Lesson Module Checklist

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

- Lab tested
- Youtube Videos uploaded

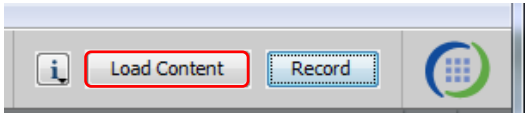
- Forum created and registration tested
- Opus accounts made and populated
- CIS 90 VMs created and configured
- Surveys and PW sheet posted

- Rosters printed
- Add codes printed

- Backup slides, Confer links, handouts on flash drive
- 9V backup battery for microphone

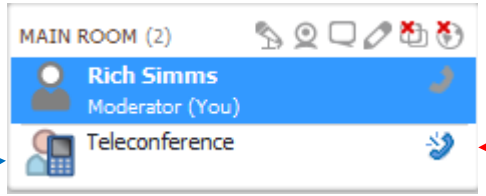
CCC Confer

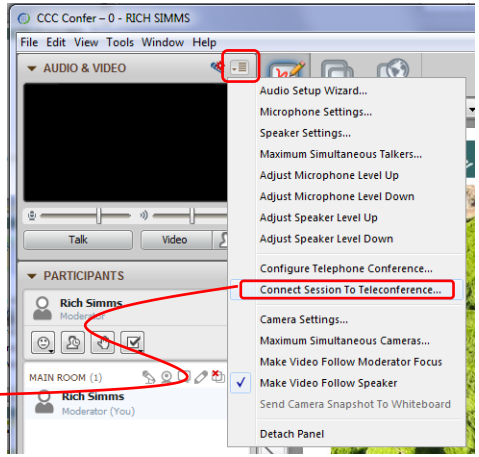
[ ] Preload White Board with *cis*lesson??*-WB*



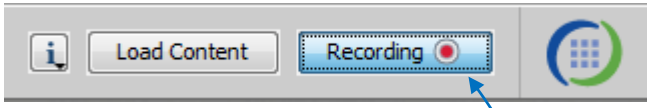
[ ] Connect session to Teleconference

Session now connected to teleconference





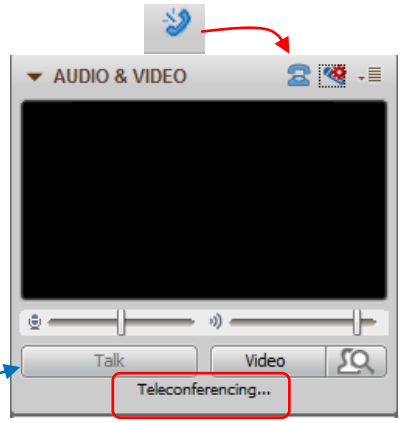
[ ] Is recording on?



Red dot means recording

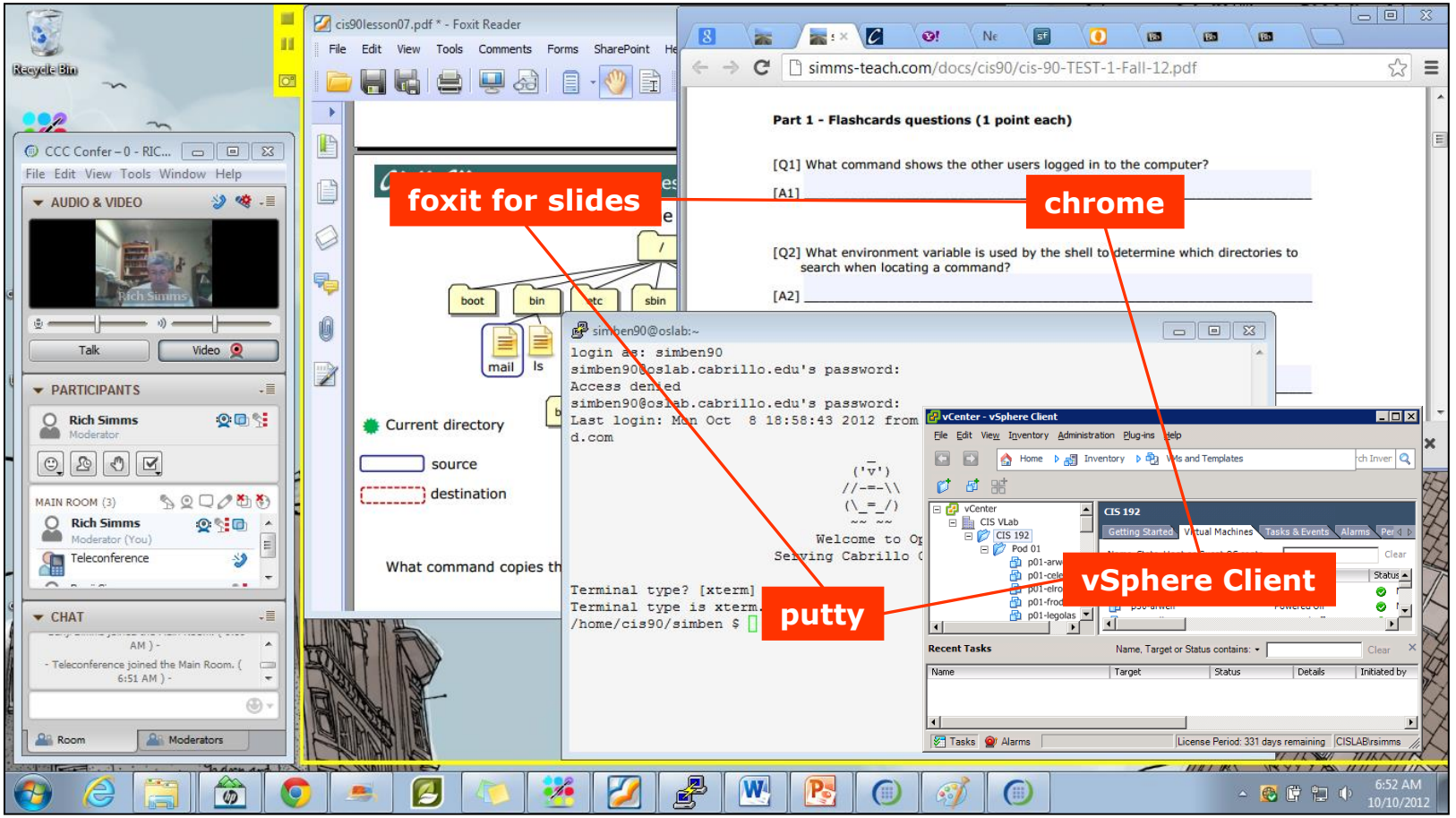
[ ] Use teleconferencing, not mic

Should be greyed out



CCC Confer

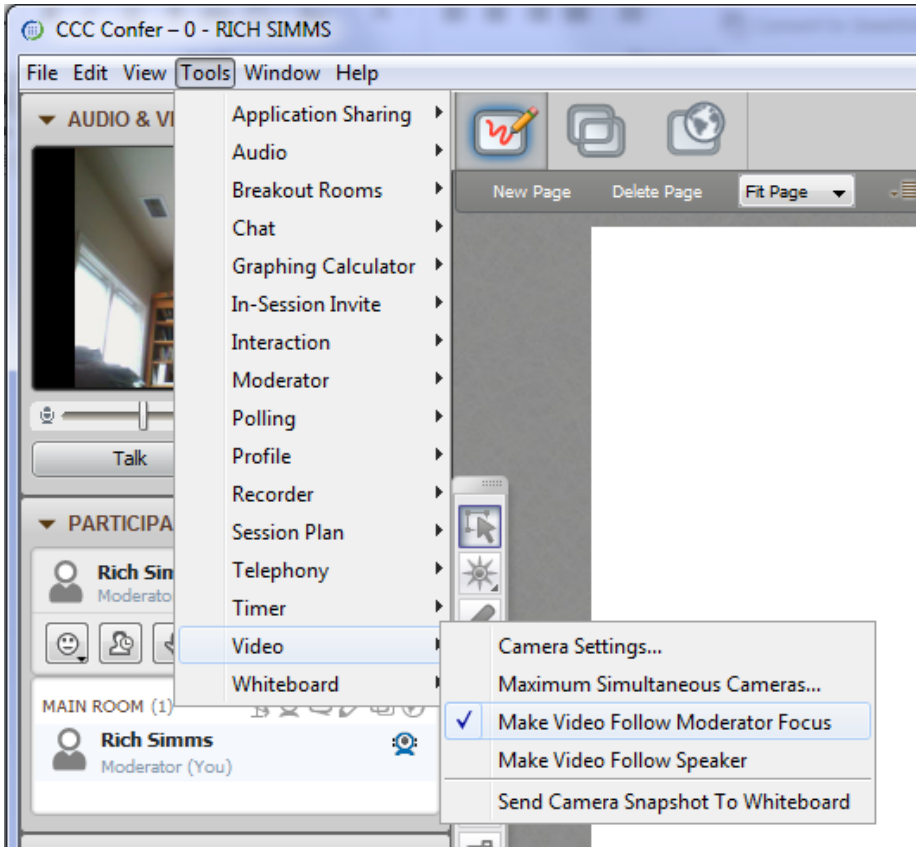
- [ ] **Video (webcam) optional**
- [ ] **layout and share apps**



CCC Confer

[ ] Video (webcam) optional

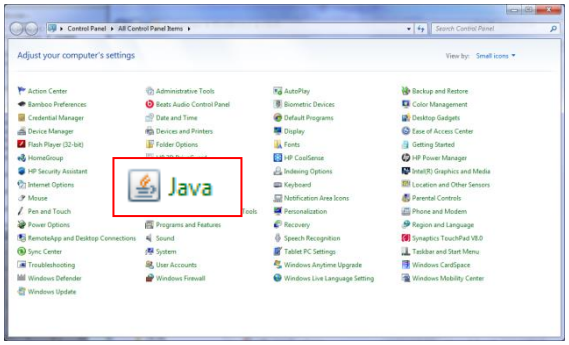
[ ] Follow moderator



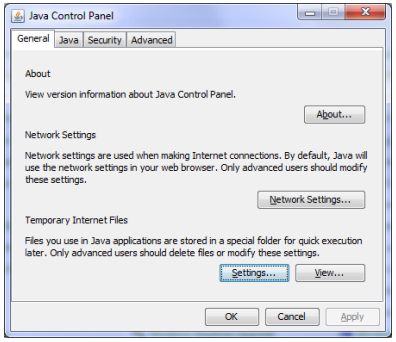
Universal Fix for CCC Confer:

1) Shrink (500 MB) and delete Java cache
2) Uninstall and reinstall latest Java runtime

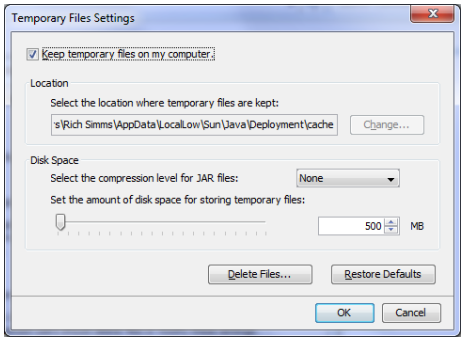
Control Panel (small icons)



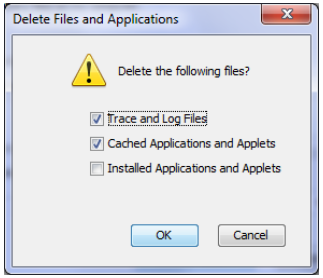
General Tab > Settings…



500MB cache size



Delete these



Google Java download

CIS 90 - Lesson 1

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

Daniel, Riley, Solomon, Curtis, Dillon, Pamela

Aarron, Elizabeth, Gabriel, Lucie, Liam, Michael L., Ryan, Benjamin L., Roger, Ariana

Evan, Alex, Natalia, Efrain, Steven, Anthony, Christopher, Samantha, Michael S., Paul S.

Justin, Hilario, Todd, Tyrone, Benjamin C., Nicholas, Paul N., Justin, Andrew, Matthew

Jordan, Mark, Dimitri, Ryan, Greg, Michael D., Jay, Brian, Richard, TBD

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

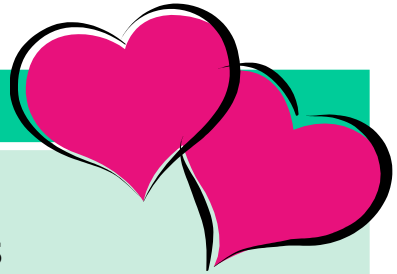
Introductions and Credits

Jim Griffin
- Created this Linux course
- Created Opus and the CIS VLab
- Jim's site: http://cabrillo.edu/~jgriffin/

Rich Simms
- HP Alumnus
- 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 (http://teacherjohn.com/)

Class and Linux Overview



Objectives

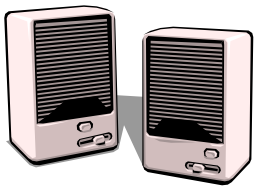
- Understand how this course works
- Use Opus (SSH)
- Use Pod VMs (SSH)
- Use Graphical Desktops (VLab)
- Use Virtual TTY terminals (VLab)
- Learn first UNIX/Linux commands
- Overview on UNIX/Linux

Agenda

- 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

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

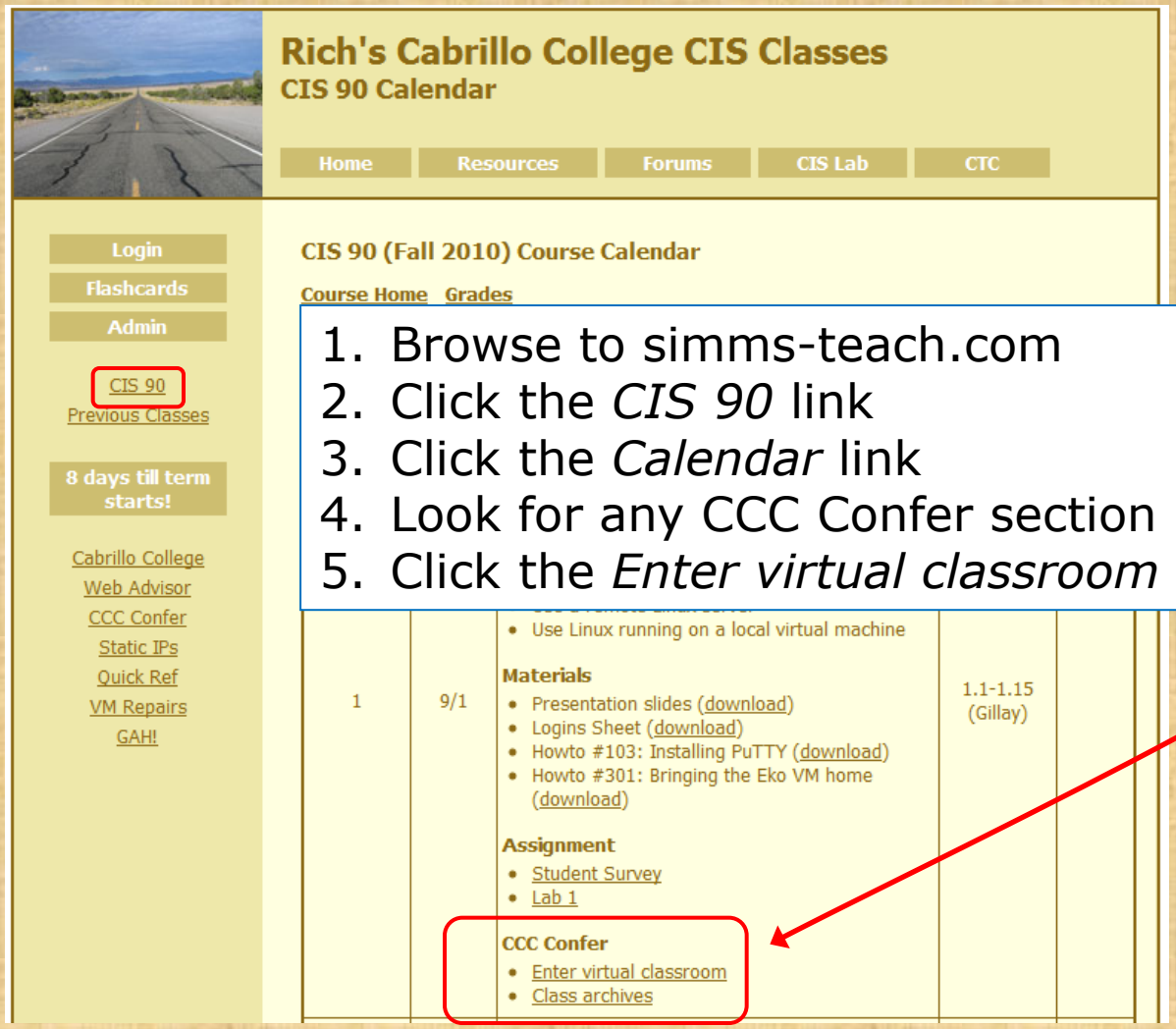


- Ask questions using the chat window or just speak if dialed in with your phone (or Skype)

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

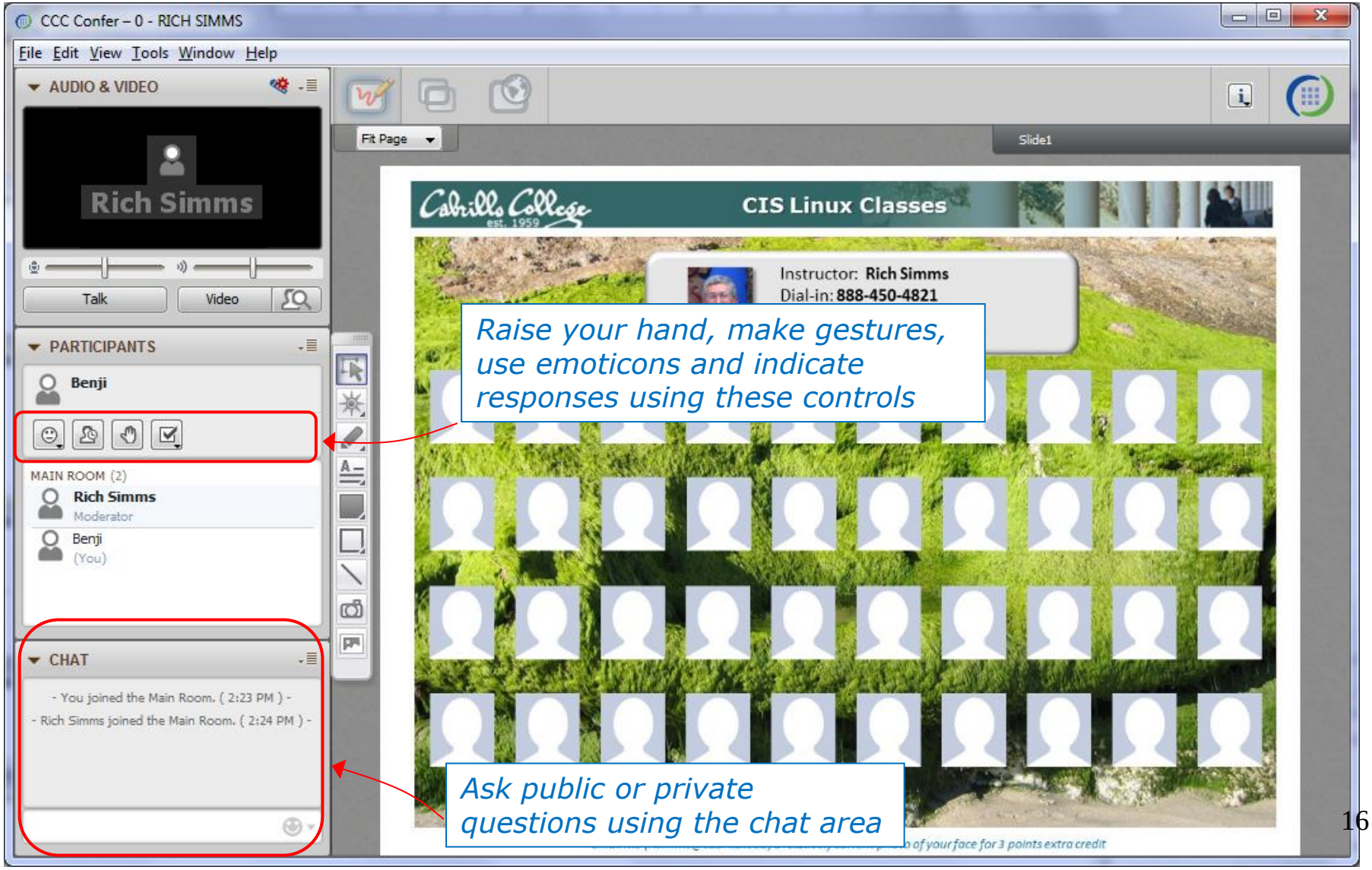
Enter the online virtual classroom



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



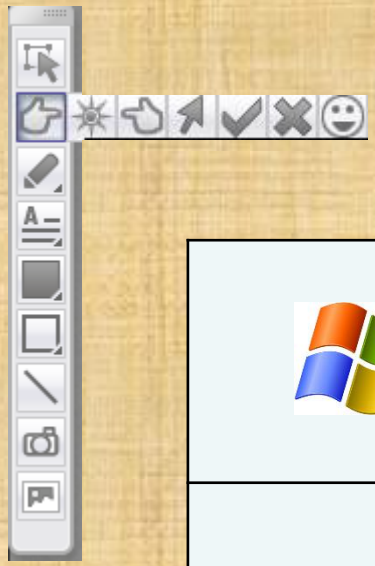
CCC Confer - Attending class online

When dialed in by phone you can use:

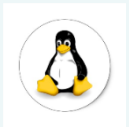
*0 Contact the operator for assistance.

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

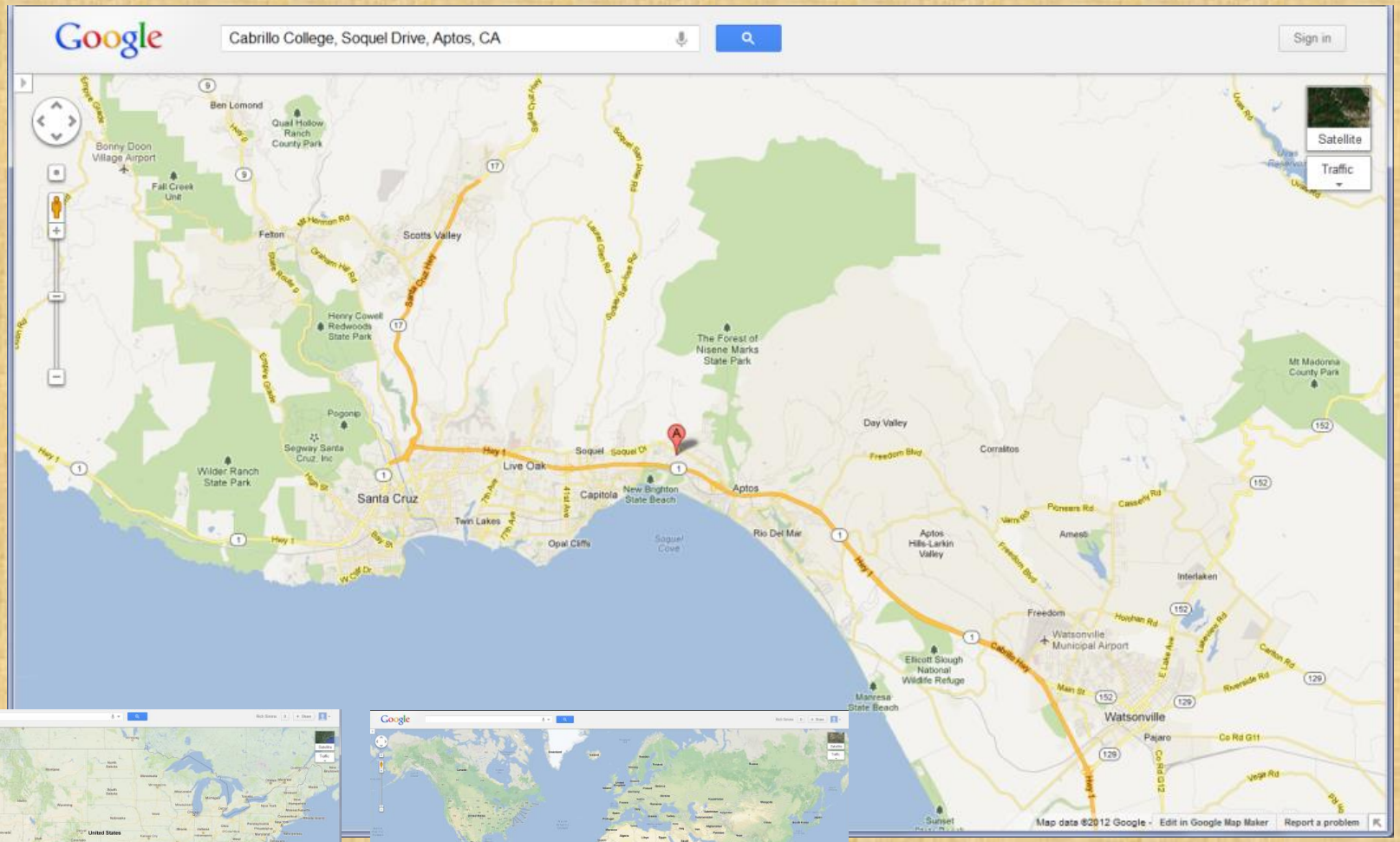
Switch to preloaded whiteboard

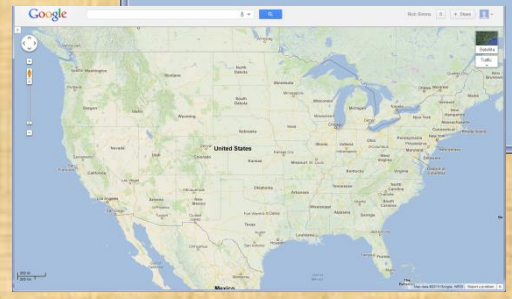


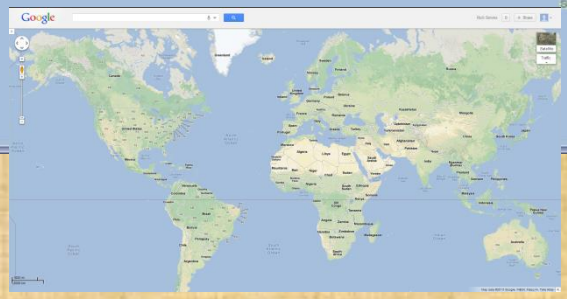
Class Activity
What kind of computer did you use to join CCC Confer?

			Other

Class Activity – Where are you now?





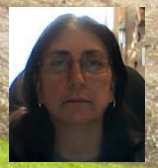


Turn Recording Off
Stay on preloaded whiteboard

Roll Call

CIS 90 - Lesson 1

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



Daniel, Riley, Solomon, Curtis, Dillon, Pam

Aarron, Liz, Gabe, Lucie, Liam, Michael L., Ryan, Benjamin L., Roger, Ariana

Evan, Alex, Natalia, Efrain, Steven, Anthony, Christopher, Samantha, Michael S., Paul S.

Justin, Hilario, Todd, Tyrone, Benjamin C., Nicholas, Paul N., Justin, Andrew, Matthew

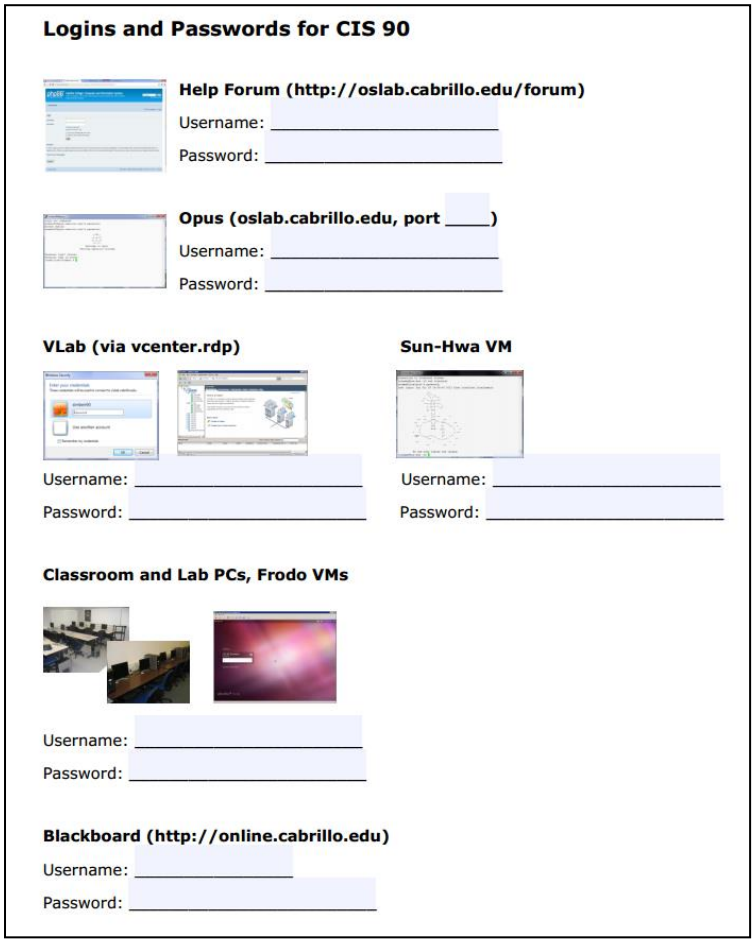
Jordan, Mark, Dimitri, Ryan, Greg, MJ, Jay, Brian, Richard, TBD

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

Login Credentials

Usernames and passwords

http://simms-teach.com/docs/cis90/logins-cis90.pdf



Logins and Passwords for CIS 90

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

Opus (oslab.cabrillo.edu, port ____)
Username: _____
Password: _____

VLab (via vcenter.rdp)
Username: _____
Password: _____

Sun-Hwa VM
Username: _____
Password: _____

Classroom and Lab PCs, Frodo VMs
Username: _____
Password: _____

Blackboard (http://online.cabrillo.edu)
Username: _____
Password: _____

An email was sent to each student on the roster containing specific login information.

For any questions on login credentials contact the instructor at risimms@cabrillo.edu

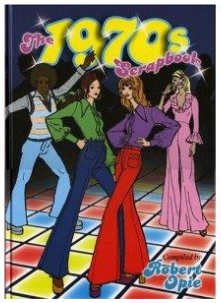
Turn Recording On
Switch back to shared slides

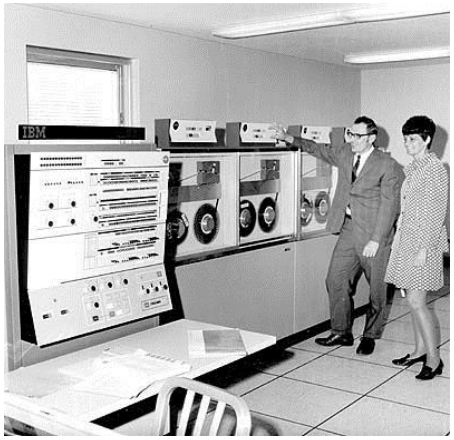
Why Study UNIX/Linux?

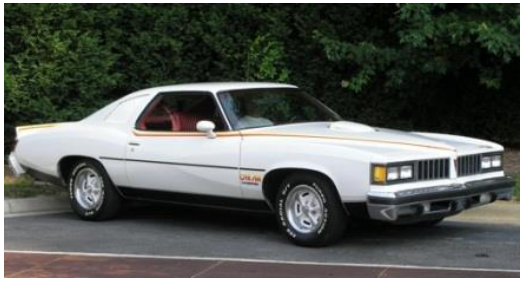
In 1971 Ken Thompson and Dennis Ritchie developed Unix at AT&T's Bell Labs

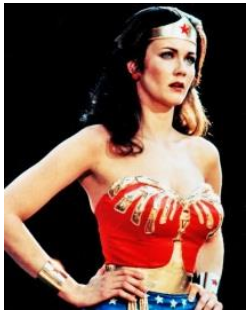
In 1971 Ken Thompson and Dennis Ritchie developed Unix at AT&T's Bell Labs

Isn't UNIX/Linux an antique Operating System dating back to the early 70's that belongs in a museum?









Heck NO !!

UNIX/Linux is widely used, constantly improved and growing fast!

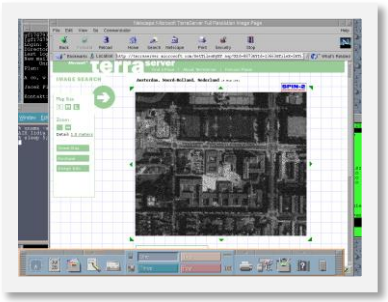
- Embedded in smartphones and many other appliances
- Internet services - Web, DNS, DHCP, Net News, Mail, etc.
- Enterprise and mission critical applications - Large databases, Enterprise Resource Management (ERM), Customer Relationship Management (CRM), data warehouse, manufacturing, supply chain management, etc.
- Hollywood - feature animation, visual effects, rendering farms.
- Number-crunching super computers
- Companies like Google, Amazon, Facebook, PayPal, Yahoo etc. are using it to run their businesses on

Commercial UNIX Operating Systems

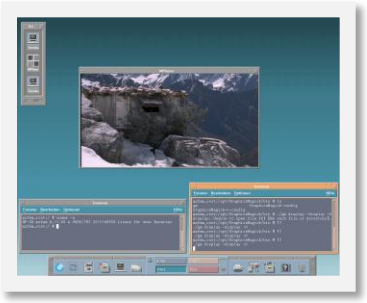
SCO UNIX

Berkeley Software Distribution

AIX



HP-UX



Solaris

Apple Mac OS X and iOS

The kernel is UNIX based

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

Embedded UNIX in Apple Products

Apple iOS

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

Sources: http://en.wikipedia.org/wiki/Darwin_(operating_system)
http://en.wikipedia.org/wiki/IOS_(Apple)
http://code.google.com/p/mobileterminal/

Embedded Linux (just a few)

Katana Robotic Arm

Linksys WRT-54GL

Tivo

Yamaha Disklavier Mark IV

Android

Some TomTom GPS models

Garmin Nuvi 5000

Buffalo NAS storage

Virgin America Personal Entertainment

MikroTik Routers

Google Chrome OS for Netbooks and Tablets

Raspberry Pi

http://www.linuxfordevices.com/c/a/Linux-For-Devices-Articles/The-Linux-Devices-Showcase/

The Open-Source Car

Summary: *Toyota is joining the Linux Foundation.*

By Steven J. Vaughan-Nichols for Linux and Open Source | July 5, 2011 -- 10:13 GMT (03:13 PDT)

Follow @sjvn

Besides a V6 as your engine, your car is very likely to soon be running Linux under the hood. The Linux Foundation will be announcing today that Toyota is joining the Foundation.

Some of you may be wondering, "What the heck is a car company doing joining the Linux Foundation?" The answer is easy. As the Foundation puts it, "A major shift is underway in the automotive industry. Car-makers are using new technologies to deliver on consumer expectations for the same connectivity in their cars as they've come to expect in their homes and offices. From dashboard computing to In-Vehicle-Infotainment (IVI), automobiles are becoming the latest wireless devices - on wheels."

And, what's one of the most popular systems for dashboard computing, heads-up driving displays and IVI? It's Linux, of course.

< snipped >

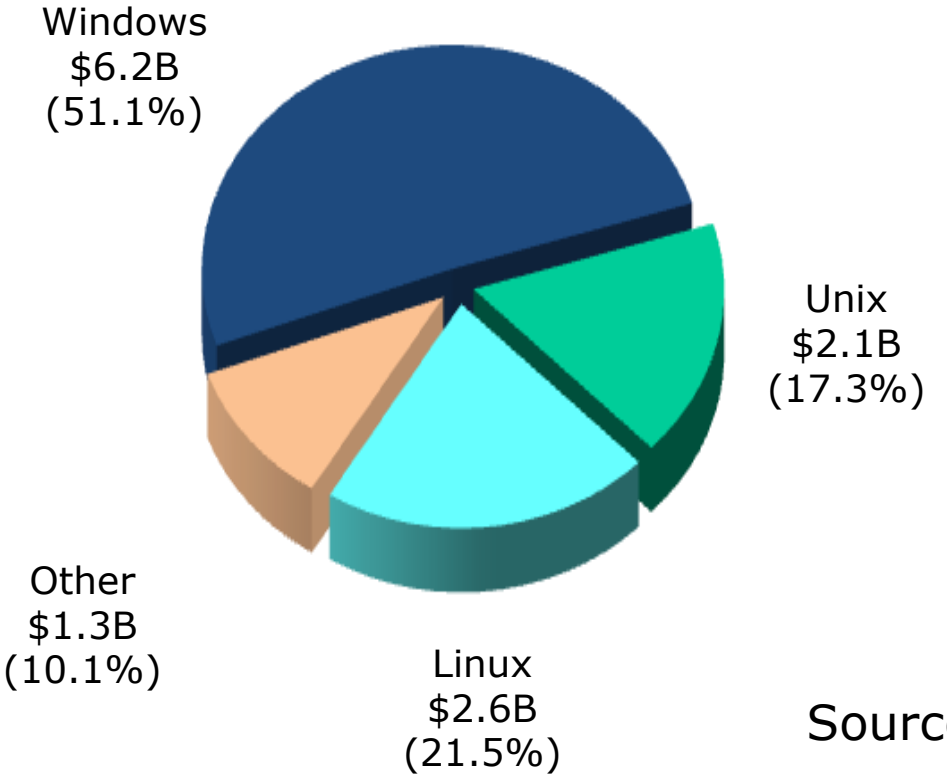
http://www.zdnet.com/blog/open-source/the-open-source-car/9193

Businesses and organizations that run on Linux

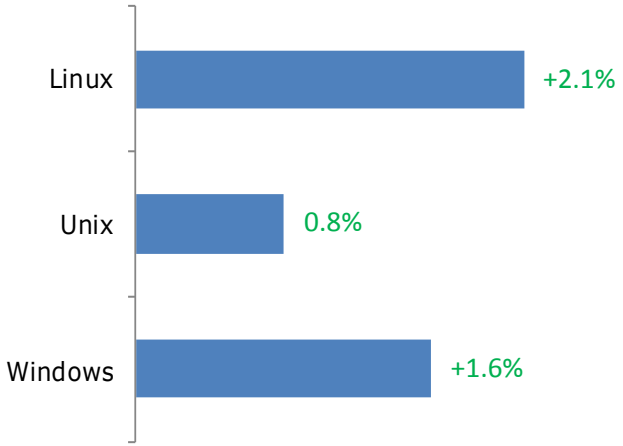
http://www.comparebusinessproducts.com/fyi/50-places-linux-running-you-might-not-expect


Worldwide Server Market

$12.2 Billion Server Revenue Q3 2012



Year over Year Change



Source: IDC, Nov 2012

http://www.idc.com/getdoc.jsp?containerId=prUS23808612#.UQx2eKVZW5I

Website hits by browser OS

Jul 2010[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%

6.9%

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%

15.8%

Jan 2013[3]

Operating Systems		
1	Windows 7	44.13%
2	Windows XP	23.70%
3	iOS	8.79%
4	Apple OS X	8.52%
5	Windows Vista	5.48%
6	Android	3.75%
7	Windows 8	2.28%
8	Linux	1.74%
9	BlackBerry	0.61%
10	SymbianOS	0.23%

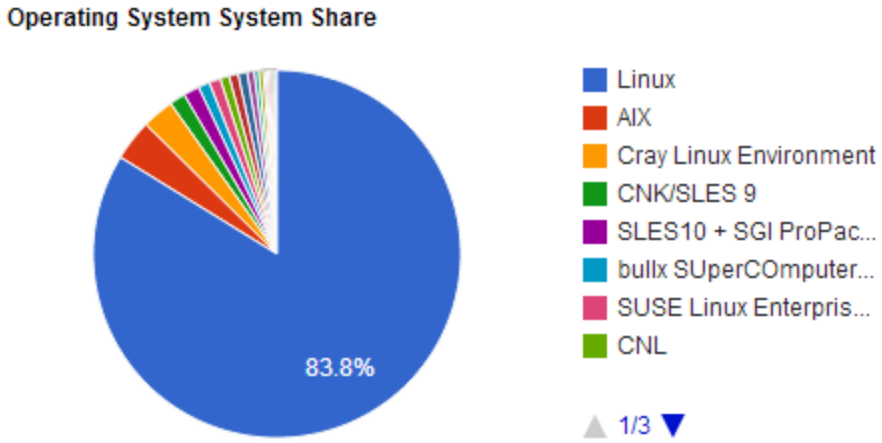
22.8%

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 01/31/2013 based on the last 15,000 page views to each website tracked by W3Counter. W3Counter's sample currently includes 63,187 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



Linux dominates the Supercomputer market

TOP500 NOVEMBER 2012

IBM iDataPlex in Canada

NASA Advanced Supercomputing (NAS) Facility

CERN

Operating System	Count	System Share (%)	Rmax (GFlops)	Rpeak (GFlops)	Cores
Linux	419	83.8	124122700	177021632	12328716
AIX	18	3.6	4072666	5099712	182976
Cray Linux Environment	14	2.8	21742588	32301256	1034656
CNK/SLES 9	7	1.4	1453422	1749811	528384
SLES10 + SGI ProPack 5	7	1.4	960800	1096704	94208
bullx SUperCOmputer Suite A.E.2.1	5	1	3241378	3961958	183424
SUSE Linux Enterprise Server 11	5	1	1624382	1921199	94752
CNL	4	0.8	453460	587565	60144
RHEL 6.2	4	0.8	1738900	2132582	102528
CentOS	4	0.8	955100	1182927	88928
Redhat Linux	3	0.6	311080	384785	42144
Windows HPC 2008	2	0.4	314300	460398	38028
RedHat Enterprise 5	2	0.4	177740	200271	17088
SUSE Linux	1	0.2	274800	308283	26304
RHEL 6.1	1	0.2	230600	340915	37056
Open Solaris	1	0.2	110600	121282	12032
Cell OS	1	0.2	81171	105830	5088
Windows Azure	1	0.2	151300	167731	8064
Super-UX	1	0.2	122400	131072	1280

Source: http://www.top500.org/statistics/list/

iso.linuxquestions.org

15 Most Popular Linux Distro Downloads

15 Most Downloaded Distribution Versions (last 30 Days)	15 Most Downloaded Distributions (Ever)
1. BackTrack 5 R3 (576742)	1. Fedora
2. CentOS 6.3 (81624)	2. Mandriva
3. FreeBSD 8.3 (12010)	3. Red Hat Enterprise Linux
4. BackTrack 5 R1 (8800)	4. SUSE
5. Oracle Linux 5 Update 7 (6246)	5. Ubuntu
6. BackTrack 5 R2 (3277)	6. CentOS
7. Linux Mint 13 "KDE" (3206)	7. Damn Small Linux
8. Ubuntu 12.10 (2737)	8. Linux XP
9. Damn Small Linux 4.4.10 (1714)	9. Knoppix
10. Zorin OS 5 "Educational" (1398)	10. Debian
11. Zenwalk Linux 7.2 (1295)	11. Slackware
12. Wifislax 4.3 (881)	12. PCLinuxOS
13. Fedora 18 (712)	13. MEPIS
14. KNOPPIX 7.0.4 (671)	14. Gentoo
15. KNOPPIX 5.1.1 (448)	15. Linux Mint

Feb 1, 2013

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

Worldwide Smartphone Sales

Worldwide Mobile Device Sales to End Users by Operating System in 3Q12 (Thousands of Units)

	Operating System	3Q12 Units	3Q12 Market Share (%)	3Q11 Units	3Q11 Market Share (%)
Google	Android ↑	122,480.0	72.4	60,490.4	52.5
Apple	iOS ↓	23,550.3	13.9	17,295.3	15.0
Blackberry	Research In Motion ↓	8,946.8	5.3	12,701.1	11.0
	Bada	5,054.7	3.0	2,478.5	2.2
Nokia	Symbian ↓	4,404.9	2.6	19,500.1	16.9
	Microsoft ↑	4,058.2	2.4	1,701.9	1.5
	Others	683.7	0.4	1,018.1	0.9
	Total	**169,178.6**	**100.0**	**115,185.4**	**100.0**

Source: Gartner (November 2012)

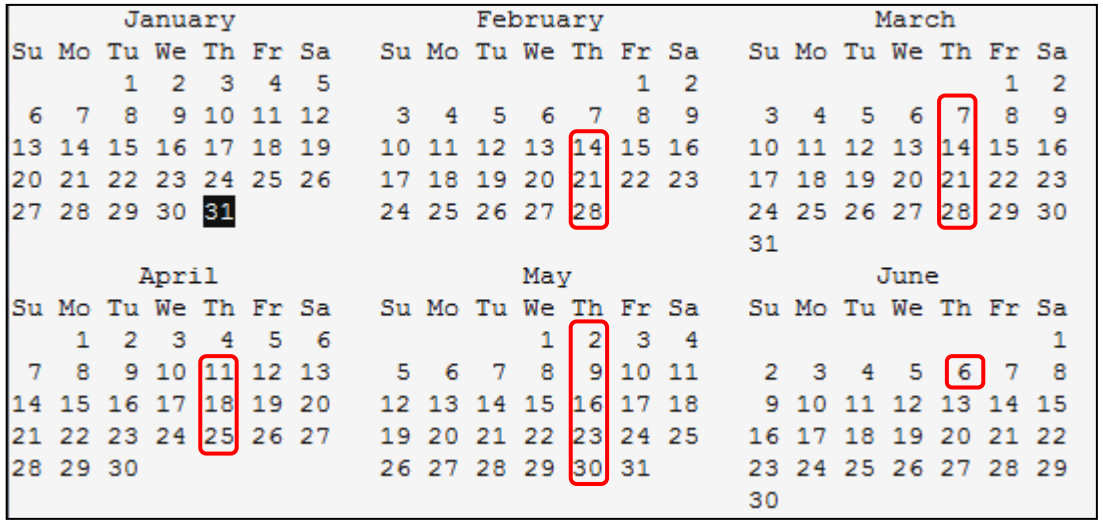
http://www.gartner.com/newsroom/id/2237315

How this class works

CIS 90
Spring 2013

Class meets in room **2501** and **online** every **Thursday afternoon**:

- **1:15-4:20PM**, from **Feb 14th** to **May 30th**
- 15 lessons (class meetings) total
- Final exam at **1-3:50PM**, on **June 6th**



January						
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		

February						
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		

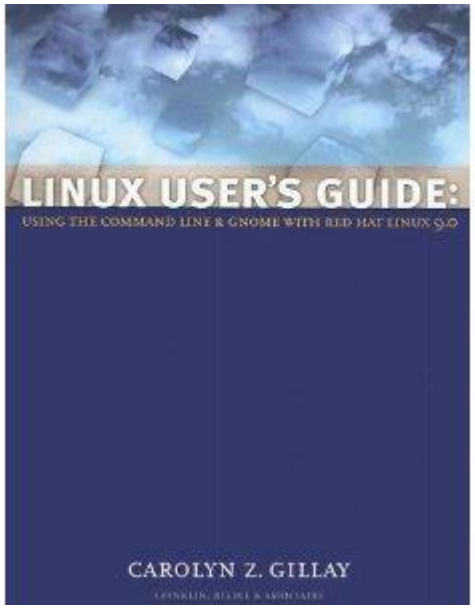
March						
Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

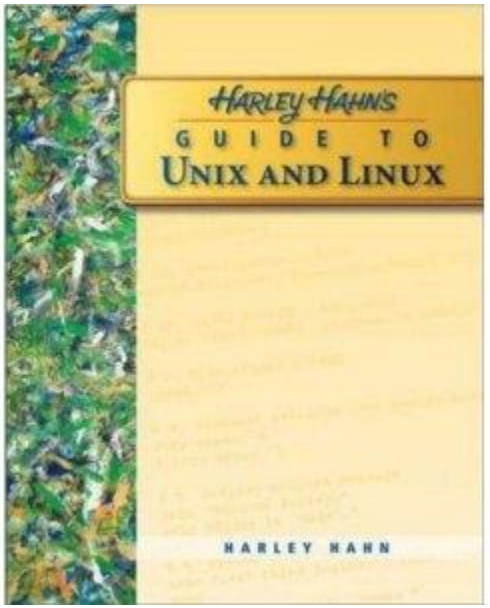
April						
Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

May						
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	

June						
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						

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

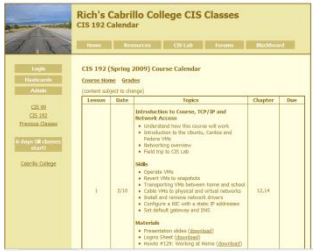
Thursday

"First minute" quiz

Lecture on new lesson material

Class activities

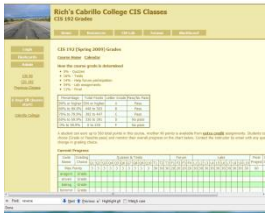
Previous week lab assignments due 11:59PM (Opus time)



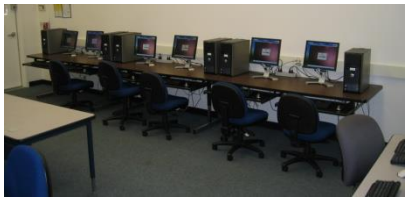
Calendar Page

Friday

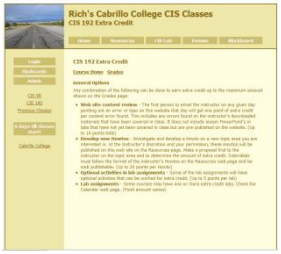
is grading day



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

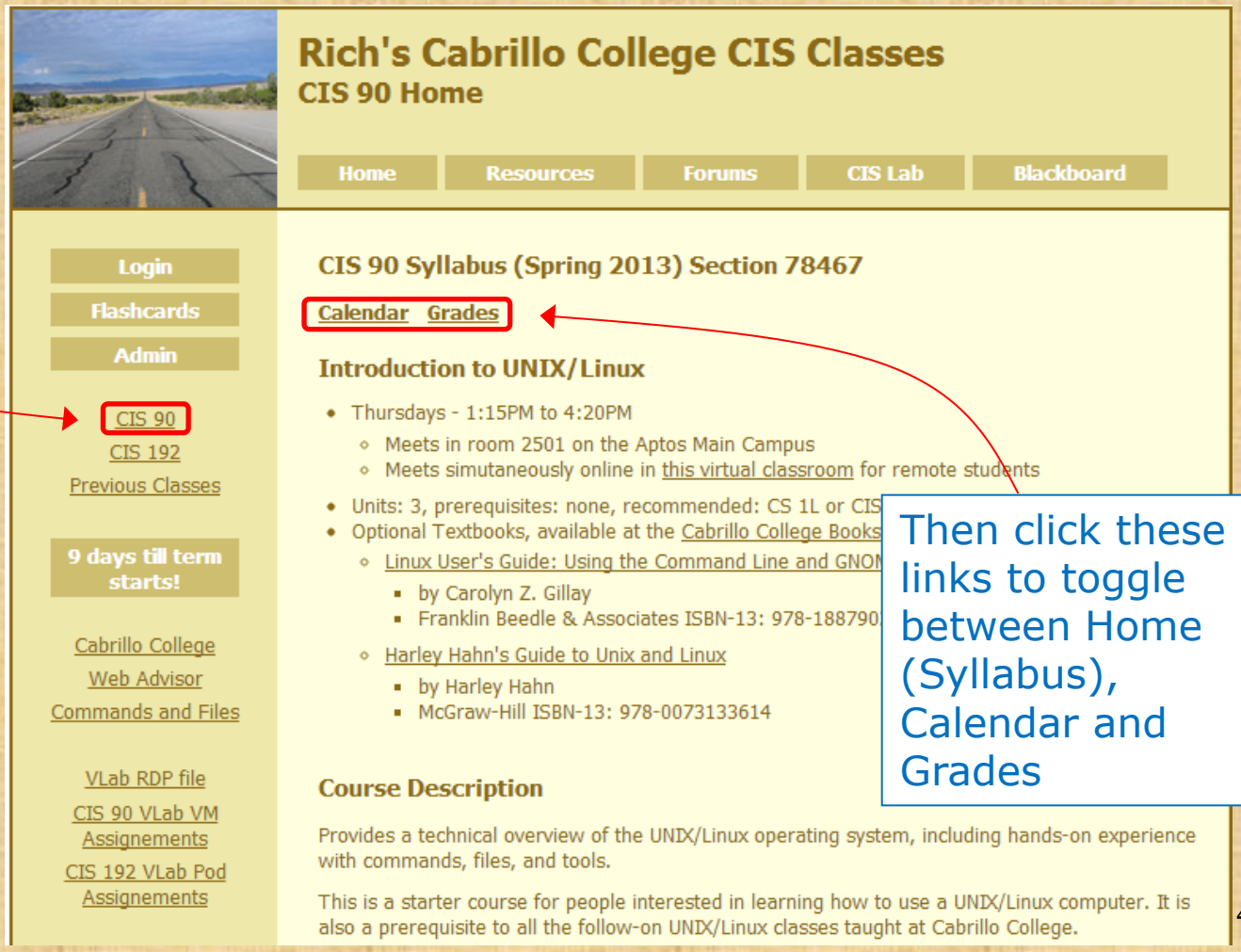
- Use the forum for the fastest response on technical or class related questions.
- Use email for personal matters only. If it's NOT personal I will most likely ask you to post your question on the forum and will answer it there instead so other students may benefit from the answer.
- Weekly office hours: 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

Home | Resources | Forums | CIS Lab | CCC

CIS 90 (Fall 2010) Sections 67727 and 68884

Calendar Grades

Introduction to UNIX/ Linux

- Wednesdays - 1:15PM to 4:20PM
  - Section 67727 meets in room 2301 on the Aptos Main Campus
  - Section 68884 meets online at CCC Confer
- Open Lab - 3 hr 3 min per week to be arranged - in the CIS Lab
- Units: 3, prerequisites: none, recommended: CIS 1C or CIS 172
- Optional Textbooks (available at the Cabrillo College Bookstore):
  - Linux User's Guide: Using the Command Line and GNOME with Red Hat Linux 9.0
    - by Garrison E. Gibbs
    - Franklin Beedie & Associates ISBN: 1887902988
  - Harley Hahn's Guide to Unix and Linux
    - by Harley Hahn
    - McGraw-Hill ISBN: 0073133612

Course Description

Provides a technical overview of the UNIX/Linux operating system, including hands-on experience with commands, files, and tools.

This is a starter course for people interested in learning how to use a UNIX/Linux computer. It is also a prerequisite to all the follow-on UNIX/Linux classes taught at Cabrillo College.

The material learned in this course is applicable to all versions of Linux and UNIX such and Red Hat, Ubuntu, HP-UX, Suse, Solaris, Debian, etc. Students will have accounts and remote access to a Linux server on campus for use during class and at home.

Student Learner Outcomes

Upon succesful 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

Some 90 shell commands will be covered that will let a student login remotely, navigate the file system, create and modify files/directories, set permissions, run & schedule programs/scripts, manage processes, do searches, do text editing with vi, and use regular expressions. Shell scripting will be covered to construct custom commands from basic commands. Students will learn how to develop a custom shell script using commands they have learned.

Taught in Both Physical and Virtual Classrooms

Don't miss class because your car broke down, you are out of town, hate the commute, or battling the flu (we'll, maybe not). Class will be taught using CCC Confer is a web based conferencing tool that allows you to participate over the Internet or phone.

All students in section 68884 will meet online every week using CCC Confer. With the permission of the instructor, students may be able to attend the physical class in Room 2301 if space is available.

Students in section 67727 are also welcome to attend class using CCC Confer whenever they wish.

The passcode and dial-in number for CCC Confer will be emailed out to all registered students. Email the instructor if you need the dial-in number and passcode.

A Day in the Life

Most classes will start with a **first minute quiz**. The reason for this is to get the class successfully started on time. The quiz questions will always be published a week earlier. Students can work together or use the forum to work out the answers in advance. Students must be in their seat when the class starts to take this quiz. There are no makeups for students arriving late or who miss class.

Following the quiz there will usually be a short amount of time for any housekeeping items that are necessary. After that the instructor will take questions on the previous weeks lesson or lab assignment before moving on.

The lecture on the new material will then begin. The lecture format will use the whiteboard, PowerPoints and live demonstrations. Periodic breaks will happen usually around the start of each hour.

In general during class, the computers will be on so students can view the presentation and Google information. There will also be frequent class activities to break up the lecture and give students some time to try out what they just learned. The last part of the class will cover the upcoming lab assignment.

Computer Lab and TBA Hours

This course includes both lecture and lab activities. The day and time of the lecture portion are shown above and in the Cabrillo Schedule. The lab activities comprise the TBAs (to be arranged) portion of the course. The TBA lab activities are required and designed to continue the learning process. The CIS lab provides students with practical hands-on experience where they implement what they learn in lecture on live Linux systems. The CIS Lab is located in the CTC (building 1400). This lab has the equipment for doing lab assignments and are available to all CIS students. The Opus server, available remotely over the Internet, is another Linux resource for CIS Linux students. Roped each weekly lab assignment to take an average of 3 hr 3 min to complete. As you would expect, some labs will require less time while others will require more. Please plan accordingly.

Late Work Will Not Be Accepted

Please complete all assignments on time as they will not be accepted if they are late. This will help both the student and instructor keep the class moving and avoid log jams at the end of the term. All assignments are due by midnight (Pacific Time) of the due date shown in the Course Calendar. If an assignment is not complete by the deadline it is better to turn in what you have completed before deadline than no submittal at all. There is always extra credit work for students needing extra points.

Contacting the Instructor

Instructor contact information and office hours are shown on Cabrillo Staff page. The preferred order of contact is: in person during office hours, CCC Confer, Opus mail, email, or the forum is faster and prefered. For personal matters use office hours or email. Please include the name of the class in your email subject lines to get past spam filters. For everything else use the Help Forum and everyone can benefit from the public questions and answers.

Help Forum

There is an electronic Help Forum for this class. This forum is intended to be a place where students can share information, ask questions, and get answers. The forum is especially intended to be a resource for completing lab assignments. It offers a way to ask questions about an obstacle or some real-then-meaningful error message, and to share solutions to those problems. Everyone should be courteous and respectful on the forum. Off-topic, rude or otherwise inappropriate posts will be removed. Joining the forum requires member registration with a real first and last name. Fake or anonymous screen names will not be allowed to register. Avatars that are photographs of the forum member are a great way for everyone to get to know each other.

Web Site

All the important course information is on http://simms-teach.com. This includes links to the forums, resources, lab assignments, flash-cards, lecture slides, grades, and the course calendar. Note that this material may change. If you print something like a lab assignment, please check the web site before submitting your work to make sure you have the latest version. The flash-cards are an optional tool students can use to drill important Linux knowledge into their brains.

Classroom Etiquette

It is important to have an effective, distraction-free physical classroom environment for learning. To minimize distractions all **cell phones should be turned off** or at least silenced. Never carry on conversations during the lecture as this is probably the most annoying distraction possible to those sitting nearby.

For students in the physical classroom, computers can be turned on for viewing lecture slides loadin, Googleing related technical information, and doing classroom exercises. A students full attention is desired so the computers should not be used during lecture for email or anything that would distract them or others from the material being taught.

For students in the virtual classroom, please use the chat window in CCC Confer to ask questions and communicate with the instructor or other classmates.

Please plan on coming to all classes. If class will be missed let the instructor know ahead of time. It is the students responsibility to get any missed material or information from other classmates (the forum is a good way to do this). Please note that being disruptive is grounds for being dropped from the class by the instructor.

Grading Policy

Grading will be based on the total number of points students earn doing quizzes, tests, lab assignments, forum participation, and final. Visit the Grades Page to see exactly how grades are determined and to track progress.

For some flexibility, personal preferences and family emergencies there are a number of extra credit opportunities. For students looking for more challenge or some additional points see the Extra Credit Page.

Students who just want to learn and not mess around with grades, can always take the class as pass/no pass. Indicate this on the Student Survey provided in the first class. You can change your mind later by contacting the instructor.

Special Learning Needs

Students with disabilities, including "invisible" disabilities such as chronic illnesses, learning disabilities, and mental disabilities, are encouraged to schedule their classes and discuss appropriate accommodations to the instructor during office hours. Please bring documentation verification of your disability from the Learning Skills or DSPS offices and a counselor or specialists recommendations for accommodating your needs.

As required by the Americans with Disabilities Act (ADA), accommodations are provided to insure equal opportunity for students with verified disabilities. If you need assistance with an accommodation, please contact the Learning Skills Program at 831-479-6220 (for students with learning disabilities and attention deficit disorders) or Disabled Student Programs and Services (DSPS) at 831-479-6379 or 831-479-6421 (TTY) to make arrangements as soon as possible.

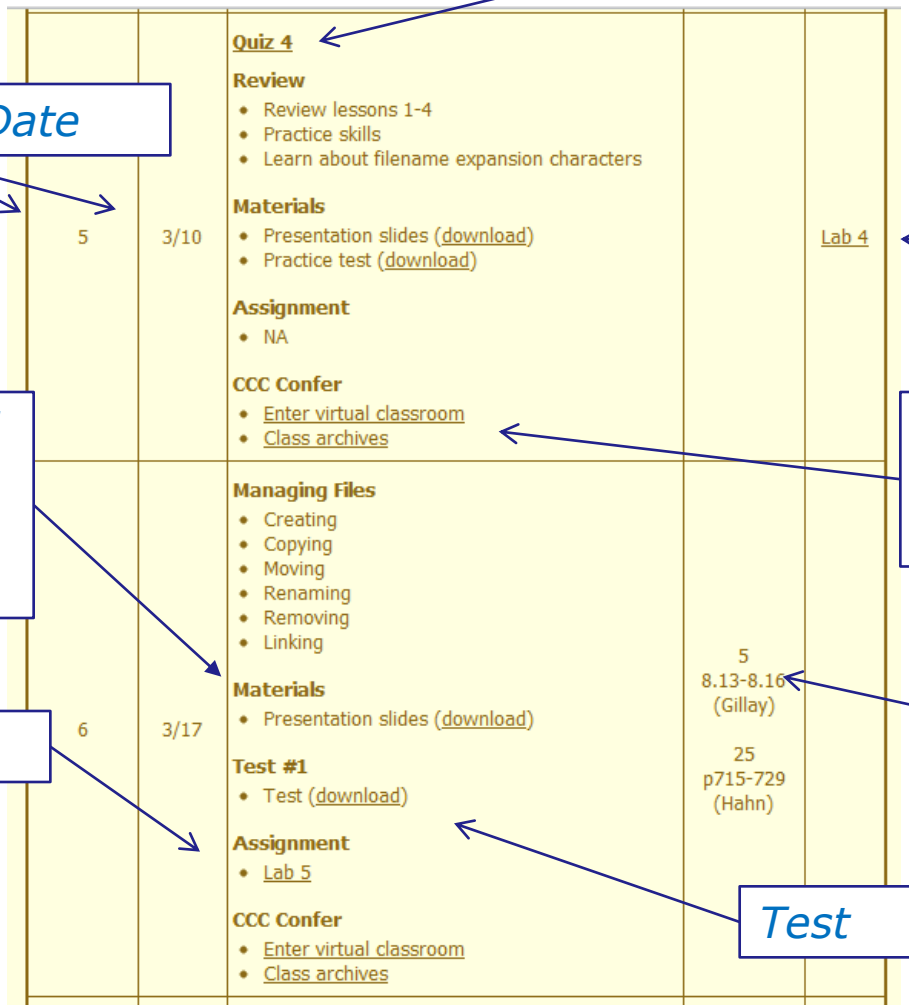
Missing Classes and Drops

It is the students responsibility to officially withdraw from classes. If you miss more than two classes, the instructor may drop you from the course enrollment unless prior arrangements have been made and agreed to.

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



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)	

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

Links to Virtual classroom and archived recordings

References to material in the textbook

Lab assignment

Test

Course Grading

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.

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.

Don't forget to post! Racking up points the forum is "low hanging fruit"

Each student is assigned a secret LOR code name

Rich's Cabrillo College CIS Classes

CIS 90 Grades

Home | Resources | Forums | CIS Lab | Blackboard

Login | Flashcards | Admin

CIS 90
CIS 192
Previous Classes

9 days till term

CIS 90 (Spring 2013) Grades

Course Home Calendar

Points can be earned from the following activities:

- First minute quizzes - 30 points (5%)
- Tests - 90 points (16%)
- Forum posts - 80 points (14%)
- Lab assignments - 300 points (54%)
- Final exam - 60 points (11%)

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 include both graded and non-graded areas of performance. Non-graded performance areas may inclu others, quality, planning & organization skills, communication, documentation, motivation, and the des beyond expectations. The forum is an excellent way to demonstrate teamwork and communication ski

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	
anborn	grade																															

More on Grading

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

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

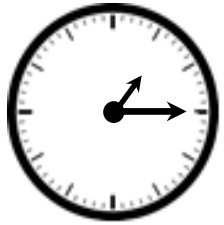
More on Grading

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 at 11:59PM will get no credit if turned in one minute late at 12:00AM (midnight) the next day

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)

- Tests will be distributed by during the last hour 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 a Linux server to verify an answer.
- Tests are open notes, open book, and open computer.
- Tests are designed to take about and hour 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 are ample extra credit opportunities which provide you with the flexibility to get the grade you want.

There is a cap on extra credit points so plan carefully!

Course outline and syllabus

Please don't forget:

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

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

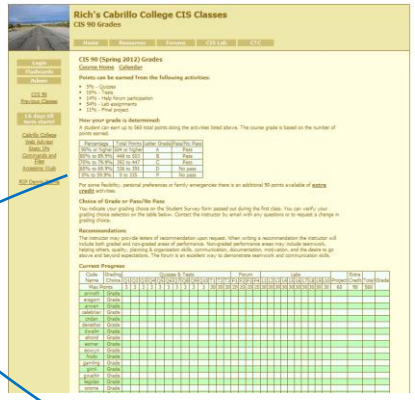
If you have not completed a lab assignment, **please turn in what you have done for partial credit**

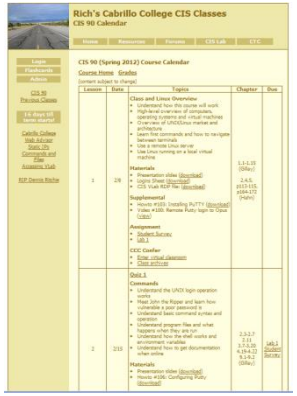
Don't panic though -- there are ample extra credit opportunities for students wanting or needing any extra points.

A lab assignment due at 11:59PM will get no credit if turned in one minute late at 12:00AM (midnight) the next day

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.





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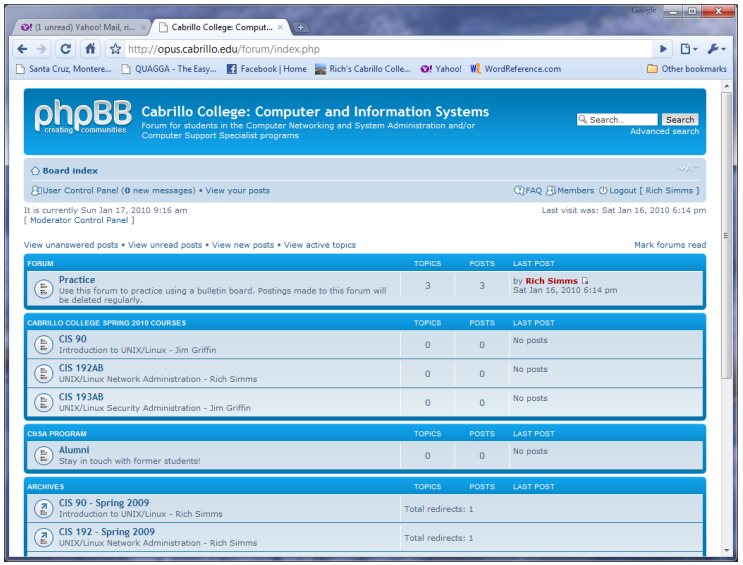
60% to 69.9%	336 to 391	D	No pass
0% to 59.9%	0 to 335	F	No pass

At the end of the course I use the table on the Grades web page to determine your grade

Help Forum

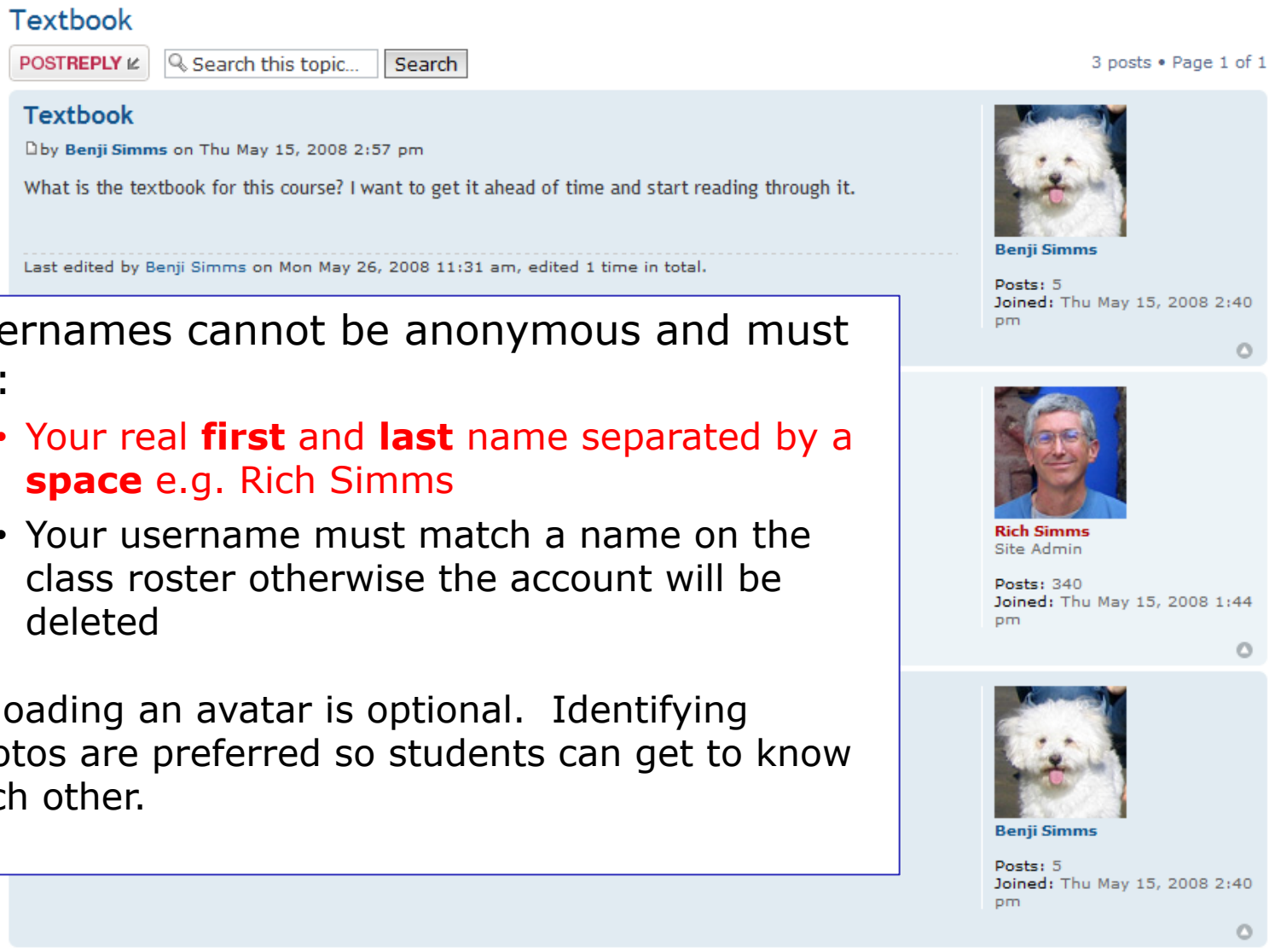
Online Help Forum



- Post questions and answers
- Collaborate on lab assignments
- Share UNIX/Linux information
- Post class notes for classmates who miss class
- Get clarifications
- 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 posting period)

Class Forum



- Usernames cannot be anonymous and must be:
  - Your real **first** and **last** name separated by a **space** e.g. Rich Simms
  - Your username must match a name on the class roster otherwise the account will be deleted
- Uploading an avatar is optional. Identifying photos are preferred so students can get to know each other.

Class Forum

Optional, but handy is to subscribe to a forum.

After logging in:

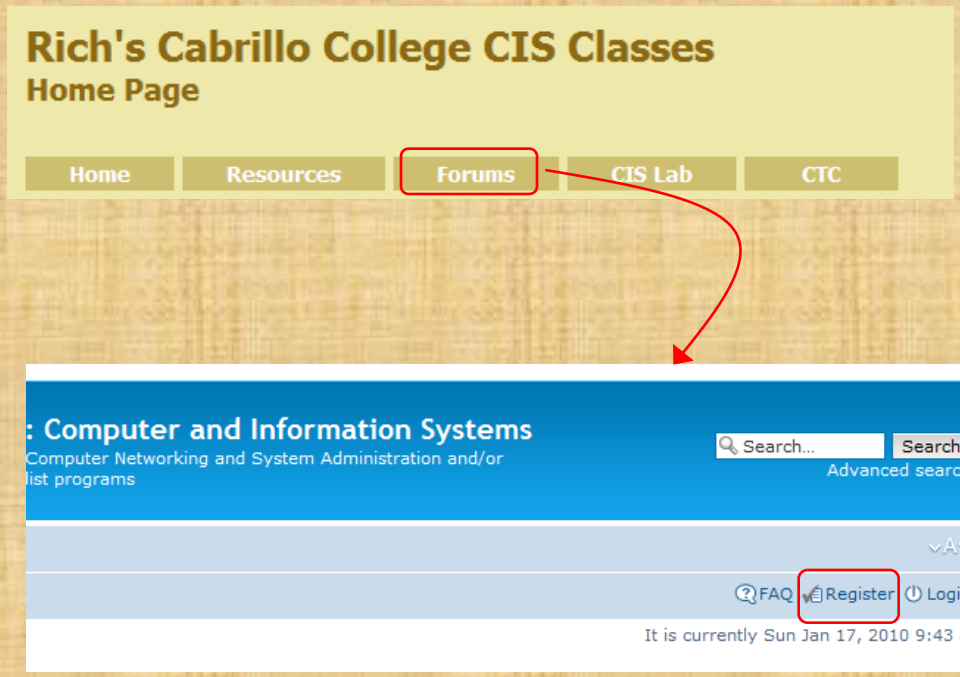
1. Go to the class forum.
2. Click the "Subscribe forum" box at the lower left. When subscribed you get email notifications when new posts are made.
3. To unsubscribe, click it again.

Unsubscribed looks like this

Subscribed looks like this

Class Activity
Forum Registration

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



To Register:

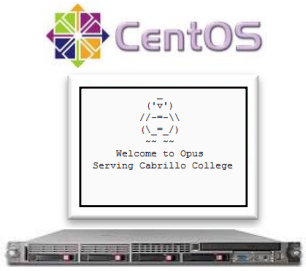
1. Browse to the forum
2. Click on Register
3. Review and agree to terms
4. Your **Username** must:
   - be your first and last name separated by a space
   - e.g. Benji Simms
   - match a name on the class roster

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

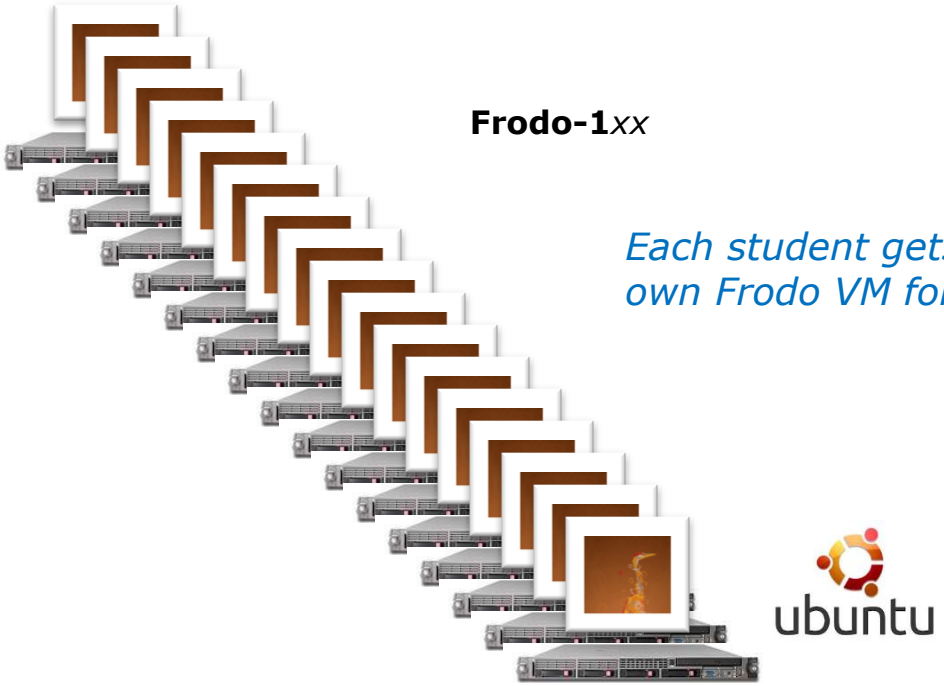
Configured for
Command Line Only



Opus

Sun-Hwa

Configured for
Graphics and Command Line



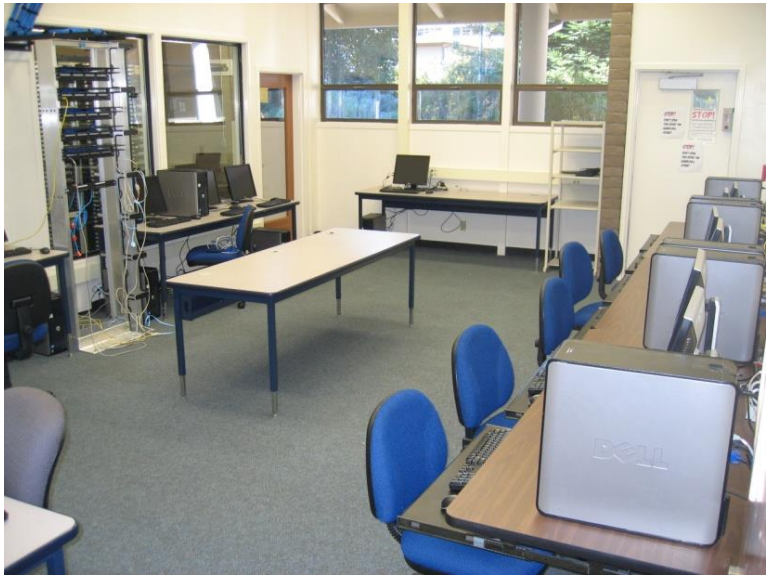
Frodo-1*xx*

Each student gets their own Frodo VM for the term

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

The CIS Lab
CTC Building Room 1403

A lab for CIS students with all the equipment needed to complete lab assignments

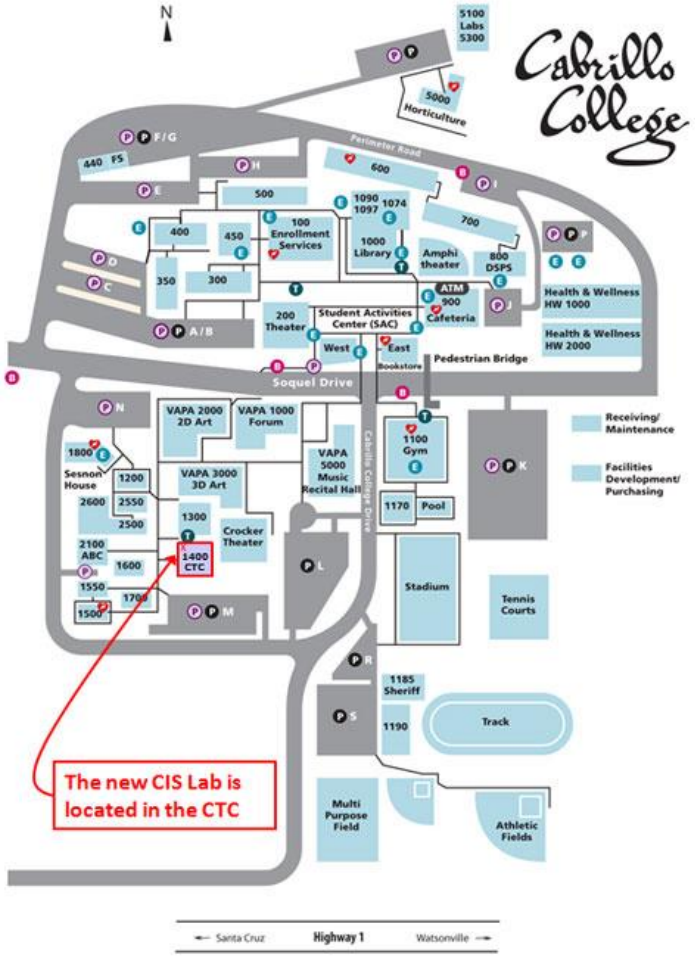


Instructors and lab assistants are available (see schedule) to help

Use this link to see the schedule and hours of operation

The CIS Lab

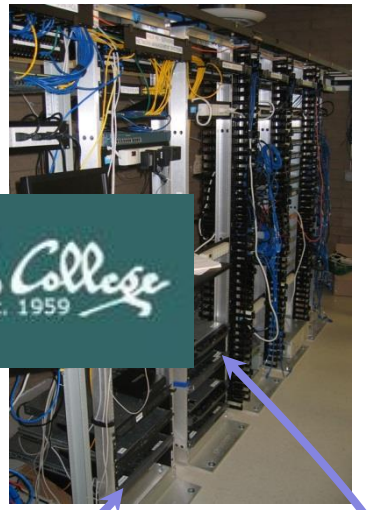
CTC Building Room 1403

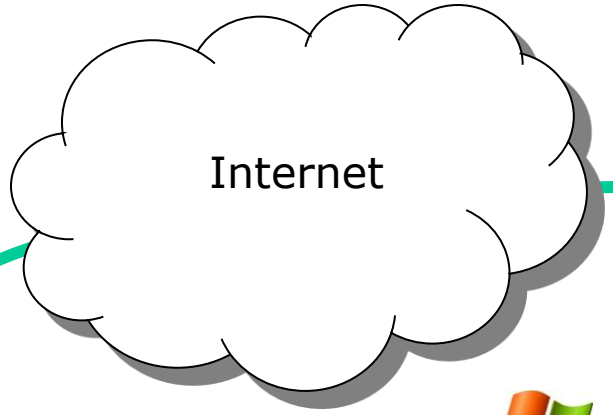


Lab Resources

Remote Access to **CIS VLab**

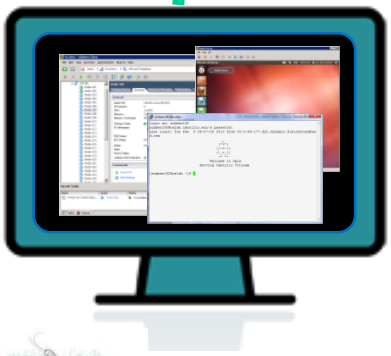
Room 1403 on Aptos Campus





cislab (Win 2008)

vCenter (VMware appliance)
vmserver3 (VMware ESXi)

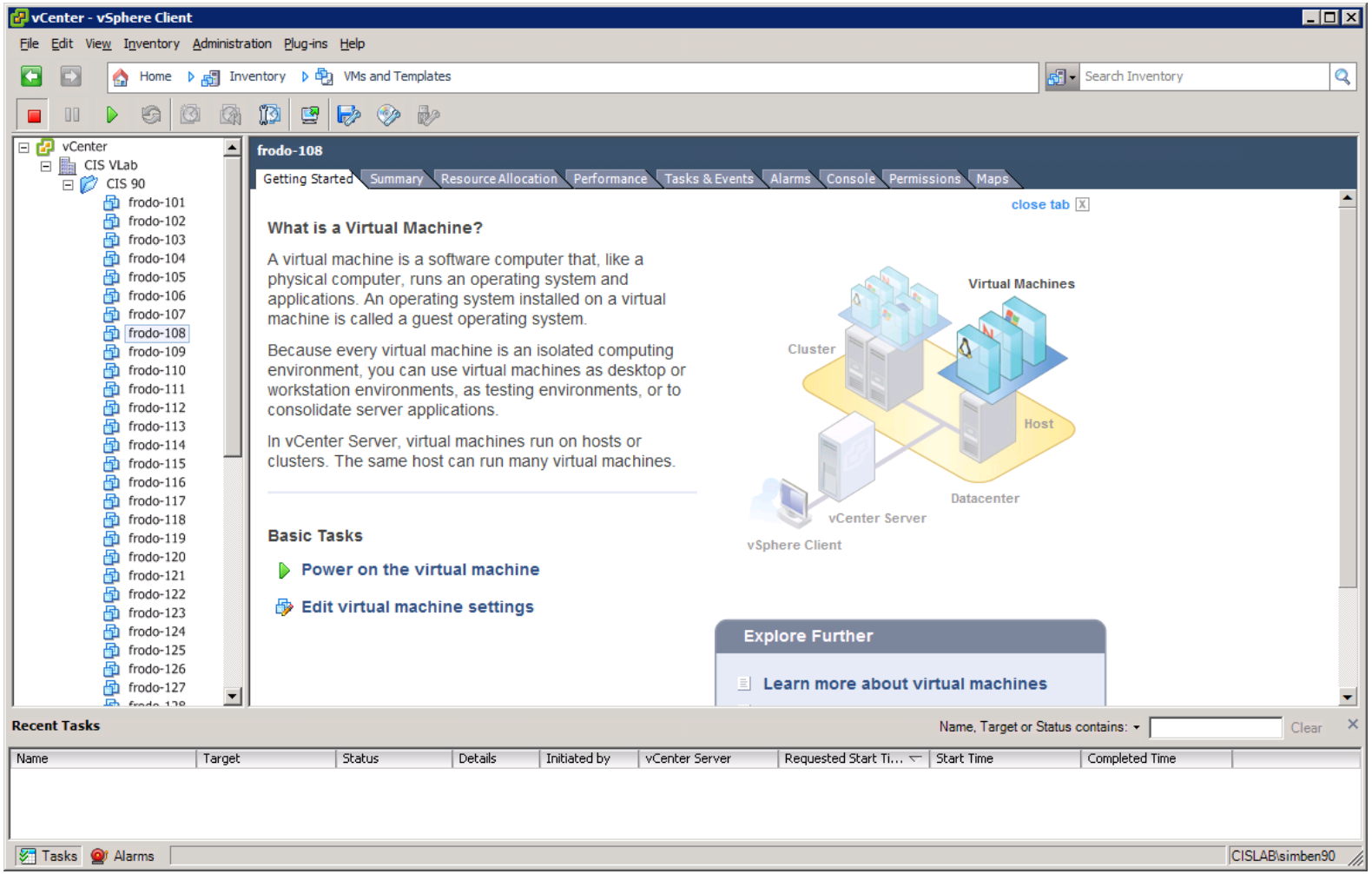


Home

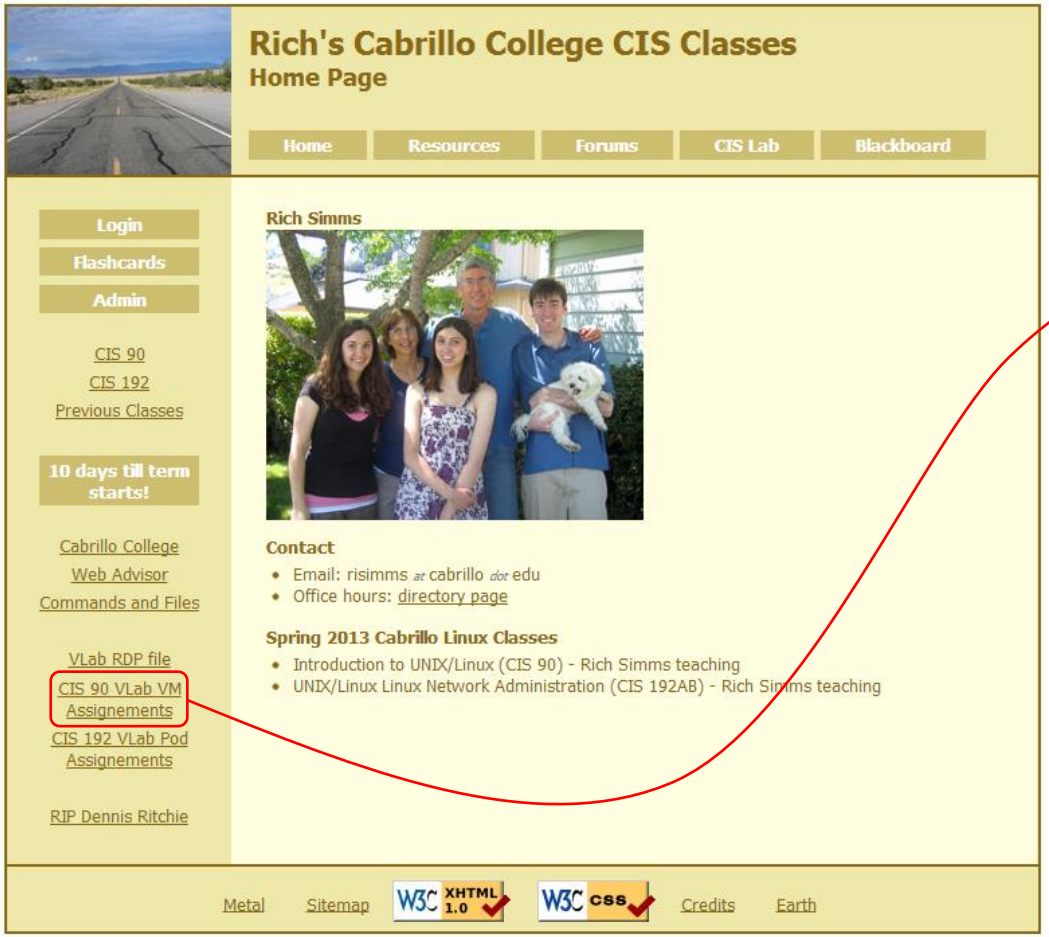
School

You can access the course VMs from school or home

CIS VLab



Each student gets their own Frodo VM for the term



CIS 90 VLab Assignments

Student	VM
Aarron	Frodo-101
Alex	Frodo-102
Andrew	Frodo-103
Anthony	Frodo-104
Ariana	Frodo-105
Benjamin C.	Frodo-106
Benjamin L.	Frodo-107
Benji	Frodo-108
Brian	Frodo-109
Christopher	Frodo-110
Curtis	Frodo-111
Daniel	Frodo-112
Dillon	Frodo-113
Dimitri	Frodo-114
Duke	Frodo-115
Efrain	Frodo-116
Elizabeth	Frodo-117
Evan	Frodo-118
Gabriel	Frodo-119
Greg	Frodo-120
Hilario	Frodo-121
Homer	Frodo-122
Jay	Frodo-123
Jordan	Frodo-124
Justin S.	Frodo-125
Justin V.	Frodo-126
Liam	Frodo-127
Lucie	Frodo-128
Mark	Frodo-129
Matthew	Frodo-130
Michael D.	Frodo-131
Michael L.	Frodo-132
Michael S.	Frodo-133
Natalia	Frodo-134
Nicholas	Frodo-135
Pamela	Frodo-136
Paul N.	Frodo-137
Paul S.	Frodo-138
Riley	Frodo-139
Richard	Frodo-140
Roger	Frodo-141
Ryan L.	Frodo-142
Ryan S.	Frodo-143
Samantha	Frodo-144
Solomon	Frodo-145
Steven	Frodo-146
Todd	Frodo-147
Tyrone	Frodo-148

To see which Frodo VM is yours use the link on the class website

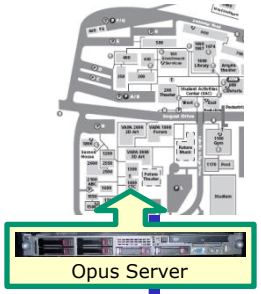
SSH

Getting the car

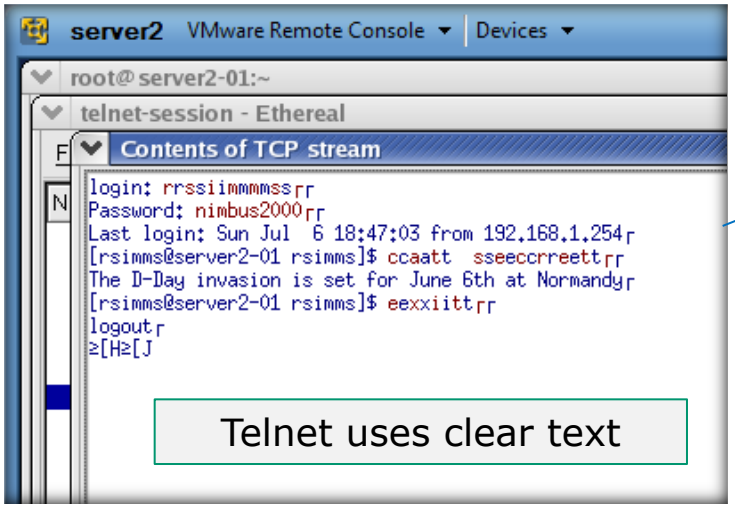
Picture credit:
http://www.cs.umd.edu/faq/ssh.html

SSH is a network protocol that enables secure connections between computers

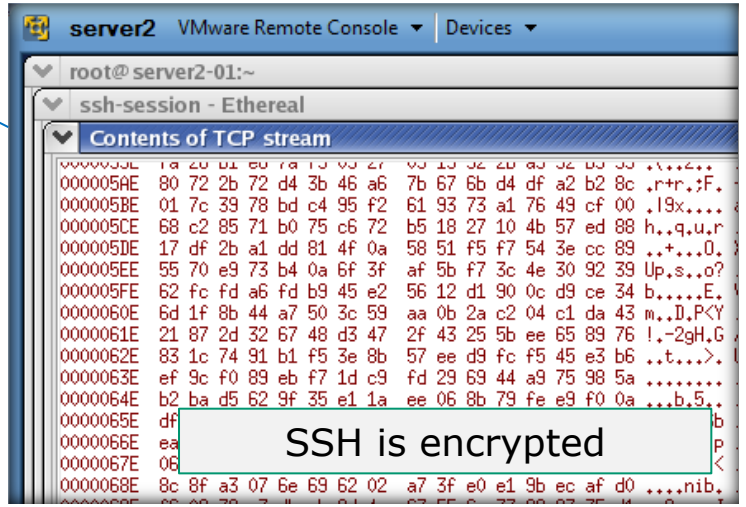
Remote Server



Sniffer view of a Telnet session



Sniffer view of a SSH session

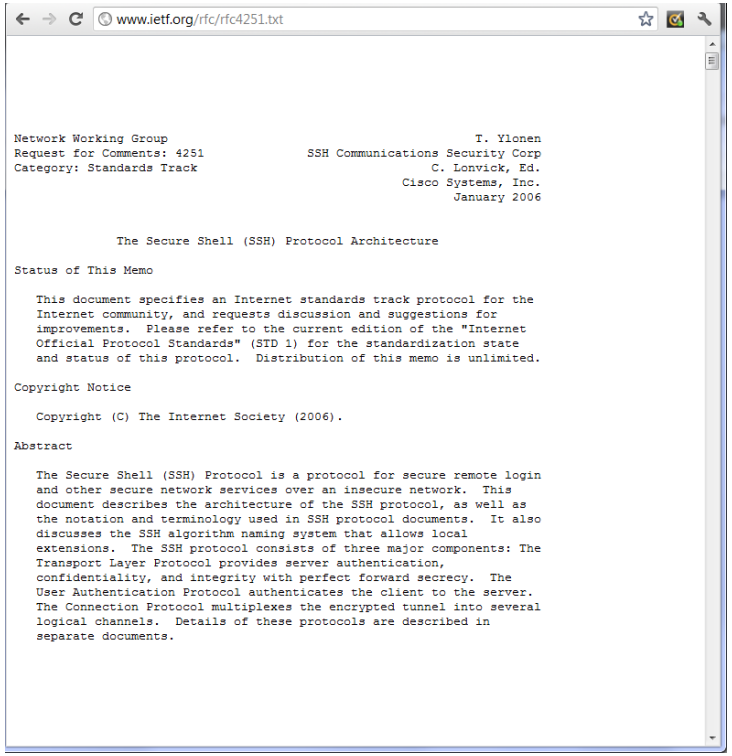


With telnet, everything is transferred in clear text over the network

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

Local computer

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

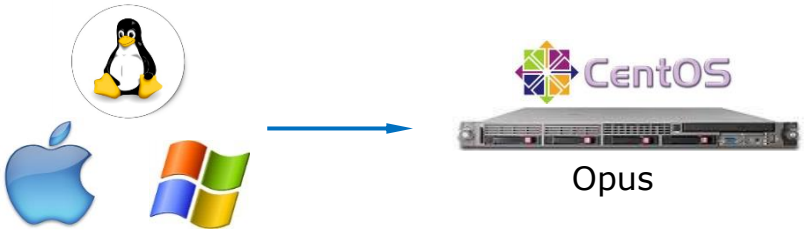
Putty is written and maintained primarily by Simon Tatham.
http://www.chiark.greenend.org.uk/~sgtatham/
Thank you Simon!

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

First driving lesson



You can log into Opus from your computer

SSH connection to a UNIX/Linux Server

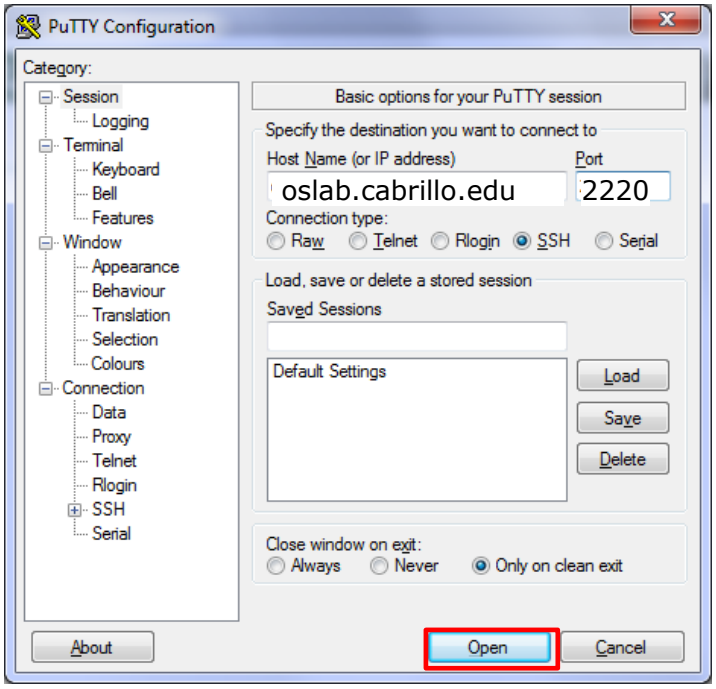
You need to know three things:

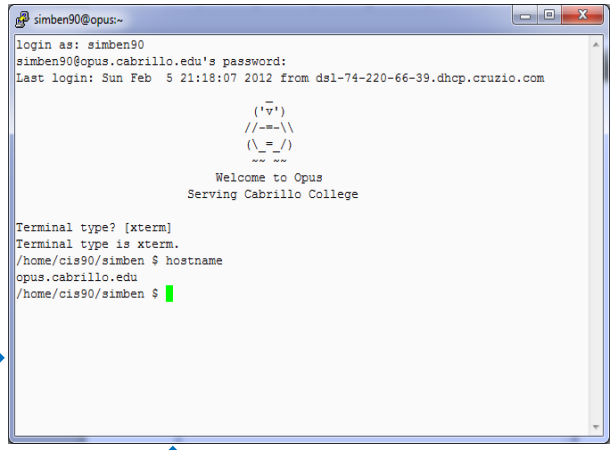
- The **hostname** of the remote server (must be a *fully qualified domain name* when going over the Internet)
- Your **login credentials** (username/password) on the remote server
- The **port number** the SSH service is listening on (the default is port 22)

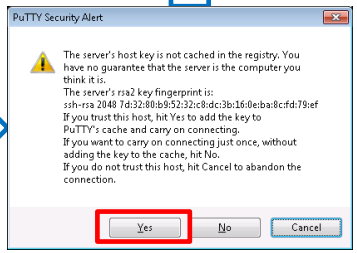
Logging into Opus from **home**

Opus

On Windows run Putty





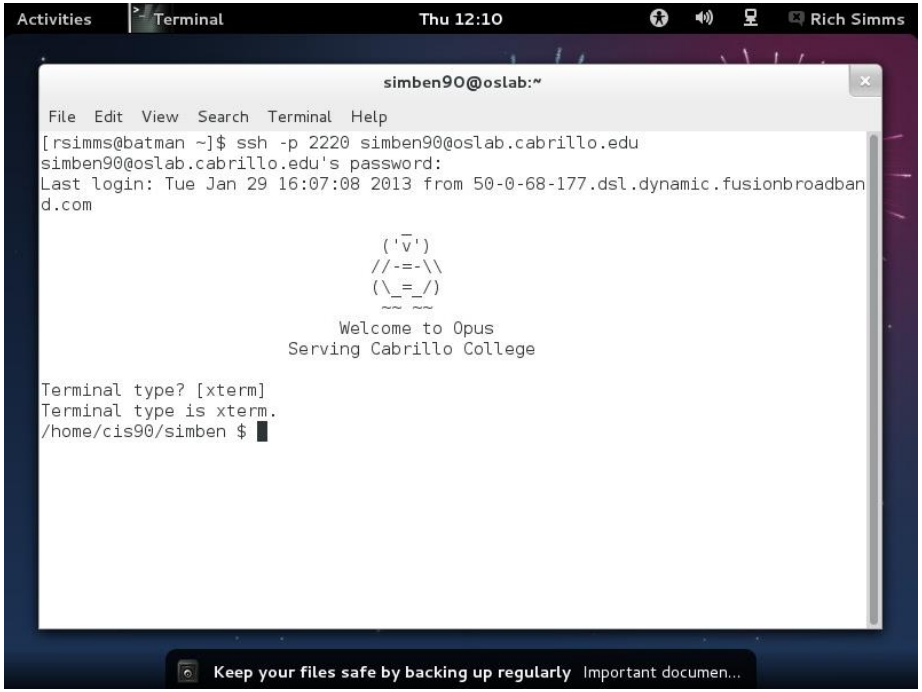


The first time a connection is made to a server this warning is displayed.

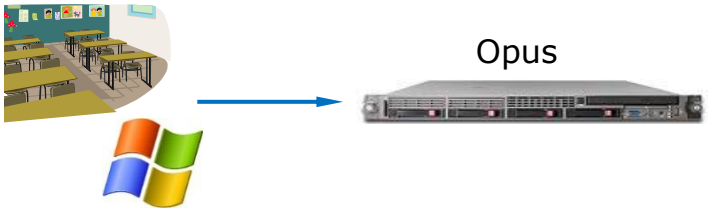
Logging into Opus from **home**

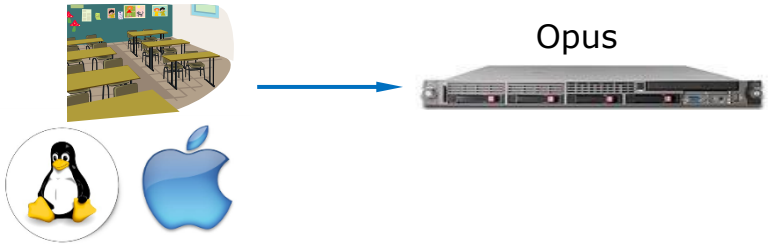
Opus

On a Mac or Linux terminal:
ssh -p 2220 *username*@**oslab.cabrillo.edu**

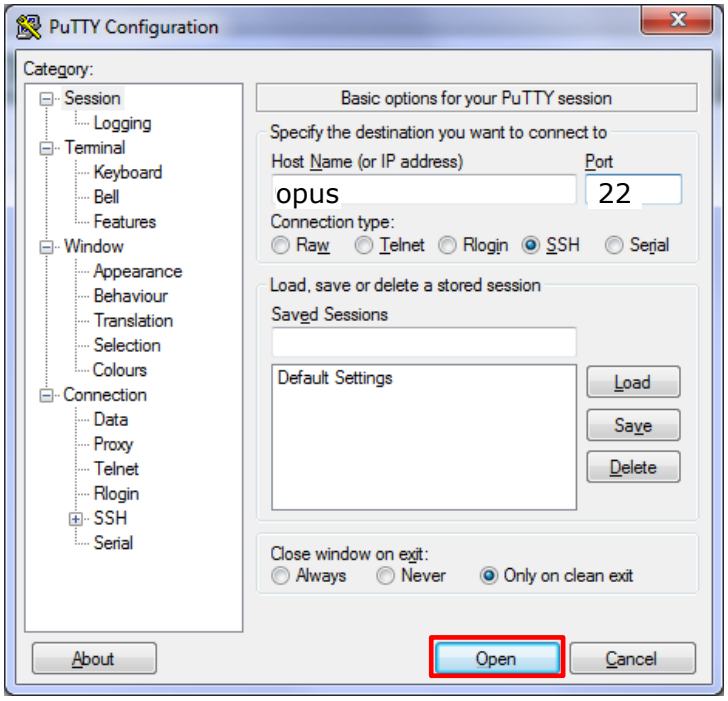


Logging into Opus from **the classroom or CIS Lab**





On Windows run Putty:



On a Mac or Linux terminal:

ssh *username*@**opus**

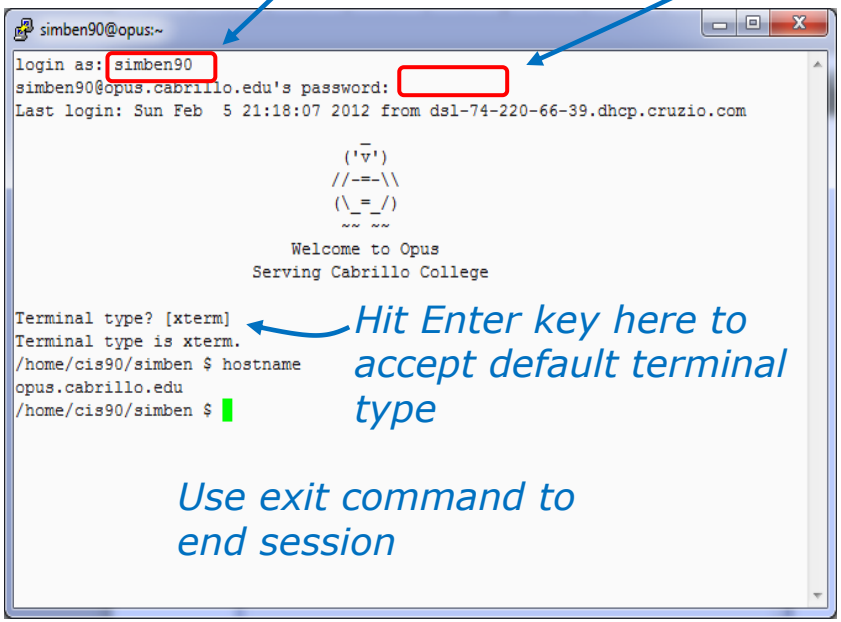
When connected to the CIS network rather than the Cabrillo campus network you can just use "opus" as the hostname with port 22

Accessing Opus from a Windows PC using Putty

Log in with username and password

username

password
(not echoed)



Class Activity

	Hostname	Port
Home or campus wireless network	oslab.cabrillo.edu	2220
Classroom or CIS Lab PCs	opus	22

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

First maneuvers

First commands for your toolbox

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 Sun-Hwa via Opus

Second driving lesson

More commands for your toolbox

SSH command is used to login to remote systems

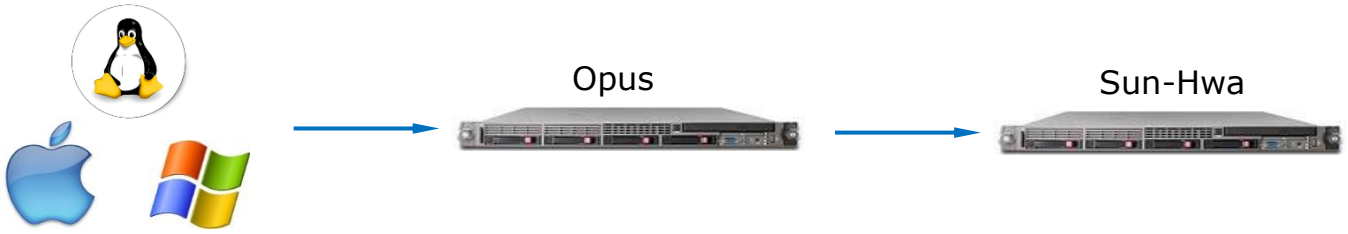
ssh *<username>*@*<hostname>*

ssh *<username>*@*<IP address>*

ssh *<domain>**<username>*@*<IP address>*

A domain must be specified in conjunction with the username for system that authenticate using Windows Active Directory

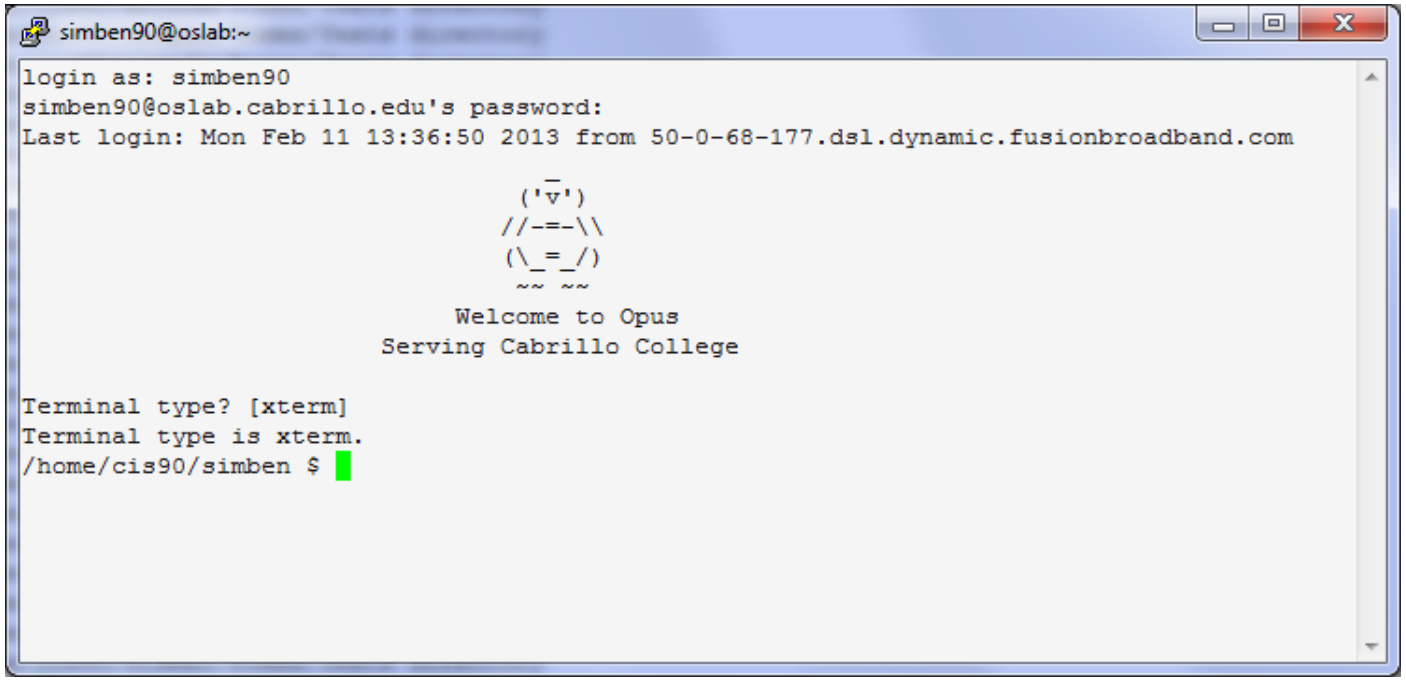
Logging into Sun-Hwa from Opus



Once you login to Opus, you can then login to another Linux system like Sun-Hwa

Logging into Sun-Hwa from Opus

Step 1 - Log into Opus

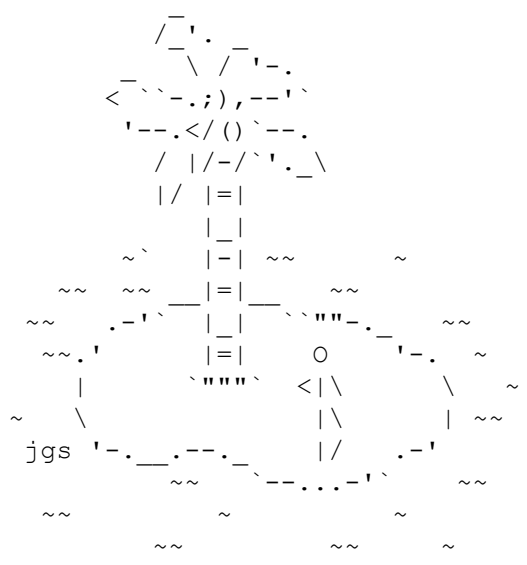


Note the Opus prompt is configured to indicate where you are in the file tree

Logging into Sun-Hwa from Opus

Step 1 - SSH into Sun-Hwa from Opus

```
/home/cis90/simben $ ssh cislab\\simben90@sun-hwa
The authenticity of host 'sun-hwa (172.30.5.21)' can't be established.
RSA key fingerprint is 4d:85:56:fb:47:59:ed:4e:c7:a9:cd:e8:cf:bb:13:cd.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'sun-hwa,172.30.5.21' (RSA) to the list of
known hosts.
cislab\simben90@sun-hwa's password:
Last login: Tue Jan 29 14:33:21 2013 from opus.cislab.net
```



```
No one ever leaves the island!

[CISLAB\simben90@sun-hwa ~]$
```

Sun-Hwa is a member of an Active Directory domain which requires the domain name, followed by two backslashes then the username.

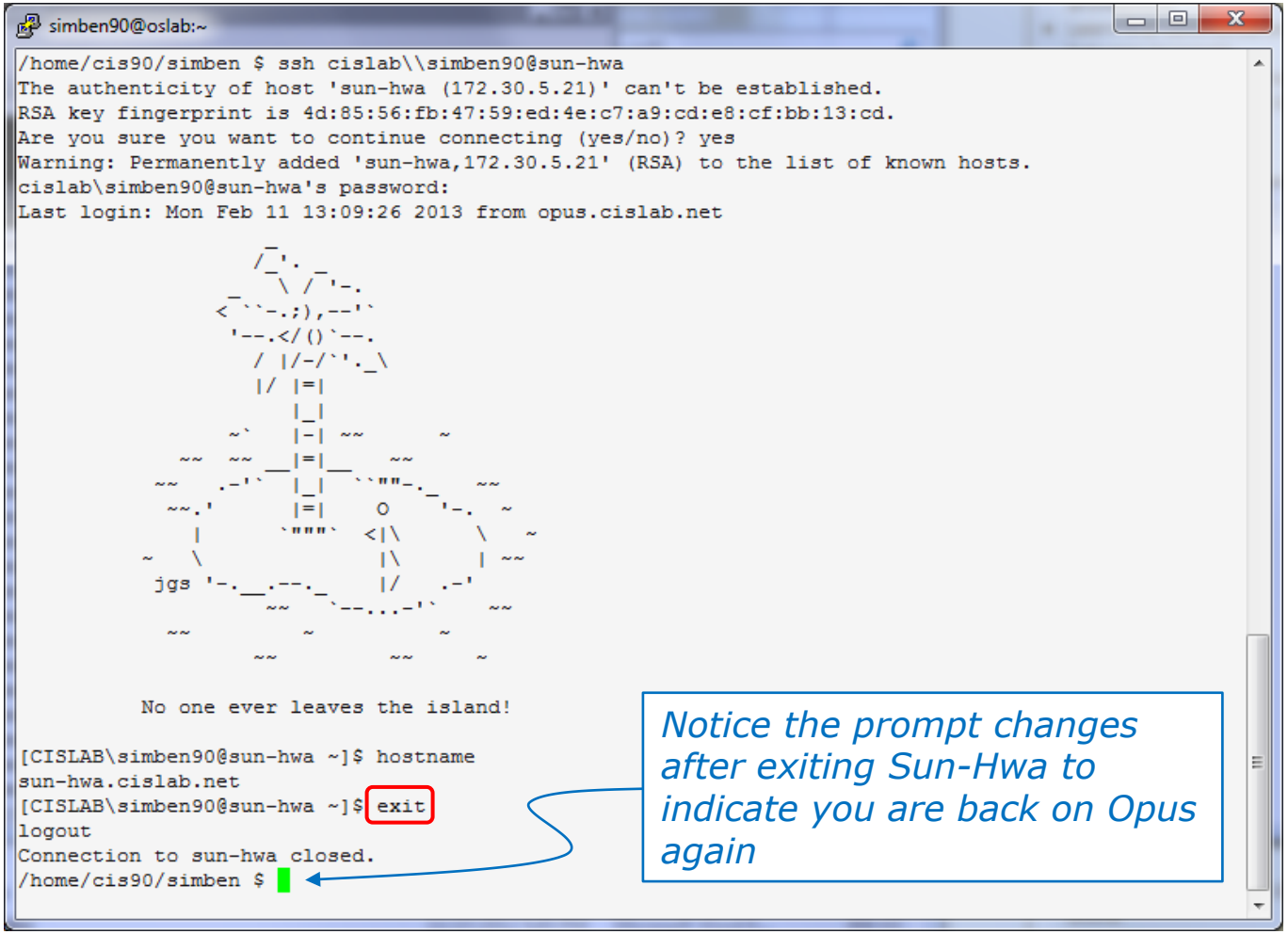
You get an authenticity warning the first time only. Type yes if you trust you are connecting to the real Sun-Hwa.

Note the shell prompt on Sun-Hwa is different than the one on Opus.

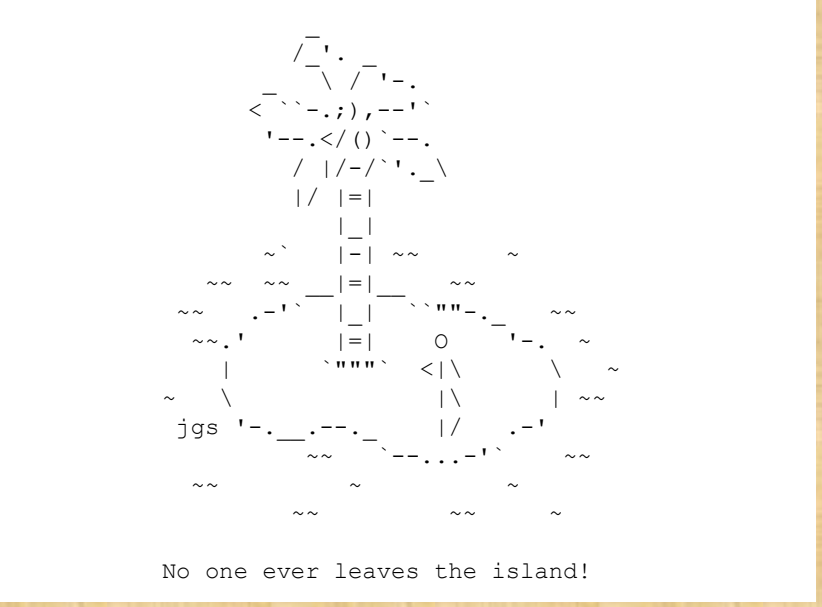
ASCII art by Joan Stark
http://www.ascii-art.com

Logging out of Sun-Hwa and back to Opus

Use the exit command on Sun-Hwa to pop back to Opus



Class Activity



1. Use Putty (or a Mac terminal) and login to Opus
2. Login to Sun-Hwa with **ssh cislab***username*@sun-hwa**
3. Type a few commands like **who** and **tty**
4. Use the **exit** command to end the Sun-Hwa session and return to Opus

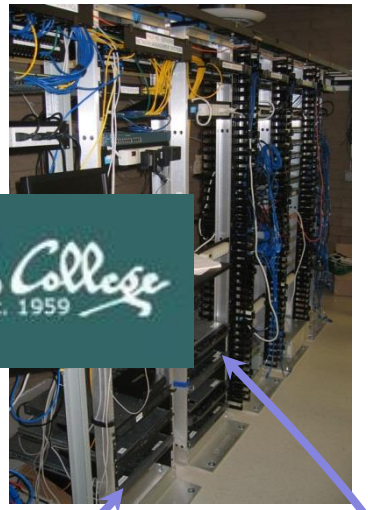
Using CIS VLab (Virtual Lab)

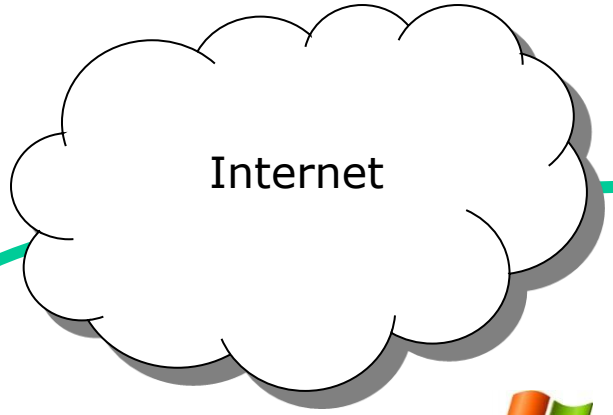
Third driving lesson

Lab Resources

Remote Access to **CIS VLab**

Room 1403 on Aptos Campus





cislab (Win 2008)

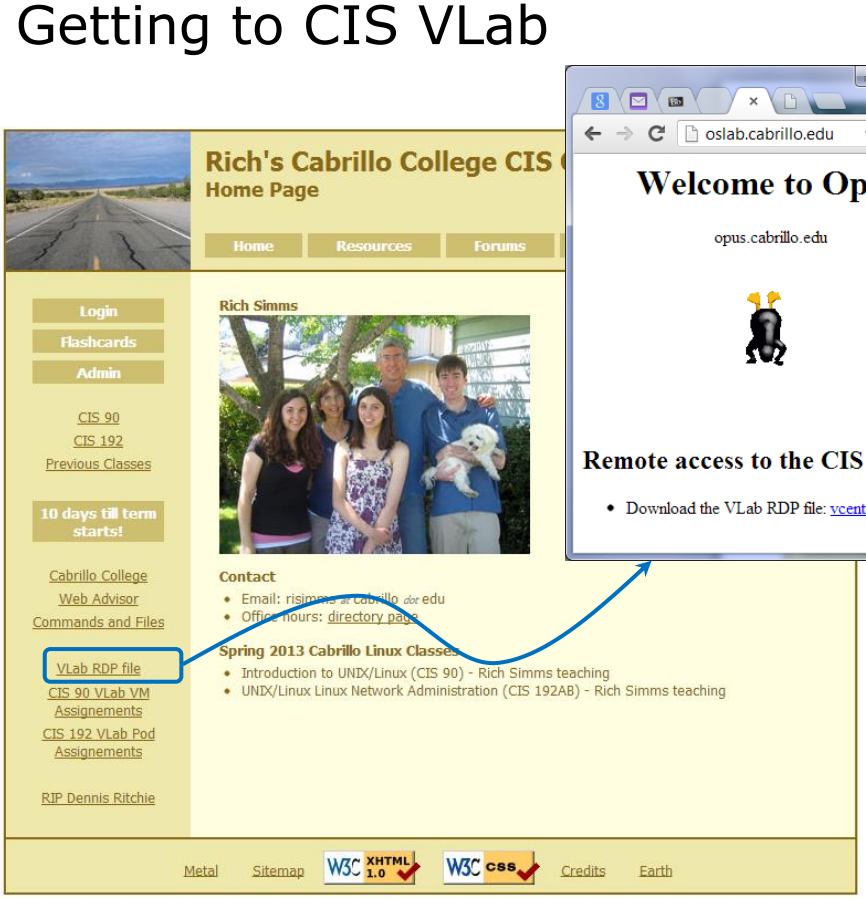
vCenter (VMware appliance)
vmserver3 (VMware ESXi)

Home

School

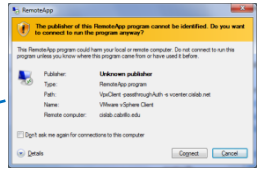
You can access the course VMs from school or home

Getting to CIS VLab



Open

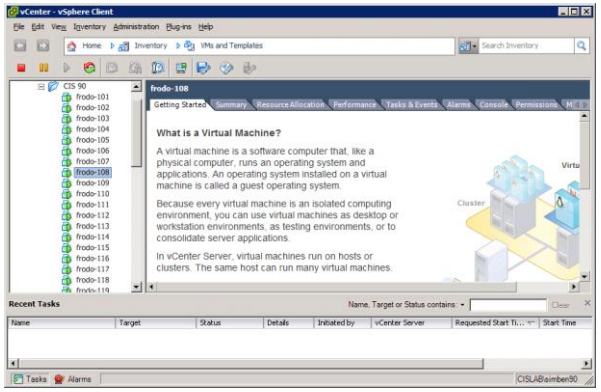
Login



Connect

Ignore

Wait …

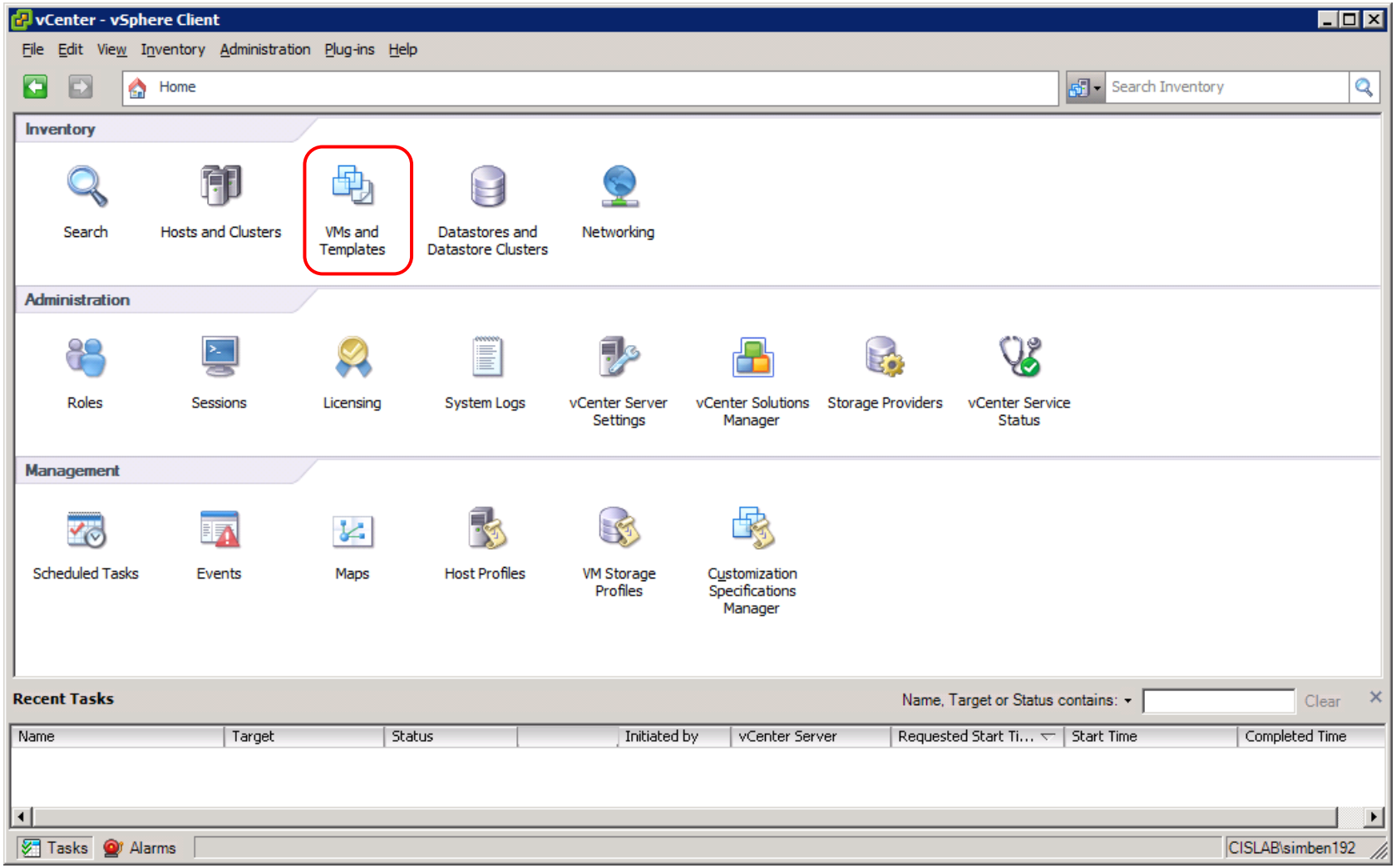


Locate and select your assigned VM

1) Download the vcenter.rdp file to your desktop and then open it to access VLab. Mac users will need to install CoRD.

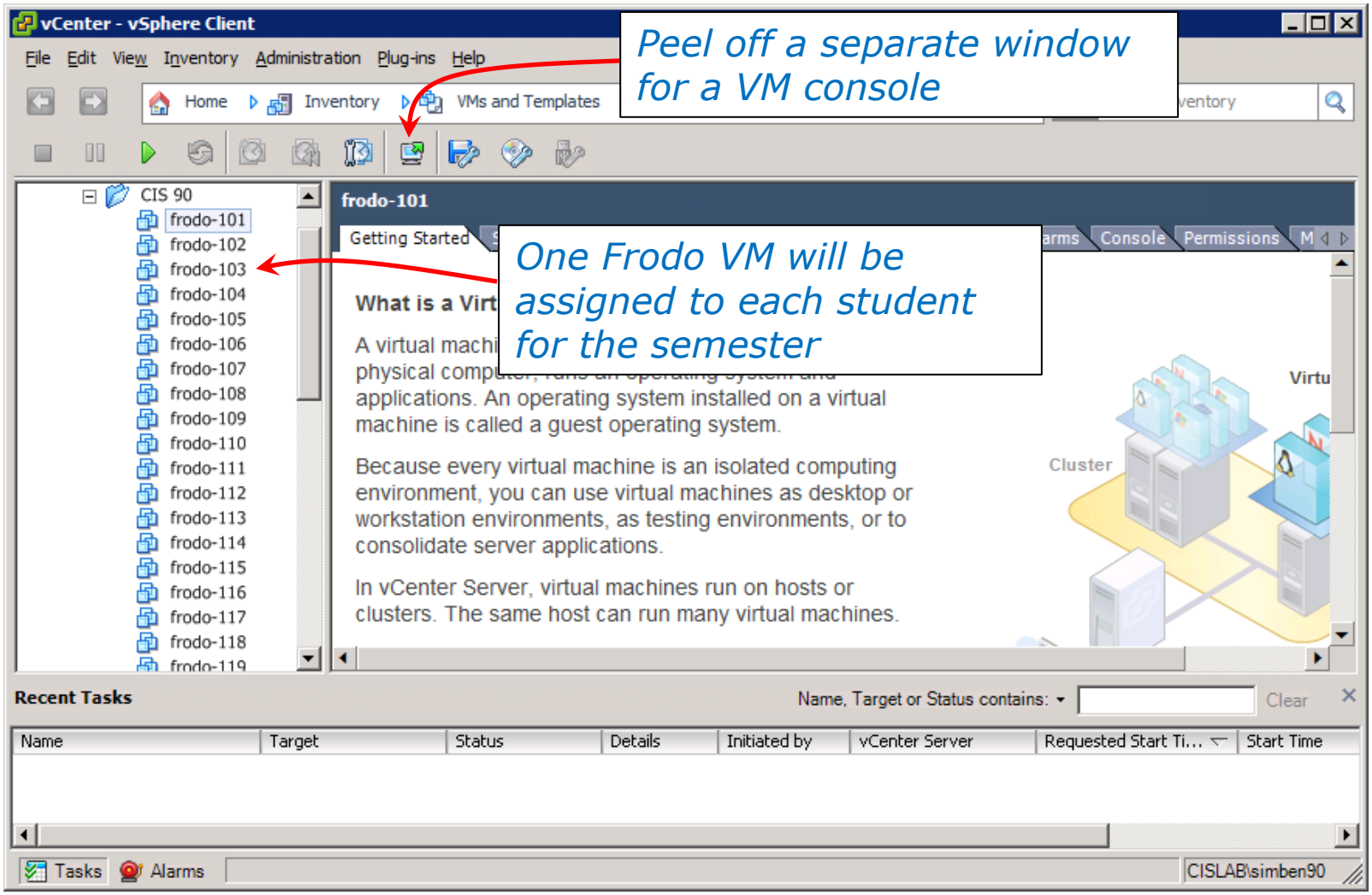
2) When entering your username and password you must preface your username with the "cislab\", for example Benji would use: cislab\simben90

CIS VLab Home View



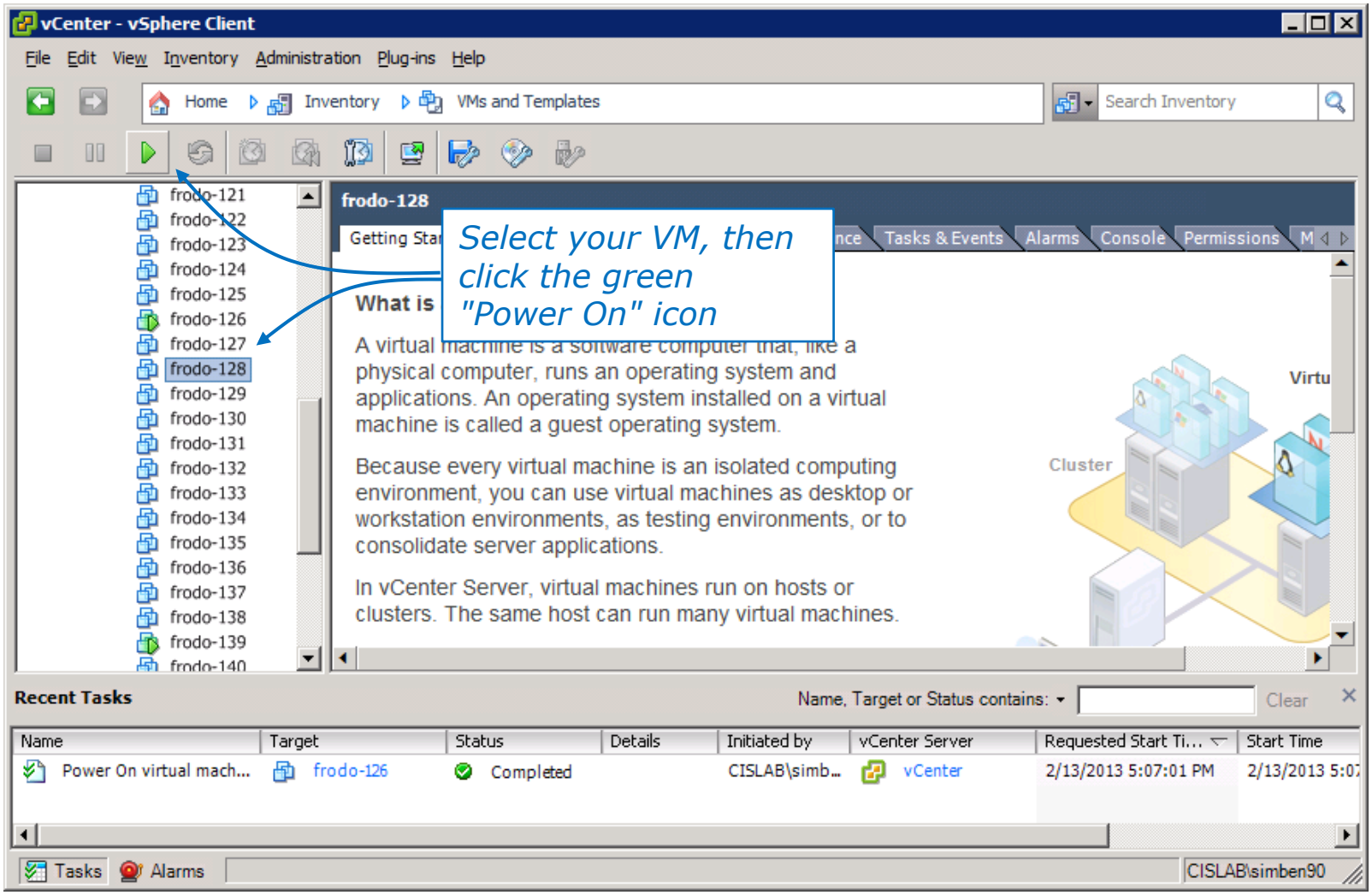
Click VMs and Templates to get to your course VMs

CIS Vlab VMs and Templates View

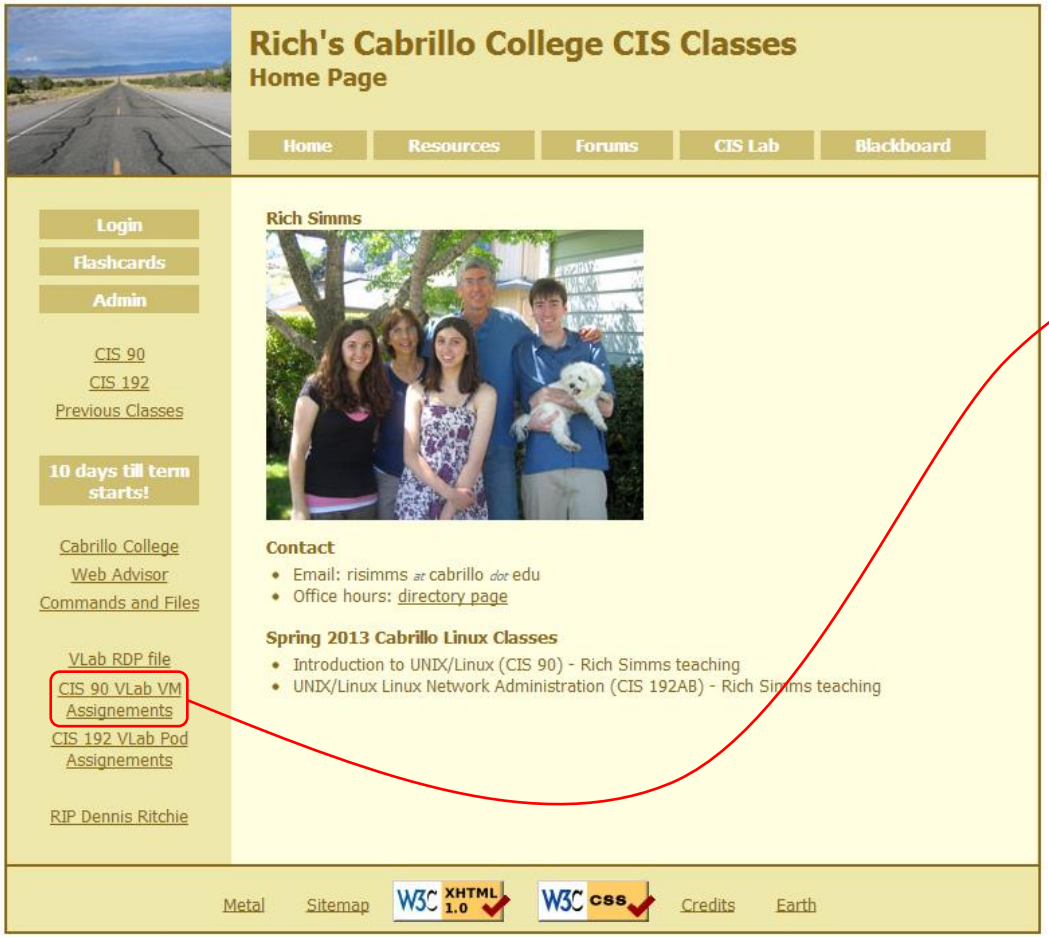


VMware vSphere Client

Powering On a VM



Note that frodo-126 and frodo-139 VMs are already powered on

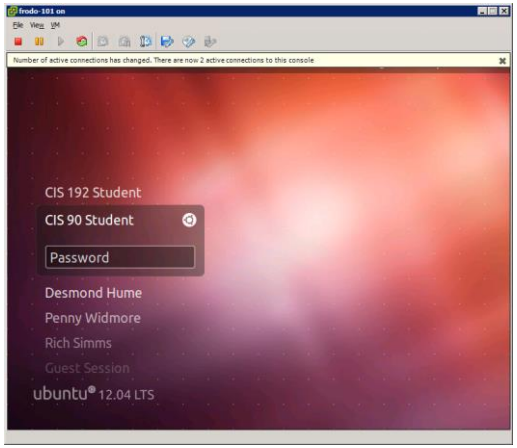


CIS 90 VLab Assignments

Student	VM
Aarron	Frodo-101
Alex	Frodo-102
Andrew	Frodo-103
Anthony	Frodo-104
Ariana	Frodo-105
Benjamin C.	Frodo-106
Benjamin L.	Frodo-107
Benji	Frodo-108
Brian	Frodo-109
Christopher	Frodo-110
Curtis	Frodo-111
Daniel	Frodo-112
Dillon	Frodo-113
Dimitri	Frodo-114
Duke	Frodo-115
Efrain	Frodo-116
Elizabeth	Frodo-117
Evan	Frodo-118
Gabriel	Frodo-119
Greg	Frodo-120
Hilario	Frodo-121
Homer	Frodo-122
Jay	Frodo-123
Jordan	Frodo-124
Justin S.	Frodo-125
Justin V.	Frodo-126
Liam	Frodo-127
Lucie	Frodo-128
Mark	Frodo-129
Matthew	Frodo-130
Michael D.	Frodo-131
Michael L.	Frodo-132
Michael S.	Frodo-133
Natalia	Frodo-134
Nicholas	Frodo-135
Pamela	Frodo-136
Paul N.	Frodo-137
Paul S.	Frodo-138
Riley	Frodo-139
Richard	Frodo-140
Roger	Frodo-141
Ryan L.	Frodo-142
Ryan S.	Frodo-143
Samantha	Frodo-144
Solomon	Frodo-145
Steven	Frodo-146
Todd	Frodo-147
Tyrone	Frodo-148

To see which Frodo VM is yours use the link on the class website

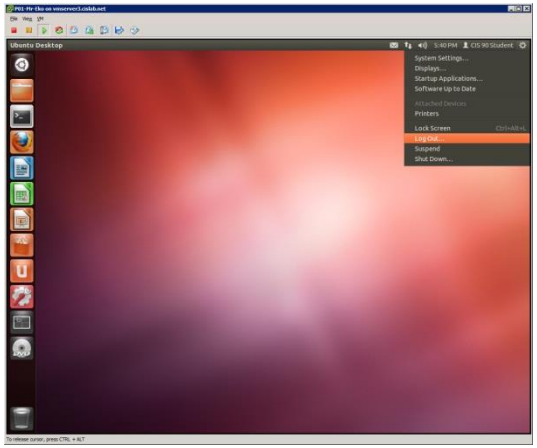
Log in as
CIS 90 Student



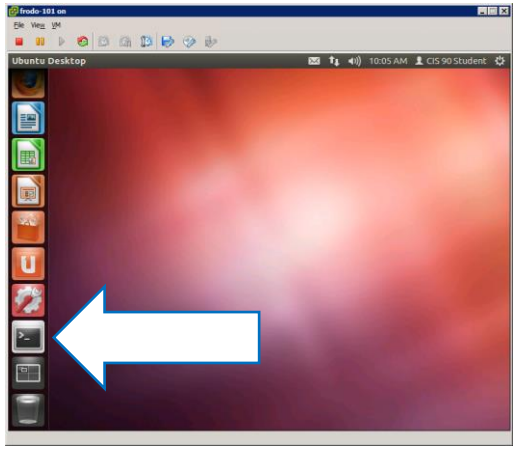
The Frodo VM

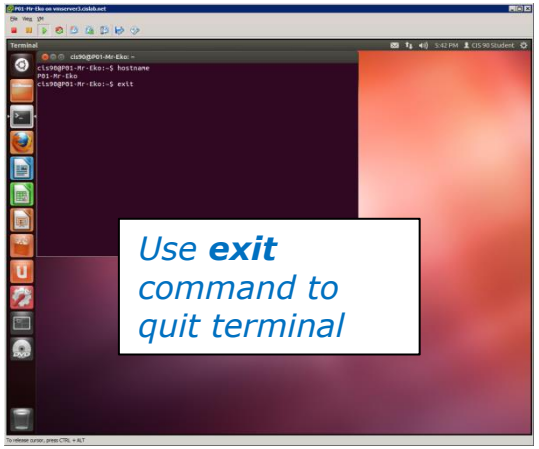
ubuntu

Shutdown using
> Shut Down…

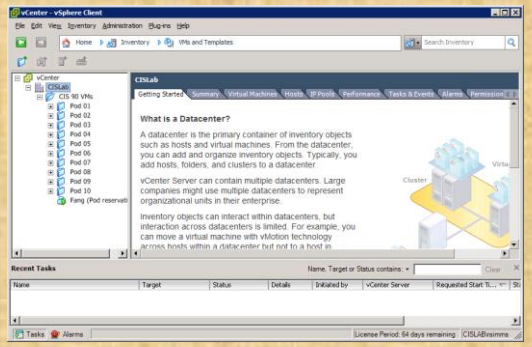


To get a graphical terminal
Terminal icon (under System Settings)





Class Activity



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

- Find your Frodo VM
- Power it on (if its not already)
- Open the console for your Frodo VM
- Login as CIS 90 Student into the graphical desktop
- Run a terminal on the graphical desktop
- Shut down the VM

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)

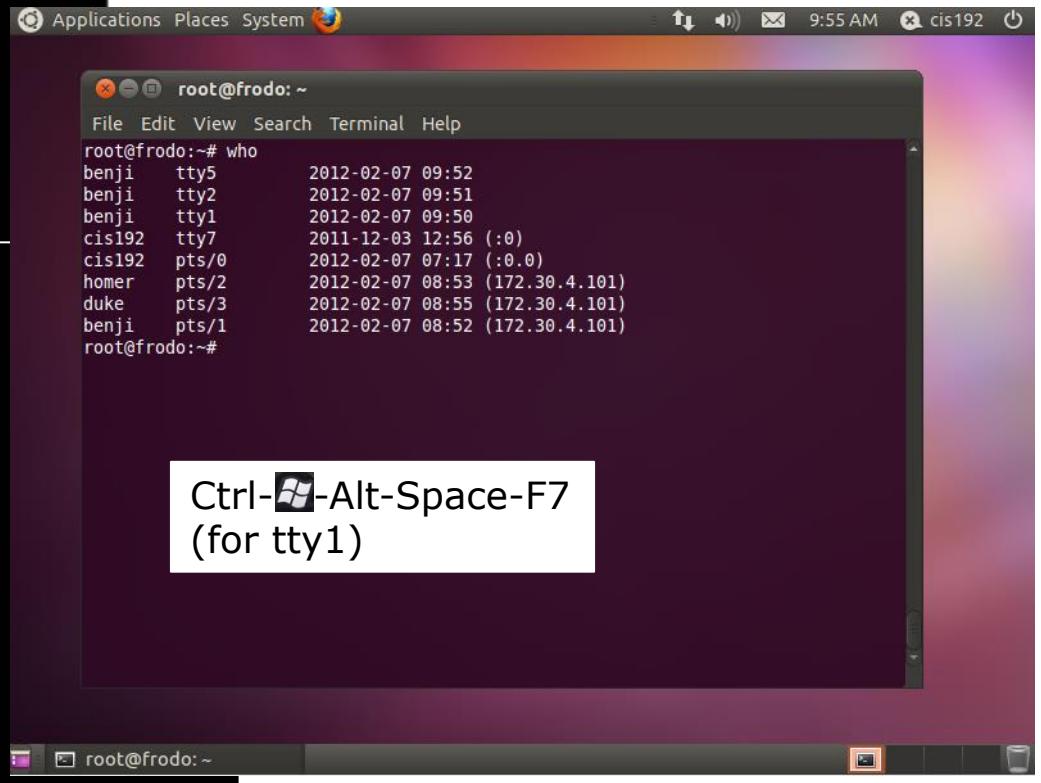
```
Ubuntu 11.04 frodo tty5

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)

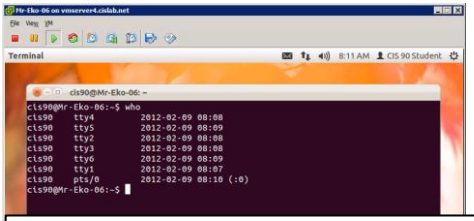
Use virtual terminals (tty's) to have multiple login sessions on one system

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



Ctrl-⊞-Alt-Space-F7 (for tty1)

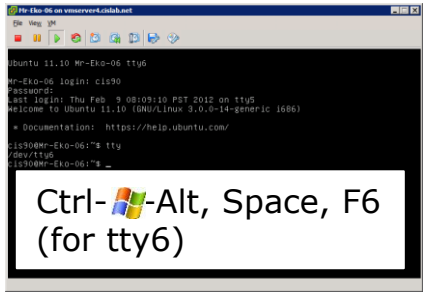
Changing Virtual TTY Terminals using **VMware vSphere**



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

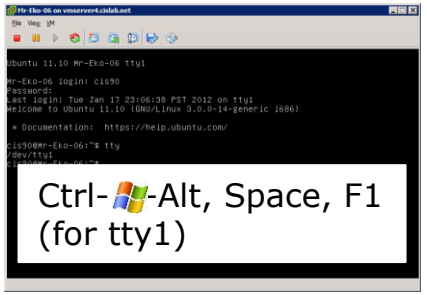
** F9 on Linux Mint and Debian

Windows PC Keyboard

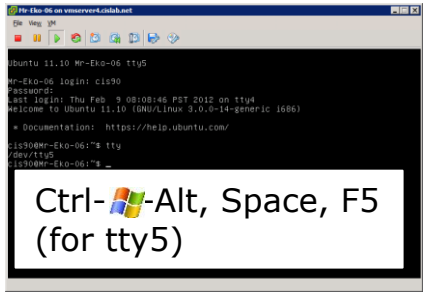


Ctrl-⊞-Alt, Space, F6
(for tty6)

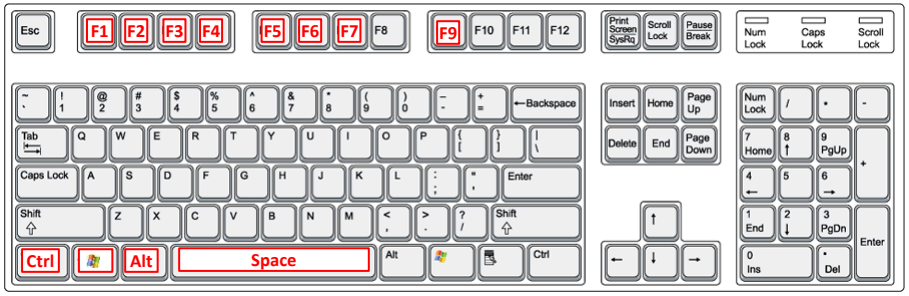
While holding down Crtl-⊞-Alt keys, tap Space, then tap Fn key*

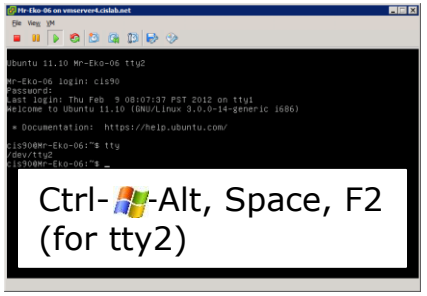


Ctrl-⊞-Alt, Space, F1
(for tty1)

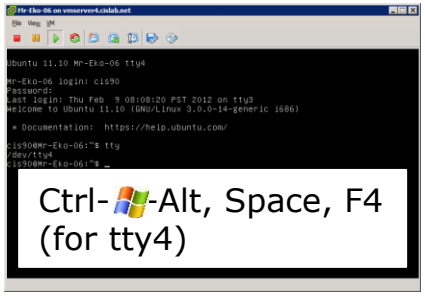


Ctrl-⊞-Alt, Space, F5
(for tty5)

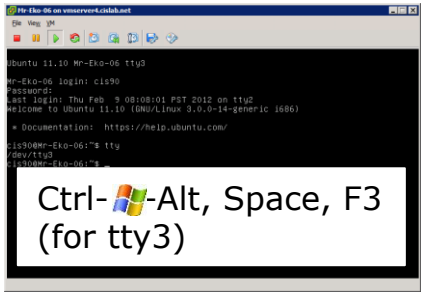




Ctrl-⊞-Alt, Space, F2
(for tty2)



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

Changing Virtual Terminals on VMware Linux VMs

VMware operations	
On PC Keyboard:	While holding down the Ctrl-⊞-Alt keys, tap spacebar then tap f1, f2, ... or f7.
On Mac keyboard:	Hold down Control and Option keys, tap the spacebar, hold down fn key (in addition to Control and Option keys) and tap f1, f2, ... or f7.

Pressing the ⊞ on some Windows keyboards may not be necessary

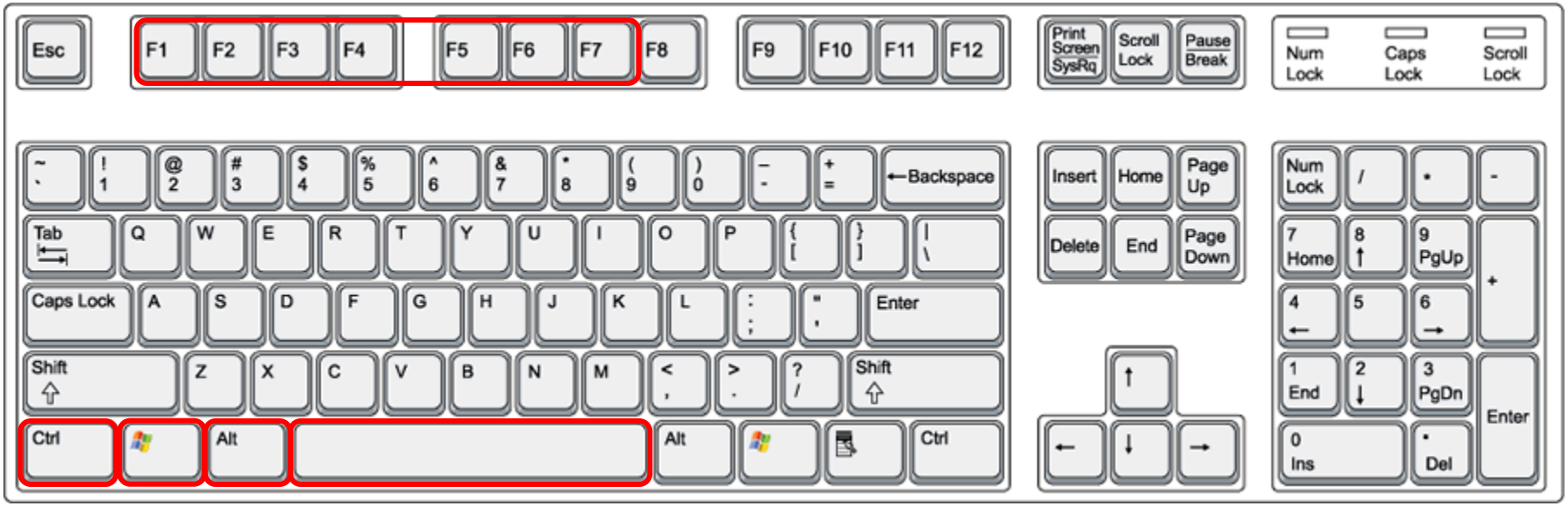
F7 is graphics mode for the Ubuntu VMs.

The Centos VMs do not have a graphics mode components installed (run level 3 only)

Note: the spacebar does not need to be tapped on a physical (non-VM) system. This is only required when changing virtual terminals on VMware VMs.

VMware VM Operations

Changing Virtual Terminals with a PC keyboard



On PC keyboard:

While holding down the **Ctrl-Alt** keys,
tap **Spacebar** then tap **F***N* key
(where *N*=1-7 to specify a function key)

VMware VM Operations

Changing Virtual Terminals with a Mac keyboard

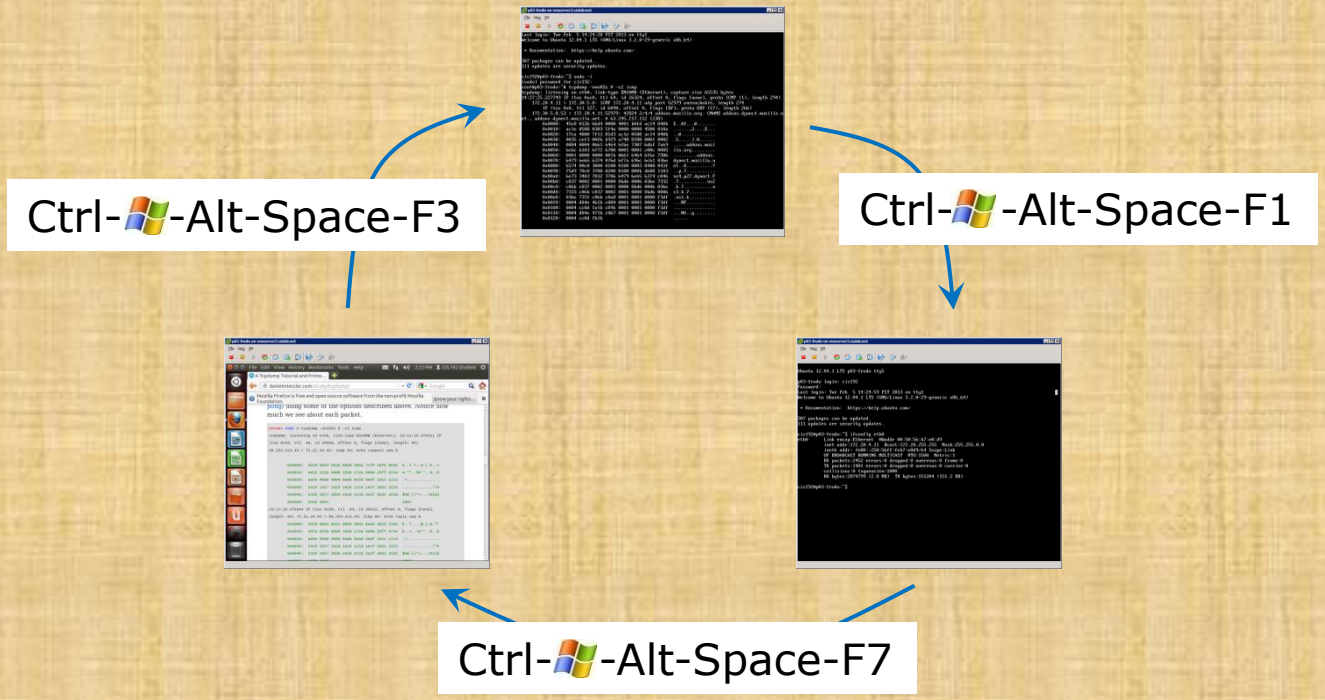
On Mac keyboard:

While holding down the **control-option** keys

tap **Spacebar** then tap **fn-F*N*** keys

(where *N*=1-7 to specify a function key)

Class Activity



On your Frodo VM:

- Try changing between the graphical desktop and the TTYs
- Login as cis90 on tty1 and tty3
- Run a terminal on the graphical desktop
- Use the who command to see how many logins there are

Logging Into VLab VMs via Opus

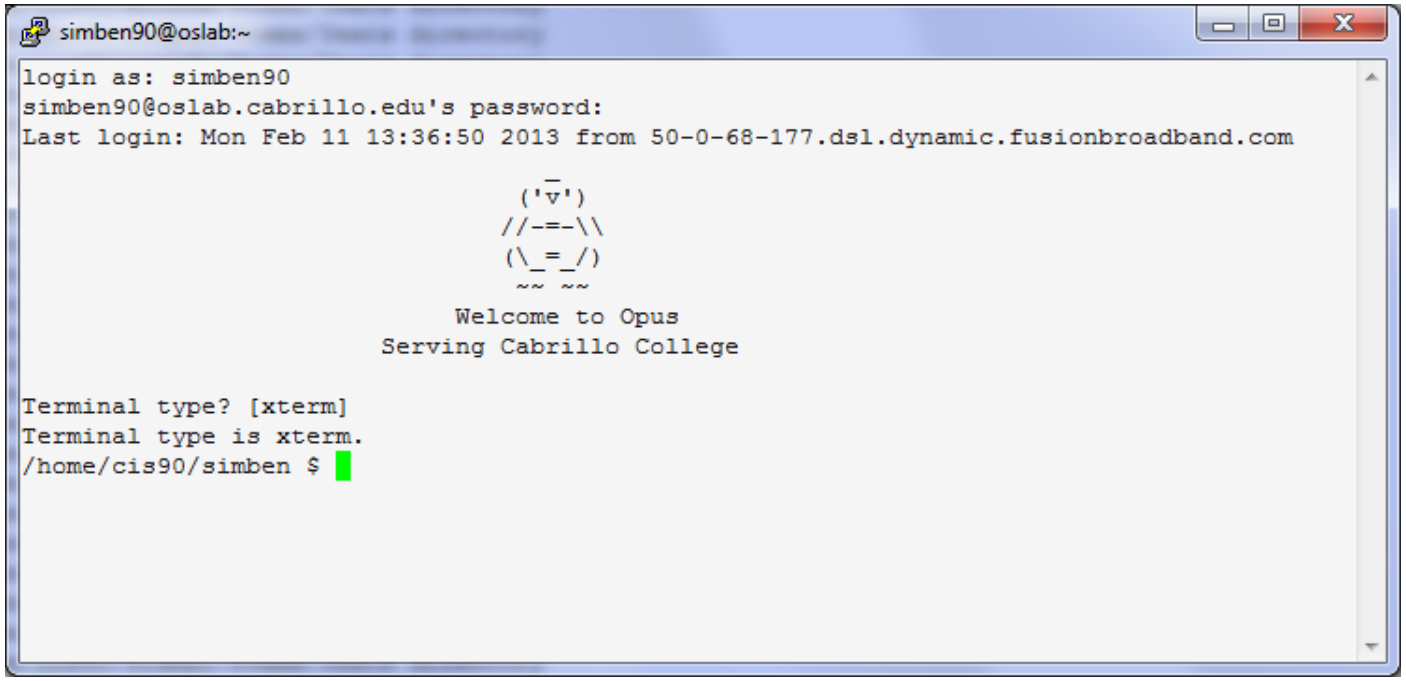
Fourth driving lesson

More commands for your toolbox

ifconfig *show IP address*

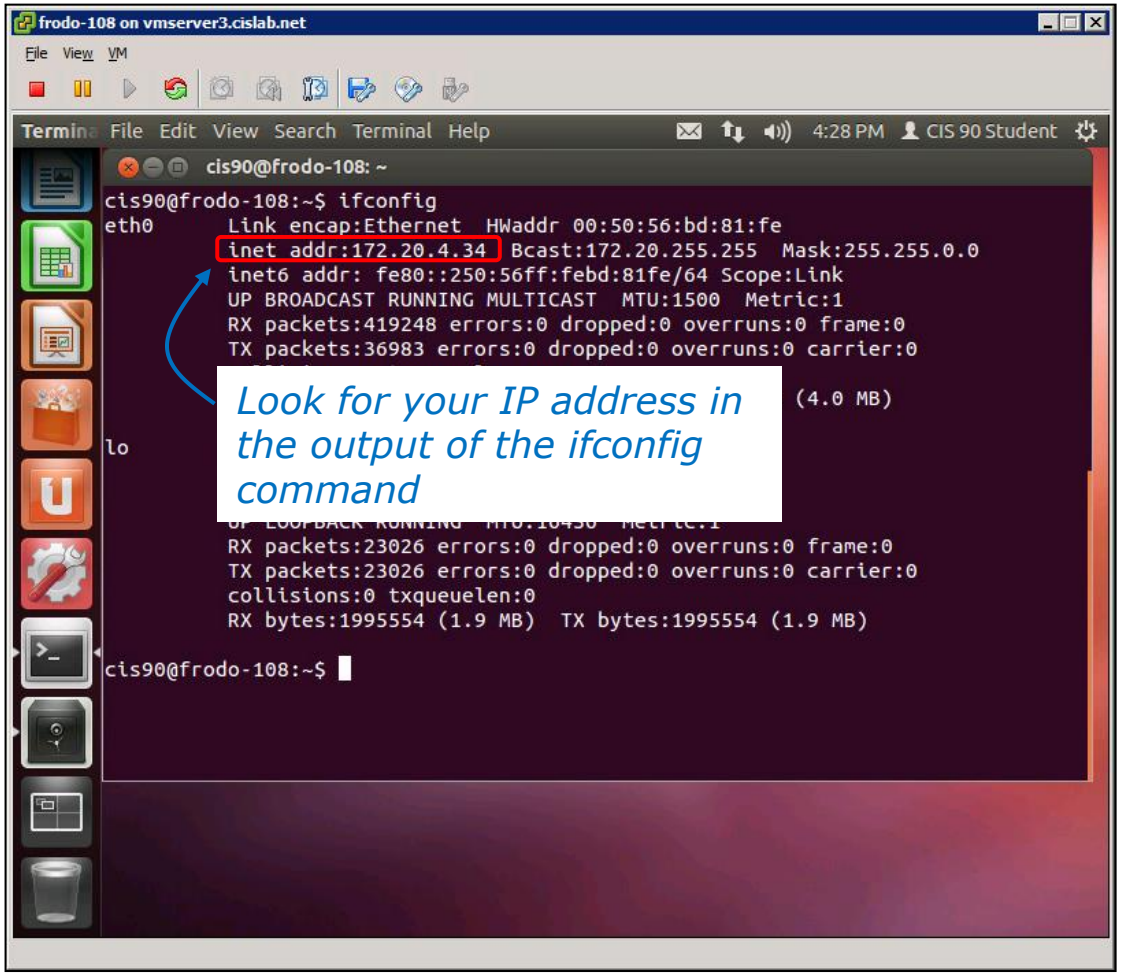
Logging into your Frodo VM from Opus

Step 1 - Log into Opus



Logging into your Frodo VM from Opus

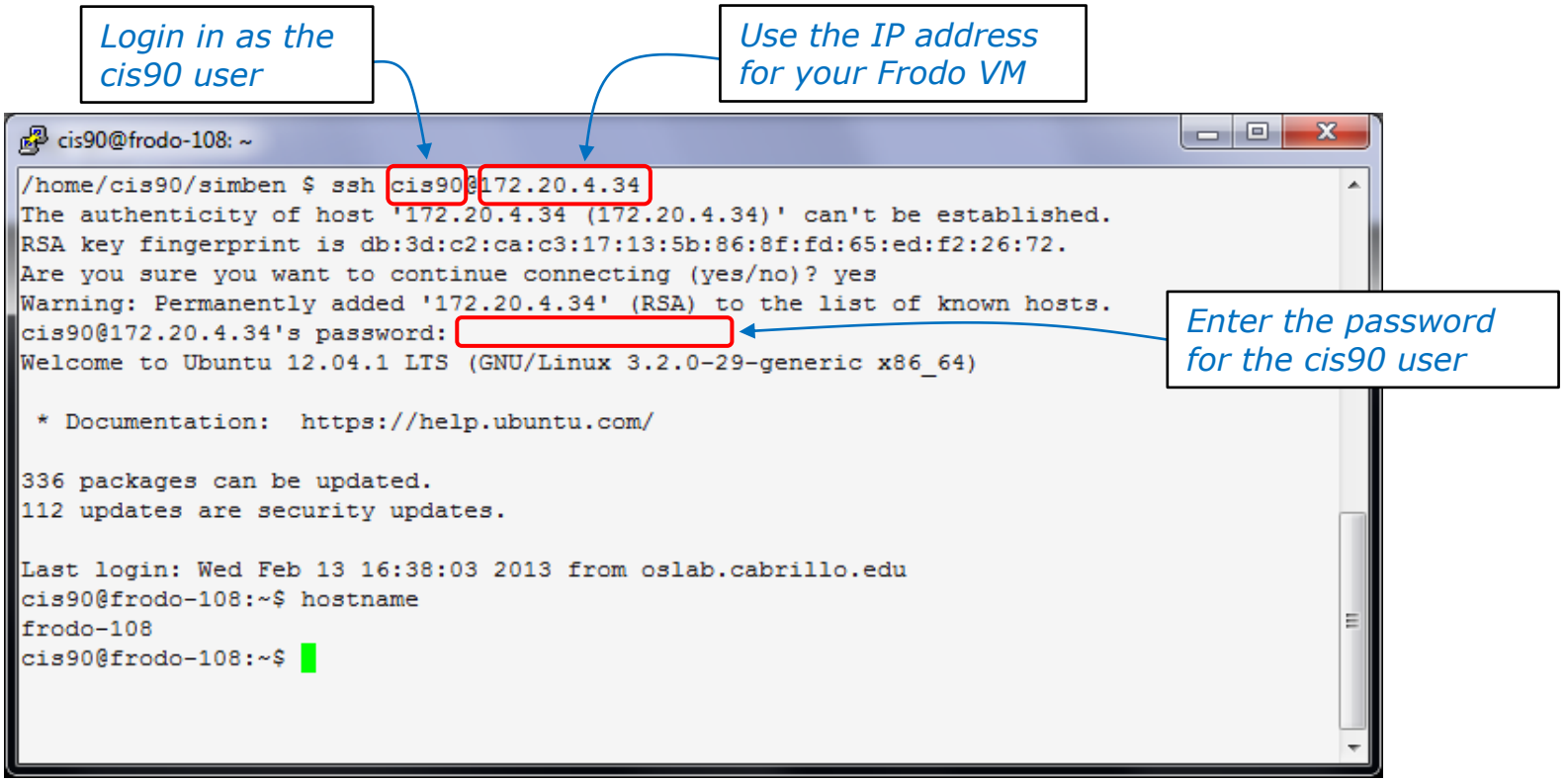
Step 2 - Run a terminal on your Frodo VM and type the **ifconfig** command



To specify just the eth0 interface use: ***ifconfig eth0***

Logging into your Frodo VM from Opus

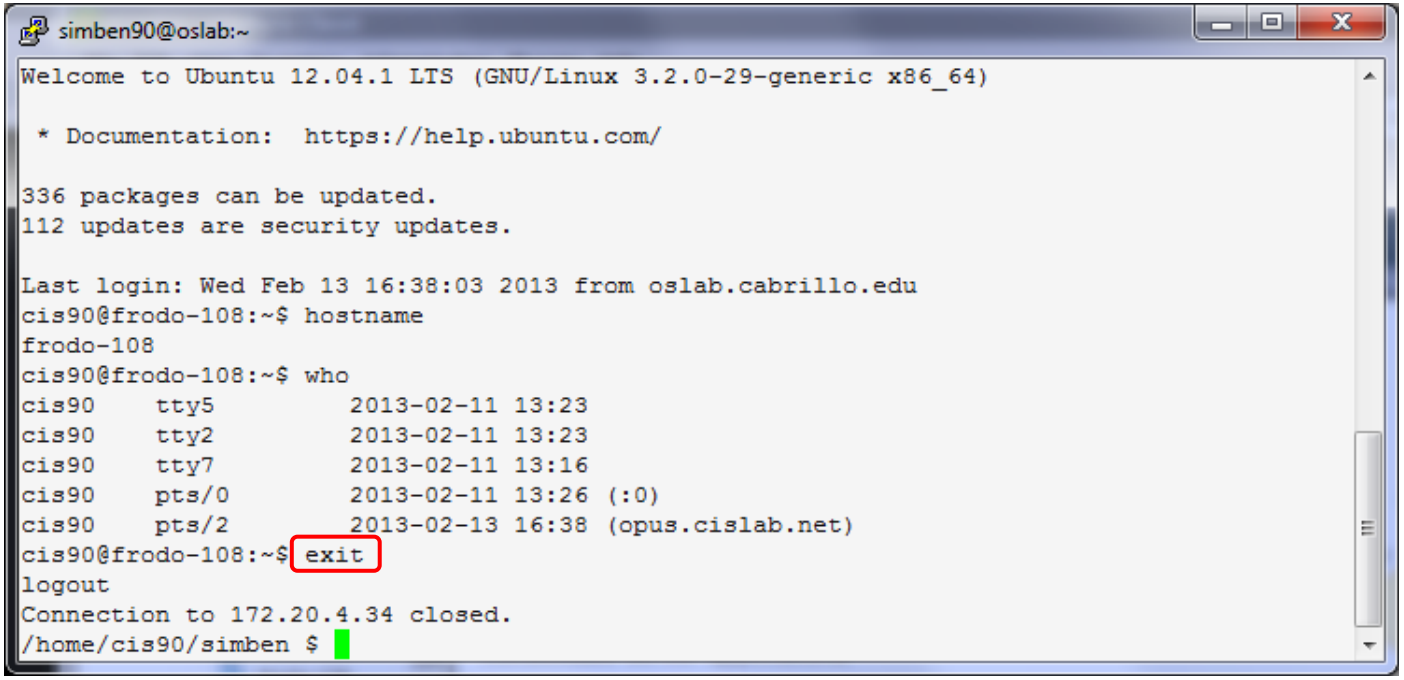
Step 3 - Use SSH to login to Frodo from Opus



Notice the prompt changes after logging into Frodo to indicate you are now communicating with a different Linux system

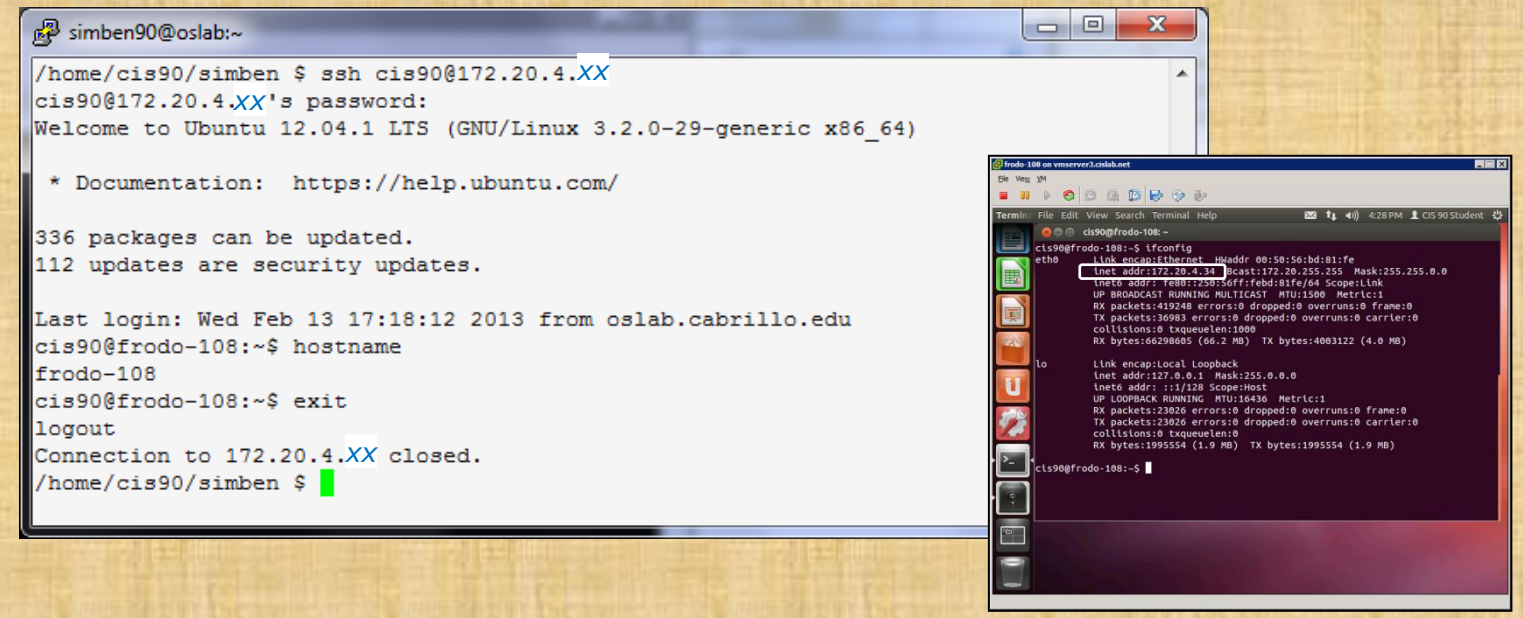
Logging out of your Frodo VM and back to Opus

Use the exit command on Frodo to pop back to Opus



Notice the prompt changes after exiting Frodo to indicate you are back on Opus again

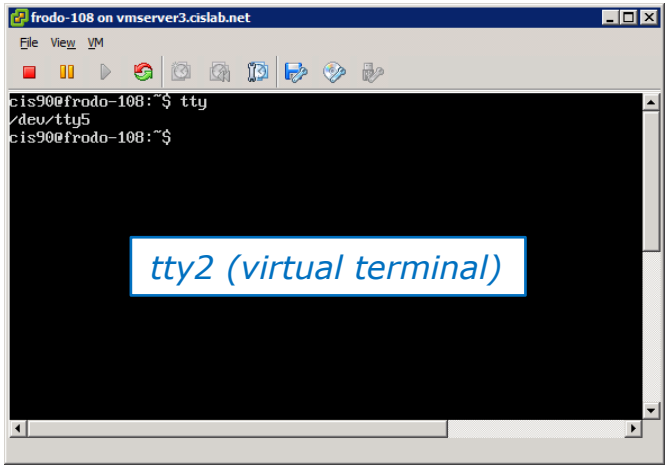
Class Activity

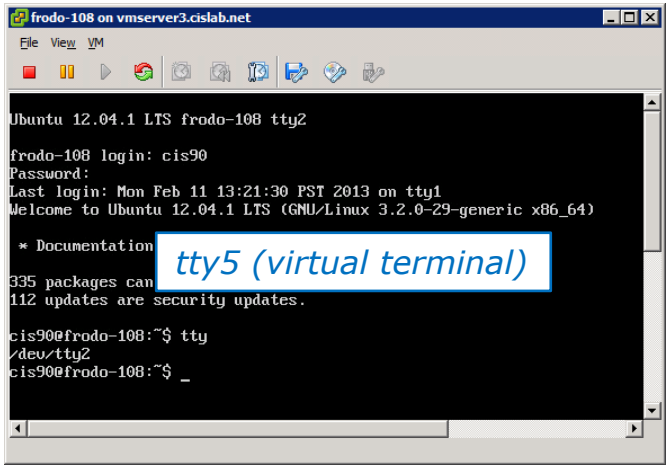


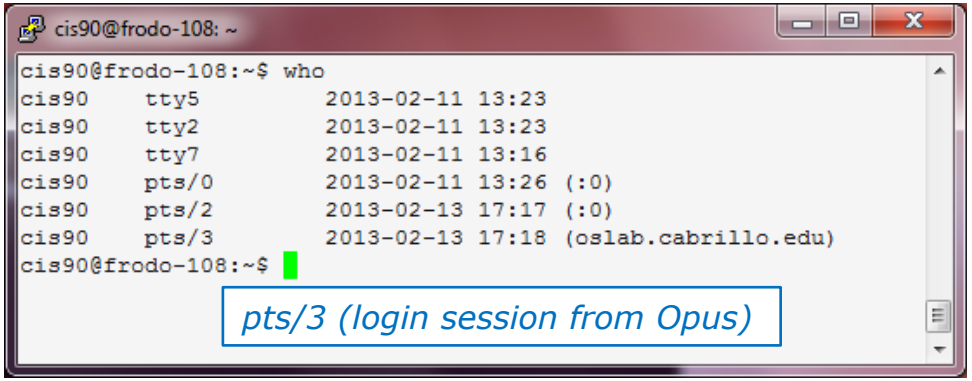
1. Use Putty (or a Mac terminal) and login to Opus
2. In VLab, determine your Frodo's IP address with the **ifconfig** command
3. Use **ssh cis90@**<*ip address*> to login to your Frodo from Opus
4. Check your prompt on Frodo -- is it your assigned Frodo VM?
5. Use the **exit** command to end the Frodo session and return to Opus

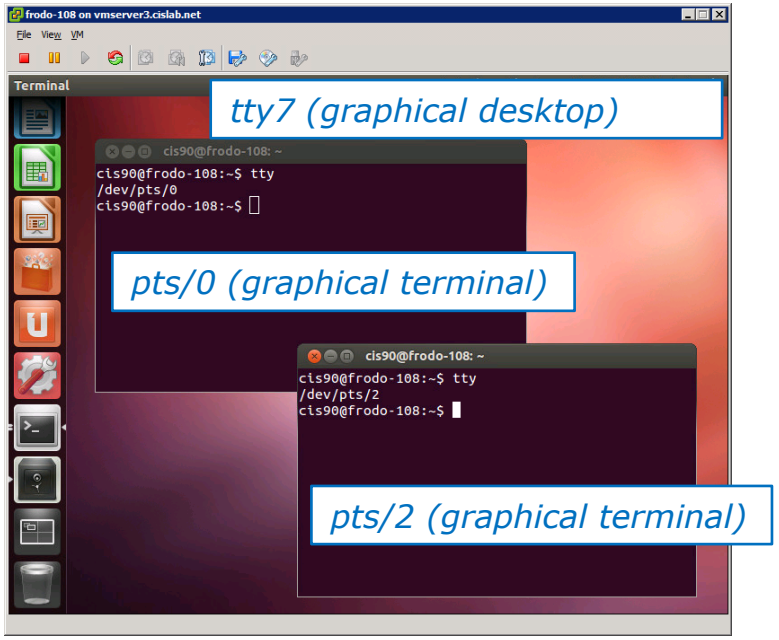
More on who command

Deciphering **who** command output (Ubuntu 12.04)









Housekeeping

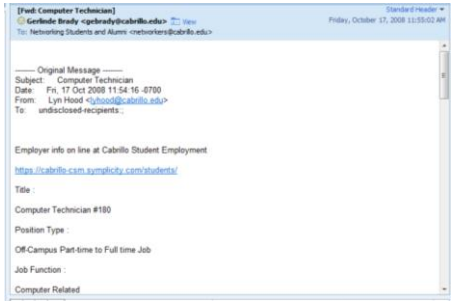
- Adds
- Last day to add is 2/23/2013

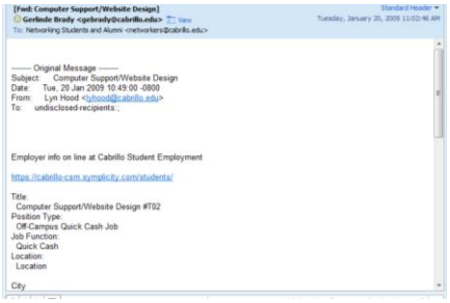
Cabrillo Networking Program Mailing list

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

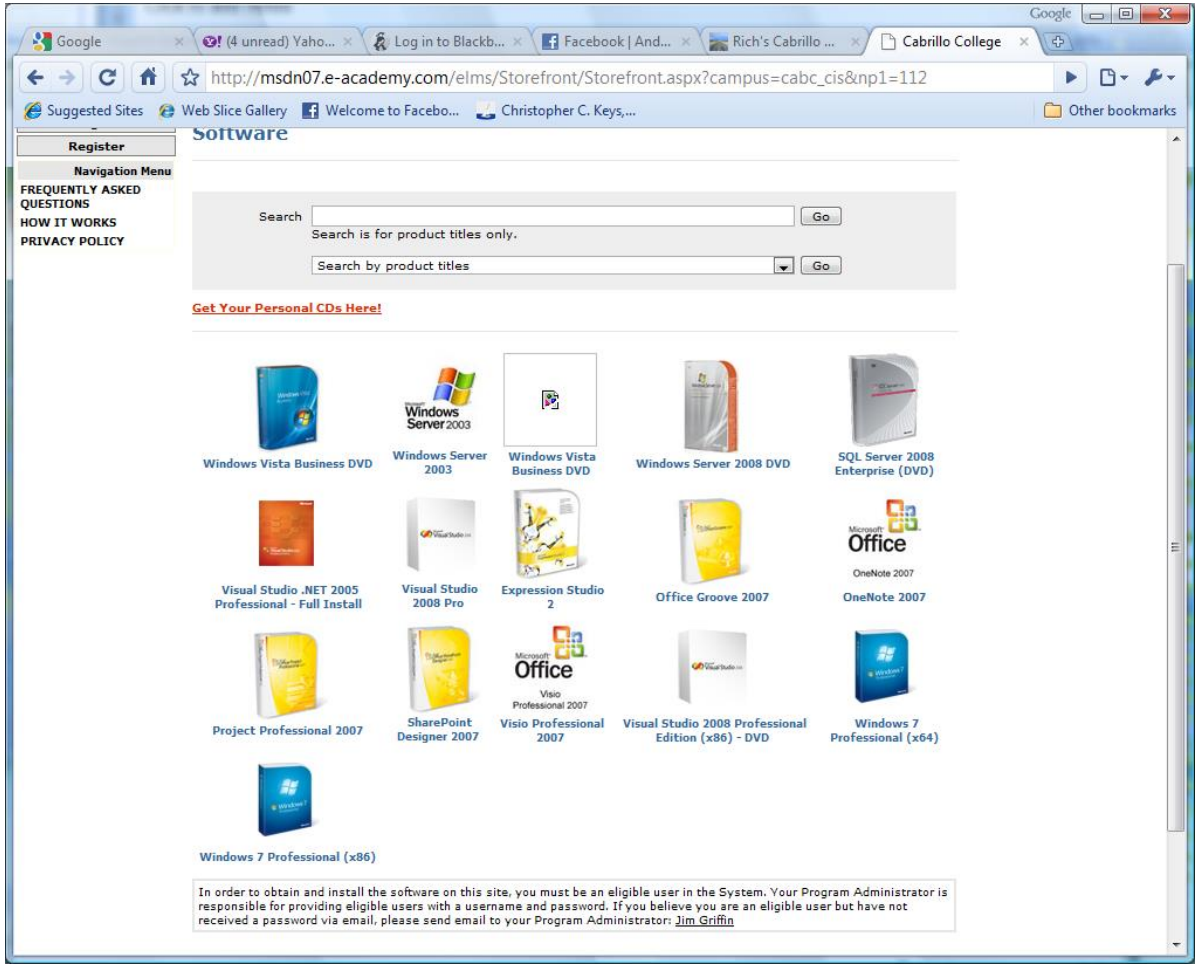
networkers-subscribe@cabrillo.edu

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





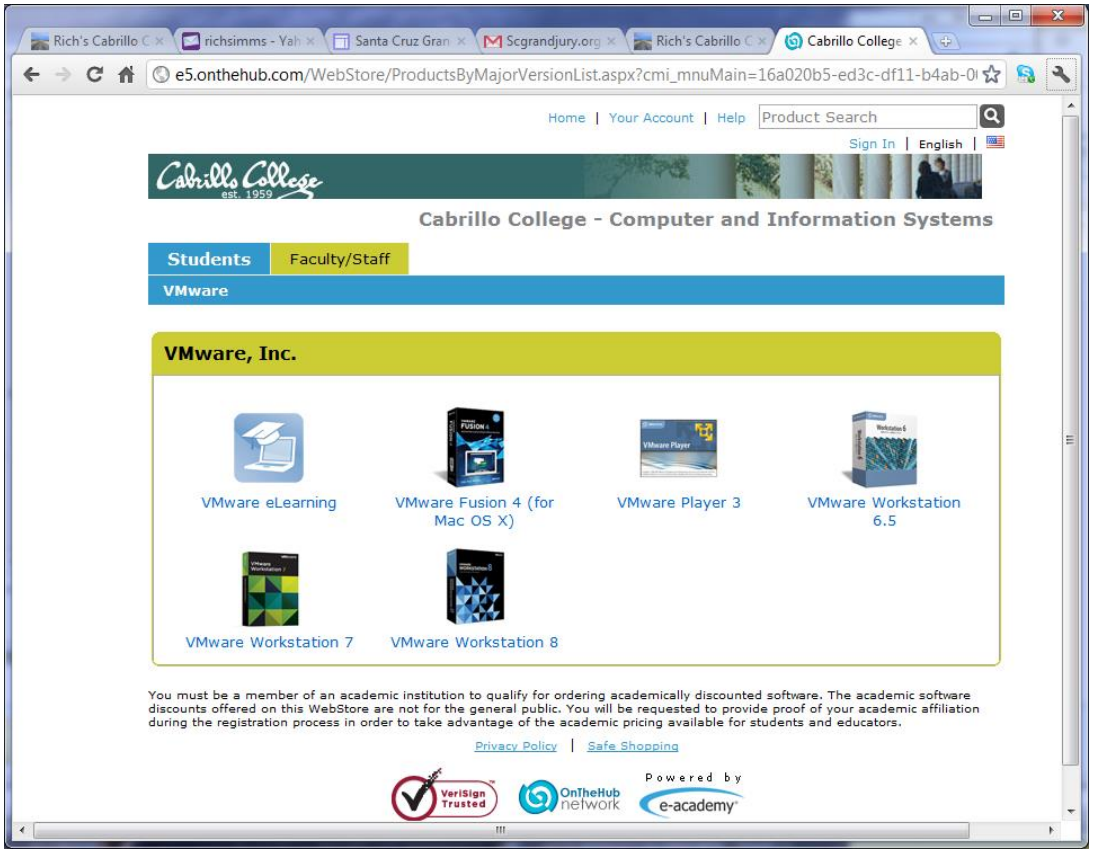
MSDN Academic Alliance



- 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



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

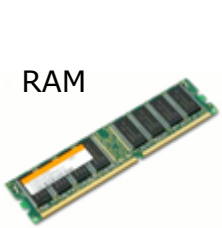
What is a computer

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

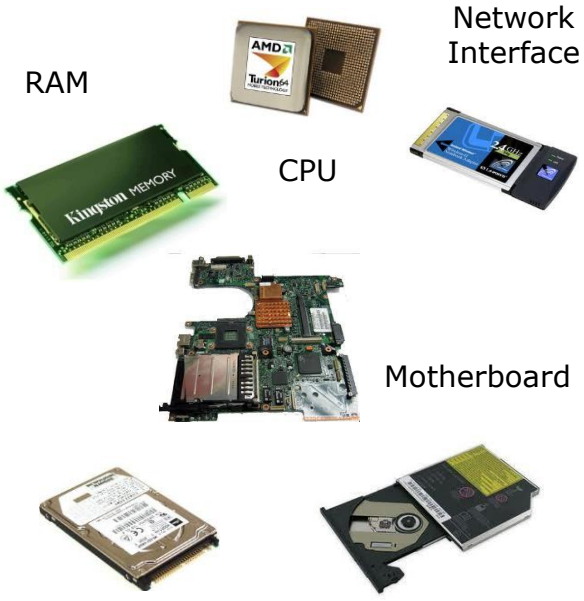
Operating System

What is a computer?

Mobile Devices

Usually one user at a time

Hardware



Mobile Devices
(designed for mobility)

Software

Programs/Apps

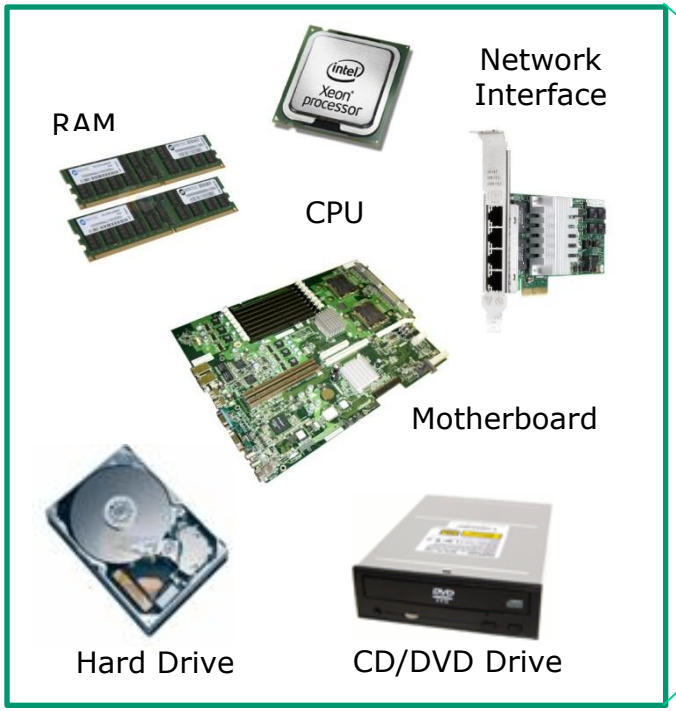
Operating System

What is a computer?

Servers

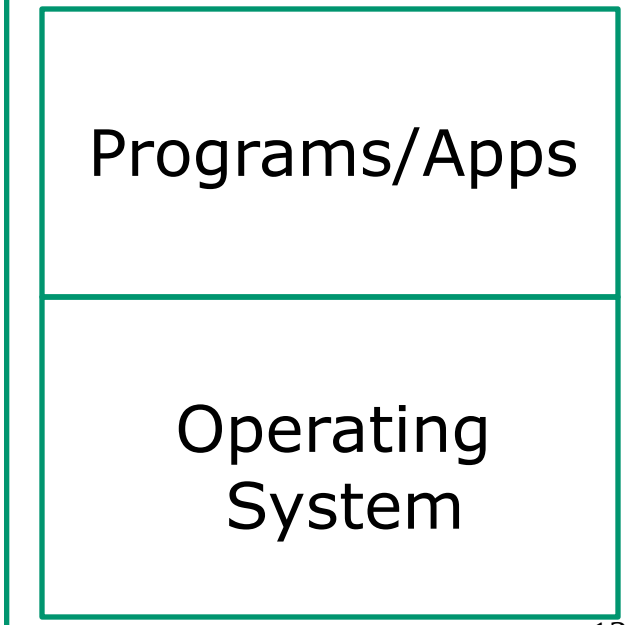
Usually many users at the same time

Hardware



Server Blade
(designed for uptime)

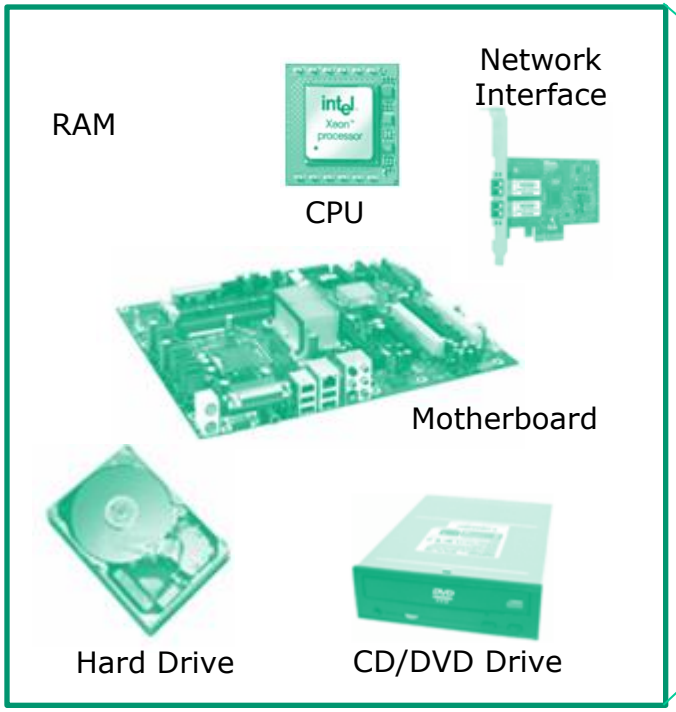
Software



What is a computer?

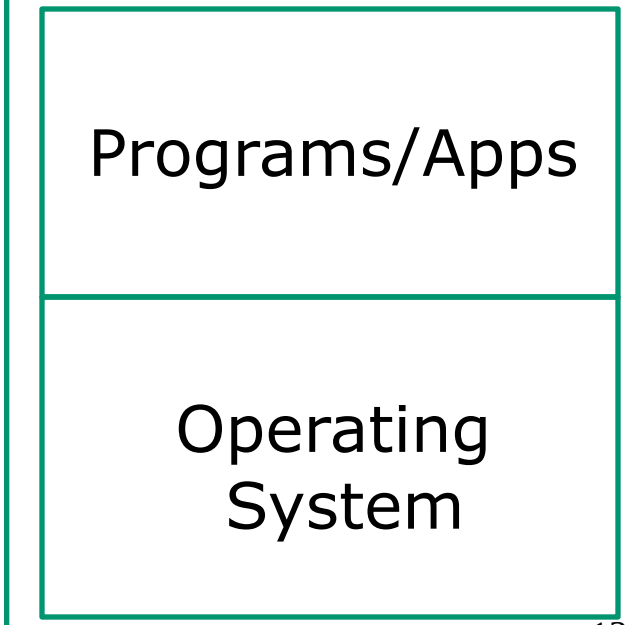
Virtual Machines

Virtual Hardware



Virtual Machine

Software

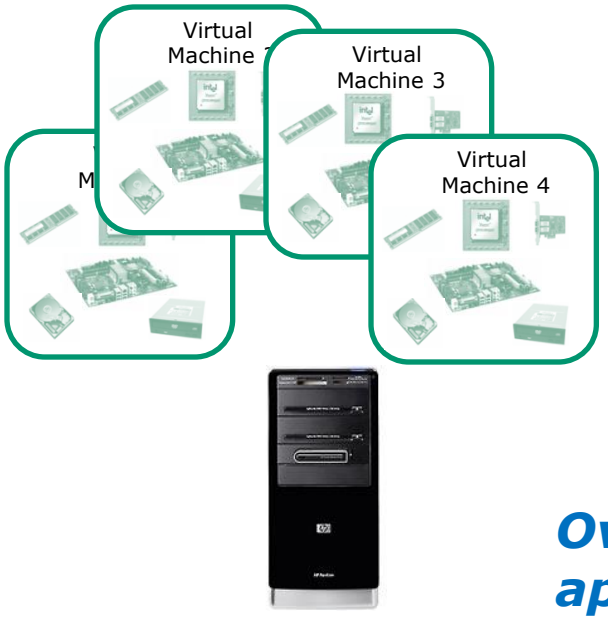


Virtual Machines

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.

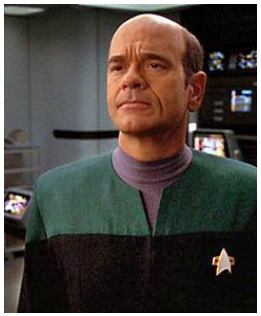
- These simulated computers are called virtual machines or VMs.



- 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.

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

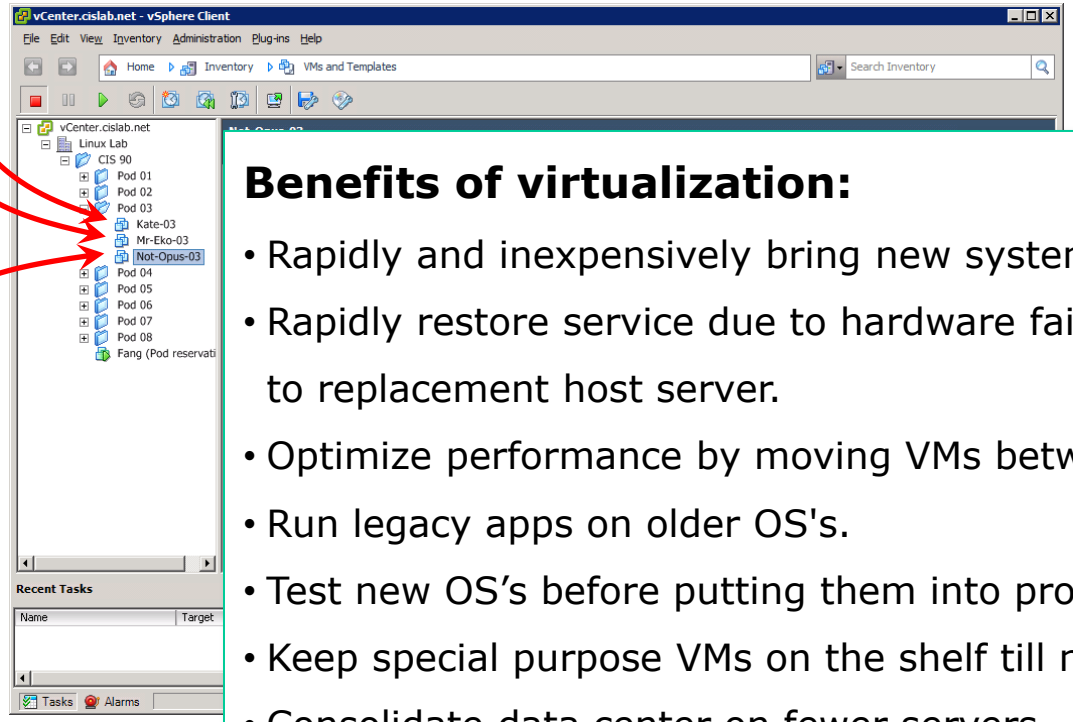


The EMH doctor on Star Trek Voyager was a simulation

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

Virtual Machines

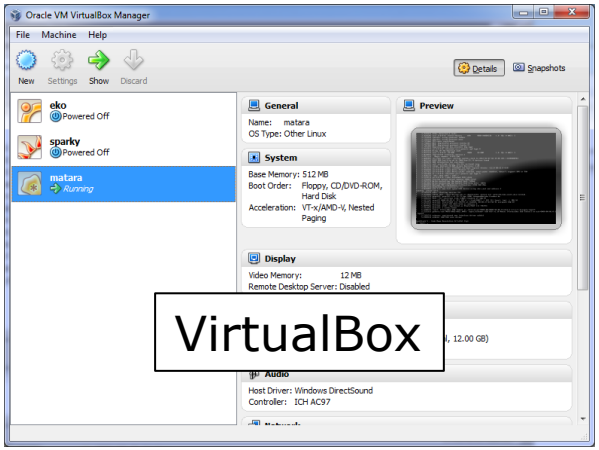
Multiple computers on one computer
… running at the same time
… sharing the same physical hardware

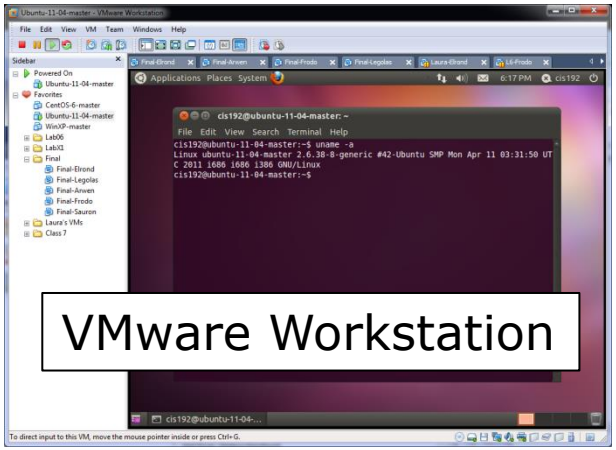


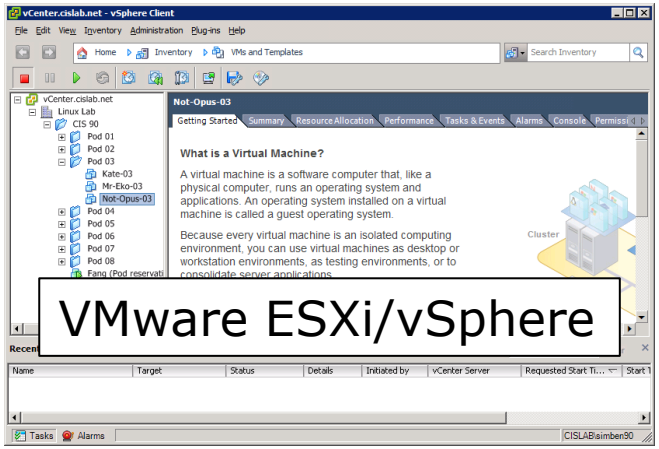
Benefits of virtualization:

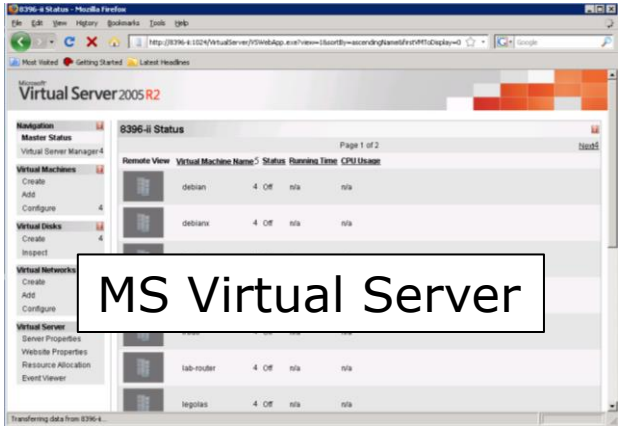
- Rapidly and inexpensively bring new systems online.
- Rapidly restore service due to hardware failures by moving VMs to replacement host server.
- Optimize performance by moving VMs between physical hosts.
- Run legacy apps on older OS's.
- Test new OS's before putting them into production.
- Keep 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

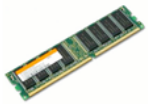
Programs/Apps

- 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

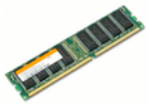
Programs (examples)

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

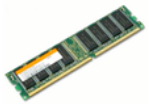
Programs

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

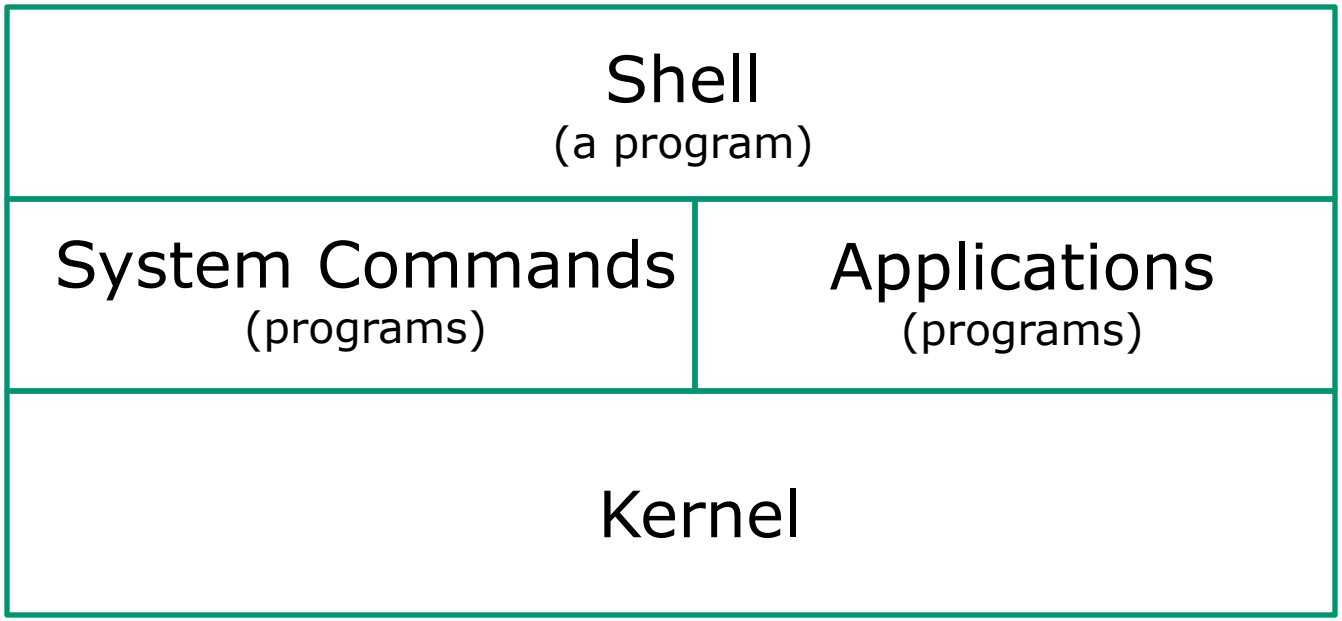
Proprietary

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

UNIX/Linux Architecture simplified

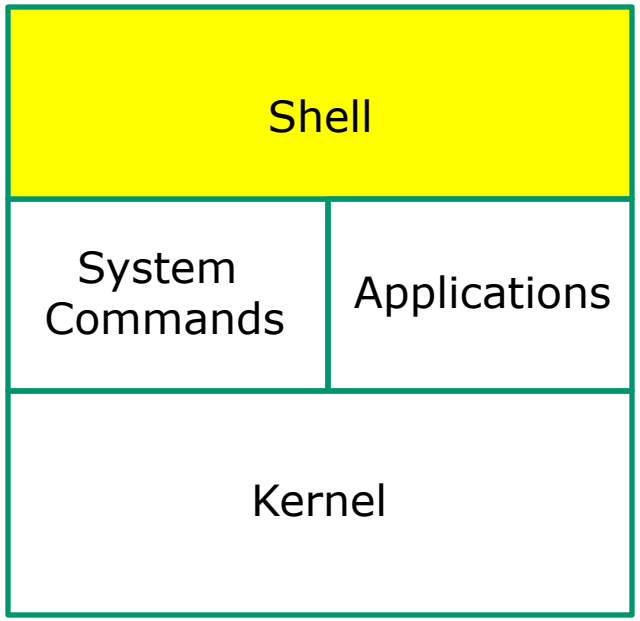
UNIX/Linux Architecture

Simplified View - Four Major Components



UNIX/Linux Architecture

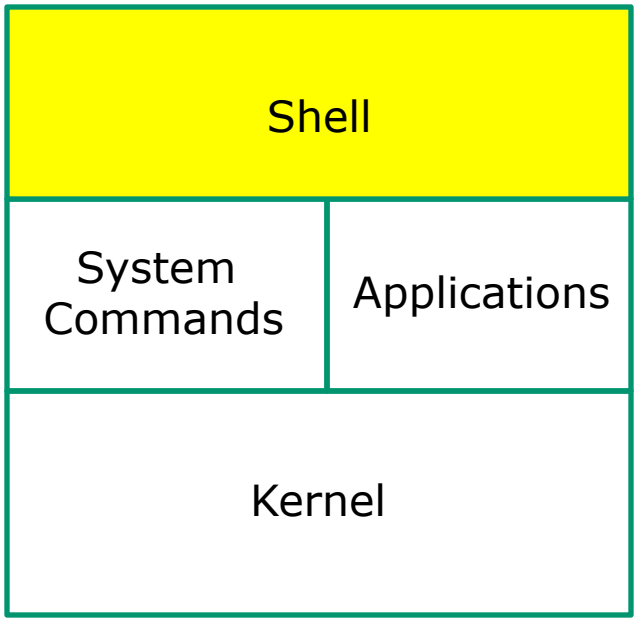
The Shell

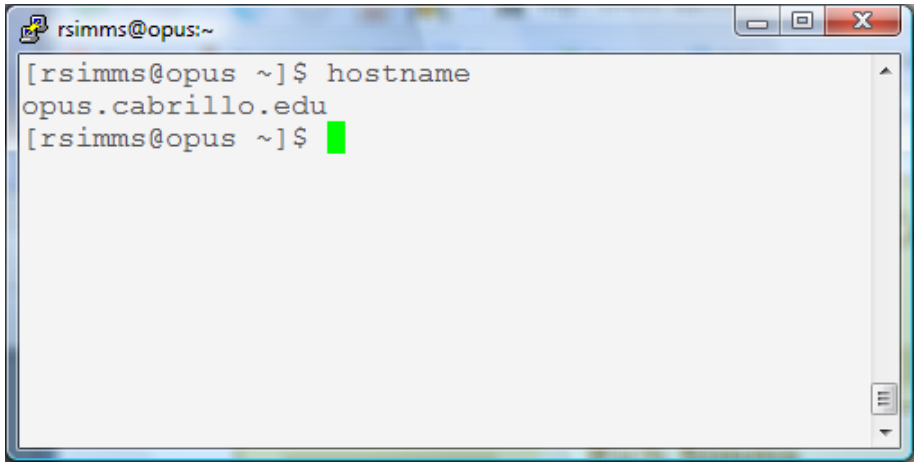


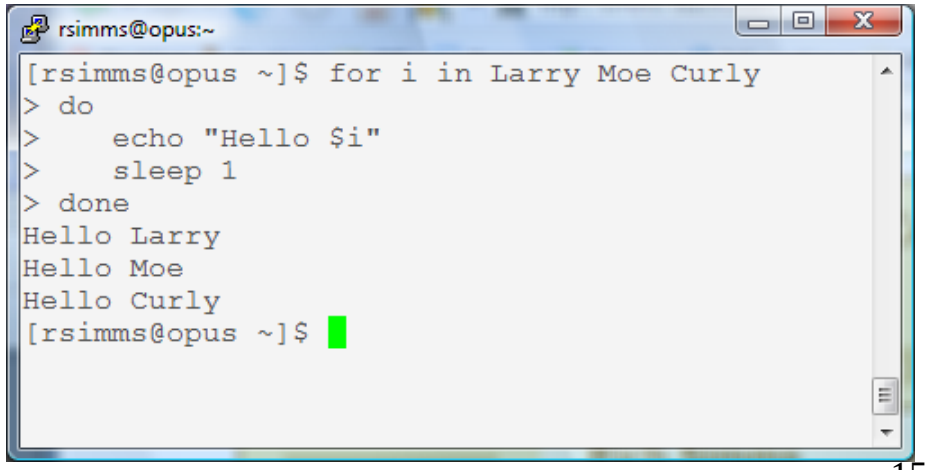
- Allows users to interact with the computer via a "command line".
- Prompts for a command, parses the command, finds the right program and gets that program executed.
- Called a "shell" because it hides the underlying operating system.
- Many shell programs are available: sh (Bourne shell), bash (born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

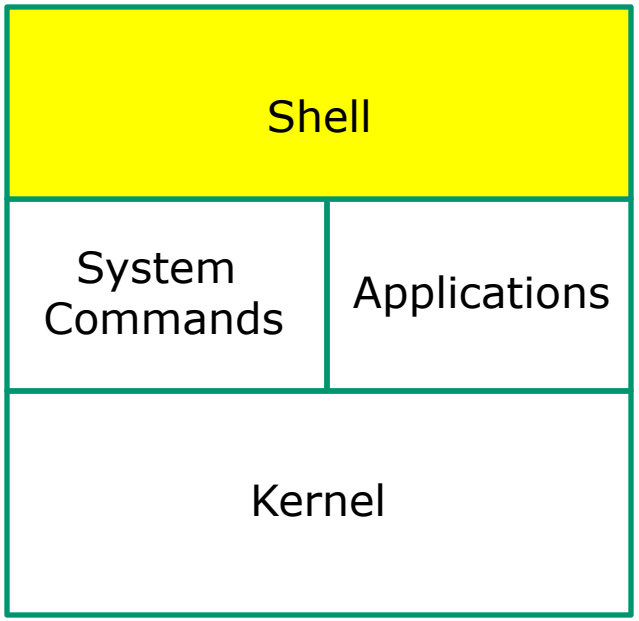






UNIX/Linux Architecture

Shells, graphical shells and in-between



Shell Command Line Interface (CLI)

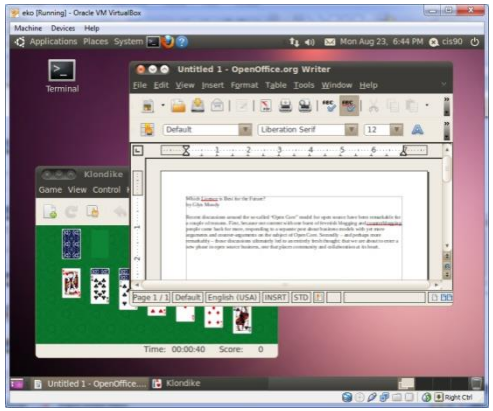
```
[root@frida root]# iptables -L -t nat
Chain PREROUTING (policy ACCEPT)
target     prot opt source               destination

Chain POSTROUTING (policy ACCEPT)
target     prot opt source               destination

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

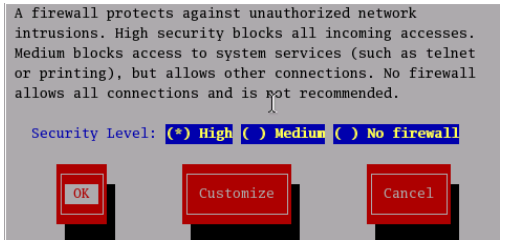
bash

Graphic shells or desktops (GUI)



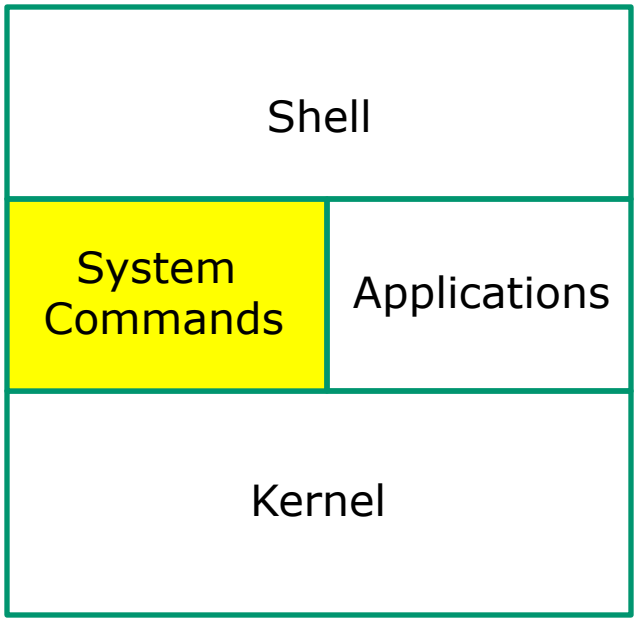
gnome

Text User Interface (TUI)



Lokkit Utility (uses curses library)

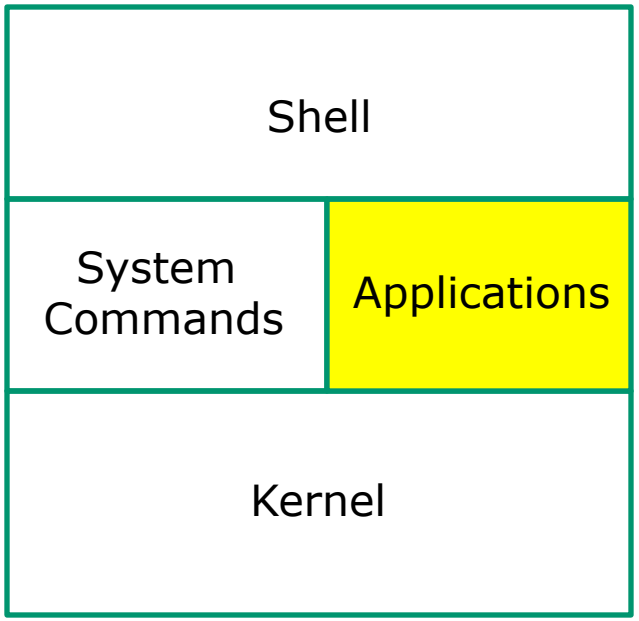
UNIX/Linux Architecture
System Commands



- 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

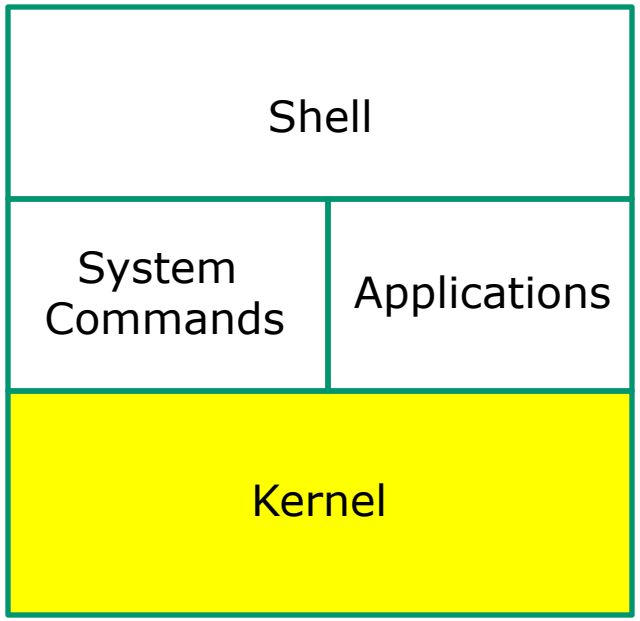
Applications



- 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

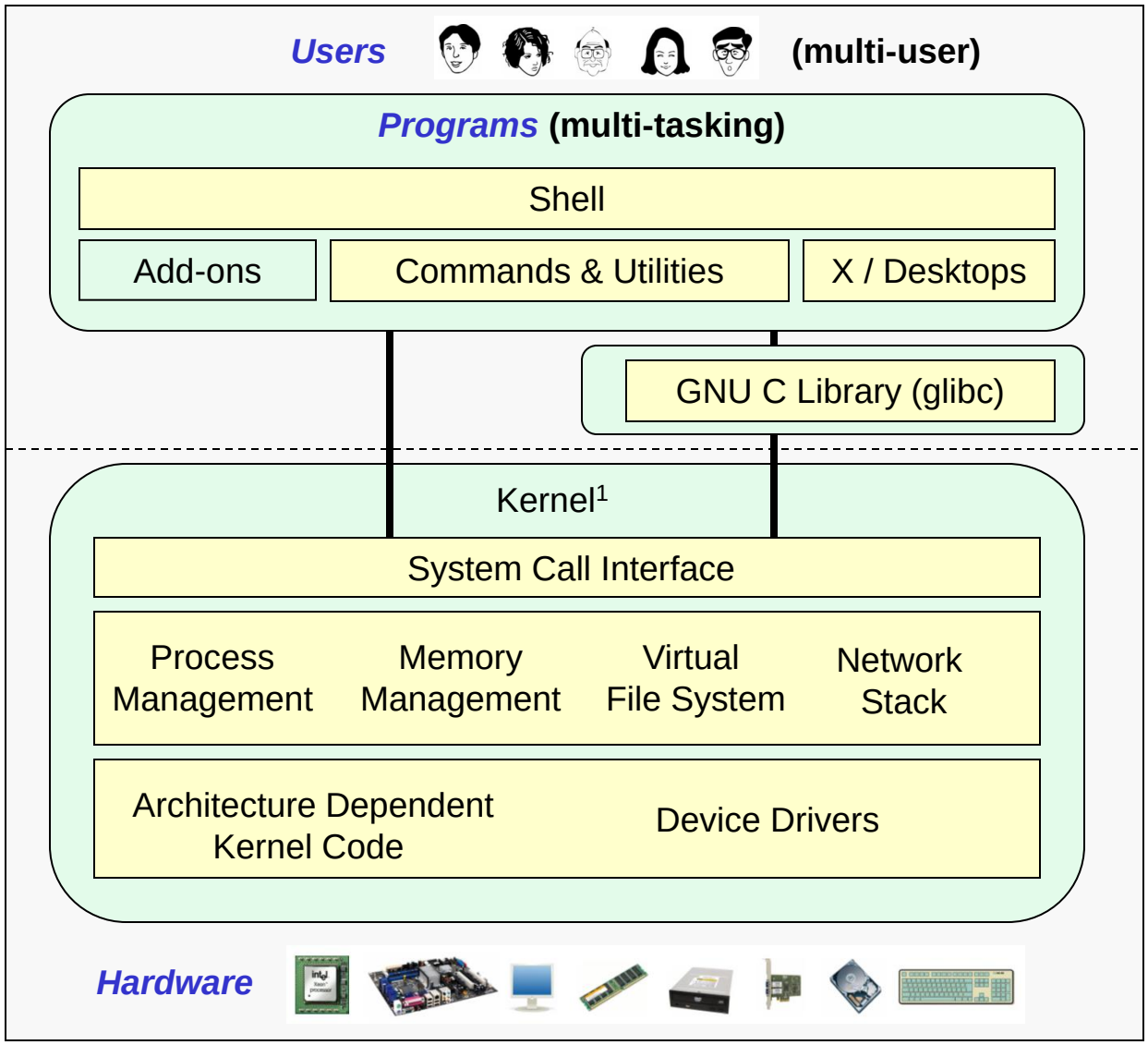


- Lowest level, inner-most core of the operating system.
- Process management - what programs are called when they are loaded and running).
- Memory management - handles all the reads and writes to memory (RAM and virtual memory)
- File System - handle all the reads and writes to files on drives.
- Network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

Assignment

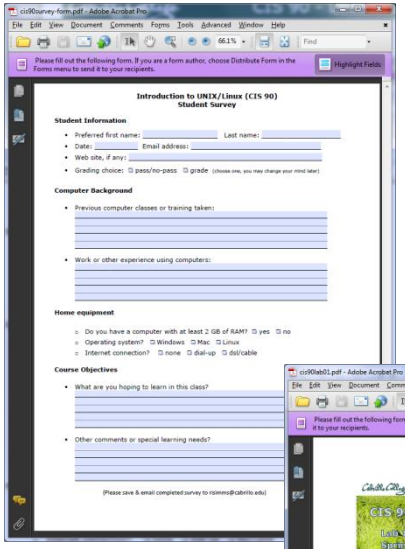
http://simms-teach.com/cis90calendar.php

CIS 90 (Spring 2013) Course Calendar

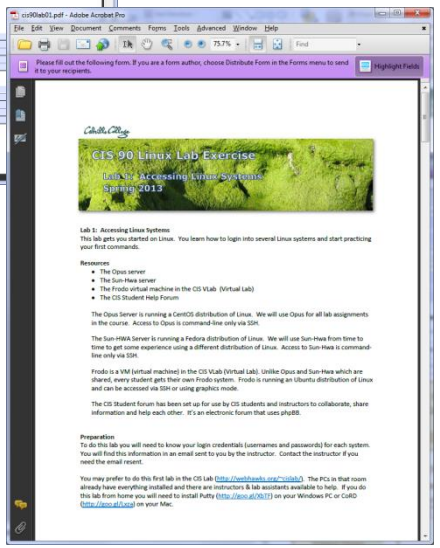
Course Home Grades

(content subject to change)

Lesson	Date	Topics	Chapter	Due
1	2/14	**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: (here) **Supplemental** • Howto #134: Accessing Opus (download) • Howto #306: Accessing VLab (download) **Assignment** • Student Survey • Lab 1 **CCC Confer** • Enter virtual classroom • Class archives	1.1-1.15 (Gillay) 2,4,5, p113-115, p164-172 (Hahn)	
2	2/21	**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 (Gillay)	Lab 1 Student Survey



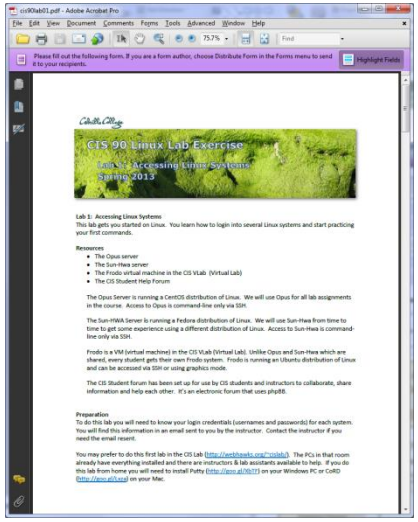
Survey



Lab 1

Both due by 11:59PM on 2/21

Lab Assignments



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.
- It's best if you fully understand each step as you do it. Use Google or refer back to lesson slides to understand the commands you are using.
- Use Google when trouble-shooting
- Keep a growing cheat sheet of commands and examples.
- Partner with another student – "two heads are better than one" (at least most of the time!)
- Use the forum to collaborate and share specific tips you learned while doing a lab.
- 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
ifconfig	- show IP address
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