



Preconfiguring Physical Interfaces on Cisco IOS XR Software

This module describes the preconfiguration of physical interfaces on routers supporting Cisco IOS XR Software. For Release 3.2, preconfiguration is supported for the Packet-over-SONET (PoS) and Gigabit Ethernet interfaces.

Preconfiguration allows you to configure modular services cards before they are inserted into the router. When the cards are inserted, they are instantly configured.

The preconfiguration information is created in a different system database tree (known as the *preconfiguration directory* on the route processor [RP]), rather than with the regularly configured interfaces.

There may be some preconfiguration data that cannot be verified unless the modular services card is present, because the verifiers themselves run only on the modular services card. Such preconfiguration data is verified when the modular services card is inserted and the verifiers are initiated. A configuration is rejected if errors are found when the configuration is copied from the preconfiguration area to the active area.



Note

Only physical interfaces can be preconfigured.

Feature History for Preconfiguring Physical Interfaces on Cisco IOS XR Software

Release	Modification
Release 2.0	PoS preconfiguration was introduced on the Cisco CRS-1.
Release 3.0	Ethernet preconfiguration was introduced on the Cisco CRS-1.
Release 3.2	Support was added for the Cisco XR 12000 Series Router.

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Prerequisites for Preconfiguring Physical Interfaces

Before preconfiguring physical interfaces, be sure that the following conditions are met:

- You must be in a user group associated with a task group that includes the proper task IDs for preconfigure commands.
Task IDs for commands are listed in the *Cisco IOS XR Task ID Reference Guide*.
- Preconfiguration drivers and files are installed. Although it may be possible to preconfigure physical interfaces without a preconfiguration driver installed, the preconfiguration files are required to set the interface definition file on the router that supplies the strings for valid interface names.

Information About Preconfiguring Physical Interfaces

To preconfigure interfaces, you need to understand the following concepts:

- [Physical Interface Preconfiguration Overview](#), page HC-2
- [Benefits of Interface Preconfiguration](#), page HC-2
- [Use of the Interface Preconfigure Command](#), page HC-2
- [Active and Standby RPs and Virtual Interface Configuration](#), page HC-3

Physical Interface Preconfiguration Overview

Preconfiguration is the process of configuring interfaces before they are present in the system. Preconfigured interfaces are not verified or applied until the actual interface with the matching location (rack/slot/module) is inserted into the router. When the anticipated modular services card is inserted and the interfaces are created, the precreated configuration information is verified and, if successful, immediately applied to the router's running configuration.

Benefits of Interface Preconfiguration

Preconfigurations reduce downtime when you add new cards to the system. With preconfiguration, the new modular services card can be instantly configured and actively running during modular services card bootup.

Another advantage of performing a preconfiguration is that during a card replacement, when the modular services card is removed, you can still see the previous configuration and make modifications.

Use of the Interface Preconfigure Command

Interfaces that are not yet present in the system can be preconfigured with the **interface preconfigure** command in global configuration mode.

The **interface preconfigure** command places the router in interface configuration mode. Users should be able to add any possible interface commands. The verifiers registered for the preconfigured interfaces verify the configuration. The preconfiguration is complete when the user enters the **end** command, or any matching **exit** or global configuration mode command.

**Note**

It is possible that some configurations cannot be verified until the modular services card is inserted.

**Note**

Do not enter the **no shutdown** command for new preconfigured interfaces, because the **no** form of this command removes the existing configuration, and there is no existing configuration.

Users are expected to provide names during preconfiguration that will match the name of the interface that will be created. If the interface names do not match, the preconfiguration cannot be applied when the interface is created. The interface names must begin with the interface type that is supported by the router and for which drivers have been installed. However, the slot, port, subinterface number, and channel interface number information cannot be validated.

**Note**

Specifying an interface name that already exists and is configured (or an abbreviated name like e0/3/0/0) is not permitted.

**Note**

The **option** keyword is not validated against the type of the interface that is getting preconfigured.

Active and Standby RPs and Virtual Interface Configuration

The standby RP is available and in a state in which it can take over the work from the active RP should that prove necessary. Conditions that necessitate the standby RP to become the active RP and assume the active RP's duties include:

- Failure detection by a watchdog
- Standby RP is administratively commanded to take over
- Removal of the active RP from the chassis

If a second RP is not present in the chassis while the first is in operation, a second RP may be inserted and will automatically become the standby RP. The standby RP may also be removed from the chassis with no effect on the system other than loss of RP redundancy.

After failover, the virtual interfaces will all be present on the standby (now active) RP. Their state and configuration will be unchanged, and there will have been no loss of forwarding (in the case of tunnels) over the interfaces during the failover. The CRS-1 system uses nonstop forwarding (NSF) over tunnels through the failover of the host RP.

**Note**

The user does not need to configure anything to guarantee that the standby interface configurations are maintained.

How to Preconfigure Physical Interfaces

This section contains the following procedures:

- [Preconfiguring a PoS Interface, page HC-4](#) (Optional)
- [Preconfiguring an Ethernet Interface, page HC-6](#) (Optional)

Preconfiguring a PoS Interface

This task describes only the most basic preconfiguration of a PoS interface. You can configure many other parameters during this process. This process prepares the interface for later automatic configuration once the proper card is inserted in the router.

SUMMARY STEPS

1. **configure**
2. **interface preconfigure** *type instance*
3. **ipv4 address** *ip-address*
4. **encapsulation** {**hdlc** | **ppp**}
5. **keepalive** *seconds*
6. **end**
or
commit
7. **show running-config**

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure Example: RP/0/RP0/CPU0:router# configure	Enters global configuration mode.
Step 2	interface preconfigure <i>type instance</i> Example: RP/0/RP0/CPU0:router(config)# interface preconfigure POS 0/1/0/0	Enters interface preconfiguration mode.
Step 3	ipv4 address <i>ip-address</i> Example: RP/0/RP0/CPU0:router(config-if-pre)# ip address 192.168.255.255/32	Assigns an IP address and subnet mask to the interface.
Step 4	encapsulation { hdlc ppp } Example: RP/0/RP0/CPU0:router(config-if-pre)# encapsulation hdlc	(Optional) Sets the interface encapsulation parameter.
Step 5	keepalive <i>seconds</i> Example: RP/0/RP0/CPU0:router(config-if-pre)# keepalive 10	(Optional) Sets the interface keepalive parameter.

	Command or Action	Purpose
Step 6	<p><code>end</code> or <code>commit</code></p> <p>Example: RP/0/RP0/CPU0:router(config-if-pre)# <code>end</code> or RP/0/RP0/CPU0:router(config-if-pre)# <code>commit</code></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: Uncommitted changes found, commit them before exiting (yes/no/cancel)? <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 7	<p><code>show running-config</code></p> <p>Example: RP/0/RP0/CPU0:router# <code>show running-config</code></p>	<p>(Optional) Displays the configuration information currently running on the router.</p>

Preconfiguring an Ethernet Interface

This task describes only the most basic preconfiguration of an Ethernet interface. You can configure many other parameters during this process, including the **mtu**, **flow-control**, **mac-accounting**, and **mac-address** keywords. This process prepares the interface for later automatic configuration once the proper card is inserted in the router.

SUMMARY STEPS

1. **configure**
2. **interface preconfigure** *type instance*
3. **ipv4 address** *ip-address*
4. **commit**
5. **exit**
6. **exit**
7. **show running-config**

DETAILED STEPS

	Command or Action	Purpose
Step 1	configure Example: RP/0/RP0/CPU0:router# configure	Enters global configuration mode.
Step 2	interface preconfigure <i>type instance</i> Example: RP/0/RP0/CPU0:router(config)# interface preconfigure TenGigE 0/1/0/0.1	Specifies the TenGigE interface name and notation, and enters interface preconfiguration mode.
Step 3	ipv4 address <i>ip-address</i> Example: RP/0/RP0/CPU0:router(config-if-pre)# ipv4 address 192.168.255.255/32	Assigns an IP address and subnet mask to the interface.
Step 4	commit Example: RP/0/RP0/CPU0:router(config-if-pre)# commit	Saves configuration changes. Use the commit command to save the configuration changes to the running configuration file and remain within the configuration session.
Step 5	exit	Exits interface preconfiguration mode and enters global configuration mode.

	Command or Action	Purpose
Step 6	<code>exit</code>	Exits global configuration and enters EXEC mode.
Step 7	<code>show running-config</code>	(Optional) Displays the configuration information currently running on the router.
	Example: <code>RP/0/RP0/CPU0:router# show running-config</code>	

Configuration Examples for Preconfiguring Physical Interfaces

This section contains the following example:

[Preconfiguring an Ethernet Interface: Example, page HC-7](#)

Preconfiguring an Ethernet Interface: Example

The following example shows how to preconfigure a basic Ethernet interface:

```
RP/0/RP0/CPU0:router# configure
RP/0/RP0/CPU0:router(config)# interface preconfigure TenGigE 0/1/0/0.1
RP/0/RP0/CPU0:router(config-if)# ipv4 address 192.168.255.255/32
RP/0/RP0/CPU0:router(config-if)# commit
```

Where to Go Next

For information about configuring Gigabit Ethernet interfaces, see the [Configuring Ethernet Interfaces on Cisco IOS XR Software](#) module in this configuration guide.

For information about configuring PoS interfaces, see the [Configuring PoS Interfaces on Cisco IOS XR Software](#) module in this configuration guide.

Additional References

The sections that follow provide references related to the preconfiguration of physical interfaces.

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 the Cisco IOS XR Software.	<i>Cisco IOS XR Getting Started Guide</i>
Information about user groups and task IDs	<i>Configuring AAA Services on Cisco IOS XR Software</i> module of the <i>Cisco IOS XR System Security Configuration 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
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

MIBs

MIBs	MIBs Link
There are no applicable MIBs for this module.	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

