



Title: VMware vSphere™ 6.7 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

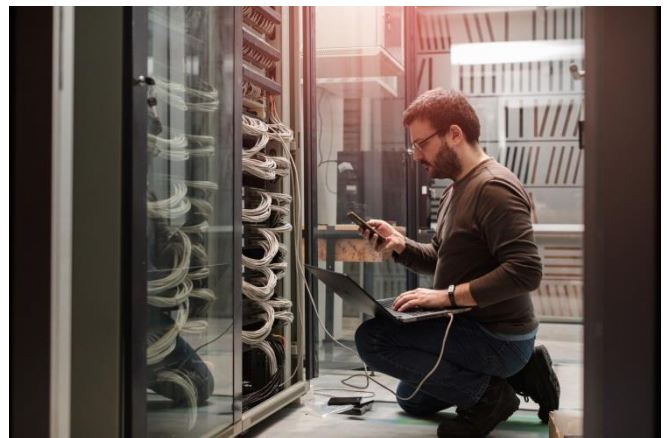
Why choose this class? Our instructors are working consultants whose job is managing VMware Infrastructures from 3 to 300 Hosts. You will benefit from the same skills and knowledge that the instructor has applied to mission-critical systems for the Fortune 500, Government and companies just like yours!

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!** Your book is your manual for successful VMware vSphere administration!

Overview: VMware vSphere™ 6.7 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™ 6.7 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.** vCenter Server HTML5 Web Client - supported for production use
 - SBS LAB 37.** vCenter Server Flex Client – required for VUM
- 9.3.** Virtual Appliance Management Interface (VAMI) Web console
 - SBS LAB 38.** Backing up the vCSA with VAMI
 - SBS LAB 39.** Password Policy for the VMware vCenter Server Appliance Operating System

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

Module 11. Virtual Networking

- 11.1.** 802.2 Networking Terms
- 11.2.** Virtual Switches
 - SBS LAB 46.** Create a VMware Standard Virtual Switch (vSS)
- 11.3.** Port Groups and VLANs
 - SBS LAB 47.** Create a Port Group using VLANs
- 11.4.** Best Practices Network Configuration
 - SBS LAB 48.** Add physical NICs and create redundancy
 - SBS LAB 49.** Create separate network for non-management VMs (production)
- 11.5.** Standard vSwitch Properties
 - SBS LAB 50.** Security policy
 - SBS LAB 51.** Set Load Balancing
 - SBS LAB 52.** Set Failover Policy
- 11.6.** vNetwork Distributed Switches (vDS)
 - SBS LAB 53.** Create a vDS and Port Group
 - SBS LAB 54.** Migrate VMs to vDS
 - SBS LAB 55.** Add Port Group to vDS



- SBS LAB 56.** vDS Security, Traffic Shaping, and Load Balancing
- SBS LAB 57.** Migrate VMs from a vDS to vSS
- SBS LAB 58.** Remove vDS

Module 12. The VMkernel port group

- 12.1.** What is a VMkernel in reality?
- 12.2.** Properties of the VMkernel
 - SBS LAB 59.** Create Redundant iSCSI Network Connections
 - SBS LAB 60.** 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 61.** Add NFS Share
- 13.6.** SAN Storage
- 13.7.** Presenting Block Storage to vSphere
 - SBS LAB 62.** Add iSCSI SAN Storage Adapter
 - SBS LAB 63.** Set Port Binding for iSCSI
- 13.8.** Understanding the VMFS File System versions 5 and 6
 - SBS LAB 64.** Formatting a LUN as VMFS 6
 - SBS LAB 65.** Setting the Path Selection Policy (PSP) for one LUN (GUI)
 - SBS LAB 66.** Setting the default Path Selection Policy (PSP) for all LUNs (CLI)
 - SBS LAB 67.** 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 68.** Check and fix VMFS filesystem using: **vSphere On-disk Metadata Analyzer (VOMA)**
- 14.2.** Command Line volume and disk management with vmkfstools
 - SBS LAB 69.** Clone a disk with vmkfstools
 - SBS LAB 70.** Inflating a Virtual disk to Eager Zeroed with vmkfstools
 - SBS LAB 71.** Locate a locked Virtual Disk with vmkfstools
 - SBS LAB 72.** Unlock a Virtual Disk with vmkfstools
- 14.3.** Recreate damaged VMFS Volume with partedUtil
 - SBS LAB 73.** 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 74.** Create VMkernel interface for vMotion
 - SBS LAB 75.** Join Class data center
 - SBS LAB 76.** Test vMotion
- 15.6.** Cluster Management
 - SBS LAB 77.** Create HA and DRS cluster
 - SBS LAB 78.** Advanced cluster parameters



- SBS LAB 79.** vMotion Troubleshooting
- SBS LAB 80.** Diagnose vMotion Network Errors
- SBS LAB 81.** HA Troubleshooting
- SBS LAB 82.** HA Slot Calculations

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

- 16.1.** Understanding vSphere Roles and Privileges
 - SBS LAB 83.** Create a vSphere Role for users/groups
- 16.2.** Understanding Resource Pools
 - SBS LAB 84.** Create Resource Pool(s)
- 16.3.** Understanding vSphere Permissions
 - SBS LAB 85.** Apply vSphere user-defined Role to a Resource Pool
 - SBS LAB 86.** Apply vSphere user-defined Role to a vNetwork (Port Group)
 - SBS LAB 87.** Apply vSphere user-defined Role to a Storage Volume

Module 17. Resource Management

- 17.1.** Shares, Reservations, and Limits
 - SBS LAB 88.** Test Shares, Reservations and limits using CPU Busy
- 17.2.** Using esxtop
 - SBS LAB 89.** Run esxtop to monitor performance
 - SBS LAB 90.** Gather esxtop results for a period of time
- 17.3.** Performance Charts and Monitoring
 - SBS LAB 91.** 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