

Implementing Mass Storage

Chapter 9



Episode: **RAID**

Objective(s):

Core 1: 3.3 Given a scenario, select and install storage devices.

Core 1: 5.3 Given a scenario, troubleshoot and diagnose problems with storage drives and RAID arrays.



Episode Description

A+

The Random Array of Independent (or Inexpensive) Disks (RAID) is a philosophy of using multiple drives working as a single drive – an array – for speed or redundancy. A good tech should understand the many RAID levels and the benefits they provide.

CompTIA



Key Terms

A+

- 0:52 - Objective term - Redundant Array of Inexpensive Disks (RAID)

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Quick Review

- RAID provides speed and/or redundancy
- RAID 0 (striping) provides speed
- RAID 1 (mirroring) provides redundancy
- RAID 5 (striping with parity) provides speed and redundancy but can only lose one drive
- RAID 6 (striping with parity) provides speed and redundancy but can lose two drives



Episode: **Hardware RAID**

Objective(s):

Core 1: 3.3 Given a scenario, select and install storage devices.

Core 2: 1.9 Given a scenario, perform OS installations and upgrades in a diverse OS environment.



Episode Description

A+

Hardware RAID uses a purpose-built RAID controller to configure and maintain RAID arrays. It's important to understand the benefits of hardware RAID and how to configure and maintain RAID arrays.

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Key Terms

A+

- 2:57 - <CTRL-R>
- 5:33 - Objective term - Hot spare/
swappable drive

CompTIA



Quick Review

- Hardware RAID requires a controller to configure the RAID arrays
- Hardware RAID has its own BIOS that comes with a special system setup to configure the RAID array
- The completed array looks like a single drive to the operating system



Episode: **Software RAID in Storage Spaces**

Objective(s): Core 1: 3.3 Given a scenario, select and install storage devices.
Core 2: 1.3 Given a scenario, use features and tools of the Microsoft Windows 10 operating system (OS).



Episode Description

A+

Microsoft's Storage Spaces feature provides a superb tool to configure many different RAID configurations on any Windows system. A good tech knows which types of RAID it supports and how to set them up.

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Key Terms

A+

- 3:57 - Just a bunch of disks (JBOD)
- 7:00 - Three-way mirror

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Quick Review

- Software RAID uses the operating system to configure the RAID array
- Windows comes with a powerful tool called Storage Spaces to configure advanced software RAID arrays
- Storage Spaces provides superb flexibility



Episode: **Encrypting Mass Storage**

Objective(s):

Core 1: 3.4 Given a scenario, install and configure motherboards, central processing units (CPUs), and add-on cards.

Core 2: 2.5 Given a scenario, manage and configure basic security settings in the Microsoft Windows OS.



Episode Description

A+

Securing mass storage is a critical aspect of system security. Make sure you know the many ways a system's mass storage can be encrypted.

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Key Terms

A+

- 0:32 - Objective term - Encryption
- 1:01 - File-based encryption
- 1:04 - Disk-based encryption
- 1:41 - Objective term - Encrypting File System (EFS)
- 4:23 - Objective term - BitLocker for Windows
- 4:28 - Objective term - FileVault for macOS
- 4:46 - Objective term - Trusted Platform Module (TPM)
- 7:55 - Objective term - BitLocker To Go

CompTIA



Quick Review

- File-based encryption encrypts files and folders; disk-based encryption encrypts entire drives
- Windows uses Encrypted File System (EFS) to encrypt folders and files
- Windows uses Bitlocker to encrypt entire hard drives
- Bitlocker requires a system with a Trusted Platform Module (TPM) chip



Episode: **Mass Storage Troubleshooting**

Objective(s): Core 1: 5.3 Given a scenario, troubleshoot and diagnose problems with storage drives and RAID arrays.



Episode Description

A+

Mass storage devices sometimes fail, resulting in the potential loss of critical data. A good tech knows the tools and procedures to diagnose and repair many mass storage problems.

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Key Terms

A+

- 0:29 - 1. Back it up
- 0:47 - 2. Mental reinstall
- 1:04 - 3. Triple check
- 1:30 - Objective term - RAID not found/RAID not working
- 2:41 - Objective term - Read/write failure or extended read/write times
- 3:03 - Objective term - Self-Monitoring, Analysis, and Reporting Technology (S.M.A.R.T.)

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Key Terms

A+

- 3:31 - Objective term - Slow/sluggish performance
- 4:01 - Objective term - Red LED status indicator
- 4:13 - Objective term - Loud clicking/grinding noises
- 4:36 - Failure to boot
- 5:06 - Objective term - Drive not recognized/bootable device not found/missing drives
- 5:38 - OS not found
- 6:15 - Attempts to boot incorrect device
- 6:29 - Continuous reboots

CompTIA



Quick Review

- Always back up important data before troubleshooting mass storage
- Use a mental process of installation to make sure all the installation steps have taken place
- Review the many symptoms in this episode!

