

**Course 543:**  
**Deploying Microsoft Cluster Services -**  
*Available for Windows 2003 (543A) or*  
*Windows 2008 (543B)*  
**(4 days)**

**Course Description...**

This course will examine the types and uses of Microsoft's high-availability solutions provided in Windows Server- including Network Load Balancing for Front-end and Clustering for Back-end servers in a Microsoft-based Server Farm. Through lecture, demonstration and hands-on workshops, attendees will install, configure and troubleshoot Microsoft Clustering Services (MSCS) and build a high-availability solution. Network Applications such as File & Print Sharing, Microsoft Exchange Server or Microsoft SQL Server, Internet Information Server (IIS), Windows SharePoint Services and Volume Shadow Copy Services (VSS) will be deployed during the course.

**Learning Objectives...**

- Identify the use of Network Storage in a Windows environment
- Examine the use of Windows Storage solutions including Network Attached Storage (NAS), Storage Area Networks (SANs), and Microsoft Cluster Service (MCSC)
- Install and configure Network Load Balancing (NLB)
- Install and configure a Windows Server Cluster (MSCS)
- Perform management functions on Microsoft Clustering Services (MSCS)
- Create backup and restoration plans for MSCS
- Troubleshoot and recover from Network Storage Disasters
- Deploy Microsoft Exchange or Microsoft SQL Server into a cluster environment
- Deploy a high-availability server farm using Windows SharePoint Services (Front-End) / SQL Server (Back-end)

**Who should attend...**

This course is valuable for System Administrators, Exchange or SQL Administrators, SharePoint Designers, Solution providers, and technical managers who need to evaluate, implement, install and manage Microsoft High-Availability Services like clustering and Network Load Balancing

**Prerequisites...**

Attendees should have prior experience with Windows Server Operating Systems. Foundation courses in Windows 2003/2008 and TCP/IP are assumed. This is NOT an



entry level course. This course is completed in a Virtual Environment, so familiarity with VMWare, Virtual PC, or Virtual Server is helpful.

## Hands-On Exercises & Demonstrations...

### *Demonstrations:*

- ✓ Windows Server 2-Node Cluster
- ✓ Windows Server Cluster running Microsoft Exchange or SQL Server
- ✓ Windows Server Network Load Balancing of a Web Server

### *Exercises:*

- ✓ Install and Configure an Active Directory Forest & Domain
- ✓ Install and Configure a 2-Node Network Load Balancing (NLB) Cluster
- ✓ Install and Configure a 2-Node Windows Server Cluster
- ✓ Create Cluster Resources and Cluster Groups
- ✓ Implementing Volume Shadow Copy Services (VSS) on a Cluster
- ✓ Make Applications and Scripts Highly available on a Cluster
- ✓ Change the Cluster Service Password
- ✓ Convert a cluster to use Majority Node Set instead of Quorum
- ✓ Backup and Restoration of Cluster Configuration
- ✓ Installing a Hotfix into a clustered environment
- ✓ Recovering from a failed Cluster Node
- ✓ Replacing a failed disk in a cluster
- ✓ Replacing a failed Exchange cluster node
- ✓ Deploy Microsoft Exchange or Microsoft SQL Server into a Clustered Environment
- ✓ Deploy a High-Availability SharePoint Server Farm utilizing NLB front-end and MSCS back-end configuration

## Course Outline...

### Chapter 1: Network Storage Foundations

- Storage Area Networks (SAN) vs. Network Attached Storage (NAS)
  - Directly attached storage devices
  - TCP/IP based
  - iSCSI
  - Fiber Channel
- Costs associated with Network Storage
  - Cost of deployment
  - Return on Investment
  - Incremented costs
  - Adding resources
- Network Storage
  - Applications of network storage
  - Supported configurations
  - Limitations/when NOT to use



- Clustering
  - The need for High Availability
  - Applications of Clustering
  - Supported configurations
  - Limitations/when NOT to use
- Network Load Balancing
  - Applications of NLB
  - Supported configurations
  - Limitations/when NOT to use

## **Chapter 2: Deploying Microsoft Cluster Service**

- Requirements for Microsoft Clustering
  - Capabilities of Windows Product Line
  - Active Directory Review
  - Use of Active Directory by Clustering Services
  - Active/Passive vs. Active/Active clusters
- Creating a Windows Cluster
  - IP address requirements
  - Storage allocation
  - Quorum drives
  - Majority Node Set
- Adding Cluster Groups and Resources
  - Creating a New Cluster Group
  - Adding base resources
  - Running a generic application on a cluster
  - Running batch jobs or scripts on a cluster

## **Chapter 3: Management, Backup and Restoration of Clustered Environments**

- Management of Clusters
  - Changing the Cluster Administrator Password
  - OS and Application Patches
  - Cluster Service Monitoring
  - Active Directory Management
- Windows Management Instrumentation and Clusters (WMI)
  - Changing the Cluster Administrator Password
  - OS and Application Patches
- Backup and Restoration of Cluster Information
  - Network-attached backup solutions
- Using Shadow Copies of Shared Folders and Volume Shadow Copy Service (VSS) on a cluster
  - What are Shadow Copies of Shared Folders
  - Understanding Volume Shadow Copy Services (VSS)

## **Chapter 4: Troubleshooting Clusters**

- Updating Clusters
  - Hotfixes and Service Packs



- Application Updates
- Recovering from a Cluster Failure
  - Replacing a failed disk
  - Replacing a failed node
- Command Line and Resource Kit Utilities
  - Cluster.exe
  - Resource Kit Tools

## **Chapter 5: Cluster Aware Enterprise Applications**

- Database Applications and Clustering
  - Types of data that can be clustered
  - Placement of Databases and Transaction Logs
  - Active/Passive vs. Active/Active 2-node deployment
  - Beyond 2-node deployments
- Clustering Microsoft Exchange
  - Software Requirements
  - Differences and Limitations of Exchange Clusters
  - Deployment of an Exchange Cluster
  - Management of an Exchange Cluster
- Clustering SQL Server
  - Software Requirements
  - Differences and Limitations of SQL Clusters
  - Deployment of a SQL Cluster
  - Management of a SQL Cluster
- Alternatives to Clustering
  - Mirrored Servers
  - Replication-base Solutions

## **Chapter 6: Building a Server Farm**

- What is a Server Farm
  - High-availability front-end configurations
  - High-availability back-end configurations
  - Selecting the appropriate technology
- Designing Configurations
  - Network Considerations
  - Front-end and Back-end Configurations
  - Security Considerations

*Please contact your ROI representative to discuss course tailoring!!!*