VMware vSphere 5.0 with ESXi and vCenter Boot Camp

This powerful 5-day 10hr/day class is an intensive introduction to VMware vSphere™ 5 including VMware ESX™ 5 and vCenter™. Assuming no prior virtualization experience, this class starts with the basics and rapidly progresses to advanced topics. 40+% of class time is devoted to labs so concepts, skills and best practices are developed and reinforced. 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 and then to use virtualization to deliver clear, tangible benefits. 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 5.0.

Course Objectives:

- Explain the many significant benefits of virtualization
- Install ESXi Server according to best practices
- 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 administer VMware vCenter
- Create virtual machines, install operating systems and applications
- Rapid 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
- Deploy and use VMware Data Recovery to back up and recover VMs
- Create and manager load balanced clusters
- Understand, create and manage high availability clusters to protect against VM service loss caused by ESXi server failures
- Configure and create VMs in Fault Tolerant mode for 100% VM uptime
- Understand how VMware and third party products, including operating systems are impacted by virtualization
- Deploy vCenter in Linked Mode for full management redundancy

Audience: System Architects, security specialists, analysts, back-up and storage administrators.

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. All attendees should have a basic familiarity with PC server hardware, disk partitioning, IP addressing, O/S installation, networking, etc.

Number of Days: 5 days

1 Introduction to vSphere 5.0
- VMware vSphere
- Problems and Opportunities
- Server Resource Utilization
- Server Consolidation
- Datacenter Issues
- OS, Application Imaging
- Back Up & Recovery
- Server Refresh
- Hardware Maintenance
- High Windows OS Costs
- MS Virtualization Calculator
- Disaster Recovery
- Test, Development & QA
- IT Technical Career Benefits
- Virtualization Over Time
- VMware ESXi
- vSphere Hardware Limits
- Small Business Bundles
- vRAM
- VMware vCenter
- Single Host Deployment
- Multiple ESXi w. Shared Storage
- vSphere Private Cloud
- Cloud Computing
- Storage, Server, Network Cloud
- New Features in vSphere 5
- VMSF and SSD

2 VMware ESXi 5.0
- Scalable ESXi Deployment
- Installing ESXi
- Hardware Virtualization Assist
- ESXi 5.0
- ESXi Configuration
- Configure Management Network
- Select Management NIC(s)
- IP, DNS Configuration
- Custom DNS Suffixes
- Network Changes and Test
- ESXi Ready for Service
- Security Warning
- vSphere Client>ESXi Host
- ESXi > Configuration
- User Groups, Host Roles
- Properties
- Sizing ESXi CPU, Memory, Storage, NICs

3 Virtual Networking
- Virtual Hardware
- Virtual and Physical Networking
- ESXi Networking
- Project Plan
- vNetwork Switches
- Standard vSwitches
- Distributed vSwitches
- Physical and Virtual Networking
- Multi-homed Networking
- Port Groups
- vSwitch Properties
- Add Network Wizards
- ESXi Physical NICs
- vSwitch Rules

4 NAS/NFS
- Network Attached Storage / Network File System
- NAS Options
- Network File System
- NAS/NFS Uses
- Defining NFS Shares on Linux
- NFS Share in Storage Roster
- NAS/NFS Trade-offs
- Troubleshooting NFS

5 Virtual Machines
- Virtual Machines & Hardware
- Creating Virtual Machines
- Datastore Browser
- New Virtual Machine Wizard
- Multicore vCPUs
- VM Wizard Memory, Disk
- Snapshot Manager
- Complete the Virtual Machine
- Remote Console
- VMware Tools
- USXi 5.0 Supports USB

Windows Performance Tips
Supported Guest OS

6 vCenter

Central Management w. vCenter
Introduction to vCenter
Licensed Add-On Features
vCenter Deployment
Supported Databases
MS SQL Express
vCenter is a Management Proxy
Database Size Estimates
Install/Select Database
vCenter uses a Java VM
vSphere Client Plug-ins
Restart vCenter
Home View
Organizing Inventory
Folders in Datacenters
VMs run on Clusters
Resource Maps
Licensing
vCenter Power Management
Power Mgt. uses Wake on LAN
VM Actions
Web Access

7 Templates, Clones

VM Rapid Deployment
Template Theory
Template Benefits
Disk Formats
Creating a New Template
Clone a VM
Clone a Template
Windows VM Customization
Non-Windows OS Customization
Virtual Appliance / Pros and Cons
Import/ Export Virtual Appliances
Adding Virtual Hardware
All VMs Support Simple Changes
Hot Add Virtual Disk
Hot Grow Disks

7.1 Advanced Virtual Hardware

VM Customizations
To Change vCPU Properties
Hotplug Hardware
Converting Virtual Disks
Raw Device Map (RDM)
Microsoft Cluster Services

8 Permissions

Permission Privileges, Roles, Users
Determining Permissions
Privilege Hierarchy
Role Assignments
vCenter Users, Groups
View vCenter Base Permissions
ESXi Users, Groups
Permissions

9 Shared Storage

Fibre Storage Area Networks
World Wide Names
Hardware Paths
iSCSI
LUN Discovery Options
CHAP Authentication Process
Troubleshooting iSCSI
Storage Views
vSphere Storage Appliance

10 VMware File System

VMFS 5.0 Features
Building a VMFS
New VMFS
Create/Grow a LUN Span
To Add an Extent
Grow Volumes
Multipathing
iSCSI SAN Multipathing
Pluggable Storage Architecture

11 Alarms

Performance Alarms
vCenter Alarms
ESXi Host Alarms
Alarm Reporting
Triggered vCenter Alarms
Custom Alarms
Alarm Best Practices

12 Host Profiles

Managing ESXi Host Configuration
Host Profiles
Edit, Review, Attach a Profile
Perform Compliance Check

13 Resource Management & Resource Pools
Resource Administration
CPU Resource Tunables
Dynamic Memory Balancing
Memory Resources Tunables
Shares
Expandable Reservations
Resource Pools
Memory/Storage Resource Allocations
Virtual Hardware Resources

14 Second Chapter Title
VMware vCenter Converter
Clone & Update Disks
Converter Steps
Prepare for Conversion
Clone Physical Disk(s)
Copy & Resize Disk
Create the New Virtual Machine
VM Reconfiguration
New VM Housekeeping

15 Data Recovery
VM Backup Challenge
Traditional Network Backup
Reduce Backup Stress
ESXi Configuration Back Up
Data Recovery
VMDR Web UI
Creating a Backup Job
Backup Reports

16 VM Migration
Virtual Machine Migration
Cold Migration
VMotion Migration
VMotion Requirements
Progress is Monitored
VM is Descheduled
VM Context is Transferred
Switch Over
VM Scheduled to Run
Housekeeping
Failed Validation
Compatibility
Storage VMotion
Adopting DRS

17 DRS
Distributed Resource Scheduler
DRS Functions
DRS Automation Level
Migration Threshold
Power Management
EVC for Intel CPUs
EVC Benefits
DRS Groups Manager
Resource Management
Adopting DRS
HA and DRS

17.1 Power Management
DRS Power Management
Power Management Requirements
PM Powering Off /On an ESXi Host
Configure ESXi for Power Mgt
Power Standby
CPU Power Management

18 VMware HA
VMware High Availability Clusters
HA VM Requirements
VMware HA Host Failures
HA Reserve Resources
VM Monitoring
HA Cluster Slots
ESXI Console NIC Failure
Maintenance Mode
Resolving HA Problems
HA and DRS

18.1 VMWare FT
VMware Fault Tolerance
FT Use Cases
FT VM Requirements
Enable FT on a VM
FT Impact on VM Memory
Testing Fault Tolerance
VMware FT Recommendations

19 Update Manager
VMware Update Manager
Patch Management
VUM Components
Install, Enable & Configure VUM
Patch Baselines
Scan for Compliance
VUM & DRS Clusters

20 Performance

Performance Analysis & Tuning
ESXi CPU Usage Strategy
Physical to Virtual CPU
Memory Ballooning
Ballooning vs. VMkernel Swap
Performance Charts
Monitoring Memory Stress
Page Faults in Task Manager
VM CPU, Memory Consumption

21 Linked Mode

Sizing vCenter – CPU, RAM, Disk
vCenter Windows Server
Join a Windows Domain
Isolated or Linked Mode
Joining a Linked Mode Group
Authentication Best Practice
Troubleshooting Linked Mode
Cloning vCenter Servers

22 Advanced Networking

Advanced Virtual Networking
Distributed vSwitches
Building a New dvSwitch
Physical Adapter Details
Migrate VMs to dvPort Groups
DvSwitch Port Assignments
Management, VMkernel Ports
Manage Physical/Virtual Adapters
DvSwitch Properties
Port Group Security
Traffic Shaping
NIC Team Settings
Originating Port Forwarding
IP Hash Forwarding
Physical NIC Load Forwarding
Active and Standby NICs
Network Failure
Resilient Network Configuration
Standard vSwitch VLANs
VLANs & VLAN Trunking
Private VLans