

Lecture 2:-

DBMS Architecture

Abstraction- Providing only required information by Hiding background information
Ex- Car driving

The drivers knows about only accelerator, steering, brakes but not how they work in mechanical terms.

DBMS provides abstract personalized view of the data

* Three schema architecture (provides view of data)

Design of DB

i) Physical level / internal level -> lowest level of data that shows, how the data is stored in DB

Ex- Image

- > As Collection of bits/bytes
- > shows Place in DB (shows data stored in blocks or what)
- > shows about encryption, use of algo (like image compression for image etc.)

It has physical schema which describes the physical structure of DB.

-> Blueprint which shows that how the data is stored physically

#Goal -> To define algorithms that allow efficient access of data

ii) Logical level / conceptual level -> shows in which order data is stored in DB

It has conceptual schema which describes the design of DB logically.

-> Blueprint which shows that of what the data is

Shows relationship between data

// Basically shows, physically stored data kya kehna chahta hai using physical to logical mapping

#Goal -> Ease to use the data

iii) View level / external level -> Providing different data view to different end user

It has view schema which describes the required DB part to different end users.

-> Blueprint which provides the required data only to end users by abstraction

Data abstraction for different users

// Also called subschemas -> kyunki different view of DB will be provided to different end users

#Goal -> Security of data

* Instance of DB

Is the collection of information stored in DB at particular moment.

* DB schema (Logical schema) ->

Is the design of DB (normally Logical schema is DB schema)

DB schema includes-

- > Attributes (Like Name, DOB, student Id etc.)
- > Consistency constraints (like name cannot be null etc., some requirement)
- > Key (like student ID)
- > Relationship

// Very important for the programmers, programs will be create on the basis of logical schema (Db schema)

* Data Models

Provides a way to to describe the data at logical level to design DB

* DBMS languages-

i) Data definition language (DDL) -> Defines the data base design. (DB schema)

Like for student data base it defines that there will be student id, student name etc.

We specify consistency constraints like a name can never be NULL etc.

ii) Data Manipulation language (DML) -> To perform various operations on the data base

Like retrieval, inserting, deleting, updating data etc.

Practically both languages are included in single DB language -> like SQL Language

Example DDL and DML (SQL)->

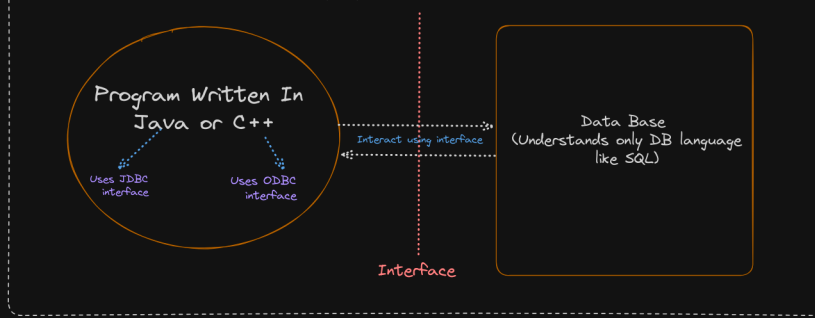
DDL-> Create table students (Name varchar[50], student ID int, Phone no int, address varchar[50]);

DML-> select * students ;

How a program can interact with Data Base

Program Language (Host Language) -> Java, C++ etc.

And our DB can understand DB language like SQL



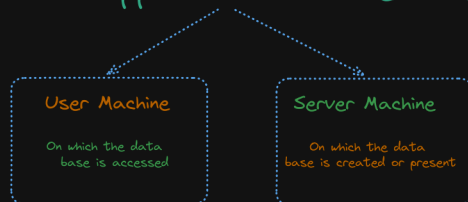
*DBA (Data Base Administrator) ->

A person who has central control on the data base and the accessing programs

Functions of DBA

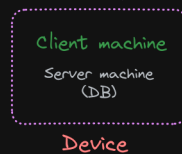
- > Schema definition (design logical schema)
- > Storage structure (Physical level schema)
- > Authorization control
- > Maintenance -
 - > Upgradge in DB
 - > Security (Avoid hacking)
 - > Periodic backup

*DBMS Application Architecture ->

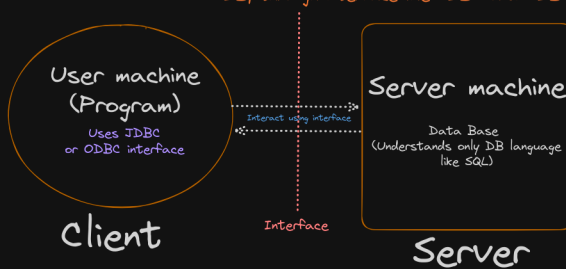


Types of DBMS application Architecture-

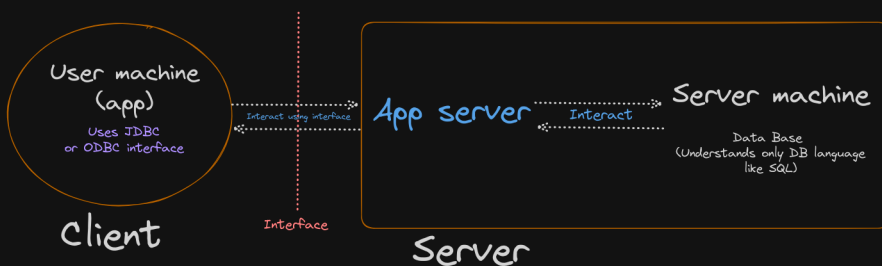
i) T1 (Tier 1) architecture -> Client machine, server machine both at same device.



ii) T2 (Tier 2) achitecture -> User machine direct interact with server machine having DB, through interface like JDBC and ODBC.



ii) T3 (Tier 3) achitecture -> User machine interact with app server and then app server interact with DB, through interface like JDBC and ODBC.



Advantages T3 architecture -

- > Authorization control
- > Maintenance -
 - > Upgradge in DB
 - > Security (Avoid hacking)
 - > Periodic backup
- > Provides layers