History and configuration

X Window System
X Windows System / X11 – brief history

• 1983 – W window system working on V-System
• June 1984 - Jim Gettys and Bob Scheifler from MIT create X Window System
• 1988 – MIT X Consortium
• January 1994 – all rights to X moved to X Consortium
• 1996 – Open Software Foundation and X/Open create The Open Group with X Project Team
• May 1999 – X Project Team is disbanded, X.org Group created
• 22/Jan/2004 – members of X.org Group create X.org Foundation
What is X Window System?

Role of X:
Windowing system for bitmaps display
Provides framework for building GUI
Handles peripheral devices like mouse, keyboard, touchpad, tablets

What is not a role of X:
Doesn’t handle windows
Doesn’t provide UI
Doesn’t draw windows elements – it’s a role for Window manager.
Implementations

- X.org
- XFree86
Widgets libraries for X Window System

- Athena
- Motif
- OpenLook
- Gnome
- KDE
X Window System internals

- Client-server architecture
- Server – displays bitmaps, handles peripheral devices
- Client – software requesting changes to contents of windows
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<th><strong>Linux</strong></th>
<th><strong>BSD</strong></th>
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<td>• Installation by default with OS: Fedora</td>
<td>• Using Package manager</td>
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<td>• Offers option on system setup: Slackware, openSuse</td>
<td>• Using ports collection</td>
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<td>• Installed with OS: TridentOS, DragonFlyBSD, GhostBSD</td>
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### Installing X11 on FreeBSD

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<th>Packages</th>
<th># pkg install xorg</th>
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| Ports collection | # cd /usr/ports/x11/xorg  
|                | # make install clean  |
Add user to video or wheel group

- `# pw groupmod video -m kili ||
pw groupmod wheel -m kili`

Add to `/boot/loader.conf`:

- `kern.vty=vt`
- `kern.vt.fb.default_mode= "1024x768"`
- `i915kms_load="YES"` only on newer Intel GPU (requires install of drm-next-kmod)

X11 Configuration
X11 Configuration

Configuration files paths:
- Single file configuration:
  - /usr/local/etc/X11/xorg.conf
  - Everything in one place
  - Horrible to manage on long run
- Multi-file configuration:
  - /usr/local/etc/X11/xorg.conf.d/
    - screen-resolution.conf
    - driver-vesa.conf
    - driver-intel.conf
  - Can split configuration to multiple files
  - Can use multiple drivers
  - Looks nice & easy to manage

I use single file since I often make changes and I am too lazy to open many files ;P
X11 Configuration

• My config file:

Section "ServerLayout"
  Identifier "X.org Configured"
  Screen 0 "Screen0" 0 0
  InputDevice "Mouse0" "CorePointer"
  InputDevice "Keyboard0" "CoreKeyboard"
EndSection
X11 Configuration

Section "Files"
    ModulePath  "/usr/local/lib/xorg/modules"
    FontPath    "/usr/local/share/fonts/misc/"
    FontPath    "/usr/local/share/fonts/TTF/"
    FontPath    "/usr/local/share/fonts/OTF/"
    FontPath    "/usr/local/share/fonts/Type1/"
    FontPath    "/usr/local/share/fonts/100dpi/"
    FontPath    "/usr/local/share/fonts/75dpi/"
    EndSection
X11 Configuration

Section "Module"
    Load "glx"
EndSection

Section "InputDevice"
    Identifier "Keyboard0"
    Driver "kbd"
EndSection
X11 Configuration

Section "InputDevice"
  Identifier "Mouse0"
  Driver  "evdev"
  Option   "Protocol" "auto"
  Option   "Device" "/dev/sysmouse"
  Option   "ZAxisMapping" "4 5 6 7"
EndSection

Section "Monitor"
  Identifier "Monitor0"
  VendorName "Monitor Vendor"
  ModelName "Monitor Model"
EndSection
X11 Configuration

Section "Device"

### Available Driver options are:
### Values: <i>: integer, <f>: float, <b>: "True"/"False",
### <s>: "String", <f>: "f> Hz/kHz/MHz",
### <p>: "<f>%"
### [a]: arg optional
#Option "ShadowFB" # [b]
#Option "DefaultRefresh" # [b]
#Option "ModeSetClearScreen" # [b]
  Identifier "Card0"
#Driver "vesa"
Driver "intel"
BusID "PCI:0:2:0"
EndSection
X11 Configuration

Section "Screen"
  Identifier "Screen0"
  Device "Card0"
  Monitor "Monitor0"
  SubSection "Display"
    Viewport 0 0
    Depth 24
    Visual "TrueColor"
    Modes "1920x1080" "1366x768" "1280x768" "1024x768" "800x600" "640x480"
EndSubSection
EndSection
X11 Configuration - Summary

4 of 5 people won't need to configure X Window System manually.

Those who do this by hand are unlucky few, who use strange hardware configuration.

Linux configuration files for X Window System have different location depending on distribution or even distro version.

Linux tries to hide this mess switching to Wayland.

Wayland is good – I want to use it on BSD, so I can forget about this presentation.
Questions?
Thank you

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