

Server Operating Systems

Lecture 1

Introduction to UNIX

What does an Operating System do?

Provide an interface between the user and the computer system

Provide a standardised environment for the application programs to run in.

Tries to ensure most efficient use of the computer's resources:

- Memory space
- Processor time
- Disk space
- Peripheral device time
- Network bandwidth

Computer Operating Systems

Single User or desktop

- MS-DOS
- Windows 3.x
- Windows 9x
- Windows 2000
- Windows XP
- Mac OS
- Linux

Computer Operating Systems

Multi-User or Network

central server based

multi-user, multi-tasking, distributed processing

- UNIX
- Linux
- Windows NT
- Windows 2000 Server
- Windows 2003 Server
- Novell Netware
- various mainframe operating systems

Servers and the Network Environment

Some important services commonly run on servers:

HTTP	Hyper Text Transfer Protocol
FTP	File Transfer Protocol
DNS	Domain Name Server
NFS	Network File System (Sun)
SMB	Server Message Block (Microsoft)
LPD	Line Printer Daemon
DHCP	Dynamic Host Control Protocol

History of UNIX

- 1969 UNIX developed by AT&T Bell Labs
- 1975 UNIX 'leaves home' and starts to be used in Universities. AT&T calls their version 'System V'
- 1980 Uni of Cal Berkeley BSD UNIX 4.2 becomes popular. Now two main branches: System V and BSD.
- 1985 Many proprietry versions of UNIX become available: Ultrix, Solaris, Xenix, Aix, Openserver.
- 1988 International standard for UNIX systems developed: SV R4 (System Five, Release 4)

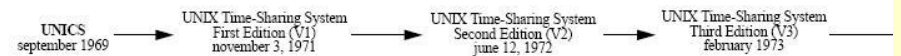
Commands can differ slightly between SVR4 and BSD based varieties.
(eg print command can be lp or lpr)

UNIX Family Tree

www.levenez.com/unix

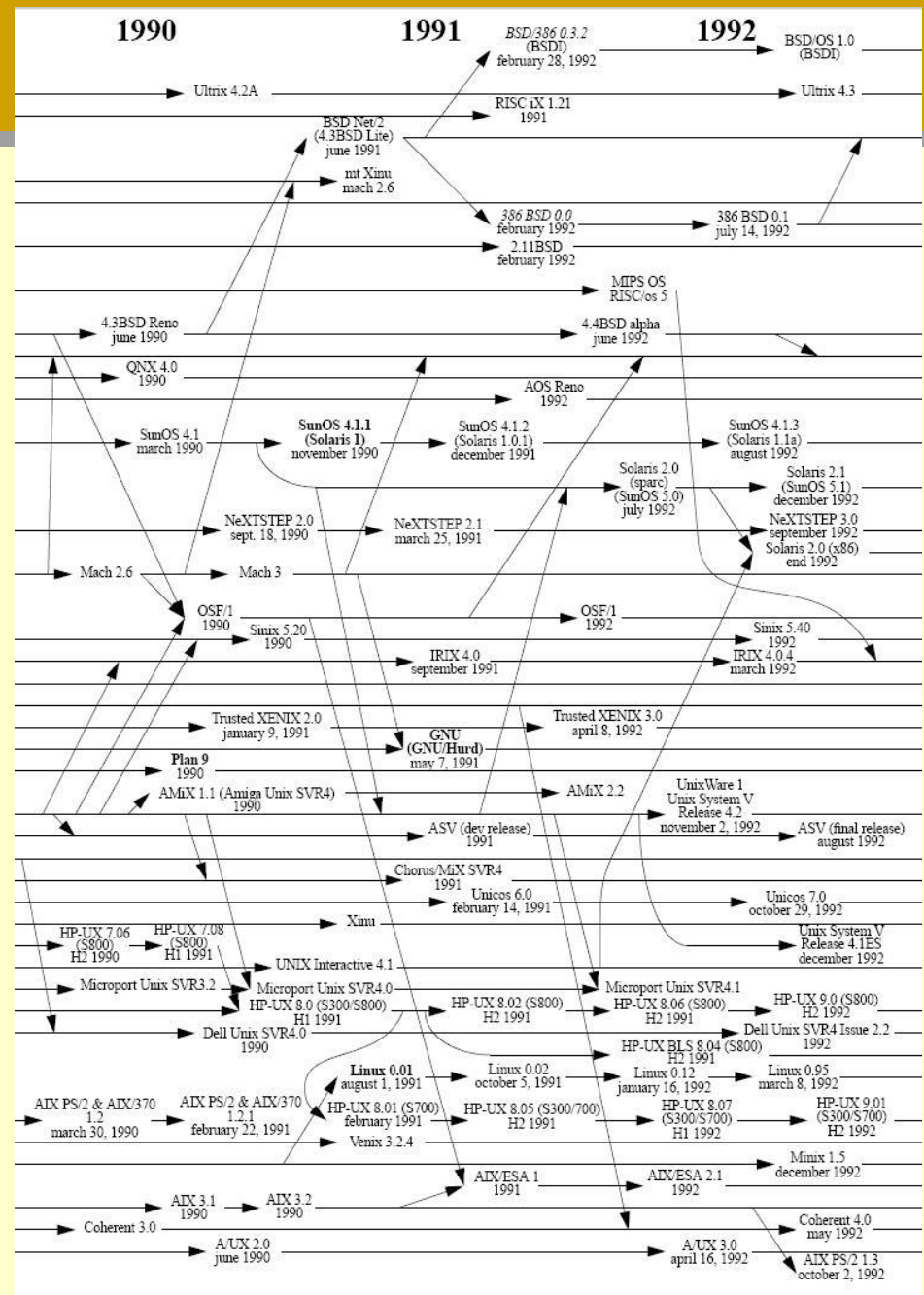
also on Moodle

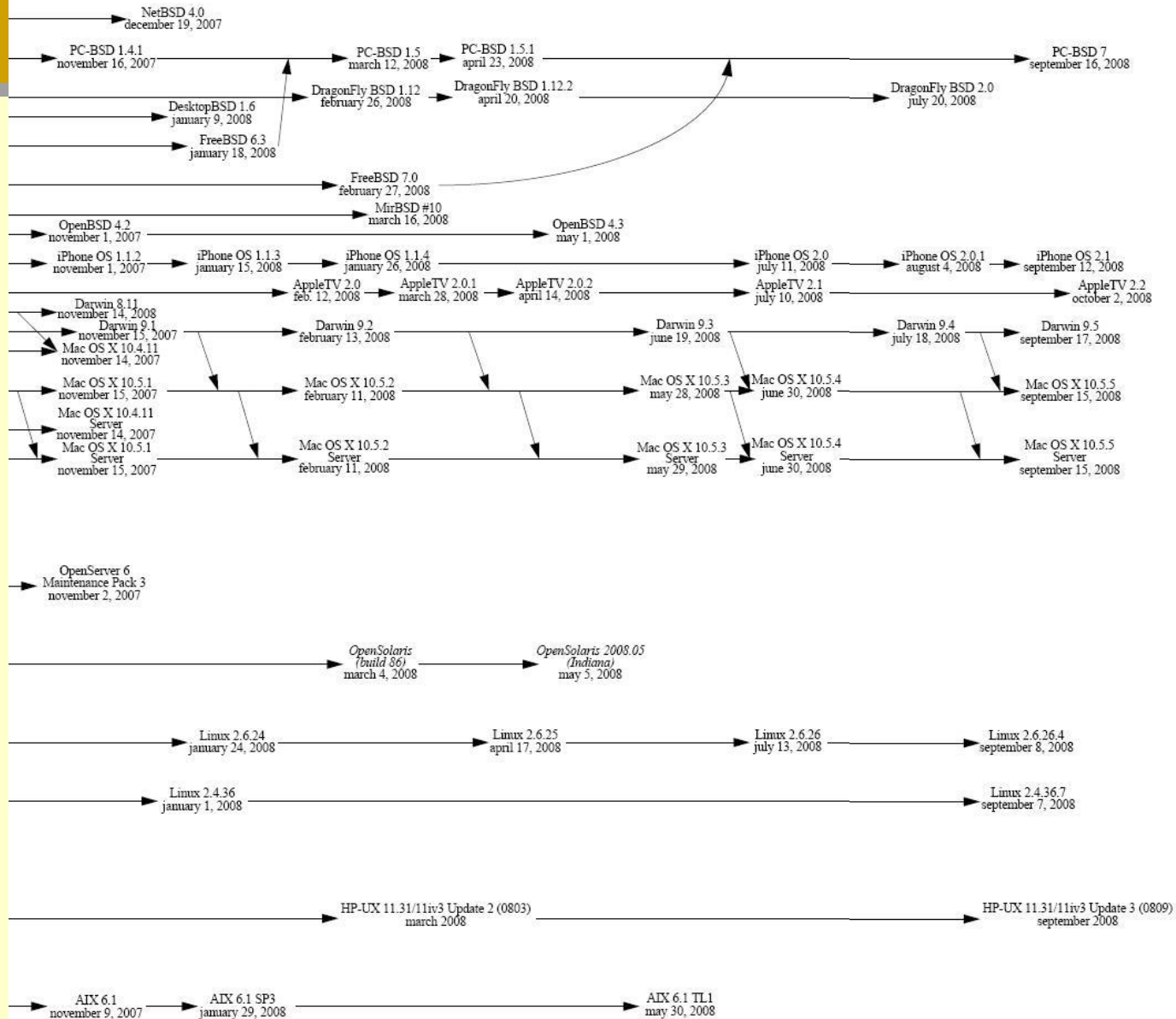
1969 1970 1971 1972 1973



Open Systems
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First appearance of Linux





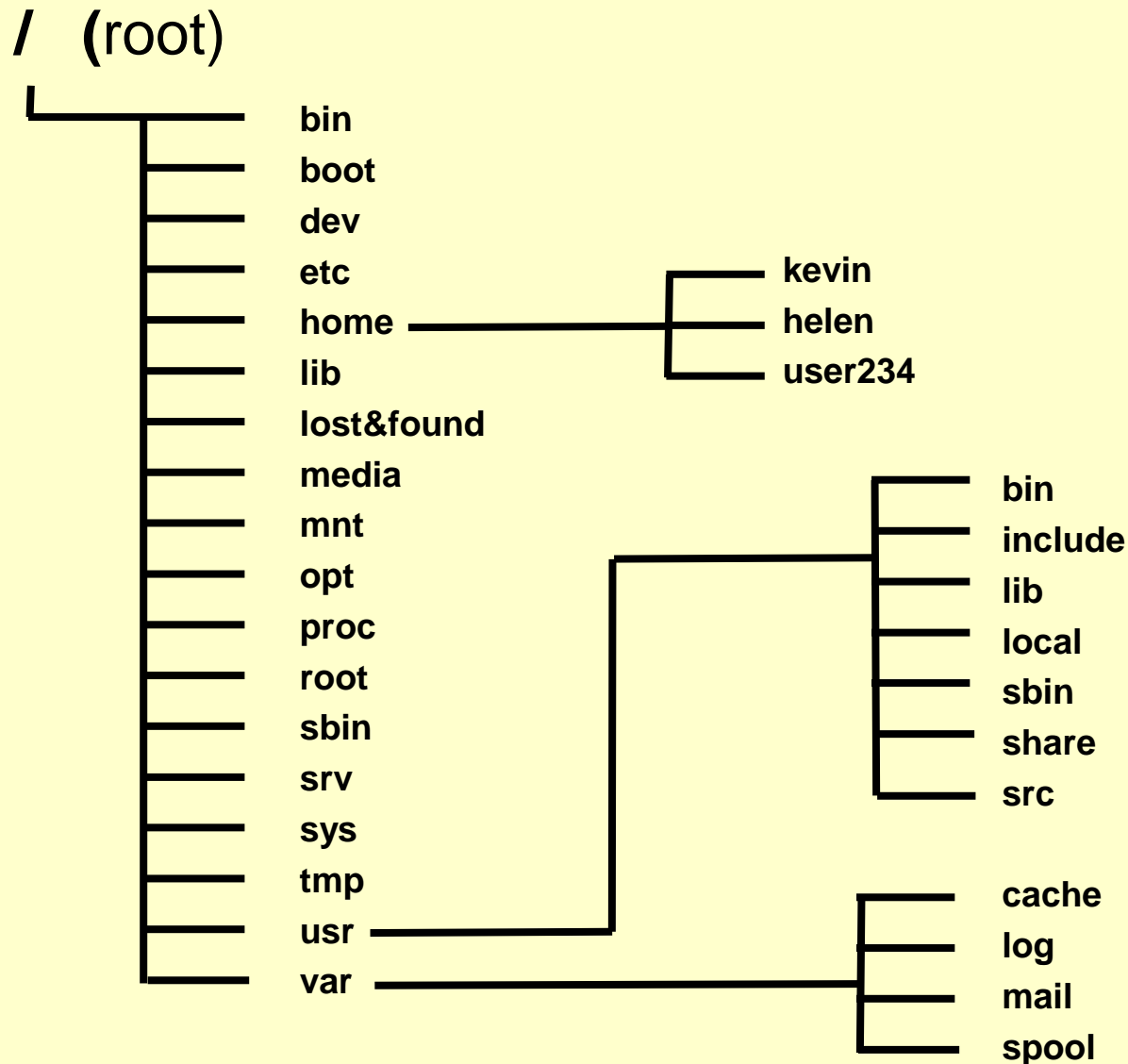
The Rise of Linux

- 1984 Richard Stallman decides to write a free, open-source version of UNIX, to combat the increasing commercialism of the existing versions.
He calls this the GNU project.
- 1990 Almost all the important parts are in place - except the kernel.
- 1991 Linus Torvalds, a Finnish student, decides to write a kernel to help him understand his university course - asks for help on the internet.
- 1995 Companies such as 'SUSE' and 'Red Hat' start to package and sell the free software for the price of a CD.
- 1998 Linux / GNU starts to appear on magazines and in the media.
- 2002 IBM, Novell, Apple and other companies start to invest in Linux development.
- 2003 Updated distributions are released every 6 months by an ever increasing number of companies.

The File System

Windows	32 bit File Allocation Table	FAT32
	New Technology File System	NTFS
UNIX	UNIX File System	UFS
Linux	Second Extended File System	ext2
	Third Extended File System	ext3

OpenSuse Linux Directory Structure



Common Unix Directories

/ Topmost directory in Unix is the *root*.

It contains a number of sub-directories.

The precise layout of sub-directories can vary from one version of UNIX / Linux to another.

There is a 'traditional' structure which most stick to.

Common Unix Directories

/bin

- Binaries - Contains executables of system programs. Like C:\Windows\System

/boot

- Contains most files necessary to boot a Linux system, including the Kernel

/dev

- Devices - Contains files that are pointers to device file names. All devices in Unix are represented by file names.

Common Unix Directories

Section 1.4.4

/etc

- Et cetera - Contains configuration files.

/home

- Contains users' home directories.

Common Unix Directories

Section 1.4.4

/lib

- Library - Contains common library files (like dll files in windows systems) used by programs.

/media

/mnt

- “Mount” directories. Standard mount points for external file systems such as the floppy disk, flash memory sticks and CD-ROMs.

Common Unix Directories

Section 1.4.4

/opt

- Optional - Contains extra software and third party applications.

/proc

- Process - Contains files related to running programs (processes) and other system information that is used by the kernel.

/root

- Super user's home directory.

Common Unix Directories

Section 1.4.4

/sbin

- Single user binaries - Contains essential executables used by the root user in system failure recovery. Also has some system admin utilities.

/tmp

- Temporary - Contains temporary files produced by jobs like software installation. On shared systems this directory is usually cleared on a regular basis.

Common Unix Directories

Section 1.4.4

/usr

- User - Contains files and programs used by users.

/usr/bin

- Contains program executables used by users.

/usr/src

- Contains source code for program executables used by users.

Common Unix Directories

Section 1.4.4

/var

- Variable - Contains dynamic data such as print spool queues, system logs and mail system error messages.

Graphical User Interface Options

GNU Network Object Model Environment (GNOME)

- Window manager, GUI and collection of applications

K Desktop Environment (KDE)

- Window manager, GUI and collection of applications

F V W M

T W M

- Very lightweight GUIs for Linux. No applications.

enlightenment

- Extremely configurable window manager and GUI. Growing number of applications.