



Disk Management

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C2L4S1

Lesson Overview

In this lesson, you will be exploring disk management and learning how to add, remove, and arrange storage devices in a Linux system.

To show your competence in Linux administration and on job interviews, you need a thorough understanding of hard drive management. Topics such as partitioning a hard drive, basic file system principles, creating and managing devices, boot sector principles, and RAID are all basic requirements for competence.

The experienced administrator will need to show practical expertise in these topics while the potential new employee will need to show a basic understanding in order to get his/her foot in the door!

Take your time to explore this lesson and be sure to do your own research and contact your instructor if you encounter difficulties or need further explanations.



Student Expectations

You should know what will be expected of you when you complete this lesson. These expectations are presented as objectives.

Objectives are short statements of expectations that tell you what you must be able to do, perform, learn, or adjust after reviewing the lesson.



Objective

Given a Linux system students should be able to create and maintain a Linux partition as per industry standards.



Outline

In this lesson, you will explore:

- Boot sector recovery
- Filesystem upkeep
- Device creation
- File quotas
- Permission & owners
- RAID

Additional Needs:

To complete this lesson, you will also need:

- [Gparted](#)
- [D*mn Small Linux](#)

Use the links above to download both applications to your Linux system. Use the information provided in this lesson to install these apps when required.

Introduction

To understand disk management, there are some essential concepts you must understand including:

- **Boot sector**
 - The boot sector is the part of the hard drive that contains the instructions to load the operating system from disk.
- **Master boot record**
 - The first 512 bytes of the hard drive (first sector) that contain the instructions for loading the operating system
- **Volume boot record**
 - The sector on a volume drive that contains the instructions for loading an operating system

Required Reading:

- [PC Guide](#)
- [Master boot record](#)
- [Fixing your MBR with Ubuntu](#)

Select **PLAY** below to view an introductory video.

View Video
VideoLesson4Introduction(C2
L4S14).mp4



File System and Quotas

The following concepts are also important:

- **File System**

- In a computer, a file system (sometimes written filesystem) is the way in which files are named and where they are placed logically for storage and retrieval on a hard disk.

- **File Maintenance**

- In Linux, there is very little file system maintenance that needs to be performed. Most versions of Linux have a defrag application, but it is rarely required because the operating system and file system work together to prevent fragmentation.

- **File Quotas**

- The maximum amount of space allocated for a user, folder, or file. Quotas are normally created to protect the operating and file system from being filled with data which may result in loss of computer services or functionality.

Select **PLAY** below to view an introductory video.

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VideoLesson4Introducti
on2(C2L4S15).mp4



Required Reading:

- [File systems](#)
- [File systems in Linux](#)
- [Filesystem tour](#)
- [Understanding Unix](#)
- [File quota howto](#)
- [Disk quotas in Linux](#)
- [Configuring quotas](#)

Partition & RAID

Physical drives in a system may be arranged in various ways:

- **Partition**

- To divide memory or mass storage into sections so it can be used for storing data. A device such as a hard drive will need to have a new partition table setup before the hard drive can be used.



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(C2L2S16V1).mp4

Part 1



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VideoLesson4Partitioning
2(C2L2S16V2).mp4

Part 2

- **RAID**

- Short for Redundant Array of Independent Disks. RAID is a hard disk technology which can be used to speed up data transfer and/or provide disk redundancy.
- RAID is normally used in a server or production environment. However, recent drops in the prices of RAID technology have encouraged home users to implement RAID structuring to protect their data .

Select **PLAY** below to view two videos on partitioning.

Required Reading:

- [Linux partitioning](#)
- [Primer on partitioning](#)
- [Partitioning your drive](#)
- [How to partition](#)
- [Raid Standards](#)
- [Raid in Action](#)
- [Raid levels explained](#)

Gparted

- **GParted**
 - A popular, GUI driven Linux application used to partition hardware devices.
- **Linux SWAP file**
 - A Linux SWAP can be either a file or actual partition that is set aside to use as virtual memory.

Select **PLAY** below to view a video on Gparted.

Required Reading:

- [Download Gparted](#)
- [Tutorial on Gparted](#)
- [Information for Gparted](#)



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VideoLesson4Gparted(C2L4S17).mp4

DSL

D*mn Small Linux

D*mn Small Linux

DSL is a small Linux flavor that runs on just about anything. The creator decided to see how small he could make a functional operating system using Linux Debian.

Most people run DSL from a Live CD to test their hardware and network functionality. It is a great troubleshooting tool and should be part of any IT Technicians' toolbox.

This portion of the lesson will introduce you to DSL and explain how to set up a Virtual Machine using DSL. You will also learn to add applications to DSL and fine-tune its performance.

Select **PLAY** below to view videos on DSL.

View Video
VideoLesson4DownloadDsl(C2L4S19V1).mp4

Download DSL

View Video
VideoLesson4DSLVirtualbox(C2L4S19V2).mp4

Virtual box for DSL

View Video
VideoLesson4RunningDSL(C2L4S19V3).mp4

Running DSL

Lesson Summary

In this lesson, you explored file system management in Linux. You learned to prepare a drive for use, and how to use partitions to separate a physical drive into multiple drives. You also explored important areas of a hard drive that contain instructions used to load the operating system including boot sectors, master boot records, and volume boot records.

Additionally, you learned to implement RAID technology in which two or more drives are combined to store data in various configurations.

Finally, you used Gparted software to partition hard drives, and you learned to use DSL—a small Linux-based operating system that runs on machines with minimal hardware horsepower.

