



## Installation and Configuration Guide for Cisco Services Ready Engine Virtualization

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# **Preface**

This preface describes the audience and conventions of the *Installation and Configuration Guide for Cisco Services Ready Engine Virtualization*. It also describes the available product documentation and provides information on how to obtain documentation and technical assistance.

- Audience, page v
- Conventions, page v
- Open Source Software Information, page vi
- Related Documentation, page vi
- Obtaining Documentation and Submitting a Service Request, page vi

## Audience

This guide is intended primarily for network administrators, system administrators, and system integrators.

## **Conventions**

This document uses the following conventions:

Convention	Item
boldface font	Commands and keywords.
<i>italic</i> font	Variables for which you supply values.
[enclosed in brackets]	Optional command keywords. You do not have to select any options.
{options enclosed in braces   separated by vertical bar}	Required command keyword to be selected from a set of options. You must choose one option.
screen font	Displayed session and system information.
boldface screen font	Information you enter.
italic screen font	Variables you enter.
<b>Option &gt; Network Preferences</b>	Choosing a menu item.



Means reader take note.

Caution

Means *reader be careful*. In this situation, you might perform an action that could result in equipment damage or loss of data.

## **Open Source Software Information**

Some components of the software created for Cisco Services Ready Virtualization are provided through open source or commercial licensing. These components and the associated copyright statements can be found at:

http://www.cisco.com/en/US/docs/interfaces\_modules/services\_modules/sre\_v/1.0/open\_source/licens e/sre\_v\_open\_source.pdf.

## **Related Documentation**

The following related documentation for Cisco Services Ready Engine Virtualization (Cisco SRE-V) is available on Cisco.com:

- Installation and Configuration Guide for Cisco Services Ready Engine Virtualization (this document)
- Release Notes for Cisco Services Ready Engine Virtualization
- FAQs and Troubleshooting Guide for Cisco Services Ready Engine Virtualization
- Open Source Used In Cisco Services Ready Engine Virtualization Release: 1.0

# **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:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html

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# **Configuration Quick Reference**



Use this configuration quick reference document if you are familiar with the Cisco Services Ready Engine (SRE) Service Module and VMware vShpere Hypervisor<sup>TM</sup>, and you only need a list of commands and steps to quickly set up and use Cisco Services Ready Engine Virtualization (Cisco SRE-V). Detailed information about the configuration steps is provided in subsequent chapters.

Use this configuration quick reference document if you purchased a blank Cisco SRE Service Module without the Cisco SRE-V or Microsoft Windows software.

See Figure i-1 for an example of the configuration, and see Figure i-2 for the location of the IP addresses, and then complete the steps that follow.

Figure i-1 shows an example of the configuration.

- The left pane shows an example of the Cisco IOS commands that you configure in the sm 1/0, sm 1/1, and vlan 1 interfaces.
- The right pane shows where the configuration is applied in Cisco SRE-V.



#### Figure i-1 Configuration Example



The IP addresses in the configuration example in Figure i-1 are for reference only and might not be valid.

Figure i-2 shows the location of the IP addresses that you configure on the Cisco SRE service module interfaces.

The Console Manager needs two IP addresses: One IP address is for the router side of the router-to-console manager link; and the other IP address is for the Console Manager side of the link.

The VMware vSphere Hypervisor<sup>TM</sup> also needs two IP addresses: One IP address is for the router side of the link that connects the router to the VMware vSphere Hypervisor<sup>TM</sup>; and the other IP address is for the VMware vSphere Hypervisor<sup>TM</sup>.





To set up and configure Cisco SRE-V, complete the following steps:

- **Step 1** Install the Cisco SRE Service Module into the router. See Chapter 2, "Installing the Cisco SRE Service Module into the Router."
- **Step 2** Configure the Cisco SRE Service Module interfaces.
  - Use the following commands from the host-router CLI:
    - enable
    - configure terminal
  - Configure *slot*/0 of the Console Manager:
    - interface sm slot/0
    - ip address console-manager-router-side-ip-address subnet-mask
    - service-module ip address console-manager-ip-address subnet-mask
    - service-module ip default-gateway console-manager-gateway-ip-address
    - service-module mgf ip address hypervisor-ip-address subnet-mask
    - no shut
    - exit

- Configure *slot*/1 of the Console Manager:
  - interface sm slot/1
  - switchport mode trunk
  - exit
- Configure VLAN 1:
  - interface vlan 1
  - ip address hypervisor-router-side-ip-address subnet-mask
  - no shut
  - end
  - copy running-config startup-config
  - show running-config

For details, see Chapter 3, "Configuring the Cisco SRE Service Module Interfaces."

- **Step 3** Go to http://www.cisco.com/go/ucse, click **Download Software**, and then download the Cisco SRE-V files.
- **Step 4** Install the Cisco SRE-V software. Use the following commands from the host-router CLI:
  - a. enable
  - b. service-module sm *slot/*0 install url *url* [script *filename*] [argument "string"]
  - c. exit

For details, see Chapter 4, "Installing and Managing the Cisco SRE-V Software."

- **Step 5** Activate the Cisco SRE-V software license. Do the following:
  - **a.** From your PC or workstation, start SSH Client, enter the IP address of the Console Manager (that you entered in Step 2), and then enter the username and password to access the Console Manager.
  - **b.** Use the following commands from the console manager interface:

license activate license name

reload



Note If you purchased Cisco SRE-V Option 2 (Hardware plus Virtualization software); or Option 3 (Hardware, plus Virtualization software, plus Microsoft Windows software), you do not need to activate the software license. For information about Cisco SRE-V software options, see the "Understanding Cisco SRE-V Options and Associated Tasks" section on page 7.

For details, see Chapter 5, "Managing the Cisco SRE-V Software Licenses."

- **Step 6** (Optional) Use the Cisco SRE-V commands to create users and roles, and then assign permissions to those users. For details, see Chapter 6, "Configuring Users, Roles, and Permissions."
- **Step 7** Configure the VMware vSphere Hypervisor<sup>TM</sup> default gateway. Do the following:
  - **a.** From your PC or workstation, start SSH Client, enter the IP address of the console manager, and then enter the username and password to access the console manager.
  - **b.** Use the following command from the console manager interface:

hypervisor set ip default-gateway hypervisor-default-gateway-ip-address

For details, see the "Configuring the VMware vSphere Hypervisor Default Gateway" section on page 1.

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- **Step 8** Go to https://hypervisor-ip-address, and download the vSphere Client. For details, see Chapter 7, "Managing Virtual Machines."
- Step 9 Install the vSphere Client. For details, see Chapter 7, "Managing Virtual Machines."
- **Step 10** Install your own version of the Microsoft Windows Server 2003 or Microsoft Windows Server 2008 software, and then activate the software license.



- **Note** Microsoft Windows Server software is not available for download from Cisco.com. It can only be purchased together with the module.
- Step 11 Configure the IP addresses for the Microsoft Windows Server by using the standard Microsoft Windows network configuration setup process. See the Microsoft Windows virtual machines in Figure i-1 for an example of the network settings.
- Step 12 Install VMware tools. For details, see the "Installing VMware Tools" section on page 7.





# **Cisco Services Ready Engine Virtualization Overview**

This chapter provides an overview of the Cisco Services Ready Engine Virtualization (Cisco SRE-V) product. It includes information about the hardware and software requirements, feature licenses, and tasks that you must complete to set up Cisco SRE-V.

This chapter contains the following sections:

- Cisco SRE-V Overview, page 1-1
- Difference Between Cisco SRE-V and VMware vSphere Hypervisor, page 1-3
- Hardware Requirements, page 1-3
- Software Requirements, page 1-4
- Managing Cisco SRE-V, page 1-6
- Basic Workflow, page 1-6
- Understanding Cisco SRE-V Options and Associated Tasks, page 1-7

## **Cisco SRE-V Overview**

Cisco SRE-V is a branch-office infrastructure platform that combines computing, networking, storage access, virtualization, and unified management into a cohesive system. It enables the VMware vSphere Hypervisor<sup>TM</sup> to be provisioned on a Cisco Services Ready Engine (SRE) Service Module and host one or multiple virtual machines running the Microsoft Windows Server operating system. The entire system is integrated with the Generation 2 of the Cisco Integrated Services Router (ISR G2).

Figure 1-1 provides an example of a Cisco SRE-V system deployment.



#### Figure 1-1 Example of a Cisco SRE-V System Deployment

1	Client Devices	4	Virtual Machines Hosted on Cisco SRE-V
2	Cisco SRE-V Management Console	5	Enterprise Storage Device
3	Cisco ISR G2 Router with Cisco SRE Service Module and Cisco SRE-V		

#### **Cisco SRE-V Terms**

The following Cisco SRE-V terms are used in this guide:

- Cisco SRE Service Module—Intel x86 architecture blade server that is hosted in a Cisco ISR G2. The Cisco SRE Service module provides the dedicated processing, network, storage, and memory to run the VMware vSphere Hypervisor<sup>TM</sup>.
- VMware vSphere Hypervisor<sup>TM</sup>—Bare-metal hypervisor from VMware that provides the platform to host virtual machines.
- Console Manager—Embedded virtual machine running Cisco Linux that provides console access to the VMware vSphere Hypervisor<sup>TM</sup> for functionality that is specific to Cisco.
- Microsoft Windows Virtual Machine—User-created virtual machine that runs the Microsoft Windows Server operating system.

See Figure 1-2 to understand the Cisco SRE-V terms.





# Difference Between Cisco SRE-V and VMware vSphere Hypervisor

The Cisco SRE-V product is different from the VMware vSphere Hypervisor<sup>TM</sup> in the following ways:

- Cisco SRE-V enables VMware vSphere Hypervisor<sup>TM</sup> to be provisioned on a Cisco SRE Service Module, which is integrated in the Cisco ISR G2.
- Configuration of the VMware vSphere Hypervisor<sup>TM</sup> IP address is done through the Cisco ISR G2.
- Configuration of the user management tasks is done using the Cisco SRE-V CLI instead of the VMware vSphere Client.
- License management for Cisco SRE-V is done through Cisco Software Licensing (CSL).
- Software upgrade packages for Cisco SRE-V are obtained from Cisco.com. Software upgrades are done using the Cisco SRE-V CLI.
- System operation such as firmware settings, advanced settings, and PCI PassThru settings are disabled.
- vCenter server access support is not available in Cisco SRE-V.

## **Hardware Requirements**

The Cisco SRE-V software runs on the Cisco SRE Service Module, which is the hardware component of Cisco SRE-V. The Cisco SRE Service Module can reside either in the Cisco 2900 series or 3900 series ISR G2.

The Cisco SRE-V software is supported on the following service modules:

- Cisco SRE 700 Service Module
- Cisco SRE 900 Service Module

Table 1-1 provides the hardware information for each of the supported service modules.

Feature	Cisco SRE 700 Service Module	Cisco SRE 900 Service Module
Form Factor	SM	SM
CPU	Intel Core 2 Duo (one core active), 1.86 GHz	Intel Core 2 Duo (two cores active), two 1.86 GHz
DRAM	4 GB	4 GB or 8 GB
eUSB Flash Memory	2-GB internal USB flash-memory module	2-GB internal USB flash-memory module
Hard Disk	1 x 500 GB	2 x 500 GB (1 TB)
Internal Network Interfaces	<ol> <li>Layer 2 Gigabit Ethernet interface</li> <li>Layer 3 Gigabit Ethernet interface</li> </ol>	<ol> <li>Layer 2 Gigabit Ethernet interface</li> <li>Layer 3 Gigabit Ethernet interface</li> </ol>

 Table 1-1
 Cisco SRE Service Module Hardware at a Glance

External Network	1 USB connector	1 USB connector
Interfaces	1 RJ-45 Gigabit Ethernet connector	1 RJ-45 Gigabit Ethernet connector
Router Platforms	2911, 2921, 2951, 3925, 3925e, 3945, 3945e	2911, 2921, 2951, 3925, 3925e, 3945, 3945e

	Table 1-1	Cisco SRE Service Module Hardware at a Glance	e (continued
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Table 1-2 shows the Cisco EtherSwitch Enhanced High-Speed WAN Interface Cards (EHWICs) and Cisco EtherSwitch service modules that are supported on the Cisco ISR G2.

Table 1-2 Supported Cisco EtherSwitch EHWIC and Cisco EtherSwitch Service Modules

Cisco EtherSwitch EHWIC	Cisco EtherSwitch Service Module
EHWIC-D-8ESG-P=, EHWIC-D-8ESG-P,	SM-D-ES3G-48-P, SM-D-ES3-48-P,
EHWIC-D-8ESG=, EHWIC-D-8ESG,	SM-D-ES2-48, SM-ES3G-24-P, SM-ES3-24-P,
EHWIC-4ESG-P=, EHWIC-4ESG-P,	SM-ES2-24-P, SM-ES2-24, SM-ES3G-16-P,
EHWIC-4ESG=, EHWIC-4ESG, SM-ES3-16-P,	SM-ES3-16-P, and SM-ES2-16-P
and SM-ES2-16-P	

## **Software Requirements**

This section provides information about third-party software, Cisco SRE-V options, and feature licenses.

#### **Third-Party Software**

Cisco SRE-V uses the following third-party software:

- VMware vSphere Hypervisor<sup>TM</sup>—For virtualization.
- Microsoft Windows Server—For the operating system.

The following Microsoft Windows Servers are certified:

- Windows Server 2003 SP2 Standard 32-bit and 64-bit
- Windows Server 2003 SP2 Enterprise 32-bit and 64-bit
- Windows Server 2008 R2 Standard 64-bit
- Windows Server 2008 R2 Enterprise 64-bit

#### **Cisco SRE-V Options**

Cisco SRE-V is available in the following three options:

 Hardware only (SM-SRE-700-K9 or SM-SRE-900-K9)—Cisco SRE Service Module without any software installed on it. See Option 1 in Figure 1-3.

If you purchase this option, you must download and install Cisco SRE-V software as well as your own version of the Microsoft Windows Server 2003 or Microsoft Windows Server 2008 software.

 Hardware plus Virtualization software (SM-SRE-700-K9 or SM-SRE-900-K9 + SW-SM-SRE-V-1.0-K9)—Cisco SRE Service Module with Cisco SRE-V software preinstalled. See Option 2 in Figure 1-3.

Purchase this option if you have your own version of Microsoft Windows Server 2003 or Microsoft Windows Server 2008 software that you want to use. If you purchase this option, the Cisco SRE-V license is preactivated.

 Hardware, plus Virtualization software, plus Microsoft Windows software (SM-SRE-700-K9 or SM-SRE-900-K9 + SW-SM-SRE-V-1.0 + MSWS-08R2ST-X86-K9)—Cisco SRE Service Module with both Cisco SRE-V and Microsoft Windows Server 2008 R2 Standard Edition 64-bit virtual machine preinstalled. See Option 3 in Figure 1-3.

If you purchase this option, both the Microsoft Windows Server 2008 R2 license and the Cisco SRE-V license are preactivated.

Figure 1-3 shows the Cisco SRE-V options.



Figure 1-3 Cisco SRE-V Options

#### Feature Licenses

Table 1-3 provides the feature licenses that are available for Cisco SRE-V.

Table 1-3 License SKUs

License SKUs	Description
FL-SRE-V-HOST	VMware vSphere Hypervisor Host pre-activated paper license purchased with the software.
FL-SRE-V-HOST=	VMware vSphere Hypervisor Host paper license purchased without the software (spare). You must activate this license.
L-FL-SRE-V-HOST=	VMware vSphere Hypervisor Host electronic license purchased without the software (spare). You must activate this license.

For information about Cisco SRE-V software licenses, see Chapter 5, "Managing the Cisco SRE-V Software Licenses."

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## **Managing Cisco SRE-V**

Cisco SRE-V uses several management interfaces:

#### **Cisco IOS CLI**

Use the Cisco IOS CLI to configure the host router and Cisco SRE Service Module interfaces. Cisco SRE-V resides on a Cisco SRE Service Module, which fits into a host Cisco router that runs the Cisco IOS software. For information about the supported Cisco IOS software, see the "Verifying the Router, Cisco SRE Service Module, and Cisco IOS Software Version Compatibility" section on page 2-2.

#### **Cisco SRE-V CLI**

Use the Cisco SRE-V CLI to configure users and assign those users with permissions to host and manage virtual machines. You can also use the Cisco SRE-V CLI to manage licenses and software upgrades. Cisco SRE-V has a virtual machine management engine with its own startup and run-time configurations and its own CLI, all of which are independent of the Cisco IOS configuration on the router.



Instead of the Cisco SRE-V CLI, you can use the Cisco License Manager to automate license-related work flow. See the "Cisco License Manager" section on page 1-6.

#### **Cisco License Manager**

Use the Cisco License Manager to automate all license-related work flow. Cisco License Manager securely communicates with the licensing back-end fulfillment systems at Cisco.com and deploys obtained licenses to managed devices on a network-wide basis. Cisco License Manager is available at no cost and can be downloaded by registered Cisco.com users from *http://www.cisco.com/go/clm*.

#### VMware vSphere Client

Use the VMware vSphere Client to manage virtual machines.

## **Basic Workflow**

- 1. Install the Cisco SRE Service Module into the ISR G2.
- 2. Use the Cisco IOS commands to configure the Cisco SRE Service Module interfaces.
- **3.** If you purchase a blank Cisco SRE Service Module, install the Cisco SRE-V software, and then activate the software license.
- 4. Use the Cisco SRE-V commands to create users and roles, and then assign permissions to those users.
- 5. Configure the VMware vSphere Hypervisor<sup>TM</sup> default gateway.
- **6.** Install the vSphere Client, and then use the vSphere Client GUI to create and manage the virtual machines.
- 7. Use the vSphere Client to create additional virtual machines.

# **Understanding Cisco SRE-V Options and Associated Tasks**

Depending on the Cisco SRE-V software option that you purchase, the tasks that you must perform vary. See Table 1-4.

Table 1-4Cisco SRE-V Options and Tasks

	If you purchased the SRE Service		
Option	Module option	Do	the following
1	Hardware only (SM-SRE-700-K9 or SM-SRE-900-K9)—Cisco SRE Service	1.	Install the Cisco SRE Service Module into the router. See Chapter 2, "Installing the Cisco SRE Service Module into the Router."
	Module. See Figure 1-3. (This option includes a blank Cisco SRE Service Module without the Cisco SRE-V or Microsoft Windows software.	2.	Configure the Cisco SRE Service Module interfaces. See Chapter 3, "Configuring the Cisco SRE Service Module Interfaces."
		3.	Download and install the Cisco SRE-V software on the Cisco SRE Service Module. See Chapter 4, "Installing and Managing the Cisco SRE-V Software."
	If you purchase this option, you must download and install Cisco SRE-V software as well as your own version of the Microsoft Windows Server 2003 or Microsoft Windows Server 2008 software.)	4.	Activate the Cisco SRE-V software license. See Chapter 5, "Managing the Cisco SRE-V Software Licenses."
		5.	(Optional) Use the Cisco SRE-V commands to create users and roles, and then assign permissions to those users. See Chapter 6, "Configuring Users, Roles, and Permissions."
		6.	Configure the VMware vSphere Hypervisor <sup>TM</sup> default gateway. See the "Configuring the VMware vSphere Hypervisor Default Gateway" section on page 7-1.
		7.	Install the vSphere Client to manage the virtual machines. See Chapter 7, "Managing Virtual Machines."
		8.	Install your own version of the Microsoft Windows Server 2003 or Microsoft Windows Server 2008 software, and then activate the software license.
		Not	• Microsoft Windows Server software is not available for download from Cisco.com. It can only be purchased together with the module.
		9.	Install VMware tools. See the "Installing VMware Tools" section on page 7-7.

Option	If you purchased the SRE Service Module option	Do t	he following
2	Hardware plus Virtualization software (SM-SRE-700-K9 or SM-SRE-900-K9 + SW-SM-SRE-V-1.0)—Cisco SRE Service Module with the Cisco SRE-V software preinstalled. See Figure 1-3. (This option does not include the Microsoft Windows Server software.	1.	Install the Cisco SRE Service Module into the router. See Chapter 2, "Installing the Cisco SRE Service Module into the Router."
		2.	Configure the Cisco SRE Service Module interfaces. See Chapter 3, "Configuring the Cisco SRE Service Module Interfaces."
		3.	(Optional) Use the Cisco SRE-V commands to create users and roles, and then assign permissions to those users. See Chapter 6, "Configuring Users, Roles, and Permissions."
	Purchase this option if you have your own version of Microsoft Windows Server 2003 or Microsoft Windows Server 2008 that you want to use	4.	Configure the VMware vSphere Hypervisor <sup>TM</sup> default gateway. See the "Configuring the VMware vSphere Hypervisor Default Gateway" section on page 7-1.
	If you purchase this option, the Cisco SRE-V license is preactivated.)	5.	Install the vSphere Client to manage the virtual machines. See Chapter 7, "Managing Virtual Machines."
		6.	Install your own version of the Microsoft Windows Server 2003 or Microsoft Windows Server 2008 software, and then activate the software license.
		Note	• Microsoft Windows Server software is not available for download from Cisco.com. It can only be purchased together with the module.
		7.	Install VMware tools. See the "Installing VMware Tools" section on page 7-7.
3	<ul> <li>Hardware, plus Virtualization software, plus Microsoft Windows software (SM-SRE-700-K9 or SM-SRE-900-K9 + SW-SM-SRE-V-1.0 + MSWS-08-R2ST-X64)—Cisco SRE</li> <li>Service Module with both Cisco SRE-V and Microsoft Windows Server 2008 R2</li> <li>Standard Edition 64-bit virtual machine preinstalled. See Figure 1-3.</li> <li>(If you purchase this option, both the Microsoft Windows Server 2008 R2</li> <li>license as well as the Cisco SRE-V</li> </ul>	1.	Install the Cisco SRE Service Module into the router. See Chapter 2, "Installing the Cisco SRE Service Module into the Router."
		2.	Use the Cisco IOS commands to configure the Cisco SRE Service Module interfaces. See Chapter 3, "Configuring the Cisco SRE Service Module Interfaces."
		3.	(Optional) Use the Cisco SRE-V commands to create users and roles, and then assign permissions to those users. See Chapter 6, "Configuring Users, Roles, and Permissions."
		4.	Configure the VMware vSphere Hypervisor <sup>TM</sup> default gateway. See the "Configuring the VMware vSphere Hypervisor Default Gateway" section on page 7-1.
	license are preactivated.	5.	Install the vSphere Client to manage the virtual machines. See
	Aith this option, you also receive a ficrosoft Windows Server 2008 R2 ecovery DVD, which you can use if you ose or delete the Microsoft Windows irtual machine from your system.)		Chapter 7, Intanaging virtual machines.

### Table 1-4 Cisco SRE-V Options and Tasks (continued)





# Installing the Cisco SRE Service Module into the Router

This chapter provides information about installing the Cisco SRE Service Module into the router. It contains the following sections:

- Basic Workflow for Installing the Cisco SRE Service Module into the Router, page 2-1
- Verifying the Router, Cisco SRE Service Module, and Cisco IOS Software Version Compatibility, page 2-2
- Installing the Cisco SRE Service Module into the Router, page 2-2
- Verifying Cisco SRE Service Module Installation, page 2-3
- Online Insertion and Removal of the Cisco SRE Service Module, page 2-3

## Basic Workflow for Installing the Cisco SRE Service Module into the Router

- 1. Verify that the router, the Cisco SRE Service Module, and the Cisco IOS software version that is installed on the router are compatible. See the "Verifying the Router, Cisco SRE Service Module, and Cisco IOS Software Version Compatibility" section on page 2-2.
- 2. Install the Cisco SRE Service Module into the router. See the "Installing the Cisco SRE Service Module into the Router" section on page 2-2.
- **3.** Verify that the Cisco SRE Service Module is correctly detected by the router. See the "Verifying Cisco SRE Service Module Installation" section on page 2-3

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# Verifying the Router, Cisco SRE Service Module, and Cisco IOS Software Version Compatibility

Table 2-1 provides the compatibility between the routers, Cisco SRE Service Modules, and the Cisco IOS software version that you must install on the router to use Cisco SRE-V.

Router	Cisco IOS Software Version for Cisco SRE 700 Service Module	Cisco IOS Software Version for Cisco SRE 900 Service Module
2911	15.1(3)T and later versions	15.1(3)T and later versions
2921	15.1(3)T and later versions	15.1(3)T and later versions
2951	15.1(3)T and later versions	15.1(3)T and later versions
3925	15.1(3)T and later versions	15.1(3)T and later versions
3925e	15.1(3)T and later versions	15.1(3)T and later versions
3945	15.1(3)T and later versions	15.1(3)T and later versions
3945e	15.1(3)T and later versions	15.1(3)T and later versions

Table 2-1 Cisco Routers, Cisco SRE Service Module, and Cisco IOS Version Compatibility

#### **Related Topics**

• Installing the Cisco SRE Service Module into the Router, page 2-2

## Installing the Cisco SRE Service Module into the Router

To install the Cisco SRE Service Module into the Cisco 2900 series or 3900 series ISR G2, see Figure 2-1. For detailed information, see *Installing Cisco Network Modules and Service Modules in Cisco Access Routers* on Cisco.com.



Figure 2-1 Cisco SRE Service Module in a Router

#### **Related Topics**

- Verifying Cisco SRE Service Module Installation, page 2-3
- Configuring the Cisco SRE Service Module Interfaces on the Router, page 3-3

## Verifying Cisco SRE Service Module Installation

After the Cisco SRE Service Module is physically installed in a Cisco router, and the router is loaded with a compatible Cisco IOS image and powered back on, do the following to ensure that the Cisco SRE Service Module is correctly detected by the router.

To verify the Cisco SRE Service Module installation, complete the following steps:

Step 1 Verify that the router detects the presence of the newly installed Cisco SRE Service Module. From the router, enter enable mode, and then use the show diag | include FRU command. The Field Replaceable Unit (FRU) details are displayed, as shown in the following example of a Cisco SRE 900 Service Module:

uter#	show di	ag   i	nclude FRU		
	Product	(FRU)	Number	:	CISCO2951/K9
	Product	(FRU)	Number	:	PWR-2921-51-POE
	Product	(FRU)	Number	:	PVDM3-32
	Product	(FRU)	Number	:	SM-SRE-900-K9

**Step 2** Use the **show hardware** command to verify that the router recognizes the service module.

#### **Related Topics**

Ro

- Installing the Cisco SRE Service Module into the Router, page 2-2
- Configuring the Cisco SRE Service Module Interfaces on the Router, page 3-3

## Online Insertion and Removal of the Cisco SRE Service Module

The Cisco 3900 series ISR G2 supports the Online Insertion and Removal (OIR), or hot swap, of the Cisco SRE Service Module.

The Cisco 2900 series ISR G2 does not support OIR of the Cisco SRE Service Module. To install or remove the Cisco SRE Service Module from the Cisco 2900 series ISR G2, make sure that you first power down the router, and then install or remove the Cisco SRE Service Module.

To perform OIR of a Cisco SRE Service Module from a Cisco 3900 series ISR G2, complete the following steps:

#### SUMMARY STEPS

- 1. service-module sm slot/0 shutdown
- 2. service-module sm slot/0 status
- 3. hw-module sm 1 oir-stop

## **DETAILED STEPS**

	Command or Action	Purpose
Step 1	service-module sm slot/0 shutdown	Shuts down the Cisco SRE Service Module system gracefully. Use this command when removing or replacing a hot-swappable module during OIR.
	Router# service-module sm 1/0 shutdown	If the virtual machines on the VMware vSphere Hypervisor <sup>TM</sup> have VMware tools installed on them, and you issue this command, the virtual machines shut down first, and then the Cisco SRE Service Module shuts down.
		If the virtual machines do not have VMware tools installed on them, and you issue this command, the virtual machines get powered off first, and then the shutdown signal is sent to the service module. After about two minutes, the Cisco SRE Service Module shuts down.
Step 2	service-module sm slot/0 status	Verifies whether the Cisco SRE Service Module system is in the shut down state.
	<b>Example:</b> Router# service-module sm 1/0 status	
Step 3	hw-module sm 1 oir-stop	Removes the Cisco SRE Service Module from the router.
	<b>Example:</b> Router# hw-module sm 1 oir-stop	When you enter this command, OIR messages are displayed. After the messages finish displaying, remove the Cisco SRE Service Module from the router.





# **Configuring the Cisco SRE Service Module Interfaces**

This chapter provides information about how to configure the Cisco SRE Service Module interfaces to run the Cisco SRE-V System software.

Before you begin, make sure that the ISR G2 in which the Cisco SRE Service Module is installed is running the supported Cisco IOS software version. See the "Verifying the Router, Cisco SRE Service Module, and Cisco IOS Software Version Compatibility" section on page 2-2.

This chapter contains the following sections:

- Basic Workflow for Configuring the Cisco SRE Service Module Interfaces, page 3-1
- Cisco SRE Service Module Interfaces Overview, page 3-2
- Configuring the Cisco SRE Service Module Interfaces, page 3-2
- Configuring VLANs, page 3-18
- Reload, Reset, and Shut Down Commands, page 3-26

## Basic Workflow for Configuring the Cisco SRE Service Module Interfaces

- 1. Configure the Cisco SRE service-module interface, sm1/0.
- 2. Configure the Cisco SRE service-module interface, sm1/1.
- 3. Configure VLAN 1.
- 4. (Optional) Configure additional VLANs.

See the "Configuring the Cisco SRE Service Module Interfaces on the Router" section on page 3-3 and the "Configuring VLANs" section on page 3-18.

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## **Cisco SRE Service Module Interfaces Overview**

The host router and the Cisco SRE Service Module use several interfaces for internal and external communication. Use the Cisco IOS CLI commands to configure each of the interfaces on the router.

Before configuring the interfaces, make sure that you have the following information for entering the Cisco SRE Service Module command environment:

- IP address of the Cisco router that contains the Cisco SRE Service Module.
- Username and password for logging into the router.
- Slot and unit number of the Cisco SRE Service Module.

The Cisco SRE Service Module communicates with the host router through the following three interfaces:

- Console Manager Interface—Console Manager interface allows you to access the service module console to perform SRE-V configuration. Accessible from within the host router, this interface provides an internal Layer 3 Gigabit Ethernet link between the router and the Cisco SRE Service Module. All configuration and management of the Console Manager interface is performed using the Cisco IOS CLI.
- MGF Interface—MGF interface enables the Cisco SRE Service Module to communicate over a high-speed backplane switch. Accessible from within the host router, this interface provides an internal Layer 2 Gigabit Ethernet link between the router and the Cisco SRE Service Module. Configuration of the MGF interface is performed using the Cisco IOS CLI. For more information about configuring MGF, see the "Multi-Gigabit Fabric on the Router" chapter in the *Cisco 3900 Series, 2900 Series, and 1900 Series Integrated Services Routers Software Configuration Guide* on Cisco.com.
- External Service Module Interface—VMware vSphere Hypervisor<sup>TM</sup> or virtual machines can use the external service module interface as a primary interface or as a backup interface. Unlike the internal interfaces, the external interface is primarily controlled and managed by the VMware vSphere Hypervisor<sup>TM</sup>. The traffic does not go into the router unless the VMware vSphere Hypervisor<sup>TM</sup> is configured to forward the traffic into the router through the MGF interface.

#### **Related Topics**

• Configuring the Cisco SRE Service Module Interfaces, page 3-2

## **Configuring the Cisco SRE Service Module Interfaces**

This section describes how to configure basic network parameters for the Cisco SRE Service Module using the Cisco IOS CLI. It contains the following sections:

- Prerequisites for Configuring the Cisco SRE Service Module Interfaces, page 3-3
- Configuring the Cisco SRE Service Module Interfaces on the Router, page 3-3
- Configuring VLANs, page 3-18

## Prerequisites for Configuring the Cisco SRE Service Module Interfaces

This section provides the prerequisites for the router, Cisco SRE Service Module, and FTP/SFTP/HTTP server.

## **Cisco Router Prerequisites**

• Make sure that your Cisco router is running the appropriate Cisco IOS software version and recognizes the Cisco SRE Service Module. See the "Verifying the Router, Cisco SRE Service Module, and Cisco IOS Software Version Compatibility" section on page 2-2 and the "Verifying Cisco SRE Service Module Installation" section on page 2-3.

## **Cisco SRE Service Module Prerequisites**



In most cases, the routers are shipped with the Cisco SRE Service Module already installed in them.

- Identify the Cisco SRE Service Module slot and port location in the host router:
  - *slot*—ID of the host router chassis slot in which the Cisco SRE Service Module resides. After you install the service module, you can obtain this information by using the Cisco IOS software CLI **show running-config** command.
  - *port*—ID of the Network Interface Card (NIC) on the Cisco SRE Service Module. The value is 0 for the Console Manager interface; and 1 for the MGF interface.

#### **Related Topics**

• Configuring the Cisco SRE Service Module Interfaces on the Router, page 3-3

## **Configuring the Cisco SRE Service Module Interfaces on the Router**

Configure the internal interfaces between the Cisco SRE Service Module and the host router. This initial configuration allows you to access the service module to install and configure the Cisco SRE-V application.

Cisco SRE-V provides the following three configuration options:

- MGF Layer 2 Switched Configuration—This configuration option provides faster performance and has no impact on the router CPU because the traffic goes through the EtherSwitch rather than the router. It supports all Layer 2 functions, such as broadcasting. You must purchase a EtherSwitch EHWIC or EtherSwitch Service Module to use this configuration option.
- Cisco IOS Layer 3 Routed Configuration—This configuration option does not require additional equipment; however, it has an impact on the router CPU. This option is complex, and some of the Layer 2 functions, such as broadcasting, are not supported.
- External Interface Configuration—This configuration option is simple to configure, low in cost, and has no impact on the router CPU. However, it requires extra cabling and an extra Gigabit Ethernet switchport on the external switch. In addition, you cannot use Cisco IOS features on the VMware vSphere Hypervisor<sup>TM</sup> networks (for example, you cannot put a virtual machine into a DMZ), and you cannot take advantage of the hardware TCP/IP/UDP/iSCSI off load features that are available on the internal interfaces.

See the following sections for more information:

- MGF Layer 2 Switched Configuration—Recommended, page 3-4
- Cisco IOS Layer 3 Routed Configuration, page 3-10
- External Interface Configuration, page 3-17

## MGF Layer 2 Switched Configuration—Recommended

Figure 3-1 shows the traffic flow in the MGF Layer 2 switched configuration. The MGF backplane switch connects the virtual network across multiple hypervisors and allows direct access to the LAN through Cisco EtherSwitch EHWICs or EtherSwitch Service Modules, without sending the traffic through the router CPU. For supported Cisco EtherSwitch EHWICs and EtherSwitch Service Modules, see Table 1-2.





Figure 3-2 shows the location of the IP addresses that you configure on the Cisco SRE service module interfaces.

The Console Manager needs two IP addresses: One IP address is for the router side of the router-to-console manager link; and the other IP address is for the Console Manager side of the link.

The VMware vSphere Hypervisor<sup>TM</sup> also needs two IP addresses: One IP address is for the router side of the link that connects the router to the VMware vSphere Hypervisor<sup>TM</sup>; and the other IP address is for the VMware vSphere Hypervisor<sup>TM</sup>.





#### PREREQUISITES

See the "Prerequisites for Configuring the Cisco SRE Service Module Interfaces" section on page 3-3.

#### **SUMMARY STEPS**

#### From the Host-Router CLI, enter:

- 1. enable
- 2. configure terminal

#### Configure *slot*/0 of the Console Manager

- 1. interface sm *slot/*0
- ip address console-manager-router-side-ip-address subnet-mask or
   ip unnumbered type number
- 3. service-module ip address console-manager-ip-address subnet-mask
- 4. service-module ip default-gateway console-manager-gateway-ip-address
- 5. service-module mgf ip address hypervisor-ip-address subnet-mask
- 6. no shut
- 7. exit
- 8. [ip route console-manager-ip-address subnet-mask sm slot/0]

#### Configure *slot*/1 of the Console Manager

- 1. interface sm *slot*/1
- 2. switchport mode trunk
- 3. [switchport trunk allowed vlan vlan\_numbers]
- 4. exit

#### **Configure VLAN 1**

- 1. interface vlan 1
- 2. ip address hypervisor-router-side-ip-address subnet-mask
- 3. no shut
- 4. end
- 5. copy running-config startup-config
- 6. show running-config

#### **DETAILED STEPS**

	Command or Action	Purpose		
	From the Host-Router CLI			
Step 1	enable <password></password>	Enters privileged EXEC mode on the host router. Enter your password if prompted.		
	Example:			
	Router> enable			
	Router> <i><password></password></i> Router#			

	Command or Action	Purpose	
Step 2	configure terminal	Enters global configuration mode on the host router.	
	<b>Example:</b> Router# configure terminal		
	Configure <i>slot/</i> 0 of the Console Manager		
Step 1	<pre>interface sm slot/0</pre>	Enters interface configuration mode for the slot and port where the Cisco SRE Service Module resides.	
	<pre>Example: Router(config)# interface sm 1/0</pre>		
Step 2	<b>ip address</b> console-manager-router-side-ip-address subnet-mask	Specifies the IP address for the router side of the link that connects the router to the Console Manager.	
	or	The Console Manager needs two IP addresses: One IP	
	<pre>ip unnumbered type number Example: Router(config-if)# ip address 10.0.0.100 255.255.255.0</pre>	address is for the router side of the router-to-console manager link; and the other IP address is for the Console Manager side of the link. In this step, you configure the	
		IP address for the router side of the link. See Figure 3-2.	
		• console-manager-router-side-ip-address subnet-mask—IP address for the router side of the	
	<pre>Of Router(config-if)# ip unnumbered gigabitethernet</pre>	link that connects the router to the Console Manager. Subnet mask to append to the IP address.	
	1/0	or	
		The <b>ip unnumbered</b> command enables IP processing on an interface without assigning an explicit IP address to that interface.	
		• <i>type</i> —Type of interface on which the router has an assigned IP address.	
		• <i>number</i> —Number of the interface on which the router has an assigned IP address.	
		<b>Note</b> The unnumbered interface must be unique. It cannot be another unnumbered interface.	
		Caution         The ip unnumbered command creates a point-to-point interface between devices.           Broadcasting is not supported.	
		Note If you use the <b>ip unnumbered</b> command, you must use the <b>ip route</b> console-manager-ip-address subnet-mask <b>sm</b> slot/ <b>0</b> command to create a static route. See Step 8.	

	Command or Action	Purpose
Step 3	service-module ip address	Specifies the IP address for the Console Manager.
	console-manager-ip-address subnet-mask	• <i>console-manager-ip-address</i> —IP address for the Console Manager. See Figure 3-2.
	<pre>Example: Router(config-if)# service-module ip address 10.0.0.1 255.255.255.0</pre>	• <i>subnet-mask</i> —Subnet mask to append to the IP address; must be in the same subnet as the host router.
		<b>Note</b> If you change the Console Manager IP address, you must reload the service module.
Step 4	<pre>service-module ip default-gateway console-manager-gateway-ip-address</pre>	Specifies the IP address of the default gateway for the Console Manager.
	<b>Example:</b> Router(config-if)# service-module ip default-gateway 10.0.0.100	• <i>console-manager-gateway-ip-address</i> —IP address for the default gateway router.
Step 5	<b>service-module mgf ip address</b> hypervisor-ip-address subnet-mask	Specifies the IP address of the VMware vSphere Hypervisor <sup>TM</sup> .
	Example:	<ul> <li><i>hypervisor-ip-address</i>—IP address of the VMware vSphere Hypervisor<sup>TM</sup>. See Figure 3-2.</li> </ul>
	Router(config-if)# service-module mgf ip address 20.0.0.1 255.255.255.0	• <i>subnet-mask</i> —Subnet mask to append to the IP address; must be in the same subnet as the host router.
Step 6	no shut	Causes the interface to be administratively up.
	<b>Example:</b> Router(config-if)# no shut	
Step 7	exit	Returns to global configuration mode on the host router.
	<b>Example:</b> Router(config)# exit	
Step 8	[ip route console-manager-ip-address subnet-mask	Creates a static route.
	Example:	If you used the <b>ip unnumbered</b> command in Step 2, you must use the <b>ip route</b> <i>console-manager-ip-address subnet-mask</i> <b>sm</b> <i>slot/</i> <b>0</b> command to create a static route.
	Router(config)# ip route 10.0.0.1 255.255.255.255 SM1/0	• console-manager-ip-address subnet-mask—IP address and subnet mask of the Console Manager.
		• <i>slot/0</i> —slot and port where the Cisco SRE Service Module resides.
	Configure <i>slot/</i> 1 of the Console Manager	
Step 1	<pre>interface sm slot/1</pre>	Enters interface configuration mode for the slot and port where the Cisco SRE Service Module resides.
	<b>Example:</b> Router(config)# interface sm 1/1	

	Command or Action	Purpose
Step 2	switchport mode trunk	Puts the port into permanent trunking mode.
	<b>Example:</b> Router(config-if)# switchport mode trunk	The default configuration is access mode. Access mode works with native VLAN, which is VLAN 1 for the Cisco SRE Service Modules.
Step 3	[switchport trunk allowed vlan vlan_numbers]	(Optional) Allows trunking on the specified VLANs.
	<b>Example:</b> Router(config-if)# switchport mode trunk Router(config-if)# switchport trunk allowed vlan 40, 60	• <i>vlan_numbers</i> —VLAN numbers on which you want to allow trunking.
Step 4	exit	Returns to global configuration mode on the host router.
	Example: Router(config)# exit	
C4 1		
Step 1	interface vian 1	Enters VLAN configuration mode for VLAN 1.
	<b>Example:</b> Router(config)# interface vlan 1	
Step 2	<b>ip address</b> hypervisor-router-side-ip-address subnet-mask	Specifies the IP address for the router side of the router-to-VMware vSphere Hypervisor <sup>TM</sup> link. See Figure 3-2.
	<b>Example:</b> Router(config-if)# ip address 20.0.0.100 255.255.255.0	• <i>hypervisor-router-side-ip-address</i> —IP address for the router side of the link that connects the router to the VMware vSphere Hypervisor <sup>TM</sup> ; must be in the same subnet as the IP address of the VMware vSphere Hypervisor <sup>TM</sup> that you configured in Step 5.
		• <i>subnet-mask</i> —Subnet mask to append to the IP address.
Step 3	no shut	Causes the interface to be administratively up.
	<b>Example:</b> Router(config-if)# no shut	
Step 4	end	Returns to global configuration mode on the host router.
	<b>Example:</b> Router(config)# end	
Step 5	copy running-config startup-config	Saves the new running configuration of the router as the startup configuration.
	Example:	
01	Router# copy running-config startup-config	
Step 6	show running-config	Displays the running configuration of the router so that you can verify the address configurations.
	Example:	
	Reacter Show running contry	

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#### Example

Figure 3-3 shows an example of the MGF Layer 2 switched configuration.

- The left pane shows an example of the Cisco IOS commands that you configure in the sm 1/0, sm 1/1, and vlan 1 interfaces.
- The right pane shows that the configuration is applied to the Console Manager and to the VMware vSphere Hypervisor<sup>TM</sup> in Cisco SRE-V. The bottom area in the right pane shows the configuration for the Microsoft Windows Server that is configured using the standard Microsoft Windows network configuration setup process. This Microsoft Windows Server runs as a virtual machine.



The IP addresses in the configuration example are for reference only and might not be valid.





#### **Related Topics**

- Configuring VLANs with MGF Layer 2 Switched Configuration, page 3-18
- Downloading the Cisco SRE-V Software, page 4-1

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## **Cisco IOS Layer 3 Routed Configuration**

Figure 3-4 shows the traffic flow in the Cisco IOS Layer 3 routed configuration. The MGF backplane switch forwards the traffic to the router CPU.





#### **SUMMARY STEPS**

From the Host-Router CLI, enter:

- 1. enable
- 2. configure terminal

#### Configure *slot*/0 of the Console Manager

- 1. interface sm slot/0
- 2. ip address console-manager-router-side-ip-address subnet-mask or

ip unnumbered type number

- 3. service-module ip address console-manager-ip-address subnet-mask
- 4. service-module ip default-gateway console-manager-gateway-ip-address
- 5. service-module mgf ip address hypervisor-ip-address subnet-mask
- 6. no shut
- 7. exit
- 8. [ip route console-manager-ip-address subnet-mask sm slot/0]

#### Configure slot/1 of the Console Manager

- 1. interface sm *slot*/1
- 2. switchport mode trunk
- 3. [switchport trunk allowed vlan *vlan\_numbers*]
- 4. exit

#### **Configure VLAN 1**

- 1. interface vlan 1
- 2. ip unnumbered gigabitethernet slot/port interface

#### Configure GE slot/port

- 1. interface gigabitethernet *slot/port interface*
- 2. ip address branch-LAN-ip-address subnet-mask
- 3. exit
- 4. ip route hypervisor-ip-address subnet-mask vlan 1
- 5. ip route virtual-machine-ip-address subnet-mask vlan 1
- 6. no shut
- 7. end
- 8. copy running-config startup-config
- 9. show running-config

## **DETAILED STEPS**

	Command or Action	Purpose	
	From the Host-Router CLI		
Step 1	<b>enable</b> <password></password>	Enters privileged EXEC mode on the host router. Enter your password if prompted.	
	Example:		
	Router> enable		
	Router> <password></password>		
	Router#		
Step 2	configure terminal	Enters global configuration mode on the host router.	
	Example:		
	Router# configure terminal		
	Configure <i>slot/</i> 0 of the Console Manager		
Step 1	<pre>interface sm slot/0</pre>	Enters interface configuration mode for the slot and port where the Cisco SRE Service Module resides.	
	Example:		
	Router(config)# interface sm 1/0		

	Command or Action	Purpose
Step 2	<b>ip address</b> console-manager-router-side-ip-address subnet-mask	Specifies the IP address for the router side of the link that connects the router to the Console Manager.
	or ip unnumbered type number Example:	The Console Manager needs two IP addresses: One IP address is for the router side of the router-to-console manager link; and the other IP address is for the Console Manager side of the link. In this step, you configure the IP address for the router side of the link. See Figure 3-2.
	<pre>Router(config-if)# ip address 10.0.0.100 255.255.255.0 Or Router(config-if)# ip unnumbered gigabitethernet 1/0</pre>	• console-manager-router-side-ip-address subnet-mask—IP address for the router side of the link that connects the router to the Console Manager. Subnet mask to append to the IP address.
	170	or The <b>ip unnumbered</b> command enables IP processing on an interface without assigning an explicit IP address to that interface.
		<ul> <li><i>type</i>—Type of interface on which the router has an assigned IP address.</li> <li><i>number</i>—Number of the interface on which the</li> </ul>
		router has an assigned IP address. <b>Note</b> The unnumbered interface must be unique. It
		Caution       The ip unnumbered command creates a point-to-point interface between devices. Broadcasting is not supported.
		Note If you use the <b>ip unnumbered</b> command, you must use the <b>ip route</b> console-manager-ip-address subnet-mask <b>sm</b> slot/ <b>0</b> command to create a static route. See Step 8.
Step 3	<b>service-module ip address</b> console-manager-ip-address subnet-mask	<ul> <li>Specifies the IP address for the Console Manager.</li> <li>console-manager-ip-address—IP address for the Console Manager. See Figure 3-2</li> </ul>
	<b>Example:</b> Router(config-if)# service-module ip address 10.0.0.1 255.255.255.0	<ul> <li>subnet-mask—Subnet mask to append to the IP address; must be in the same subnet as the host router.</li> </ul>
		<b>Note</b> If you change the Console Manager IP address, you must reload the service module.
Step 4	<pre>service-module ip default-gateway console-manager-gateway-ip-address</pre>	Specifies the IP address of the default gateway for the Console Manager.
	<b>Example:</b> Router(config-if)# service-module ip default-gateway 10.0.0.100	• <i>console-manager-gateway-ip-address</i> —IP address for the default gateway router.
	Command or Action	Purpose
--------	---	--
Step 5	<b>service-module mgf ip address</b> hypervisor-ip-address subnet-mask	Specifies the IP address of the VMware vSphere Hypervisor <sup>TM</sup> .
	<b>Example:</b> Router(config-if)# service-module mgf ip address	• <i>hypervisor-ip-address</i> —IP address of the VMware vSphere Hypervisor <sup>TM</sup> . See Figure 3-2.
	20.0.0.1 255.255.255.0	• <i>subnet-mask</i> —Subnet mask to append to the IP address; must be in the same subnet as the host router.
Step 6	no shut	Causes the interface to be administratively up.
	<b>Example:</b> Router(config-if)# no shut	
Step 7	exit	Returns to global configuration mode on the host router.
	<b>Example:</b> Router(config)# exit	
Step 8	[ip route console-manager-ip-address subnet-mask	Creates a static route.
	Example:	If you used the <b>ip unnumbered</b> command in Step 2, you must use the <b>ip route</b> <i>console-manager-ip-address subnet-mask</i> <b>sm</b> <i>slot/</i> <b>0</b> command to create a static route.
	Router(config)# ip route 10.0.0.1 255.255.255.255 SM1/0	• console-manager-ip-address subnet-mask—IP address and subnet mask of the Console Manager.
		• <i>slot/0</i> —slot and port where the Cisco SRE Service Module resides.
	Configure <i>slot/</i> 1 of the Console Manager	
Step 1	<pre>interface sm slot/1</pre>	Enters interface configuration mode for the slot and port where the Cisco SRE Service Module resides.
	<b>Example:</b> Router(config)# interface sm 1/1	
Step 2	switchport mode trunk	Puts the port into permanent trunking mode.
	<b>Example:</b> Router(config-if)# switchport mode trunk	The default configuration is access mode. Access mode works with native VLAN, which is VLAN 1 for the Cisco SRE Service Modules.
Step 3	[switchport trunk allowed vlan vlan_numbers]	(Optional) Allows trunking on the specified VLANs.
	<b>Example:</b> Router(config-if)# switchport mode trunk Router(config-if)# switchport trunk allowed vlan 30, 40	• <i>vlan_numbers</i> —VLAN numbers on which you want to allow trunking.
Step 4	exit	Returns to global configuration mode on the host router.
	<b>Example:</b> Router(config)# exit	

	Command or Action	Purpose
	Configure VLAN 1	-
Step 1	interface vlan 1	Enters VLAN configuration mode for VLAN 1.
	<b>Example:</b> Router(config)# interface vlan 1	
Step 2	<pre>ip unnumbered gigabitethernet slot/port interface Fxample:</pre>	Enables IP processing on an interface without assigning an explicit IP address to that interface. The traffic is forwarded to and from a Gigabit Ethernet interface.
	Router(config-if)# ip unnumbered gigabitethernet 0/0	• <i>slot/port</i> —Position of the Gigabit Ethernet interface in the router chassis.
		• <i>interface</i> —Number of the Gigabit Ethernet interface on which the router has an assigned IP address.
		<b>Note</b> The unnumbered interface must be unique. It cannot be another unnumbered interface.
		CautionThe ip unnumbered command creates a point-to-point interface between devices. Broadcasting is not supported.
	Configure Gigabit Ethernet <i>slot/port</i>	
Step 1	interface gigabitethernet slot/port interface	Enters Gigabit Ethernet configuration mode for the specified sub interface.
	<b>Example:</b> Router(config)# interface gigabitethernet 0/0	• <i>slot/port</i> —Position of the Gigabit Ethernet interface in the router chassis.
		• <i>interface</i> —Number of the Gigabit Ethernet interface on which the router has an assigned IP address.
Step 2	<b>ip address</b> branch-LAN-ip-address subnet-mask	Configures the IP address for the branch local area network.
	Example: Router(config-if)# ip address 20.0.0.100 255.255.255.0	• <i>branch-LAN-ip-address subnet-mask</i> —IP address for the branch local area network. Subnet mask to append to the IP address.
Step 3	exit	Exits interface mode.
Step 4	<pre>ip route hypervisor-ip-address subnet-mask vlan 1</pre>	Creates a static route entry for the VMware vSphere Hypervisor <sup>TM</sup> .
	Example: Router(config)# ip route 20.0.0.1 255.255.255.0	<i>hypervisor-ip-address subnet-mask</i> —IP address and subnet mask for the VMware vSphere Hypervisor <sup>TM</sup> . See Figure 3-2.
Step 5	<b>ip route</b> virtual-machine-ip-address subnet-mask	Creates a static route entry for the virtual machine.
	vlan 1 Evample:	• <i>virtual-machine-ip-address subnet-mask</i> —IP address and subnet mask for the virtual machine.
	Example. Router(config)# ip route 20.0.0.2 255.255.255.0	

	Command or Action	Purpose
Step 6	no shut	Causes the interface to be administratively up.
	Example:	
	Router(config-if)# no shut	
Step 7	end	Returns to global configuration mode on the host router.
	<b>Example:</b> Router(config)# end	
Step 8	copy running-config startup-config	Saves the new running configuration of the router as the startup configuration.
	Example	
	Router# copy running-config startup-config	
Step 9	show running-config	Displays the running configuration of the router so that you can verify the address configurations.
	Example:	
	Router# show running-config	

### **Example**

Figure 3-5 shows an example of the Cisco IOS Layer 3 routed configuration.

- The left pane shows an example of the Cisco IOS commands that you configure in the sm 1/0, sm 1/1, vlan 1, and Gigabit Ethernet interfaces.
- The right pane shows that the configuration is applied to the Console Manager and to the VMware vSphere Hypervisor<sup>TM</sup> in Cisco SRE-V.

The bottom area in the right pane shows the configuration for the Microsoft Windows Server that is configured using the standard Microsoft Windows network configuration setup process. This Microsoft Windows Server runs as a virtual machine.



The IP addresses in the configuration example are for reference only and might not be valid.

Figure 3-5 Configuration Example of the Cisco IOS Layer 3 Routed Configuration



#### **Related Topics**

- Configuring VLANS with Cisco IOS Layer 3 Routed Configuration, page 3-21
- Downloading the Cisco SRE-V Software, page 4-1

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### **External Interface Configuration**

The Cisco IOS configuration commands for the external interface configuration are the same as the commands for the "MGF Layer 2 Switched Configuration—Recommended" section on page 3-4 or the "Cisco IOS Layer 3 Routed Configuration" section on page 3-10, except for the following:

- The IP address of the virtual machine is on a network that is connected to the external interface.
- The virtual machine default gateway points to the external interface.
- The static route entry for the virtual machine, which is configured in the Cisco IOS Layer 3 Routed Configuration, is not required.

Figure 3-6 shows the traffic flow in the external interface configuration. The service module sends the traffic through the external interface.



#### Figure 3-6 Traffic Flow in the External Interface Configuration

To configure the external interface, complete the following steps:

- **Step 1** To configure access to the console manager and the VMware vSphere Hypervisor<sup>TM</sup>, use the configuration commands provided in one of the following sections:
  - "MGF Layer 2 Switched Configuration—Recommended" section on page 3-4 or
  - "Cisco IOS Layer 3 Routed Configuration" section on page 3-10
- **Step 2** Use the vSphere Client GUI to configure access to the virtual machine through the external interface. For instructions, see the vSphere Client online help.

### **Related Topics**

- Configuring VLANs with External Interface Configuration, page 3-25
- Downloading the Cisco SRE-V Software, page 4-1

# **Configuring VLANs**

To dedicate VLANs to different segments, you must create VLANs. See the following sections as appropriate:

- Configuring VLANs with MGF Layer 2 Switched Configuration, page 3-18
- Configuring VLANS with Cisco IOS Layer 3 Routed Configuration, page 3-21
- Configuring VLANs with External Interface Configuration, page 3-25

### **Configuring VLANs with MGF Layer 2 Switched Configuration**

If you have configured the Cisco SRE Service Module using the MGF Layer 2 switched configuration, and you want to dedicate VLANs to different segments, use the commands provided in this section.

### PREREQUISITES

Make sure that the switchport is in trunk mode, see Configure slot/1 of the Console Manager, page 3-7.

### **SUMMARY STEPS**

### From the Host-Router CLI

- 1. enable
- 2. vlan database
- 3. vlan vlan\_number
- 4. exit
- 5. configure terminal
- 6. interface vlan vlan\_number
- 7. ip address vlan-ip-address subnet mask

### **DETAILED STEPS**

	Command or Action	Purpose
From the Host-Router CLI		
Step 1	<b>enable</b> <password></password>	Enters privileged EXEC mode on the host router. Enter your password if prompted.
	Example:	
	Router> enable	
	Router> <password></password>	
	Router#	
Step 2	vlan database	Enters VLAN database mode.
	Example:	
	Router# vlan database	

	Command or Action	Purpose
Step 3	<b>vlan</b> vlan_number	Adds the specified VLAN to the database.
	Example: Router(vlan)# vlan 40 VLAN 40 added: Name: VLAN0040	
Step 4	exit	Exits VLAN database mode.
	<b>Example:</b> Router(vlan)# exit	
Step 5	configure terminal	Enters global configuration mode on the host router.
	<b>Example:</b> Router# configure terminal	
Step 6	<pre>interface vlan vlan_number</pre>	Enters VLAN configuration mode for the specified VLAN number.
	<b>Example:</b> Router(config)# interface vlan 40	
Step 7	ip address vlan-ip-address subnet-mask	Specifies the IP address for the VLAN.
		• <i>vlan-ip-address</i> —IP address for the VLAN.
	<b>Example:</b> Router(config-if)# ip address 40.0.0.100 255.255.255.0	• <i>subnet-mask</i> —Subnet mask to append to the IP address.

### Example

Note

Figure 3-7 shows an example of the entire MGF Layer 2 switched configuration along with two new vlans: vlan 40 and vlan 60.

The IP addresses in the configuration example are for reference only and might not be valid.





- MGF Layer 2 Switched Configuration—Recommended, page 3-4
- Downloading the Cisco SRE-V Software, page 4-1

### **Configuring VLANS with Cisco IOS Layer 3 Routed Configuration**

If you have configured the Cisco SRE Service Module using the Cisco IOS Layer 3 configuration, and you want to dedicate VLANs to different segments, use the commands provided in this section.

### PREREQUISITES

Make sure that the switchport is in trunk mode, see Configure slot/1 of the Console Manager, page 3-13.

### SUMMARY STEPS

### From the Host-Router CLI

- 1. enable
- 2. vlan database
- 3. vlan vlan\_number
- 4. exit
- 5. configure terminal
- 6. interface vlan number
- 7. ip unnumbered gigabitethernet *slot/port sub-interface*
- 8. exit

### Configure GE *slot/port*

- 1. interface gigabitethernet *slot/port sub-interface*
- 2. ip address branch-VLAN-ip-address subnet-mask
- 3. encapsulation dot1q vlan-id
- 4. exit
- 5. ip route virtual-machine-ip-address subnet-mask vlan\_number

### **DETAILED STEPS**

	Command or Action	Purpose
From the Host-Router CLI		· · · · · · · · · · · · · · · · · · ·
Step 1	<b>enable</b> <password></password>	Enters privileged EXEC mode on the host router. Enter your password if prompted.
	Example:	
	Router> enable Router> <i><password></password></i> Router#	
Step 2	vlan database	Enters VLAN database mode.
	<b>Example:</b> Router# vlan database	

	Command or Action	Purpose
Step 3	<b>vlan</b> vlan_number	Adds the specified VLAN to the database.
	Example: Router(vlan)# vlan 40 VLAN 40 added: Name: VLAN0040	
Step 4	exit	Exits VLAN database mode.
	<b>Example:</b> Router(vlan)# exit	
Step 5	configure terminal	Enters global configuration mode on the host router.
	<b>Example:</b> Router# configure terminal	
Step 6	<pre>interface vlan vlan_number</pre>	Enters VLAN configuration mode for the specified VLAN number.
	<b>Example:</b> Router(config)# interface vlan 40	
Step 7	<b>ip unnumbered gigabitethernet</b> <i>slot/port sub-interface</i>	Enables IP processing on an interface without assigning an explicit IP address to that interface. The traffic is forwarded to and from a Gigabit Ethernet sub-interface.
	<b>Example:</b> Router(config-if)# ip unnumbered gigabitethernet 0/0.40	• <i>slot/port</i> —Position of the Gigabit Ethernet interface in the router chassis.
		• <i>sub-interface</i> —Number of the Gigabit Ethernet sub interface on which the router has an assigned IP address.
		<b>Note</b> The unnumbered interface must be unique. It cannot be another unnumbered interface.
		<b>Caution</b> The <b>ip unnumbered command</b> creates a point-to-point interface between devices. Broadcasting is not supported.
Step 8	exit	Exits interface mode.
	Configure Gigabit Ethernet <i>slot/port</i>	
Step 1	<b>interface gigabitethernet</b> <i>slot/port sub-interface</i>	Enters Gigabit Ethernet configuration mode for the specified sub interface.
	Example:	• <i>slot/port</i> —Position of the Gigabit Ethernet interface in the router chassis.
	Router(config)# interface gigabitethernet 0/0.40	<i>sub-interface</i> —Number of the Gigabit Ethernet interface on which the router has an assigned IP address.

	Command or Action	Purpose
Step 2	<pre>ip address branch-VLAN-ip-address subnet-mask</pre>	Configures the IP address for the specific branch VLAN.
	<b>Example:</b> Router(config-if)# ip address 40.0.0.100 255.255.255.0	• <i>branch-VLAN-ip-address subnet-mask</i> —IP address for the specific branch VLAN. This IP address can be used as the default gateway for virtual machines in the VLAN defined in Step 5.
Step 3	encapsulation dotlq vlan-id	Enables IEEE 802.1Q encapsulation of traffic on the specified subinterface in VLANs.
	<b>Example:</b> Router(config-if)# encapsulation dot1q 40	• <i>vlan-id</i> —Virtual LAN identifier. The allowed range is from 1 to 1000.
Step 4	exit	Exits interface mode.
Step 5	<pre>ip route virtual-machine-ip-address subnet-mask vlan_number</pre>	<ul> <li>Creates a static route entry for the virtual machine.</li> <li><i>virtual-machine-ip-address subnet-mask</i>—IP address and subnet mask for the virtual machine.</li> </ul>
	<i>Example:</i> Router(config)# ip route 40.0.0.2 255.255.255.0	and subject mask for the virtual machine.

### Example

Note

The IP addresses in the configuration example are for reference only and might not be valid.

Figure 3-8 shows an example of the entire Cisco IOS Layer 3 routed configuration along with two new



vlans: vlan 40 and vlan 60.



• Downloading the Cisco SRE-V Software, page 4-1

### **Configuring VLANs with External Interface Configuration**

Cisco IOS CLI is not required for creating VLANs.

In the external interface configuration, you use the external vSwitch to configure VLANs.

Example

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Figure 3-9 shows an example of the entire external interface configuration along with two new vlans: vlan 40 and vlan 60.



Note

The IP addresses in the configuration example are for reference only and might not be valid.





• Downloading the Cisco SRE-V Software, page 4-1

3-25

# **Reload, Reset, and Shut Down Commands**

To reload, reset, or shut down the Cisco SRE Service Module, choose the common router commands listed in Table 3-1. You might choose to shut down the Cisco SRE Service Module for service reasons or to save energy when it is not being used.



- Some shutdown commands can potentially disrupt service. If the command output for such a command displays a confirmation prompt, confirm by pressing **Enter** or cancel by typing **n** and pressing **Enter**. You can prevent the prompt from being displayed by using the **no-confirm** keyword.
- Some commands shut down the module or application, and then immediately restart it.

Configuration Mode	Command	Purpose	
Router#	service-module sm slot/0 reload	Shuts down the Cisco SRE Service Module operating system gracefully.	
Router#	service-module sm slot/0 reset	Resets the hardware on the Cisco SRE Service Module. Use this command only to recover from a shutdown or failed state.	
		$\wedge$	
		<b>Caution</b> Using this command does <i>not</i> provide an orderly software shutdown and may impact file operations that are in progress.	
Router#	service-module sm <i>slot</i> /0 shutdown	Shuts down the Cisco SRE Service Module system gracefully. Use this command when removing or replacing a hot-swappable module during online insertion and removal (OIR). See the "Online Insertion and Removal of the Cisco SRE Service Module" section on page 2-3.	
		If the virtual machines on the VMware vSphere Hypervisor <sup>TM</sup> have VMware tools installed on them, and you issue this command, the virtual machines shut down first, and then the Cisco SRE Service Module shuts down.	
		If the virtual machines do not have VMware tools installed on them, and you issue this command, the virtual machines get powered off first, and then the shutdown signal is sent to the service module. After about two minutes, the Cisco SRE Service Module shuts down.	

### Table 3-1 Common Shutdown and Startup Commands





# Installing and Managing the Cisco SRE-V Software

This chapter provides instructions for installing and managing the Cisco SRE-V software.



- If you purchased Cisco SRE-V Option 1, a blank Cisco SRE Service Module, you must download and install the Cisco SRE-V software. For Cisco SRE-V options, see Figure 1-3.
- Microsoft Windows software is not available for download from Cisco.com. You must install your own version of the Microsoft Windows Server 2003 or Microsoft Windows Server 2008 software.

This chapter contains the following sections:

- Downloading the Cisco SRE-V Software, page 4-1
- Installing the Cisco SRE-V Software, page 4-2
- Uninstalling the Cisco SRE-V Software, page 4-4
- Verifying Software Installation or Uninstallation, page 4-5
- Upgrading the VMware vSphere Hypervisor Package, page 4-5

# **Downloading the Cisco SRE-V Software**

This section provides the steps to download the Cisco SRE-V software.

Before you begin, do the following:

- Make sure that you have the IP address or name of the FTP server in which you want to store the Cisco SRE-V software package file.
- Verify that the FTP server is accessible.

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To download the Cisco SRE-V software, complete the following steps:

Step 1 Go to http://www.cisco.com/go/ucse, click Download Software, and then download the Cisco SRE-V files.

- **Note** If you use a file extractor tool designed for Windows, such as WinZip, you must disable CR/LF conversion of tar files. For example, in WinZip 9.0, select **Configuration > Miscellaneous**, and then uncheck **TAR file smart CR/LF conversion**.
- Step 2 Copy the files to the FTP server. All files to be installed must reside in the same directory.
- **Step 3** Install the software. See the "Installing the Cisco SRE-V Software" section on page 4-2.

### **Related Topics**

• Installing the Cisco SRE-V Software, page 4-2

# **Installing the Cisco SRE-V Software**

To install the Cisco SRE-V software on the Cisco SRE Service Module, complete the following steps.



Cisco SRE-V software installation takes approximately 10 minutes. Depending on your network speed, the installation time can vary.

To view the status of the Cisco SRE-V installation, from the host-router CLI, enter the **service-module sm** *slot/***0 status** command, as shown in the following example:

Router# service-module sm 1/0 status

### SUMMARY STEPS

- 1. enable
- 2. service-module sm slot/0 install url url
- 3. [service-module sm *slot*/0 status]
- 4. exit

### **DETAILED STEPS**

	Command or Action	Purpose
Step 1	<b>enable</b> <password></password>	Enables privileged EXEC mode. Enter your password if prompted.
	<b>Example:</b> Router> enable Router> <password> Router#</password>	
Step 2	<pre>service-module sm slot/0 install url url</pre>	Starts the installation of an application on the specified Cisco SRE Service Module.
	<b>Example:</b> Router# service-module sm 2/0 install url ftp://server.com/dir/sre-v-k9.smv.1.0.1.pkg	• <i>slot/port</i> —Position of the target module in the router chassis. For Cisco SRE Service Module, always use 0 for the port number. Applications are installed into the service module through this port. The slash ( <i>I</i> ) is required between the slot and port number.
		• <b>url</b> <i>url</i> —Specifies the URL, as defined in RFC 2396, of the server and directory on which the application packages and Tcl script are located. The URL should point to the .pkg file on the FTP server.
Step 3	[service-module sm slot/0 status]	(Optional) Monitors progress of the installation.
	<b>Example:</b> Router# service-module sm 2/0 status	
Step 4	exit	Exits privileged EXEC mode.
	<b>Example:</b> Router# exit	

### **Related Topics**

- Uninstalling the Cisco SRE-V Software, page 4-4
- Determining License Activation or Installation, page 5-5

# **Uninstalling the Cisco SRE-V Software**

To uninstall the Cisco SRE-V software from the Cisco SRE Service Module, complete the following steps.

This procedure completely erases the disk on the Cisco SRE Service Module and removes the application keys. It does not remove the application licenses.

### **SUMMARY STEPS**

- 1. enable
- 2. service-module sm slot/0 uninstall
- 3. exit

### **DETAILED STEPS**

	Command or Action	Purpose
Step 1	enable	Enables privileged EXEC mode.
	<pre><password></password></pre>	• Enter your password if prompted.
	<b>Example:</b> Router> enable Router> <i><password></password></i> Router#	
Step 2	<pre>service-module sm slot/0 uninstall</pre>	Uninstalls the SRE-supported application from the specified Cisco SRE Service Module.
	<b>Example:</b> Router# service-module sm 2/0 uninstall	This command completely erases the disk on the Cisco SRE Service Module and removes the application keys. It does not remove the application licenses.
		• <i>slot/port</i> —Position of the target module in the router chassis. For Cisco SRE Service Module, always use 0 for the port number. Applications are installed into the service module through this port. The slash (/) is required between the slot and port number.
		<b>Note</b> Uninstallation is not complete until the "uninstall complete" message is displayed on the router console. To verify the status of the Cisco SRE-V uninstallation, from the host-router CLI, enter the <b>service-module sm</b> <i>slot/</i> <b>0 status</b> command.
Step 3	exit	Returns to privileged EXEC mode.
	<b>Example:</b> Router# exit	

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#### Verifying Software Installation or Uninstallation

# Verifying Software Installation or Uninstallation

To view the status of the Cisco SRE-V installation or uninstallation, from the host-router CLI, enter the **service-module sm** *slot/***0 status** command, as shown in the following example:

Router# service-module sm 1/0 status

To verify Cisco SRE-V installation, from the Console Manager interface, enter the **show software packages** command to view the list of installed software packages, as shown in the following example:

SRE-Module# show software packages

#### **Related Topics**

- Installing the Cisco SRE-V Software, page 4-2
- Uninstalling the Cisco SRE-V Software, page 4-4
- Determining License Activation or Installation, page 5-5

# Upgrading the VMware vSphere Hypervisor Package

VMware vSphere Hypervisor<sup>TM</sup> update packages (patch) are available periodically on an as-needed basis. To upgrade the package, you must first download the update package, and then install it on the VMware vSphere Hypervisor<sup>TM</sup>. See the following sections for more information:

- Downloading the VMware vSphere Hypervisor Update Package, page 4-5
- Installing the VMware vSphere Hypervisor Update Package, page 4-6

### Downloading the VMware vSphere Hypervisor Update Package

This section provides the steps to download the VMware vSphere Hypervisor<sup>TM</sup> update package.

Before you begin, do the following:

- Make sure that you have the IP address or name of the FTP server in which you want to store the VMware vSphere Hypervisor<sup>TM</sup> update package file.
- Verify that the FTP server is accessible.

To download the VMware vSphere Hypervisor<sup>TM</sup> update package, complete the following steps:

**Step 1** Go to http://www.cisco.com/go/ucse, click **Download Software**, and then download the VMware vSphere Hypervisor<sup>TM</sup> update package files.



If you use a file extractor tool designed for Windows, such as WinZip, you must disable CR/LF conversion of tar files. For example, in WinZip 9.0 select **Configuration > Miscellaneous**, and then uncheck **TAR file smart CR/LF conversion**.

- Step 2 Copy the files to the FTP server. All files to be installed must reside in the same directory.
- **Step 3** Install the VMware vSphere Hypervisor<sup>TM</sup> update package. See the "Installing the VMware vSphere Hypervisor Update Package" section on page 4-6.

### Installing the VMware vSphere Hypervisor Update Package

To install the VMware vSphere Hypervisor<sup>TM</sup> update package, complete the following steps.

### **SUMMARY STEPS**

From the Console Manager interface, enter:

- 1. [show software packages]
- 2. software install package url url

### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	[show software packages]	(Optional) Displays the VMware vSphere Hypervisor <sup>TM</sup> package version.
	<b>Example:</b> SRE-Module# show software packages	
Step 2	software install package url url	Installs the update package on the VMware vSphere Hypervisor <sup>TM</sup> .
	<b>Example:</b> SRE-Module# software install package url ftp://server.com/dir/visor-upgrade.smv.1.0.1.234.pkg	• <b>url</b> <i>url</i> —Specifies the URL of the server and directory in which the update package is located. The URL should point to the .pkg file on the FTP server.
		Note The system reboots after the upgrade is complete.





# **Managing the Cisco SRE-V Software Licenses**

This chapter provides information about the Cisco SRE-V software licenses and provides instructions for managing the software licenses. It contains the following sections:

- Software License Activation Feature Overview, page 5-1
- Basic Workflow for Software Licensing, page 5-3
- Entering the Cisco SRE-V Command Environment, page 5-3
- Determining License Activation or Installation, page 5-5
- Activating an Evaluation License, page 5-6
- Obtaining and Maintaining Software License Options, page 5-7

# **Software License Activation Feature Overview**

The Cisco software license activation feature is an orchestrated collection of processes and components designed to activate Cisco software feature sets by obtaining and validating Cisco software licenses.

The Cisco SRE-V application enables Cisco Software Licensing (CSL) to manage feature entitlements for Cisco SRE-V. CSL provides the following licenses.

• VMware vSphere Hypervisor Evaluation License—60-day evaluation license that is bundled with the Cisco SRE-V software image, which you can use to evaluate the hosting environment. Evaluation licenses require activation. The End User License Agreement (EULA) must be accepted before the evaluation license is activated.



Network access to the VMware vSphere Hypervisor<sup>TM</sup> is blocked until you activate the evaluation license. You cannot ping the VMware vSphere Hypervisor<sup>TM</sup> or connect to the vSphere Client until the evaluation license is activated.

• Permanent VMware vSphere Hypervisor Host License—Perpetual license that can be ordered along with the VMware vSphere Hypervisor software; or separately after the built-in Evaluation license expires. After permanent licenses are installed, they provide all the permissions necessary to access features in the software image. All permanent licenses are node locked and validated by the licensing infrastructure during software installation. After a permanent license is installed, you do not need to upgrade it for subsequent releases.

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Table 5-1 provides the feature license Stock-Keeping Units (SKUs) that are available for Cisco SRE-V.

License SKUs	Description
FL-SRE-V-HOST	VMware vSphere Hypervisor Host pre-activated paper license purchased with the software.
FL-SRE-V-HOST=	VMware vSphere Hypervisor Host paper license purchased without the software (spare). You must activate this license.
L-FL-SRE-V-HOST=	VMware vSphere Hypervisor Host electronic license purchased without the software (spare). You must activate this license.

Table 5-1Feature License SKUs

The Cisco Product License Registration portal provides you with services to manage your licenses. To access the Cisco Product License Registration portal, you must have a Cisco.com account. If you do not have a Cisco.com account, contact your Cisco SRE-V sales representative.

The following services are provided through the Cisco Product License Registration portal:

- Product License Registration
- Return Merchandise Authorization (RMA) Replacement Licenses
- Manage Licenses (includes resend operations)
- Migration License
- License Revocation and Transfer Operations

To understand software licensing terms, see the "Software Licensing Terms" section on page 5-2.

For information about software activation, see *Software Activation on Cisco Integrated Services Routers* and *Cisco Integrated Service Routers G2* on Cisco.com.

### **Software Licensing Terms**

This section provides information about licensing terms.

#### **End User License Agreement**

As part of the licensing process, you must accept the terms and conditions set forth in the End User License Agreement (EULA). This agreement is accepted implicitly when you first use a new device, but must be explicitly accepted before a feature set can be activated for evaluation and upon applying temporary extension licenses.

### **Product Authorization Key**

A Product Authorization Key (PAK) is required to interact with the Cisco Product Licensing Portal. A PAK is provided to you when you order and purchase the right to use a feature set for a particular platform. It serves as a receipt and is an important component to obtain and upgrade a license.

#### **Universal Device Identifier**

Cisco software performs license verification checks by comparing a stored Universal Device Identifier (UDI)—a unique and unchangeable identifier assigned to all Cisco hardware devices—with that of the device. The UDI has two main components: product ID (PID) and serial number (SN). The UDI is printed on a pull-out plastic label, which is located at the bottom front panel of the Cisco SRE Service Module. To view the UDI information, use the **show license udi** command in privileged EXEC mode.

#### **Software License Validation**

CSL uses a system of validation keys to provide a simple mechanism for deploying new feature sets that offer users increased functionality for upgrading and maintaining their software.

License keys for Cisco SRE-V must be enabled. Obtain the license key using the Cisco Product Licensing Portal. A license key is issued for a specific feature set and is node-locked to the device UDI.

# **Basic Workflow for Software Licensing**

- 1. Determine whether to activate an evaluation license or install a permanent license. See the "Determining License Activation or Installation" section on page 5-5.
- **2.** Do the following:
  - To activate an evaluation license, see the "Activating an Evaluation License" section on page 5-6.

Evaluation licenses only require activation and do not need to be installed because they are included with the Cisco SRE-V software on the Cisco SRE Service Module.

 To obtain and install a permanent license, see the "Obtaining and Maintaining Software License Options" section on page 5-7.

Permanent licenses must be installed but do not require activation.

# **Entering the Cisco SRE-V Command Environment**

To perform configuration tasks on the Cisco SRE Service Module, such as install and manage licenses and software upgrades and configure users, roles, and permissions, you must enter the Cisco SRE-V command environment. You can enter the Cisco SRE-V command environment in two ways: using Secure Shell (SSH) or through the router. See the following sections for more information:

- Entering Cisco SRE-V Command Environment Using SSH, page 5-3
- Entering the Cisco SRE-V Command Environment Through the Host Router, page 5-4

### **Entering Cisco SRE-V Command Environment Using SSH**

This section provides the steps you need to enter the Cisco SRE-V command environment using SSH. Before you begin, make sure that you have the following information:

- IP address of the Console Manager.
- Username and password for the Console Manager.

To enter the Cisco SRE-V command environment using SSH, complete the following steps:

- Step 1 From your PC or workstation, start the SSH Client. The SSH Client window opens.
- **Step 2** Enter the IP address of the Console Manager.

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Step 3	Enter	Enter the username and password to access the Console Manager.		
	Note	If you are a first-time user of the VMware vSphere Hypervisor <sup>TM</sup> , use <b>esx-admin</b> for the user name; and use <b>change_it</b> for the password. We highly recommend that you change the default password after the first reboot.		
Step 4	Verify to <b>22</b> .	that the port number displayed in the Port Number field is 22, otherwise change the port number		
Step 5	Step 5 Click Connect.			

### **Entering the Cisco SRE-V Command Environment Through the Host Router**

If you have the privileges to access the host router, follow these steps to enter the Cisco SRE-V command environment.

### PREREQUISITES

The following information is required to enter the command environment:

- IP address of the router that contains the Cisco SRE-V module.
- Username and password to log into the router.
- Slot number of the module.

### **SUMMARY STEPS**

### From the Host-Router CLI

- 1. enable
- 2. service module sm *slot/*0 session

#### From the Console Manager Interface

- **1**. Enter commands.
- 2. exit

### **DETAILED STEPS**

	Command or Action	Purpose	
	From the Host-Router CLI		
Step 1	<b>enable</b> <password></password>	<ul><li>Enters privileged EXEC mode on the host router.</li><li>Enter your password if prompted.</li></ul>	
	Example:		
	Router> enable		
	Router> <password></password>		
	Router#		

	Command or Action	Purpose
Step 2	service module sm slot/0 session	Begins a session on the Cisco SRE Service Module.
		• To start a configuration session, press <b>Enter</b> .
	Example:	
	Router# service module sm 1/0 session	
	Trying 10.0.0.1, 2065 Open	
From the Console Manager Interface—Enter commands in EXEC mode.		EXEC mode.
Step 1	Example:	Enter commands on the service module as needed. This
	SRE-Module# show user	example shows the <b>show user</b> command.
Step 2	exit	Closes the service module session.

# **Determining License Activation or Installation**

• Use the **show license feature** command to determine whether to install a permanent license or activate an evaluation license, as shown in the following example:

SRE-Module# <b>show</b> 1	license feature			
Feature name	Enforcement	Evaluation	Clear Allowed	Enabled
SRE-V-HOST-LIC	yes	yes	yes	no

• Use the **show license permanent** command to display the permanent license, as shown in the following examples:

The following example shows that a permanent license is installed and is active:

```
SRE-Module# show license permanent

StoreIndex: 1 Feature: SRE-V-HOST-LIC Version: 1.0

License Type: Permanent

License State: Active, In Use

License Count: Non-Counted
```

In the following example, the CLI returns a blank line because a permanent license is not installed:

```
SRE-Module# show license permanent
[[A blank line indicates that no permanent license is installed]]
```

• Use the **show license file** command to display the actual license files, as shown in the following example:

SRE-Module# show license file

### **Related Topics**

- Activating an Evaluation License, page 5-6
- Obtaining and Maintaining Software License Options, page 5-7

# **Activating an Evaluation License**

The **show license** commands display the types of licenses available. If the license is an evaluation license, the **show license all** command also shows whether the EULA has been accepted or not.

Note

- Evaluation licenses require activation. The EULA must be accepted before the evaluation license is activated.
- Network access to the VMware vSphere Hypervisor<sup>TM</sup> is blocked until you activate the evaluation license. You cannot ping the VMware vSphere Hypervisor<sup>TM</sup> or connect to the vSphere Client until the evaluation license is activated.

To activate an evaluation license, complete the following steps:

- **Step 1** Enter the Cisco SRE-V command environment, and then enter the commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.
- **Step 2** Use the **show license all** command to display the status of the license, as shown in the following example:

```
SRE-Module# show license all
License Store: Evaluation License Storage
StoreIndex: 0 Feature: SRE-V-HOST-LIC Version: 1.0
License Type: Evaluation
License State: Active, Not in Use, EULA not accepted
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 4 days
License Count: Non-Counted
License Priority: None
```

**Step 3** Use the **license activate** command in EXEC mode to activate the license. The EULA terms are displayed. Enter **y(es)** when asked to accept the EULA terms, as shown in the following example:

SRE-Module# license activate sreVHost
Evaluation licenses are being activated in the device for the following feature(s):

Feature Name: SRE-V-HOST-LIC

-----

EULA terms....

-----

ACCEPT? [y/n]? **y** 

**Step 4** Before the license activation can successfully take effect, enter the **reload** command, as shown in the following example:

SRE-Module# reload

When prompted to confirm with the reload, press Enter.

**Step 5** Use the **show license all** command to verify that the license is accepted and activated, as shown in the following example:

```
SRE-Module# show license all
License Store: Evaluation License Storage
StoreIndex: 0 Feature: SRE-V-HOST-LIC Version: 1.0
License Type: Evaluation
License State: Active, In Use
Evaluation total period: 8 weeks 4 days
Evaluation period left: 8 weeks 3 days
Expiry date: Sat Oct 30 01:59:32 2010
License Count: Non-Counted
License Priority: Low
```

**Step 6** Continue with the Cisco SRE-V application configuration.

Note

- After the evaluation license expires, the Cisco SRE-V application continues to run. The application does not start if the **reload** command is used or the Cisco SRE Service Module is reloaded.
- When the evaluation license is about to expire, warning messages appear on the device's console. These messages continue to appear until you either install a permanent license, or shut down the application that is using the expired evaluation license.

#### **Related Topics**

• Obtaining and Maintaining Software License Options, page 5-7

# **Obtaining and Maintaining Software License Options**

Use one of the following resources to obtain and register licenses:

- Cisco License Manager (Recommended)—Allows you to automate all license-related work flow using the GUI. See the "Cisco License Manager—Recommended" section on page 5-8.
- Cisco Product License Registration Portal—Allows you to manually obtain and register individual software licenses through a registration portal. See the "Cisco Product License Registration Portal" section on page 5-9.

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### **Cisco License Manager—Recommended**

For a network-wide deployment, the Cisco License Manager can automate all license-related work flow by securely communicating with the licensing back-end fulfillment systems at Cisco.com and deploying obtained licenses to managed devices on a network-wide basis. The Cisco License Manager application keeps an inventory of deployed licenses and generates license reports. Cisco License Manager is available at no cost and can be downloaded by registered Cisco.com users from http://www.cisco.com/go/clm.

To start the License Assistant in Cisco License Manager, do one of the following:

- Click Get License in the Quick Links pane.
- Choose a PAK, SKU, or device. Right-click, and then choose Get Licenses.
- Choose License > Get License.

The Welcome screen of the License Assistant opens. See Figure 5-1. The License Assistant wizard guides you through the steps to get licenses.

Figure 5-1	License Assistant Welcome Screen
🖀 License Assistant	
<ol> <li>Welcome</li> <li>Cisco Account</li> <li>PAKs and Devices</li> <li>Summary</li> <li>Get License</li> <li>Deploy License</li> </ol>	<b>1 - Welcome</b> This assistant guides you through the process of obtaining one or more licenses in order to activate features on your devices. You'll have the option to deploy the licenses at the end of the process or at a later time.         You will need the following information to complete this process:         • License Portal Account         • Activation Key         • Device IP Address or Hostname
	Help Sack Next > Enish Cancel

For detailed procedures, see the "Get a License Using License Assistant" section in *User Guide for Cisco License Manager, Release 2.2* on Cisco.com.

For additional information about Cisco License Manager, see the "Cisco Software Activation Conceptual Overview" chapter in the *Cisco IOS Software Activation Configuration Guide*.

### **Related Topics**

- Basic Workflow for Configuring Users, Roles, and Permissions, page 6-2
- Setting up the VMware vSphere Hypervisor Default Gateway, page 7-1

### **Cisco Product License Registration Portal**

When you are ready to deploy your application, acquire a permanent license if your Cisco SRE Service Module does not already have one. The output of the **show license permanent** command displays a blank line if your Cisco SRE Service Module does not have a permanent license.

Note

You must have a Cisco.com username and password to access some of the URLs in the following procedure. If you do not have a Cisco account, contact your Cisco SRE-V sales representative.

To obtain licenses, complete the following steps:

- **Step 1** Go to *www.cisco.com/go/ordering* and choose one of the ordering options (online retailer, reseller, or Cisco direct).
- Step 2 Specify the license that you want to purchase by entering the appropriate licence SKU (see Table 5-1). After you purchase the license, you receive a product activation key (PAK), which is an alphanumeric string that represents the purchase.
- **Step 3** To get your license file, go to the licensing portal at *www.cisco.com/go/license* and enter the appropriate information.

You must enter the PAK and the UDI of the device on which the license is to be installed. The UDI is printed on a pull-out plastic label, which is located at the bottom front panel of the Cisco SRE Service Module. The UDI can also be viewed using the **show license udi** command in privileged EXEC mode. The UDI has two main components: PID and SN.

- **Step 4** Download the license file or receive the license file through your e-mail account.
- **Step 5** Repeat Step 1 to Step 4 for each device for which you want to obtain a license.
- **Step 6** Copy the license files to an FTP, SFTP, or TFTP server that can be accessed by the Cisco SRE Service Module.
- Step 7 To install the license, use the license install command from the Cisco SRE Service Module interface.



License installation supports FTP, SFTP, or TFTP servers.

The license install command initiates several actions that result in one of the following:

- Printing of an end-user license agreement with prompts to accept the agreement (for extension licenses only).
- Messages indicating that the license is installed.

When a license is successfully installed, a message confirms the installation and its state, and whether or not the licensed feature is present in the current image, as shown in the following example:

```
SRE-Module# license install tftp://ip-address/FHH13070015_20091106190424734.lic
Installing..Feature:SRE-V-HOST-LIC..OK:No Error
1/1 licenses were successfully installed
0/1 licenses were existing licenses
0/1 licenses were failed to install
```

**Step 8** Before the license activation can successfully take effect, enter the **reload** command, as shown in the following example:

SRE-Module# reload

When prompted to confirm with the reload, press Enter.

Step 9 To display a summary of all licenses installed on your Cisco SRE Service Module, use the show license all command. The following example shows that the EULA has not been accepted:

SRE-Module# <b>show license all</b>		
License Store: Primary License Storage		
StoreIndex: 0 Feature: SRE-V-HOST-LIC	Version:	1.0
License Type: Permanent		
License State: Active, In Use		
License Count: Non-Counted		
License Priority: Medium		
License Store: Evaluation License Storage		
StoreIndex: 0 Feature: SRE-V-HOST-LIC	Version:	1.0
License Type: Evaluation		
License State: Inactive		
Evaluation total period: 8 weeks 4 days		
Evaluation period left: 4 weeks 4 days		
License Count: Non-Counted		
License Priority: Low		

**Step 10** To display licenses that are currently being used by the system, use the **show license in-use** command, as shown in the following example:

```
SRE-Module# show license in-use

StoreIndex: 0 Feature: SRE-V-HOST-LIC Version: 1.0

License Type: Permanent

License State: Active, In Use

License Count: Non-Counted

License Priority: Medium
```

Step 11 After verifying the licenses are enabled, continue with the configuration of Cisco SRE-V.

#### **Related Topics**

- Basic Workflow for Configuring Users, Roles, and Permissions, page 6-2
- Setting up the VMware vSphere Hypervisor Default Gateway, page 7-1

### **Licensing Commands**

Use the following privileged EXEC commands to perform basic licensing tasks, such as install, backup, and view licences:

• Install a license.

SRE-Module# license install url

where the URL is in the format tftp://ip\_address/filename.lic.

Note	License installation supports FTP, SFTP, or TFTP servers.

Add a comment to a license.

SRE-Module# license comment {add | delete} feature-name comment string

• Save license credentials. Use this command if you need to resend the device licenses. SRE-Module# license save credentials url

where the URL is in the format ftp://user:password@ip/filename.cred.

• Back up a license.

SRE-Module# license save ftp://path/filename.lic.

where the path is in the format ftp://user:password@ip/filename.lic.

- Remove or clear unused licenses.
  - View which feature licenses the Cisco SRE-V application is using.
     SRE-Module# show licenses all
  - Shutdown each application that uses a feature license that you want to clear.



- A license cannot be cleared if the license is currently in use.
- Clear the license.

SRE-Module# license clear feature-name









# **Configuring Users, Roles, and Permissions**

By default, the Cisco SRE-V software comes with two predefined roles: esx-admins role and vm-users role. Besides the default esx-admins and vm-users roles, you can use the Cisco SRE-V commands provided in this chapter to configure additional users, roles, and provide permissions to those users to access virtual machines.

This chapter provides the Cisco SRE-V commands to configure users, roles, and permissions. It contains the following sections:

- Users, Roles, Privileges, and Permissions Overview, page 6-1
- Basic Workflow for Configuring Users, Roles, and Permissions, page 6-2
- Working with Users, page 6-2
- Working with User Groups, page 6-7
- Working with Roles, page 6-11
- Working with Permissions, page 6-18
- Basic Workflow Option 1 Example, page 6-22

# Users, Roles, Privileges, and Permissions Overview

A user is the person who is authorized to log into the VMware vSphere Hypervisor<sup>TM</sup>. When you assign roles and permissions to users or groups, you control the objects that the users can access in the vSphere environment, and the actions that they can perform on those objects.

The VMware vSphere Hypervisor<sup>TM</sup> determines the level of access for a user based on the permissions assigned to that user. The user name, password, and permissions combination is the mechanism by which the VMware vSphere Hypervisor<sup>TM</sup> authenticates the user for access, and authorizes the user to perform activities.

To control which users or user groups can access particular vSphere objects, the VMware vSphere Hypervisor<sup>TM</sup> uses sets of pre-established privileges or roles. A role, and a user or group that are assigned to an inventory object, constitutes a permission.

By default, the Cisco SRE-V software comes with two predefined roles: esx-admins role and vm-users role. Each role has certain privileges assigned to it. Users with the esx-admins role have the privilege to manage the VMware vSphere Hypervisor<sup>TM</sup>. Users with the vm-users role have the privilege to manage virtual machines.

Besides the default esx-admins and vm-users roles, you can use the Cisco SRE-V commands provided in this chapter to configure additional users, roles, and provide permissions to those users to access virtual machines.

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The default pre-configured username for the esx-admins role is **esx-admin** and the password is **change\_it**. We highly recommend that you change the default password after the first reboot.

### **Related Topics**

- Basic Workflow for Configuring Users, Roles, and Permissions, page 6-2
- Working with Users, page 6-2
- Working with User Groups, page 6-7
- Working with Roles, page 6-11
- Working with Permissions, page 6-18

## **Basic Workflow for Configuring Users, Roles, and Permissions**

#### **Basic Workflow Option 1**

- 1. Create a user. See the "Creating Users" section on page 6-3.
- 2. Create a role. See the "Creating Roles" section on page 6-11.
- 3. Add privileges to the role. See the "Adding Privileges to an Existing Role" section on page 6-13.
- **4.** Assign the role to the user. When you assign a role, you provide the user with the permission to access virtual machines with the privileges that apply to the specified role. See the "Assigning a Role to a User" section on page 6-18.

For all of the commands used in the basic workflow option 1, see the "Basic Workflow Option 1 Example" section on page 6-22.

### **Basic Workflow Option 2**

- 1. Create users. See the "Creating Users" section on page 6-3.
- 2. Create user groups. See the "Creating User Groups" section on page 6-8.
- 3. Assign users to user groups. See the "Updating User Group Information" section on page 6-9.
- 4. Create roles. See the "Creating Roles" section on page 6-11.
- 5. Add privileges to the roles. See the "Adding Privileges to an Existing Role" section on page 6-13.
- 6. Assign the roles to the user groups. See the "Adding a Privilege Group to an Existing Role" section on page 6-14.

### **Working with Users**

To create, view, or delete users; or to update user account information, see the following sections:

- Creating Users, page 6-3
- Viewing Existing Users, page 6-5
- Updating User Account Information, page 6-6
- Deleting Users, page 6-7

### **Creating Users**

A user is the person who is authorized to log into the VMware vSphere Hypervisor<sup>TM</sup>. To create a user, use the following command:

user create username password password [fullname full name]

### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. user create username password password [fullname full name]

### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

Command or Action	Purpose
user create username password password	Creates a new user account.
[fullname full name] Example: SRE-Module# user create jsmith password	• <i>username</i> —Unique string used to log into the VMware vSphere Hypervisor <sup>TM</sup> . Maximum string length: 16 alphanumeric characters. This login username is case sensitive and must not contain spaces.
	• <b>password</b> <i>password</i> —Specifies the password to be used with the username.
	<i>password</i> —Alphanumeric string used with this username to provide access to the VMware vSphere Hypervisor <sup>TM</sup> .
	A password must contain a mix of characters from the following four character classes:
	<ul> <li>Lowercase letters</li> </ul>
	- Uppercase letters
	– Digits
	- Special characters, such as an underscore or dash
	Password Length Requirements:
	<ul> <li>If the password contains characters from one or two classes, it must contain eight characters.</li> </ul>
	<ul> <li>If the password contains characters from three classes, it must contain seven characters.</li> </ul>
	<ul> <li>If the password contains characters from all four classes, it must contain six characters.</li> </ul>
	<b>Note</b> If the password begins with an uppercase character, that character does not count towards the number of character classes used. If the password ends with a digit, that digit does not count towards the number of character classes used.
	Password Examples:
	<ul> <li>xQaTEhbU—Contains eight characters from two character classes.</li> </ul>
	<ul> <li>xQaT3pb—Contains seven characters from three character classes.</li> </ul>
	<ul> <li>xQaT3#—Contains six characters from four character classes.</li> </ul>
	• <b>fullname</b> <i>full name</i> —(Optional) Specifies the full name of the user.
	<i>full name</i> —Alphanumeric string used with this username. Maximum string length: 64 characters. You can choose to create the full name at a later time by using the <b>user update</b> command.
#### **Related Topics**

- Creating Roles, page 6-11
- Creating User Groups, page 6-8

# **Viewing Existing Users**

To view details about a specific user or to list all of the existing users, use the following command:

show user {name username | all}

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. show user {name username | all}

#### **DETAILED STEPS**

	Command or Action			Purpose
Step 1	show user {name user	rname   <b>all</b> }		Displays details about a specific user or lists all of the existing users.
	Example: SRE-Module# show use Username: jsmith Full Name: Linux Use Groups Use users 1 total group(s) Roles Ass Role Propagate esx-admins esx-admins 2 total role(s) SRE-Module# show use jsmith jsmith3 2 total user(s)	er name jsmith er,,, ser Belongs To object-Defined-In VM: CentOS 5 Host er all	Yes Yes	<ul> <li>name username—Displays details about the specified user. username—Unique string used to identify the user.</li> <li>all—Lists all the existing users.</li> </ul>

# **Updating User Account Information**

You can update the user password or full name, or add and remove the user from a specific group. To update existing user account information, use the following command:

user update username {password password | fullname full name | add-group group name |
 remove-group group name}

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. user update username {password password | fullname full name | add-group group name | remove-group group name}

#### **DETAILED STEPS**

	Command or Action	Purpose
Step 1	<pre>user update username {password password   fullname full name   add-group group name   remove-group group name}</pre>	Updates the existing user account information. You can update the user password or full name, or add and remove the user from a specific group.
	<b>Example:</b> SRE-Module# user update jsmith password	<ul> <li><i>username</i>—Login username of the user whose account you want to update.</li> <li><i>password_nassword_Specifies the updated password</i></li> </ul>
	SRE-Module# user update jsmith fullname "JohnSmith" SRE-Module# user update jsmith add-group	<i>password</i> —New alphanumeric string used with this username to provide access to the Cisco SRE Service Module. Maximum string length: 30 alphanumeric characters.
	Network SRE-Module# user update jsmith remove-group Network	• <b>fullname</b> <i>full name</i> —Specifies the updated fullname. <i>full name</i> —New full name (alphanumeric string) used with this username. Maximum string length: 64 characters.
		• <b>add-group</b> <i>group name</i> —Adds the user to a specified user group.
		<i>group name</i> —Name of the group in which you want to add the user.
		• <b>remove-group</b> <i>group name</i> —Removes the user from the specified user group.
		<i>group name</i> —Name of the group from which you want to remove the user.

# **Deleting Users**

To delete an existing user account, use the following command:

user delete username

#### SUMMARY STEPS

From the Console Manager interface, enter:

1. user delete username

#### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	user delete username	Deletes the specified user account.
	Example:	• <i>username</i> —Login username of the user whose account you want to delete.
	SRE-Module# user delete jsmith	<b>Note</b> When you delete a specific user, the user group to which the user belongs to is not deleted, nor is the role that was assigned to that user deleted.

# **Working with User Groups**

To create, view, or delete user groups, or to update user group information, see the following sections:

- Creating User Groups, page 6-8
- Viewing Existing User Groups, page 6-8
- Updating User Group Information, page 6-9
- Deleting User Groups, page 6-10

## **Creating User Groups**

To create a user group, use the following command:

group create group name

#### SUMMARY STEPS

From the Console Manager interface, enter:

1. group create group name

#### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	group create group name	Creates a new user group.
	<b>Example:</b> SRE-Module# group create admin-user	• <i>group name</i> —Unique string used to identify the new user group. Maximum string length: 16 alphanumeric characters. This group name is case sensitive and must not contain spaces.

#### **Related Topics**

• Updating User Group Information, page 6-9

# **Viewing Existing User Groups**

To view details about a specific user group or to list all of the existing user groups, use the following command:

show group {name group name | all}

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. show group {name group name | all}

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

Con	nmand or Action	Purpose
Step 1 sho	w group {name group name   all}	Displays details about a specific group or lists all of the existing user groups.
Exa SRE Gro  0 t  Rol Pro 0 t SRE vma vmu 2 t	<pre>mple: -Module# show group name vmadmin_group up Name: vmadmin_group  Users Belong to the Group otal user(s)  Roles Assigned e Object-Defined-In pagate otal role(s) -Module# show group all dmin_group ser_group otal group(s)</pre>	<ul> <li>name group name—Displays details about a specific user group. group name—Unique string used to identify the user group.</li> <li>all—Displays all the existing user groups.</li> </ul>

# **Updating User Group Information**

To add or remove the specified user from a group, use the following command:

group update group name {add-user username | remove-user username}

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. group update group name {add-user username | remove-user username}

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	<pre>group update group name {add-user username   remove-user username}</pre>	Updates the existing user group information. You can use this command to add or remove the specified user from a group.
	Example: SRE-Module# group update supergroup add-user jsmith3 SRE-Module# group update supergroup remove-user jsmith3	<ul> <li>group name—Name of the group that you want to update.</li> <li>add-user username—Adds the specified user to the group. username—Unique string used to identify the user.</li> <li>remove-user username—Removes the specified user</li> </ul>
		from the group. <i>username</i> —Unique string used to identify the user.

#### **Related Topics**

• Creating Roles, page 6-11

# **Deleting User Groups**

To delete an existing user group, use the following command:

group delete group name

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. group delete group name

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	group delete group name	Deletes the specified group.
	<b>Example:</b> SRE-Module# group delete supergroup1	<ul> <li>group name—Name of the group that you want to delete.</li> <li>Note When you delete a specific group, the user accounts that belong to the group are not deleted, nor the roles that are assigned to that group deleted.</li> </ul>

# **Working with Roles**

To create, view, or delete roles; or to update existing role information, see the following sections:

- Creating Roles, page 6-11
- Viewing Existing Roles, page 6-12
- Updating Existing Role Information, page 6-13
- Viewing System Pre-defined Privileges, page 6-16
- Deleting Roles, page 6-17

### **Creating Roles**

To create a role, use the following command:

role create role name

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. role create role name

#### **DETAILED STEPS**

	Command or Action	Purpose
Step 1	role create role name	Creates a new role.
	<b>Example:</b> SRE-Module# role create SuperRole	• <i>role name</i> —Unique string used to identify the role. Maximum string length: 80 alphanumeric characters. The role name is not case sensitive and can contain spaces.

#### **Related Topics**

• Adding Privileges to an Existing Role, page 6-13

# **Viewing Existing Roles**

To view details about a specific role or to list all of the existing roles, use the following command:

show role {name role name | all}

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. **show role** {**name** *role name* | **all**}

#### **DETAILED STEPS**

	Command or Action	Purpose
Step 1	<pre>show role {name role name   all}</pre>	Displays details about a specific role or lists all of the existing roles.
	Example: SRE-Module# show role name SuperRole Role Name: SuperRole	<ul> <li>name role name—Displays the following details about the specified role:</li> <li>Privileges that are associated with the role.</li> </ul>
	Users: jsmith (Host, Propagate)	- Permissions, such as users or user groups that are granted with the role.
	1 total user(s)	<i>role name</i> —Unique string used to identify the role.
	Groups: admingroup (Host, Propagate)	• <b>all</b> —Lists all of the existing roles in the system. Only the role names are listed.
	System.Read System.View	
	3 total privileges	
	SRE-Module# show role all No Access Read-only Administrator SuperRole	
	4 total role(s)	

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# **Updating Existing Role Information**

You update role information by adding or removing privileges from an existing role. A role can have one or more privileges associated with it. Privileges are pre-defined in VMware vSphere Hypervisor<sup>TM</sup>. Each privilege has a unique ID, which is contained in a privilege group. The privilege group can have one or more privileges. For example:

- The VirtualMachine.Config.AddNewDisk privilege is associated with a role called, SuperRole.
- The *VirtualMachine.Config.AddNewDisk* privilege belongs to the privilege group called, *VirtualMachine.Config.*
- The *VirtualMachine.Config* privilege group also has other privileges besides the *VirtualMachine.Config.AddNewDisk* privilege.

To add or remove privileges or a privilege group from an existing role, see the following sections:

- Adding Privileges to an Existing Role, page 6-13
- Removing Privileges from an Existing Role, page 6-14
- Adding a Privilege Group to an Existing Role, page 6-14
- Removing a Privilege Group from an Existing Role, page 6-15

### Adding Privileges to an Existing Role

To add a privilege to an existing role, use the following command:

role update role name add-privilege {privilege ID | all}

#### SUMMARY STEPS

From the Console Manager interface, enter:

1. role update role name add-privilege {privilege ID | all}

#### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	<pre>role update role name add-privilege {privilege</pre>	Adds the privilege to the specified role.
	ID   <b>all</b> }	• <i>role name</i> —Unique string used to identify the role.
	<b>Example:</b> SRE-Module# role update SuperRole add-privilege	• <b>add-privilege</b> <i>privilege ID</i> —Adds the privilege to the specified role.
	VirtualMachine.Config.AddNewDisk	privilege ID—Privilege string to be added.
	SRE-Module# role update SuperRole add-privilege all	• <b>all</b> —Adds all of the privileges to the specified role.

#### **Related Topics**

- Assigning a Role to a User, page 6-18
- Adding a Privilege Group to an Existing Role, page 6-14

#### **Removing Privileges from an Existing Role**

To remove a privilege from an existing role, use the following command:

role update role name remove-privilege {privilege ID | all}

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. role update role name remove-privilege {privilege ID | all}

#### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	role update role name remove-privilege	Removes the privilege from the specified role.
	{privilege 1D   <b>all</b> }	• <i>role name</i> —Unique string used to identify the role.
	<b>Example:</b> SRE-Module# role update SuperRole remove-privilege VirtualMachine.Config.AddNewDisk	remove-privilege <i>privilege ID</i> —Removes the privilege from the specified role. <i>privilege ID</i> —Privilege string to be removed.
	SRE-Module# role update SuperRole remove-privilege all	• all—Removes all of the privileges from the specified role.

#### Adding a Privilege Group to an Existing Role

To add a privilege group to an existing role, use the following command:

**role update** role name **add-privilege-group** {*privilege group ID* | **all**}

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. role update role name add-privilege-group {privilege group ID | all}

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	role update role name add-privilege-group	Adds the privilege group to the specified role.
	{privilege group ID   <b>all</b> }	• <i>role name</i> —Unique string used to identify the role.
	<b>Example:</b> SRE-Module# role update SuperRole	• <b>add-privilege-group</b> <i>privilege group ID</i> —Adds the privilege group to the specified role.
	add-privilege-group VirtualMachine.Config	privilege group ID—Privilege group string to be added.
	SRE-Module# role update SuperRole add-privilege-group all	• <b>all</b> —Adds all of the privilege groups to the specified role.

#### **Removing a Privilege Group from an Existing Role**

To remove a privilege group from an existing role, use the following command:

role update role name remove-privilege-group {privilege group ID | all}

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. role update role name remove-privilege-group {privilege group ID | all}

#### **DETAILED STEPS**

	Command or Action	Purpose
Step 1	role update role name remove-privilege-group	Removes the privilege from the specified role.
	{privilege group ID   <b>all</b> }	• <i>role name</i> —Unique string used to identify the role.
	<b>Example:</b> SRE-Module# role update SuperRole remove-privilege-group VirtualMachine.Config	• <b>remove-privilege-group</b> <i>privilege group</i> <i>ID</i> —Removes the privilege group from the specified role.
	SRE-Module# role update SuperRole remove-privilege-group all	<i>privilege group ID</i> —Privilege group string to be removed.
		• <b>all</b> —Removes all of the privilege groups from the specified role.

# **Viewing System Pre-defined Privileges**

To view system pre-defined privileges, see the following sections:

- Viewing Privileges, page 6-16
- Viewing Group Privileges, page 6-16

### **Viewing Privileges**

To view all of the system predefined privileges, use the following command:

show privilege all

#### SUMMARY STEPS

From the Console Manager interface, enter:

1. show privilege all

#### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	show privilege all	Displays all of the system predefined privileges.
	Example:	
	SRE-Module# show privilege all	
	System.Anonymous	
	System.View	
	System.Read	
	208 total privileges	

### **Viewing Group Privileges**

To view the privileges of a specific group; or to view all the system predefined privilege groups, use the following command:

show privilege-group {privilege group ID | all}

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

**1. show privilege-group** {*privilege group ID* | **all**}

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	<pre>show privilege-group {privilege group ID   all}</pre>	Displays the privileges of a specific group or displays all the system predefined privilege groups.
	Example: SRE-Module# show privilege-group System	• <i>privilege group ID</i> —Privilege group string for which you want the predefined privileges displayed.
	System.Anonymous System.View System.Read	• <b>all</b> —Displays all of the system predefined privilege groups.
	3 total privileges	
	SRE-Module# show privilege-group all System Global Folder	
	27 total privilege groups	

# **Deleting Roles**

To delete an existing role, use the following command:

role delete role name

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. role delete role name

#### **DETAILED STEPS**

	Command or Action	Purpose
Step 1	role delete role name	Deletes the specified role.
		• <i>role name</i> —Name of the role that you want to delete.
	<b>Example:</b> SRE-Module# role delete SuperRole	<b>Note</b> When you delete a specific role, the users or the user groups that are assigned to that role are not deleted.

# **Working with Permissions**

Permission refers to an object, which consists of an authorization role, a user or group name, a managed virtual machine, and host reference. Permission allows the user to access a virtual machine with any of the privileges that apply to the specified role.

To assign or remove a role from a user or user group, use the **permission add** or **permission remove** commands.

See the following sections for more information:

- Assigning a Role to a User, page 6-18
- Removing a Role from a User, page 6-19
- Assigning a Role to a User Group, page 6-20
- Removing a Role from a User Group, page 6-21

# Assigning a Role to a User

When you assign a role to a user, you provide the user with the permission to access a virtual machine with the privileges that apply to the specified role. To assign the role to the user, use the following command:

permission add role name user username [virtual-machine VM] [nopropogate]

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. permission add role name user username [virtual-machine VM] [nopropogate]

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	<pre>permission add role name user username [virtual-machine VM] [nopropogate]</pre>	Assigns the role to the user and provides the user with the permission to access a virtual machine with any of the privileges that apply to the specified role.
	Example: SRE-Module# permission add SuperRole user jsmith virtual-machine VM_1 nopropogate	• <i>role name</i> —Name of the role that you want to assign to the user.
		• <b>user</b> <i>username</i> —Specifies the username to which you want to assign the role.
		username—Unique string used to identify the user.
		• <b>virtual-machine</b> <i>VM</i> —(Optional) Provides the user the permission to access the specified virtual machine.
		VM—Name of the virtual machine.
		Role permissions are provided at object level in VMware vSphere Hypervisor <sup>TM</sup> . The <b>virtual-machine</b> keyword provides the user the permission to access the specified virtual machine. Without the <b>virtual-machine</b> keyword, the user has the permission to access all of the virtual machines in the system.
		• <b>nopropogate</b> —(Optional) Does not allow role permissions to be propagated to the sub-entities of the host.
		Without the <b>nopropogate</b> keyword, permissions are propagated to the granted object.

### **Removing a Role from a User**

When you remove a role from a user, the permission for the user to access the virtual machine is also removed. To remove the role from the user, use the following command:

permission remove role name user username [virtual-machine VM] [nopropogate]

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. permission remove role name user username [virtual-machine VM] [nopropogate]

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	<pre>permission remove role name user username [virtual-machine VM] [nopropogate]</pre>	Removes the role from the user. When you remove the role, the permission for the user to access the virtual machine is also removed.
	Example: SRE-Module# permission remove SuperRole user ismith virtual-machine VM 1 popropogate	• <i>role name</i> —Name of the role that you want to remove from the user.
		• <b>user</b> <i>username</i> —Specifies the username of the user whose role you want to remove.
		username—Unique string used to identify the user.
		• <b>virtual-machine</b> <i>VM</i> —(Optional) Removes the role permission from the specified virtual machine.
		VM—Name of the virtual machine.
		Role permissions are provided at object level in VMware vSphere Hypervisor <sup>TM</sup> . The <b>virtual-machine</b> keyword removes the user's permission to access the specified virtual machine. Without the <b>virtual-machine</b> keyword, the user cannot access any of the virtual machines in the system.
		• <b>nopropogate</b> —(Optional) Does not allow role permissions to be propagated to the sub-entities of the host.

### Assigning a Role to a User Group

When you assign a role to a user group, you provide the user group the permission to access a virtual machine with any of the privileges that apply to the specified role. To assign a role to a user group, use the following command:

permission add role name group group name [virtual-machine VM] [nopropogate]

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. permission add role name group group name [virtual-machine VM] [nopropogate]

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	<pre>permission add role name group group name [virtual-machine VM] [nopropogate]</pre>	Assigns the role to the user group and provides the user group the permission to access a virtual machine with any of the privileges that apply to the specified role.
	Example: SRE-Module# permission add SuperRole group Network virtual-machine VM_1 nopropogate	• <i>role name</i> —Name of the role that you want to assign to the user group.
		• <b>group</b> <i>group name</i> —Specifies the name of the user group to which you want to assign the role.
		<i>group name</i> —Unique string used to identify the user group.
		• <b>virtual-machine</b> <i>VM</i> —(Optional) Provides the user the permission to access the specified virtual machine.
		<i>VM</i> —Name of the virtual machine.
		Role permissions are provided at object level in VMware vSphere Hypervisor <sup>TM</sup> . The <b>virtual-machine</b> keyword provides the user group the permission to access the specified virtual machine. Without the <b>virtual-machine</b> key word, the user group has the permission to access all of the virtual machines in the system.
		• <b>nopropogate</b> —(Optional) Does not allow role permissions to be propagated to the sub-entities of the host.
		Without the <b>nopropogate</b> keyword, permissions are propagated to the granted object.

# **Removing a Role from a User Group**

When you remove a role from a user group, the permission for the user group to access the virtual machine is also removed. To remove the role from the user group, use the following command:

permission remove role name group group name [virtual-machine VM] [nopropogate]

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. permission remove role name group group name [virtual-machine VM] [nopropogate]

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	<pre>permission remove role name group group name [virtual-machine VM] [nopropogate]</pre>	Removes the role from the user group. When you remove the role, the permission for the user group to access the virtual machine is also removed.
	Example: SRE-Module# permission remove SuperRole group	• <i>role name</i> —Name of the role that you want to remove from the user group.
	Network virtuar machine vir_r hopropogate	• <b>group</b> <i>group name</i> —Specifies the name of the user group whose role you want to remove.
		<i>group name</i> —Unique string used to identify the user group.
		• <b>virtual-machine</b> <i>VM</i> —(Optional) Removes the role permission from the specified virtual machine.
		VM—Name of the virtual machine.
		Role permissions are provided at object level in VMware vSphere Hypervisor <sup>TM</sup> . The <b>virtual-machine</b> keyword removes the user group's permission to access the specified virtual machine. Without the <b>virtual-machine</b> keyword, the user group cannot access any of the virtual machines in the system.
		• <b>nopropogate</b> —(Optional) Does not allow role permissions to be propagated to the sub-entities of the host.

# **Basic Workflow Option 1 Example**

To create a user and role, add privileges to the role, and then assign the role to the user, follow these steps.

#### SUMMARY STEPS

From the Console Manager interface, enter:

- 1. user create username password password [fullname full name]
- 2. role create role name
- 3. role update role name add-privilege {privilege ID | all}
- 4. permission add role name user username [virtual-machine VM] [nopropogate]
- 5. exit

	Command or Action	Purpose
Step 1	user create username password password	Creates a new user account.
	<b>Example:</b> SRE-Module# user create jsmith password xQaTEhbU fullname "JohnSmith"	• <i>username</i> —Unique string used to log into the VMware vSphere Hypervisor <sup>TM</sup> . Maximum string length: 16 alphanumeric characters. This login username is case sensitive and must not contain spaces.
		• <b>password</b> <i>password</i> —Specifies the password to be used with the username.
		<i>password</i> —Alphanumeric string used with this username to provide access to the VMware vSphere Hypervisor <sup>TM</sup> .
		A password must contain a mix of characters from the following four character classes:
		<ul> <li>Lowercase letters</li> </ul>
		- Uppercase letters
		– Digits
		- Special characters, such as an underscore or dash
		Password Length Requirements:
		<ul> <li>If the password contains characters from one or two classes, it must contain eight characters.</li> </ul>
		<ul> <li>If the password contains characters from three classes, it must contain seven characters.</li> </ul>
		<ul> <li>If the password contains characters from all four classes, it must contain six characters.</li> </ul>
		<b>Note</b> If the password begins with an uppercase character, that character does not count towards the number of character classes used. If the password ends with a digit, that digit does not count towards the number of character classes used.
		Password Examples:
		<ul> <li>xQaTEhbU—Contains eight characters from two character classes.</li> </ul>
		<ul> <li>xQaT3pb—Contains seven characters from three character classes.</li> </ul>
		<ul> <li>xQaT3#—Contains six characters from four character classes.</li> </ul>
		• <b>fullname</b> <i>full name</i> —(Optional) Specifies the full name of the user.
		<i>full name</i> —Alphanumeric string used with this username. Maximum string length: 64 characters. You can choose to create the full name at a later time by using the <b>user update</b> command.

	Command or Action	Purpose
Step 2	role create role name	Creates a role.
	<b>Example:</b> SRE-Module# role create SuperRole	• <i>role name</i> —Unique string used to identify the role. Maximum string length: 80 alphanumeric characters. The role name is not case sensitive and can contain spaces.
Step 3	<pre>role update role name add-privilege {privilege ID   all}</pre>	<ul> <li>Adds the privilege to the specified role.</li> <li><i>role name</i>—Unique string used to identify the role.</li> </ul>
	Example: SRE-Module# role update SuperRole add-privilege VirtualMachine.Config.AddNewDisk SRE-Module# role update SuperRole add-privilege all	<ul> <li>add-privilege <i>privilege ID</i>—Adds the privilege to the specified role.</li> <li><i>privilege ID</i>—Privilege string to be added.</li> <li>all—Adds all of the privileges to the specified role.</li> </ul>
Step 4	<pre>permission add role name user username [virtual-machine VM] [nopropogate]</pre>	Assigns the role to the user and provides the user with the permission to access a virtual machine with any of the privileges that apply to the specified role.
Stop 5	<pre>Example: SRE-Module# permission add SuperRole user jsmith virtual-machine VM_1 nopropogate</pre>	<ul> <li><i>role name</i>—Name of the role that you want to assign to the user.</li> <li><b>user</b> <i>username</i>—Specifies the username to which you want to assign the role. <i>username</i>—Unique string used to identify the user.</li> <li><b>virtual-machine</b> <i>VM</i>—(Optional) Provides the user the permission to access the specified virtual machine. <i>VM</i>—Name of the virtual machine.</li> <li>Role permissions are provided at object level in VMware vSphere Hypervisor<sup>TM</sup>. The <b>virtual-machine</b> keyword gives the user the permission to access the specified virtual machine.</li> <li><b>virtual-machine</b> keyword, the user has the permission to access all of the virtual machines in the system.</li> <li><b>nopropogate</b>—(Optional) Does not allow role permissions to be propagated to the sub-entities of the host.</li> <li>Without the <b>nopropogate</b> keyword, permissions are propagated to the granted object.</li> </ul>
Step 5	exit	Closes the service module session.





# CHAPTER **7**

# **Managing Virtual Machines**

A virtual machine is a software computer (just like a physical computer), which runs an operating system and applications. Virtual machines run on the VMware vSphere Hypervisor<sup>TM</sup>. You can use the same VMware vSphere Hypervisor<sup>TM</sup> to run several virtual machines. Use the vSphere Client GUI to create and manage virtual machines.

Note

We recommend that you use the vSphere Client GUI to manage virtual machines, but if you choose to use the CLI, see the commands listed in Chapter 8, "Managing Virtual Machines Using the Cisco SRE-V CLI."

This chapter contains the following section:

- Configuring the VMware vSphere Hypervisor Default Gateway, page 7-1
- Downloading and Installing the vSphere Client, page 7-3
- Important Information About Creating Virtual Machines, page 7-5
- Information About vSwitches, page 7-8

# **Configuring the VMware vSphere Hypervisor Default Gateway**

To manage virtual machines, configure the VMware vSphere Hypervisor<sup>TM</sup> default gateway. See the following sections:

- Setting up the VMware vSphere Hypervisor Default Gateway, page 7-1
- Changing the VMware vSphere Hypervisor Default Gateway, page 7-2

# Setting up the VMware vSphere Hypervisor Default Gateway

To configure the VMware vSphere Hypervisor<sup>TM</sup> default gateway, use the following command:

hypervisor set ip default-gateway hypervisor-default-gateway-ip-address

#### SUMMARY STEPS

From the Console Manager interface, enter:

1. hypervisor set ip default-gateway hypervisor-default-gateway-ip-address

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	<b>hypervisor set ip default-gateway</b> hypervisor-default-gateway-ip-address	Specifies the IP address for the default gateway. Typically, this is the IP address for the router side of the
	Example:	Figure 3-2.
	SRE-Module# hypervisor set ip default-gateway 20.0.0.100	• <i>hypervisor-default-gateway-ip-address</i> —IP address for the default gateway.

#### **Related Topics**

• Downloading and Installing the vSphere Client, page 7-3

# Changing the VMware vSphere Hypervisor Default Gateway

To change the VMware vSphere Hypervisor<sup>TM</sup> default gateway, you must first remove the existing default gateway, and then reconfigure the new default gateway.

To remove the existing VMware vSphere Hypervisor<sup>TM</sup> default gateway, use the following command:

#### hypervisor set ip default-gateway 0.0.0.0

To reconfigure the VMware vSphere Hypervisor<sup>TM</sup> default gateway, see the "Setting up the VMware vSphere Hypervisor Default Gateway" section on page 7-1.

#### SUMMARY STEPS

From the Console Manager interface, enter:

1. hypervisor set ip default-gateway 0.0.0.0

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	hypervisor set ip default-gateway 0.0.0.0	Removes the IP address of the default gateway from the VMware vSphere Hypervisor <sup>TM</sup> .
	Example:	
	SRE-Module# hypervisor set ip default-gateway 0.0.0.0	

# **Downloading and Installing the vSphere Client**

To manage the virtual machine, you must download and install the vSphere Client.

The vSphere Client contains an online tutorial for first time users. It also contains embedded in-line getting started assistance, which allows you to set up your virtual infrastructure through an easy to use, step-by-step process. If you are an experienced user, you can choose to turn-off the getting started in-line assistance.

٩, Note

To download the vSphere Client, connection to the Internet is required. Before you download the vSphere client, verify that you have network connectivity.

To download and install the vSphere client, complete the following steps:

- **Step 1** Go to https://hypervisor-ip-address. You are directed to the VMware website and the Welcome page opens.
- **Step 2** Click **Download vSphere Client**, and then click **Run** to download the vSphere Client. The VMware vSphere Client is installed and a shortcut icon to the client appears on your desktop.
- Step 3 Click the VMware vSphere Client icon to open the login window.
- Step 4 To manage a single VMware vSphere Hypervisor<sup>TM</sup>, enter the IP address or hostname of the VMware vSphere Hypervisor<sup>TM</sup> and the username and password, and then click Login. The vSphere Client GUI opens.



If you are a first-time user of the VMware vSphere Hypervisor<sup>TM</sup>, use **esx-admin** for the user name; and use **change\_it** for the password. We highly recommend that you change the default password after the first reboot.

# <u>Note</u>

If you purchased the Cisco SRE-V Option 3 (Hardware, plus Virtualization software, plus Microsoft Windows software), a virtual machine is provided to you by default. For Cisco SRE-V options, see Figure 1-3.

Γ

**Step 5** From the vSphere Client main page, do one of the following:

- To use the existing virtual machine that is provided to you by default with your Cisco SRE-V software Option 3, do the following:
  - From the left navigation tree, click the host name to expand it, and then choose the virtual machine.
  - Follow the instructions that are displayed in the right pane under the Getting Started tab. See Figure 7-1.

Figure 7-1 vSphere Client Inventory Page with a Virtual Machine Selected

🦉 192.168.100.131 - vSphere Clic	ent 🖉		172 19 153 120	_ 8 ×	_ 8 ×
Ele Edit View Inventory Admini	istration Plug-ins Help				
🖸 🔝 🛕 Home 🕨 🛃	Inventory 🕨 🎁 Inventory				
🔳 II 🕨 🗐 🙆 🖉	a 🔯 😫 🕪 🧇				
H 192.168.100.131	M New Virtual Machine Getting Started Surmary Resource Alloca	ion Performance Events Console	Permissions close tab	X	
	A virtual machine is a software comp physical computer, runs an operatin applications. An operating system in machine is called a guest operating Because every virtual machine is an envolument, you can use virtual ma- consolidate sover applications. Virtual machines run on hosts. The si- many virtual machines. Basic Tasks P Power on the virtual machine Basic Tasks Edit virtual machine settings	uter that, like a system and tabled on a virtual valem. Solitated computing solitated computing solitated computing solitated computing and host can run	Vertual Matchines		
Recent Tasks	1			Name, Target or Status contain	v Clear ×
Name Targ	et Status Details	Initiated by Requested Start Ti	Start Time Completed Time		
🖄 Create virtual machine 📲	192.168.100.1 🔮 Completed	root 1/4/2008 5:54:56 PM	1/4/2008 5:54:56 PM 1/4/2008 5:55:03 PM		
🐖 Tasks				Eval	uation Mode: 54 days remaining root
👌 Start 🔯 🙇 🖉 🕼	In with the vSohere 4 WWware vSohere 4: Priv				3 5 11:01 AM

- To create a new virtual machine, see the "Important Information About Creating Virtual Machines" section on page 7-5, and then do the following:
  - From the left navigation tree, choose the host name.
  - Follow the instructions that are displayed in the right pane under the Getting Started tab. See Figure 7-2.

Figure 7-2 vSphere Client Inventory Page with the Host Name Selected

🚰 192.168.100.131 - vSphere Clier	ıt 🔪	ø	172 19 153 120	_ 8 ×	_ 8 ×
Ele Edit View Inventory Administ	ration Blug-ins Help				
🖸 🔝 🛕 Home 🕨 🛃 Ir	wentory 🕨 🚮 Inventory				
<b>B</b>					
192.168.100.131	localhost. VMware ESXi, 4.1.0	, 00000   Evaluation (54 days remaining			
	Getting Started Summery	Virtual Machines Resource Allocation Perf	ormance Configuration Local Users & Groups Events Perm	ssions	
	What is a Hest?		close tab 🗵		<u>~</u>
	what is a nostr				
	as ESX or ESXi, to run v CPU and memory resou give virtual machines ac connectivity.	in uses writialization software, such irtual machines. Hosts provide the rces that virtual machines use and cess to storage and network	Virtual Machines		
	You can add a virtual m one or by deploying a vi	achine to a host by creating a new rtual appliance.	Host		
	The easiest way to add virtual appliance. A virtu machine with an operati installed. A new virtual n system installed on it, su	a virtual machine is to deploy a al appliance is a pre-built virtual ng system and software already nachine will need an operating uch as Windows or Linux.			
			vSphere Client		
	Basic Tasks				
	🔠 Deploy from VA M	arketplace			
	at Create a new virt	ual machine	Explore Further		
			Learn about vSphere Manage multiple hosts, eliminate downlime, load balance your datacenter with vMotion, and more     Evaluate vSphere		
				J	
Recent Tasks				Name, Target or Status contains: *	Clear ×
Name Target	t Status	Details Initiated by Requested	Rart Ti Start Time Completed Time	· · · · · · · · · · · · · · · · · · ·	
					1
🔄 Tasks				Evaluation Mode: 5	4 days remaining root C
🥂 Start 🛛 🥵 🖉 Log I	n with the vSphere 🕼 VMware	vSphere 4: Priv 8 192.168.100.131 - v3	ph		5 🐨 🔂 🚺 11:02 AM

# <u>Note</u>

If you are an experienced user, you can choose to remove the Getting Started tab from your view.
 Go to Edit > Client Settings. The General tab is selected by default. From the Tasks pane, uncheck the Show Getting Started Tab checkbox.

- **Step 6** To manage the virtual machines, use the functionality provided by the vSphere Client:
  - To access the online tutorial that is embedded in the vSphere Client GUI, click Help > Tutorial.
  - To access the vSphere Client online help, click Help > Help Topics.

# Important Information About Creating Virtual Machines

If you purchased the Cisco SRE-V Option 3 (Hardware, plus Virtualization software, plus Microsoft Windows software), a virtual machine with VMware tools and datastore(s) is provided to you by default. You can create additional virtual machines if needed.

If you purchased the Cisco SRE-V Option 1 (Hardware only - without the Virtualization or Microsoft Windows software); or Option 2 (Hardware plus Virtualization software), you must create virtual machines.

For Cisco SRE-V options, see Figure 1-3.

See the following sections:

- Basic Workflow for Creating Virtual Machines, page 7-6
- Limitations for Creating Virtual Machines, page 7-6
- Networking Prerequisites for Creating Virtual Machines, page 7-6
- Installing VMware Tools, page 7-7

### **Basic Workflow for Creating Virtual Machines**

- 1. (Optional) Create a datastore in Cisco SRE-V.
- 2. Create the virtual machine.
- 3. Install the operating system on the virtual machine.
- 4. Configure networking (external) for a virtual machine.
- 5. Configure networking (internal) for a virtual machine.

For instructions, see the vSphere Client online help.

# **Limitations for Creating Virtual Machines**

Before creating virtual machines, note the following limitations:

- Each virtual machines has its own resource limitations, such as CPU core number and memory size.
- Virtual Symmetric Multiprocessing (vSMP) is not supported.
- Physical peripheral devices, such as serial port is not supported.
- The physical USB device, which is plugged into the USB port in the front panel of the Cisco SRE Service Module, must not exceed 500 mA (2.5 Watt). For information about assigning USB devices to a virtual machine, see the vSphere user guide.

#### **Related Topics**

• Downloading and Installing the vSphere Client, page 7-3

# **Networking Prerequisites for Creating Virtual Machines**

If you want to assign virtual machines on different VLANs, you must configure VLANs on the ISR G2. For instructions, see the "Configuring VLANs" section on page 3-18.

#### Example

```
interface SM1/1
descriptionInternalswitchinterfaceconnected to ServiceModule
switchport mode trunk
!
interface Vlan50
ip address 50.50.50.5 255.255.255.0
!
interface Vlan60
ip address 60.60.60.6 255.255.255.0
```

#### **Related Topics**

• Downloading and Installing the vSphere Client, page 7-3

### Installing VMware Tools

VMware Tools are a suite of utilities that enhance the performance of the virtual machine's guest operating system and improves the management of the virtual machine.

If you purchased the Cisco SRE-V Option 3 (Hardware, plus Virtualization software, plus Microsoft Windows software), a virtual machine with VMware tools is provided to you by default so you do not need to install VMware tools on that machine. But, if you create a new virtual machine, you must install VMware tools on that virtual machine.

If you purchased the Cisco SRE-V Option 1 (Hardware only - without the Virtualization or Microsoft Windows software) or Option 2 (Hardware plus Virtualization software), you must install VMware tools after you create the virtual machine.

For Cisco SRE-V options, see Figure 1-3.

Note

Before you install VMware tools, make sure that you have installed the supported guest operating system on the virtual machine.

To install VMware tools on a virtual machine, complete the following steps:

- **Step 1** Go to the vSphere Client GUI main page.
- **Step 2** From the left navigation tree, click the host name to expand it.
- Step 3 Right-click the virtual machine in which you want to install VMware tools, and then choose Power > Power On.
- **Step 4** Click the **Console** tab to make sure that the guest operating system starts successfully, and log in if necessary.
- **Step 5** Right-click the virtual machine in which you want to install VMware tools, choose **Guest**, and then choose **Install/Upgrade VMware Tools**. The Install VMware Tools confirmation dialog box opens.
- **Step 6** Click **Ok** in the confirmation dialog box.
- **Step 7** Log into the virtual machine.
- **Step 8** Go to **Start > Open Windows Explorer**.
- **Step 9** Under Computer, click on the **VMware Tools** folder, and then choose **VMware Tools** or **VMware Tools** of **VMware**
- **Step 10** Follow the steps in the wizard to complete the installation.
- Step 11 Click Finish.
- **Step 12** Choose **Yes** when prompted to restart your system.
- **Step 13** To verify the VMware tools installation status, click the **Summary** tab in the vSphere Client GUI. You should see VM Tools Status OK.

For more information, see *The VMware Tools Installation Guide For Operating System Specific Packages*.

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**Related Topics** 

• Downloading and Installing the vSphere Client, page 7-3

# Information About vSwitches

The system creates the following vSwitches in the VMware vSphere Hypervisor<sup>TM</sup>:

• vSwitch0—Uses the MGF interface to connect the VMware vSphere Hypervisor<sup>TM</sup> and the guest virtual machines to the router. The MGF interface is sm *slot*/1.

The vSwitch0 contains two port groups:

 Management Network—Used by the vSphere client to connect to the VMware vSphere Hypervisor<sup>TM</sup>.



Do not modify the Management Network port group.

 VM Network—Used by the guest virtual machines for sending and receiving network traffic through the Cisco ISR G2.



You can modify the VM Network port group.

 ciscoSwitchLocal—Contains the ciscoReservedLocal port group. The ciscoSwitchLocal along with the ciscoReservedLocal port group is used for internal communication within the Cisco SRE Service Module.



Do not modify the ciscoSwitchLocal or the ciscoReservedLocal port group.

- ciscoSwitch—Contains the CiscoReserved port group. The ciscoSwitch along with the CiscoReserved port group is used for the following:
  - Internal communication between the Cisco ISR G2 and the Cisco SRE Service Module.
  - External connection to the Cisco SRE Service Module management interface, such as SSH, CLM, and web service API.



Do not modify the ciscoSwitch or the CiscoReserved port group.

To display the vSwitches and port groups in the VMware vSphere Hypervisor<sup>TM</sup>, use the **show hypervisor vswitch** command from the console manager interface. For details, see the "Viewing vSwitches in the VMware vSphere Hypervisor" section on page 8-12.

#### Example

SRE-Module# show	hyperv	visor v	vswit	ch					
Switch Name vSwitch0	Num Pc 128	orts	Usec 3	l Ports	Con 128	figured	Ports	MTU 1500	Uplinks vmnic2
PortGroup Name VM Network Management Netw	work	VLAN 0 0	ID	Used Po 0 1	rts	Uplinks vmnic2 vmnic2			
Switch Name ciscoSwitchLocal	Num Pc	orts 8	Used	l Ports 3	Con	figured 8	Ports	MTU	Uplinks 1500
PortGroup Name CiscoReservedL	ocal	VLAN	ID	Used Po O	rts	Uplinks 2			
Switch Name ciscoSwitch PortGroup Name CiscoReserved	Num Pc 8 V	orts TLAN II 0	Used 3 D Us	l Ports sed Port 1	Con 8 s Uj	figured plinks vmnic1	Ports	MTU 1500	Uplinks vmnic1









# Managing Virtual Machines Using the Cisco SRE-V CLI



We recommend that you use the vSphere Client GUI instead of the Cisco SRE-V CLI to manage virtual machines. See Chapter 7, "Managing Virtual Machines."

You can use the Cisco SRE-V CLI to export, import, power-on, power-off, shutdown, delete, troubleshoot, or view details about virtual machines. See the following topics for more information:

- Exporting the Virtual Machine to a Remote Location, page 8-1
- Importing the Virtual Machine to VMware vSphere Hypervisor, page 8-2
- Deleting a Virtual Machine, page 8-5
- Managing System Logs, page 8-6
- Changing the VMware vSphere Hypervisor Root Password, page 8-10
- Viewing Information About a Specific Virtual Machine, page 8-10
- Viewing Information About All Virtual Machines, page 8-11
- Viewing VMware vSphere Hypervisor Management Settings, page 8-12
- Viewing vSwitches in the VMware vSphere Hypervisor, page 8-12
- Viewing VMkernel NICs in the VMware vSphere Hypervisor, page 8-13
- Power on, Power off, or Shut Down a Virtual Machine, page 8-14

# **Exporting the Virtual Machine to a Remote Location**

To export the virtual machine in OVF format and upload it to a specified remote location, use the following command:

virtual-machine export vm name remote url [username username password]

#### PREREQUISITES

Make sure that the virtual machine that you want to export is not running.

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. virtual-machine export vm name remote url [username username password]

#### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose			
Step 1	<pre>virtual-machine export vm name remote url [username username password password]</pre>	Exports the virtual machine in OVF format and uploads it to a specified remote location.			
	<b>Example:</b> SRE-Module# virtual-machine export Win2K3 ftn://ftnserver.com/dir	• <i>vm name</i> —Unique string used to identify the virtual machine. Maximum string length: 32 alphanumeric characters.			
	COMPLETE	<b>Note</b> If the virtual machine name contains a space, make sure that you add the name in quotes, otherwise, the export operation will fail. For example "Win 2K3".			
		• <i>remote url</i> —URL where the virtual machine (Microsoft Windows image) must be exported. Supported protocols: FTP, FTPS, and SFTP.			
		• <b>username</b> <i>username</i> —(Optional) Specifies the login name of the user who has access to the remote site.			
		username—Unique string to log into the remote site.			
		• <b>password</b> <i>password</i> —(Optional) Specifies the password used with the username to access the remote site.			
		<i>password</i> —Unique string used with the username to access the remote site.			

#### **Related Topics**

• Importing the Virtual Machine to VMware vSphere Hypervisor, page 8-2

# Importing the Virtual Machine to VMware vSphere Hypervisor

To import a virtual machine in OVF format from a specified remote location to a data store in VMware vSphere Hypervisor<sup>TM</sup>, use the following command:

#### virtual-machine import remote url datastore data store name [username username password password] [name vm name]

#### PREREQUISITES

Make sure you have done the following:

- Cisco SRE-V license is activated.
- Firewall rules are set up correctly so that the Cisco SRE Service Module console manager interface can reach the remote URL.
- VMware vSphere Hypervisor<sup>TM</sup> default gateway IP address is configured. See the "Setting up the VMware vSphere Hypervisor Default Gateway" section on page 7-1.
- Read the "Important Information About Creating Virtual Machines" section on page 7-5.

#### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. virtual-machine import remote url datastore data store name [username username password password] [name vm name]

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

Step 1virtual-machine import remote url datastore data store name [username username password password] [name vm name]Imports the virtual machine from the specified re- location to a data store in VM ware vSphere Hype The imported image must be in OVF format.Example: SRE-Module# virtual-machine import ftp://1.1.1.1/x/y.ovf datastore datastore1 Evaluation licenses are being activated in the device for the following feature(s):Imports the virtual machine from the specified re- location to a data store in VM ware vSphere Hype The imported image must be in OVF format.SRE-Module# virtual-machine import ftp://1.1.1.1/x/y.ovf datastore datastore1 Evaluation licenses are being activated in the device for the following feature(s):Mote remote url—URL where the virtual machine imported is located. Supported protocols: FT and SFTP.Feature Name:SRE-V-HOST-LICdatastore data store name—Specifies the name	mote rvisor <sup>TM</sup> .
Example: SRE-Module# virtual-machine import ftp://1.1.1.1/x/y.ovf datastore datastore1 Evaluation licenses are being activated in the 	
<ul> <li>EULA contents</li> <li>ACCEPT? [y/n]? y</li> <li>COMPLETE</li> <li>data store where the virtual machine you are in must reside.</li> <li>data store name—Name of the data store where the virtual machine you are importing must reside.</li> <li>username username—(Optional) Specifies the name of the user who has access to the remote username—Unique string used with the username to provide the remote site.</li> <li>name vm name—(Optional) Specifies the name virtual machine.</li> <li>vm name—Unique string used to identify the machine.</li> <li>Note If the virtual machine name contains a spa sure that you add the name in quotes, other</li> </ul>	t contain 'ill fail. to be 2, FTPS, ne of the mporting ere the e. ne login e site. ote site. e access to name to ne of the virtual umeric tee, make ewise, the


If you purchased the Cisco SRE-V Option 3 (Hardware, plus Virtualization software, plus Microsoft Windows software), a virtual machine is provided to you by default. Both the Virtualization software license and the Microsoft Windows software license on this virtual machine are preactivated. If you choose to export this virtual machine and then import it back, you must do the following, otherwise, the Microsoft Windows software license activation will fail:

• Manually add the following configuration lines to the OVF file in the Virtual Hardware section:

```
<VirtualHardwareSection>
....
....
.vmw:ExtraConfig vmw:key="acpi.passthru.slic" vmw:value="true"/>
.vmw:ExtraConfig vmw:key="acpi.passthru.slicvendor" vmw:value="true"/>
.vmw:ExtraConfig vmw:key="smbios.addhostvendor" vmw:value="true"/>
....
```

• Before you power on the virtual machine, verify that the VMX files contain the following parameters. If these parameters are missing, you must add them:

```
uuid.action = "create"
pcie.reportDataLink= "TRUE"
```

#### **Related Topics**

• Exporting the Virtual Machine to a Remote Location, page 8-1

# **Deleting a Virtual Machine**

To remove the specified virtual machine from the inventory and delete all of its files from the data store, use the following command:

virtual-machine delete vm name [noconfirm]

### PREREQUISITES

Make sure that virtual machine is shut down or powered off.

### SUMMARY STEPS

From the Console Manager interface, enter:

1. virtual-machine delete vm name [noconfirm]

Γ

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose			
Step 1	virtual-machine delete vm name [noconfirm]	Removes the specified virtual machine from the inventory and deletes all of its files from the data store.			
	<b>Example:</b> SRE-Module# virtual-machine delete windows-2008 This will delete the virtual machine and all of its related files. Do you wish to continue? $(y/n) y$	<ul> <li><i>vm name</i>—Unique string used to identify the virtual machine. Maximum string length: 32 alphanumeric characters. The virtual machine name is case sensitive.</li> <li><b>noconfirm</b>—(Optional) Powers on, powers off, or shuts down the specified virtual machine without providing a confirmation message.</li> </ul>			

# **Managing System Logs**

System logs list events, alarms, and assorted logs that contain information about activities in your vSphere environment. For information about storing, removing, and viewing logs see the following sections:

- Storing System Logs in a File in the Local Datastore, page 8-6
- Storing System Logs in a Remote Server, page 8-7
- Removing System Logs from a Local File or a Remote Server, page 8-8
- Viewing VMware vSphere Hypervisor Logs, page 8-8
- Viewing VMware vSphere Hypervisor Datastore Information, page 8-9

## Storing System Logs in a File in the Local Datastore

To store system logs in a file in the local datastore, use the following command:

hypervisor set syslog local datastore datastore name file file name

### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. hypervisor set syslog local datastore datastore name file file name

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose			
Step 1	<b>hypervisor set syslog local datastore</b> <i>datastore name</i> <b>file</b> <i>file name</i>	Specifies the file in a local datastore in which the system logs are stored.			
	Example:	• <i>datastore name</i> —Name of the datastore in which to store the system log file.			
	SRE-Module# hypervisor set syslog local datastore datastore0 file /var/log/mysyslog.log	• <b>file</b> <i>file name</i> —Specifies the name of the file in which to store the system logs.			
		<i>file name</i> —Name of the file in which to store the system logs.			

## Storing System Logs in a Remote Server

To store system log file in a remote server, use the following command:

hypervisor set syslog remote hostname hostname port port number

### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. hypervisor set syslog remote hostname hostname port port number

### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose			
Step 1	hypervisor set syslog remote hostname hostname port port number	Specifies the remote server in which the system logs are stored.			
	<b>Example:</b> SRE-Module# hypervisor set syslog remote	<ul> <li><i>hostname</i>—Hostname or IP address of the remote server in which to store the system logs.</li> <li><i>port part number</i>. Specifies the part number of the server in the server in</li></ul>			
	hostname 1.100.50.11 port 1000	• <b>port</b> <i>port number</i> —specifies the port number of the remote syslog server in which to store the system logs.			
		<i>port number</i> —Port number of the remote syslog server in which to store the system logs.			

## **Removing System Logs from a Local File or a Remote Server**

To remove the system logs from a local file in the datastore or from a remote server, use the following command:

hypervisor unset syslog {local | remote}

### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. hypervisor unset syslog {local | remote}

### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose		
Step 1	hypervisor unset syslog {local   remote}	Removes the system logs from a local file in the datastore or from a remote server.		
	<b>Example:</b> SRE-Module# hypervisor set syslog remote hostname 1.100.50.11 port 1000	<ul> <li>local—Removes the system logs from the local file in the datastore in which the logs reside.</li> <li>remote—Removes the system logs from the remote server in which the logs reside.</li> </ul>		

## Viewing VMware vSphere Hypervisor Logs

To display system messages, system boot logs, and host VMware vSphere Hypervisor<sup>TM</sup> logs, use the following command:

show hypervisor log {messages | config | mgmt-agent}

### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. show hypervisor log {messages | config | mgmt-agent}

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose			
Step 1	<pre>show hypervisor log {messages   config   mgmt-agent}</pre>	Displays system messages, system boot logs, and host VMware vSphere Hypervisor <sup>TM</sup> logs.			
	<b>Example:</b> SRE-Module# show hypervisor log config	<ul> <li>messages—Displays the VMware vSphere Hypervisor<sup>TM</sup> system messages. This log file is located at /var/log/messages.</li> <li>File size: Approximately 1.1 MB.</li> </ul>			
		• <b>config</b> —Displays the VMware vSphere Hypervisor <sup>TM</sup> system boot logs. This log file is located at /var/log/sysboot.log. File size: Approximately 12 K.			
		<ul> <li>mgmt-agent—Displays the VMware vSphere Hypervisor<sup>TM</sup> host logs. This log file is located at /var/log/VMware/hostd.log.</li> <li>File size: Approximately 512 K.</li> </ul>			

## Viewing VMware vSphere Hypervisor Datastore Information

To view details such as name, capacity, and free space available on all of the existing datastores in VMware vSphere Hypervisor<sup>TM</sup>, use the following command:

show hypervisor datastore [all]

### **SUMMARY STEPS**

From the Console Manager interface, enter:

#### 1. show hypervisor datastore [all]

### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or A	ction		Purpose		
tep 1	show hypervi	sor datastore [a	11]	Displays details, such as the name, capacity, and free spa available on all of the existing data stores in the VMwar vSphere Hypervisor <sup>TM</sup> .		
	SRE-Module# Name datastore1	show hypervisor Capacity 500GB	datastore Free Space 200GB	• <b>all</b> —(Optional) Displays details, such as the name, capacity, and free space available on all of the existing data stores in the VMware vSphere Hypervisor <sup>TM</sup> .		

# **Changing the VMware vSphere Hypervisor Root Password**

The root password is the password used between the Management virtual machine and the VMware vSphere Hypervisor<sup>TM</sup>. The root password is used internally for management purposes, which you can change. To change the root password, you provide a password seed. The system uses the password seed to generate the new root password.

To change the root password, use the following command:

hypervisor set password seed password\_seed

### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. hypervisor set password seed password\_seed

### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose			
Step 1	hypervisor set password seed password_seed Example: SRE-Module# hypervisor set password seed Ci5co\$ysTems	Specifies the password seed, which the system uses to generate the new root password. After the new password is generated, it takes effect immediately. Ensure that you keep the password seed securely. You cannot retrieve the root password, but the password seed is required to help recover the root password for technical assistance.			
		• <b>seed</b> <i>password_seed</i> —Unique string used by the system to generate the root password. The seed password is case sensitive and can contain a mix of characters from the following four character classes:			
		- Lowercase letters			
		- Uppercase letters			
		– Digits			
		- Special characters, such as ~! @ # \$ % ^ & * () + = / <>. ,			

# **Viewing Information About a Specific Virtual Machine**

To view details such as CPU, memory size, disk size, interfaces, status, and VMware tools about a specific virtual machine, use the following command:

show virtual-machine name vm name

### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. show virtual-machine name vm name

### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Act	ion	Purpose		
Step 1	<pre>show virtual-m Example: SRE-Module# sh CPU: Memory Size: vDisk(s): vNIC(s): Status: VMware Tools:</pre>	achine name vm name ow virtual-machine name Win2K3 2 vCPUs 1 GB Disk 1(200 GB) NIC 1(MAC=1234.5678.ABCD) NIC 2(MAC=1234.5678.EFGH) Running Installed	<ul> <li>Displays details such as, CPU, memory size, disk size, interfaces, status, and VMware tools about a specific virtual machine.</li> <li><i>vm name</i>—Unique string used to identify the virtual machine. Maximum string length: 32 alphanumeric characters. The virtual machine name is case sensitive.</li> </ul>		

# **Viewing Information About All Virtual Machines**

To view a list of all of the virtual machines in the system and their running status, use the following command:

show virtual-machine [all]

### **SUMMARY STEPS**

From the Console Manager interface, enter:

#### 1. show virtual-machine [all]

### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action show virtual-machine [all]			Purpose           Lists all of the virtual machines in the system and their running status: Running or Stopped.		
Step 1						
	Example: SRE-Module# show virtual-machine Name Status Win2K3 Running Win2K8 Stopped		• al sy Note	I—(Optional) Lists all the virtual machines in the estem and their running status: Running or Stopped. The management virtual machine is not displayed in the list.		

# **Viewing VMware vSphere Hypervisor Management Settings**

The management network is the network that is used to connect to the VMware vSphere Hypervisor<sup>TM</sup> remotely. To view the VMware vSphere Hypervisor<sup>TM</sup> management network settings, such as the hostname, IP address, subnet mask, IP gateway, and DNS server, use the following command:

show hypervisor ip

### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. show hypervisor ip

#### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose		
Step 1	<pre>show hypervisor ip Example: SRE-Module# show hypervisor ip</pre>	Displays the VMware vSphere Hypervisor <sup>TM</sup> management network settings, such as the hostname, IP address, subnet mask, IP gateway, and the primary and secondary DNS servers.		
	Hostname: esxi-blade IP Address: 1.100.80.30 Subnet Mask: 255.255.255.0 IP Gateway: 1.100.80.1 Preferred DNS Server: 1.100.80.5 Alternative DNS Server: 1.100.80.6	<b>Note</b> The preferred DNS server is the primary DNS server and the alternative DNS server is the secondary DNS server.		

# Viewing vSwitches in the VMware vSphere Hypervisor

To view the vSwitches and port groups in VMware vSphere Hypervisor<sup>TM</sup>, use the following command:

show hypervisor vswitch [all]

### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. show hypervisor vswitch [all]

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose			
Step 1	show hypervisor vswitch [all]	Displays all of the existing vSwitches and port groups in the VMware vSphere Hypervisor <sup>TM</sup> . See the "Information About vSwitches" section on page 7-8.			
		• <b>all</b> —(Optional) Displays all of the existing vSwitches and port groups in the VMware vSphere Hypervisor <sup>TM</sup> .			

#### Example:

SRE-Module# <b>show</b>	hype	ervisor v	vswit	ch				
Switch Name vSwitch0	Num 128	Ports	Useo 3	l Ports	Con 128	figured Ports	MTU 1500	Uplinks vmnic2
PortGroup Name portgroup0 Management Netw	work	VLAN 0 0	ID	Used Po: 0 1	rts	Uplinks vmnic2 vmnic2		
Switch Name hgSwitch	Num 8	Ports	Useo 3	l Ports	Con 8	figured Ports	MTU 1500	Uplinks
PortGroup Name hgNet		VLAN 0	ID	Used Po: 2	rts	Uplinks		
Switch Name ciscoSwitch	Num 8	Ports	Useo 3	l Ports	Con 8	figured Ports	MTU 1500	Uplinks vmnic1
PortGroup Name CiscoReserved		VLAN 0	ID	Used Po: 1	rts	Uplinks vmnic1		

# Viewing VMkernel NICs in the VMware vSphere Hypervisor

The VMkernel TCP/IP stack handles traffic for VMware vSphere Hypervisor<sup>TM</sup> services such as, VMware vMotion, ISCSI, NFS, and host management.

To view all of the VMkernel NICs on the VMware vSphere Hypervisor<sup>TM</sup>, use the following command:

show hypervisor vmknic [all]

### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. show hypervisor vmknic [all]

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	show hypervisor vmknic [all]	Displays all of the VMkernel NICs on the VMware vSphere Hypervisor <sup>TM</sup> .
		• <b>all</b> —(Optional) Displays all of the VMkernel NICs on the VMware vSphere Hypervisor <sup>TM</sup> .

#### Example:

SRE-Module# show hypervisor vmknic				
Intf.	Portgroup/DVPort	IP Address	Netmask	MAC
vmk0 vmk1	Management Network hgNet	1.100.50.160 169.254.1.1	255.255.255.0 255.255.255.0	00:23:eb:a1:05:e7 00:50:56:73:96:e8

```
2 total VMkernel nic(s)
```

# Power on, Power off, or Shut Down a Virtual Machine

To power on, power off, or shut down a virtual machine, use the following command:

virtual-machine {power-on | power-off | shutdown} vm name [noconfirm]

### PREREQUISITES

- To power on a virtual machine, make sure that the virtual machine is not running.
- To power off a virtual machine, make sure that the virtual machine is running.
- To shut down a virtual machine, verify the following:
  - Make sure that the virtual machine is running.
  - Make sure that VMware tools are installed on the virtual machine.

### **SUMMARY STEPS**

From the Console Manager interface, enter:

1. virtual-machine {power-on | power-off | shutdown} vm name [noconfirm]

### **DETAILED STEPS**

To perform configuration tasks on the Cisco SRE Service Module, you must enter the Cisco SRE-V command environment, and then enter the configuration commands. See the "Entering the Cisco SRE-V Command Environment" section on page 5-3.

	Command or Action	Purpose
Step 1	virtual-machine {power-on   power-off   shutdown} vm name [noconfirm]	Powers on, powers off, or shuts down the specified virtual machine.
	<pre>Example: SRE-Module# virtual-machine power-on windows-2008 SRE-Module# virtual-machine power-off windows-2008 This will do a forced shutdown of the virtual machine. This may cause data loss or corruption. Do you wish to continue? (y/n) n SRE-Module# virtual-machine power-off noconfirm windows-2008 SRE-Module# virtual-machine shutdown windows-2008 The virtual machine "windows-2008" cannot be shutdown, no VMware tools installed.</pre>	<ul> <li>power-on—Powers on the virtual machine.</li> <li>power-off—Powers off the virtual machine. The power-off command causes a forced shutdown of the virtual machine, which might result in loss or corruption of data.</li> <li>shutdown—Shuts down the virtual machine gracefully. Only the virtual machines that have VMware tools installed on them shutdown gracefully.</li> <li><i>vm name</i>—Unique string used to identify the virtual machine. Maximum string length: 32 alphanumeric characters. The virtual machine name is case sensitive.</li> <li>noconfirm—(Optional) Powers on, powers off, or shuts down the specified virtual machine without providing a confirmation message.</li> </ul>







# **Recovering from Device or Software Failure**

To transfer a software license from a failed device to a new device, use the Return Merchandise Authorization (RMA) replacement license transfer process.

If the Microsoft Windows software gets corrupted or accidently deleted from your system, reinstall Microsoft Windows by using the Microsoft Windows Server 2008 recovery DVD, which you received when you purchased the Cisco SRE-V Option 3 (Hardware, plus Virtualization software, plus Microsoft Windows software). For Cisco SRE-V options, see Figure 1-3.

This chapter contains the following sections:

- RMA Replacement License Transfer Process Overview, page 9-1
- Recovering from a Microsoft Windows Software Failure, page 9-3

# **RMA Replacement License Transfer Process Overview**

To transfer a software license from a failed device to a new device, use the Cisco Product License Registration portal to initiate a RMA replacement license

(https://tools.cisco.com/SWIFT/Licensing/LicenseAdminServlet/rmaLicenseTransfer).

If you need assistance to obtain a license, contact Cisco technical support at: http://www.cisco.com/techsupport.

To transfer the license from the failed device to the new device, use the RMA License Transfer portal. See the "Transferring Licenses From a Failed Device to a New Device" section on page 9-2.

## **Transferring Licenses From a Failed Device to a New Device**

Figure 9-1 shows the RMA license replacement process.



To transfer licenses from a failed device to a new device, complete the following steps:

- Step 1 Obtain the Universal Device Identifier (UDI) of the defective device and the RMA device.
- Step 2 Enter the UDI into the RMA License portal tool on Cisco.com.

The license portal determines the licenses that are associated with defective device, and then issues replacement licenses.

- **Step 3** Install the replacement license on the new device.
- **Step 4** Do the following:
  - **a.** Provide Cisco TAC access to the new device, and then have Cisco TAC install the OEM Microsoft Windows marker on the device.
  - **b.** Install the Microsoft Windows software using the Microsoft Windows Server 2008 recovery DVD, which you received when you purchased the Cisco SRE-V Option 3 (Hardware, plus Virtualization software, plus Microsoft Windows software). For Cisco SRE-V options, see Figure 1-3.

Use the vSphere Client GUI (recommended) or the Cisco SRE-V CLI to install Microsoft Windows. See the "Recovering from a Microsoft Windows Software Failure" section on page 9-3.

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# **Recovering from a Microsoft Windows Software Failure**

If the Microsoft Windows software gets corrupted or accidently deleted from your system, reinstall Microsoft Windows by using the Microsoft Windows Server 2008 recovery DVD, which you received when you purchased the Cisco SRE-V Option 3 (Hardware, plus Virtualization software, plus Microsoft Windows software). For Cisco SRE-V options, see Figure 1-3.

To recover from a Microsoft Windows software failure, complete the following steps:

- Step 1 If the Microsoft Windows software gets corrupted, delete it from your system.
- Step 2 Install Microsoft Windows software. You can use the vSphere Client GUI (recommended) or the Cisco SRE-V CLI to install Microsoft Windows.
- **Step 3** To use the vSphere Client GUI to install and manage Microsoft Windows virtual machines, do the following:
  - **a.** Install Microsoft Windows Server 2008 from the recovery DVD. After Microsoft Windows 2008 Server is installed, a virtual machine is created.
  - b. Click the VMware vSphere Client icon on your desktop to open the login window.
  - c. Enter the IP address or hostname of the VMware vSphere Hypervisor<sup>TM</sup> and the username and password, and then click Login. The VSphere Client GUI opens.
  - d. Choose File > Deploy OVF Template... The Deploy OVF Template wizard opens.
  - e. Choose the Deploy from File radio button.
  - f. Enter the location of the recovery DVD in the field provided, or click **Browse...**, and then navigate to the location where you copied the contents of the recovery DVD.
  - **g.** Click **Next** >. The OVF Template Details page opens, which summarizes the information about the OVF template.
  - h. Verify the details, and then click Next >. The End User License Agreement Page opens.
  - i. Click Accept if you agree with the terms and conditions, and then click Next >. The Name and Location page opens.
  - **j**. Enter a unique name for the deployed OVF template, and then select the folder location within the inventory where the OVF template must reside.

The name can contain a maximum of 80 characters. It must be unique within the virtual machine folder. The name is case sensitive.

- k. Click Next >. The Network Mapping page opens.
- I. Specify the networks that must use the deployed OVF template. To change the destination network, click the network listed in the Destination Network column, and then choose a network from the drop-down list.
- **m.** Click **Next** >. The Ready to Complete page opens where you can verify the OVF template's configuration.
- n. Click Finish.









# Configuring the Cisco SRE Service Module Interfaces—Cisco IOS Version 15.1(2)T

Note

If the ISR G2 in which the Cisco SRE Service Module is installed is running Cisco IOS version 15.1(2)T, and you do not want to upgrade to the supported Cisco IOS version (see the "Verifying the Router, Cisco SRE Service Module, and Cisco IOS Software Version Compatibility" section on page 2-2), follow the procedure documented in this appendix to configure the Cisco SRE Service Module interfaces.

Caution

You cannot configure VLANs for Cisco SRE Service Modules if the ISR G2 is running Cisco IOS version 15.1(2)T.

This chapter provides information about how to configure the Cisco SRE Service Module interfaces to run the Cisco SRE-V System software.

This chapter contains the following sections:

- Basic Workflow for Configuring the Cisco SRE Service Module Interfaces, page A-1
- Cisco SRE Service Module Interfaces Overview, page A-2
- Configuring the Cisco SRE Service Module Interfaces, page A-5

# Basic Workflow for Configuring the Cisco SRE Service Module Interfaces

- 1. Configure the service-module interface on the router. See the "Configuring the Service-Module Interface on the Router" section on page A-6.
- 2. Configure the MGF interface on the module. See the "Configuring the MGF Interface on the Module" section on page A-8.

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# **Cisco SRE Service Module Interfaces Overview**

The host router and the Cisco SRE Service Module use several interfaces for internal and external communication. Use the Cisco IOS CLI commands to configure each of the interfaces on the router.

Before configuring the interfaces, make sure that you have the following information for entering the Cisco SRE Service Module command environment:

- IP address of the Cisco router that contains the Cisco SRE Service Module.
- Username and password for logging into the router.
- Slot and unit number of the Cisco SRE Service Module.

The service module communicates with the host router through two internal Gigabit Ethernet (GE) interfaces:

- One GE interface connects to the router Peripheral Component Interconnect Express (PCIe). Use the Cisco IOS CLI to configure and manage this interface. This interface is sm *slot/*0.
- The other GE interface connects to the multi-gigabit fabric (MGF). Use the Cisco IOS CLI to configure the IP address of the MGF interface for the VMware vSphere Hypervisor<sup>TM</sup>. This configuration allows the VSphere Client to communicate with the VMware vSphere Hypervisor<sup>TM</sup>. This interface is sm *slot*/1.
- There is a third Gigabit Ethernet interface, which is located on the external face plate of the Cisco SRE Service Module. This Gigabit Ethernet interface is configured and managed by the VMware vSphere Hypervisor<sup>TM</sup>.

See Figure A-1.



### Figure A-1 Host Router and Cisco SRE Service Module Interfaces

Callout	Location	Cisco SRE Service Module Interface	Slot and Port	Configure IP Address	Configure From
1	PCIe Link	Service-Module interface	slot/0	IP address of the router side of the interface	Cisco IOS CLI
				Example:	
				Router(config-if)# ip address 10.0.0.1 255.255.255.0	
2				IP address of the module side of the interface	
				Example:	
				Router(config-if)# service-module ip address 10.0.0.2 255.255.255.0	

Callout	Location	Cisco SRE Service Module Interface	Slot and Port	Configure IP Address	Configure From
3	MGF Link	MGF interface (Module interface to manage virtual machines)	slot/1	IP address of the router side of the interface	Cisco IOS CLI
				Example:	
				Router(config-if)# ip address 10.10.10.1 255.255.255.0	
4				IP address of the module side of the interface	
				Example:	
				Router(config-if)# service-module ip address 10.10.10.2 255.255.255.0	
5	Module Faceplate	External interface (Module interface to external link)		_	VMware vSphere Hypervisor <sup>TM</sup>

See the following sections for more information:

- Service-Module Interface, page A-4
- MGF Interface, page A-4
- External Service Module Interface, page A-5

## **Service-Module Interface**

The service-module interface is used to access the service module console for configuration. Visible only to the Cisco IOS software on the host router, the service-module interface is an internal GE interface between the router and the Cisco SRE Service Module. The service-module interface connects to the router PCIe and all configuration and management of the service-module interface is performed using the Cisco IOS CLI.

## **MGF Interface**

The MGF interface enables the Cisco SRE Service Module to communicate with one or more service modules installed in the host router. Configuration of the MGF interface is performed from the Cisco IOS CLI. The Cisco-authorized application running that is on the Cisco SRE Service Module manages the connections. For more information about configuring MGF, see the "Multi-Gigabit Fabric on the Router" chapter in the *Cisco 3900 Series, 2900 Series, and 1900 Series Integrated Services Routers Software Configuration Guide* on Cisco.com.

## **External Service Module Interface**

The external service-module interface can be used as a backup interface to connect the VMware vSphere Hypervisor directly to the LAN. Unlike the internal interfaces, the external interface is primarily controlled and managed by the VMware vSphere Hypervisor. The traffic does not go into the router unless the VMware vSphere Hypervisor is configured to forward the traffic into the router through the MGF interface.

# **Configuring the Cisco SRE Service Module Interfaces**

This section describes how to configure basic network parameters for the Cisco SRE Service Module using the Cisco IOS CLI. It contains the following sections:

- Perquisites for Configuring the Cisco SRE Service Module Interfaces, page A-5
- Configuring the Service-Module Interface on the Router, page A-6
- Configuring the MGF Interface on the Module, page A-8

## Perquisites for Configuring the Cisco SRE Service Module Interfaces

### **Cisco Router Prerequisites**

Make sure that your Cisco router is running the appropriate Cisco IOS software version and recognizes the Cisco SRE Service Module.

### **Cisco SRE Service Module Prerequisites**



In most cases, the routers are shipped with the Cisco SRE Service Module already installed in them.

Make a note of the Cisco SRE Service Module slot location in the host router:

- *slot*—ID of the host router chassis slot in which the Cisco SRE Service Module resides. After you install the module, you can obtain this information by using the Cisco IOS software CLI **show running-config** command.
- *port*—ID of the Network Interface Card (NIC) on the Cisco SRE Service Module. The value is 0 for the PCIe interface and 1 for the MGF interface.

### FTP/SFTP/HTTP Server Prerequisites

- If you need to download a new image, access a FTP, Secure FTP (SFTP), or HTTP server.
- Verify that the FTP/SFTP/HTTP server is accessible.

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## **Configuring the Service-Module Interface on the Router**

Configure the internal interface between the Cisco SRE Service Module and the host router. This initial configuration allows you to access the service module to install and configure the Cisco SRE-V application.

### PREREQUISITES

See the "Perquisites for Configuring the Cisco SRE Service Module Interfaces" section on page A-5.

### **SUMMARY STEPS**

#### From the Host-Router CLI

- 1. enable
- 2. configure terminal
- 3. interface sm slot/0
- 4. ip address router-side-ip-address subnet-mask or

ip unnumbered type number

- 5. service-module ip address module-side-ip-address subnet-mask
- 6. service-module ip default-gateway gateway-ip-address
- 7. no shut
- 8. end
- 9. copy running-config startup-config
- 10. show running-config

#### **DETAILED STEPS**

	Command or Action	Purpose		
	From the Host-Router CLI			
Step 1	<b>enable</b> <password></password>	Enters privileged EXEC mode on the host router. Enter your password if prompted.		
	Example:			
	Router> enable			
	Router> <password></password>			
	Router#			
Step 2	configure terminal	Enters global configuration mode on the host router.		
	<b>Example:</b> Router# configure terminal			
Step 3	<pre>interface sm slot/0</pre>	Enters interface configuration mode for the slot and port where the Cisco SRE Service Module resides.		
	Example:			
	Router(config)# interface sm 1/0			

	Command or Action	Purpose
Step 4	ip address router-side-ip-address subnet-mask	Specifies the IP address for the router side of the interface.
	Of ip unnumbered type number exit ip route service-module-ip-address subnet-mask sm slot/0	<ul> <li>router-side-ip-address subnet-mask—IP address and subnet mask for the router.</li> <li>or</li> <li>Enables IP processing on an interface without assigning an</li> </ul>
		explicit IP address to the interface.
	<b>Example:</b> Router(config-if)# ip address 10.0.0.1 255.255.255.0	<ul> <li><i>type</i>—Type of interface on which the router has an assigned IP address.</li> <li><i>number</i>—Number of the interface on which the router</li> </ul>
	<pre>Or Router(config-if)# ip unnumbered gigabitethernet 1/0 Router(config-if)# exit</pre>	has an assigned IP address. Note The unnumbered interface cannot be another unnumbered interface.
	Router(config)# ip route 192.168.100.60 255.255.255.255 SM1/0	<ul> <li><i>service-module-ip-address subnet-mask</i>—IP address and subnet mask of the service module.</li> </ul>
		• <i>slot/0</i> —slot and port where the Cisco SRE Service Module resides.
Step 5	<pre>service-module ip address module-side-ip-address subnet-mask Example: Router(config-if)# service-module ip address</pre>	<ul> <li>Specifies the IP address for the module side of the interface.</li> <li><i>module-side-ip-address</i>—IP address for the module.</li> <li><i>subnet-mask</i>—Subnet mask to append to the IP address; must be in the same subnet as the host router.</li> </ul>
Step 6	10.0.0.2 255.255.255.0 service-module ip default-gateway gateway-ip-address	Specifies the IP address of the default gateway for the module.
	<b>Example:</b> Router(config-if)# service-module ip default-gateway 10.0.0.1	• <i>gateway-ip-address</i> —IP address for the default router.
Step 7	no shut	Causes the interface to be administratively down.
	<b>Example:</b> Router# no shut	
Step 8	end	Returns to global configuration mode on the host router.
	<b>Example:</b> Router(config-if)# end	

	Command or Action	Purpose
Step 9	copy running-config startup-config	Saves the new running configuration of the router as the startup configuration.
	<b>Example:</b> Router# copy running-config startup-config	
Step 10	show running-config	Displays the running configuration of the router so that you can verify the address configurations.
	<b>Example:</b> Router# show running-config	

#### Example

The following example shows the configuration of the internal interface between the Cisco SRE Service Module and the router:

```
interface SM1/0
ip address 10.0.0.1 255.255.255.0
service-module ip address 10.0.0.2 255.255.255.0
service-module ip default-gateway 10.0.0.1
```

## Configuring the MGF Interface on the Module

Cisco 3900 series and 2900 series ISR G2s use the MGF interface to inter-communicate with the router. Next generation module drivers integrate with the MGF to perform port configurations, configure packet flow, and control traffic buffering.

### PREREQUISITES

See the "Perquisites for Configuring the Cisco SRE Service Module Interfaces" section on page A-5.

### SUMMARY STEPS

#### From the Host-Router CLI

- 1. enable
- 2. configure terminal
- 3. interface sm slot/1
- 4. ip address router-side-ip-address subnet-mask
- 5. service-module ip address module-side-ip-address subnet-mask
- 6. end
- 7. copy running-config startup-config
- 8. service module sm slot/0 session

#### From the Console Manager Interface

- 9. hypervisor set ip default-gateway module-side-ip-address
- 10. Press Control-Alt-6 x.

	Command or Action	Purpose	
	From the Host-Router CLI		
Step 1	enable <password></password>	Enters privileged EXEC mode on the host router. Enter your password if prompted.	
	<b>Example:</b> Router> enable Router> <i><password></password></i> Router#		
Step 2	configure terminal	Enters global configuration mode on the host router.	
	<b>Example:</b> Router# configure terminal		
Step 3	<pre>interface sm slot/1</pre>	Enters interface configuration mode for the slot and port where the Cisco SRE Service Module resides.	
	<b>Example:</b> Router(config)# interface sm 1/1		
Step 4	ip address router-side-ip-address subnet-mask	Specifies the IP address for the router side of the interface.	
	<b>Example:</b> Router(config-if)# ip address 10.10.10.1 255.255.255.0	• <i>router-side-ip-address subnet-mask</i> —IP address and subnet mask for the router.	
Step 5	service-module ip address	Specifies the IP address for the module side of the interface.	
	module-side-ip-address subnet-mask	• <i>module-side-ip-address</i> —IP address for the module.	
	<pre>Example: Router(config-if)# service-module ip address 10.10.10.2 255.255.255.0</pre>	• <i>subnet-mask</i> —Subnet mask to append to the IP address; must be in the same subnet as the host router.	
Step 6	end	Returns to global configuration mode on the host router.	
	<b>Example:</b> Router(config-if)# end		
Step 7	copy running-config startup-config	Saves the new running configuration of the router as the startup configuration.	
	<b>Example:</b> Router# copy running-config startup-config		
Step 8	service module sm slot/0 session	Begins a session on the Cisco SRE Service Module. To start a configuration session, press <b>Enter</b> .	
	Example:		
	Router# service module sm 1/0 session		
	Trying 10.0.0.1, 2065 Open		

	Command or Action	Purpose		
	From the Console Manager Interface—Enter commands in EXEC mode.			
Step 9 Step 10	<b>hypervisor set ip default-gateway</b> router-side-ip-address	<ul> <li>Specifies the default gateway IP address that the VMware vSphere Hypervisor will use to communicate to the VSphere client.</li> <li><i>router-side-ip-address</i>—IP address that you configured for the router side of the interface. See Step 4.</li> </ul>		
	Example:			
	SRE-Module# hypervisor set ip default-gateway 10.10.10.1			
	Press Control-Alt-6 x.	Closes the service module session and returns to the host router CLI.		
		<b>Note</b> The service module session stays up until you clear it in the next step. While it remains up, you can return to it from the router CLI by pressing <b>Enter</b> .		

### **Examples**

The following example shows the configuration of the interface between the Cisco SRE Service Module and the MGF.

interface SM1/1
ip address 10.10.10.1 255.255.255.0
service-module ip address 10.10.10.2 255.255.255.0



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