C H A P T E R 3

Configuring the Cisco SRE Service Module Interfaces

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

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

This chapter contains the following sections:

Basic Workflow for Configuring the Cisco SRE Service Module Interfaces

1. Configure *slot*/0 of the Console Manager.
2. Configure *slot*/1 of the VMware vSphere Hypervisor™.
3. Configure VLAN 1.
4. (Optional) Configure additional VLANs.

See the "Configuring the Cisco SRE Service Module Interfaces on the Router" section on page 3-3 and the "Configuring VLANs" section on page 3-26.

Cisco SRE Service Module Interfaces Overview

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

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

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

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

- Console Manager Interface—Console Manager interface allows you to access the service module console to perform SRE-V configuration. Accessible from within the host router, this interface provides an internal Layer 3 Gigabit Ethernet link between the router and the Cisco SRE Service Module. All configuration and management of the Console Manager interface is performed using the Cisco IOS CLI.

- MGF Interface—MGF interface enables the Cisco SRE Service Module to communicate over a high-speed backplane switch. Accessible from within the host router, this interface provides an internal Layer 2 Gigabit Ethernet link between the router and the Cisco SRE Service Module. Configuration of the MGF interface is performed using the Cisco IOS CLI. For more information about configuring MGF, see the "Multi-Gigabit Fabric on the Router" chapter in the *Cisco 3900 Series, 2900 Series, and 1900 Series Integrated Services Routers Software Configuration Guide* on Cisco.com.

- External Service Module Interface—VMware vSphere Hypervisor[TM] or virtual machines can use the external service module interface as a primary interface or as a backup interface. Unlike the internal interfaces, the external interface is primarily controlled and managed by the VMware vSphere Hypervisor[TM]. The traffic does not go into the router unless the VMware vSphere Hypervisor[TM] is configured to forward the traffic into the router through the MGF interface.

Related Topic

Configuring the Cisco SRE Service Module Interfaces

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

Prerequisites for Configuring the Cisco SRE Service Module Interfaces

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

Cisco Router Prerequisites

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

Cisco SRE Service Module Prerequisites

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

Identify the Cisco SRE Service Module slot and port location in the host router:

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

Related Topic

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

Configuring the Cisco SRE Service Module Interfaces on the Router

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

Cisco SRE-V provides the following configuration options:

- MGF Layer 2 Switched Configuration—This configuration option provides faster performance and has no impact on the router CPU because the traffic goes through the EtherSwitch rather than the router. It supports all Layer 2 functions, such as broadcasting. You must purchase a EtherSwitch EHWIC or EtherSwitch Service Module to use this configuration option.
- Cisco IOS Layer 3 Routed Configuration—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.
  - 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.

- 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 following sections for more information:

- MGF Layer 2 Switched Configuration—Recommended, page 3-4
- Cisco IOS Layer 3 Routed Configuration Options, page 3-12
- External Interface Configuration, page 3-25

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.

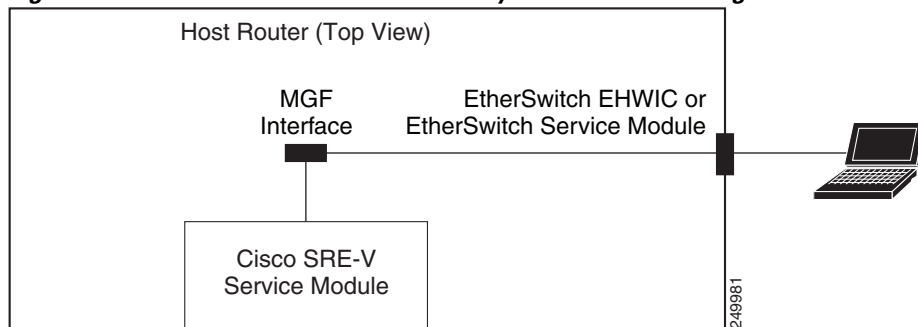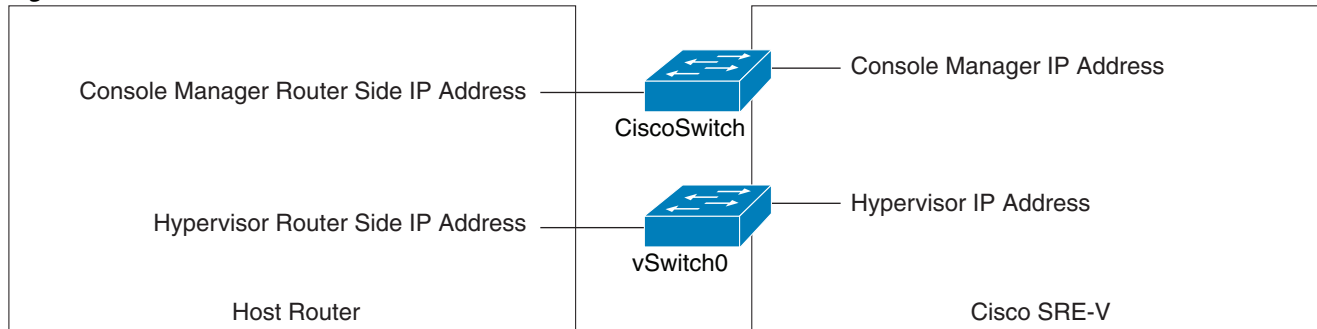*Figure 3-1   Traffic Flow in the MGF Layer 2 Switched Configuration*

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

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

The VMware vSphere Hypervisor^{TM} also needs two IP addresses: One IP address is for the router side of the link that connects the router to the VMware vSphere Hypervisor^{TM}; and the other IP address is for the VMware vSphere Hypervisor^{TM}.

Figure 3-2   *IP Address Location*

PREREQUISITES

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

SUMMARY STEPS

From the Host-Router CLI, enter:

1. **enable**

2. **configure terminal**

Configure *slot*/0 of the Console Manager

1. **interface sm** *slot*/**0**

2. **ip address** *console-manager-router-side-ip-address subnet-mask*
   or
   [**ip unnumbered** *type number*]

3. **service-module ip address** *console-manager-ip-address subnet-mask*

4. **service-module ip default-gateway** *console-manager-gateway-ip-address*

5. **service-module mgf ip address** *hypervisor-ip-address subnet-mask*

6. **no shut**

7. **exit**

8. [**ip route** *console-manager-ip-address subnet-mask* **sm** *slot/***0**]

Configure the VMware vSphere Hypervisor Default Gateway

See the "Setting up the VMware vSphere Hypervisor Default Gateway" section on page 7-1.

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 VLAN 1

1. **interface vlan 1**

2. **ip address** *hypervisor-router-side-ip-address subnet-mask*
    or
    [**ip unnumbered** *type number*]

3. **no shut**

4. **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	`enable`
	`<password>`
	
	Example:
	`Router> enable`
	`Router> <password>`
	`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 *slot*/0 of the Console Manager	

Step 1	`interface sm` *slot*`/0`
	
	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	`ip address` *console-manager-router-side-ip-address* *subnet-mask* or `[ip unnumbered` *type number*`]` **Example:** Router(config-if)# ip address 10.0.0.100 255.255.255.0 or Router(config-if)# ip unnumbered gigabitethernet 1/0	Specifies the IP address for the router side of the link that connects the router to the Console Manager. The Console Manager needs two IP addresses: One IP address is for the router side of the router-to-console manager link; and the other IP address is for the Console Manager side of the link. In this step, you configure the IP address for the router side of the link. See Figure 3-2. • *console-manager-router-side-ip-address subnet-mask*—IP address for the router side of the link that connects the router to the Console Manager. Subnet mask to append to the IP address. or (Optional) The **ip unnumbered** command enables IP processing on an interface without assigning an explicit IP address to that interface. • *type*—Type of interface on which the router has an assigned IP address. • *number*—Number of the interface on which the router has an assigned IP address. **Note** The unnumbered interface must be unique. It cannot be another unnumbered interface. ⚠ **Caution** The **ip unnumbered** command creates a point-to-point interface between devices. Broadcasting is not supported. **Note** If you use the **ip unnumbered** command, you must use the **ip route** *console-manager-ip-address subnet-mask* **sm** *slot/***0** command to create a static route. See Step 8.
Step 3	`service-module ip address` *console-manager-ip-address subnet-mask* **Example:** Router(config-if)# service-module ip address 10.0.0.1 255.255.255.0	Specifies the IP address for the Console Manager. • *console-manager-ip-address*—IP address for the Console Manager. See Figure 3-2. • *subnet-mask*—Subnet mask to append to the IP address; must be in the same subnet as the host router. **Note** If you change the Console Manager IP address, you must reload the service module.
Step 4	`service-module ip default-gateway` *console-manager-gateway-ip-address* **Example:** Router(config-if)# service-module ip default-gateway 10.0.0.100	Specifies the IP address of the default gateway for the Console Manager. • *console-manager-gateway-ip-address*—IP address for the default gateway router.

	Command or Action	Purpose
Step 5	**service-module mgf ip address** *hypervisor-ip-address subnet-mask* **Example:** Router(config-if)# service-module mgf ip address 20.0.0.1 255.255.255.0	Specifies the IP address of the VMware vSphere Hypervisor™. • *hypervisor-ip-address*—IP address of the VMware vSphere Hypervisor™. See Figure 3-2. • *subnet-mask*—Subnet mask to append to the IP address; must be in the same subnet as the host router. **Note** If you change the VMware vSphere Hypervisor™ IP address, you must reload the service module.
Step 6	**no shut** **Example:** Router(config-if)# no shut	Causes the interface to be administratively up.
Step 7	**exit** **Example:** Router(config)# exit	Returns to global configuration mode on the host router.
Step 8	**[ip route** *console-manager-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** *console-manager-ip-address subnet-mask* **sm** *slot***/0** command to create a static route. • *console-manager-ip-address subnet-mask*—IP address and subnet mask of the Console Manager. • *slot/0*—slot and port where the Cisco SRE Service Module resides.
	Configure the VMware vSphere Hypervisor Default Gateway	See the "Setting up the VMware vSphere Hypervisor Default Gateway" section on page 7-1.
	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. Access mode works with native VLAN, which is VLAN 1 for the Cisco SRE Service Modules.
Step 3	**[switchport trunk allowed vlan** *vlan_numbers***]** **Example:** Router(config-if)# switchport mode trunk Router(config-if)# switchport trunk allowed vlan 40, 60	(Optional) Allows trunking on the specified VLANs. • *vlan_numbers*—VLAN numbers on which you want to allow trunking.

	Command or Action	Purpose

Step 4	`exit`
	
	Example:
	`Router(config)# exit`
		Returns to global configuration mode on the host router.

Configure VLAN 1		

Step 1	`interface vlan 1`
	
	Example:
	`Router(config)# interface vlan 1`
		Enters VLAN configuration mode for VLAN 1.

Step 2	`ip address` *hypervisor-router-side-ip-address subnet-mask*
	
	or
	
	`[ip unnumbered` *type number*`]`
	
	Example:
	`Router(config-if)# ip address 20.0.0.100 255.255.255.0`
	
	or
	
	`Router(config-if)# ip unnumbered gigabitethernet 1/0`
		Specifies the IP address for the router side of the router-to-VMware vSphere Hypervisor™ link. See Figure 3-2.
		
		• *hypervisor-router-side-ip-address*—IP address for the router side of the link that connects the router to the VMware vSphere Hypervisor™; must be in the same subnet as the IP address of the VMware vSphere Hypervisor™ that you configured in Step 5.
		
		• *subnet-mask*—Subnet mask to append to the IP address.
		
		or
		
		(Optional) The **ip unnumbered** command enables IP processing on an interface without assigning an explicit IP address to that interface.
		
		• *type*—Type of interface on which the router has an assigned IP address.
		
		• *number*—Number of the interface on which the router has an assigned IP address.
		
		Note The unnumbered interface must be unique. It cannot be another unnumbered interface.
		
		⚠
		Caution The **ip unnumbered command** creates a point-to-point interface between devices. Broadcasting is not supported.
		
		• If you use the **ip unnumbered** command, you must use the **ip route** *hypervisor-ip-address subnet-mask* **vlan 1** command to create a static route.
		
		Note Make sure that the VMware vSphere Hypervisor™ IP address is configured on VLAN 1.

Step 3	`no shut`
	
	Example:
	`Router(config-if)# no shut`
		Causes the interface to be administratively up.

	Command or Action	Purpose
Step 4	**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 1 interfaces.

- The right pane shows that the configuration is applied to the Console Manager and to the VMware vSphere Hypervisor™ in Cisco SRE-V. The bottom area in the right pane shows the configuration for the Microsoft Windows Server that is configured using the standard Microsoft Windows network configuration setup process. This Microsoft Windows Server runs as a virtual machine.

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*
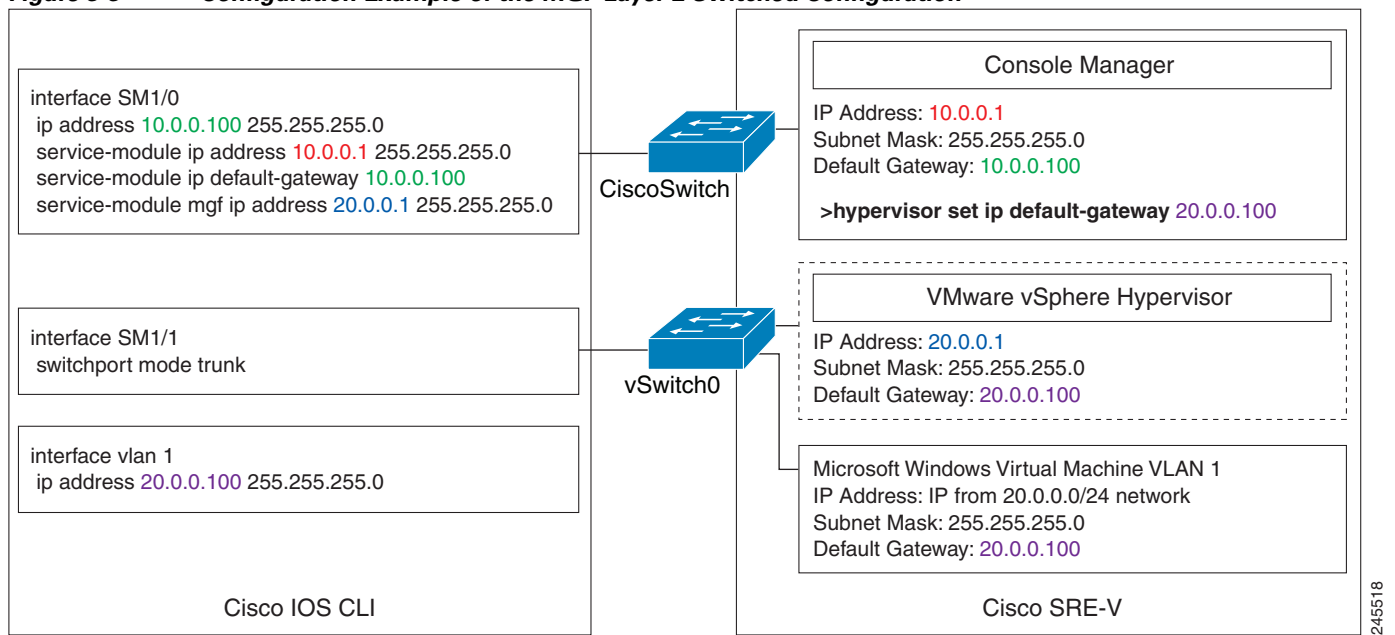
Related Topics

- Configuring VLANs with MGF Layer 2 Switched Configuration, page 3-26
- 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
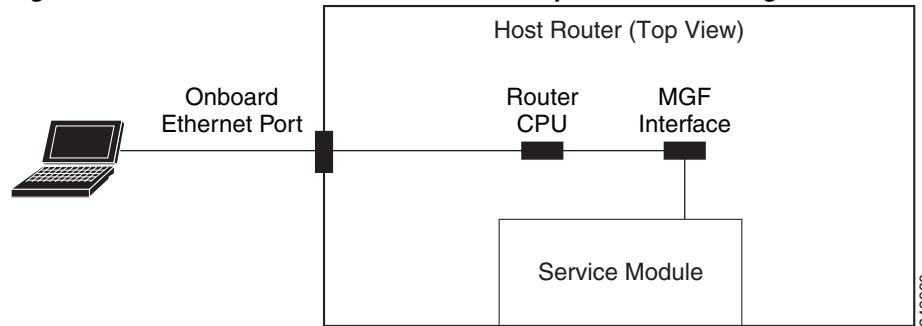
You can either add the VMware vSphere Hypervisor^{TM} and the virtual servers in one branch subnet, and the client PCs in another branch subnet; or you can add all of the devices in the same branch subnet. Depending on which branch subnet you choose to add the devices, the configuration commands that 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 3-12
- Cisco IOS Layer 3 Routed Configuration—Devices in the Same Branch Subnet, page 3-18

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

Use this configuration option if you want to add the VMware vSphere Hypervisor^{TM} 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^{TM} 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^{TM}and the virtual server, and the subnet of the client PCs without any static route or routing protocol configuration.

PREREQUISITES

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

SUMMARY STEPS

From the Host-Router CLI, enter:

1. **enable**

2. **configure terminal**

Configure *slot*/0 of the Console Manager

1. **interface sm** *slot*/**0**

2. **ip address** *console-manager-router-side-ip-address subnet-mask*

3. **service-module ip address** *console-manager-ip-address subnet-mask*

4. **service-module ip default-gateway** *console-manager-gateway-ip-address*

5. **service-module mgf ip address** *hypervisor-ip-address subnet-mask*

6. **no shut**

7. **exit**

Configure the VMware vSphere Hypervisor Default Gateway

See the "Setting up the VMware vSphere Hypervisor Default Gateway" section on page 7-1.

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 VLAN 1

1. **interface vlan 1**

2. **ip address** *hypervisor-router-side-ip-address subnet-mask*

3. **no shut**

4. **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	`enable`
	`<password>`
	
	Example:
	`Router> enable`
	`Router> <password>`
	`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 *slot*/0 of the Console Manager	

Step 1	`interface sm` *slot*`/0`
	
	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	`ip address` *console-manager-router-side-ip-address subnet-mask* **Example:** `Router(config-if)# ip address 10.0.0.100 255.255.255.0`	Specifies the IP address for the router side of the link that connects the router to the Console Manager. The Console Manager needs two IP addresses: One IP address is for the router side of the router-to-console manager link; and the other IP address is for the Console Manager side of the link. In this step, you configure the IP address for the router side of the link. See Figure 3-2. • *console-manager-router-side-ip-address subnet-mask*—IP address for the router side of the link that connects the router to the Console Manager. Subnet mask to append to the IP address.
Step 3	`service-module ip address` *console-manager-ip-address subnet-mask* **Example:** `Router(config-if)# service-module ip address 10.0.0.1 255.255.255.0`	Specifies the IP address for the Console Manager. • *console-manager-ip-address*—IP address for the Console Manager. See Figure 3-2. • *subnet-mask*—Subnet mask to append to the IP address; must be in the same subnet as the host router. **Note** If you change the Console Manager IP address, you must reload the service module.
Step 4	`service-module ip default-gateway` *console-manager-gateway-ip-address* **Example:** `Router(config-if)# service-module ip default-gateway 10.0.0.100`	Specifies the IP address of the default gateway for the Console Manager. • *console-manager-gateway-ip-address*—IP address for the default gateway router.
Step 5	`service-module mgf ip address` *hypervisor-ip-address subnet-mask* **Example:** `Router(config-if)# service-module mgf ip address 20.0.0.1 255.255.255.0`	Specifies the IP address of the VMware vSphere Hypervisor™. • *hypervisor-ip-address*—IP address of the VMware vSphere Hypervisor™. See Figure 3-2. • *subnet-mask*—Subnet mask to append to the IP address; must be in the same subnet as the host router.

Step 6	`no shut`
	
	Example:
	`Router(config-if)# no shut`
		Causes the interface to be administratively up.

Step 7	`exit`
	
	Example:
	`Router(config)# exit`
		Returns to global configuration mode on the host router.

	Configure the VMware vSphere Hypervisor Default Gateway	See the "Setting up the VMware vSphere Hypervisor Default Gateway" section on page 7-1.

	Command or Action	Purpose
	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. Access mode works with native VLAN, which is VLAN 1 for the Cisco SRE Service Modules.

Step 3	`[switchport trunk allowed vlan` *vlan_numbers*`]`
	
	Example:
	`Router(config-if)# switchport mode trunk`
	`Router(config-if)# switchport trunk allowed vlan 40, 60`
		(Optional) Allows trunking on the specified VLANs.
		
		• *vlan_numbers*—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 VLAN 1	

Step 1	`interface vlan 1`
	
	Example:
	`Router(config)# interface vlan 1`
		Enters VLAN configuration mode for VLAN 1.

Step 2	`ip address` *hypervisor-router-side-ip-address*
	subnet-mask
	
	Example:
	`Router(config-if)# ip address 20.0.0.100`
	`255.255.255.0`
		Specifies the IP address for the router side of the router-to-VMware vSphere Hypervisor™ link. See Figure 3-2.
		
		• *hypervisor-router-side-ip-address*—IP address for the router side of the link that connects the router to the VMware vSphere Hypervisor™; must be in the same subnet as the IP address of the VMware vSphere Hypervisor™ that you configured in Step 5.
		
		• *subnet-mask*—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.

	Command or Action	Purpose
	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 3-5 shows an example of the Cisco IOS Layer 3 routed configuration in which the VMware vSphere Hypervisor[TM] and the virtual servers are in one branch subnet; and the client PCs are in another branch subnet.
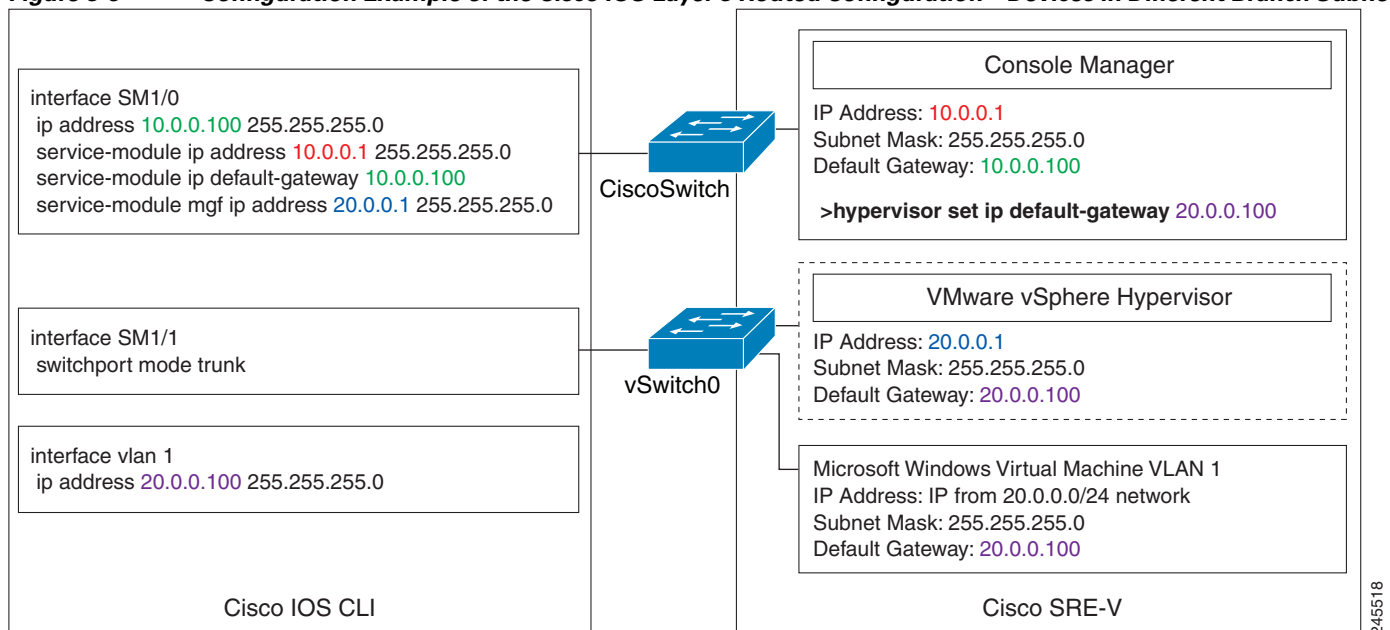
- The left pane shows an example of the Cisco IOS commands that you configure in the sm 1/0, sm 1/1, and vlan 1 interfaces.

- The right pane shows that the configuration is applied to the Console Manager and to the VMware vSphere Hypervisor[TM] in Cisco SRE-V. The bottom area in the right pane shows the configuration for the Microsoft Windows Server that is configured using the standard Microsoft Windows network configuration setup process. This Microsoft Windows Server runs as a virtual machine.

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

Figure 3-5   Configuration Example of the Cisco IOS Layer 3 Routed Configuration—Devices in Different Branch Subnets

Cisco IOS CLI

```
interface SM1/0
 ip address 10.0.0.100 255.255.255.0
 service-module ip address 10.0.0.1 255.255.255.0
 service-module ip default-gateway 10.0.0.100
 service-module mgf ip address 20.0.0.1 255.255.255.0
```

```
interface SM1/1
 switchport mode trunk
```

```
interface vlan 1
 ip address 20.0.0.100 255.255.255.0
```

CiscoSwitch

vSwitch0

Cisco SRE-V

Console Manager
IP Address: 10.0.0.1
Subnet Mask: 255.255.255.0
Default Gateway: 10.0.0.100

>**hypervisor set ip default-gateway** 20.0.0.100

VMware vSphere Hypervisor
IP Address: 20.0.0.1
Subnet Mask: 255.255.255.0
Default Gateway: 20.0.0.100

Microsoft Windows Virtual Machine VLAN 1
IP Address: IP from 20.0.0.0/24 network
Subnet Mask: 255.255.255.0
Default Gateway: 20.0.0.100

Related Topics

- Cisco IOS Layer 3 Routed Configuration—Devices in the Same Branch Subnet, page 3-18
- 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.

PREREQUISITES

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

SUMMARY STEPS

From the Host-Router CLI, enter:

1. **enable**

2. **configure terminal**

Configure *slot*/0 of the Console Manager

1. **interface sm** *slot*/**0**

2. **ip unnumbered** *type number*

3. **service-module ip address** *console-manager-ip-address subnet-mask*

4. **service-module ip default-gateway** *console-manager-gateway-ip-address*

5. **service-module mgf ip address** *hypervisor-ip-address subnet-mask*

6. **no shut**

7. **exit**

8. **ip route** *console-manager-ip-address subnet-mask* **sm** *slot*/**0**

Configure the VMware vSphere Hypervisor Default Gateway

See the "Setting up the VMware vSphere Hypervisor Default Gateway" section on page 7-1.

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 VLAN 1

1. **interface vlan 1**

2. **ip unnumbered gigabitethernet** *slot/port interface*

Configure GE *slot/port*

1. **interface gigabitethernet** *slot/port interface*

2. **ip address** *branch-LAN-ip-address subnet-mask*

3. **exit**

4. **ip route** *hypervisor-ip-address subnet-mask* **vlan 1**

5. **ip route** *virtual-machine-ip-address subnet-mask* **vlan 1**

6. **no shut**

7. **end**

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`
 `<password>`
 	
 Example:
 `Router> enable`
 `Router> <password>`
 `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 *slot***/0 of the Console Manager**	
Step 1 `interface sm slot/0` **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	`ip unnumbered` *type number*
	
	Example:
	`Router(config-if)# ip address 10.0.0.100`
	`255.255.255.0`
	
	 or
	
	`Router(config-if)# ip unnumbered gigabitethernet`
	`1/0`
		Enables IP processing on an interface without assigning an explicit IP address to that interface.
		
		• *type*—Type of interface on which the router has an assigned IP address.
		
		• *number*—Number of the interface on which the router has an assigned IP address.
		
		Note The unnumbered interface must be unique. It cannot be another unnumbered interface.
		
		⚠
		Caution The **ip unnumbered** command creates a point-to-point interface between devices. Broadcasting is not supported.
		
		Note If you use the **ip unnumbered** command, you must use the **ip route** *console-manager-ip-address subnet-mask* **sm** *slot***/0** command to create a static route. See Step 8.

Step 3	`service-module ip address`
	console-manager-ip-address subnet-mask
	
	Example:
	`Router(config-if)# service-module ip address`
	`10.0.0.1 255.255.255.0`
		Specifies the IP address for the Console Manager.
		
		• *console-manager-ip-address*—IP address for the Console Manager. See Figure 3-2.
		
		• *subnet-mask*—Subnet mask to append to the IP address; must be in the same subnet as the host router.
		
		Note If you change the Console Manager IP address, you must reload the service module.

Step 4	`service-module ip default-gateway`
	console-manager-gateway-ip-address
	
	Example:
	`Router(config-if)# service-module ip`
	`default-gateway 10.0.0.100`
		Specifies the IP address of the default gateway for the Console Manager.
		
		• *console-manager-gateway-ip-address*—IP address for the default gateway router.

Step 5	`service-module mgf ip address`
	hypervisor-ip-address subnet-mask
	
	Example:
	`Router(config-if)# service-module mgf ip address`
	`20.0.0.1 255.255.255.0`
		Specifies the IP address of the VMware vSphere Hypervisor™.
		
		• *hypervisor-ip-address*—IP address of the VMware vSphere Hypervisor™. See Figure 3-2.
		
		• *subnet-mask*—Subnet mask to append to the IP address; must be in the same subnet as the host router.

Step 6	`no shut`
	
	Example:
	`Router(config-if)# no shut`
		Causes the interface to be administratively up.

	Command or Action	Purpose

Step 7	`exit`
	
	Example:
	`Router(config)# exit`
		Returns to global configuration mode on the host router.

Step 8	`ip route` *console-manager-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.
		
		• *console-manager-ip-address subnet-mask*—IP address and subnet mask of the Console Manager.
		
		• *slot/0*—slot and port where the Cisco SRE Service Module resides.

	Configure the VMware vSphere Hypervisor Default Gateway	See the "Setting up the VMware vSphere Hypervisor Default Gateway" section on page 7-1.
	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. Access mode works with native VLAN, which is VLAN 1 for the Cisco SRE Service Modules.

Step 3	`[switchport trunk allowed vlan` *vlan_numbers*`]`
	
	Example:
	`Router(config-if)# switchport mode trunk`
	`Router(config-if)# switchport trunk allowed vlan 30, 40`
		(Optional) Allows trunking on the specified VLANs.
		
		• *vlan_numbers*—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 VLAN 1	

Step 1	`interface vlan 1`
	
	Example:
	`Router(config)# interface vlan 1`
		Enters VLAN configuration mode for VLAN 1.

	Command or Action	Purpose
Step 2	`ip unnumbered gigabitethernet` *slot/port interface* **Example:** `Router(config-if)# ip unnumbered gigabitethernet 0/0.1`	Enables IP processing on an interface without assigning an explicit IP address to that interface. The traffic is forwarded to and from a Gigabit Ethernet interface. • *slot/port*—Position of the Gigabit Ethernet interface in the router chassis. • *interface*—Number of the Gigabit Ethernet interface on which the router has an assigned IP address. **Note** The unnumbered interface must be unique. It cannot be another unnumbered interface. ⚠ **Caution** The **ip unnumbered** command creates a point-to-point interface between devices. Broadcasting is not supported.
Configure Gigabit Ethernet *slot/port*		
Step 1	`interface gigabitethernet` *slot/port interface* **Example:** `Router(config)# interface gigabitethernet 0/0.1`	Enters Gigabit Ethernet configuration mode for the specified sub interface. • *slot/port*—Position of the Gigabit Ethernet interface in the router chassis. • *interface*—Number of the Gigabit Ethernet interface on which the router has an assigned IP address.
Step 2	`ip address` *branch-LAN-ip-address subnet-mask* **Example:** `Router(config-if)# ip address 20.0.0.100 255.255.255.0`	Configures the IP address for the branch local area network. • *branch-LAN-ip-address subnet-mask*—IP address for the branch local area network. Subnet mask to append to the IP address.
Step 3	`exit`	Exits interface mode.

Step 4	`ip route` *hypervisor-ip-address subnet-mask* `vlan 1`
	
	Example:
	`Router(config)# ip route 20.0.0.1 255.255.255.0`
		Creates a static route entry for the VMware vSphere Hypervisor[TM].
		
		hypervisor-ip-address subnet-mask—IP address and subnet mask for the VMware vSphere Hypervisor[TM]. See Figure 3-2.

Step 5	`ip route` *virtual-machine-ip-address subnet-mask* `vlan 1`
	
	Example:
	`Router(config)# ip route 20.0.0.2 255.255.255.0`
		Creates a static route entry for the virtual machine.
		
		• *virtual-machine-ip-address subnet-mask*—IP address and subnet mask for the virtual machine.

Step 6	`no shut`
	
	Example:
	`Router(config-if)# no shut`
		Causes the interface to be administratively up.

	Command or Action	Purpose

Step 7	`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 3-6 shows an example of the Cisco IOS Layer 3 routed configuration where the VMware vSphere Hypervisor[TM] 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 1, and Gigabit Ethernet interfaces.

- The right pane shows that the configuration is applied to the Console Manager and to the VMware vSphere Hypervisor[TM] in Cisco SRE-V.

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

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

Figure 3-6   *Configuration Example of the Cisco IOS Layer 3 Routed Configuration—Devices in the Same Branch Subnet*
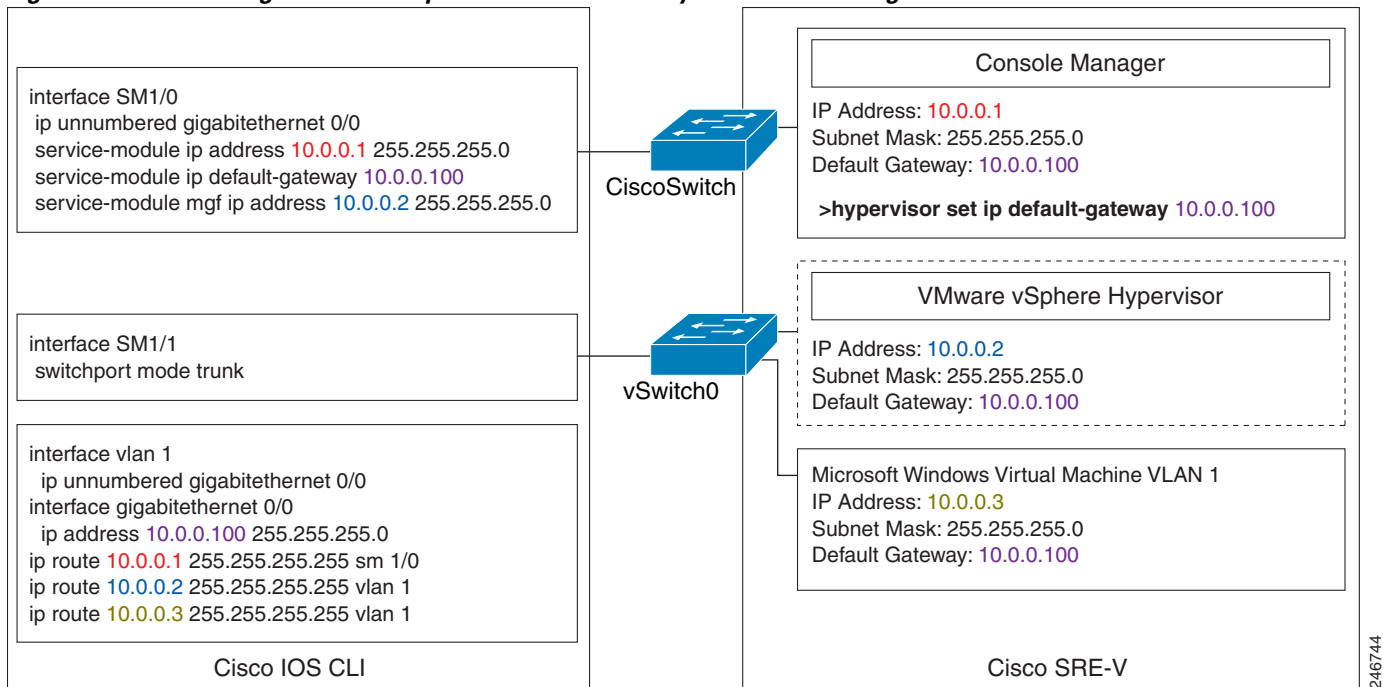
Related Topics

- Configuring VLANs with Cisco IOS Layer 3 Routed Configuration Options, page 3-29
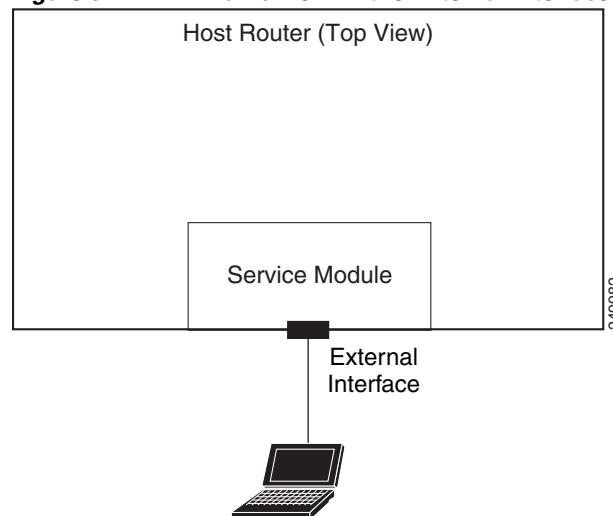
- Downloading the Cisco SRE-V Software, page 4-4

External Interface Configuration

The Cisco IOS configuration commands for the external interface configuration are the same as the commands for the "MGF Layer 2 Switched Configuration—Recommended" section on page 3-4 or the "Cisco IOS Layer 3 Routed Configuration Options" section on page 3-12, 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 3-7 shows the traffic flow in the external interface configuration. The service module sends the traffic through the external interface.

Figure 3-7   Traffic Flow in the External Interface Configuration

To configure the external interface, complete the following steps:

Step 1   To configure access to the console manager and the VMware vSphere Hypervisor™, 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 3-12

Step 2   Use the vSphere Client GUI to configure access to the virtual machine through the external interface. For instructions, see the vSphere Client online help.

Related Topics

- Configuring VLANs with External Interface Configuration, page 3-37
- Downloading the Cisco SRE-V Software, page 4-4

Configuring VLANs

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

Configuring VLANs with MGF Layer 2 Switched Configuration

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

PREREQUISITES

Make sure that the switchport is in trunk mode, see the "Configure slot/1 of the VMware vSphere Hypervisor" section on page 3-8.

SUMMARY STEPS

From the Host-Router CLI

1. **enable**

2. **vlan database**

3. **vlan** *vlan_number*

4. **exit**

5. **configure terminal**

6. **interface vlan** *vlan_number*

7. **ip address** *vlan-ip-address subnet mask*

DETAILED STEPS

Command or Action	Purpose
From the Host-Router CLI	

Step 1	**enable**
	<password>
	
	Example:
	`Router> enable`
	`Router> <password>`
	`Router#`
		Enters privileged EXEC mode on the host router. Enter your password if prompted.

Step 2	**vlan database** **Example:** `Router# vlan database`	Enters VLAN database mode.

|	Command or Action	Purpose

Step 3	**vlan** *vlan_number*
	
	Example:
	`Router(vlan)# vlan 40`
	`VLAN 40 added:`
	`    Name: VLAN0040`
		Adds the specified VLAN to the database.

Step 4	**exit** **Example:** `Router(vlan)# exit`	Exits VLAN database mode.
Step 5	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode on the host router.
Step 6	**interface vlan** *vlan_number* **Example:** `Router(config)# interface vlan 40`	Enters VLAN configuration mode for the specified VLAN number.

Step 7	**ip address** *vlan-ip-address subnet-mask*
	
	Example:
	`Router(config-if)# ip address 40.0.0.100`
	`255.255.255.0`
		Specifies the IP address for the VLAN.
		
		• *vlan-ip-address*—IP address for the VLAN.
		• *subnet-mask*—Subnet mask to append to the IP address.

Example

Figure 3-8 shows an example of the entire MGF Layer 2 switched configuration along with two new vlans: vlan 40 and vlan 60.

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

Figure 3-8   *MGF Layer 2 Switched Configuration Example with New VLANs*
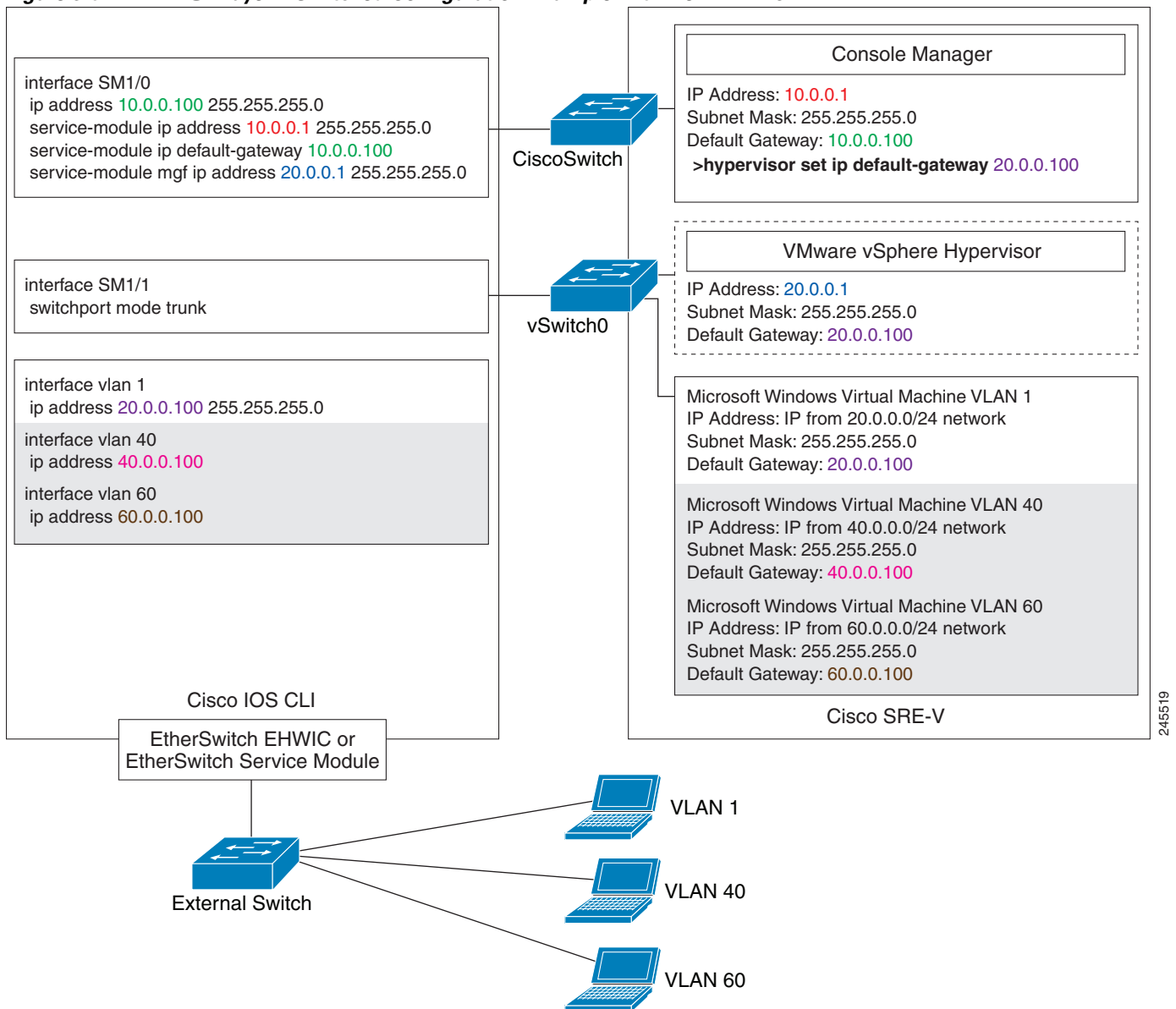
Related Topics

Configuring VLANs with Cisco IOS Layer 3 Routed Configuration Options

If you have configured the Cisco SRE Service Module using the Cisco IOS Layer 3 configuration options, and you want to dedicate VLANs to different segments, use the commands provided in the following sections as appropriate:

- Configuring VLANS with Cisco IOS Layer 3 Routed Configuration—Devices in Different Subnets, page 3-29
- Configuring VLANS with Cisco IOS Layer 3 Routed Configuration—Devices in the Same Subnet, page 3-33

Configuring VLANS with Cisco IOS Layer 3 Routed Configuration—Devices in Different Subnets

If you have used the Cisco IOS Layer 3 configuration option where the VMware vSphere Hypervisor[TM] and the virtual servers are in one branch subnet; and the client PCs are in another branch subnet, and you want to dedicate VLANs to different segments, use the commands provided in this section.

PREREQUISITES

Make sure that the switchport is in trunk mode, see the "Configure slot/1 of the VMware vSphere Hypervisor" section on page 3-15.

SUMMARY STEPS

From the Host-Router CLI

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

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**

DETAILED STEPS

	Command or Action	Purpose
	From the Host-Router CLI	

Step 1	**enable**
	<password>
	
	Example:
	`Router> enable`
	`Router> <password>`
	`Router#`
		Enters privileged EXEC mode on the host router. Enter your password if prompted.

Step 2	**vlan database** **Example:** `Router# vlan database`	Enters VLAN database mode.

Step 3	**vlan** *vlan_number*
	
	Example:
	`Router(vlan)# vlan 40`
	`VLAN 40 added:`
	`    Name: VLAN0040`
		Adds the specified VLAN to the database.

Step 4	**exit** **Example:** `Router(vlan)# exit`	Exits VLAN database mode.
Step 5	**configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode on the host router.
Step 6	**interface vlan** *vlan_number* **Example:** `Router(config)# interface vlan 40`	Enters VLAN configuration mode for the specified VLAN number.

Step 7	**ip address** *vlan-ip-address subnet-mask*
	
	Example:
	`Router(config-if)# ip address 40.0.0.100`
	`255.255.255.0`
		Specifies the IP address for the VLAN.
		
		• *vlan-ip-address*—IP address for the VLAN.
		• *subnet-mask*—Subnet mask to append to the IP address.

	Configure Gigabit Ethernet *slot/port*	

Step 1	**interface gigabitethernet** *slot/port*
	sub-interface
	
	Example:
	`Router(config)# interface gigabitethernet`
	`0/1.120`
		Enters Gigabit Ethernet configuration mode for the specified sub interface.
		
		• *slot/port*—Position of the Gigabit Ethernet interface in the router chassis.
		• *sub-interface*—Number of the Gigabit Ethernet interface on which the router has an assigned IP address.

|	Command or Action	Purpose

Step 2	`ip address` *branch-VLAN-ip-address subnet-mask*
	
	Example:
	`Router(config-if)# ip address 80.80.120.1`
	`255.255.255.0`
		Configures the IP address for the specific branch VLAN.
		
		• *branch-VLAN-ip-address subnet-mask*—IP address for the specific branch VLAN.

Step 3	`encapsulation dot1q` *vlan-id* **Example:** `Router(config-if)# encapsulation dot1q 120`	Enables IEEE 802.1Q encapsulation of traffic on the specified subinterface in VLANs. • *vlan-id*—Virtual LAN identifier. The allowed range is from 1 to 1000.
Step 4	`exit`	Exits interface mode.

Example

Figure 3-9 shows an example of the entire Cisco IOS Layer 3 routed configuration where the VMware vSphere Hypervisor™ and the virtual servers are in one branch subnet, the client PCs are in another branch subnet, and the two new VLANs, VLAN 40 and VLAN 60, are configured.

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

Figure 3-9   Cisco IOS Layer 3 Routed Configuration with Devices in Different Subnets and New VLANs
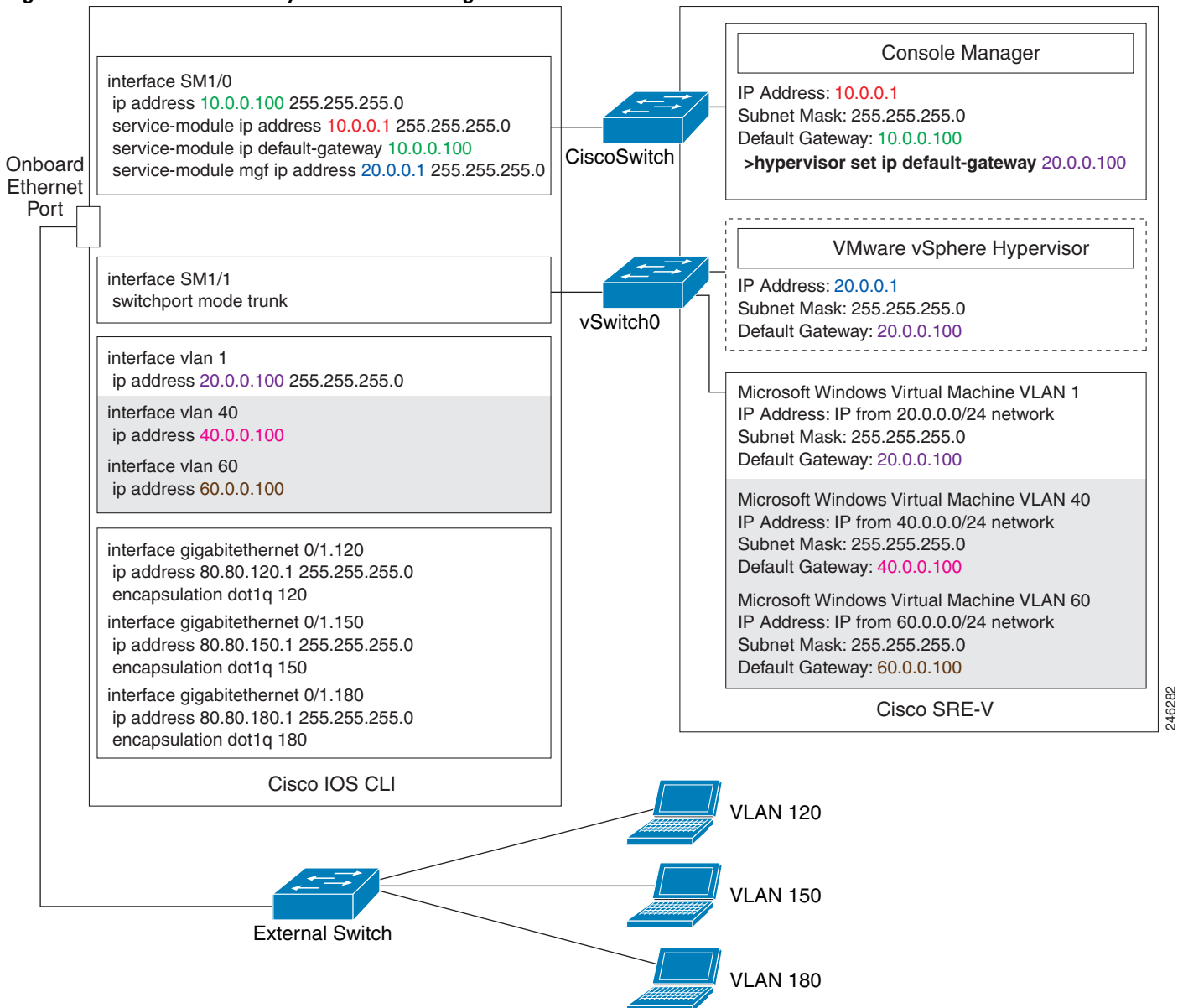
Related Topics

Configuring VLANS with Cisco IOS Layer 3 Routed Configuration—Devices in the Same Subnet

If you have used the Cisco IOS Layer 3 configuration option where the VMware vSphere Hypervisor™ and the virtual servers are in the same branch subnet as the client PCs, and you want to dedicate VLANs to different segments, use the commands provided in this section.

PREREQUISITES

Make sure that the switchport is in trunk mode, see the "Configure slot/1 of the VMware vSphere Hypervisor" section on page 3-21.

SUMMARY STEPS

From the Host-Router CLI

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

Configure GE *slot/port*

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

DETAILED STEPS

Command or Action	Purpose
From the Host-Router CLI	

Step 1 **enable**
 <password>
 	
 Example:
 `Router> enable`
 `Router> <password>`
 `Router#`
	Enters privileged EXEC mode on the host router. Enter your password if prompted.

Step 2 **vlan database** **Example:** `Router# vlan database`	Enters VLAN database mode.

Step 3 **vlan** *vlan_number*
 	
 Example:
 `Router(vlan)# vlan 40`
 `VLAN 40 added:`
 `    Name: VLAN0040`
	Adds the specified VLAN to the database.

Step 4 **exit** **Example:** `Router(vlan)# exit`	Exits VLAN database mode.
Step 5 **configure terminal** **Example:** `Router# configure terminal`	Enters global configuration mode on the host router.
Step 6 **interface vlan** *vlan_number* **Example:** `Router(config)# interface vlan 40`	Enters VLAN configuration mode for the specified VLAN number.

|	Command or Action	Purpose
Step 7	`ip unnumbered gigabitethernet` *slot/port* *sub-interface* **Example:** `Router(config-if)# ip unnumbered gigabitethernet 0/0.40`	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. • *slot/port*—Position of the Gigabit Ethernet interface in the router chassis. • *sub-interface*—Number of the Gigabit Ethernet sub interface on which the router has an assigned IP address. **Note** The unnumbered interface must be unique. It cannot be another unnumbered interface. ⚠ **Caution** The **ip unnumbered** command creates a point-to-point interface between devices. Broadcasting is not supported.
Step 8	`exit`	Exits interface mode.
Configure Gigabit Ethernet *slot/port*		
Step 1	`interface gigabitethernet` *slot/port* *sub-interface* **Example:** `Router(config)# interface gigabitethernet 0/0.40`	Enters Gigabit Ethernet configuration mode for the specified sub interface. • *slot/port*—Position of the Gigabit Ethernet interface in the router chassis. • *sub-interface*—Number of the Gigabit Ethernet interface on which the router has an assigned IP address.
Step 2	`ip address` *branch-VLAN-ip-address subnet-mask* **Example:** `Router(config-if)# ip address 40.0.0.100 255.255.255.0`	Configures the IP address for the specific branch VLAN. • *branch-VLAN-ip-address subnet-mask*—IP address for the specific branch VLAN. This IP address can be used as the default gateway for virtual machines in the VLAN defined in Step 5.
Step 3	`encapsulation dot1q` *vlan-id* **Example:** `Router(config-if)# encapsulation dot1q 40`	Enables IEEE 802.1Q encapsulation of traffic on the specified subinterface in VLANs. • *vlan-id*—Virtual LAN identifier. The allowed range is from 1 to 1000.
Step 4	`exit`	Exits interface mode.
Step 5	`ip route` *virtual-machine-ip-address subnet-mask vlan_number* *Example:* `Router(config)# ip route 40.0.0.2 255.255.255.0`	Creates a static route entry for the virtual machine. • *virtual-machine-ip-address subnet-mask*—IP address and subnet mask for the virtual machine.

Example

Figure 3-10 shows an example of the entire 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, and the two new VLANs, VLAN 40 and VLAN 60, are configured.

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

Figure 3-10   Cisco IOS Layer 3 Routed Configuration with Devices in the Same Subnet and New VLANs
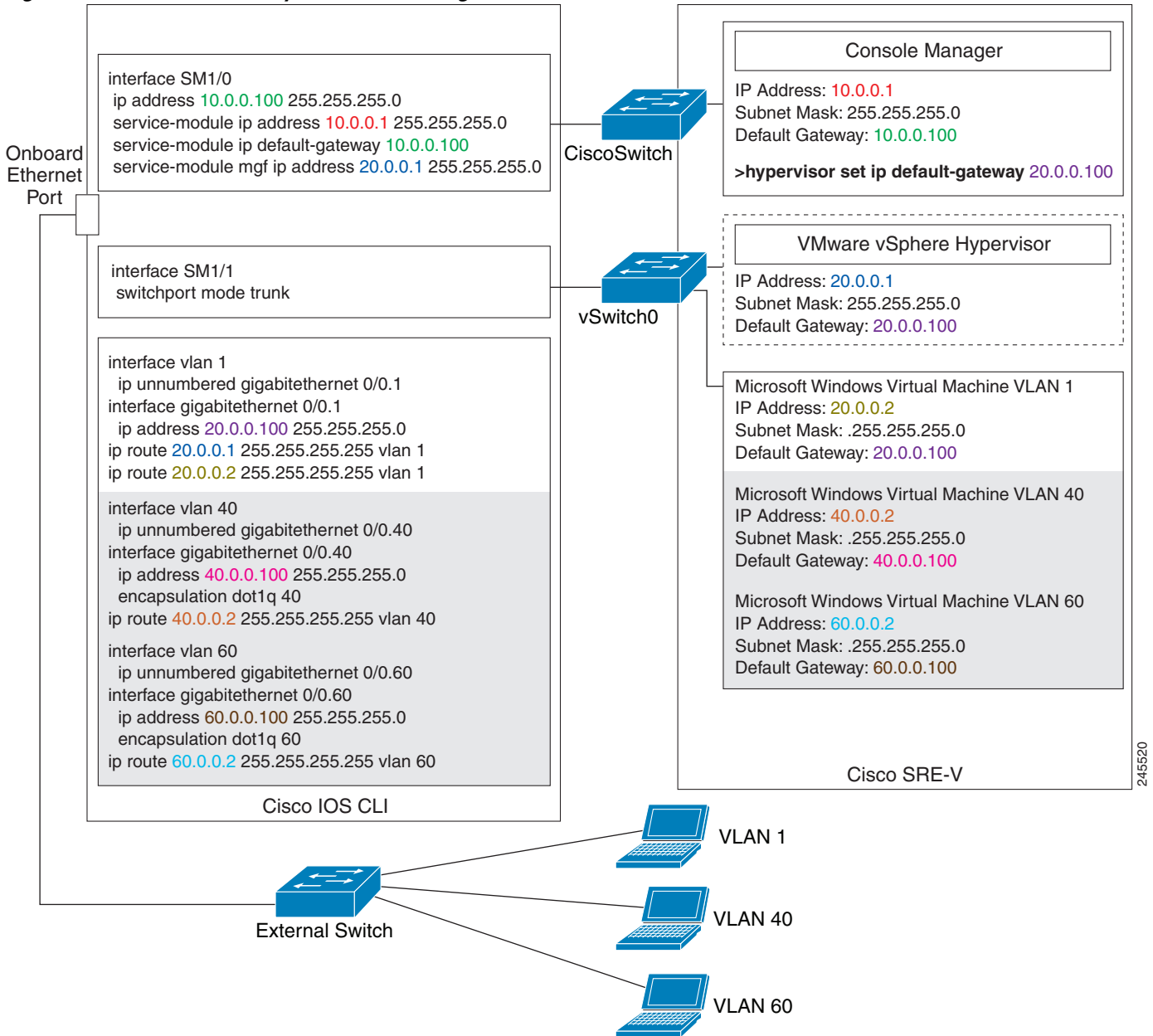
Configuring VLANs with External Interface Configuration

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

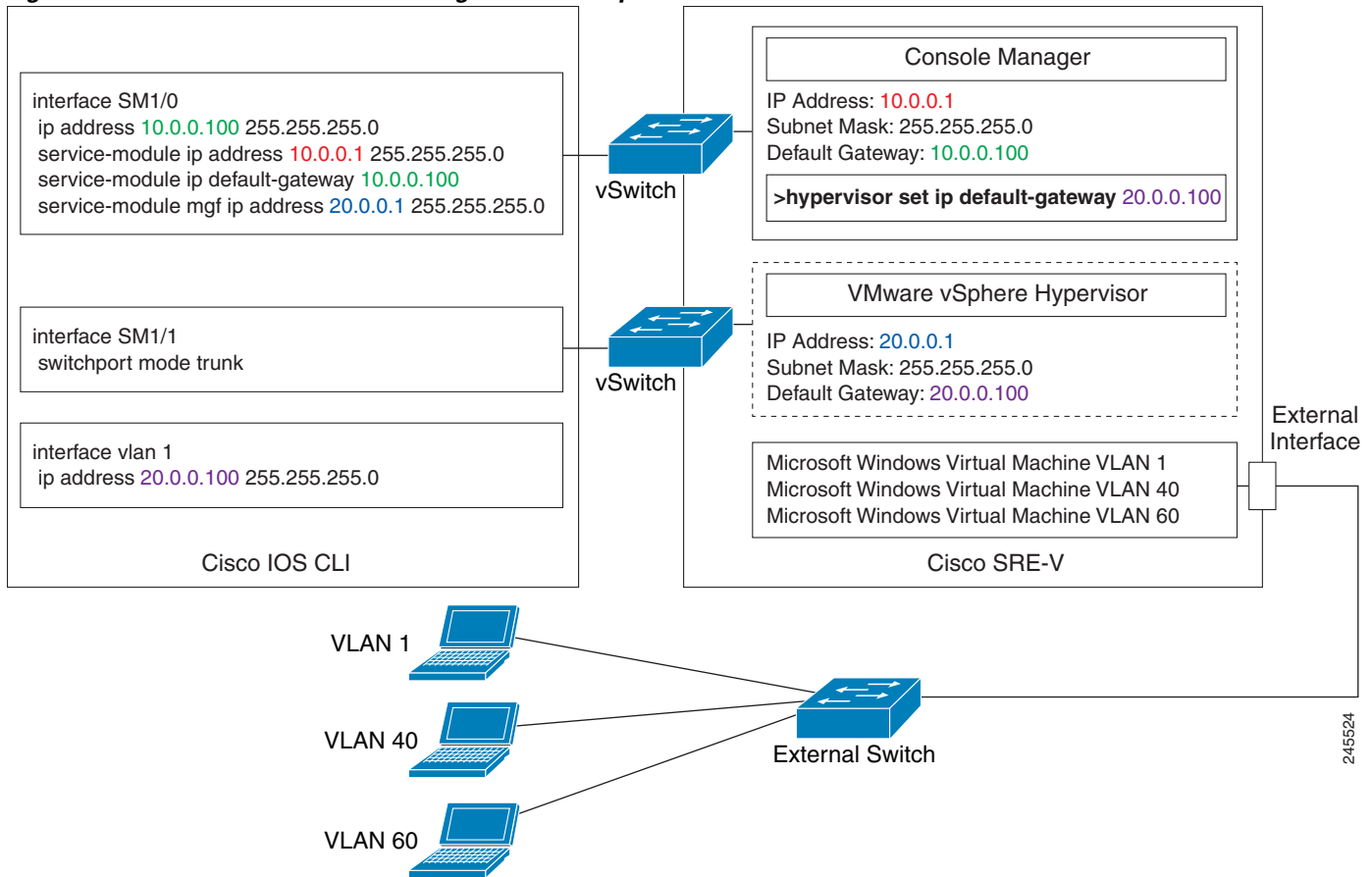**Note**   Cisco IOS CLI is not required for creating VLANs.

Example

Figure 3-11 shows an example of the entire external interface configuration along with two new vlans: vlan 40 and vlan 60.

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

Figure 3-11   ***External Interface Configuration Example with New VLANs***

Related Topics

- External Interface Configuration, page 3-25
- Downloading the Cisco SRE-V Software, page 4-4

Reload, Reset, and Shut Down Commands

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

Note
- 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 3-1   Common Shutdown and Startup Commands

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