

VMware vSphere 5 Ultimate Bootcamp

Course Introduction

Course Introduction

6m

Chapter 01 - Course Introduction and Methodology

Learn IT! Do IT! Know IT!

Certified Virtualization Expert (CVE) Certification
VMTraining's Physical Setup
VMTraining's Setup Student to Datacenter
VMTraining's Network IP Setup
Chapter 01 Review

5m

Chapter 02 - Virtualization Overview

Why Virtualize?

Why Virtualize? - Cost Savings
VMware ROI TCO Calculator v2.0
Why Virtualize? - Simplified Management!
What is Virtual Infrastructure?
What is a Virtual Machine (VM)?
Type 1 and Type 2 Hypervisors
Cloud Computing
VMware vCloud
VMware Virtualization Products
VMware Go
VMware Server 2.0
VMware Infrastructure 3 (VI3)
vSphere 4 Features
vSphere 4.1 - Features Added
vSphere 4.1 Update 1 (2011/02/10) - New Features
vSphere 5 Host Features
vSphere 5 Network Features
vSphere 5 Storage Features
vSphere 5 vCenter Features
vSphere 5 VM HW Ver. 8
vSphere 5 Misc Features
VMware vCenter Server
VMware vCenter Orchestrator
VMware View 4.6 (Virtual Desktop Infrastructure)
VMware Workstation 8
VMware ACE 2.7
VMware Fusion 4.0.1
VMware Player 3.1.4
Windows/Microsoft Virtual PC 2007
Microsoft Virtual Server 2005 R2 SP1
Windows Server Virtualization Hyper-V R2 SP1 (Windows Server 2008 R2)
System Center Virtual Machine Manager 2008 R2 SP1
SCVMM 2008 R2
XenServer Enterprise v5.6 SP2
XenDesktop & Essentials for XenServer
Virtualization Platforms
Chapter 02 Review

1h 2m

Chapter 03 - Planning and Installing ESXi

1h 24m

Topic 1: Planning the ESXi Deployment

Physical Hardware Requirements
vSphere Hypervisor 5 (VMware ESXi)
VMware ESXi 5
Booting ESXi from a SAN LUN (Fibre Channel or iSCSI)
Booting ESXi from a SAN LUN
Linux, Windows & ESX/ESXi

Topic 2: vSphere 5 Deployment Guidelines

Overview of Deployment Planning
ESXi Compatibility Guides
Determining ESX/ESXi Physical Host Size
VMware Capacity Planner
Storage: Capacity and Performance
Memory Overcommitment

Topic 3: vSphere Hypervisor (ESXi) Installation

vSphere Hypervisor 5 Installable
Demo: Installation of ESXi 5
Local Configuration of ESXi 5 using DCUI
Demo - Install ESXi 5
UDA 2.0 Script ESXi/ESX Installation
Demo - ESXi Host Install
vSphere 5 ESXi Image Builder CLI
vSphere 5 Auto Deploy for ESXi Installation
vSphere 5 Auto Deploy Process
vSphere 5 Auto Deploy Architecture

Topic 4: Configuring Hostname Resolution and NTP

Hostname Resolution in ESXi
Configuring DNS Settings
Time Synchronization
Demo - ESXi NTP Information

Topic 5: Troubleshooting ESXi

esx.conf Settings
ESXi/ESX Server Health Check
ESXi Host Boot Process
Resetting root Password ESXi 5
Troubleshooting ESXi CIM Management Agents
Troubleshooting: vmware-hostd
Purple Screen Of Death (PSOD)
Chapter 03 Review

Chapter 04 - Using Tools to Administer a VMware Environment

50m

Topic 1: Overview of 3rd Party Tools

Veeam (veeam.com)
Veeam nworks 5.6
Veeam - FastSCP 3.0.3 (free)
WinSCP 5.0.2 (free)
Datastore Browser (included ESXi 5)
ISO Programs
Novell - PlateSpin Migrate
Novell - PlateSpin Orchestrate
Quest Software (formerly Vizioncore)
PowerGUI (Quest, free)
PHD Virtual (phdvirtual.com)
VKERNEL (vkernel.com)

Topic 2: ESXi Management

ESXi Host & vCenter Server Management Overview
Direct Console User Interface (DCUI)
Managing ESXi with the vSphere Client (VIC)
Demo - vSphere Client
The Management User Interface (MUI) (ESX/ESXi/vCenter)
Managing with the vSphere Web Client
SSH Access: PuTTY, SecureCRT, FastSCP, etc.
Demo - PuTTY Session
Troubleshooting Options: ESXi 5
Configuration of Troubleshooting Options in ESXi 5
vSphere Hypervisor (ESXi) Only Features
CLI Commands Overview
vSphere Command Line Interface (vCLI)
vCLI Commands
Managing ESX/ESXi with the vSphere CLI (vCLI)
vCLI Command Syntax
vSphere SDK for Perl
vSphere Management Assistant (vMA 5.0)
PowerCLI 5.0
Topic 3: Linux Command Review
Windows Commands vs. Linux Commands
Common Command Line Interface (CLI) Options
ESXi 5 Text Editor
Demo - VI Editor
VMkernel System Information Viewing
Topic 4: Troubleshooting the vSphere Client (VIC)
vSphere Client Logs
Cannot Login Using vSphere Client
Chapter 04 Review

Chapter 05 - vCenter Server 5 and Licensing

1h 39m

Topic 1: Licensing

vCenter Server 5 and ESXi/ESX Host Licensing Model
Manage vSphere Licenses
vSphere Essentials 5 for Small Business (per 1 Socket)
vSphere 5 License Types and Pricing (per 1 Socket with vRAM Entitlements)
Calculate vSphere 5 Licensing
Windows Licensing Calculator
Microsoft Server Virtualization Validation Program
Novell SUSE Linux Enterprise Server 11 SP1 - Free

Topic 2: vCenter Server Installation

vCenter Server 5 Summary
Managing Multiple Enterprise Locations
vCenter Server 5 Specifications
vCenter Server Database Overview
vCenter Server Virtual Appliance (vCSA) Specifications
Demo - vCenter Appliance
vCenter Server 5 Architecture
vCenter Server 5 and Host Functionality
Order of vCenter Installation

Topic 3: vCenter Server Inventory

vCenter Server Home Page
Hosts and Clusters: Datacenters
Hosts and Clusters: Folders and Clusters
VMs and Templates: Subfolders
vCenter Inventory: VMs Tab

Datstores and Datastore Clusters: Folders and Datstores

Networks: Portgroups & Distributed Switches (vDS)

Topic 4: Managing vCenter Server

Scheduled Tasks

Events

Sessions

System Logs

vCenter Solutions Manager

Client Settings

vCenter Mobile Access (vCMA)

Topic 5: Planning vCenter Server Deployment

vCenter Server 5 Database Sizing

Backup Strategy for vCenter Server

vCenter Server Heartbeat 6.4

Topic 6: Troubleshooting vCenter Server and Database

Refreshing vCenter Server

ESXi Host Agent (hostd) hangs

Demo - vCenter Statistics

vCenter Server Log Files

SQL Recovery Models

vCenter Server Service (vpxd) Errors

vCenter Server Standalone Mode

Reinitializing the vCenter Server Database

vSphere Client Session Errors

Chapter 05 Review

Chapter 06 - Configuring Networking

1h 48m

Topic 1: Creating & Modifying Virtual Networks

Networking Terms

vSphere 5 Virtual Switch Types

Network Connections in ESXi

Add Network Wizard

Standard Virtual Switches – ESXi

Standard Virtual Switches – ESX

Virtual Switch and Connection Type Identification

VMware Assigned MAC Addresses

Virtual Switch Physical NIC Configurations

Ports Used by VMkernel

NIC Teaming

Cisco Discovery Protocol

Modifying vSwitch Properties (Ports Tab)

Modifying vSwitch Properties (Network Adapters Tab)

VLAN Overview

Standard vSwitch VLAN Configuration

VLAN Planning

Standard vSwitch Protection and VLANs

Standard vSwitch and Port Group Policy Exceptions: Security

Standard vSwitch and Port Group Policy Exceptions: Traffic Shaping

Standard vSwitch and Port Group Policy Exceptions: NIC Teaming

Network Failure and NIC Teaming Options

Load Balancing Method: Route Based on the Originating Virtual Port ID (Default)

Load Balancing Method: Route Based on IP Hash (Source + Destination)

Load Balancing Method: Route Based on Source MAC Hash

Port Group: Override vSwitch Failover Order

Multiple Policies Applied to a Single Team

Physical Switch Configuration

Demo - Network Configuration

Topic 2: vSphere Distributed Virtual Switches

vSphere Distributed vSwitch (vDS) Overview

vSphere Distributed Switch (vDS) New Features in vSphere 5.0

Creating a vSphere Distributed Switch

Edit dvSwitch Settings

Edit dvSwitch Uplink Policy Settings

Edit dvSwitch Port Group Settings

Port Binding Methods

Private VLANs

Private VLAN (PVLAN) Tagging

Migrating Service Console Port or VMkernel Port to vDS

Network I/O Control (NIOC)

Network I/O Control (NIOC) Best Practices

Create NetFlow

Using Port Mirroring

Demo - Virtual Distributed Switch

Cisco Nexus 1000v Virtual Switch

Nexus 1000v Architecture

Networking Review

Topic 3: Creating & Modifying Virtual Networks Using CLI

Networking CLI Commands

Physical NIC Commands

Configure Physical NICs

Virtual Switch Commands

Configure Virtual Switches

VMkernel Port Commands

Configure the VMkernel Port

Service Console (vswif) Commands

Additional Service Console (vswif) Commands

Adding a Second Service Console

Chapter 06 Review

Chapter 07 - Configuring Storage

2h 16m

Topic 1: Storage Concepts

Storage Terms

SAN vs NAS in vSphere

Device and Path Naming

vSphere's Family of Storage APIs

Multipathing

Storage APIs - Multipathing

Path Selection Considerations

Viewing Multipathing

Storage I/O Control (SIOC)

Storage APIs - Array Integration

Multipathing Commands

Multipathing Commands (vCLI)

Multipathing Command Examples

Topic 2: iSCSI Storage (GUI & Command Line)

Internet Small Computers Systems Interface (iSCSI) Overview

iSCSI Terms for ESX/ESXi

ESX/ESXi and iSCSI SAN Environment and Addressing

Hardware vs. Software Initiators

Multipathing with iSCSI

Setup Steps - Multipathing with Software iSCSI

iSCSI Software Initiator Networking

Configuring iSCSI
Configure Software Initiator
Bind VMkernel ports to Storage Adapter (GUI)
Bind VMkernel ports to Storage Adapter (CLI)
Discovering iSCSI Targets
Demo - v5 Storage Setup
Jumbo Frames
Configure Software Initiator: CHAP Authentication
iSCSI Session Options (CLI)
iSCSI Software Initiator Troubleshooting
iSCSI Vendors and Products

Topic 3: Fibre Channel Storage

What is Fibre Channel?
Fibre Channel Terms for ESXi
ESX/ESXi and Fibre Channel SAN Environment and Addressing
Scanning Fibre Channel LUNs
Multipathing with Fibre Channel
Fibre Channel Vendors and Products
Network/Storage Architecture Review

Topic 4: VMFS Datastores (GUI & Command Line)

Virtual Machine File System (VMFS-3)
Virtual Machine File System (VMFS-5)
Viewing and Creating a VMFS-3 Datastore
Upgrade VMFS-3 to VMFS-5
Viewing and Creating a VMFS-5 Datastore
Demo - Creating a VMFS-3 Datastore
Demo - Creating a VMFS-5 Datastore
Expanding Your VMFS Datastore Using Extents
Add an Extent to Existing VMFS
Expand an ESX/ESXi 4.1/5 VMFS Volume
Partition Alignment
Disk Defragmentation
VMFS Operations - vmkfstools
Displaying Disk Usage Detail (ESX vdf -h ESXi df -h)

Topic 5: NAS Storage and NFS Datastores (GUI & Command Line)

Network Attached Storage (NAS) and ESX/ESXi
NFS Components, Addressing and Access Control with NFS on Linux
NFS Target on Windows 2003 R2
Mount an NFS Datastore to Host
Demo - NFS Creating
NFS Configuration Options (CLI)
Storage APIs - Array Integration NFS

Topic 6: Raw Device Mapping (RDM)

Raw Device Mapping (RDM)
Raw Device Mapping Benefits
RDM Compatibility Modes
RDM CLI Commands
Solid State Disks (SSD)
Chapter 07 Review

Chapter 08 - VM Creation, Configuration, and Snapshots

2h 40m

Topic 1: Create a VM

VM Virtual Hardware
Types of Virtual NICs (vNIC)
Virtual Machine Files
Virtual Disk

Virtual SCSI Controller Type
VMDirectPath
Virtual Machine Access to Storage
Install Guest OS into VM
VM Console & Menus
VMware Tools
VMware Tools Configurable Features
Demo - Creating a VM

Topic 2: Create Multiple VMs, Templates, & Clones

Clones & Templates
Deploy VM from Template
Customizing the OS in a Virtual Machine
Customization Specification Manager
Deploying Across Datacenters
Demo - Template Provisioning

Topic 3: Virtual Appliances

Virtual Appliances
Import Virtual Appliances
Export VM to OVF Format

Topic 4: VMware Converter (P2V – V2V)

VMware Converter 5
VMware Converter Sources
VMware vCenter Converter 5
Pre Conversion Tasks
Hot Cloning - 4 Step Process
Post Conversion Steps
VMware vCenter Converter 5 Standalone
Troubleshooting VMware Converter

Topic 5: Manage VMs

Hot and Cold VM Migrations
Hot Add Memory and CPUs
VM Properties - Hardware Tab
VM Properties - Options Tab
Demo - New VM Features in vSphere 5
Resize a Virtual Disk
Extend VMDK
Extend Partitions Using gparted
Renaming a Virtual Machine
vmware-cmd.pl (vCLI)
Kill a VM with esxcli

Topic 6: Virtual Machine Startup/Shutdown

Startup/Shutdown of VMs
Enabling VM Startup/Shutdown
VM Startup/Shutdown Override
Demo - VM Startup/Shutdown

Topic 7: Virtual Machine Snapshots

Virtual Machine Snapshots
Files Used by Snapshots
Taking Snapshots
Snapshot Manager
Reverting to a Snapshot
Deleting Snapshots
Demo - Snapshots

Topic 8: vSphere Web Client

vSphere Web Client
vSphere Web Client - Requirements

Log in to Web Access

Demo - v5 Web Client

Topic 9: Virtual Machine Troubleshooting & Best Practices

Troubleshooting VM Problems

Differences Between VMs and Physical Servers (Best Practices)

Chapter 08 Review

Chapter 09 - Security and Permissions

1h 10m

Topic 1: Controlling User Access and Passwords

Types of Users

vCenter/ESXi/ESX Host Security Model

Permissions

Roles

Privileges Explained

ESXi Host Permissions

vCenter Permissions

Multiple Group Permissions: No Conflicts - Groups Only

Multiple Group Permissions: No Conflicts - Users and Groups

Multiple Group Permissions: Conflicting Permissions

Multiple Group Permissions: User Overrides and Unions

Multiple User Permissions: Explicit vs. Inherited

Multiple User Permissions: Explicit vs. Inherited #2

Demo - vSphere Client Permissions

Topic 2: ESXi/ESX Active Directory (AD) Integration

UNIX Authentication Model

UNIX Authentication Flow

AD-ESX/ESXi 4.1/5 Authentication Services

Assign ESX/ESXi 4.1/5 Permissions Directly to AD Users

Demo - Active Directory Integration

Topic 3: Managing Firewalls

TCP & UDP Ports

Certificates and Data Encryption

ESXi 5.0 Firewall

ESXi Firewall Configuration via vSphere Client

ESXi Host Firewall Commands

Demo - Firewall

Topic 4: SSH Access

Secure Shell (SSH)

Controlling SSH Access

SSH/Console Banner Message

Monitoring ESXi Access

Topic 5: The root Account

root Logon

Using substitute user(su) with root

For More Security Information

Topic 6: VMsafe and vShield

VMsafe Overview

Current VMsafe Partners

vShield Product Family Overview

Chapter 09 Review

Chapter 10 - Server and VM Monitoring

1h 24m

Topic 1: Optimizing Resources

Transparent Memory Page Sharing

Balloon-Driver: vmmemctl

VMkernel Swap - Defined

VM Swap Files
VMkernel Swap vm-name.vswp
Memory Compression
Virtual CPUs (vCPUs)
VMkernel CPU Load Balancing
VMs' CPU & Memory Resource Setting Terms
CPU Resource Settings
Demo - Hardware Status
Memory Resource Settings
Memory Overhead
ESXi 5 Resource Allocation per VM
Resource Shares
Monitoring - Hardware Status

Topic 2: Performance Monitoring

Performance Monitoring
Customize Performance Chart
Troubleshooting Performance
Problem: High CPU Utilization
Problem: High Memory Utilization
Problem: High Disk Utilization
Problem: High Network Utilization
Veeam Monitor
Veeam Monitor Demo
Quest Software vFoglight
Demo - Veeam Monitor
VKERNEL CapacityVIEW

Topic 3: Configuring Alarms

vCenter Alarms
Alarm Settings
Default Alarms in vCenter
Configure vCenter Notifications

Topic 4: ESXi and vCenter Logs

ESXi 5 Log Files from DCUI
Using esxtop
Demo - esxtop
Performance Snapshots from CLI
ESXi 5 Log file locations
ESXi 5 Log Files
Collecting vCenter Log Files
Collecting Diagnostics Data
Configuring Syslog on ESXi
Sending Logs to a Syslog Server
Chapter 10 Review

Chapter 11 - Advanced ESXi and vCenter Server Management

2h 28m

Topic 1: Storage Views & Topology Maps

vCenter Storage Views
Storage Views - Reports
Storage Views - Maps
vCenter Topology Maps
Host Map View

Topic 2: Storage vMotion

Storage vMotion Migration
Requirements for Storage vMotion
Storage vMotion in vSphere 5
Storage vMotion - Command-Line Interface

(vCLI) Non-interactive Mode: SvMotion Examples

Demo - Storage vMotion

Topic 3: Configuring vMotion

vMotion Migration

How vMotion Works

Demo - vMotion

vMotion: ESX/ESXi Host Requirements

Identifying CPU Characteristics

Enable or Disable Nx/xD

vMotion Errors and Warnings

VM Map View

Advanced vMotion Errors

Topic 4: Distributed Resource Scheduler (DRS) Cluster

Distributed Resource Scheduler (DRS) Overview

DRS Cluster in the vCenter Inventory

vCenter Cluster

Demo - Creating a Cluster

Configure Automation Level

Initial Placement

Dynamic Balancing/History

Demo - DRS Usage

Virtual Machine Rules

Virtual Machine to Host Rules

Virtual Machine Options

Distributed Power Management (DPM)

Enhanced vMotion Compatibility (EVC)

VM Swapfile Location

Topic 5: Datastore Clusters & Storage DRS (SDRS)

vSphere Storage API for Storage Awareness (VASA)

Profile-Driven Storage

Storage Capabilities

VM Storage Profiles

Apply Storage Profiles to VMs

Expert Tip: Known Port Conflict

Datastore Clusters

Create a Datastore Cluster

Storage DRS (SDRS) Overview

Datastore Cluster Information

Demo - Storage DRS

Topic 6: Resource Pools and Monitoring

Resource Pools

Expandable Reservations

Resource Pool Example Summary

Resource Pool Example: CPU Limits

Troubleshooting Memory Resources

Retaining Host Resource Pools

Best Practices for VM Resources

Monitoring the DRS Cluster - Resource Allocation

Monitoring the DRS Cluster - DRS Resource Distribution Graph

Monitor Cluster Usage

Topic 7: Host Profiles

Host Profiles Overview

Create Host Profile

Edit Host Profile

Attach Host Profile

Check Compliance with Host Profile

Per Host Answer Files
Apply Host Profile
Export a Host Profile
Demo - Host Profiles in vSphere 4.x
Demo - Host Profiles in vSphere 5

Topic 8: Linked Mode Group of vCenter Servers

Linked vCenter Servers Overview
Linked Mode Group Prerequisites
Create a Linked Mode Group
Manage Multiple vCenters

Topic 9: vSphere Storage Appliance (VSA)

vSphere Storage Appliance (VSA) - Overview
vSphere Storage Appliance (VSA) - Components
vSphere Storage Appliance (VSA) - Architecture
Chapter 11 Review

Chapter 12 - Patching and Upgrading ESXi

39m

Topic 1: Patching ESXi Standalone Hosts

Planned Downtime: Maintenance Mode
Patch Installation: vihostupdate.pl

Topic 2: Patching with Update Manager

Update Manager 5 Overview
Update Manager Terms
Update Manager vSphere Client Plugin
Update Manager Baselines
Update Manager Remediation Defaults and Configuration Options
Update Manager Events
Update Manager Notifications
Patch Repository
Update Manager Download Service
Update Manager Sizing Estimator
Update Manager Tab
Remediation

Topic 3: Upgrades and Migrations

Upgrade Methodology
Upgrade VirtualCenter/vCenter to a New Version
Upgrade vCenter 4.1 to 5.0
ESX/ESXi Migration to New Hardware 3.x to Any Version
Upgrade Distributed Switch to 5.0
ESXi 4.x/5.0 Migration to New Hardware - Enterprise Plus
ESX/ESXi Upgrade using Update Manager
Upgrade the Virtual Machines
Use the vSphere Client to Upgrade the VMware Tools
Use vSphere Client to Upgrade Virtual Machine Hardware
Use Update Manager to Upgrade Virtual Machines
Chapter 12 Review

Chapter 13 - Disaster Recovery and Backup

1h 26m

Topic 1: Site Recovery Manager (SRM)

VMware Site Recovery Manager (SRM) V5.0
VMware Site Recovery Manager (SRM) V5.0 - New Features
SRM Architecture Overview
SRM - Site Recovery Infrastructure
SRM - Create Recovery Plans
SRM - Test Recovery Plans
SRM - Automate Failover

Topic 2: High Availability (HA)

VMware High Availability
New vSphere 5 HA Features
vSphere 5 HA in Action
Demo - v5 High Availability
Configure HA Cluster
VMware HA: Virtual Machine Options
Host Isolation
Guidelines for Isolation Response Setting
HA VM Monitoring
HA Datastore Heartbeating
Viewing Your HA Cluster
Troubleshooting VMware HA

Topic 3: VM Fault Tolerance

Fault Tolerance Overview
Fault Tolerance Requirements
Configure VMkernel NIC
Turn on Host Certificate Checking
Turn on Fault Tolerance

Topic 4: Microsoft Clustering

Virtualizing Microsoft Clusters
Microsoft Cluster Services
Microsoft Cluster Services Requirements

Topic 5: Backup Strategies

Backup Strategies for VMs

Topic 6: VMware Data Recovery

Data Recovery 2.0 Overview
Demo - Data Recovery Setup
Data Recovery Installation & Features
Configure Network Settings
Configure VMs to Backup
Configure Data Recovery Appliance and Setup Backup Job
Demo - Data Recovery

Topic 7: Third Party Backups

PHD Virtual Backup and Recovery 5.3 for VMware
PHD Virtual Backup v5.1 - vCenter Plugin
Quest vRanger 5.2 (formerly Vizioncore)
vRanger Pro - Screenshots
Veeam Backup & Replication v5.0.2 with vPower
Veeam Backup - Screenshot
Chapter 13 Review
Course Closure

Total Duration: 18hrs 57m