



# GS716T and GS724T Smart Switches

Ethernet Audio Video  
Administration Guide

350 East Plumeria Drive  
San Jose, CA 95134  
USA

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# Ethernet Audio Video

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# 1

The Ethernet Audio Video (Ethernet AV or EAV) features available on the GS716T and GS724T Smart Switches provide audio-video quality of service to Ethernet to enhance wire-line networking for digital entertainment content streaming. The GS716T and GS724T switches support the following EAV features:

- End-to-end Bandwidth guarantees to Ethernet using QoS and admission control
- Stream reservation through the Multiple Registration Protocol (MRP) and Multiple Stream Reservation Protocol (MSRP)
- Traffic-shaping profiles through 802.1Qav
- Precise timing and synchronization in Ethernet networks by using IEEE 802.1AS

EAV, which is also known as Audio Video Bridging (AVB), helps ensure that the synchronization requirements are met for time-sensitive applications, such as audio and video, across bridged and virtual bridged local area networks consisting of LAN media where the transmission delays are fixed and symmetrical. This includes the maintenance of synchronized time during normal operation and following addition, removal, or failure of network components and network reconfiguration.

Use the MRP and 802.1AS links under the **Switching** tab to configure and monitor the following EAV features:

- [Multiple Registration Protocol Configuration](#) on page 5
- [802.1AS](#) on page 17

## Multiple Registration Protocol Configuration

Multiple Registration Protocol (MRP) is a base registration protocol that enables devices running an MRP application to register attributes to other devices in a network. MRP provides an application to register attributes such as bandwidth requirement for a given AV stream and MAC address information. It is used by various applications to propagate the registration. GS716T and GS724T Smart Switches support the following MRP applications:

- Multiple MAC Reservation Protocol (MMRP)
- Multiple Stream Reservation Protocol (MSRP)

**MMRP** allows for the propagation MAC address information in the network, and allows for the registration and deregistration of both individual MAC address information and group MAC address membership. End stations may request to join or leave a multicast group, or to register an individual MAC address with a specific VLAN. MAC address entries can be dynamically registered and deregistered if MMRP is administratively enabled on GS716T and GS724T Smart Switches.

**MSRP** reserves necessary resources in the network to facilitate time sensitive traffic to flow end to end. In a typical network, there are multiple Talkers (those who transmit streams) and multiple Listeners (those who receive streams from one or many Talkers). Each flow has specific bandwidth, frame rate, and time sync requirements. With the use of MSRP these resources are guaranteed through all intermediate devices that are between any talker and listener.

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**Note:** MRP framework must be available and enabled in all intermediate devices to ensure that the propagation of the attributes occurs throughout the network.

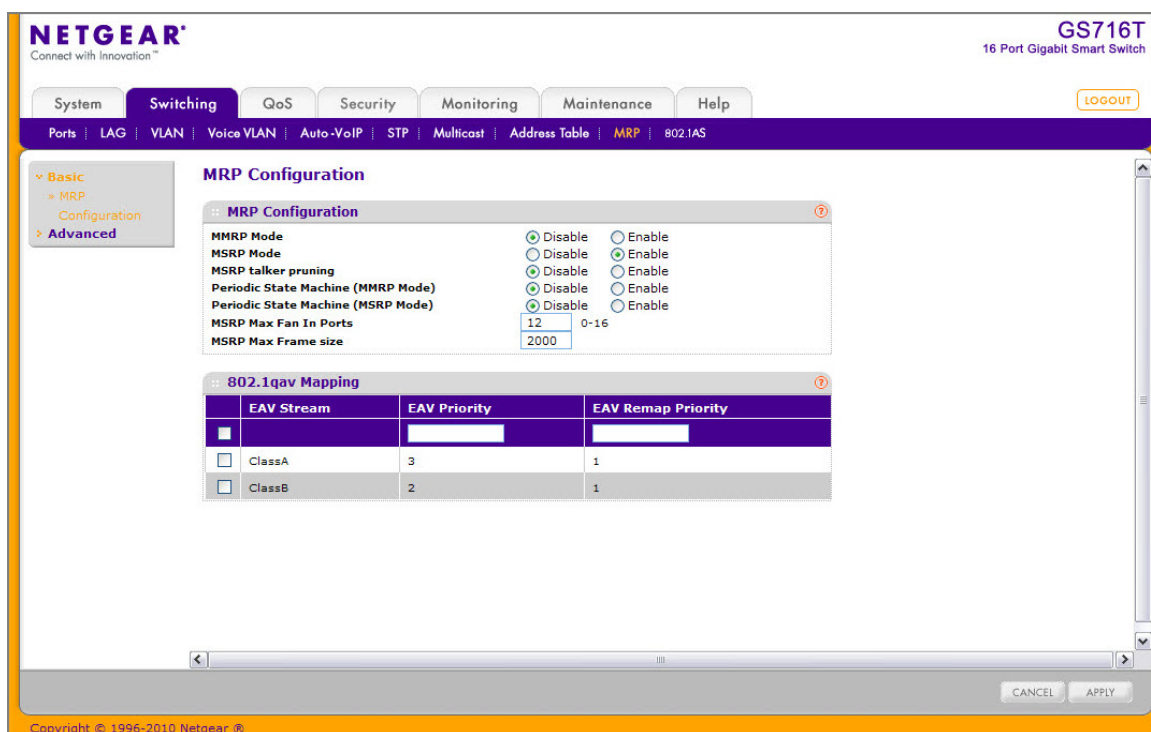
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With MRP, network attributes are declared, registered, withdrawn, and removed completely dynamically without any user intervention. This dynamic nature is especially useful in networks where:

- Network attributes are likely to change frequently, requiring reconfiguration of the intermediate devices.
- Recipients of these attributes frequently increase or decrease in number.
- Each of these changes without a dynamic self-adjusting framework would require constant attention from the network administrator.

## MRP Configuration

Use the MRP Configuration page to configure global MRP settings for the switch. To access the basic MRP Configuration page click the **Switching tab**, then click **MRP > Basic > MRP Configuration**.



To configure the MRP settings:

1. Enable or disable MMRP globally on the switch. MMRP provides an application to register MAC address information. The default mode is Disable.
2. Enable or disable MSRP globally on the switch. MSRP provides an application to register bandwidth requirement for a given AV stream. The default mode is Disable.
3. If you enable MSRP, configure the following MSRP settings:
  - a. Enable or disable MSRP talker pruning. The MSRP talker is the source of an AV stream. Default mode is Disable.
  - b. Enable or disable the MRP Periodic State Machine for MMRP on the system. Default mode is Disable. For this setting to take effect, MMRP must be enabled, but MSRP does not need to be enabled.
  - c. Enable or disable the MRP Periodic State Machine for MSRP on the system. Default mode is Disable.
  - d. In the MSRP Max Fan In Ports field, specify the maximum number of the ports where MSRP registrations are allowed.
  - e. In the MSRP Max Frame Size field, specify the maximum frame size allowed for an MSRP frame. The valid range for the frame size is 64–9216 octets.
4. Configure the 802.1Qav mapping for the Class A and/or Class B EAV streams. Class A streams have a higher transmission priority than Class B traffic.
  - In the EAV Priority field, specify the priority for each EAV stream class. The range is 0–7.
  - In the EAV Remap Priority field, specify the remap priority for non-EAV traffic. The range is 0–7.

- Click **Cancel** to cancel the configuration on the screen and reset the data on the screen to the latest value of the switch.
- If you make any changes to the page, click **Apply** to apply the change to the system.

## MRP Port Settings

Use the MRP Port Settings page to configure the per-port MRP mode and timer settings. The timers control when and how often various messages are transmitted on each interface.

To access the Port Settings page click **Switching > MRP > Advanced > Port Settings** in the navigation tree. In the following image, the MMRP mode on ports g4 and g5 is being enabled.

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GS716T  
16 Port Gigabit Smart Switch

System Switching QoS Security Monitoring Maintenance Help

Ports | LAG | VLAN | Voice VLAN | Auto-VoIP | STP | Multicast | Address Table | **MRP** | 802.1AS

Basic  
Advanced  
MRP Configuration  
Port Settings  
MMRP Statistics  
MSRP Statistics  
MSRP Reservation Parameters  
Qav Parameters  
MSRP Streams  
Information

### MRP Port Parameters

MRP Port Settings

GO TO INTERFACE  GO

	Interface	MMRP Mode	MSRP Mode	Join Timer (10-100 centiseconds)	Leave Timer (20-600 centiseconds)	LeaveAll Timer (200-6000 centiseconds)	Class A Boundary Port	Class B Boundary Port
<input type="checkbox"/>	g1	Disable	Enable	20	120	2000	False	False
<input type="checkbox"/>	g2	Disable	Enable	20	120	2000	False	False
<input type="checkbox"/>	g3	Disable	Enable	20	120	2000	False	False
<input checked="" type="checkbox"/>	g4	Disable	Enable	20	120	2000	False	False
<input checked="" type="checkbox"/>	g5	Disable	Enable	20	120	2000	False	False
<input type="checkbox"/>	g6	Disable	Enable	20	120	2000	False	False
<input type="checkbox"/>	g7	Disable	Enable	20	120	2000	False	False
<input type="checkbox"/>	g8	Disable	Enable	20	120	2000	False	False
<input type="checkbox"/>	g9	Disable	Enable	20	120	2000	False	False
<input type="checkbox"/>	g10	Disable	Enable	20	120	2000	False	False
<input type="checkbox"/>	g11	Disable	Enable	20	120	2000	False	False
<input type="checkbox"/>	g12	Disable	Enable	20	120	2000	False	False
<input type="checkbox"/>	g13	Disable	Enable	20	120	2000	False	False
<input type="checkbox"/>	g14	Disable	Enable	20	120	2000	False	False
<input type="checkbox"/>	g15	Disable	Enable	20	120	2000	False	False
<input type="checkbox"/>	g16	Disable	Enable	20	120	2000	False	False

GO TO INTERFACE  GO

CANCEL APPLY

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To configure the MRP port parameters:

- Select the check box next to the port to configure. You can select multiple ports to apply the same settings to the selected interfaces. Select the check box in the heading row to apply the same settings to all interfaces.
- Configure the following MRP port settings:
  - Enable or disable MMRP on the interface. The default mode is Disable.
  - Enable or disable MSRP on the interface. The default mode is Disable.

- c. Specify the value, in centiseconds, of the MRP Join Timer. The range is 10 to 100 centiseconds, and the default value is 20.
- d. Specify the value, in centiseconds, of the MRP Leave Timer. The range is 10 to 600 centiseconds, and the default value is 120.
- e. Specify the value, in centiseconds, of the MRP LeaveAll Timer. The range is 200 to 6000 centiseconds, and the default value is 2000.

ClassA/ClassB Boundary Port fields are not configurable and show whether the interface is a boundary port.

3. Click **Cancel** to cancel the configuration on the screen and reset the data on the screen to the latest value of the switch.
4. If you make any changes to the page, click **Apply** to apply the change to the system.

## MMRP Statistics

The MMRP Statistics page displays information regarding the MMRP frames transmitted and received by the switch and by each interface. To access the MMRP Statistics page click the **Switching** tab, then click **MRP > Advanced > MMRP Statistics**.

The screenshot shows the Netgear GS716T web interface. The top navigation bar includes tabs for System, Switching, QoS, Security, Monitoring, Maintenance, and Help. The Switching tab is active, and the MRP menu is expanded. The MMRP Statistics page is displayed, showing global statistics and a table of interface statistics.

MMRP Global Statistics						
Frames Received	0					
Bad Header	0					
Bad Format	0					
Frames Transmitted	0					
Transmission Failures	0					

MMRP Statistics						
Interface	Frames Received	Bad Header	Bad Format	Frames Transmitted	Transmission Failures	
<input type="checkbox"/> g1	0	0	0	0	0	
<input type="checkbox"/> g2	0	0	0	0	0	
<input type="checkbox"/> g3	0	0	0	0	0	
<input type="checkbox"/> g4	0	0	0	0	0	
<input type="checkbox"/> g5	0	0	0	0	0	
<input type="checkbox"/> g6	0	0	0	0	0	

At the bottom of the table, there are buttons for CLEAR, REFRESH, and CLEAR COUNTERS.

The following table describes the fields on the MMRP Statistics page.



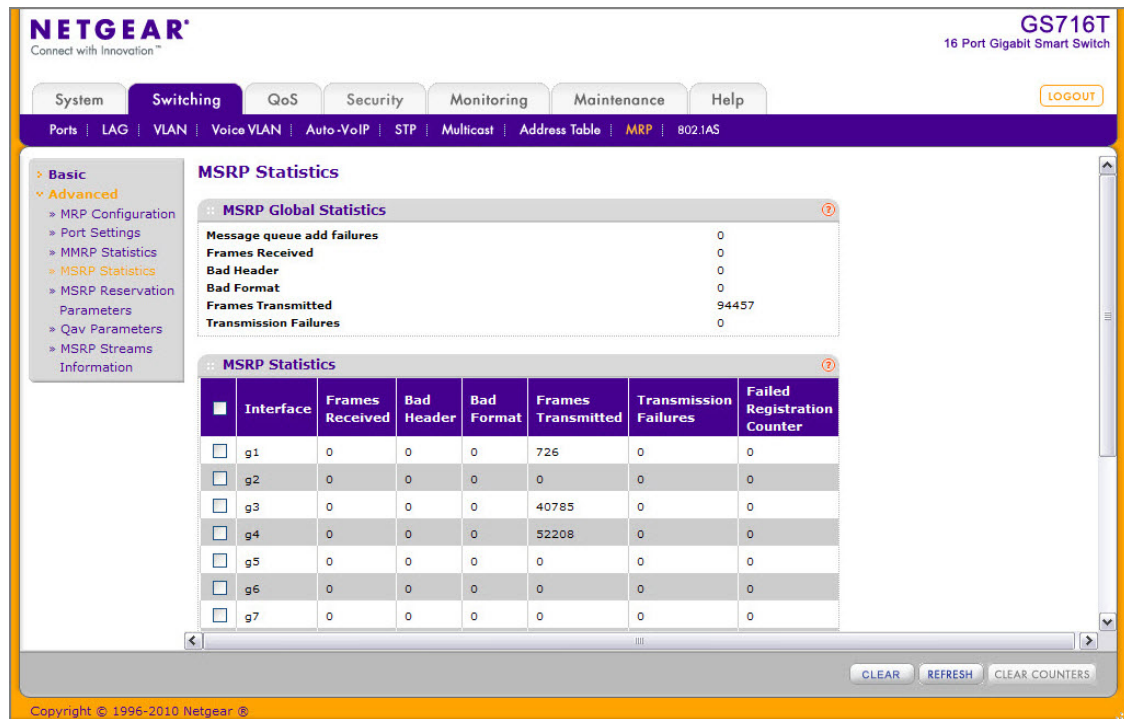
Table 1-1.

Field	Description
<b>Global MMRP Statistics</b>	
Frames Received	Shows the number of MMRP frames which were received on the switch.
Bad Header	Shows number of MMRP frames with bad headers which were received on the switch.
Bad Format	Shows number of MMRP frames with bad PDUs body formats which were received on the switch.
Frames Transmitted	Shows number of MMRP frames which were transmitted on the switch.
Transmission Failures	Shows number of MMRP frames that the switch failed to transmit.
<b>Per-Interface MMRP Statistics</b>	
Interface	Identifies the interface associated with the rest of the MMRP statistics in the row.
Frames Received	Shows number of MMRP frames which were received on particular interface.
Bad Header	Shows number of MMRP frames with bad headers which were received on the particular interface.
Bad Format	Shows number of MMRP frames with bad PDUs body formats which were received on the particular interface.
Frames Transmitted	Shows number of MMRP frames which were transmitted on the interface.
Transmission Failures	Shows number of MMRP frames transmitting of which were failed on particular interface.

To reload the page, click **Refresh**. To clear the statistics for one or more ports, select the check box next to the interface or interfaces, and click **Clear**. To clear the statistics for all interfaces, select the check box in the heading row, and click **Clear Counters**.

## MSRP Statistics

The MSRP Statistics page displays information about the MSRP frames transmitted and received by the switch and by each interface. To access the MSRP Statistics page click the **Switching** tab, then click **MRP > Advanced > MSRP Statistics**.



The following table describes the fields on the MSRP Statistics page.

**Table 1-2.**

Field	Description
<b>Global MSRP Statistics</b>	
Message Queue Add Failures	Shows the number of messages that failed to be added to the queue.
Frames Received	Shows number of MSRP frames that have been received on the switch.
Bad Header	Shows number of MSRP frames with bad headers that have been received on the switch.
Bad Format	Shows number of MSRP frames with bad PDUs body formats that have been received on the switch.
Frames Transmitted	Shows number of MSRP frames which that have been transmitted on the switch.
Transmission Failures	Shows number of MSRP frames the switch failed to transmit.
<b>Per-Interface MSRP Statistics</b>	
Interface	Identifies the interface associated with the rest of the MSRP statistics in the row.
Frames Received	Displays the number of MSRP frames which were received the interface.

Table 1-2.

Field	Description
Bad Header	Displays the number of MSRP frames with bad header which were received on the interface.
Bad Format	Displays the number of MSRP frames with bad PDUs body format which were received on the interface.
Frames Transmitted	Displays the number of MSRP frames which were transmitted on the interface.
Transmission Failures	Displays the number of MSRP frames that an interface attempted to transmit but failed.
Failed Registration Counter	Shows the number of MSRP frames that failed to register on a device or particular interface.

To reload the page, click **Refresh**. To clear the statistics for one or more ports, select the check box next to the interface or interfaces, and click **Clear**. To clear the statistics for all interfaces, select the check box in the heading row, and click **Clear Counters**.

## MSRP Reservation Parameters

Use the MSRP Reservation Parameters page to view information about the talker, listener, and intermediate device status for the devices involved in each MSRP stream flowing through the switch.

To display the MSRP Reservation Parameters page, click the **Switching** tab, then click **MRP** > **Advanced** > **MSRP Reservation Parameters**.

The screenshot shows the Netgear web interface for a GS724T switch. The 'Switching' tab is selected, and the navigation path is 'MRP' > 'Advanced' > 'MSRP Reservation Parameters'. The page title is 'MSRP Reservation Parameters'. A search bar shows 'Interface' selected and 'g5' entered. Below is a table titled 'Stream Status Parameters'.

Interface	Stream ID	Listener		Talker		Accumulated Latency	Failure Information			Stream Age
		Declaration Status	Declaration Type	Declaration Status	Declaration Type		Bridge Interface	Failure Code	Bridge MAC	
g5	11:11:11:11:11:11-1	Dedared	Ready	Registered	Advertise	647	0	0	00:00:00:00:00:00	0
g5	11:11:11:11:11:11-2	Dedared	Ready	Registered	Advertise	647	0	0	00:00:00:00:00:00	0
g5	11:11:11:11:11:11-3	Dedared	Ready	Registered	Advertise	647	0	0	00:00:00:00:00:00	0
g5	11:11:11:11:11:11-4	Dedared	Ready	Registered	Advertise	647	0	0	00:00:00:00:00:00	0
g5	11:11:11:11:11:11-5	Dedared	Ready	Registered	Advertise	647	0	0	00:00:00:00:00:00	0
g5	11:11:11:11:11:11-6	Dedared	Ready	Registered	Advertise	647	0	0	00:00:00:00:00:00	0
g5	11:11:11:11:11:11-7	Dedared	Ready	Registered	Advertise	647	0	0	00:00:00:00:00:00	0
g5	11:11:11:11:11:11-8	Dedared	Ready	Registered	Advertise	647	0	0	00:00:00:00:00:00	0
g5	11:11:11:11:11:11-9	Dedared	Ready	Registered	Advertise	647	0	0	00:00:00:00:00:00	0
g5	11:11:11:11:11:11-10	Dedared	Ready	Registered	Advertise	647	0	0	00:00:00:00:00:00	0
g5	11:11:11:11:11:11-11	Dedared	Ready	Registered	Advertise	647	0	0	00:00:00:00:00:00	0
g5	11:11:11:11:11:11-12	Dedared	Ready	Registered	Advertise	647	0	0	00:00:00:00:00:00	0
g5	11:11:11:11:11:11-13	Dedared	Ready	Registered	Advertise	647	0	0	00:00:00:00:00:00	0
g5	11:11:11:11:11:11-14	Dedared	Ready	Registered	Advertise	647	0	0	00:00:00:00:00:00	0
g5	11:11:11:11:11:11-15	Dedared	Ready	Registered	Advertise	647	0	0	00:00:00:00:00:00	0

At the bottom of the table, there is a 'REFRESH' button. The footer of the page indicates 'Copyright © 1996-2010 Netgear, Inc.'.

To search for a specific entry in the Stream Status Parameters table:

1. To search for stream status by interface, select Interface from the drop-down menu and enter the port ID (for example, g5) in the available field.
2. To search for stream status by Stream ID, select Stream ID from the drop-down menu, and enter the Stream ID (for example, 43000) in the available field.
3. Click **Go**.

The following table describes the non-configurable fields on the MSRP Reservation Parameters page.

**Table 1-3.**

Field	Description
Interface	Identifies the interface associated with the rest of the information in the row.
Stream ID	A 16-bit unsigned integer value, Unique ID, used to distinguish among multiple streams sourced by the same system.
Listener Declaration Status	Identifies the MSRP declaration status of the listener attribute.
Listener Declaration Type	Identifies the MSRP declaration type of the listener attribute.
Talker Declaration Status	Identifies the MSRP declaration status of the talker attribute.
Talker Declaration Type	Identifies the MSRP declaration type of the talker attribute.
Accumulated Latency	Identifies how much latency, in nanoseconds, the stream has suffered in its path from the Talker to a given Listener. It starts as a 0 in a Talker Advertise Declaration at the Talker, and its value is increased by one for each bridge as the Talker Advertise Declaration propagates through the network.
Failure Bridge Interface	Identifies the interface on the Bridge where the failure occurred.
Failure Code	Shows the number that represents the reason for the failure. The switch supports the following codes: <ul style="list-style-type: none"> <li>• 1—Insufficient bandwidth</li> <li>• 3—Insufficient bandwidth for the traffic class</li> <li>• 5—Stream destination_address is already in use</li> <li>• 7—Reported latency has changed</li> <li>• 8—Egress port is not Audio/Video Bridging (AVB) capable</li> <li>• 9—Use a different destination_address (i.e. MAC DA hash table full)</li> <li>• 12—Cannot store destination_address (i.e., Bridge is out of MAC DA resources)</li> <li>• 13—Requested priority is not an SR Class priority</li> <li>• 14—MaxFrameSize is too large for media</li> <li>• 15—msrpMaxFanInPorts limit has been reached</li> <li>• 16—Changes in FirstValue for a registered StreamID</li> <li>• 17—VLAN is blocked on this egress port (Registration Forbidden)</li> </ul>

Table 1-3.

Field	Description
Failure Bridge MAC	Identifies the MAC address of the switch where the failure occurred.
Stream Age	The time, in seconds, since the stream destination address was added to the Dynamic Reservations Entries table. A value of zero indicates the destination address has not been added to the table.

## Qav Parameters

Use the Qav Parameters page to configure and view the per-port IEEE 802.1Qav settings. The IEEE 802.1Qav standard supports time-sensitive traffic streams by pacing all switch traffic, including legacy asynchronous Ethernet traffic, through queuing and forwarding. When a Talker declares a stream, it identifies whether the stream is Class A or Class B and specifies the stream's bandwidth requirements. Class A traffic has a higher transmission priority than Class B traffic.

On the Qav Parameters page, you can view and configure selected bandwidth allocations for Class A and Class B traffic. To display the Qav Statistics page click the **Switching** tab, then click **MRP > Advanced > Qav Parameters**.

The screenshot shows the Netgear GS716T web interface. The top navigation bar includes tabs for System, Switching, QoS, Security, Monitoring, Maintenance, and Help. The Switching tab is active, and the left sidebar shows the navigation tree with 'Qav Parameters' selected under 'Advanced' > 'MRP Configuration' > 'Port Settings' > 'MRP Statistics' > 'MRP Reservation Parameters' > 'Qav Parameters'.

The main content area is titled 'Qav Parameters' and contains a table with the following columns: Interface, Class A (MSRP Delta Bandwidth, Bandwidth Allocated, Remaining Bandwidth), Class B (MSRP Delta Bandwidth, Bandwidth Allocated, Remaining Bandwidth), and Total (Bandwidth Allocated, Remaining Bandwidth). The table lists interfaces g1 through g11. Each interface row has a checkbox in the first column. The Class A MSRP Delta Bandwidth column is currently empty for all interfaces. The Class B MSRP Delta Bandwidth column is also empty. The Bandwidth Allocated and Remaining Bandwidth columns show values for each interface. The Total columns show the sum of allocated and remaining bandwidth for each interface.

At the bottom of the table, there are buttons for CANCEL, APPLY, and REFRESH.

To configure the Qav parameters:

1. Select the check box next to the port to configure. You can select multiple ports to apply the same settings to the selected interfaces. Select the check box in the heading row to apply the same settings to all interfaces.
2. Configure the Class A MSRP delta bandwidth.

Class A Delta bandwidth is the additional bandwidth represented as a percentage of port transmit rate which can be reserved for the traffic class A and traffic class B. Class A traffic has a higher priority. The range is 0–100.

The following Class A fields are read-only:

- The Bandwidth Allocated field shows the current rate of the class A traffic on interface (in Bps).
- The Class A Remaining Bandwidth field shows the maximum rate of the class A traffic available on interface (in Bps).

**3. Configure the Class B MSRP delta bandwidth.**

Class B Delta bandwidth is the additional bandwidth represented as a percentage of port transmit rate which can be reserved for the traffic class B. The range is 0–100.

The following Class A fields are read-only:

- The Bandwidth Allocated field shows the current rate of the class A traffic on interface (in Bps).
- The Class A Remaining Bandwidth field shows the maximum rate of the class A traffic available on interface (in Bps).

**4. View the following information about the total bandwidth:**

- The Total Bandwidth Allocated Sum of the allocated Class A and Class B traffic rates on interface (in Bps).
- Total Remaining Bandwidth, which is 75% of the interface speed minus total allocated bandwidth (in Bps/sec).

**5. Click **Cancel** to cancel the configuration on the screen and reset the data on the screen to the latest value of the switch.**

**6. If you make any changes to the page, click **Apply** to apply the change to the system.**

**7. Click **Refresh** to reload the page and update it with the most current information.**

## MSRP Streams Information

Use the MSRP Stream Information page to view information about MSRP streams flowing through each interface. To display the MSRP Stream Information page click the **Switching** tab, then click **MRP > Advanced > MSRP Stream Information**.

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Stream ID	Stream Source MAC Address	Received Accumulated Latency	Traffic Class	Rank	TSpec	Stream VLAN	Destination MAC	Received Failure Information	Talker Interface	Listener
					Max Frame Size Max Interval Frames			Bridge Interface Failure Code Bridge MAC		
1	11:11:11:11:11:11	647	Class B	Regular	64 1	100	01:22:22:22:22:22	0 0 00:00:00:00:00:00	g5	g6
2	11:11:11:11:11:11	647	Class B	Regular	64 1	100	01:22:22:22:22:23	0 0 00:00:00:00:00:00	g5	g6
3	11:11:11:11:11:11	647	Class B	Regular	64 1	100	01:22:22:22:22:24	0 0 00:00:00:00:00:00	g5	g6
4	11:11:11:11:11:11	647	Class B	Regular	64 1	100	01:22:22:22:22:25	0 0 00:00:00:00:00:00	g5	g6
5	11:11:11:11:11:11	647	Class B	Regular	64 1	100	01:22:22:22:22:26	0 0 00:00:00:00:00:00	g5	g6
6	11:11:11:11:11:11	647	Class B	Regular	64 1	100	01:22:22:22:22:27	0 0 00:00:00:00:00:00	g5	g6
7	11:11:11:11:11:11	647	Class B	Regular	64 1	100	01:22:22:22:22:28	0 0 00:00:00:00:00:00	g5	g6
8	11:11:11:11:11:11	647	Class B	Regular	64 1	100	01:22:22:22:22:29	0 0 00:00:00:00:00:00	g5	g6
9	11:11:11:11:11:11	647	Class B	Regular	64 1	100	01:22:22:22:22:2a	0 0 00:00:00:00:00:00	g5	g6
10	11:11:11:11:11:11	647	Class B	Regular	64 1	100	01:22:22:22:22:2b	0 0 00:00:00:00:00:00	g5	g6
11	11:11:11:11:11:11	647	Class B	Regular	64 1	100	01:22:22:22:22:2c	0 0 00:00:00:00:00:00	g5	g6
12	11:11:11:11:11:11	647	Class B	Regular	64 1	100	01:22:22:22:22:2d	0 0 00:00:00:00:00:00	g5	g6
13	11:11:11:11:11:11	647	Class B	Regular	64 1	100	01:22:22:22:22:2e	0 0 00:00:00:00:00:00	g5	g6

The following table describes the fields on the MSRP Stream Information page.

**Table 2:**

Field	Description
Stream ID	A 16-bit unsigned integer value, Unique ID, used to distinguish among multiple streams sourced by the same system.
Stream Source MAC Address	Identifies the MAC address of the traffic stream's source.
Received Accumulated Latency	The 32-bit unsigned Accumulated Latency component is used to determine the worst-case latency that a Stream can suffer in its path from the Talker to a given Listener. It starts as a 0 in a Talker Advertise Declaration at the Talker, and its value is increased by each Bridge as the Talker Advertise Declaration propagates through the network.
Traffic Class	Identifies whether the stream is Class A or Class B. Class A traffic has a higher priority than Class B traffic.
Rank	The 5-bit unsigned Rank component is used by systems to decide which streams can and cannot be served, when the MSRP registrations exceed the capacity of a Port to carry the corresponding data streams. If a Bridge becomes oversubscribed (e.g. network reconfiguration, 802.11 bandwidth reduction) the Rank will also be used to help determine which Stream or Streams can be dropped. A lower numeric value is more important than a higher numeric value.
TSpec Max Frame Size	The 32-bit unsigned Bandwidth component is used to allocate resources and adjust queue selection parameters in order to supply the quality of service requested by an MSRP Talker Declaration. It represents the maximum rate, in units of 1024 octets per second, at which frames in the Stream referenced by the Talker Declaration may be transmitted.



Table 2:

Field	Description
TSpec Max Interval Frames	The 32-bit unsigned Frame Rate component is used to allocate resources and adjust queue selection parameters in order to supply the quality of service requested by an MSRP Talker Declaration. It represents the maximum number of frames that the Talker may transmit in one second.
Stream VLAN	Identifies the VLAN ID of the traffic stream.
Destination MAC	Identifies the MAC address of the traffic stream's destination.
Received Failure Bridge Interface	Identifies the interface on the Bridge where the failure occurred.
Received Failure Code	Identifies the code value of the failure. For more information about the failure codes, see <a href="#">Failure Code</a> on page 13.
Received Failure Bridge MAC	Identifies the MAC address of the switch where the failure occurred.
Talker Interface	Identifies the interface on which the Talker is present.
Listeners	Identifies the interface on which Listeners are present.

Click **Refresh** to reload the page.

## 802.1AS

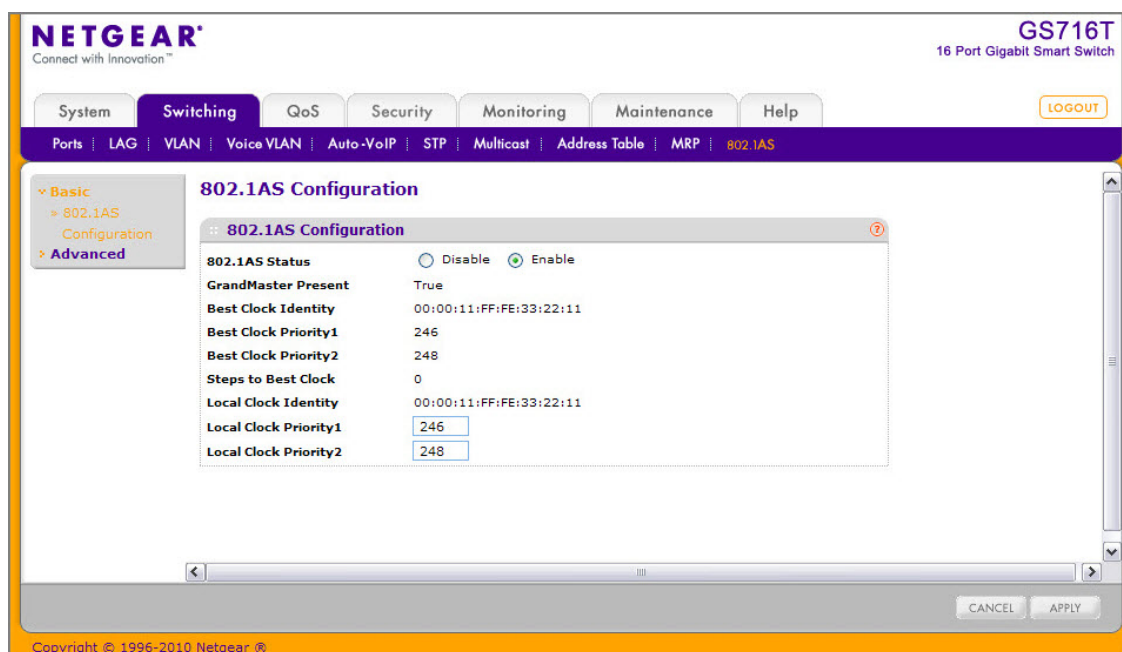
The IEEE 802.1AS standard specifies the protocol and procedures used to ensure that the QoS requirements are guaranteed for time-sensitive applications, such as audio and video. The IEEE 1588 Precision Time Protocol (PTP) forms the basis of the IEEE 802.1AS standard. PTP specifies a precise clock synchronization protocol that relies on time-stamped packets. The PTP protocol is applicable to distributed systems consisting of one or more nodes communicating over some set of communication media. The distribution of synchronous time information is performed in a hierarchical manner with a grandmaster clock at the root of the hierarchy. The grandmaster provides a common and precise time reference for one or more directly-attached slave devices by periodically exchanging timing information. In other words, all slave devices synchronize their clocks with the grandmaster clock. The slave devices can, in-turn, act as master devices for further hierarchical layers of slave devices.

## 802.1AS Configuration

Use the 802.1AS Configuration page to enable the 802.1AS mode on the switch and configure local clock priorities. The 802.1AS feature calculates the time delay between devices on a given link and maintains an accurate view of a network clock. The page also displays various global 802.1AS information.



To display the 802.1AS Configuration page click the **Switching** tab, then click **802.1AS > Basic > 802.1AS Configuration**.



To configure the global 802.1AS settings on the switch:

1. Enable or disable 802.1AS globally on the switch. The default mode is Enable.
2. Configure the Priority1 value of the local clock (this time-aware bridge).
3. Configure the Priority2 value of the local clock (this time-aware bridge).
4. Click **Cancel** to cancel the configuration on the screen and reset the data on the screen to the latest value of the switch.
5. If you make any changes to the page, click **Apply** to retain the changes to the system.

The following table shows the non-configurable information on the 802.1AS Configuration page.

**Table 1-1.**

Field	Description
GrandMaster Present	Identifies whether Grand Master Clock is present. The default is <b>False</b> .
Best Clock Identity	Shows the Best Clock Identity detected by this time-aware bridge.
Best Clock Priority1	Shows the Priority1 value of the best clock on the switch.
Best Clock Priority2	Shows the Priority2 value of the best clock on the switch.

Table 1-1.

Field	Description
Steps to Best Clock	Shows the number of links in the path from the Best Clock to this time-aware bridge. If this time-aware bridge is the best, the value is zero.
Local Clock Identity	Shows the Clock Identity of this time-aware bridge.

## 802.1AS Port Settings

Use the 802.1AS Port Settings page to configure and view per-port 802.1AS settings. To display the 802.1AS Port Settings page click the **Switching** tab, then click **802.1AS > Advanced > 802.1AS Port Settings**.

To configure the 802.1AS port settings:

1. To configure 802.1AS settings for one or more ports, click **PORTS**. To configure 802.1AS settings for one or more LAGs, click **LAGS**. To configure 802.1AS settings for both ports and LAGs, click **ALL**.
2. Select the check box next to the port or LAG to configure. You can select multiple ports or LAGs to apply the same settings to the selected interfaces. Select the check box in the heading row to apply the same settings to all interfaces.
3. Enable or disable 802.1AS on the interface.
4. Set the Pdelay threshold. This value specifies the propagation delay threshold on the interface. The threshold determines whether the port is capable of participating in the 802.1AS protocol. If the propagation delay on the interface is above the threshold you configure, the interface is not considered capable of participating in the 802.1AS protocol. The peer delay must be less than the threshold value configured on the interface. The default value is 2500 nanoseconds. The range is 0–1,000,000,000 ns.
5. Set the value for Allowed Lost Responses. If the interface does not receive valid responses to PDELAY\_REQ messages above the value of the allowed lost responses, a port is

considered to not be exchanging peer delay messages with its neighbor. The default value is 3. The range is 0–65535.

6. View the following non-configurable fields:
  - The Port Role specifies the 802.1AS role of the interface. The possible roles are as follows:
    - Disabled (default)
    - Master
    - Slave
    - Passive
  - The Propagation Delay field shows the mean propagation delay on the interface.
  - The Measuring Pdelay field shows whether the interface is receiving PDELAY response messages from other end of the link.
  - The 802.1AS Capable field shows whether the interface is 802.1AS capable or not. By default, the interface is not 802.1AS Capable.
7. Configure the Sync Interval. This value is the logarithm to the base 2 of the mean-time interval between successive SYNC messages sent on this interface. The default value is –3. The range is –5 to 5.
8. Configure the Pdelay Interval. This value is the logarithm to the base 2 of the mean time interval between successive PDELAY\_REQ messages sent on this interface. The default value is 0. The range is –5 to 5.
9. Configure the Announce Interval. This value is the logarithm to the base 2 of the mean time interval between successive ANNOUNCE messages sent on this interface. The default value is 0. The range is –5 to 5.
10. Configure the SyncRx Timeout. This value sets the number of SYNC intervals that have to pass without receipt of SYNC information before considering that the master is no longer transmitting. The default value is 3. The range is 2 to 255.
11. Configure the AnnounceRx Timeout. This value sets the number of ANNOUNCE intervals that have to pass without receipt of ANNOUNCE PDU before considering that the master is no longer transmitting. The default value is 2. The range is 2 to 255.
12. Click **Cancel** to cancel the configuration on the screen and reset the data on the screen to the latest value of the switch.
13. If you make any changes to the page, click **Apply** to retain the changes to the system.
14. Click **Refresh** to reload the page and update it with the most current information.

## 802.1AS Statistics

The 802.1AS Statistics page displays information regarding the 802.1AS messages transmitted and received by each interface. To display the 802.1AS Statistics page click the **Switching** tab, then click **802.1AS > Advanced > 802.1AS Statistics**.

If all 802.1AS statistics do not fit on the page, use the horizontal scroll bar to view additional settings. Together, the following two figures show all fields on the page.

## GS716T and GS724T Gigabit Smart Switches

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M&P

802.1AS

Basic

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802.1AS Statistics

802.1AS Statistics

802.1AS Statistics

PORTS		LAGS				All					
Interface	Sync Tx	Sync Rx	Followup Tx	Followup Rx	Announce Tx	Announce Rx	Pdelay Req Tx	Pdelay Req Rx	Pdelay Resp Tx	Pdelay Resp Rx	
g1	0	0	0	0	0	0	18622	0	0	0	
g2	0	0	0	0	0	0	0	0	0	0	
g3	0	0	0	0	0	0	1040996	0	0	0	
g4	0	0	0	0	0	0	1231020	0	0	0	
g5	0	0	0	0	0	0	0	0	0	0	
g6	0	0	0	0	0	0	0	0	0	0	
g7	0	0	0	0	0	0	0	0	0	0	
g8	0	0	0	0	0	0	0	0	0	0	
g9	0	0	0	0	0	0	187	0	0	0	
g10	0	0	0	0	0	0	0	0	0	0	
g11	0	0	0	0	0	0	0	0	0	0	
g12	0	0	0	0	0	0	0	0	0	0	
g13	0	0	0	0	0	0	0	0	0	0	

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**GS716T**  
16 Port Gigabit Smart Switch

LOGOUT

Pdelay Resp Followup Tx	Pdelay Resp Followup Rx	Signaling Tx	Signaling Rx	Sync Timeouts	Sync Discards	Announce Timeouts	Announce Discards	Pdelay Timeouts	Pdelay Discards	Bad Headers
0	0	0	0	0	0	0	0	18619	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	1040993	0	0
0	0	0	0	0	0	0	0	1231029	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	186	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0

CLEAR REFRESH

The following table describes the information the 802.1AS Statistics page displays.

**Table 1-2.**

Field	Description
Interface	Identifies the interface associated with the rest of the 802.1AS statistics in the row.
Sync Tx	Displays the total number of SYNC packets transmitted without error.
Sync Rx	Displays the total number of SYNC packets received without error.
Followup Tx	Displays the total number of FOLLOWUP packets transmitted without error.
Followup Rx	Displays the total number of FOLLOWUP packets received without error.
Announce Tx	Displays the total number of ANNOUNCE packets transmitted without error.

Table 1-2.

Field	Description
Announce Rx	Displays the total number of ANNOUNCE packets received without error.
Pdelay Req Tx	Displays the total number of PDELAY_REQ packets transmitted without error.
Pdelay Req Rx	Displays the total number of PDELAY_REQ packets received without error.
Pdelay Resp Tx	Displays the total number of PDELAY_RESP packets transmitted without error.
Pdelay Resp Rx	Displays the total number of PDELAY_RESP packets received without error.
Pdelay Resp Followup Tx	Displays the total number of PDELAY_RESP_FOLLOWUP packets transmitted without error.
Pdelay Resp Followup Rx	Displays the total number of PDELAY_RESP_FOLLOWUP packets received without error.
Signaling Tx	Displays the total number of SIGNALING packets transmitted without error.
Signaling Rx	Displays the total number of SIGNALING packets received without error.
Sync Timeouts	Displays the total number of SYNC receipt timeouts occurred.
Sync Discards	Displays the total number of SYNC packets discarded.
Announce Timeouts	Displays the total number of ANNOUNCE receipt timeouts occurred.
Announce Discards	Displays the total number of ANNOUNCE packets discarded.
Pdelay Timeouts	Displays the total number of PDELAY receipt timeouts occurred.
Pdelay Discards	Displays the total number of PDELAY packets discarded.
Bad Headers	Displays the total number of packets received with bad header.

To reload the page, click **Refresh**. To reset the statistics for all interfaces, click **Clear**.

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