CIS 90 Introduction to UNIX/Linux

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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 the runs on any computing device. It controls and allocates the hardware resources such 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


```
ip4:~ mobile$ uname -a
Darwin ip4 10.3.1 Darwin Kernel Version 10.3.1: Wed Aug  4 22:35:51 PDT 2010; r
oot:xnu-1504.55.33~10/RELEASE_ARM_S5L8930X iPhone3,1 arm N90AP Darwin
ip4:~ mobile$
```

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

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

Various Linux "Distros" (Distributions)

Red Hat Enterprise Linux

CentOS

Fedora

OpenSUSE

Debian

Ubuntu

Mint

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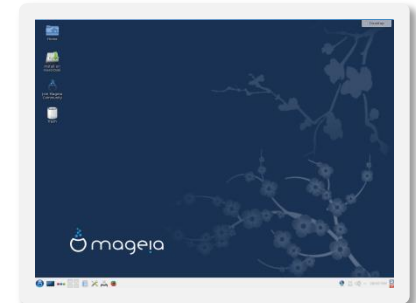
*Note: A distribution is built by a company or organization. They start with the **Linux kernel** then add a custom mix of open source components. They may then add some of their own unique software to differentiate their distribution.*

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

For more see: http://linuxgizmos.com/category/devices/

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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

Linux dominates the Supercomputer market
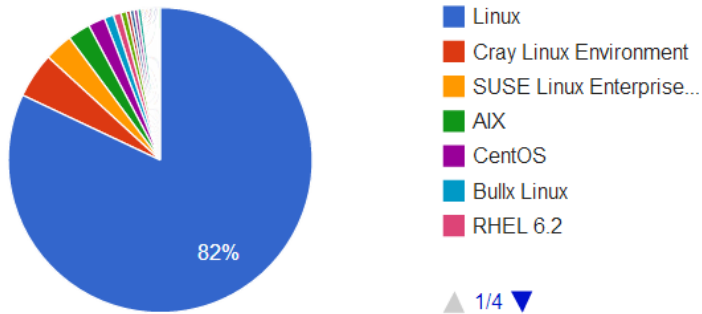
Operating System	Count	System Share (%)	Rmax (GFlops)	Rpeak (GFlops)	Cores
Linux	410	82	170,858,490	254,569,525	14,829,593
Cray Linux Environment	24	4.8	39,060,748	55,313,420	1,855,432
SUSE Linux Enterprise Server 11	15	3	10,856,287	15,078,367	520,704
AIX	12	2.4	4,443,567	5,288,805	176,288
CentOS	9	1.8	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	230,600	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

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/

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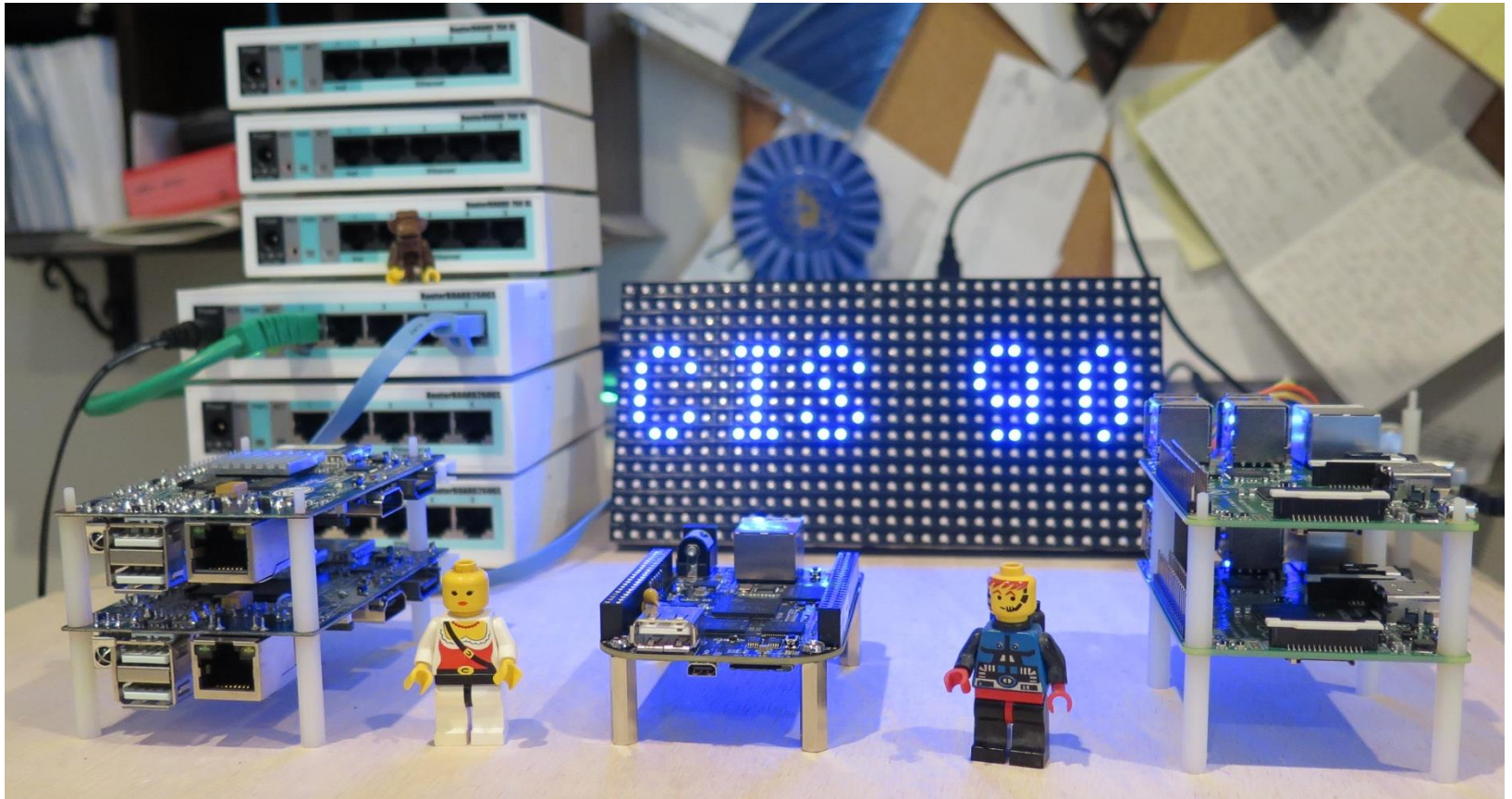**Businesses and organizations that run on Linux**

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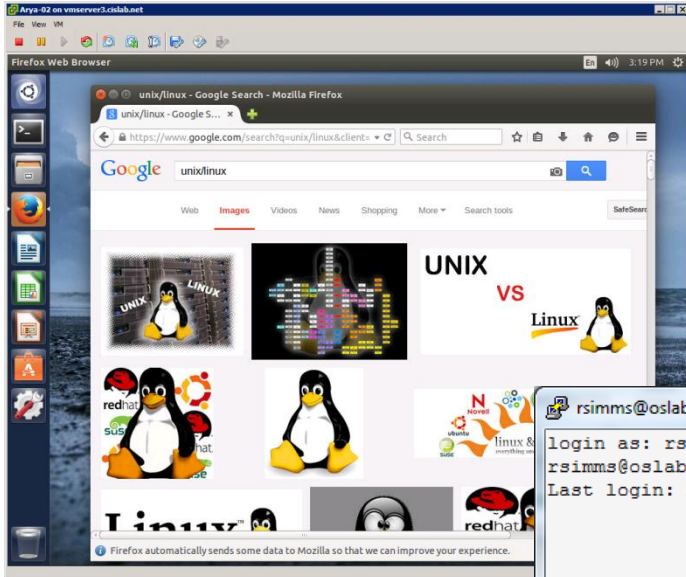An massive Amazon data center using UNIX/Linux

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

2011/5/5   http://perspectives.mvdirona.com

amazon
web services™

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A very tiny inexpensive data center using Linux

What does the UNIX/Linux interface look like?

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Graphical User Interface
Used a little in CIS 90

The Shell Command Line
Used a LOT in CIS 90

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What will we learn in CIS 90

Shell commands

Permissions

Secure logins

Processes

Navigate file tree

Scheduling tasks

Welcome to CIS 90 Introduction to UNIX/Linux

Files and directories

Mail

vi editor

Environment variables

Run programs/scripts

Filters

Pipes
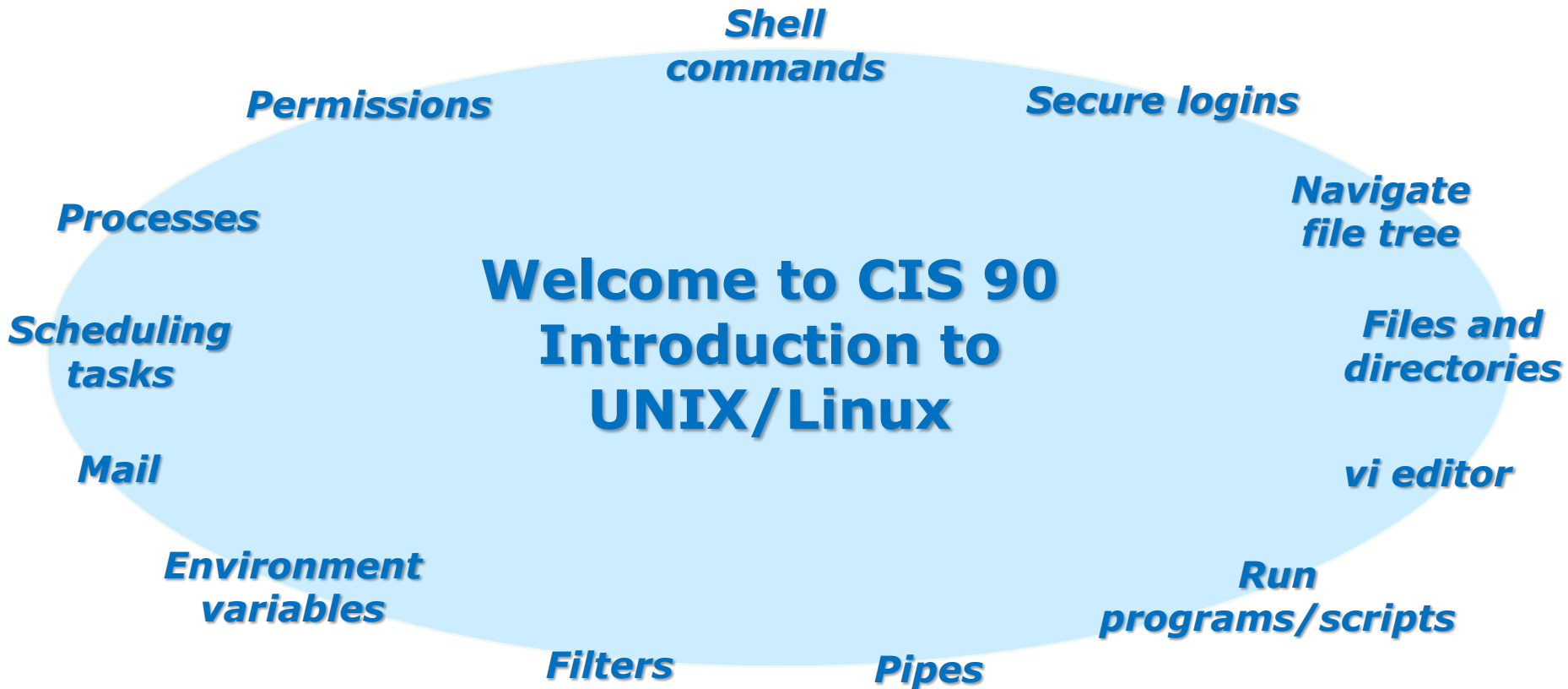
Student Learner Outcomes

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.

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Show your state of mind, let others know you stepped away, raise your hand, and indicate responses using these controls

Ask and answer questions using the chat area

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

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