VMware vSphere 6.5 with ESXi and vCenter

Course Summary

Description

This powerful 5-day class is an intensive introduction to VMware vSphere including VMware ESX 6.5 and vCenter. This course has been completely rewritten to reflect the most recent changes and improvements introduced in vSphere 6.5. 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 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 and VM cold, hot and storage migration is 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 will be able to design, implement, deploy, configure, monitor, manage, and troubleshoot vSphere 6.5.

Objectives

After taking this course, students 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 including hot-add vCPUs and Memory
- Configure, manage, monitor and secure users and groups
- 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 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

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Course Summary (cont'd)

- Implement a disaster recovery 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

Topics

- Virtualization Infrastructure Overview
- How to Install, Configure ESXi 6.5 (HoL1)
- Virtual and Physical Networking (HoL)
- NAS Shared Storage(HoL)
- Virtual Hardware and Virtual Machines (HoL)
- Install and Deploy the vCenter Server Appliance (HoL)
- VM Rapid Deployment using Templates, Clones (HoL)
- Add and Grow virtual disks (HoL)
- Advanced Virtual Hardware – Hot Plug CPU/Memory (HoL)
- ESXi and vCenter Permission Model (HoL)
- Using Fibre and iSCSI Shared Storage (HoL)
- VMFS – The VMware Cluster File System (HoL)

- ESX and vCenter Alarms (HoL)
- Resource Management and Resource Pools (HoL)
- VM Hot VMotion, Cold Migration, and Storage VMotion (HoL)
- Load Balancing w. Distributed Resource Scheduling Clusters (HoL)
- Failure Recovery with High Availability Clusters (HoL)
- Disaster Preparedness with vSphere Replication (HoL)
- Patch Management with VMware Update Manager (HoL)
- Managing Scalability and Performance (HoL)
- Final Thoughts

Audience

This class is suitable for anyone who wants 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.

Prerequisites

Before taking this course, 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.

Duration

Five days

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Course Outline

I. Virtualization Infrastructure Overview
- A. Virtualization explained
- B. How VMware virtualization compares to traditional PC deployments
- C. Common pain points in PC Server management
- D. How virtualization effectively addresses common IT issues
- E. VMware vSphere software products
- F. What's New and Improved in vSphere 6.5

II. How to Install, Configure ESXi 6.5
- A. Understanding ESXi
- B. Selecting, validating and preparing your server
- C. Storage controllers, disks and partitions
- D. Software installation and best practices
- E. Joining ESXi to a Domain
- F. Local User Management and Policies
- G. First look at the VMware vSphere Host Client

III. Virtual and Physical Networking
- A. vNetwork standard and distributed virtual Switches
- B. Virtual Switches, Ports and Port Groups
- C. Creating VMkernel ports
- D. Creating, sizing and customizing Virtual Switches

IV. Connecting to and Using NAS Shared Storage
- A. Benefits Shared Storage offer to Virtual Infrastructure
- B. Shared Storage options
- C. NFS Overview
- D. Configuring ESX to use NFS Shares
- E. Configuring NFS for performance and redundancy
- F. NFS Use Cases
- G. Troubleshooting NFS connections

V. Virtual Hardware and Virtual Machines
- A. VM virtual hardware, options and limits
- B. Sizing and creating a new VM
- C. Assigning, modifying and removing Virtual Hardware
- D. Working with a VM's BIOS
- E. VMware remote console applications
- F. Installing an OS into a VM
- G. Driver installation and customization
- H. Use and update VMware Host Client

VI. vCenter Server Appliance and Web Client
- A. The need for Identity Source management
- B. Installing and configuring vCenter Server Appliance with embedded Platform Service Controller
- C. Connecting Single Sign On (SSO) to Active Directory and other identity sources
- D. vCenter feature overview and components
- E. Organizing vCenter's inventory views
- F. Importing ESXi hosts into vCenter management
- G. Installing and Using the vSphere Next Generation Web Client

VII. VM Rapid Deployment using Templates, Clones
- A. Templates - Virtual Machine Golden Master images
- B. Creating, modifying, updating and working with Templates
- C. Patching, and refreshing Templates
- D. Cloning, one time copies of VMs
- E. Best practices for cloning and templating
- F. Adding and resizing virtual disks
- G. Hotplug VM virtual CPUs and Memory
- H. Hotplug VM virtual CPUs and Memory

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Course Outline (cont'd)

VIII. ESXi and vCenter Permission Model
A. VMware Security model
B. Configuring local users
C. Managing local permissions
D. vCenter security model
E. Local, Domain and Active Directory users and groups
F. How permissions are applied

IX. Using Fibre and iSCSI Shared Storage
A. Fibre SAN overview
B. Identifying and using Fibre Host Bus Adapters
C. Scanning and Rescanning Fibre SANs
D. iSCSI overview
E. Virtual and physical iSCSI adapters
F. Connecting to iSCSI storage
G. Scanning and rescanning iSCSI SANS
H. Performance and redundancy considerations and best practices
I. Understanding the benefits of VMware VAAI compliant storage

X. VMware File System (VMFS)
A. Unique file system properties of VMFS
B. Managing shared Volumes
C. Creating new VMFS partitions
D. Introduction to VMFS 6 features and capabilities
E. Managing VMFS capacity with LUN spanning and LUN expansion
F. Native and 3rd party Multipathing with Fibre and iSCSI SANs
G. VMFS performance considerations
H. VMFS scalability and reliability

XI. Infrastructure Monitoring with vCenter Alarms
A. Alarm categories and definitions
B. Creating custom alarms and actions
C. Reviewing alarms and acknowledging them
D. Configure vCenter so it can send E-mail and SNMP alerts

E. Work with alarm conditions, triggers and actions
F. Identify most useful alarms to review and enable

XII. Resource Management and Resource Pools
A. Delegate resources in bulk using Resource Pools
B. How ESX delivers resources to VMs
C. Shares, Reservations and Limits
D. CPU resource scheduling
E. Memory resource scheduling
F. Resource Pools

XIII. VMotion Migration, Cold Migration, Storage VMotion
A. Cold Migrations to new ESX hosts, datastores
B. Hot Migrations with VMotion
C. VMotion requirements and dependencies
D. How VMotion works – detailed explanation
E. How to test ESXi hosts and VMs for VMotion compatibility
F. Troubleshooting VMotion
G. Storage VMotion for hot VM disk migrations

XIV. Distributed Resource Scheduling Load Balanced Clusters
A. CPU and Memory resource balanced clusters with VMware Distributed Resource Scheduler
B. Resource balanced clusters with VMware Distributed Resource Scheduler
C. DRS Cluster configuration and tuning
D. Per-VM cluster policy overrides
E. Learn the features and benefits of DRS Power Management

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Course Outline (cont'd)

XV. Failure Recovery with High Availability Clusters
  A. High Availability options to minimize unplanned down time
  B. VMware High Availability clusters
  C. How VMware HA protects against ESXi host, storage network and SAN volume failures
  D. Introduction to VMware Fault Tolerance

XVI. Disaster Preparedness with vSphere Replication
  A. Explain vSphere Replication features and Use Cases
  B. Import the vSphere Replication virtual appliance
  C. Configure vSphere Replication including Recovery Point Objectives (RPOs)
  D. Enable vSphere Replication on a VM
  E. Recover a VM using vSphere Replication

XVII. Patch Management with VMware Update Manager
  A. Configure and enable VMware Update Manager
  B. Establishing a patch baseline
  C. Verifying compliance and patching ESXi hosts

XVIII. Managing Scalability and Performance
  A. VMkernel CPU and memory resource management mechanisms
  B. Tuning VM storage I/O performance
  C. Identifying and resolving resource contention
  D. Monitoring VM and ESX host performance
  E. Performance and capacity planning strategies

XIX. Final Thoughts
  A. Consolidation guidelines for VMs and Storage
  B. Determining which workloads to consolidate
  C. Other considerations