“...the number of UNIX installations has grown to 10, with more expected...”

—Dennis Ritchie and Ken Thompson, June 1972
The beginning

- Written at Bell labs (Now AT&T Bell Labs) in 1969.
  - by Ken Thompson and Dennis Ritchie.
- Not designed as a commercial operating system.
- Designed as a “hacker’s toolset” for programmers.
  - An early release was called PWB (Programmer’s work bench).
- Written for their own use and for friends and coworkers.
Early capabilities:

- First version ran on a PDP 11/20
- Had simple versions of `fork()`, `ed` and `roff`
- Used for document processing.
Growth by extension:

- Utility programs written by various people.
- As individual needs arose, solutions to the problem were created and contributed.
- Source code donated to Universities for free.
- Researchers also wrote and donated their software for it.
Commercialization:

- Commercial operating systems already existed for larger mainframes.

- VAX VMS and IBM CMS operating systems were introduced in 1977 to replace PDP-11 machines.
  - Incredibly costly application software. Compilers, editors and applications were value add-ons and priced accordingly.

- Sold commercially by AT&T and Sun microsystems (jointly) in 1984.
  - Cost is prohibitive but competitive.

- Open Software Foundation (OSF) founded in 1987 by Richard Stallman to combat increase in cost and prevent monopolistic commercialization.
  - most of what we recognize today as “Unix” is actually the applications written by the OSF (emacs, sed, awk, find, grep, bash, etc.)

- Sold to Novell in 1993

- Sold to SCO in 1995
Flavours:
Many different brands of “Unix” were created to address particular needs or support specific hardware.

- HP-UX for Hewlett-packard servers
- Solaris (SunOS) for AT&T/Sun microsystems.
- minix (an early free implementation)
- Linux (when Linus got fed up with minix and need a grad. project.)
  - Tons of “Sub-distributions”: Slackware, debian, gentoo, Unbuntu, RedHat, Suse.
- FreeBSD
- OpenBSD
- Hurd

Hardware issues aside, Dissagreement on politics motivated the branching of Unix into various flavors.
**Comparison with Windows:**

<table>
<thead>
<tr>
<th><strong>Unix</strong></th>
<th><strong>Windows/DOS</strong></th>
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<tbody>
<tr>
<td>Good</td>
<td>Bad</td>
</tr>
<tr>
<td>Multi-user</td>
<td>originally single user</td>
</tr>
<tr>
<td>Multiprocess</td>
<td>DOS not multiprocess cable</td>
</tr>
<tr>
<td>Security features present at conception</td>
<td>security features tacked on</td>
</tr>
<tr>
<td>Windowing environment separate</td>
<td>Windowing (now) integrated</td>
</tr>
<tr>
<td>Shared Libraries (.so)</td>
<td>dynamic link libraries (DLLs)</td>
</tr>
<tr>
<td>Networking features added early</td>
<td>networking features tacked on late</td>
</tr>
<tr>
<td>Historically better design decisions</td>
<td>640K/2GB limits poorly chosen</td>
</tr>
<tr>
<td>Complex configuration</td>
<td>streamlined configuration</td>
</tr>
<tr>
<td>Flexible/extensible</td>
<td>Heavily proprietary</td>
</tr>
<tr>
<td>Poor desktop market penetration</td>
<td>Deep, Wide spread penetration</td>
</tr>
<tr>
<td>multiarchitecture</td>
<td>x86 specific (recently changing)</td>
</tr>
<tr>
<td>Course filesystem security granularity</td>
<td>Fine filesystem security granularity</td>
</tr>
<tr>
<td>FREE (as in “beer” and “rights”)</td>
<td>Costly and resistance is futile</td>
</tr>
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