Preconfiguring Physical Interfaces

This module describes the preconfiguration of physical interfaces on the Cisco ASR 9000 Series Aggregation Services Routers.

Preconfiguration is supported for the following types of interfaces and controllers:

- Gigabit Ethernet

- 10-Gigabit Ethernet

- Management Ethernet

- Packet-over-SONET/SDH (POS)

- Serial

- SONET controllers and channelized SONET controllers

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 switch processor [RSP]), 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   Ten GigE interfaces will not show egress statistics when loopback line is configured because the loopback is closed at the interface controller level, before the Network Processor (NP). But on One GigE interfaces the line loopback is closed in the NP.

Note   Only physical interfaces can be preconfigured.

Feature History for Preconfiguring Physical Interfaces

Release	Modification
Release 3.7.2	Ethernet interface preconfiguration was introduced.
Release 4.0.0	POS interface preconfiguration was introduced.

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Prerequisites for Preconfiguring Physical Interfaces

You must be in a user group associated with a task group that includes the proper task IDs. The command reference guides include the task IDs required for each command. If you suspect user group assignment is preventing you from using a command, contact your AAA administrator for assistance.

Before preconfiguring physical interfaces, be sure that the following condition is met:

- 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 must understand the following concepts:

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.

Note   When you plug the anticipated modular services card in, make sure to verify any preconfiguration with the appropriate **show** commands.

Use the **show run** command to see interfaces that are in the preconfigured state.

Note   We recommend filling out preconfiguration information in your site planning guide, so that you can compare that anticipated configuration with the actual preconfigured interfaces when that card is installed and the interfaces are up.

Tip Tip Use the **commit best-effort** command to save the preconfiguration to the running configuration file. The **commit best-effort** command merges the target configuration with the running configuration and commits only valid configuration (best effort). Some configuration might fail due to semantic errors, but the valid configuration still comes up.

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.

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.

Active and Standby RSPs and Virtual Interface Configuration

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

- Failure detection by a watchdog

- Standby RSP is administratively commanded to take over

- Removal of the active RSP from the chassis

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

After failover, the virtual interfaces will all be present on the standby (now active) RSP. 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 Cisco ASR 9000 Series Router uses nonstop forwarding (NSF) over tunnels through the failover of the host RSP.

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

How to Preconfigure Physical Interfaces

This task describes only the most basic preconfiguration of an interface.

SUMMARY STEPS

1. **configure**
2. **interface preconfigure** *type interface-path-id*
3. Use one of the following commands:

   - **ipv4 address** *ip-address subnet-mask*
   - **ipv4 address***ip-address* / *prefix*

4. Configure additional interface parameters, as described in this manual in the configuration chapter that applies to the type of interface that you are configuring.
5. **end** or **commit** best-effort
6. **show running-config**

DETAILED STEPS

	Command or Action	**Purpose**
Step 1	**configure** **Example:** `RP/0/ configure`	Enters global configuration mode.

Step 2	**interface preconfigure** *type interface-path-id*
	
	Example:
	
	`RP/0//CPU0:router(config)# interface preconfigure`
	`GigabitEthernet 0/1/0/0`
		Enters interface preconfiguration mode for an interface, where *type* specifies the supported interface type that you want to configure and *interface-path-id* specifies the location where the interface will be located in *rack*/*slot*/*module*/*port* notation.

	Command or Action	**Purpose**

Step 3	Use one of the following commands:
	
	   • **ipv4 address** *ip-address subnet-mask*
	   • **ipv4 address***ip-address* / *prefix*
	
	Example:
	
	`RP/0//CPU0:router(config-if-pre)# ipv4 address`
	`192.168.1.2/32`
		Assigns an IP address and mask to the interface.

Step 4	Configure additional interface parameters, as described in this manual in the configuration chapter that applies to the type of interface that you are configuring.	

Step 5	**end** or **commit** best-effort
	
	Example:
	
	`RP/0//CPU0:router(config-if-pre)# end`
	or
	`RP/0//CPU0:router(config-if-pre)# commit`
		Saves configuration changes.
		
		   • When you issue the **end** command, the system prompts you to commit changes: `Uncommitted changes found, commit them before exiting (yes/no/cancel)?`
		
		   • 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 best-effort** command to save the configuration changes to the running configuration file and remain within the configuration session. The **commit best-effort** command merges the target configuration with the running configuration and commits only valid changes (best effort). Some configuration changes might fail due to semantic errors.

Step 6	**show running-config** **Example:** `RP/0//CPU0:router# show running-config`	(Optional) Displays the configuration information currently running on the router.

Configuration Examples for Preconfiguring Physical Interfaces

This section contains the following example:

Preconfiguring an Interface: Example

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

```
RP/0//CPU0:router# configure
RP/0//CPU0:router(config)# interface preconfigure GigabitEthernet 0/1/0/0
RP/0//CPU0:router(config-if)# ipv4 address 192.168.1.2/32
RP/0//CPU0:router(config-if)# commit
```

Preconfiguring an Interface: Example