

Classification of Database Management Systems

This lesson describes the different metrics by which we can classify DBMS.

WE'LL COVER THE FOLLOWING



- Classification based on data model
- Classification based on number of users
- Classification based on database distribution
 - Centralized systems
 - Distributed database system
 - Homogeneous distributed database systems
 - Heterogeneous distributed database systems

Database management systems can be classified based on several criteria, such as the data model, user numbers and database distribution, each of which is described below.

Classification based on data model

The most popular data model in use today is the relational data model. Well-known DBMSs like Oracle, MS SQL Server, DB2 and MySQL support this model. Other traditional models, such as hierarchical data models and network data models, are still used in the industry mainly on mainframe platforms. However, they are not commonly used due to their complexity. These are all referred to as traditional models because they preceded the relational model.

In recent years, the newer **object-oriented data models** were introduced. This model is a database management system in which information is represented in the form of objects as used in object-oriented programming. Object-oriented databases are different from relational databases, which are table-oriented. Object-oriented database management systems (OODBMS)

combine database capabilities with object-oriented programming language capabilities.

The object-oriented models have not caught on as expected, so they are not in widespread use. Some examples of object-oriented DBMSs are O2, ObjectStore, and Jasmine.

Classification based on number of users

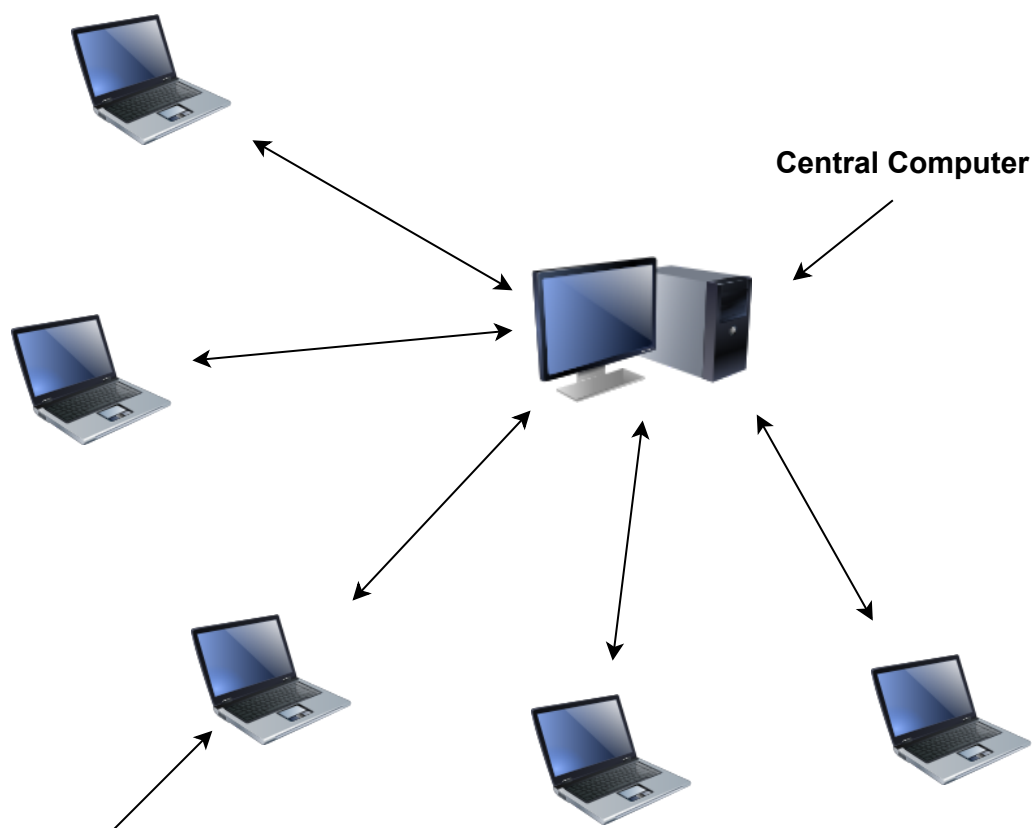
A DBMS can be classified based on the number of users it supports. It can be a **single-user database system**, which supports one user at a time, or a **multi-user database system**, which supports multiple users concurrently.

Classification based on database distribution

There are four main distribution systems for database systems and these, in turn, can be used to classify the DBMS.

Centralized systems

Within a centralized database system, DBMS and database are central. i.e., stored at a single location and is used by several other systems. This is illustrated below:

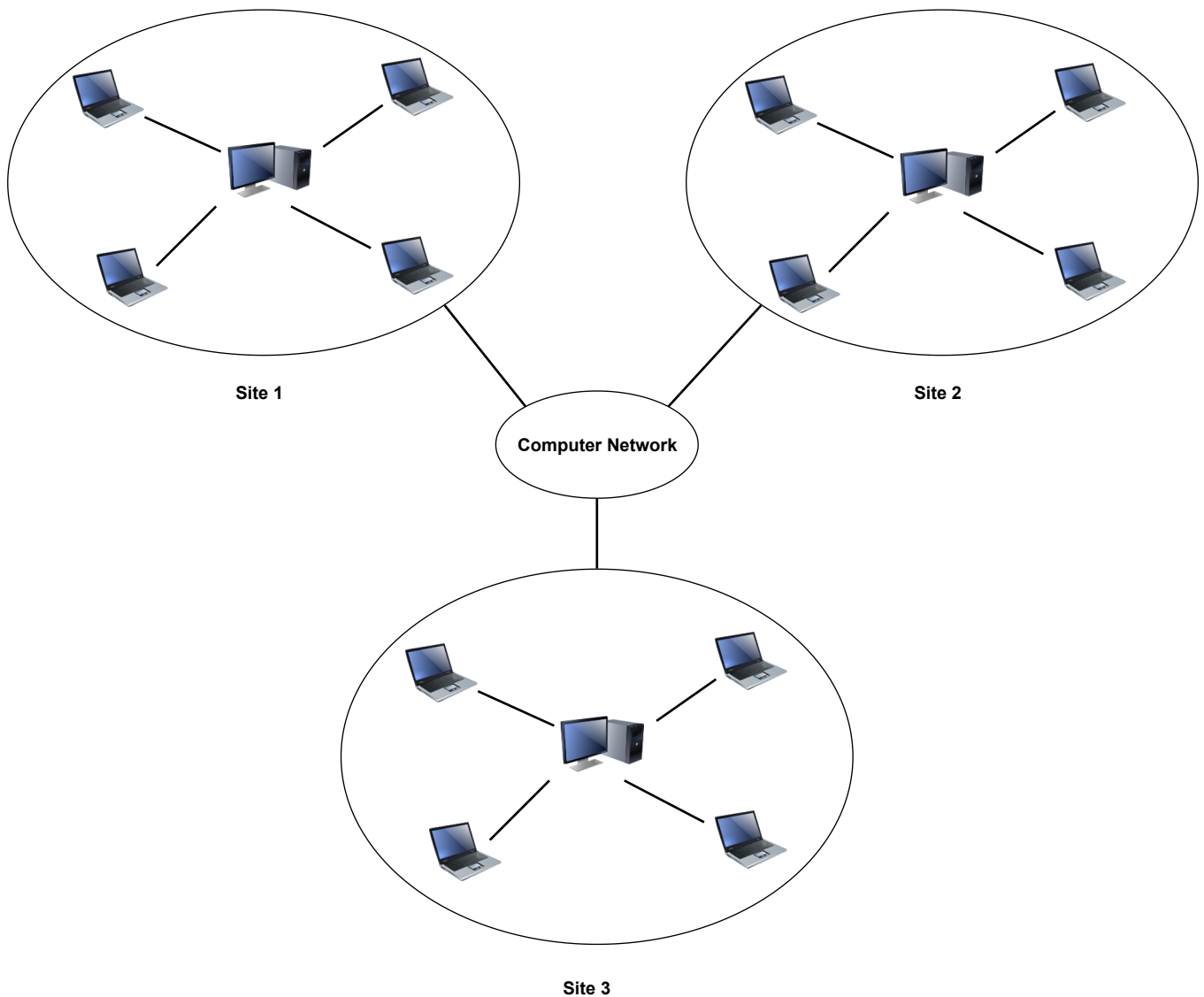


Workstation or terminal

The database is stored in the central computer. The different users can access the database using their terminals.

Distributed database system

In a distributed database system, the actual database and the DBMS software are distributed across various sites that are connected by a computer network, as shown in the figure below:



The database is distributed between the three sites

Homogeneous distributed database systems

Homogeneous distributed database systems use the same DBMS software from multiple sites. Data exchanged between these various sites can be handled easily. For example, library information systems by the same vendor, such as Geac Computer Corporation, use the same DBMS software which allows easy data exchange between the various Geac library sites.

In a heterogeneous distributed database system, different sites might use different DBMS software, but there is additional common software to support data exchange between these sites. For example, the various library database systems use the same machine-readable cataloging (MARC) format to support library record data exchange.

Quiz time! The next lesson will test your knowledge of data models.