X-WINDOWS, PRINTERS

Unrelated topics joined at last in an epic presentation you won't soon forget!

ACTUALLY...

- There isn't that much exciting or epic about the Linux+ objectives for X Windows and Printers..

X WINDOWS

- X Windows was developed in the 1980's to provide an intelligent GUI system for UNIX.

- It is an extremely simple client/server model, that is exceptionally easy to extend, hence it's power and world-wide adoption.

XFREE86

- XFree86 was the first open source clone of the X Window system, released in 1991.

- XFree86 formed the de facto GUI platform for Linux, and indeed all of X Windows development for the '90s and into the early 2000's

- Unfortunately, in 2004 the XFree86 project adopted a license change which GNU did not particularly care for, and almost all distributors switched to X.Org.

X.ORG

- The X.Org Server stepped into the picture in 2004 as a splinter off of the XFree86 project.

- Since they didn't muck with the license, most distributors jumped over to X.Org for their X Windows needs, and to this day X.Org remains the GUI platform of choice for Linux implementations.

LAYERS

- X Windows is built on a layered concept:

  - X Server

  - Window Manager

  - Desktop

- Also, a display manager runs to provide login services.

WINDOW MANAGERS

- Special type of X Clients which encapsulate other clients, allowing them to be moved, resized, or "iconified." They also provide the desktop theme, configurable menus, panel utilities, and session management. Common managers include `metacity`, `kwin` and `twm`. These window managers provide the core functionality of the GUI.

- Generally a desktop is run in addition to the window manager, though `twm` is sometimes provided as a fallback if a desktop won't start

DESKTOPS

- Fully integrated graphical environments, sitting on top of a window manager. Usually provides copy/paste features, lots of extra tools/utilities to run and configure a graphical environment. The two big guys are GNOME and KDE.

DISPLAY MANAGER

- X equivalent of the text-based login program. Three common managers are xdm, gdm and kdm. Display managers are usually started by the `init` process in run-level 5 from the `/etc/X11/prefdm` script or similar.

X FONT SERVER

- X Windows is a large and complicated piece of software. The way it handles fonts is no exception.

- `xfs`: X Windows Font Server. Supplies fonts to the X Windows server

ACCESSIBILITY

- X supports a full compliment of accessibility features to make it more usable to those with disabilities. A few common features include:

  - Sticky Keys

  - Mouse Keys

  - Braille Display

  - On-Screen Keyboards

  - Screen Readers

CONFIGURATION

- Configuring X Windows often requires at least Bachelors in Computer Science with a Minor in Great Luck.

- The main configuration file for X.Org is xorg.conf, and XFree86 is XF86Config.

- Reading the associated man pages is a must.

- Relying on the GUI configuration tools to help with X Windows configs is a Good Idea, and one Linux+ supports.

PRINTING

- There are two printer management systems in UNIX.

- The old system is `lpd` - the Line Printer Daemon. This suite has been around for ages, and uses commands such as `lpr`, `lpq`, `lpc` and `lprm` to initiate and manage print jobs.

- The new, and preferred printing system for Linux, is CUPS - the Common Unix Printing System.

CUPS

- CUPS tools and commands:

  - `lpstat`: used to view status of configured printers

  - `lp`: Create a print request

  - `cancel`: Cancel a pending print request

  - `lpadmin`: printer access control

PRINTER CONTROL

- Printing under CUPS is a two-step process.

  - First, a job is *spooled* or *queued* for printing in the print spool.

  - Second, the cups daemon pulls jobs from the print queue and feeds them to the appropriate printer.

- Access to the print queue is managed with the `accept` and `reject` commands

- Whether `cupsd` hands print jobs to the printer is controlled with the `enable` and `disable` commands.

CONFIGURING PRINTERS

- Configuring printers under lpd is painful due to the exceptionally terse and cryptic configuration files.

- CUPS is slightly more friendly

- Either way, configuration is best performed with GUI tools, according to the Linux+ objectives.

- I whole-heartedly support this notion because 1) configuring printers by hand can be painful and 2) it's so exceptionally rare that you need to print from a linux system that it isn't worth wrestling with those config formats. :)

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