UNIX SYSTEMS PROGRAMMING

By

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Previous Class

- Operating System
- Evolution of UNIX
- UNIX System Structure
- Layers of UNIX System
- Kernel Position

Today's Agenda

- Getting start with Linux / UNIX
- Files and Directories in UNIX
- Basic Uinx commands
  - passwd
  - date
  - who, whoami
  - mail, write
  - man
  - pwd
  - ls

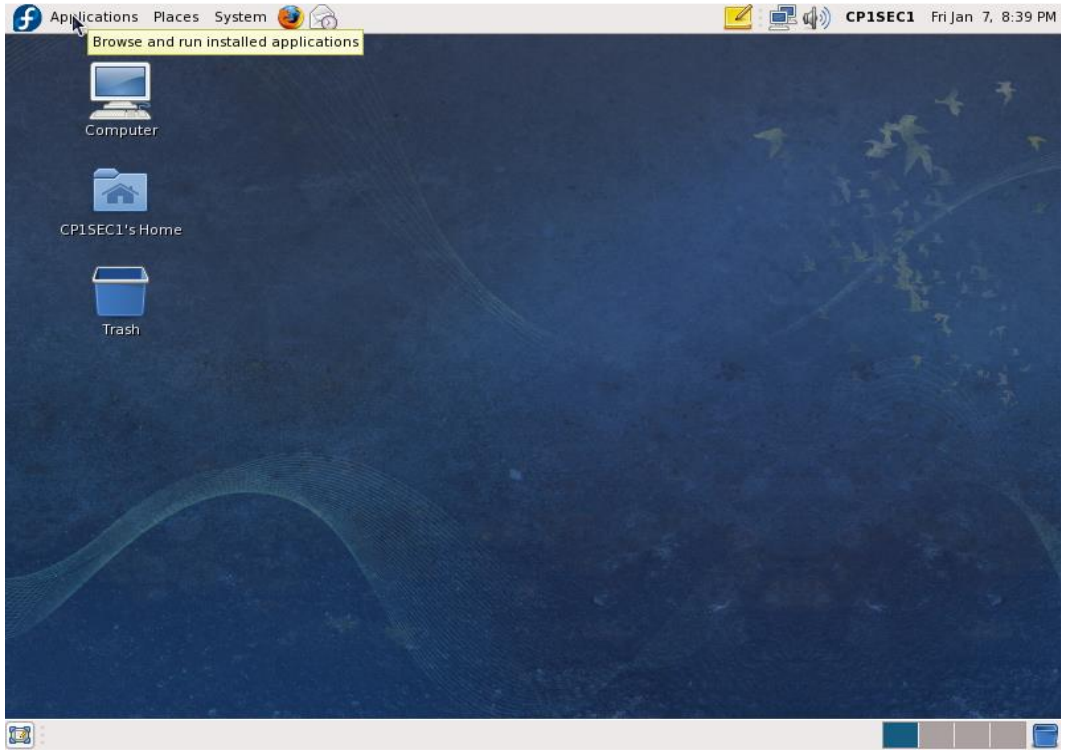
Getting Start with Linux /UNIX

- Linux / UNIX is a
  - Multi-programming,
  - Time shared / Multi-tasking and
  - Multi-user operating system
- Some of the widely used Linux distributions
  - Red Hat Linux www.redhat.com
  - **Fedora** http://fedoraproject.org
  - **We use ubuntu for the explanations**
  - Ubuntu www.ubuntu.com
  - CentOS www.centos.org
  - etc …..

Getting Start with Linux /UNIX

- Logging in Linux system
  - You must have a valid login name and password
  - Login and password are case sensitive
  - We use Ubuntu in this course for demonstration

Getting Start with Linux /UNIX

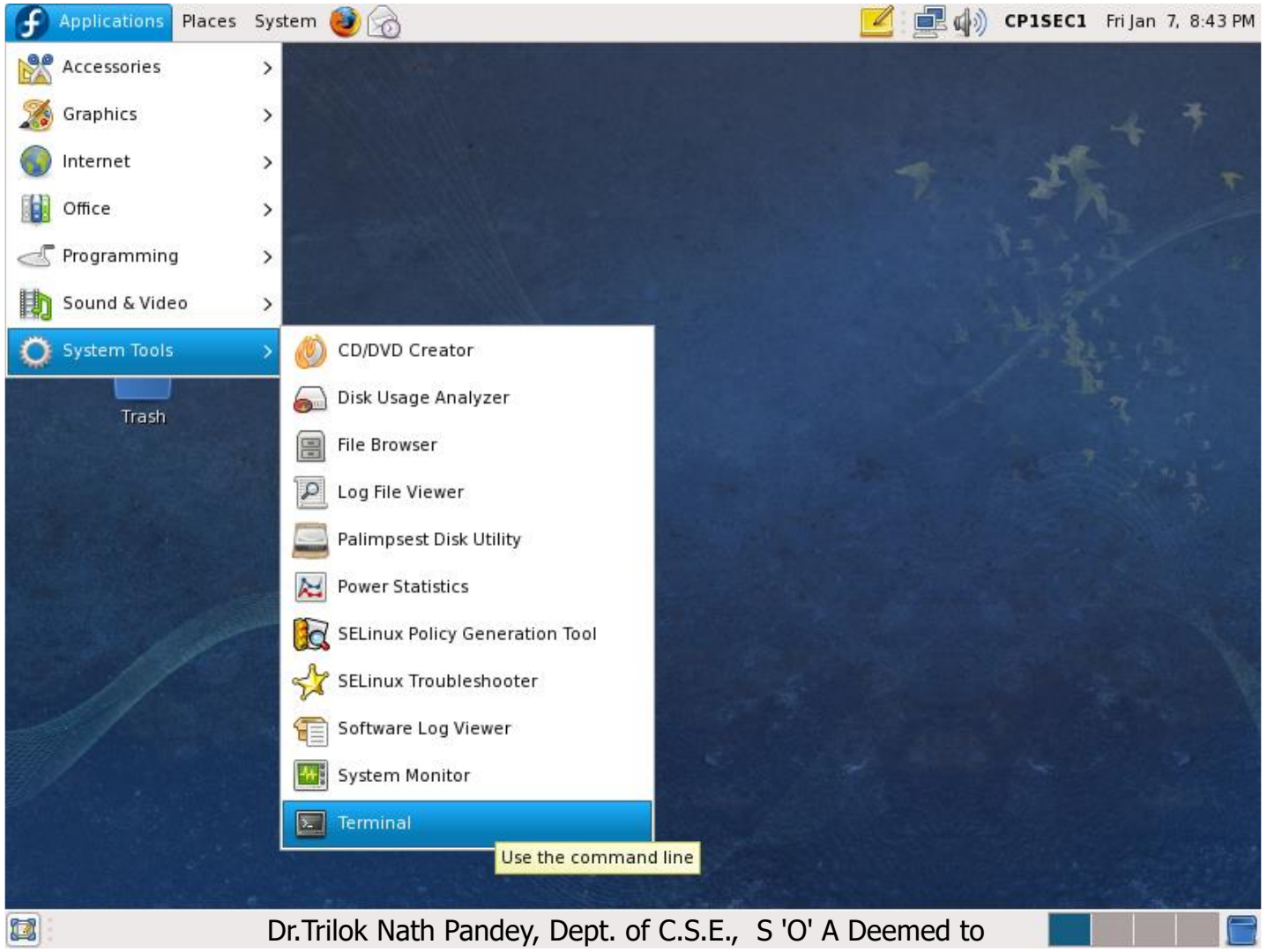


After logging in you will get a Desktop screen similar to this

Opening a terminal window

- Step 1:
  - Click on the "***Applications***" tab in the top panel (top left corner of the desktop). The "***Applications***" will provide a dropdown list
- Step 2:
  - Select (Click on) "***System Tools***" option in the dropdown list. This will provide a dropdown list
- Step 3:
  - Select (Click on) "***Terminal***" option in the dropdown list. This will open a new window

Opening a terminal window



Opening a terminal window

- Once you open a terminal window, you will ***most likely be*** in the directory named by your user-name

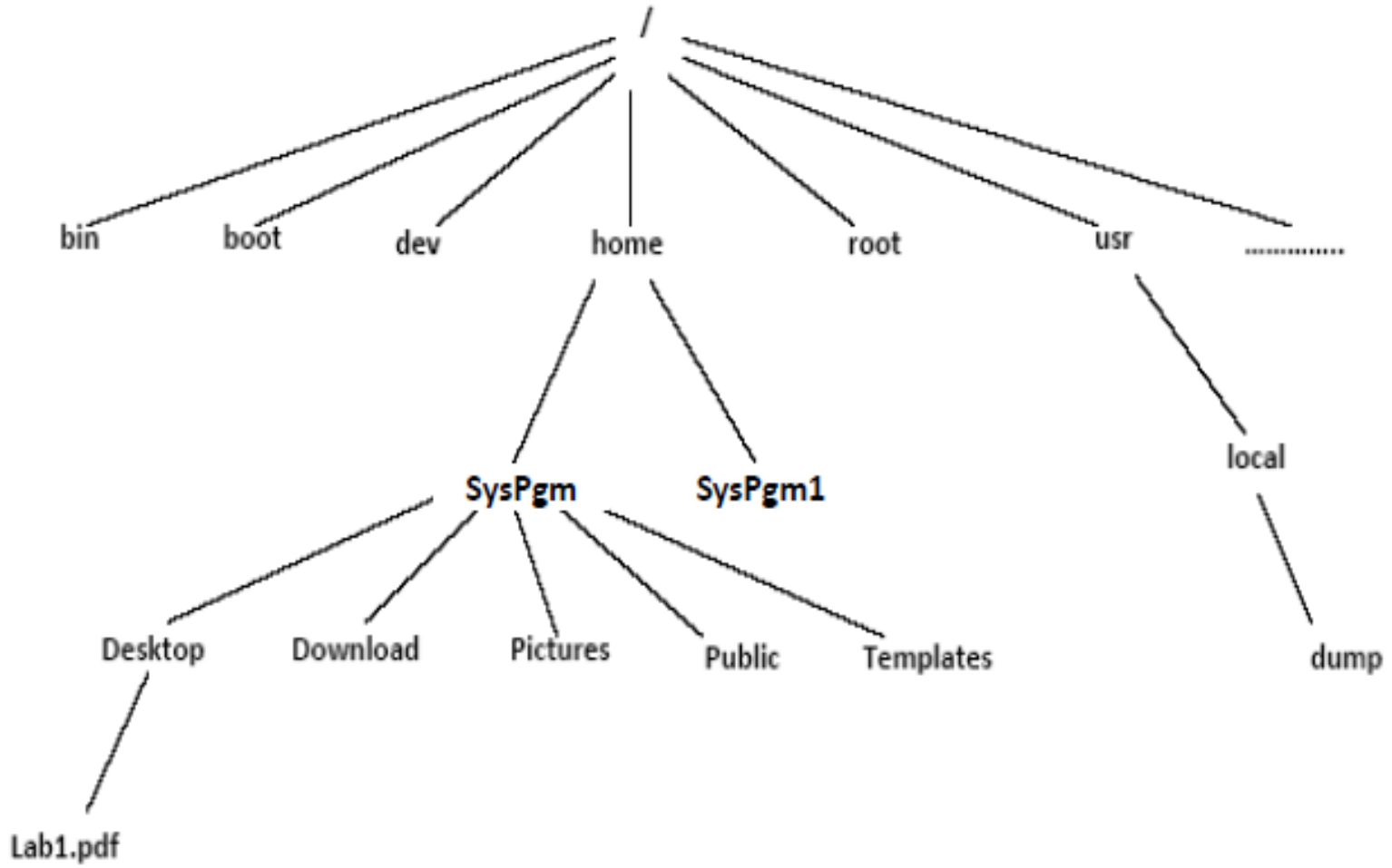
UNIX files

- Everything in UNIX is either a file or a process
  - A file is a collection of data. They are created by users using text editors, running compilers etc.
  - Examples of files:
  - A document (report, essay etc.)
  - The text of a program written in some high-level programming language (C, Pascal, Java, etc…)
  - Machine codes (executable or binary file)
  - etc …..

UNIX files & directories

- All the files are grouped together in the directory structure.
- The file-system is arranged in a hierarchical structure, like an inverted tree.
- The top of the hierarchy is traditionally called **root** (**written as a slash /**)

Example of Linux File System



Basic Linux commands

- Changing password of your account
  - Type “passwd” at the prompt
  - [SysPgm@localhost ~] $ **passwd** ↲
  - Changing password for user SysPgm.
  - Changing password for SysPgm.
  - (Current) UNIX password: <Enter your current password here>
  - New UNIX password: <Enter your new password here>
  - Retype new UNIX password: <Enter your new password again here>

Basic Linux commands

- date
  - Displays the system date
  - [SysPgm@localhost ~] $ **date** ↲
  - **Sun May 6 11:12:38 IST 2012**

Basic Linux commands

- who
  - Tells you everyone who is currently logged on
  - [SysPgm@localhost ~] $ **who** ↲

SysPgm pts/1 2012-05-24 15:09 (172.24.5.48)

SysPgm1 pts/2 2012-05-24 15:08 (172.24.5.48)

tty -> teletype -> terminal, pts ->pseudo terminal slave

Basic Linux commands

- Whoami
  - Tells you who is currently logged on
  - [SysPgm@localhost ~] $ **whoami**↲
  - SysPgm pts/1 2012-05-24 15:09 (172.24.5.48)

Basic Linux commands

- mail
  - System provides a postal system to communicate with other users
  - Some day when you log in, you will see the message
  - “**You have mail**”
  - Before the first attempt, to read your mail, type
  - [SysPgm@localhost ~] $ **mail** ↲
  - Mail will be printed, one [most recent one first] at a time

Basic Linux commands

- mail
  - Sending mail
  - [SysPgm@localhost ~] $ **mail SysPgm1** ↲

    <type your text here>
  - <ctrl – d> [end of the mail]

Basic Linux commands

- write
  - Send a message to another user
  - [SysPgm@localhost ~] $ **write SysPgm1** ↲
  - This establishes a 2 – way communication path
  - Now whatever SysPgm types will appear on
  - SysPgm1 terminal and vice versa
  - ctrl – d

Basic Linux commands

- man
  - UNIX programmer's Manual
  - Use man to find all options of a command
  - [SysPgm@localhost ~] $ **man** ↲
  - Section 1: deals with commands
  - Section 2: deals with system calls
  - Section 6: information about games
  - Remaining sections: talk about functions for use by C programmers, file formats and system maintenance

  - [SysPgm@localhost ~] $ **man 1 who** ↲

Basic Linux commands

- Print Working Directory (pwd command)
  - [SysPgm@localhost ~] $ **pwd** ↲

    /home/SysPgm/
  - Match this path with the directory structure shown above
  - Path name of home directory
- Home directory
  - When you open a terminal window, your current working directory is your home directory.
  - Your home directory has the same name as your username

Basic Linux commands

- List the contents of the current directory
  - [SysPgm@localhost ~] $ **ls** ↲
  - Displays the files and directories of the current working directory
  - Prompt displays back
- List the contents [including hidden contents] of the current directoy
  - [SysPgm@localhost ~] $ **ls -a**↲
  - Observe the result
  - All the additional files listed as result starts with a DOT (.)
  - These files are hidden files
  - Also observe the first two results. A Single dot (.) and a double consecutive dots (..)

Basic Linux commands

- (**.**) means the current directory and
- (**..**) means the parent of the current directory.
- Try typing the command,
  - [SysPgm@localhost ~] $ **ls .** ↵
  - [SysPgm@localhost ~] $ **ls . .** ↵
  - *What is your observation from the result of the above two commands?*
- The ls . gives the same result as ls (displays all the files and directories in the current directory)
- The ls .. displays the directories and files in the parent directory

Basic Linux commands

- Important options for ls
  - -i print the index number of each file
  - -l use a long listing format
  - -r reverse order while sorting
  - -R list subdirectories recursively
  - -s print size of each file [in blocks]
  - -S sort by file size
  - -t sort by modified time

Basic Linux commands

- Important options for ls
  - -u with -lt: sort by, and show, access time with -l: show access time and sort by name otherwise: sort by access time
  - -x list entries by lines instead of by columns
  - -X sort alphabetically by entry extension
  - -1 list one file per line
  - -U do not sort; list entries in directory order. In combination with one_per_line format “-1”, it will show files immediately and it has no memory limitations.

THANK YOU