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Preface

This preface describes the objectives and organization of this document and explains how to find additional information on related products and services. This preface contains the following sections:

- Objectives, page 1
- Document Revision History, page 1
- Organization, page 2
- Related Documentation, page 2
- Document Conventions, page 2
- Obtaining Documentation and Submitting a Service Request, page 4

Objectives

This document describes the Cisco ASR 1000 Series Route Processor 3 (Cisco ASR1000-RP3) that is supported on the Cisco ASR 1000 Series Aggregation Services Routers. This document also describes how to install and configure the Cisco ASR1000-RP3 module.

Document Revision History

The Document Revision History records changes made to this document. The table shows the Cisco IOS XE software release number and document revision number pertaining to the change, the date of the change, and a brief summary of the change.

<table>
<thead>
<tr>
<th>Release No.</th>
<th>Date</th>
<th>Change Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cisco IOS XE Denali 16.3.1</td>
<td>November, 2016</td>
<td>First version of the document.</td>
</tr>
</tbody>
</table>
Organization

This document contains the following chapters:

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cisco ASR1000-RP3 Module Overview</td>
<td>Provides an introduction to the Cisco ASR1000-RP3 module. Also provides information about the characteristics of the module.</td>
</tr>
<tr>
<td>2</td>
<td>Preparing to Install the Cisco ASR1000-RP3 Module</td>
<td>Describes the required tools, equipment, and safety guidelines for installing the Cisco ASR1000-RP3 module.</td>
</tr>
<tr>
<td>3</td>
<td>Installing the Cisco ASR1000-RP3 Module</td>
<td>Describes the procedures for installing and removing the Cisco ASR1000-RP3 module from a Cisco ASR 1000 Series Aggregation Services Router.</td>
</tr>
<tr>
<td>4</td>
<td>Software Licensing on Cisco ASR1000-RP3 Module</td>
<td>Provides an high-level overview of the licensing options available for the Cisco ASR1000-RP3 module.</td>
</tr>
<tr>
<td>5</td>
<td>Configuring the Cisco ASR1000-RP3 Module</td>
<td>Describes a basic router configuration, and configuration pertaining to the Cisco ASR1000-RP3 module.</td>
</tr>
<tr>
<td>6</td>
<td>Upgrading the Cisco ASR1000-RP3 Module</td>
<td>Provides information on the In-Service Software Upgrades (ISSU) procedure for the Cisco ASR1000-RP3 module.</td>
</tr>
<tr>
<td>7</td>
<td>Upgrading the ROMMON</td>
<td>Provides information about ROMMON used in the Cisco ASR1000-RP3 module.</td>
</tr>
<tr>
<td>8</td>
<td>Removing and Replacing FRUs from the Cisco ASR1000-RP3 Module</td>
<td>Describes the procedures for replacing field-replaceable units (FRUs) from the Cisco ASR1000-RP3 module.</td>
</tr>
</tbody>
</table>

Related Documentation

For information about associated services and modules in Cisco ASR 1000 Series Aggregation Services Routers, see:

- Documentation Roadmap for Cisco ASR 1000 Series, Cisco IOS XE Denali 16.x.
- Cisco ASR 1009-X Router and Cisco ASR 1006-X Router Hardware Installation Guide

Document Conventions

Within the guide, the term router is generally used to refer to a variety of Cisco products (for example, routers, access servers, and switches). Routers, access servers, and other networking devices that support Cisco IOS software are shown interchangeably within examples. These products are used only for illustrative purposes, that is, an example that shows one product does not necessarily indicate that other products are not supported.
This documentation uses the following conventions:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>^ or Ctrl</td>
<td>The ^ and Ctrl symbols represent the Control key. For example, the key combination ^D or Ctrl-D means hold down the Control key while you press the D key. Keys are indicated in capital letters, but are not case sensitive.</td>
</tr>
<tr>
<td>string</td>
<td>A string is a nonquoted set of characters shown in italics. For example, when setting a Simple Network Management Protocol (SNMP) community string to public, do not use quotation marks around the string. If you do, the string will include the quotation marks.</td>
</tr>
</tbody>
</table>

Command syntax descriptions use the following conventions:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bold</td>
<td>Bold text indicates commands and keywords that you enter exactly as shown.</td>
</tr>
<tr>
<td>italics</td>
<td>Italic text indicates arguments for which you supply values.</td>
</tr>
<tr>
<td>[x]</td>
<td>Square brackets enclose an optional element (keyword or argument).</td>
</tr>
<tr>
<td></td>
<td>A vertical line indicates a choice within an optional or required set of keywords or arguments.</td>
</tr>
<tr>
<td>[x</td>
<td>y]</td>
</tr>
<tr>
<td>{x</td>
<td>y}</td>
</tr>
</tbody>
</table>

Nested sets of square brackets or braces indicate optional or required choices within optional or required elements. For example:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>[x {y</td>
<td>z}]</td>
</tr>
</tbody>
</table>
Examples use the following conventions:

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>screen</td>
<td>Examples of information displayed on the screen are set in Courier font.</td>
</tr>
<tr>
<td>bold screen</td>
<td>Examples of text that you must enter are set in Courier bold font.</td>
</tr>
<tr>
<td>&lt;  &gt;</td>
<td>Angle brackets enclose text that is not printed to the screen, such as passwords.</td>
</tr>
<tr>
<td>!</td>
<td>An exclamation point at the beginning of a line indicates a comment line. (Exclamation points are also displayed by the Cisco IOS software for certain processes.)</td>
</tr>
<tr>
<td>[  ]</td>
<td>Square brackets enclose default responses to system prompts.</td>
</tr>
</tbody>
</table>

The following conventions are used to attract the attention of the reader:

- **Caution**
  - Means *reader be careful*. In this situation, you might do something that could result in equipment damage or loss of data.

- **Note**
  - Means *reader take note*. Notes contain helpful suggestions or references to materials that may not be contained in this manual.

- **Tip**
  - Means *the following information will help you solve a problem*. The tips information might not be troubleshooting or even an action, but could be useful information, similar to a Timesaver.

---

**Obtaining Documentation and Submitting a Service Request**


Subscribe to *What’s New in Cisco Product Documentation*, which lists all new and revised Cisco technical documentation, as an RSS feed and deliver content directly to your desktop using a reader application. The RSS feeds are a free service.
Cisco ASR1000-RP3 Module Overview

This chapter contains the following sections:

- Overview, page 1-1
- Supported and Unsupported Platforms, ESPs and Line Cards, page 1-3
- Cisco ASR 1000 Series Route Processor Differences, page 1-3
- Hardware Features, page 1-4
- Model Number Location, page 1-5
- LEDs, page 1-5
- Management and Storage Connections, page 1-7

Overview

The Cisco ASR 1000 Series Route Processor 3 (Cisco ASR1000-RP3) module runs the network operating system, BINOS kernel, and the IOSD (IOS daemon). The Cisco ASR1000-RP3 module is supported on the Cisco ASR 1013, Cisco ASR 1006-X, and Cisco ASR 1009-X routers. Figure 1-1 shows the front panel of the Cisco ASR1000-RP3 module.

The Cisco ASR1000-RP3 module supports:

- the running of the router control plane, including network control packets, and connection setup
- the synchronization of the active and standby Cisco ASR1000-RP3 and Cisco ASR 1000 Series ESP master and standby (tasks include switchover from failing master to standby)
- code storage, management, and upgrade
- On-board failure logging (OBFL) with 2 MB of memory
- the downloading of operational code for SPA interface processors (SIPs), modular interface processors (MIPs), and Cisco ASR 1000 Series ESP over Ethernet out of band channel (EOBC), which is used for communication between the control processors on the Cisco ASR 1000 Series Routers
- command line interface (CLI), alarm, network management, logging, and statistics aggregation
Overview

- punt path processing of packets not supported by the embedded services processors
- configuration repository along with a solid-state drive (SSD) for logging system statistics, records, events, errors, and dump
- the management interfaces of the platform including Dual Asynchronous Receiver/Transmitter (DUART) that is used for the CON and AUX serial ports. The MGMT Ethernet (ENET) management ports, CLI, status indicators, BITS interface, reset switch, Audible Cutoff (ACO) button, USB ports for secure key distribution, and a mini-USB Console port to connect to a USB host (laptop)
- field-replaceable unit (FRU) with online insertion and removal (OIR)
- the chassis management including activation and initialization of the other cards, selection or switchover of active versus standby cards, image management and distribution, logging facilities, distribution of user configuration information, and alarm control
- the control signals for monitoring the health of power entry modules, shutting down the power and driving alarm relays located on the power entry modules
- redundancy

Note
Although the Cisco ASR1000-RP3 and Cisco ASR1000-RP2 modules can coexist in the same chassis for a short time when you are installing the Cisco ASR1000-RP3 module, you can only have one type of RP in a chassis. For detailed information on the software upgrade procedures, see Software Upgrade Process chapter of the Cisco ASR 1000 Series Aggregation Services Routers Software Configuration Guide.

Understanding Redundancy

The Cisco ASR1000-RP3 module, the Cisco ASR1000 ESPs, and power supplies support redundancy. Only one RP and one ESP are considered active at a time and no load sharing is performed. However, the non-active RP or ESP is maintained in a warm standby state so that it can take over the active role as quickly as possible if necessary.

The following combination of components are supported:

- Single RP—Single or Dual ESPs
- Dual RP—Single or Dual ESPs

In a fully redundant chassis, each RP is separately connected to each FP and I/O card slot over separate point-to-point connections of the system interconnect over the midplane. The selection of the active RP is made separately from the selection of the active ESP.
Supported and Unsupported Platforms, ESPs and Line Cards

Table 1-1 lists the platforms in which the Cisco ASR1000-RP3 module is supported or unsupported, the ESPs and line cards that are supported or unsupported.

### Table 1-1 Cisco ASR1000-RP3 Platform Support

<table>
<thead>
<tr>
<th>Supported</th>
<th>Unsupported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platforms</td>
<td></td>
</tr>
<tr>
<td>ASR 1006-X</td>
<td>ASR 1001</td>
</tr>
<tr>
<td>ASR 1009-X</td>
<td>ASR 1001-X</td>
</tr>
<tr>
<td>ASR 1013</td>
<td>ASR 1002</td>
</tr>
<tr>
<td></td>
<td>ASR 1002-X</td>
</tr>
<tr>
<td></td>
<td>ASR 1002-HX</td>
</tr>
<tr>
<td></td>
<td>ASR 1004</td>
</tr>
<tr>
<td></td>
<td>ASR 1006</td>
</tr>
<tr>
<td></td>
<td>ASR 1001-HX</td>
</tr>
<tr>
<td>ESPs</td>
<td></td>
</tr>
<tr>
<td>ASR1000-ESP40</td>
<td>ASR1000-ESP20</td>
</tr>
<tr>
<td>ASR1000-ESP100</td>
<td>ASR1000-ESP5</td>
</tr>
<tr>
<td>ASR1000-ESP200</td>
<td>ASR1000-ESP10</td>
</tr>
<tr>
<td>Line Cards</td>
<td></td>
</tr>
<tr>
<td>ASR 1000-SIP40</td>
<td>ASR 1000-SIP10</td>
</tr>
<tr>
<td>ASR 1000-MIP100</td>
<td></td>
</tr>
<tr>
<td>ASR 1000-2T+20X1GE</td>
<td></td>
</tr>
<tr>
<td>ASR 1000-6TGE</td>
<td></td>
</tr>
</tbody>
</table>

Cisco ASR 1000 Series Route Processor Differences

The Cisco ASR 1000 RPs receive and transmit network packets through active embedded services processors. Table 1-2 describes the differences between the Cisco ASR1000-RP1, Cisco ASR1000-RP2, and Cisco ASR1000-RP3 modules.

### Table 1-2 Differences Between the Cisco ASR 1000 Series RP Modules

<table>
<thead>
<tr>
<th>Feature</th>
<th>Cisco ASR1000-RP1</th>
<th>Cisco ASR1000-RP2</th>
<th>Cisco ASR1000-RP3</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU</td>
<td>Single 1.5 GHz PowerPC</td>
<td>Dual 2.66 GHz Intel x86</td>
<td>Quad 2.2 GHz Intel</td>
</tr>
<tr>
<td>DRAM Memory</td>
<td>Supports 4 GB default</td>
<td>Supports up to 8 GB of field-replaceable memory</td>
<td>8 GB default; supports up to 64 GB of field-replaceable memory</td>
</tr>
<tr>
<td>Bulk Storage Hard Disk</td>
<td>Internal 40 GB hard-disk drive</td>
<td>Front-mounted 80 GB hard-disk (field-replaceable)</td>
<td>100 GB SSD default; 200 GB and 400 GB upgrade options (field-replaceable)</td>
</tr>
<tr>
<td>Bootflash/ NVRAM</td>
<td>512 MB eUSB</td>
<td>2 GB eUSB</td>
<td>8 GB eUSB</td>
</tr>
</tbody>
</table>
Hardware Features

The Cisco ASR1000-RP3 module provides the following enhancements compared to Cisco ASR1000-RP2 module:

- Supports up to 64 GB of memory with error detection and correction
- Provides Enhanced Serdes Interconnect (ESI) at 25 Gbps
- Contains 100 GB SSD bulk storage
- Provides 8 GB bootflash
- Comes with 8 GB of DRAM memory and can be upgraded to 16 GB, 32 GB, or 64 GB

In addition, the Cisco ASR1000-RP3 module supports the following functionalities:

- On-board Failure Logging (OBFL) with 2MB of memory
- Cisco ASR 1000 Series Router system architecture and midplane
- Gigabit Ethernet switches for Ethernet Out-of-Band Channel (EOBC) communication and boot-up of the SIPS, MIPs, and Cisco ASR 1000 Series ESP
- Runs Cisco IOS network control plane (routing protocol, connections setup)
- Cisco IOS punt packet forwarding
- Active/Standby Cisco ASR1000-RP3 module and Cisco ASR 1000 Series ESP selection
- Code storage and download operational code to Cisco ASR 1000 Series ESP and Cisco ASR 1000 SIP
- Front panel support: Console, 10/100 Management port, two USB ports, mini-USB port, CON port, and AUX port.

The Cisco ASR 1000 Series Routers have one Gigabit Ethernet Management Ethernet interface on each RP. The purpose of this interface is to allow users to perform management tasks on the router; it is an interface that does not forward network traffic but can otherwise access the router, often through Telnet and SSH, and perform most management tasks on the router. The interface is useful before a router has begun routing, or in troubleshooting scenarios when the SPA interfaces are inactive.

Note the following aspects of the Management Ethernet interface:

- Each RP has a Management Ethernet interface, but only the active RP has an accessible Management Ethernet interface (the standby RP can be accessed using the console port, however).
- IPv4, IPv6, and ARP are the only routed protocols supported for the interface.
- The interface provides a method of access to the router even if the SPA interfaces or the IOS processes are down.
- A console port that can run up to 115.2 kbps with hardware flow control. One port is used as the CONSOLE port for secure configuration and status display. The default BAUD rate for the CONSOLE port should be set at 9600 BAUD. Both console and auxiliary ports are asynchronous serial ports.

Note in Cisco IOS XE Denali 16.3.1 release, BITS T1/E1 is not supported on RP3. This support will be provided in future releases.
Model Number Location

Figure 1-2 shows the location of the model number on the Cisco ASR1000-RP3 module.

![Cisco ASR1000-RP3 Model Number Location](image1)

LEDs

Figure 1-3 shows the Cisco ASR1000-RP3 LEDs.

![Cisco ASR1000-RP3 LEDs](image2)

<table>
<thead>
<tr>
<th>No.</th>
<th>LED Label</th>
<th>LED</th>
<th>Color — State</th>
<th>Behavior</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PWR</td>
<td>Power</td>
<td>Solid green</td>
<td>All power requirements are within specification.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Off</td>
<td>Router is in standby mode.</td>
</tr>
<tr>
<td>2</td>
<td>ACTV</td>
<td>Active</td>
<td>Green</td>
<td>RP is active.</td>
</tr>
<tr>
<td>No.</td>
<td>LED Label</td>
<td>LED</td>
<td>Color — State</td>
<td>Behavior</td>
</tr>
<tr>
<td>-----</td>
<td>---------------</td>
<td>------------------</td>
<td>---------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td>3</td>
<td>CRIT</td>
<td>Critical</td>
<td>Solid Red</td>
<td>Critical alarm indicator or during boot process. Example: The ambient air temperature is above 60ºC and will start shutting down in five minutes.</td>
</tr>
<tr>
<td>4</td>
<td>MAJ</td>
<td>Major</td>
<td>Solid Red</td>
<td>Major alarm indicator. Example: The ambient air temperature is beyond short term operating range of 55ºC. System will shut down above 60ºC.</td>
</tr>
<tr>
<td>5</td>
<td>HD</td>
<td>Internal hard drive LED</td>
<td>Flashing Green</td>
<td>Activity indicator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Off</td>
<td>No activity.</td>
</tr>
<tr>
<td>6</td>
<td>USB</td>
<td>External USB Flash LED</td>
<td>Flashing Green</td>
<td>Activity indicator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Off</td>
<td>No activity.</td>
</tr>
<tr>
<td>7</td>
<td>STAT</td>
<td>System status</td>
<td>Solid green</td>
<td>Cisco IOS software has successfully booted.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Yellow</td>
<td>ROMMON has successfully loaded.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Red, Flashing Red</td>
<td>System failure or during boot process.</td>
</tr>
<tr>
<td>8</td>
<td>STBY</td>
<td>Standby</td>
<td>Yellow</td>
<td>RP is the standby processor.</td>
</tr>
<tr>
<td>9</td>
<td>MIN</td>
<td>Minor</td>
<td>Amber</td>
<td>Minor alarm indicator. Ambient air temperature is beyond normal operating range of 40ºC. Example: If the RP software determines that an unknown card has been installed or if the card has failed, the card powers it off or sets a minor alarm.</td>
</tr>
<tr>
<td>10</td>
<td>BF</td>
<td>Internal USB bootflash LED</td>
<td>Flashing Green</td>
<td>Activity indicator.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Off</td>
<td>No activity.</td>
</tr>
<tr>
<td>11</td>
<td>CARRIER</td>
<td>LED</td>
<td>Off</td>
<td>Out of service or not configured.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Solid Green</td>
<td>In frame and working properly.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Amber</td>
<td>Fault or loop condition exists.</td>
</tr>
<tr>
<td>12</td>
<td>LINK</td>
<td>10/100/1000 RJ-45 Interface LED</td>
<td>Solid Green</td>
<td>Link with no activity.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Flashing Green</td>
<td>Link with activity.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Off</td>
<td>Not connected.</td>
</tr>
<tr>
<td>13</td>
<td>CON</td>
<td>Active console indicator</td>
<td>Solid Green</td>
<td>Mini-USB console is active.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Off</td>
<td>RJ45 console is active.</td>
</tr>
</tbody>
</table>
Management and Storage Connections

Figure 1-4 shows the Cisco ASR1000-RP3 management and storage connections.

Figure 1-4  Cisco ASR1000-RP3 Connectors

<table>
<thead>
<tr>
<th>No.</th>
<th>Label</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0</td>
<td>USB0 interface</td>
<td>Side-by-side USB connector used with memory sticks or smart cards for secure key distribution.</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>USB1 interface</td>
<td>Side-by-side USB connector used with memory sticks or smart cards for secure key distribution.</td>
</tr>
<tr>
<td>3</td>
<td>BITS</td>
<td>RJ-45 connector</td>
<td>Indicates BITS timing reference.</td>
</tr>
<tr>
<td>4</td>
<td>MGMT ETHERNET</td>
<td>RJ-45 jack for copper Ethernet Management Port</td>
<td>RP has an ENET port with a RJ-45 connector to attach a management device or network for network management.</td>
</tr>
<tr>
<td>5</td>
<td>CON</td>
<td>Mini-USB console connector</td>
<td>Console port to connect to a USB host (laptop).</td>
</tr>
<tr>
<td>6</td>
<td>CON</td>
<td>RJ-45 for CON</td>
<td>Console port used to connect to a terminal.</td>
</tr>
<tr>
<td>7</td>
<td>AUX</td>
<td>RJ-45 for AUX</td>
<td>Auxiliary port used for remote management purposes.</td>
</tr>
</tbody>
</table>
Preparing to Install the Cisco ASR1000-RP3 Module

This chapter describes the general equipment, safety guidelines, and site preparation requirements for installing the Cisco ASR1000-RP3 module into the router. This chapter contains the following sections:

- Required Tools and Equipment, page 2-1
- Safety Guidelines, page 2-2

Required Tools and Equipment

You need the following tools and parts to remove and install the Cisco ASR1000-RP3 module. If you need additional equipment, contact a Cisco service representative.

- Cisco ASR1000-RP3
- Number 2 Phillips screwdriver
- Your own electrostatic discharge (ESD)-prevention equipment or ESD-preventive wrist strap or ankle strap along with instructions (supplied with your line card)
- Antistatic mat
- Antistatic container
Safety Guidelines

This section provides safety guidelines that you should follow when working with any equipment that connects to electrical power or telephone wiring.

Safety Warnings

Safety warnings appear throughout this publication in procedures that, if performed incorrectly, might harm you. A warning symbol precedes each warning statement.

Warning Definition

**Warning**

**IMPORTANT SAFETY INSTRUCTIONS**

This warning symbol means danger. You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. Use the statement number provided at the end of each warning to locate its translation in the translated safety warnings that accompanied this device.

Statement 1071

**SAVE THESE INSTRUCTIONS**

**Waarschuwing**

**BELANGRIJKE VEILIGHEIDSINSTRUCTIES**

Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van de standaard praktijken om ongelukken te voorkomen. Gebruik het nummer van de verklaring onderaan de waarschuwing als u een vertaling van de waarschuwing die bij het apparaat wordt geleverd, wilt raadplegen.

**BEWAAR DEZE INSTRUCTIES**

**Varoitus**

**TÄRKEÄT TURVALLISUUDBOHJEITA**

Tämä varoitusmerkki merkitsee vaaraa. Tilanne voi aiheuttaa ruumiillisia vammoja. Ennen kuin käsittelet laitteistoa, huomioi sähköpiirien käsittelemiseen liittyvät riskit ja tutustu onnettomuuksien yleisliin ehkäisytapoihin. Turvallisuusvaroitusten käännökset löytyvät laitteessa mukana toimitettujen käännösten turvallisuusvaroitusten joukosta varoitusten lopussa näkyvien lausuntonumeroiden avulla.

**SÄILYTÄ NÄMÄ OHJEET**
Chapter 2  Preparing to Install the Cisco ASR1000-RP3 Module

Safety Guidelines

Attention IMPORTANTES INFORMATION DE SÉCURITÉ

Ce symbole d’avertissement indique un danger. Vous vous trouvez dans une situation pouvant entraîner des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers liés aux circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions des avertissements figurant dans les consignes de sécurité traduites qui accompagnent cet appareil, référerez-vous au numéro de l'instruction situé à la fin de chaque avertissement.

CONSERVEZ CES INFORMATIONS

Warnung WICHTIGE SICHERHEITSHINWEISE


BEWAHREN SIE DIESE HINWEISE GUT AUF.

Avvertenza IMPORTANTI ISTRUZIONI SULLA SICUREZZA

Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di intervenire su qualsiasi apparecchiatura, occorre essere al corrente dei pericoli relativi ai circuiti elettrici e conoscere le procedure standard per la prevenzione di incidenti. Utilizzare il numero di istruzione presente alla fine di ciascuna avvertenza per individuare le traduzioni delle avvertenze riportate in questo documento.

CONSERVARE QUESTE ISTRUZIONI

Advarsel VIKTIGE SIKKERHETSINSTRUKSJONER

Dette advarselssymbolet betyr fare. Du er i en situasjon som kan føre til skade på person. Før du begynner å arbeide med noe av utstyret, må du være oppmerksom på farene forbundet med elektriske kretser, og kjenne til standardprosedyrer for å forhindre ulykker. Bruk nummeret i slutten av hver advarsel for å finne oversettelsen i de oversatte sikkerhetsadvarslene som fulgte med denne enheten.

TA VARE PÅ DISSE INSTRUKSJONENE

Aviso INSTRUÇÕES IMPORTANTES DE SEGURANÇA

Este símbolo de aviso significa perigo. Você está em uma situação que poderá ser causadora de lesões corporais. Antes de iniciar a utilização de qualquer equipamento, tenha conhecimento dos perigos envolvidos no manuseio de circuitos elétricos e familiarize-se com as práticas habituais de prevenção de acidentes. Utilize o número da instrução fornecido ao final de cada aviso para localizar sua tradução nos avisos de segurança traduzidos que acompanham este dispositivo.

GUARDE ESTAS INSTRUÇÕES
¡Advertencia!  
INSTRUCCIONES IMPORTANTES DE SEGURIDAD  
Este símbolo de aviso indica peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considere los riesgos de la corriente eléctrica y familiarícese con los procedimientos estándar de prevención de accidentes. Al final de cada advertencia encontrará el número que le ayudará a encontrar el texto traducido en el apartado de traducciones que acompaña a este dispositivo.  
GUADE ESTAS INSTRUCCIONES  

Warning!  
VIKTIGA SÄKERHETSANVISNINGAR  
Svara dessa anvisningar  

Figure  
FONTOS BIZTONSÁGI ELOÍRÁSOK  
Ez a figyelmezet jel veszélyre utal. Sérülésveszélyt rejtó helyzetben van. Mielőtt bármely berendezésen munkát végezte, legyen figyelemmel az elektromos áramkörök okozta kockázatokra, és ismerkedjen meg a szokásos balesetvédelmi eljárásokkal. A kiadványban szereplő figyelmeztetések fordítása a készülékhez mellékelt biztonsági figyelmeztetések között található; a fordítás az egyes figyelmeztetések végén látható szám alapján kereshető meg.  
ORIZZE MEG EZEKET AZ UTASÍTÁSOKAT!  

Warning!  
ВАЖНЫЕ ИНСТРУКЦИИ ПО СОБЛЮДЕНИЮ ТЕХНИКИ БЕЗОПАСНОСТИ  
Этот символ предупреждения обозначает опасность. То есть имеет место ситуация, в которой следует опасаться телесных повреждений. Перед эксплуатацией оборудования выясните, каким опасностям может подвергаться пользователь при использовании электрических цепей, и ознакомьтесь с правилами техники безопасности для предотвращения возможных несчастных случаев. Воспользуйтесь номером заявления, приведенным в конце каждого предупреждения, чтобы найти его переведенный вариант в переводе предупреждений по безопасности, прилагаемом к данному устройству.  
СОХРАНИТЕ ЭТИ ИНСТРУКЦИИ  

Warning!  
警告 重要的安全性说明  
此警告符号代表危险。您正处于可能受到严重伤害的工作环境中。在您使用设备开始工作之前，必须充分意识到触电的危险，并熟练掌握防止事故发生的标准工作程序。请根据每项警告结尾提供的声明号码来找到此设备的安全性警告说明的翻译文本。  
请保存这些安全性说明
Safety Guidelines

VAŽNE SIGURNOSNE NAPOMENE

Ovaj simbol upozorenja predstavlja opasnost. Nalazite se u situaciji koja može prouzročiti tjelesne ozljede. Prije rada s bilo kojim uređajem, morate razumjeti opasnosti vezane uz električne sklopopove, te biti upoznati sa standardnim načinima izbjegavanja nesreća. U prevedenim sigurnosnim upozorenjima, priloženima uz uređaj, možete prema broju koji se nalazi uz pojedino upozorenje pronaći i njegov prijevod.

SAČUVAJTE OVE UPUTE

DŮLEŽITÉ BEZPEČNOSTNÍ POKyny

Tento upozorňující symbol označuje nebezpečí. Jste v situaci, která by mohla způsobit nebezpečí úrazu. Před prací na jakémkoli vybavení si uvědomte nebezpečí související s elektrickými obvyd a seznámte se se standardními opatřením pro předcházení úrazům. Podle čísla na konci každého upozornění vyhledajte jeho překlad v přeložených bezpečnostních upozorněních, která jsou přiložena k zařízení.

USCHOVEJTE TYTO POKyny
Chapter 2 Preparing to Install the Cisco ASR1000-RP3 Module

Safety Guidelines

Προειδοποίηση

ΣΗΜΑΝΤΙΚΕΣ ΟΔΗΓΙΕΣ ΑΣΦΑΛΕΙΑΣ

Αυτό το προειδοποιητικό σύμβολο σημαίνει κίνδυνο. Βρίσκεστε σε κατάσταση που μπορεί να προκαλέσει τραυματισμό. Πριν εργαστείτε σε οποιοδήποτε εξοπλισμό, να έχετε υπόψη σας τους κίνδυνους που σχετίζονται με τα ηλεκτρικά κυκλώματα και να έχετε εξοπλισθεί με τις συνηθείς πρακτικές για την αποφυγή ατυχημάτων. Χρησιμοποιήστε τον αριθμό δήλωσης που παρέχεται στο τέλος κάθε προειδοποίησης, για να εντοπίσετε τη μετάφραση της στις μεταφρασμένες προειδοποιήσεις ασφαλείας που συνοδεύουν τη συσκευή.

ΦΥΛΑΞΤΕ ΑΥΤΕΣ ΤΙΣ ΟΔΗΓΙΕΣ

הוראות בטיחות ושימור

אם אזרחה זה מסמל סכנה. את נמצאת במערכת תלויה ל（笑）راء. לפני שהпуск אועז
כליים, עליך ליאוף את הסוכנות במעגלים של להס Literal את הניהים והמקוים
לאיתם האונון. להסרה ממסכים השימור המופיעה ברקע של הלשון של אחרית את התוombres
באת הוראות בטיחות וה솥ים של הסיכום של הקטב.

שמור הוראות אחריות

WAŻNE INSTRUKCJE DOTYCZĄCE BEZPIECZEŃSTWA

Ten symbol ostrzegania oznacza niebezpieczeństwo. Zachodzi sytuacja, która może powodować obrażenia ciała. Przed przystąpieniem do prac przy urządzeniach należy zapoznać się z zagrożeniiami związanymi z układami elektrycznymi oraz ze standardowymi środkami zapobiegania wypadkom. Na końcu każdego ostrzegania podano numer, na podstawie którego można odszukać tłumaczenie tego ostrzeżenia w dołączonym do urządzenia dokumencie z tłumaczeniami ostrzeżeń.

NINIEJSZE INSTRUKCJE NALEŻY ZACHOWAĆ

DŮLEŽITÉ BEZPEČNOSTNÉ POKYNY

Tento varovný symbol označuje nebezpečenstvo. Nachádza sa v situácii s nebezpečenstvom úrazu. Pred prácou na akom kolvek vybavení si uvedomte nebezpečenstvo súvisiace s elektrickými obvodmi a oboznámte sa so štandardnými opatreniami na predchádzanie úrazom. Podľa čísla na konci každého upozornenia vyhľadajte jeho preklad v preložených bezpečnostných upozorneniach, ktoré sú priložené k zariadeniu.

USCHOVAJTE SI TENTO NÁVOD
Chapter 2  Preparing to Install the Cisco ASR1000-RP3 Module

Safety Guidelines

Electrical Equipment Guidelines

Follow these basic guidelines when working with any electrical equipment:

- Before beginning any procedures requiring access to the chassis interior, locate the emergency power off switch for the room in which you are working.
- Disconnect power and all the external cables before moving a chassis.
- Do not work alone when potentially hazardous conditions exist.
- Never assume that power has been disconnected from a circuit; always check.
- Do not perform any action that creates a potential hazard to people or makes the equipment unsafe; carefully examine your work area for possible hazards such as moist floors, ungrounded power extension cables, and missing safety grounds.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) damage, which can occur when electronic cards or components are improperly handled, results in complete or intermittent failures. The Cisco ASR1000-RP3 modules comprise printed circuit boards that are fixed to metal carriers. Electromagnetic interference (EMI) shielding and connectors are integral components of these carriers. Although the metal carriers help to protect the boards from ESD, use a preventive antistatic strap when handling the line cards.

The following are the guidelines for preventing ESD damage:

- Always use an ESD wrist strap or ankle strap and ensure that it is touching the skin.
- Connect the equipment end of the strap to an unfinished chassis surface.
- When installing a component, use any available ejector levers or captive installation screws to properly seat the bus connectors in the backplane or midplane. These devices prevent accidental removal, provide proper grounding for the system, and help to ensure that the bus connectors are properly seated.
- When removing a component, use any available ejector levers or captive installation screws to release the bus connectors from the backplane or midplane.
- Handle the carriers using the available handles or edges only; avoid touching the printed circuit boards or connectors.
- Place a removed board component-side-up on an antistatic surface or on a static shielding container. If you plan to return the component to the factory, immediately place it in a static shielding container.
- Avoid contact between the printed circuit boards and clothing. The wrist strap protects only components from ESD voltages on the body; ESD voltages on clothing can still cause damage.
- Never attempt to remove the printed circuit board from the metal carrier.

⚠️ Caution

For safety, periodically check the resistance value of the antistatic strap. The measurement should be between 1 and 10 megohms (Mohms).
Installing the Cisco ASR1000-RP3 Module

This chapter contains the following topics:

- Installing the Cisco ASR1000-RP3 Module in the Router, page 3-1
- Removing the Cisco ASR1000-RP3 Module from the Router, page 3-3

Warning

Only trained and qualified personnel should be allowed to install, replace, or service this equipment. Statement 1030

Warning

During this procedure, wear grounding wrist straps to avoid ESD damage to any card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself. Statement 94

Installing the Cisco ASR1000-RP3 Module in the Router

The Cisco ASR1000-RP3 module can be installed in Slot R1 and Slot R0 of the Cisco ASR 1013, Cisco ASR 1006-X, and Cisco ASR 1009-X routers.

Step 1
Attach an ESD-preventive wrist strap between you and an unfinished chassis surface.

Step 2
Remove the new RP from its static shielding bag.

Step 3
Using both hands, grasp the RP by its metal carrier and orient it so that its printed circuit board components are upward.
Figure 3-1  Cisco ASR1000-RP3 With Metal Carrier and Handles

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RP Slot R1</td>
</tr>
<tr>
<td>2</td>
<td>RP Slot R0</td>
</tr>
<tr>
<td>3</td>
<td>Metal Carrier</td>
</tr>
<tr>
<td>4</td>
<td>Handles</td>
</tr>
<tr>
<td>5</td>
<td>Cisco ASR1000-RP3</td>
</tr>
</tbody>
</table>

**Caution**
Handle the RP by the metal carrier or handles only (see #3 and #4 in Figure 3-1); never touch the printed circuit board components or connector pins.

**Step 4** Align the left and right edges of the RP printed circuit board between the RP slot guides.

**Step 5** Gently slide the RP all the way into its chassis slot until you feel the connectors seat with the router midplane.

**Step 6** Seat the RP in the router midplane by tightening its captive installation screws with a number 2 Phillips or a 3/16-inch flat-blade screwdriver as shown in Figure 3-2.
Removing the Cisco ASR1000-RP3 Module from the Router

Note
If you have two RPs in the router and you want to remove one, do not power down the router. Remove the RP and then insert a new one; high availability provides for the other RP to take on the processing tasks for the router.

Step 1
Slip on an ESD-preventive wrist strap and attach it to a chassis surface.

Step 2
If connected, remove any I/O cables from the RP.

Step 3
Using a number 2 Phillips or a 3/16-inch flat-blade screwdriver, loosen the two captive screws on the faceplate of the RP.

Step 4
Using the handles on both sides of the module, with both hands gently slide the module out of the chassis slot.

Caution
Handle the RP by the carrier edges only; never touch the printed circuit board components or connector pins.
Step 5  Place the RP module on an antistatic surface with its printed circuit board components facing upward or in a static shielding bag.

Note  If you are returning the RP to the factory, immediately place it in a static shielding bag.
This chapter provides a high-level overview of the licensing options available for the Cisco ASR1000-RP3 module and information about verifying the Cisco IOS license level. The Cisco ASR1000-RP3 module supports built-in evaluation, Right To Use (RTU), and permanent licenses.

The Cisco ASR1000-RP3 module supports the following license options:

- Cisco ASR 1000 IP Base License
- Cisco ASR 1000 Advanced IP Services License (AIS)
- Cisco ASR 1000 Advanced Enterprise Services License (AES)

All the licenses supported on Cisco ASR1000-RP2 are also supported on Cisco ASR1000-RP3. The commands to install, activate and monitor the licenses are same as the ones used for other ASR 1000 platforms.

### Viewing the Cisco IOS License Level

Use the `show version` command to determine the Cisco IOS license level in the router. For example:

```
Router# show version
```

```
License Level: adventerprise
License Type: RightToUse
Next reload license Level: adventerprise
```

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>License Level: adventerprise</td>
<td>Indicates the current Cisco IOS license code level.</td>
</tr>
</tbody>
</table>

### Table 4-1 show version Command Output Description
Viewing License Information

Use the `show running-config` command or the `show startup-config` command to view the license-level information. The following example displays sample output from the `show running-config` command:

```
Router# show running-config
.
.
.
license boot level adverprise
.
.
```

Table 4-1  show version Command Output Description

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>License Type: RightToUse</td>
<td>Indicates whether you are utilizing a permanent (purchased) license, an evaluation 60-day license, or a Right-to-Use license that indicates that the purchase of a license is required.</td>
</tr>
<tr>
<td>Next reload license Level: adverprise</td>
<td>Indicates the startup configuration definition that is to be used for the next reload instance.</td>
</tr>
</tbody>
</table>

Use the `show running-config` command or the `show startup-config` command to view the license-level information. The following example displays sample output from the `show running-config` command:

```
Router# show running-config
.
.
.
license boot level adverprise
.
.
```

Table 4-2  show running-config Command Output Description

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>license boot level adverprise</td>
<td>Indicates the current requested Cisco IOS license level to boot.</td>
</tr>
</tbody>
</table>

Viewing License Information

Use the `show license udi` command to determine the Universal Device Identifier (UDI) information of your chassis. This may be required at the time of purchasing a new license. The following example displays sample output from the `show license udi` command:

```
Router# show license udi
SlotID   PID                    SN                      UDI
---------------------------------------------------------------------
*        ASR1013               NWG143603HH     ASR1013:NWG143603HH
```

You can also determine the UDI information using the `show running-config` command, for example:

```
Router# show running-config
.
.
.
license udi pid ASR1013 sn NWG143603HH
.
.
```
Viewing License Information

Use the `show license all` command to display all the applicable licenses in both Primary License Storage and Built In License Storage.

**Note**

Primary License Storage stores the currently purchased and installed licenses.

The following example displays sample output from the `show license all` command:

```
Router# show license all
License Store: Primary License Storage
StoreIndex: 0   Feature: internal_service                  Version: 1.0
  License Type: Evaluation
  License State: Active, Not in Use, EULA accepted
    Evaluation total period: 1  day  0  hour
    Evaluation period left: 0  minute  0  second
    Period used: 1  day  0  hour
  License Count: Non-Counted
  License Priority: Low

License Store: Built-In License Storage
StoreIndex: 0   Feature: adventerprise                     Version: 1.0
  License Type: EvalRightToUse
  License State: Active, Not in Use, EULA not accepted
    Evaluation total period: 8  weeks 4  days
    Evaluation period left: 8  weeks 4  days
    Period used: 0  minute  0  second
  License Count: Non-Counted
  License Priority: None

StoreIndex: 1   Feature: advipservices                     Version: 1.0
  License Type: EvalRightToUse
  License State: Active, Not in Use, EULA not accepted
    Evaluation total period: 8  weeks 4  days
    Evaluation period left: 8  weeks 4  days
    Period used: 0  minute  0  second
  License Count: Non-Counted
  License Priority: None

StoreIndex: 2   Feature: avc                               Version: 1.0
  License Type: EvalRightToUse
  License State: Active, Not in Use, EULA not accepted
    Evaluation total period: 8  weeks 4  days
    Evaluation period left: 8  weeks 4  days
    Period used: 0  minute  0  second
  License Count: Non-Counted
  License Priority: None

StoreIndex: 3   Feature: fwnat_red                         Version: 1.0
  License Type: EvalRightToUse
  License State: Active, Not in Use, EULA not accepted
    Evaluation total period: 8  weeks 4  days
    Evaluation period left: 8  weeks 4  days
    Period used: 0  minute  0  second
  License Count: Non-Counted
  License Priority: None

StoreIndex: 4   Feature: ipsec                             Version: 1.0
  License Type: EvalRightToUse
  License State: Active, Not in Use, EULA not accepted
    Evaluation total period: 8  weeks 4  days
    Evaluation period left: 8  weeks 4  days
    Period used: 0  minute  0  second
  License Count: Non-Counted
  License Priority: None
```

---

**Table 4-3**  
**show running-config Command Output Description**

<table>
<thead>
<tr>
<th>Field Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>license udi pid ASR1013 sn NWG143603HH</td>
<td>License identifier information (also displayed with the <code>show license udi</code> command).</td>
</tr>
</tbody>
</table>
License State: Active, Not in Use, EULA not accepted
   Evaluation total period: 8 weeks 4 days
   Evaluation period left: 8 weeks 4 days
   Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None

StoreIndex: 5   Feature: lawful_intr Version: 1.0
License Type: EvalRightToUse
License State: Active, Not in Use, EULA not accepted
   Evaluation total period: 8 weeks 4 days
   Evaluation period left: 8 weeks 4 days
   Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None

StoreIndex: 6   Feature: lisp Version: 1.0
License Type: EvalRightToUse
License State: Active, Not in Use, EULA not accepted
   Evaluation total period: 8 weeks 4 days
   Evaluation period left: 8 weeks 4 days
   Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None

StoreIndex: 7   Feature: otv Version: 1.0
License Type: EvalRightToUse
License State: Active, Not in Use, EULA not accepted
   Evaluation total period: 8 weeks 4 days
   Evaluation period left: 8 weeks 4 days
   Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None

StoreIndex: 8   Feature: sw_redundancy Version: 1.0
License Type: EvalRightToUse
License State: Active, Not in Use, EULA accepted
   Evaluation total period: 8 weeks 4 days
   Evaluation period left: 8 weeks 3 days
   Period used: 15 hours 22 minutes
License Count: Non-Counted
License Priority: Low

StoreIndex: 9   Feature: vpls Version: 1.0
License Type: EvalRightToUse
License State: Active, Not in Use, EULA not accepted
   Evaluation total period: 8 weeks 4 days
   Evaluation period left: 8 weeks 4 days
   Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None

StoreIndex: 10 Feature: FoundationSuiteK9 Version: 1.0
License Type: EvalRightToUse
License State: Active, Not in Use, EULA not accepted
   Evaluation total period: 8 weeks 4 days
   Evaluation period left: 8 weeks 4 days
   Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None

StoreIndex: 11 Feature: AdvUCS SuiteK9 Version: 1.0
License Type: EvalRightToUse
License State: Active, Not in Use, EULA not accepted
   Evaluation total period: 8 weeks 4 days
   Evaluation period left: 8 weeks 4 days
   Period used: 0 minute 0 second
License Count: Non-Counted
License Priority: None
Evaluation License Features

The following are the features of the Evaluation license:

- A EULA will be presented, and must be accepted, the first time you enable any feature license.
- Port licensing is not supported on RP3.
- When the 60-Day Evaluation Period expires, the license automatically changes to an RTU license. As with all other RTU licenses, there is no functionality disruption or accessibility concerns following this transition.
- As with past license implementations, the Permanent license has higher precedence than the built-in EvalRTU license.
Checking Conditions Prior to System Startup

Ensure that all card slots and compartments are closed. Install blank faceplates on empty slots. Always have power supply slots filled. If you leave a power supply slot uncovered, then you risk exposure to hazardous voltages on the power pins on the midplane.

**Warning**
Blank faceplates and cover panels serve three important functions: they prevent exposure to hazardous voltages and currents inside the chassis; they contain electromagnetic interference (EMI) that might disrupt other equipment; and they direct the flow of cooling air through the chassis. Do not operate the system unless all cards, faceplates, front covers, and rear covers are in place. Statement 1029

**Note**
To view the boot sequence, you must have a console connection to the Cisco ASR 1000 Series Router before it powers up.
Ensure that the following conditions are addressed before starting up the router:

- The network interface cable or the optional Fast Ethernet Management port cable is connected.
- The chassis is securely mounted and grounded.
- The power and interface cables are connected.
- Your PC with terminal emulation program (hyperTerminal or equivalent) is connected to the console port, powered up, and is configured for 9600 baud, 8 data bits, 1 stop bit, no parity, with flow control set to none.
- You have selected passwords for access control.
- Captive installation screws are tight on all removable components.
- The console terminal is turned on.
- You have determined the IP addresses for the network interfaces.
- The shared port adapter and the NIM is inserted in its slot, if applicable.
- Empty card slots are filled with card blanks. This ensures proper air flow through the chassis and electromagnetic compatibility (EMC).

## Powering Up the Cisco ASR 1000 Modular Platforms

### Prerequisites

Before you power on, make sure that:

- The power supply cord is plugged into the power supply inlet.
- All cables are connected.
- Your computer is powered up and connected.

You are now ready to power on the system for the first time. Follow these steps.

**Step 1**

Move the power switch to the ON position. Listen for the fans; you should immediately hear them in operation. Ensure that the power supply LED OK is green and the FAIL LED is not illuminated.

The front-panel indicator LEDs provide power, activity, and status information useful during bootup. For more detailed information about the LEDs, see “LEDs” section on page 1-5.

**Step 2**

Observe the initialization process. When the system boot is complete (the process takes a few seconds), the Cisco ASR 1000 Modular Platforms (Cisco ASR 1013, Cisco ASR 1006-X, and Cisco ASR 1009-X routers) begins to initialize.

The following is an example of what is displayed during the system boot process:

**Example 5-1 Loading from ROMMON with a System Image in Bootflash**

Initializing Hardware ...

System integrity status: 9B710000 12030000 A0A00A05

System Bootstrap, Version 16.3(2r), RELEASE SOFTWARE (fc1)
Copyright (c) 1994-2016 by cisco Systems, Inc.

Current image running: Boot ROM1
Last reset cause: LocalSoft
Performing the Initial Configuration on the Router

You can perform initial configuration on the router using the procedure described in the following sections:

- “Using the Cisco setup Command Facility” section on page 5-3
- “Using the Cisco IOS-XE CLI—Manual Configuration” section on page 5-6

Using the Cisco setup Command Facility

The **setup** command facility prompts you to enter the information that is needed to configure a router quickly. The facility takes you through an initial configuration, including LAN and WAN interfaces.

**Note**
The **setup** command facility is entered automatically if there is no configuration on the router when it is booted into Cisco IOS-XE.

For information on modifying the configuration after you create it, see the *Cisco IOS XE Configuration Guide* and the *Cisco IOS XE Command References*.

This section explains how to configure a host name for the router, set passwords, and configure an interface to communicate with the management network.

**Note**
If you make a mistake while using the **setup** command facility, you can exit and run the **setup** command facility again. Press **Ctrl-C**, and enter the **setup** command in privileged EXEC mode (**Router#**).

**Step 1**
From the Cisco IOS-XE CLI, enter the **setup** command in privileged EXEC mode:

```
Router> enable
Password: <password>
Router# setup

--- System Configuration Dialog ---
Continue with configuration dialog? [yes/no]:
```

The prompts in the **setup** command facility vary depending on your router model, on the installed interface modules, and on the software image. The following steps and the user entries (in bold) are shown as examples only.

**Step 2**
To proceed using the **setup** command facility, enter **yes**.

```
Continue with configuration dialog? [yes/no]:
```
Chapter 5  Configuring the Cisco ASR1000-RP3 Module

Performing the Initial Configuration on the Router

At any point you may enter a question mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '[]'.

Step 3 Enter yes to proceed with the basic management setup that configures only enough connectivity.

Would you like to enter basic management setup? [yes/no]: yes

Step 4 Enter a hostname for the router (“myrouter” in this example):

Configuring global parameters:
Enter host name [Router]: myrouter

Step 5 Enter an enable secret password. This password is encrypted (for more security) and cannot be seen when viewing the configuration.

The enable secret is a password used to protect access to privileged EXEC and configuration modes. This password, after entered, becomes encrypted in the configuration.
Enter enable secret: cisco

Step 6 Enter an enable password that is different from the enable secret password. This password is not encrypted (and is less secure) and can be seen when viewing the configuration.

The enable password is used when you do not specify an enable secret password, with some older software versions, and some boot images.
Enter enable password: cisco123

Step 7 Enter the virtual terminal password, which prevents unauthenticated access to the router through ports other than the console port:

The virtual terminal password is used to protect access to the router over a network interface.
Enter virtual terminal password: cisco

Step 8 Respond to the following prompts as appropriate for your network:

Configure SNMP Network Management? [no]: yes

Community string [public]:

A summary of the available interfaces is displayed. The interface summary includes interface numbering, which is dependent on the router model and the installed modules and interface cards.

Current interface summary

<table>
<thead>
<tr>
<th>Interface</th>
<th>IP-Address</th>
<th>OK? Method Status</th>
<th>Protocol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Te0/0/0</td>
<td>20.1.1.1</td>
<td>YES NVRAM</td>
<td>administratively down down</td>
</tr>
<tr>
<td>Te0/0/1</td>
<td>21.1.1.1</td>
<td>YES NVRAM</td>
<td>administratively down down</td>
</tr>
<tr>
<td>GigabitEthernet0/0/0</td>
<td>11.1.1.1</td>
<td>YES NVRAM</td>
<td>down</td>
</tr>
<tr>
<td>GigabitEthernet0/0/1</td>
<td>12.1.1.1</td>
<td>YES NVRAM</td>
<td>administratively down down</td>
</tr>
<tr>
<td>GigabitEthernet0/0/2</td>
<td>13.1.1.1</td>
<td>YES NVRAM</td>
<td>administratively down down</td>
</tr>
<tr>
<td>GigabitEthernet0/0/3</td>
<td>14.1.1.1</td>
<td>YES NVRAM</td>
<td>administratively down down</td>
</tr>
<tr>
<td>GigabitEthernet0/0/4</td>
<td>15.1.1.1</td>
<td>YES NVRAM</td>
<td>administratively down down</td>
</tr>
<tr>
<td>GigabitEthernet0/0/5</td>
<td>200.1.1.1</td>
<td>YES NVRAM</td>
<td>administratively down down</td>
</tr>
<tr>
<td>Te0/1/0</td>
<td>22.1.1.1</td>
<td>YES NVRAM</td>
<td>administratively down down</td>
</tr>
<tr>
<td>GigabitEthernet0</td>
<td>2.1.12.233</td>
<td>YES NVRAM</td>
<td>up</td>
</tr>
</tbody>
</table>

Any interface listed with OK? value "NO" does not have a valid configuration

Step 9 Respond to the following prompts as appropriate for your network:

Configuring interface GigabitEthernet0/0/1:
Configure IP on this interface? [yes]: yes
IP address for this interface [10.10.10.12]:
Subnet mask for this interface [255.0.0.0]: 255.255.255.0
Class A network is 10.0.0.0, 24 subnet bits; mask is /24

The following configuration command script is created:

hostname myrouter
enable secret 5 $1$t/Dj$yAeGKv1LLZN0BX0b9efO0
enable password cisco123
line vty 0 4 password cisco snmp-server community public !
no ip routing
!
interface GigabitEthernet0/0/0
shutdown
no ip address
!
interface GigabitEthernet0/0/1
no shutdown
ip address 10.10.10.12 255.255.255.0
!
interface GigabitEthernet0/0/2
shutdown
no ip address
!
.
.
.
end

Step 10  Respond to the following prompts. Select [2] to save the initial configuration.

[0] Go to the IOS command prompt without saving this config.
[1] Return back to the setup without saving this config.
[2] Save this configuration to nvram and exit.

Enter your selection [2]: 2
Building configuration...
Use the enabled mode 'configure' command to modify this configuration.

Press RETURN to get started! RETURN

The following user prompt is displayed:

myrouter>

Completing the Configuration

When using the Cisco setup command facility, and after you have provided all the information requested by the facility as described in “Using the Cisco setup Command Facility” section on page 5-3, the final configuration appears. To complete your router configuration, follow these steps:

Step 1  The facility prompts you to save the configuration.

- If you answer no, the configuration information you entered is not saved, and you return to the router enable prompt (Router#). Enter setup to return to the System Configuration dialog box.
- If you answer yes, the configuration is saved, and you are returned to the user EXEC prompt (Router>).

Use this configuration? (yes/no) : yes
Building configuration...
Use the enabled mode 'configure' command to modify this configuration.

%LINK-3-UPDOWN: Interface GigabitEthernet0/1/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface GigabitEthernet0/1/0, changed state to up

Step 2 When messages stop appearing on your screen, press Return to get the Router> prompt.

Step 3 The Router> prompt indicates that you are now at the command-line interface (CLI) and you have just completed an initial router configuration. Note that this is not a complete configuration. At this point, you have two choices:

- Run the setup command facility again, and create another configuration:
  
  Router> enable
  Password: password
  Router# setup

- Modify the existing configuration or configure additional features by using the CLI:
  
  Router> enable
  Password: password
  Router# configure terminal
  Router(config)#

---

Using the Cisco IOS-XE CLI—Manual Configuration

This section shows you how to access the CLI to perform the initial configuration on the router.

If the system configuration message does not appear, it means a default configuration file was installed on the router prior to shipping. Follow these steps to configure the router.

Step 1 Enter no when the following system message appears on the router:

--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no

Step 2 Press Return and continue with the manual configuration:

Several log messages are displayed.

Step 3 Press Return to bring up the Router> prompt.

Step 4 Type enable to enter privileged EXEC mode:

Router> enable
Router#
Configuring the Router Hostname

The hostname is used in CLI prompts and default configuration filenames. If you do not configure the router hostname, the router uses the factory-assigned default hostname Router.

**SUMMARY STEPS**

1. enable
2. configure terminal
3. hostname name
4. end

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 enable</td>
<td>Enables privileged EXEC mode. Enter your password if prompted.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router&gt; enable</td>
<td></td>
</tr>
<tr>
<td>Step 2 configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router# configure terminal</td>
<td></td>
</tr>
<tr>
<td>Step 3 hostname name</td>
<td>Specifies or modifies the hostname for the network server.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router(config)# hostname</td>
<td></td>
</tr>
<tr>
<td>Step 4 end</td>
<td>(Optional) Returns to privileged EXEC mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>myrouter# end</td>
<td></td>
</tr>
</tbody>
</table>

**Configuring the Enable and Enable Secret Passwords**

To provide an additional layer of security, particularly for passwords that cross the network or are stored on a TFTP server, you can use either the *enable password* command or *enable secret* command. Both commands accomplish the same thing—they allow you to establish an encrypted password that users must enter to access privileged EXEC (enable) mode.

We recommend that you use the *enable secret* command because it uses an improved encryption algorithm.

For more information, see the “Configuring Passwords and Privileges” chapter in the *Cisco IOS Security Configuration Guide*. Also see the *Cisco IOS Password Encryption Facts* tech note and the *Improving Security on Cisco Routers* tech note.
Restrictions

If you configure the `enable secret` command, it takes precedence over the `enable password` command; the two commands cannot be in effect simultaneously.

**SUMMARY STEPS**

1. `enable`
2. `configure terminal`
3. `enable secret password`
4. `end`
5. `enable`
6. `end`

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> <code>enable</code></td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router&gt; enable</td>
<td></td>
</tr>
<tr>
<td><strong>Step 2</strong> <code>configure terminal</code></td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router# configure terminal</td>
<td></td>
</tr>
<tr>
<td><strong>Step 3</strong> <code>enable secret password</code></td>
<td>Specifies an additional layer of security over the <code>enable password</code> command.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router(config)# enable secret greentree</td>
<td></td>
</tr>
<tr>
<td><strong>Step 4</strong> <code>end</code></td>
<td>Returns to privileged EXEC mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router(config)# end</td>
<td></td>
</tr>
<tr>
<td><strong>Step 5</strong> <code>enable</code></td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router(config)# enable</td>
<td>Verifies that your new enable or enable secret password works.</td>
</tr>
<tr>
<td><code>end</code></td>
<td></td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router&gt; enable</td>
<td></td>
</tr>
<tr>
<td><strong>Step 6</strong> <code>end</code></td>
<td>(Optional) Returns to privileged EXEC mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router(config)# end</td>
<td></td>
</tr>
</tbody>
</table>
Configuring the Console Idle Privileged EXEC Timeout

This section describes how to configure the console line's idle privileged EXEC timeout. By default, the privileged EXEC command interpreter waits 10 minutes to detect user input before timing out.

When you configure the console line, you can also set communication parameters, specify autobaud connections, and configure terminal operating parameters for the terminal that you are using. For more information on configuring the console line, see the *Cisco IOS Configuration Fundamentals and Network Management Configuration Guide*. In particular, see the “Configuring Operating Characteristics for Terminals” and “Troubleshooting and Fault Management” chapters.

**SUMMARY STEPS**

1. enable
2. configure terminal
3. line console 0
4. exec-timeout minutes [seconds]
5. end
6. show running-config

**DETAILED STEPS**

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 enable</td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td></td>
<td>Enter your password if prompted.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router&gt; enable</td>
<td></td>
</tr>
<tr>
<td>Step 2 configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router# configure terminal</td>
<td></td>
</tr>
<tr>
<td>Step 3 line console 0</td>
<td>Configures the console line and starts the line configuration command collection mode.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router(config)# line console 0</td>
<td></td>
</tr>
<tr>
<td>Step 4 exec-timeout minutes [seconds]</td>
<td>Sets the idle privileged EXEC timeout, which is the interval that the privileged EXEC command interpreter waits until user input is detected.</td>
</tr>
<tr>
<td>Example:</td>
<td></td>
</tr>
<tr>
<td>Router(config-line)# exec-timeout 0 0</td>
<td>The example shows how to specify no timeout. Setting the exec-timeout value to 0 will cause the router to never log out after it is logged in. This could have security implications if you leave the console without manually logging out using the disable command.</td>
</tr>
</tbody>
</table>
Performing the Initial Configuration on the Router

### Step 5

**Command or Action**

```
end
```

**Purpose**

Returns to privileged EXEC mode.

**Example:**

```bash
Router(config)# end
```

### Step 6

**Command or Action**

```
show running-config
```

**Purpose**

Displays the running configuration file.

**Example:**

```bash
Router# show running-config
```

### Examples

The following example shows how to set the console idle privileged EXEC timeout to 2 minutes 30 seconds:

```
line console
exec-timeout 2 30
```

The following example shows how to set the console idle privileged EXEC timeout to 30 seconds:

```
line console
exec-timeout 0 30
```

### Gigabit Ethernet Management Interface Overview

The router provides an Ethernet management port named GigabitEthernet0.

The purpose of this interface is to allow users to perform management tasks on the router; it is an interface that should not, and often cannot, forward network traffic. It can, however, be used to access the router through Telnet and SSH to perform management tasks on the router. The interface is useful before a router has begun routing, or in troubleshooting scenarios when other forwarding interfaces are inactive.

The following aspects of the management Ethernet interface should be noted:

- The router has one management Ethernet interface named GigabitEthernet0.
- IPv4, IPv6, and ARP are the only routed protocols supported for the interface.
- The interface provides a way to access the router even if forwarding interfaces are not functional, or the Cisco IOS is down.
- The management Ethernet interface is part of its own VRF. See the *Cisco ASR 1000 Series Aggregation Services Routers Software Configuration Guide* for more details.

### Default Gigabit Ethernet Configuration

By default, a forwarding VRF is configured for the interface with a special group named Mgmt-intf. This cannot be changed. This isolates the traffic on the management interface away from the forwarding plane. Otherwise, the interface can be configured like other Gigabit Ethernet interfaces for most functions.

For example, the default configuration is as follows:

```
interface GigabitEthernet0
vrf forwarding Mgmt-intf
```
Configuring Gigabit Ethernet Interfaces

This section shows how to assign an IP address and interface description to an Ethernet interface on your router.

For comprehensive configuration information on Gigabit Ethernet interfaces, see the “Configuring LAN Interfaces” chapter of the Cisco IOS Interface and Hardware Component Configuration Guide.

For information on interface numbering, see the software configuration guide pertaining to your router.

### SUMMARY STEPS

1. `enable`
2. `show ip interface brief`
3. `configure terminal`
4. `interface gigabitethernet 0`
5. `ip address ip-address mask`
6. `no shutdown`
7. `end`
8. `show ip interface brief`

### DETAILED STEPS

<table>
<thead>
<tr>
<th>Command or Action</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Step 1</strong> enable</td>
<td>Enables privileged EXEC mode.</td>
</tr>
<tr>
<td></td>
<td>Enter your password if prompted.</td>
</tr>
<tr>
<td><strong>Step 2</strong> show ip interface brief</td>
<td>Displays a brief status of the interfaces that are configured for IP and the type of Ethernet interface that is on your router.</td>
</tr>
<tr>
<td><strong>Step 3</strong> configure terminal</td>
<td>Enters global configuration mode.</td>
</tr>
<tr>
<td><strong>Step 4</strong> interface gigabitethernet 0</td>
<td>Specifies the Ethernet interface and enters interface configuration mode.</td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Router&gt; enable</td>
<td></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Router# show ip interface brief</td>
<td></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Router# configure terminal</td>
<td></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
<tr>
<td>Router(config)# interface gigabitethernet 0</td>
<td></td>
</tr>
<tr>
<td><strong>Example:</strong></td>
<td></td>
</tr>
</tbody>
</table>
Saving Your Router Configuration

This section describes how to avoid losing your configuration at the next system reload or power cycle by saving the running configuration to the startup configuration in NVRAM. The NVRAM provides 32 MB of storage on the router.

SUMMARY STEPS

1. enable
2. copy running-config startup-config
### Verifying the Initial Configuration

Enter the following commands in Cisco IOS-XE to verify the initial configuration on the router:

- **show version**—Displays the system hardware version, the installed software version, the names and sources of configuration files, the boot images, and the amount of installed DRAM, NVRAM, and flash memory.
- **show diag**—Lists and displays diagnostic information about the installed controllers, interface processors, and port adapters.
- **show configuration**—Helps verify if you have configured the correct hostname and password.

After you have completed and verified the initial configuration, the specific features and functions are ready to be configured. See the *Cisco ASR 1000 Series Aggregation Services Routers Software Configuration Guide*.

### Powering Off the Cisco ASR 1000 Modular Platforms

This section explains how to shut down the Cisco ASR 1000 Modular Platforms (Cisco ASR 1013, Cisco ASR 1006-X, and Cisco ASR 1009-X routers). We recommend that before turning off all power to the chassis, you issue the **reload** command. This ensures that the operating system cleans up all the file systems.

To remove power from the Cisco ASR 1000 Modular Platforms safely, follow this procedure:

#### Step 1
Slip on the ESD-preventive wrist strap included in the accessory kit.
Step 2  Enter the `reload` command.

Step 3  Confirm the `reload` command:

```
Router# reload
Proceed with reload? [confirm]
```

```
Apr 21 03:42:59.920 R0/0: %PMAN-5-EXITACTION: Process manager is exiting: process exit with reload chassis code
```

Step 4  After confirming the `reload` command, wait until the system bootstrap message is displayed before powering off the system:

```
System Bootstrap, Version 16.3(2r), RELEASE SOFTWARE (fc1)
Copyright (c) 1994-2016 by cisco Systems, Inc.
Current image running: Boot ROM1
Last reset cause: LocalSoft
ASR1000-RP3 platform with 67108864 Kbytes of main memory
```

Step 5  Place the Standby switch in the Standby position.

**Note**  The fans in the power supply modules continue to run even if the Standby switch is in the Standby position.

**Note**  After powering off the router, wait for a minimum of 30 seconds before powering it on again.

**Cisco ASR1000-RP3 Alarm Monitoring**

The Cisco ASR1000-RP3 faceplate displays the CRIT, MAJ, and MIN alarm indicator LEDs. An external element can be connected to a power supply using the DB-25 alarm connector on the power supply. The external element is a DC light bulb for a visual alarm and a bell for an audible alarm.

If an alarm illuminates the CRIT, MIN, or MAJ LED on the Cisco ASR 1000 Series Route Processor (RP) faceplate, and a visual or audible alarm is wired, the alarm also activates an alarm relay in the power supply DB-25 connector (on the Cisco ASR 1006 Router and Cisco ASR 1004 Router). The bell rings or the light bulb flashes and alerts site personnel that a router alarm condition exists.

**Note**  Shielded cables must be used to connect to the DB-25 alarm connector on both the AC and DC power supplies, in order to comply with the FCC/EN55022/CISPR22 Class A emissions requirements.

The alarm signals sent to this DB-25 connector are identical in function to those sent to the system LEDs on the Cisco ASR1000-RP1, Cisco ASR1000-RP2, and Cisco ASR1000-RP3. Each alarm consists of three contact pins that are switched when an alarm becomes active, which causes a corresponding contact closure between the DB-25 connector pins. As a result, a critical, major, or minor alarm condition detected in the router can trigger a simultaneous fault indication in some of the following ways:
• System alarm LEDs—The three system alarm LEDs on the Cisco ASR1000-RP3 faceplate constitute the standard method of alarm notification in the router. These LEDs indicate router status at all times, but you must directly observe these LEDs to become aware of a router alarm condition. See Cisco ASR 1000 Series Route Processor LEDs for LED descriptions.

• External alarm monitoring facility—By equipping your router with a telco-style external alarm monitoring facility, you can provide a more physical indication of router status. A visual alarm, however, can be reset only by resolving the problem that caused the alarm condition.

An external audible alarm can be reset by clearing the condition that caused the alarm or by pressing the Audible Cutoff (ACO) button on the Cisco ASR1000-RP3 module. An audible alarm can be sounded to immediately alert you to an alarm condition in the router. An audible alarm generated by the system continues to sound until you either press the ACO button to silence the alarm or clear the alarm condition itself. Pressing this button does not resolve the alarm condition.

• To clear an audible alarm, do one of the following:
  – Press the Audible Cut Off button on the route processor faceplate (see Figure 2-1: Cisco ASR1000-RP Route Processor Faceplate LEDs and Connectors)
  – Enter the clear facility-alarm command.

• To clear a visual alarm, you must resolve the alarm condition. The clear facility-alarm command does not clear an alarm LED on the RP faceplate or turn off the DC light bulb. For example, if a critical alarm LED is illuminated because an active SPA was removed without a graceful deactivation of the SPA, the only way to resolve that alarm is to replace the SPA.

### Reporting Functions

The chassis manager on the forwarding engine control processor manages the local resources of the forwarding processor. The Cisco ASR 1000 Modular Platforms (Cisco ASR 1013, Cisco ASR 1006-X, and Cisco ASR 1009-X routers) display warning messages on the console if the chassis interface-monitored parameters exceed a threshold. You can also retrieve and display environmental status reports with the following commands:

• `show environment all`
• `show version`
• `show inventory`
• `show platform`
• `show platform software status control-processor`
• `show diag`

Parameters are measured and reporting functions are updated every 60 seconds. A brief description of each of these commands follows.

The `show environment all` command displays temperature, voltage, fan, and power supply information. The following is sample output from the `show environment all` command.

#### Example 5-2 show environment all Command

<table>
<thead>
<tr>
<th>Sensor</th>
<th>Location</th>
<th>State</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1: VMA</td>
<td>F0</td>
<td>Normal</td>
<td>1796 mV</td>
</tr>
<tr>
<td>V1: VMB</td>
<td>F0</td>
<td>Normal</td>
<td>1201 mV</td>
</tr>
</tbody>
</table>
### Cisco ASR1000-RP3 Alarm Monitoring

<table>
<thead>
<tr>
<th>Input</th>
<th>Monitor Type</th>
<th>Temperature</th>
<th>Status</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1: VMC</td>
<td>F0</td>
<td>Normal</td>
<td>996 mV</td>
<td></td>
</tr>
<tr>
<td>V1: VMD</td>
<td>F0</td>
<td>Normal</td>
<td>1049 mV</td>
<td></td>
</tr>
<tr>
<td>V1: VME</td>
<td>F0</td>
<td>Normal</td>
<td>1049 mV</td>
<td></td>
</tr>
<tr>
<td>V1: VMF</td>
<td>F0</td>
<td>Normal</td>
<td>1098 mV</td>
<td></td>
</tr>
<tr>
<td>V1: 12v</td>
<td>F0</td>
<td>Normal</td>
<td>11879 mV</td>
<td></td>
</tr>
<tr>
<td>V1: VDD</td>
<td>F0</td>
<td>Normal</td>
<td>3286 mV</td>
<td></td>
</tr>
<tr>
<td>V1: GP1</td>
<td>F0</td>
<td>Normal</td>
<td>900 mV</td>
<td></td>
</tr>
<tr>
<td>V1: GP2</td>
<td>F0</td>
<td>Normal</td>
<td>766 mV</td>
<td></td>
</tr>
<tr>
<td>V2: VMA</td>
<td>F0</td>
<td>Normal</td>
<td>3291 mV</td>
<td></td>
</tr>
<tr>
<td>V2: VMB</td>
<td>F0</td>
<td>Normal</td>
<td>2495 mV</td>
<td></td>
</tr>
<tr>
<td>V2: VMC</td>
<td>F0</td>
<td>Normal</td>
<td>1499 mV</td>
<td></td>
</tr>
<tr>
<td>V2: VMD</td>
<td>F0</td>
<td>Normal</td>
<td>1196 mV</td>
<td></td>
</tr>
<tr>
<td>V2: VME</td>
<td>F0</td>
<td>Normal</td>
<td>1098 mV</td>
<td></td>
</tr>
<tr>
<td>V2: VMF</td>
<td>F0</td>
<td>Normal</td>
<td>996 mV</td>
<td></td>
</tr>
<tr>
<td>V2: 12v</td>
<td>F0</td>
<td>Normal</td>
<td>11835 mV</td>
<td></td>
</tr>
<tr>
<td>V2: VDD</td>
<td>F0</td>
<td>Normal</td>
<td>3291 mV</td>
<td></td>
</tr>
<tr>
<td>V2: GP1</td>
<td>F0</td>
<td>Normal</td>
<td>766 mV</td>
<td></td>
</tr>
<tr>
<td>V2: GP2</td>
<td>F0</td>
<td>Normal</td>
<td>1098 mV</td>
<td></td>
</tr>
<tr>
<td>Temp: Inlet</td>
<td>F0</td>
<td>Normal</td>
<td>23 Celsius</td>
<td></td>
</tr>
<tr>
<td>Temp: Pop Die</td>
<td>F0</td>
<td>Normal</td>
<td>40 Celsius</td>
<td></td>
</tr>
<tr>
<td>Temp: Left Ext</td>
<td>F0</td>
<td>Normal</td>
<td>33 Celsius</td>
<td></td>
</tr>
<tr>
<td>Temp: HKP Die</td>
<td>F0</td>
<td>Normal</td>
<td>44 Celsius</td>
<td></td>
</tr>
<tr>
<td>Temp: CPP Rear</td>
<td>F0</td>
<td>Normal</td>
<td>39 Celsius</td>
<td></td>
</tr>
<tr>
<td>Temp: Olv Die</td>
<td>F0</td>
<td>Normal</td>
<td>32 Celsius</td>
<td></td>
</tr>
<tr>
<td>Temp: Rght Ext</td>
<td>F0</td>
<td>Normal</td>
<td>32 Celsius</td>
<td></td>
</tr>
<tr>
<td>Temp: MCH Die</td>
<td>F0</td>
<td>Normal</td>
<td>47 Celsius</td>
<td></td>
</tr>
<tr>
<td>V3: VMA</td>
<td>F0</td>
<td>Normal</td>
<td>3291 mV</td>
<td></td>
</tr>
<tr>
<td>V3: VMB</td>
<td>F0</td>
<td>Normal</td>
<td>2490 mV</td>
<td></td>
</tr>
<tr>
<td>V3: VMC</td>
<td>F0</td>
<td>Normal</td>
<td>1499 mV</td>
<td></td>
</tr>
<tr>
<td>V3: VMD</td>
<td>F0</td>
<td>Normal</td>
<td>1000 mV</td>
<td></td>
</tr>
<tr>
<td>V3: 12v</td>
<td>F0</td>
<td>Normal</td>
<td>11865 mV</td>
<td></td>
</tr>
<tr>
<td>V3: VDD</td>
<td>F0</td>
<td>Normal</td>
<td>3291 mV</td>
<td></td>
</tr>
<tr>
<td>V3: VMA</td>
<td>F1</td>
<td>Normal</td>
<td>1796 mV</td>
<td></td>
</tr>
<tr>
<td>V3: VMB</td>
<td>F1</td>
<td>Normal</td>
<td>1196 mV</td>
<td></td>
</tr>
<tr>
<td>V3: VMC</td>
<td>F1</td>
<td>Normal</td>
<td>996 mV</td>
<td></td>
</tr>
<tr>
<td>V3: VMD</td>
<td>F1</td>
<td>Normal</td>
<td>1044 mV</td>
<td></td>
</tr>
<tr>
<td>V3: VME</td>
<td>F1</td>
<td>Normal</td>
<td>1035 mV</td>
<td></td>
</tr>
<tr>
<td>V3: VMF</td>
<td>F1</td>
<td>Normal</td>
<td>1098 mV</td>
<td></td>
</tr>
<tr>
<td>V3: 12v</td>
<td>F1</td>
<td>Normal</td>
<td>11879 mV</td>
<td></td>
</tr>
<tr>
<td>V3: VDD</td>
<td>F1</td>
<td>Normal</td>
<td>3271 mV</td>
<td></td>
</tr>
<tr>
<td>V3: GP1</td>
<td>F1</td>
<td>Normal</td>
<td>905 mV</td>
<td></td>
</tr>
<tr>
<td>V3: GP2</td>
<td>F1</td>
<td>Normal</td>
<td>766 mV</td>
<td></td>
</tr>
<tr>
<td>V2: VMA</td>
<td>F1</td>
<td>Normal</td>
<td>3295 mV</td>
<td></td>
</tr>
<tr>
<td>V2: VMB</td>
<td>F1</td>
<td>Normal</td>
<td>2495 mV</td>
<td></td>
</tr>
<tr>
<td>V2: VMC</td>
<td>F1</td>
<td>Normal</td>
<td>1499 mV</td>
<td></td>
</tr>
<tr>
<td>V2: VMD</td>
<td>F1</td>
<td>Normal</td>
<td>1201 mV</td>
<td></td>
</tr>
<tr>
<td>V2: VME</td>
<td>F1</td>
<td>Normal</td>
<td>1098 mV</td>
<td></td>
</tr>
<tr>
<td>V2: VMF</td>
<td>F1</td>
<td>Normal</td>
<td>996 mV</td>
<td></td>
</tr>
<tr>
<td>V2: 12v</td>
<td>F1</td>
<td>Normal</td>
<td>11835 mV</td>
<td></td>
</tr>
<tr>
<td>V2: VDD</td>
<td>F1</td>
<td>Normal</td>
<td>3276 mV</td>
<td></td>
</tr>
<tr>
<td>V2: GP1</td>
<td>F1</td>
<td>Normal</td>
<td>769 mV</td>
<td></td>
</tr>
<tr>
<td>V2: GP2</td>
<td>F1</td>
<td>Normal</td>
<td>1098 mV</td>
<td></td>
</tr>
<tr>
<td>Temp: Inlet</td>
<td>F1</td>
<td>Normal</td>
<td>24 Celsius</td>
<td></td>
</tr>
<tr>
<td>Temp: Pop Die</td>
<td>F1</td>
<td>Normal</td>
<td>44 Celsius</td>
<td></td>
</tr>
<tr>
<td>Temp: Left Ext</td>
<td>F1</td>
<td>Normal</td>
<td>31 Celsius</td>
<td></td>
</tr>
<tr>
<td>Temp: HKP Die</td>
<td>F1</td>
<td>Normal</td>
<td>49 Celsius</td>
<td></td>
</tr>
<tr>
<td>Temp: CPP Rear</td>
<td>F1</td>
<td>Normal</td>
<td>43 Celsius</td>
<td></td>
</tr>
<tr>
<td>Temp: Olv Die</td>
<td>F1</td>
<td>Normal</td>
<td>36 Celsius</td>
<td></td>
</tr>
<tr>
<td>Temp: Rght Ext</td>
<td>F1</td>
<td>Normal</td>
<td>32 Celsius</td>
<td></td>
</tr>
<tr>
<td>Temp: MCH Die</td>
<td>F1</td>
<td>Normal</td>
<td>50 Celsius</td>
<td></td>
</tr>
<tr>
<td>V3: VMA</td>
<td>F1</td>
<td>Normal</td>
<td>3291 mV</td>
<td></td>
</tr>
<tr>
<td>V3: VMB</td>
<td>F1</td>
<td>Normal</td>
<td>2495 mV</td>
<td></td>
</tr>
<tr>
<td>V3: VMC</td>
<td>F1</td>
<td>Normal</td>
<td>1499 mV</td>
<td></td>
</tr>
<tr>
<td>V3: VMD</td>
<td>F1</td>
<td>Normal</td>
<td>1000 mV</td>
<td></td>
</tr>
</tbody>
</table>
V3: 12v          F1                Normal            11865 mV
V3: VDD          F1                Normal            3286 mV
PEM Iout         P0                Normal            21 A
PEM Vout         P0                Normal            0 V DC
PEM Vin          P0                Normal            225 V AC
Temp: Temp1      P0                Normal            14 Celsius
Temp: Temp2      P0                Normal            26 Celsius
Temp: Temp3      P0                Normal            0 Celsius
PEM Iout         P1                Normal            22 A
PEM Vout         P1                Normal            0 V DC
PEM Vin          P1                Normal            225 V AC
Temp: Temp1      P1                Normal            14 Celsius
Temp: Temp2      P1                Normal            27 Celsius
Temp: Temp3      P1                Normal            0 Celsius
PEM Iout         P2                Normal            1 A
PEM Vout         P2                Normal            0 V DC
PEM Vin          P2                Normal            0 V AC
Temp: Temp1      P2                Normal            0 Celsius
Temp: Temp2      P2                Normal            16 Celsius
Temp: Temp3      P2                Normal            0 Celsius
PEM Iout         P3                Normal            1 A
PEM Vout         P3                Normal            0 V DC
PEM Vin          P3                Normal            0 V AC
Temp: Temp1      P3                Normal            0 Celsius
Temp: Temp2      P3                Normal            16 Celsius
Temp: Temp3      P3                Normal            0 Celsius
PEM Iout         P4                Normal            1 A
PEM Vout         P4                Normal            0 V DC
PEM Vin          P4                Normal            0 V AC
Temp: Temp1      P4                Normal            0 Celsius
Temp: Temp2      P4                Normal            16 Celsius
Temp: Temp3      P4                Normal            0 Celsius
PEM Iout         P5                Normal            1 A
PEM Vout         P5                Normal            0 V DC
PEM Vin          P5                Normal            0 V AC
Temp: Temp1      P5                Normal            0 Celsius
Temp: Temp2      P5                Normal            16 Celsius
Temp: Temp3      P5                Normal            0 Celsius
Temp: FC PWM1    P6                Fan Speed 45%     24 Celsius
Temp1            P7                Normal            22 Celsius
Temp: FC PWM1    P7                Fan Speed 45%     24 Celsius
VVM 0: VX1       R0                Normal            607 mV
VVM 0: VX2       R0                Normal            1212 mV
VVM 0: VX3       R0                Normal            1207 mV
VVM 0: VX4       R0                Normal            994 mV
VVM 0: VP1       R0                Normal            3305 mV
VVM 0: VP2       R0                Normal            3312 mV
VVM 0: VP3       R0                Normal            5024 mV
VVM 0: VP4       R0                Normal            1506 mV
VVM 0: VH        R0                Normal            12003 mV
VVM 1: VX3       R0                Normal            1050 mV
VVM 1: VP1       R0                Normal            1696 mV
VVM 1: VP2       R0                Normal            1815 mV
VVM 1: VP3       R0                Normal            2511 mV
VVM 1: VP4       R0                Normal            3285 mV
VVM 1: VH        R0                Normal            12013 mV
VVM 2: VX1       R0                Normal            992 mV
VVM 2: VP1       R0                Normal            1199 mV
VVM 2: VP2       R0                Normal            1809 mV
VVM 2: VH        R0                Normal            11998 mV
Temp: CPU-IN     R0                Normal            24 Celsius
Temp: Outlet     R0                Normal            28 Celsius
Temp: Center     R0                Normal            15 Celsius
Temp: Inlet R0 Normal 27 Celsius
Temp: DDR4 In R0 Normal 24 Celsius
Temp: DDR4 Out R0 Normal 20 Celsius
V1: VMA 0 Normal 1103 mV
V1: VMB 0 Normal 1196 mV
V1: VMC 0 Normal 1499 mV
V1: VMD 0 Normal 1801 mV
V1: VME 0 Normal 2490 mV
V1: VMF 0 Normal 3291 mV
V1: 12v 0 Normal 3281 mV
V1: VDD 0 Normal 11938 mV
V1: VDD 0 Normal 3281 mV
V1: GP1 0 Normal 749 mV
V1: GP2 0 Normal 903 mV
V2: VMB 0 Normal 1000 mV
V2: VME 0 Normal 751 mV
V2: VMF 0 Normal 751 mV
V2: 12v 0 Normal 11923 mV
V2: VDD 0 Normal 3286 mV
V2: GP2 0 Normal 749 mV
Temp: Left 0 Normal 23 Celsius
Temp: Center 0 Normal 23 Celsius
Temp: Asic1 0 Normal 31 Celsius
Temp: Right 0 Normal 20 Celsius

The `show version` command displays the system hardware configuration, software version, and names and sources of configuration files and boot images.

The following is sample output from the `show version` command:

### Example 5-3 show version Command

```
Router# show version

Cisco IOS XE Software, Version BLD_V163_MR_THROTTLE_LATEST_20160817_000512
Cisco IOS Software [Denali], ASR1000 Software (X86_64_LINUX_IOSD-UNIVERSALK9-M),
Experimental Version 16.3.20160817:001450
[vl63_mr_throttle-BLD-BLD_V163_MR_THROTTLE_LATEST_20160817_000512 122]
Copyright (c) 1986-2016 by Cisco Systems, Inc.
Compiled Tue 16-Aug-16 18:16 by mcpre

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ROM: IOS-XE ROMMON

RP3 uptime is 9 minutes
Uptime for this control processor is 11 minutes
System returned to ROM by reload
System image file is
"bootflash:asr1000rpx86-universalk9.BLD_V163_MR_THROTTLE_LATEST_20160817_000512.SSA.bin"
Last reload reason: Reload Command
```
Cisco ASR 1000 Route Processor 3 Alarm Monitoring

Chapter 5 Configuring the Cisco ASR1000-RP3 Module

This product contains cryptographic features and is subject to United States and local country laws governing import, export, transfer and use. Delivery of Cisco cryptographic products does not imply third-party authority to import, export, distribute or use encryption. Importers, exporters, distributors and users are responsible for compliance with U.S. and local country laws. By using this product you agree to comply with applicable laws and regulations. If you are unable to comply with U.S. and local laws, return this product immediately.

A summary of U.S. laws governing Cisco cryptographic products may be found at: http://www.cisco.com/wwl/export/crypto/tool/stqrg.html

If you require further assistance please contact us by sending email to export@cisco.com.

License Type: Default. No valid license found.
License Level: ipbase
Next reload license Level: ipbase

Cisco ASR1006-X (RP3) processor (revision RP3) with 14994684K/24590K bytes of memory.
Processor board ID FXS1829Q0LR
5 Gigabit Ethernet interfaces
3 Ten Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
67108864K bytes of physical memory.
7600127K bytes of eUSB flash at bootflash:
97620247K bytes of SATA hard disk at harddisk:
0K bytes of at webui:

Configuration register is 0x2102

The show inventory command displays an extended report that includes the product inventory listing of all the Cisco products installed in the networking device. The following is sample output from the show inventory command:

Example 5-4 show inventory Command

Router# show inventory
NAME: "Chassis", DESC: "Cisco ASR1006-X Chassis"
PID: ASR1006-X , VID: V00 , SN: FXS1829Q0LR

NAME: "module 0", DESC: "Cisco ASR1000 SPA Interface Processor 40"
PID: ASR1000-SIP40 , VID: V01 , SN: JAE160804PL

NAME: "SPA subslot 0/0", DESC: "1-port 10 Gigabit Ethernet Shared Port Adapter XFP based"
PID: SPA-1X10GE-L-V2 , VID: V02 , SN: JAE145207F5

NAME: "SPA subslot 0/1", DESC: "1-port 10 Gigabit Ethernet Shared Port Adapter XFP based"
PID: SPA-1X10GE-L-V2 , VID: V02 , SN: JAE1431137E

NAME: "SPA subslot 0/2", DESC: "5-port Gigabit Ethernet Shared Port Adapter"
PID: SPA-5X1GE-V2 , VID: V02 , SN: JAE1326D4V5

NAME: "subslot 0/2 transceiver 0", DESC: "GE T"
PID: SP7041-E , VID: E , SN: MTC161204FS

NAME: "SPA subslot 0/3", DESC: "1-port 10 Gigabit Ethernet Shared Port Adapter XFP based"
PID: SPA-1X10GE-L-V2 , VID: V02 , SN: JAE13062NZM

NAME: "module R0", DESC: "Cisco ASR1000 Route Processor 3"
Cisco ASR1000-RP3 Alarm Monitoring

Chapter 5    Configuring the Cisco ASR1000-RP3 Module

The `show platform` command displays platform information.
The following is sample output from the `show platform` command:

```
Example 5-5    show platform Command

Router# show platform

Chassis type: ASR1006-X

<table>
<thead>
<tr>
<th>Slot</th>
<th>Type</th>
<th>State</th>
<th>Insert time (ago)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>ASR1000-SIP40</td>
<td>ok</td>
<td>00:10:54</td>
</tr>
<tr>
<td>0/0</td>
<td>SPA-1X10GE-L-V2</td>
<td>ok</td>
<td>00:09:12</td>
</tr>
<tr>
<td>0/1</td>
<td>SPA-1X10GE-L-V2</td>
<td>ok</td>
<td>00:09:07</td>
</tr>
<tr>
<td>0/2</td>
<td>SPA-5X1GE-V2</td>
<td>ok</td>
<td>00:08:57</td>
</tr>
<tr>
<td>0/3</td>
<td>SPA-1X10GE-L-V2</td>
<td>ok</td>
<td>00:08:53</td>
</tr>
<tr>
<td>R0</td>
<td>ASR1000-RP3</td>
<td>ok, active</td>
<td>00:10:54</td>
</tr>
<tr>
<td>F0</td>
<td>ASR1000-ESP40</td>
<td>ok, active</td>
<td>00:10:54</td>
</tr>
<tr>
<td>F1</td>
<td>ASR1000-ESP40</td>
<td>ok, standby</td>
<td>00:10:54</td>
</tr>
<tr>
<td>P0</td>
<td>ASR1000X-AC-750W</td>
<td>ok</td>
<td>00:09:53</td>
</tr>
<tr>
<td>P1</td>
<td>ASR1000X-AC-750W</td>
<td>ok</td>
<td>00:09:51</td>
</tr>
<tr>
<td>P2</td>
<td>ASR1000X-AC-750W</td>
<td>ps, fail</td>
<td>00:09:51</td>
</tr>
<tr>
<td>P3</td>
<td>ASR1000X-AC-750W</td>
<td>ps, fail</td>
<td>00:09:51</td>
</tr>
<tr>
<td>P4</td>
<td>ASR1000X-AC-750W</td>
<td>ps, fail</td>
<td>00:09:51</td>
</tr>
<tr>
<td>P5</td>
<td>ASR1000X-AC-750W</td>
<td>ps, fail</td>
<td>00:09:51</td>
</tr>
<tr>
<td>P6</td>
<td>ASR1000X-FAN</td>
<td>ok</td>
<td>00:09:47</td>
</tr>
<tr>
<td>P7</td>
<td>ASR1000X-FAN</td>
<td>ok</td>
<td>00:09:46</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Slot</th>
<th>CPLD Version</th>
<th>Firmware Version</th>
</tr>
</thead>
</table>
```
The `show platform software status control-processor` command displays the average load, memory usage, and CPU utilization levels at which the router is running. The output also specifies whether the levels of these system health parameters are within defined thresholds.

**Note**
The output does not display SIP-related information on a monolithic router.

The following is sample output from the `show platform software status control-processor` command:

**Example 5-6 show platform software status control-processor Command**

```
Router# show platform software status control-processor
RP0: online, statistics updated 1 seconds ago
Load Average: healthy
  1-Min: 0.00, status: healthy, under 8.00
  5-Min: 0.03, status: healthy, under 8.00
  15-Min: 0.07, status: healthy, under 10.00
Memory (kb): healthy
  Total: 8092776
  Used: 3491556 (43%)
  Free: 4601220 (57%)
  Committed: 3566404 (44%), status: healthy, under 95%
Per-core Statistics
CPU0: CPU Utilization (percentage of time spent)
  User: 0.00, System: 0.00, Nice: 0.00, Idle: 100.00
  IRQ: 0.00, SIRQ: 0.00, IOwait: 0.00
CPU1: CPU Utilization (percentage of time spent)
  User: 1.30, System: 0.40, Nice: 0.00, Idle: 98.30
  IRQ: 0.00, SIRQ: 0.00, IOwait: 0.00
CPU2: CPU Utilization (percentage of time spent)
  User: 0.49, System: 8.89, Nice: 0.00, Idle: 90.60
  IRQ: 0.00, SIRQ: 0.00, IOwait: 0.00
CPU3: CPU Utilization (percentage of time spent)
  User: 2.00, System: 0.40, Nice: 0.00, Idle: 97.60
  IRQ: 0.00, SIRQ: 0.00, IOwait: 0.00
CPU4: CPU Utilization (percentage of time spent)
  User: 0.00, System: 0.30, Nice: 0.00, Idle: 99.69
  IRQ: 0.00, SIRQ: 0.00, IOwait: 0.00
CPU5: CPU Utilization (percentage of time spent)
  User: 0.40, System: 0.10, Nice: 0.00, Idle: 99.50
  IRQ: 0.00, SIRQ: 0.00, IOwait: 0.00
CPU6: CPU Utilization (percentage of time spent)
  User: 0.40, System: 0.40, Nice: 0.00, Idle: 99.19
  IRQ: 0.00, SIRQ: 0.00, IOwait: 0.00
CPU7: CPU Utilization (percentage of time spent)
  User: 0.80, System: 1.30, Nice: 0.00, Idle: 97.90
  IRQ: 0.00, SIRQ: 0.00, IOwait: 0.00
```

The `show diag slot R0 eeprom` command displays the configuration hardware information.

The following is sample output from the `show diag slot R0 eeprom` command:
Example 5-7  show diag slot R0 eeprom Command

Router# show diag slot R0 eeprom
Slot R0 EEPROM data:

    Product Identifier (PID) : ASR1000-RP3
    Version Identifier (VID) : V00
    PCB Serial Number        : JAE201902DX
    Top Assy. Part Number    : 68-5621-04
    Hardware Revision        : 0.1
    CLEI Code                : UNASSIGNED
Upgrading the Cisco ASR1000-RP3 Module

Upgrading the Software

The In-Service Software Upgrades (ISSU) procedure for ASR1000-RP3 is same as that for ASR1000-RP2.

For detailed information on the software upgrade procedures, see Software Upgrade Process chapter of the Cisco ASR 1000 Series Aggregation Services Routers Software Configuration Guide.

Migrating from ASR1000-RP2 to ASR1000-RP3

This section describes the basic steps required for migrating from ASR1000-RP2 to ASR1000-RP3 without reloading the entire chassis in the field.

**Step 1** Upgrade the RP2 based system to Cisco IOS XE Denali 16.3.1 or later (Universal images).

Router# show platform
Chassis type: ASR1006-X

<table>
<thead>
<tr>
<th>Slot</th>
<th>Type</th>
<th>State</th>
<th>Insert time (ago)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R0</td>
<td>ASR1000-RP2</td>
<td>ok, standby</td>
<td>00:11:48</td>
</tr>
<tr>
<td>R1</td>
<td>ASR1000-RP2</td>
<td>ok, active</td>
<td>00:11:48</td>
</tr>
</tbody>
</table>

**Step 2** Replace the RP2 which is in Standby mode with an RP3 card.

Router# show platform
Chassis type: ASR1006-X

<table>
<thead>
<tr>
<th>Slot</th>
<th>Type</th>
<th>State</th>
<th>Insert time (ago)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R0</td>
<td>ASR1000-RP3</td>
<td>ok, standby</td>
<td>00:45:48</td>
</tr>
<tr>
<td>R1</td>
<td>ASR1000-RP2</td>
<td>ok, active</td>
<td>00:45:48</td>
</tr>
</tbody>
</table>

**Step 3** Switchover from an Active RP2 to Standby RP3.

Router# show platform
Chassis type: ASR1006-X

<table>
<thead>
<tr>
<th>Slot</th>
<th>Type</th>
<th>State</th>
<th>Insert time (ago)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R0</td>
<td>ASR1000-RP3</td>
<td>ok, active</td>
<td>01:00:48</td>
</tr>
<tr>
<td>R1</td>
<td>ASR1000-RP2</td>
<td>ok, standby</td>
<td>01:00:48</td>
</tr>
</tbody>
</table>
Step 4  Replace the RP2 which is in standby mode with an RP3.

Router# show platform
Chassis type: ASR1006-X

<table>
<thead>
<tr>
<th>Slot</th>
<th>Type</th>
<th>State</th>
<th>Insert time (ago)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R0</td>
<td>ASR1000-RP3</td>
<td>ok, active</td>
<td>01:30:48</td>
</tr>
<tr>
<td>R1</td>
<td>ASR1000-RP3</td>
<td>ok, standby</td>
<td>01:30:48</td>
</tr>
</tbody>
</table>

Note
- ASR1000-RP3 to ASR1000-RP2 downgrade is not supported.
- Even though the ASR1000-RP2 and ASR1000-RP3 can co-exist in the chassis, it is only supported to enable customers to migrate the system to RP3 without requiring a reload.
  - Follow the above upgrade process during a maintenance window and replace both RP2s with RP3.
  - We do not recommend that the system runs with both RP2 and RP3 cards for a long duration.

Upgrading Complex Programmable Logic Device (CPLD)

The CPLD version for Cisco ASR1000-RP3 is 16082219. For upgrading CPLD for ASR1000-RP3, please refer to the following document:
Upgrading the ROMMON

This chapter provides information about ROMMON used in the Cisco ASR1000-RP3 module. It contains the following sections:

- Available ROMMON Version on the Cisco ASR1000-RP3 Module, page 7-1
- Upgrading the ROMMON Version, page 7-1
- Verifying the ROMMON Version, page 7-1

Available ROMMON Version on the Cisco ASR1000-RP3 Module

The Cisco ASR1000-RP3 module is shipped with the ROMMON release 16.3(2r).

Upgrading the ROMMON Version

**Note**
The minimum ROMMON version 16.3(2r) is already installed on the Cisco ASR1000-RP3 module at the time of purchase.


Verifying the ROMMON Version

To verify the ROMMON version installed on the Cisco ASR1000-RP3 module, use the `show platform` command.

```
Router# show platform
...  
Slot  CPLD Version     Firmware Version
-----  ---------------  ---------------------------------------
R0     16080112        16.3(2r)
...  
```
Removing and Replacing FRUs from the Cisco ASR1000-RP3 Module

This chapter describes procedures for removing and replacing field-replaceable units (FRUs) from the Cisco ASR1000-RP3 module. It contains the following sections:

- Removing and Replacing the Internal Hard Drive, page 8-1
- Removing and Replacing the DIMM Memory, page 8-4

Removing and Replacing the Internal Hard Drive

This section explains how to remove a hard drive assembly from the Cisco ASR1000-RP3 module and replace it with a new internal hard drive.

Note

- The Cisco ASR1000-RP3 module contains 100 GB SSD by default; 200 GB and 400 GB field-replaceable upgrade option.
- The Cisco ASR1000-RP3 module is supported on the Cisco ASR 1006-X, Cisco ASR 1009-X, and the Cisco ASR 1013.

Removing the Internal Hard Drive

Warning

During this procedure, wear grounding wrist straps to avoid ESD damage to the card. Do not directly touch the backplane with your hand or any metal tool, or you could shock yourself.

Before you begin, read the following important notices:

- The reason you would remove the internal hard drive is that it is failing or failed; so any data recovery may be lost.
- The form-factor internal hard drive is accessible from the front panel of the Cisco ASR1000-RP3 module and supports the online insertion and removal feature (OIR) using the following CLI commands for the standby and active RP:

- [Command Example]
Removing and Replacing the Internal Hard Drive

- **request platform hardware filesystem harddisk: offline**—Unmounts the hard disk on the active RP.
- **request platform hardware filesystem harddisk: online**—Mounts the hard disk on the active RP. If the disk is not provisioned properly, this command will provision the disk.
- **request platform hardware filesystem stby-harddisk: offline**—Unmounts the hard disk on the standby RP.
- **request platform hardware filesystem stby-harddisk: online**—Mounts the hard disk on the standby RP. If the disk is not provisioned properly, this command will provision the disk.

- If the drive is functioning, you can back it up to a drive plugged into a USB port using the `archive tar` command.

**Step 1** Run the **request platform hardware filesystem harddisk: offline** command.

**Step 2** Slip on an ESD-preventive wrist strap.

**Step 3** From the front panel of the RP module, unscrew the fastener screw.

**Figure 8-1** Cisco ASR1000-RP3 Front Panel

1. Internal hard drive fastener screw
2. Internal hard drive

**Step 4** Pull out the internal hard drive.
Chapter 8  Removing and Replacing FRUs from the Cisco ASR1000-RP3 Module

Removing and Replacing the Internal Hard Drive

Figure 8-2  Cisco ASR1000-RP3 Internal Hard Drive

| Step 5 | Place the component in an antistatic bag to return it. |
| Step 6 | Wait until the following console message is displayed: |

%IOSXE-0-PLATFORM: R0/0: udev: harddisk: has been removed

Replacing the Internal Hard Drive

| Step 1 | Carefully slide the internal hard drive unit into the Cisco ASR1000-RP3 faceplate slot. The component is keyed for easy insertion. |
| Step 2 | Tighten the fastener screw on the front panel. |
| Step 3 | Wait until the following console message is displayed: |

%IOSXE-0-PLATFORM: R0/0: udev: harddisk: file system ready" appears. |

If after several minutes the above message is not displayed, enter the following command:

request platform hardware filesystem harddisk: online

Note  The only reason the system would not be able to automatically mount the new hard disk following a physical insertion is that the disk is not partitioned correctly.

| Step 4 | Verify that the disk is working by entering the following command: |
|        | dir harddisk |
Removing and Replacing the DIMM Memory

The Cisco ASR1000-RP3 module comes with the DIMMs preinstalled. At the time of purchase, you choose the amount of memory you require. Use the procedures listed in this section if you choose to upgrade the memory.

Figure 8-3 shows the location of the DIMMs in a Cisco ASR1000-RP3 module.

![Cisco ASR1000-RP3 DIMM Location](image)

Table 8-1 provides the PID and the memory DIMM slots that are supported in the Cisco ASR1000-RP3 module.

<table>
<thead>
<tr>
<th>Memory PID Option</th>
<th>Ch-A DIMM0</th>
<th>Ch-A DIMM1</th>
<th>Ch-B DIMM0</th>
<th>Ch-B DIMM1</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-ASR1K-RP3-8GB=</td>
<td>4 GB</td>
<td>—</td>
<td>4 GB</td>
<td>—</td>
</tr>
<tr>
<td>M-ASR1K-RP3-16GB=</td>
<td>8 GB</td>
<td>—</td>
<td>8 GB</td>
<td>—</td>
</tr>
<tr>
<td>M-ASR1K-RP3-32GB=</td>
<td>8 GB</td>
<td>8 GB</td>
<td>8 GB</td>
<td>8 GB</td>
</tr>
<tr>
<td>M-ASR1K-RP3-64GB=</td>
<td>16 GB</td>
<td>16 GB</td>
<td>16 GB</td>
<td>16 GB</td>
</tr>
</tbody>
</table>

RP2 memory cannot be reused on RP3. For RP3 memory upgrade from 8 GB to either 16 GB or 32 GB or 64 GB, remove all existing DIMMs from the system, and install the new DIMMs pair in the system. This eliminates issues with mismatched DIMMs.
**Basic Work Flow for Removing and Replacing DIMMs**

The Cisco ASR 1006-X, Cisco ASR 1009-X, and Cisco ASR 1013 routers have redundant RPs. The following are the steps for removing and replacing the DIMM memory modules on these routers.

**Step 1** Remove the standby RP. See *Removing the Cisco ASR1000-RP3 Module from the Router, page 3-3*.

**Step 2** Remove the DIMM from the standby RP. See *Removing the DIMMs, page 8-5*.

**Step 3** Insert the new DIMM memory module on the standby RP. See *Replacing the DIMMs, page 8-7*.

**Step 4** Insert the standby RP. See *Installing the Cisco ASR1000-RP3 Module in the Router, page 3-1*.

**Step 5** Verify the memory upgrade on the standby RP by running the following commands:

```
Router# configure terminal
Router(config-red)# redundancy
Router(config-r-mc)# main-cpu
Router(config-r-mc)# standby console enable
Router(config-r-mc)# end
```

```
Cisco IOS Software, IOS-XE Software (PPC_LINUX_IOSD-ADVENTERPRISEK9-M), Experimental
Version 15.2(20111220:221816) [v152_2_s_xe36_throttle-tozhang-xe36_ios 114]
.
.
cisco ASR1006X (RP3) processor with 1689519K/6147K bytes of memory.
Processor board ID FOX1224G4VX
20 Gigabit Ethernet interfaces
32768K bytes of non-volatile configuration memory.
4194304K bytes of physical memory.
955063K bytes of eUSB flash at bootflash:
39004543K bytes of SATA hard disk at harddisk:
.
.
```

**Step 6** Use the *redundancy force-switchover* command to switch the upgraded standby RP to the active state. The RP that was in the active state moves to the standby state.

**Step 7** Repeat Step 1 through Step 5 on the standby RP.

---

**Removing the DIMMs**

The Cisco ASR1000-RP3 module already comes with the DIMMs preinstalled. At the time of purchase, you choose the amount of memory you require. Use this procedure only if you want to upgrade the memory.

**Before you begin:**

- Use an ESD-preventive wrist strap.
- Back up data that you want to save before replacing a eUSB device.
- Make sure that the component is keyed and slotted for easier connection.
Removing and Replacing the DIMM Memory

To ensure the DIMMs are functioning properly, all DIMMs must be replaced at the same time and must be of the same manufacturer and part number. (This is because vendors may have multiple versions of the DIMM.)

Step 1
With a wrist strap on, loosen the two captive screws on the faceplate of the RP.

Step 2
Using the handles on both sides of the module, with both hands gently slide the module out of the chassis slot.

Step 3
Place the RP on an antistatic mat or pad and ensure that you are wearing an antistatic device, such as a wrist strap.

Step 4
Position the RP so that the faceplate is toward you and the edge connector is away from you.

Step 5
Locate the DIMMs in the RP.

Figure 8-4  Cisco ASR1000-RP3 DIMM Location

<table>
<thead>
<tr>
<th></th>
<th>Ch-A DIMM0</th>
<th></th>
<th>Ch-B DIMM0</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ch-A DIMM0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Ch-A DIMM1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Ch-B DIMM0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Ch-B DIMM1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The DIMMs shown in Figure 8-5 and Figure 8-7 are representative and may not look exactly like the DIMMs used on the RP3; but the procedure is the same.

Step 6
For the DIMM you want to remove, pull down the levers on either side of the DIMM socket outwards to release the DIMM from the socket as shown in Figure 8-5.


**Removing and Replacing the DIMM Memory**

**Step 7** When the DIMM is released from the socket, grasp each end of the DIMM with your thumb and forefinger and pull the DIMM completely out of the socket. Handle only the edges of the DIMM; avoid touching the memory module or pins and the metal traces (the metal fingers along the connector edge of the DIMM) along the socket edge.

**Step 8** Place the DIMM in an antistatic bag to protect it from ESD damage.

**Step 9** Repeat Step 5 through Step 8 for the remaining DIMMs if required for the upgrade.

**Replacing the DIMMs**

**Step 1** Place the RP on an antistatic mat or pad and ensure that you are wearing an antistatic device, such as a wrist strap.

**Step 2** Position the RP so that the faceplate is towards you and the edge connector is away from you.

**Caution** DIMMs are sensitive components that can be shorted by mishandling; they are susceptible to ESD damage. Handle DIMMs by the edges only and avoid touching the pins.

**Step 3** Remove the new DIMM from the antistatic bag.

**Step 4** Hold the DIMM component-side up, with the connector edge (the metal fingers) closest to you. Hold the ends of the DIMM between your thumb and forefinger as shown in Figure 8-6.
Chapter 8      Removing and Replacing FRUs from the Cisco ASR1000-RP3 Module

Removing and Replacing the DIMM Memory

Figure 8-6        Handling the Cisco ASR1000-RP3 DIMM

Step 5  Tilt the DIMM to approximately the same angle as the socket and insert the connector edge into the socket. Note the two notches (keys) on the connector edge of the DIMM. These keys are intended to ensure correct orientation of the DIMM in the socket.

Caution   When inserting DIMMs, use firm but not excessive pressure. If you damage a socket, you will have to return the RP to the factory for repair.

Step 6  Note the orientation of the socket key on the DIMM and the DIMM socket and gently push the DIMM into the socket until the lever is flush against the side of the DIMM socket, and the DIMM edge connector is fully inserted. If necessary, rock the DIMM gently back and forth to seat it properly. The following figure shows how to install the DIMM in the socket.

Figure 8-7        Installing the DIMM in the Socket

Step 7  When the DIMM is installed, check that the release lever is flush against the side of the DIMM socket. If it is not, the DIMM might not be seated properly. If the DIMM appears misaligned, carefully remove it according to the removal procedure and then reseat it in the socket. Push the DIMM firmly back into the socket until the release lever is flush against the side of the DIMM socket.

Step 8  Repeat Step 3 through Step 7 for the remaining DIMMs.

Step 9  Replace the Cisco ASR1000-RP3 module.

After you have correctly installed the Cisco ASR1000-RP3 DIMMs and reinstalled the RP, the system should reboot properly.

If the system fails to boot properly or if the console terminal displays a checksum or memory error after you have installed new DIMMs, check the following:
• Ensure that all DIMMs are installed correctly. If necessary, shut down the system and remove the RP. Check the DIMMs by looking straight down on them to inspect them at eye level. The DIMMs should all be aligned at the same angle and the same height when properly installed. If a DIMM appears to stick out or rest in the socket at a different angle from the others, remove the DIMM and reinsert it. Then replace the RP and reboot the system for another installation check.

• Make certain that all DIMMs are of the same manufacturer and part number.

---

**Note**

If after several attempts the system fails to restart properly, contact a service representative for assistance. Before you call, make note of any error messages, unusual LED states, or any other indications that might help solve the problem.