Cisco ASR 9000 Series Aggregation Services Router VSM (Virtualized Services Module) Card Installation Guide

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Preface

This preface contains the following sections:

- Changes to This Document, page v
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- Document Conventions, page v
- Obtaining Documentation and Submitting a Service Request, page vi

Changes to This Document

Revision	Date	Change Summary
OL-30446-01	March 2014	Initial release of this document.

Audience

This guide is for hardware installers and system administrators of Cisco routers who install the Cisco ASR 9000 Aggregated Services Router Virtualized Services Module (VSM) Card, hereafter referred to as the VSM card.

This publication assumes that the user has a substantial background in installing and configuring router and switch-based hardware. The reader should also be familiar with electronic circuitry and wiring practices, and have experience as an electronic or electromechanical technician.

Document Conventions

This publication uses the following conventions:

- **Ctrl** represents the key labeled *Control*. For example, the key combination **Ctrl-Z** means hold down the **Control** key while you press the **Z** key.

Command descriptions use these conventions:

- Examples that contain system prompts denote interactive sessions, indicating the commands that you should enter at the prompt. For example:

```
RP/0/RSP0/CPU0:router#
```

- Commands and keywords are in **bold** font.
- Arguments for which you supply values are in *italic* font.
- Elements in square brackets ([ ]) are optional.
- Alternative but required keywords are grouped in braces ({ }) and separated by vertical bars (|).

Caution Means *be careful*. You are capable of doing something that might result in equipment damage or loss of data.

Note Means *take note*. Notes contain helpful suggestions or references to materials not contained in this manual.

Timesaver Means *the described action saves time*. You can save time by performing the action described in the paragraph.

Warning **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. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.**

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

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Installing VSM Cards in the Cisco ASR 9000 Series Router

This guide contains instructions for installing VSM cards in the Cisco ASR 9000 Series Aggregation Services Router.

This chapter contains the following sections:

- Pre-Installation Information, page 1-1
- VSM Card Product Overview, page 1-3
- Preparing for Installation, page 1-5
- Removing and Installing a VSM Card, page 1-6
- Checking the Installation, page 1-13

Pre-Installation Information

This section contains information about the following topics:

- Product Numbers and Supported Platforms, page 1-1
- Router Hardware Installation, page 1-2
- Cisco IOS XR Software Release and Hardware Revision Requirements, page 1-2
- Related Documentation, page 1-2

Product Numbers and Supported Platforms

Table 1-1 lists the Cisco product number to which this publication applies, and the supported router platforms for the VSM card.

Table 1-1 Product Number and Supported Platforms

Card	Cisco Product Number	Supported Platforms
Cisco ASR 9000 Virtualized Services Module (VSM) Card	A9K-VSM-500	Cisco ASR 9010 Router, Cisco ASR 9006 Router, Cisco ASR 9904 Router, Cisco ASR 9912 Router, Cisco ASR 9922 Router

Router Hardware Installation

For hardware installation and configuration information for the Cisco ASR 9000 Series Router, refer to the *Cisco ASR 9000 Series Aggregation Services Router Installation Guide*. The guide includes information on how to install, maintain, and replace router subsystems, such as cooling fans, power supplies, chassis backplanes, and so on.

Cisco IOS XR Software Release and Hardware Revision Requirements

Note The A9K-VSM-500 is not supported on Cisco IOS XR 64-bit images.

The VSM cards have certain Cisco IOS XR software requirements. Also, to ensure compatibility with the software, your VSM cards should have a specific hardware revision number. The number is printed on a label affixed to the component side of the card and is displayed by the **show diag** command.

Table 1-2 lists the hardware and software requirements for cards.

Table 1-2 VSM Cards and Cisco IOS XR Release and Hardware Version Compatibility

Card	Card Part Number	Minimum IOS XR Software Release	Required Hardware Version
Cisco ASR 9000 Virtualized Services Module (VSM) Card	A9K-VSM-500	5.1.1	1.0

The **show diag** and **show version** commands display the current hardware configuration of the router, including the system software version that is currently loaded and running. For complete descriptions of **show** commands, refer to the command reference or configuration guide for the installed Cisco IOS XR release.

If the command displays indicate that the Cisco IOS XR software is a version earlier than you need, go to http://www.cisco.com/web/Cisco_IOS_XR_Software/index.html for information about how to upgrade Cisco IOS XR Software.

For software configuration information, refer to the Cisco IOS XR software configuration and command reference publications for the installed Cisco IOS XR release. Also refer to the Cisco IOS XR software release notes for additional information.

Related Documentation

This publication describes the basic installation of the Cisco ASR 9000 Virtualized Services Module (VSM) Card card. For complete configuration information, refer to the following publications:

- *Cisco ASR 9000 Series Aggregation Services Router Hardware Installation Guide*
- *Cisco ASR 9000 Series Aggregation Services Router Getting Started Guide*
- *Cisco ASR 9000 Series Aggregation Services Router Regulatory Compliance and Safety Guide*
- *Cisco ASR 9000 Series Aggregation Services Router Interface and Hardware Component Configuration Guide*
- *Cisco ASR 9000 Seriess Aggregation Services Router CGv6 Configuration Guide*

See the "Obtaining Documentation and Submitting a Service Request" for information on how to obtain these publications.

VSM Card Product Overview

The VSM card is the next generation service card that provides a virtualized platform on the Cisco ASR 9000 Series Aggregation Services Router. The VSM card allows Cisco and third-party services and applications to be hosted simultaneously on top of a virtualized hardware environment.

The VSM card consists of:

- Platform service infrastructure (SIM)—This sub-module provides the hardware infrastructure for connecting the services components to the rest of the platform. It consists of two NPUs connected to the backplane.
- Application Processor Module—This sub-module provides the hardware framework for running services on the VSM card. It consists of four CPUs that are connected in a four-socket configuration over the high speeds QPI bus. This allows software running on any of these CPU cores to access the memories and peripherals connected to any of the four CPUs. A hardware assist block is attached to each of the CPUs.

The VSM card has four 10 Gigabit Ethernet SFP+ module ports. Each SFP+ port on the VSM card has an adjacent Link LED visible on the front panel that indicates the status of the associated SFP+ port.

The VSM card has the following guidelines and limitations:

- The VSM card is supported in any slot on the Cisco ASR 9000 Series Aggregation Services Router (ASR90xx and ASR99xx).
- There is no limit on the number of VSM cards that can be installed in the chassis at any one time.
- Traffic from satellite nV access interfaces can be redirected to the VSM card, and vice-versa.
- By default, there is no default VM application installed on the VSM card.
- The VSM card is not supported on the Cisco Aggregation Services Router ASR9001 Router.
- The VSM card is supported with the Cisco ASR 9000 Series Route Switch Processor 440, Cisco ASR 9000 Series Route Switch Processor 880, or later installed in the router. The VSM card is not supported with RSP2 installed in the router.
- The VSM card and Cisco ASR9000 ISM (Integrated Service Module) line card can operate simultaneously in the Cisco ASR 9000 Series Aggregation Services Router.
- The four 10 Gigabit Ethernet SFP+ module ports and their associated LEDS on the VSM card are not supported in the current release.

The VSM card is shown in Figure 1-1.

Figure 1-1 VSM Card

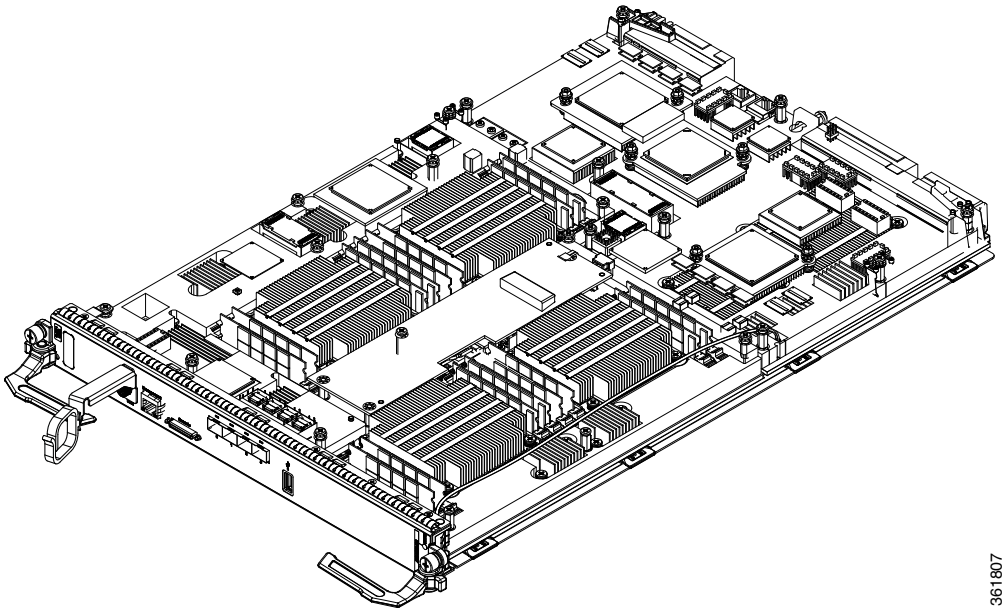
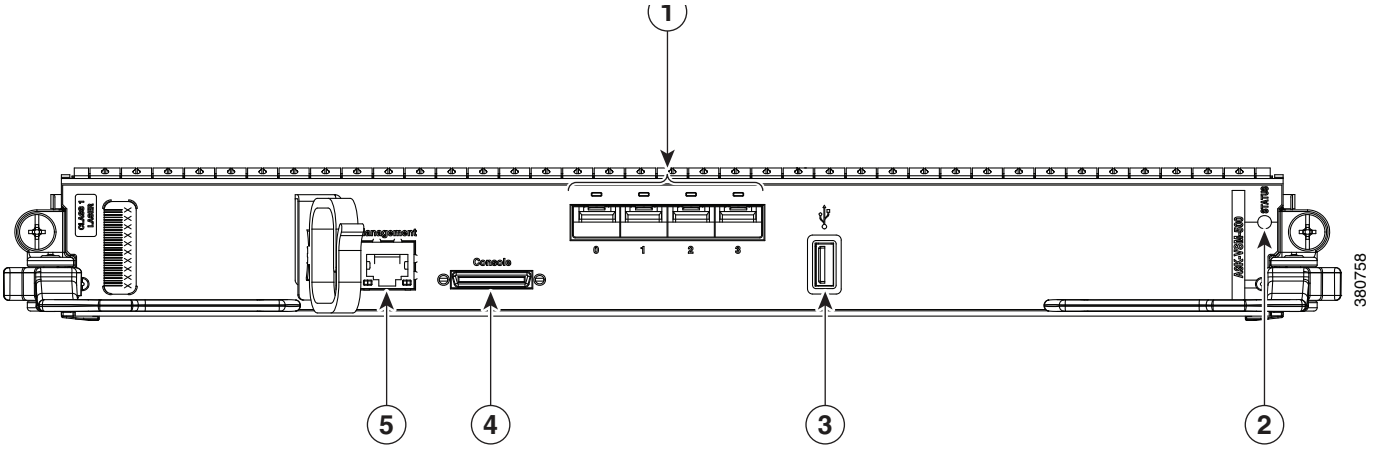


Figure 1-2 shows the front panel on the VSM card.

Figure 1-2 VSM Card Faceplate



1	Four 10 Gigabit Ethernet SFP+ module ports and LEDs (not supported in current release)	**4**	UCS combo connector
2	VSM card status LED	**5**	Gigabit Ethernet management port
3	USB port		

Preparing for Installation

The following sections provide information about preparing to install a VSM card:

- Safety Guidelines, page 1-5
- Preventing Electrostatic Discharge, page 1-5
- Required Tools and Equipment, page 1-6

Safety Guidelines

Before you perform any procedure in this publication, review the safety guidelines in this section to avoid injuring yourself or damaging the equipment.

The following guidelines are for your safety and to protect equipment. The guidelines do not include all hazards. Be alert.

Note Before installing, configuring, or maintaining a card, review the safety warnings listed in the *Cisco ASR 9000 Series Aggregation Services Router Regulatory Compliance and Safety Information* publication that accompanied your router.

- Keep the work area clear and dust free during and after installation. Do not allow dirt or debris to enter into any laser-based components.
- Do not wear loose clothing, jewelry, or other items that could get caught in the router while working with cards.
- Cisco equipment operates safely when it is used in accordance with its specifications and product usage instructions.

Caution Before working with laser optics, read the "Laser Safety" section on page 2-35.

Preventing Electrostatic Discharge

Electrostatic discharge (ESD) damage, which can occur when electronic cards or components are improperly handled, results in complete or intermittent failures. Electromagnetic interference (EMI) shielding is an integral component of the VSM card. Cisco recommends using an ESD-preventive strap whenever you are handling network equipment or one of its components.

The following are guidelines for preventing ESD damage:

- Always use an ESD-preventive wrist or ankle strap and ensure that it makes good skin contact. Connect the equipment end of the connection cord to an ESD connection socket on the router or to bare metal on the chassis.
- Avoid touching card circuit boards or connector pins. When sliding cards in or out of slots, you should handle them only by the faceplate or metal card carrier.
- When carrying a card, carry it only by the metal card carrier or inside a static shielding bag.

Caution To avoid damaging card mechanical components, never carry a card by the captive installation screws or ejector levers. Doing so can damage these components and cause card insertion problems.

- Place removed cards component-side-up on an antistatic surface or in a static shielding bag. If you plan to return the component to the factory, immediately place it in a static shielding bag.
- Avoid contact between the cards and clothing. The wrist strap only protects the board from ESD voltages on the body; ESD voltages on clothing can still cause damage.

Caution For safety, periodically check the resistance value of the ESD strap. The measurement should be between 1 and 10 megohms.

Required Tools and Equipment

You need the following tools and parts to remove and install VSM cards:

- Flat-blade or Phillips screwdriver
- ESD-preventive wrist or ankle strap and instructions

Note If you need additional equipment, see Cisco.com or your service representative for ordering information.

Removing and Installing a VSM Card

The following sections provide procedures for removing or installing a VSM card:

- Handling a VSM Card, page 1-6
- Guidelines for VSM Card Removal and Installation, page 1-7
- Removing a Card, page 1-8
- Installing a VSM Card, page 1-10

Note See "Guidelines for VSM Card Removal and Installation" before removing a VSM card while power to the router is on.

Handling a VSM Card

Each VSM card circuit board is mounted to a metal carrier and is sensitive to electrostatic discharge (ESD) damage. Before you begin installation, read "Preparing for Installation" for a list of parts and tools required for installation.

Caution Always handle the VSM card by the carrier edges and handle; never touch the VSM card components or connector pins.

When a slot is not in use, a blank must fill the empty slot to allow the router to conform to electromagnetic interference (EMI) emissions requirements and to allow proper airflow across the installed modules. If you plan to install a VSM card in a slot that is not in use, you must first remove the blank.

Guidelines for VSM Card Removal and Installation

Guidelines for card removal and installation include the following:

Caution Be careful to avoid damaging the electromagnetic interference (EMI) gasket that runs along the full length of the card front panel edges. Damage to the EMI gasket can affect your system's ability to meet EMI requirements.

- Online insertion and removal (OIR) is supported, enabling you to remove and install VSM cards while the router is operating. OIR is seamless to users on the network, maintains all routing information, and ensures session preservation. However, you must power down a VSM card prior to removing it from the chassis.

Note To avoid solid state disk failures, it is mandatory to power down the VSM card before OIR.

- To power down the VSM card, use the **hw-module power disable** command in administration configuration mode. To power up the VSM card after OIR, use the **no** form of this command. The example below shows how to power down the VSM card installed in slot 0:

```
RP/0/RSP0/CPU0:router#admin
RP/0/RSP0/CPU0:router(admin)#configure
RP/0/RSP0/CPU0:router(admin-config)#hw-module power disable location 0/0/cpu0
RP/0/RSP0/CPU0:router(admin-config)#commit
RP/0/RSP0/CPU0:router(admin-config)#exit
RP/0/RSP0/CPU0:router(admin)#exit
```

Caution Use two hands when handling the VSM card. Each VSM card weighs about 21.2 lb (9.6 kg).

Caution When installing a VSM card, always fully tighten both captive installation screws to ensure that the card is correctly seated in the backplane connector. A card that is only partially seated in the backplane might not operate properly, even if it boots.

Caution The router may indicate a hardware failure if you do not follow proper procedures. Remove or insert only one card at a time. Allow at least 15 seconds for the router to complete the preceding tasks before removing or inserting another card.

After removing and inserting a card into the same slot, allow at least 60 seconds before removing or inserting another card.

- Cards have two ejector levers to release the card from its backplane connector. Use the levers when you are removing the card and to seat the card firmly in its backplane connector when you are installing the card. The ejector levers align and seat the card connectors in the backplane.

Caution When you remove a card, always use the ejector levers to ensure that the connector pins disconnect from the backplane in the sequence expected by the router. Any card that is only partially connected to the backplane can halt the router.

When you install a card, always use the ejector levers to ensure that the card is correctly aligned with the backplane connector; the connector pins should make contact with the backplane in the correct order, indicating that the card is fully seated in the backplane. If a card is only partially seated in the backplane, the router will hang and subsequently crash.

Caution To avoid damaging card mechanical components, never carry a card by the captive installation screws or ejector levers. Doing so can damage these components and cause card insertion problems.

Removing a Card

If you are migrating from a line card to a VSM card or replacing a failed VSM card, you must first remove the existing card and then install the new VSM card in the same slot. To remove a line card or VSM card, follow these steps:

Step 1 Attach an ESD-preventive wrist or ankle strap and follow its instructions for use.

Step 2 Disconnect and remove all interface cables from the ports; note the current connections of the cables to the ports on the card.

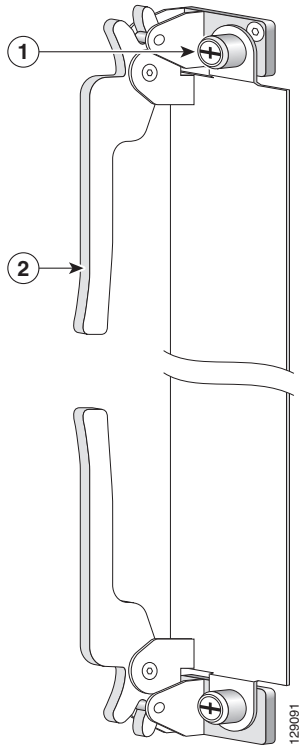
Step 3 Detach the card cable-management bracket from the card.

Step 4 Use a screwdriver to loosen the captive screw at each end of the card faceplate.

Caution When you remove a card, always use the ejector levers to ensure that the card connector pins disconnect from the backplane in the logical sequence expected by the router. Any card that is only partially connected to the backplane can halt the router.

Step 5 Simultaneously pivot the ejector levers away from each other to release the card from the backplane connector.

Figure 1-3 Ejector Levers and Captive Screws



1	Captive screw	**2**	Ejector lever

Step 6 Grasp the ejector levers and pull the card halfway out of the slot.

Step 7 Grasp the card and gently pull it straight out of the slot, keeping your other hand under the card to guide it. Avoid touching the card printed circuit board, components, or any connector pins.

Caution Use two hands when handling the VSM card. Each VSM card weighs about 21.2 lb (9.6 kg)

Step 8 Place the removed card on an antistatic mat, or immediately place it in an antistatic bag if you plan to return it to the factory.

Step 9 If the card slot is to remain empty, install a line card blank (Product Number A9K-LC-FILR) to keep dust out of the chassis and to maintain proper airflow through the line card compartment. Secure the line card blank to the chassis by tightening its captive screws.

Caution Be careful not to damage or disturb the EMI spring fingers located on the front edge of the card face plate.

Note Always insert a dust plug in an optical port opening for each port that is not in use.

Installing a VSM Card

A VSM card slides into any available line card slot and connects directly to the backplane. If you are installing a new VSM card, you must first remove the line card blank from the available slot.

Note Refer to the installation and configuration guide for your router for information on line card slot types, slot width, and slot location.

Caution When installing a VSM card, always fully tighten both captive installation screws to ensure that the card is correctly seated in the backplane connector. A VSM card that is only partially seated in the backplane might not operate properly, even if it boots.

Caution The router may indicate a hardware failure if you do not follow proper procedures. Remove or insert only one VSM card at a time. Allow at least 15 seconds for the router to complete the preceding tasks before removing or inserting another VSM card.

To install a VSM card, follow these steps:

Step 1 Attach an ESD-preventive wrist or ankle strap and follow its instructions for use.

Step 2 Choose an available line card slot for the VSM card, and verify that the card interface cable is long enough for you to connect the VSM card with any external equipment.

Caution To prevent ESD damage, handle VSM cards only by the metal card carrier. Do not touch any of the electrical components or circuitry.

Caution To avoid damaging card mechanical components, never carry a VSM card by the captive installation screws or ejector levers. Doing so can damage these components and cause card insertion problems.

Step 3 Grasp the faceplate of the VSM card with one hand and place your other hand under the metal card carrier to support the weight of the card (see Figure 1-4). Position the VSM card for insertion into the line card cage slot. Avoid touching the VSM card printed circuit board, components, or any connector pins.

Caution Use two hands when handling the VSM card. Each VSM card weighs about 21.2 lb (9.6 kg).

Step 4 Carefully slide the VSM card into the slot until the ejector levers make contact with the edges of the card cage, then stop when the ejector lever hooks catch the lip of the card cage. If they do not catch, try reinserting the VSM card until the ejector levers are fully latched.

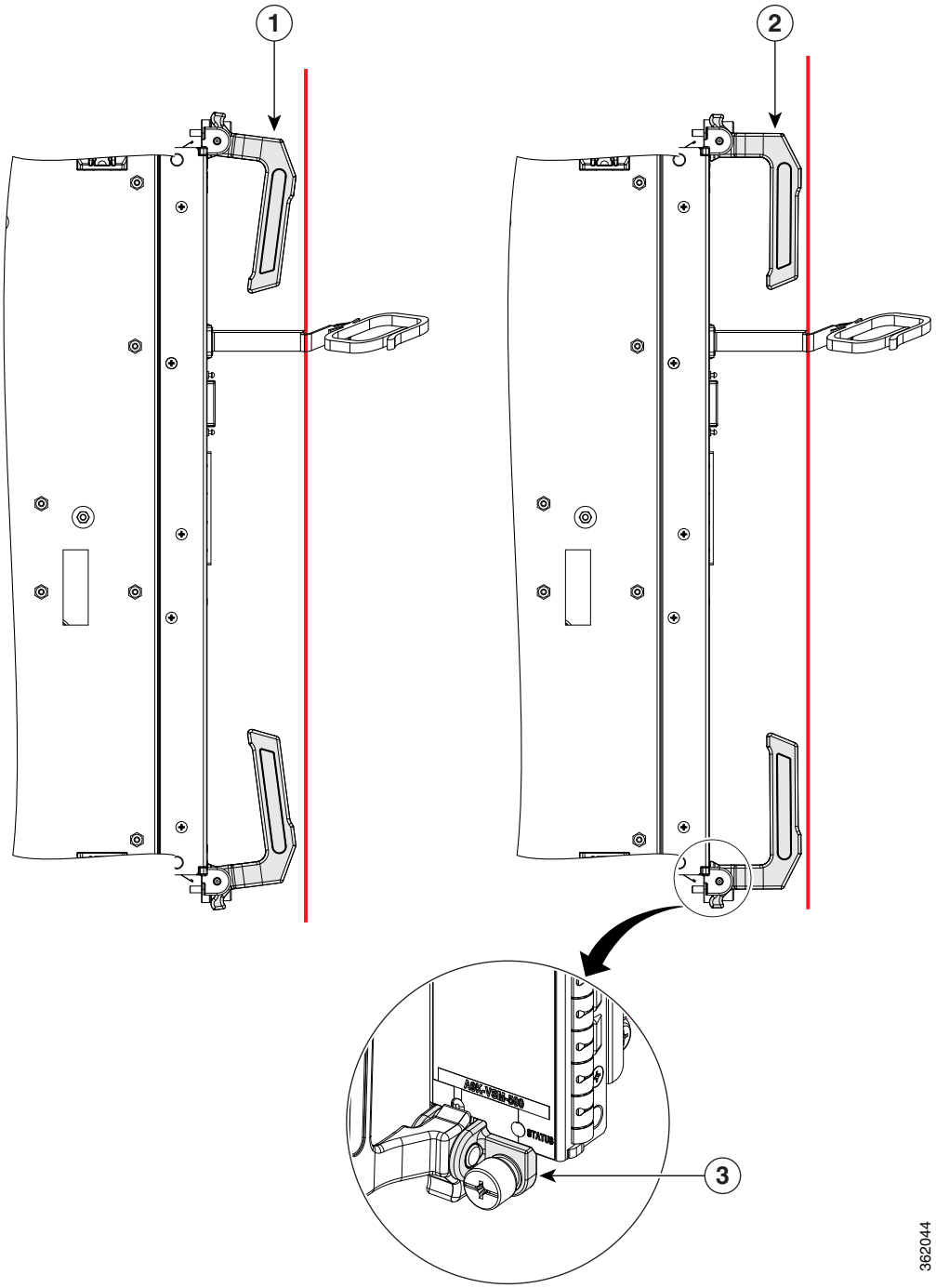
Caution When you install a VSM card, always use the ejector levers to ensure that the card is correctly aligned with the backplane connector, the card connector pins make contact with the backplane in the correct order, and the card is fully seated in the backplane. A card that is only partially seated in the backplane can cause the router to hang.

Step 5 Simultaneously pivot both ejector levers toward each other until they are perpendicular to the VSM card faceplate. This action firmly seats the card in the backplane. See Figure 1-4.

Step 6 Tighten the captive screw on each end of the VSM card faceplate to ensure proper EMI shielding and to prevent the VSM card from becoming partially dislodged from the backplane. Tighten the captive screws to a torque of 10 +/–1 in-lb. See Figure 1-4.

Caution To ensure adequate space for additional line cards or VSM cards, always tighten the captive installation screws on each newly installed VSM card before you insert any additional cards. These screws also ensure correct seating in the backplane connector, prevent accidental removal, and provide proper grounding and EMI shielding for the router.

Figure 1-4 VSM Card Ejector Lever Positions During Installation



Note: Vertical red lines in Figure 1-4 indicate a line fully parallel to the VSM card front panel.					
1	Slightly loose position of ejector levers when the VSM card is fully seated in the backplane, but the captive installation screws are not fully tightened	**2**	Fully parallel position of ejector levers when the VSM card is fully seated in the backplane and captive installation screws are fully tightened	**3**	Slight gap that may be present when the VSM card is fully seated in the backplane and captive installation screws are fully tightened

Checking the Installation

This section describes the procedures you can use to verify the VSM card installation and includes information on the following topics:

- Verifying the Installation, page 1-13
- Using show Commands to Verify VSM Card Status, page 1-14

Verifying the Installation

This section describes how to verify the VSM card installation by observing the VSM card LED states and the information displayed on the console terminal. See the "Status LEDs" section on page 2-2 for detailed information about the status LEDs on the VSM card.

When the system has reinitialized all interfaces, the VSM card STATUS LED should be green (on). The console screen also displays a message as the system discovers each interface during its reinitialization.

Use the following procedure to verify that a VSM card is installed correctly:

Step 1 Observe the console display messages and verify that the system discovers the VSM card, while the system reinitializes each interface, as follows:

- As a VSM card is initialized, the STATUS LED will first be amber, indicating that power is on, but the VSM card is being configured. When the VSM card is active, the STATUS LED will illuminate green.

Step 2 When the VSM card STATUS LED is green, all associated interfaces are configurable.

- If a VSM card is replaced with a VSM card of the same type (as in an OIR or hardware swap), the previous configuration is reinstated when the VSM card becomes active.
- If a VSM card has not been previously installed in the same slot, then the configuration for all associated interfaces is empty. New interfaces are not available until you configure them.

Step 3 If the VSM card has not become active, refer to the system console messages. If there is no indication that an upgrade is underway, see "Verifying and Troubleshooting the VSM Card Installation".

Using show Commands to Verify VSM Card Status

The following procedure uses **show** commands to verify that the new VSM card is installed correctly and operating correctly.

Step 1 Use the **show running-config** command to display the system configuration.

Step 2 Display information about the installed VSM cards using the **show diag** command.

Step 3 Use the **show hw-module fpd location** <rack/slot/subslot> command to verify the FPD version information of the VSM card installed in the system. The **hw-module fpd location** <rack/slot/subslot> command can be used for upgrading the FPD version on the installed VSM cards.

Note If a VSM card does not meet the minimum version required, the FPD may need to be updated. Refer to *Cisco ASR 9000 Series Aggregation Services Router System Management Configuration Guide* for instructions.

Step 4 Use the **show platform** command to check the state of all the boards in the chassis, including the VSM card.

The VSM card state should be "IOS XR RUN" in the **show platform** command output.

Step 5 Finally, you can use the **show version** command to obtain software version information for the installed VSM cards.

Table 1-3 describes the **show** commands you can use to display VSM card information.

Table 1-3 show Commands to Display VSM Card Information

Command	Type of Information Provided	Example
show running-config	Current running (active) configuration.	**show running-config**
show diag	Card type in that slot, hardware revision, part number, and EEPROM contents.	**show diag**
show hw-module fpd location *<rack/slot/subslot>*	FPD version information of VSM cards in the system.	**show hw-module fpd location 0/2/cpu0** or **show hw-module fpd location all**
show platform	Router's installed card type, slot, and state information.	**show platform**
show version	Cisco IOS XR software version, names and sources of configuration files, and boot images.	**show version**

For complete descriptions of **show** commands, refer to the command reference or configuration guide for the installed Cisco IOS XR release.

Use the following procedure to verify that the VSM card is installed correctly:

Step 1 Observe the console display messages and verify that the system discovers the VSM card.

Step 2 Verify that the STATUS LED on the VSM card goes on (is green) and remains on after the reinitialization is complete. If the STATUS LED remains on, proceed to Step 5. If the STATUS LED does not remain on, proceed to Step 3.

Step 3 If the STATUS LED on a VSM card fails to go on, the VSM card might not be fully seated.

1. Remove the VSM card.
2. Inspect the VSM card. Verify there are no bent pins or parts and that there is nothing lodged in the devices that could prevent a good connection.
3. Re-insert the VSM card in the router.
4. After the system reinitialization, the STATUS LED on the VSM card should go on and remain on. If the STATUS LED remains on, proceed to Step 5. If it does not, try reseating the VSM card in another available slot on the router. Wait for the STATUS LED on the VSM card to turn green.
5. If the STATUS LED goes on, suspect a failed backplane port in the original slot.
6. If the STATUS LED fails to go on, remove the VSM card and reinstall it accordingly.
7. If no LEDs on the VSM card go on, suspect a faulty VSM card. Contact a service representative to report the problem and obtain further instructions.

Step 4 If the VSM card is new and is not a replacement, configure the new VSM card using the instructions in Cisco IOS XR Getting Started Guide for the Cisco ASR 9000 Series Router and Cisco ASR 9000 Series Aggregation Services Router Interface and Hardware Component Configuration Guide.

Step 5 Repeat Step 1 through Step 4 to verify that any additional VSM cards are properly installed.

If you experience other problems that you are unable to solve, contact TAC (see the "Obtaining Documentation and Submitting a Service Request" section in the Preface) or a service representative for assistance.

Verifying and Troubleshooting the VSM Card Installation

This chapter contains information about the following topics:

- Verifying and Troubleshooting VSM Card Installation, page 2-1
- Configuring and Troubleshooting the VSM Card, page 2-4
- Replacing a VSM Card, page 2-5
- Performing OIR of a VSM Card, page 2-6
- Regulatory, Compliance, and Safety Information, page 2-35

Verifying and Troubleshooting VSM Card Installation

After installing the hardware, you need to look at the LEDs on the front panel of the VSM card to verify that the VSM card was installed correctly. If it was not, you need to troubleshoot to find the problem. The following sections provide information about how to verify and troubleshoot VSM card installations:

- Initial Boot Process, page 2-1
- Status LEDs, page 2-2
- Troubleshooting the Installation, page 2-3

To verify that the VSM card is working properly:

Step 1 Check that the VSM card Status LED is on (green) to verify that the card is operating normally.

Step 2 If the VSM card Status LED is not green, refer to the "Status LEDs" section on page 2-2 to identify any possible problems.

Initial Boot Process

During a typical VSM card boot process, the following events occur:

1. The CBC powers up the CPU complex. BIOS and ROMMON run to enumerate and initialize the hardware devices (both non- Cisco specific and Cisco-specific devices).

2. The host operating system runs.
3. The SysAdmin VM (for service VM manageability purposes) and IOS-XR VM are launched.
4. The RSP loads the VSM card with its Cisco IOS XR software. First, the minimum boot image (MBI) package is downloaded and then other packages are downloaded from the RSP.

To verify that the line card is working properly,

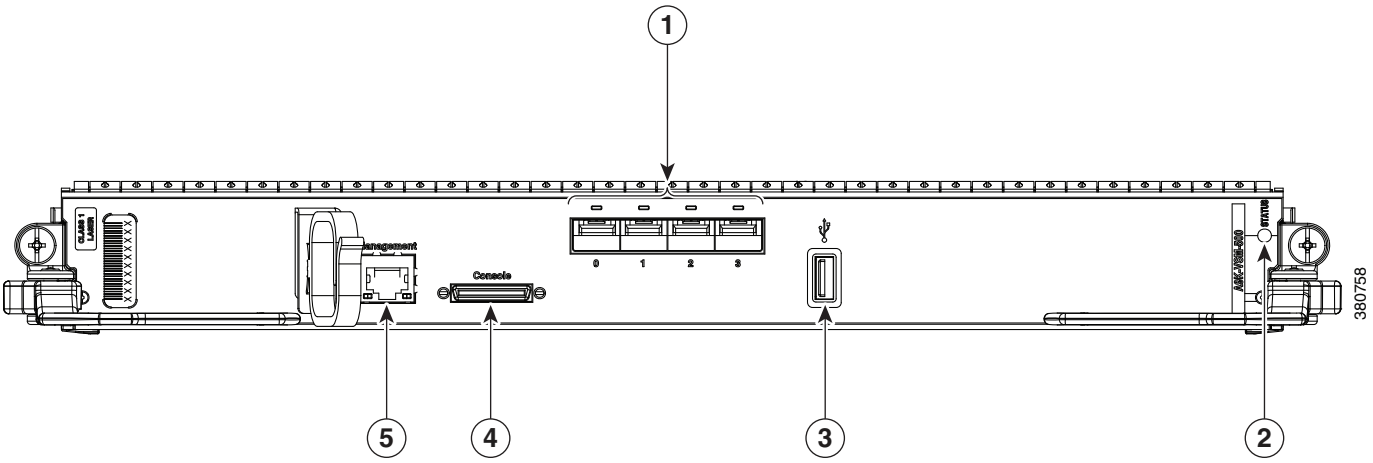
Step 1 Check that the Card Status LED is on (green) to verify that the card is operating normally.

Step 2 If the Card Status LED is not on, see the "Advanced VSM Card Troubleshooting" section on page 2-5 to identify any possible problems.

Status LEDs

You can use the Card Status LED on the VSM card front panel to verify proper operation or troubleshoot a failure. Refer to Figure 2-1 and Table 2-1.

Figure 2-1 VSM Card Faceplate



1	Four 10 Gigabit Ethernet SFP+ module ports and LEDs (not supported in current release)	**4**	UCS combo connector
2	VSM card status LED	**5**	Gigabit Ethernet management port
3	USB port		

Table 2-1 Card Status LEDs

LED Color	Description
Card Status LEDs (one per card)	
Off	VSM card is powered off. The LED might turn off momentarily when switching between the states described above, although the card has not powered off.
Red	VSM card has encountered a hardware error, and is not passing traffic.
Green	VSM card has booted properly, and is ready to pass or is passing traffic.

Troubleshooting the Installation

If the Card Status LED on the VSM card front panel indicates some issue, there is either a problem with the VSM card installation or a hardware failure. To verify that the VSM card is installed correctly, follow these steps:

Step 1 If the Card Status LED fails to go on, check the router connections as follows:

a. Verify that the VSM card board connector is fully seated in the backplane. Loosen the captive installation screws and firmly pivot the ejector levers toward each other until both are parallel to the VSM card faceplate. Tighten the captive installation screws.

b. Verify that all power cords and data cables are firmly connected at both ends.

c. Verify that all components on the card are fully seated and secured to their sockets.

After the VSM card re initializes, the Card Status LED on the VSM card should go on. If the Card Status LED goes on, the installation is complete; if the Card Status LED does not go on, proceed to the next step.

Step 2 If the Card Status LED still fails to go on, remove the VSM card and try installing it in another available slot.

- If the Card Status LED goes on when the VSM card is installed in the new slot, suspect a failed backplane port in the original line card slot.
- If the Card Status LED still does not go on, halt the installation. Contact a service representative to report the faulty equipment and obtain further instructions.

Step 3 If an error message displays on the console terminal during the card initialization, see the appropriate reference publication for error message definitions.

If you experience other problems that you cannot solve, contact a Cisco service representative for assistance.

Configuring and Troubleshooting the VSM Card

After the person who installed the hardware verifies that the new VSM card is installed correctly by examining the LEDs, the network administrator can configure the new interface. The following sections provide information on configuring and troubleshooting the VSM card:

- Line Card Interface Address, page 2-4
- Using Configuration Commands, page 2-4
- Advanced VSM Card Troubleshooting, page 2-5
- Reloading a VSM Card, page 2-5

Line Card Interface Address

A Cisco ASR 9000 Series Router identifies an interface address by its rack number, line card slot number, instance number, and port number, in the format *rack/slot/instance/port*. The *rack* parameter is reserved for multirack systems, so is always 0 (zero) for the Cisco ASR 9000 Series. The line card *slot*s are numbered from 0 to 7 (Cisco ASR 9010 Router), 0 to 3 (Cisco ASR 9006 Router), 0 to 1 (Cisco ASR 9904 Router), 0 to 9 (Cisco ASR 9912 Router), or 0 to 19 (Cisco ASR 9922 Router).

Instance numbers are reserved for cards that have subslots. This parameter is 0(zero) for the four interfaces on the front-panel of the VSM card. The instance number is 1 for the twelve internal interfaces that are used to configure a service VM. The ports on the card are numbered 0, 1, 2, and so on. For example, the *rack/slot/instance/port* address of the fourth port on the front of a VSM card installed in line card slot 1 is 0/1/0/3.

Using Configuration Commands

The command line interface (CLI) for Cisco IOS XR software is divided into different command modes. To configure a card, you enter the correct mode and then enter the commands you need. When you first log in, you are automatically in EXEC mode. Next, enter the configure command to access configuration mode.

For software configuration information, refer to the Cisco IOS XR software configuration and command reference publications for the installed Cisco IOS XR release. Also refer to the Cisco IOS XR software release notes for additional information.

VSM Card Configuration

There are two set of interfaces on the VSM card—four 10GE (FCOE) interfaces on the front panel and twelve 10GE internal interfaces.

Note In IOS XR 5.1.1, the four 10GE interfaces on the front panel are not supported.

The internal interfaces are used when configuring a service VM to bring in traffic to the service VM. The internal interfaces are configured using the **vnic interface** command. For more information about how to configure the internal interfaces on the VSM card, see the *Cisco ASR 9000 Series Aggregation Services Router CGv6 Configuration Guide*.

Advanced VSM Card Troubleshooting

This section briefly describes advanced troubleshooting commands that can be used in the event of a VSM card failure.

Note This section assumes that you possess basic proficiency in the use of Cisco IOS XR software commands.

By using the commands listed in this section, you should be able to determine the nature of the problems you are having with your VSM card. The first step is to identify the cause of the VSM card failure or console errors that you are seeing.

To discover which card may be at fault, it is essential to collect the output from the following commands:

- **show logging**
- **show diag**
- **show context location**

Along with these **show** commands, you should also gather the following information:

- Console Logs and Syslog Information—This information is crucial if multiple symptoms are occurring. If the router is configured to send logs to a Syslog server, you may see some information on what has occurred. For console logs, it is best to be directly connected to the router on the console port with logging enabled.
- Additional Data—The **show tech-support** command is a compilation of many different commands, including **show version**, **show running-config**, and **show stacks**. This information is required when working on issues with the Cisco Technical Assistance Center (Cisco TAC).

For examples of how to use these commands and the resulting output, refer to the *Cisco ASR 9000 Series Troubleshooting Guide*.

For complete descriptions of **show** commands, refer to the command reference or configuration guide for the installed Cisco IOS XR release.

Note It is important to collect the show tech-support data before doing a reload or power cycle. Failure to do so can cause all information about the problem to be lost.

Reloading a VSM Card

To reload the VSM card, execute the **hw-module location reload** command in admin mode. Refer to the *Cisco ASR 9000 Series Aggregation Services Router System Management Command Reference* online for command syntax.

Replacing a VSM Card

To replace a VSM module for a Return Material Authorization (RMA), follow these steps.

Note For information on the RMA process, refer to the Cisco Returns Portal.

Step 1 Uninstall CGv6 on the VSM:

- Deactivate CGv6 VM
- Uninstall CGv6 OVA Package
- Disable the Service Enablement Feature — Perform this operation only if you are removing the CGN service completely from the router. If there are multiple VSM line cards in the chassis and if you are doing VSM OIR or removing or replacing an individual VSM card, do not perform this operation

  Refer to the Uninstalling CGv6 on VSM section in the "Carrier Grade IPv6 over Virtualized Services Module (VSM)" chapter of the *CGv6 Configuration Guide for Cisco ASR 9000 Series Routers*.

Step 2 Power down the VSM card using the **hw-module power disable** command in administration configuration mode. The example below shows how to power down the VSM card installed in slot 0:

```
RP/0/RSP0/CPU0:router# admin
RP/0/RSP0/CPU0:router(admin)# configure
RP/0/RSP0/CPU0:router(admin-config)# hw-module power disable location 0/0/cpu0
RP/0/RSP0/CPU0:router(admin-config)# commit
RP/0/RSP0/CPU0:router(admin-config)# exit
RP/0/RSP0/CPU0:router(admin)# exit
```

Step 3 Remove the VSM card.

Step 4 Install the replacement VSM card.

Step 5 Install CGv6 OVA package.

Step 6 Activate CGv6 VM.

Performing OIR of a VSM Card

To perform OIR (online insertion and removal) of a VSM module, follow these steps.

Note Before removing the VSM card from the chassis, always deactivate the CGv6 VM and uninstall the CGv6 OVA package.

Step 1 Uninstall CGv6 on the VSM:

- Deactivate CGv6 VM
- Uninstall CGv6 OVA Package
- Disable the Service Enablement Feature — Perform this operation only if you are removing the CGN service completely from the router. If there are multiple VSM line cards in the chassis and if you are doing VSM OIR or removing or replacing an individual VSM card, do not perform this operation

  Refer to the Uninstalling CGv6 on VSM section in the "Carrier Grade IPv6 over Virtualized Services Module (VSM)" chapter of the *CGv6 Configuration Guide for Cisco ASR 9000 Series Routers*.

Step 2 Power down the VSM card using the **hw-module power disable** command in administration configuration mode. The example below shows how to power down the VSM card installed in slot 0:

```
RP/0/RSP0/CPU0:router# admin
RP/0/RSP0/CPU0:router(admin)# configure
RP/0/RSP0/CPU0:router(admin-config)# hw-module power disable location 0/0/cpu0
RP/0/RSP0/CPU0:router(admin-config)# commit
RP/0/RSP0/CPU0:router(admin-config)# exit
RP/0/RSP0/CPU0:router(admin)# exit
```

Step 3 Remove the VSM card.

Step 4 Install the VSM card again.

Step 5 Use the **show platform** command to confirm the VSM card is in UP state.

Step 6 After the VSM state is UP, install CGv6 OVA package.

Step 7 Activate CGv6 VM.

Collecting VSM Information

Here is the example output from the **show running-config virtual-service** command:

```
RP/0/RSP0/CPU0:router#show running-config virtual-service
virtual-service enable
virtual-service application1
vnic interface TenGigE0/1/1/0
```

Here is the example output from the **show platform** command with the VSM card installed in slot 2:

```
RP/0/RSP0/CPU0:router#show platform

Node            Type                        State           Config State
--------------------------------------------------------------------------------
0/RSP0/CPU0     A9K-RSP440-TR(Active)       IOS XR RUN      PWR,NSHUT,MON
0/0/CPU0        A9K-8T-E                    IOS XR RUN      PWR,NSHUT,MON
0/1/CPU0        A9K-8T-E                    IOS XR RUN      PWR,NSHUT,MON
0/2/CPU0        A9K-VSM-500                 IOS XR RUN      PWR,NSHUT,MON
```

Here is the example output for the **show platform summary location** command:

```
RP/0/RSP0/CPU0:router#show platform summary location 0/1/cpu0
------------------------------------------------------------------------------
     Platform Node : 0/1/CPU0 (slot 3)
               PID : A9K-VSM-500
         Card Type : ASR9K Virtualized Services Module
            VID/SN : V00  / FOC1741N8EF
       Oper State : IOS XR RUN
       Last Reset : Card is reset by user
                  : Mon Feb 10 10:17:20 2014
     Configuration : Power is enabled
                     Bootup enabled.
                     Monitoring Disabled
       Rommon Ver : Version 1.00 (20010101:000000)
       IOS SW Ver : 5.1.1.22I
       Main Power : Power state Enabled. Estimate power 800 Watts of power required.
           Faults : N/A
------------------------------------------------------------------------------
```

Here is the example output for the **show inventory** command, with the VSM card installed in slot 2:

```
RP/0/RSP0/CPU0:router#show inventory
NAME: "module 0/RSP0/CPU0", DESCR: "ASR9K Route Switch Processor with 440G/slot Fabric and
12GB"
PID: A9K-RSP440-SE, VID: V01, SN: FOC16088174
```

```
NAME: "module 0/1/CPU0", DESCR: "2-Port 10GE, 20-Port GE Low Queue LC Requires XFPs and
SFPs"
PID: A9K-2T20GE-L, VID: V04, SN: FOC161286VE

NAME: "module mau TenGigE0/1/CPU0/0", DESCR: "Multirate 10GBASE-SR, SMF"
PID: XFP-10G-MM-SR      , VID: V02 , SN: SPC1726025P

NAME: "module mau TenGigE0/1/CPU0/1", DESCR: "Multirate 10GBASE-SR, SMF"
PID: XFP-10G-MM-SR      , VID: V02 , SN: SPC1726010G

NAME: "module 0/2/CPU0", DESCR: "ASR9K Virtualized Services Module"
PID: A9K-VSM-500 , VID: V00 , SN: FOC1741N8EF
```

Here is the example output for the **show hw-module fpd location all** command, with the VSM card installed in slot 2:

```
RP/0/RSP0/CPU0:router#show hw-module fpd location all

==================================== ========================================
                                     Existing Field Programmable Devices
                                     ========================================
                                       HW                        Current SW Upg/
Location     Card Type               Version Type Subtype Inst   Version   Dng?
============ ======================= ======= ==== ======= ==== =========== ====
0/RSP0/CPU0  A9K-RSP440-TR             1.0   lc   cbc     0      16.115    No
                                             lc   fpga1   0       0.09     Yes
                                             lc   fpga2   0       1.06     No
                                             lc   fpga3   0       4.09     No
                                             lc   rommon  0       0.70     Yes
------------------------------------------------------------------------------
0/FT0/SP     ASR-9006-FAN              1.0   ft   cbc     7       5.02     No
------------------------------------------------------------------------------
0/FT1/SP     ASR-9006-FAN              1.0   ft   cbc     8       5.02     No
------------------------------------------------------------------------------
0/1/CPU0     A9K-2T20GE-L              1.0   lc   fpga1   0       0.43     Yes
                                             lc   fpga2   0       0.16     No
                                             lc   cbc     0       2.02     Yes
                                             lc   cpld2   0       0.11     No
                                             lc   cpld1   0       0.19     Yes
                                             lc   cpld3   0       0.10     No
                                             lc   rommon  0       1.03     Yes
------------------------------------------------------------------------------
0/1/CPU0     A9K-2T20GE-L              1.0   lc   fpga1   1       0.43     Yes
------------------------------------------------------------------------------
0/2/CPU0     A9K-VSM-500               1.0   lc   cbc     0      33.02     No
                                             lc   fpga1   0       1.25     No
                                             lc   bios    0       3.00     No
                                             lc   ibmc    0       5.08     No
------------------------------------------------------------------------------
NOTES:
1.  One or more FPD needs an upgrade or a downgrade.  This can be accomplished
    using the "<admin> upgrade hw-module fpd <fpd> location <loc>" CLI.
```

Here is the example output for the **show hw-module fpd location 0/2/CPU0** command, with the VSM installed in slot 2:

```
RP/0/RSP0/CPU0:router#show hw-module fpd location 0/2/cpu0

==================================== ========================================
                                     Existing Field Programmable Devices
                                     ========================================
                                       HW                        Current SW Upg/
Location     Card Type               Version Type Subtype Inst   Version   Dng?
```

```
============ ======================== ======= ==== ======= ==== =========== ====
0/2/CPU0     A9K-VSM-500                1.0   lc   cbc     0      33.02     No
                                              lc   fpga1   0       1.25     No
                                              lc   bios    0       3.00     No
                                              lc   ibmc    0       5.08     No
-------------------------------------------------------------------------------
```

If the upg/dng? column says Yes, it means that one or more FPD needs an upgrade or a downgrade. This can be accomplished using the **admin upgrade hw-module fpd** command.

Below is a description of fields for the show hw-module fpd location all command.

- Location: Location of the module in the rack/slot/module notation.
- Card Type: Module part number.
- HW Version: Hardware model version for the module.
- Type: Hardware type
  - lc—Line card
- Subtype: CBC, FPGA, BIOS, iBMC, CPLD, or ROMMON.
- Inst: A unique ID used by the FPD process.
- Current SW Version: Currently running FPD image version.
- HW Version: Hardware version of the card.
- Upg/Dng?: Specifies whether an FPD upgrade or downgrade is required.

Here is the example output for the **show fpd package** command:

```
RP/0/RSP0/CPU0:router(admin)#show fpd package

============================== ===============================================
                                      Field Programmable Device Package
                               ===============================================
                                                                  SW      Min Req   Min Req
Card Type            FPD Description            Type Subtype   Version   SW Ver    HW Vers
==================== ========================== ==== ======= =========== ========  =========
A9K-VSM-500          CPUCtrl Forge              lc   bios        3.00        0.00      0.1
                     CPUCtrl Forge              lc   cbc        33.02        0.00      0.1
                     CPUCtrl Forge              lc   fpga1       1.25        0.00      0.1
                     CPUCtrl Forge              lc   ibmc        5.08        0.00      0.1
-------------------------------------------------------------------------------------------
A9K-RSP440-TR        Can Bus Ctrl (CBC) RSP3    lc   cbc        16.115       0.00      0.1
                     ClockCtrl0 RSP3            lc   fpga2       1.06        0.00      0.1
                     UTI RSP3                   lc   fpga3       4.09        0.00      0.1
                     CPUCtrl RSP3               lc   fpga1       0.10        0.00      0.1
                     ROMMONB RSP3               lc   rommon      0.71        0.00      0.1
-------------------------------------------------------------------------------------------
A9K-RSP440-SE        Can Bus Ctrl (CBC) RSP3    lc   cbc        16.115       0.00      0.1
                     ClockCtrl0 RSP3            lc   fpga2       1.06        0.00      0.1
                     UTI RSP3                   lc   fpga3       4.09        0.00      0.1
                     CPUCtrl RSP3               lc   fpga1       0.10        0.00      0.1
                     ROMMONB RSP3               lc   rommon      0.71        0.00      0.1
-------------------------------------------------------------------------------------------
```

Here is the example output for the **show tech vsm location 0/0/CPU0** command, with the VSM card installed in slot 0:

```
RP/0/RSP0/CPU0:router#show tech vsm location 0/0/CPU0 terminal
-------------------------------------------------------------------------------
                  show tech-support vsm for location 0/0/CPU0
-------------------------------------------------------------------------------
```

```
------------------------- show ipv4 interface brief -------------------------
Interface                      IP-Address      Status                Protocol
MgmtEth0/RSP0/CPU0/0           5.25.8.111      Up                    Up
MgmtEth0/RSP0/CPU0/1           unassigned      Shutdown              Down
TenGigE0/0/1/0                 unassigned      Shutdown              Down
TenGigE0/0/1/1                 unassigned      Shutdown              Down
TenGigE0/0/1/2                 unassigned      Shutdown              Down
TenGigE0/0/1/3                 unassigned      Shutdown              Down
TenGigE0/0/1/4                 unassigned      Shutdown              Down
TenGigE0/0/1/5                 unassigned      Shutdown              Down
TenGigE0/0/1/6                 unassigned      Shutdown              Down
TenGigE0/0/1/7                 unassigned      Shutdown              Down
TenGigE0/0/1/8                 unassigned      Shutdown              Down
TenGigE0/0/1/9                 unassigned      Shutdown              Down
TenGigE0/0/1/10                unassigned      Shutdown              Down
TenGigE0/0/1/11                unassigned      Shutdown              Down
------------------------------ show platform ------------------------------
Node            Type                       State            Config State
--------------------------------------------------------------------------
0/RSP0/CPU0     A9K-RSP440-TR(Active)      IOS XR RUN       PWR,NSHUT,MON
0/0/CPU0        A9K-VSM-500                IOS XR RUN       PWR,NSHUT,MON
---------------------------- show install active ----------------------------
Secure Domain Router: Owner
  Node 0/RSP0/CPU0 [RP] [SDR: Owner]
    Boot Device: mem:
    Boot Image: /asr9k-os-mbi-5.1.1/0x100305/mbiasr9k-rsp3.vm
    Active Packages:
      mem:asr9k-services-px-5.1.1
      mem:asr9k-mini-px-5.1.1
      mem:asr9k-fpd-px-5.1.1
      mem:asr9k-services-infra-5.1.1

  Node 0/0/CPU0 [LC] [SDR: Owner]
    Boot Device: mem:
    Boot Image: /asr9k-os-mbi-5.1.1/lc/0x3C0266/mbiasr9k-lc-x86e.vm
    Active Packages:
      mem:asr9k-services-px-5.1.1
      mem:asr9k-mini-px-5.1.1
      mem:asr9k-services-infra-5.1.1

------------------------------ show platform ------------------------------
Node            Type                       State            Config State
--------------------------------------------------------------------------
0/RSP0/CPU0     A9K-RSP440-TR(Active)      IOS XR RUN       PWR,NSHUT,MON
0/0/CPU0        A9K-VSM-500                IOS XR RUN       PWR,NSHUT,MON

--------------------------------- show diag ---------------------------------

NODE module 0/RSP0/CPU0  ASR9K Route Switch Processor with 440G/slot Fabric and 6GB

  MAIN:  board type 0x100306
  S/N:   FOC1738N4T8
  Top Assy. Number:   68-4872-02
  PID:   A9K-RSP440-TR
  HwRev (UDI_VID):   V04
  Chip HwRev: V1.0
  New Deviation Number: 0
  CLEI:  IPUCBB3BTB
  Board State : IOS XR RUN
  PLD:    Motherboard: N/A, Processor version: 0x0 (rev: 2.174), Power: N/A
  MONLIB:
  ROMMON: Version 0.70 [ASR9K x86 ROMMON],
  Board FPGA/CPLD/ASIC Hardware Revision:
    FabSwitch0  : V1.5
```

```
    FabSwitch1  : V1.5
    FabArbiter  : V0.0
    FIA  : V0.2
    IntCtrl  : V0.9
    ClkCtrl  : V2.10
    10GPuntFPGA  : V1.6
    HD  : V17.0
    USB0  : V17.0
    USB1  : V0.0
    CpuCtrl  : V0.9
    YDTI  : V4.9
    LIU  : V0.0
    MLANSwitch  : V0.0
    EOBCSwitch  : V0.0
    HostInftCtrl  : V0.0
    PHY  : V0.0
    Offload10GE  : V0.0
    E10GEDualMAC0  : V0.0
    E10GEDualMAC1  : V0.0
    EGEDualMAC0  : V0.0
    EGEDualMAC1  : V0.0
    CBC (active partition)  : v16.115
    CBC (inactive partition)  : v16.115

NODE module 0/0/CPU0

  MAIN:  board type 0x3c0266
  S/N:   FOC1723N0D8
  Top Assy. Number:   68-4610-02
  PCA:   73-14608-02
  PID:   A9K-VSM-500
  HwRev (UDI_VID):   V00
  Chip HwRev: V0.5
  New Deviation Number: 0
  CLEI:
  Board State : IOS XR RUN
  PLD:    Motherboard: N/A, Processor version: 0x0 (rev: 2.174), Power: N/A
  Rommon: V3.00 [ASR9K x86 ROMMON]
  BMC Version  : V5.08
  KVM Version  : V2.08
  Calvados Version  : V1.05
  Board FPGA/CPLD/ASIC Hardware Revision:
    NP0  : V4.194
    NP1  : V4.194
    FIA0  : V0.2
    FIA1  : V0.2
    X-Bar  : V1.5
    Arbiter  : V0.0
    CPUCtrl  : V1.25
    DBCtrl  : V1.25
    PHYCtrl  : V1.25
    PortCtrl  : V1.25
    Virtualized Services Module 500 Daughter board  : V0.5
    CBC (active partition)  : v33.2
    CBC (inactive partition)  : v33.2

---------- show controllers fabric fia link-status location 0/0/CPU0 ----------

 ********** FIA-0 **********
Category: link-0
                                spaui link-0                      Up
                                spaui link-1                      Up
                                 arb  link-0                      Up
                                 xbar link-0                      Up
```

```
                                  xbar link-1                       Up

 ********** FIA-1 **********
Category: link-1
                                 spaui link-0                       Up
                                 spaui link-1                       Up
                                  arb  link-0                       Up
                                  xbar link-0                       Up
                                  xbar link-1                       Up

-- show controllers fabric crossbar link-status instance 0 location 0/0/CPU0 --
PORT    Remote Slot  Remote Inst    Logical ID  Status
==================================================
03        00               00             0        Up
04        00               00             1        Up
09        04               00             1        Up
12        04               00             0        Up
14        04               01             1        Up
16        04               01             0        Up
23        00               01             0        Up
25        00               01             1        Up


------------- show controllers np crashinfo all location 0/0/CPU0 -------------

               Node: 0/0/CPU0:
----------------------------------------------------------------

               ****No Crash Dump info found!!!! file name: /harddisk:/np/NPdatalog_0_0_CPU0_np0_prm1.txt
****
-------------------------------------------------------------------------------------------------
         Backup Crash Dump file name is ("/harddisk:/np/NPdatalog_0_0_CPU0_np0_prm2.txt")
-------------------------------------------------------------

               ****No Crash Dump info found!!!! file name: /harddisk:/np/NPdatalog_0_0_CPU0_np1_prm1.txt
****
-------------------------------------------------------------------------------------------------
         Backup Crash Dump file name is ("/harddisk:/np/NPdatalog_0_0_CPU0_np1_prm2.txt")
-------------------------------------------------------------

---------------- show controllers np drvlog location 0/0/CPU0 -----------------

               Node: 0/0/CPU0:
----------------------------------------------------------------
                NP Driver Log
               ===============

               ****    Opening NP driver log  ****
               ****  Wed Feb 12 15:49:43 2014 ****

               ****    Opening NP driver log  ****
               ****  Wed Feb 12 15:54:47 2014 ****

               ****    Opening NP driver log  ****
               ****  Wed Feb 12 16:01:03 2014 ****

               ****    Opening NP driver log  ****
               ****  Tue Feb 18 12:02:21 2014 ****

               ****    Opening NP driver log  ****
               ****  Tue Feb 18 13:12:09 2014 ****

               ****    Opening NP driver log  ****
               ****  Tue Feb 18 16:05:50 2014 ****
```

```
                ****    Opening NP driver log  ****
                ****  Tue Feb 18 17:23:46 2014 ****

                ****    Opening NP driver log  ****
                ****  Tue Feb 18 18:10:30 2014 ****

                ****    Opening NP driver log  ****
                ****  Wed Feb 19 15:13:52 2014 ****

                ****    Opening NP driver log  ****
                ****  Wed Feb 19 15:27:25 2014 ****

                ****    Opening NP driver log  ****
                ****  Wed Feb 19 16:26:58 2014 ****

------------------------------------------------------------
         Backup Driver Log file name is ("/harddisk:/np/NPdrvlog2_0_0_CPU0.txt")
------------------------------------------------------------

-------- show controller np fabric-counters all all location 0/0/CPU0 ---------

                Node: 0/0/CPU0:
----------------------------------------------------------------
Egress fabric-to-bridge interface 1 counters for NP 0
 INTERLAKEN_TX_PACKETS                          0x00000000 000126b4
 INTERLAKEN_TX_BYTES                            0x00000000 009b56ac
 INTERLAKEN_TX_BAD_PACKETS                      0x00000000 00000000
 ----------------------------------------------------------------
Egress fabric-to-bridge interface 2 counters for NP 0
 INTERLAKEN_TX_PACKETS                          0x00000000 00000000
 INTERLAKEN_TX_BYTES                            0x00000000 00000000
 INTERLAKEN_TX_BAD_PACKETS                      0x00000000 00000000
 ----------------------------------------------------------------
Egress fabric-to-bridge interface 1 counters for NP 1
 INTERLAKEN_TX_PACKETS                          0x00000000 00000040
 INTERLAKEN_TX_BYTES                            0x00000000 00008aa7
 INTERLAKEN_TX_BAD_PACKETS                      0x00000000 00000000
 ----------------------------------------------------------------
Egress fabric-to-bridge interface 2 counters for NP 1
 INTERLAKEN_TX_PACKETS                          0x00000000 00000000
 INTERLAKEN_TX_BYTES                            0x00000000 00000000
 INTERLAKEN_TX_BAD_PACKETS                      0x00000000 00000000
 ----------------------------------------------------------------

                Node: 0/0/CPU0:
----------------------------------------------------------------
Ingress fabric-to-bridge interface 1 counters for NP 0
 INTERLAKEN_RX_PACKETS                          0x00000000 000126b4
 INTERLAKEN_RX_BYTES                            0x00000000 009b56ac
 INTERLAKEN_RX_BAD_PACKETS                      0x00000000 00000000
 INTERLAKEN_RX_CRC_ERROR                        0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_ERROR_0                0x00000000 00000001
 INTERLAKEN_RX_ALIGNMENT_ERROR_1                0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_ERROR_2                0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_ERROR_3                0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE                0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE_1              0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE_2              0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE_3              0x00000000 00000000
 INTERLAKEN_RX_BLK_TYPE_ERROR_AGGR              0x00000000 00000000
 INTERLAKEN_RX_DIAG_CRC_ERROR_AGGR              0x00000000 00000000
 INTERLAKEN_RX_WORD_SYNC_ERROR_AGGR             0x00000000 000f2015
 INTERLAKEN_LAST_CNT                            0x00000000 00000000
```

```
 Net IF0                                    0x0000009c 14234244
 ------------------------------------------------------------
Ingress fabric-to-bridge interface 2 counters for NP 0
 INTERLAKEN_RX_PACKETS                      0x00000000 00000000
 INTERLAKEN_RX_BYTES                        0x00000000 00000000
 INTERLAKEN_RX_BAD_PACKETS                  0x00000000 00000000
 INTERLAKEN_RX_CRC_ERROR                    0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_ERROR_0            0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_ERROR_1            0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_ERROR_2            0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_ERROR_3            0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE            0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE_1          0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE_2          0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE_3          0x00000000 00000000
 INTERLAKEN_RX_BLK_TYPE_ERROR_AGGR          0x00000000 00000000
 INTERLAKEN_RX_DIAG_CRC_ERROR_AGGR          0x00000000 00000000
 INTERLAKEN_RX_WORD_SYNC_ERROR_AGGR         0x00000000 00000000
 INTERLAKEN_LAST_CNT                        0x00000000 00000000
 Net IF0                                    0x00000000 00000000
 ------------------------------------------------------------
Ingress fabric-to-bridge interface 1 counters for NP 1
 INTERLAKEN_RX_PACKETS                      0x00000000 00000040
 INTERLAKEN_RX_BYTES                        0x00000000 00008aa7
 INTERLAKEN_RX_BAD_PACKETS                  0x00000000 00000000
 INTERLAKEN_RX_CRC_ERROR                    0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_ERROR_0            0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_ERROR_1            0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_ERROR_2            0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_ERROR_3            0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE            0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE_1          0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE_2          0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE_3          0x00000000 00000000
 INTERLAKEN_RX_BLK_TYPE_ERROR_AGGR          0x00000000 00000000
 INTERLAKEN_RX_DIAG_CRC_ERROR_AGGR          0x00000000 00000000
 INTERLAKEN_RX_WORD_SYNC_ERROR_AGGR         0x00000000 00014532
 INTERLAKEN_LAST_CNT                        0x00000000 00000000
 Net IF0                                    0x000000cb 1ed88530
 ------------------------------------------------------------
Ingress fabric-to-bridge interface 2 counters for NP 1
 INTERLAKEN_RX_PACKETS                      0x00000000 00000000
 INTERLAKEN_RX_BYTES                        0x00000000 00000000
 INTERLAKEN_RX_BAD_PACKETS                  0x00000000 00000000
 INTERLAKEN_RX_CRC_ERROR                    0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_ERROR_0            0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_ERROR_1            0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_ERROR_2            0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_ERROR_3            0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE            0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE_1          0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE_2          0x00000000 00000000
 INTERLAKEN_RX_ALIGNMENT_FAILURE_3          0x00000000 00000000
 INTERLAKEN_RX_BLK_TYPE_ERROR_AGGR          0x00000000 00000000
 INTERLAKEN_RX_DIAG_CRC_ERROR_AGGR          0x00000000 00000000
 INTERLAKEN_RX_WORD_SYNC_ERROR_AGGR         0x00000000 00000000
 INTERLAKEN_LAST_CNT                        0x00000000 00000000
 Net IF0                                    0x00000000 00000000
 ------------------------------------------------------------

------------- show controllers fabric fia stats location 0/0/CPU0 -------------

 ********** FIA-0 **********
Category: count-0
```

```
                          From Unicast Xbar[0]                    37922
                          From Unicast Xbar[1]                    37833
                          From Unicast Xbar[2]                        0
                          From Unicast Xbar[3]                        0
                        From MultiCast Xbar[0]                        0
                        From MultiCast Xbar[1]                        0
                        From MultiCast Xbar[2]                        0
                        From MultiCast Xbar[3]                        0
                            To Unicast Xbar[0]                    37767
                            To Unicast Xbar[1]                    37988
                            To Unicast Xbar[2]                        0
                            To Unicast Xbar[3]                        0
                          To MultiCast Xbar[0]                        0
                          To MultiCast Xbar[1]                        0
                          To MultiCast Xbar[2]                        0
                          To MultiCast Xbar[3]                        0
                          To Line Interface[0]                    75755
                          To Line Interface[1]                        0
                        From Line Interface[0]                    75755
                        From Line Interface[1]                        0
                                 Ingress drop:                       18
                                  Egress drop:                        0
                                  Total drop:                        18

 ********** FIA-1 **********
Category: count-1
                          From Unicast Xbar[0]                       34
                          From Unicast Xbar[1]                       31
                          From Unicast Xbar[2]                        0
                          From Unicast Xbar[3]                        0
                        From MultiCast Xbar[0]                        0
                        From MultiCast Xbar[1]                        0
                        From MultiCast Xbar[2]                        0
                        From MultiCast Xbar[3]                        0
                            To Unicast Xbar[0]                       35
                            To Unicast Xbar[1]                       30
                            To Unicast Xbar[2]                        0
                            To Unicast Xbar[3]                        0
                          To MultiCast Xbar[0]                        0
                          To MultiCast Xbar[1]                        0
                          To MultiCast Xbar[2]                        0
                          To MultiCast Xbar[3]                        0
                          To Line Interface[0]                       65
                          To Line Interface[1]                        0
                        From Line Interface[0]                       65
                        From Line Interface[1]                        0
                                 Ingress drop:                        7
                                  Egress drop:                        0
                                  Total drop:                         7

---------------- sh controllers np ports all location 0/0/CPU0 ----------------

                Node: 0/0/CPU0:
----------------------------------------------------------------

NP Bridge Fia                       Ports
-- ------ --- -----------------------------------------------------
0  --     0   TenGigE0/0/1/0, TenGigE0/0/1/1, TenGigE0/0/1/2, TenGigE0/0/1/3, TenGigE0/0/1/4, TenGigE0/0/1/5
1  --     1   TenGigE0/0/1/6, TenGigE0/0/1/7, TenGigE0/0/1/8, TenGigE0/0/1/9, TenGigE0/0/1/10,
TenGigE0/0/1/11

------------- show controllers np counters all location 0/0/CPU0 --------------

                Node: 0/0/CPU0:
```

```
------------------------------------------------------------------

Show global stats counters for NP0, revision v2

Read 19 non-zero NP counters:
Offset  Counter                                          FrameValue   Rate (pps)
--------------------------------------------------------------------------------
  16  MDF_TX_LC_CPU                                         86460          22
  21  MDF_TX_FABRIC                                         75755          19
  33  PARSE_FAB_RECEIVE_CNT                                 75755          19
  37  PARSE_INTR_RECEIVE_CNT                              2005429         513
  41  PARSE_INJ_RECEIVE_CNT                                 75747          19
  49  PARSE_TM_LOOP_RECEIVE_CNT                             18857           5
  68  PRS_HEALTH_MON                                        18857           5
  77  INTR_FRAME_TYPE_7                                     10716           3
 106  PARSE_RSP_INJ_FAB_CNT                                 75690          19
 108  PARSE_RSP_INJ_DIAGS_CNT                                  65           0
 109  PARSE_EGR_INJ_PKT_TYP_UNKNOWN                         75690          19
 120  PARSE_LC_INJ_FAB_CNT                                  75690          19
 122  PARSE_LC_INJ_DIAGS_CNT                                   57           0
 285  DBG_RSV_EP_L_RSV_ING_PUNT                             10837           3
 790  DIAGS                                                    57           0
 902  PUNT_STATISTICS                                       10713           3
 904  PUNT_DIAGS_RSP_ACT                                       65           0
 908  NETIO_RP_TO_LC_CPU_PUNT                               75690          19
1200  MODIFY_PUNT_REASON_MISS_DROP                              1           0

Show global stats counters for NP1, revision v2

Read 15 non-zero NP counters:
Offset  Counter                                          FrameValue   Rate (pps)
--------------------------------------------------------------------------------
  16  MDF_TX_LC_CPU                                         10521           3
  21  MDF_TX_FABRIC                                            65           0
  33  PARSE_FAB_RECEIVE_CNT                                    65           0
  37  PARSE_INTR_RECEIVE_CNT                              2005185         513
  41  PARSE_INJ_RECEIVE_CNT                                    57           0
  49  PARSE_TM_LOOP_RECEIVE_CNT                             18858           5
  68  PRS_HEALTH_MON                                        18858           5
  77  INTR_FRAME_TYPE_7                                     10467           3
 108  PARSE_RSP_INJ_DIAGS_CNT                                  65           0
 122  PARSE_LC_INJ_DIAGS_CNT                                   57           0
 285  DBG_RSV_EP_L_RSV_ING_PUNT                             10588           3
 790  DIAGS                                                    57           0
 902  PUNT_STATISTICS                                       10464           3
 904  PUNT_DIAGS_RSP_ACT                                       65           0
1200  MODIFY_PUNT_REASON_MISS_DROP                              1           0

---------------------- show interfaces location 0/0/CPU0 ----------------------
TenGigE0/0/1/0 is administratively down, line protocol is administratively down
  Interface state transitions: 0
  Hardware is TenGigE, address is 0000.0000.0028 (bia 0000.0000.0028)
  Internet address is Unknown
  MTU 1514 bytes, BW 10000000 Kbit (Max: 10000000 Kbit)
     reliability 255/255, txload 0/255, rxload 0/255
  Encapsulation ARPA,
  Full-duplex, 10000Mb/s, link type is force-up
  output flow control is on, input flow control is on
  loopback not set,
  Last input never, output never
  Last clearing of "show interface" counters never
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 total input drops
```

```
     0 drops for unrecognized upper-level protocol
     Received 0 broadcast packets, 0 multicast packets
              0 runts, 0 giants, 0 throttles, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 total output drops
     Output 0 broadcast packets, 0 multicast packets
     0 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions

TenGigE0/0/1/1 is administratively down, line protocol is administratively down
  Interface state transitions: 0
  Hardware is TenGigE, address is 0000.0000.0029 (bia 0000.0000.0029)
  Internet address is Unknown
  MTU 1514 bytes, BW 10000000 Kbit (Max: 10000000 Kbit)
     reliability 255/255, txload 0/255, rxload 0/255
  Encapsulation ARPA,
  Full-duplex, 10000Mb/s, link type is force-up
  output flow control is on, input flow control is on
  loopback not set,
  Last input never, output never
  Last clearing of "show interface" counters never
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 total input drops
     0 drops for unrecognized upper-level protocol
     Received 0 broadcast packets, 0 multicast packets
              0 runts, 0 giants, 0 throttles, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 total output drops
     Output 0 broadcast packets, 0 multicast packets
     0 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions

TenGigE0/0/1/2 is administratively down, line protocol is administratively down
  Interface state transitions: 0
  Hardware is TenGigE, address is 0000.0000.002a (bia 0000.0000.002a)
  Internet address is Unknown
  MTU 1514 bytes, BW 10000000 Kbit (Max: 10000000 Kbit)
     reliability 255/255, txload 0/255, rxload 0/255
  Encapsulation ARPA,
  Full-duplex, 10000Mb/s, link type is force-up
  output flow control is on, input flow control is on
  loopback not set,
  Last input never, output never
  Last clearing of "show interface" counters never
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 total input drops
     0 drops for unrecognized upper-level protocol
     Received 0 broadcast packets, 0 multicast packets
              0 runts, 0 giants, 0 throttles, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 total output drops
     Output 0 broadcast packets, 0 multicast packets
     0 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions

TenGigE0/0/1/3 is administratively down, line protocol is administratively down
  Interface state transitions: 0
  Hardware is TenGigE, address is 0000.0000.002b (bia 0000.0000.002b)
  Internet address is Unknown
```

```
  MTU 1514 bytes, BW 10000000 Kbit (Max: 10000000 Kbit)
     reliability 255/255, txload 0/255, rxload 0/255
  Encapsulation ARPA,
  Full-duplex, 10000Mb/s, link type is force-up
  output flow control is on, input flow control is on
  loopback not set,
  Last input never, output never
  Last clearing of "show interface" counters never
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 total input drops
     0 drops for unrecognized upper-level protocol
     Received 0 broadcast packets, 0 multicast packets
              0 runts, 0 giants, 0 throttles, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 total output drops
     Output 0 broadcast packets, 0 multicast packets
     0 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions

TenGigE0/0/1/4 is administratively down, line protocol is administratively down
  Interface state transitions: 0
  Hardware is TenGigE, address is 0000.0000.002c (bia 0000.0000.002c)
  Internet address is Unknown
  MTU 1514 bytes, BW 10000000 Kbit (Max: 10000000 Kbit)
     reliability 255/255, txload 0/255, rxload 0/255
  Encapsulation ARPA,
  Full-duplex, 10000Mb/s, link type is force-up
  output flow control is on, input flow control is on
  loopback not set,
  Last input never, output never
  Last clearing of "show interface" counters never
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 total input drops
     0 drops for unrecognized upper-level protocol
     Received 0 broadcast packets, 0 multicast packets
              0 runts, 0 giants, 0 throttles, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 total output drops
     Output 0 broadcast packets, 0 multicast packets
     0 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions

TenGigE0/0/1/5 is administratively down, line protocol is administratively down
  Interface state transitions: 0
  Hardware is TenGigE, address is 0000.0000.002d (bia 0000.0000.002d)
  Internet address is Unknown
  MTU 1514 bytes, BW 10000000 Kbit (Max: 10000000 Kbit)
     reliability 255/255, txload 0/255, rxload 0/255
  Encapsulation ARPA,
  Full-duplex, 10000Mb/s, link type is force-up
  output flow control is on, input flow control is on
  loopback not set,
  Last input never, output never
  Last clearing of "show interface" counters never
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 total input drops
     0 drops for unrecognized upper-level protocol
     Received 0 broadcast packets, 0 multicast packets
              0 runts, 0 giants, 0 throttles, 0 parity
```

```
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 total output drops
     Output 0 broadcast packets, 0 multicast packets
     0 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions

TenGigE0/0/1/6 is administratively down, line protocol is administratively down
  Interface state transitions: 0
  Hardware is TenGigE, address is 0000.0000.002e (bia 0000.0000.002e)
  Internet address is Unknown
  MTU 1514 bytes, BW 10000000 Kbit (Max: 10000000 Kbit)
     reliability 255/255, txload 0/255, rxload 0/255
  Encapsulation ARPA,
  Full-duplex, 10000Mb/s, link type is force-up
  output flow control is on, input flow control is on
  loopback not set,
  Last input never, output never
  Last clearing of "show interface" counters never
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 total input drops
     0 drops for unrecognized upper-level protocol
     Received 0 broadcast packets, 0 multicast packets
              0 runts, 0 giants, 0 throttles, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 total output drops
     Output 0 broadcast packets, 0 multicast packets
     0 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions

TenGigE0/0/1/7 is administratively down, line protocol is administratively down
  Interface state transitions: 0
  Hardware is TenGigE, address is 0000.0000.002f (bia 0000.0000.002f)
  Internet address is Unknown
  MTU 1514 bytes, BW 10000000 Kbit (Max: 10000000 Kbit)
     reliability 255/255, txload 0/255, rxload 0/255
  Encapsulation ARPA,
  Full-duplex, 10000Mb/s, link type is force-up
  output flow control is on, input flow control is on
  loopback not set,
  Last input never, output never
  Last clearing of "show interface" counters never
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 total input drops
     0 drops for unrecognized upper-level protocol
     Received 0 broadcast packets, 0 multicast packets
              0 runts, 0 giants, 0 throttles, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 total output drops
     Output 0 broadcast packets, 0 multicast packets
     0 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions

TenGigE0/0/1/8 is administratively down, line protocol is administratively down
  Interface state transitions: 0
  Hardware is TenGigE, address is 0000.0000.0030 (bia 0000.0000.0030)
  Internet address is Unknown
  MTU 1514 bytes, BW 10000000 Kbit (Max: 10000000 Kbit)
     reliability 255/255, txload 0/255, rxload 0/255
  Encapsulation ARPA,
```

```
  Full-duplex, 10000Mb/s, link type is force-up
  output flow control is on, input flow control is on
  loopback not set,
  Last input never, output never
  Last clearing of "show interface" counters never
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 total input drops
     0 drops for unrecognized upper-level protocol
     Received 0 broadcast packets, 0 multicast packets
              0 runts, 0 giants, 0 throttles, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 total output drops
     Output 0 broadcast packets, 0 multicast packets
     0 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions

TenGigE0/0/1/9 is administratively down, line protocol is administratively down
  Interface state transitions: 0
  Hardware is TenGigE, address is 0000.0000.0031 (bia 0000.0000.0031)
  Internet address is Unknown
  MTU 1514 bytes, BW 10000000 Kbit (Max: 10000000 Kbit)
     reliability 255/255, txload 0/255, rxload 0/255
  Encapsulation ARPA,
  Full-duplex, 10000Mb/s, link type is force-up
  output flow control is on, input flow control is on
  loopback not set,
  Last input never, output never
  Last clearing of "show interface" counters never
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 total input drops
     0 drops for unrecognized upper-level protocol
     Received 0 broadcast packets, 0 multicast packets
              0 runts, 0 giants, 0 throttles, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 total output drops
     Output 0 broadcast packets, 0 multicast packets
     0 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions

TenGigE0/0/1/10 is administratively down, line protocol is administratively down
  Interface state transitions: 0
  Hardware is TenGigE, address is 0000.0000.0032 (bia 0000.0000.0032)
  Internet address is Unknown
  MTU 1514 bytes, BW 10000000 Kbit (Max: 10000000 Kbit)
     reliability 255/255, txload 0/255, rxload 0/255
  Encapsulation ARPA,
  Full-duplex, 10000Mb/s, link type is force-up
  output flow control is on, input flow control is on
  loopback not set,
  Last input never, output never
  Last clearing of "show interface" counters never
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 total input drops
     0 drops for unrecognized upper-level protocol
     Received 0 broadcast packets, 0 multicast packets
              0 runts, 0 giants, 0 throttles, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 total output drops
     Output 0 broadcast packets, 0 multicast packets
```

```
     0 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions

TenGigE0/0/1/11 is administratively down, line protocol is administratively down
  Interface state transitions: 0
  Hardware is TenGigE, address is 0000.0000.0033 (bia 0000.0000.0033)
  Internet address is Unknown
  MTU 1514 bytes, BW 10000000 Kbit (Max: 10000000 Kbit)
     reliability 255/255, txload 0/255, rxload 0/255
  Encapsulation ARPA,
  Full-duplex, 10000Mb/s, link type is force-up
  output flow control is on, input flow control is on
  loopback not set,
  Last input never, output never
  Last clearing of "show interface" counters never
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 total input drops
     0 drops for unrecognized upper-level protocol
     Received 0 broadcast packets, 0 multicast packets
              0 runts, 0 giants, 0 throttles, 0 parity
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
     0 packets output, 0 bytes, 0 total output drops
     Output 0 broadcast packets, 0 multicast packets
     0 output errors, 0 underruns, 0 applique, 0 resets
     0 output buffer failures, 0 output buffers swapped out
     0 carrier transitions

---- show controllers switch data-path summary hardware location 0/0/CPU0 -----

 Port    Connected to          Mode   State      Speed  PVE Enabled   PVE Port
-------------------------------------------------------------------------------
    0          N-0, 0          Xaui      Up    10-Gbps           No          -
    2          N-0, 1          Xaui      Up    10-Gbps           No          -
    4          N-1, 0          Xaui      Up    10-Gbps          Yes         54
    6          N-1, 1          Xaui      Up    10-Gbps          Yes         55
    8          N-2, 0          Xaui      Up    10-Gbps          Yes         56
   10          N-2, 1          Xaui      Up    10-Gbps          Yes         57
   16          N-3, 0          Xaui      Up    10-Gbps          Yes         58
   18          N-3, 1          Xaui      Up    10-Gbps          Yes         59
   20          N-4, 0          Xaui      Up    10-Gbps          Yes         48
   22          N-4, 1          Xaui      Up    10-Gbps          Yes         49
   24          N-5, 0          Xaui      Up    10-Gbps          Yes         50
   26          N-5, 1          Xaui      Up    10-Gbps          Yes         51
   32          N-6, 0          Xaui      Up    10-Gbps          Yes         52
   34          N-6, 1          Xaui      Up    10-Gbps          Yes         53
   38       GE Switch    1000Base_X      Up     1-Gbps          Yes         38
   40           FP, 0         Rxaui    Down    10-Gbps           No          -
   41           FP, 2         Rxaui    Down    10-Gbps           No          -
   42           FP, 3         Rxaui    Down    10-Gbps           No          -
   43           FP, 1         Rxaui    Down    10-Gbps           No          -
   48         NP-1, 0         Rxaui      Up    10-Gbps          Yes         20
   49         NP-1, 1         Rxaui      Up    10-Gbps          Yes         22
   50         NP-1, 2         Rxaui      Up    10-Gbps          Yes         24
   51         NP-1, 3         Rxaui      Up    10-Gbps          Yes         26
   52         NP-1, 4         Rxaui      Up    10-Gbps          Yes         32
   53         NP-1, 5         Rxaui      Up    10-Gbps          Yes         34
   54         NP-0, 0         Rxaui      Up    10-Gbps          Yes          4
   55         NP-0, 1         Rxaui      Up    10-Gbps          Yes          6
   56         NP-0, 2         Rxaui      Up    10-Gbps          Yes          8
   57         NP-0, 3         Rxaui      Up    10-Gbps          Yes         10
   58         NP-0, 4         Rxaui      Up    10-Gbps          Yes         16
   59         NP-0, 5         Rxaui      Up    10-Gbps          Yes         18
```

```
---- show controllers switch data-path statistics mac 38 location 0/0/CPU0 ----

Port MAC counters : port 38
  Good Octets Rcv           =       8634     | Good Octets Sent          =       8634
  Good Packets Rcv          =          0     | Good Packets Sent         =          0
  Bad Octets Rcv            =          0
  Unicast Packets Rcv       =         17     | Unicast Packets Sent      =         17
  Multicast Packets Rcv     =          0     | Multicast Packets Sent    =          0
  Broadcast Packets Rcv     =          0     | Broadcast Packets Sent    =          0
  0 - 64 bytes Packets      =          0
  65 - 127 bytes Packets    =          4
  128 - 255 bytes Packets   =          8
  256 - 511 bytes Packets   =          6
  512 - 1023 bytes Packets  =          8
  1024 - max bytes Packets  =          8
  Mac Transmit Errors       =          0
  Excessive Collisions      =          0
  Flow Control Sent         =          0
  Good Flow Control Rcv     =          0
  Bad Flow Control Rcv      =          0
  Undersize Packets Rcv     =          0
  Fragmented Packets Rcv    =          0
  Oversized Packets Rcv     =          0
  Jabber Packets Rcv        =          0
  MAC Receive Error         =          0
  Bad CRC                   =          0
  Dropped Rx Packets (OOR)  =          0
  Collisions                =          0
  Late Collisions           =          0
  Multiple Packets Sent     =          0
  Deferred Packets Sent     =          0
  Unrecognized MAC Control  =          0

------------------------ show drops location 0/0/CPU0 -------------------------

                Node: 0/0/CPU0:
------------------------------------------------------------------

NP 0 Drops:
------------------------------------------------------------------
PARSE_EGR_INJ_PKT_TYP_UNKNOWN                                 76310
MODIFY_PUNT_REASON_MISS_DROP                                  1
------------------------------------------------------------------

NP 1 Drops:
------------------------------------------------------------------
MODIFY_PUNT_REASON_MISS_DROP                                  1
------------------------------------------------------------------

No Bridge 0 Drops
------------------------------------------------------------------

No Bridge 1 Drops
------------------------------------------------------------------

FIA 0 Drops:
------------------------------------------------------------------
Total drop:                                                   18
Ingress drop:                                                 18
Ingress sp0 crc err                                           1
Ingress sp0 align fail                                        3
Ingress sp1 crc err                                           8
Ingress sp1 bad code                                          2
```

```
Ingress sp1 align fail                                          3
Ingress sp1 prot err                                            1
------------------------------------------------------------------

FIA 1 Drops:
------------------------------------------------------------------
Total drop:                                                     7
Ingress drop:                                                   7
Ingress sp0 crc err                                             1
Ingress sp0 align fail                                          3
Ingress sp1 align fail                                          3
------------------------------------------------------------------

------------- show controllers np counters all location 0/0/CPU0 --------------

               Node: 0/0/CPU0:
------------------------------------------------------------------

Show global stats counters for NP0, revision v2

Read 19 non-zero NP counters:
Offset  Counter                                         FrameValue   Rate (pps)
--------------------------------------------------------------------------------
  16  MDF_TX_LC_CPU                                         87162          24
  21  MDF_TX_FABRIC                                         76375          21
  33  PARSE_FAB_RECEIVE_CNT                                 76375          21
  37  PARSE_INTR_RECEIVE_CNT                              2020368         513
  41  PARSE_INJ_RECEIVE_CNT                                 76368          21
  49  PARSE_TM_LOOP_RECEIVE_CNT                             18998           5
  68  PRS_HEALTH_MON                                        18998           5
  77  INTR_FRAME_TYPE_7                                     10797           3
 106  PARSE_RSP_INJ_FAB_CNT                                 76310          21
 108  PARSE_RSP_INJ_DIAGS_CNT                                  65           0
 109  PARSE_EGR_INJ_PKT_TYP_UNKNOWN                         76310          21
 120  PARSE_LC_INJ_FAB_CNT                                  76310          21
 122  PARSE_LC_INJ_DIAGS_CNT                                   58           0
 285  DBG_RSV_EP_L_RSV_ING_PUNT                             10919           3
 790  DIAGS                                                    58           0
 902  PUNT_STATISTICS                                       10794           3
 904  PUNT_DIAGS_RSP_ACT                                       65           0
 908  NETIO_RP_TO_LC_CPU_PUNT                               76310          21
1200  MODIFY_PUNT_REASON_MISS_DROP                              1           0


Show global stats counters for NP1, revision v2

Read 15 non-zero NP counters:
Offset  Counter                                         FrameValue   Rate (pps)
--------------------------------------------------------------------------------
  16  MDF_TX_LC_CPU                                         10601           3
  21  MDF_TX_FABRIC                                            65           0
  33  PARSE_FAB_RECEIVE_CNT                                    65           0
  37  PARSE_INTR_RECEIVE_CNT                              2020122         513
  41  PARSE_INJ_RECEIVE_CNT                                    58           0
  49  PARSE_TM_LOOP_RECEIVE_CNT                             18998           5
  68  PRS_HEALTH_MON                                        18998           5
  77  INTR_FRAME_TYPE_7                                     10546           3
 108  PARSE_RSP_INJ_DIAGS_CNT                                  65           0
 122  PARSE_LC_INJ_DIAGS_CNT                                   58           0
 285  DBG_RSV_EP_L_RSV_ING_PUNT                             10668           3
 790  DIAGS                                                    58           0
 902  PUNT_STATISTICS                                       10543           3
 904  PUNT_DIAGS_RSP_ACT                                       65           0
1200  MODIFY_PUNT_REASON_MISS_DROP                              1           0
```

```
---- show controllers np punt-path-counters all HoST-SGMII-0 all location -----
--------------------------------- 0/0/CPU0 ----------------------------------

               Node: 0/0/CPU0:
----------------------------------------------------------------
All sgmii counters for NP 0:
 SGMII_T_64_FRM_CNT                          0x00000000 00000000
 SGMII_T_65_127_FRM_CNT                      0x00000000 00003dde
 SGMII_T_128_255_FRM_CNT                     0x00000000 000114bc
 SGMII_T_256_511_FRM_CNT                     0x00000000 000001cc
 SGMII_T_512_1023_FRM_CNT                    0x00000000 00000011
 SGMII_T_1024_1518_FRM_CNT                   0x00000000 00000006
 SGMII_T_1519_1522_FRM_CNT                   0x00000000 00000000
 SGMII_T_BYTE_CNT                            0x00000000 00bdb443
 SGMII_T_FRM_CNT                             0x00000000 00015483
 SGMII_T_MULTICAST_FRM_CNT                   0x00000000 00000000
 SGMII_T_BROADCAST_FRM_CNT                   0x00000000 00000000
 SGMII_T_CONTROL_FRM_CNT                     0x00000000 00000000
 SGMII_T_PAUSE_FRM_CNT                       0x00000000 00000000
 SGMII_T_FCS_ERR_FRM_CNT                     0x00000000 00000000
 SGMII_T_LENGTH_ERR_FRM_CNT                  0x00000000 00000000
 SGMII_T_OVERSIZE_FRM_CNT                    0x00000000 00000006
 SGMII_T_JABBER_FRM_CNT                      0x00000000 00000000
 SGMII_T_UNDERSIZE_FRM_CNT                   0x00000000 00000000
 SGMII_T_FRAGMENT_FRM_CNT                    0x00000000 00000000
 SGMII_R_64_FRM_CNT                          0x00000000 00000000
 SGMII_R_65_127_FRM_CNT                      0x00000000 000023a4
 SGMII_R_128_255_FRM_CNT                     0x00000000 00010687
 SGMII_R_256_511_FRM_CNT                     0x00000000 0000000d
 SGMII_R_512_1023_FRM_CNT                    0x00000000 0000000c
 SGMII_R_1024_1518_FRM_CNT                   0x00000000 00000006
 SGMII_R_1519_1522_FRM_CNT                   0x00000000 00000000
 SGMII_R_BYTE_CNT                            0x00000000 00a67f9b
 SGMII_R_FRM_CNT                             0x00000000 00012a50
 SGMII_R_MULTICAST_FRM_CNT                   0x00000000 00000000
 SGMII_R_BROADCAST_FRM_CNT                   0x00000000 00000000
 SGMII_R_CONTROL_FRM_CNT                     0x00000000 00000000
 SGMII_R_PAUSE_FRM_CNT                       0x00000000 00000000
 SGMII_R_FCS_ERR_FRM_CNT                     0x00000000 00000000
 SGMII_R_LENGTH_ERR_FRM_CNT                  0x00000000 00000000
 SGMII_R_OVERSIZE_FRM_CNT                    0x00000000 00000006
 SGMII_R_JABBER_FRM_CNT                      0x00000000 00000000
 SGMII_R_CODE_ERR_CNT                        0x00000000 00000000
 SGMII_R_UNDERSIZE_FRM_CNT                   0x00000000 00000000
 SGMII_R_FRAGMENT_FRM_CNT                    0x00000000 00000000
 SGMII_R_EXCEED_MAX_FRM_CNT                  0x00000000 00000000
 SGMII_R_EXCEED_MAX_WITH_ERR_FRM_CNT         0x00000000 00000000
 ----------------------------------------------------------------
All sgmii counters for NP 1:
 SGMII_T_64_FRM_CNT                          0x00000000 00000000
 SGMII_T_65_127_FRM_CNT                      0x00000000 000019ce
 SGMII_T_128_255_FRM_CNT                     0x00000000 00000f3c
 SGMII_T_256_511_FRM_CNT                     0x00000000 00000050
 SGMII_T_512_1023_FRM_CNT                    0x00000000 0000000c
 SGMII_T_1024_1518_FRM_CNT                   0x00000000 00000006
 SGMII_T_1519_1522_FRM_CNT                   0x00000000 00000000
 SGMII_T_BYTE_CNT                            0x00000000 0015dd28
 SGMII_T_FRM_CNT                             0x00000000 00002972
 SGMII_T_MULTICAST_FRM_CNT                   0x00000000 00000000
 SGMII_T_BROADCAST_FRM_CNT                   0x00000000 00000000
 SGMII_T_CONTROL_FRM_CNT                     0x00000000 00000000
 SGMII_T_PAUSE_FRM_CNT                       0x00000000 00000000
```

```
 SGMII_T_FCS_ERR_FRM_CNT                        0x00000000 00000000
 SGMII_T_LENGTH_ERR_FRM_CNT                     0x00000000 00000000
 SGMII_T_OVERSIZE_FRM_CNT                       0x00000000 00000006
 SGMII_T_JABBER_FRM_CNT                         0x00000000 00000000
 SGMII_T_UNDERSIZE_FRM_CNT                      0x00000000 00000000
 SGMII_T_FRAGMENT_FRM_CNT                       0x00000000 00000000
 SGMII_R_64_FRM_CNT                             0x00000000 00000000
 SGMII_R_65_127_FRM_CNT                         0x00000000 00000000
 SGMII_R_128_255_FRM_CNT                        0x00000000 00000015
 SGMII_R_256_511_FRM_CNT                        0x00000000 0000000d
 SGMII_R_512_1023_FRM_CNT                       0x00000000 0000000c
 SGMII_R_1024_1518_FRM_CNT                      0x00000000 00000006
 SGMII_R_1519_1522_FRM_CNT                      0x00000000 00000000
 SGMII_R_BYTE_CNT                               0x00000000 000079f8
 SGMII_R_FRM_CNT                                0x00000000 0000003a
 SGMII_R_MULTICAST_FRM_CNT                      0x00000000 00000000
 SGMII_R_BROADCAST_FRM_CNT                      0x00000000 00000000
 SGMII_R_CONTROL_FRM_CNT                        0x00000000 00000000
 SGMII_R_PAUSE_FRM_CNT                          0x00000000 00000000
 SGMII_R_FCS_ERR_FRM_CNT                        0x00000000 00000000
 SGMII_R_LENGTH_ERR_FRM_CNT                     0x00000000 00000000
 SGMII_R_OVERSIZE_FRM_CNT                       0x00000000 00000006
 SGMII_R_JABBER_FRM_CNT                         0x00000000 00000000
 SGMII_R_CODE_ERR_CNT                           0x00000000 00000000
 SGMII_R_UNDERSIZE_FRM_CNT                      0x00000000 00000000
 SGMII_R_FRAGMENT_FRM_CNT                       0x00000000 00000000
 SGMII_R_EXCEED_MAX_FRM_CNT                     0x00000000 00000000
 SGMII_R_EXCEED_MAX_WITH_ERR_FRM_CNT            0x00000000 00000000
 ---------------------------------------------------------------

---- show controllers np punt-path-counters all HOST-SGMII-1 all location -----
--------------------------------- 0/0/CPU0 ----------------------------------

               Node: 0/0/CPU0:
----------------------------------------------------------------
All sgmii counters for NP 0:
 SGMII_T_64_FRM_CNT                             0x00000000 00000000
 SGMII_T_65_127_FRM_CNT                         0x00000000 00000000
 SGMII_T_128_255_FRM_CNT                        0x00000000 00000000
 SGMII_T_256_511_FRM_CNT                        0x00000000 00000000
 SGMII_T_512_1023_FRM_CNT                       0x00000000 00000000
 SGMII_T_1024_1518_FRM_CNT                      0x00000000 00000000
 SGMII_T_1519_1522_FRM_CNT                      0x00000000 00000000
 SGMII_T_BYTE_CNT                               0x00000000 00000000
 SGMII_T_FRM_CNT                                0x00000000 00000000
 SGMII_T_MULTICAST_FRM_CNT                      0x00000000 00000000
 SGMII_T_BROADCAST_FRM_CNT                      0x00000000 00000000
 SGMII_T_CONTROL_FRM_CNT                        0x00000000 00000000
 SGMII_T_PAUSE_FRM_CNT                          0x00000000 00000000
 SGMII_T_FCS_ERR_FRM_CNT                        0x00000000 00000000
 SGMII_T_LENGTH_ERR_FRM_CNT                     0x00000000 00000000
 SGMII_T_OVERSIZE_FRM_CNT                       0x00000000 00000000
 SGMII_T_JABBER_FRM_CNT                         0x00000000 00000000
 SGMII_T_UNDERSIZE_FRM_CNT                      0x00000000 00000000
 SGMII_T_FRAGMENT_FRM_CNT                       0x00000000 00000000
 SGMII_R_64_FRM_CNT                             0x00000000 00000000
 SGMII_R_65_127_FRM_CNT                         0x00000000 00000000
 SGMII_R_128_255_FRM_CNT                        0x00000000 00000000
 SGMII_R_256_511_FRM_CNT                        0x00000000 00000000
 SGMII_R_512_1023_FRM_CNT                       0x00000000 00000000
 SGMII_R_1024_1518_FRM_CNT                      0x00000000 00000000
 SGMII_R_1519_1522_FRM_CNT                      0x00000000 00000000
 SGMII_R_BYTE_CNT                               0x00000000 00000000
 SGMII_R_FRM_CNT                                0x00000000 00000000
```

```
 SGMII_R_MULTICAST_FRM_CNT                      0x00000000 00000000
 SGMII_R_BROADCAST_FRM_CNT                      0x00000000 00000000
 SGMII_R_CONTROL_FRM_CNT                        0x00000000 00000000
 SGMII_R_PAUSE_FRM_CNT                          0x00000000 00000000
 SGMII_R_FCS_ERR_FRM_CNT                        0x00000000 00000000
 SGMII_R_LENGTH_ERR_FRM_CNT                     0x00000000 00000000
 SGMII_R_OVERSIZE_FRM_CNT                       0x00000000 00000000
 SGMII_R_JABBER_FRM_CNT                         0x00000000 00000000
 SGMII_R_CODE_ERR_CNT                           0x00000000 00000000
 SGMII_R_UNDERSIZE_FRM_CNT                      0x00000000 00000000
 SGMII_R_FRAGMENT_FRM_CNT                       0x00000000 00000000
 SGMII_R_EXCEED_MAX_FRM_CNT                     0x00000000 00000000
 SGMII_R_EXCEED_MAX_WITH_ERR_FRM_CNT            0x00000000 00000000
 ------------------------------------------------------------
All sgmii counters for NP 1:
 SGMII_T_64_FRM_CNT                             0x00000000 00000000
 SGMII_T_65_127_FRM_CNT                         0x00000000 00000000
 SGMII_T_128_255_FRM_CNT                        0x00000000 00000000
 SGMII_T_256_511_FRM_CNT                        0x00000000 00000000
 SGMII_T_512_1023_FRM_CNT                       0x00000000 00000000
 SGMII_T_1024_1518_FRM_CNT                      0x00000000 00000000
 SGMII_T_1519_1522_FRM_CNT                      0x00000000 00000000
 SGMII_T_BYTE_CNT                               0x00000000 00000000
 SGMII_T_FRM_CNT                                0x00000000 00000000
 SGMII_T_MULTICAST_FRM_CNT                      0x00000000 00000000
 SGMII_T_BROADCAST_FRM_CNT                      0x00000000 00000000
 SGMII_T_CONTROL_FRM_CNT                        0x00000000 00000000
 SGMII_T_PAUSE_FRM_CNT                          0x00000000 00000000
 SGMII_T_FCS_ERR_FRM_CNT                        0x00000000 00000000
 SGMII_T_LENGTH_ERR_FRM_CNT                     0x00000000 00000000
 SGMII_T_OVERSIZE_FRM_CNT                       0x00000000 00000000
 SGMII_T_JABBER_FRM_CNT                         0x00000000 00000000
 SGMII_T_UNDERSIZE_FRM_CNT                      0x00000000 00000000
 SGMII_T_FRAGMENT_FRM_CNT                       0x00000000 00000000
 SGMII_R_64_FRM_CNT                             0x00000000 00000000
 SGMII_R_65_127_FRM_CNT                         0x00000000 00000000
 SGMII_R_128_255_FRM_CNT                        0x00000000 00000000
 SGMII_R_256_511_FRM_CNT                        0x00000000 00000000
 SGMII_R_512_1023_FRM_CNT                       0x00000000 00000000
 SGMII_R_1024_1518_FRM_CNT                      0x00000000 00000000
 SGMII_R_1519_1522_FRM_CNT                      0x00000000 00000000
 SGMII_R_BYTE_CNT                               0x00000000 00000000
 SGMII_R_FRM_CNT                                0x00000000 00000000
 SGMII_R_MULTICAST_FRM_CNT                      0x00000000 00000000
 SGMII_R_BROADCAST_FRM_CNT                      0x00000000 00000000
 SGMII_R_CONTROL_FRM_CNT                        0x00000000 00000000
 SGMII_R_PAUSE_FRM_CNT                          0x00000000 00000000
 SGMII_R_FCS_ERR_FRM_CNT                        0x00000000 00000000
 SGMII_R_LENGTH_ERR_FRM_CNT                     0x00000000 00000000
 SGMII_R_OVERSIZE_FRM_CNT                       0x00000000 00000000
 SGMII_R_JABBER_FRM_CNT                         0x00000000 00000000
 SGMII_R_CODE_ERR_CNT                           0x00000000 00000000
 SGMII_R_UNDERSIZE_FRM_CNT                      0x00000000 00000000
 SGMII_R_FRAGMENT_FRM_CNT                       0x00000000 00000000
 SGMII_R_EXCEED_MAX_FRM_CNT                     0x00000000 00000000
 SGMII_R_EXCEED_MAX_WITH_ERR_FRM_CNT            0x00000000 00000000
 ------------------------------------------------------------

-------------------- show spp sid stats location 0/0/CPU0 ----------------------
Punted per-SID stats

SID  Stream ID name             Stats
  2. DIAG                          116
  7. NETIO_HI                    76620
```

```
 33. NP_STATS                    21435

Total Punts    98171

ASR9k Inject per-SID stats

SID Stream ID name             Stats
  2. DIAG                        116
  9. NETIO_LOW                 76620

Total Injects        76736

------------------ show spp node-counters location 0/0/CPU0 -------------------
cfm_off_tx_node
             Hostname updated:               1
------------------------------
port1/rx
              packets received:           98171
        SPP Rx interrupt/pulse:          348853
------------------------------
port1/tx
           packets transmitted:           76736
------------------------------
port1/classify
                     forwarded:           21435
Punted to default punt process:             116
------------------------------
client/inject
               inject to port1:           76736
------------------------------
client/punt
              punted to client:           98171
------------------------------


---------------------- show netio drops location 0/0/CPU0 ----------------------

Drops for interfaces on node 0/0/CPU0


--------------------------------------------------------------------------------
Interface: EINT0/0/CPU0 (0x000000c0)
--------------------------------------------------------------------------------

Interface input drops:         0 pkts
Interface input errors:        1 pkts
Interface input unknown proto: 0 pkts
Interface output drops:        0 pkts
Interface output errors:       0 pkts

Node drop counts:

Caps <num>  (Protocol <num> Chain):
-----------------------------------
    DLL/function name                          Address    Drop pkts   Drop bytes
    -----------------------------------------  ----------  ----------  ----------

ipv4 <26>  (ipv4 <12> decaps):
    /pkg/lib/liblpts_netio.dll                0x0ca20322           1          58

--------- show lpts pifib hardware entry statistics location 0/0/CPU0 ---------

             Node: 0/0/CPU0:
----------------------------------------
```

```
L3 - L3 Protocol;L4 - Layer4 Protocol; Intf - Interface;
Dest - Destination Node;
LU - Local chassis fabric unicast;
LM - Local chassis fabric multicast;
RU - Multi chassis fabric unicast;
RM - Multi chassis fabric multicast;
na - Not Applicable or Not Available

Offset L3   VRD id       L4     Intf            Dest       Pkts/Drops      laddr,Port raddr,Port          acl
name
------ ---- ------------ ------ --------------- ---------- --------------- --------------------
-----------------------------------
8      IPV4 *           any    any             Local      0/0             any,any any,any
9      CLNS *           -      any             LU(803)    0/0             - -
10     IPV4 *           ICMP   any             Local      0/0             any,any any,ECHO
11     IPV4 **eint      TCP    any             LU(803)    0/0             any,18722 192.0.128.2,7400
12     IPV4 **eint      TCP    any             LU(803)    0/0             any,25834 192.0.128.2,7400
13     IPV4 **eint      TCP    any             LU(803)    0/0             any,45107 192.0.128.2,7400
14     IPV4 **eint      TCP    any             LU(803)    0/0             any,18718 192.0.128.2,60935
15     IPV4 **eint      TCP    any             LU(803)    0/0             any,63607 192.0.128.2,41036
16     IPV4 **eint      TCP    any             LU(803)    0/0             any,30303 192.0.128.2,46389
17     IPV4 **eint      TCP    any             LU(803)    0/0             any,47142 192.0.128.2,7400
18     IPV4 **eint      TCP    any             LU(803)    0/0             any,19500 192.0.128.2,41036
19     IPV4 **eint      TCP    any             LU(803)    0/0             any,15877 192.0.128.2,7400
20     IPV4 **eint      TCP    any             LU(803)    0/0             any,28755 192.0.128.2,7400
21     IPV4 **eint      TCP    any             LU(803)    0/0             any,16644 192.0.128.2,7400
22     IPV4 **eint      TCP    any             LU(803)    0/0             any,58620 192.0.128.2,47788
23     IPV4 **eint      TCP    any             LU(803)    0/0             any,36510 192.0.128.2,33911
24     IPV4 **eint      TCP    any             LU(803)    0/0             any,60614 192.0.128.2,49521
25     IPV4 **eint      TCP    any             LU(803)    0/0             any,18998 192.0.128.2,7400
26     IPV4 **eint      TCP    any             LU(803)    0/0             any,26739 192.0.128.2,47788
27     IPV4 **eint      UDP    any             LU(803)    0/0             any,69 any,any
28     IPV4 default     L2TPV3 any             LU(803)    0/0             any,any any,any
29     IPV4 *           OSPF   any             LU(803)    0/0             224.0.0.5,any any,any
30     IPV4 *           OSPF   any             LU(803)    0/0             224.0.0.6,any any,any
31     IPV4 *           TCP    any             LU(803)    0/0             any,any any,179
32     IPV4 *           UDP    any             LU(803)    0/0             any,1701 any,any
33     IPV4 *           TCP    any             LU(803)    0/0             any,179 any,any
34     IPV4 *           ICMP   any             LU(803)    0/0             any,any any,ECHOREPLY
35     IPV4 *           ICMP   any             Local      0/0             any,any any,UNREACH
36     IPV4 *           ICMP   any             Local      0/0             any,any any,TIMXCEED
37     IPV4 *           ICMP   any             Local      0/0             any,any any,PARAMPROB
38     IPV4 *           ICMP   any             Local      0/0             any,any any,SRCQUENCH
39     IPV4 *           ICMP   any             Local      0/0             any,any any,REDIRECT
40     IPV4 *           ICMP   any             Local      0/0             any,any any,TSTAMP
41     IPV4 *           ICMP   any             Local      0/0             any,any any,MASKREQ
42     IPV4 *           TCP    any             LU(803)    0/0             any,any any,any
43     IPV4 *           UDP    any             LU(803)    0/0             any,any any,any
44     IPV4 *           OSPF   any             LU(803)    0/0             any,any any,any
45     IPV4 *           RSVP   any             Local      0/0             any,any any,any
46     IPV4 *           any    any             LU(803)    0/0             any,any any,any
47     IPV4 *           UDP    any             LM[805]    0/0             any,3785 128.1.0.0/16,any 254
48     IPV4 *           UDP    any             Local      0/0             any,any any,any
3      IPV6 *           any    any             Local      0/0             any,any any,any
4      IPV6 *           ICMP6  any             Local      0/0             any,any any,NDRTRSLCT
5      IPV6 *           ICMP6  any             Local      0/0             any,any any,NDRTRADV
6      IPV6 *           ICMP6  any             Local      0/0             any,any any,NDNBRSLCT
7      IPV6 *           ICMP6  any             Local      0/0             any,any any,NDNBRADV
8      IPV6 *           ICMP6  any             Local      0/0             any,any any,NDREDIRECT
9      IPV6 *           ICMP6  any             Local      0/0             any,any any,ECHOREQ
10     IPV6 *           OSPF   any             LU(803)    0/0             ff02::5,any any,any
11     IPV6 *           OSPF   any             LU(803)    0/0             ff02::6,any any,any
12     IPV6 *           TCP    any             LU(803)    0/0             any,any any,179
13     IPV6 *           TCP    any             LU(803)    0/0             any,179 any,any
```

```
14     IPV6 *           ICMP6  any           LU(803)    0/0           any,any any,ECHOREPLY
15     IPV6 *           ICMP6  any           Local      0/0           any,any any,UNREACH
16     IPV6 *           ICMP6  any           Local      0/0           any,any any,PAK2BIG
17     IPV6 *           ICMP6  any           Local      0/0           any,any any,TIMXCEED
18     IPV6 *           ICMP6  any           Local      0/0           any,any any,HDRBAD
19     IPV6 *           TCP    any           LU(803)    0/0           any,any any,any
20     IPV6 *           UDP    any           LU(803)    0/0           any,any any,any
21     IPV6 *           OSPF   any           LU(803)    0/0           any,any any,any
22     IPV6 *           any    any           LU(803)    0/0           any,any any,any

------------------------
statistics:

Type            Num. Entries         Pkts
------          ------------         ----
IPv4            41                   0/0
IPv6            20                   0/0
Packets accepted by deleted entries: 0
Packets dropped by deleted entries: 0
Run out of statistics counter errors: 0

---------------------- show controllers np summary all ----------------------

                Node: 0/0/CPU0:
----------------------------------------------------------------
 [total 2 NP]  Driver Version 12.46a Build 3
 NP 0 :  Hardware Revision: v2 A0
      :  Ucode - Version: 1.0 Build Date: ( Feb 2 2014, 16:4:00 )
 NP 1 :  Hardware Revision: v2 A0
      :  Ucode - Version: 1.0 Build Date: ( Feb 2 2014, 16:4:00 )

--------------------------------- show diag ---------------------------------

NODE module 0/RSP0/CPU0  ASR9K Route Switch Processor with 440G/slot Fabric and 6GB

  MAIN:  board type 0x100306
  S/N:   FOC1738N4T8
  Top Assy. Number:   68-4872-02
  PID:   A9K-RSP440-TR
  HwRev (UDI_VID):   V04
  Chip HwRev: V1.0
  New Deviation Number: 0
  CLEI:  IPUCBB3BTB
  Board State : IOS XR RUN
  PLD:    Motherboard: N/A, Processor version: 0x0 (rev: 2.174), Power: N/A
  MONLIB:
  ROMMON: Version 0.70 [ASR9K x86 ROMMON],
  Board FPGA/CPLD/ASIC Hardware Revision:
    FabSwitch0  : V1.5
    FabSwitch1  : V1.5
    FabArbiter  : V0.0
    FIA  : V0.2
    IntCtrl  : V0.9
    ClkCtrl  : V2.10
    10GPuntFPGA  : V1.6
    HD  : V17.0
    USB0  : V17.0
    USB1  : V0.0
    CpuCtrl  : V0.9
    YDTI  : V4.9
    LIU  : V0.0
    MLANSwitch  : V0.0
    EOBCSwitch  : V0.0
    HostInftCtrl  : V0.0
```

```
    PHY  : V0.0
    Offload10GE  : V0.0
    E10GEDualMAC0  : V0.0
    E10GEDualMAC1  : V0.0
    EGEDualMAC0  : V0.0
    EGEDualMAC1  : V0.0
    CBC (active partition)  : v16.115
    CBC (inactive partition)  : v16.115

NODE module 0/0/CPU0

  MAIN:  board type 0x3c0266
  S/N:   FOC1723N0D8
  Top Assy. Number:   68-4610-02
  PCA:   73-14608-02
  PID:   A9K-VSM-500
  HwRev (UDI_VID):   V00
  Chip HwRev: V0.5
  New Deviation Number: 0
  CLEI:
  Board State : IOS XR RUN
  PLD:    Motherboard: N/A, Processor version: 0x0 (rev: 2.174), Power: N/A
  Rommon: V3.00 [ASR9K x86 ROMMON]
  BMC Version  : V5.08
  KVM Version  : V2.08
  Calvados Version  : V1.05
  Board FPGA/CPLD/ASIC Hardware Revision:
    NP0  : V4.194
    NP1  : V4.194
    FIA0  : V0.2
    FIA1  : V0.2
    X-Bar  : V1.5
    Arbiter  : V0.0
    CPUCtrl  : V1.25
    DBCtrl  : V1.25
    PHYCtrl  : V1.25
    PortCtrl  : V1.25
    Virtualized Services Module 500 Daughter board  : V0.5
    CBC (active partition)  : v33.2
    CBC (inactive partition)  : v33.2

-------------------------------- show version --------------------------------

Cisco IOS XR Software, Version 5.1.1[Default]
Copyright (c) 2014 by Cisco Systems, Inc.

ROM: System Bootstrap, Version 0.70(c) 1994-2012 by Cisco Systems,  Inc.

MORIARTY uptime is 2 hours, 12 minutes
System image file is "tftp://202.153.144.25//tftp-blr-users1/ankejriw/asr9k-mini-px.vm"

cisco ASR9K Series (Intel 686 F6M14S4) processor with 6291456K bytes of memory.
Intel 686 F6M14S4 processor at 2131MHz, Revision 2.174
ASR-9010 AC Chassis

2 Management Ethernet
12 TenGigE
503k bytes of non-volatile configuration memory.
6271M bytes of hard disk.
12510192k bytes of disk0: (Sector size 512 bytes).
12510192k bytes of disk1: (Sector size 512 bytes).

Configuration register on node 0/RSP0/CPU0 is 0x102
Boot device on node 0/RSP0/CPU0 is mem:
```

```
Package active on node 0/RSP0/CPU0:
asr9k-services-infra, V 5.1.1[Default], Cisco Systems, at mem:asr9k-services-infra-5.1.1
    Built on Mon Feb  3 02:34:52 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

iosxr-infra, V 5.1.1[Default], Cisco Systems, at mem:iosxr-infra-5.1.1
    Built on Mon Feb  3 01:38:05 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

iosxr-fwding, V 5.1.1[Default], Cisco Systems, at mem:iosxr-fwding-5.1.1
    Built on Mon Feb  3 01:38:05 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

iosxr-routing, V 5.1.1[Default], Cisco Systems, at mem:iosxr-routing-5.1.1
    Built on Mon Feb  3 01:38:05 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

iosxr-diags, V 5.1.1[Default], Cisco Systems, at mem:iosxr-diags-5.1.1
    Built on Mon Feb  3 01:38:08 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

iosxr-ce, V 5.1.1[Default], Cisco Systems, at mem:iosxr-ce-5.1.1
    Built on Mon Feb  3 01:38:08 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-cpp, V 5.1.1[Default], Cisco Systems, at mem:asr9k-cpp-5.1.1
    Built on Mon Feb  3 01:38:08 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-os-mbi, V 5.1.1[Default], Cisco Systems, at mem:asr9k-os-mbi-5.1.1
    Built on Mon Feb  3 01:40:52 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-base, V 5.1.1[Default], Cisco Systems, at mem:asr9k-base-5.1.1
    Built on Mon Feb  3 01:38:11 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-fwding, V 5.1.1[Default], Cisco Systems, at mem:asr9k-fwding-5.1.1
    Built on Mon Feb  3 01:38:24 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-ce, V 5.1.1[Default], Cisco Systems, at mem:asr9k-ce-5.1.1
    Built on Mon Feb  3 01:38:28 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-diags-supp, V 5.1.1[Default], Cisco Systems, at mem:asr9k-diags-supp-5.1.1
    Built on Mon Feb  3 01:38:32 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-scfclient, V 5.1.1[Default], Cisco Systems, at mem:asr9k-scfclient-5.1.1
    Built on Mon Feb  3 01:38:35 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

iosxr-service, V 5.1.1[Default], Cisco Systems, at mem:iosxr-service-5.1.1
    Built on Mon Feb  3 02:34:43 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-service-supp, V 5.1.1[Default], Cisco Systems, at mem:asr9k-service-supp-5.1.1
    Built on Mon Feb  3 02:34:43 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-fpd, V 5.1.1[Default], Cisco Systems, at mem:asr9k-fpd-5.1.1
    Built on Mon Feb  3 02:34:03 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie
```

```
Boot device on node 0/0/CPU0 is mem:
Package active on node 0/0/CPU0:
asr9k-services-infra, V 5.1.1[Default], Cisco Systems, at mem:asr9k-services-infra-5.1.1
    Built on Mon Feb  3 02:34:52 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

iosxr-infra, V 5.1.1[Default], Cisco Systems, at mem:iosxr-infra-5.1.1
    Built on Mon Feb  3 01:38:05 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

iosxr-fwding, V 5.1.1[Default], Cisco Systems, at mem:iosxr-fwding-5.1.1
    Built on Mon Feb  3 01:38:05 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

iosxr-routing, V 5.1.1[Default], Cisco Systems, at mem:iosxr-routing-5.1.1
    Built on Mon Feb  3 01:38:05 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

iosxr-diags, V 5.1.1[Default], Cisco Systems, at mem:iosxr-diags-5.1.1
    Built on Mon Feb  3 01:38:08 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

iosxr-ce, V 5.1.1[Default], Cisco Systems, at mem:iosxr-ce-5.1.1
    Built on Mon Feb  3 01:38:08 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-cpp, V 5.1.1[Default], Cisco Systems, at mem:asr9k-cpp-5.1.1
    Built on Mon Feb  3 01:38:08 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-os-mbi, V 5.1.1[Default], Cisco Systems, at mem:asr9k-os-mbi-5.1.1
    Built on Mon Feb  3 01:40:52 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-base, V 5.1.1[Default], Cisco Systems, at mem:asr9k-base-5.1.1
    Built on Mon Feb  3 01:38:11 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-fwding, V 5.1.1[Default], Cisco Systems, at mem:asr9k-fwding-5.1.1
    Built on Mon Feb  3 01:38:24 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-ce, V 5.1.1[Default], Cisco Systems, at mem:asr9k-ce-5.1.1
    Built on Mon Feb  3 01:38:28 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-diags-supp, V 5.1.1[Default], Cisco Systems, at mem:asr9k-diags-supp-5.1.1
    Built on Mon Feb  3 01:38:32 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-scfclient, V 5.1.1[Default], Cisco Systems, at mem:asr9k-scfclient-5.1.1
    Built on Mon Feb  3 01:38:35 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

iosxr-service, V 5.1.1[Default], Cisco Systems, at mem:iosxr-service-5.1.1
    Built on Mon Feb  3 02:34:43 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

asr9k-service-supp, V 5.1.1[Default], Cisco Systems, at mem:asr9k-service-supp-5.1.1
    Built on Mon Feb  3 02:34:43 UTC 2014
    By iox-bld5 in /auto/srcarchive9/production/5.1.1/all/workspace for pie

--------------------------------------------------------------------------------
```

```
                        show tech-support vsm complete
------------------------------------------------------------------------------
```

Upgrading Field-Programmable Devices

In general terms, field-programmable devices (FPDs) are hardware devices implemented on router cards that support separate software upgrades. The term FPD has been introduced to collectively and generically describe any type of programmable hardware device on the Cisco ASR 9000 Aggregation Services Router VSM card. Cisco IOS XR software provides the Cisco FPD upgrade feature to manage the upgrade of FPD images on the VSM card.

For more information about FPD upgrades on the Cisco ASR 9000 Series Aggregation Services Router, see the *Cisco ASR 9000 Series Aggregation Services Router System Management Configuration Guide*.

Determine if an FPD upgrade is required on the VSM card using the **show hw-module fpd location** command. If the VSM card has the minimum required version to facilitate the launch of a virtual service, no further action is required. If an FPD upgrade is required on the VSM card, follow the steps below.

Step 1 Check if the FPD upgrade is required by executing the **show hw-module fpd location** command:

```
RP/0/RSP0/CPU0:router(admin)#show hw-module fpd location 0/0/CPU0

==================================== ========================================
                                     Existing Field Programmable Devices
                                     ========================================
                                       HW                          Current SW Upg/
Location     Card Type               Version Type Subtype Inst   Version   Dng?
============ ======================= ======= ==== ======= ==== =========== ====
0/0/CPU0     A9K-VSM-500               1.0   lc   cbc     0      33.02     No
                                             lc   fpga1   0       1.15     Yes
                                             lc   bios    0       3.00     No
                                             lc   ibmc    0       5.08     No
--------------------------------------------------------------------------------
NOTES:
1.  One or more FPD needs an upgrade or a downgrade.  This can be accomplished
    using the "admin> upgrade hw-module fpd <fpd> location <loc>" CLI.
```

Step 2 In the example shown in Step 1, FPGA1 needs an upgrade. Enter the **upgrade hw-module fpd** command in administration EXEC mode.

```
RP/0/RSP0/CPU0:router(admin)#upgrade hw-module fpd fpga1 force location 0/0/CPU0
 ***** UPGRADE WARNING MESSAGE: *****
   *  This upgrade operation has a maximum timout of 90 minutes.  *
   *  If you are executing the cmd for one specific location and  *
   *  card in that location reloads or goes down for some reason  *
   *  you can press CTRL-C to get back the RP's prompt.           *
   *  If you are executing the cmd for _all_ locations and a node *
   *  reloads or is down please allow other nodes to finish the   *
   *  upgrade process before pressing CTRL-C.                     *
 % RELOAD REMINDER:
   - The upgrade operation of the target module will not interrupt its normal
     operation. However, for the changes to take effect, the target module
     will need to be manually reloaded after the upgrade operation. This can
     be accomplished with the use of "hw-module <target> reload" command.
   - If automatic reload operation is desired after the upgrade, please use
     the "reload" option at the end of the upgrade command.
   - The output of "show hw-module fpd location" command will not display
     correct version information after the upgrade if the target module is
     not reloaded.
 NOTE: Chassis CLI will not be accessible while upgrade is in progress.
 Continue? [confirm] Y
 FPD upgrade in progress on some hardware, reload/configuration change
 on those is not recommended as it might cause HW programming failure
 and result in RMA of the hardware.
 Starting the upgrade/download of following FPD:
 ============ ==== ======= ======= ============ =========
                                    Current     Upg/Dng
 Location     Type Subtype Upg/Dng  Version     Version
 ============ ==== ======= ======= ============ =========
0/0/CPU0     lc   fpga1   upg          1.15       1.25
 ------------------------------------------------------
 Successfully upgraded     fpga1 for          A9K-VSM-500 on location    0/0/CPU0 from
1.15 to  1.25
 FPD upgrade has ended.
```

Changing RSP-440 Configuration Register Settings

When a VSM card is installed in the Cisco ASR 9000 Series Aggregation Services Router, the default baud rate on the RSP-440 is not sufficient. The baud rate on the VSM card is 115200 baud. If the baud rates on the RSP-440 and the VSM card do not match, there will be data loss on the console. The baud rate on the RSP-440 must be changed from 9600 baud (default) to 115200 baud. To change the configuration register settings, use the **confreg** command. See the *Cisco ASR 9000 Series Aggregation Services Router ROM Monitor Configuration Guide* for more information.

Regulatory, Compliance, and Safety Information

This section contains information on laser safety.

For other regulatory, compliance, and safety information, including translated safety warnings, refer to the *Cisco ASR 9000 Series Aggregation Services Router Regulatory Compliance and Safety Information* publication.

Laser Safety

Single-mode Ethernet line cards (all of the line cards) are equipped with a Class 1 laser. Multimode Ethernet line cards (Gigabit Ethernet) are equipped with a Class 1 LED. These devices emit invisible radiation. Do not stare into operational line card ports. The following laser warnings apply to the line cards:

- Class 1 Laser Product Warning (Single-mode)
- Class 1 LED Product Warning (Multimode)
- General Laser Warning

Class 1 Laser Product Warning (Single-mode)

Warning **Class 1 laser product.** Statement 1008

Class 1 LED Product Warning (Multimode)

Warning **Class 1 LED product.** Statement 1027

General Laser Warning

Warning **Invisible laser radiation can be emitted from the aperture of the port when no cable is connected. Avoid exposure to laser radiation and do not stare into open apertures.** Statement 70

Technical Specifications

This appendix lists the specifications for the VSM card for the Cisco ASR 9000 Series Aggregation Services Router.

The specifications are presented in the following tables:

Table A-1, "Cisco ASR9000 VSM Card Ordering Information"

Table A-2, "Cisco ASR 9000 Series Environmental Specifications"

Table A-3, "Card and Fan Tray Power Consumption Specifications"

Table A-4, "VSM Card Technical Specifications"

Table A-1 provides ordering information for the Cisco ASR 9000 Virtualized Services Module (VSM) Card.

Table A-1 Cisco ASR9000 VSM Card Ordering Information

Product Name	Part Number
Cisco ASR 9000 Virtualized Services Module (VSM) Card	A9K-VSM-500(=)
Cisco ASR9000 CGN License (1 per 5 million translations)[1]	A9K-XLAT-LIC-5M(=)
Virtual Machine License for Cisco ASR 9000 Router	A9K-VM-LIC(=)

1. In IOS XR Release 5.1.1, the user must select at least one unit of CGN license. Up to sixteen units of CGN license (1 per 5 million translations) supported per Cisco ASR 9000 Virtualized Services Module (VSM) Card.

Table A-2 lists the environmental specifications for the Cisco ASR 9000 Series Router.

Table A-2 Cisco ASR 9000 Series Environmental Specifications

Description	Value
Operating Temperature:	41 degrees to 104 degrees F (5 degrees to 40 degrees C)
Operating Temperature (Short term)[1]:	23 degrees to 131 degrees F (–5 degrees to 55 degrees C)[2]

Table A-2 Cisco ASR 9000 Series Environmental Specifications (continued)

Description	Value
Nonoperating Temperature	–4 degrees to 149 degrees F (–20 degrees to 65 degrees C)
Humidity	Operating: 10 to 85 percent noncondensing Nonoperating: 5 to 95 percent noncondensing
Altitude	Operating: 0 to 13,000 ft (0 to 4,000 m) Nonoperating: 0 to 15,000 ft (0 to 4,570 m)
Power Dissipation (Cisco ASR 9010 Router)	7600 W maximum
Power Dissipation (Cisco ASR 9006 Router)	4556 W maximum
Acoustic noise	78 dB at 80.6 degrees F (27 degrees C) maximum
Shock	Operating (halfsine): 21 in/sec (0.53 m/sec) Nonoperating (trapezoidal pulse): 20 G[3], 52 in/sec (1.32 m/sec)
Vibration	Operating: 0.35 Grms[4] from 3 to 500 Hz Nonoperating: 1.0 Grms from 3 to 500 Hz

1. Short-term refers to a period of not more than 96 consecutive hours and a total of no more than 15 days in 1 year. (This refers to a total of 360 hours in any given year, but no more than 15 occurrences during that 1-year period.).
2. Operating temperature specifications for the router will differ from those listed in this table when 40-port Gigabit Ethernet line cards using GLC-GE-100FX SFP transceiver modules are installed in the router. This is due to the lower temperature specifications of the SFP module. Please contact a Cisco representative for more information.
3. G is a value of acceleration, where 1G equals 32.17 ft/sec^2 (9.81 m/sec^2).
4. Grms is the root mean square value of acceleration.

Table A-3 lists the power consumption specifications for the RSP card, line cards, and fan tray.

Caution Be sure that the chassis configuration complies with the required power budgets. Failure to properly verify the configuration may result in an unpredictable state if one of the power units fails. Contact your local sales representative for assistance.

Table A-3 Card and Fan Tray Power Consumption Specifications

Description	Value
RSP Card	
Power consumption	170 W at 86 degrees F (30 degrees C) 195 W at 104 degrees F (40 degrees C) 205 W at 131 degrees F (55 degrees C)
VSM Card	
Power consumption	750 W at 86 degrees F (30 degrees C) 800 W at 104 degrees F (40 degrees C) 850 W at 131 degrees F (55 degrees C)

Table A-3 Card and Fan Tray Power Consumption Specifications

Description	Value
Fan Tray	
Power consumption	160 W at 86 degrees F (30 degrees C) 300 W at 104 degrees F (40 degrees C) 475 W at 131 degrees F (55 degrees C)

Table A-4 lists the technical specifications for the VSM card.

Table A-4 VSM Card Technical Specifications

Description	Value
Height	14 in (35.56 cm)
Width	1.72 in (4.37 cm)
Depth	20.5 in (52.07 cm)
Weight	21.2 lb (9.6 kg)

Acronyms

This appendix lists the acronyms and abbreviations used in this document.

Table B-1 Acronyms and Abbreviations

Abbreviation	Description
BIOS	Basic Input/Output System
CBC	CanBus Controller
CLI	Command Line Interface
CPLD	Complex Programmable Logic Device
CPU	Central Processing Unit
EMI	Electromagnetic Interference
ESD	Electrostatic Discharge
EXEC	privileged command mode
FPD	Field Programmable Device
FPGA	Field-Programmable Gate Array
iBMC	Integrated Baseboard Management Controller
NPU	Network Processing Unit
nV	Network Virtualization
OIR	Online Insertion and Removal
QPI	Intel QuickPath Interconnect
ROMMON	ROM Monitor
RSP	Route Switch Processor
SFP	Small Form-factor Pluggable
UCS	Unified Computing System
USB	Universal Serial Bus
VM	Virtual Machine
VSM	Virtualized Services Module