Port Traffic Controls- Jumbo Packets

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Overview

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

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<thead>
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<th>Default</th>
<th>Menu</th>
<th>CLI</th>
<th>Web</th>
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<td>display VLAN jumbo status</td>
<td>n/a</td>
<td>—</td>
<td>12-5</td>
<td>—</td>
</tr>
<tr>
<td>configure jumbo VLANs</td>
<td>Disabled</td>
<td>—</td>
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The *Maximum Transmission Unit* (MTU) is the maximum size IP packet the switch can receive for Layer 2 packets inbound on a port. The switch drops any inbound packets 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 Gbs or 10 Gbps speeds accept forward packets of up to 9220 bytes (including four bytes for a VLAN tag) when configured for jumbo traffic. You can enable inbound jumbo packets on a per-VLAN basis. That is, on a VLAN configured for jumbo traffic, all ports belonging to that VLAN and *operating* at 1 Gbs or 10 Gbps allow inbound jumbo packets 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 packets that do not exceed 1522 bytes are allowed inbound on that port.)

Terminology

**Jumbo Packet:** An IP packet exceeding 1522 bytes in size. The maximum Jumbo packet 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 packets from external devices.

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

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

- **Required Port Speed**: Allow inbound and outbound jumbo packets on ports operating at speeds of 1 gigabit or higher. At lower port speeds, only standard (1522-byte or smaller) packets are allowed, regardless of the jumbo configuration.

- **Flow Control**: Disable flow control (the default setting) on any ports or trunks through which you want to transmit or receive jumbo packets. Leaving flow control enabled on a port can cause a high rate of jumbo drops to occur on the port.

- **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 packets 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 “Operating Notes for Jumbo Traffic-Handling” on page 12-7.
Configuring Jumbo Packet Operation

<table>
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<tr>
<td>show vlans ports &lt; port-list &gt;</td>
<td>12-6</td>
</tr>
<tr>
<td>show vlans &lt; vid &gt;</td>
<td>12-7</td>
</tr>
<tr>
<td>jumbo</td>
<td>12-7</td>
</tr>
</tbody>
</table>

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 packets 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 packets on one or more VLANs statically configured in the switch. (All ports belonging to a jumbo-enabled VLAN can receive jumbo packets.

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 “Operating Notes for Jumbo Traffic-Handling” on page 12-7.) See figure 12-1, below.

![Figure 12-1. Example Listing of Static VLANs To Show Jumbo Status Per VLAN](image)

**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.)
Port Traffic Controls - Jumbo Packets
Overview

![Port Traffic Controls- Jumbo Packets](image1)

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 >.*

![Syntax](image2)

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 packets 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 packets through any other VLAN statically configured on the switch, regardless of whether the other VLAN is enabled for jumbo packets. 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.)

Operating Notes for Jumbo Traffic-Handling

- ProCurve does not recommend configuring a voice VLAN to accept jumbo packets. Voice VLAN packets are typically small, and allowing a voice VLAN to accept jumbo packet traffic can degrade the voice transmission performance.
- You can configure the default, primary, and/or (if configured) the management VLAN to accept jumbo packets 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 packets 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 packets of up to 9220 bytes in length. A port receiving packets exceeding the applicable MTU drops such packets, causing the switch to generate an Event Log message and increment the “Giant Rx” counter (displayed by show interfaces < port-list >).
- The switch does not allow flow control and jumbo packet capability to co-exist on a port. Attempting to configure both on the same port generates an error message in the CLI and sends a similar message to the Event Log.
- 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 packets, 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 packets 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 packets 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:

<table>
<thead>
<tr>
<th>Ports</th>
<th>VLAN 100</th>
<th>VLAN 200</th>
<th>VLAN 300</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jumbo-Enabled?</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
</tr>
</tbody>
</table>

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 packets 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 packets can forward them to the ports in the VLAN that do not have jumbo capability.
Jumbo packets can also be forwarded out non-jumbo ports when the jumbo packets 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.

Figure 12-4. Forwarding Jumbo Packets Through Non-Jumbo Ports
Troubleshooting

A VLAN is configured to allow jumbo packets, but one or more ports drops all inbound jumbo packets. 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 packets. 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 packets. 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 packets” 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 packets received on the jumbo VLAN to non-jumbo ports. Refer to “Outbound Jumbo Traffic” on page 12-8.