Exercise 2 – Build X window

Announced Date: 2004/10/11
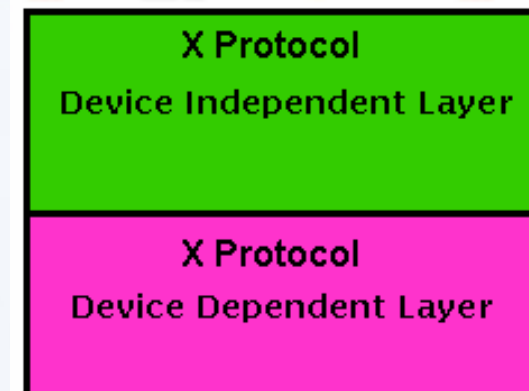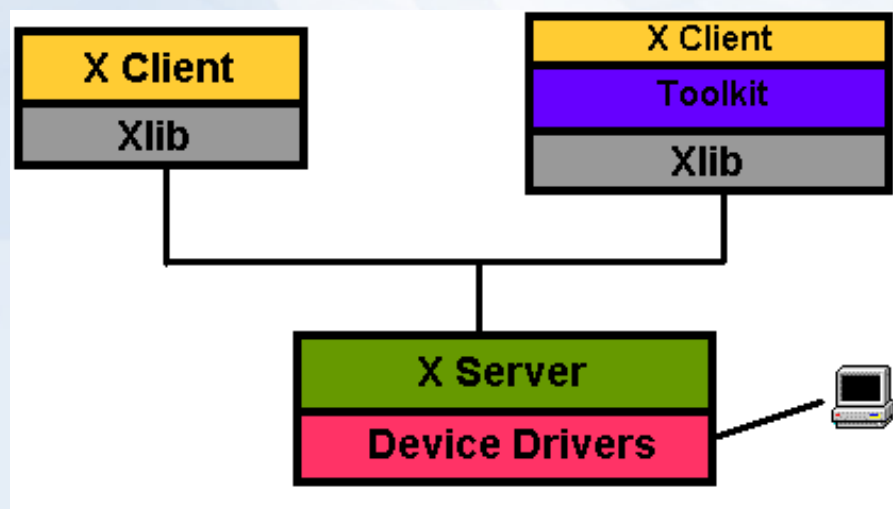Due Date: 2004/10/24
Bonus Due Date: 2004/17

X Window System (1)

> ## The X Protocol

- Aim to provide a network transparent graphical user interface for the UNIX-like OS.
- Client-Server architecture
  - **The X client request display service.**
  - **The X server provide display service**

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X Window System (2)

> ## Naming

- X Window System
- X Version 11
- X Window System, Version 11
- X11

> ## Version

- X11R6
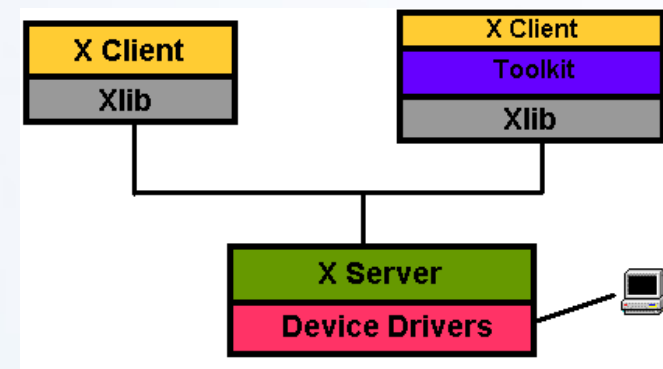 - **X Window System Version 11 Release 6**

> ## Latest version

- From X.Org
  - **X11R6.8   Sep.9 2004**

X Window System (3)

> Advantages of X protocol

– The X server is highly portable (various OS, Language)

– The X Clients also have high portability

– X support most oriented network protocol

– Local and network based computing look and feel the same

X Client		X Client
Xlib		Toolkit
		Xlib

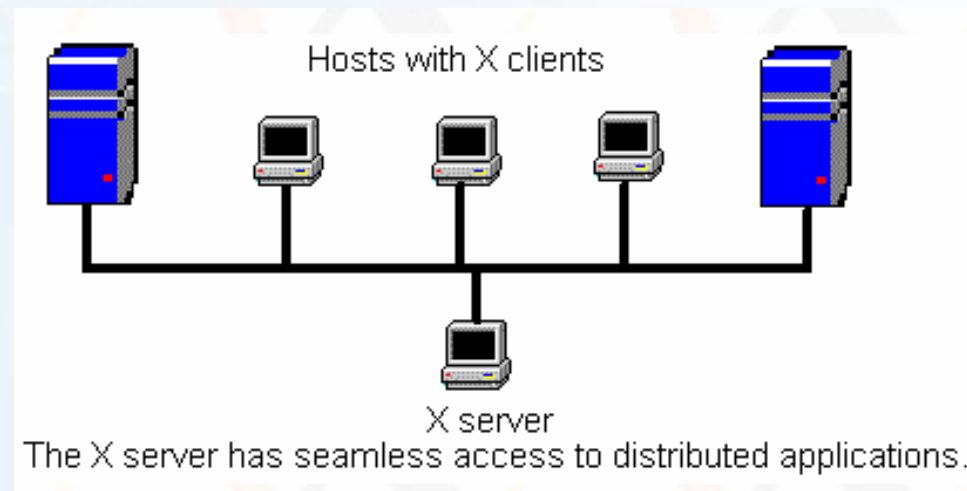| X Server |
|---|
| Device Drivers |

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X Window System –
Client-Server Design

> Client
- Request service (like create window)
- Receive events from X server (like mouse input)

> Server
- Manage the keyboard, mouse and display device
- Create, draw and destroy graphic objects on screen

Hosts with X clients

X server
The X server has seamless access to distributed applications.

X11 implementation

> An open-source implementation of X Window System

  – XFree86 project

  • **FreeBSD 4.10-Release, 5.2.1-Release**

  – Xorg foundation

  • **FreeBSD 5.3-Release**
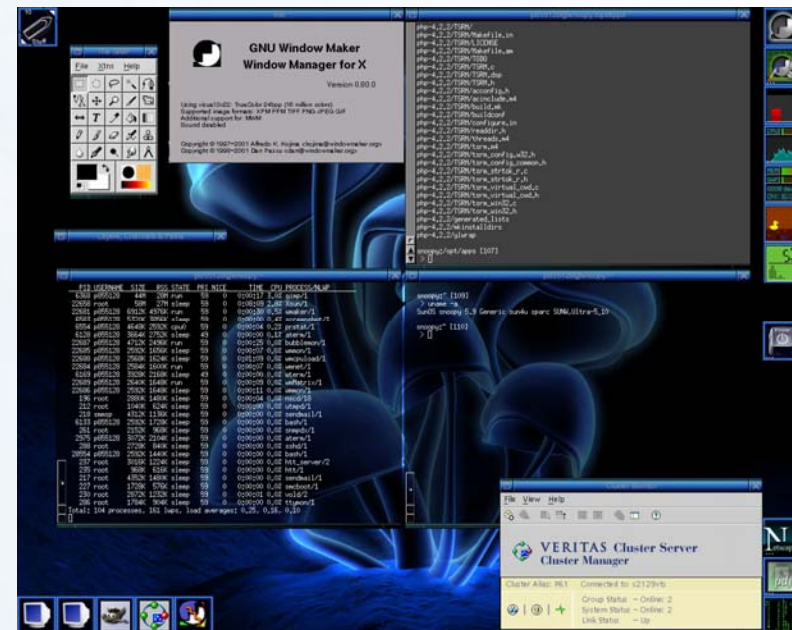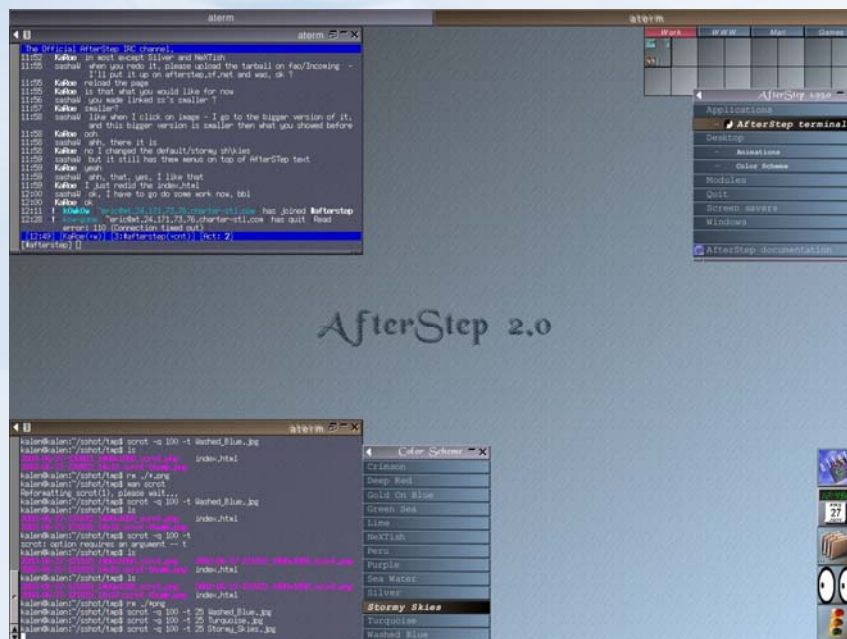 • **X11 official flavor**

The Window Manager

> ## Window Manager

– Provide certain look-and-feel window in front of you

- **AfterStep**
- **Enlightenment**
- **Window Maker**

Steps of this exercise

1. Install X11
2. Configuring X11
3. Install Window Manager

Installing X11 (1)

> Use cvsup to update your ports
  - /usr/local/bin/cvsup –g –L 1 /usr/local/etc/cvsup-ports

> Pre-steps:
  - We use Xorg as our X Server
  - Add the following line in /etc/make.conf
    - > X_WINDOW_SYSTEM=xorg
  - Do this line
    - > pkg_delete -f /var/db/pkg/imake-4* /var/db/pkg/XFree86-*
  - Your "PATH" environment variable
    - > Edit /etc/csh.cshrc
    - > set path = (/bin /sbin /usr/bin /usr/sbin /usr/local/bin /usr/X11R6/bin)

Installing X11 (2)

> ## We use Xorg as our X Server

- To build and install Xorg from the ports
  - **% login as root**
  - **% cd /usr/ports/x11/xorg**
  - **% make install clean**

> ## If you want to install XFree86

  - **% login as root**
  - **% cd /usr/ports/x11/XFree86-4**
  - **% make install clean**

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It will run about 50 minutes

P4 1.8G   1GB Ram   100MB NIC

Install Xorg needs 4G free space

Configuring X11 (1)

> Pre-step – know your hardware

– Monitor specifications

• Horizon Synchronization frequency

> Ex: 31 ~ 81 KHz

• Vertical Synchronization frequency

> Ex: 56 ~ 76 KHz

– Video adaptor chipset

> Ex: ATi Radeon 9200SE

> Ex: nVIDIA GeFource FX5200

> **Ex: ATI Mobility RADEON 7500 (16M) (IBMT30)**

– Video Adapter Memory

> Ex:128MB

Configuring X11 (2)

> ## Configuration of X11 is a multi-step process

1. Generate an X11 configuration skeleton file

   - **% Xorg –configure**   **(Xorg)**
     > The file will be put in /root/xorg.conf.new
   - **% XFree86 –configure**   **(XFree86)**
     > The file will be put in /root/XF86Config.new

2. Test the existing configuration to

   - **% Xorg –config /root/xorg.conf.new**   **(Xorg)**
   - **% XFree86 –xf86config /root/XF86Config.new (XFree86)**
     > If a black and grey grid and an X mouse cursor appear, the configuration was successful
     > Press "Ctrl+Alt+Backspace" to leave the test

Configuring X11 (3)
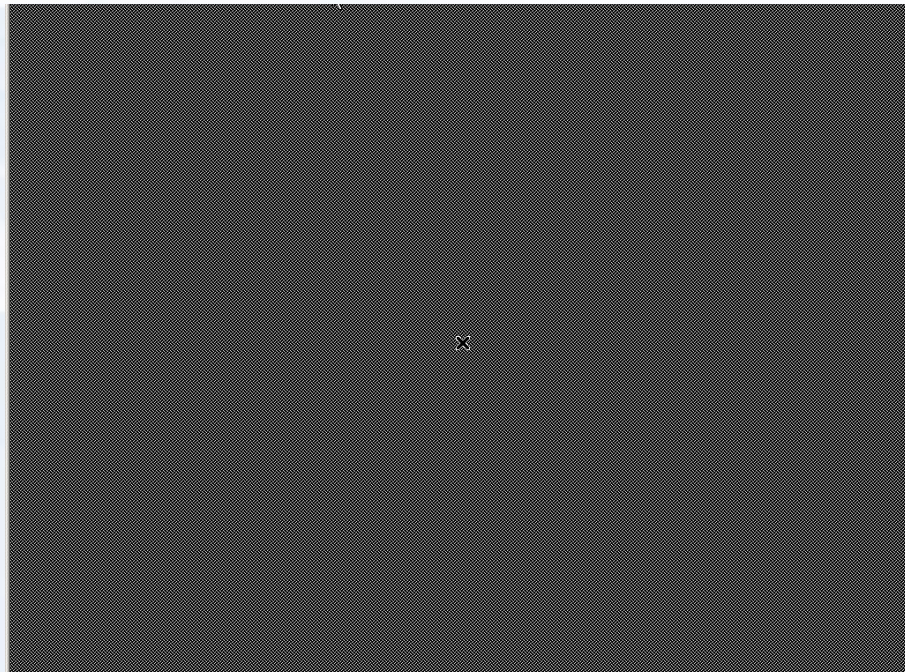
3. Tune Configuration file
   - **Edit /root/xorg.conf.new   (Xorg)**
   - **Edit /root/XF86Config.new   (XFree86)**
     > Section Monitor
     > Section Screen

```
Section "Monitor"
    Identifier       "Monitor0"
    VendorName  "Monitor Vendor"
    ModelName    "Monitor Model"
EndSection
```

```
Section "Screen"
    Identifier "Screen0"
    Device     "Card0"
    Monitor    "Monitor0"
    DefaultDepth 24
    SubSection "Display"
        Viewport   0 0
        Depth      24
        Modes      "1280x1024" "1024x768"
    EndSubSection
EndSection
```

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Configuring X11 (4)

– Copy configuration file to real place
  - **% cp /root/xorg.conf.new /etc/X11/xorg.conf   (Xorg)**
  - **% cp /root/XF86Config.new /etc/X11/XF86Config   (XFree86)**
– Use X window
  - **% startx**

Install Window Manager

> We use afterstep as our WM

- http://www.afterstep.org/
  - % cd /usr/ports/x11-wm/afterstep-stable
  - % make –DWITH_DIFFERENT_LOOKNFEELS –DWITH_SAVEWINDOWS install clean

Configuring X11 to use afterstep

> ## Edit xinitrc

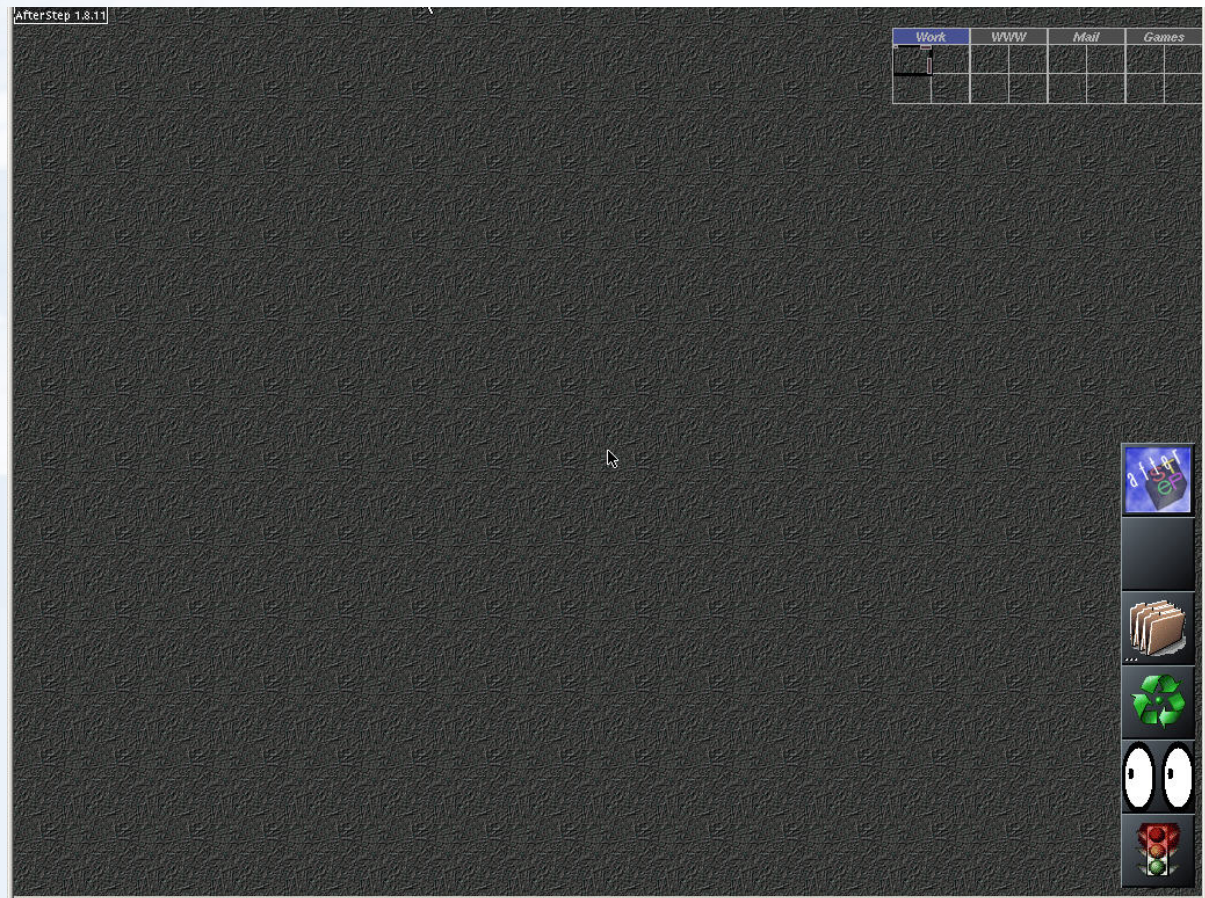- **% cd /usr/X11R6/lib/X11/xinit**
- **% chmod u+w xinitrc**
- **Edit xinitrc**

Original

```
# start some nice programs

twm &
xclock -geometry 50x50-1+1 &
xterm -geometry 80x50+494+51 &
xterm -geometry 80x20+494-0 &
exec xterm -geometry 80x66+0+0 -name login
```

```
# start some nice programs
exec afterstep
```

Run Your X-window

> % startx
> Ctrl + Alt + Backspace – force to quit X
> Left button: copy
> Right button: paste

AfterStep Configuration (1)

> Location of configuration file
- Global configuration file directory
  - **/usr/X11R6/share/afterstep/**
- Personal configuration file directory
  - **~/GNUstep/Library/AfterStep/**

> When AfterStep starts
- It first tries to read personal configuration files, and then read global configuration files for those not found.
- Copy what you want to change from global to personal and edit it

AfterStep Configuration (2)

> Under /usr/X11R6/share/afterstep/

Name	Purpose
autoexec	Define what is run when AfterStep starts and restarts
base.24bpp	Define module, pixmap, scripts, cursor, pager
start/	Start menu when you click left button
looks/	Define how AfterStep looks
wharf	wharf module configuration file
pager	pager module configuration file

AfterStep Configuration (3)

Pager module

Start menu

look

Wharf module

AfterStep Configuration –
Add something to start menu

> Steps

- install your favorite applications first
- Add entry under directory
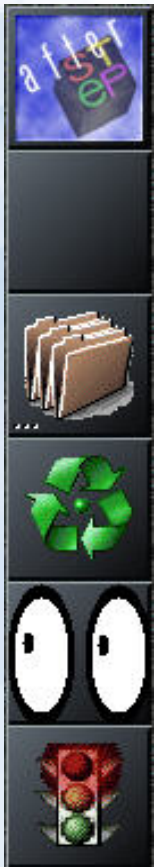- Edit the entry file
- Update menu

```
AfterStep 1.8.11                    X
Applications                        ..
Desktop                             ..
Modules                             ..
Quit                                ..
Screen_savers                       ..
Windows                             ..
AfterStep documentation
```

```
Exec "WWW-firefox" exec firefox &
MiniPixmap "mini-app.xpm"
```

```
tytsai@tybsd:/<3>afterstep/start> ls
Applications/   Modules/        Screen_savers/  a_nop
Desktop/        Quit/           Windows/        b_afterstepdoc
```

```
tytsai@tybsd:/<3>afterstep/start> ls
Applications/   Modules/        Screen_savers/  a_nop           c_firefox
Desktop/        Quit/           Windows/        b_afterstepdoc  d_xterm
```

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AfterStep Configuration –
Add something to wharf module

> Edit wharf configuration file

```
# AfterStep documentation
*Wharf afterstepdoc AfterStep3.xpm Exec "-" afterstepdoc &
# Time
*Wharf clock - Swallow "asclock" asclock -shape -12 -position +1+1 &
# Pagers
#*Wharf Pagers Monitor.xpm,3_dots.xpm Folders
# *Wharf Pager - MaxSwallowModule "Pager" Pager 0 3
#*Wharf ~Folders
# File system
#
#*Wharf asfsm - Swallow "asfsm_lite" asfsm_lite -bg Grey30 -fg Grey70 -bp None -
pbg Grey40 -pfg Grey70 -pbp None -i 30 &
# System load
#*Wharf asload - Swallow "asload" asload -shape &
# Mail
#*Wharf asmail - Swallow "asmail" asmail -geometry +0+0 &
…
```