



Configuring 10-Gigabit Ethernet WAN SPA Controllers on Cisco IOS XR Software

This module describes the configuration of 10-Gigabit Ethernet WAN SPA physical layer controllers on routers supporting Cisco IOS XR software. The 10-Gigabit Ethernet WAN SPA enables the Cisco CRS-1 to operate in DWDM Wide Area Networks (WANs) by combining Ethernet data with synchronous SONET/SDH transport. The 10-Gigabit Ethernet WAN SPA Ethernet interfaces use data-rates that are compatible with the following standards:

- SONET STS-192c transmission formats as defined by ANSI
- Synchronous Digital Hierarchy (SDH) VC-4-64c containers specified by ITU

To configure a 10-Gigabit Ethernet interface, refer to the [Configuring Ethernet Interfaces on Cisco IOS XR Software](#) module, later in this document.

Feature History for Configuring 10-Gigabit Ethernet WAN SPA Controllers

Release	Modification
Release 3.5.0	This feature was introduced on the Cisco CRS-1.

Contents

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Prerequisites for Configuring 10-Gigabit Ethernet WAN SPA Controllers

Before configuring a 10-Gigabit Ethernet WAN SPA controller, be sure that the following tasks and conditions are met:

- You must be in a user group associated with a task group that includes the proper task IDs for 10-Gigabit Ethernet WAN SPA controller commands. Task IDs for commands are listed in *Cisco IOS XR Interface and Hardware Component Command Reference*.

**Note**

After you install the 10-Gigabit Ethernet WAN SPA, the controller configuration is necessary only if you want to use LAN mode. If you are using the 10-Gigabit Ethernet WAN SPA in WAN mode, then you can skip controller configuration and go directly to 10-Gigabit Ethernet interface configuration, as described in the [Configuring Ethernet Interfaces on Cisco IOS XR Software](#) module, later in this document.

Information About 10-Gigabit Ethernet WAN SPA Controllers

The 10-Gigabit Ethernet WAN SPA controller provides the following functionality:

- toggling between WAN and LAN mode
- the ability to monitor the mode, status, and overhead bits in each section, line, and path
- the ability to monitor alarms
- VLAN tag stacking and Q in Q functionality
- Layer 2PDU filtering
- L2PT protocol translation support for the following three protocols:
 - Spanning Tree Protocol (STP)
 - Cisco discovery protocol (CDP)
 - VLAN trunking protocol (VTP)

By default, the SPA comes up in WAN mode. Use the **lanmode on** command in WAN controller configuration mode change to LAN mode and toggle back and forth between LAN and WAN modes.

**Note**

After you configure a 10-Gigabit Ethernet WAN SPA controller to run in WAN or LAN mode, you need to use the **hw-module subslot shutdown** command to cycle the power of the 10-Gigabit Ethernet WAN SPA for the mode configuration changes to take affect.

How to Configure 10-Gigabit Ethernet WAN SPA Controllers

The 10-Gigabit Ethernet WAN SPA controllers are configured in the physical layer control element of the Cisco IOS XR software configuration space. This configuration is done using the **controller wanphy** command, and is described in the task that follows.

**Note**

All interface configuration tasks for the 10-Gigabit Ethernet interfaces must be performed in interface configuration mode. Refer to *Configuring Ethernet Interfaces on Cisco IOS XR Software* module for more information.

Configuring the 10-Gigabit Ethernet WAN SPA Controller

This task describes how to configure the 10-Gigabit Ethernet WAN SPA controller to run in LAN mode.

Restrictions

- A 10-Gigabit Ethernet WAN SPA can only be connected to another 10-Gigabit Ethernet WIS interface that supports Clause 50 of the IEEE 802.3 protocol standard.
- The 10-Gigabit Ethernet WAN SPA cannot be connected to an OC192-c POS SPA.

SUMMARY STEPS

1. **configure**
2. **controller wanphy** *interface-id*
3. **[no] lanmode on**
4. **commit**
5. **exit**
6. **hw-module subslot** *subslot-id* **shutdown unpowered**
7. **commit**
8. **no hw-module subslot** *subslot-id* **shutdown unpowered**
9. **end**
or
commit
10. **exit**
11. **show controllers wanphy** *interface-id* **all**

DETAILED STEPS

	Command or Action	Purpose
Step 1	<code>configure</code> Example: RP/0/RP0/CPU0:router# configure	Enters global configuration mode.
Step 2	<code>controller wanphy interface-id</code> Example: RP/0/RP0/CPU0:router(config)# controller wanphy 0/3/4/0	Specifies the 10-Gigabit Ethernet WAN SPA controller name and enters WAN physical controller configuration mode. The <i>interface-id</i> is expressed in the <i>rack/slot/module/port</i> notation.
Step 3	<code>lanmode on</code> or <code>no lanmode on</code> Example: RP/0/RP0/CPU0:router(config-wanphy)# no shutdown	Configures the 10-Gigabit Ethernet WAN SPA to run in LAN mode or WAN mode. <ul style="list-style-type: none"> By default, the SPA comes up in WAN mode. To change the default configuration so that the SPA runs in LAN mode, enter the lanmode on command. To return the SPA to run in the default WAN mode, enter the no lanmode on command.
Step 4	<code>commit</code> Example: RP/0/RP0/CPU0:router(config-wanphy)# commit	Saves configuration changes to the running configuration file and remains within the configuration session.
Step 5	<code>exit</code> Example: RP/0/RP0/CPU0:router# exit	Exits WAN physical controller configuration mode.
Step 6	<code>hw-module subslot subslot-id shutdown unpowered</code> Example: RP/0/RP0/CPU0:router(config)# hw-module subslot 0/3/4 shutdown unpowered	Administratively shuts down the 10-Gigabit Ethernet WAN SPA controller. Replace the <i>subslot-id</i> with the subslot that contains the 10-Gigabit Ethernet WAN SPA in the <i>rack/slot/subslot</i> notation. Note You need to shutdown and cycle the SPA so that the configuration changes you performed in Step 1 through Step 4 take effect.
Step 7	<code>commit</code> Example: RP/0/RP0/CPU0:router(config)# commit	Saves configuration changes to the running configuration file and remains within the configuration session.
Step 8	<code>no hw-module subslot subslot-id shutdown unpowered</code> Example: RP/0/RP0/CPU0:router(config)# no hw-module subslot 0/3/4 shutdown unpowered	Reloads the Cisco IOS XR software on the 10-Gigabit Ethernet WAN SPA so that the mode configuration changes performed in Step 1 through Step 7 take affect. Replace the <i>subslot-id</i> with the subslot that contains the 10-Gigabit Ethernet WAN SPA in the <i>rack/slot/subslot</i> notation.

	Command or Action	Purpose
Step 9	<pre>end or commit</pre> <p>Example: RP/0/0/CPU0:router(config)# end or RP/0/0/CPU0:router(config-e3)# commit </p>	<p>Saves configuration changes.</p> <ul style="list-style-type: none"> When you issue the end command, the system prompts you to commit changes: <pre>Uncommitted changes found, commit them before exiting(yes/no/cancel)? [cancel]:</pre> <ul style="list-style-type: none"> Entering yes saves configuration changes to the running configuration file, exits the configuration session, and returns the router to EXEC mode. Entering no exits the configuration session and returns the router to EXEC mode without committing the configuration changes. Entering cancel leaves the router in the current configuration session without exiting or committing the configuration changes. Use the commit command to save the configuration changes to the running configuration file and remain within the configuration session.
Step 10	<pre>exit</pre> <p>Example: RP/0/RP0/CPU0:router# exit </p>	Exits global configuration mode.
Step 11	<pre>show controllers wanphy interface-id all</pre> <p>Example: RP/0/RP0/CPU0:router# show controllers wanphy 0/3/4/0 all </p>	<p>Verifies that the 10-Gigabit Ethernet WAN SPA is in the correct mode after the reload.</p> <p>The show controllers wanphy command also displays SONET alarm counts, Serdes count registers, and raw register data from the Rx J1 Path Trace Buffer.</p>

Examples

The following example shows how to configure a 10-Gigabit Ethernet WAN SPA controller to run in LAN mode:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# controller wanphy 0/3/4/0
RP/0/RP0/CPU0:router(config-wanphy)# lanmode on
```

To complete the mode change the SPA must be power-cycled.

```
RP/0/RP0/CPU0:router (config-wanphy)# commit
RP/0/RP0/CPU0:router (config-wanphy)# exit
RP/0/RP0/CPU0:router(config)# hw-module subslot 0/3/4 shutdown unpowered
RP/0/RP0/CPU0:router (config)# commit
RP/0/RP0/CPU0:router(config)# no hw-module subslot 0/3/4 shutdown unpowered
RP/0/RP0/CPU0:router (config)# commit
RP/0/RP0/CPU0:router (config)# exit
```

```

RP/0/RP0/CPU0:router# show controllers wanphy 0/3/4/0 all

Interface: wanphy0_3_4_0
Configuration Mode: LAN Mode
SECTION
LOF = 0, LOS = 0, BIP(B1) = 0
LINE
AIS = 0, RDI = 0, FEBE = 0, BIP(B2) = 0
PATH
AIS = 0, RDI = 0, FEBE = 0, BIP(B2) = 0
LOP = 0, NEWPTR = 0, PSE = 0, NSE = 0
WIS ALARMS
SER = 0, FELCDP = 0, FEALSP = 0
WLOS = 0, PLCD = 0
LFEBIP = 0, PBEC = 0
Active Alarms[All defects]:
Active Alarms[Highest Alarms]:
Rx(K1/K2): N/A, Tx(K1/K2): N/A
S1S0 = N/A, C2 = N/A
PATH TRACE BUFFER
Remote IP addr:
BER thresholds: N/A
TCA thresholds: N/A
REGISTERS
P_FEBE : 0
L_FE_BIP: 0
L_BIP : 0
P_BEC : 0
S_BIP : 0
J1-Rx0 : 0x 0
J1-Rx1 : 0x 0
J1-Rx2 : 0x 0
J1-Rx3 : 0x 0
J1-Rx4 : 0x 0
J1-Rx5 : 0x 0
J1-Rx6 : 0x 0
J1-Rx7 : 0x 0
Internal Information
Operational Mode : LAN Mode
Curent Alarms: 0x0

```

The following example shows how to return a 10-Gigabit Ethernet WAN SPA controller to run in the default WAN mode:

```

RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# controller wanphy 0/3/4/0
RP/0/RP0/CPU0:router(config-wanphy)# no lanmode on

```

To complete the mode change the SPA must be power-cycled.

```

RP/0/RP0/CPU0:router(config-wanphy)# commit
RP/0/RP0/CPU0:router(config-wanphy)# exit
RP/0/RP0/CPU0:router(config)# hw-module subslot 0/3/4 shutdown unpowered
RP/0/RP0/CPU0:router(config)# commit
RP/0/RP0/CPU0:router(config)# no hw-module subslot 0/3/4 shutdown unpowered
RP/0/RP0/CPU0:router(config)# commit
RP/0/RP0/CPU0:router(config)# exit

```

```

RP/0/RP0/CPU0:router# show controllers wanphy 0/3/4/0 all

Interface: wanphy0_3_4_0
Configuration Mode: WAN Mode
SECTION
  LOF = 1, LOS = 1, BIP(B1) = 2912
LINE
  AIS = 1, RDI = 0, FEBE = 949, BIP(B2) = 48562
PATH
  AIS = 1, RDI = 0, FEBE = 0, BIP(B2) = 0
  LOP = 0, NEWPTR = 0, PSE = 0, NSE = 0
WIS ALARMS
  SER = 9, FELCDP = 0, FEAISP = 0
  WLOS = 1, PLCD = 0
  LFEBIP = 47260, PBEC = 949

Active Alarms[All defects]: lof,
Active Alarms[Highest Alarms]: lof
Rx(K1/K2): N/A, Tx(K1/K2): N/A
S1S0 = N/A, C2 = N/A
PATH TRACE BUFFER
Remote IP addr: 000.000.000.000
BER thresholds: N/A
TCA thresholds: N/A

REGISTERS
P_FEBE : 949
L_FE_BIP: 47260
L_BIP : 48562
P_BEC : 949
S_BIP : 2912
J1-Rx0 : 0x3136
J1-Rx1 : 0x352e
J1-Rx2 : 0x3234
J1-Rx3 : 0x332e
J1-Rx4 : 0x3132
J1-Rx5 : 0x3900
J1-Rx6 : 0x3138
J1-Rx7 : 0x372e
Internal Information
Operational Mode : WAN Mode
Curent Alarms: 0x8

```

The following example shows how to display information about 10-Gigabit Ethernet WAN SPA controller alarms:

```

RP/0/RP0/CPU0:router#show controllers wanphy 0/3/4/0 alarms

Interface: wanphy0_3_4_0
Configuration Mode: WAN Mode
SECTION
  LOF = 1, LOS = 1, BIP(B1) = 2912
LINE
  AIS = 1, RDI = 0, FEBE = 949, BIP(B2) = 48562
PATH
  AIS = 1, RDI = 0, FEBE = 0, BIP(B2) = 0
  LOP = 0, NEWPTR = 0, PSE = 0, NSE = 0
WIS ALARMS
  SER = 9, FELCDP = 0, FEAISP = 0
  WLOS = 1, PLCD = 0
  LFEBIP = 47260, PBEC = 949

```

```

Active Alarms[All defects]:
Active Alarms[Highest Alarms]:
  Rx(K1/K2): N/A, Tx(K1/K2): N/A
  S1S0 = N/A, C2 = N/A
PATH TRACE BUFFER
Remote IP addr: 198.25.62.2
BER thresholds: N/A
TCA thresholds: N/A

```

The following example shows how to display information about 10-Gigabit Ethernet WAN SPA controller registers:

```

RP/0/RP0/CPU0:router# show controllers wanphy 0/3/4/0 registers

Interface: wanphy0_3_4_0
Configuration Mode: WAN Mode
REGISTERS
P_FEBE   : 949
L_FE_BIP: 47260
L_BIP    : 48562
P_BEC    : 949
S_BIP    : 2912
J1-Rx0   : 0x3136
J1-Rx1   : 0x352e
J1-Rx2   : 0x3234
J1-Rx3   : 0x332e
J1-Rx4   : 0x3132
J1-Rx5   : 0x3900
J1-Rx6   : 0x3138
J1-Rx7   : 0x372e
Internal Information
Operational Mode : WAN Mode
Current Alarms: 0x0

```

What to Do Next

To configure an associated 10-Gigabit Ethernet interface, see the [Configuring Ethernet Interfaces on Cisco IOS XR Software](#) module later in this document.

Additional References

The following sections provide references related to 10-Gigabit Ethernet WAN SPA controller configuration.

Related Documents

Related Topic	Document Title
Cisco IOS XR master command reference	<i>Cisco IOS XR Master Commands List</i> , Release 3.2
Cisco IOS XR interface configuration commands	<i>Cisco IOS XR Interface and Hardware Component Command Reference</i>
Initial system bootup and configuration information for a router using Cisco IOS XR software	<i>Cisco IOS XR Getting Started Guide</i>
Information about configuring interfaces and other components on the Cisco CRS-1 from a remote Craft Works Interface (CWI) client management application	<i>Cisco CRS-1 Series Carrier Routing System Craft Works Interface Configuration Guide</i>

Standards

Standards	Title
IEEE Standard 802.3ae - 2002	<i>The Ethernet Protocol IEEE 802.3ae for LAN, WAN and MAN</i>

MIBs

MIBs	MIBs Link
No new or modified MIBs are supported by this feature, and support for existing MIBs has not been modified by this feature	To locate and download MIBs for selected platforms using Cisco IOS XR software, use the Cisco MIB Locator found at the following URL: http://cisco.com/public/sw-center/netmgmt/cmtk/mibs.shtml

RFCs

RFCs	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified by this feature.	

Technical Assistance

Description	Link
The Cisco Technical Support website contains thousands of pages of searchable technical content, including links to products, technologies, solutions, technical tips, and tools. Registered Cisco.com users can log in from this page to access even more content.	http://www.cisco.com/techsupport