Lesson Module Checklist

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

- Lab
- Surveys and PW sheet posted
- Youtube Videos uploaded

- Forum created
- Opus accounts made and populated
- Pod VMs created

- Rosters printed

- Backup slides, Confer links, handouts on flash drive

[ ] Has the phone bridge been added?

[ ] Is recording on?

[ ] Does the phone bridge have the mike?

[ ] Share slides, putties, Chrome and VLab

[ ] Disable spelling on PowerPoint

CIS 90 - Lesson 1

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


Justin, Garratt, Sean, Donald

Carlile, Carter, Dajan, Bryn, Rita, Kelly, Benjamin, Ray, Fidel, Michael

Evan, Efrain, Bjorn, Carlos P., Joshua, Gustavo, David, Jacob, Humberto, Gwyneth

Ryan, Timothy, Steven, Stacey, Sean, Hannah, Jose, Max, Kristen, Evie

Jessica, Chad, Andrew, Luis, Carlos R.

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

Student Learner Outcomes

Upon successful completion of this course students will be able to:

Navigate and manage the UNIX/Linux file system

Automate and schedule tasks

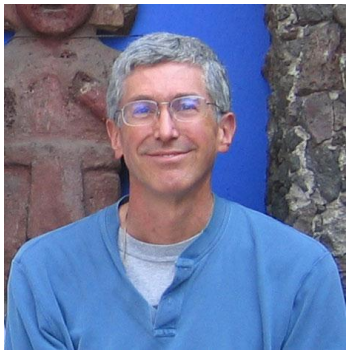
Customize the shell environment

.

Introductions

Introductions and Credits

Jim Griffin
- Jim created this Linux course
- Jim's site: http://cabrillo.edu/~jgriffin/



Rich Simms
- Worked at HP for 27+ years
- Started teaching this course in 2008 when Jim went on sabbatical
- Rich's site: http://simms-teach.com

And thanks to John Govsky for many teaching best practices: e.g. the First Minute quizzes, the online forum, and the point grading system

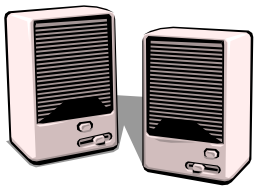
Class and Linux Overview

Objectives	Agenda
• Understand how this course works • Use Opus (SSH) • Use Pod VMs (SSH) • Use Graphical Desktops (VLab) • Use Virtual TTY terminals (VLab) • Learn first UNIX/Linux commands • Overview on UNIX/Linux	• Introductions • How this class works • Using Opus and VLab • Housekeeping • UNIX/Linux Market • Computers • Virtual Machines • UNIX/Linux Architecture • First Commands • Navigating Terminals • Lab 1 • Wrap up

Virtual Classroom with CCC Confer

- Enables remote students to attend class
- CCC = California Community Colleges
- Web conferencing tool + phone bridge (conference call)
- Each class is recorded and archived for viewing later
- Local students in the classroom can also use it for viewing slides, using the chat window, polls, and online emoticons.

- Listen using your computer's speakers/headset or with your phone using the dial-in number

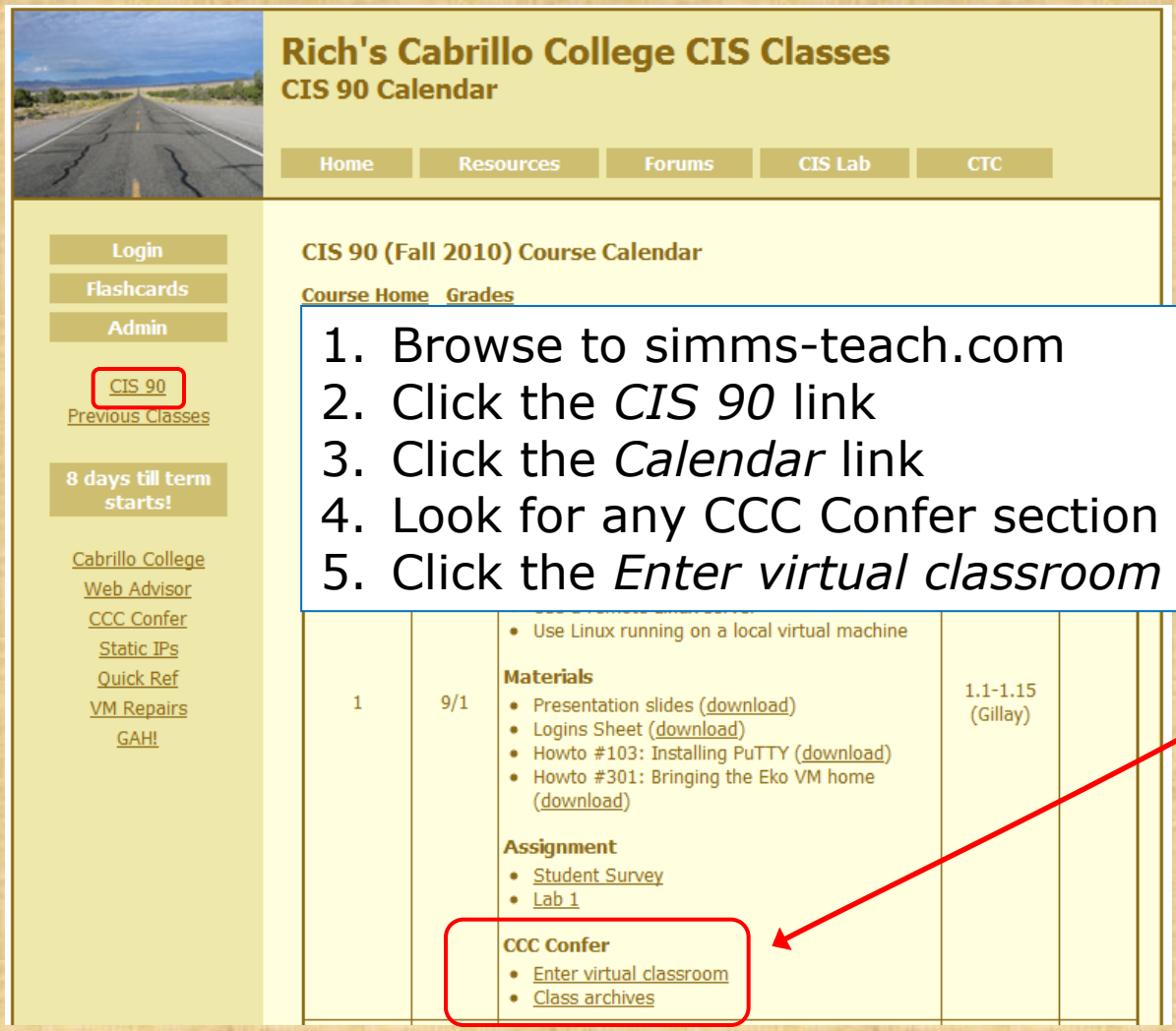


- Ask questions using the chat window or just speak if dialed in with your phone (or Skype)

Dialing in by phone (or Skype) is best because you can ask and answer questions by speaking rather than use a chat window

Class Activity

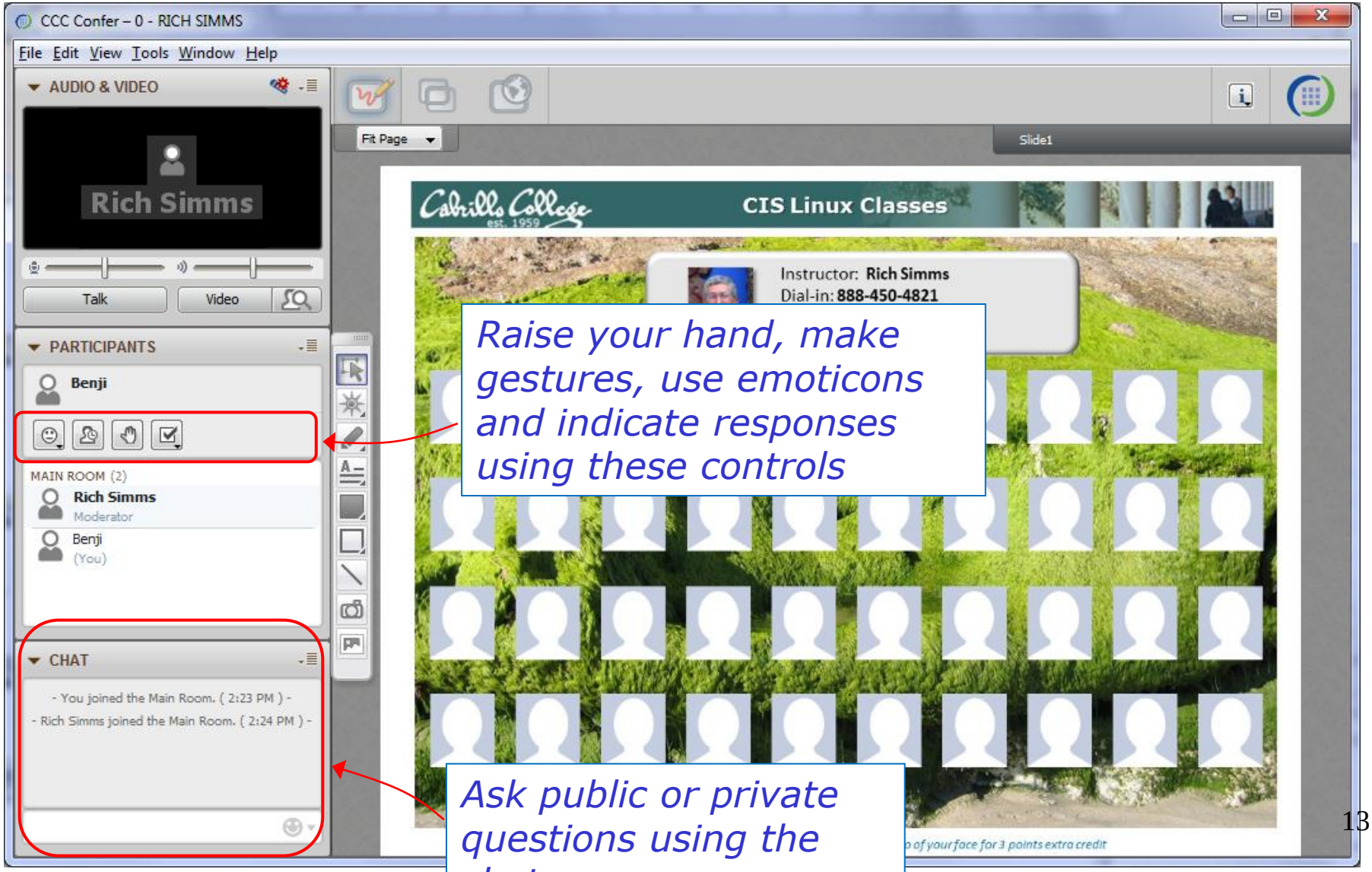
Enter the online virtual classroom



CCC Confer - Attending class online

CCC Confer uses Java which requires a download and installation of the Java Runtime Environment from java.com (Oracle)

CCC Confer - Attending class online

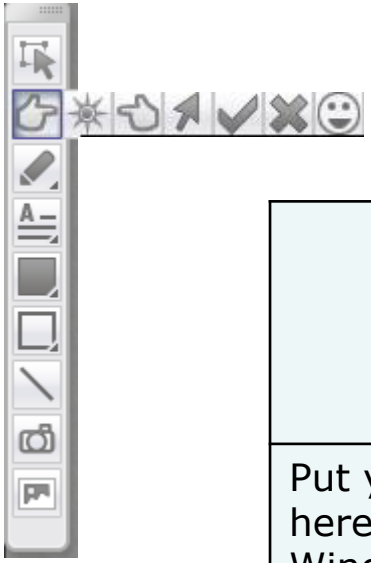


CCC Confer - Attending class online

When dialed in by phone you can use:

*0 Contact the operator for assistance.

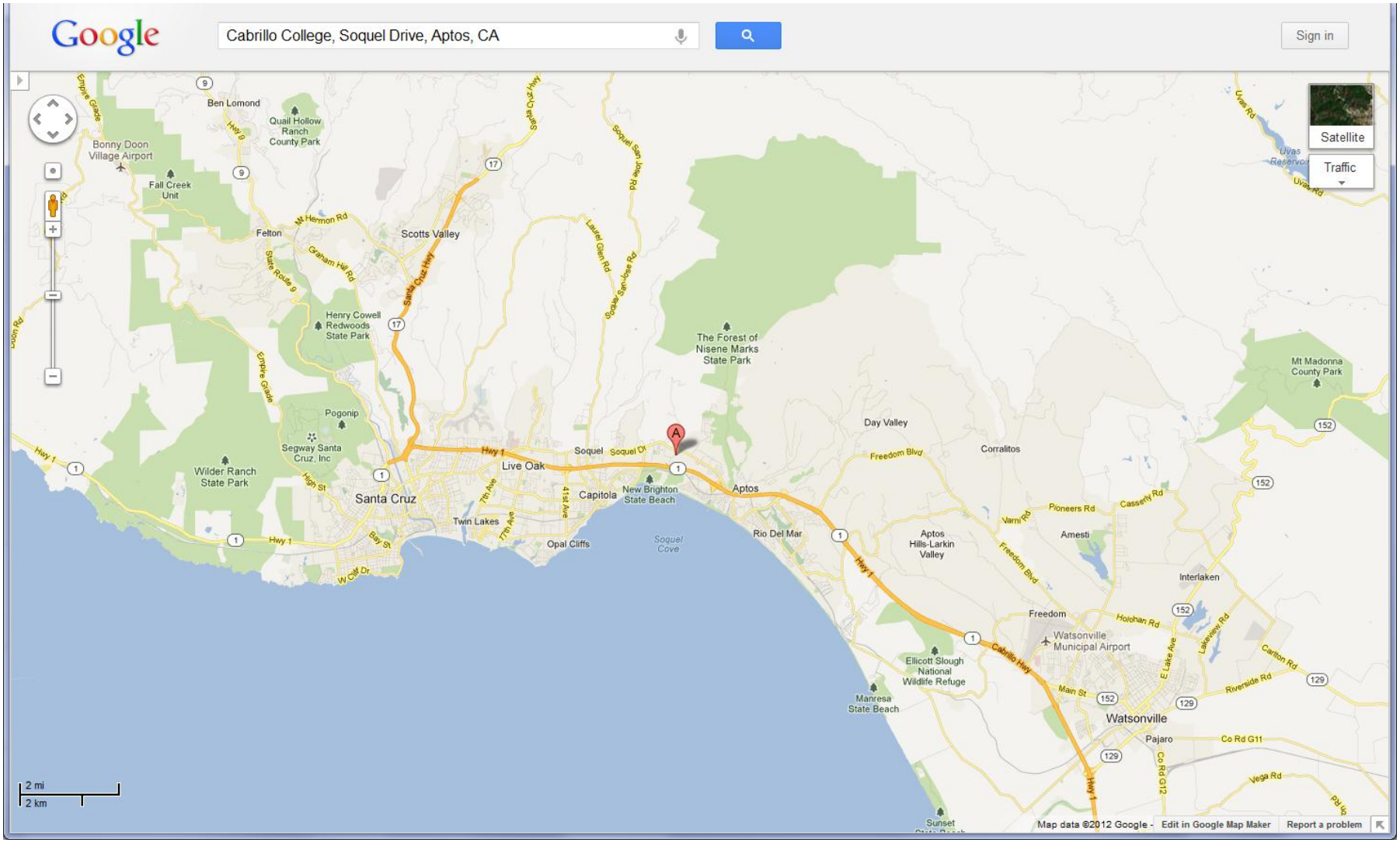
*6 Mute/unmute your individual line with a private announcement.



Class Activity
What kind of computer did you use to join CCC Confer?

			Other
Put your pointer here if using a Windows PC:	Put your pointer here if using a Apple Mac:	Put your pointer here if using a Linux system:	Put your pointer here if using something else:

Class Activity – Where are you now?

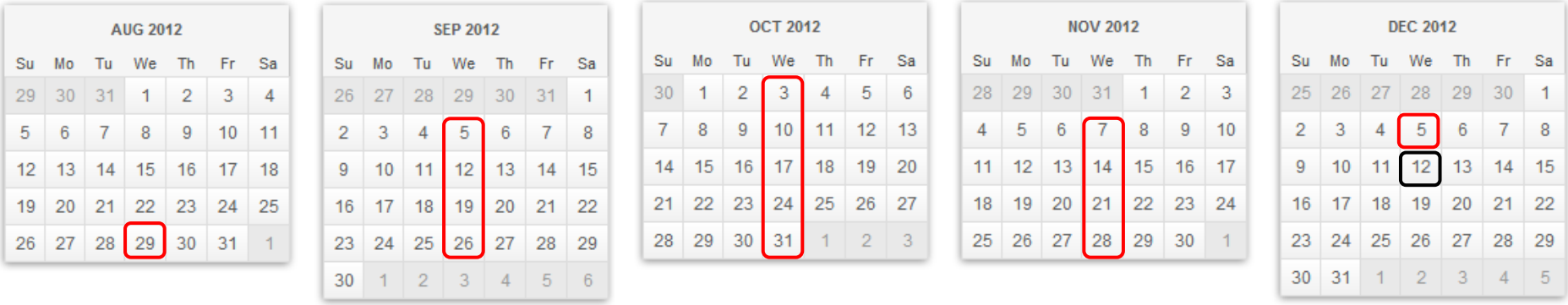


How this class works

CIS 90
Spring 2012

Class meets in room 2501 and online every Wednesday afternoon:

- 1:15-4:20PM, from Aug 29th to Dec 5th
- 15 lessons (class meetings) total
- Final exam (Test #3) at 1-3:50PM, on Dec 12th



AUG 2012

Su	Mo	Tu	We	Th	Fr	Sa
29	30	31	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	31	1

SEP 2012

Su	Mo	Tu	We	Th	Fr	Sa
26	27	28	29	30	31	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	1	2	3	4	5	6

OCT 2012

Su	Mo	Tu	We	Th	Fr	Sa
30	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	31	1	2	3

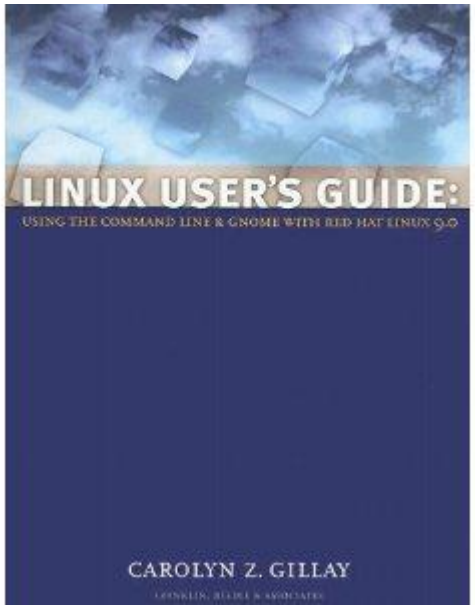
NOV 2012

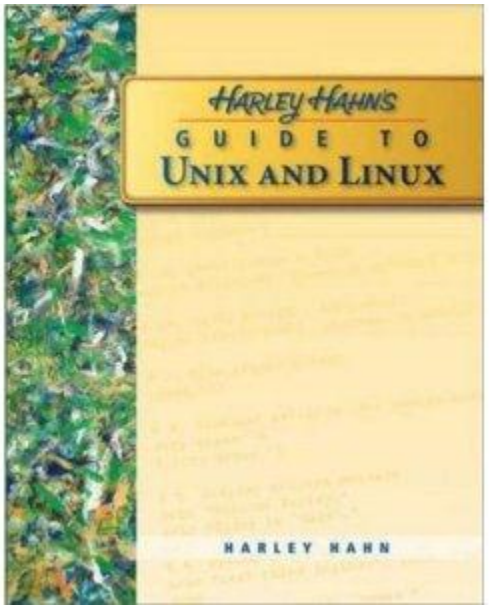
Su	Mo	Tu	We	Th	Fr	Sa
28	29	30	31	1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	1

DEC 2012

Su	Mo	Tu	We	Th	Fr	Sa
25	26	27	28	29	30	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	31	1	2	3	4	5

You may attend by either coming to room 2501 or remotely using CCC Confer





Optional Textbooks:

Linux User's Guide: Using the Command Line and GNOME with Red Hat Linux 9.0
by Carolyn Z. Gillay
Franklin Beedle & Associates ISBN: 1887902988

Harley Hahn's Guide to Unix and Linux
by Harley Hahn
McGraw-Hill ISBN: 0073133612

The typical week

http://simms-teach.com

Use Forum to ask and answer questions

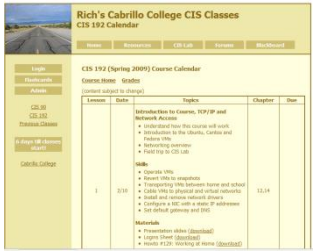
Wednesday

"First minute" quiz

Lecture on new lesson material

Class activities

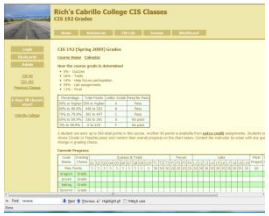
Previous week lab assignments due 11:59PM (Opus time)



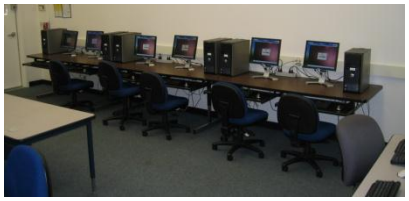
Calendar Page

Thursday

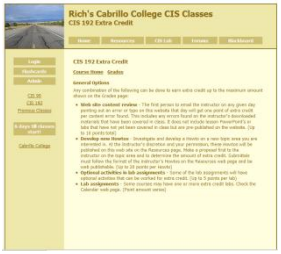
is grading day



Check progress on the Grades Page



Work Lab Assignments in the CIS Lab or from home



Check Extra Credit Page if you need some more points

Contacting the instructor

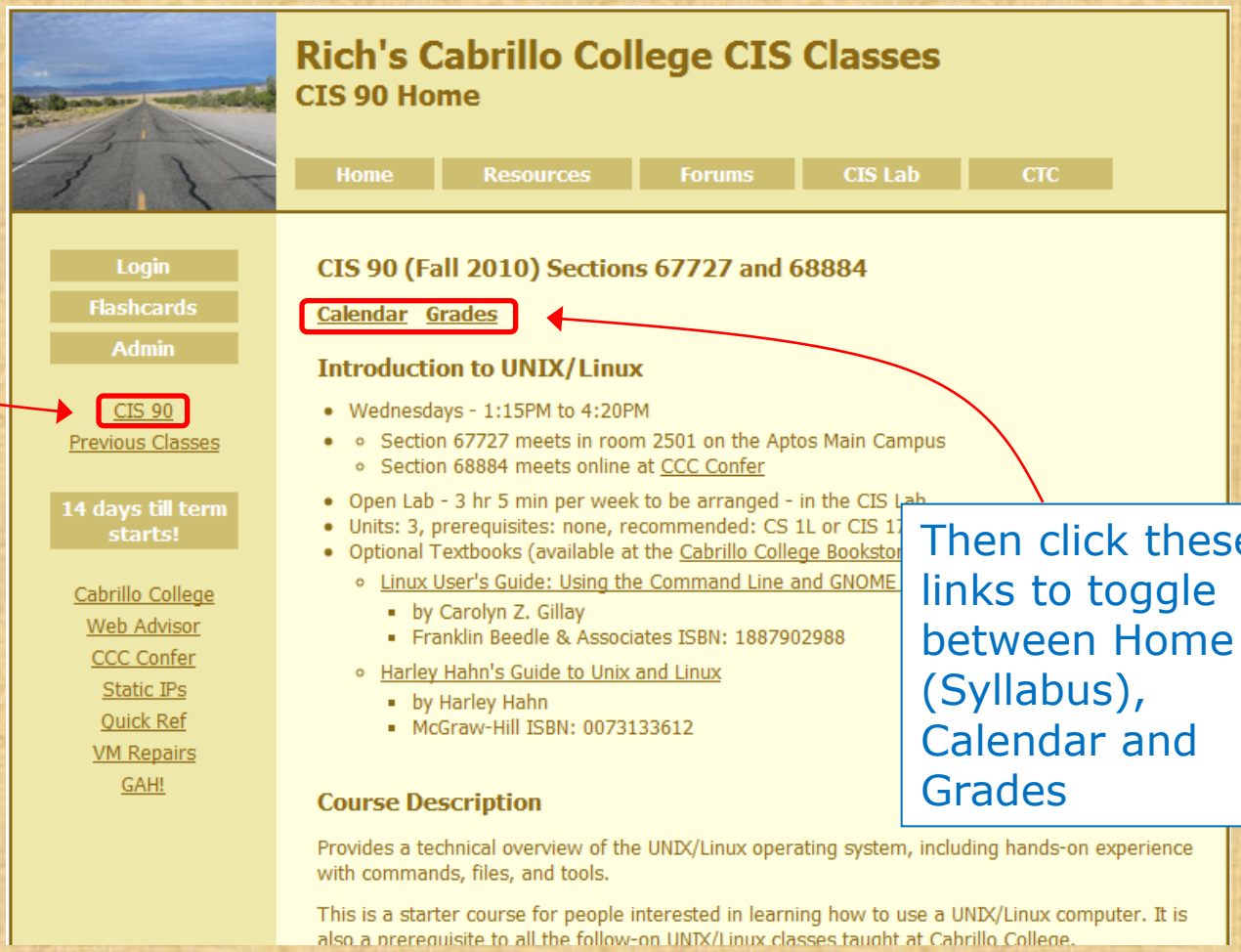
- Use the forum for the fastest response on technical or class related questions.
- Use email for personal matters only. If it's NOT personal I will most likely ask you to post your question on the forum and will answer it there instead so other students may benefit from the answer.
- Weekly office hours: http://babyface.cabrillo.edu/salsa/listing.jsp?staffId=1426
- Also available in the CIS Lab for help with lab assignments or class material: http://babyface.cabrillo.edu/salsa/listing.jsp?staffId=1426

- Avoid leaving a message on voice mail. Checked rarely so don't expect a fast response!

Class Exercise (class website)

Please browse to: ***http://simms-teach.com***

First click on ***CIS 90*** *on left panel to see syllabus*



Then click these links to toggle between Home (Syllabus), Calendar and Grades


Rich's Cabrillo College CIS Classes
CIS 90 Home

CIS 90 (Fall 2010) Sections 67727 and 68884

Introduction to UNIX/ Linux

Course Description

Student Learner Outcomes

Taught in Both Physical and Virtual Classrooms

A Day in the Life

Computer Lab and TBA Hours

Late Work Will Not Be Accepted

Contacting the Instructor

Help Forum

Web Site

Classroom Etiquette

Grading Policy

Special Learning Needs

Missing Classes and Drops

Course Syllabus
(on the CIS 90 home page)

It is a good idea to read through the syllabus carefully to avoid any surprises and get a good idea how this course works.

Course Calendar

First minute quiz

Lesson # and Date

What is due by 11:59PM (Opus time) that day

Lesson slides, feel free to download during class for local viewing

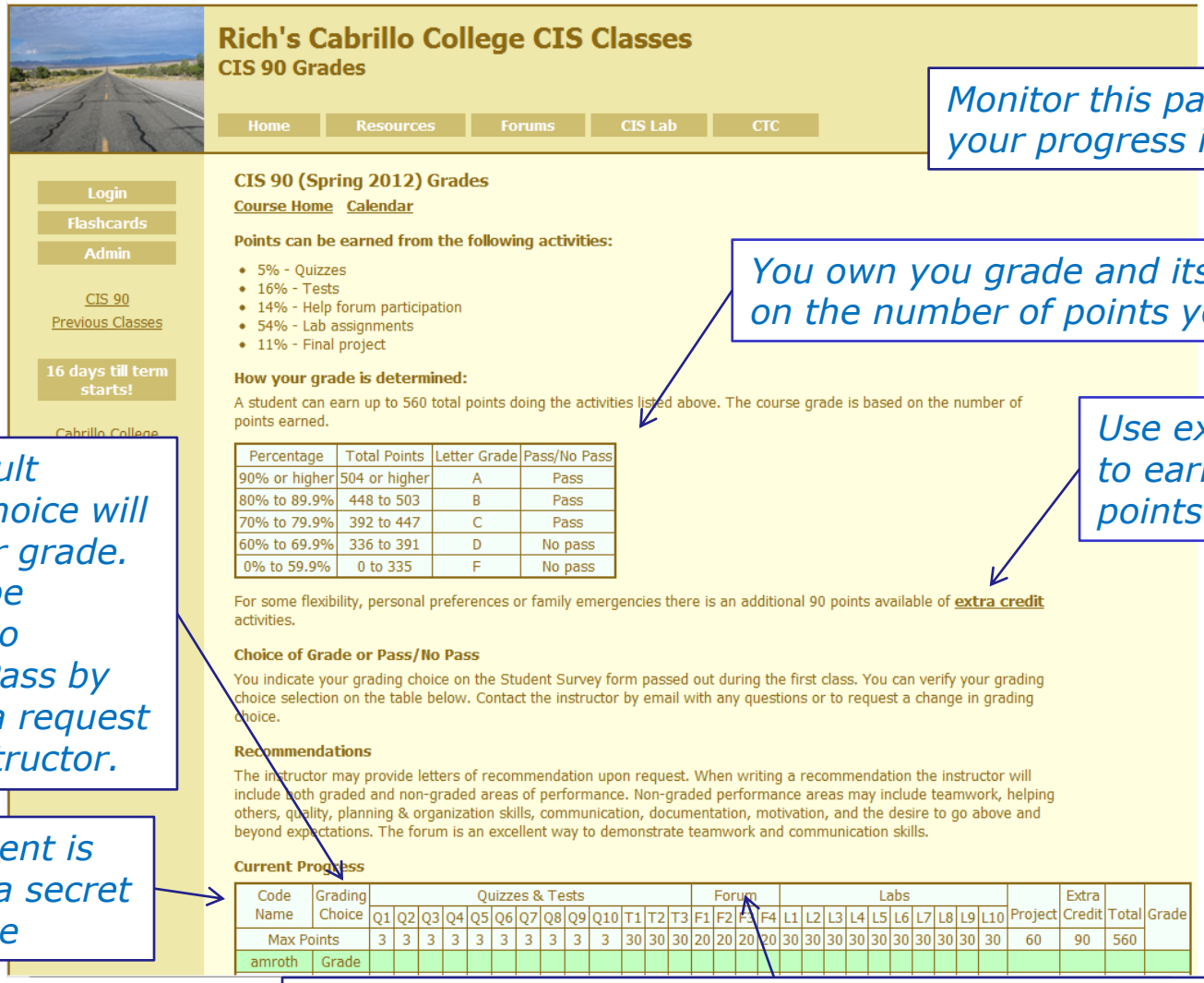
References to material in the textbook

Lab assignment

Test

5	3/10	**Quiz 4** **Review** • Review lessons 1-4 • Practice skills • Learn about filename expansion characters **Materials** • Presentation slides (download) • Practice test (download) **Assignment** • NA **CCC Confer** • Enter virtual classroom • Class archives		Lab 4
6	3/17	**Managing Files** • Creating • Copying • Moving • Renaming • Removing • Linking **Materials** • Presentation slides (download) **Test #1** • Test (download) **Assignment** • Lab 5 **CCC Confer** • Enter virtual classroom • Class archives	5 8.13-8.16 (Gillay) 25 p715-729 (Hahn)	

Course Grading



Rich's Cabrillo College CIS Classes

CIS 90 Grades

Home | Resources | Forums | CIS Lab | CTC

Login | Flashcards | Admin

CIS 90 Previous Classes

16 days till term starts!

Cabrillo College

CIS 90 (Spring 2012) 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 project

How your grade is determined:

A student can earn up to 560 total points doing the activities listed above. The course grade is based on the 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 points available of 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. You can verify your grading choice selection on the table below. Contact the instructor by email with any questions or to request a change in grading choice.

Recommendations

The instructor may provide letters of recommendation upon request. When writing a recommendation the instructor will include both graded and non-graded areas of performance. Non-graded performance areas may include teamwork, helping others, quality, planning & organization skills, communication, documentation, motivation, and the desire to go above and beyond expectations. The forum is an excellent way to demonstrate teamwork and communication skills.

Current Progress

Code Name	Grading Choice	Quizzes & Tests													Forum				Labs										Project	Extra Credit	Total	Grade
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	T1	T2	T3	F1	F2	F3	F4	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10				
Max Points		3	3	3	3	3	3	3	3	3	3	30	30	30	20	20	20	20	30	30	30	30	30	30	30	30	30	30	60	90	560	
amroth	Grade																															

Monitor this page to track your progress in the course.

You own you grade and its based solely on the number of points you earn.

Use extra credit to earn additional points

Your default grading choice will be a letter grade. This can be changed to Pass/No Pass by emailing a request to the instructor.

Each student is assigned a secret code name

Don't forget to post - with respect to earning points consider the forum as "low hanging fruit"

More on Grading

Points can be earned from the following activities:

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

Quizzes: 10 x 3 = 30 points
Tests: 3 x 30 = 90 points
Forum: 4 x 20 = 80 points
Labs: 10 x 30 = 300 points
Project: 1 x 60 = 60 points

How your grade is determined:

A student can earn up to 560 total points doing the activities listed above. The course grade is based on the 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
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For some flexibility, personal preferences or family emergencies there is an additional 90 points available of **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. You can verify your grading choice selection on the table below. Contact the instructor by email with any questions or to request a change in grading choice.

The student can decide the grade they want and how they want to earn it

Grading observations on previous classes

Code Name	Grading Choice	Quizzes & Tests													Forum				Labs										Final Project	Extra Credit	Total	Grade
		Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	T1	T2	T3	F1	F2	F3	F4	L1	L2	L3	L4	L5	L6	L7	L8	L9	L10				
Max Points		3	3	3	3	3	3	3	3	3	3	30	30	30	20	20	20	20	30	30	30	30	30	30	30	30	30	30	60	90	560	
aragorn	Grade	3	3	3	3	3	3	3	3	3	3	28	27	25	20	20	20	16	28	30	30	24	30	29	29	30	30	30	57		533	A
eomer	Grade	2	3	3	3	3	3	2		3	3	33	26		20	20	20	20	28	27	28	30	29	28	28	29	30	28	90	45	584	A
balrog	P/NP											26			12	0	0		28												66	NP
nazgul	Grade		2			3			3	3	1	24	19		20	8	20	20	28	24	30	24	28	30	29	30	30	30	9		415	C
sauron	Grade		3	3	3		0	1		3	3	28	22	18	20	0	20	20	30	28	30	28			29	30	30	27	90	35	501	B

Percentage	Total Points	Letter Grade	Pass/No Pass
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- **Aragorn** got an A by doing solid work across the board and did no extra credit
- **Eomer** skipped the final yet still got an A by doing some extra credit
- **Balrog** probably should have just dropped the course
- **Sauron** kicked himself later for not doing any posts during the second quarter of the course to turn that B to an A

More on Grading

Lab Assignments (10 labs, 30 points each)

- Will be due at 11:59PM (Opus time) on the date shown on the course Calendar.
- ***Late work is not accepted***. There is no credit for any work turned in after the deadline. If you don't complete a lab assignment, please turn in what you have, by the due date, for partial credit.
- Students may work together and collaborate on labs but they must submit their own work to get credit.
- Lab resources, instructors, and assistants are available in the CIS lab. In addition the Linux Opus server and the CIS VLab may be accessed from anywhere over the Internet.

A lab assignment due Wednesday night at 11:59PM (Opus time) will get no credit if turned in one minute late at 12:00AM Thursday!

More on Grading

"First Minute" quizzes (10 quizzes, 3 points each)

As an incentive to start class on time, 3 points are awarded for correctly answering 3 questions, in the correct order, at the very beginning of class.

- The quiz questions are shown on CCC Confer at ***1:15PM*** sharp.
- The quiz questions are given out in advance and students can use the forum to collaborate on answers prior to class.
- The ***order of the questions*** will not be known until the quiz is given! Emailed answers that are not in order will be marked as incorrect.
- Quizzes are open book/notes. Students may not give or ask others for assistance while taking a quiz.
- To take the quiz, students email the answers to the instructor.
- There are ***no makeup's*** for these quizzes and they ***must be turned in within the first few minutes of class***.

More on Grading

Tests (3 tests, 30 points each)

- Test 1 and Test 2 will be distributed by during the last half of the class.
- Test 3 is the final exam.
- Tests are usually comprised of fill-in-the-blank type questions. Often you will have to use one of the Linux servers to check your answer.
- Tests are open notes, open book, and open computer.
- Tests are designed to take about 1.5 hours and be turned in at the end of class. To minimize "clock stress" on Test 1 and 2, you may continue to work on the test after class is over and turn it no later than 11:59PM.
- Students may not give or ask others for assistance while taking a test.
- Tests 1 and 2 may be taken remotely online. Students must take Test 3 (the final exam) in room 2501 on campus.

See the archived courses for an idea of what these tests are like

More on Grading

Forum Posts (4 quarters, up to 20 points per quarter)

- The end of each term quarter is shown on the course calendar.
- Each post in the forum for this class is worth 4 points, up to 20 points maximum per quarter.
- The posts for the quarter will be due at ***11:59PM*** (Forum time) on the date shown on the course Calendar.
- Extra posts in one quarter do not carry over to the next quarter.
- Only posts in the forum for this class will be counted.

As far as earning points, forum posts are "low hanging fruit" !!

More on Grading

Extra credit (up to 90 points)

- You need to attend to a family emergency and can't turn in a lab assignment on time … don't worry!
- Your schedule/commute doesn't allow you to take any of the "first minute" quizzes …. don't worry!
- You crash and burn on a test … don't worry!
- You just don't like making forum posts … don't worry!
- ***There is a cap on extra credit points so plan carefully!***

There are ample extra credit opportunities which provide you with the flexibility to get the grade you want.

Course outline and syllabus

Please don't forget:

1) **No makeup's for missed quizzes**

2) **Late work (Labs assignments) will not be accepted**

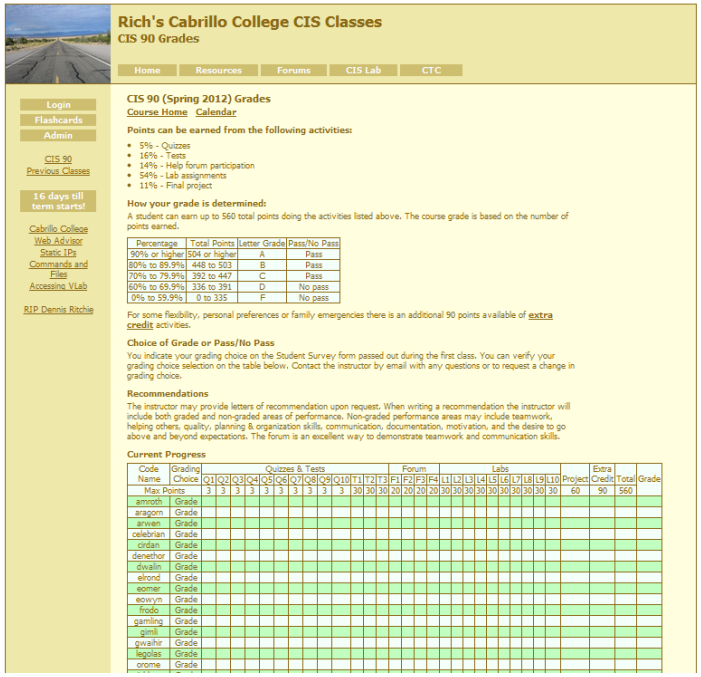
If you have not completed a lab assignment, **please turn in what you have done for partial credit**

Don't panic though -- there are ample extra credit opportunities for students wanting or needing any extra points.

A lab assignment due Wednesday night at 11:59PM will get no credit if turned in one minute late at 12:00AM Thursday

Final word on Grading

- You control your grade for this course!
- Use the Grades web page to plan for the grade you wish to receive and track your progress.
- Use the Calendar web page to see due dates for all assignments.



Rich's Cabrillo College CIS Classes
CIS 90 Grades

Home | Resources | Forums | CIS Lab | CTC

Login | Flashcards | Admin

CIS 90 Previous Classes

16 days till term starts!

Cabrillo College Web Advisor | Static IPs | Commands and Files | Accessing VLab

RIP Dennis Ritchie

CIS 90 (Spring 2012) Grades

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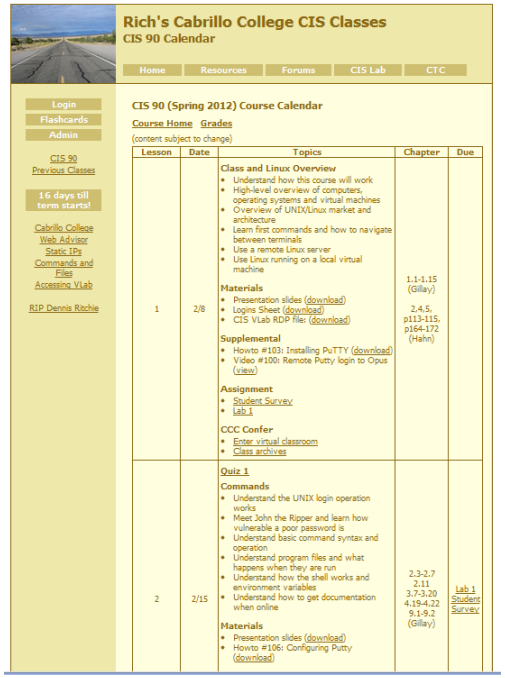
Max Points		3	3	3	3	3	3	3	3	3	3	30	30	30	20	20	20	20	30	30	30	30	30	30	30	30	60	90	560	
amroth	Grade																													
aragorn	Grade																													
arwen	Grade																													
celebrian	Grade																													
cirdan	Grade																													
denethor	Grade																													
dwalin	Grade																													
elrond	Grade																													
eomer	Grade																													
eowyn	Grade																													
frodo	Grade																													
gamling	Grade																													
gimli	Grade																													
gwaihir	Grade																													
legolas	Grade																													
orome	Grade																													



Rich's Cabrillo College CIS Classes
CIS 90 Calendar

Home | Resources | Forums | CIS Lab | CTC

Login | Flashcards | Admin

CIS 90 Previous Classes

16 days till term starts!

Cabrillo College Web Advisor | Static IPs | Commands and Files | Accessing VLab

RIP Dennis Ritchie

CIS 90 (Spring 2012) Course Calendar

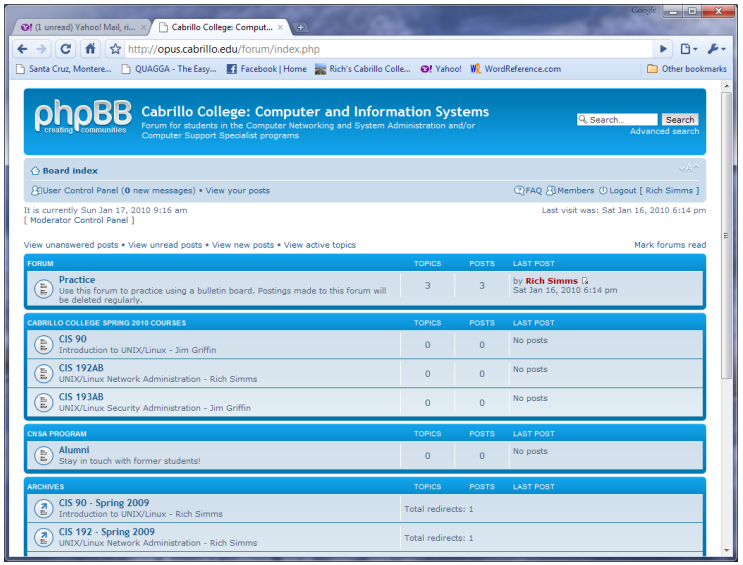
Course Home Grades

(content subject to change)

Lesson	Date	Topics	Chapter	Due
1	2/8	**Class and Linux Overview** • Understand how this course will work • High-level overview of computers, operating systems and virtual machines • Overview of UNIX/Linux market and architecture • Learn first commands and how to navigate between terminals • Use a remote Linux server • Use Linux running on a local virtual machine **Materials** • Presentation slides (download) • Logins Sheet (download) • CIS VLab RDP file: (download) **Supplemental** • Howto #103: Installing PuTTY (download) • Video #100: Remote Putty login to Opus (view) **Assignment** • Student Survey • Lab 1 **CCC Confer** • Enter virtual classroom • Class archives	1.1-1.15 (Gilley) 2.4,5, p113-115, p164-172 (Hahn)	
2	2/15	**Quiz 1** **Commands** • Understand the UNIX login operation works • Meet John the Ripper and learn how vulnerable a poor password is • Understand basic command syntax and operation • Understand program files and what happens when they are run • Understand how the shell works and environment variables • Understand how to get documentation when online **Materials** • Presentation slides (download) • Howto #106: Configuring Putty (download)	2.3-2.7 2.11 3.7-3.20 4.19-4.22 9.1-9.2 (Gilley)	Lab 1 Student Survey

Help Forum

Online Help Forum

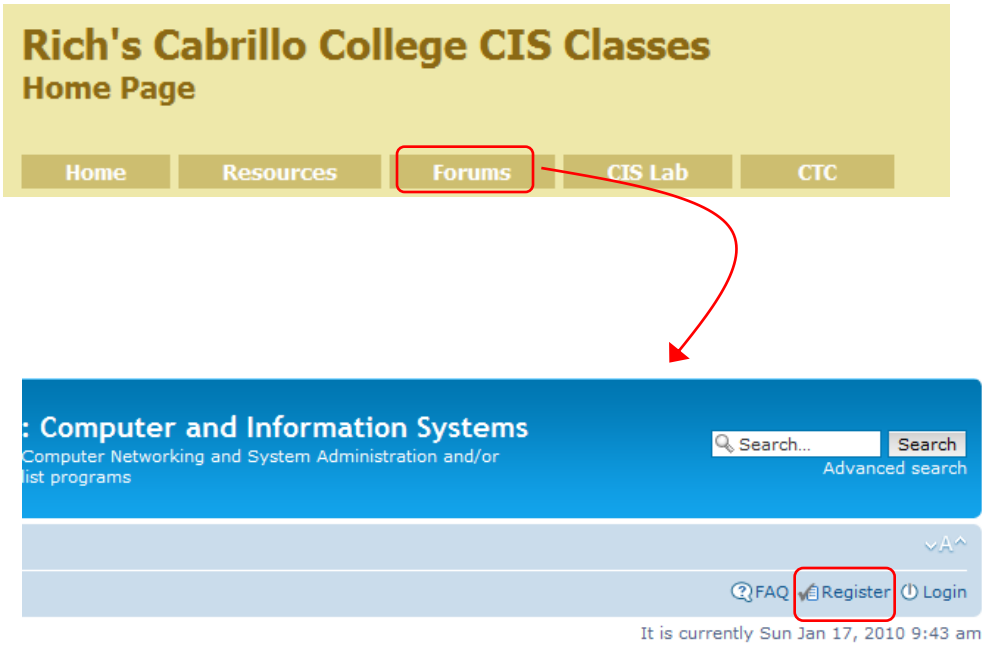


- Post questions and answers
- Collaborate on lab assignments
- Share UNIX/Linux information
- Post class notes for classmates who miss class
- Get clarifications on assignments
- Collaborate on quiz questions
- Never post passwords!

As an incentive to use the forum - students can earn 4 points per CIS 90 forum post (capped at 20 points for each ¼ of the course calendar)

Class Activity
Forum Registration

*There is a Forums link on **simms-teach.com***



To Register:

1. Browse to the forum
2. Click on Register
3. Review and agree to terms
4. Your **Username** must be:
   - your first and last name separated by a space
   - e.g. Rich Simms
   - match a name on the class roster

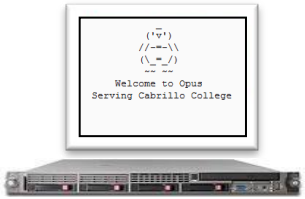
Note: If you have already registered you don't need to do it again. If your username is incomplete or does not match a name of the class roster it will be modified or deleted by the instructor.

Lab Resources

The CIS 90 Playground

Command Line Only

Red Hat Enterprise Linux



Opus

Fedora

Sun-Hwa

Graphics and Command Line

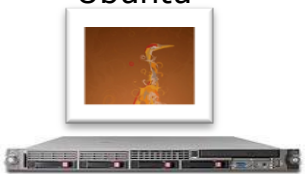
Linux Mint

Pxx-Hugo

Debian

Pxx-Kate

Ubuntu



Pxx-Mr-Eko

CentOS

Pxx-Not-Opus

Pxx is the pod number, where xx = 01 to 10

OpenSUSE

Fang

Fang is used for reserving the graphics systems

All the systems above are virtual machines (VMs) available remotely from on or off-campus

The CIS 90 Playground

Internet

CIS Lab
Room 1403

CIS-Lab-01

CIS-Lab-02 . . .

172.20.0.1xx

NoPar

Classroom
Room 2501

Snickers (DHCP)

Instructor

Station-01

Station-02 . . .

172.30.1.1xx

CIS VLab
Virtual Machines

Command line access only via SSH

Opus

Sun-Hwa

172.30.5.xxx

Command line access via SSH and graphical desktop via RDP

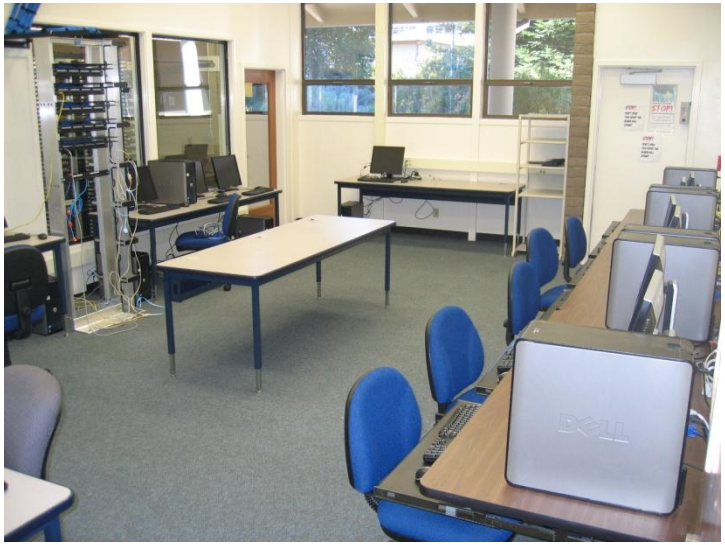
Fang

Pod 1	Pod 2 . . .
P01-Hugo	P02-Hugo
P01-Kate	P02-Kate
P01-Mr-Eko	P02-Mr-Eko
P01-Not-Opus	P02-Not-Opus

172.20.90.xxx

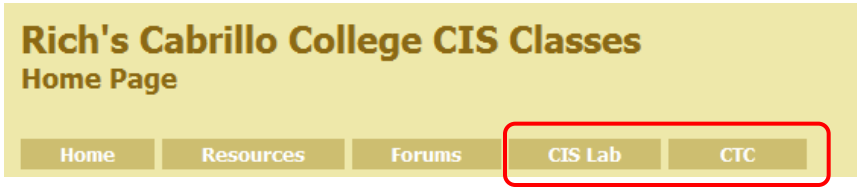
The CIS Lab
CTC Building Room 1403

There are ten stations (labeled CIS-Lab-XX) in the CIS Lab for use by CIS students.



Each station has:
- Putty (for SSH command line access to Opus and Sun-Hwa)
- RDP access to CIS 90 Pod VMs

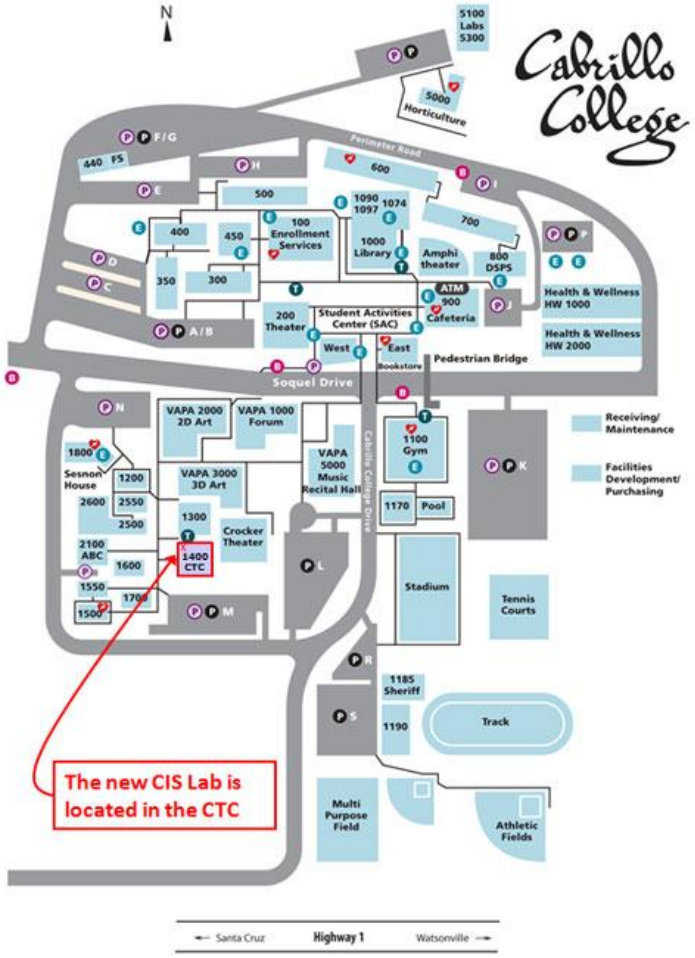
Instructors and Lab Assistants are available (see schedule) to help students with lab assignments



Use these links to get the schedule and hours of operation

The CIS Lab

CTC Building Room 1403



Login Credentials

Usernames and passwords

Passwords

Turn OFF the recording

Logins and Passwords for CIS 90

Help Forum (http://oslab.cabrillo.edu/forum)

Username: _____

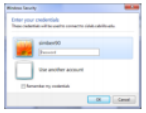
Password: _____

Opus (oslab.cabrillo.edu, port 2220)

Username: _____

Password: _____

VLab (cislab.cabrillo.edu)



Username: _____

Password: _____

Sun-Hwa (oslab.cabrillo.edu, port 2221)

Classroom PCs,

Lab PCs,

Hugo, Kate, Mr-Eko, and Not-Opus

Username: _____

Password: _____

This Logins sheet can be downloaded from the website.

See Lesson 1 materials on the Calendar page.

Contact the instructor at risimms@cabrillo.edu for your credentials if you miss this presentation.

Passwords

Turn recording back ON

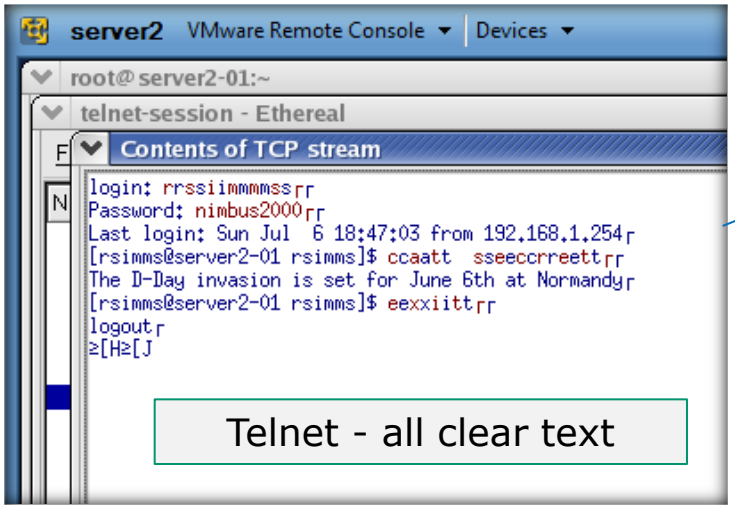
SSH

Picture credit:
http://www.cs.umd.edu/faq/ssh.html

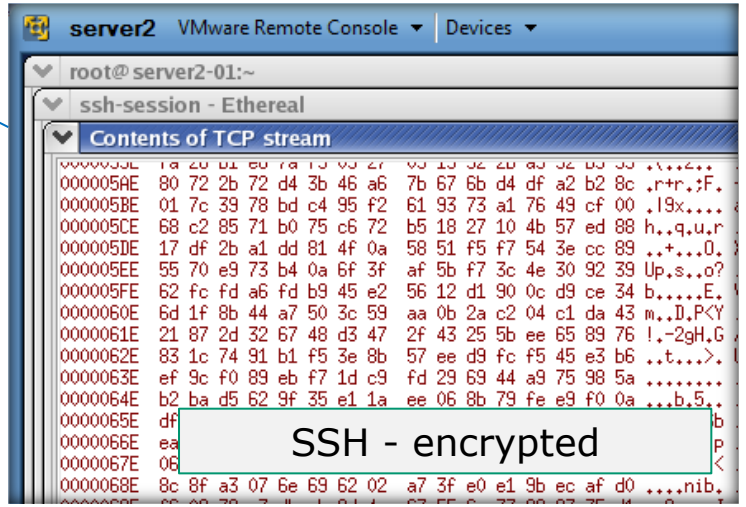
SSH is a network protocol that enables secure connections between computers

Remote Server

Sniffer view of a Telnet session



Sniffer view of a SSH session

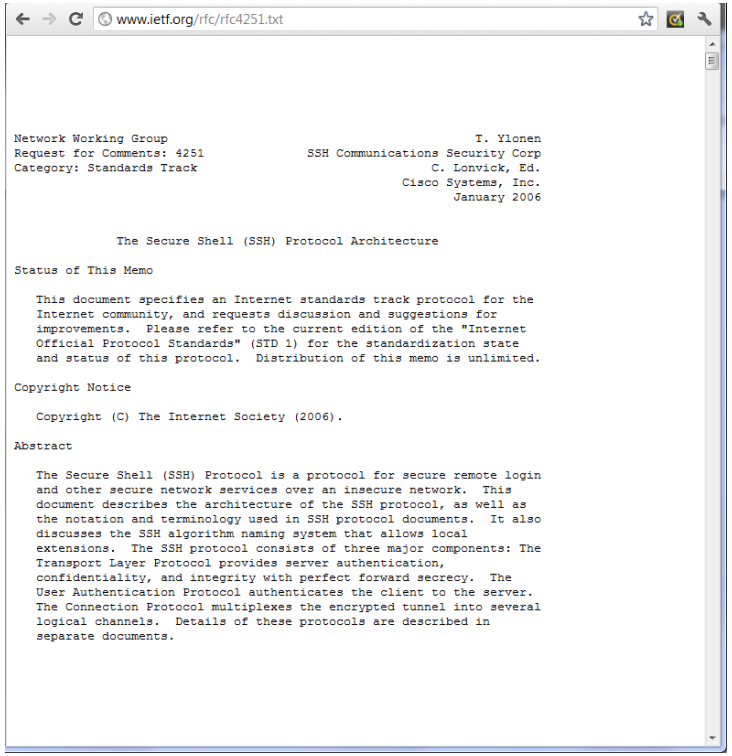


Local computer

With telnet, everything is transferred in clear text over the network

With ssh, everything is encrypted. This is how we will access all remote systems in CIS 90.

SSH is a standards based protocol



- See RFCs 4250 to 4254 at www.ietf.org
- “RFC” = Request for Comment
- “IETF” = Internet Engineering Task Force

SSH tools

- Linux and Mac already have SSH built in
- Droid smartphones can use the ConnectBot app for SSH
- iPhones can use the iSSH app for SSH
- Windows can use the Putty app for SSH

Putty is written and maintained primarily by Simon Tatham.
http://www.chiark.greenend.org.uk/~sgtatham/
Thank you Simon!

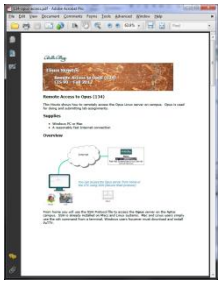
Class Activity – SSH Prep

Operating System	 **Students in the classroom**	 **Students at home**
	 • Login as CIS90 on the classroom computer • Run the Putty program	 • Google "putty download" • Download the putty.exe binary to your desktop • Run the Putty program http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html
 		• Run a Terminal

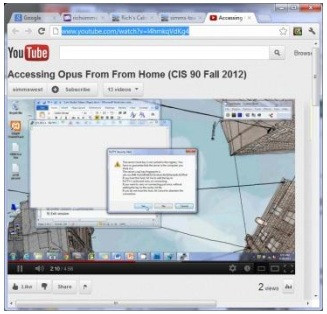
Logging Into Opus via SSH

Opus Howtos on the Website

Shows step-by-step how to access the CIS VLab



Howto #134: Remote Access to Opus (document)
http://simms-teach.com/howtos/134-opus-access.pdf



Accessing Opus from Windows (video)
http://www.youtube.com/watch?v=l4hmkqVdKg4

SSH connection to a UNIX/Linux Server

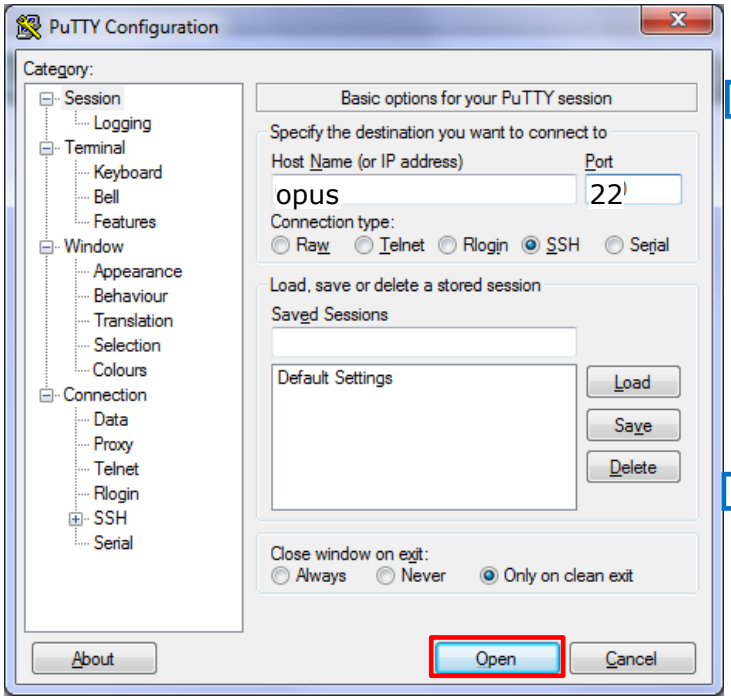
You need to know three things:

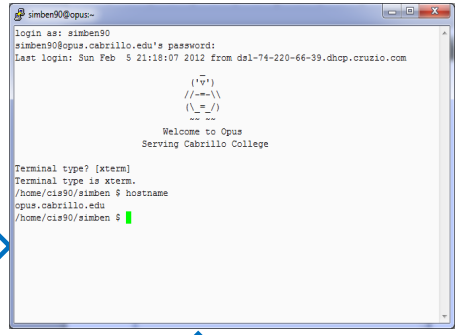
- The **hostname** of the remote server (must be a *fully qualified domain name* when going over the Internet)
- Your **login credentials** (username/password) on the remote server
- The **port number** the SSH service is listening on (the default is port 22)

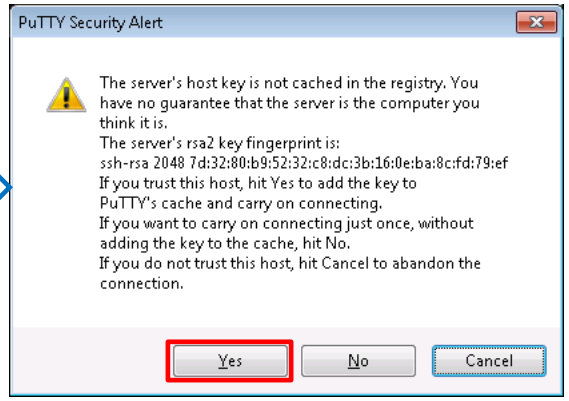
Logging into Opus from **the classroom or CIS Lab**

Opus

On Windows run Putty







The first time a connection is made to a server this warning is displayed.

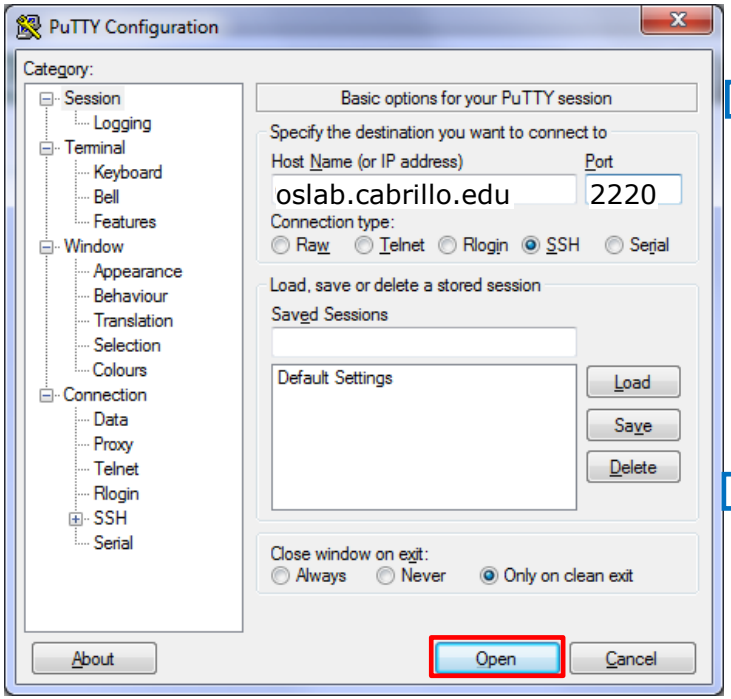
On a Mac or Linux terminal:

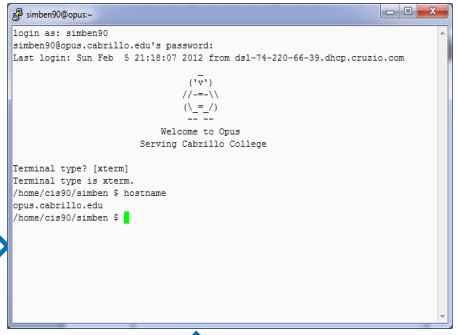
ssh *username*@**opus** *If not specified, the default port 22 is used*

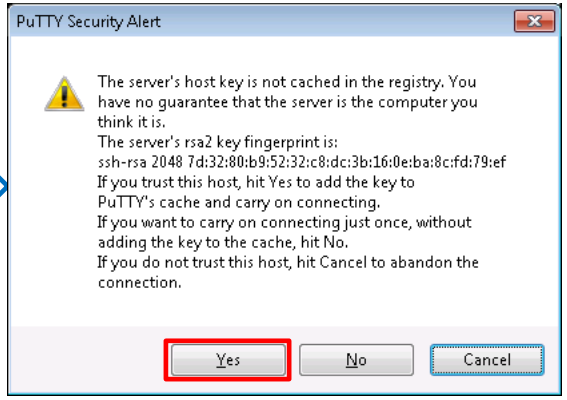
Logging into Opus from **home**

Opus

On Windows run Putty







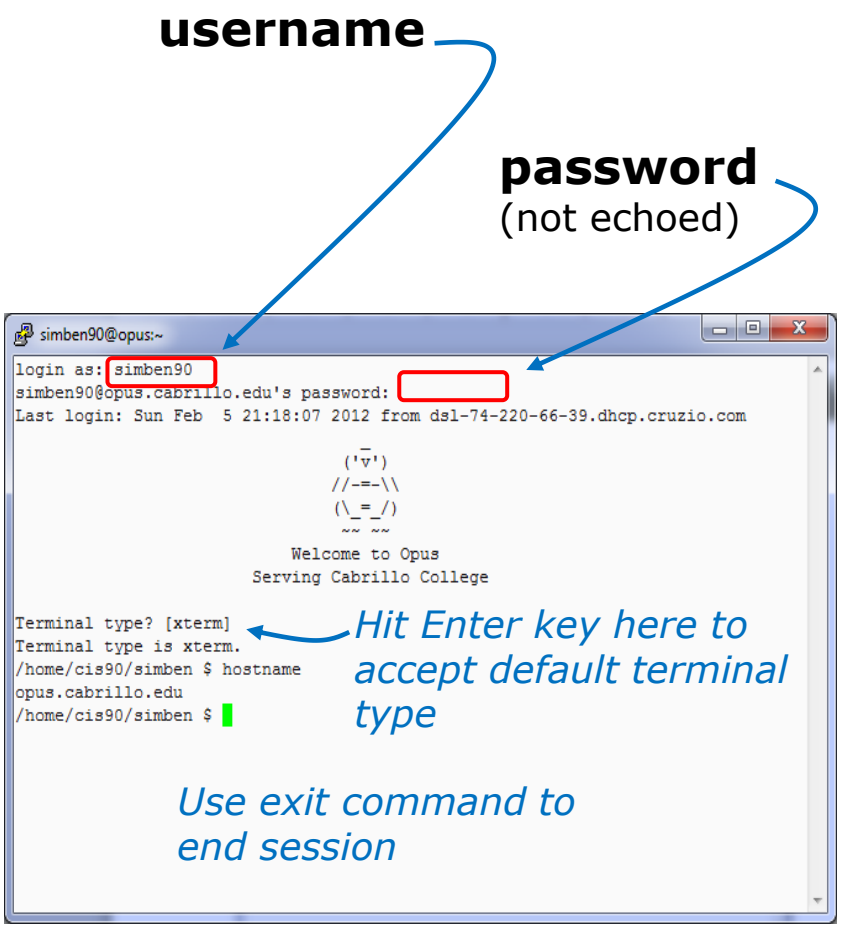
The first time a connection is made to a server this warning is displayed.

On a Mac or Linux terminal:

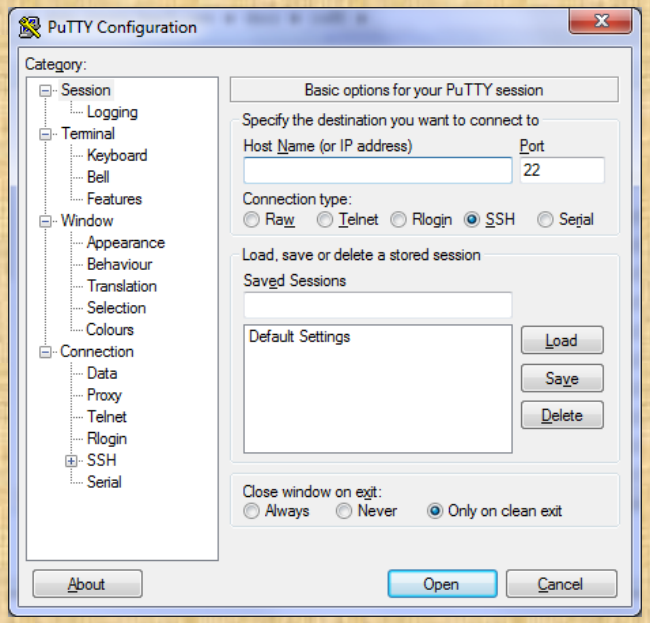
ssh -p 2220 *username*@**oslab.cabrillo.edu**

Accessing Opus from a Windows PC using Putty

Log in with username and password



Class Activity



1. Use Putty (or a Mac terminal) and connect to Opus
2. Login using your unique username and password
3. Use the **exit** command to end the session

Lesson 1 Commands

Lesson 1 Commands

cal	- show calendar
date	- show current time and date
clear	- clear the terminal screen
hostname	- show the name of the computer being accessed
ps	- show processes (includes shell) being run
uname	- show kernel name
cat /etc/issue	- usually shows distro (distribution) name
cat /etc/*-release	- usually shows distro (distribution) name
who	- show everyone logged in
who am i	- identifies which login session you are using
tty	- show terminal device
id	- show username and group information
history	- show previous commands
exit	- terminate your shell and log off

Lesson 1 Commands

```
login as: simben90
simben90@oslab.cabrillo.edu's password:
Last login: Sun Aug 26 08:54:09 2012 from 41-3-21-
105.dsl.dynamic.fusionbroadban
d.com

                                   _
                                  ('v')
                                 //-=-\\
                                 (\_=_/)
                                  ~~ ~~
                          Welcome to Opus
                       Serving Cabrillo College

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

Shell prompt

The initial shell prompt string on Opus, for the user simben90, is "/home/cis90/simben $ "

The prompt is used by the shell to request a command from the user.

Lesson 1 Commands

```
login as: simben90
simben90@oslab.cabrillo.edu's password:
Last login: Sun Aug 26 08:54:09 2012 from 41-3-21-
105.dsl.dynamic.fusionbroadban
d.com

                                   _
                                  ('v')
                                 //-=-\\
                                 (\_=_/)
                                  ~~ ~~
                              Welcome to Opus
                          Serving Cabrillo College

Terminal type? [xterm]
Terminal type is xterm.
/home/cis90/simben $
/home/cis90/simben $ cal
     August 2012
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 31
```

*Entering the **cal** command after the prompt tells the shell to run the cal program. The cal program shows a calendar for the current month.*

Lesson 1 Commands

```
/home/cis90/simben $ cal 12 2012
    December 2012
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 31
```

*Adding month and year arguments to the **cal** command lets you specify any month of any year*

```
/home/cis90/simben $ date
Mon Aug 27 09:01:29 PDT 2012
```

*The **date** command runs the date program which shows the current date and time*

Lesson 1 Commands

*This portion is the shell **prompt***

```
/home/cis90/simben $ cal 12 2012
    December 2012
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 31
```

*This is the **command** which includes two arguments 12 and 2012*

```
/home/cis90/simben $ cal 12 2012
    December 2012
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 31
```

*This is the **output** of the command*

```
/home/cis90/simben $ cal 12 2012
    December 2012
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 31
```

Lesson 1 Commands

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

Shell prompt

The clear command will clear the screen.

(On scrollable terminals you are still abler to scroll back to see previous commands entered)

Lesson 1 Commands

```
/home/cis90/simben $ hostname
opus.cislab.net
```

*The **hostname** command shows the name of the system being interacted with*

```
/home/cis90/simben $ ps
  PID TTY          TIME CMD
21629 pts/0    00:00:00 bash
21674 pts/0    00:00:00 ps
```

*The **ps** command shows the processes (programs loaded into memory and running) belonging to your username. This is an easy way to see the name of the shell program being used which is **bash** in this example.*

```
/home/cis90/simben $ uname
Linux
```

*The **uname** command shows the name of the kernel being used. In this example the kernel is Linux.*

```
/home/cis90/simben $ cat /etc/issue
CentOS release 6.2 (Final)
Kernel \r on \l

/home/cis90/simben $ cat /etc/*-release
CentOS release 6.2 (Final)
CentOS release 6.2 (Final)
CentOS release 6.2 (Final)
```

*These two **cat** commands can usually be used to show the name of the Linux distribution being used. In this case version 6.2 of the CentOS distribution is being used.*

Lesson 1 Commands

```
/home/cis90/simben $ who
simben90 pts/0        2012-08-27 09:00 (50-0-68-235.dsl.dynamic.fusionbroadband.com)
milhom90 pts/1        2012-08-27 09:02 (50-0-68-235.dsl.dynamic.fusionbroadband.com)
rsimms   pts/2        2012-08-27 09:03 (50-0-68-235.dsl.dynamic.fusionbroadband.com)
rsimms   pts/3        2012-08-27 09:03 (50-0-68-235.dsl.dynamic.fusionbroadband.com)
cis90    pts/4        2012-08-27 09:55 (p1-hugo.cislab.net)
```

*The **who** commands show all users currently logged in. It also shows the terminal device they are using, when they logged in, and where they logged in from. For example, the cis90 user is using the pts/4 terminal device and logged in from the Hugo server in Pod 1 (p1-hugo) at 9:55AM on August 27th. The other uses are logged in from off campus.*

```
/home/cis90/simben $ who am i
simben90 pts/0        2012-08-27 09:00 (41-3-21-105.dsl.dynamic.fusionbroadband.com)
```

*The **who am i** command indicates the specific login session you are using. This is a good way to distinguish which session you are currently interacting when you have more than one login session underway.*

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

*The **tty** command shows the terminal device being used for the login session. Note: "/dev/pts/0" is the same device as the abbreviated "pts/0" shown in the **who** and **who am i** command output. Every login session uses a unique terminal device*

Lesson 1 Commands

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

*The **id** command shows the username and UID (User ID) number as well as additional information. In the example above the user is simben90 and the user ID number is 1001*

```
/home/cis90/simben $ id milhom90
uid=1002(milhom90) gid=190(cis90) groups=190(cis90),100(users)

/home/cis90/simben $ id rsimms
uid=201(rsimms) gid=503(staff) groups=503(staff),100(users),190(cis90),191(cis191),192(cis192)
```

*Specifying a username as an argument on the **id** command with show user ID's for other users. For example the UID number for milhome90 is 1002 and for rsimms it is 201.*

```
/home/cis90/simben $ history
< snipped>
   54  cal
   55  cal 12 2012
   56  date
   57  clear
   58  hostname
   59  ps
   60  uname
   61  cat /etc/issue
   62  cat /etc/*-release
   63  who
   64  who am i
   65  tty
   66  id
   67  id milhome90
   68  id milhom90
   69  id rsimms
   70  history
```

*The **history** command shows all previously entered commands*

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

*The **exit** command logs out and ends the session*

Class Activity

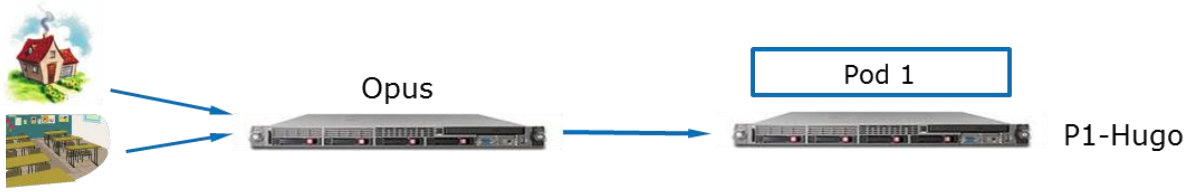
Use Putty (or a Mac terminal) and log into Opus

Try these commands:

cal	- show calendar
date	- show current time and date
clear	- clear the terminal screen
hostname	- show the name of the computer being accessed
ps	- show processes (includes shell) being run
uname	- show kernel name
cat /etc/issue	- usually shows distro (distribution) name
cat /etc/*-release	- usually shows distro (distribution) name
who	- show everyone logged in
who am i	- identifies which login session you are using
tty	- show terminal device
id	- show username and group information
history	- show previous commands
exit	- terminate your shell and log off

Logging Into Pod VMs via Opus

Logging into one of the CIS 90 pod servers from **Opus**

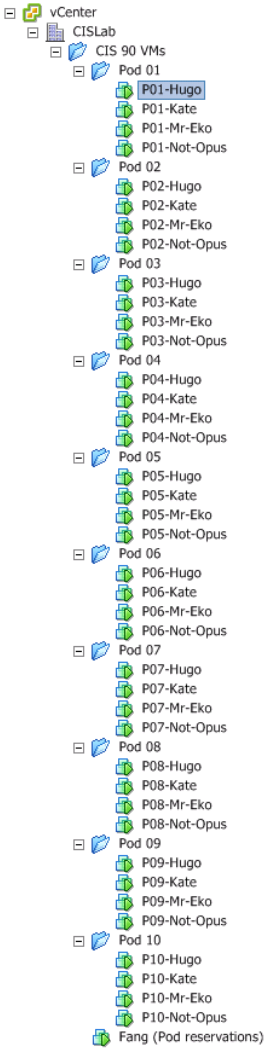


First log into Opus,
then ssh to the desired server using the cis90 account

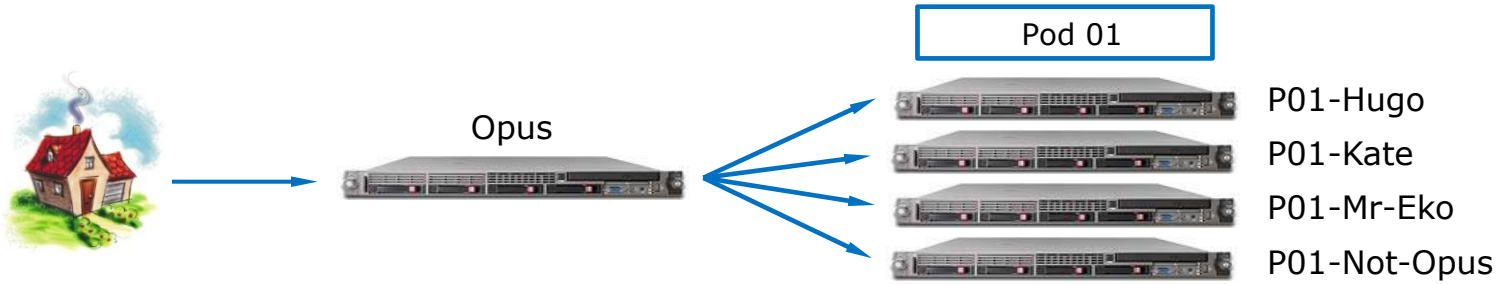
```
simben90@opus:~
login as: simben90
simben90@oslab.cabrillo.edu's password:
Last login: Thu Aug  2 14:22:36 2012 from 50-0-68-235.dsl.dynamic.fusionbroadban
d.com
                                   _
                                  ('v')
                                 //-=-\\
                                 (\_=_/)
                                  ~~ ~~
                          Welcome to Opus
                       Serving Cabrillo College

Terminal type? [xterm]
Terminal type is xterm.
/home/cis90/simben $ ssh cis90@P1-Hugo
cis90@p1-hugo's password:
Welcome to Linux Mint 13 Maya (GNU/Linux 3.2.0-23-generic x86_64)

Welcome to Linux Mint
 * Documentation:  http://www.linuxmint.com
Last login: Fri Aug  3 17:52:25 2012 from opus.cislab.net
cis90@P01-Hugo ~ $
```

This logs you in to the P1-Hugo server

*Type the **exit** command to drop back into Opus*



Logging into CIS 90 pod servers from **Opus**



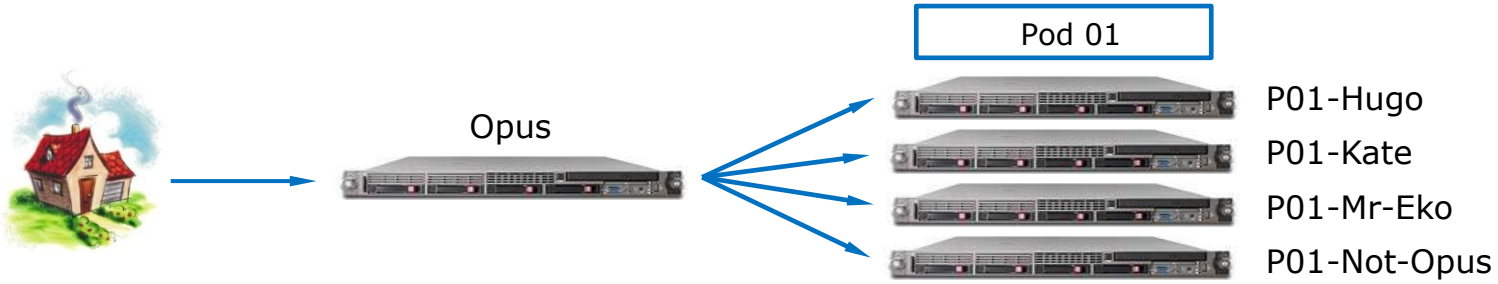
For example, after logging into Opus, log into P01-Mr-Eko from Opus with:

ssh cis90@p01-mr-eko

The hostname or IP address of the server you want to login to.

Individual student accounts have not been created on the CIS 90 Pod servers. Everyone can use the cis90 account instead.

Use the **hostname** command to show which computer your are interacting with




```
/home/cis90/simben $ hostname
opus.cislab.net
/home/cis90/simben $ ssh cis90@p01-hugo
The authenticity of host 'p01-hugo (172.20.90.11)' can't be established.
RSA key fingerprint is 86:d4:49:19:69:d9:2c:1b:48:94:57:6c:3e:e2:08:57.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'p01-hugo' (RSA) to the list of known hosts.
cis90@p01-hugo's password:
Welcome to Linux Mint 13 Maya (GNU/Linux 3.2.0-23-generic x86_64)

Welcome to Linux Mint
 * Documentation:  http://www.linuxmint.com
Last login: Mon Aug 27 14:39:56 2012 from opus.cislab.net
cis90@P01-Hugo ~ $ hostname
P01-Hugo
cis90@P01-Hugo ~ $ exit
logout
Connection to p01-hugo closed.
/home/cis90/simben $ hostname
opus.cislab.net
```

*Use **hostname** to see we are on Opus*

***ssh** to P1-Hugo*

*Use **hostname** to see we are on P1-Hugo*

***exit** back to Opus*

*Use **hostname** to verify we are back on Opus again*

Using CIS VLab (Virtual Lab)

Lab Resources

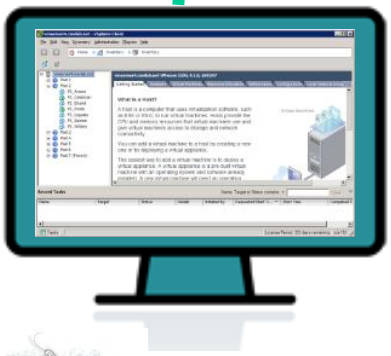
Remote Access to **CIS VLab**

Room 1403 on Aptos Campus

Internet

cislab (Win 2008)

vmserver4 (VMware ESXi)



You can access the course VMs from school or home using RDP (Remote Desktop Protocol)

Home

School

Mr-Eko

Not-Opus

Fang

Kate

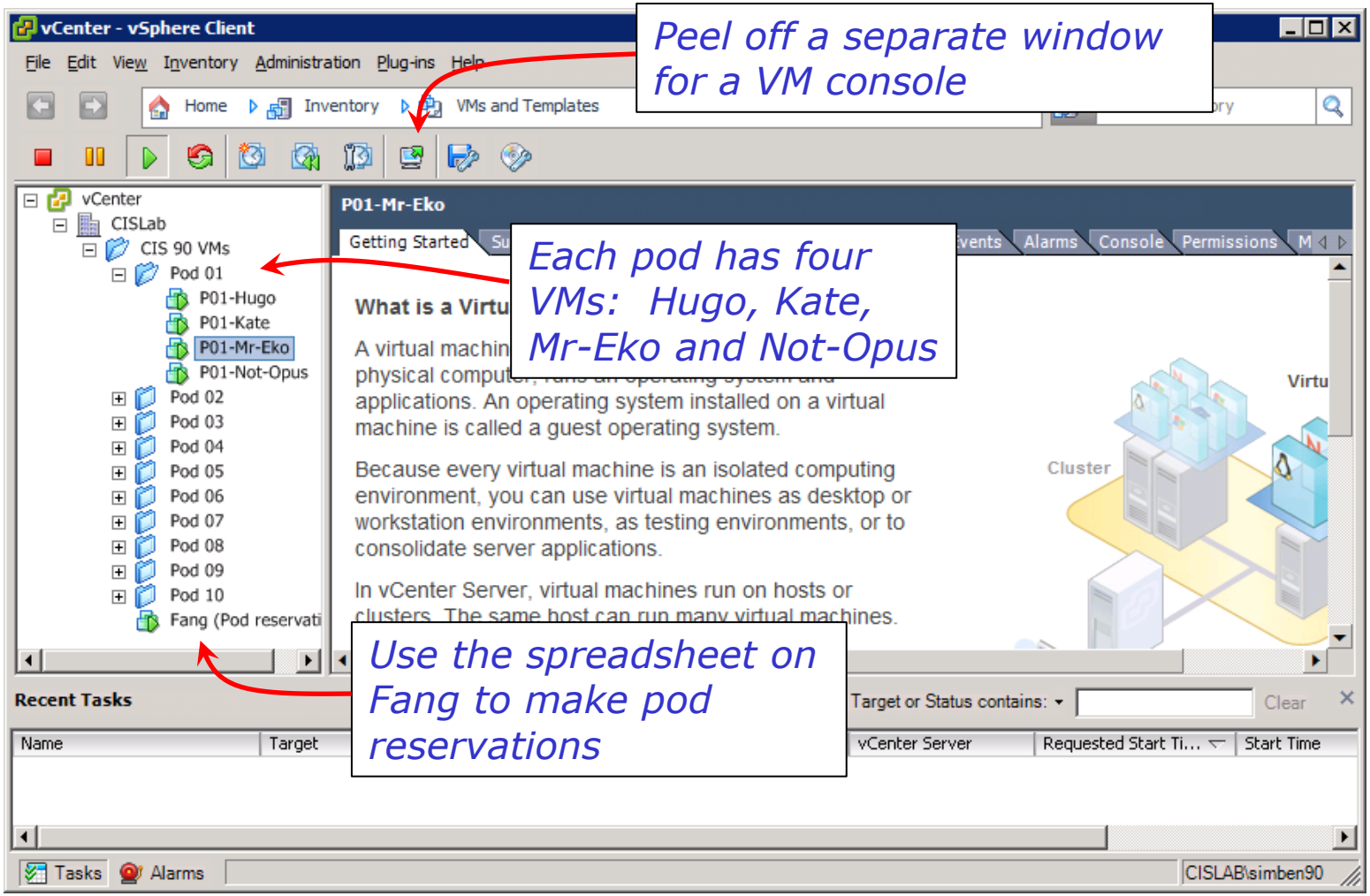
VLab Howtos on the Website

Shows step-by-step how to access the CIS VLab

Howto #305: Accessing Vlab (document)
http://simms-teach.com/howtos/305-cis-90-vlab-access.pdf

Accessing VLab from Windows (video)
http://www.youtube.com/watch?v=2geF2uNjuFw

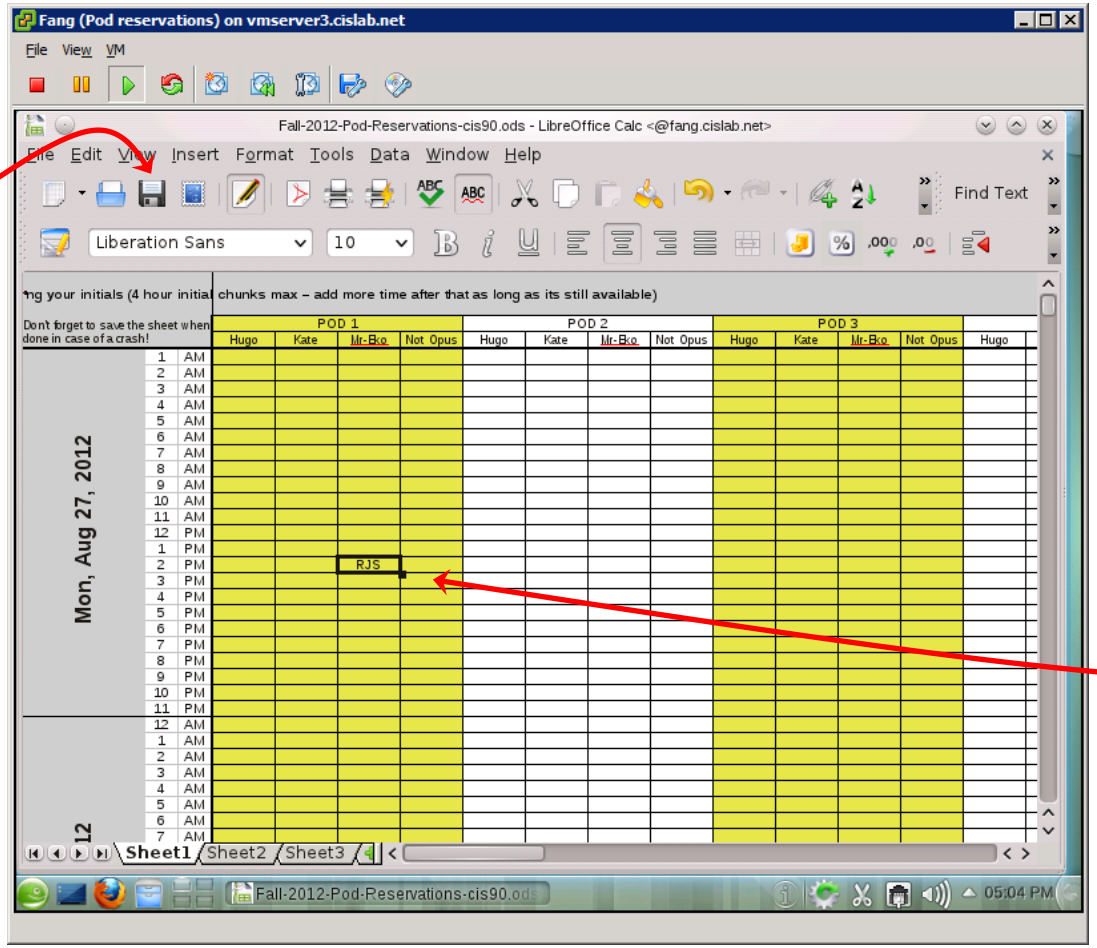
CIS VLab



VMware vSphere Client

The Fang VM (openSUSE)

It's a good idea to save the spreadsheet after you make your changes



Type your initials into the spreadsheet cells to indicate the date, time and VMs you wish to reserve.

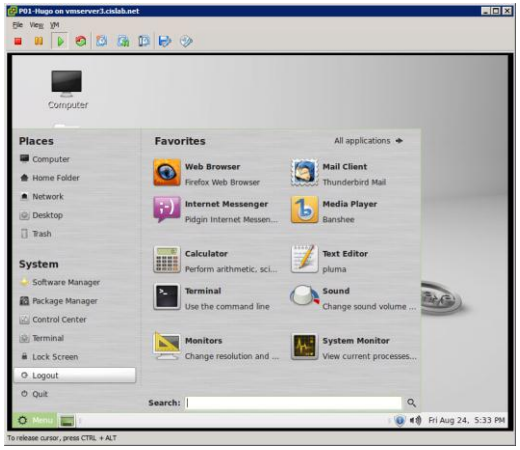
This spreadsheet does not enforce reservations it is just a way for multiple students to share common resources

Log in as
cis90

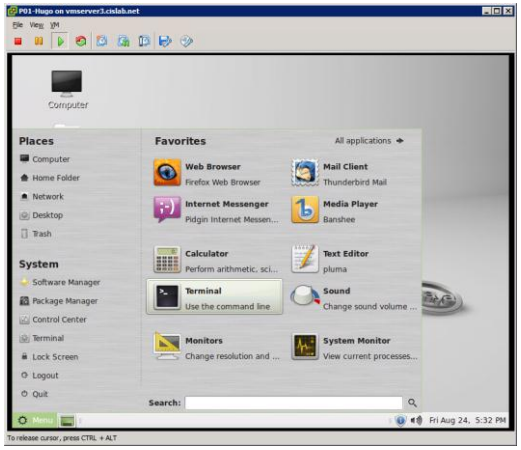
The Hugo VM (Linux Mint)

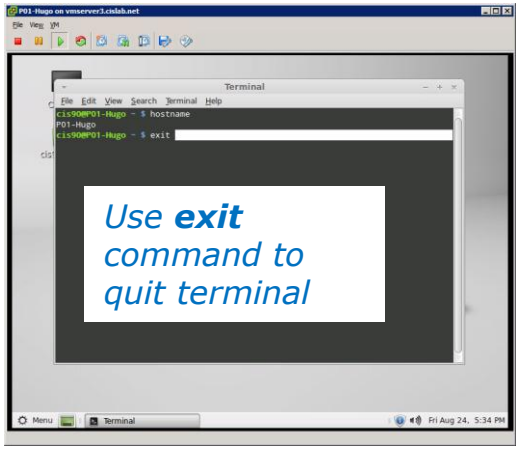
Summary
Mouse control: good
TTYs: F1 to F6
Graphics: F9
Desktop: KDE

Log out using
Menu **> Logout**

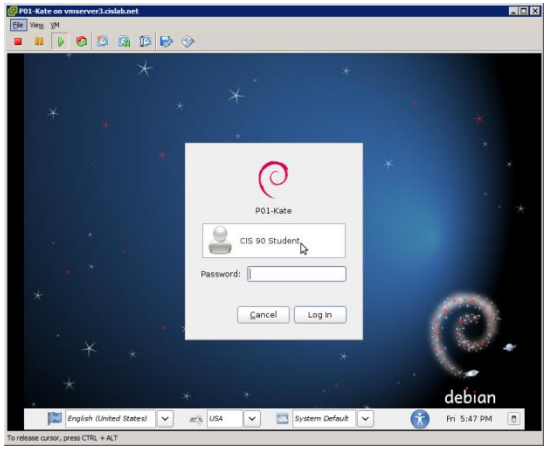


To get a graphical terminal
Menu **> Terminal**





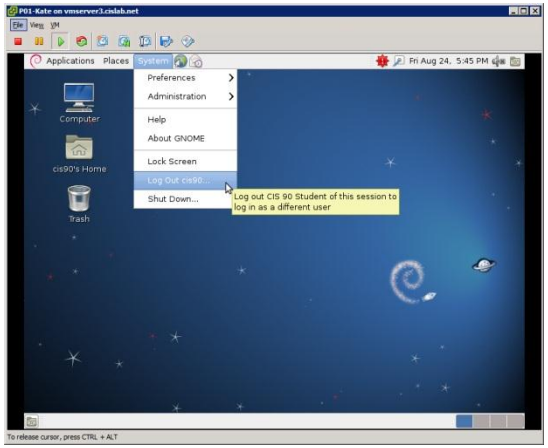
Log in as
CIS 90 Student



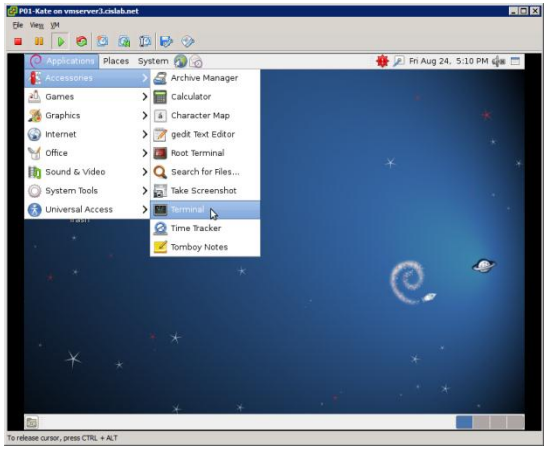
The Kate VM (Debian)

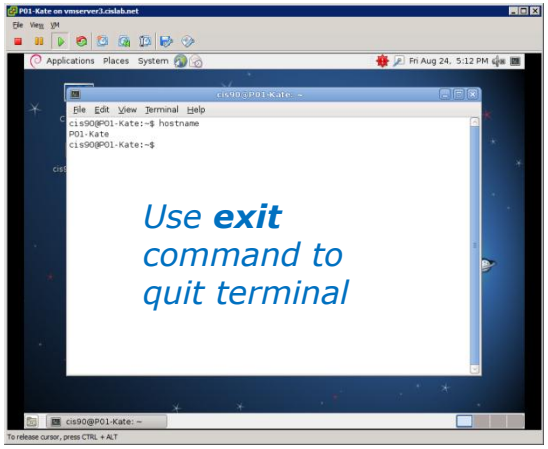
Summary
Mouse control: yucky
TTYs: F1 to F6
Graphics: F9
Desktop: GNOME

Log out using
System > Log Out cis90...



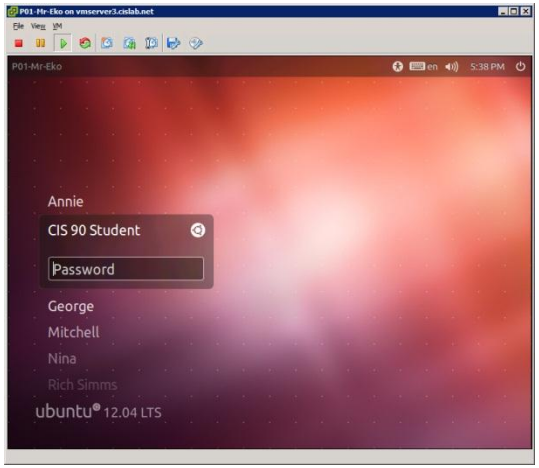
To get a graphical terminal
Applications > Accessories > Terminal





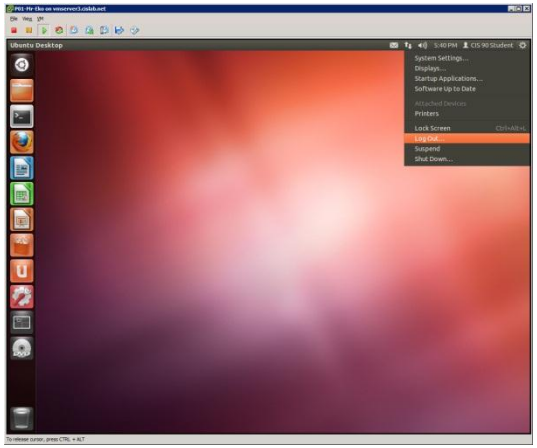
The Mr-Eko VM (Ubuntu)

Log in as
CIS 90 Student

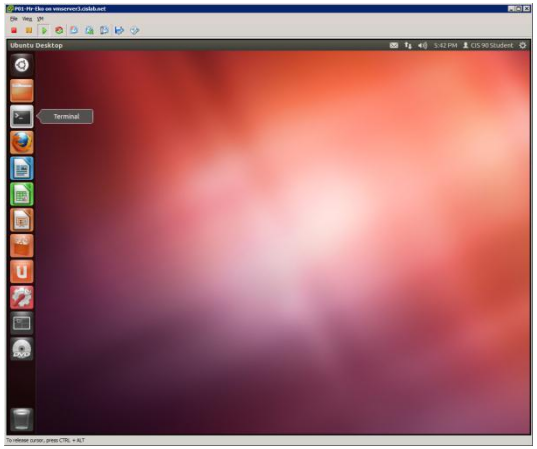


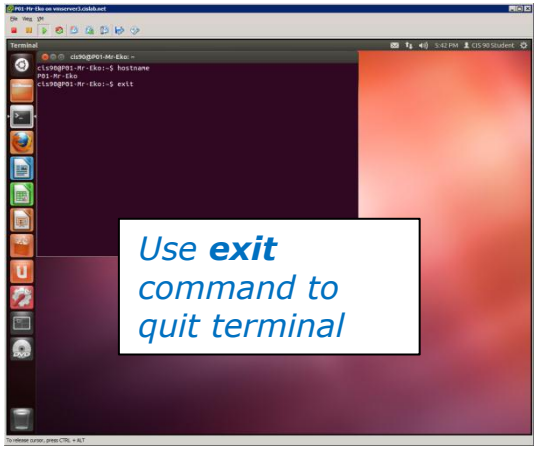
Summary
Mouse control: good
TTYs: F1 to F6
Graphics: F7
Desktop: Unity

Log out using
> LogOut...



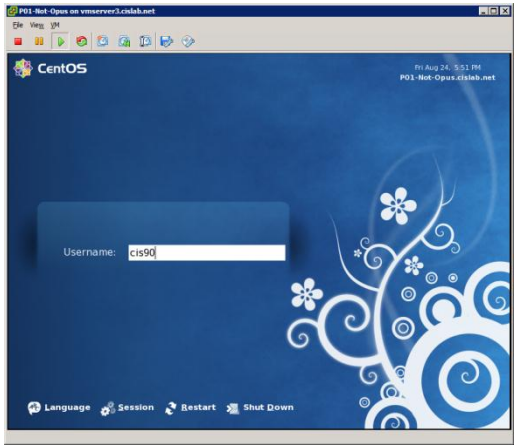
To get a graphical terminal
Terminal icon





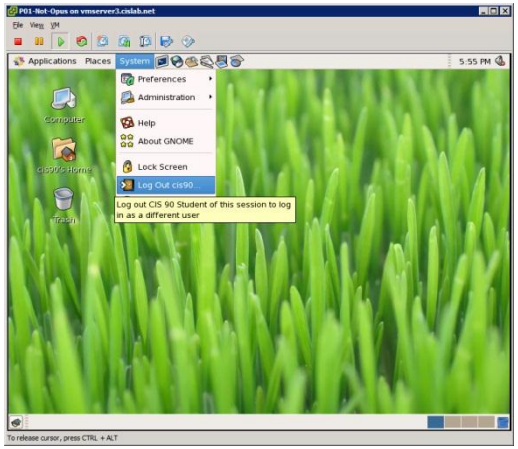
The Not-Opus VM (CentOS)

Log in as
cis90

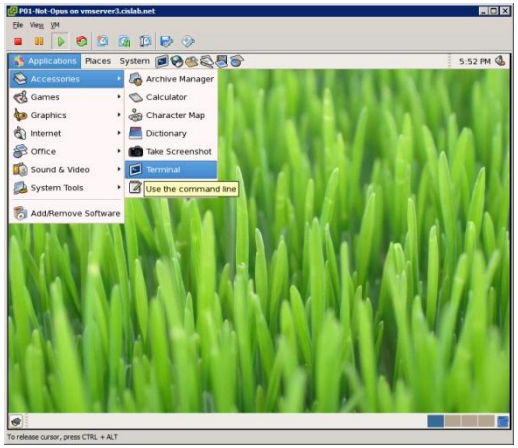


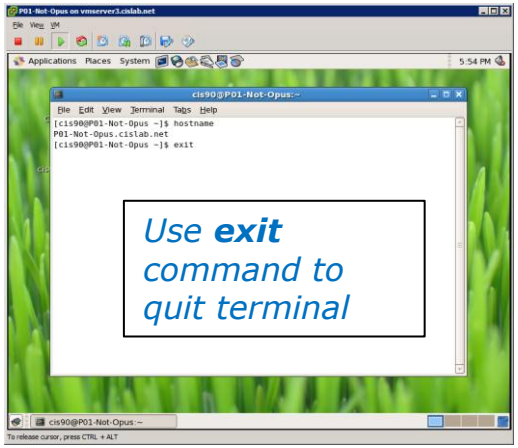
Summary
Mouse control: good
TTYs: F1 to F6
Graphics: F7
Desktop: GNOME

Log out using
System > Log Out cis90...



To get a graphical terminal
Applications > Accessories > Terminal





Virtual/Console tty Terminals

```
Ubuntu 11.04 frodo tty1

frodo login: benji
Password:
Last login: Tue Feb  7 08:52:55 PST 2012 from 172.30.4.101 on pts/1
Welcome to Frodo (Ubuntu 11.04)
benji@frodo:~$ uname
Linux
benji@frodo:~$ _
```

Ctrl-⊞-Alt-Space-F1 (for tty1)

```
Ubuntu 11.04 frodo tty2

frodo login: benji
Password:
Last login: Tue Feb  7 09:50:35 PST 2012 on tty1
Welcome to Frodo (Ubuntu 11.04)
benji@frodo:~$ tty
/dev/tty2
benji@frodo:~$ ps
  PID TTY          T
16314 tty2     00:00
17097 tty2     00:00
benji@frodo:~$
```

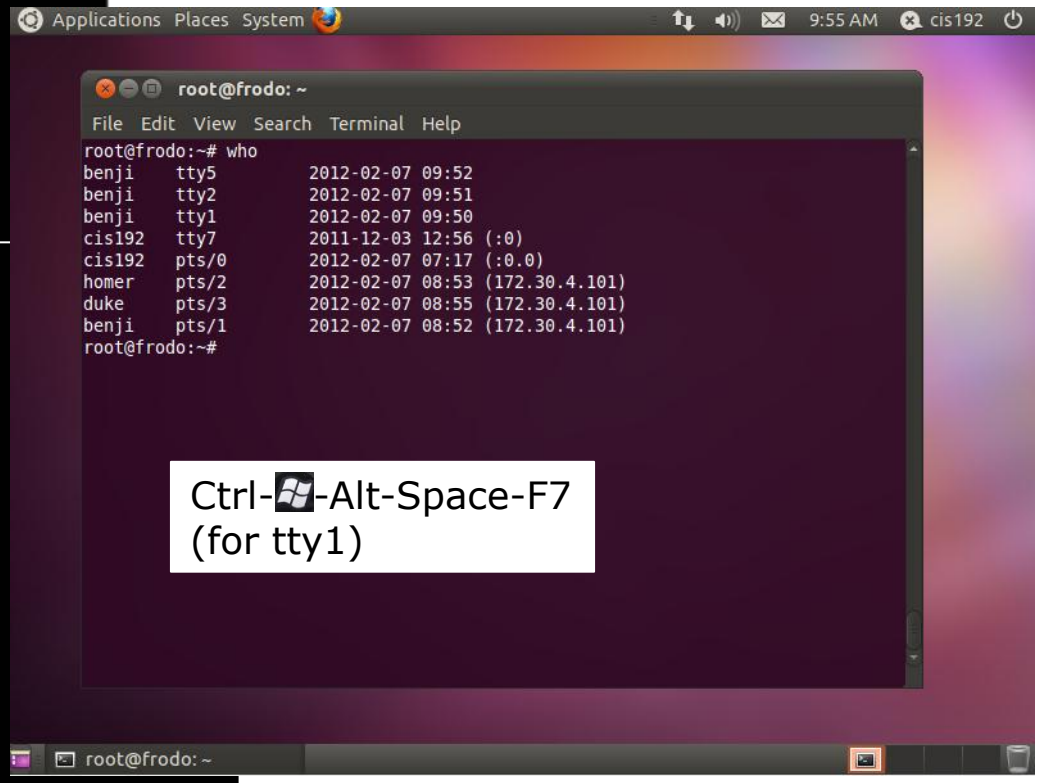
Ctrl-⊞-Alt-Space-F2 (for tty2)

```
Ubuntu 11.04 frodo tty5

frodo login: benji
Password:
Last login: Tue Feb  7 09:51:43 PST 2012 on tty2
Welcome to Frodo (Ubuntu 11.04)
benji@frodo:~$ hostname
frodo
benji@frodo:~$ ls
examples.desktop
benji@frodo:~$ date
Tue Feb  7 09:54:56 PST 2012
benji@frodo:~$ _
```

Ctrl-⊞-Alt-Space-F5 (for tty5)

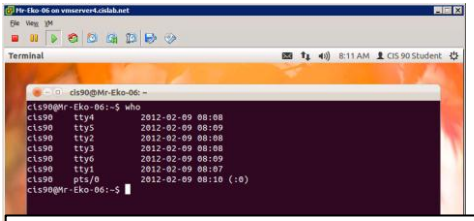
Use virtual terminals (tty's) to have multiple login sessions on one system

While holding down Crtl-⊞-Alt keys, tap Space, then tap Fn key



Ctrl-⊞-Alt-Space-F7 (for tty1)

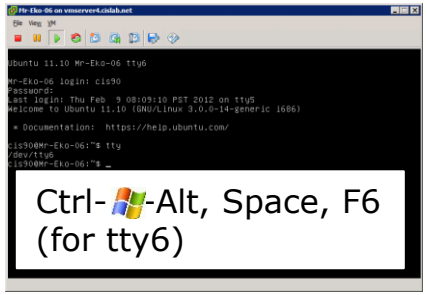
Changing Virtual TTY Terminals using **VMware vSphere**



Ctrl-⊞-Alt, Space, F7**
(for graphics)

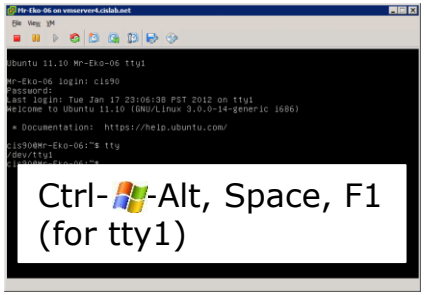
** F9 on Linux Mint and Debian

Windows PC Keyboard

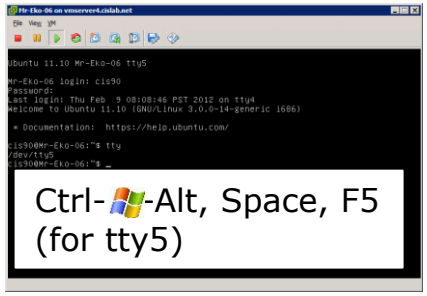


Ctrl-⊞-Alt, Space, F6
(for tty6)

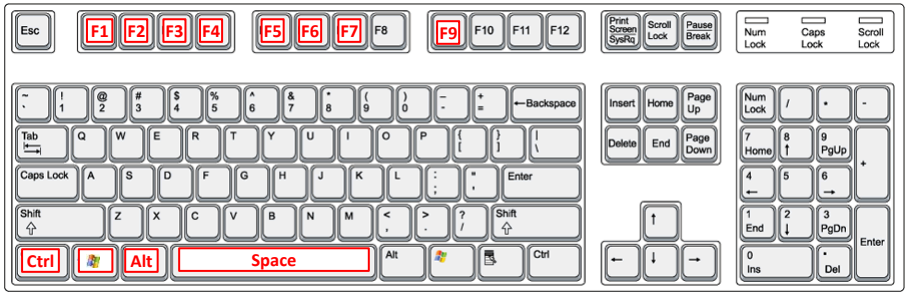
While holding down Crtl-⊞-Alt keys, tap Space, then tap Fn key*

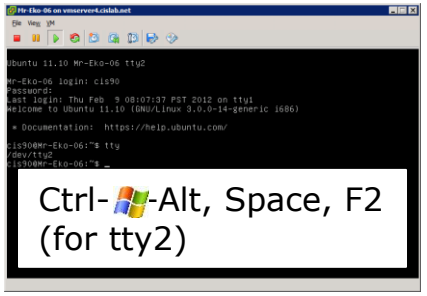


Ctrl-⊞-Alt, Space, F1
(for tty1)

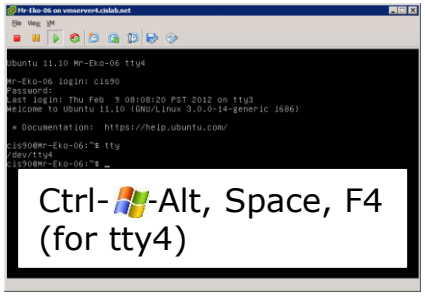


Ctrl-⊞-Alt, Space, F5
(for tty5)

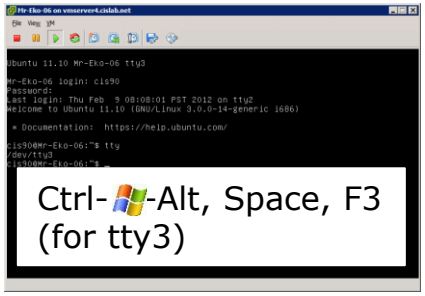




Ctrl-⊞-Alt, Space, F2
(for tty2)



Ctrl-⊞-Alt, Space, F4
(for tty4)

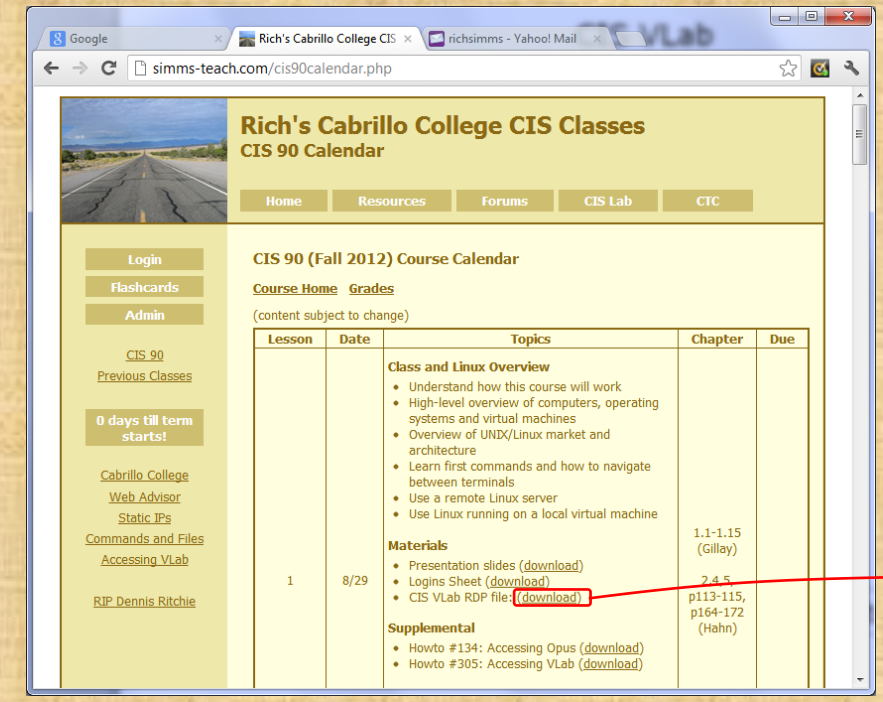


Ctrl-⊞-Alt, Space, F3
(for tty3)

*On some PC keyboards it is not necessary to use the ⊞ key

Note: This is for vSphere only. The ⊞ key and Space bar are not pressed for physical (non-VM) servers

Class Activity - CIS VLab



You must download and use the RDP file to access VLab with your unique credentials

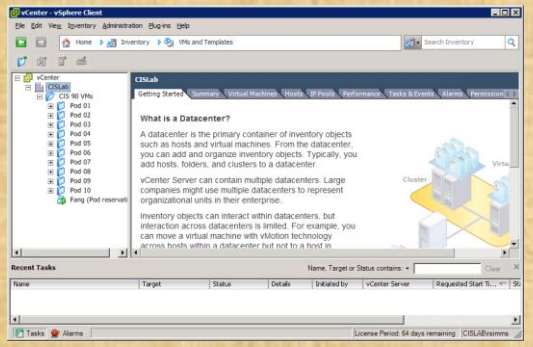
Class Activity – "Follow Along" Demo

POD 1				POD 2				POD 3			
Hugo	Kate	Mr-Eko	Not Opus	Hugo	Kate	Mr-Eko	Not Opus	Hugo	Kate	Mr-Eko	Not Opus
JRA	GAB	SJC	DRD	CLE	CBF	DAH	BUK	RCK	KML	BTL	RLM
JRA	GAB	SJC	DRD	CLE	CBF	DAH	BUK	RCK	KML	BTL	RLM
JRA	GAB	SJC	DRD	CLE	CBF	DAH	BUK	RCK	KML	BTL	RLM
JRA	GAB	SJC	DRD	CLE	CBF	DAH	BUK	RCK	KML	BTL	RLM

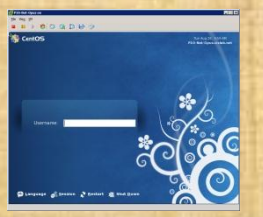
POD 4				POD 5				POD 6			
Hugo	Kate	Mr-Eko	Not Opus	Hugo	Kate	Mr-Eko	Not Opus	Hugo	Kate	Mr-Eko	Not Opus
FAM	MDM	EHN	EOO	BZP	CP	JCP	GR	DAS	JLW	HZ	GDG
FAM	MDM	EHN	EOO	BZP	CP	JCP	GR	DAS	JLW	HZ	GDG
FAM	MDM	EHN	EOO	BZP	CP	JCP	GR	DAS	JLW	HZ	GDG
FAM	MDM	EHN	EOO	BZP	CP	JCP	GR	DAS	JLW	HZ	GDG

POD 7				POD 8				POD 9			
Hugo	Kate	Mr-Eko	Not Opus	Hugo	Kate	Mr-Eko	Not Opus	Hugo	Kate	Mr-Eko	Not Opus
RAB	TWDO	SCP	SES	DKF	HEW	JRC	MBF	KLG	EV	JLR	CCM
RAB	TWDO	SCP	SES	DKF	HEW	JRC	MBF	KLG	EV	JLR	CCM
RAB	TWDO	SCP	SES	DKF	HEW	JRC	MBF	KLG	EV	JLR	CCM
RAB	TWDO	SCP	SES	DKF	HEW	JRC	MBF	KLG	EV	JLR	CCM

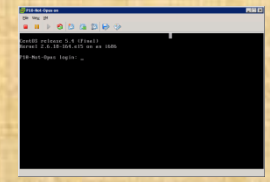
POD 10			
Hugo	Kate	Mr-Eko	Not Opus
AHE	LAG	COR	
AHE	LAG	COR	
AHE	LAG	COR	
AHE	LAG	COR	



VMware vSphere



Graphical Desktop



Virtual TTY terminal

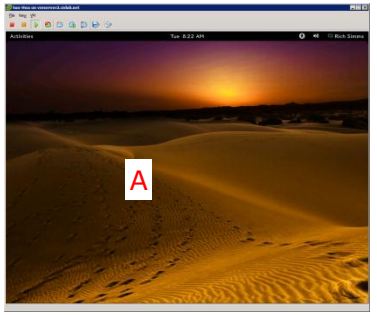
Try logging into CIS VLab with your **own credentials**

- Use the reservation for you shown above (from Fang)
- Open the console of the VM reserved with vSphere
- Login as cis90 into the graphical desktop
- Try changing between the graphical desktop and the TTYs
- Logout when done

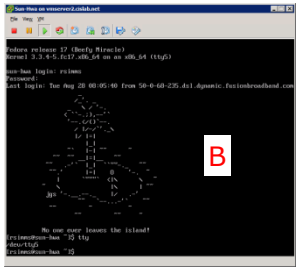
More on who command

Deciphering **who** command output (Fedora 15)
Teletype Terminals (tty), Pseudo Terminals (pts), X windows displays (:*n*)

	user	terminal device	date & time of login	(where logged in from)
A	rsimms	:0	2012-08-02 16:45	(:0)
	cis90	tty2	2012-08-28 08:07	
	rsimms	pts/0	2012-08-02 16:45	(:0)
	rsimms	pts/2	2012-08-02 16:46	(:0)
	rsimms	pts/1	2012-08-02 17:02	(:0)
	rsimms	pts/3	2012-08-02 17:03	(:0)
	rsimms	pts/4	2012-08-02 17:12	(:0)
	rsimms	pts/5	2012-08-02 17:13	(:0)
	rsimms	pts/6	2012-08-02 17:38	(:0)
	rsimms	pts/7	2012-08-02 17:39	(:0)
C	rsimms	pts/8	2012-08-28 08:05	(70-14-68-145.dsl.com)
	CISLAB\simben90	pts/9	2012-08-28 08:06	(70-14-68-145.dsl.com)
	CISLAB\milhom90	tty3	2012-08-28 08:08	
E	cis90	pts/10	2012-08-28 08:11	(p9-hugo.cislab.net)
B	rsimms	tty5	2012-08-28 08:12	
D	rsimms	pts/11	2012-08-28 08:29	(:0)

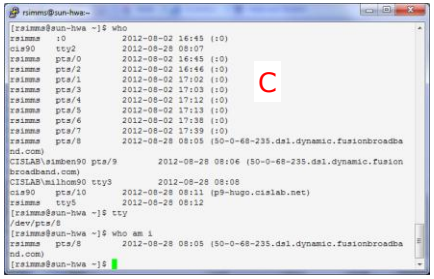


:0 – the graphical desktop

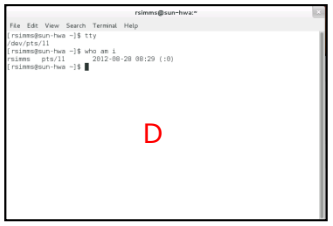


tty5 - a virtual terminal (Ctrl-Alt-F5)

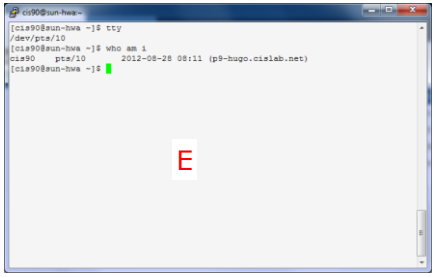
Note, a PTS (Pseudo Terminal) device will be either a graphical terminal on the desktop or a remote login from another computer



pts/8 - an SSH login over the Internet from Windows PC



pts/11 – a graphical terminal on the desktop



pts/10 – an SSH login from Pod Server P9-Hugo

Deciphering **who** command output (Red Hat 9)
Teletype Terminals (tty), Pseudo Terminals (pts), X windows displays (:*n*)

/dev/pts/3 (Putty)

```
[rsimms@frida rsimms]$ who
root     tty1         Jun 23 16:00
rsimms   tty2         Jun 23 16:00
rsimms   :0           Jun 22 15:43
rsimms   pts/0        Jun 22 15:43 (:0.0)
root     pts/1        Jun 23 16:08 (192.168.0.25)
rsimms   pts/2        Jun 23 16:04 (:0.0)
rsimms   pts/3        Jun 23 16:08 (192.168.0.25)
[rsimms@frida rsimms]$ tty
/dev/pts/3
[rsimms@frida rsimms]$
```

/dev/tty/2 (Ctrl-Alt-F2)

```
[rsimms@frida rsimms]$ who
root     tty1         Jun 23 16:00
rsimms   tty2         Jun 23 16:00
rsimms   :0           Jun 22 15:43
rsimms   pts/0        Jun 22 15:43 (:0.0)
root     pts/1        Jun 23 16:08 (192.168.0.25)
rsimms   pts/2        Jun 23 16:04 (:0.0)
rsimms   pts/3        Jun 23 16:08 (192.168.0.25)
[rsimms@frida rsimms]$ tty
/dev/tty2
[rsimms@frida rsimms]$
```

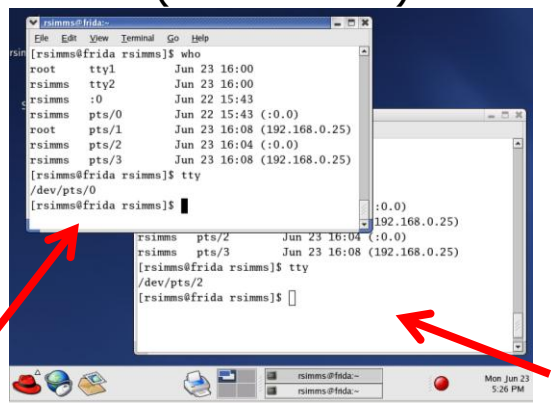
```
[root@frida root]# who
root     tty1         Jun 23 16:00
rsimms   tty2         Jun 23 16:00
rsimms   :0           Jun 22 15:43
rsimms   pts/0        Jun 22 15:43 (:0.0)
root     pts/1        Jun 23 16:08 (192.168.0.25)
rsimms   pts/2        Jun 23 16:04 (:0.0)
rsimms   pts/3        Jun 23 16:08 (192.168.0.25)
[root@frida root]# tty
/dev/tty1
[root@frida root]#
```

/dev/tty/1 (Ctrl-Alt-F1)

```
rsimms   :0           Jun 22 15:43
rsimms   pts/0        Jun 22 15:43 (:0.0)
root     pts/1        Jun 23 16:08 (192.168.0.25)
rsimms   pts/2        Jun 23 16:04 (:0.0)
rsimms   pts/3        Jun 23 16:08 (192.168.0.25)
[root@frida root]# ps
  PID TTY          TIME CMD
 3369 pts/1    00:00:00 bash
 3592 pts/1    00:00:00 ps
[root@frida root]#
[root@frida root]# tty
/dev/pts/1
[root@frida root]#
```

/dev/pts/1 (Putty)

:0 (Ctrl-Alt-F7)



/dev/pts/0

/dev/pts/2

Output from who command:

```
root     tty1         Jun 23 16:00
rsimms   tty2         Jun 23 16:00
rsimms   :0           Jun 22 15:43
rsimms   pts/0        Jun 22 15:43 (:0.0)
root     pts/1        Jun 23 16:08 (192.168.0.25)
rsimms   pts/2        Jun 23 16:04 (:0.0)
rsimms   pts/3        Jun 23 16:08 (192.168.0.25)
```

Notes:

:0 = X display 0
:0.0 = X display 0, screen 0
No scroll bars on tty's

Housekeeping

Can I add this class?

- Probably!
- The instructor will email add codes to students that request them after the first class meeting.
- The last day for students to add CIS 90 is Sept 8th.
- Enrolled and wait-listed students that don't show up or don’t contact the instructor in advance ***will be dropped or lose their space on the wait list***.

Roll Call for both sections

Turn OFF the recording

Roll Call

CIS 90 - Lesson 1

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


Justin, Garratt, Sean, Donald

Carlile, Carter, Dajan, Bryn, Rita, Kelly, Benjamin, Ray, Fidel, Michael

Evan, Efrain, Bjorn, Carlos P., Joshua, Gustavo, David, Jacob, Humberto, Gwyneth

Ryan, Timothy, Steven, Stacey, Sean, Hannah, Jose, Max, Kristen, Evie

Jessica, Chad, Andrew, Luis, Carlos R.

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

Roll Call for both sections

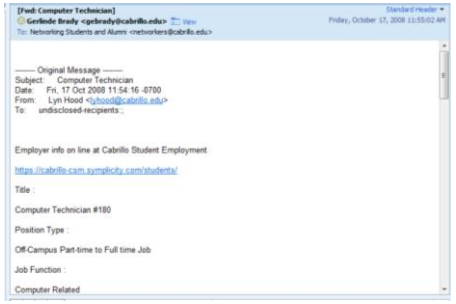
Turn recording back ON

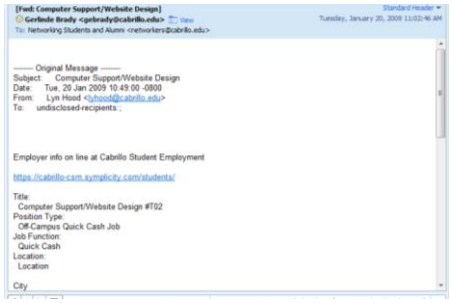
Cabrillo Networking Program Mailing list

Subscribe by sending an email (no subject or body) to:

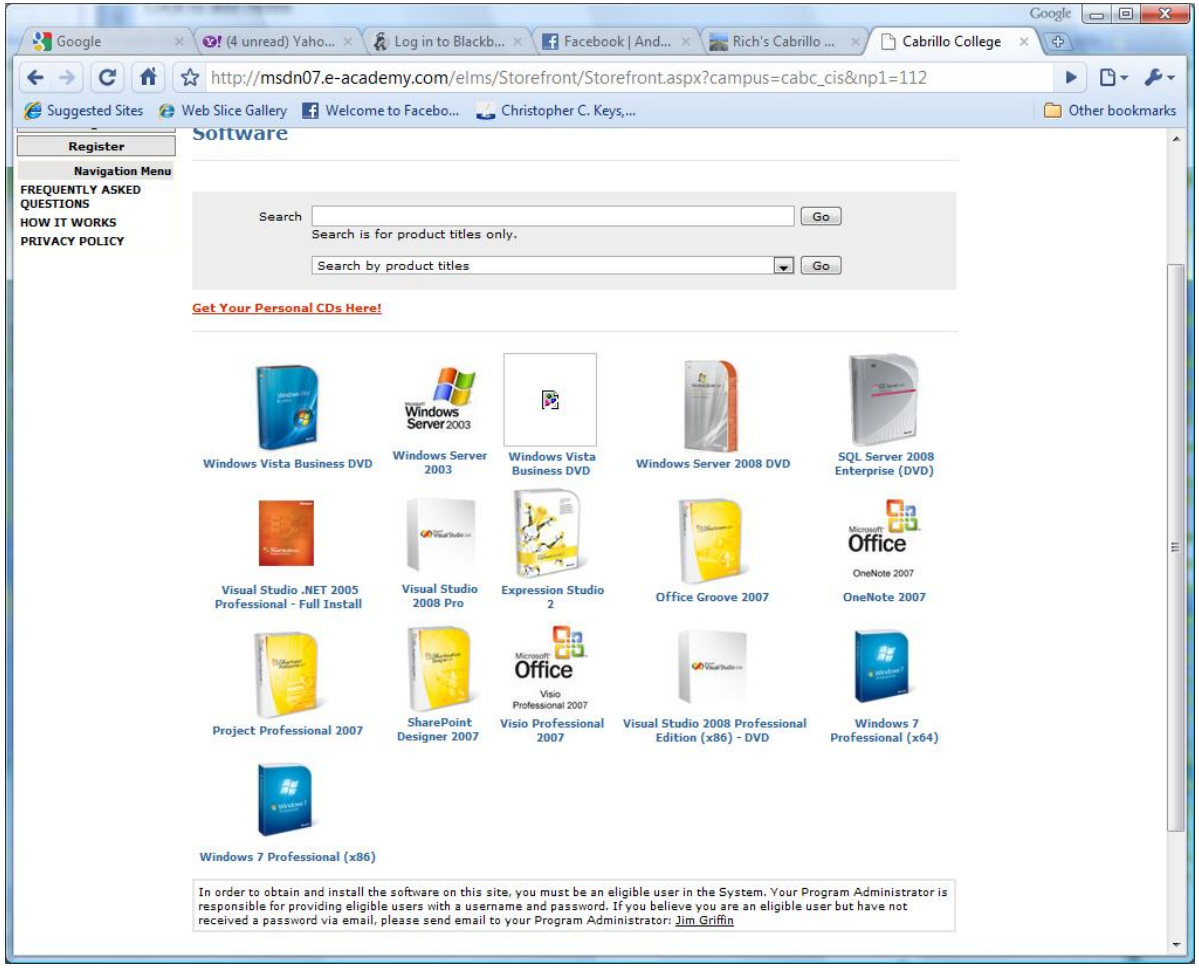
networkers-subscribe@cabrillo.edu

- Program information
- Certification information
- Career and job information
- Short-term classes, events, lectures, tours, etc.
- Surveys
- Networking info and links





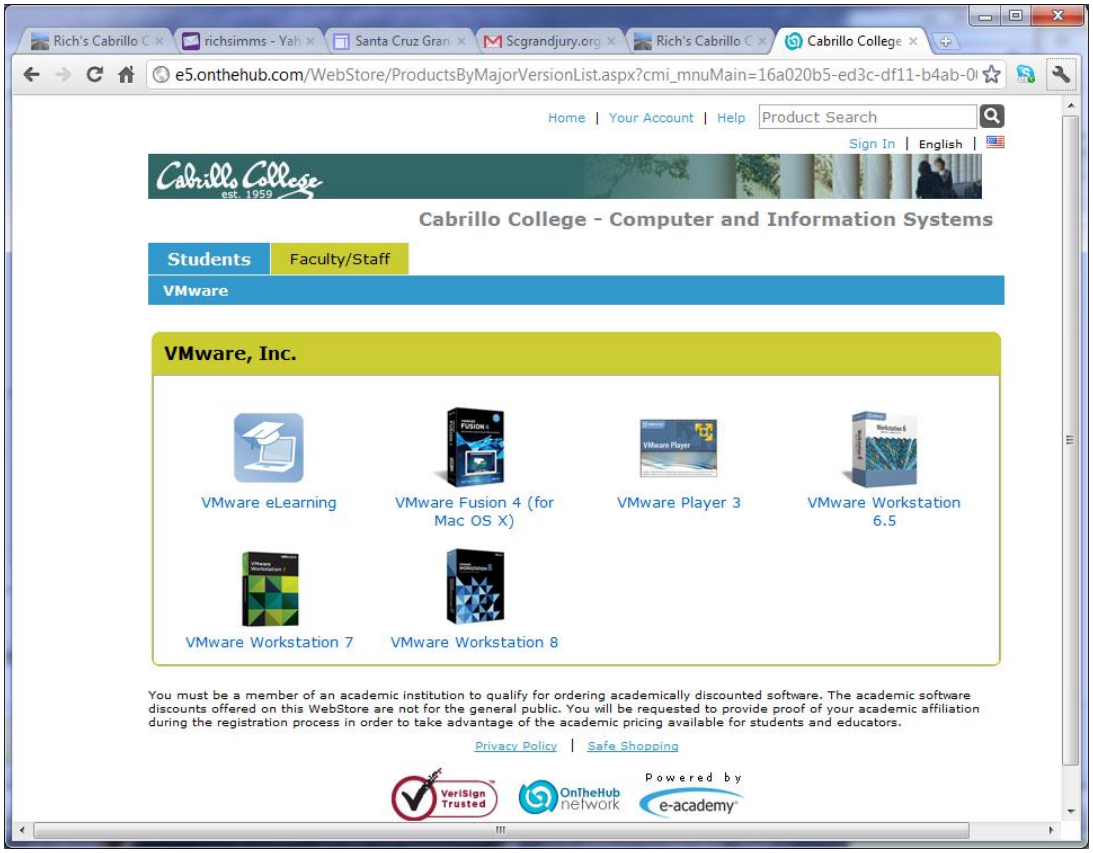
MSDN Academic Alliance



- Microsoft software for students registered in a CIS or CS class at Cabrillo
- Available after registration is final (two weeks after first class)

To get to this page, go to **http://simms-teach.com/resources** and click on the appropriate link in the Tools and Software section

VMware e-academy



- VMware software for students registered in a CIS or CS class at Cabrillo
- Available after registration is final (two weeks after first class)

To get to this page, go to **http://simms-teach.com/resources** and click on the appropriate link in the Tools and Software section

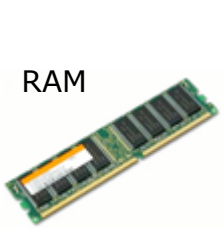
What is a computer

What is a computer?

Desktops

Usually one user at a time

Hardware



RAM

CPU

Network Interface

Motherboard

Hard Drive

CD/DVD Drive

Desktop or Workstation

Software

Programs/Apps

Operating System

What is a computer?

Mobile Devices

Usually one user at a time

Hardware

RAM

CPU

Network Interface

Motherboard

Hard Drive

CD/DVD Drive

Mobile Devices
(designed for mobility)

Software

Programs/Apps

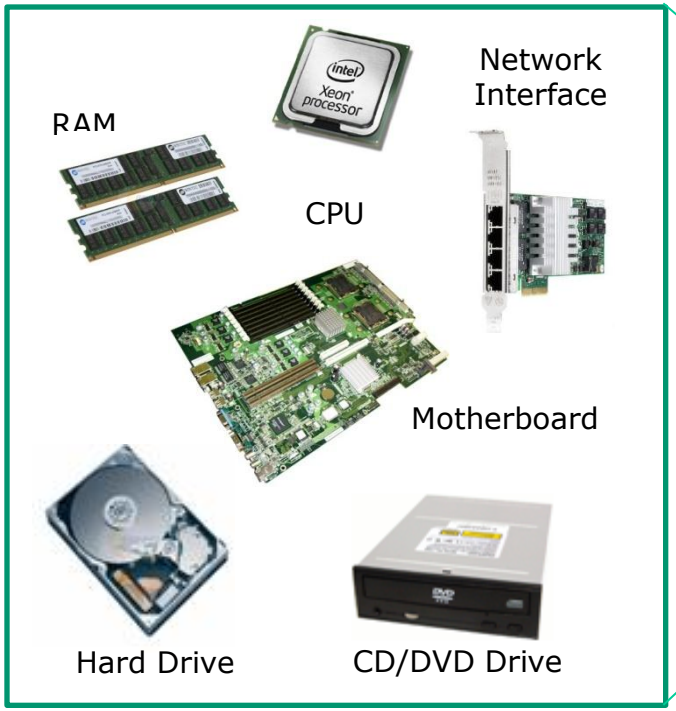
Operating System

What is a computer?

Servers

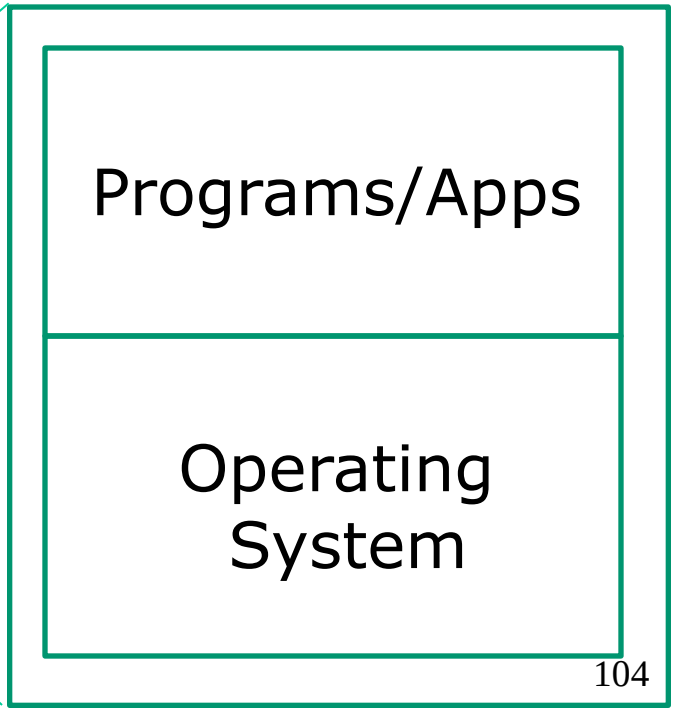
Usually many users at the same time

Hardware



Server Blade
(designed for uptime)

Software



What is a computer?

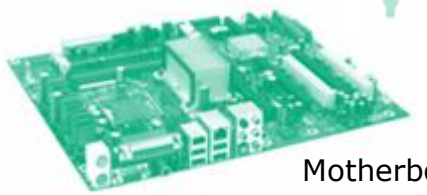
Virtual Machines

Virtual Hardware

RAM

CPU

Network Interface



Motherboard

Hard Drive

CD/DVD Drive

Virtual Machine

Software

Programs/Apps

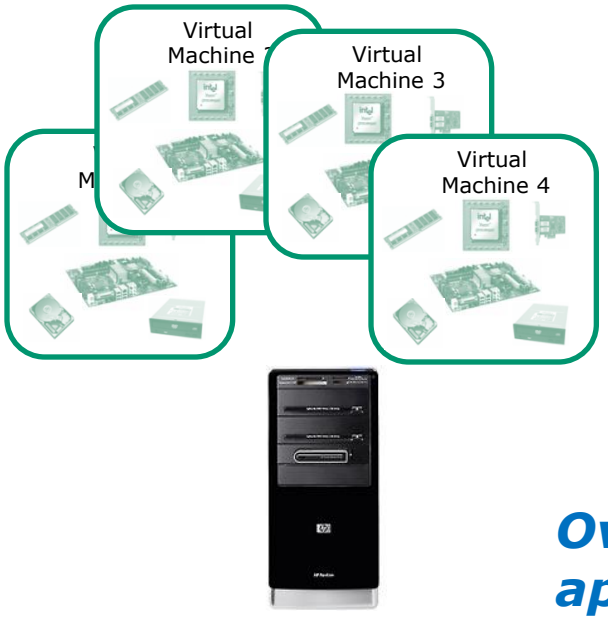
Operating System

Virtual Machines

What is a virtual machine?

- There are software programs (e.g. VMWare, VirtualBox, MS Virtual Server) that simulate perfectly all the hardware of a real computer.

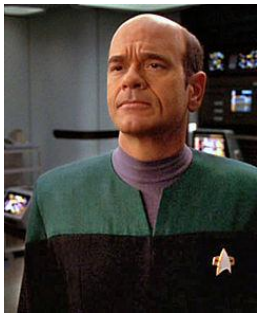
- These simulated computers are called virtual machines or VMs.



- You load an operating system and applications on virtual machines just like you would any other computer.

- The guest OS and apps don't even know they are not running on a "real" computer.

- Opus used to be a 1U rack mounted server. Now it's a VM on a server in building 1300.

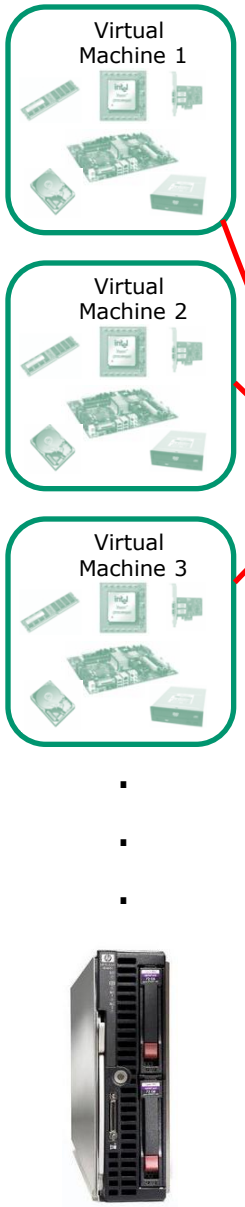


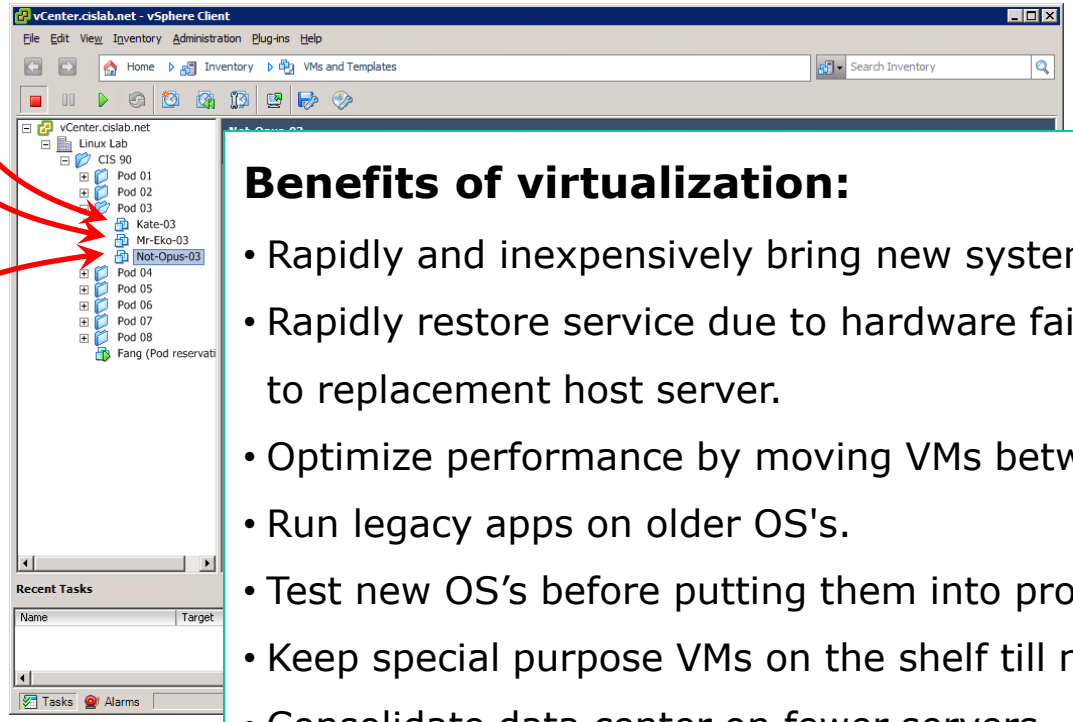
The EMH doctor on Star Trek Voyager was a simulation

Over the network, virtual machines appear just like any other computer.

Virtual Machines

Multiple computers on one computer
… running at the same time
… sharing the same physical hardware

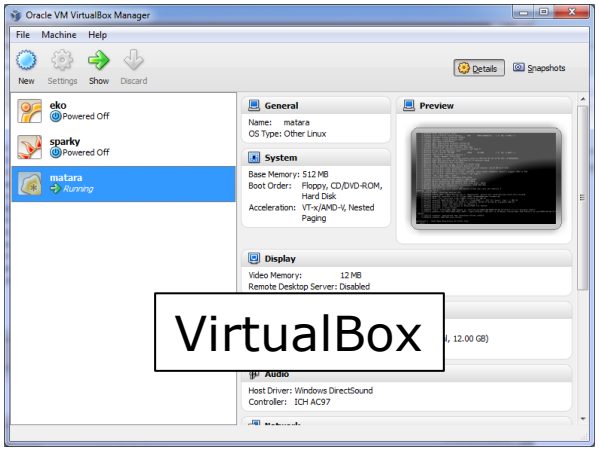


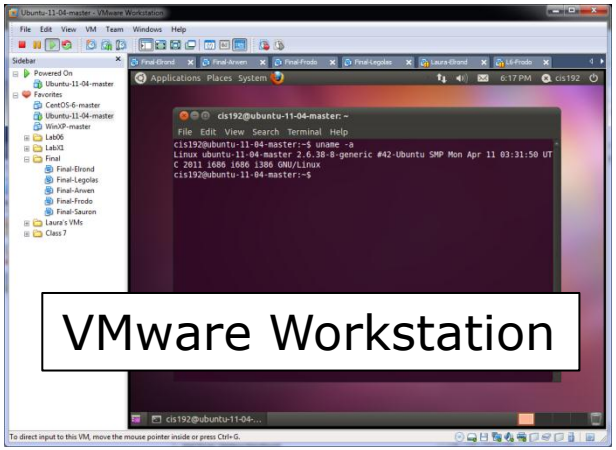


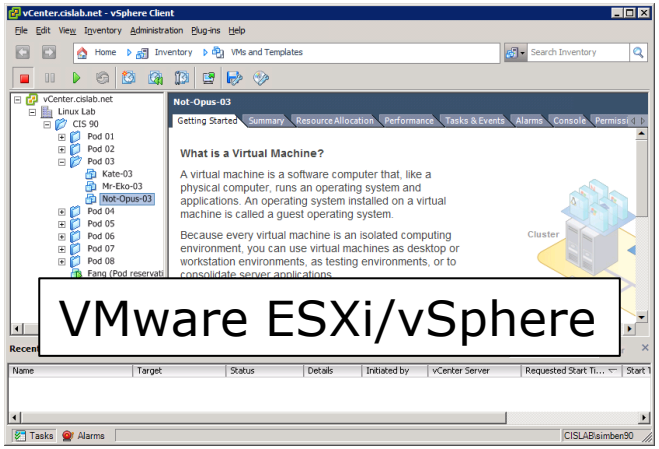
Benefits of virtualization:

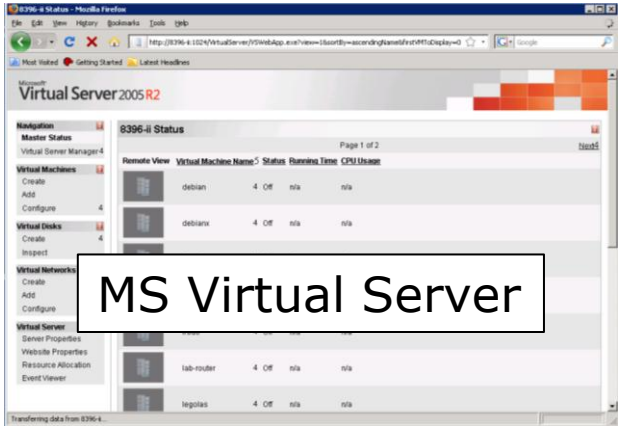
- Rapidly and inexpensively bring new systems online.
- Rapidly restore service due to hardware failures by moving VMs to replacement host server.
- Optimize performance by moving VMs between physical hosts.
- Run legacy apps on older OS's.
- Test new OS's before putting them into production.
- Keep special purpose VMs on the shelf till needed.
- Consolidate data center on fewer servers.
- Students can have their own personal computer lab!

Various Virtualization Products









Software

Software – Programs/Apps

Users





Software

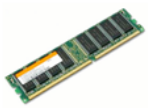
Programs/Apps

- Some programs come as part of the OS
- Some programs are add-ons purchases or downloads
- Provide the interface between user and computer
- Depends on the OS for all access to the hardware

Operating System

Hardware




Software – Programs/Apps

Users





Software

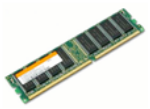
Programs (examples)

Common		Enterprise	UI	Browsers
Word games vi	Photoshop email iTunes	SAP Oracle custom	Explorer bash cmd.exe	Firefox IE Safari

Operating System

Hardware




Software - The Operating System

Users





Software

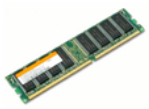
Programs

Operating System

- Interface to the hardware
- Shares hardware resources
- Schedules/executes programs
- Process management
- Input/output services
- System monitoring
- Network stack

Hardware




Software - The Operating System

Users





Software

Programs

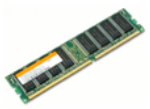
Operating System (examples):

Windows 7 Windows Server	Red Hat Linux Ubuntu Linux	Mac OS X HP-UX

Hardware








Software Licensing

Public Domain (paid for by the taxpayer)

- Source code is available
- No license, no copyright, maybe modified and redistributed
- Examples: USGS mapping software, NASA aerodynamics software.

Open Source

- Source code is available
- Community of developers doing online collaboration
- Pragmatic redistribution licenses
- Examples: Apache, Firefox, Android, OpenOffice

Free Software Movement

- Source code is available
- GNU (“GNU is not UNIX”) license, COPYLEFT
- Examples: GNU/Linux, GIMP

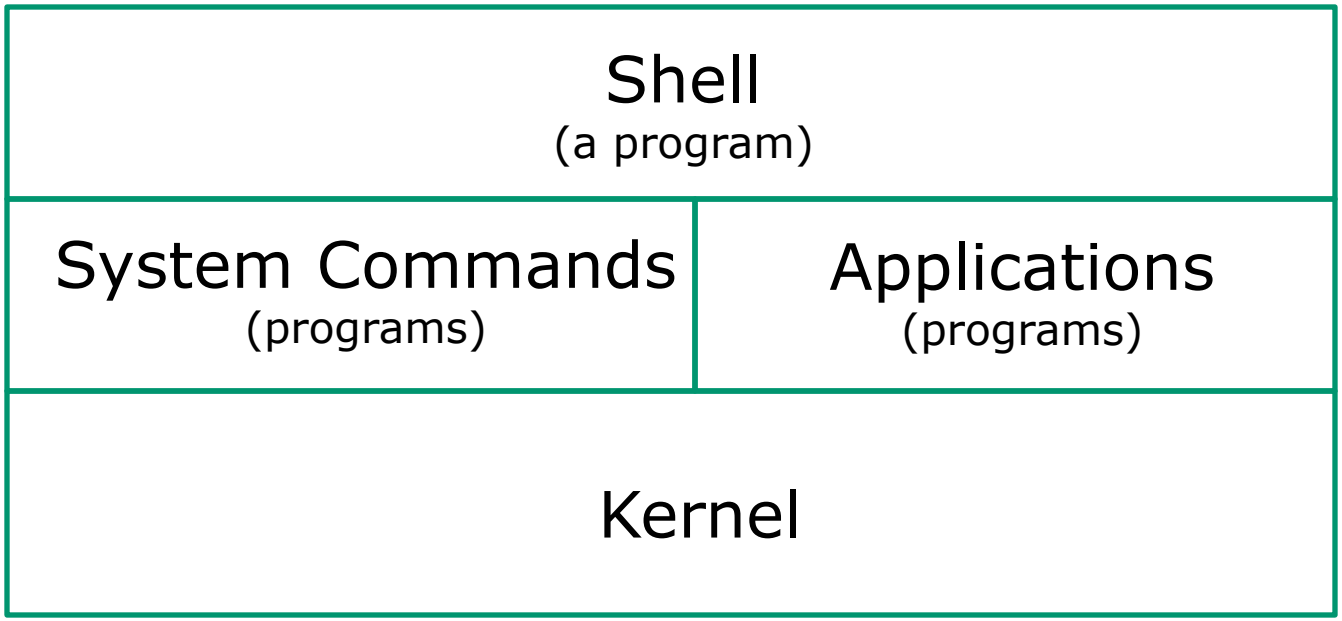
Proprietary

- Intellectual property
- Copyright law
- Examples: Adobe Photoshop, Microsoft Windows, Mac OS X, AT&T UNIX System V

UNIX/Linux Architecture simplified

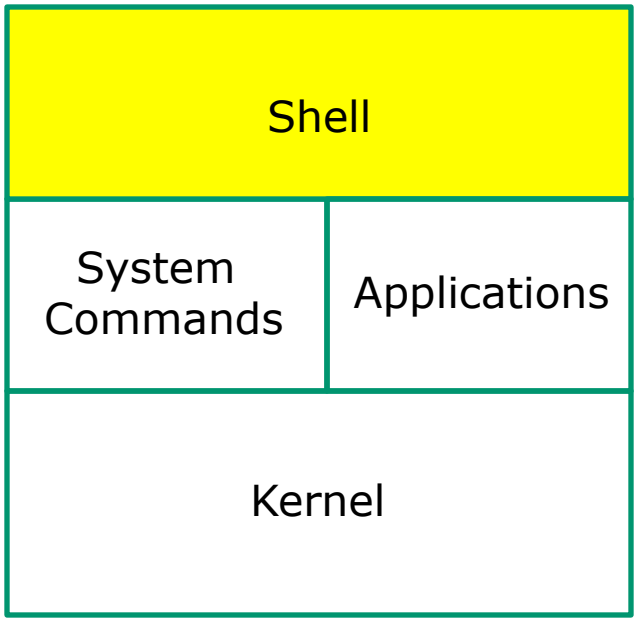
UNIX/Linux Architecture

Simplified View - Four Major Components



UNIX/Linux Architecture

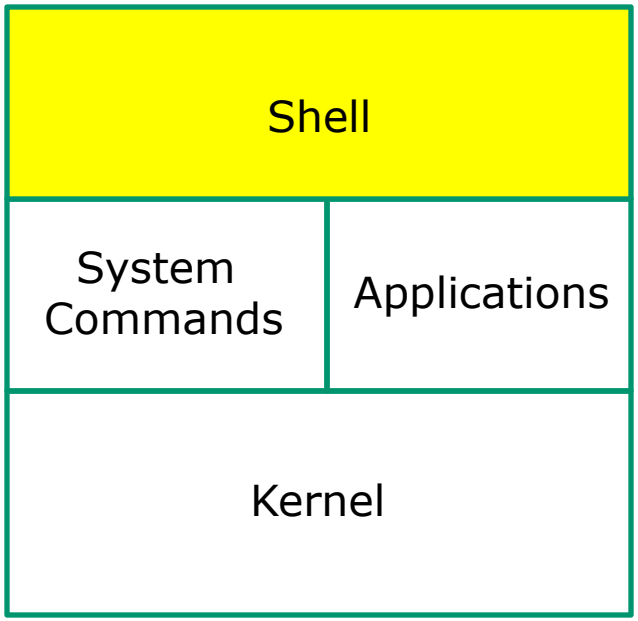
The Shell

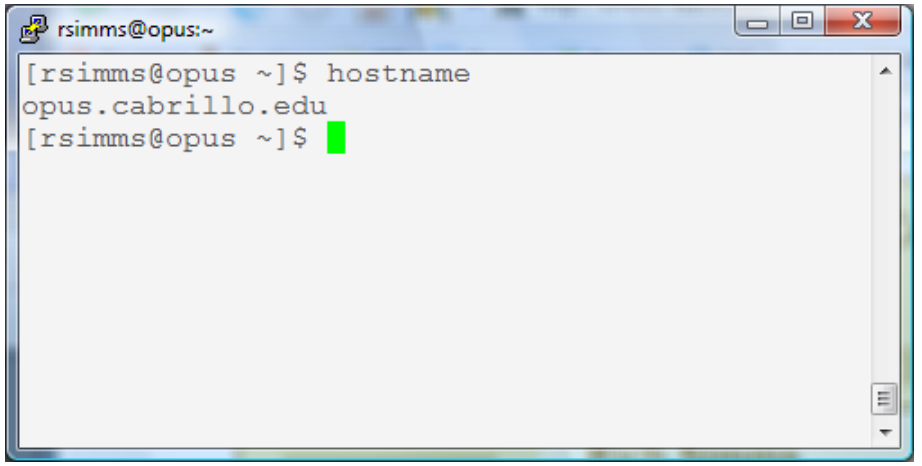


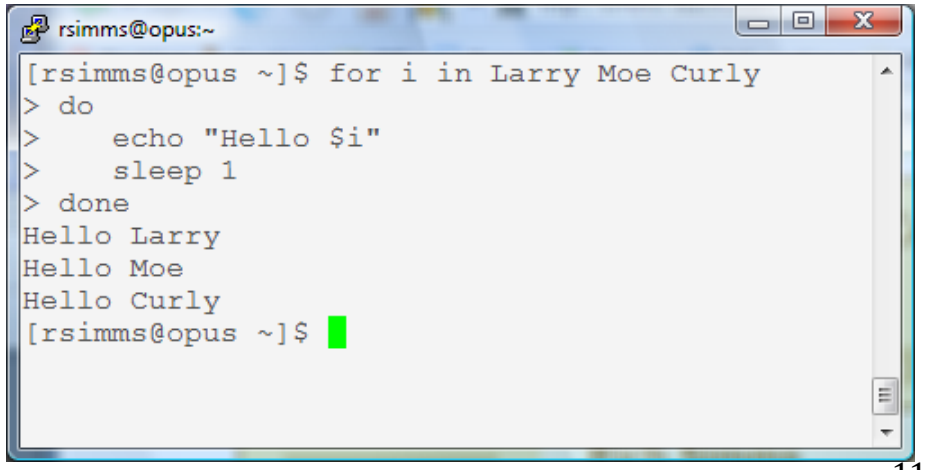
- Allows users to interact with the computer via a "command line".
- Prompts for a command, parses the command, finds the right program and gets that program executed.
- Called a "shell" because it hides the underlying operating system.
- Many shell programs are available: sh (Bourne shell), bash (born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

UNIX/Linux Architecture

The Shell is a user interface and a programming language

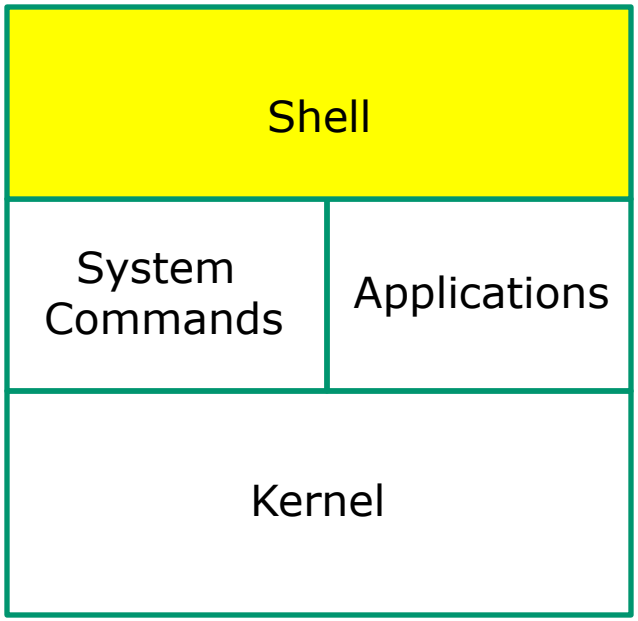






UNIX/Linux Architecture

Shells, graphical shells and in-between

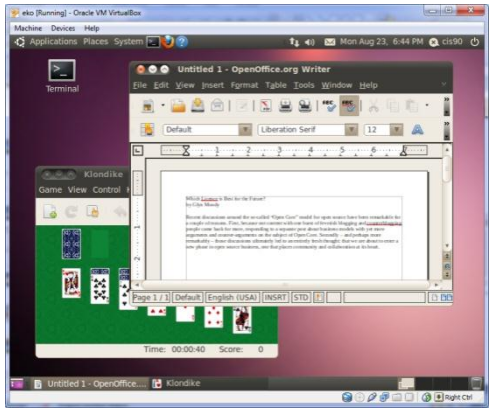


Shell Command Line Interface (CLI)

```
[root@frida root]# iptables -L -t nat
Chain PREROUTING (policy ACCEPT)
target     prot opt source               destination

Chain POSTROUTING (policy ACCEPT)
target     prot opt source               destination

Chain OUTPUT (policy ACCEPT)
target     prot opt source               destination
[root@frida root]#
```

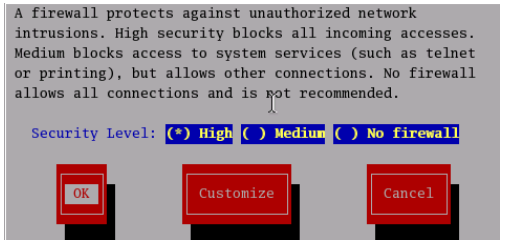
bash

Graphic shells or desktops (GUI)



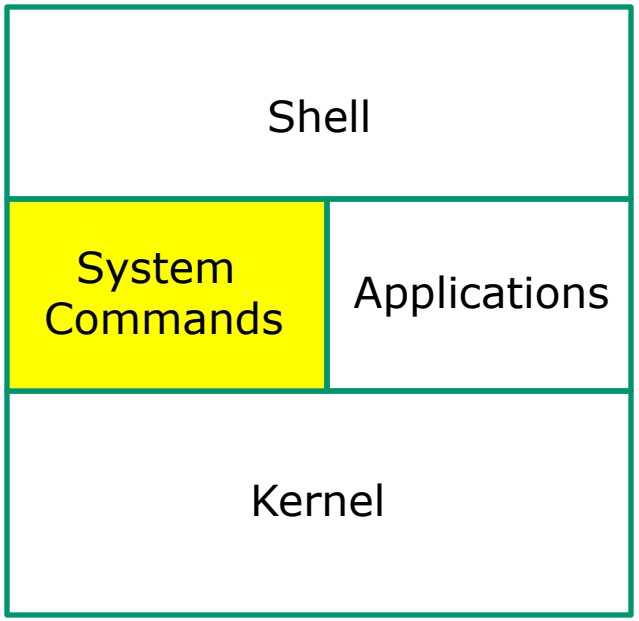
gnome

Text User Interface (TUI)



Lokkit Utility (uses curses library)

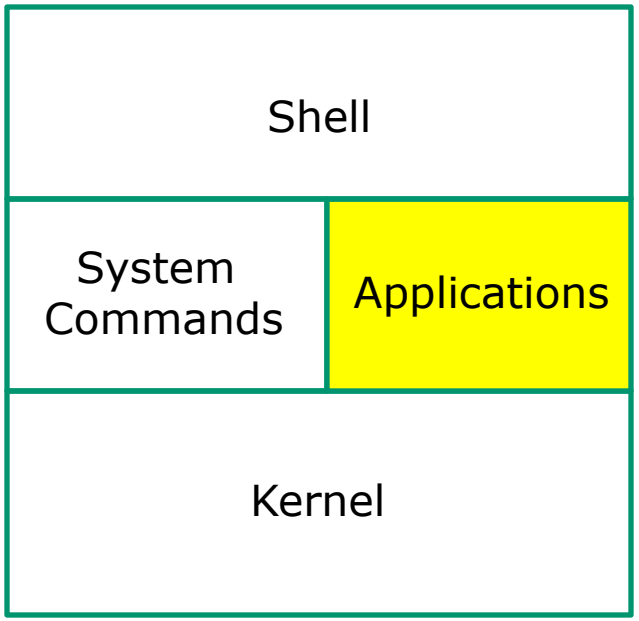
UNIX/Linux Architecture
System Commands



- 100's of system commands and utilities .
- Commands like **ls** (list directories), **cat** (print a file), **rm** (remove a file), … etc.
- Utilities like **vi** (text editor), **sort** (sorts file contents), **find** (searches), … etc.
- Larger utilities like **sendmail** (email), **tar** (backup), **tcpdump** (sniffer), … etc.
- Administrative utilities like **useradd**, **groupadd**, **passwd** (change password), … etc.

UNIX/Linux Architecture

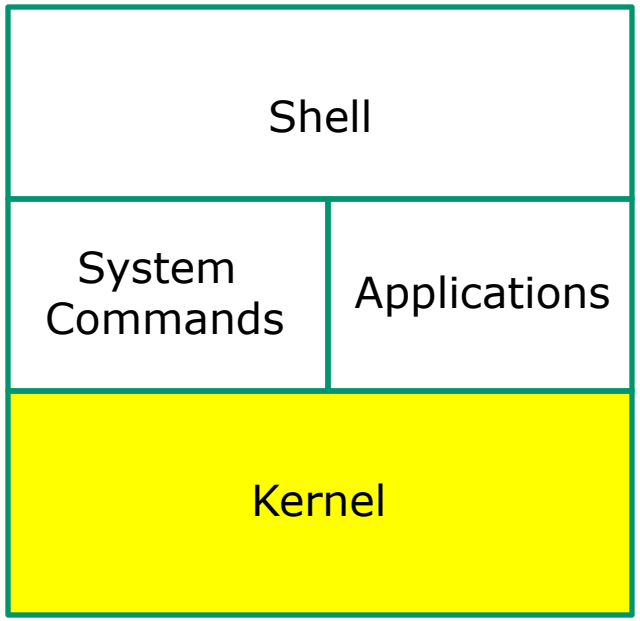
Applications



- Could be included in the distribution or optionally installed.
- Could be an add-on program developed by an ISV (Independent Software Vendor) or Open Source organization.
- Could be an in-house developed custom application.
- Examples are **Apache** (web server), **GIMP** (GNU image manipulation program), **OpenOffice** (word processing, spreadsheets, presentations), **Oracle** (commercial database), … etc.

UNIX/Linux Architecture

Kernel

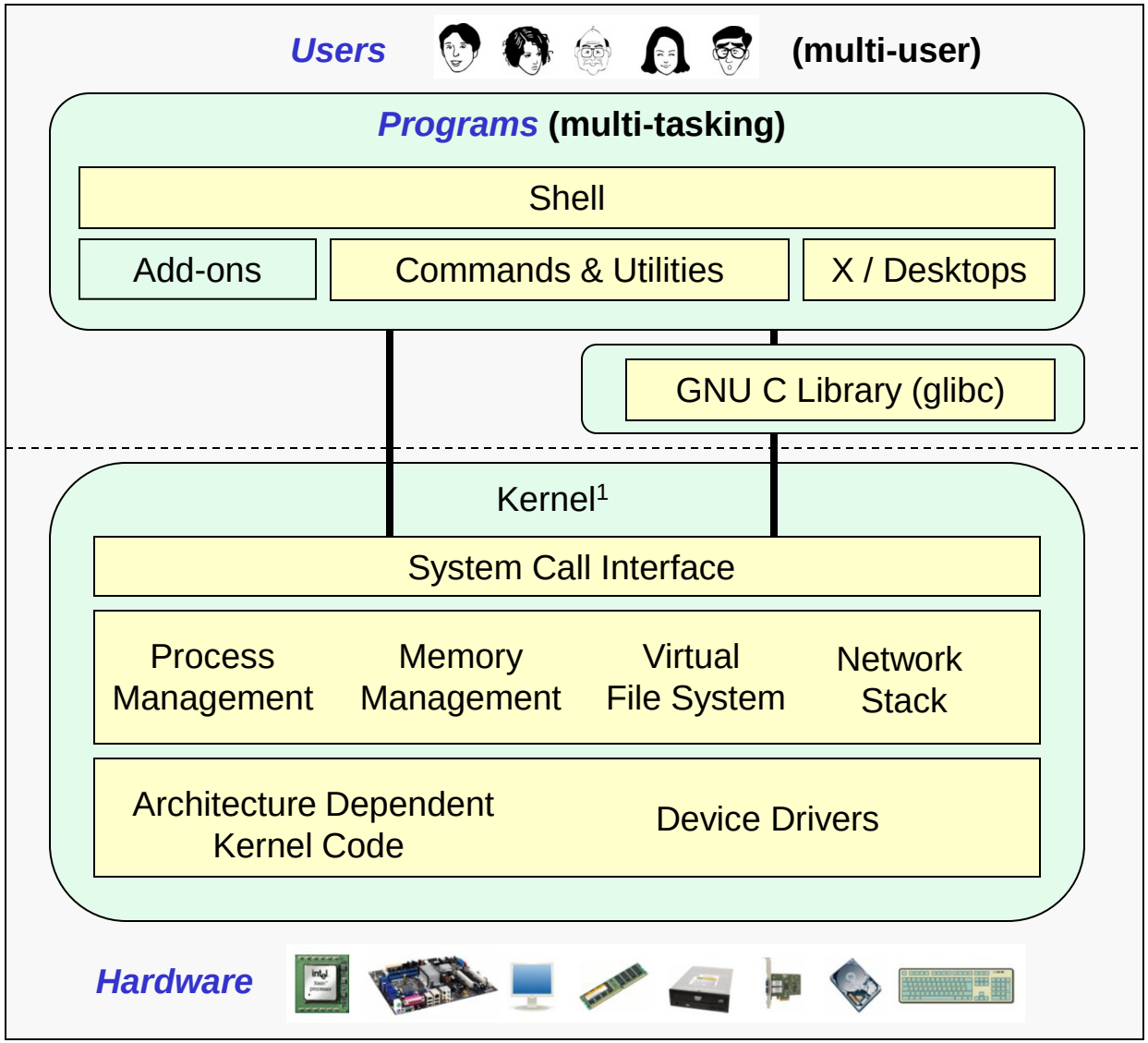


- Lowest level, inner-most core of the operating system.
- Process management - what programs are called when they are loaded and running).
- Memory management - handles all the reads and writes to memory (RAM and virtual memory)
- File System - handle all the reads and writes to files on drives.
- Network stack - provides the communication layers to exchange packets with other computers

All Linux distros are based on the GNU/Linux Operating System Architecture

User Space

Kernel Space



Richard Stallman started the GNU project in 1983 to create a free UNIX-like OS. He Founded the Free Software Foundation in 1985. In 1989 he wrote the first version of the GNU General Public License

Linus Torvalds, as a student, initially conceived and assembled the Linux kernel in 1991. The kernel was later re-licensed under the GNU General Public License in 1992.

[1]See "Anatomy of the Linux kernel" by M. Tim Jones at http://www-128.ibm.com/developerworks/linux/library/l-linux-kernel/

UNIX/Linux Design "Observations"

- Multi-tasking and multi-user capabilities
- Unlike Windows, the GUI does not run in the kernel (adds stability)
- Unlike Windows, multiple graphical desktops available
- Linux kernel is "monolithic", not a "microkernel"
- Dynamic - can load and unload modules on the fly
- Programs restricted to the privileges of the user running them (more secure)
- Scalable - scales up to handle the largest enterprise and mission-critical applications
- Portable - runs on a variety of hardware platforms
- Reliable and robust
- Powerful, but NOT friendly !!

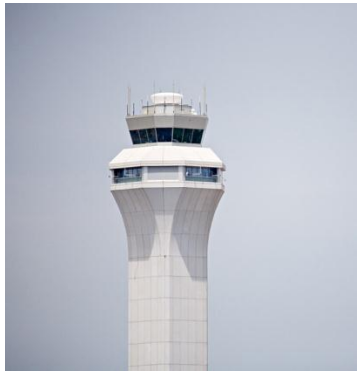
UNIX/Linux Market

Public Works Infrastructure

Roads

Water

Bridges



Airways

Power

Telecomunications

IT (Information Technology) Infrastructure

Network

Servers

Storage

Desktops

Mobile

Software

Computing Infrastructure
Where UNIX/Linux is used

- Internet services - Web, DNS, DHCP, Net News, Mail, etc.
- Enterprise and mission critical applications - Large databases, Enterprise Resource Management (ERM), Customer Relationship Management (CRM), data warehouse, manufacturing, supply chain management, etc.
- Hollywood - feature animation, visual effects, rendering farms.
- Scientific applications and number-crunching
- Embedded in smartphones and other appliances

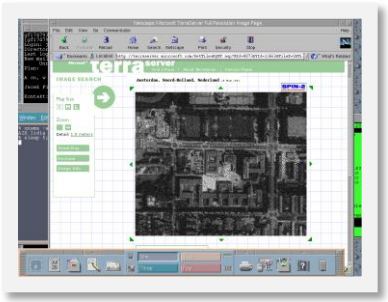
Operating Systems

Various **UNIX** Based Products

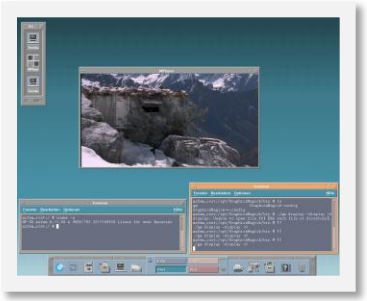
SCO UNIX

Berkeley Software Distribution

AIX



HP-UX



Solaris

Apple Mac OS X and iOS

The kernel is UNIX based

Operating Systems
Embedding **UNIX** in Products

Apple iOS

The Apple iOS, internally known as Darwin, like Mac OS X, runs on a UNIX like kernel (Mach kernel + BSD components)

Source: http://en.wikipedia.org/wiki/Darwin_(operating_system)
http://en.wikipedia.org/wiki/IOS_(Apple)

Operating Systems

Using a Terminal on an iPhone

iPhone

Mobile Terminal

uname command

http://code.google.com/p/mobileterminal/

Operating Systems

Various **Linux** Distributions

OpenSUSE

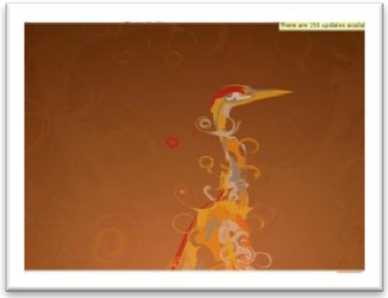
Red Hat Enterprise Linux

Fedora

Debian

CentOS

Ubuntu



Mandriva

*Note: A distribution is built by a company or organization. They start with the **Linux kernel** then add a custom mix of open source components. They may then add some of their own unique software to differentiate their distribution.*

Tux, the penguin, is the Linux kernel mascot

iso.linuxquestions.org

15 Most Popular Downloads

15 Most Downloaded Distribution Versions (last 30 Days)	15 Most Downloaded Distributions (Ever)
1. FreeBSD 8.3 (152941)	1. Fedora
2. Mandriva Linux 2011 (120840)	2. Mandriva
3. OS4 12.5 (68012)	3. Red Hat Enterprise Linux
4. CentOS 6.3 (46492)	4. SUSE
5. BackTrack 5 R3 (11165)	5. Ubuntu
6. Linux Mint 5 Elyssa (6043)	6. CentOS
7. Untangle Gateway 9.3 (3928)	7. Damn Small Linux
8. BackTrack 5 R2 (1807)	8. Linux XP
9. Ubuntu 12.04 (1480)	9. Knoppix
10. Fedora 17 (1200)	10. Debian
11. BackTrack 5 R1 (948)	11. Slackware
12. Damn Small Linux 4.4.10 (834)	12. MEPIS
13. Zorin OS 6 "Educational", "Gaming" (585)	13. PCLinuxOS
14. CentOS 5.5 (433)	14. Gentoo
15. Linux Mint 13 "KDE" (329)	15. Linspire

August 27, 2012

There are hundreds of Linux distributions. The one thing they have in common is they all use the Linux kernel.

Operating Systems
Embedding Linux in Products

Google Chrome OS
(coming soon)
for Netbooks and Tablets

Tivo

Buffalo
NAS storage

Android

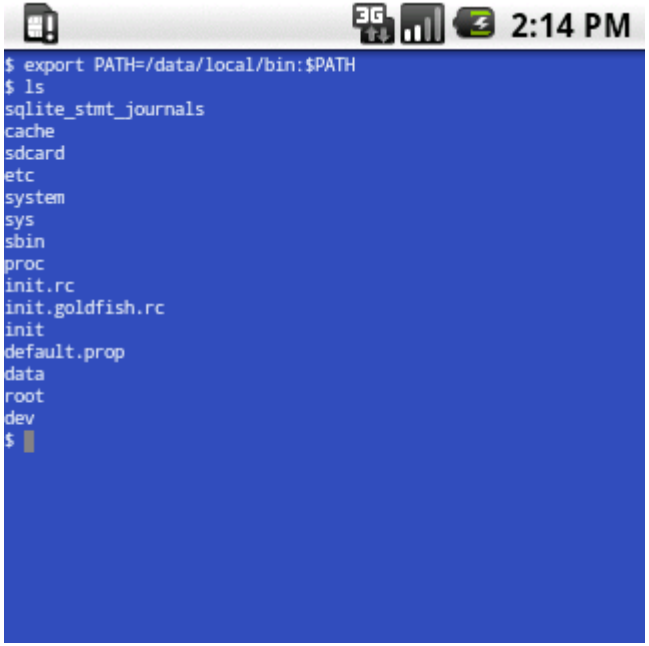
MikroTik Routers

Operating Systems

Running a Terminal on a Droid smartphone

Android

Android Terminal Emulator



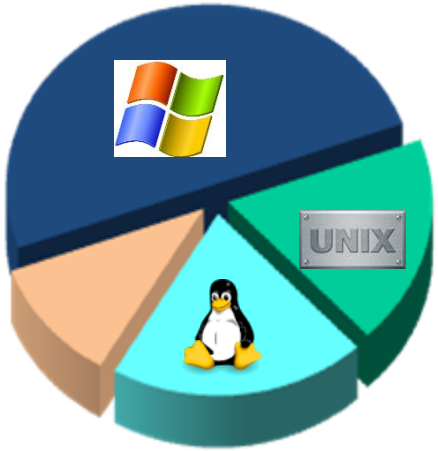
export and ls commands

https://market.android.com/details?id=jackpal.androidterm&hl=en

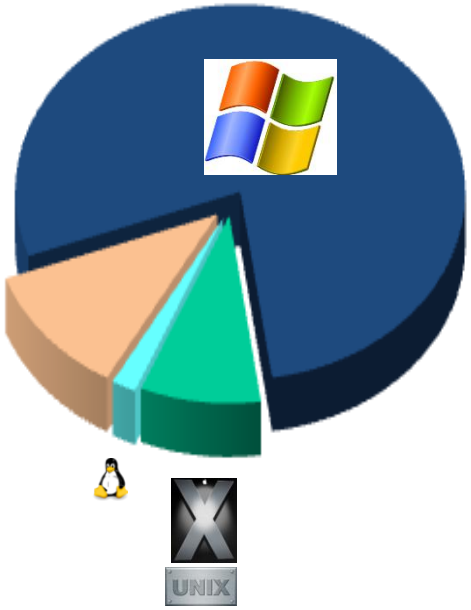
UNIX/Linux Overview

Server, PC, Smartphone markets

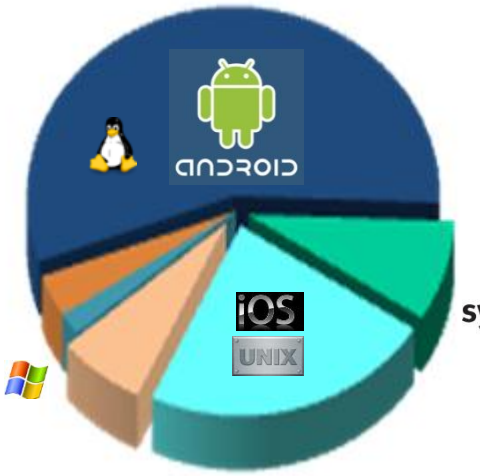
Servers



PC's



Smartphones



Worldwide Server Market

$11.8 Billion Server Revenue 1Q 2012

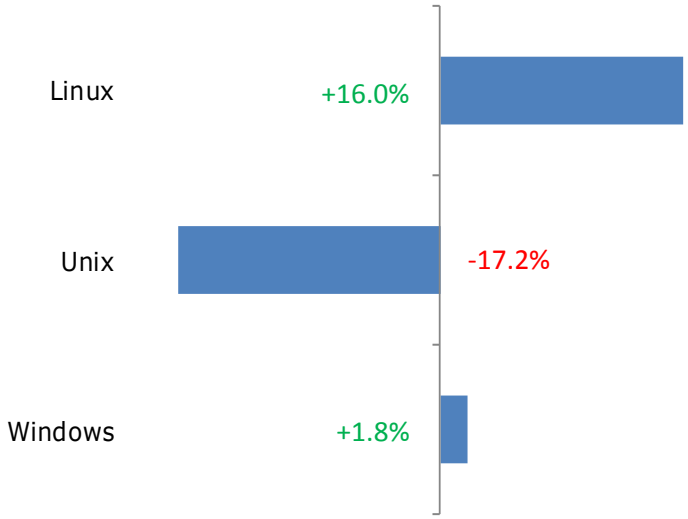
Windows
$5.9B
(50.2%)

Unix
$2.2B
(18.3%)

Other
$1.3B
(11.0%)

Linux
$2.4B
(20.7%)

Year over Year Change



Source: IDC, May 2012

http://www.idc.com/getdoc.jsp?containerId=prUS23513412

Website hits by OS

Implies "ballpark market share" for PCs

Jul 20101[1]

Operating Systems		
1	Windows XP	48.17%
2	Windows 7	17.02%
3	Windows Vista	16.60%
4	Mac OS X	4.84%
5	Linux	1.45%
6	Windows 2003	1.02%
7	iPhone OSX	0.56%
8	Windows 2000	0.31%
9	WAP	0.12%
10	Android	0.08%

Dec 2011[2]

Operating Systems		
1	Windows 7	37.60%
2	Windows XP	31.72%
3	Windows Vista	8.87%
4	Apple OS X	8.59%
5	Apple iOS	3.96%
6	Linux	1.64%
7	Android	1.64%
8	BlackBerry	0.68%
9	SymbianOS	0.23%
10	Windows 2000	0.09%

Jul 2012[3]

Operating Systems		
1	Windows 7	44.12%
2	Windows XP	27.06%
3	Apple OS X	8.66%
4	iOS	7.09%
5	Windows Vista	6.95%
6	Android	2.49%
7	Linux	1.75%
8	BlackBerry	0.64%
9	Windows 8	0.19%
10	SymbianOS	0.19%

1-This report was generated 07/31/2010 based on the last 15,000 page views to each website tracked by W3Counter. W3Counter's sample currently includes 38,996 websites. The browser market share graph includes data from all versions of the named browser families, not only the top 10 as listed below.

2-This report was generated 12/31/2011 based on the last 15,000 page views to each website tracked by W3Counter. W3Counter's sample currently includes 53,526 websites. The browser market share graph includes data from all versions of the named browser families, not only the top 10 as listed below.

3-This report was generated 07/31/2012 based on the last 15,000 page views to each website tracked by W3Counter. W3Counter's sample currently includes 59,310 websites. The browser market share graph includes data from all versions of the named browser families, not only the top 10 as listed below

W3Counter

source: http://www.w3counter.com/globalstats.php

Worldwide Smartphone Sales

Worldwide Smartphone Sales to End Users by Operating System in 1Q12 (Thousands of Units)

	Operating System	1Q12 Units	1Q12 Market Share (%)	1Q11 Units	1Q11 Market Share (%)
Google	Android ↑	81,067.4	56.1	36,350.1	36.4
Apple	iOS ↑	33,120.5	22.9	16,883.2	16.9
Nokia	Symbian ↓	12,466.9	8.6	27,598.5	27.7
Blackberry	Research In Motion ↓	9,939.3	6.9	13,004.0	13.0
	Bada	3,842.2	2.7	1,862.2	1.9
	Microsoft ↓	2,712.5	1.9	2,582.1	2.6
	Others	1,242.9	0.9	1,495.0	1.5
	Total	**144,391.7**	**100.099,775.0**		**100.0**

Source: Gartner (May 2012)

Additional information can be found in the Gartner report "Market Share: Mobile Devices, Worldwide, 1Q12." The report is available on Gartner's website at http://www.gartner.com/resId=2015915.

http://www.gartner.com/it/page.jsp?id=2017015

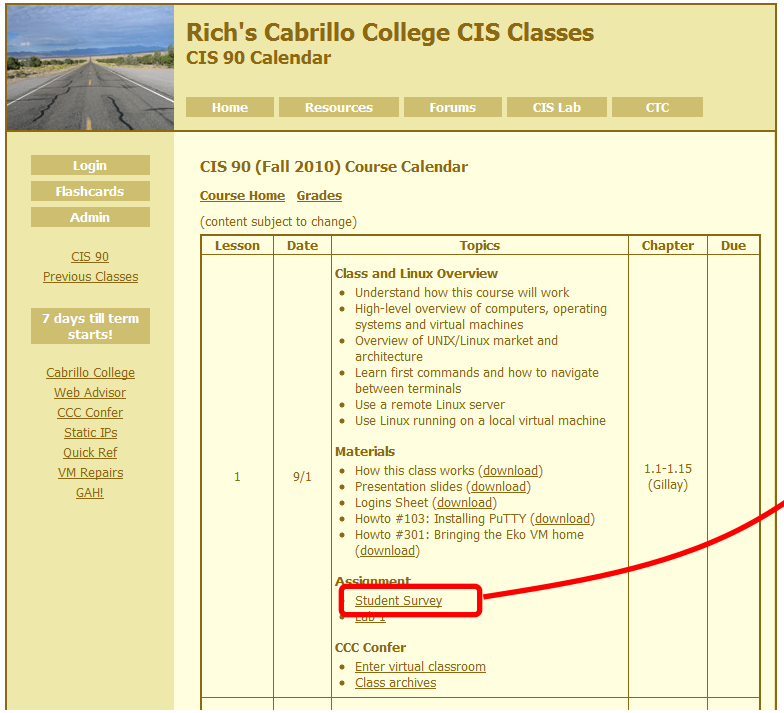
Assignment

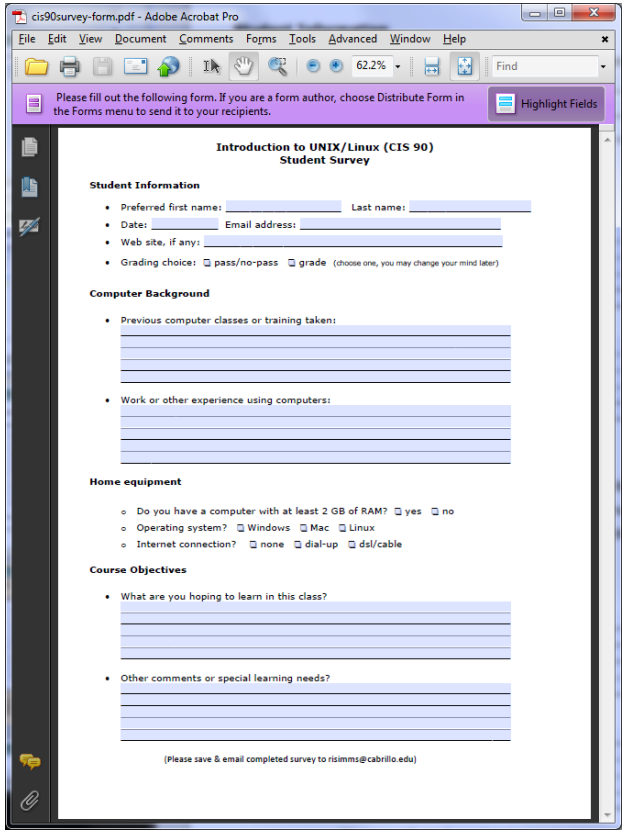
http://simms-teach.com/cis90calendar.php

1	8/29	• Presentation slides (download) • Logins Sheet (download) • CIS VLab RDP file: (download) **Supplemental** • Howto #134: Accessing Opus (download) • Howto #305: Accessing VLab (download) **Assignment** • Student Survey • Lab 1 **CCC Confer** • Enter virtual classroom • Class archives	2,4,5, p113-115, p164-172 (Hahn)	
2	9/5	**Quiz 1** **Commands** • Understand the UNIX login operation works • Meet John the Ripper and learn how vulnerable a poor password is • Understand basic command syntax and operation • Understand program files and what happens when they are run • Understand how the shell works and environment variables • Understand how to get documentation when online	2.3-2.7 2.11 3.7-3.20 4.19-4.22 9.1-9.2	Lab 1 Student Survey

Note: The first lab assignment and student survey is due by 11:59PM one week from today!

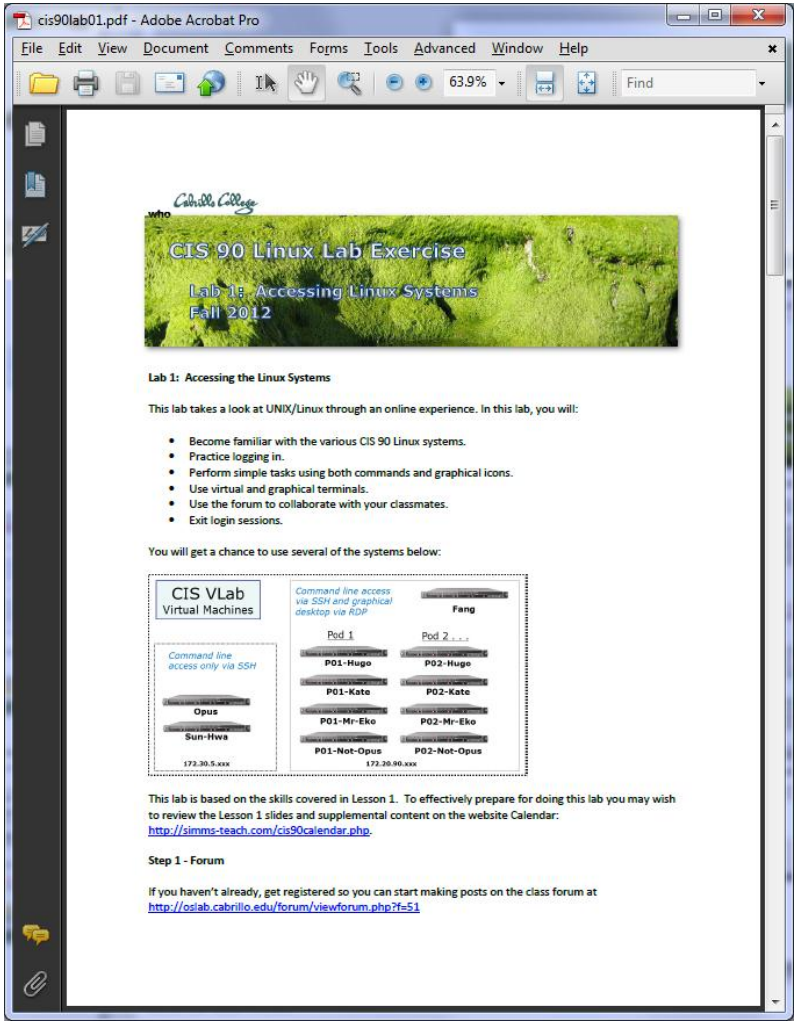
Student Survey





Please ***download*** survey, fill it out, save it, and email to risimms@cabrillo.edu

Lab 1



Pearls of Wisdom:

- Don't wait till the last minute to start.
- The *slower* you go the *sooner* you will be finished.
- A few minutes reading the forum can save you hour(s).
- Line up materials, references, equipment and software ahead of time.
- Use Google when trouble-shooting
- Late work is not accepted so submit what you have for partial credit.

Wrap up

New shell commands:

cal	- show calendar
clear	- clear the terminal screen
date	- show current time and date
exit	- terminate your shell and log off
history	- show previous commands
hostname	- show the name of the computer being accessed
id	- show user and group id information
ps	- show processes (loaded programs) being run
ssh	- secure login to a remote system
uname	- show kernel name
tty	- show terminal device
who	- show everyone logged in
who am i	- identifies which login session you are using
Ctrl-Win-Alt-F1 to Ctrl-Win-Alt-F7	- change between terminals and X windows (graphics)

New Files and Directories:

VMware:

Ctrl-Alt	- to release mouse from VM

Next Class

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

Lab 1 & Survey

Quiz questions for next class:

- What part of UNIX/Linux is both a user interface and a programming language?
- What is the lowest level, inner-most component of a UNIX/Linux Operating System called?
- What command shows the other users logged in to the computer?

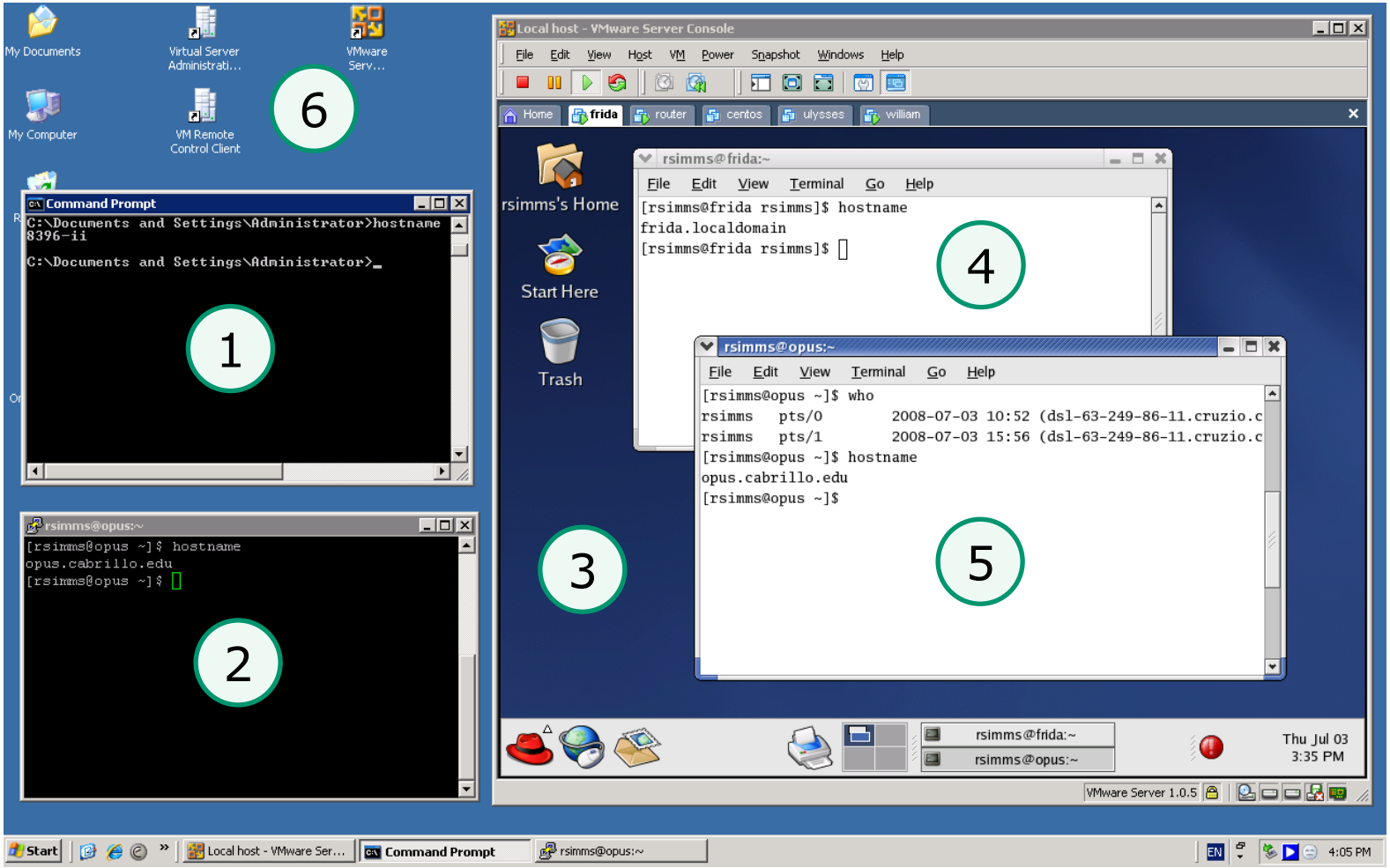
END

Backup

Excuse me, but who am I talking to?

What computer are we talking to?

Is it 8396-II (Windows), Opus (RHEL) or Frida (RH9)?

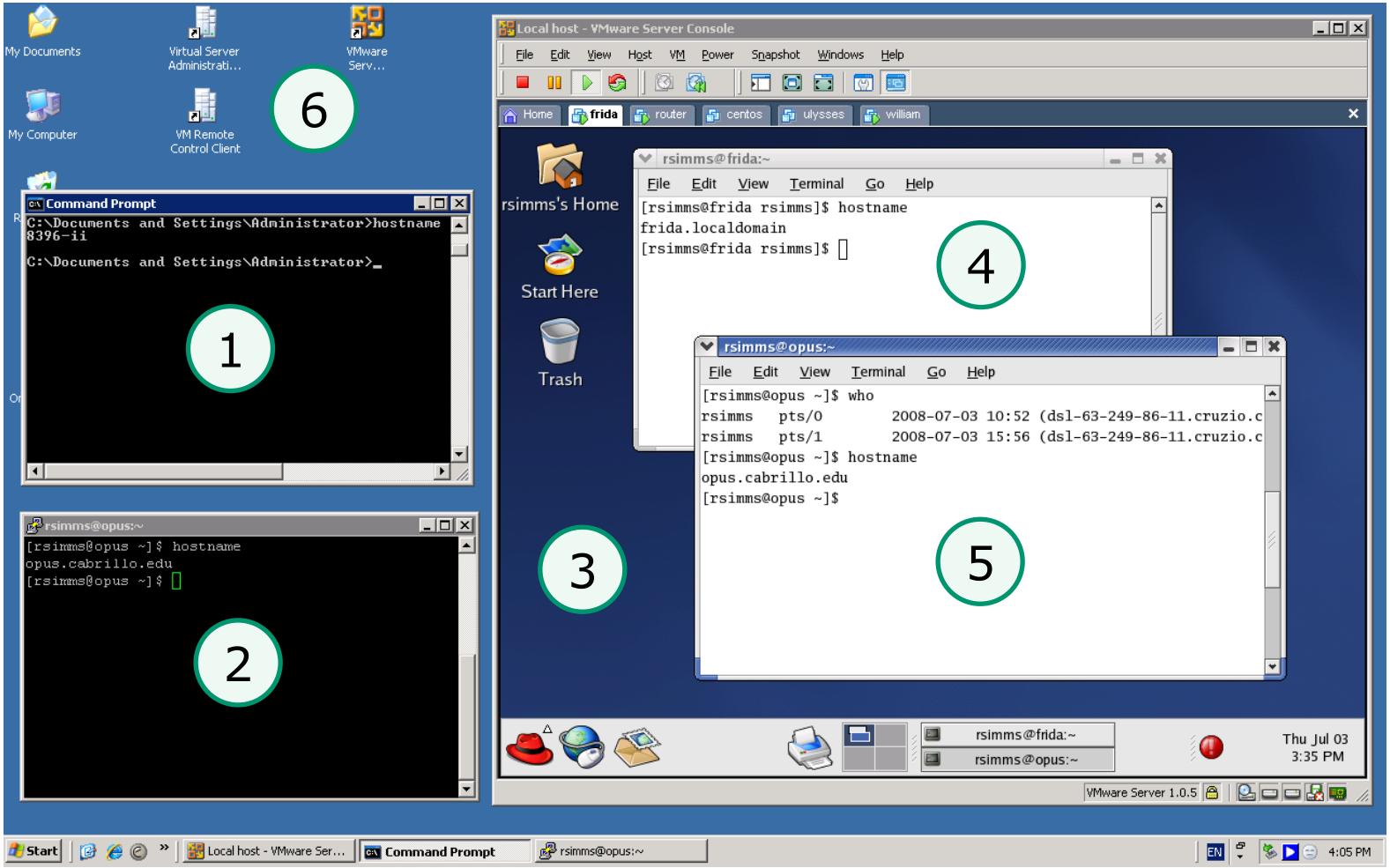


1=????? 2=????? 3=?????

4=????? 5=????? 6=?????

What computer are we talking to?

8396-II (Windows), Opus (RHEL) or Frida (RH9)



1=8396-ii 2=?????? 3=??????

4=?????? 5=?????? 6=??????

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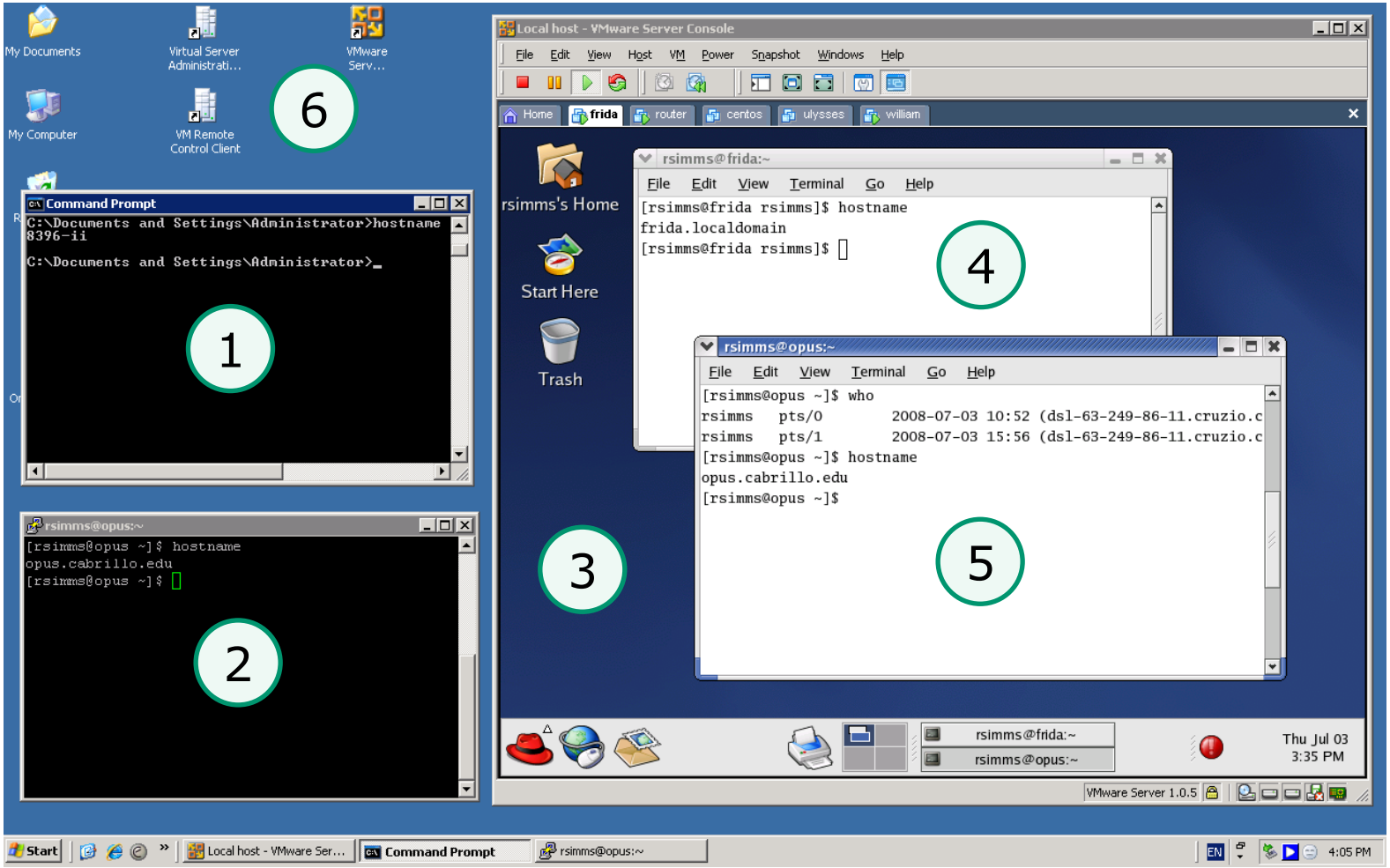

1=8396-ii 2=Opus 3=??????

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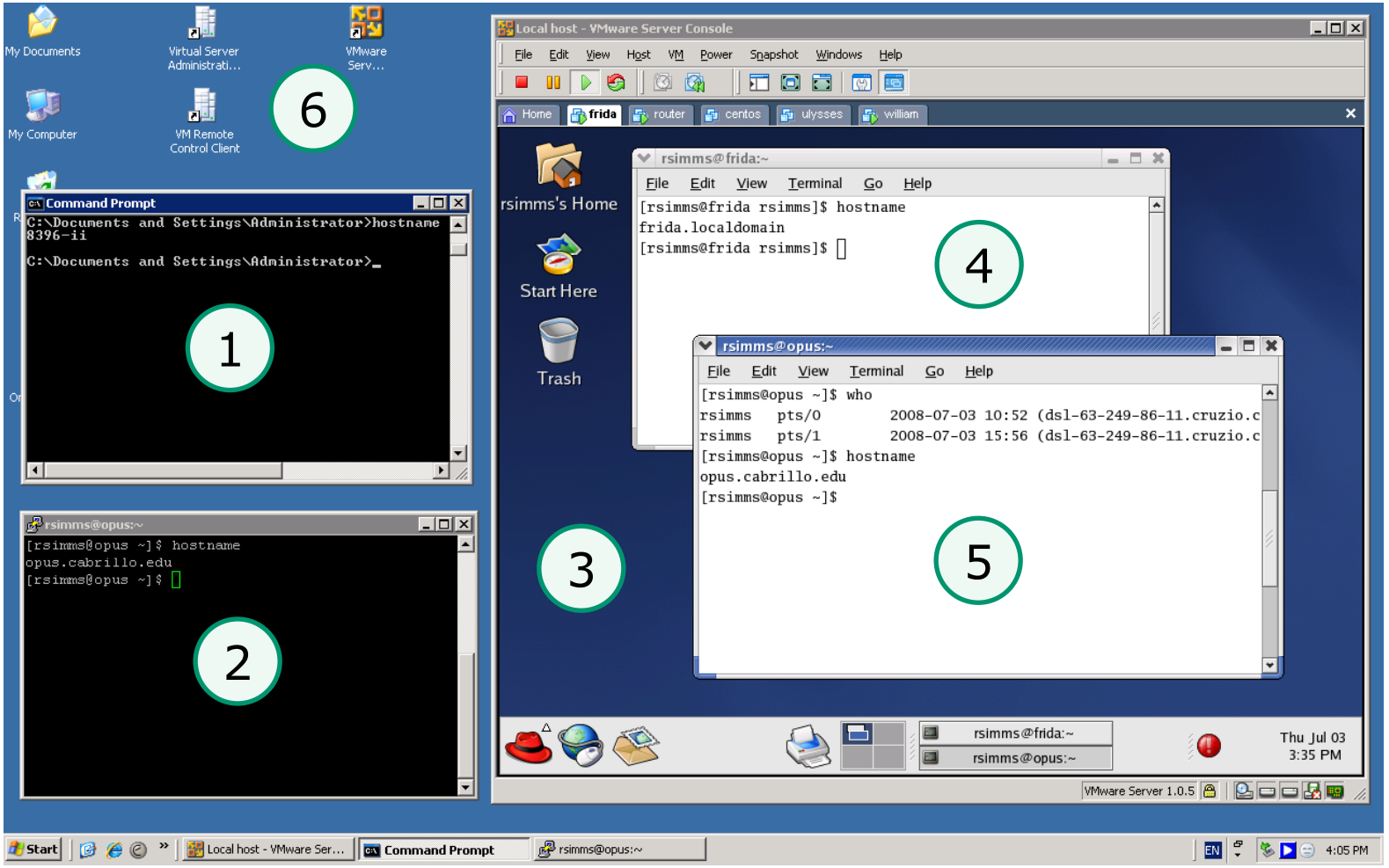
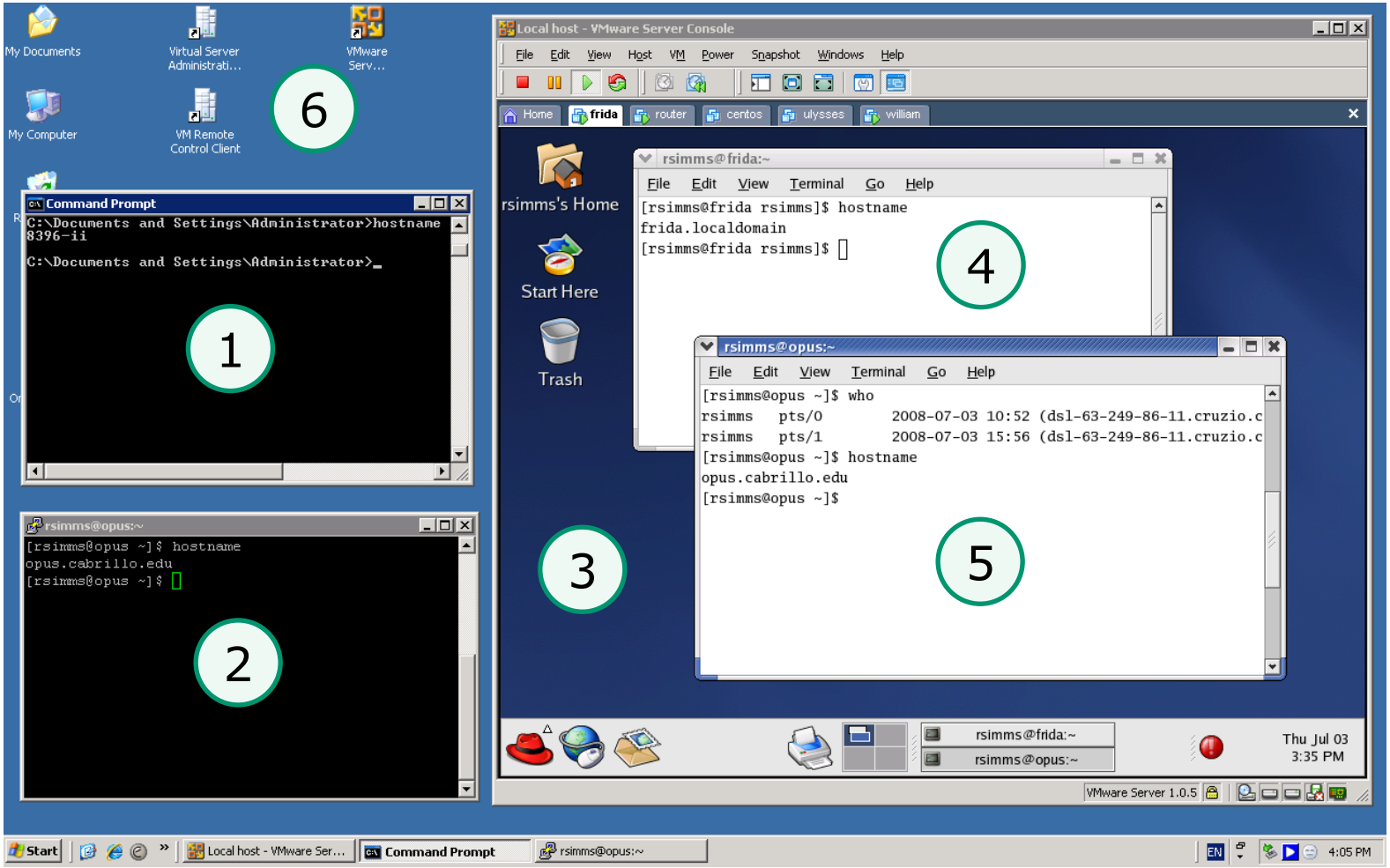


1=8396-ii 2=Opus 3=Frida

4=?????? 5=?????? 6=??????

What computer are we talking to?

8396-II (Windows), Opus (RHEL) or Frida (RH9)

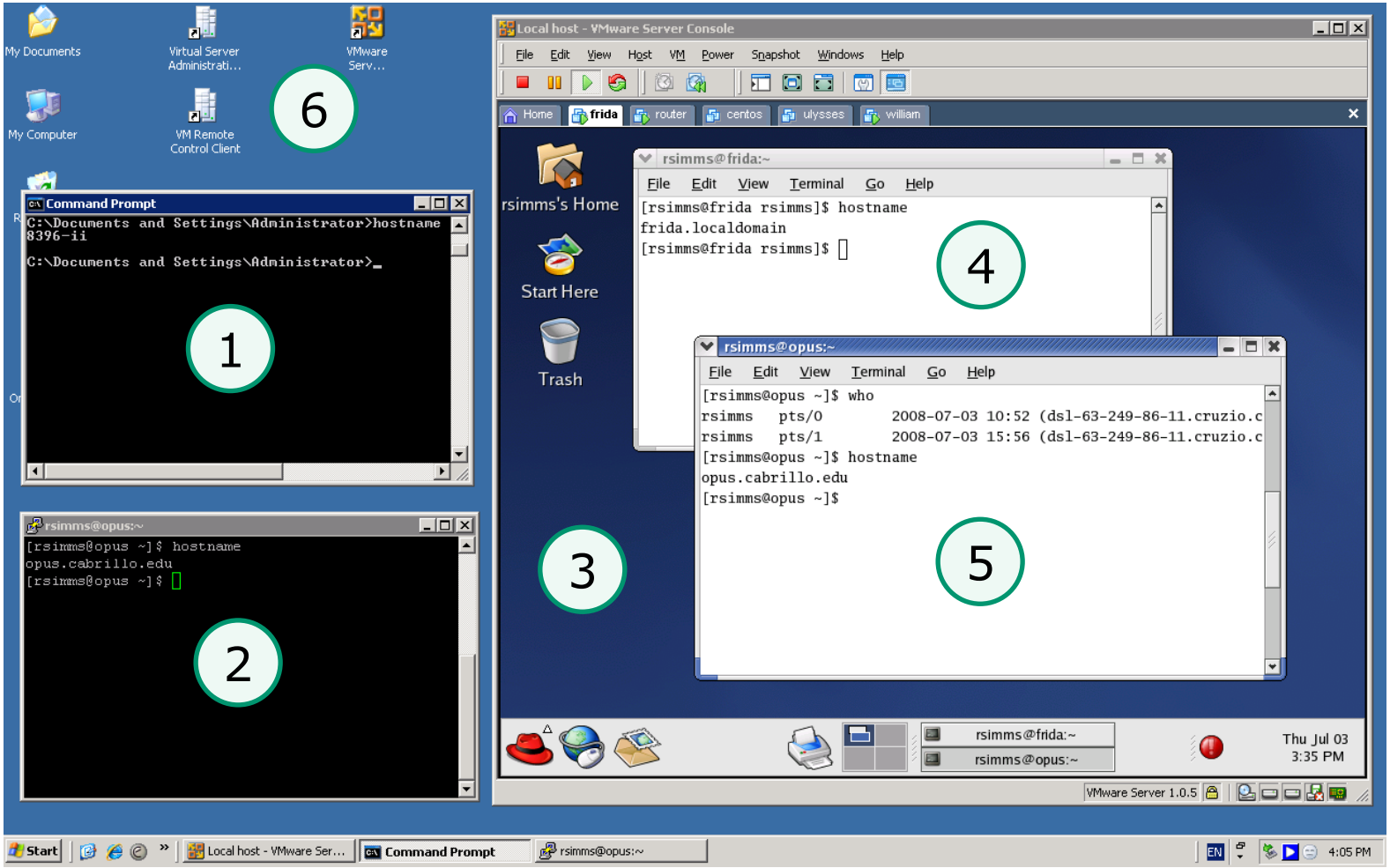


1=8396-ii 2=Opus 3=Frida

4=frida 5=?????? 6=??????

What computer are we talking to?

8396-II (Windows), Opus (RHEL) or Frida (RH9)

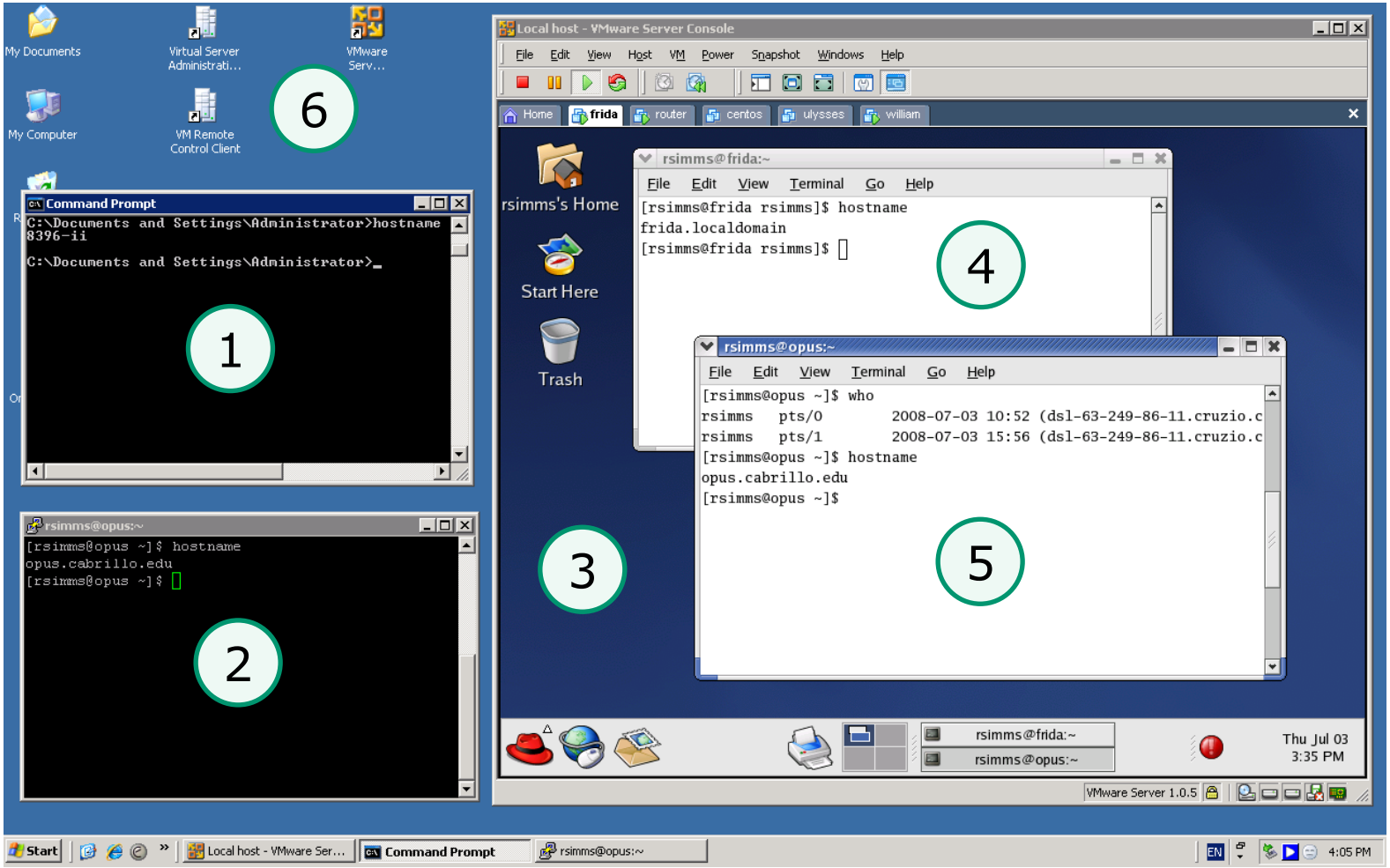


1=8396-ii 2=Opus 3=Frida

4=frida 5=Opus 6=??????

What computer are we talking to?

8396-II (Windows), Opus (RHEL) or Frida (RH9)



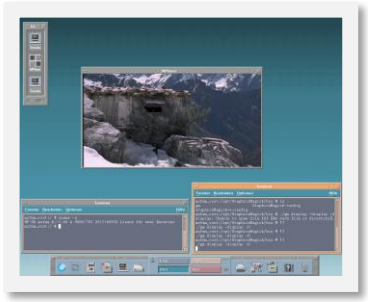
1=8396-ii 2=Opus 3=Frida

4=Frida 5=Opus 6=8396-ii

Operating Systems

Running a terminal on an HP-UX system

HP-UX



cupsim98.cup.hp.com - PuTTY

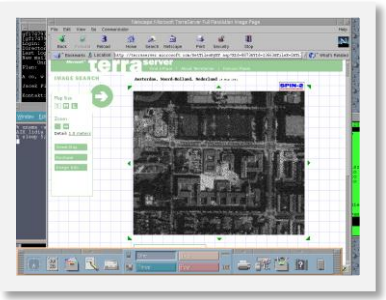
```
restrictions as set forth in sub-paragraph (c)(1)(ii) of the Rights in
Technical Data and Computer Software clause in DFARS 252.227-7013.


                Hewlett-Packard Company
                3000 Hanover Street
                Palo Alto, CA 94304 U.S.A.

Rights for non-DOD U.S. Government Departments and Agencies are as set
forth in FAR 52.227-19(c)(1,2).
You have mail.

Value of TERM has been set to "xterm".
WARNING:  YOU ARE SUPERUSER !!

# ls /
.mozilla          .sw               home              sbin
.mozilla-license  bin               lib               stand
.profile          core              lost+found        tmp
.rnd              dev               net               usr
.ssh              etc               opt               var
# uname -a
HP-UX cupsim98 B.11.23 U ia64 0564465391 unlimited-user license
#
```

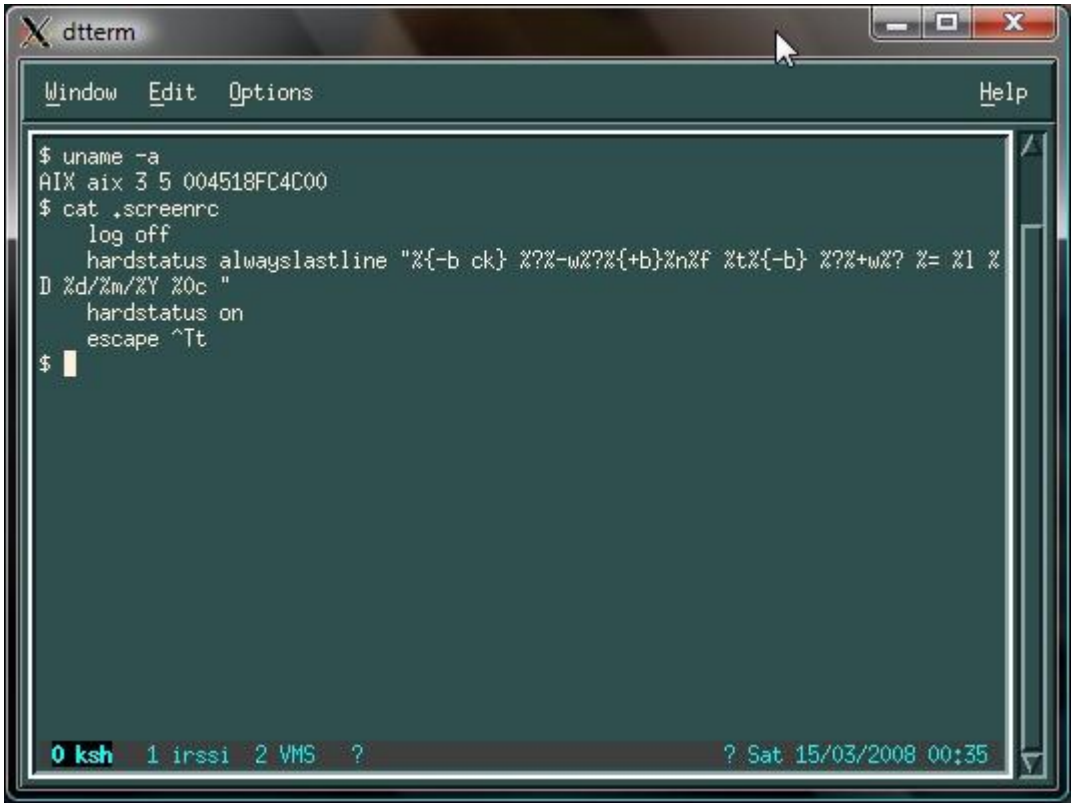
ls and uname

Operating Systems

Running a terminal on an IBM AIX system

AIX





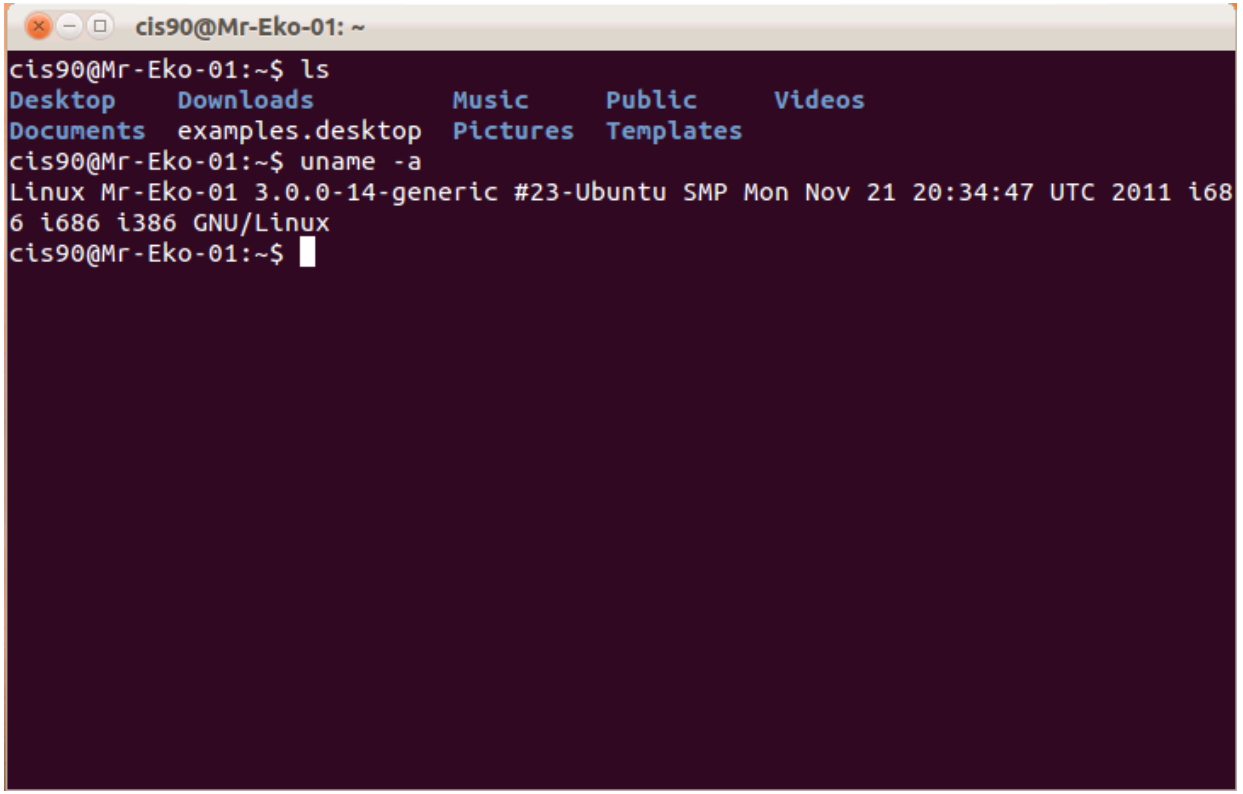
uname and cat commands

http://unixsadm.blogspot.com/2008_03_01_archive.html

Operating Systems

Running a terminal on an Ubuntu system

Ubuntu



ls and uname commands

Operating Systems

Embedding Linux in Products ... maybe?

Is it based on Linux kernel or not?

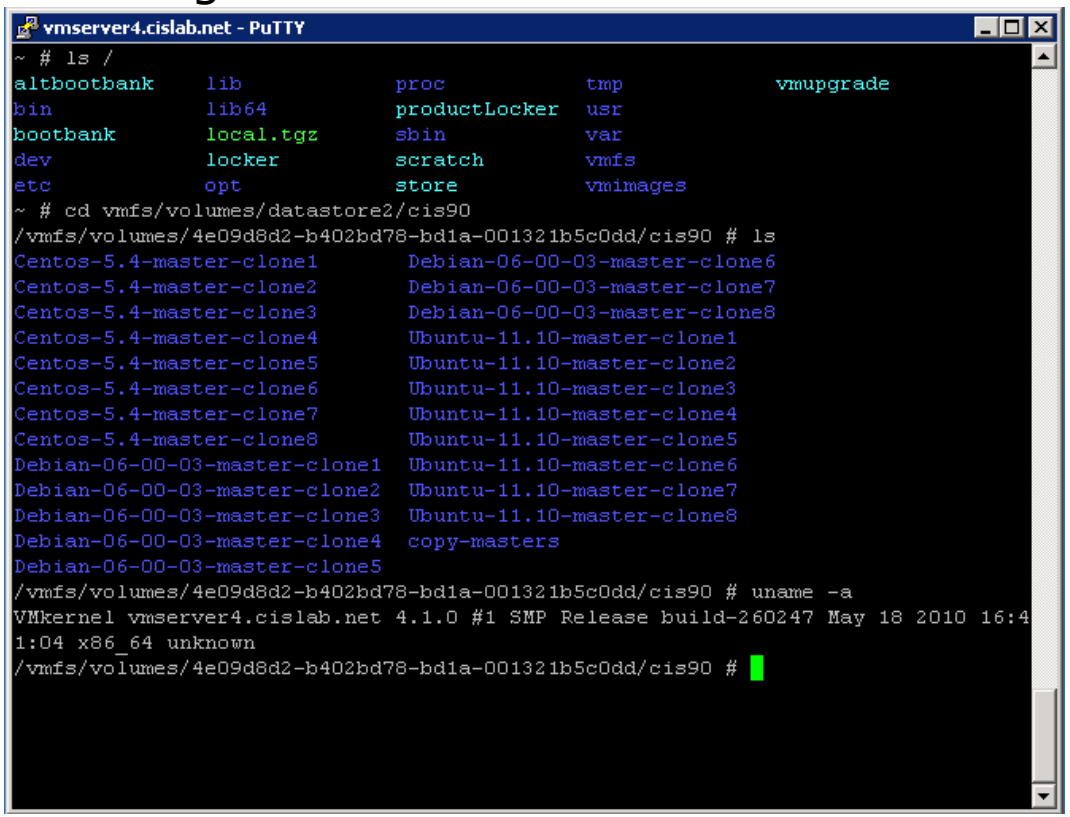
http://blog.scottlowe.org/2007/08/19/the-linux-kernel-binary-modules-and-esx-server/
http://www.theregister.co.uk/2007/08/16/vmware_derived_from_linux/

Operating Systems

Maybe ... embedding Linux in Products?

vmware®

Running terminal on VMware ESXi server



ls, cd and uname commands

Linux distros mentioned by top server vendors

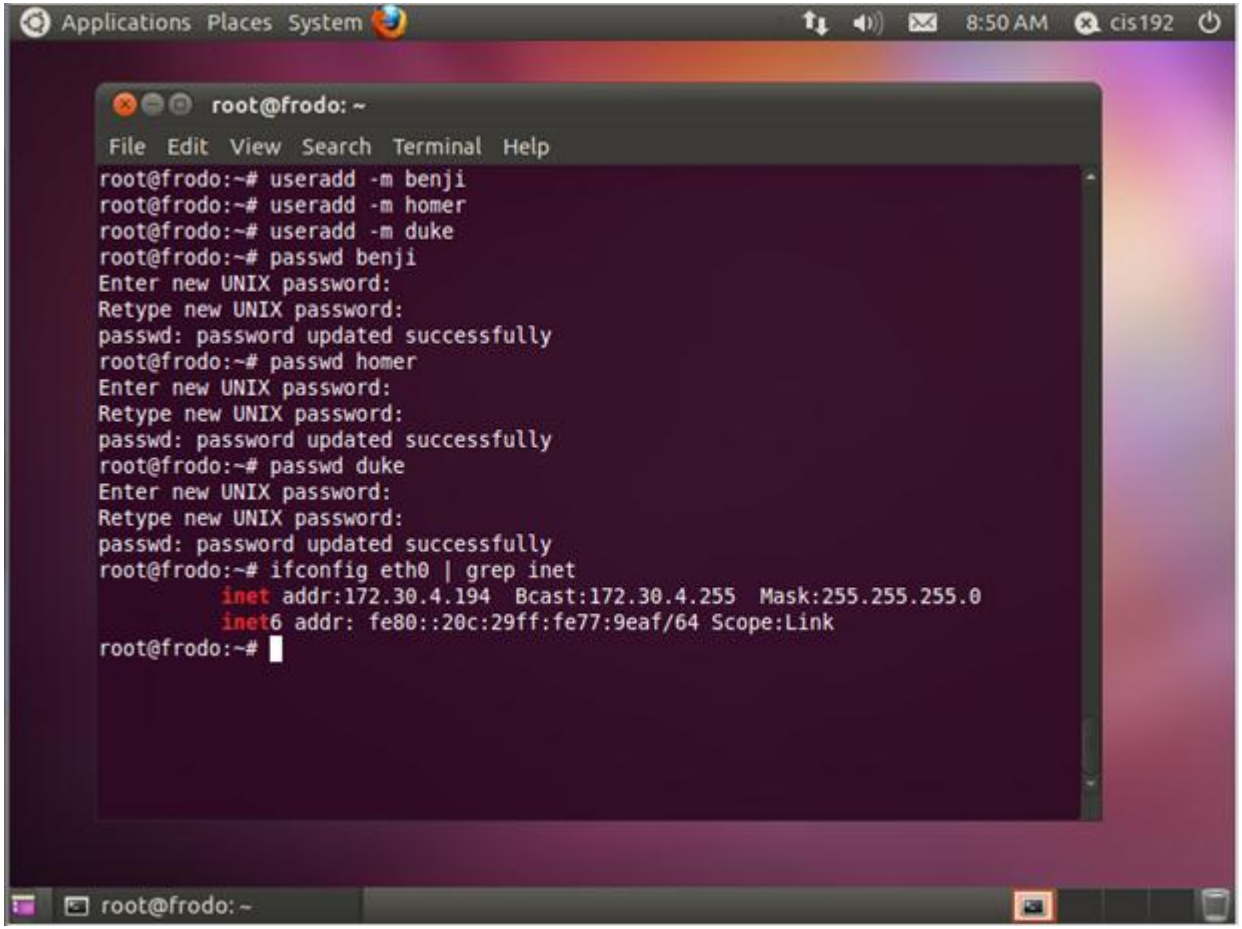
Server market share source: IDC 3Q11 report

Vendor	HP (29.8%)	IBM (29.8%)	Dell (15.1%)	Oracle/Sun (6.0%)
Red Hat Enterprise	✓	✓	✓	✓
Novell SUSE	✓	✓	✓	✓
Debian/GNU Linux	✓	✓		
Oracle EL	✓	✓		✓
Asianux	✓	✓		
Ubuntu	✓	✓		
CentOs	✓	✓		
Fedora	✓	✓		
OpenSUSE	✓	✓		

For CIS 90 we will be primarily using Red Hat Enterprise Linux

Multiuser Multitasking OS

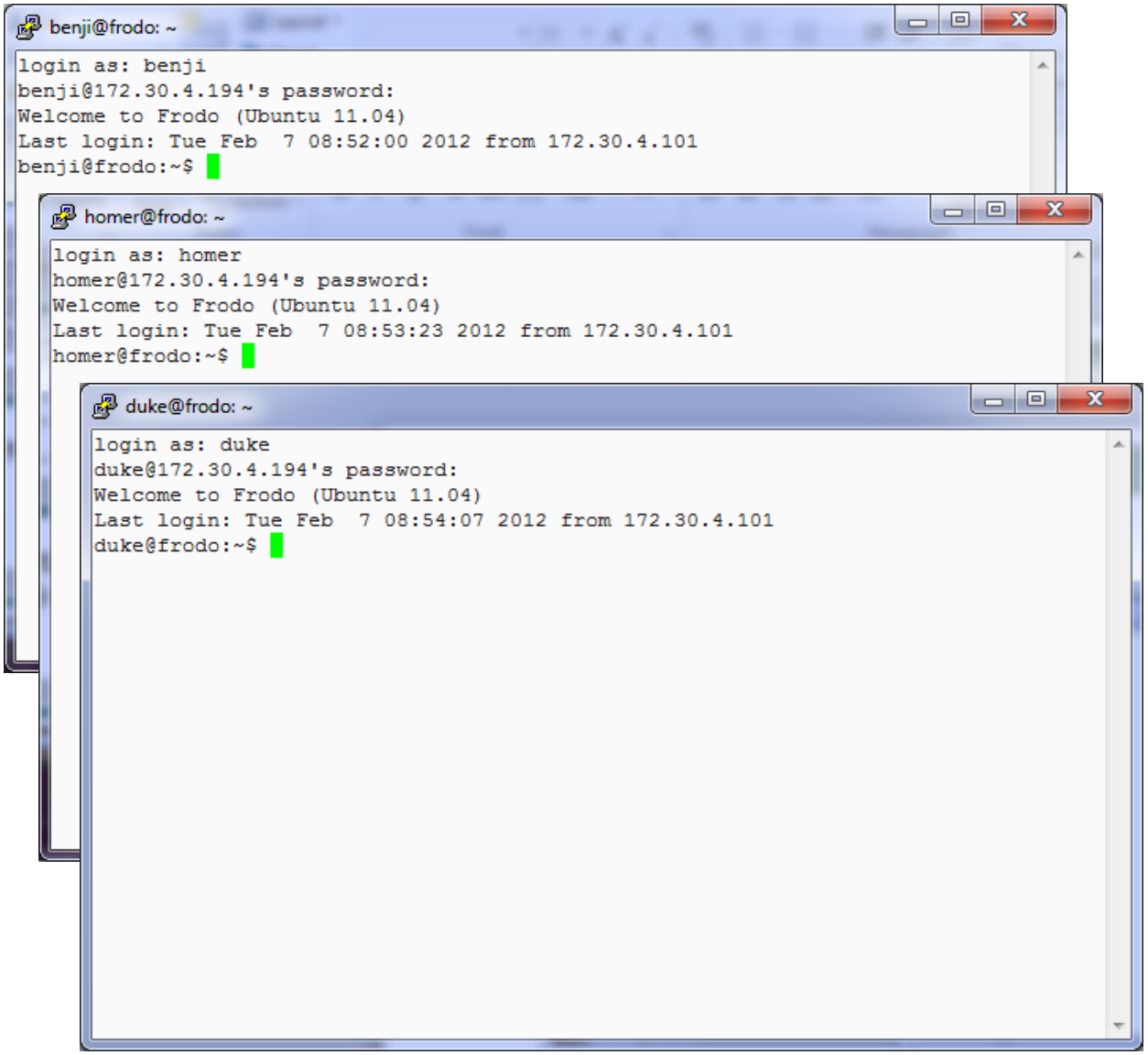
Multiuser/Multitasking Operating System



Let's add some more users to this Ubuntu server named Frodo

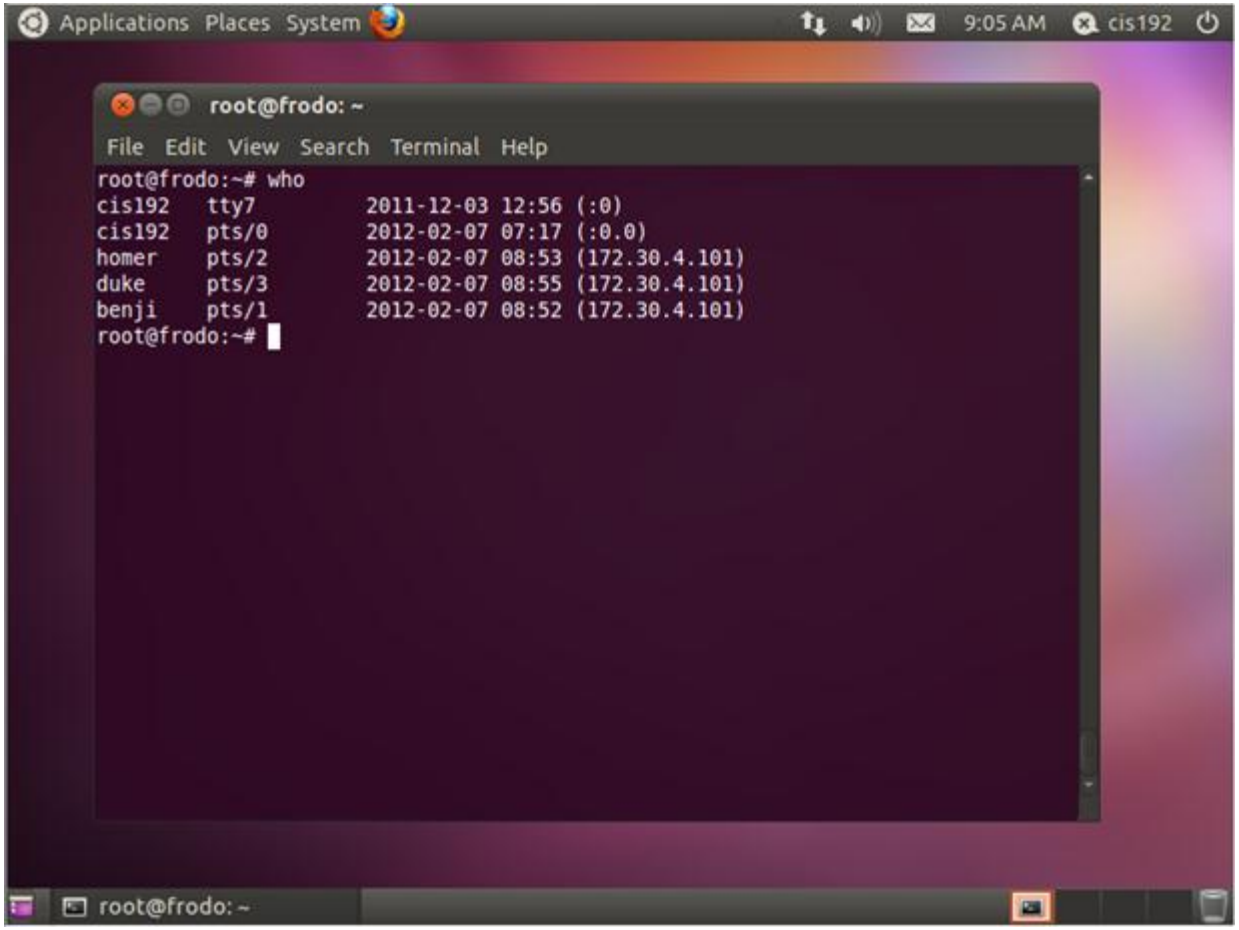
Note: You will learn system administration skills like this in CIS 191AB

Multiuser/Multitasking Operating System



Next let's log into Frodo from another computer using each of the new usernames

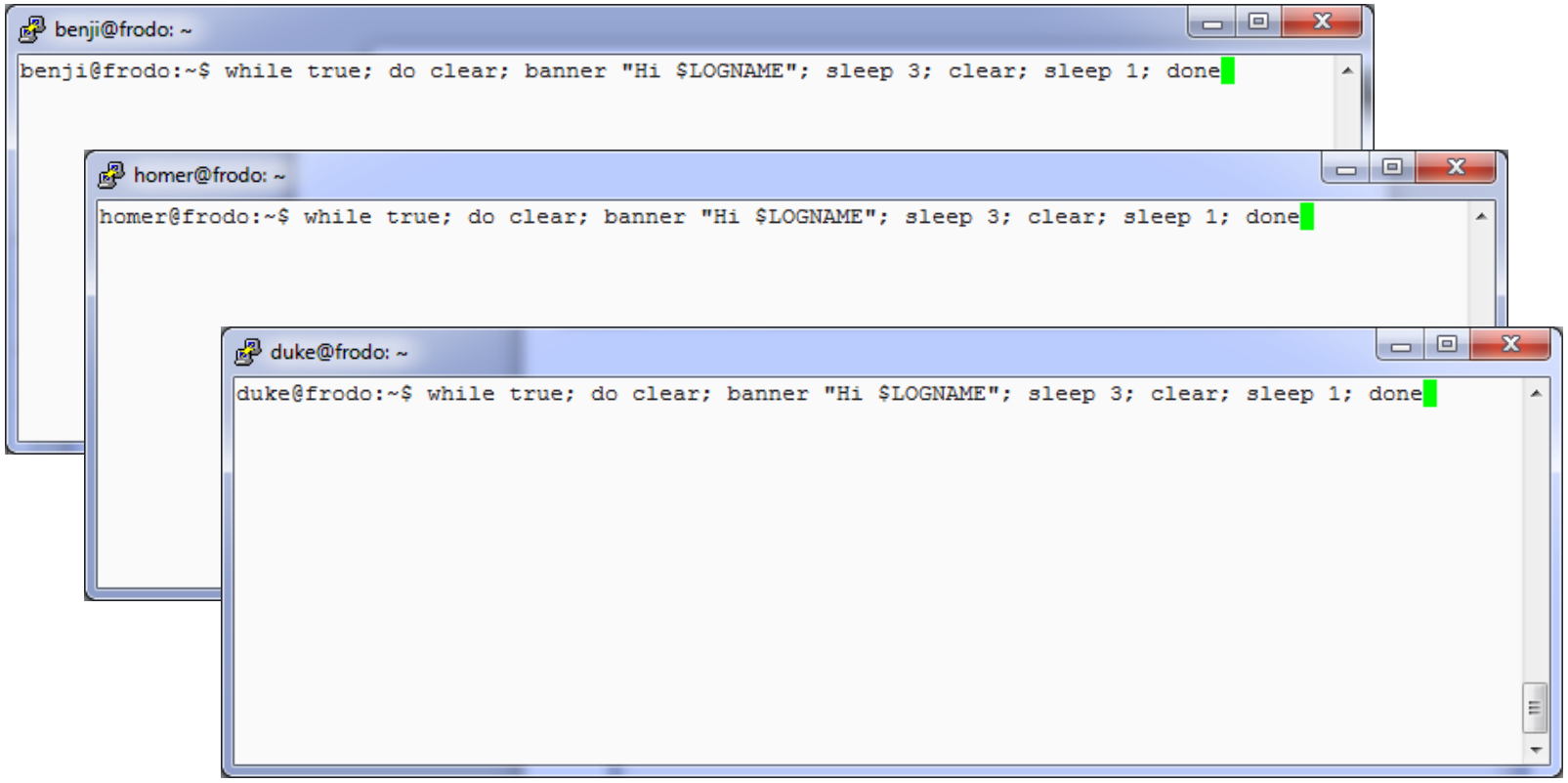
Multiuser/Multitasking Operating System



Back on Frodo, use the **who** command to show all the users currently logged in

This shows the **multi-user** capability of the OS

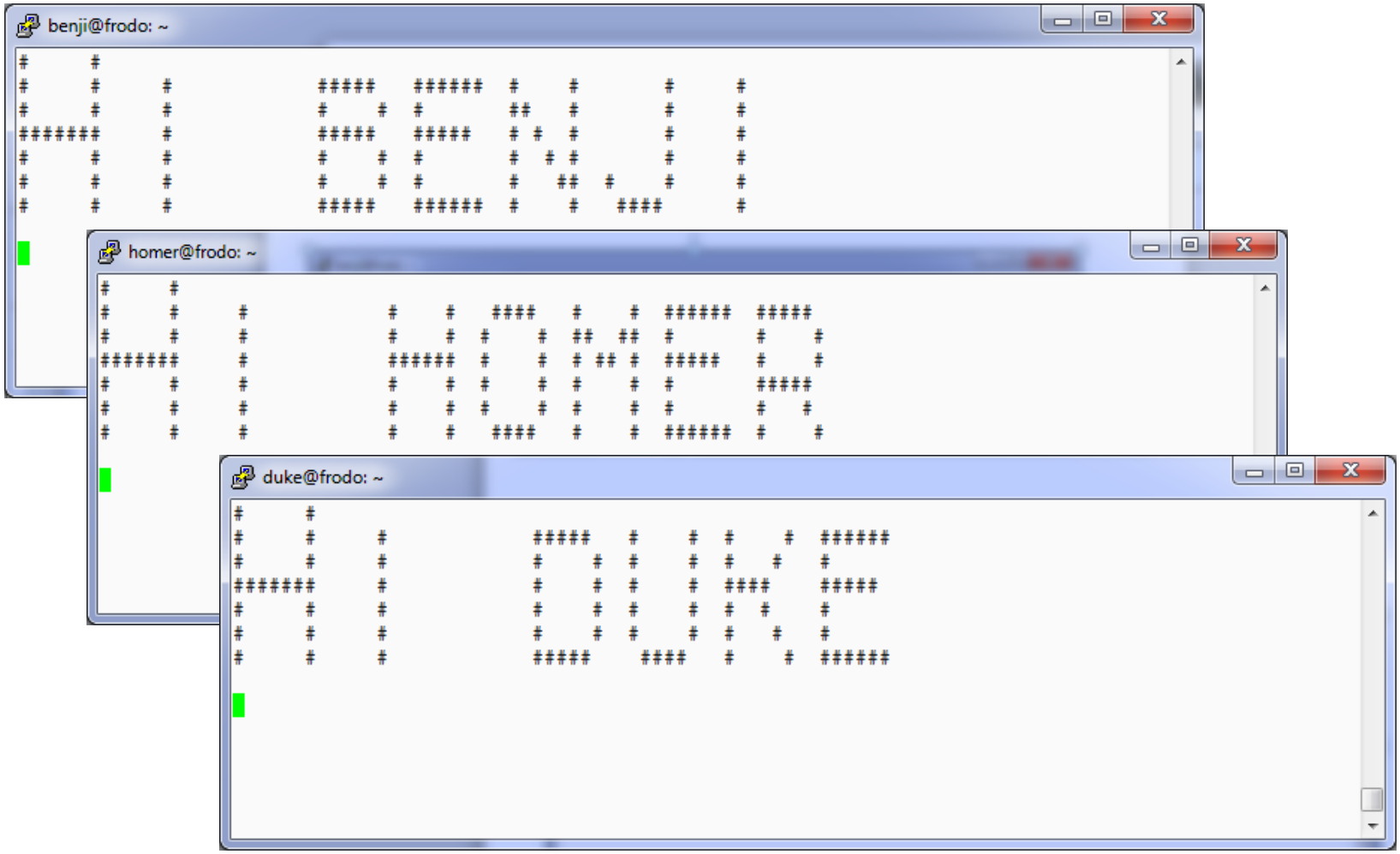
Multiuser/Multitasking Operating System



Next have each user run a simple script that flashes a banner of their name on screen repeatedly.

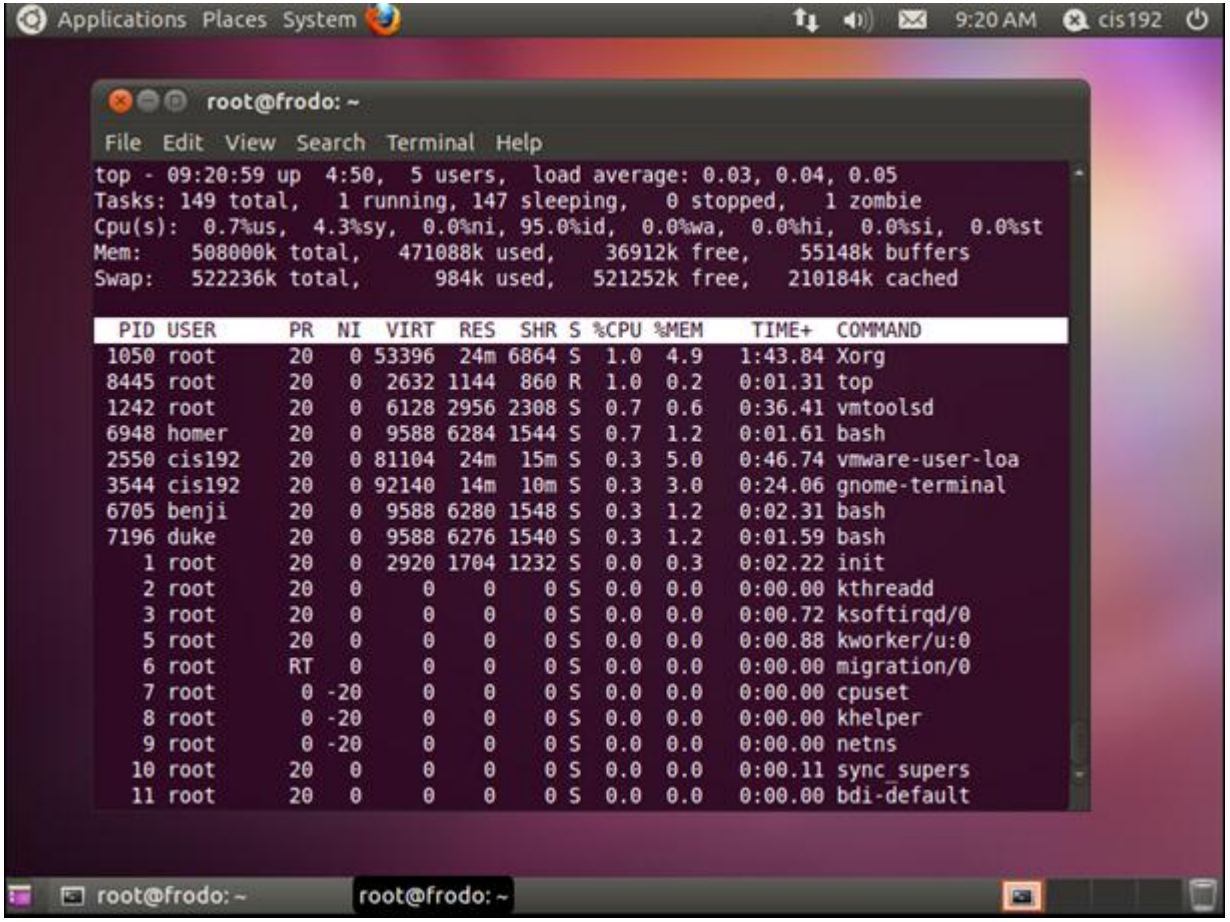
Note: You will learn UNIX scripting skills like this in CIS 130

Multiuser/Multitasking Operating System



These simple scripts loop forever

Multiuser/Multitasking Operating System



Each PID represents a process being run by the operating system. This includes the scripts being run by the three new users.

They are all being run at the same time.

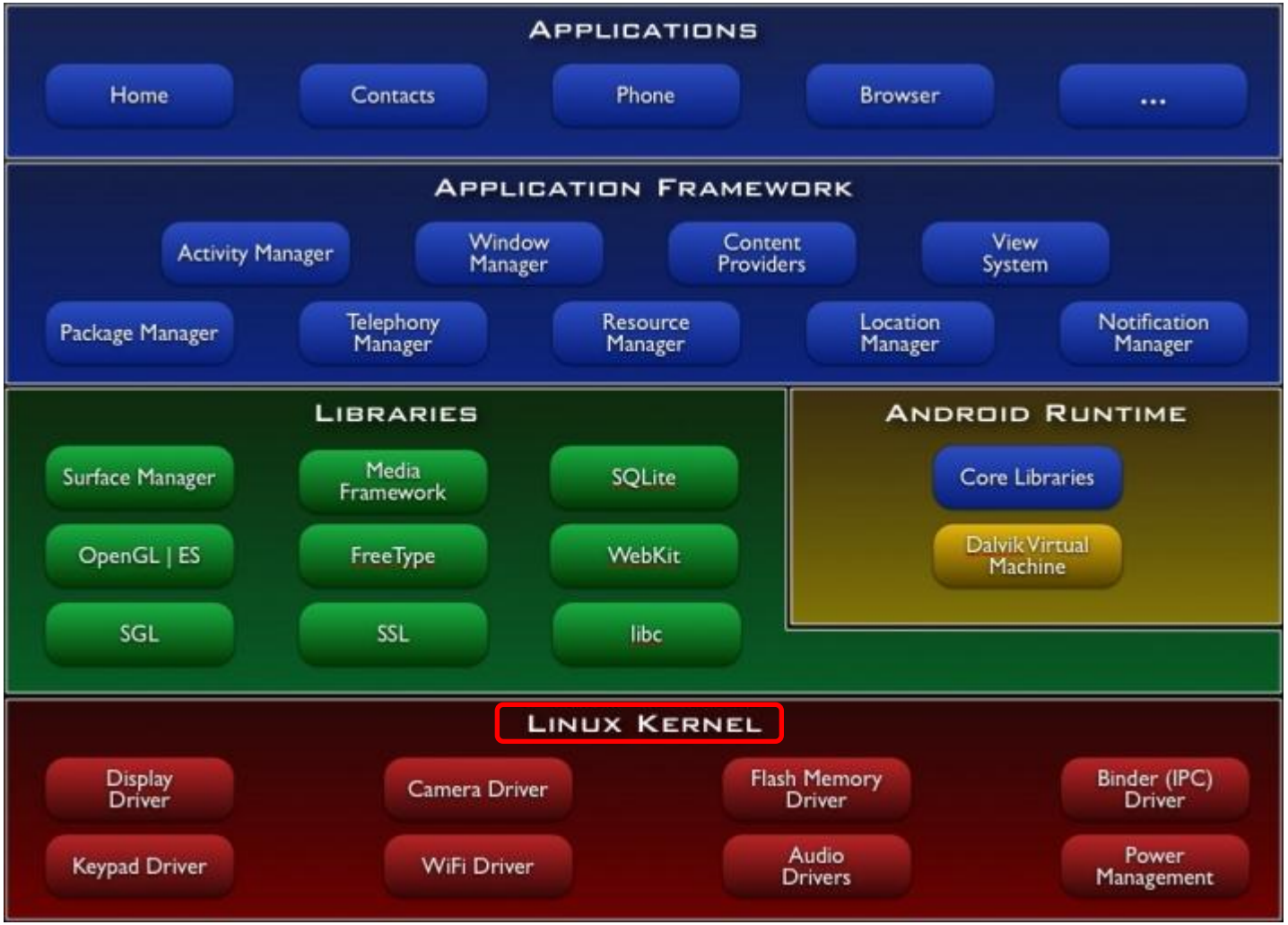
This illustrates **Multitasking**

The Android software stack uses the Linux 2.6 kernel 

Android

Lets peel off the covers and look inside

The Android software stack uses the Linux 2.6 kernel 



Source: http://developer.android.com/guide/basics/what-is-android.html

UNIX/Linux Architectures

How is UNIX/Linux put together?

What are the fundamental components?

GNU/Linux Distributions

OpenSUSE

RedHat Enterprise Linux

Fedora

Debian

CentOS

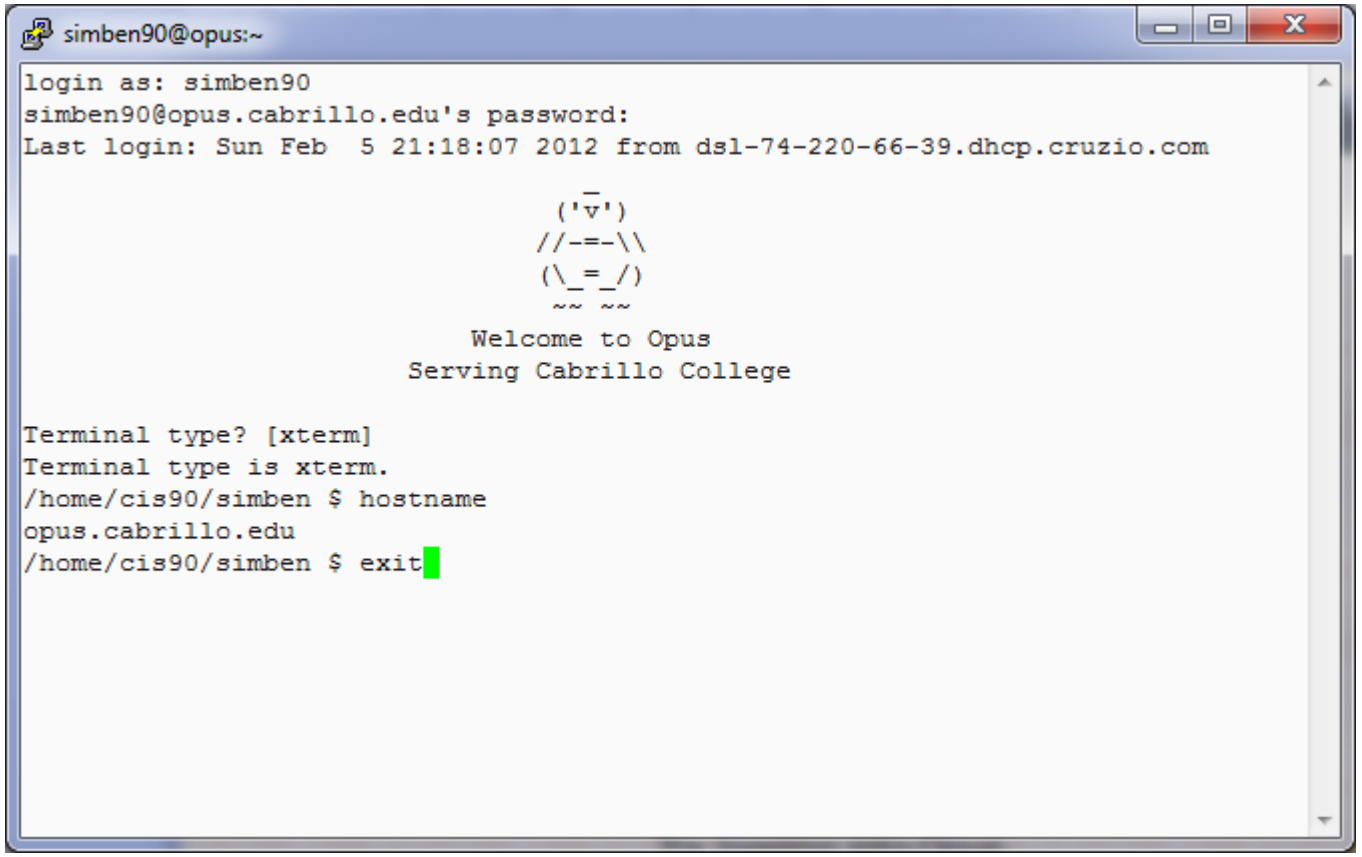
Ubuntu

Mandriva

Lets peel off the covers and look inside

More on Lesson 1 Commands

Class Activity



Log into your account on Opus and as we learn the new commands in the upcoming section, try them out on Opus

who

shows who is logged in and which terminals they are using

```
[rsimms@frida rsimms]$ who
root     tty1         Jul  3 13:54
root     tty2         Jul  3 13:55
rsimms   tty3         Jul  3 13:55
cisco    :0           Jul  3 13:48
cisco    pts/0        Jul  3 13:49 (:0.0)
cisco    pts/1        Jul  3 13:49 (:0.0)
bsimms   pts/2        Jul  3 13:53 (192.168.0.26)
hmiller  pts/3        Jul  3 13:55 (192.168.0.26)
droddy   pts/4        Jul  3 13:57 (192.168.0.25)
```

Usernames

Terminal devices

Date and time of login

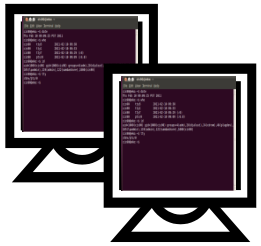
Where logged in from (blank or :0.0) if local, hostname or IP if remote

Note the same user can login more that once using different terminals

tty's (virtual terminals)

More pts's (SSH logins)

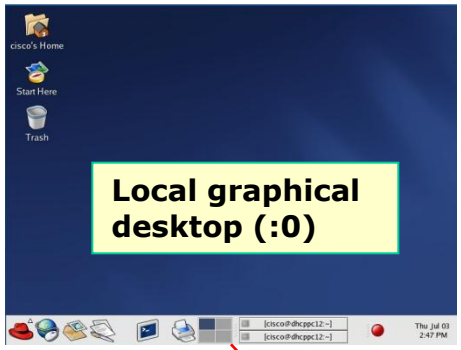
pts's
(graphical terminal windows)

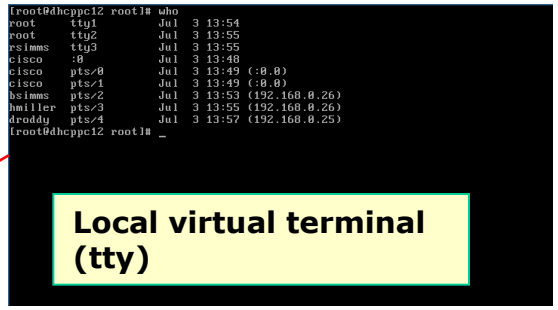


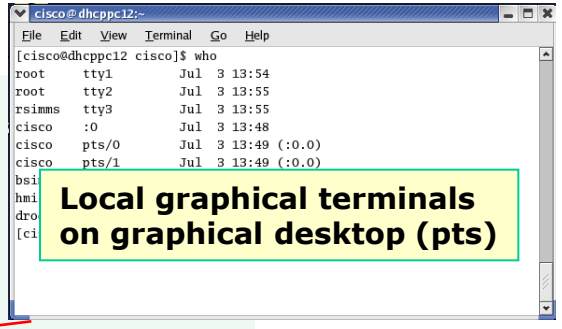
Always keep this mental model in mind that every UNIX/Linux computer has lots of terminals attached

who

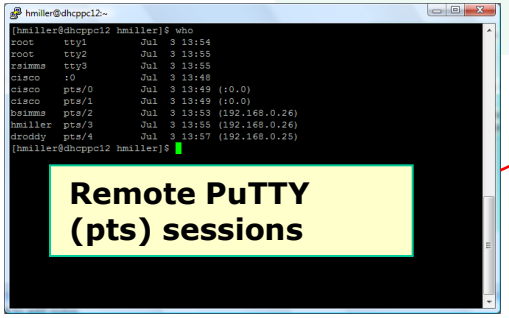
show who is logged on








```
[rsimms@frida rsimms]$ who
root     tty1         Jul  3 13:54
root     tty2         Jul  3 13:55
rsimms   tty3         Jul  3 13:55
cisco    :0           Jul  3 13:48
cisco    pts/0        Jul  3 13:49 (:0.0)
cisco    pts/1        Jul  3 13:49 (:0.0)
bsimms   pts/2        Jul  3 13:53 (192.168.0.26)
hmiller  pts/3        Jul  3 13:55 (192.168.0.26)
droddy   pts/4        Jul  3 13:57 (192.168.0.25)
```

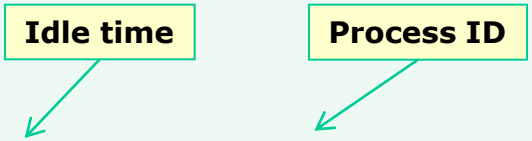


We can tell from this who output that root and rsimms are logged in on virtual terminals (tty1, tty2, and tty3). cisco has logged into the graphical desktop (:0) and opened two terminals there (:0.0). bsimms, hmiller and droddy are remotely logged in using PuTTY (pts/2, pts/3 and pts/4)

who (continued)

various who command options

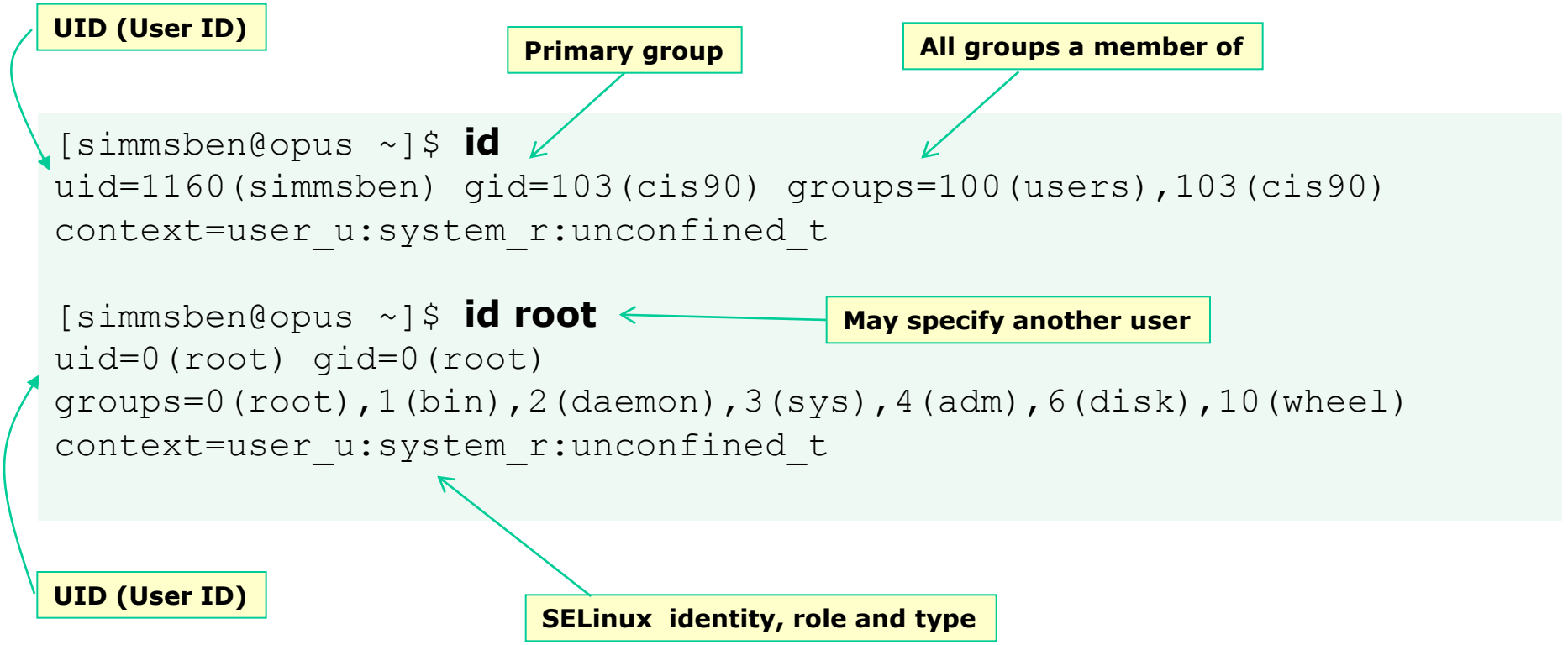
```
[rsimms@frida rsimms]$ who am i
rsimms   tty3         Jul  3 13:55

[rsimms@frida rsimms]$ who -Hu
NAME     LINE         TIME         IDLE          PID COMMENT
root     tty1         Jul  3 13:54 00:07        1390
root     tty2         Jul  3 13:55 00:07        1391
rsimms   tty3         Jul  3 13:55 00:07        1392
cisco    :0           Jul  3 13:48   ?          1451
cisco    pts/0        Jul  3 13:49 00:03        1581 (:0.0)
cisco    pts/1        Jul  3 13:49 00:08        1581 (:0.0)
bsimms   pts/2        Jul  3 13:53 00:08        1753 (192.168.0.26)
hmiller  pts/3        Jul  3 13:55   .          1924 (192.168.0.26)
droddy   pts/4        Jul  3 13:57 00:04        1962 (192.168.0.25)

[rsimms@frida rsimms]$ who -q
root root rsimms cisco cisco cisco bsimms hmiller droddy
# users=9
```



H=add heading, u=show idle time, q=login names and count

id

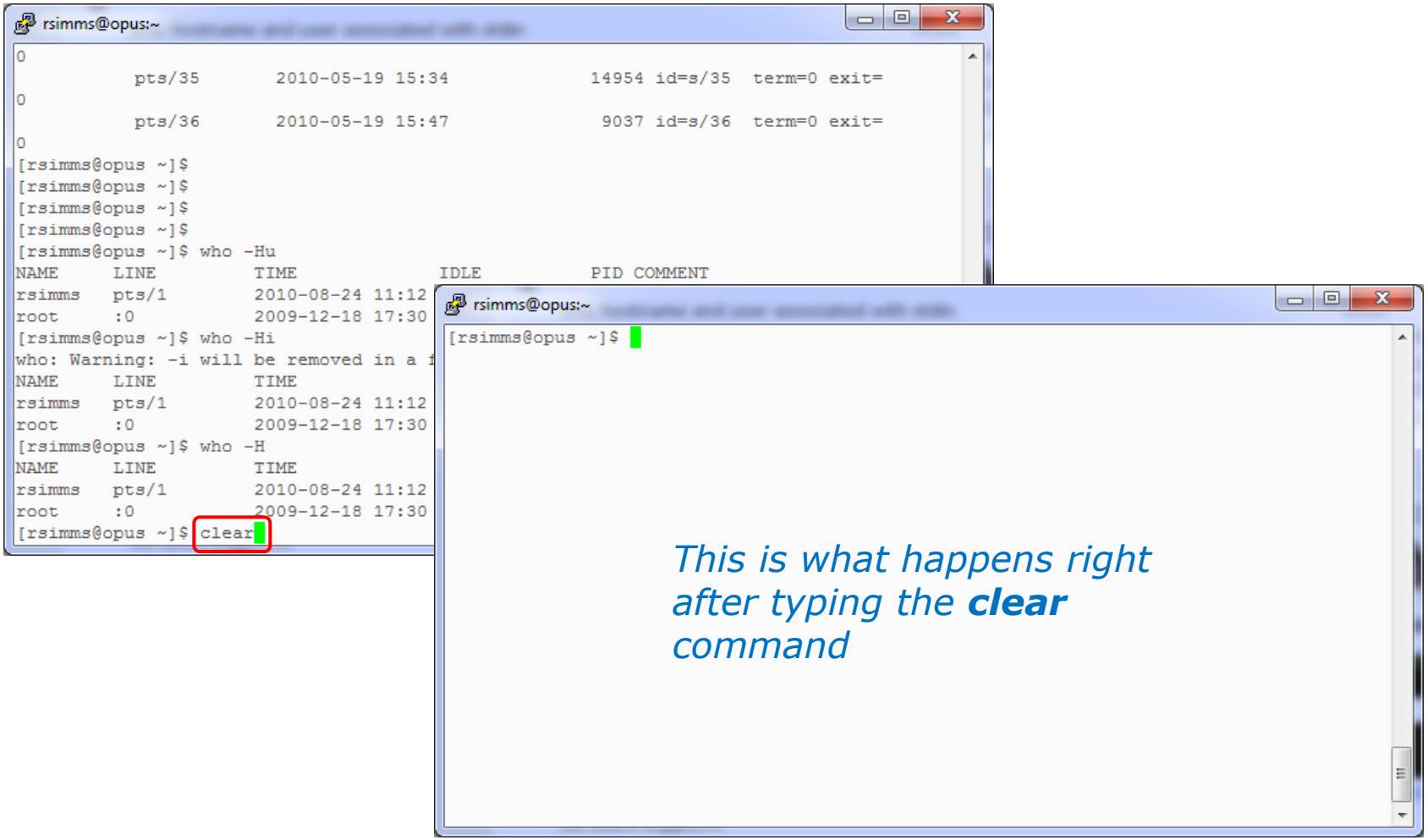
Show user's UID, group membership and other info



*The **uid** (user ID number) of the simmsben user is 1160, the **uid** of root is 0. root is the "superuser" account.*

clear

clear the terminal display



hostname

show the name of the current computer

```
/home/cis90/guest $ hostname
opus.cabrillo.edu
```

Connected to Opus using PuTTY

```
cis90@eko:~$ hostname
eko
```

Connected to Eko using PuTTY

```
C:\Users\Administrator> hostname
dv2000
```

In the DOS command prompt on Windows

Hostname will always tell you the name of the computer you are talking to. It even works in Windows!

cal

show calendar

```
[simmsben@opus ~]$ cal
     June 2008
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

[simmsben@opus ~]$ 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
```

If month and year not specified then current month is shown

*What day of the week were you born on? Specify your birth month and year as arguments to the **cal** command*

cal

show calendar

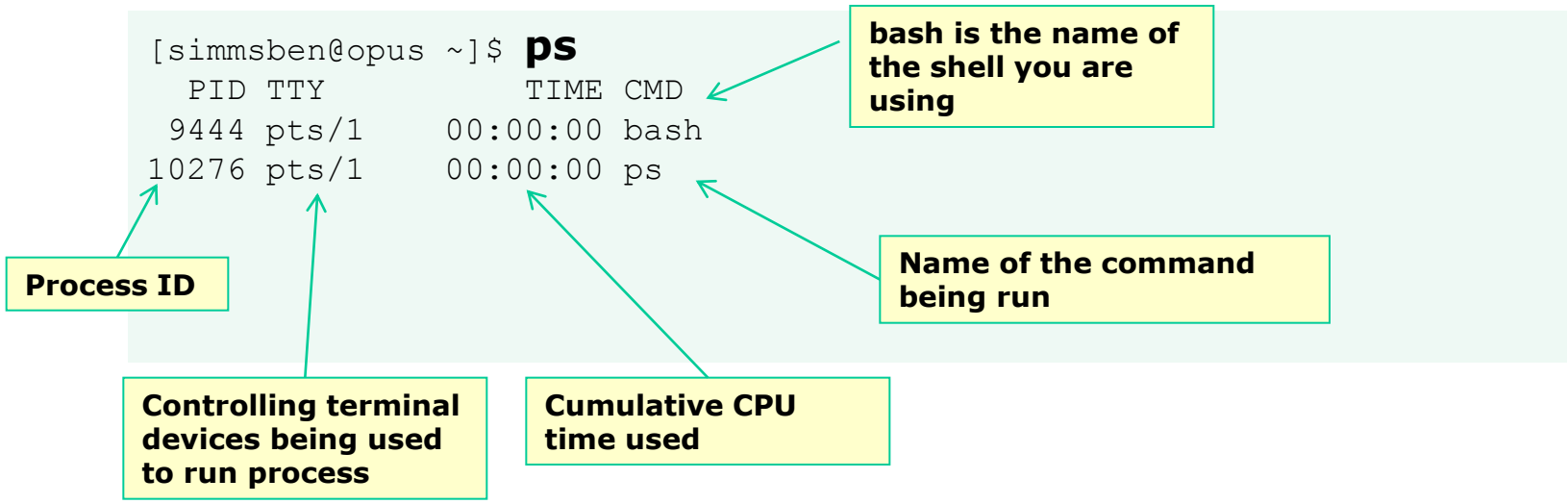
```
/home/cis90/guest $ cal 2010
                                2010

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

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

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

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

Specify just the year to see all 12 months

ps

show active processes

When a program is loaded into memory and being executed (run) by the kernel it is called a process



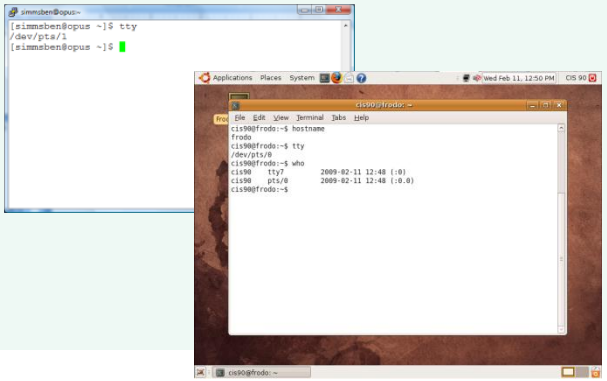
TIP: For Lab 1 this is how you answer the question on which shell you are using!

tty

show which terminal is being used for session

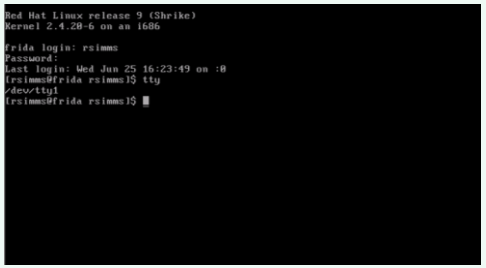
```
[simmsben@opus ~]$ tty
/dev/pts/1
```

pts's are pseudo terminal devices. You will see these used for remote PuTTY sessions and for terminals you open on the graphical desktop.



```
[rsimms@frida rsimms]$ tty
/dev/tty1
```

tty's are virtual teletype terminal devices tty1 through tty6. They are available locally by pressing Ctrl-Alt-F1 though Ctrl-Alt-F6



uname

show name of the operating system kernel

```
[simmsben@opus ~]$ uname
Linux
```

uname shows the name of the operating system kernel

history

show command history

```
/home/cis90/guest $ history
    1  date
    2  cal
    3  who
    4  who am i
    5  hostname
    6  id
    7  clear
    8  ps
    9  tty
   10  uname
   11  exit
   12  history
```

Separate histories are maintained for the same user while using different terminals.

Histories are merged when user has logged off them.

/sbin/ifconfig

show network interface status

```
cis192@frodo:~$ /sbin/ifconfig
eth0      Link encap:Ethernet  HWaddr 00:0c:29:6f:53:d9
          inet addr:192.168.0.24  Bcast:192.168.0.255  Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe6f:53d9/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:113172 errors:0 dropped:0 overruns:0 frame:0
          TX packets:728 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:15963968 (15.9 MB)  TX bytes:84589 (84.5 KB)
          Interrupt:18 Base address:0x1400
<snipped>
```

*The **inet addr** is the IP address for your system. Use this with Putty or SSH command for remote logins.*

Learn more on Linux Network Administration by taking CIS 192AB

ssh

login to a remote system

Syntax: **ssh** *user***@***hostname*

Where
- *user* = the user login name
- *hostname* = the name or IP address of the remote computer

Examples:

ssh simben90@opus.cabrillo.edu

ssh cis90@172.30.4.198

ssh root@frida

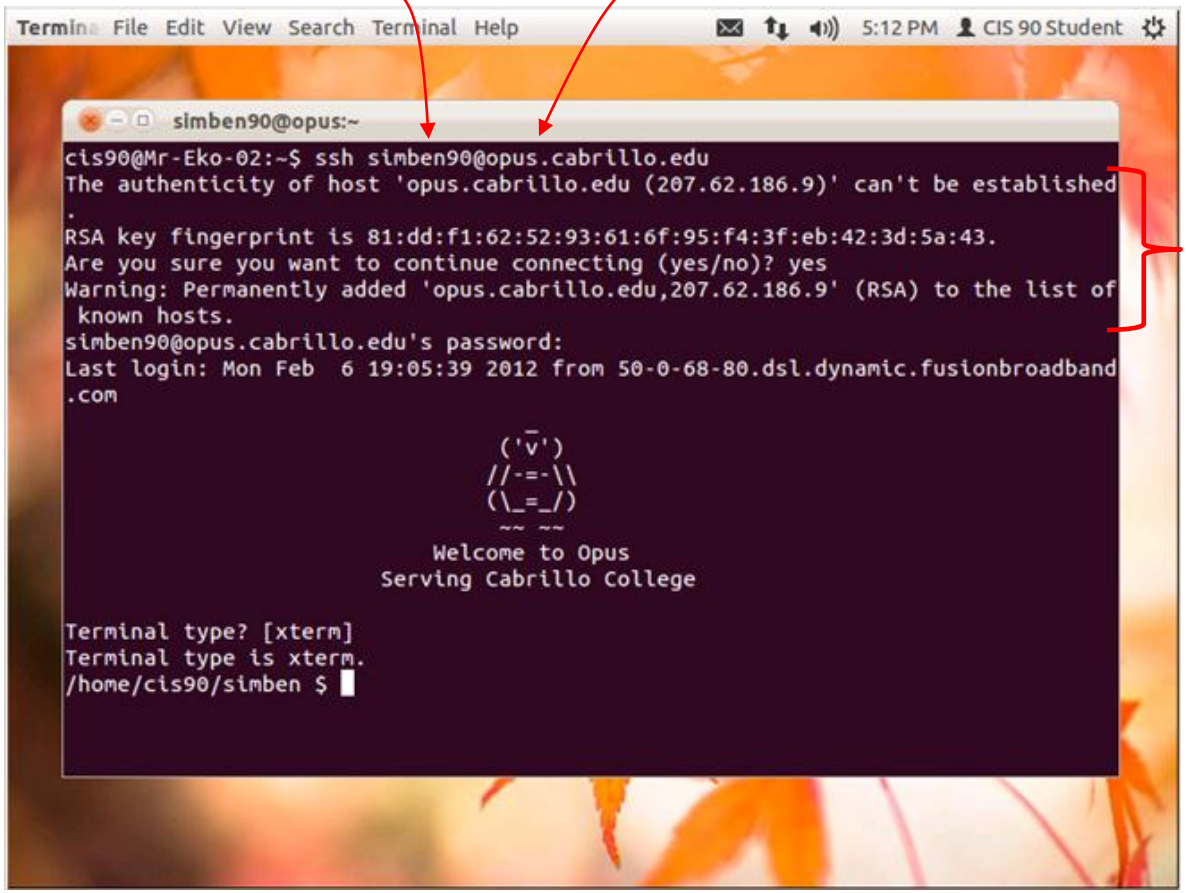
ssh

login to a remote system

Example: ssh simben90@opus.cabrillo.edu

*user is **simben90***

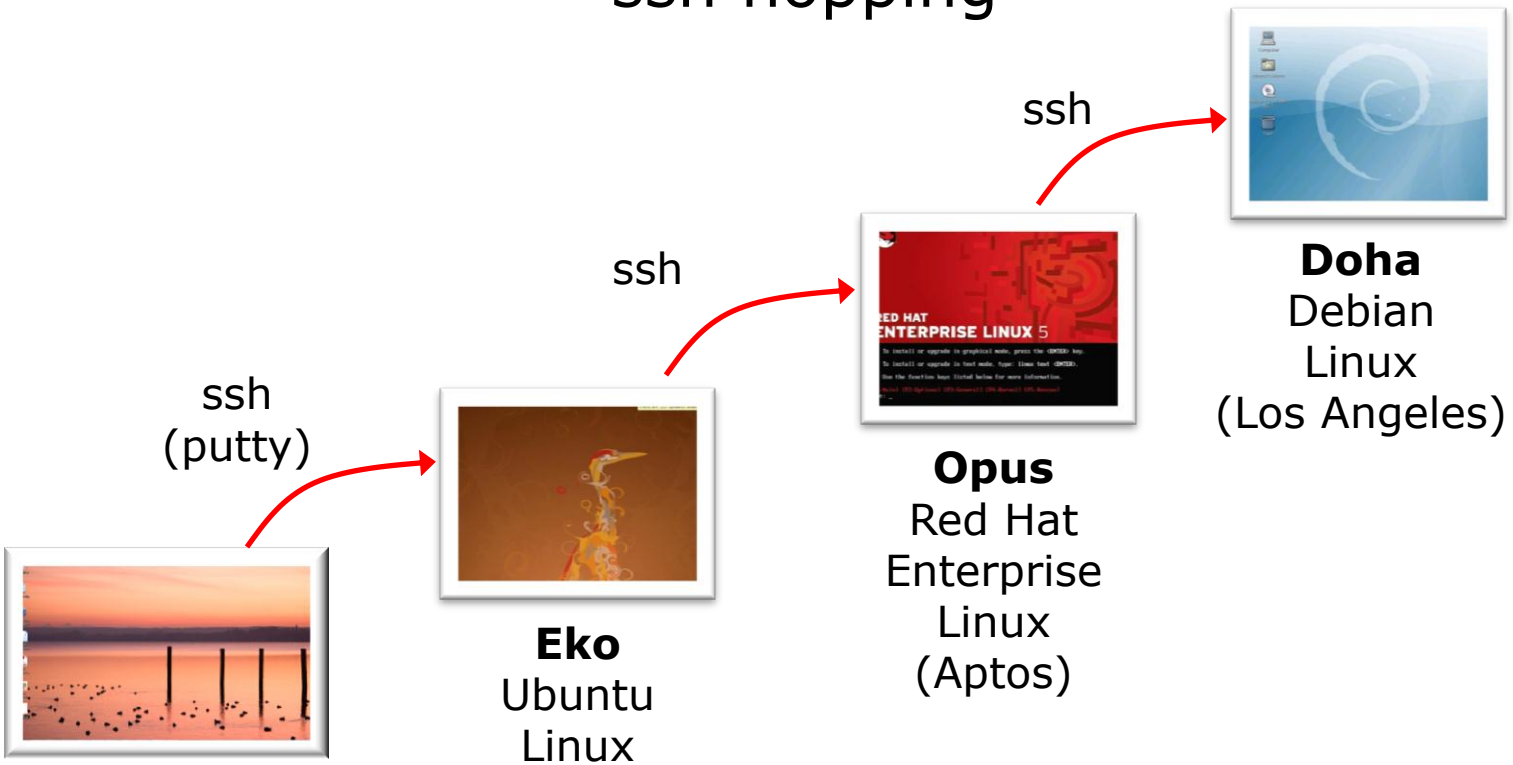
*host is **opus.cabrillo.edu***



*The first time you login to a remote computer you will get this message, type **yes** to continue*

ssh

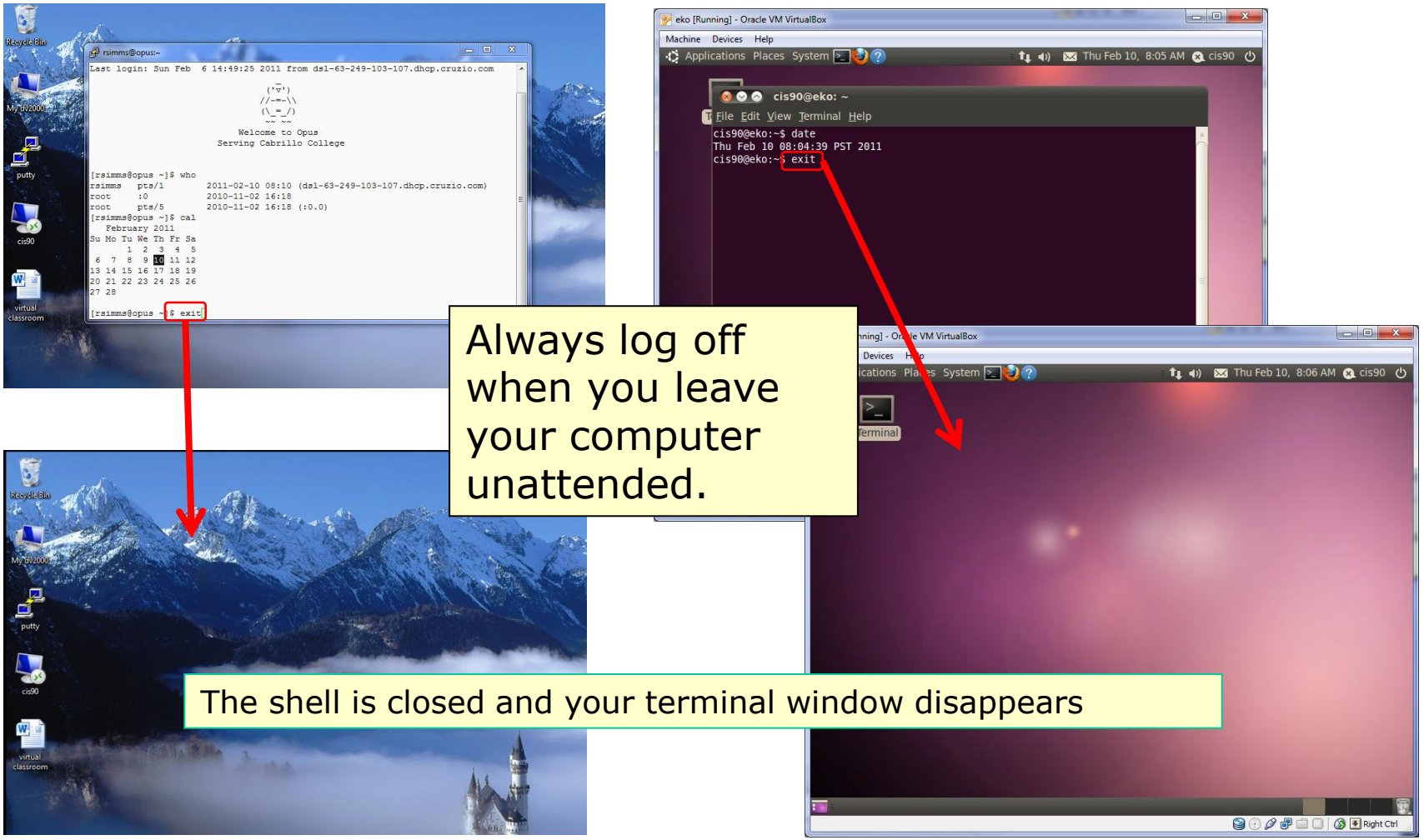
"ssh hopping"



We will start on my Windows notebook computer dv2000. From dv2000 Putty into Eko. From Eko, ssh into Opus. From Opus ssh into simms-teach.com

exit

terminate shell and log off



Course Lingo

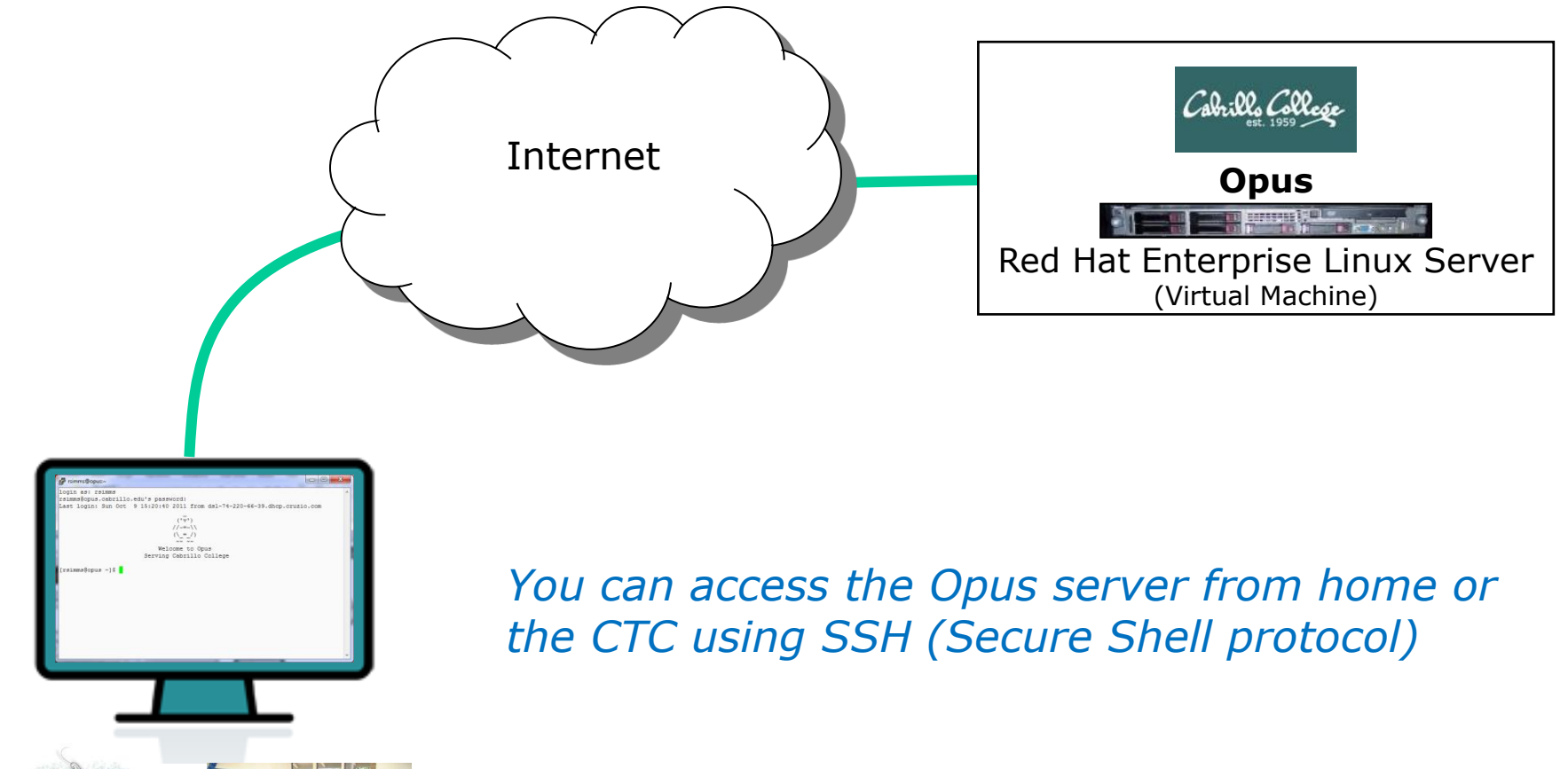
Some lingo for this class

- "**machine**" = the hardware portion of a computer
- "**VM**" = a virtual machine where the hardware is emulated by software
- "**server**" = typically a high end, always-on, computer designed to be used remotely by multiple users
- "**system**" = UNIX/Linux folks almost always refer to their UNIX/Linux servers as system.
- "**host**" = a computer or system on the network
- "**OS**" = Operating System
- "**distro**" = a distribution of Linux, e.g. Red Hat, SUSE, Ubuntu.
- "**SSH**" = secure shell
- "**shell**" = The user interface to UNIX/Linux
- "**SSH into Opus**" = use Putty on Windows or the ssh command on Linux to connect to Opus.
- "**Putty into Opus**" = run the Putty program on windows and connect remotely using SSH to the computer on campus named Opus

Some lingo for this class

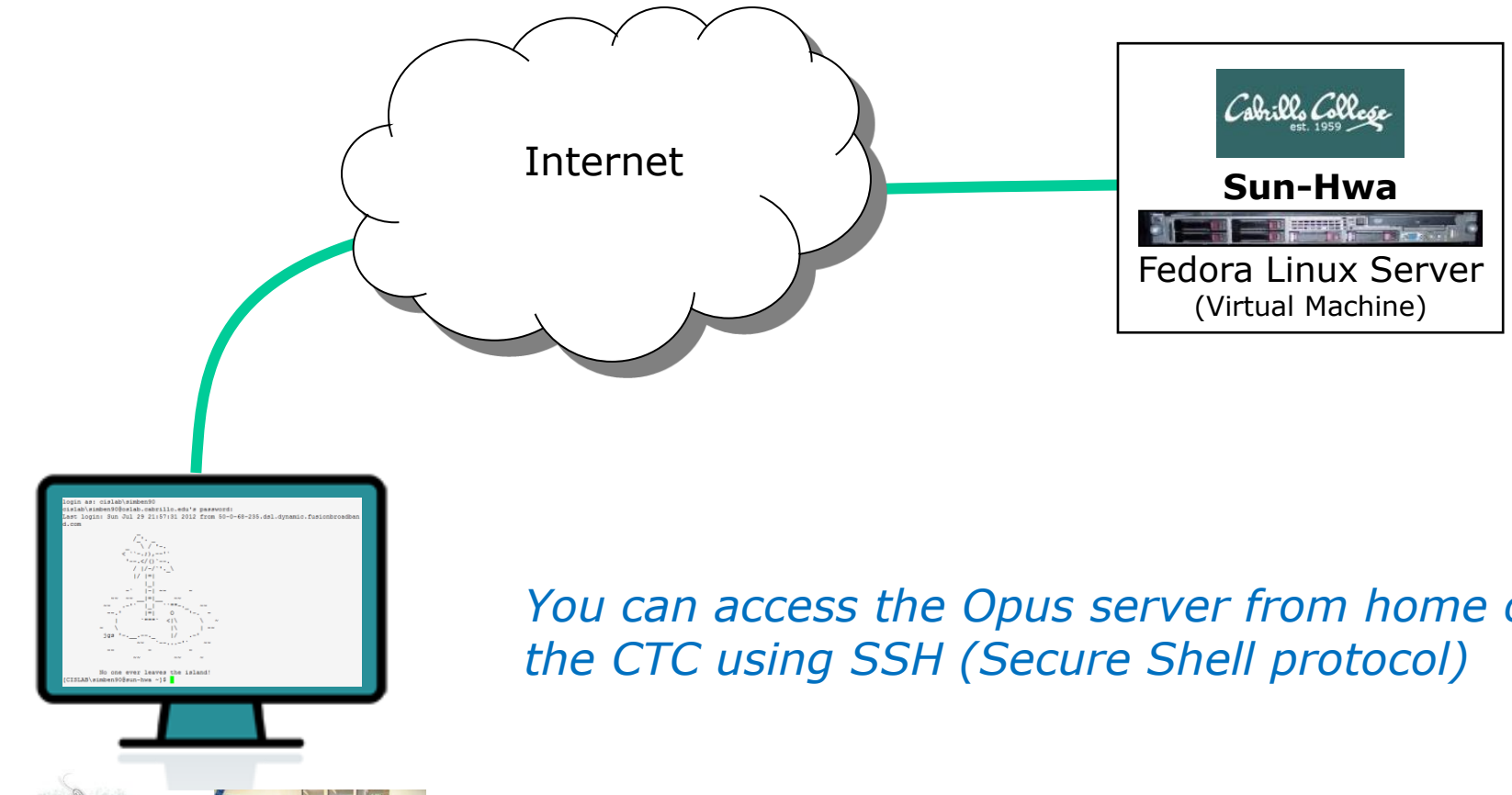
- "**console**" = a local terminal for entering commands.
- "**virtual terminal**" = when using a local console there are a number of virtual terminals that can be used. Ctrl-Alt-F*n*, where *n*=1 to 7 will bring up different terminals. For example, Ctrl-Alt-F2 brings up tty2. These terminals have no scroll bars.
- "**tty**"= a teletype, very early and noisy way to interact with a computer. A teletype had a keyboard and a printer and was connected to a computer. The virtual terminals are named tty1, tty2, etc.
- "**graphical terminal**" = A terminal program that can be run on a graphical desktop. These terminals have scroll bars.
- "**bring up tty2**" - bring up the tty2 console by pressing Ctrl-Alt-F2 keys at the same time
- "**terminal emulator**" – programs like Putty that run on a PC and emulate a terminal.

Remote Access to **Opus**



You can access the Opus server from home or the CTC using SSH (Secure Shell protocol)

Remote Access to **Opus**



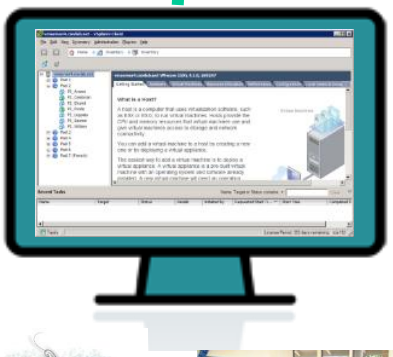
You can access the Opus server from home or the CTC using SSH (Secure Shell protocol)

Room 1403 on Aptos Campus

Internet

cislab (Win 2008)

vmservers (VMware ESXi)



You can access the course VMs from home or the CTC using RDP (Remote Desktop Protocol)

Fang

Mr-Eko

Not-Opus

Kate

Hugo

Home

Lab or Classroom