Microsoft® Jump Start

M4: Managing Storage for Windows Server 2012

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Microsoft

Jump Start Target Agenda | Day One

Day 1	Day 2
Module 1: Installing and Configuring Servers Based on Windows Server 2012	Module 7: Implementing Failover Clustering
Module 2: Monitoring and Maintaining Windows Server 2012	Module 8: Implementing Hyper-V
Module 3: Managing Windows Server 2012 by Using PowerShell 3.0	Module 9: Implementing Failover Clustering with Hyper-V
- MEAL BREAK -	- MEAL BREAK -
Module 4: Managing Storage for Windows Server 2012	Module 10: Implementing Dynamic Access Control
Module 5: Implementing Network Services	Module 11: Implementing Active Directory Domain Services
Module 6: Implementing Direct Access	Module 12: Implementing Active Directory Federation Services

Module Overview

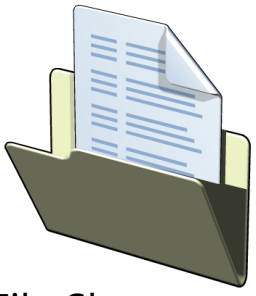
- New Features in Windows Server 2012 Storage
- Configuring iSCSI Storage
- Configuring Storage Spaces in Windows Server 2012
- Configuring BranchCache in Windows Server 2012

File and Storage Services in Windows Server 2012

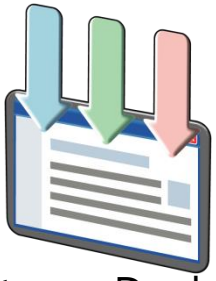
- Multiterabyte volumes
- Data deduplication
- iSCSI target server
- Storage spaces and storage pools
- Unified remote management of File and Storage Services in Server Manager
- Windows PowerShell cmdlets for File and Storage Services

What Is Data Deduplication?

- Data deduplication identifies and removes duplications within data without compromising its integrity or fidelity with the ultimate goal to store more data on less space
- When you enable data deduplication on a volume, a background task runs with low-priority that:
  1. Segments data into small, variable sized chunks
  2. Identifies duplicate chunks
  3. Replaces redundant copies with a reference
  4. Compresses chunks
- You should consider using deduplication for the following areas:



File Shares



Software Deployment Shares

VHD Libraries

DEMO: Configuring Data Deduplication

- In this demonstration, you will see how to configure data deduplication

What Are Thin Provisioning and Trim Storage?

- Thin provisioning is the ability to allocate storage space just-in time
- Trim storage is the ability to reclaim storage that is no longer needed
- Thin provisioning and trim storage are available by default in Windows Server 2012; no feature or role needs to be installed
- Thin provisioning and trim storage include the following capabilities:
  - Identification
  - Notification
  - Optimization

What's New in File Server Resource Manager?

You can use the File Server Resource Manager to manage and classify data that is stored on file servers

- File Server Resource Manager includes the following features:
  - File classification infrastructure
  - File management tasks
  - Quota management
  - File screening management
  - Storage reports

- The new features in File Server Resource Manager include:
  - Dynamic Access Control
  - Manual classification
  - Access-denied assistance
  - File management tasks
  - Automatic classification

What Are Basic and Dynamic Disks?

- **Basic disks:**
  - Are disks initialized for basic storage
  - Are the default storage for Windows
- **Dynamic disks:**
  - Can be modified without restarting Windows
  - Provide several options for configuring volumes
- **Disk volume requirements include:**
  - System volume for hardware specific files required to start the server
  - Boot volume for the operating system files

What is the new Resilient File System (ReFS)?

- Metadata integrity with checksums
- Integrity streams providing optional user data integrity
- Allocation on write transactional model
- Large volume, file, and directory sizes (278 bytes with 16-KB cluster size)
- Storage pooling and virtualization
- Data striping for performance and redundancy
- Disk scrubbing for protection against latent disk errors
- Resiliency to corruptions with salvage
- Shared storage pools across machines

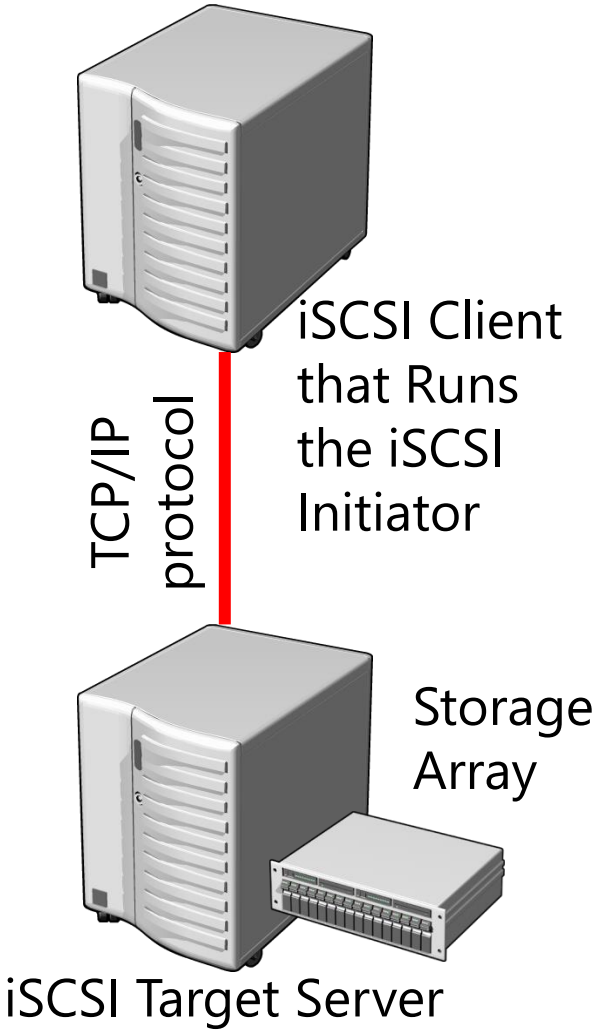
Removed and Deprecated Features

- The following features are removed and deprecated in Windows Server 2012:
  - Storage Manager for Storage Area Networks (SANs) snap-in
  - Storage Explorer snap-in
  - SCSIport host-bus adapter driver
  - File Server Resource Manager command-line tools
  - FRS
  - Share and Storage Management snap-in
  - Shared Folders snap-in
  - VDS provider

What Is iSCSI?

iSCSI transmits SCSI commands over IP networks

Component	Description
IP Network	Provide high performance and redundancy
iSCSI Targets	Run on the storage device and enable access to the disks
iSCSI Initiators	A software component or host adapter on the server that provides access to iSCSI targets
iSCSI Qualified Name (IQN)	A globally unique identifier used to address initiators and targets on an iSCSI network



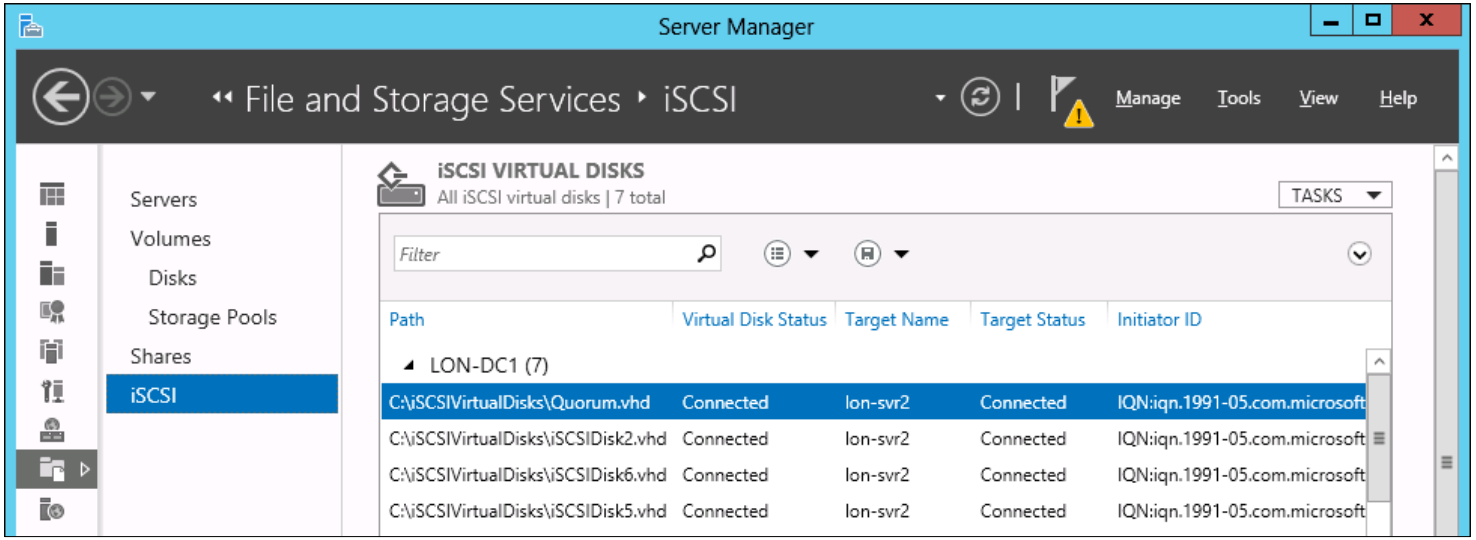
iSCSI Target Server and iSCSI Initiator

The iSCSI target server:

- Is available as role service in Windows Server 2012
- Provides the following features:
  - Network/diskless boot
  - Server application storage
  - Heterogeneous storage
  - Lab environments

The iSCSI initiator:

- Runs as a service in the operating system
- Installed by default on Windows 8 and Windows Server 2012; just needs to be started



Advanced iSCSI Configuration Options

Locating iSCSI storage. There are two approaches:

- iSCSI SendTargets. Use this command to receive a list of targets from an iSCSI target server
- iSNS. Use this for larger networks; similar to DNS, iSNS stores iSCSI targets

Configuring iSCSI for high availability. There are two technologies:

- MCS. In the event of a failure, all outstanding iSCSI commands are reassigned to another connection automatically
- MPIO. If you have multiple network interface cards (NICs) in your iSCSI initiator and iSCSI target server, you can use MPIO to provide failover redundancy during network outages

DEMO: Configuring iSCSI Target

- In this demonstration, you will see how to configure an iSCSI target

DEMO: Connecting to the iSCSI Storage

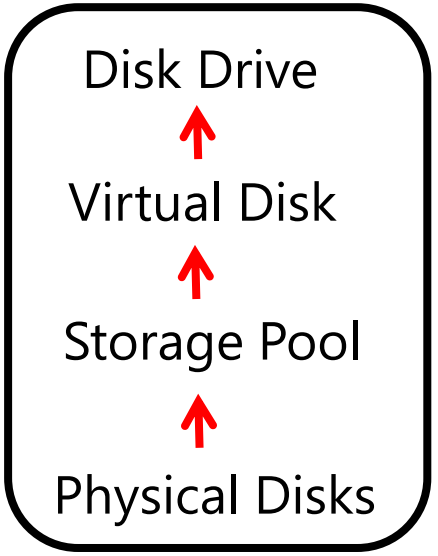
- In this demonstration, you will see how to connect to the iSCSI storage

What Are Storage Spaces?

You can use storage spaces to add physical disks of any type and size to a storage pool and create highly-available virtual disks from it

To create a virtual disk, you need the following:

- One or more physical disks
- Storage pool that includes the disks
- Virtual drives (or storage spaces) that are created with disks from the storage pool
- Disk drives that are based on virtual drives



Virtual drives are not VHDs; they should be considered as a drive in Disk Manager

Storage Spaces Features

To optimally use storage spaces in your environment, you should consider the following features:

Feature	Options
Storage layout	Simple Two-way or three-way mirrors Parity
Disk sector size	512 or 512e
Drive allocation	Data-store Manual Hot-Spare
Provisioning schemes	Thin provisioning space Fixed provisioning space

To support failover clustering, all assigned drives must support a multi-initiator protocol, such as Serial-Attached SCSI (SAS)

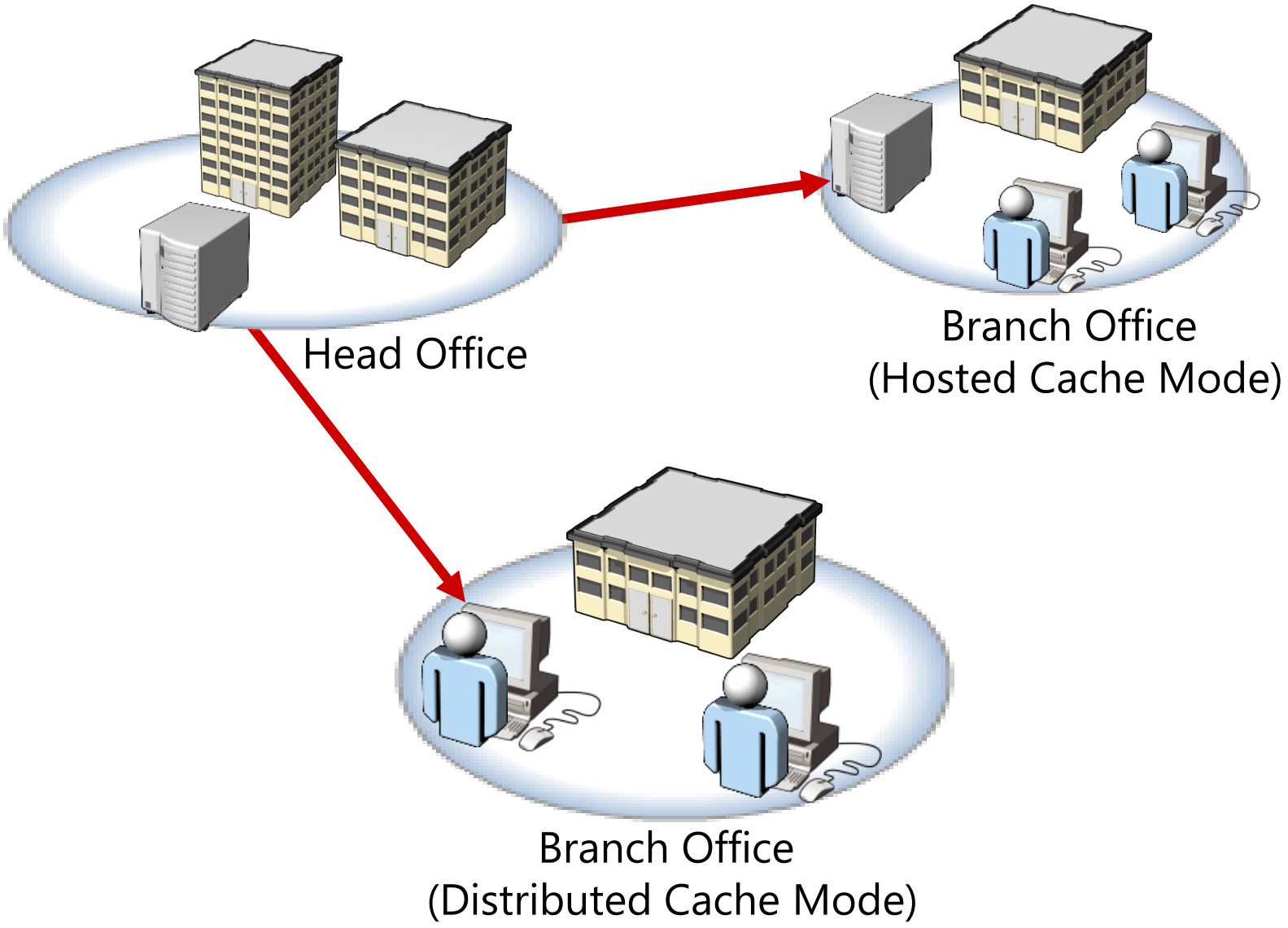
DEMO: Configuring a Storage Space

- In this demonstration, you will see how to configure a storage space

DEMO: Implementing Redundant Storage Spaces

- In this demonstration, you will see how to implement redundant storage spaces

How Does BranchCache Work?



BranchCache Requirements

Requirements for using BranchCache

- Install the BranchCache feature or the BranchCache for Network Files feature on the server that is hosting the content
- Configure client computers, either by using Group Policy or the netsh command

Requirements for Distributed and Hosted Cache modes

- In the Distributed Cache mode, no server is required in the branch office; just Windows 7, Windows 8 or Windows Server 2008 R2 or later as client computers are required
- In the Hosted Cache mode, Windows Server 2012 server must be configured for BranchCache host in the branch office
- The BranchCache host server must have a digital certificate

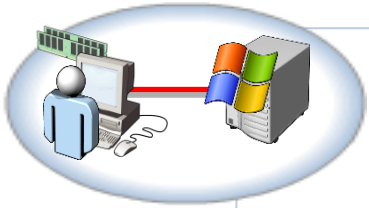
Configuring BranchCache Server Settings

Configuring the Web Server

1. Install the BranchCache feature

Configuring the File Server

1. Install BranchCache for Network Files role service
2. Enable BranchCache on the server
3. Enable BranchCache on file shares



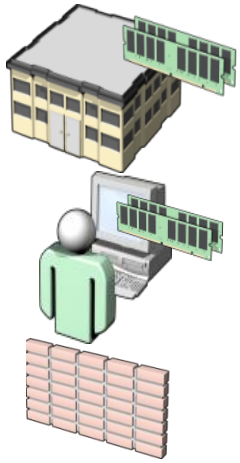
Configuring the Hosted Cache Server

1. Add the BranchCache feature to the Windows Server 2012 server
2. Configure BranchCache with a trusted certificate

Configuring BranchCache Client Settings

To enable and configure BranchCache, you need to perform the following steps:

1. Enable BranchCache
2. Enable the Distributed Cache mode or Hosted Cache mode
3. Configure the client firewall



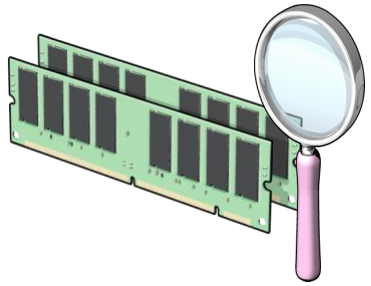
You can modify BranchCache settings and perform additional configuration tasks, such as:

- Setting the cache size
- Setting the location of the Hosted Cache server
- Clearing the cache
- Creating and replicating a shared key for using in a server cluster

Monitoring BranchCache

The BranchCache monitoring tools include:

- The netsh branchcache show status all command
- Event Viewer
- Performance counters



Quick Review

- Why would you implement MPIO together with iSCSI? What problems would you solve with this?
- Why must you have the iSCSI initiator component?

- You moved LON-SVR1 to its own OU. Why?
- When would you consider implementing BranchCache into your own organization?

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