

Lesson Module Status

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



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

A grid of student names, each accompanied by a placeholder icon (a blue square with a white silhouette of a person's head and shoulders). The names are arranged in approximately 10 rows and 10 columns. The name 'Rich' is the only one with a real photograph of a man with glasses and a blue shirt. The names are: Dennis, Mark, Fernando, Sean B., Christine, Francisco, Rich, Adriana, Carlile, Sergio, Jonah, Alex, Angel, Mike P., James B., Shelter, Salina, Steven, Rudy, Vincent, Chris, Casady, James, Samuel, Liz, Songul, Aaron, Laura S., Abdul, Nathan, Miguel, Nicholas, Luke, Jose, Brian, John, Victor, Janelle, Sarah, Tony, Jennifer, Juan, Saulius, Sean S., Stephanie, Elyse, Bryan, Astitow, James G., Leandro, Stephen, Eric, Jason, Matthew, Joshua, Mike D., Anthony, Laura P., Jacob, Stephen, Nic, Cesar, Lars, Dale, Tanya.

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



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



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

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

Class and Linux Overview

Objectives

- Understand how this course works
- High-level overview of computers, operating systems, and virtual machines
- Overview of UNIX/Linux market and architecture
- Learn first commands
- Use SSH to login and enter commands on a remote Linux server
- Login and enter commands on a local virtual machine using both virtual and graphical terminals.

Agenda

- Introductions
- How this class works
- Housekeeping
- UNIX/Linux Market
- Computers
- UNIX/Linux Architecture
- Using Linux
- Remote Access
- Local access
- Virtual Machines
- Equipment
- Simple Commands
- Navigating Terminals
- Wrap up



Introductions

Course history and credits



Jim Griffin

- Jim created this Linux course
- See him at GNU/Linux Users Group meetings
- Jim's site: <http://cabrillo.edu/~jgriffin/>



Rich Simms

- Worked at HP for 27+ years
- Started teaching this course in 2008 when Jim went on sabbatical
- Added some teaching best practices he liked when he took classes at Cabrillo (e.g. John Govsky's online help forum, first minute quizzes, no late work policy)
- Also added the PowerPoint slides and Howto's for common Linux tasks



Times and dates

CIS 90 uses CCC-Confer Fall 2010

September 2010

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

October 2010

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

November 2010

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

December 2010

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

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

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



Attending online with CCC Confer



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

Class Activity

Enter the online virtual classroom

Rich's Cabrillo College CIS Classes
CIS 90 Calendar

Home Resources Forums CIS Lab CTC

Login
Flashcards
Admin
CIS 90
Previous Classes

8 days till term starts!

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

CIS 90 (Fall 2010) Course Calendar
Course Home Grades

(content su
Lesson

| | | | |
|---|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|
| 1 | 9/1 | <ul style="list-style-type: none">Use Linux running on a local virtual machine <p>Materials</p> <ul style="list-style-type: none">Presentation slides (download)Logins Sheet (download)Howto #103: Installing PuTTY (download)Howto #301: Bringing the Eko VM home (download) <p>Assignment</p> <ul style="list-style-type: none">Student SurveyLab 1 <p>CCC Confer</p> <ul style="list-style-type: none">Enter virtual classroomClass archives | 1.1-1.15 (Gillay) |
|---|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|

1. Browse to simms-teach.com
2. Click *CIS 90* link
3. Click *Calendar* link
4. Look for any CCC Confer section
5. Click *Enter virtual classroom* link

CCC Confer - Attending class online



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

CCC Confer - Attending class online

The screenshot displays the CCC Confer application window titled "CCC Confer - RICH SIMMS - CIS 90 TEST". The interface includes a menu bar (File, Session, View, Tools, Window, Help), a toolbar, and a main content area divided into a Participants list, a Whiteboard, and a Chat area. The Participants list shows "Rich-Simms (Mo..." and "Benji (Me)". The Whiteboard area is titled "Whiteboard - Main Room (Scaled 99%)" and contains a "Public Screen" control and a "Follow Moderator" checkbox. The Chat area shows a conversation between "weekenus:", "Me:", and "Moderator:". The audio controls at the bottom show "Rich-Simms" and "Teleconference available".

Raise your hand, make gestures, use emoticons and indicate responses using these controls

Ask public or private questions using the chat area

CCC Confer - Attending class online

STUDENT CONFERENCE FEATURES

- *0 Contact the operator for assistance.
- *6 Mute/unmute your individual line with a private announcement.

This only works if you dial-in using your telephone



How this class works

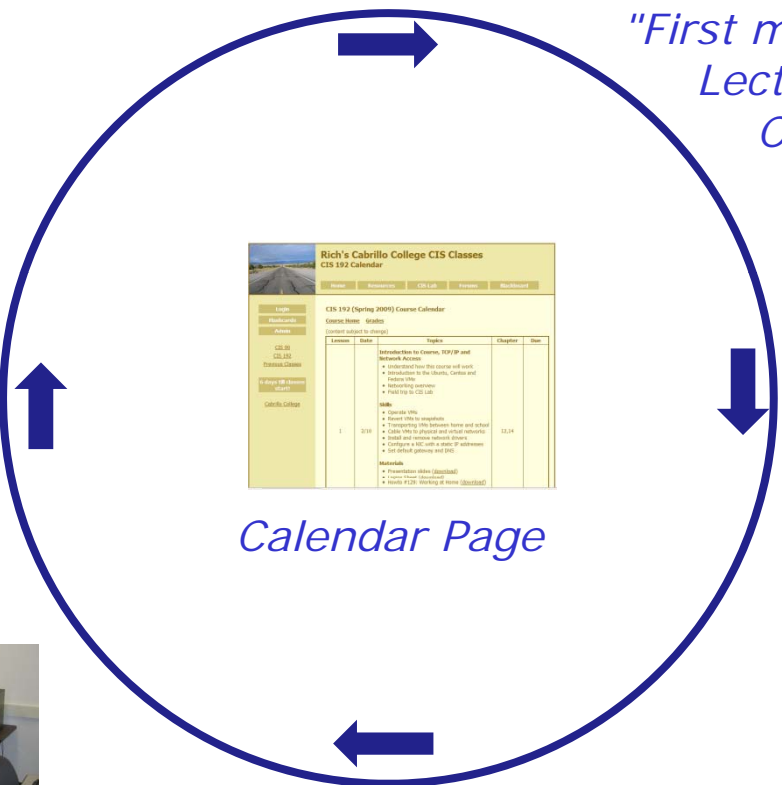
The typical week
<http://simms-teach.com>

Wednesday

"First minute" quiz
Lecture on new lesson material
Class activities
Lab assignments due midnight



Use Forum to ask and answer questions



Calendar Page



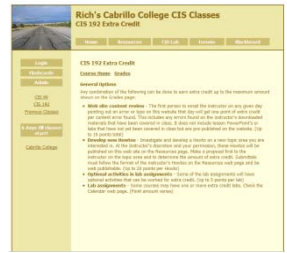
Thursday
is grading day



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



Check progress on the Grades Page



Check Extra Credit Page if you need some more points

Contacting the instructor

- Use the forum for the fastest response on technical or class related questions.
- Use email for personal matters.
- Weekly office hours on the mornings (Wed 11-11:50) in room 2502
- The instructor will be available in the CIS Lab 2.5 hours (TBD) every week to help students with lab assignments or to better understand class material.
- Leave a message on voice mail if you have no network access. Checked rarely so don't expect a fast response.





Using Website

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

Rich's Cabrillo College CIS Classes Home Page

Home Resources Forums CIS Lab CTC

Login
Flashcards
Admin

[CIS 90](#)
[Previous Classes](#)

14 days till term starts!

[Cabrillo College](#)
[Web Advisor](#)
[CCC Confer](#)
[Static IPs](#)
[Quick Ref](#)
[VM Repairs](#)
[GAH!](#)

Rich Simms

Contact

- Email: [risimms @ cabrillo .dot edu](mailto:risimms@cabrillo.edu)
- Office hours: [directory page](#)

Fall 2010 Linux Classes

- Introduction to UNIX/Linux (CIS 90) - Rich Simms teaching
- UNIX/Linux System Administration (CIS 191AB) - [Jim Griffin](#) teaching

Metal Sitemap Credits Earth

Class Exercise (class website)

Please browse to: <http://simms-teach.com>

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

Rich's Cabrillo College CIS Classes
CIS 90 Home

Home Resources Forums CIS Lab CTC

Login
Flashcards
Admin
CIS 90
Previous Classes

14 days till term starts!

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

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 2501 on the Aptos Main Campus
 - Section 68884 meets online at [CCC Confer](#)
- Open Lab - 3 hr 5 min per week to be arranged - in the CIS Lab
- Units: 3, prerequisites: none, recommended: CS 1L or CIS 17
- Optional Textbooks (available at the [Cabrillo College Bookstore](#))
 - [Linux User's Guide: Using the Command Line and GNOME](#)
 - by Carolyn Z. Gillay
 - Franklin Beedle & 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.

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

Course Syllabus (on the CIS 90 home page)

Rich's Cabrillo College CIS Classes
CIS 90 Home

CIS 90 (Fall 2014) Sections 6727 and 6884

Course Info

- Introduction to UNIX/Linux
- Introduction 1 (30% of 4 units)
- Section 6727 meets in room 2012 on the Lower Main Campus
- Section 6884 meets in room 2012
- Class will be held on Wednesdays at 10:00 AM
- Units: 3 units/90 minutes, prerequisite: CIS 10 or CIS 107
- Course Number/Section of the Course Catalog
- How to Apply Online using the [Cabrillo College Website](#)
- Prerequisites: CIS 10 or CIS 107
- Prerequisites: CIS 10 or CIS 107
- Prerequisites: CIS 10 or CIS 107
- Prerequisites: CIS 10 or CIS 107

Course Description

Provides a thorough overview of the UNIX/Linux operating system, including file system, shell, and network. This is a primer course for people interested in learning how to use a UNIX/Linux system. It is a first step in the process of becoming a professional UNIX/Linux system administrator.

Student Learning Outcomes

- Upon successful completion of this course students will be able to:
 - Describe and manage the UNIX/Linux file system
 - Describe the shell environment
 - Describe the network environment

Taught in Both Physical and Virtual Classrooms

This course is taught in both physical and virtual classrooms. The physical classroom is located in room 2012 on the Lower Main Campus. The virtual classroom is located in room 2012 on the Lower Main Campus. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms.

A Day in the Life

This course is a hybrid course. The hybrid format is a combination of face-to-face and online instruction. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms.

Computer Lab and TBA Hours

This course includes both lecture and lab activities. The lab activities are designed to provide hands-on experience with the UNIX/Linux operating system. The lab activities are designed to provide hands-on experience with the UNIX/Linux operating system. The lab activities are designed to provide hands-on experience with the UNIX/Linux operating system.

Lab Work Will Not Be Accepted

This course is a hybrid course. The hybrid format is a combination of face-to-face and online instruction. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms.

Contacting the Instructor

This course is a hybrid course. The hybrid format is a combination of face-to-face and online instruction. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms.

Key Dates

This course is a hybrid course. The hybrid format is a combination of face-to-face and online instruction. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms.

Web Site

This course is a hybrid course. The hybrid format is a combination of face-to-face and online instruction. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms.

Questions/Requests

This course is a hybrid course. The hybrid format is a combination of face-to-face and online instruction. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms.

Grading Policy

This course is a hybrid course. The hybrid format is a combination of face-to-face and online instruction. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms.

Special Learning Needs

This course is a hybrid course. The hybrid format is a combination of face-to-face and online instruction. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms.

Missing Classes and Drops

This course is a hybrid course. The hybrid format is a combination of face-to-face and online instruction. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms. The course is taught in both physical and virtual classrooms.

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

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

Course Calendar

Lesson # and Date

| | | | | | |
|--|---|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|--------------------------------------------------|
| | 7 | 3/25 | <ul style="list-style-type: none"> • Details <p>Materials</p> <ul style="list-style-type: none"> • Presentation slides (download) <p>Assignment</p> <ul style="list-style-type: none"> • Lab 6 | 8 | Lab 5 |
| | | | <p>Quiz 6</p> <p>Input/Output Processing</p> <ul style="list-style-type: none"> • stdin, stdout, stderr • Redirection • Filters and tees • Miscellaneous commands • Pipes | | |
| | 8 | 4/1 | <p>Materials</p> <ul style="list-style-type: none"> • Presentation slides (download) <p>Assignment</p> <ul style="list-style-type: none"> • Lab 7 | 7 | Lab 6 5 posts |
| | 9 | 4/8 | <p>Quiz 7</p> <p>Review</p> <p>Materials</p> <ul style="list-style-type: none"> • Presentation slides (download) <p>Assignment</p> <ul style="list-style-type: none"> • NA | | Lab 7 |
| | | 4/15 | Spring Break | | |
| | | | Test #2 | | |

First minute quiz

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

Lab assignment

Test

What is due (by midnight of that class)

References to material in the textbook

Course Grading

Rich's Cabrillo College CIS Classes
CIS 90 Grades

Home Resources CIS Lab Forums Blackboard

Login
Flashcards
Admin

CIS 90 (Spring 2009) Grades
Course Home Calendar

How the course grade is determined

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

| Percentage | Total Points | Letter Grade | Pass/No Pass |
|---------------|---------------|--------------|--------------|
| 90% or higher | 504 or higher | A | Pass |
| 80% to 89.9% | 448 to 503 | B | Pass |
| 70% to 79.9% | 392 to 447 | C | Pass |
| 60% to 69.9% | 336 to 391 | D | No pass |
| 0% to 59.9% | 0 to 335 | F | No pass |

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

Current Progress

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

Monitor this page to track your progress in the course.

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

Use extra credit to earn additional points

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

Each student is assigned a secret code name

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



More on grading

More on Grading

Points can be earned from the following activities:

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

Quizzes: 10 x 3 = 30 points

Tests: 3 x 30 = 90 points

Forum: 4 x 20 = 80 points

Labs: 10 x 30 = 300 points

Project: 1 x 60 = 60 points

How your grade is determined:

A student can earn up to 560 total points doing the activities listed above. The course grade is based on the number of points earned.

| Percentage | Total Points | Letter Grade | Pass/No Pass |
|---------------|---------------|--------------|--------------|
| 90% or higher | 504 or higher | A | Pass |
| 80% to 89.9% | 448 to 503 | B | Pass |
| 70% to 79.9% | 392 to 447 | C | Pass |
| 60% to 69.9% | 336 to 391 | D | No pass |
| 0% to 59.9% | 0 to 335 | F | No pass |

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

Choice of Grade or Pass/No Pass

You indicate your grading choice on the Student Survey form passed out during the first class. You can verify your grading choice selection on the table below. Contact the instructor by email with any questions or to request a change in grading choice.

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

More on Grading

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

| Percentage | Total Points | Letter Grade | Pass/No Pass |
|---------------|---------------|--------------|--------------|
| 90% or higher | 504 or higher | A | Pass |
| 80% to 89.9% | 448 to 503 | B | Pass |
| 70% to 79.9% | 392 to 447 | C | Pass |
| 60% to 69.9% | 336 to 391 | D | No pass |
| 0% to 59.9% | 0 to 335 | F | No pass |

Observations on a previous class:

- **Aragorn** got an A by doing solid work across the board and never did any extra credit
- **Eomer** skipped the final yet still got an A by doing some extra credit
- **Balrog** probably should have just dropped the course
- **Sauron** kicked himself later for not doing any posts during the second quarter of the course to turn that B to an A

More on Grading



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

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

- The quiz questions are given out in advance and students can use the forum to collaborate on answers prior to class.
- The order of the questions will not be known until the quiz is given!
- Quizzes are closed notes and closed book.
- Students may not give or ask others for assistance while taking a quiz.
- To take the quiz, students can email the answers to the instructor. Students in the classroom can also write the answers on a piece of scrap paper to hand in.
- There are **no makeup's** for these quizzes and they **must be turned in within the first few minutes of class.**

More on Grading



Tests (3 tests, 30 points each)

- Test 1 and Test 2 will be distributed by during the last half of the class.
- Test 3 is the final exam.
- Tests are usually comprised of fill-in-the-blank type questions. Often you will have to use the Opus Linux server to check the answer.
- Tests are open notes, open book, and open computer.
- Tests are designed to take about 1.5 hours and be turned in at the end of class. To minimize "clock stress" and "room 2501 brain freeze" you can take the test home and turn it in by midnight the day of the test.
- Students may not give or ask others for assistance while taking a test.

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

More on Grading

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

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

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

More on Grading

Lab Assignments (10 labs, 30 points each)

- Will be due at midnight (Opus time) on the date shown on the course Calendar.
- **Late work is not accepted.** If you don't complete a lab assignment, please turn in what you have, by the due date, for partial credit.
- Students may work together and collaborate on labs but they must submit their own work to get credit.
- Lab resources, instructors, and assistants are available in the CTC and CIS lab. In addition the Linux Opus server may be accessed from anywhere over the Internet.

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

More on Grading

Extra credit (up to 90 points)

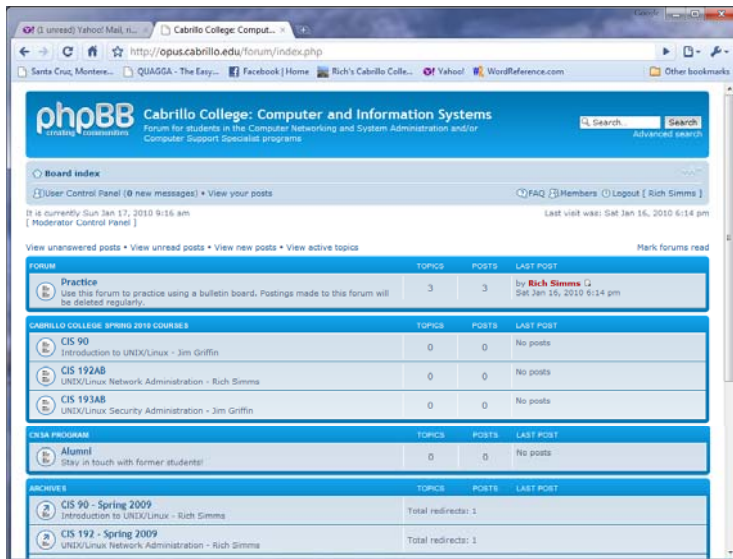
- You need to attend to a family emergency and can't turn in a lab assignment on time ... don't worry!
- Your schedule/commute doesn't allow you to take any of the "first minute" quizzes don't worry!
- You crash and burn on a test ... don't worry!
- You just don't like making forum posts ... don't worry!

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



Help Forum

Online Help Forum



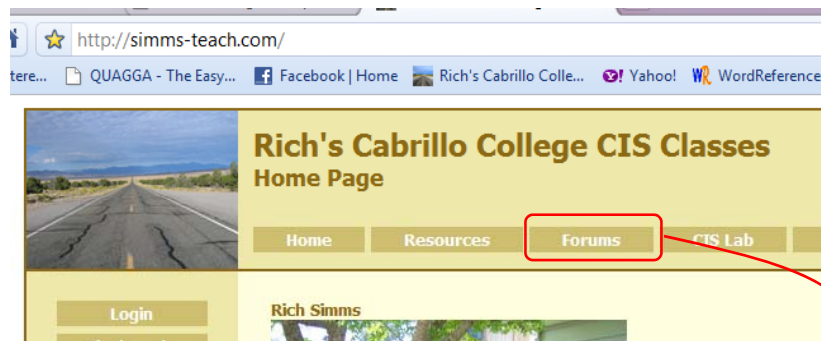
- Post questions and answers
- Share Linux information
- Post class notes for classmates who miss class
- Get clarifications
- Collaborate on quiz questions
- Share Linux information
- **Never post passwords!**



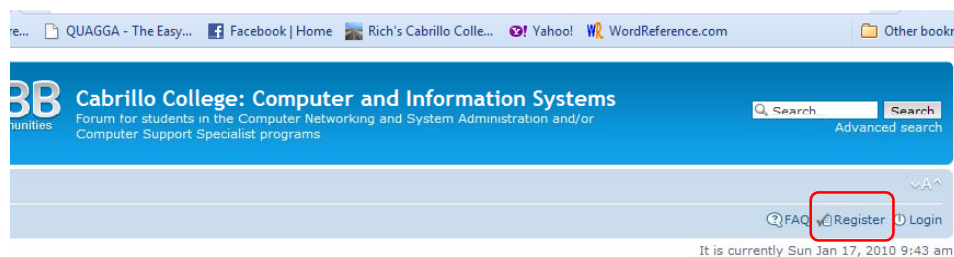
As an incentive to use the forum - students can earn 4 points per CIS 90 forum post (capped at 20 points for each ¼ of the course calendar)

Class Activity Forum Registration


There is a Forums link on simms-teach.com



Or browse to opus.cabrillo.edu/forum

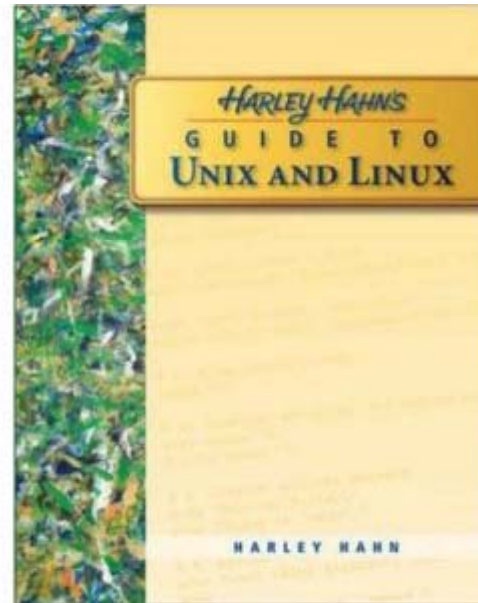
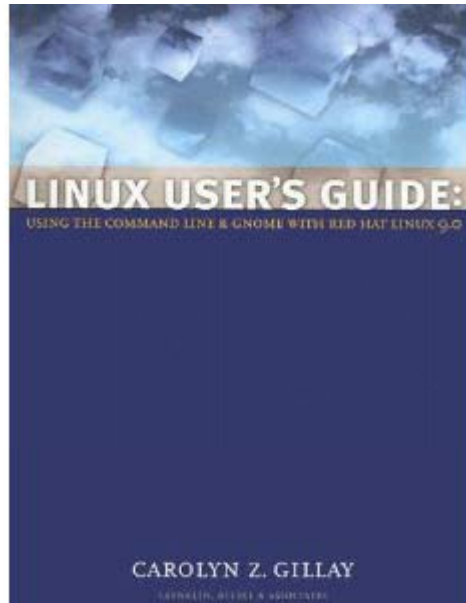


To Register:

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

Note: Anonymous or incomplete user account names will be deleted!

Textbooks



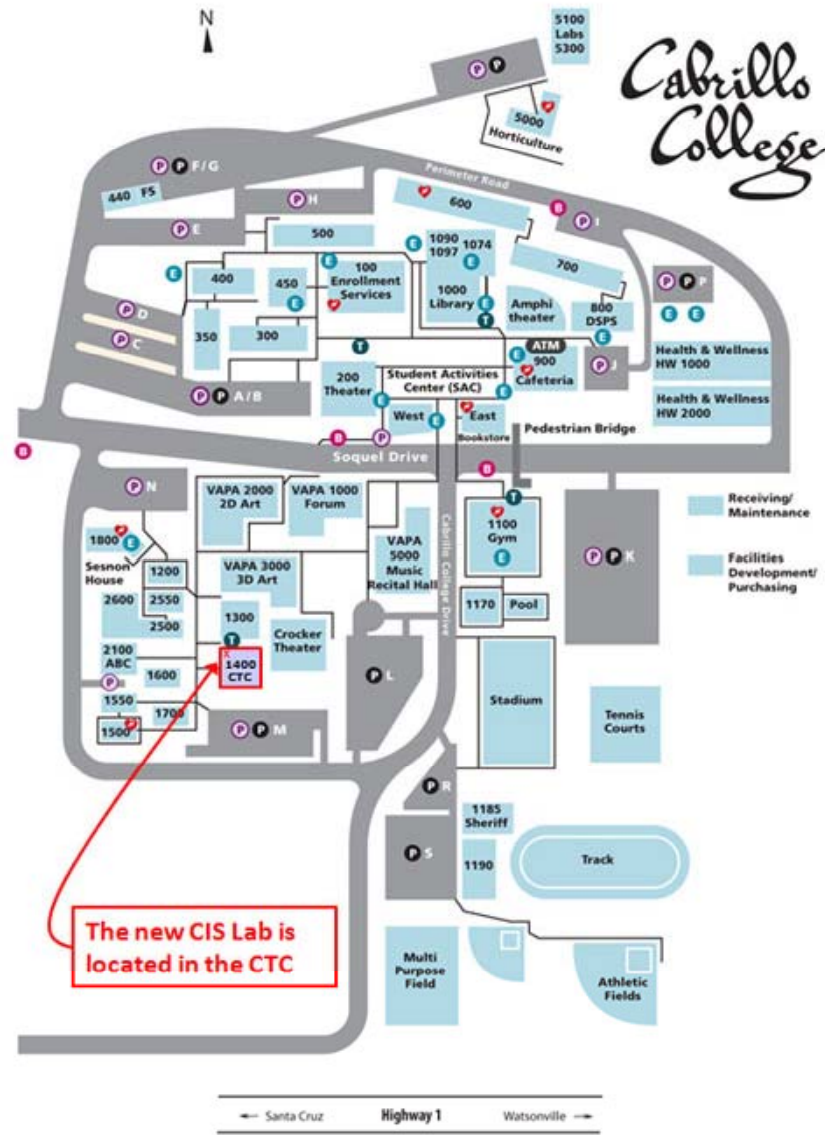
Optional Textbooks:

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

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

More on Labs

Lab Resources



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



Lab Resources

Lab resources and instructor assistance are available in the CIS Lab

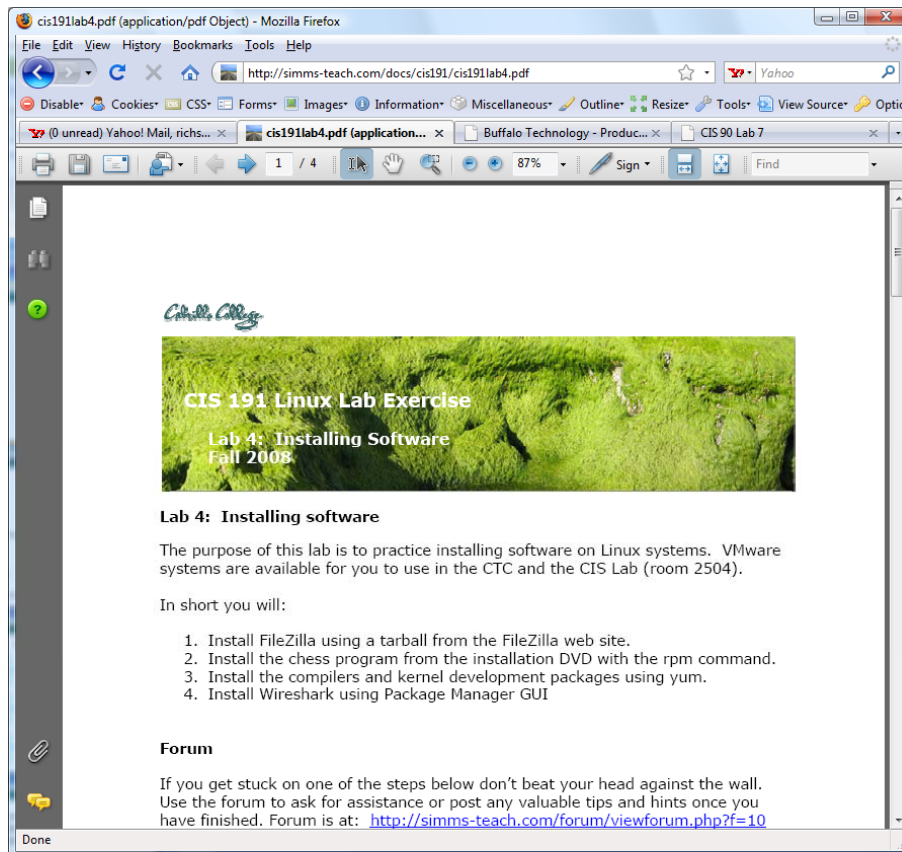


Stations CIS-Lab-01 to CIS-Lab-06 are available on the east wall



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

Lab Assignment Tips



Pearls of Wisdom:

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

Housekeeping

Can I add this class?

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

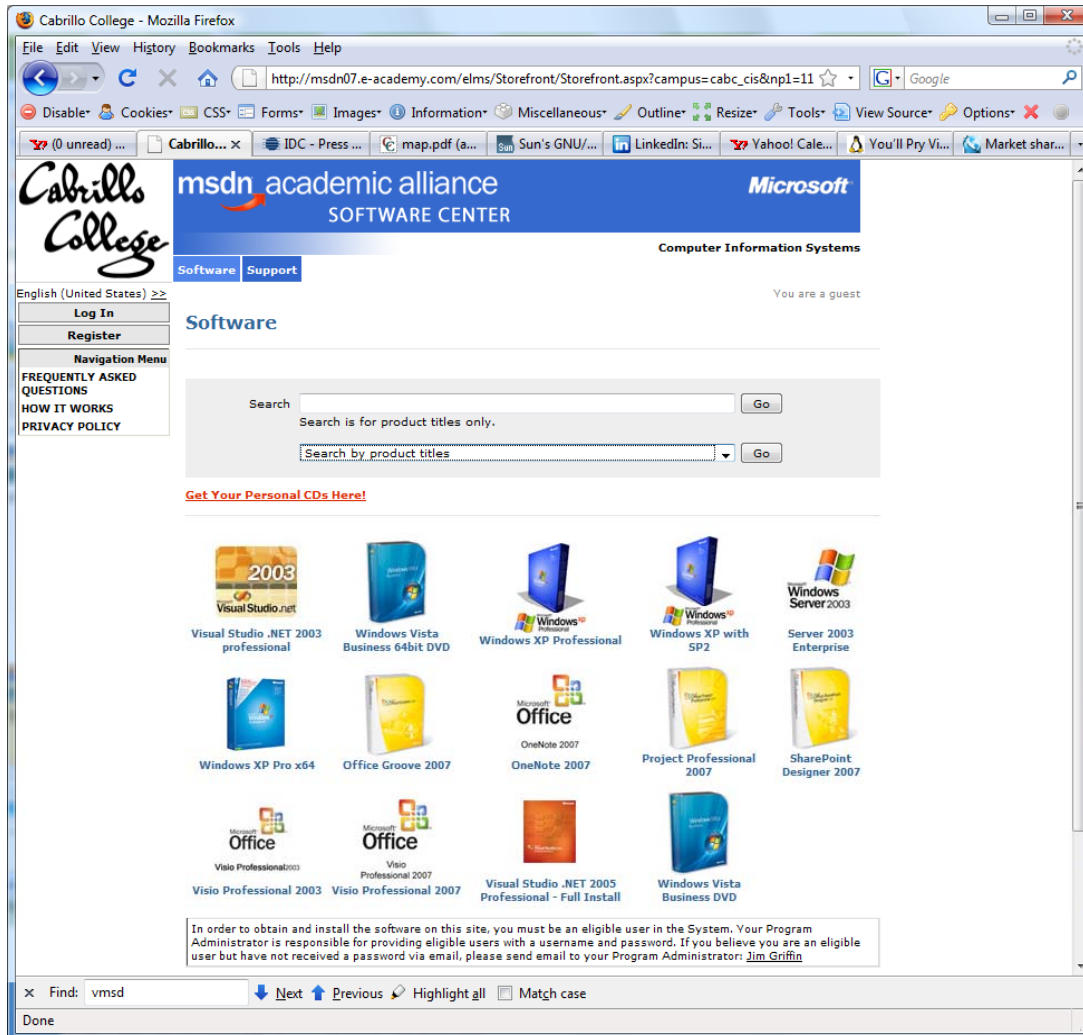
Roll Call for both sections

Turn OFF the recording

Roll Call for both sections

Turn recording back ON

MSDN Academic Alliance



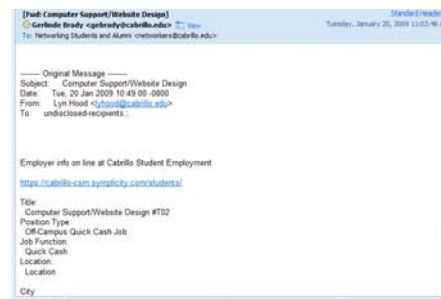
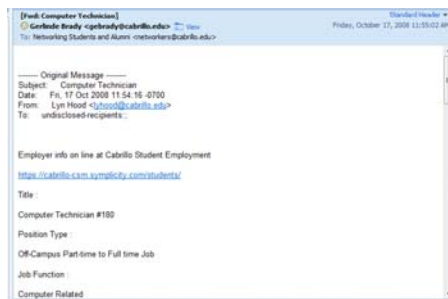
- For students registered in a CIS or CS class at Cabrillo
- Email instructor after registration is final (two weeks after first class)

Cabrillo Networking Program Mailing list

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

networkers-subscribe@cabrillo.edu

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



Logins Sheet

Rich's Cabrillo College CIS Classes
CIS 90 Calendar

Home Resources Forums CIS Lab CTC

Login
Flashcards
Admin

CIS 90
Previous Classes

7 days till term starts!

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

CIS 90 (Fall 2010) Course Calendar
Course Home Grades
(content subject to change)

| Lesson | Date | Topics | Chapter | Due |
|--------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----|
| 1 | 9/1 | <p>Class and Linux Overview</p> <ul style="list-style-type: none"> 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 <p>Materials</p> <ul style="list-style-type: none"> How this class works (download) Registration slides (download) Logins Sheet (download) Howto #109: Installing FORTY (download) Howto #301: Bringing the Eko VM home (download) <p>Assignment</p> <ul style="list-style-type: none"> Student Survey Lab 1 <p>CCC Confer</p> <ul style="list-style-type: none"> Enter virtual classroom Class archives | 1-1.15 (Gillay) | |

Logins and Passwords for CIS 90

Class Computer:
Username: ris90 Password: _____

CIS-Lab-XX PC's (in room 2504 and the CTC)
Username: ris90 Password: _____

VMs (on the CIS-Lab-XX PC's)
Username: cis90 Password: _____
Username: root Password: _____

Opus (opus.cabrillo.edu)
Username: _____ Password: _____
Username: _____ Password: _____

Help Forum (<http://simms-teach.com/forum/>)
Username: _____ Password: _____

Other:
System: _____ Username: _____ Password: _____
System: _____ Username: _____ Password: _____
System: _____ Username: _____ Password: _____
System: _____ Username: _____ Password: _____

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

Passwords

Switch to CCCC whiteboard

Turn OFF the recording

Passwords

Switch to Powerpoints

Turn recording back ON

Student Survey

Rich's Cabrillo College CIS Classes
CIS 90 Calendar

Home Resources Forums CIS Lab CTC

CIS 90 (Fall 2010) Course Calendar
Course Home Grades
(content subject to change)

| Lesson | Date | Topics | Chapter | Due |
|--------|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----|
| 1 | 9/1 | <p>Class and Linux Overview</p> <ul style="list-style-type: none"> 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 <p>Materials</p> <ul style="list-style-type: none"> How this class works (download) Presentation slides (download) Logins Sheet (download) Howto #103: Installing PuTTY (download) Howto #301: Bringing the Eko VM home (download) <p>Assignment</p> <ul style="list-style-type: none"> Student Survey <p>CCC Confer</p> <ul style="list-style-type: none"> Enter virtual classroom Class archives | 1.1-1.15 (Gillay) | |

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

Student Information

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

Computer Background

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

Home equipment

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

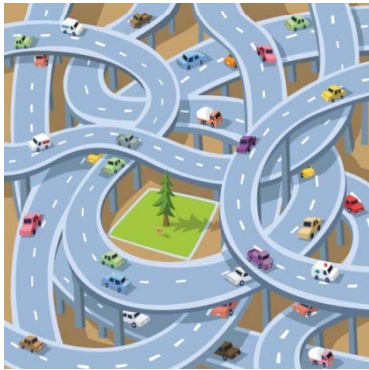
Course Objectives

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

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

UNIX/Linux in the Market

Public Works Infrastructure



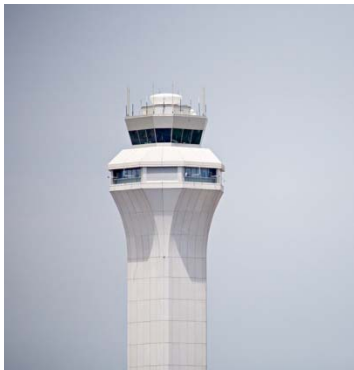
Roads



Water



Bridges



Airways

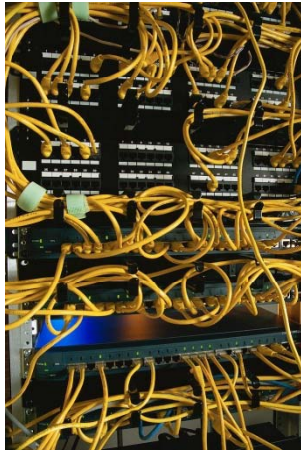


Power



Telecommunications

IT (Information Technology) Infrastructure



Network



Servers



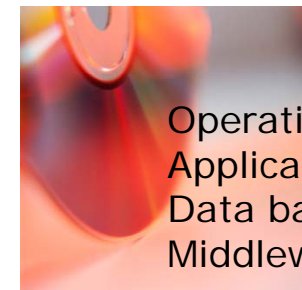
Storage



Desktops



Mobile



Operating Systems
Applications
Data bases
Middleware

Software

Computing Infrastructure Where UNIX/Linux is used

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

Operating Systems

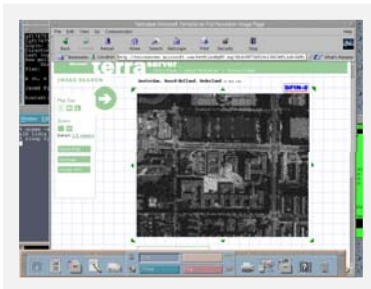
Various UNIX Based Products

SCO UNIX

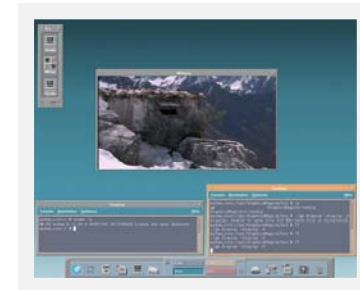


Berkeley
Software
Distribution

AIX



HP-UX



Solaris



Apple Mac OS X
and iOS



*The kernel is
UNIX based*

Operating Systems

Various Linux Distributions

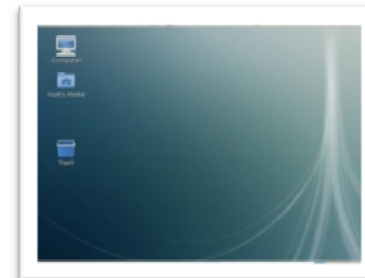
OpenSUSE



Red Hat Enterprise Linux



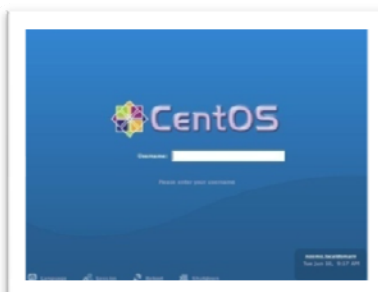
Fedora



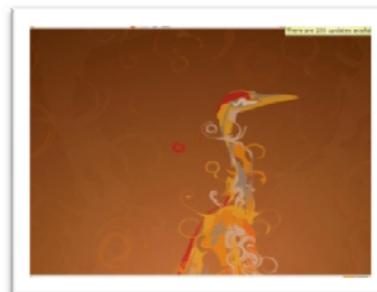
Debian



CentOS



Ubuntu



Mandriva



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



Tux, the penguin, is the Linux kernel mascot

Operating Systems

Embedding Linux in Products

Google Chrome OS
(coming soon)
for Netbooks and Tablets



Tivo



Buffalo
NAS storage



Android



MikroTik Routers



Operating Systems

Embedding UNIX in Products

Apple iOS



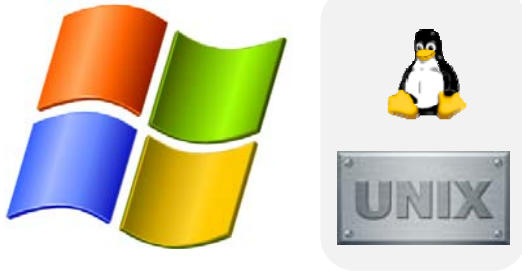
*The Apple iOS, like Mac OS X, runs on a UNIX like kernel
(Mach kernel + BSD components)*

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

UNIX/Linux Overview

Server, PC, Smartphone markets

Servers

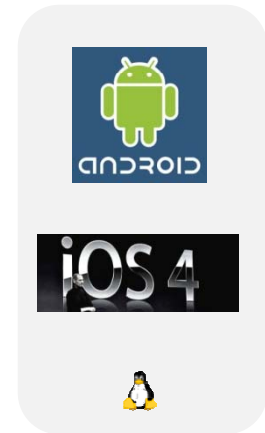


PC's



Smartphones

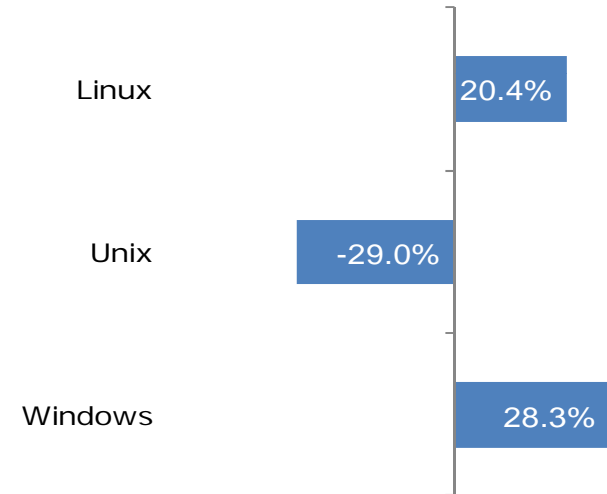
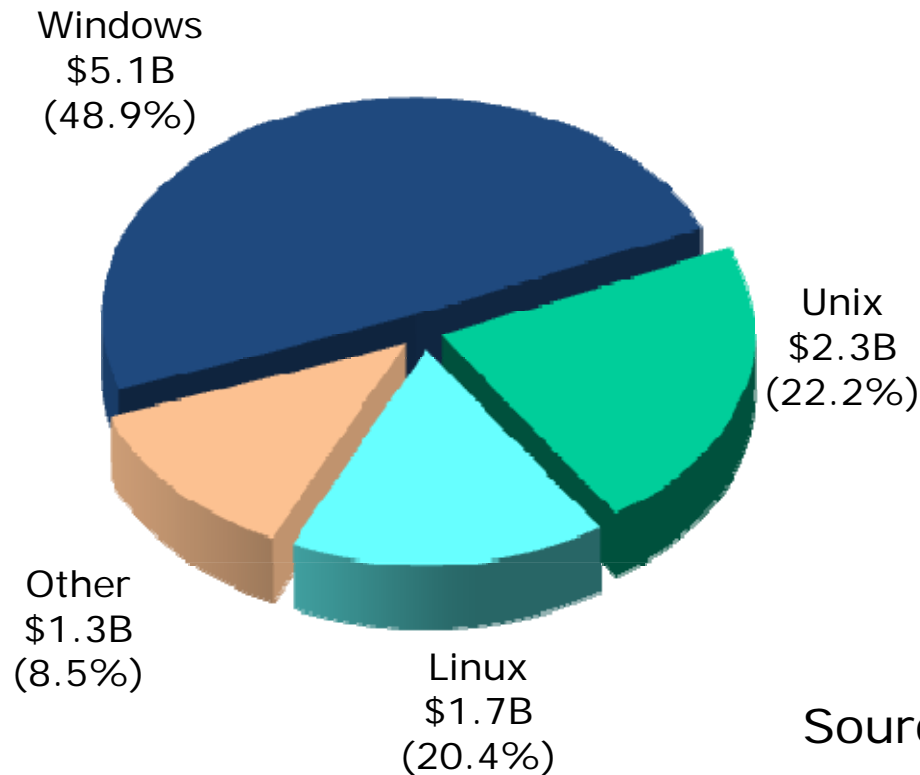
symbian
OS



Worldwide Server Market

\$10.4B Server Revenue 1Q 2010

Year over Year Change



Source: IDC, May 2010

Website hits by OS

Implies "ballpark market share" for PCs

May 2008¹

Jan 2009²

Jul 2010³

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

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

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

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

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

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

Worldwide Server Market

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

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

Source: Gartner (August 2010)

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

iso.linuxquestions.org 15 Most Popular Downloads

Jan 30, 2009

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

Aug 17, 2010

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

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

distrowatch.com Top "Ten" Lists

Ladislav Bodnar 2007

1. Ubuntu
2. openSUSE
3. Fedora
4. Debian
5. Mandriva
6. PCLinuxOS
7. MEPIS
8. KNOPPIX
9. Slackware
10. Gentoo
11. FreeBSD

Jan 2009

1. Ubuntu
2. openSUSE
3. Fedora
4. Debian
5. Mandriva
6. Linux Mint
7. PCLinuxOS
8. Slackware
9. Gentoo
10. CentOS
11. FreeBSD

Jan 2010

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

CentOS is a clone distro of Red Hat Enterprise

Linux distros mentioned by top server vendors

Server market share source: IDC 1Q10 report

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

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

What is a computer

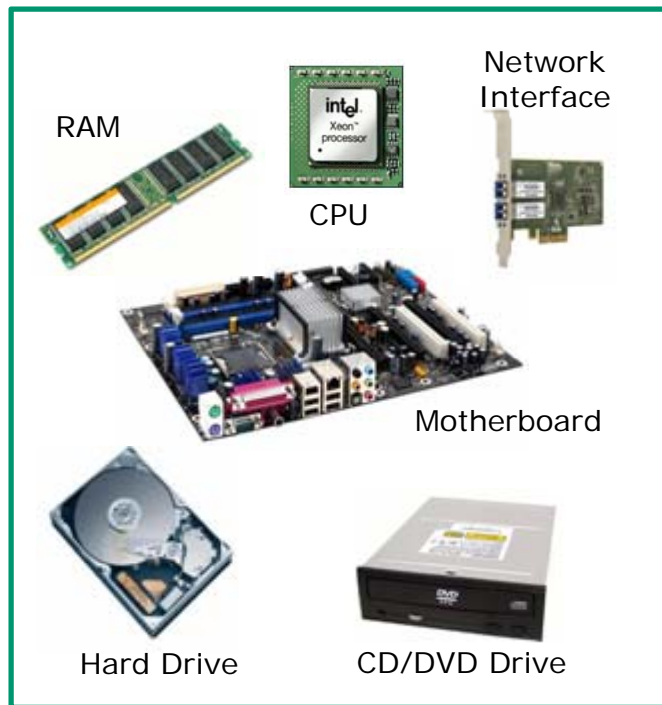
What is a computer?

Desktops

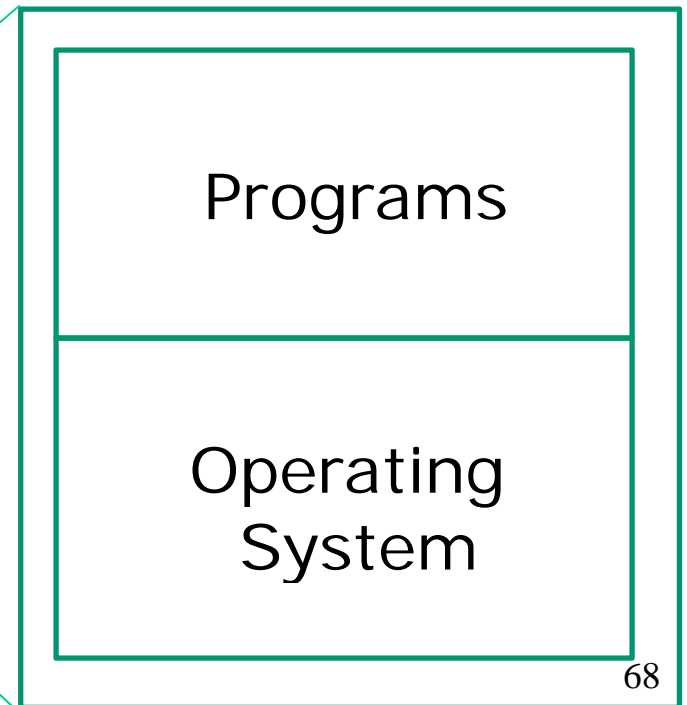


Usually one user at a time

Hardware



Software



Desktop or Workstation

What is a computer?

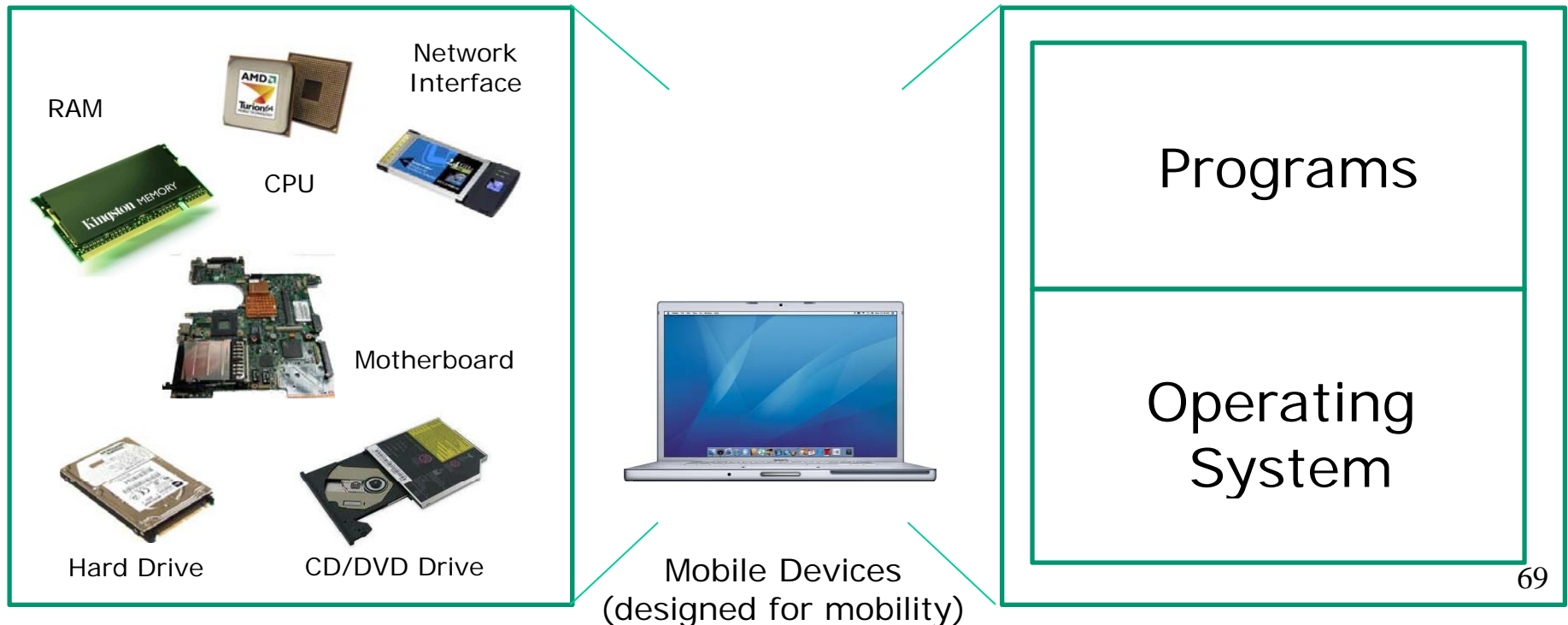
Mobile Devices



Usually one user at a time

Hardware

Software



What is a computer?

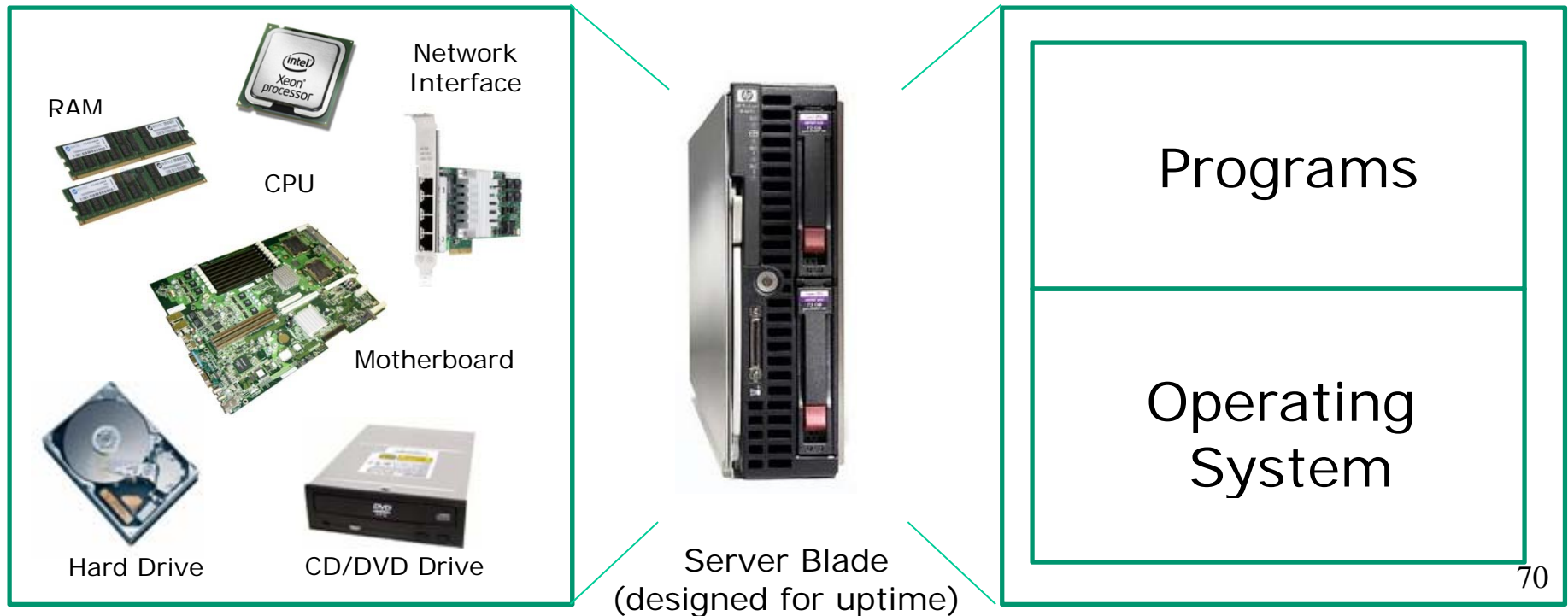
Servers



*Usually many users
at the same time*

Hardware

Software



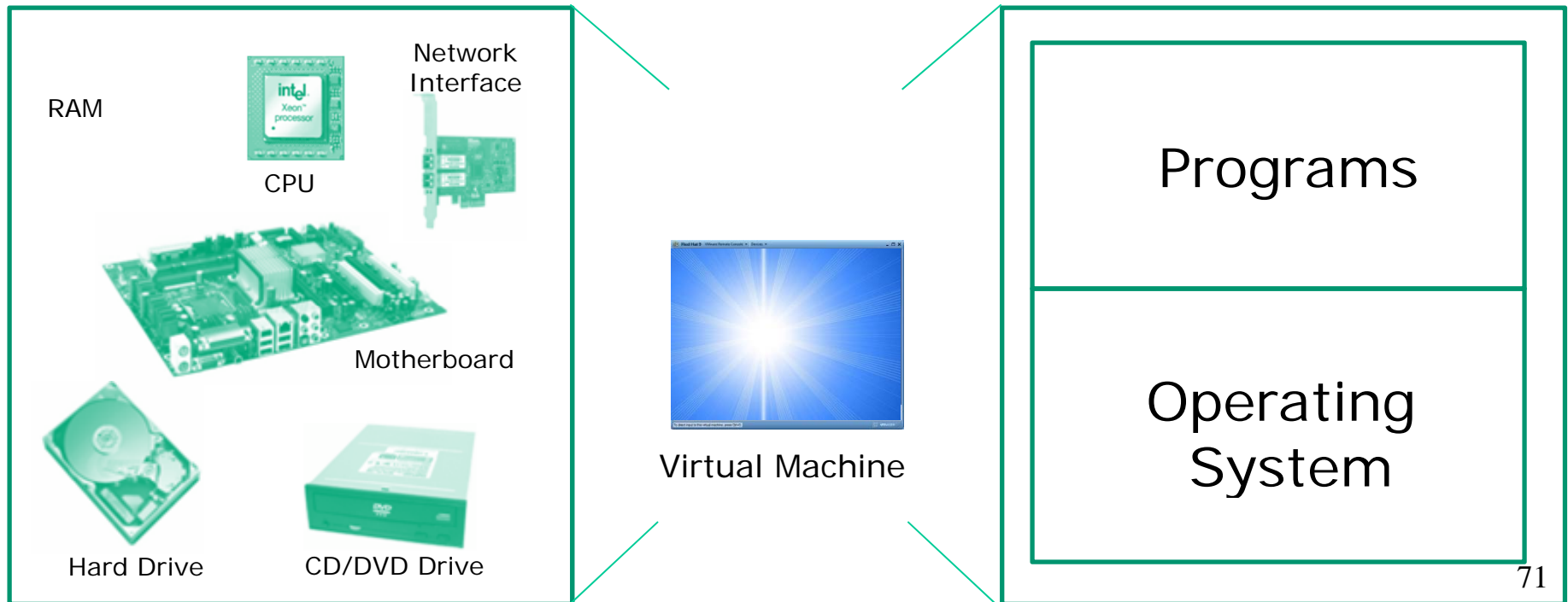
What is a computer?

Virtual Machines



Virtual Hardware

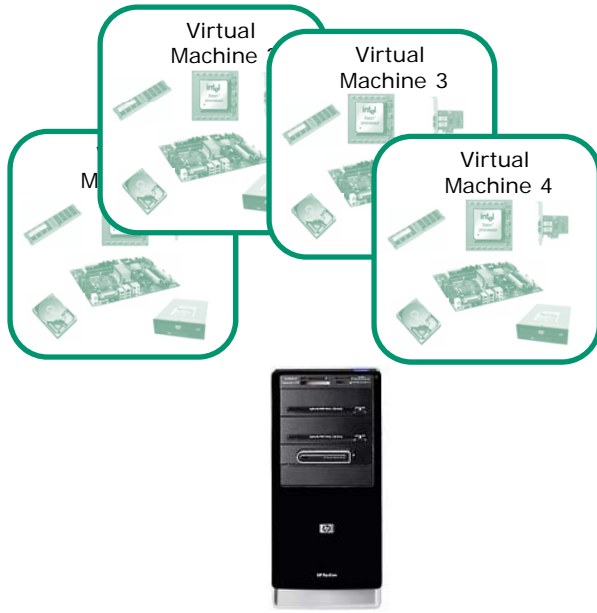
Software



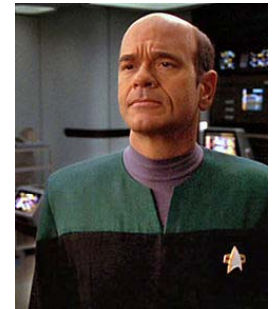
Virtual Machines

What is a virtual machine?

- There are software programs (e.g. VMWare, VirtualBox, MS Virtual Server) that simulate perfectly all the hardware of a real computer.
- These simulated computers are called virtual machines or VMs.



- You load an operating system and applications on virtual machines just like you would any other computer.
- The guest OS and apps don't even know they are not running on a "real" computer.
- Over the network the virtual machines appear just like any other computer.
- Opus used to be a 1U rack mounted server in building 1300. Now it's a VM in 1200.



The EMH doctor on Star Trek Voyager was a simulation

Software

Software - The Programs

Users



Software

Programs

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

Operating System

Hardware



Software - The Programs

Users



Software

Programs (examples)

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

Operating System

Hardware



Software - The Operating System

Users



Software

Programs

Operating System

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

Hardware



Software - The Operating System




Users



Software

Programs

Operating System (examples):

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

Hardware



Types of software

Public Domain (paid for by the taxpayer)

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

Open Source

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

Free Software Movement

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

Proprietary

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

UNIX/Linux Architecture

How is UNIX/Linux put together?

What are the fundamental components?

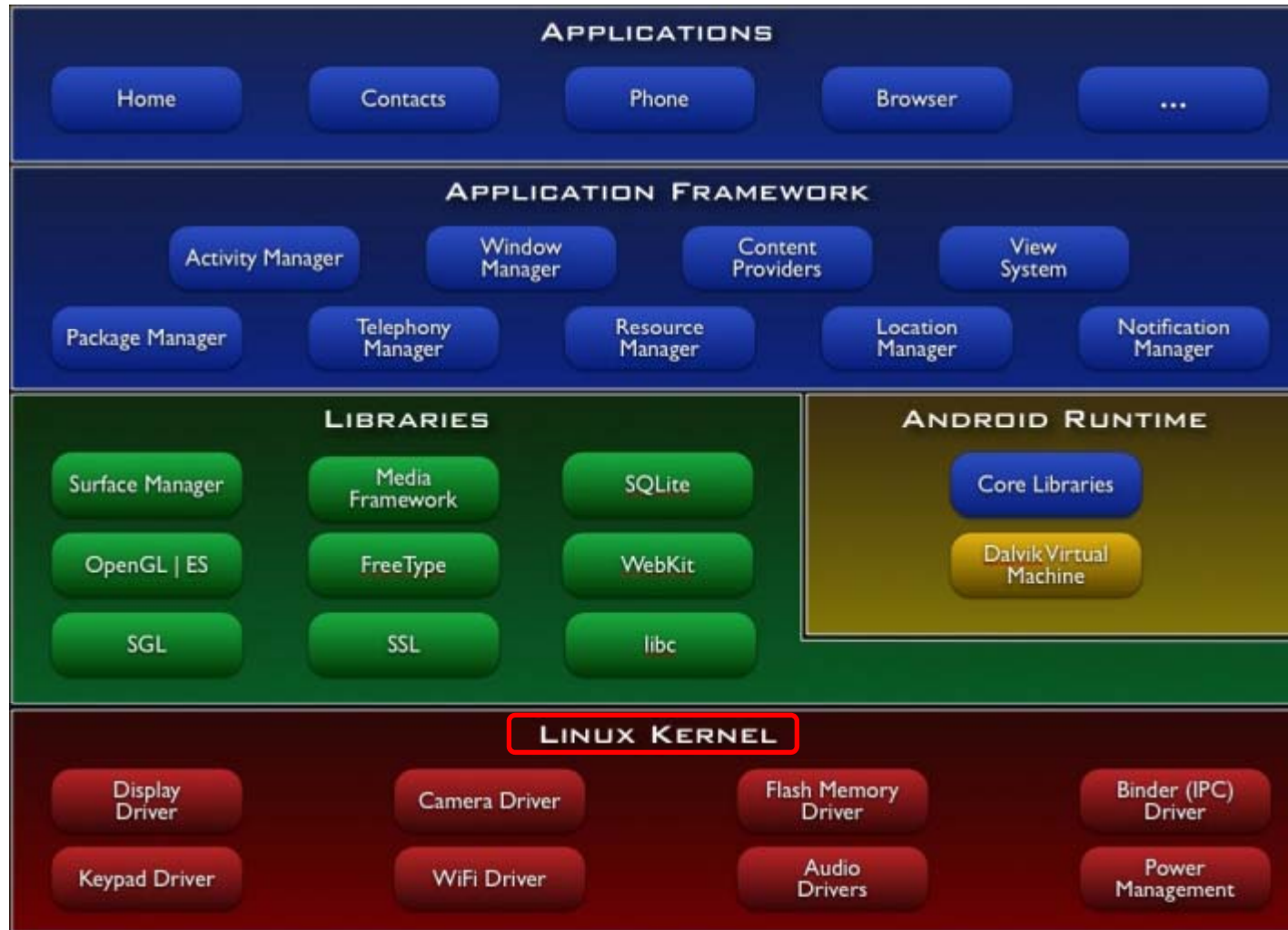
The Android software stack uses the Linux 2.6 kernel 

Android



Lets peel off the covers and look inside

The Android software stack uses the Linux 2.6 kernel 



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

GNU/Linux Distributions

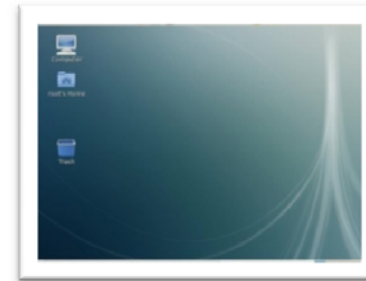
OpenSUSE



RedHat Enterprise Linux



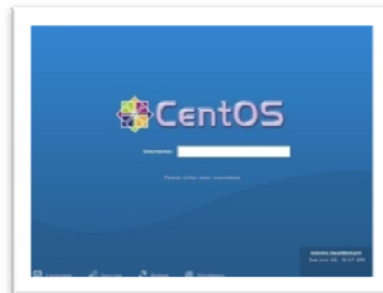
Fedora



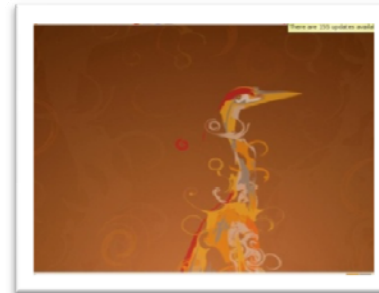
Debian



CentOS



Ubuntu



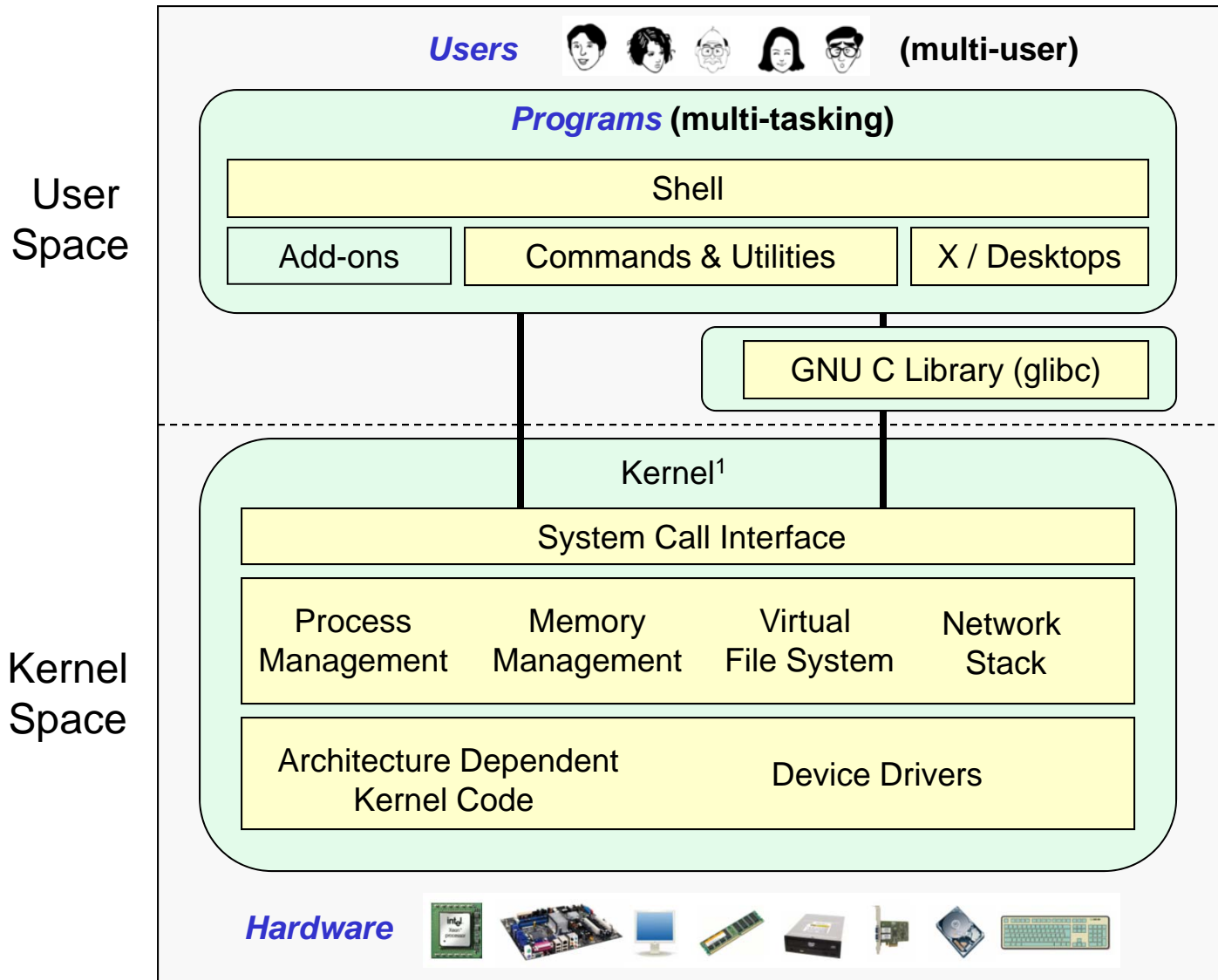
Mandriva



Lets peel off the covers and look inside



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



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 84 in 1992.

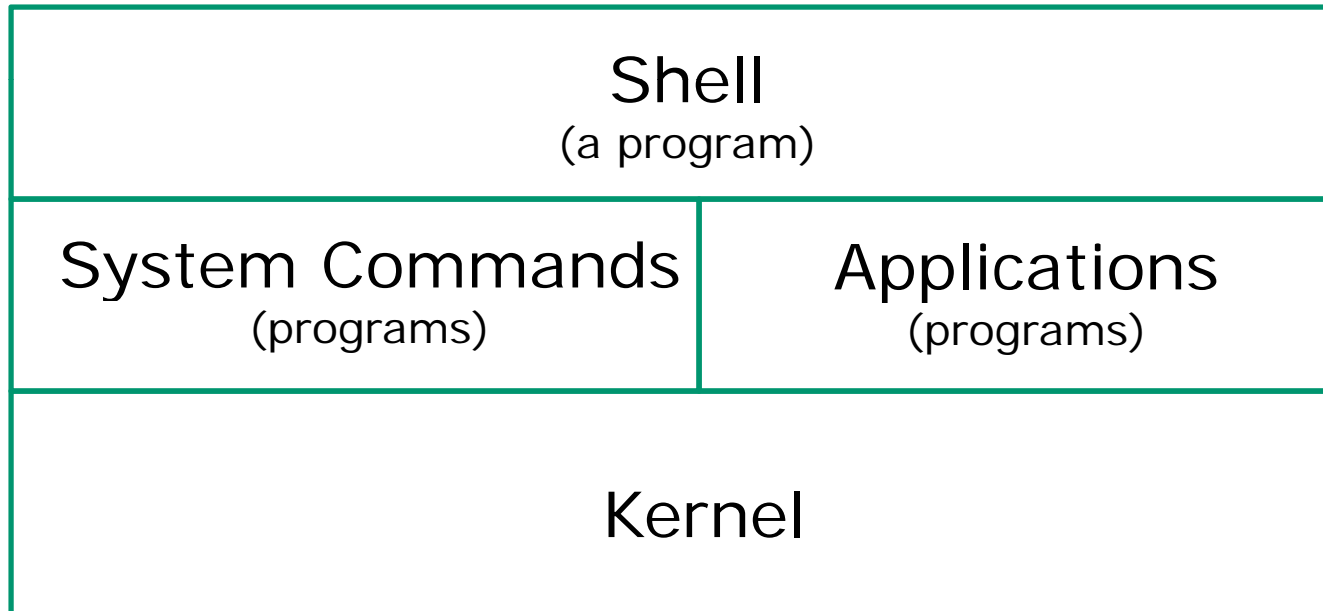
¹See "Anatomy of the Linux kernel" by M. Tim Jones at <http://www-128.ibm.com/developerworks/linux/library/l-linux-kernel/>

UNIX/Linux Architecture simplified

UNIX/Linux Architecture

Simplified View - Four Major Components

Users 

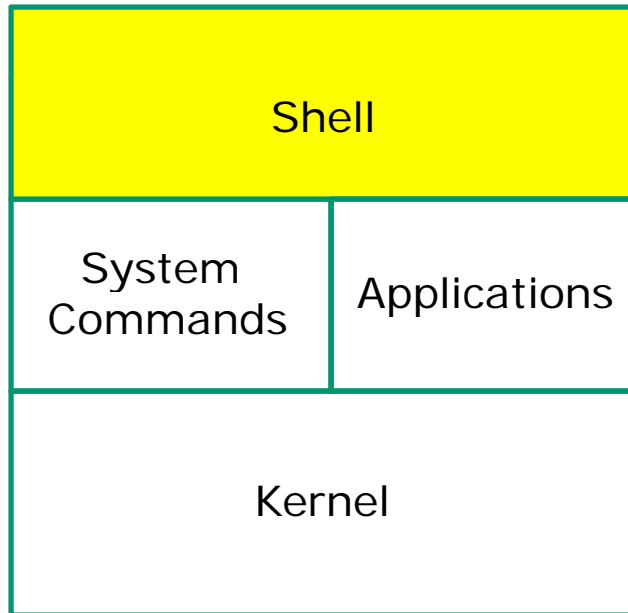


Hardware



UNIX/Linux Architecture

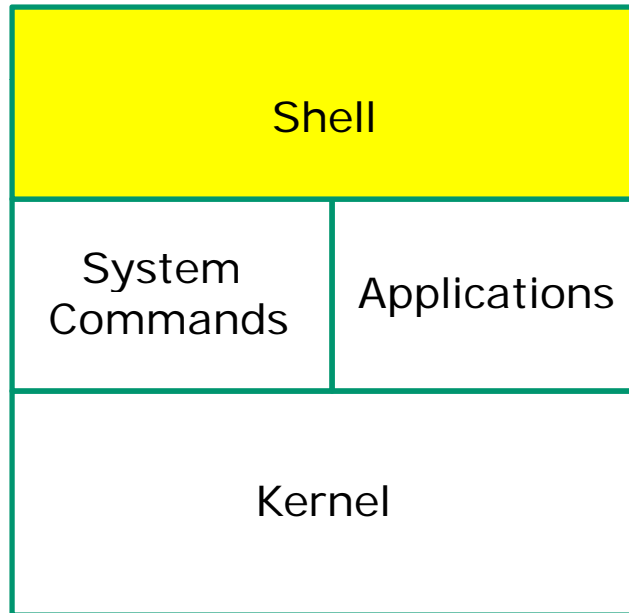
The Shell



- 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



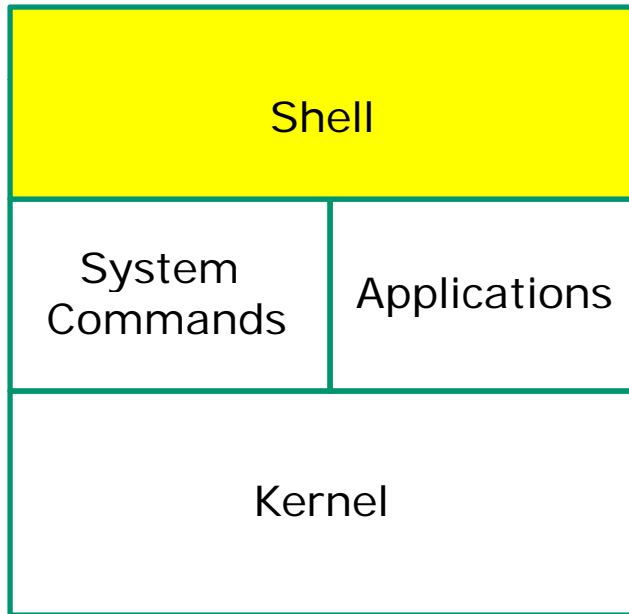
```
rsimms@opus:~  
[rsimms@opus ~]$ hostname  
opus.cabrillo.edu  
[rsimms@opus ~]$ █
```

```
rsimms@opus:~  
[rsimms@opus ~]$ for i in Larry Moe Curly  
> do  
>   echo "Hello $i"  
>   sleep 1  
> done  
Hello Larry  
Hello Moe  
Hello Curly  
[rsimms@opus ~]$ █
```



UNIX/Linux Architecture

Shells, graphical shells and in-between



Shell Command Line Interface (CLI)

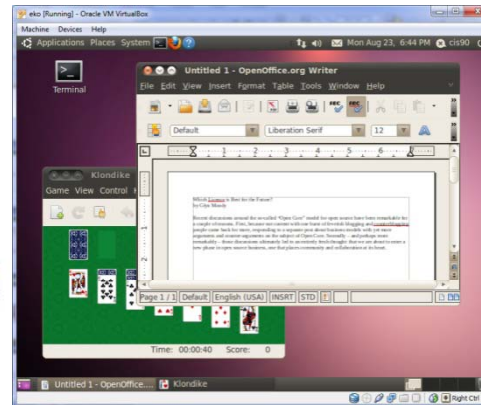
```
[root@frida root]# iptables -L -t nat
Chain PREROUTING (policy ACCEPT)
target     prot opt source                destination

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)

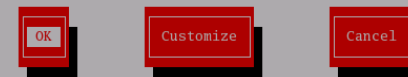


gnome

Text User Interface (TUI)

A firewall protects against unauthorized network intrusions. High security blocks all incoming accesses. Medium blocks access to system services (such as telnet or printing), but allows other connections. No firewall allows all connections and is not recommended.

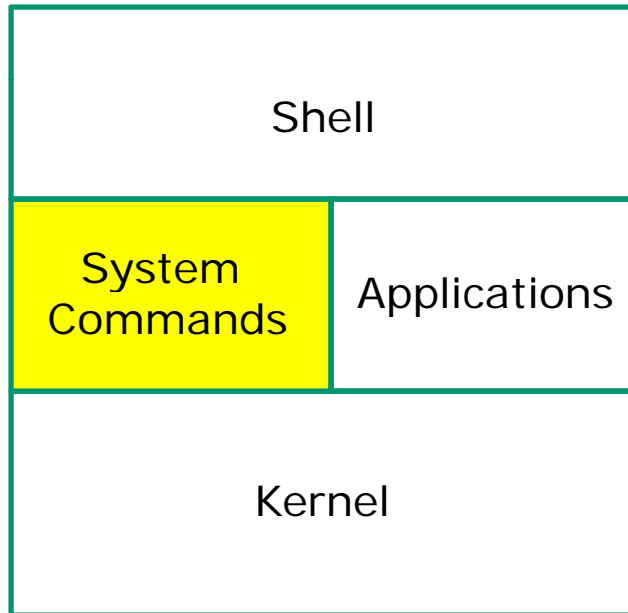
Security Level: High Medium No firewall



Lokkit Utility (uses curses library)

UNIX/Linux Architecture

System Commands

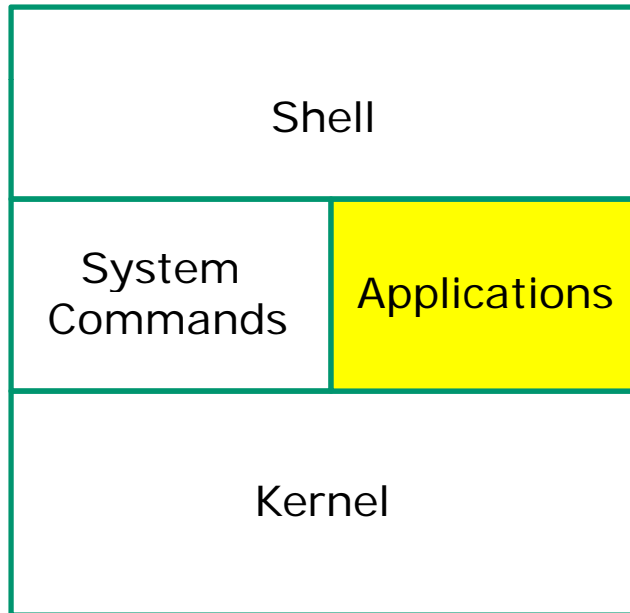


- 100's of system commands and utilities .
- Commands like **ls** (list directories), **cat** (print a file), **rm** (remove a file), ... etc.
- Utilities like **vi** (text editor), **sort** (sorts file contents), **find** (searches), ... etc.
- Larger utilities like **sendmail** (email), **tar** (backup),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



UNIX/Linux Architecture

Applications

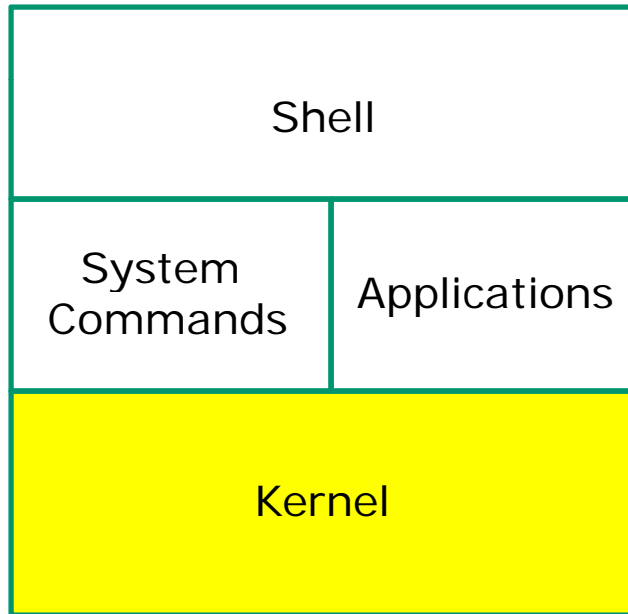


- Could be included in the distribution or optionally installed.
- Could be an add-on program developed by an ISV (Independent Software Vendor) or Open Source organization.
- Could be an in-house developed custom application.
- Examples are **Apache** (web server), **GIMP** (GNU image manipulation program),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



UNIX/Linux Architecture

Kernel



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



UNIX/Linux Design “Observations”

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

Course Lingo

Some lingo for this class

- ❖ "**VM**" = a virtual machine
- ❖ "**machine**" = the hardware portion of a computer
- ❖ "**system**" = a computer (hardware and software)
- ❖ "**host**" = a computer or system on the network
- ❖ "**OS**" = Operating System
- ❖ "**distro**" = a distribution of Linux, e.g. Red Hat, SUSE, Ubuntu.
- ❖ "**SSH**" = secure shell
- ❖ "**shell**" = The user interface to UNIX/Linux
- ❖ "**SSH into Opus**" = use Putty if on Windows or the ssh command if on Linux to connect to Opus.
- ❖ "**Putty into Opus**" = run the Putty program on windows and connect remotely using SSH to the computer on campus named Opus.cabrillo.edu
- ❖ "**revert a VM to it's snapshot**" = restore a VM back to the original pristine state. This undoes any configuration changes, VMware settings and restores the contents of the hard drive(s)
- ❖ "**start up a VM**" = the same as powering up any computer, first the BIOS runs, then the OS is loaded, then services are started

Some lingo for this class

- ❖ "**VMware or VirtualBox host**" = the physical computer that all the VMs are running on.
- ❖ "**VMware or VirtualBox guest**" = the virtual machine running on the VMware host.
- ❖ "**Guest OS**" = the operating system running on the VM.
- ❖ "**console**" = a local terminal for entering commands. No scrollbars.
- ❖ "**virtual terminal**" = when using a local console there are a number of virtual terminals that can be used. Ctrl-Alt-F n , where $n=1$ to 7 will bring up different terminals. For example, Ctrl-Alt-F2 brings up tty2. These terminals have no scroll bars.
- ❖ "**tty**" = a teletype, very early and noisy way to interact with a computer. A teletype had a keyboard and a printer and was connected to a computer. The virtual terminals are named tty1, tty2, etc.
- ❖ "**graphical terminal**" = A terminal program that can be run on a graphical desktop. These terminals have scroll bars.
- ❖ "**bring up tty2**" - bring up the tty2 console by pressing Ctrl-Alt-F2 keys at the same time

Using Linux

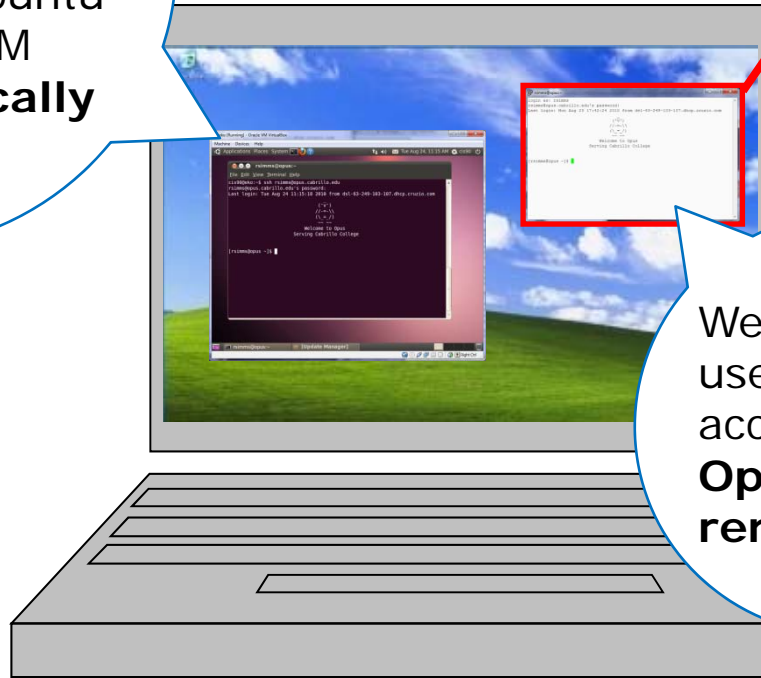
Using Linux systems

Local and remote access

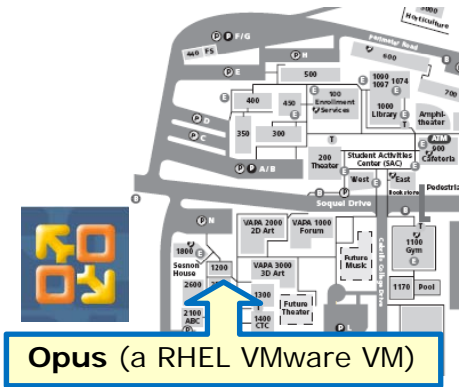
Most of the time in this course we will be using Opus



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



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



SSH is a network protocol that enables secure connections between computers

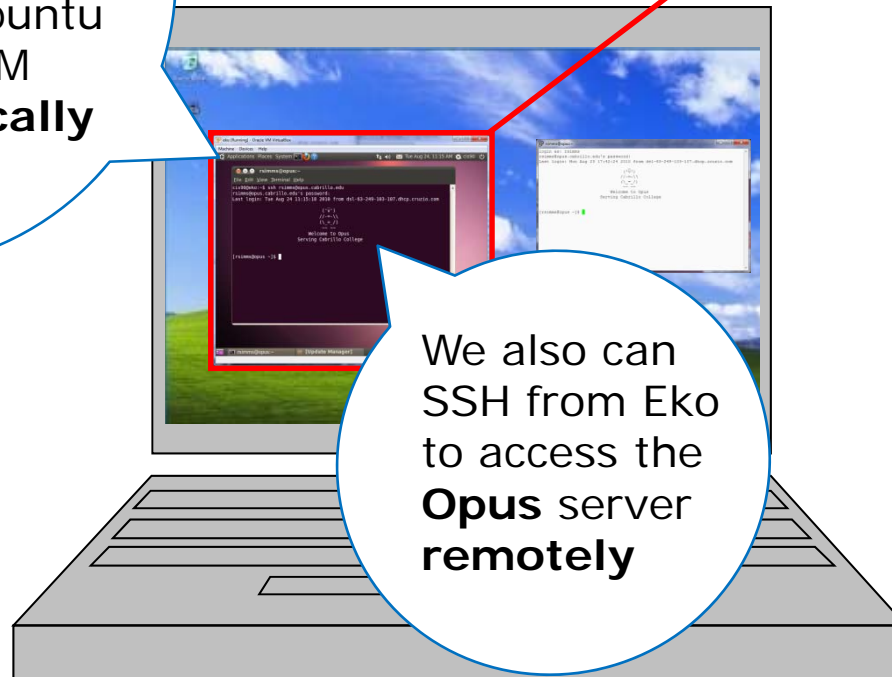
Using Linux systems

Local and remote access

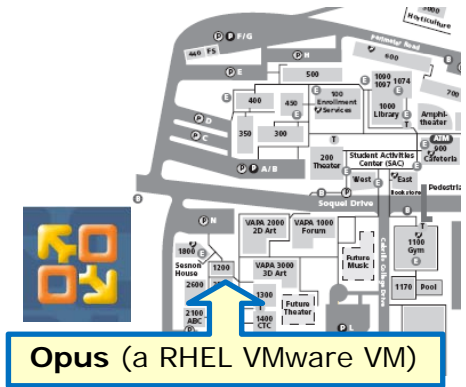
Most of the time in this course we will be using Opus



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



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



SSH is a network protocol that enables secure connections between computers

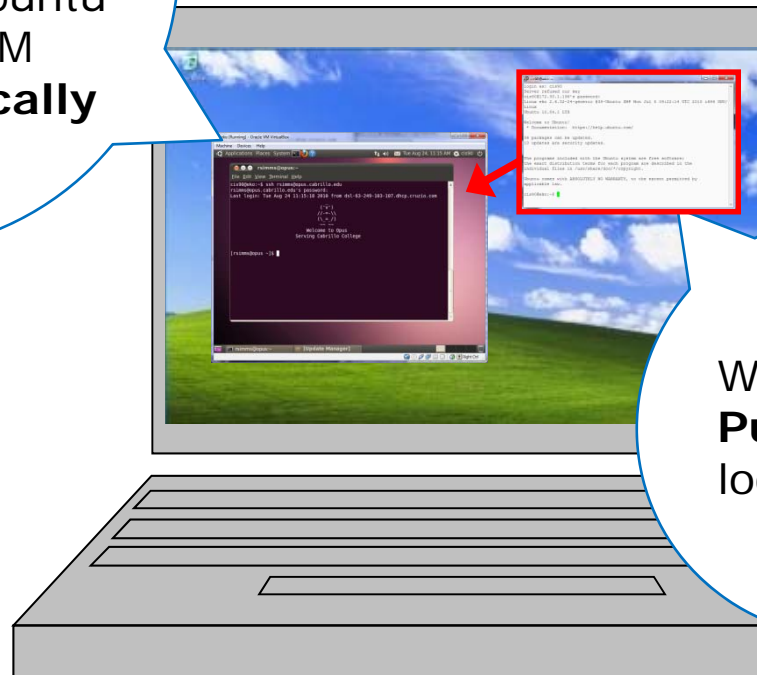
Using Linux systems

Local and remote access

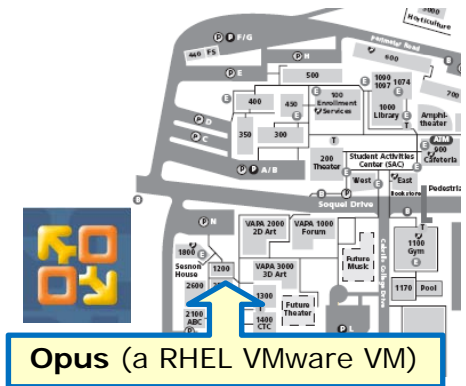
Most of the time in this course we will be using Opus



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



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



SSH is a network protocol that enables secure connections between computers



Installing SSH (Putty) at Home

Accessing UNIX/Linux systems over the network

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



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

Installing SSH (Putty) at Home On Windows Systems

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

Rich's Cabrillo College CIS Classes Resources

Home **Resources** Forums CIS Lab CTC

Login
Flashcards
Admin

CIS 90
Previous Classes

11 days till term starts!

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

Links

Instructors

- [Linux Master Jim](#)
- [Programming Master Ed](#)
- [Network Master Gerlinde](#)
- [Network Master Rick](#)
- [Web Master John](#)
- [Windows Master Gary](#)

Clubs

- [GNU Linux Users Group](#)

Departments

- [CNSA](#)
- [CIS](#)
- [CS](#)

Crib Sheets

- [Ollie Wright \(CIS 90\)](#)

Documentation

Getting Linux

- [Linux ISOs](#)
- [Kernels](#)
- [RPMs \(rpmfind\)](#)
- [RPMs \(pbone\)](#)

Tools and Software

- [Apache](#)
- [Bastille](#)
- [cygwin](#)
- [DOS boot disks](#)
- [Dynamips/Dynagen](#)
- [John the Ripper](#)
- [MSDN Academic Alliance](#)
- [Netfilter](#)
- [Putty SSH Tools](#)
- [Quagga routing suite](#)
- [Tripwire](#)
- [VirtualBox](#)
- [VMware Server](#)
- [Wireshark](#)

Student Howtos

- [NFS](#)
- [NIS](#)
- [PPP](#)
- [Putty SSH Keys](#)
- [sed](#)
- [Making an ethernet cable by Michael George](#)
- [Home VM access via Linksys router by Marc Romansky](#)
- [Putty to VMs by Marc Romansky](#)
- [Installing VirtualBox by Marcos Valdebenito](#)
- [Linux Permissions by Michael Wicherski](#)
- [Guide to /bin/mail](#)

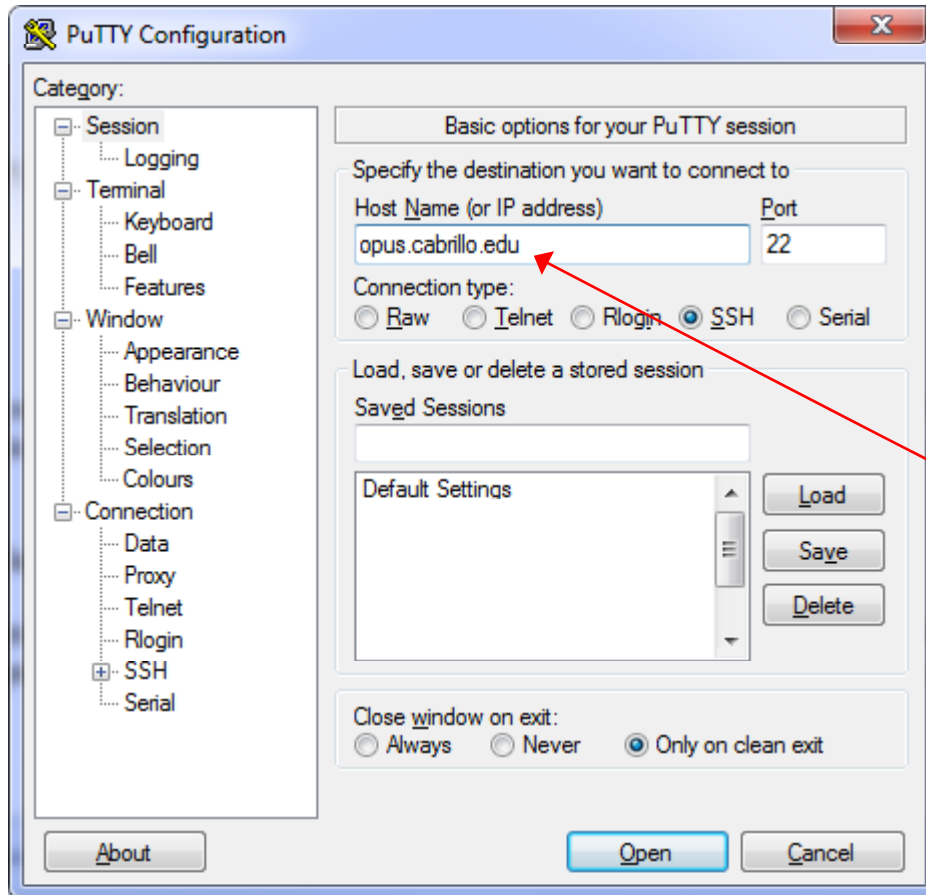
On the course website, first click on the Resources link, then click on the Putty SSH Tools link

Installing SSH (Putty) at Home On Windows Systems

The screenshot shows a web browser window at the URL <http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>. The page title is "PuTTY Download Page". It contains a list of links: Home, Licence, FAQ, Docs, Download, Keys, Links, Mirrors, Updates, Feedback, Changes, Wishlist, and Team. Below the links, it says "Here are the PuTTY files themselves:" followed by a bulleted list of files: PuTTY (the Telnet and SSH client itself), PSCP (an SCP client), PSFTP (an SFTP client), PuTTYtel (a Telnet-only client), Plink (a command-line interface), Pageant (an SSH authentication agent), and PuTTYgen (an RSA and DSA key generation utility). A callout box with a red arrow pointing to the "putty.exe" link in the "Binaries" section contains the text: "Click on the **putty.exe** link and download to your desktop or a folder where you can find it." The "Binaries" section lists the latest release version (beta 0.60) and provides download links for PuTTY, PuTTYtel, and PSCP, each with options for FTP, RSA signature, and DSA signature. The browser's address bar and tabs are visible at the bottom.

Installing SSH (Putty) at Home

On Windows Systems



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

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

Class Exercise for Online Students Installing PuTTY

Install PuTTY at home on Windows:

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

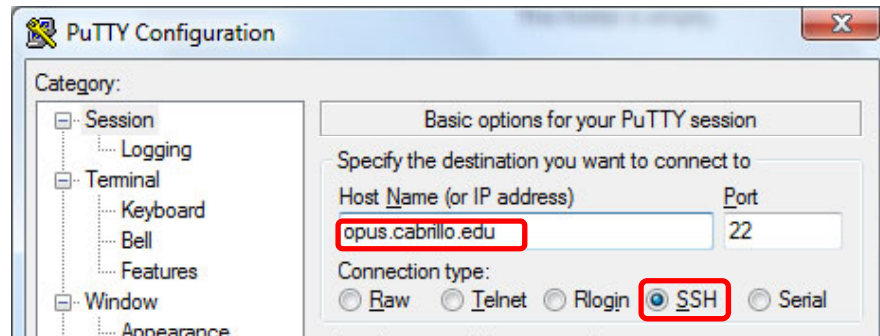
PuTTY is a program that can be installed on Microsoft Windows to securely access a remote computer. PuTTY uses the SSH network protocol to encrypt all connections between computers.

Remote Access

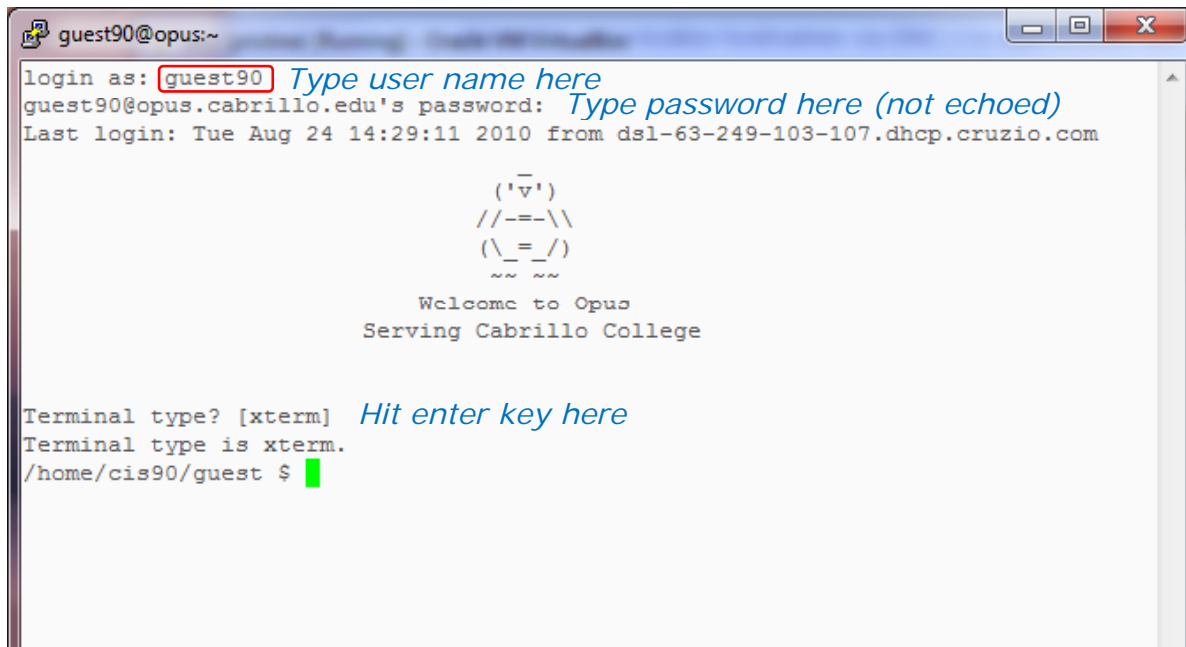
Remote access to Opus (from Windows) with PuTTY



Putty icon on Windows desktop



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

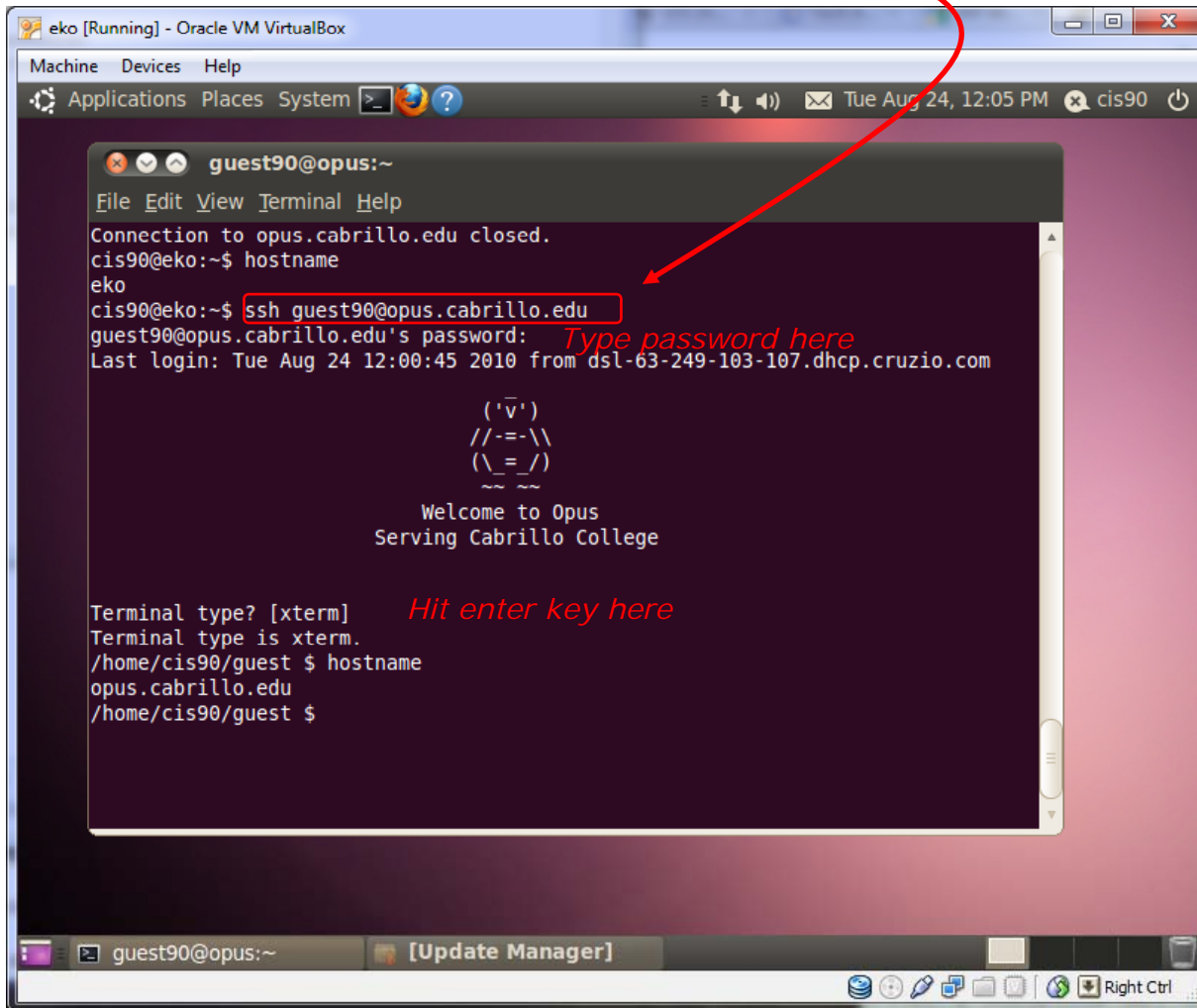


Opus is Linux server located in building 1200 on campus

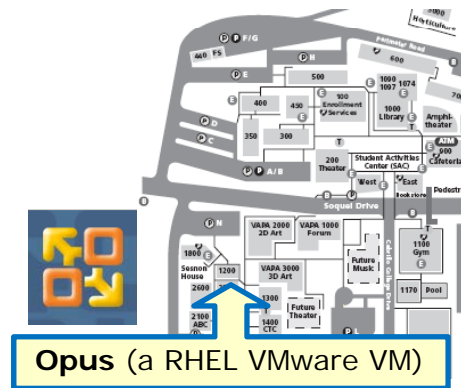


Opus (a RHEL VMware VM)

Remote access to Opus (from Linux) using SSH command
`ssh guest90@opus.cabrillo.edu`



*Opus is Linux server
located in building
1200 on campus*



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

```
login as: guest90 Type user name here  
guest90@opus.cabrillo.edu's password: Type password here (not echoed)  
Last login: Tue Aug 24 14:29:11 2010 from dsl-63-249-103-123.dhcp.cruzio.com
```

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

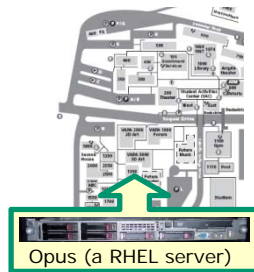
```
Terminal type? [xterm] Hit enter key here  
Terminal type is xterm.  
/home/cis90/guest $
```

 *Prompt string on Opus for CIS 90*

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

Telnet vs SSH (Secure Shell)

Remote computer



SSH is a network protocol that enables secure connections between computers

Sniffer view of a Telnet session

Telnet - all clear text

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

Sniffer view of a SSH session

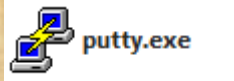
SSH - encrypted

With ssh, it is encrypted.

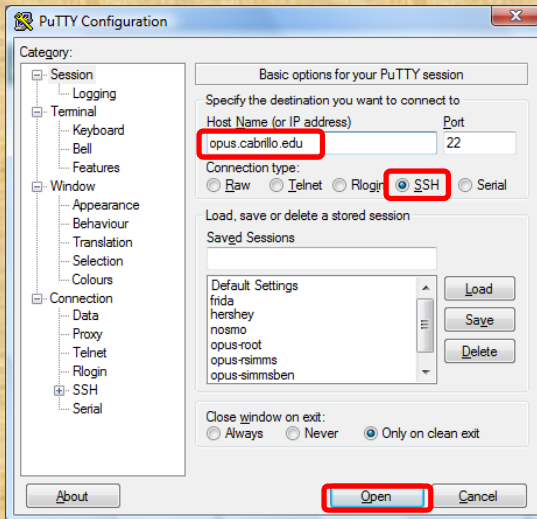
username
password
cat secret
exit



Local computer

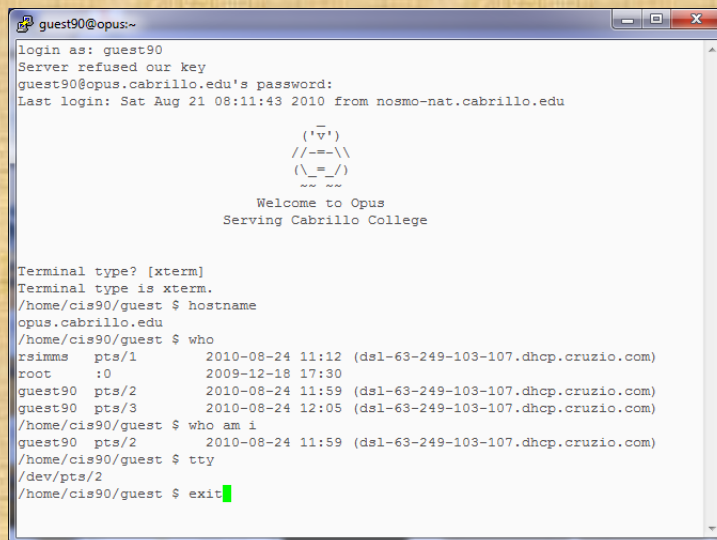


Class Exercise Remote access to Opus



Access Opus with PuTTY:

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



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

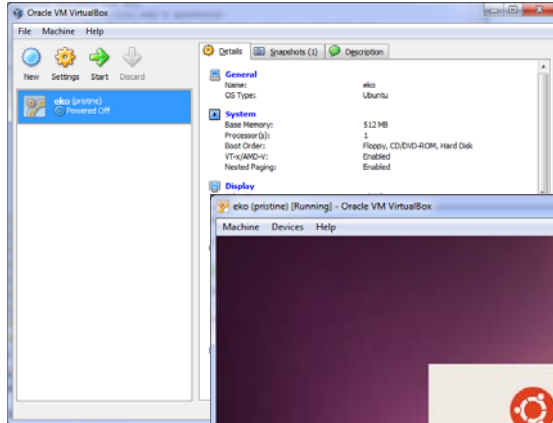
Local Access



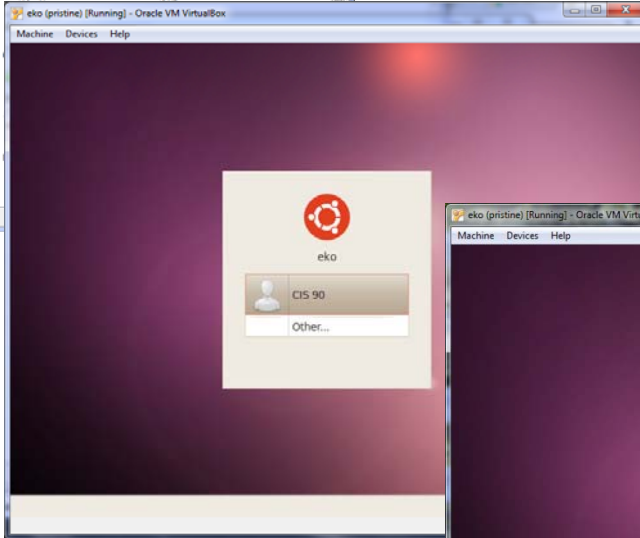
Start VirtualBox using desktop icon or Start menu

Local access to the Ubuntu Linux VM named Eko

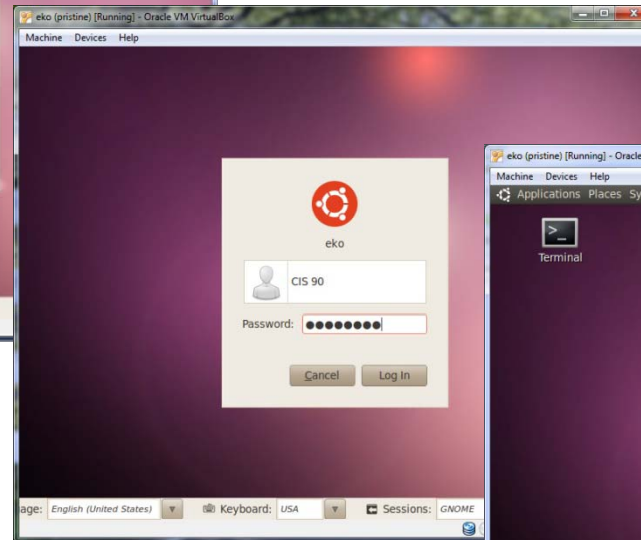
VirtualBox and the Eko VM are installed on all class and lab systems.



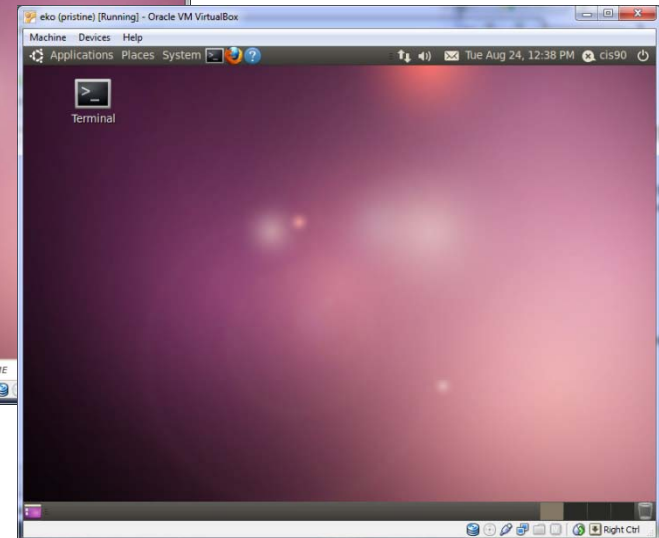
Select Eko VM then click green start arrow button



Select CIS 90 user

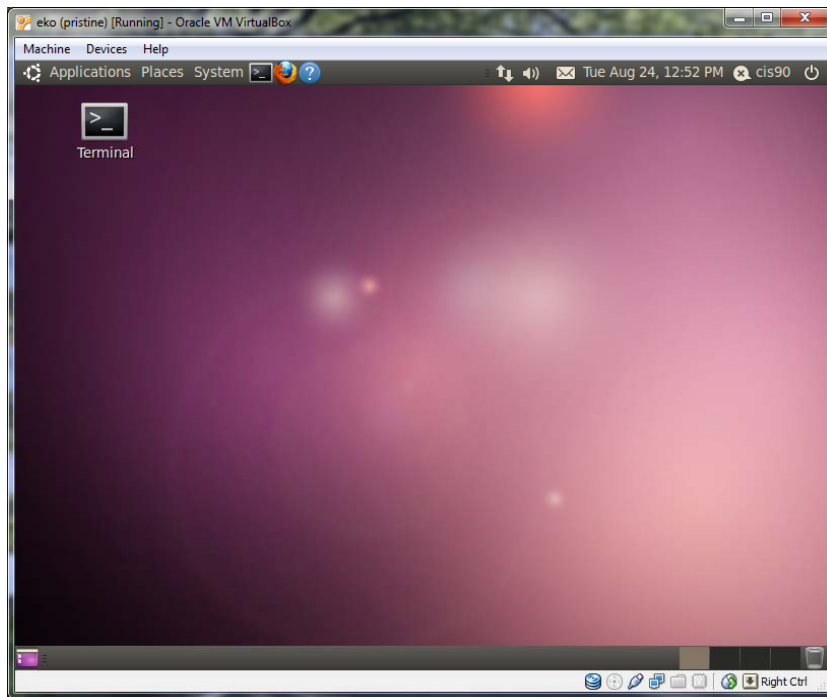


Enter password

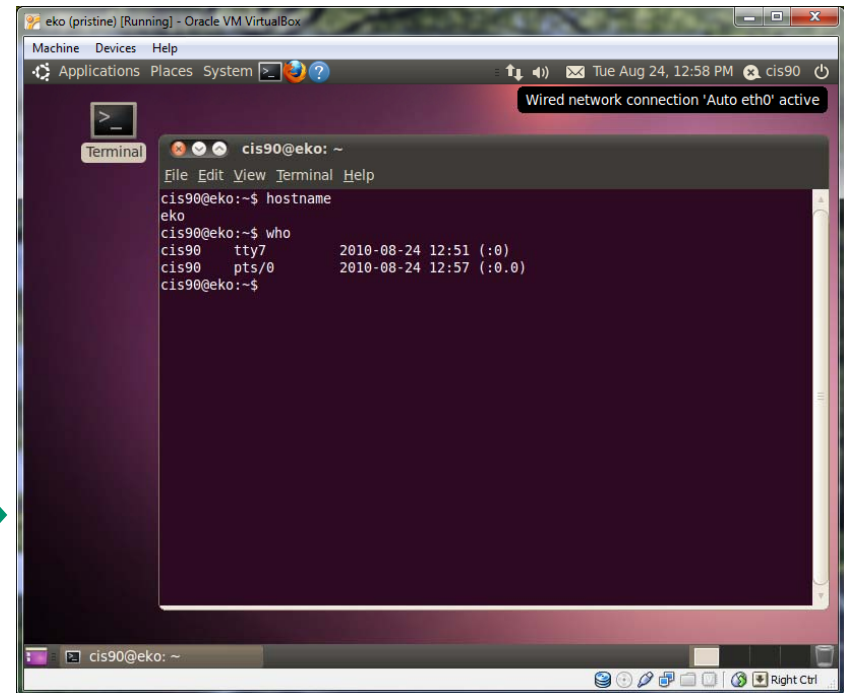


The Eko VM can be used at home. See the Howto "Bringing the Eko VM home" on the website's Resources page

Bringing up a graphical terminal window

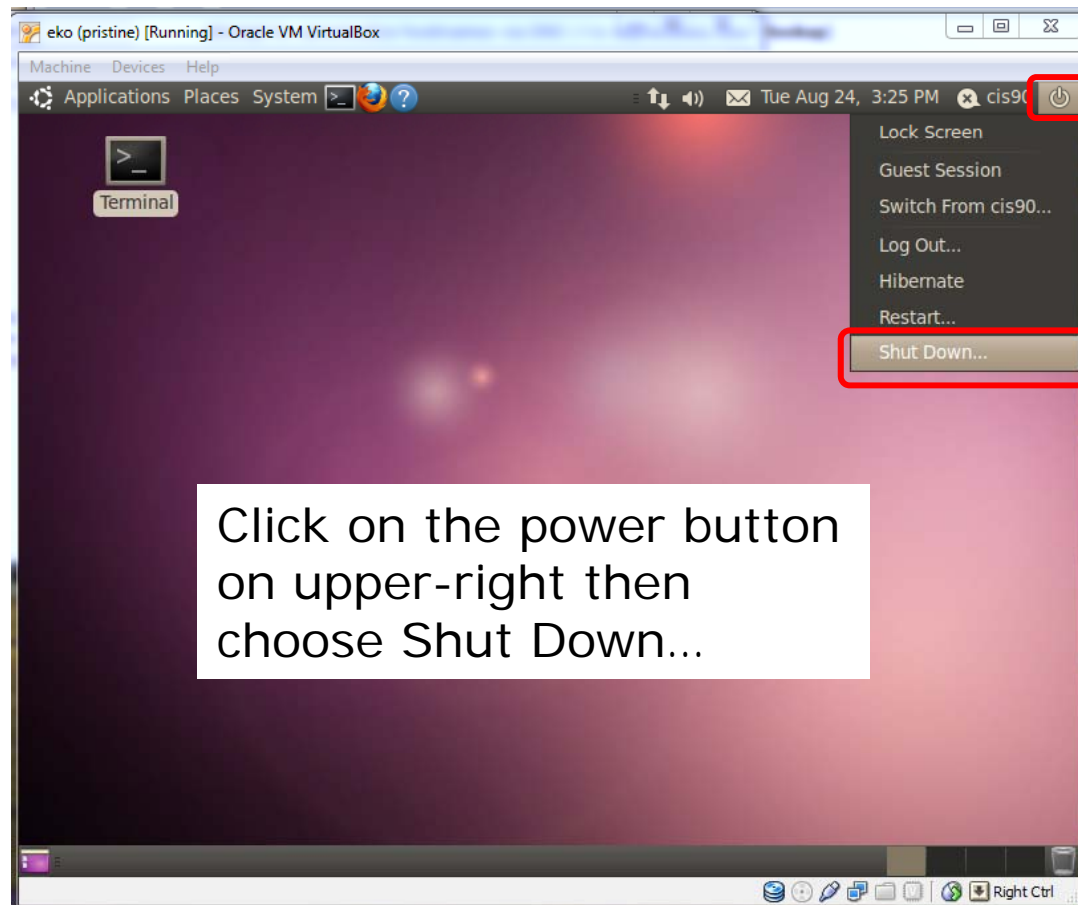


Open graphical terminal on Eko by double clicking on Terminal icon



Type commands into graphical terminal window

Shutting down the Ubuntu VM Eko



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

Equipment

Lab Resources

CIS Lab now in the CTC Building 1400

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



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

Commands

who

show who is logged on

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

Username

Terminal devices

Date and time of login

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

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

who show who is logged on

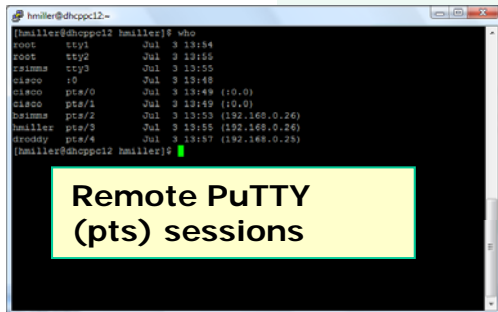
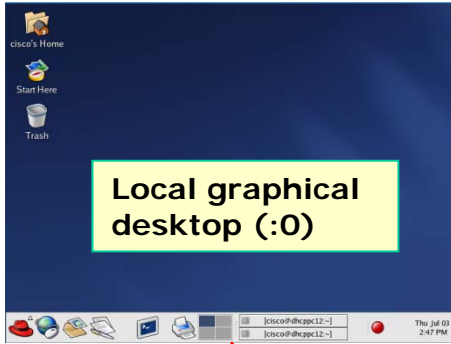
```
[root@dhcppc12 root]# who
root    tty1    Jul 3 13:54
root    tty2    Jul 3 13:55
rsimms  tty3    Jul 3 13:55
cisco   :0      Jul 3 13:48
cisco   pts/0   Jul 3 13:49 (:0.0)
cisco   pts/1   Jul 3 13:49 (:0.0)
bsimms  pts/2   Jul 3 13:53 (192.168.0.26)
hmllder pts/3   Jul 3 13:55 (192.168.0.26)
droddy  pts/4   Jul 3 13:57 (192.168.0.25)
[root@dhcppc12 root]#
```

Local virtual terminal (tty)

```
cisco@dhcppc12:~$ who
[cisco@dhcppc12 cisco]$ who
root    tty1    Jul 3 13:54
root    tty2    Jul 3 13:55
rsimms  tty3    Jul 3 13:55
cisco   :0      Jul 3 13:48
cisco   pts/0   Jul 3 13:49 (:0.0)
cisco   pts/1   Jul 3 13:49 (:0.0)
bsimms  pts/2   Jul 3 13:53 (192.168.0.26)
hmllder pts/3   Jul 3 13:55 (192.168.0.26)
droddy  pts/4   Jul 3 13:57 (192.168.0.25)
[cisco@dhcppc12 ~]$
```

Local graphical terminals on graphical desktop (pts)

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



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

who (continued)

various who command options

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

Idle time

Process ID

```
[rsimms@frida rsimms]$ who -Hu
```

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

```
[rsimms@frida rsimms]$ who -q
```

```
root root rsimms cisco cisco cisco bsimms hmiller droddy
# users=9
```

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

id

show information about yourself or another user

Primary group

All groups a member of

```
[simmsben@opus ~]$ id
uid=1160(simmsben) gid=103(cis90) groups=100(users),103(cis90)
context=user_u:system_r:unconfined_t
```

```
[simmsben@opus ~]$ id root
uid=0(root) gid=0(root)
groups=0(root),1(bin),2(daemon),3(sys),4(adm),6(disk),10(wheel)
context=user_u:system_r:unconfined_t
```

May specify another user

SELinux identity, role and type

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

clear

clear the terminal display

```
rsimms@opus:~$ cat /etc/passwd | grep pts
0 pts/35 2010-05-19 15:34 14954 id=s/35 term=0 exit=
0 pts/36 2010-05-19 15:47 9037 id=s/36 term=0 exit=
0
[rsimms@opus ~]$
[rsimms@opus ~]$
[rsimms@opus ~]$
[rsimms@opus ~]$
[rsimms@opus ~]$ who -Hu
NAME LINE TIME IDLE PID COMMENT
rsimms pts/1 2010-08-24 11:12
root :0 2009-12-18 17:30
[rsimms@opus ~]$ who -Hi
who: Warning: -1 will be removed in a
NAME LINE TIME
rsimms pts/1 2010-08-24 11:12
root :0 2009-12-18 17:30
[rsimms@opus ~]$ who -H
NAME LINE TIME
rsimms pts/1 2010-08-24 11:12
root :0 2009-12-18 17:30
[rsimms@opus ~]$ clear
```

```
rsimms@opus:~$
```

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

hostname

show the name of the current computer

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

*Connected to Opus
using PuTTY*

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

*Connected to Eko using
PuTTY*

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

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

*In the DOS command
prompt on Windows*

cal

show calendar

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

```
June 2008
```

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

If month and year not specified then current month is shown

```
[simmsben@opus ~]$ cal 9 2001
```

```
September 2001
```

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

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

cal show calendar

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

```

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

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

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

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

```

*Specify just the
year to see all 12
months*

ps

show active processes

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

```
[simmsben@opus ~]$ ps
  PID TTY          TIME CMD
 9444 pts/1        00:00:00 bash
10276 pts/1        00:00:00 ps
```

The diagram illustrates the output of the `ps` command. It shows a table with four columns: PID, TTY, TIME, and CMD. Callout boxes with arrows point to each column to explain its meaning:

- Process ID**: Points to the PID column.
- Controlling terminal devices being used to run process**: Points to the TTY column.
- Cumulative CPU time used**: Points to the TIME column.
- Name of the command being run**: Points to the CMD column.
- bash is the name of the shell you are using**: Points to the 'bash' command in the first row.

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

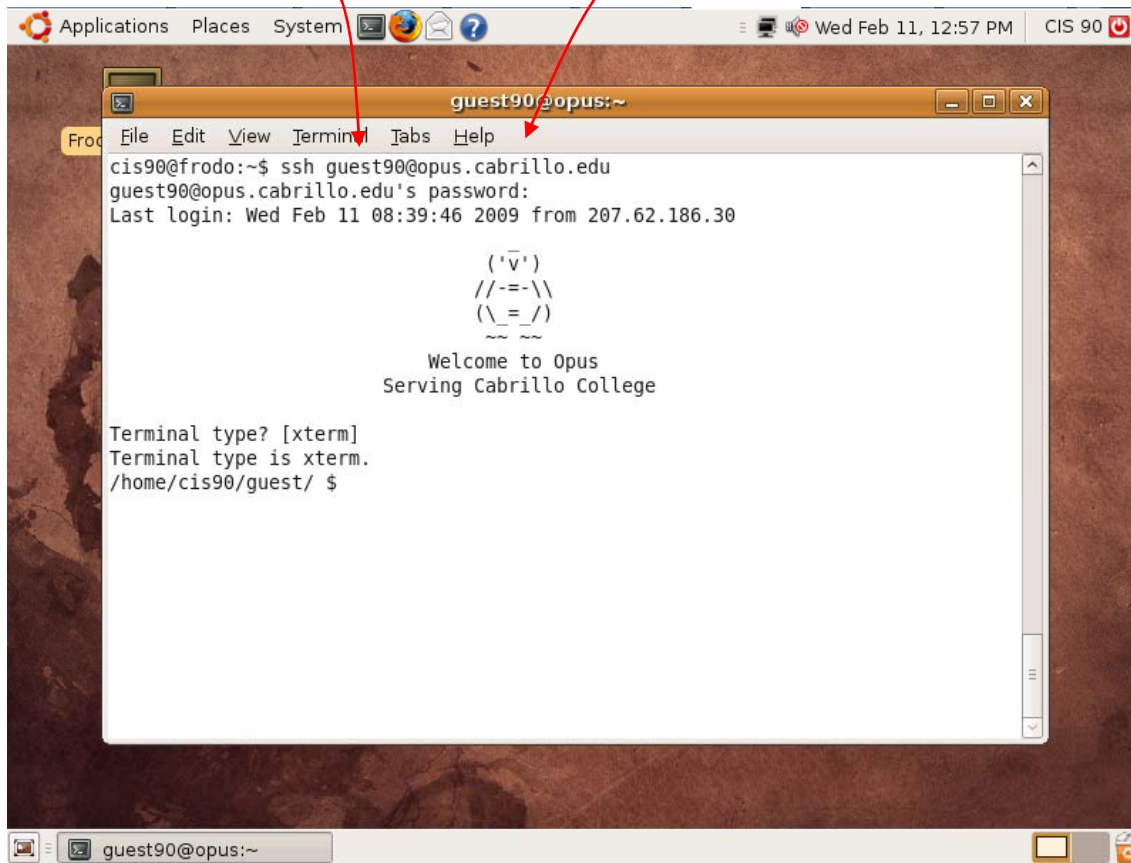
ssh *user@host*

login to a remote system

ssh guest90@opus.cabrillo.edu

user is guest90

host is opus.cabrillo.edu



```
Applications  Places  System  Wed Feb 11, 12:57 PM  CIS 90
guest90@opus:~
File Edit View Termin Tabs Help
cis90@frodo:~$ ssh guest90@opus.cabrillo.edu
guest90@opus.cabrillo.edu's password:
Last login: Wed Feb 11 08:39:46 2009 from 207.62.186.30

      ( '~ ' )
     //  --  \\
    ( \  _  / )
     ~ ~ ~ ~

  Welcome to Opus
  Serving Cabrillo College

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

ssh *user@host* login to a remote system

user is rsimms

host computer is opus.cabrillo.edu

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

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

[rsimms@opus ~]$
```

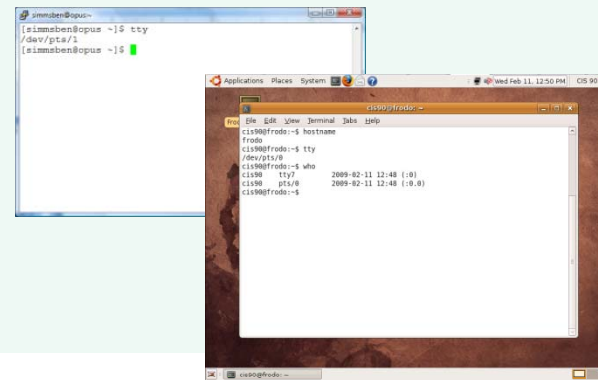
*first time you
login you will
get this
message, type
yes to
continue*

tty

show which terminal is being used for session

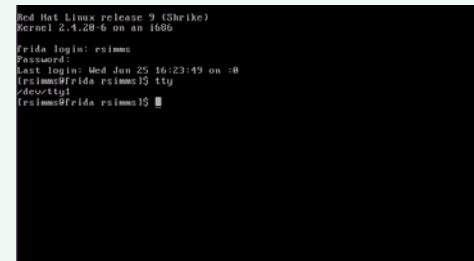
```
[simmsben@opus ~]$ tty  
/dev/pts/1
```

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



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

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



uname

show name of the operating system

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

uname shows the name of the operating system

history

show command history

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

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

Histories are merged when user has logged off them.

/sbin/ifconfig

show network interface status

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

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

cis192@frodo:~$
```

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

exit

terminate shell and log off

```
partide VMware Remote Console - Devices
Red Hat Linux release 9 (Shrike)
Kernel 2.4.20-6 on an i686

partide login: rsimms
Password:
[rsimms@partide rsimms]$ tty
/dev/tty1
[rsimms@partide rsimms]$ id
uid=500(rsimms) gid=500(rsimms) groups=500(rsimms)
[rsimms@partide rsimms]$ uname
Linux
[rsimms@partide rsimms]$ hostname
partide
[rsimms@partide rsimms]$ ps
  PID TTY          TIME CMD
 10197 tty1      00:00:00 bash
 10243 tty1      00:00:00 ps
[rsimms@partide rsimms]$ exit
```

```
partide VMware Remote Console - Devices
root@partide:~
[root@partide root]# uname
Linux
You have new mail in /var/spool/mail/root
[root@partide root]# hostname
partide
[root@partide root]# id
uid=0(root) gid=0(root) groups=0(root),1(bin),2(daemon),3(sys),4(adm),6(disk),10(wheel)
[root@partide root]# tty
/dev/pts/0
[root@partide root]# ps
  PID TTY          TIME CMD
 3546 pts/0      00:00:00 bash
10161 pts/0      00:00:00 ps
[root@partide root]# cal
      July 2008
Su Mo Tu We Th Fr Sa
 1  2  3  4  5
 6  7  8  9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30 31
[root@partide root]# exit
```

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

```
partide VMware Remote Console - Devices
Red Hat Linux release 9 (Shrike)
Kernel 2.4.20-6 on an i686

partide login: _
```



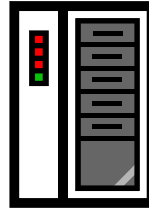
The shell is closed and your screen text or terminal window disappears

Navigating Terminals

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

/dev/pts/3 (Putty)

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



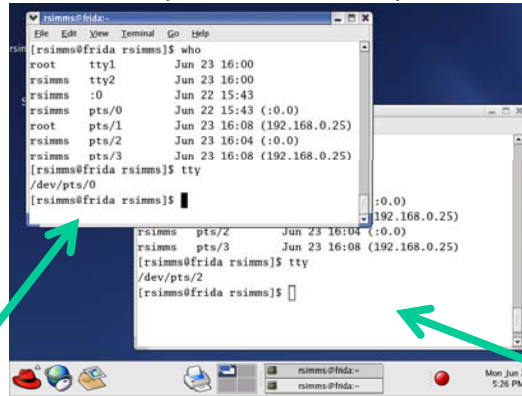
/dev/tty/2 (Ctrl-Alt-F2)

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

```
rsimms@frida:~$ ps
PID TTY          TIME CMD
3369 pts/1      00:00:00 bash
3592 pts/1      00:00:00 ps
rsimms@frida:~$
```

/dev/pts/1 (Putty)

:0 (Ctrl-Alt-F7)



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

/dev/pts/0

/dev/pts/2

Output from who command:

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

Notes:

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

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

The screenshot displays a VMware Server Console window titled "Local host - VMware Server Console". Inside, there are three virtual machines (VMs) running:

- 8396-II (Win 2003):** A Windows XP desktop environment. A "Command Prompt" window (1) shows the command `hostname` resulting in `8396-ii`. A "VM Remote Control Client" window (6) is also visible.
- Frida (RH9):** A Linux desktop environment. A terminal window (4) shows the command `hostname` resulting in `frida.localdomain`.
- Opus (RHEL5):** A Linux desktop environment. A terminal window (5) shows the command `who` resulting in:

```
rsimms pts/0      2008-07-03 10:52 (dsl-63-249-86-11.cruzio.c  
rsimms pts/1      2008-07-03 15:56 (dsl-63-249-86-11.cruzio.c
```

and the command `hostname` resulting in `opus.cabrillo.edu`.

The VMware console title bar and taskbar at the bottom indicate the host is "Local host" and the current VM is "rsimms@opus:~".

8396-II
(Win 2003) ? ?

Frida
(RH9) ? ?

Opus
(RHEL5) ? ?

Use hostname command to know for sure

The screenshot displays a VMware Server 1.0.5 console with three virtual machines (VMs) running. The desktop background is blue with icons for 'My Documents', 'My Computer', 'Virtual Server Administrator', 'VM Remote Control Client', and 'VMware Services'. A 'Command Prompt' window (labeled 1) shows the command 'hostname' being executed on the 8396-II VM, resulting in the output '8396-ii'. A terminal window (labeled 2) shows the command 'hostname' being executed on the Opus (RHEL5) VM, resulting in the output 'opus.cabrillo.edu'. Another terminal window (labeled 3) shows the command 'hostname' being executed on the Frida (RH9) VM, resulting in the output 'opus.cabrillo.edu'. A third terminal window (labeled 4) shows the command 'hostname' being executed on the Frida (RH9) VM, resulting in the output 'frida.localdomain'. A fourth terminal window (labeled 5) shows the 'who' command being executed on the Opus (RHEL5) VM, resulting in the output 'rsimms pts/0 2008-07-03 10:52 (dsl-63-249-86-11.cruzio.c' and 'rsimms pts/1 2008-07-03 15:56 (dsl-63-249-86-11.cruzio.c', followed by the 'hostname' command being executed on the Opus (RHEL5) VM, resulting in the output 'opus.cabrillo.edu'. A sixth terminal window (labeled 6) shows the 'hostname' command being executed on the 8396-II VM, resulting in the output '8396-ii'. The VMware Server 1.0.5 console window shows the VMs 'frida', 'router', 'centos', 'ulysses', and 'william'.

8396-II
(Win 2003)

1 6

Frida
(RH9)

3 4

Opus
(RHEL5)

2 5

Wrap up

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

Rich's Cabrillo College CIS Classes
CIS 90 Calendar

Home Resources Forums CIS Lab CTC

Login
Flashcards
Admin

CIS 90
Previous Classes

6 days till term starts!

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

CIS 90 (Fall 2010) Course Calendar

Course Home Grades
(content subject to change)

| Lesson | Date | Topics | Chapter | Due |
|--------|------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------|
| 1 | 9/1 | <p>Class and Linux Overview</p> <ul style="list-style-type: none"> 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 <p>Materials</p> <ul style="list-style-type: none"> How this class works (download) Presentation slides (download) Logins Sheet (download) Howto #103: Installing PUTTY (download) Howto #301: Bringing the Eko VM home (download) <p>Assignment</p> <ul style="list-style-type: none"> Student Survey Lab 1 <p>CCC Confer</p> <ul style="list-style-type: none"> Enter virtual classroom Class archives | 1.1-1.15 (Gillay) | |
| 2 | 9/8 | <p>Quiz 1</p> <p>Commands</p> <ul style="list-style-type: none"> 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 <p>Materials</p> <ul style="list-style-type: none"> Presentation slides (download) Howto #106: Configuring Putty (download) <p>Assignment</p> <ul style="list-style-type: none"> Lab 2 <p>CCC Confer</p> <ul style="list-style-type: none"> Enter virtual classroom Class archives | 2.3-2.7 2.11 3.7-3.20 4.19-4.22 9.1-9.2 (Gillay) | Lab 1 Student Survey |
| | 9/10 | Last day to add CIS 90 | | |

http://simms-tech.com/docs/cis90/cis90lab01.pdf

CIS 90 Linux Lab Exercise
Lab 1: Accessing the Linux Operating System
Fall 2010

Lab 1: Accessing the Linux Operating System

This lab takes a look at UNIX through an online experience on a Red Hat Enterprise server and an Ubuntu Linux client. In this lab, you will:

1. Log on to a Linux system locally and remotely
2. Log on to a Linux system using both command-line and a graphical interface (GUI)
3. Start a terminal window session from a graphic desktop.
4. Start multiple sessions on a single system
5. Perform simple tasks using both commands and graphical icons
6. Exit from a login session

Forum
If you get stuck, have a question or want to share something you learned with this lab then

Downloading 1.06 MB of 117 MB

Please turn in the survey by then as well

New commands:

- | | |
|-------------------------------|--------------------------------------------------------|
| cal | - show calendars |
| clear | - clear the terminal screen |
| exit | - terminate your shell and log off |
| history | - show previous commands |
| hostname | - show the name of the computer being accessed |
| id | - show user and group id information |
| ifconfig | - show network interface info |
| ps | - show processes (loaded programs) being run |
| ssh | - secure login to a remote system |
| uname | - show OS name |
| tty | - show terminal information |
| who | - show who else is logged on |
| Ctrl-Alt-F1 to Ctrl-Alt-F7 | - Change between terminals and X windows (graphics) |

New Files and Directories:

VirtualBox:

- | | |
|------------|-------------------------------------|
| Right Ctrl | - to release mouse cursor out of VM |
|------------|-------------------------------------|

Next Class

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

**Lab 1
& Survey**

Quiz questions for next class:

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

Backup