**Red Hat Linux Study Notes - Summary**

**Introduction**

* Documenting Linux upskilling journey with a focus on Red Hat.
* Exploring Linux fundamentals, networking, security, scripting, and system administration.
* No immediate plan for Red Hat certification, but considering RHCSA in the future.

**System Administration Basics**

**User & Group Management**

* Created users and groups using useradd, usermod, userdel, and passwd.
* Users can have one primary group but multiple secondary groups.
* Used visudo to edit sudo privileges and configured TACACS+ for authentication.

**File Permissions & ACLs**

* Standard Linux permissions (chmod, chown, chgrp), and umask for defaults.
* Used getfacl and setfacl for extended permissions.
* Set GID on directories to enforce group ownership inheritance.
* Used SUID for privilege escalation in a controlled way.

**Process Management & Performance Tuning**

* Used ps, top, pgrep, kill, renice, and tuned profiles for resource allocation.
* journalctl for system logs, systemctl to manage services.
* cron for scheduled tasks, at for one-time jobs.
* Explored process scheduling and tuned profiles.

**Storage & Filesystems**

**Disk Management & Partitioning**

* Used lsblk, fdisk, parted, and mkfs for partitioning and filesystem setup.
* Mounted partitions persistently via /etc/fstab.
* Used fsck and xfs\_repair for disk health checks.
* Explored swap space management.

**LVM & Stratis**

* Created Logical Volume Manager (LVM) groups, resized volumes dynamically.
* Used Stratis to pool storage, take snapshots, and persist mounts.

**Networking on RHEL**

* Configured static IPs and routes using nmcli.
* Set up VLANs, network bonds (Teaming vs. Bonding), and firewall rules using firewalld.
* Explored iptables and firewalld zones: public, external, internal, trusted, etc.
* Configured DHCP, DNS resolution, and troubleshooting with dig and nslookup.

**Security & Authentication**

**SELinux**

* getenforce, setenforce, sestatus for enforcing security contexts.
* Used semanage, restorecon, and ausearch for SELinux troubleshooting.

**Firewall Management**

* Configured rules using firewall-cmd.
* Created custom services and zones.
* Explored masquerading and NAT.

**802.1X Integration with ISE**

* Configured network authentication for secure access.

**Containers & Automation**

**Podman & Container Management**

* Used podman and skopeo for managing containers.
* Pulled images from Red Hat’s registry and deployed applications.
* Explored podman generate systemd (deprecated but noted).

**Infrastructure as Code & Scripting**

* Automated Azure deployments with Terraform, GitHub Actions, and VS Code.
* Used Bash scripting for automation: variables, loops, conditionals, and functions.
* Implemented backup scripts with tar, rsync, and logging mechanisms.
* Used trap for signal handling in scripts.

**Advanced Topics & Troubleshooting**

**Boot Process & Kernel Management**

* Explored grub, systemd, and dracut for managing boot sequences.
* Used systemctl to change targets and debug failed boots.

**Logging & Monitoring**

* journalctl for system logs and persistent storage.
* tcpdump, nmap, iftop, and netstat for network troubleshooting.
* Captured packets and analyzed logs for issue resolution.

**NFS & Autofs**

* Configured NFS for file sharing.
* Used auto.master and auto.home to automate mounts.
* Managed user access to networked file systems.

**Final Thoughts**

* Covered all major RHCSA topics through hands-on labs.
* Strong grasp on networking, security, automation, and containerization.
* Will revisit complex topics like Stratis, VDO, and SELinux as needed.
* Planning to explore Docker, Kubernetes, and cloud-based Linux deployments next.

**Closing Note**

Excellent documentation of hands-on Linux learning. Keep practicing and refining these skills for cloud and DevOps roles!