Ateneo de Manila University

Introduction to the UNIX/Linux Graphical User Interface

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Section I

GUI
Graphical User Interface (GUI)

★ can be considered as one of the greatest achievements of computer science in the last century

★ gave computing mass market appeal

★ takes advantage of the computer’s graphics capabilities to make programs easier to use

★ provide the user with a simple interface to the computing system
Components of a GUI

★ pointer
- a symbol is used to select objects and commands
- typically is a appears as a small angled arrow
- an I-beam or a block pointer is used to character based GUI’s
- also know as the cursor

★ pointing device
- usually a mouse or trackball
- enables you to manipulate the pointer

★ icons
- small pictures that represent commands, files, or windows.
- icons can be moved around the display screen as if they were real objects on your desk

★ desktop
– area on the display screen where icons are grouped
– the icons are intended to represent real objects on a real desktop

★ windows
– divides the screen into different areas
– each window can run a different program or display a different file
– can also move windows around the display screen
– their shape and size can be changed at will

★ menu
– another way of grouping command
– menu items can be clicked to execute the commands
Section II

X-Window System
History

★ developed in 1984 at the Laboratory for Computer Science at the Massachusetts Institute of Technology

★ part of the Athena project in cooperation with DEC

★ descended from a windowing system project at Stanford called W

★ some research at Xerox Corporation’s Palo Alto Research Center (PARC) also went into X’s design

★ the first operational GUI ran on the Alto computer which was completed at Xerox PARC on April 1973

★ is currently developed and distributed by the X Consortium

★ the current version of the X Window System is X11R6.6 and it supports several UNIX(R) and UNIX-like operating systems
XFree86

★ a free and open source implementations of the X Window System

★ primarily a collection of X servers for UNIX-like OSs on Intel x86 platform

★ derived from X386, and much of it is contributed back into X11R6

★ the current version of the XFree86 Window System is XFree86 4.2.0
XFree86

★ client-server based architecture
★ support for a large number of video card and monitors
★ support for OpenGL standards
★ support for Direct Rendering Interface (DRI)
★ support for a wide range of Internationalized keyboards and input devices
Components of an X-Window System

★ display
  – refers to the totality of the input and output device being access by a particular user
  – each system can have multiple displays

★ display manager
  – interface to enables users to logon
  – enables users to select their desktop/window managers
  – enables remote X connections to be made

★ desktop environment
  – manages all the elements in a desktop/screen
  – loads the window manager

★ screen
  – also called the Desktop
– is the collection of all elements on the display

★ root window
– refers to the window behind all elements on the screen
– programs are executed from this window
– can be as simple as a blank screen or can have menus and icons

★ window manager
– is the main interface between the X Window system and the user
– provides such functionality as window borders, menus, icons, virtual desktops, button bars, tool bars
– users can customize it at will, often adding to its functionality in the process

★ pointer
– is the arrow or indicator of any given shape which represents the location your pointing device
– changes to give you contextual feedback on the state of the mouse on the screen

★ window

– is a frame in which any given application resides
– includes pretty much anything except the so-called root window
– **Active Window** refers to the window currently in focus

★ menu and icons

– used to represent objects, programs and commands
– can be places in windows and in the screen
Section III

Window Managers
Window Managers

★ FVWM and variants

★ MLVWM

★ IceWM

★ Sawmill

★ Enlightenment

★ KVWM

★ DTWM
FVWM

★ F Virtual Window Manager

★ one of the original free software window managers

★ developed by Robert Nation

★ variants are: FVWM, FVWM2, FVWM95
Figure 1: FVWM2 screenshot
MLVWM

★ Macintosh-Like Virtual Window Manager

★ intended to emulate the MacOS look

★ developed by Takashi Hasegawa
Figure 2: MLVWM screenshot
IceWM

★ ICE Window Manager

★ is a small, but powerful window manager

★ optional use of mouse

★ developed by Marko Macek and Mathias Hasselmann
Figure 3: ICEWM screenshot
Sawmill WM

★ Sawmill Window Manager

★ is an extensible window manager using a Lisp-based scripting language

★ it aims to simply to manage windows in the most flexible and attractive manner possible

★ developed by John Harper
Figure 4: Sawmill WM screenshot
Enlightenment Window Manager

★ is a completely themeable, highly configurable Window Manager
★ version E16 can run in both GNOME and KDE
★ version E17 will be a desktop environment
★ developed by Eric Rasterman
Figure 5: Enlightenment screenshot
KDE Window Manager

★ is a fully customizable, themable window manager

★ is the default window manager of KDE

★ developed by KDE development team
DTWM

★ Desktop Window Manager
★ is the window manager of CDE
★ maintained by the Open Group
Section IV

Desktop Environments
Desktop Environments

⭐ CDE
⭐ XFCE
⭐ KDE
⭐ Gnome
CDE

★ Common Desktop Environment

★ is an integrated graphical user interface for open systems desktop computing

★ provides delivers a single, standard graphical interface for the management of data, files and applications

★ popular Unix Desktop Environment

★ maintained by the Open Group
Figure 6: CDE screenshot
XFCE

★ looks and feels like CDE

★ is a lightweight desktop environment for various UNIX systems

★ one of the smallest and fastest completely GNOME and KDE compliant desktop environments

★ developed by Olivier Fourdan
Figure 7: XFCE screenshot
KDE

★ K Desktop Environment

★ is a powerful Open Source graphical desktop environment

★ combines ease of use, contemporary functionality, and outstanding graphical design with the technological superiority of the Unix operating system

★ is a mature desktop suite as a base for a growing number of applications

★ provides WYSIWYG developer tools

★ contains an entire office productivity suite

★ maintained by the K Development Team
Figure 8: KDE screenshot
GNOME

★ a complete free and easy-to-use desktop environment for the user
★ rich collection of tools, libraries, and components to develop powerful applications on Unix
★ provides WYSIWYG developer tools
★ contains a number of office productivity applications
★ maintained by the GNOME developers
Figure 9: GNOME screenshot
Figure 10: The Teacher’s Desktop screenshot