



The Linux GUI



Unit objectives

After completing this unit, you should be able to:

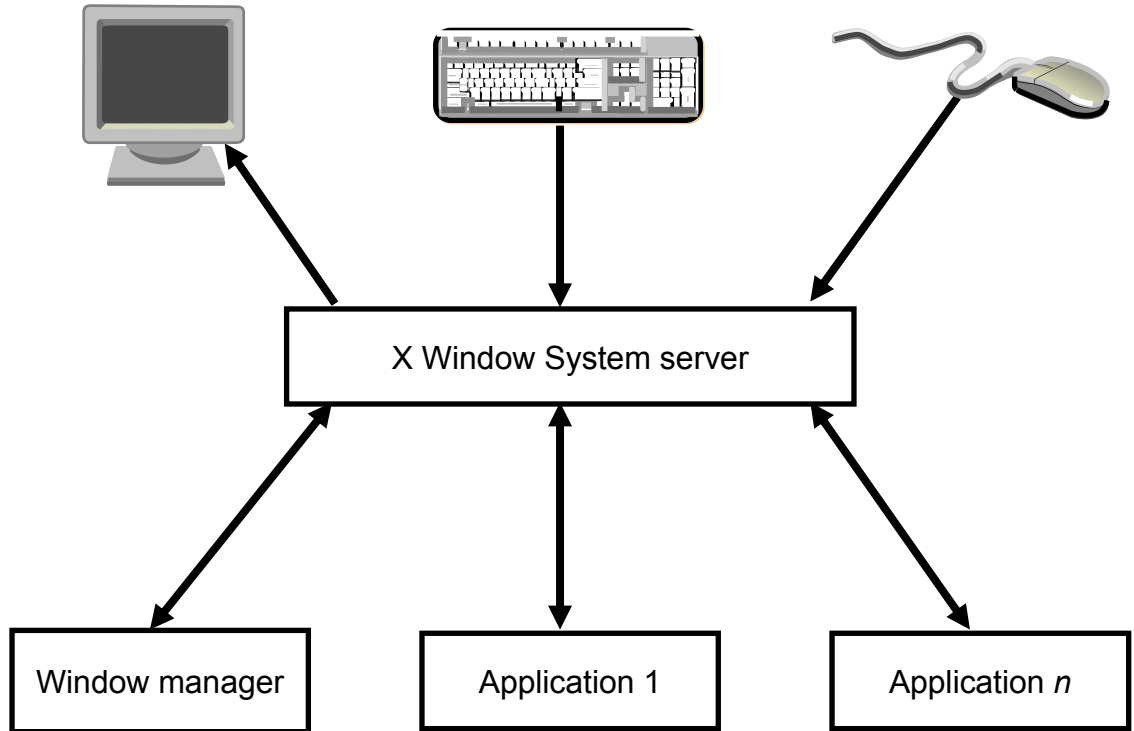
- List the main components of the X Window System
- List the function of the X Server
- List the function of a window manager
- List the main characteristics of desktop environments
- Switch between GNOME and KDE

The Linux graphical user interface

- The X Window System is the GUI of Linux.
 - Developed at MIT in 1984
 - Current standards body: X Consortium
 - Short name: X
- X uses client-server model with network connections.
 - Highly flexible
 - Easy exchange of components
 - Supports networked applications and sessions, independent of the OS

Client/server architecture

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X components

- An X Server:
 - Controls keyboard, mouse, and one or more screens
 - Controls resolution, refresh rate, and color depth
 - Allows simultaneous access by several clients
 - Performs basic graphic operations
 - Forwards keyboard and mouse events to the correct clients
- An X Client:
 - Is, for instance, an application
 - Receives keyboard and mouse inputs from server
 - Sends output to be displayed to server
- A window manager:
 - Is a special X Client
 - Performs window dressing on other clients
 - Allows other client windows to be moved, iconified, and so forth

X servers in Linux

- Most distributions use X.org (www.X.org) or XFree86 (www.xfree86.org) as their X Server.
 - Open source
 - Supports most video adapters
- Other X Servers for Linux are available as well.
 - Xi Graphics (<http://www.xig.com>)

X configuration

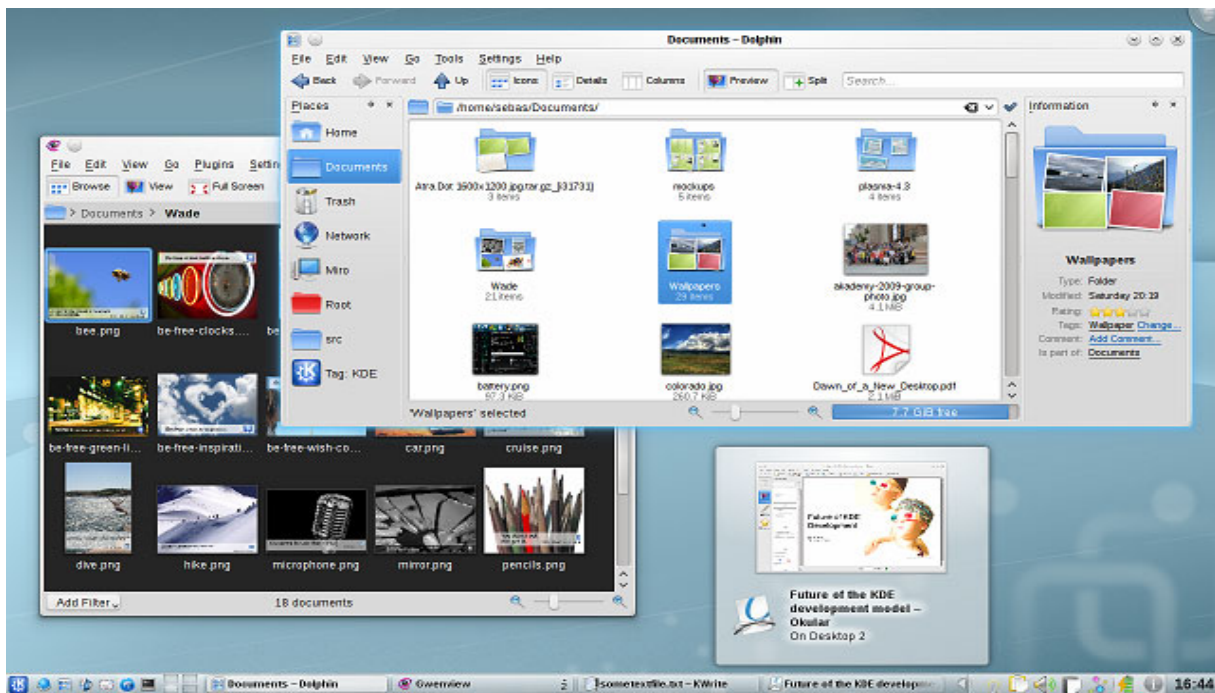
- X needs to be configured for your hardware.
 - Keyboard
 - Mouse
 - Graphical adapter
 - Monitor
- Things to configure include the refresh rate, resolution, and color depth.
- Config file is `/etc/X11/xorg.conf` or `/etc/X11/XF86Config`
- Manual configuration is possible but hard.
 - See *XFree86-HOWTO* for details
- Automated configuration tools are available.
 - During installation of distribution
 - X.org/XFree86 tools: `X -configure`, `xf86config`
 - Distribution tools: `system-config-display` (RHEL), `sax2/yast2` (SLES)

Desktop environments

- A desktop environment is:
 - A set of tools, libraries and standards that allows rapid development of X clients
 - A set of X clients (including one or more window managers) that are developed with these tools, libraries, and standards
- Examples:
 - GNU Network Object Model Environment (GNOME)
 - K Desktop Environment (KDE)
- Advantages of desktop environments:
 - Integration (cut and paste through clipboard and drag and drop)
 - Common look (themes)

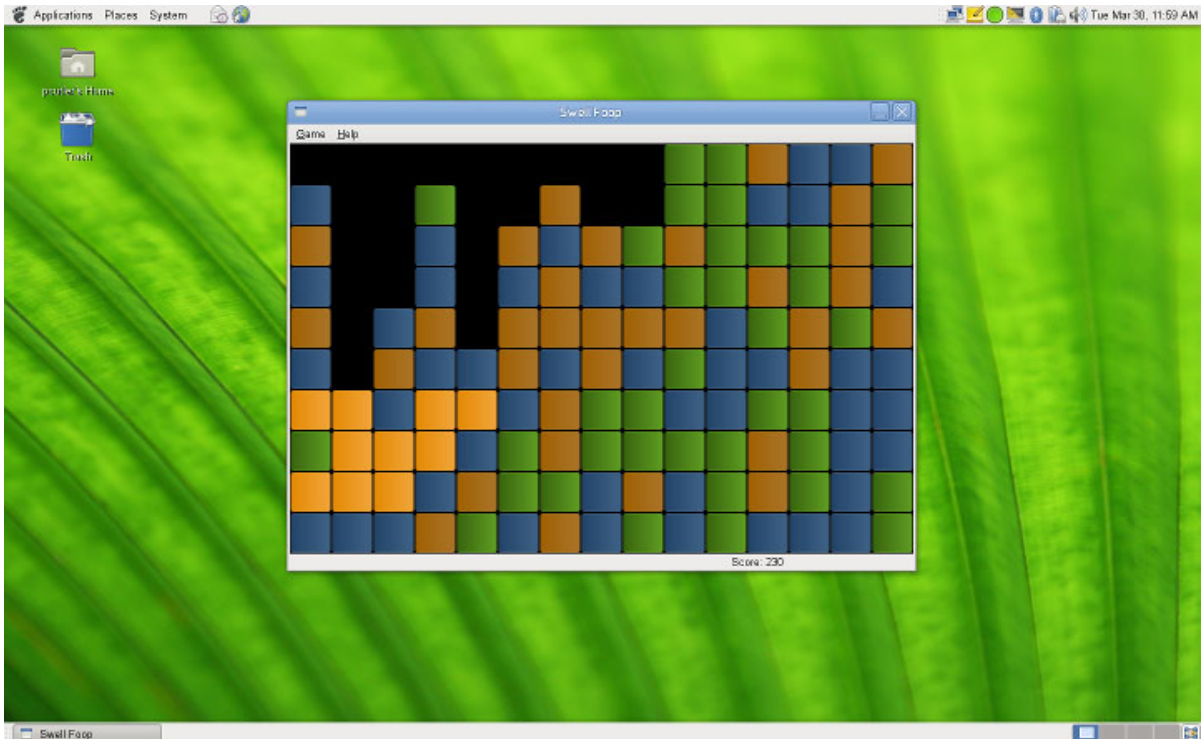
The KDE

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The GNOME desktop environment

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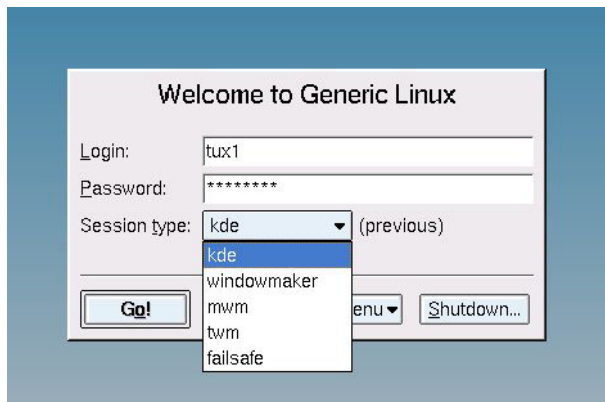


Starting X

- If logged in on a text terminal, run `startx`.
 - This only starts a single session.
 - When the session ends, you are back in your text terminal.
- If you want to enable the graphical log in screen, bring the system into runlevel 5.
 - To switch manually, use `init 5` command.
 - To make change permanent, edit `/etc/inittab`:
 - `id:5:initdefault:`

Choosing your desktop environment

- Most distributions provide multiple desktop environments.
- To choose between them, select from the Login prompt.
- Every user can have his or her own preference.



Unit review

- The GUI of Linux is based on the X Window System (X for short).
- X uses a client-server model.
- The most common X Server under Linux is XFree86 or X.org.
- A desktop environment is a set of tools, libraries, and standards that allow development of X clients and a set of X clients developed with this.
- The most common desktop environments on Linux are KDE and GNOME.
- To switch between desktop environments, use the session type list from the graphical log in prompt.

Checkpoint

1. True or False: The main configuration file of KDE is `/etc/X11/XF86Config`.
2. What statement describes the function of the X Server best?
 - a. It receives input from the keyboard and mouse and forwards this to the appropriate client, and it receives output from the clients and displays this on the screen.
 - b. It performs the window dressing; it makes sure that every application has a border around its windows so that the window can be resized, moved, and iconified.
 - c. It allows the user to type commands while in a graphical environment.
 - d. It shows a set of eyes looking at the cursor.
3. How do you start X?

Checkpoint solutions

1. True or False: The main configuration file of KDE is /etc/X11/XF86Config.
The answer is false.

2. What statement describes the function of the X Server best?

- a. It receives input from the keyboard and mouse and forwards this to the appropriate client, and it receives output from the clients and displays this on the screen.
- b. It performs the window dressing; it makes sure that every application has a border around its windows so that the window can be resized, moved, and iconified.
- c. It allows the user to type commands while in a graphical environment.
- d. It shows a set of eyes looking at the cursor.

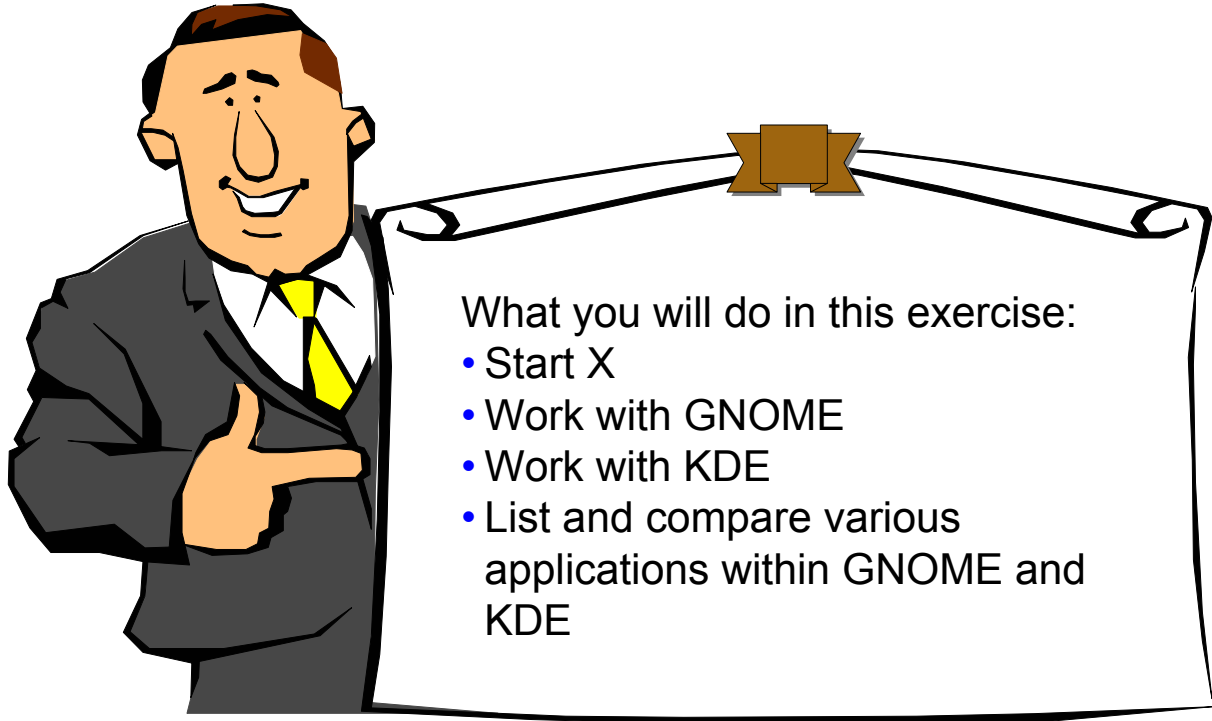
The answer is it receives input from the keyboard and mouse and forwards this to the appropriate client, and it receives output from the clients and displays this on the screen.

3. How do you start X?

The answer is with the **startx** command or by switching the system to runlevel 5.

Exercise: The Linux GUI

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What you will do in this exercise:

- Start X
- Work with GNOME
- Work with KDE
- List and compare various applications within GNOME and KDE

Unit summary

Having completed this unit, you should be able to:

- List the main components of the X Window System
- List the function of the X Server
- List the function of a window manager
- List the main characteristics of desktop environments
- Switch between GNOME and KDE