



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

**COURSE NAME : 23CST207 - DATABASE MANAGEMENT
SYSTEMS**

II YEAR / IV SEMESTER

Unit 1- Introduction to Data Base

**Topic 4 : Three level schema and DBMS
Architecture**



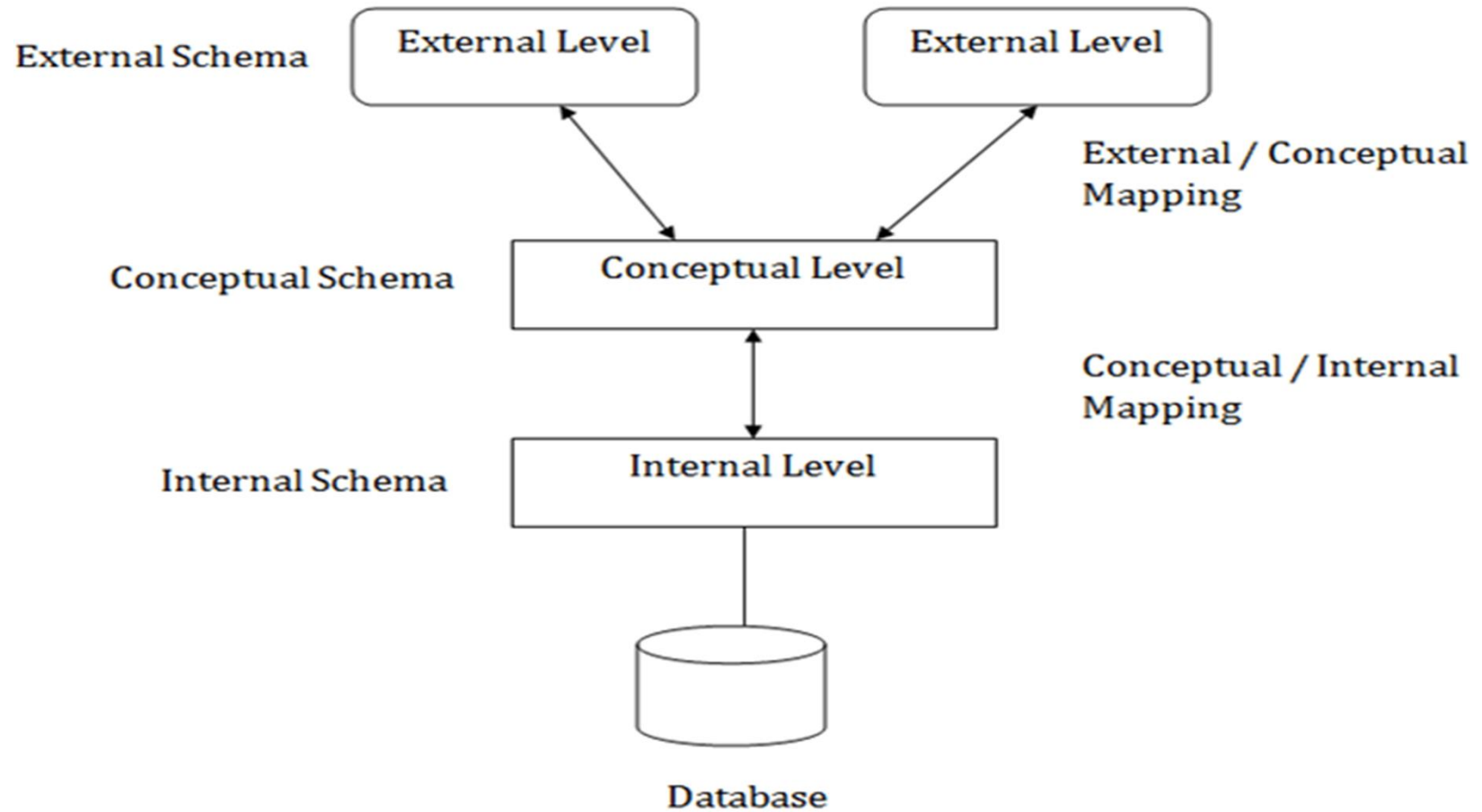
Three level schema



- The three schema architecture is also called ANSI/SPARC architecture or three-level architecture.
- This framework is used to describe the structure of a specific database system.
- The three schema architecture is also used to separate the user applications and physical database.
- The three schema architecture contains three-levels. It breaks the database down into three different categories.



Three level schema





Objectives of Three schema Architecture

- Different users need different views of the same data.
- The approach in which a particular user needs to see the data may change over time.
- All users should be able to access the same data according to their requirements.
- DBA should be able to change the conceptual structure of the database without affecting the user's
- Internal structure of the database should be unaffected by changes to physical aspects of the storage.



Objectives of Three schema Architecture – Cont..



1.Internal Level

Internal view

STORED_EMPLOYEE record length 60	
Empno	: 4 decimal offset 0 unique
Ename	: String length 15 offset 4
Salary	: 8,2 decimal offset 19
Deptno	: 4 decimal offset 27
Post	: string length 15 offset 31

- The internal level has an internal schema which describes the physical storage structure of the database.
- The internal schema is also known as a physical schema.
- It uses the physical data model. It is used to define that how the data will be stored in a block.
- The physical level is used to describe complex low-level data structures in detail.



Objectives of Three schema Architecture – Cont..



1. Internal Level

➤ Storage space allocations.

For Example: B-Trees, Hashing etc.

➤ Access paths.

For Example: Specification of primary and secondary keys, indexes, pointers and sequencing.

➤ Data compression and encryption techniques.

➤ Optimization of internal structures.

➤ Representation of stored fields.

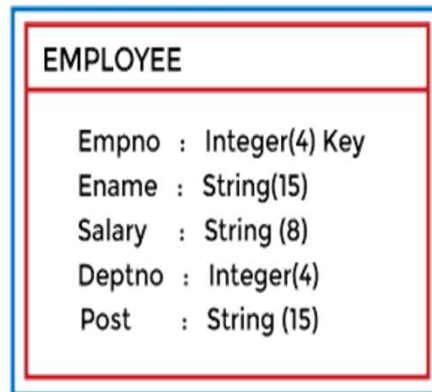


Objectives of Three schema Architecture – Cont..



2. Conceptual Level

Global view



- The conceptual schema describes the design of a database at the conceptual level. Conceptual level is also known as logical level.
- The conceptual schema describes the structure of the whole database.
- The conceptual level describes what data are to be stored in the database and also describes what relationship exists among those data.
- In the conceptual level, internal details such as an implementation of the data structure are hidden.
- Programmers and database administrators work at this level.



Objectives of Three schema Architecture – Cont..

3.External Level

- At the external level, a database contains several schemas that sometimes called as subschema. The subschema is used to describe the different view of the database.
- An external schema is also known as view schema.
- Each view schema describes the database part that a particular user group is interested and hides the remaining database from that user group.
- The view schema describes the end user interaction with database systems.

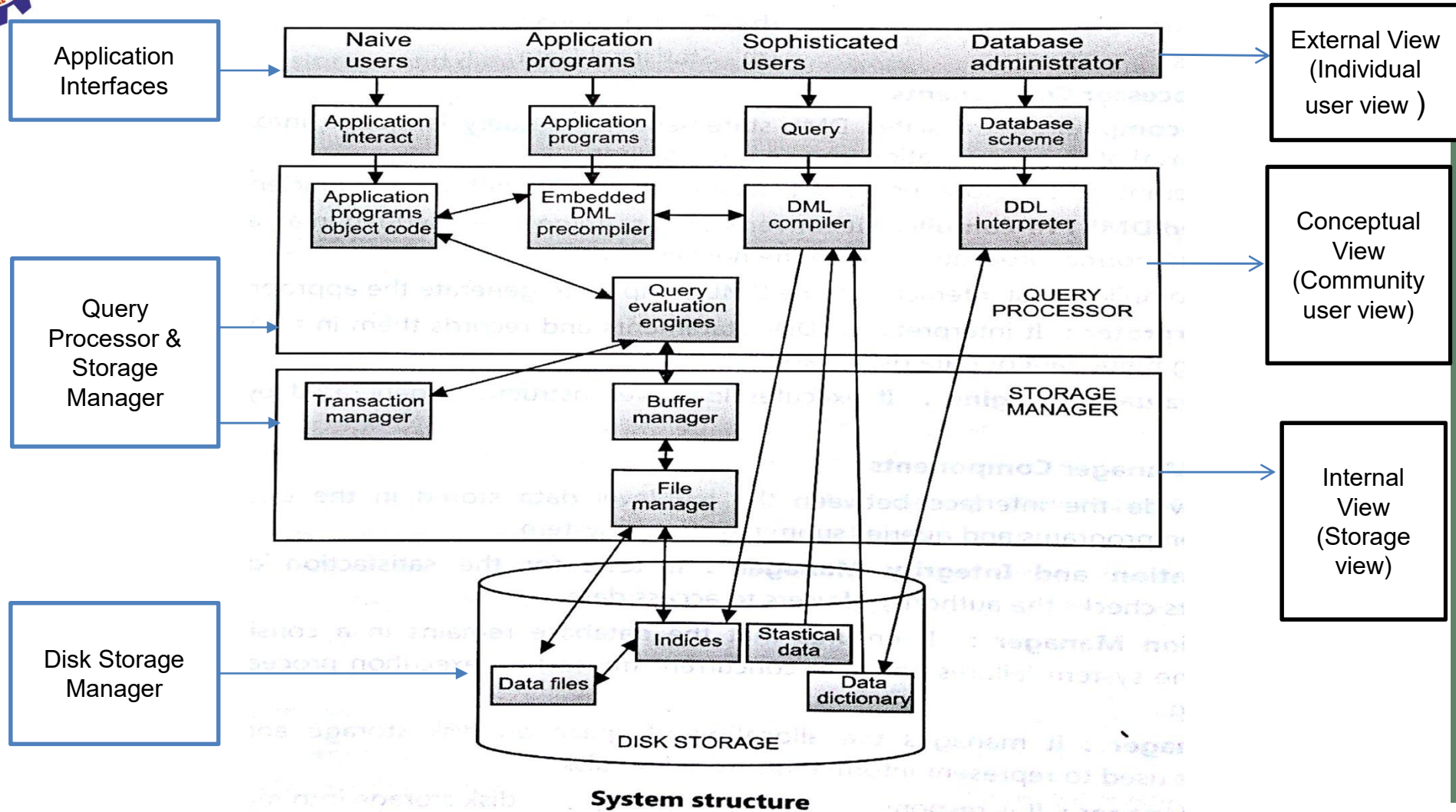
External
View

Empno	Ename
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Empno	Ename	Salary	DeptNo
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DATABASE ARCHITECTURE





Query processor

1.DDL Interpreter

- This is basically a translator which interprets the DDL statement in Data dictionaries.

2. DML Compiler

- It translates DML statements query Languages into an evaluation plan.

3.Query Evaluation Engine

- It executes the low-level instructions generated by the DML Compiler



Storage Manager

1. Authorization and Integrity Manager

- Who want to access the data and test for integrity constraints.

2. Transaction Manager

- Concurrent transaction execution processed without conflicting.

3. File Manager

- Manages allocation of space on disk storage and representation of the information on disk.

4. Buffer Manager

- Fetching the data from disk storage into main memory and what data to cache in main memory.



1-Tier Architecture

- In 1-tier architecture, the DBMS is the only entity where the user directly sits on the DBMS and uses it.
- Any changes done here will directly be done on the DBMS itself. It does not provide handy tools for end-users.
- Database designers and programmers normally prefer to use single-tier architecture.

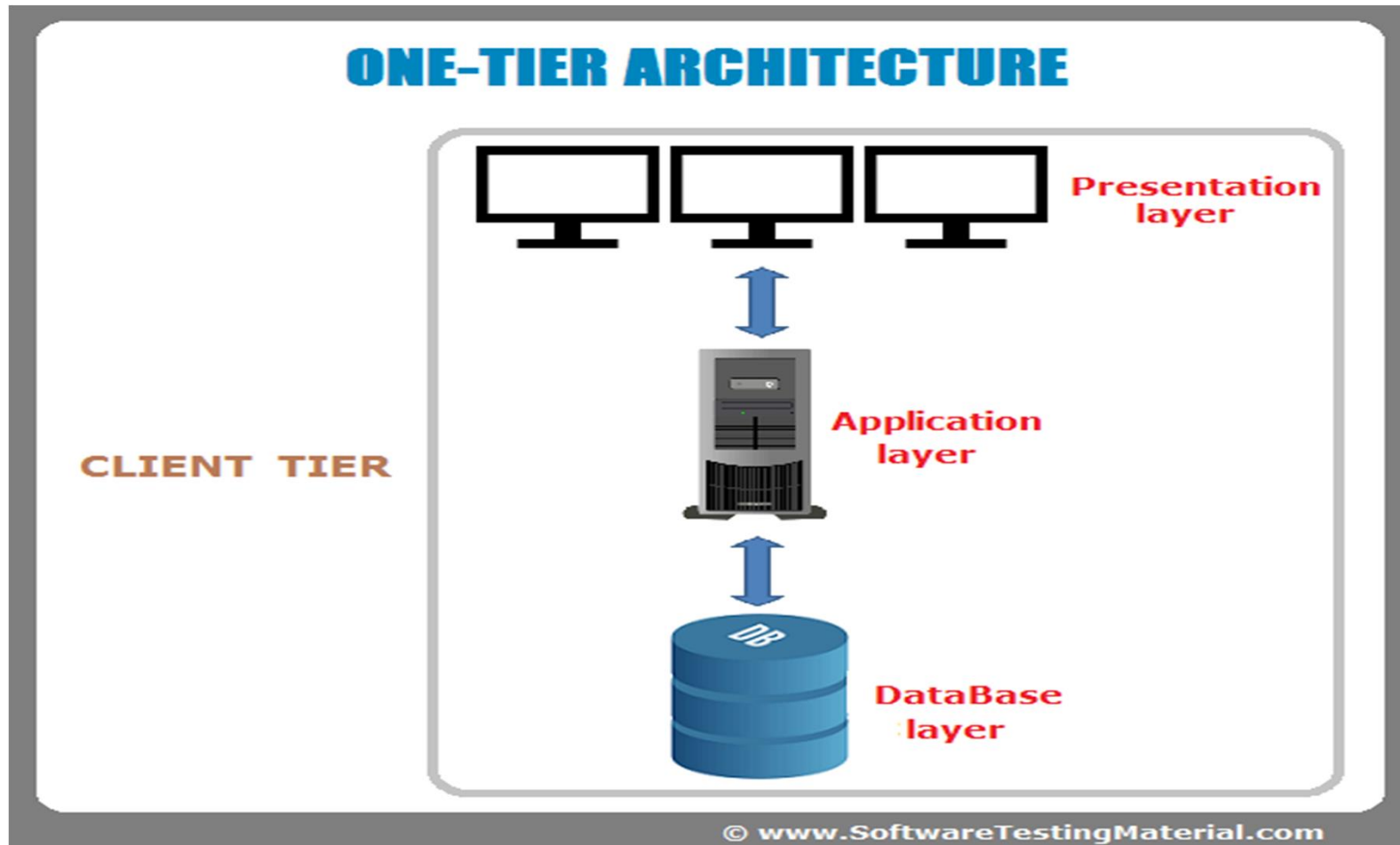


Break





Cont..



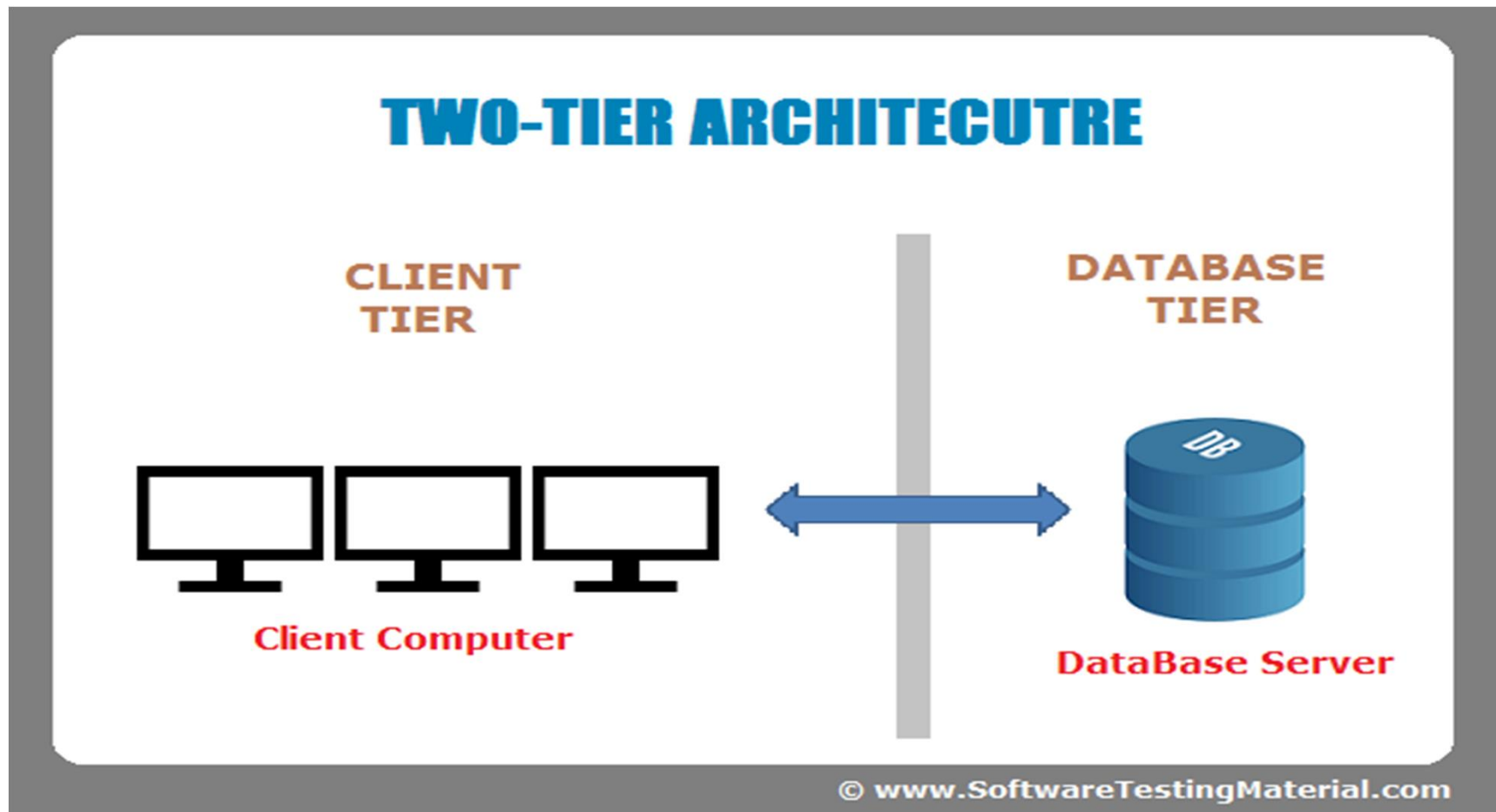


2-Tier Architecture

- If the architecture of DBMS is 2-tier, then it must have an application through which the DBMS can be accessed.
- Programmers use 2-tier architecture where they access the DBMS by means of an application.
- Here the application tier is entirely independent of the database in terms of operation, design, and programming.



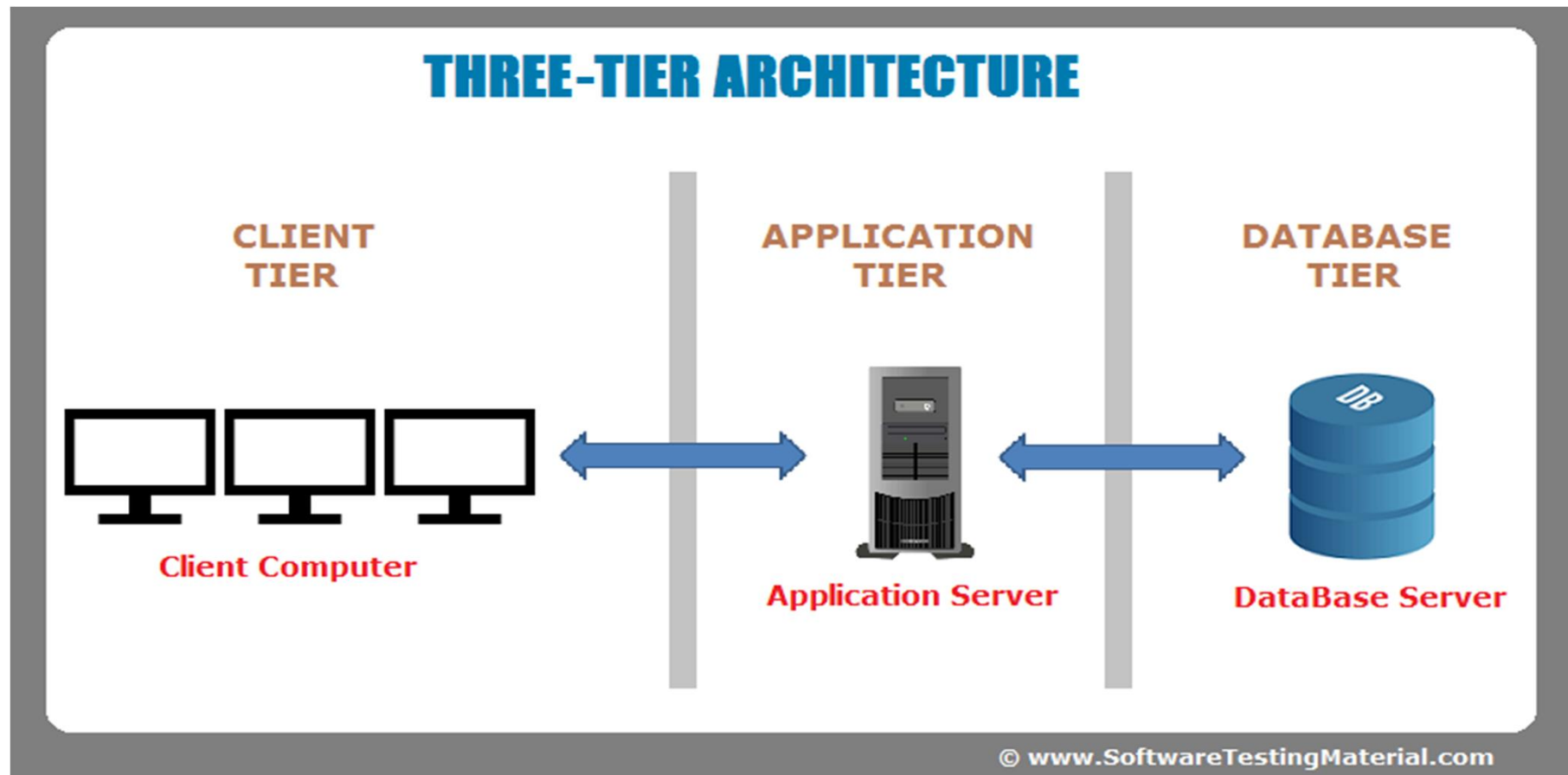
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3-Tier Architecture

- A 3-tier architecture separates its tiers from each other based on the complexity of the users and how they use the data present in the database.
- It is the most widely used architecture to design a DBMS.





Evaluation



1. List out the types of structure view

a) _____

b) _____

c) _____

Answer :

a) External View

b) Conceptual View

c) Internal View



REFERENCES



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THANK YOU