2.0 Systems Operation and Maintenance

2.1 Given a scenario, conduct software installations, configurations, updates, and removals.

- **Package types**
  - .rpm
  - .deb
  - .tar
  - .tgz
  - .gz
- **Installation tools**
  - RPM
  - Dpkg
  - APT

- YUM
- DNF
- Zypper
- **Build tools**
  - Commands
    - make
    - make install
    - ldd
  - Compilers
  - Shared libraries

- **Repositories**
  - Configuration
  - Creation
  - Syncing
  - Locations
- **Acquisition commands**
  - wget
  - curl

2.2 Given a scenario, manage users and groups.

- **Creation**
  - useradd
  - groupadd
- **Modification**
  - usermod
  - groupmod
  - passwd
  - chage
- **Deletion**
  - userdel
  - groupdel

- **Queries**
  - id
  - whoami
  - who
  - w
  - last
- **Quotas**
  - User quota
  - Group quota
- **Profiles**
  - Bash parameters
    - User entries
      - .bashrc

- .bash_profile
- .profile
- Global entries
  - /etc/bashrc
  - /etc/profile.d/
  - /etc/skel
  - /etc/profile
- **Important files and file contents**
  - /etc/passwd
  - /etc/group
  - /etc/shadow

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2.3 Given a scenario, create, modify, and redirect files.

- **Text editors**
  - nano
  - vi
- **File readers**
  - grep
  - cat
  - tail
  - head
  - less
  - more
- **Output redirection**
  - ‹
  - ›
  - |
  - ‹‹
  - ››
  - 2›
  - &›
  - stdin
  - stdout

- stderr
- /dev/null
- /dev/tty
- xargs
- tee
- Here documents
- **Text processing**
  - grep
  - tr
  - echo
  - sort
  - awk
  - sed
  - cut
  - printf
  - egrep
  - wc
  - paste
- **File and directory operations**
  - touch

- mv
- cp
- rm
- scp
- ls
- rsync
- mkdir
- rmdir
- ln
  - Symbolic (soft)
  - Hard
- unlink
- inodes
- find
- locate
- grep
- which
- whereis
- diff
- updatedb

2.4 Given a scenario, manage services.

- **Systemd management**
  - Systemctl
    - Enabled
    - Disabled
    - Start
    - Stop
    - Mask
    - Restart
    - Status
    - Daemon-reload
  - Systemd-analyze blame
  - Unit files
    - Directory locations
    - Environment parameters

- Targets
- Hostnamectl
- Automount
- **SysVinit**
  - chkconfig
    - on
    - off
    - level
  - Runlevels
    - Definitions of 0–6
    - /etc/init.d
    - /etc/rc.d
    - /etc/rc.local
    - /etc/inittab

- Commands
  - runlevel
  - telinit
- Service
  - Restart
  - Status
  - Stop
  - Start
  - Reload

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2.5 Summarize and explain server roles.

- **NTP**
- **SSH**
- **Web**
- **Certificate authority**
- **Name server**
- **DHCP**
- **File servers**

- **Authentication server**
- **Proxy**
- **Logging**
- **Containers**
- **VPN**
- **Monitoring**
- **Database**

- **Print server**
- **Mail server**
- **Load balancer**
- **Clustering**

2.6 Given a scenario, automate and schedule jobs.

- **cron**
- **at**
- **crontab**
- **fg**

- **bg**
- **&**
- **kill**
- **Ctrl+c**

- **Ctrl+z**
- **nohup**

2.7 Explain the use and operation of Linux devices.

- **Types of devices**
  - Client devices
  - Bluetooth
  - WiFi
  - USB
  - Monitors
  - GPIO
  - Network adapters
  - PCI
  - HBA
  - SATA
  - SCSI
  - Printers
  - Video
  - Audio

- **Monitoring and configuration tools**
  - lsdev
  - lsusb
  - lspci
  - lsblk
  - dmesg
  - lpr
  - lpq
  - abrt
  - CUPS
  - udevadm
    - add
    - reload-rules
    - control
    - trigger

- **File locations**
  - /proc
  - /sys
  - /dev
  - /dev/mapper
  - /etc/X11
- **Hot pluggable devices**
  - /usr/lib/udev/rules.d (System rules - Lowest priority)
  - /run/udev/rules.d (Volatile Rules)
  - /etc/udev/rules.d (Local Administration - Highest priority)
  - /etc/udev/rules.d

2.8 Compare and contrast Linux graphical user interfaces.

- **Servers**
  - Wayland
  - X11
- **GUI**
  - Gnome
  - Unity
  - Cinnamon

- MATE
- KDE
- **Remote desktop**
  - VNC
  - XRDP
  - NX
  - Spice

- **Console redirection**
  - SSH port forwarding
    - Local
    - Remote
    - X11 forwarding
    - VNC
- **Accessibility**

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