VMware vSphere with ESXi and vCenter

This powerful 5-day class is an intense introduction to virtualization using VMware's vSphere™ 5.5 including VMware ESX™ 5.5 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.

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 5.5.

Course Objectives:

- 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
- Install, configure and administer VMware vCenter
- Rapid deployment of VMs using golden-master templates
- Perform VM cold and hot migrations
- Deploy and use VMware Data Recovery to back up and recover VMs
- Create and manage load balanced clusters
- Monitor and tune both ESXi and virtual machine performance
- Patch and update ESXi servers using vCenter Update Manager
- Replicate critical VMs to protect against data and service loss
- Understand how VMware and third party products, including operating systems are impacted by virtualization

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 5.5

VMware vSphere
Server Resource Utilization
Server Consolidation
Datacenter Issues
OS, Application Imaging
Hardware Maintenance
Windows Licensing for VMs
Windows Server 2012
Disaster Recovery

Test, Development & QA
Virtualization Over Time
VMware vSphere 5.5 Editions
vSphere Acceleration Kits
VMware Service & Support (SnS)
VMware ESXi
Multiple ESXi w. Shared Storage
vSphere Private Cloud
Storage Cloud
What's New in vSphere

2 VMware ESXi
Stand Alone ESXi
Scaling Up Networks, Storage
Installing ESXi
Performing an In-Place Upgrade
ESXi 5.5 DCUI
ESXi Configuration & Settings
Configure Management Network
IPV4 & DNS Configuration
Apply Network Changes
ESXi Ready for Service
Security Warning
ESXi Host Roles
Licensed Features in ESXi 5.5

3 Virtual Networking
Virtual to Physical Networking
Teamed Networking
Multi-homed Networking
vSwitch Properties
ESXi Physical NICs
vSwitch Rules

4 NAS/NFS
Network Attached Storage
Network File System
NAS Components
Define NFS Shares
NFS Share in Storage Roster
NAS/NFS Trade-offs
Troubleshooting NFS

5 Virtual Machines
Virtual Hardware
Take Ownership of a VM
New Virtual Machine Wizard
VM Wizard – Virtual CPUs
Snapshot Manager
Complete the Virtual Machine
Remote Console
VMware Tools
USB Virtual Device Support
Windows Performance Tips
Supported Guest OS

6 vCenter
Central Management w. vCenter
vCenter is a Management Proxy
vCenter for Windows
vCenter Server Appliance (vCSA)
vCenter Server
Inventory Service
vCenter Simple Install
vCenter for Databases
Install vCenter for Windows
vCenter Windows Services
Configuring vCSA IP Properties
VMs run on Clusters
Adding Licenses to vCenter
Web Client
Migrating a VM
vSphere Clients
vCenter Limits

7 Templates, Clones
Template Theory
Template Benefits
Templates
Disk Formats
Creating a New Template
Template Properties
VM Cloning
Clone a Template
Template Maintenance
Windows VM Customization
Non-Windows OS Customization
Virtual Machines / Pros and Cons
Import/ Export Virtual Appliances
CPU to vCPU Virtualization
Windows 7 Basic 3D Video
Adding Virtual Hardware
All VMs Support Simple Changes
Hot Add Virtual Hardware
Hot Grow Disks

8 Permissions
Permission Privileges and Roles
Determining Permissions

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Determining Permissions
Role Assignments
Work with Roles
vCenter Users, Groups
vCenter Base Permissions
ESXi Users, Groups
View ESXi Permissions
9 Shared Storage
Fibre Storage Area Networks
Fibre Switched Fabric Topology
Hardware Paths
iSCSI, Capabilities, Motivation
LUN Discovery Options
iSCSI Hardware & Software Initiators
Challenge Authentication Protocol
CHAP Authentication Process
Scan iSCSI SAN
New iSCSI LUNs
iSCSI Trade-offs
Storage Properties, Views, Reports
ESXi 5.5 Boot from SAN
10 VMware File System
VMFS 5 Features
Building a VMFS
Properties and Formatting
New VMFS
VMFS Capacity Management
LUN Span – Before/After
Grow VMFS into Free Space
Multipathing
iSCSI SAN Multipathing
Pluggable Storage Architecture
11 Alarms
Performance Alarms
vCenter Alarms
Alarm Settings
ESXi Host Alarms
Virtual Machine Alarms
Alarm Reporting
Default Alarm Definitions
Set Local Mail Server Properties
Change Custom Alarms
Alarm Best Practices
12 Resource Pools
Resource Administration
VM CPU Resource Tunables
Dynamic Memory Balancing
Resource Shares
Resource Pools
Expandable Reservations
Auto-Update Resource Pools
Resource Allocations
13 Converter
Converter Import Source Options
What's New in Converter 5.5
Clone & Update Disks
Install and Enable Converter
Launch Converter Enterprise
Specify New VM Location
Clone Physical Disk(s)
Copying Disk Volumes
Create the New Virtual Machine
VM Reconfiguration
Converter Housekeeping
New VM Housekeeping
Converter Caveats
Conversion in Progress
14 VM Migration
Virtual Machine Migration
Cold Migration
VMotion Migration, Benefits, Requirements
Progress is Monitored
VM Descheduled
Switch Over
VM Scheduled to Run
Housekeeping
Validation
Host and CPU Compatibility
Storage VMotion
15 DRS
Distributed Resource Scheduler
DRS Clusters / Functions
DRS Automation Level
Migration Threshold
Power Management
EVC and AMD CPUs
EVC Benefits
Affinity, Anti-Affinity Rules
DRS Groups Manager
Resource Management
Adopting DRS

16 VMware HA
High Availability Clusters
VMware HA Host Failures
Admission Control
HA Cluster Heartbeat
Datastore Heartbeat
HA Restart Priority
VM Monitoring
Maintenance Mode
Resolving HA Problems
HA and DRS
Isolation Response
VMware Fault Tolerance

17 Host Profiles
Managing ESXi Host Configuration
Host Profiles
Attaching Host Profiles
Host Benefits, Tasks, Contents
Bringing a Host into Compliance
Guest OS Compliance?

18 vSphere Replications
VM Synchronization
VM Replication Policies
Replicated VM
vSphere Client Integration Plug-in
Select Replication Server
Advanced Disk Configuration
vSphere Replication > Manage
Recovering a VM

19 Update Manager
VMware Update Manager
Patch Management
Install VUM
VUM Storage
Configure VUM
Patch Download Settings and Schedule
Stock Patch Baselines
Selected Patches
VUM and DRS Clusters

20 Performance
Performance Analysis & Tuning
ESXi CPU Usage Strategy
Active VM CPU Scheduling
Physical to Virtual CPU
Sequential vs Concurrent Tasks
Physical & VM Memory
Transparent Page Sharing
Memory Ballooning
Ballooning vs. VMkernel Swap
VMkernel Native Drivers
ESXi and SSDs
Performance Charts
Performance Problems
CPU Ready Time
Monitoring Memory Stress
Page Faults
Memory Consumption

21 Final Thoughts
What to Virtualize
CPU Storage and Network Considerations
Server Capacity Management
Delivering High Availability
Virtualization Security Issues

22 Appendix 1 – Definitions & Acronyms