



Overview

This document is a summary of software functionality that is specific to the Cisco 4000 Series Integrated Services Routers (ISRs).

The following table lists the router models that belong to the Cisco 4000 Series ISRs.

Table 1: Cisco 4000 Series Router Models

Cisco 4400 Series ISRs	Cisco 4300 Series ISRs	Cisco 4200 Series ISRs
<ul style="list-style-type: none">• Cisco 4431 ISR• Cisco 4451 ISR• Cisco 4461 ISR	<ul style="list-style-type: none">• Cisco 4321 ISR• Cisco 4331 ISR• Cisco 4351 ISR	Cisco 4221 ISR



Note Unless otherwise specified, the information in this document is applicable to both Cisco 4400 Series, Cisco 4300 Series and Cisco 4200 Series routers.

The following sections are included in this chapter:

- [Introduction, on page 1](#)
- [Sections in this Document, on page 2](#)
- [Processes, on page 3](#)

Introduction

The Cisco 4000 Series ISRs are modular routers with LAN and WAN connections that can be configured by means of interface modules, including Cisco Enhanced Service Modules (SM-Xs), and Network Interface Modules (NIMs). NIM slots also support removable storage for hosted applications.

The following features are provided for enterprise and service provider applications:

- Enterprise Applications
 - High-end branch gateway
 - Regional site aggregation

- Key server or PfR primary controller
- Device consolidation or "Rack in a Box"
- Service Provider Applications
 - High-end managed services in Customer-Premises Equipment (CPE)
 - Services consolidation platform
 - Route reflector or shadow router
 - Flexible customer edge router

The router runs Cisco IOS XE software, and uses software components in many separate processes. This modular architecture increases network resiliency, compared to standard Cisco IOS software.

Sections in this Document

Table 2: Sections in this Document

Section	Description
Overview, on page 1	Provides a high-level description of the router and describes the main internal processes of the router.
Using Cisco IOS XE Software	Describes the basics of using Cisco IOS XE software with the router.
Managing the Device Using Web User Interface	Describes the uses of a Gigabit Ethernet management interface and a web user interface.
Console Port, Telnet, and SSH Handling	Describes software features that are common across Cisco IOS XE platforms.
Installing the Software	Contains important information about filesystems, packages, licensing, and installing software.
Basic Router Configuration	Describes the basic tasks required to configure a router.
Slot and Subslot Configuration	Provides information about the chassis slot numbers and subslots where the service modules are installed.
System Messages	Provides information about syslog messages.
Trace Management	Describes the tracing function where logs of internal events on a router are recorded.
Environmental Monitoring and PoE Management	Describes the environmental monitoring features on a router.
Configuring High Availability	Provides information about high availability features on a router to ensure network-wide protection.

Section	Description
Configuration Examples	Lists examples that include software installation and packaging.
Managing Cisco Enhanced Services and Network Interface Modules	Includes information about modules that can be attached to the router and provides related links to further documentation. For further details on configuring the modules (NIMs and SMs), also see the Documentation Roadmap .

Processes

The list of background processes in the following table may be useful for checking router state and troubleshooting. However, you do not need to understand these processes to understand most router operations.

Table 3: Individual Processes

Process	Purpose	Affected FRUs	Sub Package Mapping
Chassis Manager	Controls chassis management functions, including management of the High Availability (HA) state, environmental monitoring, and FRU state control.	RP SIP ESP	RPControl SIPBase ESPBase
Host Manager	Provides an interface between the IOS process and many of the information gathering functions of the underlying platform kernel and operating system.	RP SIP ESP	RPControl SIPBase ESPBase
Logger	Provides IOS logging services to processes running on each FRU.	RP SIP ESP	RPControl SIPBase ESPBase
IOS	Implements all forwarding and routing features for the router.	RP	RPIOS

Process	Purpose	Affected FRUs	Sub Package Mapping
Forwarding Manager	Manages downloading of configuration details to the ESP and the communication of forwarding plane information, such as statistics, to the IOS process.	RP ESP	RPControl ESPBase
Pluggable Services	Provide integration between platform policy applications, such as authentication and the IOS process.	RP	RPControl
Shell Manager	Provides user interface (UI) features relating to non-IOS components of the consolidated package. These features are also available for use in diagnostic mode when the IOS process fails.	RP	RPControl
IO Module process	Exchanges configuration and other control messages with a NIM, or Enhanced Service Module (SM-X).	IO Module	SIPSPA
CPP driver process	Manages CPP hardware forwarding engine on the ESP.	ESP	ESPBase
CPP HA process	Manages HA state for the CPP hardware forwarding engine.	ESP	ESPBase
CPP SP process	Performs high-latency tasks for the CPP-facing functionality in the ESP instance of the Forwarding Manager process.	ESP	ESPBase

For further details of router capabilities and models, see the [Hardware Installation Guide for the Cisco 4000 Series Integrated Services Routers](#).