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 –
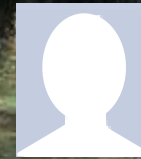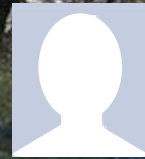- Backup slides, CCC info, handouts on flash drive -

CIS 90 - Lesson 3

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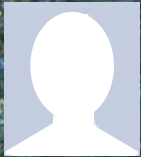Passcode: **761867**

Dieskau Jonathan Ana David

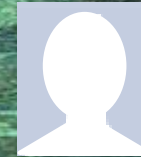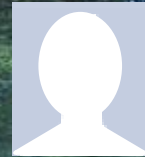Obie Dave Cole Corey Nancy Ryan Elia Tasha Darren Scott
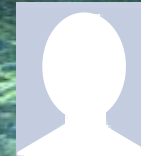
Devin Everett Juan Raven Rogan Mike Mook Melissa Cameron Jose

Jeff Matt Kenneth Ousmane Ian TBD TBD TBD TBD TBD

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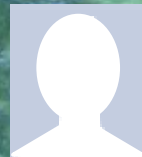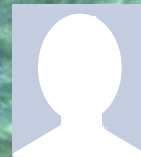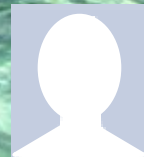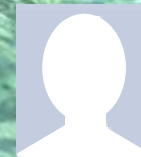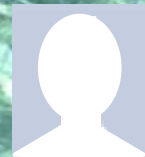
Quiz

Please close your books, notes, lesson materials, forum and 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

[ ] Has the phone bridge been added?

[ ] Is recording on?

[ ] Does the phone bridge have the mike?

[ ] Share slides, putty (rsimms, simmsben, roddyduk), Chrome, vlab

[ ] Disable spelling on PowerPoint

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?

1) On Opus, what is the prompt string? (7 times)
2) On Opus, how may current login sessions are there? (3 times)
3) On Opus, what is the hostname? (2 times)
4) On Opus, what terminal device did you use? (9 times)
5) On Opus, what OS kernel is being run? (5 times)
6) On Opus, which distribution of Linux is being run? (4 times)
7) On Opus, what is your username and uid (user ID) number ? (4 times)
8) On Opus, what shell is being used? (5 times)
9) On Opus, can you bring up a virtual terminal, like tty2? (9 times)
10) On Not-Opus, what is the prompt string? (6 times)
11) On Not-Opus, what is the hostname? (3 times)
12) On Not-Opus, what terminal device did you use? (7 times)
13) On Not-Opus, what OS kernel is being run? (5 times)
14) On Not-Opus, which distribution of Linux is being run? (2 times)
15) On Not-Opus, what is your username and uid (user ID) number? (3 times)
16) On Not-Opus, what shell is being used? (4 times)
17) On Mr-Eko, what is the prompt string? (9 times)
18) On Mr-Eko, what is the hostname? (2 times)
19) On Mr-Eko, what terminal device did you use? (6 times)
20) On Mr-Eko, what OS kernel is being run? (5 times)
21) On Mr-Eko, which distribution of Linux is being run? (5 times)
22) On Mr-Eko, what is your username and uid (user ID) number? (8 times)
23) On Mr-Eko, what shell is being used? (6 times)
24) On Kate, what is the prompt string? (5 times)
25) On Kate, what is the hostname? (1 times)
26) On Kate, what terminal device did you use? (5 times)
27) On Kate, what OS kernel is being run? (6 times)
28) On Kate, which distribution of Linux is being run? (7 times)
29) On Kate, what is your username and uid (user ID) number? (3 times)
30) On Kate, what shell is being used? (4 times)
31) Extra Credit: On any system, does logging off one session log you off all other sessions? (2 times)
32) Extra Credit: On any system, does the history command remember commands for past login sessions? (5 times)
33) Extra Credit: Does the history command remember commands entered on another system? (10 times)
34) Extra Credit: On the same system, is your command history the same for each login session? (16 times)

Lab 1 Results

xx times incorrect

9

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 guest90 …

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 file and ask you three questions.

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

This lab is graded by checking that you issued each of the Lab 2 commands and answered the three questions at the end.

Subtle Stuff

Opus (a RHEL server)
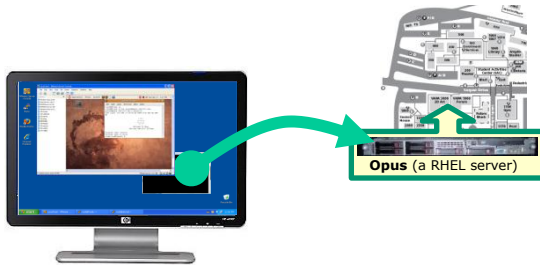
*Putty to **rsimms@opus.cabrillo.edu***
or
*Putty to **opus.cabrillo.edu***

Basic options for your PuTTY session

Specify the destination you want to connect to
Host Name (or IP address)   Port
rsimms@opus.cabrillo.edu   22
Connection type:
○ Raw   ○ Telnet   ○ Rlogin   ● SSH   ○ Serial

opus.cabrillo.edu - PuTTY

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

Basic options for your PuTTY session

Specify the destination you want to connect to
Host Name (or IP address)   Port
opus.cabrillo.edu   22
Connection type:
○ Raw   ○ Telnet   ○ Rlogin   ● SSH   ○ Serial

opus.cabrillo.edu - PuTTY

```
login as:
```

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

12
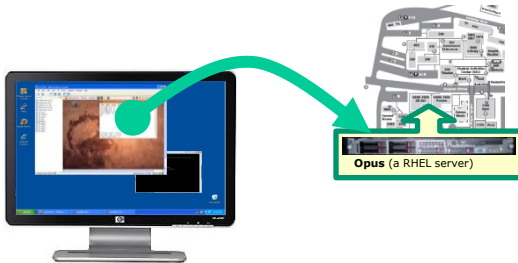
ssh rsimms@opus.cabrillo.edu
or
ssh opus.cabrillo.edu

from the Ubuntu Eko VM


```
cis90@eko: ~
File Edit View Terminal Help
Connection to opus.cabrillo.edu closed.
cis90@eko:~$ ssh opus.cabrillo.edu
cis90@opus.cabrillo.edu's password:
Permission denied, please try again.
cis90@opus.cabrillo.edu's password:
```

```
simmsben@opus:~
File Edit View Terminal Help
cis90@eko:~$ ssh simmsben@opus.cabrillo.edu
simmsben@opus.cabrillo.edu's password:
Last login: Mon Sep  6 15:42:09 2010 from dsl-63-249-1
                    ('v')
                   //-=-\\
                   (\_=_/)
                    ~~ ~~
               Welcome to Opus
            Serving Cabrillo College

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

*If you don't specify the user on the **ssh** command it will use the user you are currently logged in as. This account may not exist on the remote system!*
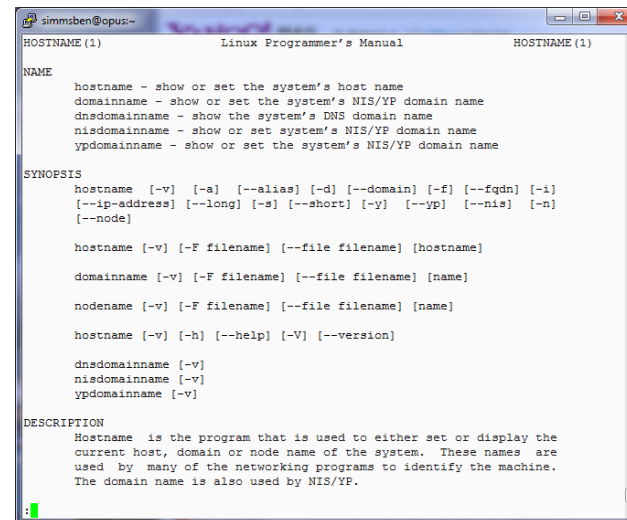
13

Command Review

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

```
/home/cis90ol/simmsben $ type hostname
hostname is /bin/hostname
/home/cis90ol/simmsben $
```

The hostname program is in the /bin directory

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

```
/home/cis90ol/simmsben $ 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.
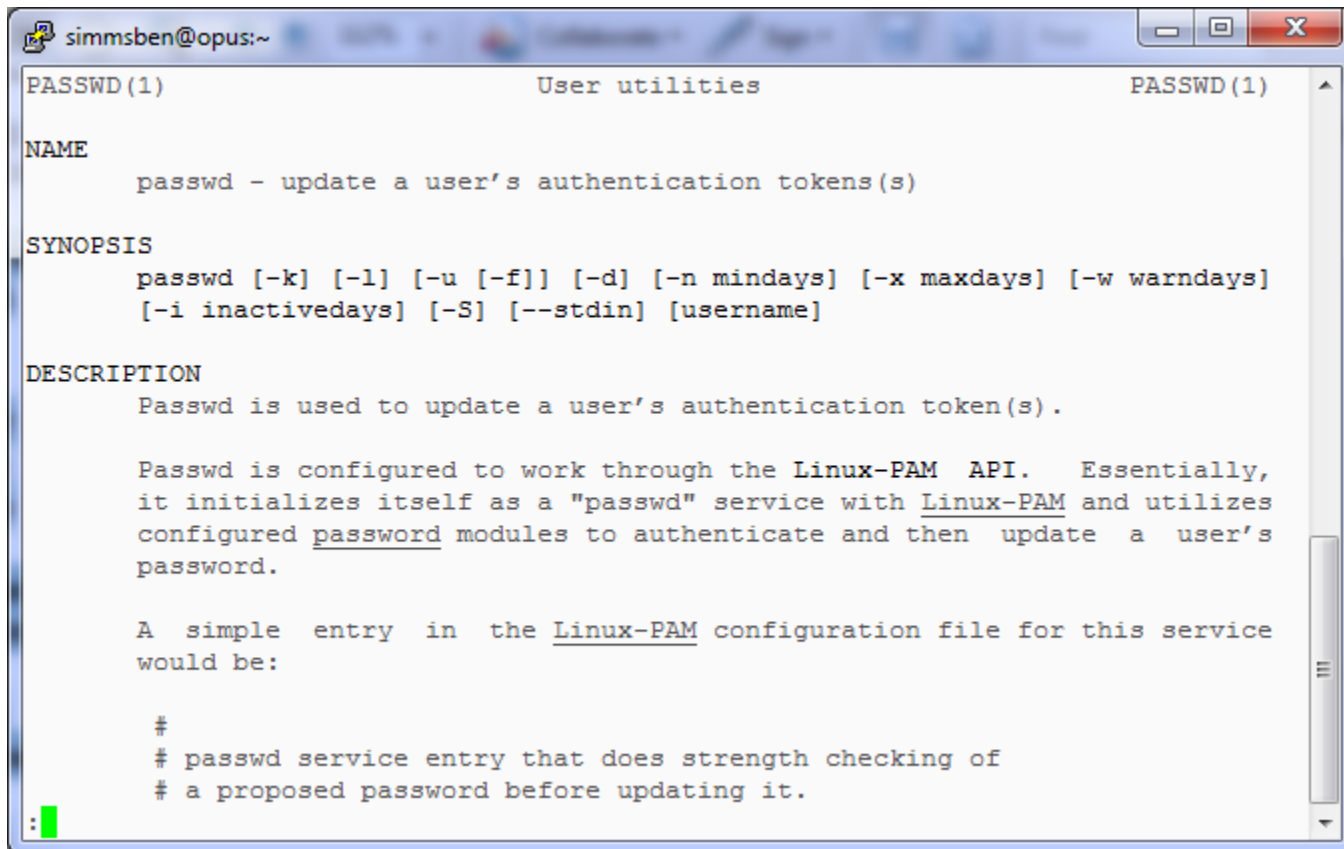   The domain name is also used by NIS/YP.

Command Review

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

Command Review

```
/home/cis90/simmsben $ type passwd
passwd is /usr/bin/passwd
```

passwd resides in the /usr/bin directory

```
/home/cis90/simmsben $ man passwd
```


There is the man page for the passwd command
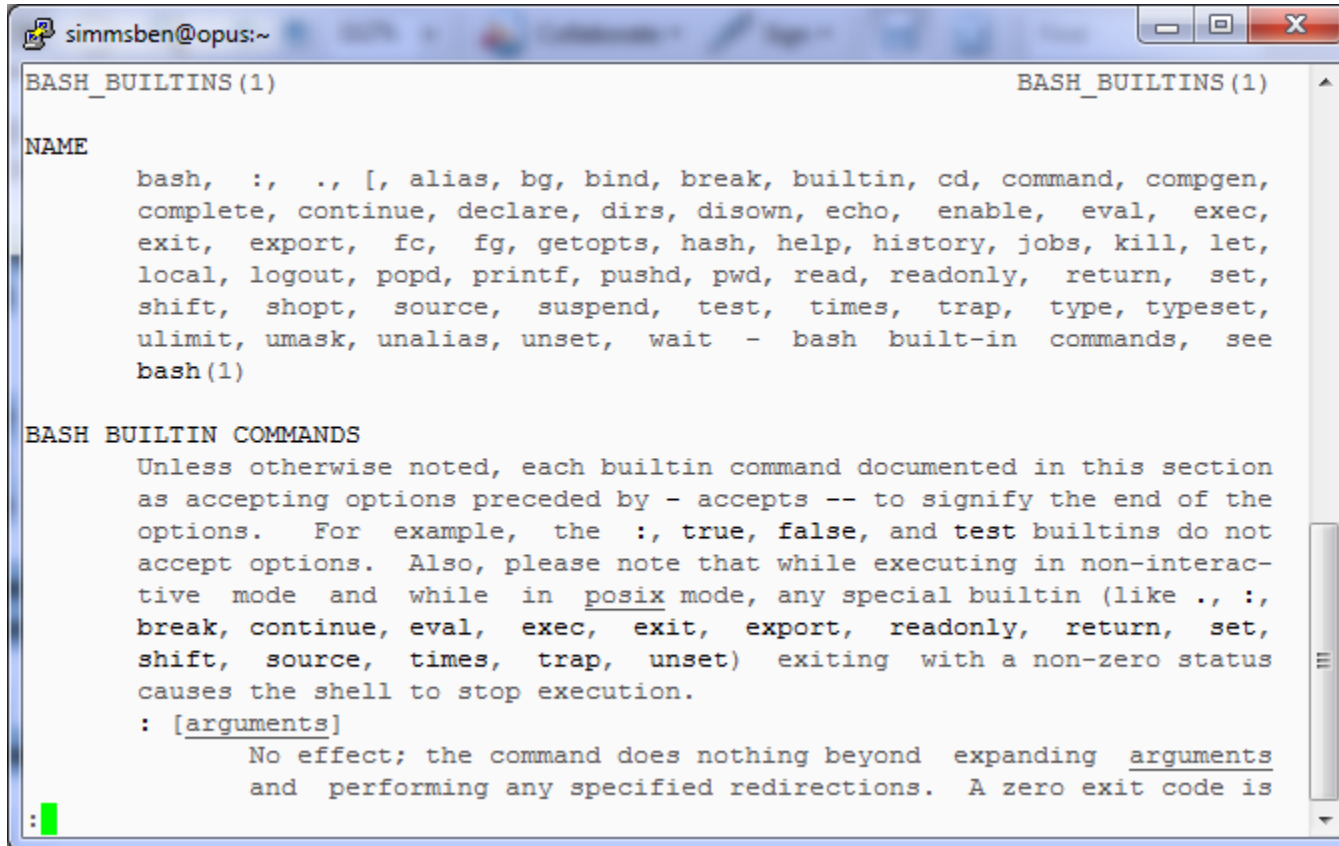
Command Review

`/home/cis90/simmsben $` **type history**
`history is a` `shell builtin`

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

`/home/cis90/simmsben $` **man history**

```
simmsben@opus:~

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
:
```

history does not have its own man page either

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

17

Command Review

```
/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*

18

Mini Review

Lesson/Lab 1		Lesson/Lab 2	
Commands	**Files & Directories**	**Commands**	**Files & Directories**
cal clear date exit history hostname id ifconfig ps ssh uname tty who who am i	/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

Life of the Shell
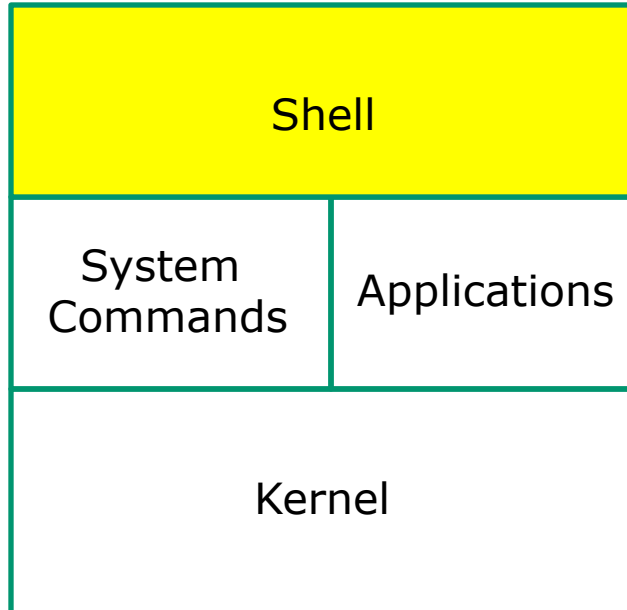
1) Prompt

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

Examples

```
/home/cis90/simmsben $
/home/cis90/simmsben $ ls
/home/cis90/simmsben $ ls -l
/home/cis90/simmsben $ ls -lt
/home/cis90/simmsben $ ls -lt Poems/
/home/cis90/simmsben $ ls -lt Poems/ bin/
/home/cis90/simmsben $ ls -lt 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.

22

Commands are Programs

Program
(a file on the hard drive)

Loads into RAM

stdout

console
screen
(default)

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

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

0   1   2

read ⬆⬇ write
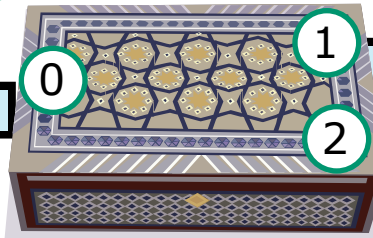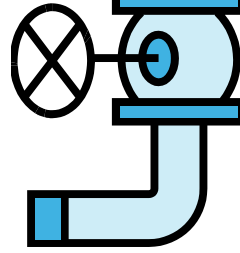
console
keyboard
(default)

Operating System   C

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

stdin

Keyboard   B
Additional data command needs from user. E.g. passwords, math expressions, …
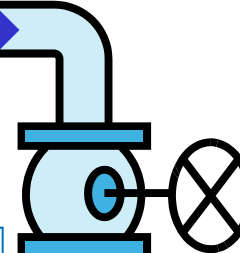
console
screen
(default)

stderr

Example program to process: ls command

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

stdout

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

Options: NA
Args: Poems/

0 **ls** 1

2

ant   Blake
nursery
Shakespeare
twister
Yeats

read

stdin

directory contents
ant   Blake   nursery
Shakespeare   twister
Yeats
(This file information comes from the kernel)

stderr

24
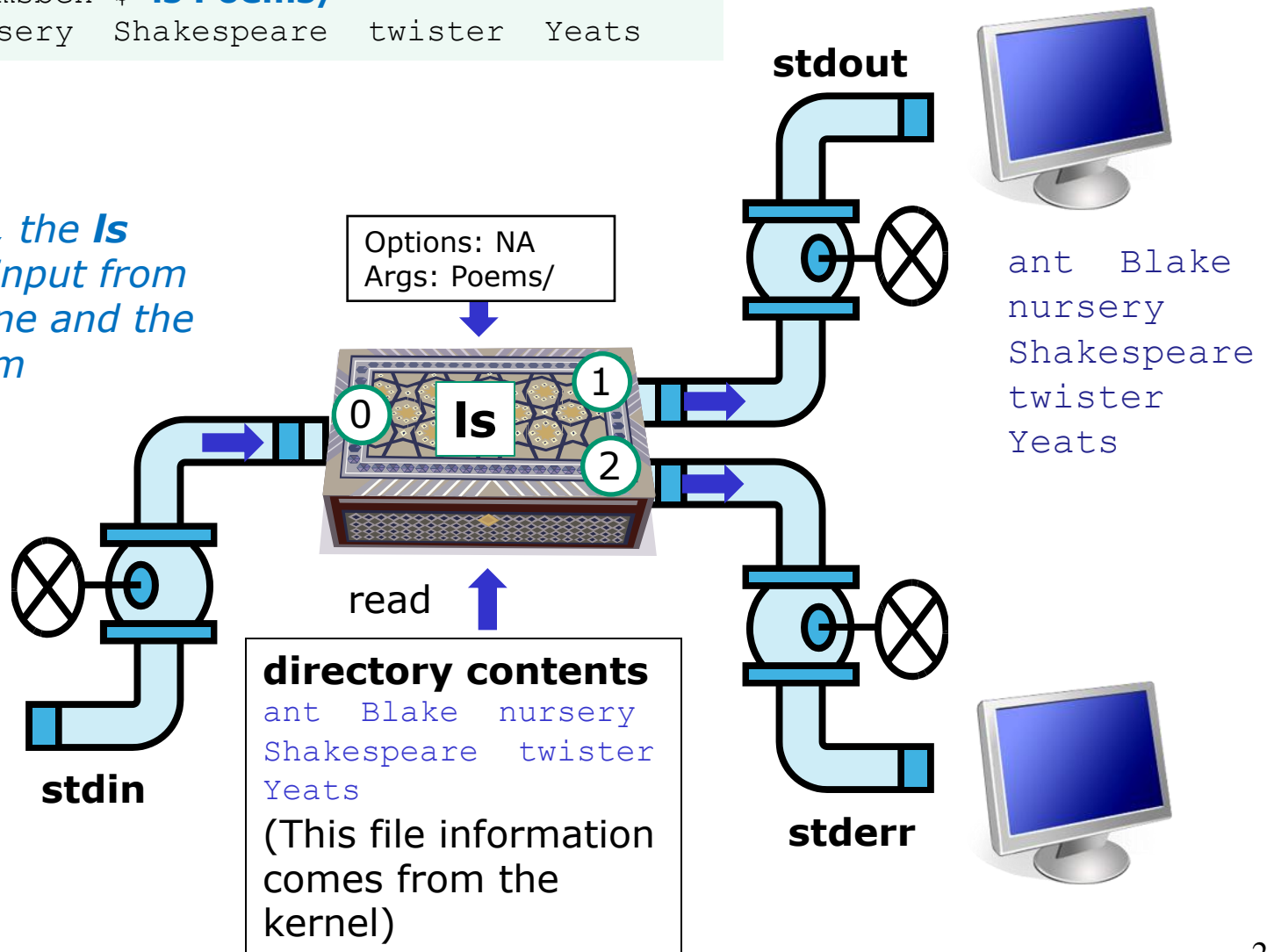
Example program to process: bc command

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

/dev/pts/1

stdout

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

Options: NA
Args: NA

0 **bc** 1

2

4

2+2

stdin

stderr

25
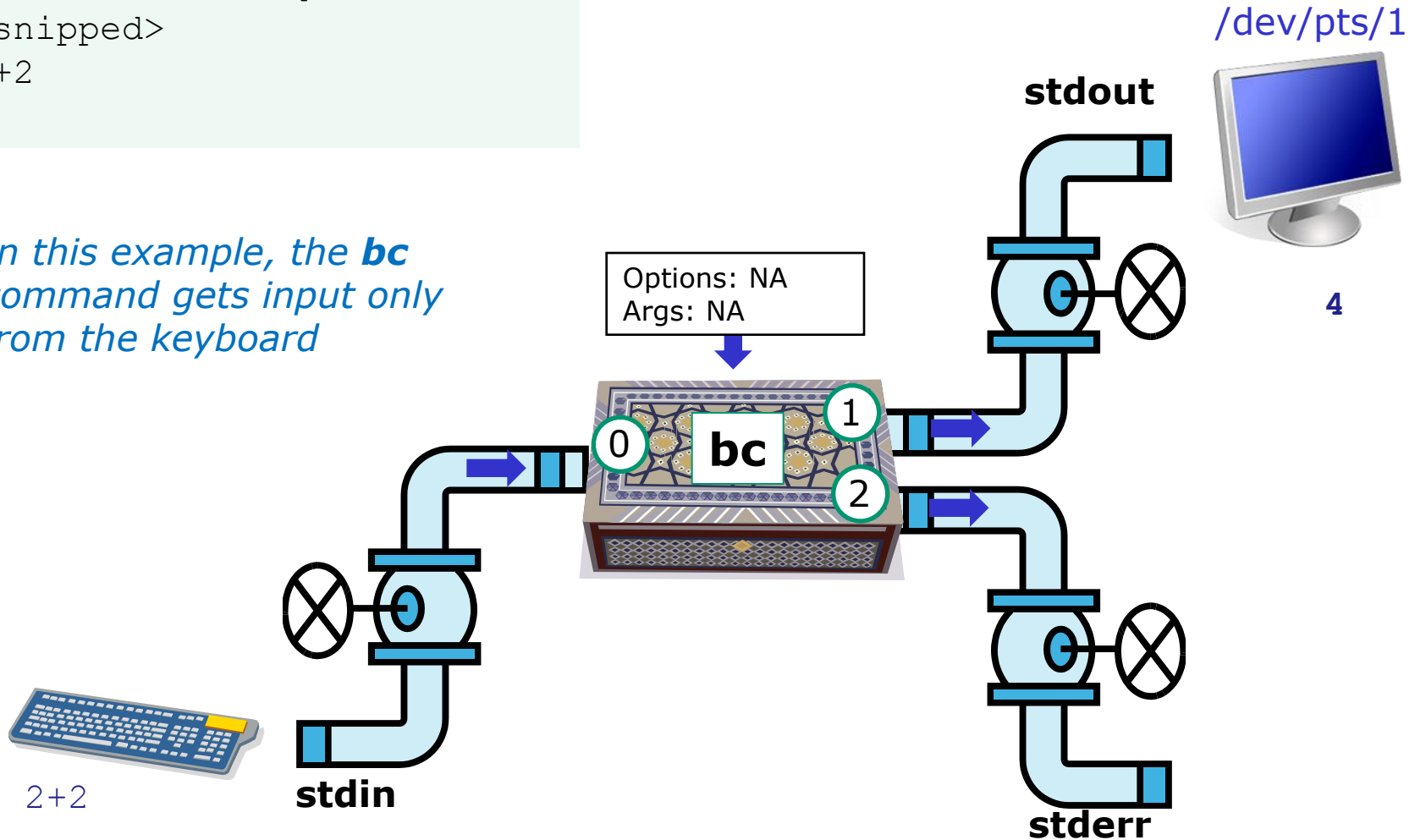
Environment Variables
Names and Values

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
```


26

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
```

HI

FAN

27

Practice Test Questions

What is your uid (user ID)?

Benji's uid is 1000

```
/home/cis90/simben $ id
uid=1000(simben90) gid=90(cis90) groups=90(cis90),100(users)
context=user_u:system_r:unconfined_t
/home/cis90/simben $
```

Practice Test Questions

What day of the week was Sept 11, 2001?

It was a Tuesday

```
/home/cis90ol/simmsben $ 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/cis90ol/simmsben $
```

Practice Test Questions

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

It's in /bin

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

Practice Test Questions

Parse the following command. How many options and how many arguments does it have?

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

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. How many options and how many arguments does it have?

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

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

33

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/cis90ol/simmsben $ echo $TERM
xterm
/home/cis90ol/simmsben $
```

Practice Test Questions

What directories make up your path?

Use echo $PATH to find out:

```
/home/cis90/simben $ echo $PATH
/usr/kerberos/bin:/usr/local/bin:/bin:/usr/bin:/home/cis90/
simben/../bin:/home/cis90/simben/bin:.
/home/cis90/simben $
```

37

Practice Test Questions

Are the **yum** and **useradd** commands in your path?

```
/home/cis90/simben $ type yum      Yes, on path
yum is /usr/bin/yum

/home/cis90/simben $ type useradd    No, not on path
-bash: type: useradd: not found

/home/cis90/simben $ echo $PATH
/usr/kerberos/bin:/usr/local/bin:/bin:/usr/bin:/home/cis90
   /simben/../bin:/home/cis90/simben/bin:.


/home/cis90/simben $ type yum
yum is hashed (/usr/bin/yum)
/home/cis90/simben $
```

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/cis90ol/roddyduk $ ps
  PID TTY          TIME CMD
25547 pts/5    00:00:00 bash
26730 pts/5    00:00:00 ps
/home/cis90ol/roddyduk $
```

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

39

Practice Test Questions

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

Trouble

If you are looking for trouble ... you came to the right place!

1) Login to a mystery system at 172.30.4.18 using your VLab username and password
   - Classroom students, Putty to 172.30.4.18
   - Remote students, login as cis90 on assigned VLab VM and from that VM use:
     ssh *username***@172.30.4.18**

2) Use your Linux skills to find out:
   - the hostname of the system
   - the Linux distro being used
   - the name of the shell being used
   - your uid on this system
   - the OS kernel name
   - your terminal device you are using

3) Compare this system to Opus, what is different?

4) Did you find any trouble?

5) If you found trouble, fix it!

Remote Student Assigned VMs

tbd	Not-Opus-01
tbd	Kate-01
tbd	Mr-Eko-01
tbd	Not-Opus-02
tbd	Kate-02
tbd	Mr-Eko-02
tbd	Not-Opus-03
tbd	Kate-03
tbd	Mr-Eko-03
tbd	Not-Opus-04
tbd	Kate-04
tbd	Mr-Eko-04
tbd	Not-Opus-05
tbd	Kate-05
tbd	Mr-Eko-05
tbd	Not-Opus-06
tbd	Kate-06
tbd	Mr-Eko-6
tbd	Not-Opus-07
tbd	Kate-07
tbd	Mr-Eko-7
tbd	Not-Opus-08
tbd	Kate-08
tbd	Mr-Eko-8

Housekeeping

Note: Lab 2 due today

- Use **history –a** before **submit**

- submit as many times as you wish up to midnight

- Use **verify** command (which is a script) to see what you submitted.

Student Surveys

I'm missing surveys from several students

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

risimms@cabrillo.edu

46

Lord of the Rings Character Code Names

Current Progress					
Code Name	Grading Choice	Q1	Q2	Q3	Q4
Max Points		3	3	3	3
aragorn	Grade				
arwen	Grade				
balrog	Grade				
boromir	Grade				
denethor	Grade				
dwalin	Grade				
elrond	Grade				
eomer	Grade				
eowyn	Grade				
faramir	Grade				
frodo	Grade				
galadriel	Grade				
gimli	Grade				
glorfindel	Grade				
ioreth	Grade				
legolas	Grade				
lobelia	Grade				
nazgul	Grade				
pippin	Grade				
saruman	Grade				
sauron	Grade				
theoden	Grade				
treebeard	Grade				

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/cis90ol/simmsben $ 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/simmsben $ cat lab01.graded
[rsimms@opus lab01]$ cat graded/simben

GRADING RUBRIC
One point for each correct answer

Q1: 1 point(s)
Q2: 1 point(s)
Q3: 1 point(s)
Q4: 1 point(s)


< snipped >


Q28: 1 point(s)
Q29: 1 point(s)
Q30: 1 point(s)
Q31: 1 point(s)
Q32: 1 point(s)
Q33: 1 point(s)
Q34: 1 point(s)

Total: 30 points + 4 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/simmsben $ ls /home/cis90/answers/
lab01
/home/cis90/simmsben $ cat /home/cis90/answers/lab01
/home/cis90/simben $ cat /home/cis90/answers/lab01
1) /home/cis90/simben $
2) 2
3) opus.cabrillo.edu
4) /dev/pts/2
5) Linux
6) Red Hat Enterprise Linux Server
7) simben90 (uid=1000)
8) bash

< snipped >

31) no
32) yes
33) no
34) no
/home/cis90/simben $
```

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

49

Extra Credit

Link to Extra Credit page is on the Grades page

Note the caps on extra credit.

Extra Credit Howtos

MSDN Academic Alliance

Your accounts have been created from your email addresses and activated.

Link is on website Resources page in Tools and Software section

Happy downloading!

VMware Academic Alliance

Your accounts have been created from your email addresses and activated.

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

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
simmsben writes message to rsimms


```
simmsben@opus:~

/home/cis90/simmsben $ who
simmsben pts/0          2008-07-24 09:42 (dsl-63-249-86-11.cruzio.com)
simmsmar pts/1          2008-07-24 09:38 (dsl-63-249-86-11.cruzio.com)
rsimms   pts/2          2008-07-24 09:49 (dsl-63-249-86-11.cruzio.com)
rsimms   pts/3          2008-07-24 13:09 (dsl-63-249-86-11.cruzio.com)
rsimms   pts/4          2008-07-24 13:10 (dsl-63-24
/home/cis90/simmsben $ write rsimms pts/4
Hola
Bye
Ctrl-D
/home/cis90/simmsben $
```

Note, the pts/4 is only needed if there is more than one login by the target user

```
rsimms@opus:~

[rsimms@opus ~]$ tty
/dev/pts/4
[rsimms@opus ~]$
Message from simmsben@opus.cabrillo.edu on pts/0 at 13:24 ...
Hola
Bye

EOF
[rsimms@opus ~]$
```

write command
Beji chats with Mary using write commands

```
simmsben@opus:~

/home/cis90/simmsben $ write simmsmar 1
will you play gopher with me? 3
o 5 (a convention, "o" used for over)

Message from simmsmar@opus.cabrillo.edu on pts/1 at 17:19 ... 8
how about in five minutes? 10
o 12
ok, don't take too long or i'll start barking 13
o 15
see you soon bye   18
EOF   20
bye    21   (Ctrl-D) 22
/home/cis90/simmsk
```

simmsben

Use Ctrl-D to stop writing. Ctrl-D is EOF (End of File) and is slightly more friendly than Ctrl-C
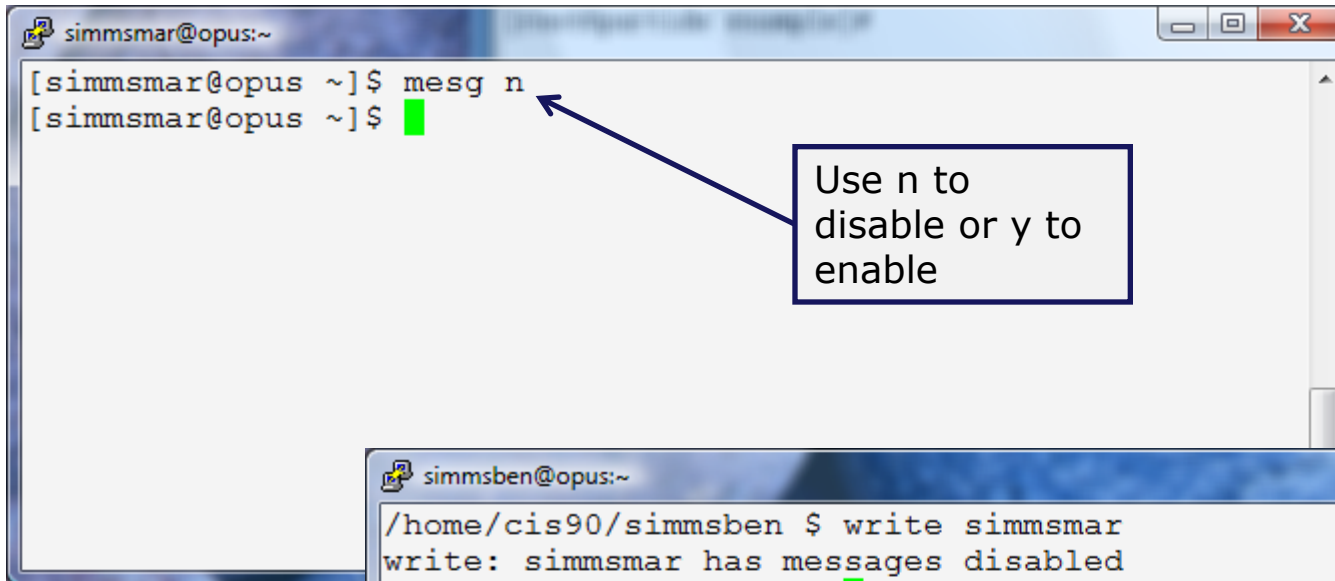
```
simmsmar@opus:~

[simmsmar@opus ~]$
Message from simmsben@opus.cabrillo.edu on pts/2 at 17:18 ... 2
will you play gopher with me? 4
o 6
write simmsben   7
how about in five minutes? 9
o 11
ok, don't take too long or i'll start barking   14
o 16
see you soon bye  17      (Ctrl-D) 19
[simmsmar@opus ~]$ bye
EOF 23
[simmsmar@opus ~]$
```

simmsmar

58

mesg command
enable or disable writes to your terminal
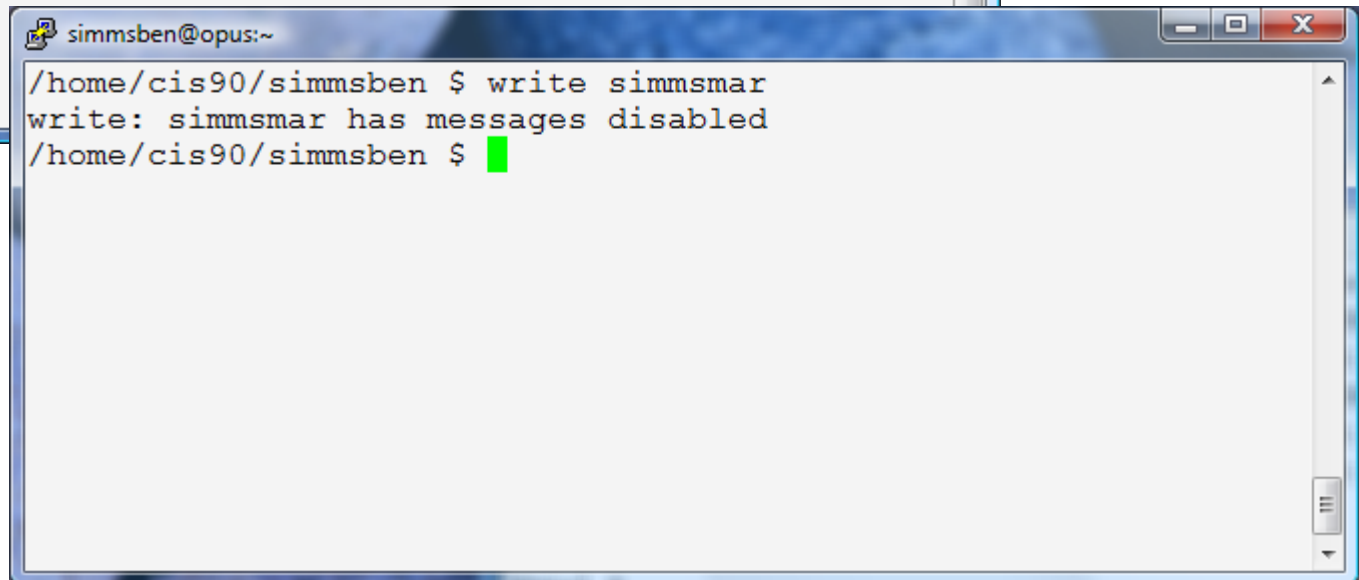
```
simmsmar@opus:~

[simmsmar@opus ~]$ mesg n
[simmsmar@opus ~]$ █
```

Use n to
disable or y to
enable

simmsmar

```
simmsben@opus:~

/home/cis90/simmsben $ write simmsmar
write: simmsmar has messages disabled
/home/cis90/simmsben $ █
```

simmsben

59

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

Mail Command

Notes to Rich

[ ] - Send out Welcome letter

Use script in /cis90/misc/uhist directory

cp list-full list

mail-welcome

UNIX mail
Sending messages

Benji sends an email to Rich and Mary

Intended recipients

simmsben

```
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 $
```

The first prompt is "Subject: ", you enter the subject, then enter the message. The last prompt is "Cc: ". After hitting Enter the message is sent

Use . or Ctrl-D to end the message

richsimms@yahoo.com

simmsmar

Tip: cc yourself to save a copy of messages sent

Class Exercise
UNIX mail

- Logon to Opus

- Send me a message and cc: yourself

```
/home/cis90ol/simmsben $ mail rsimms
Subject: Hello
This mail program is pretty crazy!
- Benji
.
Cc: simmsben
You have new mail in /var/spool/mail/simmsben
/home/cis90ol/simmsben $
```

replace this with your own username

UNIX mail
Sending messages continued

Benji sends an email to Rich and Mary

Intended recipients

simmsben

```
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 $
```

Use . or Ctrl-D to end the message

The first prompt is "Subject: ", you enter the subject, then enter the message. The last prompt is "Cc: ". After hitting Enter the message is sent

richsimms@yahoo.com

simmsmar

Tip: cc yourself to save a copy of messages sent

UNIX Mail
Reading messages

simmsmar

Mary reads email from Benji

One message is in the header list (in tray), "N" means New, "1" is the message number

The & is the mail prompt.

Enter a 1 to read message 1

```
simmsmar@opus:~
You have mail in /var/spool/mail/simmsmar
[simmsmar@opus ~]$ mail
Mail version 8.1 6/6/93.  Type ? for help.
"/var/spool/mail/simmsmar": 1 message 1 new
>N  1 simmsben@opus.cabril  Wed Jul 23 15:16  19/682    "Salsa on Friday"
& 1
Message 1:
From simmsben@opus.cabrillo.edu  Wed Jul 23 15:16:39 2008
Date: Wed, 23 Jul 2008 15:16:39 -0700
From: Benji Simms <simmsben@opus.cabrillo.edu>
To: richsimms@yahoo.com, simmsmar@opus.cabrillo.edu
Subject: Salsa on Friday

See you at the Palomar dance floor.  Bring
your dancing shoes!

- Benji

&
```

UNIX mail
Reading messages sent from UNIX mail

Rich reads email from Benji

richsimms@yahoo.com

67

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 **x** command to exit

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

UNIX Mail
Replying to messages

Mary replies to email from Benji

simmsmar

```
simmsmar@opus:~
& 1
Message 1:
From simmsben@opus.cabrillo.edu  Wed Jul 23 15:16:39 2008
Date: Wed, 23 Jul 2008 15:16:39 -0700
From: Benji Simms <simmsben@opus.cabrillo.edu>
To: richsimms@yahoo.com, simmsmar@opus.cabrillo.edu
Subject: Salsa on Friday

See you at the Palomar dance floor.  Bring
your dancing shoes!

- Benji

& r
To: richsimms@yahoo.com simmsmar@opus.cabrillo.edu
    simmsben@opus.cabrillo.edu
Subject: Re: Salsa on Friday

I'll see you there!

- Mary
.
Cc: richsimms@yahoo.com
&
```

Enter an r to "reply to all" for the last message read. Note if you don't specify a message number mail will use the current message

69

UNIX Mail
Benji gets the reply from Mary

simmsben

Benji reads reply from Mary

```
simmsben@opus:~
You have mail in /var/spool/mail/simmsben
/home/cis90/simmsben $ mail
Mail version 8.1 6/6/93.  Type ? for help.
"/var/spool/mail/simmsben": 1 message 1 new
>N  1 simmsmar@opus.cabril  Wed Jul 23 16:25  19/677   "Re: Salsa on I
& p 1
Message 1:
From simmsmar@opus.cabrillo.edu  Wed Jul 23 16:25:51 2008
Date: Wed, 23 Jul 2008 16:25:51 -0700
From: Mary Simms <simmsmar@opus.cabrillo.edu>
To: richsimms@yahoo.com, simmsben@opus.cabrillo.edu,
        simmsmar@opus.cabrillo.edu
Subject: Re: Salsa on Friday

I'll see you there!


- Mary

&
```

Entering just the message number or a "p" followed by the message number are equivalent. The p is the mail print command.

70

UNIX Mail

Rich reads reply from Mary

richsimms@yahoo.com

Class Exercise
UNIX mail

- Send an email to your pair mate and ask them what they think of UNIX mail. Hint: use **mail *username***

- Read your mail and reply to any messages you receive Hint: run **mail,** type **n** command to read next messages, use **r** command to reply

- Use **x** to exit mail

- Tip: use **ls /home/cis90** to see all CIS 90 home directories (add "90" for their usernames) and send an email to three other students (your choice) in one message. Hint: use **mail *user1 user2 user3***

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

More on Mail Command

mail command
read and write modes

Read mode:

- `mail`   (to read new messages)

- `mail -f`   (to read saved messages in mbox)

- `mail -f myfile`   (to read saved messages in myfile)

Write mode:

- `mail simmsben`

- `mail simmsben simmsmar richsimms@yahoo.com`

mail command
read mode sub commands

You are in **read mode** when you invoke mail with no arguments

- ?   print these commands
- p <message list>   print messages
- n   goto and print next message
- e <message list>   edit messages
- d <message list>   delete messages
- s <message list> file   save (append) messages to file
- u <message list>   undelete messages
- R <message list>   reply to sender(s)
- r <message list>   reply to all
- m <user list>   mail to specific users
- q   quit, saving read messages to local mbox file
- x   quit, mark all mail as unread and undeleted.
- h   print out active message headers

A <message list> consists of integers, ranges of same, or user names separated by spaces. If omitted, Mail uses the current message

A <user list> consists of user names separated by spaces.

mail command
(h)header sub-command

h (print headers – e.g. list my in tray)

```
simmsben@opus:~
& h
   1  simmsmar@opus.cabril   Wed Jul 23 16:25   19/677    "Re: Salsa on Friday"
   2  simmsben@opus.cabril   Thu Jul 24 13:54   28/962    "test of attached message"
>  3  simmsben@opus.cabril   Thu Jul 24 14:03   25/932    "Another test"
N  4  roddyduk@opus.cabril   Thu Jul 24 14:17   18/729    "Lets play ball"
N  5  millehom@opus.cabril   Thu Jul 24 14:20   21/746    "Linux scripts"
&
```

message numbers

N = New, message is unread

> points to the current message (last one printed)

mail command
(p)rint sub-command

```
simmsben@opus:~
& h
    1 simmsmar@opus.cabril   Wed Jul 23 16:25   19/677    "Re: Salsa on Friday"
    2 simmsben@opus.cabril   Thu Jul 24 13:54   28/962    "test of attached message"
    3 simmsben@opus.cabril   Thu Jul 24 14:03   25/932    "Another test"
    4 roddyduk@opus.cabril   Thu Jul 24 14:17   18/729    "Lets play ball"
>   5 millehom@opus.cabril   Thu Jul 24 14:20   21/746    "Linux scripts"
& print simmsmar
Message 1:
From simmsmar@opus.cabrillo.edu  Wed Jul 23 16:25:51 2008
Date: Wed, 23 Jul 2008 16:25:51 -0700
From: Mary Simms <simmsmar@opus.cabrillo.edu>
To: richsimms@yahoo.com, simmsben@opus.cabrillo.edu,
        simmsmar@opus.cabrillo.edu
Subject: Re: Salsa on Friday

I'll see you there!

- Mary

&
```
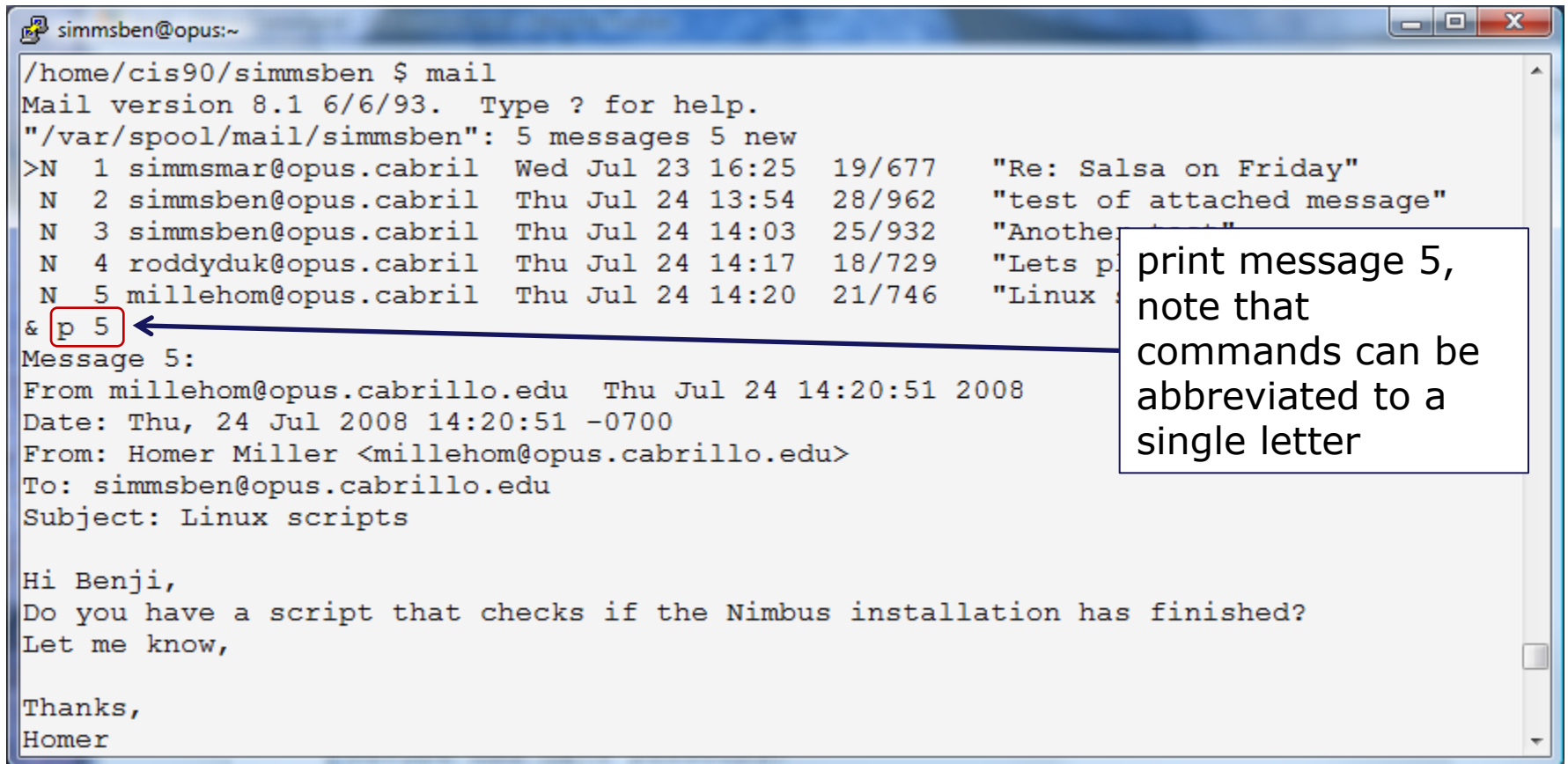
print all messages from simmsmar

mail command
(p)rint sub-command

```
simmsben@opus:~

/home/cis90/simmsben $ mail
Mail version 8.1 6/6/93.  Type ? for help.
"/var/spool/mail/simmsben": 5 messages 5 new
>N  1 simmsmar@opus.cabril   Wed Jul 23 16:25   19/677    "Re: Salsa on Friday"
 N  2 simmsben@opus.cabril   Thu Jul 24 13:54   28/962    "test of attached message"
 N  3 simmsben@opus.cabril   Thu Jul 24 14:03   25/932    "Another test"
 N  4 roddyduk@opus.cabril   Thu Jul 24 14:17   18/729    "Lets pl
 N  5 millehom@opus.cabril   Thu Jul 24 14:20   21/746    "Linux
& p 5
Message 5:
From millehom@opus.cabrillo.edu  Thu Jul 24 14:20:51 2008
Date: Thu, 24 Jul 2008 14:20:51 -0700
From: Homer Miller <millehom@opus.cabrillo.edu>
To: simmsben@opus.cabrillo.edu
Subject: Linux scripts

Hi Benji,
Do you have a script that checks if the Nimbus installation has finished?
Let me know,

Thanks,
Homer
```
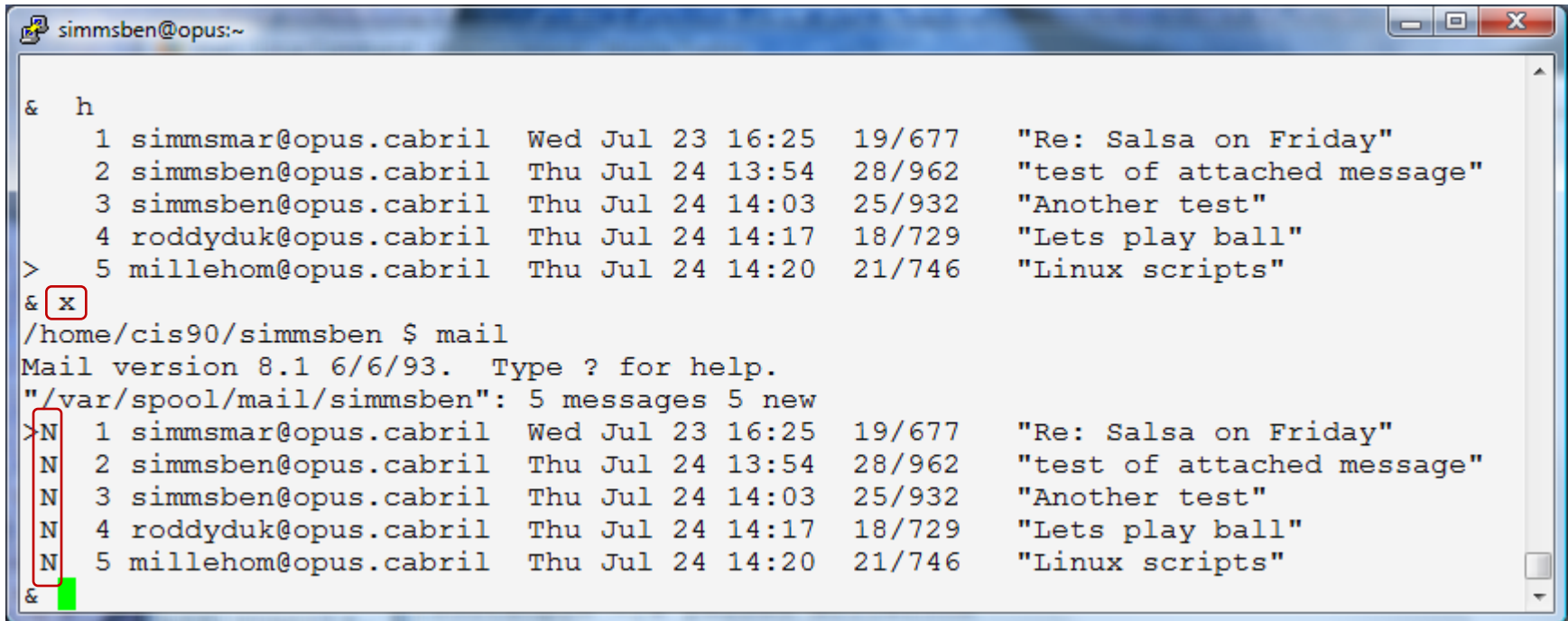
print message 5, note that commands can be abbreviated to a single letter

78

mail command
(p)rint sub-command

print messages 4 -5

mail command
e(x)it sub-command

```
simmsben@opus:~

&  h
     1 simmsmar@opus.cabril   Wed Jul 23 16:25   19/677    "Re: Salsa on Friday"
     2 simmsben@opus.cabril   Thu Jul 24 13:54   28/962    "test of attached message"
     3 simmsben@opus.cabril   Thu Jul 24 14:03   25/932    "Another test"
     4 roddyduk@opus.cabril   Thu Jul 24 14:17   18/729    "Lets play ball"
>    5 millehom@opus.cabril   Thu Jul 24 14:20   21/746    "Linux scripts"
&  x
/home/cis90/simmsben $ mail
Mail version 8.1 6/6/93.  Type ? for help.
"/var/spool/mail/simmsben": 5 messages 5 new
>N   1 simmsmar@opus.cabril   Wed Jul 23 16:25   19/677    "Re: Salsa on Friday"
 N   2 simmsben@opus.cabril   Thu Jul 24 13:54   28/962    "test of attached message"
 N   3 simmsben@opus.cabril   Thu Jul 24 14:03   25/932    "Another test"
 N   4 roddyduk@opus.cabril   Thu Jul 24 14:17   18/729    "Lets play ball"
 N   5 millehom@opus.cabril   Thu Jul 24 14:20   21/746    "Linux scripts"
&
```
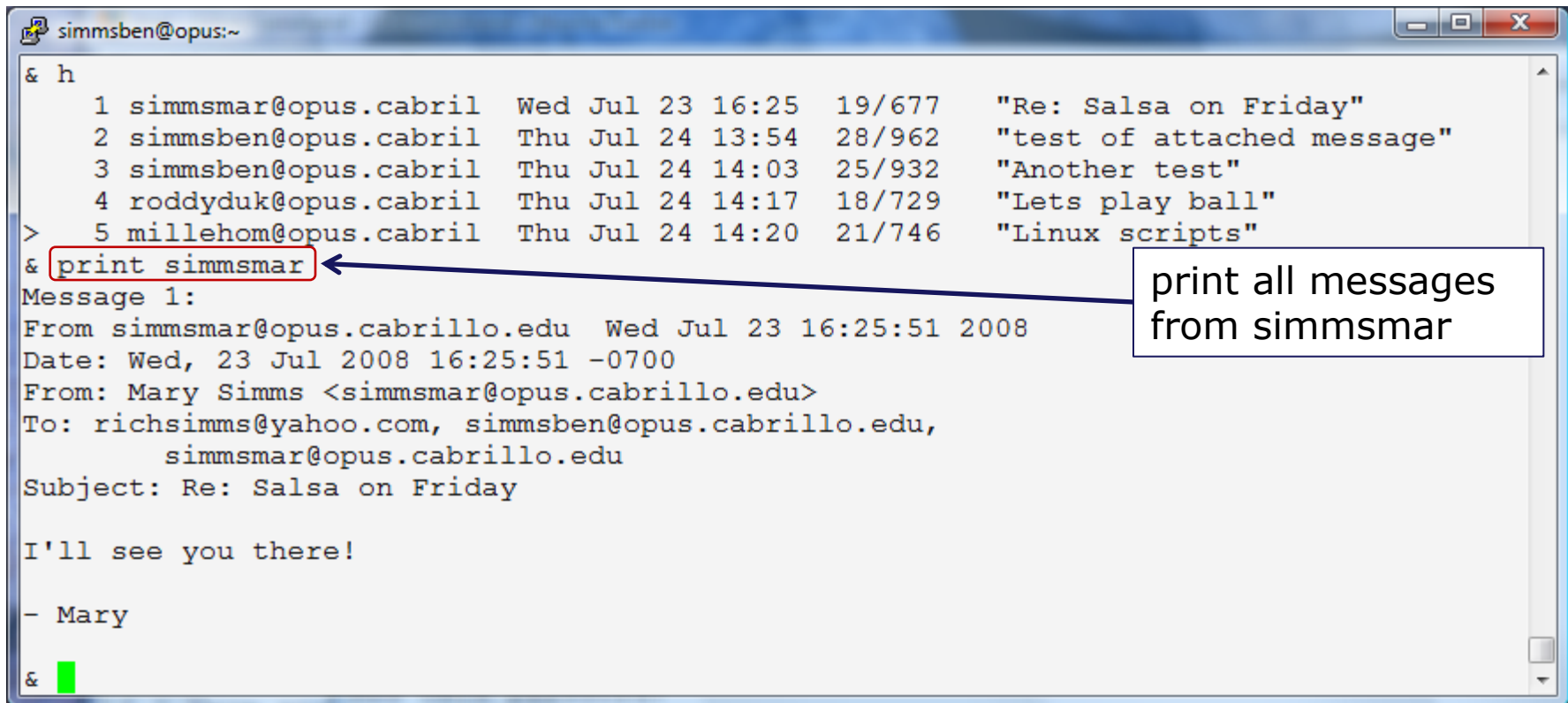
x will exit mail. All messages revert back to their original state (unread and undeleted). When you return to mail again all the messages will still be there.

80

mail command
(q)uit sub-command

*q will quit mail. **All read messages are moved to a local file named mbox**. When you return to mail again those message will not appear. To read your old messages you must specify the mbox file with the –f option.*

Class Exercise
UNIX mail

- Send your self some 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 **q** command to quit mail program

- Read your mail again, where did your messages go?

- Use **q** to quit mail

- Read the mail in your mbox file with **mail –f** or **mail –f mbox**

- Use **q** to quit mail

mail command
Various mailbox files

The most frequent Lab 3 question ever:
Help! ... where did my messages go!

mail

system mail box
`/var/mail/username`
(new mail arrives here,
any messages that have been
read are deleted on **quit** and
moved to mbox)

Answer, they went
to mbox
Use **mail –f mbox**
to view them

local mail box
`mbox`
(read messages go here on **quit**)

local mail box
`yourfile`
(messages can go here with **save**)

83

mail command
Various mail examples

```
[rsimms@opus ~]$ mail
Mail version 8.1 6/6/93.  Type ? for help.
"/var/spool/mail/rsimms": 6 messages 6 new
>N  1 jimg@opus.cabrillo.e  Sun Jun 22 13:53  21/826   "Hot days and servers"
 N  2 simmsben@opus.cabril  Thu Jul 24 12:27  16/697   "Nisene Hike"
 N  3 simmsmar@opus.cabril  Thu Jul 24 12:28  18/728   "Don't forget to bring"
 N  4 simmsben@opus.cabril  Thu Jul 24 12:29  17/696   "Bone lost"
 N  5 rsimms@opus.cabrillo  Thu Jul 24 12:33  20/808   "Re: Hot days and serv"
 N  6 roddyduk@opus.cabril  Thu Jul 24 15:41  18/691   "Salsa"
& p 3-4
Message 3:
From simmsmar@opus.cabrillo.edu  Thu Jul 24 12:28:38 2008
Date: Thu, 24 Jul 2008 12:28:38 -0700
From: Mary Simms <simmsmar@opus.cabrillo.edu>
To: rsimms@opus.cabrillo.edu
Subject: Don't forget to bring pen drive

I need to use it again to back up some files and practice partitioning.
Thanks
Mary

Message 4:
From simmsben@opus.cabrillo.edu  Thu Jul 24 12:29:27 2008
Date: Thu, 24 Jul 2008 12:29:27 -0700
From: Benji Simms <simmsben@opus.cabrillo.edu>
To: rsimms@opus.cabrillo.edu
Subject: Bone lost

Did you see that old bone I was chewing? I can't find it anywhere!
- Ben
```

Let's read 2 of the new messages

84

mail command

Various mail examples

Message 4 is saved in a mailbox file named bone

```
& s 4 bone
"bone" [New file]
& h
 N  1 jimg@opus.cabrillo.e   Sun Jun 22 13:53  21/826  "Hot days and servers"
 N  2 simmsben@opus.cabril   Thu Jul 24 12:27  16/697  "Nisene Hike"
    3 simmsmar@opus.cabril   Thu Jul 24 12:28  18/728  "Don't forget to bring"
>*  4 simmsben@opus.cabril   Thu Jul 24 12:29  17/696  "Bone lost"
 N  5 rsimms@opus.cabrillo   Thu Jul 24 12:33  20/808  "Re: Hot days and serv"
 N  6 roddyduk@opus.cabril   Thu Jul 24 15:41  18/691  "Salsa"
& q
Saved 1 message in mbox
Held 4 messages in /var/spool/mail/rsimms
```

Messages 3 and 4 have been read already so no "N". Message 4 which was saved to the bone mailbox has a "" to indicate it has been saved.*

On q (for quit) message 3 was read so it is moved to mbox. Unread messages are held in the system mailbox file

```
[rsimms@opus ~]$ mail
Mail version 8.1 6/6/93.  Type ? for help.
"/var/spool/mail/rsimms": 4 messages 4 unread
>U  1 jimg@opus.cabrillo.e   Sun Jun 22 13:53  22/836  "Hot days and servers"
 U  2 simmsben@opus.cabril   Thu Jul 24 12:27  17/707  "Nisene Hike"
 U  3 rsimms@opus.cabrillo   Thu Jul 24 12:33  21/818  "Re: Hot days and serv"
 U  4 roddyduk@opus.cabril   Thu Jul 24 15:41  19/701  "Salsa"
& q
Held 4 messages in /var/spool/mail/rsimms
```

The "U" indicates messages are unread

```
[rsimms@opus ~]$ mail -f mbox
Mail version 8.1 6/6/93.  Type ? for help.
"mbox": 1 message
>   1 simmsmar@opus.cabril   Thu Jul 24 12:28  19/739  "Don't forget to bring"
& q
[rsimms@opus ~]$ mail -f bone
Mail version 8.1 6/6/93.  Type ? for help.
"bone": 1 message 1 new
>   1 simmsben@opus.cabril   Thu Jul 24 12:29  18/706  "Bone lost"
& q
"bone" complete
[rsimms@opus ~]$
```

Use the –f option and the mailbox filename as an argument to read messages in those mail boxes

85
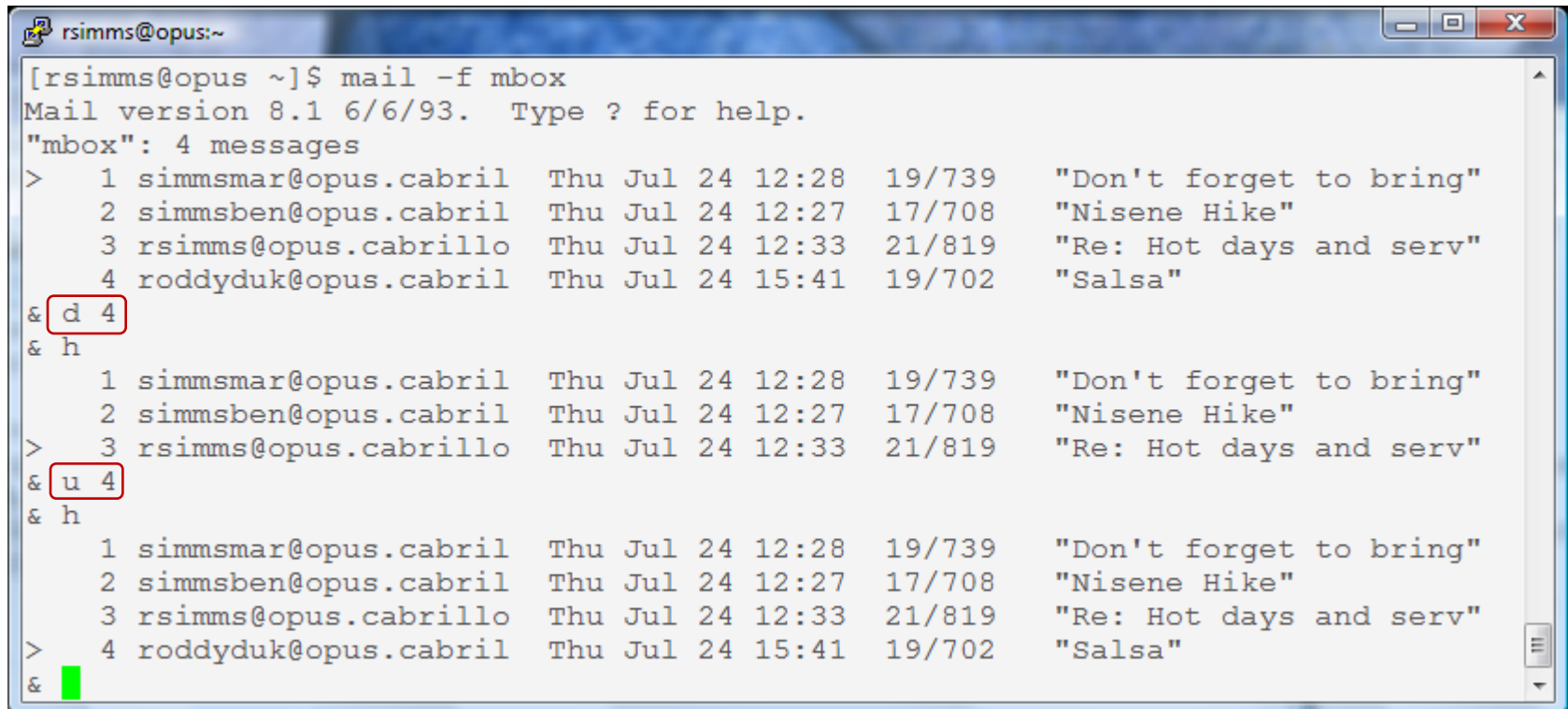
Class Exercise
UNIX mail

- Send yourself several test messages (hint: **mail $LOGNAME**)
- Run **mail** and read the messages you sent to yourself
- Save the first message to a file named in2011

   s 1 in2011

- Use **q** to quit mail
- Use **mail –f** to read messages now in mbox, use **q** to quit
- Use **mail –f mbox** to read messages now in mbox , use **q** to quit
- Use **mail –f in2011** to read messages now in in2011 , use **q** to quit

mail command
(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"
&
```

87

mail command
Copying messages from mbox back to system mail box

mail command
Forwarding a message with ~m

This is how you forward message 5

mail command
The mail boxes are all ascii text

```
/home/cis90/simmsben $ cat /var/mail/simmsben
From millehom@opus.cabrillo.edu  Thu Jul 24 16:26:56 2008
Return-Path: <millehom@opus.cabrillo.edu>
Received: from opus.cabrillo.edu (opus [127.0.0.1])
        by opus.cabrillo.edu (8.13.8/8.13.8) with ESMTP id m6ONQuBk016775
        for <simmsben@opus.cabrillo.edu>; Thu, 24 Jul 2008 16:26:56 -0700
Received: (from millehom@localhost)
        by opus.cabrillo.edu (8.13.8/8.13.8/Submit) id m6ONQuqw016774
        for simmsben; Thu, 24 Jul 2008 16:26:56 -0700
Date: Thu, 24 Jul 2008 16:26:56 -0700
From: Homer Miller <millehom@opus.cabrillo.edu>
Message-Id: <200807242326.m6ONQuqw016774@opus.cabrillo.edu>
To: simmsben@opus.cabrillo.edu
Subject: RC4 review

Meeting at 4:00 today in Big Sur room.  Looks like we have 2 showstoppers and need to rebuild tonight.

Homer

/home/cis90/simmsben $ mail
Mail version 8.1 6/6/93.  Type ? for help.
"/var/spool/mail/simmsben": 1 message 1 new
>N  1 millehom@opus.cabril  Thu Jul 24 16:26  18/741   "RC4 review"
& 1
Message 1:
From millehom@opus.cabrillo.edu  Thu Jul 24 16:26:56 2008
Date: Thu, 24 Jul 2008 16:26:56 -0700
From: Homer Miller <millehom@opus.cabrillo.edu>
To: simmsben@opus.cabrillo.edu
Subject: RC4 review

Meeting at 4:00 today in Big Sur room.  Looks like we have 2 showstoppers and need to rebuild tonight.

Homer
```

90

end-to-end email

end-to-end email

compose and send message

open and read message

end-to-end email

DA
Delivery
Agent

MTA
Mail
Transport
Agent

MTA
Mail
Transport
Agent

**Message
Store**

AA
Access
Agent

MUA
Mail
User
Agent

MUA
Mail
User
Agent

compose and send message

open and read message

93
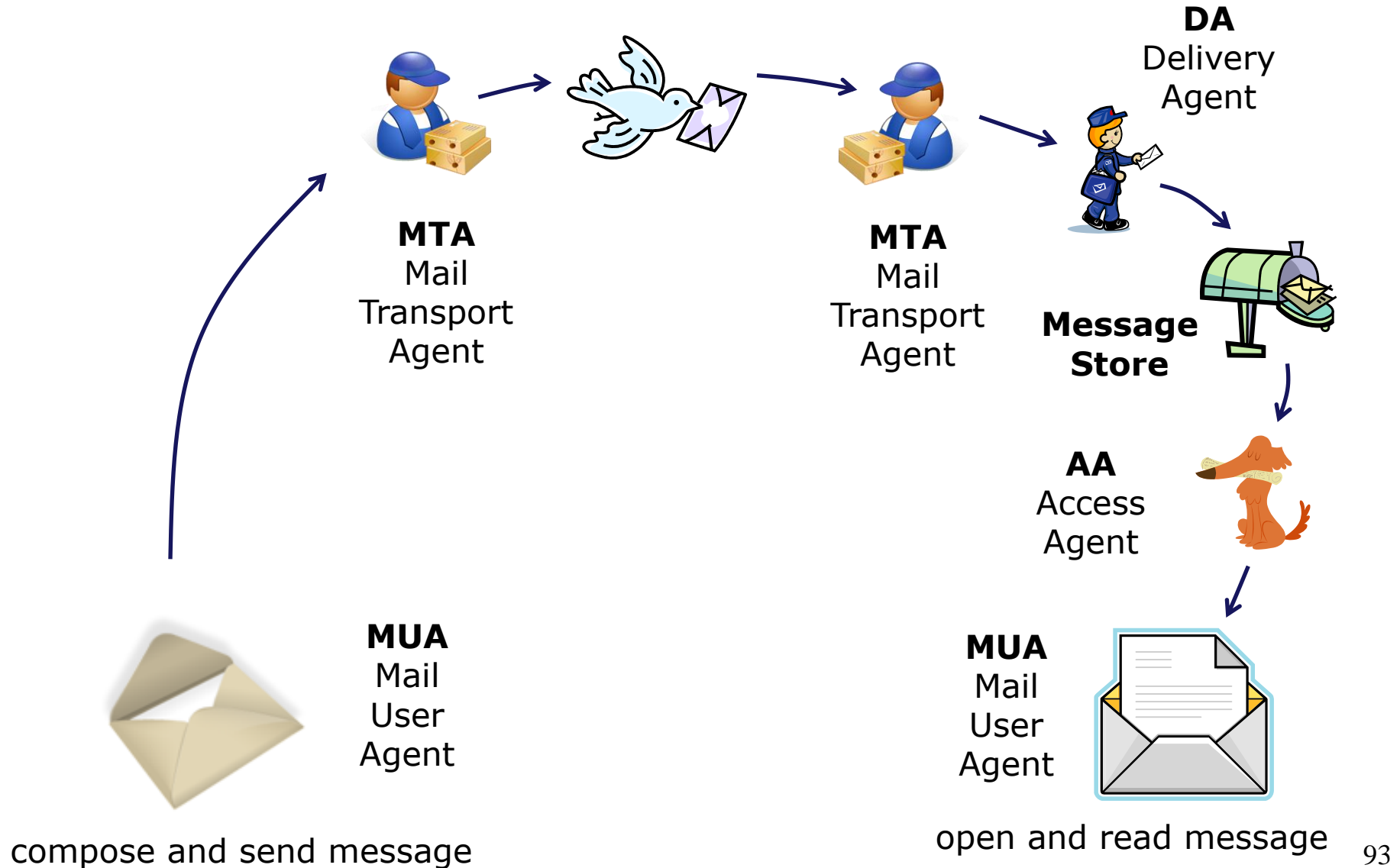
end-to-end email: example Implementation
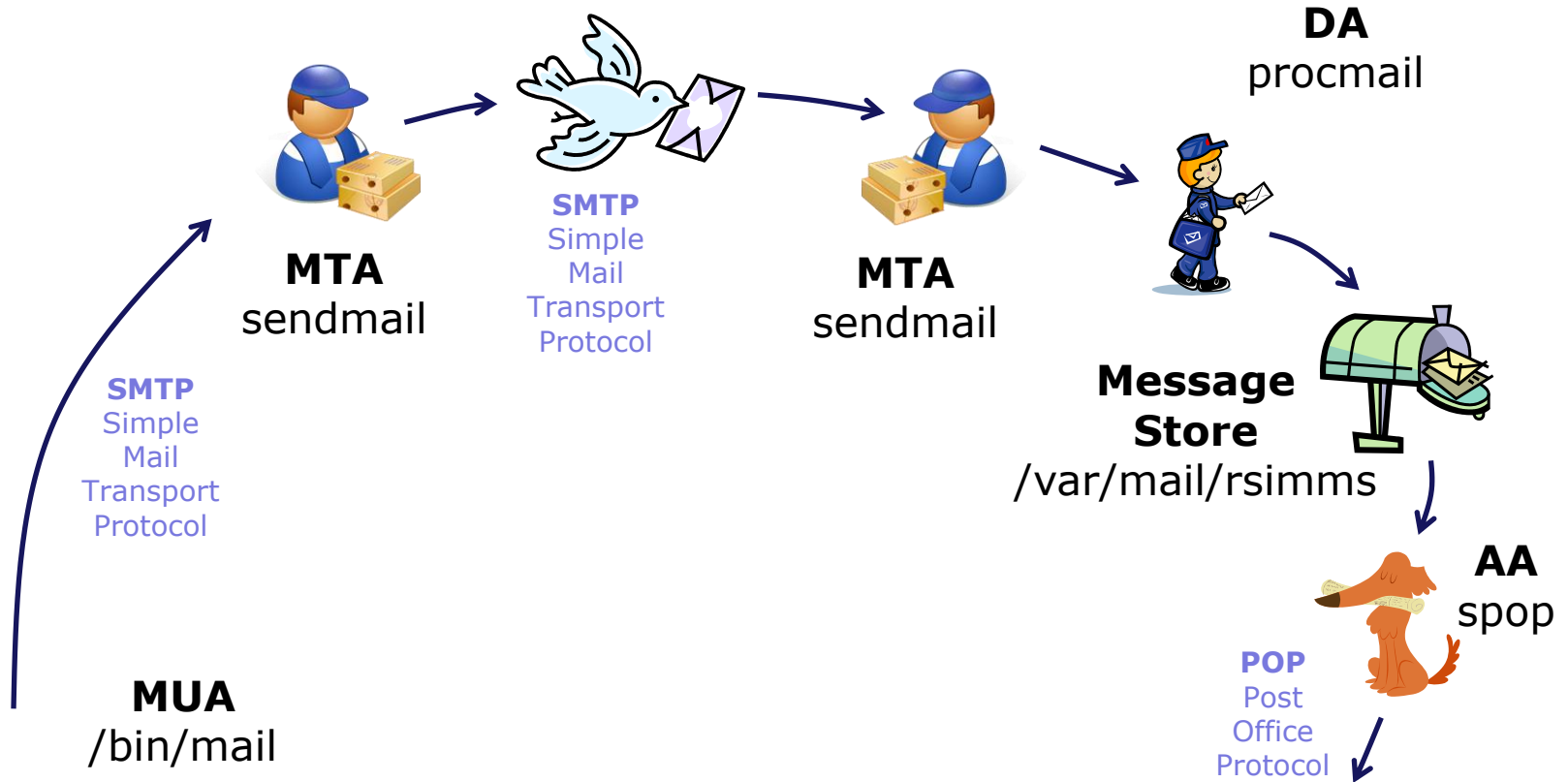
DA
procmail

MTA
sendmail

SMTP
Simple
Mail
Transport
Protocol

MTA
sendmail

SMTP
Simple
Mail
Transport
Protocol

**Message
Store**
/var/mail/rsimms

AA
spop

POP
Post
Office
Protocol

MUA
/bin/mail

```
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
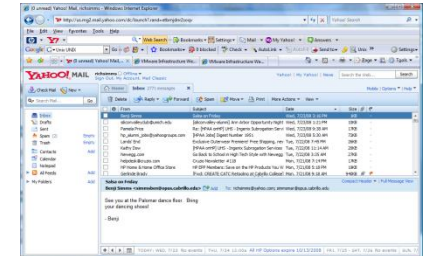
open and read message   94

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

AA
Access
Agent

POP
Post
Office
Protocol

Example MUA: Windows Mail (on Vista)
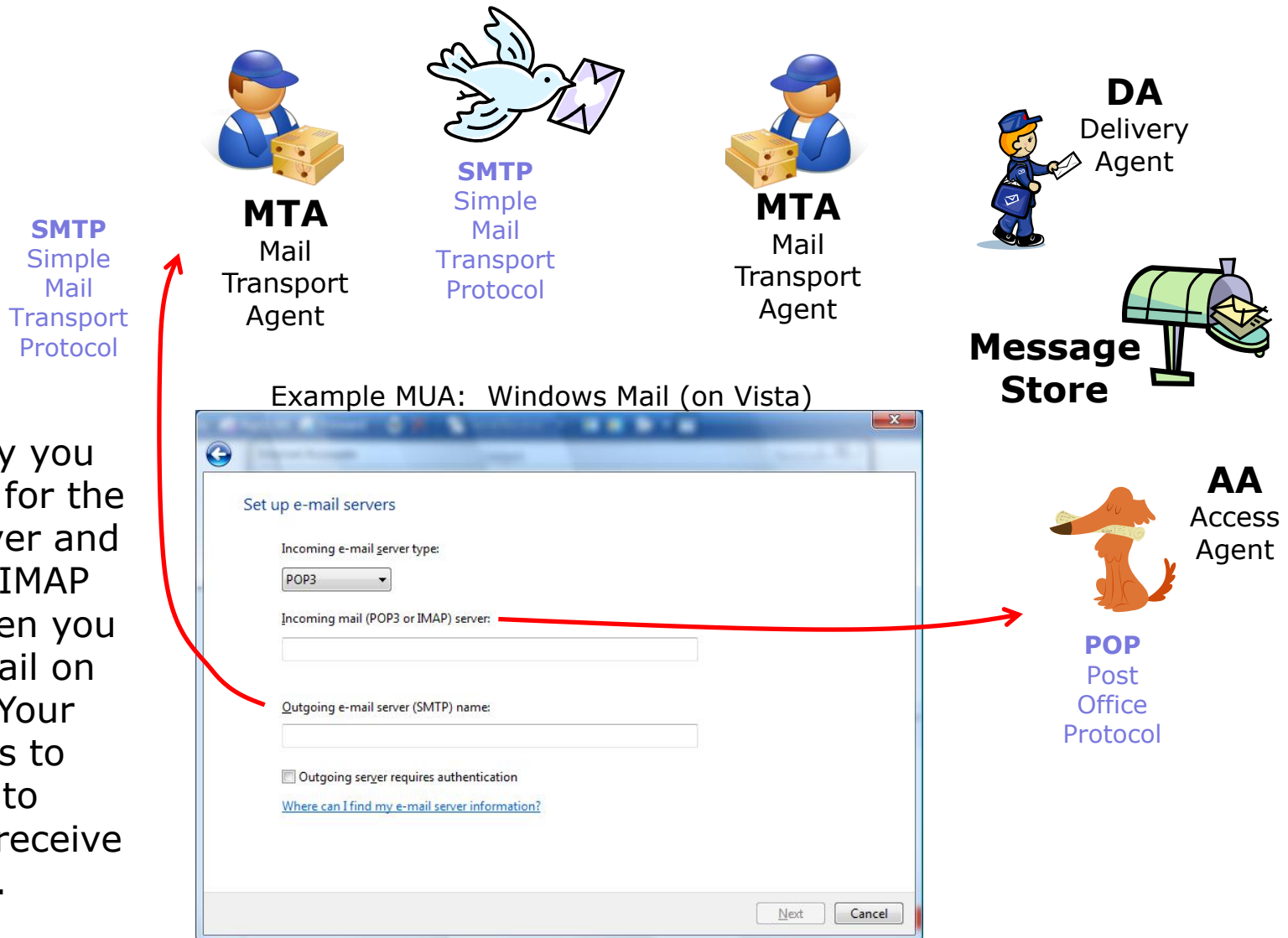
This is why you get asked for the SMTP server and the POP3/IMAP server when you set up email on your PC. Your MUA needs to know this to send and receive messages.

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?

Next   Cancel

95

Other MUAs MTAs, DAs, AAs

end-to-end email
some of the many players

MTA   sendmail, Exim, Microsoft Exchange Server, 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

- Check your mbox file (**mail –f**) if you think you have lost a message

- use **mail –f uhistory** to review your collection

- Use the **d** command in mail to delete duplicates in your uhistory file

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

Wrap up

New commands:
    mail   - UNIX mail
        ?   print these commands
        p <message list>   print messages
        n   goto and print next message
        e <message list>   edit messages
        d <message list>   delete messages
        s <message list> file   save (append) messages to file
        u <message list>   undelete messages
        R <message list>   reply to sender(s)
        r <message list>   reply to all
        m <user list>   mail to specific users
        q   quit, saving read messages to local mbox file
        x   quit, mark all mail as unread and undeleted.
        h   print out active message headers
    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*
    mbox   - File in users home directory where read messages
                                              are archived to

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?

• With /bin/mail, where do all messages that have been read go after using the quit command?

Backup