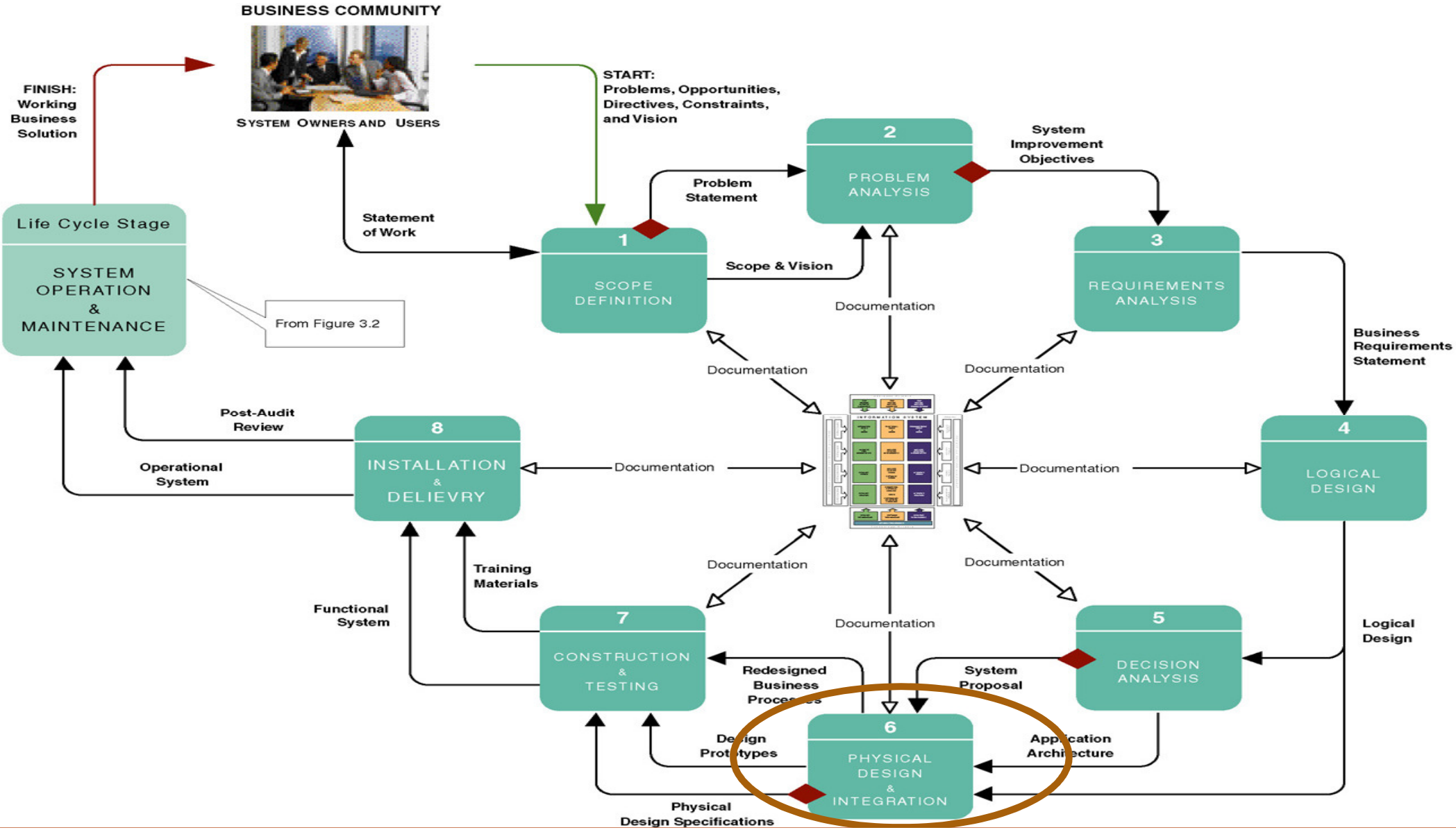
System Design

LAB 1 SYSTEM ARCHITECTURES

Lab Rules

- No Late more than 15 min.
- No Late Assignments.
- Assignments are individual
- Mobile Silent.
- No side talks.

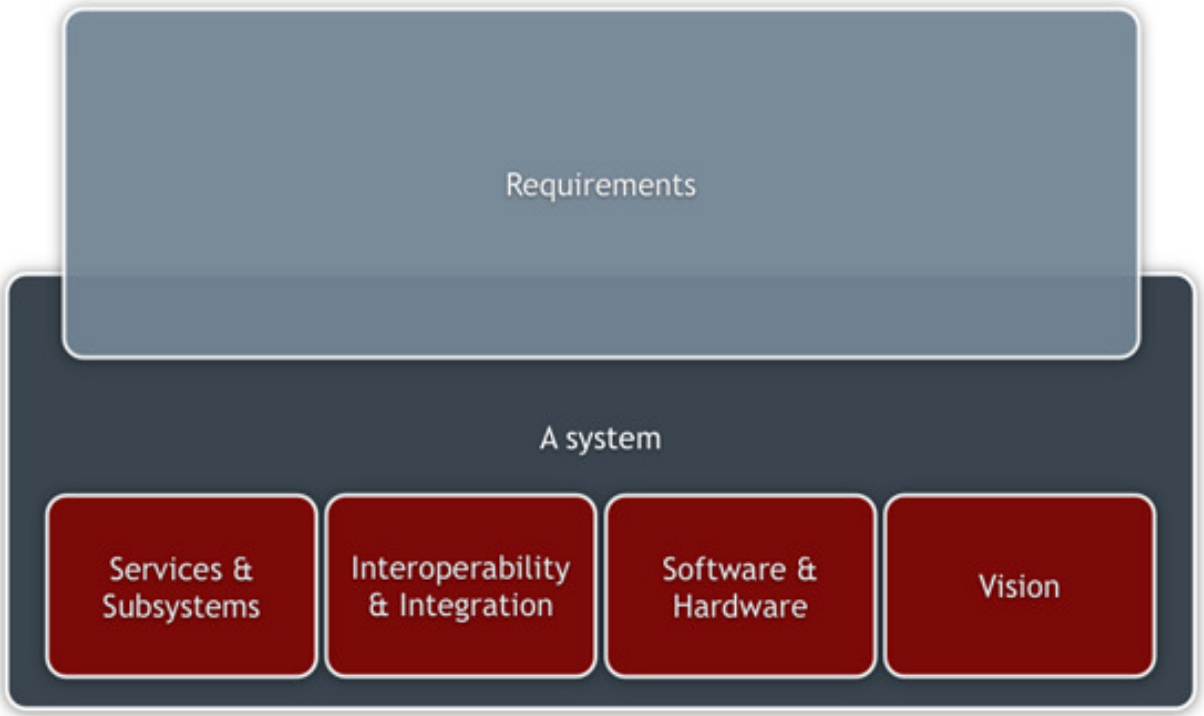

BUSINESS COMMUNITY
SYSTEM OWNERS AND USERS
FINISH: Working Business Solution
START: Problems, Opportunities, Directives, Constraints, and Vision
Life Cycle Stage
SYSTEM OPERATION & MAINTENANCE
From Figure 3.2
Statement of Work
1
SCOPE DEFINITION
Problem Statement
2
PROBLEM ANALYSIS
System Improvement Objectives
3
REQUIREMENTS ANALYSIS
Business Requirements Statement
4
LOGICAL DESIGN
Logical Design
5
DECISION ANALYSIS
System Proposal
6
PHYSICAL DESIGN & INTEGRATION
Application Architecture
Design Prototypes
Redesigned Business Processes
Physical Design Specifications
7
CONSTRUCTION & TESTING
Functional System
Training Materials
8
INSTALLATION & DELIEVRY
Post-Audit Review
Operational System
Scope & Vision
Documentation
Documentation
Documentation
Documentation
Documentation
Documentation
Documentation
Documentation

System Architecture

"System architecture" refers to 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



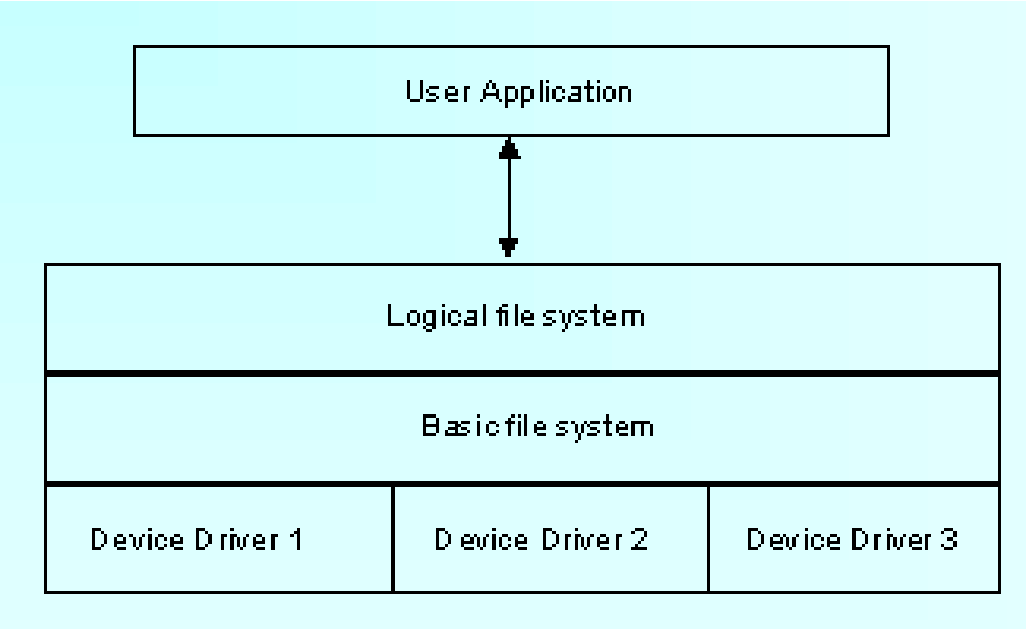
Different System Architectures

1. File Server Architecture
2. Client/Server Architecture
3. Service-Oriented Architecture
4. Cloud Computing

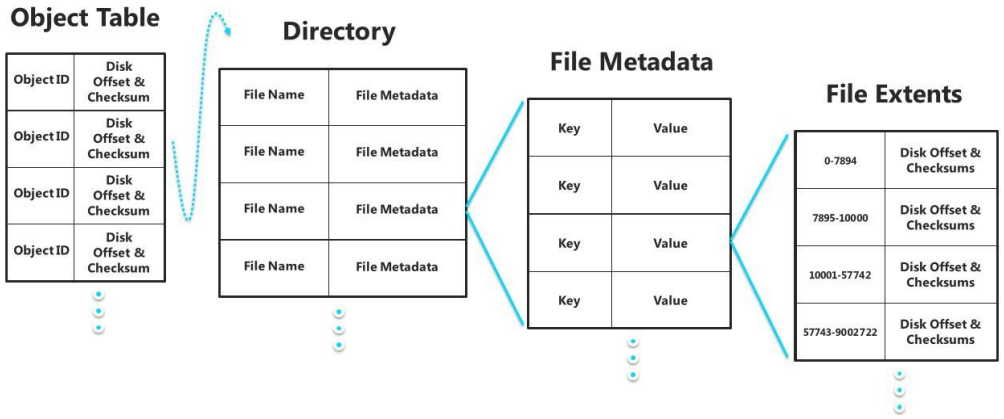
File System Architecture

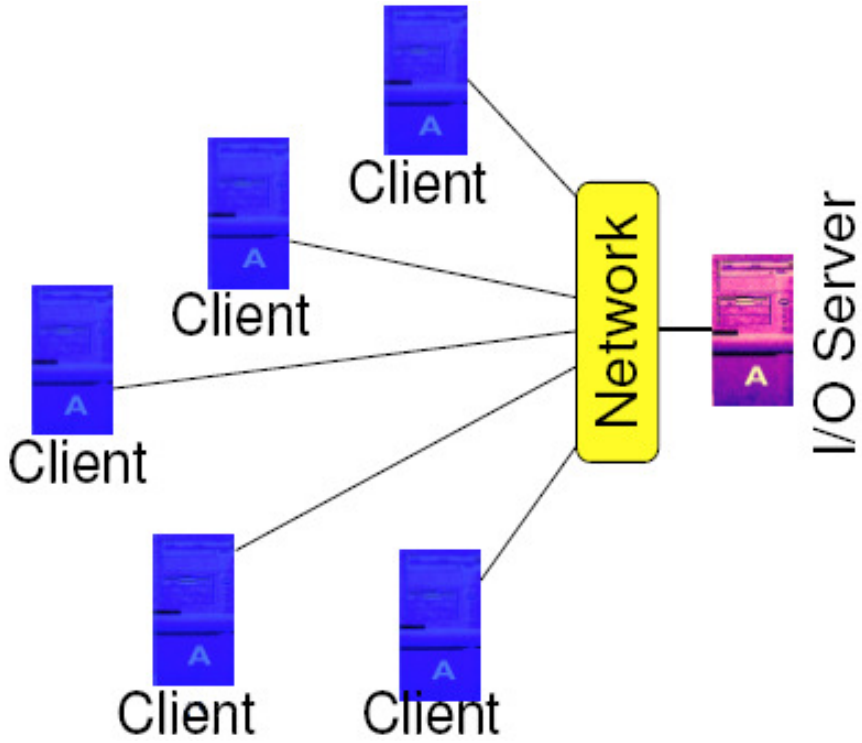
File Servers are useful for sharing information across the network.

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



File System Architecture

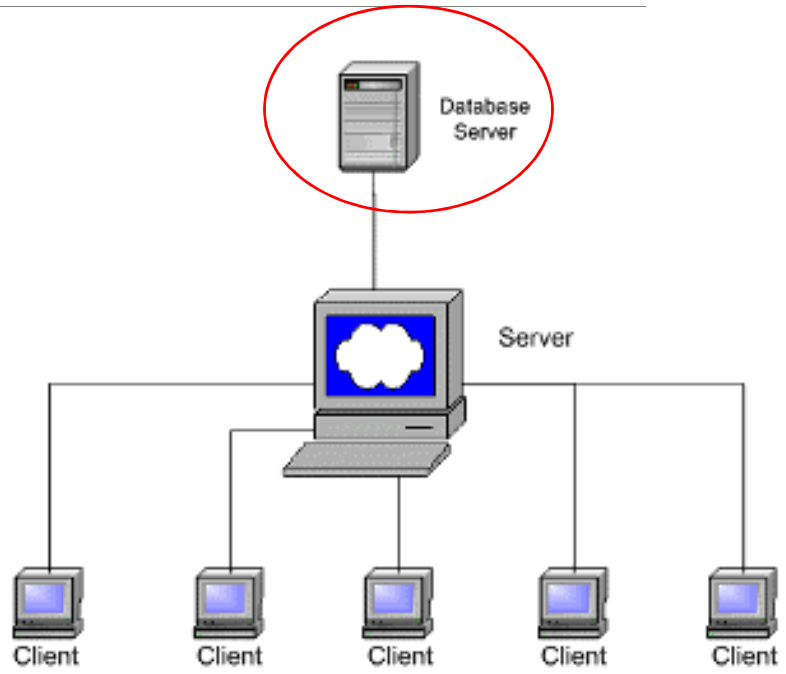




Client Server Architecture

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.

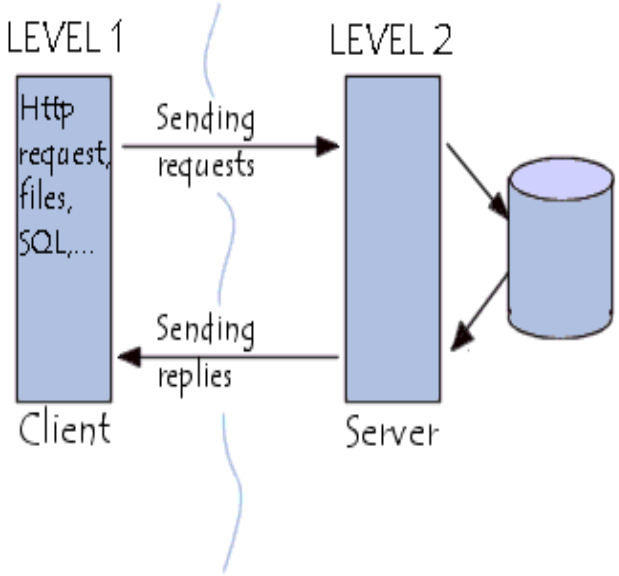
Server- A server is one or more multi-user processors with share memory providing computing, connectivity and the database services and the interfaces relevant to the business need.

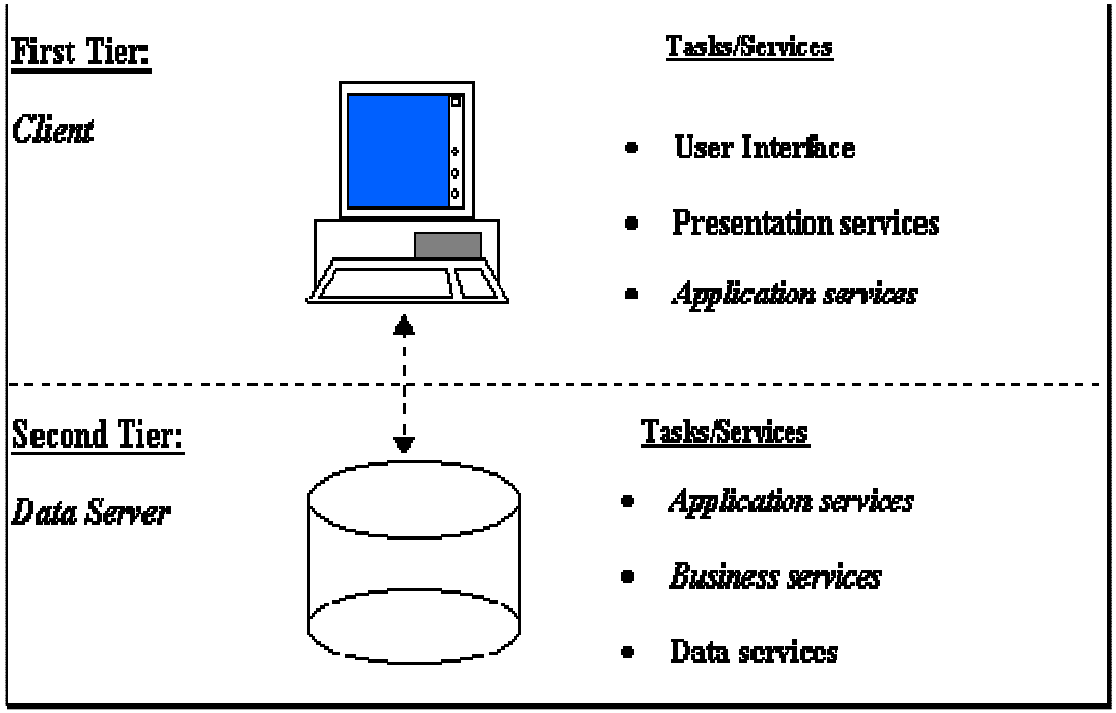


Client Server Architecture

Types of Client-Server Architecture:

- **Two-Tier Architecture:**

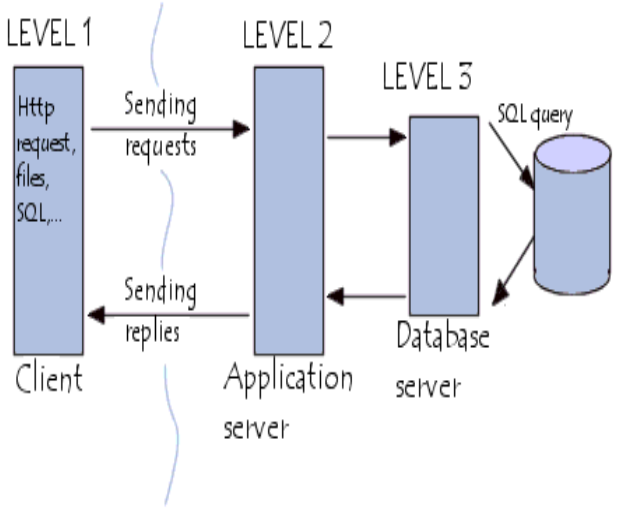


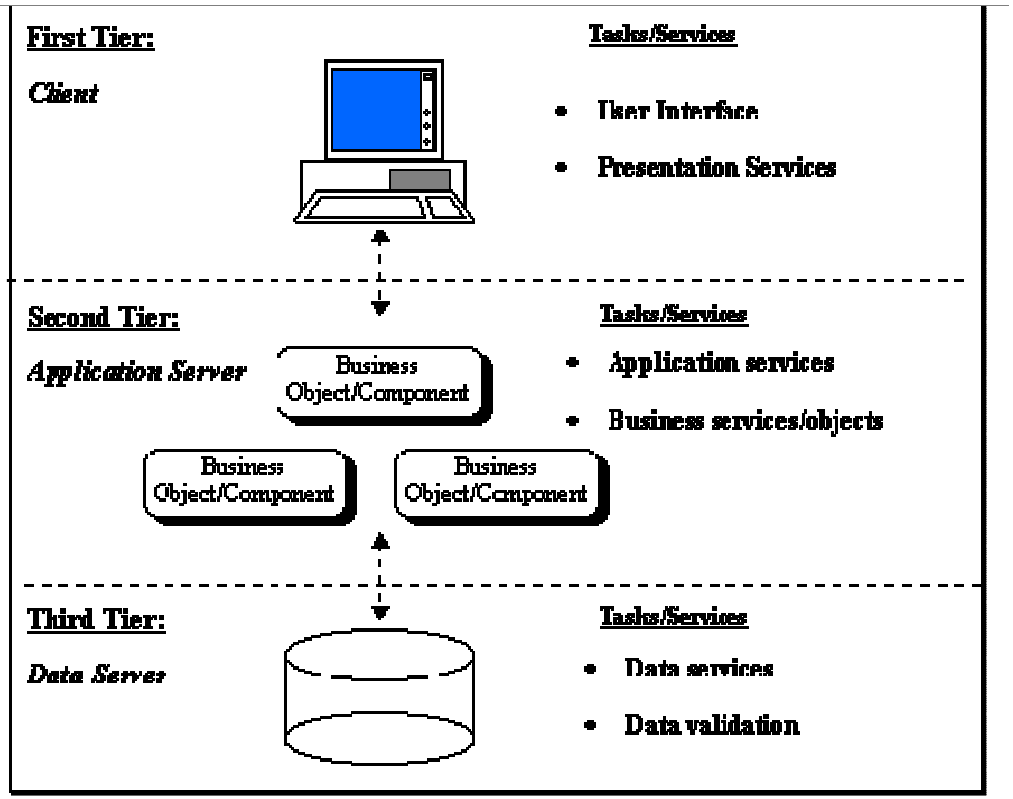


Client Server Architecture

Types of Client-Server Architecture:

- **Three-Tier Architecture - nTiers**





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.

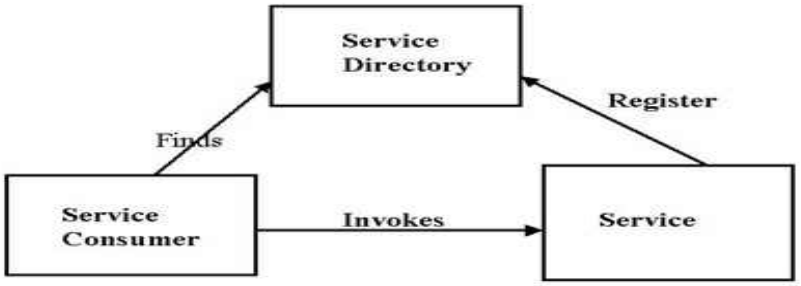
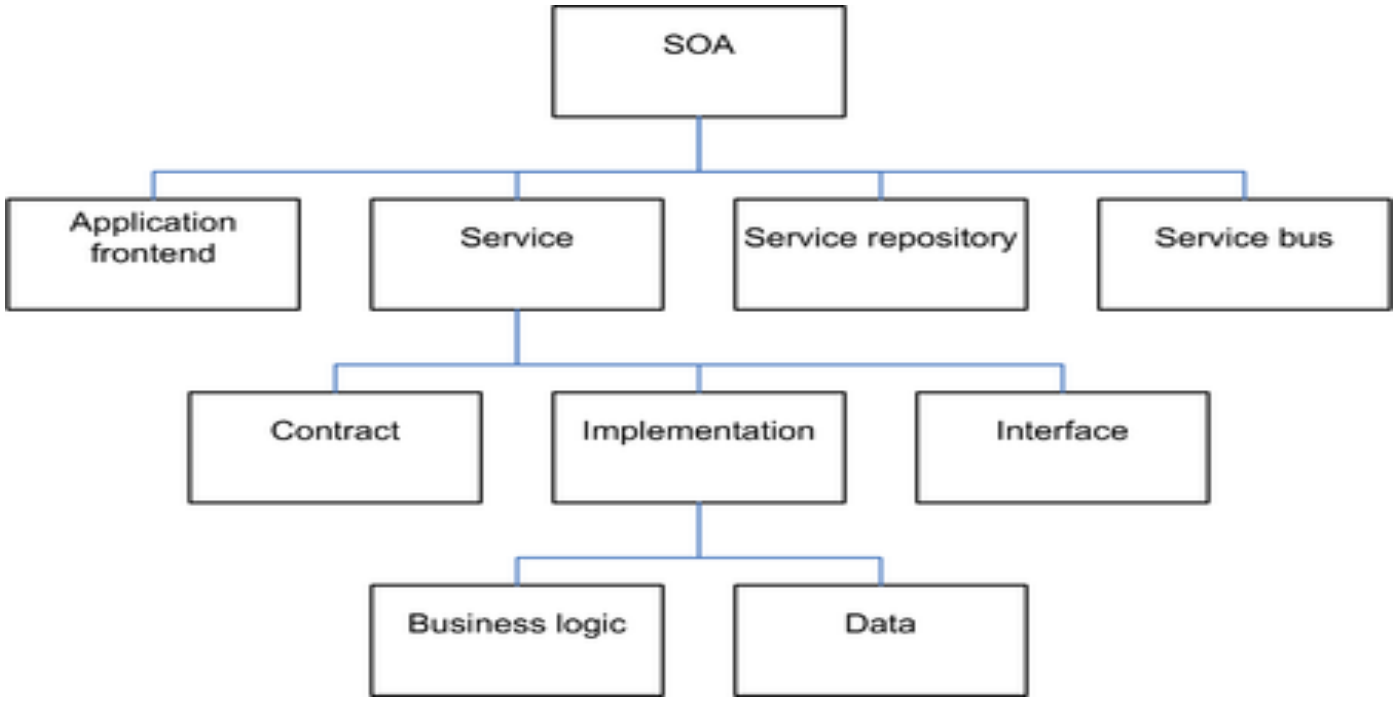


Fig 1. Service Oriented Architecture

Service-Oriented Architecture

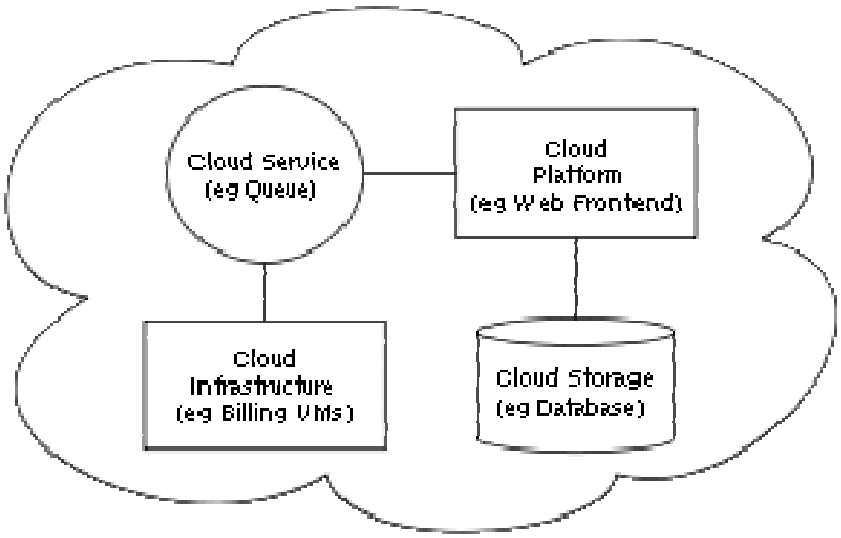
Elements of SOA

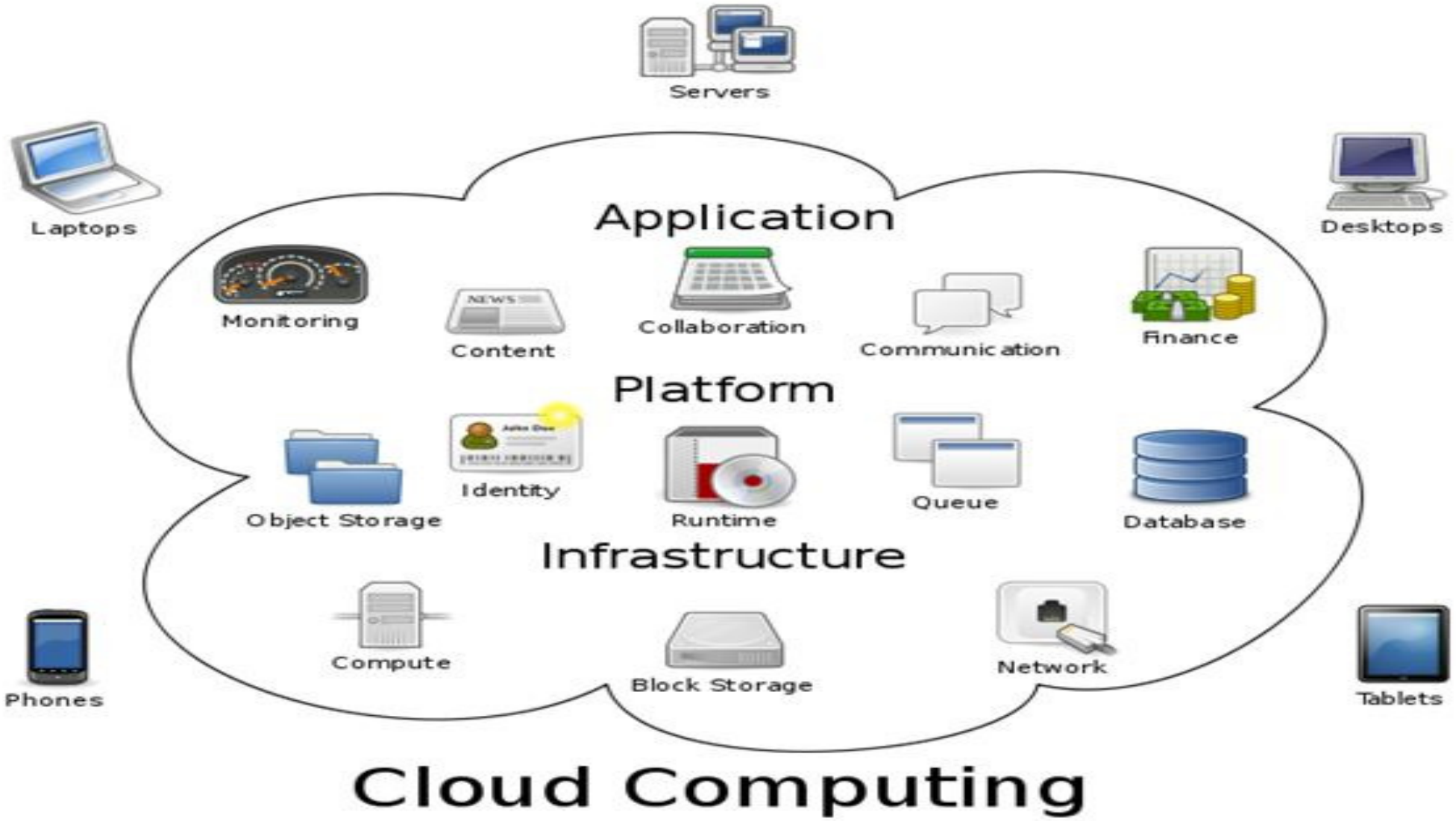


Cloud Computing

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




Servers
Laptops
Desktops
Application
Monitoring
Content
Collaboration
Communication
Finance
Platform
Identity
Object Storage
Runtime
Queue
Database
Infrastructure
Compute
Block Storage
Network
Phones
Tablets
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

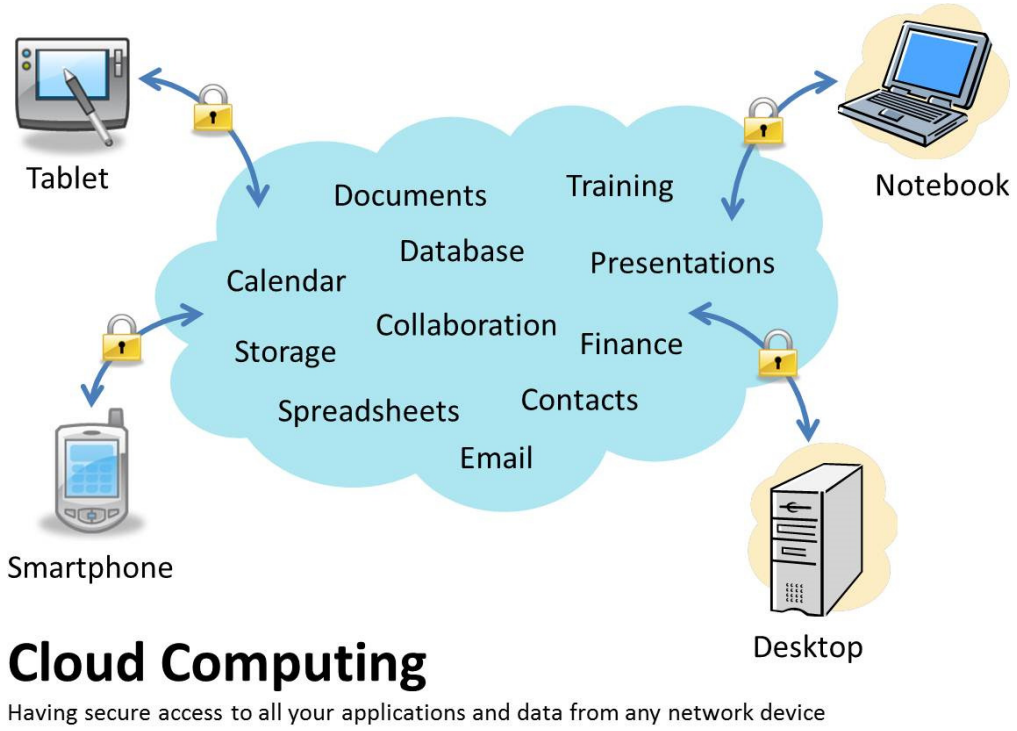
Type of cloud computing

- **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.

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.



Cloud Computing

All services provided are connected together for same user and same settings.

These services are accessible using any media:

- Smart-phone, web,…