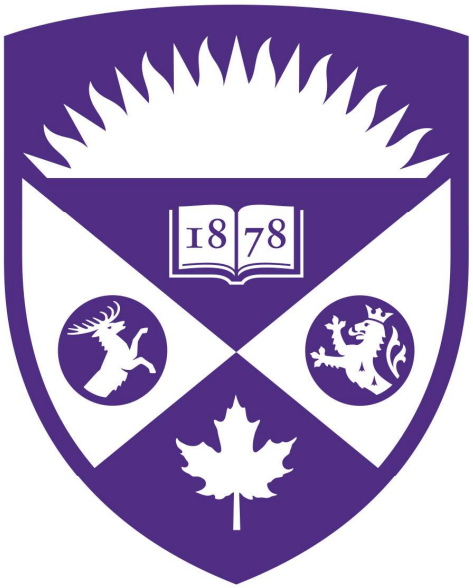

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Unix Basics

Winter 2022

- https://uni.xkcd.com/
- https://copy.sh/v86/?profile=archlinux

Unix accounts

- One must have an “account” to use a Unix computer.
  - To share resources, need to tell users apart.
- Username (public) and password (private)
- There is at least one super user account in a system usually named “root”, who has absolute power over the system.

- Your account on GAUL: gaul is a subdomain in the computer science network for undergraduates.
- Access off-campus through *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).

Login/Logout

- Most Unix systems support remote login
  - Via SSH (formerly telnet)
- You need
  - Network access
  - An SSH client

Login/Logout

- On macOS and Linux, ssh is already installed
  - Open a terminal and use the ssh command
- On Windows 10/11, you likely need to install a client
  - Enable WSL or download PuTTY

Login/Logout

- Open a terminal and type
  - `ssh <username>@compute.gaul.csd.uwo.ca`
  - Type “yes” to accept the key
- There are many SSH clients you could use on any system
  - https://en.wikipedia.org/wiki/Comparison_of_SSH_clients

Login/Logout

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\wbeld>ssh wbeldman@compute.gaul.csd.uwo.ca
The authenticity of host compute.gaul.csd.uwo.ca (129.100.20.156)' can't be
established.
ED25519 key fingerprint is SHA256:BnP25feegeJVvgIN2HTlRAoanCwft96OFCNowVvSWqo.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'compute.gaul.csd.uwo.ca' (ED25519) to the list of known
hosts.
[wbeldman@compute ~]$
```

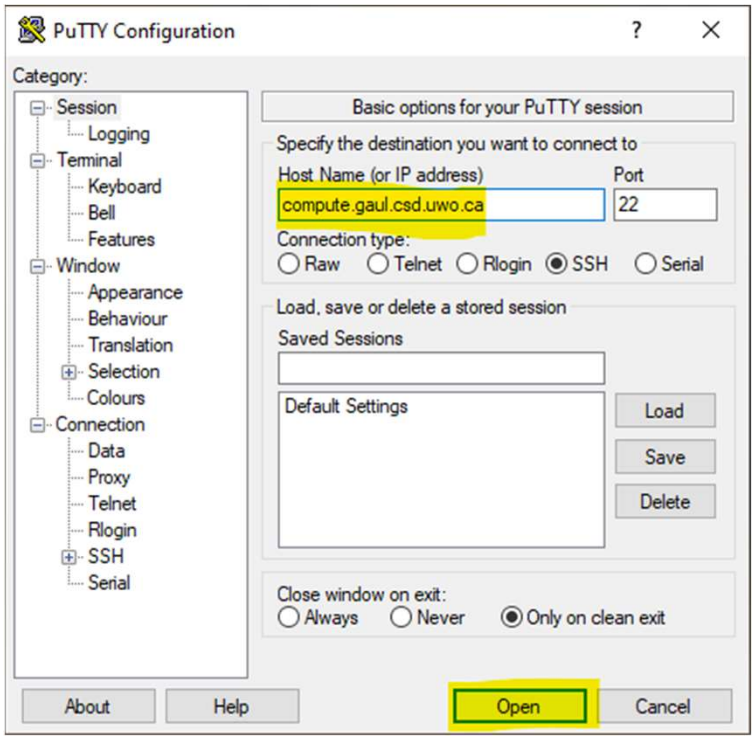
Login/Logout

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Try the new cross-platform PowerShell https://aka.ms/pscore6

PS C:\Users\wbeld>ssh wbeldman@compute.gaul.csd.uwo.ca
wbeldman@compute.gaul.csd.uwo.ca's password:
Last login: Mon Jan  3 12:26:30 2022 from 108.162.135.88
[wbeldman@compute ~]$
```

Login/Logout



Login/Logout

- You can “jump” from “compute” to any system in MC244 (linux01-linux30) by SSHing again
  - `[wbeldman@compute ~]$ ssh wbeldman@linux##.gaul.csd.uwo.ca`
- linux01-linux30 is accessible directly from on-campus
- GAUL is a shared system. Respect the privacy of others. Do not read/modify/delete files you did not create yourself. Even if you are able.

Login/Logout

- When you are done your session, don't forget to logout
- Use the command "exit"

```
[wbeldman@compute ~]$ exit
logout
Connection to compute.gaul.csd.uwo.ca closed.
PS C:\Users\wbeld>
```

Some basic commands

- You now know ssh and exit
- who – Who is currently logged in and using the system
- whoami – Who am I logged in as?

```
[wbeldman@compute ~]$ who
wbeldman pts/0        2022-01-03 12:49 (108.162.135.88)
[wbeldman@compute ~]$ whoami
wbeldman
```

Some basic commands

- You now know ssh, exit, who, whoami
- Is there a “whereami”?
  - pwd – “print working directory”

```
[wbeldman@compute ~]$ pwd
/home/wbeldman
```

Some basic commands

- When you first login, you start in your home directory
- This is your personal area. You can do whatever you please in this area

Some basic commands

- You now know ssh, exit, who, whoami, pwd
- ls – “List”
  - Your home directory may be empty so the command may list nothing (for now)
  - Use ls <directoryname> to list a specific directory

```
[wbeldman@compute ~]$ ls
```

Some basic commands

- You now know ssh, exit, who, whoami, pwd, ls
- cd – “change directory”
- Use cd to navigate the system
- cd <dirname> to change to the directory called <dirname>

```
[wbeldman@compute ~]$ cd /tmp
[wbeldman@compute tmp]$ pwd
/tmp
```

Some basic commands

- cd has some shortcuts
  - `cd ..` – change one directory up in the tree
  - `cd -` - change to the last directory you were in
  - `cd ~` - change to your home directory
- You can jump to specific directories by combining directory names
  - `cd ~/Labs/Lab01`

Some basic commands

- You now know ssh, exit, who, whoami, pwd, ls, cd
- mkdir <dirname> – “Make directory”
- rmdir <dirname> - “Remove directory”

```
[wbeldman@compute ~]$ mkdir testfolder
[wbeldman@compute ~]$ ls
testfolder
[wbeldman@compute ~]$ rmdir testfolder
[wbeldman@compute ~]$ ls
[wbeldman@compute ~]$
```

Some basic commands

- cat <filename> – Concatenate a files contents to your screen
- more <filename>, less <filename>
  - cat will spit out EVERYTHING
  - more and less allow you to control the output one screen at a time
  - (use “q” to quit)

Some basic commands

```
[wbeldman@compute $ cat readme.txt
Unix is easy
```

Some basic commands

- To edit a file, Unix comes with some basic editors like vi and emacs
- Unix editors will be covered later

Some basic commands

- cp <filename> <destination> – “copy”
- mv <filename> <destination> - “move”

```
[wbeldman@compute testfolder]$ mv readme.txt ..
[wbeldman@compute testfolder]$ cat readme.txt
cat: readme.txt: No such file or directory
[wbeldman@compute testfolder]$ cd ..
[wbeldman@compute ~]$ cat readme.txt
Unix is easy
```

Some basic commands

- rm <filename> – “remove”
  - Use rm –i to be prompted before deleting

```
[wbeldman@compute ~]$ ls readme.txt
ls: cannot access 'readme.txt': No such file or directory
```

Some basic commands

- CTRL+c – Interrupt the current task
  - If you make a mistake and you can't control your session, CTRL+c will return control to you

```
[wbeldman@compute ~]$ cat
^C
[wbeldman@compute ~]$
```

Some basic commands

- man <command> – “Manual”
  - Use arrows or space or enter to scroll the manual
  - Use q to quit the manual

Some basic commands

```
[wbeldman@compute ~]$ man cat
NAME
       cat - concatenate files and print on the standard output

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

DESCRIPTION
       Concatenate FILE(s) to standard output.

…

 Manual page cat(1) line 1/69 (END) (press h for help or q to quit)
```

Some basic commands

- sftp – “secure file transfer protocol”
  - Can be used to transfer files from one computer (yours) to another (GAUL)
  - There are many graphical SFTP programs you may prefer to use
    - https://en.wikipedia.org/wiki/Category:SFTP_clients

Some basic commands

- Like “ssh”, “sftp” has several commands for managing your session (both on GAUL and your local home PC)
- ls, pwd, cd to navigate GAUL. lls, lpwd, and lcd to navigate your local home PC
- get <remotefile> – download a file
- put <localfile> – upload a file
- quit – Quit the session

Some basic commands

```
PS C:\Users\wbeld> sftp wbeldman@compute.gaul.csd.uwo.ca
wbeldman@compute.gaul.csd.uwo.ca's password:
Connected to compute.gaul.csd.uwo.ca.
sftp> ls
readme.txt
sftp> lls
 Volume in drive C is OS
 Volume Serial Number is 0C9F-FCFB

 Directory of C:\Users\wbeld

2021-12-26  12:15 PM    <DIR>          .
2021-12-26  12:15 PM    <DIR>          ..
2021-10-22  08:08 PM    <DIR>          .ssh
2021-02-22  11:17 PM    <DIR>          Documents
…
```

Exercise 1

- Try it yourself. ssh into compute.gaul.csd.uwo.ca
- Use your Western username and password
  - Contact WTS if you don’t know your Western username and password

Exercise 1

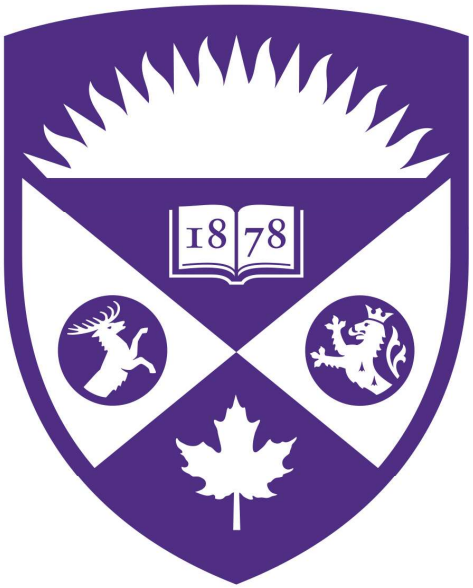
- If you do not have access to GAUL
  - The system administrator is waiting for the add/drop list of the course from the Registrar.
  - It can take up to 7 days for the information from the Registrar to the computer science network admin.
- https://wiki.sci.uwo.ca/sts/computer-science/gaul

Exercise 2

- Try the commands we've learned on GAUL
  - E.g. cd, ls, man, cat, mkdir, rmdir

Exercise 3

- Logout



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