云计算与虚拟化技术

第4讲：VMware ESXi

阮晓龙

13938213680 / rxl@hactcm.edu.cn

http://cloud.xg.hactcm.edu.cn
http://www.51xueweb.cn

河南中医药大学信息管理与信息系统教研室
信息技术学院网络与信息系统科研工作室

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2

讨论提纲

- VMware ESXi Architecture
  - Understanding the ESXi Hypervisor
- Planning a VMware vSphere Deployment
- Deploying VMware ESXi
  - Installing VMware ESXi Interactively
  - Performing Post-installation Configuration
- Using the vSphere Host Client
  - vSphere Web Client
  - Configuring Time Synchronization
  - Configuring Name Resolution
  - Create a Virtual machine

3

1.VMware ESXi Architecture
1.1Understanding the ESXi Hypervisor

- ESXi, as a piece of software, is quite small in comparison to the average size of most software, weighing in at just a few hundred megabytes. The small footprint provides numerous advantages, such as reduced attack surface, less code to find bugs, shorter deployment times, and multiple deployment methods.
- While appearing small and simple from the outside, ESXi is actually a complex system with capabilities that have been refined over many years of vSphere releases.

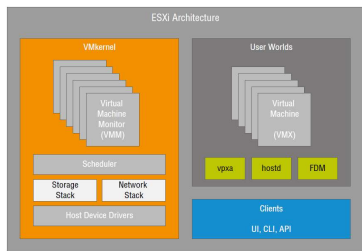**1.VMware ESXi Architecture**   1.2Examining the ESXi Components

- There are a number of major components that make up VMware's ESXi hypervisor. Let's start with the most important component of any operating system (OS): the kernel; or in this case, the VMkernel.This process is the heart of the ESXi OS and controls the majority of the other components.
- The VMkernel is responsible for resource management and scheduling, running virtual machines (VMs), and starting the processes needed for host management.

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1.VMware ESXi Architecture   1.2Examining the ESXi Components

FIGURE 2.1
The VMware ESXi architecture.

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1.VMware ESXi Architecture   1.2Examining the ESXi Components

- The Virtual Machine Monitor (VMM) is a process that runs inside the VMkernel. It virtualizes guest OS instructions and manages guest OS memory.
- The VMM sends storage and network requests to the VMkernel and passes all other requests to the VMX process. There is a VMM process for each virtual CPU in every virtual machine.

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1.VMware ESXi Architecture

1.2Examining the ESXi Components

- The resource scheduler also sits inside the VMkernel.
  - Its job is to take hardware resource requests from the VMM and VMX processes and schedule them on to the underlying physical system.
  - Considering that one ESXi physical server could have a large number of virtual machines running on it at any one time, the resource scheduler is a critical component.
  - It has direct access to the underlying physical hardware through the storage and network stacks to the host device drivers.

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1.VMware ESXi Architecture

1.2Examining the ESXi Components

- Just like the majority of operating systems, in ESXi, the User World space is for non-kernel processes to execute.
  - This allows non-privileged execution of tasks to help ensure the integrity of the OS.
  - Only kernel-related tasks can run in the kernel space.
  - ESXi has a number of processes that run in the User World; two of the most important are hostd and VMX.

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1.VMware ESXi Architecture

1.2Examining the ESXi Components

- Each VM that is running on an ESXi host has a single Virtual Machine Execution (VMX) helper process running in the User World space.
  - The VMX process controls the VM's keyboard, mouse, and screen (KMS); remote console; and some non-critical I/O operations like CD-ROM.
  - This process works in conjunction with the VMM processes to provide each VM's functionality to the administrator.

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1.VMware ESXi Architecture
1.2Examining the ESXi Components

- Finally, each ESXi host also has a single process running called hostd.
  - Hostd is a proxy service for the VMkernel.
  - All graphical and command-line interface (CLI) and application programming interface (API) calls are routed to the appropriate VMX or kernel process through hostd.
    - These might come from the vSphere Host client, a PowerCLI instruction, or vCenter Server itself.
 - All instructions reach the VMkernel through hostd.

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2.Planning a VMware vSphere Deployment

- To plan a vSphere deployment, you must answer a number of questions:
  - What types of servers will I use for the underlying physical hardware?
  - What kinds of storage will I use, and how will I connect that storage to my servers?
  - How will the networking be configured?

  - please note that this list is far from comprehensive

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2.Planning a VMwa

- What should you do：
  - Choosing a Server Platform
  - Determining a Storage Architecture
  - Integrating with the Network Infrastructure

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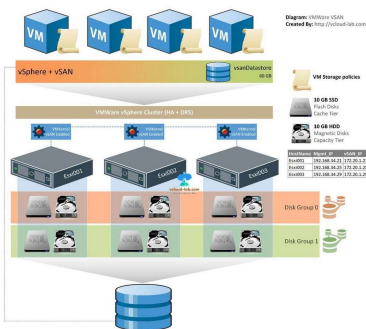
3. Deploying VMware ESXi

- After you've established the basics of your vSphere design, you must decide exactly how you will deploy ESXi.
- You have three options:
  - Interactive installation of ESXi
  - Unattended (scripted) installation of ESXi
  - Automated provisioning of ESXi

  - Of these, the simplest is an interactive installation of ESXi.
  - The most complex—but perhaps the most powerful, depending on your needs and your environment—is automated provisioning of ESXi.

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14

3. Deploying VMware ESXi   3.1Installing VMware ESXi Interactively

- VMware has done a great job of making the interactive installation of ESXi as simple and straightforward as possible. It takes just minutes to install.Perform the following steps to interactively install ESXi:
  - 1. Ensure that your server hardware is configured to boot from the CD-ROM/DVD drive.
  - 2. Ensure that VMware ESXi installation media is available to the server.
  - 3. Power on the server.
  - 4. Press Enter to boot the ESXi installer.
  - 5. At the End User License Agreement (EULA) screen, press F11 to accept the EULA and continue with the installation.

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15

3. Deploying VMware ESXi   3.1Installing VMware ESXi Interactively

- VMware has done a great job of making the interactive installation of ESXi as simple and straightforward as possible. It takes just minutes to install.Perform the following steps to interactively install ESXi:
  - 6. Next, the installer will display a list of available disks on which you can install or upgrade ESXi.
  - 7. To get more information about a device, highlight the device and press F1.
  - 8. Use the arrow keys to select the device on which you are going to install ESXi, and press Enter.
  - 9. If the selected device includes a VMFS datastore or an installation of ESXi, you'll be prompted to choose what action you want to take. Select the desired action and press Enter.
  - 10. Select the desired keyboard layout and press Enter.

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3. Deploying VMware ESXi

3.1Installing VMware ESXi Interactively

- VMware has done a great job of making the interactive installation of ESXi as simple and straightforward as possible. It takes just minutes to install.Perform the following steps to interactively install ESXi:

  - 11. Enter (and confirm) a password for the root account. Press Enter when you are ready to continue with the installation. Be sure to make note of this password—you'll need it later.

  - 12. At the final confirmation screen, press F11 to proceed with the installation of ESXi. After the installation process begins, it takes only a few minutes to install ESXi onto the selected storage device.

  - 13. Press Enter to reboot the host at the Installation Complete screen.

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- 在VMware WorkStation Pro上安装VMware ESXi 6.7
  - 规划网络
  - 创建虚拟主机
  - 安装VMware ESXi

- 在Sugon A620上通过IPMI安装VMware ESXi 6.7
  - 规划网络
  - 访问IPMI
  - 安装VMware ESXi

3. Deploying VMware ESXi
3.2Performing Post-installation Configuration

□ DCUI **FIGURE 2.8**
The ESXi home screen provides options for customizing the system and restarting or shutting down the server.

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3. Deploying VMware ESXi
3.2Performing Post-installation Configuration

□ Reconfiguring the Management Network

FIGURE 2.7
Network connectivity won't be established if the ESXi installer links the wrong NIC to the management network.

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3. Deploying VMware ESXi
3.2Performing Post-installation Configuration

□ Reconfiguring the Management Network
  ■ 1. Access the console of the ESXi host, either physically or via a remote console solution such as an IP-based KVM.
  ■ 2. On the ESXi home screen, press F2 for Customize System/View Logs.If a root password has been set, enter that root password.
  ■ 3. From the System Customization menu, select Configure Management Network and press Enter.
  ■ 4. From the Configure Management Network menu, select Network Adapters and press Enter.

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3. Deploying VMware ESXi
3.2 Performing Post-installation Configuration

- Reconfiguring the Management Network
    - 5. Use the spacebar to toggle which network adapter or adapters will be used for the system's management network. Press Enter when finished.
    - 6. Press Esc to exit the Configure Management Network menu. When prompted to apply changes and restart the management network, press Y. After the correct NIC has been assigned to the ESXi management network, the System Customization menu provides a Test Management Network option to verify network connectivity.
    - 7. Press Esc to log out of the System Customization menu and return to the ESXi home screen.

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4.VMware vSphere Host Client
4.1 Using the vSphere Host Client

- This might come as a bit of a shock for IT professionals who have grown accustomed to managing Microsoft Windows–based servers from the server's console (even via Remote Desktop), but ESXi wasn't designed for you to manage it from the server's console. Instead, you should use the vSphere Host Client.

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4.VMware vSphere Host Client
4.1 Using the vSphere Host Client

- In earlier versions, both stand-alone ESXi hosts and vCenter servers were administered with the C# Client, which is now known as the "legacy desktop client."
- vSphere 5.0 introduced the Web Client, but that was only for administering vCenter Server, not ESXi hosts directly.
- Things have come a long way since the move to web-based clients, and now each ESXi host has a built-in web-based UI called the vSphere Host Client.
- There is no client to install, and there's nothing to set up; it's running as soon as the host is online.

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4.VMware vSphere Host Client

□ Using the vSphere Host Client to administer an ESXi host requires authentication with a user account that exists on that specific host, whereas connecting to a vCenter Server installation relies on Single Sign-On users for authentication. Additionally, a number of significant features—such as initiating vMotion, for example—are available only when you're connecting to a vCenter Server installation.

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• 使用VMware vSphere Host Client管理：
  - Visit VMware vSphsere Host Client
  - Configuring Time Synchronization
  - Configuring Name Resolution

4.VMware vSphere Host Client

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使用VMware vSphere Host Client创建VM：
- 在ESXi上创建虚拟主机
- 为虚拟主机安装CentOS 7操作系统
- 配置CentOS 7操作系统能够提供服务
- 监控CentOS 7的运行