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Distributed database

A distributed database is a database system that spans multiple physical locations, typically across different computers or networks.

The data is physically stored on multiple servers, but it appears to users as a single, unified database.

This allows for improved scalability, availability, and fault tolerance.

Two main types of distributed databases

1. Homogeneous distributed databases: All servers in the system use the same database management system (DBMS).
2. Heterogeneous distributed databases: Different servers in the system may use different DBMSs.

Database Links

Database links are objects in a distributed database that allow users to access data from other databases in the system.

They act like virtual connections between databases, allowing users to perform queries and operations as if the data were local.

Benefits of using database links

- Improved data accessibility: Users can access data from multiple databases in a single query.
- Reduced data redundancy: Data does not need to be replicated on multiple servers.
- Enhanced application functionality: Applications can access data from different sources.

Snapshot

A snapshot is a point-in-time copy of a database or a portion of a database. Snapshots are often used for backup and recovery purposes, testing new applications or software changes, and reporting and analysis.

Two main types of snapshots

- Logical snapshots: These are copies of the database schema and data at a specific point in time.
- Physical snapshots: These are copies of the database files at a specific point in time.

Benefits of using snapshots

- Improved backup and recovery: Snapshots can be used to quickly restore the database to a previous state in case of a failure.

- Enhanced testing and development: Snapshots can be used to test new applications or software changes without affecting the production database.
- Simplified reporting and analysis: Snapshots can be used to analyze data at a specific point in time without affecting the performance of the production database.

Relationship between Distributed Database, Database Links, and Snapshots

- Distributed databases provide the infrastructure for storing and managing data across multiple locations.
- Database links facilitate communication and access to data across different databases in a distributed system.
- Snapshots can be used to capture a point-in-time copy of a distributed database or individual databases within it, enabling backup, recovery, testing, and analysis.

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