

CompTIA A+ Core 2 Exam 220-1102

# Lesson 15



## Managing Linux and macOS

# Objectives

- Identify features of Linux
- Identify features of macOS

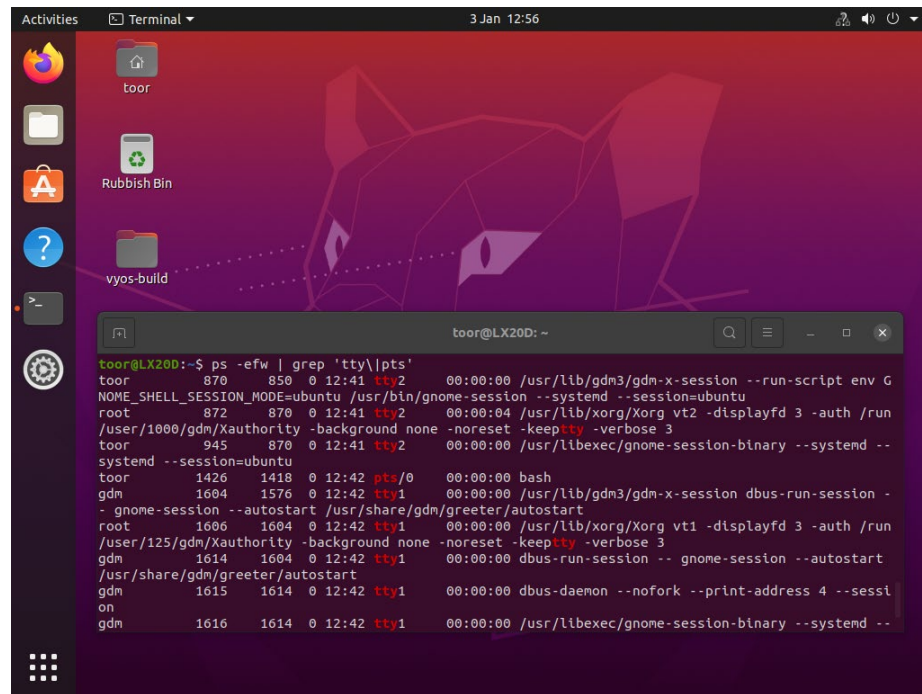
Lesson 15

# Topic 15A

## Identify Features of Linux

# Shells, Terminals, and Consoles

- Shells and terminals
  - Shell is command interpreter
  - Terminal is a user interface for a shell
- Desktop environments
  - Xorg display server
  - Gnome, KDE, Cinammon, and Xfce shells
- Switching between consoles



The screenshot shows a Linux desktop environment with a red and purple background. A terminal window is open, displaying the output of the command `ps -efw | grep 'tty|pts'`. The terminal window title is `toor@LX20D: ~`. The desktop has a sidebar with icons for Firefox, Files, App Store, Help, and Settings. Desktop icons include 'toor', 'Rubbish Bin', and 'vyos-build'.

```
toor@LX20D:~$ ps -efw | grep 'tty|pts'
```

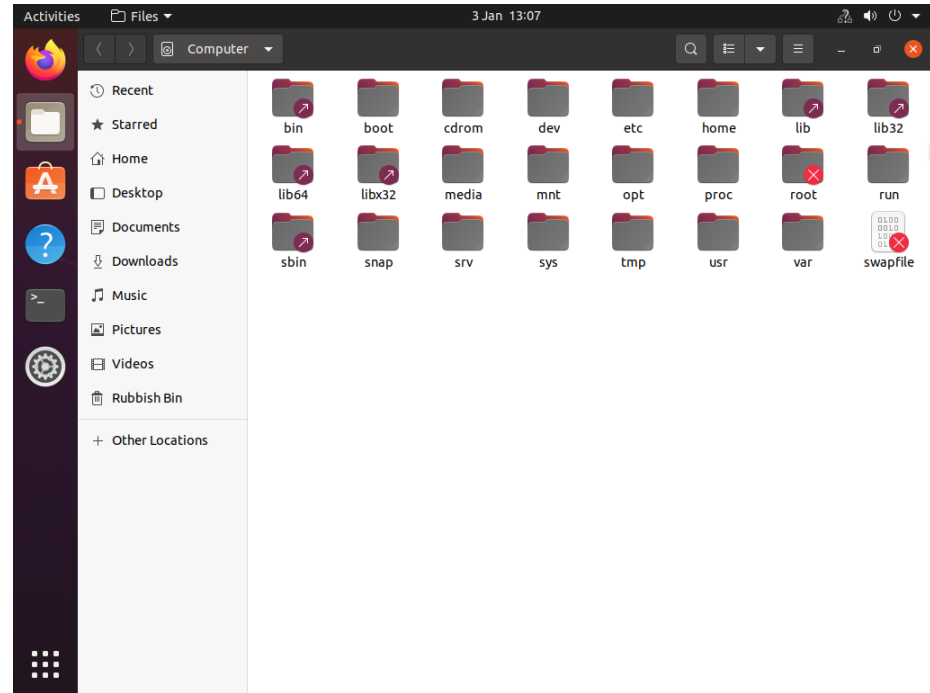
USER	PID	PPID	TIME	TTY	COMMAND
toor	870	850	0 12:41	pts/0	00:00:00 /usr/lib/gdm3/gdm-x-session --run-script env G
NAME	SHELL	SESSION_MODE	ubuntu	/usr/bin/gnome-session --systemd --session=ubuntu	
root	872	870	0 12:41	pts/0	00:00:04 /usr/lib/xorg/Xorg vt2 -displayfd 3 -auth /run
/user/1000/gdm/Xauthority	-background	none	-noreset -keep	tty -verbose 3	
toor	945	870	0 12:41	pts/0	00:00:00 /usr/libexec/gnome-session-binary --systemd --
systemd	--session=ubuntu				
toor	1426	1418	0 12:42	pts/0	00:00:00 bash
gdm	1604	1576	0 12:42	pts/0	00:00:00 /usr/lib/gdm3/gdm-x-session dbus-run-session -
-	gnome-session	--autostart	/usr/share/gdm/greeter/autostart		
root	1606	1604	0 12:42	pts/0	00:00:00 /usr/lib/xorg/Xorg vt1 -displayfd 3 -auth /run
/user/125/gdm/Xauthority	-background	none	-noreset -keep	tty -verbose 3	
gdm	1614	1604	0 12:42	pts/0	00:00:00 dbus-run-session -- gnome-session --autostart
/usr/share/gdm/greeter/autostart					
gdm	1615	1614	0 12:42	pts/0	00:00:00 dbus-daemon --nofork --print-address 4 --sessi
on					
gdm	1616	1614	0 12:42	pts/0	00:00:00 /usr/libexec/gnome-session-binary --systemd --

# Command Interface

- Syntax
  - Command word, options (- and --), arguments
- Case sensitivity
- Getting help
  - man
- File editors
  - nano, vi/vim

# Navigation Commands

- Unified file system and file system Hierarchy Standard (FHS)
- pwd command
  - List current directory
- cd command
  - Change directory
- ls command
  - List directory contents
- cat command
  - Output file contents



# Search Commands

- find command
  - File search tool
- grep command
  - File contents search tool
  - Also filter any data piped as input
- Metacharacters and escaping
  - \ ' ' and " "

# File Management Commands

- cp command
  - Copy files
- mv command
  - Move (and rename) files
- rm command
  - Delete files
  - -r
- df and du commands
  - Report free space

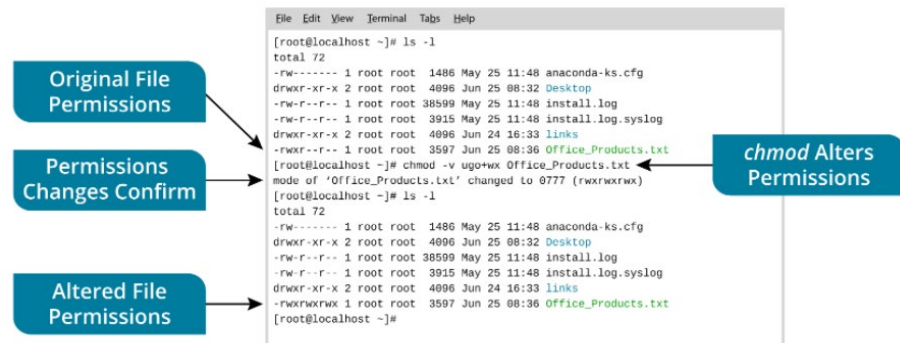


# User Account Management

- root/superuser account
- su command
  - Switch user
- sudo
  - Superuser do
- User management commands
  - useradd, usermod, userdel
- Group management commands
  - groupadd, groupmod, groupdel
  - newgrp to set effective group ID

# File Permissions Commands

- Read, write, execute for user, group, world
  - - rwx r-x r--
- Octal permissions
  - Read=4, Write=2, and Execute=1
  - 0754
- chmod
- File ownership
  - chown
  - chgrp



# Package Management Commands

```
toor@LX200:/home$ cat /etc/apt/sources.list
#deb cdrom:[Ubuntu 20.04.2.0 LTS _Focal Fossa_ - Release amd64 (20210209.1)]/ focal main restricted

# See http://help.ubuntu.com/community/UpgradeNotes for how to upgrade to
# newer versions of the distribution.
deb http://gb.archive.ubuntu.com/ubuntu/ focal main restricted
# deb-src http://gb.archive.ubuntu.com/ubuntu/ focal main restricted

## Major bug fix updates produced after the final release of the
## distribution.
deb http://gb.archive.ubuntu.com/ubuntu/ focal-updates main restricted
# deb-src http://gb.archive.ubuntu.com/ubuntu/ focal-updates main restricted

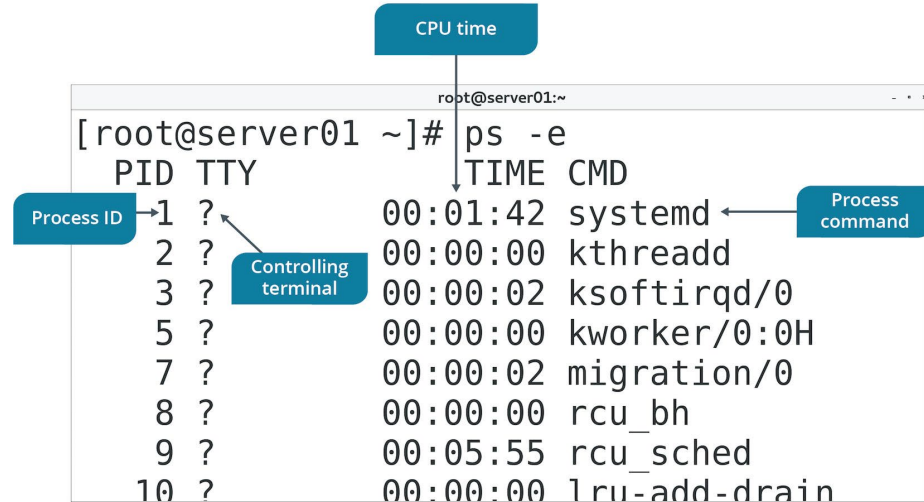
## N.B. software from this repository is ENTIRELY UNSUPPORTED by the Ubuntu
## team. Also, please note that software in universe WILL NOT receive any
## review or updates from the Ubuntu security team.
deb http://gb.archive.ubuntu.com/ubuntu/ focal universe
# deb-src http://gb.archive.ubuntu.com/ubuntu/ focal universe
deb http://gb.archive.ubuntu.com/ubuntu/ focal-updates universe
# deb-src http://gb.archive.ubuntu.com/ubuntu/ focal-updates universe

## N.B. software from this repository is ENTIRELY UNSUPPORTED by the Ubuntu
## team, and may not be under a free licence. Please satisfy yourself as to
## your rights to use the software. Also, please note that software in
## multiverse WILL NOT receive any review or updates from the Ubuntu
## security team.
deb http://gb.archive.ubuntu.com/ubuntu/ focal multiverse
# deb-src http://gb.archive.ubuntu.com/ubuntu/ focal multiverse
deb http://gb.archive.ubuntu.com/ubuntu/ focal-updates multiverse
# deb-src http://gb.archive.ubuntu.com/ubuntu/ focal-updates multiverse
```

- Package management
  - Advanced Packaging Tool (APT)
  - Yellowdog Updater, Modified (YUM)
- Distributions and repositories
  - Package integrity verification
- apt-get
  - update, upgrade, install
- yum
  - check-update, update, install
- Antivirus

# Process Monitoring Commands (Slide 1 of 2)

- Process ID (PID)
- ps Command
  - PID, terminal/pseudoterminal, CPU time, command



A terminal window titled 'root@server01:~' showing the output of the 'ps -e' command. The output is a table with columns: PID, TTY, TIME, and CMD. Annotations with arrows point to specific parts of the output: 'CPU time' points to the 'TIME' column; 'Process ID' points to the first '1' in the first row; 'Controlling terminal' points to the first '?' in the first row; and 'Process command' points to 'systemd' in the first row.

PID	TTY	TIME	CMD
1	?	00:01:42	systemd
2	?	00:00:00	kthreadd
3	?	00:00:02	ksoftirqd/0
5	?	00:00:00	kworker/0:0H
7	?	00:00:02	migration/0
8	?	00:00:00	rcu_bh
9	?	00:05:55	rcu_sched
10	?	00:00:00	lru-add-drain

# Process Monitoring Commands (slide 2 of 2)

## Total system details

```
root@server01:~  
top - 15:39:21 up 5 days, 20:58,  2 users,  load average: 0.08, 0.07, 0.1  
Tasks: 291 total,   1 running, 290 sleeping,   0 stopped,   0 zombie  
%Cpu(s):  4.0 us,  4.5 sy,   0.0 ni, 91.4 id,   0.0 wa,   0.0 hi,   0.0 si,  
KiB Mem : 7915376 total, 3992396 free, 1158144 used, 2764836 buff/cac  
KiB Swap: 8126460 total, 8126460 free,    0 used. 6022044 avail Me
```

## System details by process

PID	USER	PR	NI	VIRT	RES	SHR	S	%CPU	%MEM	TIME+
884	polkitd	20	0	650036	19012	5432	S	6.6	0.2	488:39.58
882	dbus	20	0	71224	4700	1932	S	2.0	0.1	167:55.82
2580	student+	20	0	4063464	261620	73944	S	1.7	3.3	16:59.89
885	root	20	0	396304	6120	3196	S	1.3	0.1	107:20.79
<b>30994</b>	<b>root</b>	<b>20</b>	<b>0</b>	<b>162112</b>	<b>2408</b>	<b>1580</b>	<b>R</b>	<b>1.3</b>	<b>0.0</b>	<b>0:00.08</b>
1921	root	20	0	353532	90912	51112	S	1.0	1.1	6:45.79
3504	student+	20	0	769132	34712	17092	S	1.0	0.4	0:46.50
1	root	20	0	194068	7168	4192	S	0.3	0.1	1:42.31
890	root	20	0	13216	836	628	S	0.3	0.0	0:16.22
2751	student+	20	0	611428	6932	5188	S	0.3	0.1	42:20.70

# Network Management Commands

- Adapter naming and network configuration managers
- ip Command
  - Report configuration and apply non-persistent changes
- dig Command
  - Troubleshoot name resolution and DNS
- Samba
  - File sharing with Windows

# Backup and Scheduling Commands

- Backup utilities and file copy tools
  - Compression (tar, gzip)
  - Backup products
- Task scheduler (cron)

## Review Activity: Features of Linux

- Shells, Terminals, and Consoles
- Command Interface
- Navigation Commands
- Search Commands
- File Management Commands
- User Account Management
- File Permissions Commands
- Package Management Commands
- Process Monitoring Commands
- Network Management Commands
- Backup and Scheduling Commands



## Lab Activity

- Assisted Lab: Manage Linux Using Command-line Tools
  - Use the Samba file sharing software to create a shared folder on a Linux host and access it from Windows
- Assisted Lab: Manage Files Using Linux Command-line Tools
  - Work at a Linux command-line to manage directories and files

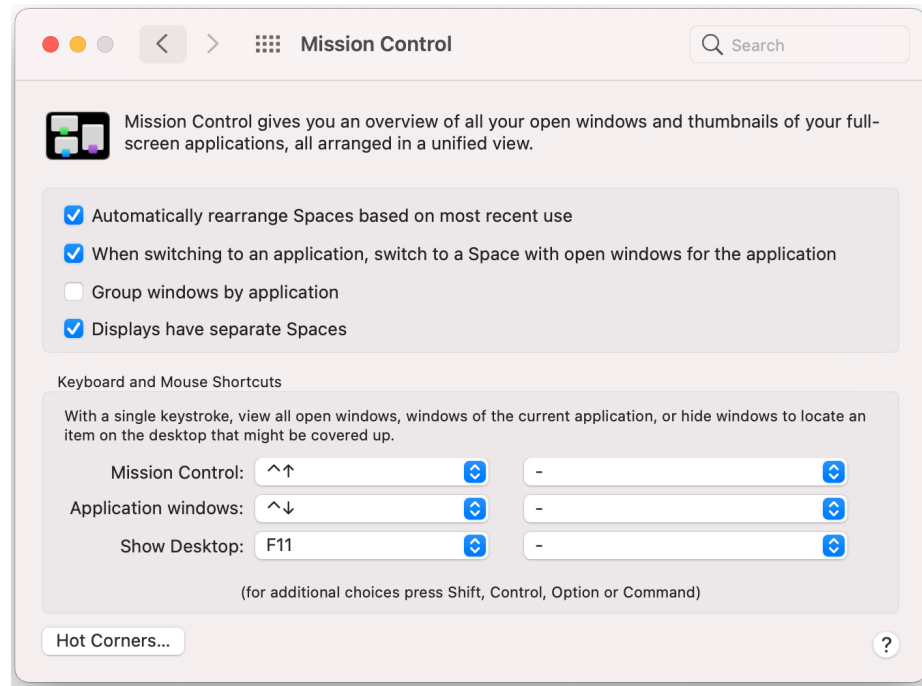
## Lesson 15

# Topic 15B

## Identify Features of macOS

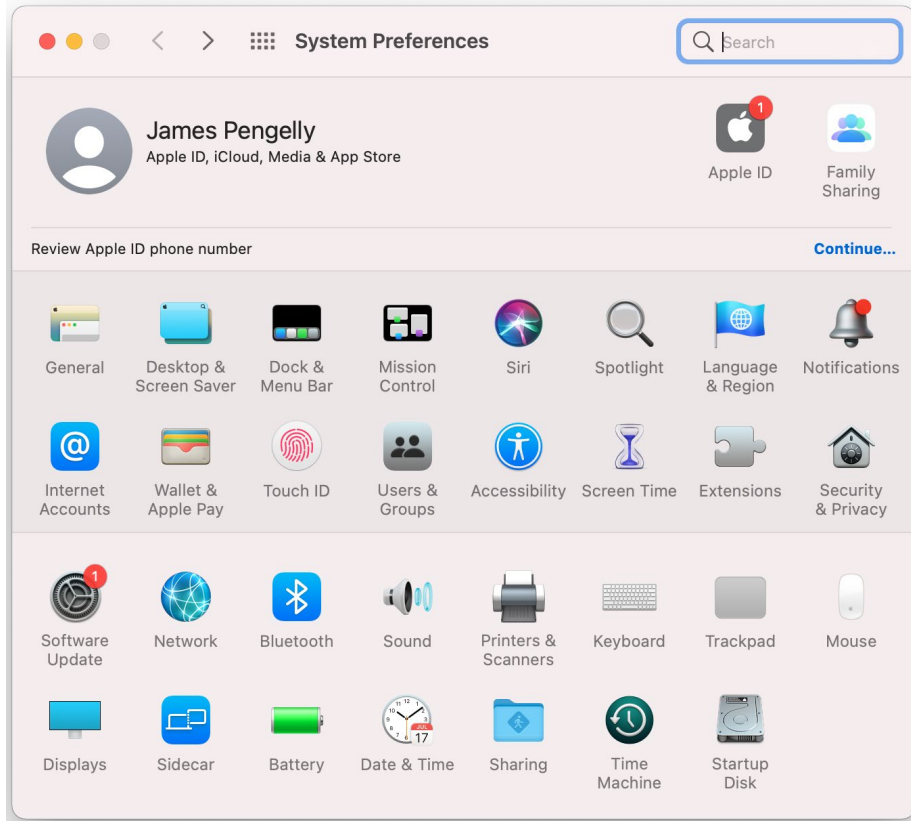
# Interface Features

- Menu bar and Dock
  - Launch, switch, and manage apps
- Spotlight
  - Search feature
- Terminal
  - Zsh or Bash command-line environment
- Mission Control and multiple desktops



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# System Preferences

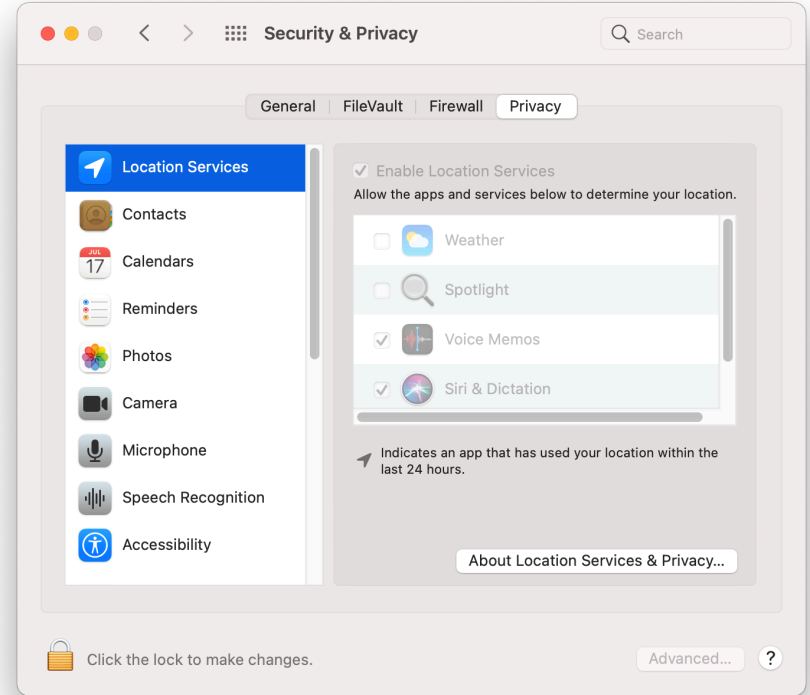


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- Apple keyboards
- Apple Magic Mouse and Trackpad and gesture support
- Displays
- Accessibility

# Security and User Management

- Apple ID
  - Access app store and iCloud
  - Sign in via System Preferences to associate with local account
- Privacy
- Internet Accounts and Keychain
  - Secure password storage
- FileVault
  - Disk encryption



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# Finder and iCloud

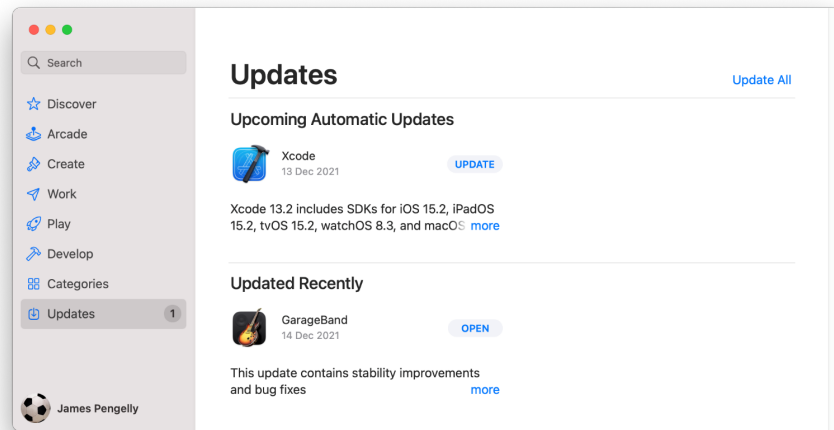


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- Finder
  - File management interface
- iCloud
  - Online storage and backup

# App Installation and Management

- Installation from the App Store
  - Apple ID
- Installation from download
  - Package format (DMG, PKG)
  - .APP installation directory
- App uninstallation
- Antivirus
- Corporate restrictions



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# OS and App Updates

- App Store updates
  - Updates for store apps
  - Updates and version upgrades for macOS
- Download apps updates

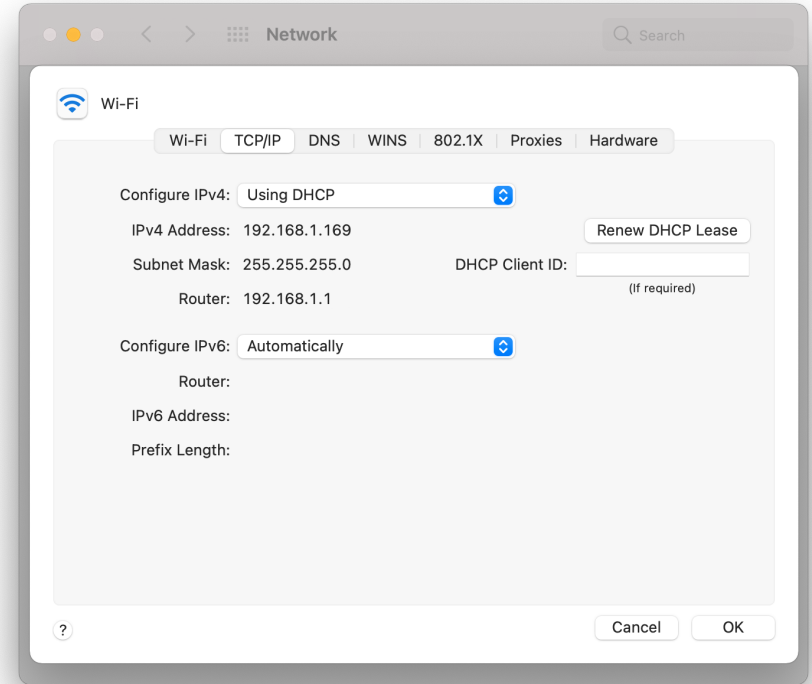


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# Device and Network Settings

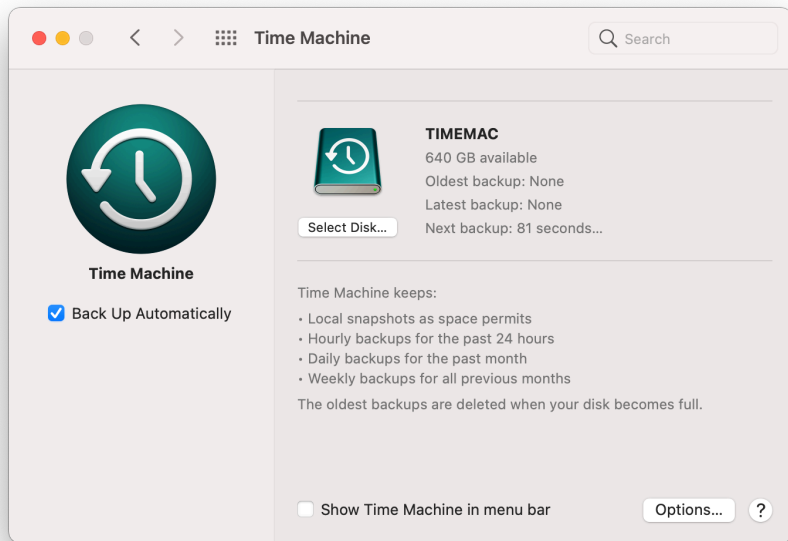
- Network
  - Join Wi-Fi network
  - TCP/IP and proxy settings
- Printers & Scanners
- Disk Utility
- Optical drives and Remote Disc



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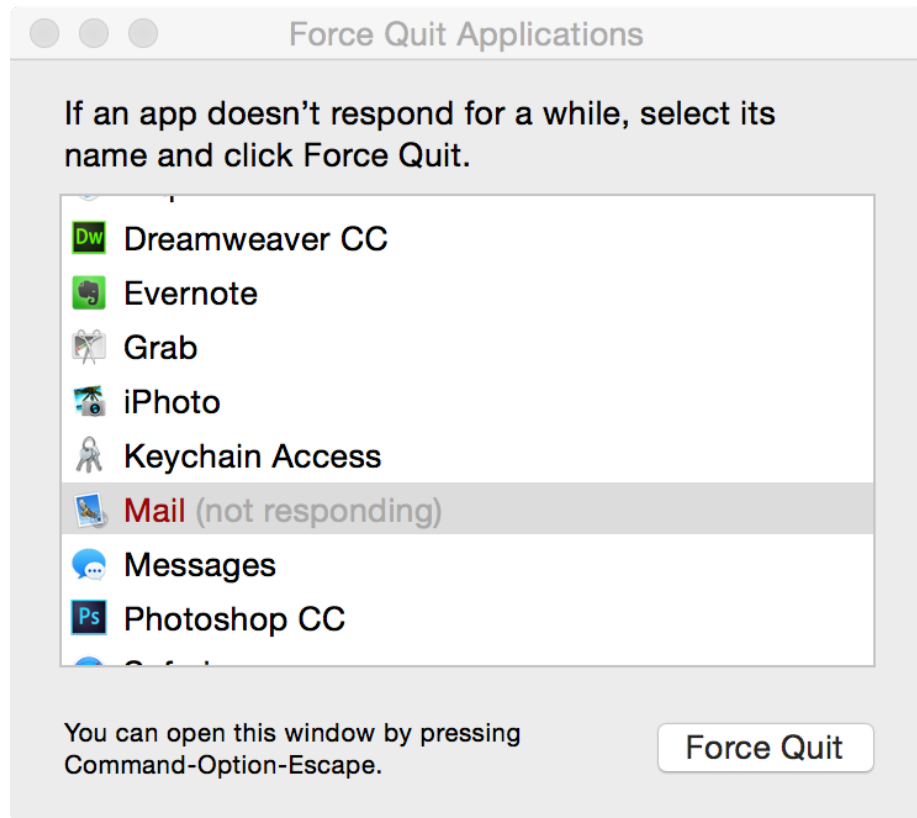
# Time Machine Backup

- Automated backup to an external drive or partition
  - APFS-formatted



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# Troubleshooting Crashes and Boot Issues



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- App crashes and Force Quit
  - COMMAND+OPTION+ESC
- Recovery menu

## Review Activity: Features of macOS

- Interface Features
- System Preferences
- Security and User Management
- Finder and iCloud
- App Installation and Management
- OS and App Updates
- Network and Device Settings
- Time Machine Backup
- Troubleshoot Crashes and Boot Issues

## Lab Activity

- APPLIED Lab: Support and Troubleshoot Network Hosts
  - Work independently to diagnose and remediate a network connectivity issue

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## Summary