

University of Central Punjab

*(Faculty of Information
Technology)*

Course: CSNC 2411

**Computer Communications and Networks
(Lab)**



Lab 1

Overview of Basic Linux Commands, Process
Management, and Network Management

Lab Manual 01

Objectives

- Linux commands related to directory structure and file manipulation
- Process and network management commands
- How to compile C code in Linux
- Endianness in systems

Reference Material

General commands for opening terminal

1. To open the terminal you will either open it using GUI or press “Ctrl+Alt+T”.
2. To open two windows in the same terminal you will use “Ctrl+Shift+T”.
3. To copy something from your terminal you will use “Ctrl+Shift+C”.
4. To paste something in the Terminal you will press “Ctrl+Shift+V”.
5. To terminate any running program you will use “Ctrl+C” or “Ctrl+Z”.

Play with Folders

1. The “ls” command is used for viewing files, folders and directories
2. To move the file from one directory to another we can use “mv” command
mv Path_Of_Source_folder <space> Path_Of_Destination_Folder
Example: move a file “mycode.c” from folder “Desktop/MyCode/” to “Desktop”
“mv Desktop/MyCode/mycode.c Desktop”
3. Can create a directory using command “mkdir” command.
Example: syntax for creating a testdirectory is “mkdir testdirectory”
4. To remove any directory use “rmdir”. Example” “rmdir testdirectory”
5. “man” command is used to show information related to any command; e.g, “man cd”

Compilation of C code

1. Save your C file with *.c extension; e.g, MyCode.c
2. To compile any C file you should be in the same directory as your code. Write “cd <directory_name>” to change to the directory; e.g, cd Desktop. To go directly into home directory we simply write “cd ~”. To go one step up in the hierarchy of directories we write “cd ..”.
3. To compile your file using gcc compiler you first have to go to the directory where the file is placed and then you will write the following:
gcc <file_name>.c -o <executable_fileName>
4. If there is any error in your code then compiler will tell you those errors and you will correct them. If there is no error, you will see an executable created in the same directory having a diamond like shape. Then you will run your executable by issuing the following command in the directory where your executable is placed:
./<executable_fileName>
Example: ./IamExeFile

5. Make sure that you write the correct file name, otherwise you will get an error. You can use TAB after writing two to three letters of the file name, and it will auto complete the file name for you.

Endianness

In computing, “endianness” refers to the order of bytes (or sometimes bits) within a binary representation of a number. It can also be used more generally to refer to the internal ordering of any representation, such as the digits in a numeral system.

Little and Big endian are two ways of storing multibyte data-types (int, float, etc). In little endian machines, last byte of binary representation of the multibyte data-type is stored first. On the other hand, in big endian machines, first byte of binary representation of the multibyte data-type is stored first.

Lab Tasks

- Task 1. Find out the purpose of the following commands and execute them on your system with different parameters. [5 marks]**

ls, cd, pwd, mkdir, rmdir, rm, cp, mv, touch

- Task 2. In the table below you are given various network commands. Run the commands in the Linux terminal and interpret the results. You are also required to attach screenshots of the results obtained after you run the commands. [7 marks]**

top	The top program provides a dynamic real-time view of a running system. It can display system summary information as well as a list of tasks currently being managed by the Linux kernel.	top
ps	ps displays status of a selection of the active processes.	ps
kill pid	Kill is used to send a signal to a process, where pid stands for process id Default syntax for this is kill [-signal number or name)] pid On your terminal to see the list of available signals, use Kill -L A PID of -1 is special; it indicates all processes except the kill process itself and init. It will terminate all programs and log off. BEWARE!	kill -SIGKILL pid
chmod	This command is used to grant or revert read, write, and execute permissions from a user, group or others. Following are the symbolic representations of three different roles: You can check the details by typing: man chmod chmod 400 lab1.txt	

	<p>Check what happened to your file.</p> <p>Now write</p> <pre>chmod 700 lab1.txt</pre> <p>What happened to your file?</p>	
ifconfig	<p>ifconfig is used to configure the kernel-resident network interfaces.</p> <p>If no arguments are given, ifconfig displays the status of the currently active interfaces. If a single interface argument is given, it displays the status of the given interface only; if a single -a argument is given, it displays the status of all interfaces, even those that are down. Otherwise, it configures an interface.</p> <ul style="list-style-type: none"> • Default Gateway Functionality • System IP address • System Physical Address (MAC address) 	<p>ifconfig</p> <pre>ifconfig -a</pre> <pre>ifconfig eth0</pre>
traceroute	<p>traceroute prints the route that packets take to a network host. traceroute gives an insight to the entire path that a packet travels through, names and identity of routers and devices in your path, network latency (the time taken to send and receive data to each devices on the path). It's a tool that can be used to verify the path that your data will take to reach its destination, without actually sending your data.</p> <p>Write on your terminal</p> <pre>traceroute ucp.edu.pk</pre>	
ping	<p>Ping is a command that is used to check the connection and latency rate between two computers in a network. One network pings another in order to exchange data packets (Response) to calculate the latency and exchange rate.</p> <p>Syntax for ping is:</p> <p>ping [other network's ID (Domain/IP Address)]</p>	

Task 3. Write a C program to find the host byte order (little endian or big endian) of your machine. Your program must output the byte order of your machine along with the data stored in the individual bytes; e.g, you can store a number in hex, as 0x3412, and visualize how data is stored in the memory (either in little or big endian format).