TNE30019/TNE80014 – Unix for Telecommunications

Unix as a Client OS

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Outline

- What is a client OS?
- BSD as client OS
- Linux as client OS

Unix Dominates Server Market

- Until now we have primarily considered servers
  - Generally only have CLI
  - No UI devices
  - Locked away
- About **66%**[1] of servers use Unix (33% Windows)
- About **100%**[1] of supercomputers based on Unix
- What about desktop, tablets, mobile devices?

[1] Source: http://en.wikipedia.org/wiki/Usage_share_of_operating_systems

What Are Clients?

- Desktop / workstation
  - Computers we use for general work
  - Keyboard, mouse, monitor
  - User Interface (UI) important!
- Emerging mobile devices / tables
  - Computers we don't(?) use for general work
  - Touchscreen, monitor
  - Replacing desktops
  - User Interface (UI) important!

Desktop Operating Systems

- Most people think of **Windows**
- Convenient graphical user interface
- Support for multiple forms of Hardware
- All commonly used applications
  - Microsoft Office
  - Web Browsers
  - Chat and VoIP
  - ...
- Access Unix systems via SSH, scp, network services

What About Unix?

- Traditionally not good in this arena
  - Difficult to install
  - Complex to maintain
  - GUI not standard, lacks usability
  - Knowledge of OS implementation often required
  - "OS made by programmers for programmers"
- First efforts were woeful (for non-programmers)
- Even against older other OS, such as Windows 3.0

BSD as Desktop OS

- Not ideal choice
- Many open source projects are geared towards Linux
  - More users, greater effort
  - Use Linux features/APIs that are not compatible with BSD
  - Not an issue for server software – typically uses basic functionality such as network and file access
  - More of an issue for GUI based software
- Most closed source projects are geared towards Linux
  - More users
  - Companies typically release binaries
  - Without source not possible to make it work on BSD

BSD and Linux Compatibility

- Linux dynamic link libraries are installed on BSD system
  - Allows Linux compiled binaries to run under BSD
  - Not each and every library supported
  - Does not always work
  - Often requires tweaking to get it right
- What does this mean?
- If you want Unix desktop $\rightarrow$ use Linux (or Mac OS X)

Linux Distribution (Distros)

- Linux comes in lots of flavours
- Difference between different Linux distros?

- All use same Linux kernel source code
- Kernel `Makefile` is different, so have different default compiled kernel (can recompile yourself anyway)
- `/etc` and in particular `rc` startup scripts organised differently (but these are hidden from user mostly)
- Different software packages provided
  - Easier to get software for popular distros
  - Otherwise more work (see BSD)
- **Different installer, system and package management**

What Software Do You Need?

- Unix has all basic applications
  - GUI (XWindows + KDE, Gnome, ...)
  - Browser (Firefox, Chrome, Opera, ...)
  - Office (OpenOffice, LibreOffice, ...)
  - Email, chat, VoIP, ...
- More and more companies release Linux binaries
- More and more web-based apps that run on Linux
  - Except if they use Silverlight, ...
- Still almost all desktops are sold with Windows
- Many applications only run on Windows
- Many blockbuster PC games only run on Windows
  - Linux-based Steam OS may change that ...
- Only about **17.5%**[2] of desktops run Unix (13% Mac OS X)

[2]Source: http://en.wikipedia.org/wiki/Usage_share_of_operating_systems

Smartphones and Tablets

- By far largest growth in terms of device numbers
- Not general purpose
- But partially replacing traditional desktops
- Mobile Windows largely failed
- Android shows that Linux can be successful on clients
  - Good and easy to use GUI
  - Many applications can be installed easily
- About **54%**[3] run on Android (13% iOS, 12% Windows)

[3]Source: http://en.wikipedia.org/wiki/Usage_share_of_operating_systems

Why Not Have Best of Both Worlds?

- Can install more than one OS on desktop
- Dual boot
  - Efficient – time-critical tasks, old hardware
  - Can only use one OS at any time
- Virtual Machines (Virtual Box, VMWare)
  - Can use both simultaneously and also exchange data
  - Requires more powerful hardware
  - Problems if low level hardware access required
- Run Windows apps under Unix – Wine
  - https://www.winehq.org/
  - Many apps work, but "only" 90% of popular API calls implemented
  - No 64bit support yet
- Run Unix apps on Windows – Cygwin
  - https://www.cygwin.com/
  - Shell and many (but not all) applications

The Future