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Database Management System (BCSC – 1003)

Topic: Log Based Recovery

Dr. Nikhil Govil

Assistant Professor, Dept. of CEA, GLA University, Mathura.

Topics to be covered

- Log Based Recovery
- Log Record Representation
- Types of Log Records
- Approaches to Modify Database

Log Based Recovery

- The log is a sequence of records.
- Log of each transaction is maintained in some stable storage so that if any failure occurs, then it can be recovered from there.
- Any operation which is performed on the database is recorded on the log.
- Prior to performing any modification to database, an update log record is created to reflect that modification.

Log Record Representation

- An update log record represented as: <Ti, Xj, V_1, V_2> has these fields:

1. Transaction identifier: Unique Identifier of the transaction that performed the write operation.
2. Data item: Unique identifier of the data item written.
3. Old value: Value of data item prior to write.
4. New value: Value of data item after write operation.

Types of Log Records

Other type of log records are:

- <Ti start>: It contains information about when a transaction Ti starts.
- <Ti commit>: It contains information about when a transaction Ti commits.
- <Ti abort>: It contains information about when a transaction Ti aborts.

Approaches to Modify Database

There are two approaches to modify the database:

1. Deferred database modification: The deferred modification technique occurs if the transaction does not modify the database until it has committed. In this method, all the logs are created and stored in the stable storage, and the database is updated when a transaction commits.

2. Immediate database modification: The Immediate modification technique occurs if database modification occurs while the transaction is still active. In this technique, the database is modified immediately after every operation.

References

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Thank
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