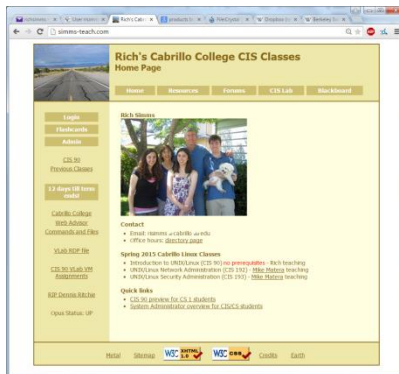


CIS 90

Introduction to UNIX/Linux



For a copy of these slides browse to <http://simms-teach.com> and click on the link titled "CIS 90 preview for CS 1 students"

What is UNIX/Linux?

What is UNIX/Linux?



UNIX is an operating system that was first released in 1971. It was created by Ken Thompson and Dennis Ritchie at AT&T Bell Labs.



Linux is the kernel of a UNIX-like operating system that became available in 1991. It was created by Linus Torvalds a computer science student at the University of Helsinki in Finland.



GNU Linux is a complete UNIX-like operating system built on the Linux kernel.

What is an operating system?

It is the core software that runs on any computing device. It controls and allocates the hardware resources such as memory, hard drives, CPUs, and network across multiple users and applications. Examples include Windows, UNIX, and Linux.

Where can
you find
UNIX/Linux?

Embedded Unix in Apple Products

Apple iOS



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

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

Various Linux "Distros" (Distributions)

Red Hat Enterprise Linux



CentOS



Fedora



OpenSUSE



Debian



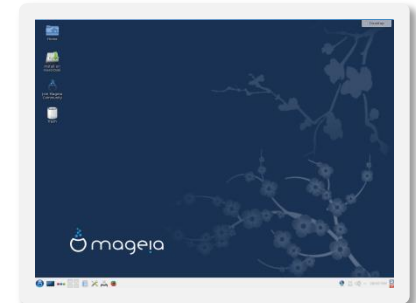
Ubuntu



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

Embedded Linux (just a few)



Katana
Robotic Arm



Erle-Copter
drone



Stir smart desk



Asus RT-AC66U
wireless router



Tivo



Yamaha Disklavier
Mark IV



Android
Cell Phones



Some TomTom
GPS models



Garmin
Nuvi 5000



Buffalo
NAS storage



Virgin America
Personal
Entertainment



TripBPX
Phone
System



MikroTik
Routers



Sony TVs



Android Tablets



Raspberry Pi



Polycom
SoundPoint
Phone

Film Studios



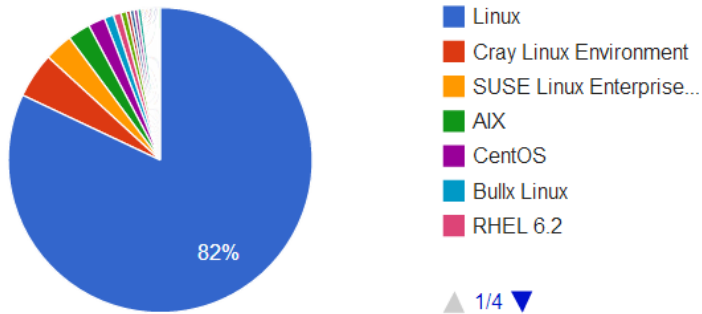
Film studios like DreamWorks have huge Linux "rendering farms" to produce the animation and special effects



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



Operating System Share (by system) June 2014



Operating System	Count	System Share (%)	Rmax (GFlops)	Rpeak (GFlops)	Cores
Linux	410	82	170,858,490	254,569,525	14,829,593
Cray Linux Environment	24	4.8	39,060,748	55,313,420	1,855,432
SUSE Linux Enterprise Server 11	15	3	10,856,287	15,078,367	520,704
AIX	12	2.4	4,443,567	5,288,805	176,288
CentOS	9	1.8	2,438,215	3,276,319	172,296
Bullx Linux	5	1	1,565,126	1,878,599	69,668
RHEL 6.2	4	0.8	1,738,900	2,132,582	102,528
bullx SUpErCOmputer Suite A.E.2.1	3	0.6	2,942,070	3,583,180	165,888
SLES10 + SGI ProPack 5	2	0.4	398,000	439,910	38,400
Redhat Enterprise Linux 6.5	2	0.4	611,669	628,800	28,000
Redhat Enterprise Linux 6.4	2	0.4	720,702	1,223,280	56,026
Redhat Enterprise Linux 6	2	0.4	2,433,470	3,032,783	295,656
Redhat Linux	1	0.2	196,234	262,560	8,412
RHEL 6.1	1	0.2	230,800	340,915	37,056
bullx SCS	1	0.2	255,078	274,176	12,240
SUSE Linux	1	0.2	274,800	308,283	26,304
Kylin Linux	1	0.2	33,862,700	54,902,400	3,120,000
Windows Azure	1	0.2	151,300	167,731	8,064
CNL	1	0.2	165,600	201,216	20,960
Windows HPC 2008	1	0.2	180,600	233,472	30,720
Scientific Linux	1	0.2	188,725	199,680	9,600
CNK/SLES 9	1	0.2	190,900	222,822	65,536

Linux dominates the Supercomputer market



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

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



Businesses and organizations that run on Linux



WIKIPEDIA
The Free Encyclopedia



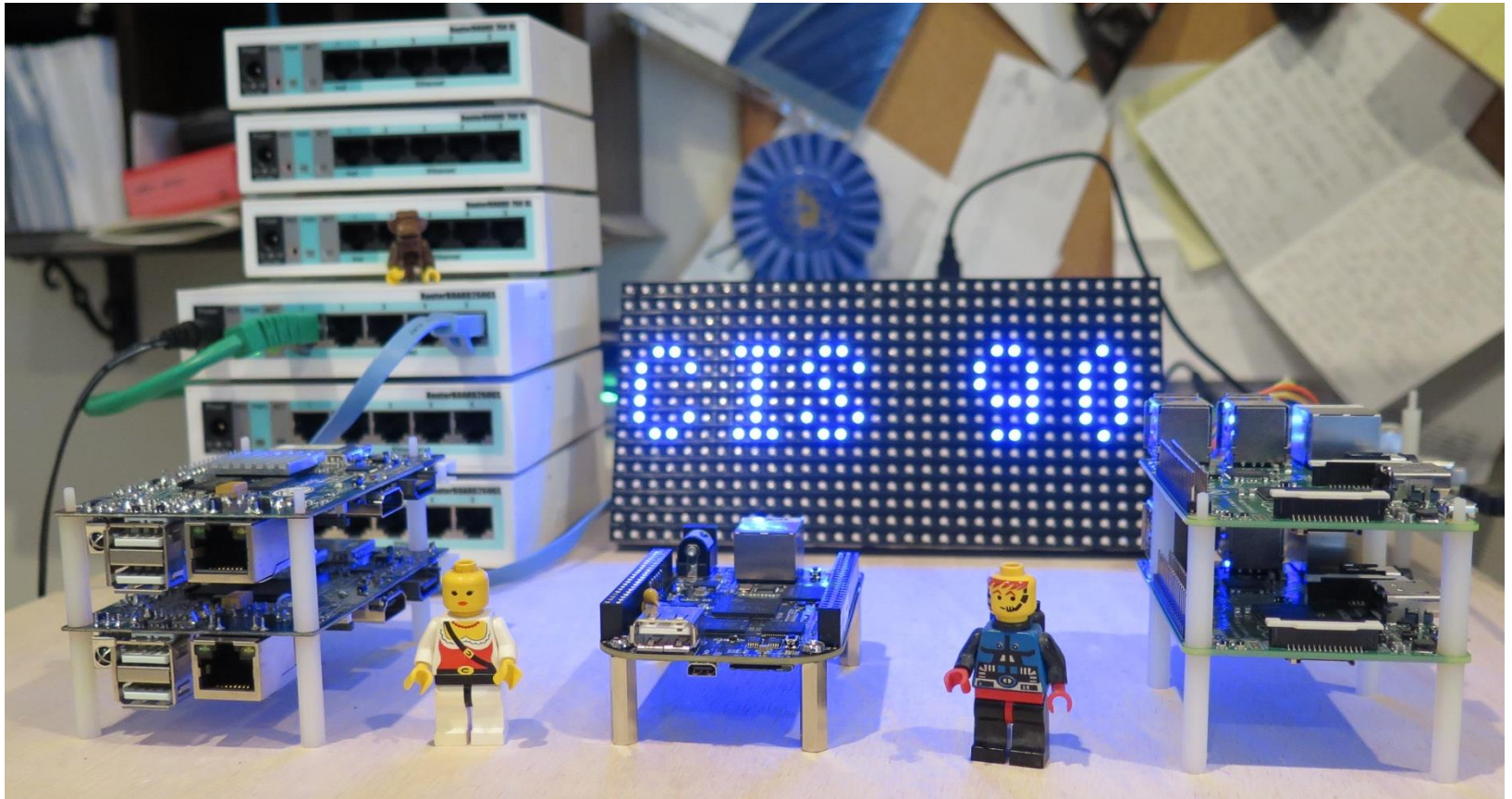
An massive Amazon data center using UNIX/Linux



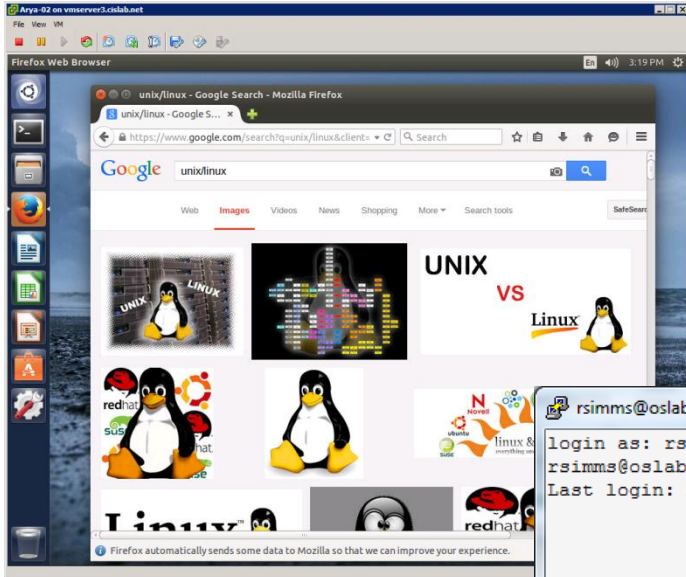
Every day, Amazon Web Services adds enough new capacity to support all of Amazon.com's global infrastructure through the company's first 5 years, when it was a \$2.76B annual revenue enterprise



A very tiny inexpensive data center using Linux



What does the
UNIX/Linux
interface
look like?

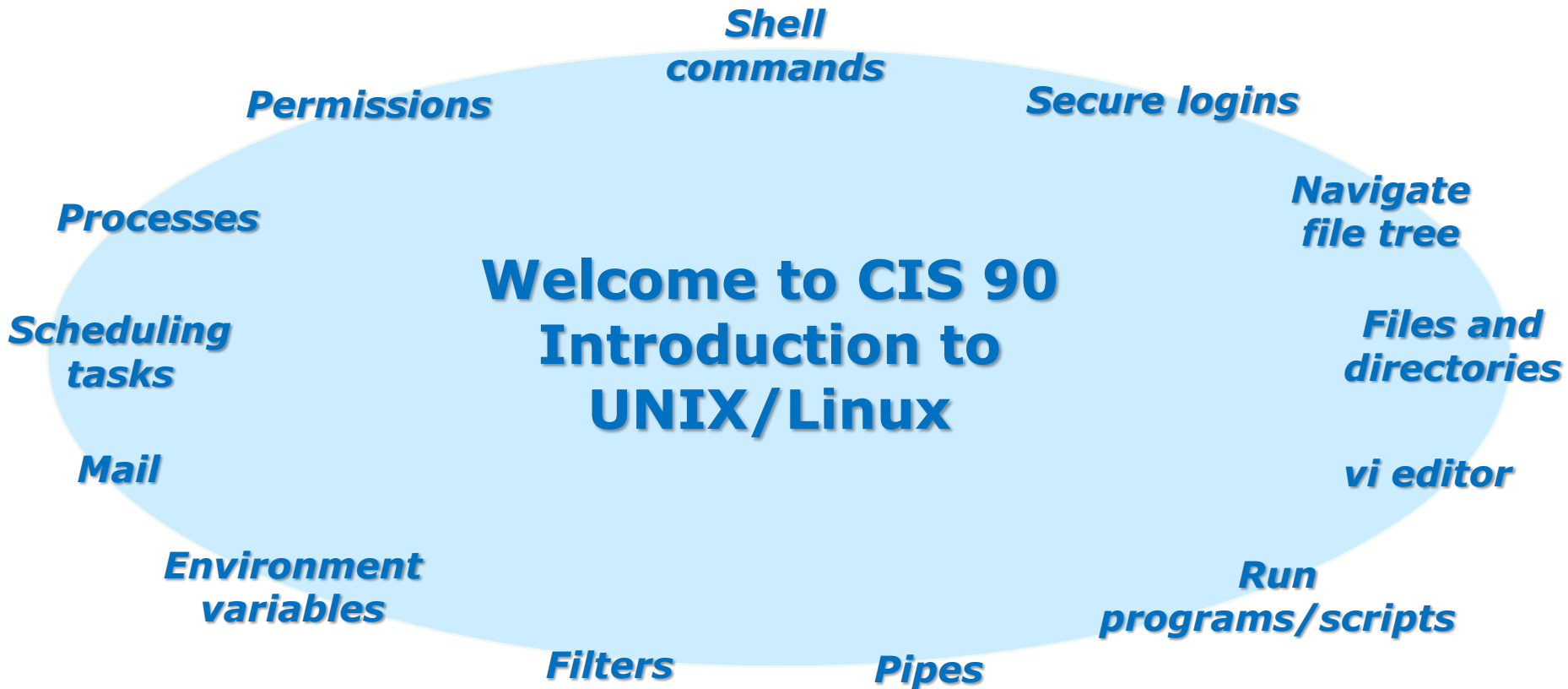


Graphical User Interface Used a little in CIS 90

```
rsimms@oslab:~  
login as: rsimms  
rsimms@oslab.cis.cabrillo.edu's password:  
Last login: Mon May 11 09:04:24 2015 from 2601:647:cb00:b07d:8843:b472:685e:f583  
  
      ( 'v' )  
     \|_--_\  
      (\_ _ /)  
       ~ ~ ~  
  
      Welcome to Opus  
      Serving Cabrillo College  
  
[rsimms@oslab ~]$ grep love ~/simben90/poems/Shakespeare/*  
/home/cis90/simben/poems/Shakespeare/sonnet10:For shame deny that thou bear'st love to any,  
/home/cis90/simben/poems/Shakespeare/sonnet10:Shall hate be fairer lodg'd then gentle love?  
/home/cis90/simben/poems/Shakespeare/sonnet10: Make thee another self for love of me,  
/home/cis90/simben/poems/Shakespeare/sonnet15: And all in war with Time for love of you,  
/home/cis90/simben/poems/Shakespeare/sonnet26:Lord of my love, to whom in vassalage  
/home/cis90/simben/poems/Shakespeare/sonnet26: Then may I dare to boast how I do love thee,  
/home/cis90/simben/poems/Shakespeare/sonnet3:Of his self-love, to stop posterity?  
/home/cis90/simben/poems/Shakespeare/sonnet3:Calls back the lovely April of her prime,  
/home/cis90/simben/poems/Shakespeare/sonnet4:Unthrifty loveliness, why dost thou spend  
/home/cis90/simben/poems/Shakespeare/sonnet5:The lovely gaze where every eye doth dwell  
/home/cis90/simben/poems/Shakespeare/sonnet9: No love toward others in that bosom sits  
[rsimms@oslab ~]$
```

The Shell Command Line Used a LOT in CIS 90

What will we learn in CIS 90



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.

CIS 90 taught in Virtual or Physical Classrooms

CCC Confer - Attending class online

The screenshot displays the CCC Confer application window titled "CCC Confer - 0 - RICH SIMMS". The interface includes a menu bar (File, Edit, View, Tools, Window, Help) and a toolbar with icons for drawing, erasing, and navigating. The main content area shows a presentation slide titled "CIS Linux Classes" with the Cabrillo College logo and instructor information: "Instructor: Rich Simms" and "Dial-in: 888-450-4821". The slide features a grid of 30 white silhouette icons representing participants. A blue callout box points to a set of four icons (smiley face, hand, hand with raised index finger, and checkmark) in the PARTICIPANTS panel, with the text: "Show your state of mind, let others know you stepped away, raise your hand, and indicate responses using these controls". Another blue callout box points to the CHAT area at the bottom of the interface, with the text: "Ask and answer questions using the chat area". The CHAT area shows a log of messages: "- You joined the Main Room. (2:23 PM) -" and "- Rich Simms joined the Main Room. (2:24 PM) -". The PARTICIPANTS list on the left shows "Benji" and "Rich Simms (Moderator)".

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

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

Home Resources Forums CIS Lab Blackboard

[Login](#)
[Flashcards](#)
[Admin](#)

CIS 90
Previous Classes

12 days till term ends!

[Cabrillo College Web Advisor](#)
[Commands and Files](#)
[VLab RDP file](#)
[CIS 90 VLab VM Assignments](#)
[RIP Dennis Ritchie](#)
[Opus Status: UP](#)

CIS 90 (Spring 2015) Calendar
[Course Home](#) [Grades](#) [Calendar](#)

Lesson	Date	Topics	Chapter	Due*
1	1/28	Class and Linux Overview <ul style="list-style-type: none"> Understand how this course will work High-level overview of computers, operating systems and virtual machines Overview of UNIX/Linux market and architecture Using SSH for remote network logins Using terminals and the command line Materials <ul style="list-style-type: none"> Presentation slides (download) Login Credentials Sheet (download) Supplemental <ul style="list-style-type: none"> Howto #143: Logging into Opus (download) Assignment <ul style="list-style-type: none"> Student Survey Lab 1 CCC Confer <ul style="list-style-type: none"> Enter virtual classroom Class archives 	1.1-1.15 (Gillay) 2.4.5, p113-115, p164-172 (Hahn)	
2	2/4	Quiz 1 Commands <ul style="list-style-type: none"> Understand how the UNIX login operation works Meet John the Ripper and learn how vulnerable a poor password is Understand basic command syntax and operation Understand program files and what happens when they are run Understand how the shell works and environment variables Understand how to get online documentation Materials <ul style="list-style-type: none"> Presentation slides (download) Howto #106: Configuring Putty (download) Assignment <ul style="list-style-type: none"> Lab 2 CCC Confer <ul style="list-style-type: none"> Enter virtual classroom Class archives 	2.3-2.7 2.11 3.7-3.20 4.19-4.22 9.1-9.2 (Gillay)	Lab 1 Student Survey
	2/7	Last day to add CIS 90		
		Quiz 2 Electronic Mail <ul style="list-style-type: none"> Learn how to use the UNIX communication tools write and /bin/mail Overview on end-to-end email Materials		

For more information feel free to browse the current term or previous term CIS 90 Calendar pages to see lessons, lab assignments and the student forum