MICROSOFT OFFICIAL COURSE

Module 5

Configuring Disks and Device Drivers

Module Overview

- Partitioning Disks in Windows® 7
- Managing Disk Volumes
- Maintaining Disks in Windows 7
- Installing and Configuring Device Drivers

Lesson 1: Partitioning Disks in Windows 7

- What Is an MBR Disk?
- What Is a GPT Disk?
- Disk Management Tools
- Demonstration: Converting an MBR Partition to a GPT Partition

What Is an MBR Disk?

Master Boot Record (MBR) Disk

The MBR contains the partition table for the disk and a small amount of executable code called the master boot code.

- Is created when the disk is partitioned
- Contains a four partition entry table
- Is on the first sector of the hard disk
- Limits the number & size of partitions

What Is a GPT Disk?

GUID Partition Table(GPT)

Contains an array of partition entries describing the start and end LBA of each partition on disk

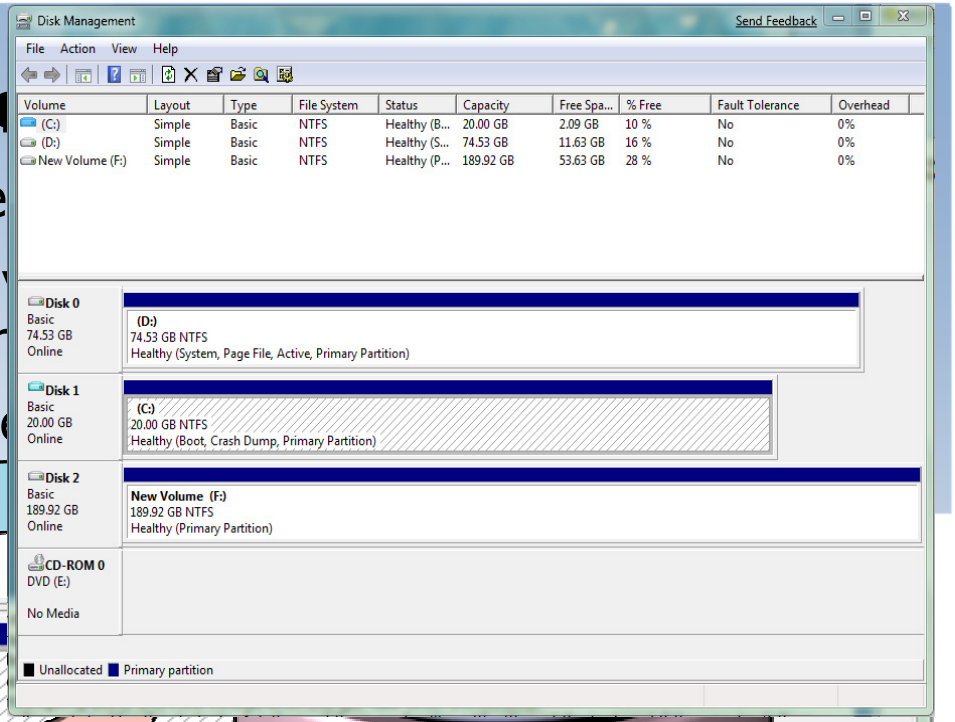
- Supports more partitions
- Supports larger partitions
- Enhances reliability
- Supports boot disks on 64-bit Windows operating systems, UEFI systems

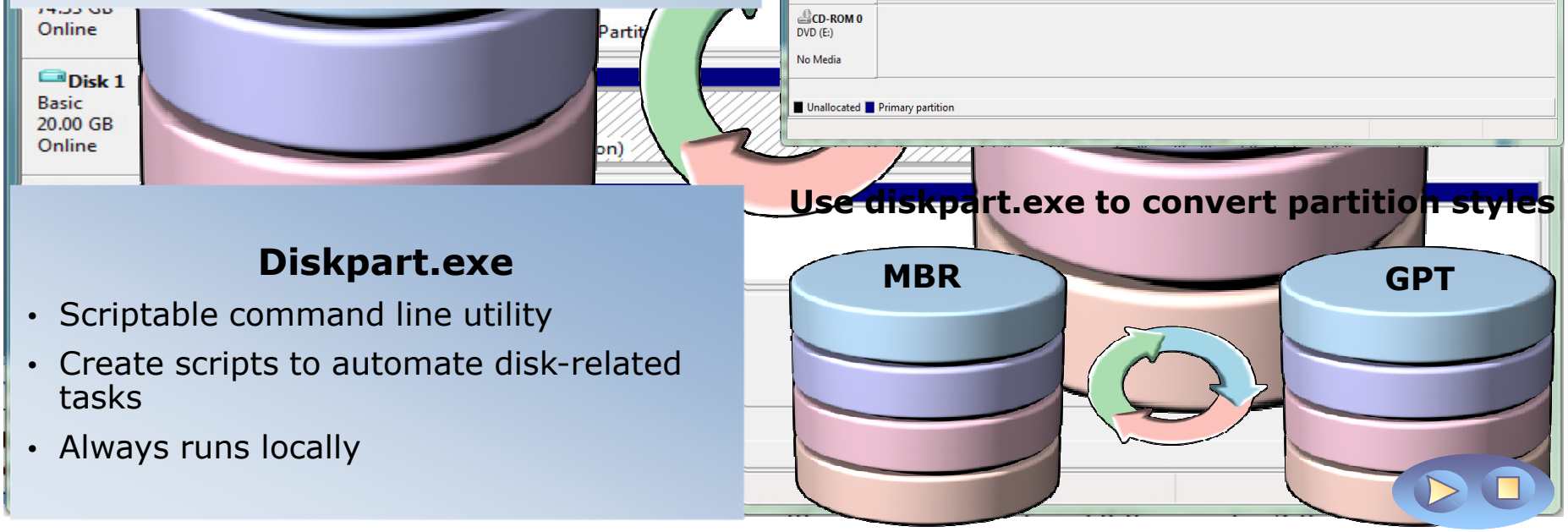
Disk Management Tools

Use diskpart.exe to convert partition styles

Disk Management Snap-in

- Graphical user interface
- Manage disks and volumes, both basic and dynamic, locally or on remote computers
- Simple partition creation





Diskpart.exe

- Scriptable command line utility
- Create scripts to automate disk-related tasks
- Always runs locally

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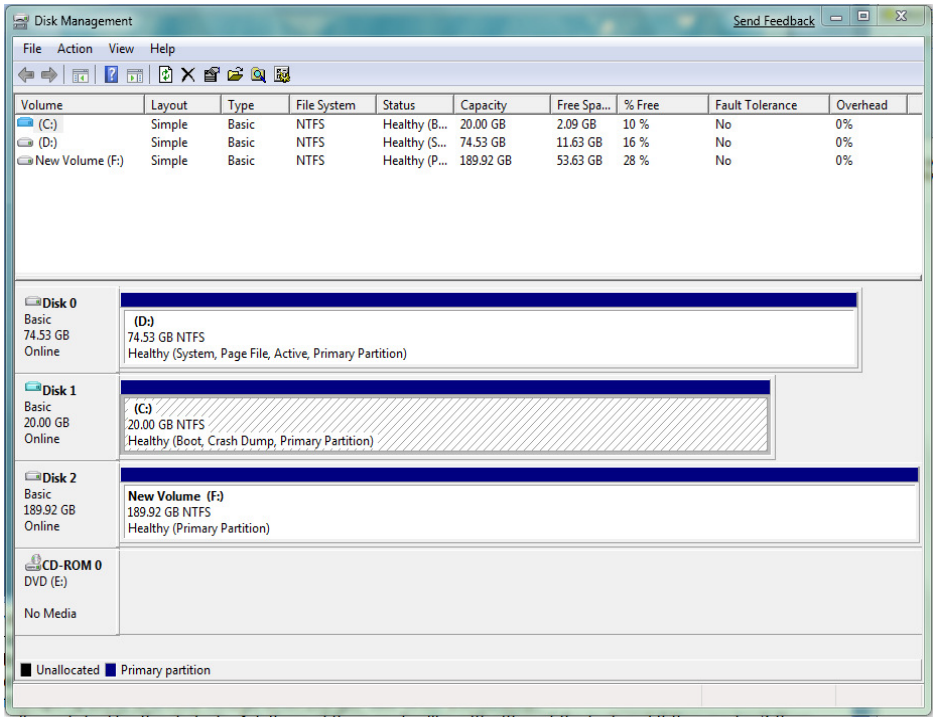

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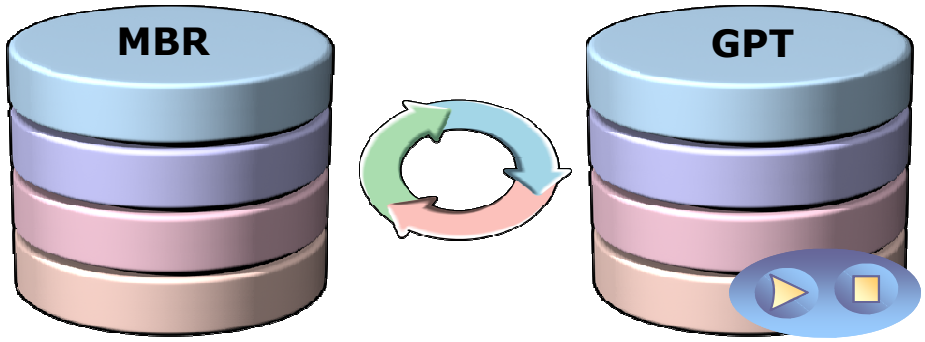
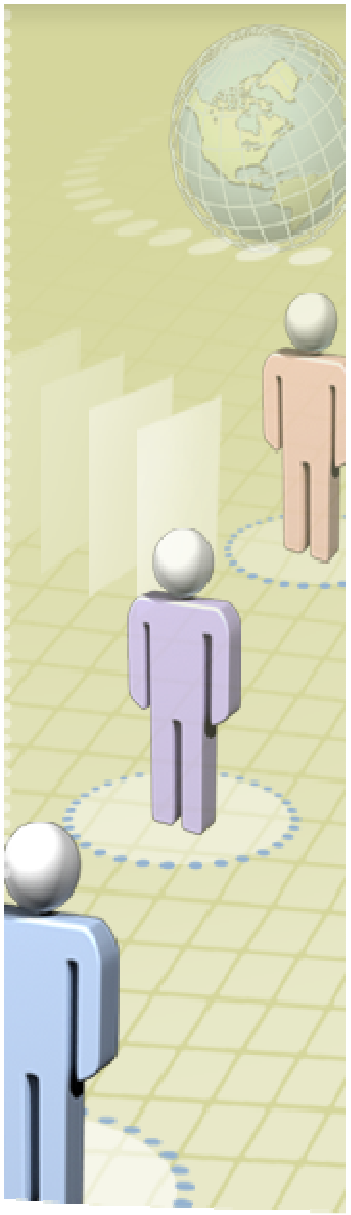
Use diskpart.exe to convert partition styles

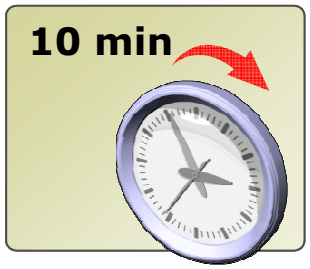


Demonstration: Converting an MBR Partition to a GPT Partition



In this demonstration, you will see how to:

- Convert a Disk to GPT by using Diskpart.exe
- Convert Disk 3 to GPT by using Disk Management
- Verify the Disk Type



Lesson 2: Managing Disk Volumes

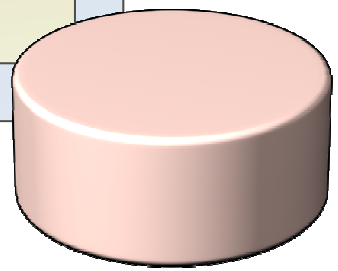
- What Is a Simple Volume?
- Demonstration: Creating a Simple Volume
- What Are Spanned and Striped Volumes?
- Demonstration: Creating Spanned and Striped Volumes
- Purpose of Resizing a Volume
- Demonstration: Resizing a Volume

What Is a Simple Volume?

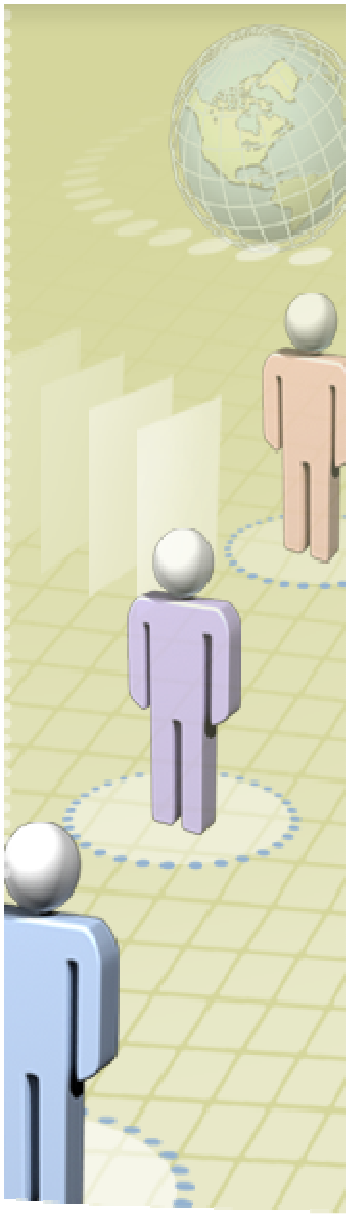
Simple Volume

Dynamic volume that encompasses available free-space from a single, dynamic, hard disk drive

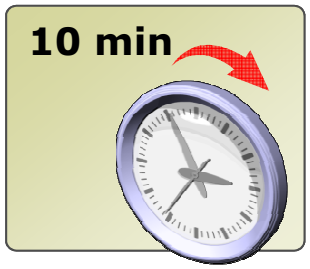
- Can be extended on same disk
- Not fault tolerant
- Volume I/O performance the same as Disk I/O performance
- Can be extended across disks creating a spanned volume



Demonstration: Creating a Simple Volume



In this demonstration, you will see how to create a simple volume by using Disk Management and Diskpart.exe.



What Are Spanned and Striped Volumes?

Spanned

- Requires dynamic disks
- Space allocated from multiple dynamic disks
- Up to 32 disks can be combined into single spanned volume
- No fault tolerance
- No performance improvement compared to simple volumes
- Can shrink or extend

Striped

- Requires multiple dynamic disks
- Allocated space from each disk must be identical
- Up to 32 disks can be combined into single striped volume
- No fault tolerance
- Well suited for isolating the paging file
- Provides for faster throughput

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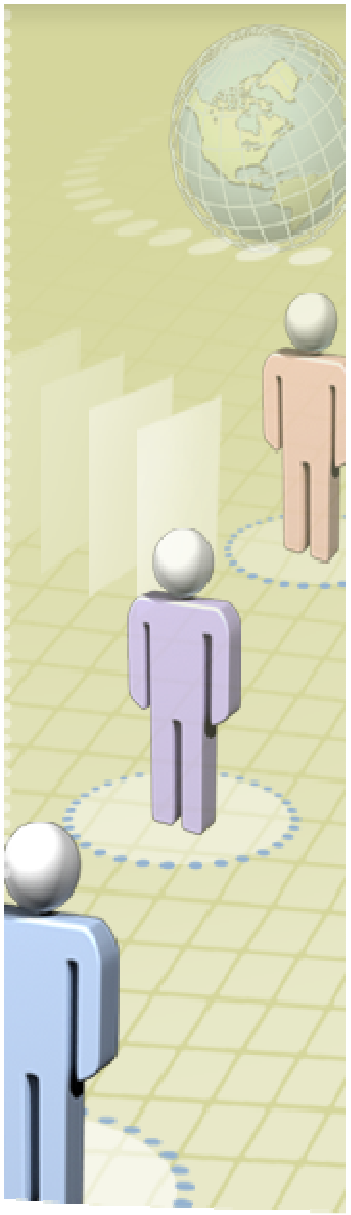
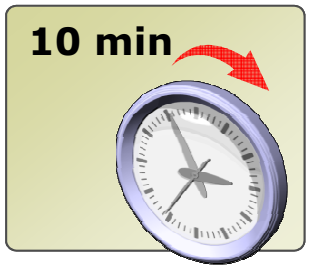
Demonstration: Creating Spanned and Striped Volumes



In this demonstration, you will see how to:

- Create a spanned volume
- Create a striped volume



Purpose of Resizing a Volume

Resize a volume to create additional, unallocated space to use for data or programs on a new volume.

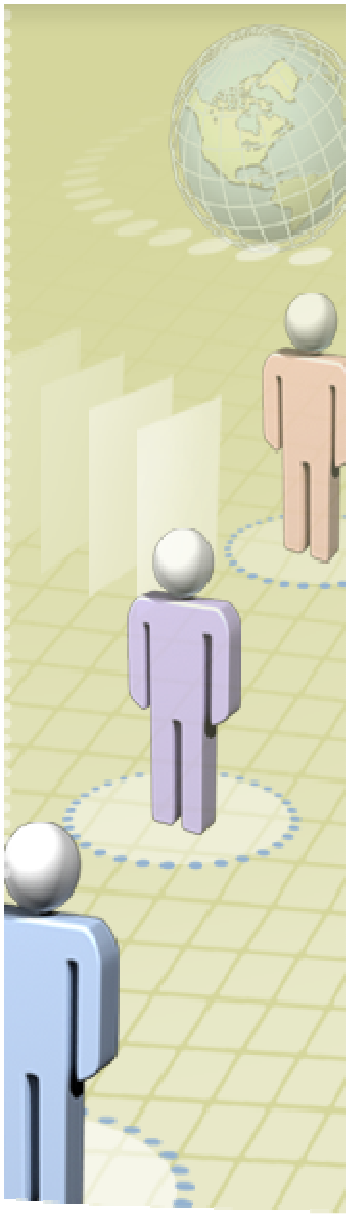
Shrink simple and spanned dynamic disks to:

- Extend the simple volume on the same disk
- Extend a simple volume to include unallocated space on other disks on the same computer

Before shrinking:

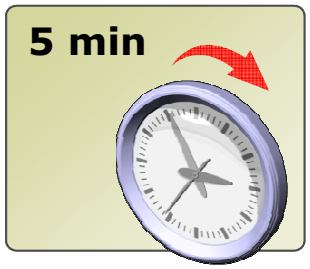
- Defragment the disk
- Reduce shadow copy disk space consumption
- Ensure that no page files are stored on the volume to be shrunk

Demonstration: Resizing a Volume



In this demonstration, you will see how to:

- Shrink a volume by using Diskpart.exe
- Extend a volume by Disk Management



Lesson 3: Maintaining Disks in Windows 7

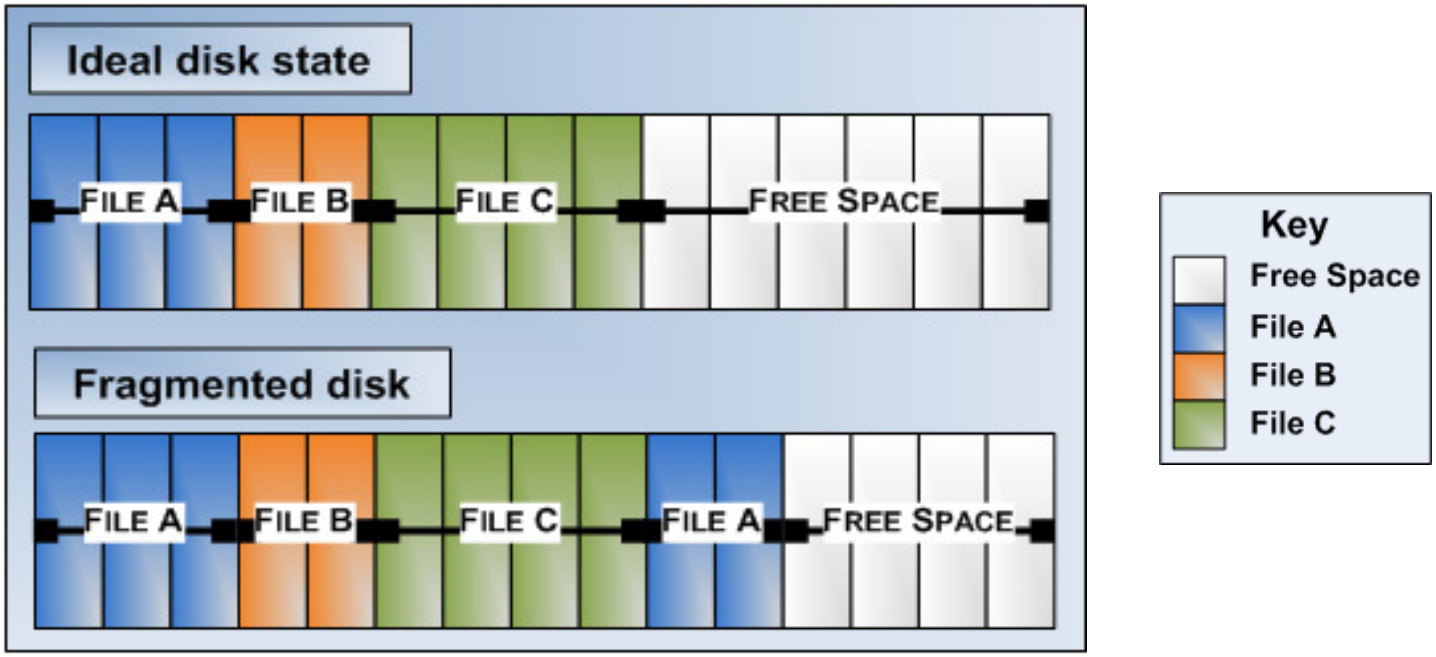
- What Is Disk Fragmentation?
- Defragmenting a Disk
- What Are Disk Quotas?
- Demonstration: Configuring Disk Quotas (Optional)

What Is Disk Fragmentation?

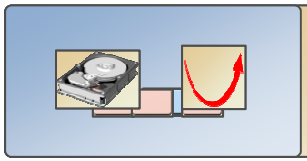
Disk fragmentation is the non-contiguous storage of data on a volume

Disk fragmentation can:

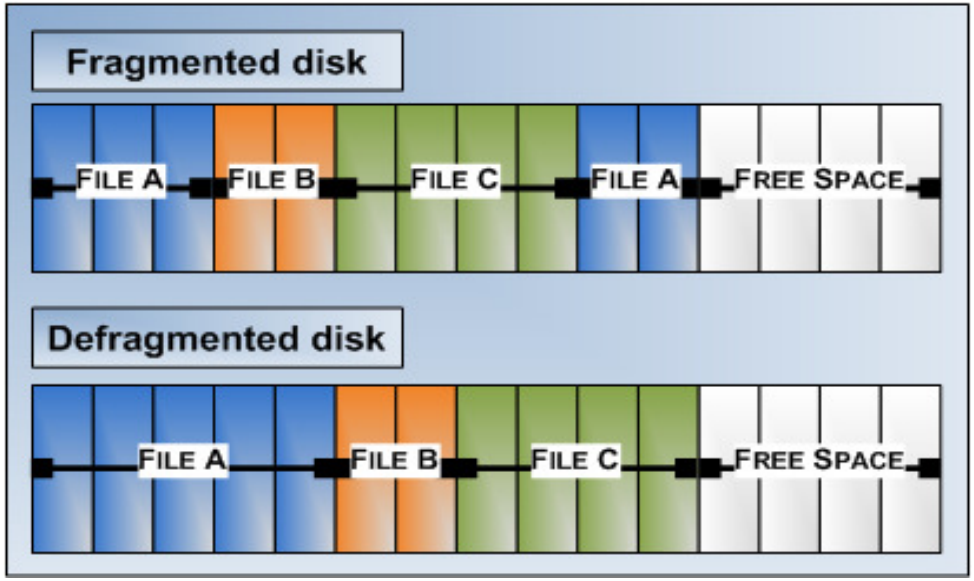
- Consist of both fragmented files and fragmented free space
- Lead to poor performance of the disk subsystem

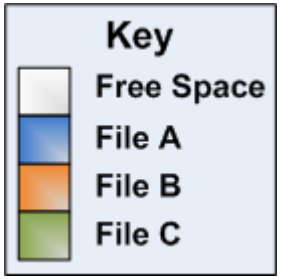


Defragmenting a Disk

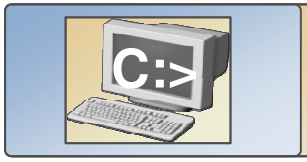


Rearrange data and reunite fragmented files





Scheduled to run automatically by default



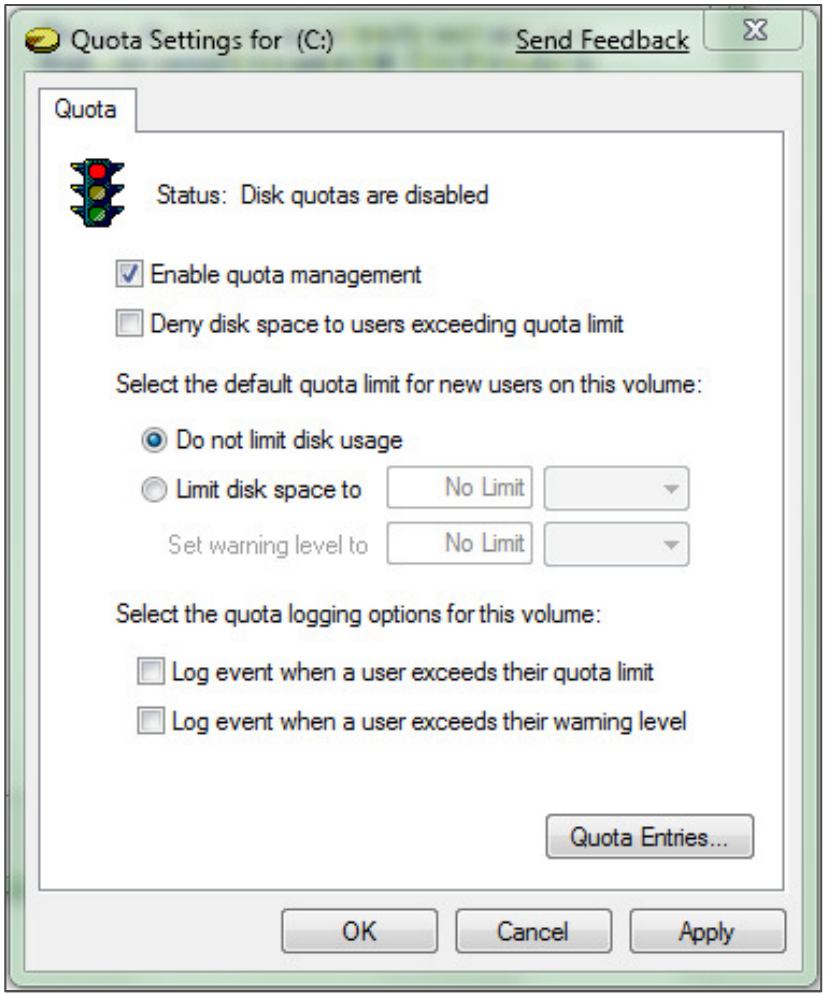
Can be run from the command-line

What Are Disk Quotas?

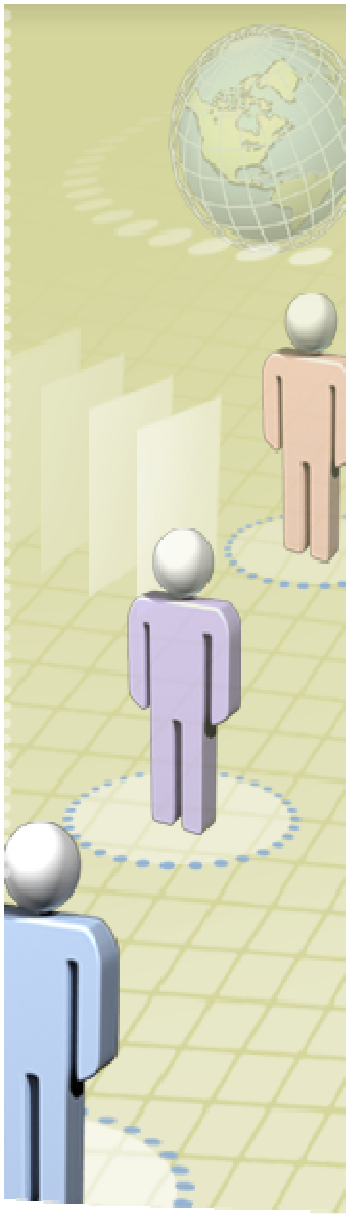
A disk quota is a way for you to limit use of disk space on a volume for each user to conserve disk space.

Disk quotas help you:

- Track and restrict disk consumption
- Proactively monitor available space
- Determine who is consuming available space
- Plan for storage capacity increases

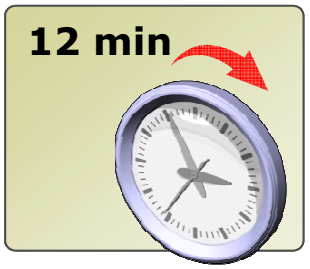


Demonstration: Configuring Disk Quotas (Optional)



In this demonstration, you will see how to:

- Create quotas in a Volume
- Test a quota
- Review quota alerts and event-log messages



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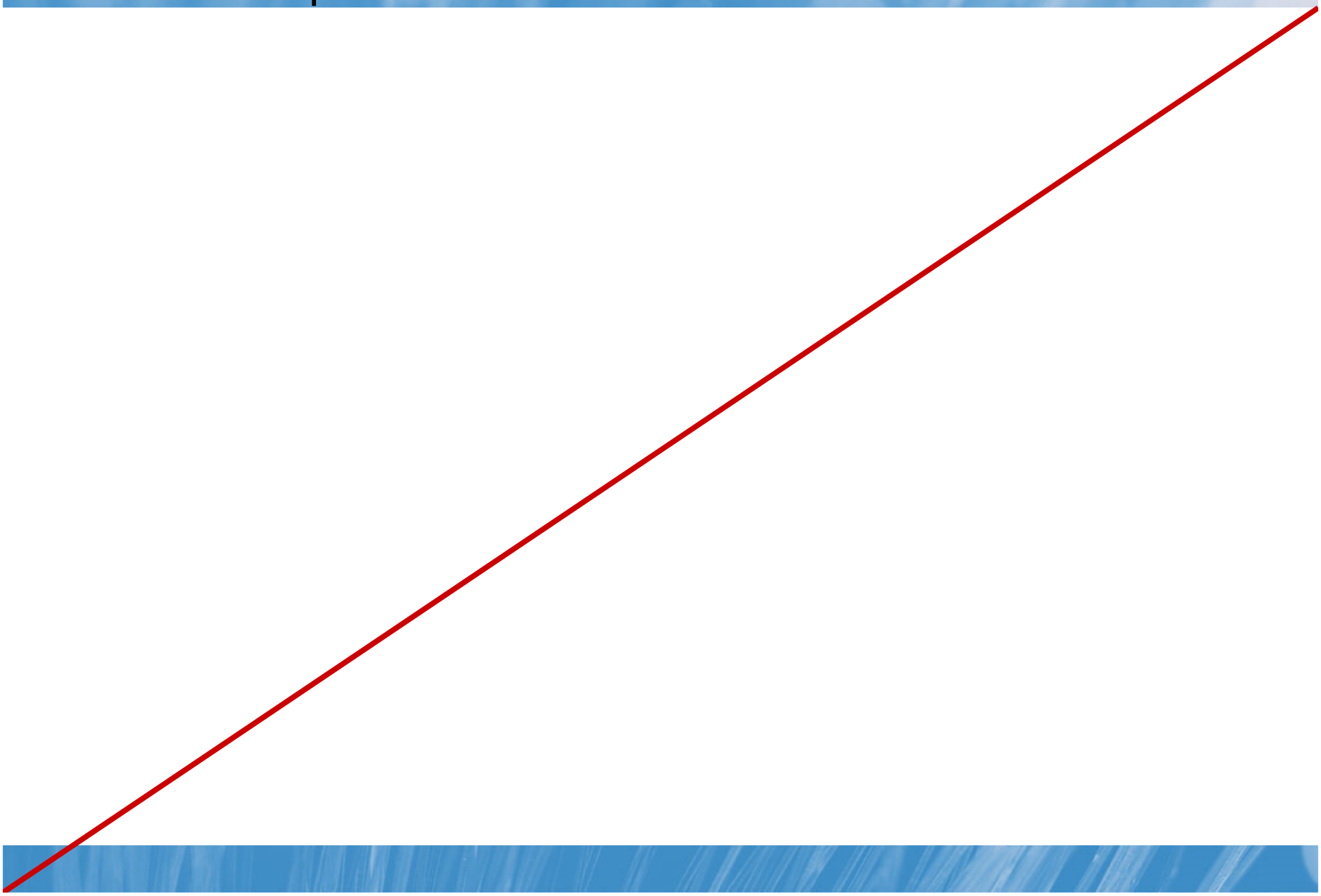

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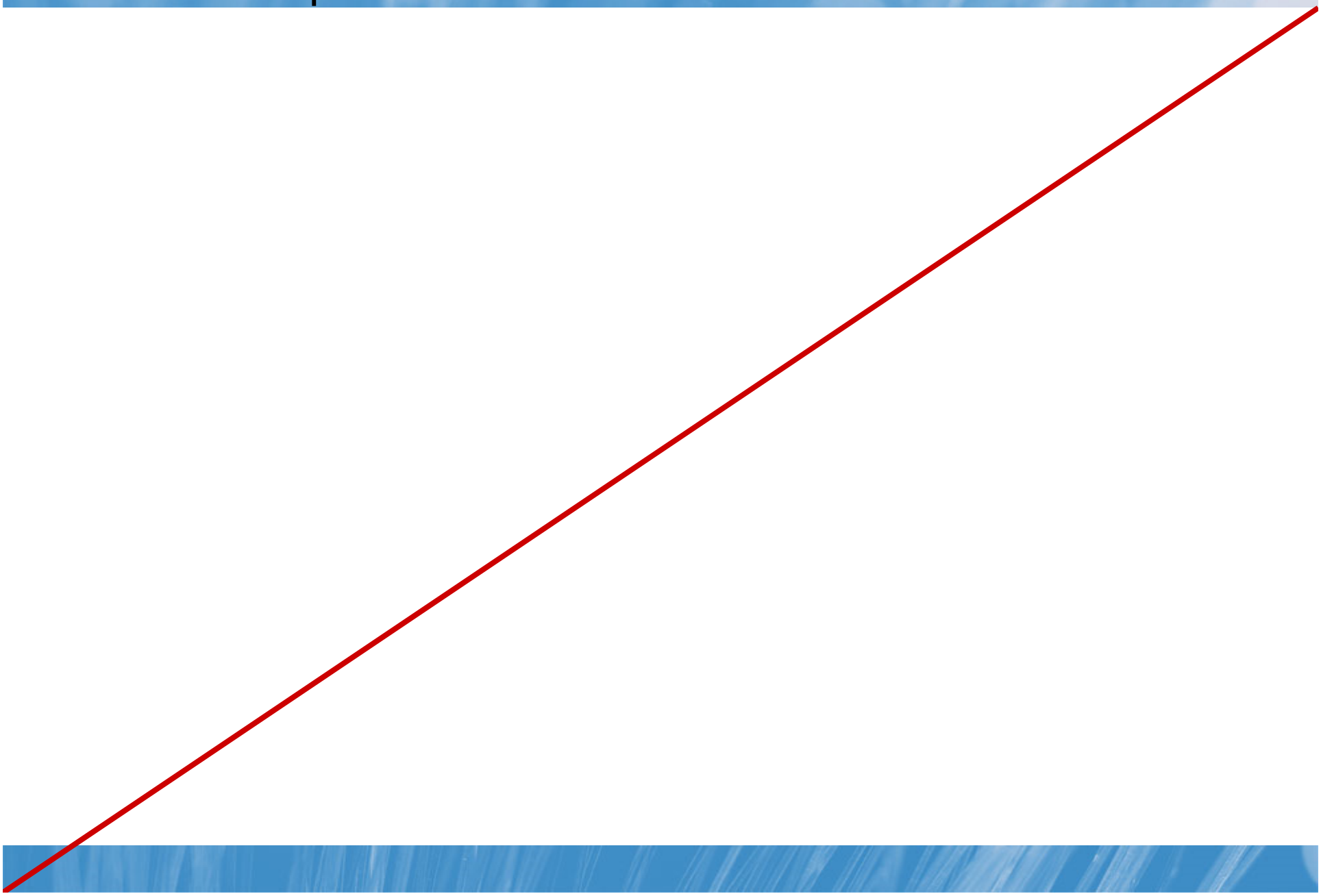


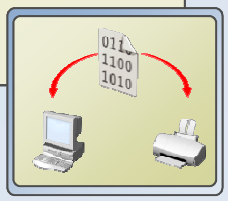
Lesson 4: Installing and Configuring Device Drivers

- Overview of Device Drivers in Windows 7
- Installing Devices and Drivers
- Device Driver Management Tools
- Options for Updating Drivers
- Managing Signed Drivers
- Discussion: Options for Recovering from a Driver Problem
- Demonstration: Managing Drivers

Overview of Device Drivers in Windows 7

A driver is a small software program that allows a hardware device to communicate with a computer.

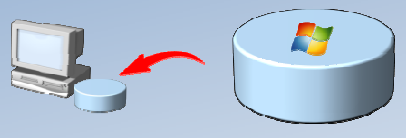
- Drivers developed for the 32-bit versions do not work with the 64-bit versions, and vice versa.
- Device drivers that ship with Windows 7 have a Microsoft digital signature.
- The driver store is the driver repository.
- Device metadata packages contain device experience XML documents that represent:
  - The properties of the device
  - The device functions
  - Applications and services that support the device.



Installing Devices and Drivers

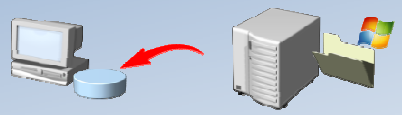
Improve end-user device driver installation by:

- ✓ **Staging driver packages in the protected driver store**



Add to the Driver Store by using the Plug-and-Play utility (Pnputil.exe) at a Command Prompt

- ✓ **Configuring client computers to automatically search a specified list of folders**



Search folders specified by the DevicePath registry entry

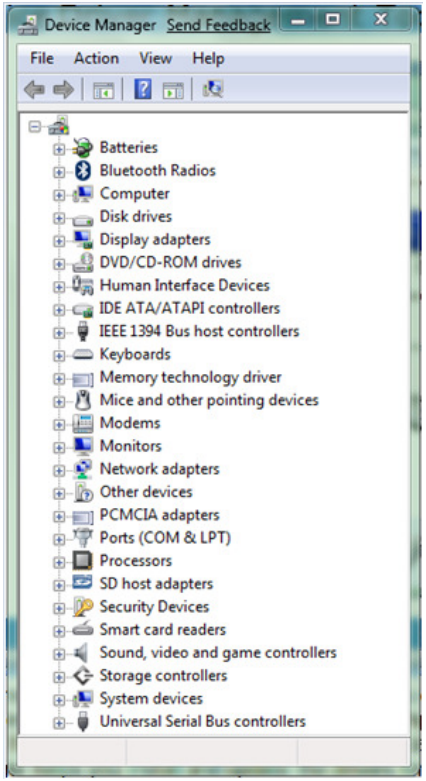
Device Driver Management Tools

Device Stage™

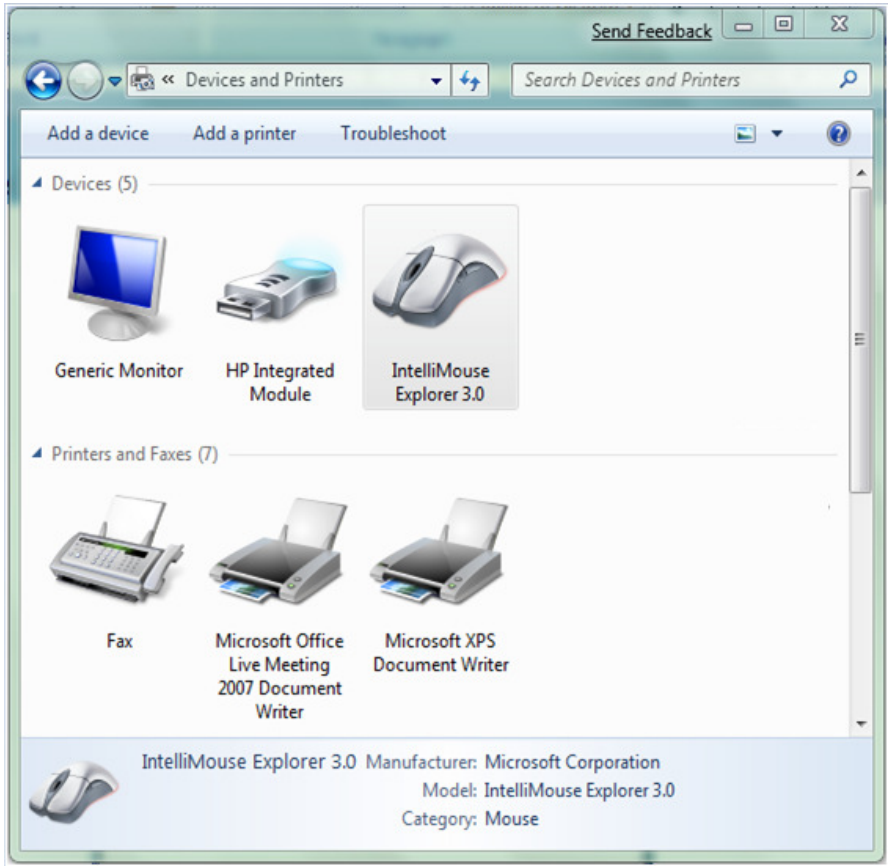
- Provides users with a way to access devices and advanced options for managing them
- Devices in use are shown on the taskbar with a photo-realistic icon

Device Driver Management Tools

Device Manager



Devices and Printers



Device Stage

Options for Updating Drivers

Dynamic Update

- Works with Windows Update to download critical fixes and device drivers required for the setup process

Windows Update™

- Delivers software updates and drivers, and provides automatic updating options

Manufacturer's media or Web site

- Use the media or browse to the device manufacturer's Web site to obtain an updated driver

Device Manager

- Updates the driver software for the device manually

Compatibility Report

- Use this report to load a new or updated driver during an upgrade

Managing Signed Drivers

Benefits of signing and staging driver packages

- Improved security
- Reduced support costs
- Better user experience

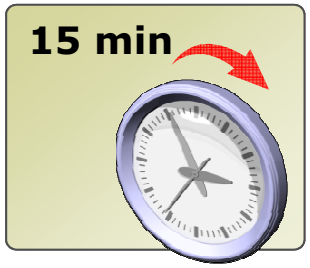
Maintaining signed drivers

- Use Sigverif.exe to check for unsigned device drivers
- Use a Command Prompt to run the driverquery command with the /si switch to obtain a basic list of signed and unsigned device drivers
- Use Group Policy to deploy certificates to client computers

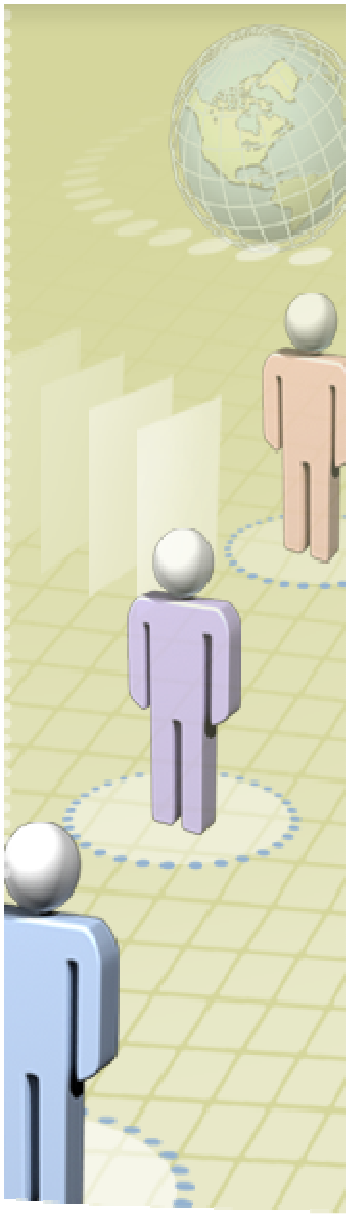
Discussion: Options for Recovering from a Driver Problem

1. How often have new devices and their associated drivers introduced reliability problems on computers that you manage?

2. What are possible ways of recovering from a driver problem? Describe a situation in which you might use each recovery method to resolve a driver problem.

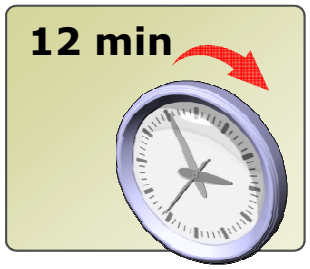


Demonstration: Managing Drivers



In this demonstration, you will see how to:

- Update a device driver
- Roll back a device driver
- Install a driver into the driver store



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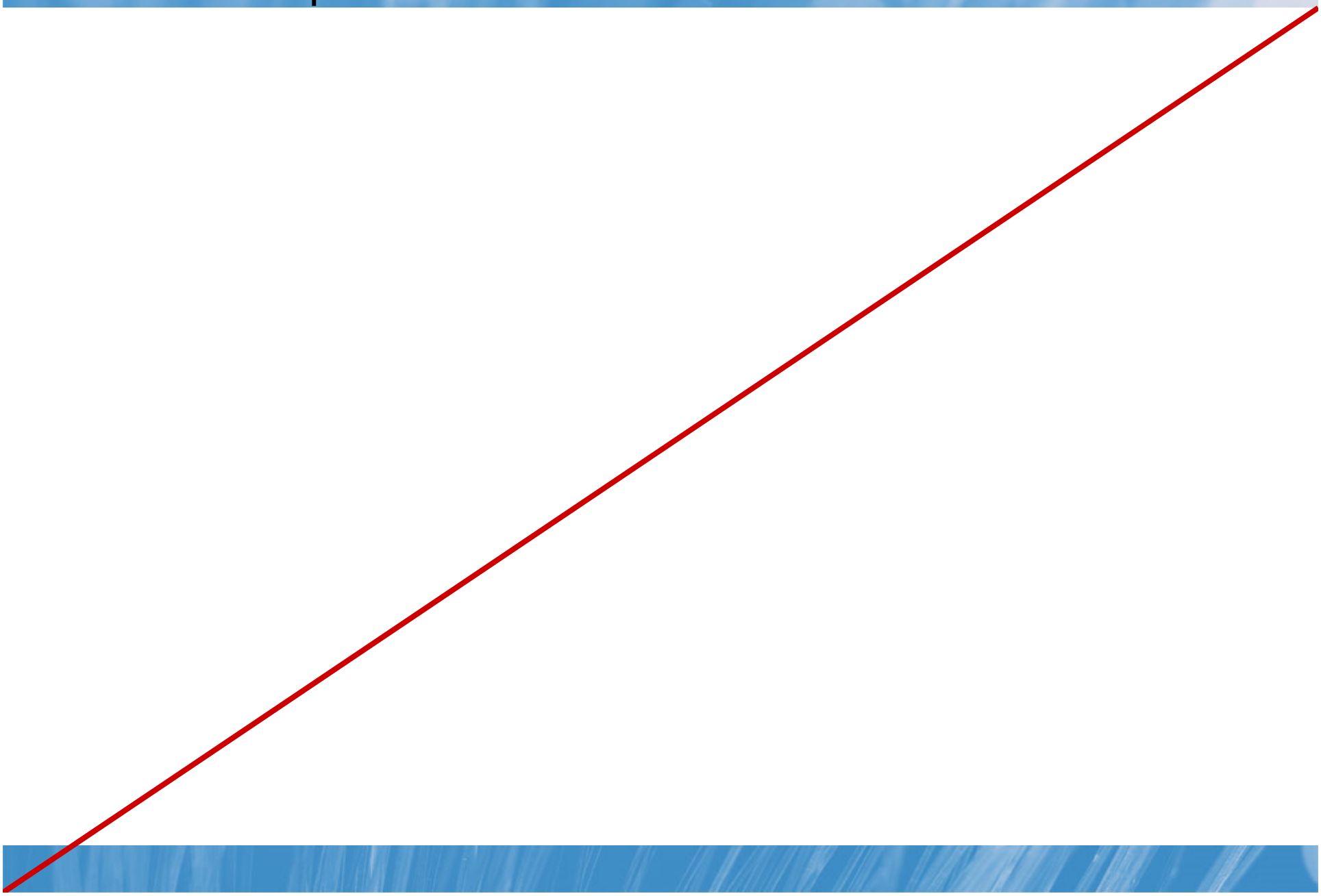

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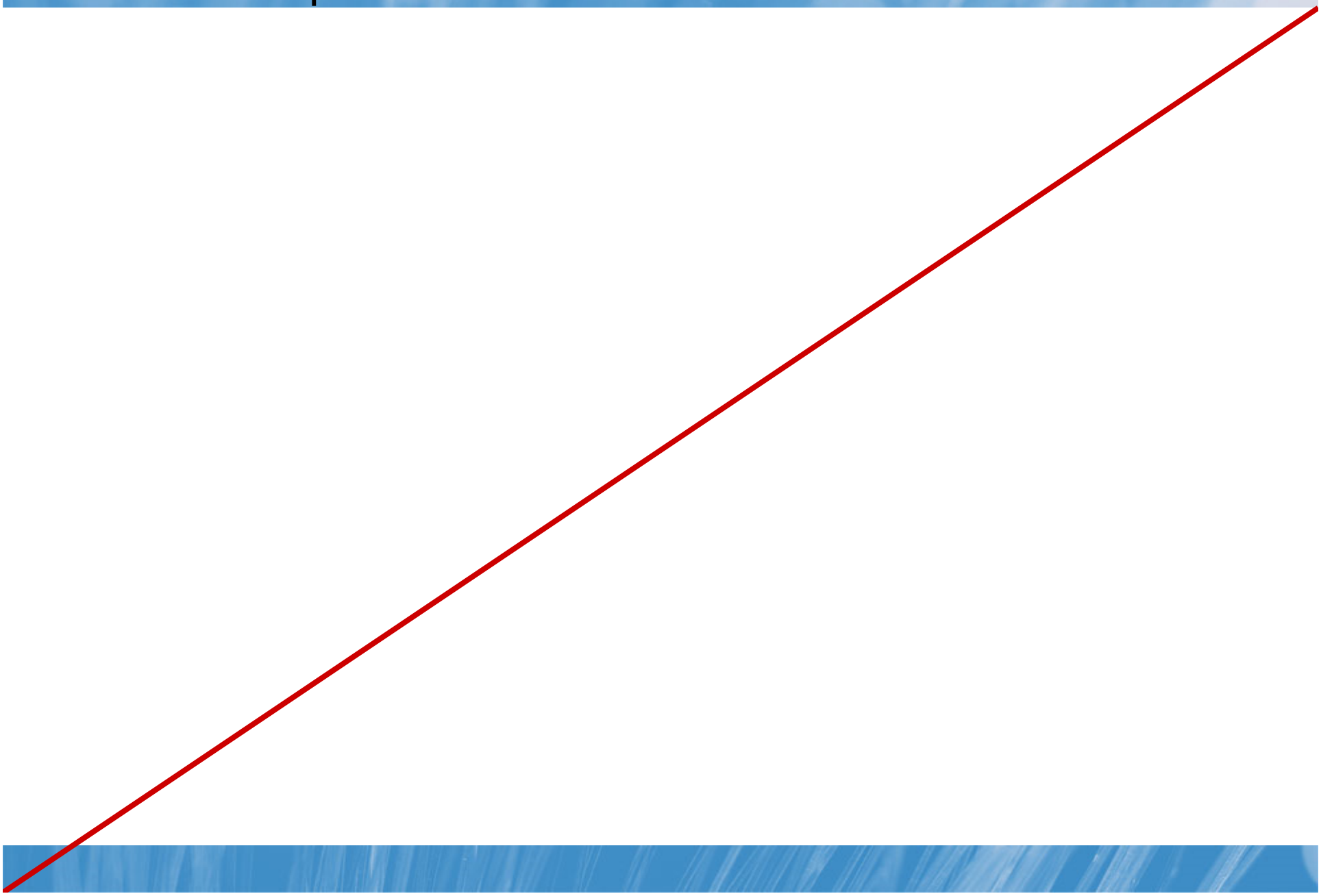

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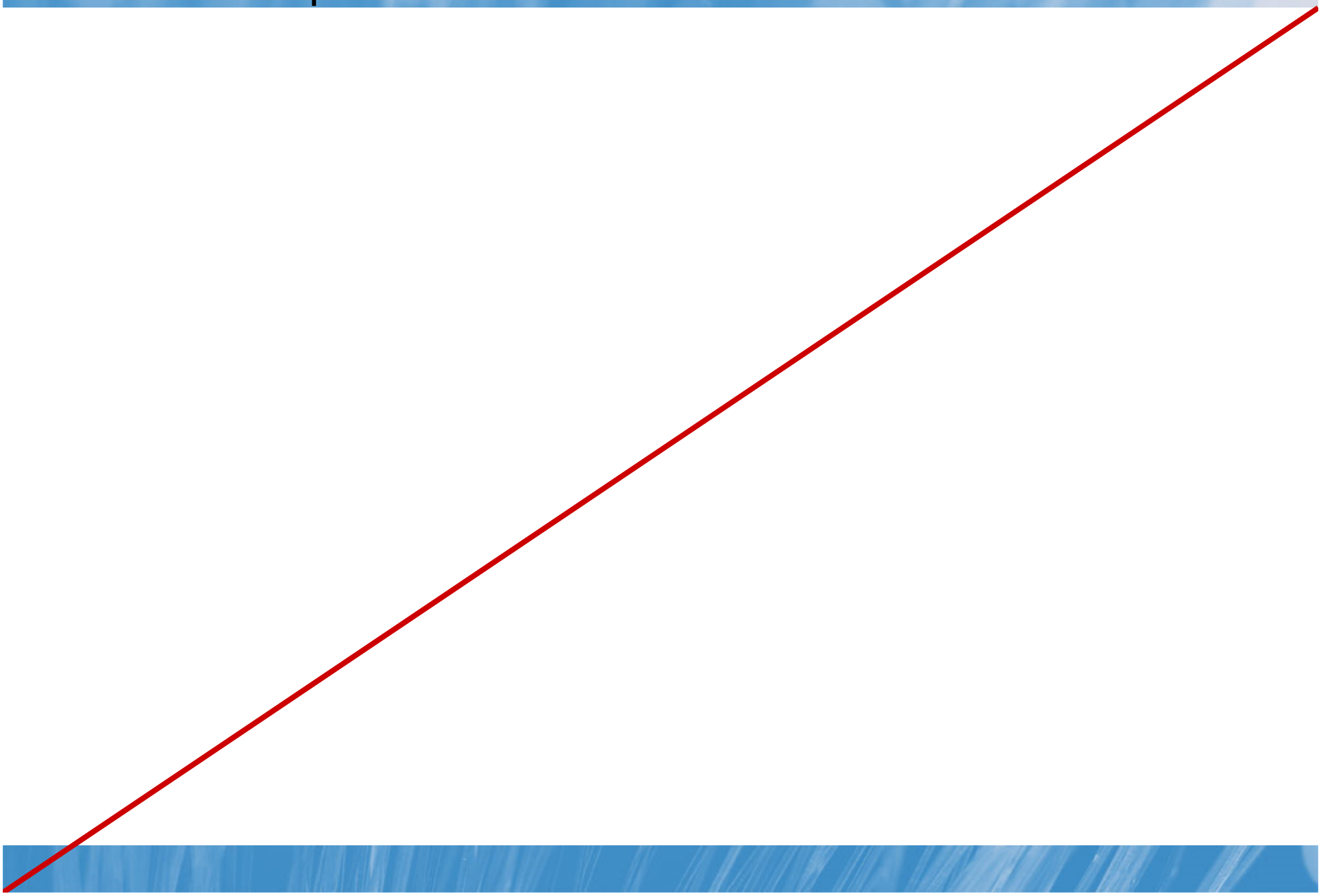

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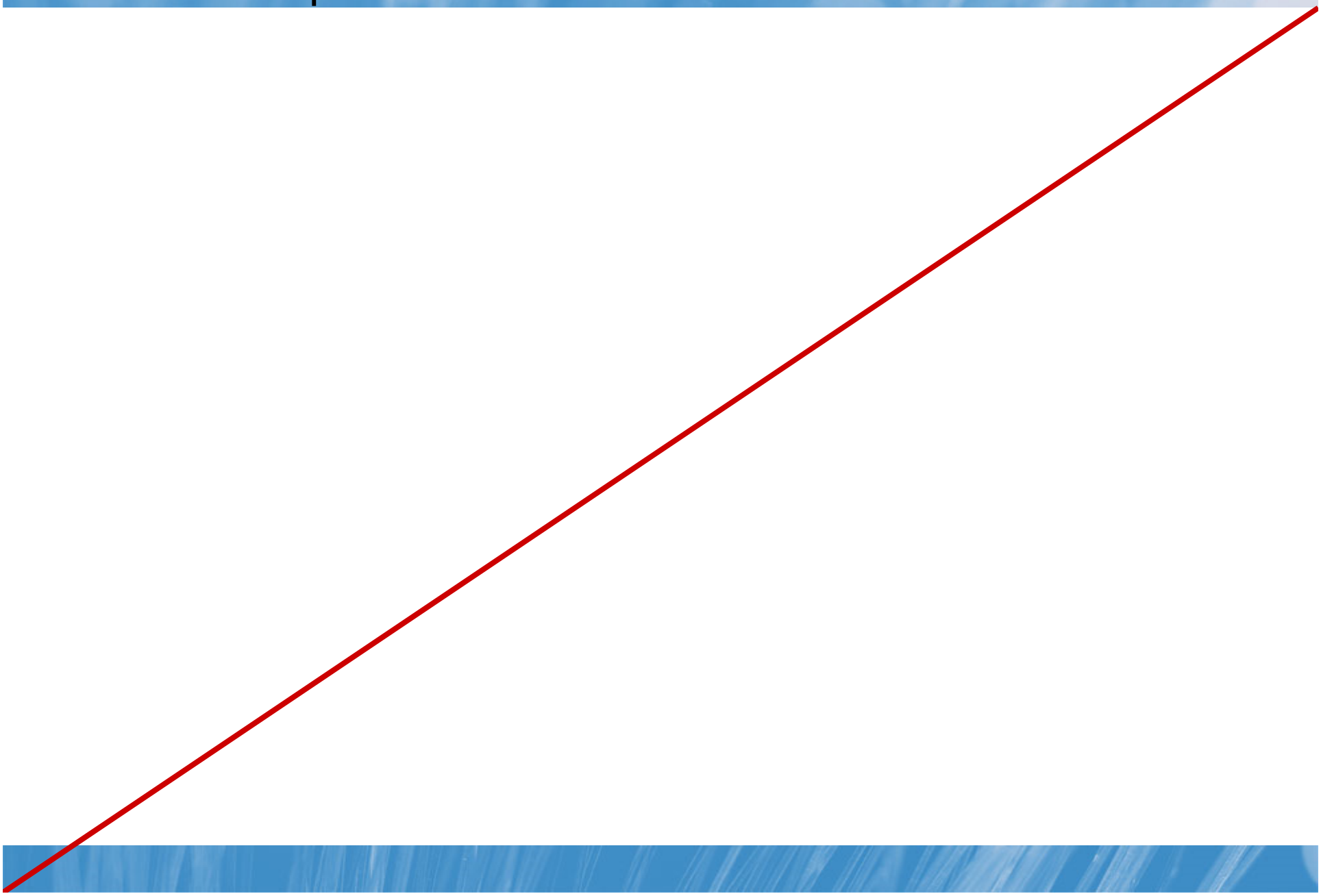

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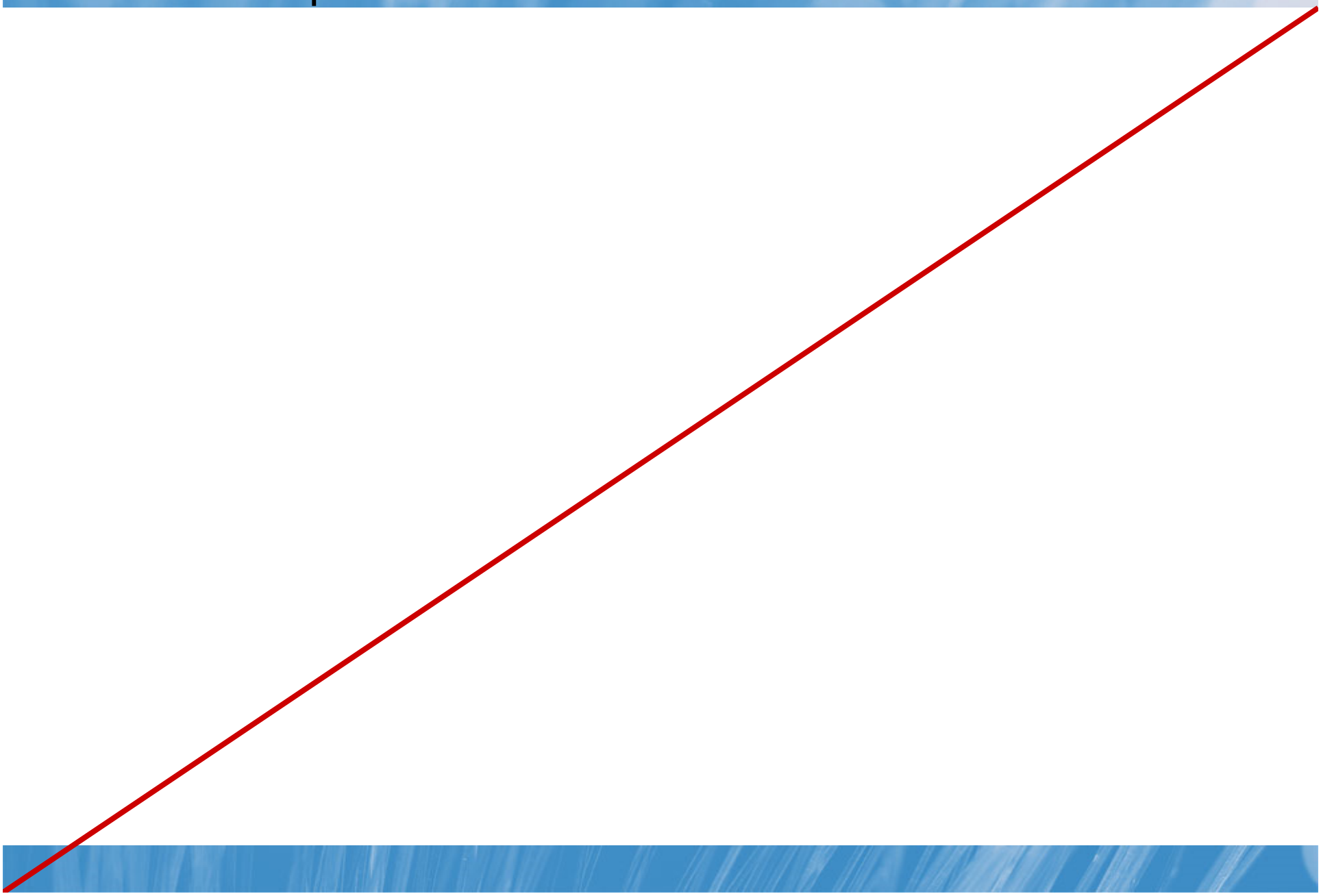

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