BCP Support

The Bridge Control Protocol (BCP) Support feature provides support for BCP to Cisco devices, as described in RFC 3518. The Cisco implementation of BCP is a VLAN infrastructure that does not require the use of subinterfaces to group Ethernet 802.1Q trunks and the corresponding PPP links. This approach enables users to process VLAN encapsulated packets without having to configure subinterfaces for every possible VLAN configuration.

Feature History for the BCP Support feature

<table>
<thead>
<tr>
<th>Release</th>
<th>Modification</th>
</tr>
</thead>
<tbody>
<tr>
<td>12.3(2)T</td>
<td>This feature was introduced.</td>
</tr>
<tr>
<td>12.3(4)T</td>
<td>This feature was modified to enhance the performance of the bridging of Ethernet packets over PPP-encapsulated interfaces. The <strong>PPP bcp tagged-frame</strong> command was introduced to provide the option to either enable or disable the negotiation of IEEE 802.1Q-tagged packets.</td>
</tr>
</tbody>
</table>

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at [http://www.cisco.com/go/fn](http://www.cisco.com/go/fn). You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

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Restrictions for BCP Support

Each individual VLAN ID can be configured only once, as either part of a single VLAN ID range or on a subinterface.

Information About BCP Support

To configure the BCP Support feature, you must understand the following concept:

- VLAN ID Ranges, page 2

VLAN ID Ranges

In the traditional, subinterface-based approach to VLANs, a subinterface is created for every necessary VLAN ID, and then the application or protocol attributes are configured on every subinterface. In the VLAN range approach, a single VLAN ID range is created, and the application or protocol attributes are configured on the range as a whole.

How to Bridge a Range of VLAN IDs

This section contains the following procedures:

- Configuring a Range of VLAN IDs, page 2
- Enabling the Negotiation of IEEE 802.1Q-Tagged Packets, page 4

Configuring a Range of VLAN IDs

In this task, you create a range of VLAN IDs and then assign the VLAN ID range to the serial interface.

SUMMARY STEPS

1. enable
2. configure terminal
3. no ip routing
4. bridge number protocol ieee
5. interface type number
6. vlan-range dot1q start-range end-range [native]
7. description description
8. bridge-group number
9. exit
10. interface type number
11. encapsulation ppp
12. bridge-group number
### DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong></td>
<td>enable</td>
</tr>
</tbody>
</table>
| Example:          | Router(config)# enable | Enters privileged EXEC mode.  
|                   |         | - Enter your password if prompted. |
| **Step 2**        | configure terminal  |
| Example:          | Router(config)# configure terminal | Enters global configuration mode. |
| **Step 3**        | no ip routing  |
| Example:          | Router(config)# no ip routing | Disables all routing. |
| **Step 4**        | bridge number protocol ieee  |
| Example:          | Router(config)# bridge 1 protocol ieee | Enables bridge and spanning-tree protocols. |
| **Step 5**        | interface type number  |
| Example:          | Router(config)# interface ethernet 0 | Enters interface configuration mode.  
|                   |         | - This is the Ethernet interface that is connected to the 802.1Q trunk. Both the Ethernet interface and the serial interface must be assigned to the same bridge group. |
| **Step 6**        | vlan-range dot1q start-range end-range [native]  |
| Example:          | Router(config-if)# vlan-range dot1q 1 99 | Configures the range of VLAN IDs the interface is to bridge and enters VLAN range configuration mode.  
|                   |         | - Configuring the **native** keyword instructs the interface to bridge untagged (native) packets. |
| **Step 7**        | description description  |
| Example:          | Router(config-if-vlan-range)# description 1 to 99 | (Optional) Describes the VLAN ID range. |
| **Step 8**        | bridge-group number  |
| Example:          | Router(config-if-vlan-range)# bridge-group 1 | Assigns the VLAN ID range to a bridge group. |
| **Step 9**        | exit  |
| Example:          | Router(config-if-vlan-range)# exit | Exits to global configuration mode. |
| **Step 10**       | interface type number  |
| Example:          | Router(config)# interface serial 1 | Enters interface configuration mode. |
## Enabling the Negotiation of IEEE 802.1Q-Tagged Packets

In this task, you enable the negotiation of IEEE 802.1Q-tagged packets.

### SUMMARY STEPS

1. `enable`
2. `configure terminal`
3. `interface type number`
4. `ppp bcp tagged-frame`

### DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> <code>enable</code></td>
<td>Enters privileged EXEC mode.</td>
</tr>
<tr>
<td><strong>Example:</strong> <code>Router(config)# enable</code></td>
<td>Enter your password if prompted.</td>
</tr>
<tr>
<td><strong>Step 2</strong> <code>configure terminal</code></td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td><strong>Example:</strong> <code>Router(config)# configure terminal</code></td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong> <code>interface type number</code></td>
<td>Enters interface configuration mode.</td>
</tr>
<tr>
<td><strong>Example:</strong> <code>Router(config)# interface serial 4/0</code></td>
<td>This is the interface that will be bridging the IEEE 802.1Q-tagged packets.</td>
</tr>
<tr>
<td><strong>Step 4</strong> <code>ppp bcp tagged-frame</code></td>
<td>Enables the negotiation of IEEE 802.1Q-tagged packets.</td>
</tr>
<tr>
<td><strong>Example:</strong> <code>Router(config-if)# ppp bcp tagged-frame</code></td>
<td></td>
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</tbody>
</table>
Configuration Examples for BCP Support

This section provides the following configuration examples:

- Bridging a Range of VLAN IDs: Example, page 5
- Bridging a Range of VLAN IDs over Multiple Interfaces: Example, page 5
- Bridging a Range of VLAN IDs from Untagged Packets: Example, page 5
- Enabling the Negotiation of IEEE 802.1Q-Tagged Packets: Example, page 6

Bridging a Range of VLAN IDs: Example

The following example bridges tagged 802.1Q packets that have VLAN IDs from 1 to 500. Ingress packets that have VLAN IDs outside of this range are dropped.

```plaintext
no ip routing
!
bridge 1 protocol ieee
!
interface ethernet 0
vlan-range dot1q 1 500
bridge-group 1
!
interface serial 0
  encapsulation ppp
  bridge-group 1
```

Bridging a Range of VLAN IDs over Multiple Interfaces: Example

The following example bridges two ranges of VLAN IDs. Packets with a VLAN ID from 1 to 600 are bridged by serial interface 0, and packets with a VLAN ID from 800 to 4000 are bridged by serial interface 1.

```plaintext
no ip routing
!
bridge 1 protocol ieee
bridge 2 protocol ieee
!
interface ethernet 0
  vlan-range dot1q 1 600
  bridge-group 1
  vlan-range dot1q 800 4000
  bridge-group 2
!
interface serial 0
  encapsulation ppp
  bridge-group 1
!
interface serial 1
  encapsulation ppp
  bridge-group 2
```

Bridging a Range of VLAN IDs from Untagged Packets: Example

The following example bridges untagged packets with a VLAN ID from 1 to 500:
interface ethernet 0
  vlan-range dot1q 1 500 native
  bridge-group 1

Enabling the Negotiation of IEEE 802.1Q-Tagged Packets: Example

The following example enables the negotiation of IEEE 802.1Q-tagged packets on serial interface 4/0:

interface serial 4/0
  ppp bcp tagged-frame

Additional References

The following sections provide references related to BCP support:

RFCs

<table>
<thead>
<tr>
<th>RFCs</th>
<th>Title</th>
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<tbody>
<tr>
<td>3518</td>
<td>Point-to-Point Protocol (PPP) Bridging Control Protocol (BCP)</td>
</tr>
<tr>
<td>2878</td>
<td>Point-to-Point Protocol (PPP) Bridging Control Protocol (BCP)</td>
</tr>
<tr>
<td>1638</td>
<td>PPP Bridging Control Protocol (BCP)</td>
</tr>
</tbody>
</table>

Technical Assistance

<table>
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<th>Link</th>
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<tbody>
<tr>
<td>Technical Assistance Center (TAC) home page, containing 30,000 pages of</td>
<td><a href="http://www.cisco.com/public/support/tac/home.shtml">http://www.cisco.com/public/support/tac/home.shtml</a></td>
</tr>
<tr>
<td>searchable technical content, including links to products, technologies,</td>
<td></td>
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<tr>
<td>solutions, technical tips, and tools. Registered Cisco.com users can log</td>
<td></td>
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<tr>
<td>in from this page to access even more content.</td>
<td></td>
</tr>
</tbody>
</table>
Command Reference


New Commands

- `debug tbridge virtual-port`
- `ppp bcp tagged-frame`
- `vlan-id dot1q`
- `vlan-range dot1q`

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