VERSA-4K

Video over LAN Gigabit Ethernet Switch Setup



VIDEO OVER LAN GIGBIT ETHERNET SWITCH SETUP

While Video-over-IP multicasting offers immense benefits, it also presents challenges. Multicasting broadcasts video data on the LAN that are available to multiple receivers simultaneously, without transmitting multiple copies. So, when multicast IP data enters a subnet, if not properly configured the switches may send the multicast data to all their ports. This is referred to as multicast flooding and means that all the ports in that subnet are required to process that multicast data even if there are not Receivers (decoders) there to grab this data. This can cause more data to travel across the network and slow or overrun the network infrastructure. IGMP (Internet Group Management Protocol) offers a solution to this issue. So the most important thing in making sure your video-over-LAN infrastructure is to make sure IGMP is enabled on your switch. Of course it is also recommended that you use a dedicated network for video multicasting in order to avoid possible interaction or interruption of the LAN for normal use (email, browsing, VoIP, etc).

Selecting an Ethernet switch for Video over IP

Look for these minimum features:

- Gigabit (1000-Mbps) or faster Ethernet ports
- Support for IGMP snooping
- Support for Jumbo frames and enable Jumbo frames in configuration
- PoE ports (optional if you don't want to plug power supplies to the Senders and Receivers)
- If you have more than one switch make sure you have high bandwidth connections between switches, preferably multi-Gigabit or multiple slower links using Link Aggregation Control Protocol (LACP)

You may also:

- Look for Layer 3 or "managed" switches that perform IGMP Snooping using dedicated hardware (ASICs) rather than software routines running on a general-purpose processor
- Check the maximum number of concurrent "snoopable groups" each switch can handle and make sure that they meet or exceed the number of Senders (encoders) that you want to connect to the network. Note that Senders are the devices mostly responsible for creating network traffic. Receivers hardly add much to it
- Check the throughput speeds of the switch. Make sure that each port is full-duplex and supports speeds for each port are 1 Gbps

EXAMPLE CONFIGURATION FOR CISCO ETHERNET SWITCHES

This example covers basic setup requirements for typical Cisco Managed Ethernet Switches. The instructions should be similar and applicable to various Cisco Switch models.

Enabling IGMP in the Switch

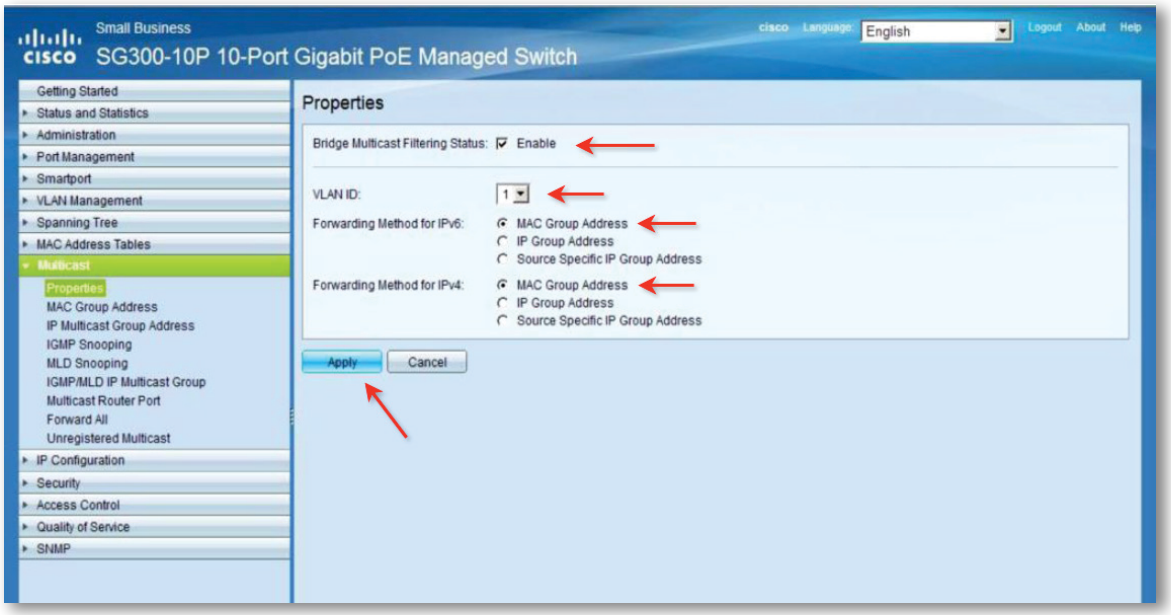
Follow the steps below to enable the IGMP feature on the Gigabit Ethernet Switch.

First you have to access the Web Server GUI in the Ethernet Switch

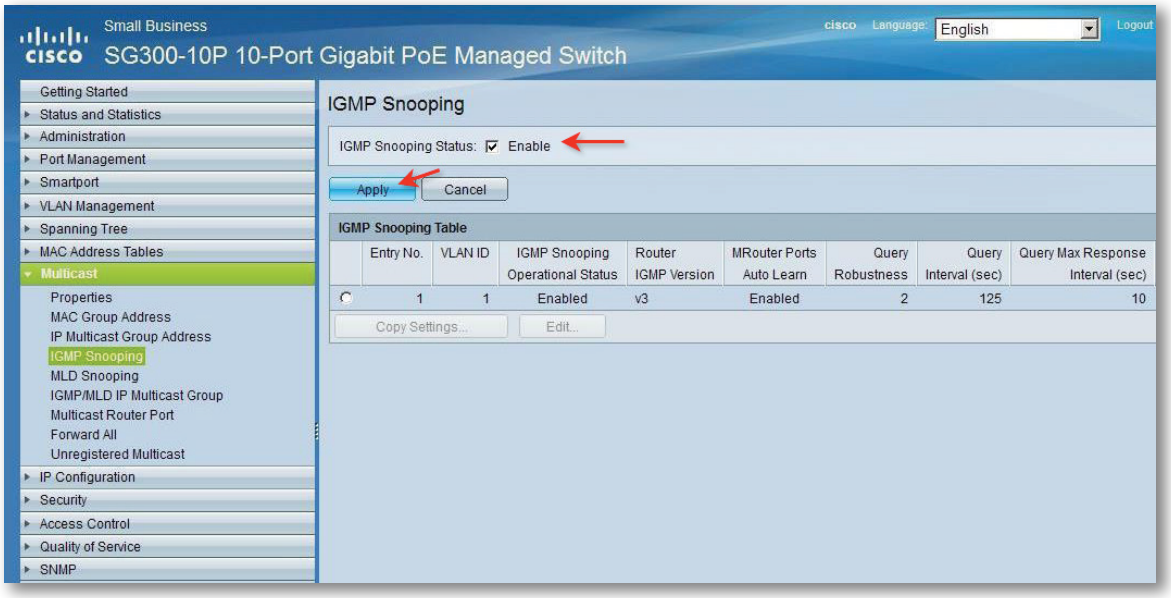
- Make sure your computer is on the same subnet as the Switch
- Open a browser and enter the IP address of the Switch

IGMP Snooping Configuration

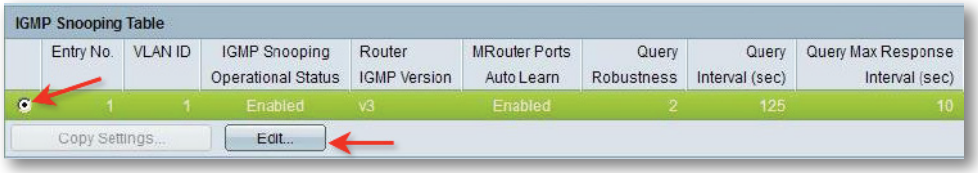
- Navigate to the menu: “Multicast --> Properties”
- Set the configuration as shown below, and then click “Apply”



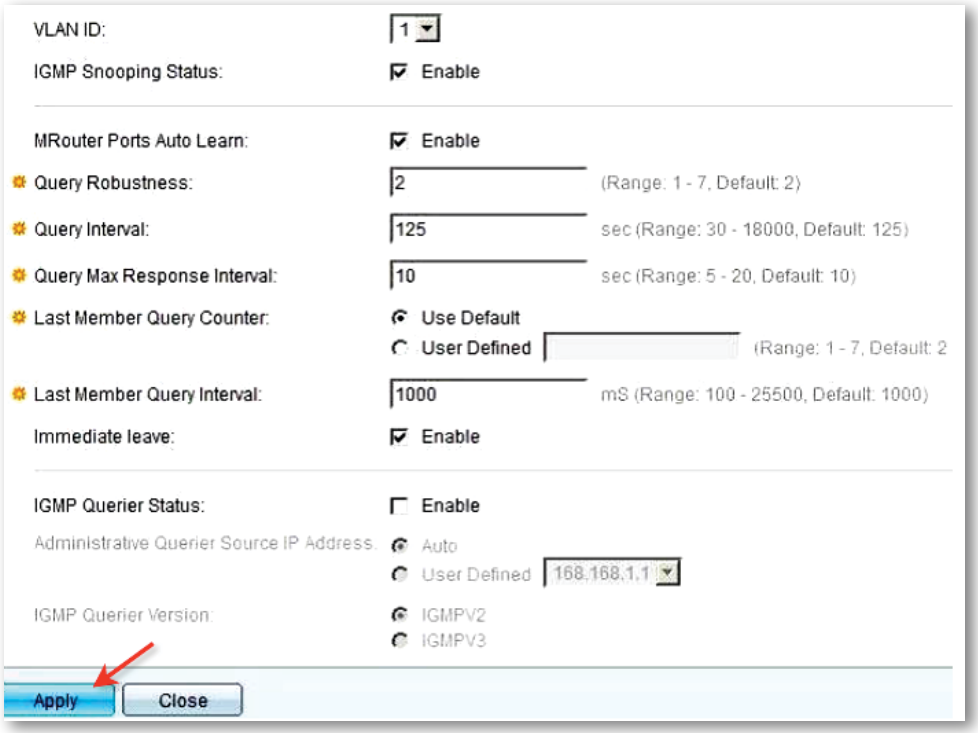
- Navigate to the menu: “Multicast --> IGMP Snooping”
  - Enable the “IGMP Snooping Status” as shown below, and then click “Apply”



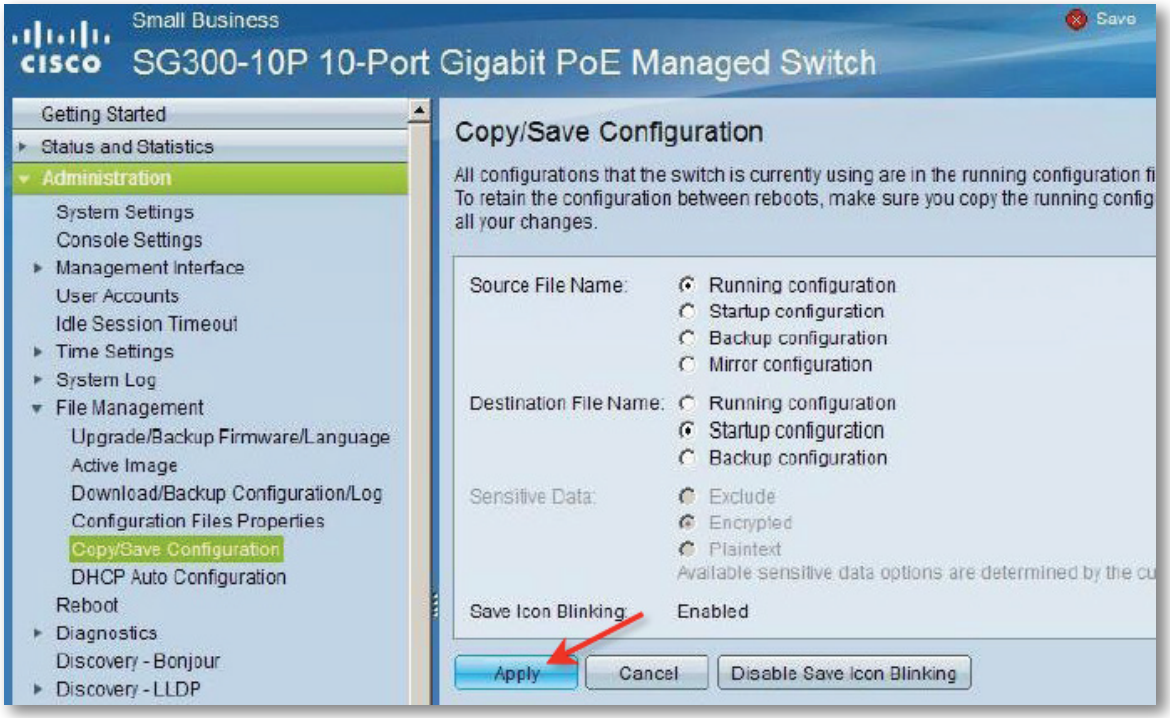
- Now select the button under IGMP Snooping Table and Click on “Edit” button



- Make sure the settings match those shown below



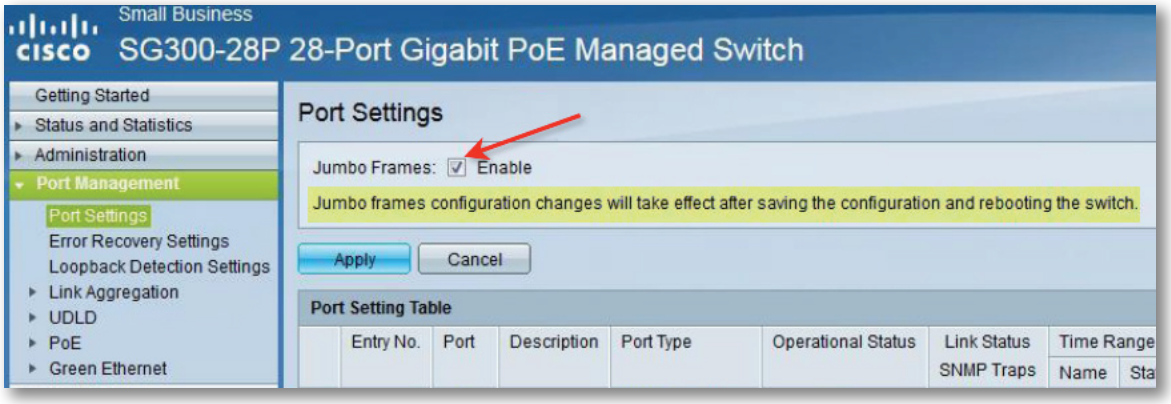
- Save your changes in “Administration --> File Management --> Copy/Save Configuration” menu and click on “Apply” as shown below



Enabling Jumbo Frames in the Switch

Follow the steps below to enable the Jumbo Frames option

- Navigate to the menu: “Port Mgmt --> Port Settings”
- Select “Jumbo Frames” Enable box and hit “Apply”

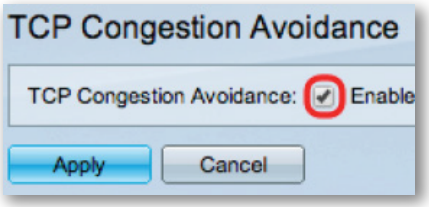


- Save your changes in “Administration --> File Management --> Copy/Save Configuration” menu and click on “Apply”

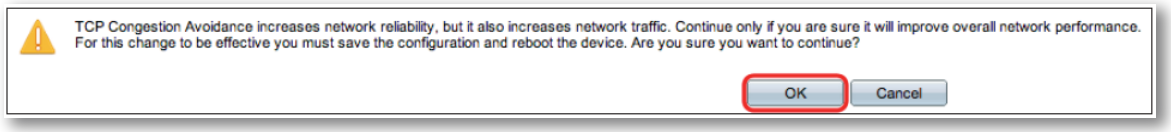
Enabling TCP Congestion Avoidance in the Switch (ONLY IF NEEDED)

This step is only needed if you have configured IGMP and Jumbo Frames per above sections, but still experiencing trouble

- In the menu navigate to “Quality of Service” and select “General > TCP Congestion Avoidance”
- Check the Enable check box in the TCP Congestion Avoidance field



- Check the Enable check box in the TCP Congestion Avoidance field
- Click Apply. The Enable TCP Congestion Avoidance window appears



- Click OK. TCP Congestion Avoidance is enabled
- Save your changes in “Administration --> File Management --> Copy/Save Configuration” menu and click on “Apply”

EXAMPLE CONFIGURATION FOR NETGEAR ETHERNET SWITCH

This example covers basic setup requirements for most typical Netgear Ethernet Switches

Enabling IGMP in the Switch

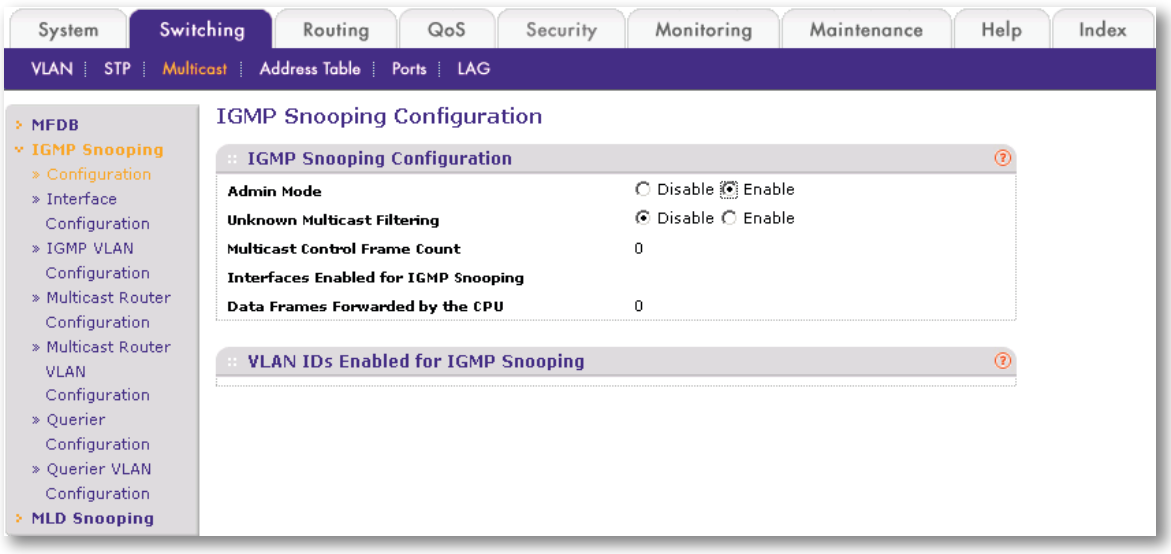
Follow the steps below to enable the IGMP feature on the Gigabit Ethernet Switch.

Step 1: Access the Ethernet Switch web server

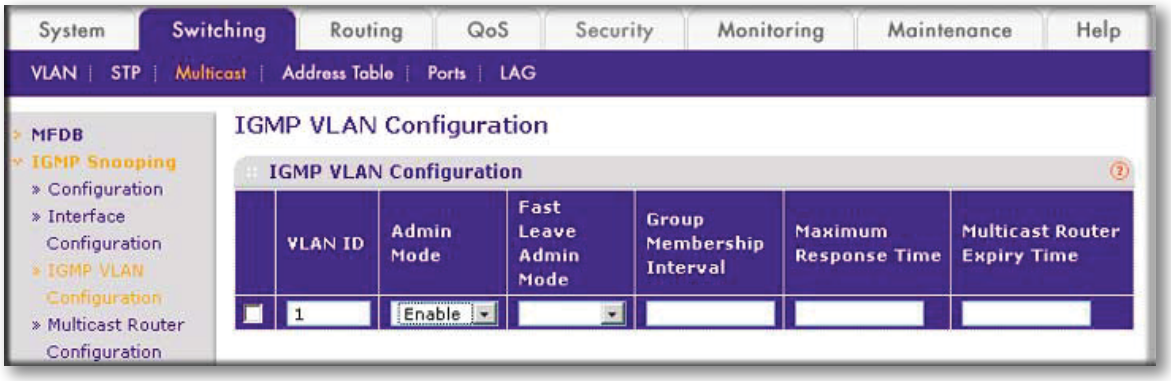
- Make sure your computer is on the same subnet as the Ethernet Switch
- Enter the IP address of the Ethernet Switch into a browser

Step 2: IGMP Snooping Configuration

- Navigate to the menu: “Switching Tab Multicast --> IGMP Snooping Config” & Set the configuration as shown below, and then click “Apply”

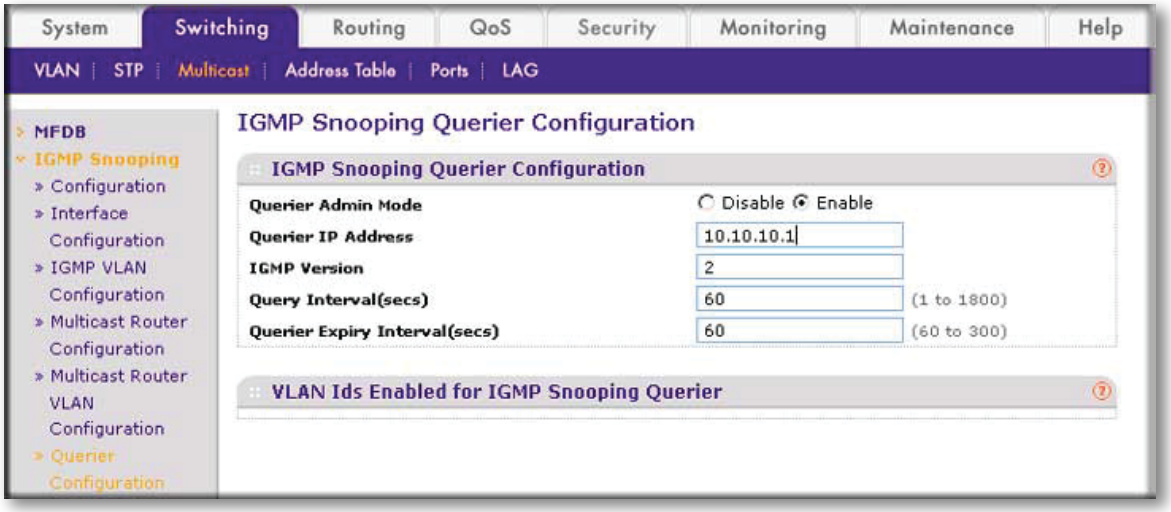


- Enable IGMP snooping on VLAN 1
  - Select Switching --> Multicast --> IGMP Snooping --> IGMP VLAN Configuration A screen similar to the following appears

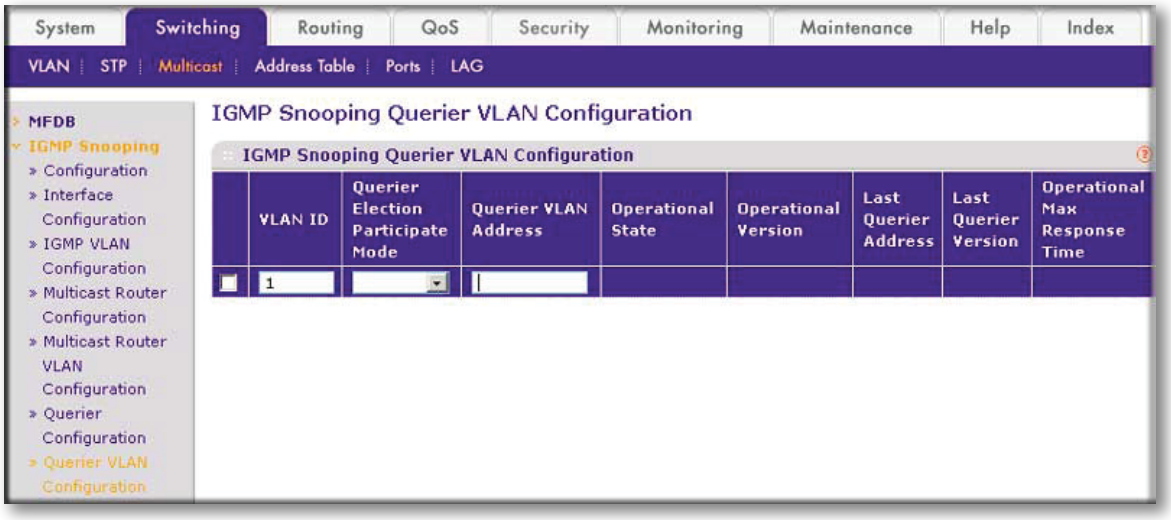


  - Enter the following information:
    - In the VLAN ID field, enter 1
    - In the Admin Mode field, select Enable
    - Click Add

- Enable the IGMP snooping querier globally
  - Select Switching --> Multicast --> IGMP Snooping --> IGMP VLAN Configuration. A screen similar to the following displays



  - Enter the following information:
    - For Querier Admin Mode, select the Enable radio button
    - In the Querier IP Address field, enter 10.10.10.1 or the IP address of the Ethernet Switch itself (could also be 192.168.0.239)
  - Click Apply
- Enable the IGMP snooping querier on VLAN 1
  - Select Switching --> Multicast --> IGMP Snooping --> Querier VLAN Configuration. A screen similar to the following displays



  - In the VLAN ID field, enter 1
  - Click “Add”

Enabling Jumbo Frames in the Switch

Follow the steps below to enable the Jumbo Frames option

- Navigate to the menu: Switching --> Ports --> Port Configuration
- For each port set the Max Frame Size allowed (typically 9216)
- Click “Save”