

CHAPTER 12: DISTRIBUTED DATABASE MANAGEMENT SYSTEMS

1. A distributed database management system (DDBMS) governs the storage and processing of logically related data over interconnected computer systems.
 - a. True
 - b. False

ANSWER: True

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: The Evolution of Distributed Database Management System

REF: p.554

2. Distributed data access was needed to support geographically dispersed business units.
 - a. True
 - b. False

ANSWER: True

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: The Evolution of Distributed Database Management System

REF: p.555

3. Rapid ad hoc data became unnecessary in the quick-response decision-making environment.
 - a. True
 - b. False

ANSWER: False

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: The Evolution of Distributed Database Management System

REF: p.555

4. The Internet is the repository for distributed data.
 - a. True
 - b. False

ANSWER: True

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: The Evolution of Distributed Database Management System

REF: p.555

5. Current distributed database management system (DDBMS) are subject to some problems, such as the complexity of management and control
 - a. True
 - b. False

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ANSWER: True

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

REF: p.556

STATE: DISC: Information Technology

TOP: DDBMS Advantages and Disadvantages

6. Distributed processing shares a database's logical processing among two or more physically independent sites that are connected through a network.
- a. True
 - b. False

ANSWER: True

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

REF: p.556

STATE: DISC: Information Technology

TOP: Distributed Processing and Distributed Databases

7. One of the advantages of a distributed database management system (DDBMS) is that the data is located near the site with the least demand.
- a. True
 - b. False

ANSWER: False

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

REF: p.557

STATE: DISC: Information Technology

TOP: Distributed Processing and Distributed Databases

8. One of the advantages of a distributed database management system (DDBMS) is growth facilitation.
- a. True
 - b. False

ANSWER: True

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

REF: p.557

STATE: DISC: Information Technology

TOP: Distributed Processing and Distributed Databases

9. One of the advantages of a distributed database management system (DDBMS) is security.
- a. True
 - b. False

ANSWER: False

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

REF: p.557

STATE: DISC: Information Technology

TOP: Distributed Processing and Distributed Databases

10. Distributed processing does not require a distributed database, and a distributed database does not require distributed processing.
- a. True
 - b. False

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ANSWER: False

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

REF: p.558

STATE: DISC: Information Technology

TOP: Distributed Processing and Distributed Databases

11. In order to manage distributed data, copies or parts of the database processing functions must be distributed to all data storage sites.
- a. True
 - b. False

ANSWER: True

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

REF: p.558

STATE: DISC: Information Technology

TOP: Distributed Processing and Distributed Databases

12. A database management system (DBMS) must have validation, transformation, and mapping functions, as well as other functions, in order to be classified as distributed.
- a. True
 - b. False

ANSWER: True

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

REF: p.559

STATE: DISC: Information Technology

TOP: Characteristics of Distributed Database Management Systems

13. A fully distributed database management system (DBMS) must perform all the functions of a centralized DBMS, and it must handle all necessary functions imposed by the distribution of data and processing.
- a. True
 - b. False

ANSWER: True

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

REF: p.559

STATE: DISC: Information Technology

TOP: Characteristics of Distributed Database Management Systems

14. The transaction processor (TP) is the software component found in each computer that requests data.
- a. True
 - b. False

ANSWER: True

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

REF: p.560

STATE: DISC: Information Technology

TOP: DDBMS Components

15. A distributed database management system (DDBMS) must be communications-media-dependent.
- a. True
 - b. False

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ANSWER: False

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: DDBMS Components

REF: p.560

16. A transaction processor (TP) is the software component residing on each computer that stores and retrieves data located at the site.

- a. True
- b. False

ANSWER: False

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: DDBMS Components

REF: p.560

17. In the single-site processing, single-site data (SPSD) scenario, all processing must be done on the end user's side of the system.

- a. True
- b. False

ANSWER: False

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Levels of Data and Process Distribution

REF: p.561

18. Performance transparency ensures that the system finds the most cost-effective path to access remote data.

- a. True
- b. False

ANSWER: True

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distributed Database Transparency Features

REF: p.565

19. The level of transparency supported by the distributed database management system remains the same for all systems.

- a. True
- b. False

ANSWER: False

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distribution Transparency

REF: p.565

20. Distribution transparency is supported by a distributed data dictionary.

- a. True
- b. False

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ANSWER: True

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distribution Transparency

REF: p.567

21. Distributed database systems do not require complex mechanisms to manage transactions and ensure the database's consistency and integrity.

a. True

b. False

ANSWER: False

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Transaction Transparency

REF: p.568

22. A remote transaction, composed of several requests, may access data at multiple sites.

a. True

b. False

ANSWER: False

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Transaction Transparency

REF: p.568

23. A centralized database management is subject to a problem such as_____

a. a growing number of remote locations

b. maintaining and operating small database systems

c. dependence on multiple sites

d. organizational flexibility of the database

ANSWER: a

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: The Evolution of Distributed Database Management Systems

REF: p.556

24. A disadvantage of a distributed database management system (DDBMS) is that:

a. it is slower in terms of data access.

b. adding new sites affects other sites' operations.

c. it is processor dependent.

d. there are lack of standards.

ANSWER: d

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distributed Processing and Distributed Databases

REF: p.557

25. A distributed database is composed of several parts known as database_____.

a. sections b. fragments

c. partitions d. parts

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ANSWER: b

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distributed Processing and Distributed Databases

REF: p.557

26. Distributed processing does not require:

- a. database processing functions to be distributed to all data storage sites.
- b. an existing distributed database.
- c. a network of interconnected components.
- d. multiple sites to share processing chores.

ANSWER: b

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distributed Processing and Distributed Databases

REF: p.558

27. A database management system needs_____to prepare the data for presentation to the end user or to an application program.

- a. security b. concurrency control
- c. formatting d. I/O interface

ANSWER: c

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Characteristics of Distributed Database Management Systems

REF: p.559

28. The_____processor is the software component found in each computer that requests data. It receives and processes the application's data requests.

- a. database b. transaction
- c. data d. network

ANSWER: b

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: DDBMS Components

REF: p.560

29. In theory, a(n)_____can be an independent centralized database management system with proper interfaces to support remote access from other independent database management systems in the network.

- a. transaction processor b. application processor
- c. transaction manager d. data processor

ANSWER: d

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: DDBMS Components

REF: p.561

Chapter 12: Distributed Database Management Systems

30. Under the _____ scenario, all record- and file-locking activities are performed at the end-user location.
- single-site processing, single-site data
 - multiple-site processing, single-site data
 - single-site processing, multiple-site data
 - multiple-site processing, multiple-site data

ANSWER: b

PTS: 1

DIF: Difficulty: Easy

REF: p.562-563

NAT: BUSPROG: Technology

STATE: DISC: Information Technology

KEY: Bloom's: Knowledge

TOP: Levels of Data and Process Distribution

31. _____ distributed database management system (DDBMS) integrate multiple instances of the same DBMS over a network.
- Homogeneous
 - Heterogeneous
 - Fully heterogeneous
 - Combination

ANSWER: a

PTS: 1

DIF: Difficulty: Easy

REF: p.563

NAT: BUSPROG: Technology

STATE: DISC: Information Technology

KEY: Bloom's: Knowledge

TOP: Levels of Data and Process Distribution

32. A _____ distributed database system will support different database management systems (DBMS) that may even support different models running under different computer systems.
- fully heterogeneous
 - fully homogeneous
 - homogeneous
 - heterogeneous

ANSWER: a

PTS: 1

DIF: Difficulty: Easy

REF: p.563

NAT: BUSPROG: Technology

STATE: DISC: Information Technology

KEY: Bloom's: Knowledge

TOP: Levels of Data and Process Distribution

33. A DDBMS is subject to which of the following restrictions?
- Multiple instances of the same database should be integrated over a network.
 - All database processing must be done at a single site.
 - Rapid ad hoc data access is not possible.
 - Remote data access is provided on a read-only basis.

ANSWER: d

PTS: 1

DIF: Difficulty: Easy

REF: p.564

NAT: BUSPROG: Technology

STATE: DISC: Information Technology

KEY: Bloom's: Knowledge

TOP: Levels of Data and Process Distribution

34. _____ transparency allows a physically dispersed database to be managed as though it were centralized.
- Distribution
 - Transaction
 - Failure
 - Performance

Chapter 12: Distributed Database Management Systems

ANSWER: a

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distribution Transparency

REF: p.565

35. _____transparency allows data to be updated simultaneously at several network sites.

- a. Transaction b. Distribution
- c. Failure d. Performance

ANSWER: a

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distributed Database Transparency Features

REF: p.565

36. _____transparency allows the system to operate as if it were a centralized database management system.

- a. Heterogeneity b. Distribution
- c. Performance d. Failure

ANSWER:

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distributed Database Transparency Features

REF: p.565

37. _____transparency is the highest level of transparency. The end user or programmer does not need to know that a database is partitioned.

- a. Performance b. Fragmentation
- c. Location d. Local mapping

ANSWER: b

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distribution Transparency

REF: p.565

38. _____transparency exists when the end user or programmer must specify the database fragment names but does not need to specify where these fragments are located.

- a. Transaction b. Location
- c. Local mapping d. Fragmentation

ANSWER: b

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distribution Transparency

REF: p.565

39. A _____contains the description of the entire database as seen by the database administrator.

- a. distributed global dictionary b. distributed data dictionary
- c. distributed global schema d. distributed data schema

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ANSWER: b

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distribution Transparency

REF: p.567

40. A _____ lets a single SQL statement access the data that are to be processed by a single remote database processor.
- a. remote request b. remote transaction
 - c. distributed request d. distributed transaction

ANSWER: a

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Transaction Transparency

REF: p.568

41. A distributed _____ can reference several different local or remote data processing sites.
- a. request b. site
 - c. data location d. transaction

ANSWER: d

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Transaction Transparency

REF: p.569

42. A _____ request lets a single SQL statement reference data located at several different local or remote DP sites.
- a. distributed b. transaction
 - c. fragmented d. remote

ANSWER: a

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Transaction Transparency

REF: p.570

43. The _____ guarantees that if a portion of a transaction operation cannot be committed, all changes made at the other sites participating in the transaction will be undone to maintain a consistent database state.
- a. DO-UNDO-REDO protocol b. two-phase commit protocol (2PC)
 - c. coordinator protocol d. write-ahead protocol

ANSWER: b

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Transaction Transparency

REF: p.571

44. The objective of _____ optimization is to minimize the total cost associated with the execution of a request.
- a. data b. remote
 - c. transaction d. query

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ANSWER: d

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Performance and Failure Transparency

REF: p.574

45. _____ is the delay imposed by the amount of time required for a data packet to make a round trip from point A to point B.
- a. Data distribution
 - b. Replica transparency
 - c. Network latency
 - d. Network partitioning

ANSWER: c

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Performance and Failure Transparency

REF: p.574

46. _____ fragmentation allows a user to break a single object into two or more segments, or fragments.
- a. Horizontal
 - b. Vertical
 - c. Data
 - d. Request

ANSWER: c

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distributed Database Design

REF: p.575

47. _____ fragmentation refers to the division of a relation into subsets of tuples.
- a. Vertical
 - b. Horizontal
 - c. Data
 - d. Mixed

ANSWER: b

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distributed Database Design

REF: p.575

48. _____ fragmentation refers to the division of a relation into attribute subsets.
- a. Data
 - b. Horizontal
 - c. Vertical
 - d. Mixed

ANSWER: c

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distributed Database Design

REF: p.575

49. The _____ rule requires that all copies of data fragments be identical.
- a. shared fragment
 - b. mutual consistency
 - c. horizontal fragmentation
 - d. replication

Chapter 12: Distributed Database Management Systems

ANSWER: b

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distributed Database Design

REF: p.578

50. A(n)_____database stores each database fragment at a single site.

- a. partially replicated b. unreplicated
- c. fully replicated d. partitioned

ANSWER: b

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distributed Database Design

REF: p.580

51. In a basic distributed processing environment, the distributed processing system shares the database chores among three sites connected through a_____.

ANSWER: communications network

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: DDBMS Advantages and Disadvantages

REF: p.556

52. One of the advantages of a distributed database management system (DDBMS) is_____operating cost.

ANSWER: reduced
lower

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distributed Processing and Distributed Databases

REF: p.557

53. A user-friendly_____is one advantage of a distributed database management system (DDBMS).

ANSWER: interface

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distributed Processing and Distributed Databases

REF: p.557

54. One of the advantages of a distributed database management system (DDBMS) is less danger of a single-_____failure.

ANSWER: point

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distributed Processing and Distributed Databases

REF: p.557

55. One of the advantages of a distributed database management system (DDBMS) is processor_____.

ANSWER: independence

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Distributed Processing and Distributed Databases

REF: p.557

56. _____management ensures that data move from one consistent state to another.

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ANSWER: Transaction

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Characteristics of Distributed Database Management Systems

REF: p.559

57. In a distributed database management system (DDBMS), _____ occurs to determine the data location of local and remote fragments.

ANSWER: mapping

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Characteristics of Distributed Database Management Systems

REF: p.559

58. In a distributed database management system (DDBMS), query _____ is used to find the best access strategy.

ANSWER: optimization

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Characteristics of Distributed Database Management Systems

REF: p.559

59. In a distributed database management system (DDBMS), _____ control is used to manage simultaneous data access and ensure data consistency across database fragments.

ANSWER: concurrency

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: Characteristics of Distributed Database Management Systems

REF: p.559

60. A transaction processor is also known as the _____ processor.

ANSWER: application

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: DDBMS Components

REF: p.560

61. The distributed database system must be _____ of the computer hardware system.

ANSWER: independent

PTS: 1

NAT: BUSPROG: Technology

KEY: Bloom's: Knowledge

DIF: Difficulty: Easy

STATE: DISC: Information Technology

TOP: DDBMS Components

REF: p.560

62. The _____ scenario is typical of most mainframe and midrange UNIX/LINUX server database management systems (DBMS)

ANSWER: single-site processing, single-site data

SPSD

single-site processing, single-site data (SPSD)

Chapter 12: Distributed Database Management Systems

PTS: 1 DIF: Difficulty: Easy REF: p.561-562
NAT: BUSPROG: Technology STATE: DISC: Information Technology
KEY: Bloom's: Knowledge TOP: Levels of Data and Process Distribution

63. Typically, the_____scenario requires a network file server running conventional applications that are accessed through a network.

ANSWER: multiple-site processing, single-site
data
MPSD

PTS: 1 DIF: Difficulty: Easy REF: p.562
NAT: BUSPROG: Technology STATE: DISC: Information Technology
KEY: Bloom's: Knowledge TOP: Levels of Data and Process Distribution

64. The_____fragment condition indicates that no row has a duplicate, regardless of the fragment in which it is located.

ANSWER: unique

PTS: 1 DIF: Difficulty: Easy REF: p.566
NAT: BUSPROG: Technology STATE: DISC: Information Technology
KEY: Bloom's: Knowledge TOP: Distribution Transparency

65. The database description, known as the distributed_____schema, is the common database schema used by local transaction processors (TPs) to translate user requests into subqueries that will be processed by different data processors (DPs).

ANSWER: global

PTS: 1 DIF: Difficulty: Easy REF: p.567-568
NAT: BUSPROG: Technology STATE: DISC: Information Technology
KEY: Bloom's: Knowledge TOP: Distribution Transparency

66. The_____protocol is used by a DP to roll transactions back and forward with the help of the system's transaction log entries.

ANSWER: DO-UNDO-REDO
DO UNDO REDO
do-undo-redo
do undo redo

PTS: 1 DIF: Difficulty: Easy REF: p.572
NAT: BUSPROG: Technology STATE: DISC: Information Technology
KEY: Bloom's: Knowledge TOP: Transaction Transparency

67. The_____forces the log entry to be written to permanent storage before the actual operation takes place.

ANSWER: write-ahead protocol

PTS: 1 DIF: Difficulty: Easy REF: p.572
NAT: BUSPROG: Technology STATE: DISC: Information Technology
KEY: Bloom's: Knowledge TOP: Transaction Transparency

Chapter 12: Distributed Database Management Systems

68. _____ describes the process of deciding where to locate data

ANSWER: Data allocation

PTS: 1

DIF: Difficulty: Easy

REF: p.580

NAT: BUSPROG: Technology

STATE: DISC: Information Technology

KEY: Bloom's: Knowledge

TOP: Distributed Database Design

69. A fully distributed database management system must perform all of the functions of a centralized database management system (DBMS). What are these functions?

ANSWER: 1. Receive the request of an application or end user.

2. Validate, analyze, and decompose the request. The request might include mathematical and logical operations such as the following: Select all customers with a balance greater than \$1,000. The request might require data from only a single table, or it might require access to several tables.

3. Map the request's logical-to-physical data components.

4. Decompose the request into several disk I/O operations.

5. Search for, locate, read, and validate the data.

6. Ensure database consistency, security, and integrity.

7. Validate the data for the conditions, if any, specified by the request.

8. Present the selected data in the required format.

PTS: 1

DIF: Difficulty: Moderate

REF: p.559

NAT: BUSPROG: Analytic

STATE: DISC: Information Technology

KEY: Bloom's: Comprehension

TOP: Characteristics of Distributed Database Management Systems

70. Explain the difference between homogeneous and heterogeneous distributed database management systems (DDBMS).

ANSWER: Homogeneous DDBMSs integrate multiple instances of the same DBMS over a network—for example, multiple instances of Oracle 11g running on different platforms. In contrast, heterogeneous DDBMSs integrate different types of DBMSs over a network, but all support the same data model. A fully heterogeneous DDBMS will support different DBMSs, each one supporting a different data model, running under different computer systems.

PTS: 1

DIF: Difficulty: Moderate

REF: p.563

NAT: BUSPROG: Technology

STATE: DISC: Information Technology

KEY: Bloom's: Knowledge

TOP: Levels of Data and Process Distribution

Chapter 12: Distributed Database Management Systems

71. Describe performance transparency and heterogeneity transparency.

ANSWER: Performance transparency allows the system to perform as if it were a centralized DBMS. The system will not suffer any performance degradation due to its use on a network or because of the network's platform differences. Performance transparency also ensures that the system will find the most cost-effective path to access remote data. The system should be able to "scale out" in a transparent manner, or increase performance capacity by adding more transaction or data-processing nodes, without affecting the overall performance of the system.

PTS: 1	DIF: Difficulty: Moderate	REF: p.565
NAT: BUSPROG: Analytic	STATE: DISC: Information Technology	
KEY: Bloom's: Comprehension	TOP: Distributed Database Transparency Features	

72. What is transaction transparency? What are some of the basic concepts that one should know to understand how transactions are managed in a distributed database management system (DDBMS)?

ANSWER: Transaction transparency is a DDBMS property that ensures database transactions will maintain the distributed database's integrity and consistency. It should be remembered that a DDBMS database transaction can update data stored in many different computers connected in a network. Transaction transparency ensures that the transaction will be completed only when all database sites involved in the transaction complete their part of the transaction.

Distributed database systems require complex mechanisms to manage transactions and ensure the database's consistency and integrity. To understand how the transactions are managed, the basic concepts governing remote requests, remote transactions, distributed transactions, and distributed requests should be known.

PTS: 1	DIF: Difficulty: Moderate	REF: p.568
NAT: BUSPROG: Analytic	STATE: DISC: Information Technology	
KEY: Bloom's: Comprehension	TOP: Transaction Transparency	

73. Explain the three types of operations defined by the DO-UNDO-REDO protocol.

ANSWER:

1. DO performs the operation and records the "before" and "after" values in the transaction log.
2. UNDO reverses an operation, using the log entries written by the DO portion of the sequence.
3. REDO redoes an operation, using the log entries written by the DO portion of the sequence.

PTS: 1	DIF: Difficulty: Moderate	REF: p.572
NAT: BUSPROG: Analytic	STATE: DISC: Information Technology	
KEY: Bloom's: Comprehension	TOP: Transaction Transparency	

Chapter 12: Distributed Database Management Systems

74. Discuss the CAP Theorem and the three desirable properties it mentions.

ANSWER: According to Dr. Eric Brewer, there are three commonly desirable properties in any highly distributed data system – consistency, availability, and partition tolerance. However, it is impossible for a system to provide all three at the same time.

Consistency takes a bigger role in a distributed database. All nodes should see the same data at the same time which means the replicas should be immediately undated. This involves dealing with latency and network partitioning delays.

Availability is a paramount requirement of all web-centric organizations. No received request should ever be lost and requests should always be filled by the system.

Partition tolerance means the system continues to operate even in the event of a node failure and will fail only if all nodes fail.

PTS: 1

NAT: BUSPROG: Analytic

KEY: Bloom's: Comprehension

DIF: Difficulty: Moderate

STATE: DISC: Information Technology

TOP: The CAP Theorem

REF: p.581

75. Describe any five of the 12 commandments formulated by C. J. Date for distributed databases.

ANSWER: With the rise of relational databases, most vendors implemented their own versions of distributed databases, generally highlighting their respective product's strengths. To make comparisons easier, C. J. Date formulated 12 "commandments" or basic principles of distributed databases. Although no current DDBMS conforms to all of them, they constitute a useful target. Students may choose any five of the following 12 commandments and describe them:

Rule 1: Local-site independence.

Each local site can act as an independent, autonomous, centralized DBMS. Each site is responsible for security, concurrency control, backup, and recovery.

Rule 2: Central-site independence.

No site in the network relies on a central site or any other site. All sites have the same capabilities.

Rule 3: Failure independence.

The system is not affected by node failures. The system is in continuous operation even in the case of a node failure or an expansion of the network.

Rule 4: Location transparency.

The user does not need to know the location of data to retrieve those data.

Rule 5: Fragmentation transparency.

Data fragmentation is transparent to the user, who sees only one logical database. The user does not need to know the name of the database fragments to retrieve them.

Rule 6: Replication transparency.

The user sees only one logical database. The DDBMS transparently selects the database fragment to access. To the user, the DDBMS manages all fragments transparently.

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Rule 7: Distributed query processing.

A distributed query may be executed at several different data processor sites. Query optimization is performed transparently by the DDBMS.

Rule 8: Distributed transaction processing.

A transaction may update data at several different sites, and the transaction is executed transparently.

Rule 9: Hardware independence.

The system must run on any hardware platform.

Rule 10: Operating system independence.

The system must run on any operating system platform.

Rule 11: Network independence.

The system must run on any network platform.

Rule 12: Database independence.

The system must support any vendor's database product.

PTS: 1

NAT: BUSPROG: Analytic

KEY: Bloom's: Comprehension

DIF: Difficulty: Moderate

STATE: DISC: Information Technology

TOP: C.J. Date's 12 Commandments for
Distributed Databases

REF: p.583