QSS

QSW-M2116P-2T2S

User Guide

Document Version: 3
07/04/2023

Contents

1. About QSS

The QNAP Switch System (QSS) is a network management operating system for QNAP switch devices. QSS allows for Layer 2 network administration and system management of the switch.

2. Switch Access

Method	Description	Requirements
Web browser	You can access the switch using any computer on the same network if you have the following information: • Switch name (Example: http://example123/) or IP address • Login credentials of a valid user account For details, see Accessing the Switch Using a Browser	• Computer that is connected to the same network as the switch • Web browser
Qfinder Pro	Qfinder Pro is a desktop utility that enables you to locate and access QNAP devices on a specific network. The utility supports Windows, macOS, Linux, and Chrome OS. For details, see Accessing the Switch Using Qfinder Pro.	• Computer that is connected to the same network as the switch • Web browser • Qfinder Pro

Accessing the Switch Using a Browser

You can access the switch using any computer on the network if you know its IP address and the login credentials of a valid user account. QNAP switches support DHCP client configuration by default for IP assignment. When connected to a network, the switch automatically obtains an IP address from a DHCP server.

Note

- If you do not know the IP address of the switch, can locate it using Qfinder Pro.
- If the switch is not connected to a DHCP supported network, you can access the switch web interface by changing the IP address of the computer to `169.254.100.102`.
- The default IP address of the switch is `169.254.100.101`.

1. Verify that your computer is connected to the same network as the switch.
2. Open a web browser on your computer.
3. Type the IP address of the switch in the address bar.
   The QSS login page appears.
4. Specify the default username and password.

Default Username	Default Password
admin	The MAC address of the switch image omitting any punctuation and capitalizing any letters. **Tip** For example, if the MAC address is 00:0a:0b:0c:00:01, the default password is 000A0B0C0001. You can find the MAC address using Qfinder Pro. It is also printed on a sticker on the device as "MAC". **Note** You are prompted to change the password after logging in for the first time. QNAP strongly recommends changing the password after first time login for security reasons.

5. Click **Login**.

The QSS desktop appears.

Important
After setting up the switch, ensure that you change the IP address of the computer to the original configuration.

Accessing the Switch Using Qfinder Pro

1. Install Qfinder Pro on a computer that is connected to the same network as the switch.

Tip
To download Qfinder Pro, go to https://www.qnap.com/en/utilities.

2. Open Qfinder Pro.
   Qfinder Pro automatically searches for all QNAP devices on the network.
3. Locate the switch in the list, and then double-click the name or IP address.
   The QSS login screen opens in the default web browser.
4. Specify the default username and password.

Default Username	Default Password
admin	The MAC address of the switch image omitting any punctuation and capitalizing any letters. **Tip** For example, if the MAC address is 00:0a:0b:0c:00:01, the default password is 000A0B0C0001. You can find the MAC address using Qfinder Pro. It is also printed on a sticker on the device as "MAC".

5. Click **Login**.

The QSS desktop appears.

Getting Started

1. Log in to the switch as an administrator.
   The default administrator account is `admin`.
   For details, see Switch Access.

2. Configure the system IP settings.
   For details, see Configuring Connection Settings.

3. Configure port settings.
   For details, see Configuring Port Settings.

4. Add and configure various network settings.
   For details, see Network Management.

3. Client Device Management

The **MAC History** screen displays information about devices connected to the switch. This screen provides access to all the connected devices and access to Wake-on-LAN (WoL) commands.

WoL allows network administrators to remotely maintain WoL-enabled devices when they are powered down, by sending specially coded network packets that power them up.

Scanning for Connected Devices

1. Log in to QSS.
2. Go to **Devices** > **MAC History** .
3. Click **Scan**.

QSS scans for connected devices.

Sending a WoL Packet to a Device

1. Go to **Devices** > **MAC History** .
2. Identify a previously connected device.
3. Click .
   The **Send WoL Command** window opens.
4. Select a WoL configuration.

Configuration	Description
Wake now	Sends a WoL command to the device immediately.
Wake later	Sends a WoL command to the device on a scheduled date. **a.** Click the date. A dialog box opens. **b.** Select a date. The dialog box closes. **c.** Click the time. The time picker drop-down menu opens. **d.** Select a time.

5. Click **Apply**.

QSS sends a WoL command to the device.

Deleting a MAC Address

1. Log in to QSS.
2. Go to **Devices** > **MAC History** .
3. Identify a connected device.

4. Click .
   A dialog box opens.
5. Click **Delete**.

QSS deletes the MAC address.

Clearing the MAC Address History

1. Log in to QSS.
2. Go to **Devices** > **MAC History** .
3. Click **Clear**.
   A dialog box opens.
4. Click **Clear**.

QSS clears the MAC address history.

4. Network Management

Basic network configuration of the switch includes port management, VLAN configuration, configuration of various protocols, and traffic management via Quality of Service (QoS) and Access Control Lists (ACLs).

Dashboard

The dashboard opens to the configuration section of the interface. Click the drop-down menu in the dashboard to view the port status, VLAN status, link aggregation status, and port traffic for all ports.

You can also delete user-configured network settings and monitor the network settings of the switch.

Configuring Port Settings

1. Log in to QSS.
2. Go to **Configuration** > **Ports** .
3. Go to **Port Configuration**.
4. Identify a port.
5. Configure the settings.

Setting	Description
State	Controls the operation status for a port
Speed	Specifies the maximum speed at which a port can operate
Flow Control	Controls the flow control status for a port • When the port speed is set to auto, the maximum speed is advertised to the link partner. • When the port speed is fixed, Flow Control automatically matches that speed. **Important** Flow Control is not supported when the port speed is set to HDX.
Maximum Frame Size	Controls the maximum frame size allowed for the port

6. Click **Apply**.

QSS saves the settings.

Managing PoE Settings

Power over Ethernet (PoE) systems pass electric power along Ethernet cables, and allow a single cable to provide both a data connection and electric power to devices such as wireless access points, cameras, or VoIP phones.

The **PoE** screen displays information about PoE power consumption and provides access to PoE scheduling and configuration options.

Configuring PoE Settings

1. Go to **Configuration** > **PoE** > **Power Configuration** .

Tip
You can monitor the maximum PoE supply that is available for each PoE port.

2. Identify a port.
3. Configure the settings.

Setting	Description
PoE Mode	Controls the PoE operating mode for the port
Priority	Controls the priority of each port If multiple ports share the same priority, the port with the lower number is given priority.
Power Consumption	Displays the amount of power currently consumed by the powered device

4. Click **Apply**.

QSS saves the settings.

Configuring a PoE Schedule

1. Log in to QSS.
2. Go to **Configuration** > **PoE** .
3. Go to **PoE Schedule**.
4. Identify a port.
5. Click  .
   Scheduling is enabled for the port.
6. Click  .
   The **PoE Schedule Configuration** window opens.
7. Configure the schedule.
   a. Optional: Select additional ports.
      Selected ports will also be included in the schedule.
   b. Select port operating hours.
   c. Optional: Select **Activate schedule now**.
8. Click **Save**.
   The **PoE Schedule Configuration** window closes.
9. Click **Apply**.

QSS saves the schedule.

Managing VLANs

A virtual LAN (VLAN) groups multiple network devices together and limits the broadcast domain. Members of the VLAN are isolated and network traffic is only sent between the group members.

Each VLAN is assigned a specific VLAN identification number. The **VLAN** screen displays information about existing VLANs and provides access to VLAN configuration options.

Adding a VLAN

A virtual LAN (VLAN) groups multiple network devices together and limits their broadcast domain. Members of a VLAN are isolated and network traffic is only sent between group members

Each VLAN is assigned a specific VLAN identification number. The **VLAN** screen displays information about existing VLANs and provides access to VLAN configuration options.

1. Log in to QSS.
2. Go to **Configuration** > **VLAN** .
3. Click **Add**.
   The **Add VLAN** window opens.
4. Specify a VLAN ID.
5. Select ports to include in the VLAN.
   Only tagged ports can belong to multiple VLANs.
6. Click **Save**.

QSS adds the VLAN.

Editing a VLAN

1. Go to **Configuration** > **VLAN** .
2. Identify a VLAN.
3. Click .
   The **Edit VLAN** window opens.
4. Select ports to include in the VLAN.
5. Click **Save**.
   The **Edit VLAN** window closes.
6. Click **Apply**.

QSS saves the settings.

Managing Link Aggregation Groups

Link Aggregation Control Protocol (LACP) allows you to combine multiple network adapters into a single logical network interface. This ensures high port reliability and redundancy. In case of port failure, traffic continues on the remaining ports.

The **Link Aggregation** page displays information about existing link aggregation groups and provides access to configuration options.

Adding a Trunking Group Using LACP

1. Go to **Configuration** > **Link Aggregation** .
2. Click **Add**.
   The **Add Group** window opens.
3. Configure the group settings.

Setting	User Action
Group number	Specify the group number between 1 and 10
Mode	Select the link aggregation mode for the group. • **LACP**: Provides automatic failover and dynamic configuration • **Static**: Aggregates all configurations at once on the selected link aggregation ports **Important** Enable link aggregation before connecting cables to the switch to avoid creating a data loop.
Port Configuration	Specifies which ports are included in the group A maximum of 4 ports may be included in a group.

4. Click **Save**.

QSS creates the group.

Adding a Link Aggregation Group (LAG)

Link Aggregation Control Protocol (LACP) allows you to combine multiple network adapters into a single logical network interface. This ensures increased throughput and provides redundancy. In case of port failure, traffic continues on the remaining ports.

The **Link Aggregation** page displays information about existing link aggregation groups and provides access to configuration options.

Warning
To prevent network loop errors during the LAG configuration process, do not connect the switch to other devices using more than one network cable until after you have configured LAGs on all the devices. You can enable loop protection to avoid network loops in the connected network.

1. Log in to QSS.
2. Go to **Configuration** > **Link Aggregation** .
3. Identify a group.
4. Click .
   The **Edit Group** window opens.
5. Configure the group settings.

Setting	Description
Mode	Controls the link aggregation mode for the group • **LACP**: Provides automatic failover and dynamic configuration • **Static**: Aggregates all configurations at once on the selected link aggregation ports **Important** Enable Link Aggregation before connecting cables to the switch to avoid creating a data loop.
Port Configuration	Specifies which ports are included in the group **Note** Ensure that you configure the same settings for all the member ports in a LAG.

6. Click **Save**.

QSS updates the group settings.

Note
When assigning a LAG to a VLAN, QNAP recommends removing individual LAG port members from the VLAN, and then adding the entire group to the VLAN as required. If individual port members are not removed, the VLAN is reset to its default settings.

Managing Port Traffic

The **Traffic** section of QSS provides port traffic configuration options.

The **MAC Address Table** page gives access to unicast traffic configuration options by directing traffic to specific ports on the VLAN ID and the destination MAC address of the frame of the sending network device.

Rate Limits supports configuring incoming and outgoing rate-limiting options for all traffic on a port and provides bandwidth usage limitation options. When a limit enabled on a switch port, excess traffic above the configured setting is discarded by QSS.

Adding a Static MAC Address

The MAC address table tracks MAC addresses and forwards associated unicast traffic through specific ports.

1. Log in to QSS.
2. Go to **Configuration** > **MAC Address Table** .
3. Specify the aging time for the MAC table.

Note
You can configure the amount of time that an entry remains in the MAC table.

4. Click **Add**.
   The **Add Static MAC Address** window opens.
5. Configure the MAC address settings.
   a. Specify a VLAN ID.

   b. Specify a MAC address.

   c. Select at least one port.

6. Click **Save**.
   The **Add Static MAC Address** window closes.

QSS adds the MAC address.

Configuring Rate Limiting

1. Go to **Configuration** > **Traffic** > **Rate Limits** .
2. Identify a port.
3. Click .
   The **Configure Rate Limiting** window opens.
4. Configure the rate limits.

   a. Optional: Select additional ports.
   Rate limits will also apply to the additional ports.

   b. Specify the ingress rate.

   c. Specify the egress rate.

5. Click **Save**.

QSS saves the rate limits.

Adding an Access Control List Entry

An Access Control List (ACL) controls access to specific network objects by limiting which IP address or MAC address can connect.

The **Security** page displays information about existing IP addressed-based ACL entries and provides access to configuration options.

1. Go to **Configuration** > **Security** .
2. Click **Add**.
   The **Add ACL - IP address** window opens.
3. Configure the ACL entry settings.

Setting	User Action
No.	Specify the number of the ACL entry This value must be from 1 to 250
Protocol	Select the type of traffic affected by the ACL entry • **TCP** • **UDP**
Source	
IP address	Specify the IP address of an incoming connection
Subnet mask	Specify the subnet mask used by an incoming connection

Setting	User Action
Port	Specify the port number used by an incoming connection
Destination	
IP address	Specify the IP address being accessed by a source connection
Subnet mask	Specify the subnet mask being accessed by a source connection **Important** If a source is not specified, set the subnet mask to `255.255.255.255`. If set to `255.255.255.0`, the entry will be configured for the whole subnet.
Port	Specify the port number being accessed by a source connection
Permission	Specify the type of permission type used for this ACL entry • **Allow**: Allows access for the configured IP addresses • **Deny**: Restricts access for the configured IP addresses

Important
If the source or destination are left blank, the permission setting is applied to all connections.

4. Click **Save**.

QSS adds the ACL entry.

Configuring IGMP Snooping

The Internet Group Management Protocol (IGMP) manages membership to IP multicast groups. IP hosts and adjacent multicast routers use IGMP to establish multicast group memberships.

The **IGMP Snooping** page displays information about detected IGMP groups and provides access to IGMP snooping configuration options.

1. Log in to QSS.
2. Go to **Configuration** > **IGMP Snooping** .
3. Click .
   QSS enables IGMP snooping.
4. Configure the IGMP snooping settings.

Setting	Description
Multicast flood blocking	Blocks multicast flooding from unknown sources
Router Port	Specifies which ports to use as the router port for the VLAN After receiving an IGMP packet, QSS forwards the traffic through the selected router ports.
Fast Leave	Specifies the ports that support the IGMP v2 Fast Leave feature After receiving an IGMP leave message, QSS stops forwarding multicast traffic to the selected Fast Leave ports.

5. Click **Save**.

QSS saves the IGMP snooping settings.

Configuring QoS Settings

Quality of service (QoS) improves network traffic shaping by classifying and prioritizing different network devices and packets.

1. Log in to QSS.
2. Go to **Configuration** > **QoS** .
3. Click  .
4. Select a QoS mode.

Mode	Description
Port-based	Prioritizes traffic for each port
VLAN-based	Prioritizes traffic for each VLAN

5. Configure the priority.
   Larger numbers are given greater priority.
6. Click **Apply**.

QSS updates the QoS settings.

Configuring Port Mirroring

Port mirroring monitors network traffic and forwards a copy of a packet from one network switch port to another.

1. Log in to QSS.
2. Go to **Configuration** > **Port Mirroring** .
3. Click  .
   QSS enables port mirroring.
4. Select the mirror type.

Mirror Type	Description
Transmit & receive	Mirrors all packets to the destination port
Transmit only	Mirrors only outgoing packets to the destination port
Receive only	Mirrors only incoming packets to the destination port

5. Select source ports.

Tip
You can select multiple source ports at the same time.

6. Select a destination port.
7. Click **Save**.

QSS saves the settings.

Configuring the LLDP Settings

The Link Layer Discovery Protocol (LLDP) uses periodic broadcasts to advertise device information over the network and discover neighboring devices. This protocol operates by establishing a distributed database and gathering information from neighboring ports connected by a network link.

The **LLDP** page displays information about detected devices and allows you to enable or disable LLDP.

1. Log in to QSS.
2. Go to **Configuration** > **LLDP** .
3. Change the LLDP control status.

Toggle Setting	User Action
	Click to enable the LLDP function.
	Click to disable the LLDP function.

4. Click **Save**.

QSS saves the setting.

Configuring Loop Protection

A loop occurs when data packets are continually forwarded between ports. If a loop is detected, loop protection can disable the interface.

1. Log in to QSS.
2. Go to **Configuration** > **Loop Protection** .
3. Click  .
4. Configure the settings.

Setting	Description
Transmission time	Controls the time between transmitted loop protection packets **Note** • The default transmission time is 5 seconds. • The value must be from 1 to 10 seconds.
Shutdown time	Controls how long to disable a port after detecting a loop **Note** • The default shutdown time is 180 seconds. • The value must be from 0 to 604800 seconds.

5. Click **Save**.

QSS saves the settings.

Deleting a Network Setting

1. Log in to QSS.
2. Go to **Configuration**.
3. Select a network setting.

Note
Deleting network settings is applicable only to ACL rules, link aggregation groups, static MAC addresses, and VLANs.

4. Click .
   A confirmation message appears.
5. Click **Delete**.

QSS deletes the network setting.

Monitoring Network Settings

You can monitor the following network settings in the **Configuration** section. These settings can be used to monitor and diagnose switch operations.

1. Log in to QSS.
2. Go to **Configuration**.
3. Select a network setting.

Setting	Description
IGMP Snooping Statistics	Go to **IGMP Snooping** > **IGMP Snooping Statistics** . Displays statistical information about detected IGMP groups.
LLP Remote Devices	Go to **LLDP** > **LLDP Remote Devices** . Displays information about the LLDP-enabled port including system capabilities and remote management IP address. Possible system capabilities include: • Bridge • DOCSIS cable device • Repeater • Reserved • Router • Station only • Telephone • WLAN access point • Other

Setting	Description
Port Status	Go to **Port Management** > **Port Status** to view the following port status information: • Port number • Port link status • Port state • Port speed • Flow control
Port Statistics	**a.** Go to **Port Management** > **Port Statistics** to view the statistics of the network ports. **b.** Click  to change the viewing option to List View.

5. System Management

The QSS **System Management** section provides device configuration and firmware update configuration options.

System Settings

This screen contains system configuration options such as system information, IP information, password settings, time settings, and backup and restore settings for the switch.

Changing the Switch Name

1. Log in to QSS.
2. Go to **System Management** > **System Information** .
3. Click .
4. Specify the device name:
   Requirements:
   - Length: 1–14 characters
   - Valid characters: A–Z, a–z, 0–9
   - Valid special characters: Hyphen (-)
5. Click to confirm the switch name.

QSS updates the switch name.

Configuring Connection Settings

1. Go to **System Management** > **Settings** > **IP** .
2. Configure the connection settings.

Setting	Description
Obtain IP & DNS automatically	Obtain the IP & DNS information automatically from the DHCP server. **Tip** Click to refresh the IP & DNS information.
Set the IP & DNS manually	Specify the IP & DNS manually.

3. Click **Apply**.

QSS updates the connection settings.

Updating the Switch Password

1. Go to **System Management** > **Settings** > **Password** .
2. Specify a new password.

Tip
Click to make the password visible.

Setting	User Action
Current password	Specify the current password of the device
New password	Specify a password that contains 8 to 20 ASCII characters
Confirm new password	Reenter the new password

3. Click **Apply**.

QSS updates the password.

Configuring Time Settings

Note
You must configure the system time correctly to avoid the following issues.

- When using a web browser to connect to the device or save a file, the displayed time of the action is incorrect.
- Event logs do not reflect the exact time that events occurred.
- Scheduled tasks run at the wrong time.

1. Go to **System Management** > **Settings** > **Time** .
2. Select a time zone.
3. Specify the date and time format.
4. Select the time setting.

Option	User Action
Date & time format	Specify a date and time format.

Time configuration	Specify a method to synchronize the time.
	• **Manual configuration**: Specify the date and time
	• **Synchronize with Internet time server**: Sync the switch with the specified Internet time server
	  • **Server**: Name of the Network Time Protocol (NTP) server
	  Examples: time.nist.gov, time.windows.com
	  • **Time zone**: Specify the time zone

5. Click **Apply**.

QSS updates the time settings.

Managing Logs

You can filter logs by type or search for specific log files. These logs can be used to diagnose issues or monitor switch operations.

1. Go to **System Management** > **Logs** .

2. Perform any of the following tasks.

Task	User Action
Search log files	**a.** Locate the **Search** field. **b.** Enter search terms.
Delete log files	**a.** Click **Clear**. The **Clear Logs** window opens. **b.** Click **Clear**.

QSS performs the specified task.

Resetting the Switch to Factory Settings

Resetting the switch deletes the data stored on the device and restores the switch to the default factory settings.

Tip
You can also reset the switch to factory defaults by pressing and holding the physical reset button for 10 seconds.

1. Log in to QSS.
2. Open QuNetSwitch.
3. Go to **System Management** > **Settings** > **Factory Reset** .
4. Click **Factory Reset**.
   A confirmation message appears.
5. Click **Yes**.

QSS resets the switch to the factory default settings.

Restarting the Switch

1. Log in to QSS.
2. Click  located on the upper-right corner of the page.
3. Click **Restart Switch**.
   A confirmation message appears.
4. Click **Yes**.

QSS restarts the switch.

Viewing the Switch Information

To view the hardware and system information of the switch, go to **System Management** > **System Information** .

The screen provides the following information.

Information	Description
Switch CPU	Displays the switch CPU information along with the supported software
PoE controller	Displays the PoE controller integrated into the switch
Switch CPU temperature	Displays the real time temperature of the CPU
System temperature	Displays the overall real time temperature of the switch
PoE controller temperature	Displays the real time temperature of the PoE controller
System fan	Displays the fan speed (in RPM) of the installed fans

Firmware Management

QNAP recommends keeping your device firmware up to date. This ensures that your device can benefit from new QSS software features, security updates, enhancements, and bug fixes.

You can update the firmware using one of the following methods:

Update Method	Description
Using **Live Update**	Firmware updates are automatically detected by QSS and installed onto your device. For details, see Checking for Live Updates.
Using **Firmware Update**	You can check for latest device firmware updates on the QNAP website, download the firmware update to a computer, and manually install the firmware update onto your device. For details, see Updating the Firmware Manually.

Firmware Requirements

Your device must meet the following requirements to perform a firmware update:

Settings	Requirements
Hardware settings	• A computer Ethernet cables **Note** QNAP recommends updating the firmware using wired Ethernet connections to ensure your network connection is reliable during firmware updates.
Administrator privileges	You must be a switch administrator or have admin privileges to update the firmware.
Stop switch operations	QNAP recommends stopping all other switch operations before the firmware update. The switch must be restarted for the firmware update to take effect and may disrupt ongoing switch services or operations.
Device model name	Ensure you have the correct switch model name. You can find the switch model name using the following methods: • Locate the model name on a sticker on the bottom or rear of your device. • Log on to your device to find the model name.

Settings	Requirements
Firmware version	If you are updating the firmware using **Firmware Update**, ensure the selected firmware version is correct for your device model.

Checking for Live Updates

Warning
Do not power off your device during the firmware update process.

Important

- Make sure you review through the Firmware Requirements before updating the firmware.
- The update may require several minutes or longer, depending on your hardware configuration and network connection.

1. Go to **System Management** > **Firmware Update** > **Live Update** .
2. Click **Check for Update**.
   QSS checks for available firmware updates. You can choose to update QSS if there is an available update.
3. Click **Update System**.
   A confirmation message appears.
4. Click **Update**.

QSS updates the firmware.

Updating the Firmware Manually

Warning
Do not power off your device during the firmware update process.

Important

- Make sure you review through the Firmware Requirements before updating the firmware.
- The update may require several minutes or longer, depending on your hardware configuration and network connection.

1. Download the device firmware.
   a. Go to http://www.qnap.com/download.
   b. Select the product type.
   c. Select your device model.
   d. Read the release notes and confirm the following:
      - The device model matches the firmware version.
      - Updating the firmware is necessary.

- Check for any additional firmware update setup instructions.

2. Ensure that the product model and firmware are correct.
3. Select the download server based on your location.
4. Download the firmware package.
5. Click **Browse**.
6. Select a folder.
7. Save the downloaded firmware package.
8. Extract the firmware image file.
9. Go to **System Management** > **Firmware Update** > **Firmware Update** .
10. Click **Browse** and then select the extracted firmware image file.
11. Click **Update System**.
    A confirmation message window appears.
12. Click **Update**.

The device restarts immediately.