CPE3201

Linux File System (Continue)

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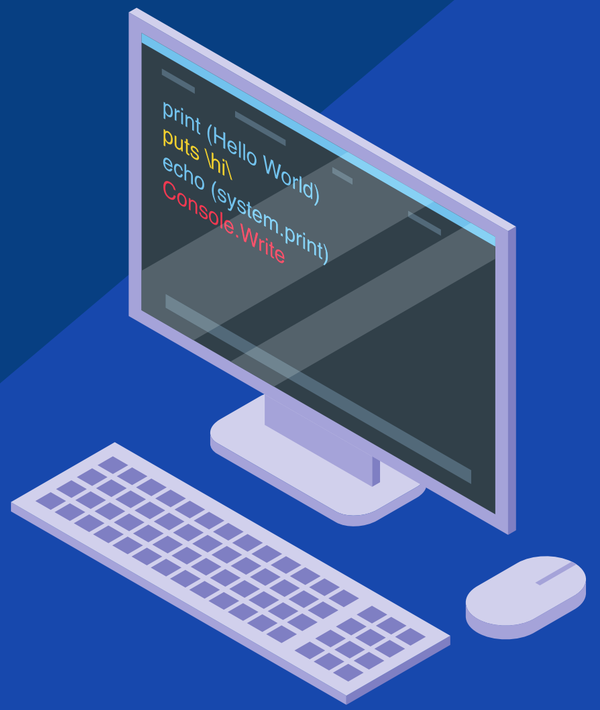

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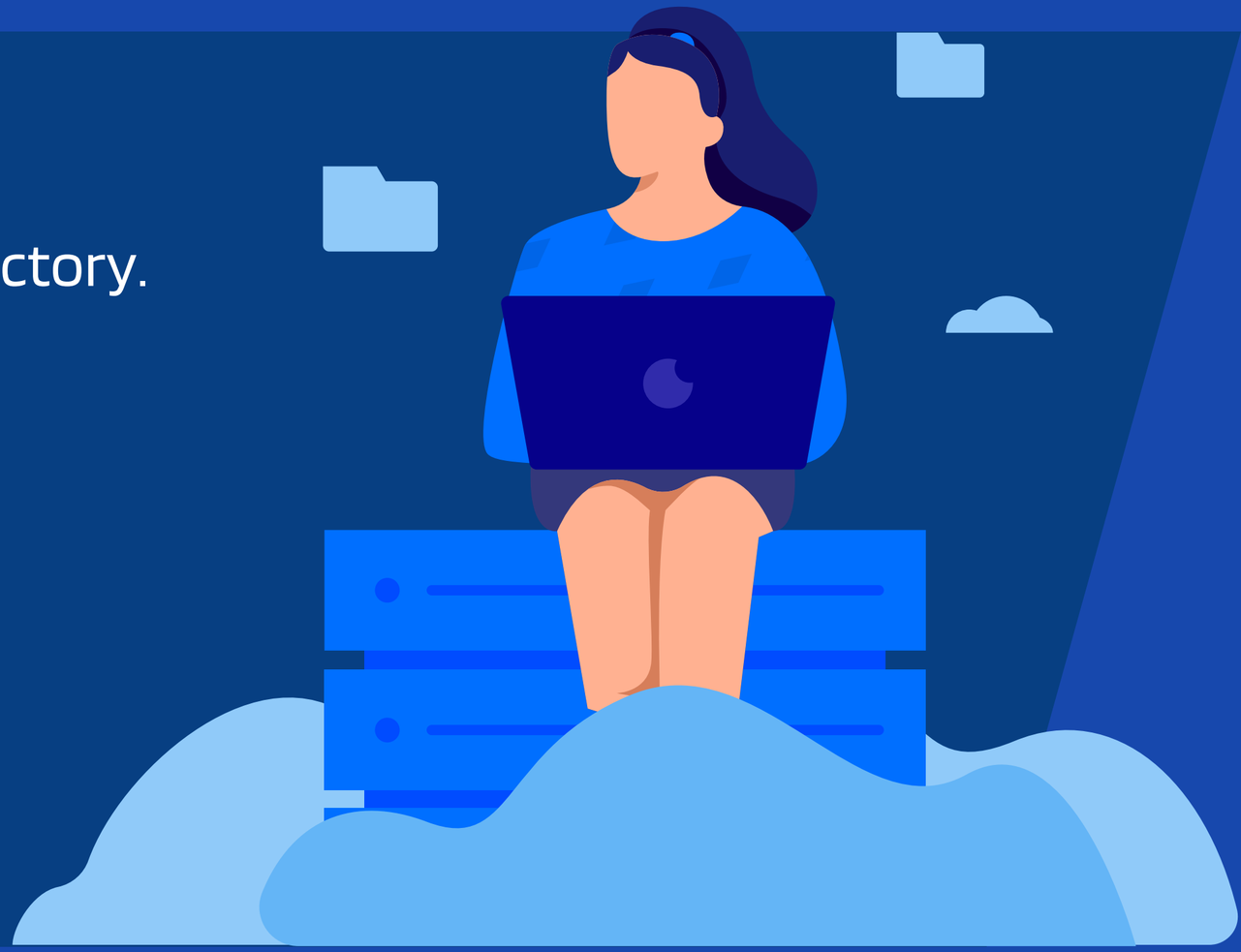
Linux shell commands (Review)

Print working directory (pwd)

Show the absolute path to the working directory.

```
/root% pwd
/root
/root% _
```



Change directory (cd)

Go to another directory.

- Go to a child directory → input the directory name after cd (e.g., cd Cindy)
- Go to a parent directory → `cd ..`
- Go to the root directory → `cd /`
- Go to the home directory → `cd`

List (ls)

List directory contents of files and directories.

```
/% ls
bin         home        linuxrc     mnt         root        sys         var
dev         lib         lost+found  opt         run         tmp
etc         lib32       media       proc        sbin        usr
/% _
```

- -l Display long detailed information.
- -a Show all files Include hidden ones.
- -t Sort files by last modification time.
- -r Show files in a reverse order.
- -S Sort files by their sizes.
- -R List files recursively, including sub.
- -i Display the index number (inode).
- -g Display the group ownership.
- -h Display file sizes in human-readable format (e.g., 1K, 234M, 2G).

Make directory (mkdir)

Create new directories.

Syntax: `mkdir [option] [name_of_directory]`

-p (parents) Create all directories leading up to the given directory that do not exist already.

```
mkdir -p folder_a/folder_a1
```

- It will create `folder_a1` under `folder_a` if `folder_a` exists.
- if `folder_a` doesn't exist, it will create `folder_a` first, then `folder_a1`.

How to reference filename with spaces in Linux

Method 1: Use quote

```
mkdir “folder a” or mkdir ‘folder a’
```

Method 2: Use backslash (escape character)

```
mkdir folder\ a
```

Escape characters change the special characters, including space, into a normal text.

Activity

Make the following directory tree inside the home directory and create an empty text file as shown.

```
-Text Files
--Test 1
--Test 2
```

Capitalization and spaces must be exactly as shown.

Working with a text file

Touch

- Create a new file if not existed, or
- Change time stamp of an existing file.

Syntax: `touch [option] [file_name]`

Activity

Create `sample.txt` in `Test 1` as shown.

```
-Text Files
--Test 1
---sample.txt
--Test 2
```

Go to the home directory and run `ls -R`.

Make Screenshot#1.

Clear the terminal screen (clear)

- Equivalent to the cls command on Windows.

```
 like an initrd
[    0.616008] Freeing initrd memory: 4720k freed
[    0.637197] platform rtc_cmos: registered platform RTC device (no PNP device
found)
[    0.819989] io scheduler noop registered (default)
[    0.970378] Non-volatile memory driver v1.3
[    0.970378] Serial: 8250/16550 driver, 4 ports, IRQ sharing enabled
[    1.254886] serial8250: ttyS0 at I/O 0x3f8 (irq = 4) is a 16550A
[    1.327352] brd: module loaded
[    1.356191] loop: module loaded
[    1.356191] Uniform Multi-Platform E-IDE driver
[    1.369995] ide-gd driver 1.18
[    1.369995] ide-cd driver 5.00
[    1.381129] serio: i8042 KBD port at 0x60,0x64 irq 1
[    1.381129] serio: i8042 AUX port at 0x60,0x64 irq 12
[    1.400269] mice: PS/2 mouse device common for all mice
[    1.400269] input: AT Translated Set 2 keyboard as /devices/platform/i8042/se
rio0/input/input0
[    1.413919] rtc_cmos rtc_cmos: rtc core: registered rtc_cmos as rtc0
[    1.413919] rtc0: alarms up to one day, 114 bytes nvram
[    1.440487] RAMDISK: ext2 filesystem found at block 0
[    1.440487] RAMDISK: Loading 4719KiB [1 disk] into ram disk... done.
[    2.455543] VFS: Mounted root (ext2 filesystem) on device 1:0.

/root% clear_
```

```
/root% _
```

Print messages (echo)

Print messages on the terminal.

Syntax: `echo [messages]`

Equivalent to “printf” in C and “println” in Java.

Example:

`echo “hello world”`

```
/root% echo "hello world"
hello world
/root% _
```

Input/Output redirection

Redirect messages to a file.

```
echo “Hello world” > hello.txt
```

Redirect the “Hello world” message to the hello.txt file.

If the text file does not exist, Linux will create it first.

Append

Assuming that we run this command.

`echo “Hello world” > hello.txt`

If we run the following command

`echo “This is Linux” > hello.txt`

the “Hello world” in hello.txt will be replaced by “This is Linux”

```
/root% echo "Hello world" > hello.txt
/root% echo "This is Linux" >> hello.txt
/root% cat hello.txt
Hello world
This is Linux
/root% _
```

To add “This is Linux” as a new line (maintaining “Hello world”), we must use

`echo “This is Linux” >> hello.txt`

Concatenate (cat)

`cat (filename)` → Display the content.

Activity

From the previous activity, go to the `Test 1` directory (where `sample.txt` is saved). If the session timeout occurs, you will have to create the directory tree again.

1. Clear the terminal screen (use `clear` command).
2. Run the `pwd` command.
3. Add `"Hello everyone."` to `sample.txt`
4. Followed by `"My name is (your name)"` on the next line.
5. Display the content in `sample.txt` (use `cat` command).
6. Make Screenshot#2

Concatenate (cat)

`cat (filename)` → Display the content.

`cat -n (filename)` → Display content with line number.

`cat -e (filename)` → Display content with $ at the end of each line.

`cat > (filename)` → Create a new file and add content one line at a time.

- Press Enter to start a new line.
- Press Ctrl-D to save *(require a physical keyboard)*.

`cat (older filename) > (newer file name)` → Copy a file.

`cat <filename1> <filename2>....  > <newFilename>`

→ Concatenate the contents of multiple files in a single new file.

Head & Tail

`head hello.txt` → Display the first 10 lines of `hello.txt`

`head -2 hello.txt` → Display the first 2 lines of `hello.txt`

`tail hello.txt` → Display the last 10 lines of `hello.txt`

`tail -2 hello.txt` → Display the last 2 lines of `hello.txt`

Copy, move, and remove files

Copy (cp)

Copy file(s) to a different directory.

```
cp [option] (source file/directory) (target directory)
```

→ Copy a file or directory to a different directory.

```
cp [option] (source file) (target file)
```

→ Copy a file to the same or different directory and rename the target file.

Options

-r Copies file hierarchies under the file or directory

Activity

Copy `sample.txt` to the same directory (`Test 1`). Name the new file `example.txt`

The new directory tree should look like this.

```
-Text Files
--Test 1
---sample.txt
---example.txt
--Test 2
```

Go to the home directory and run `ls -R`.

Make Screenshot#3.

Move (mv)

Move file(s) to a different directory.

```
mv [option] (source file/directory) (target directory)
```

→ Move a file or directory to a different directory.

```
mv [option] (source file) (target file)
```

→ Move a file to the same or different directory and rename the target file.

Activity

Move `example.txt` to `Test 2`.

The new directory tree should look like this.

```
-Text Files
--Test 1
---sample.txt
--Test 2
---example.txt
```

Go to the home directory and run `ls -R`.

Make Screenshot#4.