



Switch Configuration Example for Q-SYS™ Platform

Cisco Meraki MS-320 Series

Important Note

This switch configuration example is intended to serve as a network setup guideline for systems using Q-LAN audio and video streaming within your Q-SYS system and should be used alongside the [Q-SYS Q-LAN Networking Overview](#) tech note for deeper setup insight. Keep in mind that QSC is unable to provide live network configuration support for third-party switch configuration. To learn more about network switch qualification services and the plug-and-play Q-SYS NS Series preconfigured network switches, visit <http://www.qsc.com/switches>.

This document applies to these Cisco switches:

Meraki MS-320 Series

Introduction

As of release 5.3.x, Q-SYS Designer software now supports AES67-standard interoperability. The AES67 standard does not prescribe a method of discovery for devices so manufacturers are free to implement one or more discovery services for their devices. In this configuration document, the process uses Bonjour as the discovery method for AES67 devices.

Q-SYS Designer now also offers a selection of Differential Services Code Point (DSCP) setting presets to optimize Quality of Service (QoS) for different types of deployment. DSCP codes are a six-bit value placed in the IP header of data packet, and they instruct a network switch to handle various types of data with defined levels of priority that ensure proper QoS.

The Meraki sub-brand of Cisco are networking products that offer simplified cloud-based configuration via the centralized Meraki Dashboard. To configure a Meraki product, the product must have access to the Internet via the Management VLAN. This guide to configuring the MS-320 assumes that the switch has already been “claimed” and activated within a user’s Meraki Dashboard online account and is currently shown in Meraki Dashboard as “Active.”

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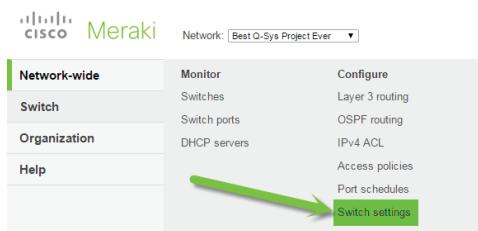
Cisco Meraki MS-320 Series



Configuration for Q-LAN

This procedure describes how an authorized administrator enables prioritization of Q-LAN protocols for successful operation with Q-Sys. This does not include optimization for Dante; see the next procedure for configuring the switch for both Dante and Q-LAN.

Note: The IP address of the management interface is not relevant to the functionality of Q-Sys or to the configuration.



1. Log into the Meraki Dashboard. Click **Switch**, and then click **Switch settings** under **Configure**.

NOTE: Spanning Tree Protocol settings are at the discretion of the network administrator and are not relevant to the functionality of Q-Sys.

VLAN	Protocol	Source port	Destination port	DSCP	Edit DSCP to CoS map
1 Any	UDP	319	319	Set DSCP to 56 -- class 5 (CST Q-LAN)	X X X
2 Any	UDP	320	320	Set DSCP to 56 -- class 5 (CST Q-LAN)	X X X
3 Any	Any			Trust incoming DSCP	X

2. Under **Quality of Service**, click **Edit DSCP to CoS map**.

A dialog box will appear containing a table of mapping settings.

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DSCP to Class-of-Service mapping

DSCP value	CoS value	Title
34	4	AF41 QLAN Audio
46	5	EF QLAN PTP

[Add another DSCP to CoS mapping](#)

[Save changes](#) [Close](#)

Quality of service

Quality of service
CoS allows for prioritization traffic within the network. The Differentiated Services Code Point (DSCP) bits in the packet header are set to inform the switches which Class-of-Service (CoS) queue should be used.

VLAN	Protocol	Source port	Destination port	DSCP	Edit DSCP to CoS map
1	Any	Any			Trust incoming DSCP

[Add a QoS rule for this network](#)

3. Delete all but two rows (using the **X** at the right of each row) of settings.
In the first row, set the DSCP value at **34** and the CoS value at **4**. Title it “AF41 QLAN Audio” (the title is purely informational).
4. In the second row, set DSCP at **46** and CoS at **5**. Title this one “EF QLAN PTP” (also purely informational). Click **Save changes**.
This will return you to the **Switch settings** page.
4. Under **Quality of service**, modify the first rule to these settings.
VLAN: Any
Protocol: Any
DSCP: Trust incoming DSCP
5. Under **MTU Configuration**, change **Default** MTU size to **1522**. (“MTU” stands for “maximum transmission unit.” Setting this number to 1522 prevents the switch from accepting jumbo packets, which will interfere with Q-LAN.)
6. Click **Save changes** at the bottom of the page. This will save all the settings to the switch.

Notes on the Meraki MS-320 series:

- These switches are unique in that they cannot be managed locally using a CLI or web interface. A helper web interface allows you to set static IP, subnet mask, gateway and DNS servers, but this is simply for configuring the switch to access the Meraki cloud management system; it cannot be used to further configure the switch. For full documentation of this procedure, see the Getting Started section of the Dashboard help system.
- IGMP Snooping and Querying are enabled by default and cannot be changed from the web administration interface. However, Q-Sys functions properly using this default IGMP configuration, and QSC does not recommend disabling it. To disable or re-enable, contact Meraki technical support.
- The MS-320 series offers Layer 3 routing capabilities (using either static routes or OSPF), but they do not support a multicast routing protocol, such as PIM. Therefore, Q-Sys equipment cannot be separated onto different VLANs without the multicast being handled by an external router that is capable of multicast routing.
- Cisco Meraki switches do not use a configuration file to preserve settings. However, when multiple devices are active in a Meraki “Network,” it is possible to clone settings through the cloud from one to multiple others.

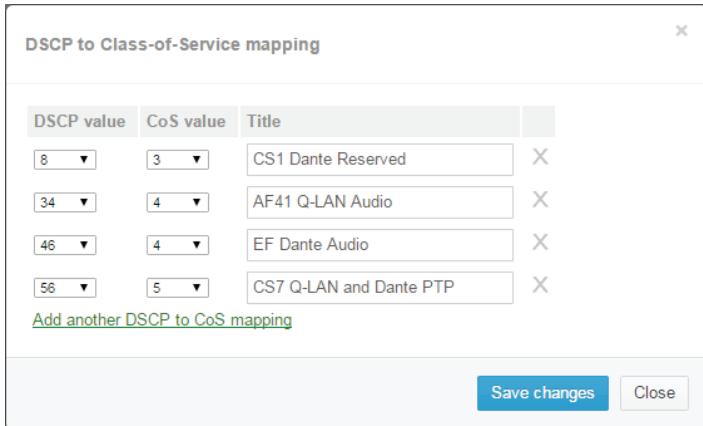
Configuration for both Dante and Q-LAN

Because the DSCP markings of Dante and Q-LAN data conflict with each other, the QoS configuration portrayed in the previous procedure does not allow both protocols to co-exist on the same VLAN or share the same uplink VLAN trunks to other switches.

Dante's audio packets share the same DSCP 46 priority markings (i.e., 'EF' or Expedited Forwarding) as Q-LAN's PTP (Precision Time Protocol) packets. Therefore, you must add recognition of Q-LAN PTP packets and elevate their priority above the other DSCP 46 packets (i.e., Dante audio).

The following procedure details the configuration for supporting both Dante and Q-LAN on the same VLAN.

1. Open the **Switch settings** page. Under **Quality of service**, click **Edit DSCP to CoS map**.



DSCP value	CoS value	Title
8	3	CS1 Dante Reserved
34	4	AF41 Q-LAN Audio
46	4	EF Dante Audio
56	5	CS7 Q-LAN and Dante PTP

Add another DSCP to CoS mapping Save changes Close

2. In the dialog box, select these parameters and enter these titles, and then click **Save changes**.

Note that these rules map DSCP 56 (PTP , both Q-LAN and Dante) to CoS 5, while mapping both DSCP 46 and 34 to the same CoS 4 queue. This creates one PTP queue combined from Q-LAN and Dante, as well as one audio queue that combines audio packets from both Q-LAN and Dante.

The next step shows how to change the DSCP value of the incoming Q-LAN PTP packets from 46 to 56.

3. Under **Quality of service**, make these changes to the rule table. Place the **Trust incoming DSCP** entry last in the list.

Click **Save changes**.



VLAN	Protocol	Source port	Destination port	DSCP
1	Any	UDP	319	319
2	Any	UDP	320	320
3	Any	Any	Any	Trust incoming DSCP

Add a QoS rule for this network

NOTE: Rules 1 and 2 in Step 3 will relabel Q-LAN PTP packets to DSCP 56 so they will route to the proper egress queue. Therefore, any downstream switch meant to handle Q-LAN (whether or not it also carries Dante), will also need to properly recognize DSCP 56 packets and place them into the highest-priority queue; any downstream switch that is configured to recognize the Q-LAN PTP packets only as DSCP 46 will not recognize and properly prioritize these packets.