

## VMware vSphere 6.7 with ESXi and vCenter

<b>Course Name</b>	<b>VMware vSphere 6.7 with ESXi and vCenter</b>  <a href="#">VMware vSphere 6.7 with ESXi and vCenter</a>  <a href="#">VMware vSphere 6.7 with ESXi and vCenter</a>
<b>Format</b>	5-day, 8hr/day instructor led training
<b>Course Books</b>	720pg <b>Study Guide</b> fully annotated with slide notes 240pg <b>Lab Guide</b> with detailed instructions on how to complete 20+ lab tasks
<b>vSphere Version</b>	Based on VMware vSphere 6.7 released May 2018
<b>Delivery Options</b>	Instructor Led On-site. Instructor Led Distance. Instructor Led Mixed On-Site & Remote. Self-paced video training with full lab access and support.
<b>Remote Labs</b>	Remote access to dedicated rack of servers with one enterprise class PC Server per student, an iSCSI SAN, etc.
<b>Max Attendees</b>	We generally recommend no more than 16 students per class We can provide concurrent lab access for 150+ students
<b>Requirements</b>	Course can be run from any location that has a reliable Internet connection. Each attendee needs a PC that supports Microsoft Terminal Services
<b>Lab Time</b>	45+% of class time is devoted to hands-on labs
<b>Recorded Lectures</b>	Attendees receive lifetime access to video recordings of all of the lectures in this course
<b>Suggested Price</b>	\$3,595 USD per seat

## Overview

This powerful 5-day class is an intensive introduction to VMware vSphere™ including VMware ESXi™ 6.7 and vCenter™ 6.7. This course has been completely rewritten to reflect the most recent changes introduced in vSphere 6.y. Our courseware and labs have been fully updated and now use Host Client and Web Client rather than legacy vSphere Client for both presentation material and lab procedures.

Assuming no prior virtualization experience, this class starts with the basics and rapidly progresses to advanced topics. With 45+% of class time is devoted to labs, students learn the skills they need to become effective vSphere administrators.

Students use dedicated labs that start with installation and configuration of stand-alone ESXi servers and progress to shared storage, networking and centralized management. The class continues to advanced topics including resource management, high availability, replication, performance, disaster preparedness, rapid deployment and VM cold, hot and storage migration.

This class is unique in its approach; which is to identify and eliminate common IT pain points using vSphere. Students learn how to deliver business value; not just the technical or mechanical aspects of the software.

By the end of the class, attendees will have learned the skills, and best practices of virtualization. Attendees will be able to design, implement, deploy, configure, monitor, manage and troubleshoot vSphere 6.7.

# Objectives

At the end of the course, attendees will be able to:

- Explain the many significant benefits of virtualization
- Install ESXi Server according to best practices
- Upgrade and use Host Client to manage stand alone ESXi hosts
- Configure and manage local storage resources
- Create virtual and virtual to physical network configurations
- Define and use file share (NAS / NFS) datastores
- Create virtual machines, install operating systems and applications
- Install, configure and upgrade VMware Tools
- Install, configure and update the Platform Service Controller and vCenter Server Appliance
- Rapidly deployment of VMs using golden-master templates
- Create clones - one-time copies of virtual machine
- Use Guest OS customization to rapidly configure new VMs according to requirements
- Configure and use hotplug hardware to upgrade VM hardware with zero downtime
- Configure, manage, monitor and secure users and groups
- Work with roles and permissions to implement access controls to vCenter
- Understand the benefits and trade offs of network attached storage and Fibre, iSCSI SANs
- Configure and use shared SAN storage including Fibre SAN, iSCSI SAN
- Add and grow VM virtual disks including system disks and secondary volumes
- Use vCenter alarms to monitor ESXi, VM, storage and network health, performance, state
- Use Resource Pools to bulk delegate resource to meet Service Level Agreements
- Perform VM cold migrations, hot VMotion migrations and Storage VMotion
- Configure and manage server CPU and Memory capacity and maintain VM responsiveness with Distributed Resource Schedule load balanced clusters
- Deliver high VM service availability using VMware High Availability clusters
- Use HA to successfully minimize VM down time caused by ESXi host failures, storage network failures or SAN volume failures
- Implement a disaster preparedness strategy using VMware Replication
- Use vSphere Replication to hot replicate and recover business critical Virtual Machines
- Patch and update ESXi servers using vCenter Update Manager
- Monitor and tune both ESXi and virtual machine performance
- Understand how VMware and third party products, including operating systems, are impacted by virtualization
- Troubleshoot common problems

# Prerequisites

Attendees should have user, operator or administrator experience on common operating systems such as Microsoft Windows®, Linux™, UNIX™, etc. Experience installing, configuring and managing operating systems, storage systems and or networks is useful but not required. We assume that all attendees have a basic familiarity with PC server hardware, disk partitioning, IP addressing, O/S installation, networking, etc.

## Who Should Attend

This class is suitable for anyone who want to learn how to extract the maximum benefit from their investment in Virtual Infrastructure, including:

- **System architects** or others who need to design virtual infrastructure
- **Security specialists** responsible for administering, managing, securing Virtual Infrastructure
- **Operators** responsible for day-to-day operation of Virtual Infrastructure
- **Performance analysts** who need to understand, provision, monitor Virtual Infrastructure
- **Business Continuity specialists** responsible for disaster recovery and high availability
- **Storage administrators** who work with Fibre / iSCSI SAN volumes and NAS datastores
- **Managers** who need an unbiased understanding of virtualization before committing their organization to a virtual infrastructure deployment.

## Chapter List

Our class consists of the following 22 chapters:

1. Virtualization Infrastructure Overview
2. How to Install, Configure ESXi 6.7 (HoL<sup>1</sup>)
3. Virtual and Physical Networking (HoL)
4. NAS Shared Storage(HoL)
5. Virtual Hardware and Virtual Machines (HoL)
6. Install and Deploy the vCenter Server Appliance (HoL)
7. VM Rapid Deployment using Templates, Clones (HoL)  
Add and Grow virtual disks (HoL)  
Advanced Virtual Hardware - Hot Plug CPU/Memory (HoL)
8. ESXi and vCenter Permission Model (HoL)
9. Using Fibre and iSCSI Shared Storage (HoL)
10. VMFS - The VMware Cluster File System (HoL)
11. ESX and vCenter Alarms (HoL)
12. Resource Management and Resource Pools (HoL)
13. VM Hot VMotion, Cold Migration and Storage VMotion (HoL)
14. Load Balancing w. Distributed Resource Scheduling Clusters (HoL)
15. Failure Recovery with High Availability Clusters (HoL)
16. Disaster Preparedness with vSphere Replication (HoL)
17. Patch Management with VMware Update Manager (HoL)
18. Managing Scalability and Performance (HoL)
19. Final Thoughts

<sup>1</sup> HoL - Every attendee perform one or more **Hands on Lab** exercises at the end of the chapter

## Hands On Labs

Attendees will complete the following hands on labs during the class:

- Install of ESXi 6.7 and perform post-install configurations
- Update ESXi 6.7 Host Client to improve stability and add features
- Create, update Network Standard vSwitches. Use NIC Teams for performance and redundancy
- Enable Jumbo Frames on vSwitches and VMkernel ports
- Define, connect to and browse NFS file shares
- Create a Virtual Machine and install a guest OS into the VM. Install VMware Tools into the VM. Add 3<sup>rd</sup> party tools and utilities to the VM
- Export a VM in Open Virtual Machine Format (OVF) and then re-import it
- Install and configure the vCenter Server Appliance (vCSA)
- Configure Single Sign On (SSO) identity sources including Active Directory
- Configure vCenter's inventory views to organize inventory objects
- Getting started with VMware Next Generation Web Client
- Work with Clones and Templates. Convert a VM into a template. Rapidly deploy new VMs from template. Copy VMs using cloning.
- Use guest OS customization to easily change the identity of a VM. Create, update and deploy VMs using Guest OS Customization Specifications
- Work with virtual disks. Hot add a secondary virtual disk. Grow a non-system volume. Grow a Windows system disk and increase it's partitions without the need for 3<sup>rd</sup> party tools
- Configure and test hotplug memory. Create multi-core vCPUs
- Work with vCenter permissions. Use and customize Roles
- iSCSI, Fibre Storage Area Networks. Scanning for and connecting to SAN shared storage
- VMware VMFS - VMware's cluster file system. How to create, tune and grow VMFS volumes
- vCenter alarms for monitoring key infrastructure objects. Send SNMP traps to a trap receiver on high VM resource consumption
- Create and resource tune Resource Pools. Test resource resource delegations
- Cold Migration VMs from one ESXi host and storage volume to another
- Hot VMotion the live running state of a VM from one ESXi host to another
- Hot Storage Migrate the live disk state of a running VM from one datastore to another
- Build and test an automated CPU and Memory resource load balancing DRS clusters
- Create and test an HA cluster. Watch the cluster place and restart VMs during a server failures
- Prepare for an IT failure with vSphere Replication. Hot replicate and then restore a running VM
- Set up VMware Update Manager to patch/update ESXi hosts. Perform an ESXi host Patch Scan, review host non-compliance with attached patch baselines and then apply patches to update the ESXi host
- Performance analysis and bench marking storage and networking

Students now benefit from un-shared labs. Rather than working in teams of 2, students now complete all tasks by themselves on their own private lab environment. This provides a better learning environment for students and facilitates remote attendance.

## Certification

Attendees will acquire all of the knowledge and hands on skills they need to successfully challenge the [Certified Virtualization Professional \(CVP\)](#) exam at the end of the course.

Please check with your training provider to see if a CVP exam voucher are included in the price of this course.

# Detailed Chapter List

## Chapter 1 - Virtualization Infrastructure Overview

- Virtualization explained
- How VMware virtualization compares to traditional PC deployments
- Common pain points in PC Server management
- How virtualization effectively addresses common IT issues
- VMware vSphere software products
- What's New and Improved in vSphere 6.7

## Chapter 2 - How to Install, Configure ESXi 6.7

- Understanding ESXi
- Selecting, validating and preparing your server
- Storage controllers, disks and partitions
- Software installation and best practices
- Join ESXi to a Domain
- Local User Management and Policies
- First look at the VMware vSphere Client and VMware Host Client

## Chapter 3 - Virtual and Physical Networking

- vNetwork standard and distributed virtual Switches
- Virtual Switches, Ports and Port Groups
- Creating VMkernel NICs
- Creating, sizing and customizing Virtual Switches

## Chapter 4 - Connecting to and Using NAS Shared Storage

- Benefits Shared Storage offer to Virtual Infrastructure
- NFS Overview
- Configuring ESX to use NFS Shares
- Configuring NFS for performance and redundancy
- NFS Use Cases
- Troubleshooting NFS connections

## Chapter 5 - Virtual Hardware and Virtual Machines

- VM virtual hardware, options and limits
- Sizing and creating a new VM
- Assigning, modifying and removing Virtual Hardware
- Working with a VM's BIOS
- VMware remote console applications
- Installing an OS into a VM
- Driver installation and customization

## Chapter 6 - vCenter Server Appliance and Web Client

- The need for Identity Source management
- Installing and configuring vCenter Server Appliance with an embedded Platform Service Controller
- Connecting Single Sign On (SSO) to Active Directory and other identity sources
- vCenter feature overview and components
- Organizing vCenter's inventory views
- Importing ESX hosts into vCenter management
- Administering vCenter Server with Web Client

## Chapter 7 - VM Rapid Deployment using Templates, Clones

- Templates - Virtual Machine Golden Master images
- Creating, modifying, updating and working with Templates
- Patching, and refreshing Templates
- Cloning, one time copies of VMs
- Best practices for cloning and templating
- Adding and resizing virtual disks
- Hotplug VM virtual CPUs and Memory

## Chapter 8 - ESXi and vCenter Permission Model

- VMware Security model
- Configuring local users and groups
- Managing local permissions
- vCenter security model
- Local, Domain and Active Directory users and groups
- How permissions are applied

## Chapter 9 - Using Fibre and iSCSI Shared Storage

- Fibre SAN overview
- Identifying and using Fibre Host Bus Adapters
- Scanning and Rescanning Fibre SANs
- iSCSI overview
- Virtual and physical iSCSI adapters
- Connecting to iSCSI storage
- Scanning and rescanning iSCSI SANS
- Performance and redundancy considerations and best practices
- Understanding the benefits of VMware VAAI compliant storage

## Chapter 10 - VMware File System (VMFS)

- Unique file system properties of VMFS
- Managing shared Volumes
- Creating new VMFS partitions
- Explanation of new VMFS 6 features and capabilities
- Managing VMFS capacity with LUN spanning and LUN expansion
- Native and 3rd party Multipathing with Fibre and iSCSI SANs
- VMFS performance considerations
- VMFS scalability and reliability

## Chapter 11 - Infrastructure Monitoring with vCenter Alarms

- Alarm categories and definitions
- Creating custom alarms and actions
- Configure vCenter so it can send E-mail and SNMP alerts
- Reviewing alarms and acknowledging them
- Work with alarm conditions, triggers and actions
- Identify most useful alarms to review and enable

## Chapter 12 - Resource Management and Resource Pools

- Delegate resources in bulk using Resource Pools
- How ESX delivers resources to VMs
- Shares, Reservations and Limits
- CPU resource scheduling
- Memory resource scheduling
- Resource Pools

## Chapter 13 - VMotion Migration, Cold Migration, Storage VMotion

- Cold VM migrations to new ESX hosts, datastores
- Hot Migrations with VMotion
- VMotion requirements and dependencies
- How VMotion works - detailed explanation
- Troubleshooting VMotion
- How to test hosts for VMotion compatibility
- Storage VMotion for hot VM disk migrations

## Chapter 14 - Distributed Resource Scheduling Clusters

- CPU and Memory resource balanced clusters with VMware Distributed Resource Scheduler
- DRS Cluster configuration and tuning
- Per-VM cluster policy overrides
- Learn the features and benefits of DRS Power Management

## Chapter 15 - Failure Recovery with High Availability Clusters

- High Availability options to minimize unplanned down time
- How VMware HA protects against ESXi host, storage network and SAN volume failures
- Understand and review HA's many policies
- Introduction to continuous VM availability using VMware Fault Tolerance

## Chapter 16 - Disaster Preparedness with vSphere Replication

- Explain vSphere Replication features and Use Cases
- Import the vSphere Replication virtual appliance
- Configure vSphere Replication including Recovery Point Objectives (RPOs)
- Performing an initial VM replication
- Scheduling periodic VM synchronization to the replication target site
- Recover a VM using vSphere Replication

## Chapter 17 - Patch Management with VMware Update Manager

- Configure and enable VMware Update Manager
- Establishing a patch baseline
- Verifying compliance and patching ESXi hosts

## Chapter 18 - Managing Scalability and Performance

- VMkernel CPU and memory resource management mechanisms
- Tuning VM storage I/O performance
- Identifying and resolving resource contention
- Monitoring VM and ESX host performance
- Performance and capacity planning strategies

## Chapter 19 - Final Thoughts

- Consolidation guidelines for VMs and Storage
- Determining which workloads to consolidate
- Other considerations
- Useful books, white papers and online resources

## For More Information

This class can be customized to meet your unique training and delivery needs, including:

- On-site delivery at your facility
- Custom timetables including 3-day rapid delivery boot-camps
- Content and Lab customization to meet your unique training needs
- Distance training
- Mentoring, implementation planning and assistance

For more information or to check pricing and availability, please contact your authorized [ESXLab.com](http://ESXLab.com) training partner or visit [www.esxlab.com](http://www.esxlab.com).