

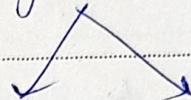
Types of distributed database



Homo genous

Autonomous Non-

Hetero genous



Uses message passing to info update	Autonomous	Federated	Multidatabase
	A master DBMS coordinates	All are independent, module is employed	A central

1) Network transparency or distribution transparency



location transparency

Naming transparency

2) Replication transparency

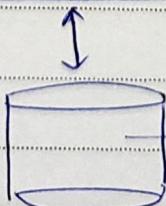
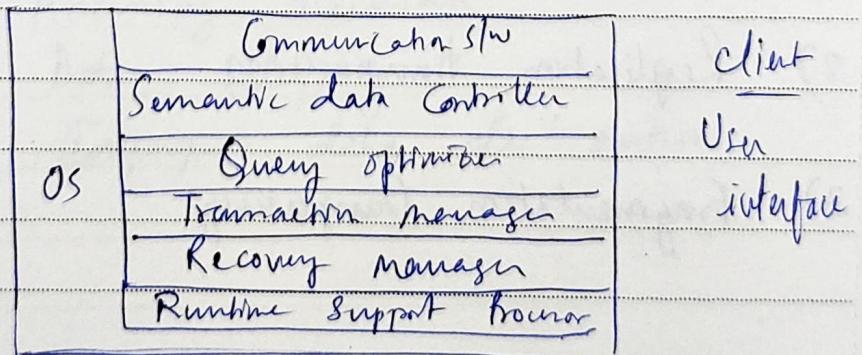
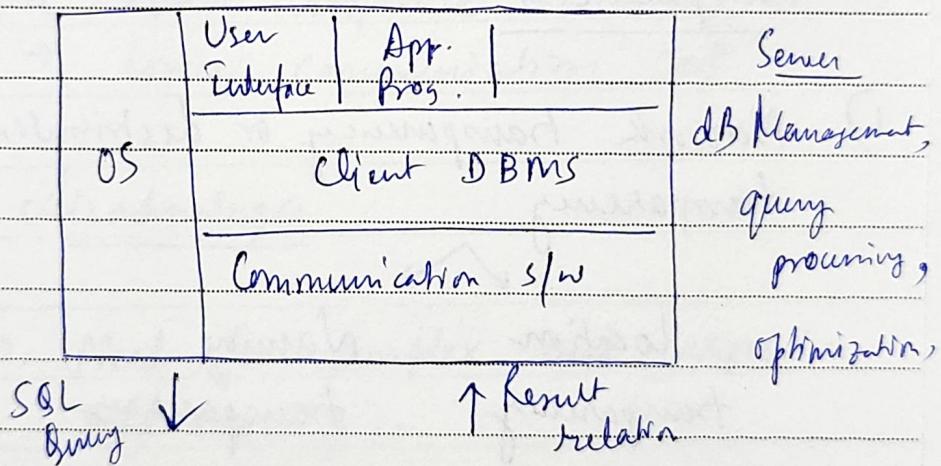
3) Fragmentation transparency

— / —

Architectures

- 1) Client-Server → Each has their own duty
- 2) Peer to peer → Any machine can do the transactions, querying etc.
- 3) Multi - DBMS architecture

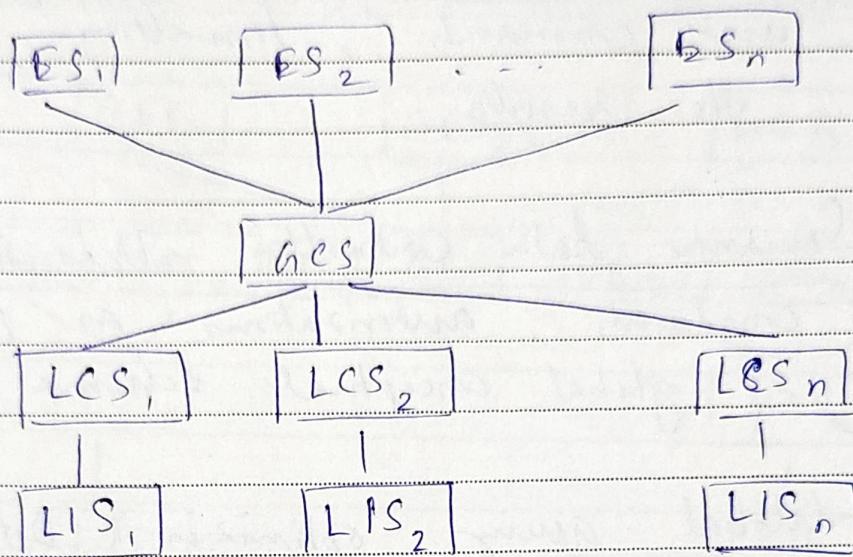
Client Server



Database

DOMS

Peer to Peer



Global Conceptual Schema :- Global logical view of the data

Local Conceptual Schema : Logical data organization at each site

Local internal schema : physical data organization at each site

External schema :- User view of the data.

DOMS

Components of DDBMS

— / —

User interface handler :- interpreting user commands, formating the results

Semantic data controller : User integrity constraints, authorizations as part of global conceptual schema.

Global query optimizer : Determines an execution strategy, translates global query to local ones.

Distributed execution manager.

Coordinates the distributed execution of the user request.

Local query optimizer :- choose best access path to data.

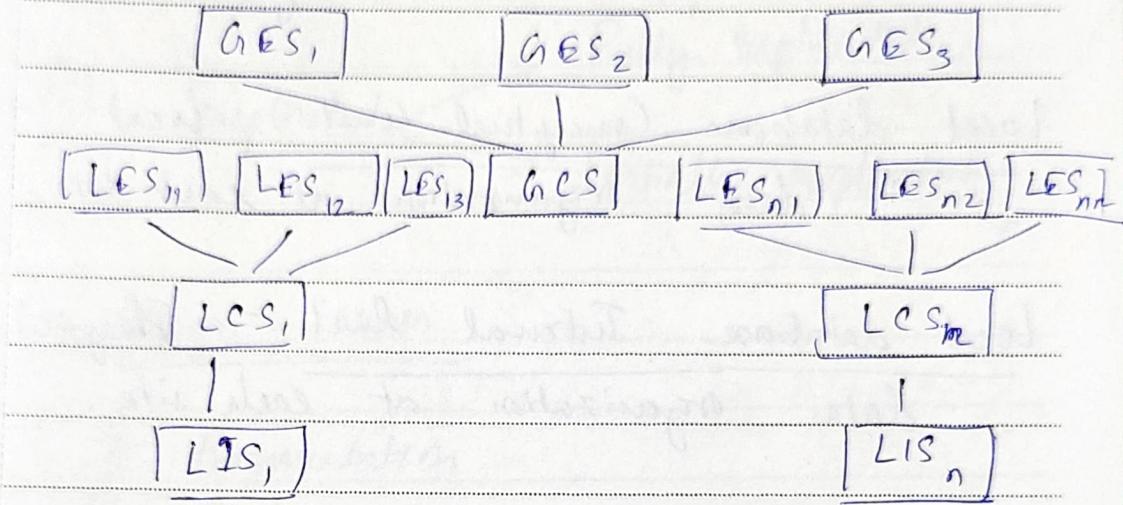
Local recovery manager :- local database is consistent.

Run-time support, processor : acquires the database contains database **DOMS** buffer.

— / —

Multidatabase architecture

(Individual DBMSs are fully autonomous)



→ Collection of two or more autonomous database systems.

Multi database view level :- Depicts multiple user views comprising of subsets of the integrated database

Multi database Conceptual level :-

Comprises of global logical multi-dB structure.

Multi database internal level :-

Data distribution across diff. sites and multi database to local database mapping.

DOMS

Local database View level :- Public view
of local data

Local database Conceptual level :- Local
data organization at each site.

Local database Internal level :- Physical
data organization at each site.

Two design alternatives of ~~be~~ Multi DB

- ① With GCS
- ② Without GCS

Logically integrated DBMS

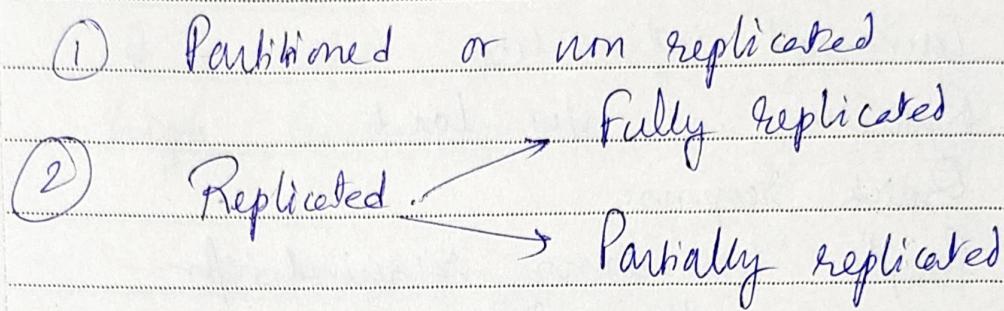
GCS defines the conceptual view
of the entire database.

Distributed multi-DBMS

Views a collection of local databases
that the local devices want to share.

DOMS

Distributed database design



Design issues

- ① Fragmentation
- ② Distribution.

Design Alternatives

- Non replicated and non fragmented
- Fully replicated
- Partially replicated
- Fragmented
 - Vertical
 - Horizontal
 - Hybrid.
- Mixed.

Combination of fragmentation & partial replication. Tables are initially fragmented, then partially replicated.

DOMS

Advantages of replication

- 1) Increased reliability
- 2) Reduction in n/w load
- 3) Quick response
- 4) Simple transactions required for acieving the data

Disadvantages

- 1) Increased storage requirements
- 2) Increased cost and complexity
- 3) Complex coordination b/w application and data.

Correctness rules of fragmentation

1. Completeness : Consistency decomposition property is to be maintained.
2. Reconstruction : Reconstructibility of the relation from fragments.
3. Disjointness : Each fragment will have different data points.