

ESXLab VMware vSphere Boot Camp

Format	Instructor lead, VMware vSphere Boot Camp. Intensive introduction to vSphere delivered over 5, 10-hour days
Version	Covers VMware vSphere 4 including ESX 4 and vCenter 4
Courseware	Study Guide (800+ pages in 2 books). Lab Guide (200+ pages)
Lab Access	Remote access to a rack of up to HP DL365 servers, with one server/attendee. iSCSI SAN, file shares and other services/resources included
Max Students	12 attendees per server pod.
Requirements	Course can be run from any location that has a reliable Internet connection. The only requirement is one PC/attendee that can run Microsoft Terminal Services
Lab Time	40+% of class time is devoted to hands-on labs
Availability	July, 2010

Overview

This class is an intensive 5-day introduction to VMware's vSphere™ including VMware ESX™ 4 and vCenter™ 4. It is delivered in boot camp format of 5, 10 hour extended training days.

This class is intended for experienced Windows and Linux administrators who need to take charge of their VMware implementation/operation and then drive it to the max. No prior virtualization experience is assumed, but a willingness to work hard is required! This class starts with the basics and rapidly progresses to advanced topics. More than 40% of class time is devoted to labs so concepts, skills and best practices are reinforced.

All key aspects of VMware vSphere are covered - from installation of ESX and vCenter through to resource & power management, back up & recovery, monitoring and alarms, load balancing, service availability, and much more. Each topic is presented from the perspective of delivering key business and/or economic 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 4.

Note that this class includes lectures/labs that use the Service Console's command line. Linux command line skills are helpful but not required.

Objectives

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

- Explain the many significant benefits of virtualization
- Install ESX Server according to best practices
- Configure and manage local storage
- Create virtual, distributed virtual, and virtual to physical LAN segments
- Define and use NAS datastores
- Create virtual machines, install operating systems and applications
- Install, configure and administer VMware vCenter
- Rapidly deployment of VMs using golden-master templates
- Create clones - one-time copies of virtual machine
- Use VMware vNetwork Distributed vSwitches to deliver consistent network configurations
- Understand and use shared SAN storage including Fibre and iSCSI SANs
- Perform VM cold migrations, hot migrations and Storage VMotion
- Use VMware Consolidated Back Up to back up and restore running VMs
- Use VMware Data Recovery to back up and recover VMs and files
- Configure, manage, monitor and secure users and groups
- Create and manage Distributed Resource Schedule load balanced clusters
- Understand and use Distributed Power Management
- Create and manage VMware High Availability clusters to protect against VM service loss caused by ESX server failures
- Use Fault Tolerance to deliver 100% VM uptime
- Monitor and tune both ESX and virtual machine performance
- Patch management using vCenter Update Manager
- Understand how VMware and third party products, including operating systems, are impacted by virtualization
- Secure and lock down the Service Console
- Create and enforce server configuration with Host Profiles
- Troubleshoot common problems

Who Should Attend?

- **System architects** or others who need to design virtual infrastructure
- **Senior administrators** responsible for technical design and implementation of new Virtual Infrastructure projects
- **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 Virtual Infrastructure sees and 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.

Chapter Outline

Chapter 1 - Virtualization Infrastructure
 Chapter 2 - Stand Alone ESX Server Installation
 Chapter 3 - Virtual and Physical Networking
 Chapter 4 - NAS Shared Storage
 Chapter 5 - Virtual Hardware and Virtual Machines
 Chapter 6 - vCenter
 Chapter 7 - vCenter Inventory
 Chapter 8 - VM Rapid Deployment using Templates, Clones
 Chapter 9 - ESX and vCenter Permission Model
 Chapter 10 - Advanced Virtual Networking
 Chapter 11 - Using Fibre and iSCSI Shared Storage
 Chapter 12 - VMware File System (VMFS)
 Chapter 13 - Resource Management and Resource Pools
 Chapter 14 - Guided Consolidation
 Chapter 15 - VM Hot and Cold Migration, Storage VMotion
 Chapter 16 - Load Balancing w. Distributed Resource Scheduler
 Chapter 17 - Failure Recover with High Availability Clusters
 Chapter 18 - VMware Fault Tolerance
 Chapter 19 - VMware Consolidated Back Up
 Chapter 20 - VMware Data Recovery
 Chapter 21 - Consolidation with vCenter Converter
 Chapter 22 - Effective Performance Monitoring
 Chapter 23 - ESX and vCenter Alarms
 Chapter 24 - ESX Host Profiles
 Chapter 25 - Update Manager
 Chapter 26 - Securing the ESX Service Console
 Chapter 27 - Final Thoughts

Hands On Labs

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

- Perform a custom install of ESX and perform post-install configurations
- Create and update network Standard Virtual Switches
- Define, connect to and browse NFS file shares
- Create a Virtual Machine. Install Windows 2003 into the VM. Install VMware Tools into the VM. Add 3rd party tools and utilities to the VM
- Install and configure vCenter on Windows 2003. Install vCenter Modules
- Configure vCenter's inventory views to organize inventory objects
- 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 its partitions without the need for 3rd party tools
- Work with vCenter permissions. Use and customize Roles
- Create, update and work with Network Distributed 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 load balancing with VMware DRS clusters
- Manage server power consumption with Distributed Power Mgt clusters
- Use HA clusters to minimize VM down time due to server failures
- Guided Consolidation. Rapidly discover, monitor and migrate physical machines into VMs
- Back up and restore a VM using VMware Consolidated Back Up
- Back up and restore a VM using VMware Data Recovery appliances
- Set up and use VMware Guided Consolidation to import a Windows server
- Using Converter Enterprise to migrate physical machines to VMs
- Performance analysis and benchmarking storage and networking
- vCenter alarms for monitoring key infrastructure objects. Send SNMP traps to a trap receiver on high VM resource consumption
- Create and edit VMware ESX Host Profiles
- Apply updates to ESX using VMware Update Manager
- Secure the Service Console

Detailed Course Outline

Chapter 1 - Virtualization Infrastructure

- Virtualization explained
- How VMware virtualization compares to traditional PC deployments
- Common pain points of physical deployments
- How virtualization effectively addresses issues and brings new
- VMware vSphere software products

Chapter 2 - Stand Alone ESX Server Installation

- Understanding ESXi and full ESX
- Selecting, validating and preparing your server
- Sizing Service Console and VMkernel resources
- Storage controllers, disks and partitions
- Software installation and licensing
- Installation recommendations and best practices
- 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
- Service Console and VMkernel ports
- Creating, sizing Virtual Switches

Chapter 4 - NAS Shared Storage

- Benefits Shared Storage offer to Virtual Infrastructure
- Shared Storage options
- NFS Overview
- Configuring ESX to use NFS Shares
- 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
- VM best practices for monitoring and scalability

- Understanding what should and should not be virtualized

Chapter 6 - vCenter

- vCenter architectural and feature overview
- vCenter components
- VMware Licensing

Chapter 7 - vCenter Inventory

- vCenter's views into Virtual Infrastructure
- Role of the datacenter
- Using folders to impart political, geographic or technical boundaries
- Importing ESX hosts into vCenter management
- Troubleshooting vCenter

Chapter 8 - 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
- Performance considerations

Chapter 9 - ESX 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 10 - Advanced Virtual Networking

- Uplinking Virtual and Physical Network segments using NICs
- Distributed virtual switches and distributed Port Groups
- NIC teaming for redundancy and Performance
- Connecting to vLANs
- Enhanced Network Security
- Virtual routers and firewalls
- Assigning physical NICs to VMs

Chapter 11 - Using Fibre and iSCSI Shared Storage

- Fibre SAN overview
- Identifying and using Fibre Host Bus Adapters
- Scanning and Rescanning Fibre SANs
- Partitioning and formatting Fibre SAN Storage
- Performance and redundancy considerations and best practices
- iSCSI overview
- Virtual and physical iSCSI adapters
- Creating virtual iSCSI adapters
- Connecting to iSCSI storage
- Scanning and rescanning iSCSI SANs
- Performance and redundancy considerations and best practices

Chapter 12 - VMware File System (VMFS)

- VMFS Overview
- Unique file system properties of VMFS
- Managing shared Volumes
- Creating new VMFS partitions
- Managing VMFS capacity with LUN spanning
- Native and 3rd party Multipathing with Fibre and iSCSI SANs
- VMFS performance considerations

Chapter 13 - Resource Management and Resource Pools

- How ESX delivers resources to VMs
- Shares, Reservations and Limits
- CPU resource scheduling
- Memory resource scheduling
- Disk I/O bandwidth management
- Network bandwidth management
- Resource Pools

Chapter 14 – Guided Consolidation

- Use Guided Consolidation to discover, Domains and servers
- Extract hardware profiles from select servers
- Monitor physical server resource consumption
- Select and convert physical servers to VMs

Chapter 15 - VM Hot and Cold Migration, Storage VMotion

- Moving Virtual Machines
- 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 16 – Load Balancing w. Distributed Resource Scheduler

- Delegated resource management with Resource Pools
- Resource balanced clusters with VMware Distributed Resource Scheduler
- DRS Cluster configuration and tuning
- Isolation response and per-VM policy overrides
- Using Distributed Power Management to reduce server power demands

Chapter 17 – Failure Recover with High Availability Clusters

- High Availability options
- Manually take ownership of a VM from a failed server
- VMware High Availability clusters
- VMware Fault Tolerance

Chapter 18 – VMware Fault Tolerance

- Overview of VMware Fault Tolerance
- Creating and monitoring a Fault Tolerant VM
- Use cases for VMware Fault Tolerance

Chapter 19 – VMware Consolidated Back Up

- Pro's and Con's of traditional back up strategies
- Backup and recovery with VMware Consolidated Back Up
- Third party back up solutions
- Backing up the ESX Service Console

Chapter 20 – VMware Data Recovery

- Deploying the VMware Data Recovery virtual appliance
- Creating and running VM back ups using Data Recovery
- Scheduling back ups
- Restoring a VM using Data Recovery

Chapter 21 - Consolidation with vCenter 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
- Performing physical to virtual conversions from Guided Consolidation

Chapter 22 – Effective Performance Monitoring

- VMkernel CPU and memory resource management mechanisms
- Identifying and resolving resource contention
- Monitoring VM and ESX host performance
- Configuring and customizing resource based alarms
- Performance and capacity planning strategies

Chapter 23 – ESX and vCenter Alarms

- VMware Capacity Planner overview
- Finding and monitoring physical workloads
- Reviewing physical server performance data

Chapter 24 – ESX Host Profiles

- Create and refine a new Host Profile template
- Verify host configuration compliance using Host Profiles
- Enforce configuration standards on non-compliant ESX hosts

Chapter 25 - Update Manager

- Overview of ESX patch management
- Create patch baselines
- Scan ESX host for compliance with baselines
- Automatically apply critical patches

Chapter 26 - Securing the ESX Service Console

- Service Console default services
- Locking down enabled services
- Setting custom restrictions on access

Chapter 27 – 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 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 training partner.