VMware vSphere 6.0 with ESXi and vCenter

Course Name	**VMware vSphere 6.0 with ESXi and vCenter**
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Format	5-day instructor led training
Course Books	735 pg Study Guide fully annotated with slide notes 244 pg Lab Guide with detailed steps for completing all labs
vSphere Version	Covers uses VMware vSphere 6.0 Update 2 which was released in March 2016
Delivery Options	Instructor Led On-site. Instructor Led Distance. Instructor Led Mixed On-Site & Remote Evening and/or weekend delivery
Remote Labs	Remote access to dedicated rack of servers with one enterprise class PC Server per student, an iSCSI SAN, etc.
Max Attendees	We recommend you place no more than 16 students per class We can provide concurrent lab access for 150+ students
Requirements	Course can be run from any location that has a reliable Internet connection. Each attendee needs a PC that supports Microsoft Terminal Services
Lab Time	40+% of class time is devoted to hands-on labs
Availability	First released July, 2015. Last updated March 2016
Certification	Prepares attendees to challenge the ESXLab Certified Virtualization Specialist exam One exam voucher included with this class
Suggested Price	$3,495 USD per seat

Overview

This powerful 5-day class is an intensive introduction to VMware vSphere™ including VMware ESX™ 6.0 and vCenter™. This course has been completely rewritten to reflect the changes and improvements introduced in vSphere 6. Our courseware and labs have been fully updated and now use 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 40+% of class time is devoted to labs, students learn the skills they need to become effective vSphere administrators.

Labs 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 balancing, high availability, power management, back up and recovery, performance, vCenter redundancy, VM redundancy. Disaster recovery, rapid deployment, hot migration and workload consolidation are also covered.

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

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will be able to design, implement, deploy, configure, monitor, manage and troubleshoot vSphere 6.0.

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
- Configure and manage local storage
- Create virtual, distributed virtual, and virtual to physical LAN segments
- Understand and use shared SAN storage including Fibre SAN, iSCSI SAN
- Define and use file share (NAS) datastores
- Install, configure and update the Platform Service Controller and vCenter Server Appliance
- Create and use Content Libraries to manage ISO repositories
- Create virtual machines, install operating systems and applications
- Configure and use hotplug hardware including hot-add vCPUs and Memory
- Add and grow virtual disks including system disks and secondary volumes
- Rapidly deployment of VMs using golden-master templates
- Create clones – one-time copies of virtual machine
- Perform VM cold migrations, hot migrations and Storage VMotion
- Configure, manage, monitor and secure users and groups
- Understand the benefits and trade offs of network attached storage and Fibre, iSCSI SANs
- Deploy and use VMware Replication to hot back up and recover critical Virtual Machines
- Create and manage load balanced clusters
- Enable, configure and use Distributed Power Management to reduce electrical power by soft powering off unneeded ESXi servers
- Understand, create and manage high availability clusters to protect against VM service loss caused by ESXi server failures
- Monitor and tune both ESXi and virtual machine performance
- Patch and update ESXi servers using vCenter Update Manager
- Understand how VMware and third party products, including operating systems, are impacted by virtualization
- \Understand and use advanced vSwitch settings like NIC Teaming and Security
- 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 6.0 Installable(HoL[1])
3. Virtual and Physical Networking(HoL)
4. Content Libraries and 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. Workload consolidation with vCenter Converter Standalone(HoL)
14. VM Hot VMotion, Cold Migration and Storage VMotion(HoL)
15. Load Balancing w. Distributed Resource Scheduler(HoL)
16. Failure Recovery with High Availability Clusters(HoL)
17. Hot VM Protection with vSphere Replication (HoL)
18. Patch Management with VMware Update Manager(HoL)
19. Managing Scalability and Performance(HoL)
20. Final Thoughts

[1] **HoL** – Every attendee perform one or more **Hands on Labs** at the end of each chapter

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Hands On Labs

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

- Install of ESXi 6.0 Update 2 and perform post-install configurations
- Create, update Network Standard vSwitches. Use NIC Teams for performance and redundancy
- Define, connect to and browse NFS file shares. Create a Content Library and add ISO images
- Create a Virtual Machine and install a guest OS into the VM. Install VMware Tools into the VM. Add 3rd party tools and utilities to the VM
- Export a VM in Open Virtual Machine Format (OVF) and then re-import it (optional lab)
- Install and configure the vCenter Server Appliance
- 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 3rd party tools
- Configure and test hotplug memory. Create multi-core vCPUs
- Work with vCenter permissions. Use and customize Roles
- vCenter alarms for monitoring key infrastructure objects. Send SNMP traps to a trap receiver on high VM resource consumption
- iSCSI, Fibre Storage Area Networks. Connecting to shared storage
- VMware VMFS – VMware's proprietary cluster file system. How to create, tune and grow VMFS volumes
- Create, manage and monitor Resource Pools. Work with resource tuning settings.
- Import a Windows/Linux workload to a VM using VMware Converter
- VM migration including Cold Migration, Storage Migration and VMotion
- Automated VM resource load balancing with DRS clusters
- Use HA clusters to minimize VM down time due to server failures
- Replicate and restore VMs using VMware Replication
- Set up VMware Update Manager to patch/update ESXi hosts
- Performance analysis and benchmarking storage and networking

Certification

Attendees have the option to earn ESXLab Certified Virtualization Specialist (ECVS) by challenging a certification exam a the end of the 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 6.0

Chapter 2 – How to Install, Configure ESXi 6.0 Update 2

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

Chapter 3 – Virtual and Physical Networking

- vNetwork standard and distributed virtual Switches
- Virtual Switches, Ports and Port Groups
- Creating VMkernel ports
- 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 and Web Client

- The need for Identity Source management
- Installing an external Platform Service Controller
- Installing and configuring vCenter Server Appliance
- 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
- 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 – ESX and vCenter Alarms

- Alarm categories and definitions
- Creating custom alarms and actions
- Reviewing alarms and acknowledging them

Chapter 12 – Resource Management and Resource Pools

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

Chapter 13 – Consolidation with VMware Converter

- vCenter Converter overview
- Converting physical machines, virtual machines and OS Images
- Cold migrations of physical machines to virtual machines
- Hot migrations of physical machines to virtual machines

Chapter 14 – VMotion Migration, Cold Migration, Storage VMotion

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

Chapter 15 – Distributed Resource Scheduling Clusters

- Delegated resource management with Resource Pools
- 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

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Chapter 16 – Failure Recovery with High Availability Clusters

- High Availability options to minimize unplanned down time
- VMware High Availability clusters
- VMware Fault Tolerance

Chapter 17 – 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)
- Enable vSphere Replication on a VM
- Recover a VM using vSphere Replication

Chapter 18 – Patch Management with VMware Update Manager

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

Chapter 19 – 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 20 – Final Thoughts

- Consolidation guidelines for VMs and Storage
- Determining which workloads to consolidate
- Other considerations

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 meed 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** training partner or visit www.esxlab.com.

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