



Video Surveillance Deployment Guide for the UCS Express Platform

November 2012

This guide describes the key requirements and instructions for deploying a virtualized Cisco® Video Surveillance Manager (VSM) on the Cisco Unified Computing System™ (UCS) Express platform.

Contents

This document includes the following sections:

[Introduction, page 2](#)

[System Overview, page 3](#)

[Installing and Configuring the ISR Router and SRE, page 8](#)

[Installing the vSphere Client, page 11](#)

[Deploying the VSM 6.3.2 Template, page 12](#)

[Configuring Network Switches for the VSM VM, page 19](#)

[Configuring NTP, page 21](#)

[Configuring the VSM VM, page 24](#)

[Testing Network Connectivity, page 27](#)

[More Information, page 27](#)



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Introduction

This guide describes the key requirements and instructions for deploying a virtualized Cisco VSM on the Cisco UCS Express platform. This guide describes installation and configuration guidelines for the Service Ready Engine (SRE) blade server, VMware vSphere Hypervisor, Integrated Service Router Generation 2 (ISR G2), and the VSM virtual machine (VM), as well as best practice recommendations.

Audience

This guide is intended for use by Cisco System Engineers, Physical Security Advanced Technology Provider (ATP) partners, and technical field staff who develop and implement Cisco Video Surveillance and UCS Express for branch office solutions.

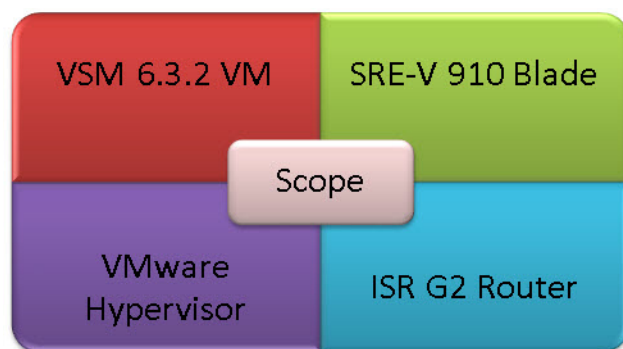
A successful implementation also requires additional knowledge in the following areas:

- Cisco ISR-G2 (29xx/39xx Series) Internetwork Operating System (IOS) router configuration
- Cisco Video Surveillance Manager (Version 6.3.2) installation and configuration

Scope

This guide contains detailed instructions on the installation of the VSM on UCS Express on the ISR G2 ([Figure 1](#)).

Figure 1 **Deployment Guide Scope**



Note

This guide assumes that the ESXi Hypervisor is installed on the SRE 910 service module.



Note

This guide does not describe the configuration and operation of these products. For a full description of these products, see the [“More Information” section on page 27](#).

System Overview

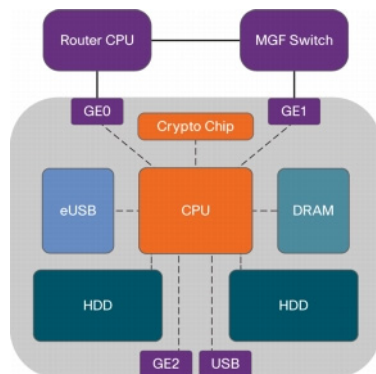
The Cisco UCS Express product is an SRE blade on an ISR G2 branch office router running the SRE-V (ESXi) virtualization software. The 2900 and 3900 series routers have various Gigabit Ethernet interfaces onboard, wide-area network (WAN) interface card (WIC) interface slots, and multiple service module slots, depending on the model (Figure 2).

Figure 2 Cisco Integrated Service Routers and Service Ready Engine



The SRE 910 blade is inserted into one of the service module slots. Figure 3 displays that there are two Gigabit Ethernet internal interfaces on the router: one connected to the router and the second connected to MultiGigabit Fabric (MGF). There is also one external Gigabit Ethernet interface on the front panel of the SRE. The SRE blade has two 500 GB hard drives and 4 GB of random-access memory (RAM).

Figure 3 SRE Hardware Architecture



EtherSwitch Router Configuration

The specific router configuration depends on which interface is being used to connect to the external switch. In the first recommended deployment configuration (Figure 4), the EtherSwitch Enhanced High-speed WAN interface card (EHWIC) or EtherSwitch Service Module is used to connect to the external switch (Figure 5).

Figure 4 Host Router Connected to External Switch via MGF and EtherSwitch

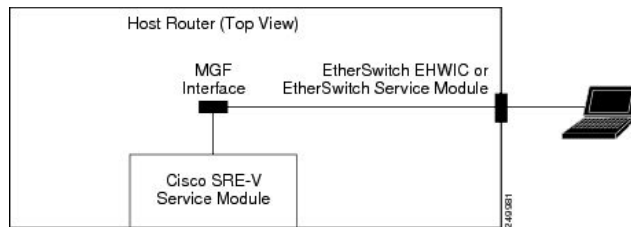
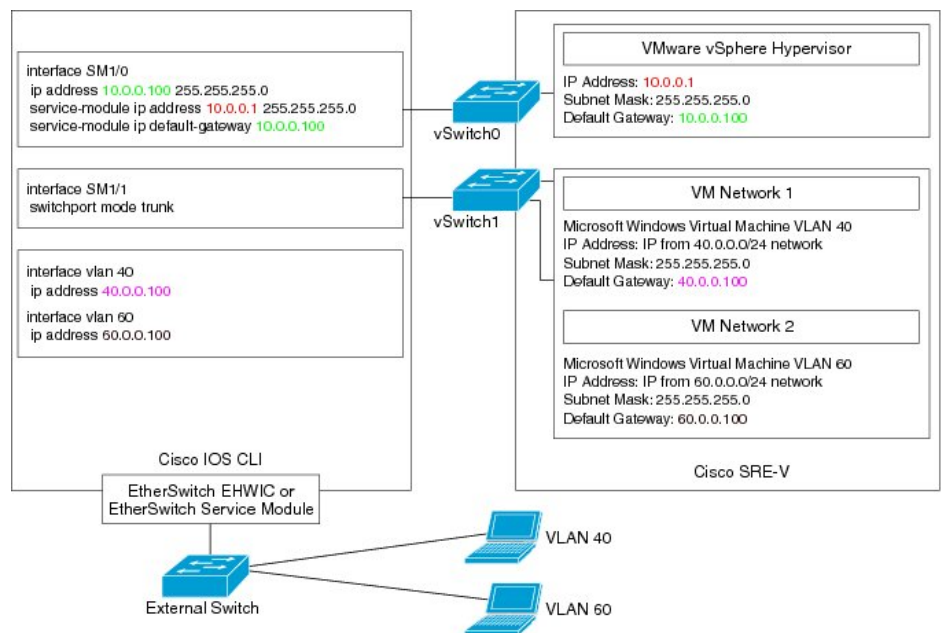


Figure 5 Router Configuration Sample and Topology for External Switch via MGF and EtherSwitch



Note

For this configuration, the Cisco EtherSwitch EHWIC/EtherSwitch service module is required. A list of supported EtherSwitch modules can be found in the *Installation and Configuration Guide for Cisco Services Ready Engine Virtualization*, Release 2.0 at http://www.cisco.com/en/US/docs/interfaces_modules/services_modules/sre_v/2.0/user/guide/overview.html.

Onboard Ethernet Router Configuration

In the second possible deployment configuration (Figure 6), the router's onboard Ethernet port is used to connect to the external switch (Figure 7).

Figure 6 Host Router Connected to an External Switch via an Onboard Router Port

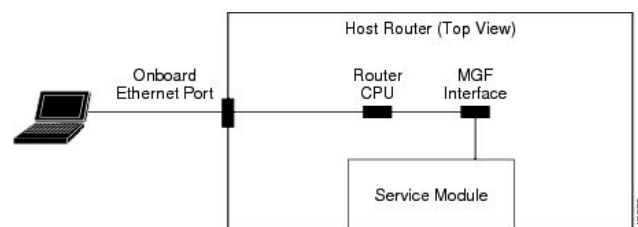
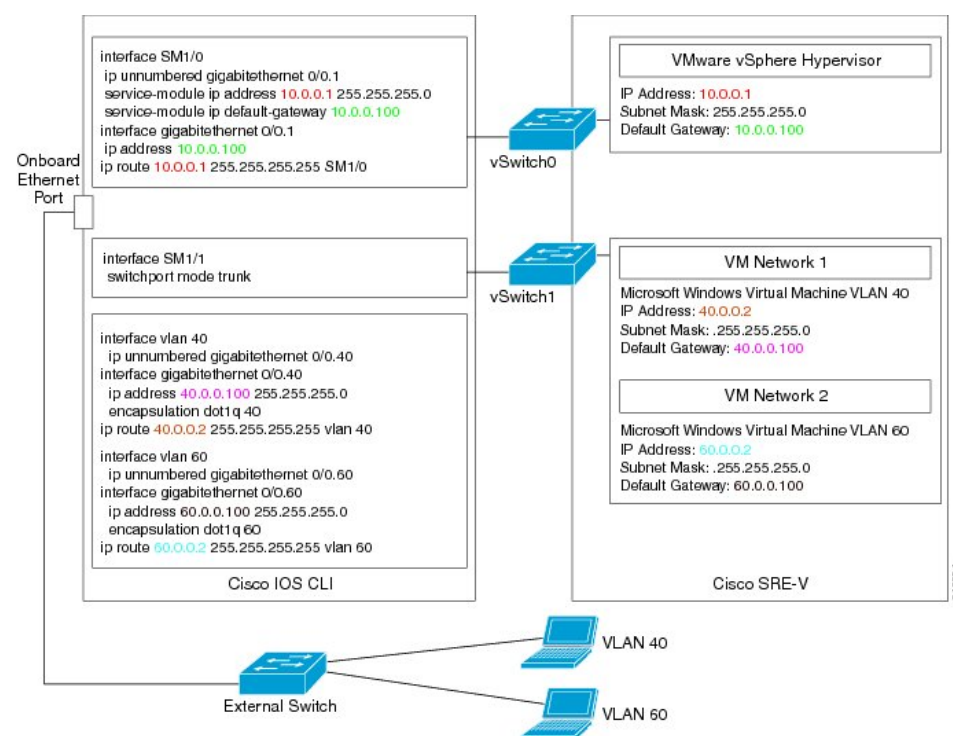


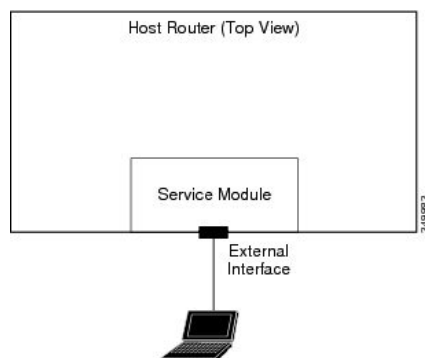
Figure 7 Router Configuration Sample and Topology for External Switch via Onboard Port



External Interface Router Configuration

In the third potential deployment configuration (Figure 8), the external interface on the front panel of the UCS Express Service Module is used to connect to the external switch.

Figure 8 Host Router for External Switch via Front Panel Service Module Interface



This option has some limitations:

- It does not go through the router.
- ISR Router features, such as Transmission Control Protocol (TCP) Internet Protocol (IP)/User Datagram Protocol (UDP) offload, is not supported on this interface.

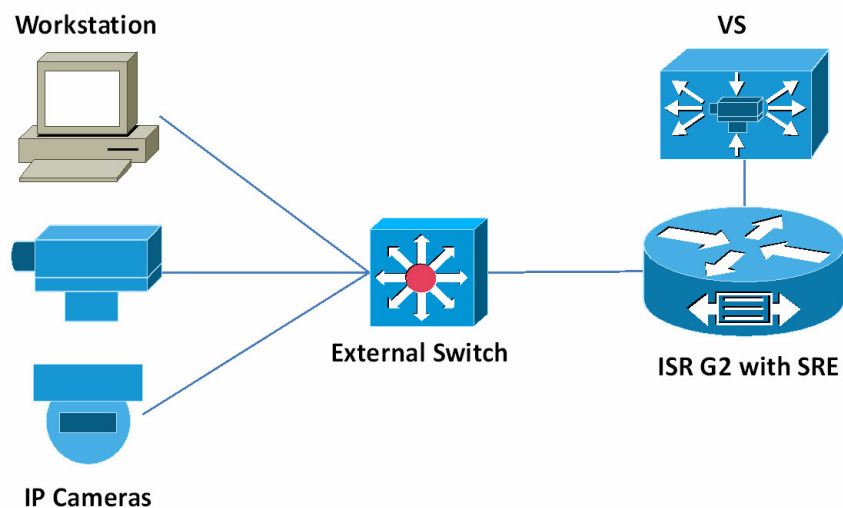
More details can be found in the *Installation and Configuration Guide for Cisco Services Ready Engine Virtualization*, Release 2.0 at

http://www.cisco.com/en/US/docs/interfaces_modules/services_modules/sre_v/2.0/user/guide/overview.html.

Logical Network Topology

Figure 9 illustrates the overall logical topology of the networking and video surveillance components, including a UCS Express containing the SRE-V running VSM, the Video Surveillance Operations Manager (VSOM), various IP cameras, an external switch, and the operator workstations running the VSOM client.

Figure 9 **Logical Network Topology**



Caution

This deployment guide has been validated to operate within the specifications outlined in the *Cisco Video Surveillance Manager for UCS Express Data Sheet* (http://www.cisco.com/en/US/prod/collateral/vpndevc/ps6918/ps9145/ps9152/data_sheet_c78-703863.html). See the data sheet on cisco.com for the latest guidelines, including maximum number of cameras, maximum I/O, and maximum raw storage.

Installing and Configuring the ISR Router and SRE

This guide describes the installation steps of configuring the ISR router and SRE, setting up the network interfaces, configuring hypervisor services and guest clients, and deploying and verifying the VSM VM.



Note

In the following configuration examples, it is assumed that:

- SRE is inserted into Slot 1
- 10.10.1.0/24 is the management network
- 10.3.8.0/21 is the VSM network
- VSM virtual LAN (VLAN) is 60

Verifying the IOS Image of the ISR

To verify the IOS image of the ISR:

Step 1 Log on to the router console and run the show version command to check the running version.

Step 2 Ensure that the ISR G2 is running 15.1(4)M, or a later version of IOS image.

If the router is running a version older than 15.1(4)M, then download and upgrade the IOS image to the correct version. To learn how to upgrade an IOS image, navigate to the Cisco web site at http://www.cisco.com/en/US/docs/net_mgmt/configuration_engine/3.0/administration/guide/upgrade.html.

Configuring the ISR Interface

To configure the ISR interface:

Step 1 Log on to the router console and view the running configuration with the **show running-config** command.

This command displays two interfaces, **SM 1/0** and **SM 1/1**, assuming that the SRE blade is plugged into Service Module Slot 1. **SM 1/0** is connected to the vSwitch0 vmKernel port of the Hypervisor, and **SM 1/1** is connected to the vSwitch0 VM port group.

Step 2 Configure the router and hypervisor IP addresses by executing the following commands:

```
interface GigabitEthernet0/0
description $ETH-LAN$$ETH-SW-LAUNCH$$INTF-INFO-GE 0/0$
ip address 10.10.1.151 255.255.255.0
interface SM1/0
ip unnumbered GigabitEthernet0/0
service-module ip address 10.10.1.152 255.255.255.0
service-module ip default-gateway 10.10.1.151
```


Configuring the ISR VLANs

To configure the ISR VLANs:

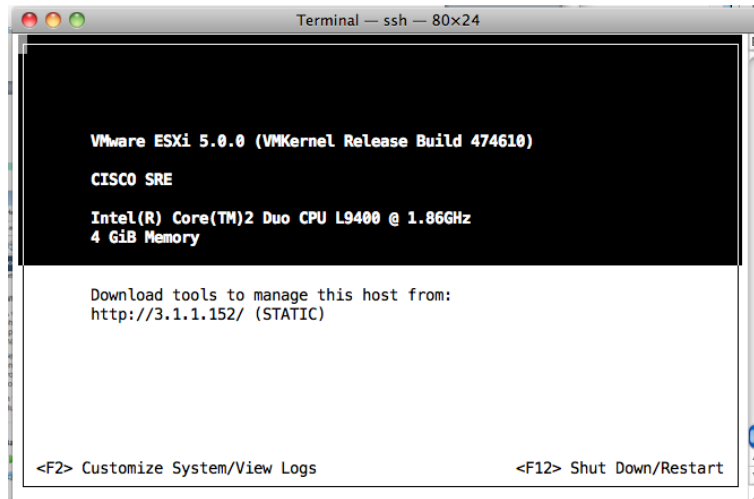
-
- Step 1** Configure the **SM 1/1** connected to the Service Module as a trunk port:
- ```
interface SM1/1
description Internal switch interface connected to Service Module
switchport mode trunk
```
- Step 2** Create sub-interfaces on the onboard router port to run 802.1q encapsulation for VLAN traffic, assign IP address for the sub-interfaces for VLAN routing, and create the VLANs:
- ```
interface GigabitEthernet0/1.60
encapsulation dot1Q 60
ip address 10.3.8.3 255.255.248.0
vlan 60
interface Vlan60
description VSM VLAN
ip unnumbered GigabitEthernet0/1.60
```
- Step 3** Create VLAN routes and a static route for the hypervisor:
- ```
ip route 10.10.1.152 255.255.255.255 SM1/0
ip route 10.3.8.5 255.255.255.255 Vlan60
```
- 

## Verifying and Configuring the SRE Hypervisor

To verify and configure the SRE hypervisor:

- 
- Step 1** From the router console, session into the Service Module to verify that the hypervisor is running on the SRE blade.
- Step 2** Assuming that the SRE is inserted into Slot 1 and the ESXi 5 hypervisor is installed and running on the blade, run the following command to session into the blade:
- ```
service-module sm 1/0 session
```
- Step 3** Verify that you are now logged on to the hypervisor user interface logon screen ([Figure 10](#)).

Figure 10 Hypervisor User Interface Screen



- Step 4** Log on to the hypervisor with the **root** username and **blank** password.
- Step 5** Press the **F2** key to enter the **Customize System** mode and set the password.
- Step 6** Navigate to **Troubleshooting Options** and enable **SSH**.
- Step 7** Press the **Esc** key to save and exit this mode.
- Step 8** Return to the IOS console or exit the session:
- To return to the IOS console, press the **Ctrl+Shift+6** sequence and then press **x**.
 - To exit the session, enter the following command:
- ```
service-module sm 1/0 session clear
```



**Note**

SRE-V comes with a 60-day trial license. A permanent license is required after 60 days. For details about licensing, see the *Installation and Configuration Guide for Cisco Services Ready Engine Virtualization*, Release 2.0 at [http://www.cisco.com/en/US/docs/interfaces\\_modules/services\\_modules/sre\\_v/2.0/user/guide/license.html](http://www.cisco.com/en/US/docs/interfaces_modules/services_modules/sre_v/2.0/user/guide/license.html)

# Installing the vSphere Client

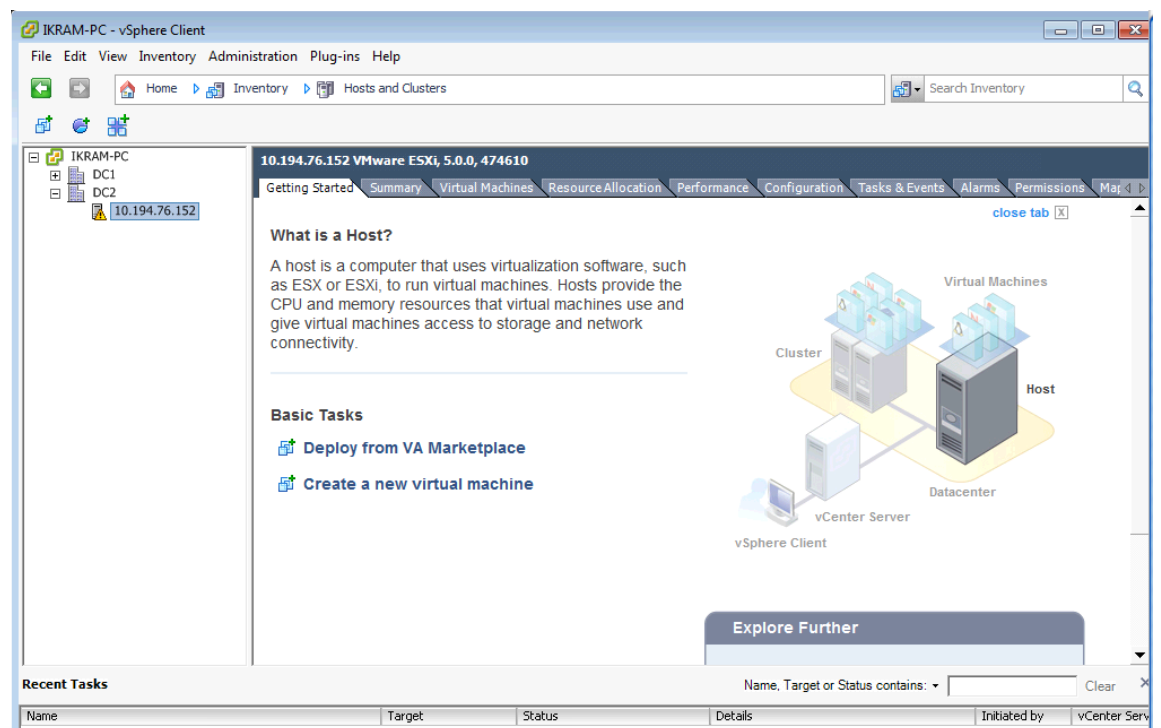
To install the vSphere client:

- Step 1** Open a web browser and enter the hypervisor URL (**http://3.1.1.152/**).
- Step 2** Click the **Download vSphere Client** link to download the vSphere client to your computer.



**Note** Internet connection is required to download the vSphere client. After the vSphere client is installed, launch the client (Figure 11) and enter the hypervisor's IP address and credentials to access the host.

**Figure 11** vSphere Client Main Screen



# Deploying the VSM 6.3.2 Template

To deploy the VSM 6.3.2 template:

- Step 1** Download the **VSM 6.3.2 template** from the Cisco web page or insert a USB drive with the VSM template.
- Step 2** Copy the template to the same computer on which the vSphere client was previously installed.

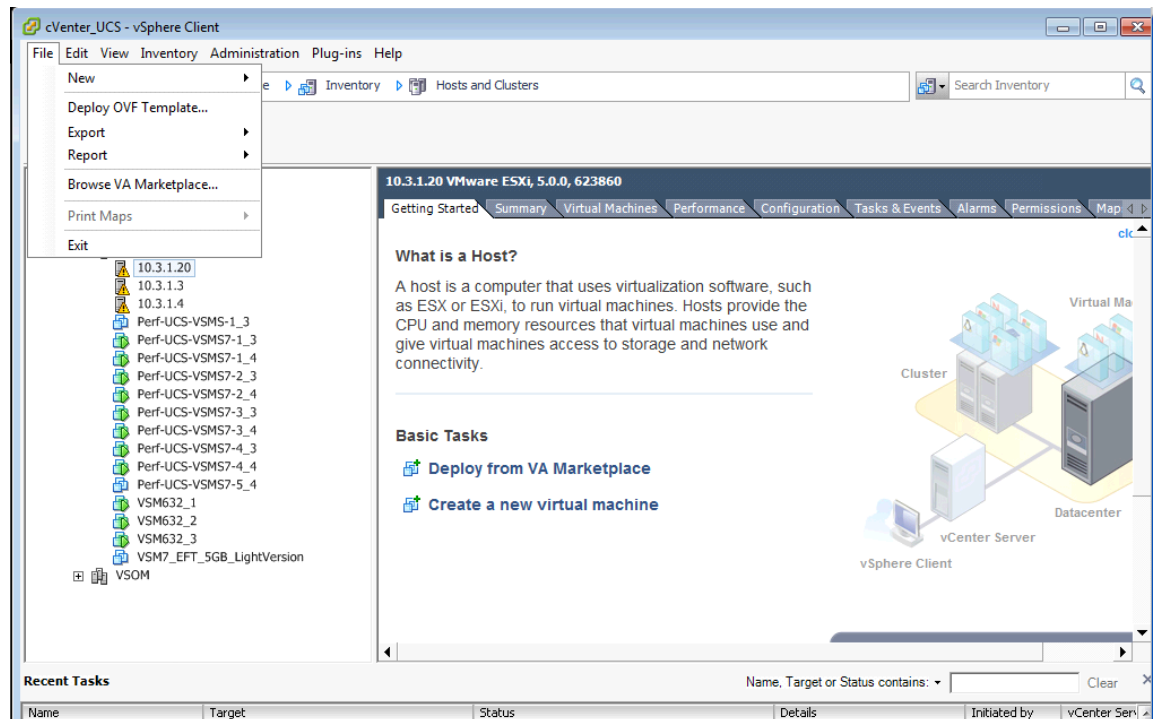


**Note**

The OVF Template is approximately 2.5 GB in size. Once deployed, the VM requires 20 GB of space (without including the space for the video partitions).

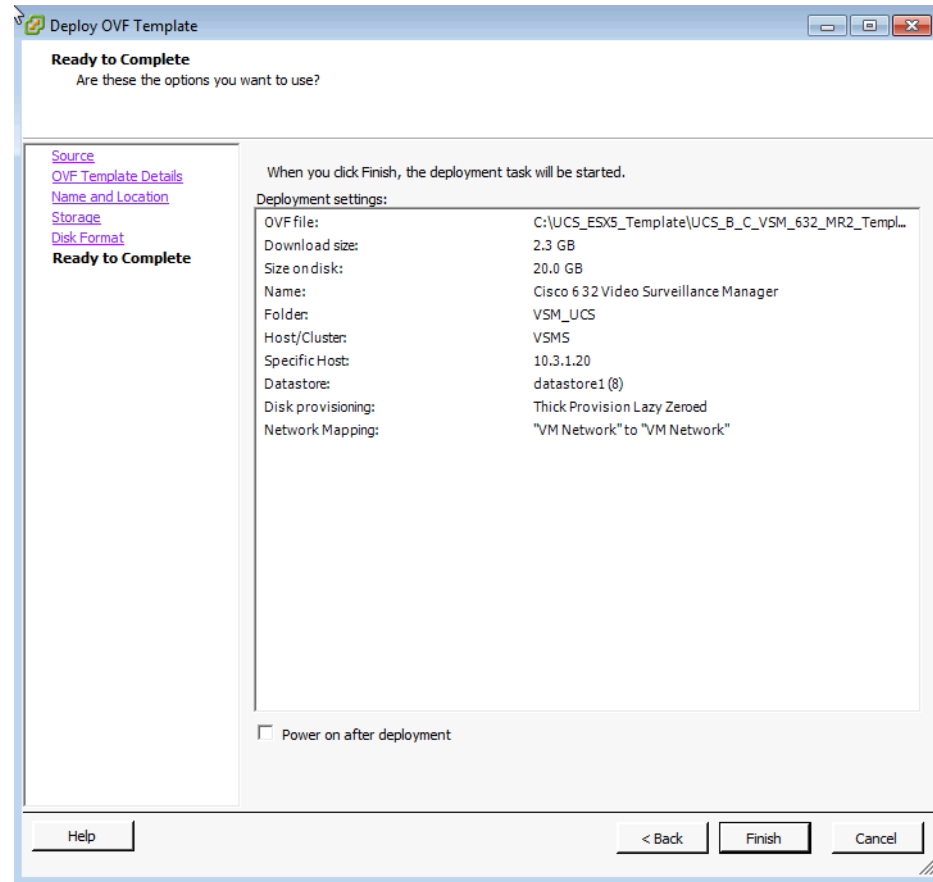
- Step 3** Launch the vSphere client and connect to the hypervisor.
- Step 4** Click **File > Deploy OVF Template** to launch the OVF Deploy Template wizard (Figure 12).

**Figure 12** Launching the Deploy OVF Template Wizard in the vSphere Client



- Step 5** Follow the instructions in the wizard:
- Click **Browse** and either enter a URL to download, or specify a location and select the **VSM template**.
  - Enter an appropriate **name** for this virtual machine.
  - Complete the remaining steps by choosing all of the default options.
  - Click **Finish** to begin deploying the VSM template.

Figure 13 displays the result of those selected deployment settings.

**Figure 13**      *Ready to Complete the OVF Wizard – VSM Template and Default Settings*

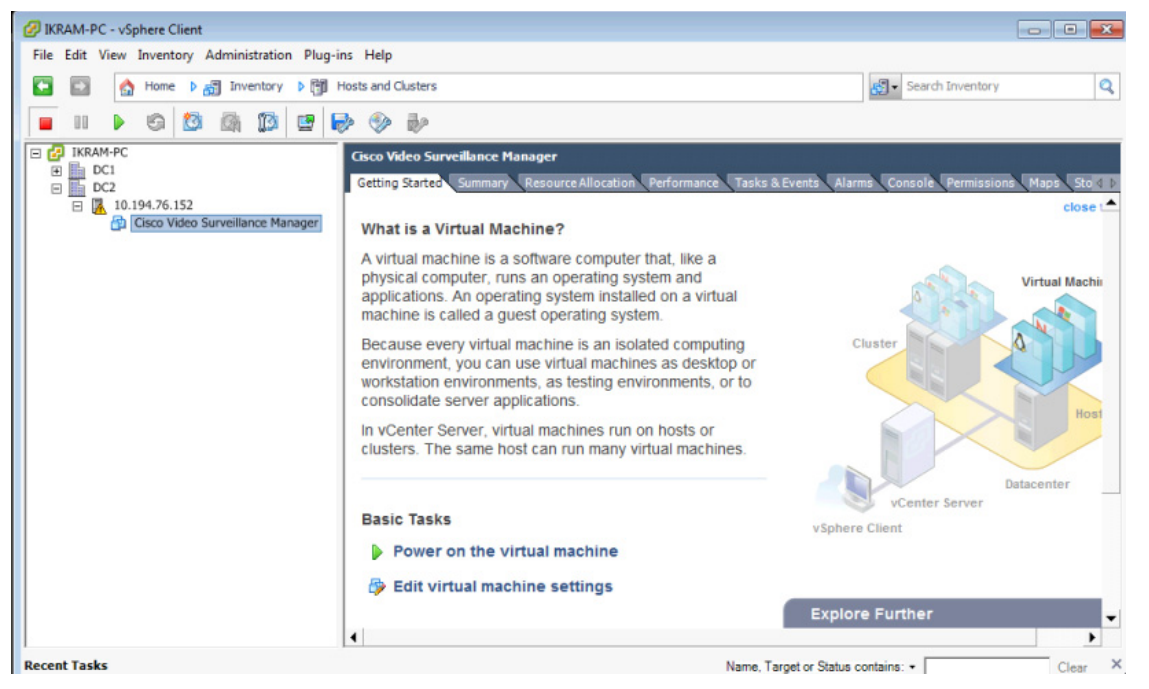
Once the VSM template is successfully deployed, the VSM VM displays under the hypervisor entry in the left-hand Inventory tree (Figure 14, left pane).

For more information about OVF Templates, see  
<http://www.vmware.com/technical-resources/interfaces/ovf.html>.

**Note**

The VSM VM size is 30 GB.

**Figure 14** VSM VM Console in the vSphere Client



## Creating New Media Hard Disks

The size of a new media hard disk is based on the redundant array of independent disks (RAID) configuration of the hypervisor. If the hypervisor is configured with a RAID 0 setting, then the usable disk size for the media partition is 860 GB; if using a RAID 1 setting, then the usable disk size is 400 GB. A RAID configuration is specified when the SRE module is ordered.



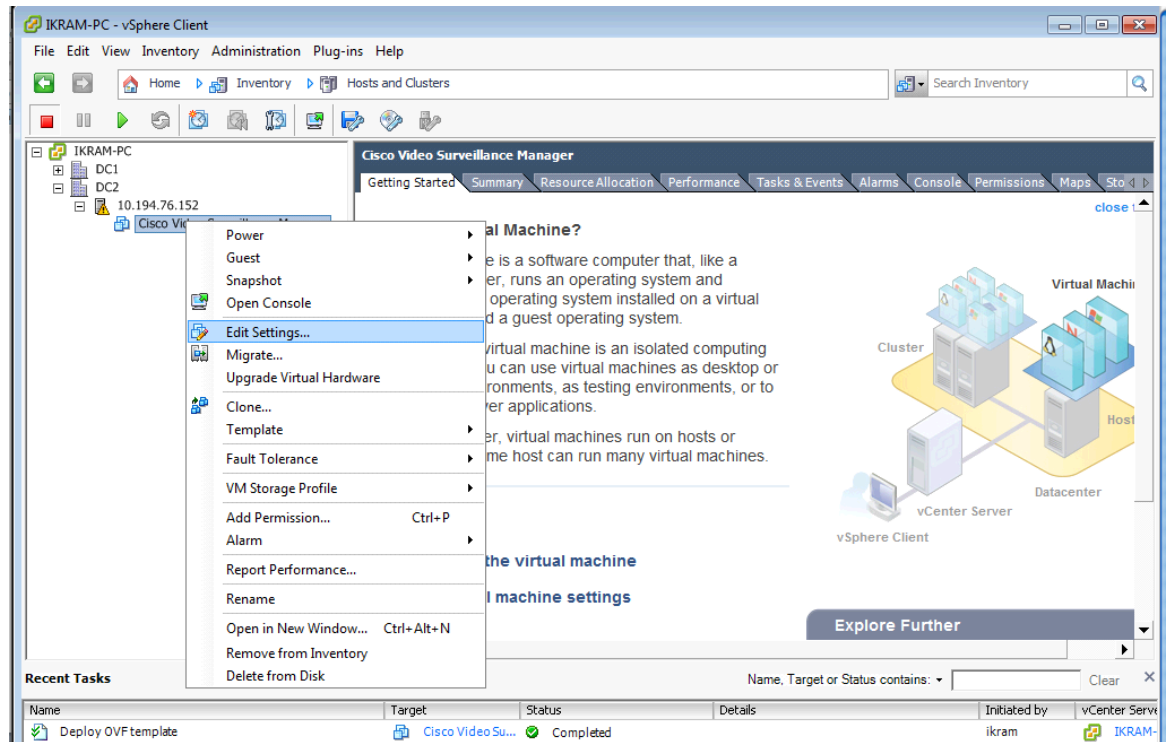
### Note

Cisco assumes that the SRE comes with RAID configured. If it is not configured, or if the RAID configuration must be modified, then follow the instructions in the SRE configuration guide listed in the reference section.

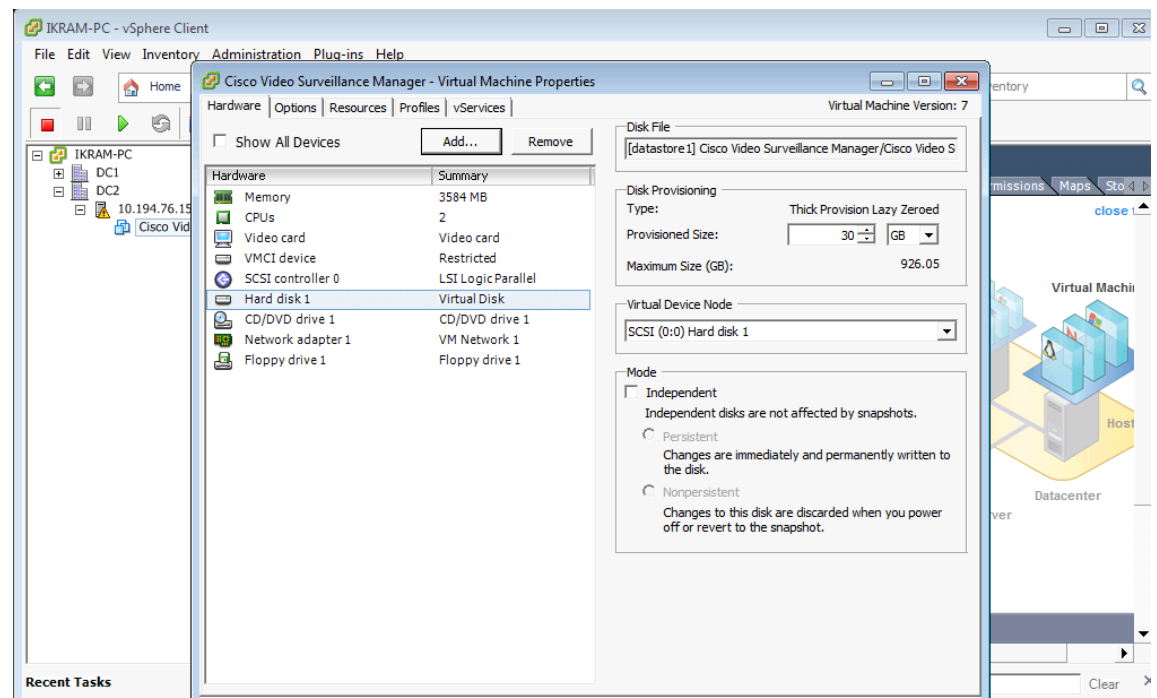
### To create a new media hard disk for the VSM VM:

- Step 1** Launch the vSphere client and connect to the vCenter server (see [Figure 11 on page 11](#)).
- Step 2** In the left pane (Inventory tree), right-click the hypervisor's name and select **Edit Settings** ([Figure 15](#)) to launch the Virtual Machine Properties—Hardware Tab settings ([Figure 16](#)).

**Figure 15** vCenter UCS, vSphere Client—Edit Settings

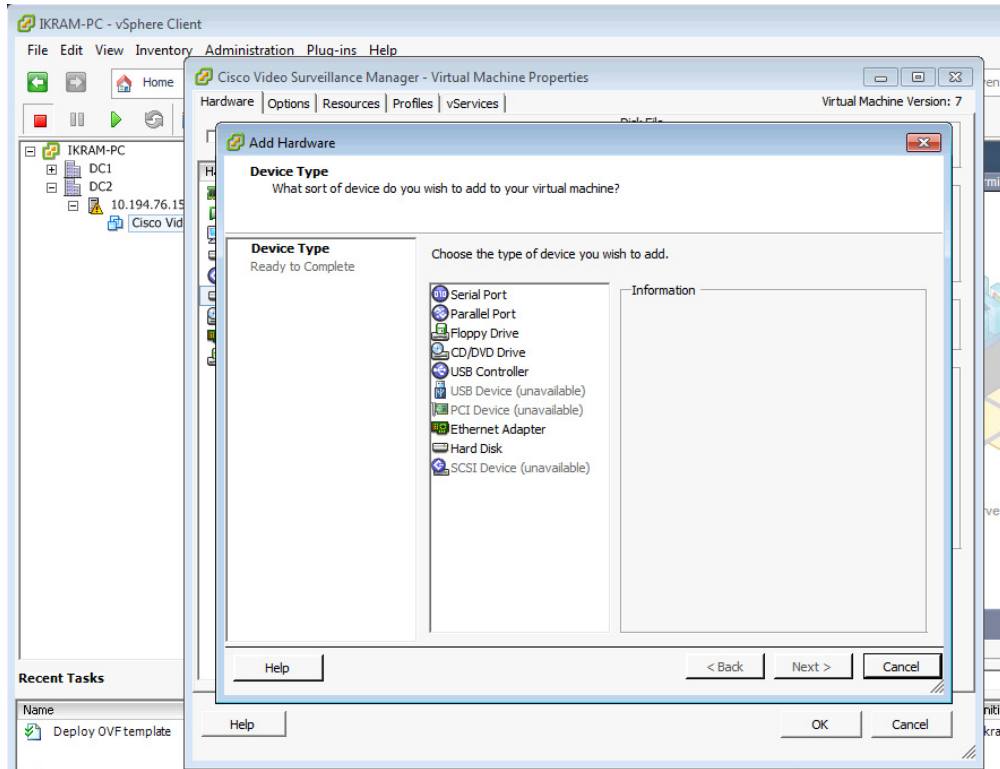


**Figure 16** Virtual Machine Properties—Hardware Tab Settings



- Step 3** Select **Hard disk n** and note the **Disk Provisioning** sizes (Maximum Size and Provisioned Size).
- Step 4** Click **Add** to display the Add Hardware screen (Figure 17).

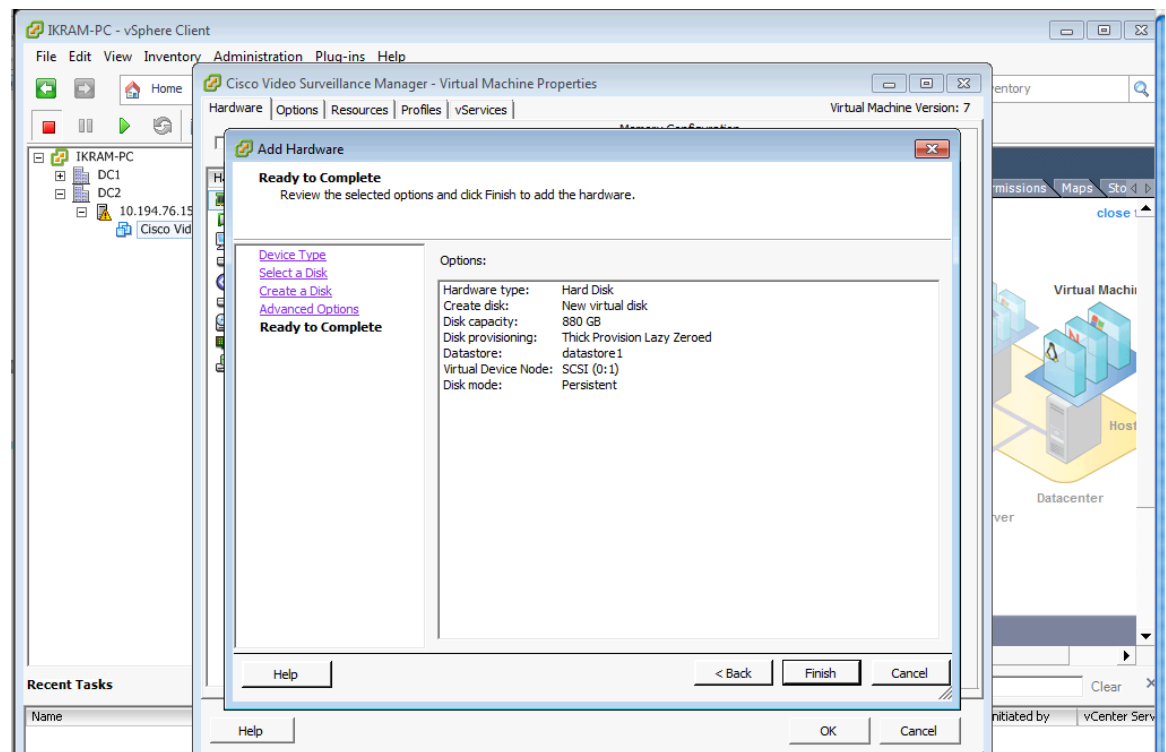
**Figure 17** *Selecting a Hard Disk*



- Step 5** From the device type list, select **Hard Disk** and click **Next** to display the next screen.
- Step 6** Select the default options for adding the new hard disk and proceed to the final screen (Figure 18).

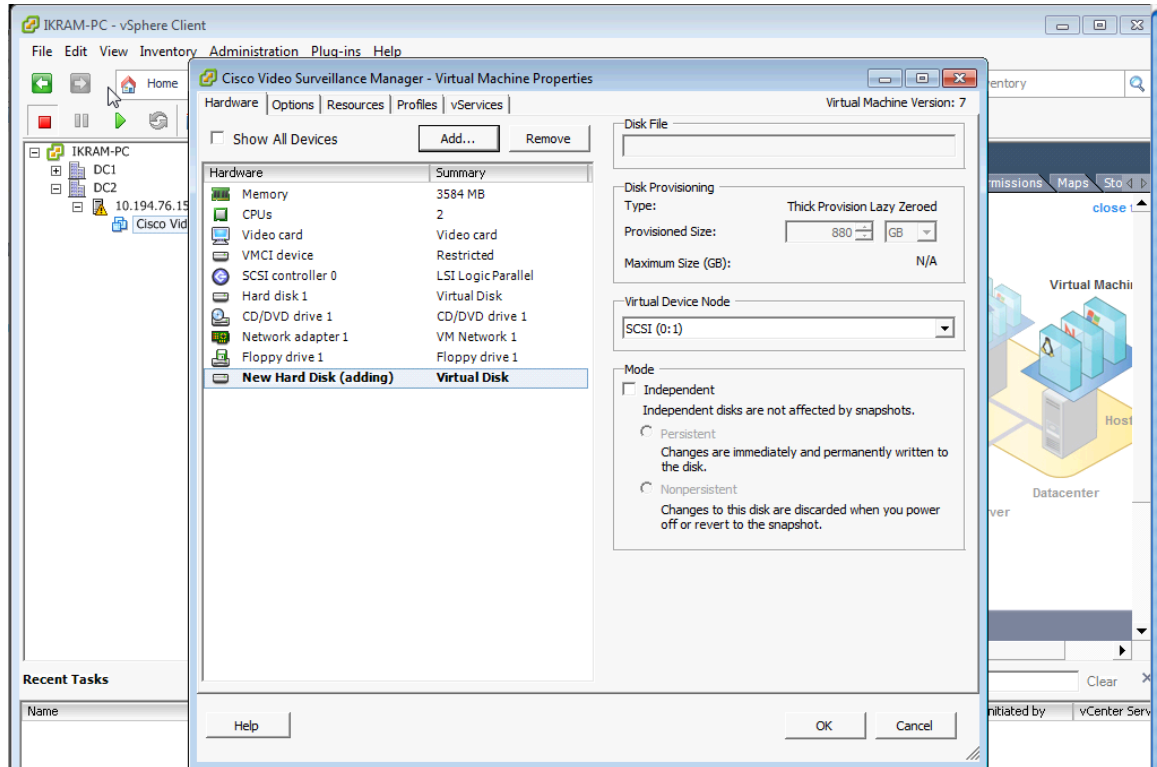


**Figure 18** Summary of New Hard Disk Options



- Step 7** Click **Finish** to return to the Virtual Machine Properties (Figure 16 on page 15) and view the newly created hard disk.
- Step 8** Click **OK** (Figure 19) to accept the new hard disk and to complete the procedure.

**Figure 19**      **Ready to Add New Hard Disk to VSM VM**

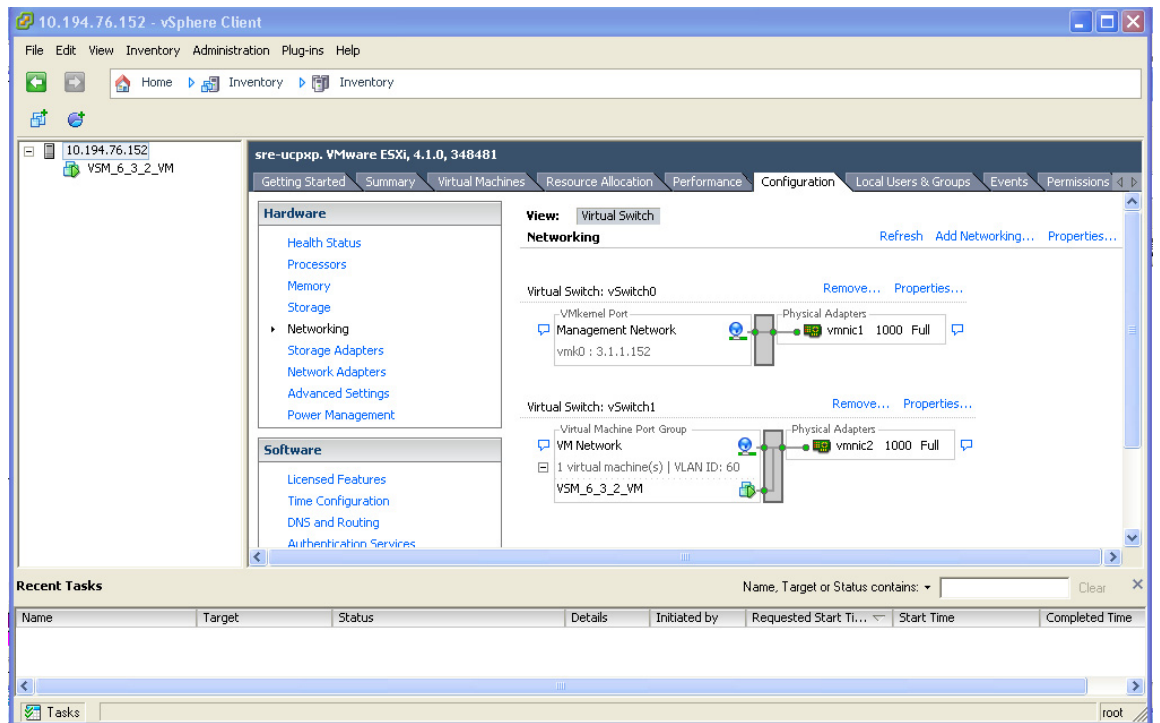


# Configuring Network Switches for the VSM VM

To set up the networking configuration for the VSM VM:

- Step 1** Launch the vSphere client and connect to the vCenter server (see [Figure 11 on page 11](#)).
- Step 2** In the left pane (Inventory tree), click the hypervisor's name > click the **Configuration** tab.
- Step 3** In the Hardware section, click **Networking** ([Figure 20](#)).

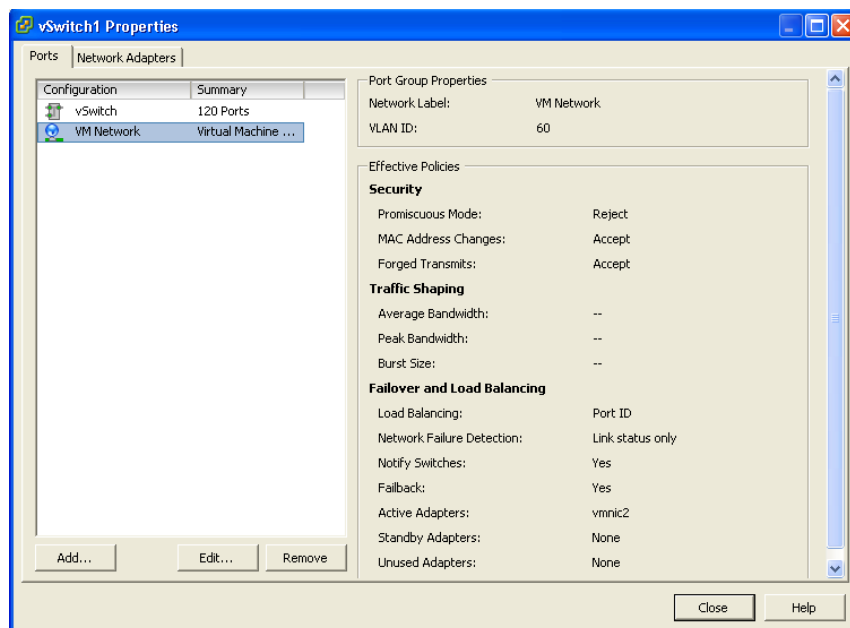
**Figure 20** VM Switch Networking Properties—vSphere Client



The defaults, **virtual switch: vSwitch 0** and **virtual switch: vSwitch1**, display.

- Step 4** Click **Properties** to configure the virtual switch's properties ([Figure 21](#)).

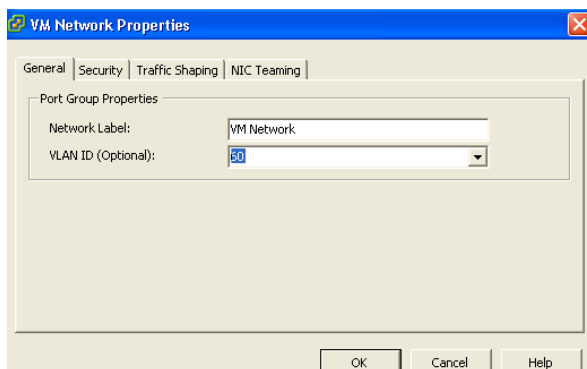
**Figure 21** VM Switch1 Networking Properties—vSphere Client



**Step 5** Select **VM Network** and click **Edit**.

**Step 6** Optional. Change the VLAN ID to the VSM VLAN (for example, 60) (Figure 22).

**Figure 22** VM Networking Properties—vSphere Client



**Step 7** Click **OK** to complete the network configuration.

# Configuring NTP



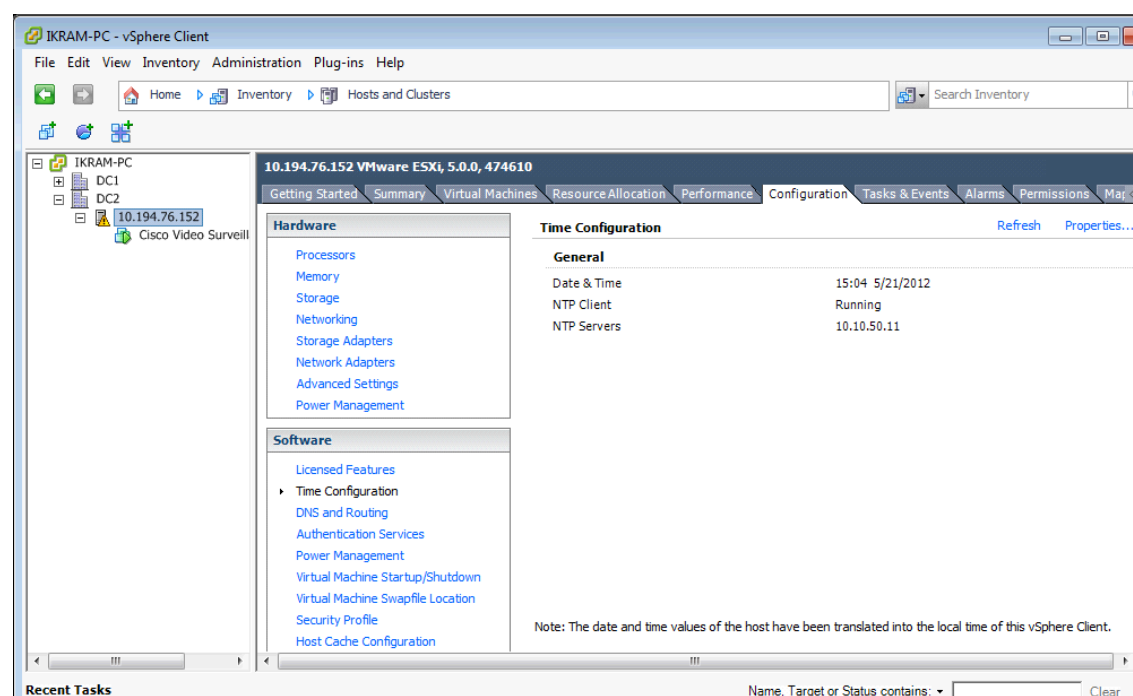
## Note

We recommend that you use the Network Time Protocol (NTP) source to maintain the correct time on the server. Configuring NTP should be done before configuring the video. The clock should be set to use Coordinated Universal Time (UTC) and the appropriate time zone for the server.

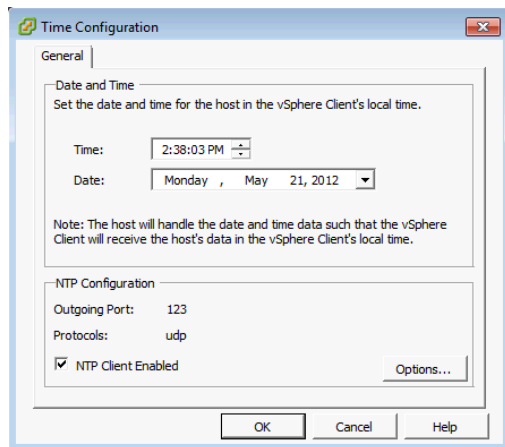
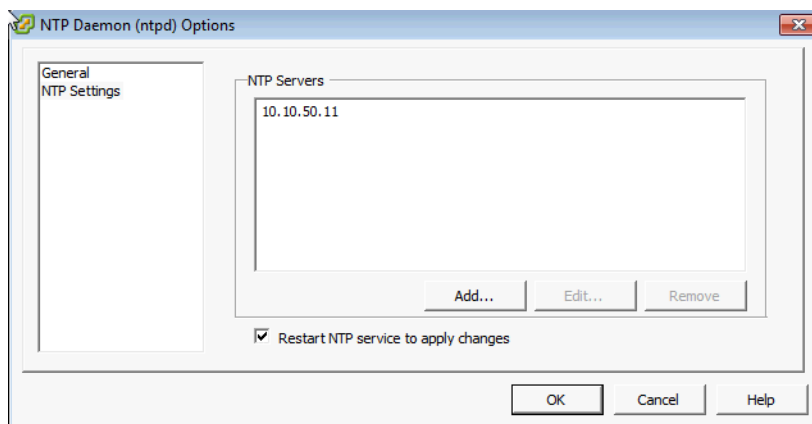
### To set up the NTP configuration for the VSM VM:

- Step 1** Launch the vSphere client and connect to the vCenter server.
- Step 2** In the left pane (Inventory tree), click the hypervisor's name.
- Step 3** Click the **Configuration** tab, and in the Software area (Figure 23), click **Time Configuration**.

**Figure 23** Time Configuration Properties—NTP Settings



- Step 4** Click **Properties** to configure the NTP settings.
- Step 5** Check the **NTP Client Enabled** check box and click **Options** to add NTP server address (Figure 24 and Figure 25).

**Figure 24** *Time Configuration—General Properties***Figure 25** *NTP Daemon Options*

**Step 6** Click **OK** to complete the NTP configuration for the hypervisor.

**Note**

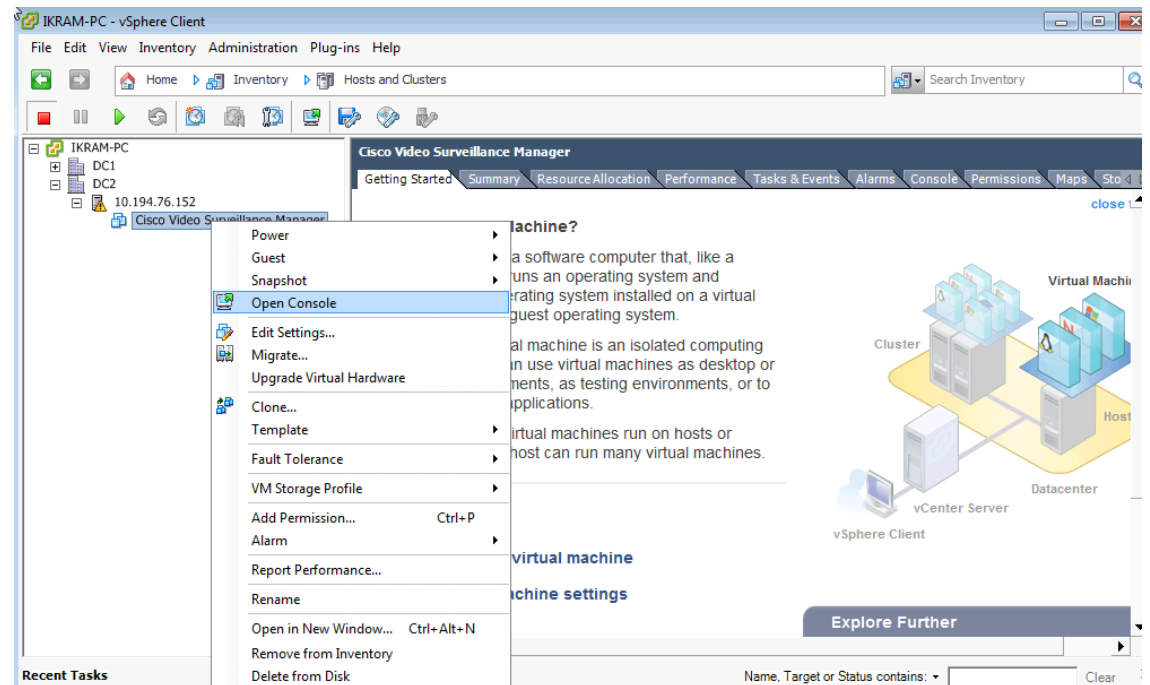
To set up the NTP configuration on the VSM VM running SUSE, use Yet Another Setup Tool (YaST) to configure the NTP source and server time.

# Launching the VSM VM

To launch the VSM VM:

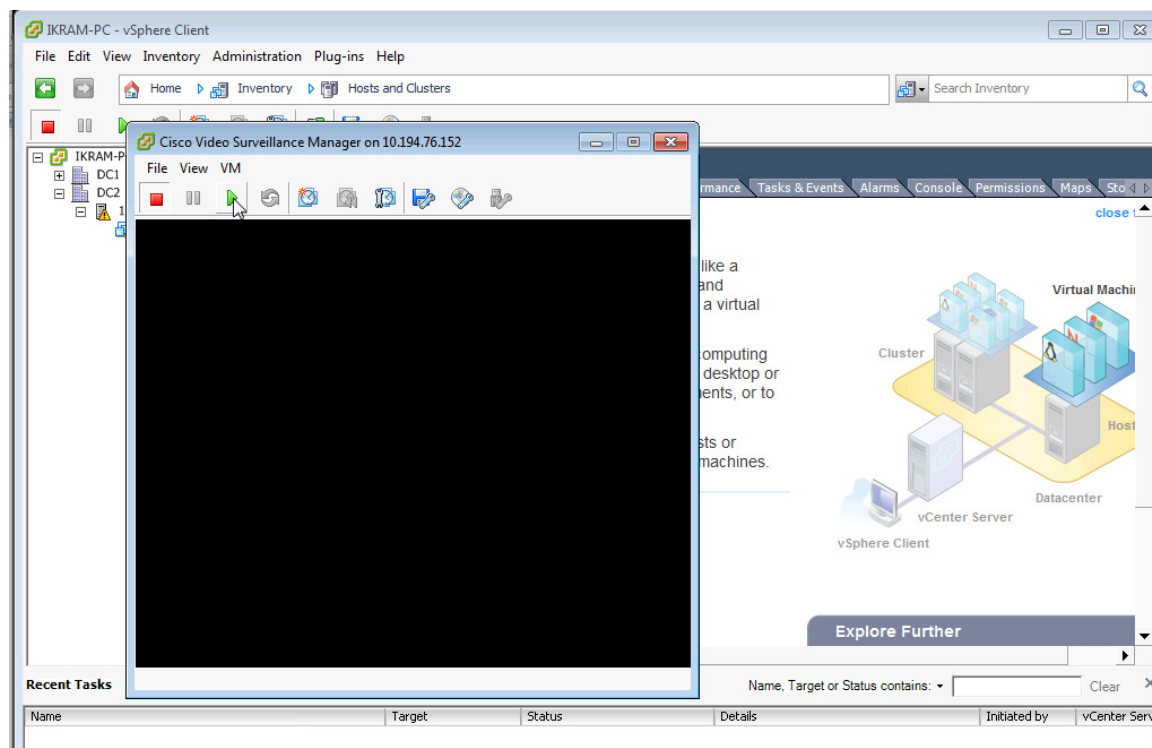
- Step 1** In the left pane (Inventory tree) of the vCenter\_UCS-vSphere client, right-click the **VSM VM name** and select **Open Console** (Figure 26) to launch the VM console.

**Figure 26** Opening the VSM VM Console



- Step 2** On the console toolbar, click the **green arrow** (Figure 27).

**Figure 27** *Launching the VSM VM Console*



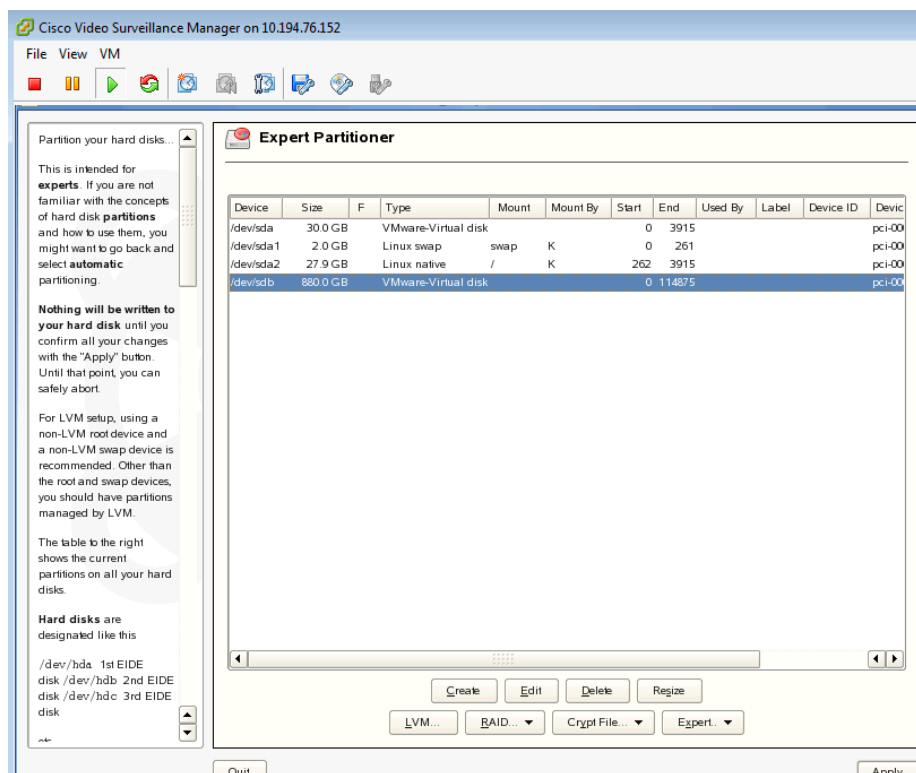
## Configuring the VSM VM

**To configure the VSM VM:**

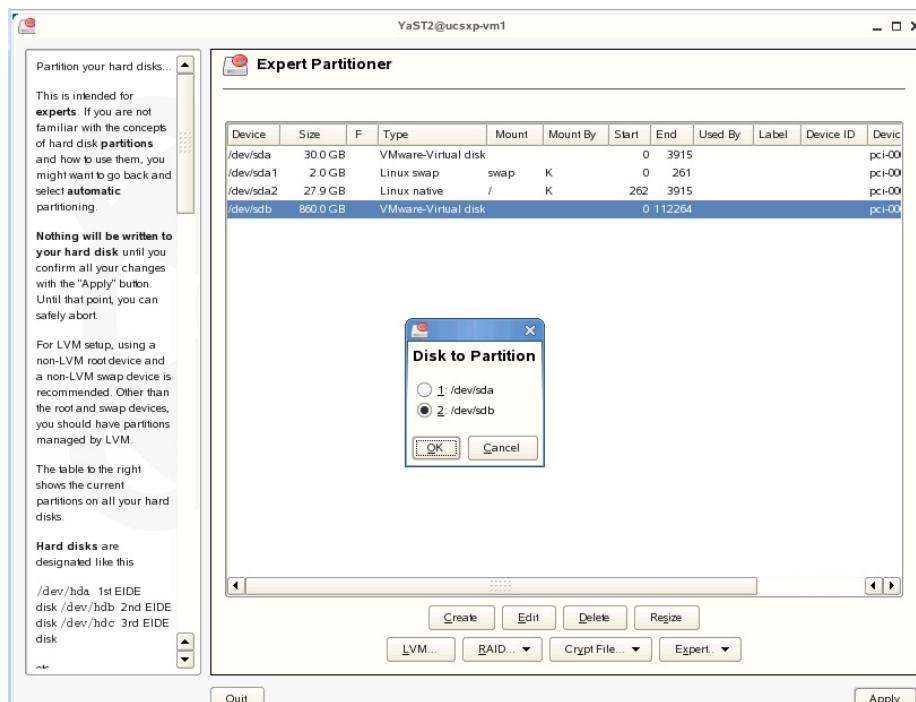
- Step 1** Open the VSM VM console and log on to VSM with either your specific authentication or the standard default username of **root** and the **secur4u** password.
- Step 2** Launch the Yet another Software Tool (YaST) partitioner utility to add the new media partition ([Figure 28](#), [Figure 29](#), [Figure 30](#), [Figure 31](#)).



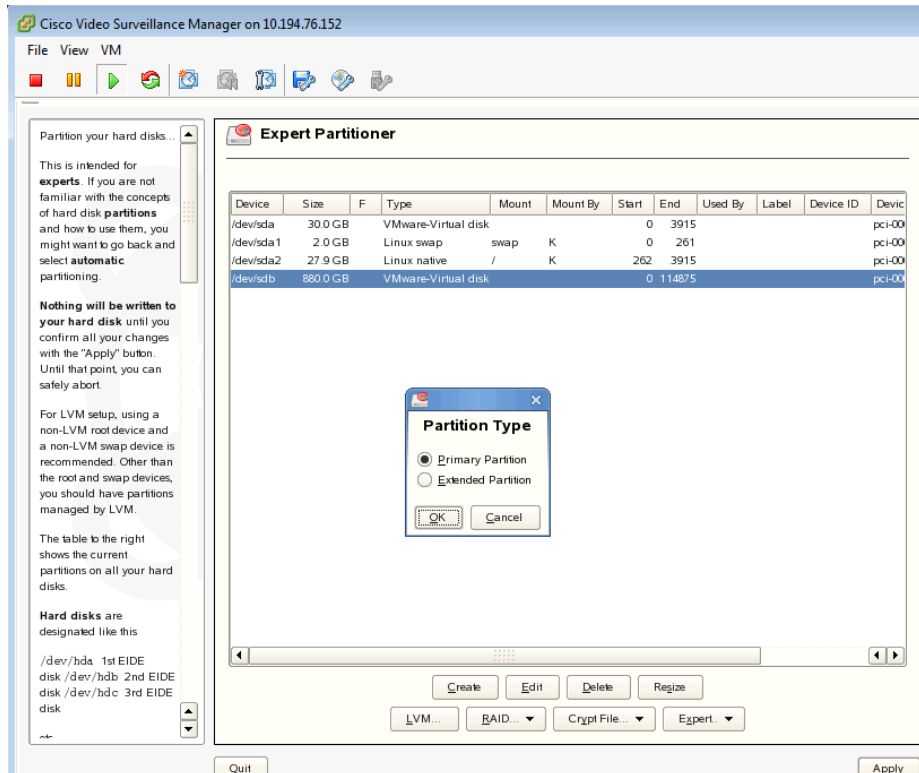
**Figure 28** Creating a New Media Partition in YaST



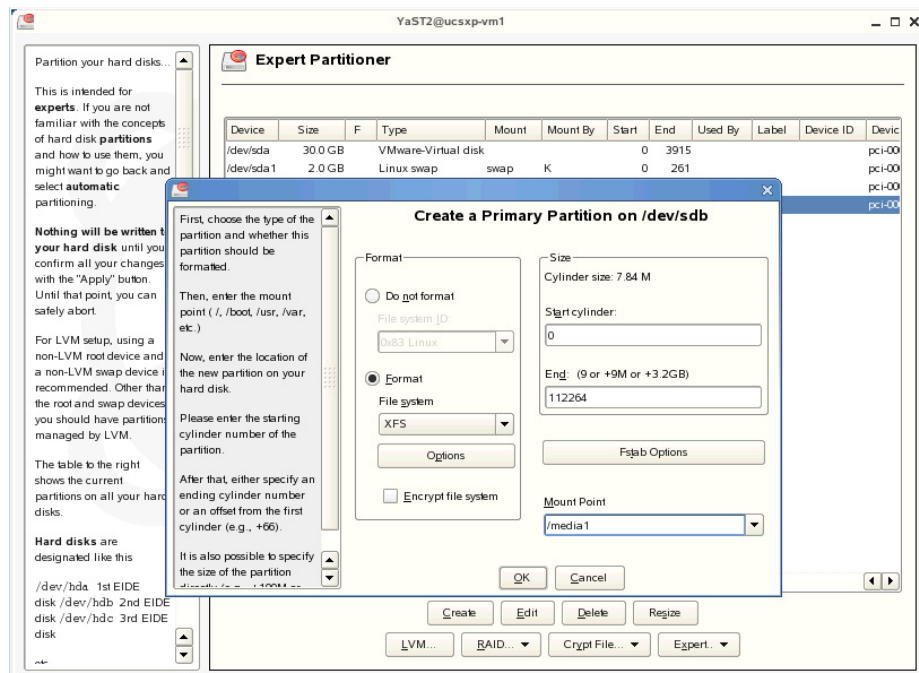
**Figure 29** Selecting the Disk Device to Partition in YaST



**Figure 30** *Selecting Partition Type in YaST*



**Figure 31** *Using XFS Format—Choose Partition Size and Name the Mount Point in YaST*



- Step 3** After successfully creating the partition, change ownership of partition to the nobody account and group with the **chown nobody:nobody /media1** command.
- Step 4** Reboot the VSM VM: log off and select **Reboot**.
- Step 5** After the VM reboots, open the Video Surveillance Management Console (VSMC) page from the browser and configure the Media Server options to set the **/media1** partition for storing archives and video clip data.

**Note**

Remember to finish all of the remaining VSM administration and configuration tasks. For information about VSM Install and User Guides, refer to the [“More Information” section on page 27](#).

## Testing Network Connectivity

To verify that network connectivity is working properly between endpoints, including IP cameras and VSOM operator workstations:

- Step 1** Log on to the VSM server and ensure that all Cisco services are running and operational.
- Step 2** Navigate to the VSMC page and from the Status Console, verify the status of the Cisco services.

## More Information

For more information about Cisco-related products, see the following resources:

- Cisco Physical Security and Building Systems:  
<http://www.cisco.com/go/physec/>
- Cisco UCS Express (SRE-V) Install and Upgrade Guides:  
[http://www.cisco.com/en/US/products/ps11273/prod\\_installation\\_guides\\_list.html](http://www.cisco.com/en/US/products/ps11273/prod_installation_guides_list.html)
- Cisco Video Surveillance Media Server Software—Install and Upgrade Guides:  
[http://www.cisco.com/en/US/products/ps9152/prod\\_installation\\_guides\\_list.html](http://www.cisco.com/en/US/products/ps9152/prod_installation_guides_list.html)
- Installing and Configuring VMware Tools:  
<http://www.vmware.com/pdf/vmware-tools-installation-configuration.pdf>
- Cisco Configuration Engine Administration Guide—Upgrade or Downgrade an IOS Image  
[http://www.cisco.com/en/US/docs/net\\_mgmt/configuration\\_engine/3.0/administration/guide/upgrade.html](http://www.cisco.com/en/US/docs/net_mgmt/configuration_engine/3.0/administration/guide/upgrade.html)
- Installation and Configuration Guide for Cisco Services Ready Engine Virtualization, Release 2.0  
[http://www.cisco.com/en/US/docs/interfaces\\_modules/services\\_modules/sre\\_v/2.0/user/guide/overview.html](http://www.cisco.com/en/US/docs/interfaces_modules/services_modules/sre_v/2.0/user/guide/overview.html)

