USERS GUIDE

IPX Series

Network Switch Recommendations & Configuration

10Gbps Network Switch Configurations

Manual Number: 161115

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RECOMMENDED NETWORK SWITCHES

The IPX will work with most non-blocking, IGMP 10G network switch. Layer 3 will allow more control, however, Layer 2 will work as well. It is highly recommended to communicate with the representative of the desired network switch brand to confirm configuration and capabilities. Below are some models that have been tested with the IPX Series.

1.1 Switch Speed

The IPX Series requires the switch to be a 10 GbE.
IPX Series technology is used to transmit uncompressed video up to 4K along with other AV signals such as audio, USB and control signals. For video alone, it means raw bandwidth of about 4 Gb/sec for HD and 8 Gb/sec for 4K mean a bandwidth of around 6 GB/s, and that just for video. It is therefore easy to understand why the IPX requires 10 GbE network switches.

1.2 Packets Routing

To enable the transmission of a source to multiple destinations, IPX devices make use of Multicast. The default behavior of layer 2 Ethernet switch is to broadcast those packets which mean that every packet will be transmitted to all possible destinations. This is why any network switch used with IPX Series has to support IGMP Snooping. IPX end points use IGMP protocol to assign the end points into multicast groups and the router uses IGMP snooping to efficiently route multicast packets only to receivers that want to receive them.

Many switches have the IGMP Snooping feature disabled by default and manual configuration is required. Often, a simple check mark near “Enable IGMP Snooping” is the only thing needed to enable IGMP Snooping.
However, the implementation of IGMP Snooping is vendor specific and additional configuration is often needed.

An Ethernet switch can be informed that a device wants to leave a multicast channel by sending it a IGMP LEAVE GROUP packet. Once received, the time it takes for the switch to apply the new configuration may vary from one switch to the other. Most switches implement and include FASTLEAVE configuration option. When enabled, it takes much less time for a particular port to leave a multicast group to assign the port to

a different multicast group. The end results are a noticeably shorter video switching time. Aurora recommends to always enable the FASTLEAVE option when available. With FASTLEAVE option, seamless switching is possible for 4K video sources. Without FASTLEAVE option, 'seamless' switching is limited to 1080P 60 Hz video signals.

1.3 Ethernet Switch Configuration

The following list includes all network switch configuration options that Aurora Engineers have come across so far. Look for these or similar options when configuring your switch.

1. Enable IGMP Snooping
   a. Must be enabled
2. Enable IGMP Snooping on VLAN 1
   a. Must be enabled when all ports default to VLAN1
3. Filter/Drop unregistered Multicast traffic
   a. If not applied, the behavior of the switch will be to broadcast multicast packets if the switch has no known destination for that packet.
   b. Must be enabled if found
4. Unregistered Multicast Flooding
   a. Must be disabled if found
5. Filter Unregistered Multicast (different wording than number 4 above)
   a. Must be enabled if found
6. Enable IGMP Query
7. Enable IGMP Query on VLAN1
8. Set IGMP Version to IGMP V2
   a. Must be set if found
9. Enable FASTLEAVE on port X
   a. This is optional. Should be enabled, if found
10. Enable FASTLEAVE for VLAN1
    a. This is optional. Should be enabled if found

1.4 Ethernet Switch Models

The following is a list of 10G Ethernet switch models that have been verified to date. Check with Aurora to see if any others may have been added at a later time relative to the manual revision date.

Aurora IPX-FSW Series Fiber 10G

IPX-FSW-8 8 Port Switch Layer 3 with 8 1G RJ-45 ports
IPX-FSW-12 12 Port Switch Layer 3 with 8 1G RJ-45 Ports
IPX-FSW-24 24 Port Switch Layer 3 with 4 1G RJ-45 Ports

Arista Networks

7050SX-72 72 Port SFP+ 10G Fiber Switch
7050SX-96 96 Port SFP+ 10G Fiber Switch
7050SX-128 128 Port SFP+ 10G Fiber Switch

7050TX-64 64 Port 10G Copper Switch
7050TX-72 72 Port 10G Copper Switch
7050TX-96 96 Port 10G Copper Switch
7050TX-128 128 Port 10G Copper Switch

Extreme Networks

X670-48T 48 Port Copper Switch
X670-48X 48 Port SFP+ Fiber Switch

Huawei

CE6851-48S6Q-HI (48*10G Base-X SFP+ Fibber Ports + 6*40G QSFP+ Ports)

CE8860-4C-EI (4 Sub Card Slots)

Sub card for CE8860

CE88-D24S2CQ (24*10G Base-X SFP+ Fiber Ports+ 2*40G/100G QSFP+ Ports)

CE6850-48T6Q-HI (48*10G Base-T Copper Ports+ 6*40G QSFP+ Ports)

CE8860-4C-EI (4 Sub Card Slots)

Sub card for CE8860

CE88-D24T2CQ (24*10G Base-T Copper Ports+ 2*40G/100G QSFP+ Ports)

Netgear Copper 10G

XS708E 8 Port ProSAFE Plus Switch (Note: This is a layer 2 switch and does not have fast switching. IPX Seamless switch mode will work however at times you may see a slight glitch in the image.) One port is a shared 10G SFP+ Fiber Ports.

XS708T 8 Port ProSAFE Smart Managed Switch with 1 shared 10G SFP+ Fiber Ports.

XS712T 12 Port ProSAFE Smart Managed Switch with 2 shared 10G SFP+ Fiber Ports.

XS728T 28 Port ProSAFE Smart Managed Switch 24 Copper and 4 non-shared 10G SFP+ Fiber Ports

XS748T 48 Port ProSAFE Smart Managed Switch 44 Copper and 4 non-shared 10G SFP+ Fiber Ports

CONFIGURATIONS

Switch Login & Connections

Login

You must first log onto the switch with administrator right. Follow the switch manufacturer manual to do so. It will also give you the default Admin password.

Console Port

Some manufacturers use RS-232 / “Console port” for switch configuration and dedicated console cable which is different from a standard Cat X (RJ45) cable.

Ethernet

Other manufacturers go through standard 1Gbe compatible port for switch configuration. If this is the case, the manufacturer will give you the default “IP Address” of the switch. Make sure your network adaptor has an IP Address in the same network.

Depending on login method above, switch configuration will be done either through a Web Browser or a Telnet Client.

Aurora IPX-FSW Series

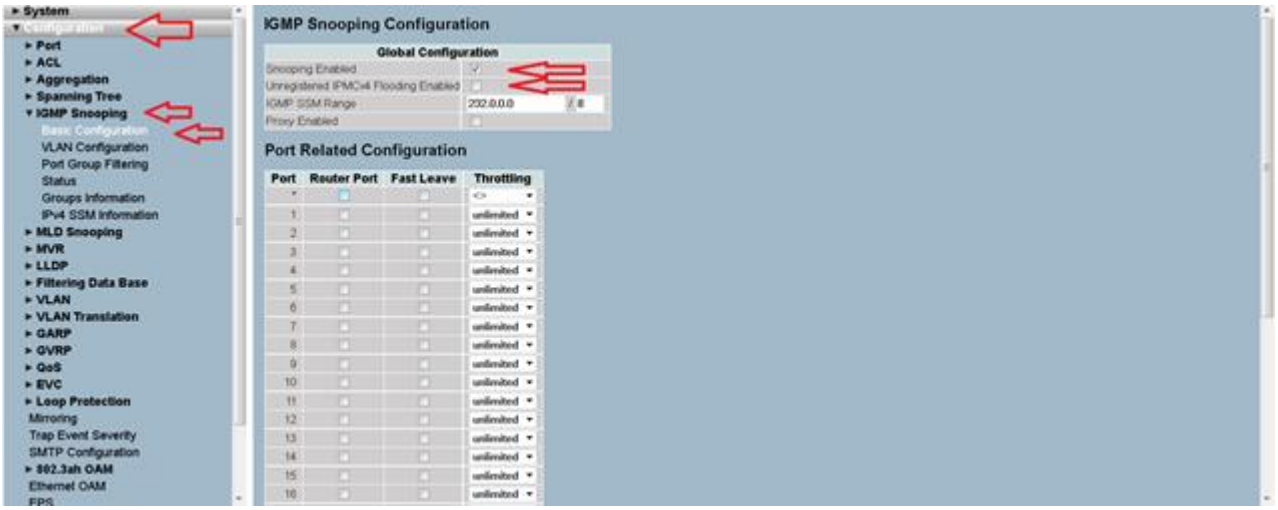
The Aurora IPX-FSW Series is designed to work out of the box as it is pre-configured. To confirm that the default configuration is correct or if settings have been changed inadvertently, open a console (RS232 baud rate 38400) and type the following commands at the prompt:

Switch> **enable**

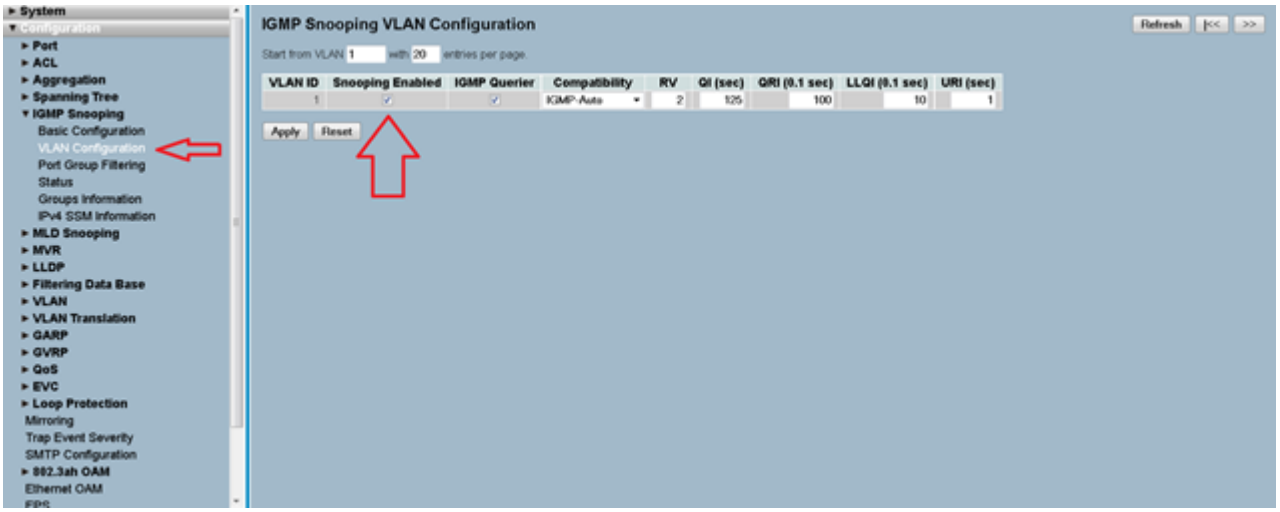
Switch# **show ip igmp snooping mrouter** -> expected output: IGMP Snooping Enabled

Switch# **show ip igmp snooping fast-leave** -> expected output: IGMP Snooping fast-leave is enabled

1. Go to the “Configuration” / “IGMP Snooping” / “Basic Configuration” tab as shown in next screen shot:



2. Make sure “Snooping Enabled” is checked.
3. Make sure “Unregistered IPMCv4 Flooding Enabled” is NOT checked.
4. After the changes are made, go at the bottom of the page and click the “Apply” button.
5. Next, go to the “VLAN Configuration” tab as showed in next screen shot:



6. Make sure “Snooping Enabled” is checked, and click “Apply”.

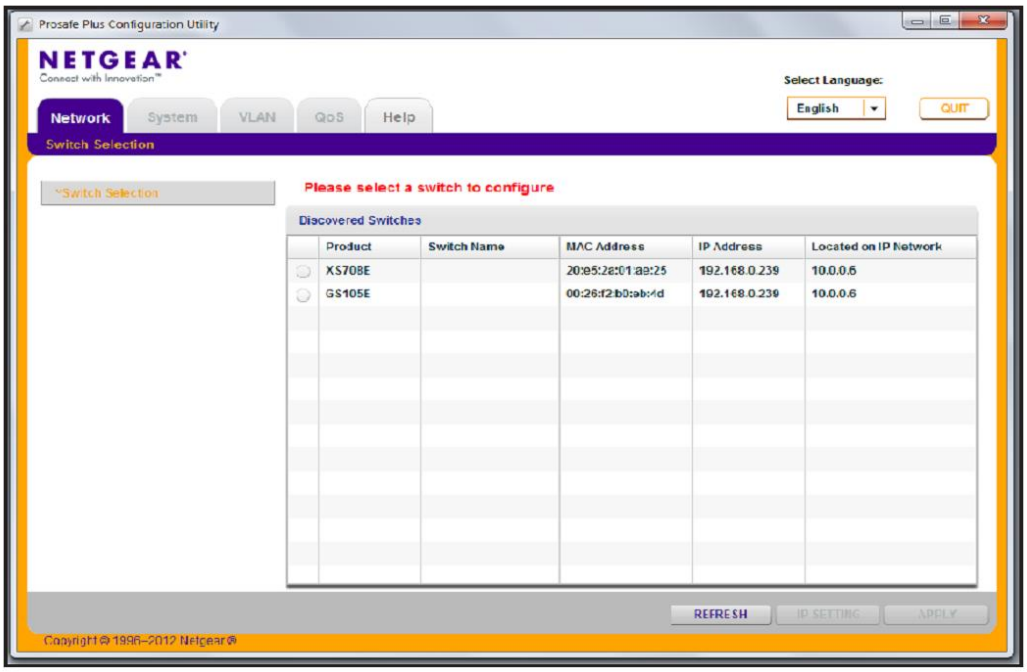
Netgear ProSAFE XS708E

This switch does not support FASTLEAVE option however there is a XS708T available that does. While it supports 'seamless' switching for 1080P video resolutions it is not capable to support seamless' switching for 4K30 resolutions and higher.

To configure the XS708E, use the ProSAFE Plus Switch Utility that is found on the Resource CD shipped with ProSAFE PLUS switch. The utility can be installed on any Windows computer on the same network as the switches to be managed. The user manual for the switch utility can be found here

http://www.downloads.netgear.com/files/GDC/GS105E/ProSAFE%20Plus%20Switch%20Utility%20User%20Guide_21Dec2012.pdf

Running the tool will list discovered switches as shown here below



Select the switch you want to configure and a switch from the list and press the Apply button on the bottom right of the screen.

To enable Multicast:

- Select 'Systems' tab and from there select 'Multicast' sections
- In the IGMP Snooping Status list, select Enable and click Apply
- In the Block Unknown Multicast Address list, select Enable and click Apply
- You can also change the VLAN for which the IGMP snooping is enabled. In the VLAN ID Enabled for IGMP Snooping field, enter a valid ID and click Apply. This field

is dimmed if VLAN is not enabled.

To enable VLAN:

- Select VLAN Tab
- Select Port Based and select Enable
- Select Yes if a message appears asking if you want to delete previous VLAN settings
- For each port to be added to the new group, enter the ID of the VLAN group

Netgear ProSAFE XS712T

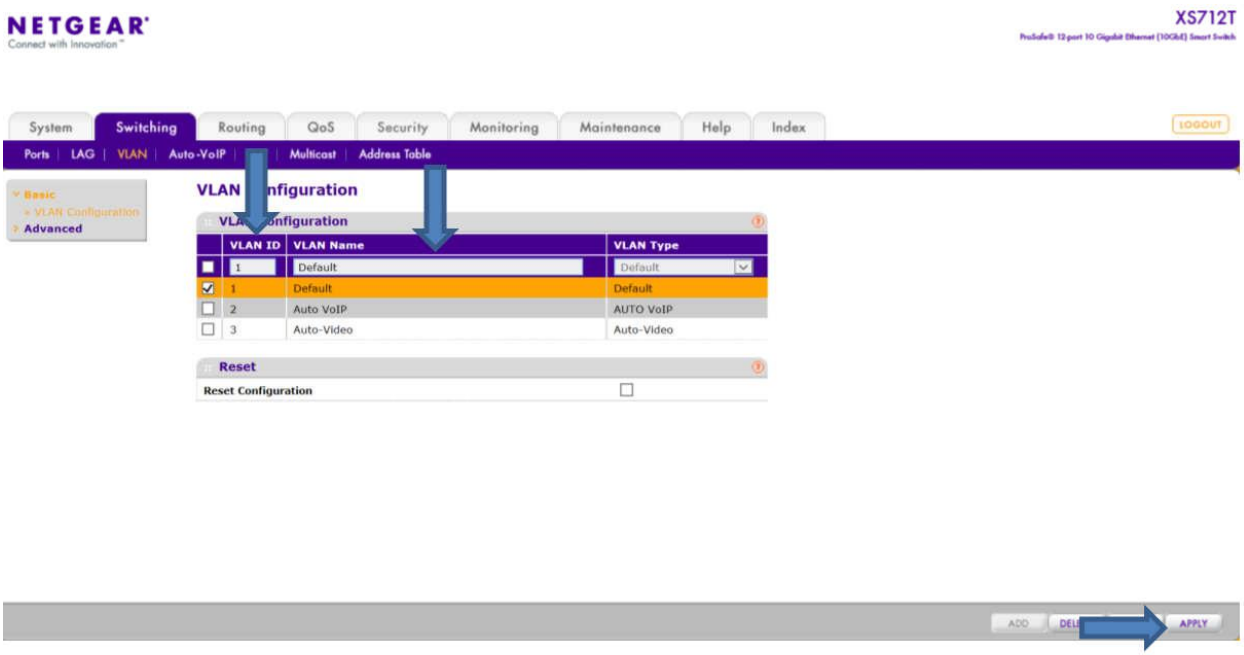
To configure the XS712T, use the Smart Control Center Utility that is found on the Resource CD shipped with ProSAFE Smart switch. The utility can also be downloaded directly from here http://support.netgear.com/product/XS712T. The utility can be installed on any Windows computer on the same network as the switches to be managed. The product guide and software manual for the switch utility are also located at http://support.netgear.com/product/XS712T

If the switch is connected to DHCP server make sure that the computer is also set to DHCP mode and then run the utility and use the discover button to find the switch.

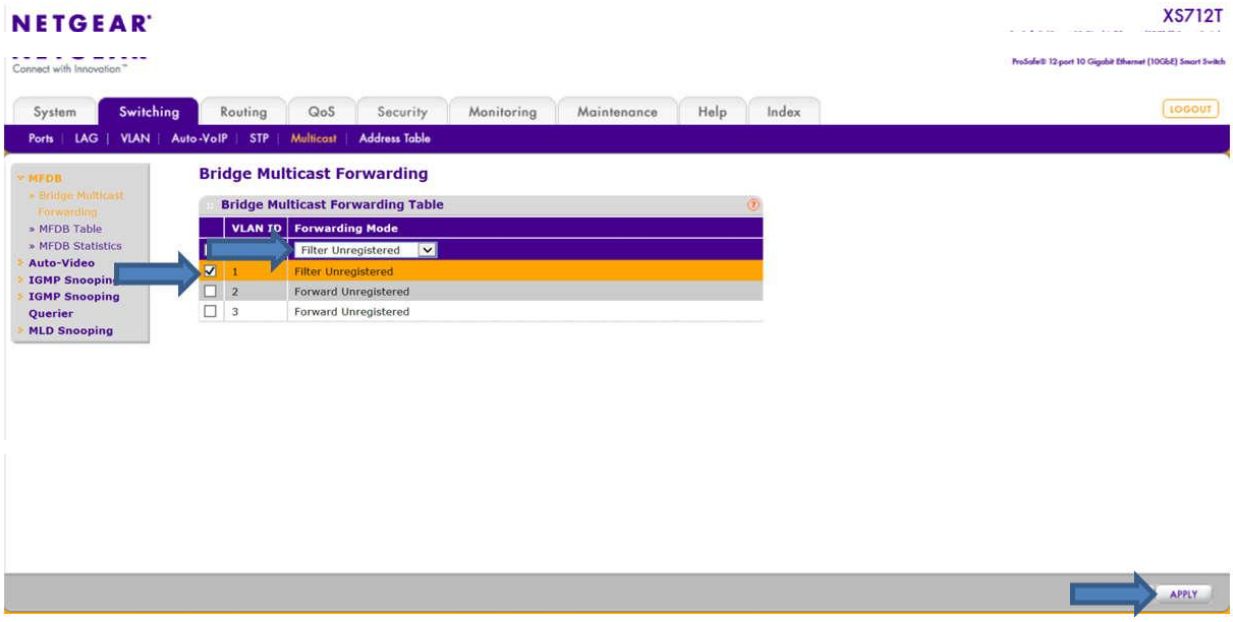
If you are using a static IP address in your network, configure the switch IP address before connecting the switch to your network. The default IP address of the switch is 192.168.0.239. Set up the computer with a static IP address in the 192.168.0.x subnet and connect it to the switch and run the utility.

To configure the switch to work with IPX Series type devices, follow the instruction below to setup VLAN and to enable both Multicasting and IGMP snooping.

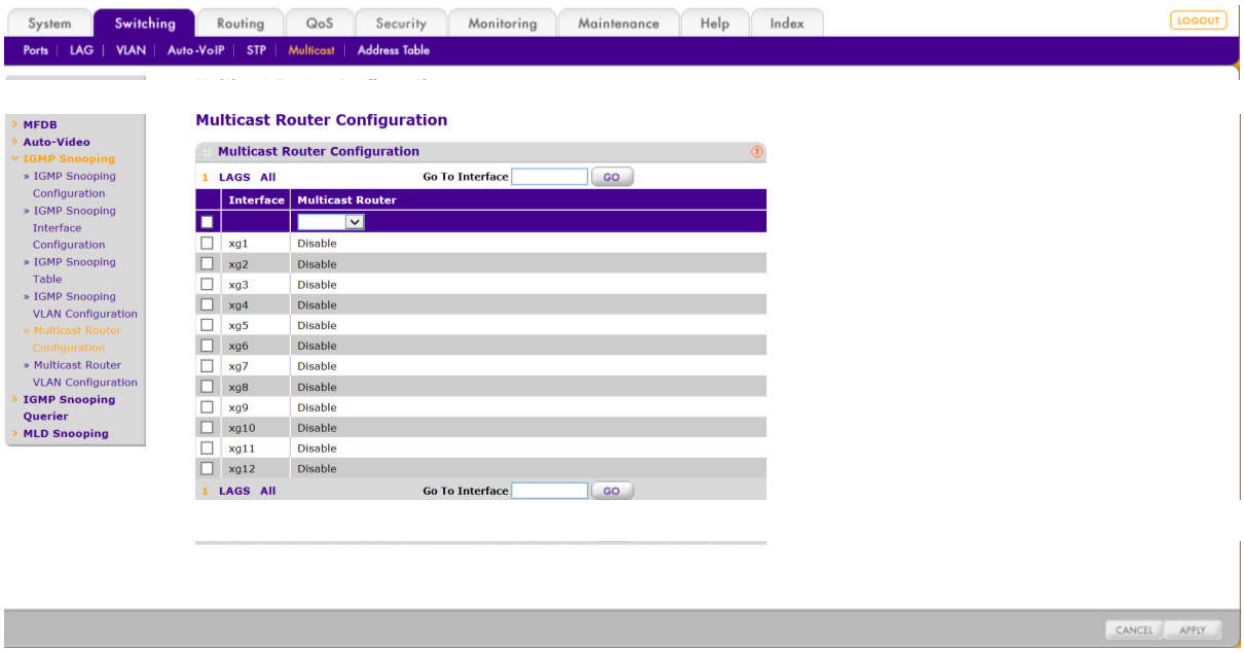
1. If not available, create VLAN ID #1.
2. Once “VLAN ID” and “VLAN Name” fields are filled as showed, press “Apply” on the lower right of the screen.



3. Go to the "Multicast" tab.
4. Select VLAN ID #1 and select “Filter Unregistered” in the drop- down list.
5. Press Apply in the lower right.

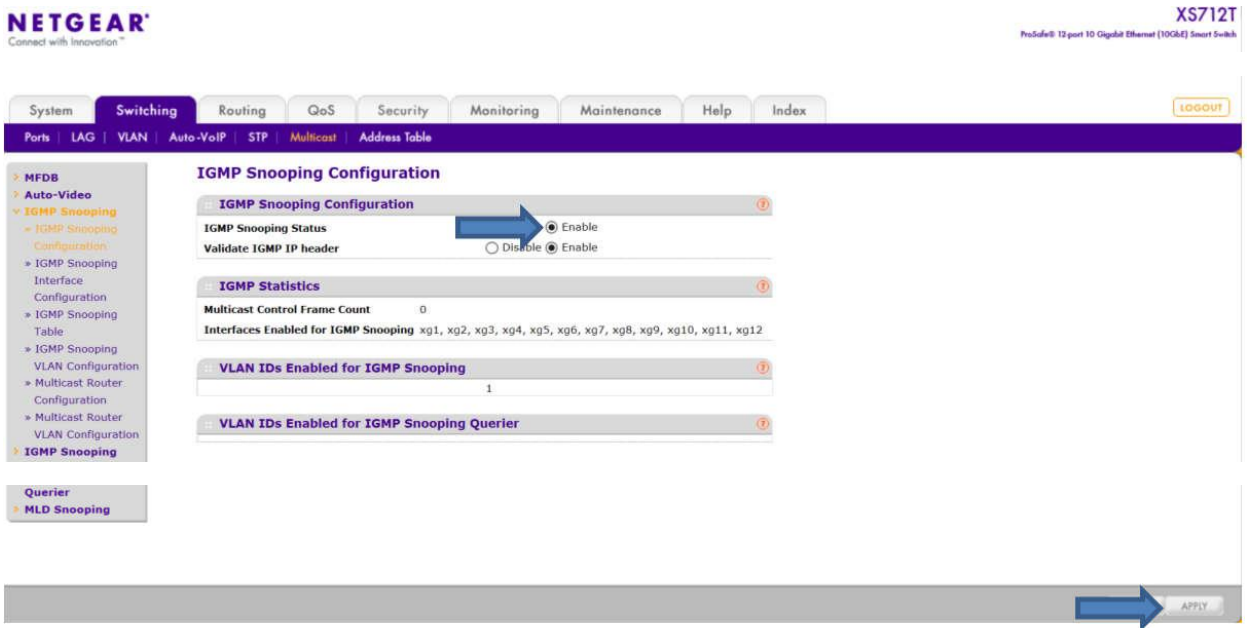


6. While in Multicast section, go to “Multicast Router Configuration”
7. Make sure that “Multicast Router” option is disabled for all ports.
8. Press “Apply” if you changed anything.



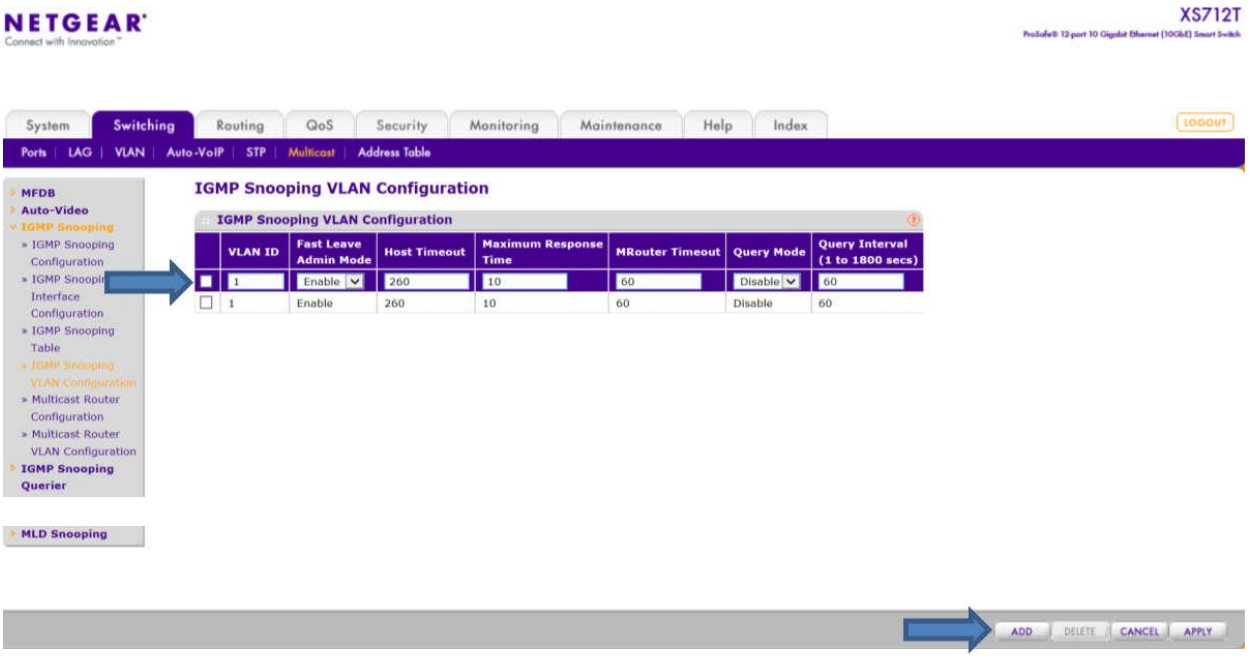
Next, go to “IGMP Snooping Configuration section”

9. Enabling IGMP Snooping. Both “IGMP Snooping Status” and "Validate IGMP IP header” need to be enabled
10. Press “Apply”



11. Now, go to “IGMP Snooping VLAN Configuration”
12. Fill the row as shown below

13. Press “ADD” in the lower right of the screen.

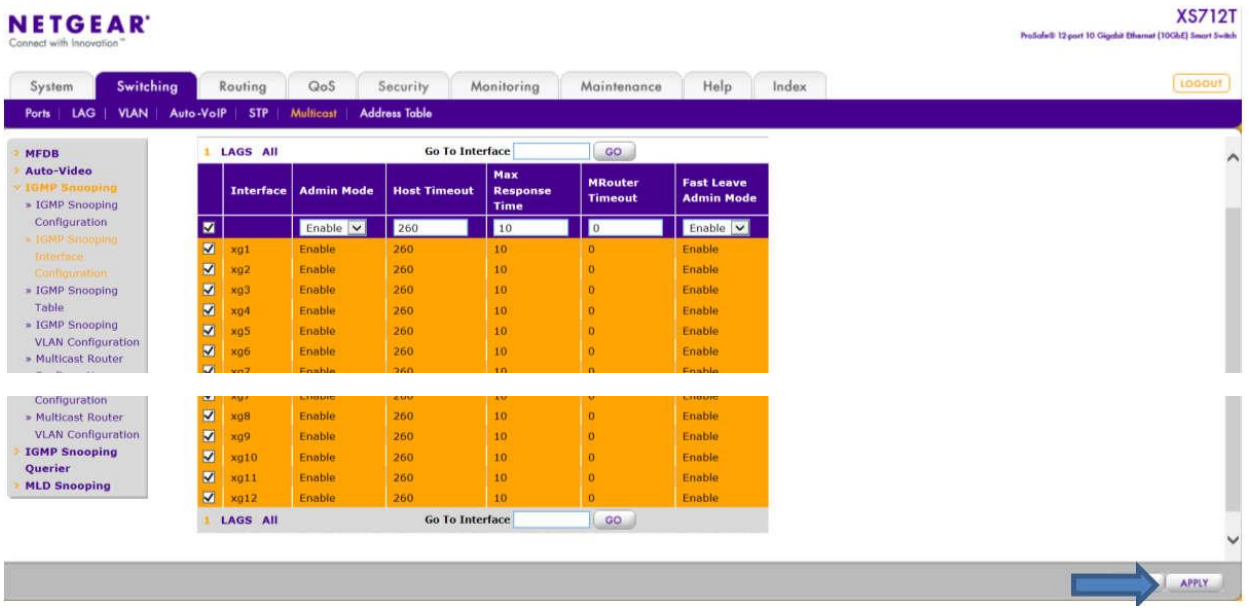


14. Still in Multicast section, go to “IGMP Snooping Interface Configuration”.

15. Select all ports as shown below.

16. Fill the first row as shown below.

17. Press Apply on the lower right.



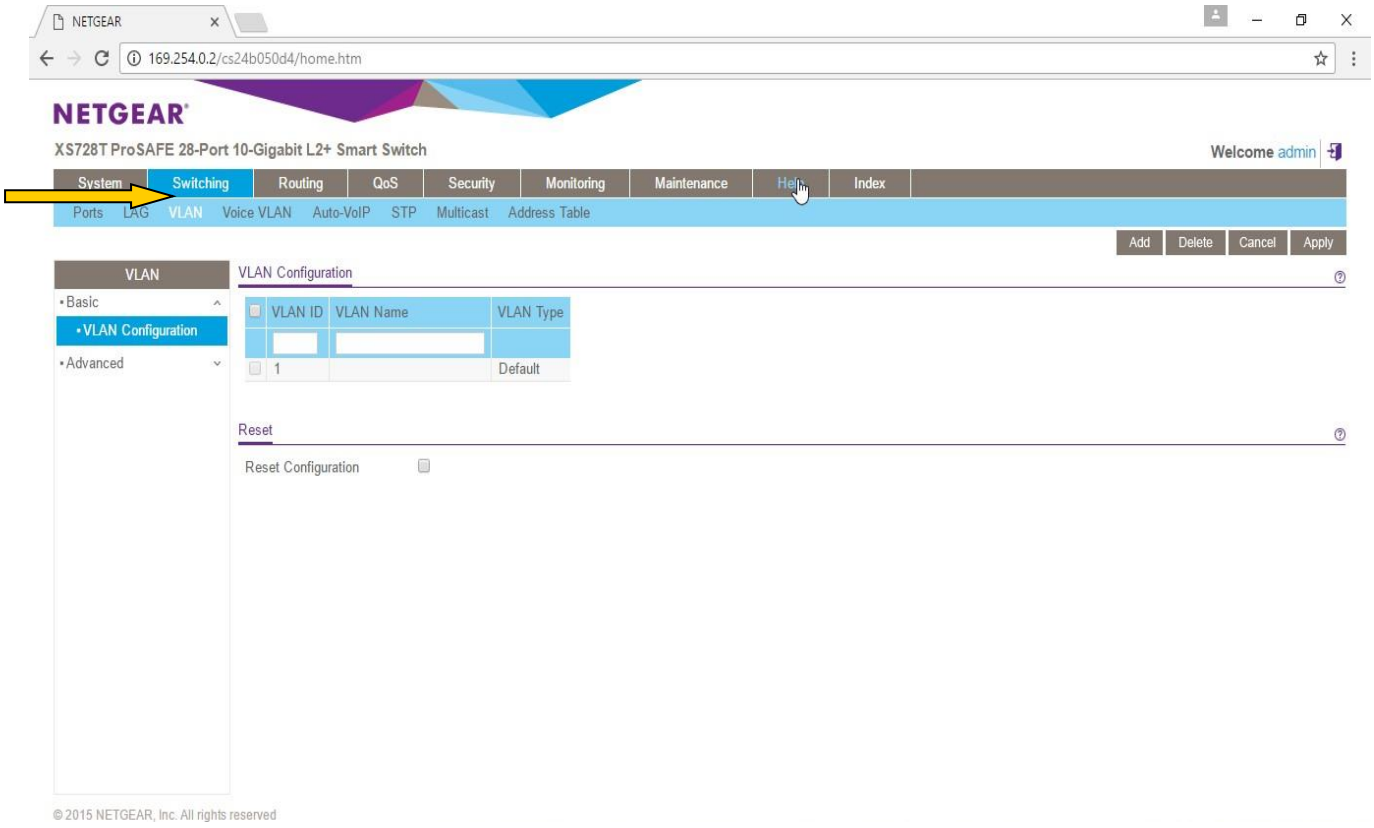
Netgear ProSAFE XS728T

Setup PC/Laptop that's used to for setup to 192.168.0.200 / 255.255.255.0 / 192.168.0.1.

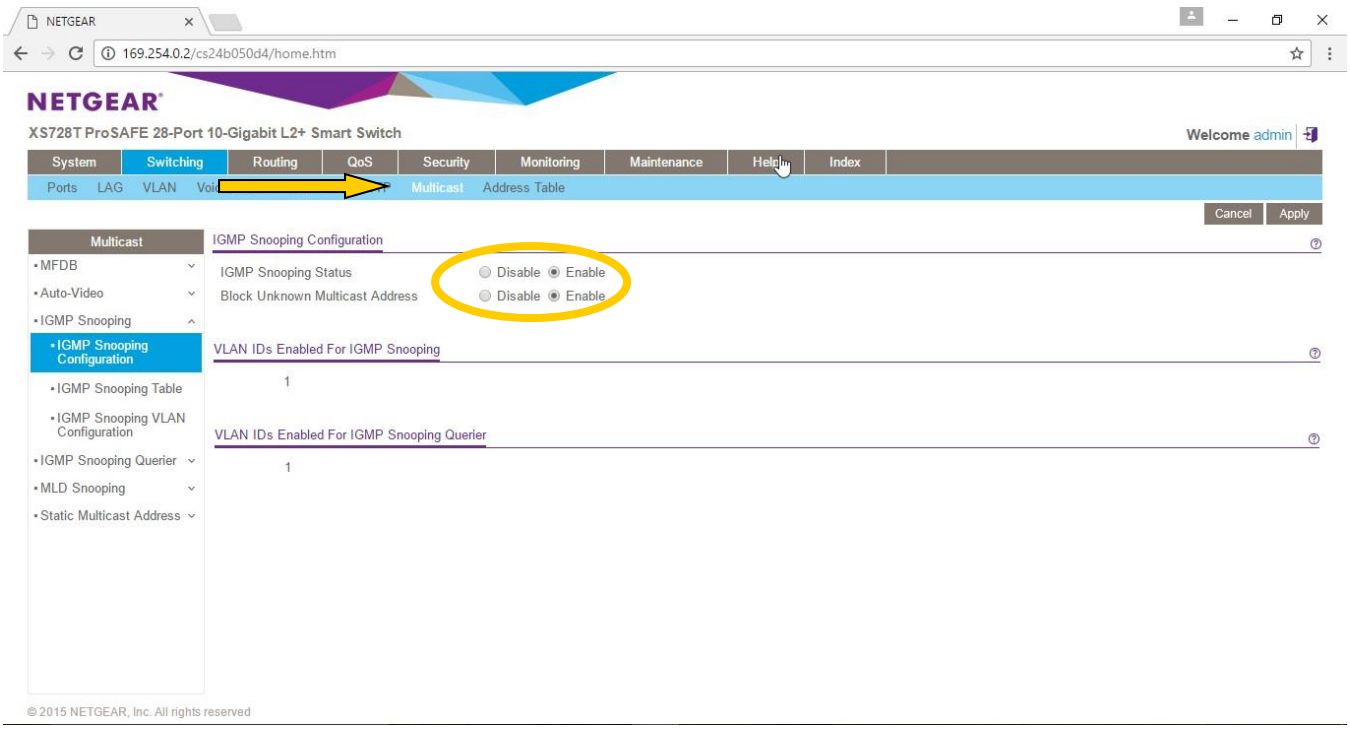
Log into the switch using its IP address (if set to static) or its default IP, 192.168.0.239. Default password is "password".

1/ Reset the switch to factory defaults (Maintenance --> Factory Default) to ensure all settings are reset. If IP is unknown, factory defaults can be set by press and hold "Factory Defaults" button for 2s or longer.

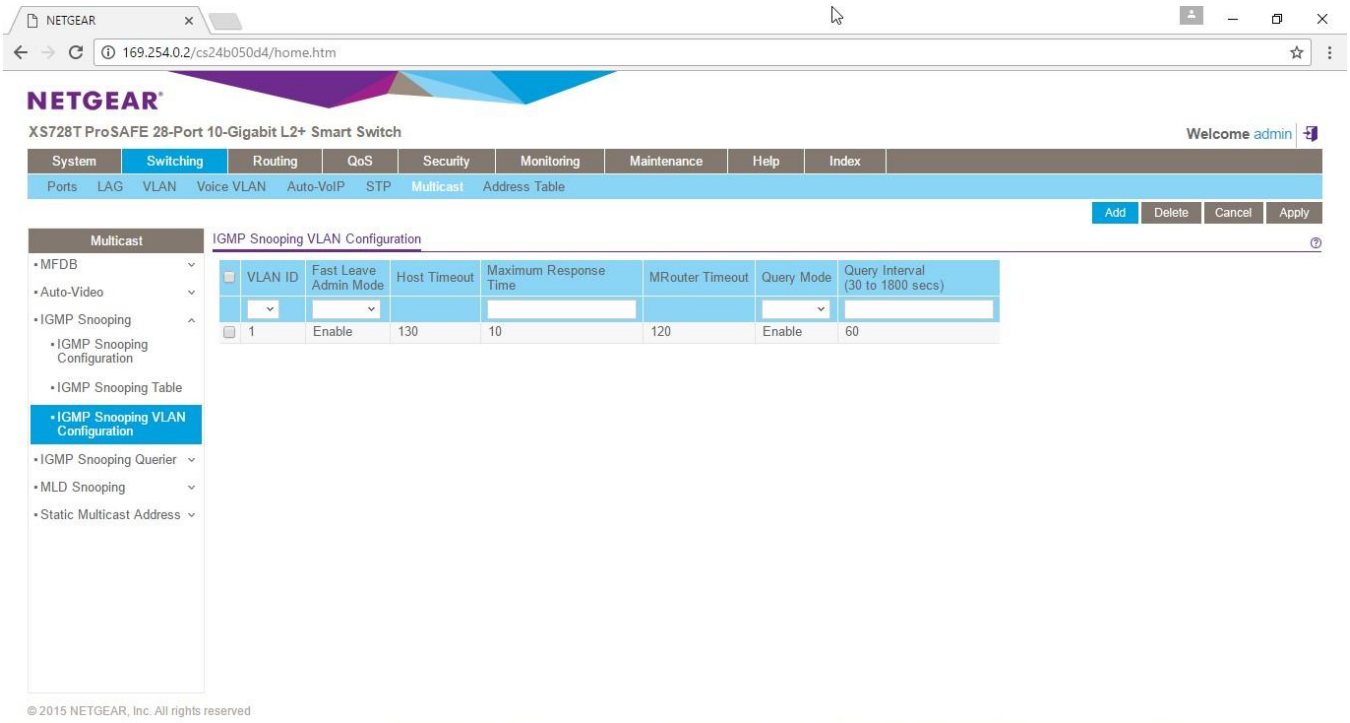
2/ Create VLAN 1 (default) if no VLAN is available (Switching --> VLAN).



3/ IGMP Snooping Configuration: have both IGMP Snooping Status and Block Unknown Multicast Address enabled.



4/ IGMP Snooping VLAN Configuration: set the parameters as shown in picture.



Netgear M7300-24XF XSM7224S

Login into the switch and execute those commands:

(The left column is the prompt you should get. Right column is the command to have to type)

Switch>	**enable**
Switch#	**configure**
Switch (Config)#	**set igmp**
Switch (Config)#	**set igmp unknow-multicast filter**
Switch (Config)#	***e*xit**
Switch#	**vlan database**
Switch (Vlan)#	**set igmp 1**
Switch (Vlan)#	**set igmp fast-leave 1**
Switch (Vlan)#	**exit**
Switch#	**copy system:running-config nvram:startup-config**
Switch#	**show igmpsnooping**
Switch#	**show igmpsnooping 1**

Extreme Network Summit X670 Series

Aurora has tested two (2) Extreme Networks X670 Series switches in its lab; **X670V-48t** with 48 10GBase-T interfaces and **X670-48x** with 48 SFP+ interfaces. Other switches in this series share the same firmware and should work as well with Aurora IPX Series based devices.

This includes:

- X670-G2-48x-4q
- X670-G2-72x
- X670V-48t

IGMP snooping is enabled by default for these switches. Fast Leave features should be enabled. This allows IPX Series to switch faster and enables 'Seamless' switching.

Do the following to enable fast leave:

- Open a console (RS232 baud rate 9600)
- Login: admin
- Password: <enter password>
- To find the <VLAN_NAME> type: **show igmp snooping**

The vlan name is reported in the first column. Enter the following commands using the return vlan_name

- configure igmp snooping leave-timeout 0
- enable igmp snooping vlan <VLAN_NAME> fast-leave

To save the configuration enter:

- save configuration primary

Arista Networks 7050X Series

Aurora has tested and validated the Arista **7050SX-64** in its lab. Since same firmware is used in all 7050X series switches, other switches in the series should work as well. This includes the following fiber and copper switches

Fiber:

- 7050SX-72
- 7050SX-96

- 7050SX-128

Copper:

- 7050TX-64
- 7050TX-72
- 7050TX-96
- 7050TX-128

Configuration is done through serial port. To configure any of the 7050X switches do the following:

- Through the serial port, log into switch with default admin password
  - Username admin
  - No password
- To enable config mode type:
  - **enable**
  - **configure terminal**
  - **interface management 1**
  - **ip address 192.168.2.201/24**
  - **end**
- To enter into switch config mode type:
  - **enable**
  - **conf**
- (You should now see this prompt)
  - **localhost(config)#**
- To change the operating mode to store and forward:
  - **switch forwarding-mode store-and-forward**
- To enable the IGMP querier type:
  - **ip igmp snooping vlan 1 querier address 192.168.2.99**
  - **ip igmp snooping vlan 1 querier**
  - **show ip igmp snooping querier**
  - **show ip igmp snooping querier status**

The switch is now properly configured.

Huawei Cloud Engine Series

Aurora has tested and validated the Huawei Cloud Engine Series Switches. Since same firmware is used in all CE685X-HI and CE8800 series switches, other switches in the series should work as well. This includes the following fiber and copper switches

Fiber:

- **CE6851-48S6Q-HI** (48*10G Base-X SFP+ Fibber Ports + 6*40G QSFP+ Ports)
- **CE8860-4C-EI** (4 Sub Card Slots)
  - Sub card for CE8860
- **CE88-D24S2CQ** (24*10G Base-X SFP+ Fiber Ports+ 2*40G/100G QSFP+ Ports)

Copper:

- **CE6850-48T6Q-HI** (48*10G Base-T Copper Ports+ 6*40G QSFP+ Ports)
- **CE8860-4C-EI** (4 Sub Card Slots)
  - Sub card for CE8860
- **CE88-D24T2CQ** (24*10G Base-T Copper Ports+ 2*40G/100G QSFP+ Ports)

Configuration is done through serial port. To configure any of the Cloud Engine switches do the following:

- Through the serial port, log into switch
  - No username admin
  - No password
- To enable config mode type:
  - **system-view immediately**
  - **interface MEth 0/0/0**
  - **ip address 192.168.2.201 24**
  - **quit**
- To enter into switch config mode type:
  - **system-view immediately**
- (You should now see this prompt)
  - **[HUAWEI]**
- To change the operating mode to store and forward:

- **assign forward mode store-and-forward**

- To enable the IGMP querier type:
  - **[HUAWEI]igmp snooping enable**
  - **[HUAWEI]vlan 1**
  - **[HUAWEI-vlan1]igmp snooping enable**
  - **[HUAWEI-vlan1]igmp snooping querier enable**
  - **[HUAWEI-vlan1]quit**
  - **[HUAWEI]acl 2000**
  - **[HUAWEI-acl4-basic-2000]rule permit source 192.168.2.99 0**
  - **[HUAWEI-acl4-basic-2000]rule deny source any**
  - **[HUAWEI-acl4-basic-2000]quit**
  - **[HUAWEI-vlan1]igmp snooping query ip –source-policy 2000**
  - **[HUAWEI]Save**
  - **display igmp snooping querier vlan 1**
  - **display igmp snooping statistics vlan 1**

The switch is now properly configured.

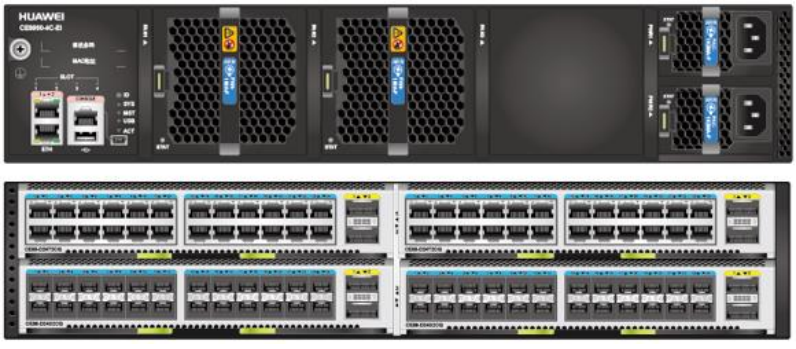
For more information,

CE6850-HI

http://e.huawei.com/en/products/enterprise-networking/switches/data-center-switches/ce6800

CE8800

http://e.huawei.com/en/products/enterprise-networking/switches/data-center-switches/ce8800



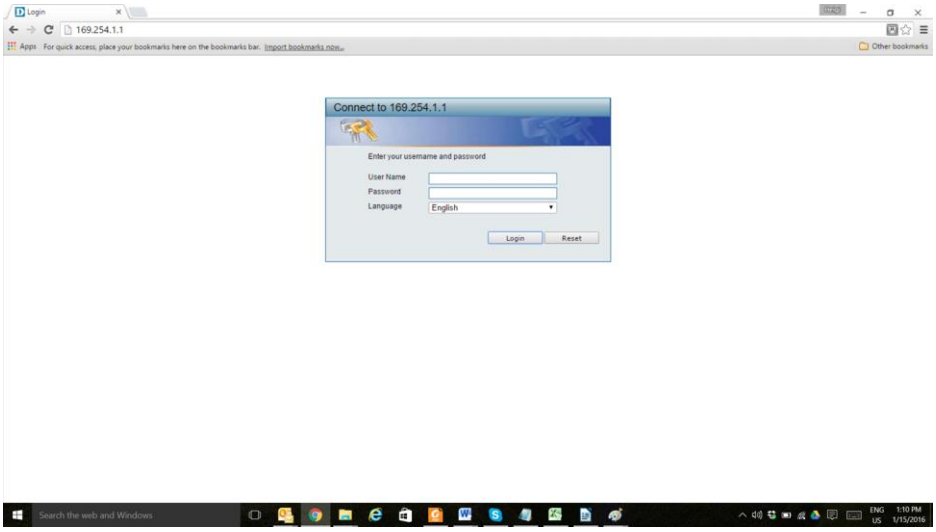
D-Link DXS-1210-12TC

D-Link DXWS-1210-12TC is an inexpensive hybrid 10G switch with up to 12 concurrent ports. This is a smart managed switch that is entirely configured through web-browser interface. The switch has 8 10GBaseT ports, 2 SFP+ ports and 2 ports that are mutually exclusive 10GBaseT or SFP+ ports.

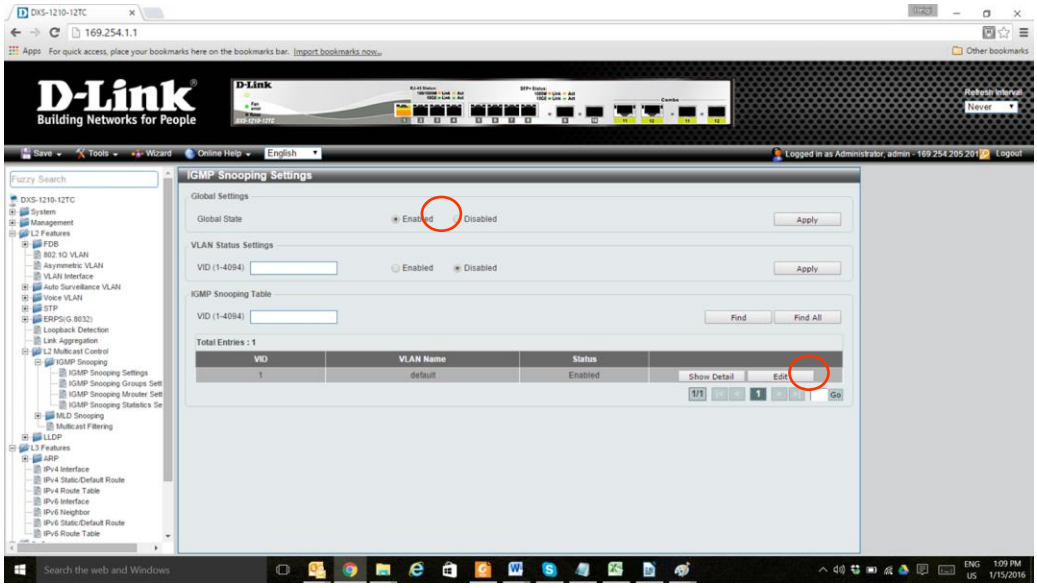
Make sure that switch is using recent firmware 1.10.013 or later.

Use the following steps to configure the switch for use with IPX Series devices

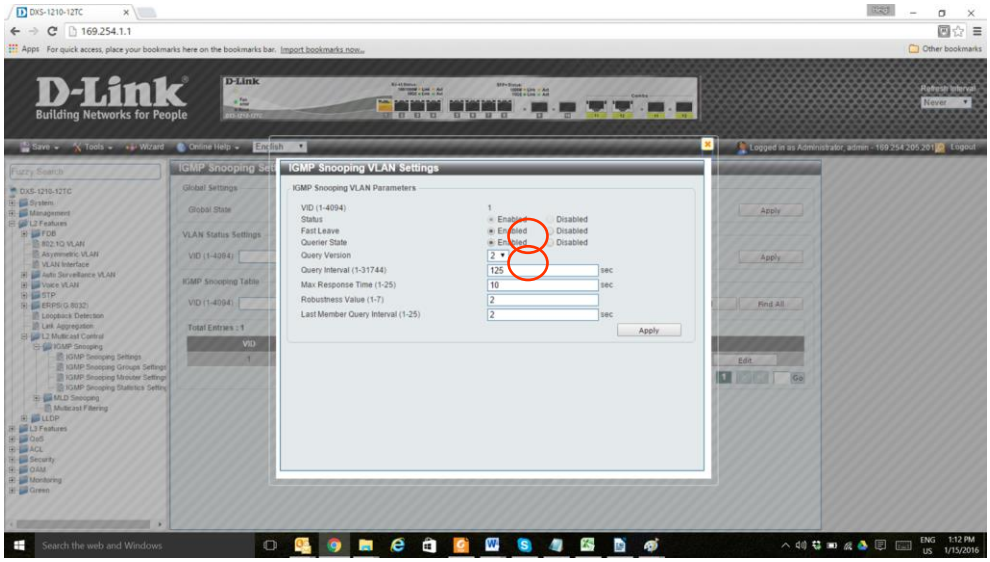
1. Connect your computer to any unused switch port. Use any browser to login into the switch. To login your computer needs to be on the same subnet as the switch. Consult the switch manual for more information. On first login you will be prompted to set/change default switch password.



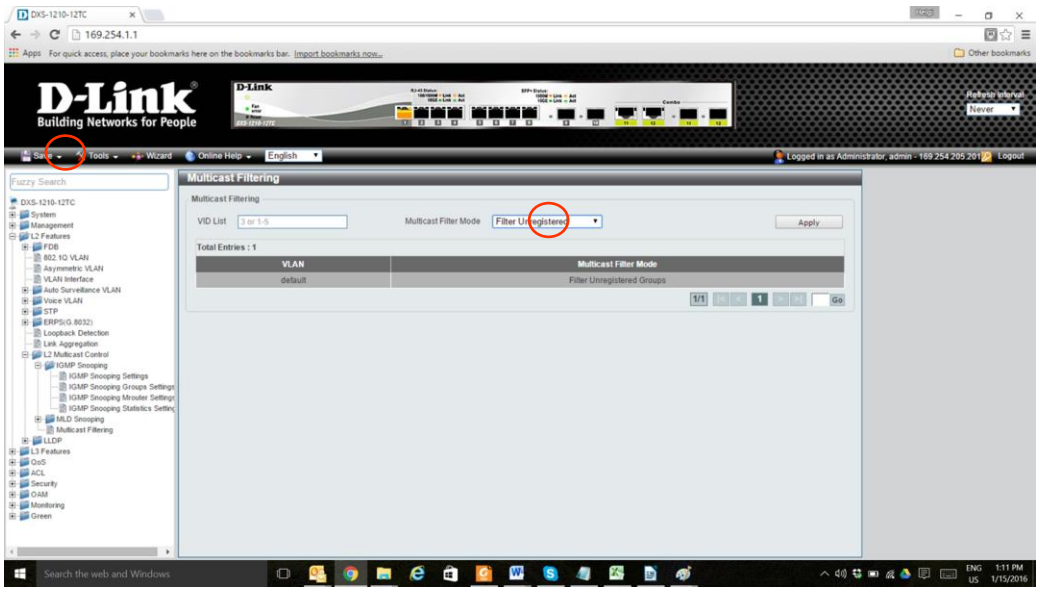
2. Enable IGMP snooping by navigating to L2 Features - L2 Multicast Control – IGMP Snooping – IGMP Snooping settings
3. Change the IGMP global setting to 'Enabled and press the 'Apply' button afterward



4. While still in the IGMP Snooping Settings page, go to the detailed settings and press the 'Edit' button
5. Enable FastLeave
6. Enable Querier state and select Version 2
7. Press Apply



8. Finally go to L2 Features – L2 Multicast Control – Multicast Filtering and select 'Filter Unregistered' from the drop down menu.
9. Press Save to Save the switch configuration.
10. The switch is now properly configured.


DXS-1210-12TC
169.254.1.1
D-Link
Building Networks for People
Tools
Wizard
Online Help
English
Logout
Multicast Filtering
Multicast Filtering
VID List
Multicast Filter Mode
Filter Unregistered
Apply
Total Entries : 1
VLAN
Multicast Filter Mode
default
Filter Unregistered Groups
Search the web and Windows

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