– LPI 101 –

Install & Configure X

(Linux Professional Institute Certification)

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$Id: gl1.110.1.slides.tex,v 1.3 2003/05/30 05:04:32 waratah Exp $

Install & Configure XFree86

Objective

Candidate should be able to configure and install X and an X font server. This objective includes verifying that the video card and monitor are supported by an X server, as well as customizing and tuning X for the videocard and monitor. It also includes installing an X font server, installing fonts, and configuring X to use the font server (may require a manual edit of /etc/X11/XF86Config in the ”Files” section)

Install & Configure XFree86

Key files, terms, and utilities

```
XF86Setup
xf86config
xvidtune
/etc/X11/XF86Config
.Xresources
```

Install & Configure XFree86

Resources of interest

:

:

The Linux Desktop GUI

- On Linux, the graphical desktop is controlled by 4 different types of software:
  - The X server - hardware interface
  - A window manager - windows, icons etc
  - Desktop manager - file manager, control panel etc
  - The application itself (the x-client)
- Only the X server & X-client are mandatory

Window Managers

- Some window managers are:
  - AfterStep - Light resource usage
  - Blackbox - Fast & simple
  - Enlightenment - Resource intensive
  - FVWM - Not so popular anymore
  - IceWM - Emulates OS/2 & windows
  - Sawfish - default for Gnome
  - Window Maker

Desktop Environments

- There are two main Desktops are:
  - KDE
  - Gnome

Starting X

- The X server is an executable called 'X'
- Usually a link:

```
$ ls -l `which X`
lrwxrwxrwx    ...   /usr/bin/X11/X -> XFree86
```

- You can start X in several ways:
  - X directly - (not very useful)
  - xinit - X & one X-term client
  - startx - X & desktop (KDE or Gnome)

X Server Screen references

When X starts, it associates itself with a *display & screen*. The syntax for this is: `':display.screen'`

- Display is 0 for the first X server, 1 for the next etc.
- Screen is 0 for the first screen on a multihead card
- The default for display & screen are both 0

Example:

```
:0.1
```

The second screen (head) on X server 0

```
:1.0 or :1
```

The first screen on the second X server

Starting X directly

- The syntax for X is:

  `X [:display.screen] [options]`

  Examples:

  `$ X` ↩

  Start X on display 0, screen 0

  `$ X :1` ↩

  Start X on display 1, screen 1

  `$ X :1.1` ↩

  Start X on display 1, screen 1

Starting X using xinit

- The syntax for xinit is:

  `xinit [[client] options ] [--[server] [display] options ]`

  Examples:

  `$ xinit` ↩

  Start X and one xterm on display 0, screen 0

  `$ xinit -- :1` ↩

  Start X and 1 xterm on the second display

  `$ xinit /usr/X11R6/bin/xcalc -- :1` ↩

  Start X and xcalc on the second display

  `$ xinit /usr/bin/startkde -- :1` ↩

  Start X and kde on the second display

Starting X using startx

- startx is a wrapper for X and your favourite desktop
- it has the same syntax as xinit
- On RedHat, default desktop is in `/etc/sysconfig/desktop`

  Examples:

  `$ startx` ↩

  Start X and the default desktop on display 0, screen 0

  `$ startx -- :1 -depth 16` ↩

  Start X and desktop on the second display in 16 bit colour

  `$ startx /usr/bin/startkde -- :1` ↩

  Start X and the kde desktop on the second display

Running X-clients remotely

- An X-client can be told to direct its output to a given display in one of two ways:
  - By using the DISPLAY environment variable
  - By using the -display option on the command line
- A remote display is specified using the syntax:

  `hostname:display.screen`

  Example:

  `node12.c222:1.0`

  Refers to the first screen on the second display of host node12.c222

Running X-clients remotely

- Using the -display option

  ```
  $ xcalc -display node12.c222:1.0 ↩
  ```

- Using the DISPLAY environment variable

  ```
  $ export DISPLAY=node12.c222:1.0 ↩
  $ xcalc ↩
  ```

Both methods will run xcalc on the second display of host node12.c222. Note that in the second case, the DISPLAY variable is exported so it will apply to all X-clients started on that terminal.

Controlling access to the X server

- By default, an X server will only accept connections from clients running on the same host as the server.
- Remote access can be granted using the `xhost` command
  - `xhost +` - Disable access control (any host is OK)
  - `xhost -` - Enable access control (only listed hosts)
  - `xhost +hostname` - Allow hostname to connect
  - `xhost -hostname` - Disallow hostname from connecting
- xhost uses host based access control
- xhost must be run on the X server.

Testing access to the X server

- As a client, you can see if you have permission to connect to a remote X server by:
  - Setting & exporting the DISPLAY variable to the desired X server
  - running xhost without any arguments
- Example:- See if node12.c222 is available to us for display

```
$ export DISPLAY=node12.c222:1.0 ↩
$ xhost ↩
xhost:  unable to open display "node12.c222:.0"
```

The X server

- There are two versions of the X server:
- X version 3:
  - Uses the configuration file `/etc/X11/XF86Config`
  - Has different X executables for different cards
- X version 4:
  - Uses the configuration file `/etc/X11/XF86Config-4`
  - Has only one executable for all video cards (XFree86)

The X server

- To tell which version you are running do the following:

  Example:

  ```
  $ ls -l ‘which X‘ ↩
  lrwxrwxrwx   .... /usr/bin/X11/X -> XF86_SVGA
  ```

  Using X version 3 on an SVGA card

  ```
  $ ls -l ‘which X‘ ↩
  lwxrwxrwx    .... /usr/bin/X11/X -> XFree86
  ```

  Using X version 4.

Version 3 drivers

The version 3 drivers are specific to a particular card type. Some of the more common drivers are:

- XF86_3DL - 3D Labs video cards
- XF86_8514 - 8514 video cards
- XF86_AGX - AGX video cards
- XF86_FB - Generic frame buffer device for non-specific cards
- XF86_Mach64 - ATI Mach 64 video cards
- XF86_S3 - S3 based video cards
- XF86_S3V - S3 virge video cards
- XF86_SVGA - VESA Super VGA cards
- XF86_VGA16 - 16 colour VGA cards

The X server

- The X server:
  - is the interface to the graphics card
  - allows X clients to display information
  - can run multiple instances on a single card
  - accepts **local or remote** X-clients