

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
```

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:

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
```

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
```

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.
