



4.0 Linux Troubleshooting and Diagnostics

4.1

Given a scenario, analyze system properties and remediate accordingly.

• Network monitoring and configuration

- Latency
 - Bandwidth
 - Throughput
- Routing
- Saturation
- Packet drop
- Timeouts
- Name resolution
- Localhost vs. Unix socket
- Adapters
 - RDMA drivers
- Interface configurations
- Commands
 - nmap
 - netstat
 - iftop
 - route
 - iperf
 - tcpdump
 - ipset

- Wireshark
 - tshark
- netcat
- traceroute
- mtr
- arp
- nslookup
- dig
- host
- whois
- ping
- nmcli
- ip
- tracepath

• Storage monitoring and configuration

- iostat
- ioping
- IO scheduling
 - cfq
 - noop
 - deadline

- du
- df
- LVM tools
- fsck
- partprobe

• CPU monitoring and configuration

- /proc/cpuinfo
- uptime
- loadaverage
- sar
- sysctl

• Memory monitoring and configuration

- swapon
- swapoff
- mkswap
- vmstat
- Out of memory killer
- free
- /proc/meminfo
- Buffer cache output

• Lost root password

- Single user mode

4.2

Given a scenario, analyze system processes in order to optimize performance.

• Process management

- Process states
 - Zombie
 - Uninterruptible sleep
 - Interruptible sleep
 - Running

- Priorities
- Kill signals
- Commands
 - nice
 - renice
 - top

- time
- ps
- lsof
- pgrep
- pkill
- PIDs

4.3 Given a scenario, analyze and troubleshoot user issues.

- **Permissions**
 - File
 - Directory
 - **Access**
 - Local
 - Remote
 - **Authentication**
 - Local
 - External
 - Policy violations
 - **File creation**
 - Quotas
 - Storage
 - Inode exhaustion
 - Immutable files
 - **Insufficient privileges for authorization**
 - SELinux violations
 - **Environment and shell issues**
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4.4 Given a scenario, analyze and troubleshoot application and hardware issues.

- **SELinux context violations**
- **Storage**
 - Degraded storage
 - Missing devices
 - Missing volumes
 - Missing mount point
 - Performance issues
 - Resource exhaustion
 - Adapters
 - SCSI
 - RAID
 - SATA
 - HBA
 - /sys/class/scsi_host/host#/scan
 - Storage integrity
 - Bad blocks
- **Firewall**
 - Restrictive ACLs
 - Blocked ports
 - Blocked protocols
- **Permission**
 - Ownership
 - Executables
 - Inheritance
 - Service accounts
 - Group memberships
- **Dependencies**
 - Patching
 - Update issues
 - Versioning
 - Libraries
 - Environment variables
 - GCC compatibility
 - Repositories
- **Troubleshooting additional hardware issues**
 - Memory
 - Printers
 - Video
 - GPU drivers
 - Communications ports
 - USB
 - Keyboard mapping
 - Hardware or software compatibility issues
 - Commands
 - dmidecode
 - lshw