

Filesystems

Sumner Evans and Sam Sartor

November 8, 2017

Mines Linux Users Group

Introduction

What are Filesystems?

- Filesystems manage the storage and retrieval of files from storage media.
- Filesystems are an abstraction layer between storage media (SSDs, HDDs, disk drives, even tape drives).
- Filesystems exist on *partitions*, physically contiguous segments of the disk.

Filesystems are Responsible for...

- **Space management:** filesystems allocate and manage space in discrete chunks. Filesystems must keep track of what data is stored at each chunk.
- **Filenames:** identify a storage location in the file system. Can be case sensitive (ext4) or case insensitive (HFS, NTFS).
- **Directories (folders):** group files into separate collections. Modern filesystems allow arbitrary nesting of directories.
- **Metadata:** filesystems store book-keeping information about their contents (e.g. file sizes, last accessed date, owner and permissions, etc.).
- **Access Control:** prevent unauthorized access to files on disk.
- **Data Integrity:** filesystems must be resilient to failure, some are better at this than others.

History of Filesystems

Current Filesystems

Linux

Windows & mac

Flashdrives

Other Options

Alternative Filesystems

Virtual Filesystems

What is a virtual filesystem?

Configuration/maintenance

Questions?

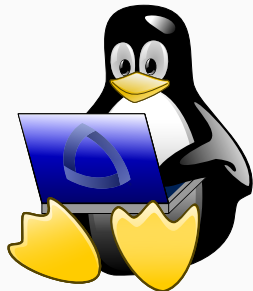
References

- https://en.wikipedia.org/wiki/File_system
- <http://www.tldp.org/LDP/sag/html/filesystems.html>

Copyright Notice

This presentation was from the **Mines Linux Users Group**. A mostly-complete archive of our presentations can be found online at <https://lug.mines.edu>.

Individual authors may have certain copyright or licensing restrictions on their presentations. Please be certain to contact the original author to obtain permission to reuse or distribute these slides.



Colorado School of Mines
Linux Users Group