



Installation and Configuration Guide for Cisco Services Ready Engine Virtualization

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Installation and Configuration Guide for Cisco Services Ready Engine Virtualization Release 2.0
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Preface

This preface describes the audience and conventions of the *Installation and Configuration Guide for Cisco Services Ready Engine Virtualization Release 2.0*. 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 font</i>	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.
<i>italic screen font</i>	Variables you enter.
Option > Network Preferences	Choosing a menu item.

**Note**

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. For more information about these components and associated copyright statements, see:

http://www.cisco.com/en/US/docs/interfaces_modules/services_modules/sre_v/1.5/open_source/licensing/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 Release 2.0* (this document)
- *Release Notes for Cisco Services Ready Engine Virtualization Release 2.0*
- *FAQs and Troubleshooting Guide for Cisco Services Ready Engine Virtualization Release 2.0*
- *Open Source Used In Cisco Services Ready Engine Virtualization Release 2.0*

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>

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS version 2.0.



Configuration Quick Reference

Last Updated: September 17, 2012



Note

- Use this configuration quick reference document if you are familiar with the Cisco Services Ready Engine (SRE) Service Module and VMware vSphere Hypervisor, 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 only if you purchased a blank Cisco SRE Service Module without the Cisco SRE-V or Microsoft Windows software. The steps may be different if you purchased a Cisco SRE Service Module with some of the software preinstalled.

See [Figure i-1](#) for an example of the configuration and [Figure i-2](#) for the location of the IP addresses. Then complete the steps that follow.



Note

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

[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 interfaces.
- The right pane shows where the configuration is applied in Cisco SRE-V.

Figure i-1 Configuration Example

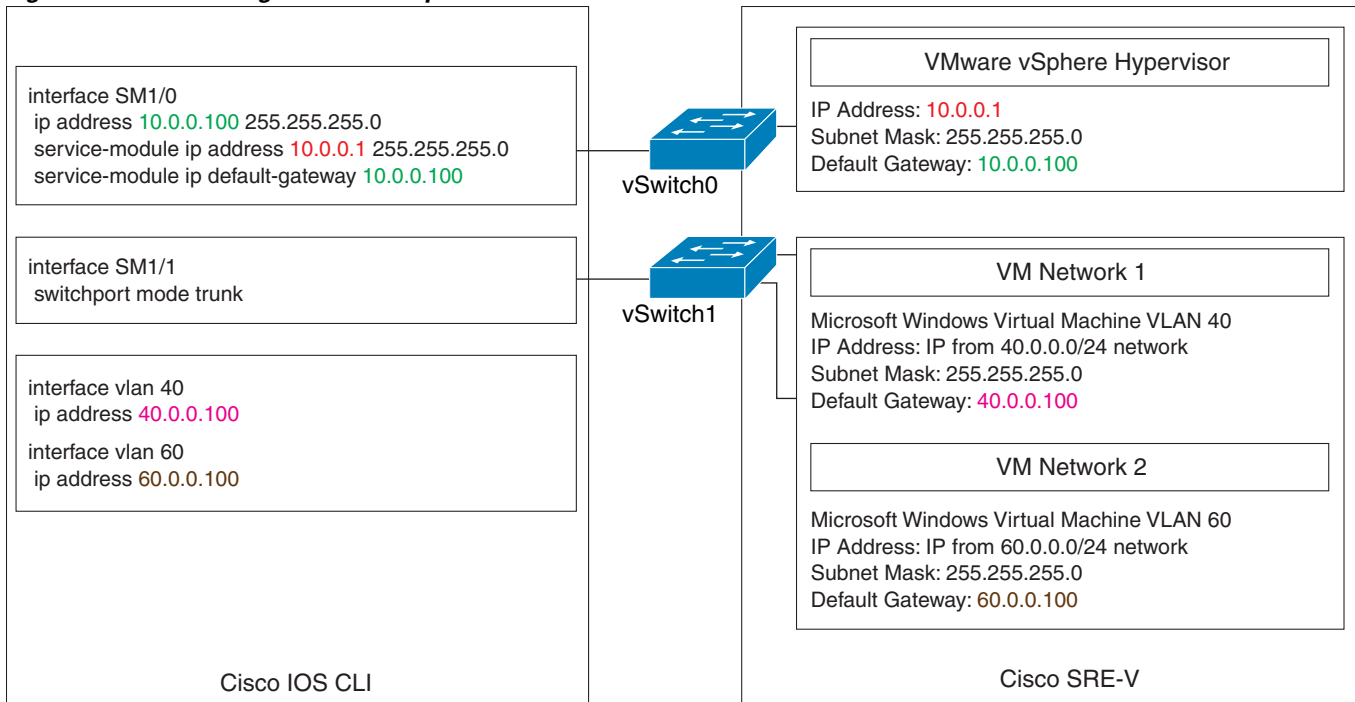
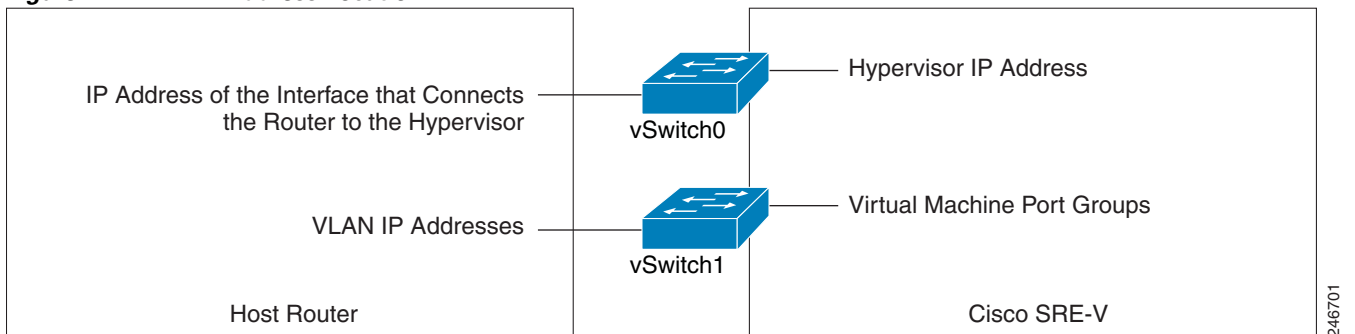


Figure i-2 shows the location of the IP addresses.

To access the VMware vSphere Hypervisor through the ISR G2, you must provide two IP addresses: one IP address is of the interface that connects the router to the VMware vSphere Hypervisor; and the other IP address is of the VMware vSphere Hypervisor.

You can access the virtual machines through the MGF interface. The port groups on a vSwitch in the VMware vSphere Hypervisor can be assigned to corresponding VLAN interfaces in Cisco IOS. For example, port group 50 in the VMware vSphere Hypervisor can be assigned to VLAN 50 in Cisco IOS.

Figure i-2 IP Address Location



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

Procedure

- 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 VMware vSphere Hypervisor:
 - **interface sm slot/0**
 - **ip address router-to-hypervisor-interface-IP-address subnet-mask**
 - **service-module ip address hypervisor-ip-address subnet-mask**
 - **service-module ip default-gateway hypervisor-gateway-ip-address**
 - **no shut**
 - **exit**
 - Configure *slot/1* of the VMware vSphere Hypervisor:
 - **interface sm slot/1**
 - **switchport mode trunk**
 - **exit**
 - Configure VLANs:
 - **configure terminal**
 - **interface vlan vlan_number**
 - **ip address vlan-ip-address subnet mask**
 - **no shut**
 - **end**
 - Save the configuration:
 - **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:

- **enable**
- **service-module sm slot/0 install url url argument disk-cfg-mode={raid1 | raid0 | nonraid}**

For details, see [Chapter 4, “Installing and Managing the Cisco SRE-V Software.”](#)

- Step 5** Register and activate the VMware vSphere Hypervisor license. For details, see [Chapter 5, “Managing the VMware vSphere Hypervisor License.”](#)

- Step 6** Go to <https://hypervisor-ip-address>, and download the vSphere Client. For details, see [Chapter 6, “Managing Virtual Machines.”](#)

- Step 7** Install the vSphere Client. For details, see [Chapter 6, “Managing Virtual Machines.”](#)

- Step 8** Install your own version of the Microsoft Windows Server 2003 software, Microsoft Windows Server 2008 software, or Linux distribution, 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 service module.

- Step 9** 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 10** Install VMware tools. For details, see the [“Installing VMware Tools”](#) section on page 7.
-



CHAPTER 1

Cisco Services Ready Engine Virtualization Overview

Last Updated: September 17, 2012

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.

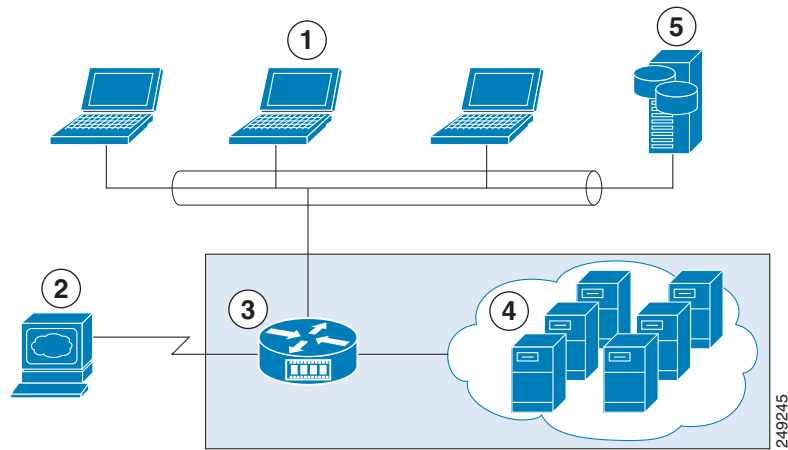
- [Cisco SRE-V Overview, page 1-1](#)
- [Differences Between Cisco SRE-V and VMware vSphere Hypervisor, page 1-3](#)
- [Hardware Requirements, page 1-3](#)
- [Software Requirements, page 1-4](#)
- [Managing Cisco SRE-V, page 1-7](#)
- [Basic Workflow, page 1-8](#)

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 to be provisioned on a Cisco Services Ready Engine (SRE) Service Module and host one or multiple virtual machines running the Microsoft Windows Server or Linux operating systems. 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		

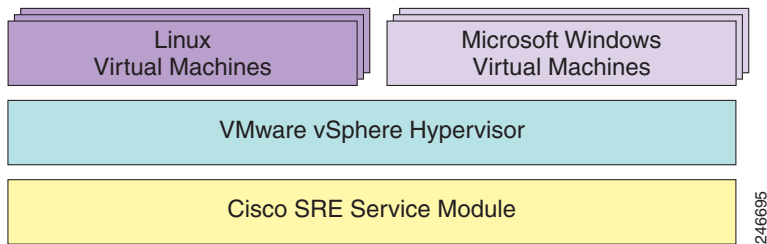
Cisco SRE-V Terms

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.
- VMware vSphere Hypervisor—Bare-metal hypervisor from VMware that provides the platform to host virtual machines.
- Virtual Machines—User-created virtual machines that run the Microsoft Windows Server or Linux operating systems.

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

Figure 1-2 Cisco SRE-V Terms



Differences Between Cisco SRE-V and VMware vSphere Hypervisor

The Cisco SRE-V product is different from the VMware vSphere Hypervisor in the following ways:

- Cisco SRE-V enables VMware vSphere Hypervisor to be provisioned on a Cisco SRE Service Module, which is integrated in the Cisco ISR G2.
- Configuration of the VMware vSphere Hypervisor IP address is done through the Cisco ISR G2.
- Redundant Array of Inexpensive Disks (RAID) management for Cisco SRE-V is done through the RAID management CLI.
- Software upgrade packages are obtained from Cisco.com.
- PCI passthrough settings are not applicable for the current generation hardware.

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 or 710 Service Module
- Cisco SRE 900 or 910 Service Module

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

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

Feature	Cisco SRE 700 or 710 Service Module	Cisco SRE 900 or 910 Service Module
Form Factor	SM	SM
CPU	Intel Core 2 Solo (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	1 Layer 2 Gigabit Ethernet interface 1 Layer 3 Gigabit Ethernet interface	1 Layer 2 Gigabit Ethernet interface 1 Layer 3 Gigabit Ethernet interface
External Network Interfaces	1 USB connector 1 RJ-45 Gigabit Ethernet connector	1 USB connector 1 RJ-45 Gigabit Ethernet connector
Router Platforms	2911, 2921, 2951, 3925, 3925e, 3945, 3945e	2911, 2921, 2951, 3925, 3925e, 3945, 3945e

Table 1-2 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, EHWIC-D-8ESG=, EHWIC-D-8ESG, EHWIC-4ESG-P=, EHWIC-4ESG-P, EHWIC-4ESG=, and EHWIC-4ESG	SM-D-ES3G-48-P, SM-D-ES3-48-P, SM-D-ES2-48, SM-ES3G-24-P, SM-ES3-24-P, SM-ES2-24-P, SM-ES2-24, and SM-ES3G-16-P

Software Requirements

- [Feature Licenses, page 1-4](#)
- [Third-Party Software, page 1-5](#)
- [Cisco SRE-V Options, page 1-5](#)

Feature Licenses

[Table 1-3](#) provides the feature license Stock-Keeping Units (SKUs) that are available for Cisco SRE-V.

Table 1-3 Feature License SKUs

License SKUs	Description
Licenses Without the VMware vCenter Server Support	
FL-SRE-V-HOST	VMware vSphere Hypervisor Host paper license purchased with the software.
FL-SRE-V-HOST=	VMware vSphere Hypervisor Host paper license purchased without the software (spare).
L-FL-SRE-V-HOST=	VMware vSphere Hypervisor Host electronic license purchased without the software (spare).
Licenses With the VMware vCenter Server Support	
FL-SRE-V-HOSTVC	Feature license for the VMware vSphere Hypervisor software on the Cisco SRE Service Module, which includes VMware vCenter Server management support. This license can be purchased with the software.
FL-SRE-V-HOSTVC=	Feature license for the VMware vSphere Hypervisor software on the Cisco SRE Service Module, which includes VMware vCenter Server management support (spare).
L-FL-SRE-V-HOSTVC=	E-delivery feature license for the VMware vSphere Hypervisor software on the Cisco SRE Service Module, which includes VMware vCenter Server management support (spare).
Upgrade Licenses to Add VMware vCenter Server Support	
FL-SRE-V-VC-UPG=	Feature license to upgrade the VMware vSphere Hypervisor software on the Cisco SRE Service Module to enable VMware vCenter Server management support (spare).
L-FL-SRE-V-VC-UPG=	E-delivery feature license to upgrade the VMware vSphere Hypervisor software on the Cisco SRE Service Module to enable VMware vCenter Server management support (spare).

For more information about VMware vSphere Hypervisor licenses, see [Chapter 5, “Managing the VMware vSphere Hypervisor License.”](#)

Third-Party Software

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

- VMware vSphere Hypervisor—For virtualization.
- Microsoft Windows Server—For the guest operating system in virtual machines.

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
- Linux—For the guest operating system in virtual machines.

For a list of supported Linux distributions, see the *VMware Compatibility Guide* at:

<http://www.vmware.com/resources/compatibility/search.php?deviceCategory=software>

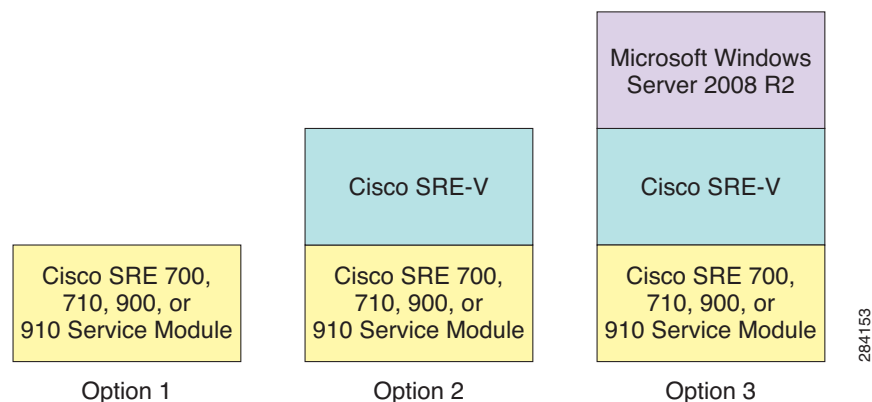
Cisco SRE-V Options

The software required depends on the Cisco SRE-V option that you choose.

- [Option 1: Hardware Only \(Cisco SRE 700, 710, 900, or 910 Service Module\)](#), page 1-5
- [Option 2: Hardware Plus Virtualization Software \(Cisco SRE 700, 710, 900, or 910 Service Module plus Cisco SRE-V\)](#), page 1-6
- [Option 3: Hardware Plus Virtualization Software and Microsoft Windows Software \(Cisco SRE 700, 710, 900, or 910 Service Module plus Cisco SRE-V plus Microsoft Windows Server 2008 R2\)](#), page 1-6

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

Figure 1-3 Cisco SRE-V Release 2.0 Options



Option 1: Hardware Only (Cisco SRE 700, 710, 900, or 910 Service Module)

This is a Cisco SRE Service Module without any software installed on it. See option 1 in [Figure 1-3](#).

If you purchase this option, you must do the following:

- Download and install the Cisco SRE-V software.
- Download and install your own version of the Microsoft Windows Server 2003 software, Microsoft Windows Server 2008 software, or Linux distribution.
- Purchase a “spare” VMware vSphere Hypervisor license from Cisco.com; otherwise, the Cisco SRE-V software will stop functioning after the 60-day evaluation period expires. After you purchase the license, you must register and activate it.

For more information about VMware vSphere Hypervisor licenses, see [Chapter 5, “Managing the VMware vSphere Hypervisor License.”](#)

Option 2: Hardware Plus Virtualization Software (Cisco SRE 700, 710, 900, or 910 Service Module plus Cisco SRE-V)

This is the Cisco SRE Service Module with the Cisco SRE-V software preinstalled. See option 2 in [Figure 1-3](#).



Note

At the time of purchase, you can choose the RAID option that you want enabled on the Cisco SRE-V software. RAID is *not supported* on the Cisco SRE 700 or 710 Service Module. It is supported on the Cisco SRE 900 and 910 Service Modules only.

Purchase this option if you have your own version of Microsoft Windows Server 2003 software, Microsoft Windows Server 2008 software, or Linux distribution that you want to use.

If you purchase this option, you must do the following:

- Download and install your own version of the Microsoft Windows Server 2003 software, Microsoft Windows Server 2008 software, or Linux distribution.
- Activate your VMware vSphere Hypervisor license.

If you purchase the VMware vSphere Hypervisor license at the same time you purchase the Cisco SRE Service Module, a VMware license key is shipped to you in an envelope. This envelope is in the same package as the Cisco SRE Service Module. To use the Cisco SRE-V software, you must activate the VMware license key using the vSphere Client GUI; otherwise, the Cisco SRE-V software will stop functioning after the 60-day evaluation period expires.

If you choose to purchase the VMware vSphere Hypervisor license after you purchase the Cisco SRE Service Module, you must purchase a “spare” VMware vSphere Hypervisor license from Cisco Systems. After you purchase the license, you must register and activate it; otherwise, the Cisco SRE-V software will stop functioning after the 60-day evaluation period expires.

For more information about VMware vSphere Hypervisor licenses, see [Chapter 5, “Managing the VMware vSphere Hypervisor License.”](#)

Option 3: Hardware Plus Virtualization Software and Microsoft Windows Software (Cisco SRE 700, 710, 900, or 910 Service Module plus Cisco SRE-V plus Microsoft Windows Server 2008 R2)

This is the 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](#).

**Note**

At the time of purchase, you can choose the RAID option that you want enabled on the Cisco SRE-V software. RAID is *not supported* on the Cisco SRE 700 or 710 Service Module. It is supported on the Cisco SRE 900 and 910 Service Modules only.

If you purchase this option, you must activate your VMware vSphere Hypervisor license.

If you purchase the VMware vSphere Hypervisor license at the same time that you purchase the Cisco SRE Service Module, a VMware license key is shipped to you in an envelope. This envelope is in the same package as the Cisco SRE Service Module. To use the Cisco SRE-V software, you must activate the VMware license key using the vSphere Client GUI; otherwise, the Cisco SRE-V software will stop functioning after the 60-day evaluation period expires.

If you choose to purchase the VMware vSphere Hypervisor license after you purchase the Cisco SRE Service Module, you must purchase a “spare” VMware vSphere Hypervisor license from Cisco Systems. After you purchase the license, you must register and activate it; otherwise, the Cisco SRE-V software will stop functioning after the 60-day evaluation period expires.

For more information about VMware vSphere Hypervisor licenses, see [Chapter 5, “Managing the VMware vSphere Hypervisor License.”](#)

**Note**

With this option, the Microsoft Windows Server 2008 R2 license is preactivated. With this option, you also receive a Microsoft Windows Server 2008 R2 recovery DVD, which you can use if you lose or delete the Microsoft Windows virtual machine from your system.

Managing Cisco SRE-V

Cisco SRE-V uses several management interfaces.

- [Cisco IOS CLI, page 1-7](#)
- [RAID Management CLI, page 1-7](#)
- [VMware vSphere Client, page 1-8](#)
- [VMware vCenter Server, page 1-8](#)

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 2-1.

RAID Management CLI

Use the RAID management CLI to add or modify the RAID configuration. See [Managing RAID, page 7-1](#) for more information about RAID.

VMware vSphere Client

Use the VMware vSphere Client to manage the virtual machines.

VMware vCenter Server

Use the VMware vCenter Server to manage the virtual machines.

Basic Workflow

Table 1-4 lists the basic workflow steps and the options and network types for which each step applies.

Table 1-4 Basic Workflow

Step	Task	For option 1	For option 2	For option 3
1	Install the Cisco SRE Service Module into the ISR G2. See Chapter 2, “Installing the Cisco SRE Service Module into the Router.”	X	X	X
2	Use the Cisco IOS commands to configure the Cisco SRE Service Module interfaces. See Chapter 3, “Configuring the Cisco SRE Service Module Interfaces.”	X	X	X
3	Download and install the Cisco SRE-V software. See Chapter 4, “Installing and Managing the Cisco SRE-V Software.”	X		
4	Register and activate the VMware vSphere Hypervisor license. See Chapter 5, “Managing the VMware vSphere Hypervisor License.”	X	X	X
5	Install the vSphere Client, and then use the vSphere Client GUI to create and manage the virtual machines. See Chapter 6, “Managing Virtual Machines.”	X	X	X
6	Install your own version of the Microsoft Windows Server 2003 software, Microsoft Windows Server 2008 software, or Linux distribution, and then activate the software license.	X	X	
7	Install VMware tools. See the “Installing VMware Tools” section on page 6-7.	X	X	X



CHAPTER 2

Installing the Cisco SRE Service Module into the Router

Last Updated: September 17, 2012

- [Verifying the Router, Cisco SRE Service Module, and Cisco IOS Software Version Compatibility, page 2-1](#)
- [Installing the Cisco SRE Service Module into the Router, page 2-1](#)
- [Verifying the Cisco SRE Service Module Installation, page 2-2](#)
- [Online Insertion and Removal of the Cisco SRE Service Module, page 2-3](#)

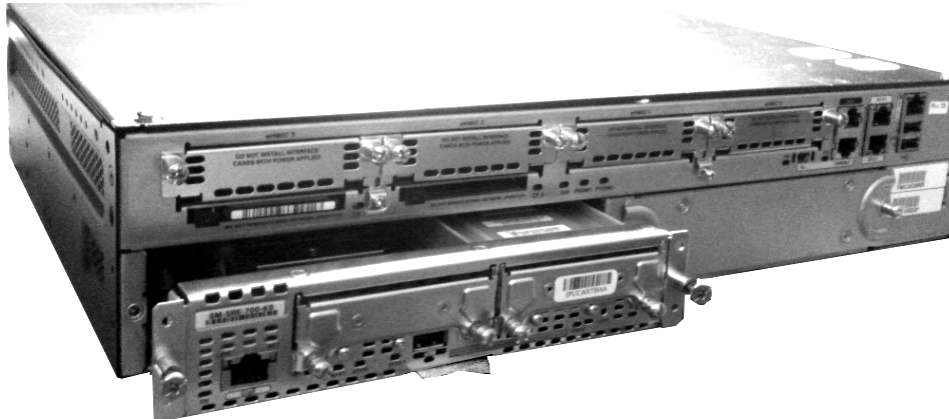
Verifying the Router, Cisco SRE Service Module, and Cisco IOS Software Version Compatibility

For all Cisco router models (2911, 2921, 2951, 3925, 3925e, 3945, and 3945e), and for all versions of the Cisco SRE Service Module (700, 710, 900, and 910), the Cisco IOS software version that you must install on the router, in order to use Cisco SRE-V, is Release 15.1(4) M or later.

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](#).

Figure 2-1 Cisco SRE Service Module in a Router

**Caution**

Before you install or remove the Cisco SRE Service Module from a Cisco 2900 series ISR G2, make sure that you first power down the router.

Related Topics

- [Configuring the Cisco SRE Service Module Interfaces on the Router, page 3-3](#)

Verifying the Cisco SRE Service Module Installation

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

Procedure

Step 1 From the router, enter **enable** to go into enable mode.

Step 2 Enter the **show diag | include FRU** command.

The system displays the Field Replaceable Unit (FRU) details, as shown in the following example of a Cisco SRE 900 Service Module:

```
Router# show diag | include 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 3 Use the **show hardware** command to verify that the router recognizes the service module.

Related Topics

- [Configuring the Cisco SRE Service Module Interfaces on the Router, page 3-3](#)

Online Insertion and Removal of the Cisco SRE Service Module



Note

Only 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 the OIR of the Cisco SRE Service Module.

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

PREREQUISITES

You cannot perform the OIR of a Cisco SRE Service Module when the VMware vSphere Hypervisor is in lockdown mode. If you enter the **service-module sm slot/0 shutdown** command when the VMware vSphere Hypervisor is in lockdown mode, the system moves the Cisco SRE Service Module to shutdown state but the VMware vSphere Hypervisor does not shut down. In addition, the system cannot process any subsequent **service-module sm slot/0** commands. To recover from this, reset the Cisco SRE Service Module.

For more information about lockdown mode, see the [“About Lockdown Mode”](#) section on page 6-5.

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 Example: Router# service-module sm 1/0 shutdown	Shuts down the Cisco SRE Service Module system gracefully. Use this command when removing or replacing a hot-swappable module during OIR. <ul style="list-style-type: none"> • If the virtual machines on the VMware vSphere Hypervisor 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 power off first, and then the shutdown signal is sent to the service module. After about two minutes, the Cisco SRE Service Module shuts down. <p>Note The system does not support the service-module sm slot/0 shutdown command when the VMware vSphere Hypervisor is in lockdown mode.</p>

	Command or Action	Purpose
Step 2	service-module sm slot/0 status Example: Router# service-module sm 1/0 status	Verifies whether the Cisco SRE Service Module system is in the shut down state.
Step 3	hw-module sm 1 oir-stop Example: Router# hw-module sm 1 oir-stop	Removes the Cisco SRE Service Module from the router. When you enter this command, OIR messages are displayed. After the messages finish displaying, remove the Cisco SRE Service Module from the router.



CHAPTER 3

Configuring the Cisco SRE Service Module Interfaces

Last Updated: September 17, 2012

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

- [Cisco SRE Service Module Interfaces Overview, page 3-1](#)
- [Prerequisites for Configuring the Cisco SRE Service Module Interfaces, page 3-2](#)
- [Configuring the Cisco SRE Service Module Interfaces on the Router, page 3-3](#)
- [Reloading, Resetting, and Shutting Down the Cisco SRE Service Module, page 3-25](#)

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.

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

- MGF interface
- Console interface
- External service module interface

See [Table 3-1](#) for more information about the interfaces.

Table 3-1 Cisco SRE Service Module Interfaces

Interface	Purpose	Accessed from	Additional Information
MGF interface	Enables the Cisco SRE Service Module to communicate over a high-speed backplane switch.	Within the host router.	Provides an internal Layer 2 Gigabit Ethernet link between the router and the Cisco SRE Service Module. You configure the MGF interface through the Cisco IOS CLI. For more information about configuring MGF, see the <i>“Multi-Gigabit Fabric on the Router”</i> chapter in the <i>Cisco 3900 Series, 2900 Series, and 1900 Series Integrated Services Routers Software Configuration Guide</i> .
Console interface	Provides access to the VMware vSphere Hypervisor Direct Console User Interface (DCUI), for performing Cisco SRE-V configuration.	Within the host router.	Provides an internal Layer 3 Gigabit Ethernet link between the router and the Cisco SRE Service Module. You configure and manage the console interface through the Cisco IOS CLI.
External service module interface	Used by VMware vSphere Hypervisor or virtual machines as a primary interface or as a backup interface.	Primarily controlled and managed by the VMware vSphere Hypervisor.	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 or the console interface.

Prerequisites for Configuring the Cisco SRE Service Module Interfaces

- [Cisco Router Prerequisites, page 3-2](#)
- [Cisco SRE Service Module Prerequisites, page 3-3](#)

Cisco Router Prerequisites

Ensure 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 2-1 and the [“Verifying the Cisco SRE Service Module Installation”](#) section on page 2-2.

Cisco SRE Service Module Prerequisites

**Note**

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

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.
- 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 interface and 1 for the MGF interface.

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 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 an EtherSwitch EHWIC or EtherSwitch Service Module to use this configuration option. See the [“MGF Layer 2 Switched Configuration—Recommended”](#) section on page 3-4.
- Cisco IOS Layer 3 Routed Configuration—Choose one of the following options:
 - Cisco IOS Layer 3 Routed Configuration with Devices in Different Subnets—Choose this configuration option if you want to add the VMware vSphere Hypervisor and the virtual servers in one branch subnet and the client PCs in another branch subnet. This configuration option does not require additional equipment; however, it has an impact on the router CPU. See the [“Cisco IOS Layer 3 Routed Configuration—Devices in Different Branch Subnets”](#) section on page 3-11.
 - Cisco IOS Layer 3 Routed Configuration with Devices in the Same Subnet—Choose this configuration option if you want to add the VMware vSphere Hypervisor and the virtual servers in the same branch subnet as the client PCs. 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. See the [“Cisco IOS Layer 3 Routed Configuration—Devices in the Same Branch Subnet”](#) section on page 3-16.
- External Interface Configuration—This configuration option is simple to configure and 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 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 “[External Interface Configuration](#)” section on page 3-22.

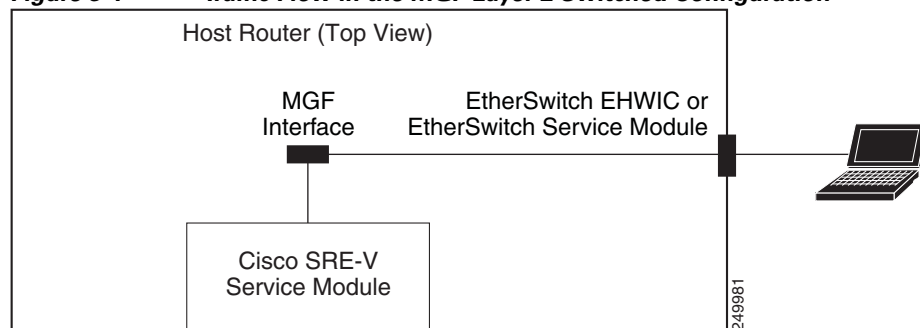
**Note**

For the Cisco IOS **service-module** commands to take effect, make sure that the **Management Network** VMkernel port group is configured to use the vSwitch that has the PCIe interface as the uplink. We recommend that you do not change the default VMkernel port group name, which is Management Network.

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 3-1 Traffic Flow in the MGF Layer 2 Switched Configuration

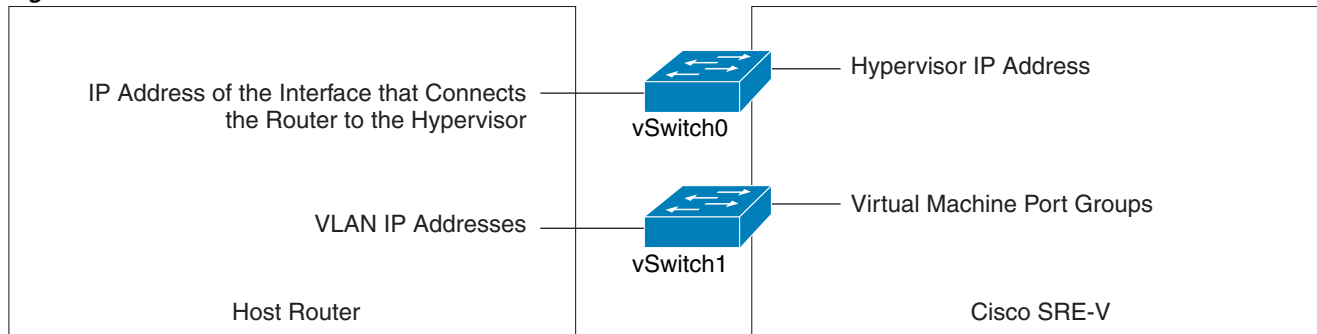


[Figure 3-2](#) shows the location of the IP addresses.

To access the VMware vSphere Hypervisor through the ISR G2, you must provide two IP addresses: one IP address is of the interface that connects the router to the VMware vSphere Hypervisor and the other IP address is of the VMware vSphere Hypervisor.

The virtual machines are accessed through the MGF interface. The port groups on a vSwitch in the VMware vSphere Hypervisor can be assigned to corresponding VLAN interfaces in Cisco IOS. For example, port group 50 in the VMware vSphere Hypervisor can be assigned to VLAN 50 in Cisco IOS.

Figure 3-2 IP Address Location



246701

SUMMARY STEPS

From the Host-Router CLI, enter:

1. **enable**
2. **configure terminal**

Configure *slot/0* of the VMware vSphere Hypervisor

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

Configure *slot/1* of the VMware vSphere Hypervisor

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

Configure VLANs

1. **configure terminal**
2. **interface vlan *vlan_number***
3. **ip address *vlan-ip-address subnet mask***
4. **no shut**
5. **end**


Save Configuration

1. **copy running-config startup-config**

2. show running-config

DETAILED STEPS

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

Command or Action	Purpose
<p>Step 2</p> <p>ip address <i>router-to-hypervisor-interface-IP-address</i> <i>subnet-mask</i></p> <p>or</p> <p>[ip unnumbered <i>type number</i>]</p> <p>Example: Router(config-if)# ip address 10.0.0.100 255.255.255.0</p> <p>or</p> <p>Router(config-if)# ip unnumbered gigabitethernet 1/0</p>	<p>Specifies the IP address of the interface that connects the router to the VMware vSphere Hypervisor. See Figure 3-2.</p> <ul style="list-style-type: none"> <i>router-to-hypervisor-interface-IP-address</i>—IP address of the interface that connects the router to the VMware vSphere Hypervisor. <i>subnet-mask</i>—Subnet mask to append to the IP address. <p>or</p> <p>(Optional) The ip unnumbered command enables IP processing on an interface without assigning an explicit IP address to that interface.</p> <ul style="list-style-type: none"> <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. <p>Note The unnumbered interface must be unique. It cannot be another unnumbered interface.</p> <p> Caution The ip unnumbered command creates a point-to-point interface between devices. Broadcasting is not supported.</p> <p>Note If you use the ip unnumbered command, you must use the ip route hypervisor-ip-address subnet-mask sm slot/0 command to create a static route. See Step 7.</p>
<p>Step 3</p> <p>service-module ip address <i>hypervisor-ip-address</i> <i>subnet-mask</i></p> <p>Example: Router(config-if)# service-module ip address 10.0.0.1 255.255.255.0</p>	<p>Specifies the IP address of the VMware vSphere Hypervisor.</p> <ul style="list-style-type: none"> <i>hypervisor-ip-address</i>—IP address of the VMware vSphere Hypervisor. See Figure 3-2. <i>subnet-mask</i>—Subnet mask to append to the IP address; must be in the same subnet as the host router.
<p>Step 4</p> <p>service-module ip default-gateway <i>hypervisor-gateway-ip-address</i></p> <p>Example: Router(config-if)# service-module ip default-gateway 10.0.0.100</p>	<p>Specifies the IP address of the default gateway for the VMware vSphere Hypervisor.</p> <ul style="list-style-type: none"> <i>hypervisor-gateway-ip-address</i>—IP address for the default gateway router.
<p>Step 5</p> <p>no shut</p> <p>Example: Router(config-if)# no shut</p>	<p>Causes the interface to be administratively up.</p>

	Command or Action	Purpose
Step 6	exit Example: Router(config)# exit	Returns to global configuration mode on the host router.
Step 7	[ip route hypervisor-ip-address subnet-mask sm slot/0] Example: Router(config)# ip route 10.0.0.1 255.255.255.255 SM1/0	Creates a static route. If you used the ip unnumbered command in Step 2 , you must use the ip route hypervisor-ip-address subnet-mask sm slot/0 command to create a static route. <ul style="list-style-type: none"> <i>hypervisor-ip-address subnet-mask</i>—IP address and subnet mask of the VMware vSphere Hypervisor. <i>slot/0</i>—slot and port where the Cisco SRE Service Module resides.
Configure slot/1 of the VMware vSphere Hypervisor		
Step 1	interface sm slot/1 Example: Router(config)# interface sm 1/1	Enters interface configuration mode for the slot and port where the Cisco SRE Service Module resides.
Step 2	switchport mode trunk Example: Router(config-if)# switchport mode trunk	Puts the port into permanent trunking mode. The default configuration is access mode.
Step 3	[switchport trunk allowed vlan vlan_numbers] Example: Router(config-if)# switchport mode trunk Router(config-if)# switchport trunk allowed vlan 1-2,40,60,1002-1005	(Optional) Allows trunking on the specified VLANs. <ul style="list-style-type: none"> <i>vlan_numbers</i>—VLAN numbers on which you want to allow trunking.
Step 4	exit Example: Router(config)# exit	Returns to global configuration mode on the host router.
Configure VLANs		
Step 1	configure terminal Example: Router# configure terminal	Enters global configuration mode on the host router.
Step 2	interface vlan vlan_number Example: Router(config)# interface vlan 40	Enters VLAN configuration mode for the specified VLAN number.

	Command or Action	Purpose
Step 3	ip address <i>vlan-ip-address</i> <i>subnet-mask</i> Example: Router(config-if)# ip address 40.0.0.100 255.255.255.0	Specifies the IP address for the VLAN. <ul style="list-style-type: none"> • <i>vlan-ip-address</i>—IP address for the VLAN. • <i>subnet-mask</i>—Subnet mask to append to the IP address.
Step 4	no shut Example: Router(config-if)# no shut	Causes the interface to be administratively up.
Step 5	end Example: Router(config)# end	Returns to global configuration mode on the host router.
Save Configuration		
Step 1	copy running-config startup-config Example: Router# copy running-config startup-config	Saves the new running configuration of the router as the startup configuration.
Step 2	show running-config Example: Router# show running-config	Displays the running configuration of the router so that you can verify the address configurations.

Example

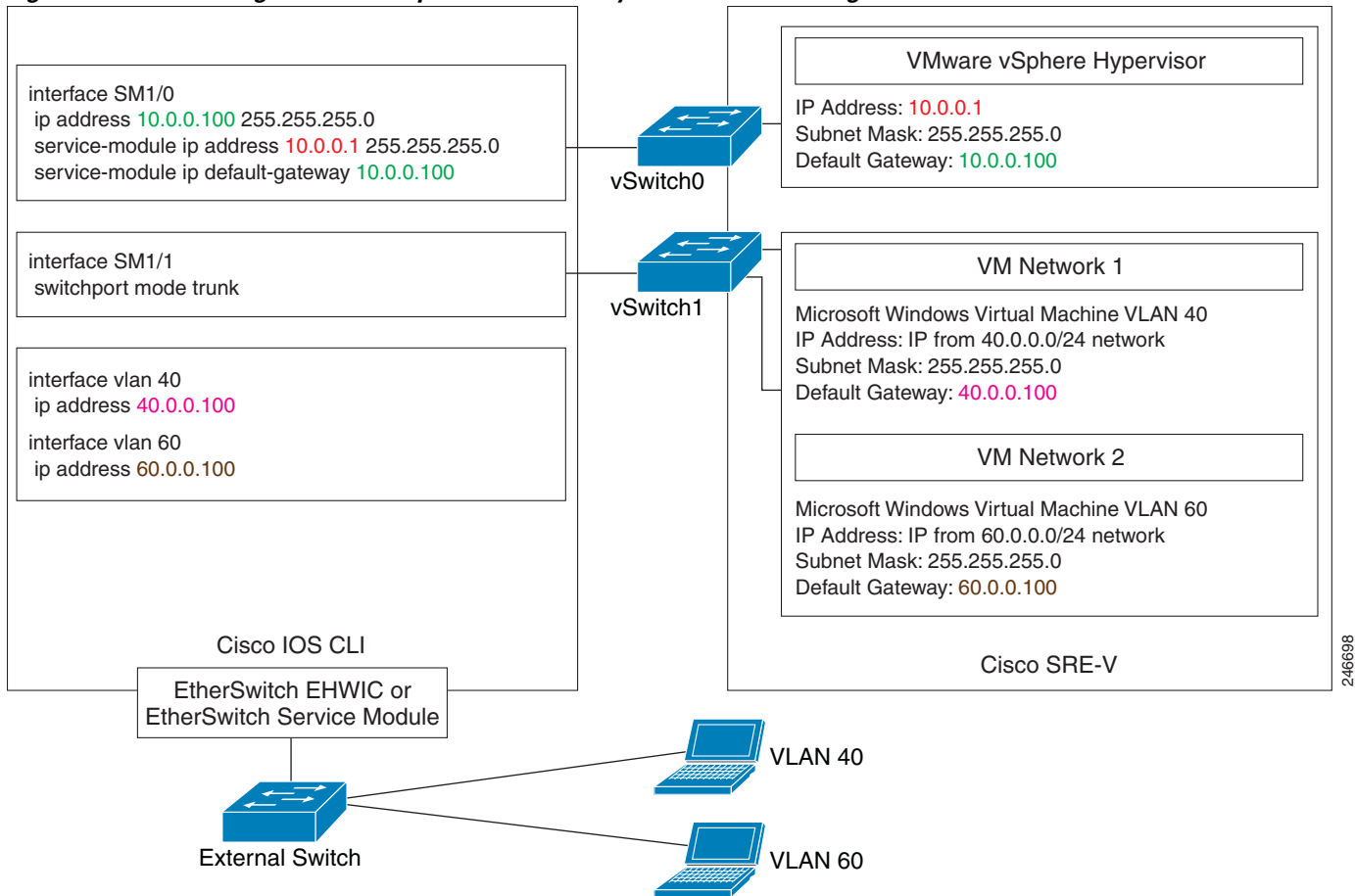
Figure 3-3 shows an example of the MGF Layer 2 switched configuration.

- The left pane shows an example of the Cisco IOS commands that you configure in the sm 1/0, sm 1/1, and VLAN interfaces.
- The right pane shows that the configuration is applied to the VMware vSphere Hypervisor. The bottom area in the right pane shows the configuration for the Microsoft Windows Servers that are configured using the standard Microsoft Windows network configuration setup process. These Microsoft Windows Servers run as virtual machines.



Note

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

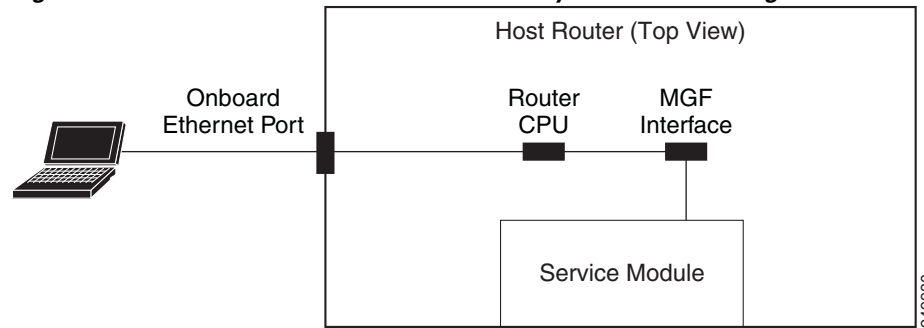
Figure 3-3 Configuration Example of the MGF Layer 2 Switched Configuration**Related Topic**

- [Downloading the Cisco SRE-V Software, page 4-4](#)

Cisco IOS Layer 3 Routed Configuration Options

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.

Figure 3-4 Traffic Flow in the Cisco IOS Layer 3 Routed Configuration



You can either add the VMware vSphere Hypervisor and the virtual servers in one branch subnet, and the client PCs in another branch subnet; or you can add all of the devices in the same branch subnet. Depending on which branch subnet you choose to add the devices, the configuration commands that you must use vary. See the following sections for the Cisco IOS Layer 3 routed configuration options:

- [Cisco IOS Layer 3 Routed Configuration—Devices in Different Branch Subnets, page 3-11](#)
- [Cisco IOS Layer 3 Routed Configuration—Devices in the Same Branch Subnet, page 3-16](#)

Cisco IOS Layer 3 Routed Configuration—Devices in Different Branch Subnets

Use this configuration option if you want to add the VMware vSphere Hypervisor and the virtual servers in one branch subnet; and the client PCs in another branch subnet.

When you assign a subnet to the VMware vSphere Hypervisor and to the virtual servers, that subnet is automatically added to the routing table as a directly connected route. As long as the client PCs are on a subnet that is reachable from the router, no additional routing configuration is necessary. Typically, the client PCs are on a subnet of the onboard Ethernet interface, which is also automatically added to the routing table as a directly connected route. Therefore, the router sends traffic between the subnet of the VMware vSphere Hypervisor and the virtual server, and the subnet of the client PCs without any static route or routing protocol configuration.

SUMMARY STEPS

From the Host-Router CLI, enter:

1. `enable`
2. `configure terminal`

Configure *slot/0* of the VMware vSphere Hypervisor

1. `interface sm slot/0`
2. `ip address router-to-hypervisor-interface-IP-address subnet-mask`
3. `service-module ip address hypervisor-ip-address subnet-mask`
4. `service-module ip default-gateway hypervisor-gateway-ip-address`
5. `no shut`
6. `exit`

Configure *slot/1* of the VMware vSphere Hypervisor

1. `interface sm slot/1`

2. **switchport mode trunk**
3. **[switchport trunk allowed vlan *vlan_numbers*]**
4. **exit**

Configure VLANs

1. **configure terminal**
2. **interface vlan *vlan_number***
3. **ip address *vlan-ip-address subnet mask***
4. **no shut**
5. **exit**

Configure Gigabit Ethernet *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**

Save Configuration

1. **copy running-config startup-config**
2. **show running-config**

DETAILED STEPS

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

	Command or Action	Purpose
Step 2	<p>ip address <i>router-to-hypervisor-interface-IP-address</i> <i>subnet-mask</i></p> <p>Example: Router(config-if)# ip address 10.0.0.100 255.255.255.0</p>	<p>Specifies the IP address of the interface that connects the router to the VMware vSphere Hypervisor. See Figure 3-2.</p> <ul style="list-style-type: none"> <i>router-to-hypervisor-interface-IP-address</i>—IP address of the interface that connects the router to the VMware vSphere Hypervisor. <i>subnet-mask</i>—Subnet mask to append to the IP address.
Step 3	<p>service-module ip address <i>hypervisor-ip-address</i> <i>subnet-mask</i></p> <p>Example: Router(config-if)# service-module ip address 10.0.0.1 255.255.255.0</p>	<p>Specifies the IP address of the VMware vSphere Hypervisor.</p> <ul style="list-style-type: none"> <i>hypervisor-ip-address</i>—IP address of the VMware vSphere Hypervisor. See Figure 3-2. <i>subnet-mask</i>—Subnet mask to append to the IP address; must be in the same subnet as the host router.
Step 4	<p>service-module ip default-gateway <i>hypervisor-gateway-ip-address</i></p> <p>Example: Router(config-if)# service-module ip default-gateway 10.0.0.100</p>	<p>Specifies the IP address of the default gateway for the VMware vSphere Hypervisor.</p> <ul style="list-style-type: none"> <i>hypervisor-gateway-ip-address</i>—IP address for the default gateway router.
Step 5	<p>no shut</p> <p>Example: Router(config-if)# no shut</p>	<p>Causes the interface to be administratively up.</p>
Step 6	<p>exit</p> <p>Example: Router(config)# exit</p>	<p>Returns to global configuration mode on the host router.</p>
Configure <i>slot/1</i> of the VMware vSphere Hypervisor		
Step 1	<p>interface sm <i>slot/1</i></p> <p>Example: Router(config)# interface sm 1/1</p>	<p>Enters interface configuration mode for the slot and port where the Cisco SRE Service Module resides.</p>
Step 2	<p>switchport mode trunk</p> <p>Example: Router(config-if)# switchport mode trunk</p>	<p>Puts the port into permanent trunking mode.</p> <p>The default configuration is access mode. Access mode works with native VLAN, which is VLAN 1 for the Cisco SRE Service Modules.</p>
Step 3	<p>[switchport trunk allowed vlan <i>vlan_numbers</i>]</p> <p>Example: Router(config-if)# switchport mode trunk Router(config-if)# switchport trunk allowed vlan 1-2,40,60,1002-1005</p>	<p>(Optional) Allows trunking on the specified VLANs.</p> <ul style="list-style-type: none"> <i>vlan_numbers</i>—VLAN numbers on which you want to allow trunking.

	Command or Action	Purpose
Step 4	<p>exit</p> <p>Example: Router(config)# exit</p>	Returns to global configuration mode on the host router.
Configure VLANs		
Step 1	<p>configure terminal</p> <p>Example: Router# configure terminal</p>	Enters global configuration mode on the host router.
Step 2	<p>interface vlan <i>vlan_number</i></p> <p>Example: Router(config)# interface vlan 40</p>	Enters VLAN configuration mode for the specified VLAN number.
Step 3	<p>ip address <i>vlan-ip-address subnet-mask</i></p> <p>Example: Router(config-if)# ip address 40.0.0.100 255.255.255.0</p>	<p>Specifies the IP address for the VLAN.</p> <ul style="list-style-type: none"> <i>vlan-ip-address</i>—IP address for the VLAN. <i>subnet-mask</i>—Subnet mask to append to the IP address.
Step 4	<p>no shut</p> <p>Example: Router(config-if)# no shut</p>	Causes the interface to be administratively up.
Step 5	<p>exit</p> <p>Example: Router(config)# exit</p>	Returns to global configuration mode on the host router.
Configure Gigabit Ethernet <i>slot/port</i>		
Step 1	<p>interface gigabitethernet <i>slot/port sub-interface</i></p> <p>Example: Router(config)# interface gigabitethernet 0/1.120</p>	<p>Enters Gigabit Ethernet configuration mode for the specified sub interface.</p> <ul style="list-style-type: none"> <i>slot/port</i>—Position of the Gigabit Ethernet interface in the router chassis. <i>sub-interface</i>—Number of the Gigabit Ethernet interface on which the router has an assigned IP address.
Step 2	<p>ip address <i>branch-VLAN-ip-address subnet-mask</i></p> <p>Example: Router(config-if)# ip address 80.80.120.1 255.255.255.0</p>	<p>Configures the IP address for the specific branch VLAN.</p> <ul style="list-style-type: none"> <i>branch-VLAN-ip-address</i>—IP address for the specific branch VLAN. <i>subnet-mask</i>—Subnet mask to append to the IP address.
Step 3	<p>encapsulation dot1q <i>vlan-id</i></p> <p>Example: Router(config-if)# encapsulation dot1q 120</p>	<p>Enables IEEE 802.1Q encapsulation of traffic on the specified subinterface in VLANs.</p> <ul style="list-style-type: none"> <i>vlan-id</i>—Virtual LAN identifier. The allowed range is from 1 to 1000.

	Command or Action	Purpose
Step 4	<code>exit</code>	Exits interface mode.
Save Configuration		
Step 1	<code>copy running-config startup-config</code>	Saves the new running configuration of the router as the startup configuration.
	Example: Router# <code>copy running-config startup-config</code>	
Step 2	<code>show running-config</code>	Displays the running configuration of the router so that you can verify the address configurations.
	Example: Router# <code>show running-config</code>	

Example

shows an example of the Cisco IOS Layer 3 routed configuration in which the VMware vSphere Hypervisor and the virtual servers are in one branch subnet; and the client PCs are in another branch subnet.

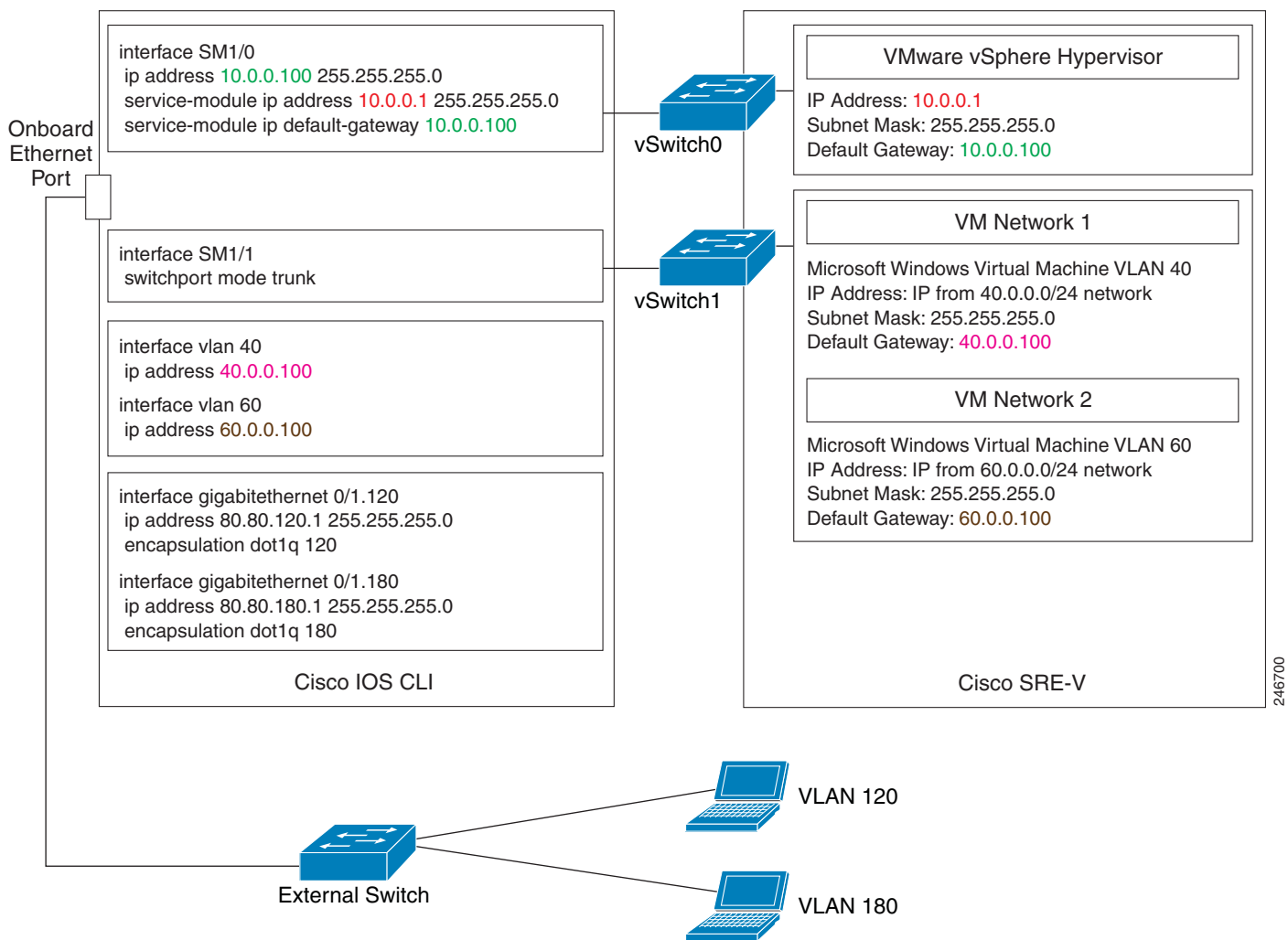
- The left pane shows an example of the Cisco IOS commands that you configure in the sm 1/0, sm 1/1, and VLAN interfaces.
- The right pane shows that the configuration is applied to the VMware vSphere Hypervisor. The bottom area in the right pane shows the configuration for the Microsoft Windows Servers that are configured using the standard Microsoft Windows network configuration setup process. These Microsoft Windows Servers run as virtual machines.



Note

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

Cisco IOS Layer 3 Routed Configuration—Devices in Different Subnets



Related Topics

- [Downloading the Cisco SRE-V Software, page 4-4](#)

Cisco IOS Layer 3 Routed Configuration—Devices in the Same Branch Subnet

Use this configuration option if you want to add the VMware vSphere Hypervisor and the virtual servers in the same branch subnet as the client PCs.

Use the **ip unnumbered** interface configuration to place the VMware vSphere Hypervisor and the virtual servers on the same subnet as the client PCs. Because the **ip unnumbered** interface configuration creates two interfaces with the same subnet in Cisco IOS, you must also configure static routes for the VMware vSphere Hypervisor and the virtual servers.

SUMMARY STEPS

From the Host-Router CLI, enter:

1. **enable**
2. **configure terminal**

Configure *slot/0* of the VMware vSphere Hypervisor

1. **interface sm *slot/0***
2. **ip unnumbered gigabitethernet *slot/port sub-interface***
3. **service-module ip address *hypervisor-ip-address subnet-mask***
4. **service-module ip default-gateway *hypervisor-gateway-ip-address***
5. **exit**

Configure *slot/1* of the VMware vSphere Hypervisor

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

Configure VLANs

1. **configure terminal**
2. **interface vlan *vlan_number***
3. **ip unnumbered gigabitethernet *slot/port sub-interface***
4. **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** *vlan_number***
6. **ip route *hypervisor-ip-address subnet-mask* **sm** *slot/0***
7. **exit**


Save Configuration

1. **copy running-config startup-config**
2. **show running-config**

DETAILED STEPS

	Command or Action	Purpose
From the Host-Router CLI		
Step 1	<pre>enable <password></pre> <p>Example: Router> enable Router> <password> Router#</p>	Enters privileged EXEC mode on the host router. Enter your password if prompted.
Step 2	<pre>configure terminal</pre> <p>Example: Router# configure terminal</p>	Enters global configuration mode on the host router.
Configure <i>slot/0</i> of the VMware vSphere Hypervisor		
Step 1	<pre>interface sm slot/0</pre> <p>Example: Router(config)# interface sm 1/0</p>	Enters interface configuration mode for the slot and port where the Cisco SRE Service Module resides.
Step 2	<pre>ip unnumbered gigabitethernet slot/port sub-interface</pre> <p>Example: Router(config-if)# ip unnumbered gigabitethernet 0/0.1</p>	<p>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.</p> <ul style="list-style-type: none"> <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. <p>Note The unnumbered interface must be unique. It cannot be another unnumbered interface.</p> <p> Caution The ip unnumbered command creates a point-to-point interface between devices. Broadcasting is not supported.</p>
Step 3	<pre>service-module ip address hypervisor-ip-address subnet-mask</pre> <p>Example: Router(config-if)# service-module ip address 10.0.0.1 255.255.255.0</p>	<p>Specifies the IP address of the VMware vSphere Hypervisor.</p> <ul style="list-style-type: none"> <i>hypervisor-ip-address</i>—IP address of the VMware vSphere Hypervisor. See Figure 3-2. <i>subnet-mask</i>—Subnet mask to append to the IP address; must be in the same subnet as the host router.

	Command or Action	Purpose
Step 4	<pre>service-module ip default-gateway hypervisor-gateway-ip-address</pre> <p>Example: Router(config-if)# service-module ip default-gateway 10.0.0.100 </p>	<p>Specifies the IP address of the default gateway for the VMware vSphere Hypervisor.</p> <ul style="list-style-type: none"> <i>hypervisor-gateway-ip-address</i>—IP address for the default gateway router.
Step 5	<pre>exit</pre>	Exits interface mode.
Configure <i>slot/1</i> of the VMware vSphere Hypervisor		
Step 1	<pre>interface sm slot/1</pre> <p>Example: Router(config)# interface sm 1/1 </p>	Enters interface configuration mode for the slot and port where the Cisco SRE Service Module resides.
Step 2	<pre>switchport mode trunk</pre> <p>Example: Router(config-if)# switchport mode trunk </p>	<p>Puts the port into permanent trunking mode.</p> <p>The default configuration is access mode. Access mode works with native VLAN, which is VLAN 1 for the Cisco SRE Service Modules.</p>
Step 3	<pre>[switchport trunk allowed vlan <i>vlan_numbers</i>]</pre> <p>Example: Router(config-if)# switchport mode trunk Router(config-if)# switchport trunk allowed vlan 1-2,40,60,1002-1005 </p>	<p>(Optional) Allows trunking on the specified VLANs.</p> <ul style="list-style-type: none"> <i>vlan_numbers</i>—VLAN numbers on which you want to allow trunking.
Step 4	<pre>exit</pre> <p>Example: Router(config)# exit </p>	Returns to global configuration mode on the host router.
Configure VLANs		
Step 1	<pre>configure terminal</pre> <p>Example: Router# configure terminal </p>	Enters global configuration mode on the host router.
Step 2	<pre>interface vlan <i>vlan_number</i></pre> <p>Example: Router(config)# interface vlan 40 </p>	Enters VLAN configuration mode for the specified VLAN number.

	Command or Action	Purpose
Step 3	<pre>ip unnumbered gigabitethernet slot/port sub-interface</pre> <p>Example: Router(config-if)# ip unnumbered gigabitethernet 0/0.40</p>	<p>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.</p> <ul style="list-style-type: none"> <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. <p>Note The unnumbered interface must be unique. It cannot be another unnumbered interface.</p> <p> Caution The ip unnumbered command creates a point-to-point interface between devices. Broadcasting is not supported.</p>
Step 4	<pre>exit</pre> <p>Configure Gigabit Ethernet <i>slot/port</i></p>	Exits interface mode.
Step 1	<pre>interface gigabitethernet slot/port sub-interface</pre> <p>Example: Router(config)# interface gigabitethernet 0/0.40</p>	<p>Enters Gigabit Ethernet configuration mode for the specified sub interface.</p> <ul style="list-style-type: none"> <i>slot/port</i>—Position of the Gigabit Ethernet interface in the router chassis. <i>sub-interface</i>—Number of the Gigabit Ethernet interface on which the router has an assigned IP address.
Step 2	<pre>ip address branch-VLAN-ip-address subnet-mask</pre> <p>Example: Router(config-if)# ip address 40.0.0.100 255.255.255.0</p>	<p>Configures the IP address for the specific branch VLAN.</p> <ul style="list-style-type: none"> <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	<pre>encapsulation dot1q vlan-id</pre> <p>Example: Router(config-if)# encapsulation dot1q 40</p>	<p>Enables IEEE 802.1Q encapsulation of traffic on the specified subinterface in VLANs.</p> <ul style="list-style-type: none"> <i>vlan-id</i>—Virtual LAN identifier. The allowed range is from 1 to 1000.
Step 4	<pre>exit</pre>	Exits interface mode.
Step 5	<pre>ip route virtual-machine-ip-address subnet-mask vlan vlan_number</pre> <p>Example: Router(config)# ip route 40.0.0.2 255.255.255.0 vlan 40</p>	<p>Creates a static route entry for the virtual machine.</p> <ul style="list-style-type: none"> <i>virtual-machine-ip-address subnet-mask</i>—IP address and subnet mask for the virtual machine.

	Command or Action	Purpose
Step 6	<pre>ip route <i>hypervisor-ip-address</i> <i>subnet-mask</i> <i>sm</i> <i>slot/0</i></pre> <p>Example: Router(config)# ip route 10.0.0.1 255.255.255.255 SM1/0</p>	<p>Creates a static route.</p> <ul style="list-style-type: none"> <i>hypervisor-ip-address subnet-mask</i>—IP address and subnet mask of the VMware vSphere Hypervisor. <i>slot/0</i>—slot and port where the Cisco SRE Service Module resides.
Step 7	<pre>exit</pre>	Exits interface mode.
Save Configuration		
Step 1	<pre>copy running-config startup-config</pre> <p>Example: Router# copy running-config startup-config</p>	Saves the new running configuration of the router as the startup configuration.
Step 2	<pre>show running-config</pre> <p>Example: Router# show running-config</p>	Displays the running configuration of the router so that you can verify the address configurations.

Example

Figure 3-5 shows an example of the Cisco IOS Layer 3 routed configuration where the VMware vSphere Hypervisor and the virtual servers are in the same branch subnet as the client PCs.

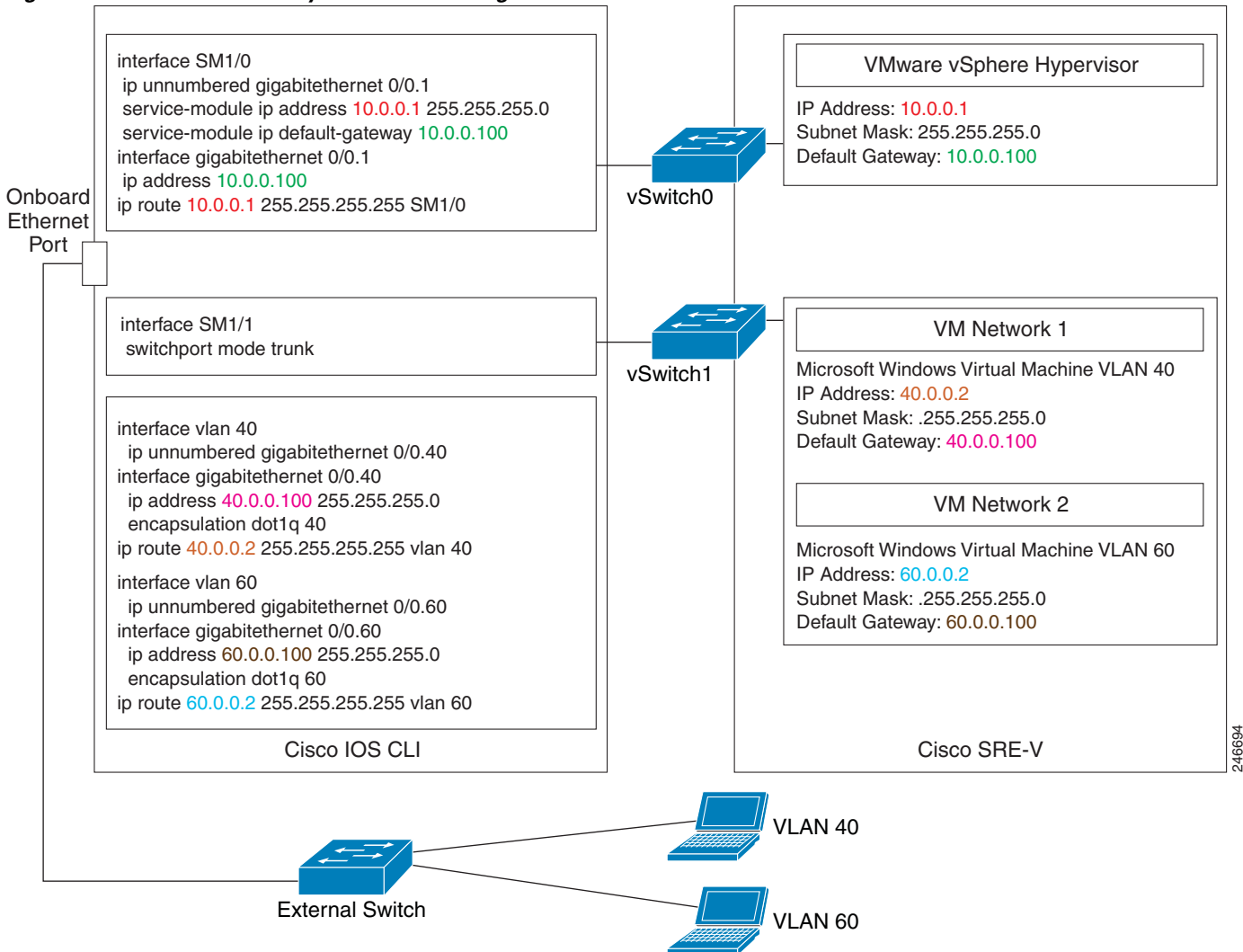
- The left pane shows an example of the Cisco IOS commands that you configure in the sm 1/0, sm 1/1, VLAN, and Gigabit Ethernet interfaces.
- The right pane shows that the configuration is applied to the VMware vSphere Hypervisor. The bottom area in the right pane shows the configuration for the Microsoft Windows Servers that are configured using the standard Microsoft Windows network configuration setup process. These Microsoft Windows Servers run as virtual machines.



Note

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

Figure 3-5 Cisco IOS Layer 3 Routed Configuration—Devices in the Same Subnet

**Related Topic**

- [Downloading the Cisco SRE-V Software, page 4-4](#)

External Interface Configuration

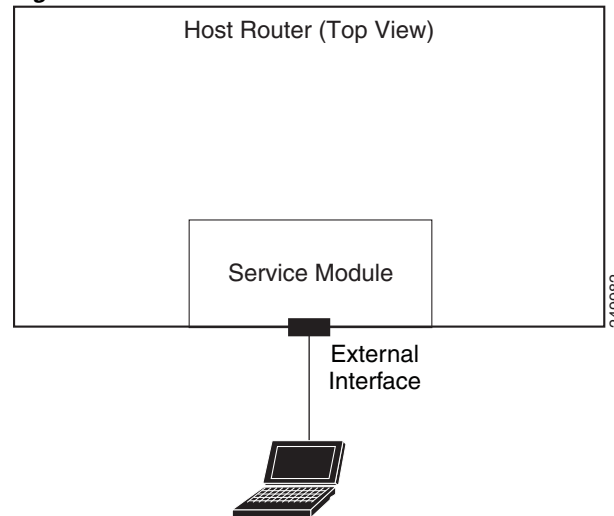
There are two steps to configuring the external interface. First you use Cisco IOS commands and then you use the vSphere client GUI.

The Cisco IOS commands for this 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 Options](#)” 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.

Procedure

-
- Step 1** To configure access to the VMware vSphere Hypervisor, 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 Options” section on page 3-10
- Step 2** To configure access to the virtual machine through the external interface, use the vSphere client GUI. In the vSphere client GUI, create a new virtual machine port group with the attributes shown in the Standard Switch: vSwitch2 portion of Figure 3-8. For instructions, see the *Services Ready Engine Virtualization (SRE-V) Self Training Guide*.
-

Example

Figure 3-7 shows an example of step 1, the Cisco IOS external interface configuration.



Note

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

Figure 3-7 External Interface Configuration—Step 1: Cisco IOS Configuration

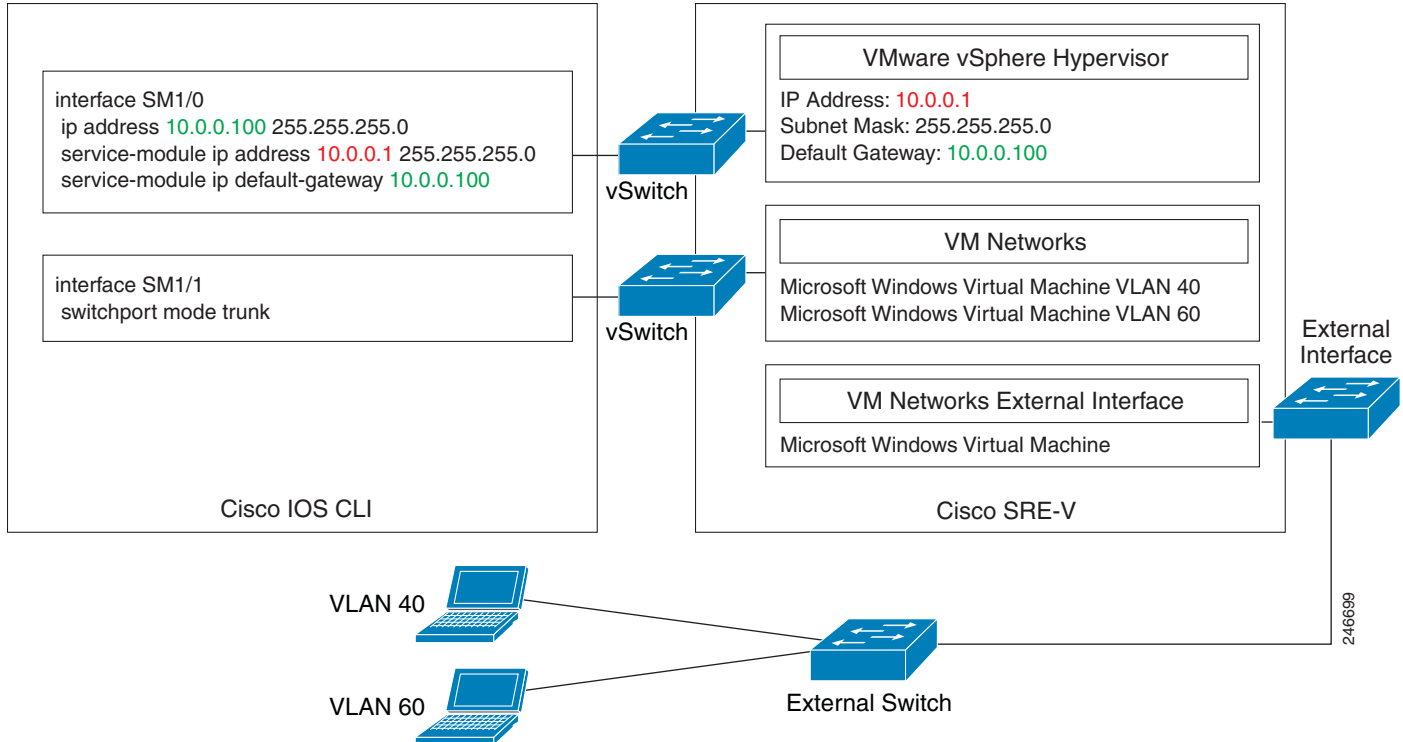
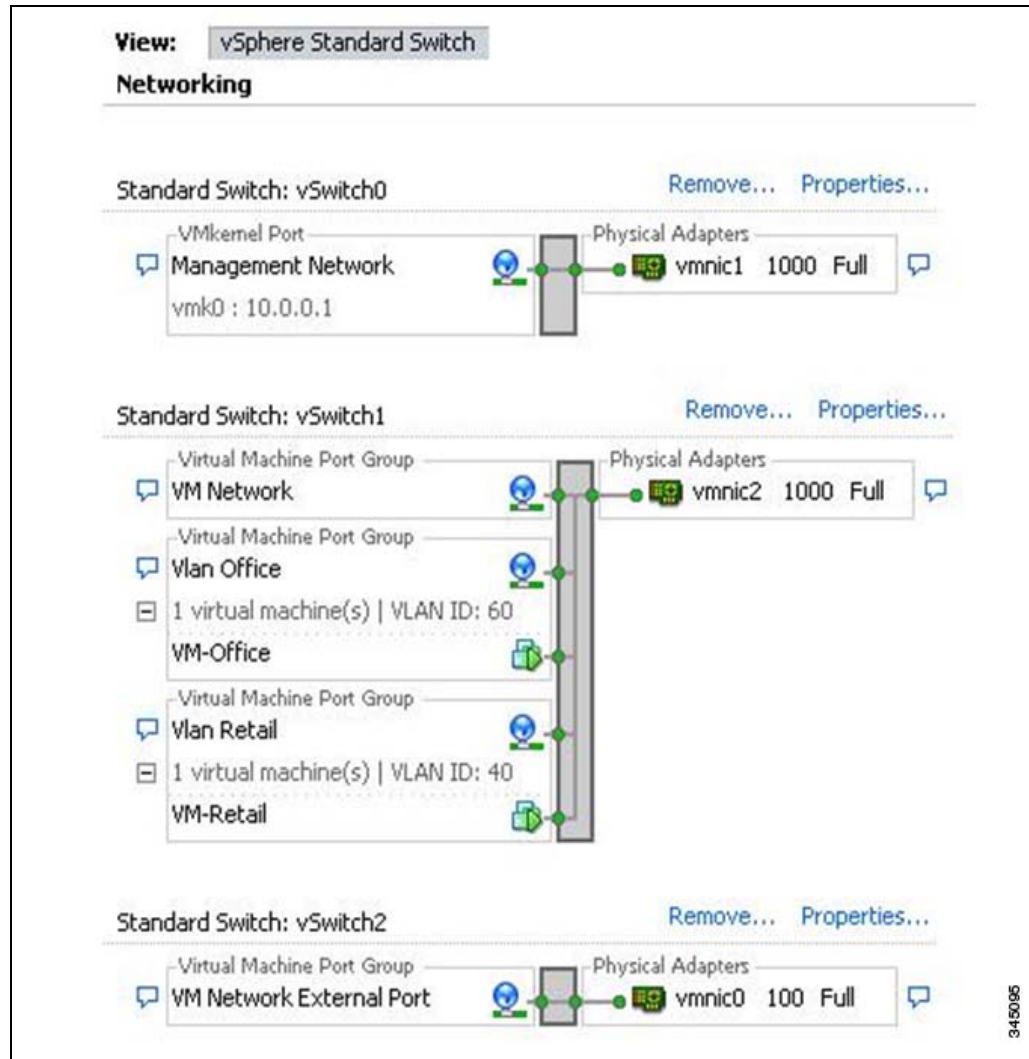


Figure 3-8 shows an example of step 2, the attributes for the new virtual machine port group that was created with the vSphere client GUI.

Figure 3-8 External Interface Configuration—Step 2: VMware vSphere Client GUI Configuration



Related Topic

- [Downloading the Cisco SRE-V Software, page 4-4](#)

Reloading, Resetting, and Shutting Down the Cisco SRE Service Module

- [Using CLI Commands to Reload, Reset, or Shut Down the Service Module, page 3-26](#)
- [Using the Hardware to Shut Down the Cisco SRE Service Module, page 3-27](#)

Using CLI Commands to Reload, Reset, or Shut Down the Service Module

To reload, reset, or shut down the Cisco SRE Service Module, choose the common router commands listed in [Table 3-2](#). You might choose to shut down the Cisco SRE Service Module for service reasons or to save energy when it is not being used.



Note

- For these Cisco IOS **service-module** commands to take effect, make sure that the **Management Network** VMkernel port group is configured to use the vSwitch that has the vmnic1 interface as the uplink.
- Some shutdown commands can potentially disrupt service. If the command output for such a command displays a confirmation prompt, press **Enter** to confirm; or type **n** to cancel, and then press **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.

Table 3-2 Common Shutdown and Startup Commands


Configuration Mode	Command	Purpose
Router#	service-module sm slot/0 reload	Gracefully shuts down the Cisco SRE Service Module and then powers it on.
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.  Caution Using this command does <i>not</i> provide an orderly software shutdown and may impact file operations that are in progress.

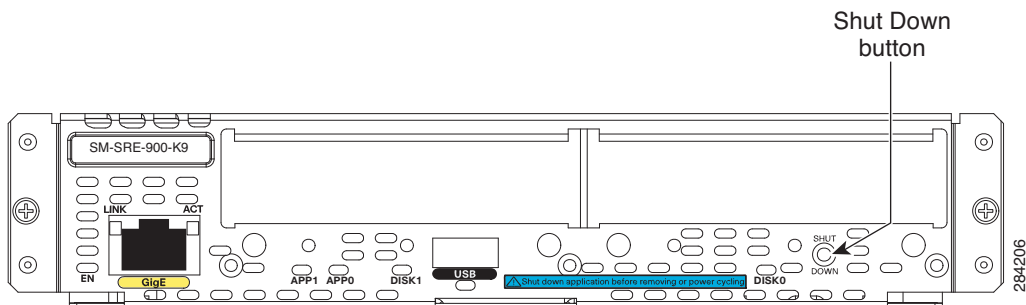
Table 3-2 Common Shutdown and Startup Commands (continued)

Configuration Mode	Command	Purpose
Router#	<code>service-module sm slot/0 shutdown</code>	<p>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.</p> <p>If the virtual machines on the VMware vSphere Hypervisor 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.</p> <p>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.</p> <p>Note If you enter the <code>service-module sm slot/0 shutdown</code> command when the VMware vSphere Hypervisor is in lockdown mode, the system shuts down the Cisco SRE Service Module but not the VMware vSphere Hypervisor. In addition, the system cannot process any subsequent <code>service-module sm slot/0</code> commands. For more information about lockdown mode, see the “About Lockdown Mode” section on page 6-5.</p>

Using the Hardware to Shut Down the Cisco SRE Service Module

You can shut down the software by pressing the shut down button on the Cisco SRE Service Module. [Figure 3-9](#) shows the location of the shut down button on the Cisco SRE 900 Service Module. The button is in the same location for the Cisco SRE 700, 710, and 910 Service Modules.

Figure 3-9 Shut Down Button on the Cisco SRE 900 Service Module



To perform a graceful shutdown of the software, follow these steps.



Note

You can only perform this procedure after you have installed the software.

Procedure

-
- Step 1** Locate the shut down button. Refer to [Figure 3-9](#).
- Step 2** Stick a pin into the recessed hole to press the button.
The system gracefully shuts down.
-

After you shut down the Cisco SRE Service Module, disable the heartbeat reset function to prevent the system from restarting. To disable the heartbeat reset function, use the **service-module sm slot/0 heartbeat-reset disable** command. See the “[VMware vSphere Hypervisor Does Not Remain in a Shutdown State](#)” section on page 6-10.



CHAPTER 4

Installing and Managing the Cisco SRE-V Software

Last Updated: September 17, 2012



Note

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.

- [Understanding RAID Options, page 4-1](#)
- [Downloading and Installing the Cisco SRE-V Software, page 4-4](#)
- [Upgrading, Migrating, and Downgrading the Cisco SRE-V Software, page 4-9](#)
- [Entering and Exiting the VMware vSphere Hypervisor DCUI, page 4-11](#)
- [Installing VMware and Other Applications, page 4-12](#)

Understanding RAID Options

When installing the Cisco SRE-V application on a Cisco SRE 900 or 910 Service Module, you can choose to store data files on local Redundant Array of Inexpensive Disks (RAID). The available RAID mode options are: RAID 1, RAID 0, and non-RAID.



Note

RAID is *not supported* on the Cisco SRE 700 or 710 Service Module. It is supported on the Cisco SRE 900 and 910 Service Modules only.

Table 4-1 provides a summary of the RAID options.

Table 4-1 Summary of RAID Options

Options	Description	Advantages	Disadvantages
RAID 1	Mirrored set of disk drives, where the data in both the disks is identical.	<ul style="list-style-type: none"> • High availability • Fault tolerance • Hot-swapping 	<ul style="list-style-type: none"> • Storage—465 GB • Small performance impact
RAID 0	Data is stored evenly in stripe blocks across two or more disks without redundancy (mirroring). The data in both the disk drives is different.	<ul style="list-style-type: none"> • Storage—927 GB • Double performance 	<ul style="list-style-type: none"> • No error checking • No fault tolerance • No hot-swapping • No redundancy
Non-RAID	Disk drives of a computer are not configured as RAID. Also referred to as JBOD.	<ul style="list-style-type: none"> • Portable 	<ul style="list-style-type: none"> • No error checking • No fault tolerance • No hot-swapping • No redundancy

See the following sections for more information:

- [RAID 1, page 4-2](#)
- [RAID 0, page 4-3](#)
- [Non-RAID, page 4-4](#)

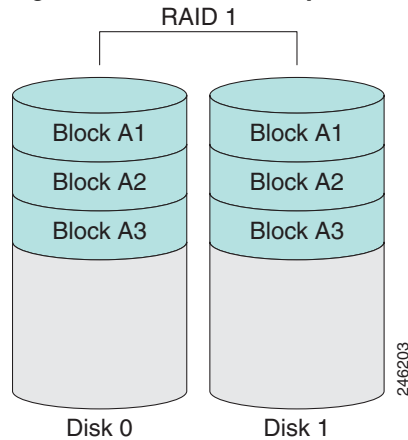
RAID 1

RAID 1 does the following:

- Creates a mirrored set of disk drives, where the data in both the disk drives is identical. See [Figure 4-1](#).
- Provides high availability. If one disk drive fails, the other disk drive takes over, preserving the datastore.
- Supports fault tolerance and hot-swapping. When one disk drive fails, you can remove the faulty disk drive and replace it with a new disk drive. See the [“Hot-Swapping the Faulty RAID 1 Disk Drive” section on page 7-2](#).

Compared to RAID 0, there is less storage space with RAID 1 because only half of the total potential disk storage space (465 GB) is available. This leads to a small impact on performance.

[Figure 4-1](#) shows that in RAID 1, the data in disk 0 and disk 1 is identical (mirrored).

Figure 4-1 RAID 1 Option—Data in Disk 0 and Disk 1 Is Identical

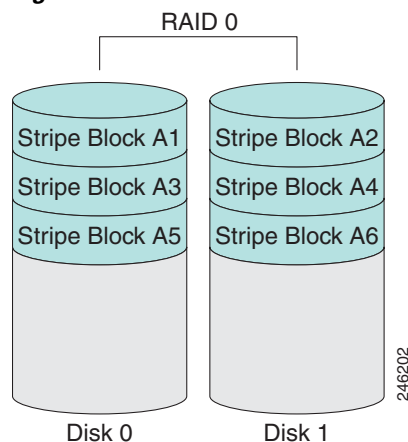
RAID 0

With RAID 0, the data is stored evenly in stripe blocks across two disk drives without redundancy (mirroring). The data in both the disk drives is different. See [Figure 4-2](#).

Compared to RAID 1, RAID 0 provides additional storage because both the disk drives (927 GB) are used to store data. The performance is improved by two times because the read and write operation occurs in parallel within the two disk drives.

However, there is no fault tolerance, error checking, or hot-swapping. If one disk drive fails, the data in the entire array is destroyed. Because there is no error checking or hot-swapping, the array is susceptible to unrecoverable errors.

[Figure 4-2](#) shows that in RAID 0, the data in disk 0 and disk 1 is different. The data is evenly divided across Disk 0 and Disk 1 without redundancy.

Figure 4-2 RAID 0—Data in Disk 0 and Disk 1 Is Different

Non-RAID

When the disk drives of a computer are not configured as RAID, the computer is in non-RAID mode. Non-RAID mode is also referred to as Just a Bunch of Disks or Just a Bunch of Drives (JBOD). Non-RAID mode does not support fault tolerance, error checking, hot-swapping, or redundancy.

Related Topics

- [Entering the RAID Management Command Environment, page 7-1](#)
- [Hot-Swapping the Faulty RAID 1 Disk Drive, page 7-2](#)

Downloading and Installing the Cisco SRE-V Software

- [Downloading the Cisco SRE-V Software, page 4-4](#)
- [Installing the Cisco SRE-V Software—Clean Install, page 4-5](#)
- [Uninstalling the Cisco SRE-V Software, page 4-7](#)
- [Verifying Software Installation or Uninstallation, page 4-8](#)

Downloading the Cisco SRE-V Software

Before You Begin

- Ensure 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.

Procedure

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

- For the Cisco SRE 700 or 710 Service Module, download the following .zip file:
sre-v-k9.SPA.smv.2.0.0.zip
 - For the Cisco SRE 900 or 910 Service Module, download the following .zip file:
sre-v-k9-r.SPA.smv.2.0.0.zip
- where r in the file name stands for RAID. RAID is supported on the Cisco SRE 900 and 910 Service Modules only.



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, choose **Configuration > Miscellaneous**, and then uncheck **TAR file smart CR/LF conversion**.

Step 2 Extract the zip files to an FTP server. All files to be installed must reside in the same directory.

- Step 3** Install the Cisco SRE-V software. See the “[Installing the Cisco SRE-V Software—Clean Install](#)” section on page 4-5 or the “[Migrating the Cisco SRE-V Software from Release 1.0 or 1.1 to Release 2.0](#)” section on page 4-9 as appropriate.
-

Related Topics

- [Understanding RAID Options](#), page 4-1
- [Installing the Cisco SRE-V Software—Clean Install](#), page 4-5
- [Migrating the Cisco SRE-V Software from Release 1.0 or 1.1 to Release 2.0](#), page 4-9

Installing the Cisco SRE-V Software—Clean Install



Caution

Do not use this procedure if you have a previous version of Cisco SRE-V software installed on your system. If you do, you will lose all data. To upgrade to the next version, use the upgrade procedure. See the “[Migrating the Cisco SRE-V Software from Release 1.0 or 1.1 to Release 2.0](#)” section on page 4-9.



Note

- 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
```

Before you begin installing the Cisco SRE-V software, see the “[Understanding RAID Options](#)” section on page 4-1.

SUMMARY STEPS

1. **enable**
2. **service-module sm slot/0 install url url**
or
service-module sm slot/0 install url url argument disk-cfg-mode={raid1 | raid0 | nonraid}
3. **[service-module sm slot/0 status]**
4. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	<pre>enable <password></pre> <p>Example:</p> <pre>Router> enable Router> <password> Router#</pre>	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	<pre>service-module sm slot/0 install url url</pre> <p>or</p> <pre>service-module sm slot/0 install url url argument disk-cfg-mode={raid1 raid0 nonraid}</pre> <p>Example of Cisco SRE 900 or 910 Service Module:</p> <pre>Router# service-module sm 2/0 install url ftp://server.com/dir/sre-v-k9-r.SPA.smv.2.0.0.pkg Loading galactica-whql#\$.1/solaria/2.0.0/raid/sre-v-k9-r. SPA.smv.2.0.0.pkg Delete the installed Cisco SRE-V Software and proceed with new installation? [no]: yes Loading solaria/2.0.0/raid/sre-v-k9-r.SPA.smv.2.0.0.pkg.i ninstall.sre ! [OK - 5994/4096 bytes]</pre> <pre>Service module installation ios_version 15.1(3.22)M0.6, ios_image c2951-universalk9-mz pkg_name sre-v-k9-r.spa.smv.2.0.0.pkg key_file sre-v-k9-r.spa.smv.2.0.0.key helper_file sre-v-installer.spa.smv.2.0.0 pid SM-SRE-900-K9</pre> <pre>Check target platform capabilities cpu 1865 Please select disk configuration (-1 = nonraid, 0 = raid0, 1 = raid1) [-1]:</pre> <p>or</p> <pre>Router# service-module sm 2/0 install url ftp://server.com/dir/sre-v-k9-r.SPA.smv.2.0.0.pkg argument disk-cfg-mode=raid1</pre> <pre>Router# service-module sm 2/0 install url ftp://server.com/dir/sre-v-k9-r.SPA.smv.2.0.0.pkg argument disk-cfg-mode=raid0</pre> <pre>Router# service-module sm 2/0 install url ftp://server.com/dir/sre-v-k9-r.SPA.smv.2.0.0.pkg argument disk-cfg-mode=nonraid</pre>	<p>Starts the installation of the Cisco SRE-V application. After you enter the install command, you are prompted to choose a disk configuration (RAID mode). The disk configuration options are: 1, 0, or -1.</p> <ul style="list-style-type: none"> • 1 is RAID 1 mode. • 0 is RAID 0 mode. • -1 is non-RAID mode <p>For information about RAID options, see the “Understanding RAID Options” section on page 4-1.</p> <p>or</p> <p>Starts the installation of the Cisco SRE-V application in the specified RAID mode. The RAID mode options are: RAID 1, RAID 0, or non-RAID. For information about RAID options, see the “Understanding RAID Options” section on page 4-1.</p> <p>Note RAID is <i>not supported</i> on the Cisco SRE 700 or 710 Service Modules. RAID is supported on the Cisco SRE 900 and 910 Service Modules only.</p> <ul style="list-style-type: none"> • <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. • <i>url 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. <p>In the url, you can choose to use the username and password of the FTP server. For example:</p> <pre>ftp://username:password@server.com/dir/ sre-v-k9-r.SPA.smv.2.0.0.pkg.</pre>

	Command or Action	Purpose
Step 2 (continued)	<p>Example of Cisco SRE 900 or 910 Service Module with FTP credentials in the URL:</p> <pre>Router# service-module sm 2/0 install url ftp://username:password@server.com/dir/sre-v-k9-r .SPA.smv.2.0.0.pkg</pre>	<ul style="list-style-type: none"> • raid1—Installs Cisco SRE-V in RAID 1 mode. For more information, see the “RAID 1” section on page 4-2. • raid0—Installs Cisco SRE-V in RAID 0 mode. For more information, see the “RAID 0” section on page 4-3. • nonraid—Installs Cisco SRE-V in non-RAID mode. For more information, see the “Non-RAID” section on page 4-4.
Step 3	<p>[service-module sm slot/0 status]</p> <p>Example:</p> <pre>Router# service-module sm 2/0 status</pre>	(Optional) Monitors progress of the installation.
Step 4	<p>exit</p> <p>Example:</p> <pre>Router# exit</pre>	Exits privileged EXEC mode.

After you successfully install Cisco SRE-V Release 2.0, and you session into the service module, the console interface is displayed. The console interface allows you to access the VMware vSphere Hypervisor DCUI to perform Cisco SRE-V configuration. See “Entering and Exiting the VMware vSphere Hypervisor DCUI” section on page 4-11.

Related Topics

- [Understanding RAID Options, page 4-1](#)
- [Downloading the Cisco SRE-V Software, page 4-4](#)
- [Uninstalling the Cisco SRE-V Software, page 4-7](#)

Uninstalling the Cisco SRE-V Software



Caution

This procedure erases the disk on the Cisco SRE Service Module and removes the application keys.

SUMMARY STEPS

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

DETAILED STEPS

	Command or Action	Purpose
Step 1	<pre>enable <password></pre> <p>Example: Router> enable Router> <password> Router#</p>	Enables privileged EXEC mode. Enter your password if prompted.
Step 2	<pre>service-module sm slot/0 uninstall</pre> <p>Example: Router# service-module sm 2/0 uninstall</p>	<p>Uninstalls the SRE-supported application from the specified Cisco SRE Service Module.</p> <p>This command completely erases the disk on the Cisco SRE Service Module and removes the application keys. It does not remove the application licenses.</p> <ul style="list-style-type: none"> • <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. <p>Note 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 service-module sm slot/0 status command.</p>
Step 3	<pre>exit</pre> <p>Example: Router# exit</p>	Returns to privileged EXEC mode.

Related Topic

- [Downloading the Cisco SRE-V Software, page 4-4](#)

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
Service Module is Cisco SM1/0
Service Module supports session via TTY line 67
Service Module is in Steady state
Service Module heartbeat-reset is enabled
Getting status from the Service Module, please wait..
Cisco SRE-V Software 2.0.0.0
VMware ESXi 5.0.0 build-348481 running on SRE

Module resource information:
CPU Frequency: 1860 MHz
Memory Size: 4067 MB
Disk 0 Size: 500108 MB
Disk 1 Size: 500108 MB
```

Disk 2 Size: 1955 MB

No install/uninstall in progress

Related Topics

- [Installing the Cisco SRE-V Software—Clean Install, page 4-5](#)
- [Uninstalling the Cisco SRE-V Software, page 4-7](#)

Upgrading, Migrating, and Downgrading the Cisco SRE-V Software

- [About Upgrading and Migrating, page 4-9](#)
- [Migrating the Cisco SRE-V Software from Release 1.0 or 1.1 to Release 2.0, page 4-9](#)
- [Upgrading the Cisco SRE-V Software from Release 1.5 to Release 2.0, page 4-10](#)
- [Downgrading the Cisco SRE-V Software from Release 2.0 to Release 1.5, 1.1, or 1.0, page 4-10](#)

About Upgrading and Migrating

When you migrate the software, you perform a clean install of the Release 2.0 software and keep only the datastore content. To migrate the software, use the **keep-ds** argument.

When you upgrade the software, you perform a clean install of the Release 2.0 software and keep the VMware vSphere Hypervisor host configuration data as well as the datastore content. To upgrade the software, use the **upgrade** argument. To keep the VMWare vSphere Hypervisor host configuration data, use the **upgrade** argument.

If you use both the **keep-ds** and the **upgrade** arguments, the system uses the **upgrade** argument and ignores the **keep-ds** argument.

Migrating the Cisco SRE-V Software from Release 1.0 or 1.1 to Release 2.0

Before You Begin

- Download the appropriate version of the Cisco SRE-V upgrade software. See the “[Downloading the Cisco SRE-V Software](#)” section on page 4-4.

Procedure

- Step 1** Use the **service-module sm slot/0 install url url argument keep-ds** command to install the Cisco SRE-V software, as shown in the following example:

```
Router# service-module sm 2/0 install url  
ftp://server.com/dir/sre-v-k9-r.SPA.smv.2.0.0.pkg argument keep-ds
```

where *url* is 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.

In the URL, you can choose to use the username and password of the FTP server. For example:

```
Router# service-module sm 2/0 install url
ftp://username:password@server.com/dir/sre-v-k9-r.SPA.smv.2.0.0.pkg argument keep-ds
```

- Step 2** After the upgrade, the content in the disk is retained but you must reconfigure the VMware vSphere Hypervisor, and then add the virtual machines to the inventory.
-

Related Topics

- [Cannot View Datastores, page 7-7](#)

Upgrading the Cisco SRE-V Software from Release 1.5 to Release 2.0

Before You Begin

- Download the appropriate version of the Cisco SRE-V upgrade software. See the “[Downloading the Cisco SRE-V Software](#)” section on page 4-4.

Procedure

- Step 1** Use the `service-module sm slot/0 install url url argument upgrade` command to install the Cisco SRE-V software, as shown in the following example:

```
Router# service-module sm 2/0 install url
ftp://server.com/dir/sre-v-k9-r.SPA.smv.2.0.0.pkg argument upgrade
```

where *url* is 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.

In the URL, you can choose to use the username and password of the FTP server. For example:

```
Router# service-module sm 2/0 install url
ftp://username:password@server.com/dir/sre-v-k9-r.SPA.smv.2.0.0.pkg argument upgrade
```

Related Topics

- [Cannot View Datastores, page 7-7](#)

Downgrading the Cisco SRE-V Software from Release 2.0 to Release 1.5, 1.1, or 1.0

Before You Begin

- Export the virtual machines to a remote location.
- Download the software for the Cisco SRE-V release for which you want to downgrade. See the “[Downloading the Cisco SRE-V Software](#)” section on page 4-4. Instead of downloading Release 2.0, download the version you need.

Procedure

- Step 1** Use the **service-module sm slot/0 install url url** command to install the lower version of the Cisco SRE-V software. See the following example which is downgrading to Release 1.1. (If you are downgrading to a different version, substitute that version number).

```
Router# service-module sm slot/0 install url
ftp://server.com/dir/sre-v-k9.smv.1.1.1.pkg
```

where *url* is 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. In the URL, you can choose to use the username and password of the FTP server. For example:

```
Router# service-module sm slot/0 install url
ftp://username:password@server.com/dir/sre-v-k9.smv.1.1.1.pkg
```

- Step 2** Choose the RAID mode that you want enabled. During the installation process, you are prompted to choose a disk configuration (RAID mode). The disk configuration options are: 1, 0, or -1.

- 1 is RAID 1 mode.
- 0 is RAID 0 mode.
- -1 is non-RAID mode.

The service module reboots and the downgraded version of the Cisco SRE-V software is installed.

- Step 3** Reconfigure the VMware vSphere Hypervisor.

- Step 4** Import the virtual machines that you had exported.
-

Entering and Exiting the VMware vSphere Hypervisor DCUI

Procedure

- Step 1** Use the **service-module sm slot/0 session** command to session into the Cisco SRE Service Module, as shown in the following example:

```
Router# service-module sm 2/0 session
SRE-Module#
```

The DCUI Welcome page appears.

- Step 2** If you are a first-time user of the VMware vSphere Hypervisor, use **root** for the username; and for the password, leave the field empty. After you login, we recommend that you change the password.

- Step 3** To exit from the DCUI, press **Ctrl + Shift + 6 + x**.

The router prompt appears.

- Step 4** Enter the **disconnect** command to disconnect from the DCUI, as shown in the following example:

```
Router# disconnect
```

- Step 5** At the confirmation prompt, press **Enter** to confirm the disconnect operation.
-

Installing VMware and Other Applications

- [Other Cisco Applications on the Cisco SRE Service Module, page 4-12](#)
- [Installing the VMware vSphere Hypervisor Patch or Update Release, page 4-12](#)

Other Cisco Applications on the Cisco SRE Service Module

Before You Begin

- Export the virtual machines to a remote location.
- Download the application that you want to install on the Cisco SRE Service Module.
- Download the hardware utility called sm-hw-util.1.1.1. This hardware utility changes the SATA mode from AHCI to IDE. The sm-hw-util.1.1.1 utility is part of the file called sm-hw-util.1.1.1.zip. Go to Cisco.com and enter sm-hw-util.1.1.1.zip to search for the file.

Procedure

-
- Step 1** Use the **service-module sm slot/0 install url url/sm-hw-uti1.1.1.1 argument sata-mode=ide** command to change the SATA mode from AHCI to IDE:

```
Router# service-module sm slot/0 install url url/sm-hw-uti1.1.1.x argument
sata-mode=ide
```

- Step 2** Use the **service-module sm slot/0 install url application_url** command to install the software, as shown in the following example:

```
Router# service-module sm slot/0 install url application_url.pkg
```

where *url* is 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.

The service module reboots and the application is installed.

Installing the VMware vSphere Hypervisor Patch or Update Release

VMware vSphere Hypervisor patches and update releases are available periodically on an as-needed basis from Cisco.com. However, you can also install patches released from VMware.com onto this platform

Restriction

- RAID functionality is not provided in VMware patches. To prevent the RAID functionality from being overwritten when installing a patch or update release using the ESXi CLI on a Cisco SRE 900 or 910 Service Module, use the **software vib update** command and not the **software vib install** command.

Before You Begin

- Download the patch or update release.

Procedure

-
- Step 1** Use an update utility, such as vCenter Update Manager (VUM), the vSphere remote CLI, or the ESXi CLI to install the patch or update release.
-



CHAPTER 5

Managing the VMware vSphere Hypervisor License

Last Updated: September 17, 2012

Cisco SRE-V uses the VMware vSphere Hypervisor software for virtualization. This chapter provides information about how to manage the VMware vSphere Hypervisor license.

- [VMware vSphere Hypervisor License Overview, page 5-1](#)
- [Registering the VMware vSphere Hypervisor License, page 5-2](#)
- [Activating the VMware License Key, page 5-3](#)
- [Accessing the VMware License Key Information, page 5-4](#)

VMware vSphere Hypervisor License Overview

The following two types of VMware vSphere Hypervisor licenses are available:

- 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.
- Permanent VMware vSphere Hypervisor Host License—Perpetual license that can be obtained along with the Cisco SRE-V software image, or can be purchased separately, after the built-in evaluation license expires. After a permanent license is installed, it provides all the permissions necessary, to access the features in the software image. You do not need to upgrade a permanent licence for subsequent releases.

The following types of permanent licenses are available:

- VMware vSphere Hypervisor Host License—Does not provide the ability to manage the VMware vSphere Hypervisor host through the VMware vCenter Server.
- VMware vSphere Hypervisor Host with VMware vCenter Server Agent License—Provides the ability to manage the VMware vSphere Hypervisor host through the VMware vCenter Server.

For feature license SKUs that are available for Cisco SRE-V, see [Table 5-1](#).



Note

You can convert the **VMware vSphere Hypervisor Host** license to a **VMware vSphere Hypervisor Host with VMware vCenter Server Agent** license by purchasing an upgrade license.

Table 5-1 shows the feature license SKUs that are available for Cisco SRE-V.

Table 5-1 Feature License SKUs

License SKUs	Description
Licenses Without VMware vCenter Server Support	
FL-SRE-V-HOST	VMware vSphere Hypervisor Host paper license purchased with the software.
FL-SRE-V-HOST=	VMware vSphere Hypervisor Host paper license purchased without the software (spare).
L-FL-SRE-V-HOST=	VMware vSphere Hypervisor Host electronic license purchased without the software (spare).
Licenses With VMware vCenter Server Support	
FL-SRE-V-HOSTVC	Feature license for the VMware vSphere Hypervisor software on the Cisco SRE Service Module, which includes VMware vCenter Server management support. This license can be purchased with the software.
FL-SRE-V-HOSTVC=	Feature license for the VMware vSphere Hypervisor software on the Cisco SRE Service Module, which includes VMware vCenter Server management support (spare).
L-FL-SRE-V-HOSTVC=	E-delivery feature license for the VMware vSphere Hypervisor software on the Cisco SRE Service Module, which includes VMware vCenter Server management support (spare).
Upgrade Licenses to Add VMware vCenter Server Support	
FL-SRE-V-VC-UPG=	Feature license to upgrade the VMware vSphere Hypervisor software on the Cisco SRE Service Module to enable VMware vCenter Server management support (spare).
L-FL-SRE-V-VC-UPG=	E-delivery feature license to upgrade the VMware vSphere Hypervisor software on the Cisco SRE Service Module to enable VMware vCenter Server management support (spare).

Related Topics

- [Cisco SRE-V Options, page 1-5](#)

Registering the VMware vSphere Hypervisor License

Use this procedure if you purchased Cisco SRE-V option 1 (hardware only) and a spare VMware vSphere Hypervisor license from Cisco.com.

When you purchase the spare VMware vSphere Hypervisor license, you receive a letter from Cisco Systems, which contains the activation code, which you must register with VMware. After, you register the activation code, you receive a VMware license key, which you must activate using the vSphere Client GUI.




Note

You must register the activation code with VMware within 30 days of receipt.

To register the activation code and receive the VMware license key, complete the following steps.

Procedure

- Step 1** To register the activation code with VMware, go to <https://www.vmware.com/oem/code.do?Name=CISCOISR-AC>.
The VMware Product Registration page opens.

- Step 2** Do one of the following:
- If you are a registered VMware user, enter your credentials, and then click **Sign In**. The VMware Partner Activation Code Registration page opens.
 - If you are new to VMware, click **Register**. The Register For Your VMware Product page opens. Enter the required information in the fields provided, and then click **Continue**. You receive an e-mail from VMware to activate your account. Click **Activate Now** provided in your e-mail, and then enter your password in the field provided. The VMware Partner Activation Code Registration page opens.
- Step 3** Enter the activation code that you received from Cisco Systems in the Partner Activation Code(s) text box, and then click **Continue**. The Add License Administrator page opens. By default, your name is added as the License Administrator.
- Step 4** To allow additional people to receive information about future updates and serial number upgrades, enter their e-mail address in the space provided in the Add License Administrator page, and then click **Continue**.
- The VMware Confirmation Page opens with the license key redemption information for the activation codes that you registered.
- Step 5** Save the product redemption information for your records, and then click **Continue**. The Link to Downloads and VMware's License Portal page opens thanking you for your registration.
- After you finish the registration process, you receive an e-mail from VMware with information about the VMware license key or serial number.
-  **Note** We highly recommend that you write down the VMware license key and store it in a secure, easily accessible location.
- Step 6** To use Cisco SRE-V software, you must assign the VMware license key to the VMware vSphere Hypervisor host using the vSphere Client GUI as appropriate. See [“Activating the VMware License Key” section on page 5-3](#).

Related Topics

- [Cisco SRE-V Options, page 1-5](#)

Activating the VMware License Key

Before You Begin

- Download and install the vSphere Client. See the [“Downloading and Installing the vSphere Client” section on page 6-1](#).

Procedure

- Step 1** From the vSphere Client GUI, click the **Configuration** tab.
- Step 2** From the left pane, under Software, choose **Licensed Features**
- Step 3** Click **Edit...**, which is located on the top right corner of the Licensed Features page.
- The Assign License page opens.

- Step 4** Choose **Assign a New License to this Host** radio button, and then click **Enter Key**.
The Add License Key window opens.
- Step 5** Enter the license key in the New License Key field, and then click **OK**.
-

Related Topics

- [Cisco SRE-V Options, page 1-5](#)

Accessing the VMware License Key Information

You can access the license key information from the vSphere Client GUI or the console interface.

**Note**

We highly recommend that you write down the VMware license key and store it in a secure, easily accessible location.

- [Accessing the VMware License Key Information from the vSphere Client GUI, page 5-4](#)
- [Accessing the VMware License Key Information from the Console Interface, page 5-4](#)

Accessing the VMware License Key Information from the vSphere Client GUI

Procedure

- Step 1** From the vSphere Client GUI, choose a host.
- Step 2** Click the **Configuration** tab, and then choose **Licensed Features**.
The license key information displays in the following format: XXXX-XXXX-XXXX-XXXX.
-

Accessing the VMware License Key Information from the Console Interface

The console interface allows you to access the VMware vSphere Hypervisor DCUI. To obtain the license key information from the console interface, choose **View Support Information**.

The license key information displays in the following format: XXXX-XXXX-XXXX-XXXX.

The physical machine serial number is also displayed. Make sure that you do not confuse the license key information with the physical machine serial number.



CHAPTER 6

Managing Virtual Machines

Last Updated: September 17, 2012

A virtual machine is a software computer (just like a physical computer) that runs an operating system and applications. Virtual machines run on the VMware vSphere Hypervisor. You can use the same VMware vSphere Hypervisor to run several virtual machines. Use the vSphere Client GUI to create and manage virtual machines. Use the VMware vCenter Server to manage multiple VMware vSphere Hypervisor hosts.

- [Downloading and Installing the vSphere Client, page 6-1](#)
- [Downloading the VMware vCenter Server, page 6-4](#)
- [Managing the Cisco SRE Service Module with the VMware vCenter Server, page 6-4](#)
- [About Lockdown Mode, page 6-5](#)
- [Important Information About Creating Virtual Machines, page 6-6](#)
- [Information About vSwitches, page 6-8](#)
- [VMware vSphere Hypervisor Advanced Customization, page 6-9](#)

Downloading and Installing the vSphere Client

To manage the virtual machine, you must download and install the vSphere Client on a Microsoft Windows system with Microsoft .NET 3.5 SP1 framework.

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.



Note

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

Procedure

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, enter the IP address or hostname of the VMware vSphere Hypervisor and the username and password, and then click **Login**. The vSphere Client GUI opens.



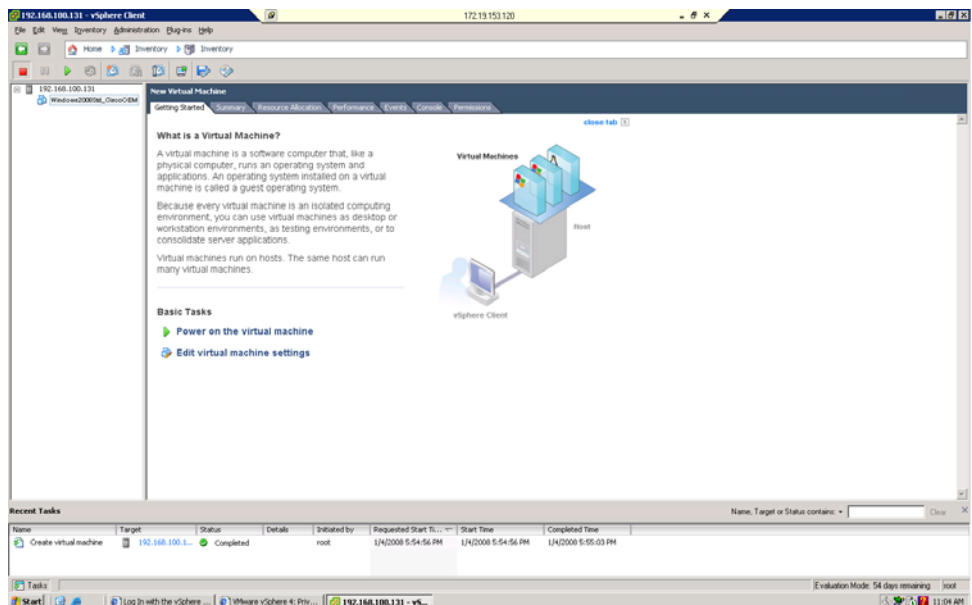
Note If you are a first-time user of the VMware vSphere Hypervisor, use **root** for the username; and for the password, leave the field empty. After you login, we recommend that you change the password.



Note 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](#).

- 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 6-1](#).

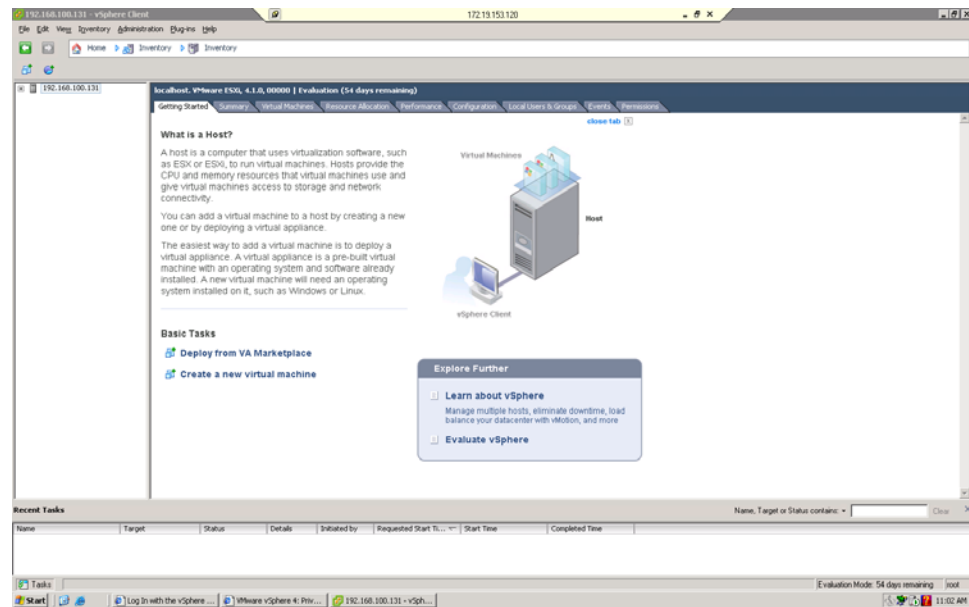
Figure 6-1 vSphere Client Inventory Page with a Virtual Machine Selected



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- To create a new virtual machine, see the “[Important Information About Creating Virtual Machines](#)” section on page 6-6, 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 6-2](#).

Figure 6-2 vSphere Client Inventory Page with the Host Name Selected



Note 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.

Related Topics

- [Downloading the VMware vCenter Server, page 6-4](#)
- [Managing the Cisco SRE Service Module with the VMware vCenter Server, page 6-4](#)
- [Important Information About Creating Virtual Machines, page 6-6](#)

Downloading the VMware vCenter Server

To manage multiple VMware vSphere Hypervisor hosts, download the VMware vCenter Server.

Before You Begin

- Download and install the vSphere Client. See the “[Downloading and Installing the vSphere Client](#)” section on page 6-1.
- To download the VMware vCenter Server, connection to the Internet is required. Verify that you have network connectivity.

Procedure

Step 1 Go to `https://hypervisor-ip-address`.

You are directed to the VMware website and the Welcome page opens.

Step 2 Click **Download VMware vCenter**.

For information on the VMware vCenter Server, see *vSphere Installation and Setup* at <http://pubs.vmware.com/vsphere-50/topic/com.vmware.ICbase/PDF/vsphere-esxi-vcenter-server-50-installation-setup-guide.pdf>.

Managing the Cisco SRE Service Module with the VMware vCenter Server

Before You Begin

- Download and install the vSphere Client. See “[Downloading and Installing the vSphere Client](#)” section on page 6-1.
- Download the VMware vCenter Server. See “[Downloading the VMware vCenter Server](#)” section on page 6-4.

Procedure

Step 1 Click the **VMware vSphere Client** icon to open the login window.

Step 2 To manage multiple hosts, enter the IP address or hostname of the VMware vCenter Server, and the username and password of the VMware vCenter Server, and then click **Login**.

The vSphere Client GUI opens.

Step 3 From the vSphere Client main page, do the following:

- a. Create a datastore.
- b. Add a VMware vSphere Hypervisor host. The Add Host Wizard page opens.
- c. Provide the IP address, and the username and password of the VMware vSphere Hypervisor host.

For details, see *vSphere Installation and Setup* at <http://pubs.vmware.com/vsphere-50/topic/com.vmware.ICbase/PDF/vsphere-esxi-vcenter-server-50-installation-setup-guide.pdf>.

About Lockdown Mode

The VMware vSphere Hypervisor allows a host to be in lockdown mode when it is controlled by the VMware vCenter Server.

- [Behavior When Lockdown Mode is Disabled](#), page 6-5
- [Behavior When Lockdown Mode is Enabled](#), page 6-5
- [Determining if Lockdown Mode is Enabled](#), page 6-6

Behavior When Lockdown Mode is Disabled

By default, lockdown mode is disabled. When lockdown mode is disabled, all router and module communication commands behave normally.

Behavior When Lockdown Mode is Enabled

When lockdown mode is enabled, the VMware vSphere Hypervisor host can be only be managed by the VMware vCenter Server using its internal user called vpxuser. All other configuration methods, such as the vSphere Client, PowerCLI, and vCLI are disabled.

[Table 6-1](#) describes the behavior of commands when lockdown mode is enabled.

Table 6-1 Command Behavior in Lockdown Mode

Command	Behavior in Lockdown Mode
<code>service-module slot/0 status</code>	Works normally. Displays a status such as: VMware ESXi 5.0.0 build-469512 running on SRE (LOCKDOWN) .
<code>interface slot/0</code> <code>service-module heartbeat-reset</code>	Works normally. Note This is the same behavior as when lockdown mode is disabled.
<code>service-module sm slot/0 reset</code>	Works normally. Note This is the same behavior as when lockdown mode is disabled.
<code>interface slot/0</code> <code>service-module ip address</code> <code>service-module ip default gateway</code>	Ignored. These command stays in the Cisco IOS configuration and visible when you enter the show running-config command. However, they do not change VMware vSphere Hypervisor settings.

Table 6-1 Command Behavior in Lockdown Mode

Command	Behavior in Lockdown Mode
<code>service-module sm slot/0 reload</code> <code>service-module sm slot/0 shutdown</code>	Change the status of the Service Module as reported by the host router, but have no affect on the VMware vSphere Hypervisor.

Determining if Lockdown Mode is Enabled

To see if lockdown mode is enabled, enter the `service-module sm slot/0 status` command. If lockdown mode is enabled, the system displays (LOCKDOWN) in the output. See the following example:

```
VMware ESXi 5.0.0 build-469512 running on SRE (LOCKDOWN)
```



Note

It can take up to ten seconds after enabling lockdown mode before the system recognizes it.

For more details about the VMware vSphere Hypervisor lockdown mode, see the VMware Knowledge Base article at

http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=1008077.

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 information about the Cisco SRE-V options, see [Figure 1-3](#).

See the following sections:

- [Basic Workflow for Creating Virtual Machines, page 6-6](#)
- [Limitations for Creating Virtual Machines, page 6-7](#)
- [Networking Prerequisites for Creating Virtual Machines, page 6-7](#)
- [Installing VMware Tools, page 6-7](#)

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 Topic

- [Downloading and Installing the vSphere Client, page 6-1](#)

Networking Prerequisites for Creating Virtual Machines

If you want to assign virtual machines on different VLANs, you must configure VLANs on the ISR G2.

Example

```
interface SM1/1
description Internal switch interface connected to Service Module
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 Topic

- [Downloading and Installing the vSphere Client, page 6-1](#)

Installing VMware Tools

VMware Tools are a suite of utilities that enhances 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 information about the Cisco SRE-V options, see [Figure 1-3](#).

Before You Begin

- Install the supported guest operating system on the virtual machine.

Procedure

- 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 64** as appropriate.
The VMware Installation Wizard opens.
- 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* document.

Related Topic

- [Downloading and Installing the vSphere Client, page 6-1](#)

Information About vSwitches

The system creates the following vSwitches in the VMware vSphere Hypervisor:

- vSwitch0—Uses the PCIe interface to connect to the VMware vSphere Hypervisor. The PCIe interface is sm slot/0.

vSwitch0 contains the VMkernel port group for the Management Network. The Management Network is used by the vSphere client to connect to the VMware vSphere Hypervisor.



Note

For the Cisco IOS **service-module** commands to take effect, make sure that the **Management Network** VMkernel port group is configured to use the vSwitch that has the PCIe interface as the uplink. We recommend that you do not change the default VMkernel port group name, which is Management Network.

- vSwitch1—By default, vSwitch1 is connected to the MGF interface of the Cisco SRE Service Module. The MGF interface is sm slot/1.
vSwitch1 contains the VM Network port group, which can be used by guest virtual machines.

VMware vSphere Hypervisor Advanced Customization

- [Network Analysis Module Support, page 6-9](#)
- [Console Takes a Long Time to Reboot After Resetting System Configuration, page 6-9](#)
- [Cannot Change the VMware vSphere Hypervisor IP Address from the vSphere Console Interface, page 6-9](#)
- [Changing the IP Address of the VMware vSphere Hypervisor's Management Network, page 6-10](#)
- [Changing the Management Network Link, page 6-10](#)
- [Modifying Access to the DCUI, page 6-10](#)
- [VMware vSphere Hypervisor Does Not Remain in a Shutdown State, page 6-10](#)
- [Adding the Virtual Machines in the Same Subnet as the VMware vSphere Hypervisor, page 6-11](#)

Network Analysis Module Support

By default, the Network Analysis Module (NAM) capability is enabled on Cisco SRE-V. Only one NAM capable service module is supported in a ISR G2. Therefore, if the ISR G2 contains more than one NAM, make sure that you keep one NAM enabled, and disable the rest of the NAMs.

- To disable a NAM, use the following command from tech-support:

```
# esxcfg-advcfg --user-var CiscoRBCPNAMCapable --set-user-var 0
```
- To enable a NAM, use the following command from tech-support:

```
# esxcfg-advcfg --user-var CiscoRBCPNAMCapable --set-user-var 1
```

Reboot the Cisco SRE Service Module for the change to take effect.

Console Takes a Long Time to Reboot After Resetting System Configuration

When you choose the **Reset System Configuration** option from the vSphere console interface, the console reboots after a time interval of approximately two minutes. This is expected behavior.

Cannot Change the VMware vSphere Hypervisor IP Address from the vSphere Console Interface

When you use the vSphere console interface to change the IP address of the VMware vSphere Hypervisor, that IP address change is temporary and does not appear after you reboot the Cisco SRE Service Module. When you reboot the Cisco SRE Service Module, you notice that the IP address that you had configured using the following Cisco IOS command is in effect:

```
service-module ip address hypervisor-ip-address subnet-mask
```

If you want to change the IP address of the VMware vSphere Hypervisor, see the [“Changing the IP Address of the VMware vSphere Hypervisor’s Management Network”](#) section on page 6-10.

Changing the IP Address of the VMware vSphere Hypervisor’s Management Network

To change the IP address of the VMware vSphere Hypervisor, do the following:

1. Enter interface configuration mode for the slot and port where the Cisco SRE Service Module resides. For example:

```
Router(config)# interface sm 1/0
Router(config-if)#
```

2. Enter the following commands:

```
Router(config-if)# service-module heartbeat-reset disable
Router(config-if)# no service-module ip default-gateway hypervisor-gateway-ip-address
Router(config-if)# no service-module ip address hypervisor-ip-address subnet-mask
```

3. Use the vSphere console interface to change the IP address of the VMware vSphere Hypervisor.

Changing the Management Network Link

From the vSphere client, go to **Home > Inventory > Configuration > Networking**. Notice that under Virtual Network: vswitch0, the Management Network is connected to the Physical Adapter vmnic1, which is the PCIe link. To change this link, for example, from vmnic1 to vmic0, do the following:

1. Enter interface configuration mode for the slot and port where the Cisco SRE Service Module resides. For example:

```
Router(config)# interface sm 1/0
Router(config-if)#
```

2. Enter the following commands:

```
Router(config-if)# service-module heartbeat-reset disable
Router(config-if)# no service-module ip default-gateway hypervisor-gateway-ip-address
Router(config-if)# no service-module ip address hypervisor-ip-address subnet-mask
```

Modifying Access to the DCUI

The value for the VMkernel.Boot.tty2Port is **com1**. Do not change this value.

Cisco IOS uses the **com1** serial port to session into the console interface. The console interface allows you to access the VMware vSphere Hypervisor DCUI to perform Cisco SRE-V configuration. If you try to change the **com1** port value from Advanced Settings in the vSphere Client GUI, you will not be able to access the Cisco SRE Service Module. To access the Cisco SRE Service Module, you must reinstall Cisco SRE-V.

VMware vSphere Hypervisor Does Not Remain in a Shutdown State

VMware vSphere Hypervisor cannot remain in a shutdown state, unless you disable heartbeat reset.

To disable heartbeat reset, do the following:

1. Enter interface configuration mode for the slot and port where the Cisco SRE Service Module resides. For example:

```
Router(config)# interface sm 1/0  
Router(config-if)#
```

2. Enter the **service-module heartbeat-reset disable** command to disable heartbeat-reset:

```
Router(config-if)# service-module heartbeat-reset disable
```

Adding the Virtual Machines in the Same Subnet as the VMware vSphere Hypervisor

To add virtual machines in the same subnet as the VMware vSphere Hypervisor, complete the following steps.

PREREQUISITES

See the [“Prerequisites for Configuring the Cisco SRE Service Module Interfaces”](#) section on page 3-2.

SUMMARY STEPS

From the Host-Router CLI, enter:

1. **enable**
2. **configure terminal**

Configure VLANs

1. **interface vlan** *vlan_number*
2. **ip address** *vlan-ip-address subnet mask*
3. **no shut**
4. **end**

Configure *slot/0* of the VMware vSphere Hypervisor

1. **interface sm** *slot/0*
2. **ip unnumbered vlan** *vlan_number*
3. **service-module ip address** *hypervisor-ip-address subnet-mask*
4. **service-module ip default-gateway** *hypervisor-gateway-ip-address*
5. **no shut**
6. **exit**
7. **ip route** *hypervisor-ip-address subnet-mask sm slot/0*

Configure *slot/1* of the VMware vSphere Hypervisor

1. **interface sm** *slot/1*
2. **switchport mode trunk**
3. **[switchport trunk allowed vlan** *vlan_numbers***]**

4. exit

Save Configuration

1. copy running-config startup-config
2. show running-config

DETAILED STEPS

	Command or Action	Purpose
From the Host-Router CLI		
Step 1	enable <i><password></i> Example: Router> enable Router> <i><password></i> Router#	Enters privileged EXEC mode on the host router. Enter your password if prompted.
Step 2	configure terminal Example: Router# configure terminal	Enters global configuration mode on the host router.
Configure VLANs		
Step 1	interface vlan <i>vlan_number</i> Example: Router(config)# interface vlan1	Enters VLAN configuration mode for the specified VLAN number.
Step 2	ip address <i>vlan-ip-address subnet-mask</i> Example: Router(config-if)# ip address 10.0.0.100 255.255.255.0	Specifies the IP address for the VLAN. <ul style="list-style-type: none"> • <i>vlan-ip-address</i>—IP address for the VLAN. • <i>subnet-mask</i>—Subnet mask to append to the IP address.
Step 3	no shut Example: Router(config-if)# no shut	Causes the interface to be administratively up.
Step 4	end Example: Router(config)# end	Returns to global configuration mode on the host router.
Configure slot/0 of the VMware vSphere Hypervisor		
Step 1	interface sm <i>slot/0</i> Example: Router(config)# interface sm 1/0	Enters interface configuration mode for the slot and port where the Cisco SRE Service Module resides.

	Command or Action	Purpose
Step 2	<p>ip unnumbered vlan <i>vlan_number</i></p> <p>Example: Router(config-if)# ip unnumbered vlan1</p>	<p>The ip unnumbered command enables IP processing on the specified VLAN interface without assigning an explicit IP address to that interface.</p> <ul style="list-style-type: none"> <i>vlan_number</i>—Number of the VLAN interface on which the router has an assigned IP address. <p>Note The unnumbered interface must be unique. It cannot be another unnumbered interface. The ip unnumbered command creates a point-to-point interface between devices. Broadcasting is not supported.</p>
Step 3	<p>service-module ip address <i>hypervisor-ip-address</i> <i>subnet-mask</i></p> <p>Example: Router(config-if)# service-module ip address 10.0.0.1 255.255.255.0</p>	<p>Specifies the IP address of the VMware vSphere Hypervisor.</p> <ul style="list-style-type: none"> <i>hypervisor-ip-address</i>—IP address of the VMware vSphere Hypervisor. See Figure 3-2. <i>subnet-mask</i>—Subnet mask to append to the IP address; must be in the same subnet as the host router.
Step 4	<p>service-module ip default-gateway <i>hypervisor-gateway-ip-address</i></p> <p>Example: Router(config-if)# service-module ip default-gateway 10.0.0.100</p>	<p>Specifies the IP address of the default gateway for the VMware vSphere Hypervisor.</p> <ul style="list-style-type: none"> <i>hypervisor-gateway-ip-address</i>—IP address for the default gateway router.
Step 5	<p>no shut</p> <p>Example: Router(config-if)# no shut</p>	<p>Causes the interface to be administratively up.</p>
Step 6	<p>exit</p> <p>Example: Router(config)# exit</p>	<p>Returns to global configuration mode on the host router.</p>
Step 7	<p>ip route <i>hypervisor-ip-address</i> <i>subnet-mask</i> sm <i>slot/0</i></p> <p>Example: Router(config)# ip route 10.0.0.1 255.255.255.255 SM1/0</p>	<p>Creates a static route.</p> <p>If you used the ip unnumbered command in Step 2, you must use the ip route <i>hypervisor-ip-address</i> <i>subnet-mask</i> sm <i>slot/0</i> command to create a static route.</p> <ul style="list-style-type: none"> <i>hypervisor-ip-address</i> <i>subnet-mask</i>—IP address and subnet mask of the VMware vSphere Hypervisor. <i>slot/0</i>—slot and port where the Cisco SRE Service Module resides.
Configure <i>slot/1</i> of the VMware vSphere Hypervisor		
Step 1	<p>interface sm <i>slot/1</i></p> <p>Example: Router(config)# interface sm 1/1</p>	<p>Enters interface configuration mode for the slot and port where the Cisco SRE Service Module resides.</p>

	Command or Action	Purpose
Step 2	<code>switchport mode trunk</code> Example: Router(config-if)# <code>switchport mode trunk</code>	Puts the port into permanent trunking mode. The default configuration is access mode.
Step 3	<code>[switchport trunk allowed vlan <i>vlan_numbers</i>]</code> Example: Router(config-if)# <code>switchport mode trunk</code> Router(config-if)# <code>switchport trunk allowed vlan 1-2,40,60,1002-1005</code>	(Optional) Allows trunking on the specified VLANs. <ul style="list-style-type: none"> <i>vlan_numbers</i>—VLAN numbers on which you want to allow trunking.
Step 4	<code>exit</code> Example: Router(config)# <code>exit</code>	Returns to global configuration mode on the host router.
Save Configuration		
Step 1	<code>copy running-config startup-config</code> Example: Router# <code>copy running-config startup-config</code>	Saves the new running configuration of the router as the startup configuration.
Step 2	<code>show running-config</code> Example: Router# <code>show running-config</code>	Displays the running configuration of the router so that you can verify the address configurations.



CHAPTER 7

Managing RAID

Last Updated: September 17, 2012

- [Entering the RAID Management Command Environment, page 7-1](#)
- [Hot-Swapping the Faulty RAID 1 Disk Drive, page 7-2](#)
- [Commands for Managing RAID, page 7-4](#)
- [Troubleshooting RAID, page 7-7](#)

Entering the RAID Management Command Environment

To add or modify RAID configuration, you must enter the RAID management command environment.



Note

The RAID management CLI is different from the Cisco IOS CLI. For a list of frequently used commands that you can use to manage RAID, see the [“Commands for Managing RAID” section on page 7-4](#).

Before You Begin

- Shutdown all virtual machines.
- Back up the datastore.
- Enable Remote Tech Support (SSH) through the VMware vSphere Hypervisor DCUI or the vSphere Client.

Procedure

- Step 1** Use the SSH Client software to log into the VMware vSphere Hypervisor. Do the following:
- For the hostname, enter the IP address of the VMware vSphere Hypervisor or the DNS hostname.
 - If prompted to accept the server’s host key, click **Yes**.
 - Use **root** for the username.
 - When prompted for a password, do the following:
 - If you are a first time user, leave the password empty by pressing **Enter**.
 - If you have configured a password, enter that password, and then press **Enter**.

The following Tech Support Shell prompt appears:

```
~ #
```

Step 2 At the Tech Support Shell prompt, use the **promise-raid-cli** command, and then press **Enter**. You enter the RAID management command environment:

```
~ # promise-raid-cli
raid-cli>
```

Step 3 Use the appropriate RAID management command(s) as shown in the following example:

```
raid-cli> logdrv
```

For a list of frequently used commands that you can use to manage RAID, see the “[Commands for Managing RAID](#)” section on page 7-4.

Step 4 Use the **exit** command to exit from the RAID management command environment:

```
raid-cli> exit
~ #
```

Step 5 Use the **exit** command to exit from the Tech Support Shell:

```
~ # exit
```

Related Topics

- [Understanding RAID Options, page 4-1](#)
- [Commands for Managing RAID, page 7-4](#)
- [Determining the Location of the Physical SATA Drive, page 7-3](#)

Hot-Swapping the Faulty RAID 1 Disk Drive



Note Hot-swapping is supported in RAID 1 mode only.

If you chose the RAID 1 option during installation, and one of the disk drives fails, you can replace that faulty disk drive with a new disk drive.

Procedure

Step 1 Determine the location of the faulty disk drive. See the “[Determining the Location of the Physical SATA Drive](#)” section on page 7-3.

Step 2 Remove the faulty disk drive.

Step 3 Insert a new disk drive. The rebuild process starts automatically on the new disk drive.

The rebuild process might take approximately two hours to complete. You can continue to perform normal system operations during the rebuild process.



Caution Make sure that you do not unplug the functional disc drive during the rebuild process. If you do, you will lose data.

If the rebuild process does not start, see the “[Rebuild Process Does Not Start](#)” section on page 7-7 to resolve the problem.

- Step 4** (Optional) To check the rebuild status, use the `rb -a list` command from the RAID management command environment, as shown in the following example:

```
raid-cli> rb -a list
Rebuild is in progress 10% in logical drive with ID 0 on controller #0!
```

You can also check the rebuild status in syslog.

Related Topics

- [Understanding RAID Options, page 4-1](#)
- [Entering the RAID Management Command Environment, page 7-1](#)
- [Rebuild Process Does Not Start, page 7-7](#)

Determining the Location of the Physical SATA Drive

Procedure

- Step 1** From the vSphere Client GUI Home page, do the following:
- Choose **Inventory > Configuration**.
 - From the Hardware pane (left pane), choose **Storage**.
 - From the right pane, click **Datastores**.
 - Right-click a datastore, and then choose **Properties**. The Properties dialog box opens.
 - From the Properties dialog box, click **Manage Paths...** From the Paths pane, look at the Runtime Name column. The Runtime Name column provides information about the location of datastore1 as shown in the following example:

```
vmhba0:C0:T1:L0
```

where T1 is the location of the datastore. T is the SCSI target and 1 is the ID number of a JBOD or RAID volume where the datastore is located. T1 maps to the JBOD volume ID 1 in [Step 2](#).

- Step 2** From the RAID management command environment, use the `logdrv` command, as shown in the following example:

```
raid-cli> logdrv
ID   RAID   Disks  Stripe  Size(MB)      DiskID Name
0    JBOD   1      N/A     476940.02     (1)   JBOD on port 01 (00)
1    JBOD   1      N/A     476940.02     (2)   JBOD on port 02 (00)
```

T1 from [Step 1](#) maps to the JBOD volume **1** (ID column). This JBOD volume **1** (ID column) is built on top of the physical SATA drive **2** (DiskID column). DiskID 2 indicates that it is the second physical SATA drive.

**Note**

The DiskID number that is displayed from the RAID management CLI output does not match with the disk number that is displayed on the front panel of the Cisco SRE Service Module:

- Disk 0 on the front panel of the Cisco SRE Service Module is represented as DiskID 1 in the RAID management CLI output.
- Disk 1 on the front panel of the Cisco SRE Service Module is represented as DiskID 2 in the RAID management CLI output.

Commands for Managing RAID

You can use the RAID management CLI to add or modify RAID configuration, to view RAID status, and to migrate between RAID levels.

**Note**

The RAID management CLI is different from the Cisco IOS CLI.

[Table 7-1](#) provides a list of frequently used commands that you can use to manage RAID. A comprehensive list of all of the RAID Management commands is available online. You can either use the **help** command to access all of the RAID commands, or you can prepend a command with **help** to display details about that command. For example, the **help logdrv** command provides the syntax and options for the logdrv command.

Table 7-1 RAID Management Commands

Command or Action	Purpose
<pre>phydrv -a list</pre> <p>or</p> <pre>phydrv</pre> <p>Example:</p> <pre>raid-cli> phydrv -a list ID CH Size Model Serial F/W 1 0 476940.02MB Hitachi HTE545050B9A30100726PBN40317EASNPE 100726PBN40317EASNPE PB4OC64G 2 1 476940.02MB Hitachi HTE545050B9A30100726PBN40317EA189E 100726PBN40317EA189E PB4OC64G</pre>	<p>Displays information about physical drives.</p> <p>Note The DiskID number that is displayed from the RAID management CLI output does not match with the disk number that is displayed on the front panel of the Cisco SRE Service Module:</p> <ul style="list-style-type: none"> – Disk 0 on the front panel of the Cisco SRE Service Module is represented as DiskID 1 in the RAID management CLI output. – Disk 1 on the front panel of the Cisco SRE Service Module is represented as DiskID 2 in the RAID management CLI output.

Table 7-1 RAID Management Commands (continued)

Command or Action	Purpose																					
<pre>logdrv -a list</pre> <p>or</p> <pre>logdrv</pre> <p>Example:</p> <pre>raid-cli> logdrv -a list</pre> <table border="1"> <thead> <tr> <th>ID</th> <th>RAID</th> <th>Disks</th> <th>Sectors</th> <th>Size(MB)</th> <th>DiskID</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>JBOD</td> <td>1</td> <td>64</td> <td>476940.02</td> <td>(1)</td> <td>JBOD on port 01 (00)</td> </tr> <tr> <td>1</td> <td>JBOD</td> <td>1</td> <td>64</td> <td>476940.02</td> <td>(2)</td> <td>JBOD on port 02 (00)</td> </tr> </tbody> </table>	ID	RAID	Disks	Sectors	Size(MB)	DiskID	Name	0	JBOD	1	64	476940.02	(1)	JBOD on port 01 (00)	1	JBOD	1	64	476940.02	(2)	JBOD on port 02 (00)	<p>Displays information about logical RAID volumes.</p> <p>Note The DiskID number that is displayed from the RAID management CLI output does not match with the disk number that is displayed on the front panel of the Cisco SRE Service Module:</p> <ul style="list-style-type: none"> - Disk 0 on the front panel of the Cisco SRE Service Module is represented as DiskID 1 in the RAID management CLI output. - Disk 1 on the front panel of the Cisco SRE Service Module is represented as DiskID 2 in the RAID management CLI output.
ID	RAID	Disks	Sectors	Size(MB)	DiskID	Name																
0	JBOD	1	64	476940.02	(1)	JBOD on port 01 (00)																
1	JBOD	1	64	476940.02	(2)	JBOD on port 02 (00)																
<pre>logdrv -a clear -i 0</pre> <p>or</p> <pre>logdrv -a clear</pre> <p>Example:</p> <pre>raid-cli> logdrv -a clear -i 0</pre>	Removes all of the logical volumes from the system.																					
<pre>logdrv -a del -i 0 -l 1</pre> <p>or</p> <pre>logdrv -a del -l 1</pre> <p>Example:</p> <pre>raid-cli> logdrv -a del -i 0 -l 1</pre>	<p>Removes the second logical volume.</p> <p>Note The logical volume ID can start with 0.</p>																					
<pre>logdrv -a add -p 1,2 -e 0,0 -z</pre> <pre>"raid=raid0,name=RAID0,init=quick"</pre> <p>Example:</p> <pre>raid-cli> logdrv -a add -p 1,2 -e 0,0 -z</pre> <pre>"raid=raid0,name=RAID0,init=quick"</pre> <table border="1"> <thead> <tr> <th>ID</th> <th>RAID</th> <th>Disks</th> <th>Sectors</th> <th>Size(MB)</th> <th>DiskID</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>RAID0</td> <td>2</td> <td>64</td> <td>953752.00</td> <td>(1,2)</td> <td>RAID0</td> </tr> </tbody> </table>	ID	RAID	Disks	Sectors	Size(MB)	DiskID	Name	0	RAID0	2	64	953752.00	(1,2)	RAID0	<p>Creates a simple block level striping RAID 0 volume using the full capacity (single full extent on each of the drives) across both first and second SATA drives.</p> <p>-z can be used to change stripe block size.</p> <p>Note Cisco SRE-V supports a maximum of two logical volumes.</p>							
ID	RAID	Disks	Sectors	Size(MB)	DiskID	Name																
0	RAID0	2	64	953752.00	(1,2)	RAID0																
<pre>logdrv -a add -p 1,2 -e 0,0, -z</pre> <pre>"raid=raid1,name=RAID1,init=quick"</pre> <p>Example:</p> <pre>raid-cli> logdrv -a add -i 0 -p 1,2 -e 0,0 -z</pre> <pre>"name=RAID1,raid=raid1"</pre> <table border="1"> <thead> <tr> <th>ID</th> <th>RAID</th> <th>Disks</th> <th>Sectors</th> <th>Size(MB)</th> <th>DiskID</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>RAID1</td> <td>2</td> <td>64</td> <td>476876.00</td> <td>(1,2)</td> <td>RAID1</td> </tr> </tbody> </table>	ID	RAID	Disks	Sectors	Size(MB)	DiskID	Name	0	RAID1	2	64	476876.00	(1,2)	RAID1	<p>Creates a simple 1:1 mirrored RAID 1 volume using the full capacity on both SATA drives.</p> <p>Note You can create a maximum of two logical volumes.</p>							
ID	RAID	Disks	Sectors	Size(MB)	DiskID	Name																
0	RAID1	2	64	476876.00	(1,2)	RAID1																

Table 7-1 RAID Management Commands (continued)

Command or Action	Purpose																																			
<pre>logdrv -a add -i 0 -p 1,2 -z "raid=JBOD,init=quick"</pre> <p>Example:</p> <pre>raid-cli> logdrv -a add -i 0 -p 1,2 -z "raid=JBOD,init=quick"</pre> <table border="1"> <thead> <tr> <th>ID</th> <th>RAID</th> <th>Disks</th> <th>Sectors</th> <th>Size(MB)</th> <th>DiskID</th> <th>Name</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>JBOD</td> <td>1</td> <td>64</td> <td>476940.02</td> <td>(1)</td> <td>JBOD on port 01</td> </tr> <tr> <td>(00)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>1</td> <td>JBOD</td> <td>1</td> <td>64</td> <td>476940.02</td> <td>(2)</td> <td>JBOD on port 02</td> </tr> <tr> <td>(00)</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	ID	RAID	Disks	Sectors	Size(MB)	DiskID	Name	0	JBOD	1	64	476940.02	(1)	JBOD on port 01	(00)							1	JBOD	1	64	476940.02	(2)	JBOD on port 02	(00)							<p>Removes the RAID metadata on both SATA drives and makes them non-RAID drives.</p> <p>If a datastore is not created on top of the JBOD volume, that JBOD volume might disappear after reboot.</p>
ID	RAID	Disks	Sectors	Size(MB)	DiskID	Name																														
0	JBOD	1	64	476940.02	(1)	JBOD on port 01																														
(00)																																				
1	JBOD	1	64	476940.02	(2)	JBOD on port 02																														
(00)																																				
<pre>logdrv -a list -v</pre> <p>or</p> <pre>logdrv -v</pre> <p>Example:</p> <pre>***** raid-cli> logdrv -a list -v Array ID : 0 Array name : RAID0 Array size : 953752.00 MB Array stripe size in number of blocks : 64 Array sector size : 512 Array raid mode : RAID0 Array write cache mode : Write Through Number of disks in array : 2 Disk members with ID in array : (1,2) Array activity status : Idle Array functional status : Online Driver Cache Mode: Write Thru Driver Lookahead threshold: 0 Driver Consolidation: enabled</pre>	<p>Displays details about the RAID configuration.</p>																																			
<pre>event -a list -v -c 10</pre> <p>Example:</p> <pre>raid-cli> event -a list -v -c 10 Time: Jan 29, 2011 06:19:00 EventID: 0x90001 Event Description: Logical drive "RAID0" deleted Time: Jan 29, 2011 06:18:40 EventID: 0x90000 Event Description: Logical drive "RAID0" created Time: Jan 29, 2011 06:18:30 EventID: 0x90001 Event Description: Logical drive "RAID0" deleted</pre>	<p>Displays the oldest ten events (if available) from the event queue.</p>																																			

Related Topics

- [Understanding RAID Options, page 4-1](#)
- [Entering the RAID Management Command Environment, page 7-1](#)

Troubleshooting RAID

- [Cannot View Datastores, page 7-7](#)
- [Rebuild Process Does Not Start, page 7-7](#)
- [Maintain RAID 1 Logical Volume, page 7-9](#)

Cannot View Datastores

Problem

After disk migration, reboot, or Cisco SRE-V software upgrade, you are unable to view the datastores in **Inventory > Configuration > Storage**.

Solution

To resolve this problem, do the following:

1. Rescan the system a couple of times. From the vSphere Client GUI Home page, do the following:
 - a. Choose **Inventory > Configuration**.
 - b. From the Hardware pane (left pane), choose **Storage**.
 - c. From the Datastores pane (right pane), choose **Rescan All...** (located on the upper right corner). The Rescan dialog box opens.
 - d. Click **OK**.
2. If rescanning the system does not resolve the problem, do the following:
 - a. Choose **Inventory > Configuration**.
 - b. From the Hardware pane (left pane), choose **Storage**.
 - c. Click the **Add Storage...** button. The Select Storage Type wizard page opens.
 - d. From the right pane, choose **Disk/LUN**, and then click **Next**. The Select Disk/LUN wizard page opens.
 - e. From the right pane, choose a disk, and then click **Next**. The Select VMFS Mount Options wizard page opens.
 - f. From the right pane, choose the **Assign a New Signature** radio button, and then click **Next**.
 - g. Choose **Free Space**, and then click **Finish**.

The missing datastores display with a modified name, which you can change. For example, Datastore_R0 displays as snap-XXXXX-datastore_R0; and datastore_R1 displays as snap-XXXXX-datastore_R1. To change the name of the datastore, right-click the appropriate datastore, and then choose **Rename**.

Related Topics

- [Migrating the Cisco SRE-V Software from Release 1.0 or 1.1 to Release 2.0, page 4-9](#)

Rebuild Process Does Not Start

Problem

After hot-swapping the faulty RAID 1 disk drive, the rebuild process does not start.

Probable Cause

RAID configuration shows a new JBOD volume, which you must delete.

Solution

To resolve this problem, do the following:

1. From the RAID management CLI, use the **logdrv** command to view RAID configuration.

When the valid partition table appears on the newly inserted drive, you might notice that the RAID configuration is unbalanced, as shown in the following example:

```
raid-cli> logdrv
ID   RAID   Disks  Sectors  Size(MB)      DiskID Name
0   RAID1   2      64      476876.00     (-,2) RAID1
1   JBOD    1      64      476940.02     (1) JBOD on port 01 (00)
```

where (-,2) RAID1 represents an unbalanced array; and ID 1 shows a new JBOD volume. JBOD represents non-RAID, which you must delete.

2. Use the **logdrv -a del -l <ID number of the JBOD>** command to delete the JBOD volume:

```
raid-cli> logdrv -a del -l 1
```



Note -l in the command is lower case “L” and stands for logical.

After the JBOD volume is deleted, the rebuild process starts automatically on the new disk drive.

The rebuild process might take approximately two hours to complete. You can continue to perform normal system operations during the rebuild process.



Caution Do not unplug the functional disk drive during the rebuild process. If you do, you will lose data.

3. (Optional) To check the rebuild status, use the **rb -a list** command, as shown in the following example:

```
raid-cli> rb -a list
Rebuild is in progress 10% in logical drive with ID 0 on controller #0!
```

You can also check the rebuild status in syslog.

Related Topic

- [Hot-Swapping the Faulty RAID 1 Disk Drive, page 7-2](#)

Maintain RAID 1 Logical Volume

Problem

User data on the RAID 1 logical volume can become unsynchronized after you hot-swap a running RAID 1 disk drive.

Probable Cause

The RAID subsystem does not aggressively monitor user data on the RAID 1 logical volume. If the user data on the disk drive is altered or corrupted when it is removed from the chassis, for example when doing an offline data backup, the RAID 1 rebuild process does not start when the disk drive is placed back into the system unless user data on the RAID 1 logical volume was accessed during the hot-swap.

Solution

Manually start the RAID 1 rebuild process or perform a redundancy check.

1. If the rebuild process does not start automatically, from the RAID management CLI, use the **event -v -c 10** command to identify the disk drive that is hot-swapped.

```
raid-cli>event -v -c 10
Time: Feb 11, 2008 03:12:50
EventID: 0x90002
Event Description: Logical drive "raid1" goes online
Time: Feb 11, 2008 03:12:50
EventID: 0xd000a
Event Description: Port 2 target 1 plugged in
```



Note

- Port 2 refers to disk drive 2, which may require a rebuild.
- If the rebuild process started automatically, the event description does not display “Logical drive “raid1” goes online” as shown above. Instead, it shows “Rebuild on logical drive “raid1” started”.

2. Use the **logdrv** command to find out the logical volume ID of RAID 1.

```
raid-cli>logdrv
ID   RAID Disks  Stripe  Size(MB)          DiskID Name
0   RAID1      2       N/A  476837.12        (1,2) raid1
```

3. Use the **rb -a start -l 0 -i 0 -p 2 -e 0** command to start the rebuild process or use the **rc -a start -l 0 -i 0** command to start a redundancy check.
4. (Optional) To check the rebuild status, use the **rb -a list** command.

```
raid-cli> rb -a list
Rebuild is in progress 10% in logical drive with ID 0 on controller #0!
```

The redundancy check starts the synchronization process. To check the synchronization status, use the **sync -a list** command, as show in the following example:

```
raid-cli>sync -a list
Synchronization is in progress 0% in logical drive with ID 0 on controller #0!
```

You can also check the status in syslog.



CHAPTER 8

Recovering from Device or Software Failure

Last Updated: September 17, 2012

- [Transferring Licenses from a Defective Device to an RMA Device, page 8-1](#)
- [Recovering from a Microsoft Windows Software Failure, page 8-3](#)

Transferring Licenses from a Defective Device to an RMA Device

If the service module is defective, contact Cisco TAC to obtain a Return Merchandise Authorization (RMA) service module. A blank RMA service module is shipped to you. After you receive the RMA service module, you must transfer and activate the VMware vSphere Hypervisor license and the Microsoft Windows license (if applicable) from the defective device onto the RMA service module.

Before you begin, make sure that you have the following:

- The VMware license key or serial number that was used to activate the VMware vSphere Hypervisor license on the defective service module. See [“Accessing the VMware License Key Information” section on page 5-4](#).
- The virtual key that was used to activate the Microsoft Windows license on the defective service module (if you purchased Cisco SRE-V option 3: hardware, plus virtualization software, plus Microsoft Windows software).

The virtual key is on the Microsoft Windows Certificate of Authenticity (COA) label, which is located at the bottom of the defective service module. The COA label contains two sets of keys: physical key and virtual key. Make a note of the virtual key because this is the key that you will need to transfer onto the RMA device. See [Figure 8-1](#).

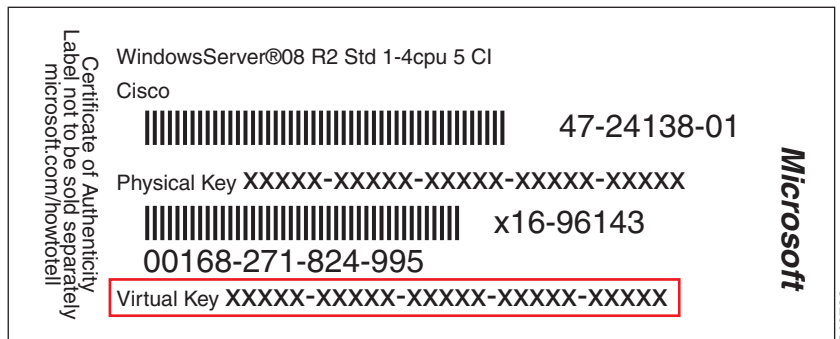


Note

Before you send the defective service module to Cisco Systems, make sure that you retain a copy of the original COA label. After you return the service module, Cisco Systems cannot retrieve the COA label from the returned service module.

Figure 8-1 shows the COA label.

Figure 8-1 COA Label



To transfer and activate the VMware vSphere Hypervisor license and the Microsoft Windows license from the defective service module onto an RMA service module, complete the following steps.


Procedure

-
- Step 1** Install the RMA service module into the router. See [Chapter 2, “Installing the Cisco SRE Service Module into the Router.”](#)
- Step 2** If you have not configured the Cisco SRE Service Module interfaces, configure them. See [Chapter 3, “Configuring the Cisco SRE Service Module Interfaces.”](#)
- Step 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.”](#)
- Step 4** Transfer the VMware vSphere Hypervisor license from the defective device onto the RMA device. Use the same license key that you had used to activate the VMware vSphere Hypervisor license on the defective device. If you purchased the VMware vSphere Hypervisor license at the same time that you purchased the Cisco SRE Service Module, the VMware license key was shipped to you in an envelope. This envelope is in the same package as the Cisco SRE Service Module. See [Chapter 5, “Managing the VMware vSphere Hypervisor License”](#).
- Step 5** If you have not installed the vSphere Client, install it. See [Chapter 6, “Managing Virtual Machines.”](#)
- Step 6** If you purchased the Cisco SRE-V option 3 (hardware, plus virtualization software, plus Microsoft Windows software), install the Microsoft Windows software using the Microsoft Windows Server 2008 recovery DVD. Do the following:
- Use the vSphere Client GUI to install the Microsoft Windows software. See [Recovering from a Microsoft Windows Software Failure, page 8-3](#).
 - Transfer and activate the Microsoft Windows license onto the virtual machine. Access the virtual machine console from the vSphere Client, and then enter the virtual key in the product key field. See [Figure 8-1](#).
 - Follow the instructions provided on the screen by Microsoft to continue with the activation process.
- Step 7** If you purchased the Cisco SRE-V option 1 (hardware only) or option 2 (hardware plus virtualization software), install your own version of the Microsoft Windows Server 2003 or Microsoft Windows Server 2008 software, and then activate the software license.
-

Recovering from a Microsoft Windows Software Failure

If the Microsoft Windows software gets corrupted or accidentally deleted from your system, reinstall Microsoft Windows by using the Microsoft Windows Server 2008 recovery DVD, which you received when you purchased Cisco SRE-V option 3 (hardware, plus virtualization software, plus Microsoft Windows software). For information about the Cisco SRE-V options, see [Figure 1-3](#).

Procedure

- Step 1** If the Microsoft Windows software is corrupted, delete it from your system.
- Step 2** Insert the Microsoft Windows Server 2008 recovery DVD into a DVD drive that the VMware vSphere client can access.
- Step 3** Click the **VMware vSphere Client** icon on your desktop to open the login window.
- Step 4** Enter the IP address or hostname of the VMware vSphere Hypervisor and the username and password, and then click **Login**.
The VSphere Client GUI opens.
- Step 5** Choose **File > Deploy OVF Template...**
The Deploy OVF Template wizard opens.
- Step 6** Select **Deploy from File**.
- Step 7** 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.
- Step 8** Click **Next >**.
The OVF Template Details page opens, which summarizes the information about the OVF template.
- Step 9** Verify the details, and then click **Next >**.
The End User License Agreement Page opens.
- Step 10** Click **Accept** if you agree with the terms and conditions, and then click **Next >**.
The Name and Location page opens.
- Step 11** Enter a unique name for the deployed OVF template, and then select the folder location within the inventory where the OVF template must reside.
-  **Note** The name can contain a maximum of 80 characters. It must be unique within the virtual machine folder. The name is case sensitive.
-
- Step 12** Click **Next >**.
The Network Mapping page opens.
- Step 13** 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.
- Step 14** Click **Next >**.
The Ready to Complete page opens where you can verify the OVF template's configuration.
- Step 15** Click **Finish**.
-



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