

DURABILITY

TRANSACTION

❖ Transaction

- A logical unit of work that consists of one or more SQL statements.

❖ Transaction Management

- One of the most fundamental functions of database that controls the concurrency of user's transaction and maintains the data consistency
- Example of bank transaction
 - Check Account A → Decrease from Account A → Increase from Account B → Check Account B

❖ Condition of transaction integrity

- Atomicity
- Consistency
- Isolation
- Durability

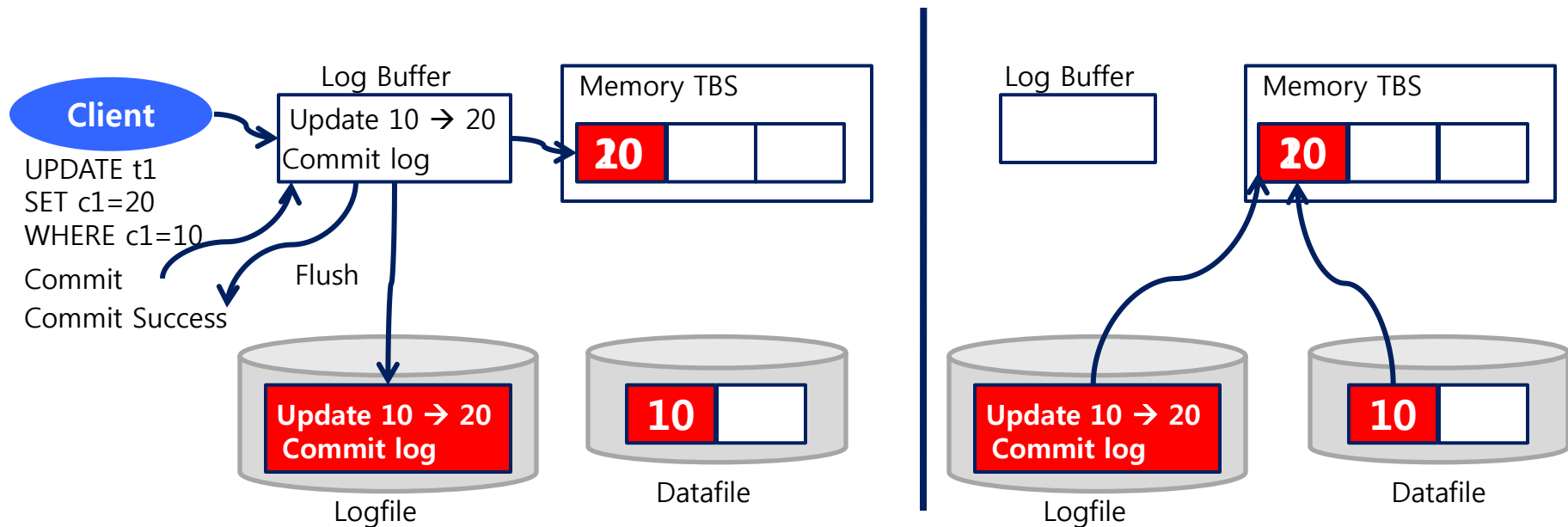
DURABILITY

❖ Transaction's durability

- Property that committed transaction has to be guaranteed against any kind of system failure before modification of database object is flushed into the disk. This is when the DBMS sent a commit response to the user
- DBMS manages log records to provide durability of the transaction
- The log records can cause disk I/O and which can also lead to reduction of performance by so-called bottleneck of transaction handling
- There is a trade-off relationship between safety and a performance in a perfect durability of the transaction and a performance of transaction processing

DURABILITY

❖ Transaction's durability and a recovery



Abnormal Shutdown → SERVER Restart → Restart Recovery

DURABILITY LEVEL

❖ How to configure Durability Level

- Configure it from a file called 'altibase.properties'
 - COMMIT_WRITE_WAIT_MODE & LOG_BUFFER_TYPE
- DB starts up with the configured Durability Level
- Property cannot be modified while DB is operating

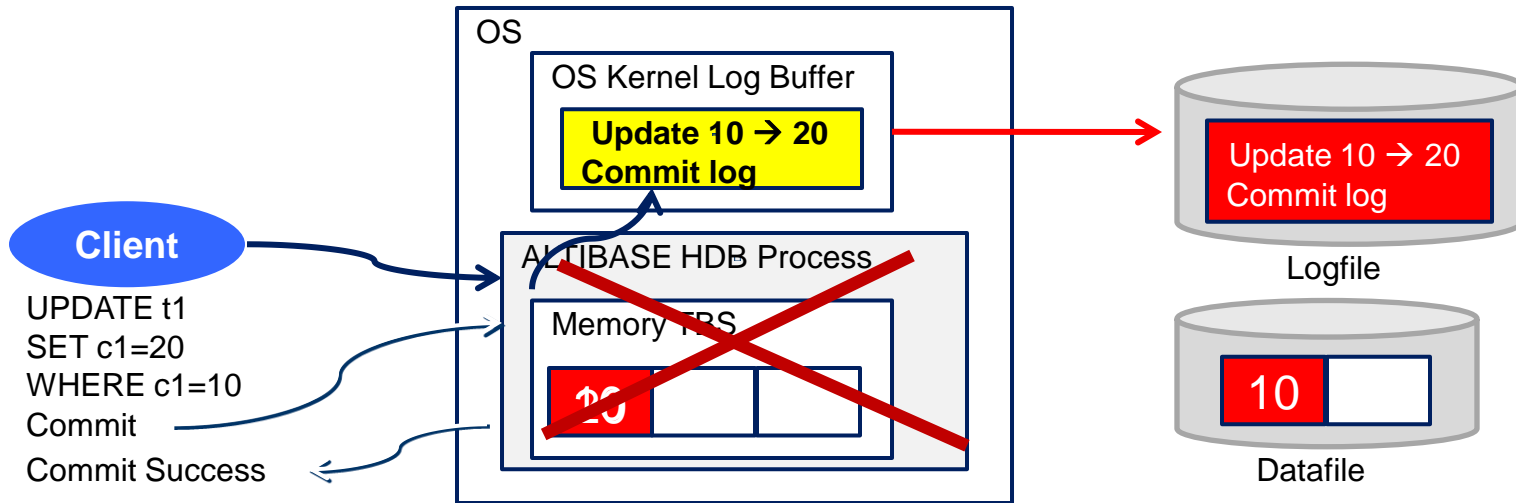
- Async/Sync
 - COMMIT_WRITE_WAIT_MODE = 0(Async)
 - COMMIT_WRITE_WAIT_MODE = 1(Sync)

- Log Buffer Type
 - LOG_BUFFER_TYPE = 0 (OS Kernel)
 - LOG_BUFFER_TYPE = 1(Altibase process)

DURABILITY LEVEL

❖ Performance Based (Default Level)

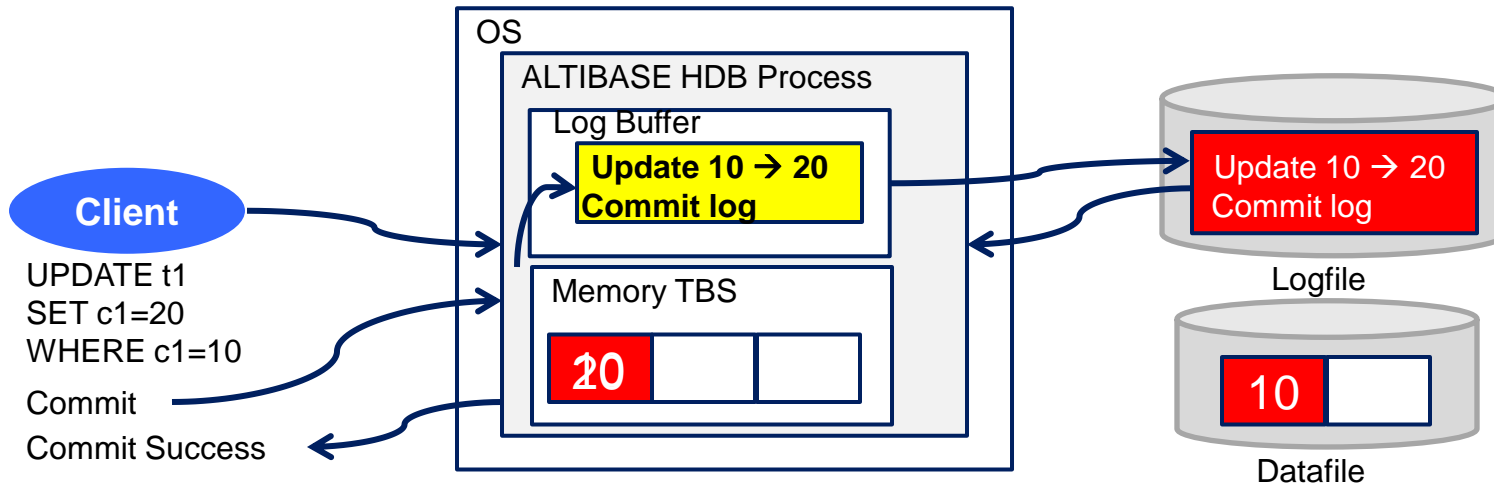
- Because the log buffer is stored in the OS kernel area, even if the ALTIBASE HDB process terminates abnormally, logs for committed transactions written to log files by OS
- Transaction durability is guaranteed except in the event of an OS crash



DURABILITY LEVEL

❖ Safety Based

- Records log into the process area of log buffer and guarantees saving into physical log files thus guarantees durability although Altibase has failures itself
- Perfect durability of transaction in any kinds of system failures as all the logs are recorded into log file but it has slowest performance out of all durability levels



Thank you!

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The logo for Altibase, featuring a stylized blue 'A' followed by the word 'ALTIBASE' in a bold, blue, sans-serif font.