



# Unix Basics

# Unix Accounts

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- ◆ One must have an “account” to use a Unix computer.
  - To share resources, need to tell users apart.
- ◆ Username (public) and password (private).
- ◆ You can only access the resources that are specified by your account information.
  - Accounts track, control, and limit user activity.
- ◆ There is at least one super user account in a system usually named “root”, who has absolute power over the system. (On Microsoft Windows, this account is usually named “administrator”.)

# Unix Accounts

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- ◆ Your account on GAUL: gaul is a subdomain in computer science network for undergraduates.
- ◆ access off-campus through [compute.gaul.csd.uwo.ca](http://compute.gaul.csd.uwo.ca). OS is Linux (Fedora).
- ◆ In MC 244: linux01.gaul.csd.uwo.ca through linux30.gaul.csd.uwo.ca. OS is Linux (Fedora).
- ◆ On campus,  
[ssh linux01.gaul.csd.uwo.ca](http://ssh linux01.gaul.csd.uwo.ca)
- ◆ From home or outside campus,  
[ssh compute.gaul.csd.uwo.ca](http://ssh compute.gaul.csd.uwo.ca) first
- ◆ For windows user, you may need PuTTY.

# Login to Your Account from Home

- ◆ Most Unix computers support remote login.
  - Unless it is deliberately turned off.
  - **ssh** (or **telnet**, not supported on gaul) protocol.
- ◆ You need
  - Internet access
  - A **ssh** client program.
    - ❖ **ssh, slogin** (unix, linux, windows 10)
    - ❖ **PuTTY** (windows, better than command prompt window and maybe better than windows PowerShell)

# Login to Your Account from Home

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- ◆ For Unix (including MacOS) and Linux
  - Open a terminal
  - Use `ssh` in the terminal
- ◆ For Windows 10
  - Open a windows PowerShell
  - Use `ssh` in the windows PowerShell
- ◆ For Windows without ssh client
  - Open PuTTY
  - Use `ssh` in PuTTY

# Login to Your Account

```
kaizhong — kzhang@compute:~ — ssh kzhang@compute.gaul.csd.uwo.ca — 80x23  
iMac: ~ [532] > ssh kzhang@compute.gaul.csd.uwo.ca  
kzhang@compute.gaul.csd.uwo.ca's password: ?
```

Waiting for password

Use your uwo email username

```
kaizhong — kzhang@compute:~ — ssh kzhang@compute.gaul.csd.uwo.ca — 80x23  
iMac: ~ [537] > ssh kzhang@compute.gaul.csd.uwo.ca  
kzhang@compute.gaul.csd.uwo.ca's password:  
Last login: Wed Jul 15 22:54:05 2020 from 64.231.146.220  
compute.gaul: ~ [51] %
```

Password is not displayed

Prompt

Cursor

# After Login

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Do **NOT** do the following on Gaul.

- ◆ Do **not** delete any file that is not created by yourself.
- ◆ You can **not** change your password from Gaul.
  - Do not use **passwd** to change your Gaul password.
  - Choose a good password from uwo identity manager.
- ◆ Do not send email with unix utilities on Gaul.
  - E-mail is **not** currently configured on Gaul.

# To Make a Good Password

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- ◆ A bad password not only harms you
  - Attacks are much easier with a compromised account on a computer
- ◆ A good password
  - Easily remembered by YOU
  - Difficult to be guessed by others
- ◆ Tricks to make a good password
  - Pick letters from a sentence
    - ❖ I love Unix loenx
  - Pick letters, numbers, and symbols that sound, look like, or replace a phrase
    - ❖ I hate carrots! → ih8^s!



# E-mail

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- ◆ `mail`, `pine`, and `mutt` are Unix utilities to read and send e-mail:

`compute > mail`

- ◆ E-mail is **NOT** currently configured on Gaul.
- ◆ Use your uwo email account.

# Log out

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- ◆ When you're done, don't forget to logout!!!!!!

compute > exit

compute > logout

# Some Basic Commands: **who**

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- ◆ **who**: Who are using the system.

```
compute > who
```

```
kzhang pts/1 Sep 7 14:08
```

```
li96 pts/2 Sep 7 14:29
```

- ◆ **who am i**: Who am i.

```
compute > who am i
```

```
kzhang pts/1 Sep 7 14:08
```

# Some Basic Commands: `pwd`

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- ◆ When you login to your account, you login into your `home directory`.
- ◆ The files of your account form an upside-down tree with your `home directory` as the root of the tree.
- ◆ After login, you can navigate the file system. At any moment, you will be in one directory.
- ◆ The directory you are in is called `current working directory`, or `current directory`.
- ◆ `pwd`: Print current working directory  
`compute > pwd`  
`/home/kzhang`

When I just login, this is my home directory and current working directory.

# Some Basic Commands: `ls` and `cd`

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◆ Use `ls` to see what is in your current directory

◆ `ls`: List the files under current directory

```
compute > ls
```

```
alignment/  cs2211/    lib/       papers/    tmp/
bin/        cs3340/    notes/     reademe    Tmp/
```

◆ Use `cd` to navigate your file system

◆ `cd dir_name`: Change directory to `dir_name`

- `compute > cd cs2211` (now the current directory is `cs2211`)
- To go back use `cd` and `..`
- `compute > cd ..` (now the current directory is `/home/kzhang`)
- `..` (two dots) is the parent directory
- `.` (one dot) is the current directory
- `~` is the home directory

# Some Basic Commands: `cat` and `mkdir`

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- ◆ `cat`: Display the content of a text file.  
`compute > cat readme`  
Unix is easy!
- ◆ Can also use `more` and `less` to display page by page  
`Compute > more readme`  
Unix is easy!
- ◆ `mkdir`: Make (create) a new directory.  
`compute > mkdir new_dir`  
(create a new directory, `new_dir`, in current directory)
- ◆ Use text editors to create new text file  
we will learn `vi` and `emacs`

# Some Basic Commands: **mv** and **cp**

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- ◆ **mv**: Move files from one directory to another

```
compute > mv readme cs2211/
```

(move file **readme** from current directory to directory **cs2211**)

- ◆ **cp**: Copy files from one directory to another

```
compute > cp cs2211/readme .
```

(copy **readme** from **cs2211** to the current directory )

or equivalently

```
compute > cd cs2211
```

```
compute > cp readme ..
```

```
compute > cd ..
```

# Some Basic Commands: `rm` and `rmdir`

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- ◆ `rm`: Remove files or directories.

`compute > rm readme`

(delete file `readme` from current working directory.)

- ◆ `rm -i`: Prompt before removal.
  - Prevent deleting files by accident.
  - Should be used in most cases.
- ◆ `rmdir`: Remove directory.



# Some Basic Commands: **man** (1)

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- ◆ **Ctrl-c**: (press <Control> and c at the same time) Interrupt the current task.

compute > cat

**^C**

- ◆ **man**: See the manual page of a command.
  - how to use the command
  - command options

# Some Basic Commands: **man** (2)

- ◆ **man**: See the manual page of a command.

```
compute > man cat
```

CAT(1)

User Commands

CAT(1)

## NAME

cat - concatenate files and print on the standard output

## SYNOPSIS

cat [OPTION] ... [FILE] ...

## DESCRIPTION

Concatenate FILE(s) to standard output.

With no FILE, or when FILE is -, read standard input.

-A, --show-all

equivalent to -vET

-b, --number-nonblank

number nonempty output lines, overrides -n

-e equivalent to -vE

-E, --show-ends

- ◆ **xman**: Graphical, X-Windows version

# File Transfer: **sftp** (1)

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- ◆ **SFTP** Secure File Transfer Protocol
- ◆ Transfer files between your home computer and your gaul account

```
% sftp user_name@compute.gaul.csd.uwo.ca
```

```
Password:
```

```
Connected to compute.gaul.csd.uwo.ca.
```

```
sftp>
```

```
use ls, pwd, and cd to navigate gaul file system
```

```
use ll, lpwd, and lcd to navigate home file system
```

```
use get remotefile to download remotefile to home
```

```
use put localfile to upload localfile to gaul
```

```
sftp> quit
```

```
%
```

# File Transfer: **sftp** (2)

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## ◆ Basic SFTP commands

- **ls** list the remote directory
- **pwd** show path of the remote directory
- **cd** change the remote directory
- **lls** list the local directory
- **lpwd** show path of the local directory
- **lcd** change the local directory
- **get remotefile** download remotefile
- **put localfile** upload localfile
- **quit** disconnect

# Exercise 1

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- ◆ **ssh** to your Gaul account
  - **ssh user\_name@compute.gaul.csd.uwo.ca**
  - **user\_name**: the same as your uwo email account @uwo.ca
  - password: the same as your uwo email account
- ◆ If you have no Gaul account
  - The system administrator is waiting for the add/drop list of the course from the Registrar.
  - It can take up to 7 days for the information from the Registrar to the computer science network admin.
  - Keep on trying everyday 😊

## Exercise 2

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- ◆ Try the Following Commands with **man**
  - **cd**: change directory to ..
  - **pwd**: show the path of current directory.
  - **more**: show the content of a file in pages.
  - **cp**: copy a file from .. to ..
  - **rm (rm -i)**: remove a file.
  - **mkdir**: make a directory.
  - **rmdir**: remove a directory.
  - **mv**: move a file or directory to..
- ◆ Again for now, do not remove or overwrite the files that are not created by yourself.

# Exercise 3

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◆ Logout