



CENTER FOR
GENOME RESEARCH &
BIOCOMPUTING

“Introduction to Unix/Linux” INX_U18, Day 1, 2018-07-23

Welcome!, course overview, using SSH, Unix history

Learning Outcome(s):

Log in to the command-line interface on the CGRB infrastructure.

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About me

- Matthew Peterson, OSU CGRB
- Office: ALS 3122
- Email: matthew@cgrb.oregonstate.edu
 - I will try to reply to emails within 24-hours
- Office hours:
 - Immediately following each class
 - Also by appointment

Official Instructor (of record)

- Dr. Shawn O'Neil
- Office: ALS 3135
- Email: shawn.oneil@cgrb.oregonstate.edu
- Responsible for concerns/issues with:
 - Final grading
 - Class/classroom experience

Resources

- Class website (resources, syllabus, etc.):
 - Single Canvas site (not the default one created by the Registrar)
- Book
 - “A Primer for Computational Biology”
 - <http://library.open.oregonstate.edu/computationalbiology/>
 - A Practical Guide to Linux Commands, Editors, and Shell Programming (3rd Edition)
 - <https://www.amazon.com/Practical-Guide-Commands-Editors-Programming/dp/013308504X>

Grading

- All home work and quizzes will be given equal weight, converted to percentage, and finally converted to pass/no-pass at a cutoff of 66.6%
- Late HWs: I don't have a TA, so please get things in on time. I'll only accept late HWs (with 10% penalty) if you make a good faith effort to get it completed on time (i.e., you submitted something worthy of looking at).
- **All sections of all assignments are to be attempted/completed “In Good Faith.”**

“In Good Faith”

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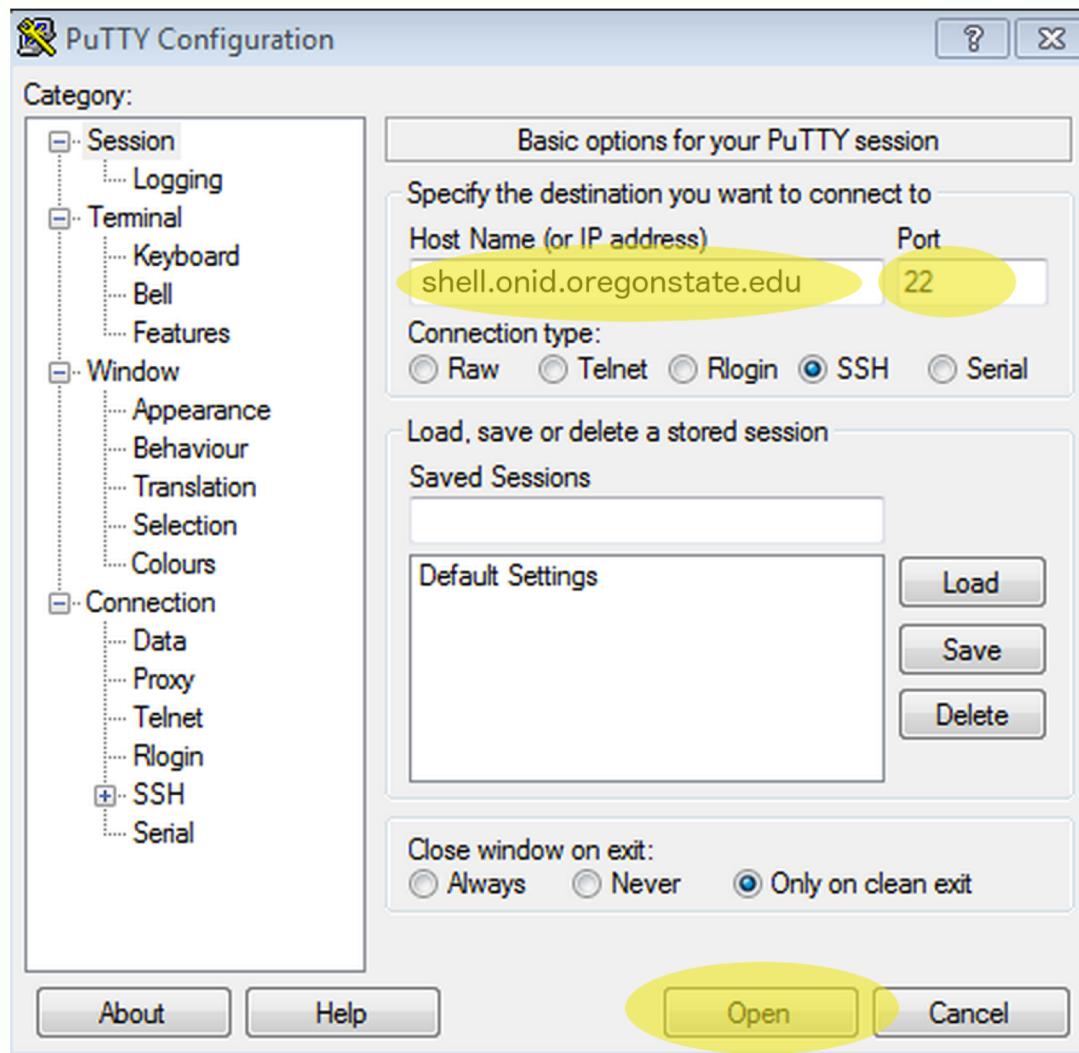


“In contract law, the **implied covenant of good faith and fair dealing** is a general presumption that the parties to a contract will deal with each other honestly, fairly, and in good faith, so as to not destroy the right of the other party or parties to receive the benefits of the contract.”

Expectations

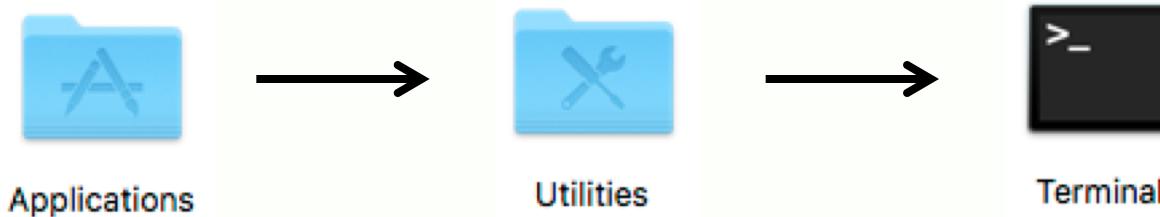
- Work hard
- Show up to every class
- Interact with me in class, at office hours, via email
- Interact with other students

Windows SSH Terminal; putty.exe



MacOSX Terminal; SSH

The “Terminal” program is built-in to MacOSX:



In terminal run ssh (using port # N) to connect:

```
ssh -p N yourloginname_ws@hostname.edu
```

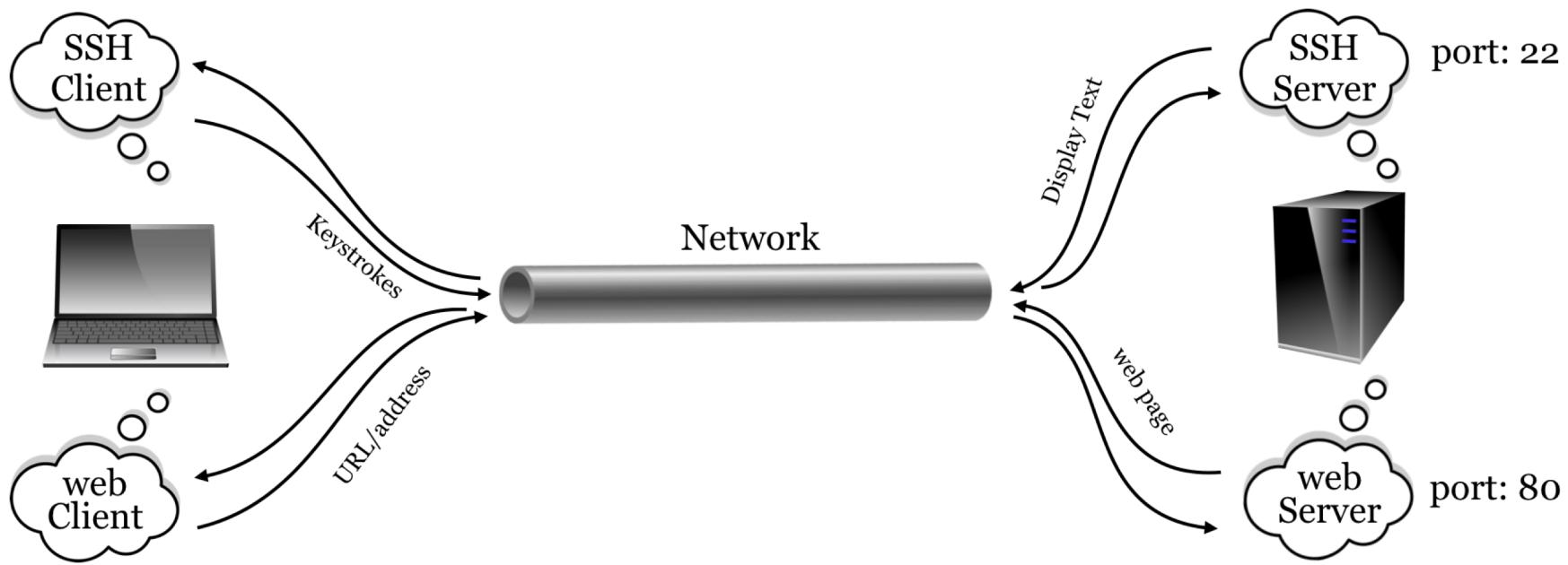
Command prompt

The diagram illustrates the structure of a command prompt. It shows a terminal session with the following components:

- Username:** `oneils`
- Machine Name:** `@atmosphere`
- Working Directory:** `~$`
- Command:** `echo`
- Parameter 1:** `hello`
- Parameter 2:** `there`
- Output:** `hello there`

A bracket labeled "Output" groups the final two lines of text: `hello there`.

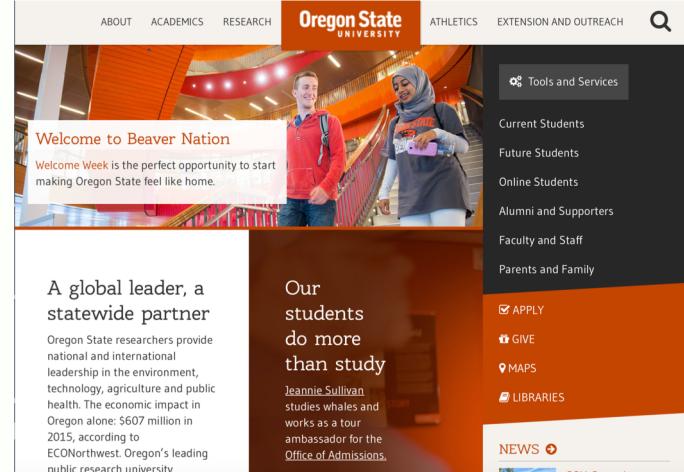
Client connection to Server



Web client to web server, port 80



Port 80

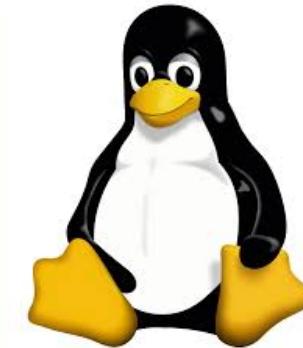
A thick orange horizontal double-headed arrow indicating a bidirectional connection between the web client and the web server.A screenshot of the Oregon State University website. The header includes links for ABOUT, ACADEMICS, RESEARCH, ATHLETICS, EXTENSION AND OUTREACH, and a search bar. The main content features a "Welcome to Beaver Nation" section with a photo of two students, a "Global leader" sidebar, and a "Our students do more than study" sidebar. The footer includes links for Tools and Services, Current Students, Future Students, Online Students, Alumni and Supporters, Faculty and Staff, Parents and Family, and various social media and application links.

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SSH client to SSH (Linux) server



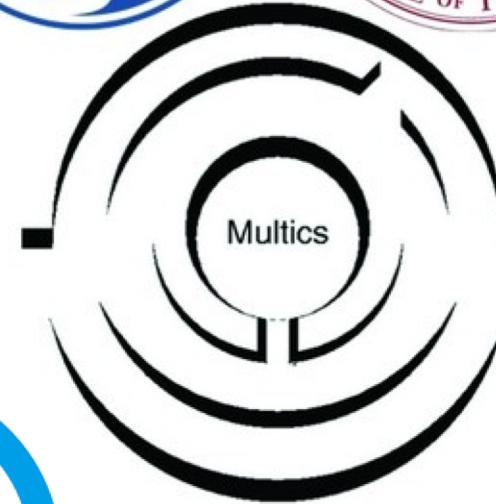
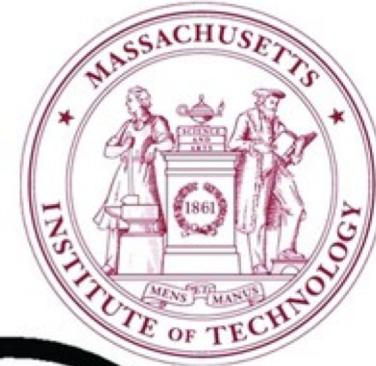
Port 22 (default)



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(brief) Unix “history” - Multics

- ~1964
- Multics
 - (**M**ultiplexed **I**nformation and **C**omputing **S)**
 - “time-sharing”



Unix “history” - Unix

- Circa 1970
- Unix
 - (play of words on “Multics”)
 - Improved upon Multics,
licensed for free, (academics
love free stuff!)



Unix “history” - Unix

- ~1983
- AT&T spins off Bell Labs,
tries to sell Unix
- Academics’ response:
 - GNU (**GNU’s Not Unix**)
 - BSD
(**Berkley Software Distribution**)



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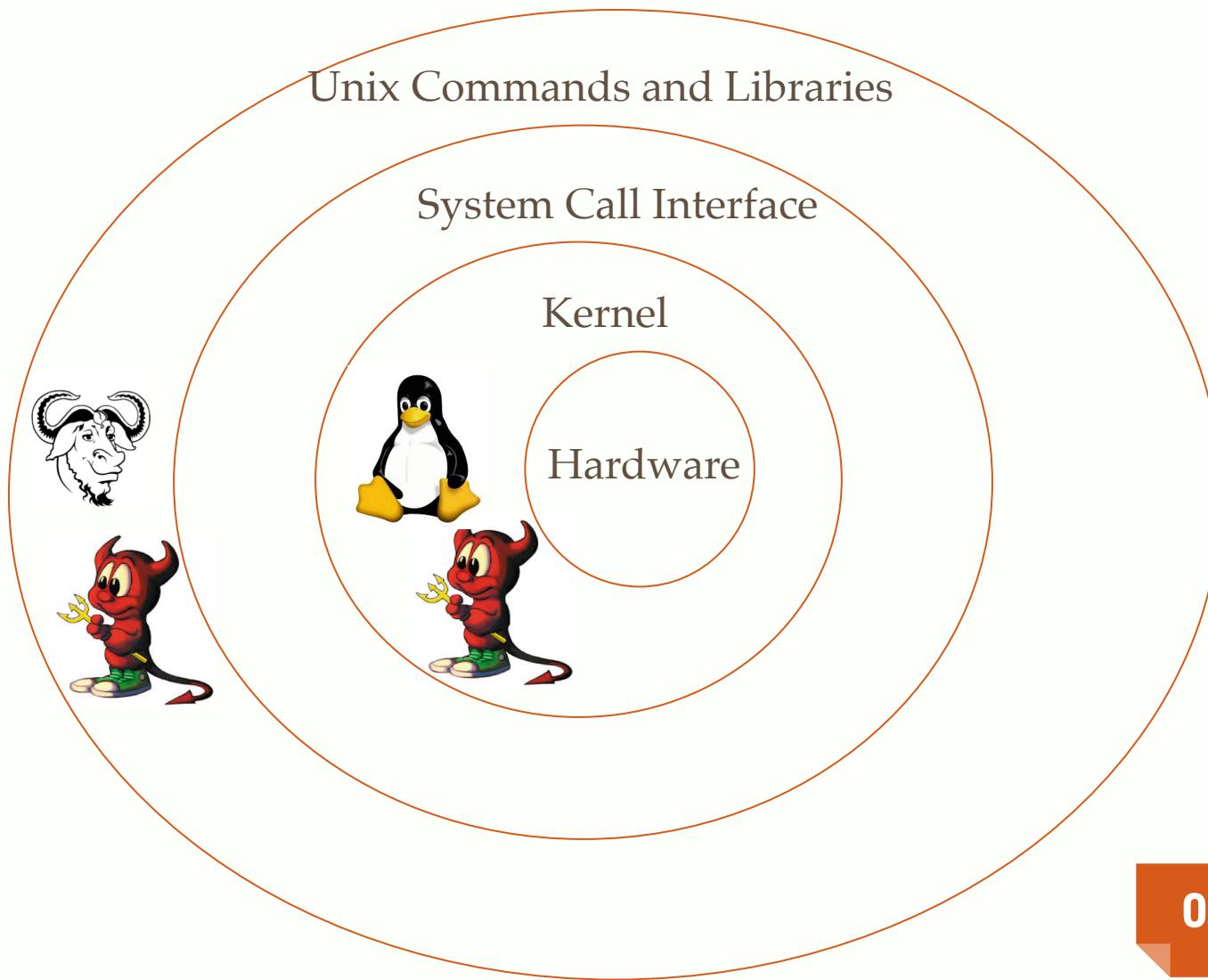
Unix “history” - Unix

- ~1993
- Linus Torvalds creates Linux “kernel” (core of OS) and releases it for free (Unix-like utilities not included)
- BSD-UNIX created by academics that mimics the function of AT&T Unix, but shares none of the source code / intellectual property (this ends up in court though....)

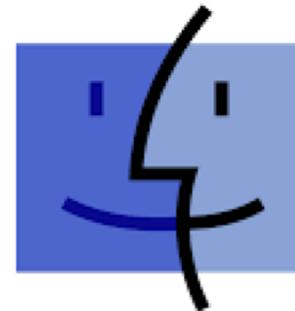
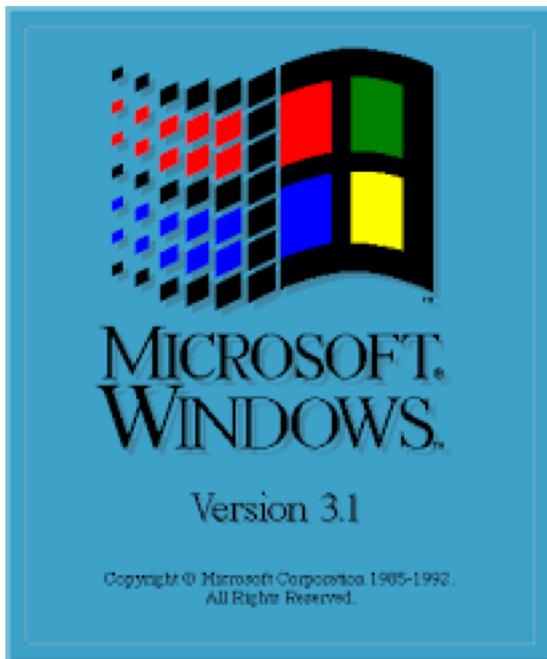


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“Kernel,” “Shell,” “Applications

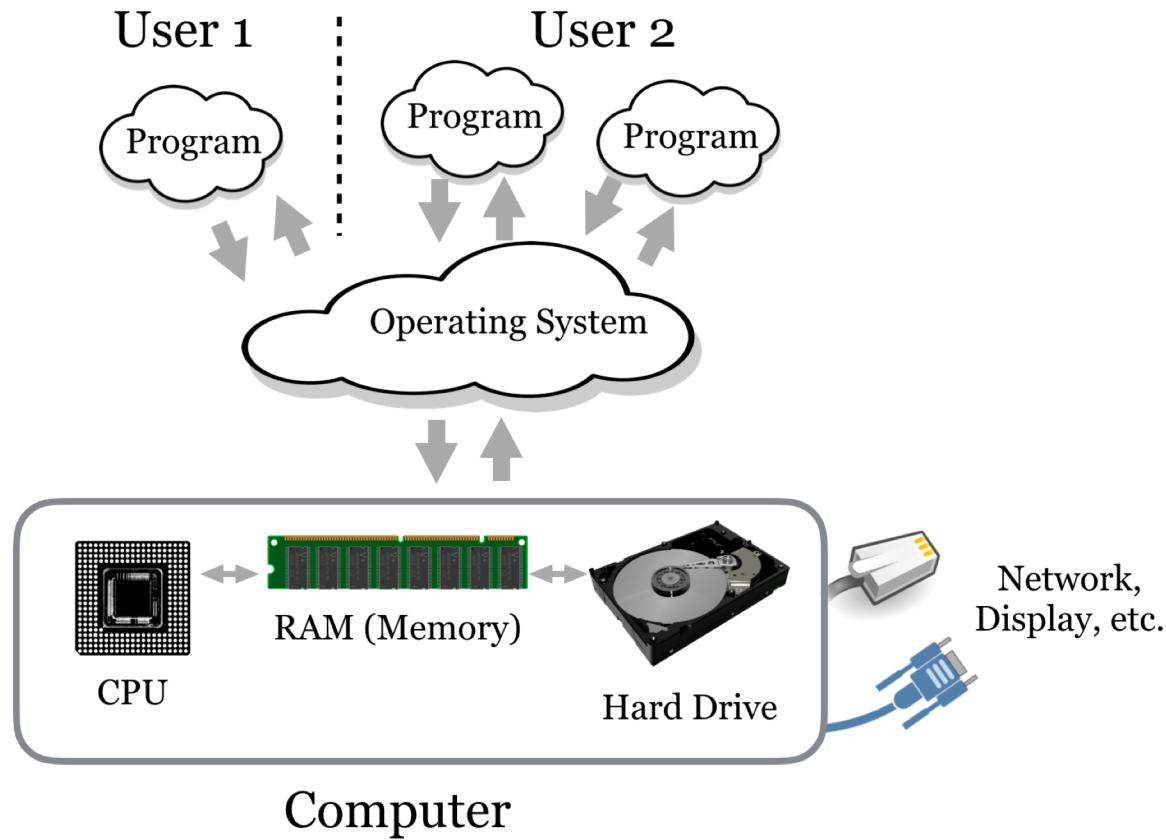


What about Windows / MacOS?



Mac OS

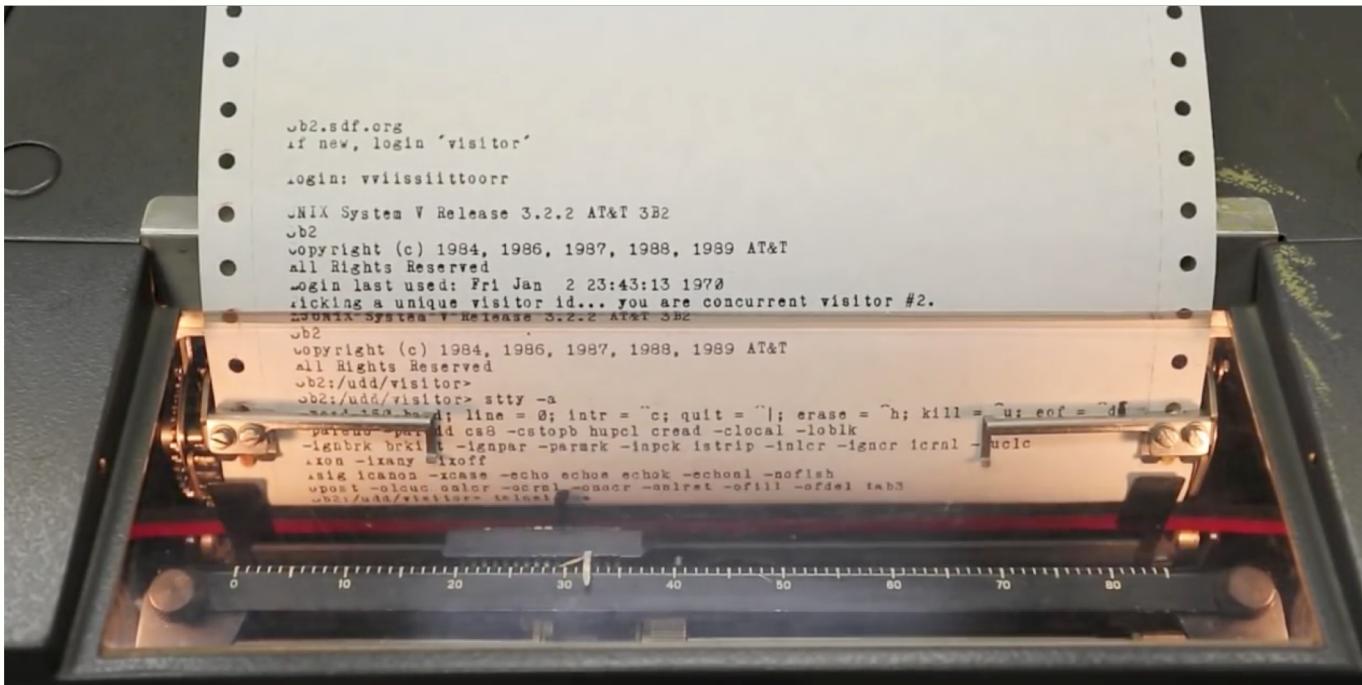
The Shell



The Dock: Operating System (OS), Shell, or Application?



Bonus: Teletype (via modem)!



<https://www.youtube.com/watch?v=MikoF6KZjm0>