Linux Commands

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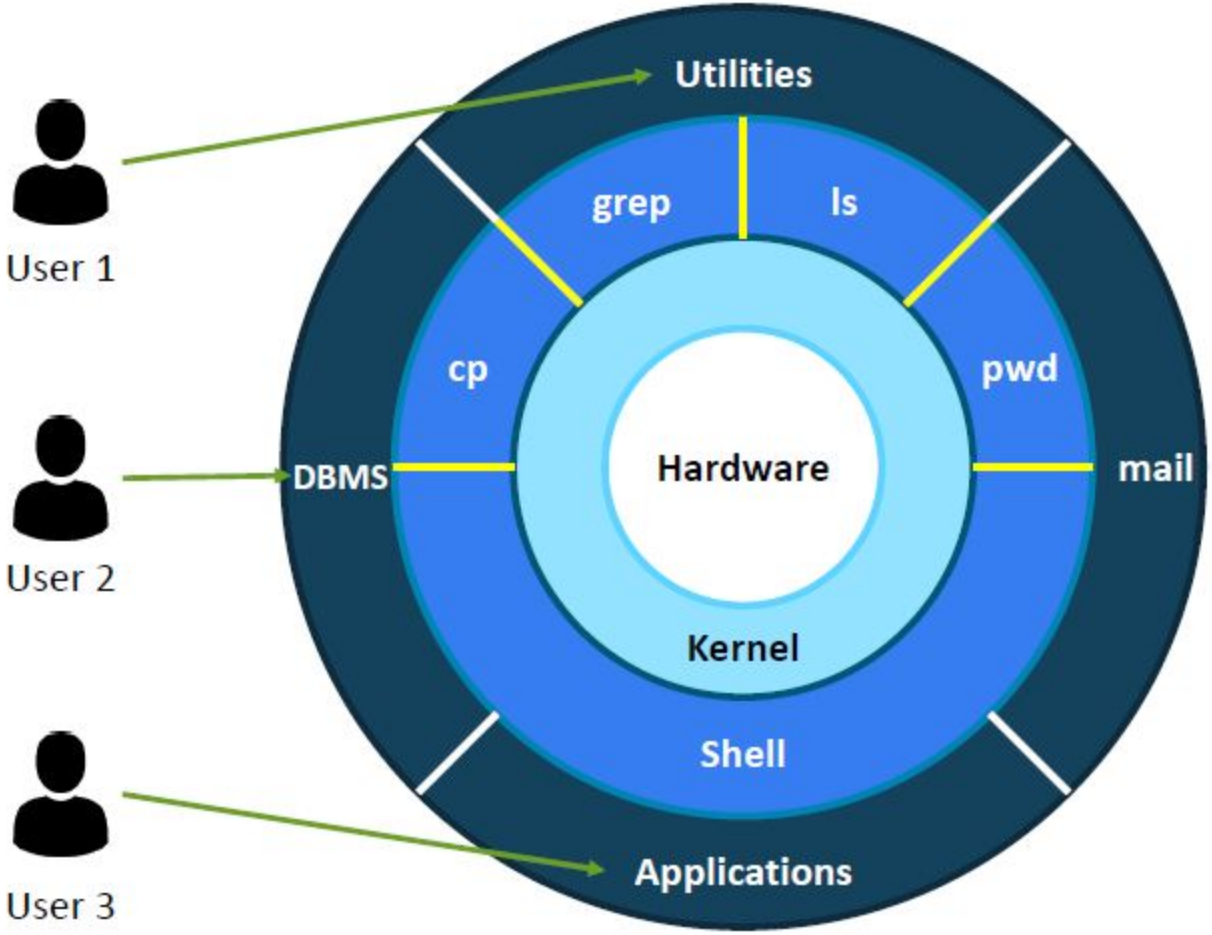
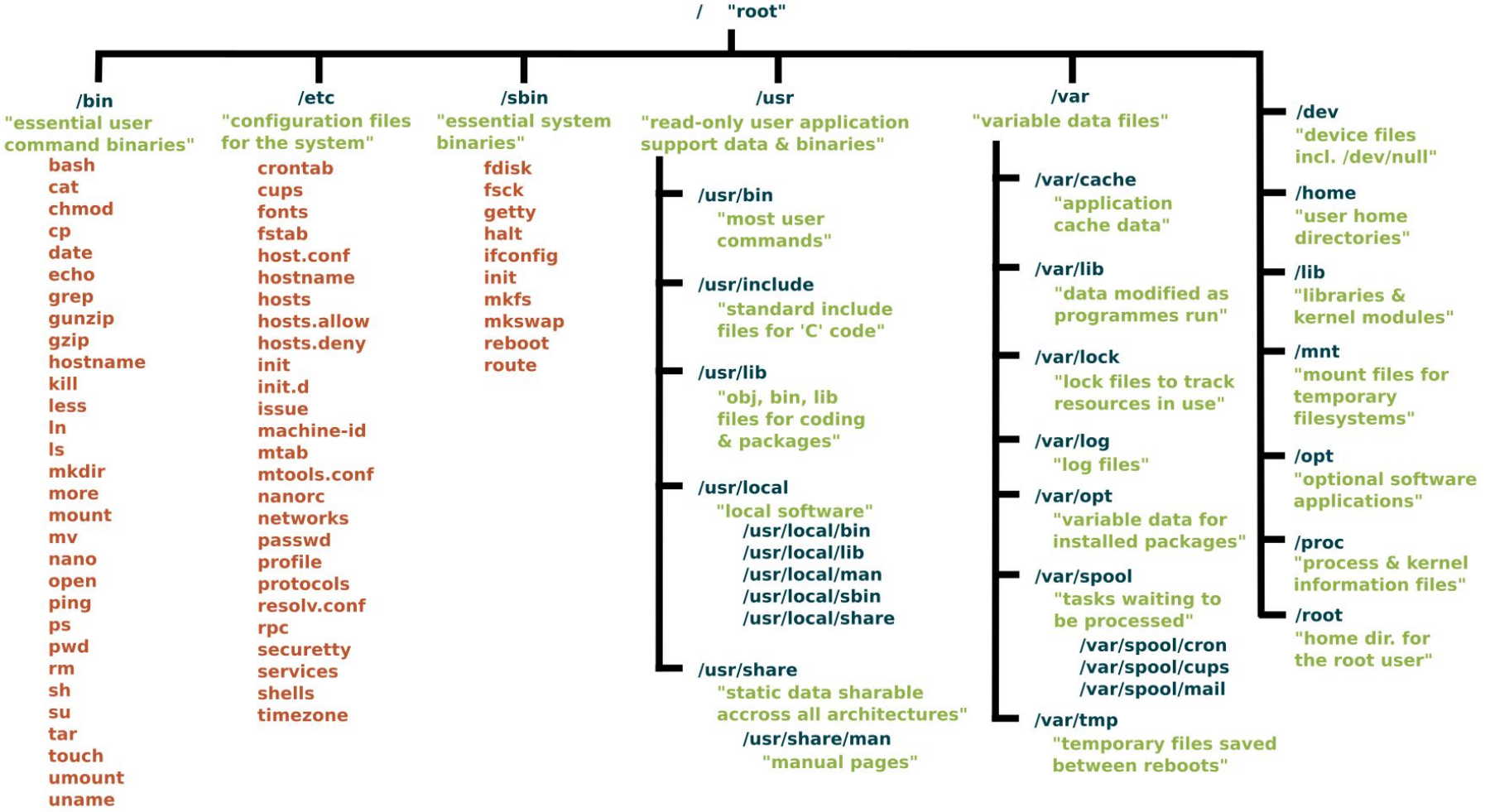
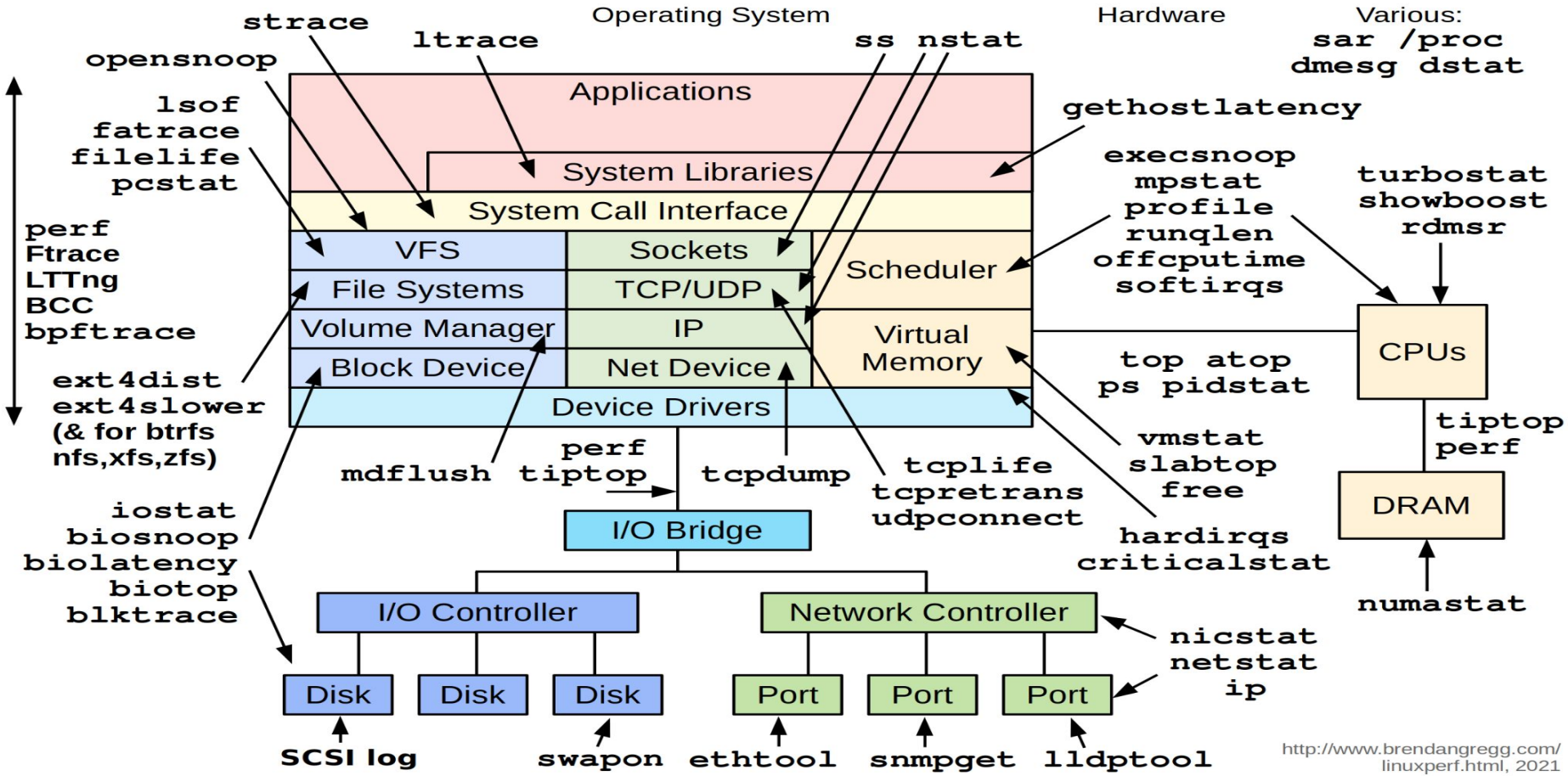

Utilities
grep
ls
cp
pwd
DBMS
Hardware
mail
Kernel
Shell
Applications
User 1
User 2
User 3


/ "root"
/bin
"essential user command binaries"
bash
cat
chmod
cp
date
echo
grep
gunzip
gzip
hostname
kill
less
ln
ls
mkdir
more
mount
mv
nano
open
ping
ps
pwd
rm
sh
su
tar
touch
umount
uname
/etc
"configuration files for the system"
crontab
cups
fonts
fstab
host.conf
hostname
hosts
hosts.allow
hosts.deny
init
init.d
issue
machine-id
mtab
mtools.conf
nanorc
networks
passwd
profile
protocols
resolv.conf
rpc
securetty
services
shells
timezone
/sbin
"essential system binaries"
fdisk
fsck
getty
halt
ifconfig
init
mkfs
mkswap
reboot
route
/usr
"read-only user application support data & binaries"
/usr/bin
"most user commands"
/usr/include
"standard include files for 'C' code"
/usr/lib
"obj, bin, lib files for coding & packages"
/usr/local
"local software"
/usr/local/bin
/usr/local/lib
/usr/local/man
/usr/local/sbin
/usr/local/share
/usr/share
"static data sharable accross all architectures"
/usr/share/man
"manual pages"
/var
"variable data files"
/var/cache
"application cache data"
/var/lib
"data modified as programmes run"
/var/lock
"lock files to track resources in use"
/var/log
"log files"
/var/opt
"variable data for installed packages"
/var/spool
"tasks waiting to be processed"
/var/spool/cron
/var/spool/cups
/var/spool/mail
/var/tmp
"temporary files saved between reboots"
/dev
"device files incl. /dev/null"
/home
"user home directories"
/lib
"libraries & kernel modules"
/mnt
"mount files for temporary filesystems"
/opt
"optional software applications"
/proc
"process & kernel information files"
/root
"home dir. for the root user"

Linux Performance Observability Tools



http://www.brendangregg.com/
linuxperf.html, 2021

Commands

File Navigation:

- cd – Change directory
- ls – List files in a directory
- pwd – Print working directory
- find – Search for files
- tree – View directory structure

File Operations:

- touch – Create an empty file
- cp – Copy files and directories
- mv – Move/rename files
- rm – Remove files
- cat – Concatenate and view file contents
- nano / vim – Text editors for coding
- grep / awk / sed – Text processing tools for parsing logs and files.

Feature	grep	awk	sed
Primary Purpose	Search for patterns in text	Field-based processing and manipulation	Stream-based text editing and substitution
Complexity	Simple and easy to use	Medium complexity, requires understanding of fields and actions	Moderate complexity, suitable for editing and substitution
Main Strength	Fast searching for patterns	Extracting, manipulating, and formatting fields	Substitution, deletion, and editing of text
Best for	Searching for lines matching patterns	Working with structured data (fields, columns)	Modifying files or streams in place
Pattern Matching	Supports regex	Supports regex	Supports regex
File Modification	Does **not modify** files (only reads)	Can modify and format fields, output	Can modify files in-place with -i
Speed	Very fast for searching patterns	Slower than grep, especially with large files	Fast for simple transformations, slower for complex edits
File Input	Works well with single-line or multiline input	Works well with line-by-line input, field-based data	Works line-by-line, can edit large files
Multi-file Operations	Supports multi-file search with -r	Supports multi-file operations, can iterate over files	Can process multiple files with loops or wildcards
Data Extraction	Not designed for extracting fields	Excellent for extracting and printing specific fields	Not designed for field extraction
Data Transformation	Not for transforming data, only searching	Can transform data (print, modify, calculate)	Excellent for transforming text (substitution, insertion)
Ease of Use	Very simple, just search patterns	Requires learning field manipulation and formatting	Simple for text manipulation, but requires understanding of commands
Use Case Examples	Search for events in logs, find occurrences of a word	Process CSVs, format and extract specific data, perform calculations	Edit or replace specific text in files, delete lines

Tool	Pros	Cons
grep	- Fast and efficient for searching patterns- Simple syntax- Excellent for finding specific lines or occurrences	- Limited to searching (no manipulation)- Cannot modify files or perform complex transformations
awk	- Great for field-based processing- Powerful data manipulation (can perform calculations)- Flexible and highly customizable	- Slower for simple tasks compared to grep- Requires learning syntax for field handling- More complex for beginners
sed	- Excellent for editing and transforming text- Can edit files in place- Powerful for substitution and deletion	- Limited field-based processing (compared to awk)- Can be complex for beginners to understand advanced features

Commands

Permissions & Ownership:

- chmod – Change file permissions
- chown – Change file owner/group
- chgrp – Change group ownership

Process Management:

- ps – View running processes
- top – Interactive process viewer
- kill – Terminate processes
- nohup – Run a command that continues after the session ends.
- bg / fg – Move jobs to the background or foreground

Commands

Networking (for Developers working with APIs/Services):

- ping – Test network connectivity
- curl – Transfer data from or to a server
- wget – Download files from the web
- netstat – Show network connections
- ssh – Securely access a remote system.
- scp – Securely copy files between systems.
- ss – Utility to investigate sockets.
- sysctl – Modify kernel parameters at runtime.

File System:

- stat – Display file or file system status

Commands

Disk Management:

- df -h – Disk space usage
- du -sh – Disk usage for directories
- fdisk – Partition table manipulator
- mount / umount – Mount and unmount filesystems

System Information:

- uname -a – Get system information
- hostname – Show or set the system hostname
- lscpu – Display CPU architecture information
- lsblk – List information about block devices (disks)
- free – View system memory usage.
- uptime – Check how long the system has been running.

Commands

Backup & Restore:

- tar – Archive files
- rsync – Synchronize files and directories

Performance Monitoring:

- vmstat – System performance
- iostat – CPU and I/O statistics
- htop – Interactive process viewer (advanced)
- lsof – List open files and network connections.

Commands

System & Service Monitoring:

- journalctl – View logs from systemd services
- systemctl – Control the systemd system and service manager
- service – Manage services on SysVinit systems
- docker ps – List running Docker containers
- tail / less – View logs (e.g., tail -f /var/log/syslog to view log files in real-time).

Package Management (depending on distro):

- apt-get / apt – Debian/Ubuntu package manager
- yum / dnf – RedHat/CentOS package manager
- pacman – Arch Linux package manager
- brew – Homebrew for Linux

Commands

Containerization:

- docker – Docker container management
- docker-compose – Define and manage multi-container Docker apps
- kubectl – Kubernetes command-line tool
- helm – Package manager for Kubernetes

Automation:

- ansible – Automation for configuration management
- terraform – Infrastructure as code
- vagrant – Virtual machine management
- chef / puppet – Configuration management

Commands

history | grep <command> to find previously used commands

Use > to redirect output to a file (e.g., ls > files.txt)

Use | to pass the output of one command to another (e.g., ps aux | grep nginx)