



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

Release	Modification
12.3(2)T	This feature was introduced.
12.3(4)T	This feature was modified to enhance the performance of the bridging of Ethernet packets over PPP-encapsulated interfaces. The ppp bcp tagged-frame command was introduced to provide the option to either enable or disable the negotiation of IEEE 802.1Q-tagged packets.

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>. 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

	Command or Action	Purpose
Step 1	enable Example: Router(config)# enable	Enters privileged EXEC mode. <ul style="list-style-type: none">Enter your password if prompted.
Step 2	configure terminal 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. <ul style="list-style-type: none">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. <ul style="list-style-type: none">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.

	Command or Action	Purpose
Step 11	encapsulation <code>ppp</code> Example: Router(config-if)# encapsulation ppp	Enables PPP on the interface.
Step 12	bridge-group <code>number</code> Example: Router(config-if)# bridge-group 1	Assigns the interface to a bridge group. <ul style="list-style-type: none"> The serial interface must be assigned to the same bridge group as the Ethernet interface that is connected to the 802.1Q trunk.

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

	Command or Action	Purpose
Step 1	enable Example: Router(config)# enable	Enters privileged EXEC mode. <ul style="list-style-type: none"> Enter your password if prompted.
Step 2	configure terminal Example: Router(config)# configure terminal	Enters global configuration mode.
Step 3	interface <i>type number</i> Example: Router(config)# interface serial 4/0	Enters interface configuration mode. <ul style="list-style-type: none"> This is the interface that will be bridging the IEEE 802.1Q-tagged packets.
Step 4	ppp bcp tagged-frame Example: Router(config-if)# ppp bcp tagged-frame	Enables the negotiation of IEEE 802.1Q-tagged packets.

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.

```
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.

```
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

RFCs	Title
3518	<i>Point-to-Point Protocol (PPP) Bridging Control Protocol (BCP)</i>
2878	<i>Point-to-Point Protocol (PPP) Bridging Control Protocol (BCP)</i>
1638	<i>PPP Bridging Control Protocol (BCP)</i>

Technical Assistance

Description	Link
Technical Assistance Center (TAC) home page, containing 30,000 pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/public/support/tac/home.shtml

Command Reference

The following commands are introduced or modified in the feature or features documented in this module. For information about these commands, see the *Cisco IOS Bridging Command Reference* at http://www.cisco.com/en/US/docs/ios/bridging/command/reference/br_book.html or the *Cisco IOS IBM Networking Command Reference* at http://www.cisco.com/en/US/docs/ios/ibm/command/reference/ibm_book.html. For information about all Cisco IOS commands, go to the Command Lookup Tool at <http://tools.cisco.com/Support/CLILookup> or to the *Cisco IOS Master Commands List*.

New Commands

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

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