Unix Workshop 2014

5 Aug 2014

What is Unix

Multitasking, multiuser operating system

Often the OS of choice for large servers, large clusters

Unix Around You

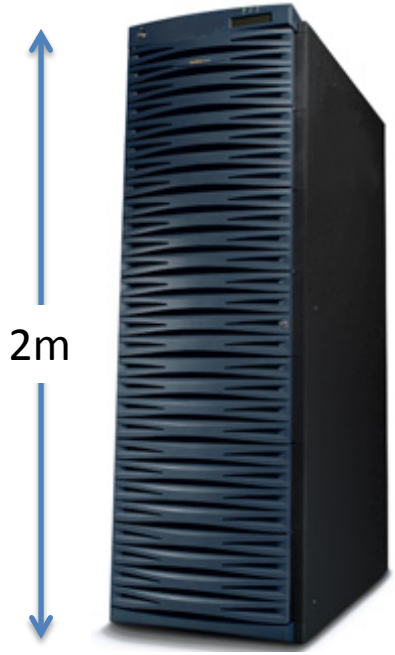
You're probably familiar with these:

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

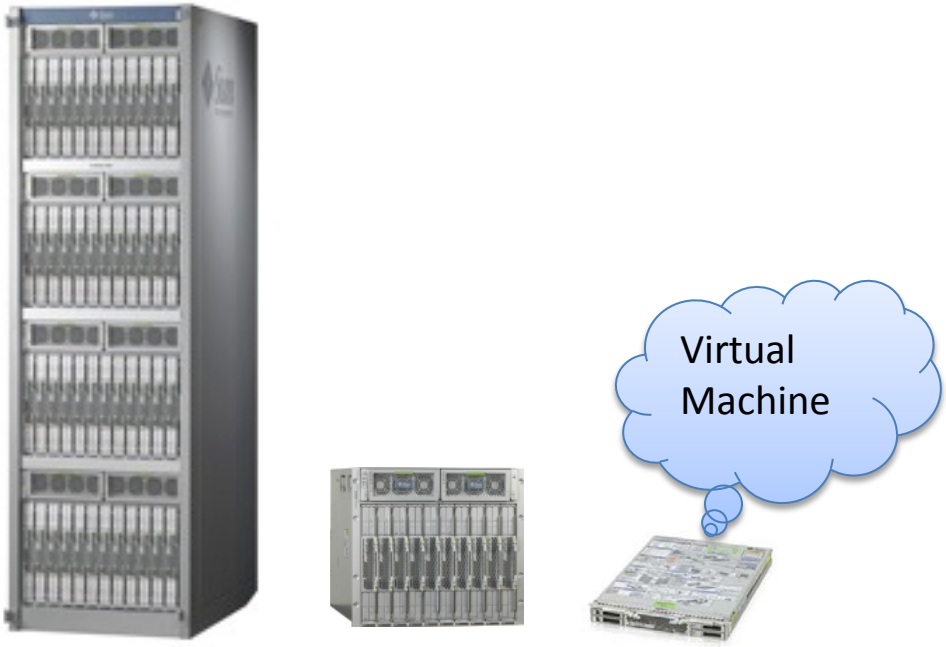
Many websites run on Unix

What is SunFire?

In 2001: Full-sized rack



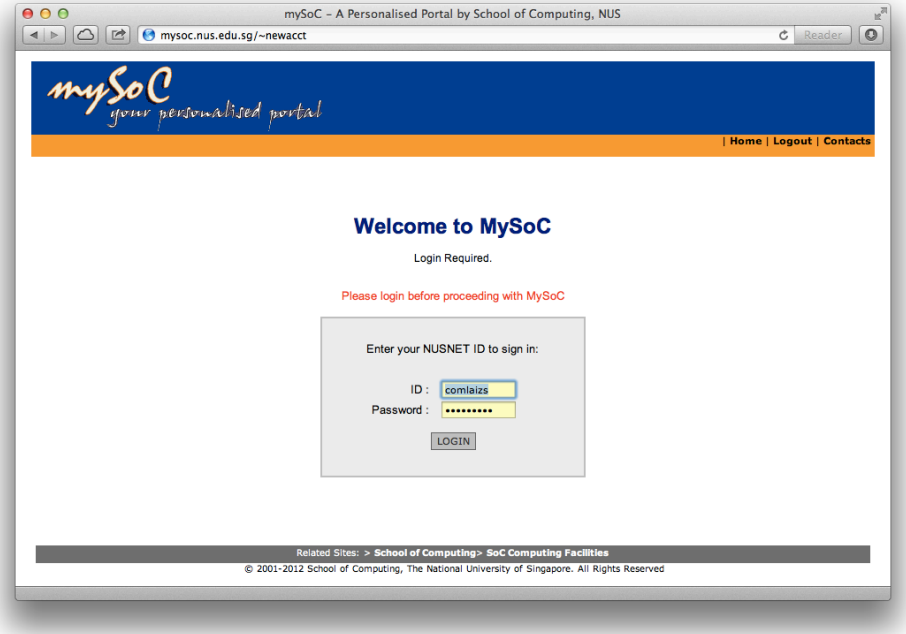
Today: A solaris zone in a blade of a chassis quarter-size of a rack!



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

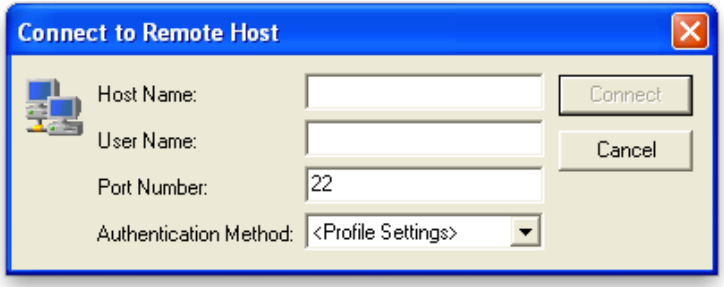


https://mysoc.nus.edu.sg/~newacct

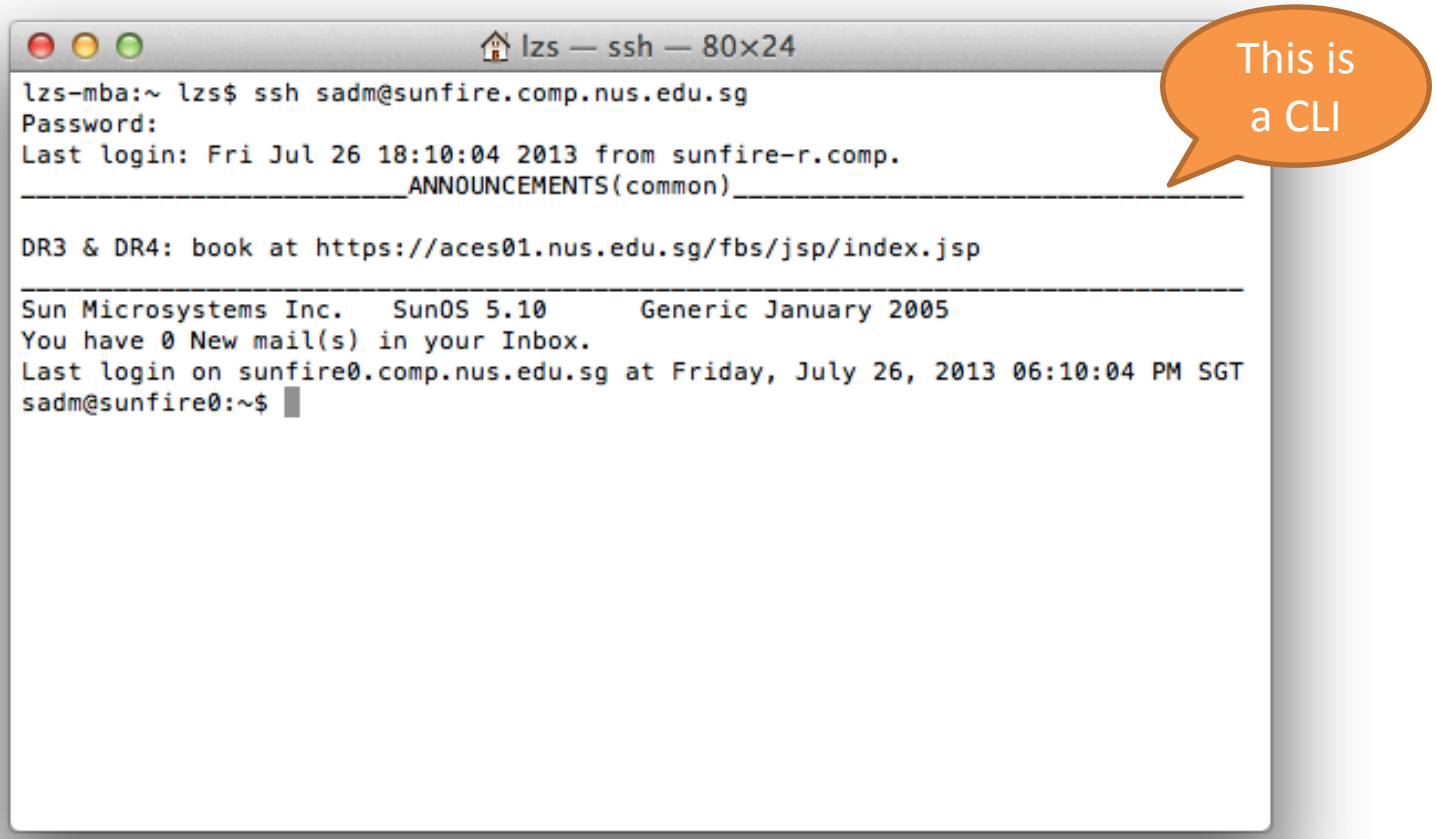
Login using your NUSNET user name and password

Activity: Connecting to SunFire

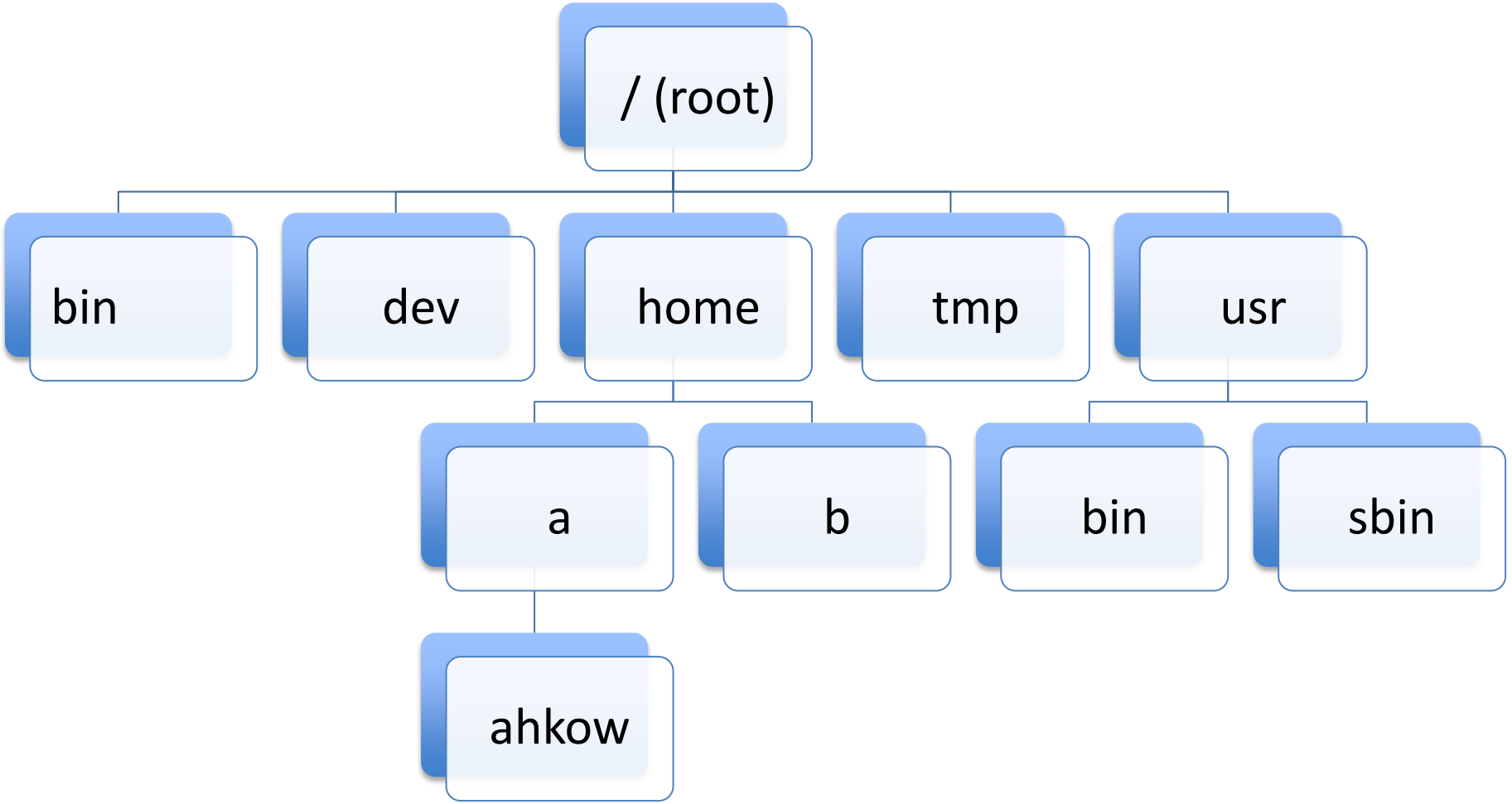
1. From the desktop, launch the SSH Secure Shell Client application
2. Click on Quick Connect
   Host Name: sunfire.comp.nus.edu.sg
   User Name: Your SoC user name
3. Click on Connect
4. Click on “Yes” at the Host identification dialog
5. Enter your SoC password in the password dialog



The Shell


lzs — ssh — 80×24
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 — 80×24

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

Working With Files

Command	Description
cp <file1> <file2>	Copy a file
mv <file1> <file2>	Move or rename a file
mv <file> ~/<dir>/	Move file into a subdirectory
rm <file>	Remove (delete) a file
mkdir <dir>	Create a subdirectory
rmdir <dir>	Remove (delete) a subdirectory
rm –r <dir>	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
| user
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

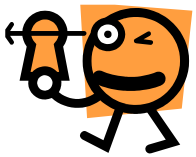
Command history

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

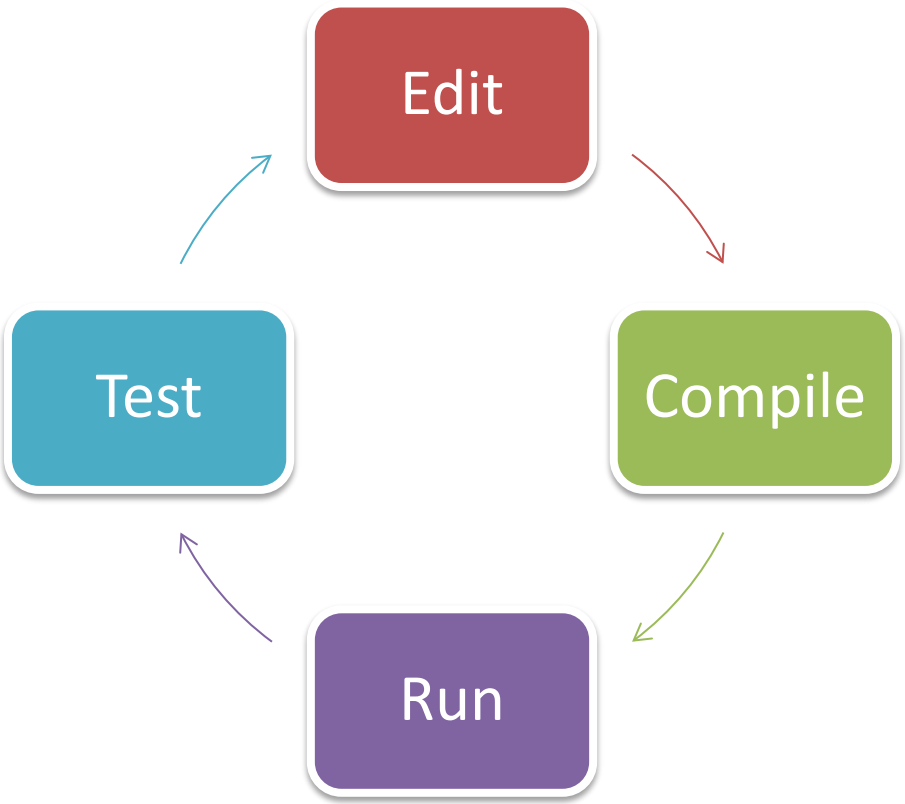
Run this in your shell:

```
$ mkdir workshop
$ cd workshop
$ cp /tmp/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
lpq –P<printer>	Check print queue of specified printer
lprm –P<printer> <id>	Remove job id from specified printer
pusage	Check print quota

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
```

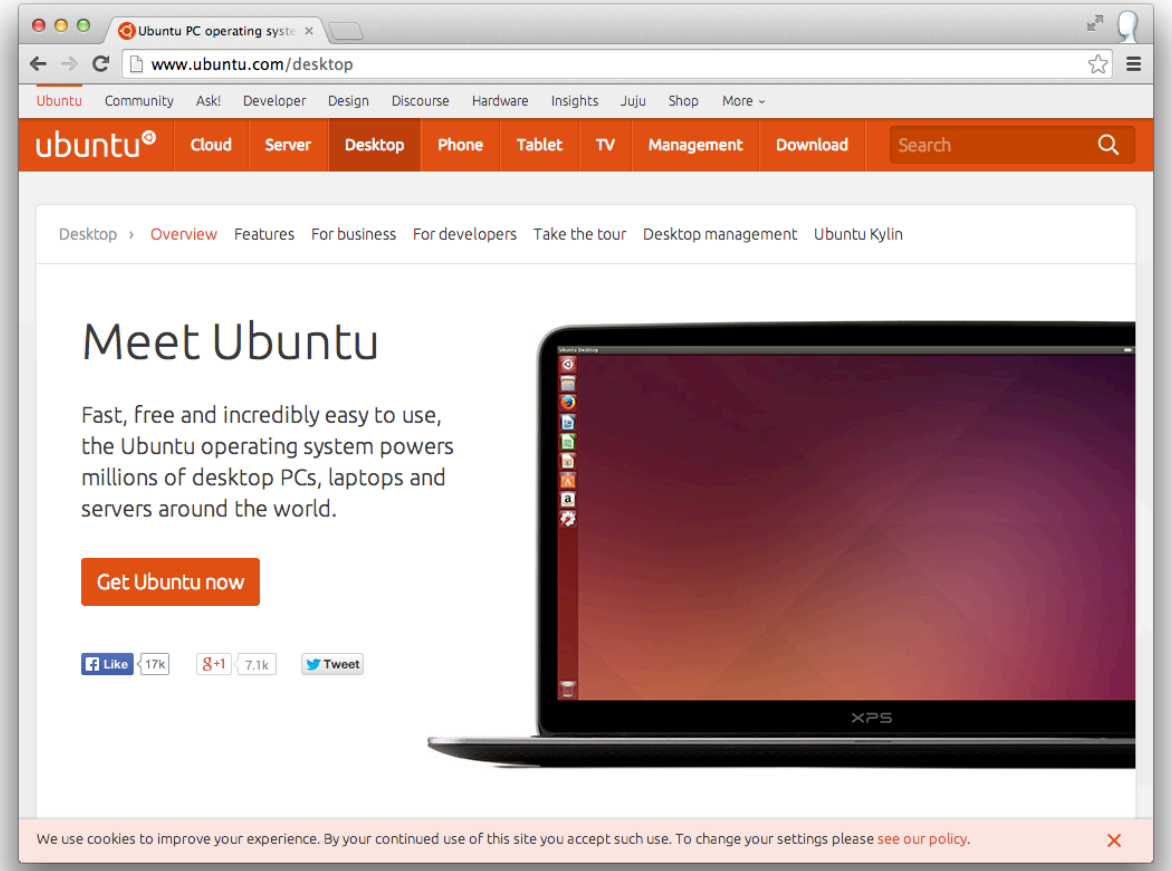
Set the right permissions:

```
$ 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

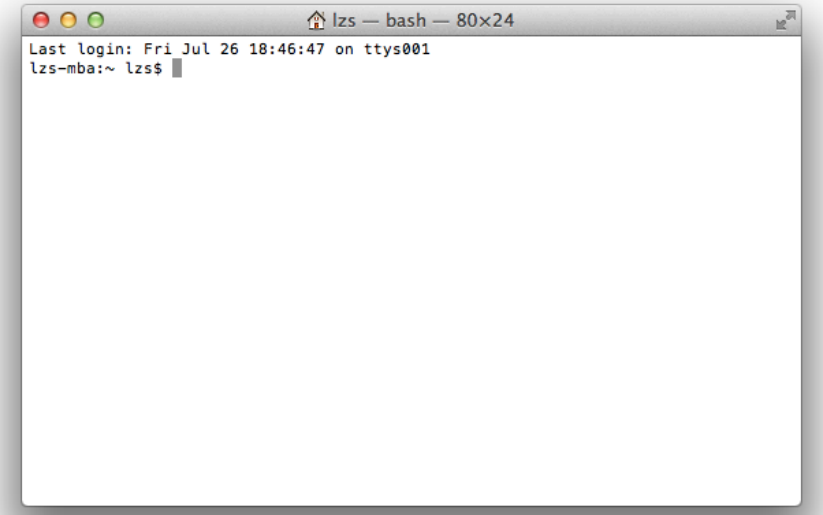


www.ubuntu.com

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

http://goo.gl/uSydr4

Q&A

Download slides: http://goo.gl/bNBHlB

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)?

Thanks for attending Acad Day!

Do give us your feedback at:

http://tinyurl.com/otqt2ee