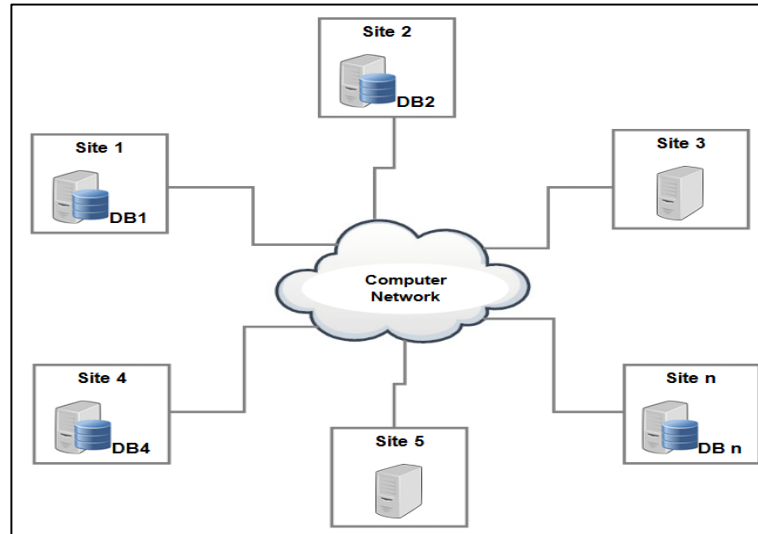


Database Management System (BCSC – 0003)

Topic: Distributed Database



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Topics to be covered



- Distributed DBMS
- Types of Distributed Databases
- Data Replication & Fragmentation

Distributed DBMS

- A distributed database is a set of interconnected databases that is distributed over the computer network or internet.
- A Distributed Database Management System (DDBMS) manages the distributed database and provides mechanisms so as to make the databases transparent to the users.
- In these systems, data is intentionally distributed among multiple nodes so that all computing resources of the organization can be optimally used.

Distributed DBMS



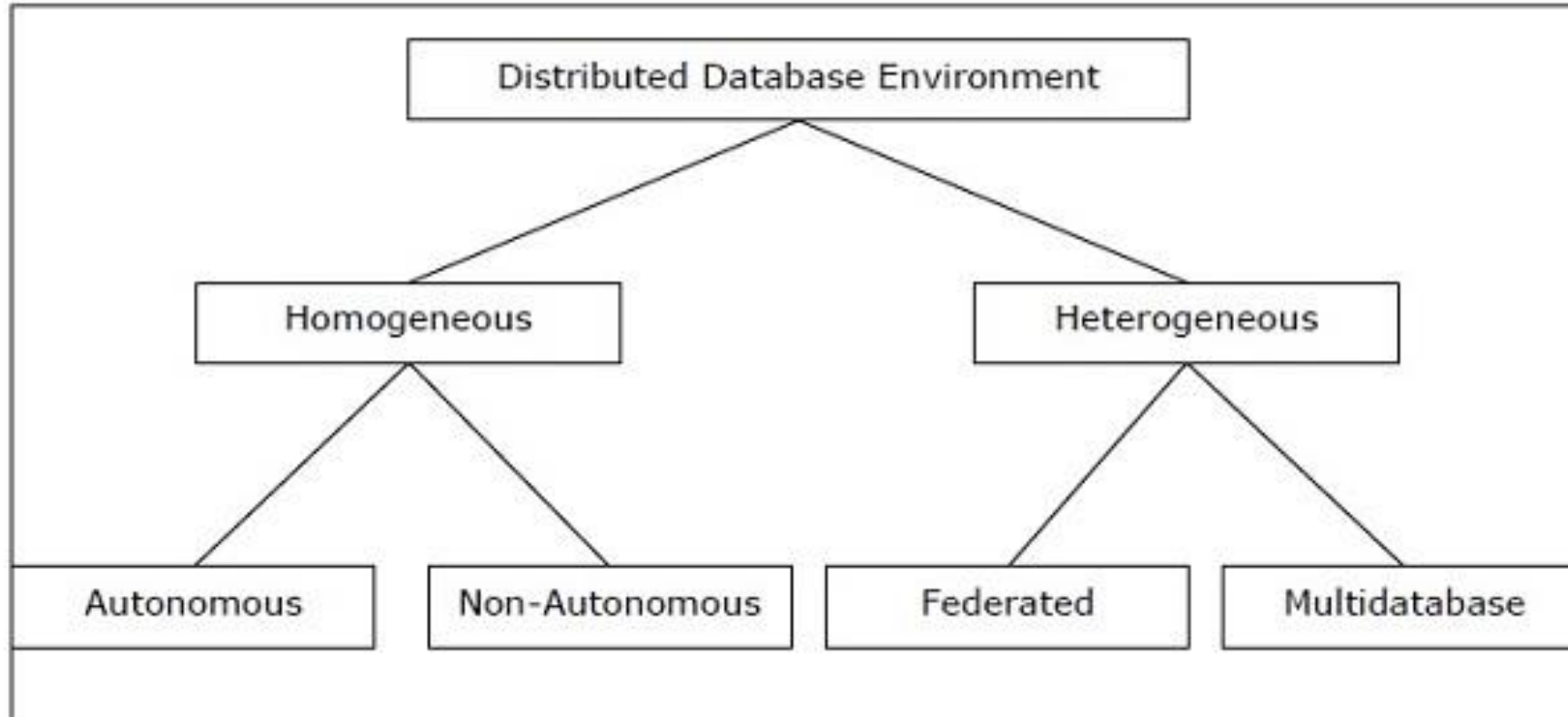
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The following factors encourage moving over to DDBMS –

- Distributed Nature of Organizational Units
- Need for Sharing of Data
- Support for Both OLTP and OLAP
- Database Recovery
- Support for Multiple Application Software

Types of Distributed Database

Distributed databases can be broadly classified into homogeneous and heterogeneous distributed database environments.



Types of Distributed Database

Homogeneous Distributed Databases

In a homogeneous distributed database, all the sites use identical DBMS and operating systems.

Types of Homogeneous Distributed Database

There are two types of homogeneous distributed database –

Autonomous: Each database is independent that functions on its own. They are integrated by a controlling application and use message passing to share data updates.

Non-autonomous: Data is distributed across the homogeneous nodes and a central or master DBMS co-ordinates data updates across the sites.

Types of Distributed Database

Heterogeneous Distributed Databases

In a heterogeneous distributed database, different sites have different operating systems.

Types of Heterogeneous Distributed Databases

There are two types of heterogeneous distributed database –

Federated: The heterogeneous database systems are independent in nature and integrated together so that they function as a single database system.

Un-federated (Multidatabases): The database systems employ a central coordinating module through which the databases are accessed.

Data Replication & Fragmentation

Data Replication

- Data replication is the process of storing separate copies of the database at two or more sites. It is a popular fault tolerance technique of distributed databases.

Fragmentation

- Fragmentation is the task of dividing a table into a set of smaller tables. The subsets of the table are called fragments. Fragmentation can be of three types: horizontal, vertical, and hybrid (combination of horizontal and vertical).
- Fragmentation should be done in a way so that the original table can be reconstructed from the fragments. This is needed so that the original table can be reconstructed from the fragments whenever required.

References



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*Thank
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