System Information & Troubleshooting (Plus)

Linux Commands Course · Section 18

System Facts — uname, hostnamectl, lsb_release

▒▒ Kernel and architecture

```
uname -a
```

Example output:

```
Linux workstation 6.8.0-45-generic #1 SMP x86_64 GNU/Linux
```

Displays kernel name, version, architecture, and OS type.

▒▒ Host identity

```
hostnamectl
```

Output example:

```
   Static hostname: workstation
         Icon name: computer-laptop
           Chassis: laptop
        Machine ID: 3c68f3e8d9284f2d8b22a
           Boot ID: 86b9e1c9bbd64c83bb7e2
  Operating System: Ubuntu 24.04 LTS
            Kernel: Linux 6.8.0-45-generic
      Architecture: x86-64
```

▒▒ Distribution info

```
lsb_release -a
```

or

```
cat /etc/os-release
```

Shows distribution name, release, and codename.

Quick Health Snapshot

▒▒ Uptime and load

```
uptime
```

Output:

```
10:25:41 up 3 days,  2:41,  3 users,  load average: 0.20, 0.25, 0.18
```

Shows system uptime and average CPU load over 1, 5, and 15 minutes.

▒▒ Memory usage

```
free -h
```

Example:

```
               total        used        free      shared  buff/cache   available
Mem:            15Gi       3.5Gi       9.4Gi       256Mi       2.2Gi        11Gi
Swap:          2.0Gi       0.0Gi       2.0Gi
```

▒▒ System performance overview

```
vmstat 2 5
```

- Displays CPU, memory, swap, and I/O stats every 2 seconds (5 times).

▒▒ Disk I/O stats

```
iostat -x 2 3
```

- Requires sysstat package (sudo apt install sysstat).
- Shows read/write rates and utilization per device.

Kernel Messages – dmesg

Displays boot and kernel messages.

```
dmesg | less
```

Filter for hardware errors:

```
dmesg | grep -i error
```

Or view only recent messages:

```
dmesg --ctime | tail -n 20
```

Helpful for diagnosing device issues or driver problems.

Hardware Overview

▒▒ CPU Information

```
lscpu
```

Example output:

```
Architecture:            x86_64
CPU(s):                  8
Model name:              Intel(R) Core(TM) i7-10750H CPU @ 2.60GHz
Thread(s) per core:      2
Core(s) per socket:      6
```

▒▒ Memory Layout

```
lsmem
```

Shows detected memory blocks and sizes.

PCI Devices — lspci

Lists hardware on the PCI bus (network cards, GPUs, etc.).

```
lspci | less
```

Example snippet:

```
00:02.0 VGA compatible controller: Intel Corporation UHD Graphics
01:00.0 3D controller: NVIDIA Corporation RTX 3060
```

Add `-v` or `-vv` for verbose details.

USB Devices — lsusb

Show all connected USB devices.

```
lsusb
```

Example output:

```
Bus 001 Device 004: ID 046d:c52b Logitech USB Receiver
Bus 002 Device 002: ID 0781:5567 SanDisk Cruzer Blade
```

Use `lsusb -t` for a tree view by USB port.

System BIOS and Hardware Metadata — dmidecode

dmidecode reads the **DMI/SMBIOS table** for low-level system details.

```
sudo dmidecode | less
```

Examples of sections:

- BIOS version and vendor
- Baseboard (motherboard) info
- Chassis and serial numbers
- Memory slot info

To target a specific type:

```
sudo dmidecode -t bios
sudo dmidecode -t memory
sudo dmidecode -t system
```

Read-only — safe to inspect, not modify.

Example — Quick System Summary

Combine tools for a complete picture:

```
echo "==== SYSTEM ===="
hostnamectl
echo "==== CPU ===="
lscpu | grep 'Model name'
echo "==== MEMORY ===="
free -h
echo "==== DISKS ===="
lsblk -f
echo "==== NETWORK ===="
ip a | grep inet
```

This gives an at-a-glance report of your machine.

Recap

- **System facts:** uname, hostnamectl, lsb_release, /etc/os-release
- **Health:** uptime, free -h, vmstat, iostat, dmesg
- **Hardware:** lscpu, lsmem, lspci, lsusb, dmidecode

These commands together let you audit, benchmark, and troubleshoot your Linux system effectively.
