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# Module 5: Managing Disks

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# Overview

- 
- Preparing Disks
  - Managing Disk Properties
  - Managing Mounted Drives
  - Converting Disks
  - Creating Volumes
  - Importing a Disk

## Introduction

One of the tasks that you perform when administering a server is managing disks. By knowing what tools are available to set up and manage disks and what capabilities are provided by Microsoft® Windows® Server 2003, you can better manage disk drives and use advanced features, such as creating a mounted drive and importing a foreign disk.

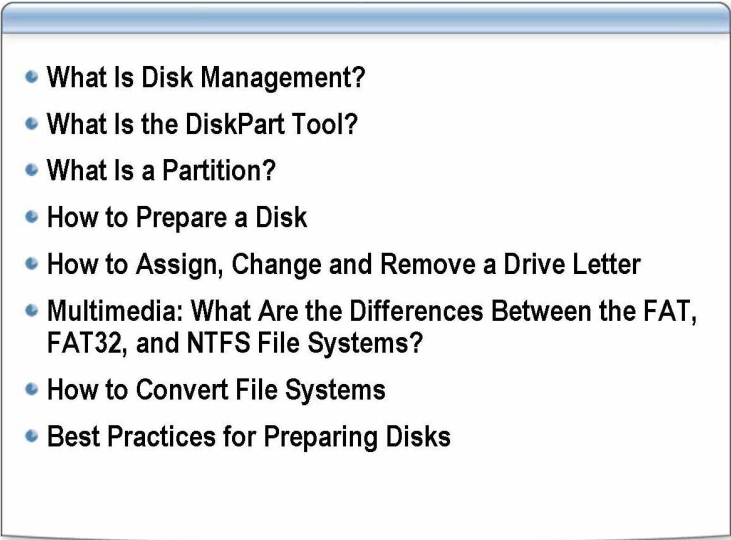
This module covers the tasks that you use to manage disks and describes how to use the tools to manage and set up disks.

## Objectives

After completing this module, you will be able to:

- Initialize and partition a disk.
- View and update disk properties.
- Manage mounted drives.
- Convert a disk from basic to dynamic and from dynamic to basic.
- Create volumes on a disk.
- Import disks.

# Lesson: Preparing Disks

- 
- What Is Disk Management?
  - What Is the DiskPart Tool?
  - What Is a Partition?
  - How to Prepare a Disk
  - How to Assign, Change and Remove a Drive Letter
  - Multimedia: What Are the Differences Between the FAT, FAT32, and NTFS File Systems?
  - How to Convert File Systems
  - Best Practices for Preparing Disks

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## Introduction

When you install a new disk, Windows Server 2003 recognizes it and configures it as a basic disk. A basic disk is the default storage medium and provides limited configuration capabilities.

This lesson describes how to partition a basic disk by using Disk Management and the DiskPart command-line tool. It also explains how file system attributes affect disks and how to use the file systems when you configure disks.

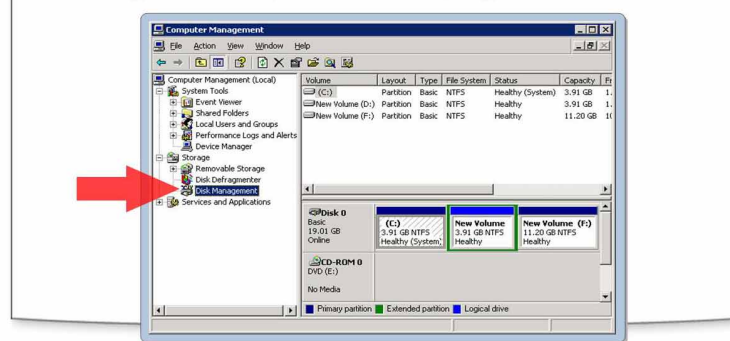
## Lesson objectives

After completing this lesson, you will be able to:

- Explain the function of Disk Management.
- Explain the function of DiskPart.
- Explain partitions.
- Initialize, format, and delete a partition by using Disk Management and DiskPart.
- Add, change, and remove a drive letter by using Disk Management and DiskPart.
- Distinguish between FAT (file allocation table), FAT32, and the NTFS file system.
- Convert file systems.
- Explain best practices for preparing disks.

## What Is Disk Management?

- A snap-in located in Computer Management
- Use to view disk information and perform disk management tasks on local and remote computers
- Enables you to perform most disk-related tasks without shutting down the system or interrupting users



### Introduction

Disk Management, a Microsoft Management Console (MMC) snap-in, is a system utility that consolidates all of your disk management tasks for both local and remote administration of Windows Server 2003. Because Disk Management is an MMC snap-in, it uses the interface, menu structure, and shortcut menus that you are accustomed to using. You can gain access to Disk Management in the Computer Management console, or you can create a separate console for it.

### Perform disk management tasks

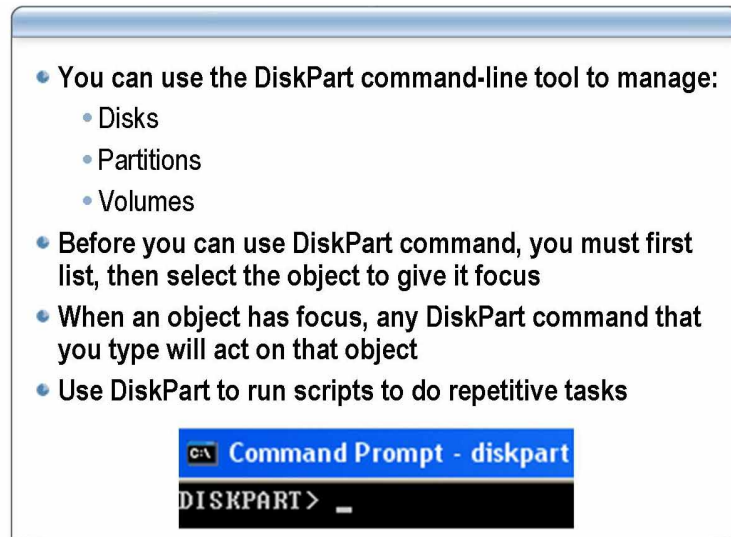
You can use Disk Management to configure and manage your storage space and perform all your disk management tasks. You can also use Disk Management to convert disk storage type, create and extend volumes, and perform other disk management tasks, such as managing drive letters and paths and maintaining Windows Server 2003.

### Local and remote administration

When you create a separate console and add the Disk Management snap-in, you can focus the snap-in either on the local computer or on another computer for remote administration of that computer. As a member of the Administrators group or Server Operators group, you can manage disks on a computer running Windows Server 2003 that is a member of the domain, or of a trusted domain, from any other computer running Windows Server 2003 on the network.

For example, you can create a console to which you add multiple Disk Management snap-ins, each focused on a different remote computer. You can then manage the disk storage of all of the computers from that single console.

## What Is the DiskPart Tool?



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### Introduction

By using the DiskPart command-line tool, you can perform many disk management tasks from the command line. Use DiskPart to perform disk-related tasks at the command line as an alternative to using Disk Management.

### Use DiskPart to manage objects

DiskPart is a text-mode command interpreter that enables you to manage objects, such as disks, partitions, and volumes, by using scripts or direct input from a command prompt. Administrators often write scripts to perform repetitive tasks.

### Give an object focus

Before you can use a DiskPart command, you must first list and then select an object that you want to manage to give it focus. When an object has focus, any DiskPart command that you type acts on that object.

You can list the available objects and determine an object's number or drive letter by using the **list disk**, **list volume**, and **list partition** commands. The **list disk** and **list volume** commands display all the disks and volumes that are on the computer, whereas the **list partition** command displays only those partitions on the disk that have focus. When you use the **list** commands, an asterisk (\*) appears next to the object with focus.

You select an object by using its number or drive letter, such as disk 0, partition 1, volume 3, or volume C. When you select an object, the focus remains on that object until you select a different object. For example, if the focus is set on disk 0 and you select volume 8 on disk 2, the focus shifts from disk 0 to disk 2, volume 8.

**DiskPart example**

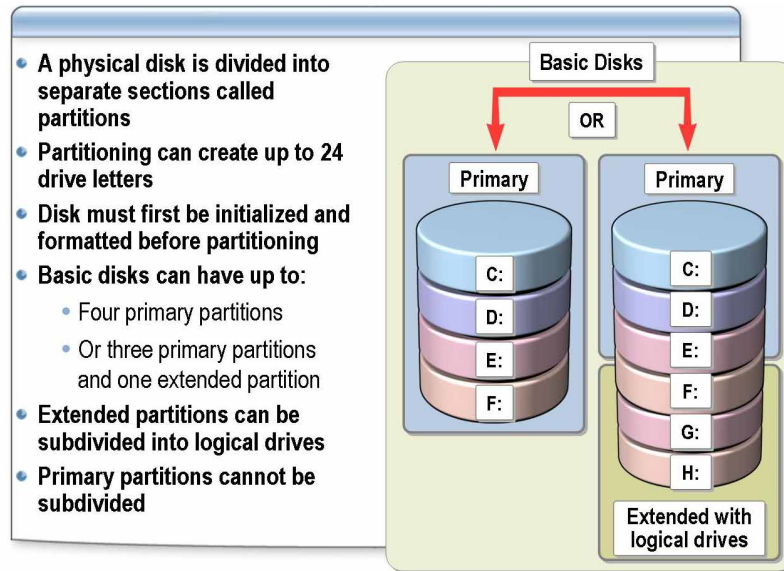
The following table shows an example of using the **diskpart** command to focus on a particular disk.

Command	Description	Response																								
C:\diskpart	Type <b>diskpart</b> on the command line.	Microsoft DiskPart version 5.2 Copyright (C) 1999-2001 Microsoft Corporation. On computer: VANCOUVER																								
DISKPART> list disk	Type <b>list disk</b> to request a list of disks on the server.  A list of disks, their status, size, and unallocated space appears.	<table><tr><th>Disk ###</th><th>Status</th><th>Size</th><th>Free</th><th>Dyn</th><th>Gpt</th></tr><tr><td>-----</td><td>-----</td><td>-----</td><td>-----</td><td>----</td><td>----</td></tr><tr><td>Disk 0</td><td>Online</td><td>37 GB</td><td>0 B</td><td></td><td></td></tr></table>	Disk ###	Status	Size	Free	Dyn	Gpt	-----	-----	-----	-----	----	----	Disk 0	Online	37 GB	0 B								
Disk ###	Status	Size	Free	Dyn	Gpt																					
-----	-----	-----	-----	----	----																					
Disk 0	Online	37 GB	0 B																							
DISKPART> <b>select disk 0</b>	Type <b>select disk <i>n</i></b> to focus on the selected disk.  Disk 0 is now selected.  The object with focus has an asterisk.	<table><tr><td colspan="6">DISKPART&gt; list disk</td></tr><tr><th>Disk ###</th><th>Status</th><th>Size</th><th>Free</th><th>Dyn</th><th>Gpt</th></tr><tr><td>-----</td><td>-----</td><td>-----</td><td>-----</td><td>----</td><td>----</td></tr><tr><td>* Disk 0</td><td>Online</td><td>37 GB</td><td>0 B</td><td></td><td></td></tr></table>	DISKPART> list disk						Disk ###	Status	Size	Free	Dyn	Gpt	-----	-----	-----	-----	----	----	* Disk 0	Online	37 GB	0 B		
DISKPART> list disk																										
Disk ###	Status	Size	Free	Dyn	Gpt																					
-----	-----	-----	-----	----	----																					
* Disk 0	Online	37 GB	0 B																							

**Partition and volume focus**

On a basic disk, the partition focus and volume focus are the same. If you change the focus on one item, you change the focus on the other.

## What Is a Partition?



### Introduction

Disk partitioning is a way to divide a basic physical disk into sections so that each section, or *partition*, functions as a separate unit. You can use partitioning to divide the hard disk drive into several drive letters so that it is easier to organize data files. Each partition is assigned a different drive letter, such as C or D. After you create a partition, you must format it with a file system before you can store data on the partition.

### Partition example

An administrator who wants to keep applications separate from the system files can use partitioning to set up a drive letter for the application files and another drive letter for the system files.

### Initialize a disk

When you attach a new disk to your computer, you must first initialize the disk before you can create partitions. When you first start Disk Management after installing a new disk, a wizard appears that provides a list of the new disks that are detected by the operating system. When you complete the wizard, the operating system initializes the disk by writing a disk signature, the end of sector marker (also called a signature word), and a master boot record (MBR). If you cancel the wizard before the disk signature is written, the disk status remains Not Initialized.

### Primary partitions

You create primary partitions on a basic disk. A basic disk can have up to four primary partitions or three primary partitions and one extended partition. A primary partition cannot be subdivided. An extended partition can be divided into logical drives.

**Note** For more information about partitions, see Appendix D, “Partition Styles,” on the Student Materials compact disc.

### Logical drives

Logical drives are similar to primary partitions, except that you can create up to 24 logical drives per disk but are limited to four primary partitions per disk. You can format a logical drive and assign a drive letter to it.



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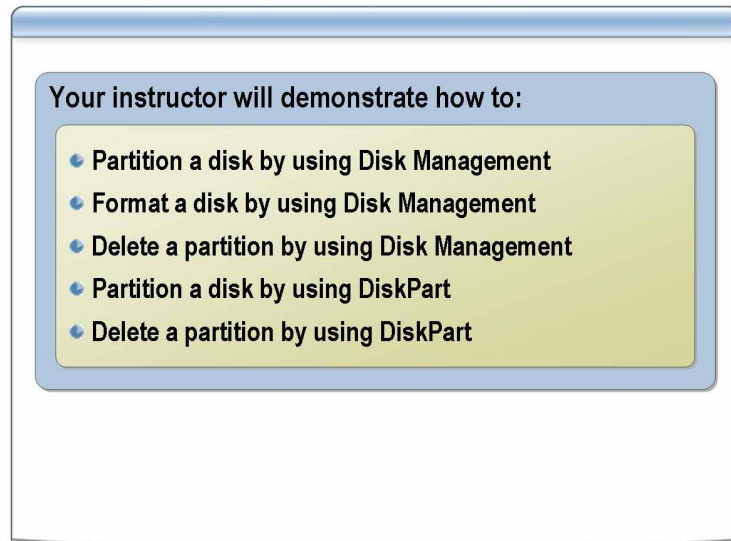
<b>Extended partitions</b>	You can create an extended partition only on a basic disk. Unlike a primary partition, you do not format an extended partition with a file system. Instead, you create one or more logical drives in the extended partition and then format them with a file system.
<b>Format a disk</b>	You must format a disk before you can use it. Formatting a disk configures the partition with a file allocation table. Formatting prepares the disk for reading and writing. When you format a disk, the operating system erases all the file allocation tables on the disk, tests the disk to verify that the sectors are reliable, marks bad sectors, and creates internal address tables that it later uses to locate information.
<b>Delete a partition</b>	Deleting a partition destroys all of the data in the partition. The partition is then restored to an unallocated space. If you are deleting an extended partition, you must delete all of its logical drives on the disk before deleting the partition.
<b>Assign drive letters</b>	Windows Server 2003 allows the static assignment of drive letters to partitions, volumes, and CD-ROM drives. This means that you assign a drive letter to a specific partition, volume, or CD-ROM drive. It is often convenient to assign drive letters to removable devices in such a way that the devices appear after the permanent partitions and volumes on the computer.
<b>Manage drive letters</b>	You can use up to 24 drive letters, from C through Z. Drive letters A and B are reserved for floppy disk drives. However, if you have only one floppy disk drive, you can use the letter B for a network drive. When you add a new hard disk to an existing computer system, it will not affect previously assigned drive letters.

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**Important** Before you delete or create partitions on a hard disk, be sure to back up the disk contents, because creating and deleting partitions destroys any existing data. As with any major change to disk contents, it is recommended that you back up the entire contents of the hard disk before working with partitions, even if you do not plan to make changes to any of the partitions.

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## How to Prepare a Disk



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### Introduction

You can use either Disk Management or DiskPart to partition a disk. You can use Disk Management to not only partition the disk, but also to format and assign drive letters at the same time. When you partition an existing disk, you must first delete the partitions. You can use either DiskPart or Disk Management to accomplish this task.

### Procedure for partitioning a disk by using Disk Management

To partition a disk by using Disk Management:

1. In Computer Management, open Disk Management.
2. Right-click an unallocated region of a basic disk, and then click **New Partition**, or right-click free space in an extended partition, and then click **New Logical Drive**.
3. In the New Partition Wizard, click **Next**.
4. On the **Select Partition Type** page, click **Primary Partition**, and then click **Next**.
5. On the **Specify Partition Size** page, type *nnn* (where *nnn* is the size in megabytes), and then click **Next**.
6. On the **Assign Drive Letter or Path** page, select the drive letter, and then click **Next**.
7. On the **Format Partition** page:
  - a. Select the appropriate file system and allocation unit size.
  - b. Type the appropriate volume label.
  - c. Select or clear the **Perform a quick format** and **Enable file and folder compression** check boxes.
8. Click **Next**, and then click **Finish**.

**Procedure for formatting a disk**

To format a disk by using Disk Management:

1. In Computer Management, open Disk Management.
2. Right-click the partition, logical drive, or basic volume that you want to format or reformat, and then click **Format**.
3. Select the options that you want under:
  - **Volume Label**—name the disk.
  - **File System**—select either NTFS or FAT.
  - **Allocation Unit Size**—select the allocated size of the disk that you want to format.
4. If you are sure that the disk is undamaged, select the **Perform a Quick Format** check box.
5. To compress files and folders on the disk, with NTFS volumes only, select **Enable File and Folder Compression**.

**Procedure for deleting a partition**

To delete a partition by using Disk Management:

1. In Computer Management, open Disk Management.
2. Right-click the partition that you want to delete, and then click **Delete Partition**.

**Procedure for partitioning a disk by using DiskPart**

To partition a disk by using DiskPart:

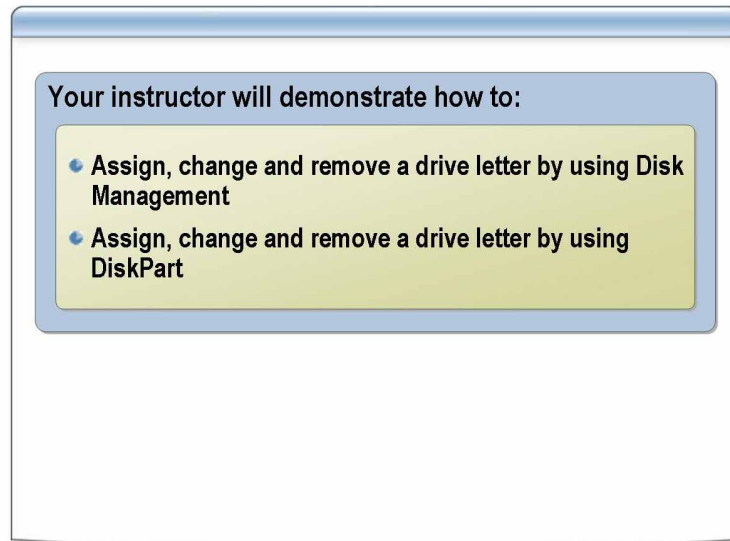
1. At the prompt, type **diskpart**
2. At the prompt, type **list disk** and then make a note of the number of the disk on which you want to create a primary or extended partition.
3. At the DISKPART prompt, type **select disk *n*** (where *n* is the disk number of the disk where you want to create the primary or extended partition).
4. At the DISKPART prompt, type one of the following (where *number* is in megabytes):
  - **create partition primary size=*number***
  - Or–
  - **create partition extended size=*number***
  - Or–
  - **create partition logical size=*number***

**Procedure for deleting a partition by using DiskPart**

To delete a partition by using DiskPart:

1. Open Command Prompt, and then type **diskpart**
2. At the DISKPART prompt, type **list disk**  
Make a note of the disk number of the disk from which you want to delete the partition.
3. At the DISKPART prompt, type **select disk *n*** (where *n* is the disk that you want to delete the partition from).
4. At the DISKPART prompt, type **list partition**  
Make a note of the number of the partition that you want to delete.
5. At the DISKPART prompt, type **select partition *n***, where *n* is the partition number of the partition that you want to delete.
6. At the DISKPART prompt, type **delete partition**

## How to Assign, Change, or Remove a Drive Letter



### Introduction

You can use either Disk Management or DiskPart to assign, change or remove drive letters on partition. As an administrator, you will manage disk drive letters by using these tools.

### Procedure using Disk Management

To assign, change, or remove drive letters by using Disk Management:

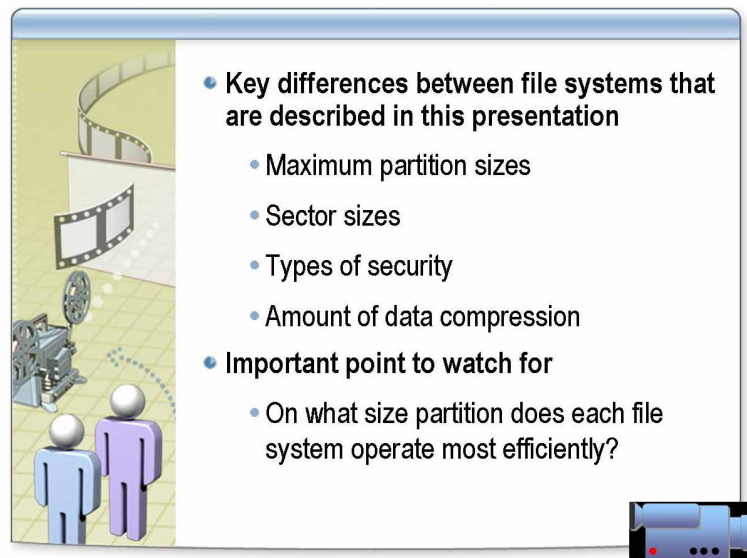
1. In Computer Management, open Disk Management.
2. Right-click a partition, logical drive, or volume, and then click **Change Drive Letter and Paths**.
3. Do one of the following:
  - To assign a drive letter, click **Add**, and then click the drive letter that you want to use.
  - To modify a drive letter, click it, click **Change**, and then click the drive letter that you want to use.
  - To remove a drive letter, click it, and then click **Remove**.

### Procedure using DiskPart

To assign, change, or remove a drive letter by using DiskPart:

1. Open Command prompt, and then type **diskpart**
2. At the DISKPART prompt, type **list volume**. Make note of the number of the volume whose drive letter you want to assign, change, or remove.
3. At the DISKPART prompt, type **select volume *n*** (where *n* is the number of the volume whose drive letter you want to assign, change, or remove).
4. At the DISKPART prompt, type one of the following:
  - a. **assign letter=*L*** (where *L* is the drive letter that you want to assign or change)
  - b. **remove letter=*L*** (where *L* is the drive letter that you want to remove)

## Multimedia: What Are the Differences Between the FAT, FAT32, and NTFS File Systems?



### Introduction

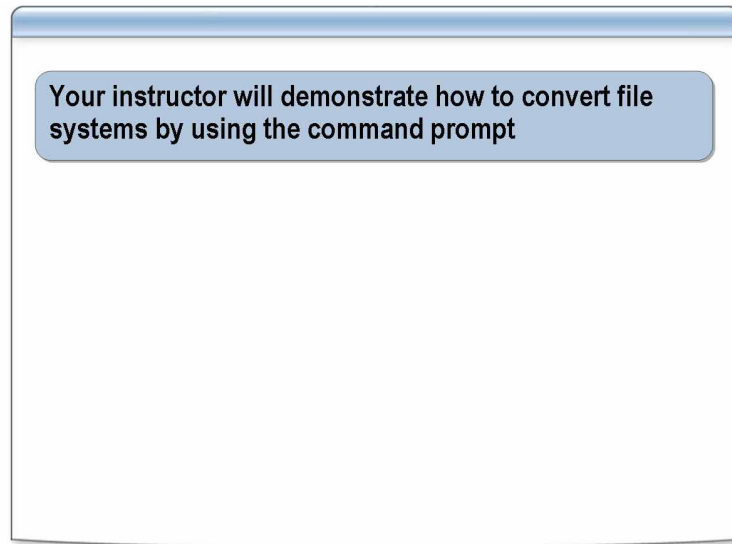
Windows supports three main file systems: FAT (file allocation table), FAT32, and NTFS. This presentation describes the main features and uses of each of the file systems.

### Key file system features

The following table summarizes the main features of the three file systems.

	FAT	FAT32	NTFS
<b>Max partition size</b>	4 gigabytes (GB)	32 GB	2 terabytes
<b>Sector size</b>	16 kilobytes (KB) to 64 KB	As low as 4 KB	As low as 4 KB
<b>Security</b>	File attributes	File attributes	File, folder, and encryption
<b>Compression</b>	None	None	Files, folders, and drives

## How to Convert File Systems



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### Introduction

As a systems administrator, you may be asked to convert an existing volume from FAT32 to NTFS. Use the following steps to perform this task.

### Procedure

To convert a volume from a FAT or FAT32 drive to NTFS:

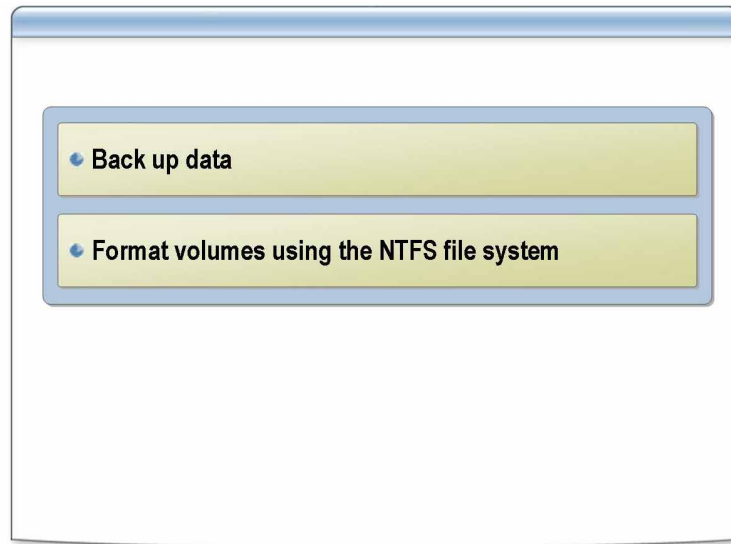
1. In a command prompt, type **convert d: /fs:ntfs** (where *d:* is the letter of the disk drive).
2. Press ENTER.

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**Note** If the partition you are converting is the system or boot partition, you must restart the computer running Windows Server 2003.

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## Best Practices for Preparing Disks



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### Introduction

When you prepare a disk for partitioning, it is recommended that you back up your data and format your volumes with the NTFS file system.

### Back up data


Because deleting or creating partitions or volumes destroys any existing data, be sure to back up the disk contents beforehand. As with any major change to disk contents, it is recommended that you back up the entire contents of the hard disk before working with partitions or volumes, even if you do not plan to make changes to any of the partitions or volumes.

### Format volumes using the NTFS file system

Many features in the Windows Server 2003 family of operating systems, such as file and folder permissions, encryption, large volume support, and sparse file management, require the NTFS file system format. Be prepared by formatting your volumes by using the NTFS file system.



## Practice: Preparing Disks



**In this practice, you will:**

- Change the drive letter of a disk
- Delete a partition
- Create an extended partition on a disk
- Configure two logical drives
- Format a logical drive with the NTFS file system
- Format a logical drive with the FAT32 file system

### Objective

In this practice, you will:

- Change the drive letter of a disk.
- Delete a partition.
- Create an extended partition on a disk.
- Configure two logical drives.
- Format a logical drive with the NTFS file system.
- Format a logical drive with the FAT32 file system.

### Scenario

You are the systems administrator for an organizational unit on a large network. After arriving at work one morning, you read an e-mail message from your manager that includes the following information:

A new server in the graphics department needs additional configuration. You must complete the following tasks:

- The graphics department manager wants the CD-ROM drives on all the departmental servers to use the letter Z.
- The D drive must be deleted, and the 4-GB extended partition must be increased to 6 GB and then divided into two equal parts. One of the graphic artists wants to temporarily use 3 GB of this space for a graphics program based on Windows 95. The D partition should be NTFS and the E partition should be FAT32.

**Practice****► Change the drive letter of the CD-ROM drive**

1. Log on to the domain as *ComputerUser* with a password of **P@ssw0rd**.
2. Using **Run as** open Computer Management with administrative privileges.
3. Open Disk Management and change the drive letter of the CD-ROM drive to Z.

**► Delete the D drive and create a 6-GB extended partition**

1. Using Disk Management, delete the **D** drive.
2. Delete the free space.
3. Create a 6-GB extended partition.

**► Create logical drive D and logical drive E**

1. Using Disk Management, create a 3-GB drive named D formatted with NTFS.
2. Create a 3-GB drive named E formatted with FAT 32.
3. Convert E to NTFS.
4. Close all windows and log off.

## Lesson: Managing Disk Properties

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- What Are Disk Properties?
  - How to View Disk Properties
  - How to Rescan Disk Properties

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### Introduction

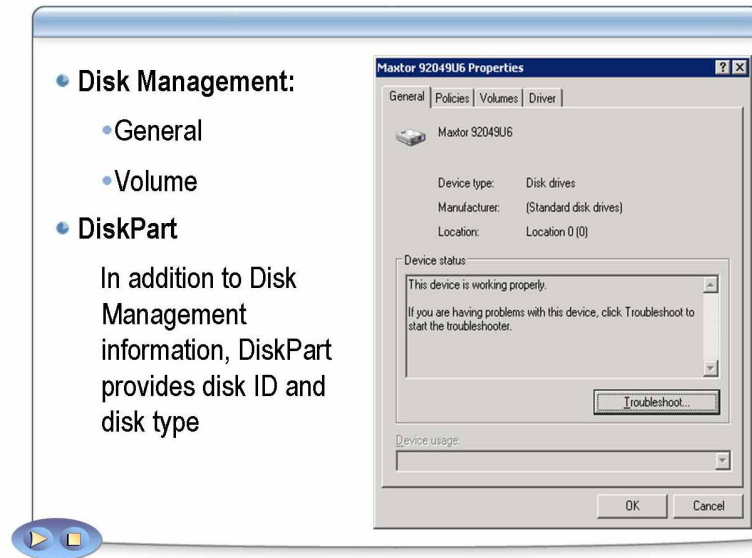
This lesson explains disk properties. Systems administrators use the information in disk properties when they replace the hard disk in a server. An administrator also must rescan disks when updating disk configurations that have changed.

### Lesson objectives

After completing this lesson, you will be able to:

- Explain disk properties.
- View disk properties.
- Rescan disk properties to update disk configuration changes.

## What Are Disk Properties?



### Definition

You can use either Disk Management or DiskPart to view disk properties, which contain information about the physical disk and the volumes that it contains.

### Use of disk properties information

Use the information in disk properties when you replace a hard disk or to verify that a specific disk is installed on a server.

### Latest disk information

Disk properties provide the latest available information about the disk. You can access this information by using DiskPart or by using Disk Management to open the **Properties** dialog box for the disk. The following tabs in the **Properties** dialog box display disk properties:

- *General*. Provides the model number and the location of the disk.
- *Volumes*. Provides the disk number, type, status, partition style, capacity, unallocated space, and reserved space of the disk.

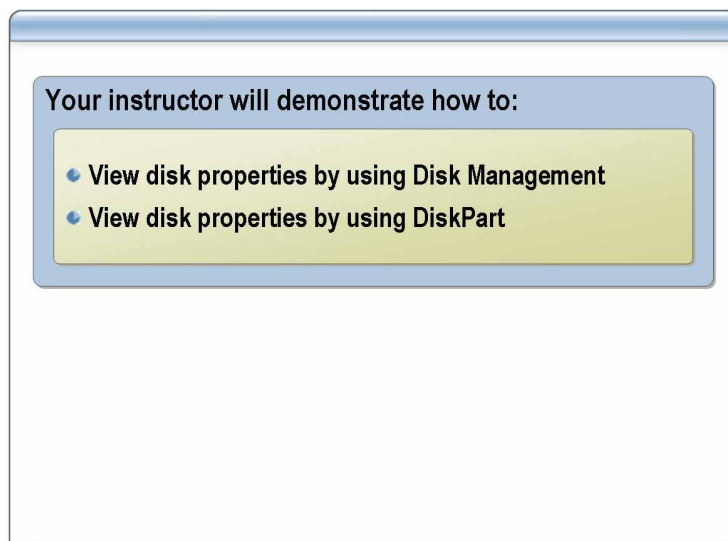
In addition to the information in Disk Management, DiskPart provides the Disk ID and the disk type, such as IDE, ATA, or SCSI.

For example, to order a replacement for a failed hard disk, the systems administrator must know the model, type, and capacity of the original disk. After installing the new disk, the administrator configures it with the disk number, partitions, unallocated space, and volume type.

### Rescan disks

After you move hard disks between computers, you must rescan the disks. When Disk Management rescans disk properties, it scans all attached disks for changes to the disk configuration. It also updates information about removable media, CD-ROM drives, basic volumes, file systems, and drive letters.

## How to View Disk Properties



### Introduction

Before you replace a hard disk, it is important to know the manufacturer, model number, drive type, and capacity of the drive so that you can find a comparable or exact replacement. After you install the new disk, you must know the disk number, volume type, partition style, and number of partitions or volumes so that you can restore the environment of the previous disk.

### Procedure using Disk Management

To view disk properties by using Disk Management:

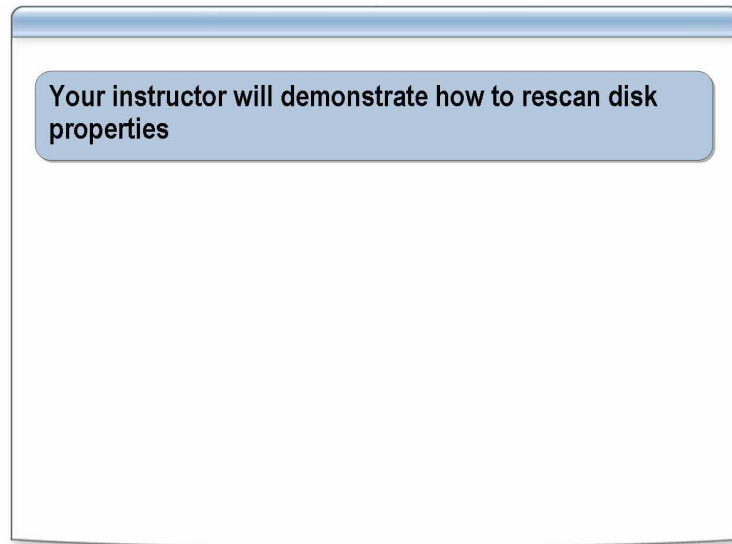
1. In Computer Management, open Disk Management.
2. In the graphical view or disk list, right-click a disk, and then click **Properties**.
3. Click the **General** tab, and then record the model number.
4. Click the **Volumes** tab, and then record the following values:
  - Disk
  - Type
  - Status
  - Partition style
  - Capacity

**Procedure using  
DiskPart**

To view the disk type by using DiskPart:

1. Open Command Prompt.
2. Type the following commands at the prompt, at then press ENTER after each command:
  - a. **diskpart**
  - b. **select disk 0**
  - c. **detail disk**
3. Record the type.

## How to Rescan Disk Properties



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### Introduction

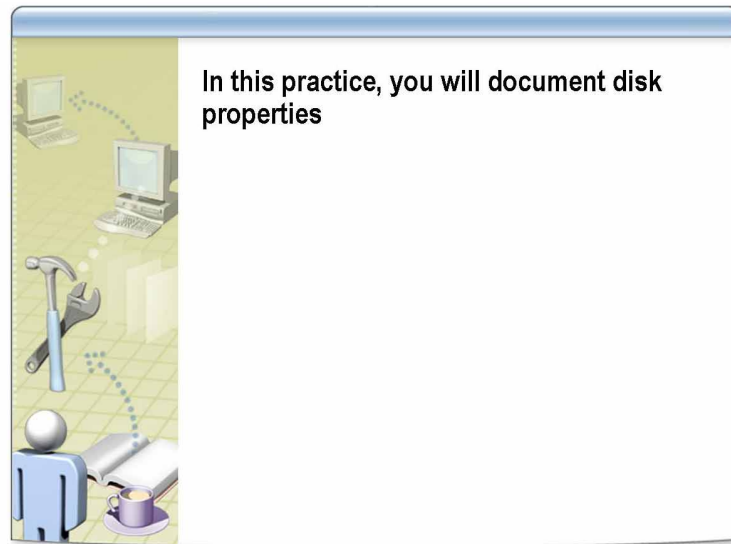
When you add a new disk to your computer, if Disk Management does not detect it, you can rescan the disk to update the disk properties.

### Procedure

To update disk properties by using Disk Management:

1. In Computer Management, open Disk Management.
2. Click **Action**, and then click **Rescan Disks**.

## Practice: Documenting Disk Properties



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**Objective**

In this practice, you will document disk properties.

**Scenario**

You are the systems administrator for an organizational unit on a large network. After arriving at work one morning, you read the following e-mail message from your manager:

We need to take inventory of all the different disk drives that we have installed on our servers. By doing this, we will be better prepared in an emergency if one of the drives fails. We will be able to order a replacement quickly without having to figure out the model number, capacity, and so on.

Please collect the following information about the disk on the server in the graphics department:

- Manufacturer
- Model
- Disk type
- Drive capacity

You should also collect the volume information so that we do not spend hours trying to remember how the disk was configured in case we need to replace it:

- Disk number
- Partition style
- Number of partitions
- Capacity of each partition

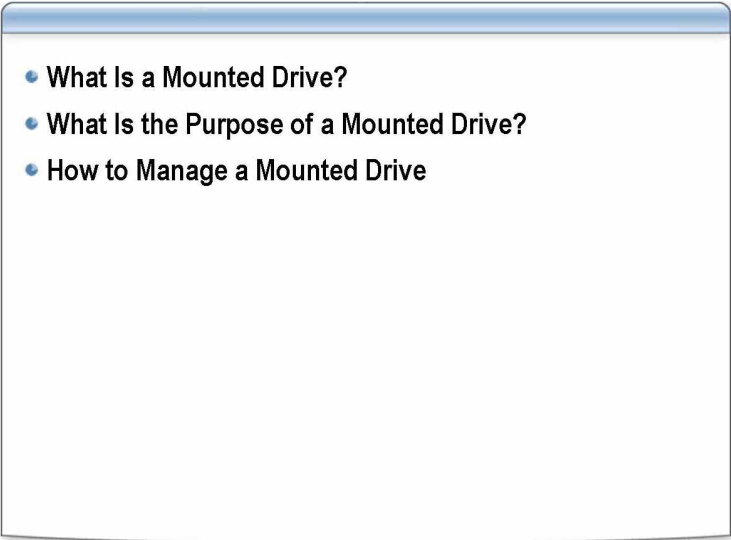
Please write this information in the Systems log book so that we can access the information quickly in case of a disk failure.



**Practice****► Examine the properties of a disk**

1. Log on to the domain as *ComputerUser* with a password of **P@ssword**.
2. Using **Run as** open Computer Management with administrative privileges, and then open Disk Management.
3. Open the properties for disk 0 and record the following information:  
Model: \_\_\_\_\_  
Disk number: \_\_\_\_\_  
Partition style: \_\_\_\_\_  
Drive capacity: \_\_\_\_\_  
Number of partitions: \_\_\_\_\_  
Capacity of C: \_\_\_\_\_  
Capacity of D: \_\_\_\_\_  
Capacity of E: \_\_\_\_\_
4. Open a command prompt with administrator privileges, and then use DiskPart to determine the disk type and record it:  
Disk Type: \_\_\_\_\_
5. Close all windows and log off.

## Lesson: Managing Mounted Drives

- 
- What Is a Mounted Drive?
  - What Is the Purpose of a Mounted Drive?
  - How to Manage a Mounted Drive

---

### Introduction

Using mounted drives can help you manage and organize data on your server. For example, to provide a more intuitive name for your drive, you can use a mounted drive to add a drive description of an existing partition. Use a mounted drive when you have two drives of related data that logically belong on one drive. Also, mounted drives help you manage the limited number of drive letters that you have to work with on a hard disk.

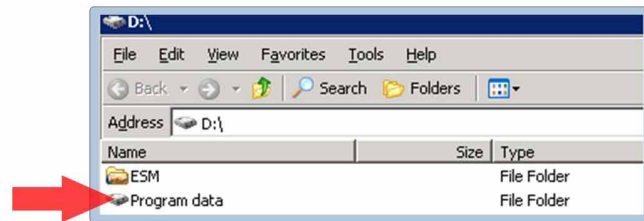
### Lesson objectives

After completing this lesson, you will be able to:

- Explain a mounted drive.
- Explain how to use a mounted drive.
- Create a mounted drive by using Disk Management and DiskPart.
- Delete a mounted drive by using Disk Management.

## What Is a Mounted Drive?

- Is assigned a path rather than a drive letter
- Can unify different file systems on a logical drive
- Allows you to add more drives without using up drive letters



### Definition

A mounted drive is a self-contained unit of storage that is administered by an NTFS file system. You can use Disk Management to mount a local drive to any empty folder on a local NTFS volume rather than to a drive letter. This method is similar to creating a shortcut that points to a disk partition or volume. Mounting a drive to a folder allows you to use an intuitive name for the folder, such as Program Data. Users can then save their documents in the Program Data folder rather than to a drive letter.

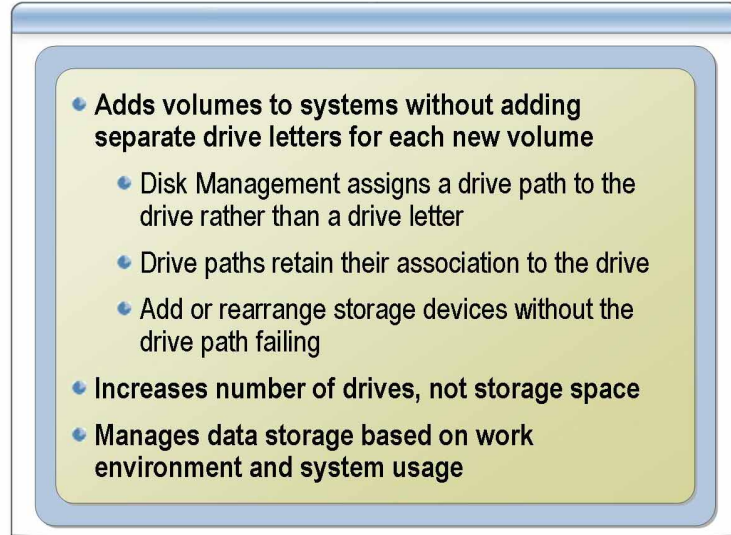
### Assigns drive path not drive letter

When you mount a local drive to an empty folder on an NTFS volume, Disk Management assigns a path rather than a letter to the drive. Mounted drives are not subject to the 26-drive limit that is imposed by drive letters, so you can use mounted drives to access more than 26 drives on your computer. Windows Server 2003 ensures that drive paths retain their association to the drive, so you can add or rearrange storage devices without causing the drive path to fail.

### Unifies disparate file systems

By using mounted drives, you can unify into one logical file system disparate file systems such as NTFS 5.0, a 16-bit FAT file system, an ISO-9660 file system on a CD-ROM drive, and so on. Neither users nor applications need information about the volume on which a specific file resides. A complete path provides all the information they need to locate a specified file. You can rearrange volumes, substitute volumes, or subdivide one volume into many volumes without requiring users or applications to change settings.

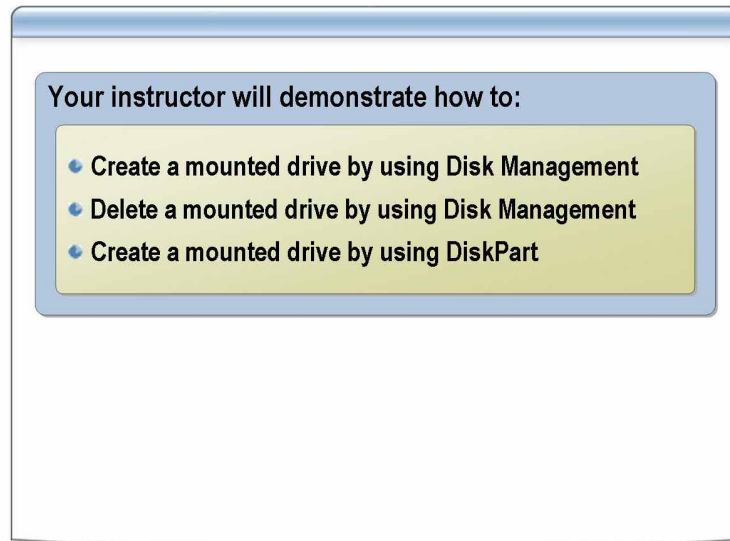
## What Is the Purpose of a Mounted Drive?



---

<b>Introduction</b>	Using NTFS mounted drives is a convenient way to add volumes to a computer when no drive letters are available. Also, you can add space to a volume by mounting other disks as folders on the volume instead of re-creating the volume on a larger disk.
<b>Add volumes to systems</b>	You can add new volumes to your system without adding separate drive letters for each new volume. Doing this makes it easier to manage your drive letters.
<b>Create multiple mounted drives per volume</b>	You can create multiple mounted drives per volume. For example, you can mount a drive to the C:\Program Files folder. The new drive is logically mounted under C:\, but it does not need its own drive letter.
<b>Manage data storage</b>	Mounted drives help you manage data storage that is based on the work environment and system usage. For example, you can move the My Documents folder to a larger drive when space is low on drive C, and then mount it as C:\My Documents.
<b>Delete a mounted drive</b>	When you delete a mounted drive, all of the files and folders remain on the drive that was mounted. For example, if you mounted drive F as C:\Temp, after you delete it, the files and folders that you copied to C:\Temp are available on drive F.
<b>Examples of using a mounted drive</b>	<p>You can use a mounted drive as a gateway to a volume. When you create a volume as a mounted drive, users and applications can refer to the mounted drive by either the path of the mounted drive, such as C:\mnt\Ddrive, or a drive letter, such as D.</p> <p>For example is an application server currently has a drive C that is near its capacity, a drive D that stores data, and an empty drive E. The application uses the C:\Temp folder extensively. You can mount the E drive to C:\Temp to provide additional space for temporary files.</p>

## How to Manage a Mounted Drive



### Introduction

Use a mounted drive to manage server resources more efficiently.

### Procedure for creating a mounted drive using Disk Management

To create a mounted drive by using Disk Management:

1. In Computer Management, open Disk Management.
2. Right-click the volume that you want to mount, and then click **Change Drive Letter and Paths**.
3. Click **Add**, browse to **Mount in the following empty NTFS folder**, and then either type the path to an empty folder on an NTFS volume or click **Browse** to locate it.

### Procedure for deleting a mounted drive using Disk Management

To delete a mounted drive by using Disk Management:

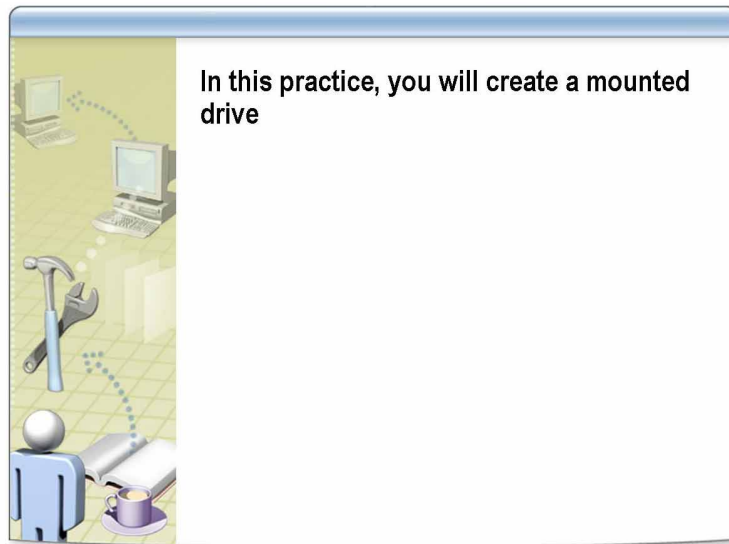
1. In Computer Management, open Disk Management.
2. Right-click the volume that you want to delete, and then click **Change Drive Letter and Paths**.
3. To delete a volume, click it, and then click **Remove**.

### Procedure for creating a mounted drive using DiskPart

To create a mounted drive by using DiskPart:

1. Open Command Prompt.
2. From the NTFS drive or folder that you want to mount elsewhere, type **diskpart**
3. At the DISKPART prompt, type **list volume** and then make note of the number of the volume that you want to mount elsewhere.
4. At the DISKPART prompt, type **select volume *n*** (where *n* is the number of the volume you want to mount elsewhere).
5. At the DISKPART prompt, type **assign mount=*\Path*** (where *Path* is the mount drive path that you want to assign to the volume).

## Practice: Creating Mounted Drives



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**Objective**

In this practice, you will create a mounted drive.

**Scenario**

You are the systems administrator for an organizational unit on a large network. After arriving at work one morning, you read the following e-mail message from your manager:

The graphics department has a problem. Half of their employees stored their bitmap drawings on the D drive, and the other half of their employees stored their photo work on the E drive. However, the graphics manager, Jeff, wants all the work on one partition. He suggested that we just copy all of the files to the D partition. This is not a solution, because over 65 percent of the D and E drives are full.

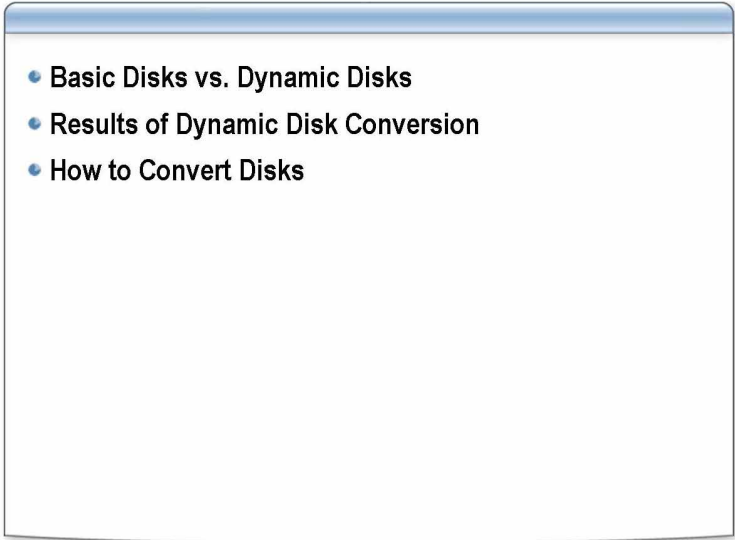
I told Jeff about mounted drives and that you could configure one for him. He wants drive E mounted to the empty D:\Photos folder.

**Practice**

► **To create a mounted drive**

1. Log on to the domain as *ComputerUser* with a password of **P@ssw0rd**.
2. Create a new folder named **D:\Photos**.
3. Using **Run as** open Computer Management with administrative privileges, and then open Disk Management.
4. Mount drive E to D:\Photos.
5. Close all windows and log off.

## Lesson: Converting Disks

- 
- Basic Disks vs. Dynamic Disks
  - Results of Dynamic Disk Conversion
  - How to Convert Disks

---

### Introduction

When a new disk is installed, it is recognized and configured as a basic disk. To create a dynamic disk, you must convert a basic disk to a dynamic disk. After the conversion is complete, you can create a wide range of dynamic volumes. You can also extend volumes over multiple disks. These capabilities provide you with greater control and helps to prevent data loss due to hardware failure.

### Lesson objectives

After completing this lesson, you will be able to:

- Explain the differences between basic and dynamic disks.
- Explain the results of a conversion to a dynamic disk.
- Convert a basic disk to a dynamic disk.

## Basic Disks vs. Dynamic Disks

Disk	Benefits
<b>Basic disks</b>	<ul style="list-style-type: none"> <li>• Use to create segregated space to organize data</li> <li>• Can be divided into up to 4 primary partitions, or up to 3 primary partitions and one extended partition</li> </ul>
<b>Dynamic disks</b>	<ul style="list-style-type: none"> <li>• Use to create volumes that span multiple disks</li> <li>• No limit on the number of volumes per disk</li> <li>• Use to create fault-tolerant disks that ensure data integrity when hardware failures occur</li> </ul>

### Introduction

A basic disk is the default disk type for Windows Server 2003. A basic disk provides you with limited capabilities for setting up your disks.

Dynamic disks provide you with more flexibility for setting up your hard disk than basic disks provide. For example, you can implement fault tolerance on a dynamic disk but not on a basic disk.

### Benefit of basic disks

The benefit of a basic disk is that it provides you with segregated space that you can use to organize your data. You can divide a basic disk into up to four primary partitions or up to three primary partitions and one extended partition that contains one or more logical drives.

### Benefits of dynamic disks

The benefits of dynamic disks are:

- A dynamic disk can be used to create volumes that span multiple disks.
- There is no limit on the number of volumes per disk that can be configured on a dynamic disk.
- Dynamic disks are used to create fault-tolerant disks that ensure data integrity when hardware failures occur.

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**Note** For more information about fault-tolerant disks, see Appendix E, “Managing Fault-Tolerant Disks,” on the Student Materials compact disc.

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### Convert basic disks to dynamic disks

Convert basic disks to dynamic disks to:

- Create and delete simple, spanned, striped, mirrored, and RAID-5 volumes.
- Extend a simple or spanned volume.
- Repair mirrored or RAID-5 volumes.
- Reactivate volumes that span more than one disk.



**Example of using  
dynamic disks**

Dynamic disks are used in a business environment where the most valuable asset is not the computer, but the data that is stored on the computer. Mission-critical data, that is, data that must be available 24 hours a day, 7 days a week, should be stored on fault-tolerant dynamic volumes.

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**Note** For more information about dynamic disks, see Appendix G, “Using Dynamic Disks,” on the Student Materials compact disc.

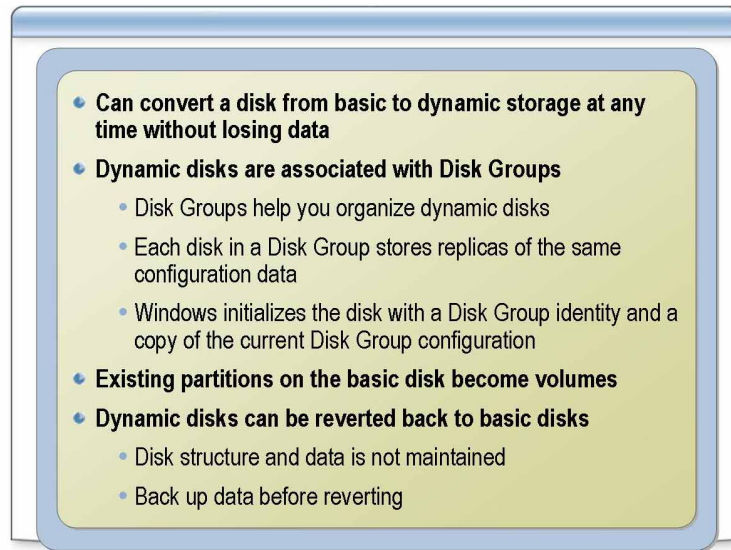
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**Note** For more information about fault-tolerant disks, such as RAID-5 and mirrored disks, see Appendix E, “Managing Fault-Tolerant Disks,” on the Student Materials compact disc.

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## Results of Dynamic Disk Conversion



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### Introduction

You can convert a disk from basic to dynamic storage at any time without losing data. When you convert a disk from basic to dynamic, the existing partitions on the basic disk become volumes.

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**Note** It is recommended that before performing any major configuration of hardware storage devices, you always back up data to another disk.

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### Disk groups

Dynamic disks are associated with disk groups. A *disk group* is a collection of disks that are managed as a collection. Disk groups help you organize dynamic disks. Each disk in a disk group stores replicas of the same configuration data. This configuration data is stored in a 1-megabyte (MB) region at the end of each dynamic disk.

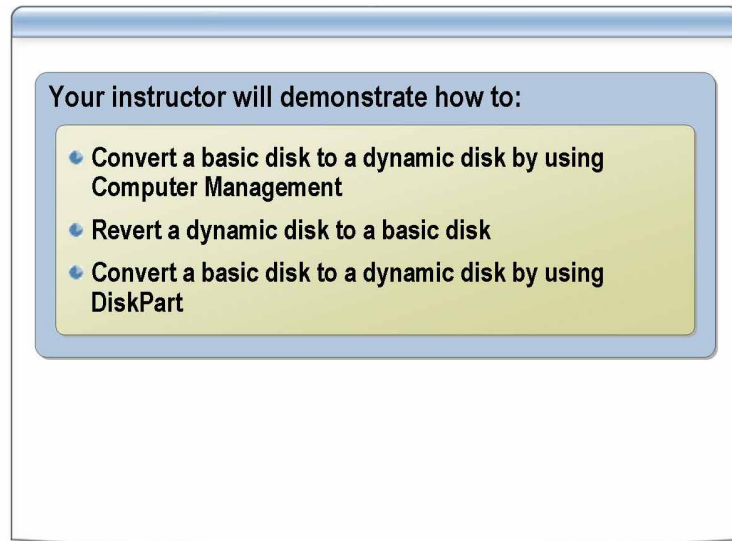
### Disk Group identity

During conversion, Windows initializes the disk with a disk group identity and a copy of the current configuration of the disk group. Windows also adds dynamic volumes to the configuration, which represents the old partitions and fault-tolerant structures on the disk. If there are no pre-existing Dynamic/Online disks, you must create a new disk group. If there are existing Dynamic/Online disks, you must add the converted disk to the existing disk group.

### Revert to a basic disk

You can revert a dynamic disk to a basic disk, but you lose the data that is on the dynamic disk. To revert a dynamic disk to a basic disk, you delete the data and volumes on the dynamic disk and then re-create a basic partition from the new unallocated space.

## How to Convert Disks



### Introduction

Most organizations use dynamic disks in their servers because they provide fault tolerance and because storage space can be extended if needed. The default disk type is basic, so you must convert a disk from basic to dynamic if you plan to use a dynamic disk.

### Procedure for converting a basic disk to a dynamic disk using Disk Management

To convert a basic disk to a dynamic disk by using Disk Management:

1. In Computer Management, open Disk Management.
2. Right-click the basic disk that you want to convert, click **Convert to Dynamic Disk**, and then follow the instructions.

### Procedure for reverting a dynamic disk to a basic disk using Disk Management

To revert a dynamic disk to a basic disk by using Disk Management:

1. Back up all volumes on the disk that you want to convert from dynamic to basic.
2. In Computer Management, open Disk Management.
3. Right-click each volume on the dynamic disk that you want to revert to a basic disk, and then click **Delete Volume** for each volume on the disk.
4. When all volumes on the disk have been deleted, right-click the disk, and then click **Convert To Basic Disk**.
5. Recreate your partitions, and then restore your data to the basic disk.

**Procedure for  
converting a basic disk  
using DiskPart**

To convert a basic disk to a dynamic disk by using DiskPart:

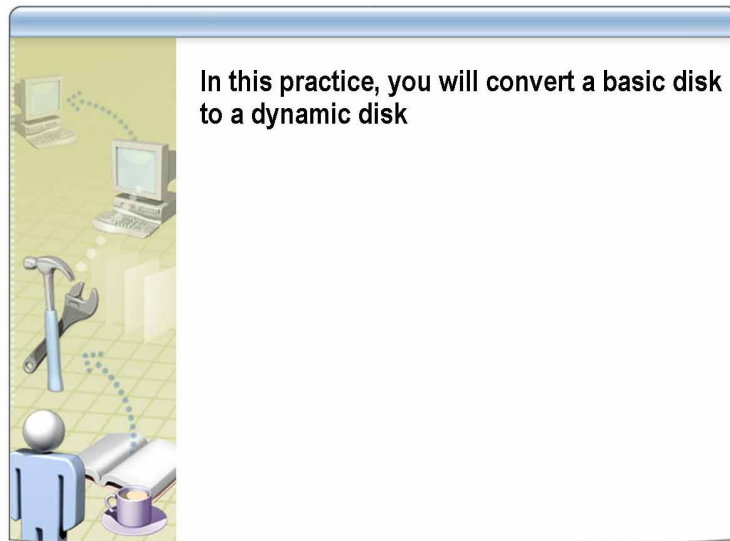
1. Open Command Prompt, and then type **diskpart**
2. At the DISKPART prompt, type **list disk**  
Make a note of the disk number of the disk that you want to convert to dynamic.
3. At the DISKPART prompt, type **select disk** and then enter the number of the disk you are converting.
4. At the DISKPART prompt, type **convert dynamic**

---

**Note** On dynamic volumes, only the volume focus is important because the previous partition focus is always lost. The disk focus is important only for simple volumes.

---

## Practice: Converting Disks

**Objective**

In this practice, you will convert a basic disk to a dynamic disk.

**Scenario**

You are the systems administrator for an organizational unit on a large network. After arriving at work one morning, you read the following e-mail message from your manager:

As you know, the graphics department staff has grown by over 50 percent this year. This growth has caused a problem with their servers because they are running out of storage. However, the manager of the graphics department, Jeff, says that when the disks were originally configured, only 30 percent of the capacity was going to be used, so 50 percent of the disk capacity was unallocated.

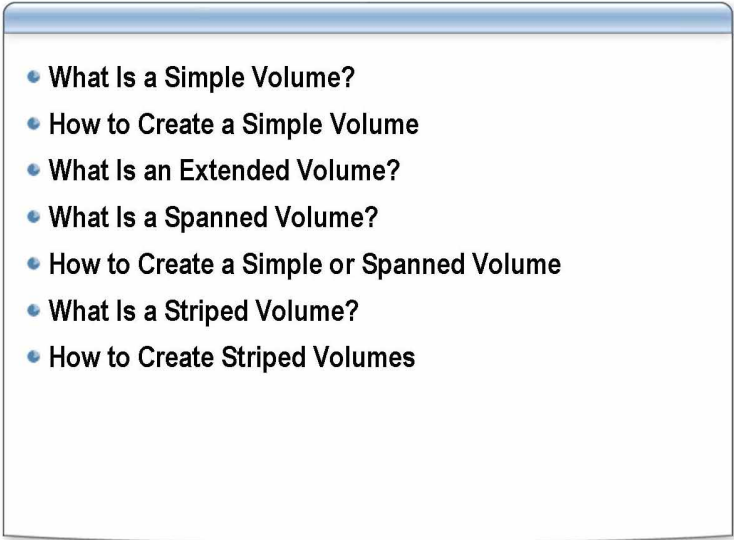
Jeff also may want to make some of the disks in the servers fault-tolerant and wants to know what that entails. He heard that the disks must be dynamic before the partitions can be extended or made fault-tolerant, so he wants to know where he can purchase dynamic disks.

Would you please go to the graphics department and explain some of these disk concepts to Jeff? Also, convert one of the disks on an existing server to dynamic so that he stops asking me about purchasing dynamic disks.

**Practice****► To convert a basic disk to a dynamic disk**

1. Log on to the domain as *ComputerUser* with a password of **P@ssw0rd**.
2. Using **Run as** open Computer Management with administrative privileges, and then open Disk Management.
3. Convert disk 0 to a dynamic disk.
4. Restart the computer.
5. Log on to the domain as *ComputerUser* with a password of **P@ssw0rd**.
6. Using **Run as** open Computer Management with administrative privileges, and then open Disk Management.
7. Verify that the disk is dynamic.
8. Close all windows and log off.

## Lesson: Creating Volumes

- 
- What Is a Simple Volume?
  - How to Create a Simple Volume
  - What Is an Extended Volume?
  - What Is a Spanned Volume?
  - How to Create a Simple or Spanned Volume
  - What Is a Striped Volume?
  - How to Create Striped Volumes

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### Introduction

Dynamic disks provide features that basic disks do not provide, such as the ability to create volumes, called spanned and striped volumes, that span multiple disks. All volumes on dynamic disks are known as dynamic volumes.

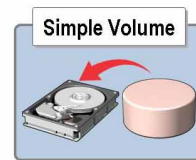
### Lesson objectives

After completing this lesson, you will be able to:

- Describe the characteristics of a simple volume.
- Create a simple volume.
- Explain the characteristics of an extended volume.
- Explain the characteristics of a spanned volume.
- Create an extended and spanned volume.
- Explain the characteristics of a striped volume.
- Create a striped volume.

## What Is a Simple Volume?

- Contains space on a single disk
- Can be created only on dynamic disks
- Has fewer restrictions than a basic disk partition
- Can use the NTFS, FAT, or FAT32 file systems
- Can be extended if formatted with NTFS



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### Definition

A simple volume is a single volume that resides on a dynamic disk. You can create a simple volume from unallocated space on a dynamic disk. A simple volume is similar to a partition, except it does not have the size limits that a partition has, nor is there a restriction on the number of volumes that you can create on a single disk.

### Simple volume file formats

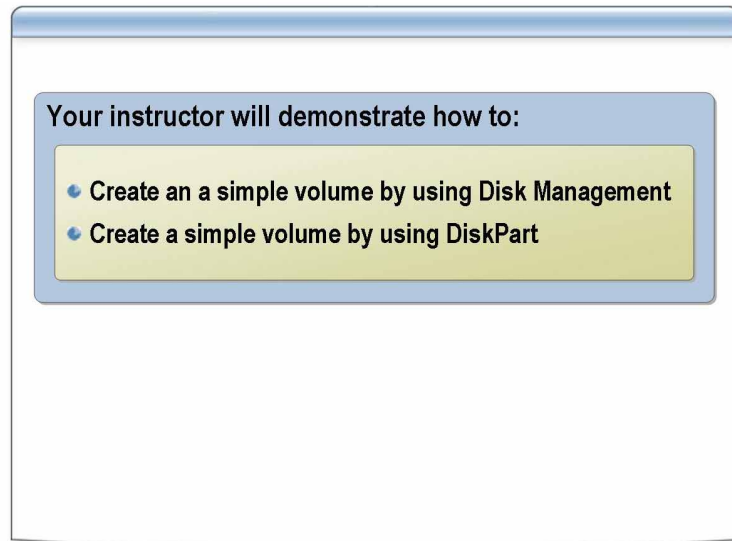
A simple volume uses the NTFS, FAT, or FAT32 file system formats. However, you can extend a simple volume only if it is formatted with the version of NTFS that is used in Windows 2000 or the Windows Server 2003 family of operating systems. Also, you can add space to, or extend, a simple volume after you create it.

### Use a simple volume for all basic data storage

You can use a simple volume for all data storage until you need more space on your disks. To gain more space, you can create an extended, spanned, or striped volume. For other than a simple volume, though, you need more than one disk.



## How to Create a Simple Volume



### Introduction

Create a single volume on a dynamic disk if you plan to expand the volume in the future.

### Procedure for creating a simple volume by using Disk Management

To create a simple volume by using Disk Management:

1. In Computer Management, open Disk Management.
2. Right-click the unallocated space on the dynamic disk on which you want to create the simple volume, and then click **New Volume**.
3. In the New Volume Wizard, click **Simple**, and then follow the instructions.

### Procedure for creating a simple volume by using DiskPart

To create a simple volume by using DiskPart:

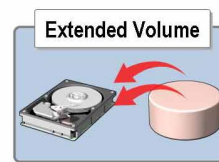
1. Open Command Prompt, and then type **diskpart**
2. At the DISKPART prompt, type **list disk**

Make note of the disk number of the disk where you want to create a simple volume.

3. At the DISKPART prompt, type **create volume simple size=*n* disk=*n*** (where **size=*n*** is the size of the disk in megabytes, and **disk=*n*** is the number of the disk).

## What Is an Extended Volume?

- Created by extending onto unallocated space on the same disk or a different disk
- Must be unformatted or formatted with a version of NTFS



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### Definition

You can increase the size of an existing simple volume by extending the volume onto unallocated space on the same disk or a different disk. To extend a simple volume, the volume must be unformatted or formatted with the version of NTFS that is used in Windows 2000 or the Windows Server 2003 family of operating systems.

### Additional hard disk space

To make additional space available without reconfiguring your hard disks, you can add space to an existing volume on your hard disk. Exceptions include any volume that contains a system partition, the boot partition, or an active paging file.

### Example of using extended volumes

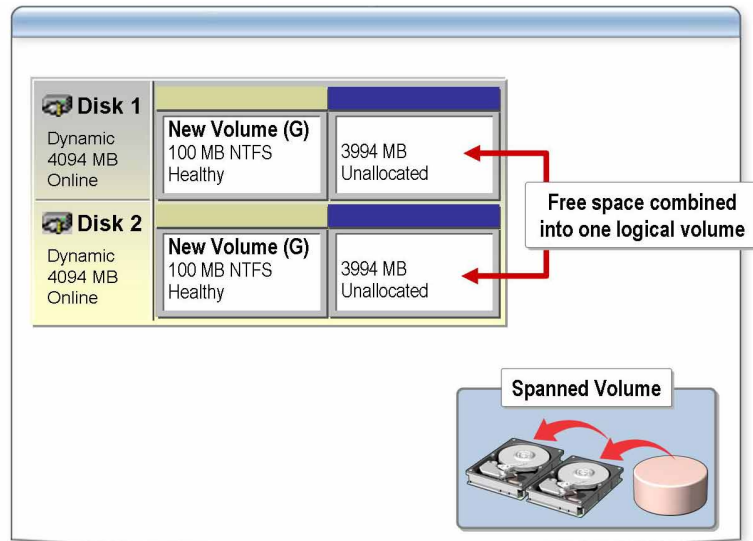
Your organization has increased the number of products it sells and needs additional hard disk space on the D drive to store their new marketing brochures. The current disk space that is used for marketing brochures is 2 GB. The marketing manager predicts that the D drive will run out of space in six months. You look at the D drive in your server and find that the D drive can be extended to include up to 6 GB of unallocated space.

---

**Important** You can extend a volume only if it was originally created on a dynamic disk. A volume that was created first on a basic disk and then converted to a dynamic disk cannot be extended.

---

## What Is a Spanned Volume?



### Definition

A spanned volume is a simple volume that allows you to create a single logical volume based on unallocated space that is available on other dynamic disks on the computer. By using spanned volumes, you can use your storage space more efficiently. After a volume is extended, to delete a part of it you must delete the entire spanned volume.

### Spanned volume file formats

You can create a spanned volume only by using the NTFS file system. Spanned volumes do not offer fault tolerance. If one of the disks that contains a spanned volume fails, the entire volume fails and all the data is lost.

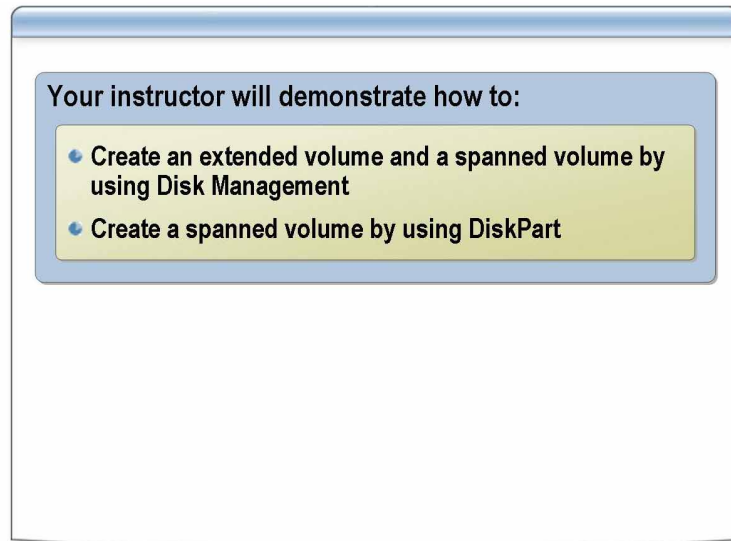
### Increase storage size

You can use spanned volumes to increase storage size when you must create a volume but do not have enough unallocated space for the volume on a single disk. By combining sections of unallocated space from multiple disks, you can create one spanned volume.

### Example of a spanned volume

Your organization hires 100 college interns every summer. The interns are provided with an old server to use for their work. The interns estimate they will need 10 GB of storage on their D drive in the next month. You want to add the storage to their assigned drive, but the drive has only 240 MB of unused space. You find that the interns' server has 15 GB of unallocated space on the E drive. You can span the D drive to include 10 GB of storage from the E drive.

## How to Create a Simple or Spanned Volume



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### Introduction

Increase the storage capacity of a simple volume by extending it to an existing volume that has unallocated space or by creating a spanned volume.

### Procedure for creating an extended or spanned volume using Disk Management

To create a spanned volume by using Disk Management:

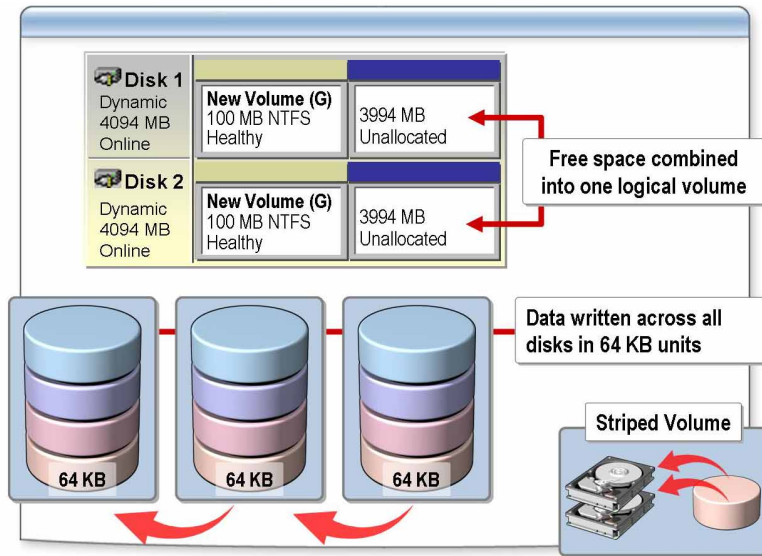
1. In Computer Management, open Disk Management.
2. Right-click the simple or spanned volume you want to extend, click **Extend Volume**, and then follow the instructions on your screen.

### Procedure for extending a simple volume using DiskPart

To create a simple volume by using DiskPart:

1. Open Command Prompt, and then type **diskpart**
2. At the DISKPART prompt, type **list volume**  
Make a note of the number of the basic volume you want to extend.
3. At the DISKPART prompt, type **select volume *n*** (where *n* is the basic volume that you want to extend into contiguous, empty space on the same disk).
4. At the DISKPART prompt, type **extend size=*o*** (where *o* is the size of the extended partition in megabytes).

## What Is a Striped Volume?



### Definition

A striped volume stores data on two or more physical disks by combining areas of free space into one logical volume on a dynamic disk. Striped volumes, also known as RAID 0, contain data that is spread across multiple dynamic disks on separate drives. Spanned volumes cannot be striped.

### Blocks of data

Data that is written to the stripe set is divided into blocks that are called *stripes*. These stripes are written simultaneously to all drives in the stripe set. The major advantage of disk striping is speed. Data can be accessed on multiple disks by using multiple drive heads, which improves performance considerably.

### Striped volumes performance

Striped volumes offer the best performance of all the disk strategies because data that is written to a striped volume is simultaneously written to all disks at the same time rather than sequentially. Consequently, disk performance is faster on a striped volume than on any other type of disk configuration.

### Striped volume uses

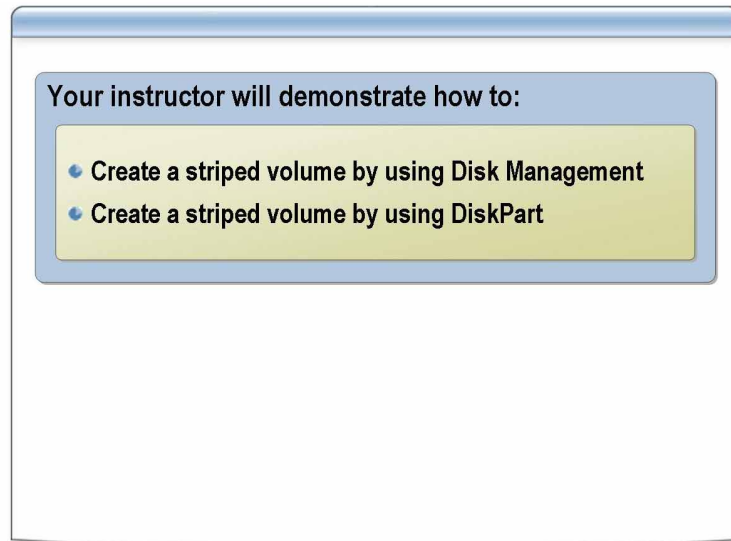
Use a striped volume when you:

- Read from or write to large databases.
- Load program images, dynamic-link libraries (DLLs), or run-time libraries.
- Want to provide the best performance for high usage files, for example page files.

### Example of striped volumes

Use striped volumes for page files, because striped volumes provide the best performance for high usage files.

## How to Create Striped Volumes



---

### Introduction

One way of managing your disks is to use dynamic volumes. To provide the best performance for accessing large databases, for example, configure a dynamic disk as a striped volume.

### Procedure for creating a striped volume

To create a striped volume by using Disk Management:

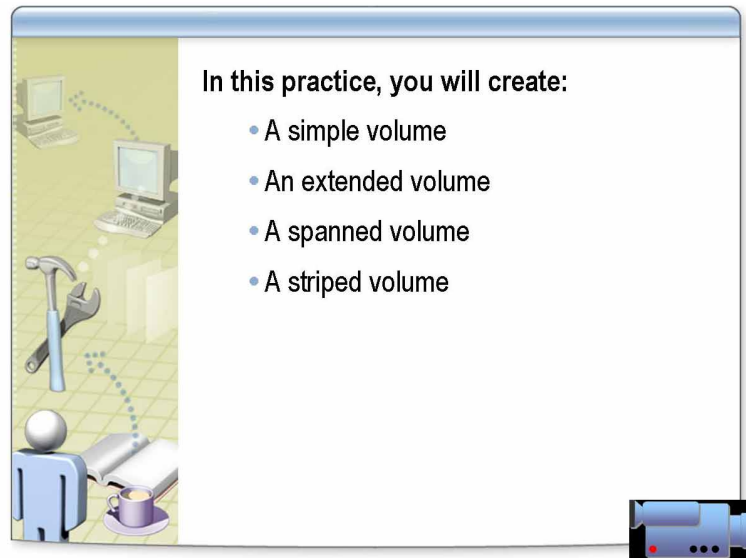
1. In Computer Management, open Disk Management.
2. Right-click the unallocated space on the dynamic disk on which you want to create the striped volume, and then click **New Volume**.
3. In the New Volume Wizard, select **Striped**, and then follow the instructions on your screen.

### Procedure for creating a striped volume

To create a striped volume by using DiskPart:

1. Open Command Prompt, and then type **diskpart**
2. At the DISKPART prompt, type **list disk**  
Make a note of the disk number of the disk on which you want to create a striped volume.
3. At the DISKPART prompt, type **create volume stripe size=*n* disk=*n*** (where **size=*n*** is the size of the disk in megabytes, and **disk=*n*** are the numbers of the disks you are striping).

## Practice: Creating Volumes



### Objective

In this practice, you will create:

- A simple volume
- An extended volume
- A spanned volume
- A striped volume

### Scenario

You are the systems administrator for an organizational unit on a large network. After arriving at work one morning, you read the following e-mail message from your manager:

The graphics department needs your help again. They are pleased with the mount drive solution that you configured earlier, but now they want to enlarge the D volume by another 2 GB. They also want you create another 1-GB volume, named F, on their server.

### Practice

#### ► Extend the D volume by 2 GB

1. Log on to the domain as *ComputerUser* with a password of **P@ssw0rd**.
2. Using **Run as** open Computer Management with administrative privileges, and then open Disk Management.
3. Extend the D volume by 2 GB.

#### ► Create a 1 GB volume and assign it the letter F

1. Open the New Volume Wizard, create a 1-GB volume, and then assign it the letter F.
2. Close all windows.

**Practice setup****► Create a spanned volume and a striped volume**

This practice is an interactive exercise. To complete this practice, you need the following:

- A computer running Microsoft Windows Server 2003, Windows XP Professional, Windows 2000, Microsoft Windows NT® 4.0, Windows 98, or Windows 95.
- A minimum display resolution of 800 x 600 with 256 colors.

**► To start the simulation**

1. Insert the Student Materials compact disc into your CD-ROM drive.
2. At the root of the compact disc, double-click **Default.htm**.
3. On the Student Materials Web page, click **Multimedia**.
4. Click **Creating Volumes**.
5. Read the introduction information, and then click the link to start the simulation.



## Lesson: Importing a Disk

- 
- What Is a Foreign Disk?
  - What Is an Offline Disk?
  - How to Import a Foreign Disk
  - How to Reactivate an Offline Disk

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### Introduction

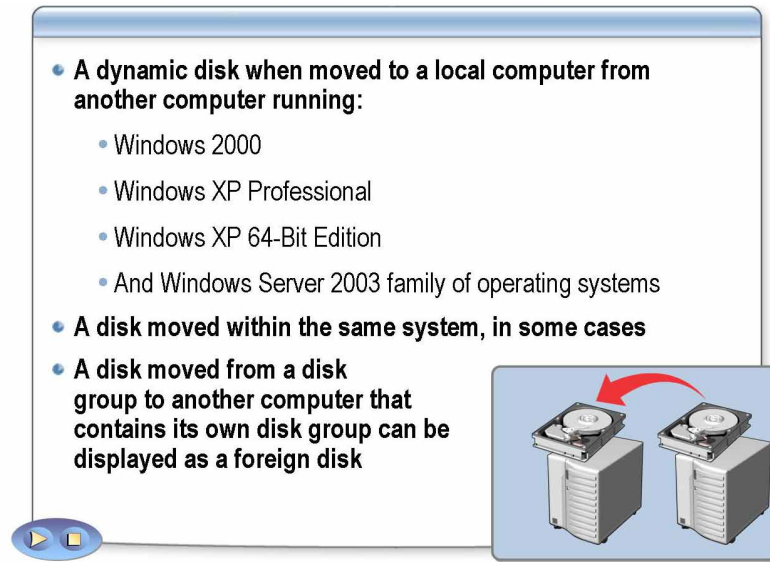
You can move a disk from another system or within the same system by importing it. After it is imported, Disk Management refers to it as a foreign disk. To manage foreign disks, you must understand the characteristics of a foreign disk, as well as what happens if a foreign disk is not imported properly.

### Lesson objectives

After completing this lesson, you will be able to:

- Explain the characteristics of a foreign disk.
- Explain what causes an offline disk.
- Import a foreign disk.
- Reactivate an offline disk.

## What Is a Foreign Disk?



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### Introduction

When you move a dynamic disk from one computer to another, Windows Server 2003 automatically considers the disk as a *foreign disk*. When Disk Manager indicates the status of a new disk as foreign, you must import the disk before you can access volumes on the disk.

### Dynamic disks moved from one computer to another

You can move dynamic disks to Windows Server 2003 from any computer running Windows 2000, Windows XP Professional, or Windows XP 64-bit Edition, or from another server running Windows Server 2003.

When you move all the disks that contain parts of a volume from one computer to another at the same time, the volume and its data are identical to the original state after the import. All simple volumes on any moved disks are recovered to their original state if the disks have been rescanned.

On a non-redundant volume that spans multiple disks, if you move only some disks from one system to another, the volume is disabled during import. The volume also becomes disabled on the original system. As long as you do not delete the volume on either the original or the target system, you can move the remaining disks later. When all disks are moved over, the volume is recovered to its original state.

### Disk failure during a move within the same system

A disk that fails during a move within the same system can appear to be foreign. Configuration data for dynamic disks is stored on all dynamic disks, so the information about which disks are owned by the system is lost when all dynamic disks fail. For example, because volumes can span multiple disks by using simple disk spanning and striping redundancy mechanisms, the display status of a volume in the **Import Foreign Disks** dialog box can become complicated if not all of the disks have been moved.

Another complication can occur when you move a disk and then later move additional disks. For example, if you move one active mirror of a volume from one system to another, and then you move another later, one of the two mirrors appears to be up-to-date on one system, and the other mirror appears up-to-date on the other system. When the two mirrors are put together on the same system, they both appear up-to-date, but they have different contents. For this reason, it is recommended that you move all fault-tolerant and non-fault-tolerant volumes that span disks at the same time.

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**Note** For more information about fault-tolerant disks, such as RAID-5 and mirrored disks, see Appendix E, “Managing Fault-Tolerant Disks,” on the Student Materials compact disc.

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**Groups of disks can be foreign**

Groups of disks that you move from one computer to another are grouped according to the computer from which they were moved. Disk Management displays the groups of moved disks as foreign disks. If you move one or more disks from a disk group to another computer that contains its own disk group, the disk group that you move is considered as Foreign until you import it into the existing group.

To import the disks in the foreign disk group, use the **Import Foreign Disks** operation that is associated with one of the disks. The manual operation lists one or more Disk Groups, identified by the name of the computer where they were created.

## What Is an Offline Disk?

- Offline disk is a status found in Disk Management
- A dynamic disk can be offline if corrupted or intermittently unavailable
- A foreign disk that fails is always offline
- Reactivate a dynamic or foreign disk to bring it back online

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### Introduction

Disk Management displays the Offline status when a dynamic disk is not accessible. The inaccessible disk may be corrupted or intermittently unavailable. The Offline status also appears if you attempt to import a foreign dynamic disk, but the operation fails. An error icon appears on the offline disk. The Offline status appears only for dynamic disks.

### Remove a disk

When you remove a dynamic disk from a computer, the remaining online dynamic disks retain information about it and its volumes. Disk Management displays the removed disk as a Dynamic/Offline disk named Missing. You can remove this Missing disk entry by removing all volumes on that disk and then using the **Remove Disk** command that is associated with that disk. When you physically remove the last dynamic disk, the Missing entry is no longer displayed in Disk Management.

### Foreign disks Reactivate or rescan an offline disk

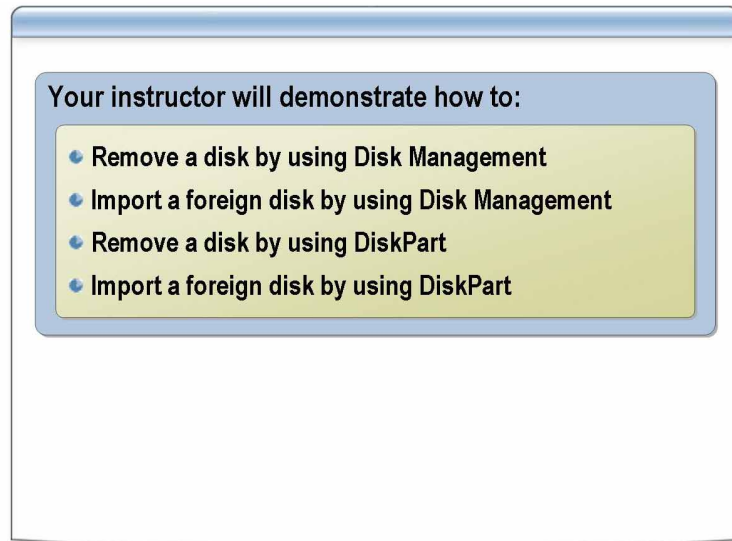
Reactivating or rescanning an offline disk changes the disk status from **Offline** to **OK**.

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**Note** For more information about troubleshooting a foreign disk, see Appendix F, “Foreign Disks Volume Status in Disk Management,” on the Student Materials compact disc.

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## How to Import a Foreign Disk



### Introduction

If you must move a disk from one server to another, use the following steps to remove and reconfigure the disk.

### Procedure for removing a disk by using Disk Management

To remove a disk by using Disk Management:

1. In Computer Management, open Disk Management.
2. For a dynamic disk, right-click the disk that you want to move, and then click **Remove Disk**. Skip this step for basic disks.
3. If the disk is external, unplug it from the computer. If the disk is internal, turn off the computer, and then physically remove the disk.

### Procedure for removing a disk by using DiskPart

To remove a disk by using DiskPart:

1. Open Command Prompt, and then type **diskpart**
2. At the DISKPART prompt, type **remove** [{letter=*D*|mount=*Path*|all}] [dismount] [noerr]
3. If the disk is external, unplug it from the computer. If the disk is internal, turn off the computer, and then physically remove the disk.

**Procedure for importing a foreign disk**

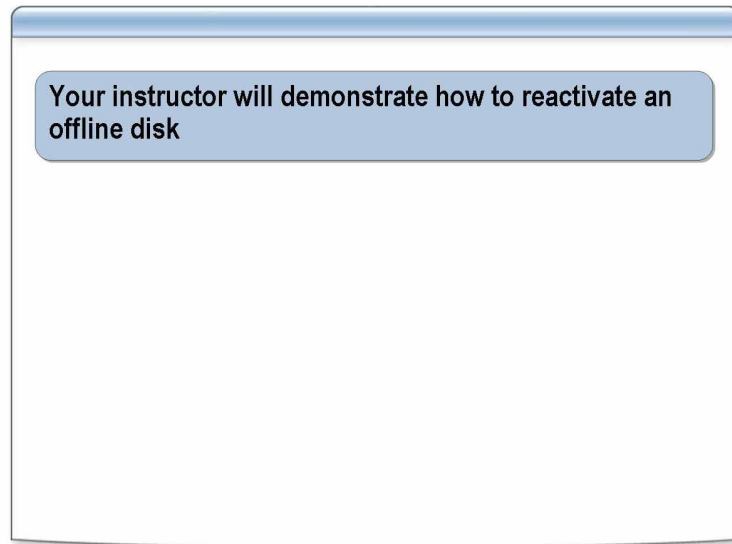
To import a foreign disk by using Disk Management:

1. If the disk is external, plug it into the computer. If the disk is internal, make sure the computer is turned off, and then physically install the disk in that computer.
2. In Computer Management, open Disk Management.
3. Start the computer that contains the disk that you moved.
4. Follow the instructions in the **Found New Hardware** dialog box.  
If the **Found New Hardware** dialog box does not appear, in Control Panel, double-click **Add Hardware** to start the Add Hardware Wizard.
5. Use Disk Management to detect the new disk.

To import a foreign disk by using DiskPart:

1. Open Command Prompt, and then type **diskpart**
2. At the DISKPART prompt, type **list disk**  
Make a note of the disk number of the disk that you want to import.
3. At the DISKPART prompt, type **select disk *n*** (where *n* is the disk number of the disk you are moving).
4. At the DISKPART prompt, type **import [noerr]**

## How to Reactivate an Offline Disk



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### Introduction

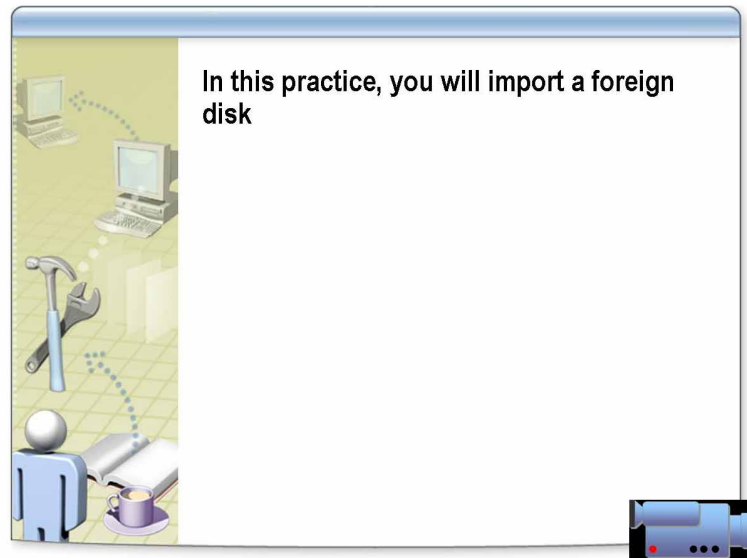
Use the following steps when you have moved a disk, but it appears in Disk Management as Missing or Offline. By reactivating the disk, you are changing the disk status to Online.

### Procedure

To reactivate an offline disk by using Disk Management:

1. In Computer Management, open Disk Management.
2. Right-click the disk marked **Missing** or **Offline**, and then click **Reactivate Disk**.

## Practice: Importing a Foreign Disk

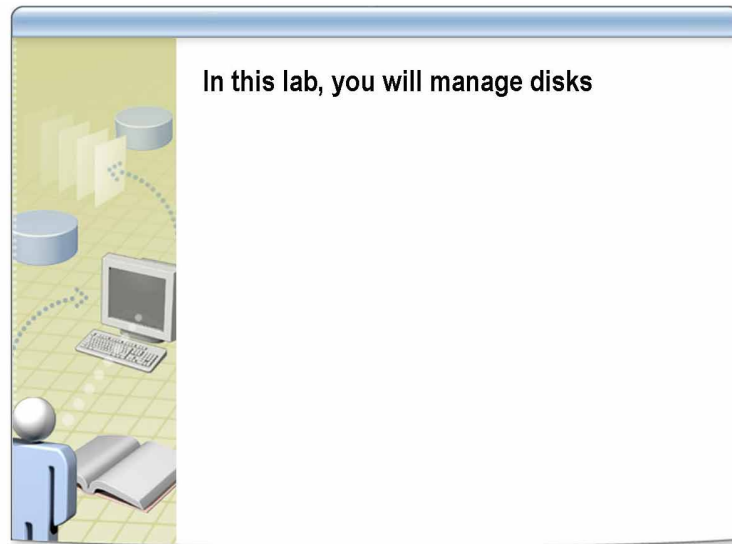


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<b>Objective</b>	In this practice, you will import a foreign disk.
<b>Scenario</b>	A hardware failure has occurred on a file server. You must move the disk from the file server to another computer to access the information on that disk while the file server is being repaired. The disk on the file server is configured as dynamic.
<b>Practice setup</b>	<p>This practice is an interactive exercise. To complete this practice, you need the following:</p> <ul style="list-style-type: none"><li>■ A computer running Windows Server 2003, Windows XP Professional, Windows 2000, Windows NT 4.0, Windows 98, or Windows 95.</li><li>■ A minimum display resolution of 800 x 600 with 256 colors.</li></ul> <p>► <b>To start the simulation</b></p> <ol style="list-style-type: none"><li>1. Insert the Student Materials compact disc into your CD-ROM drive.</li><li>2. At the root of the compact disc, double-click <b>Default.htm</b>.</li><li>3. On the Student Materials Web page, click <b>Multimedia</b>.</li><li>4. Click <b>Importing a Foreign Disk</b>.</li><li>5. Read the introduction information, and then click the link to start the simulation.</li></ol>



## Lab A: Managing Disks



### Objectives

After completing this lab, you will be able to:

- Mount a drive.
- Change a drive letter.

### Scenario

You are the systems administrator for an organizational unit on a large network. After arriving at work one morning, you read the following e-mail message from your manager:

The manager of the graphics department called to request some help. The graphic artists are testing some beta software, which requires reconfiguration of the folder structure on their drive D. All their graphics are stored on drive E, but they also want access the graphics from drive D.

I told the manager about mounted drives, and he likes that solution. He wants you to mount drive E to the empty D:\Graphics folder. After that is done, he wants drive D to become drive X. He wants you to begin working on this project as soon as possible.

After the graphics department finishes testing the beta software, remove the mounted drive and rename drive X to D.

**Estimated time to  
complete this lab:  
15 minutes**

## Exercise 1

### Mounting Drive E to D:\Graphics

In this exercise, you will mount drive E to D:\Graphics so that there are two paths to the graphics files on drive E.

Tasks	Specific instructions
1. Log on to the network.	<ul style="list-style-type: none"><li>Log on with your domain user account.</li></ul>
2. Open Computer Management with administrative credentials.	<ul style="list-style-type: none"><li>Using <b>Run as</b> open Computer Management with administrative privileges, and then open Disk Management.</li></ul>
3. Mount drive E to D:\Graphics.	<ul style="list-style-type: none"><li>a. Create a new folder named <b>D:\Graphics</b>.</li><li>b. In Computer Management, use Disk Management to mount drive E to D:\Graphics.</li></ul>
4. Copy the Labfiles folder to D:\Graphics.	<ul style="list-style-type: none"><li>Open Windows Explorer and copy the Labfiles folder to D:\Graphics.</li></ul>

## Exercise 2

### Changing Drive Letter D to X

In this exercise, you will change drive letter D to X.

Tasks	Specific instructions
1. Change drive letter D to X.	<ul style="list-style-type: none"><li>▪ In Computer Management, use Disk Management to change the drive letter from D to X.</li></ul>
2. Verify the existence of the Labfiles folder.	<ul style="list-style-type: none"><li>▪ Open Windows Explorer to verify the existence of the Labfiles folder both in X:\Graphics and on drive E.</li></ul>

## Exercise 3

### Removing Mounted Drive E

In this exercise, you will remove mounted drive E.

Tasks	Specific instructions
1. Remove drive E from the X:\Graphics path.	<ul style="list-style-type: none"><li>▪ In Computer Management, use Disk Management to remove drive E from the X:\Graphics path.</li></ul>
2. Verify the removal of Labfiles from X:\Graphics.	<ul style="list-style-type: none"><li>▪ Open Windows Explorer and verify that the Labfiles folder is not listed in the X:\Graphics path.</li></ul>
3. Verify the existence of Labfiles on drive E.	<ul style="list-style-type: none"><li>▪ In Windows Explorer, verify that the Labfiles folders exists on drive E.</li></ul>

## Exercise 4

### Changing Drive Letter X to D

In this exercise, you will change drive letter X to D.

Tasks	Specific instructions
<ul style="list-style-type: none"><li>▪ Change drive letter X to D.</li></ul>	<ul style="list-style-type: none"><li>a. In Computer Management, change drive letter X to D.</li><li>b. Close all windows and log off.</li></ul>

