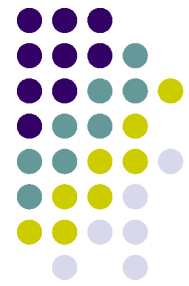


Operating Systems and Using Linux

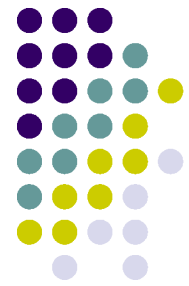


Topics

- What is an Operating System?
- Linux Overview
- Frequently Used Linux Commands

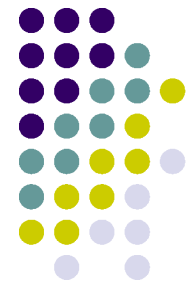


What is an Operating System?



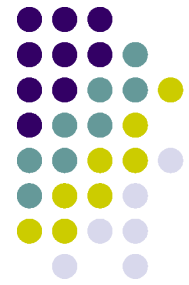
- A computer program that:
 - Controls how the CPU, memory and I/O devices work together to execute programs
 - Performs many operations, such as:
 - Allows you to communicate with the computer (tell it what to do)
 - Controls access (login) to the computer
 - Keeps track of all processes currently running
- Often referred to as simply OS

How Do I Communicate With the Computer Using the OS?



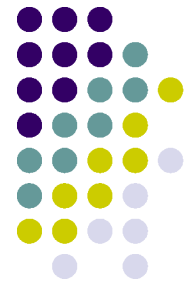
- You communicate using the particular OS's **user interface**.
 - **Graphical User Interface (GUI)** – Windows, Linux
 - **Command-driven interface** - DOS, UNIX, Linux
- We will be using the **Linux** operating system, which is very similar to UNIX. Notice that it is listed as both GUI and Command-driven.

GUI vs. Command-driven



- We will be using both the GUI version of Linux and the Command-driven Interface.
- When you connect to GL through TeraTerm, you are using only the Command-driven Interface.
- When you reboot the computer into Linux, you will use both the GUI and the Command-driven Interface.

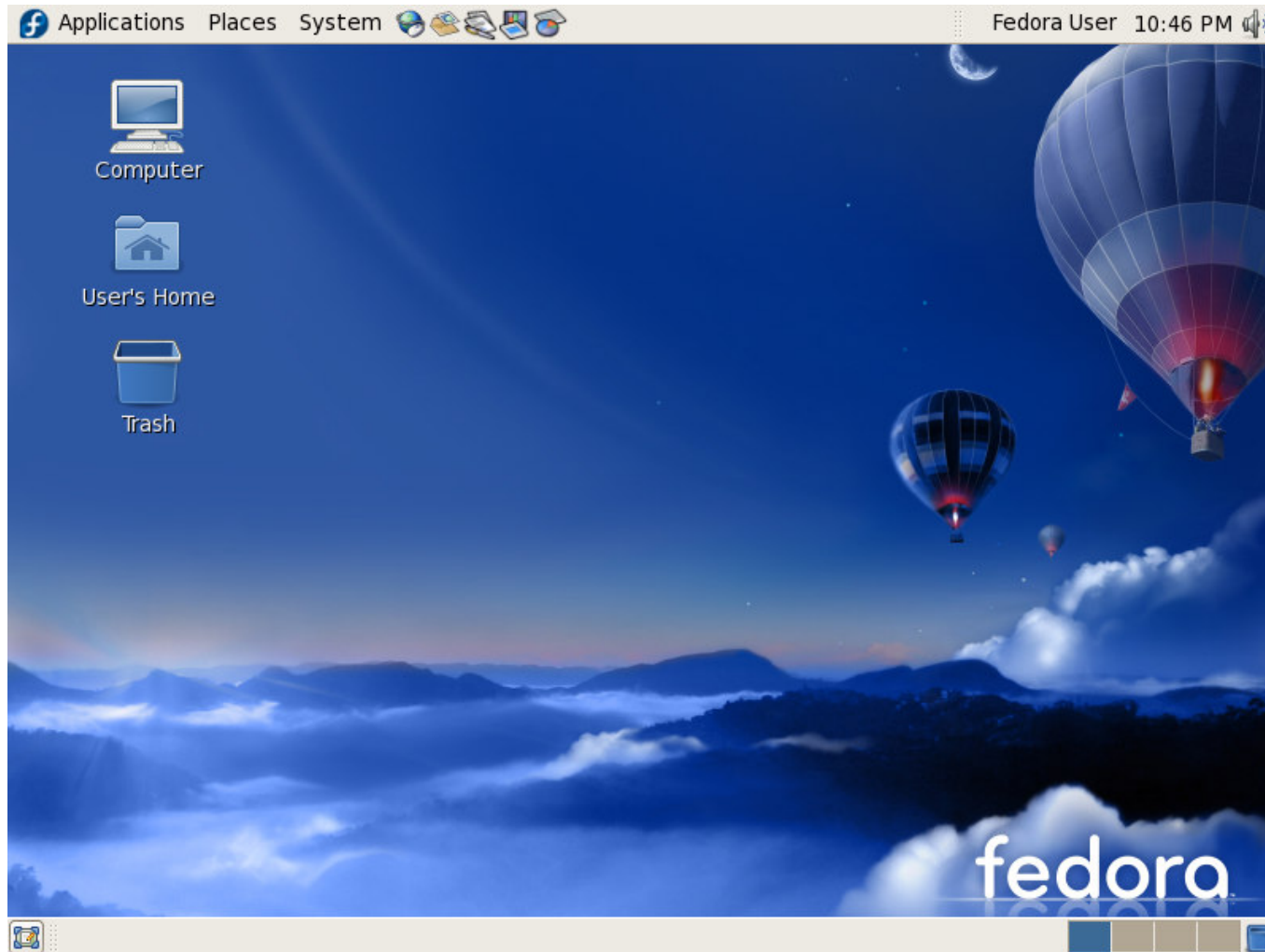
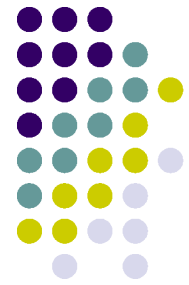
Example of Command-driven

A screenshot of a terminal window titled "dblock@linux3 - gl.umbc.edu VT". The window has a menu bar with "File", "Edit", "Setup", "Control", "Window", and "Help". The terminal content shows a prompt "linux3[5]%" followed by the command "ls" and its output "Mail bin www". A second prompt "linux3[6]%" is shown with a cursor. The window has standard window controls (minimize, maximize, close) in the top right corner and a scroll bar on the right side.

```
dblock@linux3 - gl.umbc.edu VT
File Edit Setup Control Window Help
linux3[5]# ls
Mail bin www
linux3[6]#
```

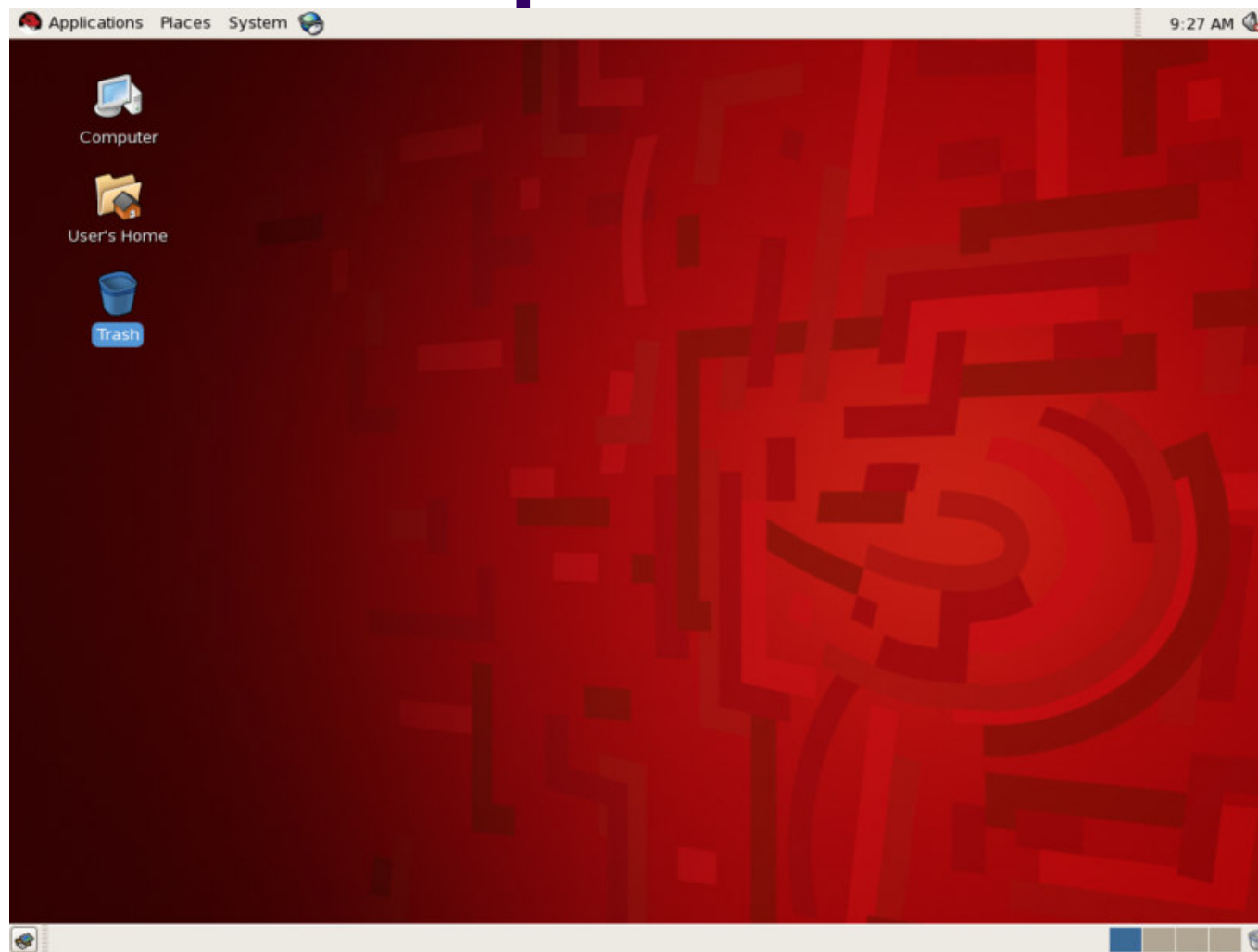
Screenshot of connection to linux3.gl.umbc.edu

Example of GUI



Screenshot of Fedora 7

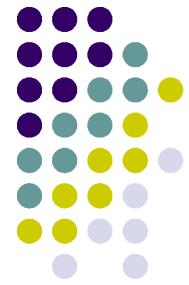
Another Example of GUI



Screenshot of Red Hat Enterprise Linux (RHEL) 5



How Do I Communicate With the Computer Using the OS? (con't)



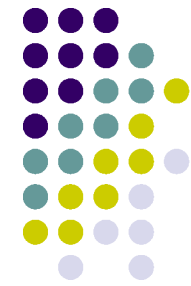
- When you **log in** to the Linux system here, a **user prompt** will be displayed:

```
linux#[1]% _
```

where # is the number of the Linux server to which you have connected. You may use any of the Linux servers: linux1, linux2 or linux3.

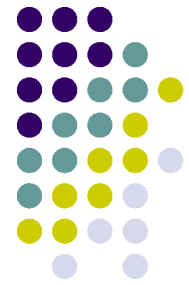
- The number in the brackets will change as you work. It is the “number” of the command that you are about to type.
- If this prompt is not on the screen at any time, you are not communicating with the OS.

Linux Overview



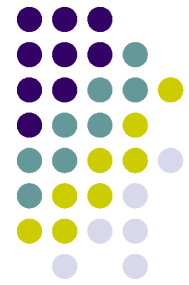
- Files and Filenames
- Directories and Subdirectories
- Frequently Used Commands

Files



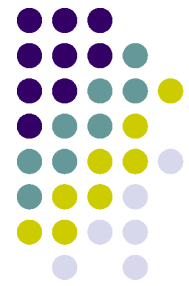
- A file is a sequence of bytes.
- It can be created by
 - a text editor (XEmacs or Notepad)
 - a computer program (such as a C program)
- It may contain a program, data, a document, or other information .
- Files that contain other files are called directories (sometimes called folders).

Linux Filenames



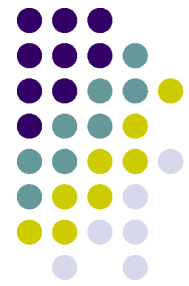
- Restrictions
 - Typically do not have spaces or other reserved characters
 - Have a maximum length (typically 255 characters but who wants to type that much!)
 - Are case sensitive
- For this class, you should stick with filenames that contain only letters (uppercase or lowercase), numbers, and the underscore (`_`) or hyphen (`-`). No spaces!
- Some examples: `firefox.exe`, `things2do.txt`, `dinner_menu.pdf`

Directories

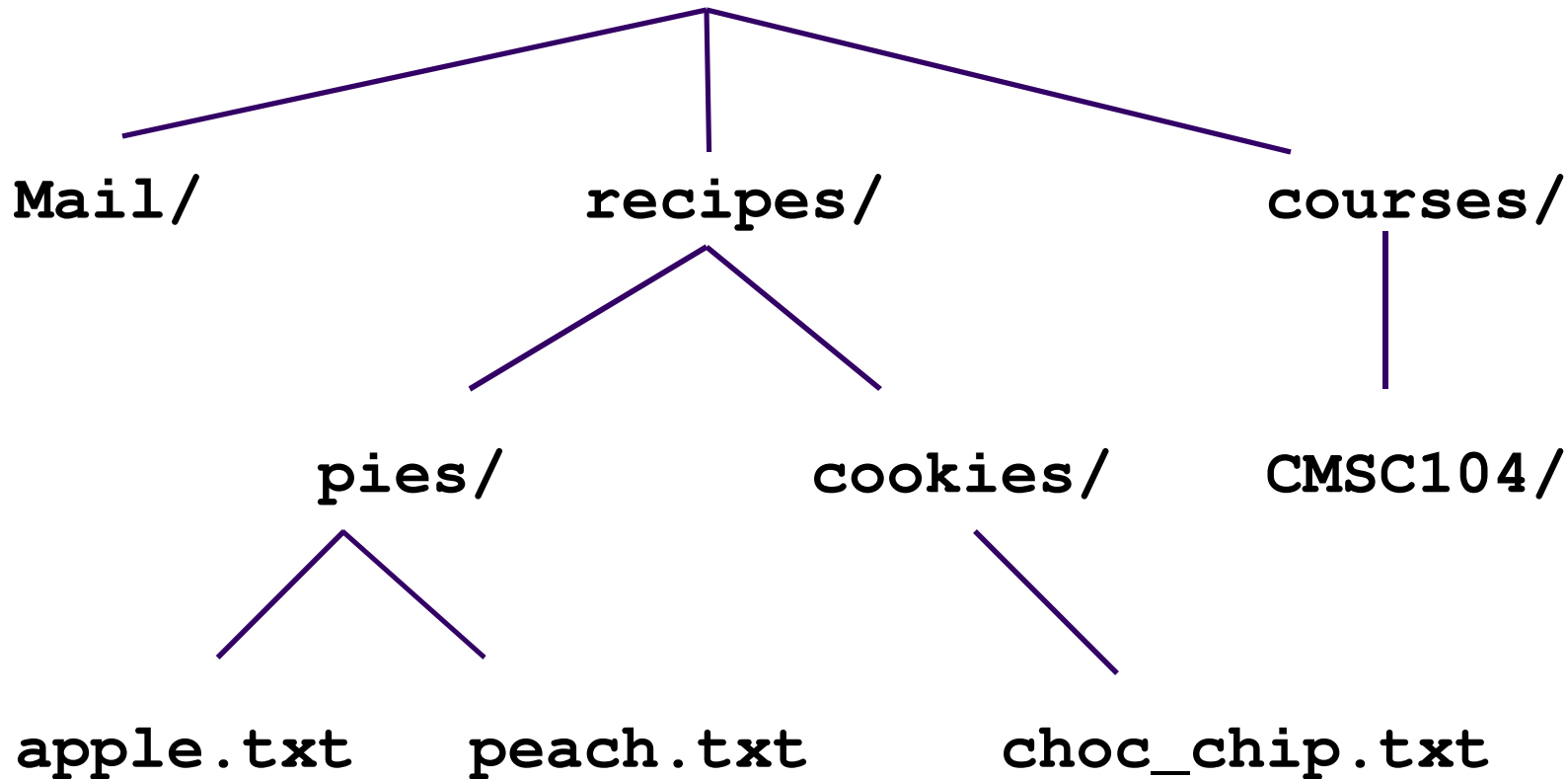


- Directories contain files or other directories called **subdirectories**. They may also be empty.
- Directories are organized in a hierarchical fashion.
- They help us to keep our files organized.

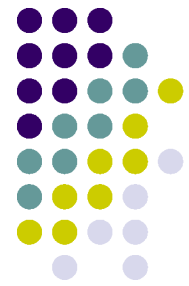
Example Directory Tree



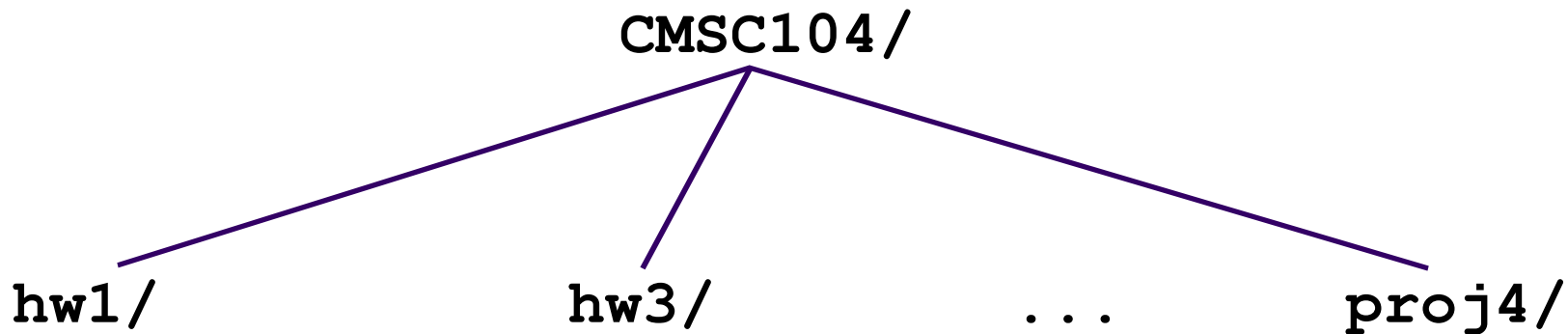
`/afs/umbc.edu/users/j/d/jdoe28/home/`



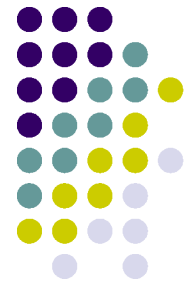
Subdirectories



- Are used for organizing your files
- For example,
 - make a subdirectory for CMSC104
 - make subdirectories for each project

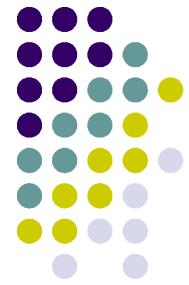


More Directories

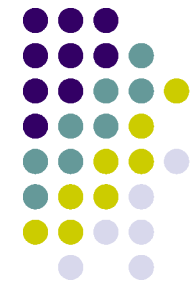


- Your **home directory** is where you are located when you log in
(e.g., /afs/umbc.edu/users/j/d/jdoe28/home/).
- The **current directory** is where you are located at any time while you are using the system.
- The / (pronounced “slash”) is the root directory in Linux.
- Files within the same directory must be given unique names.
- **Paths** allow us to give the same name to different files located in different directories.
- Each running program has a current directory and all filenames are implicitly assumed to start with the name of that directory unless they begin with a slash.

Moving in the Directory Tree



- `.` (**dot**) is the current directory.
- `..` (**dot-dot**) is the parent directory.
- Use the Linux command **cd** to change directories.
- Use dot-dot to move up the tree.
 - `cd ..`
- Use the directory name to move down.
 - `cd recipes`
- Use the complete directory name (path name) to move anywhere.
 - `cd /afs/umbc.edu/users/j/d/jdoe28/home/recipes/`



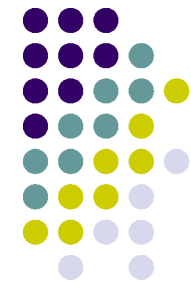
Absolute Path

- The absolute path is a path that contains the root directory and all other subdirectories you need to access the file
- It points to the same location in the directory tree regardless of the current working directory
- An example of an absolute path

```
/afs/umbc.edu/users/j/d/jdoe28/home/recipes/
```

Starts with

/

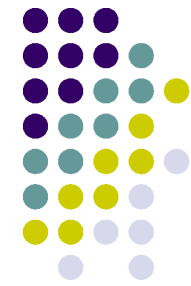


Relative Path

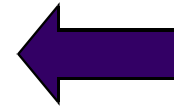
- The relative path is a partial path to a file in relation to the current working directory
- If inside of the home directory in the previous directory example, a relative path would be



Frequently Used Linux Commands

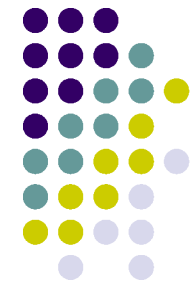


- `passwd`, `man`, `lpr`
- `pwd`, `ls`, `cat`, `more`, `cd`,
- `cp`, `mv`, `rm`, `mkdir`, `rmdir`
- `ctrl-c`



Time to
take
notes!

- References:
 - Linux man page
 - Links from the 104 homepage
 - Books and the Internet



Wildcard Characters

- You will find wildcard characters useful when manipulating files (e.g., listing or moving them).
- The wildcard characters are `*` and `?`
- `?` is used to represent any single character.
 - For example, `ls hw?.txt` would match the files `hw1.txt` and `hw2.txt` but not `hw123.txt`
- `*` is used to represent 0 or more characters.
 - For example, `ls hw*.txt` would match the files `hw1.txt` and `hw2.txt`, as well as `hw.txt`, `hw123.txt` and `hw_assignment.txt`