DC VIVA

Token, Non-Token Algorithms

- In the Token-based algorithm, a unique token is shared among all the sites in Distributed Computing Systems.
- Here, a site is allowed to enter the Computer System if it possesses the token.
- In a Non-Token based algorithm, there is no token, not even any concept of sharing a token for access.
- Here, two or more successive rounds of messages are exchanged between sites to determine which site is to enter the Computer System next.

Clock Synchronisation

- A Distributed System is a collection of computers connected via a high-speed communication network. In the distributed system, the hardware and software components communicate and coordinate their actions by message passing. Each node in distributed systems can share its resources with other nodes. So, there is a need for proper allocation of resources to preserve the state of resources and help coordinate the several processes. To resolve such conflicts, synchronisation is used. Synchronisation in distributed systems is achieved via clocks.
- The physical clocks are used to adjust the time of nodes. Each node in the system can share its local time with other nodes in the system. The time is set based on UTC (Universal Time Coordination). UTC is used as a reference time clock for the nodes in the system.

Features of DS

- Resource sharing.
- Openness.
- Concurrency.
- Scalability.
- Fault Tolerance.
- Transparency.

Transparency

- Transparency means that any form of distributed system should hide its distributed nature from its users, appearing and functioning as a normal centralized system.

Consistency

- Consistency is a property of the distributed system which ensures that every node or replica has the same view of data at a given time, irrespective of which client has updated the data. Strong consistency would mean that the distributed system converges on a single value, and the client always reads the latest data.

Lamport vs Ricart Agarwal

- Both the Ricart & Agrawala and Lamport algorithms are contention-based algorithms. With Lamport's algorithm, everyone immediately responds to a mutual exclusion request message whereas with the Ricart & Agrawala, a process that is using the resource will delay its response until it is done.

RMI

- RMI stands for Remote Method Invocation. It is a mechanism that allows an object residing in one system (JVM) to access/invoke an object running on another JVM. RMI is used to build distributed applications; it provides remote communication between Java programs. It is provided in the package java.

RPC

- Remote Procedure Call (RPC) is a powerful technique for constructing distributed, client-server based applications. It is based on extending the conventional local procedure calling so that the called procedure need not exist in the same address space as the calling procedure. The two processes may be on the same system, or they may be on different systems with a network connecting them.

Mutual Exclusion

- Mutual exclusion is a concurrency control property which is introduced to prevent race conditions. It is the requirement that a process can not enter its critical section while another concurrent process is currently present or executing in its critical section i.e only one process is allowed to execute the critical section at any given instance of time.

Distributed File System

- A Distributed File System (DFS) as the name suggests, is a file system that is distributed on multiple file servers or multiple locations. It allows programs to access or store isolated files as they do with the local ones, allowing programmers to access files from any network or computer.

Makewa Algorithm

- Maekawa’s Algorithm is quorum based approach to ensure mutual exclusion in distributed systems.
- As we know, In permission based algorithms like Lamport’s Algorithm, Ricart-Agrawala Algorithm etc. a site request permission from every other site but in quorum based approach, s site does not request permission from every other site but from a subset of sites which is called quorum.

Synchronous and Asynchronous Communication

- The key difference between synchronous and asynchronous communication is synchronous communications are scheduled, real-time interactions by phone, video, or in-person.
- Asynchronous communication happens when information can be exchanged independent of time. It doesn't require the recipient's immediate attention, allowing them to respond to the message at their convenience.

Stub

- A stub in distributed computing is a piece of code that converts parameters passed between client and server during a remote procedure call (RPC). The main idea of an RPC is to allow a local computer (client) to remotely call procedures on a different computer (server).

Which language is used in RMI? Why?

- The Java programming language's RMI system assumes the homogeneous environment of the Java virtual machine (JVM), and the system can therefore take advantage of the Java platform's object model whenever possible.