

## **Experiment 01: Study of Distributed Computing system architecture and explain with various application like university, Banking system.**

**Learning Objective:** Student should be able to write case study of Distributed Computing system architecture and explain with various application like university, Banking system.

**Tools:** Microsoft Word.

### **Theory:**

Distributed computing system refers to a network of interconnected computers that work together to achieve a common goal. Unlike traditional centralized systems, where a single powerful machine handles all tasks, distributed systems distribute the workload across multiple nodes. This decentralized approach brings various advantages, including improved reliability, scalability, and fault tolerance.

### **Key Characteristics:**

#### 1. **Decentralization:**

In a distributed computing system, there is no central point of control. Instead, tasks and responsibilities are distributed among multiple nodes.

#### 2. **Concurrency:**

Multiple tasks can be executed simultaneously across different nodes, enhancing overall system performance and efficiency.

#### 3. **Intercommunication:**

Nodes within the system communicate and coordinate with each other to share information and collaborate on tasks.

#### 4. **Fault Tolerance:**

Distributed systems are designed to be resilient to failures. If one node fails, the system can continue functioning using other available nodes.

5. Scalability:

Distributed systems can easily scale by adding or removing nodes, allowing for efficient handling of varying workloads.

6. Resource Sharing:

Resources such as processing power, storage, and memory are shared among nodes, optimizing resource utilization.

7. Heterogeneity:

Nodes in a distributed system can have different hardware configurations, operating systems, and software platforms, promoting flexibility.

**Types of Architecture of Distributed Computing Systems:**

1. Client-Server Architecture:

In this architecture, the system is divided into two main components: clients and servers. Clients request services or resources, and servers fulfill these requests. This model facilitates centralized control and resource management.

2. Peer-to-Peer (P2P) Architecture:

P2P architecture allows nodes to act both as clients and servers. Each node has equal status and can request services or provide resources. This type of architecture is known for its decentralized and self-organizing nature.

3. Three-Tier Architecture:

This architecture divides the system into three main layers: presentation, logic, and data. The presentation layer handles user interface, the logic layer processes requests, and the data layer manages storage and retrieval of data. This model enhances scalability and maintainability.

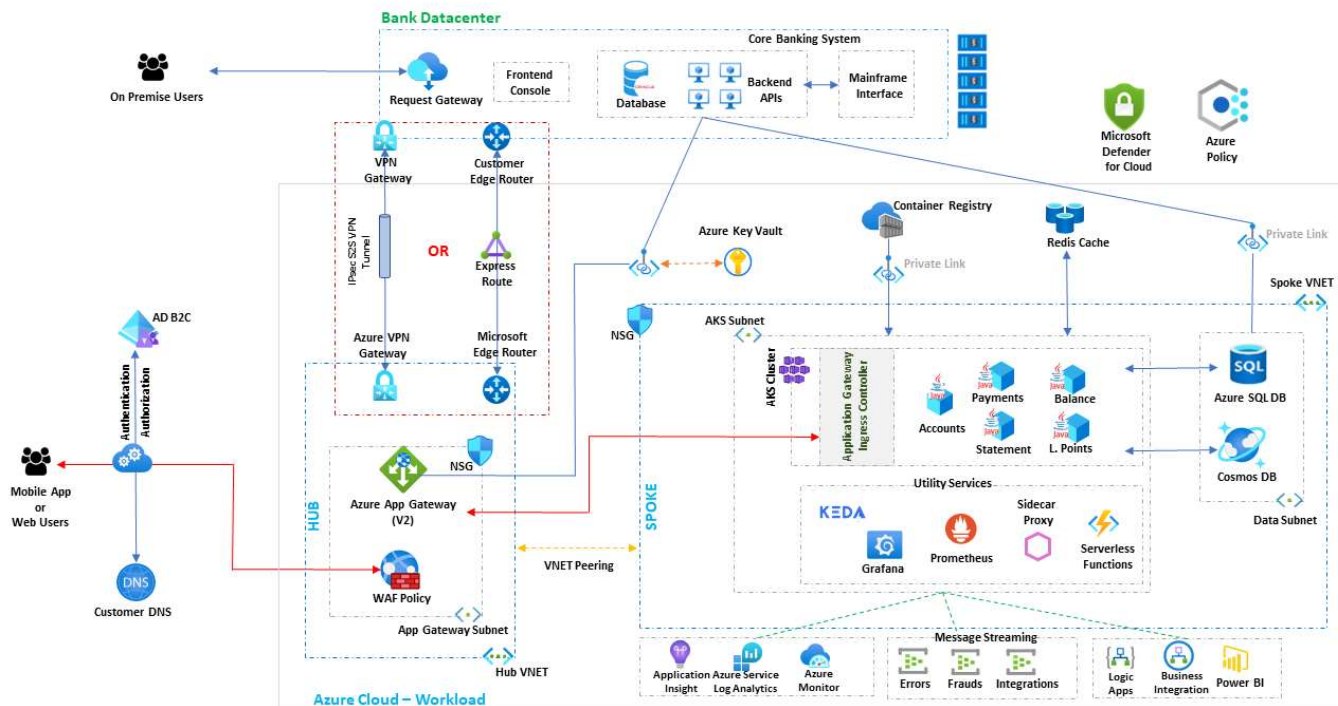
#### 4. Microservices Architecture:

In a microservices architecture, the system is composed of small, independent services that communicate with each other through well-defined APIs. This approach promotes modularity, flexibility, and easy scalability.

#### 5. Clustered Architecture:

Clustered architecture involves grouping multiple interconnected computers to work together as a single system. Nodes within a cluster share resources and collaborate on tasks, providing high availability and fault tolerance.

### Distributed Computing Architecture of Banking System



**Result and Discussion:**

- Explain Distributed Computing Architecture of University
- Explain Distributed Computing Architecture of Banking

**Learning Outcomes:** Students should have the ability to

LO1: Understand the basics of Architecture of Distributed Computing.

LO2: Studied Architecture of University & banking.

**Course Outcomes:** Upon completion of the course students will be able to create architecture of Distributed Computing

**Conclusion:** Distributed computing systems play a crucial role in modern computing, providing solutions to complex problems through collaboration and resource sharing. Understanding the different architectures helps in designing systems that meet specific requirements, whether it be scalability, fault tolerance, or efficient resource utilization.

For Faculty Use

Correction Parameters	Formative Assessment [40%]	Timely completion of Practical [ 40%]	Attendance / Learning Attitude [20%]	
Marks Obtained				