**Shell Commands to Understand Elements of Computers**

Arun Saxena

Colorado State University Global

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Dr. Joseph Issa

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**Introduction**

This document provides information on the specifications of the four main structural components of a Linux computer: Processor, Main Memory, I/O Modules, and Storage Devices. The commands used to gather this information are explained, and sample outputs are described.

**Processor**

**Description**

To check the processor information, *lscpu* command is used. This command provides detailed information about the CPU architecture, including the number of CPUs, cores, threads, and their speeds.

(lscpu - Linux man page." Linux Command Library)

**Expected Output**

This command displays detailed information about the CPU architecture, including the number of cores, clock speed, architecture type, and cache sizes.

Sample output includes:

- Architecture: Indicates whether the system is 32-bit or 64-bit.  
- CPU(s): Number of processors or cores.  
- Model name: Specific model of the CPU.  
- CPU MHz: Current clock speed of the processor in megahertz.

**Screenshot**

A screenshot of a computer

Description automatically generated

**Main Memory**

**Description**

To check the main memory information, *free-h and dmidecode* command is used. This command shows memory usage statistics, including total, used, and available RAM in a human-readable format.

(lscpu - Linux man page." Linux Command Library)

**Expected Output**

This command retrieves detailed information about the system's RAM, including:  
- Type: Type of RAM (e.g., DDR4).  
- Speed: RAM speed in MHz.  
- Size: Capacity of each memory module.

**Screenshot**

A screenshot of a computer

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A screenshot of a computer program

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**I/O Modules**

**Description**

To check the I/O Modules information, *lsblk and fdisk-l* command is used. This command lists all block devices, including I/O modules like USB drives, SD cards, and internal storage devices.

(lscpu - Linux man page." Linux Command Library)

**Expected Output**

This command lists all PCI (Peripheral Component Interconnect) devices. It helps identify various hardware components connected to the PCI bus.

A list of all PCI devices, including Ethernet controllers, network controllers, USB controllers, audio devices, etc.

**Screenshot**

A screen shot of a computer

Description automatically generated

A screenshot of a computer program

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**Storage Devices**

**Description**

*Df-h* command lists information about all available or the specified block devices. It shows details about disks and their partitions.

**Expected Output**

This command provides an overview of mounted file systems and their disk usage in a human-readable format. For detailed information about storage devices and partitions, the following command can be used:

**Screenshot**

A screenshot of a computer screen

Description automatically generated

**Conclusion**

Using the above commands, we can gather detailed specifications about the processor, main memory, I/O modules, and storage devices of a Linux computer. The outputs help in understanding the system's hardware configuration.

**References**

"lscpu - Linux man page." Linux Command Library. Retrieved from https://man7.org/linux/man-pages/man1/lscpu.1.html.

"free - Linux man page." Linux Command Library. Retrieved from https://man7.org/linux/man-pages/man1/free.1.html.

"lspci - Linux man page." Linux Command Library. Retrieved from https://man7.org/linux/man-pages/man8/lspci.8.html.

"lsblk - Linux man page." Linux Command Library. Retrieved from https://man7.org/linux/man-pages/man8/lsblk.8.html.