

L02 - FRIDAY, AUGUST 25
CPSC 1070 | FALL 2023

INTRO TO UNIX + READINESS QUIZ



School of

COMPUTING

Clemson University

```
PDP-11 simulator V3.10-0  
Disabling XQ  
#0=unix
```

```
UNIX/3.0.1: unixhptm  
real mem = 262144 bytes  
avail mem = 195776 bytes  
unix  
single-user  
# init 2  
# process accounting start  
errdemon started  
cron started  
multi-user  
type ctrl-d
```

```
login: root  
UNIX Release 3.0  
# uname -a  
unix unix 3.0.1 hptm  
#
```

ANNOUNCEMENTS

- HW-0 assigned on Canvas today and due in a week
- No class or labs on Monday, September 4th
- Reminder: Teams has multiple channels available to ask questions and is monitored by the TA staff
- If you are sick, use the Notification of Absence feature
 - Do not send a follow-up email

UNIX BENEFITS

- Simple I/O model
- Good programming tools
- Networking is easy
- Multi-tasking
- Multi-user
- Network Ready



<https://www.techopedia.com/definition/27240/unix-trademark>

WINDOWS 3.1 SIDEBAR



WHY SHOULD YOU LEARN UNIX?

- Ultimately, what are most of you wanting to do after you graduate?

last.fm **Music** **Radio** **Events** **Charts** **Community**

Come work with us! Last.fm is hiring »

Overview

Contact

Team

Moderators

Careers

We're Hiring

Last.fm is growing. We're currently looking for great people to join [our team](#).

How to Apply

To apply for any of these positions, please send an email to jobs@last.fm, with the job title as your subject. Note, **no agencies** will be considered.

Please include a short cover letter, with the following:

- Your Last.fm user name
- Your CV
- Your current notice period
- Your eligibility to work in the UK
- Your salary expectation

We reserve the right to be unimpressed if you can't follow these simple instructions. Unless otherwise stated, all positions will be full time, and based at [Last.fm HQ](#) in London N1 (see [how to get there](#)).

Last.fm does not discriminate on the basis of race, religion, colour, sex, age, non-disqualifying physical or mental disability, national origin, sexual orientation, or any other basis covered by local law. All matters related to employment are decided on the basis of qualifications, merit and business need.

If you would like to be considered for employment opportunities with Last.fm and need special assistance due to a disability or accommodation for a disability, please specify this in your application.



Java Developer

Last.fm is looking for a junior or senior Java developer to work in its Data Team on the data infrastructure behind the biggest music site on the planet. The Data Team is responsible for internal and external services including reporting, analytics, search, charts, streaming, music catalogue, scrobbling and various internal and public APIs.

You will work with offline data processing systems that are distributed, scalable and process massive amounts of data, both maintaining and extending existing systems as well as creating new ones. You will provide services to and be in frequent contact with our commercial and technical teams. You will participate in all aspects of the software development cycle from architecture, coding and testing through to deployment.

We expect you to be proactive, an excellent communicator, to have an interest in learning about and shaping complex systems, and to not shy away from the many random day-to-day tasks it requires to run our business.

We do not believe in matching developer CVs against a list of buzzwords – we look for smart people with good general programming skills as we believe that clever developers can learn new technologies quickly and well. However it wouldn't hurt if you have experience with some of the following:

- Strong relational database and SQL experience including prior work involving a complex database schema (we use PostgreSQL and MySQL.)
- Hadoop, Hive and other "NoSQL" technologies.
- Data mining and data warehousing.
- Spring.
- Object Relational Mapping tools (e.g. Hibernate.)
- Systems that generate and process terabytes of data per day.
- Unit testing (we take Quality Control seriously, see <http://blog.last.fm/2008/08/01/quality-control>.)
- Linux (all our servers run Linux so you'll need to be comfortable with a command line shell.)
- Agile development methodologies including scrum, code reviews, pair programming.
- Last.fm (being a user of the site doesn't hurt ;)
- Football or table tennis.

AND MOST IMPORTANTLY



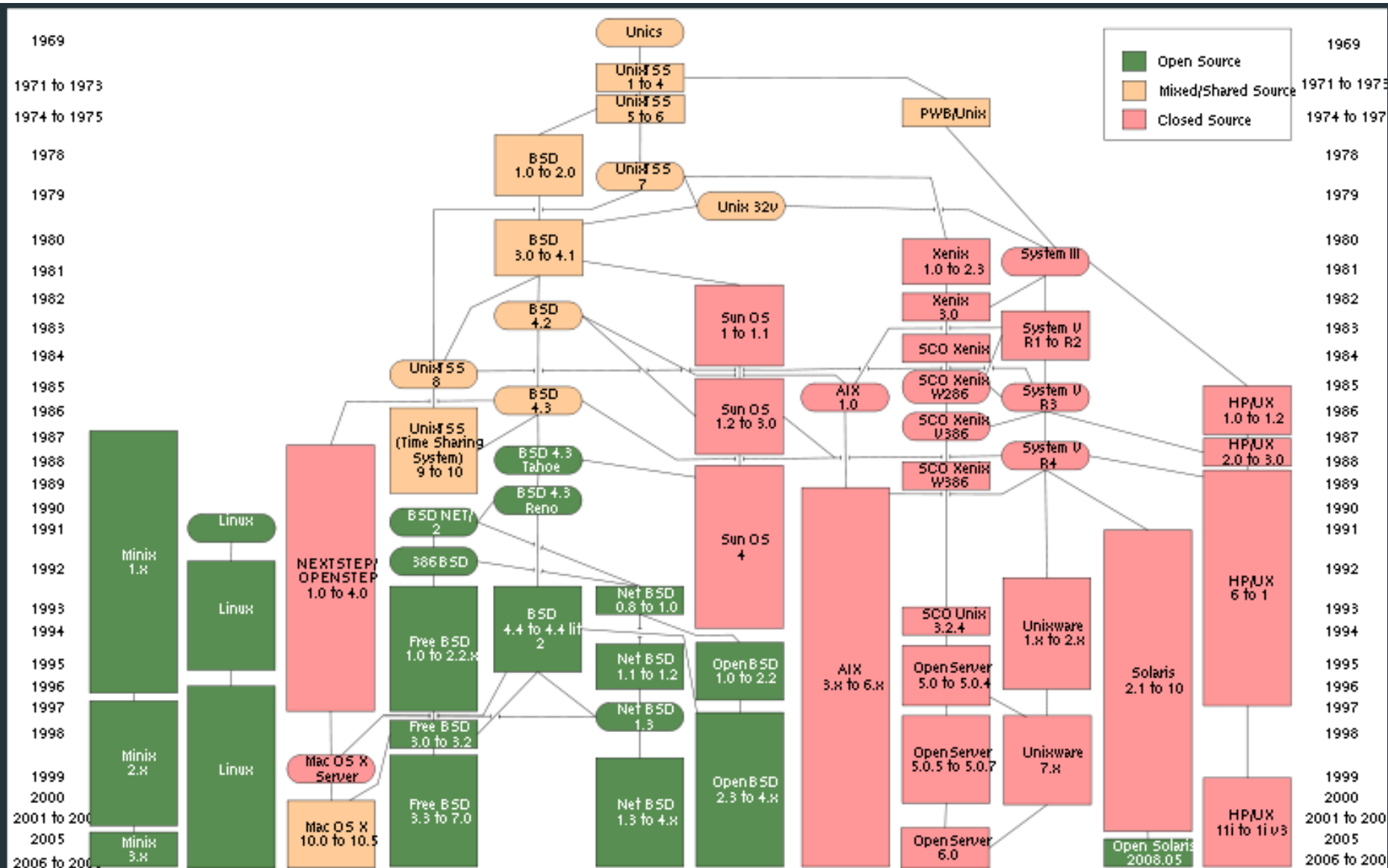
ORIGIN OF UNIX



- 1956 antitrust settlement outlined terms where Bell System could not enter the computer business
- Ken Thompson had been developing UNIX in the 1960s while working at Bell Labs
- Bell Labs was required to license its non-telephone technologies to anyone who asked for it

END RESULT??

UNIX FAMILY TREE



UNIX HISTORY

- Developed in the late 1960s and 1970s at Bell Labs
 - Goals: most versatile, powerful, and flexible OS
- K. Thompson, D. Ritchie, McIlroy, Ossanna (nroff), and Canaday
- UNICS: a pun on the MULTICS time shared system (Multiplexed Information and Computer Service)
- Thompson wrote first version of UNICS in assembler for a PDP-7 in a month
 - new file system, kernel, shell, editor, assembler
 - 1969 Thomson writes an interpreter B based on BCPL;
 - Ritchie improves on B and calls it "C"
 - 1972 UNIX is rewritten in C to facilitate porting

UNIX'S PHILOSOPHY



- Write programs that do one thing and do it well
- Write programs that work together
- Write programs that handle text streams (why?)
- K.I.S.S.

THAT CRAZY UNIX FAMILY TREE

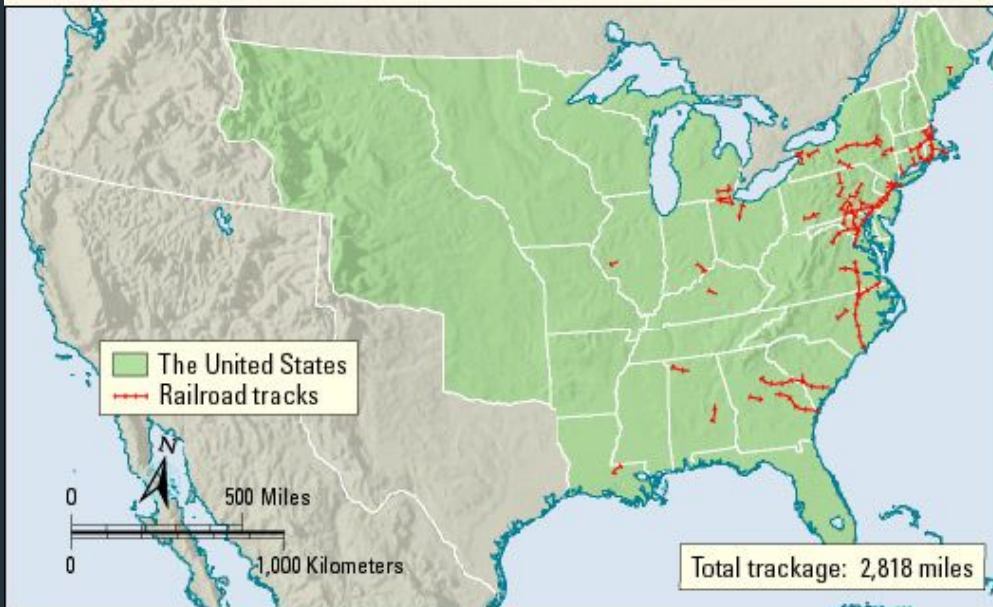
- Number of flavors of UNIX is....kinda neat
- But with neatness comes issues....
- What really is a **system call**?
 - request for operating system to do something on a user's program's behalf
- **System call** vs a **library function**



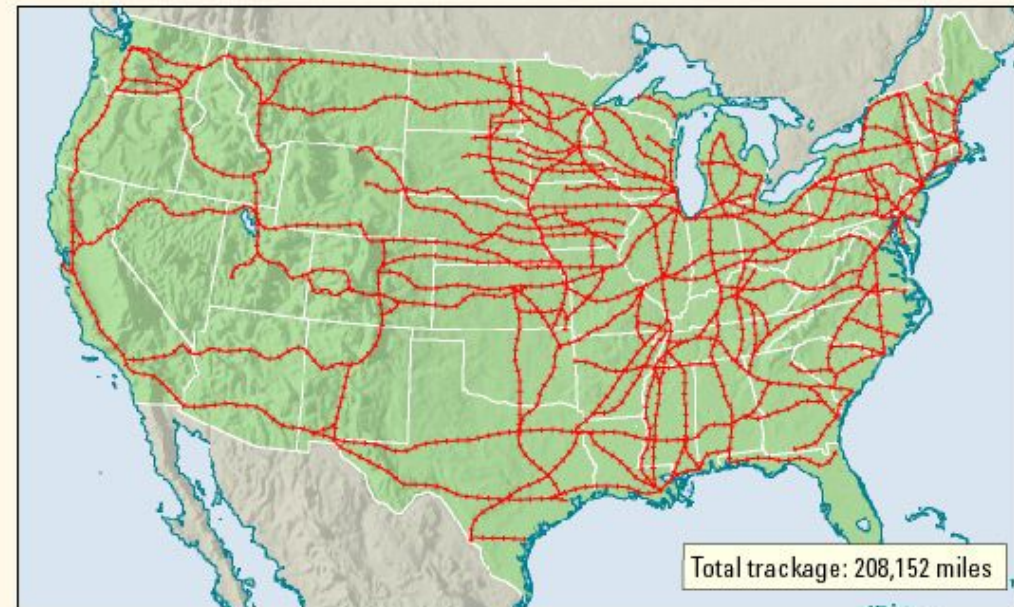


The Growth of Railroads in the United States

Railroad System, 1840



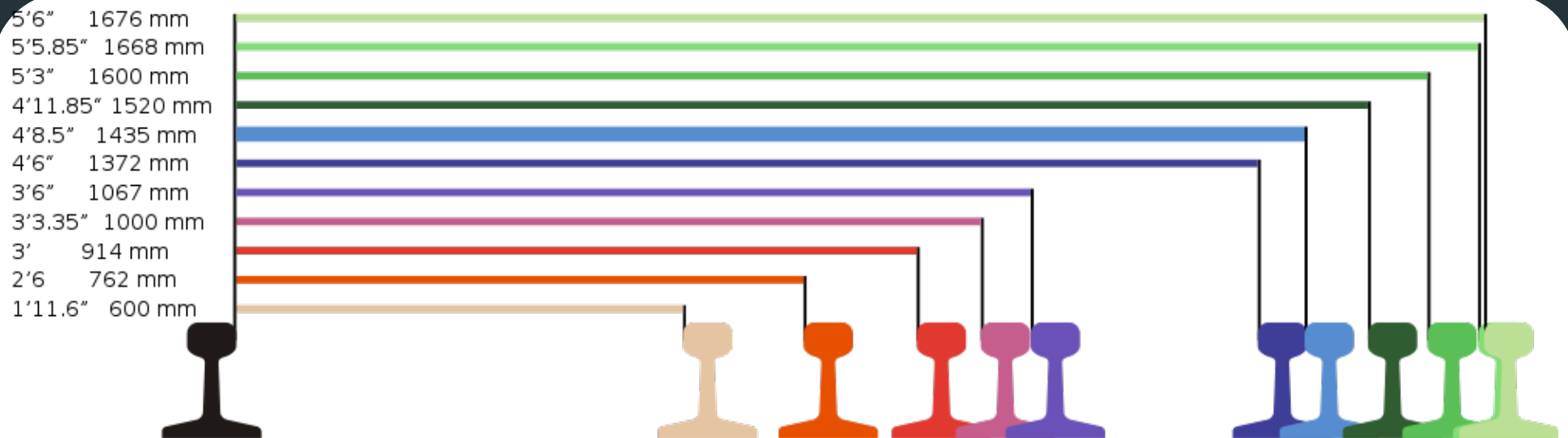
Railroad System, 1890



GEOGRAPHY SKILLBUILDER: Interpreting Maps

- 1. Region** In what part of the country were the first railroads built? By 1890, what other part of the country was densely covered by railroad tracks?
- 2. Movement** In what direction did the railroads help people move across the country?

STANDARDIZATION



LEARNING OUTCOMES

BY THE END OF THIS CLASS, YOU SHOULD BE ABLE TO:

- Describe the evolution of UNIX
- Explain the design philosophy of UNIX
- List benefits of a UNIX operating system
- Explain the importance of having a solid foundation in programming before taking subsequent courses

READINESS QUIZ