SHDSL Commands

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controller SHDSL

To configure a controller for Single-pair High-bit-rate Digital Subscriber Line (SHDSL) mode, use the **controller SHDSL** command in global configuration mode.

controller SHDSL *slot number / subslot number / port number*

Syntax Description

slot number	Defines the slot on the router in which the high-speed WAN interface cards (HWIC) is installed.
subslot number	Defines the subslot on the router in which the HWIC is installed.
port number	Defines the port on the router in which the HWIC is installed. By default, Cisco HWIC-4SHDSL and HWIC-2SHDSL use port number 0.

Command Default

Controller number: 0

Command Modes

Global configuration (config)

Command History

Release	Modification
Cisco IOS XE Release 17.2.1	Command qualified for use in Cisco SD-WAN Manager CLI templates.

Usage Guidelines

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.

Example

The following example shows how to configure a SHDSL controller.

```
Device# config-t
Device(config)# controller SHDSL 0/1/0
```

dsl-group

To create and configure a digital subscriber line (DSL) group, and enter config-controller-dsl-group mode, or to automatically configure an Asynchronous Transfer Mode (ATM) group, use the **dsl-group** command in configuration controller mode. To disable the DSL group, use the **no** form of this command.

dsl-group { *dsl-group* [**pairs** | [**m-pair**]] | **auto** [**handshake** { **auto** | **g.shdsl** | **g.shdsl.bis** } | **ignore crc** { *ignore-duration* | **always** } | **shdsl** { **4-wire mode enhanced** [**vendor-id-npsg**] | **rate** { *dsl-rate* | **auto** [**current** *current-snr-margin* | **worst** *worst-snr-margin*] } } | **shutdown**] }

no dsl-group *dsl-group*

Syntax Description

dsl-group	DSL group number. The DSL group number can be one of the following: 0 to 3
pairs	Defines the DSL wire pairs.
m-pair	M-pair mode, available only in Asynchronous Transfer Mode (ATM) (configured by the **mode atm** command). When using **m-pair**, configure **pairs** to be one of the following: 0-1 0-2 0-3 2-3
efm-bond	EFM bond, available only in Ethernet in the first mile (EFM) mode (configured by the **mode efm** command).
auto	Configure the DSL group automatically.
handshake	Handshake configuration. • **auto**: Initiate auto handshake to support automatic detection of G.SHDSL or G.SHDSL.BIS. • **g.shdsl**: Support G.SHDSL. • **g.shdsl.bis**: Support G.SHDSL.BIS.

ignore crc	Ignore CRC errors. • *ignore-duration*: Amount of time (seconds) to ignore CRC errors. • **always**: Always ignore CRC errors.
shdsl	Symmetric g.shdsl configuration. See the **4-wire mode enhanced** and **rate** options below.
4-wire mode enhanced	Symmetric G.SHDSL 4-wire mode configuration. (Optional) **vendor-id-npsg**: Configure the vendor ID to NPSG.
rate	DSL line rate configuration. • *dsl-rate*: DSL rate (kbps), excluding DSL overhead. • **auto**: Auto rate mode: • **current** *current-snr-margin*: Current SNR margin (dB). • **worst** *worst-snr-margin*: Current SNR margin (dB).
shutdown	Shut down this DSL group.
no dsl-group	When using the **no** form of the command, the options depend on what has been configured.

Command Default

No DSL group is defined or automatically configured.

Command Modes

Configuration controller (config-controller)

Configuration controller DSL group (config-controller-dsl-group)

Command History

Release	Modification
Cisco IOS XE Catalyst SD-WAN Release 17.3.1a	Command qualified for use in Cisco vManage CLI templates.

Usage Guidelines

Use the **dsl-group** command in configuration controller mode to define the DSL group, and manually configure the DSL group from configuration controller DSL group mode.

Use the **dsl-grouppairs** to define the DSL group as Ethernet First Mile (EFM) group bonding group.

Remove the DSL group before changing from a previously configured mode.

When configuring a new DSL group, configure the group with **pairs**.

Note Use the **dsl-group** command only on CPE. Do not use the Central Office (CO) option. Doing so can cause a rollback of the entire transaction.

Note Automatic configuration is not supported on IMA groups.

Automatic configuration is limited to only one DSL group and ATM interface. After a group is automatically configured, no other group can be created. All manually created groups must be deleted before creating an automatic configuration group.

```
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
Router(config-controller-dsl-group)#
```

```
Router(config)# controller SHDSL 0/1/0
Router(config-controller)# termination cpe
Router(config-controller)# mode atm
Router(config-controller)# dsl-group auto
Router(config-controller-dsl-group)#
```

```
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)#
```

```
Router(config)# controller SHDSL 0/1/0
Router(config-controller)# termination cpe
Router(config-controller)# mode efm
Router(config-controller)# dsl-group 0 pairs 0-3 efm-bond
Router(config-controller-dsl-group)#
```

```
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
Router(config-controller)# dsl-group 1 pairs 2-3 m-pair
```

The following example shows how the **no** form of the command options depend on the current configuration.

```
Device(config)# controller SHDSL 0/1/0
Device(config-controller)# dsl-group 1 pairs 2-3 m-pair
Device(config-controller-dsl-group)# exit
Device(config-controller)# no dsl-group 1 pairs 2-3 m-pair
```

firmware phy filename

To perform a PHY firmware update to the Single-pair High-bit-rate Digital Subscriber Line (SHDSL) controller, use the **firmware phy filename** command in controller configuration mode.

firmware phy filename *location*

Syntax Description

location	Firmware package location, either in the router's flash memory or a USB flash drive's memory.

Command Default None

Command Modes Controller configuration (config-controller)

Command History

Release	Modification
Cisco IOS XE Release 17.2.1	Command qualified for use in Cisco SD-WAN Manager CLI templates.

Example

The following example shows how to perform a PHY firmware update to SHDSL controller.

```
Device# config-t
Device(config)# controller SHDSL 0/1/0
Device(config-controller)# firmware phy filename flash:IDC_1.7.2.6_DFE_FW_BETA_120111A.pkg
```

Related Commands

Command	Description
controller SHDSL	Configures a SHDSL controller.

handshake

To configure a handshake, use the **handshake** command in the configuration controller DSL group mode. To remove handshake, use the **no** form of the command.

handshake { **auto** | **g.shdsl** | **g.shdsl.bis** | **ieee** | **itut** }

no handshake

Syntax Description

auto	Specifies automatic detection of SHDSL rates.
g.shdsl	Specifies G.SHDSL handshake.
g.shdsl.bis	Specifies G.SHDSL.BIS handshake.
ieee	Specifies IEEE handshake. This is supported in EFM mode only.
itut	Specifies ITUT handshake. This is supported in EFM mode only.

Command Default Auto

Command Modes Config controller DSL group (config-controller-dsl-group)

Command History

Release	Modification
Cisco IOS XE Catalyst SD-WAN Release 17.3.1a	Command qualified for use in Cisco vManage CLI templates.

Usage Guidelines

For better interoperability with different DSLAMs, use one of the following options with the **handshake auto** command:

- In CPE-ATM mode:
  - If DSLAM supports G.SHDSL rates, use the **g.shdsl** keyword.
  - If DSLAM supports G.SHDSL.BIS rates, use the **g.shdsl.bis** keyword.
- In EFM mode:
  - To avoid interoperability issues, use the **handshake** command with the keyword that matches the configuration that is in place during the termination at the CO.

```
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
Router(config-controller-dsl-group)# handshake auto
Router(config-controller-dsl-group)#

Router(config-controller-dsl-group)# no handshake
Router(config-controller-dsl-group)#
```

ignore

To ignore DSL group errors, use the **ignore** command in controller configuration DSL group mode (config-controller-dsl-grooup). To restore the default state of not ignoring errors, use the **no** form of this command.

ignore { **crc** { *seconds* | **always** } }

no ignore crc

Syntax Description

crc	Specifies cyclic redundancy check (CRC) errors.
seconds	Specifies the number of seconds to ignore errors. The range is 0 to 60 seconds.
always	Ignore errors indefinitely.

Command Default

The **no** form of this command is the default. .

Command Modes

Controller configuration DSL group mode (config-controller-dsl-grooup)

Command History

Release	Modification
Cisco IOS XE Catalyst SD-WAN Release 17.3.1a	Command qualified for use in Cisco vManage CLI templates.

Examples

The following example configures a DSL group and specifies first to ignore CRC errors, then restores the default behavior of not ignoring CRC errors.

```
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
Router(config-controller-dsl-group)# shdsl rate auto
Router(config-controller-dsl-group)# ignore crc always
Router(config-controller-dsl-group)# no ignore crc
```

mode (SHDSL)

To set the Single-pair High-bit-rate Digital Subscriber Line (SHDSL) controller mode, use the **mode** command in controller configuration mode.

mode { **atm** | **efm** }

Syntax Description

atm	Selects the ATM (Asynchronous Transfer Mode) mode. NIM supports maximum throughput of 22.7 mbps; each line supports 5704 kbps. You can configure the lines to use 2-wire, 4-wire (standard or enhanced), or m-pair.
efm	Selects the EFM (Ethernet in the First Mile) mode. NIM supports maximum throughput of 61216 kbps; each line supports maximum of 15304 kbps with 128-TCPAM. You can configure a DSL group with any one of the lines in 2-wire nonbonding mode or with multiple lines in bonding mode.

Command Default

ATM mode

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
Cisco IOS XE Catalyst SD-WAN Release 17.2.1v	Command qualified for use in Cisco SD-WAN Manager CLI templates.

Usage Guidelines

When a DSL controller is configured in ATM mode, the mode must be configured identically on both the CO and CPE sides. Both sides must be set to ATM mode.

Example

The following example shows how to select EFM mode for SHDSL controller.

```
Device# config-t
Device(config)# controller SHDSL 0/1/0
Device(config-controller)# mode efm
```

```
Device(config)# controller SHDSL 0/1/0
Device(config-controller)# termination cpe
Device(config-controller)# mode atm
Device(config-controller)# dsl-group 0 pairs 0
Device(config-controller-dsl-group)#
```

shdsl annex

To define the single-pair high-bit-rate digital subscriber line (SHDSL) G.991.2 standard, use the **shdsl annex** command in config controller DSL group mode.

shdsl annex *standard*

Syntax Description

standard	Defines the standard for the selected type of DSL group. The following annex standards are supported: • A • A-F • B (Default annexure) • B-G • F • G **IMA Group** • A • A-B • B **M-PAIR Group** • A • A-B • B • F {coding 16 | 32} • F-G {coding 16 | 32} • G {coding 16 | 32} **1-PAIR and 2-PAIR Group** • A • A-B • B • F {coding 16 | 32} • F-G {coding 16 | 32} • G {coding 16 | 32}

Command Default

SHDSL annex B

Command Modes

Config controller DSL group

Command History

Release	Modification
Cisco IOS XE Catalyst SD-WAN Release 17.3.1a	Command qualified for use in Cisco vManage CLI templates.

Usage Guidelines

Use the dsl-group command to create a DSL group, and then use the shdsl annex command to define the G.991.2 standard for the DSL group.

For additional usage guidelines, see the Cisco IOS XE shdsl annex command.

When using this command oin a CLI template in Cisco SD-WAN Manager, always create or delete annex together with rate. Both should be created or together in the same transaction. To delete annex, use **no shdsl annex** at the router prompt or in a CLI template. Failing to do so can cause issues in Cisco IOS, and can cause the Cisco Catalyst SD-WAN configuration to go out of synchronization with the device.

Examples

The following example uses the shdsl annex command to define the annex standard for a 2-Pair DSL group on a Cisco HWIC-4SHDSL:

```
Router(config-controller-dsl-group)# shdsl annex ?
  A    Annex A of G.991.2 standard
  A-B  Annex A/B of G.991.2 standard
  B    Annex B of G.991.2 standard
  F    Annex F of G.991.2 standard
  F-G  Annex F/G of G.991.2 standard
  G    Annex G of G.991.2 standard
Router(config-controller-dsl-group)# shdsl annex g ?
  coding  16-TCPAM or 32-TCPAM line coding
Router(config-controller-dsl-group)# shdsl annex g coding ?
  16-TCPAM  16-TCPAM line coding
  32-TCPAM  32-TCPAM line coding
Router(config-controller-dsl-group)# shdsl annex g coding 16 ?
  <cr>
```

Example

```
Router(config-controller-dsl-group)#shdsl annex ?
  A        Annex A of G.991.2 standard
  A-B-F-G  Annex A/B/F/G of G.991.2 standard
  A-F      Annex A/F of G.991.2 standard
  B        Annex B of G.991.2 standard
  B-G      Annex B/G of G.991.2 standard
  F        Annex F of G.991.2 standard
  G        Annex G of G.991.2 standard
Router(config-controller-dsl-group)#shdsl annex f ?
coding  16-TCPAM, 32-TCPAM line coding or auto-TCPAM line coding
```

The above TCPAM configurations are valid only in case the termination is "co". In case the termination is CPE, user will see the following output

```
shdsl annex { annex standard } [ coding < tcpam >]



Router(config-controller-dsl-group)# shdsl annex ?

A Annex A of G.991.2 standard
A-F Annex A/F of G.991.2 standard
B Annex B of G.991.2 standard
B-G Annex B/G of G.991.2 standard
F Annex F of G.991.2 standard
G Annex G of G.991.2 standard
```

```
Router(config-controller-dsl-group)# shdsl annex F coding ?

128-TCPAM 128-TCPAM line coding
16-TCPAM 16-TCPAM line coding
32-TCPAM 32-TCPAM line coding
4-TCPAM 4-TCPAM line coding
64-TCPAM 64-TCPAM line coding
8-TCPAM 8-TCPAM line coding


Router(config-controller-dsl-group)# shdsl annex F coding 32-TCPAM
```

shdsl rate

To define the single-pair high-bit-rate digital subscriber line (SHDSL) rate, use the **shdsl rate** command in config-controller-dsl-group mode. To delete the rate, use the **no** form of the command.

shdsl rate { *rate* | **auto** [**current** *current-snr-margin* | **worst** *worst-snr-margin*] }

no shdsl rate

Syntax Description

rate	SHDSL rate (kbps) for the digital subscriber line (DSL) group. The range options are shown below.
	• DSL group with 1 pair
	  • Annex A & B: 192-2304 kbps
	  • Annex F & G (32 TC-PAM): 768-5696 kbps
	  • Annex F & G (16 TC-PAM): 2304-3840 kbps
	• DSL group with 2 pairs
	  • Annex A & B: 384-4608 kbps
	  • Annex F & G (32 TC-PAM): 1536-11392 kbps
	  • Annex F & G (16 TC-PAM): 4608-7680 kbps
	• DSL group with 3 pairs
	  • Annex A & B: 576-6912 kbps
	  • Annex F & G (32 TC-PAM): 2304-12288 kbps
	  • Annex F & G (16 TC-PAM): 6912-11520 kbps
	• DSL group with 4 pairs
	  • Annex A & B: 768-9216 kbps
	  • Annex F & G (32 TC-PAM): 3072-16384 kbps
	  • Annex F & G (16 TC-PAM): 9216-15360 kbps

auto	Sets the SHDSL rate to automatic mode.
current *current-snr-margin*	Current signal-to-noise (SNR) margin.
worst *worst-snr-margin*	Worst SNR margin.

Command Default

For usage guidelines, see the Cisco IOS XE shdsl rate command.

Command Modes

Config controller DSL group

Command History

Release	Modification
Cisco IOS XE Catalyst SD-WAN Release 17.3.1a	Command qualified for use in Cisco vManage CLI templates.

Usage Guidelines

Use the dsl-group command to create a DSL group, and then use the shdsl annex command to define the G.991.2 standard for the newly created DSL group. Define the SHDSL line rate with the shdsl rate command.

Note If you enter **shdsl rate ?** at the CLI prompt to display command help, the displayed range may be incorrect.

For usage guidelines, see the Cisco IOS XE shdsl rate command.

```
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
Router(config-controller-dsl-group)# shdsl rate 2
Router(config-controller-dsl-group)#
```

shutdown (controller)

To shut down a DSL group, use the **shutdown** command in controller configuration mode. To reactivate the DSL group, use the **no** form of the command.

shutdown

no shutdown

Syntax Description

This command has no arguments or keywords.

Command Default

Using this command assumes that the interface is already enabled. By default, if this command is not issued, the interface remains enabled.

Command Modes

Controller configuration (config-controller)

Command History

Release	Modification
Cisco IOS XE Catalyst SD-WAN Release 17.2.1v	Qualified for use in Cisco vManage CLI templates.

Examples

```
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
Router(config-controller-dsl-group)# shdsl rate auto
...
Router(config-controller-dsl-group)# ignore crc always
Router(config-controller-dsl-group)# shutdown
Router(config-controller-dsl-group)# no shutdown
Router(config-controller-dsl-group)#
```

termination

To configure the termination mode of the controller, use the **termination** command in the controller configuration mode (**controller SHDSL**). You can use the **no** form of the command to configure the default termination mode (cpe), but we recommend configuring the termination mode explicitly.

termination { **co** | **cpe** }

no termination

Syntax Description

co	Set the line termination for the interface as CO (network).
cpe	Termination cpe (customer).

Command Default

The command default termination mode is CPE.

Command Modes

Controller configuration mode (config-controller)

Command History

Release	Modification
Cisco IOS XE Catalyst SD-WAN Release 17.3.1a	Command qualified for use in Cisco vManage CLI templates.

In the examples, note that SHDSL must be all capital letters.

```
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
Router(config-controller-dsl-group)#
```

```
Router(config)# controller SHDSL 0/1/0
Router(config-controller)# termination cpe
Router(config-controller)# mode atm
Router(config-controller)# dsl-group auto
Router(config-controller-dsl-group)#
```

```
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)#

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
Router(config-controller)# dsl-group 1 pairs 2-3 m-pair

Router(config)# controller SHDSL 0/1/0
Router(config-controller)# termination cpe
Router(config-controller)# mode efm
Router(config-controller)# dsl-group 0 pairs 0-3 efm-bond
Router(config-controller-dsl-group)#
```