



QNAP

QSW Managed Switches

**QSW-M3212R
QSW-M3216R**

User Guide

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1. Important Information

Original Packaging

Please keep the original packaging and packaging materials. If you want to return the product or send it for repairs, please use the original packaging to avoid damage.

QNAP reserves the right not to provide a refund or warranty service for products that are damaged due to improper packaging.

Hardware Defects

If your QNAP product has hardware defects, return the product to QNAP or a QNAP-authorized service center for maintenance or replacement. Any attempt to repair or perform maintenance procedures on the product by you or an unauthorized third party invalidates the warranty.

QNAP is not responsible for any damage or data loss caused by unauthorized modifications and installation of unsupported third-party applications.

For details, see the [QNAP Warranty Terms and Conditions](#).

Safety information

The following instructions help ensure personal safety and environmental safety. Read these instructions carefully before performing any operation.

General Instructions

- The device should be stored in a secure location with restricted access, controlled through the use of a tool, lock and key, or any means of security.
- Only qualified, skilled, and authorized persons with knowledge of all restrictions, safety precautions, and installation and maintenance procedures should have physical access to the device.
- To avoid potential injury or damage to components, ensure that the drives and other internal system components have cooled before touching them.
- Observe electrostatic discharge (ESD) procedures to avoid potential injury or damage to components.

Power

- To reduce the risk of fire or electric shock, ensure that you only connect the power cord to a properly grounded electrical outlet.
- To avoid serious injuries, a trained service technician must disconnect all PSU cords from the device before installing or replacing system components.

System Battery

- This product contains a button battery.
- If swallowed, a lithium button battery can cause severe or fatal injuries within 2 hours.
- Keep batteries out of reach of children.
- If you think batteries may have been swallowed or placed inside any part of the body, seek immediate medical attention.

- To avoid potential battery explosion, causing injury or damage to components, ensure that you replace the existing battery with a battery of the same type.
- Dispose of used batteries properly according to local regulations or the instructions of the battery manufacturer.

Moving Parts

-



Moving fan blades: Keep your body parts away from moving fan blades while the device is connected to a power source.

-



Moving components: Keep your body parts away from other moving components.

- The device is not suitable for use in locations where children are likely to be present.

2. Product Overview

This chapter provides basic information about the QNAP QSW-M3212R and QSW-M3216R switches.

About the QSW-M3212R and QSW-M3216R

To provide a robust and efficient way to manage network traffic, the QSW-M3212R features four 10 GbE RJ45 ports and eight 10 GbE SFP+ ports, while the QSW-M3216R features eight 10 GbE RJ45 ports and eight 10 GbE SFP+ ports.

Both switches can be accessed using the QNAP Switch System (QSS) to simplify network management, offering complete transparency into your network. The switches provide flexible scaling and integration for expanding your network infrastructure.

Hardware specifications



Warning

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- QNAP is not responsible for any damage or data loss caused by unauthorized modifications and installation of unsupported third-party applications.
- For details, see the [QNAP Warranty Terms and Conditions](#).



Tip

Model specifications are subject to change without prior notice. To see the latest specifications, go to <https://www.qnap.com>.

| Component | QSW-M3212R-8S4T | QSW-M3216R-8S8T |
|-----------------------|--|---|
| Processor | | |
| CPU | Marvell® 98DX3550 | |
| Chipset | | |
| Memory | 8 GB | |
| Network interfaces | <ul style="list-style-type: none"> • 4 x 100M/1G/2.5G/5G/10G RJ45 ports • 8 x 1G/10G GbE SFP+ ports | <ul style="list-style-type: none"> • 8 x 100M/1G/2.5G/5G/10G RJ45 ports • 8 x 1G/10G GbE SFP+ ports |
| Management interfaces | <ul style="list-style-type: none"> • Console ports: 1 x RJ45 port • Management ports: 1 x Marvell ® 88E1512 1 GbE port | |
| Interface | | |
| Buttons | Switch reset | |
| LEDs | | |
| System | <ul style="list-style-type: none"> • Status • Locator | |

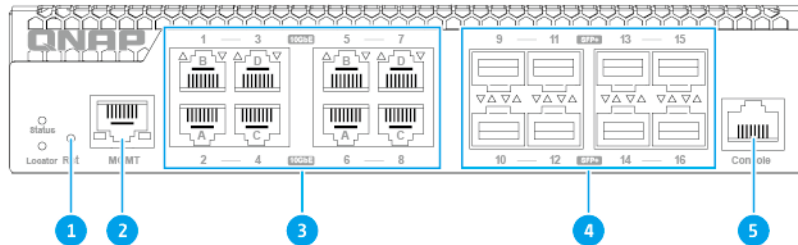
| Component | QSW-M3212R-8S4T | QSW-M3216R-8S8T |
|---------------------------|--|-----------------|
| Ports | <ul style="list-style-type: none"> • Speed • Link • Activity | |
| Dimensions | | |
| Form factor | 2U Rackmount | |
| Dimensions (H x W x D) | 207 x 199.5 x 43.3 mm (8.14 x 7.85 x 1.70 in) | |
| Net weight | 1.52kg (3.35 lbs) | |
| Others | | |
| Power supply unit | 100-240V, 50/60 Hz | |
| Maximum power consumption | 80W | |
| Sound level | 28 dB(A) | |
| Fans | System: 2 x VAPO bearing fans | |
| Operating temperature | 0°C to 40°C (32°F to 104°F) | |
| Relative humidity | <ul style="list-style-type: none"> • Non-condensing relative humidity: 5% to 95% • Wet-bulb temperature: 27°C (80.6°F) | |

Package contents

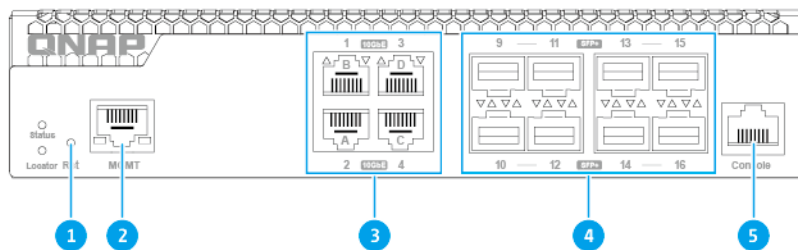
| Item | Quantity |
|--------------------------------|----------|
| QSW-M3216R / QSW-M3212R | 1 |
| Power cord | 1 |
| Rail kit | 1 |
| Quick Installation Guide (QIG) | 1 |

Components

Front panel



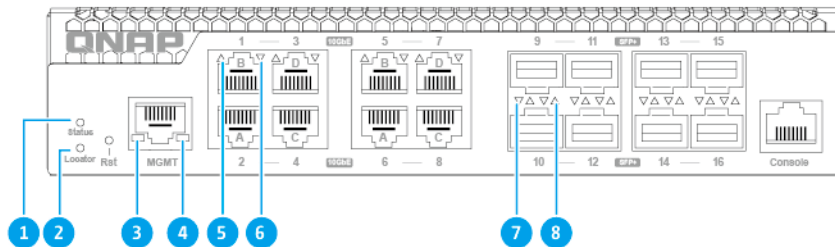
QSW-M3216R



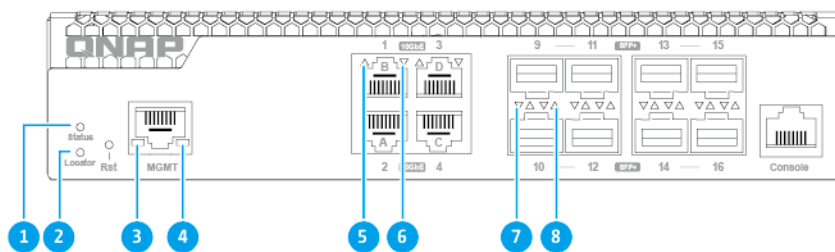
QSW-M3212R

| No. | Component | No. | Component |
|-----|-------------------|-----|-------------------|
| 1 | Reset button | 4 | 10 GbE SFP+ ports |
| 2 | Management port | 5 | Console port |
| 3 | 10 GbE RJ45 ports | - | - |

Front panel LEDs



QSW-M3216R



QSW-M3212R

| No. | Component | No. | Component |
|-----|------------------------------|-----|--|
| 1 | Status LED | 5 | 10 Gigabit Ethernet LED: 10 Gbps speed |
| 2 | Locator LED | 6 | 10 Gigabit Ethernet LED: 100M/1G/2.5G/5G speed |
| 3 | Management port speed LED | 7 | 10 Gigabit SFP+ LED: 10 Gbps speed |
| 4 | Management port activity LED | 8 | 10 Gigabit SFP+ LED: 1 Gbps speed |

Safety information

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- Dispose of used batteries properly according to local regulations or the instructions of the battery manufacturer.

Moving Parts

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Moving fan blades: Keep your body parts away from moving fan blades while the device is connected to a power source.

-



Moving components: Keep your body parts away from other moving components.

- The device is not suitable for use in locations where children are likely to be present.

3. Installation and Access

This chapter provides specific hardware installation and switch access steps.

Installation requirements

| Category | Item |
|--------------------------|--|
| Environment | <ul style="list-style-type: none"> • Room temperature: 0°C to 40°C (32°F to 104°F) • Non-condensing relative humidity: 5% to 95% • Wet-bulb temperature: 27°C (80.6°F) • Flat, anti-static surface without exposure to direct sunlight, liquids, or chemicals • Free from objects that may obstruct the switch ventilation or apply pressure to the switch or power cord. |
| Hardware and peripherals | <ul style="list-style-type: none"> • Computer or NAS • Network cable |
| Tools | <ul style="list-style-type: none"> • Phillips #1 or #2 screwdriver • Flat head screwdriver • Anti-static wrist strap |

Setting up the switch

1. Place your switch in an environment that meets the requirements.
For details, see [Installation requirements](#).
2. Power on the switch.
3. Connect the switch to a computer or network.
For details, see [Connecting the switch to a computer or network](#).
4. Log in to QSS.

Connecting the switch to a computer or network

You can connect the switch to a computer or local area network. For details, see the following topics:

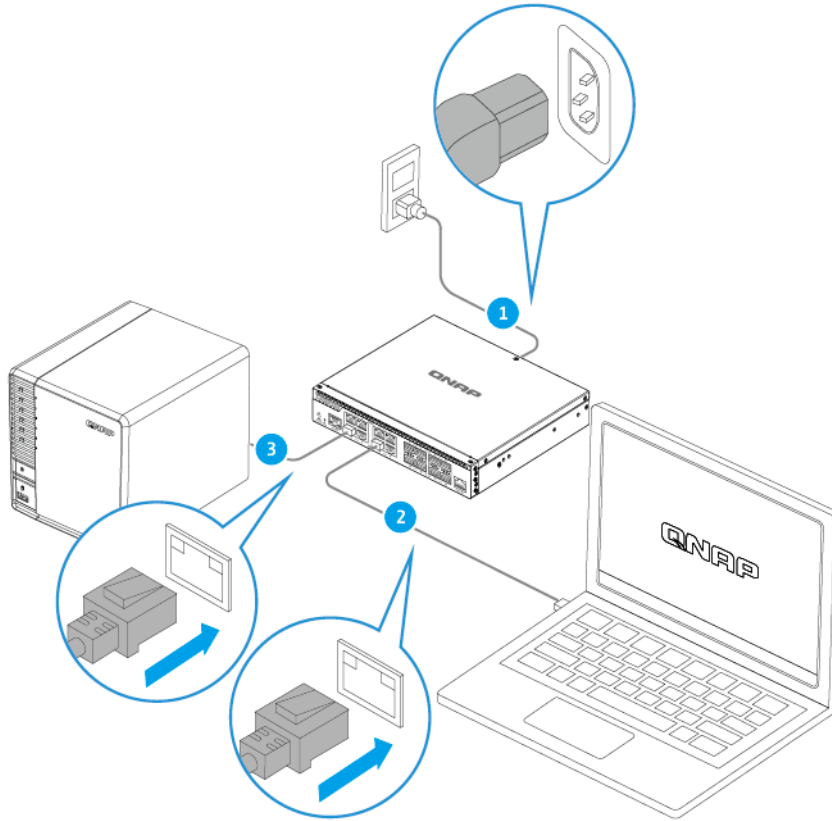
- [Connecting the switch to a computer](#)
- [Connecting the switch to a network](#)

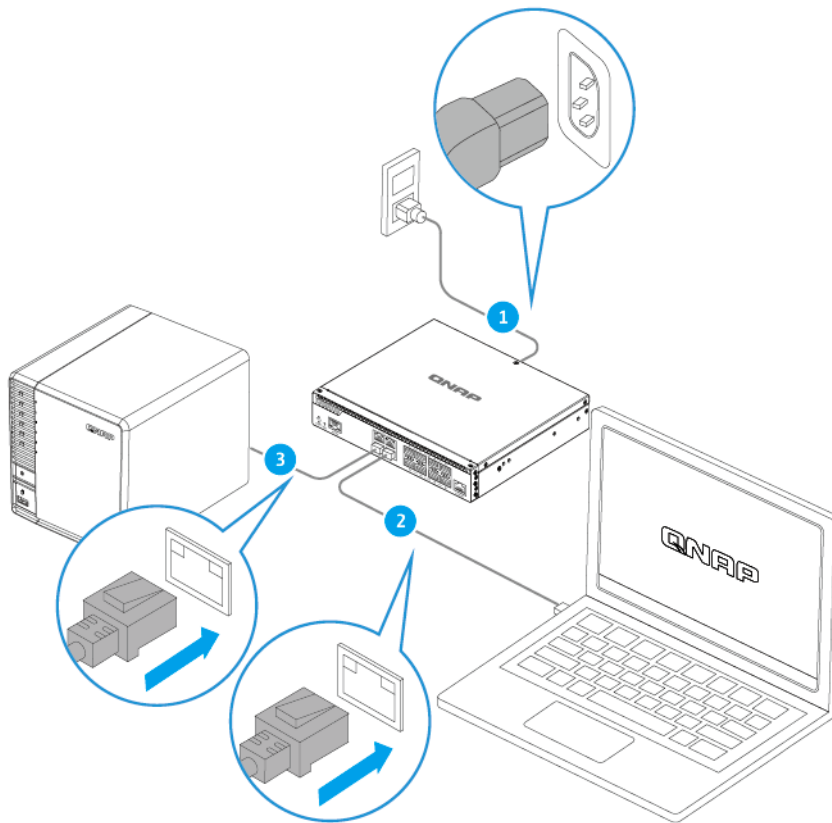
Connecting the switch to a computer

Connecting the switch to a QNAP NAS allows you to expand storage capacity and back up data to another NAS through network cable connections to a host port on the switch. However, you must connect the switch to a computer to configure the settings.

1. Power on the switch.
2. Connect the switch to a computer.

- a. Connect a network cable to the host port on the switch.
- b. Connect the network cable to a Gigabit network port on the computer.
- c. Optional: Connect the switch to the NAS.

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QSW-M3212R

3. Verify that the computer recognizes the switch.
 - a. Open Qfinder Pro on the host computer.



Note

To download Qfinder Pro, go to <https://www.qnap.com/utilities>.

- b. Locate the switch on the list.

Connecting the switch to a network

You can connect the switch to the local area network through the host port.

1. Power on the switch.
2. Connect the switch to your local area network using the host port.
3. Run Qfinder Pro on a computer that is connected to the same local area network.



Note

To download Qfinder Pro, go to <https://www.qnap.com/utilities>.

4. Locate the switch in the list and then double-click the name or IP address. The QSS login screen appears.
5. Enter your QSS login information.

6. Click **Log In**.

Switch access

| Method | Description | Requirements |
|-------------|---|--|
| Web browser | <p>You can access the switch using any computer on the same network if you have the following information:</p> <ul style="list-style-type: none"> • Switch name (Example: http://example123/) or IP address • Login credentials of a valid user account <p>For details, see Accessing the switch using a browser.</p> | <ul style="list-style-type: none"> • Computer that is connected to the same network as the switch • Web browser |
| Qfinder Pro | <p>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.</p> | <ul style="list-style-type: none"> • 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, you 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 username and password.

| Default Username | Default Password |
|------------------|--|
| admin | <p>The MAC address of the switch image omitting any punctuation and capitalizing any letters.</p> <p> Tip For example, if the MAC address is 00:0a:0b:0c:00:01, the default password is 000A0B0C0001.</p> <p> Note You can find the device MAC address with Qfinder Pro or attached to a label on the device listed as MAC.</p> <p> Note</p> <ul style="list-style-type: none"> • You are prompted to change the password after logging in for the first time. • For security reasons, QNAP strongly recommends changing the password after the first login. |

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 username and password.

| Default Username | Default Password |
|------------------|--|
| admin | <p>The MAC address of the switch image omitting any punctuation and capitalizing any letters.</p> <p> Tip For example, if the MAC address is 00:0a:0b:0c:00:01, the default password is 000A0B0C0001.</p> <p> Note You can find the device MAC address with Qfinder Pro or attached to a label on the device listed as MAC.</p> <p> Note</p> <ul style="list-style-type: none"> • You are prompted to change the password after logging in for the first time. • For security reasons, QNAP strongly recommends changing the password after the first login. |

5. Click Login.

The QSS desktop appears.

4. Basic Operations



This chapter describes basic switch operations.

LEDs


LEDs indicate system status and related information when the switch is powered on. The following LED information applies only when the switch is connected to the network.

For details on the location of the LEDs, see [Front panel LEDs](#).

System Status LED

| Status | Description |
|---------------|---|
| Green | <ul style="list-style-type: none"> The device is ready. The firmware is updated. The password has been reset. The switch has been reset to factory default settings. |
| Flashes green | <ul style="list-style-type: none"> The device is being initialized. The firmware is being updated. <p> Important When updating the firmware, do not remove the power cord, and do not force-exit the application.</p> <ul style="list-style-type: none"> The device is being reset. The device password is being reset. |
| Red | <ul style="list-style-type: none"> A system error occurred. A network loop was detected. The system is overheating. A fan error occurred. <p> Note For more details, log in to QSS.</p> |
| Off | <ul style="list-style-type: none"> The device is powered off. The device is ready for password reset. The device is ready for factory reset. |

Locator LED

| Status | Description |
|---------------|---|
| Flashes amber | The switch is being located.  Note The locator LED flashes for 30 minutes when the locator function is enabled. |
| Off | <ul style="list-style-type: none"> The switch is not being managed by the cloud. The locator function is disabled. |

10 Gigabit Ethernet LED

| Status | Description |
|---------------|--|
| Green | The network connection is operating at 10 Gbps. |
| Flashes green | The device is being accessed from a 10 GbE network. |
| Amber | The network connection is operating at 100 Mbps, 1 Gbps, 2.5 Gbps, or 5Gbps. |
| Flashes amber | The device is being accessed from a 100 Mbps, 1 Gbps, 2.5 Gbps, or 5Gbps network. |
| Off | <ul style="list-style-type: none"> There is no cable connected to the port. Auto-negotiation failed. Link speed mismatch occurred. Port link-up failure. The port is disabled in QSS. A network loop was detected and loop protection has disabled the port. |

10 Gigabit SFP+ LED

| Status | Description |
|---------------|--|
| Green | The network connection is operating at 10 Gbps. |
| Flashes green | The device is being accessed from a 10 GbE network. |
| Amber | The network connection is operating at 1 Gbps. |
| Flashes amber | The device is being accessed from a 1 Gbps network. |
| Off | <ul style="list-style-type: none"> There is no cable connected to the port. Auto-negotiation failed. Link speed mismatch occurred. Port link-up failure. The port is disabled in QSS. A network loop was detected and loop protection has disabled the port. |


Management RJ45 Speed LED

| Status | Description |
|------------------------|--|
| Green | The network connection is operating at 1 Gbps. |
| Amber | The network connection is operating at 100 Mbps. |
| Flashes green or amber | Data is being transmitted. |
| Off | There is no network connection. |

Management RJ45 Link and Activity LED

| Status | Description |
|---------------|---|
| Amber | The management port is operating as an uplink port. |
| Flashes amber | Data is being transmitted. |
| Off | There is no network connection. |

Reset button

| Operation | User Action | Result |
|-----------------------|---|--|
| Basic system reset | Press and hold the button for 5 seconds. | <p>The following settings are reset to default:</p> <ul style="list-style-type: none"> System administrator password: The default password is the device MAC address in uppercase letters without special characters. For example, if the device MAC address is 00-08-9B-F6-15-75, then the admin password would be 00089BF61575. <p> Note You can find the device MAC address with Qfinder Pro or attached to a label on the device listed as MAC.</p> <ul style="list-style-type: none"> The admin account is automatically enabled. |
| Advanced system reset | Press and hold the button for 10 seconds. | The default factory settings are restored. |

5. QSS

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.

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 settings.
For details, see [System settings](#).
3. Configure port settings and other network settings.
For details, see [Network management](#).

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 > Port Management** .
3. Go to **Port Configuration**.
4. Identify a port or LAG.
5. Configure the settings.

| Setting | Description |
|---------------------|--|
| State | Enables or disables the switching port |
| Speed | Allows the port speed to be auto-negotiated or controlled using the selected speed |
| Flow Control | Enables or disables flow control for the port <ul style="list-style-type: none"> • 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 the specified speed. |

6. Click **Save**.

QSS saves the settings.

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.



Note

Only tagged ports can belong to multiple VLANs.

6. Click **Save**.

QSS adds the VLAN.

Adding a link aggregation group (LAG)


Link Aggregation Control Protocol (LACP) allows you to combine multiple switching ports 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 | <p>Controls the link aggregation mode for the group</p> <ul style="list-style-type: none"> • LACP: Uses IEEE 802.3ad protocol to send Link Aggregation Control Protocol Data Units (LACPDU) to connected devices to establish a link aggregation. This allows you to control the bundling of several physical links into a logical link. • Static: Establishes link aggregation without the LACP protocol <p> Important Ensure that you configure the LAG before connecting cables to the switch to avoid creating a data loop.</p> |
| Port Configuration | <p>Specifies which ports are included in the group</p> <p> Note Ensure that you configure the same settings for all the member ports in a LAG.</p> |

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 Rapid Spanning Tree Protocol (RSTP) settings

RSTP provides rapid convergence of the spanning tree and builds a loop-free topology for the switch network. RSTP allows you to enable backup links in case an active link fails.





Note

- RSTP is disabled by default.
- The default bridge priority for the switch is 32768.

Enabling or disabling RSTP

1. Log in to QSS.
2. Go to **Configuration > RSTP > RSTP Configuration**.
3. Identify a port.
4. Enable or disable RSTP.

| Toggle State | Description |
|---|-------------------------------------|
|  | Click to enable the RSTP function. |
|  | Click to disable the RSTP function. |

5. Click **Save**.

QSS saves the setting.

Setting bridge priority

You can configure the RSTP bridge priority of the switch in the RSTP configuration field.

1. Log in to QSS.
2. Go to **Configuration > RSTP > RSTP Configuration** .
3. Enable RSTP.



Note

For details, see [Enabling or disabling RSTP](#).

4. Select the RSTP bridge priority from the drop-down list.



Note


- The default bridge priority is 32768.
- For root bridge priority, QNAP recommends setting the value to zero.

5. Click **Save**.

QSS updates the RSTP bridge priority.

Configuring loop protection settings


A loop occurs when data packets are continually forwarded between ports. Network loops often lead to a significant drop in network performance. Enabling loop protection allows you to disable the affected interface temporarily to avoid network degradation.

1. Log in to QSS.
2. Go to **Configuration > Loop Protection** .
3. Next to **Loop protection**, click .
4. Specify how much time after detecting a loop to disable the port.



Note

- The default shutdown time is 180 seconds.
- The value must be from 0 to 604800 seconds.

5. Next to the port number, click .
6. Click **Save**.



QSS saves the settings.

Enabling or disabling LLDP

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. Enable or disable LLDP.

| Toggle State | User Action |
|---|-------------------------------------|
|  | Click to enable the LLDP function. |
|  | Click to disable the LLDP function. |


4. Click **Save**.


QSS saves the setting.

Configuring IGMP snooping

The Internet Group Management Protocol (IGMP) manages IP multicast group memberships. 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 |
|---------------------------------|--|
| IGMP querier | Uses the switch to send periodic query packets to multicast groups to avoid multicast traffic loss |
| Multicast flood blocking | Blocks multicast flooding from unknown sources |
| Router port | Specifies which ports to use as the router port for the switch After receiving an IGMP packet, QSS forwards the control packets through the selected router ports. <div style="display: flex; align-items: flex-start;">  <div> <p>Note If you do not specify a router port, QSS automatically assigns a port to be used as a router port.</p> </div> </div> |
| Fast leave | Specifies the ports that support Fast Leave After receiving an IGMP leave message, QSS stops forwarding specific multicast traffic to the selected Fast Leave ports. |

5. Click **Save**.

QSS saves the IGMP snooping settings.


Managing access control list (ACL) entries

Access control lists allow you to handle network traffic in a switch by using controlled rule sets. Each ACL rule is a user-created set of conditions that the switch uses to determine whether a data packet can pass through the network. If the data packet matches an existing ACL rule, the switch then uses the rule to determine whether to permit or deny the packet. If there is no matching ACL rule or there are no ACL rules, the switch applies a default rule.

You can use ACLs to control host access to different parts of a network or to control traffic forwarding or blocking at the switch level.

Adding an IP address-based ACL rule

1. Log in to QSS.
2. Go to **Configuration > ACL > By IP Address**.
3. Click **Add**.
The **Add ACL - IP Address** window opens.
4. Configure the ACL settings.

| Setting | User Action |
|--------------------|--|
| ACL No. | This value must be from 1 to 255 |
| Source | |
| IP Address | Specify the IP address of an incoming connection |
| Subnet Mask | Specify the subnet mask 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 | Select specific ports to apply the ACL rule, or select All to apply the rule to all ports. |
| Permission | Specify the type of permission type used for this ACL entry <ul style="list-style-type: none"> • Allow: Allows access for the configured IP addresses • Deny: Restricts access for the configured IP addresses |



Note

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

5. Click **Save**.

QSS adds the IP address-based ACL rule.

Adding a MAC address-based ACL rule

1. Log in to QSS.

2. Go to **Configuration > ACL > By MAC Address** .
3. Click **Add**.
The **Add ACL - MAC Address** window opens.
4. Configure the ACL settings.


| Setting | User Action |
|--------------------|--|
| ACL No. | Specify a number between 1 and 255. |
| Source | |
| MAC address | Specify the source MAC address. |
| Destination | |
| MAC address | Specify the destination MAC address. |
| Port | Select specific ports to apply the ACL rule, or select All to apply the rule to all ports. |
| Permission | Select one of the following: <ul style="list-style-type: none"> • Allow • Deny |

5. Click **Save**.

QSS adds the MAC address-based ACL rule.

Configuring QoS settings

Quality of service (QoS) enables the switch to examine incoming packets and classify them into groups to prioritize certain traffic over others. You can classify these packets based on the type of traffic, source, or destination address. QSS allows you to configure and enable traffic policies on the switch ports using two QoS classification techniques, Differentiated Services Code Point (DSCP) and class of service (CoS).

1. Log in to QSS.
2. Go to **Configuration > QoS > QoS** .
3. Identify a port or LAG.
4. Under **DSCP**, click  .
DSCP is enabled on the switch port.
5. Specify a CoS value to assign to incoming packets.



Note

- When DSCP is enabled on a port, incoming packets are tagged with the specified CoS value. The packets are then processed in order of priority according to their CoS value and which queue the CoS value is mapped to.
- QSS uses CoS 802.1p priority tag values which range from 0 to 7. By default, they are each mapped to the queue of the same number, where queue 0 receives the lowest priority and queue 7 the highest priority. To change the default mappings, see [Mapping CoS values to queues](#).

- QSS does not override the CoS values of incoming packets that have already been assigned CoS values.

6. Click **Save**.

QSS saves the QoS settings.

Mapping CoS values to queues

QSS supports 8 queues for each switch port. Different queues receive different priority in the network traffic, where queue 0 receives the lowest priority and queue 7 receives the highest priority.

By default, CoS values 0-7 each map to the queue of the same number. Therefore, a data packet with CoS value 0 would be put in queue 0 and processed last, after data packets with higher CoS values have been processed. However, you can change this default mapping by assigning different queues to the CoS values. You can also assign the same queue to more than one CoS value.

1. Log in to QSS.
2. Go to **Configuration > QoS > CoS Mapping**.
3. Assign a queue for each CoS value.
4. Click **Save**.

QSS saves the mappings.

Mapping DSCP values to queues

Differentiated Services Code Point (DSCP) is a field in the header of an IP packet that is used to provide QoS optimization. You can map DSCP values to queues to determine the priority of incoming IP packets based on their DSCP values.

Queue 0 receives the lowest priority, while queue 7 receives the highest priority.

By default, QSS assigns the following queues to the following DSCP value ranges.


| DSCP Values | Queue |
|-------------|-------|
| 0-7 | 0 |
| 8-15 | 1 |
| 16-23 | 2 |
| 24-31 | 3 |
| 32-39 | 4 |
| 40-47 | 5 |
| 48-55 | 6 |
| 56-63 | 7 |

1. Log in to QSS.
2. Go to **Configuration > QoS > DSCP Mapping**.
3. Assign a queue number to each DSCP value.
4. Click **Save**.

QSS saves the mappings.

Configuring port mirroring

Port mirroring is a network monitoring technique that copies data packets from one or more source ports and transmits it to a dedicated destination port for analysis and troubleshooting.

1. Log in to QSS.
2. Go to **Configuration > Port Mirroring** .
3. Next to **Port Mirroring**, click  .
QSS enables port mirroring.
4. Select a destination port.
5. Select the mirror type on one or more source ports.

| Mirror Type | Description |
|-----------------|---|
| Disabled | Mirroring is disabled on the port |
| Both | Mirrors all packets to the destination port |
| Ingress | Mirrors only incoming packets to the destination port |
| Egress | Mirrors only outgoing packets to the destination port |

6. Click **Save**.

QSS saves the settings.

Configuring the dynamic MAC address aging timer

The **MAC Address Table** registers the source MAC addresses of all incoming traffic. The aging timer deletes a MAC address entry from the table if there has been no incoming traffic from that MAC address after the specified period.

1. Log in to QSS.
2. Go to **Configuration > MAC Address Table > Dynamic MAC Address** .
3. Specify the dynamic MAC address aging time.
4. Click **Save**.

QSS saves the dynamic MAC address aging time.



Tip

To clear the existing MAC address entries, go to **Configuration > MAC Address Table** , and then click **Clear Table**.

Adding a static MAC address


To improve frame forwarding efficiency between LAN ports, the network switch maintains a MAC address table that maps MAC addresses to LAN ports of connected devices. You can manually add a MAC address to the table, which allows the switch to retain the MAC entry even after a reboot.


1. Log in to QSS.

2. Go to **Configuration > MAC Address Table > Static MAC Address** .
3. Click **Add**.
The **Add Static MAC Address** window opens.
4. Configure the MAC address settings.
 - a. Specify a MAC address.
 - b. Specify a VLAN ID.
 - c. Select a switching port.
5. Click **Save**.
The **Add Static MAC Address** window closes.

QSS adds the MAC address.

Configuring switch IP settings

1. Log in to QSS.
2. Go to **Configuration > IP Configuration** .
3. Enable a management access mode.
 - **In-band Management:** Allows users to access QSS through the ports on the switch that are also used for network traffic management.
 - **Out-of-band Management:** Allows users to access QSS through a dedicated management port without being affected by network congestion or malfunction.
4. Under **Action**, click .
5. Configure the network management settings.

| Interface | Description |
|---------------------|---|
| DHCP | Automatically assigns an IP address and other network configuration parameters to the switch. |
| Static | |
| IP Address | An IP address that is permanently assigned to the switch. |
| Subnet Mask | A 32-bit number that is used to divide an IP network into smaller subnetworks. |
| Gateway | An IP address assigned to the device that connects your local network to the internet. |
| DNS 1 Server | A server that translates domain names into IP addresses. |
| DNS 2 Server | A backup DNS server that is used if the primary DNS server is unavailable. |
| VLAN ID | <p>A VLAN ID that is selected for the switch to communicate with other devices on the same VLAN.</p> <p> Note You can assign the static IP address to a VLAN ID only for in-band management mode.</p> |

6. Click **Save**.

QSS saves the IP settings.



System management

The **System** section of the QSS navigation menu provides access to device configuration options.

System settings

The **System Settings** menu contains system configuration options such as system information, IP information, password settings, secure connection settings, and time settings for the switch.

Changing the switch name

1. Log in to QSS.
2. Go to **System > System Settings > System Information** .
3. Click .
4. Specify the switch name.
Requirements:
 - Length: 1–32 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.

Updating the switch password

1. Log in to QSS.
2. Go to **System > System Settings > Password** .
3. 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. |

4. Click **Save**.

QSS logs you out of the switch interface. You can access the switch with the new password.

Configuring time settings



Note

You must configure the system time correctly to ensure the following:

- When using a web browser to connect to the device or save a file, the displayed time of the action is correct.
- Event logs reflect the exact time that events occur.
- Scheduled tasks run at the correct time.

1. Log in to QSS.
2. Go to **System > System Settings > Time** .
3. Specify the time zone.
4. Specify the time configuration.

| Setting | Description |
|--|--|
| Synchronize with internet time server | Ensure that your device is connected to the internet, and then specify the following information: Server: Specify the Network Time Protocol (NTP) server. Examples: time.nist.gov, time.windows.com |
| Manual configuration | Specify the date and time. |

5. Configure the Daylight Savings Time (DST) settings.
 - **Disable:** Disables the DST settings
 - **Adjust the system clock automatically:** Allows the internal clock of the switch to configure the DST settings.
 - **Adjust the system clock manually:** Allows you to manually configure the starting time, ending time, and the offset settings.
6. Click **Save**.

QSS updates the time settings.

Backing up system settings

1. Log in to QSS.
2. Go to **System > System Settings > Backup & Restore** .
3. Click **Backup**.

The device exports the system settings as a BIN file and downloads the file to your computer.

Restoring system settings



Warning

If the selected backup file contains user or user group information that already exists on the device, the system will overwrite the existing information.

1. Log in to QSS.
2. Go to **System > System Settings > Backup & Restore** .
A file explorer window opens.
3. Click **Browse**.
4. Select a valid BIN file that contains the device system settings.
5. Click **Restore**.

QSS restores the switch settings.

Resetting the switch password




Note

- You can also reset the switch password by pressing and holding the physical reset button for 5 seconds.
- The default "admin" account is automatically enabled after the system reset.

1. Log in to QSS.
2. Go to **System > System Settings > Backup & Restore** .
3. Click **Password Reset**.

QSS resets the switch password.

| Default Username | Default Password |
|------------------|---|
| admin | <p>The MAC address of the switch image omitting any punctuation and capitalizing any letters.</p> <p> 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".</p> |

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. Go to **System > System Settings > Backup & Restore** .
3. Click **Factory Reset**.
A confirmation message appears.
4. Click **Yes**.

QSS resets the switch to the factory default settings.



Note

To log in to the interface again, you must locate the device using Qfinder Pro. For details, see [Switch access](#).

Enabling secure connection (HTTPS)

1. Log in to QSS.
2. Go to **System > System Settings > HTTPS** .
3. Select **Enable Secure Connection (HTTPS)**.
4. Select a TLS version.



Note

Select the latest version of TLS to maximize system security. Ensure that your system meets the TLS requirements to avoid compatibility issues.

5. Optional: Select **Force secure connections (HTTPS) only**.



Note

After enabling this setting, you can only access the web administration page via HTTPS.

6. Click **Save**.

QSS saves the secure connection settings.

Downloading diagnostic logs

You can remotely monitor switch events (including system, LLDP, and IGMP snooping events) by recording and downloading the diagnostic logs.

1. Log in to QSS.
2. Go to **System > System Settings > Diagnostic Logs** .
3. Select the services for which you wish to download logs.



Note

By default, the system logs are included in the downloaded logs.

4. Specify a period for collecting the logs.
5. Click **Start**.
QSS starts collecting the logs of the selected services.
6. Click **Download**.

QSS downloads the compressed file to your device.

Configuring smart fan settings

1. Log in to QSS.
2. Go to **System > System Settings > Smart Fan** .



3. Select the fan speed mode.

| Option | Description |
|-----------------------------|---|
| Normal (recommended) | Fans run on normal speed. This is the default setting. |
| Quiet | Fans run on low speed to decrease noise. |
| Full speed | Fans run on high speed to lower the system temperature. This mode is suitable for high loading systems. |

4. Click **Save**.

QSS saves the smart fan 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 information on the switch

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

The screen provides the following information.

| Information | Description |
|--------------------------|--|
| Switch name | Displays the default or modified name of the switch |
| Model name | Displays the model name of the switch |
| MAC address | Displays the MAC address of the switch |
| IP address | Displays the DHCP or static IP address of the switch |
| System uptime | Displays how long the system has been operational |
| Current firmware version | Displays the firmware image version of the switch |

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 switch firmware using one of the following methods:

| Update Method | Description |
|-------------------------------|--|
| Using Check for update | Firmware updates are automatically detected by QSS and installed onto your device. For details, see Checking for live updates . |

| Update Method | Description |
|------------------------------|---|
| Using Firmware Update | You can check for firmware updates on the QNAP website , download updates to a computer, and manually install updates onto your device. For details, see Updating the firmware manually . |

Firmware update requirements

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

| Requirement | Description |
|--------------------------|--|
| Hardware equipment | <ul style="list-style-type: none"> • A computer • Ethernet cables <div style="border-left: 2px solid #0070C0; padding-left: 10px; margin-top: 10px;">  Note <ul style="list-style-type: none"> • A computer is required when updating the firmware manually or using Qfinder Pro. • QNAP recommends updating the firmware using wired Ethernet connections to ensure your network connection remains stable during the firmware update process. </div> |
| Back up system settings | QNAP recommends backing up the system settings to your computer before updating the firmware. For details, see Backing up system settings . |
| Administrator privileges | You must be a switch administrator or have administrator privileges to update the firmware. |
| Stop switch operations | Updating the firmware may disrupt ongoing switch services and operations. QNAP recommends stopping all switch operations before the firmware update. The switch must be restarted for the firmware update to take effect. |
| Device model name | Ensure that you have the correct switch model name. You can find the switch model name using one of the following methods: <ul style="list-style-type: none"> • Locate the model name on a sticker on the bottom or rear of your device. • Go to System > System Settings > Firmware Update > Live Update > Model name . • View the model name on the QSS top banner. |
| Firmware version | If you are manually updating the firmware using Firmware Update or Qfinder Pro, ensure the selected firmware version is correct for your device model. |

Checking for live updates



Warning

- To prevent data loss, QNAP recommends backing up all data on your device before updating the firmware. For details, see [Backing up system settings](#).
- Do not power off your device during the firmware update process.

**Important**

- Make sure you review [Firmware update requirements](#) before updating the firmware.
- The update may require several minutes or longer, depending on your hardware configuration and network connection.

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

QSS updates the firmware.

Updating the firmware manually**Warning**

- To prevent data loss, QNAP recommends backing up all data on your device before updating the firmware. For details, see [Backing up system settings](#).
- Do not power off your device during the firmware update process.

**Important**

- Make sure you review [Firmware update 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. Log in to QSS.
10. Go to **System > Firmware Update > Firmware Update** .
11. Click **Browse** and then select the extracted firmware image file.
12. Click **Update System**.
A confirmation message window appears.
13. Click **Update**.

QSS updates the firmware and the device restarts immediately.

Port diagnostics and LED controls

Port Tests

This page lets you run tests on the Ethernet (RJ45) ports of the network switch to find and fix network connectivity problems and make sure the switch's ports are working properly.

LED Controls

You can customize the LED behavior of the network switch on the **LED Controls** page by selecting a preferred LED mode.

Performing and viewing port diagnostics

The **Port Tests** page allows you to perform diagnostics on the RJ45 interfaces of your switch. This information can be used to troubleshoot network connectivity problems and ensure that the switch's interfaces are functioning properly. If a pair status is `Open`, it indicates that there is a break in the cable. The cable length and cable fault distance can be used to identify the location of the break.

1. Log in to QSS.
2. Go to **System > Port Diagnostics > Port Tests** .
3. Select a port number.
4. Click **Test**.

QSS displays the port test results.

Configuring switch LED behavior

The **LED Controls** page allows you to enable the locator LED to identify the location of the switch in a rack or other environment. When enabled, the locator LED flashes for the specified duration. You can also select an LED mode based on your preference.

1. Log in to QSS.
2. Go to **System > Port Diagnostics > LED Controls** .

3. Specify the LED activity duration for the locator LED.
4. Click **Start**.
QSS activates the locator LED on the switch.
5. Optional: Select an LED mode.

| LED Mode | Description |
|-------------------------------|---|
| Normal | All LEDs behave in accordance with their corresponding system state. This is the default mode. |
| Locator LED always on | The locator LED displays solid green. Other switch LEDs behave in accordance with their corresponding system state. This mode can be used to easily identify the switch in a rack or other environment. |
| Locator LED always off | The locator LED is disabled. Other switch LEDs behave in accordance with their corresponding system state. This mode can be used to reduce visual distractions. |
| Disable all LEDs | All LEDs are disabled. This mode can be used to conserve power or to reduce visual distractions. |

6. Click **Save**.

QSS saves the selected LED mode.

6. Support and Other Resources

QNAP provides the following resources:

| Resource | URL |
|-----------------|---|
| Documentation | https://docs.qnap.com |
| Service Portal | https://service.qnap.com |
| Downloads | https://download.qnap.com |
| Community Forum | https://forum.qnap.com |

7. Glossary

Qfinder Pro

QNAP utility that lets you locate and access QNAP NAS devices in your local area network

QSS

QNAP switch management application

8. Notices

This chapter provides information about warranty, disclaimers, licensing, and federal regulations.

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Version 3, 29 June 2007

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2. Source Code.

The “source code” for a work means the preferred form of the work for making modifications to it.

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FCC notice

FCC Class A Notice



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D33B77
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