

Port Traffic Controls

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Overview

This chapter explains Jumbo packets, which enable ports operating at 1 Gbps or 10 Gbps speeds to accept inbound frames of up to 9220 bytes when configured for jumbo traffic.

Feature	Default	Menu	CLI	Web
display VLAN jumbo status	n/a	—	12-4	—
configure jumbo VLANs	Disabled	—	12-6	—

The *Maximum Transmission Unit* (MTU) is the maximum size IP frame the switch can receive for Layer 2 frames inbound on a port. The switch drops any inbound frames larger than the MTU allowed on the port. On ports operating at 10 Mbps or 100 Mbps, the MTU is fixed at 1522 bytes. However, ports operating at 1 Gbps or 10 Gbps speeds accept forward frames of up to 9220 bytes (including four bytes for a VLAN tag) when configured for jumbo traffic. You can enable inbound jumbo frames on a per-VLAN basis. That is, on a VLAN configured for jumbo traffic, all ports belonging to that VLAN and *operating* at 1 Gbps or 10 Gbps allow inbound jumbo frames of up to 9220 bytes. (Regardless of the mode configured on a given jumbo-enabled port, if the port is operating at only 10 Mbps or 100 Mbps, only frames that do not exceed 1522 bytes are allowed inbound on that port.)

Terminology

Jumbo Frame: An IP frame exceeding 1522 bytes in size. The maximum Jumbo frame size is 9220 bytes. (This size includes 4 bytes for the VLAN tag.)

Jumbo VLAN: A VLAN configured to allow inbound jumbo traffic. All ports belonging to a jumbo and operating at 1 Gbps or higher can receive jumbo frames from external devices.

MTU (*Maximum Transmission Unit*): This is the maximum-size IP frame the switch can receive for Layer 2 frames inbound on a port. The switch allows jumbo frames of up to 9220 bytes.

Standard MTU: An IP frame of 1522 bytes in size. (This size includes 4 bytes for the VLAN tag.)

Operating Rules

- **Required Port Speed:** This feature allows inbound and outbound jumbo frames on ports operating at speeds of 1 gigabit or higher. At lower port speeds, only standard (1522-byte or smaller) frames are allowed, regardless of the jumbo configuration.
- **GVRP Operation:** A VLAN enabled for jumbo traffic cannot be used to create a dynamic VLAN. A port belonging to a statically configured, jumbo-enabled VLAN cannot join a dynamic VLAN.
- **Port Adds and Moves:** If you add a port to a VLAN that is already configured for jumbo traffic, the switch enables that port to receive jumbo traffic. If you remove a port from a jumbo-enabled VLAN, the switch disables jumbo traffic capability on the port only if the port is not currently a member of another jumbo-enabled VLAN. This same operation applies to port trunks.
- **Jumbo Traffic Sources:** A port belonging to a jumbo-enabled VLAN can receive inbound jumbo frames through any VLAN to which it belongs, including non-jumbo VLANs. For example, if VLAN 10 (without jumbos enabled) and VLAN 20 (with jumbos enabled) are both configured on a switch, and port 1 belongs to both VLANs, then port 1 can receive jumbo traffic from devices on either VLAN. For a method to allow only some ports in a VLAN to receive jumbo traffic, refer to “Configuring a Maximum Frame Size” on page 12-7.

Configuring Jumbo Frame Operation

Command	Page
show vlans	12-5
show vlans ports < port-list >	12-6
show vlans < vid >	12-6
jumbo	12-6
jumbo max-frame-size	12-7

Overview

1. Determine the VLAN membership of the ports or trunks through which you want the switch to accept inbound jumbo traffic. For operation with GVRP enabled, refer to the GVRP topic under “Operating Rules”, above.
2. Ensure that the ports through which you want the switch to receive jumbo frames are operating at least at gigabit speed. (Check the **Mode** field in the output for the **show interfaces brief < port-list >** command.)
3. Use the **jumbo** command to enable jumbo frames on one or more VLANs statically configured in the switch. (All ports belonging to a jumbo-enabled VLAN can receive jumbo frames.)
4. Execute **write memory** to save your configuration changes to the startup-config file.

Viewing the Current Jumbo Configuration

Syntax: show vlans

*Lists the static VLANs configured on the switch and includes a **Jumbo** column to indicate which VLANs are configured to support inbound jumbo traffic. All ports belonging to a jumbo-enabled VLAN can receive jumbo traffic. (For more information refer to “Configuring a Maximum Frame Size” on page 12-7.) See figure 12-1, below.*

```
ProCurve(config)# show vlans
```

Status and Counters - VLAN Information

Maximum VLANs to support : 8
Primary VLAN : DEFAULT_VLAN
Management VLAN :

802.1Q VLAN ID	Name	Status	Voice	Jumbo
1	DEFAULT_VLAN	Port-based	No	Yes
5	VLAN5	Port-based	No	No
22	VLAN22	Port-based	No	No

Indicates which static VLANs are configured to enable jumbo frames.

Figure 12-1. Example Listing of Static VLANs To Show Jumbo Status Per VLAN

Syntax: show vlans ports < port-list >

*Lists the static VLANs to which the specified port(s) belong, including the **Jumbo** column to indicate which VLANs are configured to support jumbo traffic. Entering only one port in < port-list > results in a list of all VLANs to which that port belongs. Entering multiple ports in < port-list > results in a superset list that includes the VLAN memberships of all ports in the list, even though the individual ports in the list may belong to different subsets of the complete VLAN listing. For example, if port 1 belongs to VLAN 1, port 2 belongs to VLAN 10, and port 3 belongs to VLAN 15, then executing this command with a < port-list > of **1-3** results in a listing of all three VLANs, even though none of the ports belong to all three VLANs. (Refer to figure 12-2.)*

```
ProCurve# show vlans ports 1-3
```

Status and Counters - VLAN Information - for ports 1-3

802.1Q VLAN ID	Name	Status	Voice	Jumbo
1	DEFAULT_VLAN	Port-based	No	Yes
10	VLAN10	Port-based	No	No
15	VLAN15	Port-based	No	No

Indicates which static VLANs are configured to enable jumbo frames.

Figure 12-2. Example of Listing the VLAN Memberships for a Range of Ports

Syntax: show vlans < vid >

This command shows port membership and jumbo configuration for the specified < vid >.

```
ProCurve(config)# show vlan 100
Status and Counters - VLAN Information - Ports - VLAN 100
802.1Q VLAN ID : 100
Name : VLAN100
Status : Port-based
Voice : No
Jumbo : No
```

Port	Information	Mode	Unknown	VLAN	Status
1		Tagged	Learn		Up
2		Tagged	Learn		Up
3		Tagged	Learn		Up
4		Tagged	Learn		Down
5		Tagged	Learn		Up

Lists the ports belonging to VLAN 100 and whether the VLAN is enabled for jumbo frame traffic.

Figure 12-3. Example of Listing the Port Membership and Jumbo Status for a VLAN

Enabling or Disabling Jumbo Traffic on a VLAN

Syntax: vlan < vid > jumbo
[no] vlan < vid > jumbo

*Configures the specified VLAN to allow jumbo frames on all ports on the switch that belong to that VLAN. If the VLAN is not already configured on the switch, **vlan < vid > jumbo** also creates the VLAN. Note that a port belonging to one jumbo VLAN can receive jumbo frames through any other VLAN statically configured on the switch, regardless of whether the other VLAN is enabled for jumbo frames. The **[no]** form of the command disables inbound jumbo traffic on all ports in the specified VLAN that do not also belong to another VLAN that is enabled for jumbo traffic. In a VLAN context, the command forms are **jumbo** and **no jumbo**. (Default: Jumbos disabled on the specified VLAN.)*

Configuring a Maximum Frame Size

You can globally set a maximum frame size for Jumbo frames that will support values from 1518 bytes to 9216 bytes for untagged frames.

Syntax: jumbo max-frame-size <size>

Sets the maximum frame size for Jumbo frames. The range is from 1518 bytes to 9216 bytes.

Note: The jumbo **max-frame-size** is set on a **GLOBAL** level.

Default: 9216 bytes

Configuring IP MTU

Note

The following feature is available on the switches covered in this guide. Jumbos support is required. On switches that do not support this command, the IP MTU value is derived from the maximum frame size and is not configurable.

You can set the IP MTU globally by entering this command. The value of **max-frame-size** must be greater than or equal to 18 bytes more than the value selected for **ip-mtu**. For example, if **ip-mtu** is set to 8964, the **max-frame-size** is configured as 8982.

Syntax: jumbo ip-mtu <size>

*Globally sets the IP MTU size. Values range between 1500 and 9198 bytes. This value must be 18 bytes less than the value of **max-frame-size**.*

Default: 9198 bytes

SNMP Implementation

Jumbo Maximum Frame Size.

The maximum frame size for Jumbos is supported with the following proprietary MIB object:

hpSwitchMaxFrameSize OBJECT-TYPE

This is the value of the global **max-frame-size** supported by the switch. The default value is set to 9216 bytes.

Jumbo IP MTU.

The IP MTU for Jumbos is supported with the following proprietary MIB object:

hpSwitchIpMTU OBJECT-TYPE

This is the value of the global Jumbos IP MTU (or L3 MTU) supported by the switch. The default value is set to 9198 bytes (a value that is 18 bytes less than the largest possible maximum frame size of 9216 bytes). This object can only be used in switches which support **max-frame-size** and **ip-mtu** configuration.

Displaying the Maximum Frame Size

Use the **show jumbos** command to display the globally configured untagged maximum frame size for the switch.

```
ProCurve(config)# show jumbos

Jumbos Global Values

Configured   : MaxFrameSize : 9216           Ip-MTU : 9198
In Use      : MaxFrameSize : 9216           Ip-MTU : 9198
```

Figure 12-4. Displaying the Maximum Frame Size and IP MTU Values

Operating Notes for Maximum Frame Size

- When you set a maximum frame size for Jumbo frames, it must be on a global level. You cannot use the **jumbo max-frame-size** command on a per-port or per-VLAN basis.
- The original way to configure Jumbo frames remains the same, which is per-VLAN, but you cannot set a maximum frame size per-VLAN.
- Jumbo support must be enabled for a VLAN from the CLI or through SNMP.
- Setting the maximum frame size does not require a reboot.

- When you upgrade to a version of software that supports setting the maximum frame size from a version that did not, the **max-frame-size** value is set automatically to 9216 bytes.
- Configuring a Jumbo maximum frame size on a VLAN allows frames up to **max-frame-size** even though other VLANs of which the port is a member are not enabled for Jumbo support.

Operating Notes for Jumbo Traffic-Handling

- ProCurve does not recommend configuring a voice VLAN to accept jumbo frames. Voice VLAN frames are typically small, and allowing a voice VLAN to accept jumbo frame traffic can degrade the voice transmission performance.
- You can configure the default, primary, and/or (if configured) the management VLAN to accept jumbo frames on all ports belonging to the VLAN.
- When the switch applies the default MTU (1522-bytes) to a VLAN, all ports in the VLAN can receive incoming frames of up to 1522 bytes in length. When the switch applies the jumbo MTU (9220 bytes) to a VLAN, all ports in that VLAN can receive incoming frames of up to 9220 bytes in length. A port receiving frames exceeding the applicable MTU drops such frames, causing the switch to generate an Event Log message and increment the “Giant Rx” counter (displayed by **show interfaces < port-list >**).
- The switch allows flow control and jumbo frame capability to co-exist on a port.
- The default MTU is 1522 bytes (including 4 bytes for the VLAN tag). The jumbo MTU is 9220 bytes (including 4 bytes for the VLAN tag).
- When a port is not a member of any jumbo-enabled VLAN, it drops all jumbo traffic. If the port is receiving “excessive” inbound jumbo traffic, the port generates an Event Log message to notify you of this condition. This same condition generates a Fault-Finder message in the Alert log of the switch’s web browser interface, and also increments the switch’s “Giant Rx” counter.
- If you do not want all ports in a given VLAN to accept jumbo frames, you can consider creating one or more jumbo VLANs with a membership comprised of only the ports you want to receive jumbo traffic. Because a port belonging to one jumbo-enabled VLAN can receive jumbo frames through any VLAN to which it belongs, this method enables you to include both jumbo-enabled and non-jumbo ports within the same VLAN. For example, suppose you wanted to allow inbound jumbo frames only on ports 6, 7, 12, and 13. However, these ports are spread across VLAN 100 and VLAN 200, and also share these VLANs with other ports you want

excluded from jumbo traffic. A solution is to create a third VLAN with the sole purpose of enabling jumbo traffic on the desired ports, while leaving the other ports on the switch disabled for jumbo traffic. That is:

	VLAN 100	VLAN 200	VLAN 300
Ports	6-10	11-15	6, 7, 12, and 13
Jumbo-Enabled?	No	No	Yes

If there are security concerns with grouping the ports as shown for VLAN 300, you can either use source-port filtering to block unwanted traffic paths or create separate jumbo VLANs, one for ports 6 and 7, and another for ports 12 and 13.

- **Outbound Jumbo Traffic.** Any port operating at 1 Gbps or higher can transmit outbound jumbo frames through any VLAN, regardless of the jumbo configuration. The VLAN is not required to be jumbo-enabled, and the port is not required to belong to any other, jumbo-enabled VLANs. This can occur in situations where a non-jumbo VLAN includes some ports that do not belong to another, jumbo-enabled VLAN and some ports that do belong to another, jumbo-enabled VLAN. In this case, ports capable of receiving jumbo frames can forward them to the ports in the VLAN that do not have jumbo capability.

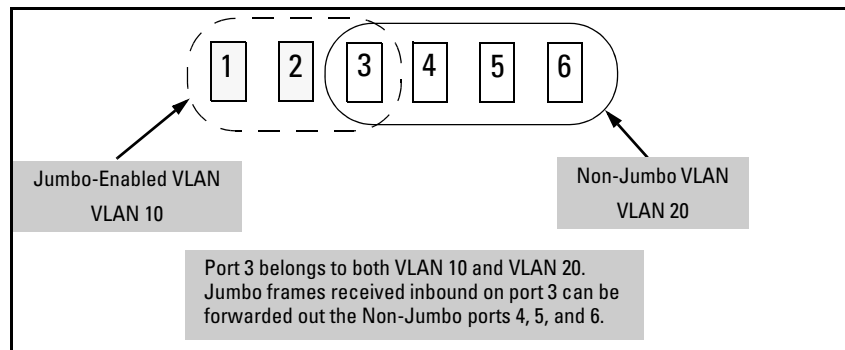


Figure 12-5. Forwarding Jumbo Frames Through Non-Jumbo Ports

Jumbo frames can also be forwarded out non-jumbo ports when the jumbo frames received inbound on a jumbo-enabled VLAN are routed to another, non-jumbo VLAN for outbound transmission on ports that have no memberships in other, jumbo-capable VLANs. Where either of the above scenarios is a possibility, the downstream device must be configured to accept the jumbo traffic. Otherwise, this traffic will be dropped by the downstream device.

Troubleshooting

A VLAN is configured to allow jumbo frames, but one or more ports drops all inbound jumbo frames. The port may not be operating at 1 gigabit or higher. Regardless of a port's configuration, if it is actually operating at a speed lower than 1 gigabit, it drops inbound jumbo frames. For example, if a port is configured for **Auto** mode (**speed-duplex auto**), but has negotiated a 100 Mbps speed with the device at the other end of the link, then the port cannot receive inbound jumbo frames. To determine the actual operating speed of one or more ports, view the **Mode** field in the output for the following command:

```
show interfaces brief < port-list >
```

A non-jumbo port is generating “Excessive undersize/giant frames” messages in the Event Log. The switches can transmit outbound jumbo traffic on any port, regardless of whether the port belongs to a jumbo VLAN. In this case, another port in the same VLAN on the switch may be jumbo-enabled through membership in a different, jumbo-enabled VLAN, and may be forwarding jumbo frames received on the jumbo VLAN to non-jumbo ports. Refer to “Outbound Jumbo Traffic” on page 12-10.

Port Traffic Controls
Overview