



Lesson Module Checklist

- Slides -
- Properties -
- Flash cards -
- First minute quiz -
- Web calendar summary -
- Web book pages -
- Commands -
- Lab

- CCC Confer wall paper -
- labx1 and Project posted -

- Materials uploaded -
- Backup slides, CCC info, handouts on flash drive -
- Check that room headset is charged Aptos (backup) -



Instructor: **Rich Simms**

Dial-in: **888-450-4821**

Passcode: **761867**



Sean C.



Don



Carlile



Andrew



Sean Fa.



Carter



Sean Fy.



Dajan



Bryn



Rita



Kelly



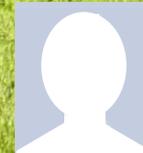
Ben



Ray



Michael



Evan



Josh



Carlos



Gustavo



Jessica



Evie



Jacob



Humberto

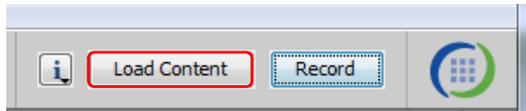


Chad

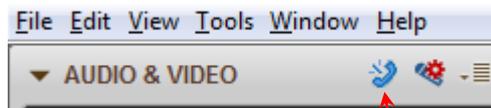
Email me (risimms@cabrillo.edu) a relatively current photo of your face for 3 points extra credit



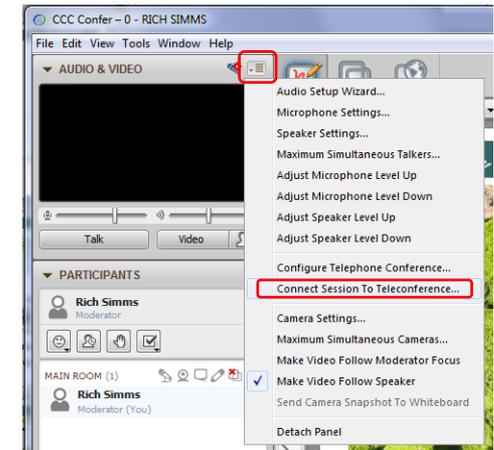
[] Load White Board with *cis*lesson??*-WB*



[] Connect session to Teleconference



Connected to teleconference



[] Is recording on?



[] Toggle Talk button to not use Mic





- [] Video (webcam) optional
- [] layout and share apps

The screenshot shows a Windows desktop with several applications open:

- CCC Confer**: A video conference window on the left showing a video feed of Rich Simms and a chat area.
- foxit for slides**: A PDF viewer window in the center showing a directory tree with folders like boot, bin, etc, and sbin. A red box labeled "foxit for slides" points to the PDF content.
- chrome**: A Google Chrome browser window on the right displaying a webpage with flashcard questions. A red box labeled "chrome" points to the browser window.
- putty**: A terminal window in the foreground showing a login attempt for simben90@oslab. A red box labeled "putty" points to the terminal window.

Red arrows connect the "foxit for slides" and "chrome" boxes to the "putty" box, indicating a workflow or dependency.

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)



Shell Scripting and Printing

Objectives

- Be able to print, view the print queue and cancel print jobs

Agenda

- Quiz
- Housekeeping
- Refresh
- Shell scripting
- Printing



Questions

Previous material and assignment

1. Previous material
2. Lab 10



Life without a path (surviving Lab 10)

The Path

- The path is a list of directories each containing commands, programs and scripts.
- The path is used by the shell to locate commands to run.
- The PATH variable defines the directories (separated by ":"s) and the search order.
- If the path is not defined then each command to run must be specified using it's absolute pathname

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

What is the fourth directory on this path?

Can you name a command found in the fourth directory of the path?

The Path

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

The tty command is in the /usr/bin directory

```
/home/cis90/simben $ oldpath=$PATH  
/home/cis90/simben $ unset PATH
```

Backup your current path

```
/home/cis90/simben $ tty  
-bash: tty: No such file or directory
```

The tty command can no longer be run by typing just its name

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

Instead the full absolute pathname must be used

```
/home/cis90/simben $ PATH=$oldpath  
/home/cis90/simben $ tty  
/dev/pts/0
```

Restore your path to what it was

Class Activity: Life without a path

Backup and remove your path variable:

```
/home/cis90/simben $ oldpath=$PATH
```

```
/home/cis90/simben $ unset PATH
```

```
/home/cis90/simben $ echo $PATH
```

```
/home/cis90/simben $
```

The Path

If the path is not defined then each command to run must be specified using an absolute pathname

```
/home/cis90/simben $ ls letter  
-bash: ls: No such file or directory
```



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

The Path

Some commands still work without a path ... why?

```
/home/cis90/simben $ echo "I want my path back"  
I want my path back
```

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

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

The Path

Fixing the path, one directory at a time ...

```
/home/cis90/simben $ ls letter
-bash: ls: No such file or directory
```



*The **ls** command is in /bin so lets put that on the path*



```
/home/cis90/simben $ PATH=/bin
/home/cis90/simben $ ls letter
letter
```

```
/home/cis90/simben $ stat letter
-bash: stat: command not found
```



*The **stat** command is in /usr/bin so lets append that directory too*



```
/home/cis90/simben $ PATH=$PATH:/usr/bin
/home/cis90/simben $ stat letter
  File: `letter'
  Size: 1059          Blocks: 16          IO Block: 4096
regular file
Device: fd00h/64768d  Inode: 102594       Links: 1
Access: (0644/-rw-r--r--)  Uid: ( 1000/simben90)  Gid: (
90/   cis90)
Access: 2012-04-30 15:43:28.000000000 -0700
Modify: 2012-03-20 10:31:30.000000000 -0700
Change: 2012-04-30 07:34:30.000000000 -0700
```

The Path



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

*The **allscripts** shell script is in /home/cis90/bin so lets add that directory to the path as well*



```
/home/cis90/simben $ PATH=$PATH:/home/cis90/bin  
/home/cis90/simben $ allscripts
```

```
*****  
*                               Fall 2012 CIS 90 Online Projects                               *  
*****  
1) Andrew  
2) Ben  
3) Benji  
4) Bryn  
5) Carlile  
6) Carlos  
  <snipped>  
21) Ray  
22) Rita  
23) Sean C.  
24) Sean F.  
25) Shahram  
  
99) Exit  
  
Enter Your Choice:
```

The Path

```
/home/cis90/simben $ datecal
bash: datecal: command not found
```



The **datecal** shell script is in your own bin directory so lets add that to the path as well



```
/home/cis90/simben $ PATH=$PATH:/home/cis90/simben/bin
/home/cis90/simben $ datecal
```

```
Tue May 8 14:30:59 PDT 2012
```

April 2012							May 2012							June 2012						
Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa	Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7			1	2	3	4	5						1	2
8	9	10	11	12	13	14	6	7	8	9	10	11	12	3	4	5	6	7	8	9
15	16	17	18	19	20	21	13	14	15	16	17	18	19	10	11	12	13	14	15	16
22	23	24	25	26	27	28	20	21	22	23	24	25	26	17	18	19	20	21	22	23
29	30						27	28	29	30	31			24	25	26	27	28	29	30

```
/home/cis90/simben $
```

The Path

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



*The **dogbone** shell script is in the current directory but not on the path*



```
/home/cis90/simben $ ./dogbone  
What is your name? Benji  
What is your favorite bone? Chicken  
Hi Benji, your favorite bone is Chicken
```

*How can I run a script in the current directory without having to put a **./** in front of it?*

The Path

Easy ... add "here" or "." to the path

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



```
/home/cis90/simben $ PATH=$PATH:.  
/home/cis90/simben $ dogbone  
What is your name? Benji  
What is your favorite bone? Chicken  
Hi Benji, your favorite bone is Chicken
```

The Path

Rebuilding the path by appending directories one at a time

```
/home/cis90/simben $ unset PATH
/home/cis90/simben $ echo $PATH
```

```
/home/cis90/simben $ PATH=/bin
/home/cis90/simben $ echo $PATH
/bin
```

Start with /bin which has all the essential UNIX/Linux commands

```
/home/cis90/simben $ PATH=$PATH:/usr/bin
/home/cis90/simben $ echo $PATH
/bin:/usr/bin
```

Append /usr/bin which has hundreds of additional UNIX/Linux commands

```
/home/cis90/simben $ PATH=$PATH:/home/cis90/bin
/home/cis90/simben $ echo $PATH
/bin:/usr/bin:/home/cis90/bin
```

Append the CIS 90 class bin directory

```
/home/cis90/simben $ PATH=$PATH:/home/cis90/simben/bin
/home/cis90/simben $ echo $PATH
/bin:/usr/bin:/home/cis90/bin:/home/cis90/simben/bin
```

Append your own student bin directory

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

Append the current directory

*CIS 90 class bin
directory*

*Student bin
directory*

*Current
directory*

The Path

Making the path permanent using .bash_profile

```

/home/cis90/simben $ cat .bash_profile
# .bash_profile

# Get the aliases and functions
if [ -f ~/.bashrc ]; then
    . ~/.bashrc
fi

# User specific environment and startup programs

PATH=$PATH:/home/cis90/bin:$HOME/bin:.
BASH_ENV=$HOME/.bashrc
USERNAME=""
PS1='$PWD $ '
export USERNAME BASH_ENV PATH
umask 002
set -o ignoreeof
stty susp
eval `tset -s -m vt100:vt100 -m :\?${TERM:-ansi} -r -Q `

/home/cis90/simben $

```

This customizes the normal path by appending the class bin directory, the student's bin directory and the "current" directory



Housekeeping

Previous material and assignment

1. Lab 10 due 11:59PM tonight
2. The Extra Credit Labs X1 and X2 (30 points each) area available.
3. The Final Project is available.

Sage advice:

Get one "practice" task script working in your project today before you leave class today.

Review the final project grading rubric to see how many points you have completed so far with your practice script.

Cabrillo College Student Senate Holiday Food Drive

Second Harvest Food Bank A Plate For Kate

by **Carter Frost** » Wed Nov 14, 2012 4:28 pm

Second Harvest Food Bank A Plate For Kate

<http://thefoodbank.org/plateforkate>

The Cabrillo College Student Senate is doing a fundraiser for Second Harvest Food Bank

There are many families in need of food this coming holiday season. Whether you donate food or money, it will go towards making sure families don't go hungry! Every \$1 donated will feed a family of four.

Cabrillo's Goal: 20,000 Pounds of Food

Food barrels and green piggies will be located throughout campus to collect donations for Second Harvest Holiday Food Drive.

I have placed a green piggy in your classroom.

Methods of donation:

1. Place non-perishable food in the barrels around campus.

Canned products and any non-perishable food items are accepted.

Can't find a barrel? Come to SAC East and there is a barrel located in the lobby.

All food collected will be distributed to both the Cabrillo Food Pantry and the Second Harvest Food Bank.

2. Feed the Green Piggies located around campus and in your classroom with your spare change. (They also don't mind a helping of a few dollars as well!)

3. Make a Monetary Donation

Make checks payable to the Second Harvest Food Bank you can drop it in a green pig or off at SAC East.

Note to instructor: The Green Pig Is Lurking In "The 2501 Closet"

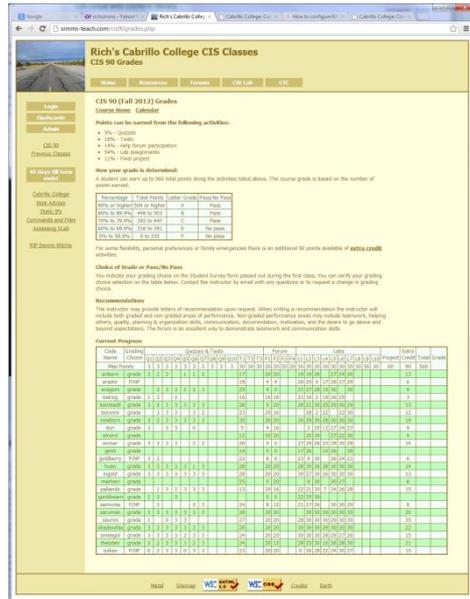
Carter Frost

Posts: 20

Joined: Wed Aug 29, 2012 2:29 pm

Managing your grade

Use the web page



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

Use Jesse's checkgrades script

```

anborn: 72% (302 of 417 points)
arador: 58% (244 of 417 points)
aragorn: 71% (298 of 417 points)
balrog: 52% (220 of 417 points)
bombadil: 92% (384 of 417 points)
boromir: 69% (288 of 417 points)
celeborn: 104% (436 of 417 points)
dori: 56% (234 of 417 points)
elrond: 68% (287 of 417 points)
eomer: 82% (344 of 417 points)
gimli: 29% (125 of 417 points)
goldberry: 64% (267 of 417 points)
huan: 105% (439 of 417 points)
ingold: 97% (405 of 417 points)
marhari: 61% (255 of 417 points)
pallando: 75% (315 of 417 points)
samwise: 73% (306 of 417 points)
saruman: 97% (406 of 417 points)
sauron: 103% (431 of 417 points)
shadowfax: 104% (434 of 417 points)
smeagol: 95% (399 of 417 points)
theoden: 93% (388 of 417 points)
tulkas: 82% (346 of 417 points)
    
```

As of November 18, 2012

Managing your grade

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

Points gone by

- 9 quizzes - 27 points
- 2 tests - 60 points
- 3 forum periods - 60 points
- 9 labs - 270 points

417 points

Points yet to earn

- 1 quizzes - 3 points
- 1 test - 30 points
- 1 forum periods - 20 points
- 1 labs - 30 points
- 1 final project - 60 points

143 points

- Plus extra credit - up to 90 points

Managing your grade Getting extra help for CIS 90

Rich's Cabrillo College CIS Classes
CIS 90 Grades

Home Resources Forums **CIS Lab** CTC

CIS 90 (Fall 2010) Grades
Course Home Calendar

Points can be earned from the following activities:

- 5% - Quizzes
- 16% - Tests
- 14% - Help forum participation
- 54% - Lab assignments
- 11% - Final

How your grade is determined:
A student can earn up to 560 total points doing the activities listed above. The course grade is number of points earned.

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

For some flexibility, personal preferences or family emergencies there is an additional 90 point **extra credit** activities.

Choice of Grade or Pass/No Pass
You indicate your grading choice on the Student Survey form passed out during the first class grading choice selection on the table below. Contact the instructor by email with any question

Come by the lab and get help from instructors and student assistants

Cabrillo Network & Systems Technology Lab
Aptos Campus

Home Resources NETLAB Location

Fall 2012 Instructor and Lab Assistant Hours

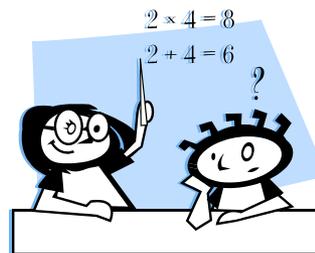
Note: The CIS Lab is closed on holidays and spring break (Sep 3, Nov 12, Nov 22-23)

Half Hour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
08:30					closed	closed	closed
09:00							closed
09:30							closed
10:00				Gerlinde	Bryan	Bryan	closed
10:30				Gerlinde	Bryan	Bryan	closed
11:00	David		David		Bryan	Bryan	closed
11:30	David		David		Bryan	Bryan	closed
12:00	David		David	Jim	Bryan	Bryan	closed
12:30	David		David	Jim	Bryan	Bryan	closed
01:00	David, Gerlinde	Chelsea	David, Gerlinde	Jim, Chelsea	Bryan	Bryan	closed
01:30	Gerlinde, Rich	Chelsea	Gerlinde	Jim, Chelsea	Bryan	Bryan	closed
02:00	Gerlinde, Rich	Chelsea		Jim, Chelsea			closed
02:30	Gerlinde, Rich	Chelsea	Bryan	Chelsea			closed
03:00	Rich, Bryan	Chelsea	Bryan	Chelsea			closed
03:30	Rich, Bryan	Chelsea	Bryan	Chelsea			closed
04:00	Bryan	Chelsea	Bryan	Chelsea	closed	closed	closed
04:30	Bryan	Chelsea, Gerlinde	Bryan	Chelsea	closed	closed	closed
05:00	Bryan	Gerlinde	Bryan	Chelsea	closed	closed	closed
05:30	Bryan			Chelsea	closed	closed	closed
06:00					closed	closed	closed
06:30					closed	closed	closed
07:00					closed	closed	closed
07:30					closed	closed	closed
08:00					closed	closed	closed
08:30					closed	closed	closed
09:00					closed	closed	closed

Gerlinde=Gerlinde Brady, Jim=Jim Griffin, Rich=Rich Simms

Managing your grade Getting extra help for CIS 90

- Rich's Office Hours Wed 4:20-5:10pm in Room 2501 (right after class) or TBA (contact me)
- Ask questions on the Forum at:
<http://opus.cabrillo.edu/forum/>



Final Exam

Can **not** be taken online using CCC Confer

It will be held in room 2501 on Wednesday, Dec 12th from 1:00 to 3:50PM (**hard stop, no extension time period**)

If you know you can't make this date you will need to contact the instructor, in advance, to arrange an exam **EARLIER** in the week.

No makeups after the Wednesday exam

Practice test will be available



	12/12	<p>Test #3 (the final exam)</p> <p>Time</p> <ul style="list-style-type: none"> • 1:00PM - 3:50PM in Room 2501 <p>Materials</p> <ul style="list-style-type: none"> • Presentation slides (download) • Test (download) 		<p>5 posts</p> <p>Lab X1</p> <p>Lab X2</p>
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Spring 2013 Linux Classes

CIS 90 Introduction to UNIX/Linux

Provides a technical overview of the UNIX/Linux operating system, including hands-on experience with commands, files, and tools. Recommended Preparation: CS 1L or CIS 172.

Transfer Credit: CSU.

Section	Days	Times	Units	Instructor	Room
78467	TH	01:15PM-04:20PM	3.00	R.Simms	OL

Section 78467 is an ONLINE course. Meets weekly throughout the semester online at the scheduled times by remote technology using CCC Confer. For details, see instructor's web page at go.cabrillo.edu/online.

CIS 192AB UNIX/Linux Network Administration

Build and monitor network infrastructures, and install, configure, and protect services on Linux TCP/IP networks. Prerequisite: CIS 81 and CIS 90. Recommended Preparation: CIS 191AB. Repeatability: May be taken 2 times.

Section	Days	Times	Units	Instructor	Room
79995	T	05:30PM-09:35PM	4.00	R.Simms	OL
&	Arr.	Arr.		R.Simms	OL

Section 79995 is an ONLINE course. Meets weekly throughout the semester online during the scheduled times by remote technology using CCC Confer with an additional 4 hr 5 min online lab per week. Students will be required to show that they meet the course prerequisites. For details, see instructor's web page at go.cabrillo.edu/online.

- Dear Sir or Madam:
 - >
 - > TWENTIETH CENTURY FOX FILM CORPORATION and its affiliated companies
 - > (collectively, "FOX") are the exclusive owners of copyrights in
 - > motion pictures.
 - >
 - > It has come to our attention that California State University Network
 - > is the service provider for the IP address listed below, from which
 - > unauthorized copying and distribution (downloading, uploading, file
 - > serving, file "swapping" or other similar activities) of FOX'S
 - > property is taking place. The documentation included at the end of
 - > this notice specifies the location of the infringement. We believe
 - > that the Internet access of the user engaging in this infringement
 - > is provided by California State University Network or a downstream
 - > service provider who purchases this connectivity from California
 - > State University Network.

- > Evidentiary Information:
 - > Notice ID: 22264275815
 - > Asset: DARKEST HOUR (2011), THE
 - > Protocol: BitTorrent
 - > IP Address: 207.62.184.250
 - > DNS: pat-cis-students.cabrillo.edu
 - > Port ID: 3116
 - > File Name: The.Darkest.Hour.2011.720p.BRRip.x264.AC3-26K
 - > File Size: 1791679401
 - > Timestamp: 2012-11-07 22:33:59.057 GMT Last Seen Date: 2012-11-07
 - > 22:33:59.057 GMT

***DO NOT USE THE
SCHOOL NETWORK FOR
PIRATING INTELLECTUAL
PROPERTY THAT
BELONGS TO OTHERS!***



Final Project Grading Rubric

Grading rubric (60 points maximum)

Possible Points	Requirements
30	Implementing all five tasks (6 points each): <ul style="list-style-type: none"> • Requirements for each task: <ul style="list-style-type: none"> - Minimum of 10 "original" script command lines - Has comments to explain what it does - Has user interaction
25	You don't have to do all of these but do at least five: <ul style="list-style-type: none"> • Redirecting stdin (5 points) • Redirecting stdout (5 points) • Redirecting stderr (5 points) • Use of permissions (5 points) • Use of filename expansion characters (5 points) • Use of absolute path (5 points) • Use of relative path (5 points) • Use of a PID (5 points) • Use of inodes (5 points) • Use of links (5 points) • Use of a GID or group (5 points) • Use of a UID or user (5 points) • Use of a signal (5 points) • Use of piping (5 points) • Use of an environment variable (5 points) • Use of /bin/mail (5 points) • Use of a conditional (5 points) The maximum for this section are 25 points.
5	Present your script in front of the class
Points lost	
-15	Fails to run from allscripts
-15	Other students in the class are unable to read and execute your script.
-15	Error messages are displayed when running one or more tasks
-up to 90	No credit for any task which contains unoriginal script code that: <ul style="list-style-type: none"> • Doesn't give full credit to the original author • Doesn't indicate where the code was obtained from • Doesn't include licensing terms • Violates copyright or licensing terms
Extra credit	
30	Up to three additional tasks (10 points each)



Final Project

forum

Use the forum effectively to get scripting help

Not so good ...

Preview:

Help!

My script is getting weird error

- Homer

*Not enough information has been provided
on this post for others to help*

Use the forum effectively to get scripting help

Better ... but requires viewer to log into Opus and you may have modified the script since posting

Preview:

Help!

My script is getting weird error

My script is here:

/home/cis90/milhom/bin/myscript

And this is the error:

CODE: SELECT ALL

```
/home/cis90/simben/bin $ ./script99
simben90
-rwxr-x--- 1 simben90 cis90 10489 Apr 30 07:33 /home/cis90/simben/bin/myscript
./script99: line 8: unexpected EOF while looking for matching `"'
./script99: line 16: syntax error: unexpected end of file
/home/cis90/simben/bin $
```

- Homer

This post provides the location of the script and the error message which enables others to help you find and fix the problem

Use the forum effectively to get scripting help

Preview:

Help!

My script is getting weird error

This is the script:

CODE: SELECT ALL

```
#!/bin/bash
# Test script
#
echo $LOGNAME
dir=/home/cis90/simben
ls -l $dir/bin/myscript
if [ -f "$dir/bin/myscript" ]; then
    echo you have a myscript file in the bin directory
else
    echo there is no myscript file in your bin directory!]
fi
exit
```

And this is the error:

CODE: SELECT ALL

```
/home/cis90/simben/bin $ ./script99
simben90
-rwxr-x--- 1 simben90 cis90 10489 Apr 30 07:33 /home/cis90/simben/bin/myscript
./script99: line 8: unexpected EOF while looking for matching `"'
./script99: line 16: syntax error: unexpected end of file
/home/cis90/simben/bin $
```

- Homer

Best ...

This post shows both the script and the error using code tags which enables others to help you find and fix the problem.

The thread will also benefit future CIS 90 students



Scripting Tips

echo

Silence is golden

Many UNIX commands that run successfully produce no output

```
[simben90@opus bin]$ alias details=file  
[simben90@opus bin]$ cp quiet quiet.bak  
[simben90@opus bin]$ value=002  
[simben90@opus bin]$ umask $value  
[simben90@opus bin]$ cat quiet > /dev/null  
[simben90@opus bin]$ > important_file
```

Silence is golden

Running or sourcing a script full of UNIX commands that produce no output still produces no output!

```
[simben90@opus bin]$ cat quiet  
alias details=file  
cp quiet quiet.bak  
value=002  
umask $value  
cat quiet > /dev/null  
> important_file
```

```
[simben90@opus bin]$ quiet  
[simben90@opus bin]$
```

```
[simben90@opus bin]$ source quiet  
[simben90@opus bin]$
```

Silence is golden

*Shell **script developers use the echo command** to provide interaction, feedback and tracing (for debugging) with the scripts they write.*

```
[simben90@opus bin]$ cat quiet
```

```
alias details=file
```

```
cp quiet quiet.bak
```

```
value=002
```

```
umask $value
```

```
echo TRACE: value=$value
```

```
cat quiet > /dev/null
```

```
echo "Quiet script successfully completed"
```

```
[simben90@opus bin]$ quiet
```

```
TRACE: value=002
```

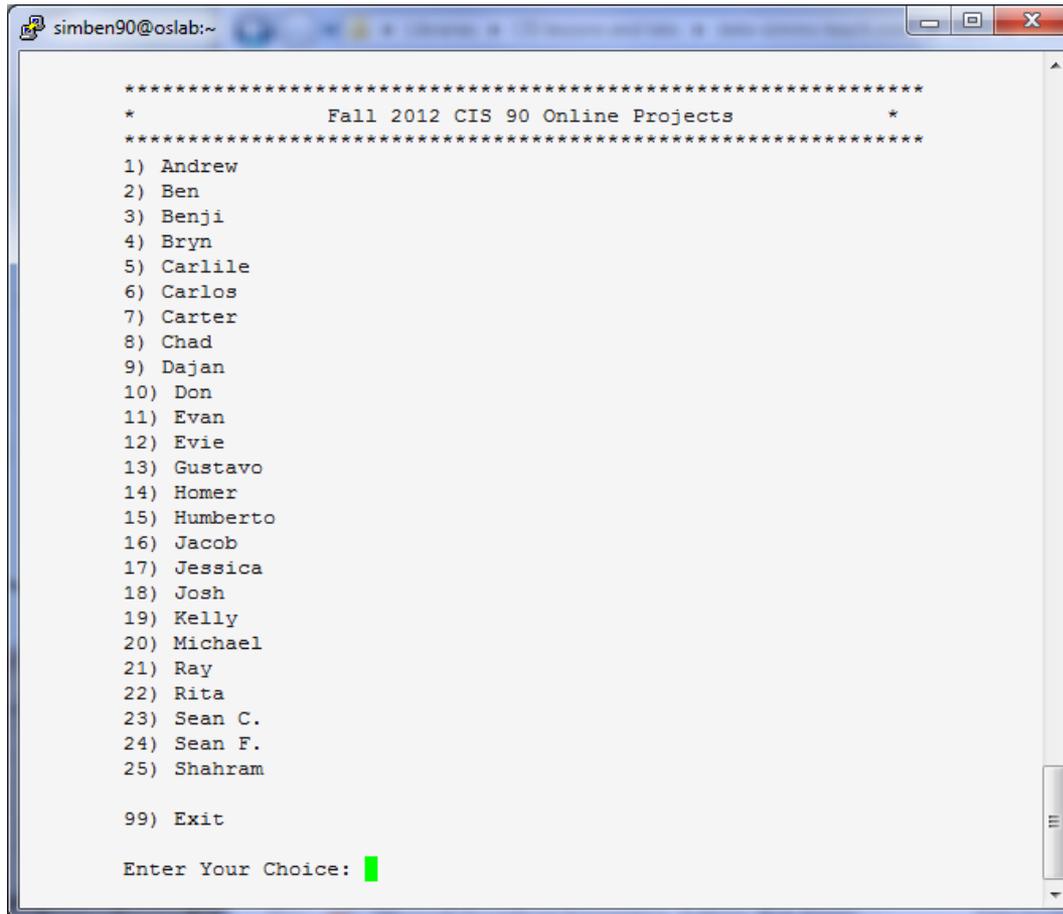
```
Quiet script successfully completed
```



Final Project

permissions

Final Project



```
simben90@oslab:~  
*****  
*           Fall 2012 CIS 90 Online Projects           *  
*****  
1) Andrew  
2) Ben  
3) Benji  
4) Bryn  
5) Carlile  
6) Carlos  
7) Carter  
8) Chad  
9) Dajan  
10) Don  
11) Evan  
12) Evie  
13) Gustavo  
14) Homer  
15) Humberto  
16) Jacob  
17) Jessica  
18) Josh  
19) Kelly  
20) Michael  
21) Ray  
22) Rita  
23) Sean C.  
24) Sean F.  
25) Shahram  
  
99) Exit  
  
Enter Your Choice: █
```

*Before leaving
class today you
want to make
sure you can run
your script from
allscripts*

Permissions

A past forum post ...

Ha Ha Class
Dby on Tue May 12, 2009 12:22 pm

I'm sure this is some kind of payback for last week "Hacking" attempt 😊



```
File Edit View Terminal Help
#!/bin/bash
# menu: A simple menu example
while true
do
clear
echo -n "
~~~~~ will fail his Final Project
1) Job 1
2) Task 2
3) Task 3
4) Task 4
5) Task 5
6) Exit
Enter Your Choice: "
read RESPONSE
case $RESPONSE in
1) # Command for Task 1
echo "~~~~~ got hacked!!!!"
echo "what is your name?"
read NAME
echo "what are ur hobbies?"
"myscript" 42L, 646C
23,1 Top
```

I will find out who did this 😊😂

~~~~~

ps. Im going to pass 😊

*Uh, oh ... someone got hacked!*

# Permissions

```
rsimms@oslab:/home/cis90/bin
[rsimms@oslab bin]$ ls -l /home/cis90/*/bin/myscript
-rwxr-xr-x. 1 calsea90 cis90 560 Nov 14 14:25 /home/cis90/calsea/bin/myscript
-rwxrwxr-x. 1 davdon90 cis90 510 Nov 14 14:28 /home/cis90/davdon/bin/myscript
-rwxrwxr-x. 1 evaand90 cis90 518 Nov 14 14:25 /home/cis90/evaand/bin/myscript
-rwxrwxr-x. 1 farsha90 cis90 551 Nov 14 14:25 /home/cis90/farsha/bin/myscript
-rwxrwxr-x. 1 frocar90 cis90 557 Nov 14 14:23 /home/cis90/frocar/bin/myscript
-rwxrwxr-x. 1 hendaj90 cis90 752 Nov 17 12:07 /home/cis90/hendaj/bin/myscript
-rwxrwxr-x. 1 kanbry90 cis90 510 Nov 14 14:24 /home/cis90/kanbry/bin/myscript
-rw-rw-r--. 1 kenrit90 cis90 481 Nov 14 22:35 /home/cis90/kenrit/bin/myscript
-rwxrwxr-x. 1 libkel90 cis90 587 Nov 14 14:21 /home/cis90/libkel/bin/myscript
-rwxrwxrwx. 1 lyoben90 cis90 508 Nov 17 11:33 /home/cis90/lyoben/bin/myscript
-rwxr-xr-x. 1 marray90 cis90 1711 Nov 15 00:33 /home/cis90/marray/bin/myscript
-rwxr-x--x. 1 milhom90 cis90 615 Nov 14 14:23 /home/cis90/milhom/bin/myscript
-rwxrwxr-x. 1 noreva90 cis90 551 Nov 14 14:21 /home/cis90/noreva/bin/myscript
-rwxr-x---. 1 simben90 cis90 10489 Nov 10 15:23 /home/cis90/simben/bin/myscript
-rwxrwxr-x. 1 verevi90 cis90 594 Nov 14 14:36 /home/cis90/verevi/bin/myscript
[rsimms@oslab bin]$
```

*Which myscrip files can only be edited by their owner? Which ones could be edited by anyone in the CIS 90 class? Which ones could be edited by anyone on Opus?*

# Overall

```

rsimms@oslab:/home/cis90/bin
[rsimms@oslab bin]$ ./checkmyscripts
Sean ==> -rwxr-xr-x. 1 calsea90 cis90 560 Nov 14 14:25 calsea/bin/myscript
Don ==> -rwxrwxr-x. 1 davdon90 cis90 510 Nov 14 14:28 davdon/bin/myscript
Carlile ==> ls: cannot access ellcar/bin/myscript: No such file or directory
Andrew ==> -rwxrwxr-x. 1 evaand90 cis90 518 Nov 14 14:25 evaand/bin/myscript
Shahram ==> -rwxrwxr-x. 1 farsha90 cis90 551 Nov 14 14:25 farsha/bin/myscript
Carter ==> -rwxrwxr-x. 1 frocar90 cis90 557 Nov 14 14:23 frocar/bin/myscript
Sean ==> ls: cannot access fyosea/bin/myscript: No such file or directory
Dajan ==> -rwxrwxr-x. 1 hendaj90 cis90 752 Nov 17 12:07 hendaj/bin/myscript
Bryn ==> -rwxrwxr-x. 1 kanbry90 cis90 510 Nov 14 14:24 kanbry/bin/myscript
Rita ==> -rw-rw-r--. 1 kenrit90 cis90 481 Nov 14 22:35 kenrit/bin/myscript
Kelly ==> -rwxrwxr-x. 1 libkel90 cis90 587 Nov 14 14:21 libkel/bin/myscript
Ben ==> -rwxrwxrwx. 1 lyoben90 cis90 508 Nov 17 11:33 lyoben/bin/myscript
Ray ==> -rwxr-xr-x. 1 marray90 cis90 1711 Nov 15 00:33 marray/bin/myscript
Chad ==> ls: cannot access mescha/bin/myscript: No such file or directory
Michael ==> ls: cannot access mesmic/bin/myscript: No such file or directory
Homer ==> -rwxr-x--x. 1 milhom90 cis90 615 Nov 14 14:23 milhom/bin/myscript
Evan ==> -rwxrwxr-x. 1 noreva90 cis90 551 Nov 14 14:21 noreva/bin/myscript
Josh ==> ls: cannot access potjos/bin/myscript: No such file or directory
Carlos ==> ls: cannot access ramcar/bin/myscript: Permission denied
Gustavo ==> ls: cannot access rangus/bin/myscript: No such file or directory
Jessica ==> ls: cannot access rawjes/bin/myscript: No such file or directory
Duke ==> ls: cannot access rodduk/bin/myscript: No such file or directory
Benji ==> -rwxr-x---. 1 simben90 cis90 10489 Nov 10 15:23 simben/bin/myscript
Evie ==> -rwxrwxr-x. 1 verevi90 cis90 594 Nov 14 14:36 verevi/bin/myscript
Jacob ==> ls: cannot access wiljac/bin/myscript: No such file or directory
Humberto ==> ls: cannot access zamhum/bin/myscript: Permission denied
[rsimms@oslab bin]$

```

*Which myscript files cannot be run by the class?*

## Class Activity

Note: One of the requirements for the final project is setting permissions on your script so that all cis90 members can run it.

To meet this requirement use:

```
cd bin  
chmod 750 myscript  
ls -l myscript
```

umask

again!

# Permissions

## Why can other classmates write to my scripts?

### *Before Lab 10*

```
/home/cis90/rodduk/bin $ umask
0002
/home/cis90/rodduk/bin $ rm newscript; touch newscript
/home/cis90/rodduk/bin $ ls -l newscript
-rw-rw-r-- 1 rodduk cis90 0 Nov 23 16:17 newscript
/home/cis90/rodduk/bin $ chmod +x newscript
/home/cis90/rodduk/bin $ ls -l newscript
-rwxrwxr-x 1 rodduk cis90 0 Nov 23 16:17 newscript
```

### *After Lab 10*

```
/home/cis90ol/simmsben $ umask
0006
/home/cis90ol/simmsben $ rm newscript; touch newscript
/home/cis90ol/simmsben $ ls -l newscript
-rw-rw---- 1 simmsben cis90ol 0 May 12 08:44 newscript
/home/cis90ol/simmsben $ chmod +x newscript
/home/cis90ol/simmsben $ ls -l newscript
-rwxrwx--x 1 simmsben cis90ol 0 May 12 08:44 newscript
```

*Because your umask setting gives group members write permission on any new files you create!*

# Permissions

```
[rodduk90@opus bin]$ cat /home/cis90/rodduk/.bash_profile
```

```
# .bash_profile
```

```
# Get the aliases and functions
```

```
if [ -f ~/.bashrc ]; then
```

```
    . ~/.bashrc
```

```
fi
```

```
# User specific environment and startup programs
```

```
PATH=$PATH:$HOME/../../bin:$HOME/bin:..
```

```
BASH_ENV=$HOME/.bashrc
```

```
USERNAME=""
```

```
PS1='$PWD $ '
```

```
export USERNAME BASH_ENV PATH
```

```
umask 002
```

```
set -o ignoreeof
```

```
stty susp
```

```
eval `tset -s -m vt100:vt100 -m :\?${TERM:-ansi} -r -Q `
```

*Note your umask is defined in .bash\_profile which runs every time you login. In lab 10 your change this setting to 006.*



## Class Activity

- Change your umask to 026
- Can group or other users modify your new files now?
- Try it, **touch** a new file and check the permissions with **ls -l**
- How would you make this a permanent umask setting?



# Scripting Tips

date

## Utilizing the date command

The date command prints the current date and time

```
/home/cis90/simben $ date
Tue Nov 20 15:54:13 PST 2012
```

The **\$** metacharacter provides the “value” of both variables, e.g. \$PS1 or commands, e.g. **\$(*command*)**:

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

```
/home/cis90/simben $ echo $(grep love poems/Shakespeare/* | wc -l)
11
```

```
/home/cis90/simben $ myname=$(grep $LOGNAME /etc/passwd | cut -f5 -d":")
/home/cis90/simben $ echo $myname
Benji Simms
```

# Utilizing the date command

```
/home/cis90/simben $ date  
Wed Nov 26 15:35:53 PST 2008
```

```
/home/cis90/simben $ date +%r  
04:14:26 PM  
/home/cis90/simben $ time=$(date +%r)  
/home/cis90/simben $ echo "At the tone the time will be $time"  
At the tone the time will be 04:15:02 PM
```

```
/home/cis90/simben $ date +%A  
Tuesday  
/home/cis90/simben $ day=$(date +%A)  
/home/cis90/simben $ echo "Today is $day"  
Today is Tuesday
```

*See the man page on date for lots of other % codes*

## Class Activity

Your turn, make a script by adding the following two lines to a file named *mydate* using the vi editor:

```
echo "Hola $LOGNAME"  
echo Today is $(date +%m/%d/%Y)
```

Give the script execute permissions and run it:

```
/home/cis90/simben $ chmod +x mydate  
/home/cis90/simben $ mydate  
Hola simben90  
Today is 11/20/2012
```



# tips on script names

# Don't name your scripts "script"

```
[simben90@opus bin]$ ls -l script  
-rwxr-x--- 1 simben90 cis90 47 Nov 23 16:44 script
```

```
[simben90@opus bin]$ cat script  
echo "Hello from the script file named script"
```

*What would happen if you ran the script above?*

# Don't name your scripts "script"

```
[simben90@opus bin]$ cat script
echo "Hello from the script file named script"
```



```
[simben90@opus bin]$ script
Script started, file is typescript
```



*Why the heck  
doesn't my script  
do what it's  
supposed to do?*

```
[simben90@opus bin]$ Where is my script?
bash: Where: command not found
[simben90@opus bin]$ exit
Script done, file is typescript
[simben90@opus bin]$ cat typescript
Script started on Wed 13 May 2009 08:00:02 AM PDT
[simben90@opus bin]$ Where is my script?
bash: Where: command not found
[simben90@opus bin]$ exit
```

```
Script done on Wed 13 May 2009 08:00:47 AM PDT
[simben90@opus bin]$
```

# Don't name your scripts "script"

*Why doesn't script do what it is supposed to do? ... because script is the name of an existing UNIX command!*

```
[simben90@opus bin]$ man script
```

```
[simben90@opus bin]$
```

The screenshot shows a terminal window titled "roddyduk@opus:~/bin" displaying the manual page for the 'script' command. The window title bar includes standard Linux window controls (minimize, maximize, close) and the window title. The terminal content is as follows:

```
SCRIPT (1) BSD General Commands Manual SCRIPT (1)
NAME
    script - make typescript of terminal session
SYNOPSIS
    script [-a] [-c COMMAND] [-f] [-q] [-t] [file]
DESCRIPTION
    Script makes a typescript of everything printed on your terminal. It is
    useful for students who need a hardcopy record of an interactive session
    as proof of an assignment, as the typescript file can be printed out
    later with lpr(1).

    If the argument file is given, script saves all dialogue in file. If no
    file name is given, the typescript is saved in the file typescript.

Options:

    -a      Append the output to file or typescript, retaining the prior con-
            tents.

    -c COMMAND
            Run the COMMAND rather than an interactive shell. This makes it
            easy for a script to capture the output of a program that behaves
            differently when its stdout is not a tty.
```

# Don't name your scripts "script"

*There are (at least) two files named script on Opus*

```
[simben90@opus bin]$ type script
script is hashed (/usr/bin/script)
[simben90@opus bin]$ file /usr/bin/script
/usr/bin/script: ELF 32-bit LSB executable, Intel 80386, version 1
(SYSV), for GNU/Linux 2.6.9, dynamically linked (uses shared libs),
for GNU/Linux 2.6.9, stripped
```

```
[simben90@opus bin]$ type /home/cis90/simben/bin/script
/home/cis90/simben/bin/script is /home/cis90/simben/bin/script
[simben90@opus bin]$ file /home/cis90/simben/bin/script
/home/cis90/simben/bin/script: ASCII text
[simben90@opus bin]$
```

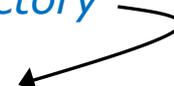
**Question:** *Why did bash run the script in /usr/bin instead of the script in /home/cis90/simben/bin?*

# Don't name your scripts "script"

**Question:** Why did bash run the script in `/usr/bin` instead of the script in `/home/cis90/simben/bin`?

```
[simben90@opus bin]$ echo $PATH  
/usr/kerberos/bin:/usr/local/bin:/bin:/usr/bin:/home/cis90/bin:  
/home/cis90/simben/bin:.
```

The Linux **script** command is in this directory



Our script, named **script**, is in this directory



**Answer:** bash searches the path in the order the directories are listed. It finds the script command in `/usr/bin` first.

# Don't name your scripts "script"

*To override the PATH you can always specify an absolute pathname to the file you want to run:*

```
[simben90@opus bin]$ /home/cis90/simben/bin/script  
Hello from the script file named script
```

```
[simben90@opus bin]$ ./script  
Hello from the script file named script
```

*Note the shell treats the . above as "here" which in this case is /home/cis90/simben/bin*

## Try the script command

- Use the **script** command to start recording
- Type various commands of your choice
- Type **exit** or hit **Ctrl-D** to end recording
- Use **cat typescript** to see what you recorded

*This would be a good way to record a session such as working one of the lab assignments for future reference.*

# Review

```
function runningScript ()  
{
```

## The rules of the road for variables

- Rule 1: A child process can only see variables the parent has exported.
- Rule 2: A child process cannot change the parent's variables.

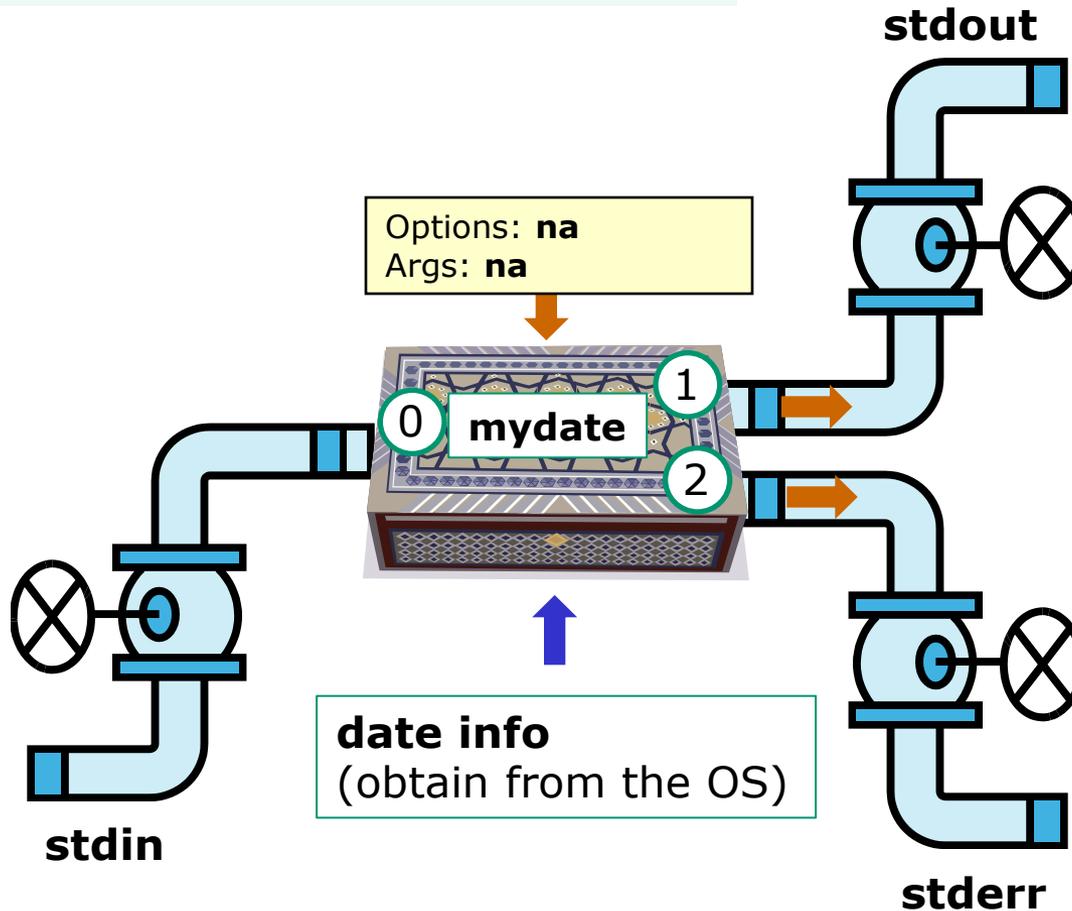
## Running a Script

```
/home/cis90/simben $ cat mydate  
#!/bin/bash  
echo "Hola $LOGNAME"  
date +%m/%d/%Y'  
echo $myvar1 $myvar2 $myvar3
```

*Add this line to  
the last script we  
made*

# Running a Script

```
$ mydate
```



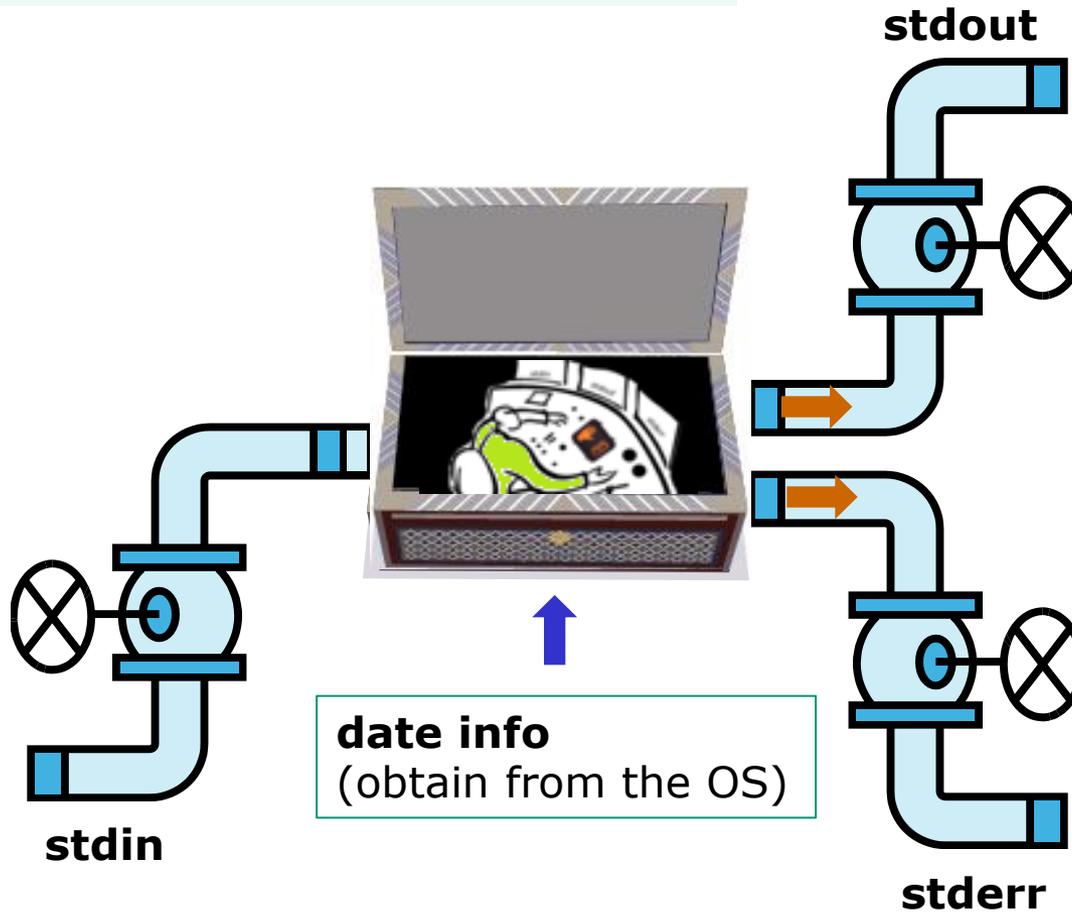
```
Hola simben90  
05/09/2012
```

*In this example, output from **myscript** goes to **stdout**.*

***stdout** has not been redirected so it goes to the default terminal device (your screen).*

# Running a Script

```
$ mydate
```

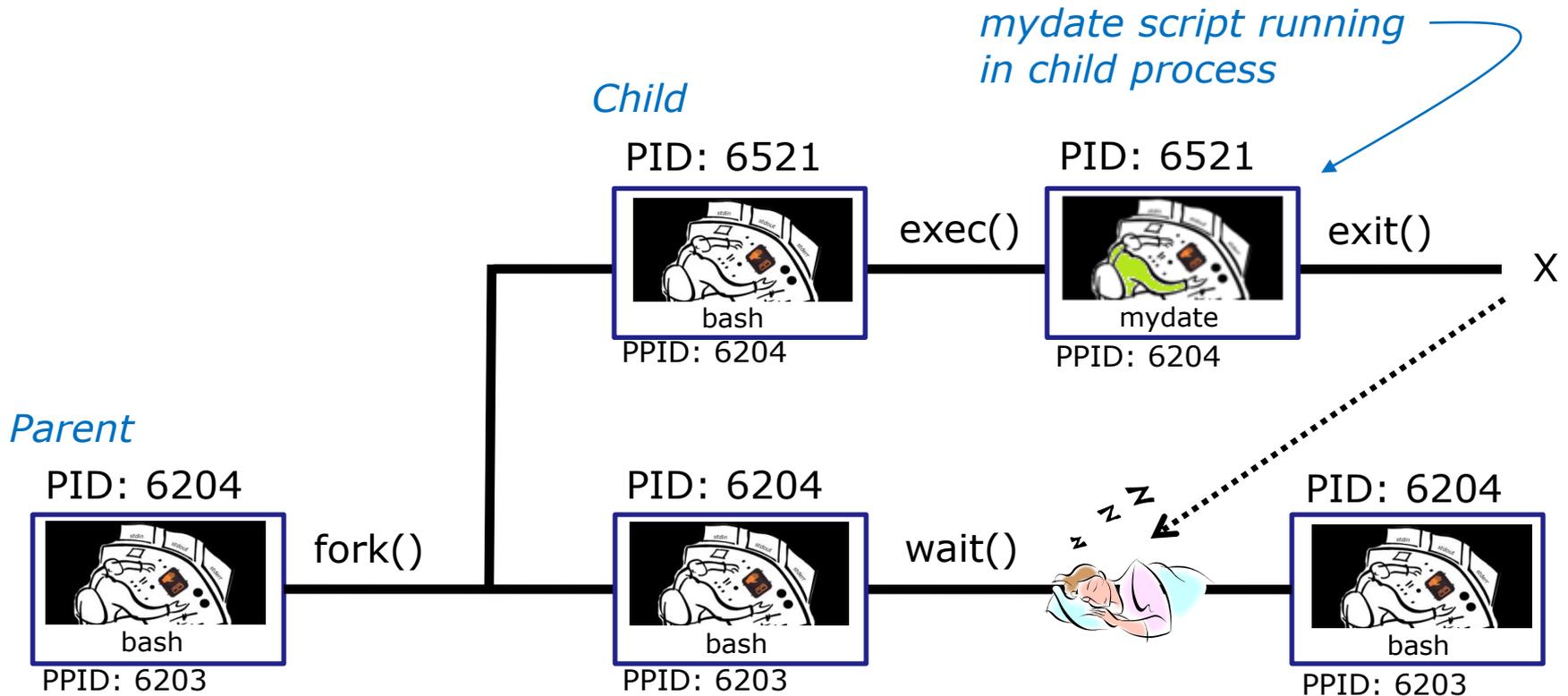


```
Hola simben90  
05/09/2012
```

*A sneak peek into memory to see what our process looks like!*



# Running a Script



Whenever you run any command, program, or script it runs as a **child process**

## Running a Script

```
/home/cis90/simben $ cat mydate
#!/bin/bash
echo "Hola $LOGNAME"
date +%m/%d/%Y'
echo $myvar1 $myvar2 $myvar3
```

*In the parent process, initialize the three variables*

```
/home/cis90/simben $ myvar1=Tic; myvar2=Tac; myvar3=Toe
/home/cis90/simben $ echo $myvar1 $myvar2 $myvar3
Tic Tac Toe
```

*What happens if we run **mydate** now?*

## Running a Script

```
/home/cis90/simben $ cat mydate  
#!/bin/bash  
echo "Hola $LOGNAME"  
date +%m/%d/%Y'  
echo $myvar1 $myvar2 $myvar3
```

```
/home/cis90/simben $ myvar1=Tic; myvar2=Tac; myvar3=Toe  
/home/cis90/simben $ echo $myvar1 $myvar2 $myvar3  
Tic Tac Toe
```

```
/home/cis90/simben $ mydate  
Hola simben90  
05/09/2012
```

*Running **mydate**  
(as a child process)*

```
/home/cis90/simben $
```

***Why no Tic Tac Toe output?***

## Running a Script

```
/home/cis90/simben $ export myvar1  
/home/cis90/simben $ mydate  
Hola simben90  
05/09/2012  
Tic
```

*Rule 1: A child process can only see variables the parent has exported*

```
/home/cis90/simben $ export myvar2  
/home/cis90/simben $ mydate  
Hola simben90  
05/09/2012  
Tic Tac
```

```
/home/cis90/simben $ export myvar3  
/home/cis90/simben $ mydate  
Hola simben90  
05/09/2012  
Tic Tac Toe
```

## Running a Script

```
/home/cis90/simben $ echo $myvar1 $myvar2 $myvar3  
Tic Tac Toe
```

```
/home/cis90/simben $ cat mydate
```

```
#!/bin/bash
```

```
echo "Hola $LOGNAME"
```

```
date +%m/%d/%Y'
```

```
echo $myvar1 $myvar2 $myvar3
```

```
myvar1=red myvar2=white myvar3=blue
```

```
echo $myvar1 $myvar2 $myvar3
```

*Add these  
new lines*

```
/home/cis90/simben $ mydate
```

```
Hola simben90
```

```
05/09/2012
```

```
Tic Tac Toe
```

```
red white blue
```

*Rule 2: A child process  
cannot change the  
parent's variables.*

```
/home/cis90/simben $ echo $myvar1 $myvar2 $myvar3
```

```
Tic Tac Toe
```

## Running a Script

*Unless we want them to*

```
/home/cis90/simben $ echo $myvar1 $myvar2 $myvar3  
Tic Tac Toe
```

```
/home/cis90/simben $ source mydate  
Hola simben90  
05/09/2012  
Tic Tac Toe  
red white blue
```

*Sourcing a script causes the instructions to be run in the parent process. A child process is not created*

```
/home/cis90/simben $ echo $myvar1 $myvar2 $myvar3  
red white blue
```



```
}  
while no-comprende  
do  
  runningScript  
done
```

# Printers

Sneak Peak for CIS 90 Students





Two predominate types of printers

- Thermal inkjet technology
- Laser, drum, toner technology



So many ways to hook them up ...

Now:

- Network
- USB
- Wireless (Bluetooth, IR)



Back then:

- Serial cable
- Parallel printer cable



# Printer Configuration

# CUPS

Example printer configuration



Printer: HP LaserJet 1320n  
Connection: LAN

# CUPS



*The LaserJets have a web-based management utility*

The screenshot shows a web browser window displaying the HP LaserJet 1320 series management utility. The browser address bar shows the IP address 172.30.1.14. The page has a blue header with the HP logo and the text "hp LaserJet 1320 series". Below the header, there are tabs for "Information", "Settings", and "Networking". The "Information" tab is selected, showing a "Device Status" section with a "Status: Ready" indicator and buttons for "Refresh Status", "Enter", and "Cancel Job". Below this is a "Supplies" section showing "Toner: (% Remaining)" and "Black Cartridge 97%" with a progress bar. At the bottom, there is a "Product Information" section with a table of device details.

| Product Information    |                         |
|------------------------|-------------------------|
| Product Name:          | hp LaserJet 1320 series |
| Formatter Number:      | JH03T2Z                 |
| Product Serial Number: | CNHC6360LV              |
| Service ID:            | 16101                   |
| Firmware Datecode:     | 20041024                |
| Total Memory:          | 16 MBytes               |

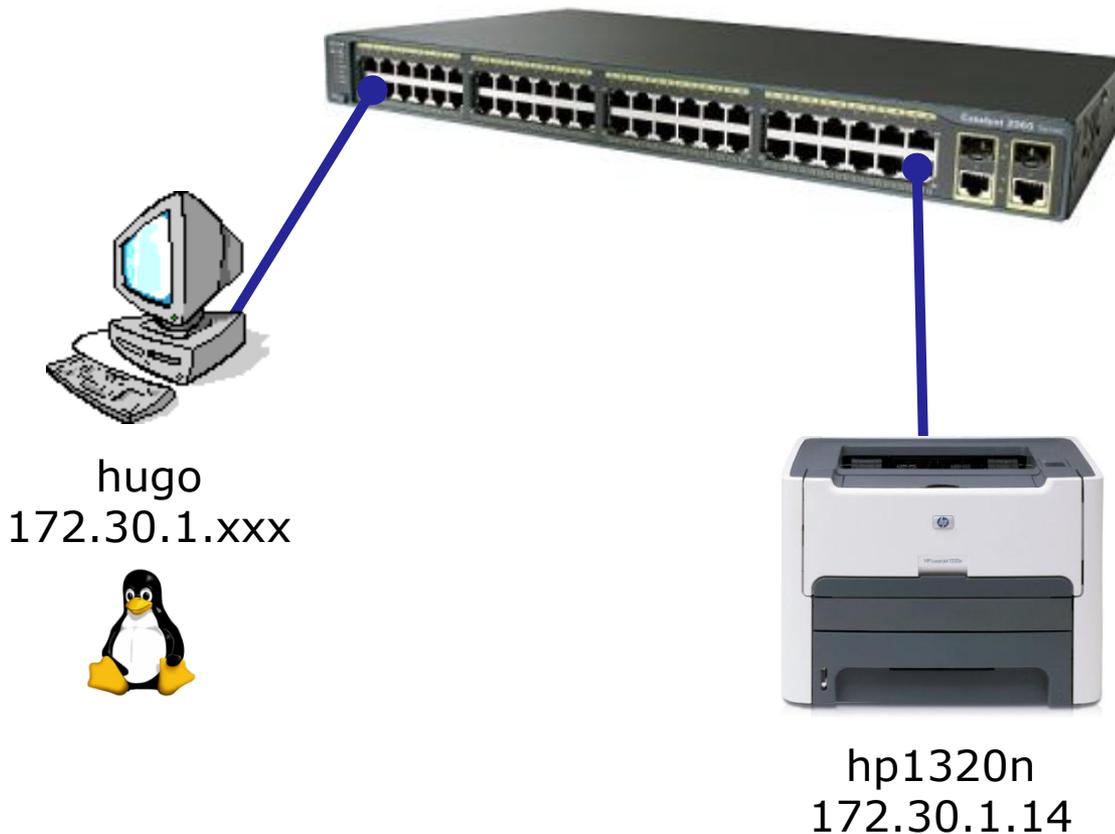
*IP Address for this 1320n  
is 172.30.1.14*



# CUPS

# CUPS

*This example will show how to add the HP 1320n as a networked printer.*



# CUPS



The image shows a terminal window titled "Hugo [Running] - Oracle VM VirtualBox". The terminal output shows the following commands and results:

```
rsimms@hugo:~$ ps -l
F S  UID  PID  PPID  C  PRI  NI ADDR  SZ  WCHAN  TTY          TIME CMD
0 S  1000  1797  1787  2  80   0  -  1777 wait   pts/0    00:00:00 bash
0 R  1000  1856  1797  0  80   0  -  1172 -      pts/0    00:00:00 ps
rsimms@hugo:~$ ps -ef | grep cups
root      674    1  0  20:24 ?        00:00:00 /usr/sbin/cupsd -F
rsimms   1878  1797  0  20:26 pts/0    00:00:00 grep  --color=auto cups
rsimms@hugo:~$ firefox localhost:631 &
```

A white box with a black border is overlaid on the terminal, containing the following text:

*Access the CUPS service using a web browser with*

```
rsimms@hugo:~$ firefox localhost:631 &
```

Hugo [Running] - Oracle VM VirtualBox

Machine View Devices Help

File Edit View History Bookmarks Tools Help

Home - CUPS 1.5.2

localhost:631

Google

Home Administration Classes Online Help Jobs Printers Search Help

## CUPS 1.5.2

CUPS is the standards-based, open source printing system developed by [Apple Inc.](#) for Mac OS® X and other UNIX®-like operating systems.



### CUPS for Users

- [Overview of CUPS](#)
- [Command-Line Printing and Options](#)
- [What's New in CUPS 1.5](#)
- [User Forum](#)

### CUPS for Administrators

- [Adding Printers and Classes](#)
- [Managing Operation Policies](#)
- [Printer Accounting Basics](#)
- [Server Security](#)
- [Using Kerberos Authentication](#)
- [Using Network Printers](#)
- [cupsd.conf Reference](#)
- [Find Printer Drivers](#)

### CUPS for Developers

- [Introduction to CUPS Programming](#)
- [CUPS API](#)
- [Filter and Backend Programming](#)
- [HTTP and IPP APIs](#)
- [PPD API](#)
- [Raster API](#)
- [PPD Compiler Driver Information File Reference](#)
- [Developer Forum](#)

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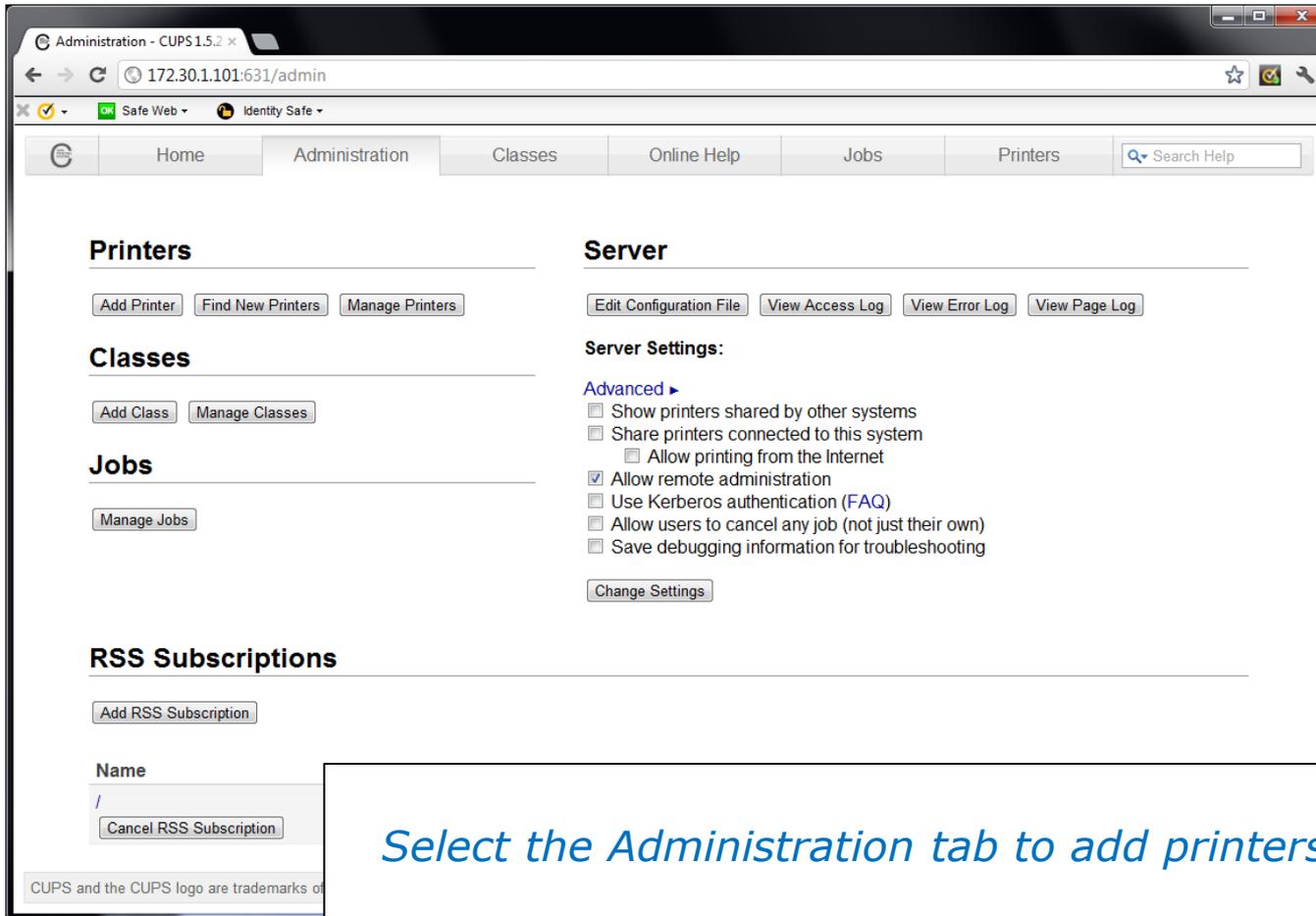


The screenshot shows a web browser window with the address bar displaying "172.30.1.101:631". The page title is "Home - CUPS 1.5.2". The navigation menu includes "Home", "Administration", "Classes", "Online Help", "Jobs", and "Printers", along with a "Search Help" field. The main content area features the heading "CUPS 1.5.2" and a description: "CUPS is the standards-based, open source printing system developed by Apple Inc. for Mac OS® X and other UNIX®-like operating systems." To the right is the "UNIX PRINTING SYSTEM" logo. Below this, there are three columns of links:

- CUPS for Users**
  - [Overview of CUPS](#)
  - [Command-Line Printing and Options](#)
  - [What's New in CUPS 1.5](#)
  - [User Forum](#)
- CUPS for Administrators**
  - [Adding Printers and Classes](#)
  - [Managing Operation Policies](#)
  - [Printer Accounting Basics](#)
  - [Server Security](#)
  - [Using Kerberos Authentication](#)
  - [Using Network Printers](#)
  - [cupsd.conf Reference](#)
  - [Find Printer Drivers](#)
- CUPS for Developers**
  - [Introduction to CUPS Programming](#)
  - [CUPS API](#)
  - [Filter and Backend Programming](#)
  - [HTTP and IPP APIs](#)
  - [PPD API](#)
  - [Raster API](#)
  - [PPD Compiler Driver Information File Reference](#)
  - [Developer Forum](#)

At the bottom left of the browser window, a small text reads: "CUPS and the CUPS logo are trademarks of Apple Inc., registered in the U.S. and other countries." A text box at the bottom of the screenshot contains the text: "Access the CUPS service remotely using a web browser on a different system".

*Access the CUPS service remotely using a web browser on a different system*



The screenshot shows a web browser window titled "Administration - CUPS 1.5.2" with the URL "172.30.1.101:631/admin". The browser's address bar shows "172.30.1.101:631/admin". The page has a navigation menu with tabs: Home, Administration, Classes, Online Help, Jobs, and Printers. A search box labeled "Search Help" is located to the right of the tabs. The main content area is divided into several sections:

- Printers:** Contains buttons for "Add Printer", "Find New Printers", and "Manage Printers".
- Classes:** Contains buttons for "Add Class" and "Manage Classes".
- Jobs:** Contains a button for "Manage Jobs".
- RSS Subscriptions:** Contains a button for "Add RSS Subscription". Below this is a form with a "Name" field containing a single slash "/" and a "Cancel RSS Subscription" button.
- Server:** Contains buttons for "Edit Configuration File", "View Access Log", "View Error Log", and "View Page Log".
- Server Settings:** Includes a section for "Advanced" settings with the following options:
  - Show printers shared by other systems
  - Share printers connected to this system
    - Allow printing from the Internet
  - Allow remote administration
  - Use Kerberos authentication (FAQ)
  - Allow users to cancel any job (not just their own)
  - Save debugging information for troubleshootingA "Change Settings" button is located below these options.

At the bottom left of the browser window, there is a small footer: "CUPS and the CUPS logo are trademarks of".

*Select the Administration tab to add printers*



The screenshot shows the CUPS 1.5.2 administration web interface. The browser address bar shows `https://172.30.1.101:631/admin/`. The interface has a navigation menu with "Home", "Administration", "Classes", "Online Help", "Jobs", and "Printers". The main content area is divided into sections: "Printers" (with "Add Printer", "Find New Printers", "Manage Printers" buttons), "Classes" (with "Add Class", "Manage Classes" buttons), "Jobs" (with "Manage Jobs" button), and "RSS Subscriptions" (with "Add RSS Subscription" button). A "Server Settings:" section is partially visible. An "Authentication Required" dialog box is overlaid on the interface, containing the message: "The server 172.30.1.101:631 requires a username and password. The server says: CUPS." Below the message are input fields for "User Name:" (containing "rsimms") and "Password:" (containing "\*\*\*\*\*"). At the bottom of the dialog are "Log In" and "Cancel" buttons.

*Must authenticate to add new printer*



The screenshot shows a web browser window titled "Add Printer - CUPS 1.5.2" with the URL <https://172.30.1.101:631/admin/>. The browser's address bar shows "Safe Web" and "Identity Safe" indicators. The page has a navigation menu with "Home", "Administration", "Classes", "Online Help", "Jobs", and "Printers", along with a "Search Help" field. The main content area is titled "Add Printer" and lists three categories of printers:

- Local Printers:**
  - HP Printer (HPLIP)
  - HP Fax (HPLIP)
- Discovered Network Printers:**
  - hp LaserJet 1320 series (9C595F) (hp hp LaserJet 1320 series)
  - hp LaserJet 1320 series (9C595F) (hp hp LaserJet 1320 series)
- Other Network Printers:**
  - Backend Error Handler
  - LPD/LPR Host or Printer
  - Internet Printing Protocol (https)
  - Internet Printing Protocol (ipp)
  - Internet Printing Protocol (ipp)
  - AppSocket/HP JetDirect
  - Internet Printing Protocol (http)
  - Windows Printer via SAMBA

A "Continue" button is located at the bottom of the list.

*Nice! CUPS service already discovered a printer on the network*



The screenshot shows a web browser window titled "Add Printer - CUPS 1.5.2" with the URL <https://172.30.1.101:631/admin>. The browser's address bar shows a security warning. The page has a navigation menu with "Home", "Administration", "Classes", "Online Help", "Jobs", and "Printers", along with a "Search Help" field. The main content area is titled "Add Printer" and contains the following fields:

- Name:**   
(May contain any printable characters except "/", "#", and space)
- Description:**   
(Human-readable description such as "HP LaserJet with Duplexer")
- Location:**   
(Human-readable location such as "Lab 1")
- Connection:** socket://172.30.1.14
- Sharing:**  Share This Printer

A "Continue" button is located below the sharing options.

*Customize printer description*

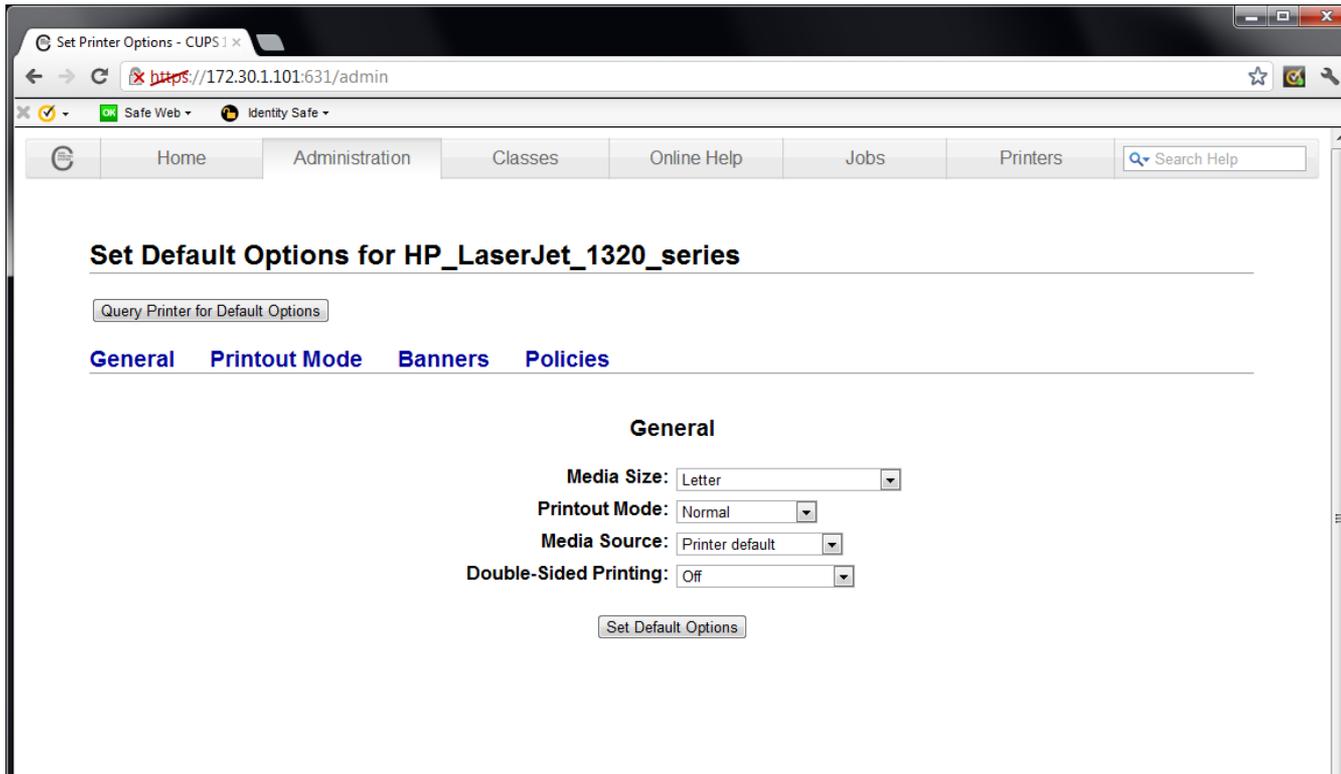


The screenshot shows a web browser window titled "Add Printer - CUPS1.5.2" with the URL <https://172.30.1.101:631/admin>. The browser's address bar shows "https://172.30.1.101:631/admin" and the page content includes a navigation menu with "Home", "Administration", "Classes", "Online Help", "Jobs", and "Printers". A search bar labeled "Search Help" is also present. The main content area is titled "Add Printer" and contains the following information:

- Name:** HP\_LaserJet\_1320\_series
- Description:** HP LaserJet 1320 series
- Location:** Family room
- Connection:** socket://172.30.1.14
- Sharing:** Do Not Share This Printer
- Make:** HP (with a dropdown menu showing "Select Another Make/Manufacturer")
- Model:** A list box containing several printer models, with "HP LaserJet 1320 Series hpjps pcl3, 3.12.2 (en)" selected.

Below the model list, there is a section "Or Provide a PPD File:" with a "Choose File" button (showing "No file chosen") and an "Add Printer" button.

*Select the printer driver*



The screenshot shows a web browser window titled "Set Printer Options - CUPS". The address bar shows "https://172.30.1.101:631/admin". The browser has tabs for "Safe Web" and "Identity Safe". The navigation menu includes "Home", "Administration", "Classes", "Online Help", "Jobs", and "Printers", along with a "Search Help" field. The main content area is titled "Set Default Options for HP\_LaserJet\_1320\_series" and contains a "Query Printer for Default Options" button. Below this are tabs for "General", "Printout Mode", "Banners", and "Policies". The "General" tab is active, showing settings for "Media Size" (Letter), "Printout Mode" (Normal), "Media Source" (Printer default), and "Double-Sided Printing" (Off). A "Set Default Options" button is located at the bottom of the settings area.

*Set default printing options for new printer*



The screenshot shows a web browser window with the address bar displaying `https://172.30.1.101:631/printers/HP_LaserJet_1320_series`. The browser's address bar also shows "Safe Web" and "Identity Safe" indicators. The page has a navigation menu with tabs for Home, Administration, Classes, Online Help, Jobs, and Printers. A search box labeled "Search Help" is located to the right of the Printers tab. The main content area features the heading "HP\_LaserJet\_1320\_series (Idle, Accepting Jobs, Not Shared)". Below this heading are two dropdown menus for "Maintenance" and "Administration". The page lists the following details: "Description: HP LaserJet 1320 series", "Location: Family room", "Driver: HP LaserJet 1320 Series hpijs pcl3, 3.12.2 (color, 2-sided printing)", "Connection: socket://172.30.1.14", and "Defaults: job-sheets=none, none media=na\_letter\_8.5x11in sides=one-sided". A "Jobs" section contains a search box labeled "Search in HP\_LaserJet\_1320\_series:" with "Search" and "Clear" buttons. Below the search box are two buttons: "Show Completed Jobs" and "Show All Jobs". The text "No jobs." is displayed in the center of the jobs section.

*Ready to roll!*



The screenshot shows a web browser window with the URL `https://172.30.1.101:631/printers/HP_LaserJet_1320_series`. The browser's address bar shows "Safe Web" and "Identity Safe" indicators. The page has a navigation menu with tabs for Home, Administration, Classes, Online Help, Jobs, and Printers. The main content area is titled "HP\_LaserJet\_1320\_series (Processing, Accepting Jobs, Not Shared)". Below the title are two dropdown menus for "Maintenance" and "Administration". The page lists printer details: "Description: HP LaserJet 1320 series", "Location: Family room", "Driver: HP LaserJet 1320 Series hpijs pcl3, 3.12.2 (color, 2-sided printing)", "Connection: socket://172.30.1.14", and "Defaults: job-sheets=none, none media=na\_letter\_8.5x11in sides=one-sided". A "Jobs" section contains a search bar for "HP\_LaserJet\_1320\_series" with "Search" and "Clear" buttons, and two buttons: "Show Completed Jobs" and "Show All Jobs". Below this, it says "Showing 1 of 1 active job." A table lists the active job with columns for ID, Name, User, Size, Pages, State, and Control. The table has one row: ID "HP\_LaserJet\_1320\_series-1", Name "Unknown", User "Withheld", Size "1k", Pages "Unknown", State "processing since", and Control buttons "Cancel Job" and "Move Job".

**HP\_LaserJet\_1320\_series (Processing, Accepting Jobs, Not Shared)**

Maintenance Administration

**Description:** HP LaserJet 1320 series  
**Location:** Family room  
**Driver:** HP LaserJet 1320 Series hpijs pcl3, 3.12.2 (color, 2-sided printing)  
**Connection:** socket://172.30.1.14  
**Defaults:** job-sheets=none, none media=na\_letter\_8.5x11in sides=one-sided

**Jobs**

Search in HP\_LaserJet\_1320\_series: Search Clear

Show Completed Jobs Show All Jobs

Showing 1 of 1 active job.

| ID                        | Name    | User     | Size | Pages   | State            | Control             |
|---------------------------|---------|----------|------|---------|------------------|---------------------|
| HP_LaserJet_1320_series-1 | Unknown | Withheld | 1k   | Unknown | processing since | Cancel Job Move Job |

*Printing a test page*



The screenshot shows a web browser window with the address bar displaying `https://172.30.1.101:631/printers/HP_LaserJet_1320_series`. The browser's address bar also shows "Safe Web" and "Identity Safe" indicators. The page has a navigation menu with tabs for Home, Administration, Classes, Online Help, Jobs, and Printers. A search box labeled "Search Help" is located to the right of the Printers tab. The main content area features the heading **HP\_LaserJet\_1320\_series (Idle, Accepting Jobs, Not Shared)**. Below this heading are two dropdown menus for "Maintenance" and "Administration". The page lists the following details: **Description:** HP LaserJet 1320 series, **Location:** Family room, **Driver:** HP LaserJet 1320 Series hpijs pcl3, 3.12.2 (color, 2-sided printing), **Connection:** socket://172.30.1.14, and **Defaults:** job-sheets=none, none media=na\_letter\_8.5x11in sides=one-sided. A section titled **Jobs** contains a search box labeled "Search in HP\_LaserJet\_1320\_series:" with "Search" and "Clear" buttons. Below the search box are two buttons: "Show Completed Jobs" and "Show All Jobs". The text "No jobs." is displayed in the center of the jobs section.

*Printed ... this printer is ready to go!*

# Printing in Linux

# Printing Commands

## **ATT System V based print subsystem**

- lp (to print)
- lpstat (queue management)
- cancel (to remove jobs)

## **BSD (Berkeley Software Distribution) based print subsystem**

- lpr (to print)
- lpq (queue management)
- lprm (to remove jobs)

## **CUPS**

- Provides both System V and Berkeley based command-line interfaces
- Supports new Internet Printing Protocol
- Works with Samba

*BSD is a branch of UNIX developed at the University of California, Berkeley*

# CUPS

## lpstat command

*Use **lpstat** to show spooled print jobs,  
available and default printers*

```
rsimms@hugo:~$ lpstat
```

```
rsimms@hugo:~$ lpstat -p
```

```
printer HP_LaserJet_1320_series is idle.  enabled since Tue 08 May  
2012 08:46:45 PM PDT
```

```
rsimms@hugo:~$ lpstat -p -d
```

```
printer HP_LaserJet_1320_series is idle.  enabled since Tue 08 May  
2012 08:46:45 PM PDT  
system default destination: HP_LaserJet_1320_series
```

*The **-p** option will show the available printers*

*The **-d** option will identify the default printer*

# CUPS

## lpstat command

### *On Opus*

```
/home/cis90/simben $ lpstat -p -d  
printer charlie disabled since Tue 26 Jan 2010 05:03:19 PM PST -  
    I don't really exist  
printer hplaser disabled since Tue 26 Jan 2010 04:58:14 PM PST -  
    Out of paper  
system default destination: charlie
```

*There are two "pretend" printers named charlie and hplaser on Opus*

# CUPS

## lp and lpr commands

*Use **lp** (or **lpr**) to print files*

```
/home/cis90/simben $ lp lab10  
request id is hplaser-5 (1 file(s))
```

```
/home/cis90/simben $ lp -d hplaser lab10  
request id is hplaser-6 (1 file(s))
```

*With **lp**, use the **-d** option to manually select a printer*

```
/home/cis90/simben $ lpr lab10
```

```
/home/cis90/simben $ lpr -P hplaser lab10
```

*With **lpr**, use the **-P** option to manually select a printer*

# CUPS

## lp and lpr commands

```
/home/cis90/simben $ echo "Print Me Quietly" | lpr -P hplaser  
/home/cis90/simben $
```

*Note that both lp and lpr will read from stdin.*

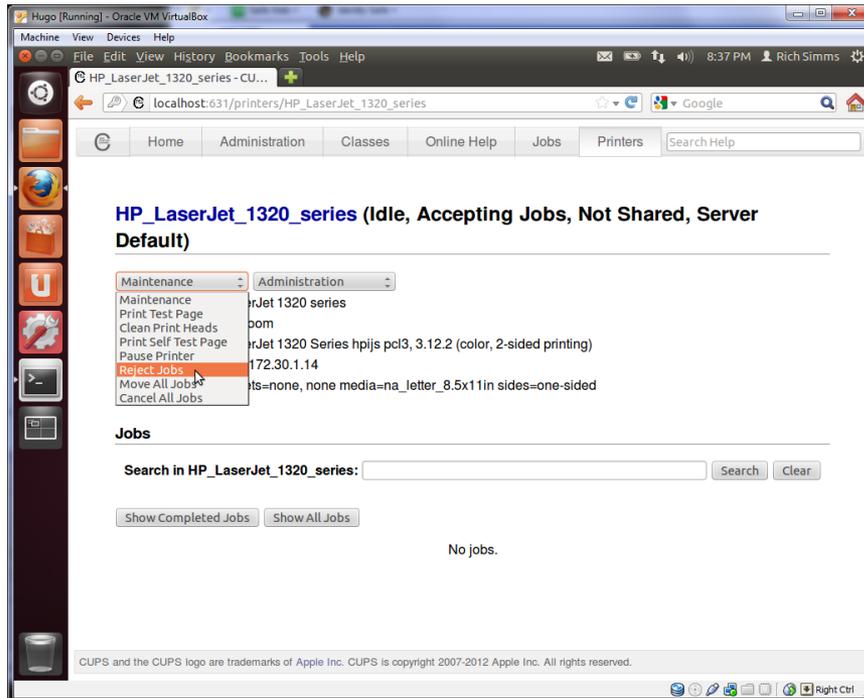
*This allows output from another command to be piped in*



# Managing Print Jobs

# CUPS

## Rejecting Jobs



*Clicking the **Reject Jobs** selection on the web based utility will reject further jobs*

```
[root@benji ~]# lp myfile
lp: Destination "hp7550" is not accepting jobs.
[root@benji ~]#
```

```
[root@benji ~]# lpr myfile
lpr: Destination "hp7550" is not accepting jobs.
[root@benji ~]#
```

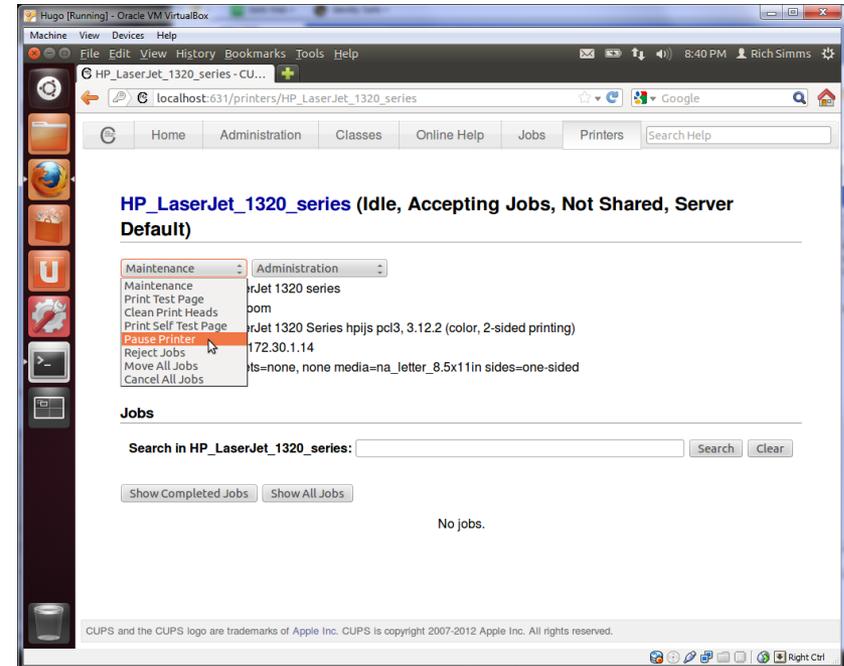
# CUPS

## Pausing the Printer

```
[root@benji ~]# lp myfile
request id is hp7550-22 (1 file(s))
```

```
[root@benji ~]# lpq
hp7550 is not ready
Rank      Owner    Job      File(s)
Total Size
1st       root    22      myfile
1024 bytes
```

```
[root@benji ~]# lpstat
hp7550-22          root
1024      Sat 15 Nov 2008 12:20:23 PM
PST
```



*Clicking the **Pause Printer** selection on the web based utility will still allow jobs to be spooled*



# CUPS

## Showing jobs waiting to print

```
[root@benji ~]# lpq
hp7550 is not ready
Rank   Owner   Job      File(s)
Total Size
1st    root    22      myfile
1024 bytes
2nd    root    23      myfile
1024 bytes
3rd    root    24      myfile
1024 bytes
4th    root    25      myfile
1024 bytes
```

*Use **lpq** or **lpstat** to show spooled print jobs*

```
[root@benji ~]# lpstat
hp7550-22          root          1024    Sat 15
Nov 2008 12:20:23 PM PST
hp7550-23          root          1024    Sat 15
Nov 2008 12:20:28 PM PST
hp7550-24          root          1024    Sat 15
Nov 2008 12:20:31 PM PST
hp7550-25          root          1024    Sat 15
Nov 2008 12:20:34 PM PST
```

# CUPS

## Removing/canceling pending print jobs

```
[root@benji ~]# lpq
hp7550 is not ready
Rank   Owner   Job    File(s)
Total Size
1st    root    22     myfile
1024 bytes
2nd    root    23     myfile
1024 bytes
3rd    root    24     myfile
1024 bytes
4th    root    25     myfile
1024 bytes
```

```
[root@benji ~]# cancel 22
[root@benji ~]# cancel 23
[root@benji ~]# lprm 24
[root@benji ~]# lprm 25
```

*Use **cancel** or **lprm**  
to remove print jobs*

```
[root@benji ~]# lpq
hp7550 is not ready
no entries
```

```
[root@benji ~]# lpstat
[root@benji ~]#
```



# Wrap up

Commands:

|              |                       |
|--------------|-----------------------|
| lp, lpr      | - Linux print command |
| cancel, lprm | - cancel print job    |
| lpq, lpstat  | - Show print queue    |

Web:

|                                                         |                                     |
|---------------------------------------------------------|-------------------------------------|
| <a href="http://hostname:631">http://hostname:631</a>   | - CUPS web based management utility |
| <a href="http://hostname:9100">http://hostname:9100</a> | - HP JetDirect printer              |



## Next Class

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

No Quiz

No Lab due

Work on final projects

Optional extra credit labs

## Final Project Workshop

- See if you can get one “starter” task scripted and working before leaving class today.
- Grade your starter script using the Final Project rubric

Implementing all five tasks (6 points each):

- Requirements for each task:
  - Minimum of 10 “original” script command lines
  - Has one or more non-generic comments to explain what it is doing
  - Has user interaction

You don't have to do all of these but do at least five:

- Redirecting stdin (5 points)
- Redirecting stdout (5 points)
- Redirecting stderr (5 points)
- Use of permissions (5 points)
- Use of filename expansion characters (5 points)
- Use of absolute path (5 points)
- Use of relative path (5 points)
- Use of a PID (5 points)
- Use of inodes (5 points)
- Use of links (5 points)
- Use of scheduling (5 points)
- Use of a GID or group (5 points)
- Use of a UID or user (5 points)
- Use of a /dev/tty device (5 points)
- Use of a signal (5 points)
- Use of piping (5 points)
- Use of an environment variable (5 points)
- Use of /bin/mail (5 points)
- Use of a conditional (5 points)

The maximum for this section is 25 points.



# Backup