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Title : Introduction to UNIX

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Goal

After the conclusion of this section you should be able to

- log onto the Unix system

- understand the concept of current working directory

- traverse and manipulate the UNIX file system

- describe the role of the shell within the UNIX environment

- use simple commands to manipulate files (cd, ls, cp, rm, cat)

- use standard I/O, piping, and redirection from the UNIX shell

What is UNIX?

What is UNIX?

What is UNIX?

- A Computer Operating System
- A Software Development Environment
  - management of hardware resources
  - directory and file system
  - loading / execution / suspension of programs
- Originally written in assembler, later rewritten in C(allowing greater portability)

What is an operating System?

- Interacts with:
  - Applications
  - Users, through a command language interpreter

- OS offers Services:
  - Scheduling of multiple programs
  - Memory management
  - Access to hardware
  - Reports errors to applications

How it is build (Philosophy behind)?

- Make each program do one thing well
  - Reusable software tools: 1 tool = 1 function
- Expect the output of every program to become the input of another, yet unknown, program to combine simple tools to perform complex tasks
- Every thing seen as a file

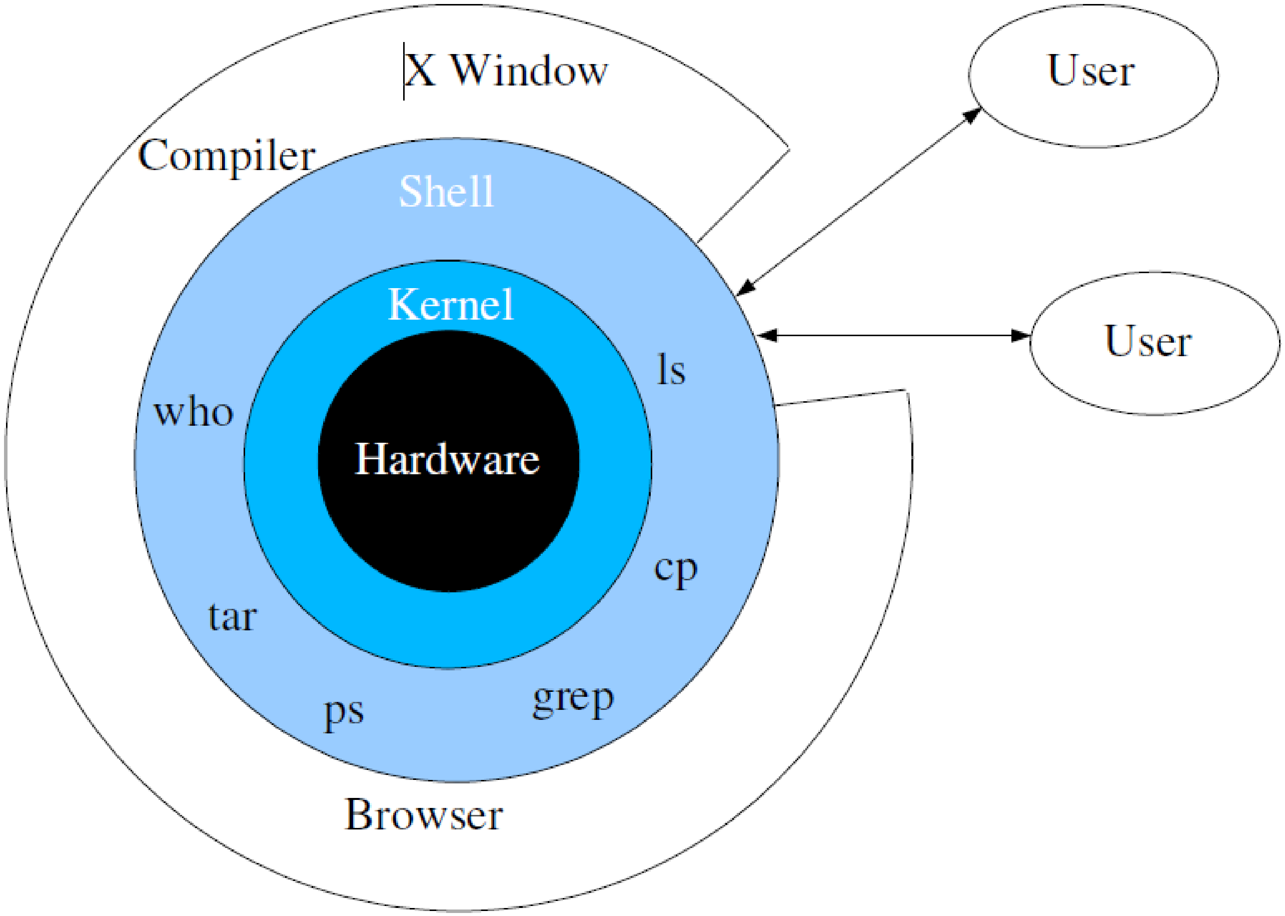
Why Use Unix?

Why UNIX?

Why Use Unix?

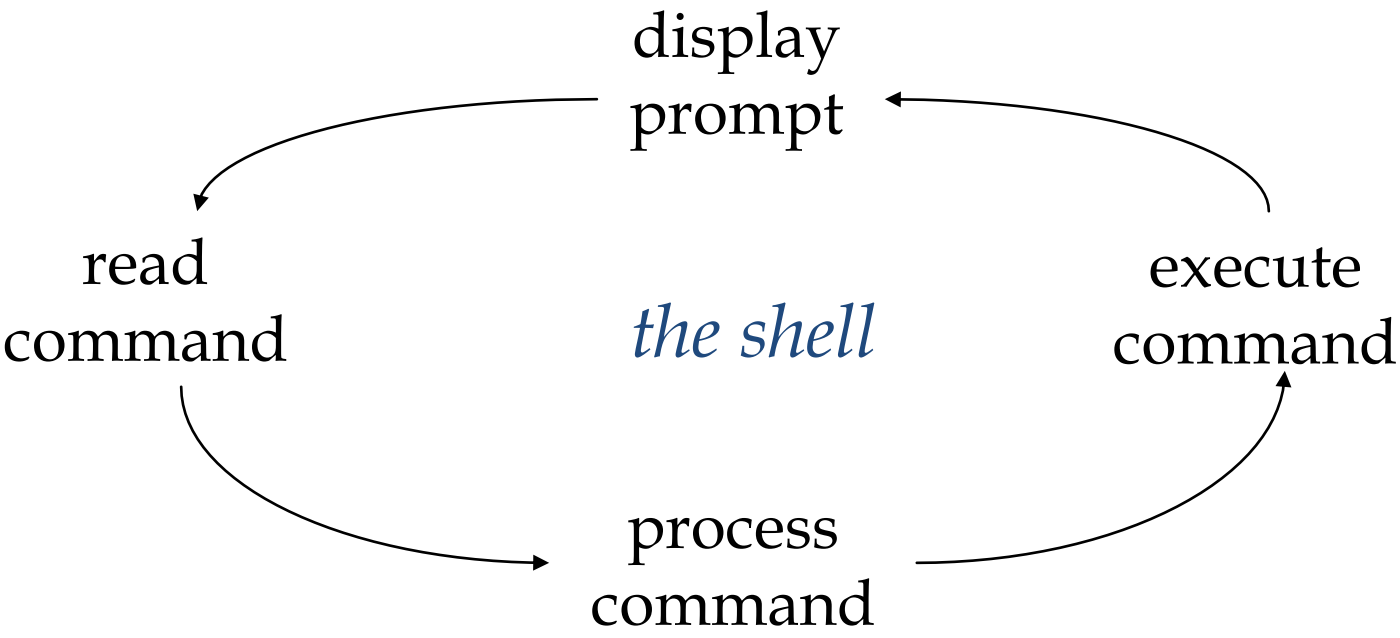
- Multi tasking/Multi-user
- Extensive set of utilities
- Built-in Networking
  - Portable (PCs, Mainframes, super-computers)
  - Graphical (with command line)

UNIX: Closer View



The Shell

- The UNIX user interface is called the *shell*.
- The shell does 4 jobs repeatedly:



display prompt

read command

the shell

execute command

process command

Session Startup

- Once you log in, your shell will be started and it will display a prompt.
- By default current working directory is home directory
- When the shell is started it looks in your home directory for some customization files.

You can change the shell prompt, your PATH, and a bunch of other things by creating customization files.

Interacting with the Shell

- The shell prints a prompt and waits for you to type in a command.
- The shell can deal with a couple of types of commands:
  - shell internals - commands that the shell handles directly.
  - External programs - the shell runs a program for you.

Basic Commands

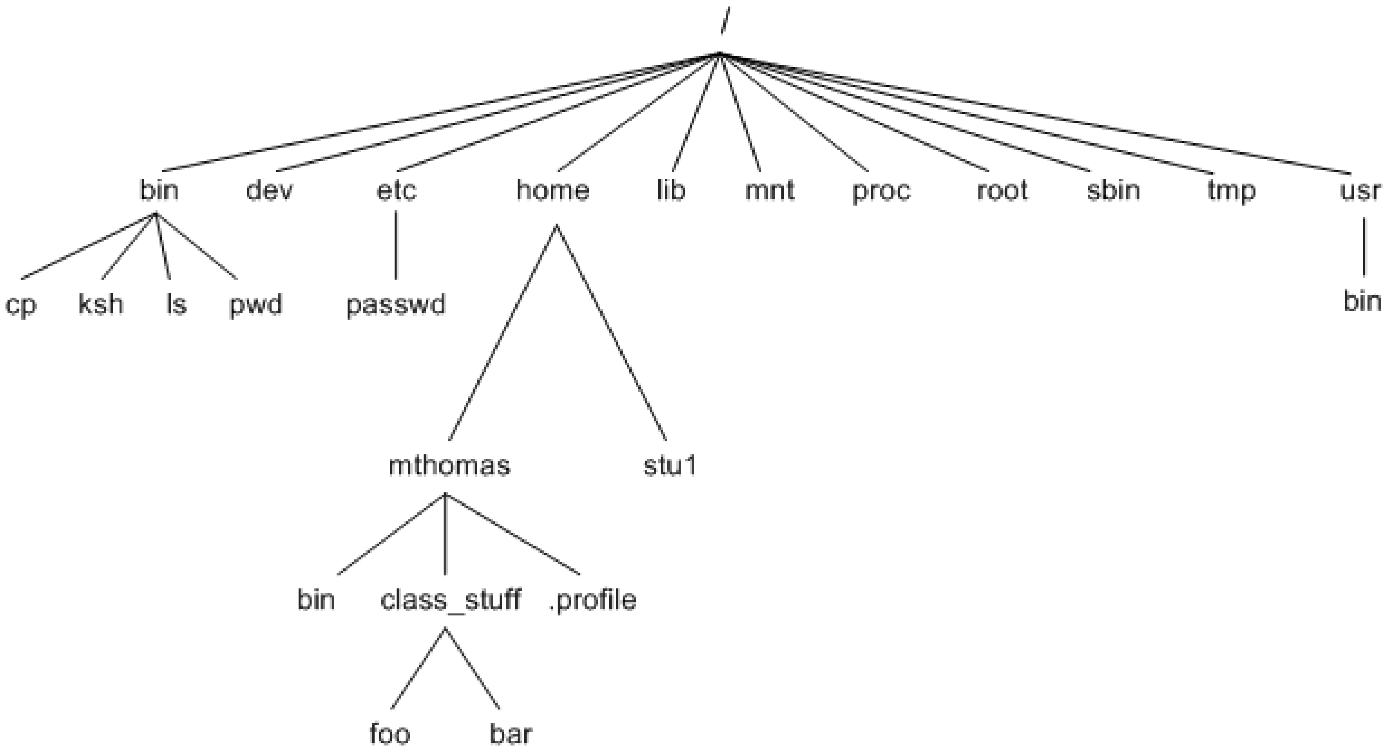
- Shell internal Commands
  - date
  - echo
  - clear
  - man
  - ps
  - top

- External commands
  - Commands created by a user (show example)

File System

- Organized as a tree
  - Each node is a directory
  - Each directory can contain other files or directories or both
  - Root: "/“
- Each file in a given directory must be unique
- UNIX is cAsE sEnSiTiVe

File System


/
bin
dev
etc
home
lib
mnt
proc
root
sbin
tmp
usr
cp
ksh
ls
pwd
passwd
bin
mthomas
stu1
bin
class_stuff
.profile
foo
bar

File System

- Files are referenced by name
  - absolute reference: beginning with "/“
  - relative reference: based on current directory
- Notation
- "..": parent directory
- ".": current directory
- "~": home directory

Commands

- ls (-l a t r R)
- pwd
- df
- cd
- cp
- mv
- rm

File attributes

- Every file has some attributes:
  - Access Times:
    - when the file was created
    - when the file was last changed
    - when the file was last read
- Size
- Owners (user and group)
- Permissions

File System Security

- Each file has three sets of permission bits
  - User
  - Group
  - Other
- Each set has three bits that represent:
  - Read
  - Write
  - execute

Other filesystem and file commands

- **mkdir** make directory
- **rmdir** Remove directory
- **touch** change file timestamp
- **cat** concatenate files and print out to terminal

Thank You!