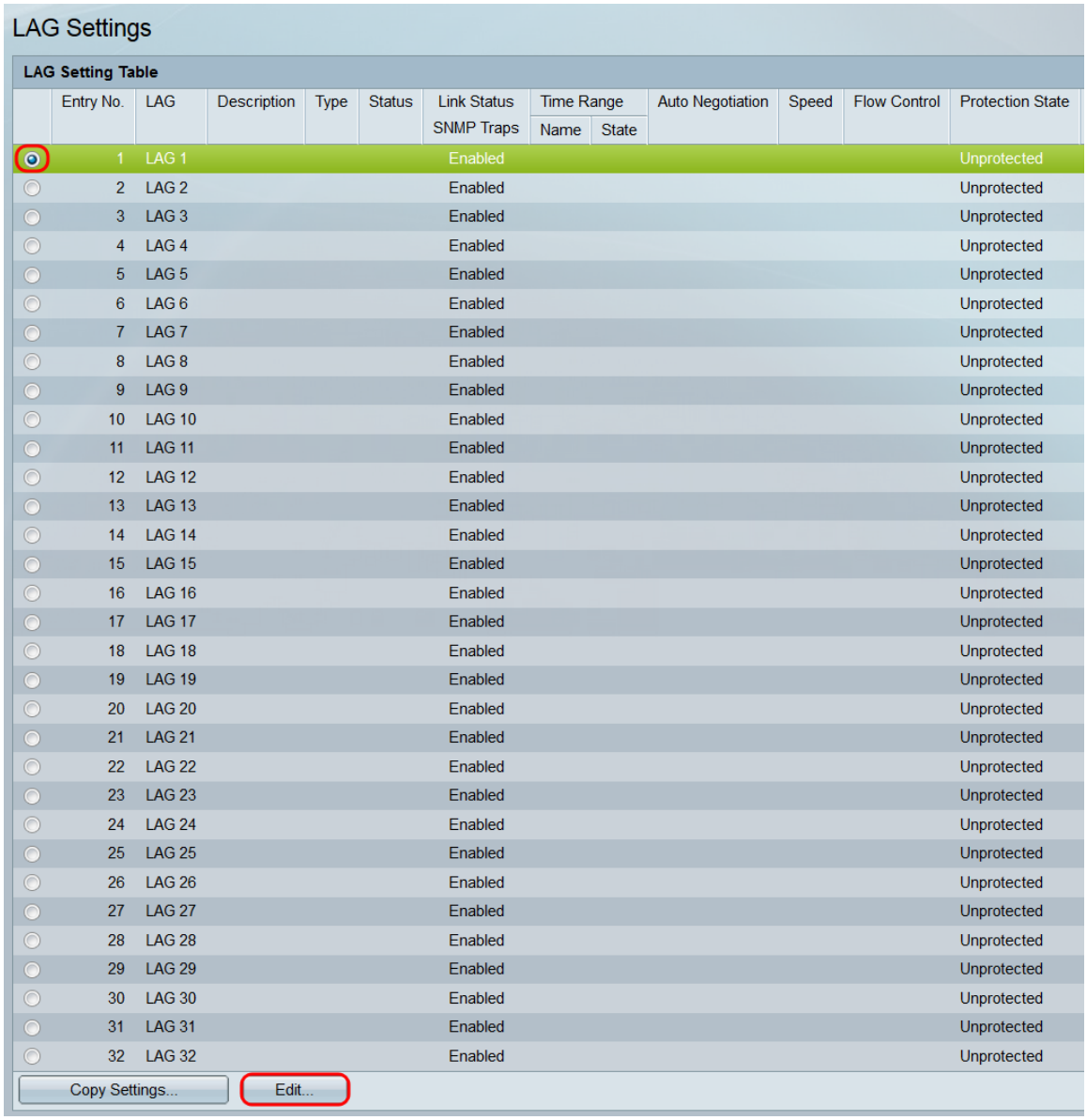

Step 10. Click **Apply**. The LAG settings are saved to the running configuration. Select another LAG to configure in the *LAG* field, or click **Close** to return to the *LAG Management* page.



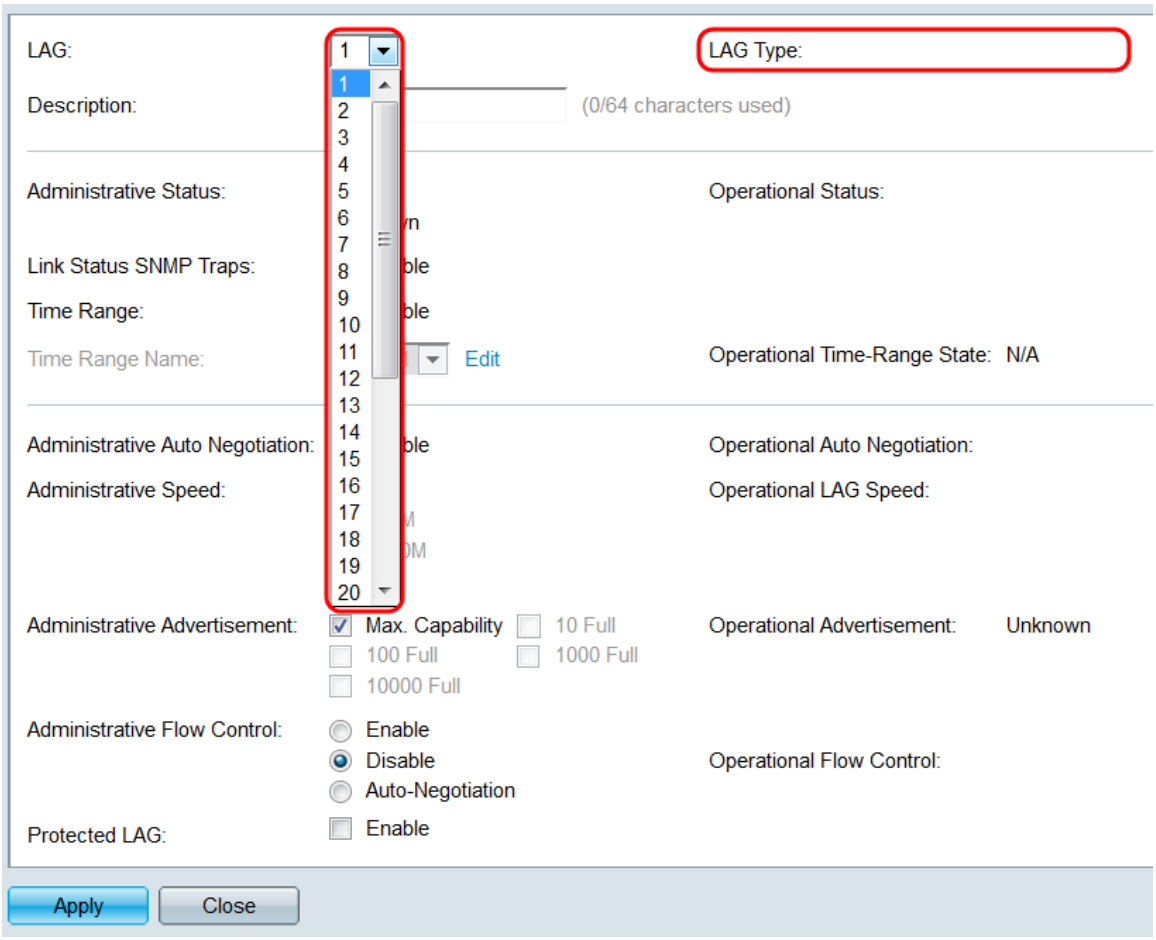
# LAG Settings

Step 1. Log in to the web configuration utility and choose **Port Management > Link Aggregation > LAG Settings**. The *LAG Settings* page opens.

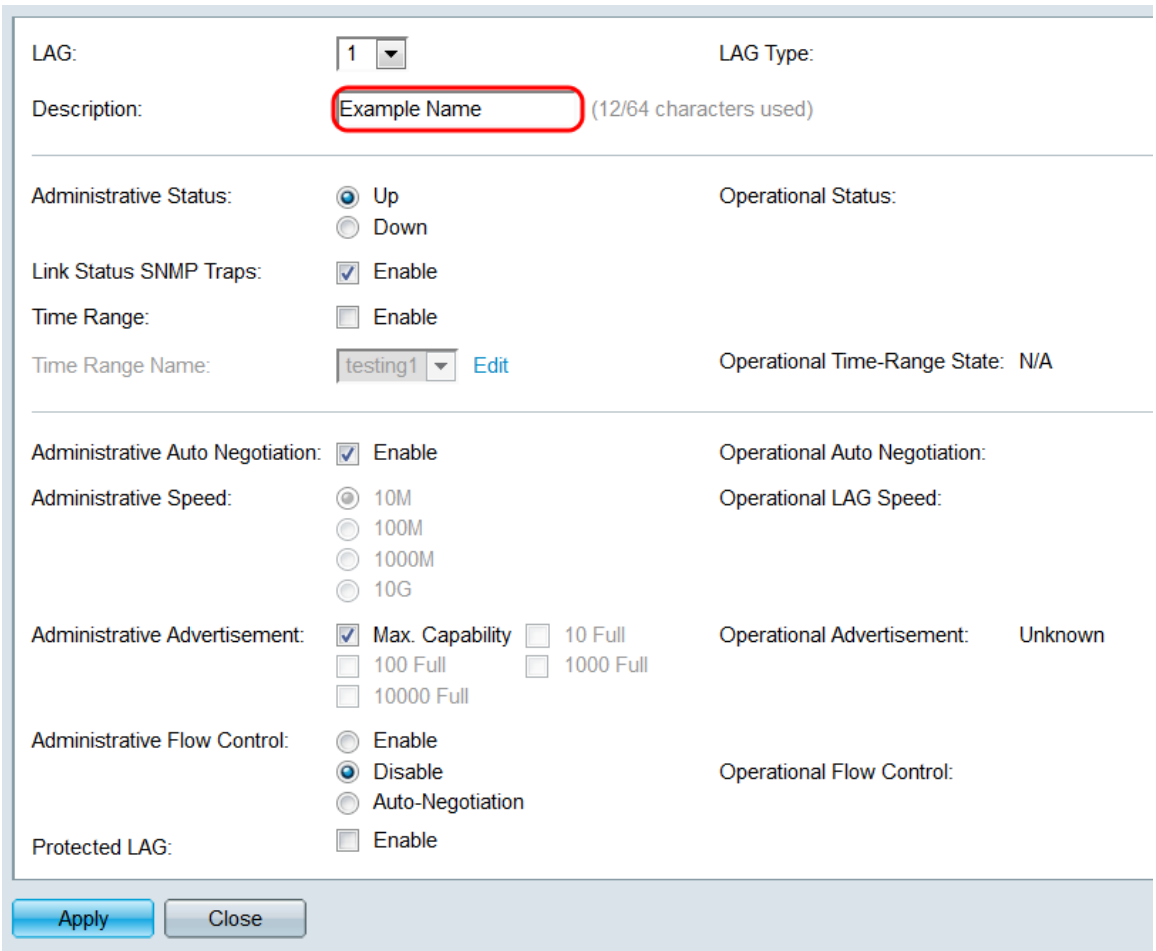

Step 2. The *LAG Setting Table* displays information on all LAGs currently configured on the switch. Select a LAG's radio button and click **Edit…** to edit its settings in the *Edit LAG Settings* page.



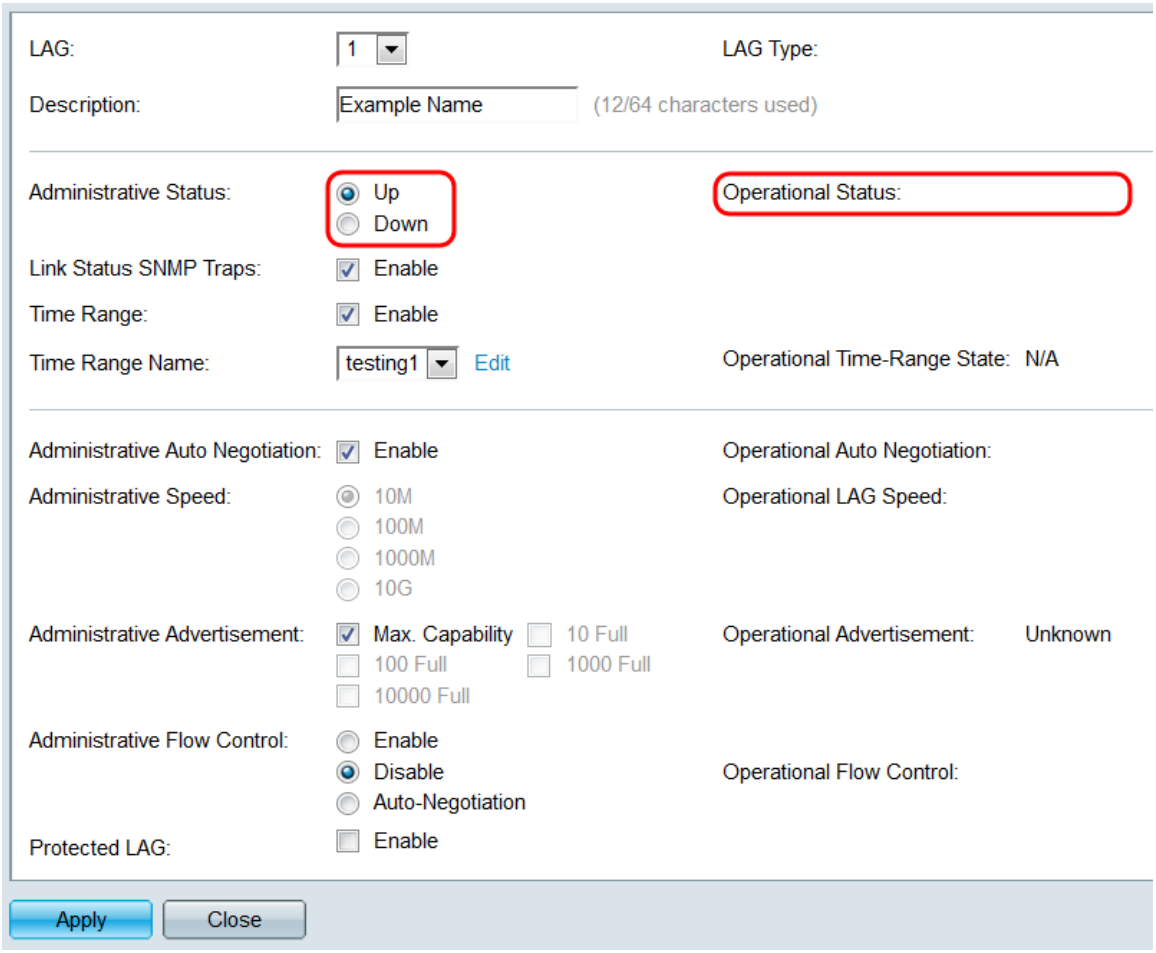

Step 3. In the *LAG* drop-down list, select the LAG whose settings you want to configure. The LAG you selected in the *LAG Setting Table* will automatically be selected here. This field can be used for switching between LAGs and configuring their settings without returning to the *LAG Settings* page. The *LAG Type* field displays the port type that makes up the LAG.



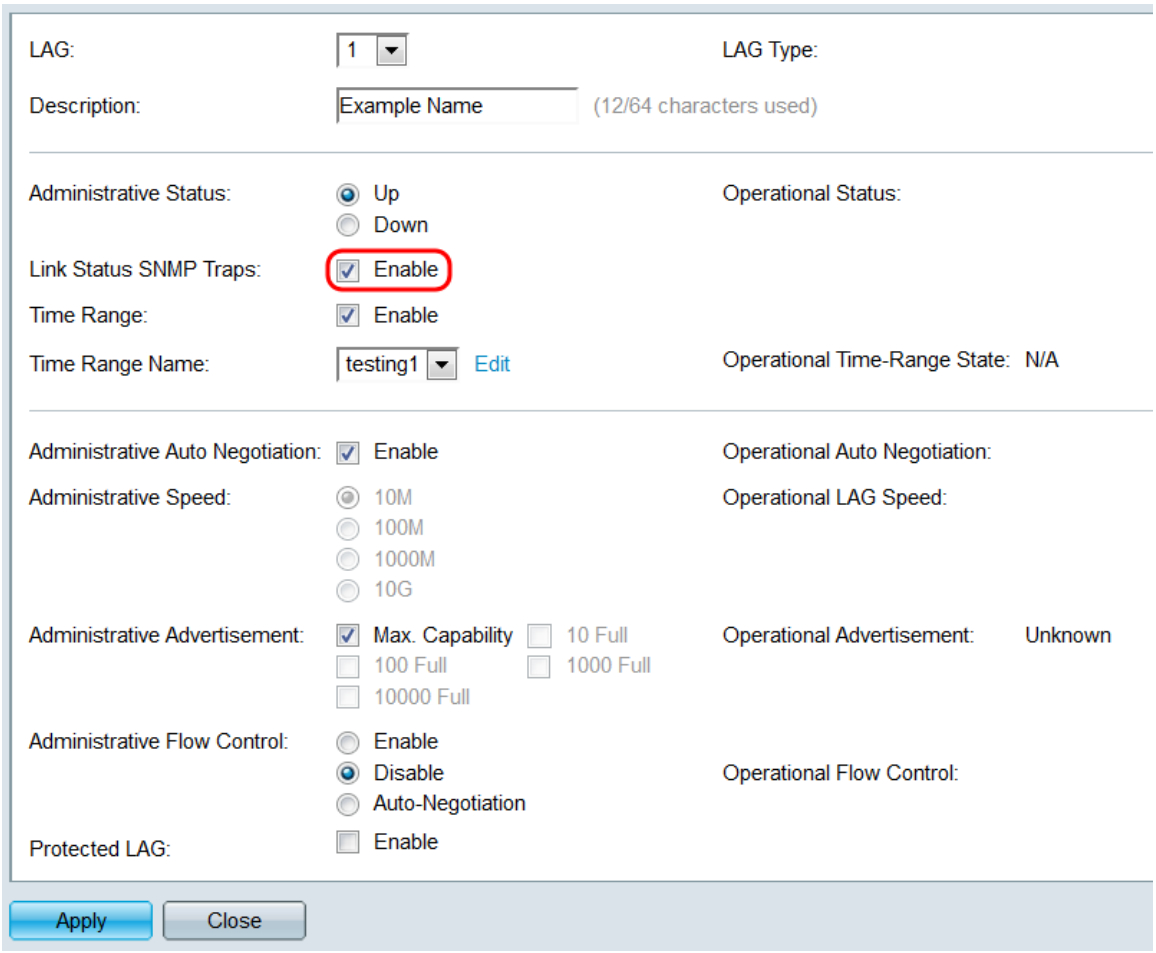

Step 4. In the *Description* field, enter in a name or comment for the LAG. This does not impact operation of the LAG, as it is only for identification purposes.



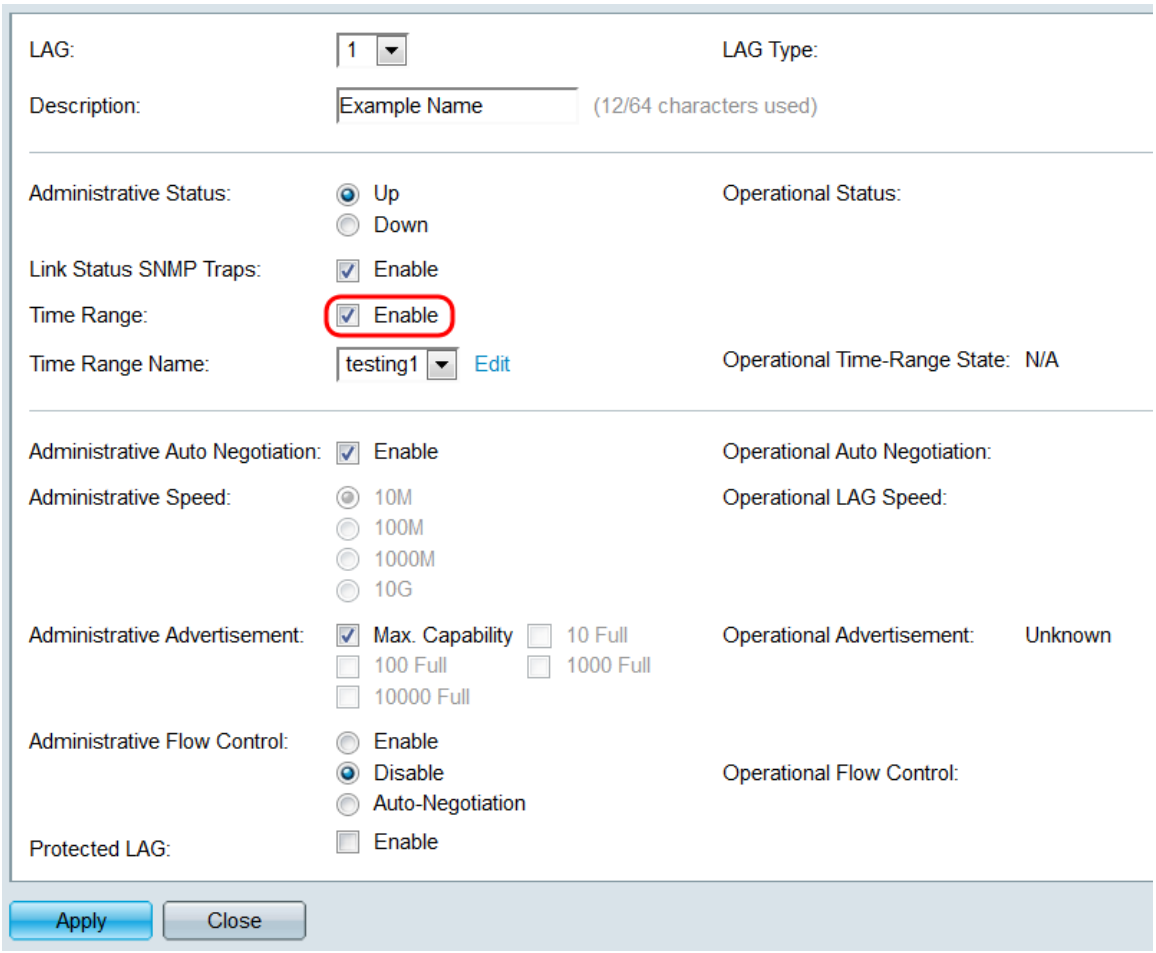
Step 5. In the *Administrative Status* field, select either the **Up** or **Down** radio button to determine if the LAG will be up (operational) or down (non-operational). The *Operational Status* field displays whether the LAG is currently up or down. If the current display mode is Basic, skip to Step 9.



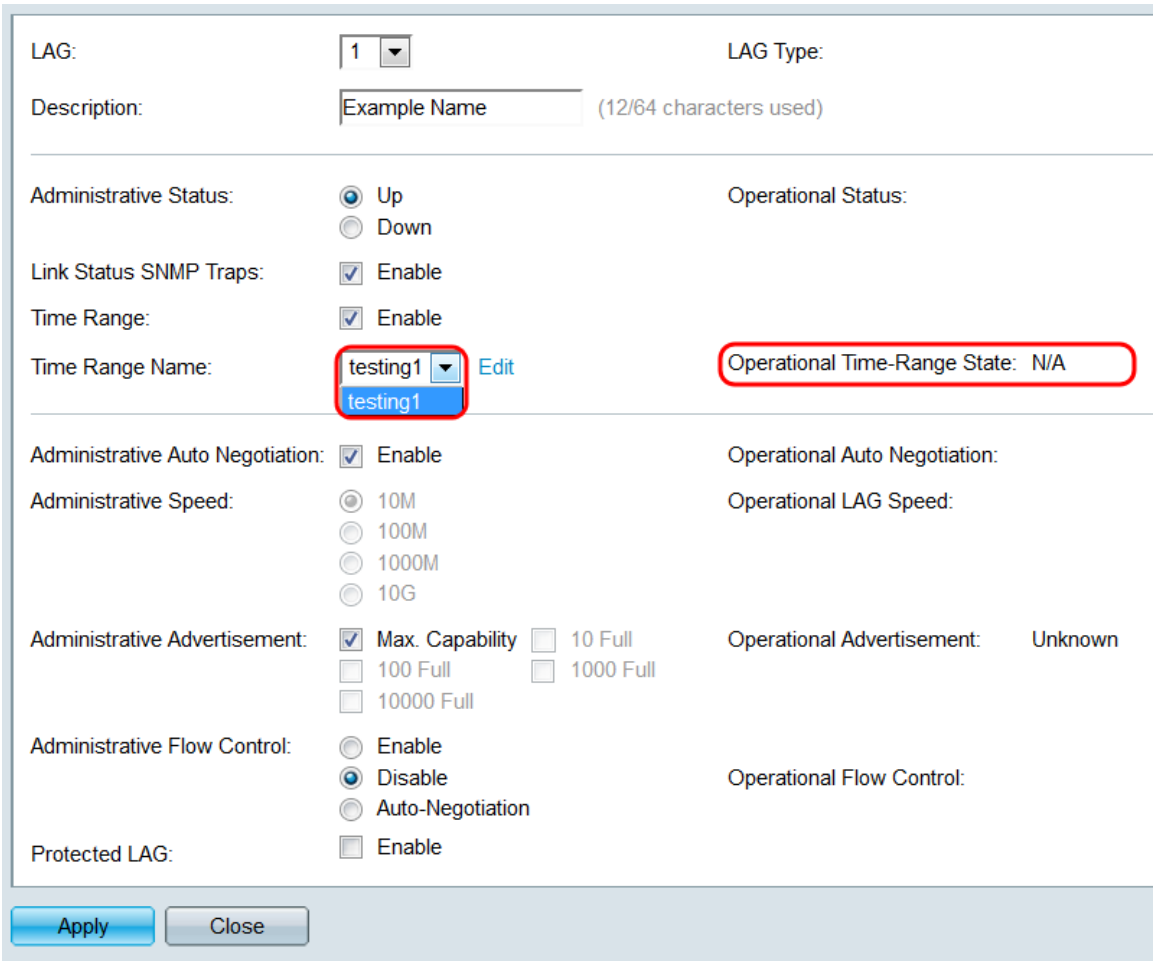

Step 6. In the *Link Status SNMP Traps* field, check the **Enable** checkbox to have the switch generate SNMP traps that notify of changes to the link status of the ports in the LAG.



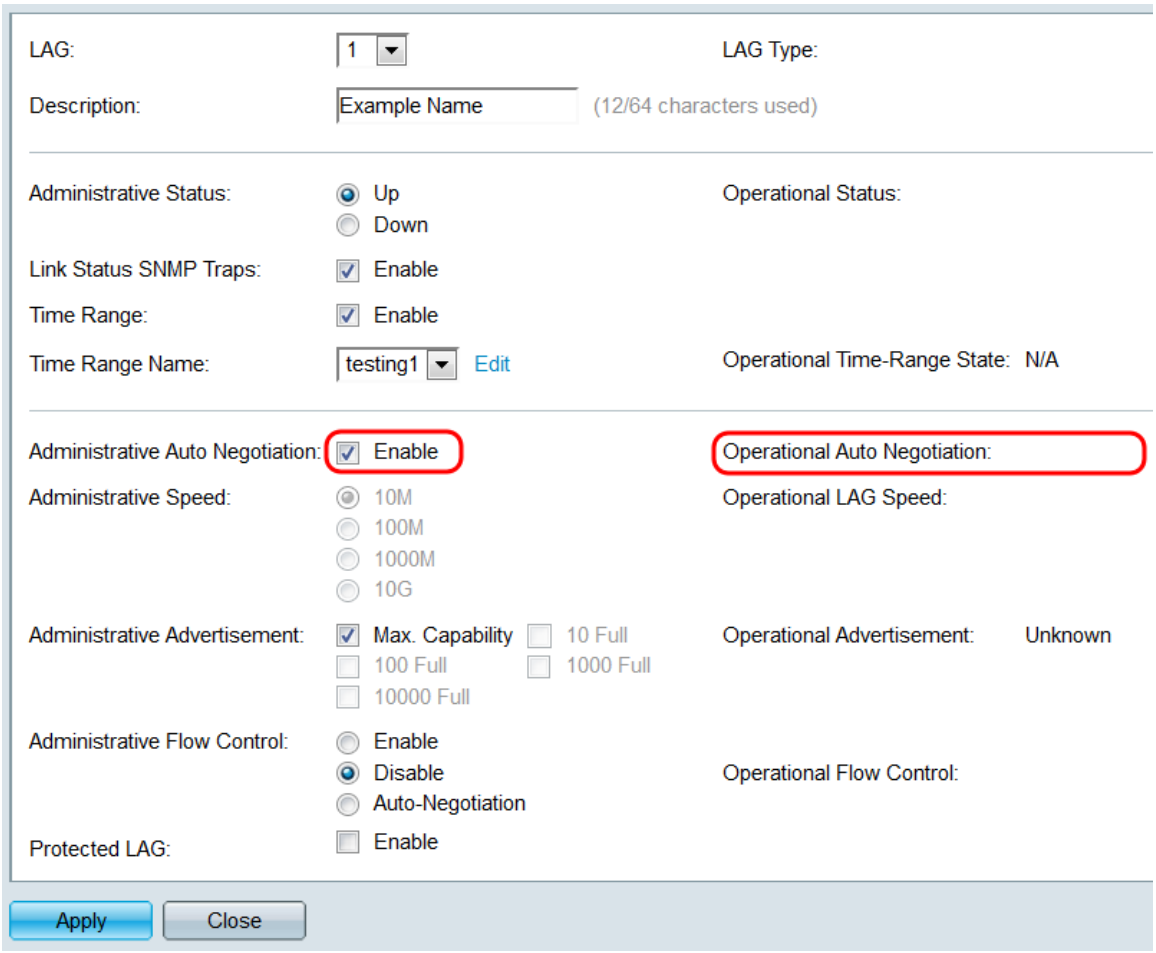

Step 7. In the *Time Range* field, check the **Enable** checkbox to have the LAG only be up during a preconfigured time range. When outside this time range, the LAG will be shut down. If there are no time range profiles available, this field is unavailable.



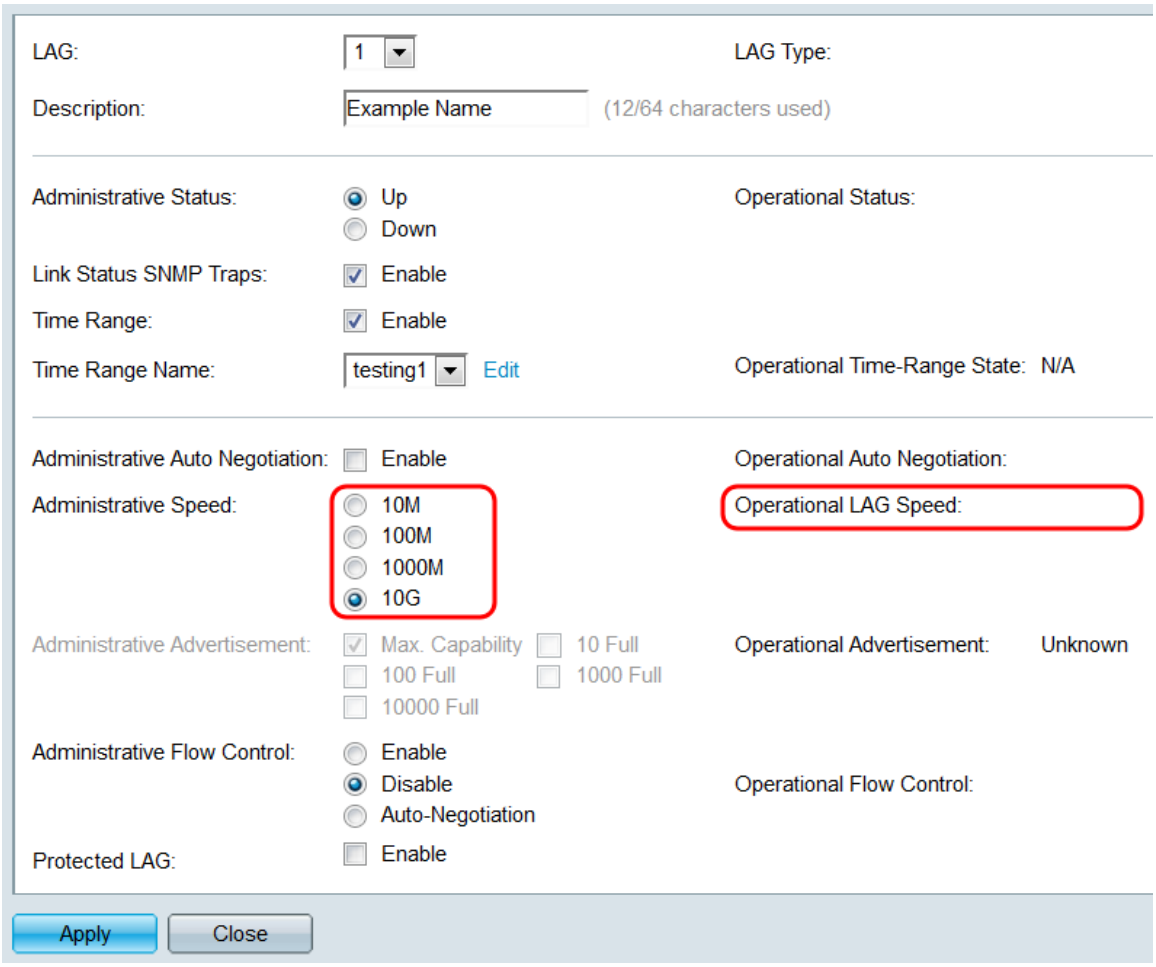

Step 8. In the *Time Range Name* drop-down list, select a time range profile to apply to the LAG. If there are no time range profiles defined, or if you wish to make changes to an existing one, click **Edit** to go to the *Time Range* page. The *Operational Time-Range State* field displays whether the time range is currently active or inactive. For more information about time ranges, please refer to the article *Setting Up a Time Range on the SG550XG and SG350XG*.




Step 9. In the *Administrative Auto Negotiation* field, check the **Enable** checkbox to turn on auto-negotiation for the LAG. This feature lets a LAG automatically transmit its transmission speed, duplex mode, and Flow Control abilities to the LAG partner. If this feature is enabled, skip to Step 11. The *Operational Auto Negotiation* field displays the current auto-negotiation status of the LAG.



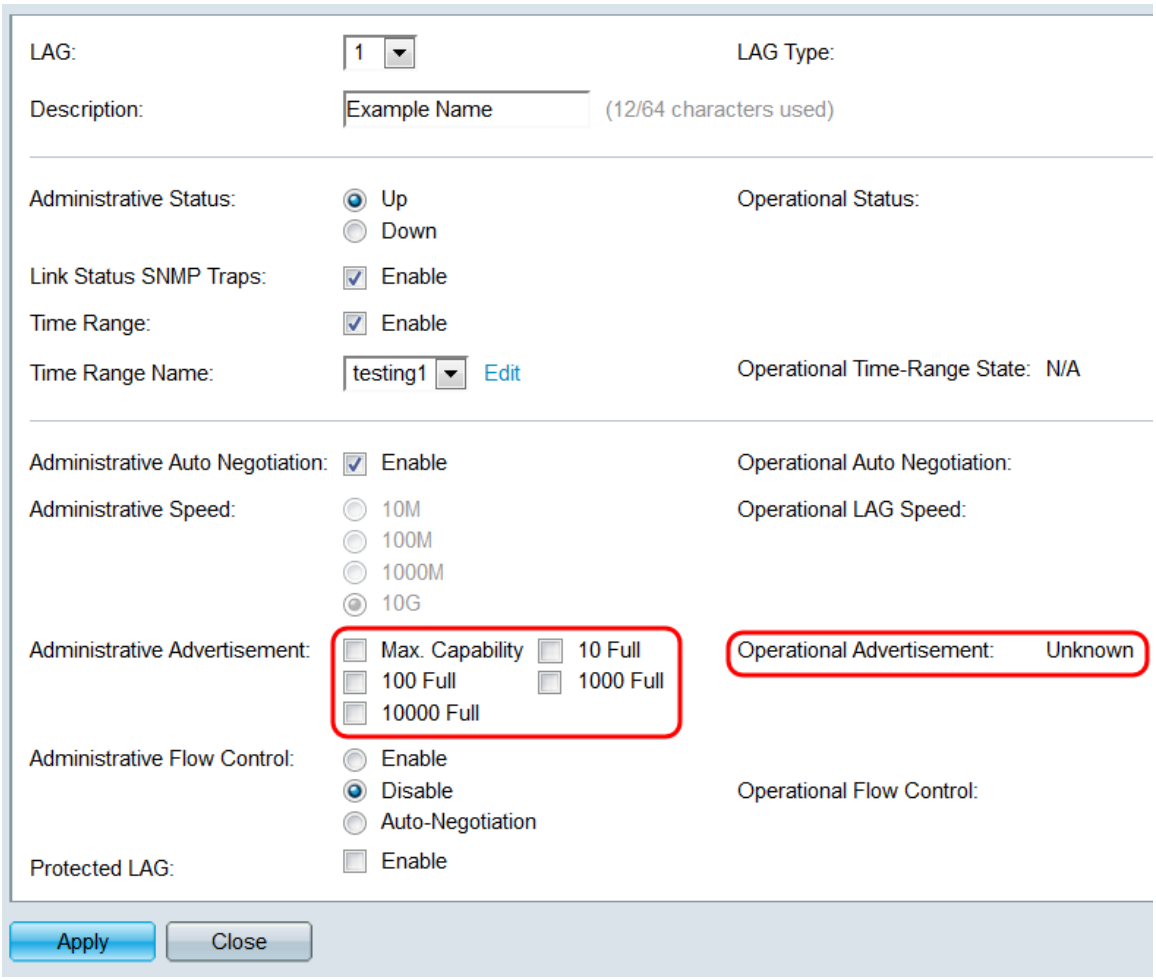

Step 10. If auto-negotiation is not enabled, the *Administrative Speed* field becomes available. Select a radio button to determine the speed of the LAG. The *Operational LAG Speed* field displays the current speed of the LAG.




The options are:

- 10M – The LAG operates at a speed of 10 Mbps.
- 100M – The LAG operates at a speed of 100 Mbps.
- 1000M – The LAG operates at a speed of 1000 Mbps.
- 10G – The LAG operates at a speed of 10 Gbps.

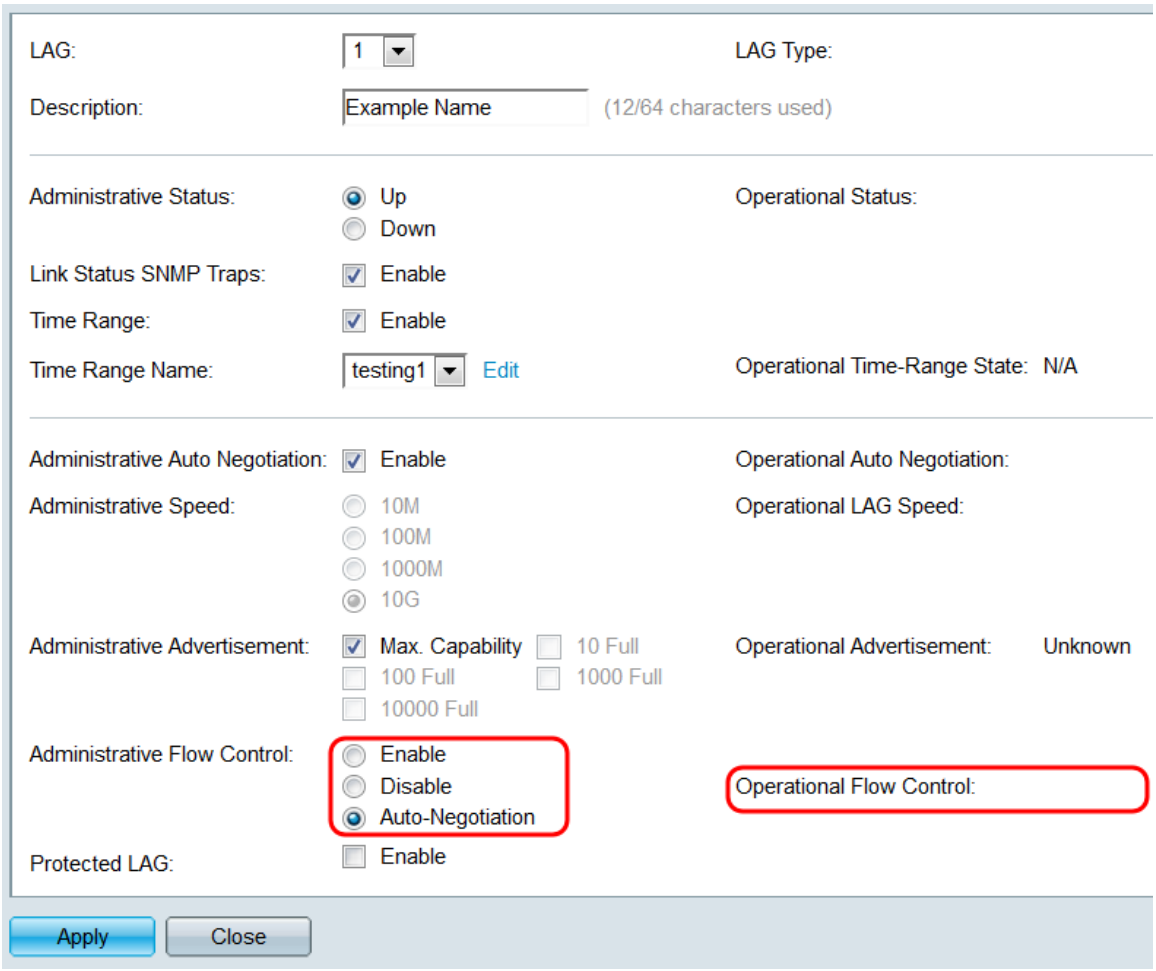
Step 11. If auto-negotiation is enabled, the *Administrative Advertisement* field will be available. Check the appropriate checkboxes to indicate which capabilities are advertised during auto-negotiation. The *Operational Advertisement* field displays the capabilities currently being advertised by the LAG.



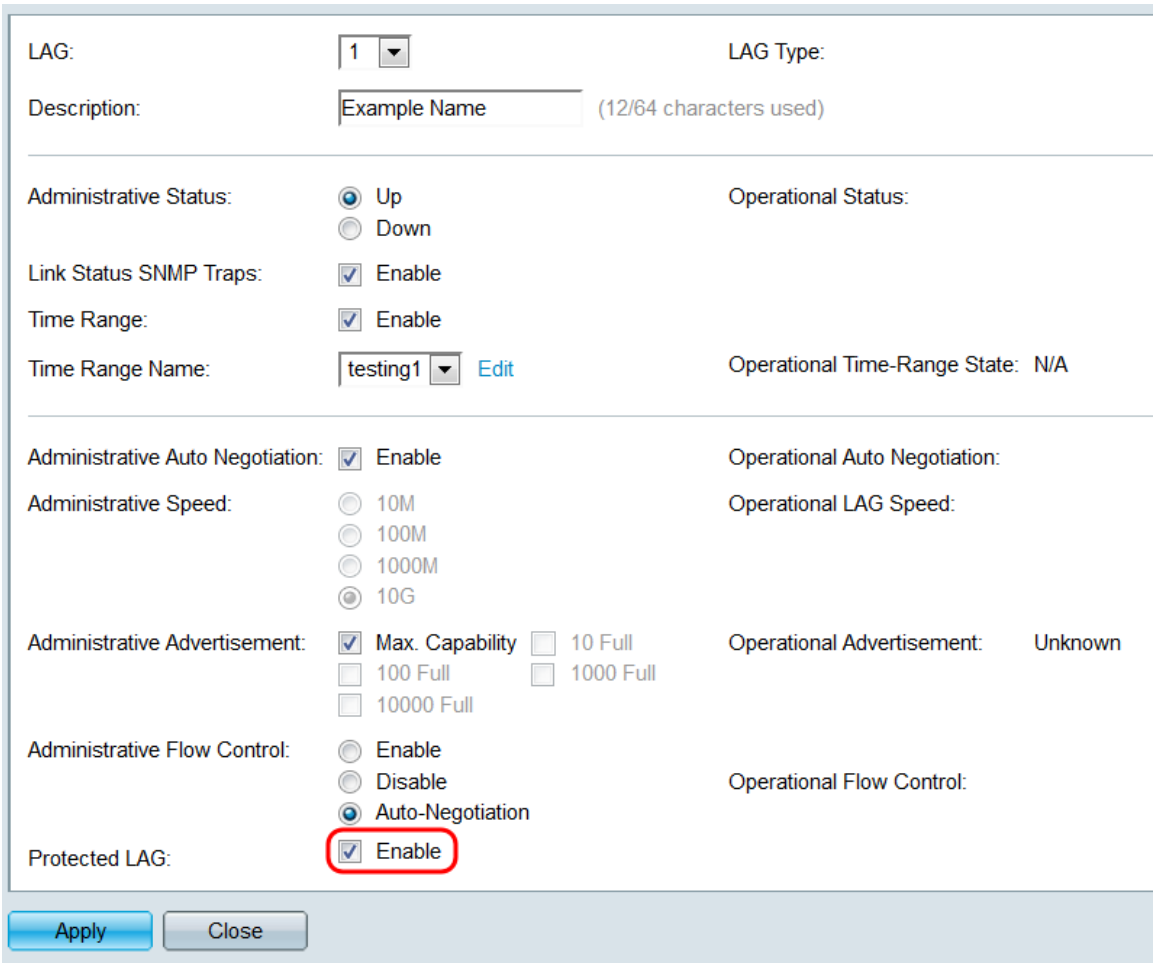

The options are:

- Max Capability – All speeds and duplex mode settings are accepted. This is checked by default. No other checkboxes can be selected if this option is selected.
- 10 Full – 10 Mbps speed and full duplex mode.
- 100 Full – 100 Mbps speed and full duplex mode.
- 1000 Full – 1000 Mbps speed and full duplex mode.
- 10000 Full – 10000 Mbps speed and full duplex mode.

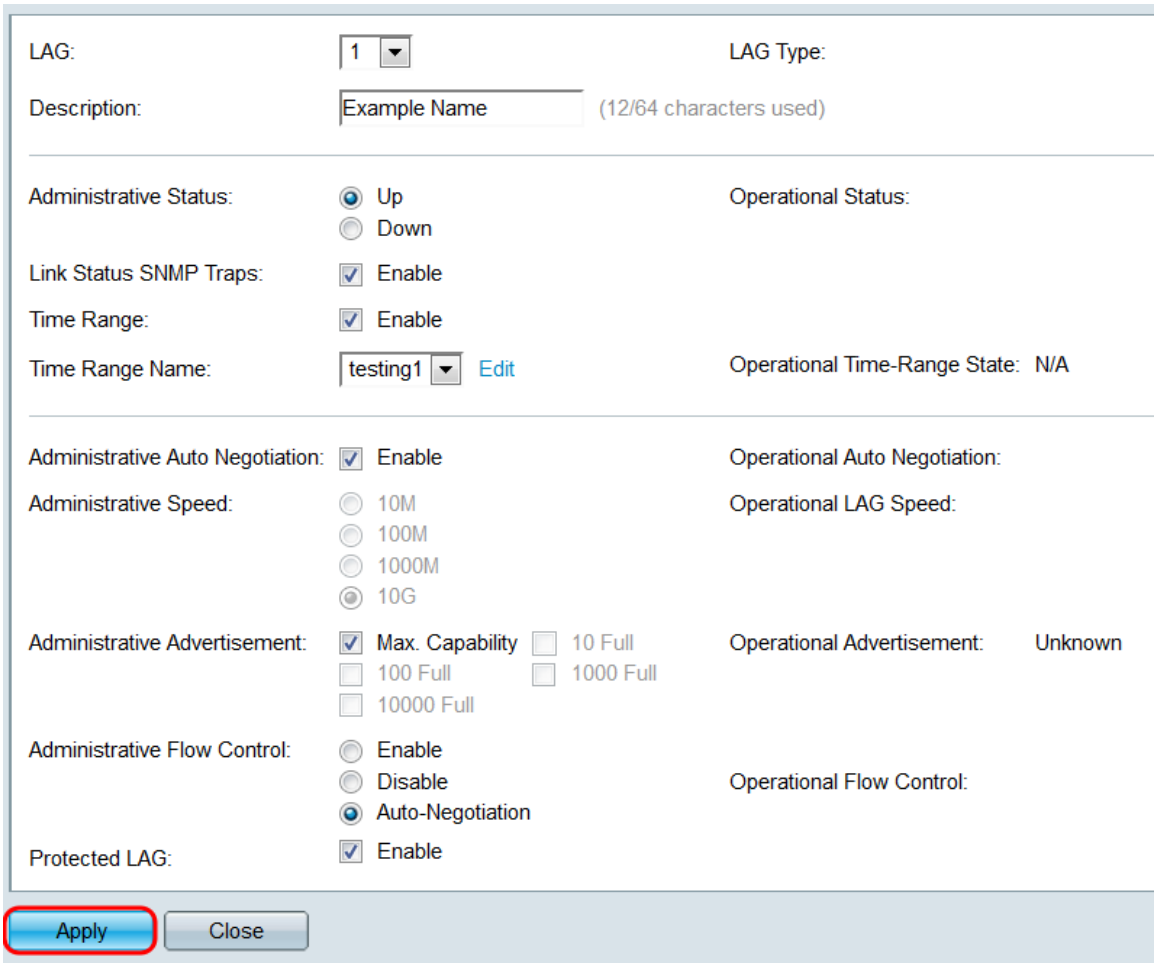
Step 12. In the *Administrative Flow Control* field, select a radio button to **Enable** or **Disable** 802.3x flow control. You can also choose to enable **Auto-Negotiation** of flow control. Flow control is a protocol that the switch can use to halt the transmission of the remote LAG if the network becomes overwhelmed. The *Operational Flow Control* field displays the current flow control status of the LAG.



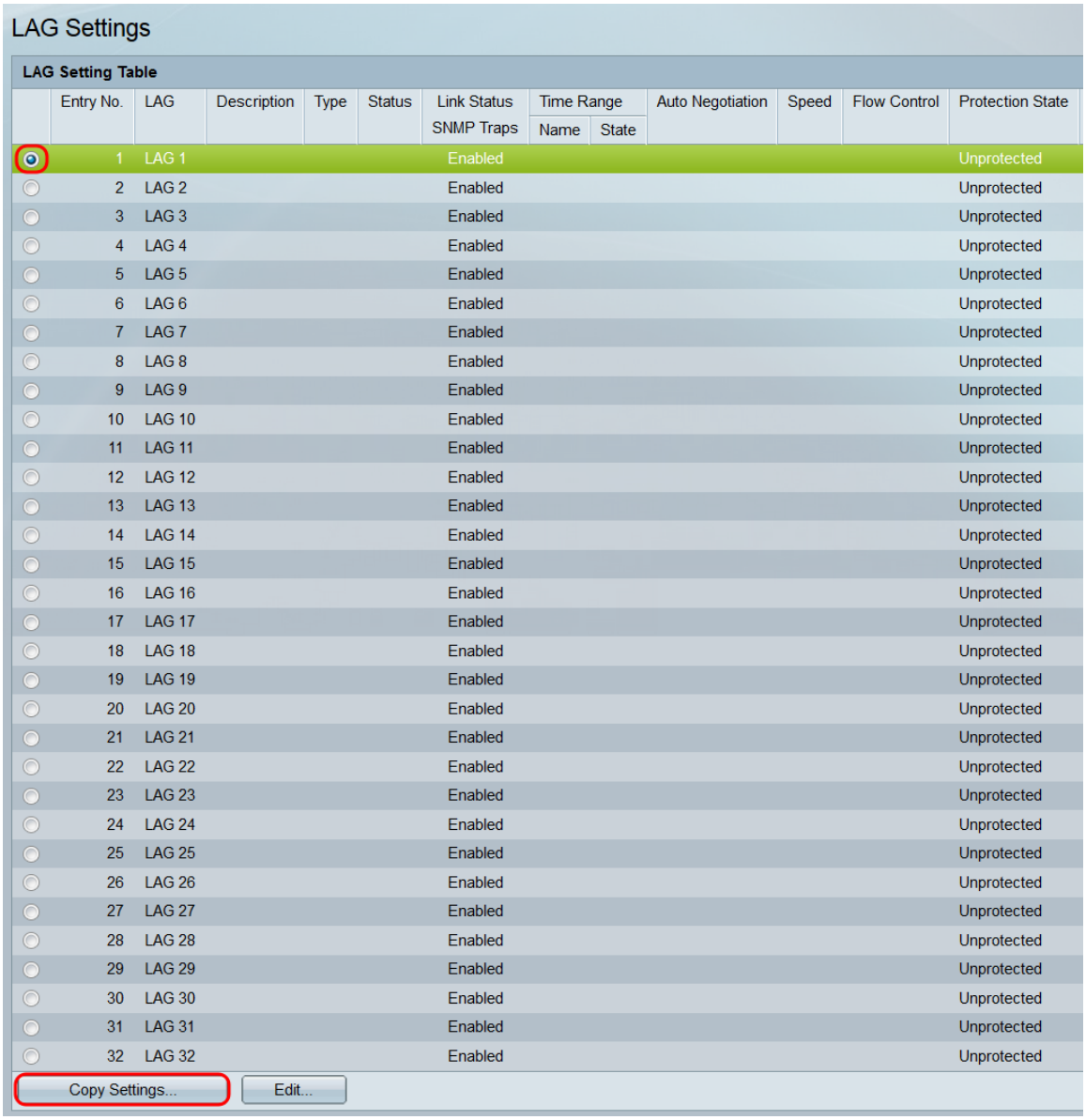

Step 13. In the *Protected LAG* field, check the **Enable** checkbox to make the LAG a protected LAG. A protected LAG provides layer 2 isolation between interfaces that share the same VLAN.



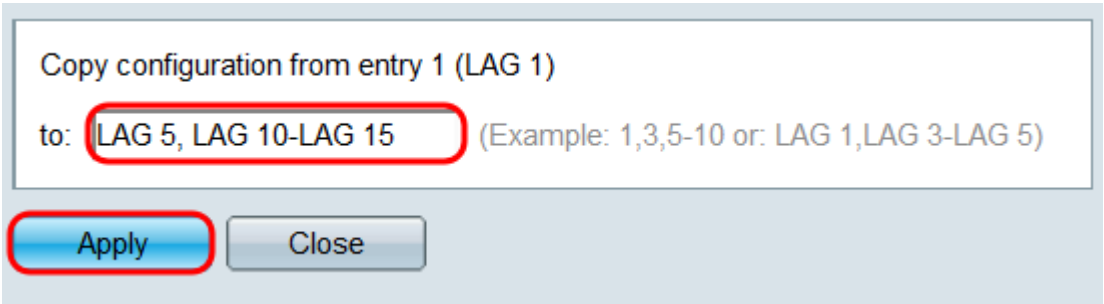

Step 14. Click **Apply**. The settings are saved to the running configuration file. Select another LAG to configure from the *LAG* field, or click **Close** to return to the *LAG Settings* page.




Step 15. If you want to quickly copy a LAG's settings to another LAG, click its radio button, then the **Copy Settings…** button. The *Copy Settings* window appears.




Step 16. In the text field, enter the LAG or range of LAGs that you want to copy the selected LAG's settings to, and click **Apply**.

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