

MEDIA OVER IP SYSTEM
All B-900-MOIP-4K Units

BINARY

BINARY MOIP SETUP GUIDE FOR PAKEDGE MS SERIES SWITCHES



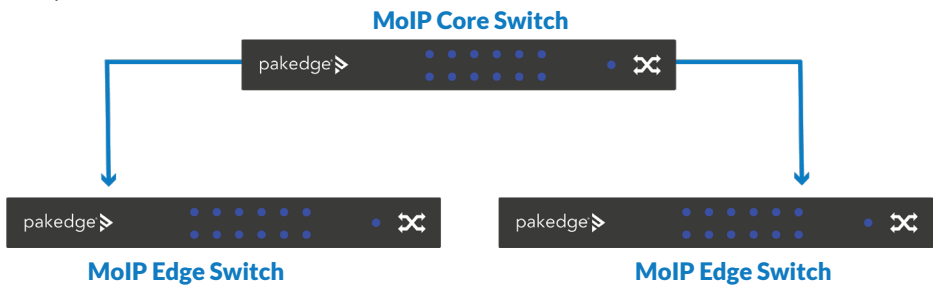
INTRODUCTION

This document covers the basic configuration of a Binary MoIP system with MS Series switches. This configuration works for most situations, but there are many variables which could necessitate modifying this setup. Use this as a general guide to start your design and configuration. Further help may be required from tech support.

If you're using a multiple switch topology, one switch acts as the Core switch for a MoIP system. This isn't necessarily the core switch for the whole network, but this switch should have all other MoIP switches connected directly to it and nowhere else. Connect the core MoIP switch to your core network switch.

If you're using a single, dedicated switch for your MoIP system you only need to follow the setup instructions for "[Core Switch configuration.](#)" A VLAN can be configured, but isn't necessary.

When placing MoIP transmitters throughout a network, pay close attention to the maximum amount of bandwidth being used along different paths between transmitters and receivers. Pakedge MS switches provide 10Gbps SFP+ uplinks, allowing for up to 20 MoIP streams to pass between each interconnected switch.



Example of multiple switch topology.

VLAN SETUP

If you're using a single, dedicated switch for MoIP you don't have to create a VLAN and can skip to the "[Core Switch configuration](#)" section.

In large networks it can be beneficial to configure the MoIP system to be part of its own VLAN. This isolates MoIP traffic so it does not interfere with other systems on the network.

The following steps can be taken to configure a VLAN for MoIP:

1. Navigate to [Interfaces > VLAN](#)
2. Under the first section Database click the **Option** icon, then click **Add** to create new VLANs on the switch. Click **Apply** at the top of the page, when finished.

The screenshot shows a 'Add VLAN' dialog box. The title bar includes a close button (X). The main area contains two input fields: 'VLAN ID or Range' with the value '10' and 'Name' with the value 'MoIP'. At the bottom, there are two buttons: 'Cancel' and 'Add'.

3. Next, navigate to **Interfaces > VLAN > Switchport Configuration**. MS Switches support two Switchport options for VLAN tagging:
 - a. **Access** - A single VLAN ID can be assigned to a port and all incoming traffic on that port is placed into that VLAN. The default for all ports on the switch is Access mode, with the VLAN set to 1.
 - b. **Trunk** - A single VLAN ID is set as the Untagged "Native VLAN." Meaning any untagged, incoming traffic is assigned to that VLAN and any traffic outgoing for that VLAN is not tagged.
A trunk port can be set to allow any number of VLANs as tagged traffic, so that traffic must be incoming or leaving on one of the specified VLANs.
4. All ports connected to MoIP devices should be set with your MoIP VLAN on **Access**.

The screenshot shows the 'Edit Switchport Configuration' dialog box. At the top, it says 'Switchport Configuration Selected: 10,11,12,13,14,15,20,21,22'. The 'Switchport Mode' is set to 'Access' and is highlighted with a blue box. Below it, 'Access VLAN (Untagged)' is set to '10'. There is also a 'Priority' field set to '0'. At the bottom, there are 'Cancel' and 'Save' buttons.

5. Ports connected to your router, switch, and access points should be set to **Trunk**.

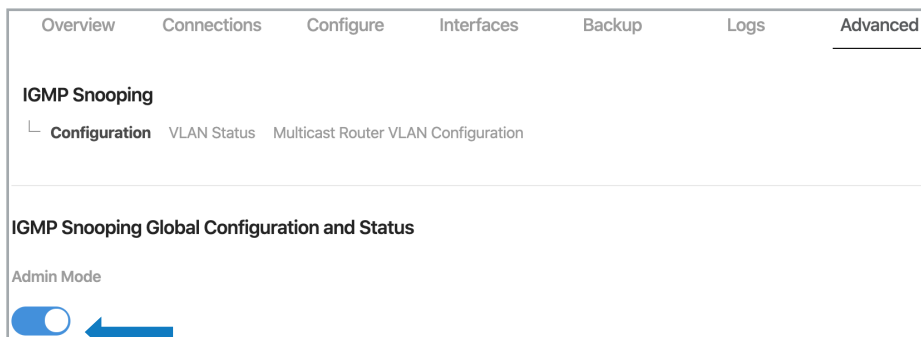
The screenshot shows the 'Edit Switchport Configuration' dialog box. At the top, it says 'Switchport Configuration Selected: 1'. The 'Switchport Mode' is set to 'Trunk' and is highlighted with a blue box. Below it, 'Trunk Native VLAN (Untagged)' is set to '1'. The 'Allow Trunk VLANs (Tagged)' field is set to '1,10'. There is also a 'Priority' field set to '0'. At the bottom, there are 'Cancel' and 'Save' buttons.

IMPORTANT: Don't forget to set up the VLAN in your router! See the router's user manual for setup instructions.

CORE SWITCH CONFIGURATION

The steps that follow use the VLAN created from the previous section as an example. If you did not set up a MoIP VLAN, select the default network VLAN ID.

1. Switches running MoIP must have their MTU set to be greater than 8000 bytes. The default configuration of MS switches is already set to the maximum of 9198. Double check this under **Interfaces > Port > Port Summary** and by editing any port to view its details.
2. Navigate to **Advanced > IGMP Snooping > Configuration**. Set **IGMP Snooping Global Configuration Status Admin Mode** to **Enable**.




Overview Connections Configure Interfaces Backup Logs **Advanced**

IGMP Snooping

Configuration VLAN Status Multicast Router VLAN Configuration

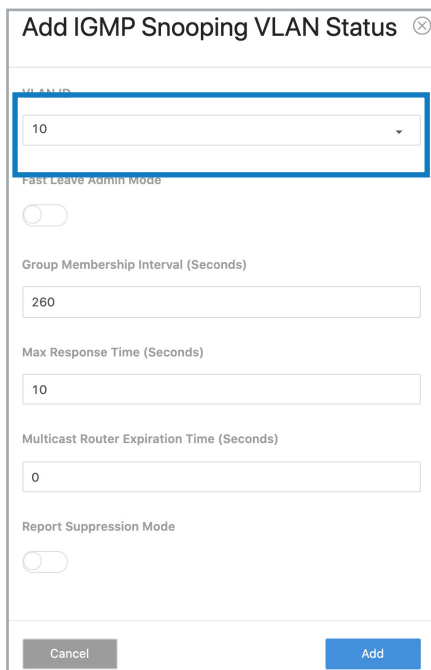
IGMP Snooping Global Configuration and Status

Admin Mode



3. Navigate to **Advanced > IGMP Snooping > VLAN Status**.
4. Click the **Option** button, then select **Add**.
5. Select the **VLAN ID** of the MoIP VLAN you created.

Note: Do not enable **Fast Leave** on the Core switch. This could cause MoIP receivers on Edge switches to lose connection with a transmitter stream, if another receiver on the same Edge switch changes to a different transmitter stream.



Add IGMP Snooping VLAN Status ⊗

VLAN ID

10

Fast Leave Admin Mode

Group Membership Interval (Seconds)

260

Max Response Time (Seconds)

10

Multicast Router Expiration Time (Seconds)

0

Report Suppression Mode

Cancel Add

- Navigate to **Advanced** > **IGMP Snooping Querier** > **Configuration** and click the **Admin Mode** toggle to make the Core switch the IGMP Snooping Querier. Leave **IP Address** at 0.0.0.0.

Admin Mode enables IGMP globally so the steps that follow are effective. An IP address of all zeros makes the switch reference itself, ensuring that it is your IGMP Querier. This protects you against any issues that could come from changing DHCP addresses.

IMPORTANT: Only enable IGMP Snooping Querier on the Core switch.

- Under **IGMP Version**, select **IGMP V2**.

The screenshot shows the 'IGMP Snooping Querier' configuration page. At the top, there are tabs for Overview, Connections, Configure, Interfaces, Backup, Logs, and Advanced. Under 'Configure', there are sub-tabs for Configuration, VLAN Configuration, and VLAN Status. The main section is titled 'IGMP Snooping Querier Configuration'. It includes an 'Admin Mode' toggle which is turned on, and an 'IP Address' field set to '0.0.0.0'. Below that, the 'IGMP Version' is set to 'IGMP v2' (selected with a radio button). Red arrows point to the 'Admin Mode' toggle and the 'IGMP v2' radio button.

- Under **IGMP Snooping Querier**, go to **VLAN Configuration** and click the **Option** button, then **Add**.

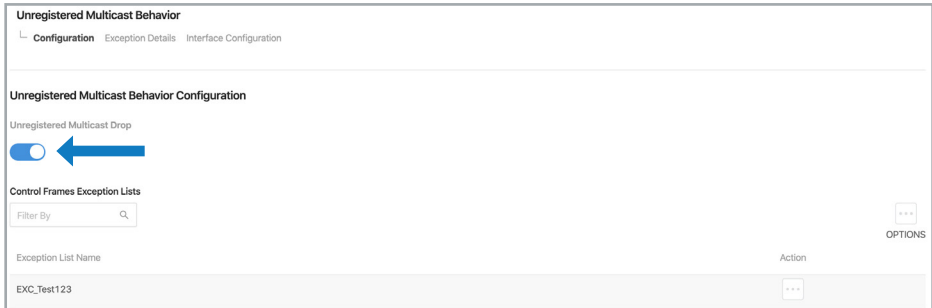
- Select the **VLAN ID** for the VLAN which is running IGMP Snooping.
- Leave **Querier Election Participation** disabled. You've manually set the Core switch as the querier.
- Leave the **Querier VLAN IP Address** at 0.0.0.0. An IP address of all zeros makes sure that this switch remains the IGMP querier for the network.

Add IGMP Snooping Querier VLAN ⊗ Configuration

The dialog box has a title bar with a close button. Below the title bar, there is a 'VLAN ID' dropdown menu with '10' selected. Below that is a 'Querier Election Participation' toggle which is turned off. Underneath is a 'Querier VLAN IP Address' text input field containing '0.0.0.0'. At the bottom, there are two buttons: a grey 'Cancel' button and a blue 'Add' button.

IMPORTANT: Do not enable **Querier Election Participation** because you are manually setting the Core switch in the network as the querier, and you're leaving querier disabled on the edge switches. Leave Querier VLAN IP Address at 0.0.0.0.

10. The MoIP VLAN must also have **Unregistered Multicast Behavior** set to drop. To do so, navigate to **Advanced > Unregistered Multicast Behavior** and click the **Unregistered Multicast Drop** toggle.

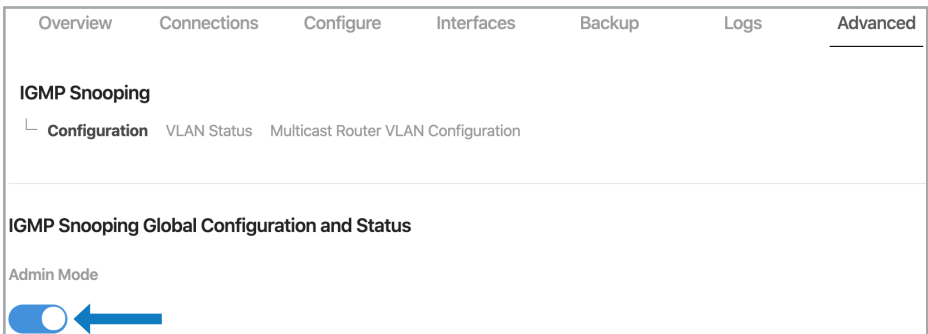


If you're using a single, dedicated switch for your MoIP configuration, you're done! If you're using multiple switches, continue on to Edge Switch Configuration.

EDGE SWITCH CONFIGURATION

All Edge switches must connect back to a central Core switch, in a MoIP topology. Be aware of the bandwidth requirements of the MoIP devices throughout your network and the limitations based on your available uplink bandwidth.

1. Switches running MoIP must have their MTU set to be greater than 8000 bytes. The default configuration of MS switches is already set to the maximum of 9198. Double check this under **Interfaces > Port > Port Summary** and by editing any port to view its details.
2. Navigate to **Advanced > IGMP Snooping > Configuration**.
3. Click the **Admin Mode** toggle, under **IGMP Snooping Global Configuration Status**.



4. Navigate to **Advanced > IGMP Snooping > VLAN Status**.
5. Click the **Option** button, then select **Add**.

6. Select the **VLAN ID** of the MoIP VLAN.

Add IGMP Snooping VLAN Status ⊗

VLAN ID

10

Fast Leave Admin Mode

Group Membership Interval (Seconds)

260

Max Response Time (Seconds)

10

Multicast Router Expiration Time (Seconds)

0

Report Suppression Mode

Cancel Add

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

IMPORTANT: *IGMP Snooping Querier* should not be enabled in *Edge switches*. If you choose to enable it, great care must be given to ensure the correct switch is acting as the querier, and it is important to calculate bandwidth for changing flows. Whichever switch is elected as the querier forwards all MoIP traffic to that switch. This is normal operation for multicast and IGMP.

- The MoIP VLAN must also have **Unregistered Multicast Behavior** set to drop. To do so, navigate to **Advanced > Unregistered Multicast Behavior** and click the **Unregistered Multicast Drop** toggle.

Unregistered Multicast Behavior

Configuration Exception Details Interface Configuration

Unregistered Multicast Behavior Configuration

Unregistered Multicast Drop

←

Control Frames Exception Lists

Filter By

Exception List Name	Action
EXC_Test123	...

OPTIONS

BINARY®

Rev: 201125-1124

Copyright ©2020, Wirepath Home Systems, LLC. All rights reserved. Control4 and Snap AV and their respective logos are registered trademarks or trademarks of Wirepath Home Systems, LLC, dba “Control4” and/or dba “SnapAV” in the United States and/or other countries. Snap AV and Binary are also registered trademarks or trademarks of Wirepath Home Systems, LLC. Other names and brands may be claimed as the property of their respective owners. All specifications subject to change without notice.