

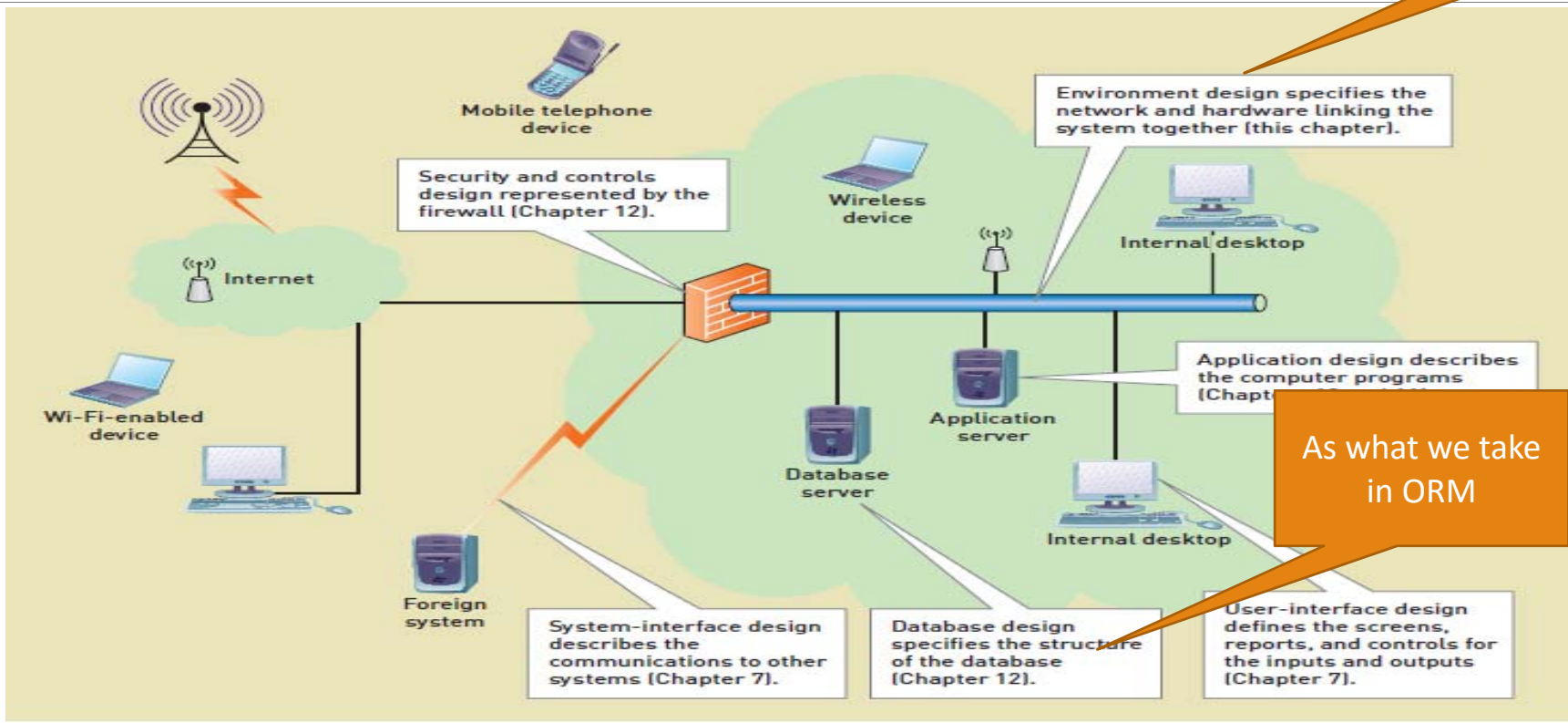
System Design

LAB 1 SYSTEM ARCHITECTURES



Overview of Design Phase

Today's lab



As what we take in ORM

Design Activities and Key Question

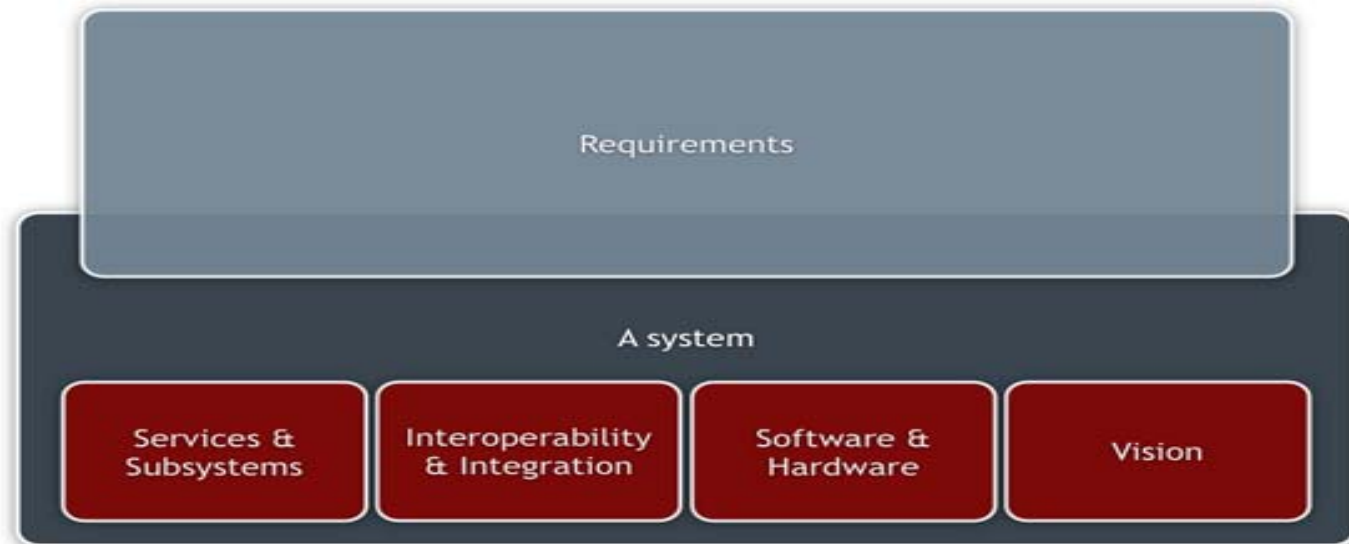
| Design activity | Key question |
|--|---|
| Design the environment | Have we specified in detail the environment and all the various options in which the software will execute? |
| Design application architecture and software | Have we specified in detail all the elements of the software and how each use case is executed? |
| Design system interfaces | Have we specified in detail how the system will communicate with all other systems inside and outside the organization? |
| Design user interfaces | Have we specified in detail how users will interact with the system to carry out all their tasks (use cases)? |
| Design the database | Have we specified in detail all the information storage requirements, including all the schema elements? |
| Design system controls and security | Have we specified in detail all the elements to ensure the system and the data are secure and protected? |

System Architecture

"System architecture" is the conceptual model that defines the way in which desired functionality is met by hardware and software components as well as how these components relate to each other and the intended users of the system.

"Architecture" is often generically used to refer to the system architecture, at least within the context of software systems development.

System Architecture



Different System Architectures

- ❑ Stand-Alone Software Systems
- ❑ File Server Architecture
- ❑ Client Server Architecture
- ❑ External\ Web Deployment Architecture
- ❑ Service-Oriented Architecture
- ❑ Cloud Computing

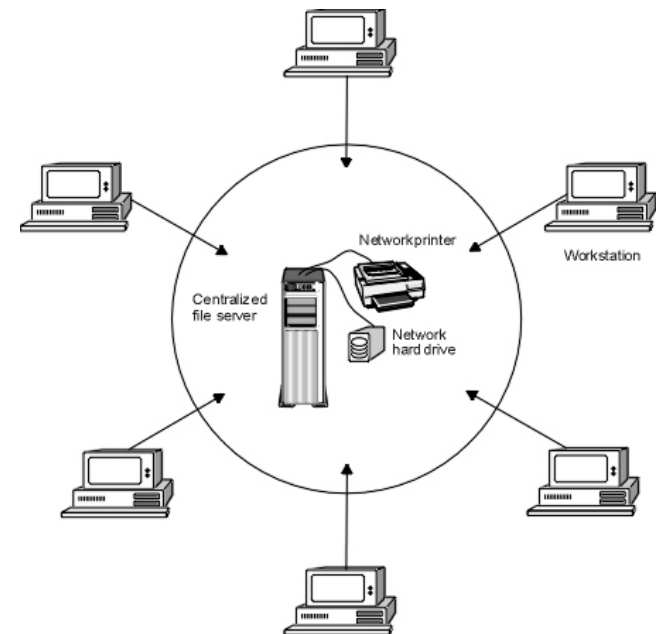
Stand-Alone Software Systems

Any software system that executes on a **single computing device** without connecting externally via an Internet or network connection is a stand-alone system.

File System Architecture

File Servers are useful for sharing information across the network .

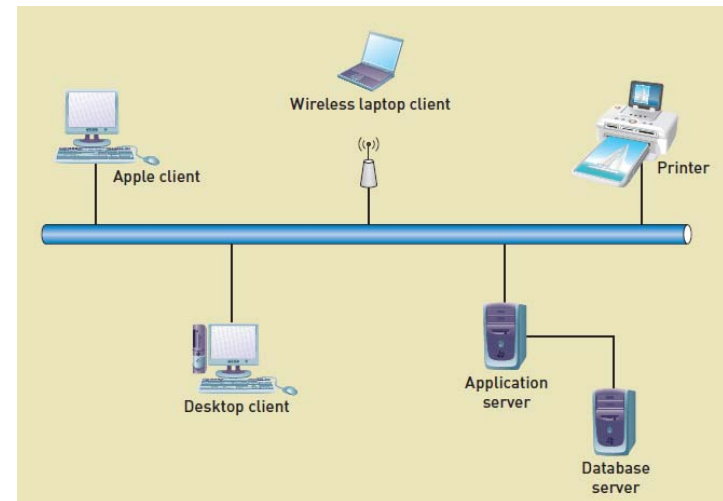
The client passes a request for file records over a network to the file server.



Client Server Architecture

Client : A client is a single-user workstation that provides presentation services and the appropriate computing, connectivity and the database services and the interfaces relevant to the business need.

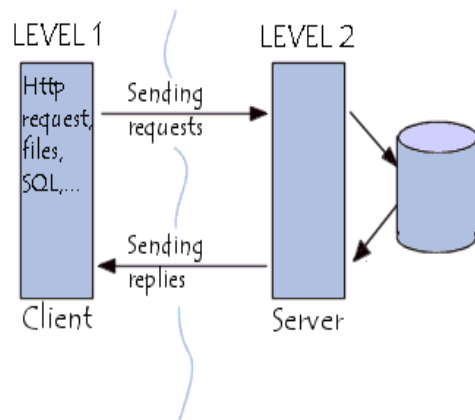
Server : A server is one or more multi-user processors with share memory providing computing, connectivity and the database services and the interfaces relevant to the business need.



Client Server Architecture

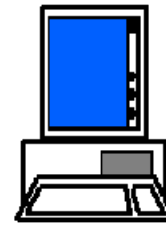
Types of Client-Server Architecture:

- Two-Tier Architecture:



First Tier:

Client



Tasks/Services

- User Interface
- Presentation services
- Application services

Second Tier:

Data Server



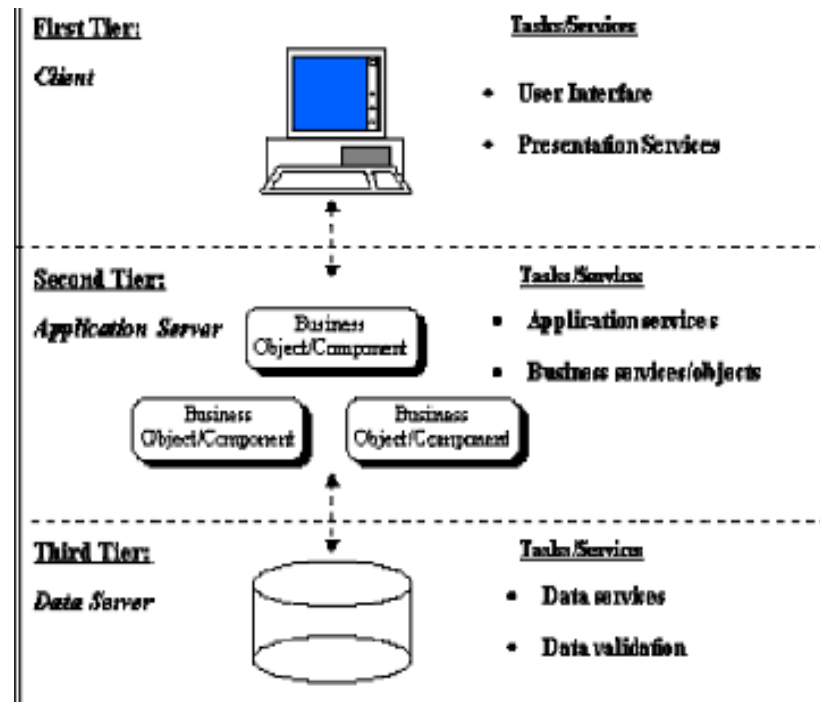
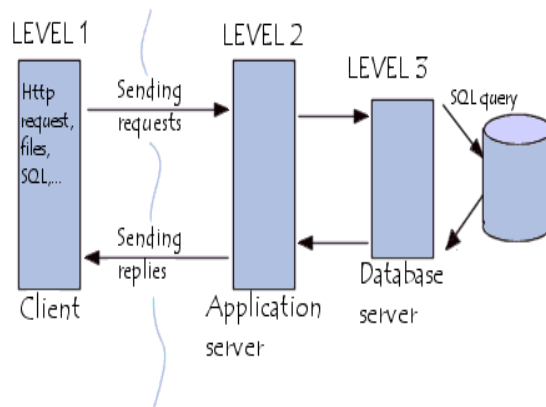
Tasks/Services

- Application services
- Business services
- Data services

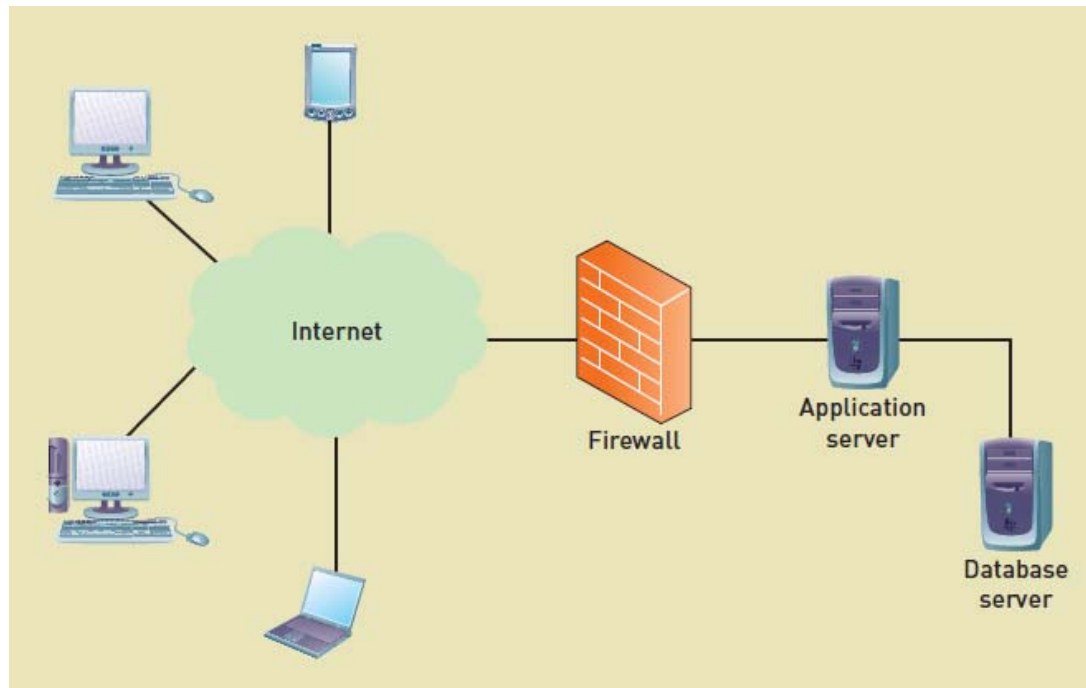
Client Server Architecture

Types of Client-Server Architecture:

- Three-Tier Architecture – n-Tiers



External\Web Deployment Architecture



Service-Oriented Architecture

service-oriented architecture (SOA) is a set of principles and methodologies for designing and developing software in the form of interoperable services. These services have well-defined business functionalities that are built as software components which can be reused for different purposes

SOA design principles are used during the phases of system development and integration.

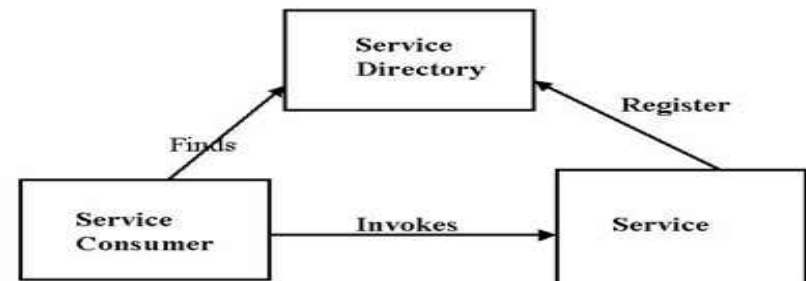
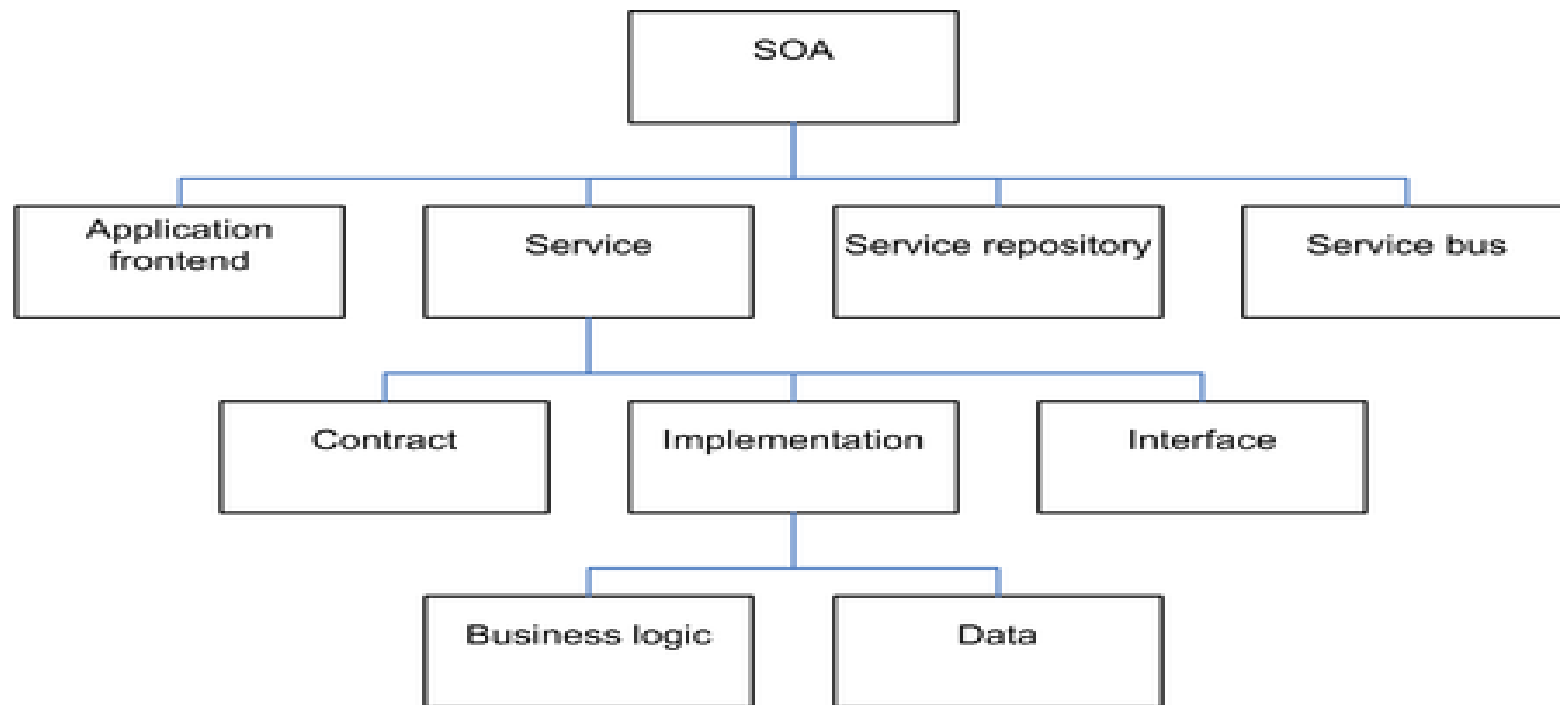


Fig 1. Service Oriented Architecture

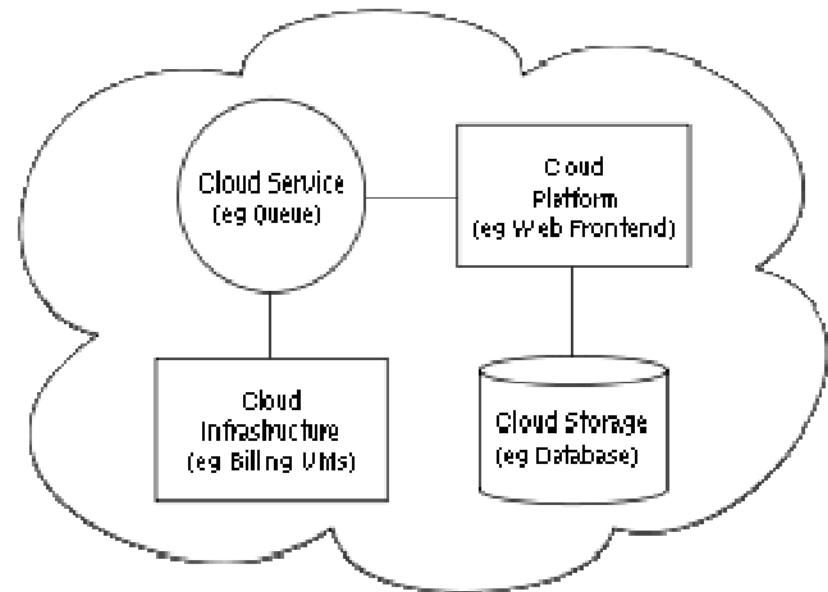
Service-Oriented Architecture



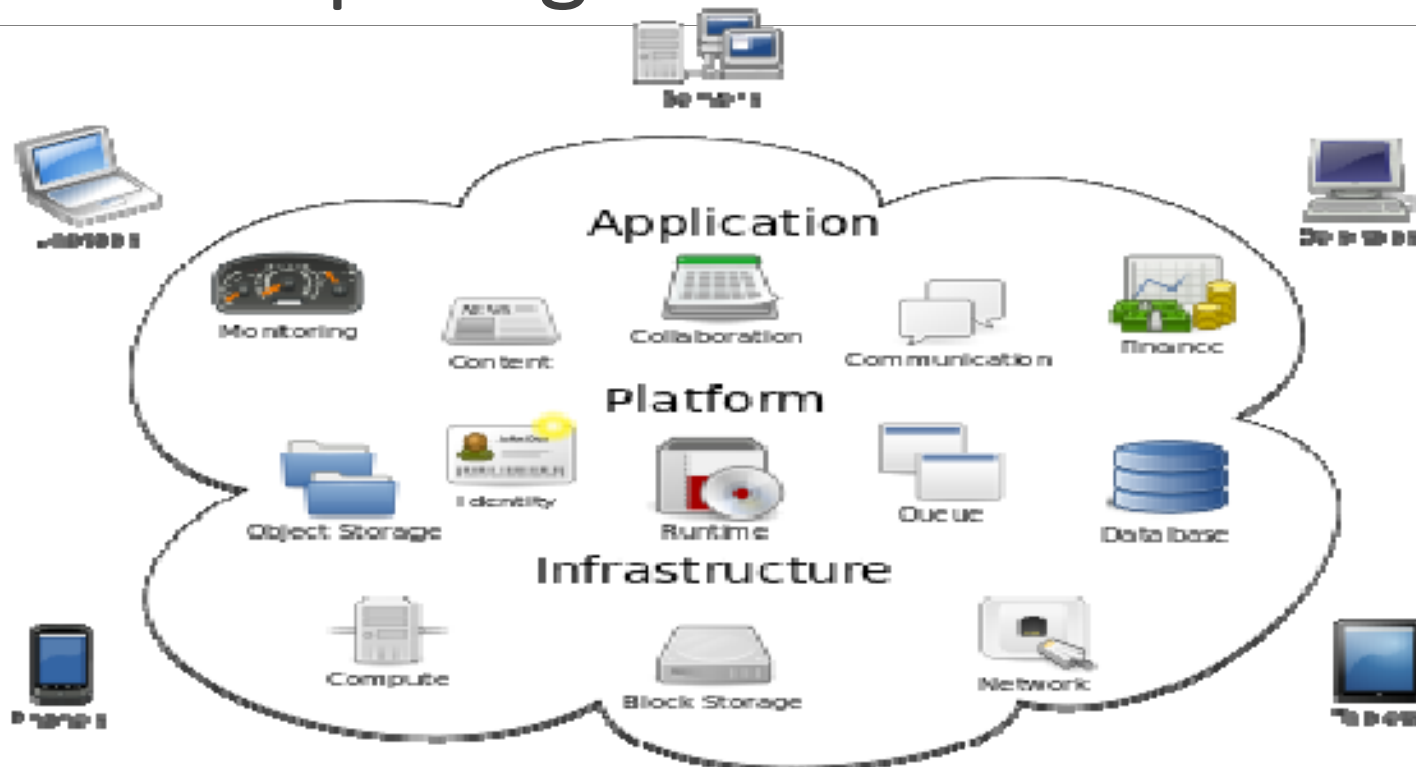
Cloud Computing

Cloud Computing is a general term used to describe a new class of network based computing that takes place over the Internet.

Cloud computing architecture refers to the components and subcomponents required for cloud computing



Cloud Computing



Cloud Computing

Cloud Computing

Type of cloud computing


- **Public clouds**

- Public clouds are run by third parties, and applications from different customers are likely to be mixed together on the cloud's servers, storage systems, and networks
- Public clouds are most often hosted away from customer premises, and they provide a way to reduce customer risk and cost by providing a flexible, even temporary extension to enterprise infrastructure.
- Public cloud provider like Amazon , Microsoft Azure

Cloud Computing

Type of cloud computing

- **Private clouds**

- Private clouds are built for the exclusive use of one client, providing the utmost control over data, security, and quality of service
 - The company owns the infrastructure and has control over how applications are deployed on it. Private clouds may be deployed in an enterprise datacenter.
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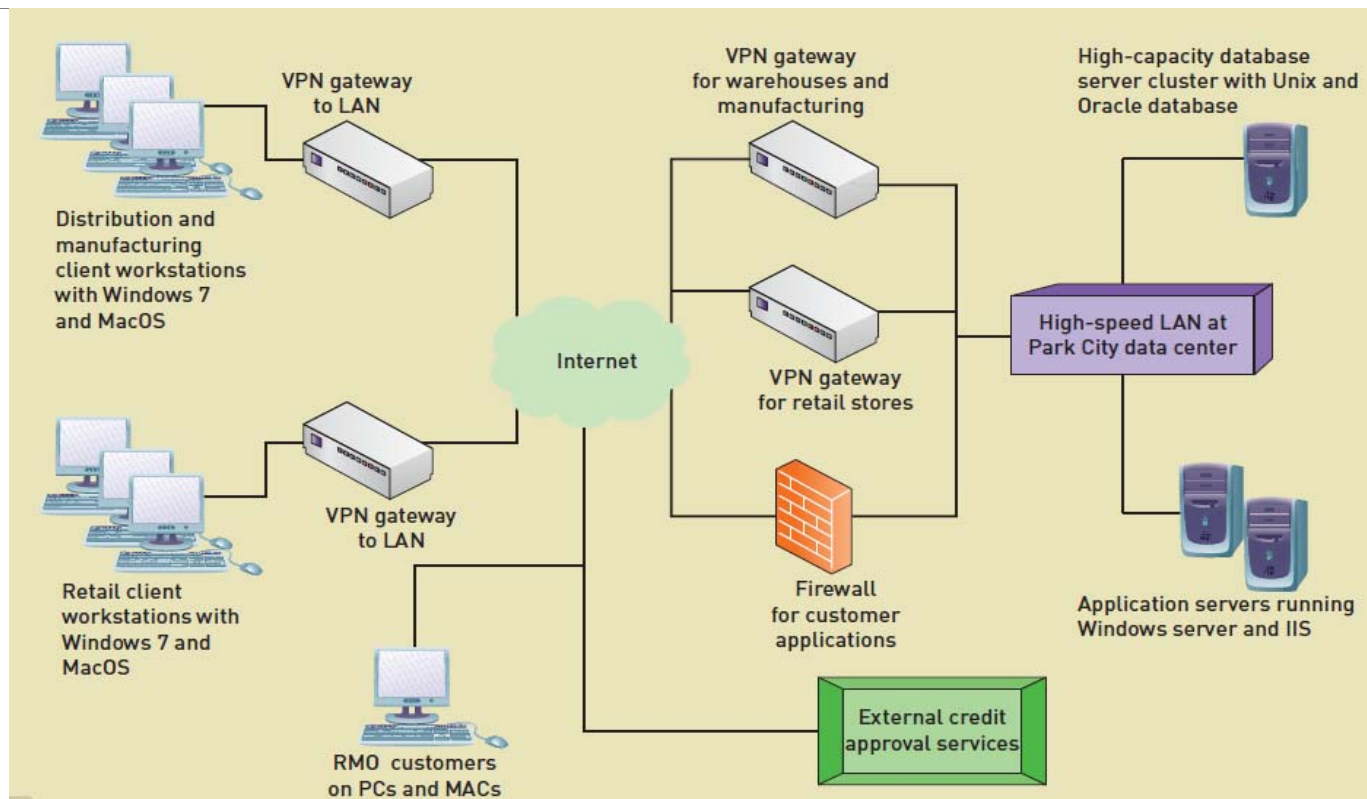
Cloud Computing

Type of cloud computing

- **Hybrid clouds**

- Hybrid clouds combine **both** public and private cloud models
- The ability to augment a private cloud with the resources of a public cloud can be used to maintain service levels in the face of rapid workload fluctuations.

RMO- Architecture



Any Questions