Lesson Module Status

- Slides (how the class works, lesson 1) - draft
- Properties - done
- Flash cards -
- First minute quiz -
- Web calendar summary - done
- Web book pages - done
- Commands - done
- Lab - draft
- Supplies (surveys, passwords) - done
- Class PC's deployed - done
- Scripts (submit) - done
- CCC Confer room scheduled - done
- Rosters printed - done
- Backup headset charged - done
- Backup slides, VC, handouts on flash drive -

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

Rich

Dennis, Mark, Fernando, Sean B., Christine, Francisco, Shelter, Salina, Steven, Chris, Nathan, Miguel, Abdul, Tony, Sarah, James G., Astitow, Mike D., Anthony, Laura P., Jacob, Nic, Stephen, Leandro, Jennifer, Nicholas, Luke, Juan, Saulius, Jose, Casady, James, Samuel, Adriana, Carlile, Liz, Sean S., Jason, Eric, Cesar, Lars, Dale, Tanya, Joshua, Matthew, Elyse, Bryan, Stephanie, John, Victor, Janelle, Brian, Songul, Rudy, Aaron, Laura S., Vincent, Angel, Mike P., James B., Sergio, Jonah, Alex

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

[ ] Has the phone bridge been added?
[ ] Is recording on?
[ ] Does the phone bridge have the mike?

Classroom students:
Log into workstations as CIS 90 using password on whiteboard

Online students:
Welcome, if you see this you made it into the virtual classroom!

Class and Linux Overview

Objectives	Agenda
• Understand how this course works • High-level overview of computers, operating systems, and virtual machines • Overview of UNIX/Linux market and architecture • Learn first commands • Use SSH to login and enter commands on a remote Linux server • Login and enter commands on a local virtual machine using both virtual and graphical terminals.	• Introductions • How this class works • Housekeeping • UNIX/Linux Market • Computers • UNIX/Linux Architecture • Using Linux • Remote Access • Local access • Virtual Machines • Equipment • Simple Commands • Navigating Terminals • Wrap up

Introductions

Course history and credits

Jim Griffin
- Jim created this Linux course
- See him at GNU/Linux Users Group meetings
- 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
- Added some teaching best practices he liked when he took classes at Cabrillo (e.g. John Govsky's online help forum, first minute quizzes, no late work policy)
- Also added the PowerPoint slides and Howto's for common Linux tasks

Times and dates

CIS 90 uses CCC-Confer

Fall 2010

September 2010

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		

October 2010

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						

November 2010

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				

December 2010

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	

- Class meets every Wednesday afternoon:
  - At 1:15-4:20PM, from Sep 1st to Dec 8th
  - 15 lessons (class meetings) total
  - Final exam at 1-3:50PM, on Dec 15th
- Classroom and online sections taught simultaneously:
  - Section 67727: Room 2501 or attend online
  - Section 68884: Attend online only
- Rich's office hours:
  - Wednesday 11-11:50 AM, room 2502
  - Also available in the lab another 2.5 hours every week

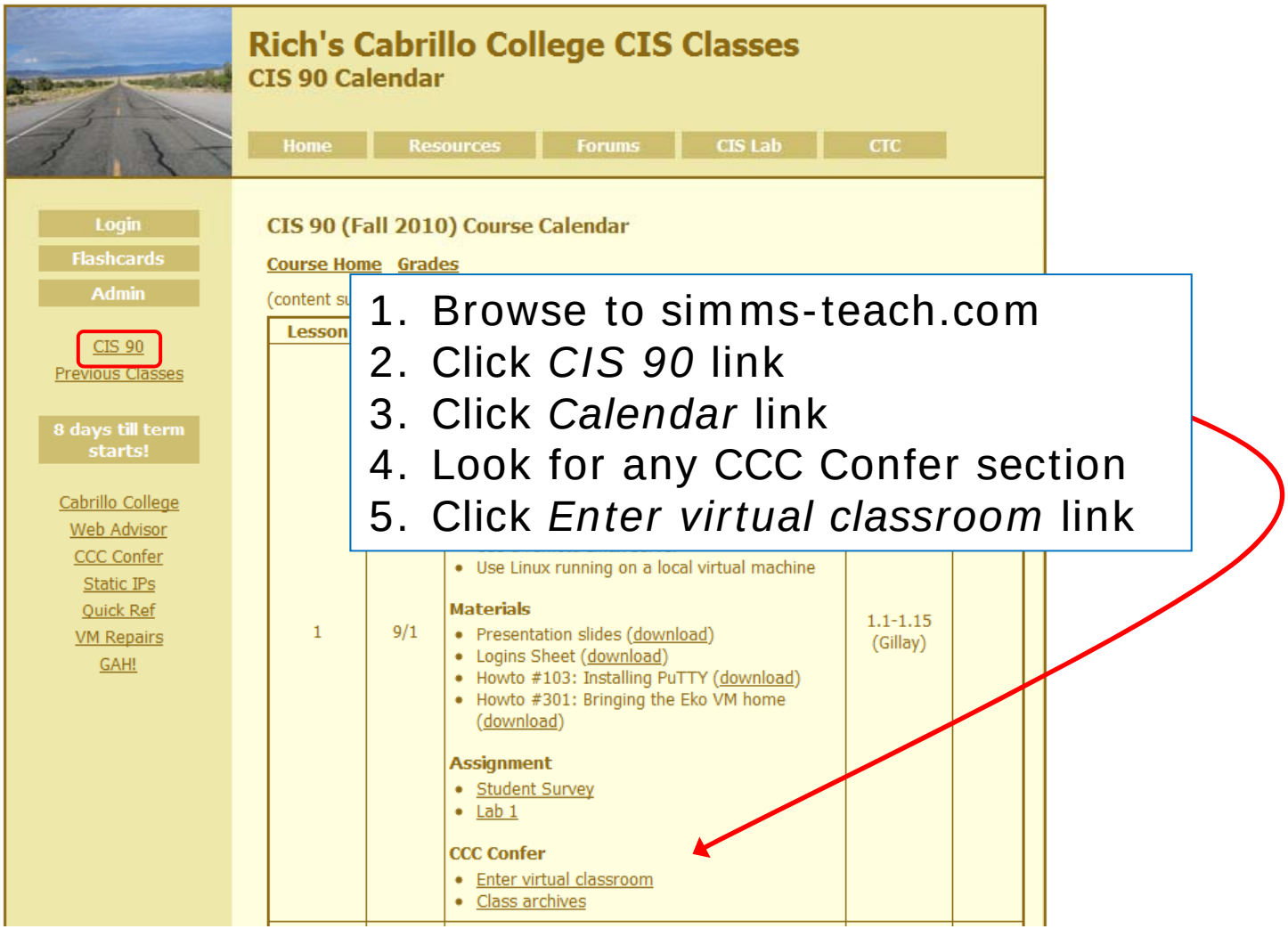
Rich won't be able to hang around after class this term. He is serving on the Santa Cruz Grand Jury this year and has a meeting at the County building following class.

Attending online with CCC Confer

- CCC = California Community Colleges
- Web conferencing tool + phone bridge (conference call)
- Online section will attend all classes online
- Classroom section may also attend classes online
- Listen using your computer's speakers (and ask ?'s using a chat window) or dial-in to the phone bridge (and ask ?'s by speaking)
- Each class is recorded and archived for viewing later

Class Activity

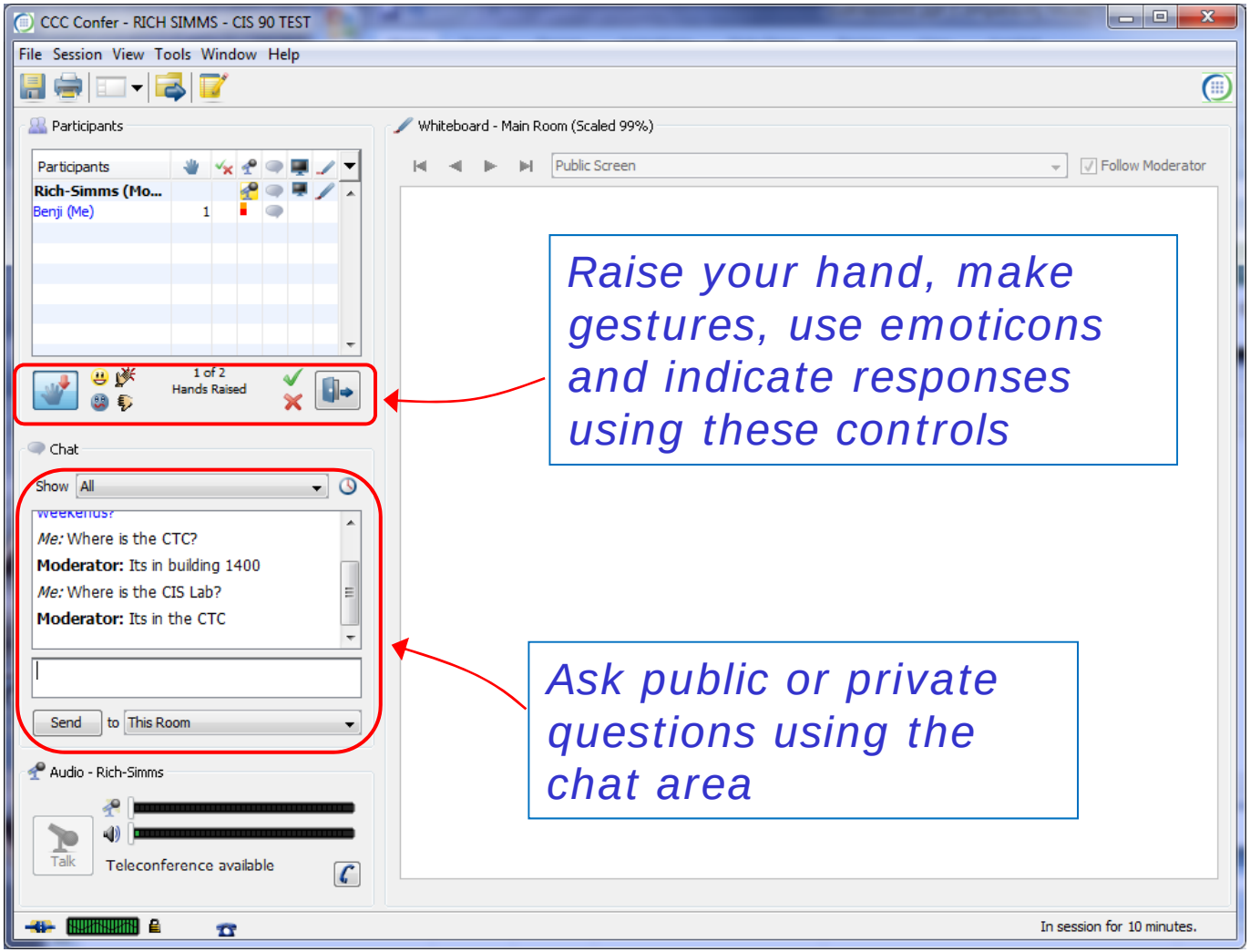
Enter the online virtual classroom



CCC Confer - Attending class online

The first time you use CCC Confer you will see the Java getting downloaded and installed

CCC Confer - Attending class online



CCC Confer - Attending class online

STUDENT CONFERENCE FEATURES

*0 Contact the operator for assistance.

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

This only works if you dial-in using your telephone

How this class works

The typical week

http://simms-teach.com

Use Forum to ask and answer questions

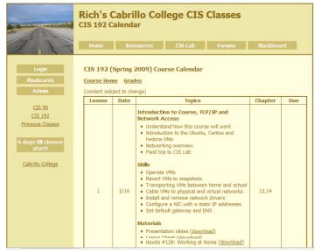
Wednesday

"First minute" quiz

Lecture on new lesson material

Class activities

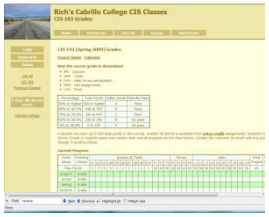
Lab assignments due midnight



Calendar Page

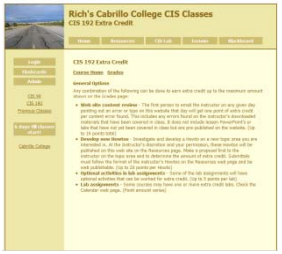
Thursday

is grading day



Check progress on the Grades Page

Work Lab Assignments for TBA portion of class (3 hours 5 min) in CIS Lab



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.
- Weekly office hours on the mornings (Wed 11-11:50) in room 2502
- The instructor will be available in the CIS Lab 2.5 hours (TBD) every week to help students with lab assignments or to better understand class material.

- Leave a message on voice mail if you have no network access. Checked rarely so don't expect a fast response.

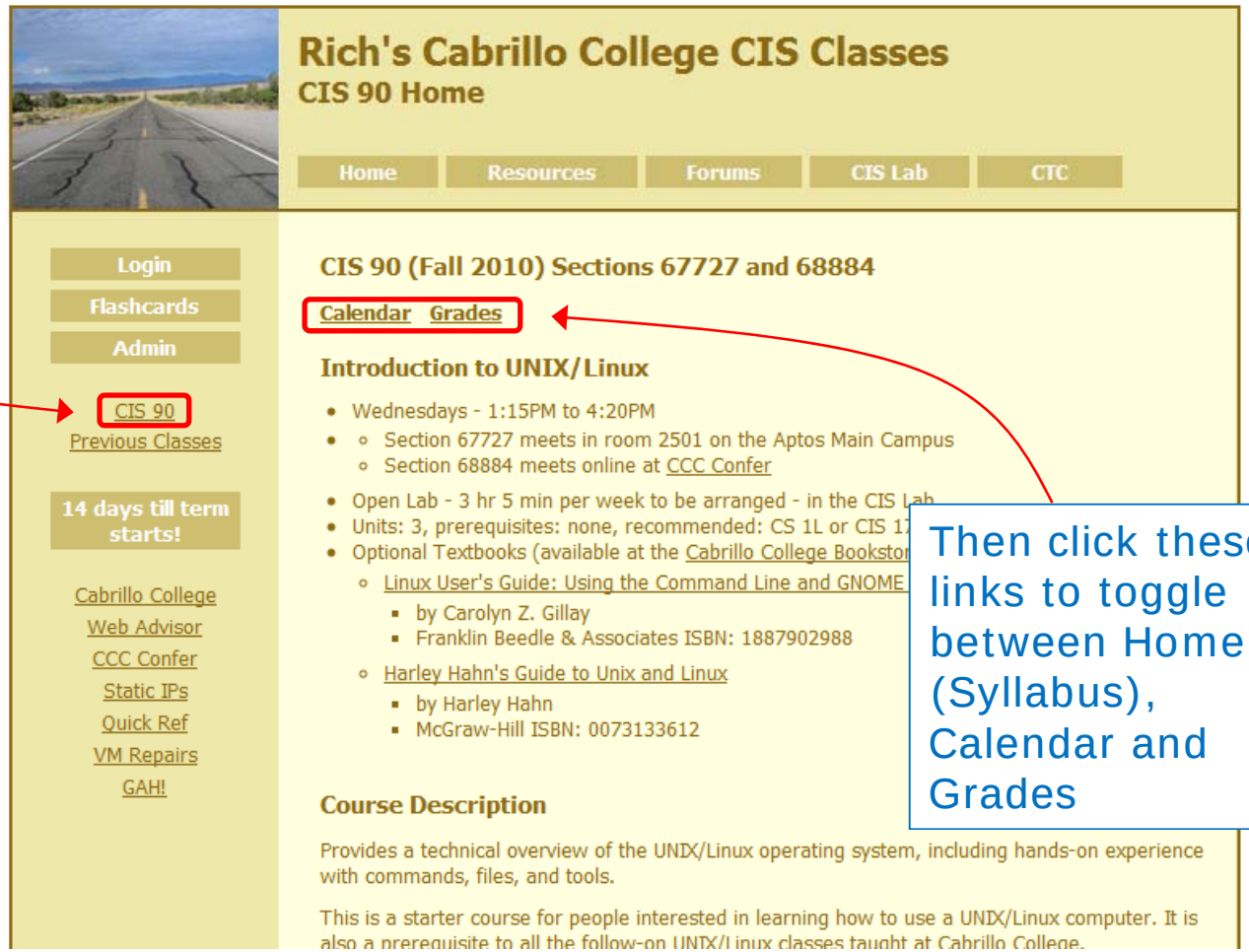
Using Website

http://simms-teach.com/

Class Exercise (class website)

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

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



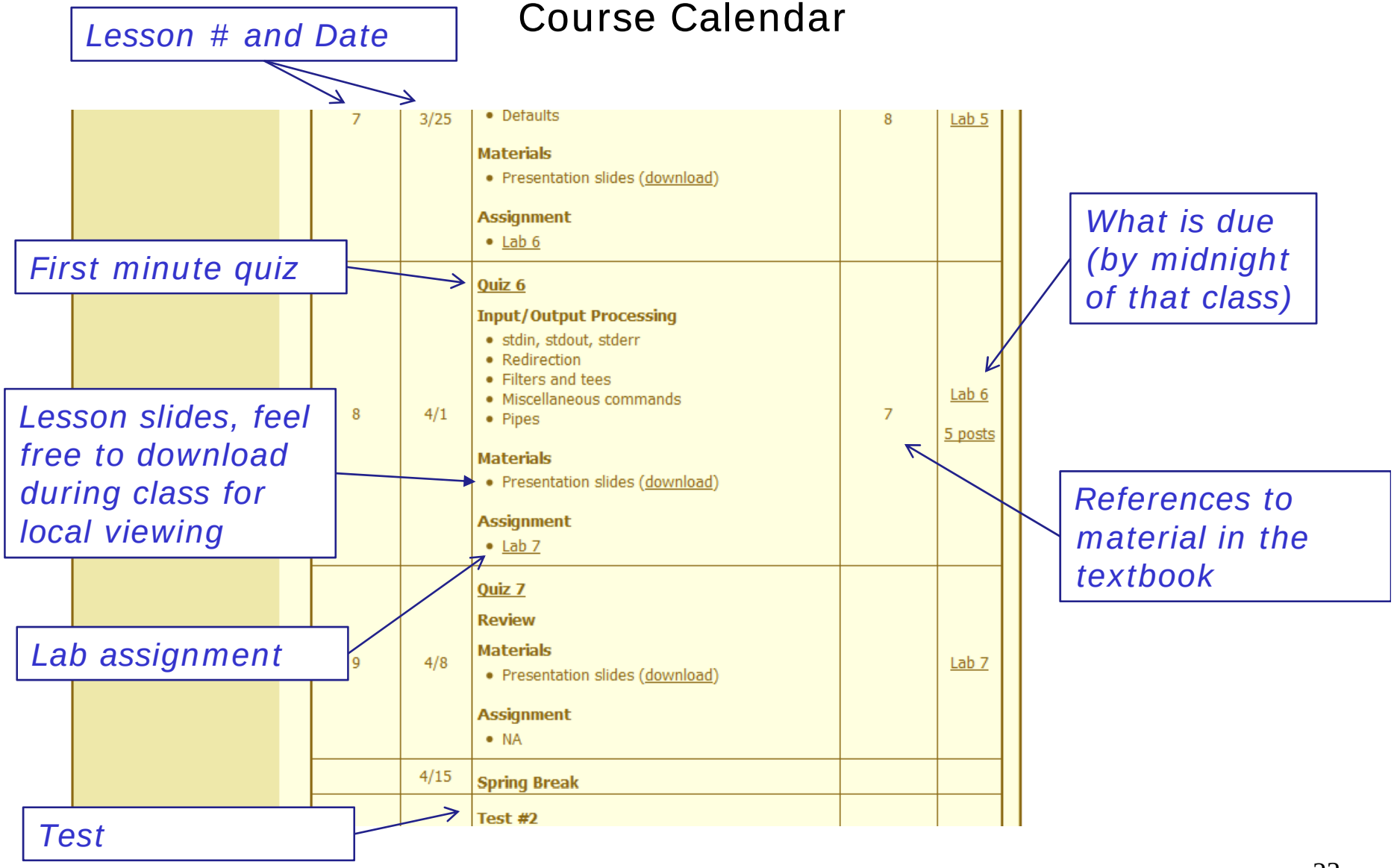
Then click these links to toggle between Home (Syllabus), Calendar and Grades

Course Syllabus
(on the CIS 90 home page)

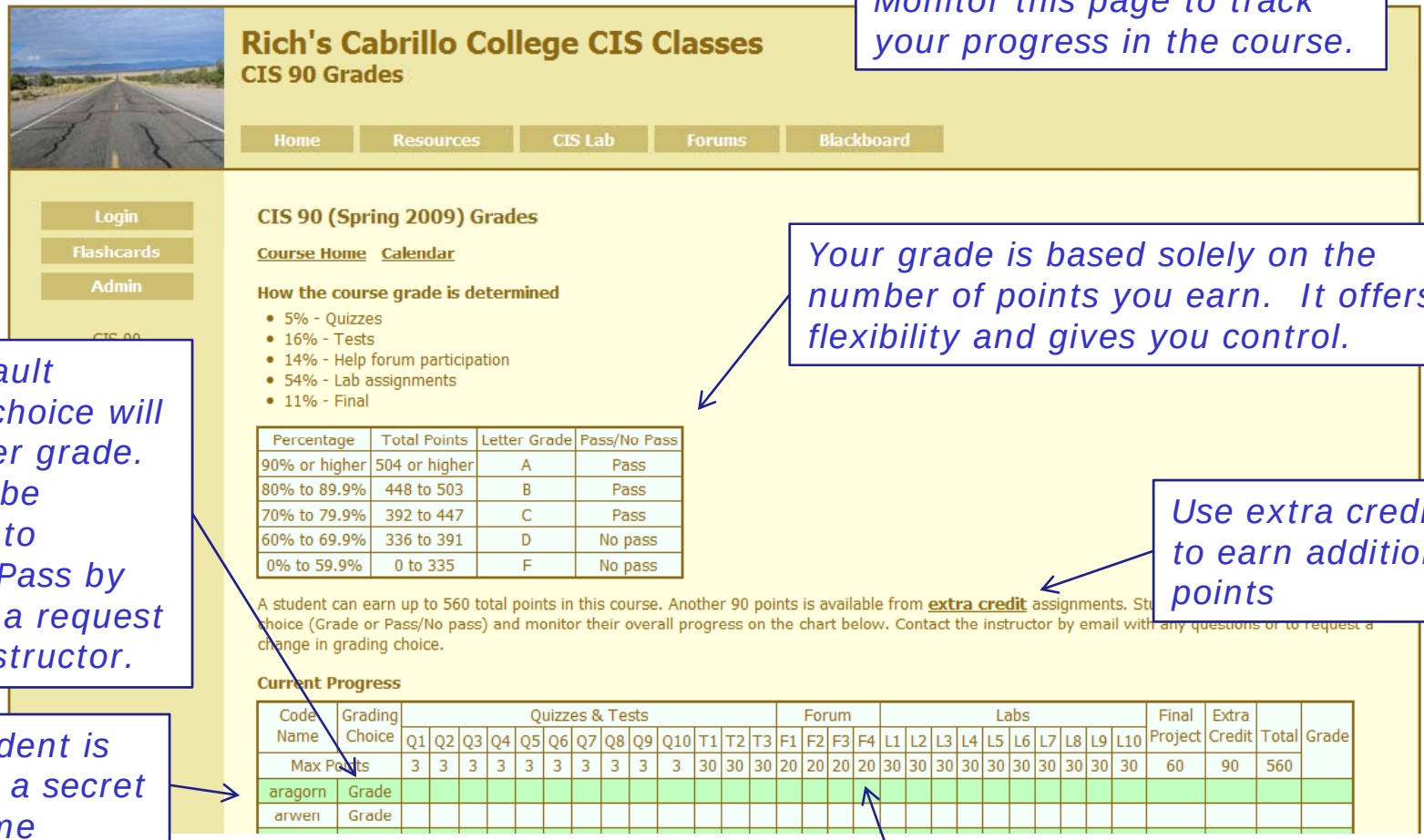
It is a good idea to read through the syllabus carefully to avoid any surprises and get a good idea how this course works.

We will cover some important syllabus highlights in the next several slides.

Course Calendar



Course Grading



Rich's Cabrillo College CIS Classes

CIS 90 Grades

Home | Resources | CIS Lab | Forums | Blackboard

Login | Flashcards | Admin

CIS 90 (Spring 2009) Grades

Course Home Calendar

How the course grade is determined

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

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

A student can earn up to 560 total points in this course. Another 90 points is available from extra credit assignments. Stu… choice (Grade or Pass/No pass) and monitor their overall progress on the chart below. Contact the instructor by email with any questions or to request a change in grading choice.

Current Progress

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																															
arwen	Grade																															

Monitor this page to track your progress in the course.

Your grade is based solely on the number of points you earn. It offers flexibility and gives you control.

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

Use extra credit to earn additional points

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

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
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.

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

More on Grading

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
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

Observations on a previous class:

- **Aragorn** got an A by doing solid work across the board and never did any 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

"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 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!
- Quizzes are closed notes and closed book.
- Students may not give or ask others for assistance while taking a quiz.
- To take the quiz, students can email the answers to the instructor. Students in the classroom can also write the answers on a piece of scrap paper to hand in.
- 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 the Opus Linux server to check the 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" and "room 2501 brain freeze" you can take the test home and turn it in by midnight the day of the test.
- Students may not give or ask others for assistance while taking a test.

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 is worth 4 points, up to 20 points maximum per quarter.
- The posts for the quarter will be due at midnight (Forum time) on the date shown on the course Calendar.

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

More on Grading

Lab Assignments (10 labs, 30 points each)

- Will be due at midnight (Opus time) on the date shown on the course Calendar.
- Late work is not accepted. 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 CTC and CIS lab. In addition the Linux Opus server may be accessed from anywhere over the Internet.

The TBA portion of this course requires spending on average of 3 hours and 5 minutes every week applying the skills learned during the lecture portion of the class.

More on Grading

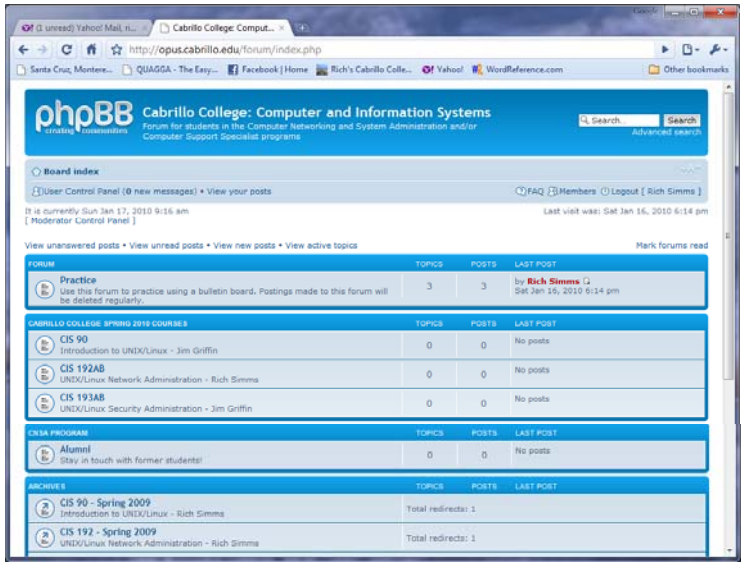
Extra credit (up to 90 points)

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

Help Forum

Online Help Forum

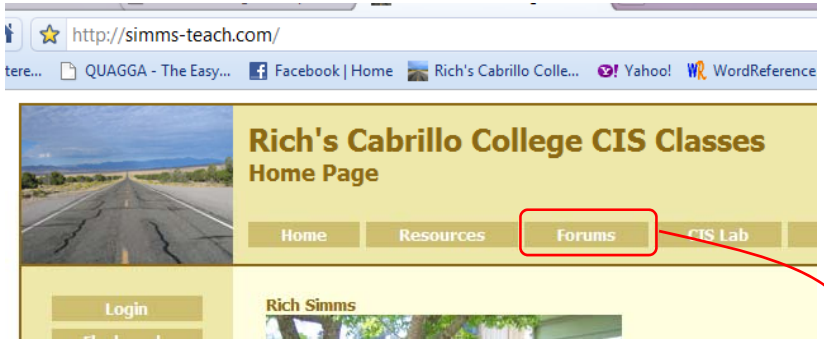


- Post questions and answers
- Share Linux information
- Post class notes for classmates who miss class
- Get clarifications
- Collaborate on quiz questions
- Share Linux information
- Never post passwords!

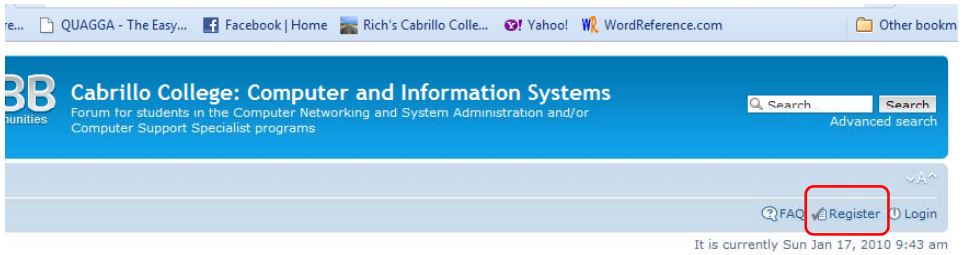
As an incentive to use the forum - students can earn 4 points per CIS 90 forum post (capped at 20 points for each ¼ of the course calendar)

Class Activity
Forum Registration

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



*Or browse to **opus.cabrillo.edu/forum***



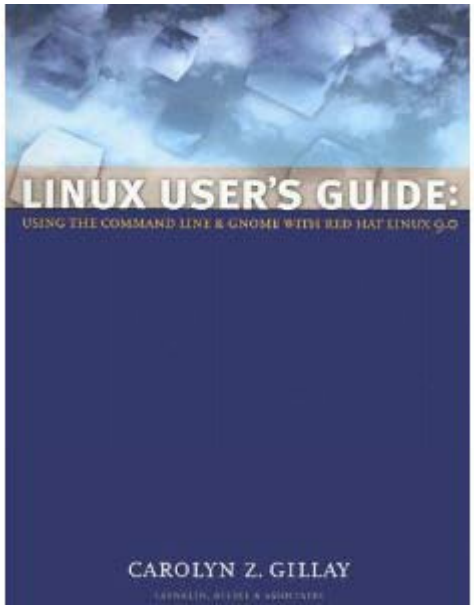
To Register:

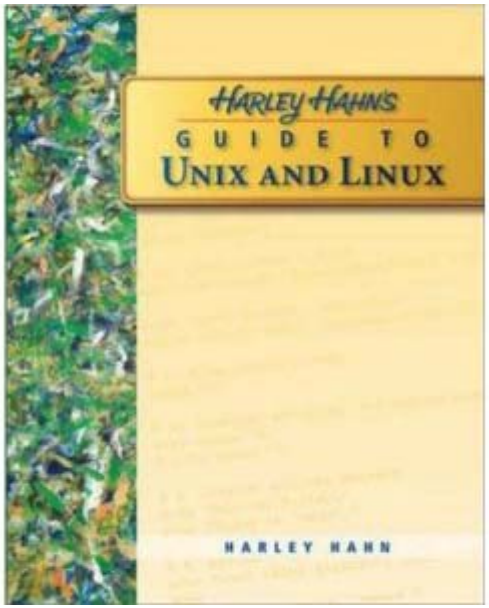
1. Browse to the forum
2. Click on 

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: Anonymous or incomplete user account names will be deleted!

Textbooks





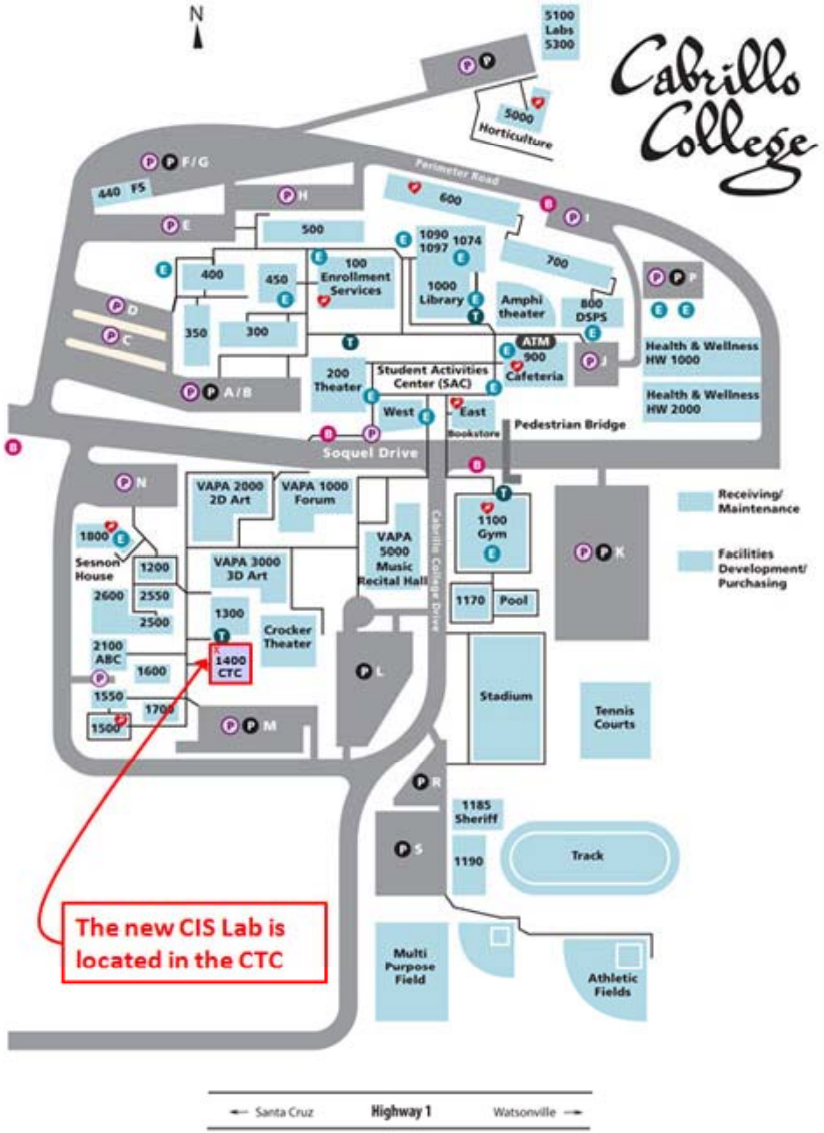
Optional Textbooks:

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

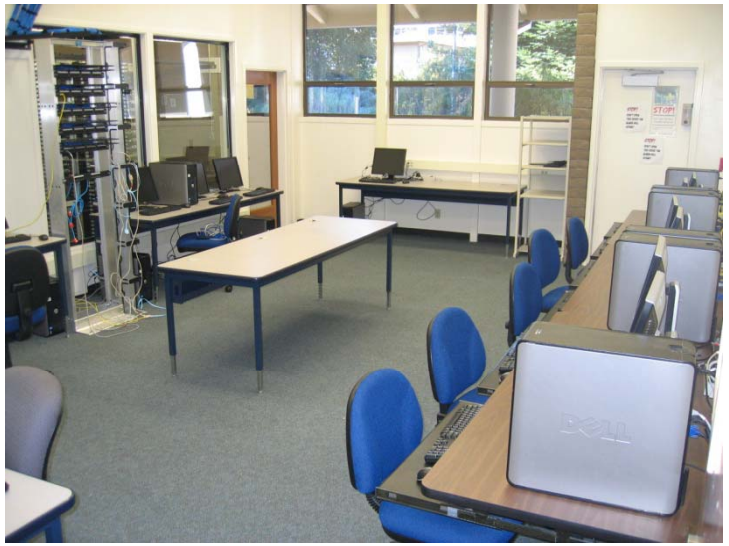
Harley Hahn's Guide to Unix and Linux
by Harley Hahn
McGraw-Hill ISBN: 0073133612

More on Labs

Lab Resources



The CIS Lab has moved
It is now inside the CTC (Building 1400)



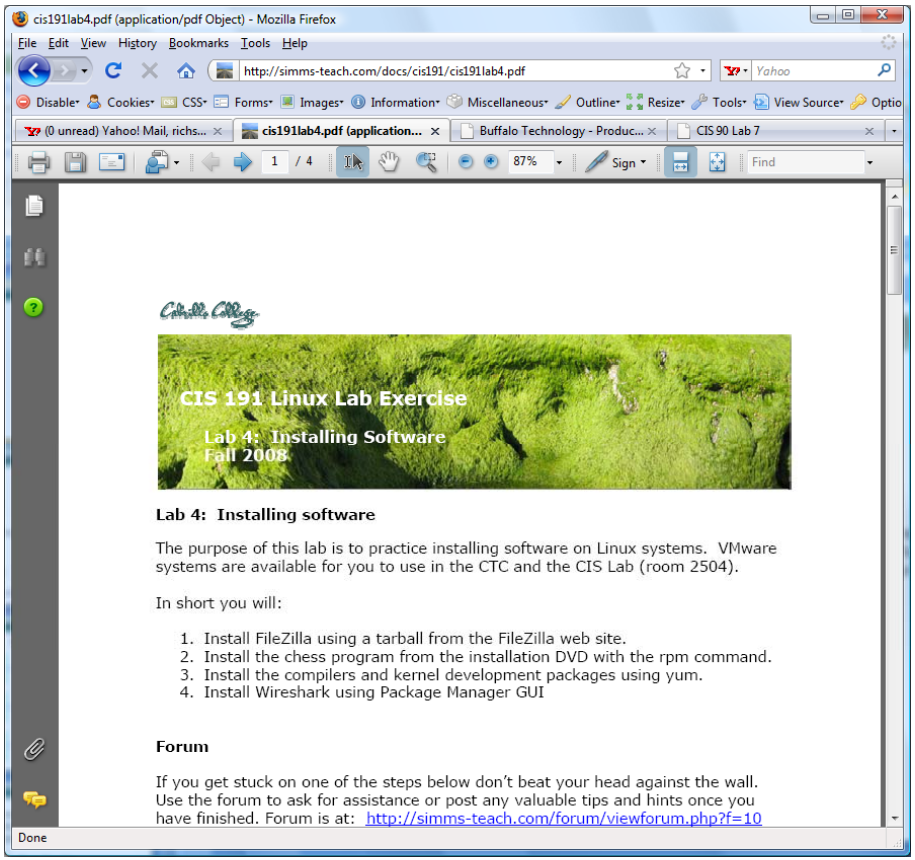
Lab Resources

Lab resources and instructor assistance are available in the CIS Lab

Stations CIS-Lab-01 to CIS-Lab-06 are available on the east wall

Stations CIS-Lab-07 to CIS-Lab-10 are available on the south wall

Lab Assignment Tips



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.

Housekeeping

Can I add this class?

- It is going to be extremely difficult for the college to add students to sections that are full.
- Both CIS 90 sections are completely full.
- CIS 90 will be offered again next term, so students may have to wait.
- Between 9/1 and 9/10, the instructor will email add codes to students on the waitlist as spaces become available. The last day for students to add CIS 90 is 9/10.
- Enrolled and wait-listed students that don't show up for class will be dropped or lose their space on the wait list unless they have made prior arrangements with the instructor.

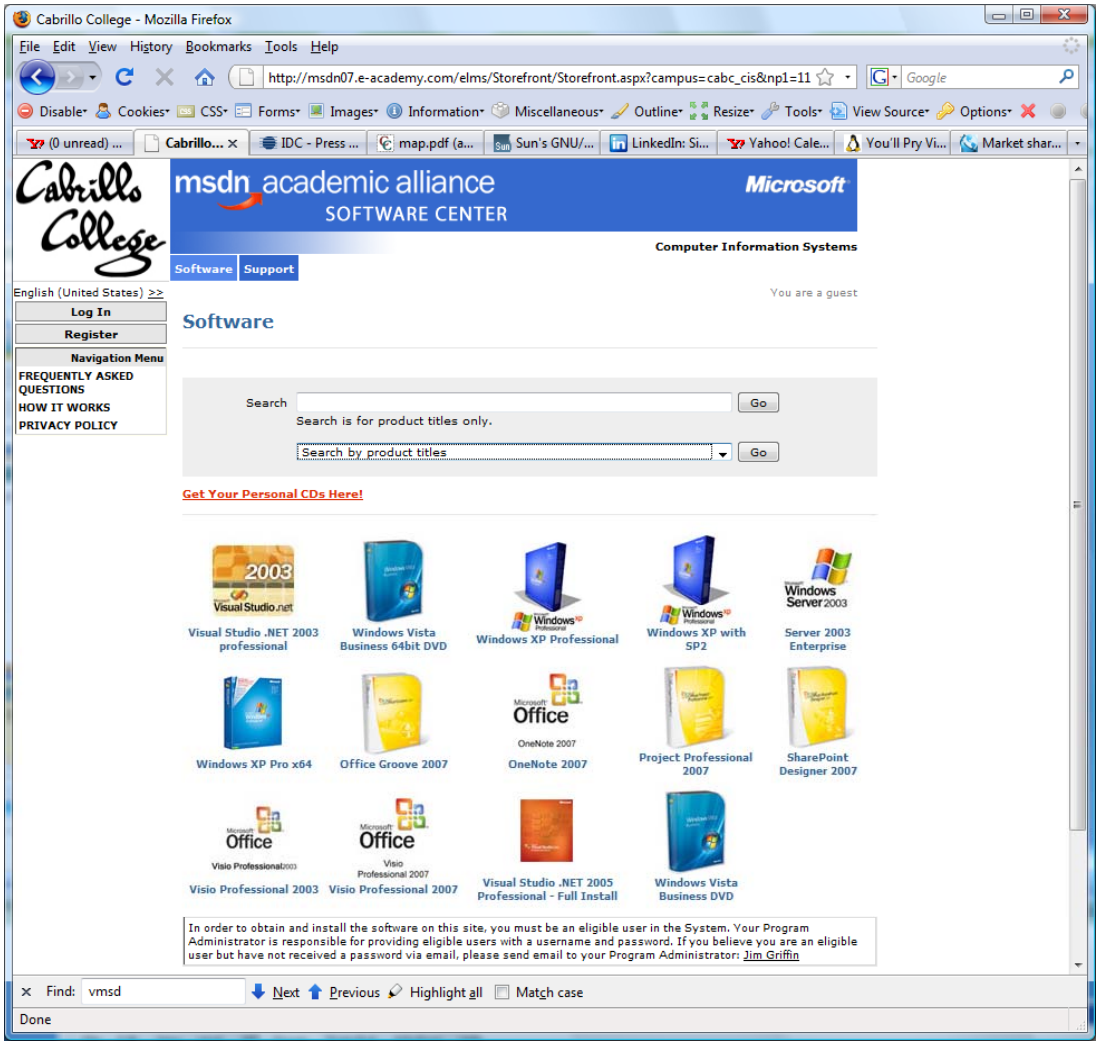
Roll Call for both sections

Turn OFF the recording

Roll Call for both sections

Turn recording back ON

MSDN Academic Alliance



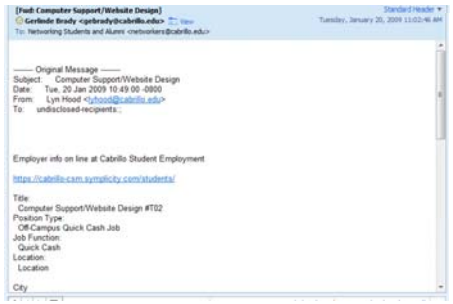
- For students registered in a CIS or CS class at Cabrillo
- Email instructor after registration is final (two weeks after first class)

Cabrillo Networking Program Mailing list

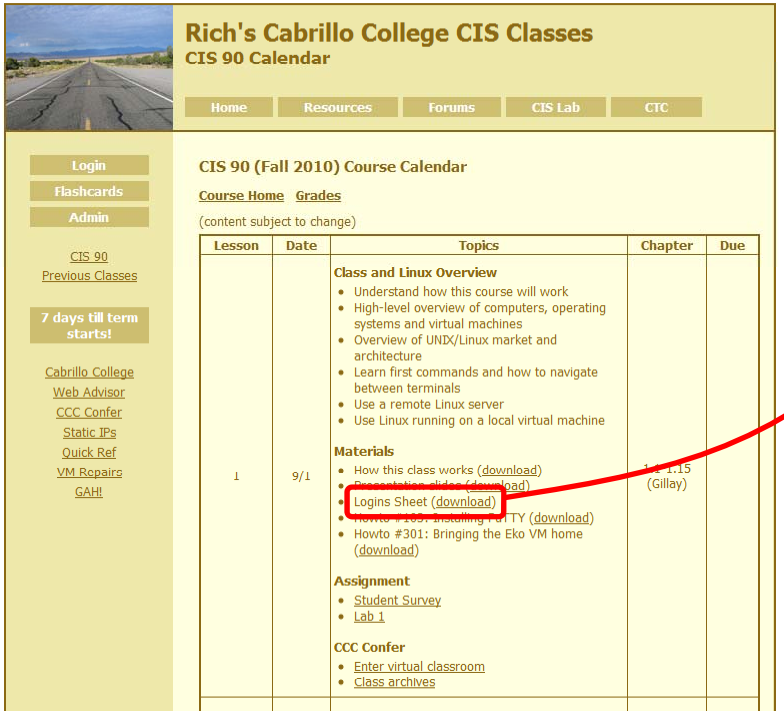
Subscribe by sending an email (no subject or body) to:

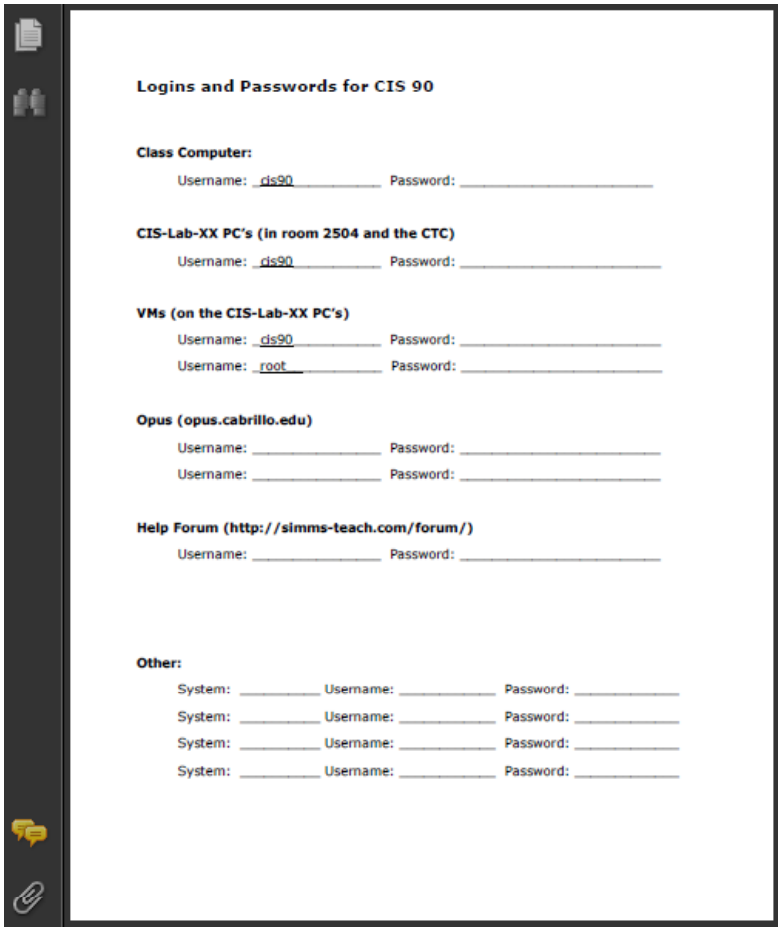
networkers-subscribe@cabrillo.edu

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



Logins Sheet





Download the login sheet for keeping track of class usernames and passwords (optional)

Passwords

Switch to CCCC whiteboard

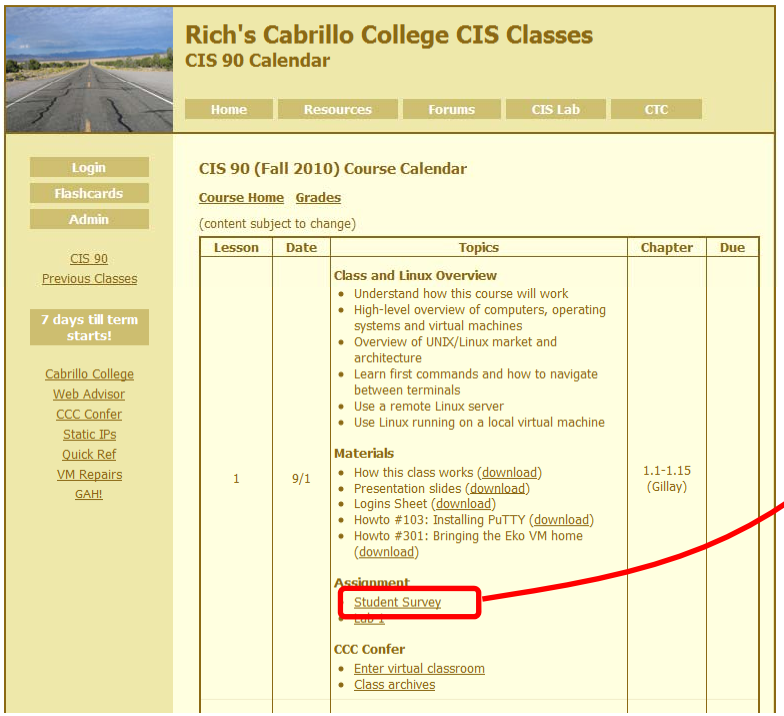
Turn OFF the recording

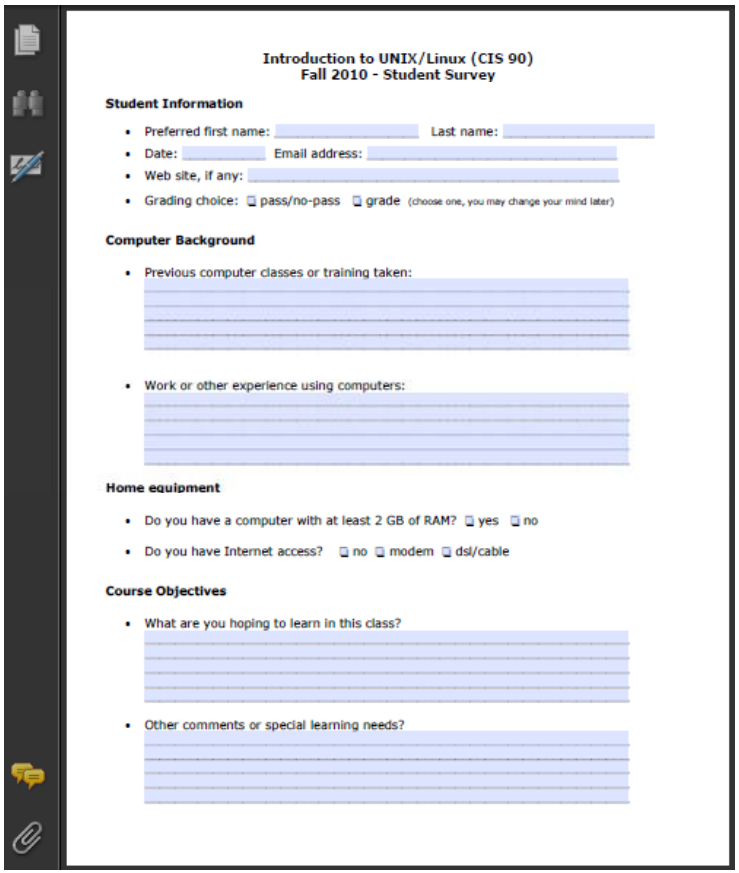
Passwords

Switch to Powerpoints

Turn recording back ON

Student Survey





Introduction to UNIX/Linux (CIS 90)
Fall 2010 - Student Survey

Student Information

- Preferred first name: Last name:
- Date: Email address:
- Web site, if any:
- Grading choice: ☐ pass/no-pass ☐ grade (choose one, you may change your mind later)

Computer Background

- Previous computer classes or training taken:
- Work or other experience using computers:

Home equipment

- Do you have a computer with at least 2 GB of RAM? ☐ yes ☐ no
- Do you have Internet access? ☐ no ☐ modem ☐ dsl/cable

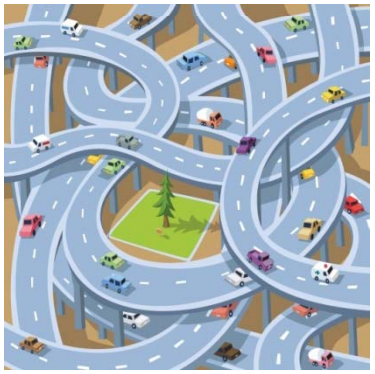
Course Objectives

- What are you hoping to learn in this class?
- Other comments or special learning needs?

Please fill out survey and email to risimms@cabrillo.edu

UNIX/Linux in the Market

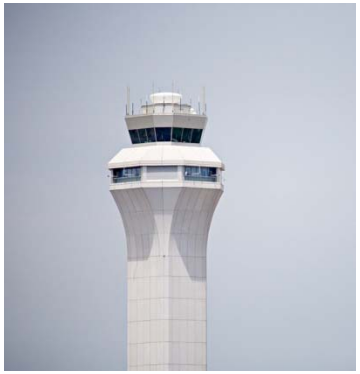
Public Works Infrastructure



Roads

Water

Bridges

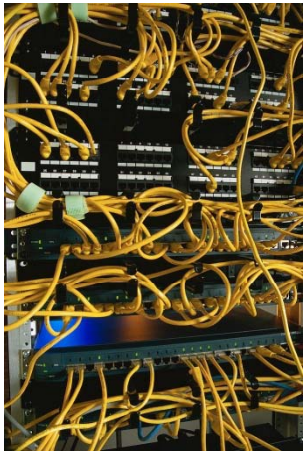


Airways

Power

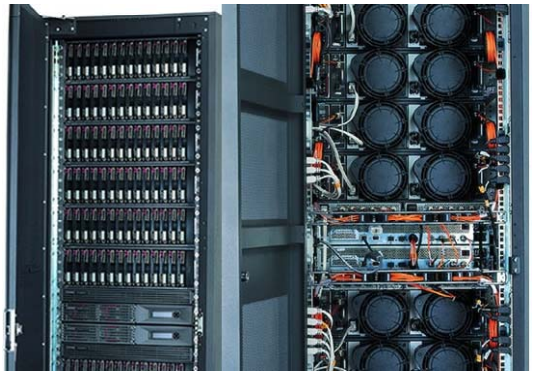
Telecomunications

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

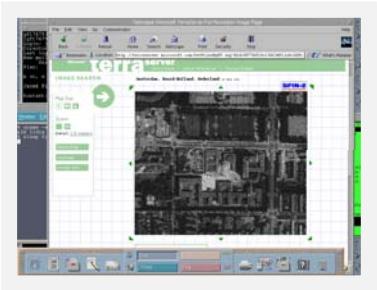
Operating Systems

Various UNIX Based Products

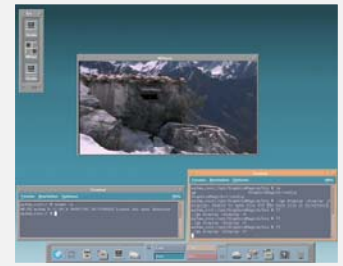
SCO UNIX

Berkeley Software Distribution

AIX



HP-UX



Solaris

Apple Mac OS X and iOS

The kernel is UNIX based

Operating Systems

Various Linux Distributions

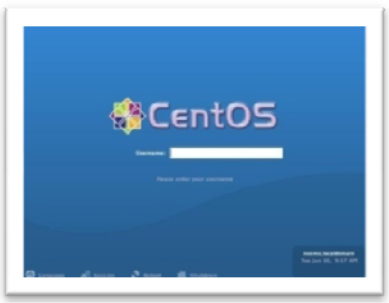
OpenSUSE

Red Hat Enterprise Linux

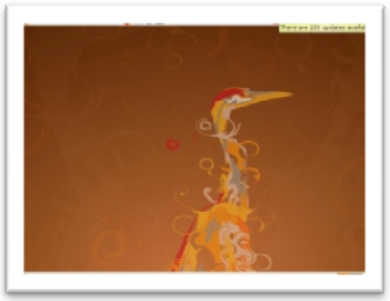
Fedora

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

Operating Systems
Embedding Linux in Products

Tivo

Google Chrome OS
(coming soon)
for Netbooks and Tablets

Buffalo
NAS storage

MikroTik Routers

Android

Operating Systems
Embedding UNIX in Products

Apple iOS

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

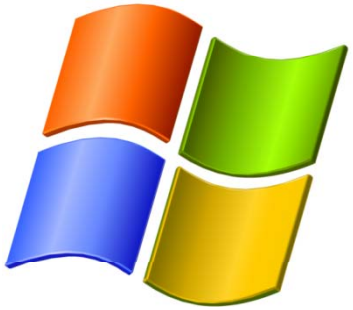
Source: http://en.wikipedia.org/wiki/Darwin_(operating_system)
http://en.wikipedia.org/wiki/IOS_(Apple)

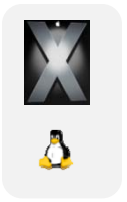
UNIX/Linux Overview

Server, PC, Smartphone markets

Servers

PC's



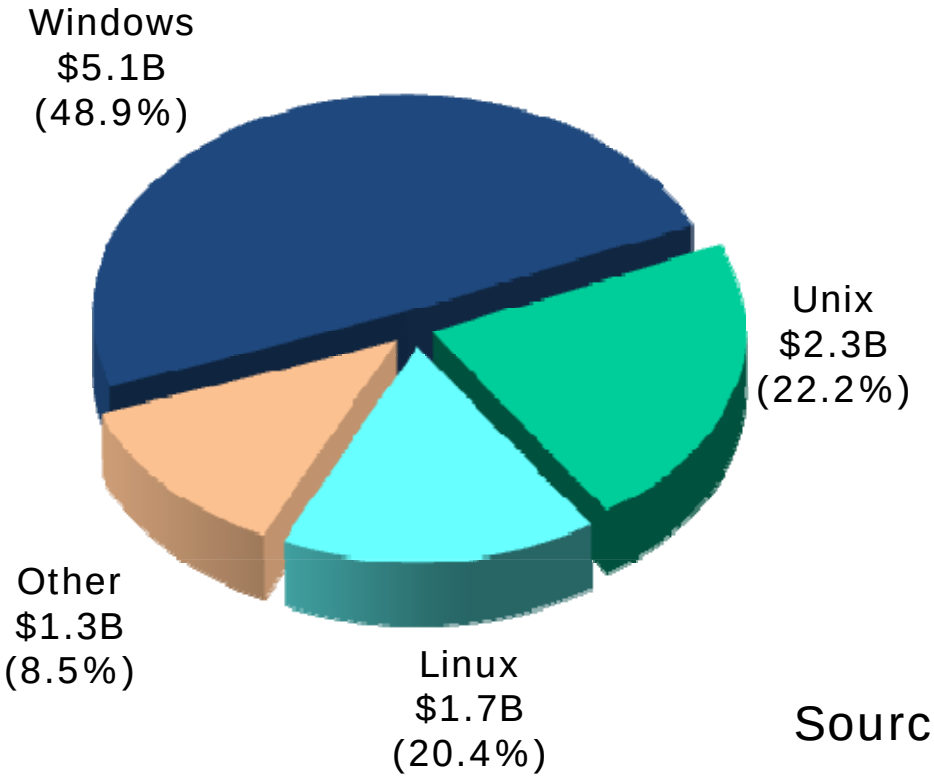


Smartphones

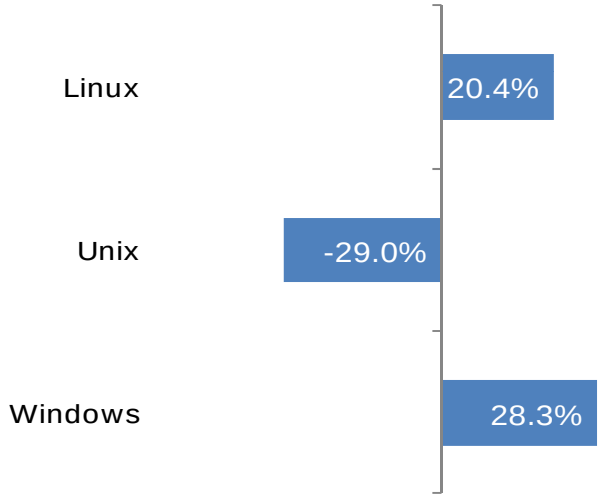
symbian OS

Worldwide Server Market

$10.4B Server Revenue 1Q 2010



Year over Year Change



Source: IDC, May 2010

http://www.idc.com/getdoc.jsp?containerId=prUS22360110

Website hits by OS

Implies "ballpark market share" for PCs

May 2008[1]

Operating Systems		
1	Windows XP	78.24%
2	Windows Vista	7.69%
3	Mac OS X	4.73%
4	Windows 2000	3.07%
5	Linux	1.95%
6	Windows 98	0.96%
7	Windows 2003	0.74%
8	Windows ME	0.36%
9	Windows NT	0.05%
10	SymbianOS	0.04%

Jan 2009[2]

Operating Systems		
1	Windows XP	72.17%
2	Windows Vista	13.44%
3	Mac OS X	5.24%
4	Linux	2.13%
5	Windows 2000	2.12%
6	Windows 2003	0.68%
7	Windows 98	0.55%
8	Windows ME	0.22%
9	SymbianOS	0.12%
10	WAP	0.04%

Jul 2010[3]

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%

1-This report was generated 05/31/2008 based on the last 24,031,012 unique visits to all tracked websites at that time. W3Counter's sample currently includes 11,976 websites. The last 25,000 page views to each website are analyzed to identify unique visits. Some visits may occur before the month of the report.

2-This report was generated 12/31/2008 based on the last 53,892,847 unique visits to all tracked websites at that time. W3Counter's sample currently includes 19,174 websites. The last 25,000 page views to each website are analyzed to identify unique visits. Some visits may occur before the month of the report.

3 - 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.

W3Counter

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

Worldwide Server Market

Table 2
Worldwide Smartphone Sales to End Users by Operating System in 2Q10
(Thousands of Units)

	Company	2Q10 Units	2Q10 Market Share (%)	2Q09 Units	2Q09 Market Share (%)
Nokia	Symbian ↓	25,386.8	41.2	20,880.8	51.0
Blackberry	Research In Motion ↓	11,228.8	18.2	7,782.2	19.0
Google	Android ↑	10,606.1	17.2	755.9	1.8
Apple	iOS ↑	8,743.0	14.2	5,325.0	13.0
	Microsoft Windows Mobile ↓	3,096.4	5.0	3,829.7	9.3
	Linux ↓	1,503.1	2.4	1,901.1	4.6
	Other OSs ↑	1,084.8	1.8	497.1	1.2
	Total	**61,649.1**	**100.0**	**40,971.8**	**100.0**

Source: Gartner (August 2010)

http://www.gartner.com/it/page.jsp?id=1421013
http://www.mobiletechreview.com/smartphone.htm

iso.linuxquestions.org

15 Most Popular Downloads

Jan 30, 2009

Mandriva
Fedora
SUSE
Red Hat
Ubuntu
Damn Small Linux
Knoppix
MEPIS
Slackware
Debian
CentOS
PCLinuxOS
Gentoo
Linspire
Xandros

Aug 17, 2010

Mandriva
Fedora
SUSE
Red Hat
Ubuntu
Damn Small Linux
Linux XP
Knoppix
Slackware
Debian
CentOS
MEPIS
PCLinuxOS
Gentoo
Linspire

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

distrowatch.com

Top "Ten" Lists

Ladislav Bodnar 2007	Jan 2009	Jan 2010
1. Ubuntu	1. Ubuntu	1. Ubuntu 9.10
2. openSUSE	2. openSUSE	2. Fedora 12
3. Fedora	3. Fedora	3. openSUSE 11.2
4. Debian	4. Debian	4. Debian 5.0
5. Mandriva	5. Mandriva	5. Mandriva 2010
6. PCLinuxOS	6. Linux Mint	6. Linux Mint 8
7. MEPIS	7. PCLinuxOS	7. PCLinuxOS 2009.2
8. KNOPPIX	8. Slackware	8. Slackware 13.0
9. Slackware	9. Gentoo	9. Gentoo 10.1
10. Gentoo	10. CentOS	10. CentOS 5.4
11. FreeBSD	11. FreeBSD	11. FreeBSD 8.0

CentOS is a clone distro of Red Hat Enterprise

Linux distros mentioned by top server vendors

Server market share source: IDC 1Q10 report

Vendor	HP (32.5%)	IBM (27.5%)	Dell (16.3%)	Oracle / Sun (6.6%)
Red Hat Enterprise	✓	✓	✓	✓
Novell SUSE	✓	✓	✓	✓
Debian/GNU Linux	✓	✓		
Oracle EL	✓	✓		✓
Asianux	✓	✓		
Ubuntu	✓	✓		
CentOs	✓	✓		
Fedora	✓	✓		
OpenSUSE	✓	✓		

For CIS 90 we will be using Red Hat Enterprise and Ubuntu

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

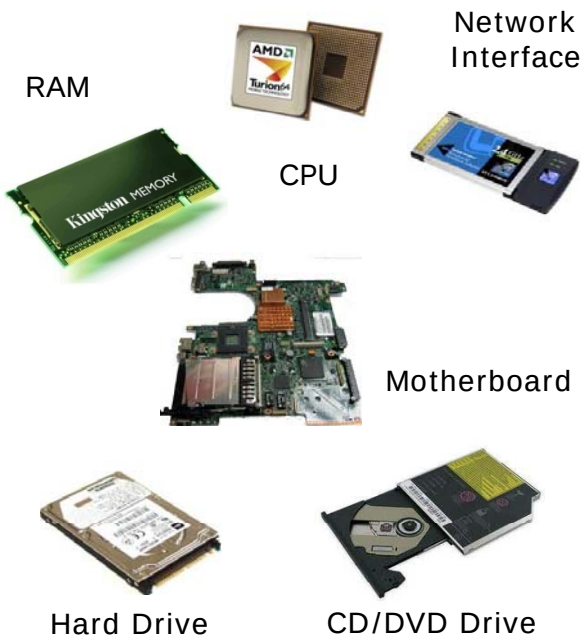
Operating System

What is a computer?

Mobile Devices

Usually one user at a time

Hardware



Mobile Devices
(designed for mobility)

Software

Programs

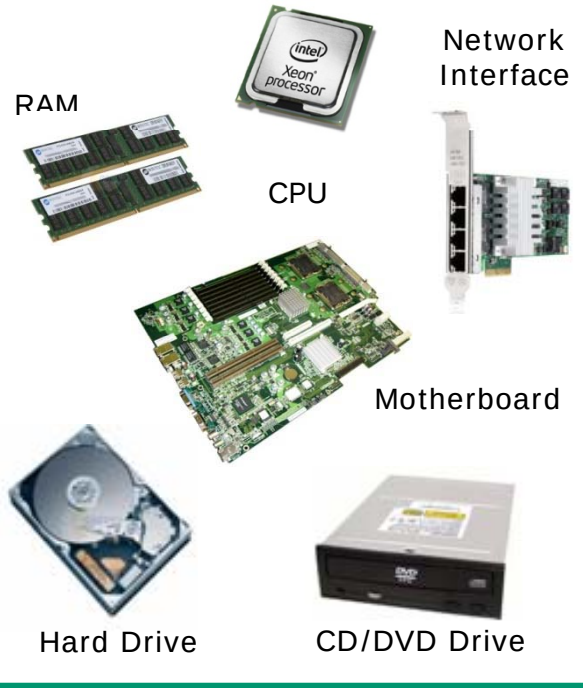
Operating System

What is a computer?

Servers

Usually many users at the same time

Hardware



Server Blade
(designed for uptime)

Software

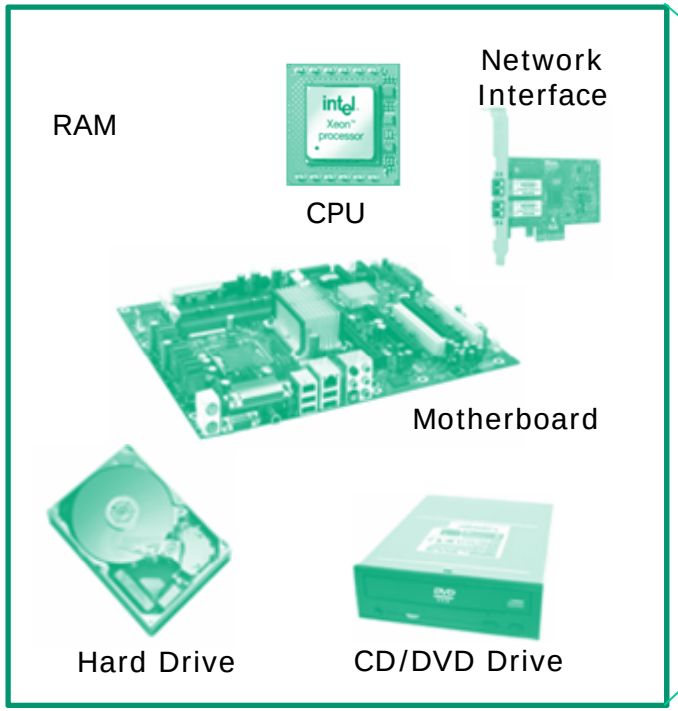
Programs

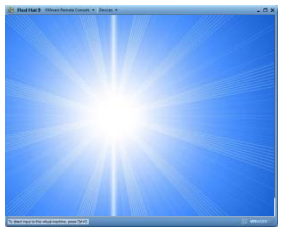
Operating System

What is a computer?

Virtual Machines

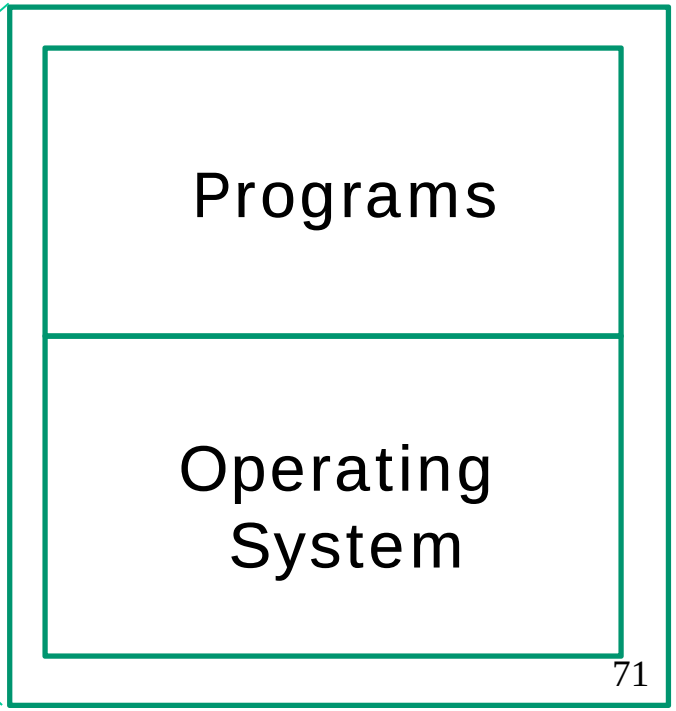
Virtual Hardware





Virtual Machine

Software

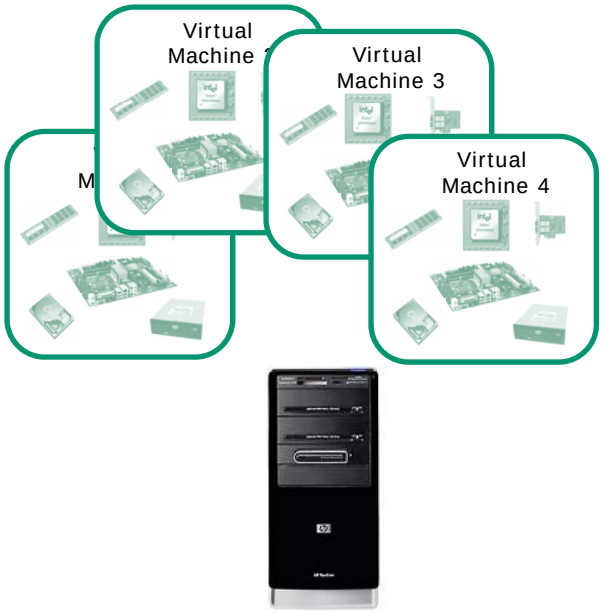


Virtual Machines

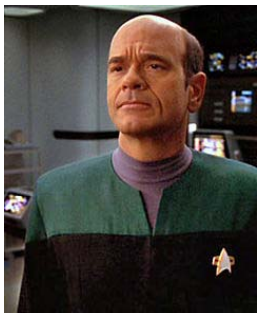
What is a virtual machine?

- 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.
- Over the network the virtual machines appear just like any other computer.
- Opus used to be a 1U rack mounted server in building 1300. Now it's a VM in 1200.



The EMH doctor on Star Trek Voyager was a simulation

Software

Software - The Programs

Users

Software

Programs
- 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 - The Programs

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

Types of software

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

How is UNIX/Linux put together?

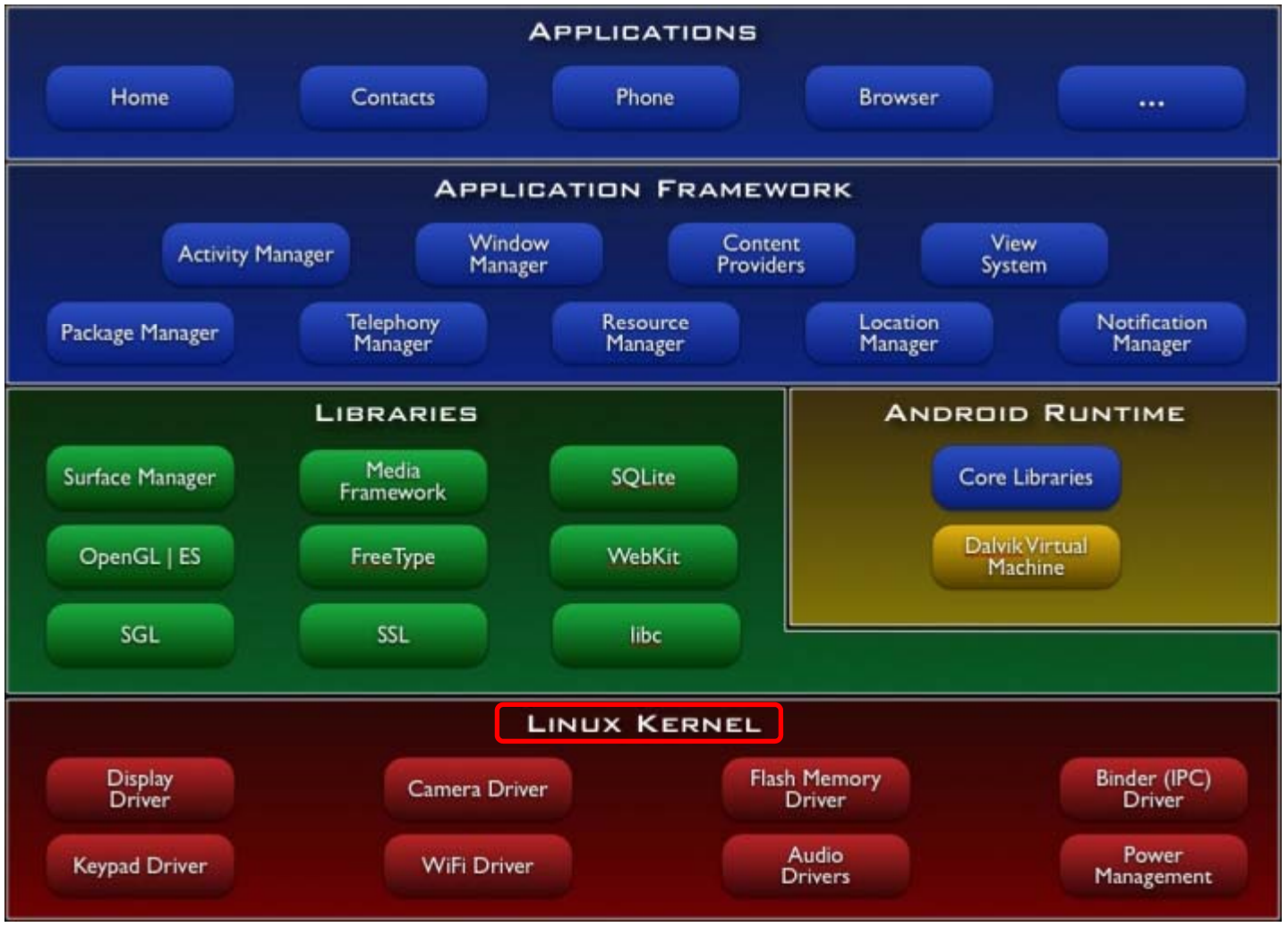
What are the fundamental components?

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

GNU/Linux Distributions

OpenSUSE

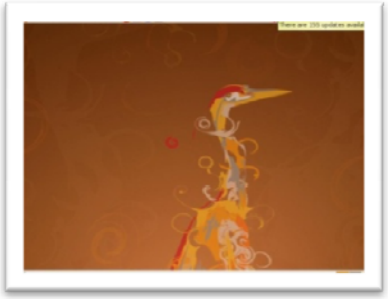
RedHat Enterprise Linux

Fedora

Debian

CentOS

Ubuntu



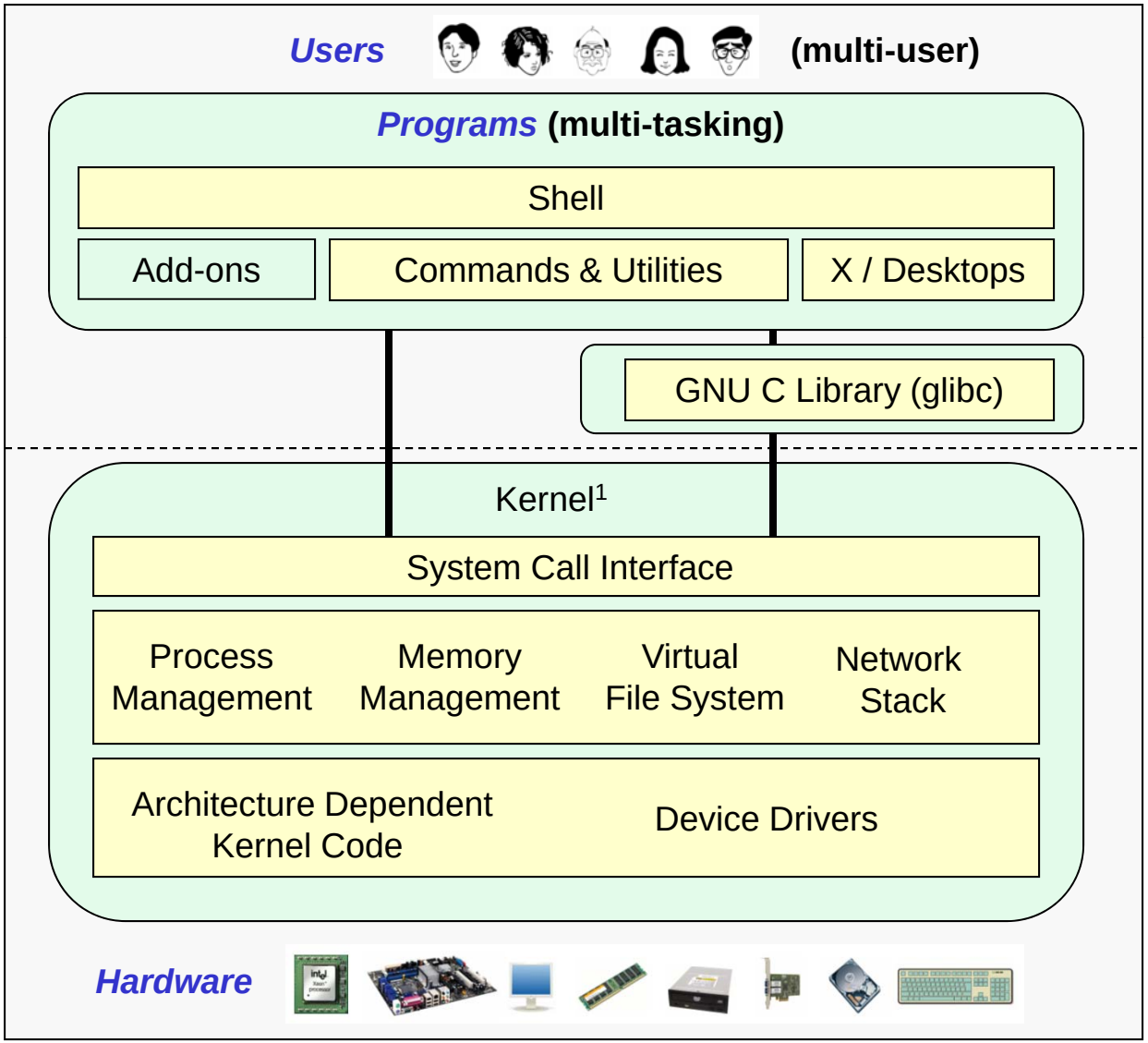
Mandriva

Lets peel off the covers and look inside

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

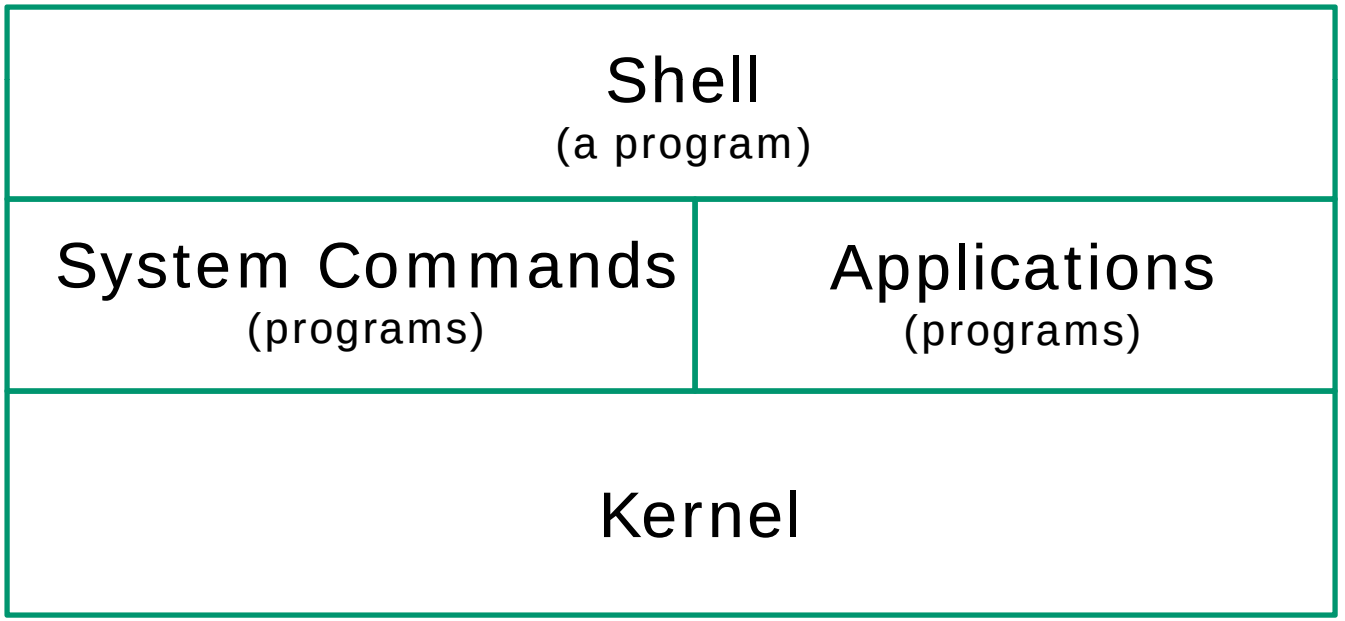
Linus Torvalds, as a student, initially conceived and assembled the Linux kernel in 1991. The kernel was later re-licensed under the GNU General Public License in 1992.

[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 Architecture simplified

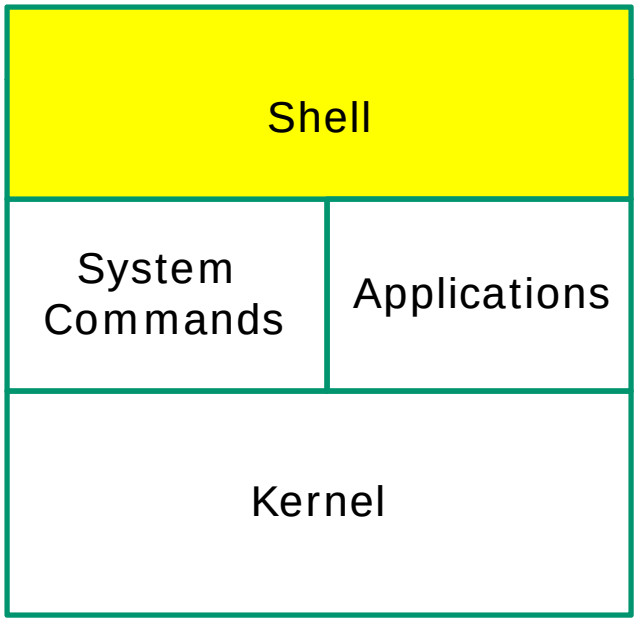
UNIX/Linux Architecture

Simplified View - Four Major Components



UNIX/Linux Architecture

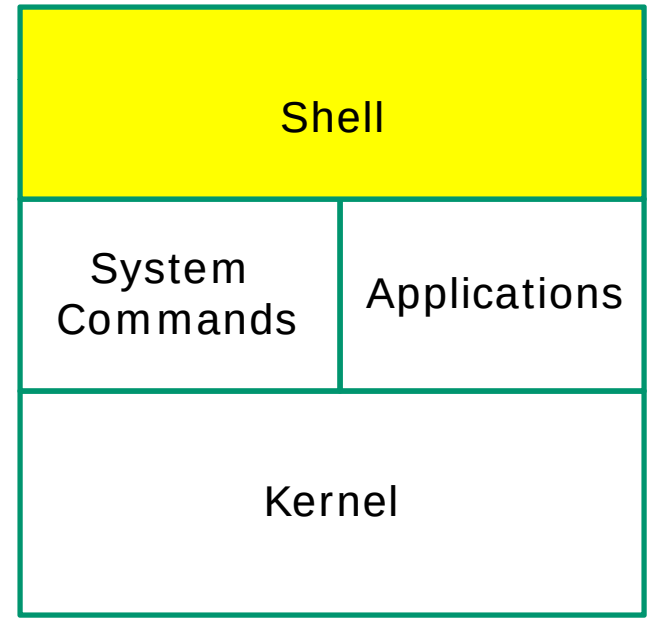
The Shell

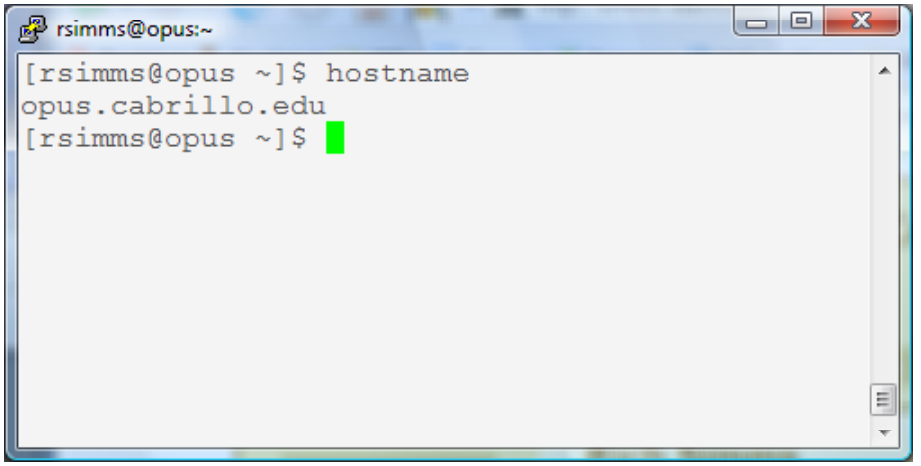


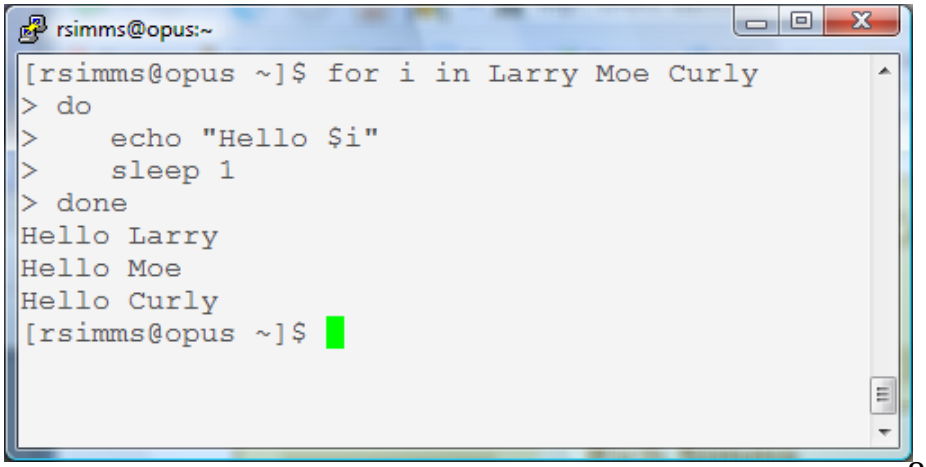
- Allows users to interact with the computer via a “command line”.
- Prompts for a command, parses the command, finds the right program and gets that program executed.
- Called a “shell” because it hides the underlying operating system.
- Many shell programs are available: sh (Bourne shell), bash (born 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

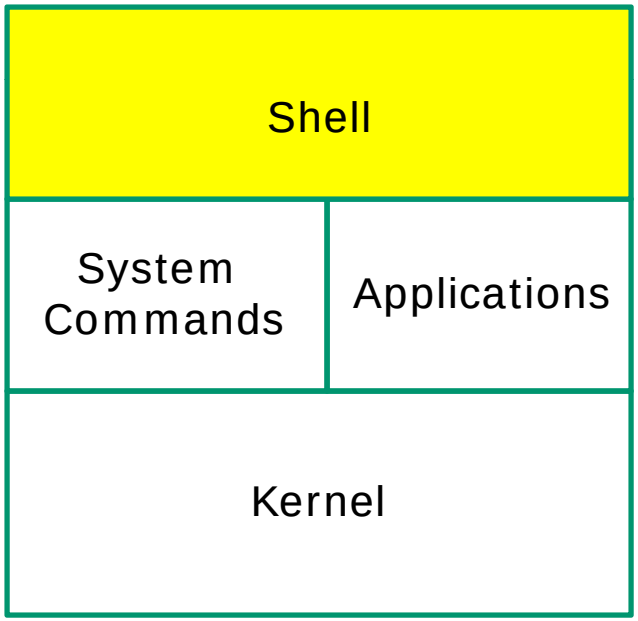






UNIX/Linux Architecture

Shells, graphical shells and in-between

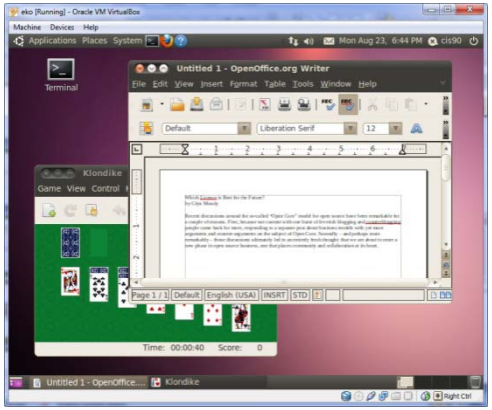


Shell Command Line Interface (CLI)

```
[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]#
```

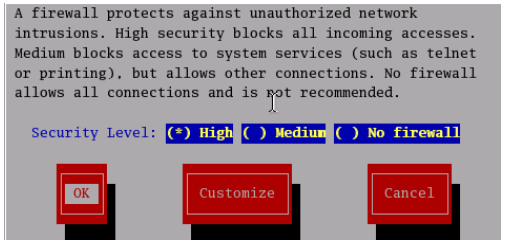
bash

Graphic shells or desktops (GUI)



gnome

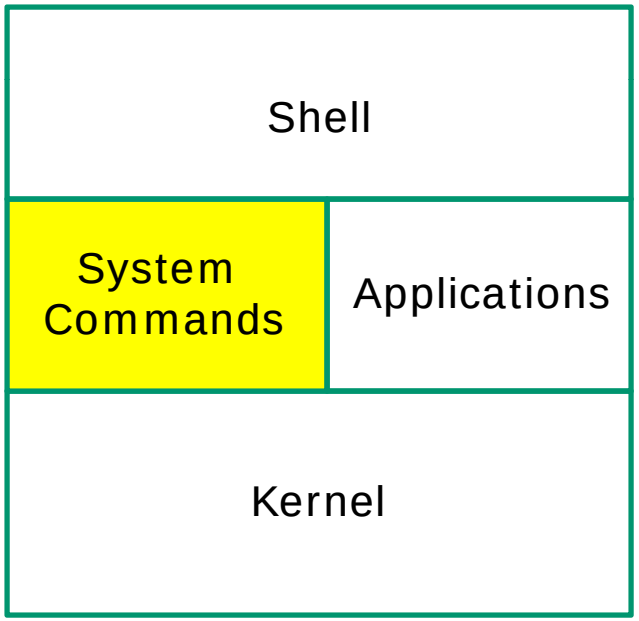
Text User Interface (TUI)



Lokkit Utility (uses curses library)

UNIX/Linux Architecture

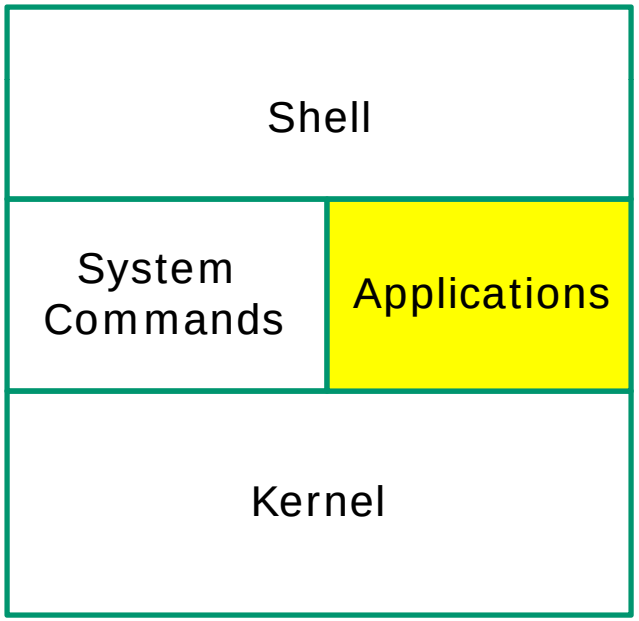
System Commands



- 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

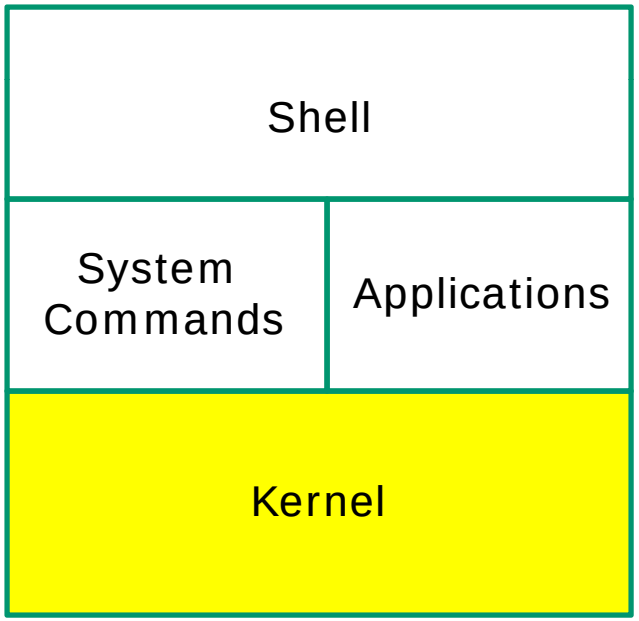
Applications



- 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

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 !!

Course Lingo

Some lingo for this class

- "**VM**" = a virtual machine
- "**machine**" = the hardware portion of a computer
- "**system**" = a computer (hardware and software)
- "**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 if on Windows or the ssh command if 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.cabrillo.edu
- "**revert a VM to it's snapshot**" = restore a VM back to the original pristine state. This undoes any configuration changes, VMware settings and restores the contents of the hard drive(s)
- "**start up a VM**" = the same as powering up any computer, first the BIOS runs, then the OS is loaded, then services are started

Some lingo for this class

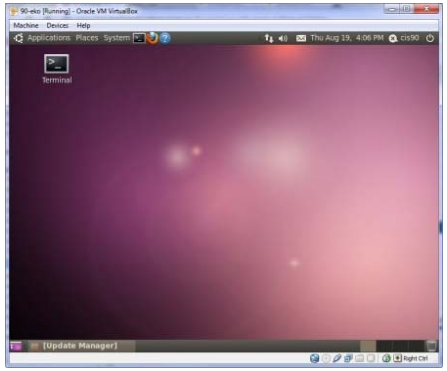
- "**VMware or VirtualBox host**" = the physical computer that all the VMs are running on.
- "**VMware or VirtualBox guest**" = the virtual machine running on the VMware host.
- "**Guest OS**" = the operating system running on the VM.
- "**console**" = a local terminal for entering commands. No scrollbars.
- "**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

Using Linux

The two Linux systems we will use in this course

Eko

- OS = Linux
- Distro = Ubuntu 10.04
- Hardware = VirtualBox VM
- Host hardware = Desktop (Pentium CPU)
- Location of host = on all classroom and lab computers
- Access = local or remote



Opus

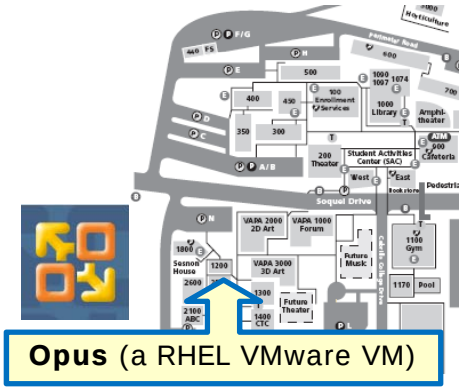
- OS = Linux
- Distro = Red Hat Enterprise Linux 5
- Hardware = VMware ESXi VM
- Host hardware = Cluster of 5 racked servers (2 Xeon CPUs each)
- Location of host = building 1200
- Access = remote only

Opus (a RHEL VM)

Using Linux systems

Local and remote access

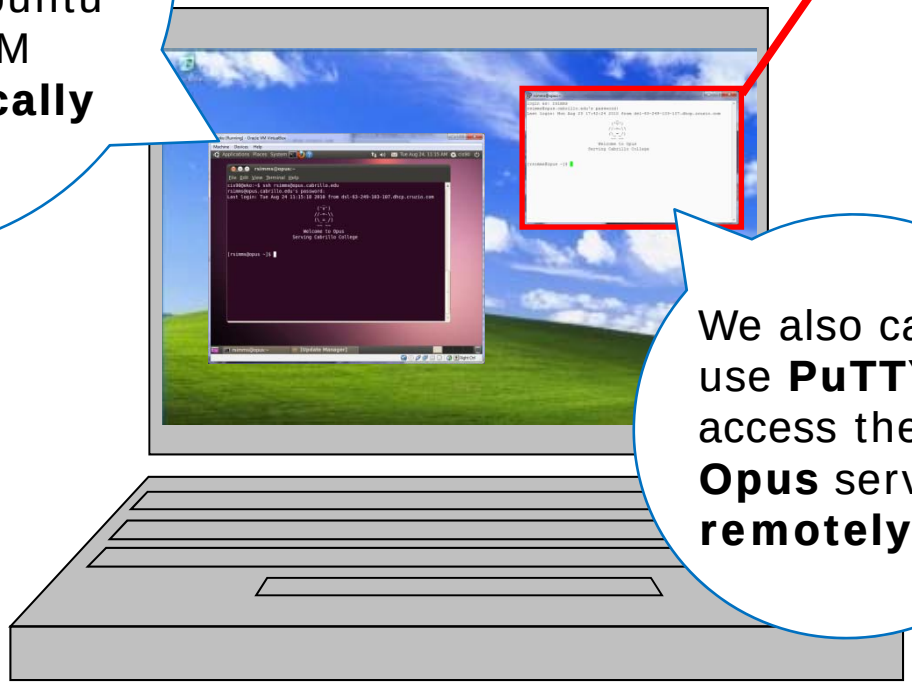
Most of the time in this course we will be using Opus



Eko is an Ubuntu VirtualBox VM that runs **locally**

Internet

SSH is a network protocol that enables secure connections between computers



We also can use **PuTTY** to access the **Opus** server **remotely**

Using Linux systems

Local and remote access

Most of the time in this course we will be using Opus

Opus (a RHEL VMware VM)

Internet

Eko is an Ubuntu VirtualBox VM that runs **locally**

SSH is a network protocol that enables secure connections between computers

We also can SSH from Eko to access the **Opus** server **remotely**

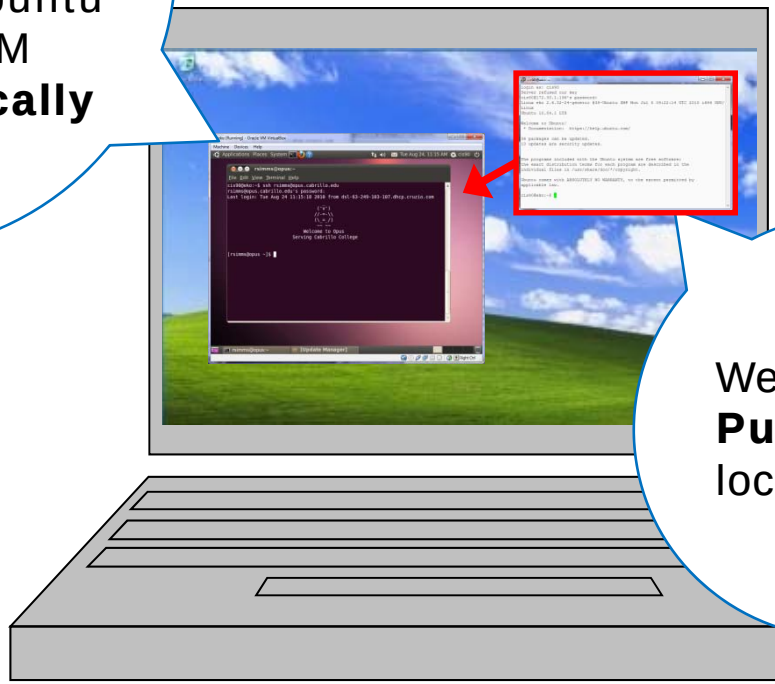
Using Linux systems

Local and remote access

Most of the time in this course we will be using Opus

Opus (a RHEL VMware VM)

Eko is an Ubuntu VirtualBox VM that runs **locally**



We can even **PuTTY** to the local **Eko VM**

SSH is a network protocol that enables secure connections between computers

Installing SSH (Putty) at Home

Accessing UNIX/Linux systems over the network

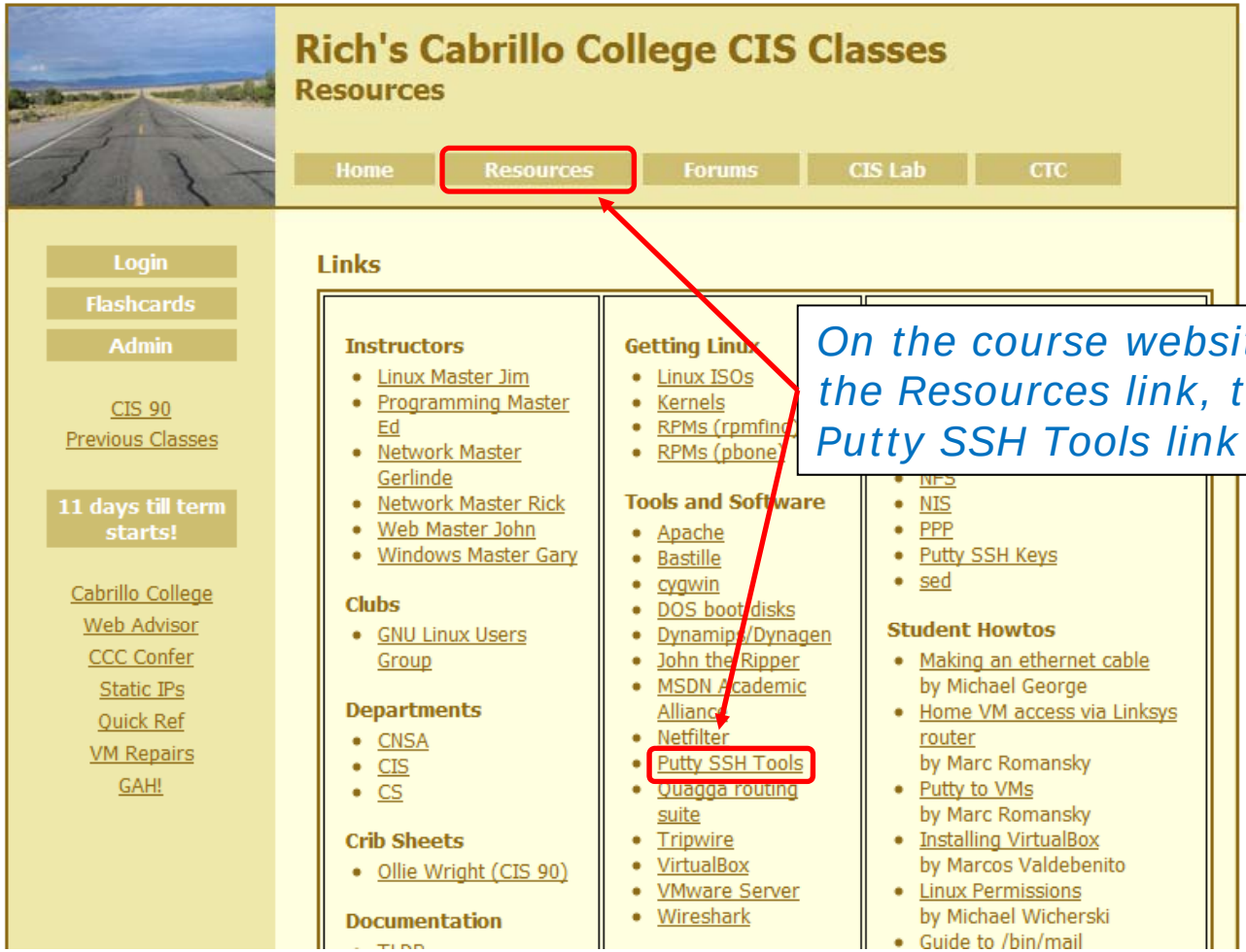
- Linux has SSH built in
- Windows does not include SSH
- Putty is a free download for adding SSH to Windows
- We will be using Putty this term on the Windows classroom systems to access Opus
- You can also install Putty on Windows at home to access Opus

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

Installing SSH (Putty) at Home

On Windows Systems

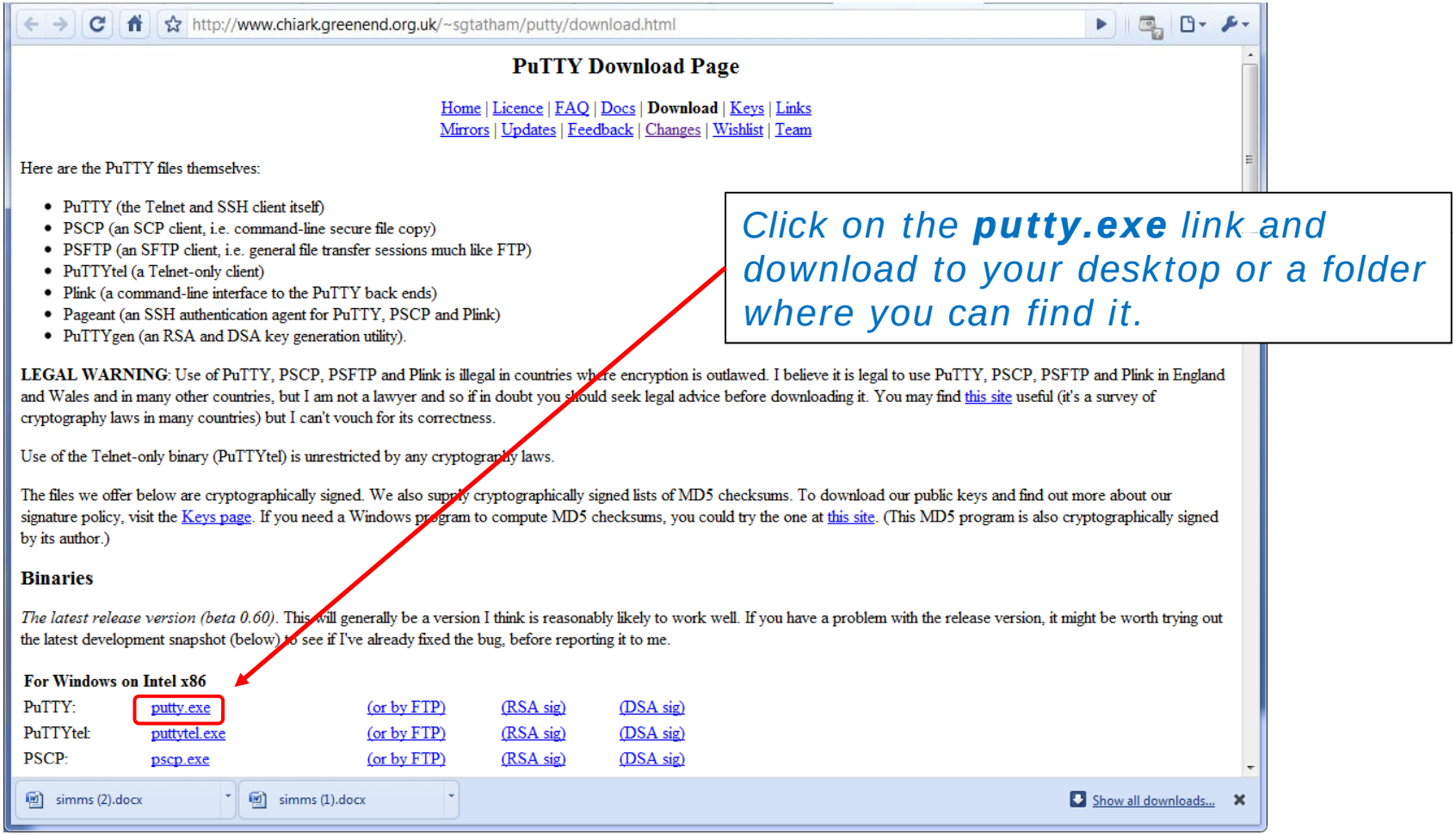
http://simms-teach.com/resources.php



On the course website, first click on the Resources link, then click on the Putty SSH Tools link

Installing SSH (Putty) at Home

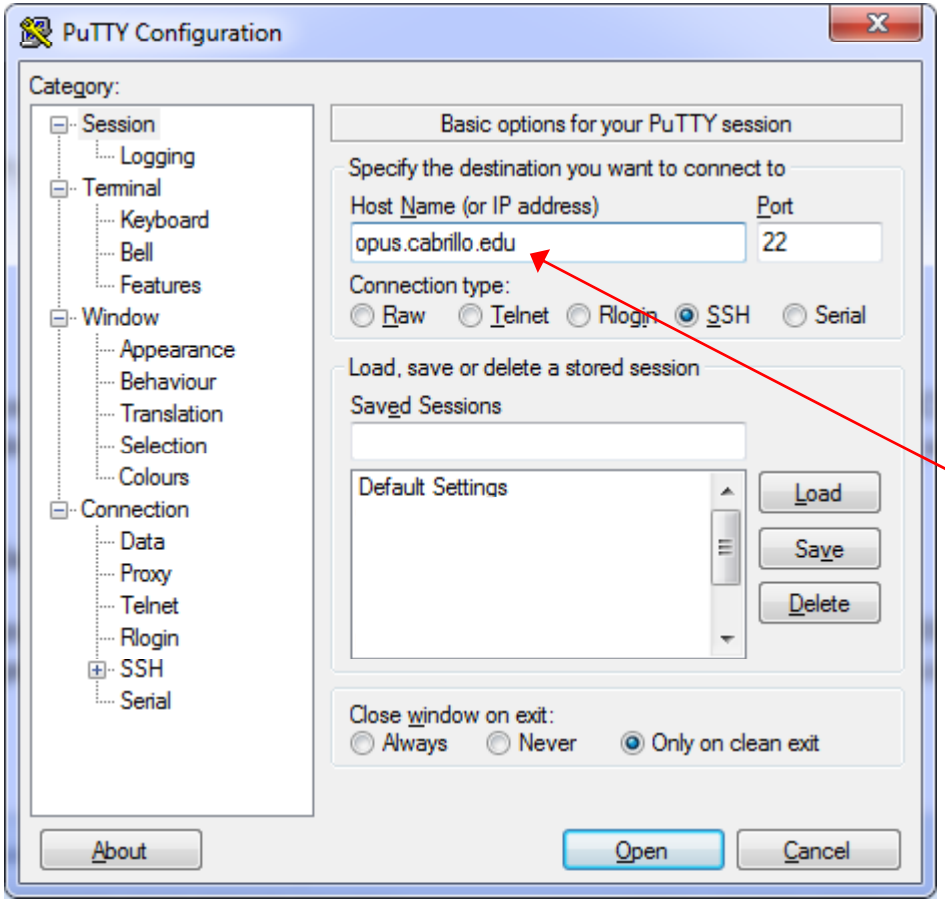
On Windows Systems



http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html

Installing SSH (Putty) at Home

On Windows Systems



That's it. Just double click on the putty.exe file you downloaded to run PuTTY.

Type the full hostname or IP address of the computer you wish to access here.

Class Exercise for Online Students

Installing PuTTY

Install PuTTY at home on Windows:

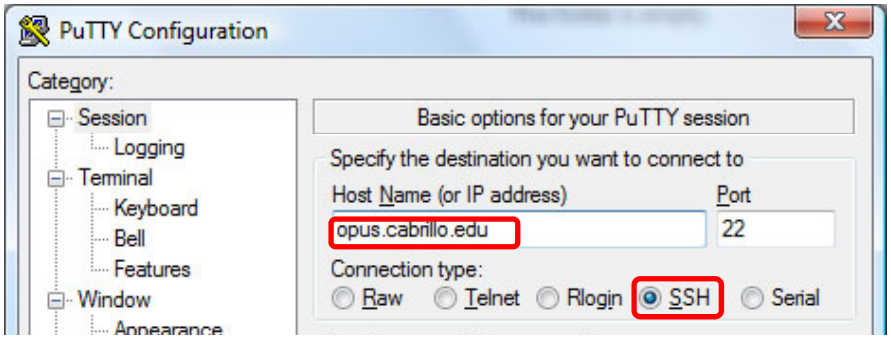
1. http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html
2. Scroll down to the "latest release version" in the Binaries section
3. Click on putty.exe link and download the file to the desktop or a folder
4. Locate the downloaded putty.exe file and run it

PuTTY is a program that can be installed on Microsoft Windows to securely access a remote computer. PuTTY uses the SSH network protocol to encrypt all connections between computers.

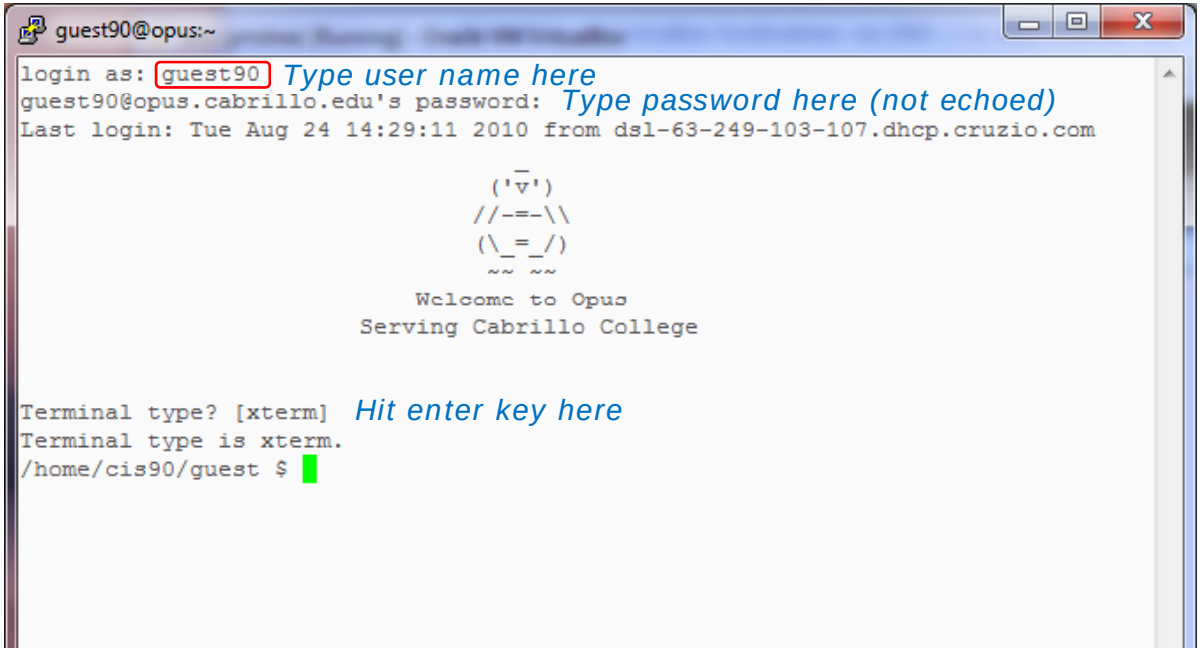
Remote Access

Remote access to Opus (from Windows) with PuTTY

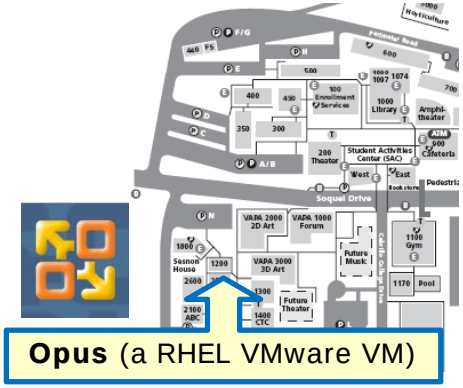
Putty icon on Windows desktop



*Set the Host Name to **opus.cabrillo.edu** and insure the Connection type is **SSH***

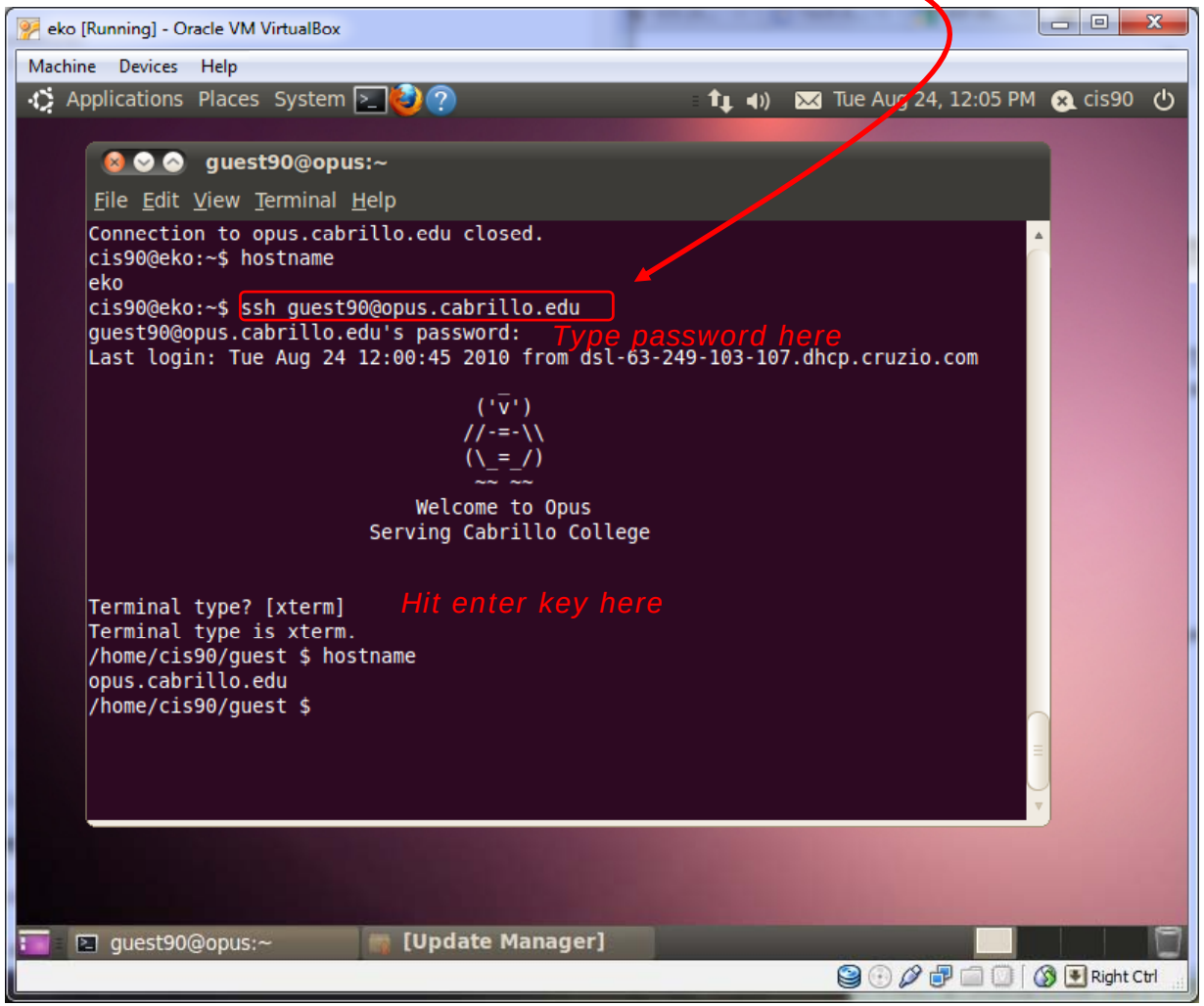


Opus is Linux server located in building 1200 on campus

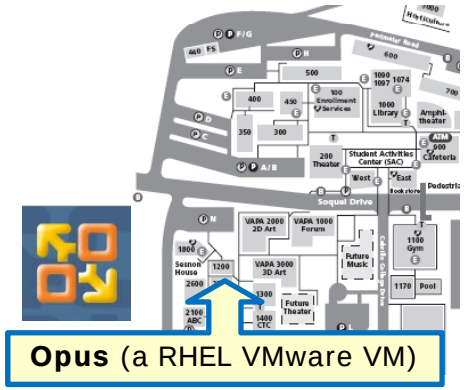


Remote access to Opus (from Linux) using SSH command

ssh guest90@opus.cabrillo.edu



Opus is Linux server located in building 1200 on campus



Logging into Opus for CIS 90
(Need username, password and terminal type)

```
login as: guest90
guest90@opus.cabrillo.edu's password:
Last login: Tue Aug 24 14:29:11 2010 from dsl-63-249-103-123.dhcp.cruzio.com

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


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

Type user name here

Type password here (not echoed)

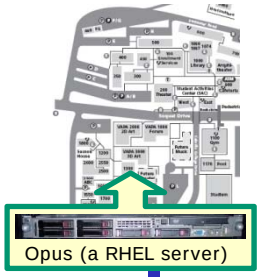
Hit enter key here

Prompt string on Opus for CIS 90

*Use the **guest90** account initially. After Lab 1 all students will get their own unique login accounts for Opus.*

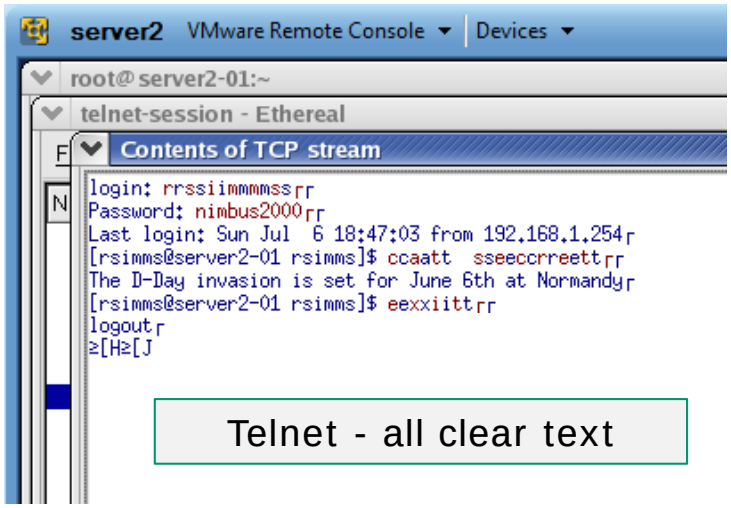
Telnet vs SSH (Secure Shell)

Remote computer

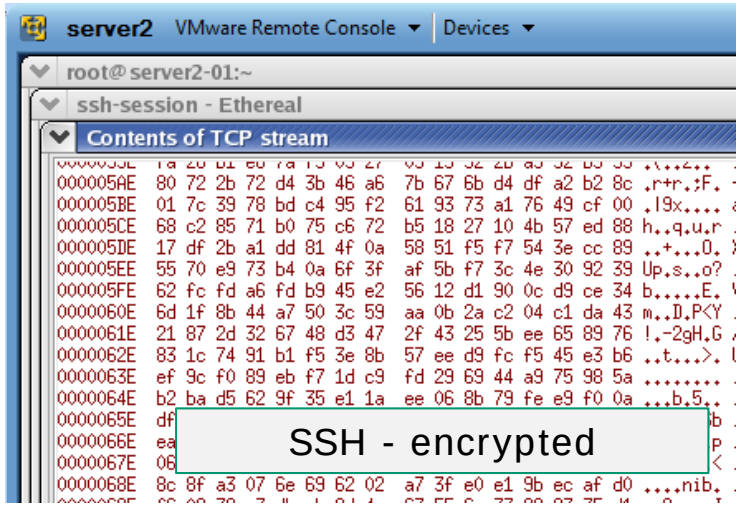


SSH is a network protocol that enables secure connections between computers

Sniffer view of a Telnet session



Sniffer view of a SSH session

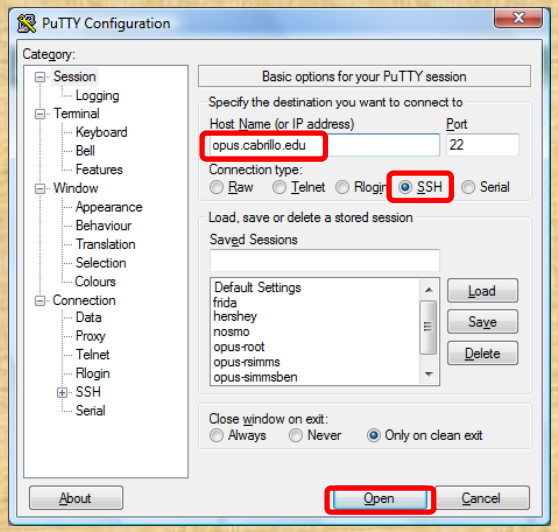


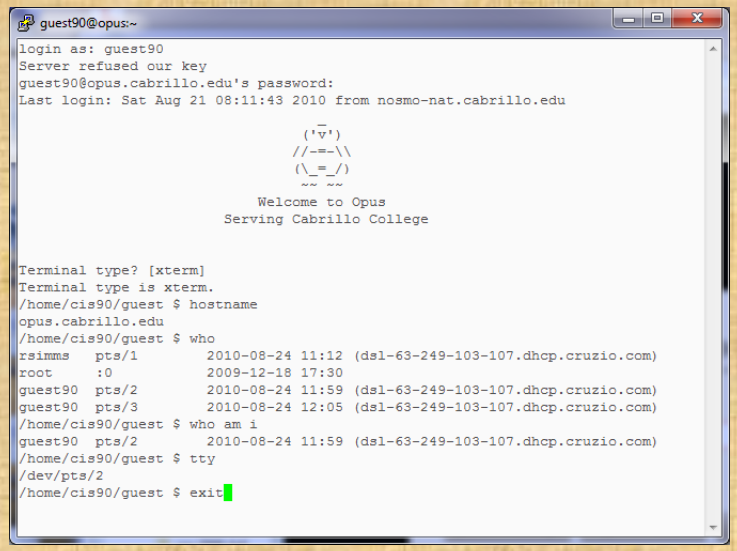
Local computer

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

With ssh, it is encrypted.

putty.exe





Class Exercise

Remote access to Opus

Access Opus with PuTTY:

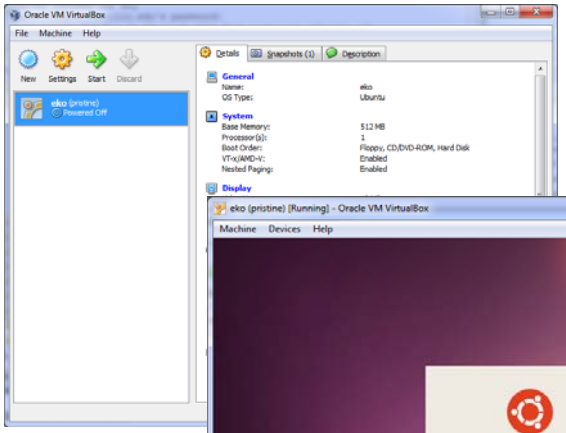
1. Open Putty on Windows desktop
2. Enter **opus.cabrillo.edu** as hostname and **SSH** as connection type
3. Click Open
4. Login as **guest90** and password on the CCC Confer whiteboard.
5. Type **hostname, who, who am i,** and **tty** commands
6. Type **exit** to end session

PuTTY is a program that can be installed on Microsoft Windows to securely access a remote computer. PuTTY uses the SSH network protocol to encrypt all connections between computers.

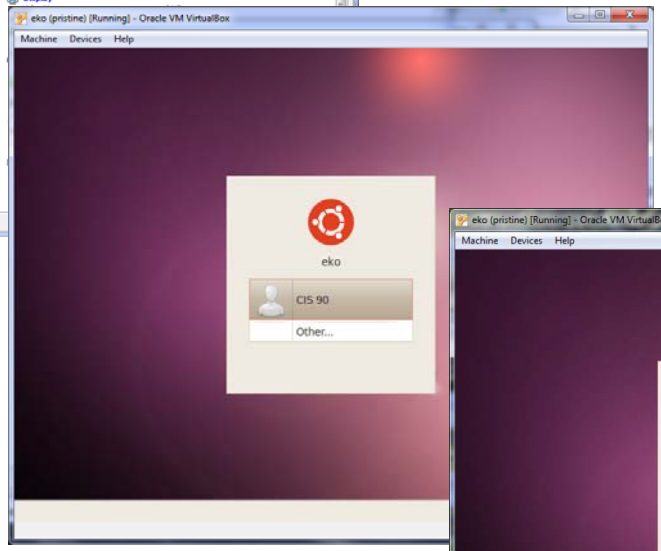
Local Access

Start VirtualBox using desktop icon or Start menu

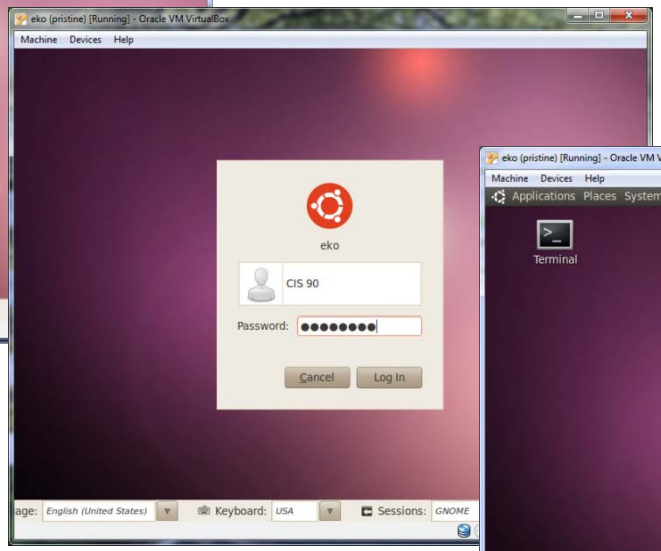
Local access to the Ubuntu Linux VM named Eko



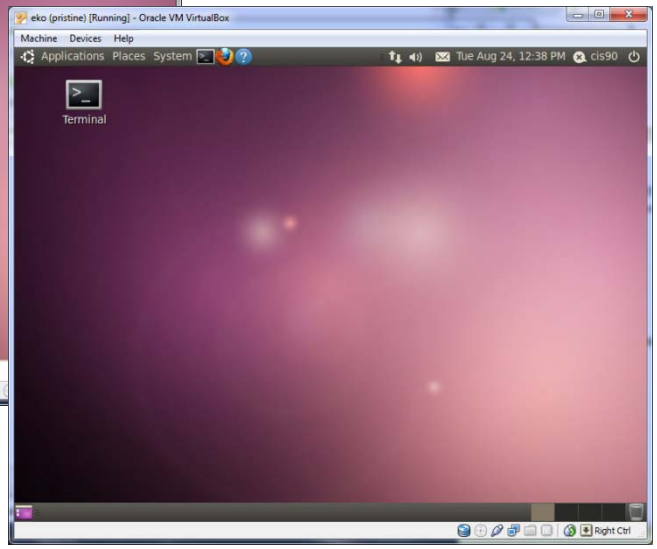
Select Eko VM then click green start arrow button



Select CIS 90 user



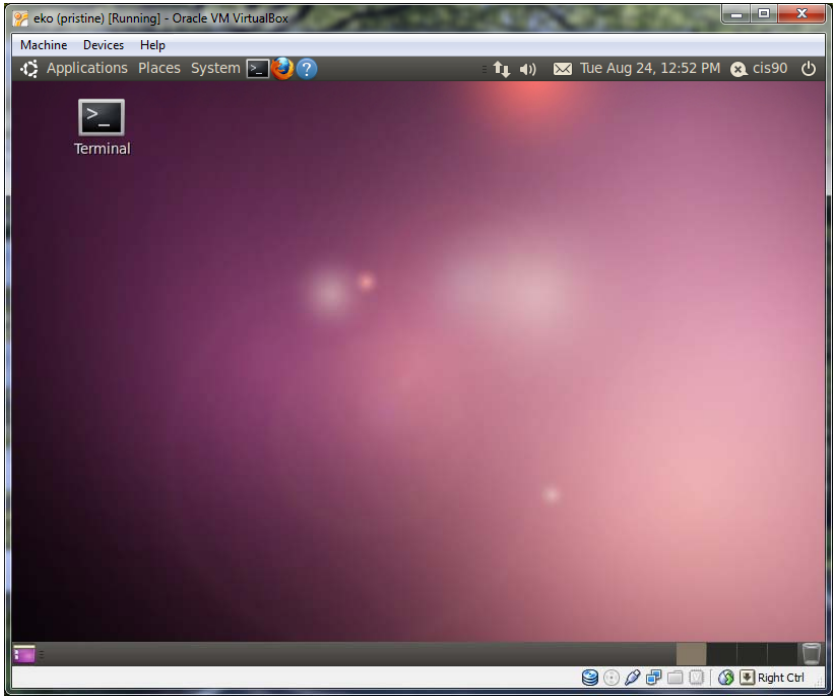
Enter password



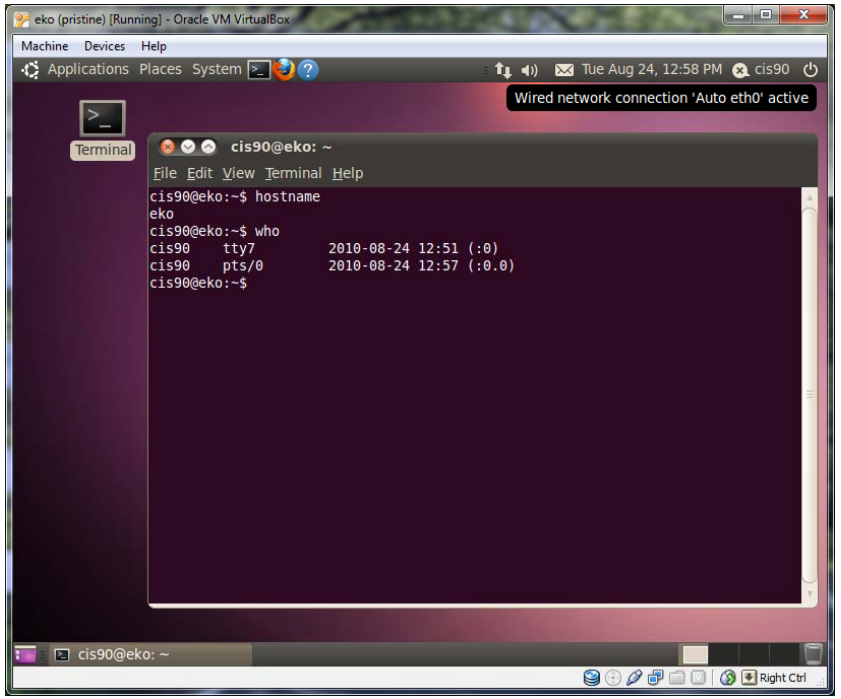
VirtualBox and the Eko VM are installed on all class and lab systems.

The Eko VM can be used at home. See the Howto "Bringing the Eko VM home" on the website 's Resources page

Bringing up a graphical terminal window

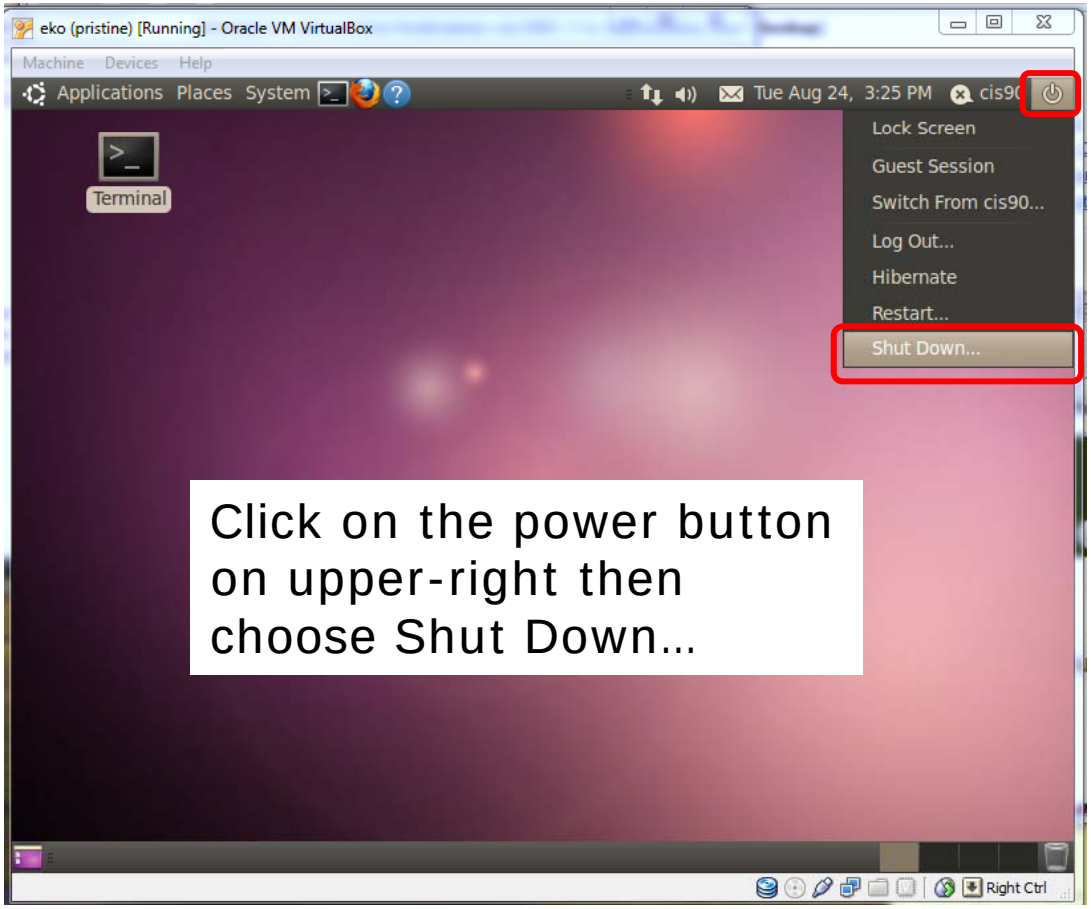


Open graphical terminal on Eko by double clicking on Terminal icon



Type commands into graphical terminal window

Shutting down the Ubuntu VM Eko



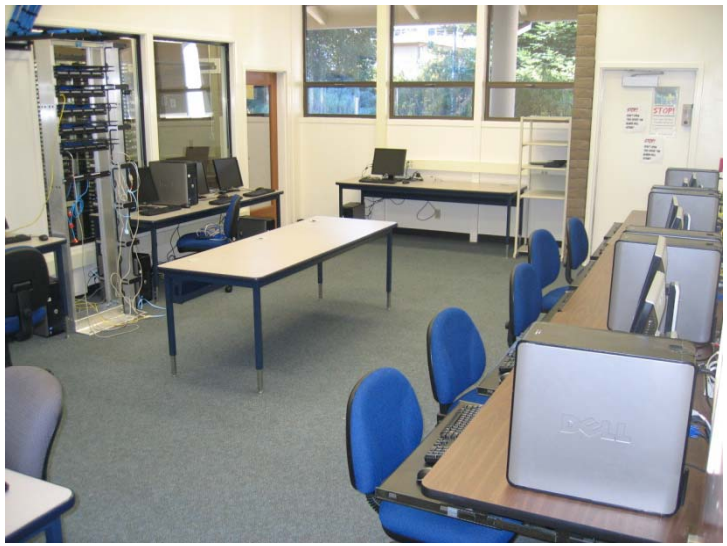
Please shut down any VMs you use just like you would shut down a regular computer

Equipment

Lab Resources

CIS Lab now in the CTC Building 1400

To run the Linux VMs - there are ten systems (labeled CIS-Lab-XX) in the CIS Lab with the Linux VMs for students to use



To access Opus using PuTTY - Putty can be used on any of the PC's in the CTC

Commands

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)
```

Usernames

Terminal devices

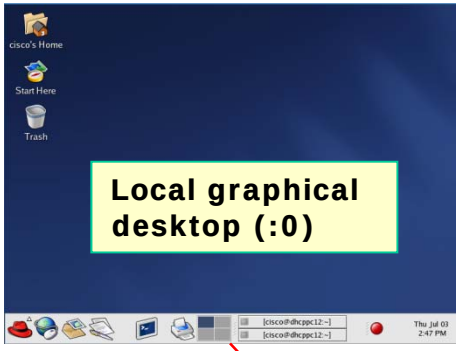
Date and time of login

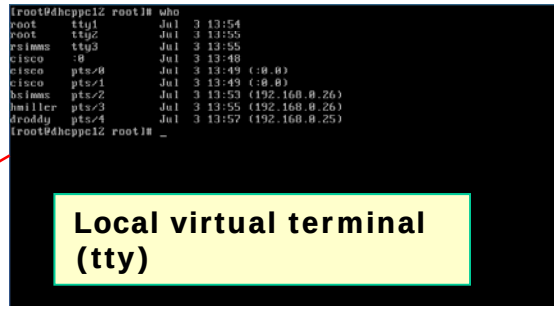
Where logged in from (blank or :0.0) if local, hostname or IP if remote

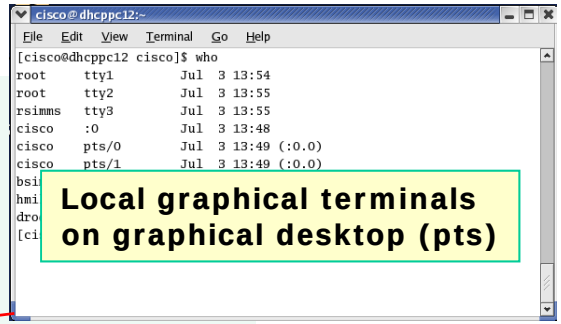
We can tell from this who output that root is logged in twice, cisco is logged in three times. rsimms, bsimms, hmiller and droddy are each logged in once.

who

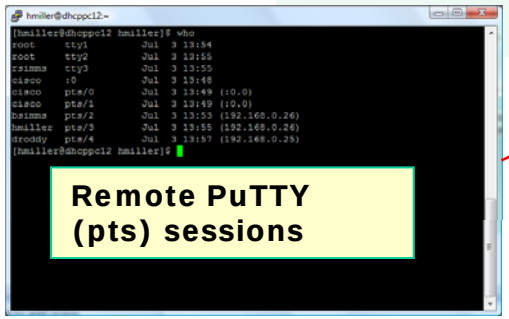
show who is logged on








```
[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)
```

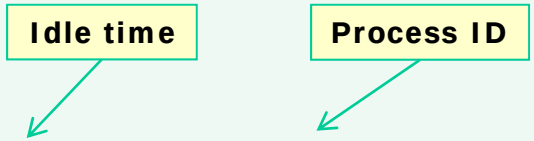


We can tell from this who output that root and rsimms are logged in on virtual terminals (tty1, tty2, and tty3). cisco has logged into the graphical desktop (:0) and opened two terminals there (:0.0). bsimms, hmiller and droddy are remotely logged in using PuTTY (pts/2, pts/3 and pts/4)

who (continued)

various who command options

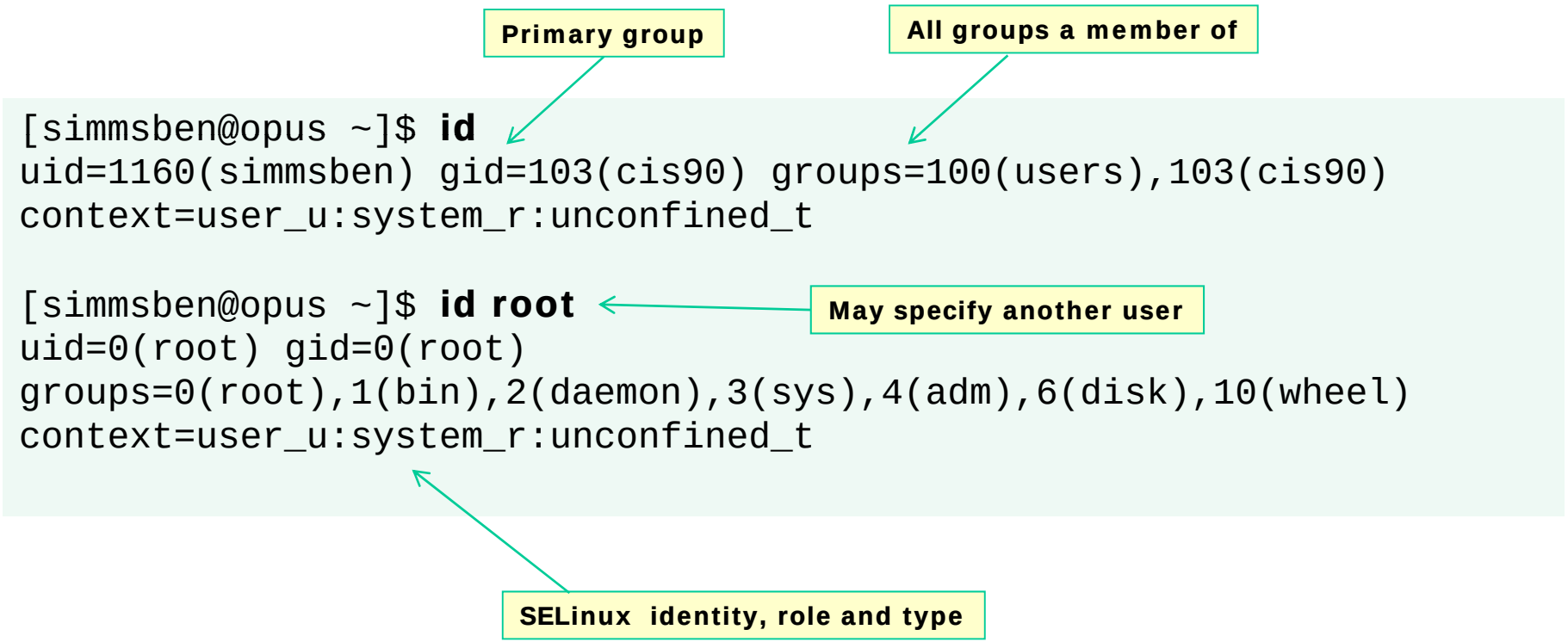
```
[rsimms@frida rsimms]$ who am i
rsimms   tty3         Jul  3 13:55

[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

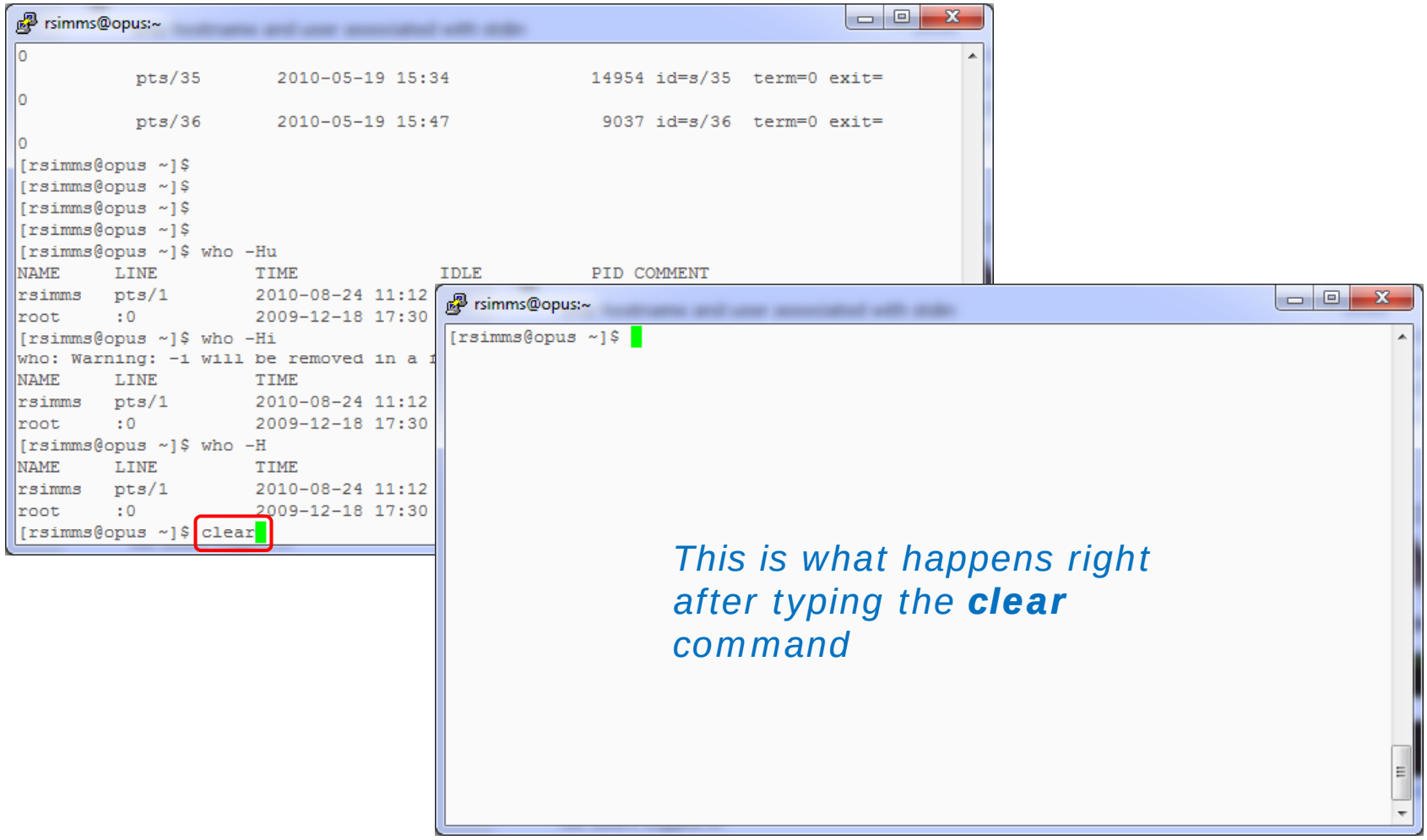
show information about yourself or another user



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

clear

clear the terminal display



*This is what happens right after typing the **clear** command*

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

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

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

In the DOS command prompt on 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

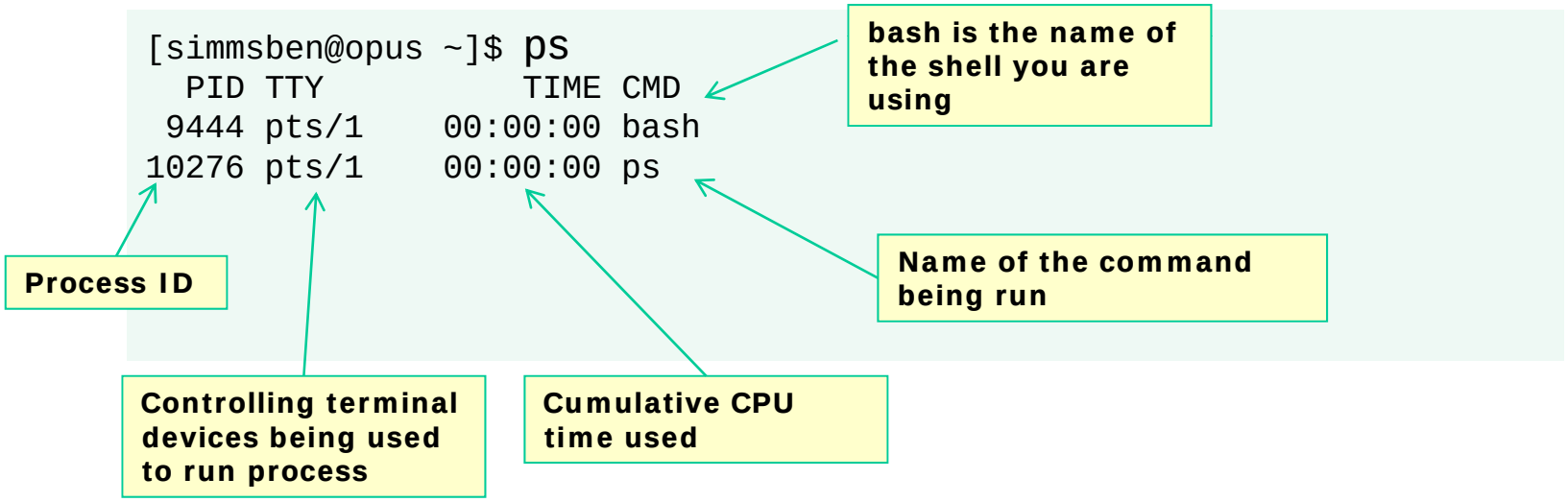
```
/home/cis90/guest $ cal 2010
                                2010

       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!

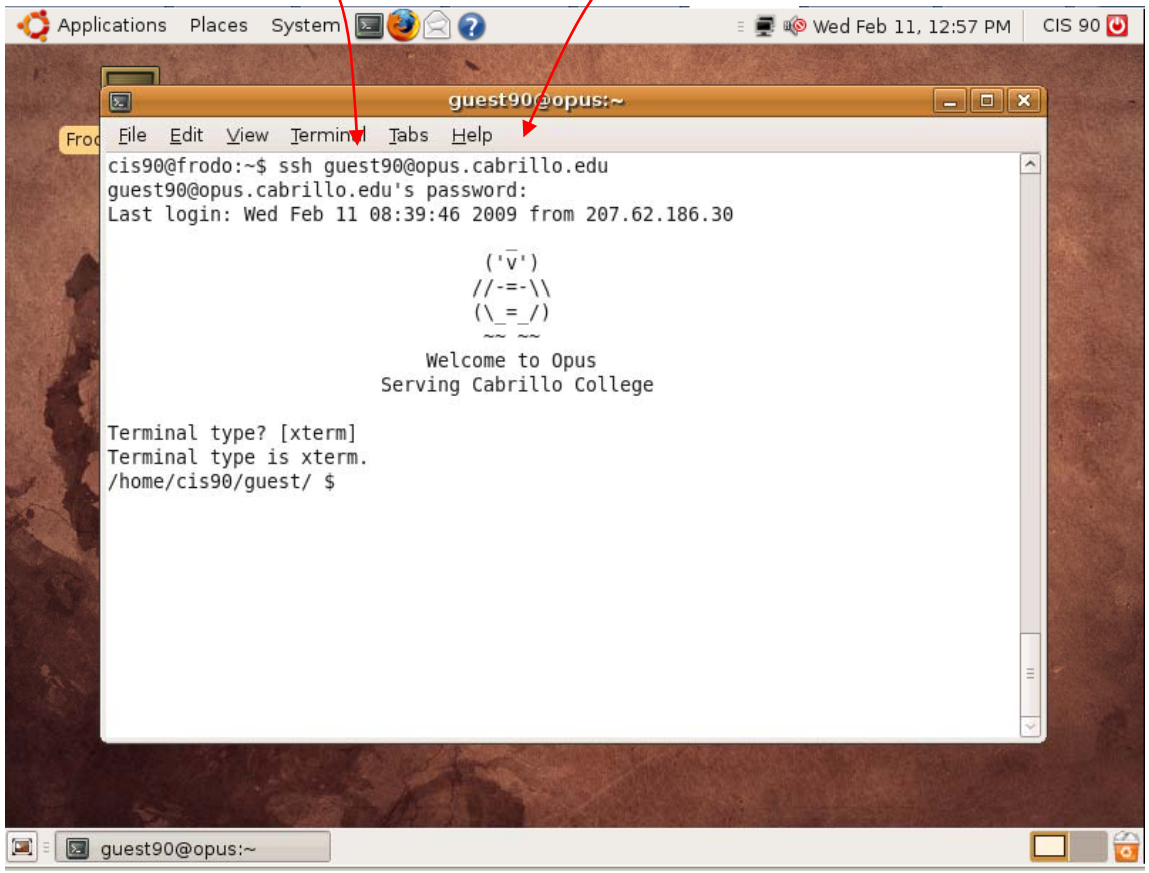
ssh *user@host*

login to a remote system

ssh guest90@opus.cabrillo.edu

*user is **guest90***

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



ssh *user@host*

login to a remote system

*user is **rsimms***

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

```
[rsimms@partide rsimms]$ ssh rsimms@opus.cabrillo.edu
The authenticity of host 'opus.cabrillo.edu (207.62.186.9)' can't be established.
RSA key fingerprint is 17:9a:6b:17:0b:34:95:d4:77:06:bc:dc:1b:cd:a1:e3.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'opus.cabrillo.edu,207.62.186.9' (RSA) to the list of known hosts.
rsimms@opus.cabrillo.edu's password:
Permission denied, please try again.
rsimms@opus.cabrillo.edu's password:
Warning: No xauth data; using fake authentication data for X11 forwarding.
Last login: Wed Aug  6 16:41:54 2008 from dsl-63-249-86-11.cruzio.com

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

[rsimms@opus ~]$
```

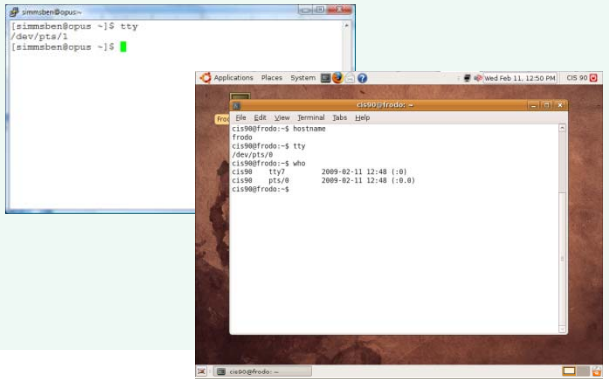
*fist time you login you will get this message, type **yes** to continue*

tty

show which terminal is being used for session

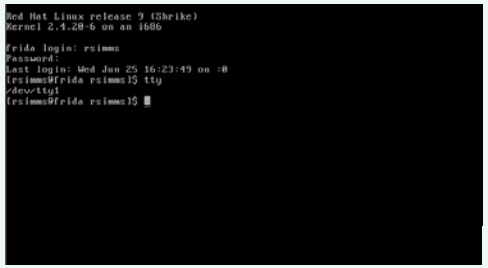
```
[simmsben@opus ~]$ tty
/dev/pts/1
```

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

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

uname shows the name of the operating system

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

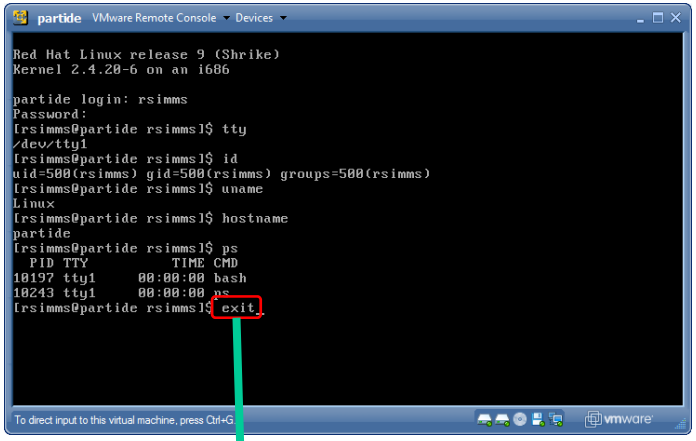
show network interface status

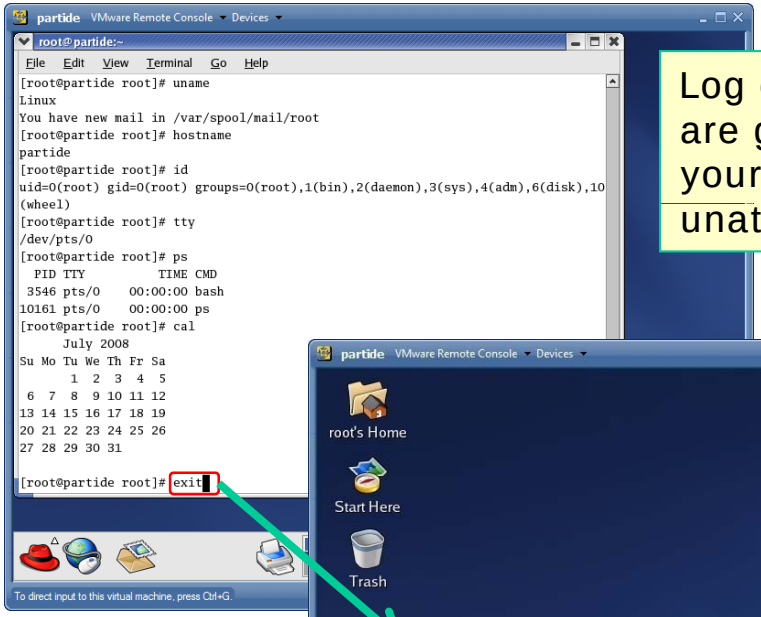
```
cis192@frodo:~$ /sbin/ifconfig
eth0      Link encap:Ethernet  HWaddr 00:0c:29:6f:53:d9
          inet addr:192.168.0.24  Bcast:192.168.0.255  Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe6f:53d9/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:113172 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

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:8 errors:0 dropped:0 overruns:0 frame:0
          TX packets:8 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:460 (460.0 B)  TX bytes:460 (460.0 B)

cis192@frodo:~$
```

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

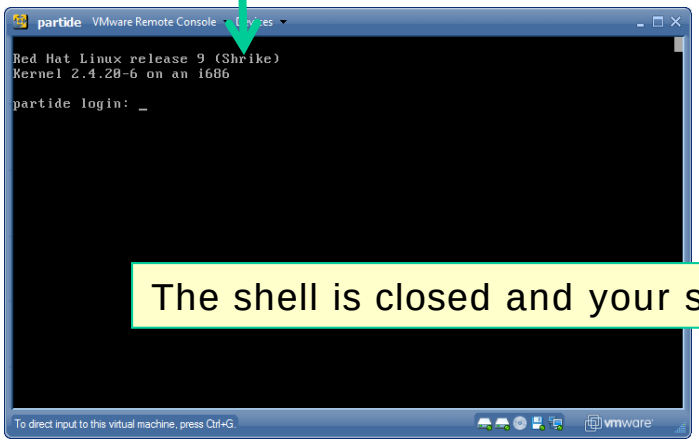
exit

terminate shell and log off





Log off when you are going to leave your computer unattended.



The shell is closed and your screen text or terminal window disappears

Navigating Terminals

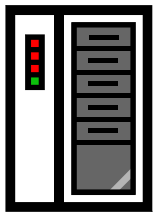
Teletype Terminals (tty), Pseudo Terminals (pts), X windows displays

/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/pts/1 (Putty)

```
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]#
```



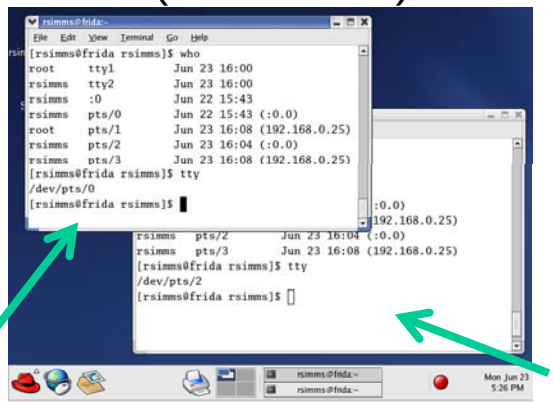
/dev/tty/2 (Ctrl-Alt-F2)

```
[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)

: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)
```

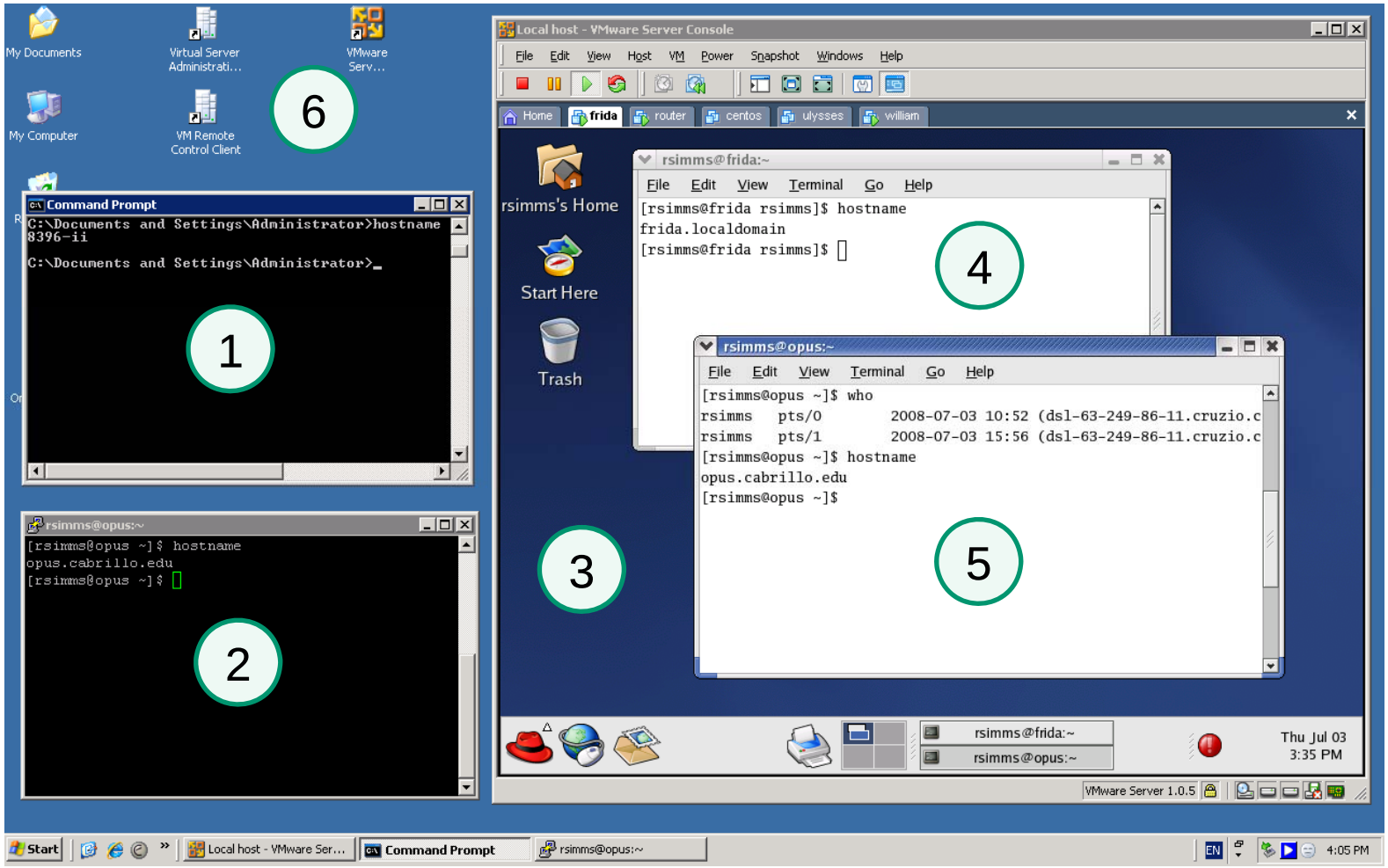
Notes:

:0 = X display 0

:0.0 = X display 0, screen 0

No scroll bars on tty's

What computer am I really using anyway ??????

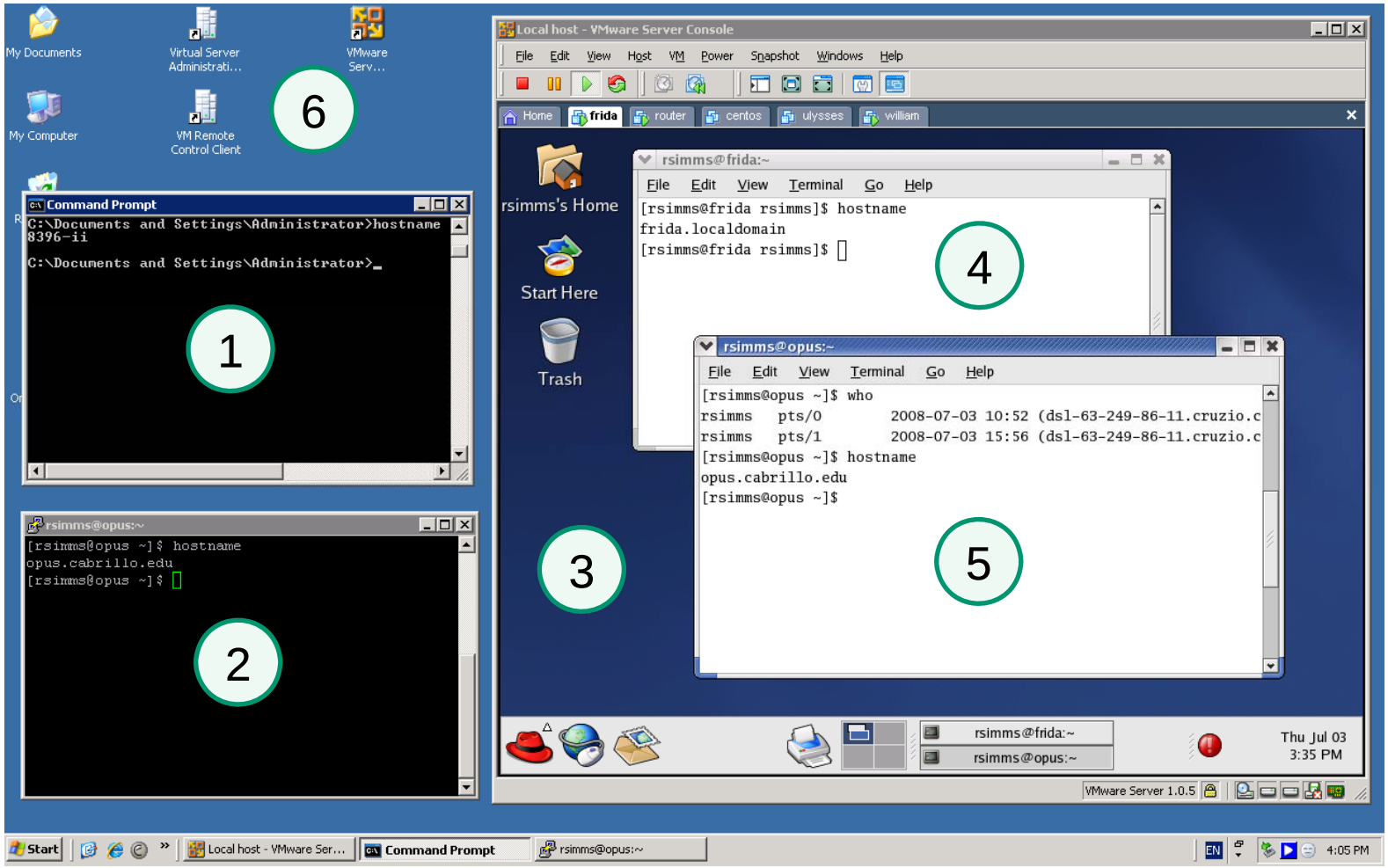


8396-II (Win 2003) ? ?

Frida (RH9) ? ?

Opus (RHEL5) ? ?

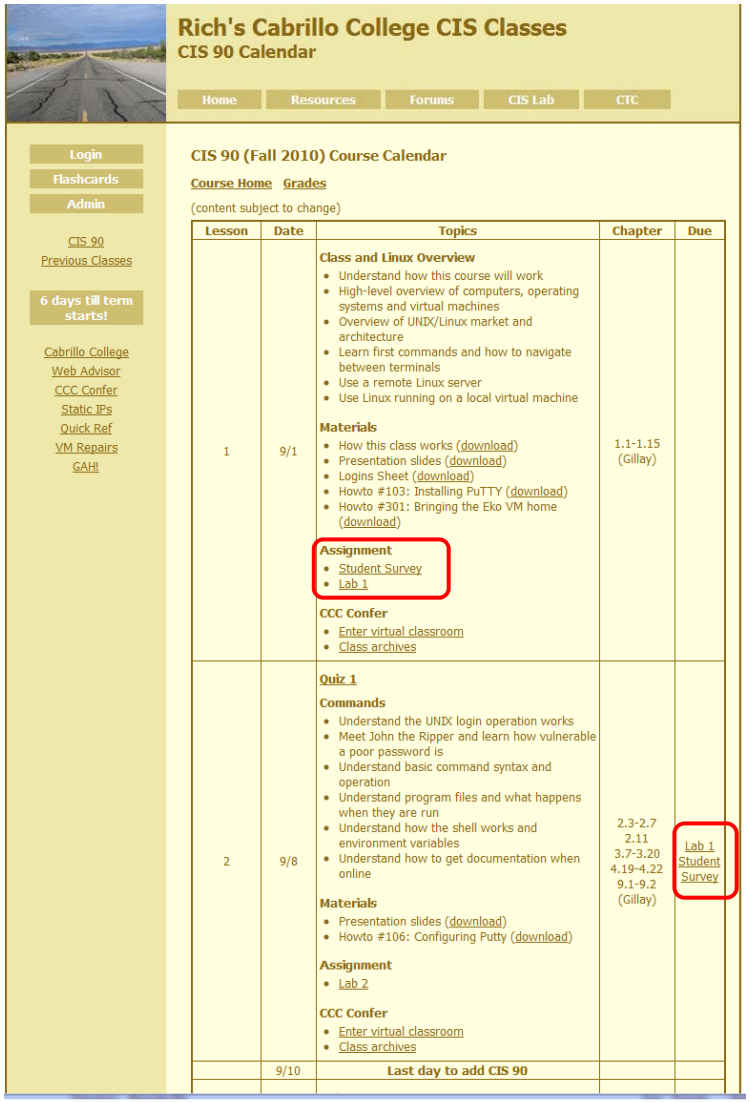
Use hostname command to know for sure



8396-II (Win 2003)	1	6
Frida (RH9)	3	4
Opus (RHEL5)	2	5

Wrap up

First lab is due midnight of our next class meeting Sept 8th



Rich's Cabrillo College CIS Classes
CIS 90 Calendar

Home | Resources | Forums | CIS Lab | CTC

Login | Flashcards | Admin

CIS 90 | Previous Classes

6 days till term starts!

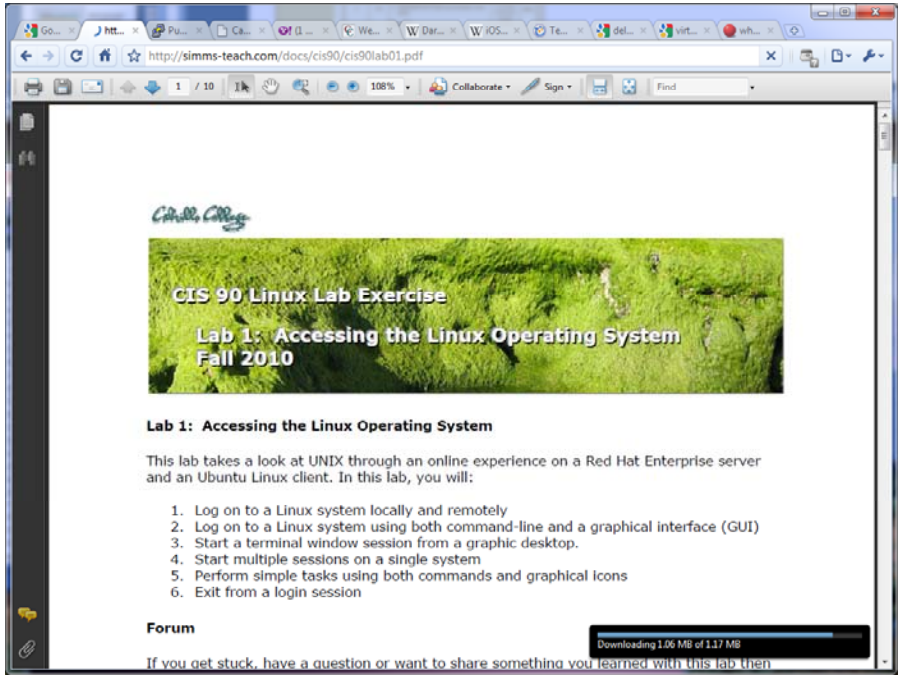
Cabrillo College | Web Advisor | CCC Confer | Static IPs | Quick Ref | VM Repairs | GAH!

CIS 90 (Fall 2010) Course Calendar

Course Home | Grades

(content subject to change)

Lesson	Date	Topics	Chapter	Due
1	9/1	**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** • How this class works (download) • Presentation slides (download) • Logins Sheet (download) • Howto #103: Installing PuTTY (download) • Howto #301: Bringing the Eko VM home (download) **Assignment** • Student Survey • Lab 1 **CCC Confer** • Enter virtual classroom • Class archives	1.1-1.15 (Gillay)	
2	9/8	**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) **Assignment** • Lab 2 **CCC Confer** • Enter virtual classroom • Class archives	2.3-2.7 2.11 3.7-3.20 4.19-4.22 9.1-9.2 (Gillay)	Lab 1 Student Survey
	9/10	**Last day to add CIS 90**		



Please turn in the survey by then as well

New commands:

cal	- show calendars
clear	- clear the terminal screen
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
ifconfig	- show network interface info
ps	- show processes (loaded programs) being run
ssh	- secure login to a remote system
uname	- show OS name
tty	- show terminal information
who	- show who else is logged on
Ctrl-Alt-F1 to Ctrl-Alt-F7	- Change between terminals and X windows (graphics)

New Files and Directories:

VirtualBox:

Right Ctrl	- to release mouse cursor out of 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?

Backup