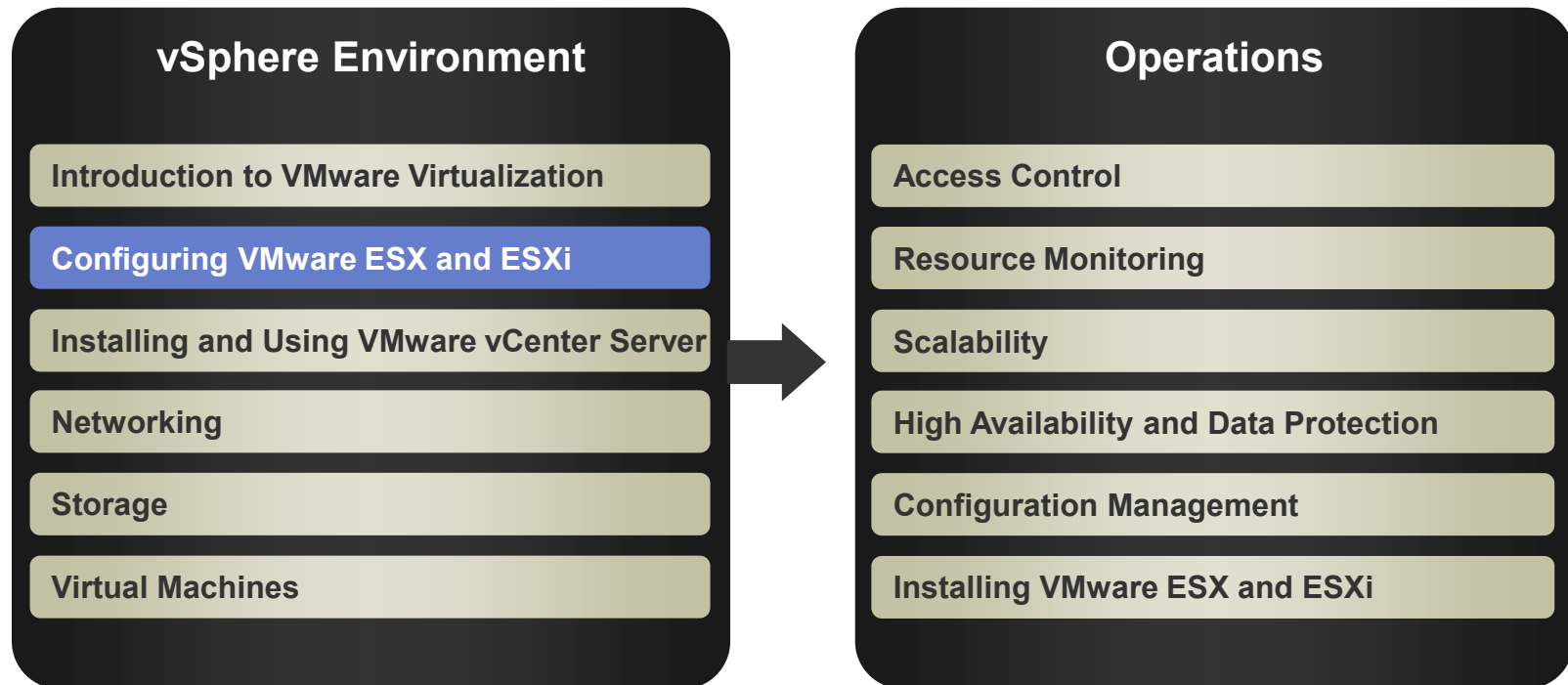




Configuring ESX/ESXi

Module 3

You Are Here



Importance

- VMware® ESX™/ESXi hosts provide the physical resources used to run virtual machines. Failure to properly install and configure ESX/ESXi hosts can negatively affect the performance, operation, and administration of all virtual machines located on these hosts.

Module Lessons

Lesson 1: Overview of ESX/ESXi

Lesson 2: Configuring ESX/ESXi



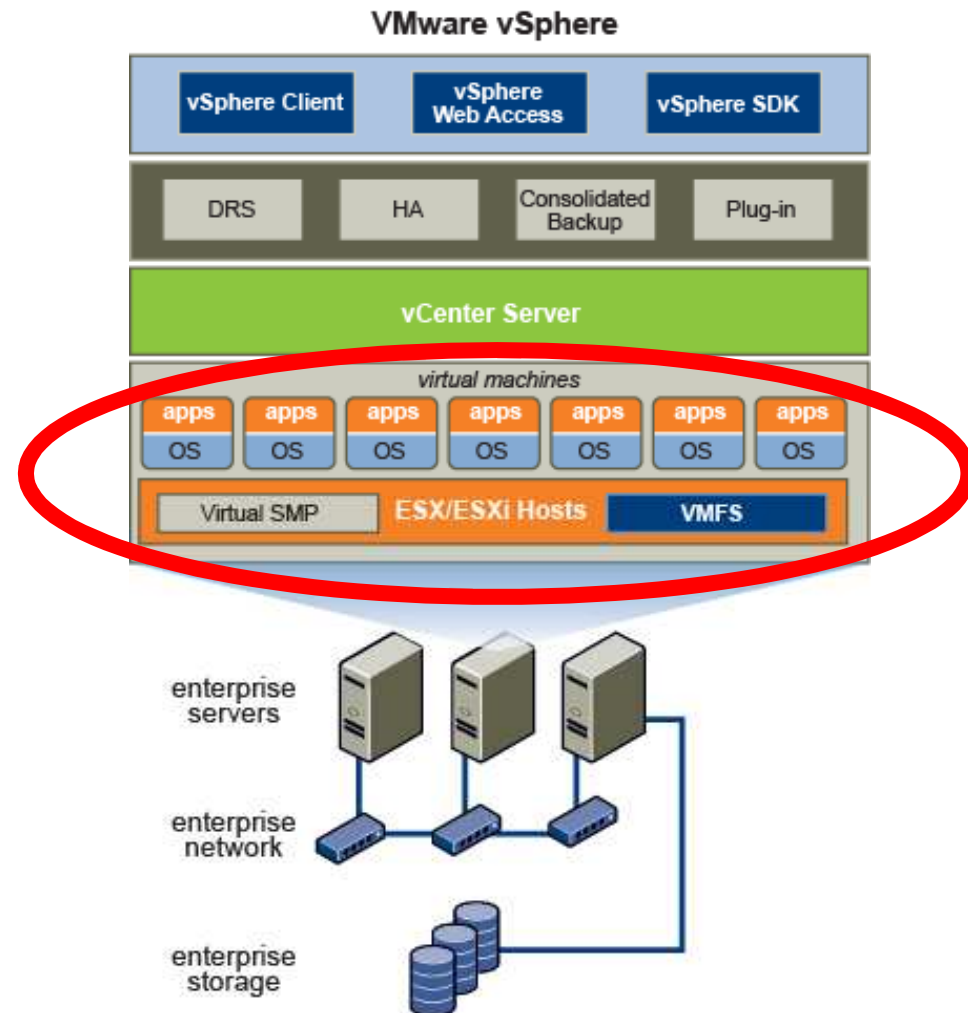
Lesson 1: Overview of ESX/ESXi

Lesson Objectives

- Describe the features of ESX/ESXi
- Identify the different versions of ESX
- Describe the architecture of ESX/ESXi

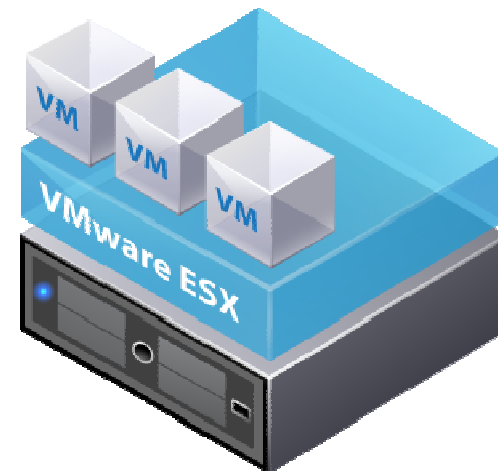
ESX/ESXi: Virtualization Platform

- ESX and ESXi are bare-metal, efficient, and reliable hypervisors running directly on server.
- ESX and ESXi abstract CPU, memory, storage, and networking into multiple virtual machines.



ESX/ESXi Features

- Can use standard and distributed virtual switches, NIC teaming, and VLANs
- Can use the VMware vStorage VMFS for storing virtual machines
- Can be managed by VMware vCenter™ Server
- Can take advantage of various VMware vSphere™ features, such as VMware VMotion™
- Can be accessed using the VMware vSphere Client



ESX, ESXi Installable, and ESXi Embedded

ESX comes in two main versions:

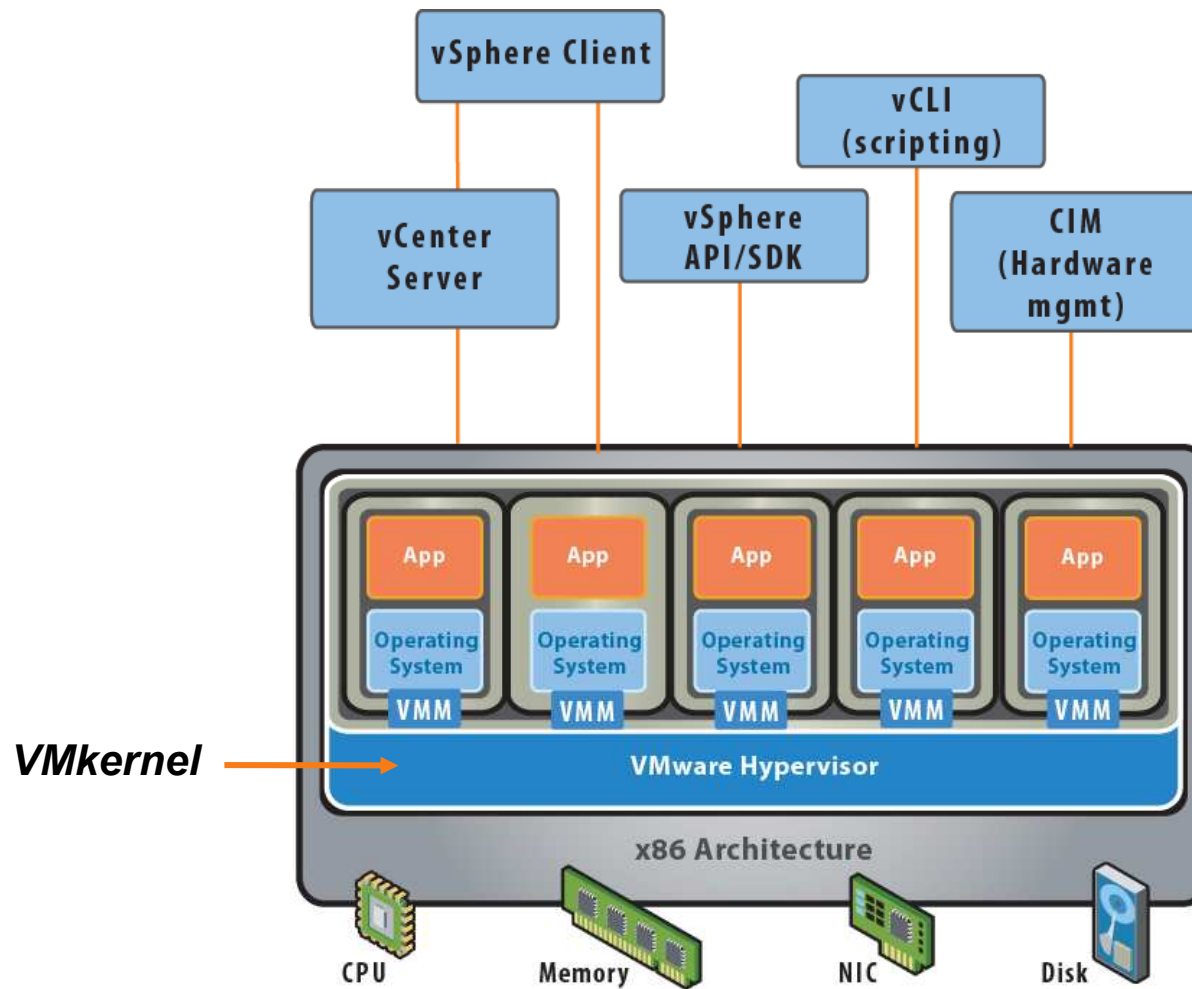
> ESX

- Managed with a built-in service console or the vSphere Command-Line Interface (vCLI)
- Available as an installable DVD boot image

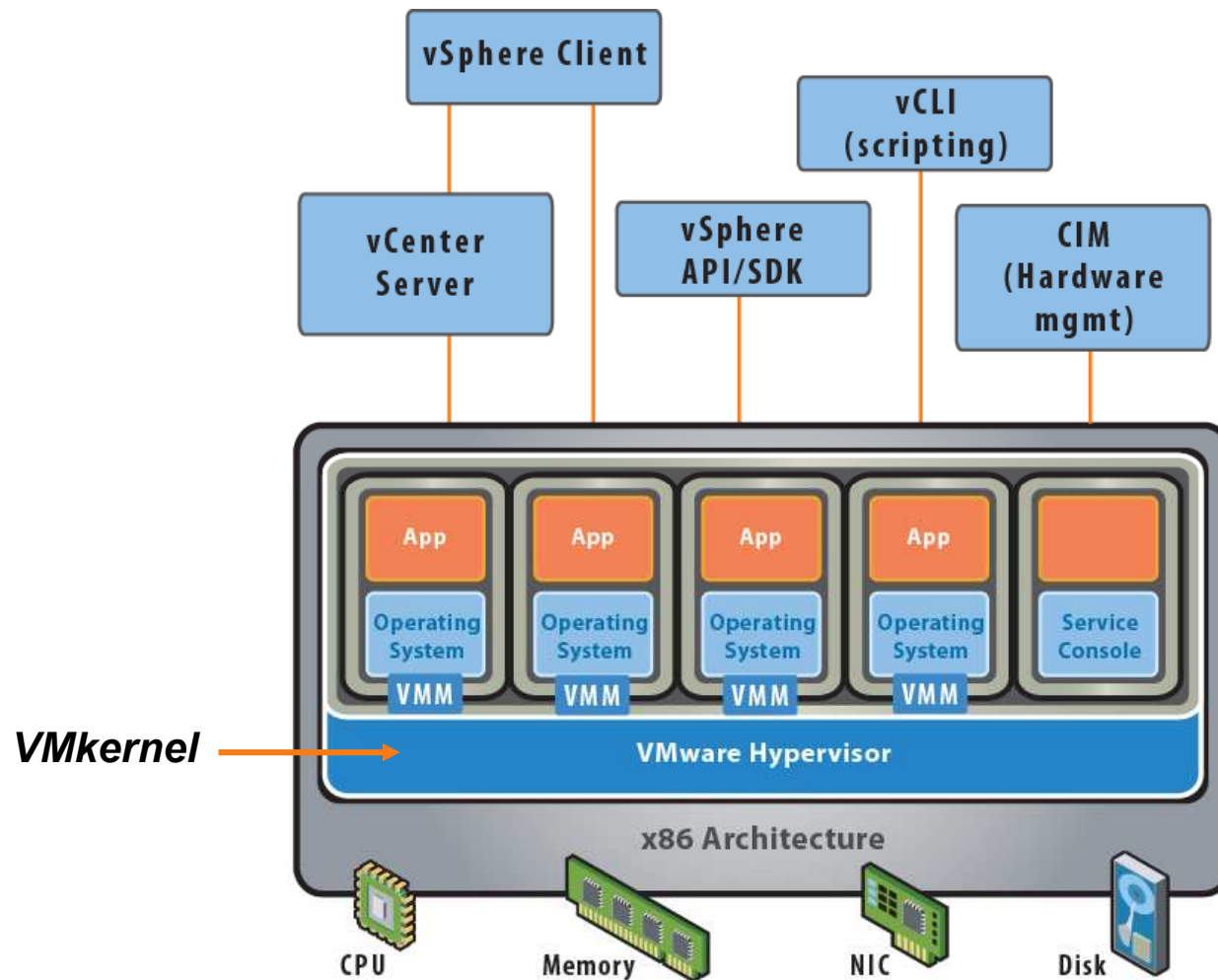
> ESXi

- Managed with a BIOS-like direct console or vCLI
- A high-security, 32MB footprint
- ESXi Installable – Available as an installable CD-ROM boot image
- ESXi Embedded – ESX image preinstalled as firmware or burned onto an external USB key by the hardware vendor

ESXi Architecture



ESX Architecture



Lesson Summary

- ESX and ESXi allow virtual machine networking and shared storage using VMFS. They can be managed by vCenter Server and accessed by the vSphere Client.
- ESX is available in two main versions: ESX and ESXi (which includes ESXi Embedded and ESXi Installable).
- ESX has a built-in, Linux-based service console that can be used to configure, manage, and troubleshoot the ESX host.
- ESXi has a compact, 32MB footprint for increased security and reliability.



Lesson 2: Configuring ESX/ESXi

Lesson Objectives

- Understand how to access the ESXi direct console user interface
- Access an ESX/ESXi host using the vSphere Client
- View or configure ESX/ESXi settings:
 - Processor and memory configuration
 - Licensing
 - NTP client
 - DNS and routing
- Understand user account best practices
- View ESX/ESXi system logs

Installing ESX/ESXi

- ESX must first be installed on supported hardware.
- ESXi Installable must first be installed on supported hardware.
- ESXi Embedded is preinstalled in the firmware of a supported vendor's hardware.
- In all cases, ESX or ESXi must be configured.

*This lesson assumes that ESX/ESXi
has already been installed.
(Installation is covered in a later module.)*

Configuring ESXi

- The direct console user interface is similar to the BIOS of a computer with a keyboard-only user interface.

```
VMware ESXi 4.0.0 Releasebuild-162903

HP ProLiant BL460c G1

2 x Intel(R) Xeon(R) CPU L5410 @ 2.33GHz
4 GB Memory

Download tools to manage this host from:
http://172.17.12.57/ (DHCP)

<F2> Customize System                <F12> Shut Down/Restart
```


Configuring ESXi: root Access

System Customization	Configure Password
Configure Password Configure Lockdown Mode	Set
Configure Management Network Restart Management Network Test Management Network Disable Management Network Restore Standard Switch	To prevent unauthorized access to this system, set the password for the user.
Configure Keyboard View Support Information View System Logs	
Restart Management Agents	
Reset System Configuration Remove Custom Extensions	
<Up/Down> Select	<Enter> Change <Esc> Log Out

The direct console allows an administrator to:

- > Set a root password (complex passwords only)
- > Enable or disable lockdown mode (to prevent user access to host as root)

Configuring ESXi: Management Network

System Customization	Configure Management Network
Configure Password	Hostname : sc-goose07
Configure Lockdown Mode	IP Address : 172.17.12.57
Configure Management Network	Network identity acquired from DHCP server 192.168.2.30
Restart Management Network	To view or modify this host's management network settings in detail, press <Enter>.
Test Management Network	
Disable Management Network	
Restore Standard Switch	
Configure Keyboard	
View Support Information	
View System Logs	

The direct console allows you to modify network settings like the host name, IP configuration (IP address, subnet mask, default gateway), and DNS servers.

<Up/Down> Select	<Enter> More	<Esc> Log Out
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Configuring ESXi: Other Settings

System Customization	Configure Keyboard
Configure Password	Default
Configure Lockdown Mode	To select the layout type for the keyboard of this host, press <Enter>.
Configure Management Network	The direct console allows an administrator:
Restart Management Network	
Test Management Network	> To configure the keyboard layout (default is English)
Disable Management Network	> To view support information
Restore Standard Switch	> To view system logs
Configure Keyboard	
View Support Information	
View System Logs	
Restart Management Agents	
Reset System Configuration	
Remove Custom Extensions	
<Up/Down> Select	<Enter> More <Esc> Log Out

Using the vSphere Client

- The vSphere Client is an interface used to connect remotely to ESX/ESXi or vCenter Server from any Windows PC.
- Download software from the main page of ESX/ESXi.

Point to ESX/ESXi host.

Download vSphere Client to supported Windows system.

VMware ESX 4
Welcome

Getting Started

If you need to access this host remotely, use the following program to install vSphere Client software. After running the installer, start the client and log in to this host.

- [Download vSphere Client](#)

Logging In to ESX/ESXi

At the vSphere Client login screen, enter:

- > Host name or IP address of ESX/ESXi host
- > User name **root**
- > Password for user **root**

VMware vSphere Client

vmware

vSphere Client

To directly manage a single host, enter the IP address or host name.
To manage multiple hosts, enter the IP address or name of a vCenter Server.

IP address / Name:

User name:

Password:

Use Windows session credentials

vSphere Client: Configuration Tab

The screenshot shows the vSphere Client interface for a virtual machine named 'sc-goose06'. The main window title is 'sc-goose06 - vSphere Client'. The menu bar includes 'File', 'Edit', 'View', 'Inventory', 'Administration', 'Plug-ins', and 'Help'. The breadcrumb navigation shows 'Home > Inventory > Inventory'. The left sidebar shows a tree view with 'sc-goose06' selected. The main content area is titled 'sc-goose06.vmeduc.com VMware ESX, 4.0.0, 140815 | Evaluation (56 days remaining)'. The 'Configuration' tab is active, showing a list of configuration options under 'Hardware' and 'Software'. The 'Hardware' section includes 'Health Status', 'Processors', 'Memory', 'Storage', 'Networking', 'Storage Adapters', 'Network Adapters', and 'Advanced Settings'. The 'Software' section includes 'Licensed Features', 'Time Configuration', 'DNS and Routing', 'Virtual Machine Startup/Shutdown', 'Virtual Machine Swapfile Location', 'Security Profile', 'System Resource Allocation', and 'Advanced Settings'. A table on the right displays sensor information:

Sensor	Status	Reading
HP ProLiant BL460c G1	Normal	

Viewing Processor and Memory Configuration

sc-goose06 | sc-goose06.vmeduc.com VMware ESX, 4.0.0, 140815 | Evaluation (56 days remaining)

Getting Started | Summary | Virtual Machines | Resource Allocation | Performance | Configuration | Users

Hardware

- Health Status
- Processors
- ▶ Memory
- Storage
- Networking
- Storage Adapters
- Network Adapters

Memory

Physical

Total	4094.3 MB
System	337.3 MB
Virtual Machines	3457.0 MB
Service Console	300.0 MB

ESX/ESXi Licensing

Before purchasing and activating licenses, you can install ESX/ESXi in evaluation mode.

Evaluation mode

- Is intended for demonstration and evaluation purposes
- Allows software to be completely operational immediately after installation
- Does not require any licensing configuration
- Provides full functionality of ESX/ESXi for 60 days from the time you install it
- Allows the software to notify you of the time remaining in the evaluation period

License Assignment Procedure

The screenshot displays the VMware vSphere interface for host 'sc-goose06'. The main window shows the 'Configuration' tab with 'Licensed Features' expanded. The 'Licensed Features' section lists various capabilities such as 'vSphere Evaluation Mode', 'NAS Usage', 'VMware HA', and 'VMware DRS'. An 'Assign License' dialog box is open, showing options to assign an existing license key or a new one. The 'Add License Key' sub-dialog is also visible, prompting for a 'New license key:'. A text box at the bottom left contains the instruction: 'The license key is a multicharacter string provided by VMware.'

sc-goose06 | sc-goose06.vmeduc.com VMware ESX, 4.0.0, 140815 | Evaluation (56 days remaining)

Getting Started Summary Virtual Machines Resource Allocation Performance Configuration Users & Groups Events Permissions

Hardware

- Health Status
- Processors
- Memory
- Storage
- Networking
- Storage Adapters
- Network Adapters
- Advanced Settings

Software

- Licensed Features
- Time Configuration
- DNS and Routing
- Virtual Machine Startup/Shutdown
- Virtual Machine Swapfile Location
- Security Profile
- System Resource Allocation
- Advanced Settings

Licensed Features

ESX Server License Type

Product: vSphere Evaluation Mode
Expires: 3/23/2009

Product Features:

- NAS Usage
- Up to 8-way virtual SMP
- SAN Usage
- iSCSI Usage
- VMware Consolidated Backup
- VMotion
- VMware HA
- VMware DRS
- vCenter agent for ESX Server
- VMware FT
- MPIO / Third-Party Multi-Pathing
- Hot-Pluggable virtual HW
- Host profiles
- Distributed Virtual Switch
- VMsafe
- dvFilter
- Storage VMotion

Assign License: sc-goose06.vmeduc.com

Assign an existing license key to this host

Product: Available

- Evaluation Mode
- (No License Key)

Add License Key

New license key:

OK Cancel

Assign a new license key to this host

Enter Key...

Product: -
Capacity: -
Available: -
Expires: -
Label: -

Help OK Cancel

The license key is a multicharacter string provided by VMware.

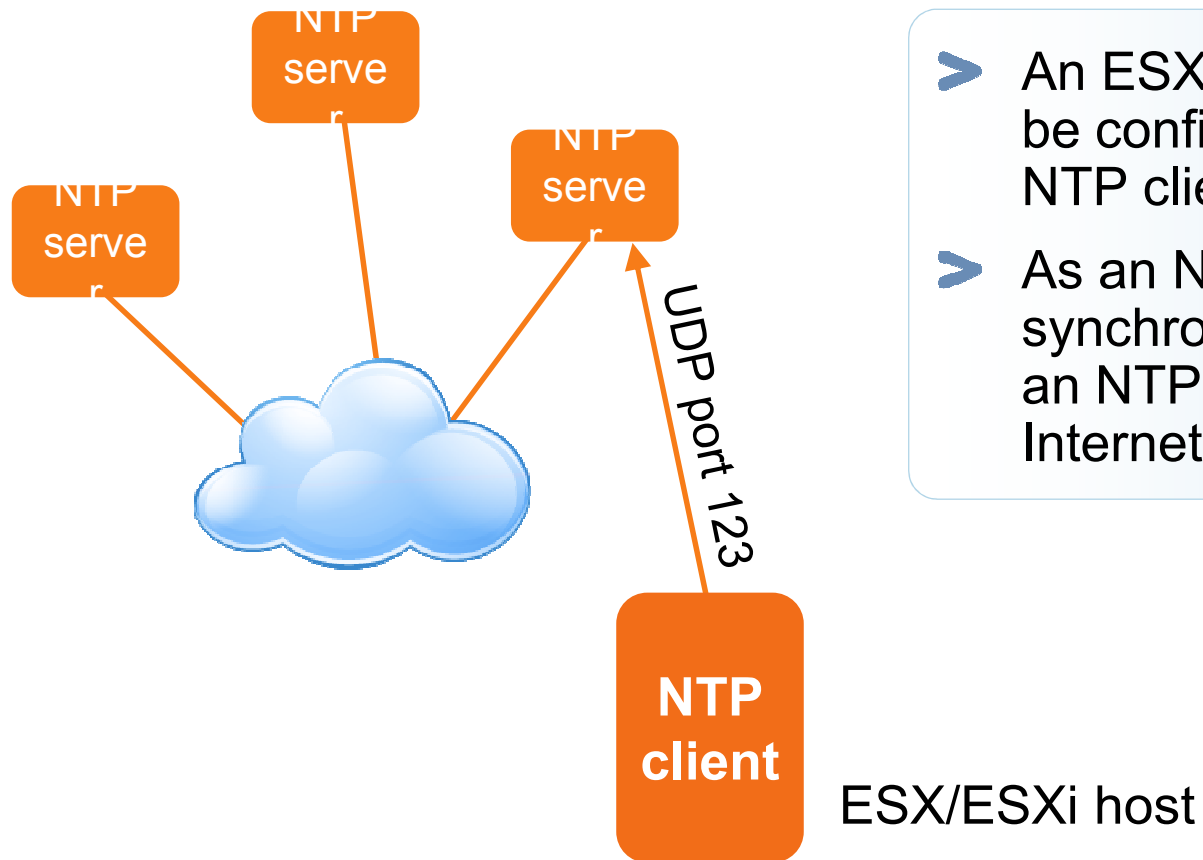
Synchronizing Host Time Using NTP

Network Time Protocol is a client-server protocol used to synchronize a computer's clock to a time reference.

NTP is important:

- For accurate performance graphs
- For accurate time stamps in log messages
- So that virtual machines have a source to synchronize with

ESX/ESXi as an NTP Client



- An ESX/ESXi host can be configured as an NTP client.
- As an NTP client, it can synchronize time with an NTP server on the Internet.

ESX/ESXi host

Configuring ESX/ESXi as an NTP Client

The Time Configuration link allows you:

- To set the date and time
- To configure your host as an NTP client

The screenshot displays the VMware ESX configuration interface for host 'sc-goose06'. The 'Configuration' tab is active, showing a sidebar with 'Hardware' and 'Software' categories. Under 'Software', 'Time Configuration' is selected. The main panel shows the 'Time Configuration' settings, including 'General' and 'NTP Configuration' sections. A dialog box is open over the 'Time Configuration' settings, showing the 'Date and Time' section with a time of 11:32:15 AM and a date of Monday, January 26, 2009. The 'NTP Configuration' section shows 'Outgoing Port' as 123, 'Protocols' as udp, and 'NTP Client Enabled' as unchecked. The dialog box has 'OK', 'Cancel', and 'Help' buttons at the bottom.

sc-goose06 sc-goose06.vmeduc.com VMware ESX, 4.0.0, 140815 | Evaluation (56 days remaining)

Getting Started Summary Virtual Machines Resource Allocation Performance Configuration Users & Groups Events

Hardware

- Health Status
- Processors
- Memory
- Storage
- Networking
- Storage Adapters
- Network Adapters
- Advanced Settings

Software

- Licensed Features
- ▶ Time Configuration
- DNS and Routing
- Virtual Machine Startup/Shutdown
- Virtual Machine Swapfile Location
- Security Profile
- System Resource Allocation
- Advanced Settings

Time Configuration

General

Date & Time	12:46 1/26/2009
NTP Client	Stopped
NTP Servers	--

Time Configuration

General

Date and Time
Set the date and time for the host in the vSphere Client's local time.

Time: 11:32:15 AM

Date: Monday, January 26, 2009

Note: The host will handle the date and time data such that the vSphere Client will receive the host's data in the vSphere Client's local time.

NTP Configuration

Outgoing Port: 123

Protocols: udp

NTP Client Enabled

Options...

OK Cancel Help

Network Settings: DNS and Routing

The DNS and Routing link allows you to change:

- > Host name and domain
- > DNS server addresses and search domains
- > Service console and VMkernel gateways

DNS and Routing	
Host Identification	
Name	sc-goose07
Domain	vmeduc.com
DNS Servers	
Method	Static
Preferred DNS Server	192.168.2.30
Alternate DNS Server	192.168.100.30
Search Domains	
vmeduc.com	
Default Gateways	
Service Console	172.17.12.1
VMkernel	

ESX Service Console Firewall

The ESX service console has a firewall through which you can enable or disable incoming or outgoing connections for a range of services.

The screenshot shows the ESX Service Console Firewall configuration interface. It is divided into several sections:

- Security Profile**: The overall configuration area.
- Firewall**: A summary section showing incoming and outgoing connections.
 - Incoming Connections**:
 - SSH Server: 22 (TCP)
 - CIM Secure Server: 5989 (TCP)
 - CIM Server: 5988 (TCP)
 - CIM SLP: 427 (UDP, TCP)
 - Outgoing Connections**:
 - VMware vCenter Agent: 902 (UDP)
 - VMware Consolidated Backup: 443,902 (TCP)
 - CIM SLP: 427 (UDP, TCP)
- Firewall Properties**: A section with a plus icon, containing:
 - Remote Access**: A text area explaining that by default, remote clients are prevented from accessing services on this host, and local clients are prevented from accessing services on remote hosts. It also states that to provide access, users should check the corresponding box, unless configured otherwise.
 - Required Services Table**: A table with columns for Label, Incoming Ports, Outgoing Ports, Protocols, and Daemon.

Label	Incoming Ports	Outgoing Ports	Protocols	Daemon
Required Services				
Secure Shell				
<input checked="" type="checkbox"/> SSH Server	22		TCP	Running
<input type="checkbox"/> SSH Client		22	TCP	N/A
Simple Network Management Protocol				
<input type="checkbox"/> SNMP Server	161	162	UDP	N/A
Ungrouped				
<input type="checkbox"/> Software iSCSI Client		3260	TCP	N/A
<input checked="" type="checkbox"/> VMware vCenter Agent		902	UDP	N/A
<input type="checkbox"/> NTP Client		123	UDP	Stopped

ESX/ESXi User Account Best Practices

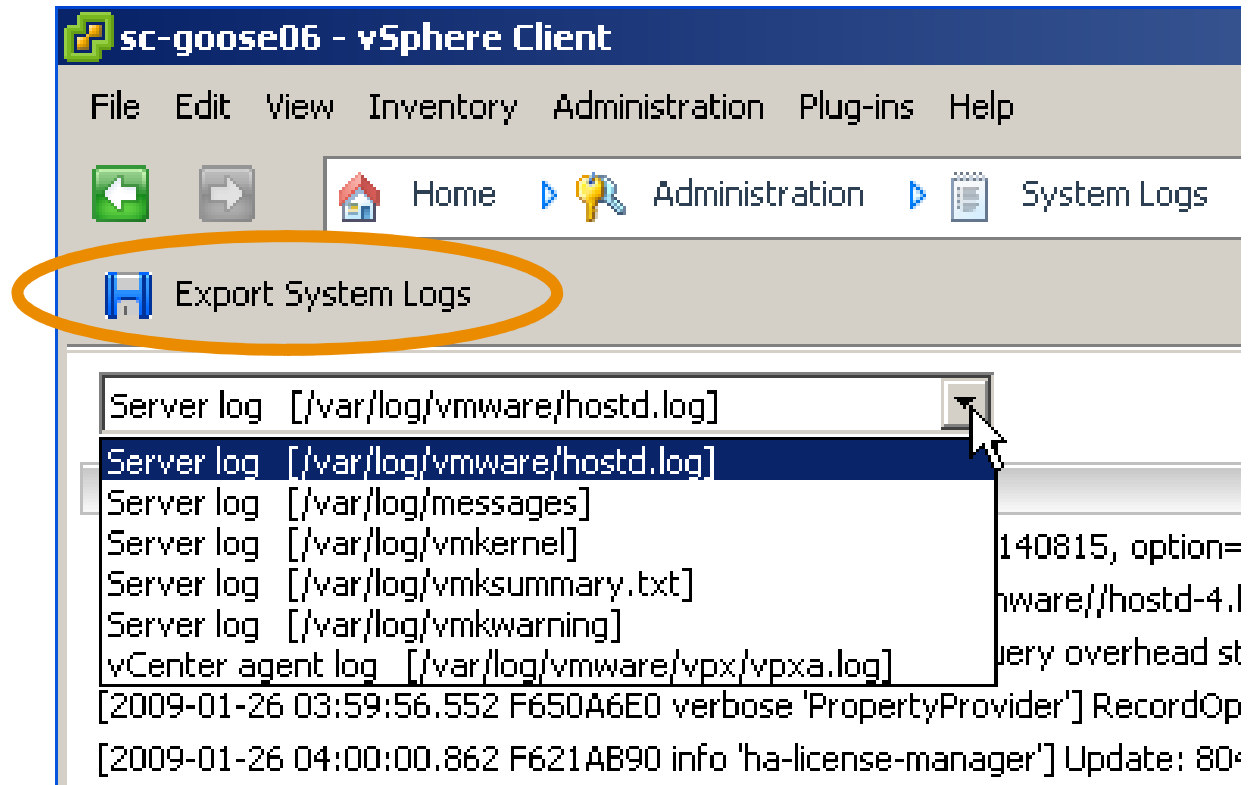
- Strictly control root privileges to the ESX/ESXi host.
- Use the vSphere Client to manage the ESX/ESXi host.
- Ideally, use vCenter Server – and thus vCenter Server user accounts – to manage hosts.

Viewing ESX/ESXi System Logs

View using the vSphere Client.

Export system logs to an archive file.

- Send in to VMware Support.



Lab 1 and eLearning Activity

In this lab, you will work to configure an ESX host.

1. Log in to the ESX host using the vSphere Client.
2. View information about your host's hardware.
3. View information about your virtual machine.
4. Configure the ESX host as an NTP client.
5. Add DNS server and default gateway information to an ESX host.
6. Export the host's system logs.

In this eLearning activity, you will view a self-paced demonstration on how to install and configure an ESXi host.

- Ask your instructor for access to the eLearning module.

Lesson Summary

- ESXi Installable and ESXi Embedded have a direct console user interface from which you can configure a few settings.
- Use the vSphere Client to configure most of an ESX/ESXi host's settings.
- Instead of accessing a host directly, whenever possible, manage and configure your ESX/ESXi hosts using vCenter Server.

Key Points

- There are two main versions of ESX available: ESX and ESXi (which includes ESXi Installable and ESXi Embedded).
- ESXi hosts have a direct console user interface to configure items like the host name, IP settings, and keyboard layout.
- The vSphere Client is used to configure ESX/ESXi hosts.