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.

MoIP Core Switch

MoIP Edge Switch   MoIP Edge Switch
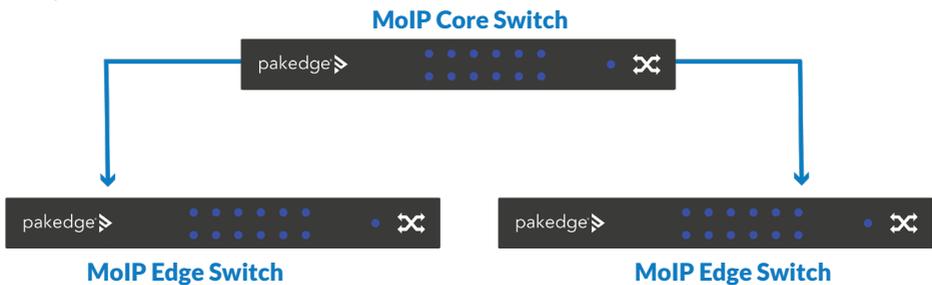
Example of multiple switch topology.

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.

Add VLAN ⊗

VLAN ID or Range

`10`

Name

`MoIP`

Cancel   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**.

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

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

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**.
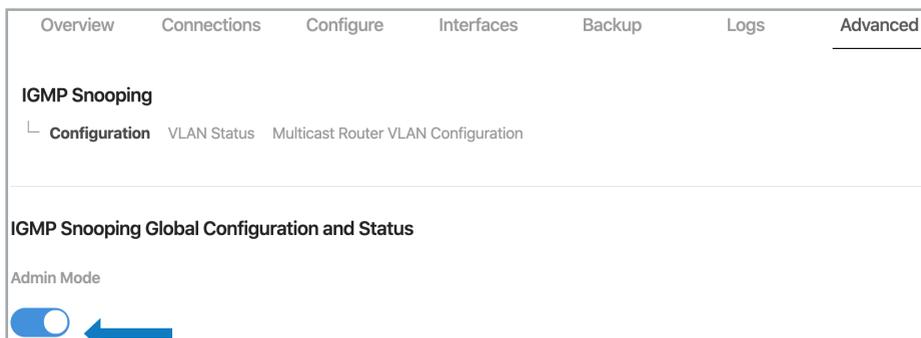
Overview	Connections	Configure	Interfaces	Backup	Logs	Advanced

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.
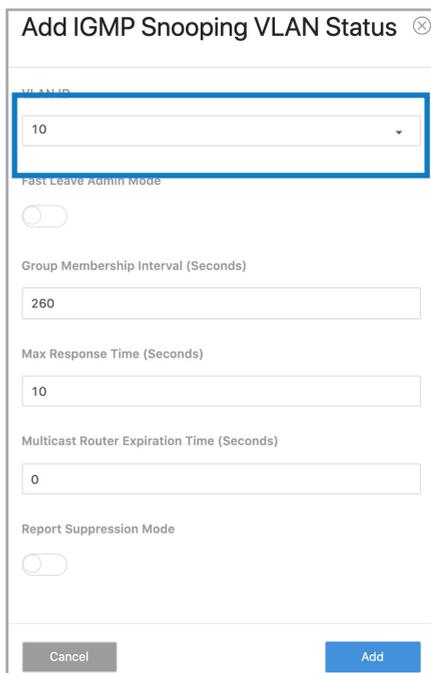
Add IGMP Snooping VLAN Status ⊗

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

6. 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.

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

9. Under **IGMP Snooping Querier**, go to **VLAN Configuration** and click the **Option** button, then **Add**.
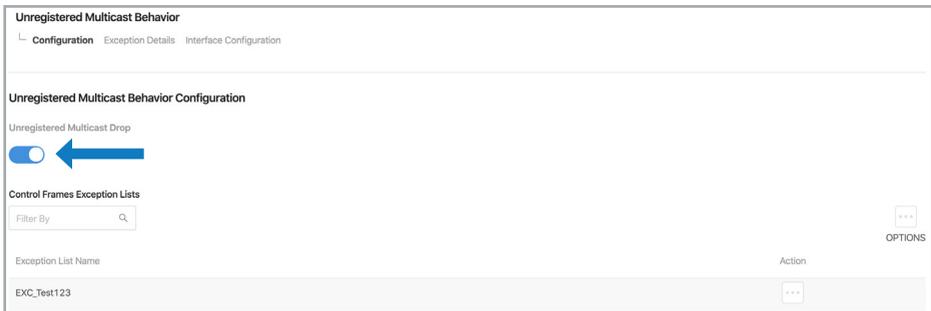
   a. Select the **VLAN ID** for the VLAN which is running IGMP Snooping.

   b. Leave **Querier Election Participation** disabled. You've manually set the Core switch as the querier.

   c. 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.

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.

Unregistered Multicast Behavior

└ **Configuration** Exception Details Interface Configuration

Unregistered Multicast Behavior Configuration

Unregistered Multicast Drop

Control Frames Exception Lists

Filter By 🔍

OPTIONS ···

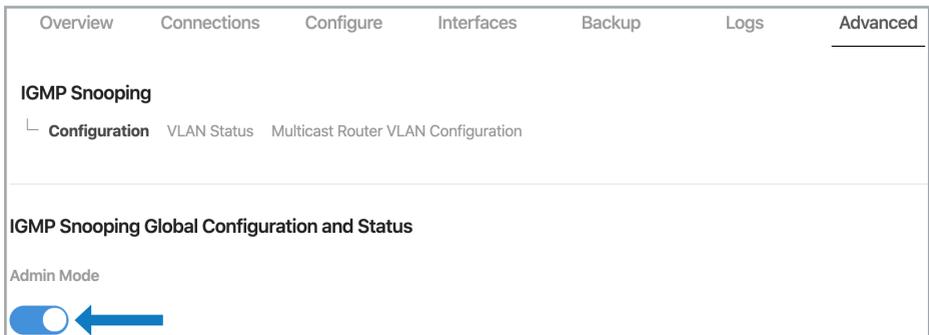| Exception List Name	Action
EXC_Test123	···

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**.

Overview	Connections	Configure	Interfaces	Backup	Logs	Advanced

IGMP Snooping

└ **Configuration** VLAN Status Multicast Router VLAN Configuration

IGMP Snooping Global Configuration and Status

Admin Mode

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 🔍							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	On	Disabled	260	10	0	Disabled	•••

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.

7. 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	Q

OPTIONS

Exception List Name	Action
EXC_Test123	...