



# Cisco Multimode G.SHDSL EFM-ATM in Cisco ISR 1000 Series Routers

G.SHDSL is the technology that allows devices to send and receive high-speed symmetrical data streams over a single pair of copper wires at rates between 192 kbps and 15.36 Mbps. This document describes how to configure Cisco G.SHDSL Ethernet in the first mile (EFM) and Asynchronous Transfer Mode (ATM). Cisco G.SHDSL EFM/ATM Network Interface Module (NIM) connects Cisco ISR 1000 Series Routers with central office Digital Subscriber Line Access Multiplexers (DSLAMs) and provides up to four lines of G.SHDSL (ITU-T 991.2) connectivity.

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## Connecting Cisco G.SHDSL EFM or ATM to the Network

For connecting Cisco G.SHDSL EFM/ATM NIMs to a network, see the section about connecting an interface card to a network in [Connecting DSL WAN Interface Cards](#).

## Cisco G.SHDSL EFM or ATM

Cisco G.SHDSL EFM/ATM NIM support up to four pairs of digital subscriber lines (DSL). The DSL pairs are bundled in groups and configured in the Cisco IOS command-line interface (CLI) by using the `dsl-group` command. Selecting the mode (ATM or EFM) is done by using the `mode` command.

The NIM supports the following features:

- You can configure up to 4 DSL groups.
- Auto mode is supported only on one DSL group. For instance, DSL group 0.
- In ATM mode, the NIM supports maximum throughput of 22.7Mbps; each line supports 5704kbps.
- In EFM mode, the NIM supports maximum throughput of 61.4Mbps; each line supports maximum of 15Mbps with 128-TCPAM.

- In EFM mode, you can configure a DSL group with any one of the lines in 2-wire non-bonding mode or with multiple lines in bonding mode.
- Depending on the mode (ATM or EFM), the corresponding interface (ATM or EFM) is automatically created.

## Configuring Cisco G.SHDSL EFM or ATM in CPE/CO Mode

You can configure the NIM in termination mode (either in CPE or CO). NIM in CO mode supports only limited features:

### Configuring NIM-4SHDSL-EA as CPE

This section describes the following topics:

The following example shows how to configure Termination CPE.



**Note** The default termination is CPE.

```
Router# conf t
Router(config)# controller shdsl 0/1/0
Router(config-controller)# termination cpe
```

### Configuring Bonding on CPE

To ensure a successful bonding group in the ATM mode configuration, confirm that the central office (CO) network equipment that is connected with the Cisco NIM-4SHDSL-EA is also configured with the same bonding group type.

The following example shows how to configure an ATM M-pair bonding on CPE:

```
Router(config)# controller shdsl 0/1/0 Router(config-controller)# termination cpe
Router(config-controller)# mode atm
Router(config-controller)# dsl-group 0 pairs 0-3 m-pair
Router(config-controller-dsl-group)#
M-pair mode should be either one of these:
o 0-1
o 0-2
o 0-3
o 2-3
```

The following example shows how to configure an EFM bonding on CPE:

```
Router(config)# controller shdsl 0/1/0 Router(config-controller)# termination cpe
Router(config-controller)# mode efm
Router(config-controller)# dsl-group 0 pairs 0 efm-bond
Router(config-controller-dsl-group)#
```

## Verify the Configuration

The following example shows the output of a 2-wire configuration in ATM mode:

```
Router# show controllers shdsl 0/1/0
Controller SHDSL 0/1/0 is UP
Hardware is NIM-4SHDSL-EA, on slot 0,bay 0 Capabilities: EFM: 2-wire, EFM-Bond, Annex A,
B, F & G
ATM: 2-wire, Mpair, Annex A, B, F & G CPE termination
Configured Mode: ATM cdb=0x7F7ED60CF480
...
...
...
ATM Stats:
ATM-TC Tx: data cells: 0, Idle/Unassigned: 0 ATM-TC Rx: data cells: 0, uncorr HEC: 0
ATM-TC Rx: OCD: 0, LCD start: 0, LCD end: 0
Group 1 is not configured Group 2 is not configured
```

## Additional References

The following sections provide references related to the power efficiency management feature.

### MIBs

MIBs	MIBs Link
CISCO-ENTITY-FRU-CONTROL-MIB	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use the Cisco MIB Locator at: <a href="http://www.cisco.com/go/mibs">http://www.cisco.com/go/mibs</a> .  Also see the "MIB Specifications Guide for the Cisco 1100 Series Integrated Service Routers".

## 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/cisco/web/support/index.html">http://www.cisco.com/cisco/web/support/index.html</a>

