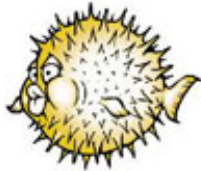


Unix Workshop 2013

5 Aug 2013

What is Unix



Multitasking, multiuser
operating system

Often the OS of choice
for large servers, large
clusters

Unix Around You



You're probably familiar with these:

- Linux
- Solaris
- Mac OS X (roots from FreeBSD and NetBSD)

Many websites run on Unix

What is SunFire?

In 2001: Full-sized rack



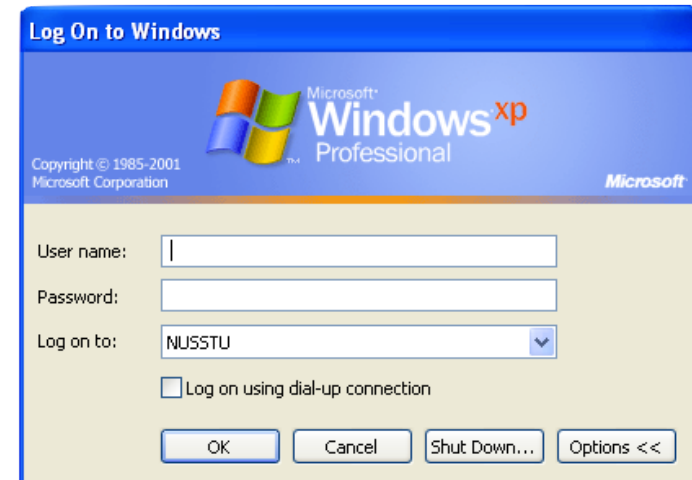
Today: A solaris zone in a blade of a chassis quarter-size of a rack!



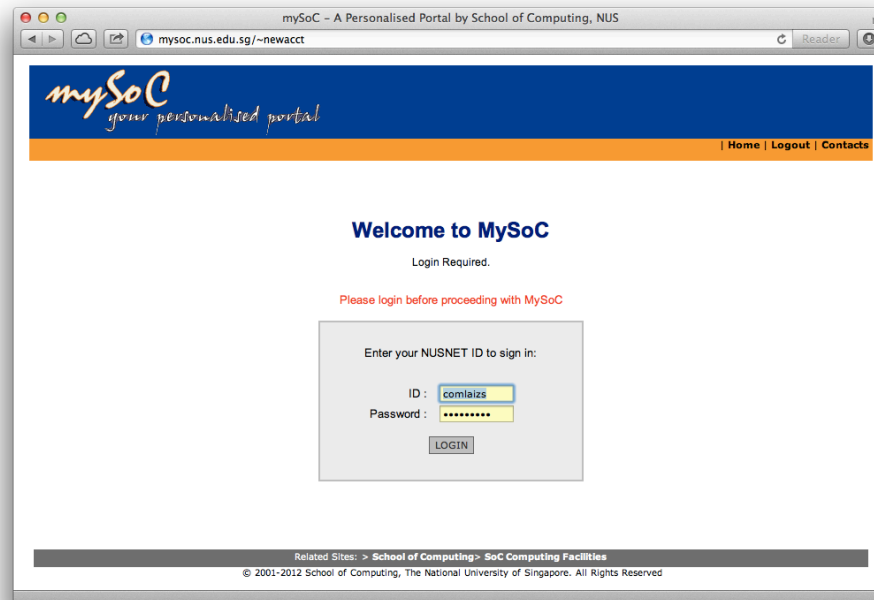
Activity: Login to NUSNET



1. Press Ctrl-Alt-Delete
2. Type in your NUSNET user name, password, and select the NUSSTU domain
3. Click the OK button



Activity: Create Your SoC Account



<https://mysoc.nus.edu.sg/~newacct>

Login using your NUSNET user name and password

Activity: Connecting to SunFire



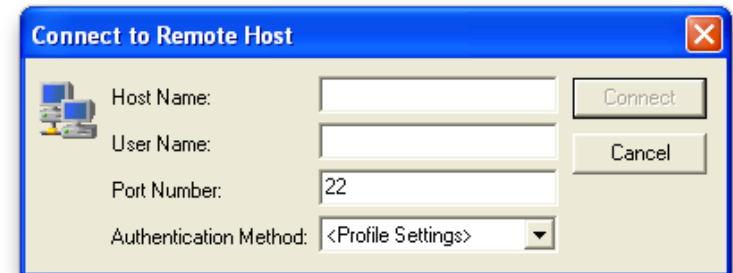
1. From the desktop, launch the SSH Secure Shell Client application

2. Click on Quick Connect
Host Name: sunfire.comp.nus.edu.sg
User Name: Your SoC user name

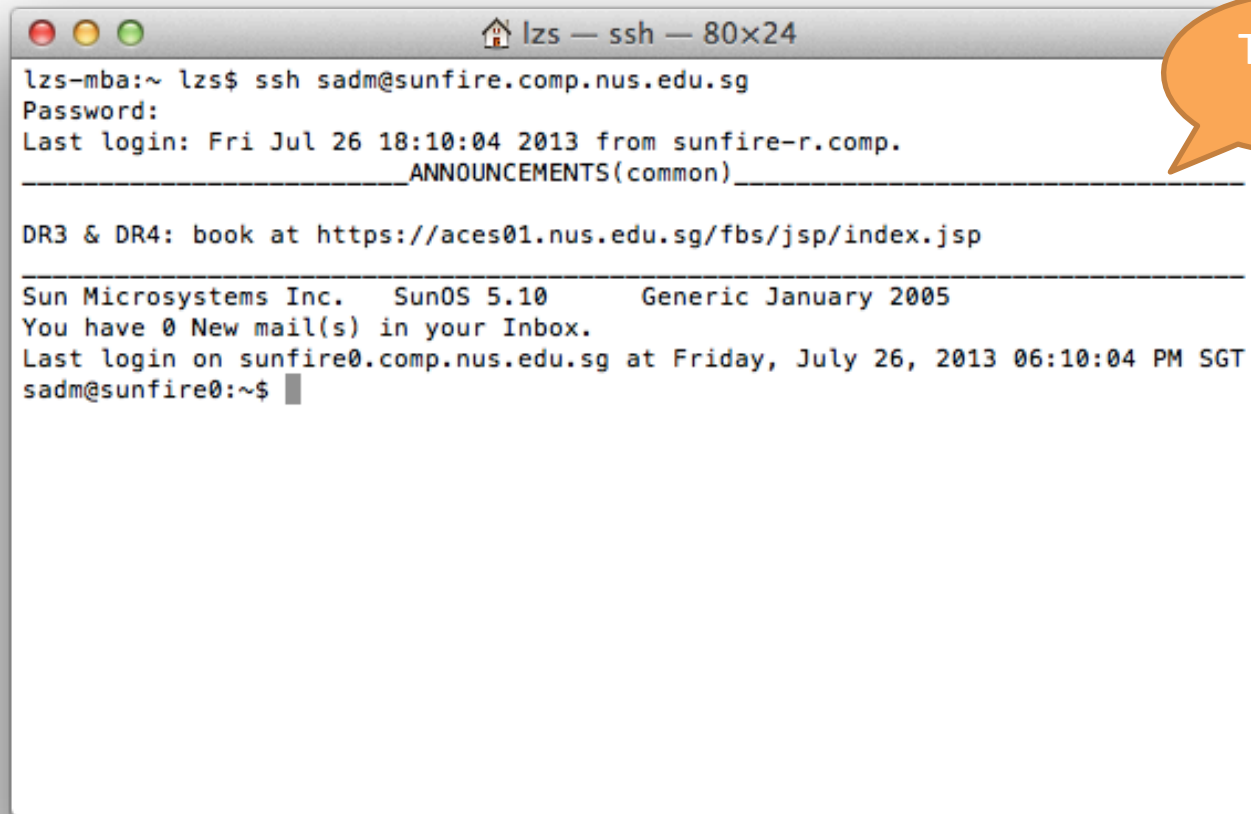
3. Click on Connect

4. Click on “Yes” at the Host identification dialog

5. Enter your SoC password in the password dialog



The Shell



A terminal window titled "lzs — ssh — 80x24" showing an SSH session. The window has a standard macOS-style title bar with red, yellow, and green buttons. The text inside the terminal is as follows:

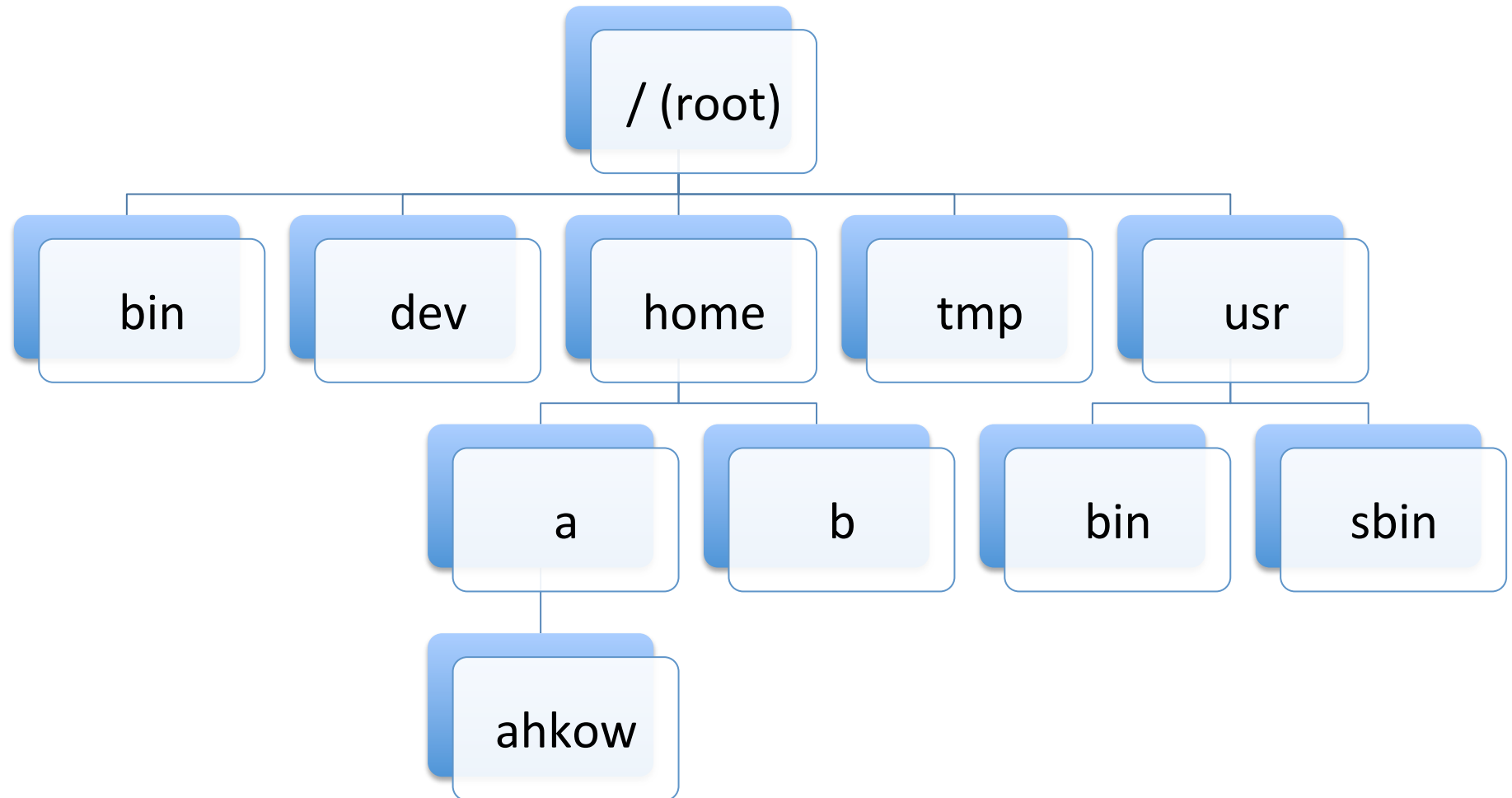
```
lzs-mba:~ lzs$ ssh sadm@sunfire.comp.nus.edu.sg
Password:
Last login: Fri Jul 26 18:10:04 2013 from sunfire-r.comp.
-----ANNOUNCEMENTS(common)-----

DR3 & DR4: book at https://aces01.nus.edu.sg/fbs/jsp/index.jsp

Sun Microsystems Inc.   SunOS 5.10       Generic January 2005
You have 0 New mail(s) in your Inbox.
Last login on sunfire0.comp.nus.edu.sg at Friday, July 26, 2013 06:10:04 PM SGT
sadm@sunfire0:~$
```

This is
a CLI

Unix Directory Tree



Activity: Working With Directories



```
lzs — ssh — 80x24
sadm@sunfire0:~$ pwd
/home/sadm
sadm@sunfire0:~$ ls -l
total 16
-rw-r--r--  1 adm  adm  2478 Jun  9  2009 pam.conf
-rw-----  1 adm  adm  2983 Jun  9  2009 smtp-postfix.xml
drwxr-xr-x  5 adm  adm    5 Jan  5  2011 work
sadm@sunfire0:~$ cd work
sadm@sunfire0:~/work$ ls -l
total 13
drwxr-xr-x 18 adm  adm  35 Jan 13  2011 Python-2.6.6
drwxr-xr-x 18 adm  adm  38 Jan  3  2011 Python-2.7.1
drwxr-xr-x  2 adm  adm   4 Nov 16  2011 src
sadm@sunfire0:~/work$ cd ..
sadm@sunfire0:~$
```

Working With Files

Command	Description
<code>cp <file1> <file2></code>	Copy a file
<code>mv <file1> <file2></code>	Move or rename a file
<code>mv <file> ~/<dir>/</code>	Move file into a subdirectory
<code>rm <file></code>	Remove (delete) a file
<code>mkdir <dir></code>	Create a subdirectory
<code>rmdir <dir></code>	Remove (delete) a subdirectory
<code>rm -r <dir></code>	Recursively remove subdirectory and its contents

Directory Contents

```
-rw-r--r--  1 sadm      sadmg      2478 Jun  9  2009 test
drwxr-xr-x  5 sadm      sadmg      5 Jan  5  2011 work
^ ^ ^ ^ ^ ^ ^ ^ ^
| | | |
| | | other
| | group
| owner
type
```

Viewing Files

Command	Description
cat <file>	Print out contents of file
more <file>	Print out contents of file page at a time
less <file>	Like above, but can go back and forth
head <file>	Show first few lines of file
tail <file>	Show last few lines of file

Editing Files

Several editors are available:

- pico / nano
- vi / vim
- Emacs

Interactive vi/vim tutorial:

<http://www.openvim.com/tutorial.html>

Shell Features

Command history

Filename completion

Wildcards

Spying Around

Command	Description
who	See who are currently logged in
w	See what programs users are running
w <userid>	See what program this user is running
last	Get login history of users
last <userid>	Get login history of this user
last -3 <userid>	Get last 3 login records of this user



Getting Help



man and apropos

Activity: Get Sample Files



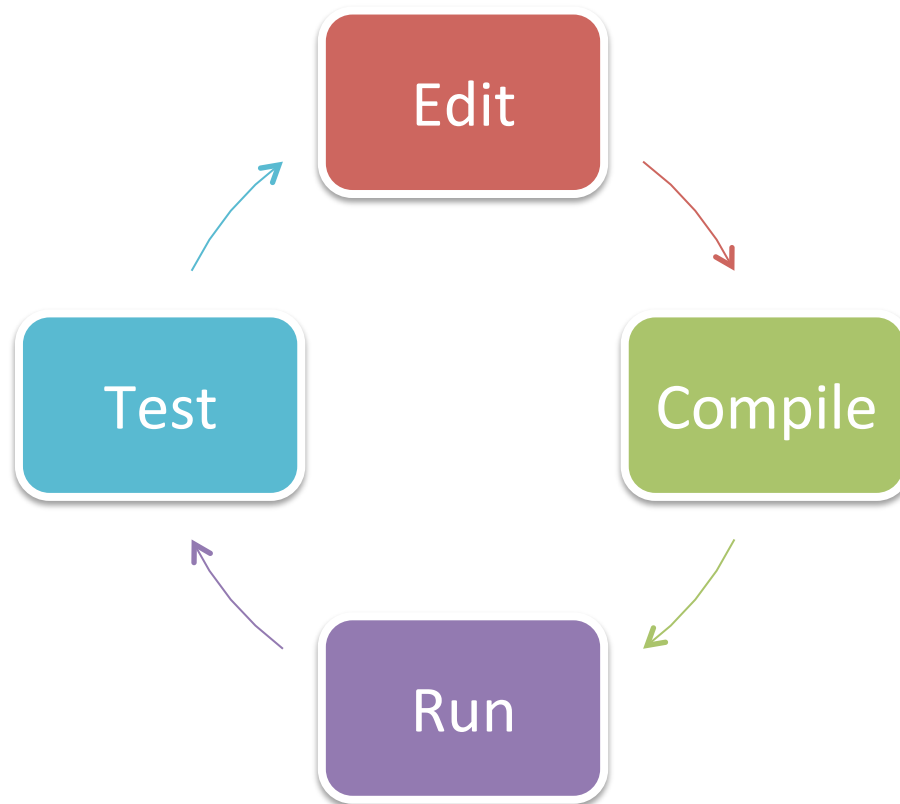
Run this in your shell:

```
$ mkdir workshop  
$ cd workshop  
$ wget http://absolut.comp.nus.edu.sg/uw/uw.zip  
$ unzip uw.zip
```

Check you got the samples:

```
$ ls -l  
gcd.c index.html wordlist.txt
```

Programming Workflow



Activity: Compiling and Running



1. C programs are compiled using the gcc compiler
\$ gcc gcd.c
2. To run a program, you must add ./ in front of its name;
the default name used by gcc is a.out
3. Run the GCD program
\$./a.out
4. Type in a pair of integers followed by the Enter key, for
example:
58 24
5. Repeat step 4 as many times as you like
6. To quit the program, press Ctrl-D

Activity: Logging Out



\$ logout

Logging out is important!

To change your SoC password, go to:

<https://mysoc.nus.edu.sg/~myacct/resetpass.cgi>

Printing

SoC printers accessed via network

- Usually through client desktop or notebook (Windows, Mac, Linux, etc)
- Also central Unix servers



Print queue management only possible through central Unix servers

Command	Description
<code>lpq -P<printer></code>	Check print queue of specified printer
<code>lprm -P<printer> <id></code>	Remove job id from specified printer

Processes and Disk Usage

Command	Description
quota	Check disk quota
du	Check disk usage in each subdirectory
du -s *	Like above, but summarize at specified directories
find ...	Find files
chmod ...	Modify file permissions
ps ...	List processes
kill ...	Kill process

Pipes and Redirection

Redirection:

```
$ sort < wordlist.txt > sorted.txt
```

Pipes:

```
$ cat wordlist.txt | sort | less
```


Shell Initialization

File	Description
~/.profile	Executed for login shells
~/.bashrc	Executed for interactive non-login shells

Used to setup the shell environment

Examples:

- Setting of \$PATH
- Setting command aliases

Activity: Setup Your Webpage



Create public_html:

```
$ mkdir ~/public_html
```

Set the right permissions:

```
$ chmod 711 ~ ~/public_html
```

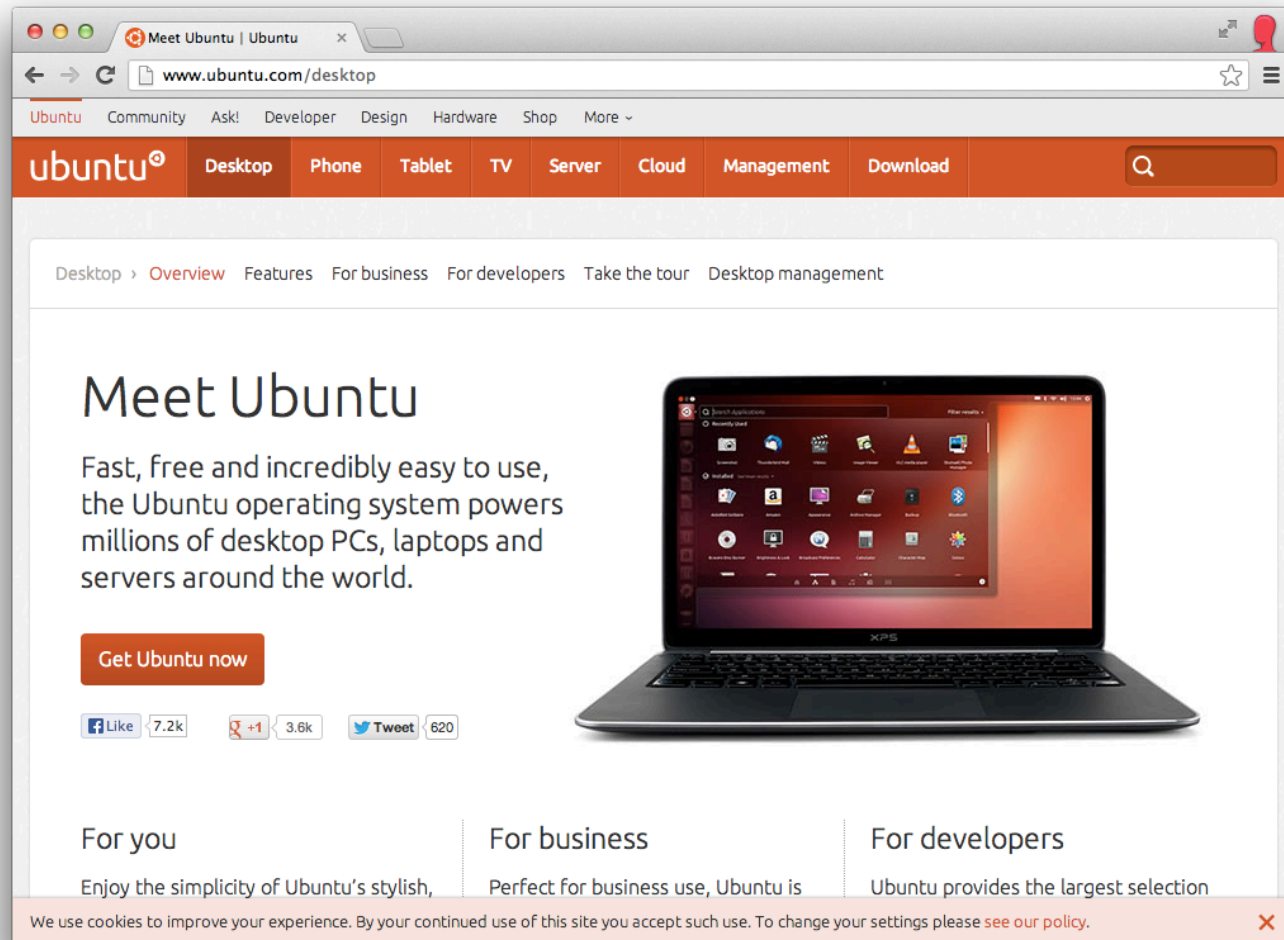
Put up a default index.html:

```
$ cp index.html ~/public_html
```

```
$ chmod 644 ~/public_html/index.html
```



Learning Unix on Your Own

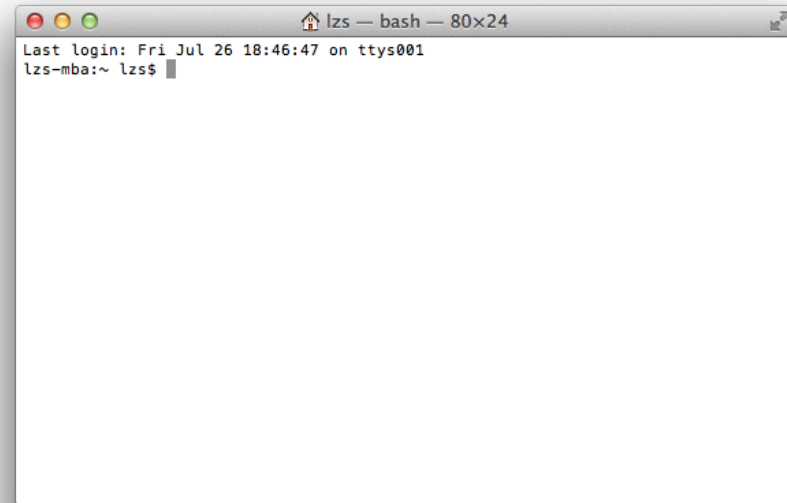


www.ubuntu.com

Unix on a Mac

OS X is every bit Unix.

Development tools in Xcode.



Useful Websites

Secure SSH

<https://docs.comp.nus.edu.sg/sites/default/files/SSHSecureShellClient-3.2.9.exe>

Putty, SSH client:

<http://www.chiark.greenend.org.uk/~sgtatham/putty/>

KiTTY, another SSH client for Windows:

<http://www.9bis.net/kitty/>

Cygwin, UNIX-like environment for Windows:

<http://www.cygwin.com/>

Description of computing facilities in SoC:

<https://docs.comp.nus.edu.sg/cf>

MySoC, intranet portal: <https://mysoc.nus.edu.sg>

Q&A



Download slides: <http://goo.gl/bNBHIB>

Challenge Activity



Look at the wordlist.txt file.

Find:

- Determine the most frequently occurring word(s).
How many times and what is/are the word(s)?