PART-2

DBMS Architecture

DBMS Architecturebase

- It includes 3 schema Architecture:
  - **External schema**
    - It can be more than one, and it contains the data that each type of user can see.
  - **Conceptual schema**
    - It contains all the tables and relations between the data
  - **Physical schema**
    - It describes the location (access paths) of the data on the disk

DBMS Architecturebase

- The concept of **data independence**:
    - It means that when I change any schema, it is not necessary that the schema at the higher level will feel this change.

Data Models

DBMS Architecturebase

- We have 2 types of data models:
  - **Logical model (Conceptual model)**
    - It contains all the data design, including: entities, attributes, and relationships.
  - **Physical model:**
    - Describes how the data is stored on the disk and the access paths needed to access and search for data

Mappings

Mappings

- It’s the process of transforming the requests and results between the levels, such as :
  - Request and results between the external schema and conceptual schema

Centralized DB Environment

Centralized DB Environment

- Centralized DB Environment has 3 shapes:
  - **Mainframe Environment**
  - **Client/Server Environment**
  - **Internet Computing Environment**

Centralized DB Environment

- **Mainframe Environment :**
  - It consists of :
    - Mainframe contains : DB server & App server
    - Monitors (PCs) connected to the mainframe
- **Problems:**
  - The process depends on one server
  - the performance is very slow because of high traffic
  - DB & App layer has a single point of failure

Centralized DB Environment

- **Client/Server Environment :**
  - It consists of 2 tiers :
    - DB server
    - Client (Thick) App locally installed
- **Problems:**
  - DB is a single point of failure
  - High cost for support
- **Advantages:**
  - Application layer isn’t a single point of failure

Centralized DB Environment

- **Independent Computeing Environment :**
  - It consists of 3 tiers :
    - DB Server
    - App Server
    - Client (Thin)
- **Problems:**
  - DB & App server has a single point of failure
- **Advantages:**
  - Lower cost for support and maintenance

Distributed DB Environment

Distributed DB Environment

- Distributed DB Environment has 2 ways:
  - **Replication:**
    - It is considered as copy & paste the DB
  - **Fragmentation**
    - It is considered as cut & paste the DB
- It support high avalibilty of the DB

Distributed DB Environment

- **Replication** has two ways:
  - **Partial Replication**
    - It’s consederd as copy & paste part of th DB to another server
  - **Full Replication:**
    - It’s consederd as copy & paste the DB to another server

Distributed DB Environment

- **Advantages:**
  - DB isn’t a single point of failure
- **Disadvantages:**
  - High cost

THANK YOU