

Grandstream Networks, Inc.

GWN78xx Series GWN78xx – IGMP Snooping Configuration Guide



GWN78XX(P) - IGMP Snooping Configuration Guide

Overview

When working in a network that includes multiple receivers or endpoints, multicast traffic is used. It improves unicast in terms of efficiency since it lets traffic be transmitted only once instead of sending traffic to each endpoint individually, saving significant bandwidth. In addition, it outperforms broadcast by delivering traffic exclusively to receivers who are interested in the incoming traffic, avoiding traffic flooding.

IGMP snooping is the method that allows the GWN78xx network switches to identify multicast groups, these groups will all receive the same traffic based on a specified multicast address, and the multicast address helps the switch to forward incoming traffic to the concerned devices in the network, to avoid flooding and to optimize the network traffic.

To manage multicast traffic, GWN78xx uses the Internet Group Management Protocol (IGMP) for IPv4 networks and the Multicast Listener Discovery (MLD) for IPv6 networks, to learn about which multicast groups are being used on the network and which hosts are members of those group.S



IGMP Snooping vs no IGMP Snooping

IGMP Snooping Configuration Example

In this section of the guide, we will present an example of how to configure IGMP snooping on a GWN78XX(P) network switch.

• Switch Configuration for IGMP Snooping

Consider the following scenario, we want to stream a music file to different users connected on a network via a GWN78xx switch.

To do that please follow the below steps :

Note

Please make sure that all devices that are connected to the switch and are part of the multicast process belong to the same VLAN.

1. Go to Multicast

IGMP snooping

Global settings, and enable IGMP snooping globally

2. Set the Unknown multicast traffic to "Forward to Router Port", this will forward all the traffic that is not part of the multicast streaming to the trunk port.

3. Keep the IGMP version to IGMPv2.

4. Enable "**Report Suppression**", this option is useful to suppress the number of multicast reports sent by the connected endpoints to the switch, it limits the membership reports sent to the querier from different devices of the same multicast group.

Overview	~	IGMP Snooping	
Switching	~	Global Settings Querier Router Port	Multicast Address Multicast Policy Multicast Port
© IP	v		IGMP Snooping
S Multicast	^		Unknown Multicast Packet Forward to Router Port C Pris option is associated with the same seming under MLD Shooping
IGMP Snooping			Multicast Forward Mode
MLD Snooping			IGMP Version IGMP/2 IGMP/3
룹 Routing	~		
E PoE	~		report suppression
لد QoS	*		Cancel OK

Enable IGMP Snooping

VLAN	Settings									
	Edit							~	Q VLAN	
	VLAN	Status	Router Port Auto-Learning	Port Fast Leave	Query Robustness	Query Interval (s)	Query Max Response Interval	s) Last Member Query Coun	t Last Membe	Operation
	1	Enabled	Enabled	Enabled	2	125	10	2	1	Ľ
	20	Disabled	Enabled	Disabled	2	125	10	2	1	Ľ
								Total 2	< 1 >	10 / page ~

Choosing the VLAN

5. Under **Multicast** \rightarrow **IGMP Snooping** \rightarrow **VLAN Settings**, select the VLAN on which the Multicast will be applied and click the edit button.

6. Enable the IGMP Snooping for the specific VLAN

7. We will enable **Port Fast Leave**, this will reduce the time it takes to block unlisted IGMP traffic sent to the device port.

Note

Port fast leave should not be activated in cases where the device linked to the interface is not the ultimate endpoint responsible for sending membership reports. Instead, if the connected device is an unmanaged switch with various endpoints connected to it, enabling port fast leave would result in blocking multicast traffic. In this scenario, if only one device wishes to leave and sends a request to the querier, the remaining devices connected to that unmanaged switch will also be prevented from receiving multicast traffic.

Global Settings > Edit			
	VLAN	1	
	IGMP Snooping		
	Router Port Auto-Learning		
	Port Fast Leave		
	Query Robustness	2	Valid range is 1-7
	 Query Interval (s) 	125	Valid range is 30-18000
	•Query Max Response Interval (s)	10	Valid range is 5-20
	Last Member Query Count	2	Valid range is 1-7
	•Last Member Query Interval (s)	1	Valid range is 1-25
		Cancel	

Global Settings

8. Go to **Multicast** \rightarrow **IGMP Snooping** \rightarrow **Querier**, select the Multicast VLAN, enable the switch to act as a Querier for that specific VLAN, and set the IP Address to the switch's IP Address.





Note

Querier: In the absence of a multicast capable router, the GWN78xx switch can be set as an IGMP Querier, and by definition, an IGMP Querier is a device responsible for querying the multicast group memberships of hosts on the network. IGMP (Internet Group Management Protocol) is used by hosts to signal their membership in multicast groups to routers or multicast-capable switches such as the GWN78xx.

In case the multicast traffic travels more than one switch, the switch with the lowest IP Address will be set as the IGMP querier.

Example: We have two switches connected and are part of multicast traffic distribution, switch A with IP address 192.168.80.7 and switch B with IP Address 192.168.80.20, in this case, switch A will be the IGMP querier since it has the lowest IP Address, and switch B will be the backup querier.

• Audio Streaming from the Server

Once the configuration is completed, any device connected to the multicast port will have its multicast address dynamically learned.

We can now verify the multicast traffic output by using a media player server such as VLC to stream audio, to do so:

- 1. Open the VLC media player, and go to **Media** \rightarrow **Stream.**
- 2. Select the track that you want to stream and choose "stream"

Open Media				
🖻 File 🛛 📀	Disc 🕂 Network	Capture Device		
File Selection				
You can select	local files with the follo	wing list and buttons.		
				Add
			-	= Remove
Use a subti	le file			
			Bro	wse
Show more opt	ons			

3. Choose the RTP / MPEG Transport stream option, then click "Add". In the address, you can enter a multicast address of your choice with base port 5004.

🛓 Stream Outpu	t	?	×
Destination Setu Select destinatio	IP ons to stream to		
+	RTP/TS 🗵		
This module o	utputs the transcoded stream to a network via RTP.		
Address	239.168.5.12		
Base port	5004 🗢		
Stream name	TEST STREAM		
	Back Next	Cancel	

- 4. Activate Transcoding and set the Audio codec necessary for streaming music.
- 5. Choose all elementary stream options and finally click stream.

Stream Output				?	
otion Setup Set up any additional	ptions for streaming				
Miscellaneous Optio	IS				
Stream all eleme	ntary streams				
Generated stream o	utput string				
			Back Stree	am Cano	cel

Under multicast address, we can see the multicast addresses that have been dynamically learned by the switch through IGMP messages.

After all of this is configured, any subscriber who joined the stream will see the multicast group address defined reflecting.

② Overview ~	IGMP Snooping	IGMP Snooping								
Switching ~	Global Settings Querier	Router Port Multicast Address	Multicast Policy Multicast P	ort						
~ 91 @	Add Refresh De						Q VLAN/Multicast Address/Member Port			
S Multicast ^	VLAN \$	Multicast Address	Source IP Address	Member Port	Address Type	Aging Time (s)	Operation			
IGMP Snooping	1	224.0.1.116	-	1/0/15	Dynamic	259	e i			
MLD Snooping	1	224.111.111.1	-		Dynamic	91	e i			
음 Routing ~~	1	239.0.0.1	-	1/0/15	Dynamic	184	e i			
	1	239.168.5.12		1/0/15	Dynamic	252	e ti			
I POE V	1	239.255.255.250		1/0/1	Dynamic	181	C 🗇			
QoS ∼							Total 5 < 1 > 10 / page ~			
⊘ Security ~	5									

Additional Settings

Additional configuration for the IGMP snooping can be applied on the GWN78xx network switches, among these configurations:

- Static Router Port Configuration
- Set static Multicast Address
- Set a Multicast Policy

Static Router Port Configuration

There are cases where you will need to manually configure the router port, this is usually configured when the router port is not dynamically learned, and the router port auto-learning is disabled.

To configure this:

• First, make sure the Router port auto-learning is disabled on the multicast VLAN used.

Global Settings > Edit			
	VLAN	1	
	IGMP Snooping		
	Router Port Auto-Learning		
	Port Fast Leave		
	 Query Robustness 	2	Valid range is 1-7
	Query Interval (s)	125	Valid range is 30-18000
	 Query Max Response Interval (s) 	10	Valid range is 5-20
	Last Member Query Count	2	Valid range is 1-7
	Last Member Query Interval (s)	1	Valid range is 1-25
		Cancel	
i			

- Go to **Multicast** \rightarrow **IGMP Snooping** \rightarrow **Router Port** and click | Add | to add a new static router port, we will set port 1/0/1 as our router port.
- For added security we can define the ports that are not allowed to be set as router ports and can only connect host devices, this can be defined in the forbidden ports section

🕜 Overview 🗸	Router Port > Edit			
🌐 Switching 🗸	VL	LAN	1	
~ 91 ©	Sta	atic Router Port ick on port to select/unselect		
😂 Multicast 🛛 🔿		Port		
IGMP Snooping		2 4 6 8	10 12 14 16 18 20 22 24	
MLD Snooping		1 3 5 7	9 11 13 15 17 19 21 23 25 ₅₇₇₄	26 27 28 57P+ 57P+ 57P+
പ്പ് Routing 🗸 🗸				
f PoE 🗸		LAG		
l≝ Qos ∽				
⊘ Security ~			2 4 6 8 10 12 14	
🖉 Maintenance 🗸			1 3 5 7 9 11 13	
ੴ System ∽	For	orbidden Port ick on port to select/unselect		
		Port		
			10 12 14 16 18 20 22 24 9 11 13 15 17 19 21 23 25 15 17	26 522 27 522 28 522 ·

Defining the router port and forbidden ports

• Click save, and now the router port will be statically defined to port 1/0/1.

⑦ Overview ~	IGMP Snooping					
Switching ~	Global Settings Querier Router Port	Multicast Address Multicast Policy	Multicast Port			
~ 91 @	Add Refresh Delete					
😂 Multicast 🔷 🔨	VLAN 🗘	Static Router Port	Forbidden Port	Dynamic Port	Aging Time (s)	Operation
	1	1/0/1	1/0/2-1/0/24,1/0/25-1/0/28	-	-	ľů
MLD Snooping						Total 1 < 1 > 10/page ~
€ PoE ~						

Results

Set Static Multicast Address

In a situation where you have a host device that does not support IGMP snooping connected to a switch interface, you can statically define the multicast address for that host, to do that:

- $\circ~$ Go to Multicast \rightarrow IGMP Snooping \rightarrow Multicast Address
- Click on Add to add a new device multicast address.
- Define the VLAN and the multicast IP Address for the device, and select the interfaces that will connect the host device, this way the switch will always forward the multicast traffic to the selected interfaces. this means that the connected host will receive the multicast traffic from the defined multicast address, even if it hasn't been subscribed to it.

⑦ Overview	~	Multicast Address > Edit		
Switching	~		•VLAN	1 · · ·
qı 💿	~		•Multicast Address	239.168.5.100 IPv4 format
Multicast	^		Click on port to select/unselect	
IGMP Snooping			Port	
MLD Snooping				
ස් Routing	~		2 4 6 8	10 12 14 16 18 20 22 24 9 11 13 15 17 19 21 23 25 26 27 28
Foe	Ÿ			
L≃ QoS	ř		LAG	
Security	~ (
🖉 Maintenance	v			2 4 6 8 10 12 14
System	~			1 3 5 7 9 11 13
				Cancel

Static Multicast Address

• Click save, the static multicast address will be displayed

Overview	~	IGMP Snooping						
Switching	÷	Global Settings Querier	Router Port Multicast Address	Multicast Policy Multicast P	ort			
qi 🥥	¥	Add Refresh De						Q VLAN/Multicast Address/Member Port
😫 Multicast	^	VLAN 0	Multicast Address	Source IP Address	Member Port	Address Type	Aging Time (s)	Operation
IGMP Snooping		11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	239.168.5.12	-	1/0/9	Dynamic	258	C D
MLD Snooping		□ 1	239.168.5.100	-	1/0/7-1/0/12	Static	-	C Ó
금 Routing	¥							Total 2 < 1 > 10 / page ~
e PoE	~							
L∠ QoS	~							
⊘ Security	~ (
🖉 Maintenance	~							
System	Ÿ							

Set Multicast Policy

In case you need to define a specific range of multicast addresses that can be used on your network, you can define this in the Multicast policy section, to do this:

• Go to Multicast → IGMP Snooping → Multicast Policy

• Click Add to add a new policy.

• Define the multicast range where hosts can or can not join the multicast stream. For example, we will allow the multicast stream to come only from addresses 239.168.5.1 to 239.168.5.100, if a stream is coming from a different multicast address, it will be blocked.

Overview	~	IGMP Snooping				
Switching	~	Global Settings Querier Router Port Multicast Addres	ss Multicast Policy Multicast Port			
() IP	~	Add Delete All				
S Multicast	^	Policy ID	Action		Multicast Address	Operation
IGMP Snooping			Allow		239.168.5.1 - 239.168.5.100	C Ó
MLD Snooping		2	Edit	×	239.0.0.1 - 239.0.0.100	e i
음 Routing	~		Multicast Policy ID			Total 2 < 1 > 10 / page ~
🖲 PoE	~		Artinn			
Lez QoS	~		Allow	v		
G Security	~ (Multicast Address IPv4 format			
🔎 Maintenance	~		239.168.5.1 - 239.168.5.100			
l System	ř		Cancel			

 $\circ \ \ \text{Go to } \textbf{Multicast} \rightarrow \textbf{IGMP Snooping} \rightarrow \textbf{Multicast Port}$

• Apply the policy created on the specific port where the multicast traffic receiver is connected, in our example, the connected endpoint on port 1/0/9 will receive only traffic coming from the multicast address range 239.168.5.1 to 239.168.5.100, any other multicast traffic will be rejected.

Overview	~	IGMP Snooping					
Switching	~	Global Settings Querier Router Por	rt Multicast Address Mul	ticast Policy Multicast Port			
⊚ IP	~	Edit					
S Multicast	^	Port	M	Edit	×	Multicast Policy	Operation
IGMP Snooping		1/0/1	25			-	ľ
MLD Snooping		1/0/2	25	1/0/9		-	e
-I Pouting		1/0/3	25	Max Multicast Group Count		-	Ľ
		1/0/4	25	Valid range is 1-256		-	Ø
PoE	ř	1/0/5	25	256		-	ľ
L∠⊂ QoS	ř	1/0/6	25	Action		-	Ø
⊘ Security	~	1/0/7	25	Reject \checkmark		-	Ľ
🖉 Maintenance	~	1/0/8	25	Multicast Policy		-	Ľ
🛱 System	τ.	1/0/9	25	Multicast Policy ID		-	e
		1/0/10	25	1 ~		-	Ľ
		1/0/11	25	Cancel OK		-	e
		1/0/12	25			-	ľ
		1/0/13	256	Reject		-	Ø

Supported Devices

Device Name	Supported	Firmware Required
GWN7801	Yes	1.0.1.20 or higher
GWN7801P	Yes	1.0.1.20 or higher
GWN7802	Yes	1.0.1.20 or higher
GWN7802P	Yes	1.0.1.20 or higher
GWN7803	Yes	1.0.1.20 or higher
GWN7803P	Yes	1.0.1.20 or higher
GWN7811	Yes	1.0.1.8 or higher
GWN7811P	Yes	1.0.1.8 or higher

GWN7812P	Yes	1.0.1.8 or higher
GWN7813	Yes	1.0.1.8 or higher
GWN7813P	Yes	1.0.1.8 or higher
GWN7806	Yes	1.0.1.14 or higher
GWN7806P	Yes	1.0.3.3 or higher
GWN7830	Yes	1.0.3.3 or higher
GWN7831	Yes	1.0.3.3 or higher
GWN7832	Yes	1.0.3.3 or higher

List of supported devices

Need Support?

Can't find the answer you're looking for? Don't worry we're here to help!

CONTACT SUPPORT