STANLEY

STANLEY
COLLEGE OF ENGINEERING & TECHNOLOGY FOR WOMEN
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1)What is Distributed system(DS)

Ans: distributed system is a software system in which components located on networked computers

 communicate and coordinate their actions by passing messages

2)Give Examples for DS

Ans: Internet(Asynchronous DS(No time bounds on process execution and message transmission)),Intranet.

3)Motivation for constructing DS

Ans: Sharing of Resources.

4)What is Remote Invocation

Ans: It is a mechanism in which request making is done in one system and request processing is done in other system.

5)What is heterogenity(means different environments) in DS

Ans:Heterogenity applies to networks,computer hardware,operating systems(Platform) and programming languages.

6)What is Middleware and its role

Ans:Middleware is the software layer that lies between the operating system and the applications,role is to provide

 Programming abstraction and masking the heteroginity of the underlying networks

7)What are the examples forMiddleware technologies

Ans:CORBA,XML,Java RMI,Web Services,DCOM(Distributed Component Object Model)

8)What are the Challenges of DS

Ans:Openness,Security,Scalability,Concurrency,Transparency,Heterogeneity,Failure Handling.

9)What are the Design Requirements for DS

Ans:Responsiveness,throughput(data transfer rate),Load Balancing,Adaptability,Reliability and Caching.

10)What are the fundamental models of DS

Ans:Interaction,Failure and Security Model.

11)What is Socket and Socket Address

Ans:Socket is a end point of Network Communication. Socket Address=Port Number + IP Address.

12)What is External Data Representation (XDR) in DS

Ans: It is a standard data serialization format (or)an agreed standard for the reprasentation of data structures and primitive values.

13)What is Marshalling(Marshalling and unmarshalling performed by both stub(client side proxy) and skeleton(server side proxy))

Ans: Converting the data(language specific ex:object) into network suitable form for transmission.

14)What are the approaches to External Data Representation (XDR) and Marshalling in DS

Ans:XML, Java's Object Serialization(Object->Byte Stream),CORBA's Common Data Representation.

15)Why HTML and XML

Ans: HTML is for defining the appearance of web pages. XML is for writing structured documents for the web

16)What is Remote Object Reference in DS

Ans:It is an identifier for a remote object that is valid throughout a DS.

17)What is Remote Interface in DS

Ans:It declares the services(methods) that are available for invocation by the objects of other processes.

18)What are the RMI Invocation semantics

Ans:Maybe,At-least-once,At-most-once.

19)What is Naming service in Java RMI

Ans:Naming is a process which allows any application to perform 2 things

   1)Bind(for registring the remote object with standard name)

   2)Look up(for getting remote object reference by providing standard name)

20)What is IDL(Interface Definition Language)

Ans:The Sun XDR language, was originally designed for specifying XDR then it was extended to become IDL,used to define service interface for Sun RPC.

21)How directory service differs from Naming service

Ans:A Directory service is a Naming service with some additional capabilities,

   it reprasents data in hierarchical fashion,

   it provides lookup service faster as it uses optimisation techniques(indexing ,caching,binary search) for search operation.

22)What is DNS?(It Translates domain names into IP Addresses)

Ans:The Domain Name System (DNS) is a hierarchical distributed naming system for computers, services,

or any resource connected to the Internet.

23)What is Navigation in DNS

Ans:Navigation is the act of chaining multiple Naming Services in order to resolve a single name to the corresponding resource.

24)What is Iterative Navigation in DNS

Ans:It is to resolve a name,in which a client presents a name to the local name server,which attempts to resolve it.

25)What is Multicast Navigation in DNS

Ans:In which a client multicasts the name to be resolved and the required object type to the group of name servers.

26)What do you mean by events and notifications in DS

Ans:Events are raised whenever the state of object changes it means one object can react to a change occuring in another object.

Objects that represents events are called notifications.

27)what is publish subcribe paradigm in Events and notifications of DS

Ans:An object that has event publishes.Those that have interest subscribe.

28)Why to Synchronize phisical clocks with real-world clocks?

Ans:To ordering the events which occured, and to find out the state of distributed programs as they execute

   or the state of a perticular process when the other is in a certain state.

29)What is clock skew?

Ans:Skew is a instantanious time difference between the readings of any 2 clocks.

30)What is clock drift?

Ans:Drift is a time difference(change in the offset) between the readings of a local and global(perfect)clock.

31)What is clock Synchronization and it types

Ans:Clock synchronization is a problem which deals with the idea that internal clocks of several computers may differ.

   2 types:

        1)Internal(Synchronization of 2 processes clocks)
2)External(Synchronization of a process clock and global clock)

32)What is UTC(Coordinated Universal Time)

Ans:It is an international standard for time keeping,it is based on atomic time(most acurate)

33)What is the drawback of Cristian's method for synchronizing clocks and what is the solution

Ans:All the services implemented by a single server,that it might fail.solution is time should be provided by a group of synchronized time servers(Berkeley algorithm).

34)What is Happened-Before Relation(partial ordering of events in a system with concurrently executing processes)

Ans: happened-before relation (denoted by ->) is a relation between the result of two events, such that if one event should happen before another event,

   the result must reflect that.

35)How to attach a timestamp to an event when there is no global clock?

Ans:Maintain a consistent set of logical clocks, one for each node.

36)What is Lamport Logical clock (Here L(e) is a timestamp of an event e occured at some process)

Ans:It is a monotonically increasing software counter or it is a mechanism in which

   the happened-before ordering can be captured numerically.

   Here,e->e'=>L(e)<L(e') is true but converse is not true thats why vector clocks

37)What is consistent cut in global states of DS

Ans:A consistent cut corresponds to a state in the distributed system which can be explained on the basis of the events that occurred up to that time,

   there is no evidence in one system of something caused in another system, and the cause has not yet been seen.

38)Why snapshot algorithm and what is its goal

Ans:For determining global states of distributed systems.Goal is to record a set of process and channel states for a set of processes.

39)What is distributed snapshot

Ans: Sometimes you want to collect the current state of a distributed computation,called a distributed snapshot.It consists of all local states and messages   in transit.It should reflect a consistent state.

40)What are the 2 rules through which snapshot algorithm is defined

Ans: 1)Marker Sending rule(It wants processes to send a marker after they have recorded their state,but before they send any other messages)

   2)Marker Receiving rule (upon receipt of marker, process record its state as well as channel state)

41)Why coordination and agreement is required among multiple processes

Ans:Coordination is required to coordinate their actions to acomplish a specific task and agreement is required to make them agree on a values.

42)why mutual exclusion for resource sharing

Ans:A collection of process share resources, mutual exclusion is needed to prevent interference and ensure consistency. (critical section)

43)List out the algorithms designed to grant permission to enter the critical section(CS)

Ans:1)Central Server Algorithm 2)Ring-based Algorithm 3)Multicast(Multicast synchronization) and logical clocks(Ricart and Agrawala's algorithm) 4)Maekawa's   voting algorithm

44)List out the election(to choose a unique process to play a particular role is called an election algorithm) algorithms.

Ans:1)A ring based election algorithm(Goal is to elect a single process coordinator which has the largest identifier)

2)The bully algorithm(uses 3 messages i.e Election(to announce an election),Answer(response to an election),Coordinator(to announce about elected process)

45)What is Central Server Algorithm

Ans:A process sends a request message to server and awaits a reply(token) from it.If no other process has the token at the time of the request, then the server replied immediately with the token.If token is currently held by other processes, the server does not reply but queues the request.Client on exiting the critical section, a message is sent to server, giving it back the token.

46)What is Ring-based Algorithm(Simplest way to arrange mutual exclusion)

Ans:Each process pi has a communication channel to the next process in the ring,the unique token is in the form of a message passed from process to process in a single direction clockwise,If a process does not require to enter the CS when it receives the token, then it immediately forwards the token to its neighbor,a process requires the token waits until it receives it, but retains it.To exit the critical section, the process sends the token on to its neighbor.

47)What is Multicast and logical clocks Algorithm(with example)

Ans:P1 and P2 request CS concurrently. The timestamp of P1 is 41 and for P2 is 34. When P3(not interested one) receives their requests, it replies immediately. When P2 receives P1's request, it finds its own request has the lower

timestamp, and so does not reply, holding P1 request in queue.   However, P1 will reply. P2 will enter CS. After P2 finishes, P2 reply P1 and P1 will enter CS.

48)What is Maekawa's voting algorithm

Ans:Think of processes as voting for one another to enter the CS. A candidate process must collect sufficient votes to enter.A voting set Vi associated with each process pi,there is at least one common member of any two voting sets, the size of all voting set are the same size to be fair.The optimal solution to minimizes K is K~sqrt(N) and M=K.

49)What is the Fault tolerance state of above algorithms

Ans: 1) The ring-based algorithm cannot tolerate any single process crash failure

2) Maekawa's algirithm can tolerate some process crash failures: if a crashed process is not in a voting set that is required

3) The central server algorithm can tolerate the crash failure of a client process that neither holds nor has requested the token

4) The Ricart and Agrawala algorithm as we have described it can be adapted to tolerate the crash failure of such a process by taking it to grant all   requests implicitly.

50)What is Byzantine general problem

Ans:Itis different from consensus in that a distinguished process supplies a value that the others are to agree upon, instead of each of them proposing a value