

Overview

Learning Objectives

- Explain the concept of an Operating System (OS)
- Discuss the history of Unix/Linux
- List features that make Linux popular
- Dissect the Linux OS

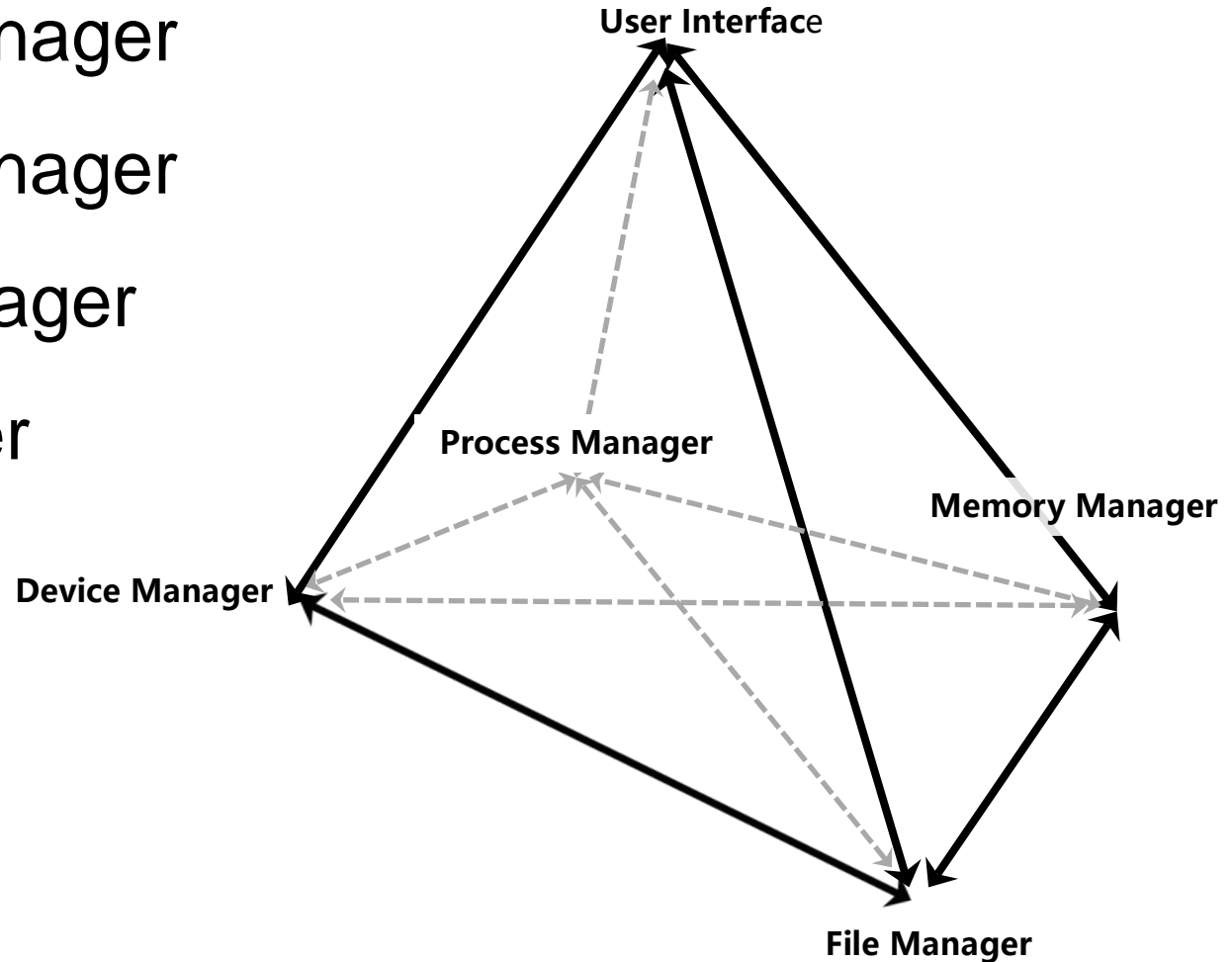
What is an Operating System

- Software that manages all of the hardware and other software in the computer
 - Every file
 - Every process
 - Every section of memory
 - Every device

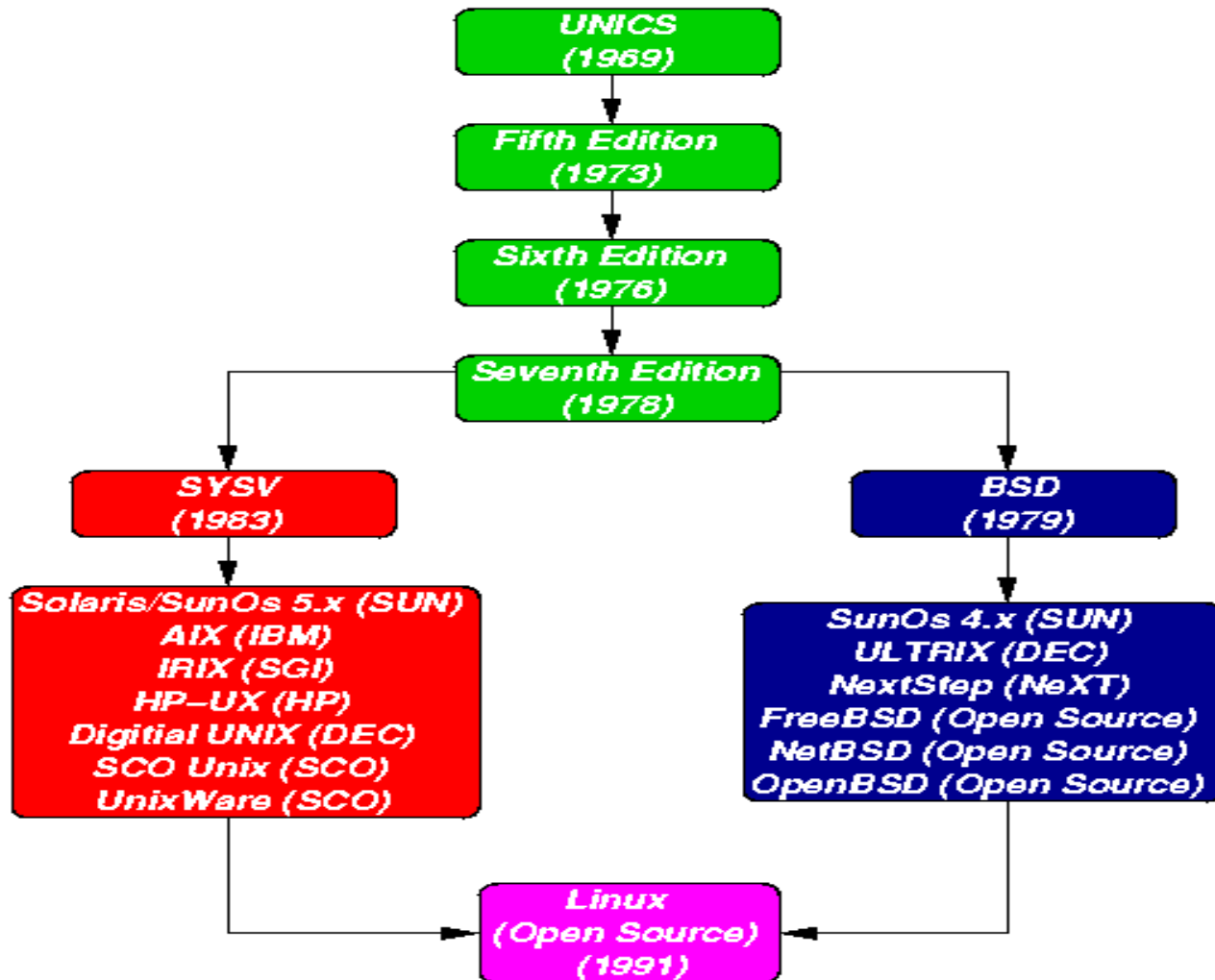


OS Software

- Memory manager
- Process manager
- Device manager
- File manager



Evolution of Unix



The Emergence of Linux

- Was started as a project by a Finish student Linus Torvalds in 1991
- The program later became the kernel of Linux
- The kernel was rapidly improved by Linux and other volunteers





Linux is Free

Distributed under GPL license

- You have the right to copy, modify, and redistribute the code
- When redistributing, you must also distribute an equivalent license with the code, making the code and the license inseparable



What Linux Is Popular?

- Free software
- Independent of both SYSV and BSD
- Portable
- Multiuser
- Multitasking
- Networking
- Device independent
- Hundreds of utilities
- Services



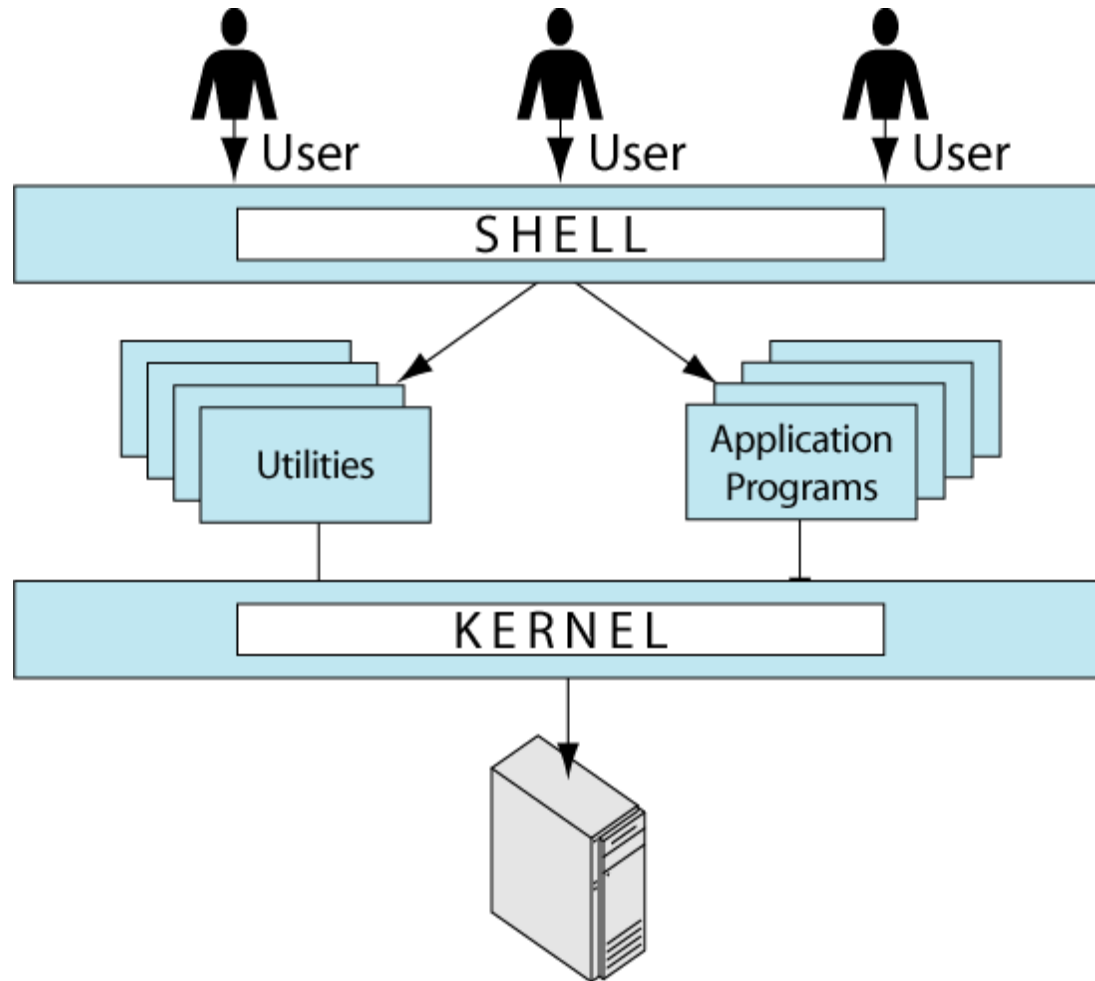
Open Source

- Run for any purpose
- Study source code
- Modify source code
- Distribute and publish


How Is Linux Used?

- Personal workstation
- File and printer server
- Internet service provider
- Three-tier client/server
- Turnkey system

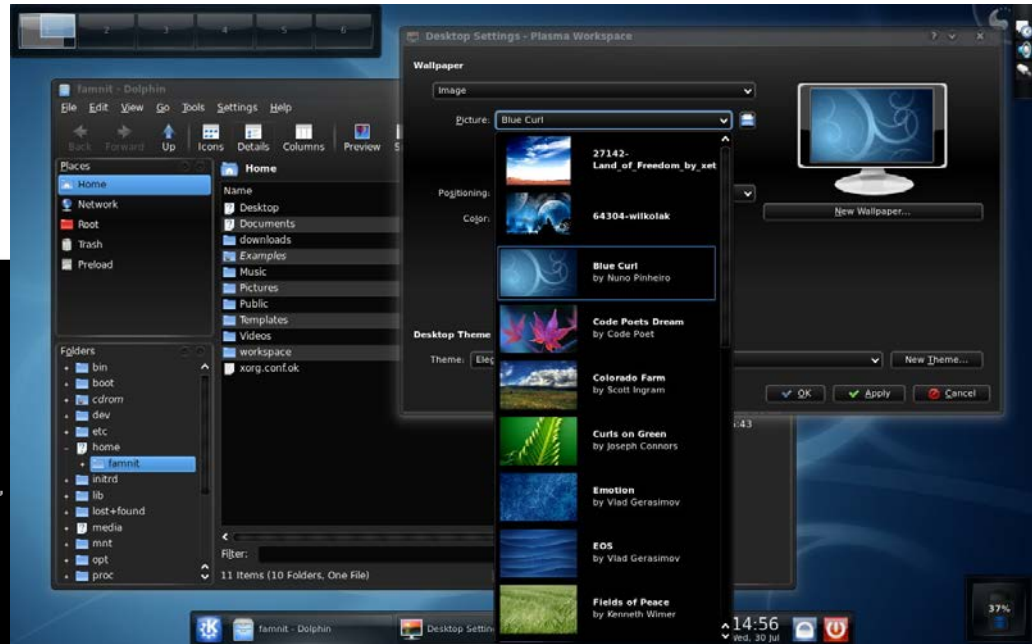
Components of Linux



Command Line vs. GUI

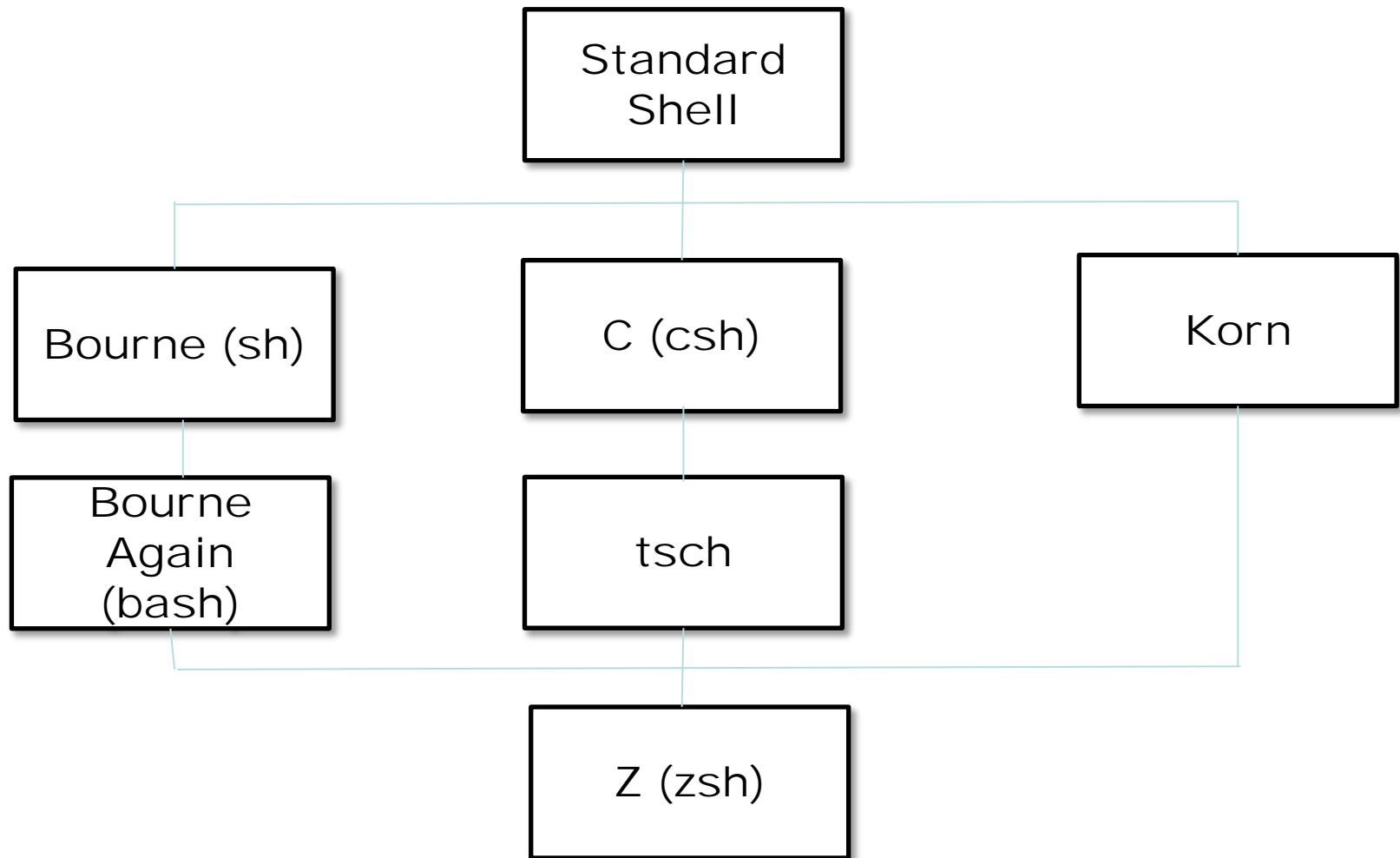


```
isapnp: No Plug & Play device found
Linux NET4.0 for Linux 2.4
Based upon Swansea University Computer Society NET3.039
Initializing RT netlink socket
Starting kswapd
VFS: Disk quotas 'quot' 6.5.1
vesafb: framebuffer at 0xc0000000, mapped to 0xc280d000,
vesafb: mode is 800x600x8, linelength=800, pages=3
vesafb: protected mode interface info at a5f3:1f5f
vesafb: scrolling: redraw
Console: switching to colour frame buffer device 100x37
fb0: VESA UGA frame buffer device
pty: 256 Unix98 ptys configured
Uniform Multi-Platform E-IDE driver Revision: 6.31
ide: Assuming 50MHz system bus speed for PIO modes; override with idebus=xx
hda: Generic 1234, ATAPI CD/DVD-ROM drive
ide0 at 0x1f0-0x1f7,0x3f6 on irq 14
hda: ATAPI 4X CD-ROM drive, 512kB Cache
Uniform CD-ROM driver Revision: 3.12
FDC 0 is an 8272A
RAMDISK driver initialized: 16 RAM disks of 4096K size 1024 blocksize
Cronyx Ltd, Synchronous PPP and CISCO HDLC (c) 1994
Linux port (c) 1998 Building Number Three Ltd & Jan "Yenya" Kasprzak.
SCSI subsystem driver Revision: 1.00
scsi0 : SCSI host adapter emulation for IDE ATAPI devices
NET4: Linux TCP/IP 1.0 for NET4.0
IP Protocols: ICMP, UDP, TCP, IGMP
IP: routing cache hash table of 512 buckets, 4Kbytes
TCP: Hash tables configured (established 2048 bind 2048)
NET4: Unix domain sockets 1.0/SMP for Linux NET4.0.
RAMDISK: Compressed image found at block 0
```





Standard Linux Shells





A Secure Hierarchical Filesystem

- Hierarchical structure
 - Directories
 - Files
- Standardized filesystem
- Secure
 - File access permissions
 - Access Control Lists (ACL)



Large Collection of Utilities

- User commands
 - Online documentation
 - System information
 - Shell
- Programmer
 - Text processing and scripting
 - File management (ls, cp, file, ...)
 - Development (cpp, make, perl)
- System Administer
 - Process and system
 - System information



About the Course

- *Not* cover a particular release or distribution of Linux
- Use Unix and Linux interchangeably
- Focus on the command line and bash shell

Summary

- Linux grew out of Unix
- Multi-user, multi-tasking system
- Secure hierarchical filesystem
- Contributed by a large community
- It's free!