Database Management System

- Database Management system is a software which control the data in database and users of database.
- DBMS is a software that interacts with the users, application programs and the database.
- A database management is a software that is used to create, maintain, and provide controlled access to user databases.
- DBMS provides an environment that is both convenient and efficient to use.

Component of DBMS Environment

- Hardware
- Software
- Data
- Procedure
- People

Functions of DBMS

- Data Processing
- User Accessible Catalog
- Concurrency Control Services
- Recovery Services
- Authorization Services
- Support for data Communication
- Integrity Services

Functions of DBMS

Data Processing

- DBMS perform different operation about data like
  - Creation of database
  - Putting data into databases
  - Arranging data into different form
  - Accessing data
- All of these activities are included at processing of data and all these activities are performed by DBMS.

Functions of DBMS

User Accessible Catalog

- Catalog mean structure of database or meta data.
- Catalog is a place or repository where information describing in database are store.
- Catalog stores
  - Data about all users of database
  - Architecture of database
- DBMS must provide a catalog in which description of data items are stored and which is accessible to users.
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Functions of DBMS

Concurrency Control Services

- Multiple user access the database at the same time
- Concurrent approach is good but very sensitive it make database **inconsistent**
- DBMS provide concurrent services to the users of database and provide the proper control so that interference cannot occur.
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Functions of DBMS

Recovery Services

- A database can be damaged or destroyed in many ways, e.g database can end abnormally during an update, hardware problem can occur; and so on. When these event has occurred, database become inconsistent.
- DBMS must provide methods to recover a database to a contestant state.

Functions of DBMS

Authorization Services

- DBMS must provide a mechanism to ensure that only authorized users can access the database. It also provide the protection of database against unauthorized access.

Functions of DBMS

Support for data Communication

- DBMS must be capable of integrating with communication software.

Functions of DBMS

Integrity Services

- Database Integrity mean correctness of stored data.
- Integrity is considered in the term of **constraints**.
- Place different checks on data which ensures the correctness of database. So responsibility of DBMS is to take care of those checks.

DBMS User Environment

- Two main type of DBMS user Environment
  - **Single User DBMS Environment**
  - **Multi-User DBMS Environment**
    - **Teleprocessing**
    - **File Server**
    - **Client Server**

DBMS User Environment

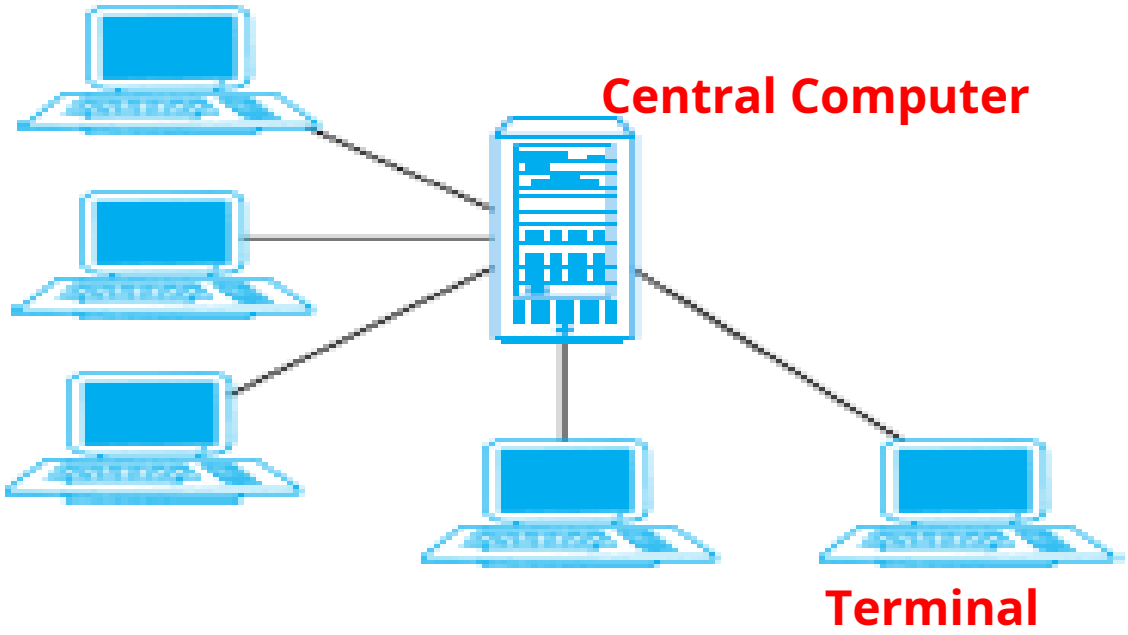
Single User DBMS Environment

- Normally called Desktop DBMS
- Only Single user can access DBMS or environment can support one user at a time.

DBMS User Environment

Multi-User DBMS Environment

- **Teleprocessing**



DBMS User Environment

Multi-User DBMS Environment

- **Teleprocessing**
  - Very old Architecture of multi-user environment
  - All processing is performed at only a central computer
  - The attached devices are called Terminal or **Dumb terminal**
  - Dumb terminal are only use to view the result or typing some thing.
  - All the processing by DBMS and application seen on dumb terminal are run on at central computer

DBMS User Environment

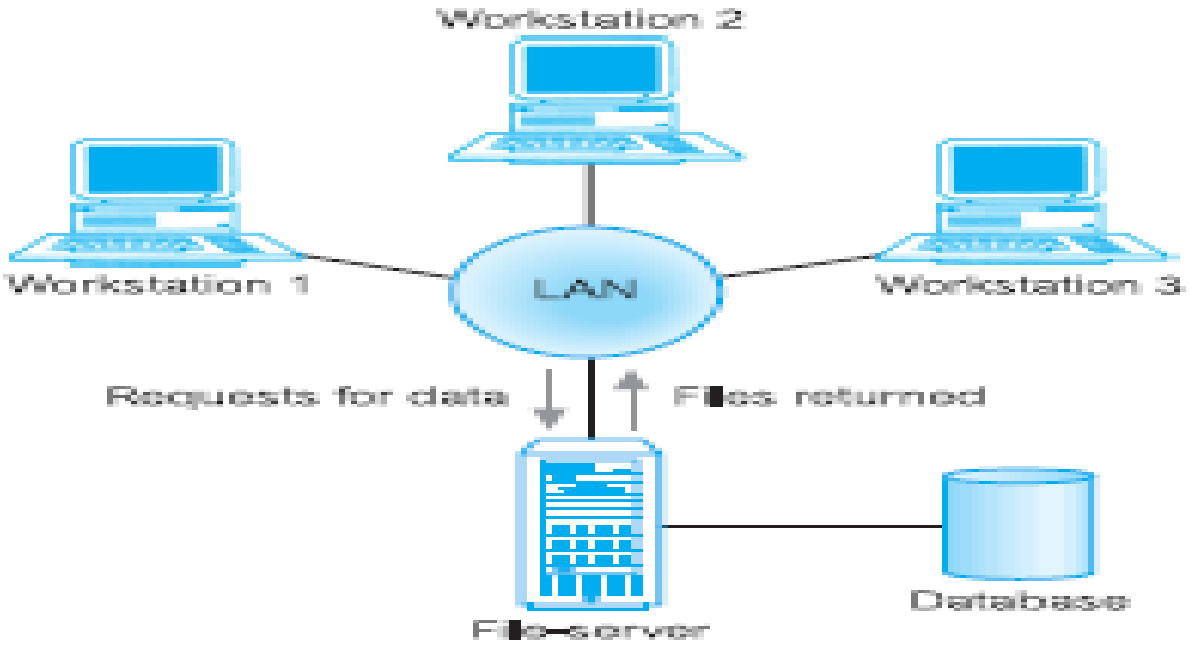
Multi-User DBMS Environment

- **Teleprocessing**
- **Drawback:**
  - Too much burden on central computer
  - Central computer become slow down
- **Solution**
  - To overcome the drawback of teleprocessing, File server environment was introduced.

DBMS User Environment

Multi-User DBMS Environment

- **File Server Environment**



DBMS User Environment

Multi-User DBMS Environment

- **File Server Environment**
  - The processing is distributed about the network.
  - Data storage was the responsibility of File server.
  - Application and copy of DBMS run on each workstation.
  - When user need any data it request from workstation to file server, the file server rather sending only that data the complete file was send to the workstation. All the files are store at file server and all the processing is done at workstation.

DBMS User Environment

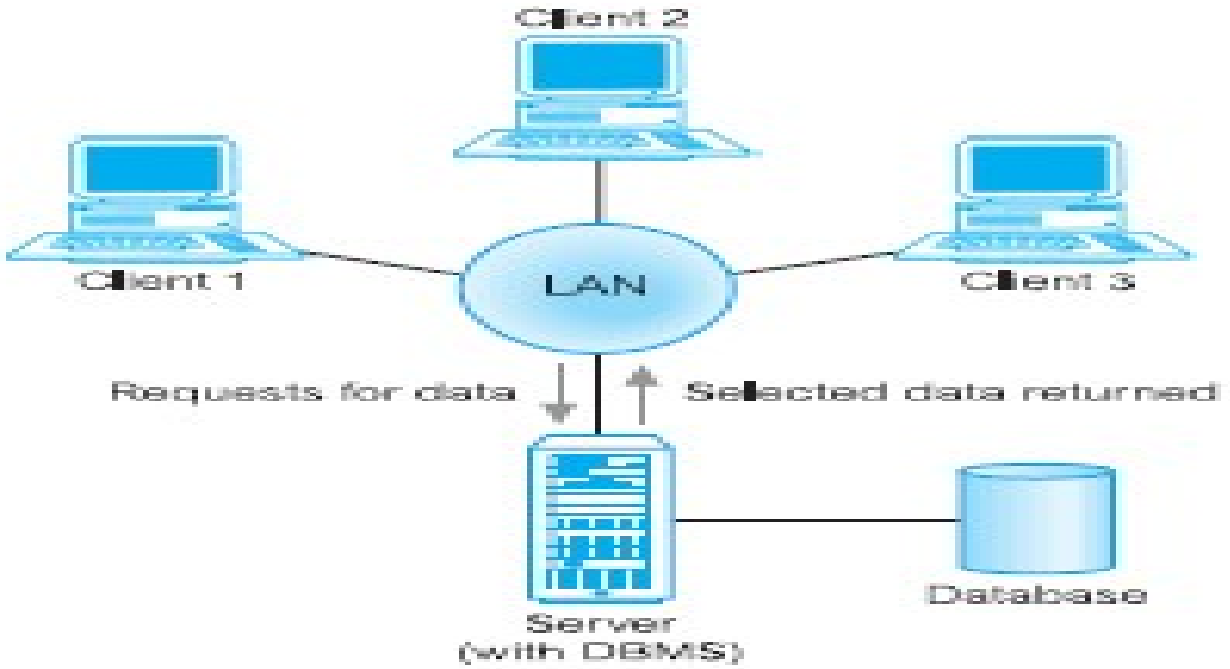
Multi-User DBMS Environment

- **File Server Environment**
- **Drawback**
  - Network Over burden
  - Full copy of DBMS is required on each workstation.
  - Concurrency control become very complex
- **Solution**
  - To overcome the drawback of File server, Client Server Architecture was developed.

DBMS User Environment

Multi-User DBMS Environment

- **Client Server Environment**



DBMS User Environment

Multi-User DBMS Environment

- **Client Server Environment**
  - DBMS run only on server machine and no copy of DBMS is on the client computer
  - Client computer manages the user interface and application programs, which means that application program are run on client computers.
  - If user want to access any data, 1st query is checked at local machine then send it to server where the DBMS check either request is valid or not and then specific result are send back to client.

DBMS User Environment

Multi-User DBMS Environment

- **Client Server Environment**
- **Advantages**
  - Concurrency control
  - Increase performances
  - Reduced network traffic