Lesson Module Checklist

- Slides
- WB

- Flash cards
- Properties
- Page numbers
- 1st minute quiz
- Web Calendar summary
- Web book pages
- Commands

- Lab tested
- MSDNAA accounts made
- VMware AA accounts made
- CIS Lab schedule published
- Census done
- cis90-students alias in /etc/aliases + newaliases command

- Welcome ready for mailing
- Historical events ready for mailing

- 9V backup battery for microphone
- Backup slides, CCC info, handouts on flash drive

CIS 90 - Lesson 3

Instructor: **Rich Simms**
Dial-in: **888-450-4821**
Passcode: **761867**

Email me (risimms@cabrillo.edu) a relatively current photo of your face for 3 points extra credit

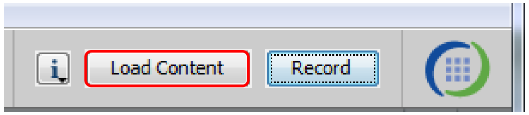
Introductions and Credits

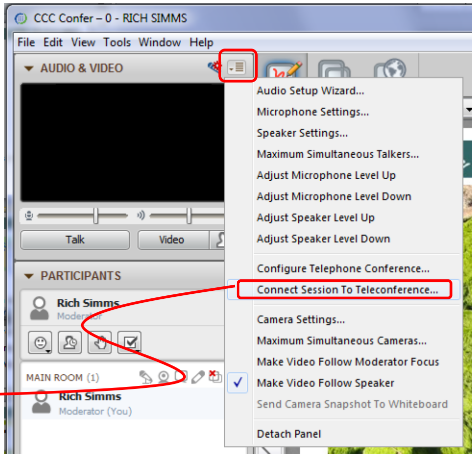
Jim Griffin
- Created this Linux course
- Created Opus and the CIS VLab
- Jim’s site: http://cabrillo.edu/~jgriffin/

Rich Simms
- HP Alumnus
- Started teaching this course in 2008 when Jim went on sabbatical
- Rich’s site: http://simms-teach.com

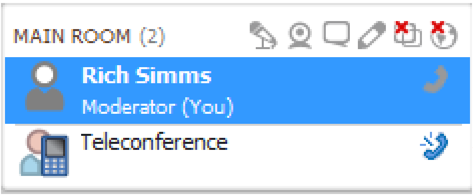
And thanks to:
- John Govsky for many teaching best practices: e.g. the First Minute quizzes, the online forum, and the point grading system (http://teacherjohn.com/)

[ ] Preload White Board with cis*lesson??*-WB



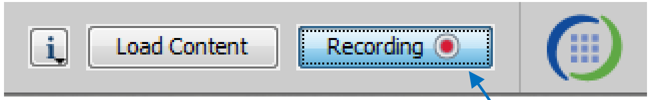

CCC Confer – 0 - RICH SIMMS
File Edit View Tools Window Help
AUDIO & VIDEO
Audio Setup Wizard...
Microphone Settings...
Speaker Settings...
Maximum Simultaneous Talkers...
Adjust Microphone Level Up
Adjust Microphone Level Down
Adjust Speaker Level Up
Adjust Speaker Level Down
Configure Telephone Conference...
Connect Session To Teleconference...
Camera Settings...
Maximum Simultaneous Cameras...
Make Video Follow Moderator Focus
Make Video Follow Speaker
Send Camera Snapshot To Whiteboard
Detach Panel
Talk
Video
PARTICIPANTS
Rich Simms
Moderator
MAIN ROOM (1)
Rich Simms
Moderator (You)

[ ] Connect session to Teleconference

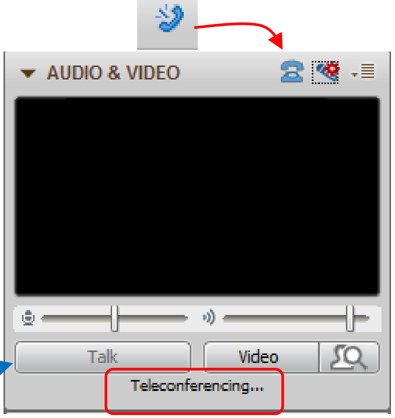


Session now connected to teleconference

[ ] Is recording on?



Red dot means recording

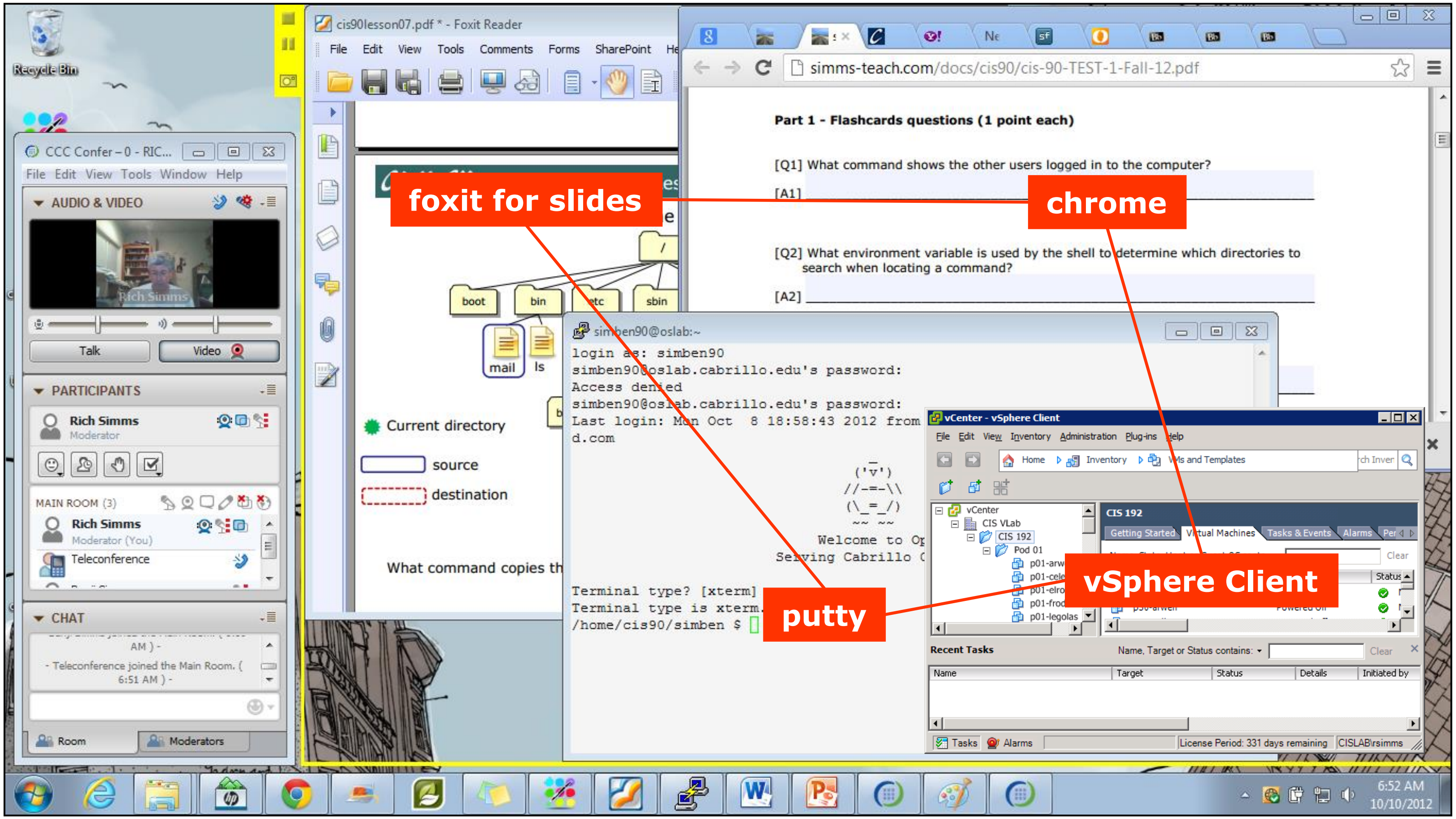


[ ] Use teleconferencing, not mic

Should be greyed out

[ ] Video (webcam) optional

[ ] layout and share apps



simms-teach.com/docs/cis90/cis-90-TEST-1-Fall-12.pdf

Part 1 - Flashcards questions (1 point each)

[Q1] What command shows the other users logged in to the computer?

[A1] ____________________

[Q2] What environment variable is used by the shell to determine which directories to search when locating a command?

[A2] ____________________

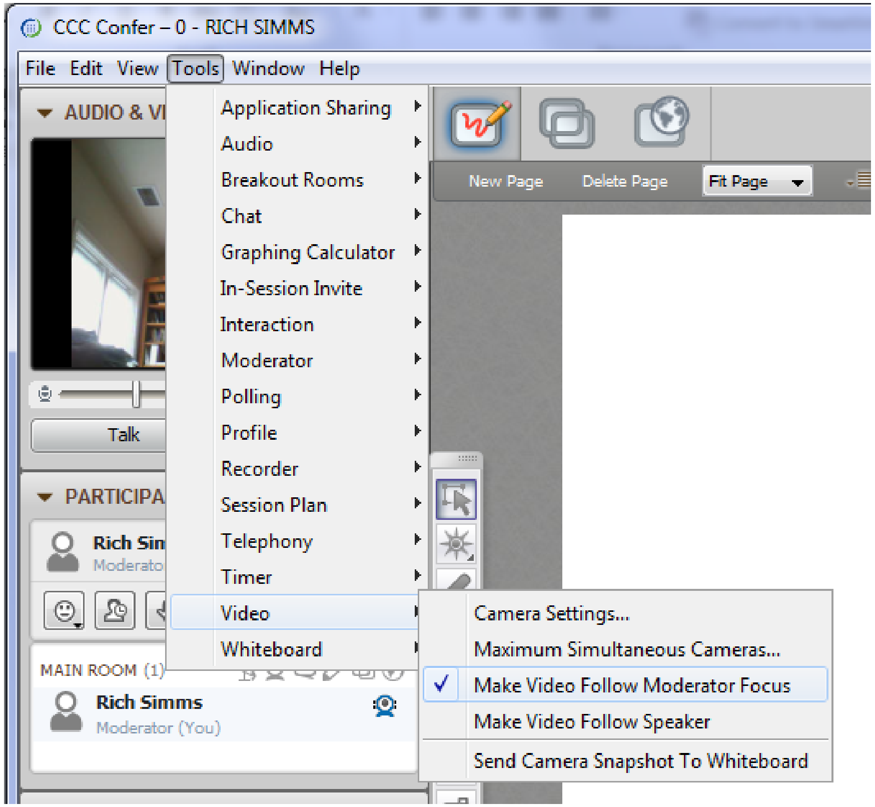
```
login as: simben90
simben90@oslab.cabrillo.edu's password:
Access denied
simben90@oslab.cabrillo.edu's password:
Last login: Mon Oct  8 18:58:43 2012 from
d.com

                                         ('v')
                                        //-=-\\
                                        (\_=_/)
                                         ^^ ^^
                                   Welcome to Op
                                Serving Cabrillo C

Terminal type? [xterm]
Terminal type is xterm.
/home/cis90/simben $
```

CCC Confer

[ ] Video (webcam) optional

[ ] Follow moderator

[ ] Double-click on postages stamps

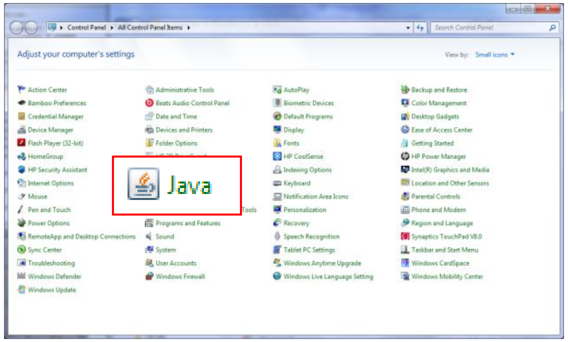


✓ Make Video Follow Moderator Focus

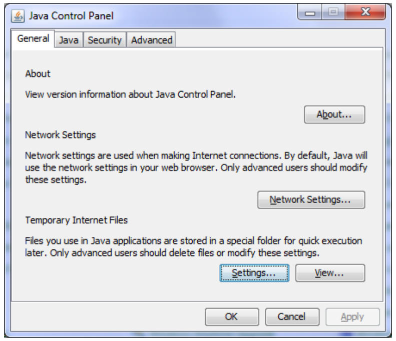
Universal Fix for CCC Confer:

1) Shrink (500 MB) and delete Java cache
2) Uninstall and reinstall latest Java runtime

Control Panel (small icons)



General Tab > Settings...



About

View version information about Java Control Panel.

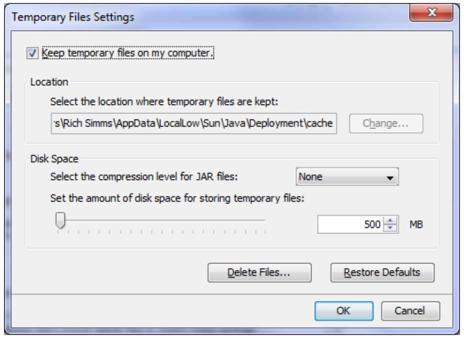
Network Settings

Network settings are used when making Internet connections. By default, Java will use the network settings in your web browser. Only advanced users should modify these settings.

Temporary Internet Files

Files you use in Java applications are stored in a special folder for quick execution later. Only advanced users should delete files or modify these settings.

500MB cache size



☑ Keep temporary files on my computer.

Location

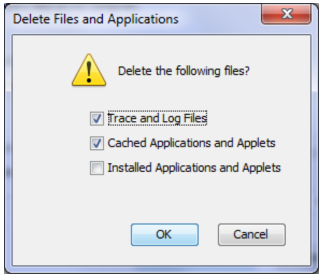
Select the location where temporary files are kept: 's\Rich Simms\AppData\LocalLow\Sun\Java\Deployment\cache

Disk Space

Select the compression level for JAR files: None

Set the amount of disk space for storing temporary files: 500 MB

Delete these



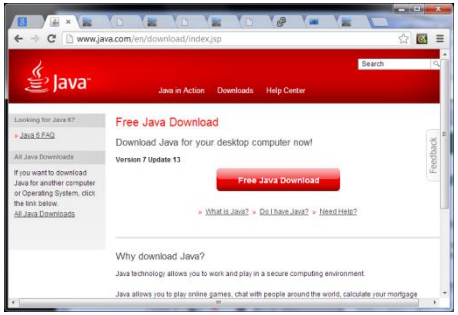
Delete the following files?

☑ Trace and Log Files

☑ Cached Applications and Applets

☐ Installed Applications and Applets

Google Java download



If you want to download Java for another computer or Operating System, click the link below.
All Java Downloads

Free Java Download

Download Java for your desktop computer now!

Version 7 Update 13

Why download Java?

Java technology allows you to work and play in a secure computing environment.

Java allows you to play online games, chat with people around the world, calculate your mortgage

First Minute Quiz

Please answer these questions **in the order** shown:

Use CCC Confer White Board

email answers to: `risimms@cabrillo.edu`

(answers must be emailed within the first few minutes of class for credit)

Electronic Mail

Objectives	Agenda
• Learn how to use the UNIX communication tools write and mail. • Overview on end-to-end email.	• Quiz • Questions from last week • Mini review • Housekeeping • Write • Basic Mail • More on Mail • End-to-end email • Other MUAs, MTAs, DA and AAs • Wrap up

Class Activity

If you haven’t already, log into Opus

Questions

Questions

How this course works?

Previous lessons

Previous labs?

Chinese Proverb	他問一個問題，五分鐘是個傻子，他不問一個問題仍然是一個傻瓜永遠。 *He who asks a question is a fool for five minutes; he who does not ask a question remains a fool forever.*

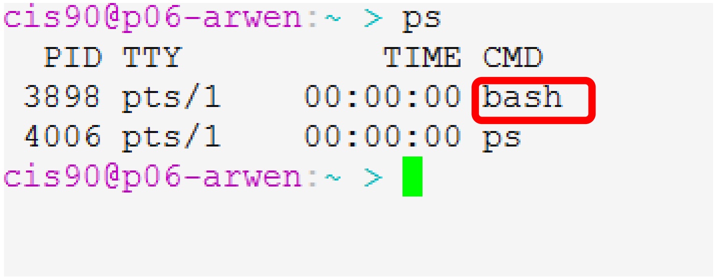
Lab 1 Results

(xx times answered incorrectly)

```
                  1   x   "1) What is your shell prompt on Doc?"
                      0   "2) What is your shell prompt on Opus?"
                      0   "3) What is your shell prompt on your assigned Arwen system?"
                      0   "4) What distro has been installed on Catalina?"
                    1 x   "5) Log into Catalina and Thabiti as cis90. Are your uid numbers the same on both?"
          9 xxxxxxxxx   "6) Which shell program are your running on your Arwen system?"
                  2 xx   "7) On Catalina, which remote system did Juliet log in from?"
                  2 xx   "8) On Doc, what is the output from the hostname command?"
                  2 xx   "9) Log in twice into Opus. Does exiting one session exit you from the other session?"
                 3 xxx "10) Log in twice into your Arwen. What is the output of the tty command in each session?"
               5 xxxxx "11) Stay logged twice into your Arwen. How are your two sessions distinguished in the who output?"
                   1 x "12) What is the name of the kernel running on Doc?"
        11 xxxxxxxxxxx "13) Log into the system named Thabiti, is Linux or UNIX installed?"
     14 xxxxxxxxxxxxxx "14) Log in as cis90 to the system whose name is the answer to Q7. What shell is running?"
  17 xxxxxxxxxxxxxxxxx "15) What does the tty command output on your Arwen's tty5 virtual console?"




             7 xxxxxxx *** NO SUBMITTAL ***
```

6) Which shell program are your running on your Arwen system?

Use the ps command to print your processes

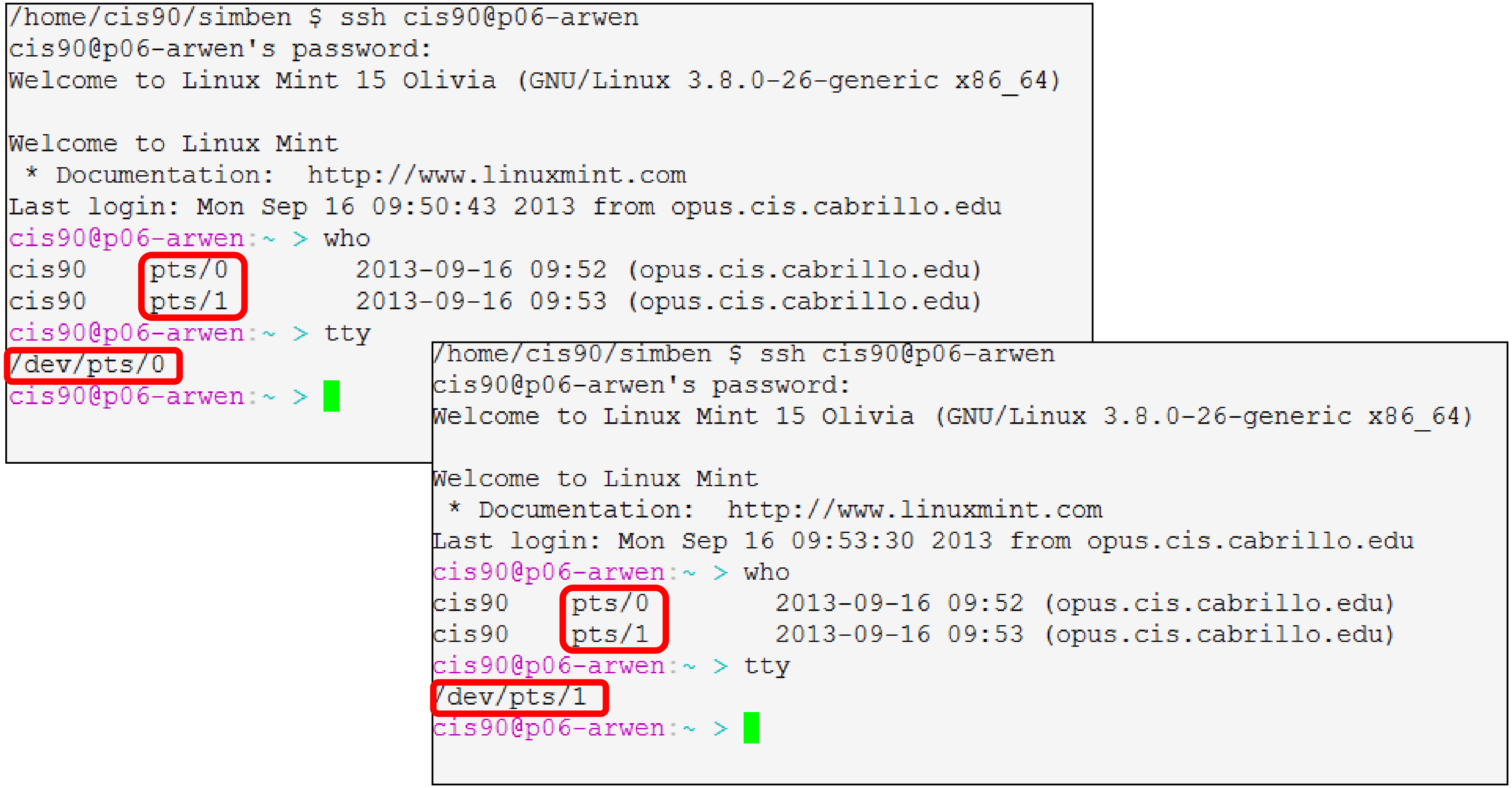


```
cis90@p06-arwen:~ > ps
  PID TTY          TIME CMD
 3898 pts/1    00:00:00 bash
 4006 pts/1    00:00:00 ps
cis90@p06-arwen:~ > 
```

This list shows two processes. The first is the bash shell and the second is the ps command

The answer is: bash

11) Stay logged twice into your Arwen. How are your two sessions distinguished in the who output?"



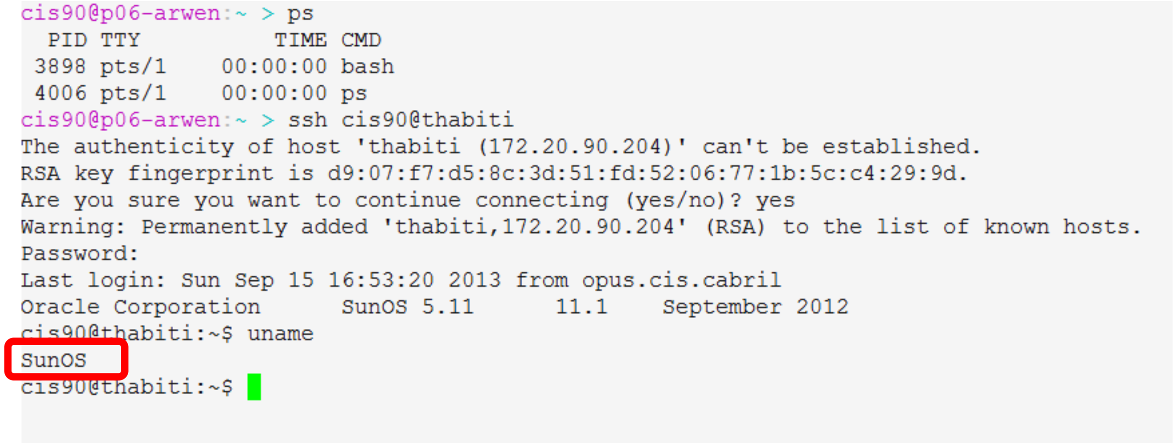
```
/home/cis90/simben $ ssh cis90@p06-arwen
cis90@p06-arwen's password:
Welcome to Linux Mint 15 Olivia (GNU/Linux 3.8.0-26-generic x86_64)

Welcome to Linux Mint
 * Documentation:  http://www.linuxmint.com
Last login: Mon Sep 16 09:50:43 2013 from opus.cis.cabrillo.edu
cis90@p06-arwen:~ > who
cis90    pts/0        2013-09-16 09:52 (opus.cis.cabrillo.edu)
cis90    pts/1        2013-09-16 09:53 (opus.cis.cabrillo.edu)
cis90@p06-arwen:~ > tty
/dev/pts/0
cis90@p06-arwen:~ >
```

```
/home/cis90/simben $ ssh cis90@p06-arwen
cis90@p06-arwen's password:
Welcome to Linux Mint 15 Olivia (GNU/Linux 3.8.0-26-generic x86_64)

Welcome to Linux Mint
 * Documentation:  http://www.linuxmint.com
Last login: Mon Sep 16 09:53:30 2013 from opus.cis.cabrillo.edu
cis90@p06-arwen:~ > who
cis90    pts/0        2013-09-16 09:52 (opus.cis.cabrillo.edu)
cis90    pts/1        2013-09-16 09:53 (opus.cis.cabrillo.edu)
cis90@p06-arwen:~ > tty
/dev/pts/1
cis90@p06-arwen:~ >
```

The answer is:

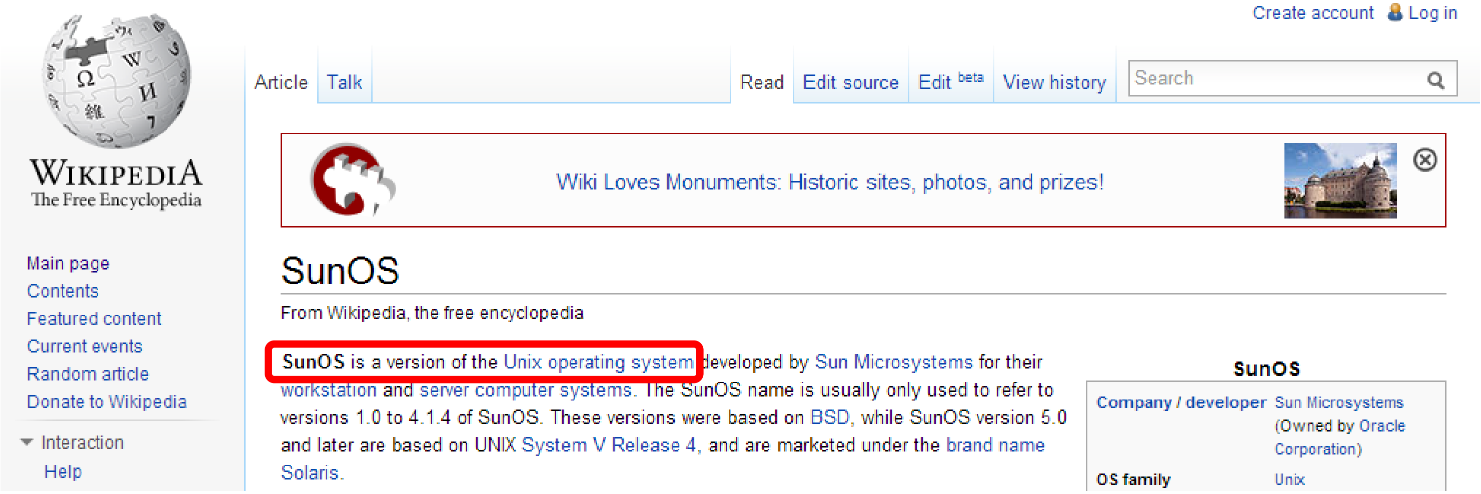
They are distinguished by the terminal device used, e.g. pts/0 vs pts/1

13) Log into the system named Thabiti, is Linux or UNIX installed?



```
cis90@p06-arwen:~ > ps
  PID TTY          TIME CMD
 3898 pts/1    00:00:00 bash
 4006 pts/1    00:00:00 ps
cis90@p06-arwen:~ > ssh cis90@thabiti
The authenticity of host 'thabiti (172.20.90.204)' can't be established.
RSA key fingerprint is d9:07:f7:d5:8c:3d:51:fd:52:06:77:1b:5c:c4:29:9d.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'thabiti,172.20.90.204' (RSA) to the list of known hosts.
Password:
Last login: Sun Sep 15 16:53:20 2013 from opus.cis.cabril
Oracle Corporation      SunOS 5.11      11.1    September 2012
cis90@thabiti:~$ uname
SunOS
cis90@thabiti:~$
```

*Use **uname** to show the name of the kernel, google the name of the kernel if it's not Linux*



SunOS

From Wikipedia, the free encyclopedia

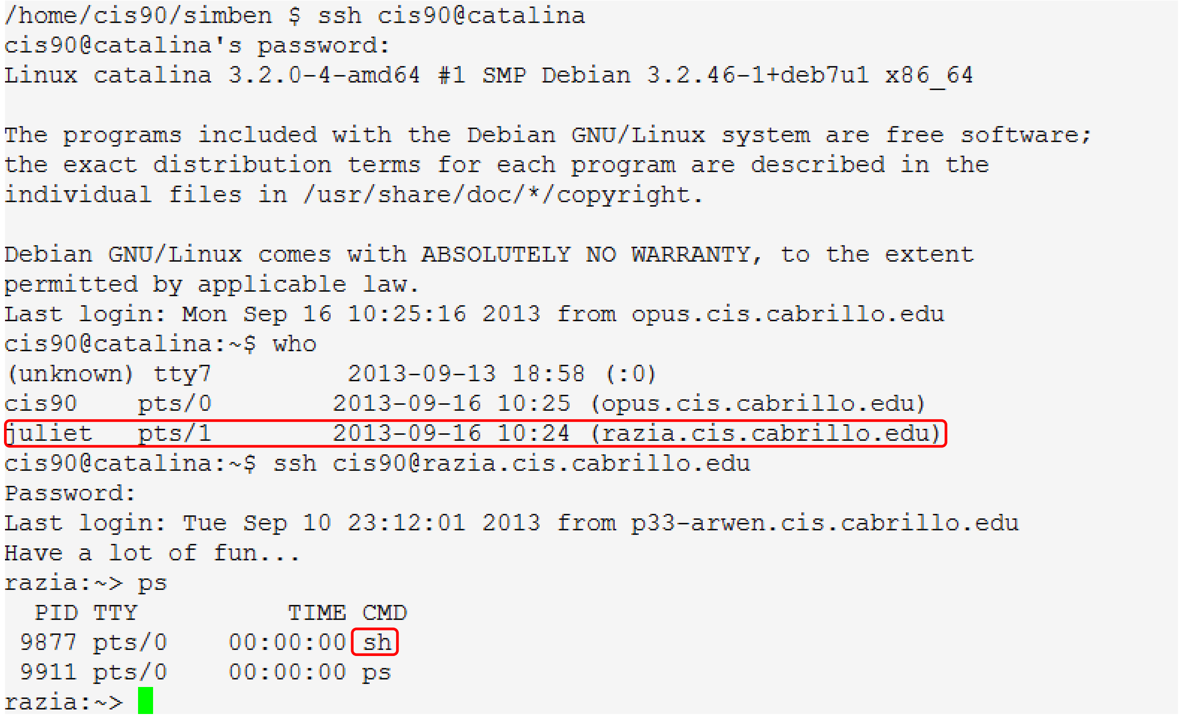
SunOS is a version of the Unix operating system developed by Sun Microsystems for their workstation and server computer systems. The SunOS name is usually only used to refer to versions 1.0 to 4.1.4 of SunOS. These versions were based on BSD, while SunOS version 5.0 and later are based on UNIX System V Release 4, and are marketed under the brand name Solaris.

SunOS	
Company / developer	Sun Microsystems (Owned by Oracle Corporation)
OS family	Unix

The answer is: UNIX

7) On Catalina, which remote system did Juliet log in from?

14) Log in as cis90 to the system whose name is the answer to Q7. What shell is running?



```
/home/cis90/simben $ ssh cis90@catalina
cis90@catalina's password:
Linux catalina 3.2.0-4-amd64 #1 SMP Debian 3.2.46-1+deb7u1 x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Mon Sep 16 10:25:16 2013 from opus.cis.cabrillo.edu
cis90@catalina:~$ who
(unknown) tty7         2013-09-13 18:58 (:0)
cis90     pts/0        2013-09-16 10:25 (opus.cis.cabrillo.edu)
juliet    pts/1        2013-09-16 10:24 (razia.cis.cabrillo.edu)
cis90@catalina:~$ ssh cis90@razia.cis.cabrillo.edu
Password:
Last login: Tue Sep 10 23:12:01 2013 from p33-arwen.cis.cabrillo.edu
Have a lot of fun...
razia:~> ps
  PID TTY          TIME CMD
 9877 pts/0    00:00:00 sh
 9911 pts/0    00:00:00 ps
razia:~> 
```

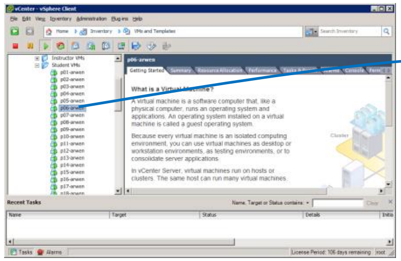
*On Catalina use **who** to see that Juliet logged in from Razia. Log into Razia and use the **ps** command to see the name of the shell*

The answer is: sh

Many shell programs have been written for UNIX/Linux. sh was the original shell written by Stephen Bourne at ATT, the csh ("C shell") was written by Bill Joy at UC Berkeley, the bash ("Bourne"-Again Shell) was written by Brian Fox for the GNU project. We will use bash in CIS 90.

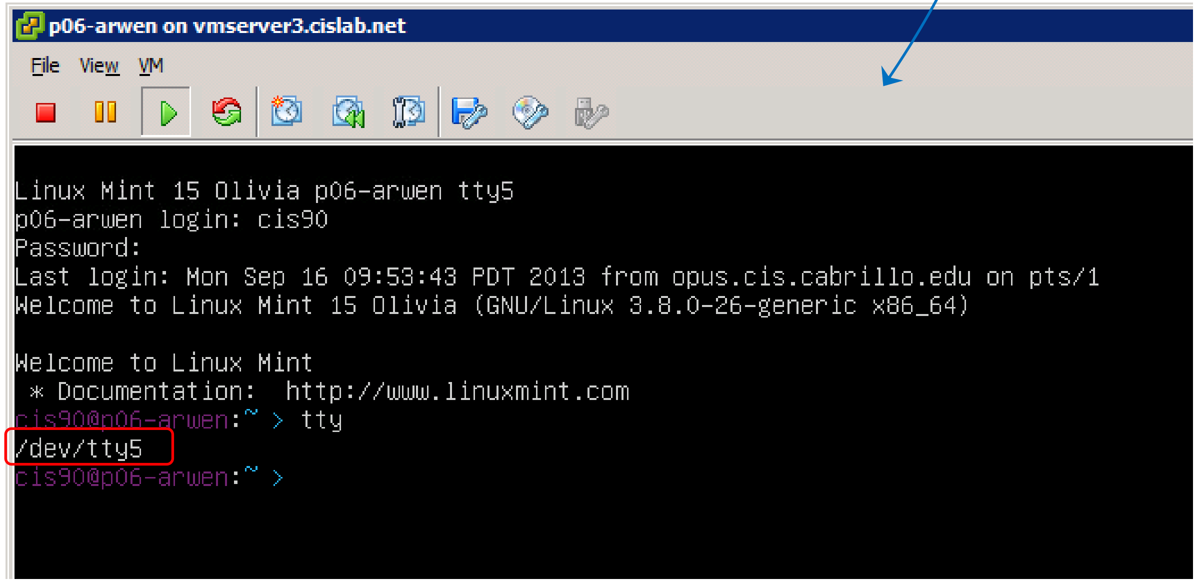
15) What does the tty command output on your Arwen's tty5 virtual console?

1) Log into VLab



2) Open a console for your Arwen

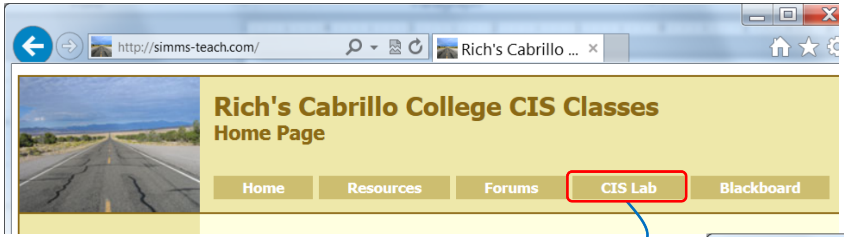
3) Change to Virtual terminal tty5



```
Linux Mint 15 Olivia p06-arwen tty5
p06-arwen login: cis90
Password:
Last login: Mon Sep 16 09:53:43 PDT 2013 from opus.cis.cabrillo.edu on pts/1
Welcome to Linux Mint 15 Olivia (GNU/Linux 3.8.0-26-generic x86_64)

Welcome to Linux Mint
 * Documentation:  http://www.linuxmint.com
cis90@p06-arwen:~ > tty
/dev/tty5
cis90@p06-arwen:~ >
```

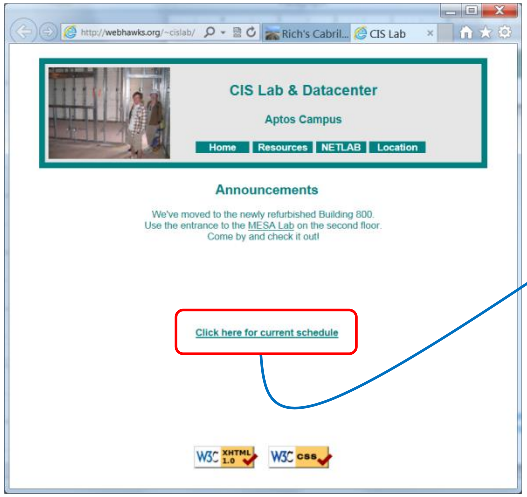
The answer is: /dev/tty5

For those who didn't submit Lab 1



Rich's Cabrillo College CIS Classes
Home Page

If you would like some help getting started, come see us in the CIS Lab.



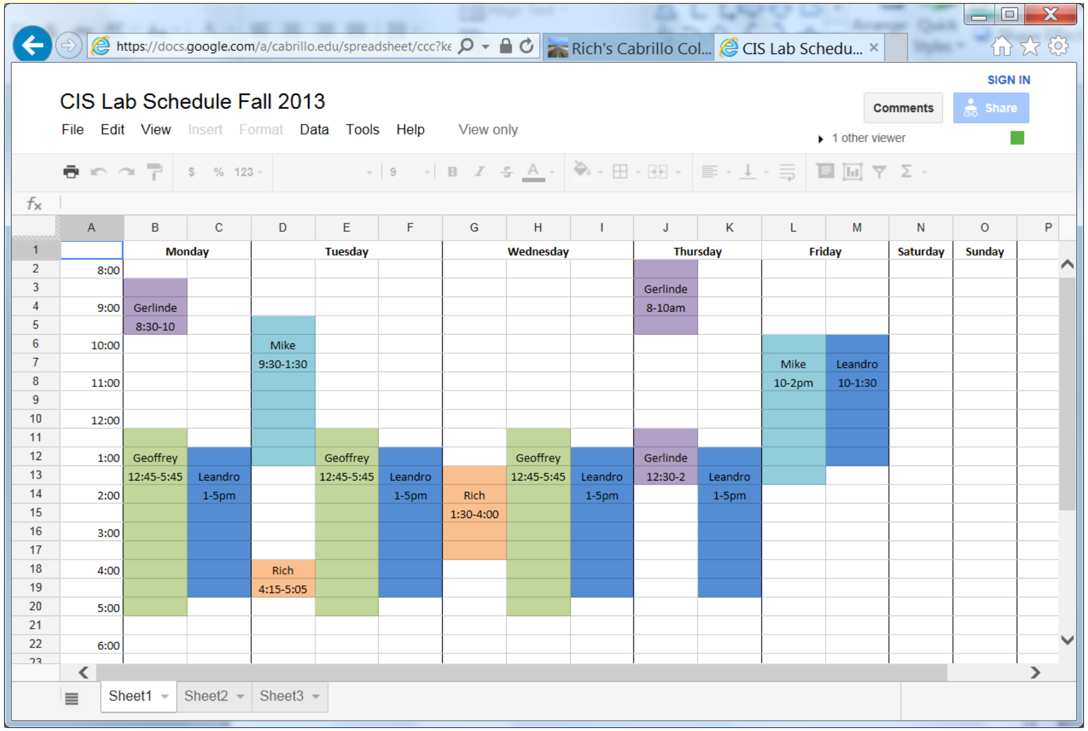
CIS Lab & Datacenter

Aptos Campus

Announcements

We've moved to the newly refurbished Building 800.
Use the entrance to the MESA Lab on the second floor.
Come by and check it out!

Click here for current schedule



CIS Lab Schedule Fall 2013

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
1		Monday			Tuesday			Wednesday		Thursday		Friday		Saturday	Sunday	
2	8:00															
3										Gerlinde						
4	9:00	Gerlinde								8-10am						
5		8:30-10														
6	10:00			Mike												
7				9:30-1:30								Mike	Leandro			
8	11:00											10-2pm	10-1:30			
9																
10	12:00															
11																
12	1:00	Geoffrey			Geoffrey			Geoffrey		Gerlinde						
13		12:45-5:45	Leandro		12:45-5:45	Leandro		12:45-5:45	Leandro	12:30-2	Leandro					
14	2:00		1-5pm			1-5pm	Rich		1-5pm		1-5pm					
15							1:30-4:00									
16	3:00															
17																
18	4:00			Rich												
19				4:15-5:05												
20	5:00															
21																
22	6:00															

Leandro and Geoffrey are both CIS 90 Alumni. Michael teaches the Linux System Administration class (CIS 191).

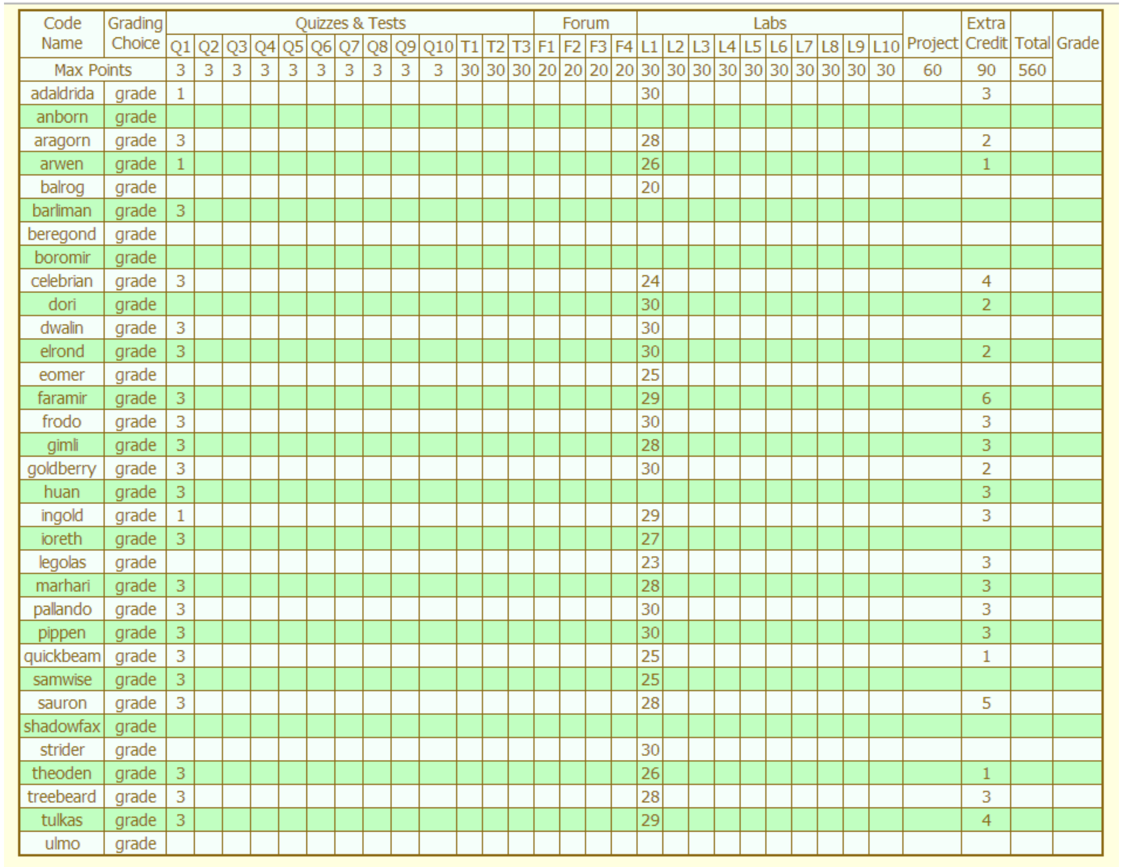
Housekeeping

Lab 2 due tonight

- Use **history -a** before using **submit.**
  - ❖ If you neglect to do this the history snapshot you send me to grade will not have the latest commands you issued.
- Submit as many times as you wish up to 11:59PM
- You can optionally use the **verify** command to see what you submitted for grading.
  - ❖ To grade, I will check your history to see if you used all the commands asked for in Lab 2 as well as your answers to the three questions.

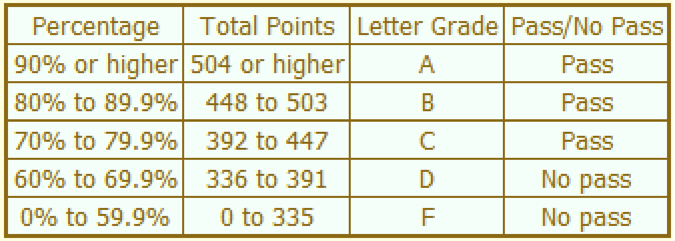
Lord of the Rings Code Names

http://simms-teach.com/cis90grades.php



Code Name	Grading Choice	Quizzes & Tests													Forum				Labs										Project	Extra Credit	Total	Grade
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	T1	T2	T3	F1	F2	F3	F4	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10				
Max Points		3	3	3	3	3	3	3	3	3	3	30	30	30	20	20	20	20	30	30	30	30	30	30	30	30	30	30	60	90	560	
adaldrida	grade	1																	30											3		
anborn	grade																															
aragorn	grade	3																	28											2		
arwen	grade	1																	26											1		
balrog	grade																		20													
barliman	grade	3																														
beregond	grade																															
boromir	grade																															
celebrian	grade	3																	24											4		
dori	grade																		30											2		
dwalin	grade	3																	30													
elrond	grade	3																	30											2		
eomer	grade																		25													
faramir	grade	3																	29											6		
frodo	grade	3																	30											3		
gimli	grade	3																	28											3		
goldberry	grade	3																	30											2		
huan	grade	3																												3		
ingold	grade	1																	29											3		
ioreth	grade	3																	27													
legolas	grade																		23											3		
marhari	grade	3																	28											3		
pallando	grade	3																	30											3		
pippen	grade	3																	30											3		
quickbeam	grade	3																	25											1		
samwise	grade	3																	25													
sauron	grade	3																	28											5		
shadowfax	grade																															
strider	grade																		30													
theoden	grade	3																	26											1		
treebeard	grade	3																	28											3		
tulkas	grade	3																	29											4		
ulmo	grade																															

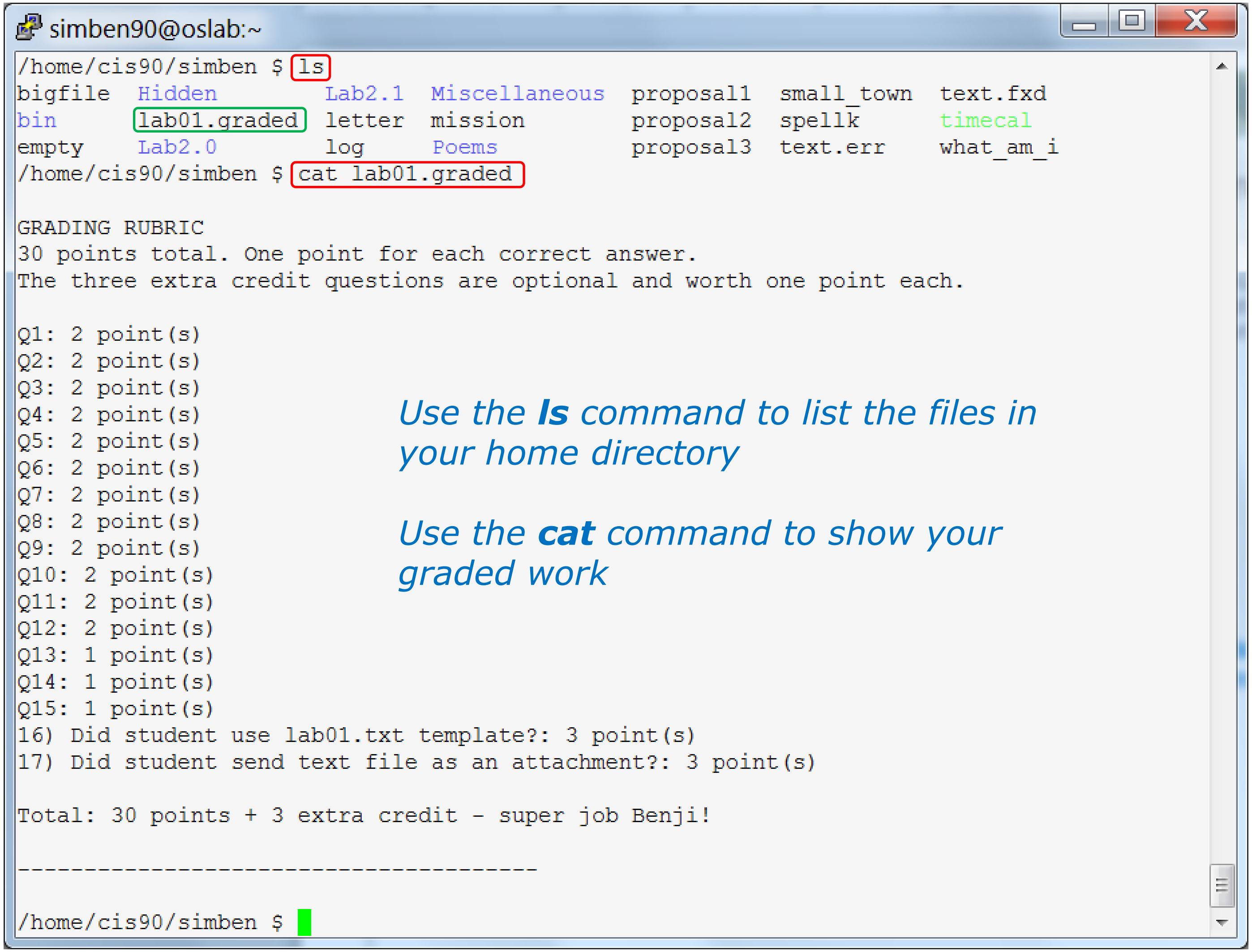
Your grade code names are now available. Send me your survey to get your code name.



Percentage	Total Points	Letter Grade	Pass/No Pass
90% or higher	504 or higher	A	Pass
80% to 89.9%	448 to 503	B	Pass
70% to 79.9%	392 to 447	C	Pass
60% to 69.9%	336 to 391	D	No pass
0% to 59.9%	0 to 335	F	No pass

Review your graded lab work

ls
cat lab01.graded



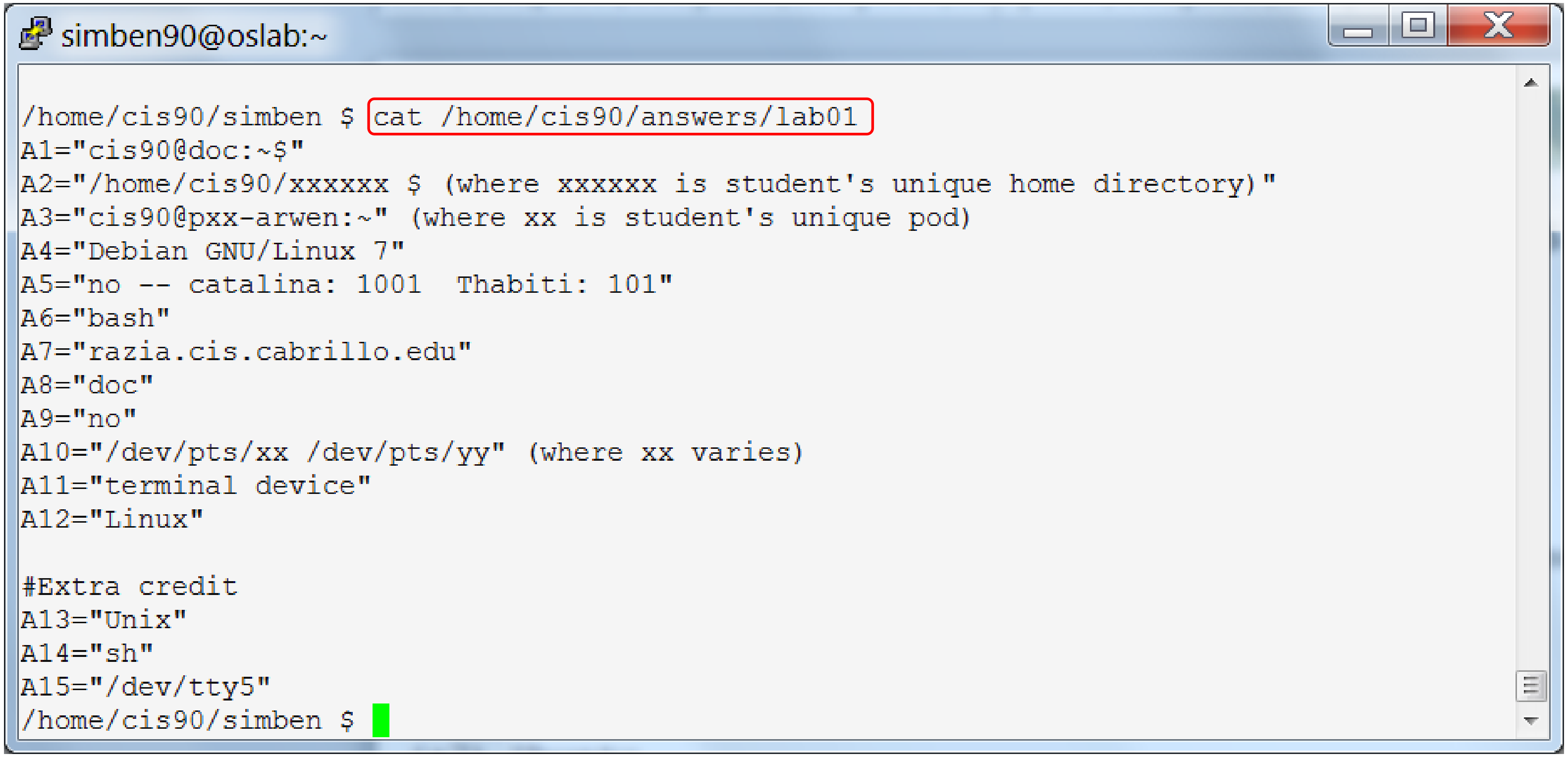
```
/home/cis90/simben $ ls
bigfile  Hidden        Lab2.1  Miscellaneous  proposal1  small_town  text.fxd
bin      lab01.graded  letter  mission        proposal2  spellk      timecal
empty    Lab2.0        log     Poems          proposal3  text.err    what_am_i
/home/cis90/simben $ cat lab01.graded

GRADING RUBRIC
30 points total. One point for each correct answer.
The three extra credit questions are optional and worth one point each.

Q1: 2 point(s)
Q2: 2 point(s)
Q3: 2 point(s)
Q4: 2 point(s)
Q5: 2 point(s)
Q6: 2 point(s)
Q7: 2 point(s)
Q8: 2 point(s)
Q9: 2 point(s)
Q10: 2 point(s)
Q11: 2 point(s)
Q12: 2 point(s)
Q13: 1 point(s)
Q14: 1 point(s)
Q15: 1 point(s)
16) Did student use lab01.txt template?: 3 point(s)
17) Did student send text file as an attachment?: 3 point(s)

Total: 30 points + 3 extra credit - super job Benji!

---------------------------------------

/home/cis90/simben $
```

*Use the **ls** command to list the files in your home directory*

*Use the **cat** command to show your graded work*

Review the correct answers for a lab

`cat /home/cis90/answers/lab01`

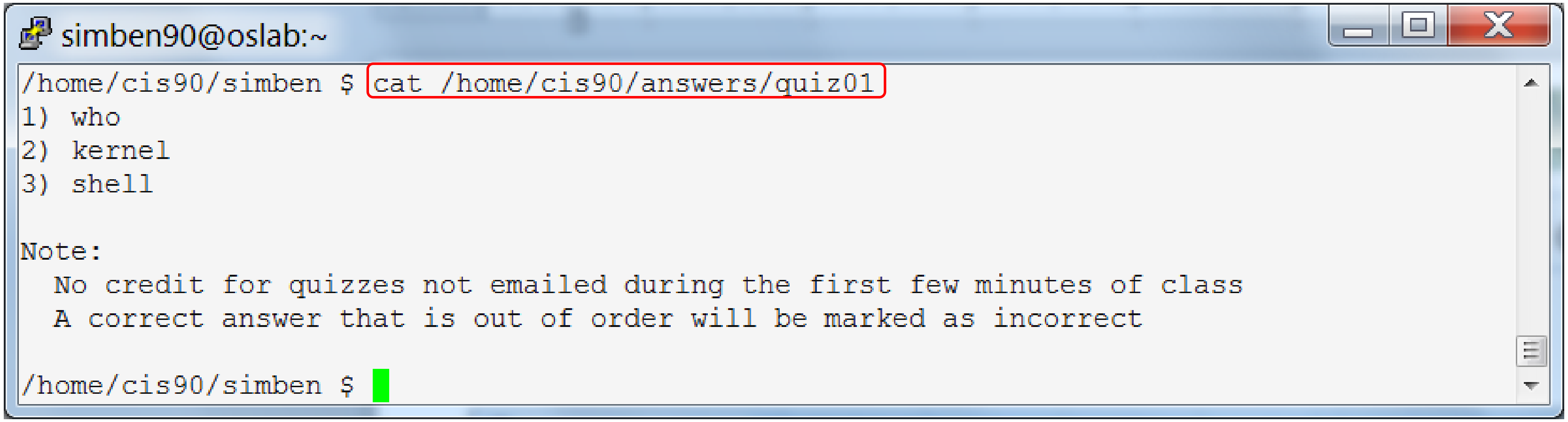


```
/home/cis90/simben $ cat /home/cis90/answers/lab01
A1="cis90@doc:~$"
A2="/home/cis90/xxxxxx $ (where xxxxxx is student's unique home directory)"
A3="cis90@pxx-arwen:~" (where xx is student's unique pod)
A4="Debian GNU/Linux 7"
A5="no -- catalina: 1001  Thabiti: 101"
A6="bash"
A7="razia.cis.cabrillo.edu"
A8="doc"
A9="no"
A10="/dev/pts/xx /dev/pts/yy" (where xx varies)
A11="terminal device"
A12="Linux"

#Extra credit
A13="Unix"
A14="sh"
A15="/dev/tty5"
/home/cis90/simben $
```

The answers to quizzes, tests and labs will be posted to the /home/cis90/answers directory after the due date has passed.

Review the correct answers for a quiz

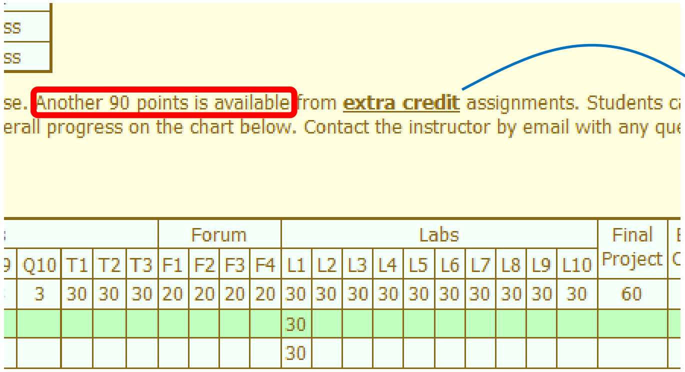
`cat /home/cis90/answers/quiz01`



```
/home/cis90/simben $ cat /home/cis90/answers/quiz01
1) who
2) kernel
3) shell

Note:
  No credit for quizzes not emailed during the first few minutes of class
  A correct answer that is out of order will be marked as incorrect

/home/cis90/simben $
```

The answers to quizzes, tests and labs will be posted to the /home/cis90/answers directory after the due date has passed.

Extra Credit

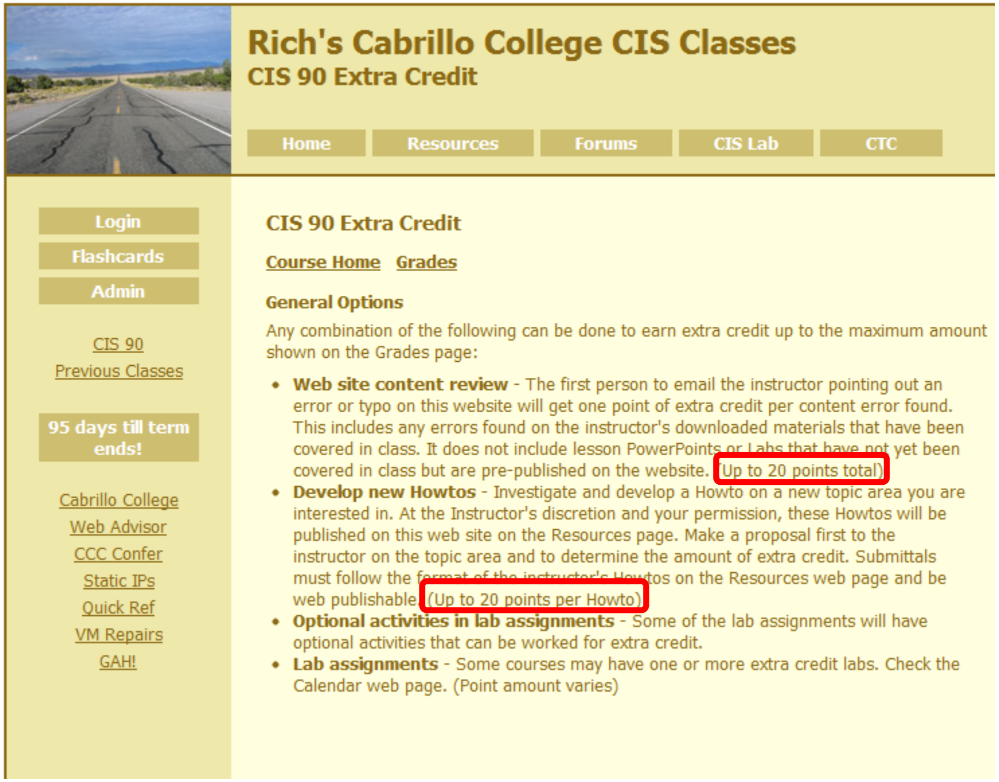


ss
ss

se. Another 90 points is available from **extra credit** assignments. Students c
erall progress on the chart below. Contact the instructor by email with any que

:					Forum				Labs										Final	E
9	Q10	T1	T2	T3	F1	F2	F3	F4	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10	Project	C
	3	30	30	30	20	20	20	20	30	30	30	30	30	30	30	30	30	30	60	
									30											
									30											

Note the caps on extra credit.



Rich's Cabrillo College CIS Classes
CIS 90 Extra Credit

CIS 90 Extra Credit

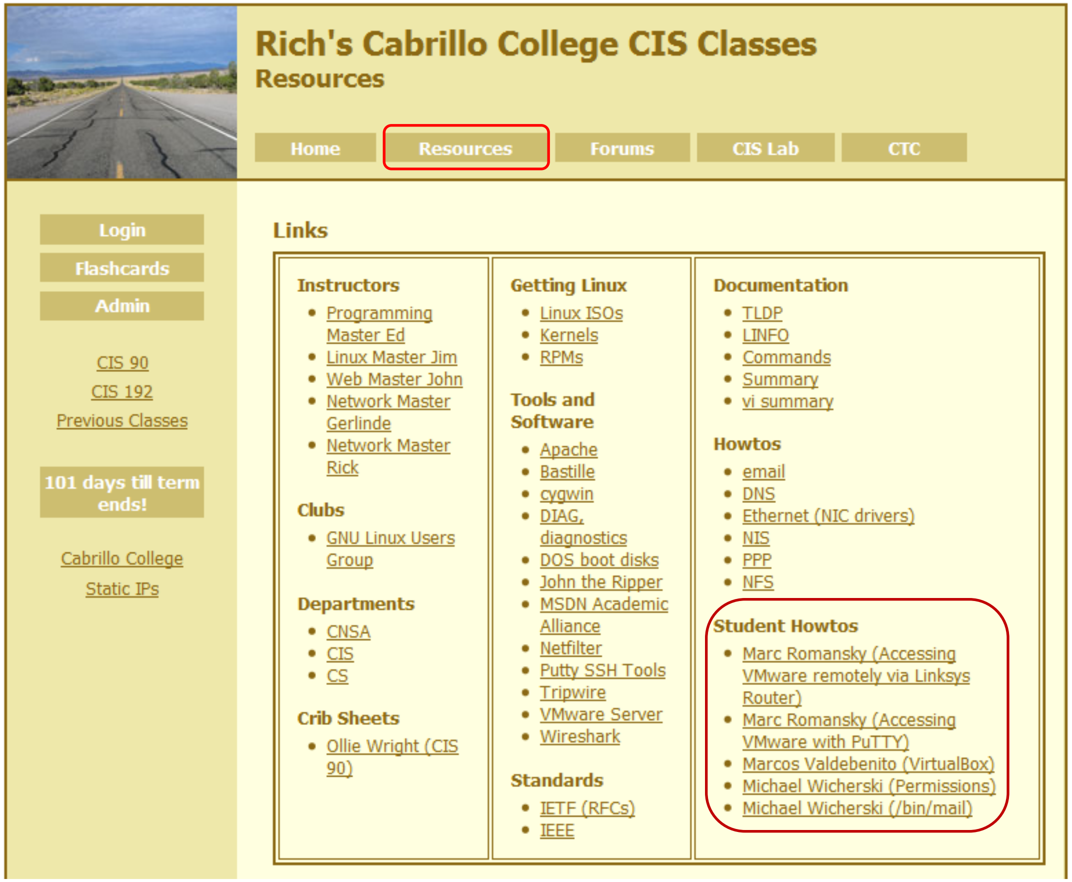
Course Home Grades

General Options

Any combination of the following can be done to earn extra credit up to the maximum amount shown on the Grades page:

- **Web site content review** - The first person to email the instructor pointing out an error or typo on this website will get one point of extra credit per content error found. This includes any errors found on the instructor's downloaded materials that have been covered in class. It does not include lesson PowerPoints or Labs that have not yet been covered in class but are pre-published on the website. (Up to 20 points total)
- **Develop new Howtos** - Investigate and develop a Howto on a new topic area you are interested in. At the Instructor's discretion and your permission, these Howtos will be published on this web site on the Resources page. Make a proposal first to the instructor on the topic area and to determine the amount of extra credit. Submittals must follow the format of the instructor's Howtos on the Resources web page and be web publishable. (Up to 20 points per Howto)
- **Optional activities in lab assignments** - Some of the lab assignments will have optional activities that can be worked for extra credit.
- **Lab assignments** - Some courses may have one or more extra credit labs. Check the Calendar web page. (Point amount varies)

Extra Credit Howtos



Rich's Cabrillo College CIS Classes
Resources

CIS 90
CIS 192
Previous Classes

101 days till term ends!

Cabrillo College
Static IPs

Links

Instructors
- Programming Master Ed
- Linux Master Jim
- Web Master John
- Network Master Gerlinde
- Network Master Rick

Clubs
- GNU Linux Users Group

Departments
- CNSA
- CIS
- CS

Crib Sheets
- Ollie Wright (CIS 90)

Getting Linux
- Linux ISOs
- Kernels
- RPMs

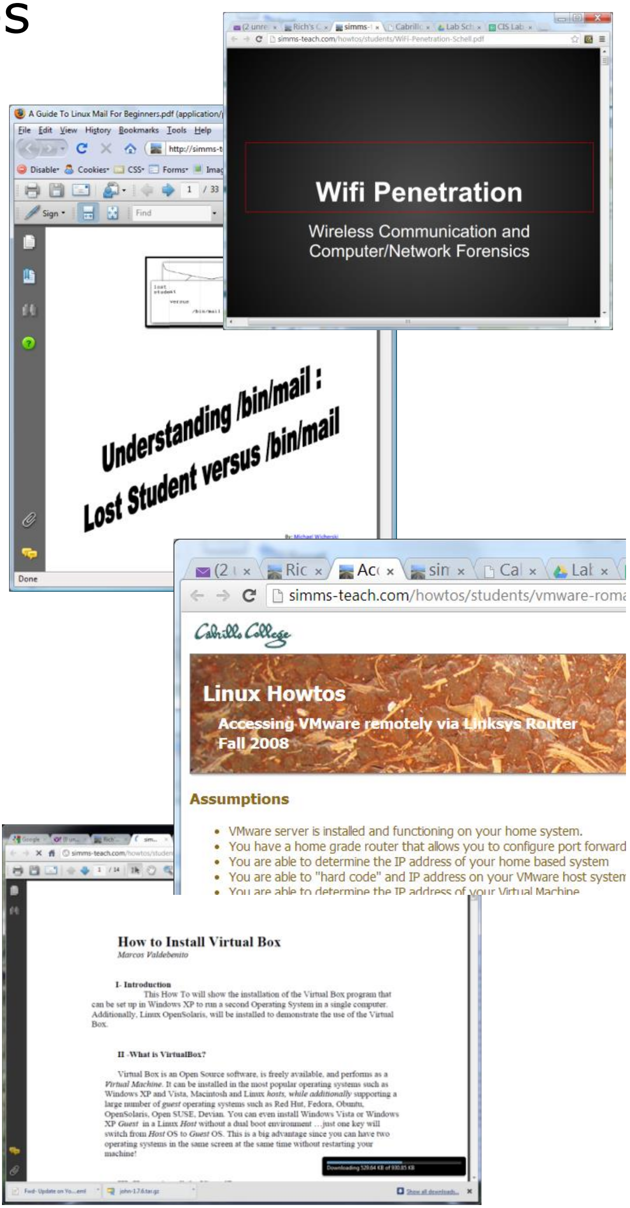
Tools and Software
- Apache
- Bastille
- cygwin
- DIAG, diagnostics
- DOS boot disks
- John the Ripper
- MSDN Academic Alliance
- Netfilter
- Putty SSH Tools
- Tripwire
- VMware Server
- Wireshark

Standards
- IETF (RFCs)
- IEEE

Documentation
- TLDP
- LINFO
- Commands
- Summary
- vi summary

Howtos
- email
- DNS
- Ethernet (NIC drivers)
- NIS
- PPP
- NFS

Student Howtos
- Marc Romansky (Accessing VMware remotely via Linksys Router)
- Marc Romansky (Accessing VMware with PuTTY)
- Marcos Valdebenito (VirtualBox)
- Michael Wicherski (Permissions)
- Michael Wicherski (/bin/mail)



simms-teach.com/howtos/students/WiFi-Penetration-Schell.pdf

Wifi Penetration

Wireless Communication and Computer/Network Forensics

A Guide To Linux Mail For Beginners.pdf

Understanding /bin/mail : Lost Student versus /bin/mail

By: Michael Wicherski

simms-teach.com/howtos/students/vmware-roma

Linux Howtos

Accessing VMware remotely via Linksys Router
Fall 2008

Assumptions

- VMware server is installed and functioning on your home system.
- You have a home grade router that allows you to configure port forward
- You are able to determine the IP address of your home based system
- You are able to "hard code" and IP address on your VMware host system
- You are able to determine the IP address of your Virtual Machine

How to Install Virtual Box
Marcos Valdebenito

I- Introduction

This How To will show the installation of the Virtual Box program that can be set up in Windows XP to run a second Operating System in a single computer. Additionally, Linux OpenSolaris, will be installed to demonstrate the use of the Virtual Box.

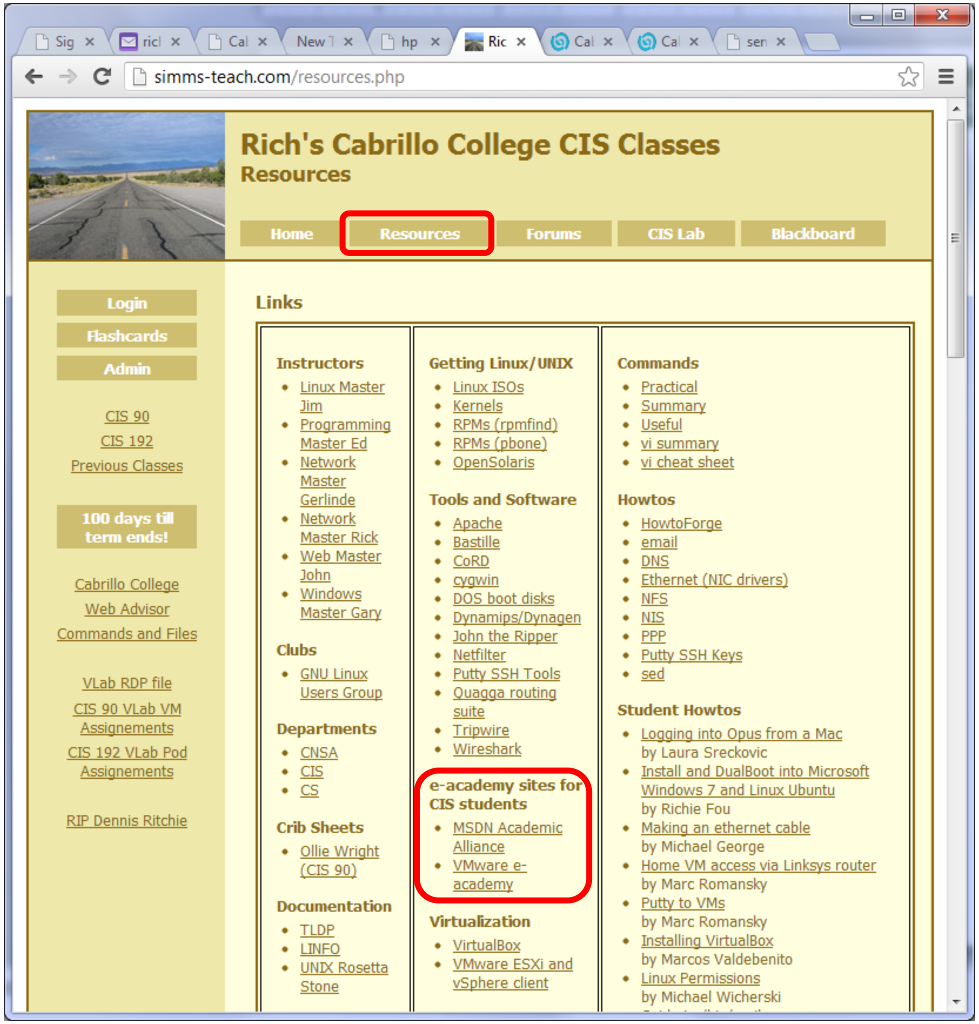
II -What is VirtualBox?

Virtual Box is an Open Source software, is freely available, and performs as a *Virtual Machine*. It can be installed in the most popular operating systems such as Windows XP and Vista, Macintosh and Linux *hosts, while additionally* supporting a large number of *guest* operating systems such as Red Hut, Fedora, Obuntu, OpenSolaris, Open SUSE, Devian. You can even install Windows Vista or Windows XP *Guest* in a Linux *Host* without a dual boot environment …just one key will switch from *Host* OS to *Guest* OS. This is a big advantage since you can have two operating systems in the same screen at the same time without restarting your machine!

Downloading 529.64 KB of 930.85 KB

If you have a strong interest in a topic write a Howto on it to share what you've learned and earn some extra credit at the same time

Software for CIS students



Rich's Cabrillo College CIS Classes

Resources

Home | Resources | Forums | CIS Lab | Blackboard

Login
Flashcards
Admin

CIS 90
CIS 192
Previous Classes

100 days till term ends!

Cabrillo College
Web Advisor
Commands and Files

VLab RDP file
CIS 90 VLab VM Assignments
CIS 192 VLab Pod Assignments

RIP Dennis Ritchie

Links

Instructors
- Linux Master Jim
- Programming Master Ed
- Network Master Gerlinde
- Network Master Rick
- Web Master John
- Windows Master Gary

Clubs
- GNU Linux Users Group

Departments
- CNSA
- CIS
- CS

Crib Sheets
- Ollie Wright (CIS 90)

Documentation
- TLDP
- LINFO
- UNIX Rosetta Stone

Getting Linux/UNIX
- Linux ISOs
- Kernels
- RPMs (rpmfind)
- RPMs (pbone)
- OpenSolaris

Tools and Software
- Apache
- Bastille
- CoRD
- cygwin
- DOS boot disks
- Dynamips/Dynagen
- John the Ripper
- Netfilter
- Putty SSH Tools
- Quagga routing suite
- Tripwire
- Wireshark

e-academy sites for CIS students
- MSDN Academic Alliance
- VMware e-academy

Virtualization
- VirtualBox
- VMware ESXi and vSphere client

Commands
- Practical
- Summary
- Useful
- vi summary
- vi cheat sheet

Howtos
- HowtoForge
- email
- DNS
- Ethernet (NIC drivers)
- NFS
- NIS
- PPP
- Putty SSH Keys
- sed

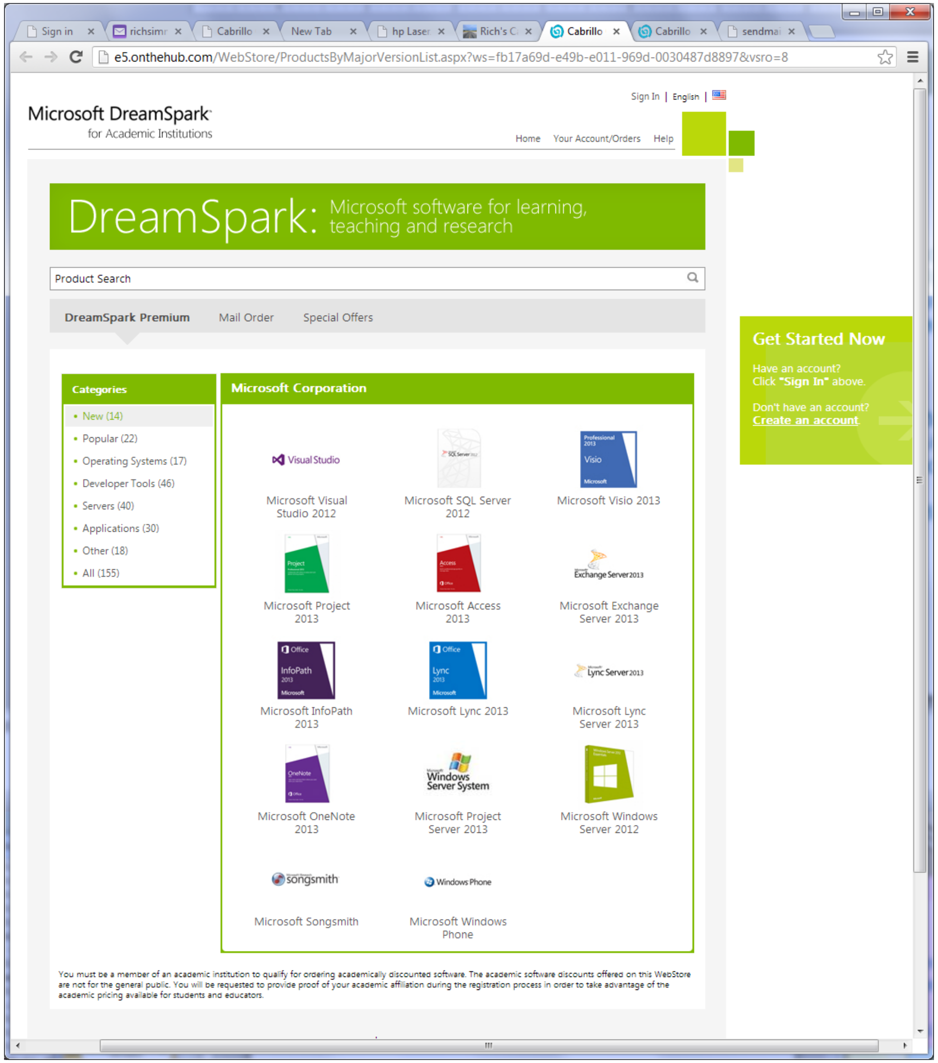
Student Howtos
- Logging into Opus from a Mac by Laura Sreckovic
- Install and DualBoot into Microsoft Windows 7 and Linux Ubuntu by Richie Fou
- Making an ethernet cable by Michael George
- Home VM access via Linksys router by Marc Romansky
- Putty to VMs by Marc Romansky
- Installing VirtualBox by Marcos Valdebenito
- Linux Permissions by Michael Wicherski

Microsoft

How to obtain Microsoft and VMware software for academic use

vmware

MSDN for CIS Students



e5.onthehub.com/WebStore/ProductsByMajorVersionList.aspx?ws=fb17a69d-e49b-e011-969d-0030487d8897&vsro=8

Microsoft DreamSpark
for Academic Institutions

DreamSpark: Microsoft software for learning, teaching and research

Get Started Now

Have an account?
Click "**Sign In**" above.

Don't have an account?
Create an account

Categories

- New (14)
- Popular (22)
- Operating Systems (17)
- Developer Tools (46)
- Servers (40)
- Applications (30)
- Other (18)
- All (155)

Microsoft Corporation

Microsoft Visual Studio 2012	Microsoft SQL Server 2012	Microsoft Visio 2013
Microsoft Project 2013	Microsoft Access 2013	Microsoft Exchange Server 2013
Microsoft InfoPath 2013	Microsoft Lync 2013	Microsoft Lync Server 2013
Microsoft OneNote 2013	Microsoft Project Server 2013	Microsoft Windows Server 2012
Microsoft Songsmith	Microsoft Windows Phone	

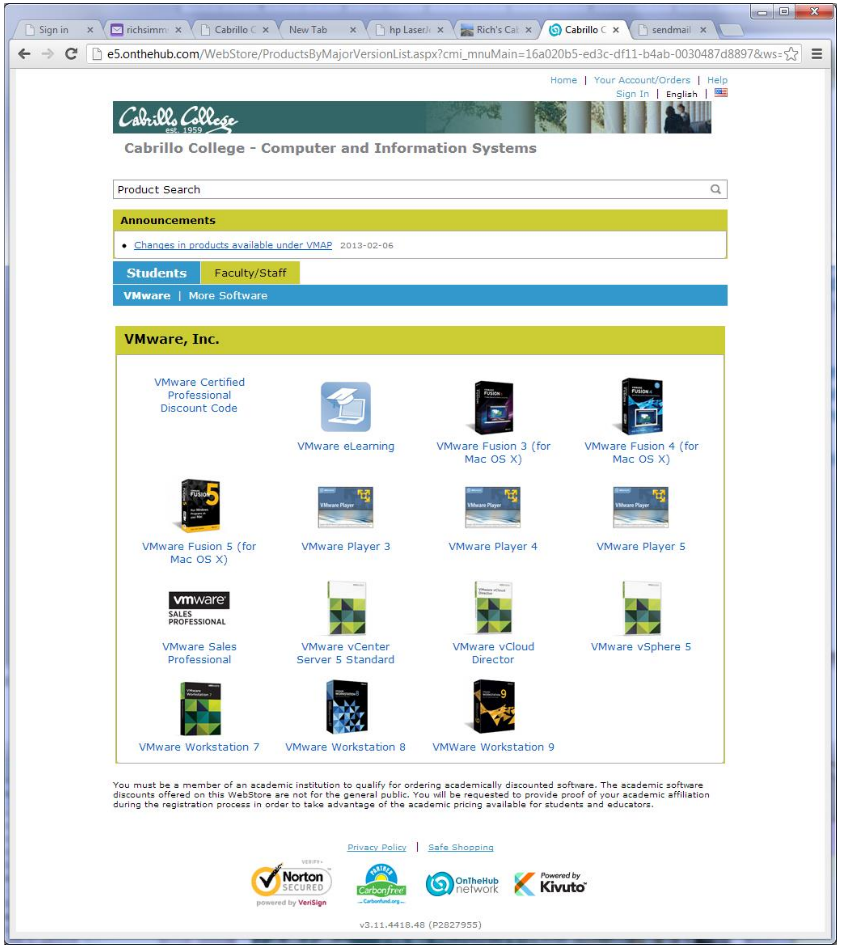
You must be a member of an academic institution to qualify for ordering academically discounted software. The academic software discounts offered on this WebStore are not for the general public. You will be requested to provide proof of your academic affiliation during the registration process in order to take advantage of the academic pricing available for students and educators.

Accounts for students enrolled in CIS 90 have been created using your WebAdvisor email addresses.

Link is on website Resources page in Tools and Software section

Happy downloading!

VMware Software for CIS Students



e5.onthehub.com/WebStore/ProductsByMajorVersionList.aspx?cmi_mnuMain=16a020b5-ed3c-df11-b4ab-0030487d8897&ws=

Cabrillo College - Computer and Information Systems

Announcements

- Changes in products available under VMAP 2013-02-06

VMware, Inc.

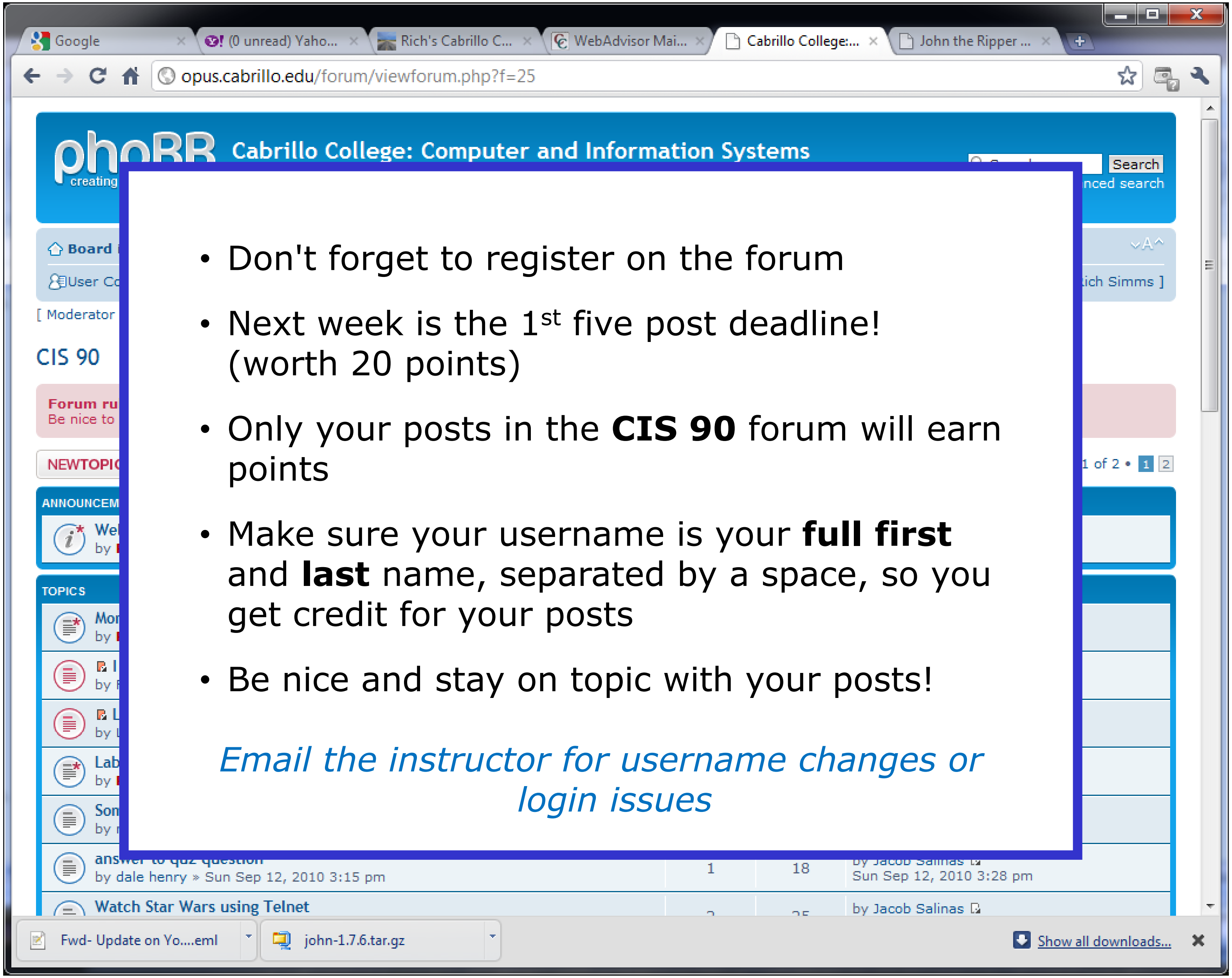
You must be a member of an academic institution to qualify for ordering academically discounted software. The academic software discounts offered on this WebStore are not for the general public. You will be requested to provide proof of your academic affiliation during the registration process in order to take advantage of the academic pricing available for students and educators.

v3.11.4418.48 (P2827955)

Accounts for students enrolled in CIS 90 have been created using your WebAdvisor email addresses.

Link is on website Resources page in Tools and Software section

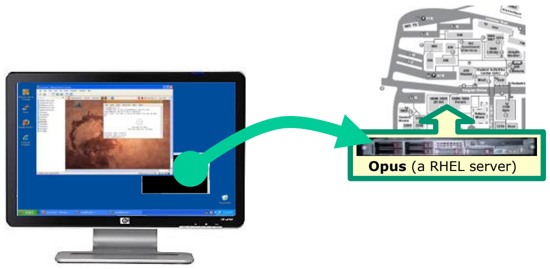
Happy downloading!



- Don't forget to register on the forum
- Next week is the 1st five post deadline! (worth 20 points)
- Only your posts in the **CIS 90** forum will earn points
- Make sure your username is your **full first** and **last** name, separated by a space, so you get credit for your posts
- Be nice and stay on topic with your posts!

Email the instructor for username changes or login issues

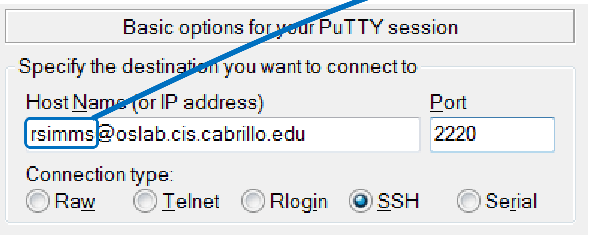
Subtle Stuff



Putty to:

rsimms@oslab.cis.cabrillo.edu

vs ***oslab.cis.cabrillo.edu***



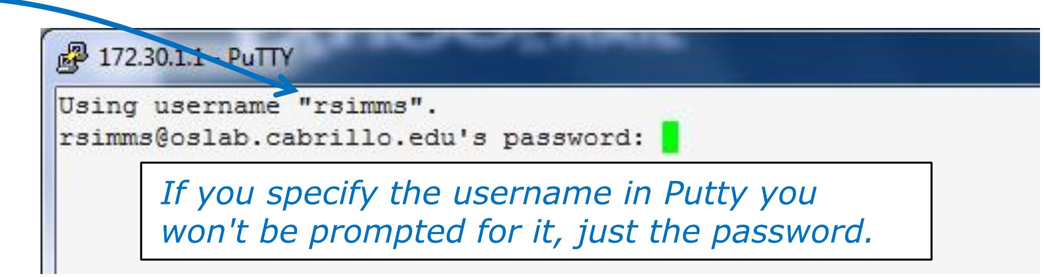
Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address): rsimms@oslab.cis.cabrillo.edu

Port: 2220

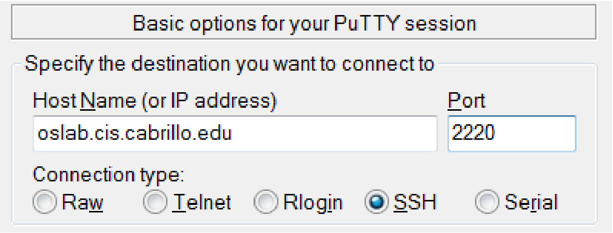
Connection type:
○ Raw ○ Telnet ○ Rlogin ● SSH ○ Serial



172.30.1.1 - PuTTY

```
Using username "rsimms".
rsimms@oslab.cabrillo.edu's password: █
```

If you specify the username in Putty you won't be prompted for it, just the password.



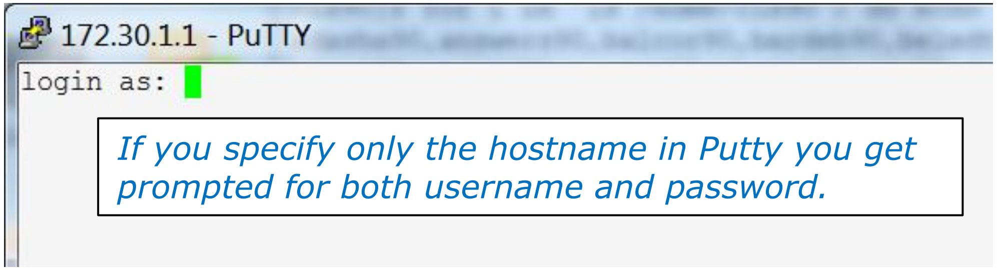
Basic options for your PuTTY session

Specify the destination you want to connect to

Host Name (or IP address): oslab.cis.cabrillo.edu

Port: 2220

Connection type:
○ Raw ○ Telnet ○ Rlogin ● SSH ○ Serial

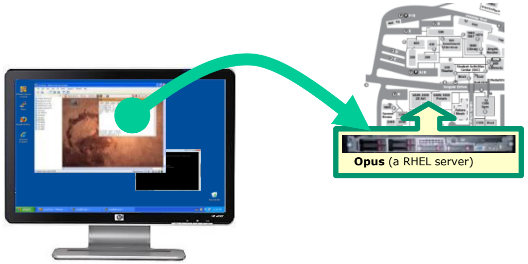


172.30.1.1 - PuTTY

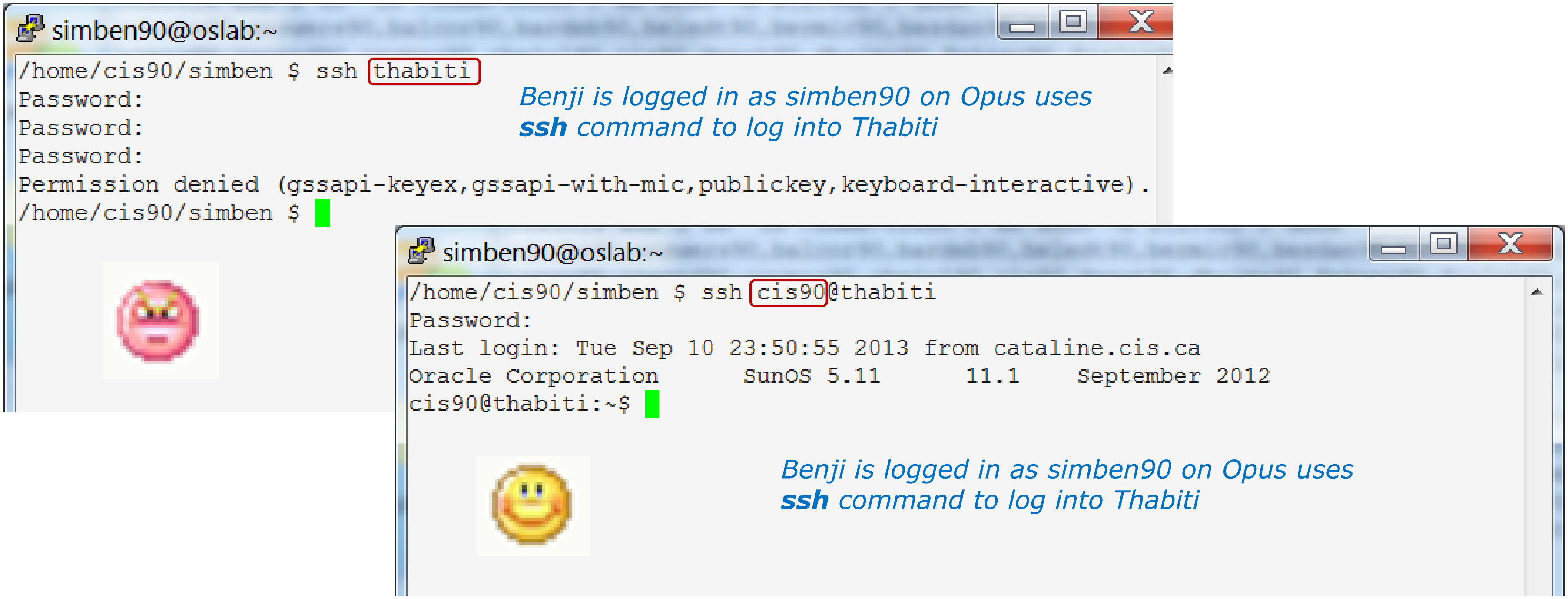
```
login as: █
```

If you specify only the hostname in Putty you get prompted for both username and password.

Tip: Use the Putty “Saved Sessions” for your Opus connection. Then you don’t have to type in the username, hostname and port number each time you connect to Opus.



ssh thabiti *vs* ***ssh cis90@thabiti***



```
/home/cis90/simben $ ssh thabiti
Password:
Password:
Password:
Permission denied (gssapi-keyex,gssapi-with-mic,publickey,keyboard-interactive).
/home/cis90/simben $
```

*Benji is logged in as simben90 on Opus uses **ssh** command to log into Thabiti*

```
/home/cis90/simben $ ssh cis90@thabiti
Password:
Last login: Tue Sep 10 23:50:55 2013 from cataline.cis.ca
Oracle Corporation      SunOS 5.11      11.1    September 2012
cis90@thabiti:~$
```

*Benji is logged in as simben90 on Opus uses **ssh** command to log into Thabiti*

*If you don't specify the username on the **ssh** command it will use the username you are currently logged in as. This account may not exist on the remote system!*

type and man caveats

Usually, to find the location of a command on your path, use the **type** command:

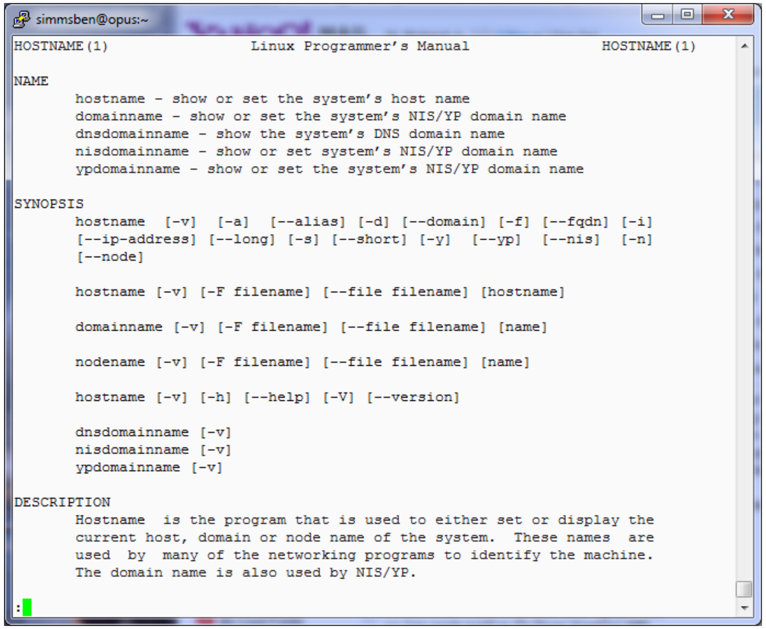
```
/home/cis90/simben $ type hostname
hostname is /bin/hostname
```

The hostname program file is in the /bin directory

type and man caveats

Usually, to find the manual page for a command, use the **man** command:

```
/home/cis90/simben $ man hostname
```



```
HOSTNAME(1)                   Linux Programmer's Manual                   HOSTNAME(1)

NAME
       hostname - show or set the system's host name
       domainname - show or set the system's NIS/YP domain name
       dnsdomainname - show the system's DNS domain name
       nisdomainname - show or set system's NIS/YP domain name
       ypdomainname - show or set the system's NIS/YP domain name

SYNOPSIS
       hostname  [-v]  [-a]  [--alias] [-d] [--domain] [-f] [--fqdn] [-i]
       [--ip-address] [--long] [-s] [--short] [-y]  [--yp]  [--nis]  [-n]
       [--node]

       hostname [-v] [-F filename] [--file filename] [hostname]

       domainname [-v] [-F filename] [--file filename] [name]

       nodename [-v] [-F filename] [--file filename] [name]

       hostname [-v] [-h] [--help] [-V] [--version]

       dnsdomainname [-v]
       nisdomainname [-v]
       ypdomainname [-v]

DESCRIPTION
       Hostname  is the program that is used to either set or display the
       current host, domain or node name of the system.  These names  are
       used  by  many of the networking programs to identify the machine.
       The domain name is also used by NIS/YP.

:
```

Command Review

However,

*sometimes you may get something different than expected with the **type** and **man** commands*

type and man caveats

```
/home/cis90/simmsben $ type ls
ls is aliased to `ls --color=tty‘
```

Note, using type on ls, without the -a option, will not display the location of the ls program file on the path!

```
/home/cis90/simmsben $ type -a ls
ls is aliased to `ls --color=tty'
ls is /bin/ls
```

The ls program file resides in the /bin directory

To see the location on the path use the -a option

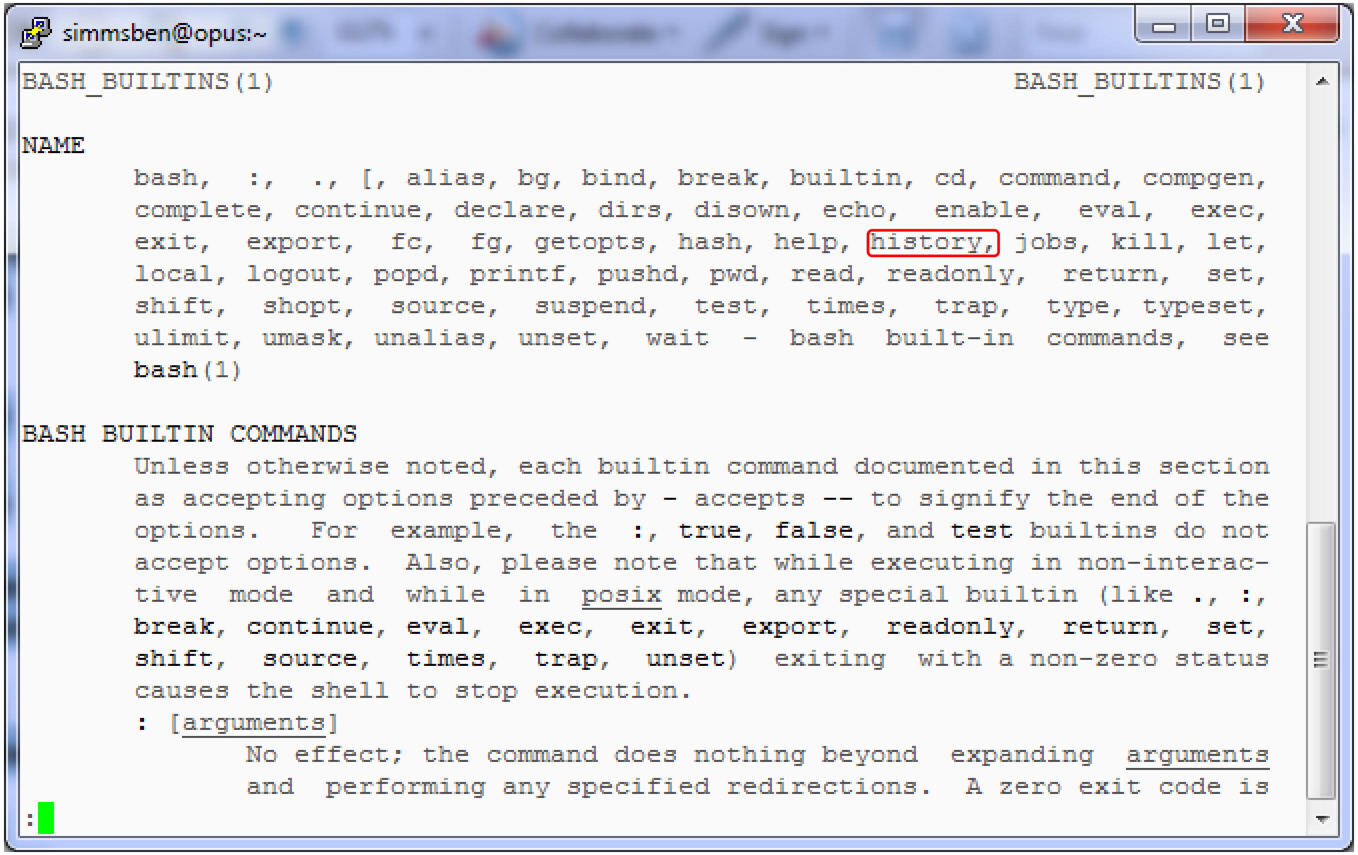
*The **ls** command is aliased, use the **-a** option on the **type** command to find where the command resides on the path*

type and man caveats

```
/home/cis90/simben $ type history
history is a shell builtin
```

*The **history** command is built into the shell and does not have its own program file*

```
/home/cis90/simben $ man history
```



```
BASH_BUILTINS(1)                                              BASH_BUILTINS(1)

NAME
       bash,  :,  .,  [, alias, bg, bind, break, builtin, cd, command, compgen,
       complete, continue, declare, dirs, disown, echo,  enable,  eval,  exec,
       exit,  export,  fc,  fg, getopts, hash, help, history, jobs, kill, let,
       local, logout, popd, printf, pushd, pwd, read, readonly,  return,  set,
       shift,  shopt,  source,  suspend,  test,  times,  trap,  type, typeset,
       ulimit, umask, unalias, unset,  wait  -  bash  built-in  commands,  see
       bash(1)

BASH BUILTIN COMMANDS
       Unless otherwise noted, each builtin command documented in this section
       as accepting options preceded by - accepts -- to signify the end of the
       options.   For  example,  the  :, true, false, and test builtins do not
       accept options.  Also, please note that while executing in non-interac-
       tive  mode  and  while  in  posix mode, any special builtin (like ., :,
       break, continue, eval,  exec,  exit,  export,  readonly,  return,  set,
       shift,  source,  times,  trap,  unset)  exiting  with a non-zero status
       causes the shell to stop execution.
       : [arguments]
              No effect; the command does nothing beyond  expanding  arguments
              and  performing any specified redirections.  A zero exit code is
:
```

*The **history** command does not have its own man page either!*

... but it is included in the man page for bash builtins

Mini Review

Expectation Check

Commands you should understand and be comfortable using

Lesson/Lab 1		Lesson/Lab 2	
Commands	Files & Directories	Commands	Files & Directories
cal	/etc/issue	apropos	/bin
clear	/etc/*-release	banner	/usr/bin
date		bash	/sbin
exit		bc	/usr/sbin
history		cat	/etc/passwd
hostname		cd	/etc/shadow
id		echo	
ps		env	
ssh		file	
uname		finger	
tty		info	
who		file	
who am i		ls	
		passwd	
		set	
		type	
		man	
		whatis	

If you have any questions on these commands, ask your instructor or post a question on the forum!

Expectation Check
Skills you should be comfortable performing

- Navigating the course website: simms-teach.com
- Entering the CCC Confer Virtual Classroom
- Reviewing Lesson video archives
- Downloading and searching lessons PDFs
- Checking your current grade status
- Checking when assignments are due
- Checking when quizzes and tests will be held
- Checking your graded labs against correct answers

- Logging into Opus from home or school using SSH
- Logging into Arwen or other VMs from Opus using SSH
- Using Arwen's graphical desktop via VLab
- Changing Virtual (TTY) Terminals on Arwen

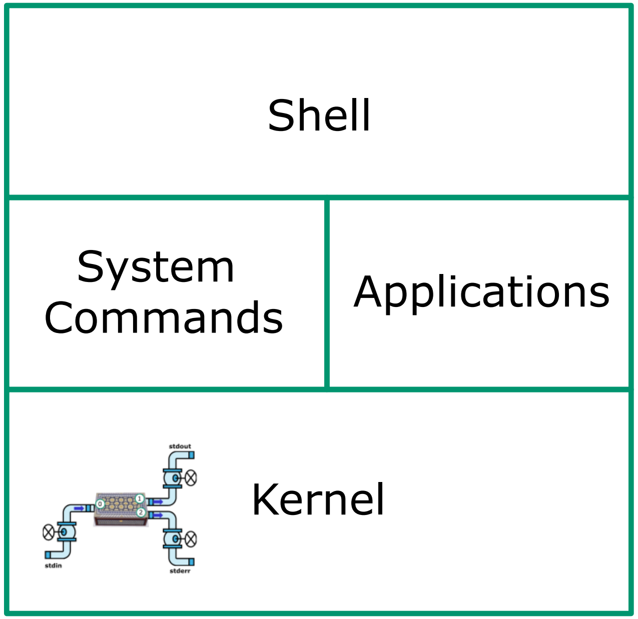
- Parsing any shell command
- Getting documentation on any command
- Identify the four key components of the UNIX/Linux architecture
- Identify the six steps the shell does for every command
- Temporarily change your shell prompt
- Set and show values of shell variables

If you have any questions on these skills, ask your instructor or post a question on the forum!

Key components of the Linux/UNIX architecture

Users interact with the shell to run commands

Commands such as ls, cal, date, tty, id, who, etc.



Shell

System Commands

Applications

Kernel

Web servers, file servers, word processors, etc.

The kernel manages processes, memory, file system, and the network stack and interacts with all the hardware components

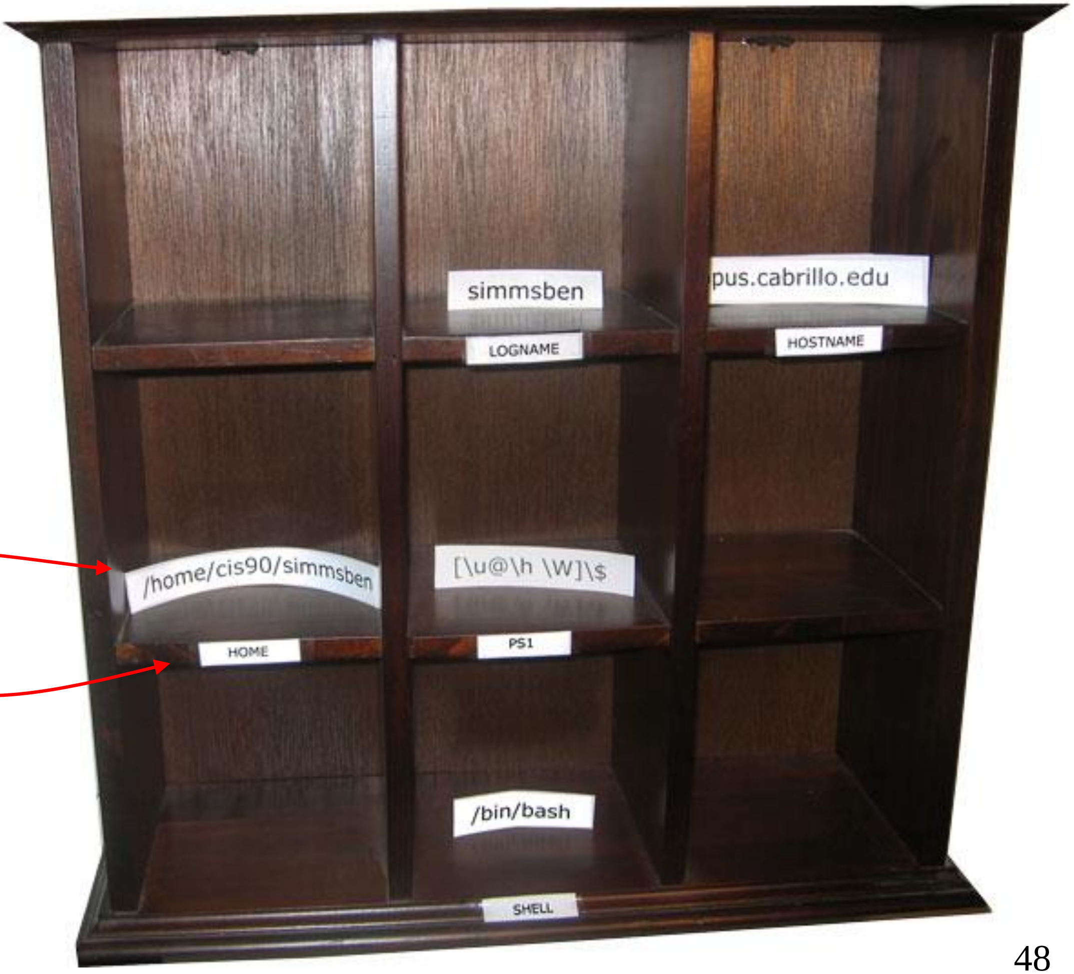
Environment Variables

Names and Values

Use $ for the "value" of a variable

Analogy: Each variable is a named location. The contents of any location is the "value" of that variable.

```
$ echo $LOGNAME
simmsben

$ echo HOME
HOME

$ echo $HOME
/home/cis90/simmsben

$ echo $SHELL
/bin/bash

$ echo $HOSTNAME
opus.cabrillo.edu
```



Variable Names and Values

Analogy: knobs and settings

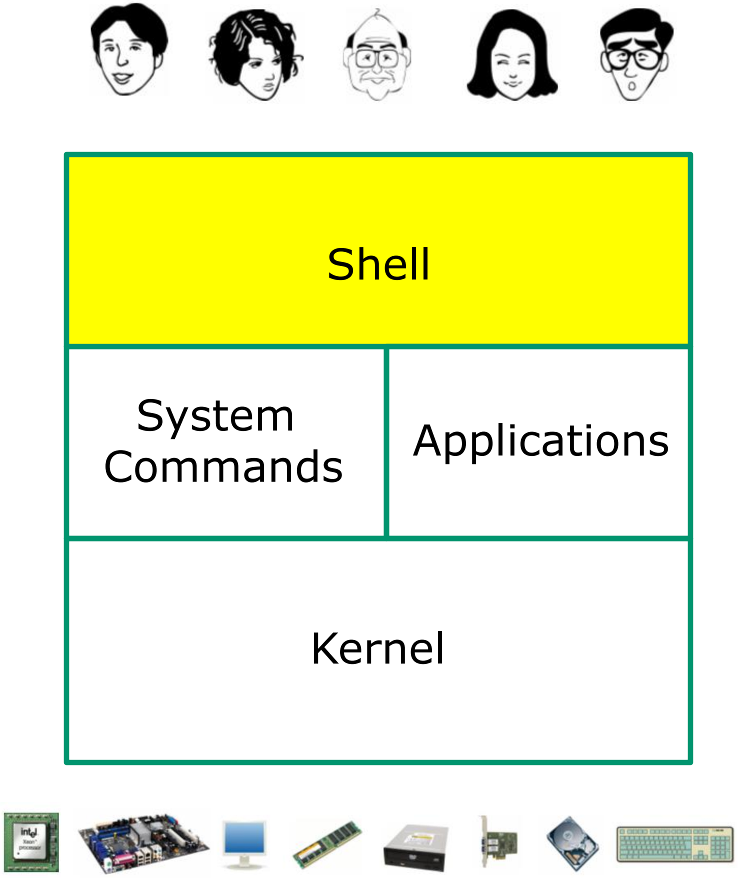
Users can create their own variables, lets make a new one called FAN

```
$ echo $FAN

$ FAN=HI
$ echo $FAN
HI
$ echo "The fan is set to: " $FAN
The fan is set to:  HI
$ FAN=LO
$ echo "The fan is set to: " $FAN
The fan is set to:  LO
```

Shell

review

The Shell



Shell

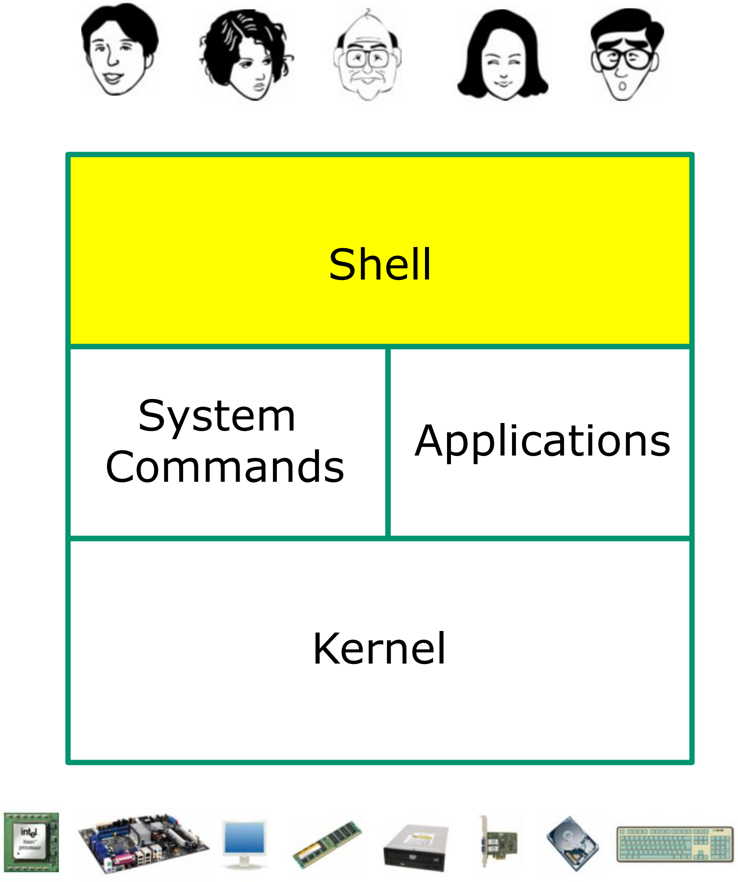
System Commands

Applications

Kernel

- Allows users to interact with the computer via a "**command line**".
- **Prompts** for a command, parses the command, finds the right program and gets that program executed.
- Is called a "**shell**" because it hides the underlying operating system.
- Multiple shell programs are available: **sh** (Bourne shell), **bash** ("bourne-again" shell), **csh** (C shell), **ksh** (Korn shell).
- The shell is a **user interface** and a **programming language** (scripts).
- GNOME and KDE desktops could be called **graphical shells**

The six steps of the Shell

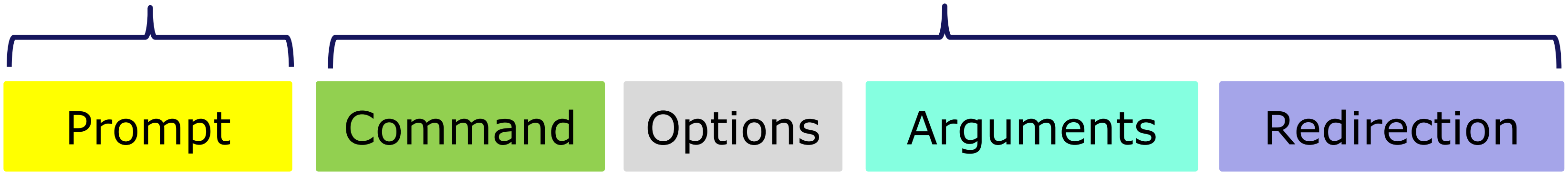


1) Prompt
2) Parse
3) Search
4) Execute
5) Nap
6) Repeat

Command Syntax

Shell prints this to prompt user to enter a command

Shell parses this command line



***Options** modify the behavior of the command*

Examples

```
/home/cis90/simben $
/home/cis90/simben $ ls
/home/cis90/simben $ ls -l
/home/cis90/simben $ ls -l -t
/home/cis90/simben $ ls -li Poems/
/home/cis90/simben $ ls -a Poems/ bin/
/home/cis90/simben $ ls -d Poems/ bin/ > mylist
```

***Arguments** are what the command works upon*

***Redirection** is covered later in the course*

***Spaces (blanks)** are used to separate the command, options and arguments. Additional blanks are ignored.*

Life of the Shell

Example:

```
/home/cis90/simben $ ls -lt proposal1 proposal2
-rw-r--r--. 1 simben90 cis90 1074 Aug 26  2003 proposal1
-rw-r--r--. 1 simben90 cis90 2175 Jul 20  2001 proposal2
/home/cis90/simben $
```

Shell Steps

1) Prompt
2) Parse
3) Search
4) Execute
5) Nap
6) Repeat

Lets take a deep dive into how a command gets executed.

Note it is always a team effort by both the shell and the command.

Life of the Shell

Shell Steps

1) Prompt
2) Parse
3) Search
4) Execute
5) Nap
6) Repeat

1) Prompt user for a command

Example:

The shell begins by outputting the prompt (which is based on the PS1 variable)

```
/home/cis90/simben $ ls -lt proposal1 proposal2
```

Then you type the command

FYI, you can mimic outputting the prompt yourself with these commands:

```
/home/cis90/simben $ echo $PS1
$PWD $
/home/cis90/simben $ echo $PWD $
/home/cis90/simben $
/home/cis90/simben $ echo my prompt is: $PWD $
my prompt is: /home/cis90/simben $
```

to show value of PS1 variable

echo the output of the previous command

was output by the echo command above

Life of the Shell

Shell Steps
1) Prompt
2) Parse
3) Search
4) Execute
5) Nap
6) Repeat

2) Parse command user typed

Example:

```
ls -lt proposal1 proposal2
```

- Command = ls
- 2 Options = l, t
- 2 Arguments = proposal1, proposal2
- Redirection = NA

The shell uses the command syntax rules to break down the command line into options, arguments and redirection.

Parsing includes expanding variables and properly any handling metacharacters.

The shell doesn't actually distinguish between options and arguments. To the shell it is just another argument comprised of a string of text separated by blanks. We will distinguish between options and arguments to better understand command syntax and how it controls what commands do.

Life of the Shell

Shell Steps
1) Prompt
2) Parse
3) Search
4) Execute
5) Nap
6) Repeat

3) Search for program on the path

```
ls -lt proposal1 proposal2
```

Use this command to see the path directories (separated by :'s) on your path

```
/home/cis90/simben $ echo $PATH
/usr/lib/qt-3.3/bin:/usr/local/bin:/bin:/usr/bin:
/usr/local/sbin:/usr/sbin:/sbin:
/home/cis90/simben/../bin:/home/cis90/simben/bin:.
```

The shell will search each directory in order for an ***ls*** *command*

```
/usr/lib/qt-3.3/bin  no
/usr/local/bin       no
/bin                 YES! - it was found in the /bin directory
/usr/bin
/usr/local/sbin
/usr/sbin
/sbin
/home/cis90/simben/../bin
/home/cis90/simben/bin
     .
```

Try mimicking what the shell does to search for ls:

```
/home/cis90/simben $ ls /usr/lib/qt-3.3/bin/ls
ls: cannot access /usr/lib/qt-3.3/bin/ls: No
such file or directory

/home/cis90/simben $ ls /usr/local/bin/ls
ls: cannot access /usr/local/bin/ls: No such
file or directory

/home/cis90/simben $ ls /bin/ls
/bin/ls
```

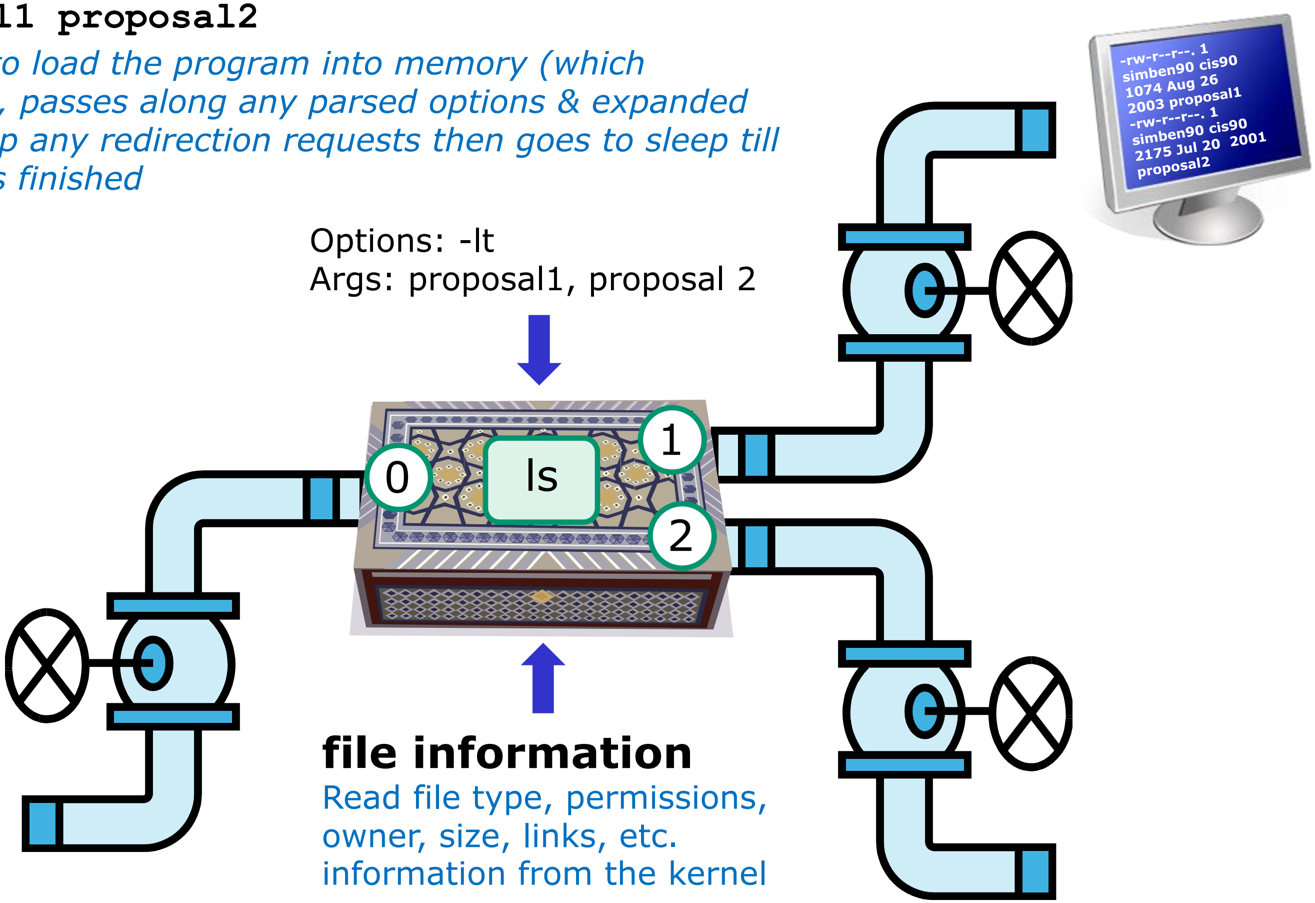
Life of the Shell

Shell Steps
1) Prompt
2) Parse
3) Search
4) Execute
5) Nap
6) Repeat

4) Execute the command

```
ls -lt proposal1 proposal2
```

Invokes the kernel to load the program into memory (which becomes a process), passes along any parsed options & expanded arguments, hooks up any redirection requests then goes to sleep till the new process has finished



```
-rw-r--r--. 1
simben90 cis90
1074 Aug 26
2003 proposal1
-rw-r--r--. 1
simben90 cis90
2175 Jul 20  2001
proposal2
```

Options: -lt
Args: proposal1, proposal 2

file information
Read file type, permissions, owner, size, links, etc. information from the kernel

Life of the Shell

Shell Steps
1) Prompt
2) Parse
3) Search
4) Execute
5) Nap
6) Repeat

5) Nap while the command (process) runs to completion

(The shell, itself a loaded process, goes into the sleep state and waits till the command process is finished)

```
/home/cis90/simben $ ls -lt proposal1 proposal2
-rw-r--r--. 1 simben90 cis90 1074 Aug 26  2003 proposal1
-rw-r--r--. 1 simben90 cis90 2175 Jul 20  2001 proposal2
```

Life of the Shell

Shell Steps
1) Prompt
2) Parse
3) Search
4) Execute
5) Nap
6) Repeat

6) And do it all over again … go to step 1

Activity

```
/home/cis90/simben $ weather=rain
/home/cis90/simben $ country=Spain
/home/cis90/simben $ location="the plain"
/home/cis90/simben $ echo The $weather in $country stays mainly in $location
The rain in Spain stays mainly in the plain
/home/cis90/simben $
```

When **echo** is loaded into memory and starts to run:

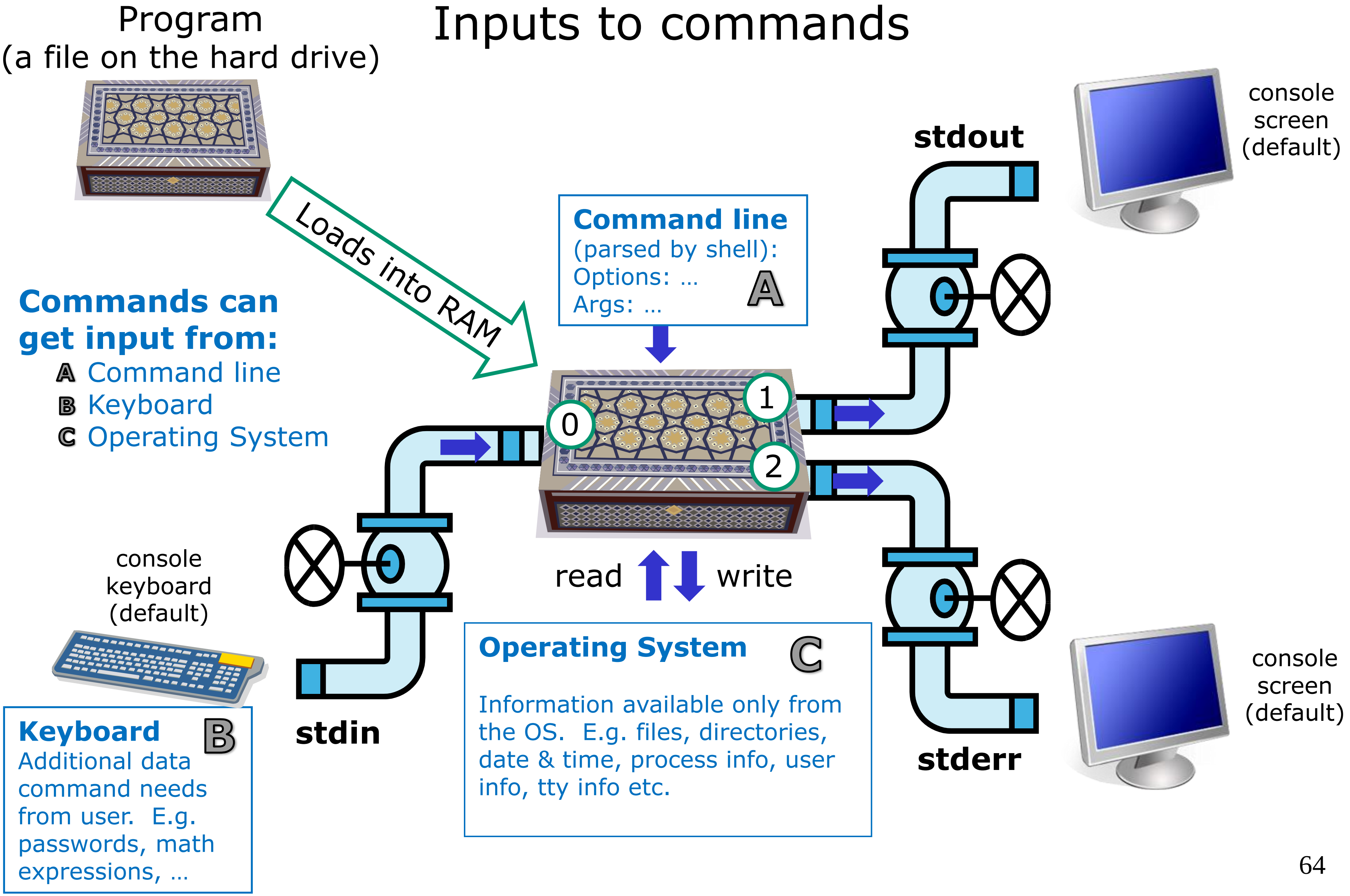
1) How many arguments does it receive from the bash shell?

2) Does **echo** see "`$weather`" or "`rain`" as one of the arguments it receives?

Inputs to commands

review

Inputs to commands



Program
(a file on the hard drive)

Loads into RAM

Commands can get input from:

- A Command line
- B Keyboard
- C Operating System

Command line A
(parsed by shell):
Options: …
Args: …

Keyboard B
Additional data command needs from user. E.g. passwords, math expressions, …

Operating System C

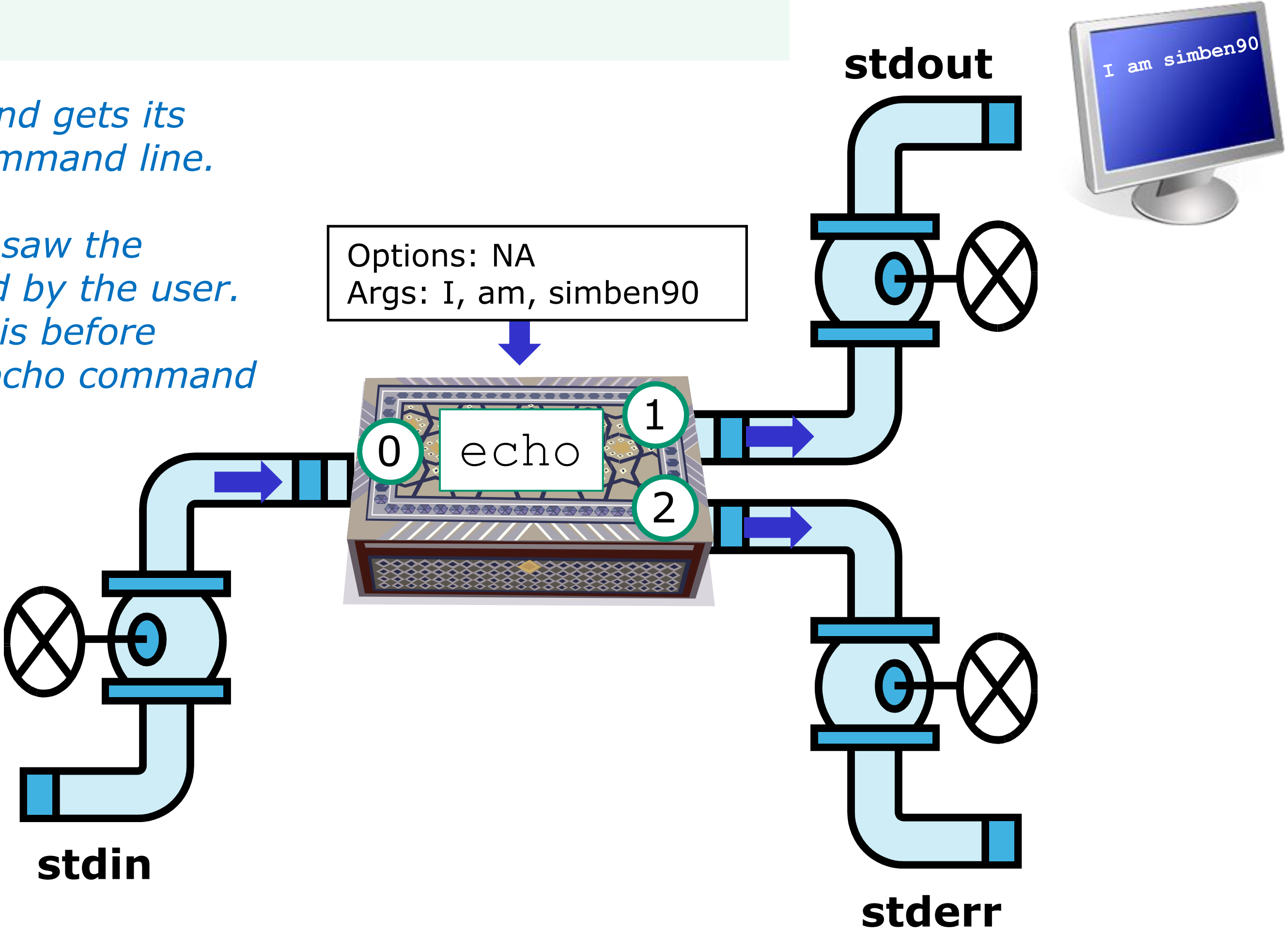
Information available only from the OS. E.g. files, directories, date & time, process info, user info, tty info etc.

echo gets input from the command line

```
/home/cis90/simben $ echo I am $LOGNAME
I am simben90
```

*The **echo** command gets its input from the command line.*

Note: echo never saw the $LOGNAME" typed by the user. bash expanded this before passing it to the echo command

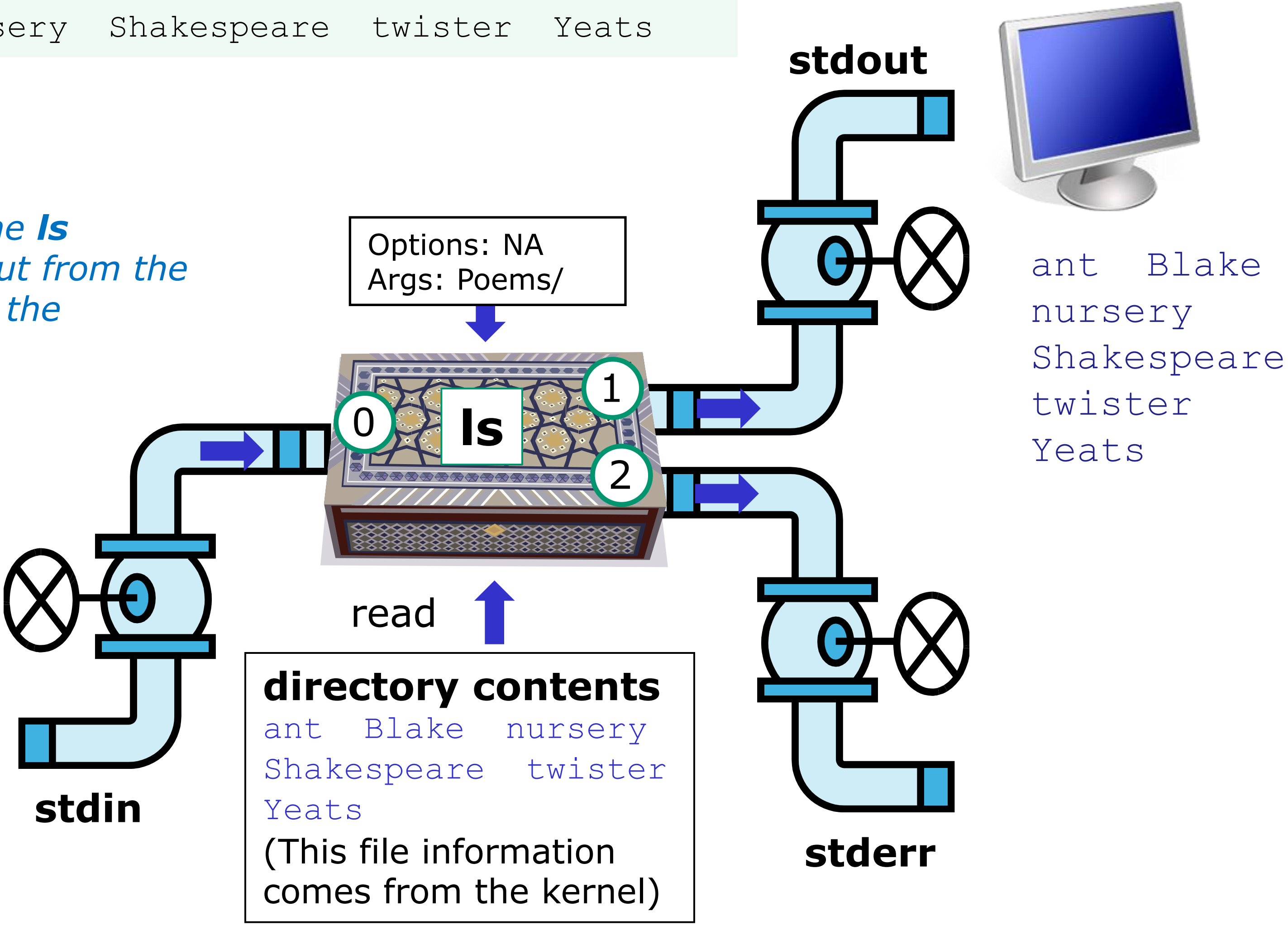

Options: NA
Args: I, am, simben90

stdin and stderr were never used for this command

This ls command got input from the OS

```
/home/cis90/simmsben $ ls Poems/
ant  Blake  nursery  Shakespeare  twister  Yeats
```

In this example, the ***ls*** *command gets input from the command line and the operating system*



```
ant  Blake
nursery
Shakespeare
twister
Yeats
```

directory contents

```
ant  Blake  nursery
Shakespeare  twister
Yeats
```

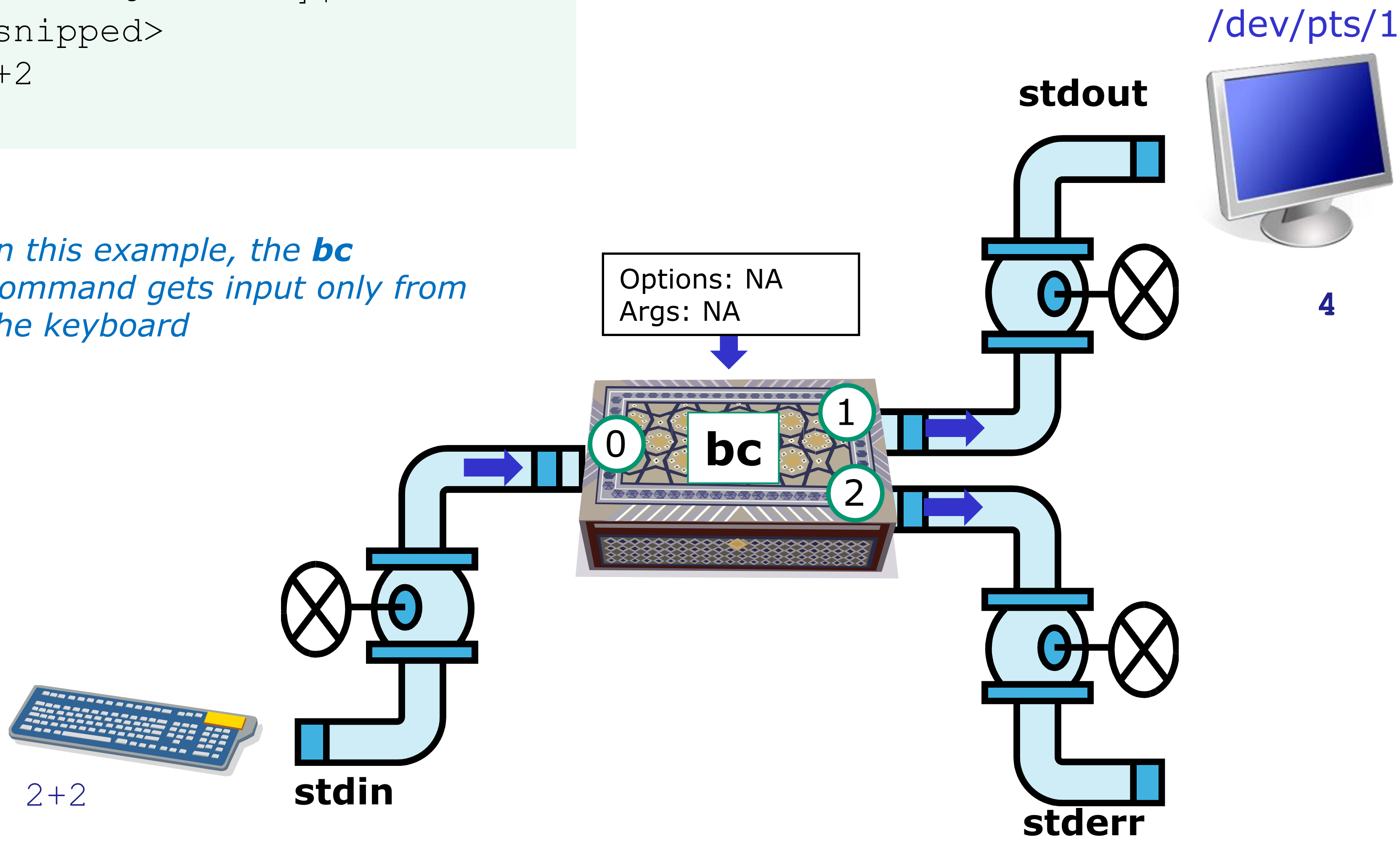
(This file information comes from the kernel)

stdin and stderr were never used for this command

This bc command gets input from the keyboard

```
[rsimms@nosmo ~]$ bc
<snipped>
2+2
4
```

*In this example, the **bc** command gets input only from the keyboard*



stderr was never used for this command

Practice Test Questions

Use CCC Confer White Board

Practice Test Questions

What is simben90's uid (user ID) on Opus?

Practice Test Questions

What is simben90's uid (user ID) on Opus?

Benji's uid is 1001

```
/home/cis90/simben $ id simben90
uid=1001(simben90) gid=190(cis90) groups=190(cis90),100(users)
/home/cis90/simben $
```

Practice Test Questions

What day of the week was Sept 11, 2001?

Practice Test Questions

What day of the week was Sept 11, 2001?

It was a Tuesday

```
/home/cis90/simben $ cal 9 2001
   September 2001
Su Mo Tu We Th Fr Sa
                   1
 2  3  4  5  6  7  8
 9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30
/home/cis90/simben $
```

Practice Test Questions

Where (what directory) does the program file for the **ps** command reside?

Practice Test Questions

Where (what directory) does the program file for the **ps** command reside?

```
/home/cis90/simben $ type ps
ps is /bin/ps
```

It's in the /bin directory

Practice Test Questions

Parse the following command line. What is the command? How many options and how many arguments are there? What are the options and arguments?

```
ls -l /boot/grub/
```

Practice Test Questions

Parse the following command line. What is the command? How many options and how many arguments are there? What are the options and arguments?

```
ls -l /boot/grub/
```

Command: ls

One option: -l (for long listing)

One argument: /boot/grub

Practice Test Questions

Parse the following command line. What is the command? How many options and how many arguments are there? What are the options and arguments?

```
echo "1 2 3" four 5 six
```

Practice Test Questions

Parse the following command line. What is the command? How many options and how many arguments are there? What are the options and arguments?

```
echo "1 2 3" four 5 six
```

Command: echo

No options

4 arguments:

- *"1 2 3"*
- *four*
- *5*
- *six*

Practice Test Questions

Which program gave you this error message?

```
/home/cis90/simben $ uname-x
-bash: uname-x: command not found
/home/cis90/simben $
```

Practice Test Questions

Which program gave you this error message?

```
/home/cis90/simben $ uname-x
-bash: uname-x: command not found
/home/cis90/simben $
```

It was the bash program. bash is the shell we are using and it could not find a command named typo on the path

Practice Test Questions

Which program gave you this error message?

```
/home/cis90/simben $ uname -x
uname: invalid option -- 'x'
Try `uname --help' for more information.
/home/cis90/simben $
```

Practice Test Questions

Which program gave you this error message?

```
/home/cis90/simben $ uname -x
uname: invalid option -- 'x'
Try `uname --help' for more information.
/home/cis90/simben $
```

It was the uname program. The uname program was loaded into memory. It started to handle its options and discovered an unknown option. It printed the error message and aborted.

Practice Test Questions

What terminal device are you using?

Practice Test Questions

What terminal device are you using?

Use the tty command to find out:

```
/home/cis90/simben $ tty
/dev/pts/0
/home/cis90/simben $
```

Practice Test Questions

What type of terminal are you using?

Practice Test Questions

What type of terminal are you using?

Use the **echo $TERM** command to find out:

```
/home/cis90/simben $ echo $TERM
xterm
```

This user's terminal type is xterm

Practice Test Questions

What directories make up your path?

Practice Test Questions

What directories make up your path?

Use echo $PATH to find out:

```
/home/cis90/simben $ echo $PATH
/usr/lib/qt-3.3/bin:/usr/local/bin:/bin:/usr/bin:
/usr/local/sbin:/usr/sbin:/sbin:/home/cis90/simben/../bin:
/home/cis90/simben/bin:.
```

/usr/lib/qt-3.3/bin
/usr/local/bin
/bin
/usr/bin
/usr/local/sbin
/usr/sbin
/sbin
/home/cis90/simben/../bin
/home/cis90/simben/bin
.

There are 10 directories specified on this user's path

Practice Test Questions

Are the **yum, useradd,** and **yell** commands on your path?

Practice Test Questions

Are the **yum, useradd,** and **yell** commands on your path?

```
/home/cis90/simben $ type yum
yum is /usr/bin/yum
```

Yes, on path

```
/home/cis90/simben $ type useradd
useradd is hashed (/usr/sbin/useradd)
```

Yes, on path

```
/home/cis90/simben $ type yell
-bash: type: yell: not found
/home/cis90/simben $
```

No, not on path

Note: "is hashed" means bash has previously searched the path and run this command. The location of the command has been saved in the hash table to speed up subsequent searches.

Practice Test Questions

Knowing the steps the shell performs, which of the two processes shown below is “taking a nap”?

```
/home/cis90/simben $ ps
  PID TTY          TIME CMD
21559 pts/0    00:00:00 bash
22012 pts/0    00:00:00 ps
```

Shell’s steps
1) Prompt
2) Parse
3) Search
4) Execute
5) Nap
6) Repeat

Practice Test Questions

Knowing the steps the shell performs, which of the two processes shown below is “taking a nap”?

Shell’s steps
1) Prompt
2) Parse
3) Search
4) Execute
5) Nap
6) Repeat

```
/home/cis90/simben $ ps
  PID TTY          TIME CMD
21559 pts/0    00:00:00 bash
22012 pts/0    00:00:00 ps
```

***bash** (the shell) is sleeping while the **ps** command runs*

```
/home/cis90/simben $ ps -l
F S   UID   PID  PPID  C PRI  NI ADDR SZ WCHAN  TTY          TIME CMD
0 S  1001 21559 21558  0  80   0 -  1275 -      pts/0    00:00:00 bash
0 R  1001 22013 21559  0  80   0 -  1213 -      pts/0    00:00:00 ps
```

Status column, R=running, S=sleeping

Practice Test Questions

What is the name of the environment variable that defines your shell prompt?

Practice Test Questions

What is the name of the environment variable that defines your shell prompt?

It's PS1

```
/home/cis90/simben $ echo $PS1
$PWD $

/home/cis90/simben $ echo "The PWD variable =" $PWD
The PWD variable = /home/cis90/simben
/home/cis90/simben $
```

Both PS1 and PS2 are environment variables

Practice Test Questions

How do your change the shell prompt to `"Enter next command: "` ?

Practice Test Questions

How do your change the shell prompt to `"Enter next command: "` ?

Set PS1 to new value using "=" sign

```
/home/cis90/simben $
/home/cis90/simben $ PS1="Enter next command: "
Enter next command:
Enter next command: echo $PWD
/home/cis90/simben
Enter next command: echo $PS1
Enter next command:
Enter next command:
```

Practice Test Questions

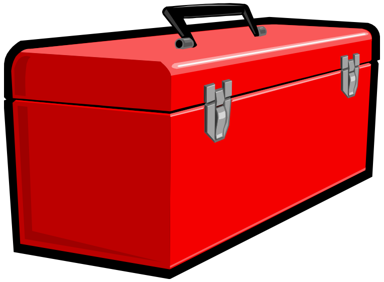
How do you restore the original shell prompt so it displays the current directory followed by a $ and a blank?

Practice Test Questions

How do your change the shell prompt to "Enter next command: " then change it back again?

To restore the original prompt use:

```
Enter next command: PS1='$PWD $ '
/home/cis90/simben $
```



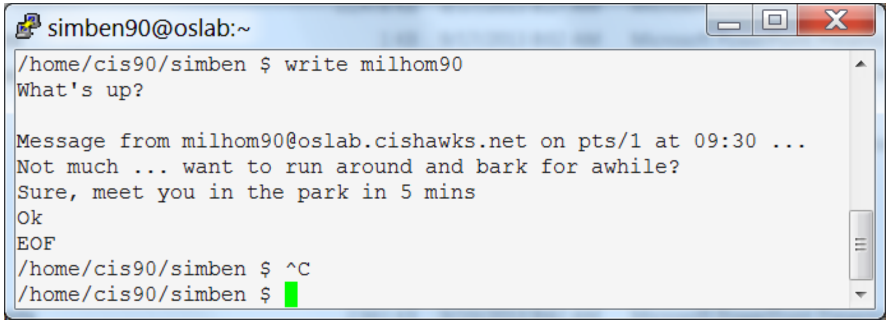
More commands for your toolbox

Introducing some new commands for this lesson

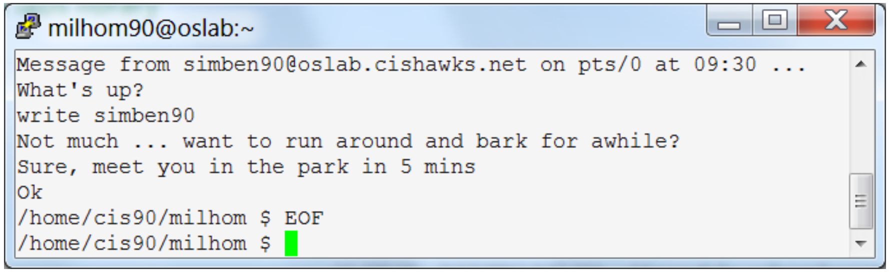
write	*“chat” with another user by writing to their terminal*
mesg	*enable/disable writes to your terminal*
mail	*send and read email*

Write Command

Use the write command to chat with another user



```
/home/cis90/simben $ write milhom90
What's up?

Message from milhom90@oslab.cishawks.net on pts/1 at 09:30 ...
Not much ... want to run around and bark for awhile?
Sure, meet you in the park in 5 mins
Ok
EOF
/home/cis90/simben $ ^C
/home/cis90/simben $
```



```
Message from simben90@oslab.cishawks.net on pts/0 at 09:30 ...
What's up?
write simben90
Not much ... want to run around and bark for awhile?
Sure, meet you in the park in 5 mins
Ok
/home/cis90/milhom $ EOF
/home/cis90/milhom $
```

write command

send a message to another user

write *username [ttyname]*

- Use *ttyname* only if there are multiple logins by the target username
- The receiver gets:

```
    Message from yourname@yourhost on yourtty at hh:mm …
```

- Each line you type gets sent to the other user's terminal
- To end sending messages type Ctrl-D (Hold down Ctrl and tap D key)
    - The receiver will see an `EOF` (end of file) at the end
- If the receiver wants to reply then they must use the **write** command as well
- Use **mesg n** (to block incoming messages)
- Use **mesg y** (to allow incoming messages)

write command

send a message to another user

```
/home/cis90/simben $ type write
write is /usr/bin/write
```

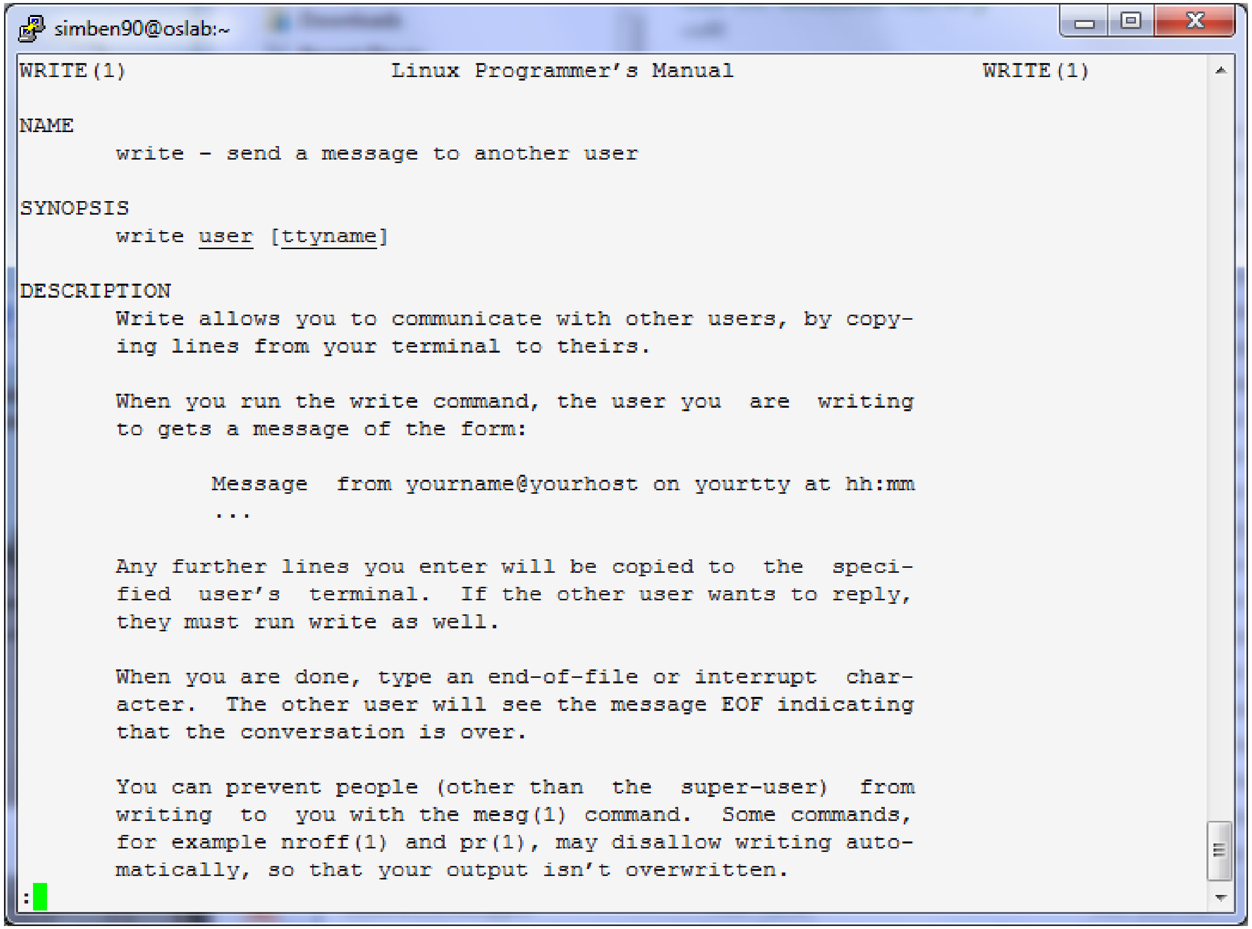
```
/home/cis90/simben $ file /usr/bin/write
/usr/bin/write: setgid ELF 32-bit LSB shared object, Intel 80386,
version 1 (SYSV), dynamically linked (uses shared libs), for
GNU/Linux 2.6.18, stripped
```

Using Lesson 2 commands you can see that the write command resides in the /usr/bin directory and it is a binary executable

write command

send a message to another user

```
/home/cis90/simben $ man write
```



```
WRITE(1)                    Linux Programmer's Manual                  WRITE(1)

NAME
       write - send a message to another user

SYNOPSIS
       write user [ttyname]

DESCRIPTION
       Write allows you to communicate with other users, by copy-
       ing lines from your terminal to theirs.

       When you run the write command, the user you  are  writing
       to gets a message of the form:

              Message  from yourname@yourhost on yourtty at hh:mm
              ...

       Any further lines you enter will be copied to  the  speci-
       fied  user's  terminal.  If the other user wants to reply,
       they must run write as well.

       When you are done, type an end-of-file or interrupt  char-
       acter.  The other user will see the message EOF indicating
       that the conversation is over.

       You can prevent people (other than  the  super-user)  from
       writing  to  you with the mesg(1) command.  Some commands,
       for example nroff(1) and pr(1), may disallow writing auto-
       matically, so that your output isn't overwritten.
:
```

*Use the **man** command to review how the write command works.*

write command

simben90 writes to milhom90

*Benji, uses the **who** command to see the current users logged into Opus. He sees his friend Homer is logged in twice.*

```
/home/cis90/simben $ who
srelau98 pts/0        2012-09-11 06:36 (anice-34-27-241-136.wanadoo.fr)
simben90 pts/1        2012-09-11 06:47 (42-15-94-107.dsl.com)
alvdes98 pts/2        2012-09-11 07:49 (c-25-14-136-111.comcast.net)
milhom90 pts/3        2012-09-11 08:03 (42-15-94-107.dsl.com)
milhom90 pts/4        2012-09-11 08:09 (42-15-94-107.dsl.com)
```

*Homer, ever curious, uses the **tty** command to see what terminal device he is using*

```
/home/cis90/milhom $ tty
/dev/pts/4
/home/cis90/milhom $
```

write command

simben90 writes to milhom90

```
/home/cis90/simben $ write milhom90
write: milhom90 is logged in more than once; writing to pts/4
```

1) Benji enters this

```
/home/cis90/milhom $
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...
```

2) Homer sees this written to his terminal

write command

simben90 writes to milhom90

```
/home/cis90/simben $ write milhom90
write: milhom90 is logged in more than once; writing to pts/4
What do you think of the new CentOS distro?
```

1) Benji enters this

```
/home/cis90/milhom $
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...
What do you think of the new CentOS distro?
```

2) Homer sees this written to his terminal

write command

simben90 writes to milhom90

```
/home/cis90/milhom $
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...
What do you think of the new CentOS distro?
write simben90
```

1) Homer enters this

```
/home/cis90/simben $ write milhom90
write: milhom90 is logged in more than once; writing to pts/4
What do you think of the new CentOS distro?

Message from milhom90@oslab.cabrillo.edu on pts/4 at 09:55 ...
```

2) and Benji sees this written to his terminal

write command

simben90 writes to milhom90

```
/home/cis90/milhom $
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...
What do you think of the new CentOS distro?
write simben90
What's with the periods on the long listing permissions?
```

1) Homer enters this

```
/home/cis90/simben $ write milhom90
write: milhom90 is logged in more than once; writing to pts/4
What do you think of the new CentOS distro?

Message from milhom90@oslab.cabrillo.edu on pts/4 at 09:55 ...
What's with the periods on the long listing permissions?
```

2) and Benji sees this written to his terminal

write command

simben90 writes to milhom90

```
/home/cis90/simben $ write milhom90
write: milhom90 is logged in more than once; writing to pts/4
What do you think of the new CentOS distro?

Message from milhom90@oslab.cabrillo.edu on pts/4 at 09:55 ...
What's with the periods on the long listing permissions?
I think it's SELinux
```

1) Benji enters this

```
/home/cis90/milhom $
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...
What do you think of the new CentOS distro?
write simben90
What's with the periods on the long listing permissions?
I think it's SELinux
```

2) Homer sees this written to his terminal

write command

simben90 writes to milhom90

```
/home/cis90/milhom $
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...
What do you think of the new CentOS distro?
write simben90
What's with the periods on the long listing permissions?
I think it's SELinux
Talk to you later, I'm going to bark a little and take a nap
```

1) Homer enters this

```
/home/cis90/simben $ write milhom90
write: milhom90 is logged in more than once; writing to pts/4
What do you think of the new CentOS distro?

Message from milhom90@oslab.cabrillo.edu on pts/4 at 09:55 ...
What's with the periods on the long listing permissions?
I think it's SELinux
Talk to you later, I'm going to bark a little and take a nap
```

2) and Benji sees this written to his terminal

write command

simben90 writes to milhom90

```
/home/cis90/milhom $
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...
What do you think of the new CentOS distro?
write simben90
What's with the periods on the long listing permissions?
I think it's SELinux
Talk to you later, I'm going to bark a little and take a nap
Ctrl-D
/home/cis90/milhom $
```

1) Homer issues a Ctrl-D (holds down Ctrl key, then taps D key)

```
/home/cis90/simben $ write milhom90
write: milhom90 is logged in more than once; writing to pts/4
What do you think of the new CentOS distro?

Message from milhom90@oslab.cabrillo.edu on pts/4 at 09:55 ...
What's with the periods on the long listing permissions?
I think it's SELinux
Talk to you later, I'm going to bark a little and take a nap
EOF
```

2) and Benji sees this written to his terminal

write command

simben90 writes to milhom90

```
/home/cis90/simben $ write milhom90
write: milhom90 is logged in more than once; writing to pts/4
What do you think of the new CentOS distro?

Message from milhom90@oslab.cabrillo.edu on pts/4 at 09:55 ...
What's with the periods on the long listing permissions?
I think it's SELinux
Talk to you later, I'm going to bark a little and take a nap
EOF
bye
```

1) Benji enters this

```
/home/cis90/milhom $
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...
What do you think of the new CentOS distro?
write simben90
What's with the periods on the long listing permissions?
I think it's SELinux
Talk to you later, I'm going to bark a little and take a nap
/home/cis90/milhom $ bye
```

2) Homer sees this written to his terminal

write command

simben90 writes to milhom90

```
/home/cis90/simben $ write milhom90
write: milhom90 is logged in more than once; writing to pts/4
What do you think of the new CentOS distro?

Message from milhom90@oslab.cabrillo.edu on pts/4 at 09:55 ...
What's with the periods on the long listing permissions?
I think it's SELinux
Talk to you later, I'm going to bark a little and take a nap
EOF
bye
Ctrl-D
/home/cis90/simben $
```

1) Benji issues a Ctrl-D (holds down Ctrl key, then taps D key)

```
/home/cis90/milhom $
Message from simben90@oslab.cabrillo.edu on pts/1 at 09:52 ...
What do you think of the new CentOS distro?
write simben90
What's with the periods on the long listing permissions?
I think it's SELinux
Talk to you later, I'm going to bark a little and take a nap
/home/cis90/milhom $ bye
EOF
```

2) and Homer sees this written to his terminal

mesg command

mesg y enables and **mesg n** disables writes to your terminal

```
/home/cis90/milhom $ mesg n
```

1) Homer disables writes to his terminal so he can take his nap

```
/home/cis90/simben $ write milhom90
write: milhom90 has messages disabled
```

2) Benji discovers that Homer is no longer accepting messages

who command

The -T option shows who is writeable

The -T option shows users messages status

```
/home/cis90/simben $ who -T
srelau98 + pts/0        2012-09-11 06:36 (anice-34-27-241-136.wanadoo.fr)
simben90 + pts/1        2012-09-11 06:47 (42-15-94-107.dsl.com)
alvdes98 + pts/2        2012-09-11 07:49 (c-25-14-136-111.comcast.net)
milhom90 - pts/3        2012-09-11 08:03 (42-15-94-107.dsl.com)
milhom90 - pts/4        2012-09-11 08:09 (42-15-94-107.dsl.com)
```

+ indicate writes to this user are enabled and - indicates writes to this user are blocked

```
/home/cis90/simben $ ls -l /dev/pts*
total 0
crw--w----. 1 srelau98 tty  136, 0 Sep 11 08:15 0
crw--w----. 1 simben90 tty  136, 1 Sep 11 08:25 1
crw--w----. 1 alvdes98 tty  136, 2 Sep 11 08:25 2
crw-------. 1 milhom90 tty  136, 3 Sep 11 08:19 3
crw-------. 1 milhom90 tty  136, 4 Sep 11 08:19 4
c---------. 1 root     root   5, 2 Jul 30 21:25 ptmx
```

We will learn about file wildcards and permissions later.

This is a just a preview showing that write permission is removed from /dev/pts/3 and /dev/pts/4 for the tty group.

Class Exercise

write and mesg

- Students, please login to Opus using your own accounts
- Rich, run the pairs script to pair up all the CIS 90 students.
- Students, use the write command to "chat" with your pair mate. e.g. **write** *username*
- Students, ask your pair mate for their real name and where they are right now.
- End the chat session with Ctrl-D

Note to Rich:
Run the pairs script in your cis90/misc/uhist directory

Sending Mail

UNIX mail

Sending messages

mail *recipient1 recipient2 … recipientn*

The mail command can be used to send an email to one or more recipients.

Each argument designates a recipient specified by a username (in /etc/passwd), a normal email address, or an alias (in /etc/aliases).

Examples:

`mail rsimms`	*username as argument*
`mail simben90 halluc90 rawjes90`	*multiple usernames as arguments*
`mail richsimms@yahoo.com brimar90`	*regular email address and username as arguments*
`mail $LOGNAME`	*your username, specified using a variable, as argument*
`mail cis90-students`	*an alias (used as a distribution list) for all CIS 90 students*

UNIX mail

Sending messages

```
/home/cis90/simben $ type mail
mail is /bin/mail
```

Using Lesson 2 commands we can observe that the mail program is on the path and in the /bin directory.

```
/home/cis90/simben $ file /bin/mail
/bin/mail: symbolic link to `mailx'
```

It is a "symbolic link" (we learn about these later) to the mailx program.

```
/home/cis90/simben $ type mailx
mailx is /bin/mailx
```

The mailx program files is also in the /bin directory.

```
/home/cis90/simben $ file /bin/mailx
/bin/mailx: ELF 32-bit LSB executable, Intel 80386, version 1
(SYSV), dynamically linked (uses shared libs), for GNU/Linux
2.6.18, stripped
```

The mailx program is a binary executable.

UNIX mail

Sending messages

As an example, Benji sends an email to Homer (a user on Opus) and Rich (using his Yahoo email address)

Homer
(milhom90)

Rich
(richsimms@yahoo.com)

Benji
(simben90)

```
/home/cis90/simben $ mail milhom90 richsimms@yahoo.com
Subject: Where is the old bone
I can't find my old bone.  Let me know if you see it.
Thanks,
Benji
.
EOT
/home/cis90/simben $
```

Use Ctrl-D or a single period to end the message (End Of Text)

Recipients can be Opus users (just specify their username) or regular email addresses.

Class Exercise
UNIX mail

- Login to Opus

- Send me a message

```
/home/cis90/simben $ mail rsimms
Subject: Hello
This mail program is pretty crazy!
.
/home/cis90/simben $
```

Notes to Rich

[ ] - Send out Welcome letter

Use script in /cis90/misc/uhist directory

cp list-full list

mail-welcome

[ ] - Test cis90-students alias

Reading Mail

UNIX mail

Sending messages

mail

To read mail, enter the mail command with no arguments. The mail command has its own mini-shell with its own set of mail oriented commands.

UNIX Mail

Reading messages

Homer
(milhom90)

```
/home/cis90/milhom $
You have new mail in /var/spool/mail/milhom90

/home/cis90/milhom $ mail
Heirloom Mail version 12.4 7/29/08.  Type ? for help.
"/var/spool/mail/milhom90": 1 message 1 new
>N  1 Benji Simms           Tue Sep 11 12:59  22/830   "Where is the old bone"
& 1
Message  1:
From simben90@oslab.cabrillo.edu  Tue Sep 11 12:59:27 2012
Return-Path: <simben90@oslab.cabrillo.edu>
From: Benji Simms <simben90@oslab.cabrillo.edu>
Date: Tue, 11 Sep 2012 12:59:27 -0700
To: richsimms@yahoo.com, milhom90@oslab.cabrillo.edu
Subject: Where is the old bone
User-Agent: Heirloom mailx 12.4 7/29/08
Content-Type: text/plain; charset=us-ascii
Status: R

I can't find my old bone.  Let me know if you see it.
Thanks,
Benji
```

Homer notices he has received new mail and runs the mail command to see what has arrived

The N signifies a new message

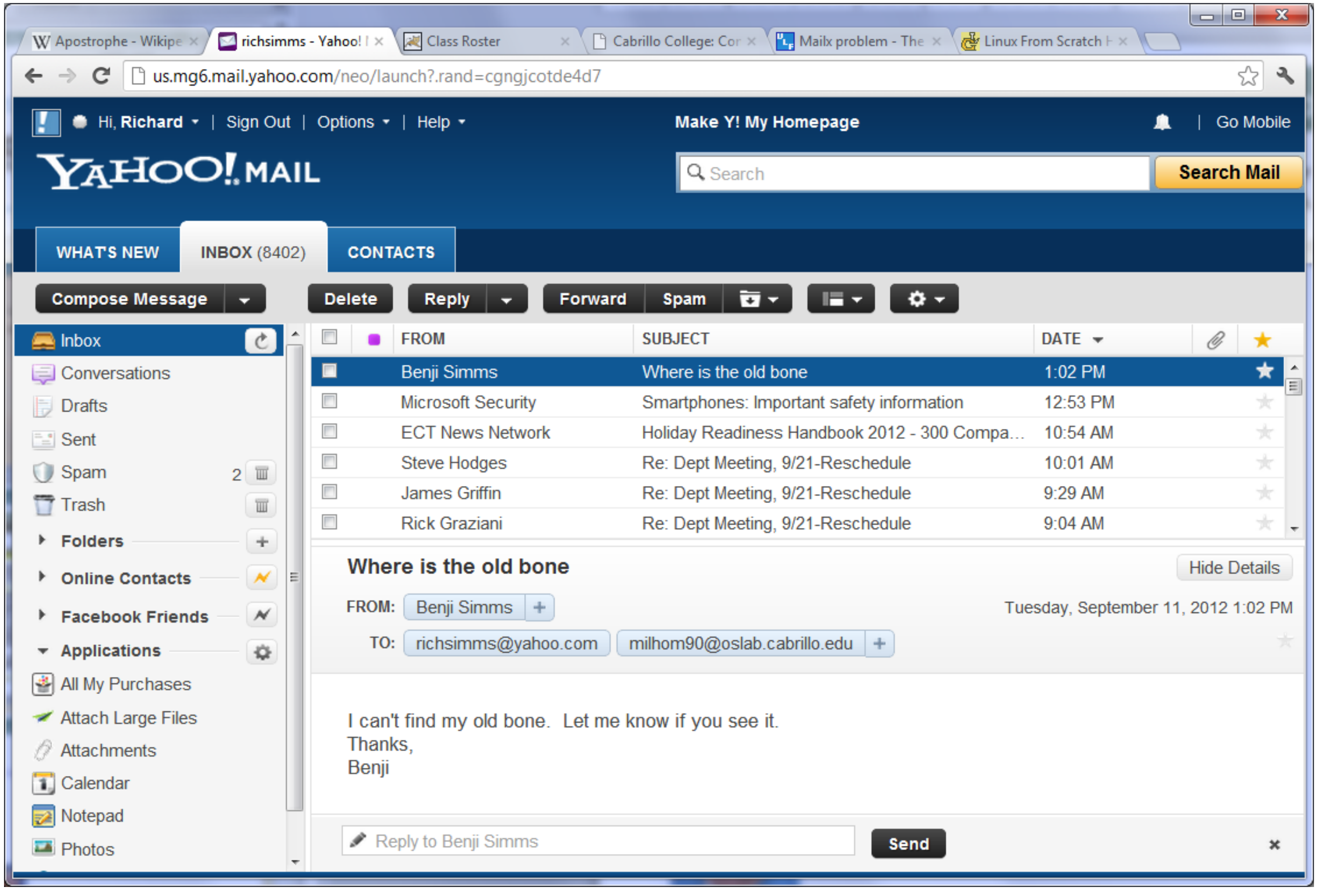
He types 1 to read message 1

The & is the mail prompt

UNIX mail

Reading messages sent from UNIX mail

Rich
(richsimms@yahoo.com)



FROM	SUBJECT	DATE
Benji Simms	Where is the old bone	1:02 PM
Microsoft Security	Smartphones: Important safety information	12:53 PM
ECT News Network	Holiday Readiness Handbook 2012 - 300 Compa…	10:54 AM
Steve Hodges	Re: Dept Meeting, 9/21-Reschedule	10:01 AM
James Griffin	Re: Dept Meeting, 9/21-Reschedule	9:29 AM
Rick Graziani	Re: Dept Meeting, 9/21-Reschedule	9:04 AM

Where is the old bone

FROM: Benji Simms
Tuesday, September 11, 2012 1:02 PM
TO: richsimms@yahoo.com milhom90@oslab.cabrillo.edu

I can't find my old bone. Let me know if you see it.
Thanks,
Benji

Rich reads the email from Benji using Yahoo mail (a mail user agent)

Class Exercise

UNIX mail

- Read your own mail by typing the **mail** command by itself

- Use the **p** command followed by the number of the message to print a message.

  p 1
  p 2

  Or just type the number of the message.

- Use the **q** command to exit

Tip: You can just hit the Enter key by itself to read the next unread message.

Replying to Mail

UNIX Mail

Replying to messages

Homer
(milhom90)

< continued from above >

```
I can't find my old bone.  Let me know if you see it.
Thanks,
Benji

& r 1
To: milhom90@oslab.cabrillo.edu richsimms@yahoo.com
 simben90@oslab.cabrillo.edu
Subject: Re: Where is the old bone

Benji Simms <simben90@oslab.cabrillo.edu> wrote:

> I can't find my old bone.  Let me know if you see it.
> Thanks,
> Benji
I think its under the sink
- Homer
.
EOT
&
```

*After reading the message from Benji, Homer replies with the mail **r** command (for reply to all).*

UNIX Mail

Benji gets the reply from Homer

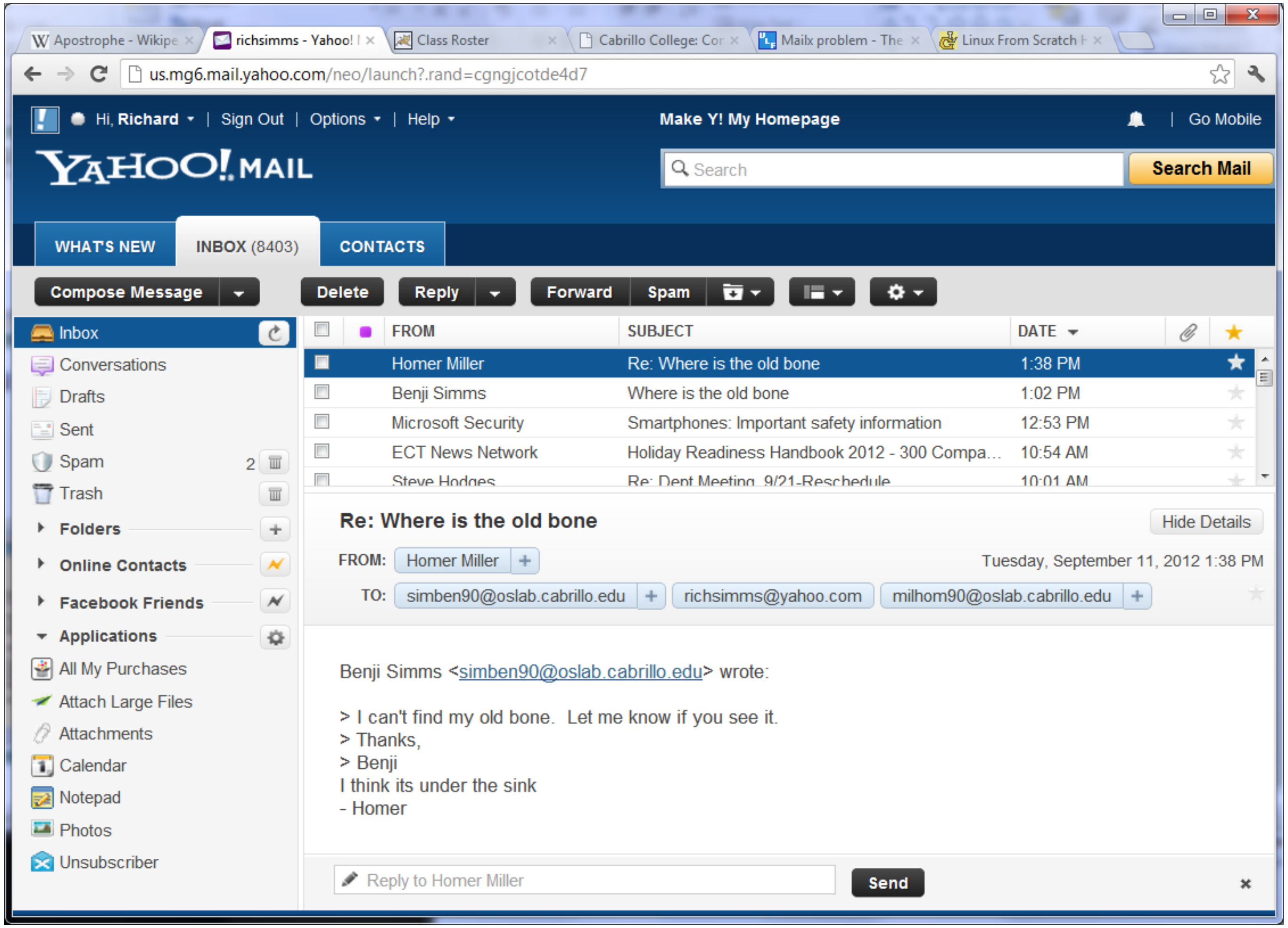
Benji
(simben90)

```
You have mail in /var/spool/mail/simben90
/home/cis90/simben $ mail
Heirloom Mail version 12.4 7/29/08.  Type ? for help.
"/var/spool/mail/simben90": 1 message 1 unread
>U  1 Homer Miller          Tue Sep 11 13:35  30/1096  "Re: Where is the old bone"
& 1
Message  1:
From milhom90@oslab.cabrillo.edu  Tue Sep 11 13:35:30 2012
Return-Path: <milhom90@oslab.cabrillo.edu>
From: Homer Miller <milhom90@oslab.cabrillo.edu>
Date: Tue, 11 Sep 2012 13:35:30 -0700
To: simben90@oslab.cabrillo.edu, richsimms@yahoo.com,
        milhom90@oslab.cabrillo.edu
Subject: Re: Where is the old bone
User-Agent: Heirloom mailx 12.4 7/29/08
Content-Type: text/plain; charset=us-ascii
Status: RO

Benji Simms <simben90@oslab.cabrillo.edu> wrote:

> I can't find my old bone.  Let me know if you see it.
> Thanks,
> Benji
I think its under the sink
- Homer

&
```

Benji notices he has new mail which he reads using the mail command (with no arguments) and then typing the message number he wants to read

UNIX Mail

Rich
(richsimms@yahoo.com)



FROM	SUBJECT	DATE
Homer Miller	Re: Where is the old bone	1:38 PM
Benji Simms	Where is the old bone	1:02 PM
Microsoft Security	Smartphones: Important safety information	12:53 PM
ECT News Network	Holiday Readiness Handbook 2012 - 300 Compa…	10:54 AM
Steve Hodges	Re: Dept Meeting 9/21-Reschedule	10:01 AM

Re: Where is the old bone

FROM: Homer Miller Tuesday, September 11, 2012 1:38 PM

TO: simben90@oslab.cabrillo.edu richsimms@yahoo.com milhom90@oslab.cabrillo.edu

Benji Simms <simben90@oslab.cabrillo.edu> wrote:

> I can't find my old bone. Let me know if you see it.
> Thanks,
> Benji

I think its under the sink
- Homer

Since Homer replied to all, Rich also gets a copy

Saving Mail to a Folder

UNIX Mail

Saving messages

Benji checks for new mail

```
/home/cis90/simben $ mail
Heirloom Mail version 12.4 7/29/08.  Type ? for help.
"/var/spool/mail/simben90": 1 message 1 new
>N  1 Homer Miller          Tue Sep 11 21:04  21/830   "Salsa"
& 1
```

Prints the first (and only) message

```
Message  1:
From milhom90@oslab.cabrillo.edu  Tue Sep 11 21:04:16 2012
Return-Path: <milhom90@oslab.cabrillo.edu>
From: Homer Miller <milhom90@oslab.cabrillo.edu>
Date: Tue, 11 Sep 2012 21:04:16 -0700
To: simben90@oslab.cabrillo.edu
Subject: Salsa
User-Agent: Heirloom mailx 12.4 7/29/08
Content-Type: text/plain; charset=us-ascii
Status: R

Don't forget, salsa class tonight at the Palomar
- Homer

& s 1 archives
```

Saves this message to a folder named "archives"

```
"archives" [New file] 23/851
& q
```

Browsing a Mail Folder

UNIX mail

Browse mail folders using the -f option

use the f option to specify a mail file

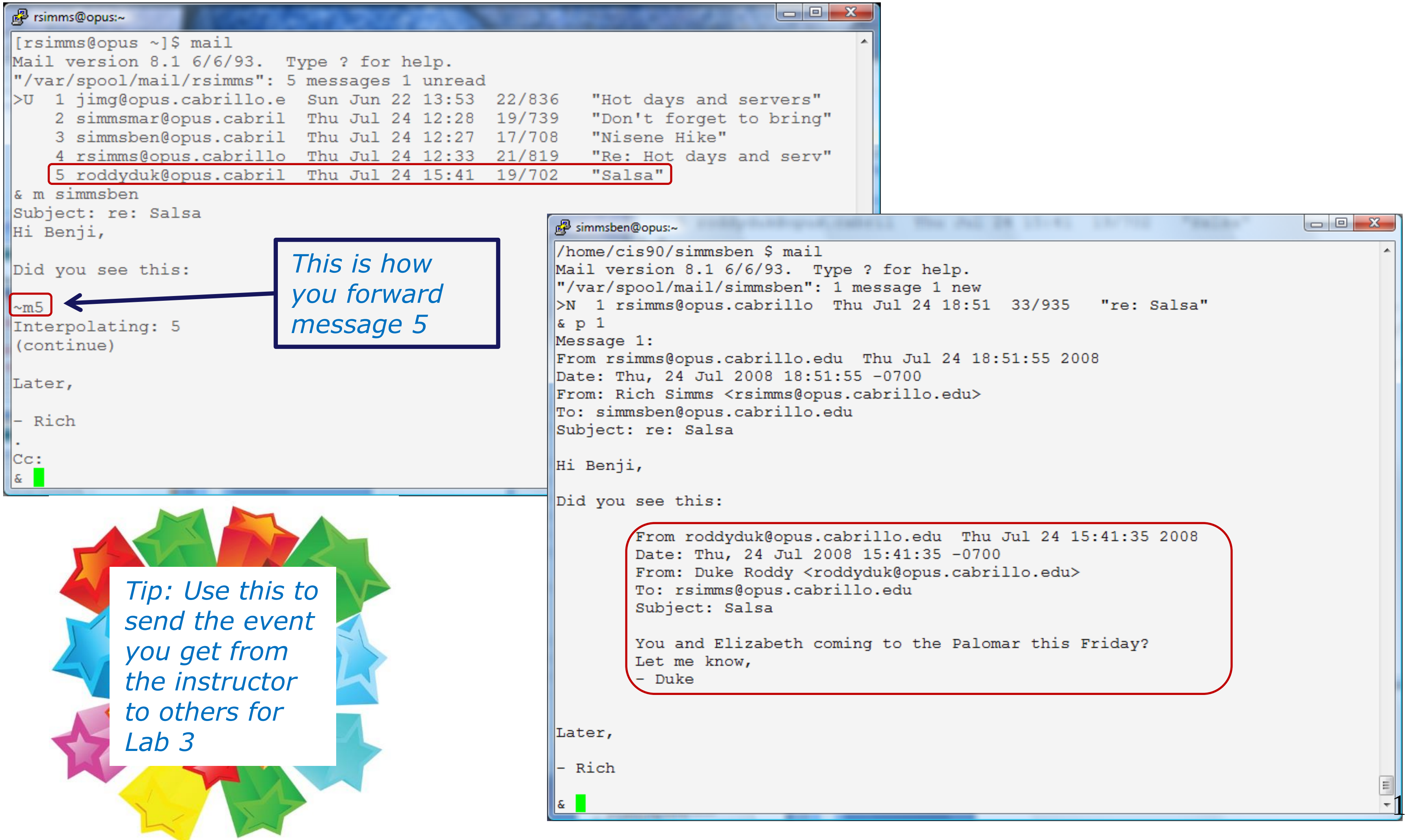
```
/home/cis90/simben $ mail -f archives
Heirloom Mail version 12.4 7/29/08.  Type ? for help.
"archives": 5 messages 4 new
    1 Homer Miller          Tue Sep 11 21:04  22/841   "Salsa"
>N  2 Homer Miller          Tue Sep 11 21:25  20/790   "Hola"
 N  3 Rich Simms            Tue Sep 11 21:58  20/752   "Treasure"
    4 Rich Simms            Tue Sep 11 22:01  21/798   "Lab Hours on Monday"
 N  5 Rich Simms            Tue Sep 11 22:01  20/796   "Where were you last
summer?"
&
```

Opening a mail folder named archives which has some saved messages

Forwarding Mail

mail commands

Forwarding a message with ~m



```
[rsimms@opus ~]$ mail
Mail version 8.1 6/6/93.  Type ? for help.
"/var/spool/mail/rsimms": 5 messages 1 unread
>U  1 jimg@opus.cabrillo.e  Sun Jun 22 13:53  22/836   "Hot days and servers"
    2 simmsmar@opus.cabril  Thu Jul 24 12:28  19/739   "Don't forget to bring"
    3 simmsben@opus.cabril  Thu Jul 24 12:27  17/708   "Nisene Hike"
    4 rsimms@opus.cabrillo  Thu Jul 24 12:33  21/819   "Re: Hot days and serv"
    5 roddyduk@opus.cabril  Thu Jul 24 15:41  19/702   "Salsa"
& m simmsben
Subject: re: Salsa
Hi Benji,

Did you see this:

~m5
Interpolating: 5
(continue)

Later,

- Rich
.
Cc:
& 
```

This is how you forward message 5

```
/home/cis90/simmsben $ mail
Mail version 8.1 6/6/93.  Type ? for help.
"/var/spool/mail/simmsben": 1 message 1 new
>N  1 rsimms@opus.cabrillo  Thu Jul 24 18:51  33/935   "re: Salsa"
& p 1
Message 1:
From rsimms@opus.cabrillo.edu  Thu Jul 24 18:51:55 2008
Date: Thu, 24 Jul 2008 18:51:55 -0700
From: Rich Simms <rsimms@opus.cabrillo.edu>
To: simmsben@opus.cabrillo.edu
Subject: re: Salsa

Hi Benji,

Did you see this:

        From roddyduk@opus.cabrillo.edu  Thu Jul 24 15:41:35 2008
        Date: Thu, 24 Jul 2008 15:41:35 -0700
        From: Duke Roddy <roddyduk@opus.cabrillo.edu>
        To: rsimms@opus.cabrillo.edu
        Subject: Salsa

        You and Elizabeth coming to the Palomar this Friday?
        Let me know,
        - Duke


Later,

- Rich

& 
```

Tip: Use this to send the event you get from the instructor to others for Lab 3

mail commands

Alternate ways to forward a message

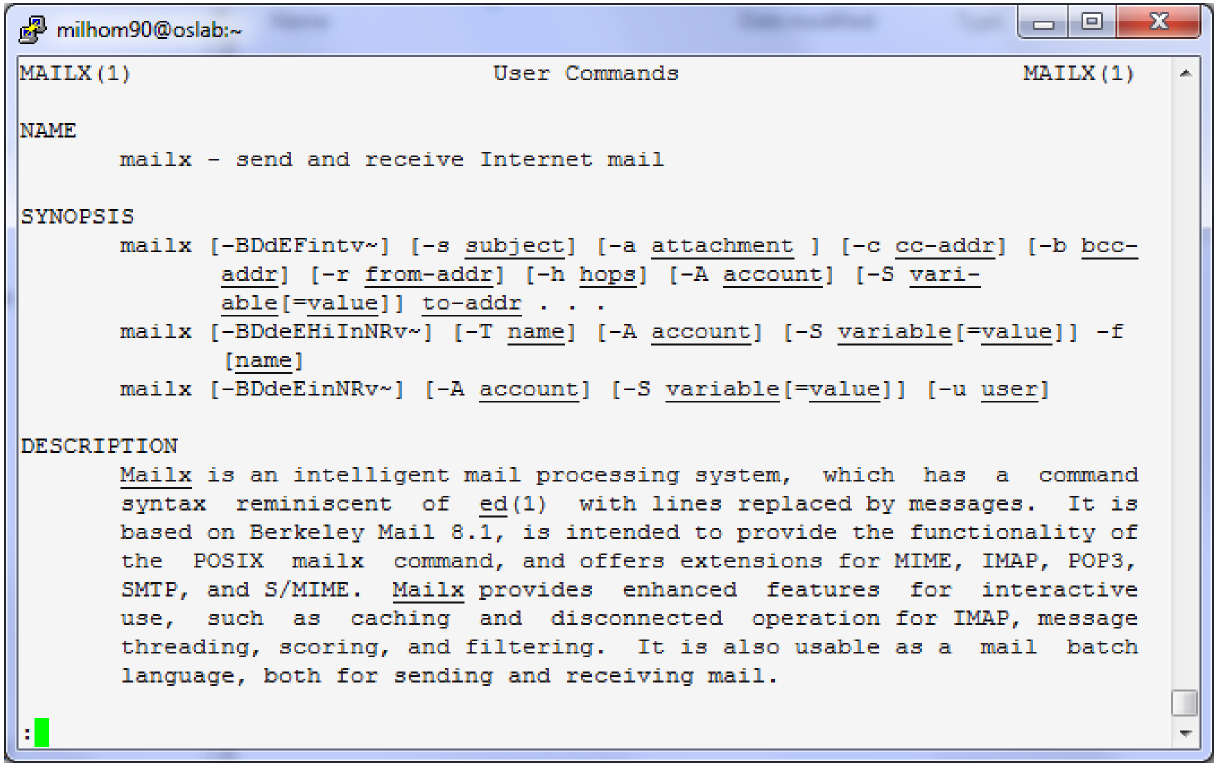
There is an easier way to forward a message with the latest version of mailx!

I wonder who will be the first person to find out how its done and post the solution to the forum?

Mail Documentation

man page for mail

```
/home/cis90/milhom $ man mail
```



```
MAILX(1)                          User Commands                          MAILX(1)

NAME
       mailx - send and receive Internet mail

SYNOPSIS
       mailx [-BDdEFintv~] [-s subject] [-a attachment ] [-c cc-addr] [-b bcc-
              addr] [-r from-addr] [-h hops] [-A account] [-S vari-
              able[=value]] to-addr . . .
       mailx [-BDdeEHiInNRv~] [-T name] [-A account] [-S variable[=value]] -f
              [name]
       mailx [-BDdeEinNRv~] [-A account] [-S variable[=value]] [-u user]

DESCRIPTION
       Mailx is an intelligent mail processing system,  which  has  a  command
       syntax  reminiscent  of  ed(1)  with lines replaced by messages.  It is
       based on Berkeley Mail 8.1, is intended to provide the functionality of
       the  POSIX  mailx  command, and offers extensions for MIME, IMAP, POP3,
       SMTP, and S/MIME.  Mailx provides  enhanced  features  for  interactive
       use,  such  as  caching  and  disconnected  operation for IMAP, message
       threading, scoring, and filtering.  It is also usable as a  mail  batch
       language, both for sending and receiving mail.

:
```

In the bash shell, use the man command for extensive documentation on mail

Mail ? command

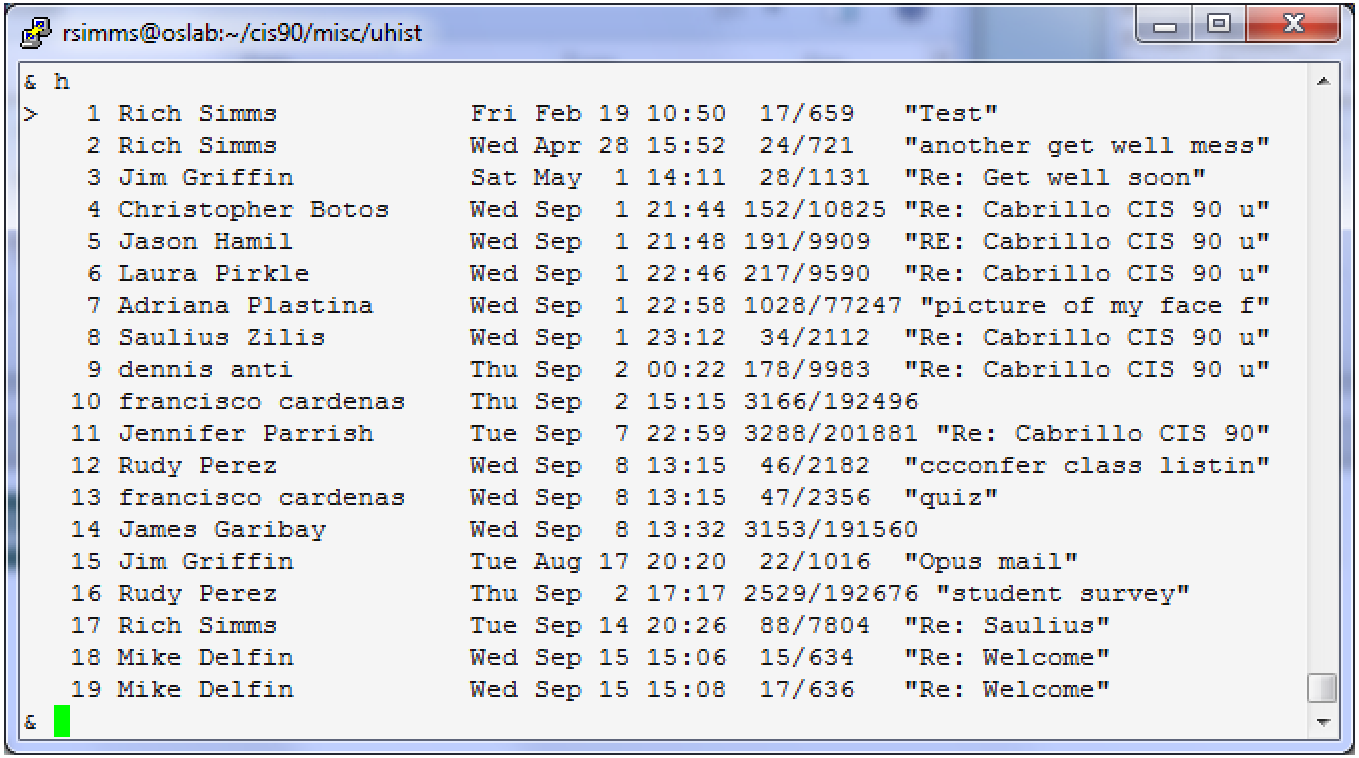
```
& ?
               mail commands
type <message list>             type messages
next                            goto and type next message
from <message list>             give head lines of messages
headers                         print out active message headers
delete <message list>           delete messages
undelete <message list>         undelete messages
save <message list> folder      append messages to folder and mark as saved
copy <message list> folder      append messages to folder without marking them
write <message list> file       append message texts to file, save attachments
preserve <message list>         keep incoming messages in mailbox even if saved
Reply <message list>            reply to message senders
reply <message list>            reply to message senders and all recipients
mail addresses                  mail to specific recipients
file folder                     change to another folder
quit                            quit and apply changes to folder
xit                             quit and discard changes made to folder
!                               shell escape
cd <directory>                  chdir to directory or home if none given
list                            list names of all available commands

A <message list> consists of integers, ranges of same, or other criteria
separated by spaces.  If omitted, mail uses the last message typed.
&
```

Use the ? command to see a short list of common mail commands

Listing messages (headers)

mail h (headers) command

e.g. list my current folder)



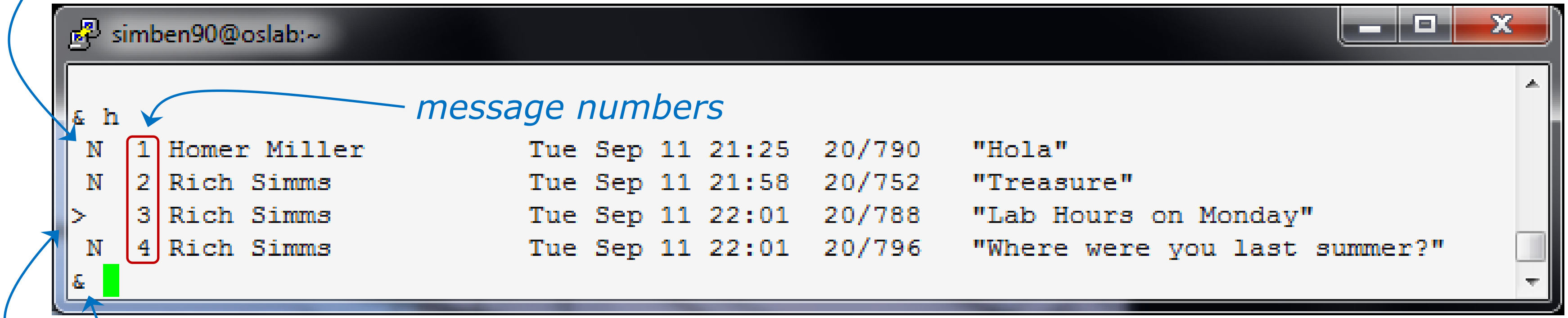
```
& h
>   1 Rich Simms            Fri Feb 19 10:50  17/659   "Test"
    2 Rich Simms            Wed Apr 28 15:52  24/721   "another get well mess"
    3 Jim Griffin           Sat May  1 14:11  28/1131  "Re: Get well soon"
    4 Christopher Botos     Wed Sep  1 21:44 152/10825 "Re: Cabrillo CIS 90 u"
    5 Jason Hamil           Wed Sep  1 21:48 191/9909  "RE: Cabrillo CIS 90 u"
    6 Laura Pirkle          Wed Sep  1 22:46 217/9590  "Re: Cabrillo CIS 90 u"
    7 Adriana Plastina      Wed Sep  1 22:58 1028/77247 "picture of my face f"
    8 Saulius Zilis         Wed Sep  1 23:12  34/2112  "Re: Cabrillo CIS 90 u"
    9 dennis anti           Thu Sep  2 00:22 178/9983  "Re: Cabrillo CIS 90 u"
   10 francisco cardenas    Thu Sep  2 15:15 3166/192496
   11 Jennifer Parrish      Tue Sep  7 22:59 3288/201881 "Re: Cabrillo CIS 90"
   12 Rudy Perez            Wed Sep  8 13:15  46/2182  "ccconfer class listin"
   13 francisco cardenas    Wed Sep  8 13:15  47/2356  "quiz"
   14 James Garibay         Wed Sep  8 13:32 3153/191560
   15 Jim Griffin           Tue Aug 17 20:20  22/1016  "Opus mail"
   16 Rudy Perez            Thu Sep  2 17:17 2529/192676 "student survey"
   17 Rich Simms            Tue Sep 14 20:26  88/7804  "Re: Saulius"
   18 Mike Delfin           Wed Sep 15 15:06  15/634   "Re: Welcome"
   19 Mike Delfin           Wed Sep 15 15:08  17/636   "Re: Welcome"
& 
```

Use the h command to show messages the current folder

mail h (headers) command

e.g. list my current folder)

N = New message, a U = Unread message



```
& h
 N  1 Homer Miller          Tue Sep 11 21:25  20/790   "Hola"
 N  2 Rich Simms            Tue Sep 11 21:58  20/752   "Treasure"
>   3 Rich Simms            Tue Sep 11 22:01  20/788   "Lab Hours on Monday"
 N  4 Rich Simms            Tue Sep 11 22:01  20/796   "Where were you last summer?"
&
```

message numbers

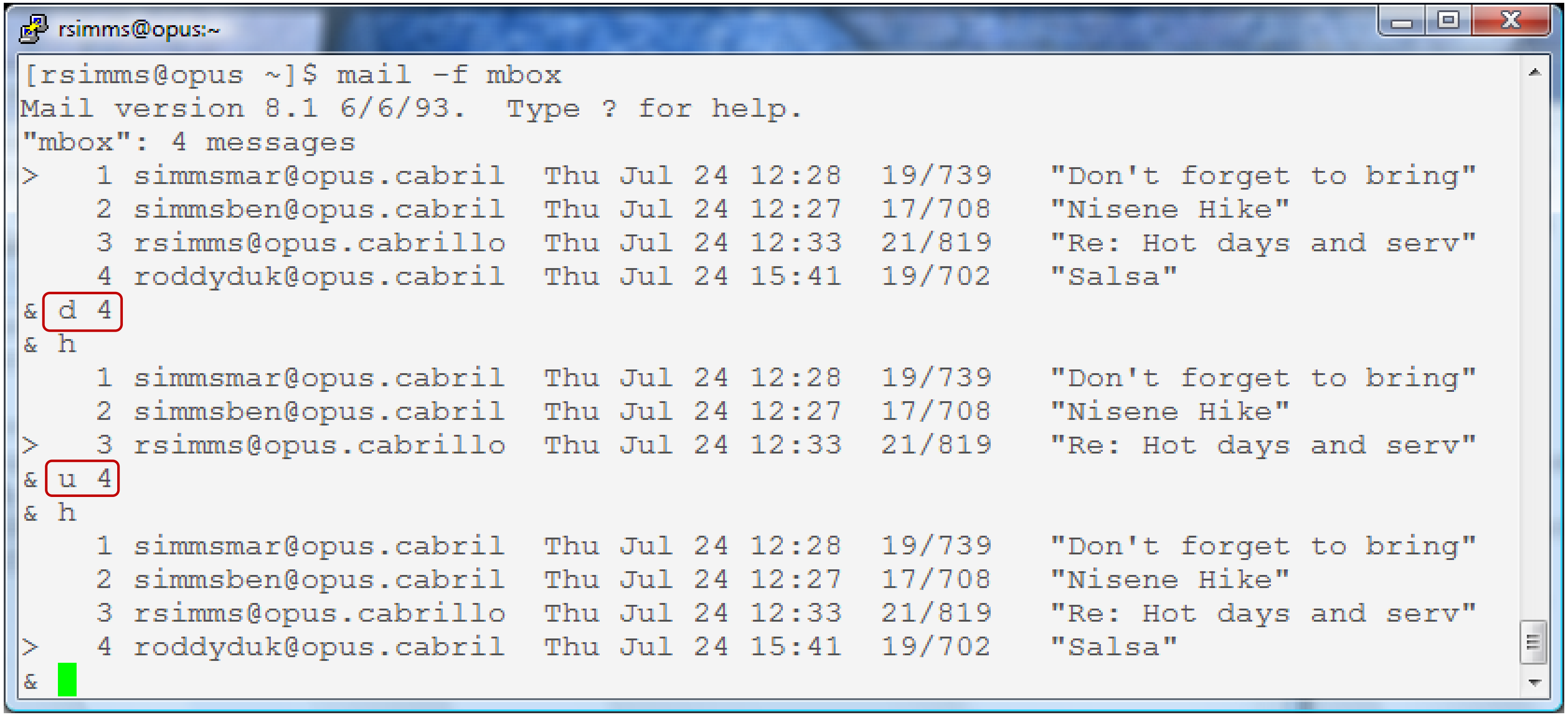
& is mail prompt for next command

> points to the current message (last one printed)

Deleting Messages

mail commands

(d)elete and (u)ndelete



```
[rsimms@opus ~]$ mail -f mbox
Mail version 8.1 6/6/93.  Type ? for help.
"mbox": 4 messages
>   1 simmsmar@opus.cabril  Thu Jul 24 12:28  19/739   "Don't forget to bring"
    2 simmsben@opus.cabril  Thu Jul 24 12:27  17/708   "Nisene Hike"
    3 rsimms@opus.cabrillo  Thu Jul 24 12:33  21/819   "Re: Hot days and serv"
    4 roddyduk@opus.cabril  Thu Jul 24 15:41  19/702   "Salsa"
& d 4
& h
    1 simmsmar@opus.cabril  Thu Jul 24 12:28  19/739   "Don't forget to bring"
    2 simmsben@opus.cabril  Thu Jul 24 12:27  17/708   "Nisene Hike"
>   3 rsimms@opus.cabrillo  Thu Jul 24 12:33  21/819   "Re: Hot days and serv"
& u 4
& h
    1 simmsmar@opus.cabril  Thu Jul 24 12:28  19/739   "Don't forget to bring"
    2 simmsben@opus.cabril  Thu Jul 24 12:27  17/708   "Nisene Hike"
    3 rsimms@opus.cabrillo  Thu Jul 24 12:33  21/819   "Re: Hot days and serv"
>   4 roddyduk@opus.cabril  Thu Jul 24 15:41  19/702   "Salsa"
& 
```

Messages can be deleted (and undeleted)

Mail files

UNIX mail

The dead.letter mail file

```
/home/cis90/simben $ mail bogus
Subject: Dead stuff
I doubt you will get this because you don't exist!
.
EOT
You have mail in /var/spool/mail/simben90
/home/cis90/simben $ /home/cis90/simben/dead.letter... Saved message in
/home/cis90/simben/dead.letter

/home/cis90/simben $ mail -f dead.letter
Heirloom Mail version 12.4 7/29/08.  Type ? for help.
"dead.letter": 1 message
>   1 To bogus              Tue Sep 17 10:04  18/562   "Dead s"
& d 1
& q
"dead.letter" complete
/home/cis90/simben $
```

Undeliverable mail is placed in your dead.letter file. You can cat this file or open it with the mail command

UNIX mail

The mail folders are ascii text files

```
/home/cis90/simben $ ls
archives      empty         Lab2.1  Miscellaneous  proposal2    text.err
bigfile       Hidden        letter  mission        proposal3    text.fxd
bin           lab01.graded  log     Poems          small_town   timecal
dead.letter   Lab2.0        mbox    proposal1      spellk       what_am_i

/home/cis90/simben $ ls /var/mail/simben90
/var/mail/simben90
```

1 & 4: User's can create there own mail folder files, giving them any name they like, such as archives and mbox

```
   /home/cis90/simben $ file archives dead.letter mbox /var/spool/mail/simben90
1) archives:                 ASCII mail text
2) dead.letter:              ASCII mail text
3) mbox:                     ASCII mail text
4) /var/spool/mail/simben90: ASCII mail text
```

*Mail files are text files that you can **cat** or open with **mail -f***

2) All undeliverable messages go into a user's dead.letter file

3) All incoming new messages are initially placed in the /var/mail/<username> file

UNIX mail

The mail folders are ascii text files

Mail files are ASCII text files. You can cat them out or open with the mail command.

```
/home/cis90/simben $ cat archives
From milhom90@oslab.cishawks.net  Mon Sep 16 18:52:53 2013
Return-Path: <milhom90@oslab.cishawks.net>
Received: from oslab.cishawks.net (localhost [127.0.0.1])
        by oslab.cabrillo.edu (8.14.4/8.14.4) with ESMTP id r8H1q rmw008499
        for <simben90@oslab.cishawks.net>; Mon, 16 Sep 2013 18:52 :53 -0700
Received: (from milhom90@localhost)
        by oslab.cishawks.net (8.14.4/8.14.4/Submit) id
        for simben90; Mon, 16 Sep 2013 18:52:53 -0700
From: Homer Miller <milhom90@oslab.cishawks.net>
Message-Id: <201309170152.r8H1qrJZ008497@oslab.cishawks
Date: Mon, 16 Sep 2013 18:52:53 -0700
To: simben90@oslab.cishawks.net
Subject: Fwd: Hot Potato
User-Agent: Heirloom mailx 12.4 7/29/08
MIME-Version: 1.0
Content-Type: text/plain; charset=us-ascii
Content-Transfer-Encoding: 7bit
Status: O

-------- Original Message --------
From: Rich Simms <rsimms@oslab.cishawks.net>
Date: Sun, 15 Sep 2013 15:41:49 -0700
To: milhom90@oslab.cishawks.net
Subject: Hot Potato


You got it ... forward it on! - Rich

/home/cis90/simben $
```

```
/home/cis90/simben $ mail -f archives
Heirloom Mail version 12.4 7/29/08.  Type ? for help.
"archives": 1 message 1 unread
>U  1 Homer Miller          Mon Sep 16 18:52  28/1002  "Fwd: H"
& 1
Message  1:
From milhom90@oslab.cishawks.net  Mon Sep 16 18:52:53 2013
Return-Path: <milhom90@oslab.cishawks.net>
From: Homer Miller <milhom90@oslab.cishawks.net>
Date: Mon, 16 Sep 2013 18:52:53 -0700
To: simben90@oslab.cishawks.net
Subject: Fwd: Hot Potato
User-Agent: Heirloom mailx 12.4 7/29/08
Content-Type: text/plain; charset=us-ascii
Status: RO

-------- Original Message --------
From: Rich Simms <rsimms@oslab.cishawks.net>
Date: Sun, 15 Sep 2013 15:41:49 -0700
To: milhom90@oslab.cishawks.net
Subject: Hot Potato


You got it ... forward it on! - Rich

& q
"archives" complete
/home/cis90/simben $
```

Class Exercise

UNIX mail

- Send yourself several test messages with different subjects:

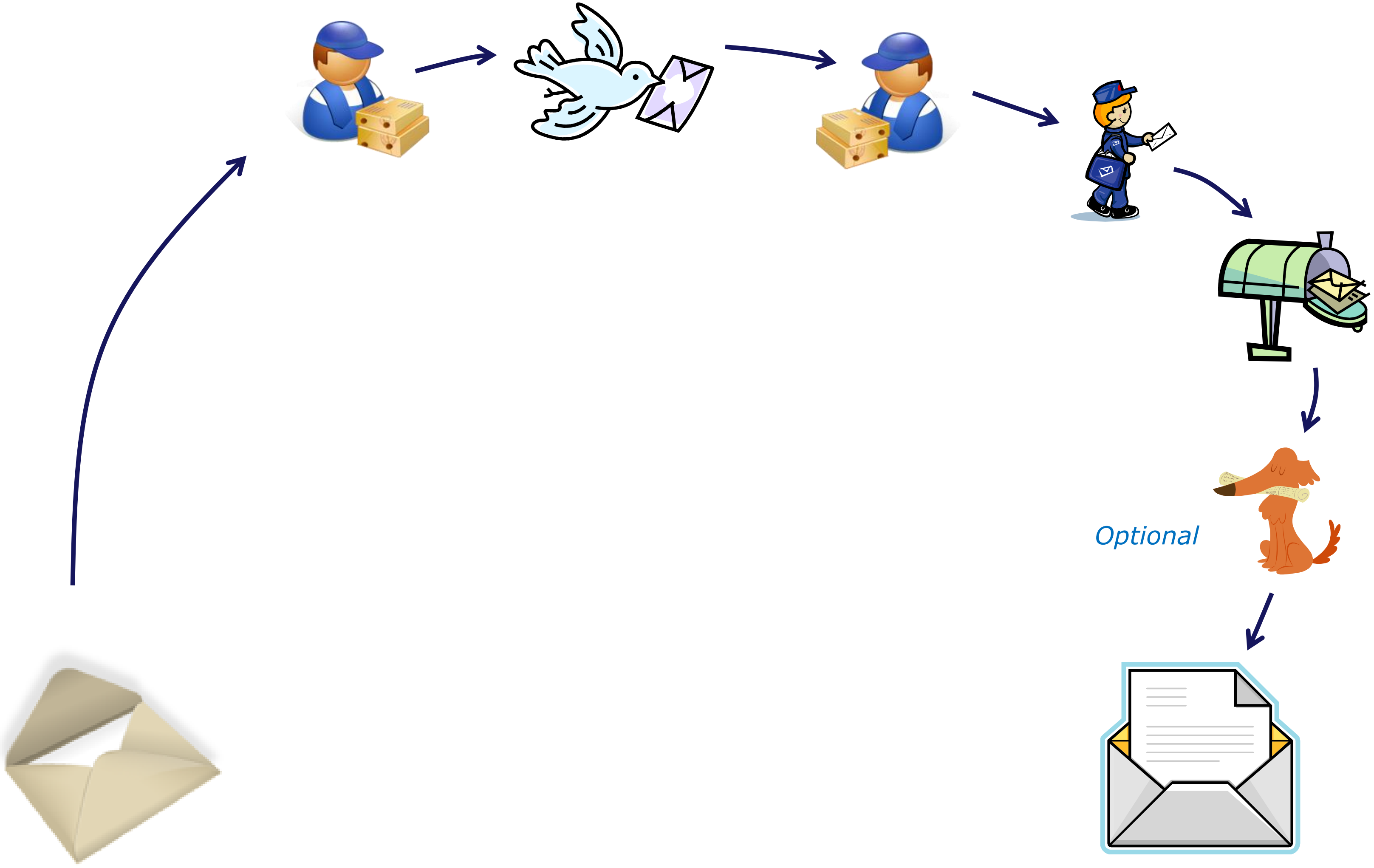
  mail $LOGNAME

  mail $LOGNAME
- Now read your mail

  mail
- Use the **h** command to list the message headers
- Read all your messages using **p** command
- Use the **d** command to delete one of the messages
- Use the **s** command to save one message to a folder named archives
- Use **q** to quit mail
- Read the mail in your archives with **mail -f archives**
- Use **q** to quit mail

end-to-end email

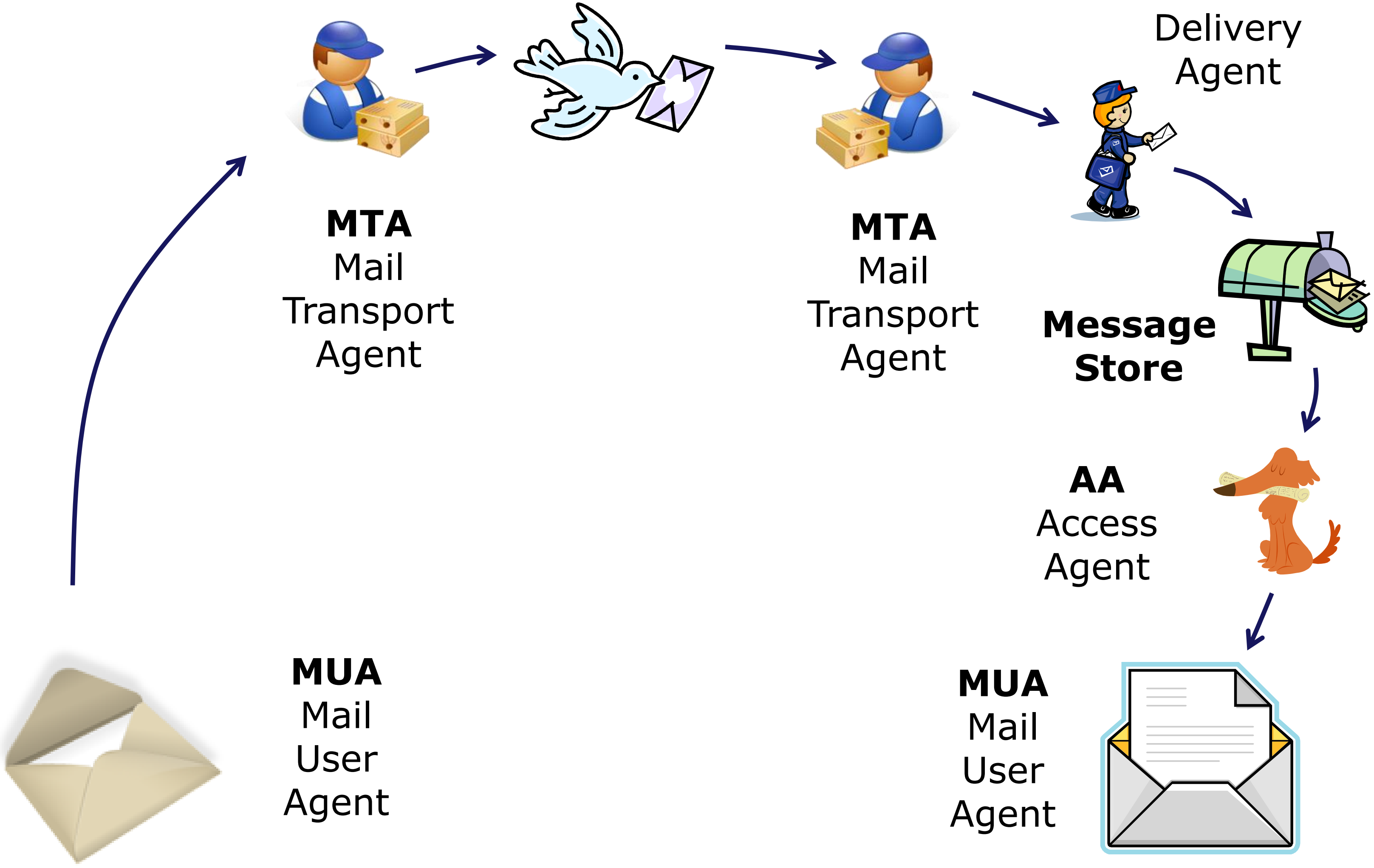
end-to-end email



compose and send message

open and read message

end-to-end email



MUA
Mail
User
Agent

MTA
Mail
Transport
Agent

MTA
Mail
Transport
Agent

DA
Delivery
Agent

Message Store

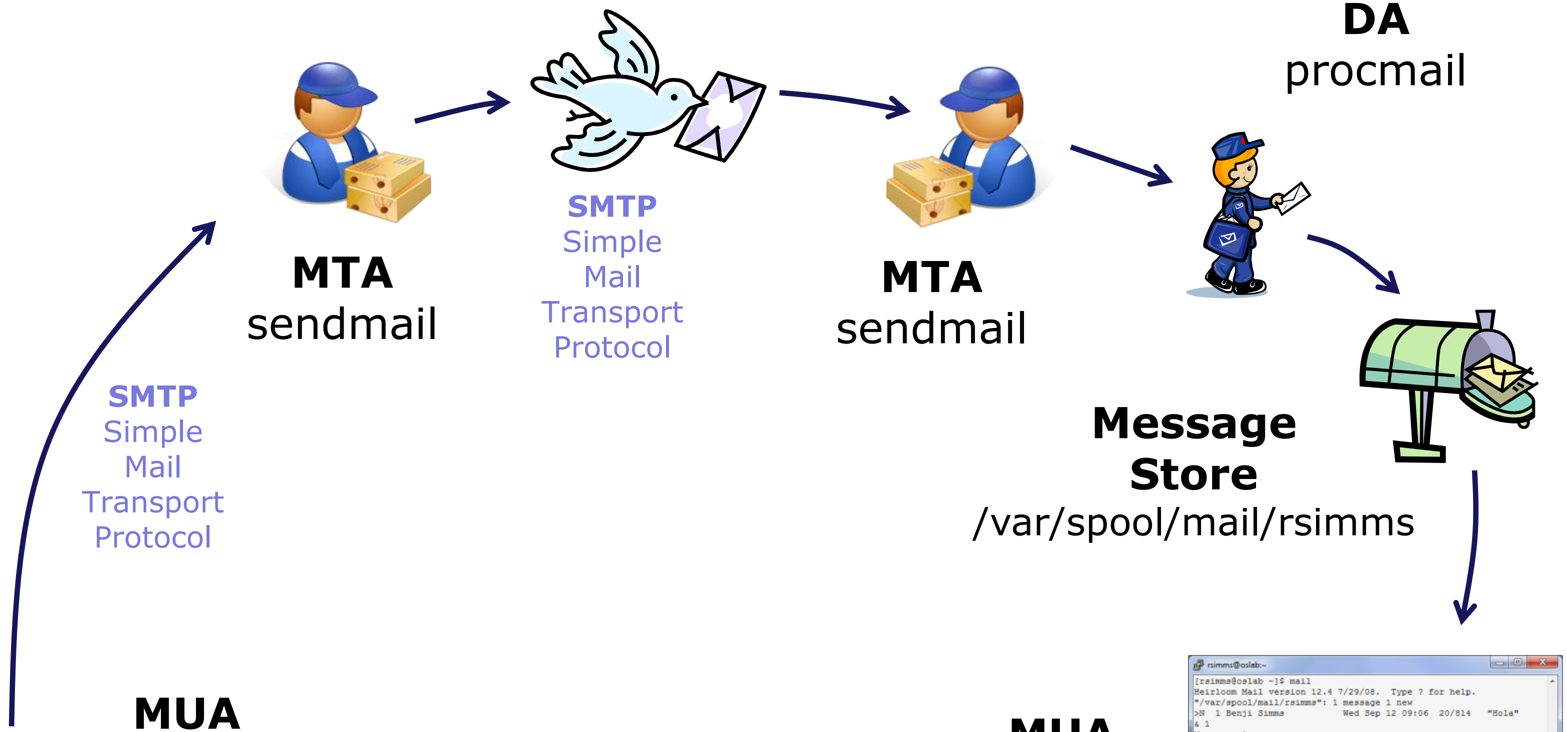
AA
Access
Agent

MUA
Mail
User
Agent

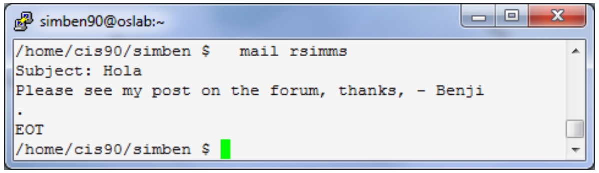
compose and send message

open and read message

end-to-end email: example Implementation



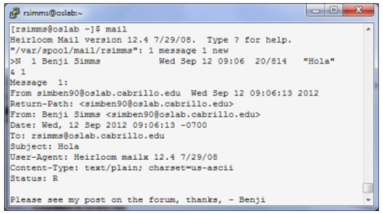
MUA
/bin/mail



```
/home/cis90/simben $   mail rsimms
Subject: Hola
Please see my post on the forum, thanks, - Benji
.
EOT
/home/cis90/simben $
```

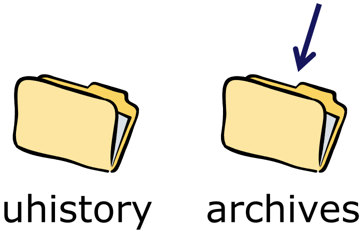
compose and send message

MUA
/bin/mail

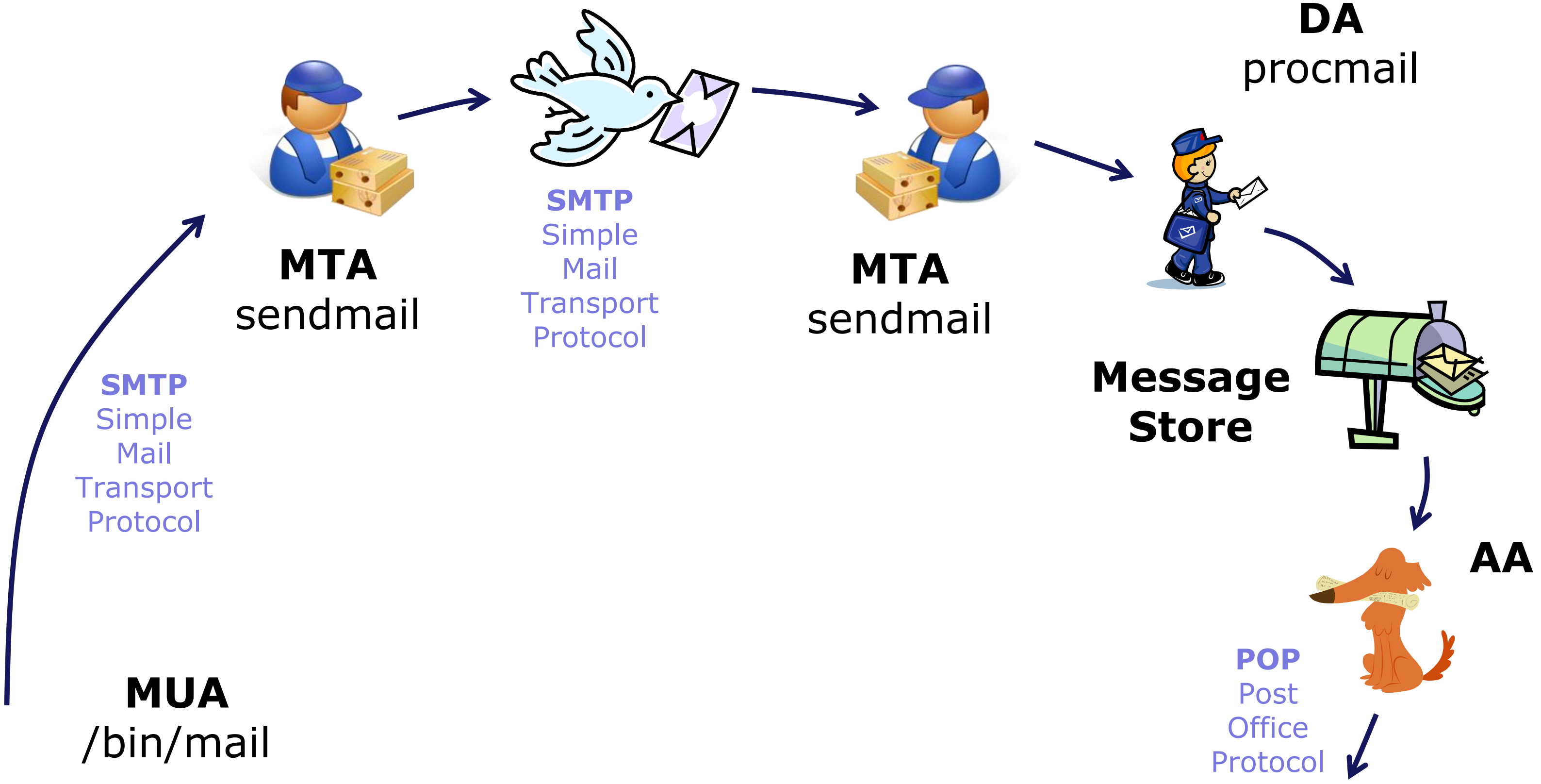


```
[rsimms@oslab ~]$ mail
Heirloom Mail version 12.4 7/29/08.  Type ? for help.
"/var/spool/mail/rsimms": 1 message 1 new
>N  1 Benji Simms           Wed Sep 12 09:06  20/814   "Hola"
& 1
Message  1:
From simben90@oslab.cabrillo.edu  Wed Sep 12 09:06:13 2012
Return-Path: <simben90@oslab.cabrillo.edu>
From: Benji Simms <simben90@oslab.cabrillo.edu>
Date: Wed, 12 Sep 2012 09:06:13 -0700
To: rsimms@oslab.cabrillo.edu
Subject: Hola
User-Agent: Heirloom mailx 12.4 7/29/08
Content-Type: text/plain; charset=us-ascii
Status: R

Please see my post on the forum, thanks, - Benji
```

open, read and save messages to folders



end-to-end email: example Implementation



DA
procmail

MTA
sendmail

SMTP
Simple
Mail
Transport
Protocol

MTA
sendmail

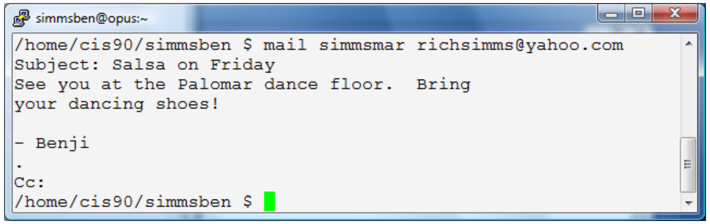
Message Store

SMTP
Simple
Mail
Transport
Protocol

AA

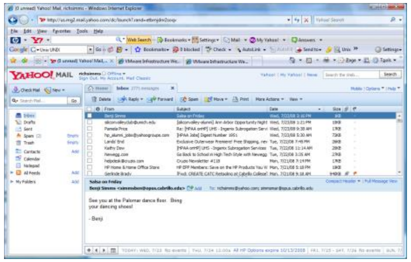
POP
Post
Office
Protocol

MUA
/bin/mail



```
/home/cis90/simmsben $ mail simmsmar richsimms@yahoo.com
Subject: Salsa on Friday
See you at the Palomar dance floor.  Bring
your dancing shoes!

- Benji
.
Cc:
/home/cis90/simmsben $
```

MUA
Yahoo
Mail



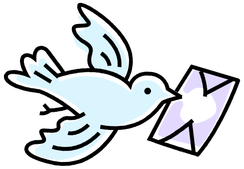
compose and send message

open and read message

end-to-end email: configuring your MUA (Mail User Agent)

SMTP
Simple
Mail
Transport
Protocol

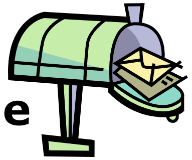
MTA
Mail
Transport
Agent



SMTP
Simple
Mail
Transport
Protocol

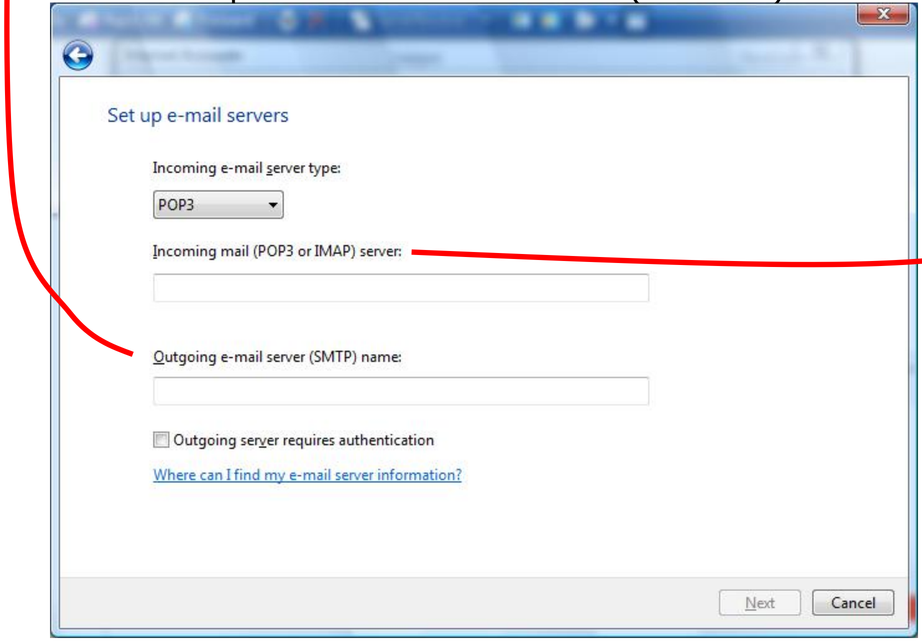
MTA
Mail
Transport
Agent

DA
Delivery
Agent



Message Store

Example MUA: Windows Mail (on Vista)



Set up e-mail servers

Incoming e-mail server type:

POP3

Incoming mail (POP3 or IMAP) server:

Outgoing e-mail server (SMTP) name:

☐ Outgoing server requires authentication

Where can I find my e-mail server information?

AA
Access
Agent

POP
Post
Office
Protocol

This is why you get asked for the SMTP server and the POP3/IMAP server when you set up email on your PC.

Your MUA needs to know this to send and receive messages.

Other MUAs MTAs, DAs, AAs

end-to-end email

some of the many players

MTA

sendmail, Exim, Microsoft Exchange, Postfix

DA

/bin/mail, procmail, smrsh

AA

imapd, spop

MUA

/bin/mail, pine, elm, Outlook, gmail, Evolution, Yahoo Mail

Lab 3

Notes to Rich

[ ] - Send out UNIX historical events for Lab 3

use mail-lab03 script in /cis90/misc/uhist directory

Lab 3 - Start early and check your Opus email every day!

You will receive another mail message from me that describes a UNIX historical event for a particular year from 1968 to 2003. Save this message to a mail file called *uhistory*.

The objective of this lab is to exchange and collect all the individual events that were sent to each student using UNIX mail.

Start by sending an email to your other classmates with your event and ask them ask them to send you their events. Each time you get UNIX event that you haven't already saved, save it to your *uhistory* mail file. See how many dates you can accumulate. Can you get all 18?

Rules:

- Do this lab on Opus using /bin/mail (the **mail** command).
- When someone asks you for the date that you received, you must send it to them with the subject being the year of the event, e.g. 1972. The email message must contain the complete text of the event for that year.
- Each email saved in *uhistory* must be for a single event/year.

If you receive an email that is missing the event or does not have the year as the subject, reply to the sender and ask them to resend a corrected version.

When you get all the UNIX event messages saved in your *uhistory* mailbox you should have up to 18 messages, each with a different date for the Subject field. Delete any duplicate dates you may have.

Lab 3 (and all future labs) must be done on Opus

Tips for Lab 3

Start this lab early in the week and check your mail daily to collect all messages

- Use the **s** command in mail to save a message to your uhistory file
- use **mail -f uhistory** to review your collection
- Use the **d** command in mail to delete duplicates in your uhistory file

Watch for more tips on the forum

Wrap up

New commands:

mail - UNIX mail

type <message list>	type messages
next	goto and type next message
from <message list>	give head lines of messages
headers	print out active message headers
delete <message list>	delete messages
undelete <message list>	undelete messages
save <message list> folder	append messages to folder and mark as saved
copy <message list> folder	append messages to folder without marking them
write <message list> file	append message texts to file, save attachments
preserve <message list>	keep incoming messages in mailbox even if saved
Reply <message list>	reply to message senders
reply <message list>	reply to message senders and all recipients
mail addresses	mail to specific recipients
file folder	change to another folder
quit	quit and apply changes to folder
xit	quit and discard changes made to folder
!	shell escape
cd <directory>	chdir to directory or home if none given
list	list names of all available commands

A <message list> consists of integers, ranges of same, or other criteria separated by spaces. If omitted, mail uses the last message typed.

mesg - Enable or disable writes to your terminal

write - Write message to another user

New Files and Directories:

/var/mail - Message store for mail

/var/mail/*username* - Incoming mailbox for *username*

Next Class

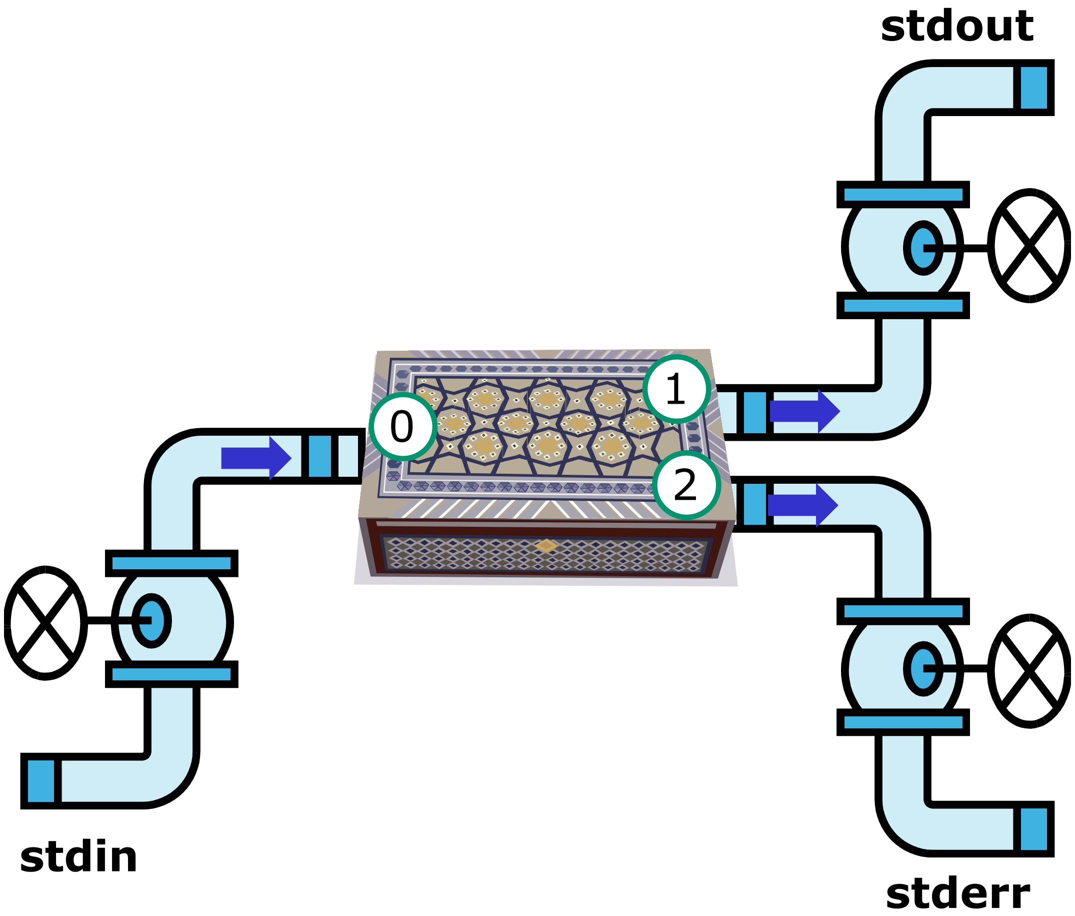
Assignment: Check Calendar Page on web site to see what is due next week.

1st five forum posts and Lab 3

Quiz questions for next class:

- What command can you use to "chat" with another user?
- How do you forward a message with /bin/mail?
- What is the dead.letter folder?

Backup


stdout
1
0
2
stdin
stderr