**DBMS and RDBMS**

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* **Objective:** Study of DBMS and RDBMS.

**DBMS**

Database management systems can be categorized according to a number of factors, including user counts, database distribution, and data models. Relational, distributed, hierarchical, object-oriented, and network are the most popular varieties of database management system software.

It gives users the means to specify the data's structure, store and retrieve data, control concurrency, protect data integrity, and facilitate backup and recovery procedures. Modern information systems cannot function properly without database management systems (DBMSs), which provide efficient and well-organized data storage and retrieval for a wide range of uses.

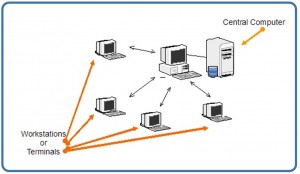
There are four main distribution systems for database systems and these, in turn, can be used to classify the DBMS. A Database Management System (DBMS) is a software application that facilitates the creation, management, and manipulation of databases.

**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.

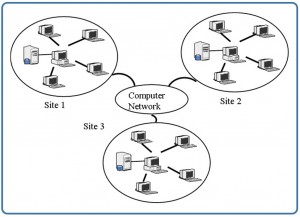
* Centralized DBMS:

A centralized DBMS is a type of database management system where the entire database is stored and managed on a single computer system. In this architecture, all data processing tasks, including data storage, retrieval, and management, are performed on this centralized system.



* Distributed Database System:

A distributed database system (DDBMS) is a type of database management system in which the database is spread across multiple interconnected computer systems or nodes. Unlike a centralized DBMS, where all data is stored on a single server, in a distributed system, data is distributed across multiple servers or nodes that are connected via a network.



* Homogenous Distributed Database System:

Homogeneous distributed database systems refer to a type of distributed database system where all nodes or sites in the distributed network use the same DBMS software and have identical database schemas. In other words, the data model, schema, and DBMS software are consistent across all nodes in the distributed system.

* Heterogeneous Distributed Database System:

Heterogeneous distributed database systems refer to a type of distributed database system where multiple nodes or sites in the distributed network use different DBMS software and may have varying database schemas.

**RDBMS**

A Relational Database Management System (RDBMS) is a type of database management system (DBMS) that stores and manages data in a structured format based on the relational model. In an RDBMS, data is organized into tables with rows and columns, where each row represents a unique record and each column represents a specific attribute of that record. Relationships between tables are established using keys, primarily primary keys and foreign keys.

* Relational Database Management Systems replicate the following characteristics in order to preserve data integrity:
* Entity Integrity: A database table cannot have two identical records.
* Referential Integrity: Only those table rows that are not used by any other table can be removed. If not, inconsistent data can result.
* Individually specified Integrity: User-defined guidelines for access and confidentiality.   
  Domain integrity: Based on default values, data types, or ranges, the database tables' columns are contained inside certain structured bounds.

| **DBMS** | **RDBMS** |
| --- | --- |
| [DBMS](https://www.geeksforgeeks.org/introduction-of-dbms-database-management-system-set-1/) stores data as file. | [RDBMS](https://www.geeksforgeeks.org/rdbms-architecture/) stores data in tabular form. |
| Data elements need to access individually. | Multiple data elements can be accessed at the same time. |
| No relationship between data. | Data is stored in the form of tables which are related to each other. |
| Normalization is not present. | Normalization is present. |
| DBMS does not support distributed database. | RDBMS supports distributed database. |
| It stores data in either a navigational or hierarchical form. | It uses a tabular structure where the headers are the column names, and the rows contain corresponding values. |
| It deals with small quantity of data. | It deals with large amount of data. |
| Data redundancy is common in this model. | Keys and indexes do not allow Data redundancy. |
| It is used for small organization and deal with small data. | It is used to handle large amount of data. |
| Security is less | More security measures provided. |
| It supports single user. | It supports multiple users. |
| Data fetching is slower for the large amount of data. | Data fetching is fast because of relational approach. |
| The data in a DBMS is subject to low security levels with regards to data manipulation. | There exists multiple levels of data security in a RDBMS. |
| Low software and hardware necessities. | Higher software and hardware necessities. |
| Examples:[XML](https://www.geeksforgeeks.org/xml-basics/), Window Registry, dbaseIIIplus etc. | Examples: [MySQL](https://www.geeksforgeeks.org/architecture-of-mysql/), [PostgreSQL](https://www.geeksforgeeks.org/what-is-postgresql-introduction/), [SQL](https://www.geeksforgeeks.org/what-is-sql/) Server, Oracle, Microsoft Access etc. |