

# UNIX Systems

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# What is this?



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# Beautiful Inside



[“The first floor of Bell Works in 2022”](#) by [Curlyrnd](#) is licensed under [CC BY-SA 4.0](#)

# Transistor water tower



“Bell Labs water tower NJ1” by [Acroterion](#) is licensed under [CC BY-SA 4.0](#)

# Multics



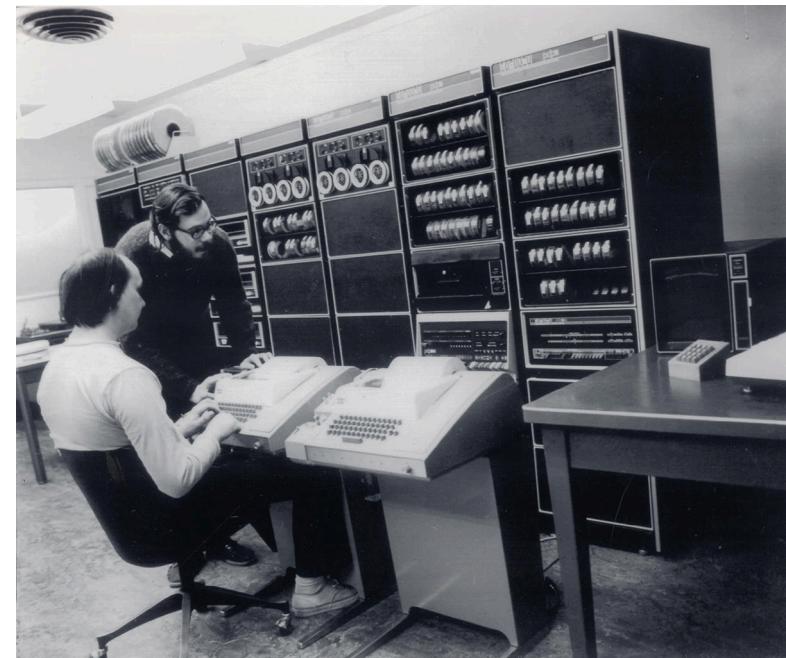
[“Multics-logo”](#) by [VectorVoyager](#) is licensed under [CC BY-SA 4.0](#)

- MIT, AT&T, and GE
- Timesharing system for mainframes
- Monolithic
- Mainframe time was expensive
- Unwieldy code

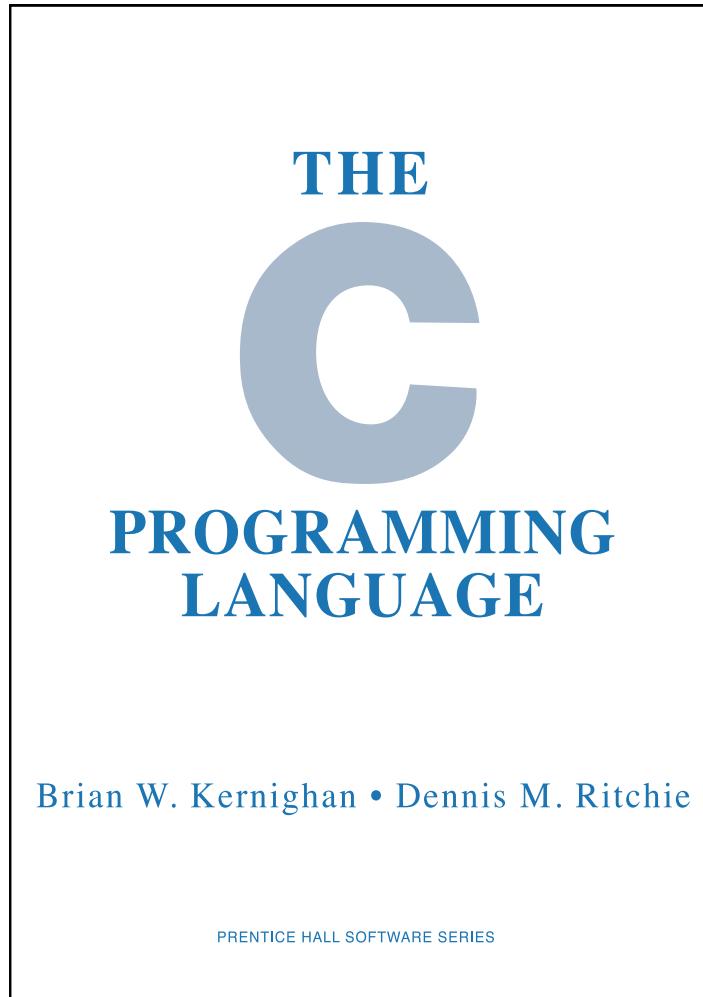
“What we wanted to preserve was not just a good environment in which to do programming, but a system around which a fellowship could form. We knew from experience that the essence of communal computing, as supplied by remote-access, time-shared machines, is not just to type programs into a terminal instead of a keypunch, but to encourage close communication.” – Dennis Ritchie

# Inception

- Smaller group of developers  
(Ken Thompson, Dennis Ritchie,  
Doug McIlroy, Joe Ossanna...)
- Smaller code base
- Simulations on old Multics  
mainframes later developed on  
PDP-7/PDP-11/20
- Man pages were a HUGE  
development
- Anti-trust suit means they have  
to give it away



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[The C Programming Language, First Edition Cover](#) is in the public domain

- Rewritten in C
- Takes over Bell Labs
- BSD Unix developed as an alternative to Bell Labs restrictive licensing
- Standards develop (System V, POSIX)
- Alternatives grow in parallel (Minix, Linux, etc.)

# Key Concepts

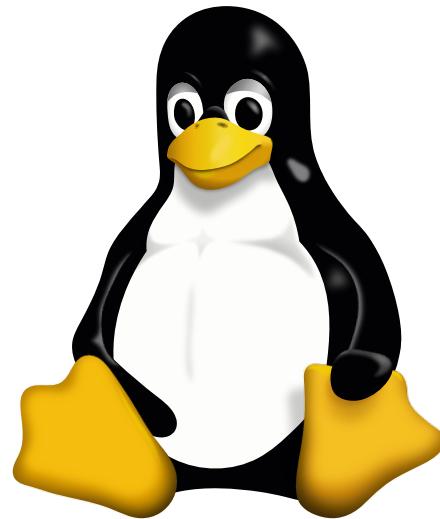
- Do one thing well
- Everything is a file
- Pipes
- Document
- Have good manuals and *make* people read them
- Steep learning curve but high productivity
- Multiuser by design
- Networking by design
- Uptime



[Jigsaw Puzzle](#) is in the public domain

# UNIX Family Tree

# Linux



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- Developed in 1991 by Linus Torvalds, meant for x86 but lots of ports today
- Linux is the kernel, there are many distributions

## **Debian Based**

- Debian
- Ubuntu
  - ▶ Mint

## **Redhat Based**

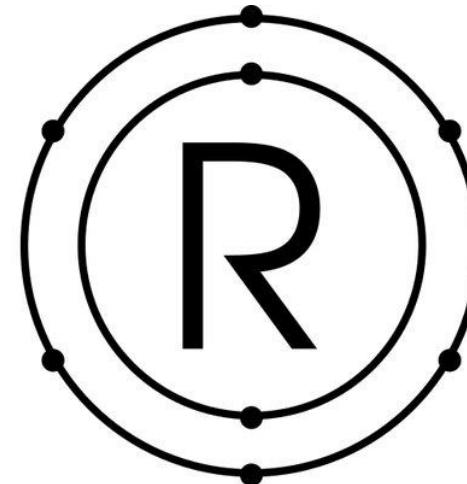
- RHEL (Redhat Enterprise Linux)
- Rockylinux
- Amazon Linux

## **Other**

- Arch
- Slackware

# What's next?

- Microkernels?
- [Redox](#)?
- Functional Package Management? ( [Guix](#) , [Nix](#) )



[RedoxOS Logo](#) is used under fair use

# Counterpoint: The Rise of Worse is Better