VMware vSphere 5.1 with ESXi and vCenter

Format	5-day instructor led training
Course Books	600+ pg Study Guide with slide notes
	200+ pg Lab Guide with detailed steps for completing labs
vSphere Version	Covers VMware vSphere 5.1 including ESXi 5.1 and vCenter
Delivery	Remote access to dedicated rack of servers with one **HP DL365 server/student,** an iSCSI SAN, etc.
Max Attendees	Limited by server availability. We currently have 90+ student servers available
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	November, 2012
Certification	Prepares attendees to challenge the ESXLab Certified Virtualization Specialist exam

Overview

This powerful 5-day class is an intense introduction to virtualization using VMware's vSphere™ 5.1 including VMware ESX™ 5.1 and vCenter™. Assuming no prior virtualization experience, this class starts with the basics and rapidly progresses to more advanced topics. More than 40% of class time is devoted to labs so concepts, skills and best practices are developed and reinforced.

Initial labs focus on installation and configuration of stand-alone ESXi servers. As the class progresses, shared storage, networking and centralized management are introduced. The class continues on to more advanced topics including resource balancing, high availability, back up and recovery, troubleshooting and more. Disaster recovery, rapid deployment, hot migration and workload consolidation are also covered.

This class is unique in its approach; which is to identify common IT pain points and then clearly explain and demonstrate how virtualization delivers clear, tangible benefits (e.g.: reduced costs, greater consistency, responsiveness, reduced administration, server consolidation, etc.). Each topic is presented from the perspective of delivering key business value; not just the technical or mechanical aspects of the software.

By the end of the class, attendees will have learned the benefits, skills, and best practices of virtualization. Attendees will be able to design, implement, deploy, configure, monitor, manage and troubleshoot VMware vSphere 5.1.

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 Single Sign On services
- Install, configure and administer VMware vCenter
- Create virtual machines, install operating systems and applications
- 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, SAN,
- Deploy and use VMware Data Recovery to back up and recover VMs
- Create and manage load balanced clusters
- 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
- Troubleshoot common problems

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 monitor, managing, securing and administering Virtual Infrastructure
- **Operators** responsible for day-to-day operation of Virtual Infrastructure
- **Performance and capacity analysts** who need to understand, provision, monitor and performance tune Virtual Infrastructure
- **Backup Administrators** who need to understand the impact of existing and new back up strategies in a virtual environment
- **Business Continuity specialists** responsible for disaster recovery and high availability
- **Storage administrators** who need to understand how VMware ESX uses Fibre SAN and iSCSI SAN volumes and NAS datastores
- **Managers** who need an unbiased understanding of virtualization before committing their organization to a virtual infrastructure deployment.

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.

Chapter List

Our class consists of the following 22 chapters:

Chapter 1 - Virtualization Infrastructure Overview
Chapter 2 – How to Install, Configure ESXi 5.1 Installable (HoL[1])
Chapter 3 - Virtual and Physical Networking (HoL)
Chapter 4 - NAS Shared Storage (HoL)
Chapter 5 - Virtual Hardware and Virtual Machines (HoL)
Chapter 6 – Configuring Identity Sources with Single Sign On (HoL)
Chapter 7 - vCenter (HoL)
Chapter 8 - VM Rapid Deployment using Templates, Clones (HoL)
Chapter 9 - ESXi and vCenter Permission Model (HoL)
Chapter 10 - Using Fibre and iSCSI Shared Storage (HoL)
Chapter 11 – VMFS – The VMware File System (HoL)
Chapter 12 - Resource Management and Resource Pools (HoL)
Chapter 13 – ESX and vCenter Alarms (HoL)
Chapter 14 – Host Profiles (HoL)
Chapter 15 - Consolidation with vCenter Converter Standalone (HoL)
Chapter 16 – Back Up, Recovery with VMware Data Recovery (HoL)
Chapter 17 - VM Hot and Cold Migration, Storage VMotion (HoL)
Chapter 18 – Load Balancing w. Distributed Resource Scheduler (HoL)
Chapter 19 – Failure Recovery with High Availability Clusters (HoL)
Chapter 20 – Patch Management with VMware Update Manager (HoL)
Chapter 21 – Managing Scalability and Performance (HoL)
Chapter 22 – Final Thoughts

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1   **HoL** – Every attendee perform a **Hands on Lab** at the end of the chapter

Hands On Labs

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

- Install of ESXi 5.1 and perform post-install configurations
- Create and update network Standard Virtual Switches
- 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 3rd party tools and utilities to the VM
- Install and configure Single Sign On (SSO). Configure identity sources including Active Directory
- Install and configure vCenter on Windows 2003. Install vCenter Modules
- Configure vCenter's inventory views to organize inventory objects
- Install and configure the 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
- Work with vCenter permissions. Use and customize Roles
- Create, update and work with Network Standard vSwitches. Create NIC Teams for added performance and redundancy
- 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
- Resource management. Work with resource tuning settings. Create, manage and monitor Resource Pools
- 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
- Back up and restore VMs using VMware Data Recovery
- Using Converter Enterprise to migrate physical machines to VMs
- vCenter alarms for monitoring key infrastructure objects. Send SNMP traps to a trap receiver on high VM resource consumption
- 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

Chapter 2 – How to Install, Configure ESXi 5.1 Installable (HoL[2])

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

Chapter 3 - Virtual and Physical Networking (HoL)

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

Chapter 4 - NAS Shared Storage (HoL)

- Benefits Shared Storage offer to Virtual Infrastructure
- Shared Storage options
- NFS Overview
- Configuring ESX to use NFS Shares
- Troubleshooting NFS connections

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2   **HoL** – Students perform a **Hands on Lab** at the end of the chapte

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Chapter 5 - Virtual Hardware and Virtual Machines (HoL)

- 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 – Identity Sources and Single Sign On (HoL)

- The need for Identity Source management
- Installing and configuring Single Sign On (SSO)
- Connecting to Active Directory and other identity sources

Chapter 7 – vCenter Server and the Next Generation Client (HoL)

- vCenter feature overview and components
- VMware Licensing
- Registering vCenter with SSO
- Organizing vCenter's inventory views
- Importing ESX hosts into vCenter management
- Installing and Using the vSphere Next Generation vSphere Client (NGC)

Chapter 8 - VM Rapid Deployment w. Templates, Clones (HoL)

- 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

Chapter 9 - ESXi and vCenter Permission Model (HoL)

- 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 10 - Using Fibre and iSCSI Shared Storage (HoL)

- 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

Chapter 11 – VMFS – The VMware File System (HoL)

- 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

Chapter 12 - Resource Management and Resource Pools (HoL)

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

Chapter 13 – ESX and vCenter Alarms (HoL)

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

Chapter 14 – Host Profiles (HoL)

- Using Host Profiles to capture an ESXi host configuration
- Perform configuration compliance scans
- Remediating out of compliance configuration issues
- Rapid ESXi host deployment/configuration with Host Profiles

Chapter 15 - Consolidation with vCenter Converter (HoL)

- 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 16 – VM Back Up, Recovery with Data Recovery (HoL)

- Pro's and Con's of traditional back up strategies
- Backing up VMs with VMware Data Recovery
- Backing and restoring your ESXi server configuration
- Third party VM back up solutions

Chapter 17 - VM Hot and Cold Migration, Storage VMotion (HoL)

- 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 18 – Load Balancing with DRS Clusters (HoL)

- Delegated resource management with Resource Pools
- Resource balanced clusters with VMware Distributed Resource Scheduler
- DRS Cluster configuration and tuning
- Per-VM cluster policy overrides

Chapter 19 – Rapid VM Recovery with HA Clusters (HoL)

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

Chapter 20 – Patching ESXi hosts with Update Manager (HoL)

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

Chapter 21 – Managing Scalability and Performance (HoL)

- 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 22 – 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.