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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

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Introduction to UNIX

Review

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Popular Shells

- **sh** Bourne Shell
- **ksh** Korn Shell
- **csh** C Shell
- **bash** Bourne-Again Shell

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Shell Variables

- The shell keeps track of a set of parameter names and values.
- Some of these parameters determine the behavior of the shell.
- We can access these variables:
  - set new values for some to customize the shell.
  - find out the value of some to help accomplish a task.

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Example Shell Variables

- **PWD** current working directory
- **PATH** list of the places to look for commands
- **HOME** home directory of user
- **HISTFILE** where your command history is saved

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Setting Shell Variables

- You can change the value of a shell variable with the set command (this is a shell builtin command):

```
export HOME=/etc
export PATH=/usr/bin:/usr/etc:/sbin
export NEWVAR = “blah blah”
```

- **Set** to print out all the shell variables

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Startup files

- **Sh, ksh:**
  - **/etc/profile (system defaults)**
  - **~/.profile**
- **bash**
  - **~/.bash_profile**
  - **~/.bashrc**
  - **~/.bash_logout**
- **csh**
  - **~/.cshrc**
  - **~/.login**
  - **~/.logout**

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The File

- Ordinary Files
- Directory Files
- Device Files

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Pathnames

- Absolute pathnames
- Relative pathnames

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File System Security

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

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File System Security

- If a file's permission is "execute", is means it can be ran as a other utility or command.

- Directories need to be
  - readable to see the files they contain
  - Executable to change directory to them
  - Writable to create, edit or remove files from them

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Other filesystem and file commands

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

- Cat> file name to create a file

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Viewing file

- **cat** existing file
- **head** a file
- **tail** a file
- **more** a file
- **less** a file
- **grep** find a pattern
- **locate** locate a file in the system
- **find** find a file in the system

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The special character *

- * matches anything.
- If you give the shell * by itself (as a command line argument) the shell will remove the * and replace it with all the filenames in the current directory
- **“a*b”** matches all files in the current directory that start with **a** and end with **b**

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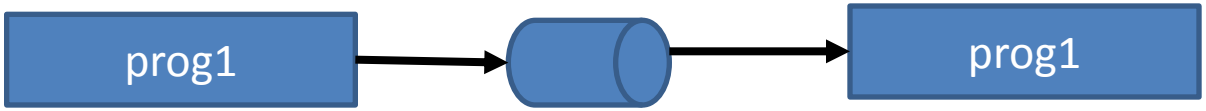
Pipes

- A pipe is a holder for a stream of data.
- A pipe can be used to hold the output of one program and feed it to the input of another.



- who | wc –l
- Who | wc –l > numusers

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Running a Program

- You type in the name of a program and some command line options:
  - The shell reads this line, finds the program and runs it, feeding it the options you specified.
  - The shell establishes 3 I/O channels:
    - Standard Input
    - Standard Output
    - Standard Error

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Input Redirection

- The shell can attach things other than your keyboard to standard input.
  - A file (the contents of the file are fed to a program as if you typed it).
  - A pipe (the output of another program is fed as input as if you typed it).

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Output Redirection

- The shell can attach things other than your screen to standard output (or stderr).
  - A file (the output of a program is stored in file).
  - A pipe (the output of a program is fed as input to another program).

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Job Control

- The shell allows you to manage jobs
  - Places jobs in the background
  - Move a job to foreground
  - Suspend a job
  - Kill a job

  - **jobs**
  - **fg [1]**

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Programming

- Text editors
  - emacs, vi, gedit
  - Can also use any PC editor if you can get at the files from your PC.

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