



# DOCSIS 3.1 Path Selection

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This document describes how to configure the path selection on the Cisco cBR Series Converged Broadband Router.

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## Information about Path Selection

DOCSIS 3.1 Path Selection feature is enhanced to support OFDM downstream channels and OFDMA upstream channels. The RCC selection process is enhanced to include OFDM channels. The TCC selection process is enhanced to include OFDMA channels.

## How to Configure Path Selection

### Configuring Downstream Bonding Group with OFDM Channel

To configure the downstream bonding group with OFDM channel, follow the steps below:

```
enable
configure terminal
interface wideband-cable slot/subslot/bay:wideband-channel
description text
cable bundle id
cable rf-channels channel-list grouplist bandwidth-percent percentage-bandwidth
```



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**Note** Channel 158 to 162 are specified as OFDM channel.

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## Verifying Downstream Bonding Group with OFDM Channel Configuration

To display the details of the downstream bonding group with OFDM channel, use the **show running-config interface** command as shown in the example below:

```
Router# show running-config interface wideband-cable 3/0/0:13

Building configuration...

Current configuration : 212 bytes
!
interface Wideband-Cable3/0/0:13
  description D31-DSBG: 1 SC-QAM plus 1 OFDM
  cable bundle 1
  cable rf-channels channel-list 8 bandwidth-percent 30
  cable rf-channels channel-list 158 bandwidth-percent 25
end
```

## Configuring Upstream Bonding Group with OFDMA Channel

To configure the upstream bonding group with OFDMA channel, follow the steps below:

```
enable
configure terminal
interface cable slot/subslot/bay
cable upstream bonding-group id
upstream id
```

## Verifying Upstream Bonding Group with OFDMA Channel Configuration

To display the details of the upstream bonding group with OFDMA channel, use the **show running-config interface** command as shown in the example below:

```
Router# show running-config interface cable 6/0/3
Building configuration...

Current configuration : 212 bytes
!
interface Cable6/0/3
  load-interval 30
  downstream Integrated-Cable 6/0/1 rf-channel 158
  upstream 0 Upstream-Cable 1/0/0 us-channel 0
  upstream 1 Upstream-Cable 1/0/0 us-channel 1
  upstream 2 Upstream-Cable 1/0/0 us-channel 2
  upstream 3 Upstream-Cable 1/0/0 us-channel 3
  upstream 6 Upstream-Cable 1/0/0 us-channel 12
  cable upstream balance-scheduling
  cable upstream bonding-group 2
    upstream 0
    upstream 1
    upstream 2
    upstream 3
    upstream 6
  attributes 80000000
  cable bundle 1
  cable privacy accept-self-signed-certificate
!
```

## Verifying the Path Selection Status

To display the path selection status of a cable modem, use the **show cable modem path-sel** command as shown in the example below:

```
router#show cable modem 38c8.5cfe.efa6 path-sel

CM 38c8.5cfe.efa6 Path-Sel Info: 07:20

RCS Filter Result: Succeed
Candidate RCS List: 2
  RCC-Id  Owner-Id  Preliminary  RCP      TLV-56  LBG      SF-Attr  CM-Attr
  1       1 :12289  Pass        Pass     --      Pass     Pass     Pass
  2       1 :12290  Pass        Pass     --      Pass     Pass     Pass

TCS Filter Result: Succeed
TCS Info:
  TCS in CGD           : 0x7          UCID: 1 2 3
  TCS in Freq Range    : 0x7          UCID: 1 2 3
  TCS Impaired         : 0x0
TCS Passed filters:
  Preliminary          : 0x7          UCID: 1 2 3
  LB Group             : 0x7          UCID: 1 2 3
  SF Attr Mask         : 0x7          UCID: 1 2 3
  CM Attr Mask         : 0x7          UCID: 1 2 3

Candidate US-BG List: 4
  UBG-Id  Chan-Mask  Preliminary  TLV-56  LBG      SF-Attr  CM-Attr
  1       0x7       Pass        --      Pass     Pass     Pass
  65537   0x2       Pass        --      Pass     Pass     Pass
  65538   0x4       Pass        --      Pass     Pass     Pass
  65536   0x1       Pass        --      Pass     Pass     Pass

Primary DS Chan Result: Skipped
Candidate Primary DS Chan List: 0

Primary US Chan Result: Skipped
Candidate Primary US Chan List: 0
```

## Clearing the Path Selection Status

To clear the path selection status for all CMs, use the **clear cable modem all path-sel** command as shown in the example below:

```
Router# clear cable modem all path-sel

Router# show cable modem c8fb.26a6.c46a path-sel

CM c8fb.26a6.c46a Path-Sel Info: N/A
Path-Sel status has been cleared after register online.
```

## Verifying the RCC Configuration

To verify the runtime RCCs on a cable interface, use the **show cable mac-domain rcc** command as shown in the example below:

```
Router# show cable mac-domain cable 7/0/0 rcc
```

RCC-ID	RCP	RCs	MD-DS-SG	CMs	WB/RCC-TMPL	D3.0	D3.1
4	00 00 00 00 00	16	0	1	WB (Wi7/0/0:0)	Y	Y
5	00 00 00 00 00	25	0	2	WB (Wi7/0/0:1)	N	Y
6	00 10 00 00 08	8	0	0	RCC-TMPL (3:1)	Y	N
7	00 00 00 00 00	4	0	0	WB (Wi7/0/0:4)	Y	Y

To display the detailed information for only DOCSIS 3.1 capable RCC, use the **show cable mac-domain rcc simplified** command as shown in the example below:

```
router#show cable mac-domain cable 7/0/0 rcc 5 simplified
```

```
RCC ID           : 5
Created Via      : Wideband - Wi7/0/0:1
CM attribute mask : 0x80000000
```

Primary Receive Channel List:

Chan Idx	RF Chan	DCID	Freq
1	In7/0/0:0	1	453000000

Non-Primary Receive Channel List:

Chan Idx	RF Chan	DCID	Freq
2	In7/0/0:1	2	459000000
3	In7/0/0:2	3	465000000
4	In7/0/0:3	4	471000000
5	In7/0/0:4	5	477000000
6	In7/0/0:5	6	483000000
7	In7/0/0:6	7	489000000
8	In7/0/0:7	8	495000000
9	In7/0/0:8	9	501000000
10	In7/0/0:9	10	507000000
11	In7/0/0:10	11	513000000
12	In7/0/0:11	12	519000000
13	In7/0/0:12	13	525000000
14	In7/0/0:13	14	531000000
15	In7/0/0:14	15	537000000
16	In7/0/0:15	16	543000000
17	In7/0/0:16	17	549000000
18	In7/0/0:17	18	555000000
19	In7/0/0:18	19	561000000
20	In7/0/0:19	20	567000000
21	In7/0/0:20	21	573000000
22	In7/0/0:21	22	579000000
23	In7/0/0:22	23	585000000
24	In7/0/0:23	24	591000000
25	In7/0/0:158	159	663000000

OFDM Receive Channel List:

Chan Idx	RF Chan	DCID	PLC-Freq	Profiles
25	In7/0/0:158	159	663000000	0 1 2

## Additional References

### Related Document

Document Title	Link
Cisco cBR Converged Broadband Routers Layer 2 and DOCSIS 3.0 Configuration Guide	<a href="http://www.cisco.com/c/en/us/td/docs/cable/cbr/configuration/guide/b_cbr_layer2_docsis30.html">http://www.cisco.com/c/en/us/td/docs/cable/cbr/configuration/guide/b_cbr_layer2_docsis30.html</a>

### MIBs

MIBs	MIBs Link
• DOCSIS-MIB	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a>

### Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	<a href="http://www.cisco.com/support">http://www.cisco.com/support</a>

## Feature Information for DOCSIS 3.1 Path Selection

Use Cisco Feature Navigator to find information about the platform support and software image support. Cisco Feature Navigator enables you to determine which software images support a specific software release, feature set, or platform. To access Cisco Feature Navigator, go to the [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn) link. An account on the Cisco.com page is not required.



**Note** The following table lists the software release in which a given feature is introduced. Unless noted otherwise, subsequent releases of that software release train also support that feature.

**Table 1: Feature Information for DOCSIS 3.1 Path Selection**

Feature Name	Releases	Feature Information
DOCSIS 3.1 Path Selection	Cisco IOS XE Fuji 16.7.1	This feature was integrated on the Cisco cBR Series Converged Broadband Routers.
DOCSIS 3.1 Upstream Path Selection	Cisco IOS XE Fuji 16.7.1	This feature was integrated on the Cisco cBR Series Converged Broadband Routers.