G.Fast and VDSL2 35b Profile

Cisco 1000 Series Intergration Services Routers (ISR) support single multimode G.fast and VDSL2 35b port, which are based on Fiber to X (FTTX) technology, to help accelerate ultra-broadband deployments at customer premises.

This chapter provides basic configuration procedures of the G.fast and VDSL2 35b and contains the following sections:

Feature Information for G.fast and VDSL2 35b Profile

The following table provides release information about the feature or features described in this module. This 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.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for G.Fast and VDSL2 35b

Feature Name	Releases	Feature Information
G.Fast and VDSL2 35b Profile	Cisco IOS XE Fuji Release 16.7.1	Cisco 1000 Series Intergration Services Routers (ISR) uses G.fast and VDSL2 35b profiles, which are based on Fiber to X (FTTx) technology, to help accelerate ultra-broadband deployments at customer premises. G.fast and VDSL2 35b are supported on the following platforms: • Cisco ISR C1112 • Cisco ISR C1113 In this release, no commands were either introduced or modified by this feature.

Restrictions for G.Fast and VDSL2 35b

• G.Fast and VDSL2 35b profile is supported only on Cisco 1100 Series Integrated Services Routers (ISRs).

Information About G.Fast and VDSL2 35b

Overview of G.fast and VDSL2 35b

G.fast is a digital subscriber line (DSL) protocol standard for local loops shorter than 500 m, with performance targets between 150 Mbit/s and 1 Gbit/s, depending on loop length. G.fast uses the gigabit broadband access technology for plain old telephone service (POTS) services that provides ultra-broadband speeds over existing wired infrastructure.

According to ITU-T G.9701, G.fast supports asymmetric and symmetric transmission at an aggregate net data rate upto 1 Gbit per sec on twisted paired wires. G.fast uses a spectrum of upto 106 MHz with all the necessary functionalities to support far-end cross-talk (FEXT) cancellation between multiple paired wires, thereby facilitating low power operation.

VDSL2 35b operates on frequencies upto 35.324 MHz with subcarrier spacing of 4.3125 kHz, supports vectoring that is compatible with ITU-T G.993.2 profile 17a. VDSL2 35b supports service providers to optimize their network infrastructure, provides simplified deployment and provisioning options, thereby lowering the overall operational cost for implementing ITU-T G.993.2.

Note There is no specific command to implement G.fast on the Cisco 1000 Series Integrated Services Routers (ISRs).

Benefits of Implementing G.fast

The ISR1000 series routers with G.fast technology provides better and improved performance using vectoring technology with dedicated speed upto 1 gigabits per sec.The infrastructural changes at customer premises is minimal because G.fast can co-exist with legacy xDSL. G.fast equipment can be deployed from fibre-fed distribution points (fibre to the distribution point, FTTdp) located very near the customer premises, or within buildings (fibre to the building, FTTB) where the existing copper wiring can be used.

Key DSL features on G.fast and VDSL2 35b

- G.fast basic standards: ITU-T G.9700 [21], ITU-T G.9701 [22], ITU-T G.9701 Amendment 1 [23], ITU-T G.997.2 [24]

- 106a and 106b profiles are supported on all G.fast supported ISR1000 Series Integrated Services Routers.

- Firmware sub-package upgrade or downgrade

- Seamless Rate Adaptation (SRA)

- Fast Rate Adaption (FRA)

- Impulse noise protection

- DSL Line Train Logging

- Vectoring, G.993.5 (G.Vector)

- Dying gasp

- Bit Swap

- Auto-Sensing Support:

- G.fast/VDSL2 combo PHY

- G.fast US/DS ratio and start frequency range

- IOS CLI

- Controller Interface CLIs

- ATM/Ethernet Interface CLIs

- Show/Debug CLIs

- MIB Support

- ADSL-LINE MIB (RFC 2662)

- VDSL2-LINE-MIB (RFC 5650)

- ENTITY-MIB

- IF-MIB

- TR-069 (CWMP)

Note VDSL2 bonding is not supported on C1100 Series Integrated Services Routers.

SRA and Bit Swap are enabled by default.

For more information on firmware upgrade and training logs, refer to the Upgrading the Modem Firmware and Collecting DSL and Training Logs sections.

Configure G.Fast and VDSL2 35b

Configuring G.fast on the Cisco 1000 ISR

```
Device# configure terminal
   controller VDSL slot/subslot/port
   operating mode auto
end
```

Before you begin

Configure the modem in the auto mode for the modem to work with G.fast and VDSL2 35b.

Example: G.Fast and VDSL2 35b

Example: The following is sample output for VDSL2 35b

```
Device# show controllers vdsL 0/3/0
Controller VDSL 0/3/0 is UP

Daemon Status:          UP

                        XTU-R (DS)              XTU-C (US)
Chip Vendor ID:         'BDCM'                  'BDCM'
Chip Vendor Specific:   0x0000                  0xC08A
Chip Vendor Country:    0xB500                  0xB500
Modem Vendor ID:        'CSCO'                  '    '
Modem Vendor Specific:  0x4602                  0x0000
Modem Vendor Country:   0xB500                  0x0000
Serial Number Near:     FGL215092KJ C1113-8P 16.8.20180
Serial Number Far:
Modem Version Near:     16.8.20180107:17011
Modem Version Far:      0xc08a

Modem Status:           TC Sync (Showtime!)
DSL Config Mode:        AUTO
Trained Mode:           G.993.2 (VDSL2) Profile 35b

TC Mode:                PTM
Selftest Result:        0x00
DELT configuration:     disabled
DELT state:             not running
```

```
Failed full inits:      0
Short inits:            0
Failed short inits:     0

Modem FW  Version:      4.16L.05
Modem PHY Version:      A2pvfbH043j.d26r

Line 0:

                        XTU-R (DS)              XTU-C (US)
Trellis:                ON                      ON
SRA:                    enabled                 enabled
SRA count:              0                       0
Bit swap:               enabled                 enabled
Bit swap count:         13                      0
Line Attenuation:        5.7 dB                  0.0 dB
Signal Attenuation:      6.4 dB                  0.0 dB
Noise Margin:            7.9 dB                 16.0 dB
Attainable Rate:         350000 kbits/s          61133 kbits/s
Actual Power:            7.0 dBm                 2.8 dBm
Per Band Status:        D1      D2      D3      U0      U1      U2      U3
Line Attenuation(dB):   3.2     3.6     6.7     N/A     0.0     0.0     N/A
Signal Attenuation(dB): 3.3     3.6     6.0     N/A     0.0     0.0     N/A
Noise Margin(dB):       8.1     8.0     7.9     N/A     19.1    14.8    N/A
Total FECC:             1968322                 1142
Total ES:               1005                    98
Total SES:              966                     88
Total LOSS:             77                      30
Total UAS:              50116                   48436
Total LPRS:             0                       0
Total LOFS:             1312                    0
Total LOLS:             0                       0


            DS Channel1   DS Channel0   US Channel1      US Channel0
Speed (kbps):            NA          348077            NA            61133
SRA Previous Speed:      NA               0            NA                0
Previous Speed:          NA          806105            NA           202881
Reed-Solomon EC:         NA           37263            NA                0
CRC Errors:              NA             827            NA               63
Header Errors:           NA               0            NA                0
Interleave (ms):         NA            0.00            NA             0.00
Actual INP:              NA           23.00            NA            22.00

Training Log :  Stopped
Training Log Filename : flash:vdsllog.bin
```

Example: The following is sample output for G.fast

```
Device# show controllers vdsL 0/3/0
Controller VDSL 0/3/0 is UP

Daemon Status:          UP

                        XTU-R (DS)              XTU-C (US)
Chip Vendor ID:         'BDCM'                  'BDCM'
Chip Vendor Specific:   0x0000                  0xC00E
Chip Vendor Country:    0xB500                  0xB500
Modem Vendor ID:        'CSCO'                  'BDCM'
Modem Vendor Specific:  0x4602                  0x0000
Modem Vendor Country:   0xB500                  0xB500
```

Example: The following is sample output for G.fast

```
Serial Number Near:      FGL213191DQ C1113-8P 16.8.20171
Serial Number Far:       eq nr port:00  oemid softwarere
Modem Version Near:      16.8.20171023:08025
Modem Version Far:       0xc00e

Modem Status:            TC Sync (Showtime!)
DSL Config Mode:         AUTO
```
Trained Mode: G.9701 (GFAST) Profile 106b
```
TC Mode:                 PTM
Selftest Result:         0x00
DELT configuration:      disabled
DELT state:              not running

Failed full inits:       0
Short inits:             0
Failed short inits:      0

Modem FW  Version:       4.16L.05
Modem PHY Version:       A2pvfbH043j.d26r

Line 0:

                         XTU-R (DS)              XTU-C (US)
Trellis:                 ON                      ON
SRA:                     enabled                 enabled
SRA count:               1                       5
Bit swap:                enabled                 enabled
Bit swap count:          0                       0
Line Attenuation:         0.0 dB                  0.0 dB
Signal Attenuation:       0.0 dB                  0.0 dB
Noise Margin:             6.4 dB                 8.9 dB
Attainable Rate:         833400 kbits/s          215007 kbits/s
Actual Power:            0.0 dBm                 4.1 dBm
RTX uc :                 0                       0
RTX tx :                 15                      26
BSW Completed :          1                       4
SRA Completed :          0                       2
FRA Completed :          0                       0
RPA Completed :          0                       0
TIGA Completed :         0                       0
Attainable Exp Thru:     833400                  214167
Error Free Thru :        805596                  202930
Total FECC:              351                     170
Total ES:                0                       0
Total SES:               0                       0
Total LOSS:              0                       0
Total UAS:               80545                   80545
Total LPRS:              0                       0
Total LOFS:              0                       0
Total LOLS:              0                       0

DS Channel1     DS Channel0   US Channel1       US Channel0
```
Speed (kbps):   NA   805677   NA   202951
```
SRA Previous Speed:         NA         805687        NA         202920
Previous Speed:             NA         805677        NA         202920
Reed-Solomon EC:            NA            351        NA            170
CRC Errors:                 NA              0        NA              0
Header Errors:              NA              0        NA              0
Interleave (ms):            NA        2810.82        NA           0.00
Actual INP:                 NA           1.47        NA           0.00

Training Log :  Stopped
Training Log Filename : flash:vdsllog.bin
```

Additional References for G.fast or VDSL2 35b

Related Documents

Related Topic	Document Title
Cisco IOS commands	Cisco IOS Master Commands List, All Releases

MIBs

MIB	MIBs Link
• CISCO-MIB	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use the URL here:Cisco MIB Locator.

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. 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. Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.	http://www.cisco.com/cisco/web/support/index.html