Troubleshooting GV-PoE Switch Disconnections Caused by RSTP Issues

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Applied to

GV-PoE Switches

- Web Managed Series: GV-APOE0811 / 0811-V2 / 1611 / 1611-V2 / 2411-V2, GV-POE0801 / 0811-V2 / 0812 / 1601-V2 / 2401-V2
- L2+ Web Managed Series: GV-APOE0812 / 1612 / 2412
- L3 Web Managed Series: GV-APOE4813

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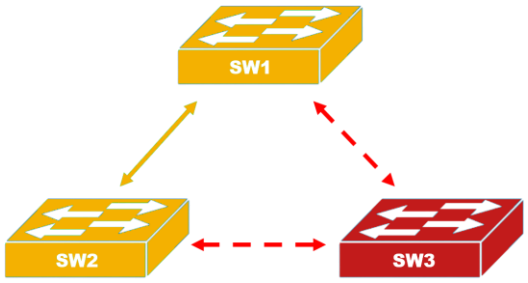
1. Introduction

What Are Logical Loops and Why Prevent Them?

In networks where switches are physically connected in a looped topology for redundancy, logical loops may form in data flow. These loops cause serious issues such as broadcast storms, unstable MAC address tables, and duplicate frames, which severely degrade network performance.

In the example below, three switches (SW1, SW2, SW3) that are physically connected in a looped topology create such a logical loop because no loop prevention protocol is enabled. This causes a broadcast storm that overwhelms SW3, leading to its disconnection (red box), while SW1 and SW2 remain online but suffer performance problems (orange boxes). The dashed lines to SW3 indicate that it no longer forwards traffic.



How RSTP Prevents Logical Loops and When to Use It

RSTP (Rapid Spanning Tree Protocol) is a Layer 2 protocol designed to prevent logical loops in Ethernet networks that have redundant physical paths. It improves on the original STP by providing faster convergence and dynamically blocking one or more links to break a looped physical topology into a loop-free logical topology. This ensures only one active path exists between any two devices, improving network reliability and preventing issues such as broadcast storms.

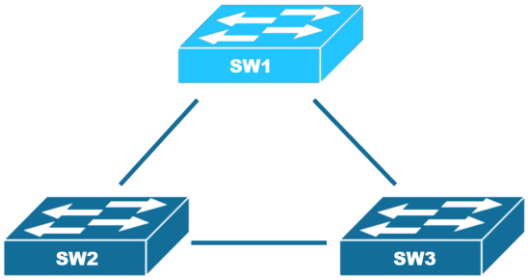
In networks with physical loops, enabling RSTP is essential to maintain stability by disabling redundant paths while keeping them as backup links ready for quick failover. However, in networks without physical loops, RSTP may mistakenly block ports, causing disconnections or half-duplex problems. Therefore, RSTP should be enabled or disabled based on the network's physical topology to ensure optimal performance.

How RSTP Works

RSTP operates through the following steps.

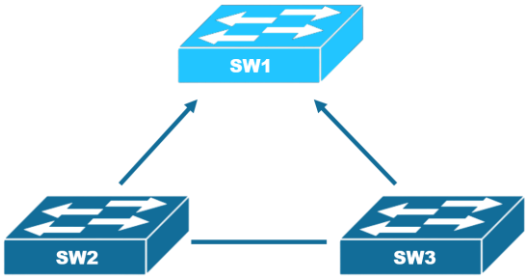
1. **Elects one switch as the Root Bridge**, which serves as the central point in a loop-free topology.

   In the example below, SW1 is elected as the Root Bridge.



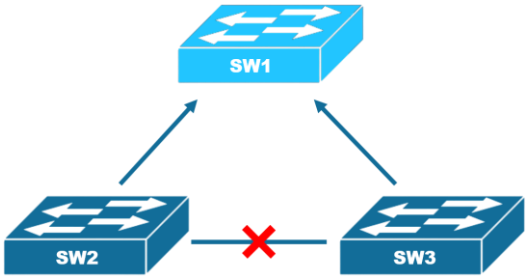
2. **Calculates the shortest path** from all other switches to the Root Bridge.

   In the example below, the shortest path from SW2 to the Root Bridge is SW2 → SW1, instead of SW2 → SW3 → SW1. Similarly, the shortest path from SW3 to the Root Bridge is also the direct link to SW1.

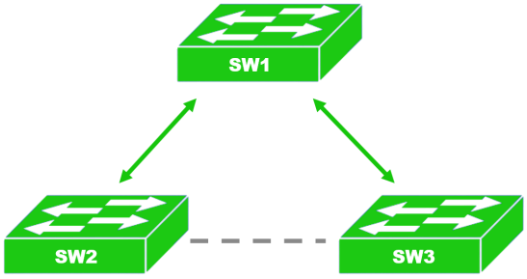


3. **Disables redundant paths** to eliminate loops while keeping backup paths ready for quick failover.

   In the example below, the path between SW2 and SW3 is disabled to prevent the option of SW2 → SW3 → SW1 and only allow the option of SW2 → SW1. The same goes for SW3, whose only option is to forward directly to SW1.



As a result, there is only one active path between any two devices (SW2 <-> SW1 <-> SW3), while the link between SW2 and SW3 remains physically connected but logically blocked, serving as a backup path that's ready for quick failover.



2. Symptom

Unexpected disconnection occurs on one or more GV-PoE Switches when multiple GV-PoE Switches are interconnected.

3. Solution

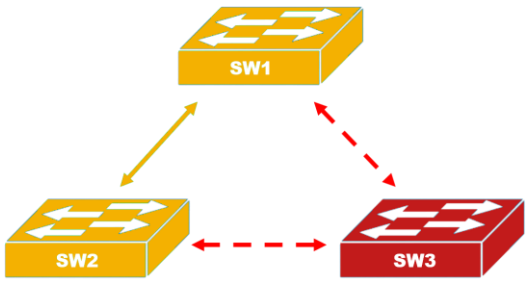
To troubleshoot GV-PoE Switch disconnection issues, follow the guide below based on your network topology. First, identify whether your network contains physical loops. If it does, see *Scenario A: Network with Physical Loops*. If not, see *Scenario B: Network without Physical Loops*. After completing the applicable scenario, continue to the *Final Step* if the issue remains unresolved.

All examples in this guide use the GV-APOE2411-V2 interface. For other GV-PoE switch models, refer to their respective user manuals.

Scenario A: Network with Physical Loops

In a GV-PoE network **with physical loops**, if the network experiences disconnection issues, it is essential to **enable RSTP** on each switch's ports connected to other switches. This prevents logical loops that can cause broadcast storms and network instability.

The figure below shows a physical loop where RSTP is not properly enabled, causing a logical loop that results in a disconnected GV-PoE Switch and an unstable network.

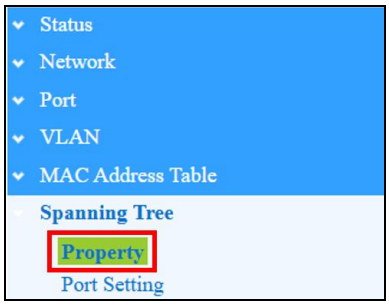


To enable RSTP at both the switch and port levels, follow the steps below **on each switch** in your GV-PoE network.

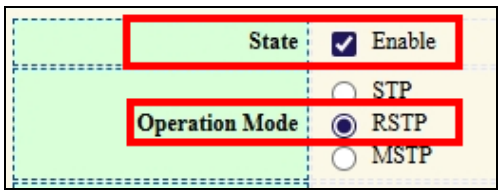
Note: RSTP is enabled by default at both the switch and port levels on all GV-PoE models. This setting is optimized for typical network conditions and generally should remain unchanged. However, for troubleshooting, it is still important to verify the RSTP status at both levels.

To enable RSTP at the switch level:

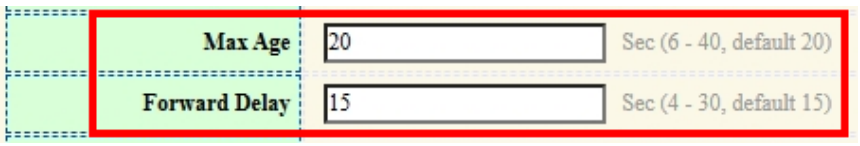
1. Open a Web browser and log in to the Web interface of the GV-PoE Switch.
2. From the left menu, go to **Spanning Tree** > **Property**.



3. Select **Enable** for State, and select **RSTP** for Operation Mode.



4. Ensure the **Max Age** and **Forward Delay** parameters remain at their default settings.



5. Click **Apply** to save the settings.

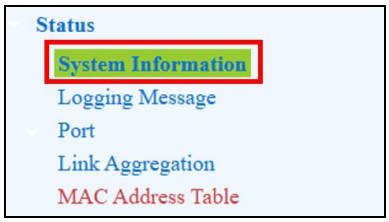
Note: If you must adjust the Max Age and Forward Delay values, ensure the following condition is met:

2 x (Forward Delay – 1) > Max Age

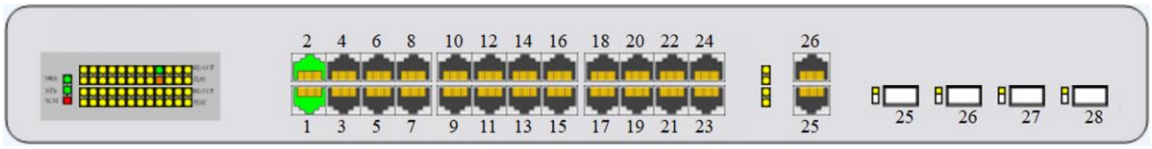
Setting Forward Delay too low or Max Age too high may cause the network to activate a path before it's ready, leading to loops and packet flooding.

To enable RSTP at the port level:

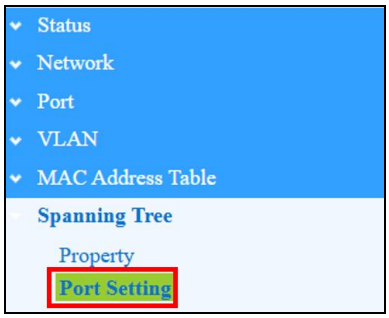
6. From the left menu, go to **Status > System Information**.



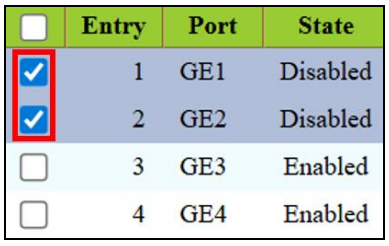
7. Identify and note the port numbers connected to other switches. In the example below, Ports 1 and 2 are connected.



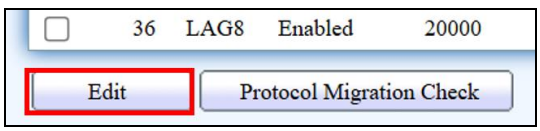
8. From the left menu, go to **Spanning Tree** > **Port Setting**.



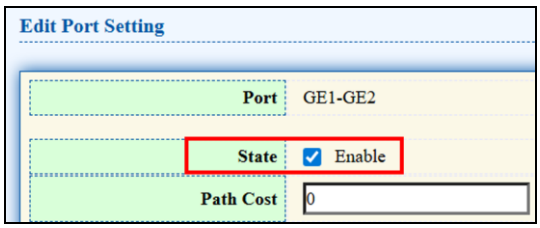
9. Ensure the ports identified in Step 7 are enabled. If they are already enabled, skip to Step 12.
10. If any ports are disabled, select them and click **Edit** at the bottom of the page.



	Entry	Port	State
☑	1	GE1	Disabled
☑	2	GE2	Disabled
☐	3	GE3	Enabled
☐	4	GE4	Enabled



11. Select **Enable** for State, and then click **Apply** to save the settings.



12. Repeat Steps 1 to 11 for each switch in your GV-PoE network.

After confirming and enabling RSTP on all switches, monitor the network to see if the disconnection issues are resolved. If the network remains unstable or switches continue to disconnect, proceed to the *Final Step: If the Issue Persists* for further troubleshooting.

Scenario B: Network without Physical Loops

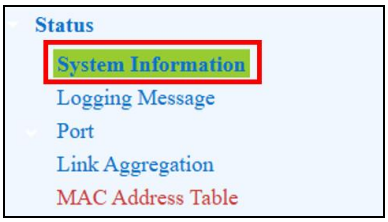
In a GV-PoE network **without physical loops**, if a GV-POE switch keeps disconnecting, it is essential to **disable RSTP** on the ports directly connected to that switch. This prevents RSTP from mistakenly blocking connections, which can lead to switch disconnections or half-duplex problems.

The figure below shows a network without physical loops where improper RSTP configuration causes a switch to appear disconnected, resulting in network instability.

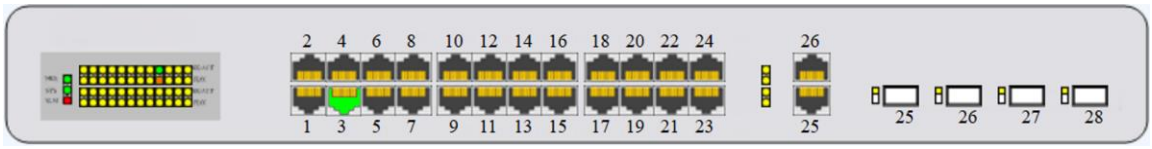
To disable RSTP on the ports directly connected to the affected switch, follow the steps below **on the switches connected to the affected switch** in your GV-PoE network. In the example figure above, SW1 and SW3 need to be configured.

To disable RSTP at the port level:

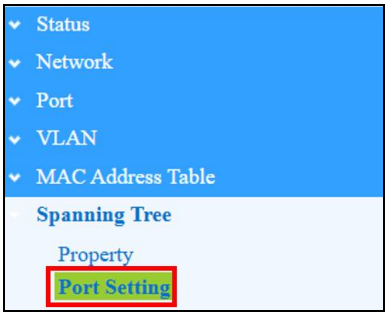
1. Open a Web browser and log in to the Web interface of the GV-PoE Switch.
2. From the left menu, go to **Status > System Information**.



3. Identify and note the port number connected to the affected switch. In the example below, Port 3 is connected.

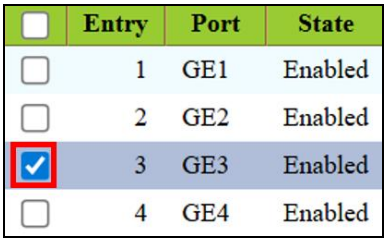


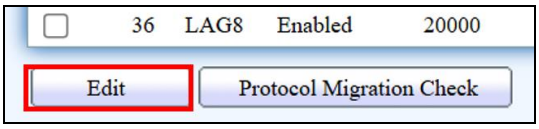
4. From the left menu, go to **Spanning Tree** > **Port Setting**.



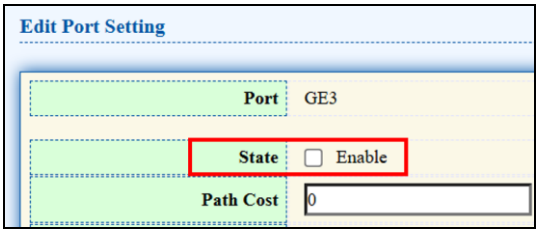
5. Ensure the port identified in Step 3 is disabled. If it is already disabled, skip to Step 8.

6. If the port is enabled, select it and click **Edit** at the bottom of the page.





7. **Disable** State, and then click **Apply** to save the settings.



8. Repeat Steps 1 to 7 for each switch connected to the affected switch in your GV-PoE network.

After confirming and disabling RSTP on all switches connected to the affected switch, monitor the network to see if the disconnection issues are resolved. If the network remains unstable or switches continue to disconnect, proceed to the *Final Step: If the Issue Persists* for further troubleshooting.

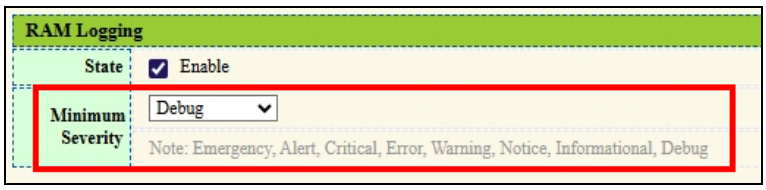
Final Step: If the Issue Persists

If the issue is still unresolved after completing the steps under your applicable scenario (Scenario A or Scenario B), proceed with collecting and providing the debug logs to the GeoVision Support Team for further analysis.

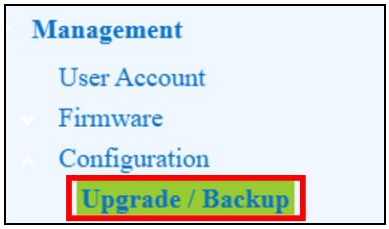
To collect the necessary logs, follow the steps below.

1. From the left menu, go to **Diagnostics** > **Logging** > **Property**.

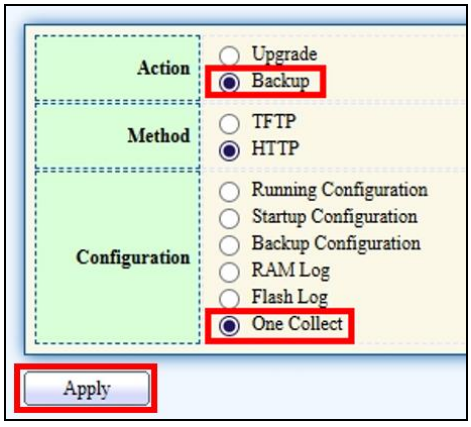
2. Under RAM Logging, select **Debug** for Minimum Severity.



3. Go to **Management** > **Configuration** > **Upgrade / Backup**.



4. Select **Backup** for Action, and select **One Collect** for Configuration. Click **Apply** to download the debug log.



5. Email the debug log to the GeoVision Support Team at support@geovision.com.tw for further analysis.