

# *Linux and the shell*

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# Lecture Objectives

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After this lecture, you should be able to:

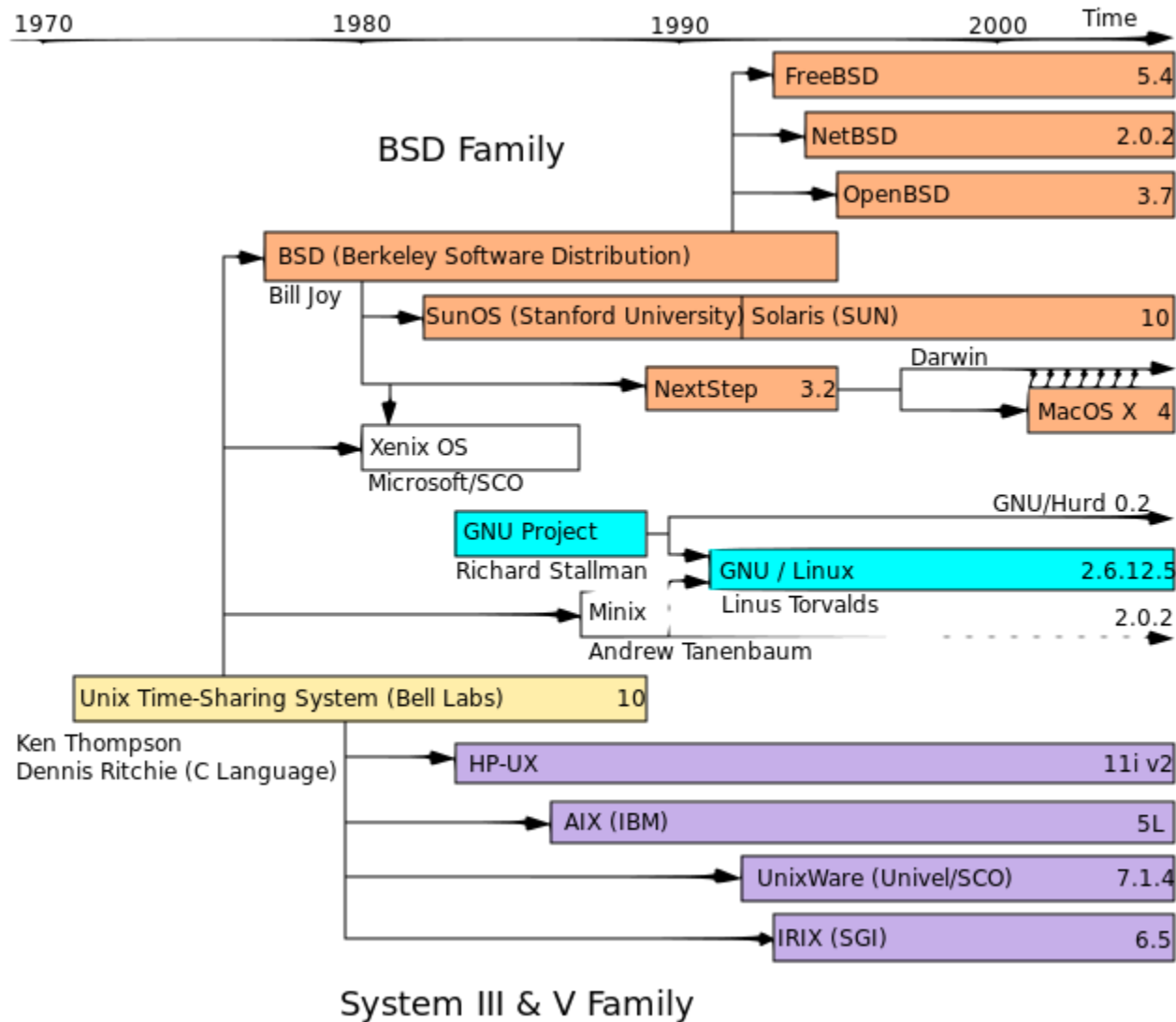
- ❑ Explain where Linux comes from
- ❑ Explain the role of the shell in Linux

# Unix

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- ❑ Ken Thompson and Dennis Ritchie created Unix at Bell Labs in 1969
- ❑ Ritchie and Brian Kernighan invented C, and then Unix was rewritten in C in 1973
- ❑ Design goals of Unix:
  - portable
  - simple, but powerful and flexible
  - designed by programmers, for programmers
- ❑ Thompson and Ritchie won the ACM Turing Prize in 1983 for their work on Unix

# Unix family tree



# Linux

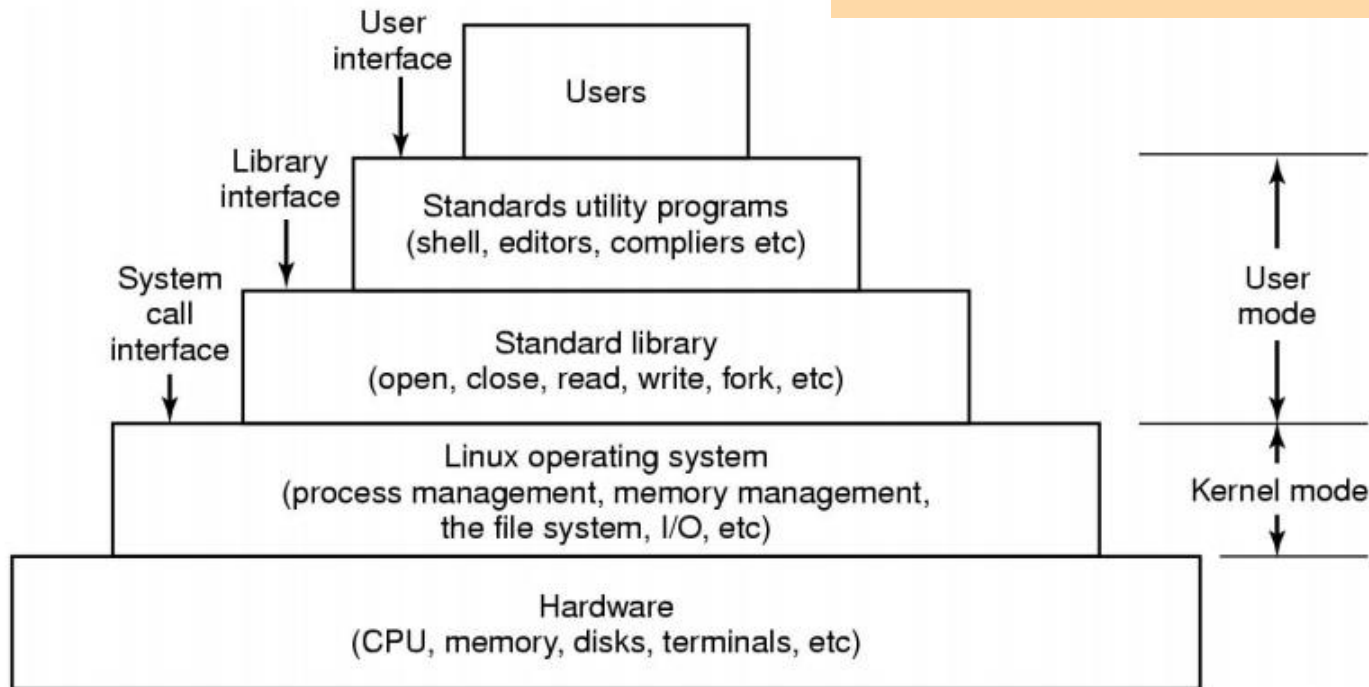
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- ❑ Andrew Tanenbaum created a simplified version of Unix for teaching purposes, called Minix
- ❑ A Finnish student, Linus Torvalds, created another Unix clone in 1991, using many ideas from Minix
- ❑ Version 1.0 of Linux was released in 1994

# Linux/GNU

When people say “Linux”, they usually mean the Linux kernel plus GNU software:

- GNU coreutils
- GNU shell



(diagram from Modern Operating Systems (3<sup>rd</sup> edition), Tanenbaum, 2008)

# The shell

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- ❑ The “shell” is a powerful command-line interface found in Unix-like systems
- ❑ The **bash** shell, typical on Linux, is a GNU replacement for the Unix Bourne shell
  - bash = “Bourne Again Shell”

- ❑ Example:

```
[brun1992@mlc104 ~]$ ls
bin    data1    hello.c    README.TXT
data   fall15   public_html
[brun1992@mlc104 ~]$ cd data
[brun1992@mlc104 data]$ ls
complaints.csv  employees.txt  README.txt    songs.csv
doe.csv         ps-out.txt    salaries.csv
[brun1992@mlc104 data]$ head -3 salaries.csv
Name,Base Pay,University or Office,Position
"Cavanaugh, John C", $327500, Office of the Chancellor, Chancellor
"Driscoll, Michael Allan", $275000, Indiana, University President
[brun1992@mlc104 data]$
```

# Summary

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- ❑ Linux is based on Unix, an influential OS developed in 1969
- ❑ Mac OS and Android are also descendants of Unix
- ❑ The shell is a powerful command-line interface found in Unix-like systems