

## REVIEW LESSON

MTA Course: 98-365 Windows Server® Administration Fundamentals

Lesson name: Understanding Storage 4.3

Topic: Understand disk types

(One 50-minute class period)

File name: WinServerFund\_RL\_4.3

### Lesson Objective

**4.3:** Understand disk types. *This objective may include but is not limited to:* basic disk; dynamic disk; mount points; file systems; mounting a virtual hard disk; distributed file systems; optical disks.

### Preparation Details

#### Prerequisite student experiences and knowledge

This MTA Certification Exam Review lesson is written for students who have learned about Windows® Server Administration fundamentals. Students who do not have the prerequisite knowledge and experiences cited in the objective will find additional learning opportunities using resources such as those listed in the Microsoft® resources and Web links at the end of this review lesson.

Students should have successfully created a disk volume.

Students should have successfully created a virtual hard disk.

#### Instructor preparation activities

- Make copies of Student Activity WinServerFund\_SA\_4.3
- If available, have one virtual machine:
  - Windows Server 2008® R2 (Windows 7® Professional would be a suitable substitute)

#### Resources, software, and additional files needed for this lesson

- WinServerFund\_PPT\_4.3
- WinServerFund\_SA\_4.3

## **Teaching Guide**

### **Essential Vocabulary**

**basic disk**—a physical disk that may contain primary partitions, extended partitions, and logical drives. Partitions and logical drives on basic disks are known as basic volumes. You can only create basic volumes on basic disks. Basic disks are compatible with older operating systems.

**distributed file system (DFS)** —provides wide area network (WAN)-friendly replication as well as simplified, highly-available access to geographically dispersed files.

**dynamic disk**—a physical disk that can use the master boot record (MBR) or GUID partition table (GPT) partitioning scheme. All volumes on dynamic disks are known as dynamic volumes. Dynamic disks were first introduced with Windows 2000<sup>®</sup> and provide features that basic disks do not, such as the ability to create volumes that span multiple disks (spanned and striped volumes) and fault tolerant volumes (mirrored and RAID-5 volumes).

**GUID partition table (GPT)** —a standard for the layout of the partition table on a physical disk. It is used on some BIOS systems because of the limitations of MBR partition tables. Recommended for very big hard drives.

**master boot record (MBR)**—the first sector of the first hard disk; a physically small but critical element in the start-up process on an x86-based computer. When a computer is booted, it processes a series of self-tests and then reads the master boot record, or MBR, into memory. The MBR contains instructions that locate the disk's system (start-up) partition, read the contents of the first sector of the system partition into memory, and then carry out the instructions contained in that sector.

**mount point**—a mount point/folder is an association between a volume and a directory on another volume.

**NTFS**—acronym for NT file system. An advanced file system designed for use specifically with the Windows NT operating system. It supports long filenames, full security access control, file system recovery, extremely large storage media, and various features for the Windows NT POSIX subsystem.

**virtual hard disk (VHD)** —the Microsoft<sup>®</sup> VHD file format specifies a virtual machine hard disk that can reside on a native host file system encapsulated within a single file. The format is used by Virtual PC 2007, Virtual Server 2005 R2 and Hyper-V<sup>®</sup>, and the format will be used by future versions of Windows Server that includes hypervisor-based virtualization technology. Beyond that, the VHD format is broadly applicable, because it is agnostic to the virtualization technology, host operating system, or guest operating system with which it is used.

## **Lesson Sequence**

### **Activating prior knowledge/lesson staging (Anticipatory Set: 10 minutes)**

1. Student prompt (see PowerPoint® slide 3): On a sheet of paper, write the difference between a basic and a dynamic disk.
2. Give students a few minutes to respond, allowing them to work until they have finished.
3. As time permits, call on a few students to report to the group with their responses.

### **Lesson activity (40 minutes)**

1. Teacher Instruction (20 minutes)
  - Use the included PowerPoint slideshow to review disk types.
  - At the end of the slideshow, ask the students to answer the Review Questions. Small-group discussions or a “think-pair-share” approach may be beneficial.
    - Show the question and give the students 1 minute to process the question and come up with answers.
    - Then give the students 2 minutes to discuss answers with a partner.
    - Finally, have each pair of students share their answers with the whole group.
    - Repeat for each additional review question.
2. Guided Practice (20 minutes; please see the “Additional notes to the instructor” section regarding this assignment)
  - Students complete WinServerFund\_SA\_4.3, creating a mount point folder.
  - If time allows, you may review all or part of the worksheet.

### **Assessment/lesson reflection (10 minutes)**

1. At the bottom of the page, tell students to write any questions they have or any topics about which they would like more assistance.
2. After class, look through the student responses and follow up with any student requiring additional help.

### **Microsoft resources and Web links**

- **Microsoft TechNet: Distributed File System**  
[http://technet.microsoft.com/en-us/library/cc753479\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/cc753479(WS.10).aspx)
- **Microsoft TechNet: How Dynamic Disks and Volumes Work: Storage Devices**  
[http://technet.microsoft.com/en-us/library/cc758035\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/cc758035(WS.10).aspx)
- **Microsoft TechNet: Self-healing NTFS**  
[http://technet.microsoft.com/en-us/library/cc771388\(WS.10\).aspx](http://technet.microsoft.com/en-us/library/cc771388(WS.10).aspx)

- **Microsoft: What are basic and dynamic disks?**  
*<http://windows.microsoft.com/en-US/windows-vista/What-are-basic-and-dynamic-disks>*

**Suggested best practices**

- Demonstrating the conversion of a basic disk to a dynamic disk may be useful as a visual aid, but not necessary.
- As noted in the PowerPoint, it is important to help the students understand that a VHD is nothing more than a container file on the disk.

**Additional notes to the instructor**

- The worksheet has the students create a VHD, which will be used to create a mount point. They previously created a VHD in WinServerFund\_SA\_2.5. They can use that VHD if it already exists, or they can create a separate VHD using a different name.