Chapter 6

Data Storge and Operations

Effective Approach for Supporting Multi-dimensional Business Report Requests

- The most effective approach for supporting multi-dimensional business report requests is **OLAP** (Online Analytical Processing).
- OLAP allows for complex queries and data analysis, providing quick answers to multi-dimensional queries.

Reference: OLAP systems are designed to handle analytical queries and are used for business intelligence purposes.

ACID Acronym

- **ACID** stands for **Atomicity, Consistency, Isolation, and Durability.**
- These are the core properties that ensure reliable processing in database transaction systems.

Reference: ACID compliance ensures that database transactions are processed reliably even in the event of failures.

Considerations for Business Continuity Plans

- When defining a business continuity plan, one should **consider written policies and procedures, impact mitigating measures, required recovery time, and acceptable disruption.**
- Critical data should be protected, and recovery processes must be clearly defined.

Reference: Business continuity plans ensure that an organization can continue operations in the event of disruptions.

DBA Action for Failing Database Schema Change

- If a database schema change is failing, the DBA should **apply the backout plan to restore a consistent database state.**
- This ensures that the database is returned to a stable condition before attempting further changes.

Reference: Having a backout plan is essential for minimizing risks during database changes.

Inconsistent Data Stores in Normal Operations

- If two data stores can be inconsistent during normal operations, the integration approach is **Asynchronous.**
- Asynchronous systems allow for data inconsistency as data synchronization occurs over time, not in real-time.

Reference: Asynchronous integration is common in distributed systems where immediate consistency is not required.

Moving Infrequently Used Data

- Data that is used infrequently or not at all may be moved to an alternative data store a process called **Archiving.**
- Archiving frees up space in active systems and helps maintain performance.

Reference: Archiving is an important part of data lifecycle management.

Activities Performed by Data Operations Staff

- Data operations staff are responsible for **implementing and controlling database environments, planning for data retention, monitoring database licenses, and tuning database performance.**
- Their role ensures the smooth operation and optimization of database systems.

Reference: Data operations staff manage the technical aspects of database administration.

Goals of Data Operations

- The goals of data operations include **assuring availability, protection, and integrity of structured data assets, and optimizing the performance of database transactions.**
- Data operations play a crucial role in maintaining the health and performance of database systems.

Reference: Ensuring data integrity and performance is at the core of data operations responsibilities.

Methods to Ensure Data Recoverability

- The data operations team ensures data is recoverable **by defining and executing the data recovery plan.**
- A well-defined recovery plan ensures that data can be restored in case of failure or corruption.

Reference: Data recovery plans are critical for protecting against data loss.

Content Distribution Network Solution

- A Content Distribution Network (CDN) supporting a multi-national website is likely to use **a replication solution.**
- Replication ensures that content is available from multiple locations, reducing load times and improving availability.

Reference: Replication in CDNs helps distribute content globally to ensure faster access.

Key Database Metrics Measured by Monitoring Tools

- Database monitoring tools measure key metrics such as **Capacity, availability, cache performance, and user statistics.**
- These metrics help DBAs optimize database performance and ensure availability.

Reference: Monitoring key database metrics is essential for proactive database management.

BASE vs. ACID in Transaction Processing

- In the BASE vs. ACID model for transaction processing, "E" in BASE stands **for Eventual Data Consistency.**
- This means that while data may be temporarily inconsistent, it will eventually become consistent.

Reference: BASE (Basically Available, Soft state, Eventual consistency) is commonly used in distributed systems where strict ACID properties are relaxed.

Importance of Archiving Transaction Data

- Periodic archiving of transaction data from a production CRM system is critical **for the maintenance of database performance.**
- Archiving helps keep the active database lean and responsive by removing historical data.

Reference: Regular archiving ensures that performance is not degraded by excessive amounts of data.

Business Continuity Plan

- A business continuity plan **outlines how a business will continue operating during an unplanned disruption in service.**
- It ensures that critical functions can be maintained or quickly restored.

Reference: Business continuity plans are vital for minimizing the impact of disruptions on operations.

Independent Facets of Database Performance

- Database performance depends on two independent facets: **Availability and Speed..**
- Both must be optimized to ensure that users can access data quickly and reliably.
- **Reference:** Availability and speed are key indicators of overall database health and performance.

Log-based Data Change Capturing Technique

- The technique for log-based change data capturing is where the **source Database Management System creates data activity logs which are monitored and applied on the target database.**
- This method tracks changes in the source system and applies them to the target system.

Reference: Log-based change capture is an efficient way to keep systems synchronized.

Crawler Program for Updating Database Index

- A database whose index is updated with a crawler program is an example of **Database technology called NoSQL.**
- NoSQL databases often rely on crawling and indexing for updating and querying unstructured or semi-structured data.

Reference: NoSQL databases are designed for flexible, large-scale data storage and retrieval, often used for big data applications.

Access to Multiple Data Stores

- The technique used to provide access to a combination of individual data stores, regardless of structure, is **Data Federation.**
- Data federation allows data to be accessed from multiple sources without needing to merge them into a single repository.

Reference: Data federation is useful in scenarios where data resides in different systems but needs to be queried together.

Causes of Poor Database Management

- **True:** Causes of poor Database Management include memory allocation errors, poor SQL coding, and database volatility.
- These issues can lead to slow performance, crashes, or data corruption.

Reference: Effective database management involves careful tuning and optimization of memory, queries, and overall system stability.

Guaranteeing Optimum Database Performance

- To guarantee optimum database performance, staff should **discuss performance requirements with the data architects.**
- This helps ensure that the database is designed and tuned to meet the specific needs of the organization.

Reference: Collaboration between DBAs and data architects is essential for optimizing database performance.

Categories of Data Types in Programming

- In computer programming, data types can be divided into two categories: **Value types and Reference types.**
- Value types store data directly, while reference types store references to the data

Reference: Understanding the difference between value types and reference types is crucial for efficient programming and memory management.

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Thank You

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