

UNIX Introduction

- UNIX is an Operating System (OS)
- Many flavors of UNIX exist
 - Linux
 - MacOS X
 - Sun Solaris
 - OpenBSD
- We will be using a server called zeus
 - zeus runs SUSE 11.3 64-bit OS

UNIX OS

- UNIX OS is made up of:
 - the kernel
 - the shell
 - the programs

The kernel

- kernel – the central component of an OS that is a bridge between applications and the data processing at the hardware level
- kernel is responsible for managing system resources through system calls
 - memory allocated to a program
 - program execution time
 - filestore and communications between hardware and software

The shell

- The shell is an interface between the user and kernel
- shell commands are interpreted by the command line interpreter
- Many different shells exist such as bash, tcsh,...
- We will be using the bash shell
- Your environment is customizable by editing `.bashrc`

Processes and Files

- Everything in UNIX is a process or file
- process – executing program
- file – collection of data

- directory is a hierarchical structure that groups files

File System

- The file system is arranged in a hierarchical structure where the top of the hierarchy is called the root
- The root is usually signified by a /
- Login to a Linux machine using your name and password
- Let's start a terminal session and explore the file system using some basic commands

File and Directory Commands

Command	Meaning
<code>pwd</code>	display present working directory
<code>ls</code>	list contents of present directory less special files beginning with a .
<code>ls -al</code>	show an extended list of all files and directories
<code>cd ..</code>	change to parent directory
<code>cd</code>	change to home directory
<code>cd ~</code>	change to home directory
<code>mkdir backup</code>	make a directory called backup
<code>rmdir backup</code>	removes an empty directory
<code>passwd</code>	change your current password

Problems

- 1) Change your password
- 2) Create a directory called CS300 (Linux is case-sensitive)
- 3) Other than your directory, name two other directories at the same level as yours

Change to the root of the file system by `cd /`

- 4) What do you think is the meaning of `ls ~/..`

Write your answer down before testing

Specific File Commands

Command	Meaning
cp file1 file2	makes a copy of file1 and names the copied file file2
mv file1 file2	moves (or renames) file1 to file2
rm file1	removes (or deletes) file1
rmdir directory	removes (or deletes) an empty directory
clear	clears the display screen
cat file1	displays the contents of a file to the screen
less file1	displays the contents of file1 to the screen one screen at a time spacebar – advances another page q - quits

Problems

In the directory `/home/CS300Public/2010` is a file called `message`.

- 1) Copy this file to the directory `CS300` in your home directory.
- 2) List the contents of this file
- 3) Make a backup of this file and call the backup `message.bk`
- 4) Remove `message.bk`

File System Security

- In the directory that contains the file message, type the command `ls -al`

```
total 12
drwxr-xr-x 2 ryand users 4096 2010-08-29 19:56 .
drwxr-xr-x 4 ryand users 4096 2010-08-29 19:56 ..
-rw-r--r-- 1 ryand users  13 2010-08-29 19:56 message
ryand@zeus: /home/CS300Public/2010>
```

Permissions

```
-rw-r--r-- 1 ryand users 13 2010-08-29 19:56 message
```

- The first – is either – for file or d for directory
 - rw- is the user's permissions
 - -r- is the group's permissions
 - r-- is the other's permissions
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- Note : Every file or directory has read, write, and execute permissions

chmod

- chmod is used to change the permissions of a file or directory

Symbol	Meaning
u	user
g	group
o	other
a	all
r	read
w	write
x	execute
+	add permission
-	subtract permission

Problems

- 1) What is the meaning of `chmod g+rx` file ?
- 2) Set the permissions for message to `-rwxr-xr-x`
- 3) What are the permissions of your home directory?
- 4) What are the permissions of the file `/etc/passwd` ?
- 5) Who owns the file?
- 6) Are you a member of the group that owns the file? Why or why not?