Types of Operating Systems

Suyash Mahar
ECE - 16116069

January 23, 2019

1 Introduction

Operating systems can be classified into multiple types based on the different functionalities, common types of operating systems are listed below:

1. Interactive Operating System
2. Real-time Operating System
3. Network Operating System
4. Application specific Operating System
5. Embedded Operating System
6. Server Operating System
7. Desktop Operating System
8. Multi-user Operating System

2 Interactive Operating Systems

Interactive Operating Systems are a class of operating systems which allows user to interact with the operating system. Interactive operating system are either single task or multi-task operating system. These operating systems have a either a *command line interface* or *graphical style interface* for the user.

2.1 Command line interface (CLI) Operating Systems

Command line interface is a Operating System interface where user enters commands as lines of text which are interpreted and executed sequentially.

Example: MS-DOS

2.2 Graphical interface Operating Systems

Another class of interactive operating system is the graphical user interface (GUI) based operating systems. These operating systems provide graphics (icons, menus, windows, etc.) for easier use of the operating system.

Example: Windows, Linux with X server or Wayland compositor.

3 Real-time Operating Systems

Real time operating systems are a class of operating systems that are for real-time systems. Real-time systems process data as it arrives, any delay introduced by buffers or similar structures is avoided. Example of real time systems are digital signal processors in audio synthesizers, operating systems monitoring sensor data for critical applications like aircraft, neurostimulators, etc.

Example: FreeRTOS and Xenomai.

4 Network Operating Systems

Network operating system is a kind of operating system which is designed for networking devices like routers, switches, modems, etc. Network operating systems can be considered to be embedded operating systems since they are embedded in network equipments.

Example: IPOS, PicOS...

5 Application specific Operating Systems (ASOS)

An application specific operating systems is a variation of general purpose operating system which provides limited number of functionalities for a particular application. Being designed for a specific application, the OS has better computational and energy performance compared to a GPOS for that specific task.

Example: IPOS, PGO...

6 Embedded Operating Systems

An embedded operating system is an operating system configured for a particular hardware that is embedded within a larger machine. These operating systems have stronger I/O capabilities to monitor the machine. Embedded operating systems are required to be performance-efficient and resource optimum.

7 Server Operating Systems

Server operating systems are a class of operating systems that are designed to work efficiently as a computer server. These operating systems are more effective in handling network and system resources to deliver services and application over a network.

Example: Windows Server 2012, Red Hat Linux...

8 Desktop Operating Systems

Desktop operating systems are class of operating systems that are designed to be run on desktop computers, these operating system are user friendly and includes utilities to increase productivity in home and office environment.

Example: Windows 10, Ubuntu 18.04...

9 Multi-user Operating Systems

Any operating systems that allows multiple users to share a common computing resource are referred to as Multi-user operating system. Most modern operating systems (excluding ASOS and embedded operating systems) are multi-user operating systems. Multi user operating systems brings down the overall establishment cost as it allows sharing of computer hardware.

Example: Ubuntu, Kubuntu, Windows 10...