# OFDM Channel Configuration

This document describes how to configure the OFDM channel on the Cisco cBR Series Converged Broadband Router.


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# Information about OFDM Channel Configuration

## OFDM Channels

DOCSIS 3.1 introduces modes for higher throughput and higher spectral efficiency while still allowing backward compatibility to DOCSIS 3.0. OFDM Channel support includes 1 OFDM channel per port with channel bandwidth from 24 MHz to 192 MHz wide.

Each OFDM channel supports a control profile, an NCP profile, and up to 5 data profiles. Profiles support one or more modulations.

## Channel Profile

A globally configured OFDM channel profile contains channel parameters, and the modulation or modulation profile associated with the control, NCP, and data profiles.

Each OFDM channel must specify an OFDM channel profile in its configuration.

## Modulation Profile

A globally configured OFDM modulation profile assigns different modulations to ranges of sub-carriers, or lists of individual sub-carriers.

A modulation profile may be assigned to a control, NCP, or data profile in a channel profile.

## Path Selection

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

# How to Configure OFDM Channel

## Configuring OFDM Channel Profile

To configure the OFDM channel profile, follow the steps below:

**enable**
**configure terminal**
**cable downstream ofdm-chan-profile** *id*
**description** *text*
**cyclic-prefix** *value*
**interleaver-depth** *value*
**pilot-scaling** *value*
**roll-off** *value*
**subcarrier-spacing** *value*
**profile-ncp modulation-default** *mod_prof_id*
**profile-control** {**modulation-default** *mod_prof_id* | **modulation-profile** *mod_prof_id*}
**profile-data** *channel_data_prof_id* {**modulation-default** *mod_prof_id* | **modulation-profile** *mod_prof_id*}

## Verifying OFDM Channel Profile Configuration

To display the OFDM channel profile details, use the **show cable ofdm-chan-profiles** command as shown in the example below:

```
Router# show cable ofdm-chan-profile 20

**** OFDM Channel Profile Configuration ****

Prof  Cycl  Roll  FFT  Intr   Pilot  Modulation (D-Default, P-Profile)
ID    Prfx  Off   KHz  Depth  Scale  Cntrl   NCP     Data Profiles

                                                     1       2       3       4       5

20    1024  128   50   16     48     D:1024  D:16    NA      NA      NA      NA      NA
**** OFDM Channel Profile Assigned Channels ****

Prof  Admin  Controller:channels
ID
20    Up     3/0/1:158             3/0/2:158             3/0/3:158             3/0/5:158
```

```
             3/0/6:158              3/0/7:158
```

To display the associations between OFDM channel profiles and OFDM channels, use the **show cable ofdm-chan-profiles** command with **channels** option as shown in the example below:

```
Router# show cable ofdm-chan-profile channels

**** OFDM Channel Profile Assigned Channels ****

Prof  Admin  Controller:channels
ID
20    Up     3/0/1:158              3/0/2:158              3/0/3:158              3/0/5:158

             3/0/6:158              3/0/7:158
30    Up     3/0/4:158
101   Up     3/0/0:158
```

To display the OFDM channel profile configurations, use the **show cable ofdm-chan-profiles** command with **configuration** option as shown in the example below:

```
Router# show cable ofdm-chan-profile configuration

**** OFDM Channel Profile Configuration ****

Prof  Cycl  Roll  FFT  Intr   Pilot  Modulation (D-Default, P-Profile)
  Description
ID    Prfx  Off   KHz  Depth  Scale  Cntrl   NCP     Data Profiles
  (Limited to 20)
                                                     1       2       3       4       5

0     192   128   50   16     48     D:256   D:16    D:1024  NA      NA      NA      NA
  System Profile 0
1     192   128   50   16     48     D:256   D:16    D:1024  D:2048  D:512   NA      NA
  System Profile 1
20    1024  128   50   16     48     D:1024  D:16    NA      NA      NA      NA     NA
30    1024  128   50   16     48     P:10    D:16    NA      NA      NA      NA      NA
```

# Configuring OFDM Modulation Profile

To configure the OFDM modulation profile, follow the steps below:

**enable**
**configure terminal**
**cable downstream ofdm-modulation-profile** *id*
**description** *text*
**subcarrier-spacing** *value*
**width** *value*
**start-frequency** *value*
**assign** {**modulation-default** *mod_prof_id* | **modulation** *mod_prof_id* {**list-subcarriers** {**freq-abs** | **freq-offset**} *value* | **range-subcarriers** {**freq-abs** | **freq-offset**} *value* **width** *value*}}

**Note** Subcarrier spacing must match the subcarrier spacing of each channel profile in which it is configured.

# Verifying OFDM Modulation Profile Configuration

To display the OFDM modulation profile details, use the **show cable ofdm-modulation-profiles** command as shown in the example below:

```
Router# show cable ofdm-modulation-profile 10

**** OFDM Modulation Profile Configuration ****

Prof  FFT  Width     Start-freq Modulations
ID    KHz  Hz        Hz
10    50   96000000  627000000  64   default
                                512  freq-abs  709050000 width   12000000
                                2048 freq-abs  629000000 width    6000000

Profile Subcarrier Modulations
  Modulation: Start-freq-abs[start-sc] - End-freq-abs[end-sc] Width-freq[num-sc]
  64  : 572600000[   0] -  626950000[1087]    54400000[1088]
  64  : 627000000[1088] -  628950000[1127]     2000000[  40]
  2048: 629000000[1128] -  634950000[1247]     6000000[ 120]
  64  : 635000000[1248] -  709000000[2728]    74050000[1481]
  512 : 709050000[2729] -  721000000[2968]    12000000[ 240]
  64  : 721050000[2969] -  722950000[3007]     1950000[  39]
  64  : 723000000[3008] -  777350000[4095]    54400000[1088]

**** OFDM Modulation Profile Assigned Channel Profiles ****

Prof  Channel
ID    Profiles
10    30
```

To display the associations between OFDM modulation profiles and OFDM channel profiles, use the **show cable ofdm-modulation-profile** command with **channel-profiles** option as shown in the example below:

```
Router# show cable ofdm-modulation-profile channel-profiles

**** OFDM Modulation Profile Assigned Channel Profiles ****

Prof  Channel
ID    Profiles
8     None
9     28
10    30
192   192
```

To display the OFDM modulation profile configurations, use the **show cable ofdm-modulation-profile** command with **configuration** option as shown in the example below:

```
Router# show cable ofdm-modulation-profile configuration

**** OFDM Modulation Profile Configuration ****

Prof  FFT  Width     Start-freq Modulations              Description
ID    KHz  Hz        Hz                                  (Limited to 20)
8     50   192000000 NA         2048 default
                                 512  freq-off   48000000
                                      width      24000000
9     50   96000000  627000000  512  default             512-1k-4k
                                 1024 freq-abs  635000000
                                      width      74050000
                                 4096 freq-abs  629000000
                                      width       6000000
10    50   96000000  627000000  64   default
                                 512  freq-abs  709050000
                                      width      12000000
                                 2048 freq-abs  629000000
                                      width       6000000
```

# Configuring Port/Controller and Channel

To configure the port/controller and channel, follow the steps below:

**enable**
**configure terminal**
**controller integrated-cable** *slot/subslot/port*
**max-ofdm-spectrum** *value*
**ofdm-freq-excl-band start-frequency** *value* **width** *value*
**rf-chan** *start_id* [*end_id*]
**ofdm channel-profile** *id* **start-frequency** *value* **width** *value* [**plc** *value*]

**Note** The range of *start_id* is 158 to 162 in the OFDM channel configuration.

The maximum OFDM spectrum is assigned to OFDM channels, which is used by the the CMTS to calculate default port base power.

Ranges of frequencies can be excluded from all OFDM channels using the **ofdm-freq-excl-band** command.

# Verifying Port/Controller and Channel Configuration

To display the RF port details, use the **show controller integrated-cable** command with **rf-port** option as shown in the example below:

```
Router# show controller integrated-cable 3/0/0 rf-port

Admin:  UP  MaxCarrier: 128  BasePower: 33 dBmV  Mode: normal
  Rf Module 0: UP
  Free freq block list has 3 blocks:
    45000000  - 107999999
    624000000 - 644999999
    837000000 - 1217999999
  Rf Port Status: UP
  MaxOfdmSpectrum:  192000000   Equivalent 6MHz channels: 32
  UsedOfdmSpectrum: 192000000   AvailOfdmSpectrum:        0
  DefaultBasePower: 33 dBmV     Equivalent 6MHz channels: 160
  OFDM frequency exclusion bands: None
```

To display the summary information on OFDM channel, use the **show controller integrated-cable** command with **rf-channel** option as shown in the example below:

```
Router# show controller integrated-cable 3/0/0 rf-port 158

Chan State Admin Mod-Type  Start       Width     PLC        Profile-ID    dcid  power
output
                           Frequency
 158   UP   UP   OFDM      627000000   96000000  663000000       20       159   34
NORMAL
```

To display detailed information on OFDM channel, use the **show controller integrated-cable** command with **rf-channel** and **verbose** options as shown in the example below:

```
Router# show controller integrated-cable 3/0/0 rf-port 158 verbose

Chan State Admin Mod-Type  Start       Width     PLC        Profile-ID    dcid  power
output
                           Frequency
 158   UP   UP   OFDM      627000000   96000000  663000000       30       159   32
NORMAL
 Resource status:   OK
```

```
 License: granted <17:02:35 EDT May 18 2016>
 OFDM channel license spectrum width: 92200000
 OFDM modulation license (spectrum width): 2K (6000000)
 OFDM config state: Configured

 OFDM channel details: [3/0/4:158]
-----------------------------------------
 OFDM channel frequency/subcarrier range     : 627000000[1088] - 722999999[3007]
 OFDM spectrum frequency/subcarrier range    : 572600000[   0] - 777399999[4095]
 Active spectrum frequency/subcarrier range  : 628900000[1126] - 721049999[2969]
 OFDM channel center frequency/subcarrier    : 675000000[2048]
 PLC spectrum start frequency/subcarrier     : 663000000[1808]
 PLC frequency/subcarrier                    : 665800000[1864]
 Channel width                               : 96000000
 Active Channel width                        : 92200000
 OFDM Spectrum width                         : 204800000
 Chan prof id                                : 30
 Cyclic Prefix                               : 1024
 Roll off                                    : 128
 Interleave depth                            : 16
 Spacing                                     : 50KHZ
 Pilot Scaling                               : 48
 Control modulation profile                  : 10
 NCP modulation default                      : 16
 Data modulation default                     : None
 Data modulation profile                     : None
 Lower guardband width in freq/subcarriers   : 1900000[38]
 Upper guardband width in freq/subcarriers   : 1900000[38]
 Licensed 4K modulation spectrum width       : 0
 Licensed 2K modulation spectrum width       : 6000000

 PLC spectrum frequencies [subcarriers]              :
  663000000[1808] - 668999999[1927]

 PLC channel frequencies [subcarriers]                 :
  665800000[1864] - 666199999[1871]   Size: 8 subcarriers

 Excluded frequencies [subcarriers]                :
  572600000[   0] - 628899999[1125]     721100000[2970] - 777399999[4095]
  Count: 2252

 Pilot frequencies [subcarriers]                   :
  *:PLC pilots
  630700000[1162]   634300000[1234]   637900000[1306]   641500000[1378]
  645100000[1450]   648700000[1522]   652300000[1594]   655900000[1666]
  659500000[1738]   663450000[1817]*  664050000[1829]*  664600000[1840]*
  665050000[1849]*  666900000[1886]*  667350000[1895]*  667900000[1906]*
  668500000[1918]*  669100000[1930]   672700000[2002]   676300000[2074]
  679900000[2146]   683500000[2218]   687100000[2290]   690700000[2362]
  694300000[2434]   697900000[2506]   701500000[2578]   705100000[2650]
  708700000[2722]   712300000[2794]   715900000[2866]   719500000[2938]
  Count: 32

 Active frequencies [subcarriers]                  :
  628900000[1126] - 721099999[2969]
  Count: 1844

 Data frequencies [subcarriers]                    :
  628900000[1126] - 630699999[1161]     630750000[1163] - 634299999[1233]
  634350000[1235] - 637899999[1305]     637950000[1307] - 641499999[1377]
  641550000[1379] - 645099999[1449]     645150000[1451] - 648699999[1521]
  648750000[1523] - 652299999[1593]     652350000[1595] - 655899999[1665]
  655950000[1667] - 659499999[1737]     659550000[1739] - 663449999[1816]
  663500000[1818] - 664049999[1828]     664100000[1830] - 664599999[1839]
  664650000[1841] - 665049999[1848]     665100000[1850] - 665799999[1863]
  666200000[1872] - 666899999[1885]     666950000[1887] - 667349999[1894]
  667400000[1896] - 667899999[1905]     667950000[1907] - 668499999[1917]
  668550000[1919] - 669099999[1929]     669150000[1931] - 672699999[2001]
  672750000[2003] - 676299999[2073]     676350000[2075] - 679899999[2145]
  679950000[2147] - 683499999[2217]     683550000[2219] - 687099999[2289]
  687150000[2291] - 690699999[2361]     690750000[2363] - 694299999[2433]
  694350000[2435] - 697899999[2505]     697950000[2507] - 701499999[2577]
  701550000[2579] - 705099999[2649]     705150000[2651] - 708699999[2721]
```

```
 708750000[2723] - 712299999[2793]     712350000[2795] - 715899999[2865]
 715950000[2867] - 719499999[2937]     719550000[2939] - 721099999[2969]
 Count: 1804

Profiles:
 Number of profiles: 2
 CTRL profile (Profile A): rate: 461916 kbps, usable rate: 368000 kbps
 Active frequencies [subcarriers]:
 Modulation:Start-freq[start-subcarrier] - End-freq[end-subcarrier]
 ------------------------------------------------------------------
 64   :628900000[1126] - 628950000[1127]     2048 :629000000[1128] - 630650000[1161]
 2048 :630750000[1163] - 634250000[1233]     2048 :634350000[1235] - 634950000[1247]
 64   :635000000[1248] - 637850000[1305]     64   :637950000[1307] - 641450000[1377]
 64   :641550000[1379] - 645050000[1449]     64   :645150000[1451] - 648650000[1521]
 64   :648750000[1523] - 652250000[1593]     64   :652350000[1595] - 655850000[1665]
 64   :655950000[1667] - 659450000[1737]     64   :659550000[1739] - 663400000[1816]
 64   :663500000[1818] - 664000000[1828]     64   :664100000[1830] - 664550000[1839]
 64   :664650000[1841] - 665000000[1848]     64   :665100000[1850] - 665750000[1863]
 64   :666200000[1872] - 666850000[1885]     64   :666950000[1887] - 667300000[1894]
 64   :667400000[1896] - 667850000[1905]     64   :667950000[1907] - 668450000[1917]
 64   :668550000[1919] - 669050000[1929]     64   :669150000[1931] - 672650000[2001]
 64   :672750000[2003] - 676250000[2073]     64   :676350000[2075] - 679850000[2145]
 64   :679950000[2147] - 683450000[2217]     64   :683550000[2219] - 687050000[2289]
 64   :687150000[2291] - 690650000[2361]     64   :690750000[2363] - 694250000[2433]
 64   :694350000[2435] - 697850000[2505]     64   :697950000[2507] - 701450000[2577]
 64   :701550000[2579] - 705050000[2649]     64   :705150000[2651] - 708650000[2721]
 64   :708750000[2723] - 709000000[2728]     512  :709050000[2729] - 712250000[2793]
 512  :712350000[2795] - 715850000[2865]     512  :715950000[2867] - 719450000[2937]
 512  :719550000[2939] - 721000000[2968]     64   :721050000[2969] - 721050000[2969]
 Active subcarrier count: 1804, ZBL count: 0
 Discontinuity time [days:hours:mins:secs]: 00:00:54:32 [16:15:02 EDT May 18 2016]

 NCP profile:
 Active frequencies [subcarriers]:
 Modulation:Start-freq[start-subcarrier] - End-freq[end-subcarrier]
 ------------------------------------------------------------------
 16   :628900000[1126] - 630650000[1161]     16   :630750000[1163] - 634250000[1233]
 16   :634350000[1235] - 637850000[1305]     16   :637950000[1307] - 641450000[1377]
 16   :641550000[1379] - 645050000[1449]     16   :645150000[1451] - 648650000[1521]
 16   :648750000[1523] - 652250000[1593]     16   :652350000[1595] - 655850000[1665]
 16   :655950000[1667] - 659450000[1737]     16   :659550000[1739] - 663400000[1816]
 16   :663500000[1818] - 664000000[1828]     16   :664100000[1830] - 664550000[1839]
 16   :664650000[1841] - 665000000[1848]     16   :665100000[1850] - 665750000[1863]
 16   :666200000[1872] - 666850000[1885]     16   :666950000[1887] - 667300000[1894]
 16   :667400000[1896] - 667850000[1905]     16   :667950000[1907] - 668450000[1917]
 16   :668550000[1919] - 669050000[1929]     16   :669150000[1931] - 672650000[2001]
 16   :672750000[2003] - 676250000[2073]     16   :676350000[2075] - 679850000[2145]
 16   :679950000[2147] - 683450000[2217]     16   :683550000[2219] - 687050000[2289]
 16   :687150000[2291] - 690650000[2361]     16   :690750000[2363] - 694250000[2433]
 16   :694350000[2435] - 697850000[2505]     16   :697950000[2507] - 701450000[2577]
 16   :701550000[2579] - 705050000[2649]     16   :705150000[2651] - 708650000[2721]
 16   :708750000[2723] - 712250000[2793]     16   :712350000[2795] - 715850000[2865]
 16   :715950000[2867] - 719450000[2937]     16   :719550000[2939] - 721050000[2969]
 Active subcarrier count: 1804, ZBL count: 0

CCCs:
  OCD CCC: 2
  DPD CCCs:
    Control profile  (Profile A) CCC: 2
        NCP profile  CCC: 2
Resource config time taken: 2286 msecs


JIB channel number: 776
Chan Pr EnqQ  Pipe  RAF   SyncTmr DqQ ChEn   RAF Pipe Phy0 Phy1 Tun# SessId 0[TkbRt MaxP]
    1[TkbRt MaxP]
 776  0   384     1   725       0 384 0100 13032    1    0    1    2      0 479610000 4485120
 383688000 4485120
 776  1   384     1  4786       0 384 0100  2190    1    0    1    2      0 479610000 4485120
 383688000 4485120
 776  2   384     1  4786       0 384 0100  2190    1    0    1    2      0 479610000 4485120
 383688000 4485120
 776  3   384     1  4786       0 384 0100  2190    1    0    1    2      0 479610000 4485120
```

```
 383688000 4485120
 776  4   384     1  4786       0 384 0100  2190    1    0    1    2      0 479610000 4485120
 383688000 4485120
 776  5   384     1  4786       0 384 0100  2190    1    0    1    2      0 479610000 4485120
 383688000 4485120
 776  6   384     1  4786       0 384 0100  2190    1    0    1    2      0 479610000 4485120
 383688000 4485120
 776  7   384     1     0       0 384 0100     0    1    0    1    2      0 479610000 4485120
 383688000 4485120

Chan   Qos-Hi   Qos-Lo    Med-Hi   Med-Lo    Low-Hi   Low-Lo
 776   368640   245760    368640   245760    614400   368640
Chan  Med Low TB-neg Qos_Exc  Med_Xof  Low_Xof  Qdrops(H-M-L)  Pos    Qlen(Hi-Med-lo) Fl
Tgl_cnt Rdy_sts
  776   0   0      0       0        0        0    0    0    0  Y      0      0      0  0
      0 ff
Chan       Rate   Neg   Pos    LastTS  CurrCr  Pos  [PLC Rate Neg Pos]
 776   10485750 65535 65535 116199669 268431360   Y [MM 86 128 1114][EM 87 128 6204][TR 2
9 3102]
DSPHY Info:
 Local rf port 0 , rf chan 158 pic loss 123
 non short CWs: = 235681130, shorts = 0, stuff bytes = 235639172 bch 235681130
 NCP msgs: = 453809753, PLC encodings = 16902476
 flow0 rcv 70203 flow1 rcv 3 flow0 drops 0 flow1 drops 0
```

# 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
```

# Example: Configuring OFDM Channel

**Note** The OFDM modulation profile must be configured before the OFDM channel profile which references it.

The following example shows how to configure OFDM channel:

**enable**
**configure terminal**
**cable downstream ofdm-modulation-profile** *9*
**description** *512-1k-4k*
**subcarrier-spacing** *50KHz*
**width** *96000000*
**start-frequency** *627000000*
**assign modulation-default** *512-QAM*
**assign modulation** *1024-QAM* **range-subcarriers freq-abs** *635000000* **width** *74050000*
**assign modulation** *4096-QAM* **range-subcarriers freq-abs** *629000000* **width** *6000000*
**exit**
**configure terminal**
**cable downstream ofdm-chan-profile** *20*
**description** *Data profiles: 2 single mod, 1 mixed mod*
**cyclic-prefix** *192*
**interleaver-depth** *16*
**pilot-scaling** *48*
**roll-off** *128*
**subcarrier-spacing** *50KHz*
**profile-ncp modulation-default** *16-QAM*
**profile-control modulation-default** *256-QAM*
**profile-data** *1* **modulation-default** *1024-QAM*
**profile-data** *2* **modulation-default** *2048-QAM*
**profile-data** *3* **modulation-profile** *9*
**exit**
**configure terminal**
**controller integrated-cable** *3/0/0*
**max-ofdm-spectrum** *96000000*
**ofdm-freq-excl-band start-frequency** *683000000* **width** *10000000*
**rf-chan** *158*
**power-adjust** *0*
**docsis-channel-id** *159*
**ofdm channel-profile** *20* **start-frequency** *627000000* **width** *96000000* **plc** *663000000*

# Additional References

### MIBs

| MIBs | MIBs Link |
|---|---|
| • DOCS-IF31-MIB | To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL:<br>http://www.cisco.com/go/mibs |

### Technical Assistance

| Description | Link |
|---|---|
| The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.<br>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.<br>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password. | http://www.cisco.com/support |

# Feature Information for OFDM Channel Configuration

Use Cisco Feature Navigator to find information about 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 http://tools.cisco.com/ITDIT/CFN/. An account on http://www.cisco.com/ is not required.

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

*Table 1: Feature Information for OFDM Channel Configuration*

| Feature Name | Releases | Feature Information |
|---|---|---|
| DOCSIS 3.1 OFDM Channel Support | Cisco IOS-XE Release 3.18.0SP | This feature was introduced on the Cisco cBR Series Converged Broadband Routers. |
| Full Spectrum 108-1218 MHz Support | Cisco IOS-XE Release 3.18.0SP | This feature was introduced on the Cisco cBR Series Converged Broadband Routers. |
| DOCSIS 3.1 Path Selection | Cisco IOS-XE Release 3.18.0SP | This feature was introduced on the Cisco cBR Series Converged Broadband Routers. |