

UNIX

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UNIX Lecture Goals

- ◆ Goal 1: Know what UNIX Operating System .
- ◆ Goal 2: Understand the basic structure of a common Unix system.

UNIX HISTORY

UNIX History

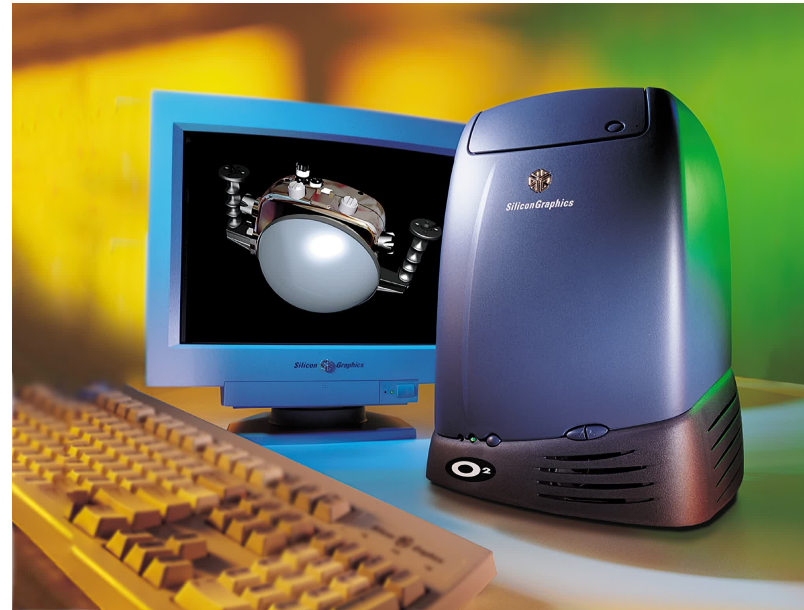
- ◆ 1969 – First Version of UNIX developed at Bell Labs by AT&T
- ◆ 1975 – UNIX 6, the first to be widely available outside Bell Labs. The first “Berkeley Software Distribution” (BSD) is released.
- ◆ 1989 – UNIX System V, the last traditional UNIX version.
- ◆ 1991 – Linus Torvalds begin developing Linux.

UNIX History

SUN Computers



Silicon Graphics



UNIX History

Linus Torvalds , creator of Linux while a student in Finland. Still the kernel maintainer.



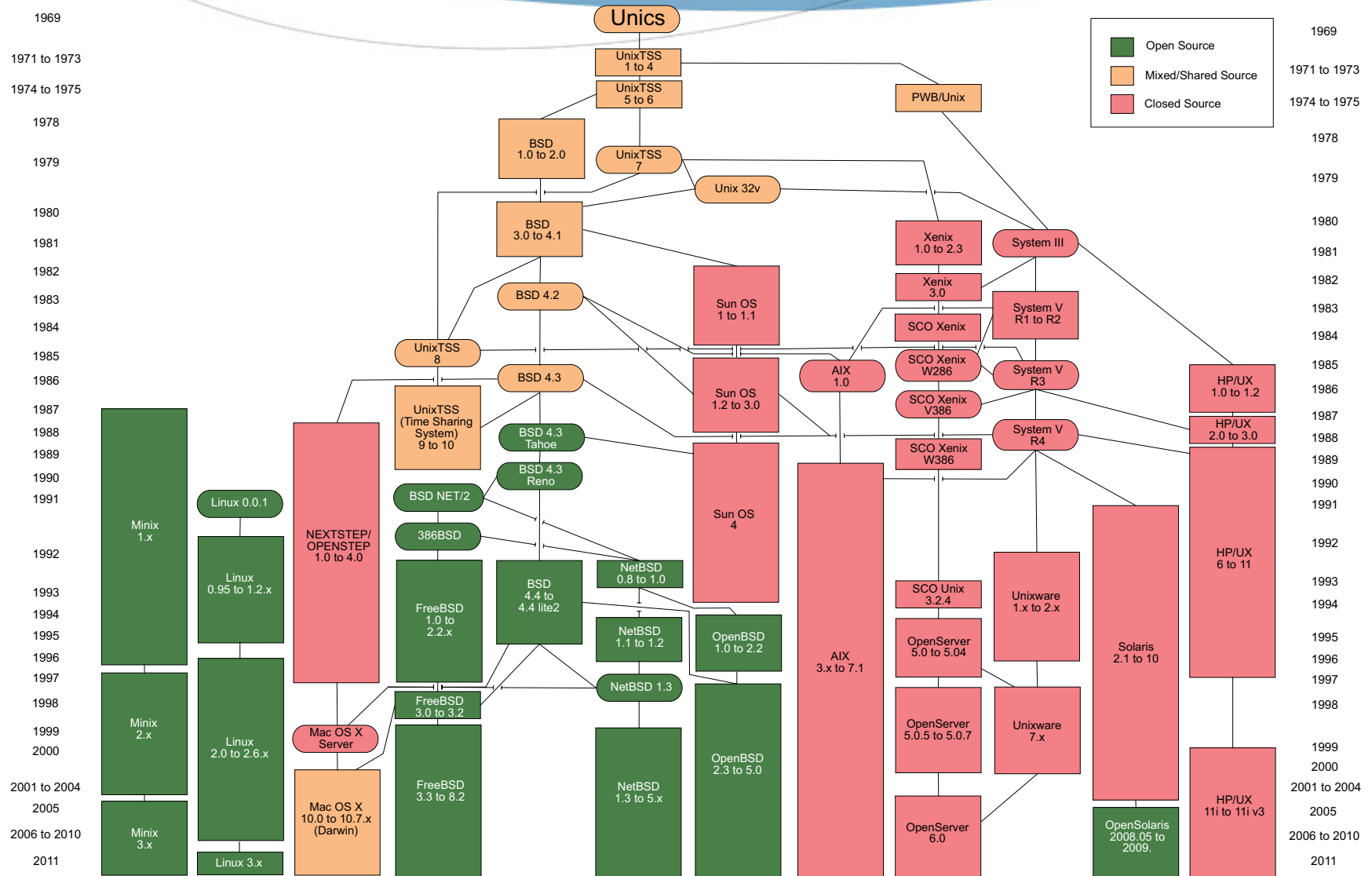
UNIX History



“UNIX-like”

- ◆ Today – UNIX itself, what’s now called “traditional UNIX” is not used, except by enthusiasts.
- ◆ There are many “UNIX-like” systems (also known as *nix or UN*X) that are similar to UNIX while not conforming to the Single UNIX Specification.
- ◆ In fact, most operating systems today except windows are “UNIX like”.

UNIX History



Why Unix and not Windows?

FAIR Principles

Findability, **A**ccessibility, **I**nteroperability,
and **R**euse of digital assets

Open Source

Open source software is software with source code that anyone can inspect, modify, and enhance.

"Source code" is the part of software that most computer users don't ever see; it's the code computer programmers can manipulate to change how a piece of software—a "program" or "application"—works. Programmers who have access to a computer program's source code can improve that program by adding features to it or fixing parts that don't always work correctly.



Source Code

```
attachEvent("onreadystatechange",H),e.attachE
boolean Number String Function Array Date RegE
_={};function F(e){var t=_[e]={};return b.ea
t[1])===!1&&e.stopOnFalse){r=!1;break}n=!1,u&
?o=u.length:r&&(s=t,c(r))}return this},remove
nction(){return u=[],this},disable:function()
re:function(){return p.fireWith(this,argument
ending",r={state:function(){return n},always:
romise)?e.promise().done(n.resolve).fail(n.re
id(function(){n=s},t[1^e][2].disable,t[2][2].
=0,n=h.call(arguments),r=n.length,i=1!==r|e&
(r),l=Array(r);r>t;t++)n[t]&&b.isFunction(n[t
/><table></table><a href='/a'>a</a><input typ
/TagName("input")[0],r.style.cssText="top:1px
est(r.getAttribute("style")),hrefNormalized:
```

Source code



Compile



Binary

BASIC LINUX FILE SYSTEM

Basic Linux File Structure

- 💧 /dev This is where all the hardware is!
- 💧 /etc This is where important stuff lives
- 💧 /home This is where user files are
- 💧 /root This is where the boss hangs out
- 💧 /tmp This is where the system stores temp files
- 💧 /usr/local This is where most programs are
- 💧 /var/log This is where the log files are

Directory Tree



Special files: `.` and `..`

Hidden files in UNIX start with a “.”, these can be viewed with the “-a” switch for ls.

There are also the special files “.” and “..” in each directory.

- `.` is a pointer to self, i.e. it references the directory itself
- `..` is a pointer to parent, i.e. to the directory containing the current directory.

File Permissions

```
red-f8-1e-df-d9-6a-b:Temp martin$ ls -lh
total 587104
drwxrwxrwx  2 martin  staff    68B Nov 12 13:50 data
-rw-r--r--@ 1 martin  staff   552B Nov 12 13:49 students.info
-rw-r--r--  1 martin  staff  287M Nov 12 13:49 testdata.tar.gz
```

First row is **d** **rw****x** **rw****x** **rw****x** this is the file permissions!

The first “**d**” means that the file is a **d**irectory, the three triplets following is “**r**ead”, “**w**rite” and “**e**xecute” permissions for “**u**ser”, “**g**roup” and “**o**ther”.

This data is followed by “owner user” (martin) “owner group” (staff), file size, date and name

Changing Permissions

The command for changing permissions is `chmod`.

```
$ chmod 750 myscript.sh
```

The number 755 is derived from the binary representation of three permission bits, “read, write, execute”.

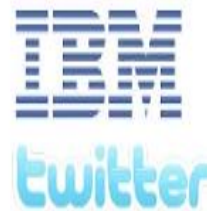
$111 = \text{read, write and execute} = 1 \times 2^2 + 1 \times 2^1 + 1 \times 2^0 = 7$

$101 = \text{read and execute} = 1 \times 2^2 + 0 \times 2^1 + 1 \times 2^0 = 5$

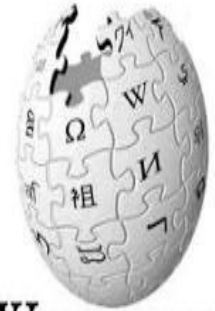
$000 = \text{no permissions} = 0 \times 2^2 + 0 \times 2^1 + 0 \times 2^0 = 0$

Note that sometimes changing permissions requires `sudo`

Why should
you learn how
to manage
Unix?



<http://www.tecmint.com>



WIKIPEDIA

Companies and Devices
Running on GNU/Linux

Tutorial!

Next you will learn some basic commands followed with some advanced ones.

The lectures will be followed by a Hands-On tutorial.