

Fragmentation & View Management

RAMNA SATTAR



Fragmentation

Fragmentation:

Fragmentation is the task of dividing a table into a set of smaller tables. The subsets of the table are called **fragments**. Fragmentation can be of three types: horizontal, vertical, and hybrid (combination of horizontal and vertical). Horizontal fragmentation can further be classified into two techniques: primary horizontal fragmentation and derived horizontal fragmentation.

Fragmentation should be done in a way so that the original table can be reconstructed from the fragments. This is needed so that the original table can be reconstructed from the fragments whenever required. This requirement is called “reconstructiveness.”



Fragmentation

Advantages of Fragmentation:

- Since data is stored close to the site of usage, efficiency of the database system is increased.
- Local query optimization techniques are sufficient for most queries since data is locally available.
- Since irrelevant data is not available at the sites, security and privacy of the database system can be maintained.



Fragmentation

Disadvantages of Fragmentation:

- When data from different fragments are required, the access speeds may be very high.
- In case of recursive fragmentations, the job of reconstruction will need expensive techniques.
- Lack of back-up copies of data in different sites may render the database ineffective in case of failure of a site.



Fragmentation

Vertical Fragmentation:

In vertical fragmentation, the fields or columns of a table are grouped into fragments. In order to maintain reconstructiveness, each fragment should contain the primary key field(s) of the table. Vertical fragmentation can be used to enforce privacy of data.



Fragmentation

Horizontal Fragmentation:

Horizontal fragmentation groups the tuples of a table in accordance to values of one or more fields. Horizontal fragmentation should also confirm to the rule of reconstructiveness. Each horizontal fragment must have all columns of the original base table.



Fragmentation

Hybrid Fragmentation:

In hybrid fragmentation, a combination of horizontal and vertical fragmentation techniques are used. This is the most flexible fragmentation technique since it generates fragments with minimal extraneous information. However, reconstruction of the original table is often an expensive task.

Hybrid fragmentation can be done in two alternative ways:

- At first, generate a set of horizontal fragments; then generate vertical fragments from one or more of the horizontal fragments.
- At first, generate a set of vertical fragments; then generate horizontal fragments from one or more of the vertical fragments.



VIEW OF DATA

VIEW OF DATA:

What is view management?

- Views enable full logical data independence.
- Views are virtual relations that are defined as the result of a query on base relations.
- Views are typically not materialized.
- Can be considered a dynamic window that reflects all relevant updates to the
▪ database.



Advantage of View Management

Advantage of View Management

- Data integrity.
- logical data independency.
- view are also value in context of security.
- Easier querying.
- shielding from change.



View Management in Distributed DBMS

View Management:

In a relational system, a view is a virtual relation, defined as the result of a query on base relations but not materialized like a base relation, which is stored in the database. A view is a dynamic window in the sense that it reflects all updates to the database. Besides their use in external schemas, views are useful for ensuring data security in a simple way. By selecting a subset of the database, views hide some data. If users may only access the database through views, they cannot see or manipulate the hidden data, which are therefore secure.

In distributed DBMS, a view can be derived from distributed relations, and the access to a view requires the execution of the distributed query corresponding to the view definition. An important issue in a distributed DBMS is to make view materialization efficient.



View Management

Views in Centralized DBMS:

Most relational DBMSs use a view mechanism where a view is a relation derived from base relations as the result of a relational query.

Views in Distributed DBMS:

The definition of a view is similar in a distributed DBMS and in centralized systems. However, a view in a distributed system may be derived from fragmented relations stored at different sites. When a view is defined, its name and its retrieval query are stored in the catalog.



THANK YOU

ANY QUERY???

