C H A P T E R 1

Cisco Services Ready Engine Virtualization Overview

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

This chapter contains the following sections:

Cisco SRE-V Overview

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 operating system. The entire system is integrated with the Generation 2 of the Cisco Integrated Services Router (ISR G2).

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

Figure 1-1   Example of a Cisco SRE-V System Deployment
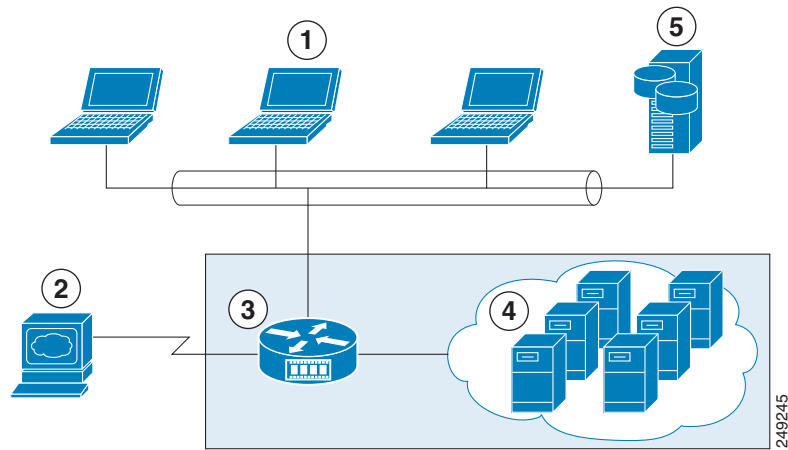
| 1	Client Devices	4	Virtual Machines Hosted on Cisco SRE-V
2	Cisco SRE-V Management Console	5	Enterprise Storage Device
3	Cisco ISR G2 Router with Cisco SRE Service Module and Cisco SRE-V		

Cisco SRE-V Terms

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

- Cisco SRE Service Module—Intel x86 architecture blade server that is hosted in a Cisco ISR G2. The Cisco SRE Service module provides the dedicated processing, network, storage, and memory to run the VMware vSphere Hypervisor[TM].

- VMware vSphere Hypervisor[TM]—Bare-metal hypervisor from VMware that provides the platform to host virtual machines.

- Console Manager—Embedded virtual machine running Cisco Linux that provides console access to the VMware vSphere Hypervisor[TM] for functionality that is specific to Cisco.

- Microsoft Windows Virtual Machine—User-created virtual machine that runs the Microsoft Windows Server operating system.

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

Figure 1-2   Cisco SRE-V Terms
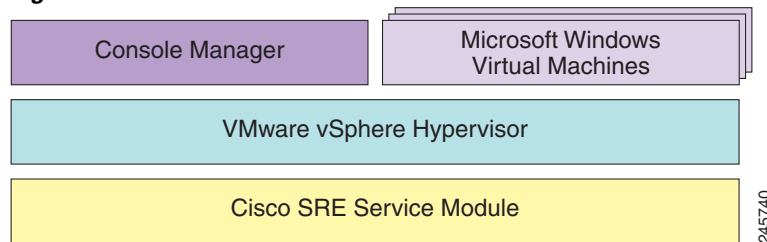
Difference Between Cisco SRE-V and VMware vSphere Hypervisor

The Cisco SRE-V product is different from the VMware vSphere Hypervisor™ 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.
- Configuration of the user management tasks is done using the Cisco SRE-V CLI instead of the VMware vSphere Client.
- Redundant Array of Inexpensive Disks (RAID) management for Cisco SRE-V is done through the RAID management CLI.
- License management for Cisco SRE-V is done through Cisco Software Licensing (CSL).
- Software upgrade packages for Cisco SRE-V are obtained from Cisco.com. Software upgrades are done using the Cisco SRE-V CLI.
- System operation such as firmware settings, advanced settings, and PCI PassThru settings are disabled.
- vCenter server access support is not available in Cisco SRE-V.

Hardware Requirements

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

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

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

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

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

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

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

Third-Party Software

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

- VMware vSphere Hypervisor^{TM}—For virtualization.

- Microsoft Windows Server—For the operating system.

  The following Microsoft Windows Servers are certified:

  – Windows Server 2003 SP2 Standard 32-bit and 64-bit

  – Windows Server 2003 SP2 Enterprise 32-bit and 64-bit

  – Windows Server 2008 R2 Standard 64-bit

  – Windows Server 2008 R2 Enterprise 64-bit

Cisco SRE-V Options

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

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

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

- Hardware plus Virtualization software (SM-SRE-700-K9 or SM-SRE-900-K9 + SW-SM-SRE-V-1.0-K9)—Cisco SRE Service Module with Cisco SRE-V software preinstalled. At the time of purchase, you can choose the RAID option that you want enabled on the Cisco SRE-V software. See Option 2 in Figure 1-3.

Note   RAID is *not supported* on the Cisco SRE 700 Service Module. It is supported on the Cisco SRE 900 Service Module only.

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

- Hardware, plus Virtualization software, plus Microsoft Windows software (SM-SRE-700-K9 or SM-SRE-900-K9 + SW-SM-SRE-V-1.0 + MSWS-08R2ST-X86-K9)—Cisco SRE Service Module with both Cisco SRE-V and Microsoft Windows Server 2008 R2 Standard Edition 64-bit virtual machine preinstalled. At the time of purchase, you can choose the RAID option that you want enabled on the Cisco SRE-V software. See Option 3 in Figure 1-3.
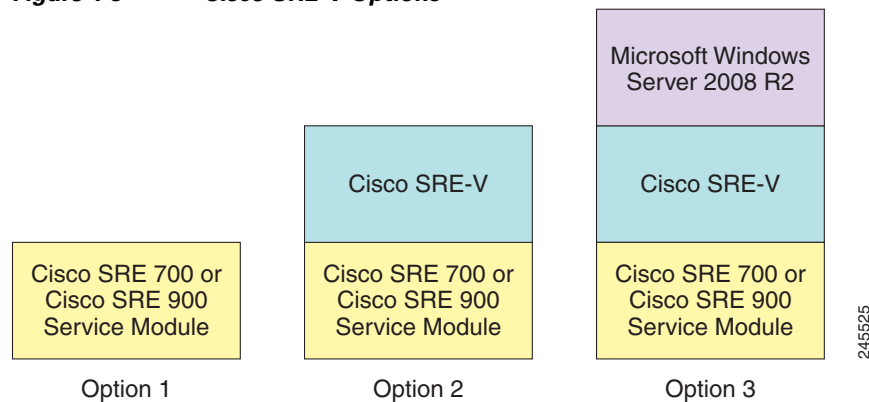
✎
Note   RAID is *not supported* on the Cisco SRE 700 Service Module. It is supported on the Cisco SRE 900 Service Module only.

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

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

Figure 1-3   *Cisco SRE-V Options*

| Option 1 | Option 2 | Option 3 |

Feature Licenses

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

Table 1-3   *License SKUs*

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

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

Managing Cisco SRE-V

Cisco SRE-V uses several management interfaces:

Cisco IOS CLI

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

Cisco SRE-V CLI

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

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

RAID Management CLI

Use the RAID management CLI to add or modify RAID configuration.

Cisco License Manager

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

VMware vSphere Client

Use the VMware vSphere Client to manage virtual machines.

Basic Workflow

1. Install the Cisco SRE Service Module into the ISR G2.

2. Use the Cisco IOS commands to configure the Cisco SRE Service Module interfaces.

3. If you purchase a blank Cisco SRE Service Module, install the Cisco SRE-V software, and then activate the software license.

4. Use the Cisco SRE-V commands to create users and roles, and then assign permissions to those users.

5. Configure the VMware vSphere Hypervisor^{TM} default gateway.

6. Install the vSphere Client, and then use the vSphere Client GUI to create and manage the virtual machines.

7. Use the vSphere Client to create additional virtual machines.

Understanding Cisco SRE-V Options and Associated Tasks

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

Table 1-4   ***Cisco SRE-V Options and Tasks***

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

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

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