Lesson Module Checklist
- Slides –
- Flash cards –
- Properties –
- Page numbers -
- 1st minute quiz –
- Web Calendar summary –
- Web book pages -
- Commands –
- Lab tested –

- MSDNAA accounts made –
- VMware AA accounts made –
- Census done -
- Welcome ready for mailing -
- Historical events ready for mailing -

- CCC Confer room whiteboard –
- Check that headset is charged –
- Backup slides, CCC info, handouts on flash drive -

CIS 90 - Lesson 3

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





Sean C. Donald Carlile Andrew Sean Fa. Carter Sean Fy. Dajan

Bryn Rita Kelly Ben Ray Fidel Michael Evan

Josh Carlos Gustavo Jessica Evie Jacob Humberto Chad

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

Quiz

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

See electronic white board

email answers to: risimms@cabrillo.edu

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

First Minute Quiz

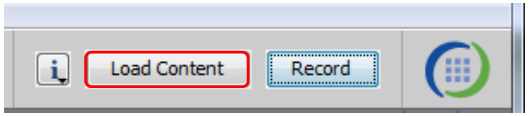
Please answer these questions **in the order** shown:

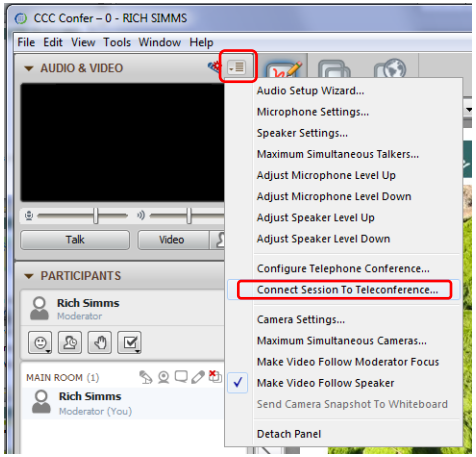
1. What is the command to print the manual page for a command?
2. How do you show your path?
3. Name four directories where one can find commands?

email answers to: `risimms@cabrillo.edu`

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

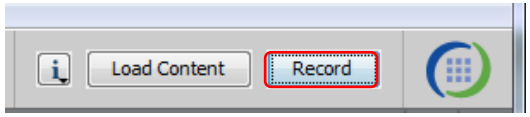
[ ] Load White Board with pics & quiz



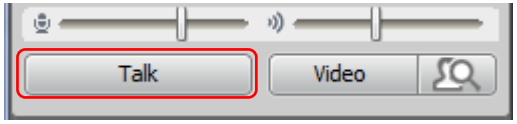


[ ] Connect session to Teleconference

[ ] Is recording on?



[ ] Toggle Talk button to not use Mic



[ ] Disable spelling on PowerPoint

[ ] Share slides, putties, Chrome and VLab

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, logon to Opus

Questions

Previous material and assignment

Questions on lab assignments or previous lesson material?

Lab 1 Results
(xx times answered incorrectly)

1) What is the shell prompt string on Opus? (3 times)
2) What is the shell prompt string on P3-Kate? (3 times)
5) What shell program is being used on Opus? (2 times)
6) On Mr-Eko, is the command history always the same between different virtual TTY terminals? (10 times)
7) On Mr-Eko, is the user ID (UID) number the same between different virtual terminals? (2 times)
8) On Mr-Eko, is the terminal device the same between different virtual terminals? (3 times)
9) On Mr-Eko, does logging off one virtual terminal log you off the others? (2 times)
10) What are the names of the kernels on Kate and Hugo? (3 times)
11) What is the name and version of the Linux distributions running on Kate and Hugo? (1 times)
12) What is the hostname of the Not-Opus system in Pod 1? (1 times)
14) On Opus, what terminal device are you using? (2 times)

Extra Credit
16) What is the hostname of the mystery system? (10 times)
17) What is the name of the distribution of Linux running of the system Annie and George logged in from? (12 times)
18) What is your user ID (UID) number on the mystery system? (11 times)

Lab 2 Notes

1) This lab must be done on Opus using your personal username! Not Mr-Eko, not your home Linux system, not user cis90 …

2) Before you submit, be sure to do the **history –a** command. This updates your history file with commands you issued for Lab 2.

3) The **submit** command will snapshot your history and ask you three questions.

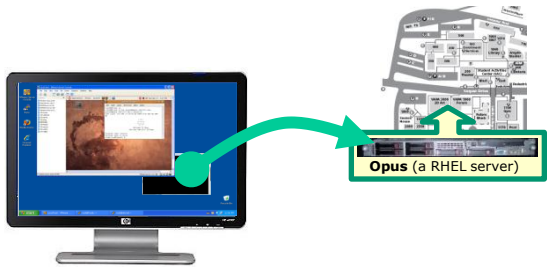
4) Submit as many times as you wish up to the deadline.

5) Use the **verify** command to see what you submitted for grading.

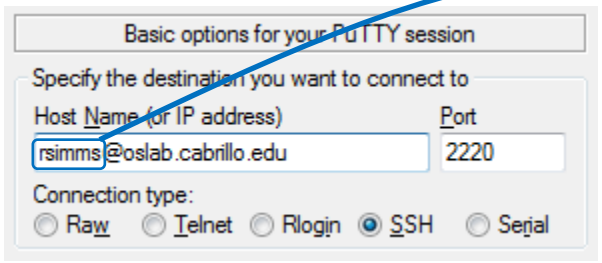
This lab is graded by checking that you:

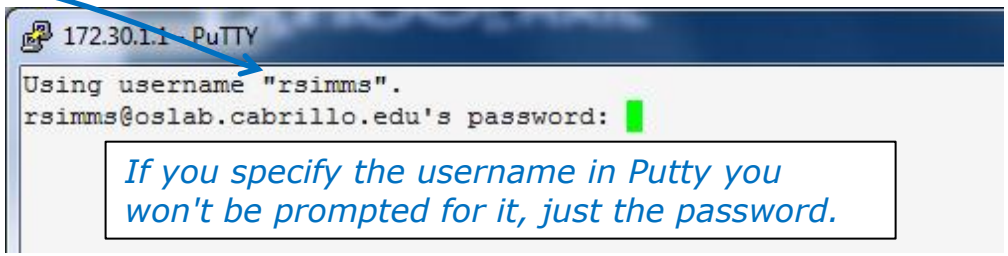
- *Issued all the commands shown in the lab*
- *Issues all the commands necessary to answer questions posed in the lab.*
- *You answered the three questions from the submit script correctly.*

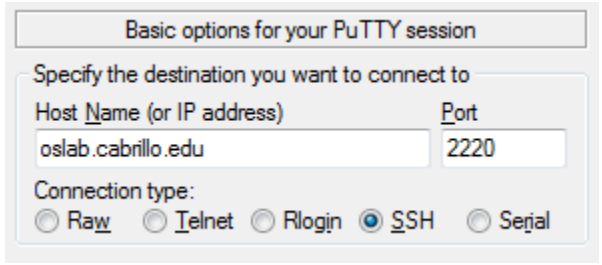
Subtle Stuff

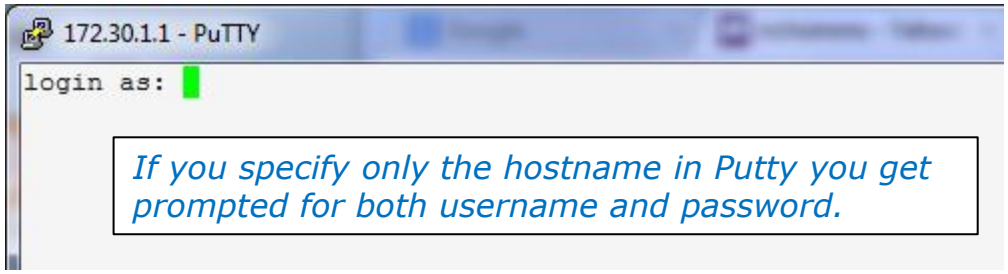


*Putty to **rsimms@oslab.cabrillo.edu***
or
*Putty to **oslab.cabrillo.edu***

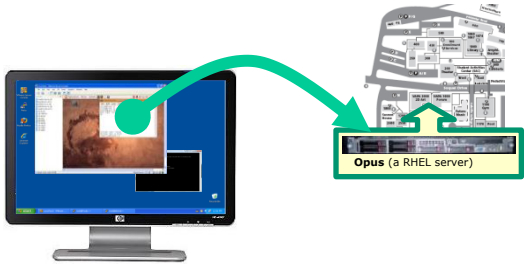






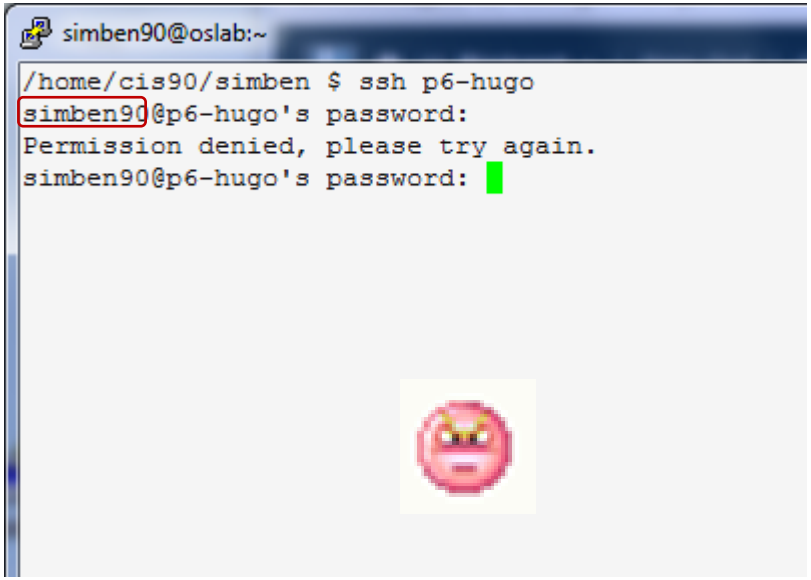


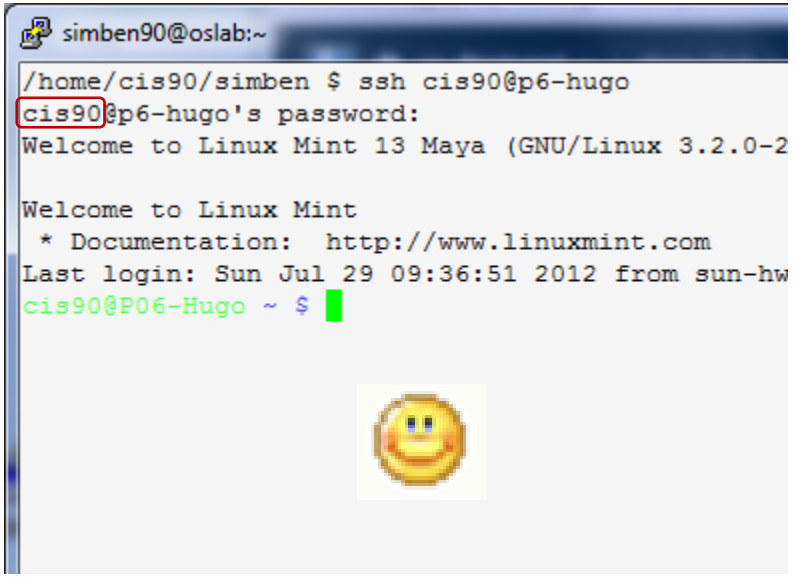
Tip: Use the Putty "Saved Sessions" for your Opus connection. Then you don't have to type in the username, hostname and port number each time you connect to Opus.



ssh cis90@p6-hugo
or
ssh p6-hugo

(from Opus)





*If you don't specify the user 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

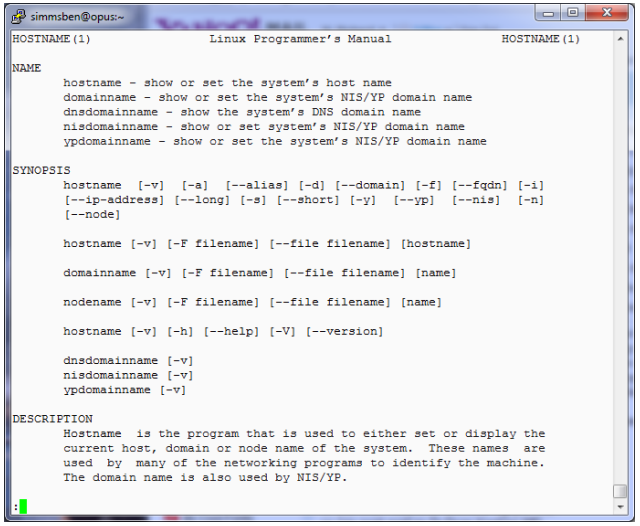
Usually, to find the location of a command on your path, use the **type** command:

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

The hostname program is in the /bin directory

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

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



Command Review

However,

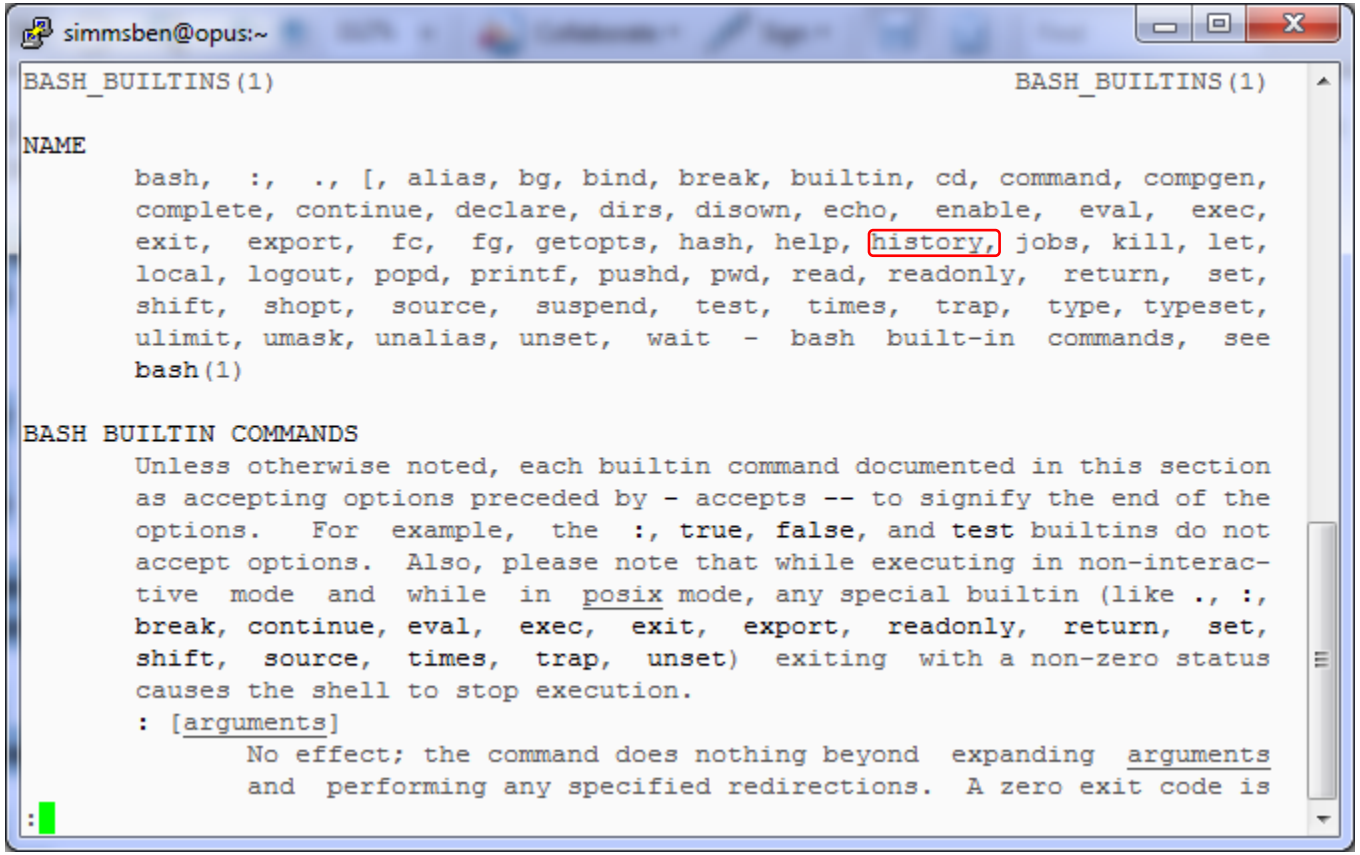
*sometimes you may get something different than you expect with the **type** and **man** commands*

type and man caveats

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

history *is part of the shell and does not have its own program file*

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



history *does not have its own man page either*

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

type and man caveats

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

Note, the location is not displayed

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

***ls** resides in the /bin directory*

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

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

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

Expectation Check

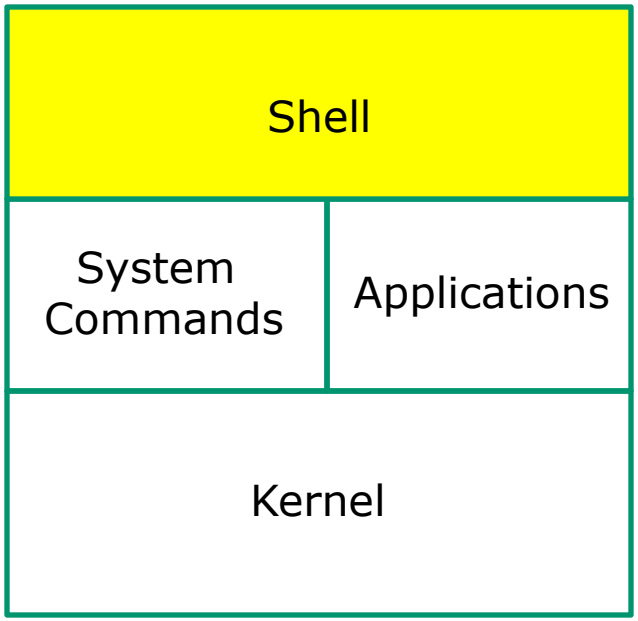
Skills you should be comfortable performing

- Entering the Virtual Classroom
- Reviewing Lesson Video Archives
- Downloading Lesson PowerPoints
- Check your current grade status
- Check when assignments are due
- Check when quizzes and tests will be held
- Check your graded labs against correct answers

- Logging into Opus from home or school
- Logging into any of the pod VMs (Hugo, Kate, Mr-Eko, Not-Opus)
- Making a reservation for pod VMs on the Fang
- Accessing pod VMs by SSH or the GUI
- Changing Virtual (TTY) Terminals on the pod VMs
- Parsing any shell command
- Getting documentation on any command
- Identify the key components of the UNIX/Linux architecture
- Identify the six steps the shell does for every command
- 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!

Life 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

Prompt	Command	Options	Arguments	Redirection

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

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

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

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
```

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

Commands are Programs

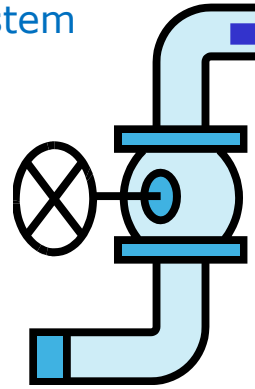
Program
(a file on the hard drive)

Loads into RAM

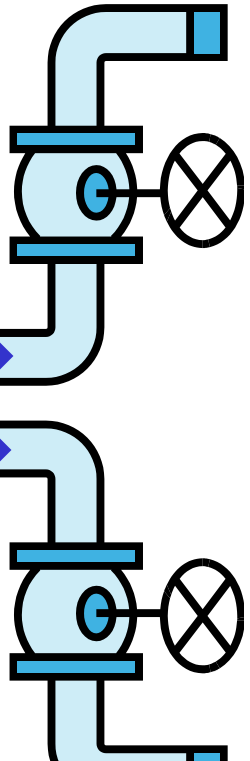
Command line
(parsed by shell):
Options: …
Args: …
A

Commands can get input from:
- A Command line
- B Keyboard
- C Operating System

read write



stdin

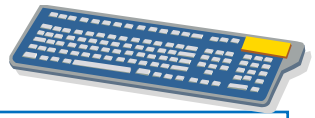


stdout

stderr

console screen (default)

console screen (default)



console keyboard (default)

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

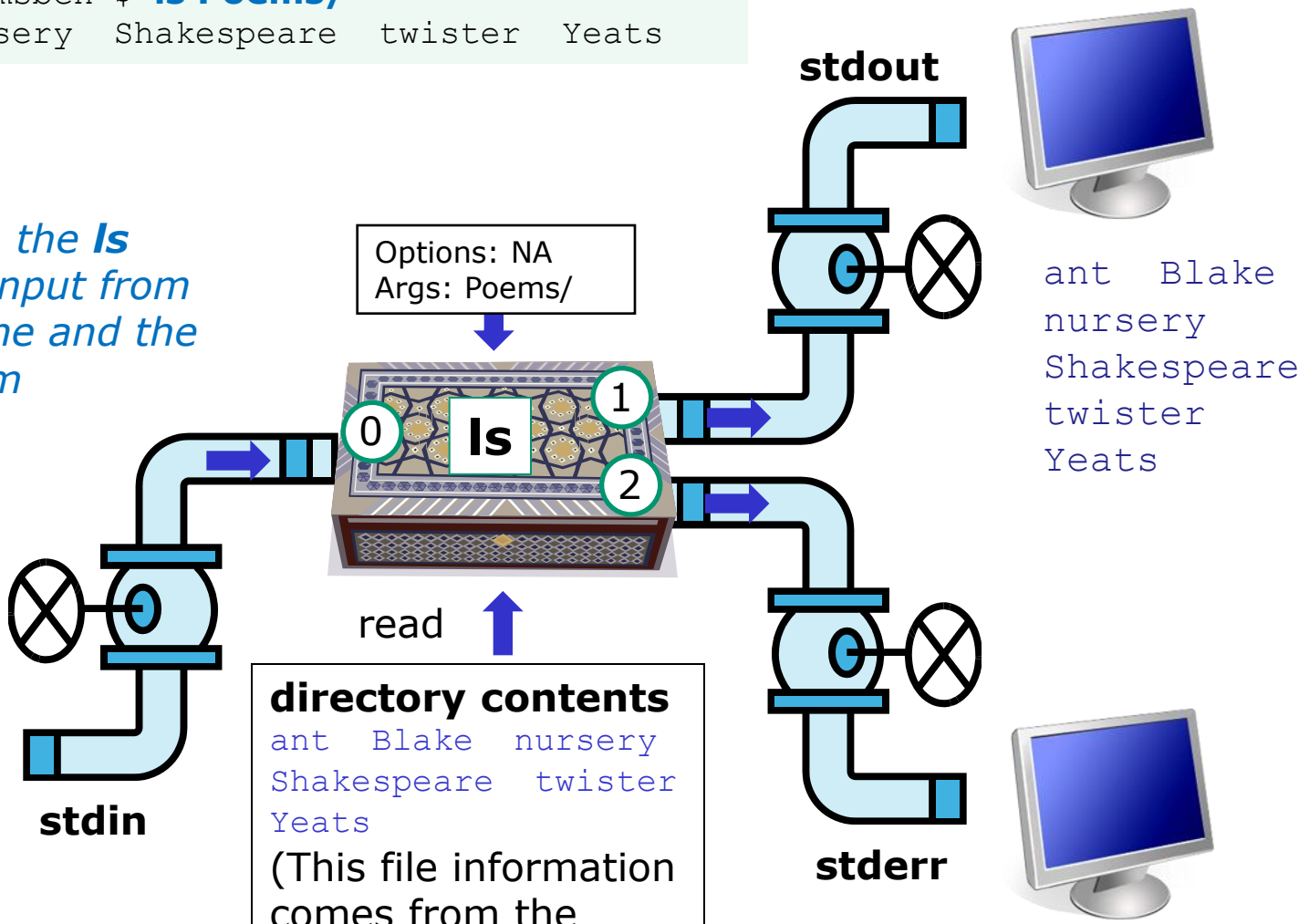
Operating System C

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

Example program to process: ls command

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

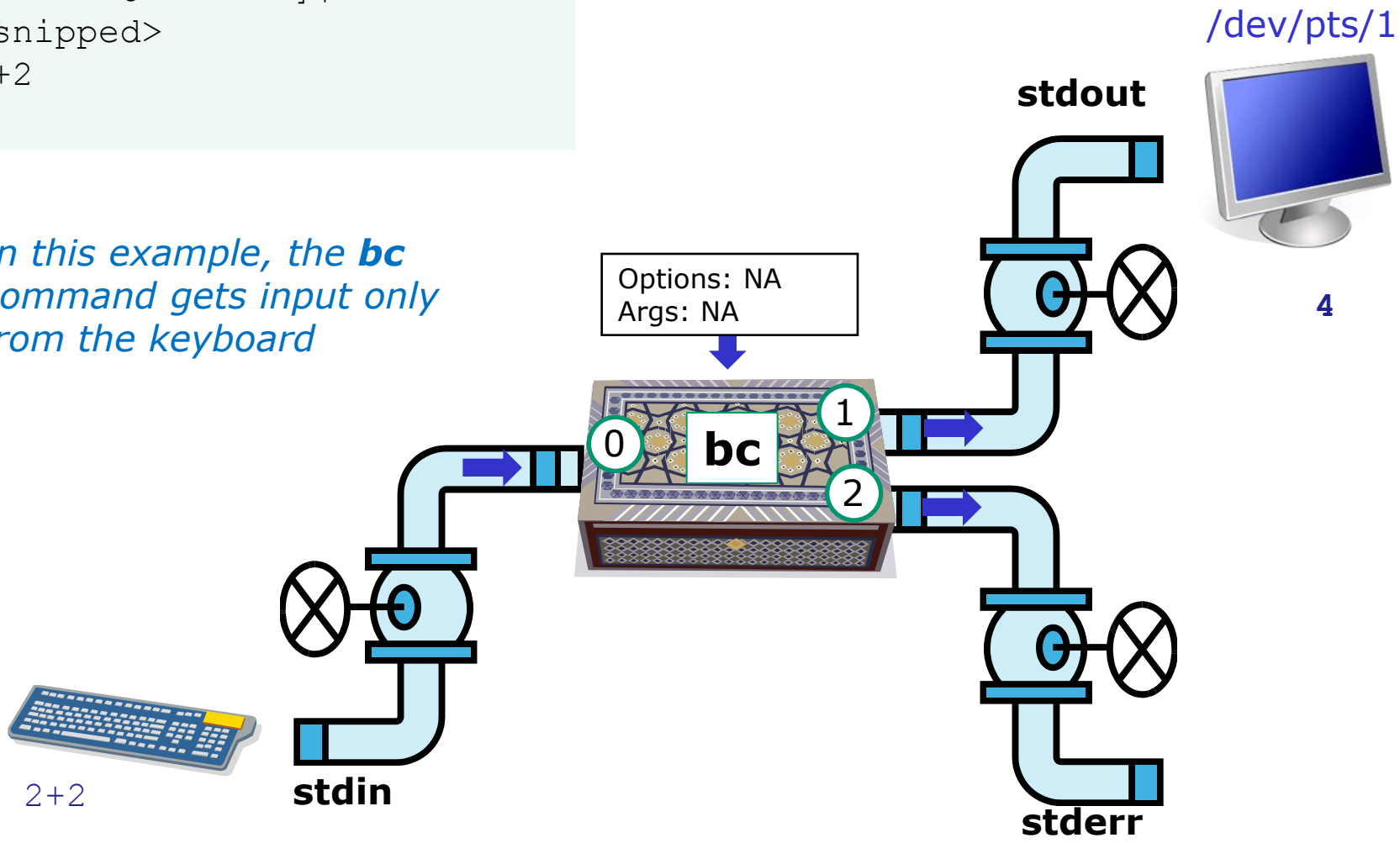
*In this example, the **ls** command gets input from the command line and the operating system*



Example program to process: bc command

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

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



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
```

Advanced Activity

A preview of things to come

Set a variable = to all the CIS 90 student usernames

```
classlist=$(cat /etc/passwd | grep cis90 | cut -f1 -d":")
echo $classlist
```

We will learn how this actually works in future lessons

Practice Test Questions

What is your uid (user ID)?

Benji's uid is 1001

```
/home/cis90/simben $ id
uid=1001(simben90) gid=190(cis90) groups=190(cis90),100(users)
context=unconfined_u:unconfined_r:unconfined_t:s0-s0:c0.c1023
/home/cis90/simben $
```

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?

```
/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/
```

Command: ls

One option: -l (for long listing)

One argument: /boot/grub (the file named grub in the /boot 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?

```
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/simmsben $ typo history
-bash: typo: command not found
/home/cis90/simmsben $
```

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/simmsben $ uname -everything
uname: invalid option -- e
Try `uname --help' for more information.
/home/cis90/simmsben $
```

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?

Use the tty command to find out:

```
/home/cis90ol/simmsben $ tty
/dev/pts/2
/home/cis90ol/simmsben $
```

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?

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?

```
/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

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?

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: " then change it back again?

Set PS1 to new value using "=" sign

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

To restore the original prompt use:

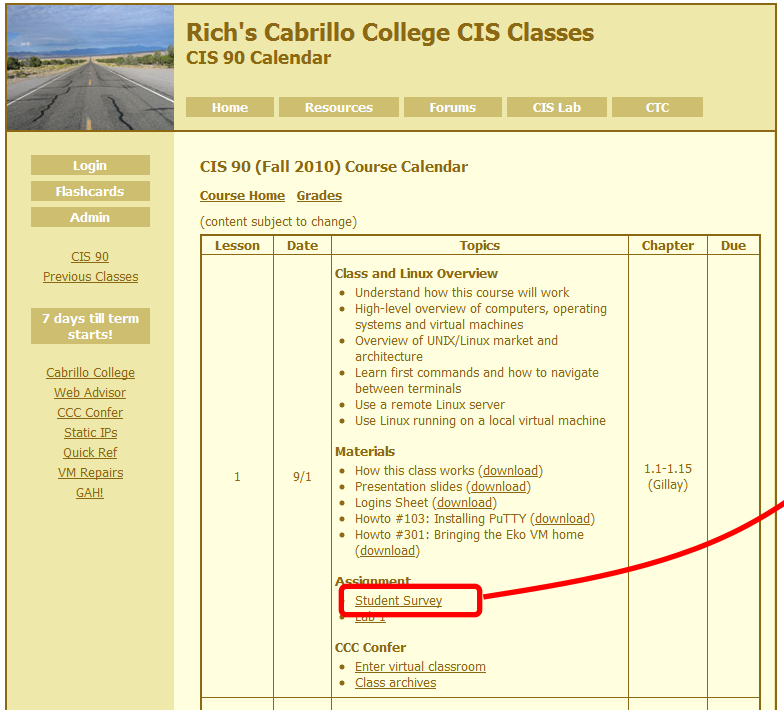
```
Enter next command: PS1='$PWD $ '
/home/cis90/simben $
```

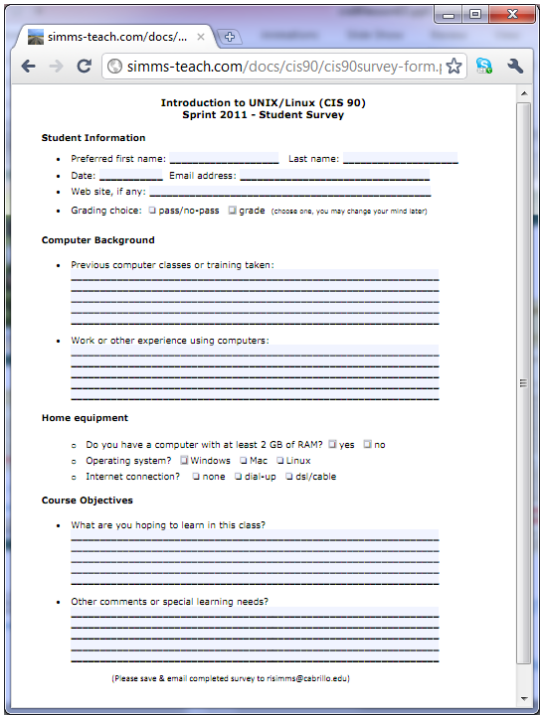
Housekeeping

Note: Lab 2 due today

- Use **history –a** before **submit**
- submit as many times as you wish up to 11:59PM
- Use **verify** command (which is a script) to see what you submitted (and I will grade)

Student Surveys





I'm missing surveys from several students

Please download, fill out, save and email as an attachment to:

risimms@cabrillo.edu

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	
Amroth	grade																															
Anborn	grade	2																	19											5		
Arador	P/NP																		26													
Aragorn	grade																		21													
Balrog	grade	1																	21													
Bombadil	grade	3																	28													
Boromir	grade																															
Celeborn	grade	3																	30													
Dior	grade																															
Dori	grade	3																														
Elrond	grade																															
Eomer	grade	3																	27													
Frodo	grade																															
Gimli	grade																		17													
Goldberry	P/NP	3																	23											3		
Huan	grade	3																	28													
Ingold	grade	3																	30													
Marhari	grade																															
Orome	grade																															
Pallando	grade																		22													
Pippin	grade																															
Quickbeam	grade	1																	22													
Samwise	P/NP																		21													
Saruman	grade	3																														
Sauron	grade	1																	29											7		
Shadowfax	grade	3																	30											6		
Smeagol	grade	3																	30													
Theoden	grade	2																	28											3		
Tulkas	P/NP	0																														

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

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

Graded work is copied to your home directories

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

/home/cis90/simben $ cat lab01.graded

GRADING RUBRIC
Two points for each correct answer for Q1 to Q15
One point for each correct answer for Q16 to Q18

Q1: 2 point(s)
Q2: 2 point(s)
Q3: 2 point(s)
Q4: 2 point(s)
Q5: 2 point(s)

snipped

Q16: 1 point(s)
Q17: 1 point(s)
Q18: 1 point(s)

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

*Log in to Opus and use the **ls** and **cat** commands to see your graded work*

Answers are posted in answers directory

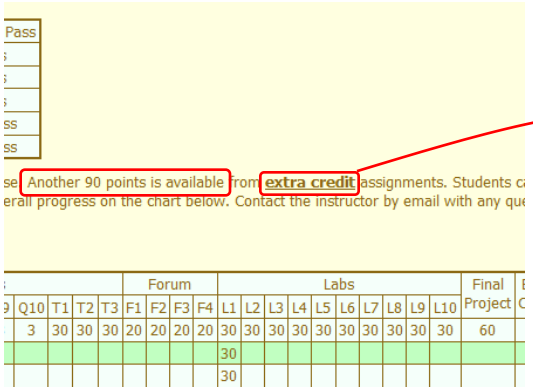
```
/home/cis90/simben $ ls /home/cis90/answers/
lab01  lab03  lab05  lab07  lab09  quiz01  test02
lab02  lab04  lab06  lab08  lab10  test01  test03

/home/cis90/simben $ cat /home/cis90/answers/lab01
1) /home/cis90/simben $ - login into Opus and view prompt (L1-
S61,64)
2) cis90@P03-Kate:~$ - login into P3-kate and view prompt (L1-
S61,64,73)
3) Monday - use cal command with birth month and year (YYYY)
then look at day (L1-S63)
4) no - log into both systems and run id commmand to see they
differ (L4-S68)
5) bash - run ps and look at first process listed (L1-S66)
6) no - log into two virtual TTY terminals, enter different
commands in each, then run history command in each virtual TTY
terminal. Compare output to verify they are differnt histories.
(L1-69,85-86)
```

snipped

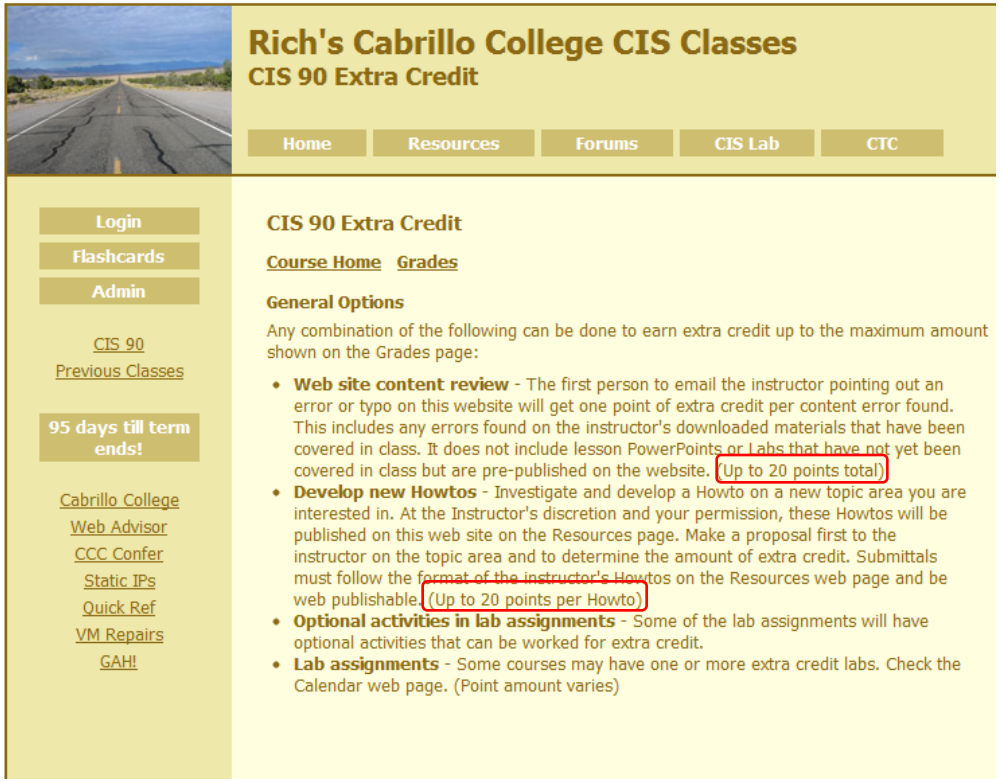
```
17) Fedora - ran cat /etc/issue on sun-hwa (L1-S66,73)
18) 1234 - ran id command on sun-hwa (L1-S68)
/home/cis90/simben $
```

The answers to labs will be posted to this directory after the due date has passed.

Extra Credit

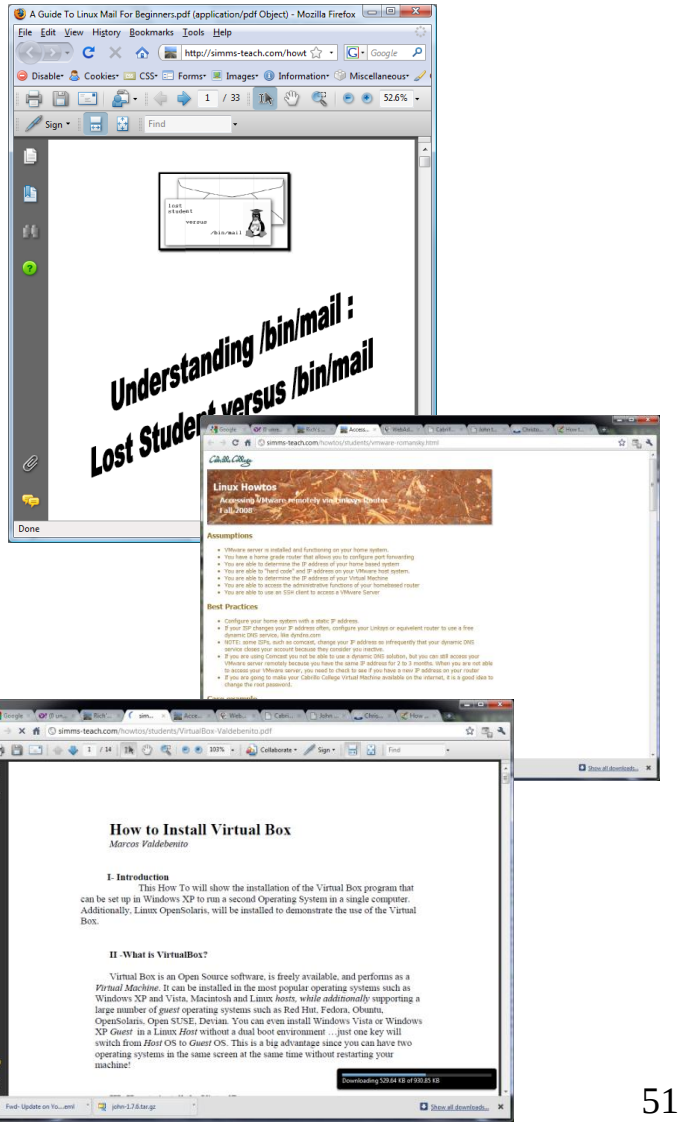


Link to Extra Credit page is on the Grades page

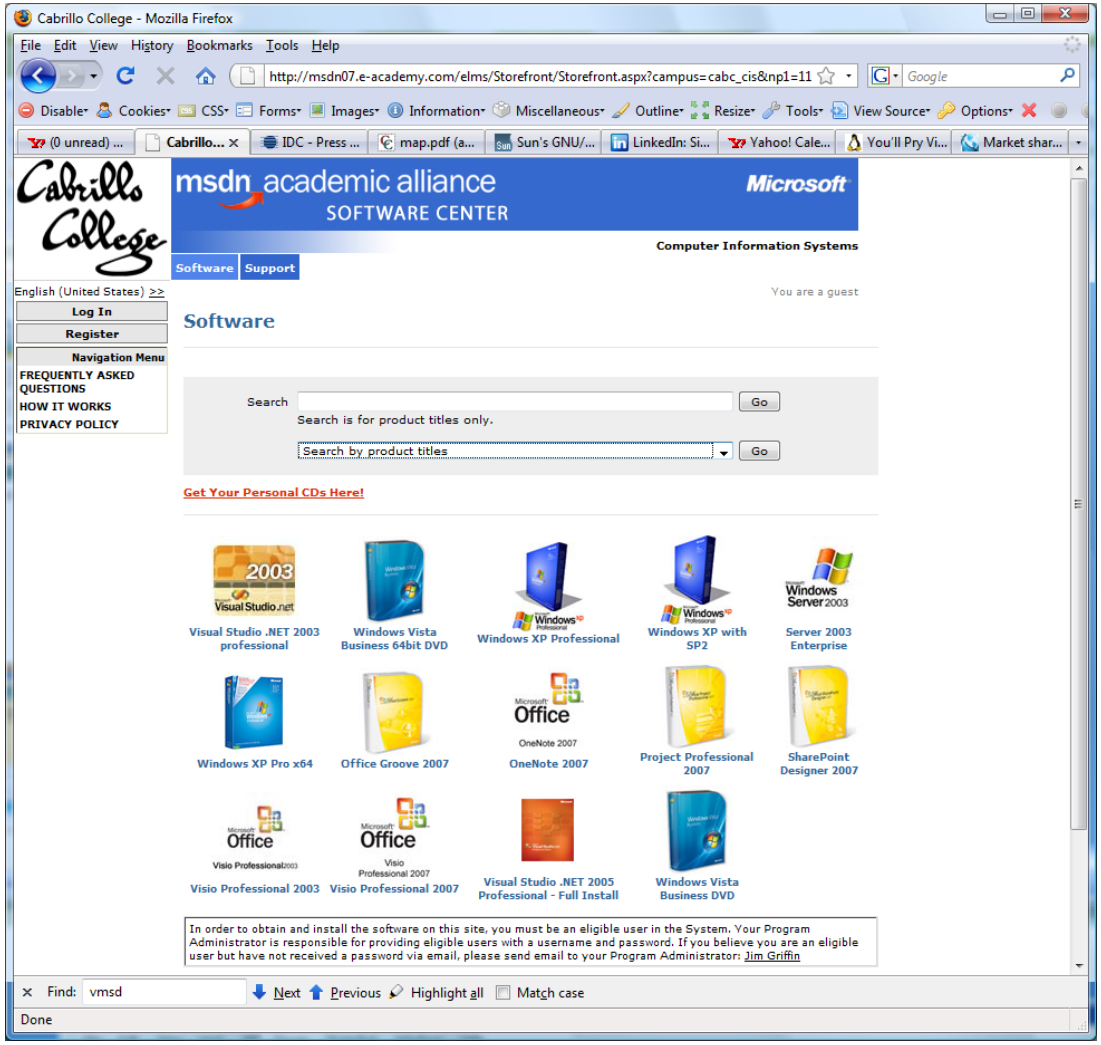


Note the caps on extra credit.

Extra Credit Howtos



MSDN Academic Alliance

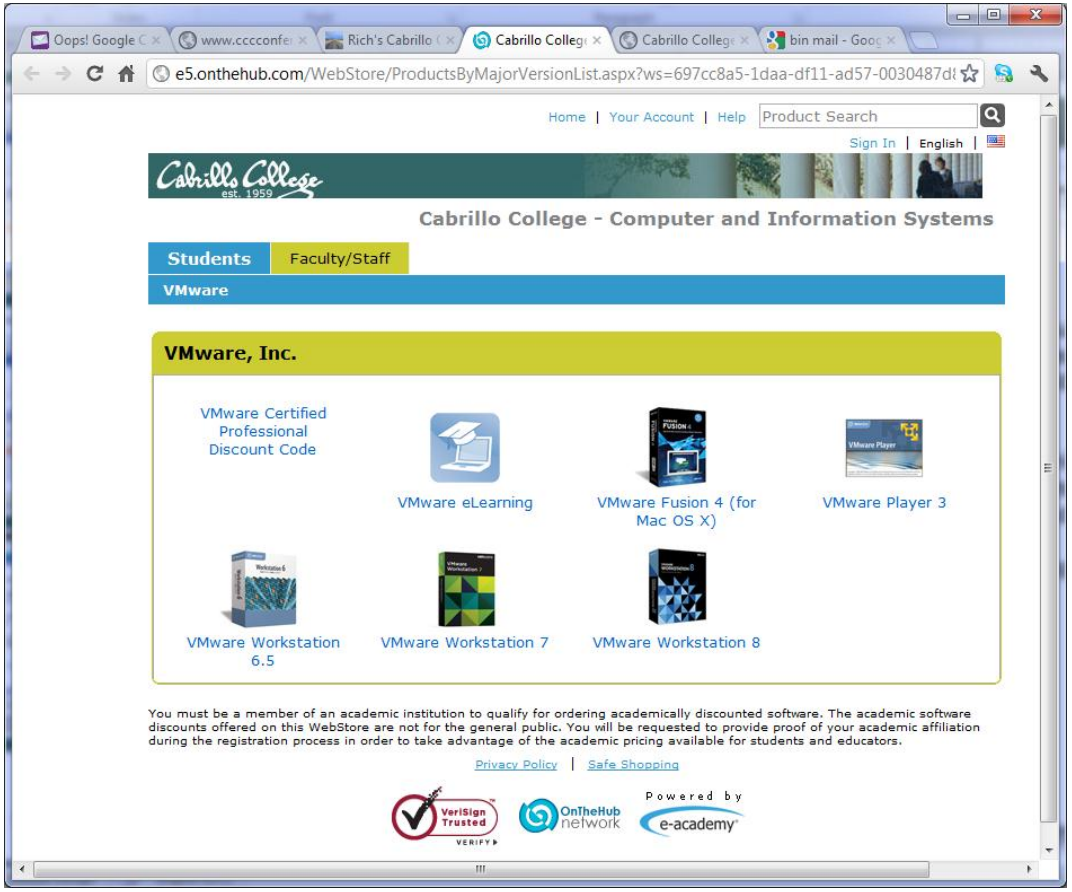


Accounts for students enrolled in CIS 90 have been created using your WebAdvisor email addresses.

Link is on website Resources page in Tools and Software section

Happy downloading!

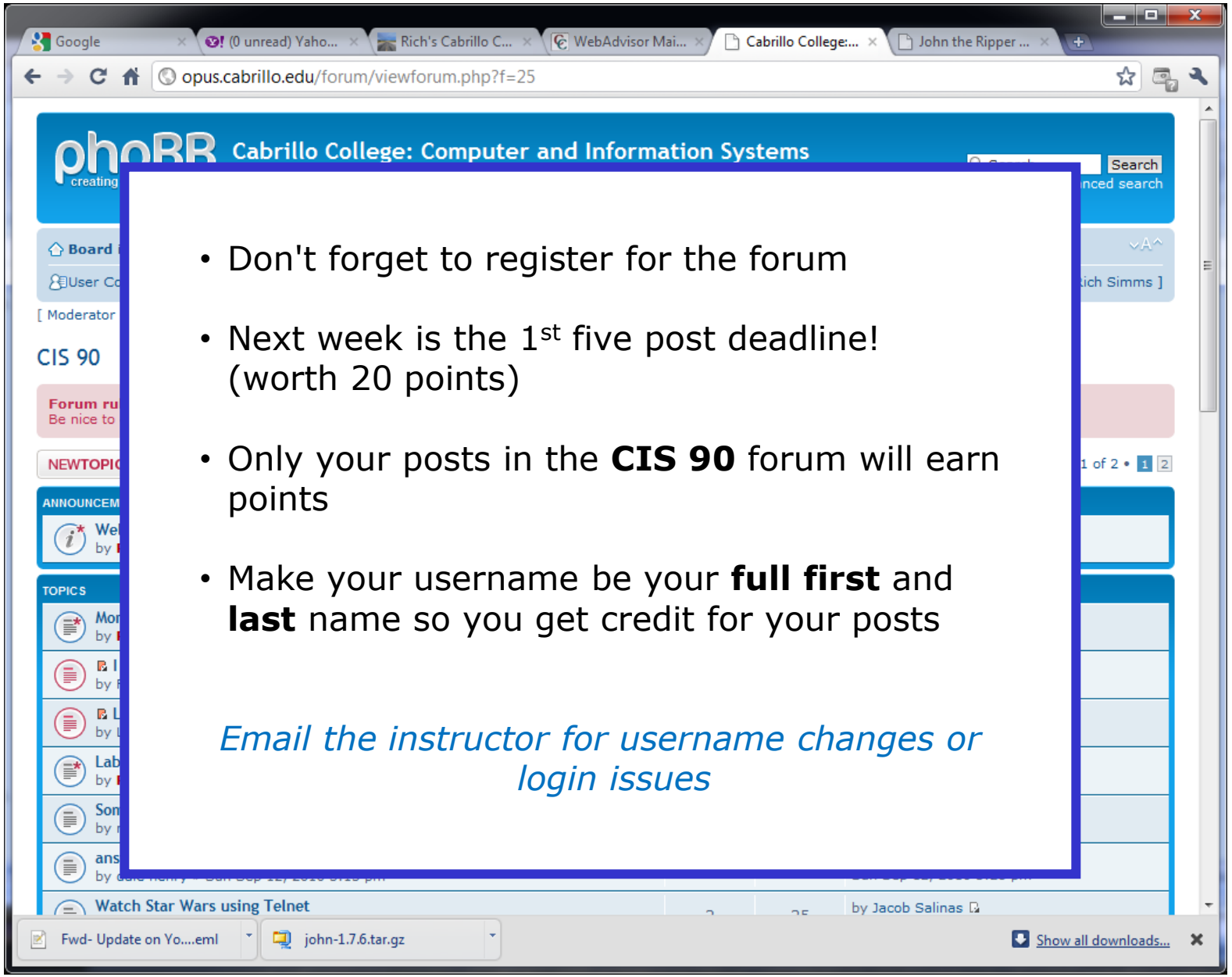
VMware Academic Alliance



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

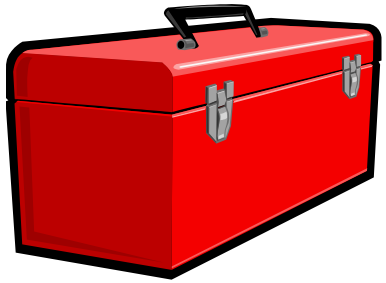
Link is on website Resources page in Tools and Software section

Happy downloading!



- Don't forget to register for 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 your username be your **full first** and **last** name so you get credit for your posts

Email the instructor for username changes or login issues



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

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
```

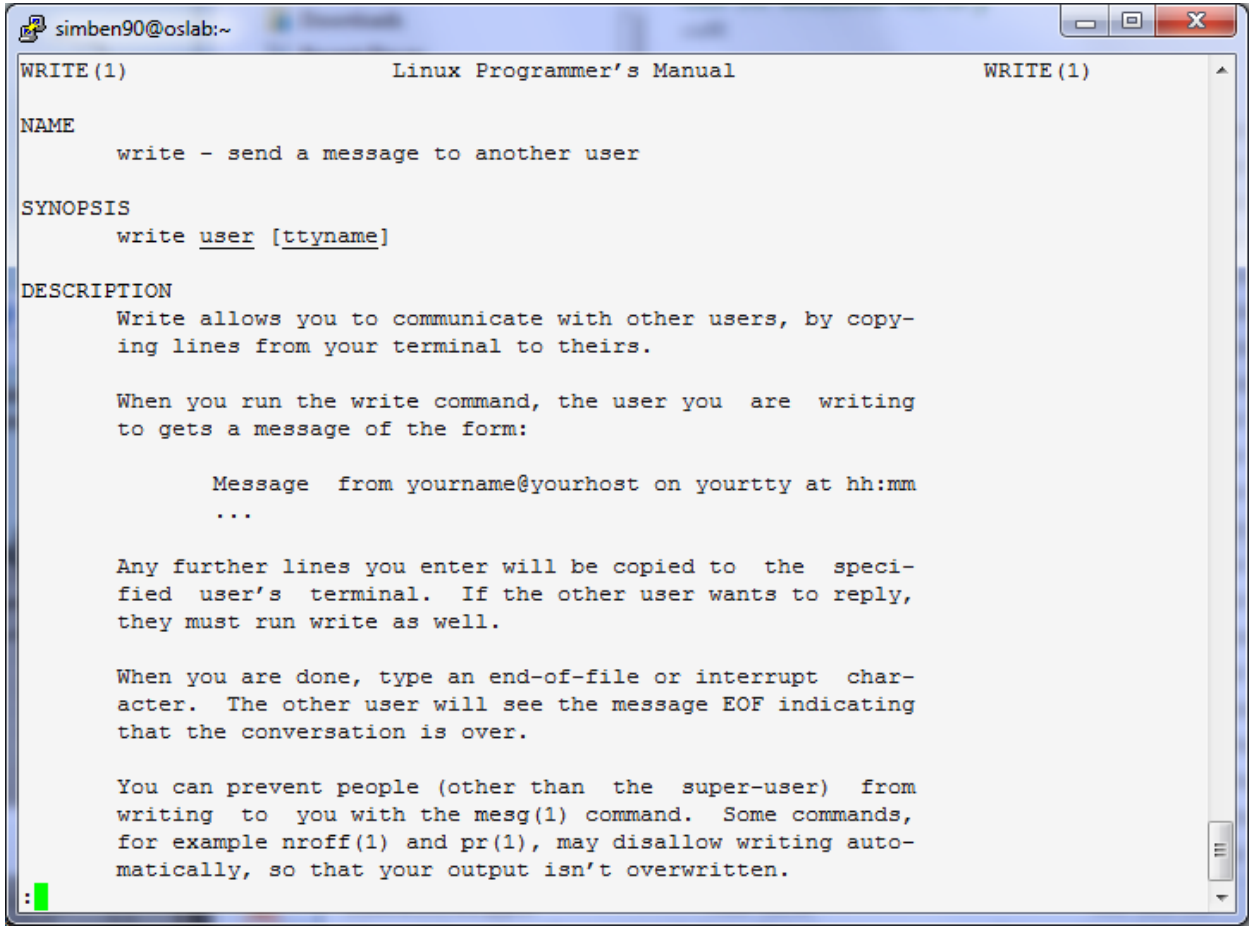
```
/home/cis90/simben $ file /usr/bin/write
/usr/bin/write: setgid ELF 32-bit LSB shared object, Intel 80386,
version 1 (SYSV), dynamically linked (uses shared libs), for
GNU/Linux 2.6.18, stripped
```

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
```



*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*

A simple form of the mail command can be used to send an email to one or more recipients. Each argument designates a recipient specified by a normal email address, a username in /etc/passwd, or an alias in /etc/aliases.

Examples:

`mail rsimms` *username as argument*

`mail rsimms kenrit90` *two usernames as arguments*

`mail risimms@cabrillo.edu marray90` *regular email address and username as arguments*

`mail $LOGNAME` *your username, specified using a variable, as argument*

`mail cis90-students` *an alias for all CIS 90 students*

UNIX mail
Sending messages

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

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

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

/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
```

Using Lesson 2 commands we can observe that the mail program is on the path and in the /bin directory. It is a "symbolic link" (we learn about these later) to the mailx program which is also in the /bin directory.

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

- Logon 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

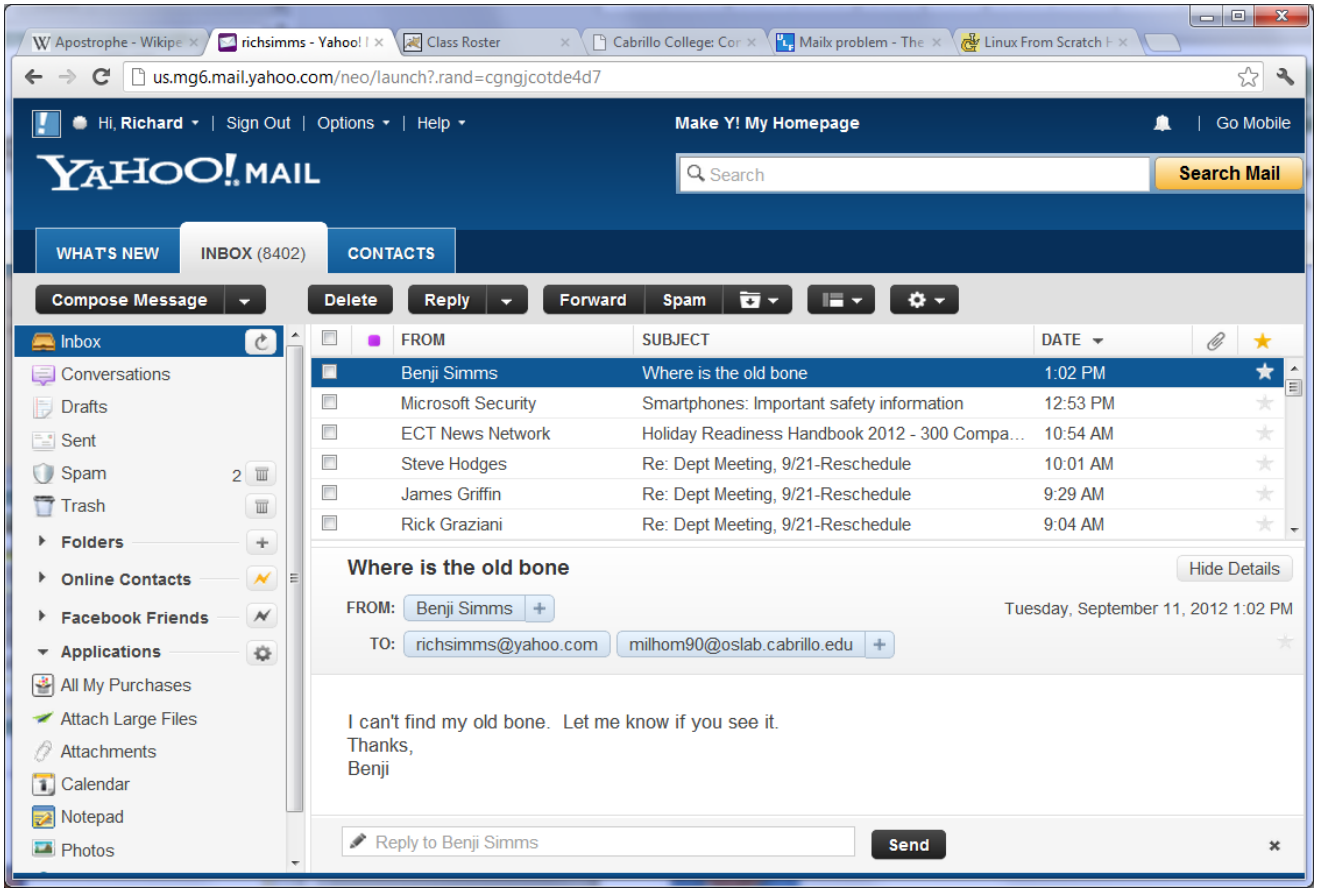
He types 1 to read message 1

The & is the mail prompt

UNIX mail

Reading messages sent from UNIX mail

Rich
(richsimms@yahoo.com)



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

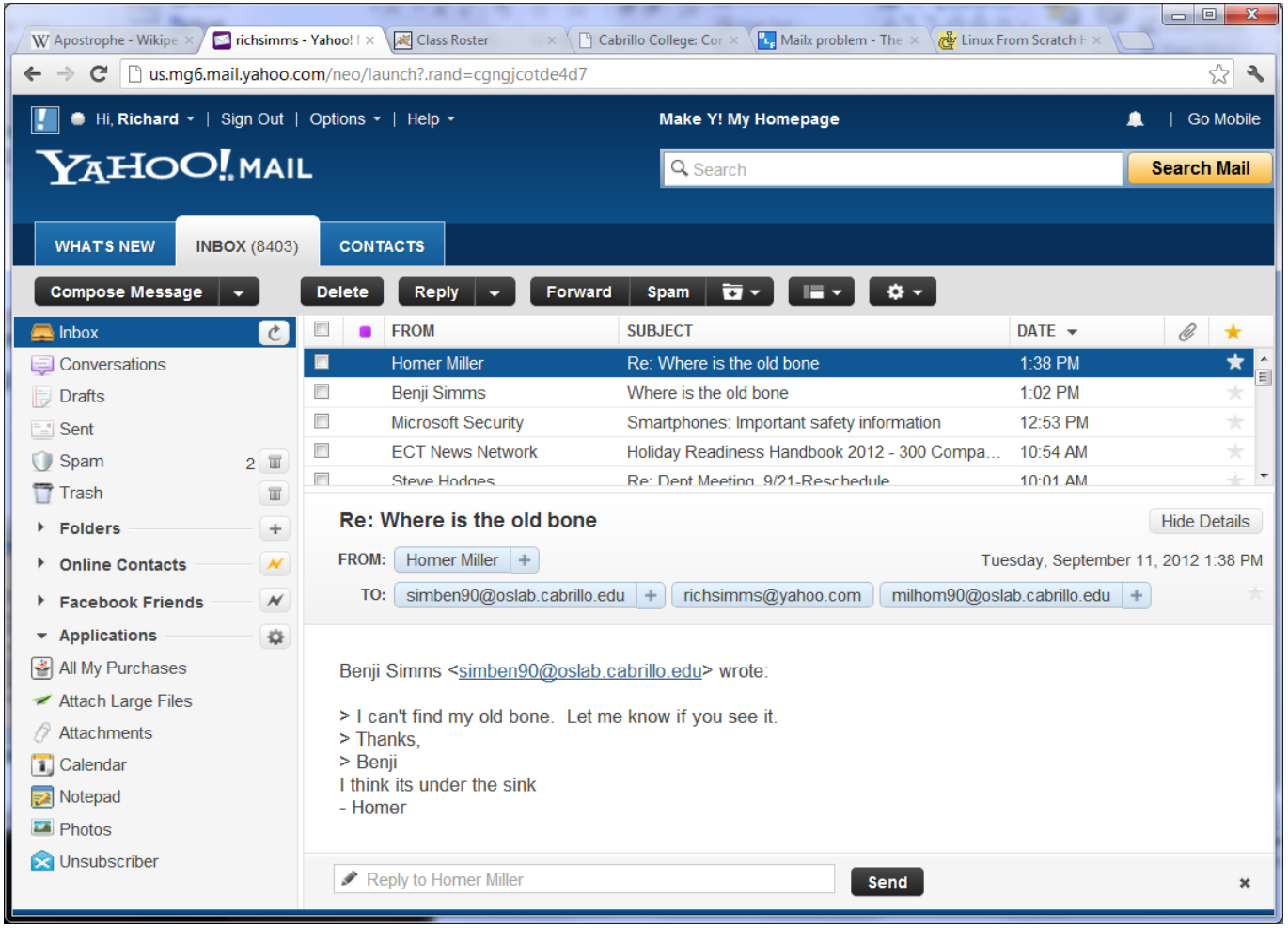
Benji
(simben90)

```
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)



Since Homer replied to all, Rich also gets a copy

Class Exercise
UNIX mail

- Use **ls /home/cis90** to see all CIS 90 home directories (add "90" to get the usernames) or the **who** command and send an email to three other CIS 90 students (your choice) in one message.

  Hint: use **mail** *user1 user2 user3*

- Reply to any emails you get (run **mail** and use **r** command)

Saving Mail to a Folder

```
/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
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
"archives" [New file] 23/851
& q
/home/cis90/simben $ mail
No mail for simben90
/home/cis90/simben $ mail -f archives
Heirloom Mail version 12.4 7/29/08.  Type ? for help.
"archives": 1 message 1 new
>   1 Homer Miller          Tue Sep 11 21:04  22/840   "Salsa"
&
```

Benji checks for new mail

Prints the first (and only) message

Saves this message to a folder named "archives"

Quits the mail program and then restarts it and finds the saved messaged is no longer there

Opens the mail folder named "archives" and sees his saved message

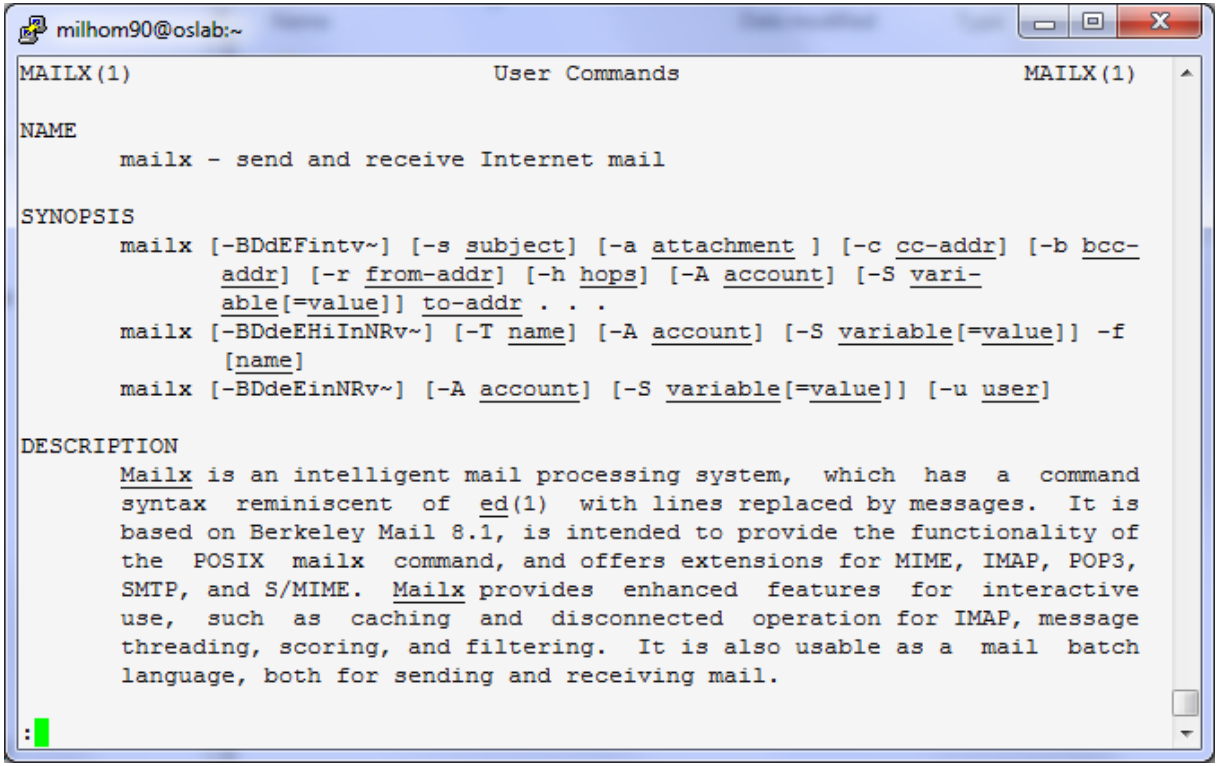
UNIX Mail

Saving messages

More on Mail

man page for mail

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



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

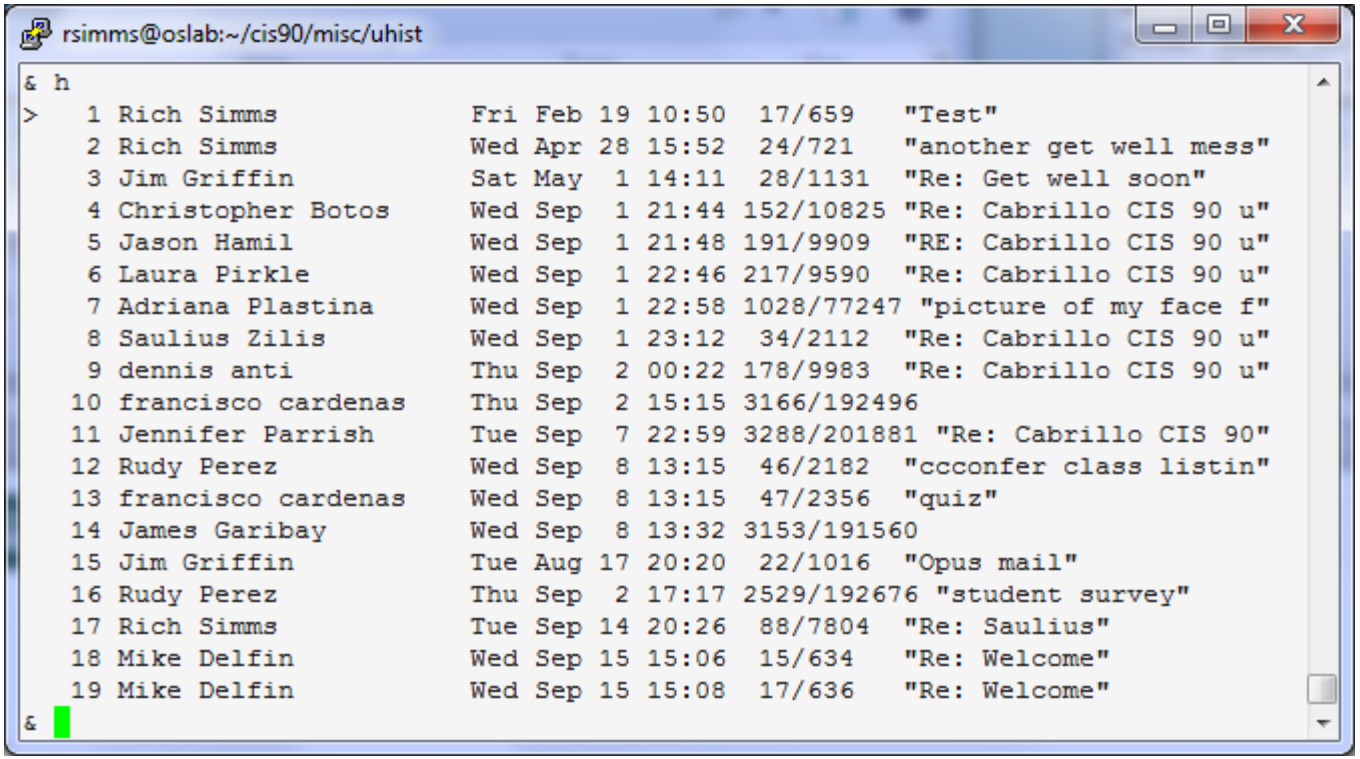
Mail ? command

```
& ?
                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

mail h (headers) command

e.g. list my current folder)

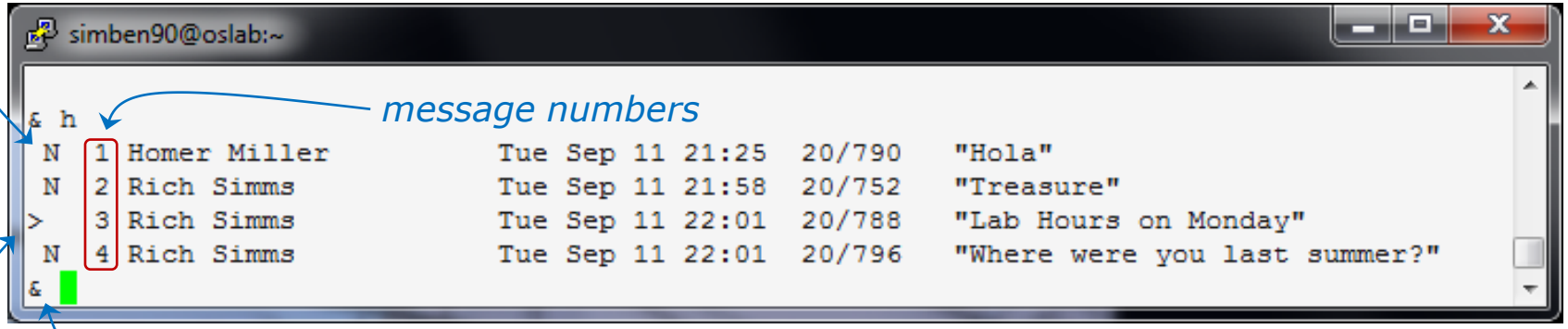


Use the h command to show message headers in the current folder

mail h (headers) command

e.g. list my current folder)

N = New message, a U = Unread message



message numbers

& is mail prompt for next command

> points to the current message (last one printed)

mail commands

(d)elete and (u)ndelete

rsimms@opus:~

```
[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 commands

Forwarding a message with ~m

```
rsimms@opus:~
[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

```
simmsben@opus:~
/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

UNIX mail

The mail folders are all 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 $ file archives dead.letter mbox
/var/spool/mail/simben90
archives:                 ASCII mail text
dead.letter:              ASCII mail text
mbox:                     ASCII mail text
/var/spool/mail/simben90: ASCII mail text

/home/cis90/simben $ cat dead.letter
From simben90 Tue Sep 11 15:49:58 2012
Return-Path: <simben90>
Received: (from simben90@localhost)
< snipped >
Content-Transfer-Encoding: 7bit

test2
```

All incoming new messages are placed in the /var/spool/mail/username file

Any messages that cannot be sent are put in the dead.letter file

UNIX mail

Browse mail folders using the -f option

```
/home/cis90/simben $ mail -f dead.letter
Heirloom Mail version 12.4 7/29/08.  Type ? for help.
"dead.letter": 1 message 1 new
>N  1 To $mylist            Tue Sep 11 15:49  17/505   "test2"
& q
"dead.letter" complete
```

Opening the dead.letter folder which contains all undelivered mail for a user

```
/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

Class Exercise
UNIX mail

- Send yourself several test messages with different subjects:

  mail $LOGNAME

  mail $LOGNAME

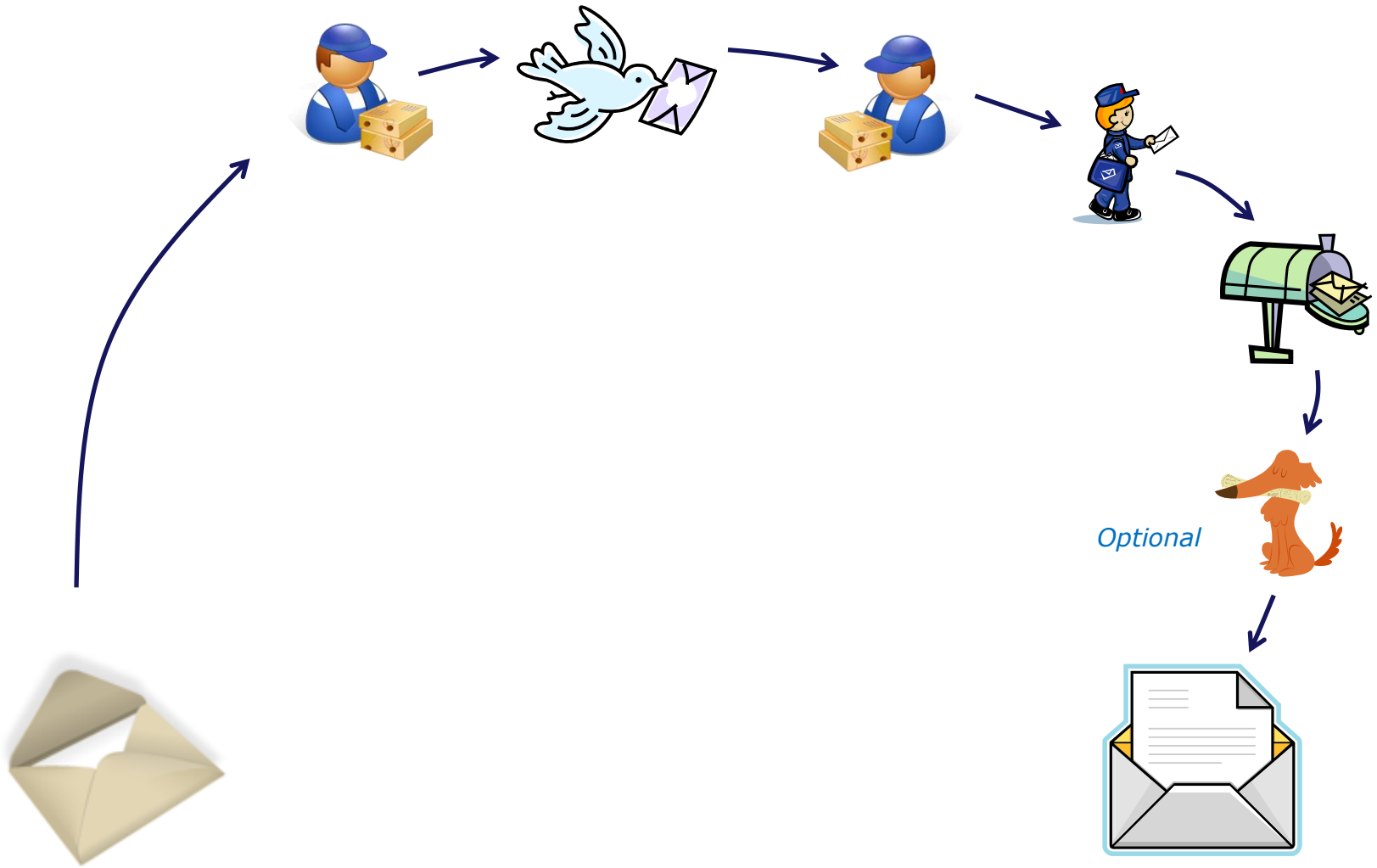
- Now read your mail

  mail

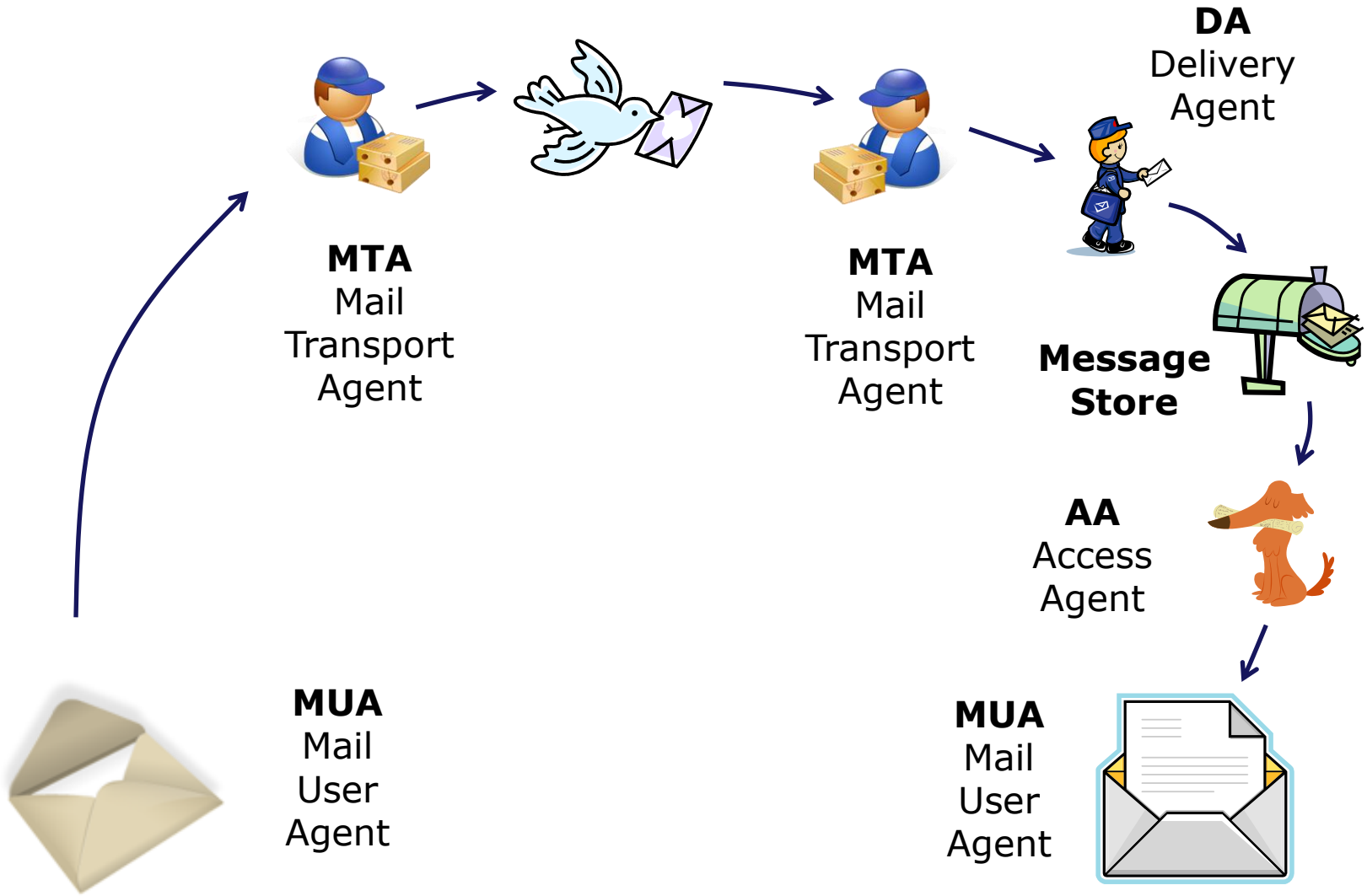
- Use the **h** command to list the message headers
- Read all your messages using **p** command
- Use the **d** command to delete one of the messages
- Use the **s** command to save one message to a folder named archives
- Use **q** to quit mail
- Read the mail in your archives with **mail –f archives**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

end-to-end email

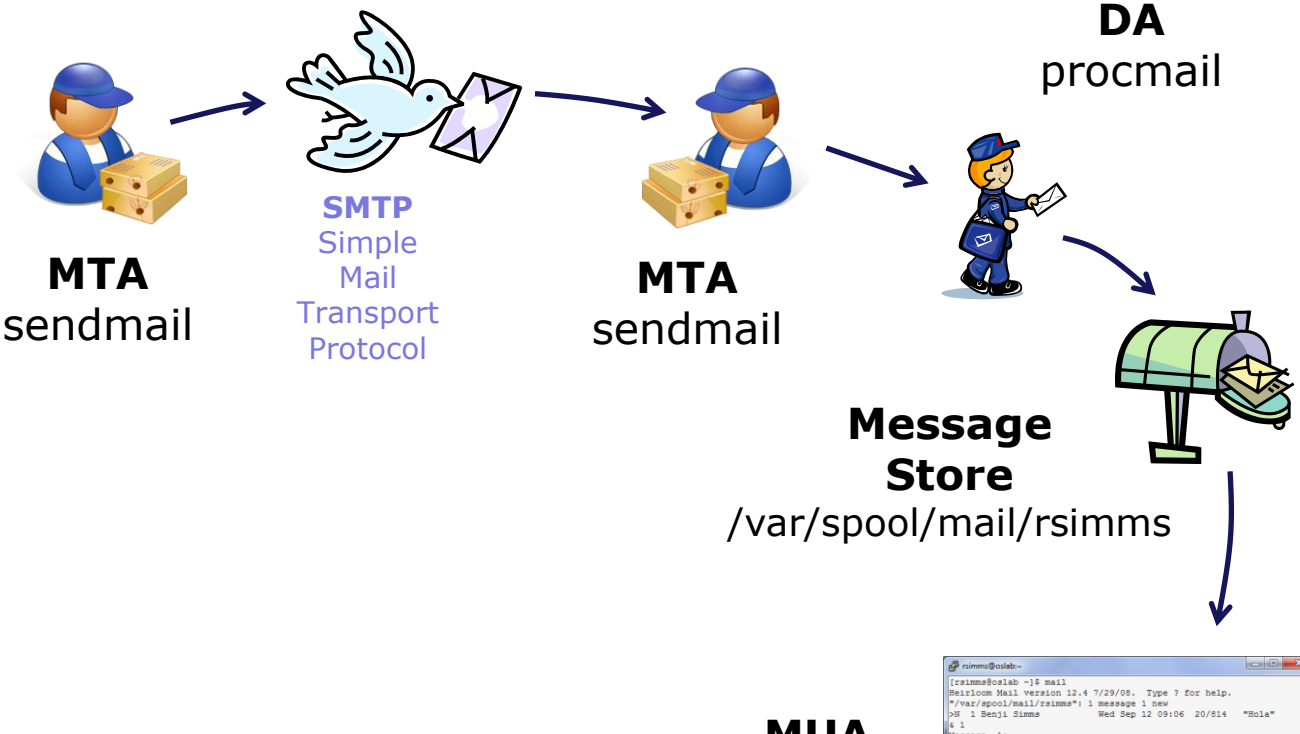
end-to-end email



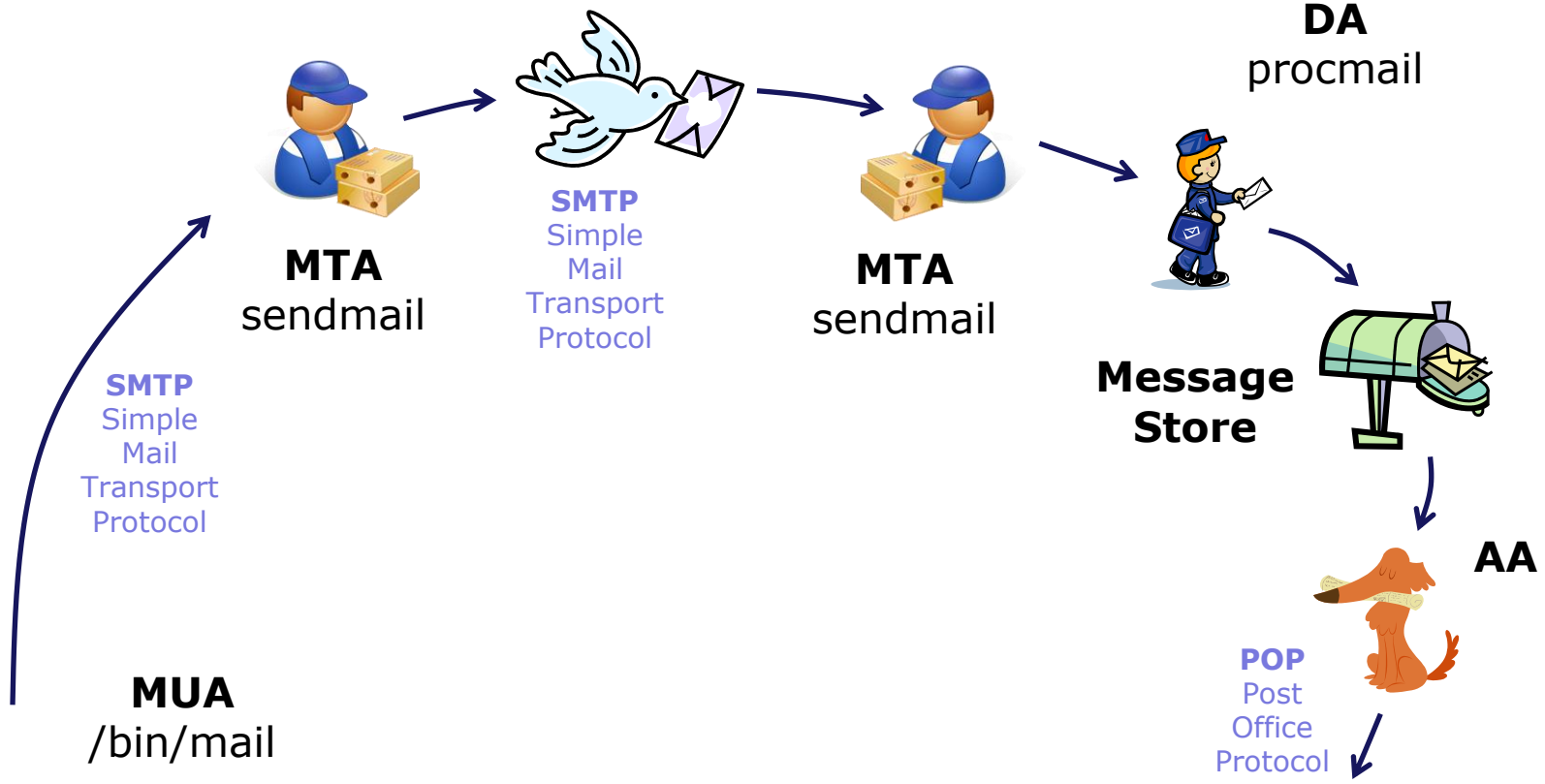
end-to-end email



end-to-end email: example Implementation

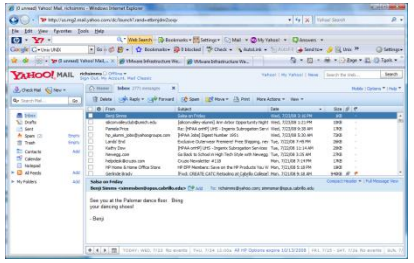


end-to-end email: example Implementation




```
simmsben@opus:~
/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

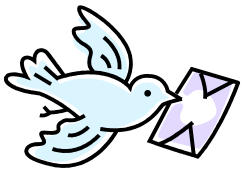


compose and send message

open and read message

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

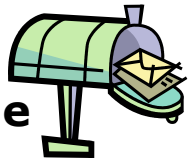
MTA
Mail
Transport
Agent



SMTP
Simple
Mail
Transport
Protocol

MTA
Mail
Transport
Agent

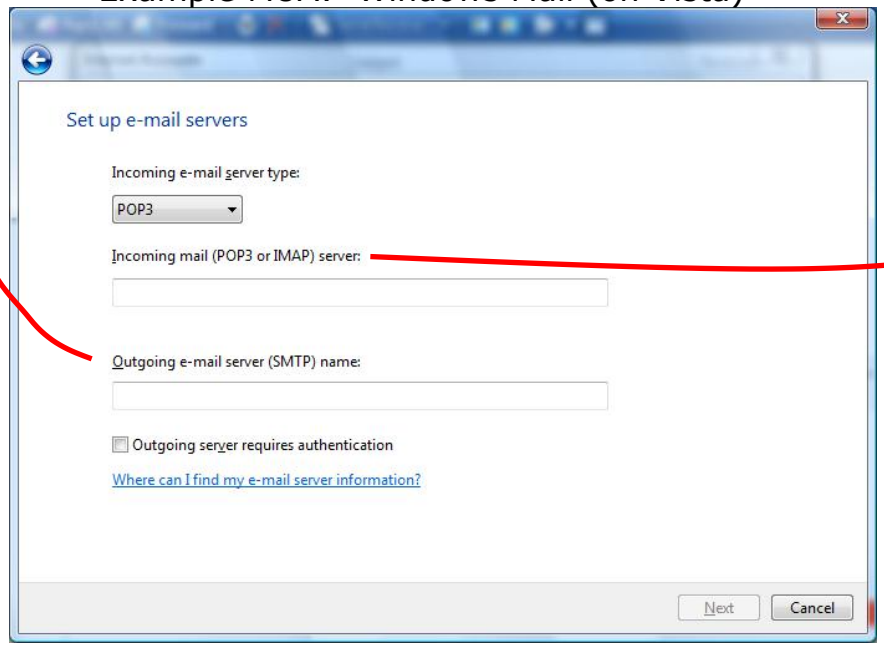
DA
Delivery
Agent



Message Store

SMTP
Simple
Mail
Transport
Protocol

Example MUA: Windows Mail (on Vista)



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 mailbox 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* mailbox. 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