

VMware vSphere 6.5 Administration Basics Ultimate Bootcamp

Course Overview

This course covers everything you need to know about the VMware vSphere 6.5 Administration Basics Ultimate Bootcamp. Students will learn about virtualization, planning and installing ESXi, using tools to administer a VMware environment, vCenter Server 6.5 and licensing, configuring networking, configuring storage, VM creation, configuration, snapshots, security and permissions, server and VM monitoring, advanced ESXi and vCenter server management, patching and upgrading ESXi, and disaster recovery and backup.

Chapter 01 - Getting Started with PowerPoint

4m

Course Introduction
Learn IT! Do IT! Know IT!
Certified Virtualization Expert (CVE) Certification

Chapter 02 - Virtualization Overview

26m

Topic 1: VMware Virtualization
The Software-Defined Datacenter (SDDC)
vCloud Suite 7.0
Class Exercise - Why Virtualize?
Why Virtualize? - Simplified Management!
VMware TCO Comparison Calculator
What is Virtual Infrastructure?
VMware vSphere 6.x
Type 1 and Type 2 Hypervisors
Hypervisors Comparison
What is a Virtual Machine (VM)?
Topic 2: Other VMware & 3rd Party Virtualization Technologies
VMware Horizon View 7.x (Virtual Desktop Infrastructure)
VMware Horizon FLEX
VMware Workstation Pro 12.5
VMware Fusion 8.5
VMware Workstation Player
Windows Server Virtualization Hyper-V (Windows Server 2012 R2)
System Center Virtual Machine Manager 2012 R2
XenServer Enterprise v7.x
XenDesktop & Essentials for XenServer
Topic 3: What's New vSphere 6.5 Overview
What's New in vSphere 6.5
Chapter 02 Review

Chapter 03 - Planning and Installing ESXi

41m

Topic 1: Planning the ESXi Deployment
Physical Hardware Requirements
vSphere Hypervisor 6.5 (VMware ESXi)
VMware ESXi 6.5
Booting ESXi from a SAN LUN (Fibre Channel or iSCSI)
Booting ESXi from a SAN LUN
Linux, Windows & ESXi
Topic 2: vSphere 6.x Deployment Guidelines
Overview of Deployment Planning
ESXi Compatibility Guides
Storage: Capacity and Performance
VMware Capacity Planner
Topic 3: vSphere Hypervisor (ESXi) Installation
vSphere Hypervisor 6.x Installable
ESXi Installation Options
VMware Software Manager
Demo: Installation of ESXi 6.5
Local Configuration of ESXi 6.0 using DCUI
vSphere 6.x ESXi Image Builder CLI
vSphere 5.x/6.x Auto Deploy Architecture
vSphere 6.x Auto Deploy for ESXi PXE Boot
Auto Deploy/ESXi Image Builder in vSphere 6.5
Auto Deploy/ESXi Image Builder in vSphere 6.5 - Demo
Topic 4: Configuring Hostname Resolution and NTP
Configuring DNS Settings
Time Synchronization
Topic 5: Troubleshooting ESXi
ESXi Host Health Check
ESXi System Logs
ESXi Host Boot Process
Resetting root Password ESXi 6.x
Troubleshooting: hostd
Troubleshooting ESXi Management Agents
Purple Screen of Death (PSOD)
Chapter 03 Review

Chapter 04 - Using Tools to Administer a VMware Environment

28m

Topic 1: Overview of 3rd Party Tools
WinSCP 5.x.x (Free)
ISO Programs
RVTools v 3.x
Other Tools
Topic 2: ESXi Management
ESXi Host & vCenter Server Management Overview
Direct Console User Interface (DCUI)
Managing ESXi with the vSphere Client (VIC)
VMware Host Client
The Management User Interface (MUI) (ESXi or vCenter)
Managing with the vSphere Web Client

NEW vSphere Client 6.5 (HTML5)
SSH Access: PuTTY, SecureCRT, WinSCP, etc.
Datastore Browser
Configuration of Troubleshooting Options in ESXi 6.x
Troubleshooting Options: ESXi 6.x
CLI Commands Overview
PowerCLI 6.5 Release 1
Topic 3: Linux Command Review
Windows Commands vs. Linux Commands
Common Command Line Interface (CLI) Options
Working at the Command Line (CLI)
ESXi 6.x Text Editor
Topic 4: Troubleshooting Host/VC Connections
Cannot Login Using any Client
Chapter 04 Review

Chapter 05 - vCenter Server 6.5 and Licensing

1h 16m

Topic 1: Licensing
vCenter Server 6.x & ESXi Host Licensing Model
vSphere Essentials 6.5 for Small Business
vSphere 6.5 License Types and Pricing
vSphere with Operations Management Enterprise Plus (vSOM)
Upgrade Enterprise to Enterprise Plus Promotion - 50% off
Topic 2: Planning vCenter Server Deployment
vCenter Server 6.5 Summary
Windows vCenter Server 6.5 Specs
Windows vCenter Database Specs
vCenter Server Virtual Appliance (vCSA) 6.0 Specifications
vCenter Server Virtual Appliance (vCSA) 6.5 Specifications
Comparing Windows vCenter 6.0 to vCSA 6.0/vCSA 6.5
vCenter Server 6.0/6.5 Host Functionality
vCenter Server 6.0/6.5 Managing Multiple Locations
vCenter Server 6.0/6.5 Connection through SSO
VC Server 6.x Architecture
Components of vCenter 6.x - Platform Services Controller (PSC)
Components of vCenter 6.x - vCenter Server
Topologies for vCenter 6.x
HA Topologies for vCenter 6.5
vCenter Server APIs
vCenter Server 6.x Database Sizing
Backup Strategy for vCenter Server
Native vCenter Server Backup
Native vCenter Server Restore
vCenter Server HA
Topic 3: vCenter Server Installation
vCenter 6.0/6.5 Installation (Windows or VCSA)
Windows vCenter 6.5 Installation
vCenter Server Appliance 6.5 for Embedded PSC (Linux Photon)
vCenter Server 6.0/6.5 Post Install
Topic 4: vSphere Web Client & vSphere Client

vSphere Web Client
Client Integration Plugin (CIP)
vSphere Web Client 6.5
vSphere Web Client - Requirements
vSphere Client (HTML5)
Using vSphere Web Client 6.5
Summary of Clients in vSphere 6.5
Topic 5: vCenter Server Inventory
vCenter Server Home Page
Hosts and Clusters: Datacenters
Hosts and Clusters: Folders and Clusters (Default View)
VMs and Templates: Subfolders
vCenter Inventory: VMs/Templates Additional Information
Storage: Folders and Datastores
Networking: Portgroups & Distributed Switches (vDS)
Content Library Basics
What's New in Content Library 6.5
Content Library Creation in 6.5
Topic 6: Managing vCenter Server
Scheduled Tasks
Events
Sessions
Tasks/Alarms/Work in Progress & Logged On As
New Recent Objects Pane
Flings at VMware Labs
Topic 7: Troubleshooting vCenter Server and Database
Refreshing vCenter Server & ESXi
Monitoring - Hardware Status
Monitoring - vCenter Server Status
VCSA root Account Timeout
Chapter 05 Review

Chapter 06 - Configuring Networking

1h 27m

Topic 1: Creating & Modifying Virtual Networks
Networking Terms
vSphere 6.x Virtual Switch Types
Network Connections in ESXi
Add/Edit Networking
Standard Virtual Switches (vSS)
More Lanes on the Highway
Virtual Switch & Connection Type Identification
VMware Assigned MAC Addresses
Custom MAC Address
Virtual Switch Physical NIC Configurations
NIC Teaming
Cisco Discovery Protocol on vSS
Modifying vSS Properties (Ports Tab in VIC)
Ports
Modifying vSwitch Properties (Network Adapters Tab)
VLAN Overview

VLAN Implementations
Standard vSwitch VLAN Configuration
Standard vSwitch Protection and VLANs
Standard vSwitch & Port Group Policy Settings: 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 Source MAC Hash
Load Balancing Method: Route Based on IP Hash (Source + Destination)
Requirements for IP Hash
Port Group: Override vSwitch Failover Order
Multiple Policies Applied to a Single Team
vSphere Packet Routing
Overriding Default Gateway of a Vmkernel Adapter
Network Performance Improvements
Physical Switch Configuration
Topic 2: vSphere Distributed Switches
vSphere Distributed vSwitch (vDS) Overview
vSphere Distributed Switch (vDS) New Features in vSphere 5.0
vSphere Distributed Switch (vDS) New Features in vSphere 5.1
vSphere Distributed Switch (vDS) New Features in vSphere 5.5
vSphere Distributed Switch (vDS) New Features in vSphere 6.0
vSphere Distributed Switch (vDS) New Features in vSphere 6.5
Creating a vSphere Distributed Switch
Edit vDS Settings
Edit vDS Uplink Settings
Edit vDS Port Group Settings
Port Binding Methods
Private VLAN (PVLAN) Tagging
Private VLANs
Migrating VMkernel Port to vDS
Network I/O Control (NIOC)
Network I/O Control (NIOC) - Best Practices
Create NetFlow
Using Port Mirroring
vDS Health Check
vDS Backup & Restore
Traffic Filtering and Marking
Per VM NIOC 3 Settings
Support for ERSPAN
Configuring ERSPAN
Networking Review
Chapter 06 Review

Chapter 07 - Configuring Storage

1h 30m

Topic 0: New Storage Features in vSphere 6.5
Storage Related Enhancements (1)
Storage Related Enhancements (2)
Topic 1: Storage Concepts

Storage Terms
SAN vs NAS in vSphere
Device and Path Naming
vSphere's Family of Storage APIs
Storage API - Array Integration
Storage API - Storage Awareness (VASA)
Comparison of Storage Provider Versions (VASA)
Multipathing
Storage API - Multipathing (PSA)
Path Selection Considerations
Viewing Multipathing from VIC
Viewing Multipathing - Web Client
Example of 3rd Party Multipathing Plugin Installation (NMP)
All Paths Down (APD)
Storage API - I/O Filtering
Storage API - I/O Filtering Info
Storage I/O Control (SIOC)
SIOC setup in Web Client
SIOC Enhancements
Configuring SIOC v2 Policy
SIOC Monitoring
Scanning LUNs - iSCSI/Fibre Channel
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
Jumbo Frames
Configure Software Initiator: CHAP Authentication
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
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-5)
Virtual Machine File System (Updates in 5.5/6.x)
About VMFS6
New Block Sizes for Small Files and Large Files
File Block Usage Example
vSphere Storage APIs - Array Integration & Automatic UNMAP
VMFS6 vs VMFS5

Upgrade VMFS-3 to VMFS-5
Upgrading VMFS5
Viewing and Creating a VMFS-5 Datastore
Extending your VMFS Datastore using Extents
Add an Extent to Existing VMFS
Expand an ESXi 6.x VMFS Volume
Hidden System Files on a VMFS
Topic 5: NAS Storage and NFS Datastores (GUI & Command Line)
Network Attached Storage (NAS)
NFS v4.1
NFS 4.1 Improvements in 6.5
NFS Components, Addressing and Access Control with NFS on Linux
NFS target on Windows 2003 R2 & higher
Mount an NFS Datastore to Host
Topic 6: Raw Device Mapping (RDM)
Raw Device Mapping (RDM)
RDM Compatibility Modes
Raw Device Mapping
Topic 7: Solid State Disks (SSD)
Solid State Disks (SSD)
Using SMART with SSD
When ESXi fails to identify SSDs
vSphere Virtual Flash
Configure a Virtual Flash Resource
Configure Virtual Flash Host Swap
Virtual Flash Read Cache
Topic 8: Storage & Management Solutions
vFoglight for Storage - Quest
vOptimizer Pro (vOPS Storage Optimizer) - Quest Software
Topic 9: VMware Virtual SAN (VSAN)
VSAN Overview
VSAN Device Configuration
VSAN Cluster Configuration
VSAN Architecture
VSAN 6.0 - What's new
VSAN Version 6.2
VSAN Version 6.5
VSAN Version 6.6
Topic 10: vSphere Virtual Volumes (VVols)
vSphere Virtual Volumes (Vvols) - Concepts
vSphere Virtual Volumes (Vvols) - Architecture
vSphere Virtual Volumes (Vvols) - Characteristics
vSphere Virtual Volumes (Vvols) - Considerations, Limitations & Guidelines
Virtual Volumes Replication
Replication Storage Policies
VVols Certified Storage Vendors
Chapter 07 Review

Chapter 08 - VM Creation, Configuration, and Snapshots

1h 34m

Topic 1: Create a VM

VM Virtual Hardware

Types of Virtual NICs (vNIC)

Virtual Machine Files

VMDK Disk Provisioning

Virtual Disk

VM HW v13 Properties

VM Hardware Versions Compared

Virtual SCSI Controller Type

Install Guest OS into VM

VM Console & Menus - VIC

VMRC or Web Console 6.5

VMware Tools

VMware Tools 5.0 & earlier vs 5.1/5.5/6.0

VMware Tools 10.1 & 10.0.12

Topic 2: Create Multiple VMs, Templates & Clones

Clones & Templates

Deploy VM from Template

Customizing the OS in a Virtual Machine

Customization Specification Manager

Topic 3: Virtual Appliances

Virtual Appliances

Import Virtual Appliances

Export VM to OVF Format

Content Library - Store Template

Use Template from Library

Customize existing VM

Deploying Across Datacenters

Topic 4: Configuration and Use of vApps

vApp Overview

Creating and using vApps

Topic 5: Manage VMs

Hot Add Memory and CPUs

VM Properties - Hardware Tab

Adding USB Devices to VM

VM Properties - Options Tab

Resize a Virtual Disk

Extend VMDK

Dell's extpart - NO REBOOT

Extend partitions using gparted

vOptimizer Pro

Raxco PerfectStorage

Renaming a Virtual Machine

Topic 6: Virtual Machine Startup / Shutdown

Startup/Shutdown of VMs

Enabling 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
Consolidating Snapshots
Topic 8: Virtual Machine Troubleshooting & Best Practices
Troubleshooting VM Problems
Differences between VMs and Physical Servers (Best Practices)
Chapter 08 Review

Chapter 09 - Security and Permissions

24m

Topic 1: Controlling User Access and Passwords
Types of Users
ESXi Account Security
ESXi Account Security Configuration
ESXi Security Enhancements
Lockdown Modes in vSphere 6.x
vSphere 6.5: Security Enhancements
VM Encryption
VM Encryption Workflow
vMotion Encryption
ESXi 6.5 Secure Boot
UEFI Secure Boot for ESXi 6.5 Hosts
VM Secure Boot
vCenter/ESXi Host Security Model
Permissions
Global Permissions
Roles
Privileges Explained
ESXi Host Permissions
Windows vCenter Permissions
vCSA Permissions
Topic 2: ESXi Active Directory (AD) Integration
AD ESXi Authentication Services
Assign ESXi Permissions Directly to AD Users
Topic 3: Managing Firewalls
ESXi Firewall
TCP & UDP Ports
ESXi Firewall Configuration via vSphere Web Client
Topic 4: Managing Security Certificates
Data Encryption
Certificate Changes in vSphere 6.0
VMware Certificate Management
Addition Certificate Information
Chapter 09 Review

Chapter 10 - Server and VM Monitoring

1h 28m

Topic 1: Optimizing Resources

Transparent Memory Page Sharing

TPS Modified - ESXi 5.0 – 6.x

Memory Overcommitment

Balloon-Driver: vmmemctl

Memory Compression

VMkernel Swap

VM Swap Files

Memory Overhead

VMkernel Swap Location

Host System Swap File

Memory Usage

ESXi v5.x vs v6.x Reclamation

Virtual CPUs (vCPUs)

VMkernel CPU Load Balancing

VMs' CPU & Memory Resource Setting Terms

CPU Resource Settings

Memory Resource Settings

ESXi 6.x Utilization per VM

Resource Shares

Topic 2: Resource Pools

Resource Pools Overview

Resource Pool Configuration

Expandable Reservations

Troubleshooting Memory Resources

Best Practices for VM Resources

Topic 3: Latency Sensitive Applications

Deploying Extremely Latency-Sensitive Applications

Latency-Sensitive Feature

Best Practices for Extremely Latency-Sensitive Applications

Topic 4: Performance Monitoring

Performance Monitoring - Overview

Performance Monitoring - Advanced

Customize Performance Chart

Troubleshooting Performance

Problem: High CPU Utilization

Problem: High Memory Utilization

Problem: High Disk Utilization

Problem: High Network Utilization

VMware vRealize Operations (formerly vCenter Operations Management Suite)

Topic 5: Configuring Alarms

vCenter Alarms

Default Alarms in vCenter

Alarm Settings

Configure vCenter Notifications

Topic 6: ESXi & vCenter Logs

ESXi 5.x/6.x Log Files from DCUI

ESXi 6.x Log File Locations

ESXi 6.x Log Files

System Logs
Collecting Windows vCenter Log Files
GUI Collecting vCSA Log Files in 6.x
Collecting vCenter Diagnostics Data
Configuring Syslog on ESXi (GUI)
Sending VC Event Stream to a Syslog Server
Syslog Servers
Logging Enhancements in VC 6.5
VMware Log Insight
Chapter 10 Review

Chapter 11 - Advanced ESXi and vCenter Server Management

1h 5m

Topic 1: Storage vMotion
Storage vMotion Migration
Requirements for Storage vMotion
Storage vMotion Architecture
Storage vMotion in vSphere 5.x/6.x
Storage vMotion in vSphere 5.x/6.0
Topic 2: Configuring vMotion
vMotion Migration
How vMotion Works
vMotion: Host Requirements
Identifying CPU Characteristics
vMotion Errors and Warnings
Advanced vMotion Errors
vMotion Improvements
Enhanced vMotion Migration "Shared Nothing" vMotion
Cross vSwitch vMotion
Cross vCenter vMotion
Long Distance vMotion
Topic 3: Distributed Resource Scheduler (DRS) Cluster
vCenter Host Cluster
Distributed Resource Scheduler (DRS) Overview
DRS Cluster in the vCenter Inventory
Retaining Host Resource Pools
Configure Automation Level
Initial Placement
DRS Recommendations, Faults & History
Virtual Machine Rules
Groups & Rules - Virtual Machine to Host
VM Overrides
Distributed Power Management (DPM)
Enhanced vMotion Compatibility (EVC)
VM Swapfile location
Planned Downtime: Maintenance Mode
Snapshot & Restore DRS tree
vSphere 6.5 DRS Enhancements
Topic 4: DRS Cluster Monitoring
Monitor Cluster Objects State
Monitoring the DRS Cluster - Resource Allocation

Monitoring the DRS Cluster - DRS Resource Distribution Graph
Monitoring the DRS Cluster - What to look for ...
Topic 5: Storage Policy-Based Management (SPBM)
Storage Policy-Based Management (SPBM)
vSphere Storage API for Storage Awareness (VASA) Storage Providers
VM Storage Policies
Create VM Storage Policies
Apply VM Storage Policies to VMs
Topic 6: Datastore Clusters & Storage DRS (SDRS)
Datastore Clusters
Storage DRS (SDRS)
Create a Datastore Cluster for SDRS
Datastore Cluster Information
Edit a Datastore Cluster
Topic 7: Enhanced Linked Mode
Manage Multiple vCenters - vSphere 6.0/6.5
Enhanced Linked Mode 6.x
Chapter 11 Review

Chapter 12 - Patching and Upgrading ESXi

40m

Topic 1: Patching ESXi Standalone Hosts & VCSA 6.x
ESXi Standalone Patch Installation
GUI VCSA Patch/Update
Topic 2: Patching the vCenter Environment
Update Manager 6.x Patching
Update Manager Terms
Update Manager Settings
Host Baseline Creation
Update Manager Events
Update Manager Notifications
Patch Repository
Web Client Remediation
Topic 3: Upgrades and Migrations
Basic vSphere Upgrade Process
Basic vCenter Upgrade Process
Services Migrated during Upgrade vCenter to 6.0/6.5
Upgrade Versions Supported
Upgrade of Multiple vSphere Products to Use vCenter 6.5
Repointing VC 6.0/6.5 to different PSC
Upgrade vCSA 5.5/6.0 to VCSA 6.5
Migrate Windows VC 5.5/6.0 to vCSA 6.5
Upgrade Host to ESXi 6.x using media
ESXi Upgrade using Update Manager (6.5) Web Client
Upgrade Distributed Switch to 6.5
Upgrade the Virtual Machines
Use the Web Client to Upgrade the VMware Tools
Use vSphere (& Web) Client to Upgrade Virtual Machine Hardware V13
Use Update Manager to Upgrade Virtual Machines
Chapter 12 Review

Chapter 13 - Disaster Recovery and Backup

1h

Topic 1: vSphere Replication 6.5

vSphere Replication v5.5

What's New in vSphere Replication v5.5 (vR)

What's New in vSphere Replication v6.0 (vR)

VR v6.0 Deploy Appliance

VR v6.0 Configure Replication

VR v6.0 Recovery

Topic 2: Site Recovery Manager (SRM)

VMware Site Recovery Manager (SRM) V5.5

VMware Site Recovery Manager (SRM) V5.5 - Features

VMware Site Recovery Manager (SRM) V5.5 - What's New

VMware Site Recovery Manager (SRM) V6.0 - What's New

VMware Site Recovery Manager (SRM) V6.5 - What's New

SRM Architecture Overview

Topic 3: High Availability (HA)

VMware High Availability

New vSphere 5.0 HA Features

New vSphere 5.1 HA Features

New vSphere 5.5 HA Features

New vSphere 6.0 HA Features

New vSphere 6.5 HA Features

vSphere 6.x HA in Action

Configure HA Cluster 6.0

HA 6.5 Configuration

VMware HA: Host Monitoring

Configure HA Admission Control vSphere 6.0 and earlier

Simplified HA Admission Control vSphere 6.5 & higher

Host Isolation

Guidelines for Isolation Response Setting

VMware HA: Heartbeats

Configure Datastore Heartbeat

VMware HA: Virtual Machine Overrides

HA VM Monitoring

Viewing your HA Cluster

HA Advanced Options

Troubleshooting VMware HA

Troubleshooting HA Agent (FDM)

Topic 4: VM Fault Tolerance

Fault Tolerance Overview

Fault Tolerance Requirements

Fault Tolerance Differences

Fault Tolerance in vSphere 6.5

Configure Fault Tolerance

Topic 5: Backup Strategies

Backup Strategies for VMs

Topic 6: Third Party Backups

Unitrends Enterprise Backup 10.0 (formerly PHD Virtual Backup)

Unitrends Backup Architecture

Quest vRanger Backup & Replication

Veeam Backup & Replication
vSphere 6.5 support in Veeam B&R 9.5 Update 1/2
Veeam Backup - Screenshots
What's New NetBackup 8.0
Chapter 13 Review
Course Closure

Total Duration: 12h 3m