Distributed Database

1- ……. A logically interrelated collection of shared data which connected over a computer **network**.

- **Distributed Database**
- Distributed DBMS
- Data base

2- …… The software system that permits the **management** of the distributed database and makes the distribution **transparent** to users.

- Distributed Database
- **Distributed DBMS**
- Data base

3- One of the characteristics of DDBMS is a collection of logically related shared data.

- **DDBMS**
- DBMS
- Distributed Database
- Reliability

4- The data is split into a …… of fragments.

- Text
- collections
- indexs
- **Number**

5- The data at each site is under the **control** of a ……...

- DDB
- **DBMS**
- DBS
- DDBE

6- Distributed Database types can be _____.

- Homogenous
- Heterogeneous
- **Both a&b**

7- _____an intelligent **distribution** of your data fragments to improve database performance and data **availability** for end-users.

- **Allocation**
- Fragmentation
- Replication
- Reconstructing

8- _____,It **divides** a database into various sub-tables and sub-relations so that data can be distributed and stored efficiently.

- Allocation
- **Fragmentation**
- Replication
- Reconstructing

9- The process of creating and maintaining multiple **copies** of data in different sites to improve database performance and data **availability** for end-users.

- Allocation
- Reconstruction
- Fragmentation
- **Replication**

10- A collection of databases scattered across multiple sites over a **network**.

- **Distributed Database**
- Distributed DBMS
- Data base
- Replication

11- …… which are applied to relational database system to **partition** the relations among network sites.

- **Data fragmentation**
- Data allocation
- Data replication
- Reconstructing

12- …… in which each fragment is stored at the site with optimal distribution.

- Data fragmentation
- **Data allocation**
- Data replication
- Reconstructing

13- ……which increases the **availability** and improves the performance of the system.

- Data fragmentation
- Data allocation
- **Data replication**

14- ……. dividing a table by assigning each **row** or group of rows of relation to one or more

- Fragments.
- Vertically Fragmentation
- **Horizontal Fragmentation**
- Mixed or hybrid Fragmentation

15- _____refers to the process of decomposing a table by **attributes** to columns.

- **Vertical Fragmentation**
- Horizontal Fragmentation
- Mixed or hybrid Fragmentation

16- The combination of vertical fragmentation of a table followed by further

- Horizontal fragmentation of some fragments
- Vertically Fragmentation
- Horizontal Fragmentation
- **Mixed or hybrid Fragmentation**
- None

17- The choice of sites and the degree of replication depend on the

- Performance of the system
- Availability goals of the system
- The types and frequencies of transactions submitted at each site.
- **All of the above**

18- …….refers to system live Time, that is system is running efficiently most of the time, the system functions even when failures occur, only delivering reduced performance until the issue is resolved

- **Reliability**
- Fragmentation transparency
- Availability
- Modular

19- relation can be specified by $\sigma\, Ci\ (R)$ operation in the relational algebra.

- **Horizontal fragmentation**
- Vertical fragmentation
- both
- None

20- Relation can be specified by $\pi Li(R)$ operation in the relational algebra.

- Horizontal fragmentation
- **Vertical fragmentation**
- both
- None

21- Any table or any fragment of the table can be accessed by the user in such a manner that they are locally stored in the site of the user by using _____.

- Fragmentation transparency
- **Location transparency**
- Replication transparency
- None

22- Any table can be accessed by the user in such a manner that it is not fragmented.

- **Fragmentation transparency**
- Location transparency
- Replication transparency
- None

23- Any table can be accessed by the user in such a manner that it is the original table.

- Fragmentation transparency
- Location transparency
- **Replication transparency**
- None

24- The starting point of bottom-up design is the individual.

- **local conceptual schemas**
- global conceptual schemas

25- The source databases are integrated and the integrated database is materialized. These are known as

- database
- **data warehouses**
- Data fragmentation

26- …. allows data exchange between applications and perform similar transformation functions

- LCS
- **EAI**
- ETL

27- The global conceptual (or mediated) schema is entirely virtual and not materialized

- **True**
- False

28- The global conceptual (or mediated) schema is entirely virtual and not materialized IN……..

- Physical integration
- **Logical integration**

29- ……. is the process of identifying that two objects are semantically related

- Schema mapping
- **Schema matching**

30- ……. refers to the transformations between the objects.

- **Schema mapping**
- Schema matching

31- That determines how to map the elements of each LCS to the other elements of the GCS.

- **Schema mapping**
- Schema matching

32- The integration is aided by ……..tools that enable extraction of data from sources, their transformation to match the GCS.

- **Extract-Transform-Load (ETL)**
- Enterprise Application Integration (EAI)
- Enterprise Information Integration (EII)

33- ……. in a distributed database refers to the production of union-compatible views for similar information expressed dissimilarly in different nodes

- **Data integration**
- Database
- Data fragmentation

34- ……A centralized database that can be accessed over a computer network.

- Distributed Database
- Distributed DBMS
- **Distributed processing**

35- ……..A DBMS running across multiple processors and disks that is designed to execute operations in parallel, whenever possible, in order to improve performance

- **Parallel DBMS**
- Distributed processing
- Parallel DDBMS

36- ……causes no interruptions in the functioning of distributed databases.

- **Modular Development**
- Reliability
- Lower Communication Cost
- Better Response

37- ……Users access the distributed database via applications, which are classified as those that do not require data from other sites

- **local applications**
- global applications

38- ……Users access the distributed database via applications, which are classified as those that do require data from other sites

- local applications
- **global applications**

39- The translation step is necessary only if the component databases are ……and local schemas are defined using different data models.

- **Heterogeneous**
- Homogenous

40- The Vertical fragmentation should be in such a manner that we can rebuild a table from the fragment by taking the natural…… operation.

- **JOIN**
- Union
- Selection
- projection

41- Each fragment must be assigned to a particular site in the distributed system This process is called

- Data allocation
- Data distribution
- **a&b**
- none

42- A fragment containing all the rows of table T is called**…….** horizontal fragment

- **Complete**
- Primary
- Partial

43- IN Horizontal fragmentation …….operation can be performed on the fragments to construct table T.

- **Union**
- JOIN
- Selection
- Projection

44- ……. requires evaluation of a large number of query trees each of which produce the required results of a query.

- **Distributed query optimization**
- A distributed system

45- …….. the operation is run at the site where the data is stored and not at the client site

- **Operation Shipping**
- Data Shipping
- Hybrid Shipping

46- ……the data fragments are transferred to the database server, where the operations are executed

- Operation Shipping
- **Data Shipping**
- Hybrid Shipping

47- ……. combination of data and operation shipping

- Operation Shipping
- Data Shipping
- **Hybrid Shipping**

48- …….data fragments are transferred to the high-speed processors, where the operation runs

- Operation Shipping
- Data Shipping
- **Hybrid Shipping**

49- ……In query trading algorithm for distributed database systems, the controlling/client site for a distributed query is called

- **The buyer**
- Sellers

50- …….to qualify tuples that are to be joined. This reduces the amount of data transfer which in turn reduces communication cost.

- **Use semi-join operation**
- Perform selection and projection operations
- Simplify operations on horizontal fragments
- Merge the common leaves and sub-trees

51- Reduces the data flow over communication network

- **Perform selection and projection operations**
- Simplify operations on horizontal fragments
- Use semi-join operation
- Merge the common leaves and sub-trees

52- Eliminating selection conditions which are not relevant to a particular site.

- Perform selection and projection operations
- **Simplify operations on horizontal fragments**
- Use semi-join operation
- Merge the common leaves and sub-trees

53- Distributed transparency provides

- **Three dimensions**
- Two dimensions

54- SQL views are of similar fashion, where the user is unaware of the fact that a view of the table and not the original table is viewed by the user.

- **FRAGMENTATION TRANSPARENCY**
- REPLICATION TRANSPARENCY
- LOCATION TRANSPARENCY

55- Replicated copies facilitate the user in continuing with the queries in case of failure of a site, without the knowledge of failure, which is known as…….

- Concurrency transparency
- **Failure transparency**

56- The data is updated by the user, it is updated and gets reflected in all the tables of multiple sites, This is hidden from the user, which is known as

- **Concurrency transparency**
- Failure transparency

57- _____ database systems are systems with a single logical database located at one site under the control of a single DBMS.

- **Centralized**
- Distributed
- Both
- None

58- _____database systems are systems with a single or multiple logical databases located at more than one site under the control of a single DDBMS.

- Centralized
- **Distributed**
- Both
- None

59- DDBMS is a collection of logically _____ shared data.

- **Related**
- Unrelated
- Far
- None

60- The data is split into several_____.

- Tracks
- Parts
- Patches
- **Fragments**

61- Implies that a system can be expanded to new locations or units by adding new servers and data to the existing setup and connecting them to the distributed system without interruption.

- Single Development
- Reliability
- **Modular Development**
- Lower Communication Cost

62- With the _____ In a distributed database, the system functions even when failures occur, only delivering reduced performance until the issue is resolved.

- Single Development
- **Reliability**
- Modular Development
- Lower Communication Cost

63- Each DBMS participates in at least _____ global application.

- **One**
- Two
- Three

64- A…… in a distributed database management system requires the transmission of data between the computers in a network

- **Query processing**
- Distribution strategy
- Query tree

65- …….is a tree data structure representing a relational algebra expression

- Query processing
- Distribution strategy
- **Query tree**

66- ……. for a query is the ordering of data transmissions and local data processing in a database system

- Query processing
- **Distribution strategy**
- Query tree

67- In distributed query processing, ……operator has been used as an effective operator in reducing relations referenced in the query to reduce the total amount of data transmission.

- **The semi-join**
- Projection
- Natural join
- Selection

68- ……. each local DBE performs on the fragments that are stored at the local site, where the local CPU and, and the disk input/output (I/O) time are the main drivers.

- **The local level**
- The global level

69- Global optimization is greatly impacted by…….

- **The database distribution design**
- Distributed database design
- Data distribution
- None

70- Each internal nodes represents a ……. between its child

- **Relational operator**
- Leaf nodes
- The root node
- The result table

71- The tables of the query are represented as …….

- Relational operator
- **Leaf nodes**
- The root node
- The result table

72- In a distributed system, the number of alternatives …….as we apply replication, horizontal fragmentation, and vertical fragmentation to the relations involved in the query

- **Increases drastically**
- Decreases drastically

73- The QUERY TREE process continues for all internal nodes ……. is executed and replaced by the result of the query.

- Relational operator
- Leaf nodes
- **The root node**
- The result table

74- 89- …. of the query Is replaced by the result table

- Relational operator
- Leaf nodes
- The root node
- **The node**

75- ……Locally storing data reduces communication costs for data manipulation in distributed databases

- Modular Development
- Reliability
- **Lower Communication Cost**
- Better Response

76- ……. Efficient data distribution in a distributed database system provides a faster response when user requests are met locally

- Modular Development
- Reliability
- Lower Communication Cost
- **Better Response**

77- The disadvantage of Distributed Database

- Costly Software
- Large Overhead
- Data Integrity
- **All of the above**

78- ……refers to how the database should be split and allocated to sites so as to optimize certain objective function

- **Distributed database design**
- Distributed database
- Distributed DBMS
- Centralized database

79- ……which determines how the data should be fragmented

- **Data fragmentation**
- Data allocation
- Data replication
- Location transparency

80- The small pieces of sub relations or sub tables are called…….

- **Fragments**
- Units
- Tracks
- Parts

81- Replication is useful in improving …….of data

- Integrity
- Reliability
- Security
- **Availability**

82- The most extreme case is replication of the whole database at every site in the distributed system, thus creating a ……. distributed database.

- Partially replicated
- **Fully replicated**
- Two are true
- None

83- A …… distributed database is a network of identical database stored on multiple sites

- **Homogeneous**
- Heterogeneous
- None

84- A……. distributed database use different schemas , operating systems, DDBMS and different data models

- Homogeneous
- **Heterogeneous**
- None

85- ..... All database in a collection are linked by a network and communicate with each other

- Distributed query processing
- Distributed transaction management
- **Network linking**

86- ……. database in a collection usually represent a single logical database and they are interconnected

- Logical integration
- Physical integration
- **Seamless integration**

87- A ……. has a number of database servers in the various sites to perform the operations due to a query

- **Distributed system**
- Distributed DBMS
- Distributed database

88- Data Shipping also appropriate in systems where the communication costs are

- High
- **Low**

89- The sites where the local queries execute are called

- Buyer
- **Seller**

90- The ……. formulates a number of alternatives for choosing sellers and for reconstructing the global results

- **Buyer**
- Seller

91- Optimal solution generally involves reduction od solution space so that …… the cost of query and data transfer.

- Increase
- **Reduce**

92- The system built around this system are …..

- Shared Disk System
- Shared nothing disk system
- **Cluster**
- Shared memory system

93- The advantage of shared Disk system :

- Limited scalability
- **Fault tolerance**
- Both
- None

DEC is : Digital Equipment Corporation

94- The DEC is application of ……

- Shared memory system
- **Shared disk system**
- Shared nothing disk system
- NUMA

95- Which of the following is application of shared nothing disk system

- Tera data database machine
- The grace and Gamma research prototypes
- DEC
- **A & B**

96- Which system is caused bandwidth problem

- **Shared memory system**
- Shared disk system
- Shared nothing disk system
- NUMA

97- which of the following is the advantage if the NUMA

- **Minimize memory bottleneck problem**
- Bandwidth problem
- Higher cost of Architectures

98- In NUMA , if a processor of group (A) access Data from group (B) that mean the processor access data from :

- The Local memory of Group (B)
- Remote memory
- The Local memory
- **A & B**

99- Database type have the same structured scheme

- **Homogenous**
- Centralized data base
- Heterogenous
- Distributed database

100- In shared disk memory, If a processor or its memory fails. The other processors can complete the task. That’s called:

- Permanent fault
- Marginal fault
- **Fault tolerance**

101- A ……. is a collection of actions that make consistent transformations of system states while preserving system consistency

- **Transaction**
- Lock
- Dead Lock

102- The relative order of execution of the conflicting operations belonging to unaborted transactions in two histories are the same

- Conflicting operations
- **Conflict equivalence**
- Result equivalent

103- Two incompatible operations (e.g., Read and Write) conflict if they both access the same data item

- **Conflicting operations**
- Conflict equivalence
- Result equivalent

104- No violation of integrity constraints

- ATOMICITY
- **CONSISTENCY**
- ISOLATION
- DURABILITY

105- Transaction is all or nothing

- **ATOMICITY**
- CONSISTENCY
- ISOLATION
- DURABILITY

106- Committed updates persist

- ATOMICITY
- CONSISTENCY
- ISOLATION
- **DURABILITY**

107- The problem of synchronizing concurrent transactions such that the consistency of the database is maintained while, at the same time, maximum degree of concurrency is achieved

- **CONCURRENCY CONTROL**
- ISOLATION
- Inconsistent retrievals

108- Transactions indicate their intentions by requesting locks from the scheduler

- **lock manager**
- Transaction manager
- None

109- A Transaction one of whose operations is rejected by a scheduler is restarted by the transaction manager with a new timestamp

- **Basic TO Algorithm**
- Conservative TO Algorithm
- Multi-version TO Algorithm

110- …….delay each operation until there is an assurance that no operation with a smaller timestamp can arrive at that scheduler. If this condition can be guaranteed, the scheduler will never reject an operation

- Basic TO Algorithm
- **Conservative TO Algorithm**
- Multi-version TO Algorithm

111- …… methods guarantee that deadlocks cannot occur in the first place. Thus, the transaction manager checks a transaction when it is first initiated and does not permit it to proceed if it may cause a deadlock

- **DEADLOCK PREVENTION**
- DEADLOCK DETECTION
- DEADLOCK AVOIDANCE

112- Make use of transaction timestamps to prioritize transactions and resolve deadlocks by aborting transactions with higher (or lower) priorities

- DEADLOCK PREVENTION
- DEADLOCK DETECTION
- **DEADLOCK AVOIDANCE**

113- Deadlocks that are local to a single site would be detected at that site using the LWFG

- Centralized Deadlock Detection
- **Hierarchical Deadlock Detection**
- DEADLOCK PREVENTION

114- Each lock manager transmits its LWFG to the deadlock detector, which then forms the GWFG and looks for cycles in it

- **Centralized Deadlock Detection**
- Hierarchical Deadlock Detection
- DEADLOCK PREVENTION

115- The effects of some transactions are not reflected on the database

- Inconsistent retrievals
- **Lost updates**
- Committed Read

116- A transaction, if it reads the same data item more than once, should always read the same value

- **Inconsistent retrievals**
- Lost updates
- committed Read

117- TRANSACTIONS PROVIDE ……execution in the presence of multiple user accesses

- Atomic
- Reliable
- A & b
- **Correct**

118- TRANSACTIONS PROVIDE ……. execution in the presence of failures

- Atomic
- Reliable
- **A & b**
- Correct

119- 2PL schedulers are placed at each site. Each scheduler handles lock requests for data at that site

- **DISTRIBUTED 2PL**
- CENTRALIZED 2PL

120- Lock requests are issued to the central scheduler

- DISTRIBUTED 2PL
- **CENTRALIZED 2PL**

121- THE PURPOSES OF REPLICATION

- System availability
- Scalability
- Performance
- **All of the above**

122- …… allows for a way to support growth with acceptable response times

- System availability
- Performance
- **Scalability**
- Application requirements

123- …….remove single points of failure by replicating data, so that data items are accessible from multiple sites

- **System availability**
- Performance
- Scalability
- Application requirements

124- …… locate the data closer to their access points, thereby localizing most of the access that contributes to a reduction in response time

- System availability
- **Performance**
- Scalability
- Application requirements

125- ……dictated by the applications, which may wish to maintain multiple data copies as part of their operational specifications

- System availability
- Performance
- Scalability
- **Application requirements**

126- ……..all copies of a data item have the same value at the end of the execution of an update transaction

- **Strong mutual consistency criteria**
- Weak mutual consistency criteria

127- ……..if the update activity ceases for some time, the values eventually become identical

- Strong mutual consistency criteria
- **Weak mutual consistency criteria**

128- ……..the probability that the system under consideration does not experience any failures in a given time interval

- **Reliability**
- Availability
- ATOMICITY

129- ……. the probability that the system is operational according to its specification at a given point in time

- Reliability
- **Availability**
- ATOMICITY

130- …….the expected time between subsequent failures in a system with repair

- MTTR
- **MTBF**
- MTTD

131- ……the expected time to repair a failed system.

- **MTTR**
- MTBF
- MTTD

132- …….. Maintain the atomicity and durability properties of local transactions

- Local recovery manager
- **LOCAL RELIABILITY PROTOCOLS**
- LOCAL LEVEL

133- The fourth failures which is found in distributed database

- Transaction failure
- Site failures
- **Communication Line failure**
- Media

134- The deviation of a system from the behavior that is described in its specification.

- Atomicity
- Availability
- **Failure**

135- …….. the effects of the transaction on the distributed database is all-or-nothing

- **Atomic commitment**
- Recovery protocols
- Termination protocols

136- Termination protocols for 2PC In Coordinator Timeouts in Wait State is

- Global-commit
- **Global-abort**
- None

137- Dealing with site failure termination protocols for 2PC in Centralized Database Participant Timeouts in The READY state

- **Remain Blocked**
- Abort the transaction following a timeout vote-abort/ignore
- None

138- Dealing with site failure termination protocols for 2PC in Distributed Database Participant Timeouts in if *Pj* is in the INTIAL state

- It cannot help Pi to terminate the transaction.
- **Reply to Pi with a "vote-abort" message**.
- Send Pi either a "vote commit" or a "vote-abort" message

139- Dealing with site failure termination protocols for 2PC in Centralized Database Participant Timeouts in The INITIAL state.

- Remain Blocked
- **Abort the transaction following a timeout vote-abort/ignore**
- None

140- Dealing with site failure termination protocols for 2PC in Distributed Database Participant Timeouts in if *Pj* is in the ABORT or COMMIT state.

- t cannot help Pi to terminate the transaction.
- Reply to Pi with a "vote-abort" message.
- **Send Pi either a "vote commit" or a "vote-abort" message**

141- The coordinator fails while in the ……. it will start the commit process upon recovery

- **INITIAL state**
- WAIT state
- The COMMIT or ABORT states

142- The coordinator fails while in the …….. the coordinator will restart the commit process for this transaction from the beginning by sending the "prepare" message one more time.

- INITIAL state
- **WAIT state**
- the COMMIT or ABORT states

143- The coordinator fails while in the…….. In this case, the coordinator will have informed the participants of its decision and terminated the transaction. Thus, upon recovery, it does not need to do anything if all the acknowledgments have been received. Otherwise, the termination protocol is involved.

- INITIAL state
- WAIT state
- **The COMMIT or ABORT states**

144- Dealing with site failure termination protocols for 2PC in Distributed Database Participant Timeouts in if *Pj* is in the Ready state

- **t cannot help Pi to terminate the transaction**.
- Reply to Pi with a "vote-abort" message.
- Send Pi either a "vote commit" or a "vote-abort" message

145- A participant fails in the……abort the transaction

- READY state
- **INITIAL state**
- ABORT or COMMIT state

146- A participant fails while in the …. the coordinator has been informed of the failed site's affirmative decision about the transaction before the failure.

- **READY state**
- INITIAL state
- ABORT or COMMIT state

147- A participant fails while in …….. state. the participant does not need to take any special action.

- READY state
- INITIAL state
- **ABORT or COMMIT state**

148- Which of the following is disadvantages of data fragmentation :

- Increase the efficiency of the database system
- **Access speed may be very high**
- Maintain the security and privacy

149- DEALING WITH SITE FAILURES THREE-PHASE COMMIT PROTOCOL Timeout in the INITIAL state

- **Abort the transaction**
- The termination protocol proceeds by electing a new coordinator
- The participant has received the "prepare-to-commit" message and is awaiting the final "global-commit" message from the coordinator

150- DEALING WITH SITE FAILURES THREE-PHASE COMMIT PROTOCOL Timeout in the Ready state

- Abort the transaction
- **The termination protocol proceeds by electing a new coordinator**
- The participant has received the "prepare-to-commit" message and is awaiting the final "global-commit" message from the coordinator

151- DEALING WITH SITE FAILURES THREE-PHASE COMMIT PROTOCOL Timeout in the PRECOMMIT state

- Abort the transaction
- The termination protocol proceeds by electing a new coordinator
- **The participant has received the "prepare-to-commit" message and is awaiting the final "global-commit" message from the coordinator**

152- DEALING WITH SITE FAILURES THREE-PHASE COMMIT PROTOCOL If the new coordinator is in the PRECOMMIT state

- **Globally commit the transaction and send a "global-commit" message**
- All the participants will have moved into the ABORT state as well

153- DEALING WITH SITE FAILURES THREE-PHASE COMMIT PROTOCOL If the new coordinator is in the ABORT state

- Globally commit the transaction and send a "global-commit" message
- **All the participants will have moved into the ABORT state as well**

154- There is only one 2PL scheduler in the distributed system

- **CENTRALIZED 2PL**
- DISTRIBUTED 2PL

155- Transaction may read any of the replicated copies of item x, by obtaining a read lock on one of the copies of x

- CENTRALIZED 2PL
- **DISTRIBUTED 2PL**

156- When the databases already exist at a number of sites.

- Top-down
- **Bottom-up**

157- LOCAL RELIABILITY PROTOCOLS CHECK POINTING

- Write a begin checkpoint record into the log.
- Collect the checkpoint data into the stable storage.
- Write an end checkpoint record into the log
- **All of the above**

158- .....Transactions execute concurrently, but the net effect of the resulting history upon the database is equivalent to some serial history

- **SERIALIZABLE HISTORY**
- TRANSACTION

159- Read lock called….. and Write lock called…….

- **Shared lock ,exclusive lock**
- Exclusive lock,shared lock

160- Finding an optimal or even a good solution to distributed data allocation is a

- **Complex optimization problem**
- Simple optimization problem
- Clear optimization problem

161- A _____ is a DBMS running across multiple processors and disks that is designed to execute operations in parallel whenever possible, in order to improve performance

- Series DBMS
- **Parallel DBMS**
- Both
- None

162- _____ that a system can be expanded to new locations or units by adding new servers and data to the existing setup and connecting them to the distributed system **without interruption**.

- **Development Modular**
- Replication
- Reliability
- Availability

163- ..... means that the system behaves as if there is a single copy of each data item – referred to as single system image

- **replication transparency**
- System availability
- MUTUAL CONSISTENCY

164- .....allows a query to see inconsistent data while replicas are being updated but requires that the replicas converge to a one-copy serializable state once the updates are propagated to all of the copies

- **Epsilon serializability (ESR)**
- Extract Transform load (ETL)

165- .....the replicas converging to the same value

- Transaction consistency
- **Mutual consistency**

166- .....the global execution history be serializable

- **Transaction consistency**
- Mutual consistency

167- EAGER UPDATE PROPAGATION define **read-one/write-all (ROWA) protocols**

168- .....applying update on all the replicas at the same time

- **Synchronous propagation**
- Deferred propagation

169- .....the updates are applied to one replica when they are issued, but their application on the other replicas is batched and deferred to the end of the transaction.

- Synchronous propagation
- **Deferred propagation**

170- .....the transaction does not wait until its updates are applied to all the copies before it commits – it commits as soon as one replica is updated

- **LAZY UPDATE PROPAGATION**
- EAGER UPDATE PROPAGATION
- Deferred propagation

171- .....have lower response times for update transactions, since an update transaction can commit as soon as it has updated one copy

- **LAZY UPDATE PROPAGATION**
- EAGER UPDATE PROPAGATION
- Deferred propagation

172- Updates are first applied at a master copy and then propagated to other copies which are called ……

- Fragments
- Units
- **Slaves**

173- Central site can be overloaded and can become a bottleneck

- DISTRIBUTED TECHNIQUE
- **CENTRALIZED TECHNIQUES**
- LAZY UPDATE

174- .....Apply the update on the local copy at the site where the update transaction originates, and then the updates are propagated to the other replica sites

- **DISTRIBUTED TECHNIQUE**
- CENTRALIZED TECHNIQUES
- LAZY UPDATE

175- .....provide the highest system availability

- **DISTRIBUTED TECHNIQUE**
- CENTRALIZED TECHNIQUES
- LAZY UPDATE

176- .....different replicas of a data item may be updated at different sites concurrently

- **DISTRIBUTED TECHNIQUE**
- CENTRALIZED TECHNIQUES
- LAZY UPDATE

177- Allow (both read and update) transactions to be submitted at any site and forwarding their operations to either the single master or to the appropriate primary master site

- EAGER CENTRALIZED PROTOCOLS
- **LAZY CENTRALIZED PROTOCOLS**

178- Query processing in DDBMS is different from query processing in centralized DBMS due to this ……..of data transfer over the network

- **communication cost**
- speed
- size

179- The type of optimization is done at……., where communication cost is a prominent factor

- **the global level**
- the local level

180- can act as the coordinating for both update and read-only transactions

- **TM**
- RM
- SC

181- .....the update transactions are not submitted to the master, but to the TM at the site where the application runs (since they don't need to know the master)

- **EAGER CENTRALIZED PROTOCOLS**
- LAZY CENTRALIZED PROTOCOLS

182- ..... does not sacrifice database consistency, but only allows read-only transactions (queries) to read inconsistent data

- **ESR**
- EII
- ETL

183- .....checks a transaction when it is first initiated and does not permit it to proceed if it may cause a deadlock

- **transaction manager**
- lock manager

184- .....Studying the GWFG for the formation of cycles

- **DEADLOCK DETECTION AND RESOLUTION**
- DEADLOCK AVOIDANCE
- DEADLOCK PREVENTION

185- _____ property of the transaction indicates that either all the operations of the transaction are carried out or none of them are carried out.

- **Atomicity**
- Consistency
- Durability
- Isolation

186- The phase that the locks is **acquired**.

- **Growing**
- Shrinking
- Both
- None

187- The phase that the locks is **released**.

- **Growing**
- **Shrinking**
- Both
- None

1- A Distriubted processing in **centralized** database can be accessed over a computer network.

- **True**
- False

2- The DBMS at each site can handle local applications **autonomously**.

- **True**
- False

3- The sites in distributed databases are not linked by a **communications network.**

- True
- **False**

4- The DBMS at each site can not handle local applications autonomously.

- True
- **False**

5- A **description** of the replication of fragments is sometimes (**Replication schema**.)

- True
- False

6- Mixed (Hybrid) fragmentation this is achieved by SELECT & PROJECT operations which is represented by $\pi Li\ (\sigma Ci(R))$

- **True**
- False

7- The replication of the databases is hidden from the user by replication transparency.

- **True**
- False

8- All the transparencies are to be maintained in distributed database system.

- **True**
- False

9- Local data storage is not possible in centralized databases.

- **True**
- False

10- Each DBMS participates in at least one global application

- **True**
- False

11- The most extreme case is replication of the whole database at every site in the distributed system, thus creating a fully replicated distributed database.

- **True**
- False

12- The users are not allowed to view the internal details of the distribution

- **True**
- False

13- The transmission cost is low when sites are connected through high speed Networks and is quite significant in other networks

- **True**
- False

14- Almost all global optimization alternatives ignore the local processing time

- **True**
- False

15- The rows that belong to the vertical fragments are specified by a condition on one or more attributes of the relation

- True
- **False**

16- Data shipping is also used in object oriented database as a preferred approach

- **True**
- False

17- The algorithm starts with the buyer assigning sub-queries to the seller sites

- **True**
- False

18- Data partitioning is not required in shared nothing system

- True
- **False**

19- NUMA is hybrid system of shared disk system and nothing shared disk system

- True
- **Fales**

20- NUMA Architectures is less than the others

- **True**
- False

21- DBMS must make the distribution transparent to users

- **True**
- False

22- Transaction (Ti) is assigned a globally unique timestamp ts(Ti)

- **True**
- False

23- Timestamps are not assigned to transactions at their initiation but at the beginning of their validation step

- **True**
- False

24- A timeout occurs at a destination site when it can get an expected message from a source site within the expected time period

- True
- **False**

25- The termination protocols serve the timeouts for both the coordinator and the participant processes

- **True**
- False

26- Timeout in the COMMIT or ABORT states sends the global commit or global abort commands to the sites that have not yet responded, and waits for their acknowledgement

- **True**
- False

27- The local query optimization re not sufficient for some queries as the data is available locally.

- True
- **False**

28- Local applications do not require data from other sites

- **True**
- False

29- Global applications require data from other sites

- **True**
- False

30- In case of a database failure in a centralized database, the system comes to a complete stop.

- **True**
- False

31- Local data storage is **possible** in centralized databases.

- True
- False

32- When i use homogeneous, if i will integrate more then one sites, Translation step is required.

- True
- **False**

33- Just like a local query optimizer, a global query optimizer must evaluate a large number of equivalent query trees

- **True**
- False

34- Timestamps are associated with transactions and data items

- **True**
- False

35- In horizontal fragmentation , Tuples of the table are placed in one system and the rest are placed in other systems.

- **True**
- False

36- In vertical fragmentation , each site may not need all columns of a table.

- **True**
- False

37- The specific implementation of the Read and Write interfaces of the transaction monitor differ according to the specific replication protocol

- **True**
- False

38- local applications do not require data from other sites

- **True**
- False

39- Global applications require data from other sites

- **True**
- False

40- In case of a database failure in a centralized database, the system comes to a complete stop.

- **True**
- False

41- Local data storage is **possible** in centralized databases.

- True
- **False**

42- when i use homogeneous, if i will integrate more then one sites, Translation step is required.

- True
- **False**

Homogeneous

A homogenous distributed database is a network of **identical databases** stored on multiple sites. The sites have the same operating system, DDBMS, and data structure, making them easily manageable.

Homogenous databases allow users to access data from each of the databases seamlessly.

The following diagram shows an example of a homogeneous database:

Heterogeneous

A heterogeneous distributed database uses **different** schemas, operating systems, DDBMS, and different data models.

In the case of a heterogeneous distributed database, a particular site can be completely unaware of other sites causing limited cooperation in processing user requests. The limitation is why translations are required to establish communication between sites.

Concurrency control Definition

The goal of **concurrency control** is to allow multiple transactions to run concurrently (which is great for performance) while ensuring that data access is controlled such that the net effect is the same as if the transactions all ran in some **serial** order. That is, we cannot have the net result be one where transactions read an interim state of data from another transaction.

Concurrency control algorithms

There are two categories of concurrency control: pessimistic and optimistic. **Pessimistic concurrency control** assumes that there is a high likelihood that two or more transactions will try to access the same resources. A transaction will lock access to the resources it needs to keep others from modifying them. **Optimistic concurrency control** assumes that it is not likely that multiple transactions will access the same resource. Optimistic techniques will not lock access to resources. Instead, they will check for conflicts at commit time. If it turns out that multiple transactions did indeed access resources concurrently, one or more of them will have to abort.

Note :

- No-fix/No-flush → redo/undo algorithm
- No-fix/Flush → undo/no-redo algorithm
- Fix/No-flush→ redo/no-undo algorithm
- Fix/Flush→ no-undo/no-redo

Distributed database features	Distributed database advantages
1- Location indecency 2- Distributed transaction management 3- Distributed query processing 4- Seamless integration 5- Network linking 6- Transaction processing	1- Modular Development 2- Reliability 3- Lower communication cost 4- Better response