



## Rich's lesson module checklist

*Last updated 02/02/2019*

- ☐ During FLEX week
  - ☐ Update website and Canvas
    - ☐ Lesson 1, Lab 1, survey, PW sheet, other supplemental materials posted
  - ☐ Canvas course and module 1 published for interested students to review
  - ☐ Login credentials document updated and secured
- ☐ Day before first class
  - ☐ Send out welcome email
  - ☐ Reset permissions on answers/
  - ☐ Change website to show "Term days left"
  - ☐ Accounts
    - ☐ Opus-II (with TBDs for walk-ins) and populated
    - ☐ VLab, Aryas, Scavenger systems, Lights XC, Netlab+, Home-ZeroW, Daughter & Son
    - ☐ Mugshot slide updated
    - ☐ VLab VM assignment sheet updated and posted
  - ☐ Last forum archived, phpBB updated to latest version, new forum created with welcome post
  - ☐ Scavenger Hunt Lab 1
    - ☐ Tested (check Mac Freedom and log rotate issues)
    - ☐ Update and test grading script
    - ☐ Trekkie sample logins
- ☐ Scavenger monitor(Opus-ii:login-monitor) cronjob
- ☐ VLab monitor(Monitor:monitor-27.py) cronjob
- ☐ Rosters printed
- ☐ Add codes printed
- ☐ Flash cards
- ☐ 1<sup>st</sup> minute quiz
- ☐ Update Calendar page
- ☐ Backup slides, whiteboard slides, lab, credentials on flash drive
- ☐ Test and bring home-ZeroW
- ☐ Print out agenda slide and annotate page numbers
- ☐ Key card for classroom door

☐ <https://zoom.us>

- ☐ Putty + Slides + Chrome
- ☐ Enable/Disable attendee sharing
  - ^ > Advanced Sharing Options > Only Host
- ☐ Enable/Disable attended annotations
  - Share > More > Disable Attendee Sharing

## Before first class starts Everyone into the virtual room!

Rich's Cabrillo College CIS Classes  
CIS 90 Calendar

CIS 90 (Fall 2014) Calendar

Course Home | **Calendar**

**CIS 90**

Lesson	Date	Topics	Chapter
1	9/2	<b>Class and Linux Overview</b> <ul style="list-style-type: none"><li>Understand how this course will work</li><li>High-level overview of computers, operating systems, and virtual machines</li><li>Overview of UNIX/Linux market and architecture</li><li>Using SSH for remote network access</li><li>Using terminals and the command line</li></ul> <b>Mythbats</b> <ul style="list-style-type: none"><li>How to #143: Logging into OpenSUSE (GOWBORN2)</li></ul> <b>Assignments</b> <ul style="list-style-type: none"><li>Student Survey</li><li>Lab 1</li></ul> <b>CIS 90 Calendar</b>	1-10 2-4.5 6-12-13 p104-117 (Hahn)

**Presentation slides (download)**

**Enter virtual classroom**

1. Log into **Canvas**, read my Announcement and review the credentials document.
2. Go to: **<http://simms-teach.com>**
  - a) Click the **CIS 90** link.
  - b) Click the **Calendar** link.
  - c) Locate today's lesson.
  - d) Find the **Presentation slides** for Lesson 1 and **download** them for easier viewing.
  - e) Click the **Enter virtual classroom** link to join ConferZoom meeting.
3. If successful help another student in the room till everyone gets in!



## Before first class starts

Google

ConferZoom

Downloaded PDF of Lesson Slides. I like Foxit Reader so I can take notes by annotating the downloaded slides.

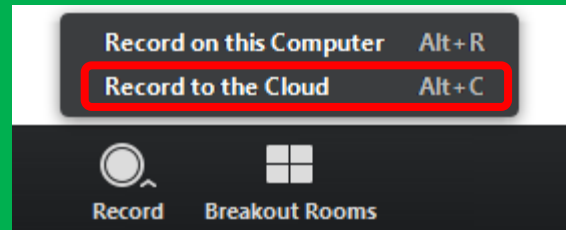
The screenshot shows a Zoom meeting interface. The main video area displays a white car with the text "Get into the car". The Zoom top bar indicates "Recording" and "View Options". The bottom bar shows controls like "Unmute", "Start Video", "Invite", "Participants", "Share Screen", "Chat", "Record", and "Leave Meeting". In the background, a web browser displays the "Rich's Cabrillo College CIS 90 Calendar" page, which includes a table of lessons. To the right, a PDF document titled "CIS 90 - Lesson 1" is open, showing a slide about "90 System Playground" with Ubuntu VMs.

CIS 90 website  
Calendar page

## Set up your computer as shown above

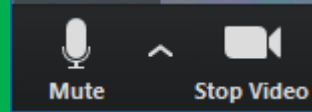
# Start





# Start Recording

Audio Check



Start Recording

# Audio & video Check

## Class and Linux Overview

### Objectives

- Understand how this course works
- Overview of computers and UNIX/Linux
- Learn how to login via ssh
- Learn first UNIX/Linux commands

### Agenda

- Introductions
- Why take this class
- How this class works
- Lab resources
- Computers
- UNIX/Linux Overview
- Logging in via SSH
- First login
- First commands
- Housekeeping
- Navigating systems
- Assignment
- Wrap up

# Introductions



# Introductions and Credits



Jim Griffin

- Created this Linux course
- Created Opus and the CIS VLab
- Jim's site:

<https://web.archive.org/web/20140209023942/http://cabrillo.edu/~jgriffin/>



Rich Simms

- HP Alumnus
- Started teaching this course in 2008 when Jim went on sabbatical
- Rich's site:

<http://simms-teach.com>

And thanks to:

- John Govsky for many teaching best practices: e.g. the First Minute quizzes, the online forum, and the point grading system. John's site: <http://teacherjohn.com/>
- Jaclyn Kostner for many webinar best practices: e.g. mug shot page.



Instructor: **Rich Simms**

Dial-in: **669-900-6833 (toll)**

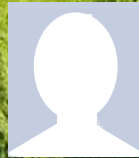
Meeting ID: **426 283 384**



Nick



Ryan



Erik



Matthew



David



Jon



Cheryl



Adina



Cody



Tanisha



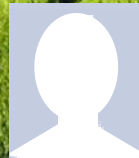
Daniel



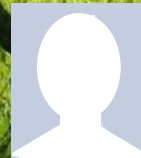
Ivan



Sequoia



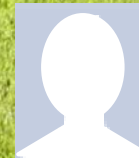
Scott



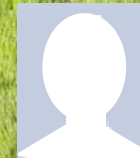
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Cole



Shane



Jim



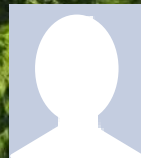
Mark



Joseph



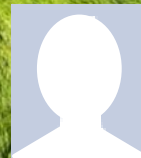
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Ohunayo



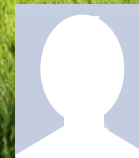
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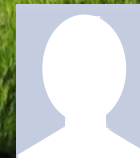
Evie



tbd



tbd



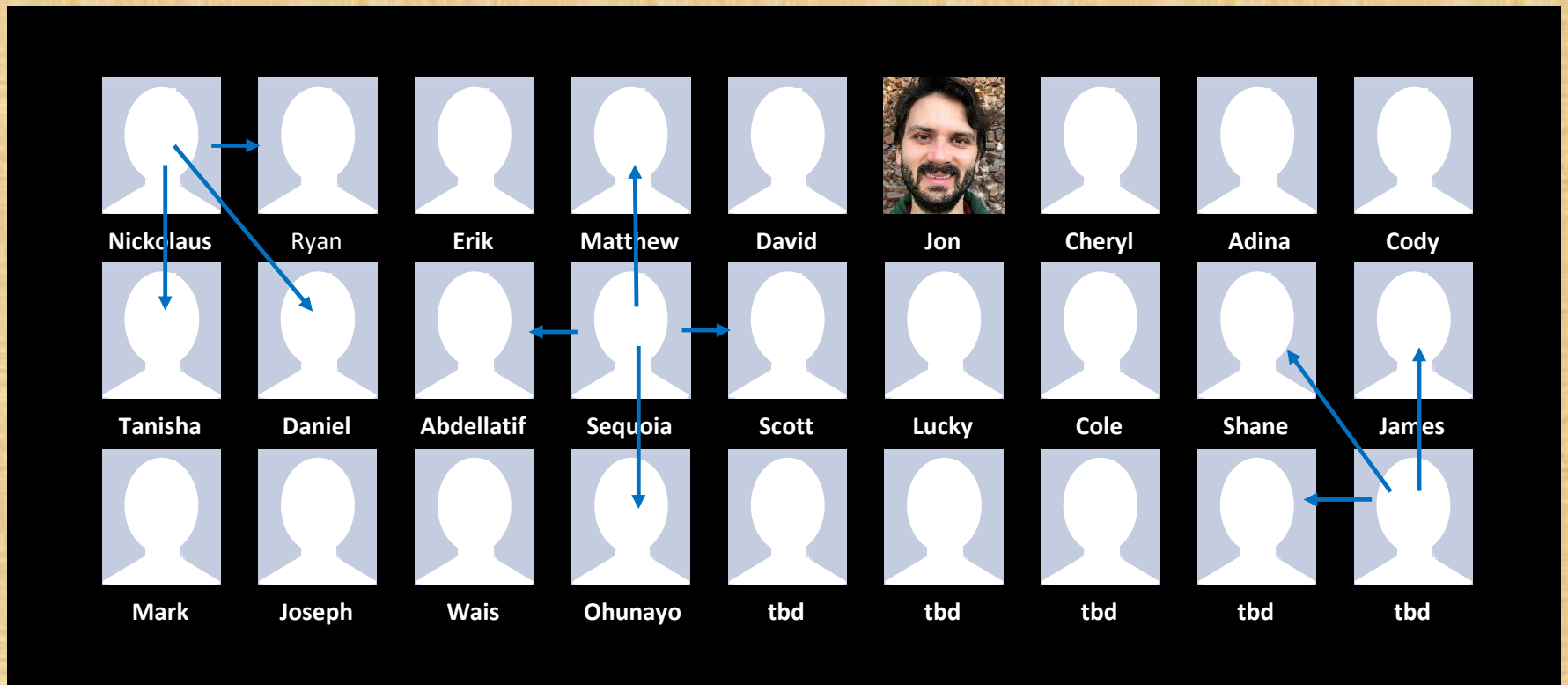
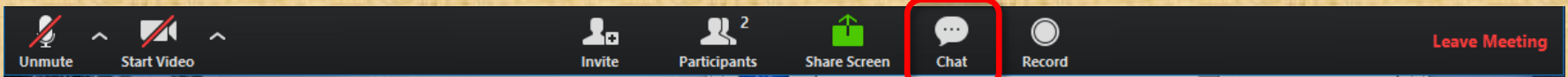
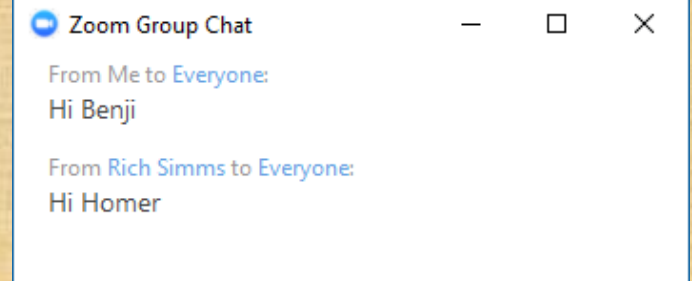
tbd



## ConferZoom Activity

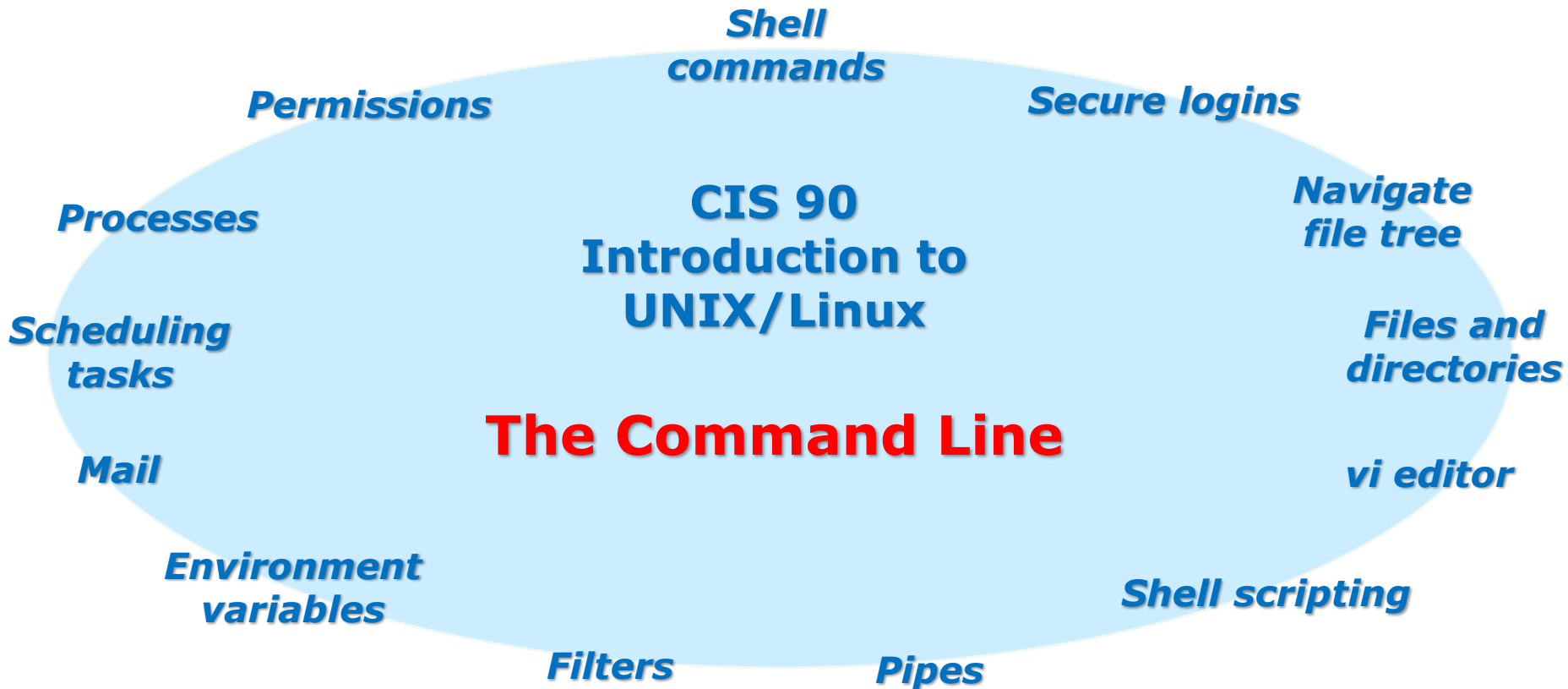
*Use the chat window in ConferZoom to say Hi to your adjacent "virtual classmates"*

*If your name is not listed above just chat Hi to anyone you want!*



# What is this class about?





### **Student Learner Outcomes**

1. Navigate and manage the UNIX/Linux file system by viewing, copying, moving, renaming, creating, and removing files and directories.
2. Use the UNIX features of file redirection and pipelines to control the flow of data to and from various commands.
3. With the aid of online manual pages, execute UNIX system commands from either a keyboard or a shell script using correct command syntax.

# How this class works

# Attending class

## How to attend class each week

- Wednesdays - 1:00PM to 4:05PM
  - Section 1 meets online in this virtual classroom
  - Section 2 meets simultaneously in room 828 on the Aptos Main Campus

Option 1: **Online “synchronous”** - from anywhere connect online to the "live" virtual classroom using ConferZoom. Use the “Enter virtual classroom” link on: <http://simms-teach.com/cis90calendar.php>

Option 2: **Traditional classroom** - drive to campus, find parking, hike to the 800 building and take a seat in the classroom.

Option 3: **Online archives “asynchronous”** - watch the archived class recording online using ConferZoom at a time that works for you. Use the “Class archives” link on: <http://simms-teach.com/cis90calendar.php>

*It doesn't matter which section you enrolled in. You can use **any** method of attending for **any** of the classes.*



# Attending Class

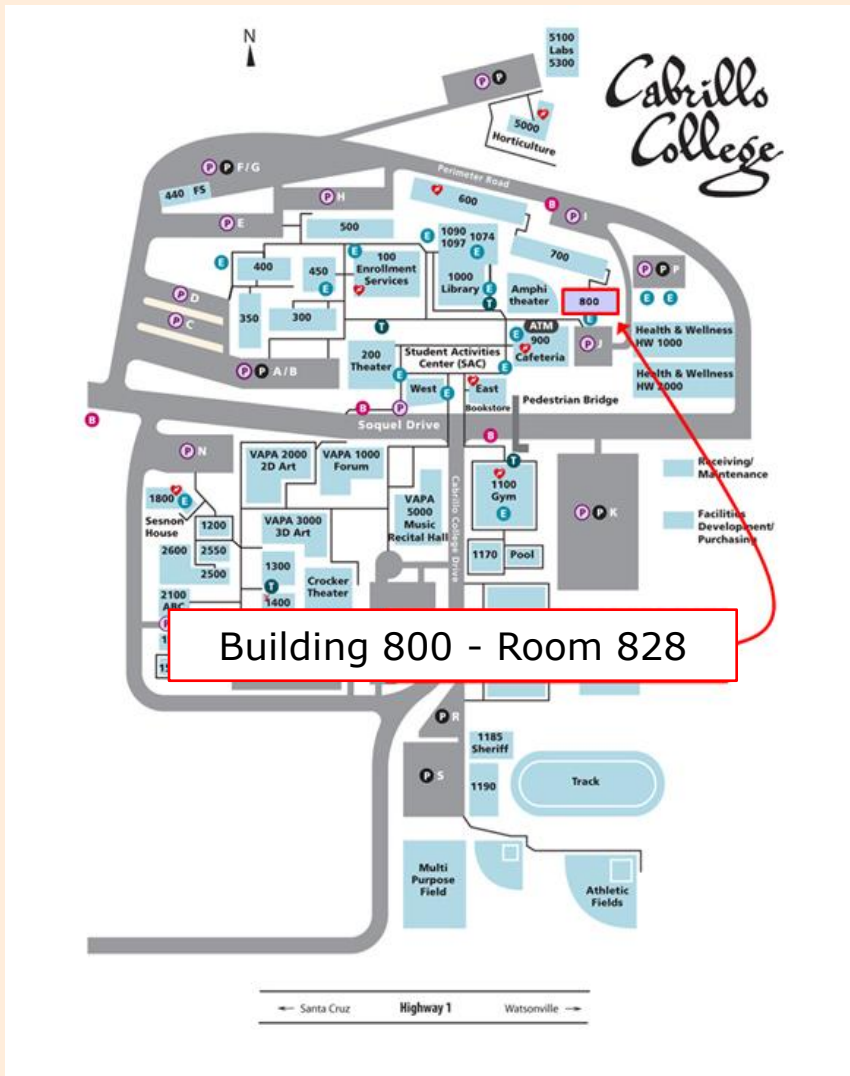
(supplemental)

Option 1: **Online (synchronous)** - from anywhere connect online to the "live" virtual classroom using ConferZoom.

The screenshot shows a web browser window with the URL [simms-teach.com/cis90calendar.php](http://simms-teach.com/cis90calendar.php). The page title is "Rich's Cabrillo College CIS Classes CIS 90 Calendar". The page has a sidebar on the left with a navigation menu and a main content area on the right. The sidebar menu includes links like "Home", "CIS 90", "CIS 90A", "CIS 90B", "CIS 90C", "CIS 90D", "CIS 90E", "CIS 90F", "CIS 90G", "CIS 90H", "CIS 90I", "CIS 90J", "CIS 90K", "CIS 90L", "CIS 90M", "CIS 90N", "CIS 90O", "CIS 90P", "CIS 90Q", "CIS 90R", "CIS 90S", "CIS 90T", "CIS 90U", "CIS 90V", "CIS 90W", "CIS 90X", "CIS 90Y", "CIS 90Z", "CIS 90AA", "CIS 90AB", "CIS 90AC", "CIS 90AD", "CIS 90AE", "CIS 90AF", "CIS 90AG", "CIS 90AH", "CIS 90AI", "CIS 90AJ", "CIS 90AK", "CIS 90AL", "CIS 90AM", "CIS 90AN", "CIS 90AO", "CIS 90AP", "CIS 90AQ", "CIS 90AR", "CIS 90AS", "CIS 90AT", "CIS 90AU", "CIS 90AV", "CIS 90AW", "CIS 90AX", "CIS 90AY", "CIS 90AZ", "CIS 90BA", "CIS 90BB", "CIS 90BC", "CIS 90BD", "CIS 90BE", "CIS 90BF", "CIS 90BG", "CIS 90BH", "CIS 90BI", "CIS 90BJ", "CIS 90BK", "CIS 90BL", "CIS 90BM", "CIS 90BN", "CIS 90BO", "CIS 90BP", "CIS 90BQ", "CIS 90BR", "CIS 90BS", "CIS 90BT", "CIS 90BU", "CIS 90BV", "CIS 90BW", "CIS 90BX", "CIS 90BY", "CIS 90BZ", "CIS 90CA", "CIS 90CB", "CIS 90CC", 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The main content area has a "Calendar" link highlighted with a red box and a blue circle with the number 3. Below the "Calendar" link is a table with columns "Lesson", "Date", "Topics", "Header", and "Foot". The table has one row with "Lesson" 1, "Date" 9/2, "Topics" "Class and Line", "Header" "Understand", and "Foot" "High-level systems and". The sidebar has a "CIS 90" link highlighted with a red box and a blue circle with the number 2. At the bottom of the sidebar is an "Enter virtual classroom" link highlighted with a red box and a blue circle with the number 4. The top of the browser window has a "1" in a blue circle pointing to the address bar.

1. Browse to **<http://simms-teach.com>**
2. Click the **[CIS 90](#)** link
3. Click the **[Calendar](#)** link
4. Click any **[Enter virtual classroom](#)** link

Option 2: **Traditional** - drive to campus, find parking, walk to the 800 building and take a seat in the classroom.



Enjoy the ocean view from the classroom windows!

Option 3: **Online archives (asynchronous)** - watch the archived class recording online using ConferZoom at a time that works for you.

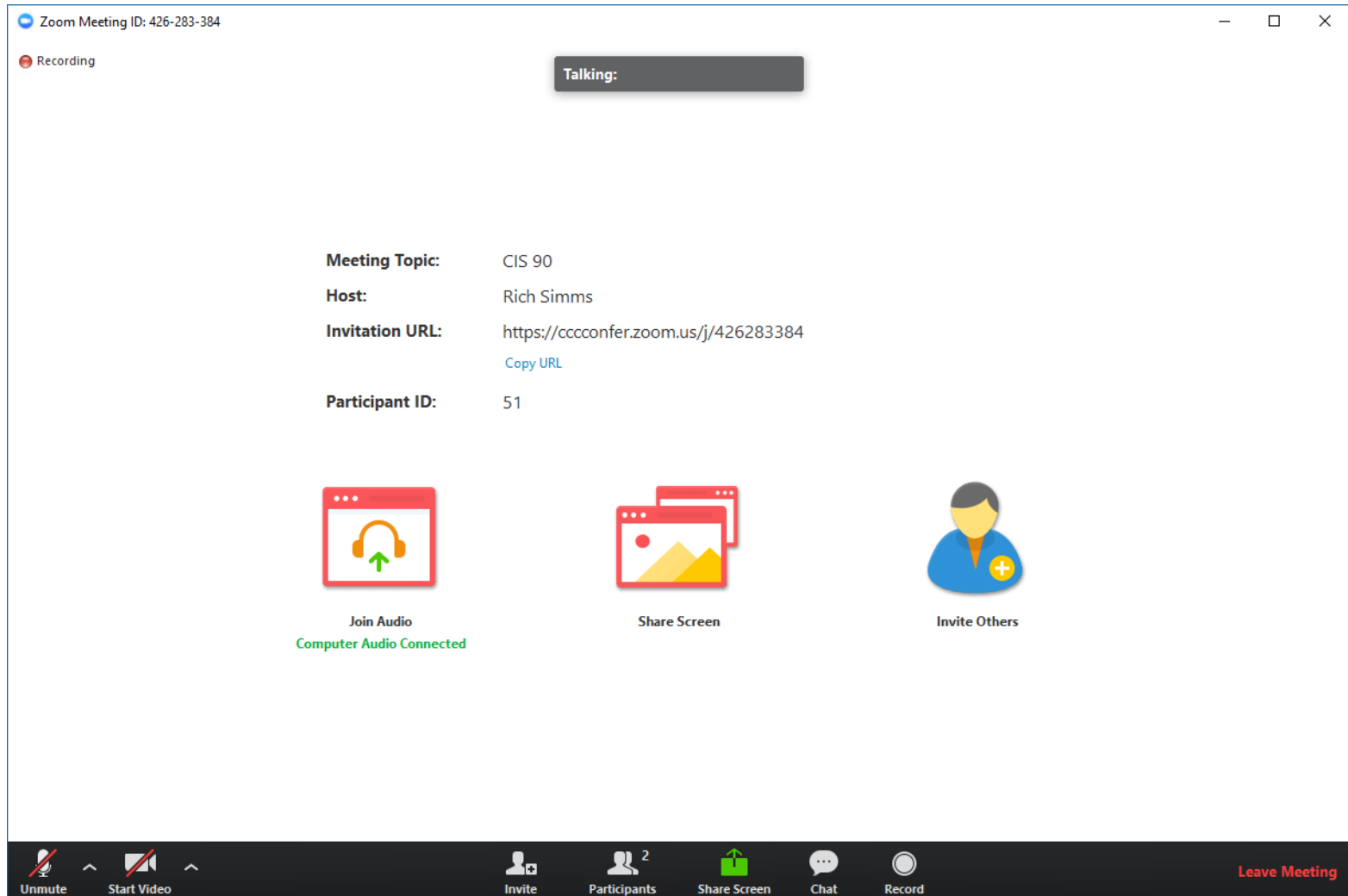
The screenshot shows a web browser window with the URL [simms-teach.com/cis90calendar.php](http://simms-teach.com/cis90calendar.php). The page title is "Rich's Cabrillo College CIS Classes CIS 90 Calendar". The page has a sidebar on the left with various links, including "CIS 90" which is highlighted with a red box and a blue circle labeled "2". The main content area has a "Calendar" link highlighted with a red box and a blue circle labeled "3". At the bottom of the page, there is a "Class archives" link highlighted with a red box and a blue circle labeled "4".

1. Browse to **<http://simms-teach.com>**
2. Click the **[CIS 90](#)** link
3. Click the **[Calendar](#)** link
4. Click any **[Class archives](#)** link



# ConferZoom

## ConferZoom



*Zoom application, host is not sharing anything*

## Help the Instructor with ConferZoom

Everyone, even students in the traditional classroom, should join into ConferZoom for the live class.

Traditional classroom students:

- If you notice **an online student with an unanswered question** please let the instructor know.
- If you notice the instructor **forgot to share the presentation** material please let the instructor know.
- If you notice the instructor **forgot to turn on recording** please jump up and down and wave your arms to let the instructor know!

The screenshot shows a Zoom meeting window. At the top, the Zoom Meeting ID is 426-283-384. A green banner indicates 'You are viewing Rich Simms' screen'. The browser window shows a slide from 'Rich's Cabrillo College C' with the title 'CIS 90'. The URL is <https://simms-teach.com/docs/cis90/cis90lesson01.pdf>. The slide content features the Cabrillo College logo and the title 'CIS 90 - Lesson 1' at the top, followed by the large text 'ConferZoom' in the center. The slide number '34' is visible in the bottom right corner. The Zoom interface at the bottom includes controls for Unmute, Start Video, Invite, Participants (3), Share Screen, Chat, Record, and a red 'Leave Meeting' button.

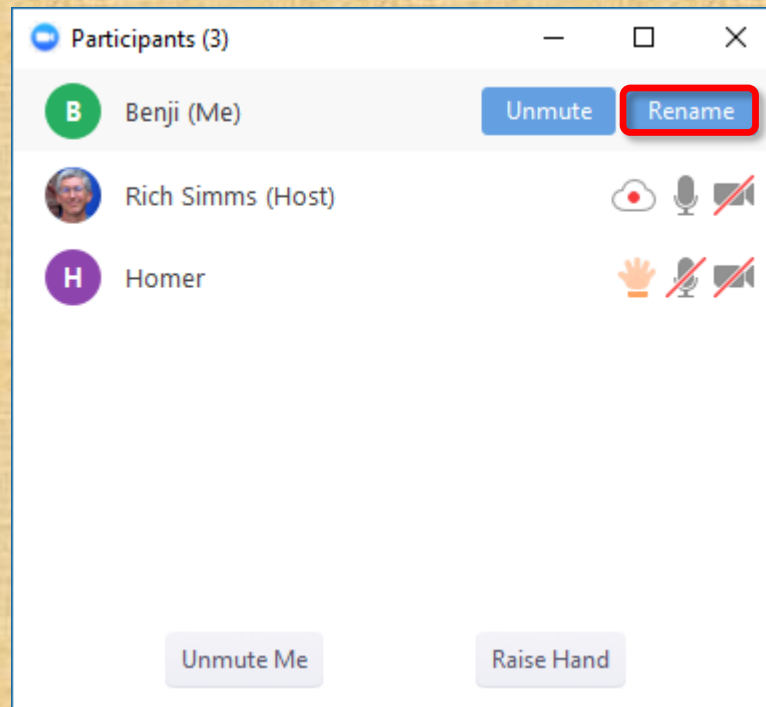
*Zoom application, host is sharing lesson slides*

## ConferZoom Activity

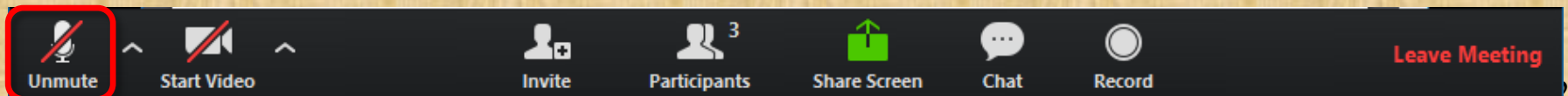
If you are not asking a question please mute your audio.

If you are eating potato chips please mute your audio!

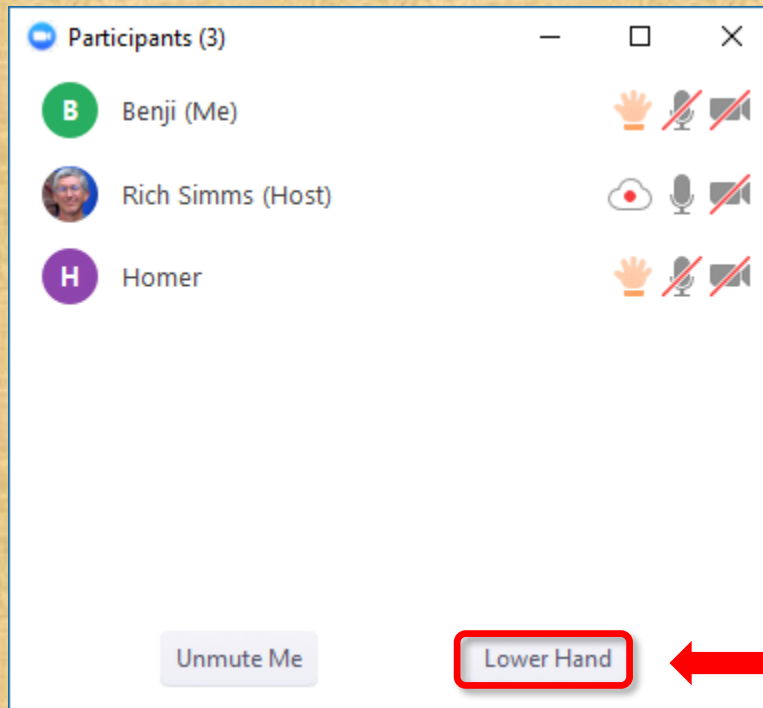
If your dog is barking please mute your audio!



Hover over your name on the list to display the Rename button. You can use this to make your name be your preferred first name.

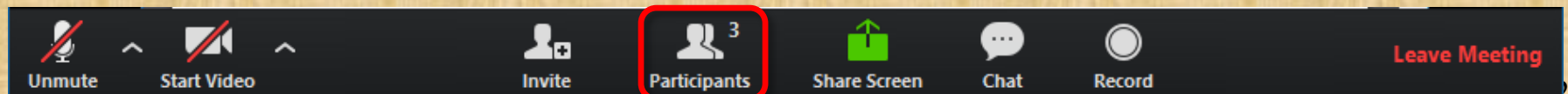


## ConferZoom Activity

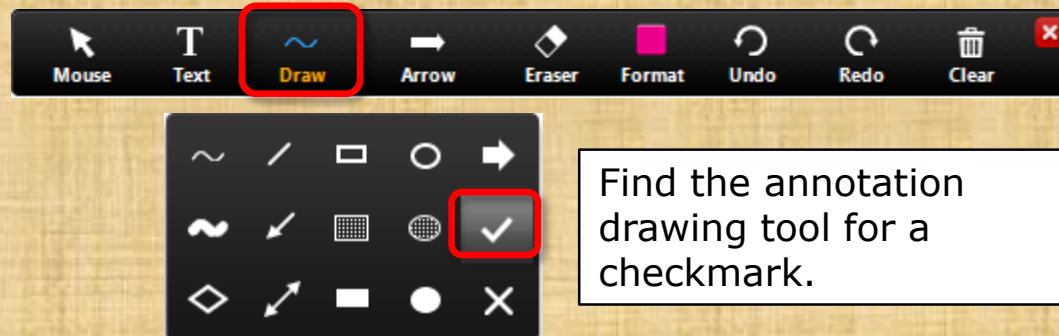
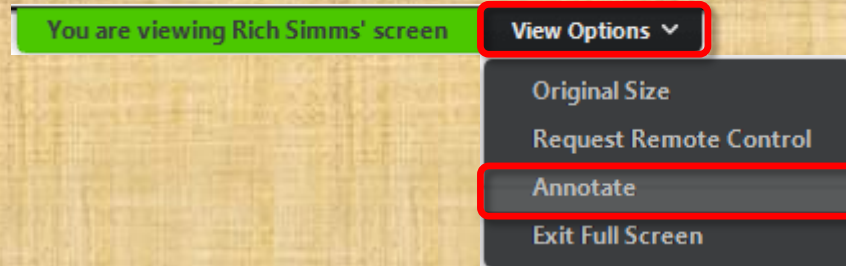


Try raising and lowering your hand a few times.

Please raise your hand when you have a question or would like to be called on to speak.



## ConferZoom Annotations



*View Options > Annotate > Draw > "✓"*

## ConferZoom Activity

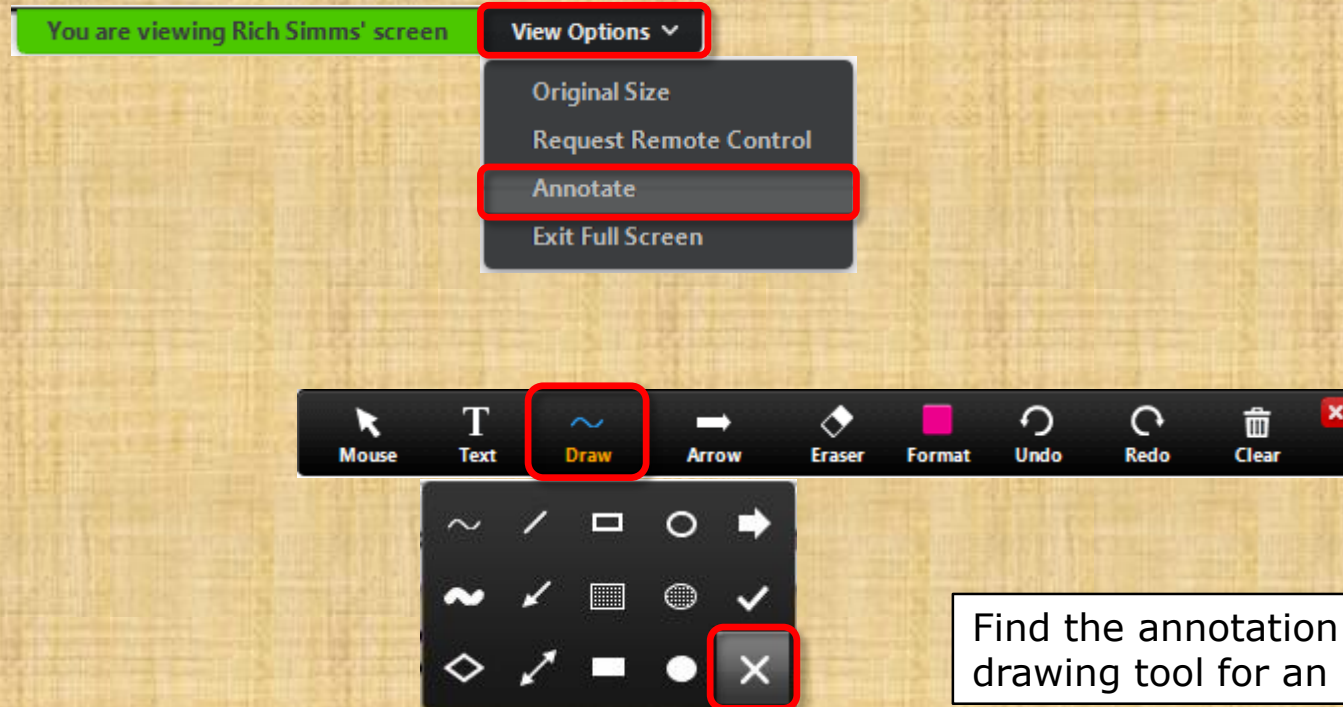
			Other

Place an ✓ to indicate the operating system is your computer running.

*(View Options > Annotate > Draw > ✓)*



## ConferZoom Annotations



*View Options > Annotate > Draw > X*

## ConferZoom Activity

Google

Cabrillo College, Soquel Drive, Aptos, CA

Sign in

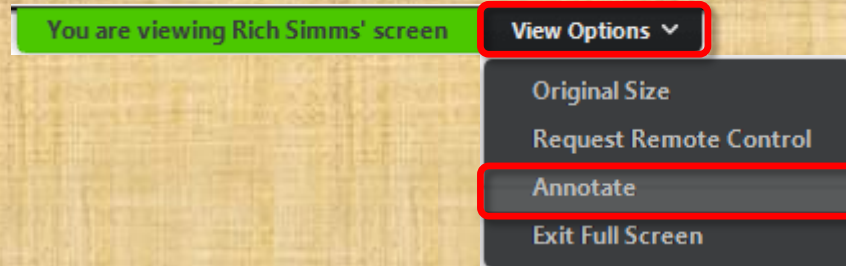
Map data ©2012 Google - Edit in Google Map Maker Report a problem

Mark your location with an X  
(*View Options > Annotate > Draw > X*)

United States

World

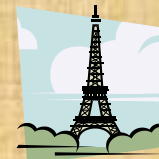
## ConferZoom Annotations



Find the annotation drawing tool for a straight line.

*View Options > Annotate > Draw > /*

## ConferZoom Activity

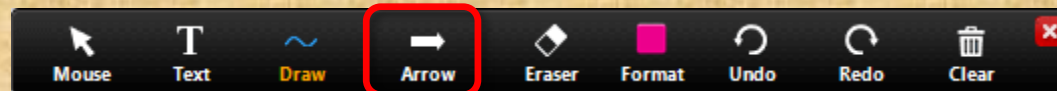
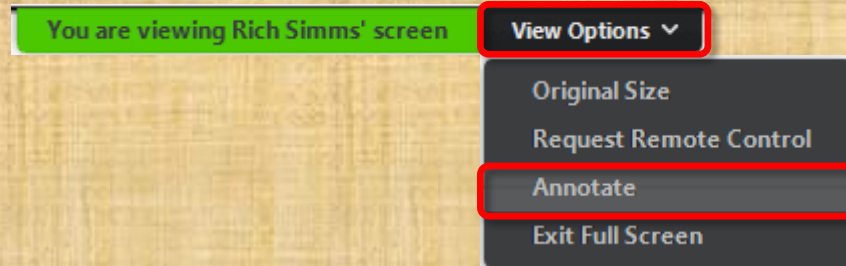


Connect the matching images with a straight line  
using your favorite color.

*(View Options > Annotate > Draw > /)*



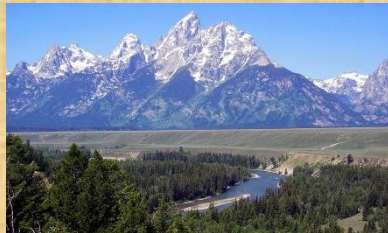
## ConferZoom Annotations



Find the annotation drawing tool for the "named" arrow.

*View Options > Annotate > Arrow*

## ConferZoom Activity



If you could instantly transport to one of these places this weekend where would you go?  
Use your "named" arrow to pick one.

# Roll Call

# Instructor Note:

PAUSE Recording,  
and do a roll call using  
latest roster



If you are attending class by watching the recordings in the archives email the instructor at:

**[risimms@cabrillo.edu](mailto:risimms@cabrillo.edu)**

to provide roll call attendance.

Instructor Note:

RESUME Recording,  
continue with lesson  
slides

# Syllabus, Calendar and Grades

## simms-teach.com Find the syllabus

1. [Secure | https://simms-teach.com](https://simms-teach.com)

Rich's Cabrillo College CIS Classes  
CIS 90 Home

Home Downloads Documents CIS 90 Resources

3. [CIS 90](#)

[Course Home](#) [Grades](#) [Calendar](#)

Introduction to UNIX/Linux

- Tuesdays - 1:00PM to 4:05PM
- Section 84743 meets in room 828 on the Aptos Main Campus
- Section 86576 meets simultaneously online in [this virtual classroom](#)
- Units: 3, prereq:
- Optional Textbook:
  - [Henry Hehl](#)
    - by Henry
    - McGraw
  - [Linux User's](#)
    - by Carol
    - Franklin

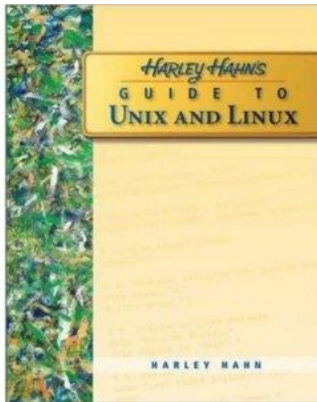
**Course Description**

Provides a technical overview of the UNIX/Linux operating system, including hands-on experience with commands, files, and tools. Topics include basic UNIX/Linux commands, files and directories, text editing, electronic mail, pipes and filters, X Windows, shell environments and scripting. Required for students wishing to pursue the UNIX/Linux track leading to industry certification.

1. Browse to **<http://simms-teach.com>**
2. Click the **[CIS 90](#)** link
3. Click the **[Course Home](#)** link

## Optional CIS 90 Textbook

*This textbook is **optional** but nice to have if you want to dig deeper into the material provided by the lesson slides.*



I really like the very first sentence in Harley Hahn's book:

*"This book will change your life."*

### **Optional Textbook:**

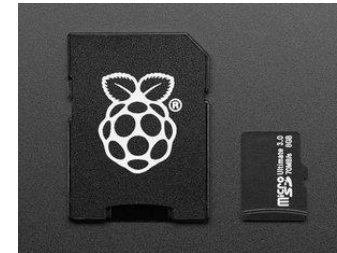
Harley Hahn's Guide to Unix and Linux  
by Harley Hahn  
McGraw-Hill ISBN: 0073133612



## Optional CIS 90 Gear

If you like "hands-on" you will love a Raspberry Pi

*If you find you really enjoy learning UNIX/Linux and want your own private server then you should consider:*



- \$35.00 Raspberry Pi 3 - Model B or B+
- \$7.50 5V 2.4A Switching Power Supply with 20AWG MicroUSB Cable
- \$14.95 16GB Card with NOOBS 2.1

# CIS 90 Spring 2019

Class meets in room **828** and **online** every **Wednesday morning**:

- 15 lessons: **9:00AM-12:05PM**, from **Jan 30<sup>th</sup>** to **May 15<sup>th</sup>**
- Final exam: **7:00AM-9:50AM**, on **WEDNESDAY May 22<sup>th</sup>**, in room **828**

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

## STARTING CLASS TIME / DAY(S)

## EXAM HOUR

## EXAM DATE

*Classes starting between:*

6:30 am and 8:55 am, MW/Daily

7:00 am-9:50 am

Monday, May 20

9:00 am and 10:15 am, MW/Daily

7:00 am-9:50 am

Wednesday, May 22

# The typical week

<http://simms-teach.com>



Use the

**Forum**

to collaborate  
with classmates  
at any time



Work on labs or practice tests  
during the week.

All assignments and due dates  
are on the **Calendar** page

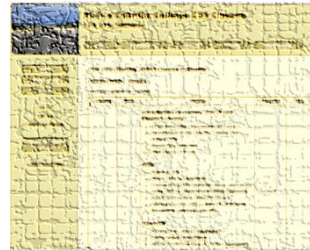
## Wednesday

"First minute" quiz

Lecture on new lesson material

Class activities

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



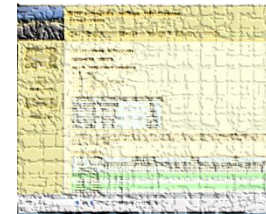
## **Calendar**

All due dates are  
found here

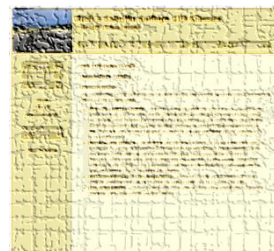


## Thursday

is grading day



Check the **Grades**  
page to see grades  
on labs, quizzes  
and tests



Peek at the **Extra Credit**  
page if you need more  
points

## Contacting the instructor

- Use the forum for the fastest response on technical or class related questions.
- Use email for personal matters. If it's not personal I will probably encourage you to post your question on the forum so I can answer it there. This is preferable because your other classmates can benefit from the answer.
- Weekly office hours on Cabrillo A-Z Directory website:  
<http://babyface.cabrillo.edu/salsa/listing.jsp?staffId=1426>
- Avoid leaving a message on voice mail. Checked rarely so don't expect a fast response (if any)!





## simms-teach.com

### Find the Calendar page

The screenshot shows a web browser window with the URL <https://simms-teach.com>. The page title is "Rich's Cabrillo College CIS Classes CIS 90 Calendar". The page has a sidebar on the left with links: "CIS 90", "CIS 90 Lab 1", "CIS 90 Lab 2", "CIS 90 Lab 3", "CIS 90 Lab 4", "CIS 90 Lab 5", "CIS 90 Lab 6", "CIS 90 Lab 7", "CIS 90 Lab 8", "CIS 90 Lab 9", "CIS 90 Lab 10", "CIS 90 Lab 11", "CIS 90 Lab 12", "CIS 90 Lab 13", "CIS 90 Lab 14", "CIS 90 Lab 15", "CIS 90 Lab 16", "CIS 90 Lab 17", "CIS 90 Lab 18", "CIS 90 Lab 19", "CIS 90 Lab 20", "CIS 90 Lab 21", "CIS 90 Lab 22", "CIS 90 Lab 23", "CIS 90 Lab 24", "CIS 90 Lab 25", "CIS 90 Lab 26", "CIS 90 Lab 27", "CIS 90 Lab 28", "CIS 90 Lab 29", "CIS 90 Lab 30", "CIS 90 Lab 31", "CIS 90 Lab 32", "CIS 90 Lab 33", "CIS 90 Lab 34", "CIS 90 Lab 35", "CIS 90 Lab 36", "CIS 90 Lab 37", "CIS 90 Lab 38", "CIS 90 Lab 39", "CIS 90 Lab 40", "CIS 90 Lab 41", "CIS 90 Lab 42", "CIS 90 Lab 43", "CIS 90 Lab 44", "CIS 90 Lab 45", "CIS 90 Lab 46", "CIS 90 Lab 47", "CIS 90 Lab 48", "CIS 90 Lab 49", "CIS 90 Lab 50", "CIS 90 Lab 51", "CIS 90 Lab 52", "CIS 90 Lab 53", "CIS 90 Lab 54", "CIS 90 Lab 55", "CIS 90 Lab 56", "CIS 90 Lab 57", "CIS 90 Lab 58", "CIS 90 Lab 59", "CIS 90 Lab 60", "CIS 90 Lab 61", "CIS 90 Lab 62", "CIS 90 Lab 63", "CIS 90 Lab 64", "CIS 90 Lab 65", "CIS 90 Lab 66", "CIS 90 Lab 67", "CIS 90 Lab 68", "CIS 90 Lab 69", "CIS 90 Lab 70", "CIS 90 Lab 71", "CIS 90 Lab 72", "CIS 90 Lab 73", "CIS 90 Lab 74", "CIS 90 Lab 75", "CIS 90 Lab 76", "CIS 90 Lab 77", "CIS 90 Lab 78", "CIS 90 Lab 79", "CIS 90 Lab 80", "CIS 90 Lab 81", "CIS 90 Lab 82", "CIS 90 Lab 83", "CIS 90 Lab 84", "CIS 90 Lab 85", "CIS 90 Lab 86", "CIS 90 Lab 87", "CIS 90 Lab 88", "CIS 90 Lab 89", "CIS 90 Lab 90", "CIS 90 Lab 91", "CIS 90 Lab 92", "CIS 90 Lab 93", "CIS 90 Lab 94", "CIS 90 Lab 95", "CIS 90 Lab 96", "CIS 90 Lab 97", "CIS 90 Lab 98", "CIS 90 Lab 99", "CIS 90 Lab 100". The main content area has links: "Course Home", "Grades", and "Calendar". Below these links is a table with columns: "Lesson", "Date", "Topics", "Chapter", and "Page". The table contains two rows of data. The first row is for "Lesson 1" on "Date 1" with topics "Class and Linux Overview", "Understand how this course will work", "High-level overview of computers, operating systems and virtual machines", "Overview of UNIX/Linux market and architecture", "Using SSH for remote network logins", and "Using terminals and the command line". The second row is for "Lesson 2" on "Date 2" with topics "Commands", "Understand how the UNIX login operation works", "Meet John the Nipper and learn how vulnerable a poor password is", and "Understand basic command-line operations".

1. <https://simms-teach.com>

2. [CIS 90](#)

3. [Calendar](#)

Lesson	Date	Topics	Chapter	Page
Lesson 1	Date 1	Class and Linux Overview <ul style="list-style-type: none"><li>Understand how this course will work</li><li>High-level overview of computers, operating systems and virtual machines</li><li>Overview of UNIX/Linux market and architecture</li><li>Using SSH for remote network logins</li><li>Using terminals and the command line</li></ul>	Chapter 1	Page 1
Lesson 2	Date 2	Commands <ul style="list-style-type: none"><li>Understand how the UNIX login operation works</li><li>Meet John the Nipper and learn how vulnerable a poor password is</li><li>Understand basic command-line operations</li></ul>	Chapter 2	Page 2

1. Browse to **<http://simms-teach.com>**
2. Click the **[CIS 90](#)** link
3. Click the **[Calendar](#)** link



## Course Calendar

Lesson	Date	Topics	Chapter	Due*
5	2/28	<b>Quiz 4</b> <b>Review</b> <ul style="list-style-type: none"> <li>Review lessons 1-4</li> <li>Practice skills</li> <li>Learn about filename expansion characters</li> </ul> <b>Materials</b> <ul style="list-style-type: none"> <li>Presentation slides (<a href="#">download</a>)</li> </ul> <b>Assignment</b> <ul style="list-style-type: none"> <li>Read/skim Lesson 5 slides</li> <li>Practice Test 1 (<a href="#">canvas</a>)</li> </ul> <b>ConferZoom</b> <ul style="list-style-type: none"> <li><a href="#">Enter virtual classroom</a></li> <li><a href="#">Class archives</a></li> </ul>		<a href="#">Lab 4</a>
6	3/7	<b>Test #1</b> <b>Managing Files</b> <ul style="list-style-type: none"> <li>Creating</li> <li>Copying</li> <li>Moving</li> <li>Renaming</li> <li>Removing</li> <li>Linking</li> </ul> <b>Materials</b> <ul style="list-style-type: none"> <li>Presentation slides (<a href="#">download</a>)</li> <li>Test 1 (<a href="#">canvas</a>)</li> </ul> <b>Assignment</b> <ul style="list-style-type: none"> <li>Read/skim Lesson 6 slides</li> <li><a href="#">Lab 5</a></li> </ul> <b>ConferZoom</b> <ul style="list-style-type: none"> <li><a href="#">Enter virtual classroom</a></li> <li><a href="#">Class archives</a></li> </ul>	5 8.4 8.13-8.16 (Gillay)  25 p715-729 p740-746 (Hahn)	

*First minute quiz*

*What is due by 11:59PM (Opus-II time) on that date (LATE WORK IS NOT ACCEPTED)*

*Links to virtual classroom and archived recordings*

*Test*

*Supplemental references to material in the Gillay and Hahn textbooks*

*Lesson # and Date*

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

*Assignment for next class*

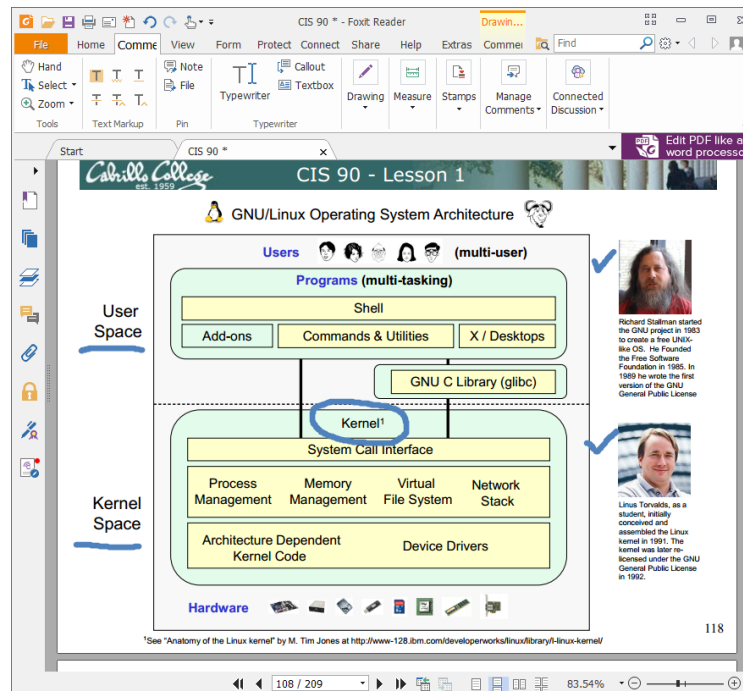
*ConferZoom links to join class online or watch archived recordings*

## Best Practices for using the Lesson Slides

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

### Materials

- Presentation slides (download)



*Download and open them in a tool like Foxit Reader so you can mark them up with notes and annotations.*



*Keep a browser open so you can look up terms you are not familiar with or open links in the lesson slides.*

<https://www.foxitsoftware.com/pdf-reader/>

**simms-teach.com**  
Find the Grades page

The screenshot shows a web browser window with the URL <https://simms-teach.com>. The page title is "Rich's Cabrillo College CIS Classes CIS 90 Grades". The page has a yellow background with a grid pattern. On the left side, there is a sidebar with links: "Home", "Grades", "Calendar", "CIS 90", "CIS 90A", "CIS 90B", "CIS 90C", "CIS 90D", "CIS 90E", "CIS 90F", "CIS 90G", "CIS 90H", "CIS 90I", "CIS 90J", "CIS 90K", "CIS 90L", "CIS 90M", "CIS 90N", "CIS 90O", "CIS 90P", "CIS 90Q", "CIS 90R", "CIS 90S", "CIS 90T", "CIS 90U", "CIS 90V", "CIS 90W", "CIS 90X", "CIS 90Y", "CIS 90Z". The "CIS 90" link is highlighted with a red box and a blue circle with the number 2. The "Grades" link is highlighted with a red box and a blue circle with the number 3. The "Calendar" link is also highlighted with a red box and a blue circle with the number 3. The main content area shows the "CIS 90 (Fall 2014) Grades" section. It includes a "Course Home" link, a "Grades" link, and a "Calendar" link. Below these links, there is a list of activities and their point values: "First minute quizzes - 30 points (33%)", "Tests - 90 points (33%)", "Forum posts - 80 points (33%)", "Lab assignments - 200 points (54%)", and "Project - 60 points (17%)". There is also a section titled "How your grade is determined:" which states that a student can earn up to 550 total points. Below this, there is a table showing the percentage ranges for each grade: "90% or higher - 50", "80% to 89.9% - 4", "70% to 79.9% - 3", "60% to 59.9% - 2", and "0% to 59.9% - 1". At the bottom of the page, there is a "Current Progress" section with a table showing the student's progress in various activities.

1. Browse to <http://simms-teach.com>
2. Click the **CIS 90** link
3. Click the **Grades** link



## Course Grading

*Monitor this page to track your progress in the course.*

*Your default grading choice will be a letter grade.*

*There is an eForm in WebAdvisor to request a change to Pass/No Pass which must be submitted and approved by the college deadline.*

*Each student is assigned a secret LOR code name*

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

*Use extra credit to earn up to 90 additional points*

**Rich's Cabrillo College CIS Classes**  
**CIS 90 Grades**

Grades | Assignments | Homework | Quizzes | Exams

**CIS 90 (Spring 2014) Grades**  
Course Home | Calendar

Points can be earned from the following activities:

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

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

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

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

**Choice of Grade or Pass/No Pass**  
You indicate your grading choice on the Student Survey form passed out during the first class. You can verify your grading choice selection on the table below. Contact the instructor by email with any questions or to request a change in grading choice.

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

**Current Progress**

Code	Grading	Quizzes & Tests										Forum				Labs										Project	Extra	Total	Grade			
Name	Choice	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	
adaldnda	grade																															

## More on Grading

[Course Home](#) [Calendar](#)

Points can be earned from the following activities:

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

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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.

*You control your grade. The more points you earn the higher your grade will be.*

# Letter Grade or Pass/No Pass

## 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

All students will receive a letter grade by default. To request the Pass/No Pass grading option students must fill out and submit this **eForm on WebAdvisor** by the college deadline. You can verify your grading choice selection on the table below. Contact the instructor with any questions.

The screenshot shows the 'Pass/No Pass Request' form from Cabrillo College's Admissions & Records department. It includes instructions, a section for student information (First Name, Last Name, Student ID, Email, Phone), a section for instructor information, and a section for the student to click 'I agree' to the following statements. The statements are: 'I understand that I will only receive a "P" Pass or "NP" No Pass grade for the class if the request is approved by the instructor.' and 'I understand that this decision is not reversible.' There is also a section for 'Request Reason/Comments'.

*Starting Fall 2018 you must use the new eForm on WebAdvisor to request the Pass/No Pass grading option.*

*There is a college deadline for this and changes are irreversible!*

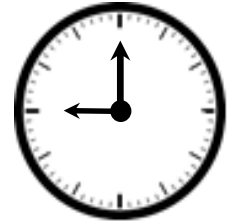


## Grading - Lab Assignments

- 10 labs, 30 points each
- Due at **11:59PM** (Opus-II time) on the date shown on the course Calendar.
- **Late work is not accepted.** There is no credit for any work turned in after the deadline. If you don't complete a lab assignment, please turn in what you have, by the due date, for partial credit.
- Students may work together and collaborate on labs but they must submit their own work to get credit.
- Lab resources, instructors, and assistants are available in the CIS lab. In addition the Linux Opus-II server and the CIS VLab may be accessed from anywhere over the Internet.

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

## Grading - First Minute Quizzes



- 10 quizzes, 3 points each
- The quiz questions are shown on ConferZoom at **9:00AM** sharp. Answers are emailed to the instructor. The order of the questions will not be known until the quiz is given! Emailed answers that are **not in order will be marked as incorrect.**
- The quiz questions are given out in advance and students can use the forum to collaborate on answers prior to class.
- Quizzes are open book/notes. Students may not give or ask others for assistance while taking a quiz.
- There are **NO makeup's** for these quizzes and they must be taken and turned in within the first few minutes of class. Answers emailed **after** the first few minutes of class **will not get credit.**
- Students that attend by watching the archives can do some extra credit work instead. In the past many working students have joined the class briefly at the start just to take the quiz and then return to work.

*An incentive to start class on time*

## Grading - Tests



- 3 tests, 30 points each
- Tests are timed. 😞
- A practice test will be made available a week before the actual test. 😊
- Test 1 and 2 will be held during the last hour of class on the days shown on the Calendar.
- Working students have the option to take test 1 and test 2 later in the day but they must be completed no later than 11:59PM (Opus-II time) on the day of the test.
- Test 3 is the final exam and is mandatory. The time of the final exam is shown on the Calendar.
- Tests are open notes, open book, and open computer.
- **Students may not give or ask others for assistance while taking a test.**
- Tests may be taken remotely online.

*Timed tests are more difficult due to the time pressure! They do help me understand what you have learned so I can adjust the course as needed.*

*If you get anxious, freeze up, or your mind just doesn't work on timed tests then come see me. I'll be happy to work with you on how to successfully take them.*

## Grading - Forum Posts

- 4 points per post, up to 20 points maximum per "posting quarter".
- The end date for each posting quarter is shown on the course calendar.
- The posts for the quarter will be due at **11:59PM** (Opus-II time) on the date shown on the course Calendar.
- **Extra posts in one quarter do not carry over to the next quarter.**
- **Only posts in the CIS 90 class forum will be counted.**

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

## 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 get anxious, panic and forget everything you know on a test ... don't worry!
- You just don't like making forum posts ... don't worry!

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

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



## Making the fine print LARGE (and **BOLD**)

Please remember:

- 1) **NO makeup's** for missed quizzes.
- 2) Quiz answers in the **wrong order** or not **emailed in the first few minutes will not be accepted.**
- 3) **Late work will not be accepted.** For example, a lab assignment due at 11:59PM will get no credit if turned in **one minute late** at 12:00AM (midnight) the next day.

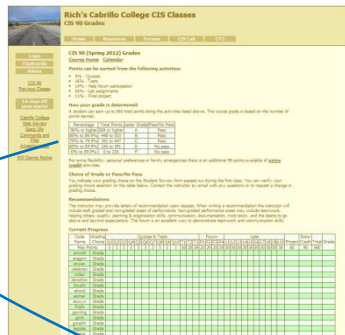
Tip: if you have not completed a lab assignment, **please turn in what you have done for partial credit.**

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

## Final word on Grading

- You control your grade for this course!
- Use the **Grades** web page to plan for the grade you wish to receive and track your progress.
- Use the **Calendar** web page to see due dates for ALL lab assignments, extra credit labs and forum posts. See when EVERY quiz and test is scheduled.

### Grades



**Rich's Cabrillo College CIS Classes**  
CIS 90 Grading

CIS 90 (Spring 2012) Grades

Grading Scale: Letter

Points can be earned from the following activities:

- Lab
- Quiz
- Test
- Final exam

How your grade is determined:

A student can earn up to 503 total points during the semester based on the number of assignments.

Grading Scale:

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

### Calendar



**Rich's Cabrillo College CIS Classes**  
CIS 90 Calendar

CIS 90 (Spring 2012) Calendar

Grading Scale: Letter

Lesson	Date	Topic	Chapter	Book
1	1/11	Introduction to CIS 90	1	1
2	1/18	Introduction to CIS 90	2	2
3	1/25	Introduction to CIS 90	3	3
4	2/1	Introduction to CIS 90	4	4
5	2/8	Introduction to CIS 90	5	5
6	2/15	Introduction to CIS 90	6	6
7	2/22	Introduction to CIS 90	7	7
8	2/29	Introduction to CIS 90	8	8
9	3/6	Introduction to CIS 90	9	9
10	3/13	Introduction to CIS 90	10	10
11	3/20	Introduction to CIS 90	11	11
12	3/27	Introduction to CIS 90	12	12
13	4/3	Introduction to CIS 90	13	13
14	4/10	Introduction to CIS 90	14	14
15	4/17	Introduction to CIS 90	15	15
16	4/24	Introduction to CIS 90	16	16
17	5/1	Introduction to CIS 90	17	17
18	5/8	Introduction to CIS 90	18	18
19	5/15	Introduction to CIS 90	19	19
20	5/22	Introduction to CIS 90	20	20
21	5/29	Introduction to CIS 90	21	21
22	6/5	Introduction to CIS 90	22	22
23	6/12	Introduction to CIS 90	23	23
24	6/19	Introduction to CIS 90	24	24
25	6/26	Introduction to CIS 90	25	25
26	7/3	Introduction to CIS 90	26	26
27	7/10	Introduction to CIS 90	27	27
28	7/17	Introduction to CIS 90	28	28
29	7/24	Introduction to CIS 90	29	29
30	7/31	Introduction to CIS 90	30	30

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
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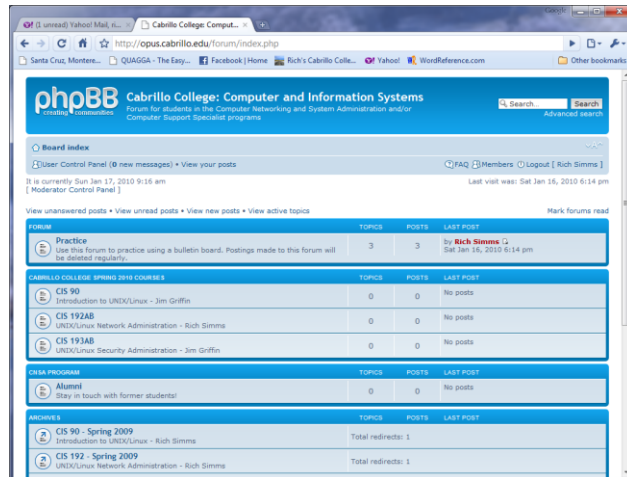
*At the end of the course the instructor will count the number of points you have earned and use this table on the Grades web page to determine your grade.*

**HELEN'S**  
**RESTAURANT**

**WHERE GOOD**  
**FRIENDS**  
**MEET TO EAT**

Help  
Forum

## Online Help Forum



- Post questions and answers
- Get clarifications on assignments
- Collaborate with classmates on assignments, quizzes and practice tests.
- Share UNIX/Linux information and ideas
- Post class notes for classmates who miss class
- **Since this is a public forum on the Internet:**
  - **Never post passwords!**
  - **Be nice, respectful, supportive and professional.**



*As an incentive to use the forum - students can earn 4 points per CIS 90 forum post (capped at 20 points for each posting period)*



## Class Forum

### Textbook

POSTREPLY ↩

Search this topic...

Search

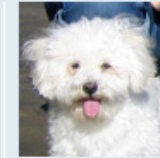
3 posts • Page 1 of 1

### Textbook

by Benji Simms on Thu May 15, 2008 2:57 pm

What is the textbook for this course? I want to get it ahead of time and start reading through it.

- No anonymous usernames! Your username must be:
  - Your real **first** and **last name** separated by a **space** e.g. Rich Simms
  - During activation if your username matches a name on the roster, but is not your full first and last name **it will be modified** to be so.
  - During activation if your username does not match a name on roster **it gets deleted** and you need to try again.
- Uploading an avatar is optional. Identifying photos are preferred so students can get to know each other.



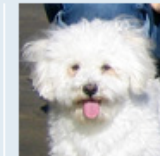
Benji Simms

Posts: 5  
Joined: Thu May 15, 2008 2:40 pm



Rich Simms  
Site Admin

Posts: 340  
Joined: Thu May 15, 2008 1:44 pm



Benji Simms

Posts: 5  
Joined: Thu May 15, 2008 2:40 pm



## Class Activity Forum Registration

Click the Forums link on  
<http://simms-teach.com>

### Rich's Cabrillo College CIS Classes CIS 90 Calendar

Home

Resources

Forums

CIS Lab

Canvas

#### : Computer and Information Systems

Computer Networking and System Administration and/or  
list programs

Search...

Search

Advanced search


FAQ

Register

Login

It is currently Sun Jan 17, 2010 9:43 am

To Register:

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

*Note: If you have already registered in a previous CIS course you don't need to do it again.*

*Note: All registrations are manually approved by the instructor. If your username is incomplete or does not match a name of the class roster it will be modified or deleted.*

## To get notifications of new forum posts

Subscribe to the forum to get email notifications of new posts

After logging in:

1. Go to the CIS 90 class forum.
2. At the bottom of the page, click the "Subscribe forum" link on the lower left. When subscribed you get email notifications when new posts are made.
3. To unsubscribe, click it again.

[Home](#) < [Board index](#) ☒ [Subscribe forum](#)

*Unsubscribed  
looks like this.*

[Home](#) < [Board index](#) ☐ [Unsubscribe forum](#)

*Subscribed  
looks like this.*

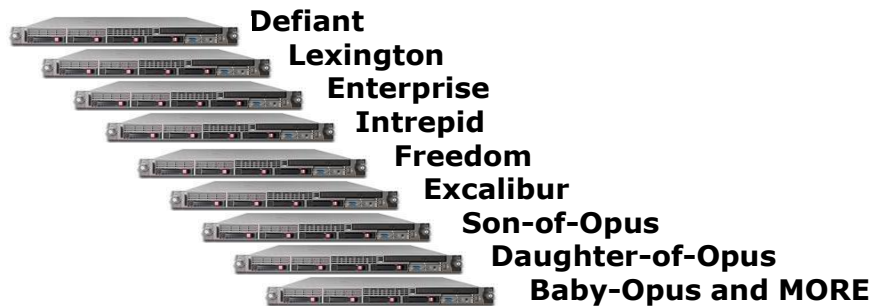
# Lab Resources

# The CIS 90 System Playground

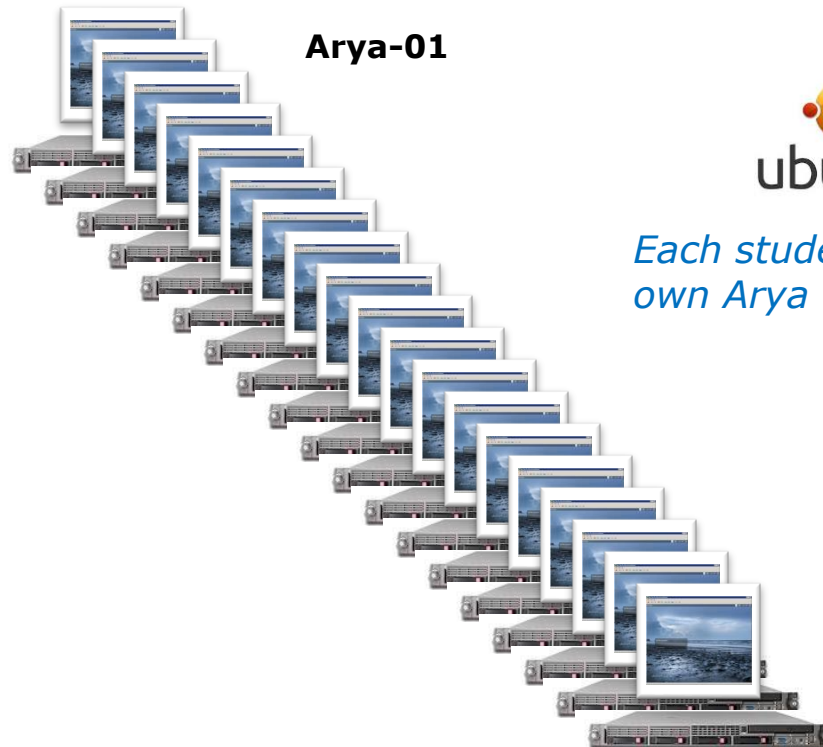
Configured for  
Command Line Only



Other UNIX/Linux servers



Configured for  
Graphics and Command Line



*Each student gets their own Arya VM for the term*

*All the systems are virtual machines (VMs) running on the CIS Lab servers. They are available from on or off-campus*

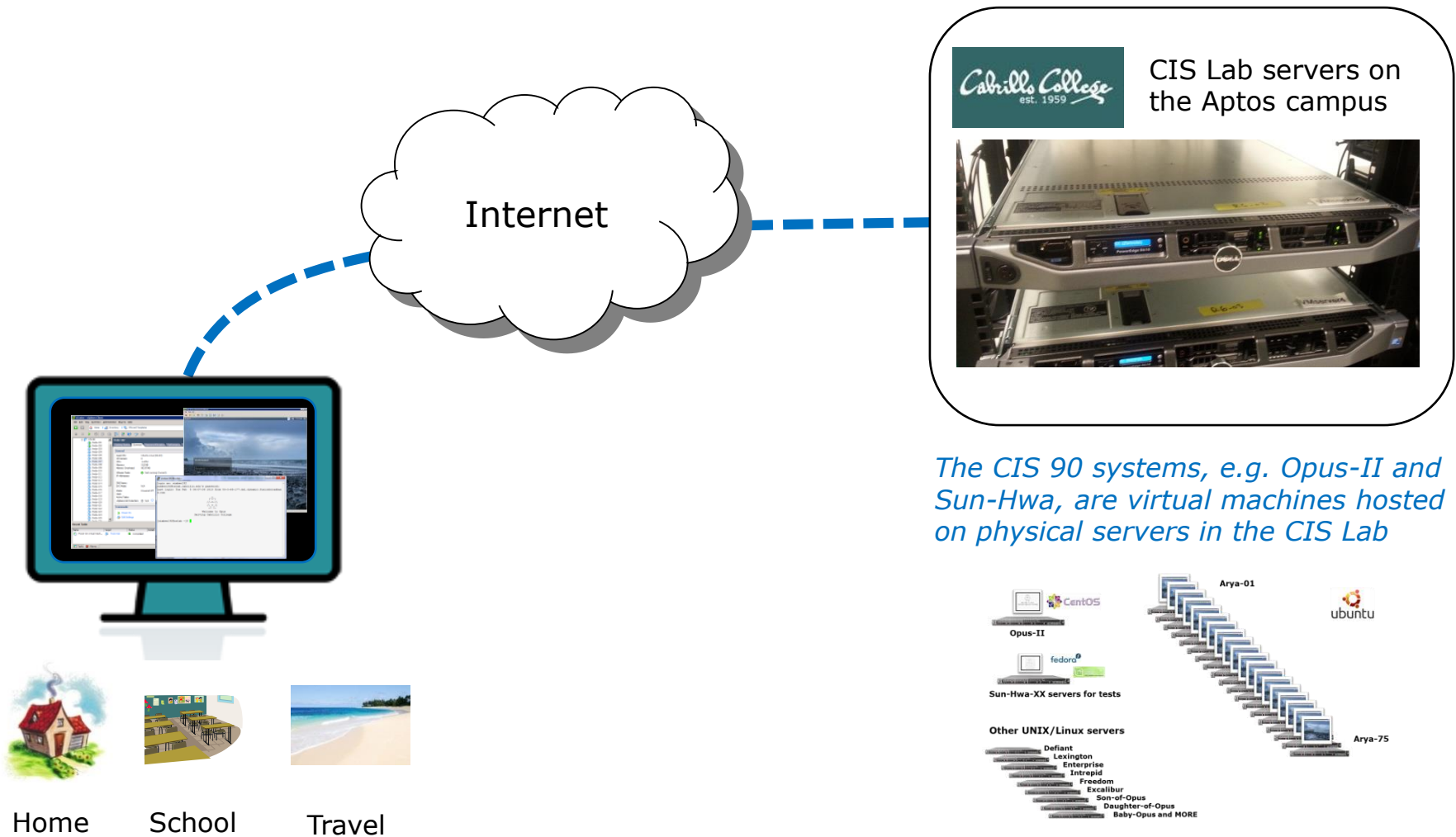
## The CIS 90 System Playground



*My micro lab on my desk at home. Watch the forum for an extra credit activity using this tiny lab.*

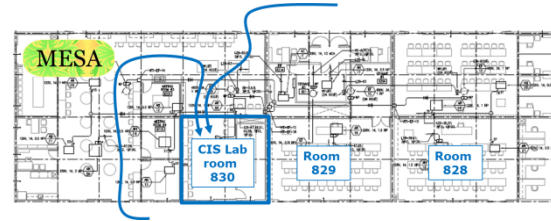
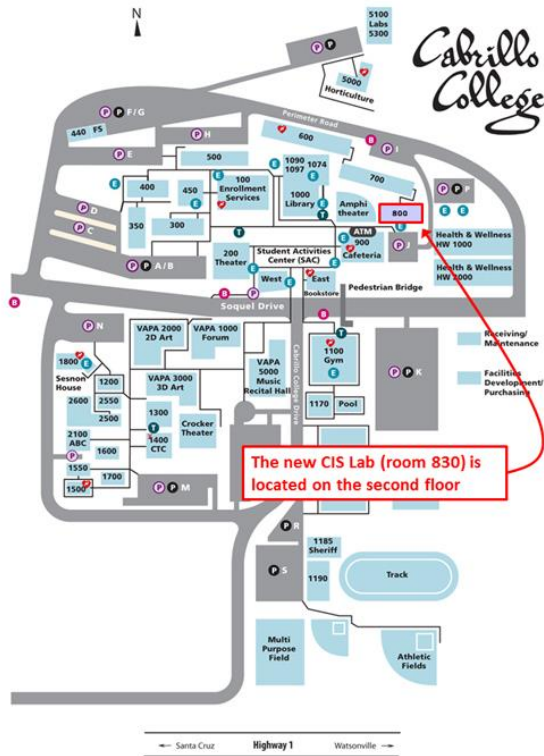


## Option 1: Work on assignments online from anywhere



## Option 2: Work on assignments in the CIS Lab

Building 800 - Room 830 (in the STEM Center)



*Instructors, lab assistants and equipment are available CIS students.*

*Great place to collaborate with classmates and a place for study groups to meet.*

### Rich's Cabrillo College CIS Classes Home Page

[Home](#)
[Resources](#)
[Forums](#)
[CIS Lab](#)
[Canvas](#)

*Use this link to see schedule and location*

## Option 3: Work on assignments in the CTC



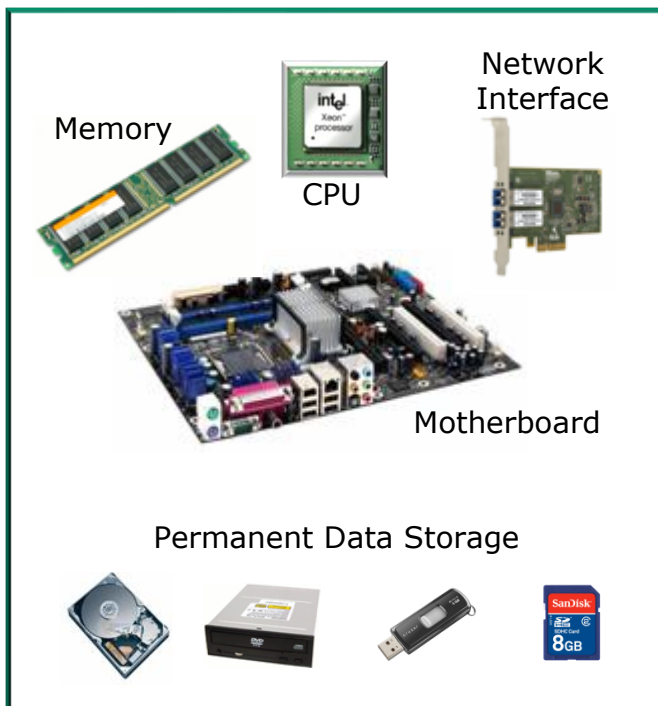
CTC (building 1400) on lower campus

# Computers

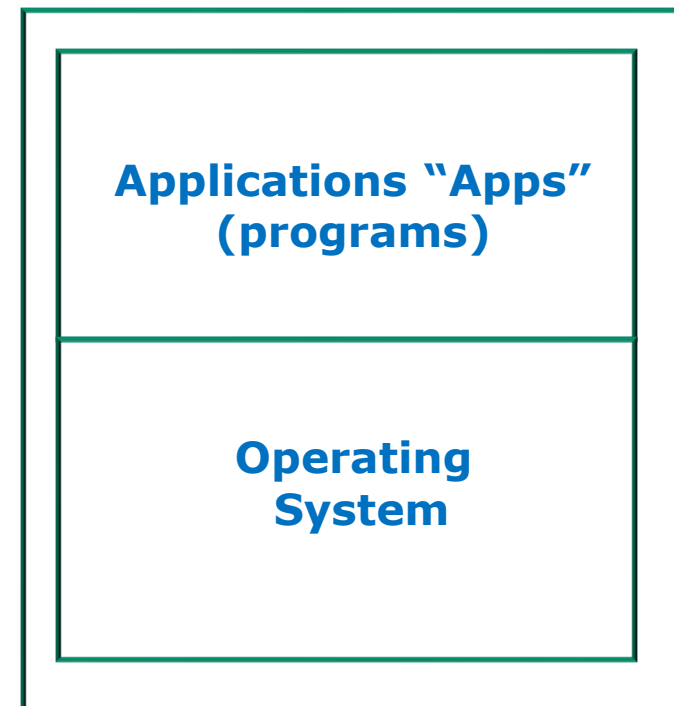
# What is a computer?



## Hardware



## Software



*At a high level all computers have the same basic hardware and software components*





# Hardware



## Computer hardware has many form factors



smart  
phone



tablet



Raspberry Pi



desktop



mobile  
"laptop"



blade  
server



"heavy iron"  
server



Virtual  
Machine



supercomputer



"pizza box" 1U  
rack server



smart watch

*Computers come in a wide variety of form factors*



App Store



The Apache Software  
Foundation



Norton  
from symantec



# Software



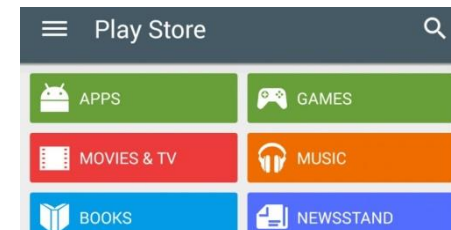
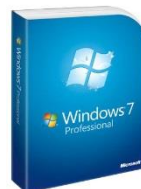
ORACLE®



GNU



McAfee®



# Software can be divided into programs (apps) and operating systems

## Users



### Applications "Apps" (programs)

- Interface to users via graphics (GUI) or command line (CLI)
- Use the OS for all access to hardware resources

Examples: word processors, spreadsheets, smartphone apps, web servers, compilers, games, email, web browsers, media players, databases, CAD/CAM, contact management, anti-virus, accounting, enterprise applications, custom software, and millions more!

### Operating System (OS)

- Shares hardware resources
- Loads and executes programs
- Manages processes (running programs)
- Manages memory
- Manages the file system
- Provides input/output services
- Monitors the system
- Network stack services

**Examples: Windows, Mac, Linux, Unix**

## Hardware



# Software Licensing

## Public Domain (paid for by the taxpayer)

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

## Open Source

- See: <http://opensource.org>
- Source code is available
- Community of developers doing online collaboration
- Pragmatic redistribution licenses
- Examples: Apache, Firefox, Android, OpenOffice, OpenBSD, LibreOffice

## Free Software Foundation

- See: <https://www.fsf.org>
- Source code is available
- GNU ("GNU is not UNIX") General Public License, COPyleft
- Examples: GNU/Linux, gimp, emacs, nano, gcc, zebra, Files

## Proprietary (closed source)

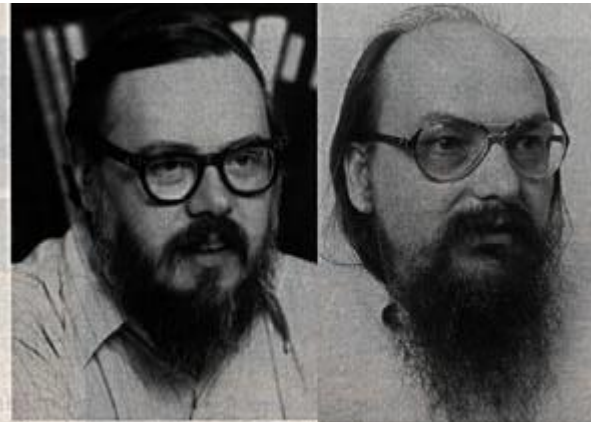
- Source code is not available
- Considered intellectual property
- Must be licensed to use
- Examples: Adobe Photoshop, Microsoft Windows, Mac OS X, AT&T UNIX System V, Cisco IOS

# UNIX/Linux overview



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

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



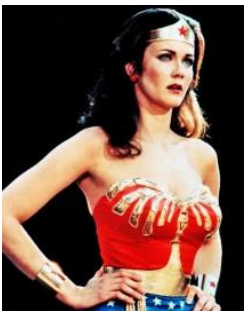
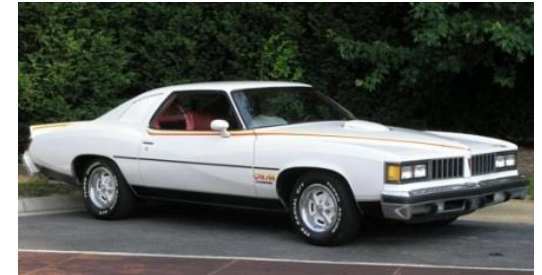
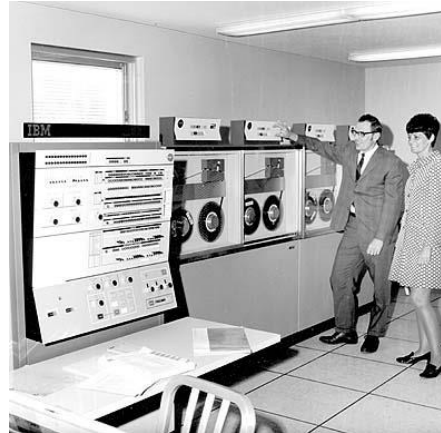
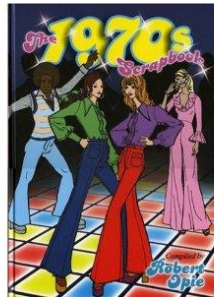
*Dennis Ritchie and Kenneth Thompson: they set the style for software development – and for software developers*



Bell Laboratories



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



## Heck NO !!

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

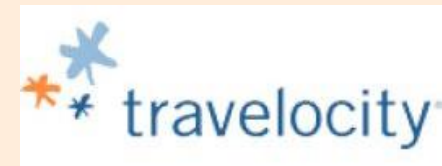
- Cloud infrastructure – Amazon AWS, OpenStack, etc.
- Embedded in smartphones, tablets and many other appliances.
- Internet services - Web, DNS, DHCP, Net News, Mail, etc.
- Enterprise and mission critical applications - Large databases, Enterprise Resource Management (ERM), Customer Relationship Management (CRM), data warehouse, manufacturing, supply chain management, etc.
- Hollywood - feature animation, visual effects, rendering farms.
- Number-crunching super computers for research.
- Businesses like Amazon, Paypal, Facebook, NYSE, Google, Home Depot run their businesses on UNIX/Linux\
- Crypto currency mining rigs

# UNIX/Linux Overview

## Supplemental

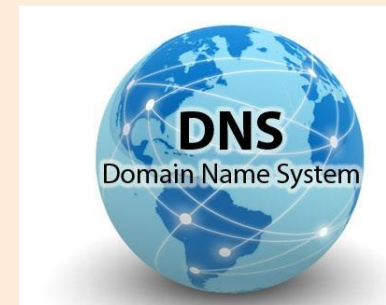


## Businesses and organizations that run on Linux





Internet service providers use UNIX/Linux to provide web, DNS, DHCP, Mail, etc. services to their customers.



## Film Studios



Film studios like DreamWorks have huge Linux "rendering farms" to produce the animation and special effects



## Televisions

### The Open-Source Car

**Summary:** Toyota is joining the Linux Foundation.



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

Follow @sjvn

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

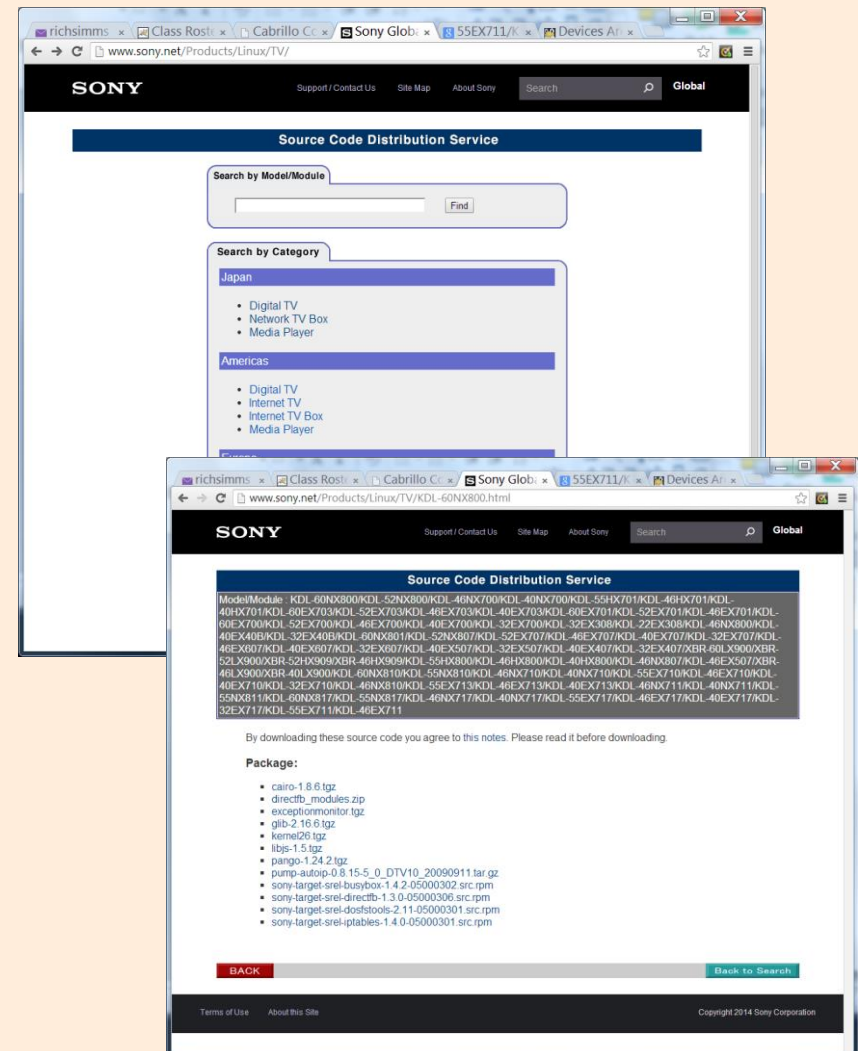


Some of you may be wondering, "What the heck is a car company doing joining the Linux Foundation?" The answer is easy. As the Foundation puts it, "A major shift is underway in the automotive industry. Car-makers are using new technologies to deliver on consumer expectations for the same connectivity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

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


< snipped >

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



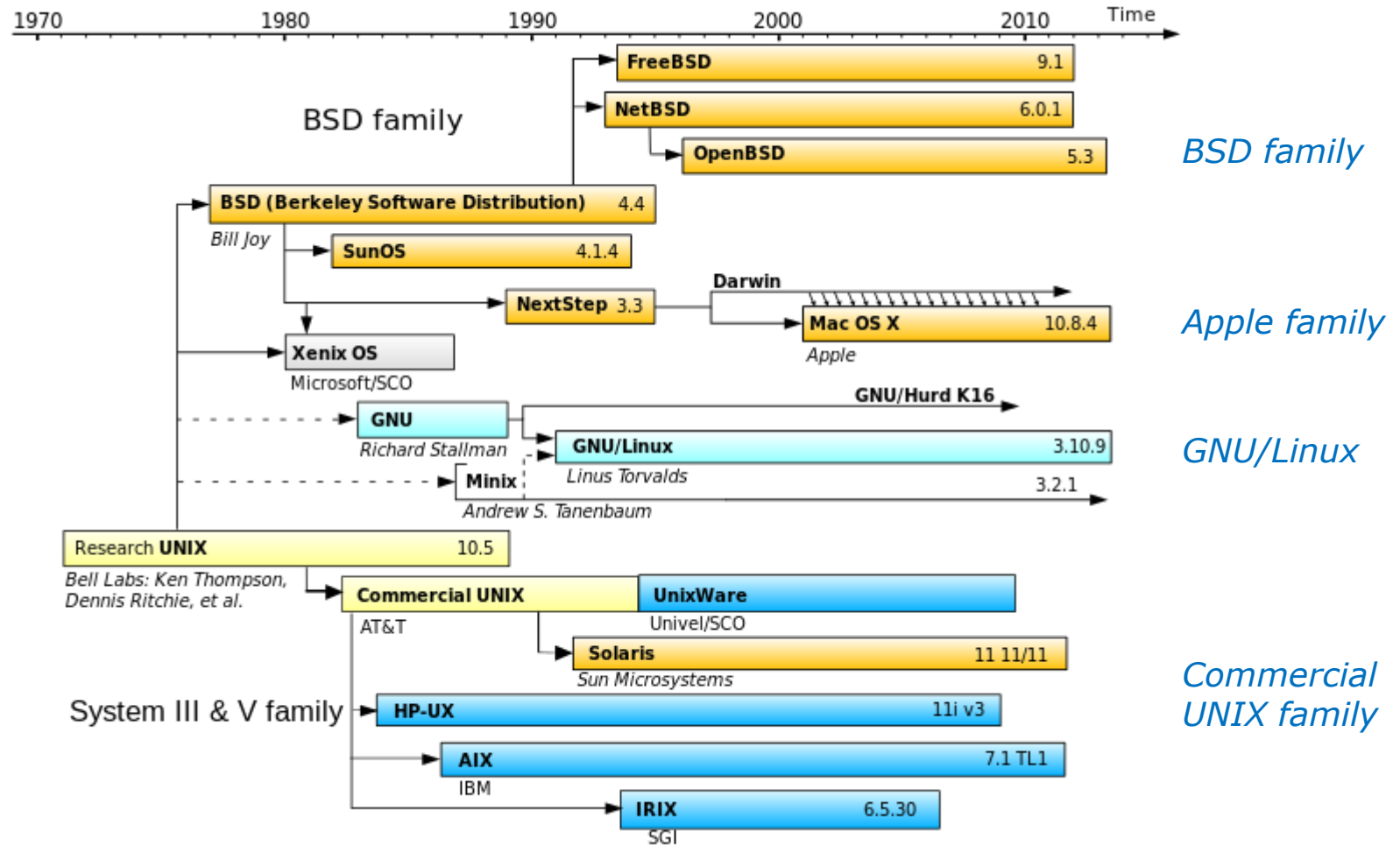
<http://www.sony.net/Products/Linux/common/search.html>





# Unix family trees





*It all started at Bell Labs*



# Unix family Trees

## Supplemental

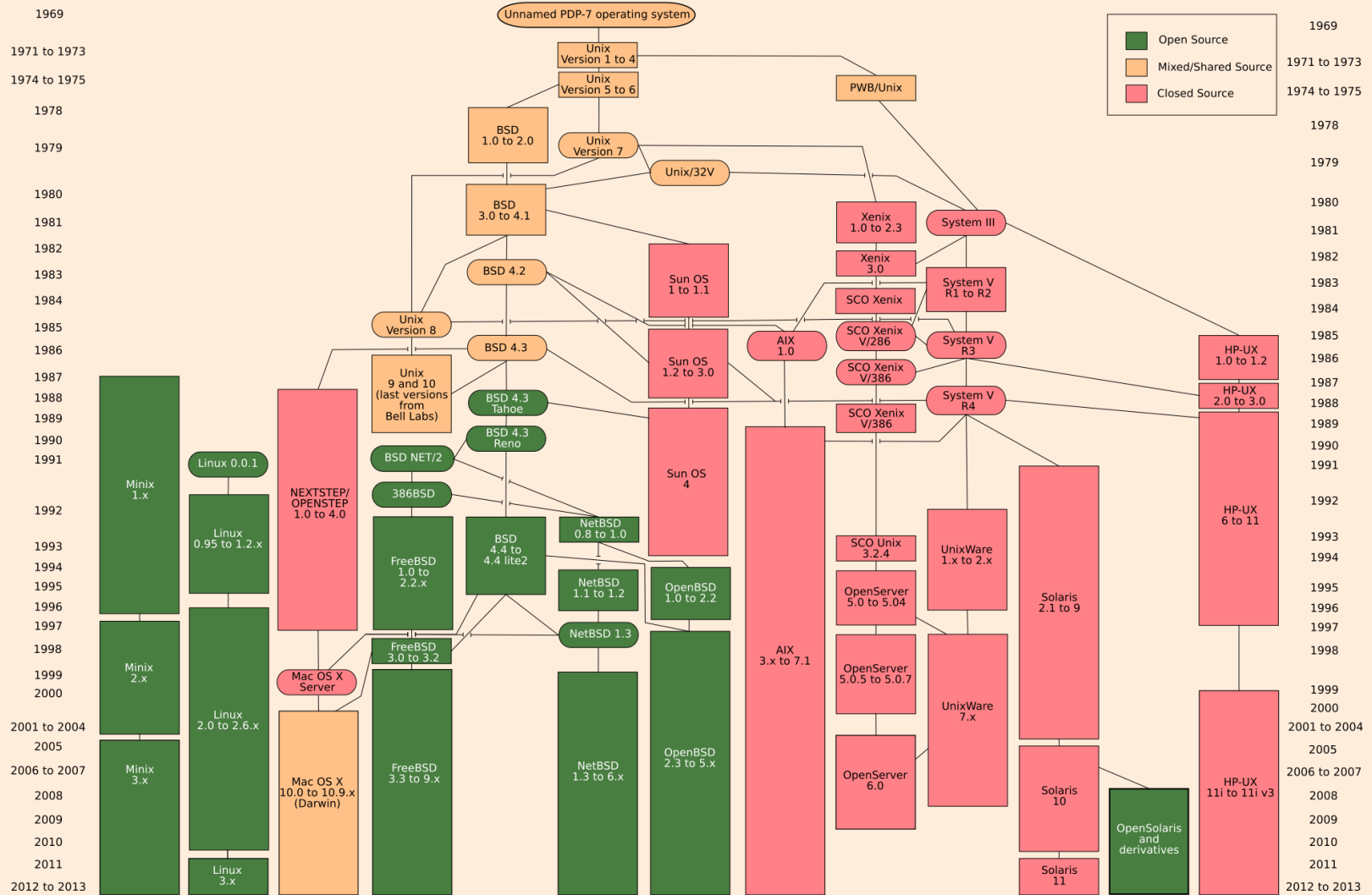
The diagram illustrates the lineage of the Linux operating system, starting from AT&T UNIX 1969 and branching out into various distributions and operating systems. The central figure is a Tux penguin, symbolizing the Linux kernel.

**AT&T UNIX 1969** leads to **UNIX 1 1971**, **UNIX 2 1972**, **UNIX 3 1973**, **UNIX 4 1973**, **UNIX 5 1974**, and **UNIX 6 1976**.

**UNIX 7 1979** branches into **UNIX 8 1985** and **UNIX 9 1986**. **UNIX 8 1985** leads to **UNIX 10 End: 1989**, which then leads to **MIPS MIPS OS 1985** and **MIPS OS End: 1989**. **UNIX 9 1986** leads to **SUN Solaris 2.0 1992** and **SUN Solaris Now**.

**UNIX 10 End: 1989** leads to **BSD 4.2 1985**, which then leads to **BSD 4.3 1989** and **BSD 4.4 End: 1993**. **BSD 4.3 1989** leads to **NetBSD 1993** and **NetBSD 1.0 1994**. **BSD 4.4 End: 1993** leads to **NetBSD 1.0 Now** and **FreeBSD 1993**.

**UNIX 11 1991** leads to **UNIX 12 1991**, which then leads to **UNIX 13 1991** and **UNIX 14 1991**. **UNIX 13 1991** leads to **UNIX 15 1991** and **UNIX 16 1991**. **UNIX 14 1991** leads to **UNIX 17 1991** and **UNIX 18 1991**. **UNIX 15 1991** leads to **UNIX 19 1991** and **UNIX 20 1991**. **UNIX 16 1991** leads to **UNIX 21 1991** and **UNIX 22 1991**. **UNIX 17 1991** leads to **UNIX 23 1991** and **UNIX 24 1991**. **UNIX 18 1991** leads to **UNIX 25 1991** and **UNIX 26 1991**. **UNIX 19 1991** leads to **UNIX 27 1991** and **UNIX 28 1991**. **UNIX 20 1991** leads to **UNIX 29 1991** and **UNIX 30 1991**. **UNIX 21 1991** leads to **UNIX 31 1991** and **UNIX 32 1991**. **UNIX 22 1991** leads to **UNIX 33 1991** and **UNIX 34 1991**. **UNIX 23 1991** leads to **UNIX 35 1991** and **UNIX 36 1991**. **UNIX 24 1991** leads to **UNIX 37 1991** and **UNIX 38 1991**. **UNIX 25 1991** leads to **UNIX 39 1991** and **UNIX 40 1991**. **UNIX 26 1991** leads to **UNIX 41 1991** and **UNIX 42 1991**. **UNIX 27 1991** leads to **UNIX 43 1991** and **UNIX 44 1991**. **UNIX 28 1991** leads to **UNIX 45 1991** and **UNIX 46 1991**. **UNIX 29 1991** leads to **UNIX 47 1991** and **UNIX 48 1991**. **UNIX 30 1991** leads to **UNIX 49 1991** and **UNIX 50 1991**. **UNIX 31 1991** leads to **UNIX 51 1991** and **UNIX 52 1991**. **UNIX 32 1991** leads to **UNIX 53 1991** and **UNIX 54 1991**. **UNIX 33 1991** leads to **UNIX 55 1991** and **UNIX 56 1991**. **UNIX 34 1991** leads to **UNIX 57 1991** and **UNIX 58 1991**. **UNIX 35 1991** leads to **UNIX 59 1991** and **UNIX 60 1991**. **UNIX 36 1991** leads to **UNIX 61 1991** and **UNIX 62 1991**. **UNIX 37 1991** leads to **UNIX 63 1991** and **UNIX 64 1991**. **UNIX 38 1991** leads to **UNIX 65 1991** and **UNIX 66 1991**. **UNIX 39 1991** leads to **UNIX 67 1991** and **UNIX 68 1991**. **UNIX 40 1991** leads to **UNIX 69 1991** and **UNIX 70 1991**. **UNIX 41 1991** leads to **UNIX 71 1991** and **UNIX 72 1991**. **UNIX 42 1991** leads to **UNIX 73 1991** and **UNIX 74 1991**. **UNIX 43 1991** leads to **UNIX 75 1991** and **UNIX 76 1991**. **UNIX 44 1991** leads to **UNIX 77 1991** and **UNIX 78 1991**. **UNIX 45 1991** leads to **UNIX 79 1991** and **UNIX 80 1991**. **UNIX 46 1991** leads to **UNIX 81 1991** and **UNIX 82 1991**. **UNIX 47 1991** leads to **UNIX 83 1991** and **UNIX 84 1991**. **UNIX 48 1991** leads to **UNIX 85 1991** and **UNIX 86 1991**. **UNIX 49 1991** leads to **UNIX 87 1991** and **UNIX 88 1991**. **UNIX 50 1991** leads to **UNIX 89 1991** and **UNIX 90 1991**. **UNIX 51 1991** leads to **UNIX 91 1991** and **UNIX 92 1991**. **UNIX 52 1991** leads to **UNIX 93 1991** and **UNIX 94 1991**. **UNIX 53 1991** leads to **UNIX 95 1991** and **UNIX 96 1991**. **UNIX 54 1991** leads to **UNIX 97 1991** and **UNIX 98 1991**. **UNIX 55 1991** leads to **UNIX 99 1991** and **UNIX 100 1991**. **UNIX 56 1991** leads to **UNIX 101 1991** and **UNIX 102 1991**. **UNIX 57 1991** leads to **UNIX 103 1991** and **UNIX 104 1991**. **UNIX 58 1991** leads to **UNIX 105 1991** and **UNIX 106 1991**. **UNIX 59 1991** leads to **UNIX 107 1991** and **UNIX 108 1991**. **UNIX 60 1991** leads to **UNIX 109 1991** and **UNIX 110 1991**. **UNIX 61 1991** leads to **UNIX 111 1991** and **UNIX 112 1991**. **UNIX 62 1991** leads to **UNIX 113 1991** and **UNIX 114 1991**. **UNIX 63 1991** leads to **UNIX 115 1991** and **UNIX 116 1991**. **UNIX 64 1991** leads to **UNIX 117 1991** and **UNIX 118 1991**. **UNIX 65 1991** leads to **UNIX 119 1991** and **UNIX 120 1991**. **UNIX 66 1991** leads to **UNIX 121 1991** and **UNIX 122 1991**. **UNIX 67 1991** leads to **UNIX 123 1991** and **UNIX 124 1991**. **UNIX 68 1991** leads to **UNIX 125 1991** and **UNIX 126 1991**. **UNIX 69 1991** leads to **UNIX 127 1991** and **UNIX 128 1991**. **UNIX 70 1991** leads to **UNIX 129 1991** and **UNIX 130 1991**. **UNIX 71 1991** leads to **UNIX 131 1991** and **UNIX 132 1991**. **UNIX 72 1991** leads to **UNIX 133 1991** and **UNIX 134 1991**. **UNIX 73 1991** leads to **UNIX 135 1991** and **UNIX 136 1991**. **UNIX 74 1991** leads to **UNIX 137 1991** and **UNIX 138 1991**. **UNIX 75 1991** leads to **UNIX 139 1991** and **UNIX 140 1991**. **UNIX 76 1991** leads to **UNIX 141 1991** and **UNIX 142 1991**. **UNIX 77 1991** leads to **UNIX 143 1991** and **UNIX 144 1991**. **UNIX 78 1991** leads to **UNIX 145 1991** and **UNIX 146 1991**. **UNIX 79 1991** leads to **UNIX 147 1991** and **UNIX 148 1991**. **UNIX 80 1991** leads to **UNIX 149 1991** and **UNIX 150 1991**. **UNIX 81 1991** leads to **UNIX 151 1991** and **UNIX 152 1991**. **UNIX 82 1991** leads to **UNIX 153 1991** and **UNIX 154 1991**. **UNIX 83 1991** leads to **UNIX 155 1991** and **UNIX 156 1991**. **UNIX 84**

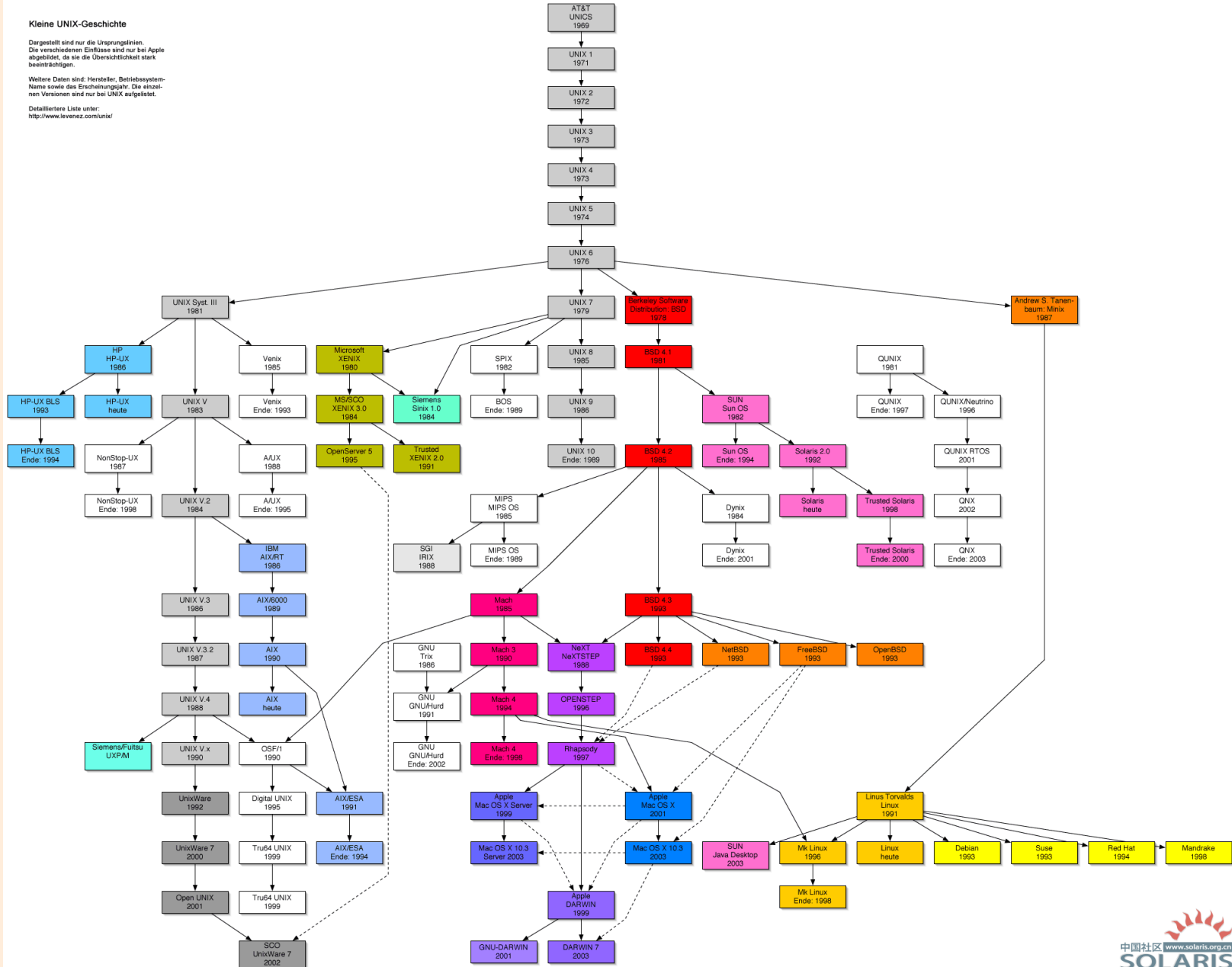


## Kleine UNIX-Geschichte

Dargestellt sind nur die Ursprungslinien.  
Die verschiedenen Einflüsse sind nur bei Apple  
abgebildet, da sie die Übersichtlichkeit stark  
beeinträchtigen.

Weitere Daten sind: Hersteller, Betriebssystem-  
Name sowie das Erscheinungsjahr. Die einzel-  
nen Versionen sind nur bei UNIX aufgelistet.

Detailliertere Liste unter:  
<http://www.levenez.com/unix/>



www.levenez.com/unix/

## Unix History

### Unix Timeline

Below, you can see the preview of the **Unix History** (move on the white zone to get a bigger image):

This is a simplified diagram of unix history. There are numerous derivative systems not listed in this chart, maybe 10 times more! In the recent past, many electronic companies had their own unix releases. This diagram is only the tip of an iceberg, with a penguin on it ;-).

System	Version	Date
Oracle Solaris	11.1	october 4, 2012
Android	4.1.1	july 9, 2012
Android	4.1.2	oct. 9, 2012
Android	4.2	oct. 29, 2012
Android	4.2.1	november 27, 2012
Linux	3.5	july 21, 2012
Linux	3.6	september 30, 2012
Linux	3.7	december 10, 2012

www.levenez.com/unix/redirect\_unix\_a4\_pdf.html

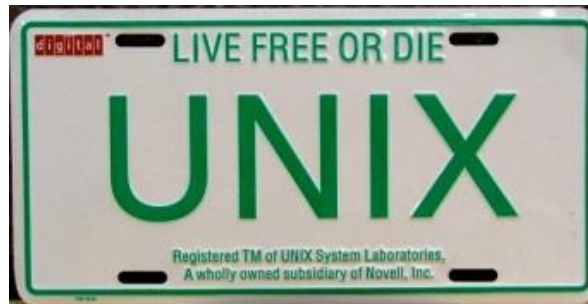


# UNIX

# Commercial UNIX

## The commercial "UNIX" descendants

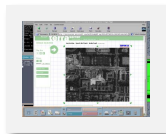
The UNIX trademark is owned and managed by The Open Group on behalf of the industry to signify products that are certified to conform to the Single UNIX Specification.



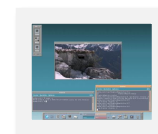
SCO UNIX  
PC servers



Sun Solaris  
Servers and workstations



IBM AIX  
Servers, mainframes and  
workstations



HP HP-UX  
Servers and workstations



Apple OS X  
Mac computers

# **BSD**

## **Berkeley**

## **Software**

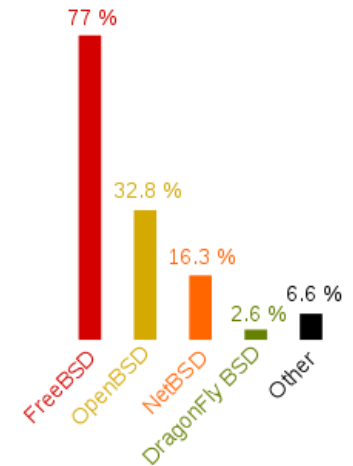
## **Distribution**

## BSD Unix and its "UNIX-like" Descendants

UC Berkeley had a source license from AT&T so they could make their own modifications and additions like TCP/IP which enabled Unix for the Internet. BSD Unix was very popular with university and government users.



*Because the original BSD Unix was based on ATT's UNIX code it had to be re-written from scratch so it could be distributed freely as open source. These "UNIX-like" descendants are not allowed to use the UNIX trademark.*



Source: <http://en.wikipedia.org/wiki/OpenBSD>

### Apple iOS



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

Sources: [http://en.wikipedia.org/wiki/Darwin\\_\(operating\\_system\)](http://en.wikipedia.org/wiki/Darwin_(operating_system))  
[http://en.wikipedia.org/wiki/IOS\\_\(Apple\)](http://en.wikipedia.org/wiki/IOS_(Apple))

# **GNU/Linux**

**GNU is Not Unix**



# GNU/Linux



Shells  
System commands  
Utilities  
Libraries  
Much more ...



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



Kernel



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

## Various GNU/Linux "Distros" (Distributions)

Red Hat Enterprise Linux



CentOS



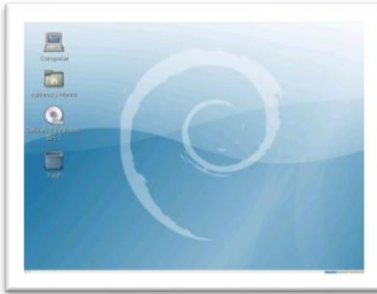
Fedora



OpenSUSE



Debian



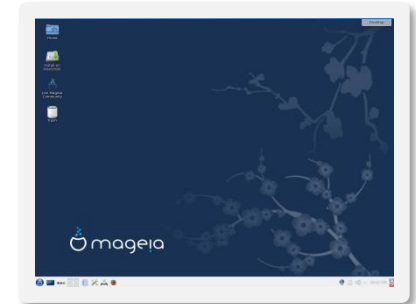
Ubuntu



Mint



Mageia



*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

## 15 Most Popular Linux Distro Downloads

15 Most Downloaded Distribution Versions (last 30 Days)	15 Most Downloaded Distributions (Ever)
<ol style="list-style-type: none"> <li>1. <a href="#">CentOS 6.9</a> (9561)</li> <li>2. <a href="#">Oracle Linux 5 Update 7</a> (3185)</li> <li>3. <a href="#">Damn Small Linux 4.4.10</a> (821)</li> <li>4. <a href="#">Oracle Linux 7.5</a> (643)</li> <li>5. <a href="#">Oracle Linux 7.4</a> (433)</li> <li>6. <a href="#">Kali Linux 2017.3</a> (202)</li> <li>7. <a href="#">Oracle Linux 7.3</a> (195)</li> <li>8. <a href="#">Puppy Linux 6.3</a> (193)</li> <li>9. <a href="#">Oracle Linux 6.9</a> (175)</li> <li>10. <a href="#">Wifislax 4.10</a> (172)</li> <li>11. <a href="#">KNOPPIX 8.1</a> (164)</li> <li>12. <a href="#">Lubuntu 12.04</a> (159)</li> <li>13. <a href="#">Macpup 528</a> (134)</li> <li>14. <a href="#">Wifislax 4.9</a> (106)</li> <li>15. <a href="#">Wifislax 4.8</a> (101)</li> </ol>	<ol style="list-style-type: none"> <li>1. <a href="#">Red Hat Enterprise Linux</a></li> <li>2. <a href="#">Fedora</a></li> <li>3. <a href="#">Ubuntu</a></li> <li>4. <a href="#">Mandriva</a></li> <li>5. <a href="#">CentOS</a></li> <li>6. <a href="#">SUSE</a></li> <li>7. <a href="#">BackTrack</a></li> <li>8. <a href="#">Damn Small Linux</a></li> <li>9. <a href="#">Linux Mint</a></li> <li>10. <a href="#">Knoppix</a></li> <li>11. <a href="#">Debian</a></li> <li>12. <a href="#">Puppy Linux</a></li> <li>13. <a href="#">Slackware</a></li> <li>14. <a href="#">PCLinuxOS</a></li> <li>15. <a href="#">Oracle Linux</a></li> </ol>

Aug 28, 2018

<http://iso.linuxquestions.org/>

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

## Embedded Linux (just a few)



Katana  
Robotic Arm



Erle-Copter  
drone



Nest Cam



Amazon  
Kindle



Stir smart desk



Asus RT-AC66U  
wireless router



Tivo



Yamaha Disklavier  
Mark IV



Android  
Cell Phones



Some TomTom  
GPS models



Garmin  
Nuvi 5000



QNAP  
NAS storage



Virgin America  
Personal  
Entertainment



TripBPX  
Phone  
System



MikroTik  
Routers



Sony TVs



Android Tablets



Raspberry Pi



Polycom  
VOIP  
Phone





# Unix/Linux Architecture simplified

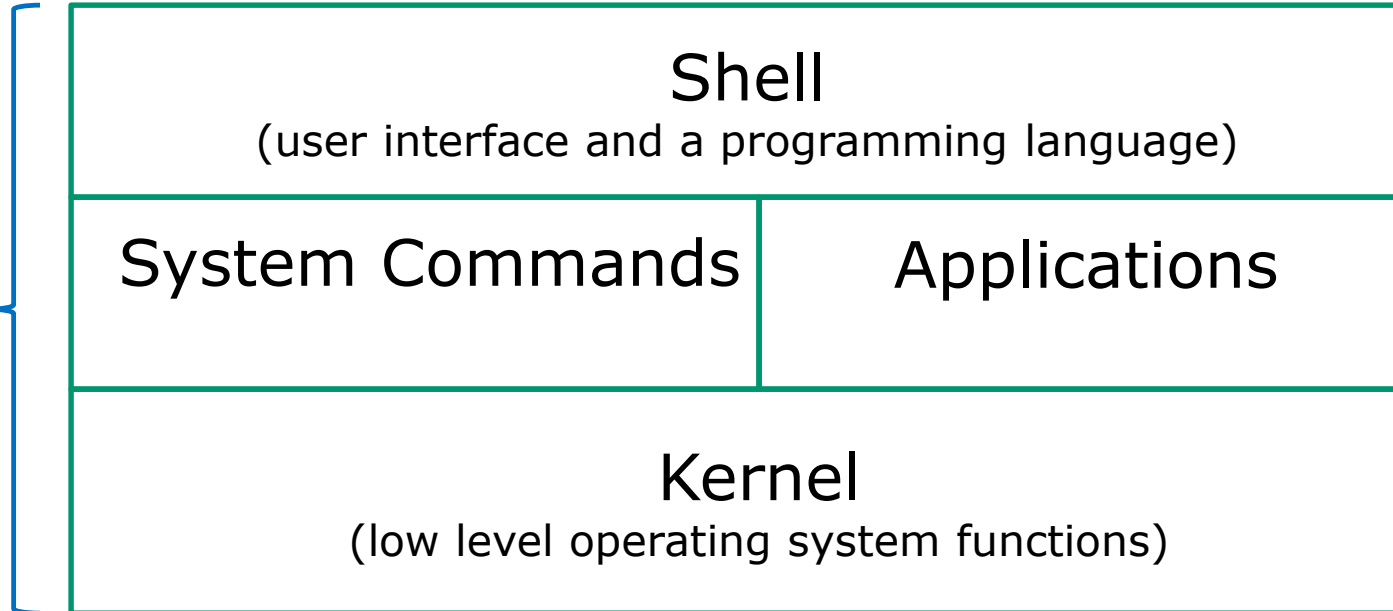


# UNIX/Linux Architecture Simplified View

**Users**



**Software**

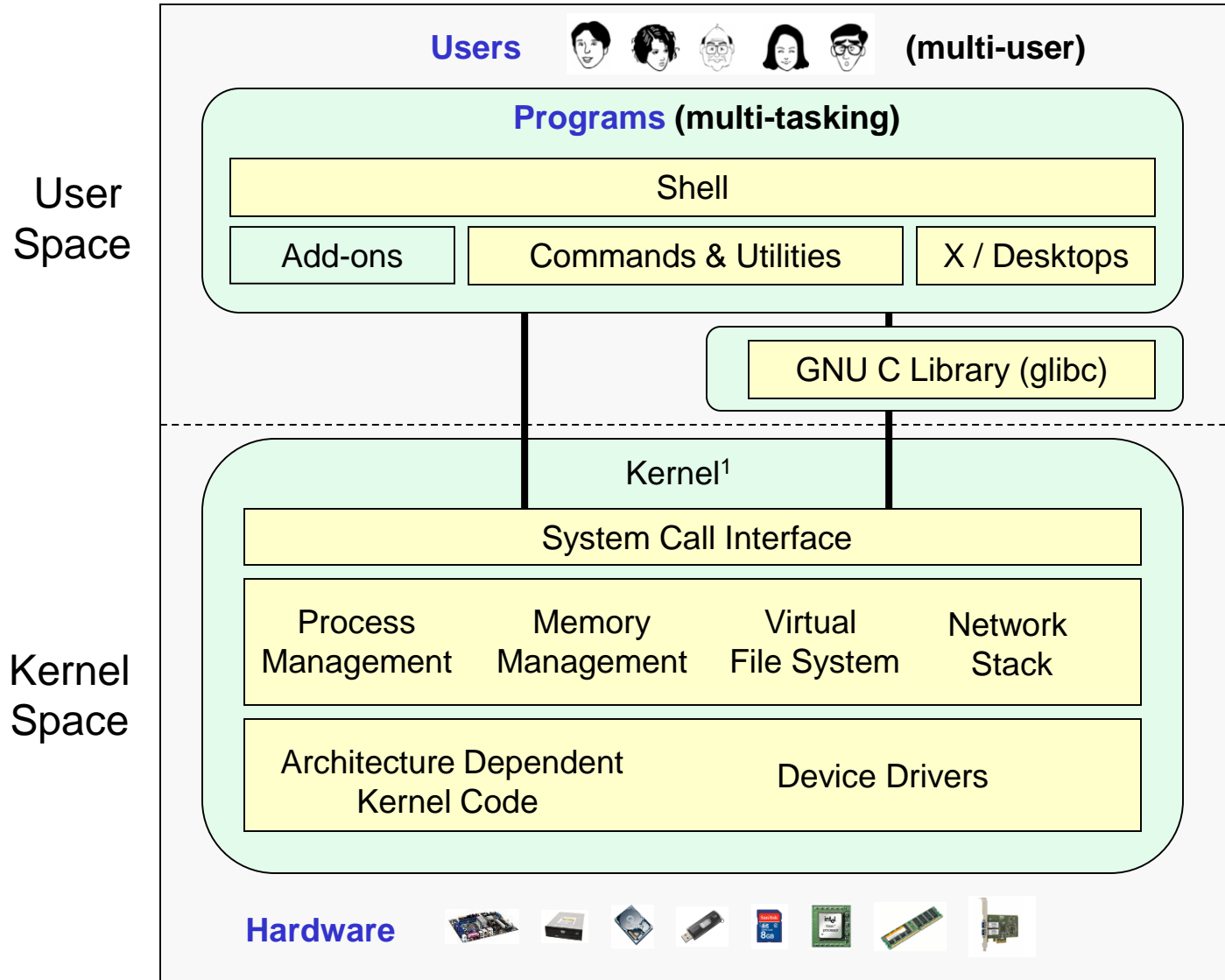


**Hardware**





## 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 in 1992.

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

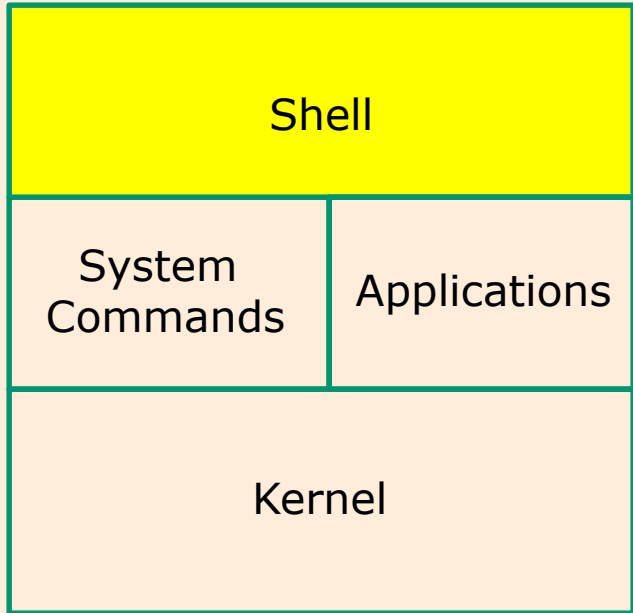
# UNIX/Linux Design “Observations”

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

# Unix/Linux Architecture simplified

supplemental

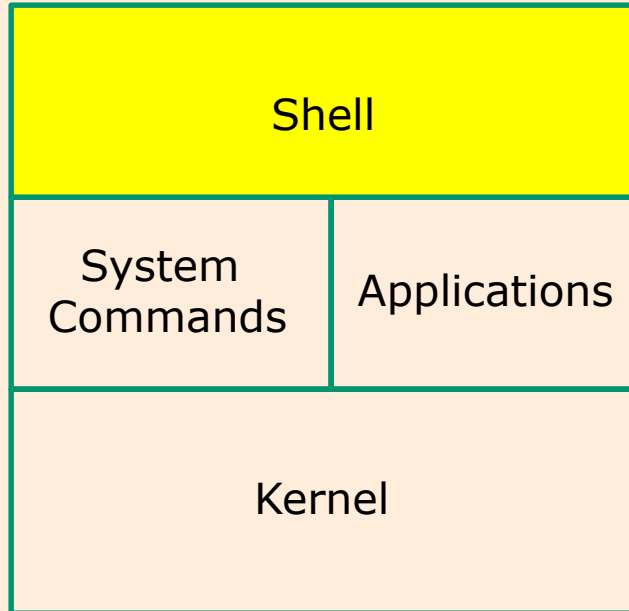
# The Shell (Command Line)



- Allows users to interact with the computer
- Called a "shell" because it hides the underlying operating system.
- Prompts user for a command, parses the command, then locates the command (a program or script) and runs it.
- Many shell programs are available: sh (Bourne shell), bash (Bourne 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.



# The Shell Continued



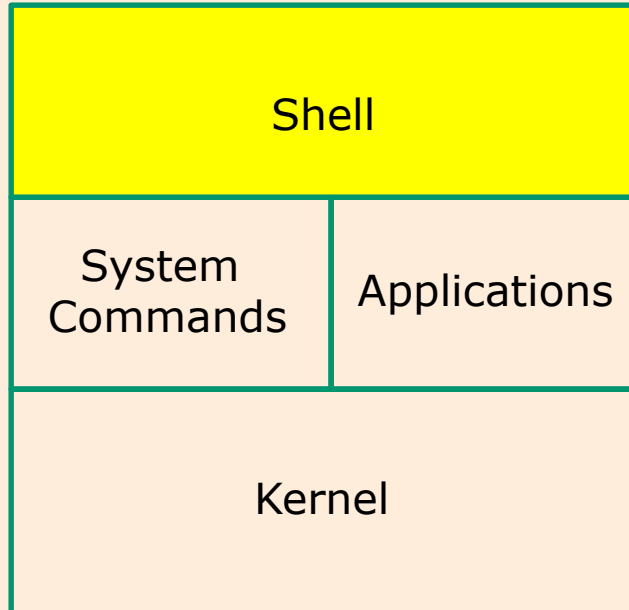
```
rsimms@opus:~  
[rsimms@opus ~]$ hostname  
opus.cabrillo.edu  
[rsimms@opus ~]$
```

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



*The shell is a user interface and a programming language*

# Various types of user interfaces



## Shell Command Line Interface (CLI)

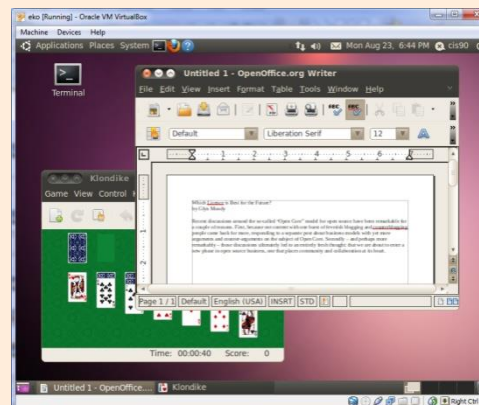
```
[root@frida root]# iptables -L -t nat
Chain PREROUTING (policy ACCEPT)
target     prot opt source                destination

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)

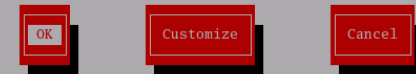


gnome

## Text User Interface (TUI)

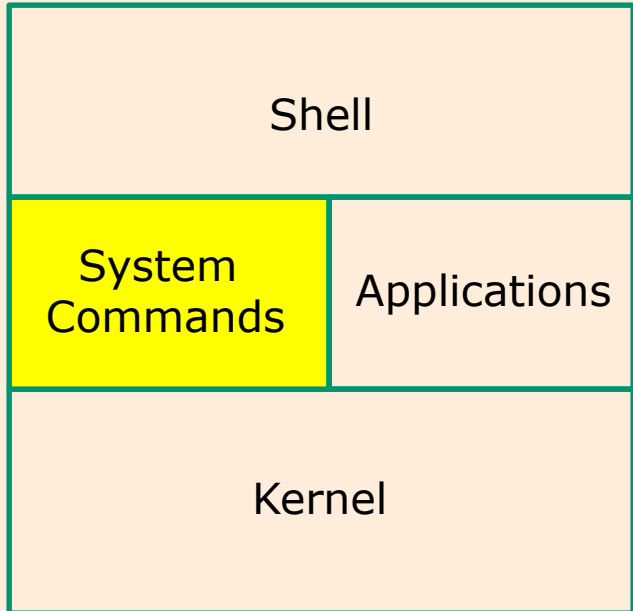
A firewall protects against unauthorized network intrusions. High security blocks all incoming accesses. Medium blocks access to system services (such as telnet or printing), but allows other connections. No firewall allows all connections and is not recommended.

Security Level: ☒ High ☐ Medium ☐ No firewall



Lokkit Utility (uses curses library)

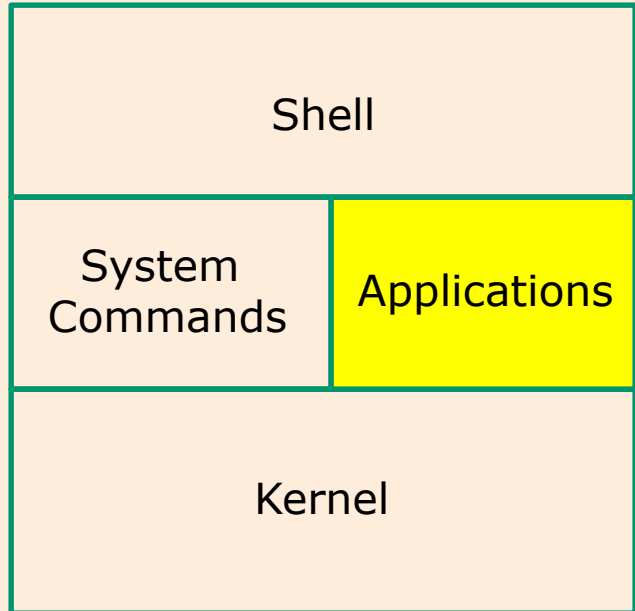
# System Commands



- 100's of system commands and utilities.
- We will learn how to use the following commands in this lesson:
  - cal
  - clear
  - date
  - exit
  - hostname
  - id
  - ps
  - ssh
  - tty
  - uname

# UNIX/Linux Architecture

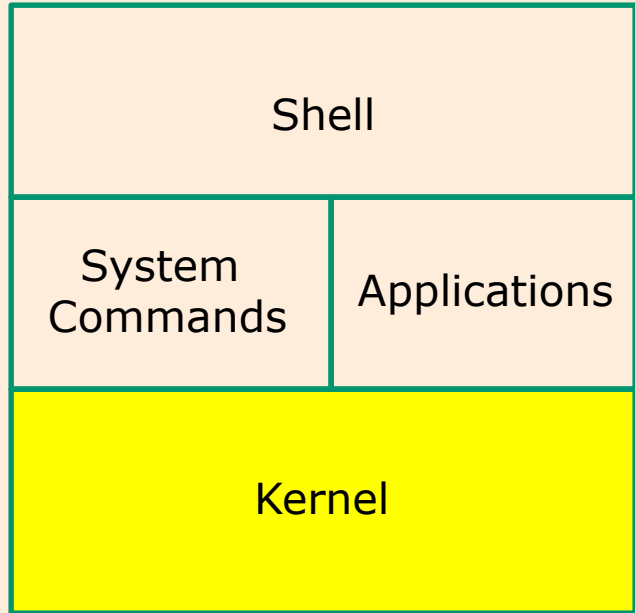
## Applications



- 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.



# The 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.





# Market Share

## Supplemental



## Worldwide Server Market



**FRAMINGHAM, Mass., June 1, 2016** – According to the International Data Corporation (IDC) **Worldwide Quarterly Server Tracker**, vendor revenue in the worldwide server market decreased 3.6% year over year to \$12.4 billion in the first quarter of 2016 (1Q16). This ended a seven quarter streak of year-over-year revenue growth as server market demand slowed due to a pause in hyperscale server deployments as well as a clear end to the enterprise refresh cycle. Worldwide server shipments decreased 3.0% to 2.2 million units in 1Q16 when compared with the same year-ago period.

Source: IDC, <https://www.idc.com/getdoc.jsp?containerId=prUS41424716>

Quarter	2012Q1	2012Q2	2012Q3	2012Q4	2013Q1	2013Q2	2013Q3	2013Q4	2014Q1	2014Q2	2014Q3	2014Q4	2015Q1	2015Q2	2015Q3
OS	Units	Units	Units	Units	Units	Units	Units	Units	Units	Units	Units	Units	Units	Units	Units
i5/OS	376	376	479	560	348	303	394	452	172	201	220	278	317	154	171
Linux	552,776	580,481	704,734	731,987	633,291	748,081	764,935	882,012	755,867	821,566	953,219	995,669	867,441	881,780	1,019,325
NetWare															
OpenVMS	121	302	238	275	193	230	209	94	46	103	103	98	29	37	43
Others	1,260	1,099	1,010	1,013	1,071	911	1,039	825	696	469	535	580	417	300	360
Unix	44,831	45,290	40,209	41,593	31,063	34,446	31,035	32,064	24,739	27,022	25,303	26,571	19,969	22,855	21,994
Windows	1,434,667	1,444,014	1,524,330	1,520,144	1,367,995	1,413,723	1,456,832	1,557,954	1,295,665	1,373,838	1,404,824	1,519,288	1,365,814	1,391,140	1,448,711
z/OS	441	452	401	998	646	688	678	911	541	940	486	713	819	1,148	687
<b>TOTAL</b>	<b>2,034,470</b>	<b>2,072,014</b>	<b>2,271,402</b>	<b>2,296,570</b>	<b>2,034,607</b>	<b>2,198,382</b>	<b>2,255,122</b>	<b>2,474,312</b>	<b>2,077,727</b>	<b>2,224,138</b>	<b>2,384,688</b>	<b>2,543,197</b>	<b>2,254,806</b>	<b>2,297,414</b>	<b>2,491,291</b>

Source: Jorge Vela at IDC

# Website hits by browser OS

Jul 2010<sup>1</sup>

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

6.9%

Jan 2013<sup>2</sup>

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

22.8%

Jul 2018<sup>3</sup>

Top 10 Platforms		
1	Android 7	16.15%
2	Windows 7	12.79%
3	Android 6	11.40%
4	iOS 11	11.36%
5	Windows 10	10.93%
6	Android 5	9.98%
7	Android 8	5.81%
8	Android 4	5.17%
9	Mac OS X	2.92%
10	Windows 8.1	2.16%

62.8%

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

2-This report was generated 01/31/2013 based on the last 15,000 page views to each website tracked by W3Counter. W3Counter's sample currently includes 63,187 websites. The browser market share graph includes data from all versions of the named browser families, not only the top 10 as listed below.

3-This report was generated 07/31/2018 based on the past month's traffic to all websites that use W3Counter's free web stats.



```

▶ Frame 181: 357 bytes on wire (2856 bits), 357 bytes captured (2856 bits) on interface 0
▶ Ethernet II, Src: Vmware_b8:31:58 (00:0c:29:bb:31:58), Dst: AsustekC_85:3e:e8 (2c:56:dc:85:3e:e8)
▶ Internet Protocol Version 4, Src: 192.168.1.56, Dst: 208.113.154.64
▶ Transmission Control Protocol, Src Port: 46618 (46618), Dst Port: 80 (80), Seq: 1, Ack: 1, Len: 303

```

## Hypertext Transfer Protocol

```

▶ GET / HTTP/1.1\r\n
Host: smilesantacruz.com\r\n
User-Agent: Mozilla/5.0 (X11; Linux i686; rv:44.0) Gecko/20100101 Firefox/44.0 Icedweasel/44.0.2\r\n
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8\r\n
Accept-Language: en-US,en;q=0.5\r\n
Accept-Encoding: gzip, deflate\r\n
Connection: keep-alive\r\n

```

*Kali Linux (Icedweasel)*

```

▶ Frame 655: 627 bytes on wire (5016 bits), 627 bytes captured (5016 bits) on interface 0
▶ Ethernet II, Src: Apple_b2:aa:8b (ac:bc:32:b2:aa:8b), Dst: Netgear_5c:a7:cc (2c:30:33:5c:a7:cc)
▶ Internet Protocol Version 4, Src: 172.30.1.55, Dst: 208.113.154.64
▶ Transmission Control Protocol, Src Port: 49428, Dst Port: 80, Seq: 1, Ack: 1, Len: 573

```

## Hypertext Transfer Protocol

```

▶ GET / HTTP/1.1\r\n
Host: smilesantacruz.com\r\n
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8\r\n
Upgrade-Insecure-Requests: 1\r\n
Cookie: __utma=222560537.1964456004.1485290514.1485290514.1485297432.2; __utmb=222560537.1.10.1485297432; __utmc=222560537; __utmt=1;
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_12_2) AppleWebKit/602.3.12 (KHTML, like Gecko) Version/10.0.2 Safari/602.3.12\r\n
Accept-Language: en-us\r\n
Accept-Encoding: gzip, deflate\r\n
Connection: keep-alive\r\n
\r\n
[Full request URI: http://smilesantacruz.com/]

```

*Mac OS X 10.12 (Safari)*



*When you surf websites you leave information such as your IP address, operating system and browser app.*

```

> Frame 169: 591 bytes on wire (4728 bits), 591 bytes captured (4728 bits) on interface 0
> Ethernet II, Src: GoodWayI_7f:66:04 (00:50:b6:7f:66:04), Dst: AsustekC_85:3e:e8 (2c:56:dc:85:3e:e8)
> Internet Protocol Version 4, Src: 192.168.1.237, Dst: 208.113.154.64
> Transmission Control Protocol, Src Port: 58706, Dst Port: 80, Seq: 1, Ack: 1, Len: 537

```

## Hypertext Transfer Protocol

```

> GET / HTTP/1.1\r\n
Accept: text/html,application/xhtml+xml,image/jxr,*/*\r\n
Accept-Language: en-US\r\n
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/51.0.2704.79 Safari/537.36 Edge/14.14393\r\n
Accept-Encoding: gzip, deflate\r\n
Host: smilesantacruz.com\r\n
Connection: Keep-Alive\r\n
> Cookie: __utma=222560537.1126876212.1485282896.1485282896.1485282896.1; __utmb=222560537.2.10.1485282896; __utmc=222560537; __utmz=222560537.1485282896.1.1
\r\n
[Full request URI: http://smilesantacruz.com/]
[HTTP request 1/2]
[Response in frame: 191]
[Next request in frame: 247]

```

*Windows 10 (Edge)*





## Smartphones



### Worldwide Smartphone Sales to End Users by Operating System in 2Q18 (Thousands of Units)

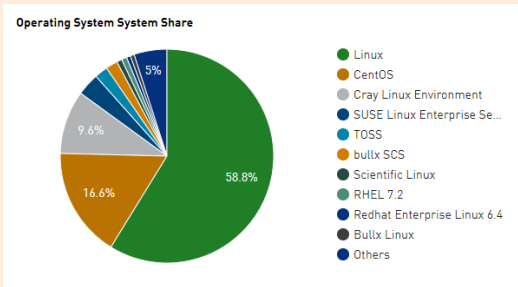
Operating System	2Q18 Units	2Q18 Market Share (%)	2Q17 Units	2Q17 Market Share (%)
Android	329,503.4	88.0	321,848.2	87.8
iOS	44,715.1	11.9	44,314.8	12.1
Other OS	112.1	0.0	433.1	0.1
<b>Total</b>	<b>374,330.6</b>	<b>100.0</b>	<b>366,596.1</b>	<b>100.0</b>

Source: Gartner (August 2018)

Source:

<https://www.gartner.com/en/newsroom/press-releases/2018-08-28-gartner-says-huawei-secured-no-2-worldwide-smartphone-vendor-spot-surpassing-apple-in-second-quarter>

## Operating System Share June 2017



## Linux dominates the Supercomputer market

Operating System	Count	System Share (%)	Rmax (GFlops)	Rpeak (GFlops)	Cores
Linux	294	58.8	295,077,397	468,341,453	18,458,180
CentOS	83	16.6	68,234,142	126,617,437	6,455,356
Cray Linux Environment	48	9.6	147,748,346	210,095,979	5,363,588
SUSE Linux Enterprise Server 11	17	3.4	31,380,602	43,168,669	1,188,944
TOSS	10	2	14,228,087	16,573,455	496,584
bullx SCS	9	1.8	12,939,575	16,288,430	435,548
Scientific Linux	4	0.8	2,993,488	4,203,277	98,552
RHEL 7.2	4	0.8	4,738,901	5,395,687	149,300
Redhat Enterprise Linux 6.4	3	0.6	2,039,492	2,937,808	81,866
Bullx Linux	3	0.6	5,911,620	7,935,130	204,000
Ubuntu 14.04	3	0.6	4,434,300	6,712,960	82,960
SUSE Linux Enterprise Server 12 SP1	3	0.6	7,395,969	9,209,709	197,288
AIX	2	0.4	869,600	1,017,856	35,840
RHEL 6.8	2	0.4	1,384,140	1,556,890	46,336
bullx SuperComputer Suite A.E.2.1	2	0.4	2,596,000	3,191,270	147,744
Redhat Enterprise Linux 6	2	0.4	2,433,470	3,032,783	295,656
Redhat Enterprise Linux 6.5	2	0.4	2,987,745	4,115,251	105,216
Kylin Linux	2	0.4	35,934,090	57,976,934	3,294,720
Sunway RaiseOS 2.0.5	1	0.2	93,014,594	125,435,904	10,649,600
Redhat Enterprise Linux 7.2	1	0.2	459,830	508,032	15,120
Redhat Linux	1	0.2	460,200	694,886	4,736
RHEL 6.2	1	0.2	773,700	961,126	46,208
RHEL 7.3	1	0.2	802,400	1,417,152	17,760
Ubuntu Linux	1	0.2	3,307,000	4,896,512	60,512
SUSE Linux	1	0.2	6,227,200	9,957,427	148,176



Tianhe-2  
supercomputer  
in China



Cray XK7  
Titan at Oak  
Ridge National  
Lab



Sequoia, IBM  
BlueGene/Q  
at Lawrence  
Livermore  
Lab



Fujitsu K  
computer in  
Japan



Mira, IBM  
BlueGene/Q  
at Argonne  
Lab

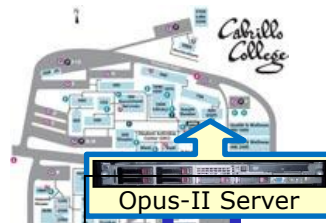
# Logging in via ssh

SSH  
(secure shell)



Getting the car keys

## Remote Server



**Problem:** We need a secure (encrypted) way to login and enter commands to a remote server over the network.

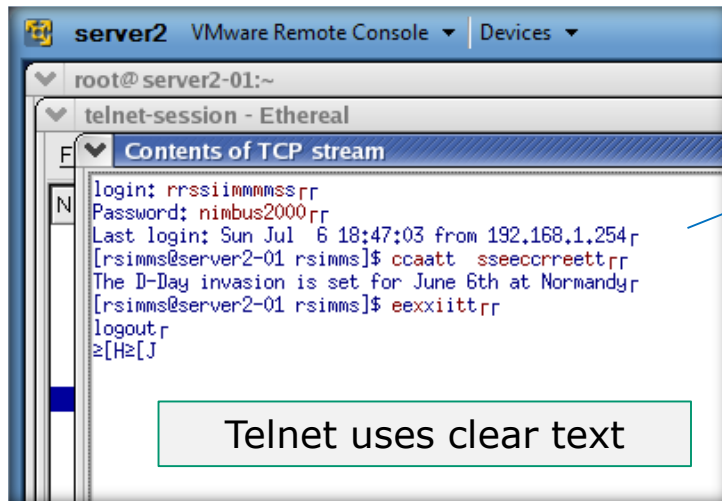


**Solution:** SSH is a network protocol that enables secure connections between computers

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

Old way: **telnet**

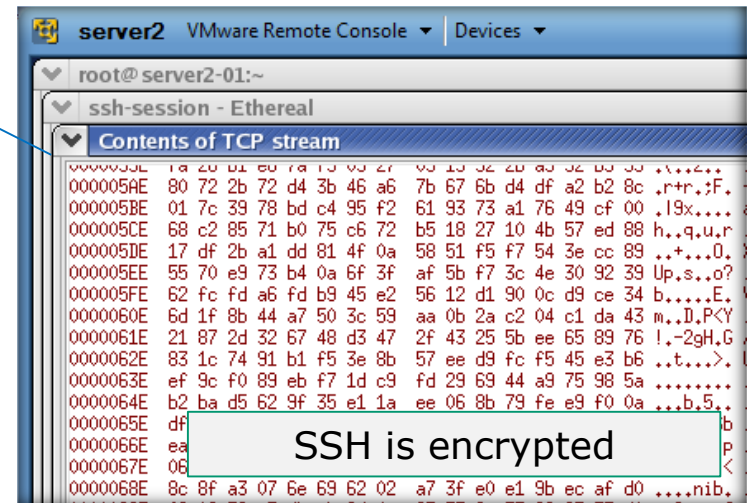
Sniffer view of a Telnet session



*With telnet, everything is transferred in clear text over the network (not good!)*

New way: **ssh**

Sniffer view of a SSH session



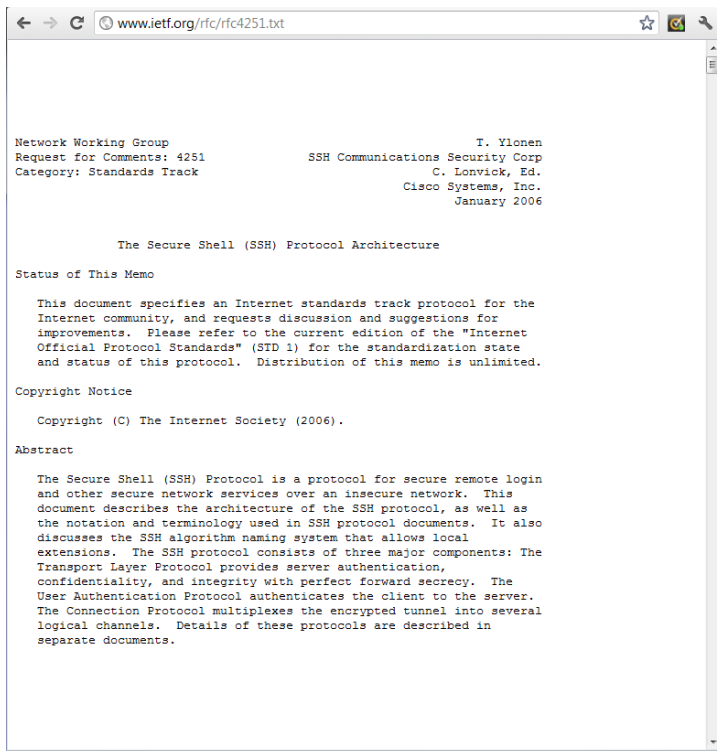
*With ssh, everything is encrypted. This is how we will access all UNIX/Linux systems in CIS 90.*

username  
password  
cat secret  
exit

**Local computer at home or on campus**



SSH (secure shell) is a standards based protocol. We will use it for remotely logging into and running commands on UNIX/Linux systems.



- See RFCs 4250 to 4254 at [www.ietf.org](http://www.ietf.org) for the gory details
- “RFC” = Request for Comment
- “IETF” = Internet Engineering Task Force

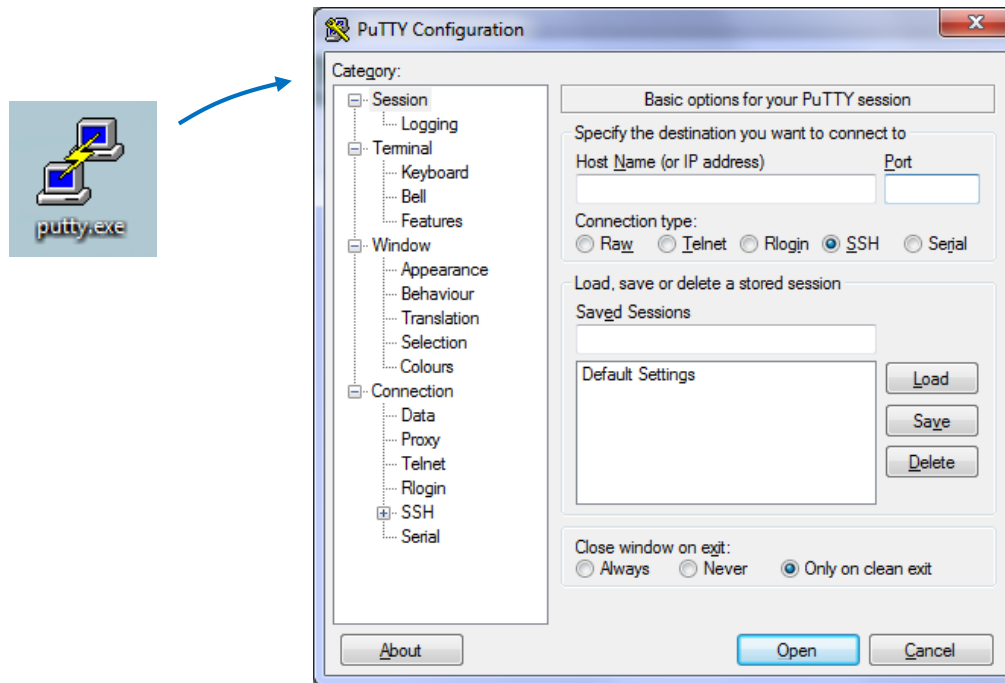
## An SSH app may need to be installed

- ✓ Linux and Mac already have SSH built in (i.e. the **ssh** command)
- ❑ Android smartphones and tablets can use SSH apps such as the free **ConnectBot** or **Juice** apps (I like Juice best)
- ❑ Apple iPhones and iPads can use ssh apps such as the **iSSH** app
- ❑ Windows users can download and install the **Putty** program

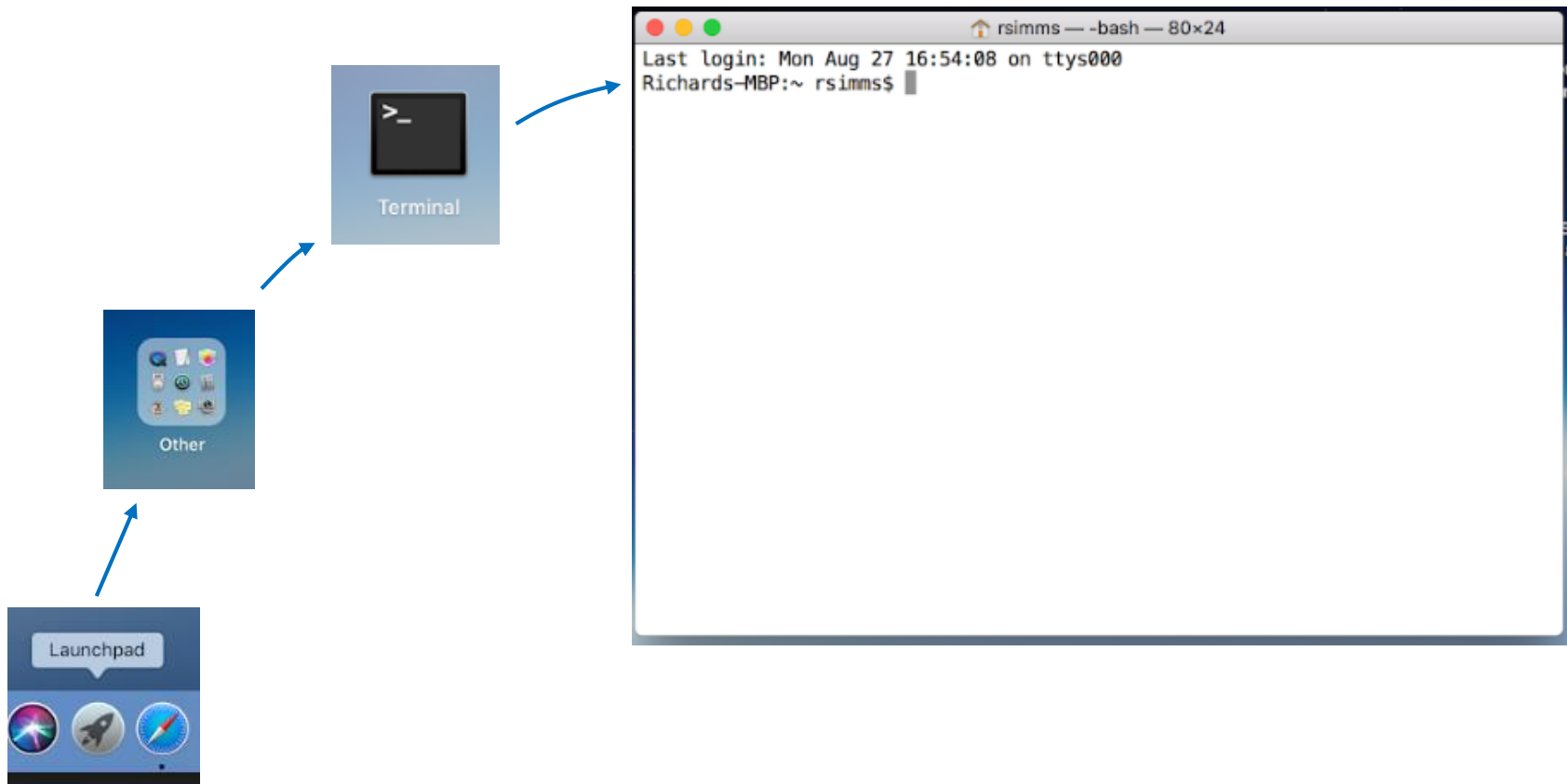


Putty is written and maintained primarily by Simon Tatham.  
<http://www.chiark.greenend.org.uk/~sgtatham/>  
Thank you Simon!






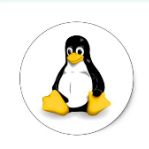

## Opening Putty on a Windows PC



## Opening a terminal on an Apple Mac



## Class Activity – Install SSH software if necessary

<b>Operating System</b>	 <b>Students in the classroom</b>	 <b>Students at home</b>
 Windows	 <ul style="list-style-type: none"> <li>Find and run the Putty program</li> </ul>	 <ul style="list-style-type: none"> <li>Google “putty download”</li> <li>Download the <u>putty.exe</u> binary to your desktop</li> <li>Run the downloaded putty.exe program</li> </ul> <a href="http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html">http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html</a>
  Linux or Mac		<ul style="list-style-type: none"> <li>Search for and run the terminal app</li> </ul>



# First Login

A white sedan is parked on a paved road in a desert landscape. The driver-side door is open, revealing the interior. A silver Thule roof rack is mounted on the car's roof. The background features prominent red rock formations and green trees under a cloudy sky. The text "Get into the car" is overlaid in large white letters.

# Get into the car

# SSH connection to a UNIX/Linux Server

To connect and login to a remote system you must know:

- The **hostname or IP Address** of the remote server (hostnames must be *fully qualified domain names* when going over the Internet)
- The **port** number the SSH service is listening on (the default for SSH is port 22)
- Your login credentials (**username** and **password**) on the remote server



## How people access a home somewhere

<http://modernwarpoetry.com/wp-content/uploads/2014/09/Vertical-Siding-Brick-wall-white-house-with-a-big-house.jpg>

1) You need an address to find someone's home on a map.

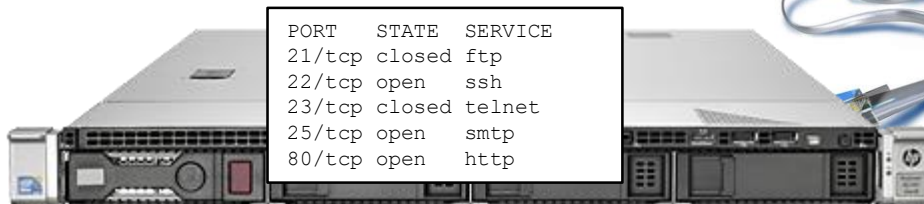


2) When you get there some doors are open and some are closed. You can only enter if the door is open.

3) Authentication is required for access:  
Homer owner: Who the heck are you?  
Visitor: My name is Rich and I live next door in the small shack

## How users access a server somewhere

1) You need an IP address or hostname to find a server on the Internet.



<http://product-images.www8-hp.com/digmedialib/prodimg/lowres/c03120597.png>

2) When you get there some ports are open and some are closed. You can only connect if the port is open.

3) Authentication is required for access:  
Server: Enter username & password  
Visiting user: rsimms & <secret>

# Logging into the Opus-II server

(The Linux server we primarily use for this course)

- The **hostname** is: **opus-ii.cis.cabrillo.edu**
- The **port** is: **2220**
- You must use your own **username** and **password** credentials

*You will need your unique login credentials for this module. To get them see my "Welcome to CISA 90" announcement in Canvas.*



# Login Credentials

Username and passwords

**Instructor Note:**

**PAUSE Recording,  
Switch to credentials  
document**

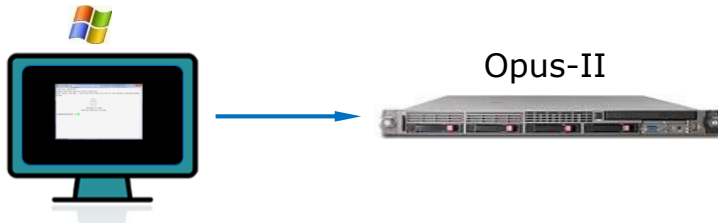
The Login Credentials slides are not included in these lesson slides.

To locate a copy, login into Canvas and read my Welcome to CIS 90 announcement.

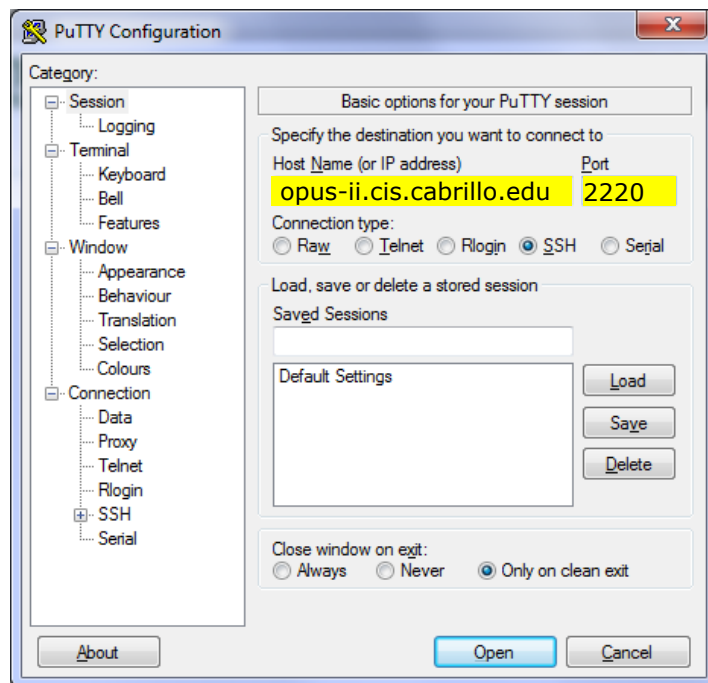
Instructor Note:

RESUME Recording,  
continue with lesson  
slides

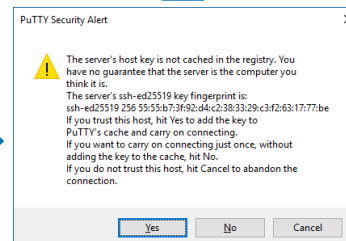
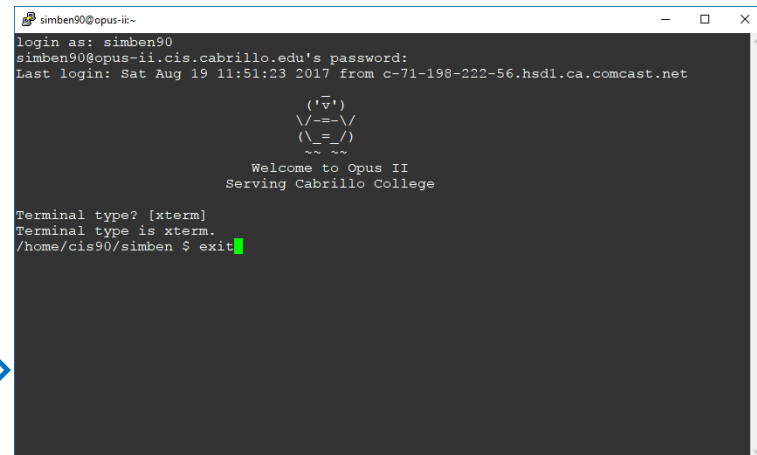
# SSH connection to a UNIX/Linux Server (From Windows using Putty)



On Windows run Putty



Click Open



Click Yes

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



## SSH connection to a UNIX/Linux Server (From Windows using Putty)

*Use your own  
username,  
not Benji's!*

Enter username  
(if prompted)

Enter password  
(not echoed)



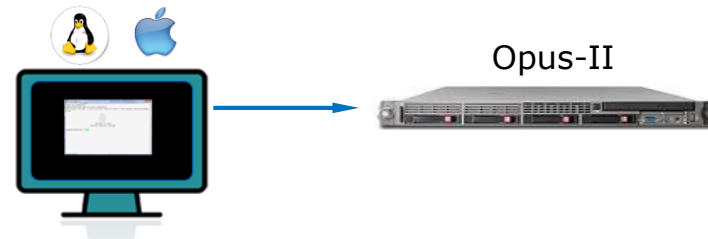
```
simben90@opus-ii:~  
login as: simben90  
simben90@opus-ii.cis.cabrillo.edu's password:   
Last login: Sat Aug 19 11:51:23 2017 from c-71-198-222-56.hsdl.ca.comcast.net  
  
      ('v')  
    \/_--\_/  
    (\_=_/_/)  
      ~~~~  
Welcome to Opus II  
Serving Cabrillo College  
  
Terminal type? [xterm]  
Terminal type is xterm.  
/home/cis90/simben $ exit
```

*Hit Enter to accept  
default terminal type*

*Enter exit command to  
end session*

*Note: If you specified the username in Putty or on the ssh  
command you will not be prompted for the username again.*

## SSH connection to a UNIX/Linux Server (From Linux or Mac using a terminal)



On a Mac or Linux terminal type:

**ssh -p 2220 username@opus-ii.cis.cabrillo.edu**

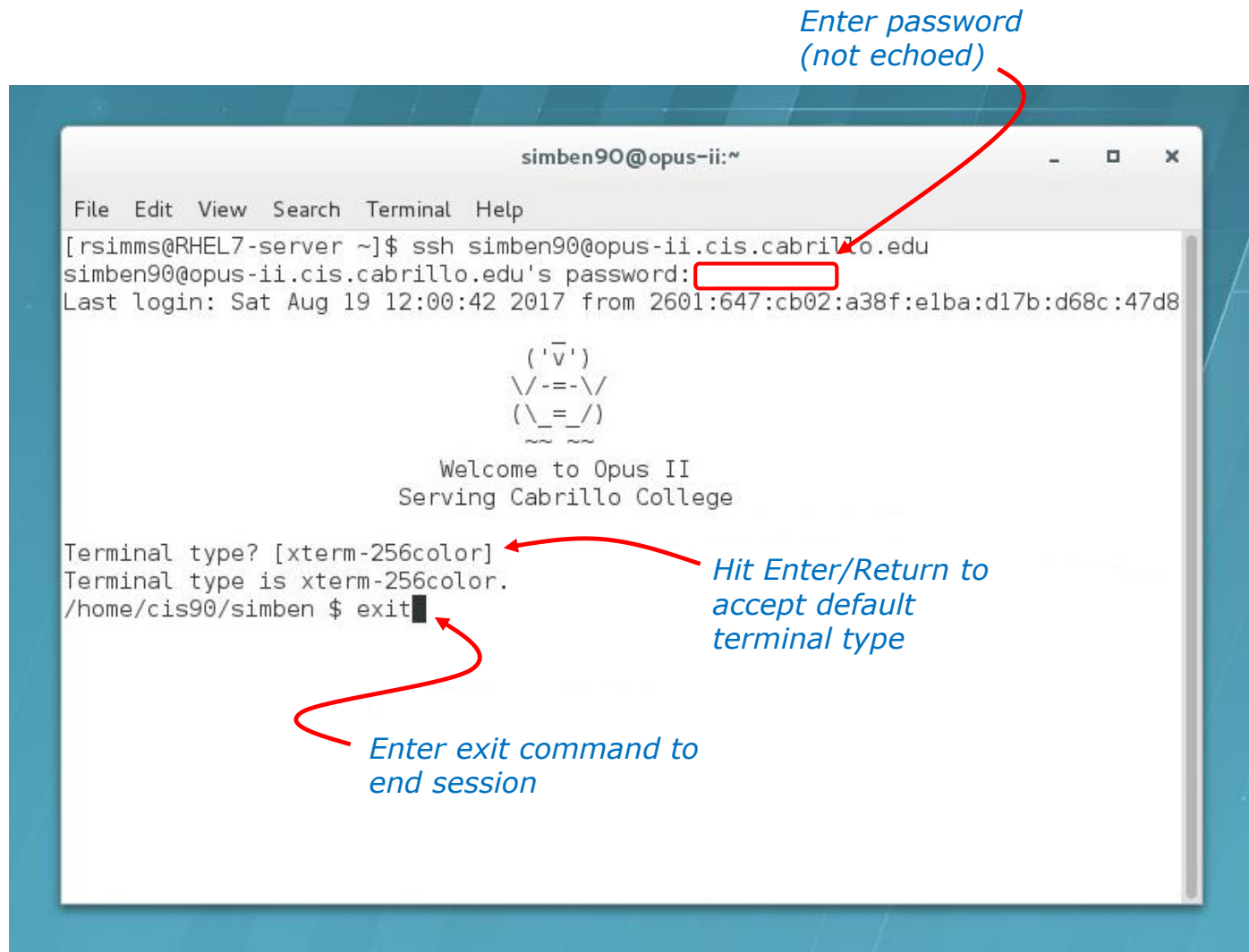
```
The authenticity of host '[opus-ii.cis.cabrillo.edu]:2220
([2607:f380:80f:f425::244]:2220)' can't be established.
RSA key fingerprint is 00:51:a2:ca:8a:08:30:9c:09:2e:e4:8a:bb:1f:94:b1.
Are you sure you want to continue connecting (yes/no)? yes
```

*An RSA fingerprint is a  
cryptographic hash of the  
server's public key.*

*Enter yes if you get  
this authenticity  
warning on the first  
connection.*

*Login continued on next slide*

## SSH connection to a UNIX/Linux Server - from Linux or Mac



The screenshot shows a terminal window titled "simben90@opus-ii:~". The terminal output is as follows:

```
File Edit View Search Terminal Help
[rsimms@RHEL7-server ~]$ ssh simben90@opus-ii.cis.cabrillo.edu
simben90@opus-ii.cis.cabrillo.edu's password: 
Last login: Sat Aug 19 12:00:42 2017 from 2601:647:cb02:a38f:elba:d17b:d68c:47d8

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

Welcome to Opus II
Serving Cabrillo College

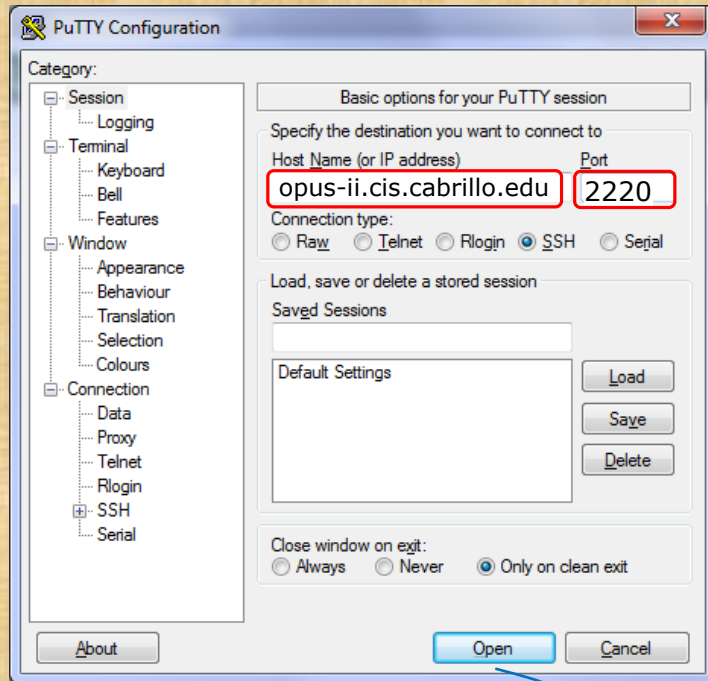
Terminal type? [xterm-256color]
Terminal type is xterm-256color.
/home/cis90/simben $ exit
```

Three red arrows point to specific parts of the terminal output with blue text annotations:

- An arrow points to the password prompt, with the annotation: *Enter password (not echoed)*
- An arrow points to the terminal type prompt, with the annotation: *Hit Enter/Return to accept default terminal type*
- An arrow points to the `exit` command, with the annotation: *Enter exit command to end session*



1) On Windows run Putty:



Respond "yes" to  
authenticity warning if  
it appears



1) On a Mac or Linux terminal type:

**ssh -p 2220 username@opus-ii.cis.cabrillo.edu**

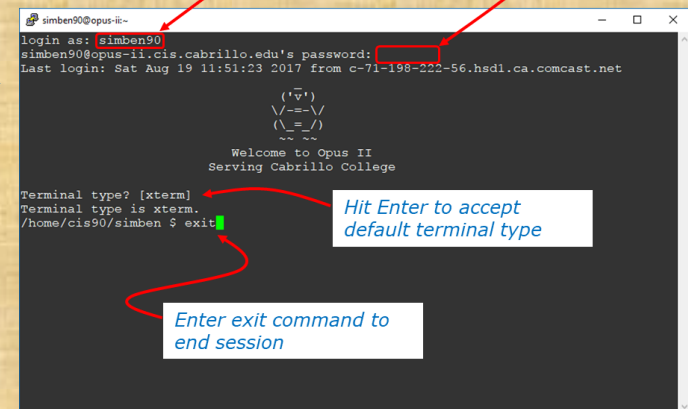
## Class Activity

**Log into Opus-II using SSH**  
(specify hostname, username, password, and port)

2) Enter your credentials (not Benji's)

username  
(if prompted)

password  
(not echoed)



Hit Enter to accept  
default terminal type

Enter exit command to  
end session



## Additional Resources

- How to open the terminal window on a mac

[https://www.youtube.com/watch?v=zw7Nd67\\_aFw](https://www.youtube.com/watch?v=zw7Nd67_aFw)

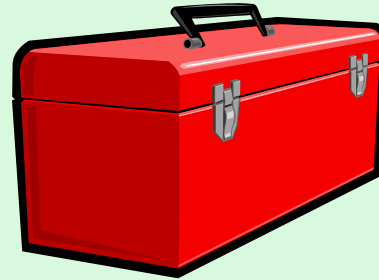


- Howto #146: Logging into Opus-II

<https://simms-teach.com/howtos/146-opus-access.pdf>







# First Commands

A wide-angle photograph of a desert landscape. A long, straight asphalt road stretches from the foreground into the distance, leading the eye towards a range of low, brown mountains on the horizon. The sky is a clear, vibrant blue with a single, small white cloud. The ground on either side of the road is dry and sandy, dotted with small, green desert shrubs. The overall scene conveys a sense of vastness and isolation.

# First driving lesson



## Lesson 1 commands for your toolbox

<b>cal</b>	- show calendar
<b>date</b>	- show current time and date
<b>clear</b>	- clear the terminal screen
<b>hostname</b>	- show the host name of the computer being accessed
<b>ps</b>	- show processes, including the name of the shell being run
<b>uname</b>	- show the kernel name
<b>cat /etc/issue</b>	- usually shows distro (distribution) name
<b>cat /etc/*-release</b>	- usually shows distro (distribution) name
<b>who</b>	- shows current login sessions
<b>who am i</b>	- identifies which login session you are using
<b>tty</b>	- shows your terminal device
<b>id</b>	- show user info including username/UID and group/GID
<b>history</b>	- show previous commands
<b>ssh</b>	- Connect and login to remote system
<b>exit</b>	- terminate your shell and log off

## Terminal type

```
login as: simben90  
simben90@oslab.cabrillo.edu's password:  
Last login: Sat Aug 19 11:02:46 2017 from oslab.cis.cabrillo.edu
```

```
      _  
    ('v')  
  \/-==-\/  
  (\_=_/_)  
   ~ ~ ~ ~
```

```
Welcome to Opus II  
Serving Cabrillo College
```

```
Terminal type? [xterm] ← Hit Enter key here to accept  
Terminal type is xterm. default terminal type  
/home/cis90/simben $
```

*The terminal type in this case is "xterm". The terminal type is different than the terminal device (more on this later).*

## Shell Prompt

login as: **simben90**

simben90@oslab.cabrillo.edu's password:

Last login: Sat Aug 19 11:02:46 2017 from oslab.cis.cabrillo.edu

```
(~'v')
```

```
\/-==-\/  
(\ _ _ /)  
~~  ~~
```

Welcome to Opus II  
Serving Cabrillo College

Terminal type? [xterm]

Terminal type is xterm.

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

*Hit Enter key here to accept  
default terminal type*

*Shell prompt - used by the shell to prompt the  
user to enter a command. The shell will display  
this prompt every time you hit the Enter key.*

**Question:** What is your exact prompt string on this system?

**Answer:** /home/cis90/simben \$



# First Commands supplemental examples

## **cal** command

*prompt*                      *command*

```
/home/cis90/simben $ cal  
August 2017  
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
```

*The **cal** command outputs the calendar for the current month.*

## cal command continued

*prompt* *command* *arguments*

```
/home/cis90/simben $ cal 12 2012
December 2012
Su Mo Tu We Th Fr Sa
      1
 2   3   4   5   6   7   8
 9  10  11  12  13  14  15
16  17  18  19  20  21  22
23  24  25  26  27  28  29
30  31
```

*Adding the month and year arguments to the **cal** command lets you specify a specific month and year*

**Question:** What day of the week (e.g Su Mo, Tu ...) was December 25, 2012?

**Answer:** Tu

## date command

*prompt*  
/home/cis90/simben \$ *command*  
Tue Aug 26 08:11:31 PDT 2014

*The **date** command outputs the current date and time.*

*Day-of-the-week Month Day-of-the-month Hours:Minutes:Seconds Time-Zone Year*

**Question:** What time is it on this system? (use HH:MM format and don't dawdle!)

**Answer:** 08:11

## Command Line Interface (CLI) terminology

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

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

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

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

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

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

*These are **arguments** for  
the command to process*

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

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

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



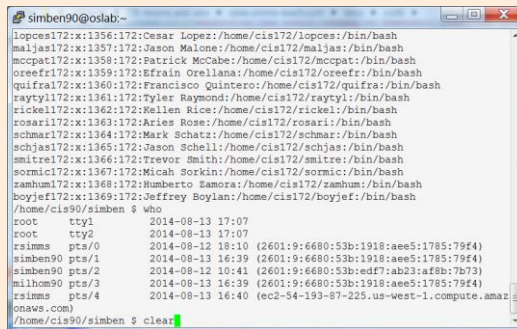
## clear command

*prompt* *command*

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

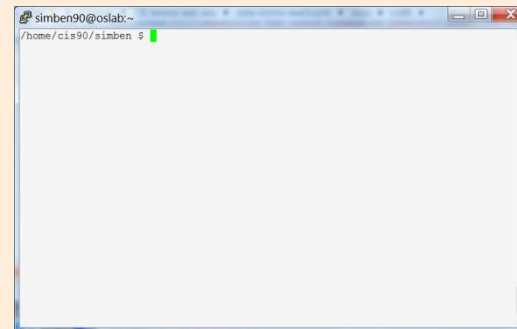
*The clear command will clear the screen.*

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



```
simben90@oslab:~$
lopecs172:x:1356:172:Cesar Lopez:/home/cis172/lopecs:/bin/bash
maljas172:x:1357:172:Jason Malone:/home/cis172/maljas:/bin/bash
mccpat172:x:1358:172:Patrick McCabe:/home/cis172/mccpat:/bin/bash
oreefr172:x:1359:172:Efrain Orellana:/home/cis172/oreefr:/bin/bash
quifra172:x:1360:172:Francisco Quintero:/home/cis172/quifra:/bin/bash
raytyl172:x:1361:172:Tyler Raymond:/home/cis172/raytyl:/bin/bash
rickel172:x:1362:172:Kellen Rice:/home/cis172/rickel:/bin/bash
rosari172:x:1363:172:Aries Rose:/home/cis172/rosari:/bin/bash
schmar172:x:1364:172:Mark Schatz:/home/cis172/schmar:/bin/bash
schjas172:x:1365:172:Jason Schell:/home/cis172/schjas:/bin/bash
smitre172:x:1366:172:Trevor Smith:/home/cis172/smitre:/bin/bash
sormic172:x:1367:172:Micah Sorkin:/home/cis172/sormic:/bin/bash
zanhum172:x:1368:172:Humberto Samora:/home/cis172/zanhum:/bin/bash
boyjef172:x:1369:172:Jeffrey Boylan:/home/cis172/boyjef:/bin/bash
/home/cis90/simben $ who
root      tty1      2014-08-13 17:07
root      tty2      2014-08-13 17:07
rsims     pts/0      2014-08-12 18:10 (2601:9:6680:53b:1918:aee5:1785:79f4)
simben90  pts/1      2014-08-13 16:39 (2601:9:6680:53b:1918:aee5:1785:79f4)
simben90  pts/2      2014-08-12 10:41 (2601:9:6680:53b:edf7:ab23:af8b:7b73)
milhom90  pts/3      2014-08-13 16:39 (2601:9:6680:53b:1918:aee5:1785:79f4)
rsims     pts/4      2014-08-13 16:40 (ec2-54-193-87-225.us-west-1.compute.amaz
onaws.com)
/home/cis90/simben $ clear
```

*before*



```
simben90@oslab:~$
/home/cis90/simben $
```

*after*

**Question:** What happens when you use the clear command?

**Answer:** The terminal window is cleared (scrolled up and out of sight)

## hostname command

*prompt*                      *command*

```
/home/cis90/simben $ hostname  
opus-ii.cis.cabrillo.edu
```

*The **hostname** command outputs the hostname of the system you are interacting with.*

**Question:** What is the hostname of this system?

**Answer:** opus-ii.cis.cabrillo.edu

## ps command

The **ps** command outputs the processes (programs loaded into memory and running) belonging to your username.

*prompt* *command*

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

PID	TTY	TIME	CMD
21629	pts/0	00:00:00	bash
21674	pts/0	00:00:00	ps

*name of the shell being run*

*name of the ps command running that produces this output*

There are a number of different shells such as **bash** (Bourne Again shell), **sh** (original Bourne shell), **ksh** (Korn shell), **dash** (Debian Almquist shell), **tcsh** (TENEX C Shell) and **csh** (C shell).

**Question:** What is the name of the shell running on this system?  
**Answer:** bash

## **uname** command

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

*The **uname** command outputs the name of the kernel being used.*

**Question:** What is the name of the kernel running on this system?  
**Answer:** Linux

## **cat** command (to show the name of the distribution)

```
/home/cis90/simben $ cat /etc/issue  
\S  
Kernel \r on an \m
```

*These two **cat** commands will usually (but not always) output something that contains the name of the distribution being used.*

```
/home/cis90/simben $ cat /etc/*-release  
CentOS Linux release 7.3.1611 (Core)  
NAME="CentOS Linux"  
VERSION="7 (Core)"  
ID="centos"  
ID_LIKE="rhel fedora"  
VERSION_ID="7"  
PRETTY_NAME="CentOS Linux 7 (Core)"  
ANSI_COLOR="0;31"  
CPE_NAME="cpe:/o:centos:centos:7"  
HOME_URL="https://www.centos.org/"  
BUG_REPORT_URL="https://bugs.centos.org/"  
  
CENTOS_MANTISBT_PROJECT="CentOS-7"  
CENTOS_MANTISBT_PROJECT_VERSION="7"  
REDHAT_SUPPORT_PRODUCT="centos"  
REDHAT_SUPPORT_PRODUCT_VERSION="7"  
  
CentOS Linux release 7.3.1611 (Core)  
CentOS Linux release 7.3.1611 (Core)
```

**Question:** Which distro has been installed on this system? (single word answer please)

**Answer:** CentOS



## **cat** command (to show the name of the distribution)

```
simben90@doc:~$ cat /etc/issue
Ubuntu 13.04 \n \l
```

*These two **cat** commands will usually (but not always) output something that contains the name of the distribution being used.*

```
simben90@doc:~$ cat /etc/*-release
DISTRIB_ID=Ubuntu
DISTRIB_RELEASE=13.04
DISTRIB_CODENAME=raring
DISTRIB_DESCRIPTION="Ubuntu 13.04"
NAME="Ubuntu"
VERSION="13.04, Raring Ringtail"
ID=ubuntu
ID_LIKE=debian
PRETTY_NAME="Ubuntu 13.04"
VERSION_ID="13.04"
HOME_URL="http://www.ubuntu.com/"
SUPPORT_URL="http://help.ubuntu.com/"
BUG_REPORT_URL="http://bugs.launchpad.net/ubuntu/"
```

**Question:** Which distro has been installed on this system? (single word answer please)

**Answer:** Ubuntu

## who command

/home/cis90/simben \$ **who**

root	tty1	2014-08-13 17:07	
root	tty2	2014-08-13 17:07	
rsimms	pts/0	2014-08-12 18:10	(2601:9:6680:53b:1918:aee5:1785:79f4)
simben90	pts/1	2014-08-13 16:39	(2601:9:6680:53b:1918:aee5:1785:79f4)
simben90	pts/2	2014-08-12 10:41	(2601:9:6680:53b:edf7:ab23:af8b:7b73)
milhom90	pts/3	2014-08-13 16:39	(2601:9:6680:53b:1918:aee5:1785:79f4)
rsimms	pts/4	2014-08-13 16:40	(ec2-54-193-87-225.us-west-1.compute.amazonaws.com)

*username*

*terminal  
device  
used for  
login  
session*

*date and time  
of login*

*where user logged in from (remote hostname  
or IP address) . If empty the user logged on  
locally rather than over the network.*

*Show information about current login sessions*

## who command

```

/home/cis90/simben $ who
local { root      tty1      2014-08-13 17:07
      root      tty2      2014-08-13 17:07
remote { rsimms     pts/0      2014-08-12 18:10 (2601:9:6680:53b:1918:aee5:1785:79f4)
      simben90 pts/1      2014-08-13 16:39 (2601:9:6680:53b:1918:aee5:1785:79f4)
      simben90 pts/2      2014-08-12 10:41 (2601:9:6680:53b:edf7:ab23:af8b:7b73)
      milhom90 pts/3      2014-08-13 16:39 (2601:9:6680:53b:1918:aee5:1785:79f4)
      rsimms     pts/4      2014-08-13 16:40 (ec2-54-193-87-225.us-west-1.compute.amazonaws.com)

```

*Users in the same room as the system can login locally. Everyone else must login remotely over the network. The IP address or hostname in the last column indicates a remote login session.*

## who command

```
/home/cis90/simben $ who
root      tty1          2014-08-13 17:07
root      tty2          2014-08-13 17:07
rsimms    pts/0          2014-08-12 18:10 (2601:9:6680:53b:1918:aee5:1785:79f4)
simben90  pts/1          2014-08-13 16:39 (2601:9:6680:53b:1918:aee5:1785:79f4)
simben90  pts/2          2014-08-12 10:41 (2601:9:6680:53b:edf7:ab23:af8b:7b73)
milhom90  pts/3          2014-08-13 16:39 (2601:9:6680:53b:1918:aee5:1785:79f4)
rsimms    pts/4          2014-08-13 16:40 (ec2-54-193-87-225.us-west-1.compute.amazonaws.com)
```

**Question:** How many login sessions (including yours) are there on this system?

**Answer:** 7

**Question:** Regarding the users logged in REMOTELY (over the network rather than local). Who has been logged in the longest?

**Answer:** simben90

**Question:** Where did that REMOTE user (the one logged in longest) login from?

**Answer:** 2601:9:6680:53b:edf7:ab23:af8b:7b73 (this is an IPv6 address)

## who am i command

*The **who am i** command lists just the session you are using*

```
/home/cis90/simben $ who am i
simben90 pts/1      2014-08-13 16:39  (2601:9:6680:53b:1918:aee5:1785:79f4)
```

<i>username</i>	<i>terminal device used for login session</i>	<i>date and time of login</i>	<i>where user logged in from (remote hostname or IP address) . If empty the user logged on locally rather than over the network.</i>
-----------------	---	-----------------------------------	--

*This is a good way to distinguish which session you are currently interacting with when you have logged in more than once on the same system.*



## **tty** command

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

*The **tty** command shows the terminal device being used for the login session.*

*Every login session uses a unique terminal device.*

*The terminal device is different than the terminal type you accepted during login.*

Question: **Which terminal device are you using to connect to this system?**  
Answer: **/dev/pts/0**

## **tty** command

```
/home/cis90/simben $ who am i
simben90 pts/1          2014-08-13 16:39 (2601:9:6680:53b:1918:aee5:1785:79f4)
/home/cis90/simben $
/home/cis90/simben $
/home/cis90/simben $ tty
/dev/pts/1
```

*The terminal device is abbreviated in **who** output. The **tty** command on the other hand shows the entire terminal device.*

**Question:** Run the who am i and tty commands.  
What portion of the output from these commands is identical?

**Answer:** pts/1

## id command

*The **id** command outputs information about the user*

```
/home/cis90/simben $ id  
uid=1201(simben90) gid=190(cis90) groups=190(cis90),100(users)  
context=unconfined_u:unconfined_r:unconfined_t:s0-s0:c0.c1023
```

**Question:** What is your uid (user ID) number on oslab?

**Answer:** 1201

**Question:** What is your username on oslab?

**Answer:** simben90

**Question:** What is your gid (group ID) number on oslab?

**Answer:** 190

## history command

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

<snipped>

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

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

*The list can span multiple login sessions.*

Question: **What happens when you use the history command?**  
Answer: **Shows previously entered commands**

## **ssh** command

(to securely log into a remote UNIX/Linux system)

### **Basic command syntax:**

*Optional. Specifies the port on the remote system. The default is port 22.*

*If a username is specified the "@" is used to separate the username from the hostname.*

**ssh -p nnnn username@hostname**

*Optional. Specifies the account username on the remote system. The default is the username on the local system.*

*Required. This can be the hostname or IP address of the remote system. If a hostname is used for a server on the Internet it must be the entire fully qualified domain name (FQDN).*



## Example **ssh** command Logging into a Arya-xx system from Opus-II

*username* → *short hostname*

```
/home/cis90/simben $ ssh cis90@arya-03
```

The authenticity of host 'arya-03 (172.20.90.3)' can't be established.  
RSA key fingerprint is 8b:a0:ef:d2:52:e4:f3:a3:c2:41:b5:93:89:c3:1d:58.  
Are you sure you want to continue connecting (yes/no)? yes  
Warning: Permanently added 'arya-03,172.20.90.3' (RSA) to the list of known hosts.

*password is typed but not echoed* →

```
cis90@arya-03's password:  
Welcome to Linux Mint 15 Olivia (GNU/Linux 3.8.0-26-generic x86_64)
```

Welcome to Linux Mint  
\* Documentation: <http://www.linuxmint.com>  
Last login: Mon Jan 27 17:13:33 2014 from opus.cis.cabrillo.edu  
cis90@arya-03:~ > **exit**  
logout  
Connection to arya-03 closed.  
/home/cis90/simben \$

*Note how the prompt changes (highlighted above) when on a different system*

## Example **ssh** command Logging into son-of-opus from Opus-II

*non-standard ssh port* → *username* → *FQDN hostname*

```
/home/cis90/simben $ ssh -p 2220 simben90@son-of-opus.simms-teach.com
simben90@son-of-opus.simms-teach.com's password: ← password is typed
Last login: Mon Jan 27 18:14:32 2014 from oslab.cis.cabrillo.edu

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

Welcome to Son of Opus
Serving Cabrillo College
```

```
[simben90@son-of-opus ~]$ exit
logout
Connection to son-of-opus.simms-teach.com closed.
/home/cis90/simben $
```

*Note how the prompt changes (highlighted above) when on different systems*

## **exit** command

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

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

# Housekeeping



## Getting Help When Stuck on an Assignment

- Google the topic/error message.
- Search the Lesson Slides (they are PDFs) for a relevant example on how to do something.
- Check the forum. Someone else may have run into the same issue and found a way past it. If not start a new topic, explain what you are trying to do and what you have tried so far.
- Talk to a tutor/assistant at the CTC (room 1403) or CIS Lab (STEM Center).
- Come see me during my office or lab hours:

<https://www.cabrillo.edu/salsa/listing.php?staffId=1426>

**I'm in the CTC (room 1403) every Tuesday from 3:30-6:00 pm.**

- Make use of the Open Questions time at the start of every class.
- Make a cheat sheet of commands and examples so you never again get stuck on the same thing!

*CIS Labs always involve some troubleshooting!*



## Help Available! In the CTC and CIS Lab

### Rich's Cabrillo College CIS Classes CIS 90 Calendar

[Home](#)
[Resources](#)
[Forums](#)
[Tutors](#)
[Canvas](#)

**Cabrillo College**  
Cabrillo Gallery  
Library #1002  
831-479-6308

CIS Lab  
in STEM Center  
Building 800

*To see tutor  
schedule, click  
the Tutors link  
on the  
website.*

*Instructors, tutors  
and equipment are  
available for CIS  
students to work on  
assignments.*



CTC  
Room 1403

Spring 2019 CIS 90 Tutoring Schedule

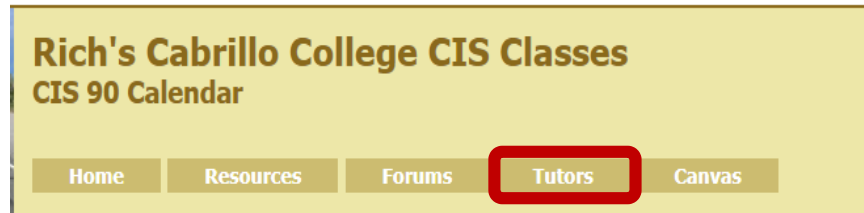
Day	Time	Tutor	Location
Mon	10:00-11:00	John	CTC Room 1403
Tue	10:00-11:00	Jane	CTC Room 1403
Wed	10:00-11:00	John	CTC Room 1403
Thu	10:00-11:00	Jane	CTC Room 1403
Fri	10:00-11:00	John	CTC Room 1403
Sat	10:00-11:00	Jane	CTC Room 1403
Sun	10:00-11:00	John	CTC Room 1403
Mon	11:00-12:00	Jane	CTC Room 1403
Tue	11:00-12:00	John	CTC Room 1403
Wed	11:00-12:00	Jane	CTC Room 1403
Thu	11:00-12:00	John	CTC Room 1403
Fri	11:00-12:00	Jane	CTC Room 1403
Sat	11:00-12:00	John	CTC Room 1403
Sun	11:00-12:00	Jane	CTC Room 1403
Mon	12:00-1:00	John	CTC Room 1403
Tue	12:00-1:00	Jane	CTC Room 1403
Wed	12:00-1:00	John	CTC Room 1403
Thu	12:00-1:00	Jane	CTC Room 1403
Fri	12:00-1:00	John	CTC Room 1403
Sat	12:00-1:00	Jane	CTC Room 1403
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Mon	1:00-2:00	Jane	CTC Room 1403
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Wed	1:00-2:00	Jane	CTC Room 1403
Thu	1:00-2:00	John	CTC Room 1403
Fri	1:00-2:00	Jane	CTC Room 1403
Sat	1:00-2:00	John	CTC Room 1403
Sun	1:00-2:00	Jane	CTC Room 1403
Mon	2:00-3:00	John	CTC Room 1403
Tue	2:00-3:00	Jane	CTC Room 1403
Wed	2:00-3:00	John	CTC Room 1403
Thu	2:00-3:00	Jane	CTC Room 1403
Fri	2:00-3:00	John	CTC Room 1403
Sat	2:00-3:00	Jane	CTC Room 1403
Sun	2:00-3:00	John	CTC Room 1403
Mon	3:00-4:00	Jane	CTC Room 1403
Tue	3:00-4:00	John	CTC Room 1403
Wed	3:00-4:00	Jane	CTC Room 1403
Thu	3:00-4:00	John	CTC Room 1403
Fri	3:00-4:00	Jane	CTC Room 1403
Sat	3:00-4:00	John	CTC Room 1403
Sun	3:00-4:00	Jane	CTC Room 1403
Mon	4:00-5:00	John	CTC Room 1403
Tue	4:00-5:00	Jane	CTC Room 1403
Wed	4:00-5:00	John	CTC Room 1403
Thu	4:00-5:00	Jane	CTC Room 1403
Fri	4:00-5:00	John	CTC Room 1403
Sat	4:00-5:00	Jane	CTC Room 1403
Sun	4:00-5:00	John	CTC Room 1403
Mon	5:00-6:00	Jane	CTC Room 1403
Tue	5:00-6:00	John	CTC Room 1403
Wed	5:00-6:00	Jane	CTC Room 1403
Thu	5:00-6:00	John	CTC Room 1403
Fri	5:00-6:00	Jane	CTC Room 1403
Sat	5:00-6:00	John	CTC Room 1403
Sun	5:00-6:00	Jane	CTC Room 1403

CTC Building 1403 (lower campus)

STEM Center  
CIS Lab  
Building 800

CTC Room 1403

## Help Available! In the CTC and CIS Lab



*To see tutor schedule, click the  
Tutors link on the website.*



*The CIS Lab is in the STEM  
center (Building 800)*



*Room 1403 is in the  
CTC (Building 1400)*

## Add Codes

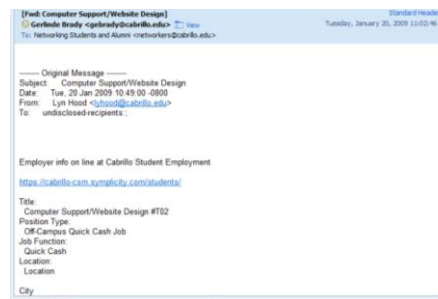
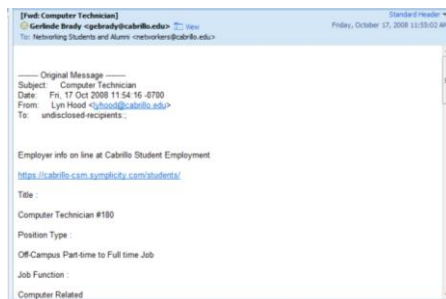
- Available after class (stop by or email me).
- Please use them online ASAP!
- If you missed the first class, obtaining an Add code will be conditional on catching up before the next class:
  - a) making a forum post.
  - b) answering one of the "first minute" quiz questions.
  - c) submitting the survey (part of the first assignment).
  - d) collecting at least one item on the scavenger hunt.

# Cabrillo Networking Program Mailing list

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

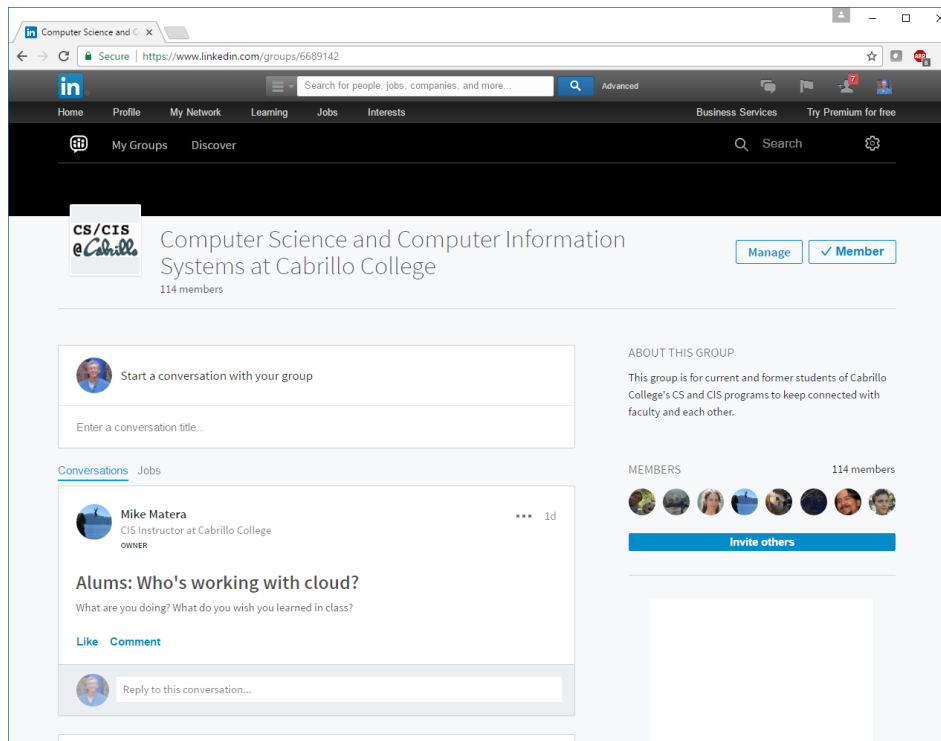
**networkers-subscribe@cabrillo.edu**

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



# LinkedIn

## Computer Science and Computer Information Systems at Cabrillo College



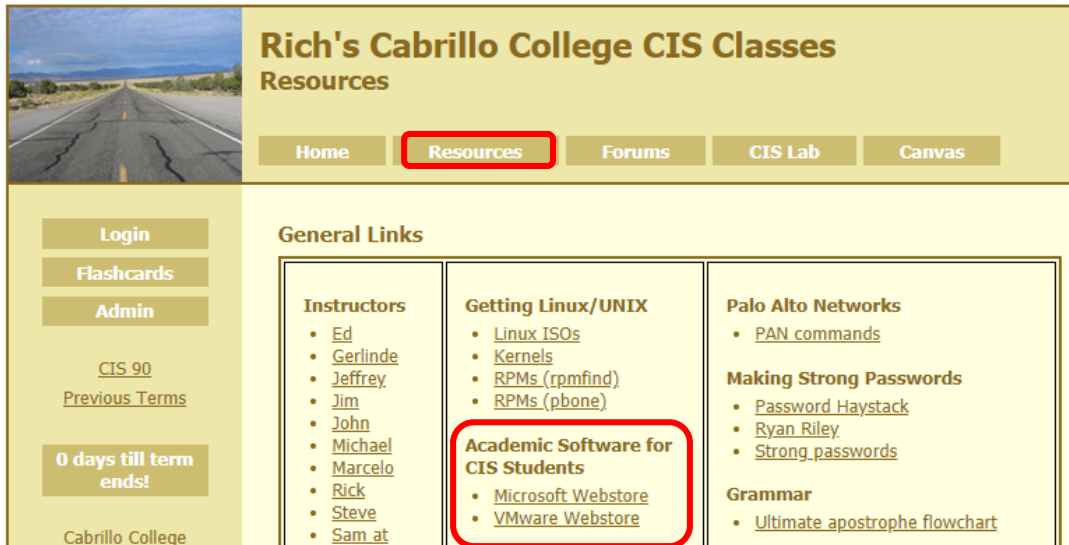
**For 3 points extra credit:**

- 1) Join LinkedIn.com
- 2) Join this group
- 3) Send me an email when finished.

<https://www.linkedin.com/groups/6689142>



## Software for eligible CIS students



The screenshot shows a web page titled "Rich's Cabrillo College CIS Classes Resources". The page has a navigation bar with links: Home, Resources (highlighted with a red box), Forums, CIS Lab, and Canvas. On the left side, there are buttons for Login, Flashcards, and Admin, along with links for CIS 90 and Previous Terms. A countdown timer shows "0 days till term ends!". The main content area is titled "General Links" and contains three columns of links. The second column, "Getting Linux/UNIX", includes a link to "Academic Software for CIS Students", which is highlighted with a red box. This link points to a page with links to the Microsoft Webstore and the VMware Webstore.

**Rich's Cabrillo College CIS Classes Resources**

Home Resources Forums CIS Lab Canvas

Login  
Flashcards  
Admin

CIS 90  
[Previous Terms](#)

0 days till term ends!

Cabrillo College

**General Links**

Instructors	Getting Linux/UNIX	Palo Alto Networks
<ul style="list-style-type: none"><li>• <a href="#">Ed</a></li><li>• <a href="#">Gerlinde</a></li><li>• <a href="#">Jeffrey</a></li><li>• <a href="#">Jim</a></li><li>• <a href="#">John</a></li><li>• <a href="#">Michael</a></li><li>• <a href="#">Marcelo</a></li><li>• <a href="#">Rick</a></li><li>• <a href="#">Steve</a></li><li>• <a href="#">Sam at</a></li></ul>	<ul style="list-style-type: none"><li>• <a href="#">Linux ISOs</a></li><li>• <a href="#">Kernels</a></li><li>• <a href="#">RPMs (rpmfind)</a></li><li>• <a href="#">RPMs (pbone)</a></li></ul> <p><b>Academic Software for CIS Students</b></p> <ul style="list-style-type: none"><li>• <a href="#">Microsoft Webstore</a></li><li>• <a href="#">VMware Webstore</a></li></ul>	<ul style="list-style-type: none"><li>• <a href="#">PAN commands</a></li></ul> <p><b>Making Strong Passwords</b></p> <ul style="list-style-type: none"><li>• <a href="#">Password Haystack</a></li><li>• <a href="#">Ryan Riley</a></li><li>• <a href="#">Strong passwords</a></li></ul> <p><b>Grammar</b></p> <ul style="list-style-type: none"><li>• <a href="#">Ultimate apostrophe flowchart</a></li></ul>



*How to obtain Microsoft and VMware software for academic use*



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

# Microsoft Academic Webstore

Microsoft software for students registered in a CIS or CS class at Cabrillo.

Available after registration is final (two weeks after first class).

For convenience, links to the Academic webstores are on the Resource page of the website:

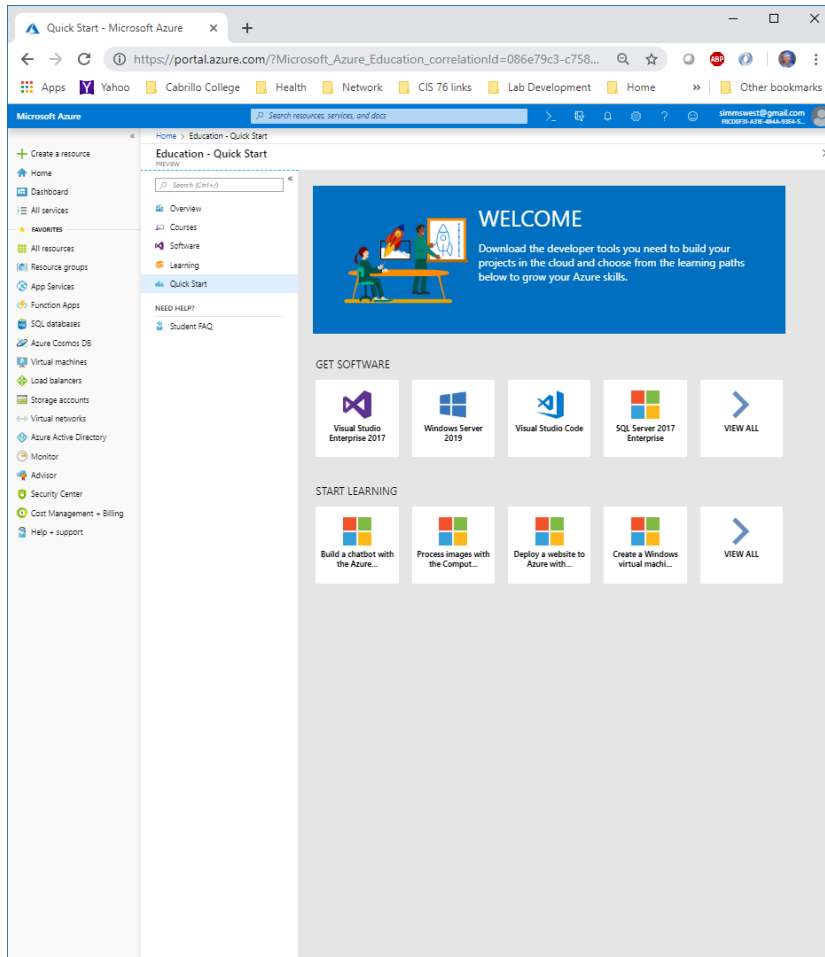
<https://simms-teach.com/resources.php>

## Academic Software for CIS Students

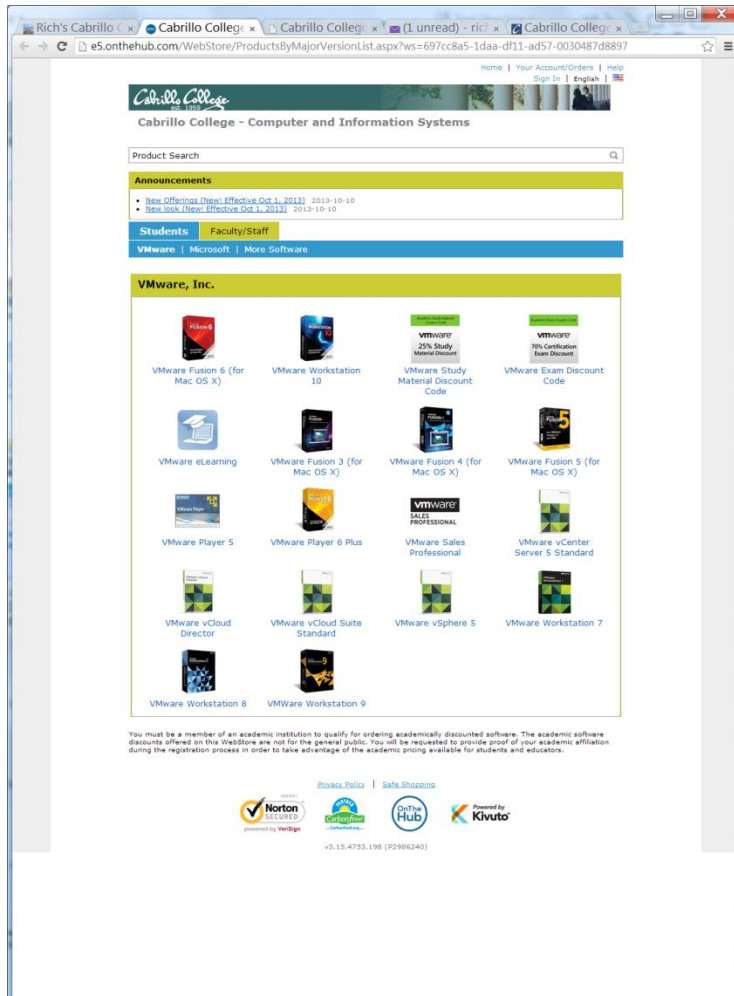
- [Microsoft Webstore](#)
- [VMware Webstore](#)

**Licensed for educational use only.**

Happy downloading!



# VMware Academic Webstore



VMware software for students registered in a CIS or CS class at Cabrillo.

Available after registration is final (two weeks after first class).

For convenience, links to the Academic webstores are on the Resource page of the website:

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

## Academic Software for CIS Students

- [Microsoft Webstore](#)
- [VMware Webstore](#)

**Licensed for educational use only.**

Happy downloading!

# Study Groups

- Two heads are better than one!
- Great way to work lab assignments and prepare for tests.
- Excellent way to learn.
- Less time being in the "I'm stuck" zone.
- A great way to develop teamwork skills.
- Improves scheduling and organization skills.
- Let me know on the student survey if you are interested and would like my help finding study partners.



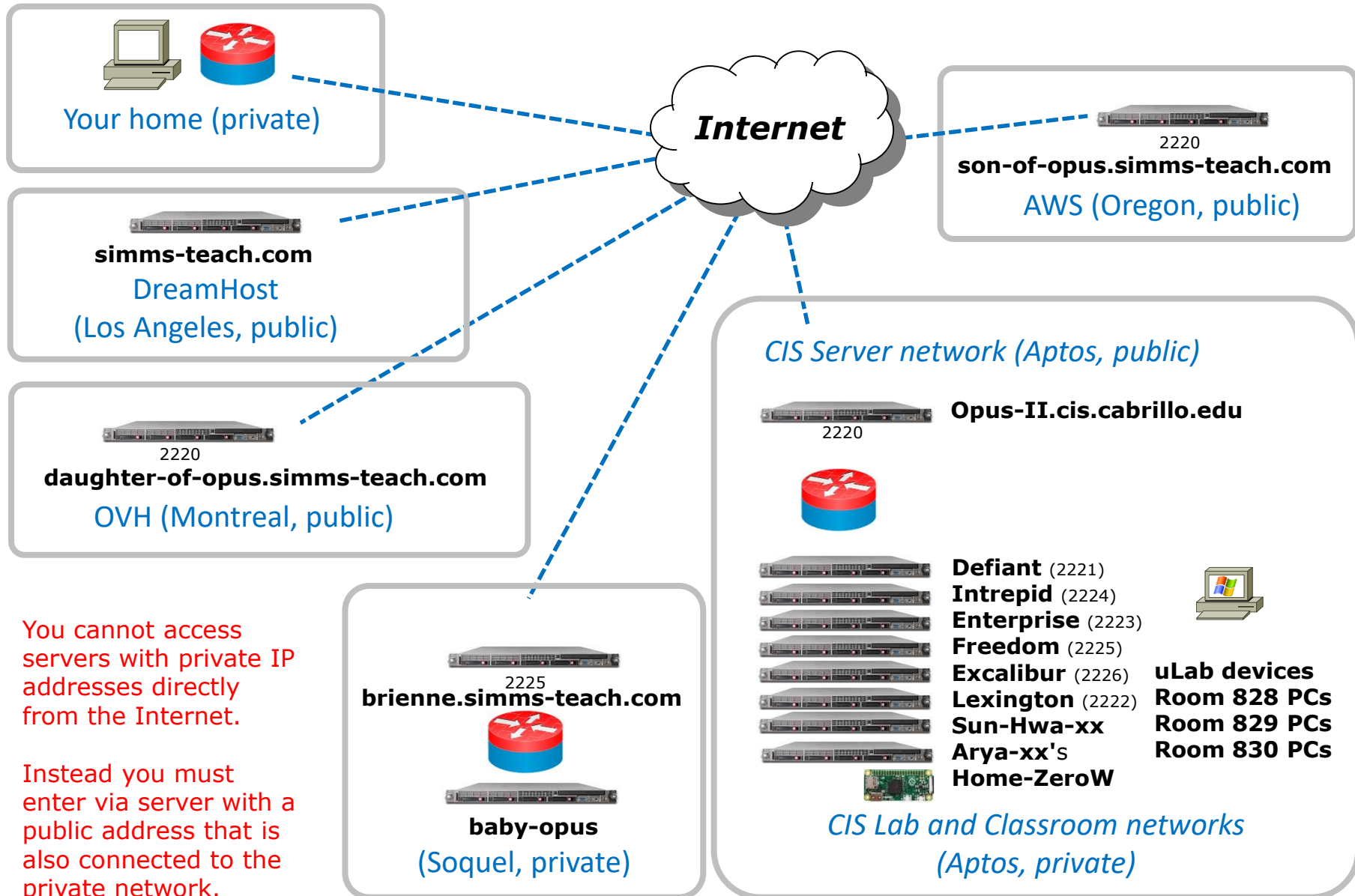


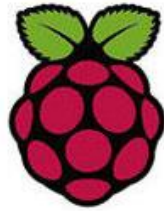
# Navigating the Internet using SSH

Second driving lesson

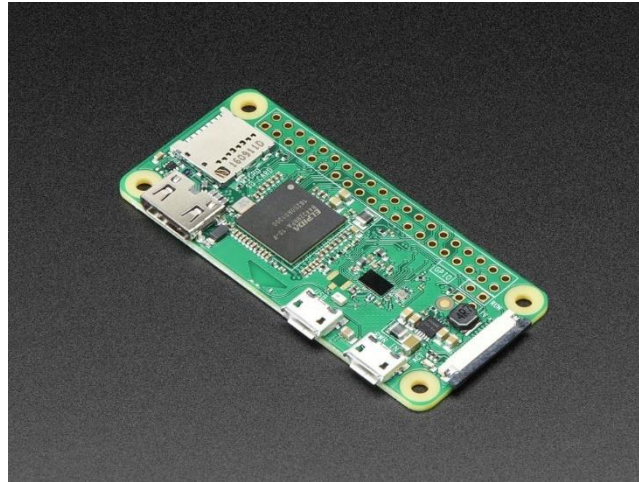


# CIS 90 systems Roadmap





**Raspberry Pi**



Raspberry Pi Zero W

<https://www.adafruit.com/products/3400>

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

Rich's Cabrillo College CIS Classes Home Page

Home Resources Forums CIS Lab Canvas

Login  
Flashcards  
Admin

CIS 90  
[Previous Terms](#)

1 day till term starts!

Cabrillo College  
[Web Advisor](#)

VLab (web)  
NETLAB+ VE  
[Annoying Issue List](#)

**CIS 90 VLab VM Assignments**

[RIP Dennis Ritchie](#)

Opus Status: UP

Rich Simms

Contact

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- Office hours: [directory page](#)

My Spring 2018 Cabrillo Classes

- CIS 90 - Introduction to UNIX/Linux

Metal Sitemap W3C XHTML 1.0 W3C CSS Credits Earth

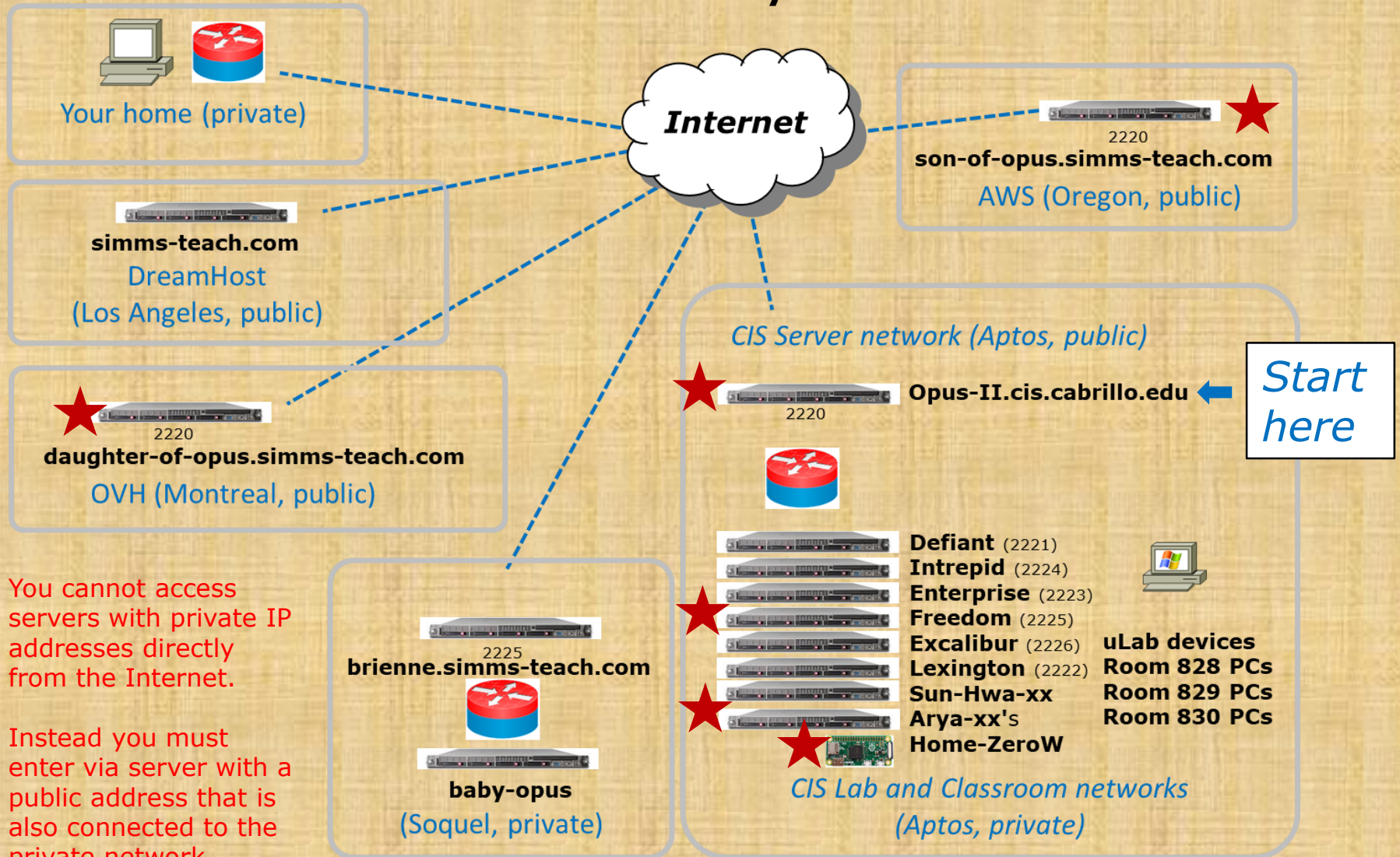
VM Name	VM ID
Araya	Araya 1
Araya 2	Araya 2
Araya 3	Araya 3
Araya 4	Araya 4
Araya 5	Araya 5
Araya 6	Araya 6
Araya 7	Araya 7
Araya 8	Araya 8
Araya 9	Araya 9
Araya 10	Araya 10
Araya 11	Araya 11
Araya 12	Araya 12
Araya 13	Araya 13
Araya 14	Araya 14
Araya 15	Araya 15
Araya 16	Araya 16
Araya 17	Araya 17
Araya 18	Araya 18
Araya 19	Araya 19
Araya 20	Araya 20
Araya 21	Araya 21
Araya 22	Araya 22
Araya 23	Araya 23
Araya 24	Araya 24
Araya 25	Araya 25
Araya 26	Araya 26
Araya 27	Araya 27
Araya 28	Araya 28
Araya 29	Araya 29
Araya 30	Araya 30
Araya 31	Araya 31
Araya 32	Araya 32
Araya 33	Araya 33
Araya 34	Araya 34
Araya 35	Araya 35
Araya 36	Araya 36
Araya 37	Araya 37
Araya 38	Araya 38
Araya 39	Araya 39
Araya 40	Araya 40
Araya 41	Araya 41
Araya 42	Araya 42
Araya 43	Araya 43
Araya 44	Araya 44
Araya 45	Araya 45
Araya 46	Araya 46
Araya 47	Araya 47
Araya 48	Araya 48
Araya 49	Araya 49
Araya 50	Araya 50
Araya 51	Araya 51
Araya 52	Araya 52
Araya 53	Araya 53
Araya 54	Araya 54
Araya 55	Araya 55
Araya 56	Araya 56
Araya 57	Araya 57
Araya 58	Araya 58
Araya 59	Araya 59
Araya 60	Araya 60
Araya 61	Araya 61
Araya 62	Araya 62
Araya 63	Araya 63
Araya 64	Araya 64
Araya 65	Araya 65
Araya 66	Araya 66
Araya 67	Araya 67
Araya 68	Araya 68
Araya 69	Araya 69
Araya 70	Araya 70
Araya 71	Araya 71
Araya 72	Araya 72
Araya 73	Araya 73
Araya 74	Araya 74
Araya 75	Araya 75
Araya 76	Araya 76
Araya 77	Araya 77
Araya 78	Araya 78
Araya 79	Araya 79
Araya 80	Araya 80
Araya 81	Araya 81
Araya 82	Araya 82
Araya 83	Araya 83
Araya 84	Araya 84
Araya 85	Araya 85
Araya 86	Araya 86
Araya 87	Araya 87
Araya 88	Araya 88
Araya 89	Araya 89
Araya 90	Araya 90
Araya 91	Araya 91
Araya 92	Araya 92
Araya 93	Araya 93
Araya 94	Araya 94
Araya 95	Araya 95
Araya 96	Araya 96
Araya 97	Araya 97
Araya 98	Araya 98
Araya 99	Araya 99
Araya 100	Araya 100

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



## Class Activity

### Follow me if you can!



You cannot access servers with private IP addresses directly from the Internet.

Instead you must enter via server with a public address that is also connected to the private network.

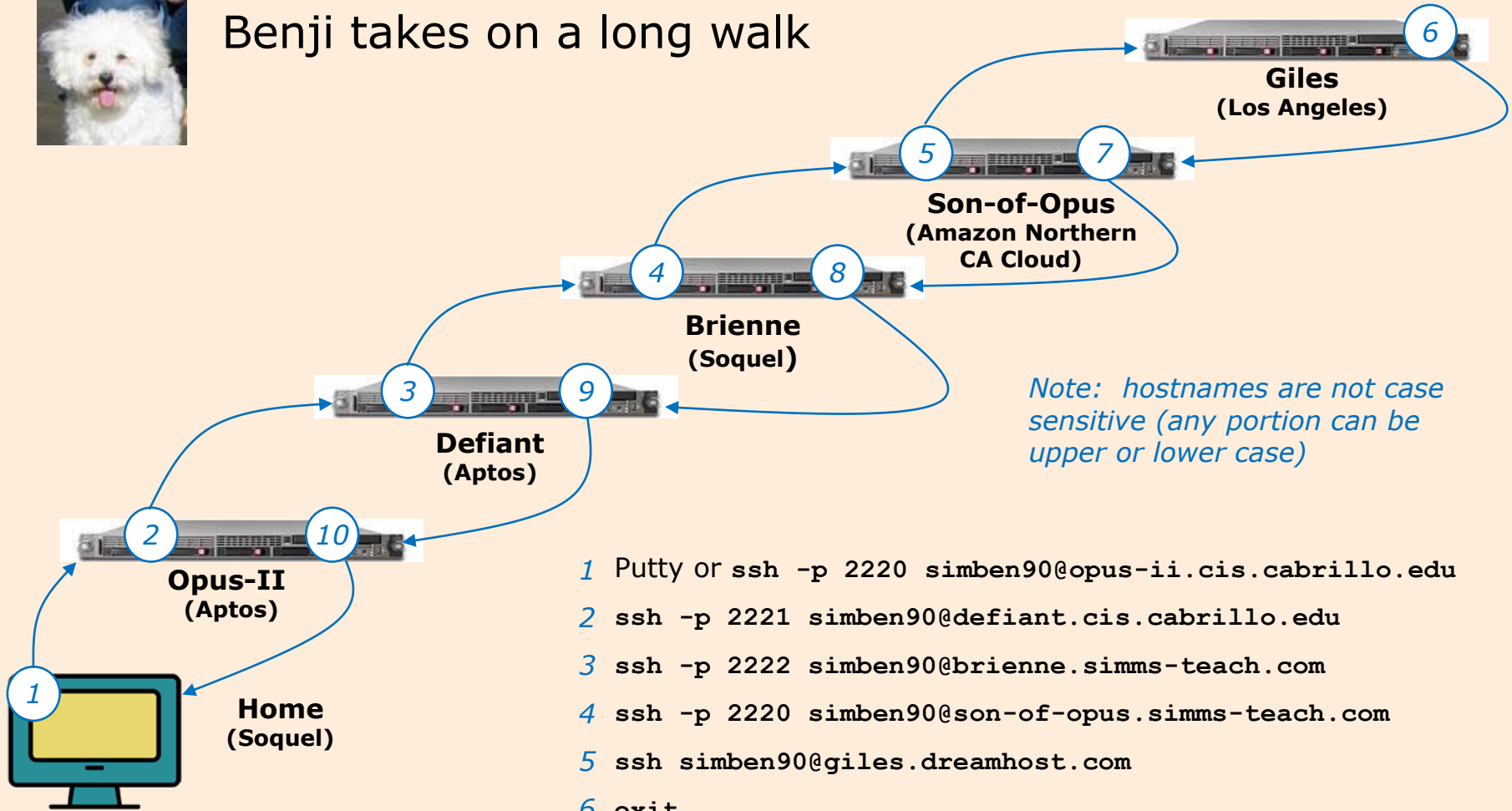


# Navigating the Internet using SSH

supplemental



Benji takes on a long walk



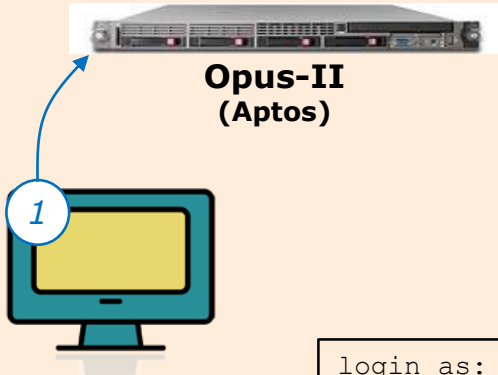
*Note: hostnames are not case sensitive (any portion can be upper or lower case)*

```

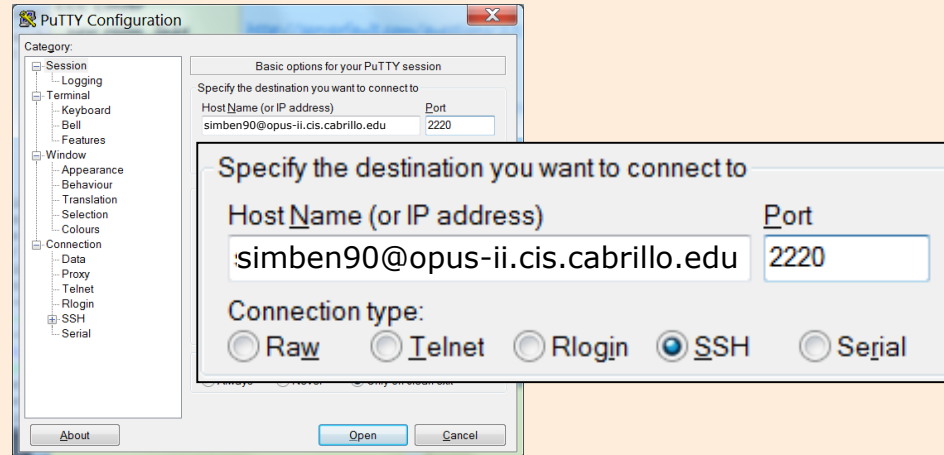
1 Putty or ssh -p 2220 simben90@opus-ii.cis.cabrillo.edu
2 ssh -p 2221 simben90@defiant.cis.cabrillo.edu
3 ssh -p 2222 simben90@brienne.simms-teach.com
4 ssh -p 2220 simben90@son-of-opus.simms-teach.com
5 ssh simben90@giles.dreamhost.com
6 exit
7 exit
8 exit
9 exit
10 exit
    
```



## Benji takes on a long walk



**Opus-II  
(Aptos)**



```
login as: simben90
simben90@opus-ii.cis.cabrillo.edu's password:
Last login: Sat Aug 19 11:02:46 2017 from oslab.cis.cabrillo.edu
```

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

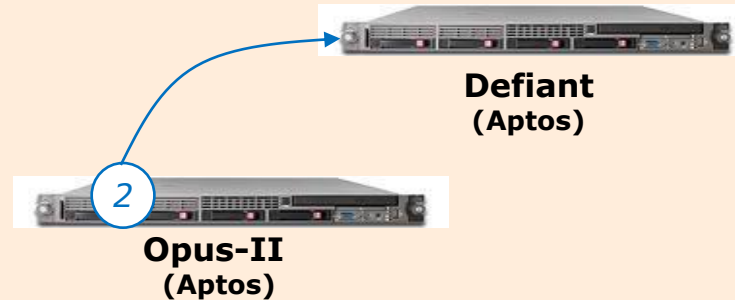
Welcome to Opus II  
Serving Cabrillo College

```
Terminal type? [xterm]
Terminal type is xterm.
/home/cis90/simben $ hostname
oslab.cis.cabrillo.edu
/home/cis90/simben $
```

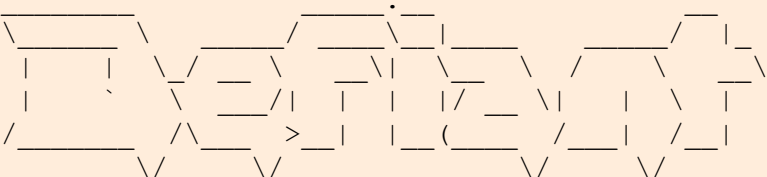
*Note: usernames and  
passwords are case sensitive*



## Benji takes on a long walk



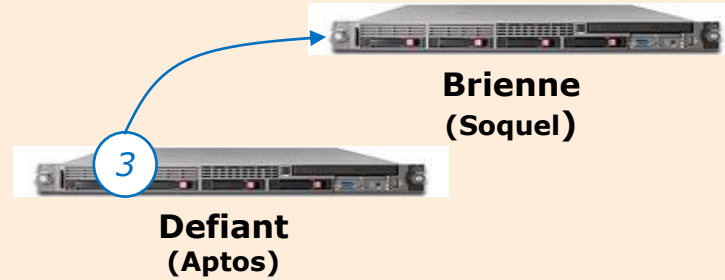
```
/home/cis90/simben $ ssh -p 2221 simben90@defiant.cis.cabrillo.edu  
The authenticity of host '[defiant.cis.cabrillo.edu]:2221 ([172.20.90.51]):2221)' can't  
be established.  
RSA key fingerprint is 98:09:e7:d3:b2:89:e5:3a:57:b0:59:ff:86:7e:8e:50.  
Are you sure you want to continue connecting (yes/no)? yes  
Warning: Permanently added '[defiant.cis.cabrillo.edu]:2221' (RSA) to the list of known  
hosts.  
simben90@defiant.cis.cabrillo.edu's password:  
Welcome to Linux Mint 17 Qiana (GNU/Linux 3.13.0-24-generic x86_64)  
  
Welcome to Linux Mint  
 * Documentation: http://www.linuxmint.com
```



```
Last login: Fri Aug 15 07:07:25 2014 from opus-ii.cis.cabrillo.edu  
[defiant] $ hostname  
defiant.cis.cabrillo.edu  
[defiant] $
```



## Benji takes on a long walk



```
[defiant] $ ssh -p 2222 simben90@brienne.simms-teach.com
The authenticity of host '[brienne.simms-teach.com]:2222 ([50.174.12.192]:2222)' can't be established.
ECDSA key fingerprint is 22:f1:74:fb:3c:36:01:8a:21:f0:00:e1:37:56:00:5f.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '[brienne.simms-teach.com]:2222,[50.174.12.192]:2222' (ECDSA) to the list of
known hosts.
simben90@brienne.simms-teach.com's password:
Welcome to Linux Mint 17.2 Rafaela (GNU/Linux 3.16.0-38-generic x86_64)
```

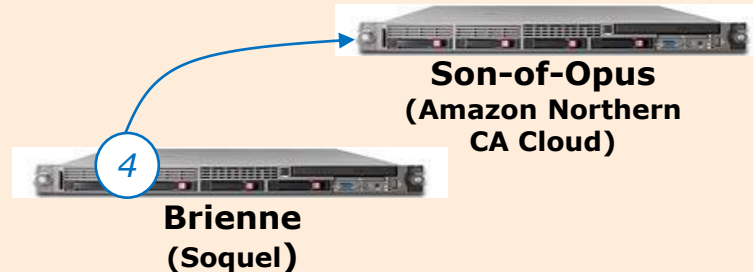
```
Welcome to Linux Mint
 * Documentation:  http://www.linuxmint.com
```

```
simben90@brienne ~ $
```





## Benji takes on a long walk



```
[simben90@brienne ~]$ ssh -p 2220 simben90@son-of-opus.simms-teach.com
The authenticity of host '[son-of-opus.simms-teach.com]:2220 ([54.193.87.225]:2220)' can't
be established.
RSA key fingerprint is 05:02:f7:48:00:e6:af:a9:dd:47:33:c3:82:80:29:4d.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '[son-of-opus.simms-teach.com]:2220,[54.193.87.225]:2220' (RSA)
to the list of known hosts.
simben90@son-of-opus.simms-teach.com's password:
Permission denied, please try again.
simben90@son-of-opus.simms-teach.com's password:
Last login: Mon Aug 18 12:55:04 2014 from 207.62.187.227
```

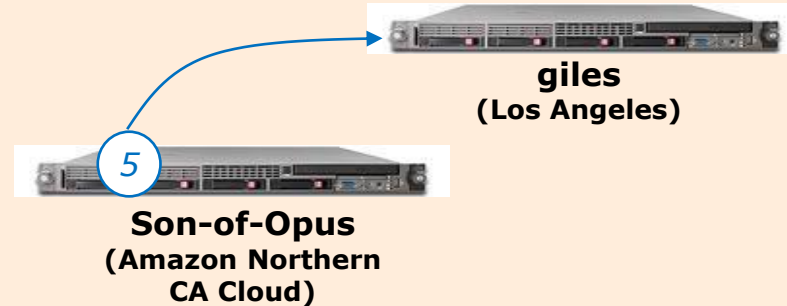
```
  _
 ('v')
//---\
(\_=_/)
~~ ~~
```

Welcome to Son-of-Opus  
Serving Cabrillo College

```
[simben90@son-of-opus ~]$
```



## Benji takes on a long walk



```
[simben90@son-of-opus ~]$ ssh simben90@giles.dreamhost.com
The authenticity of host 'giles.dreamhost.com (208.113.153.233)' can't be established.
RSA key fingerprint is d8:3c:65:de:d3:43:ef:aa:76:13:d9:16:85:b9:36:9a.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added 'giles.dreamhost.com,208.113.153.233' (RSA) to the list of known
hosts.
simben90@giles.dreamhost.com's password:
```

```

  _ _
 / _ \ _ _ | / _ \ _ _ |
 | ( _ | | | _ _ \ _ _ \
 \ _ / | | | \ _ | | _ /
 | _ /

```

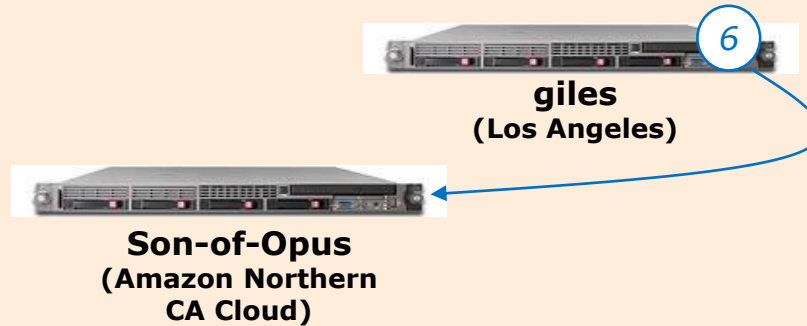
Welcome to giles.dreamhost.com

Any malicious and/or unauthorized activity is strictly forbidden.  
All activity may be logged by DreamHost Web Hosting.

```
[giles]$ hostname
giles
```



Benji takes on a long walk



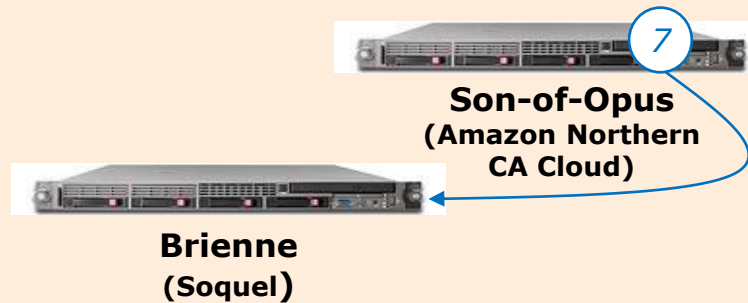
```
[giles]$ exit
logout
Connection to giles.dreamhost.com closed.
[simben90@son-of-opus ~]$ hostname
son-of-opus.simms-teach.com
[simben90@son-of-opus ~]$
```



When you **exit** a server it's like you pop it off the top of a stack and return to the previous server underneath



Benji takes on a long walk



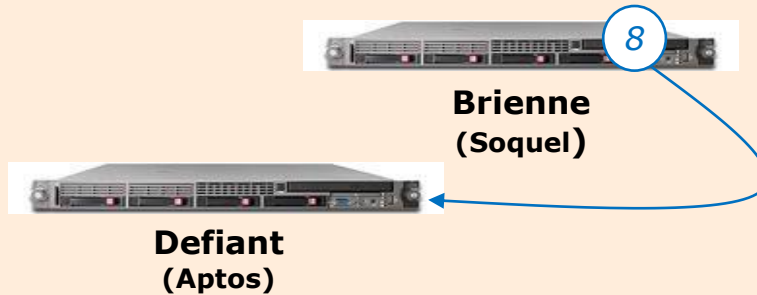
```
[simben90@son-of-opus ~]$ exit
logout
Connection to son-of-opus.simms-teach.com closed.
[simben90@brienne ~]$ hostname
brienne.simms-teach.com
[simben90@brienne ~]$
```



When you **exit** a server it's like you pop it off the top of a stack and return to the previous server underneath



Benji takes on a long walk



```
[simben90@brienne ~]$ exit
logout
Connection to brienne.simms-teach.com closed.
[defiant] $ hostname
defiant.cis.cabrillo.edu
[defiant] $
```

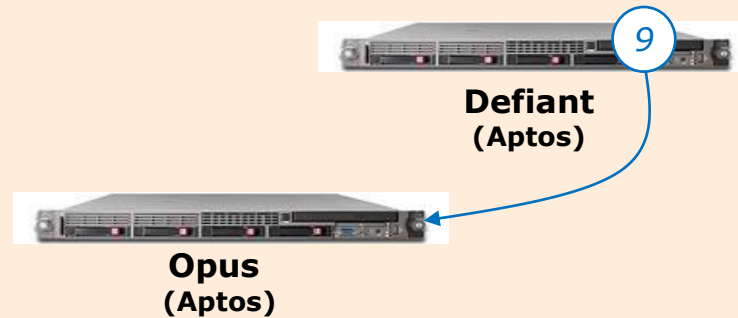


When you **exit** a server it's like you pop it off the top of a stack and return to the previous server underneath





Benji takes on a long walk



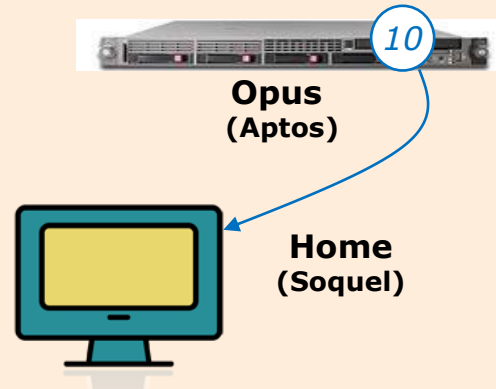
```
[defiant] $ exit
Connection to defiant.cis.cabrillo.edu closed.
/home/cis90/simben $ hostname
oslab.cis.cabrillo.edu
/home/cis90/simben $
```



When you **exit** a server it's like you pop it off the top of a stack and return to the previous server underneath

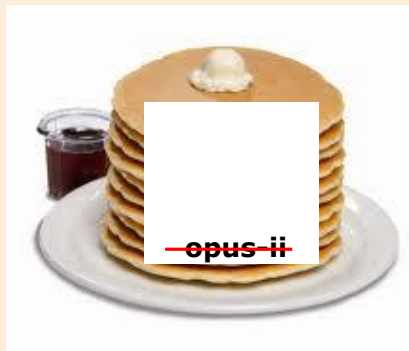


Benji takes on a long walk



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

*And the Putty terminal program closes*



*When you **exit** a server it's like you pop it off the top of a stack and return to the previous server underneath*



# Assignment





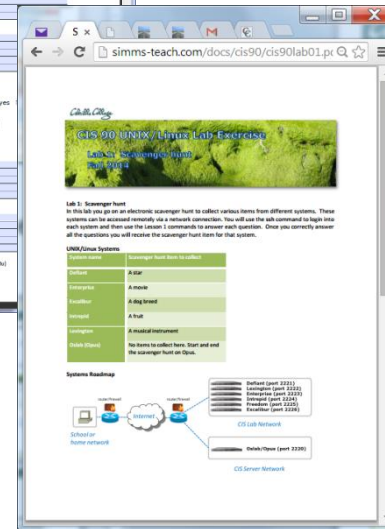
<http://simms-teach.com/cis90calendar.php>

1) Reading the Lesson slides first  
will help you with the lab

Lesson	Date	Topics	Chapter	Due*
1	1/30	<b>Class and Linux Overview</b> <ul style="list-style-type: none"> <li>Understand how this course will work</li> </ul>		<b>Due*</b>
		<b>Materials</b> <ul style="list-style-type: none"> <li>Presentation slides (<a href="#">download</a>)</li> </ul> <b>Supplemental</b> <ul style="list-style-type: none"> <li>Login credentials worksheet (<a href="#">download</a>)</li> <li>Howto #146: Logging into Opus (<a href="#">download</a>)</li> </ul> <b>Assignment</b> <ul style="list-style-type: none"> <li>Read/skim Lesson 1 slides</li> <li><b>Student Survey</b></li> <li><b>Lab 1</b></li> </ul> <b>ConferZoom</b> <ul style="list-style-type: none"> <li><a href="#">Enter virtual classroom</a></li> <li><a href="#">Class archives</a></li> </ul>	1.1-1.15 (Gillay)  2,4,5, p113-115, p164-172 (Hahn)	
2	2/6	<b>Quiz 1</b> <b>Commands</b> <ul style="list-style-type: none"> <li>Understand how the UNIX login operation works</li> <li>Meet John the Ripper and learn how vulnerable a poor password is</li> <li>Understand basic command syntax and operation</li> <li>Understand program files and what happens when they are run</li> <li>Understand how the shell works and environment variables</li> <li>Understand how to get online documentation</li> </ul> <b>Materials</b> <ul style="list-style-type: none"> <li>Presentation slides (<a href="#">download</a>)</li> <li>Howto #106: Configuring Putty (<a href="#">download</a>)</li> </ul> <b>Assignment</b> <ul style="list-style-type: none"> <li>Read/skim Lesson 2 slides</li> <li><b>Lab 2</b></li> </ul> <b>ConferZoom</b> <ul style="list-style-type: none"> <li><a href="#">Enter virtual classroom</a></li> <li><a href="#">Class archives</a></li> </ul>	2.3-2.7 2.11 3.7-3.20 4.19-4.22 9.1-9.2 (Gillay)	<b>Lab 1</b>  <b>Student Survey</b>

2) Survey

3) Lab 1  
Scavenger  
Hunt



Both deliverables are due by 11:59:59 PM  
(Opus-II time) on Wednesday 2/6.

Remember late work, even one second late,  
is not accepted. If you wait till the last  
minute to work the lab and run out of time  
submit any partial work by the deadline.

## Lab 1 - Scavenger Hunt

Starting on Opus you will log into several systems using ssh. On each system you will collect an item after answering correctly a series of questions.

*Start and  
end here*



**opus-ii.cis.cabrillo.edu**

*Get a movie*



**Enterprise**

*Get a book*



**Freedom**

*Get a fruit*



**Intrepid**

*Get a star*



**Defiant**

*Get a musical instrument*



**Lexington**

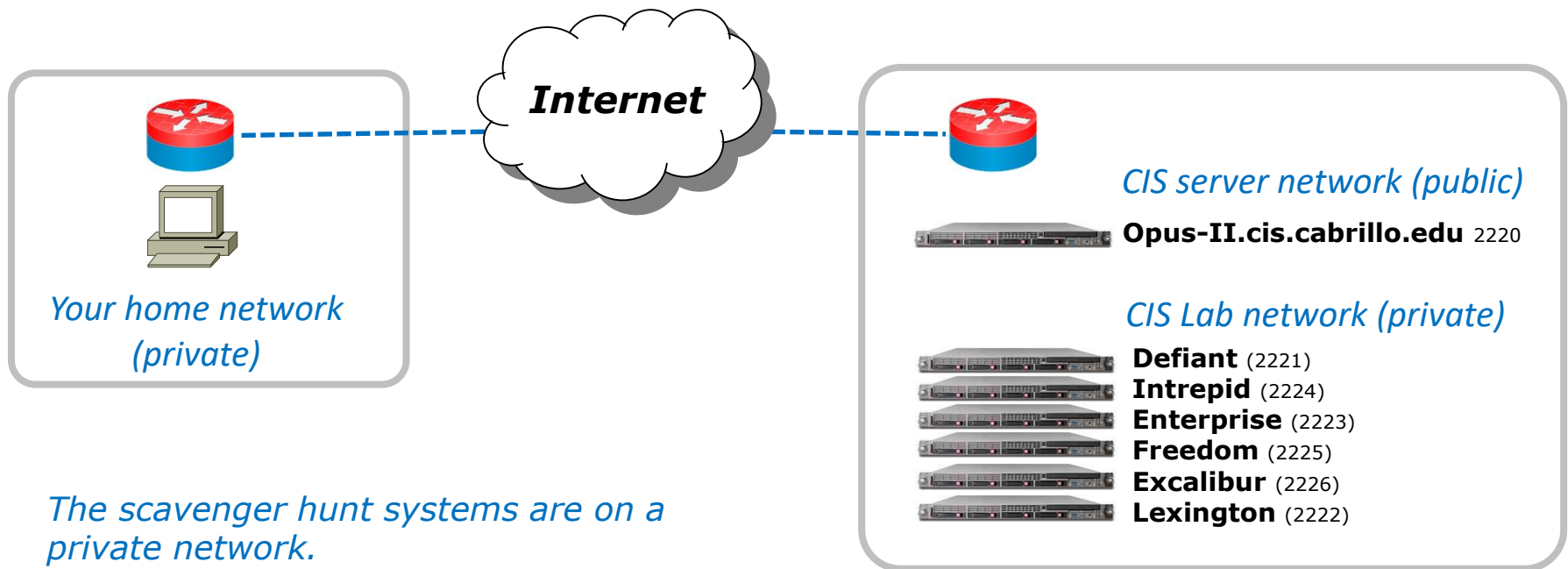
*Get a dog*



**Excalibur**



## Lab 1 - Simplified Network Map



*The scavenger hunt systems are on a private network.*

*Remote users must log into Opus-II first and from there access the scavenger hunt systems.*

# Lab 1 - Tips

Tip - as a shortcut, use **sc** instead of typing the full **scavenge** each time.

[illegible]

## Lab 1 - Tips

```
simben90@excalibur:~
#####
#  S C A V E N G E R  H U N T  #
#####

STAT
- Y
- Y
- Y

Nice work ... your answer to Q17 was:  C O R R E C T !!

You are off to a good start Benji!

Since you correctly answered all questions for the excalibur
system here is your dog:

Redbone Coonhound  copy

(Please record the system name and dog in your notes because
you will need them when submitting this lab!)

You are not done yet.  Please continue on to the next system.

INSTRUCTIONS FOR THE NEXT SYSTEM:
With the ssh command login to the next Linux system using:
  Username: simben90
  Password: <the one assigned to you by the instructor>
  Hostname: freedom.cis.cabrillo.edu
  Port: 2225
You will be scavenging for books there.

Have fun scavenging!

[simben90@excalibur ~]$
```

```
simben90@oslab:~
/home/cis90/simben $ submit
Which lab are you submitting? (1,2,3, ...) 1
Please stretch this window so it is a lot TALLER
Press Enter to continue

=====
                        Lab 1 Scavenger Hunt
Update the table below with your collected items then submit
=====

SYSTEM      ITEM      COLLECTED
defiant     star      <no entry>
lexington   instrument <no entry>
enterprise   movie     <no entry>
intrepid    fruit     <no entry>
freedom     book      <no entry>
excalibur   dog       Redbone Coonhound

BONUS QUESTION ANSWERS
Q1) <no entry>
Q2) <no entry>
Q3) <no entry>

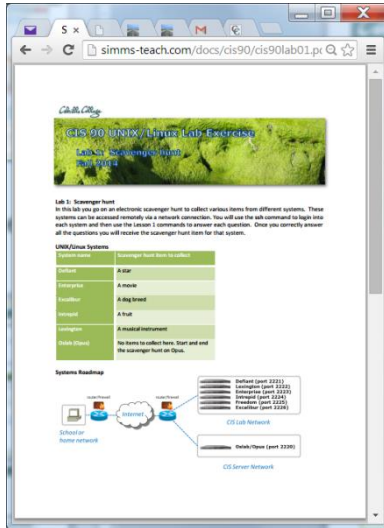
SELECTION MENU
1) Set star
2) Set instrument
3) Set movie
4) Set fruit
5) Set book
6) Set dog
7) Answer bonus questions
8) Submit your work for grading
9) Quit without submitting
Enter selection (1-9): 6
Please enter your dog on excalibur: Redbone Coonhound
```

Tip - use two login sessions. Use one to collect scavenger hunt items and the other to record your work using the **submit** script. Submit as many times as you wish. Only the last submittal will be graded.

# Lab Assignments

## Pearls of Wisdom:

- Don't wait till the last minute to start.
- The *slower* you go the *sooner* you will be finished.
- A few minutes reading the forum can save you hour(s).
- Line up materials, references, equipment and software ahead of time.
- It's best if you fully understand each step as you do it. Refer back to lesson slides to understand the commands you are using.
- Use Google when trouble-shooting
- Keep a growing cheat sheet of commands and examples.
- Study groups are very productive and beneficial.
- Use the forum to collaborate, ask questions, get clarifications and share tips you learned while doing a lab.
- Plan for things to go wrong and give yourself time to ask questions and get answers.
- **Late work is not accepted** so submit what you have for partial credit.





A full-page background image showing a sunset over a beach. The sky is filled with vibrant orange, pink, and purple clouds. The sun is low on the horizon, casting a warm glow. To the right, a dark, silhouetted cliff rises from the beach. The foreground shows the wet sand of the beach reflecting the colors of the sky, with some dark rocks scattered about.

# Wrap up



### New shell commands:

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

### New Files and Directories:

### VMware:

## Next Class

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

**Lab 1  
& Survey**

Quiz questions for next class:

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

End Meeting

# End Meeting



# Backup

# UNIX/Linux Commands on various systems



## Apple iPad



```
ipa$ v.2.5.1 - Copyright 2013, Martino Orlandi (www.treehousetec.com)
Type 'help' for a list of available commands
August 25, 2014 at 5:25 PM logged on Mary's iPad

ipa$ date
Monday, August 25, 2014 at 5:25:49 PM Pacific Daylight Time
ipa$ hostname
Mary's iPad
ipa$ uname
Darwin
ipa$ ps
PID  PROCESS NAME      USER      PRIORITY
18   timed              mobile    17
21   mediaremotd        mobile    17
23   fairplayd.A1       mobile    17
25   iaptransportd      mobile    24
28   softwareupdated    mobile    17
29   backboardd         mobile    24
33   SpringBoard        mobile    17
34   routined           mobile    17
35   softwarebehavior    mobile    17
37   aggregated          mobile    17
42   aosnotifyd         mobile    17
45   mediaserverd       mobile    24
54   identityservices   mobile    17
56   imagent            mobile    17
59   BTServer           mobile    24
60   installd           mobile    17
70   lsd                 mobile    17
72   xpcd               mobile    17
73   MobileGestaltHel   mobile    17
74   BlueTool           mobile    24
80   IMDPersistenceAg   mobile    17
83   apsd               mobile    24
85   accountsd          mobile    17
92   dataaccessd        mobile    24
94   itunescloudd       mobile    17
95   itunesstored       mobile    17
96   storebookkeeperd   mobile    17
97   gamed              mobile    24
99   medialibraryd      mobile    17
100  DuetLST            mobile    17
101  tccd               mobile    17
104  kbd                 mobile    17
105  MobileMail         mobile    24
106  softwareupdatese   mobile    17
107  assetsd            mobile    17
108  librariand         mobile    17
111  calaccessd         mobile    17
115  Skype              mobile    17
118  MobileSlideShow    mobile    24
124  geod               mobile    24
125  MobileCal          mobile    17
127  absd               mobile    17
128  ipash              mobile    17
ipa$
```

## Asus Router



```
172.30.1.1 - PuTTY
admin@RT-AC66U:/tmp/home/root# uname
Linux
admin@RT-AC66U:/tmp/home/root# date
Mon Aug 25 18:13:02 DST 2014
admin@RT-AC66U:/tmp/home/root# ps
  PID  USER    VSZ  STAT  COMMAND
    1  admin   2360  S     /sbin/init
    2  admin      0  SW<   [kthreadd]
    3  admin      0  SWN   [ksoftirqd/0]
    4  admin      0  SW<   [events/0]
    5  admin      0  SW<   [khelper]
   18  admin      0  SW<   [kblockd/0]
   49  admin      0  SW    [pdflush]
   50  admin      0  SW    [pdflush]
   51  admin      0  SW<   [kswapd0]
   52  admin      0  SW<   [aio/0]
   96  admin      0  SW<   [mtdblockd]
  125  admin      0  SW<   [kmmcd]
  129  admin    608  S     hotplug2 --persistent --no-coldplug
  162  admin   2344  S     console
  166  admin   1552  S     /bin/sh
  168  admin   1540  S     syslogd -m 0 -S -O /tmp/syslog.log -s 256 -l 6
  170  admin   1540  S     /sbin/klogd
  172  admin      0  SW<   [khubd]
  248  admin   2352  S     usbld
  320  admin   2352  S     /sbin/wanduck
  327  admin   1544  R     telnetd
  330  admin   1056  S     /bin/eapd
  335  admin   1492  S     nas
  336  admin   1860  S     /bin/wps_monitor
  337  admin   2352  S     wpsaide
  340  nobody  1100  S     dnsmasq --log-async
  341  admin   4356  S     httpd
  343  admin   1552  S     crond
  344  admin   1028  S     /usr/sbin/infosvr br0
  347  admin   3700  S     watchdog
  348  admin   2352  S     ots
  351  admin   1240  S     rstats
  365  admin   1072  S     lld2d br0
  375  admin   1376  S     /usr/sbin/acsd
  386  admin   2052  S     u2ec
  388  admin   1128  S     lpd
  391  admin   2052  S     u2ec
  395  admin   2052  S     u2ec
  412  admin   1016  S     rdnssd -u admin -i eth0
  413  admin   1084  S     rdnssd -u admin -i eth0
  461  admin   2352  S     ntp
  468  admin    748  S     dhcp6c -T LL eth0
  472  admin    744  S     dhcp6s -c /etc/dhcp6s.conf br0
  474  admin    768  S     radvd -u admin
  476  admin    768  S     radvd -u admin
  477  admin   1556  S     udhcpc -i eth0 -p /var/run/udhcpc0.pid -s /tmp/udhcp
  485  admin    760  S     miniupnpd -f /etc/upnp/config
  486  admin   2352  S     disk_monitor
  884  admin   1308  S     networkmap
 2734  admin   1692  S     -sh
 2794  admin   1544  R     ps
admin@RT-AC66U:/tmp/home/root#
```

## Samsung Galaxy smartphone



```

172.30.1.1 - PuTTY
u0_a61@d2vmu:/ $ clear
u0_a61@d2vmu:/ $ date
Wed Aug 27 17:52:55 PDT 2014
u0_a61@d2vmu:/ $ echo $SHELL
/system/bin/sh
u0_a61@d2vmu:/ $ id
uid=10061(u0_a61) gid=10061(u0_a61) groups=1015(sdcard_rw),1028(sdcard_r),3003(inet),50061(all_a61) context=u:
r:untrusted_app:s0
u0_a61@d2vmu:/ $ cat /proc/version
Linux version 3.4.0-1368792 (dpi@SWDD5612) (gcc version 4.7 (GCC) ) #1 SMP PREEMPT Wed Apr 30 20:46:12 KST 201
4
u0_a61@d2vmu:/ $ ps
USER      PID     PPID  VSIZE  RSS      WCHAN    PC         NAME
root       1         0    1372   888      ffffffff 00000000 S /init
root       2         0         0       0      ffffffff 00000000 S kthreadd
root       3         2         0       0      ffffffff 00000000 S ksoftirqd/0
root       6         2         0       0      ffffffff 00000000 S migration/0
root       7         2         0       0      ffffffff 00000000 S watchdog/0
root      12         2         0       0      ffffffff 00000000 S khelper
root      13         2         0       0      ffffffff 00000000 S suspend_sys_syn
root      14         2         0       0      ffffffff 00000000 S suspend
root      17         2         0       0      ffffffff 00000000 S irq/203-msmdata
root      18         2         0       0      ffffffff 00000000 S sync_supers
root      19         2         0       0      ffffffff 00000000 S bdi-default
root      20         2         0       0      ffffffff 00000000 S kblockd
root      21         2         0       0      ffffffff 00000000 S khubd
root      22         2         0       0      ffffffff 00000000 S l2cap
root      23         2         0       0      ffffffff 00000000 S a2mp
root      24         2         0       0      ffffffff 00000000 S cfg80211
root      25         2         0       0      ffffffff 00000000 S rpciod
root      26         2         0       0      ffffffff 00000000 S modem_notifier
root      27         2         0       0      ffffffff 00000000 S smd_channel_clo
root      28         2         0       0      ffffffff 00000000 S smsm_cb_wq
root      30         2         0       0      ffffffff 00000000 S qmi
root      31         2         0       0      ffffffff 00000000 S nmea
root      32         2         0       0      ffffffff 00000000 S msm_ipc_router
root      33         2         0       0      ffffffff 00000000 S apr_driver
root      34         2         0       0      ffffffff 00000000 S khungtaskd
root      35         2         0       0      ffffffff 00000000 S kswapd0
root      36         2         0       0      ffffffff 00000000 S fsnotify_mark
root      37         2         0       0      ffffffff 00000000 S ecryptfs-kthrea
root      38         2         0       0      ffffffff 00000000 S nfsiod
root      39         2         0       0      ffffffff 00000000 S cifsiod
root      40         2         0       0      ffffffff 00000000 S crypto
root      58         2         0       0      ffffffff 00000000 S mdp_dma_wq
  
```

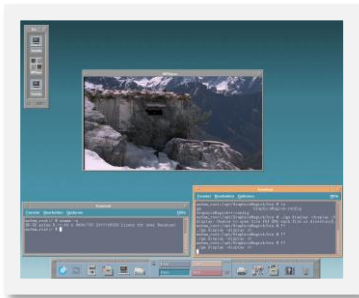
## VMware ESXi server



```
simben90@excalibur:~
~ # clear
~ # date
Thu Aug 28 00:59:38 UTC 2014
~ # hostname
vmserver3.cis.cabrillo.edu
~ # who
root          char/pty/t0      00:00   Aug 28 00:57:54   excalibur.cis.cabrillo.edu
~ # uname
VMkernel
~ # ps | head
WID  CID  World Name          Command

32769      idle1
32770      idle2
32771      idle3
32772      idle4
32773      idle5
32774      idle6
32775      idle7
32776      idle8
~ # ps | grep sh
32786      tlbflushcount
32787      tlbflushcountryflush
32788      vaSpaceTLBFlush
32873      pshare-est
32901      OCFlush
32903      BCFlush-0
33273 33273 sh                /bin/sh
33315 33315 sh                /bin/sh
33479 33479 sh                /bin/sh
33743 33743 sh                /bin/sh
33780 33780 sh                /bin/sh
33818 33818 sh                /bin/sh
33871 33871 sh                /bin/sh
33911 33911 sh                /bin/sh
33947 33947 sh                /bin/sh
33990 33990 sh                /bin/sh
34064 34064 sh                /bin/sh
34115 34115 sh                /bin/sh
34217 34217 sh                /bin/sh
34260 34260 sh                /bin/sh
34297 34297 sh                /bin/sh
34333 34333 sh                /bin/sh
34539 34539 sh                /bin/sh
34613 34613 sh                /bin/sh
34706 34706 sh                /bin/sh
35049 35049 sh                /bin/sh
4197333 4197333 sshd             sshd
4197376 4197376 sh                -sh
~ #
```

## HP-UX



```
cupsim98.cup.hp.com - PuTTY
restrictions as set forth in sub-paragraph (c)(1)(ii) of the Rights in
Technical Data and Computer Software clause in DFARS 252.227-7013.

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

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

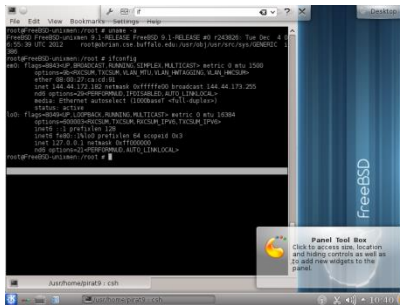
Value of TERM has been set to "xterm".
WARNING: YOU ARE SUPERUSER !!

# ls /
.mozilla          .sw              home             sbin
.mozilla-license  bin             lib             stand
.profile          core            lost+found      tmp
.rnd              dev            net             usr
.ssh              etc            opt             var

# uname -a
HP-UX cupsim98 B.11.23 U ia64 0564465391 unlimited-user license
#
```



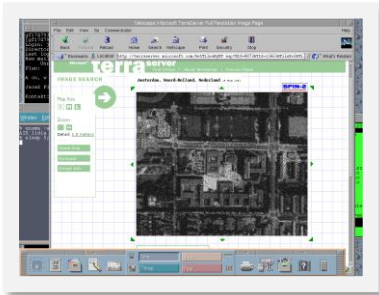
## BSD Unix



```

root@FreeBSD-unixmen:/root # uname -a
FreeBSD FreeBSD-unixmen 9.1-RELEASE FreeBSD 9.1-RELEASE #0 r243826: Tue Dec 4 10:55:39 UTC 2012 root@obrian.cse.buffalo.edu:/usr/obj/usr/src/sys/GENERIC i386
root@FreeBSD-unixmen:/root # ifconfig
em0: flags=8843<UP,BROADCAST,RUNNING,SIMPLEX,MULTICAST> metric 0 mtu 1500
    options=9b<RXCSUM, TXCSUM, VLAN_MTU, VLAN_HWTAGGING, VLAN_HWCSUM>
    ether 08:00:27:ca:cd:91
    inet 144.44.172.182 netmask 0xfffffe00 broadcast 144.44.173.255
    nd6 options=29<PERFORMNUD,IFDISABLED,AUTO_LINKLOCAL>
    media: Ethernet autoselect (1000baseT <full-duplex>)
    status: active
lo0: flags=8049<UP,LOOPBACK,RUNNING,MULTICAST> metric 0 mtu 16384
    options=600003<RXCSUM, TXCSUM, RXCSUM_IPV6, TXCSUM_IPV6>
    inet6 ::1 prefixlen 128
    inet 127.0.0.1 netmask 0xff000000
    nd6 options=21<PERFORMNUD,AUTO_LINKLOCAL>
root@FreeBSD-unixmen:/root #
  
```

## IBM AIX

A screenshot of a terminal window titled 'dtterm'. The terminal has a menu bar with 'Window', 'Edit', 'Options', and 'Help'. The command prompt is '\$'. The user has entered the command 'uname -a', which returned 'AIX aix 3 5 004518FC4C00'. The user then entered 'cat .screenrc', which displayed the following content:

```
log off
hardstatus alwayslastline "%{-b ck} %?%-w%?%{+b}%n%f %t%{-b} %?%+w%? %=- %l %
D %d/%m/%Y %Oc "
hardstatus on
escape ^Tt
```

The terminal status bar at the bottom shows '0 ksh', '1 irssi', '2 VMS', and a question mark, followed by the date and time '? Sat 15/03/2008 00:35'.



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