



**Title:** VMware vSphere™ 6.X Advanced Infrastructure Deployment (AID)

**Summary:** Class formats available:

- Online Learning (OLL)
- Live In-Classroom Training (LICT)
- Mixed class with Classroom and Online Instruction (OLL ICT mixed learning)
- Private / Onsite

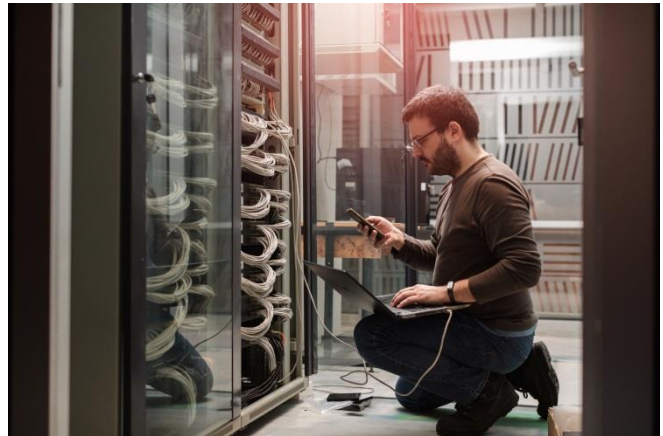
**Length:** 4 Days (30 hours of instruction)

**Compatibility:** This class is based on VMware vSphere 6.7 and fully compatible with vSphere 6.5 and 6.0

**Overview:** VMware vSphere™ 6.X Advanced Infrastructure Deployment (AID) is a perfect class for administrators that already have VMware vSphere experience, but would like to **improve their skills**, knowledge, and diagnostic abilities!

In the days of the vSphere Web Client, **command-line skills are rapidly becoming a must-have for vSphere Administrators!** We supplement use of the vSphere HTML5 Client by teaching commands and command-line utilities like the VMware vSphere CLI, SSH, and PowerShell.

For 2019 we have a 100% new book, including an exclusive section on advanced VMFS Volume management, diagnostics and recovery that you will not find in any other vSphere class!



Exclusive to **VMware vSphere™ 6.X Advanced Infrastructure Deployment (AID):**

- **ESXi Diagnostic Consoles** (find out what's wrong, FAST!!!)
- **Advanced VMFS Volume diagnostic and recovery**
- **VMware On-disk Metadata Analyzer (VOMA)**
- **Real-world Command Line techniques and usage**
- **Script library for ESXi and VCSA**

Our **VMware vSphere™ 6.X Advanced Infrastructure Deployment (AID)** features over 60 interactive Step-By-Step Labs (SBS LAB™), complete with detailed instructions and full-color screenshots of all steps. What makes our approach so unique is that every participant builds an **actual datacenter environment on real servers**, from beginning to end. Most importantly, we use the same procedures, in the same order, as they would be implemented **in your own datacenter!**

- Custom SBS labs available to supplement and enhance training
- Use your classroom IaaS resources for at least one week after class for testing and practice
- Our instructors are real-world consultants that will personally tell you all of the latest news and trends
- Keep up with the latest in emerging vSphere critical knowledge



- Objectives:**
- **Evaluate and harden ESXi hypervisor security**, firewall, SSH access and vSphere Active Directory
  - Redirect **ESXi system logging & scratch partitions**
  - Understand and use **esxcli** ESXi Host configuration command set
  - Understand and use **vim-cmd** ESXi Host and Virtual Machine management command set
  - Understand and use **vmkfstools** VMFS Volume and Virtual disk command set
  - Backup and restore ESXi configuration with: **vicfg-cfgbackup.pl**
  - Check and fix VMFS filesystem using: **vSphere On-disk Metadata Analyzer (VOMA)**
  - **Advanced VMFS Volume diagnostic and recovery**
  - Install and configure **VMware vCenter Server Appliance (VCSA)**
  - Install and configure **VMware vRealize Operations Manager (vROM)**
  - Create **vNetwork Distributed Switches (vDS)**
  - Configure and test Jumbo Frames the right way for iSCSI
  - Understand and apply VMware vSphere Path Selection Policy (PSP): **VMware fixed, Round Robin, Most Recently Used**
  - vSphere access control with **Roles, Privileges and Permissions**
  - Advanced Cluster Configuration for **HA and DRS**
  - Implement VMkernel with **vMotion TCP/IP Stack**
  - Implement **Distributed Resource Scheduling (DRS)** and **Storage Distributed Resource Scheduling (sDRS)**
  - Implement **High Availability (HA)**
  - Manage resources with **Resource Pools**
  - Utilize and integrate 3rd Party Tools into the datacenter environment
  - Command line management of vSphere
  - Monitor performance using advanced tools and commands

**Each objective will be reinforced with over 80 hands-on Step-by-Step Labs (SBS LABs)!**

**Who should attend?** Administrators who are responsible for a VMware vSphere™ environment.

**Prerequisites:** The **VMware® vSphere™ 6 Advanced Infrastructure Deployment (AID)** is intended for IT professionals **experienced with Windows Server and TCP/IP Networking** as well as some Windows or Linux Command Line use.

- Outline:**
- Module 1.** Introduction
    - 1.1. What you will find in this book
    - 1.2. Our equipment
  - Module 2.** Grounds for Virtualization and Cloud Computing
    - 2.1. Public, Private and Hybrid Clouds
    - 2.2. Virtualization defined
    - 2.3. What's in it for me?
    - 2.4. What is a hypervisor?
    - 2.5. Hypervisor Classifications
    - 2.6. Comparison of production hypervisors
  - Module 3.** VMware® vSphere™
    - 3.1. What is VMware® vSphere™?
    - 3.2. VMware® vSphere™ Components
    - 3.3. What's new in VMware® vSphere™
  - Module 4.** Managing ESXi



- SBS LAB 1.** Accessing your server with IPMI Remote Console
- SBS LAB 2.** Using ESXi Diagnostic Consoles
- SBS LAB 3.** Initial configuration using the DCUI (Console)
- SBS LAB 4.** Accessing the ESXi **HTML5 Embedded Host Client**

**Module 5.** Time in a vSphere Environment

- 5.1.** NTP (Linux) Time
- 5.2.** Windows Time
  - SBS LAB 5.** ESXi and NTP

**Module 6.** Active Directory and ESXi / vSphere

- SBS LAB 6.** Joining ESXi to Active Directory

**Module 7.** Command Line Administration of ESXi

- SBS LAB 7.** When is SSH appropriate – use cases
- SBS LAB 8.** Remote command line with Putty and SSH
- SBS LAB 9.** Validating ESXi Host configurations at the command line with SSH
- SBS LAB 10.** Validating Time configuration on your ESXi Host
- 7.2.** The ESXCLI Command Set
  - SBS LAB 11.** Run three commands with ESXCLI
- 7.3.** The vim-cmd Command Set
  - SBS LAB 12.** Using vim-cmd
  - SBS LAB 13.** Command Line patching of ESXi host with: esxcli and vim-cmd
- 7.4.** The vSphere Command Line Interface (vCLI)
  - SBS LAB 14.** Installing the via
  - SBS LAB 15.** Running commands with the via
- 7.5.** SAN Jumpstart
  - SBS LAB 16.** SAN Jumpstart
- 7.6.** Final Preparation of a diskless ESXi installation
  - SBS LAB 17.** Relocating ESXi log files to persistent storage
  - SBS LAB 18.** Advanced Logging Behavior
  - SBS LAB 19.** Redirecting the ESXi scratch partition

**Module 8.** Virtual Machines

- 8.1.** The Virtual Machine Remote Console
- 8.2.** Virtual Machine Best Practices
- 8.3.** Windows VMs
  - SBS LAB 20.** Windows Server 2016
  - SBS LAB 21.** VMware tools for Windows Server 2016
- 8.4.** Linux Virtual Machines
  - SBS LAB 22.** CentOS 7 server (RHEL Compatible)
  - SBS LAB 23.** Open-VM Tools
- 8.5.** Virtual Appliances
  - SBS LAB 24.** CentOS 7 Desktop Virtual Appliance deployment
  - SBS LAB 25.** Export/Create Virtual Appliance from Linux VM
- 8.6.** Virtual Machine File Types
  - SBS LAB 26.** Virtual machine Files and Folders
  - SBS LAB 27.** Files and Folders using Putty
- 8.7.** Managing Virtual Machine Disks - vmkfstools command
  - SBS LAB 28.** Using vmkfstools
- 8.8.** VM Configuration Parameters
  - SBS LAB 29.** Typematic Resolution



- 8.9. Timekeeping in Virtual Machines
  - SBS LAB 30. Disable Timekeeping for Windows Server VM
- 8.10. Understanding Snapshots
  - SBS LAB 31. Creating, Deleting, and Consolidating Snapshots

## Module 9. vCenter Server

- 9.1. vCenter Server Appliance (vCSA)
  - SBS LAB 32. Installing the vCSA
  - SBS LAB 33. Downloading log file bundles
  - SBS LAB 34. Connecting via SSH
- 9.2. vCenter Consoles, Clients and connections
  - SBS LAB 35. SSH Connection to vCenter
  - SBS LAB 36. Virtual Appliance Management Interface (VAMI) Web console
  - SBS LAB 37. Backing up the VCSA with VAMI
  - SBS LAB 38. vCenter Server HTML5 Web Client - supported for production use
  - SBS LAB 39. vCenter Server Flex Client – required for VUM

## Module 10. vSphere Management With vCenter Server

- SBS LAB 40. Adding AD as LDAP ID Source
- SBS LAB 41. Initial Global Permission assignment
- SBS LAB 42. Adding ESXi server(s)
- SBS LAB 43. Licensing
- SBS LAB 44. Disabling SSH alarm
- SBS LAB 45. Configuring vCenter to send and receive email
- 10.2. Scheduled Tasks
  - SBS LAB 46. Scheduled Tasks
- 10.3. Alarms
  - SBS LAB 47. Creating an Alarm for one Inventory Item
  - SBS LAB 48. Creating an Alarm for the whole environment

## Module 11. Virtual Networking

- 11.1. 802.2 Networking Terms
- 11.2. Virtual Switches
  - SBS LAB 49. Create a VMware Standard Virtual Switch (vSS)
- 11.3. Port Groups and VLANs
  - SBS LAB 50. Create a Port Group using VLANs
- 11.4. Best Practices Network Configuration
  - SBS LAB 51. Add physical NICs and create redundancy
  - SBS LAB 52. Create separate network for non-management VMs (production)
- 11.5. Standard vSwitch Properties
  - SBS LAB 53. Security policy
  - SBS LAB 54. Set Load Balancing
  - SBS LAB 55. Set Failover Policy
- 11.6. vNetwork Distributed Switches (vDS)
  - SBS LAB 56. Create a vDS and Port Group
  - SBS LAB 57. Migrate VMs to vDS
  - SBS LAB 58. Add Port Group to vDS
  - SBS LAB 59. vDS Security, Traffic Shaping, and Load Balancing
  - SBS LAB 60. Migrate VMs from a vDS to vSS
  - SBS LAB 61. Remove vDS

## Module 12. The VMkernel port group



- 12.1. What is a VMkernel in reality?
- 12.2. Properties of the VMkernel
  - SBS LAB 62. Create Redundant iSCSI Network Connections
  - SBS LAB 63. Set vSwitch Load Balancing for compliance with vSphere Port Binding requirements

**Module 13.** vSphere Storage

- 13.1. Terms
- 13.2. Redundant Array of Independent Disks (RAID)
- 13.3. Local Storage
- 13.4. Virtual SAN (HP VSA, VSA)
- 13.5. Network Attached Storage (NAS)
  - SBS LAB 64. Add NFS Share
- 13.6. SAN Storage
- 13.7. Presenting Block Storage to vSphere
  - SBS LAB 65. Add iSCSI SAN Storage Adapter
  - SBS LAB 66. Set Port Binding for iSCSI
- 13.8. Understanding the VMFS File System versions 5 and 6
  - SBS LAB 67. Formatting a LUN as VMFS 6
  - SBS LAB 68. Setting the Path Selection Policy (PSP) for one LUN (GUI)
  - SBS LAB 69. Setting the default Path Selection Policy (PSP) for all LUNs (CLI)
  - SBS LAB 70. Changing the Threshold for Round Robin (CLI)

**Module 14.** Advanced VMFS Diagnostics, recovery and Volume Management

- 14.1. vSphere On-disk Metadata Analyzer
  - SBS LAB 71. Check and fix VMFS filesystem using: **vSphere On-disk Metadata Analyzer (VOMA)**
- 14.2. Command Line volume and disk management with vmkfstools
  - SBS LAB 72. Clone a disk with vmkfstools
  - SBS LAB 73. Inflating a Virtual disk to Eager Zeroed with vmkfstools
  - SBS LAB 74. Locate a locked Virtual Disk with vmkfstools
  - SBS LAB 75. Unlock a Virtual Disk with vmkfstools
- 14.3. Recreate damaged VMFS Volume with partedUtil
  - SBS LAB 76. Recreate a corrupted VMFS Volume (partition) with partedUtil

**Module 15.** VMware HA and DRS Clusters

- 15.1. VMware vSphere Clusters overview
- 15.2. VMware vSphere Distributed Resource Scheduler (DRS)
- 15.3. VMware vSphere High Availability (HA)
- 15.4. vMotion and Fault Tolerance (FT)
- 15.5. vMotion
  - SBS LAB 77. Create VMkernel interface for vMotion
  - SBS LAB 78. Join Class data center
  - SBS LAB 79. Test vMotion
- 15.6. Cluster Management
  - SBS LAB 80. Create HA and DRS cluster
  - SBS LAB 81. Advanced cluster parameters
  - SBS LAB 82. vMotion Troubleshooting
  - SBS LAB 83. Diagnose vMotion Network Errors
  - SBS LAB 84. HA Troubleshooting
  - SBS LAB 85. HA Slot Calculations

**Module 16.** Advanced vSphere Permissions, Cloud Computing and Resource Pools



- 16.1. Understanding vSphere Roles and Privileges
  - SBS LAB 86.** Create a vSphere Role for users/groups
- 16.2. Understanding Resource Pools
  - SBS LAB 87.** Create Resource Pool(s)
- 16.3. Understanding vSphere Permissions
  - SBS LAB 88.** Apply vSphere user-defined Role to a Resource Pool
  - SBS LAB 89.** Apply vSphere user-defined Role to a vNetwork (Port Group)
  - SBS LAB 90.** Apply vSphere user-defined Role to a Storage Volume

**Module 17.** Resource Management

- 17.1. Shares, Reservations, and Limits
  - SBS LAB 91.** Test Shares, Reservations and limits using CPU Busy
- 17.2. Using esxtop
  - SBS LAB 92.** Run esxtop to monitor performance
  - SBS LAB 93.** Gather esxtop results for a period of time
- 17.3. Performance Charts and Monitoring
  - SBS LAB 94.** Using Performance Charts

**Module 18.** Appendix A – Useful Tools

**Module 19.** Appendix B– Terms

**Module 20.** Appendix C – VI Cheat Sheet

**Module 21.** Appendix D – List of Available Command Structures

**Module 22.** Appendix E – VMware High Availability Advanced Options

**Module 23.** Appendix F – VMware DRS Advanced Options

**Module 24.** Appendix G– Joining the vCenter Server Appliance to an AD Domain

**Module 25.** Appendix H– Shortcuts to Microsoft Console Commands

**Module 26.** Appendix I– Valid NTP Servers