

# CMSC 412

## File System Implementation

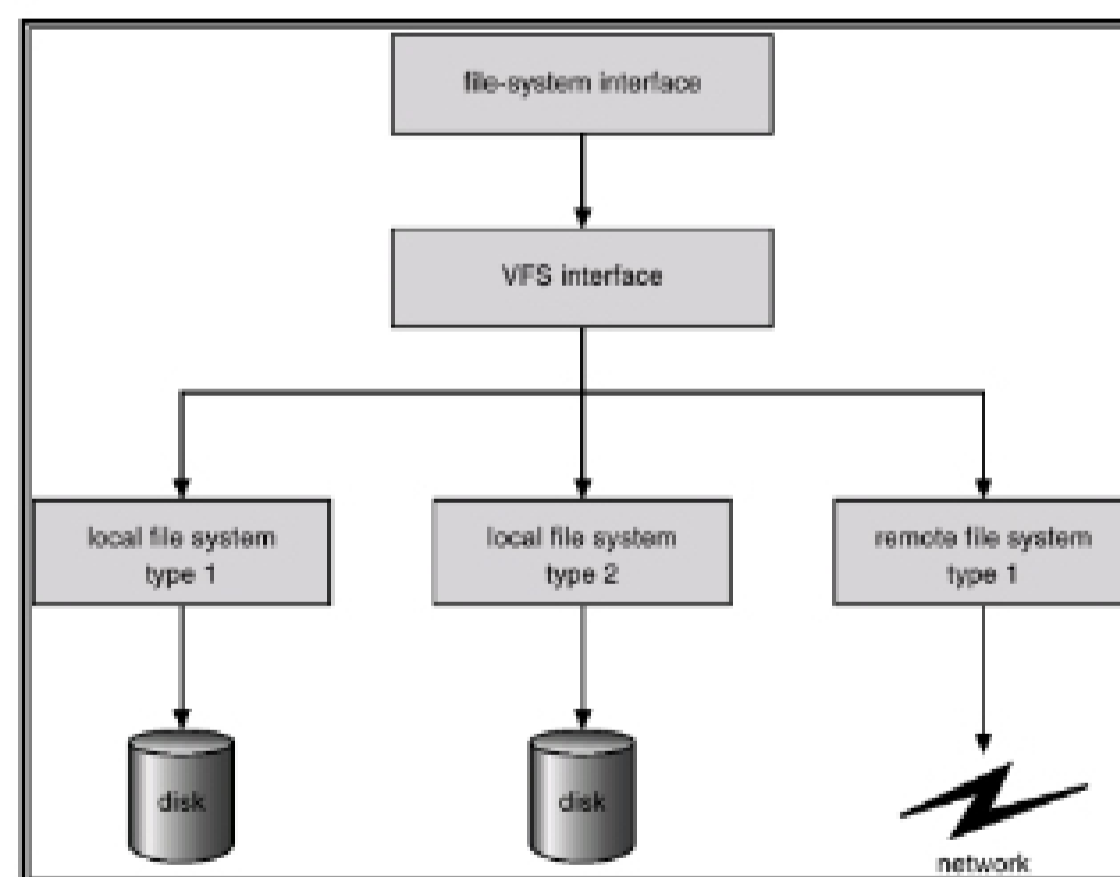
## Announcements

- Reading
  - Chapter 12
  - Chapter 14 next time

## Virtual File Systems

- **Virtual File Systems (VFS)** provide an object-oriented way of implementing file systems.
- VFS allows the same system call interface (the API) to be used for different types of file systems.
- The API is to the VFS interface, rather than any specific type of file system.

## Virtual File System



## File System Structure

- **Self-contained:** all necessary meta-information is stored on disk along with the actual file system contents.
  - I.e. must be persistent in case the OS crashes.
- **Cached:** accessing the disk is expensive, so some information is cached in memory
  - *Meta-data cache* for file characteristics, and *buffer cache* for file contents
  - Must be kept in-sync with on-disk copy

## File Structure

- File contents
  - Composed of one or more **blocks**, stored on disk. Block size usually relates to *disk's sector size*.
- File meta-data
  - Describes implementation and other characteristics of file, like size, last-modified time, location of contents, etc.
  - **File control block (FCB)** - meta-data stored on disk, though sometimes cached in memory.