

Introduction to ALITBASE XDB

For extreme performance

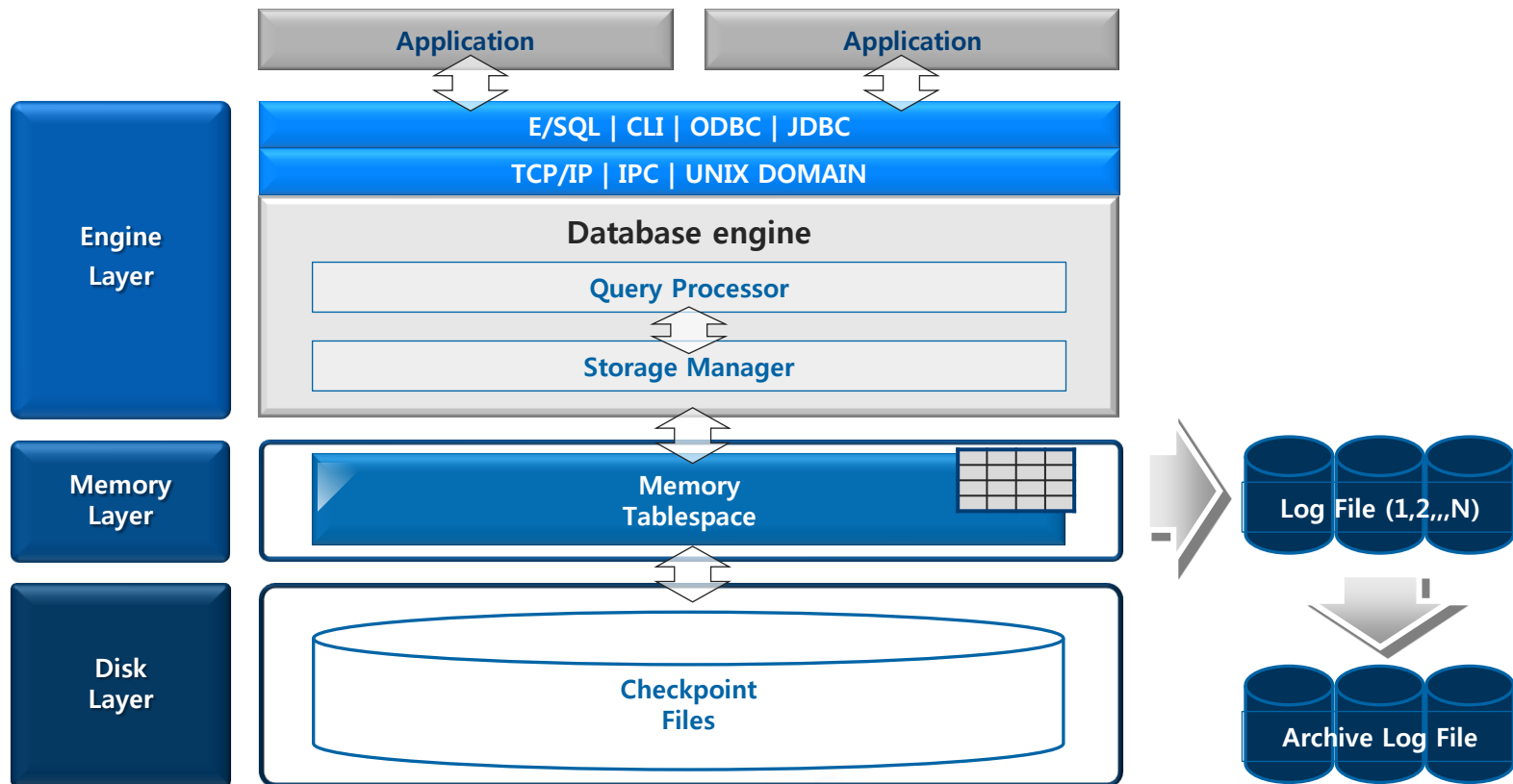


CONCEPT



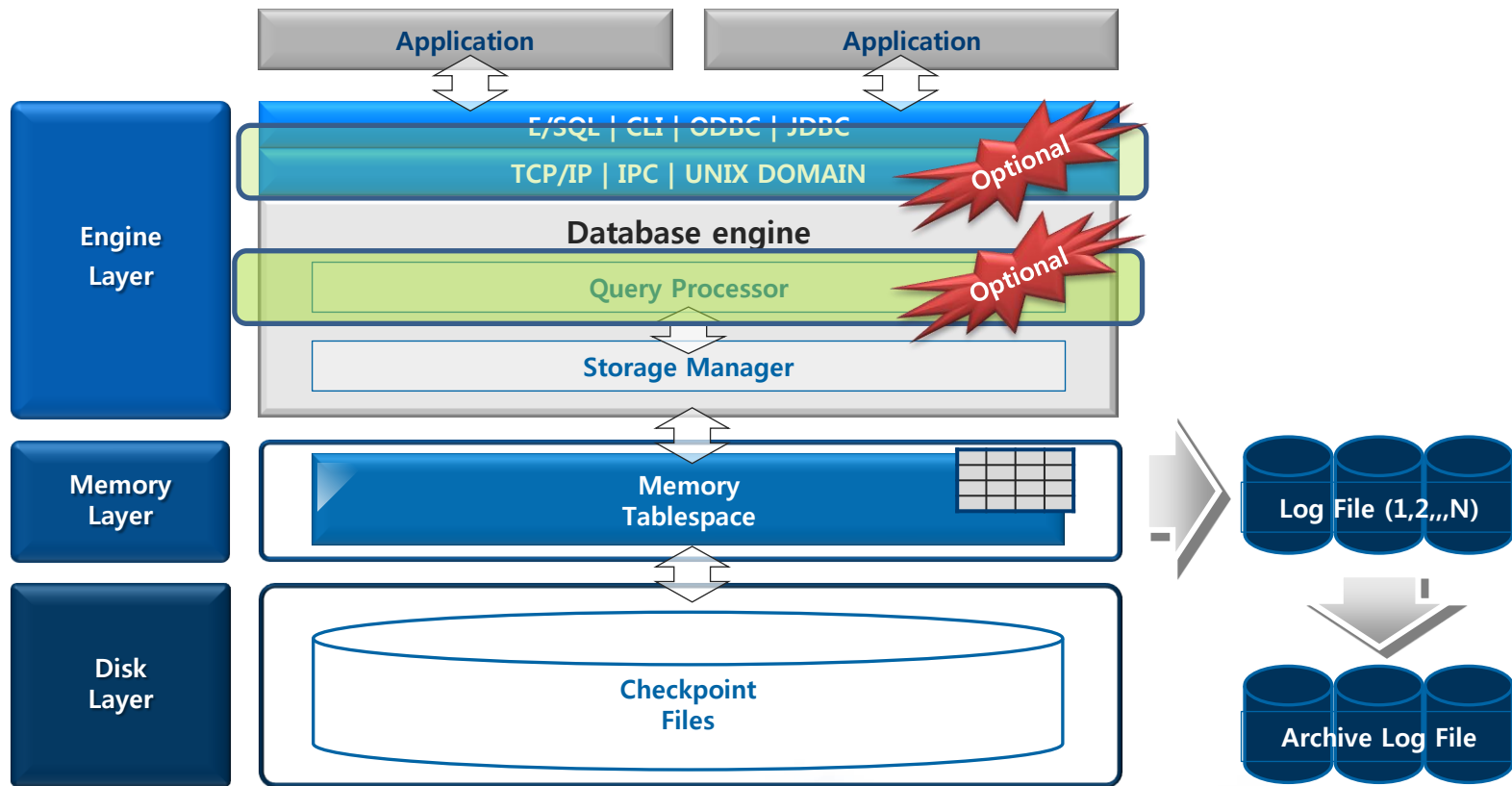
What is In-Memory DBMS?

- Data and indexes are stored in memory \Rightarrow High Performance
 - Almost no Disk I/O occurred
 - Communication protocol -> Query Processor -> Storage Manager -> Memory tablespace



ALTIBASE XDB™ *what*

- ALTIBASE XDB is an entirely new form of In-memory DBMS



Improved Stability

- Multi-Process & Multi-Thread Architecture
 - Multiple Direct Memory Access depending on the number of Clients
 - System uptime guaranteed

Increased Performance

- Extreme performance by DA(Direct Attach) and DCI(Direct Call Interface)
 - Connection protocol is not used thus direct memory access
 - Not dependent on network communication
 - Client can directly access to SM (Storage Manager)
 - Using shared memory as storage

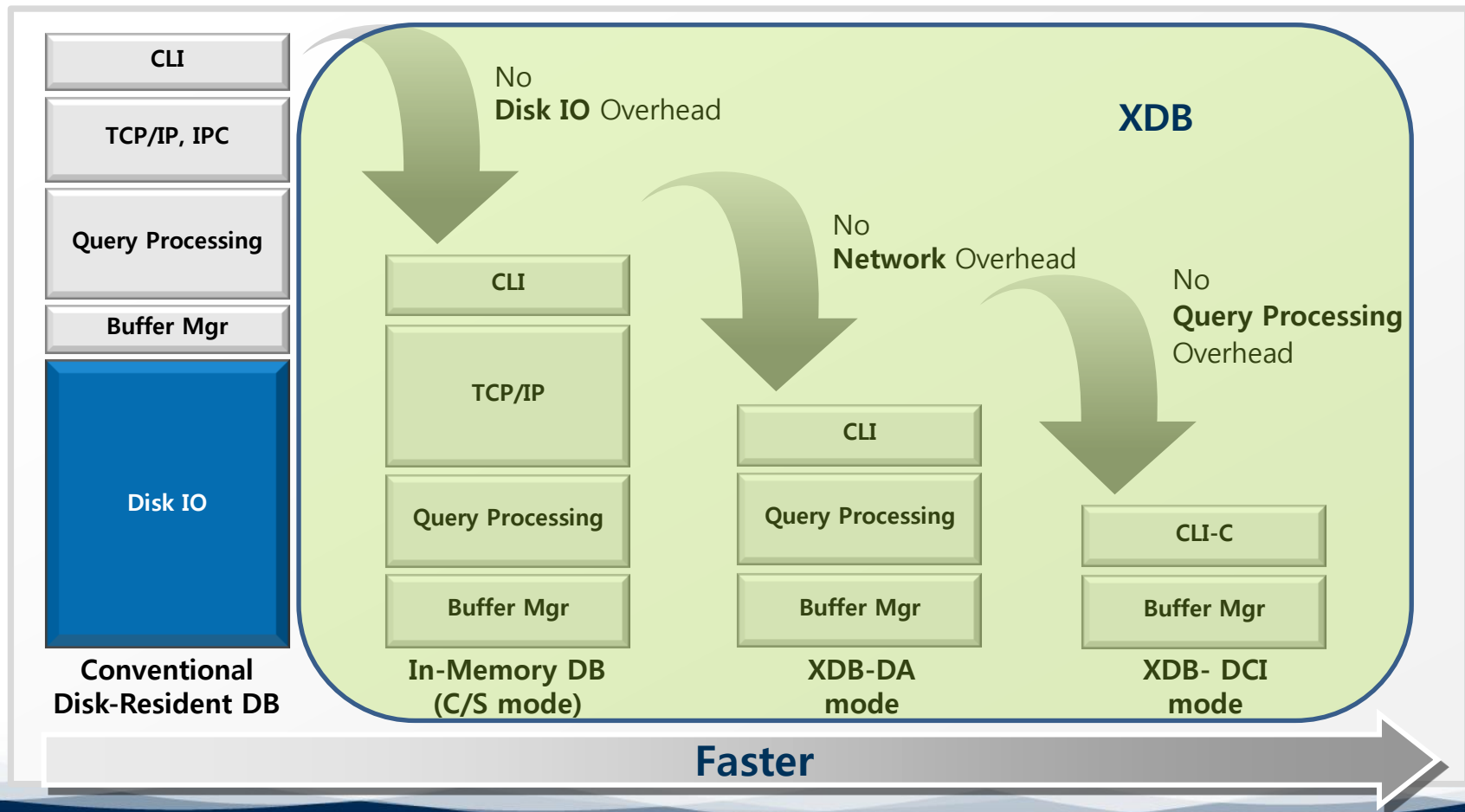


MODE

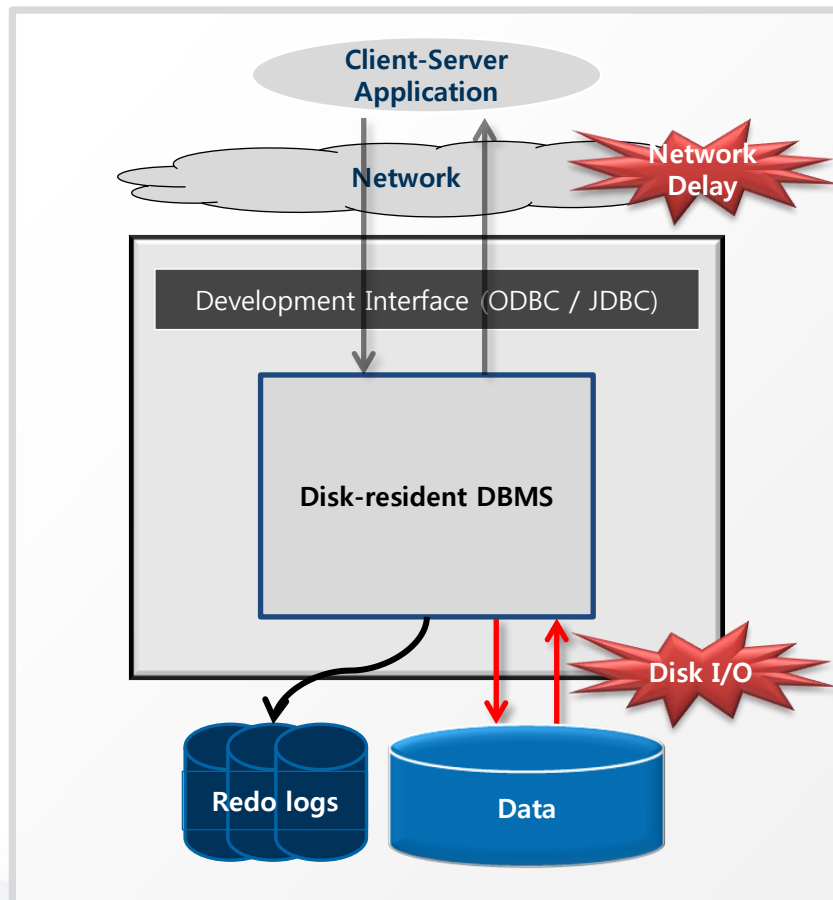
ALTIBASE

ALTIBASE XDB™ supported mode

- C/S, Direct Attach(DA) and DCI modes are provided so it can be configured depending on user's environment of DBMS architecture



- Conventional disk-resident DB does not have a limitation on a storage size but the performance slow down by Disk-I/O



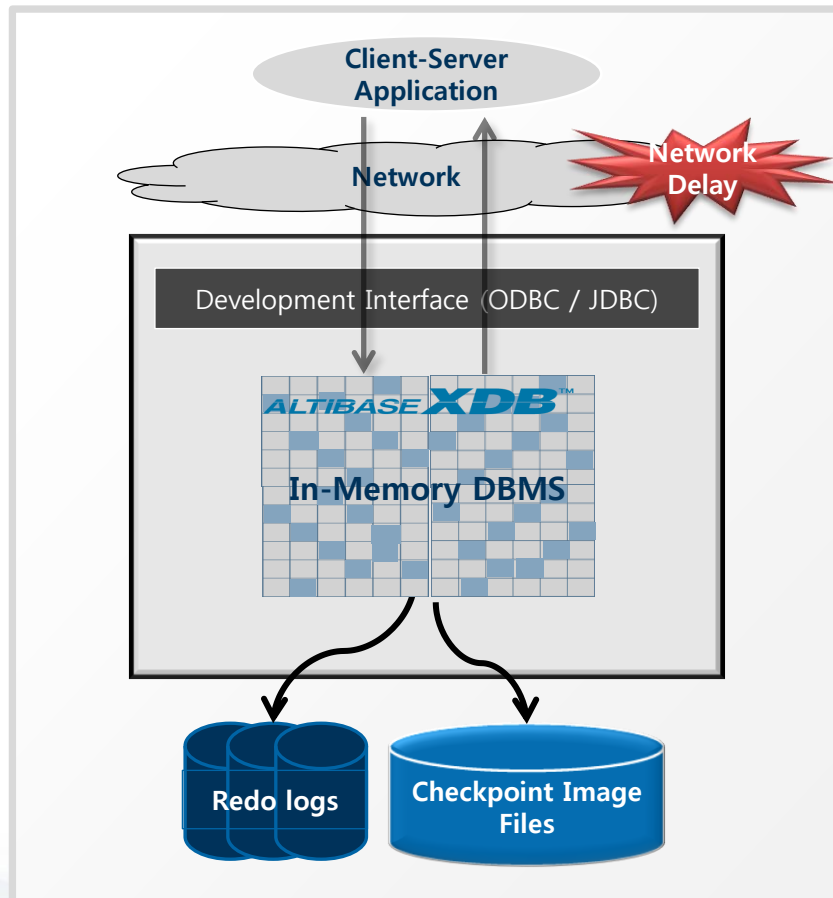
Characteristics

- All the data is stored in a disk
- If the data is requested, it is copied to memory for the better performance on the next request.
- Although Buffer Cache is being used, updated data must be applied to disk.

Limitations

- Although Buffer Cache is being used, the performance cannot be faster than that of In-Memory DBMS since data search algorithm is based on data in disk.
- Performance is degraded due to Disk I/O so tuning is necessary.
- Network costs

- Performance of In-Memory DB is faster than that of disk-resident DBMS since disk I/O is eliminated but the network overhead still exists



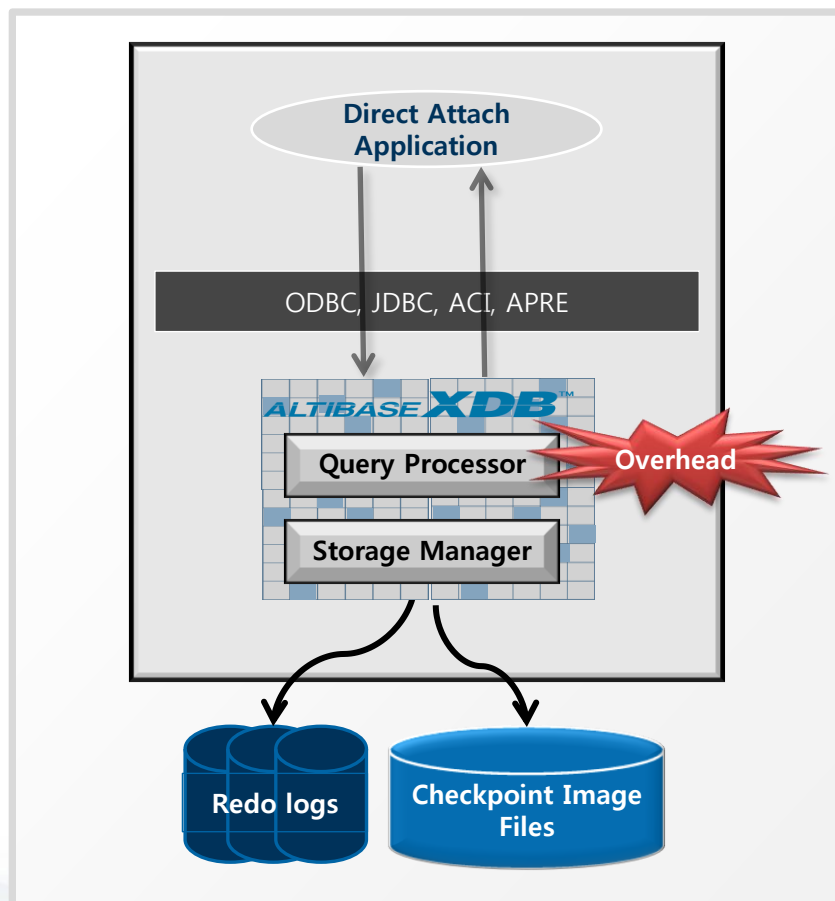
Characteristics

- All the data including index is in Memory
- Minimize Disk I/O by storing only Redo log for transaction durability and checkpoint image files for fast recovery in disk.

Limitations

- Even In-Memory DBMS cannot perform the maximum performance due to the network overhead

- Performance of XDB DA mode is faster since there is no network overhead. The performance can be improved by removing Query Processor.



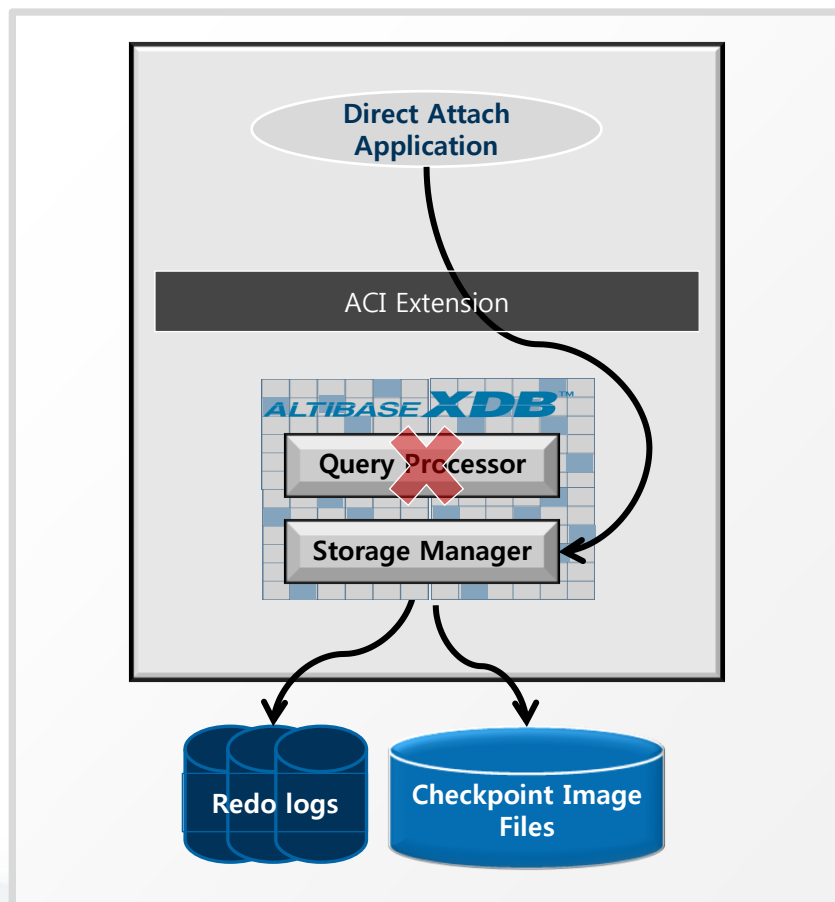
Characteristics

- Application is in a same server where DBMS is located to eliminate the network overhead.
- Performance is better than In-Memory C/S environment since there is no network
- This mode is suitable for applications that needs faster performance and uses complex SQL statement

Limitations

- The performance is still not fast enough as there is a overhead for Query Processor

- XDB DCI mode guarantees the fastest performance since it by-pass Query Processor.



Characteristics

- The most lightweight In-Memory DBMS which can perform maximum performance
- It by-passes Query Processor and directly accesses to Storage Manager
- This mode can be applied for the system that requires high performance and for the application with simple SQL statement

FEATURES

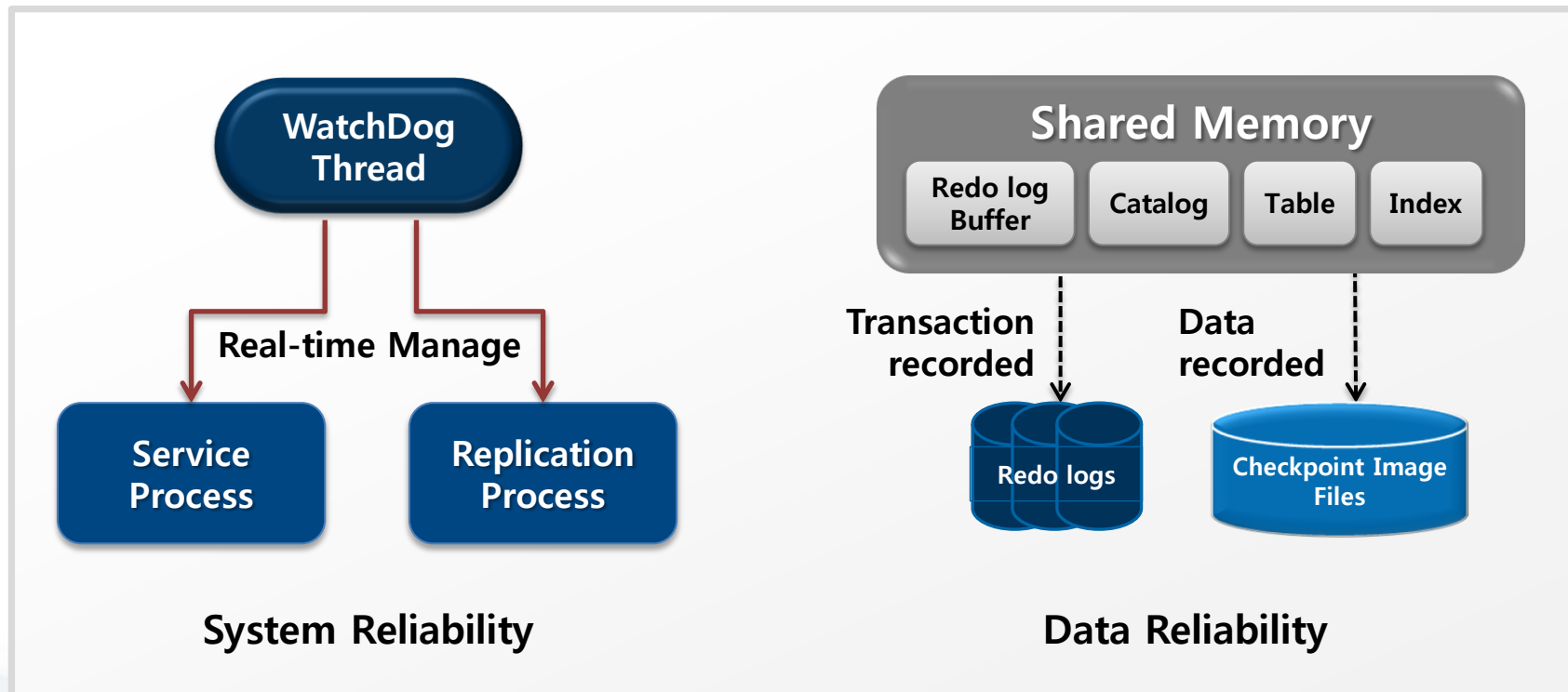


- **Internal Shield enables System Reliability.**

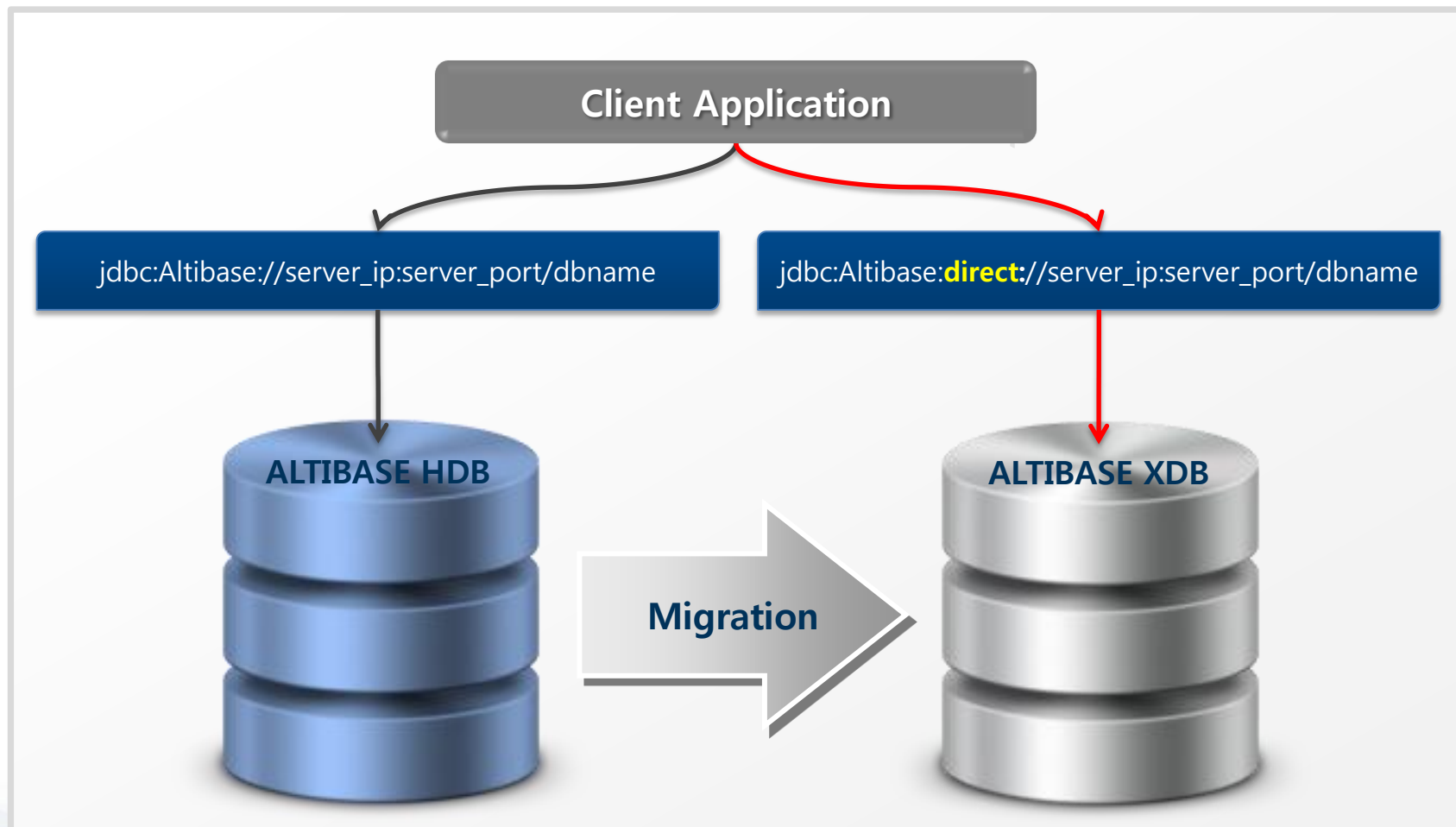
- WatchDog Thread: Internal management thread is supported for normal process of DBMS even from the unexpected situations.

- **Durability enables Data Reliability.**

- All transaction data is recorded into the disk (Buffered or Sync)

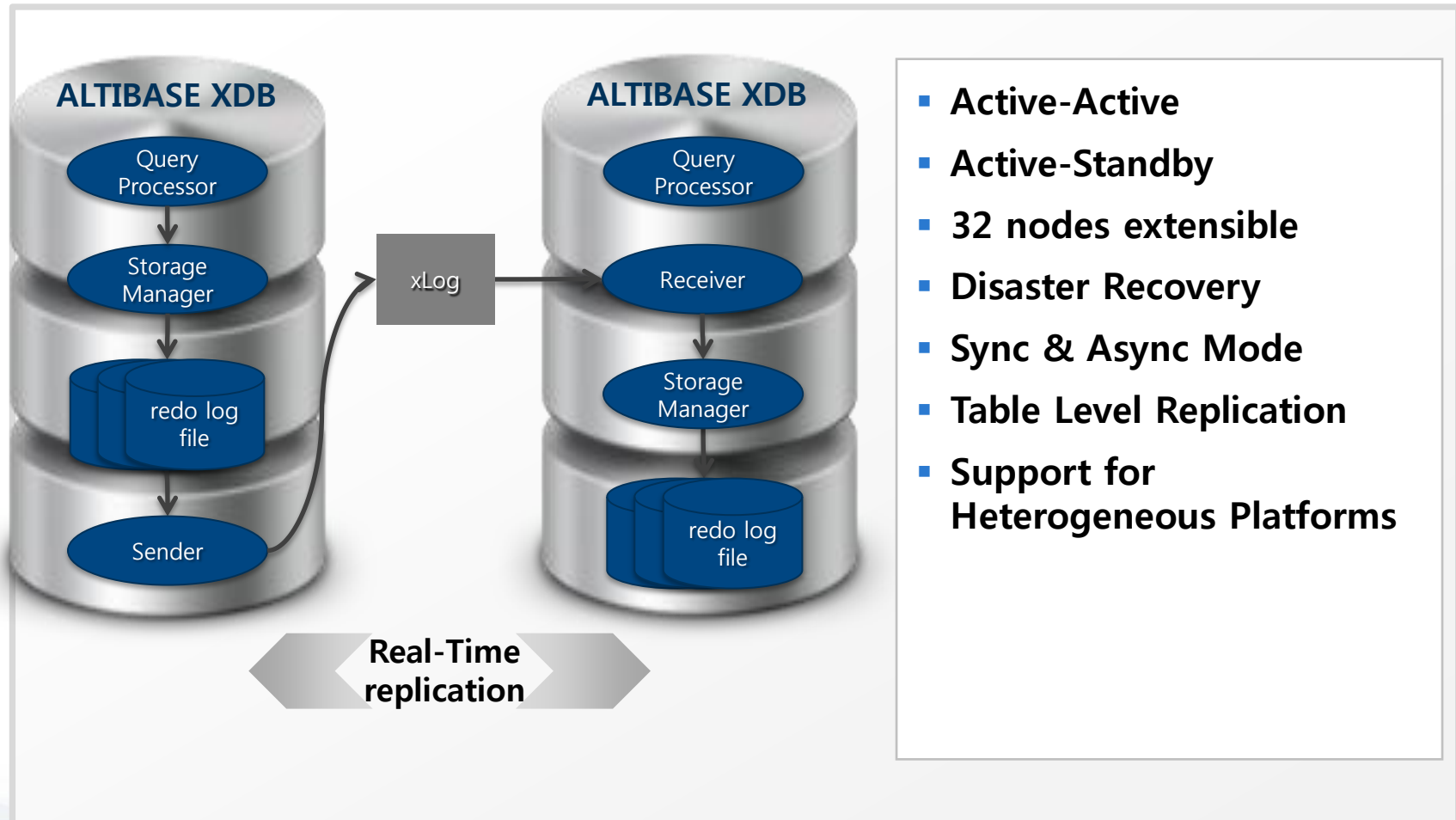


- Application migration from Altibase HDB to XDB
 - Application can be used by changing the Connection only



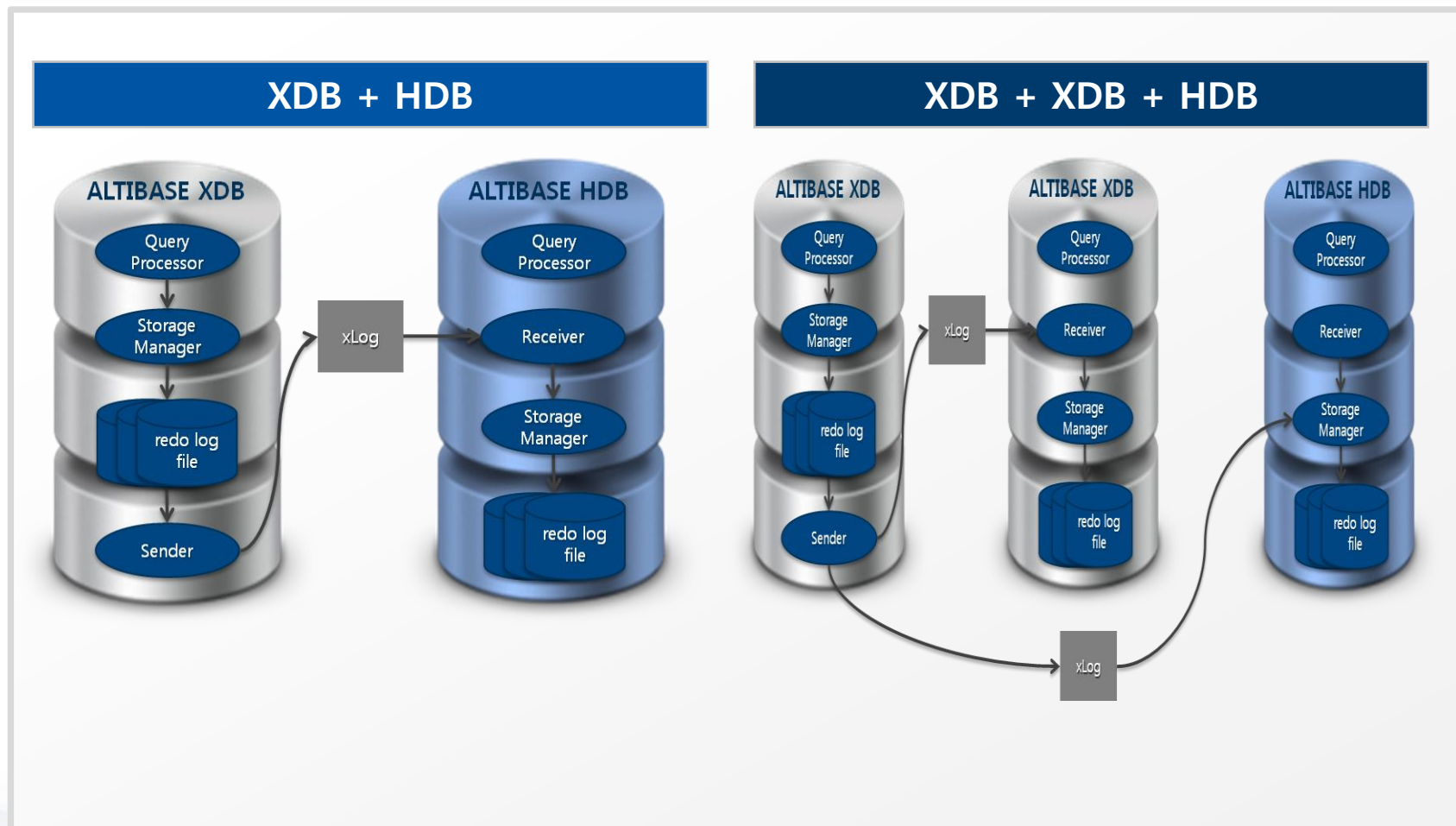
ALTIBASE XDB™ High Availability

- Replication over network enables High Availability
 - Minimized performance degradation by Shared Nothing Architecture



ALTIBASE XDB™ High Availability

- Altibase XDB + HDB Replication



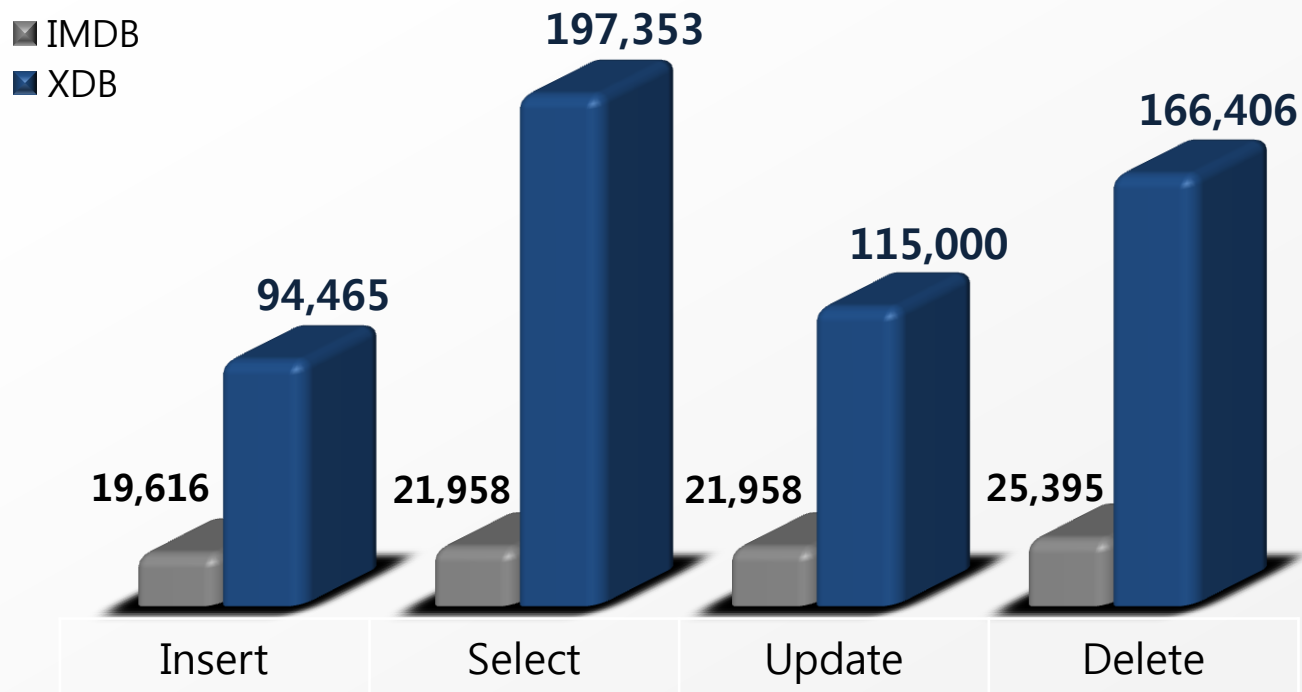
- **Practical Altibase XDB architecture**
 - XDB can be used for caching



PERFORMANCE



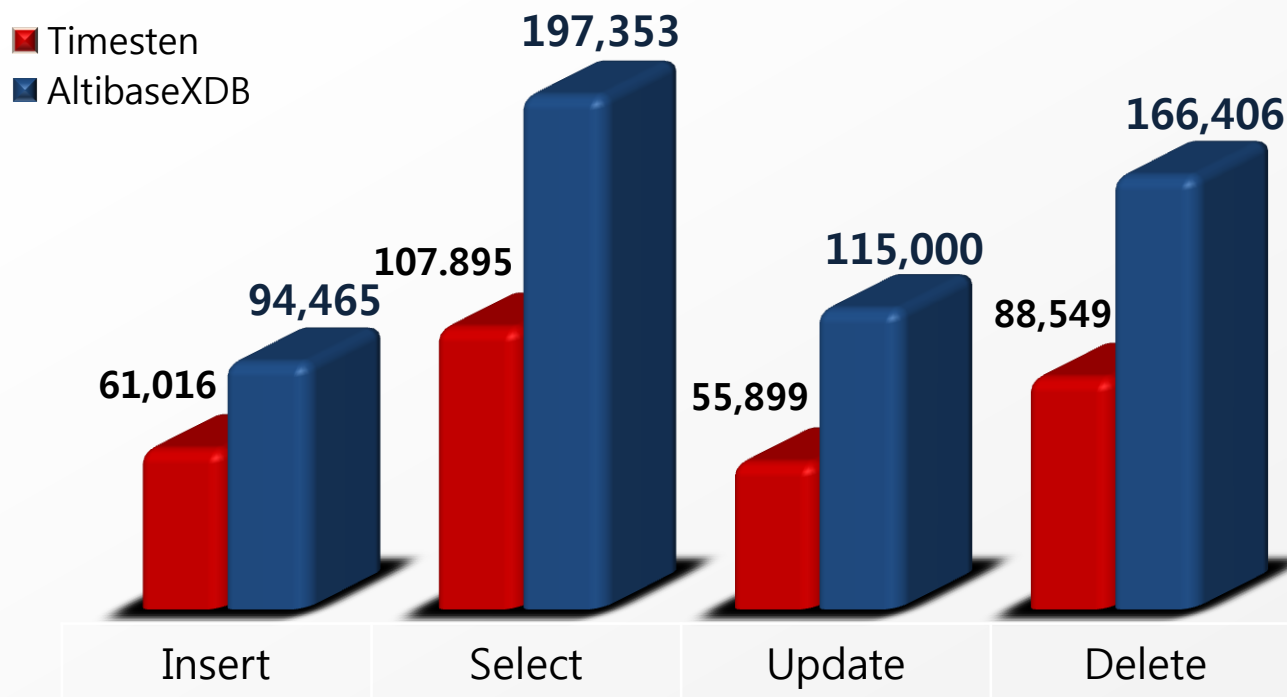
- XDB DCI mode 10times faster than In-Memory DB



* IBM X3850, 24Core*Xeon E7-4807@1.87Ghz, 32G MEM, SUSE Linux 11 SP 1 64Bit

ALTIBASE XDB™ *performance*

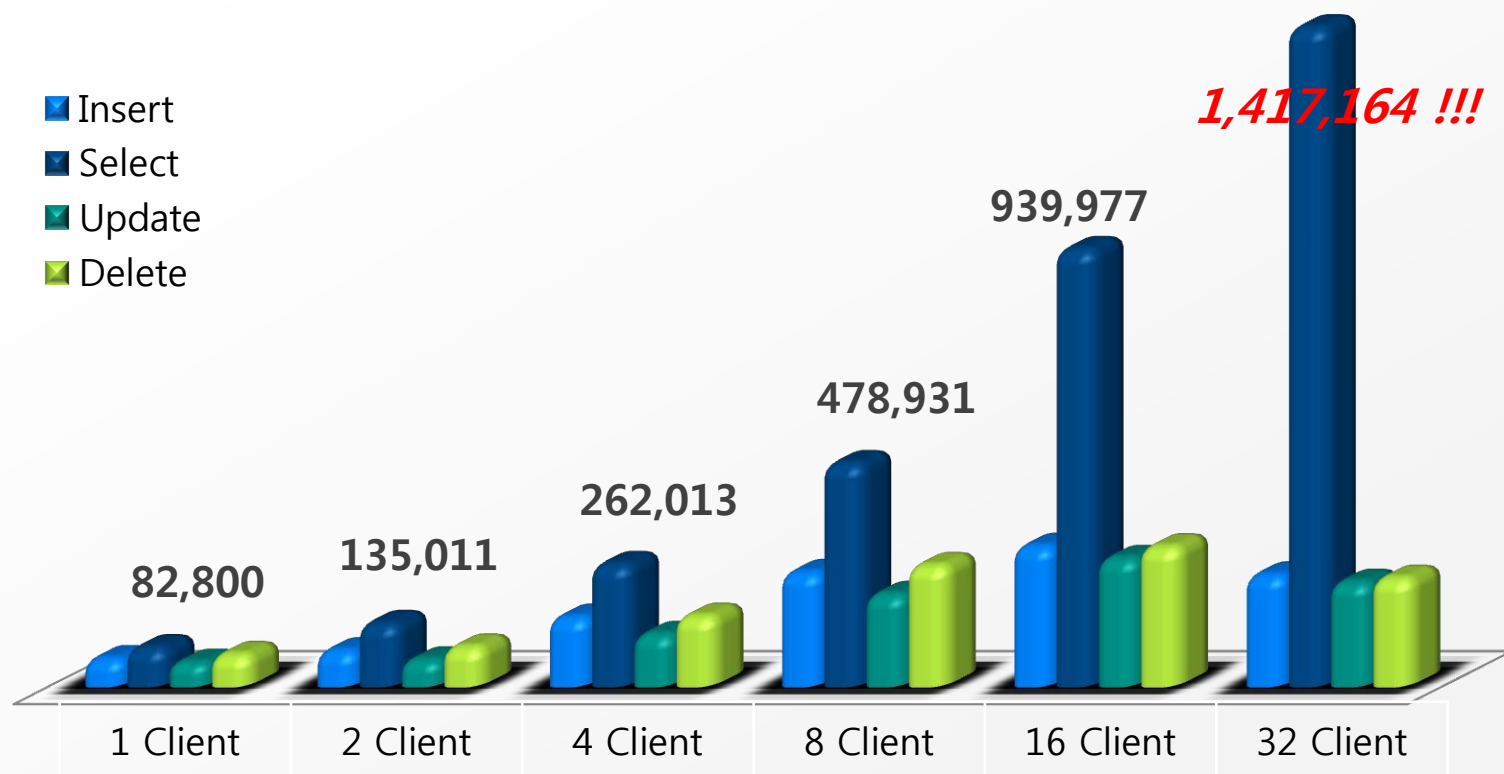
- 2x faster than Oracle TimesTen



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ALTIBASE XDB™ ▶ performance

- The fastest DBMS in the world (unit : QPS Query Per Second)



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SUMMARY



Business Requirement

- Requires Real-time Data Collecting and more Complex queries
- Stock system and MES(Manufacturing Execution System)are suitable

Real-time
Data Collecting

- Simple Insert
- Real-time and large quantity

Complex
Information Inquiry

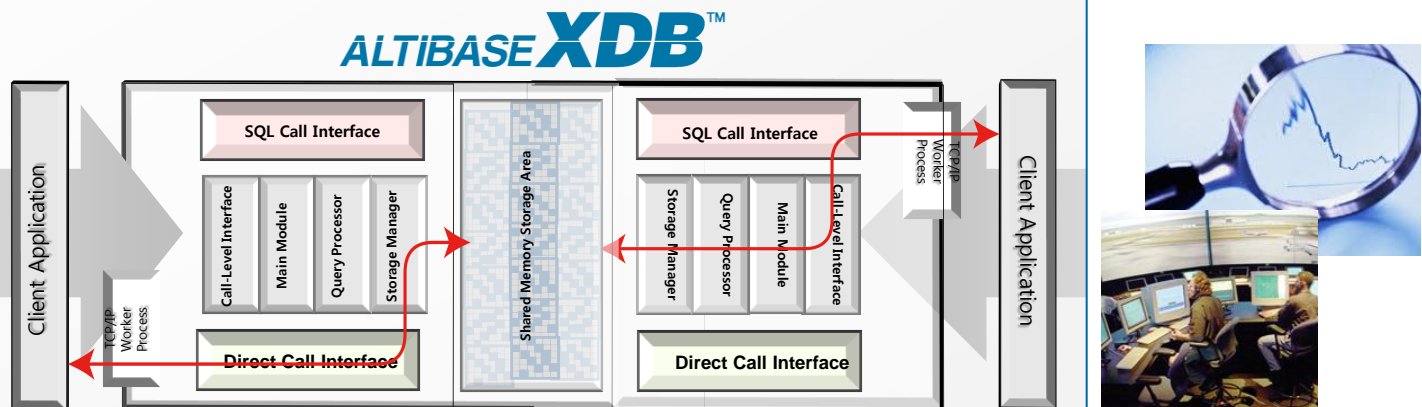
- Complex Queries
- Multi-times for same query

ALTIBASE XDB™

- DA Mode for fast data collecting
- DCI Mode for fast processing

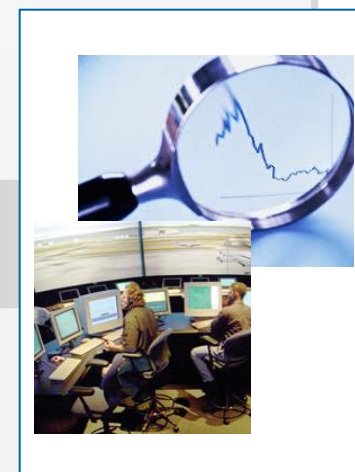


Extreme Data Creation



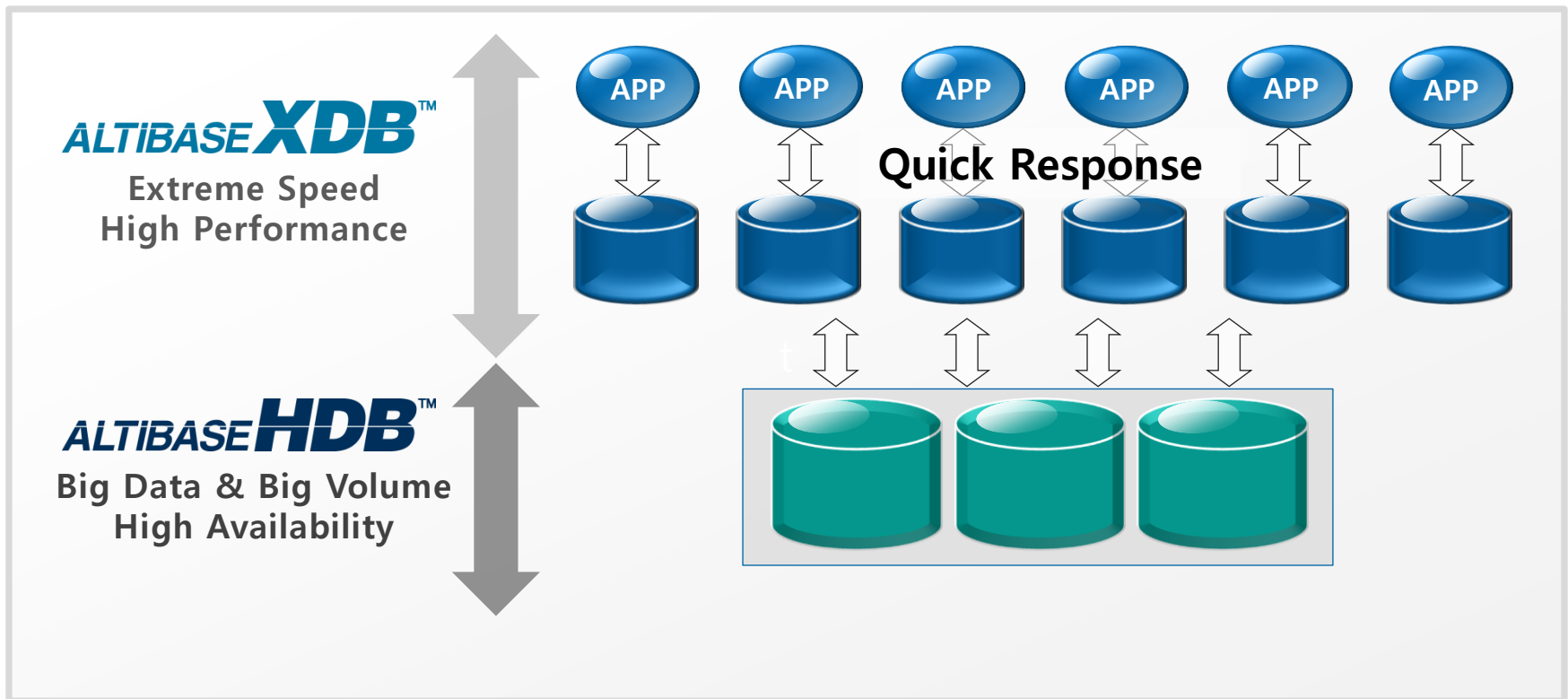
Data Collecting

Information Inquiry



Data Analysis

- Altibase supports rapidly changing business environment
 - XDB for High-Performance
 - HDB for large capacity and data integrity



any
QUESTIONS?

Thank you!

