

## vSphere Configuration and Management (4 Days)

The vSphere Configuration and Management class will provide the administrators who are new to virtualization and those who have experience with virtualization with a solid understanding of VMware virtualization. The student will have plenty of opportunity to install and configure the various features of vSphere. The class is approximately 50% lecture and 50% demo and lab. The class will show most of the new features of vSphere while still teaching the critical pieces of VMware virtualization that are not new to the current version of vSphere. There is no expected history of virtualization experience or training for the students. Experience with networks and various operating systems will be very beneficial.

### Course Outline

- I. Introduction
- II. What is virtualization?
  - a. VMware products
    - i. ESX/ESXi
    - ii. VMware Server
    - iii. VMware Player
    - iv. VMware Workstation
      1. Demo VMware Workstation – Create VM for ESX
  - b. Other virtualization products
    - i. Microsoft
      1. Hyper-V
      2. Virtual Server
      3. Virtual PC
    - ii. Xen
    - iii. Linux
  - c. Virtualization on top of general purpose O/S
  - d. Virtualization as the operating system
- III. Installation and Configuration of ESX/ESXi
  - a. VMware's Enterprise Product Line
    - i. ESX
    - ii. ESXi
    - iii. vCenter
    - iv. vSphere Client
    - v. vSphere Web Client
  - b. ESXi
    - i. Hardware supported
    - ii. Min/Max
    - iii. Install ESXi
      1. Demo
    - iv. Direct Console User Interface

- v. Management
      - 1. vSphere Client
      - 2. vSphere CLI
      - 3. Demo vSphere Client and Direct Console User Interface
  - c. Virtualization Layer
    - i. VMkernel
  - d. Physical Hardware
  - e. What is a Virtual Machine?
    - i. 4 Core resources
      - 1. Disk
      - 2. NIC
      - 3. Memory
      - 4. Processor
    - ii. Other virtual hardware
  - f. ESXi Virtual machines
    - i. Files
    - ii. Demo – create VM on ESXi
  - g. Best Practices
- IV. vCenter
  - a. Management Suite
  - b. SSO
  - c. Added functionality
    - i. Templates
    - ii. DRS
    - iii. DPM
    - iv. HA
    - v. Management of Multiple ESXi hosts
    - vi. Distributed vSwitch
  - d. Installation
    - i. SQL – local or remote?
    - ii. PostgreSQL?
    - iii. As a VM?
  - e. Join ESXi hosts
    - i. Demo
  - f. vSphere Web Client
  - g. Best Practices
- V. Networking
  - a. Standard vSwitch
    - i. Port Groups
      - 1. VMkernel
        - a. vMotion
        - b. iSCSI
        - c. NFS
        - d. Used by ESXi for management
      - 2. VMnets
        - a. Private virtual switch
        - b. NAT
      - 3. VLAN

- 4. Security
      - 5. Bandwidth shaping
    - ii. Physical NIC
      - 1. Uplink
      - 2. NIC teaming
    - iii. Virtual NIC
    - iv. Demo
  - b. Distributed vSwitch
    - i. Advantages
      - 1. Single ARP table
      - 2. Single view of all ports
      - 3. Ease of configuration with multiple ESX hosts
    - ii. Owned and Managed by vCenter
    - iii. Demo
  - c. Best Practices
- VI. Shared and Local Storage
  - a. Local
    - i. SCSI
    - ii. SATA
    - iii. IDE
    - iv. RAID
  - b. Shared
    - i. NFS
      - 1. RO
      - 2. RW
    - ii. iSCSI
      - 1. 1Gb
      - 2. 10Gb
      - 3. Hardware vs Software Initiator
    - iii. Fibre Channel
      - 1. Hardware – purpose built
      - 2. 2 Gb
      - 3. 4 Gb
    - iv. FCOE
    - v. Multipathing
  - c. Best practices
    - i. iSCSI
    - ii. NFS
      - 1. Use 10 GE if possible
      - 2. Configure NIC teaming
      - 3. Use NFS for ISO files and templates
    - iii. Fibre Channel
      - 1. Use 4 Gb
      - 2. Configure Multipathing
      - 3. FC provides highest performance
- VII. Rapid VM Creation and Deployment
  - a. Why not sysprep alone?
  - b. Templates

- i. Clone VM to Template
    - ii. Convert VM to Template
  - c. Deploy VM from Template
  - d. Demo Convert to Template and Deploy from Template
  - e. Snapshots and snapshot management
  - f. Best Practices
- VIII. Physical to Virtual (P2V)
  - a. Guided Consolidation
  - b. P2V
    - i. Demo
  - c. V2V
    - i. Demo
- IX. Access Control
  - a. AD Domain Admin and local admin have full control by default
  - b. RBAC
  - c. Default Roles
  - d. Custom Roles
  - e. Create Microsoft user and Group accounts and attach to VMware Role
  - f. Demo
  - g. Best Practices
- X. Resource Allocation
  - a. Core Resources
  - b. Limits
  - c. Shares
  - d. Reservations
  - e. Resource Management
  - f. Resource Pools
- XI. Resource Monitoring
  - a. Resource tabs using VIC
  - b. SSH (using putty)
    - i. top
    - ii. esxtop
  - c. Demo from vSphere Client and SSH
  - d. Best Practices
- XII. Scalability
  - a. vMotion
    - i. demo
  - b. DRS
    - i. demo
  - c. Best Practices
- XIII. High Availability and Data Protection
  - a. HA
    - i. demo
  - b. Data Protection
  - c. Multiple vCenter configuration
    - i. demo