# Operating System Types

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Module Code: COMP1712

Module Name: Computer Architectures and Operating Systems

Credits: 15

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## Types of OS

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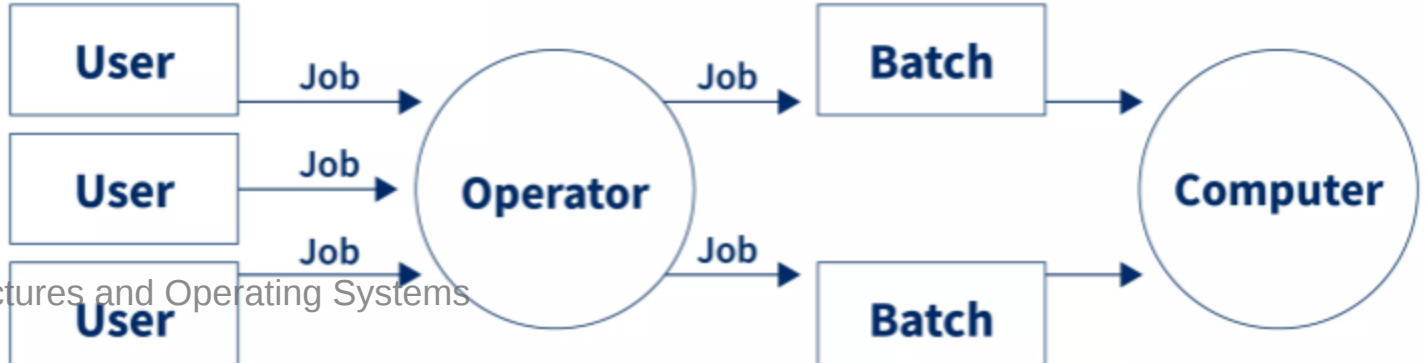
AN x64 PROCESSOR IS SCREAMING ALONG AT BILLIONS OF CYCLES PER SECOND TO RUN THE XNU KERNEL, WHICH IS FRANTICALLY WORKING THROUGH ALL THE POSIX-SPECIFIED ABSTRACTION TO CREATE THE DARWIN SYSTEM UNDERLYING OS X, WHICH IN TURN IS STRAINING ITSELF TO RUN FIREFOX AND ITS GECKO RENDERER, WHICH CREATES A FLASH OBJECT WHICH RENDERS DOZENS OF VIDEO FRAMES EVERY SECOND
BECAUSE I WANTED TO SEE A CAT JUMP INTO A BOX AND FALL OVER.
I AM A GOD.

# Batch OS

- **Batch** - because batch system is very useful for calculating the salaries of all employees in the end of month
- **Bank Invoice System** - produce all monthly statements of all bank's clients
- **Transactions Process** - mostly implement the international money transfers system.
- **Daily Report** - manufacturer industries, every day need operational statement for production line



# Multi-tasking/Time-sharing Operaing Systems

Time-sharing operating system enables people located at a different terminal(shell) to use a single computer system at the same time.

The processor time (CPU) which is shared among multiple users is termed as time sharing.

**Adv**

- It provides the advantage of quick response.
- This type of operating system avoids duplication of software.
- It reduces CPU idle time.

**DisAdv**

- Time sharing has problem of reliability.
- Question of security and integrity of user programs and data can be raised.

# Embedded OS

- Specialised operating system
- Perform a particular task for a given device that is not a computer
- Designed to be compact, efficient at how much the resources are used and most reliable.

# Real Time OS

A real time operating system time interval to process and respond to inputs is very small. Examples: Military Software Systems, Space Software Systems are the Real time OS example.

### Soft Real Time OS

- A Soft RTOS is a system in which the deadline for certain tasks can be delayed to some extent. For example, if the task deadline is 1:20:30PM, then the task can on occasions complete at let us say 1:20:35PM every. However, it can not delay for too long say 1:30PM.

### Hard Real Time OS

- A Hard RTOS is a system which meets the deadline for every process at all times. For example, if the task deadline is 1:20:30PM, then the task has to complete before 1:20:30PM every time.

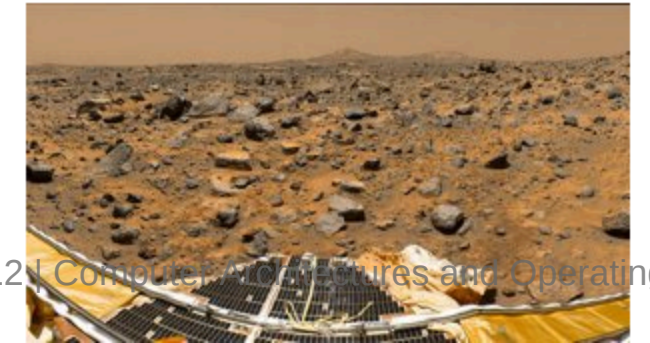
# RTOS 2

**VxWorks**: This OS is part of the Mars 2020 rover.

**QNX**: it is compatible with platforms like ARM and x86. Industries using QNX are automotive, railway transportation and health-care.

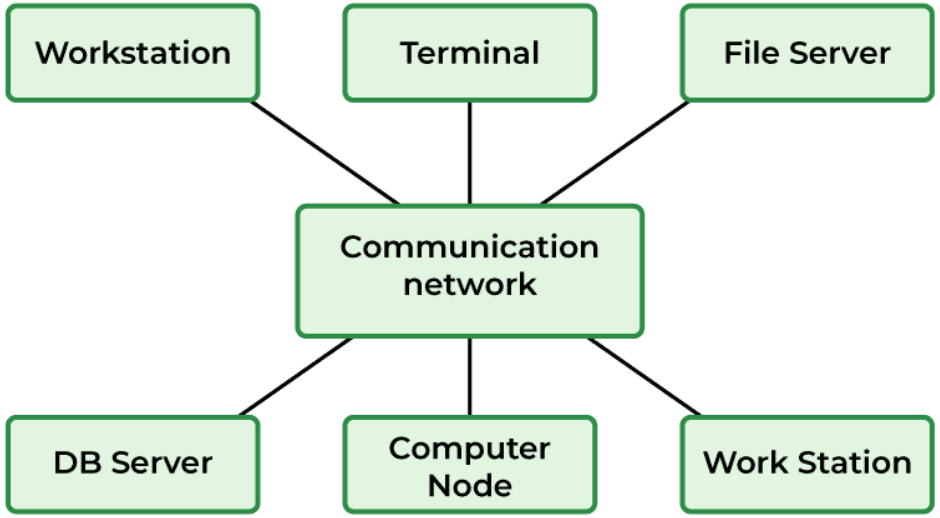
**eCos**: is an open-source real-time operating system.

**RTLinux**: is a hard RTOS. It runs the Linux operating system as a full preemptive process. As a result, it is useful in controlling robots, data acquisition systems, manufacturing plants.



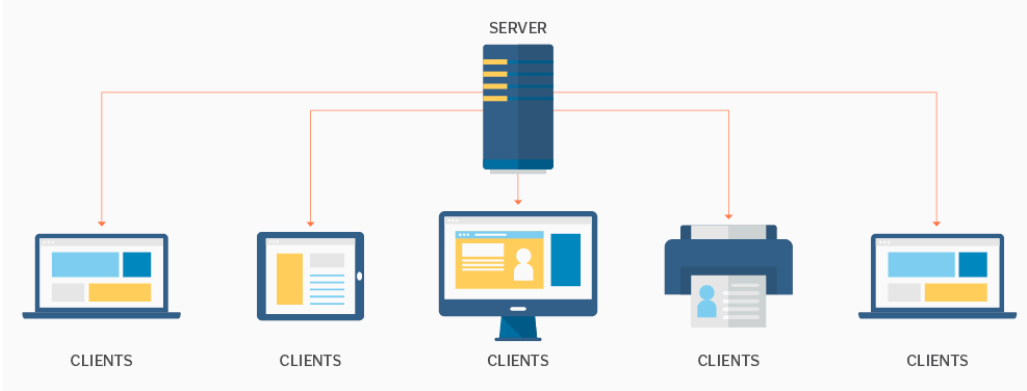

# Distributed OS

- Distributed systems use many processors located in different machines to provide very fast computation to its users.
- A DOS is a system which contains multiple components located on different machines, which coordinate and communicate actions in order to appear as a single coherent working system to the user.



# Network OS

- Network Operating System runs on a server. It provides the capability to serve to manage data, user, groups, security, application, and other networking functions.
- Includes software and associated protocols to communicate with other autonomous computers via a network conveniently and cost-effectively
- It allows devices like a disk, printers, etc., shared between computers. The individual machines that are part of the Network



# Mobile OS

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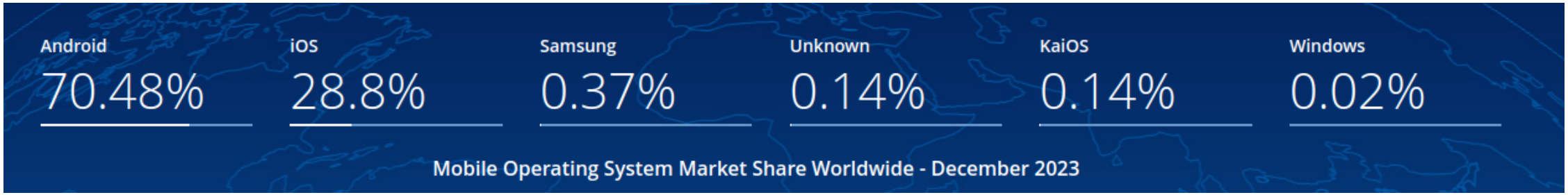
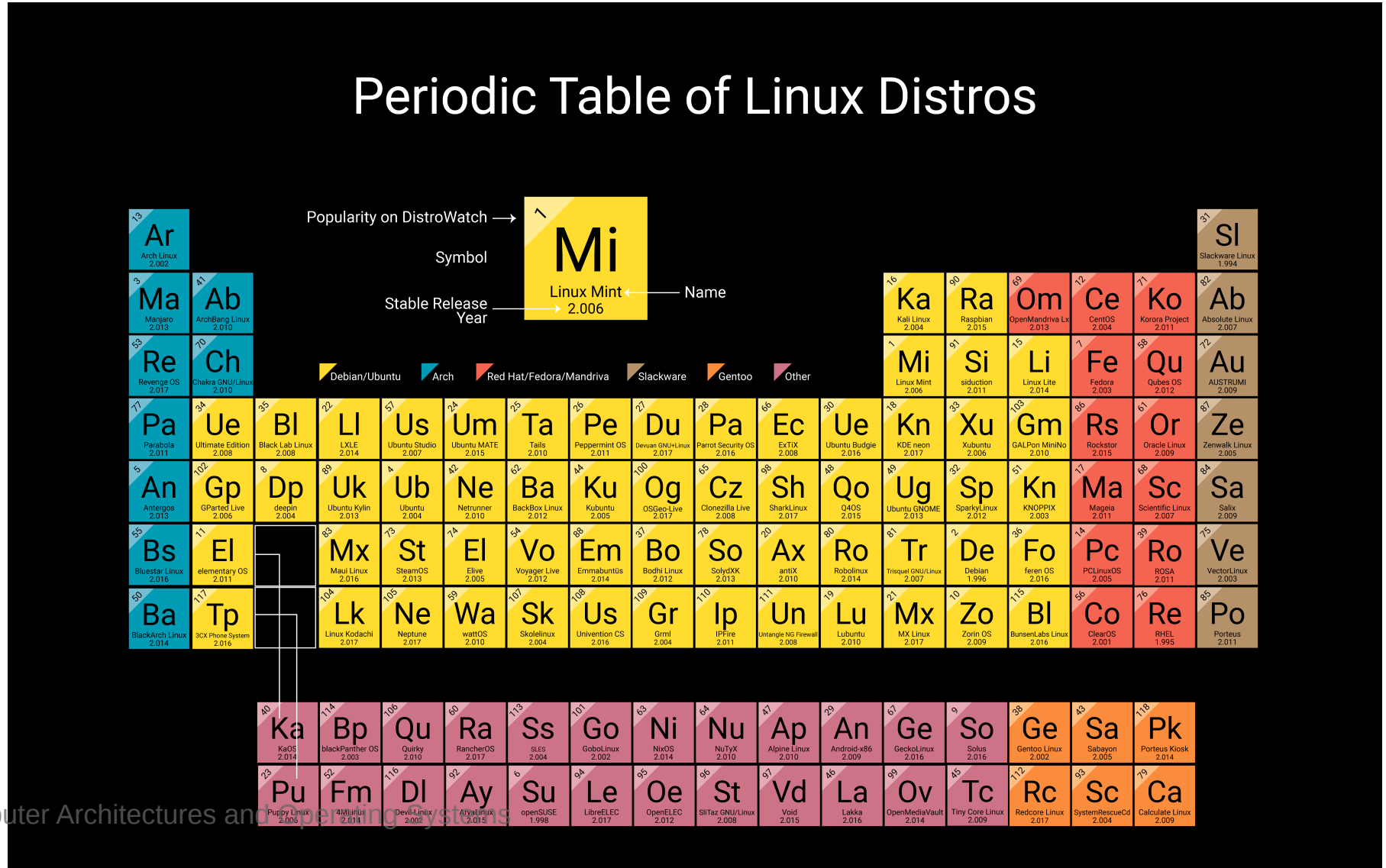
# OS - Market Share



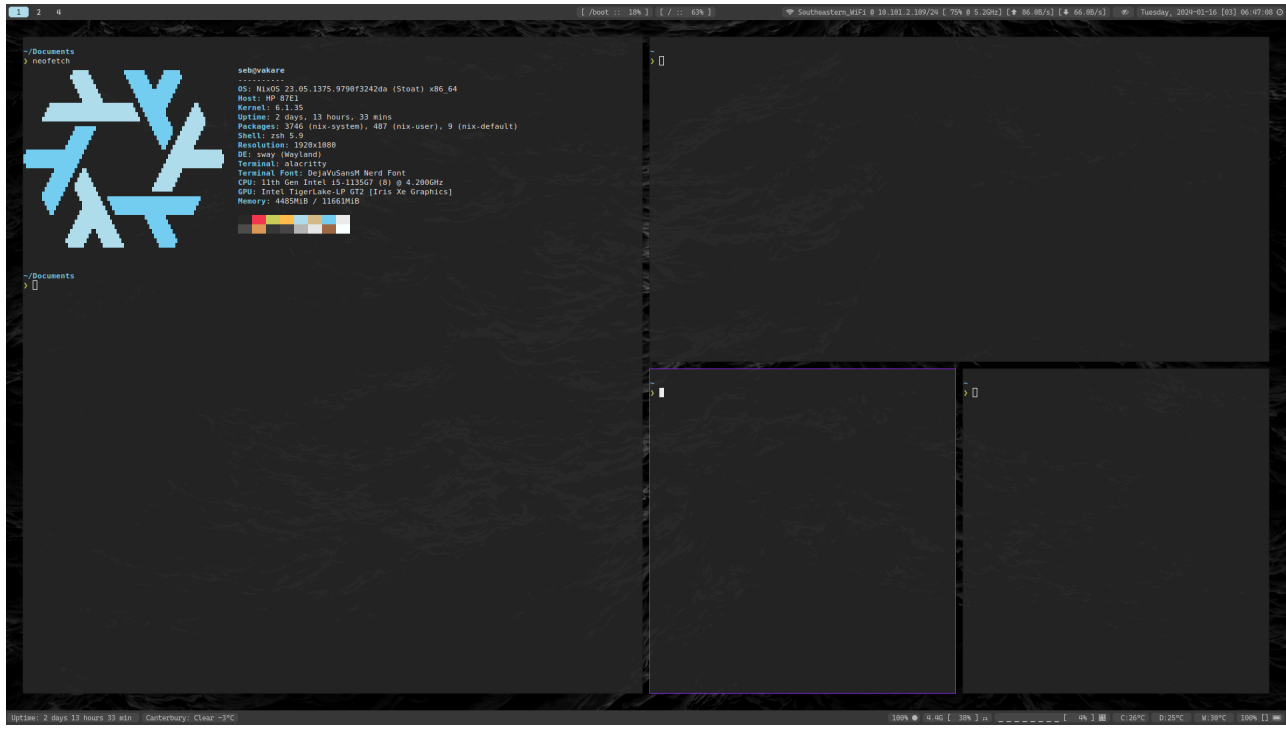
# Linux Distros



# Window Managers

**Definition:**

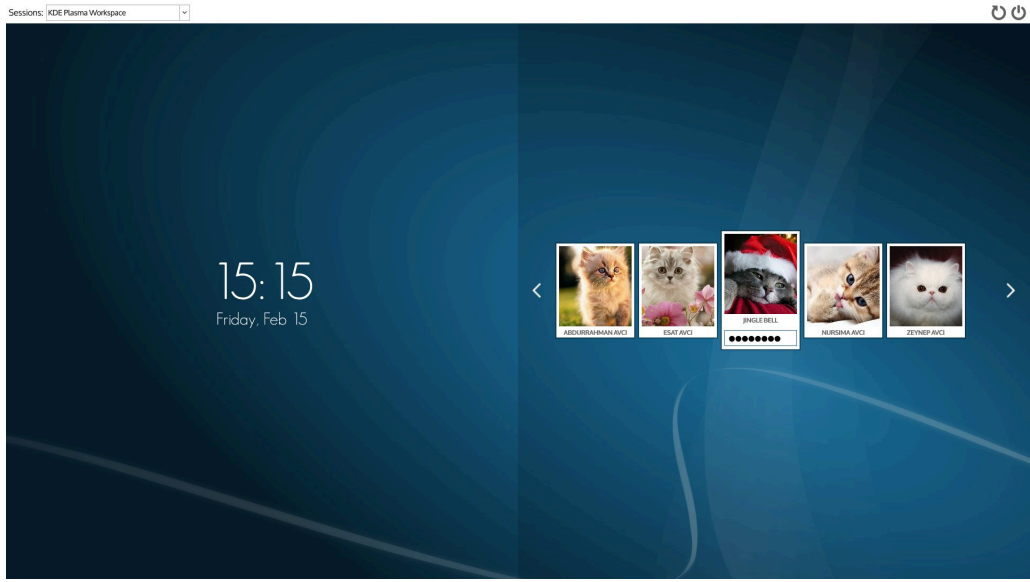
- Control the placement and appearance of windows.
- Handle window decorations, title bars, and borders.
- Example:
  - Openbox, i3, Awesome WM.
- Key Characteristics:
  - Lightweight.
  - Confgurable.



# Login Managers

**Definition:**

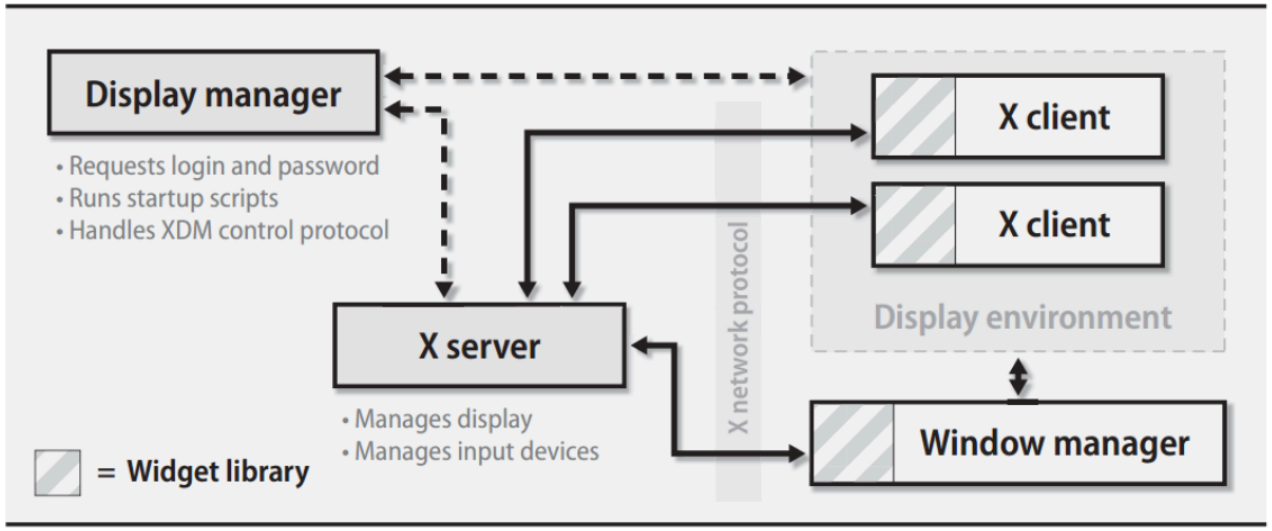
- Manage user authentication at login.
- Present login screen for entering credentials.
- Example:
  - LightDM, GDM (GNOME Display Manager), SDDM.
- Key Characteristics:
  - User authentication.
  - Session selection.



# Display Managers

**Definition:**

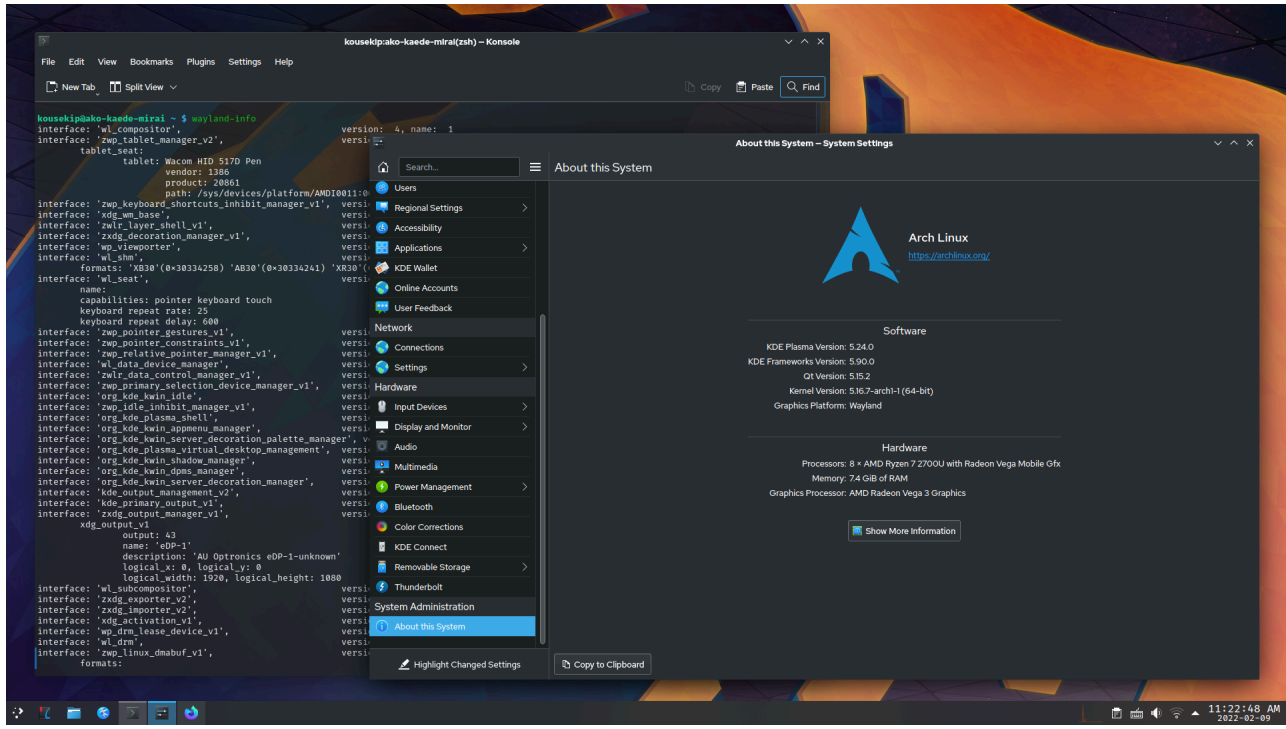
- Control the display server connection.
- Facilitate user sessions.
- Example:
  - XDM (X Display Manager), X11.
- Key Characteristics:
  - Starting graphical sessions.
  - Communicates with X server.



# Desktop Environment

## Definition:

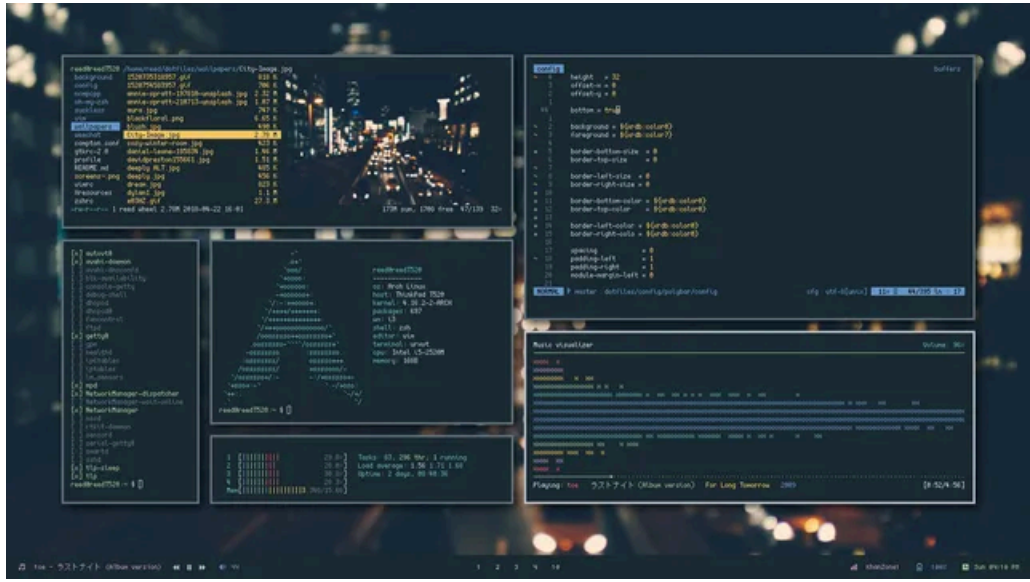
- Integrated suite of applications and tools.
- Provides a cohesive user interface.
- Example:
  - GNOME, KDE, XFCE.
- Key Characteristics:
  - Includes file manager, settings, and applications.
  - Affects overall look and feel.



# Tiling Window Managers

**Definition:**

- Organise windows in a non-overlapping layout.
- Automatic window arrangement.
- Example:
  - i3, dwm, xmonad.
- Key Characteristics:
  - No manual window placement.
  - Efficient use of screen space.



# Windows:

**Windows Manager:**

- Primarily uses the Desktop Window Manager (DWM).
- Provides window composition, rendering, and management.

**Login Manager:**

- Controlled by the Windows Logon process.
- Manages user authentication during login.

**Display Manager:**

- Uses the Windows Display Driver Model (WDDM).
- Facilitates communication with graphics hardware.

**Desktop Environment:**

- Windows OS provides a comprehensive desktop environment.
- Includes the Windows Explorer shell

# macOS:

**Windows Manager:**

- Managed by the Quartz Compositor.
- Handles window drawing and management.

**Login Manager:**

- Utilizes the macOS login window.
- Manages user authentication.

**Display Manager:**

- Core Graphics framework manages the display.
- Coordinates with hardware via Metal.

**Desktop Environment:**

- macOS includes the Aqua graphical user interface.
- Provides a cohesive user experience.