

## Special Purpose Systems

### Definition:

- Systems whose functions are limited and their objective is to deal with limited computational domains, are called special purpose systems.



## Special Purpose Systems

### Real Time Embedded Systems

CLOSE X



- We use the microwave oven in our kitchen everyday to heat, cook etc.
- Did you know that it's an embedded system?
- The display and buttons of a microwave oven depend on an operating system to run and such operating systems are called real time embedded systems.

## Special Purpose Systems

### Real Time Embedded Systems

CLOSE

- Real time embedded systems provide computing environment that reacts to input within a specific time period.
- The response time in these systems is very small so, result appears instantaneous.
- These systems do not interface using keyboard or mouse like personal computers, but use sensors, actuators etc to interface as they are a part of a larger system.

**Examples are :** Washing machines, ATM, Set top boxes, etc



## Special Purpose Systems

### Handheld Systems or Mobile system

CLOSE

- Your smart phone is nothing but an handheld system.
- Handheld systems provide some features of a computer with small size, less weight and portability.
- PDA's, Pocket PC's are some of the examples of handheld systems
- Memory should be managed efficiently due to limited size and memory.
- **Web Clipping** technique is used to display subset of a webpage content on the handheld device.



# Standalone

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A standalone device is able to function independently of other hardware. This means it is not integrated into another device.

The **computing environment** involves the collection of **computer** machinery, data storage devices, work stations, software applications, and networks that support the processing and exchange of electronic information demanded by the software solution.

# TYPES OF COMPUTING

- 1.virtualization
- 2.cloud computing
- 3.peer to peer
- 4.client-server
- 5.Traditional computing

# Virtualization

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In computing, **virtualization** (alternatively spelled *virtualisation*) refers to the act of creating a virtual (rather than actual) version of something, including virtual [computer hardware](#) platforms, [storage devices](#), and [computer network](#) resources.





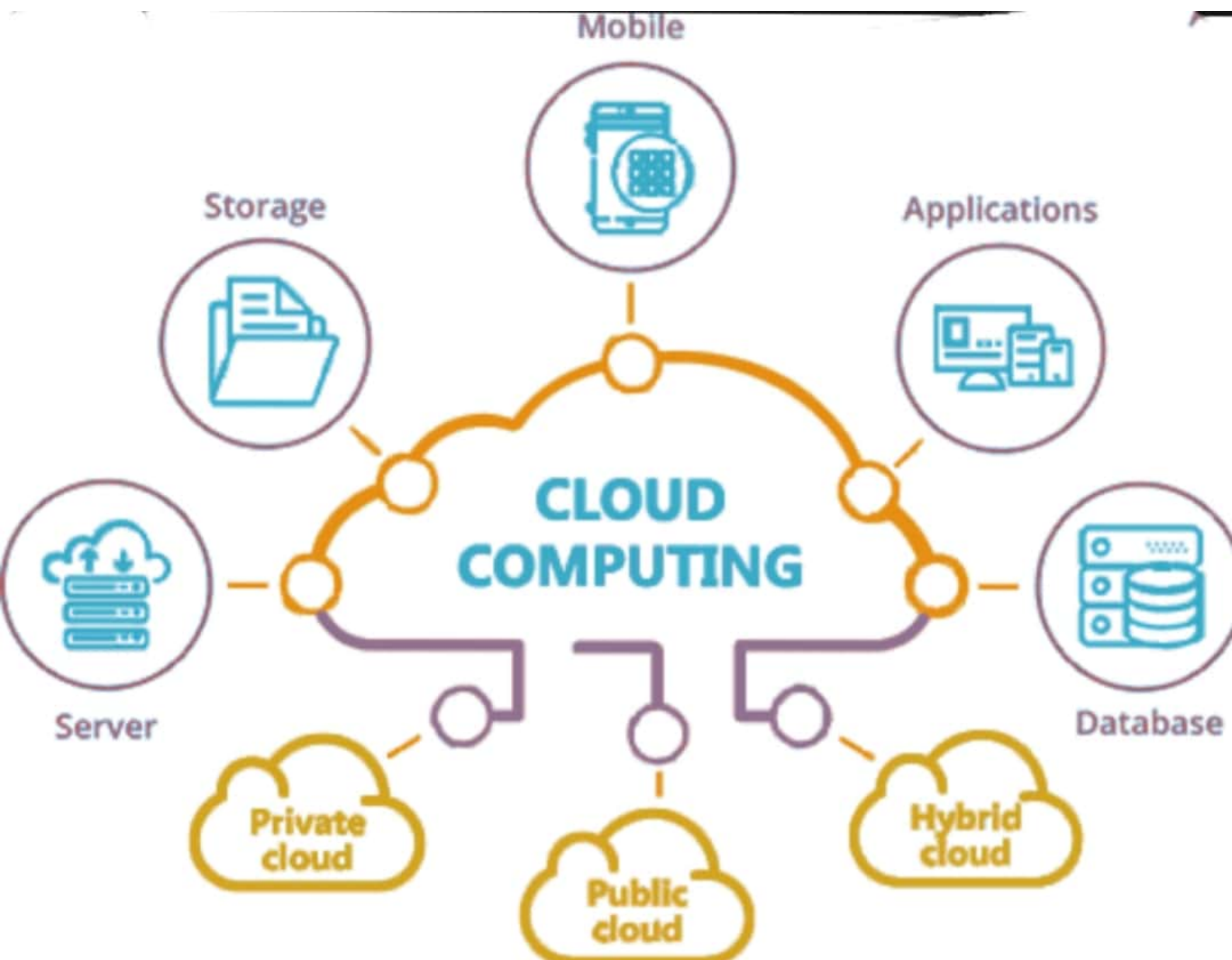
[www.educha.com](http://www.educha.com)

# Cloud computing



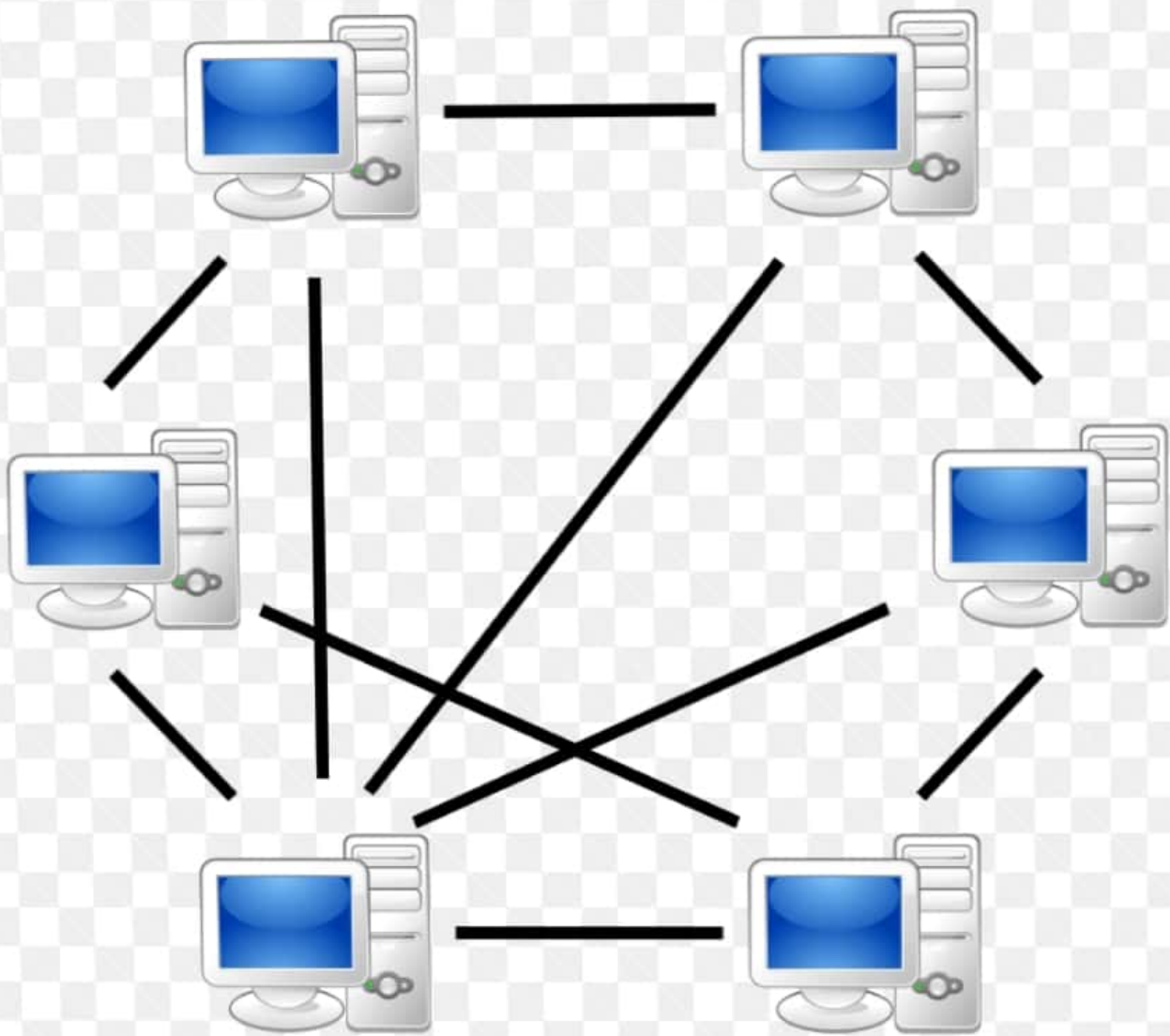
For the winner of the 2017 Preakness Stakes, see [Cloud Computing \(horse\)](#).

**Cloud computing** is the on-demand availability of [computer system resources](#), especially data storage ([cloud storage](#)) and [computing power](#), without direct active management by the user. The term is generally used to describe [data centers](#) available to many users over the [Internet](#).<sup>[1]</sup>



## Peer-to-Peer Computing

- Another model of distributed system
- P2P does not distinguish clients and servers
- Instead all nodes are considered peers
- May each act as client, server or both
- Node must join P2P network

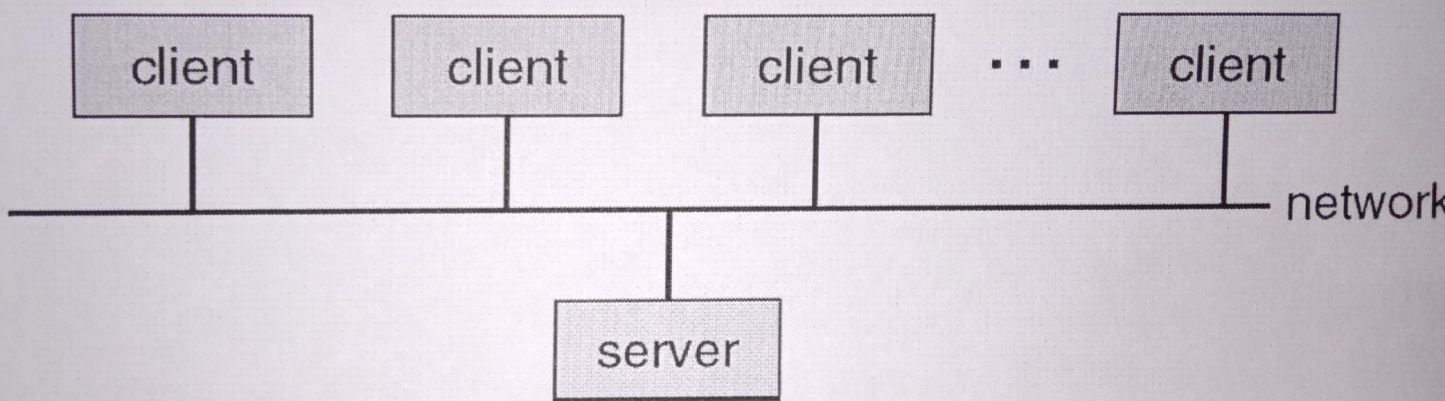


The term Client/Server is used to describe a computing model for the development of computerized systems.

This model is based on distribution of functions between two types of independent and autonomous processes: Server and Client.

A Client is any process that requests specific services from the server process.

A Server is a process that provides requested services for the Client.





### **Traditional computer**

- Blurring over time
- Office environment
  - PCs connected to a network, terminals attached to mainframe or minicomputers providing batch and timesharing
  - Now portals allowing networked and remote systems access to same resources
- Home networks
  - Used to be single system, then modems
  - Now firewalled, networked
- Client-Server Computing

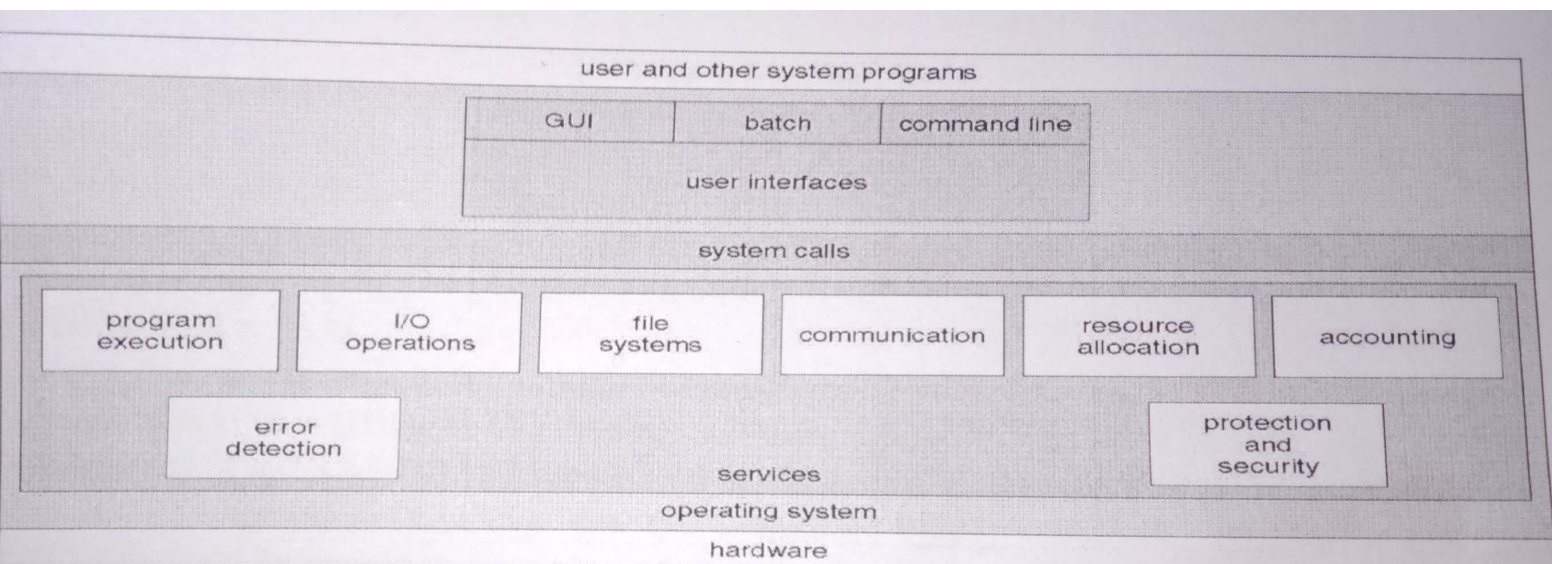




# Open-Source Operating Systems

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- ❑ Operating systems made available in source-code format rather than just binary **closed-source**
- ❑ Counter to the **copy protection** and **Digital Rights Management (DRM)** movement
- ❑ Started by **Free Software Foundation (FSF)**, which has “copyleft” **GNU Public License (GPL)**
- ❑ Examples include **GNU/Linux** and **BSD UNIX** (including core of **Mac OS X**), and many more



### Operating System Services

- One set of operating-system services provides functions that are helpful to the user:
- User interface - Almost all operating systems have a user interface (UI)
  - Varies between Command-Line (CLI), Graphics User Interface (GUI), Batch
- Program execution - The system must be able to load a program into memory and to run that program, end execution, either normally or abnormally (indicating error)
- I/O operations - A running program may require I/O, which may involve a file or an I/O device

- File-system manipulation - The file system is of particular interest. Obviously, programs need to read and write files and directories, create and delete them, search them, list file information, permission management.

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Communications – Processes may exchange information, on the same computer or between computers over a network Communications may be via shared memory or through message passing (packets moved by the OS)
- Error detection – OS needs to be constantly aware of possible errors May occur in the CPU and memory hardware, in I/O devices, in user program For each type of error, OS should take the appropriate action to ensure correct and consistent computing Debugging facilities can greatly enhance the user's and programmer's abilities to efficiently use the system
- Another set of OS functions exists for ensuring the efficient operation of the system itself via resource sharing
- **Resource allocation** - When multiple users or multiple jobs running concurrently, resources must be allocated to each of them
- Many types of resources - Some (such as CPU cycles, main memory, and file storage) may have special allocation code, others (such as I/O devices) may have general request and release code
- **Accounting** - To keep track of which users use how much and what kinds of computer resources
- **Protection and security** - The owners of information stored in a multiuser or networked computer system may want to control use of that information, concurrent processes should not interfere with each other
- **Protection** involves ensuring that all access to system resources is controlled
- **Security** of the system from outsiders requires user authentication, extends to defending external I/O devices from invalid access attempts
- If a system is to be protected and secure, precautions must be instituted throughout it. A chain is only as strong as its weakest link.