



# **Intro to Oracle TimesTen**

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- Why in-memory?
- Basic Architecture
- TimesTen replication
- Transactional durability
- Advantages of TimesTen

# Topics

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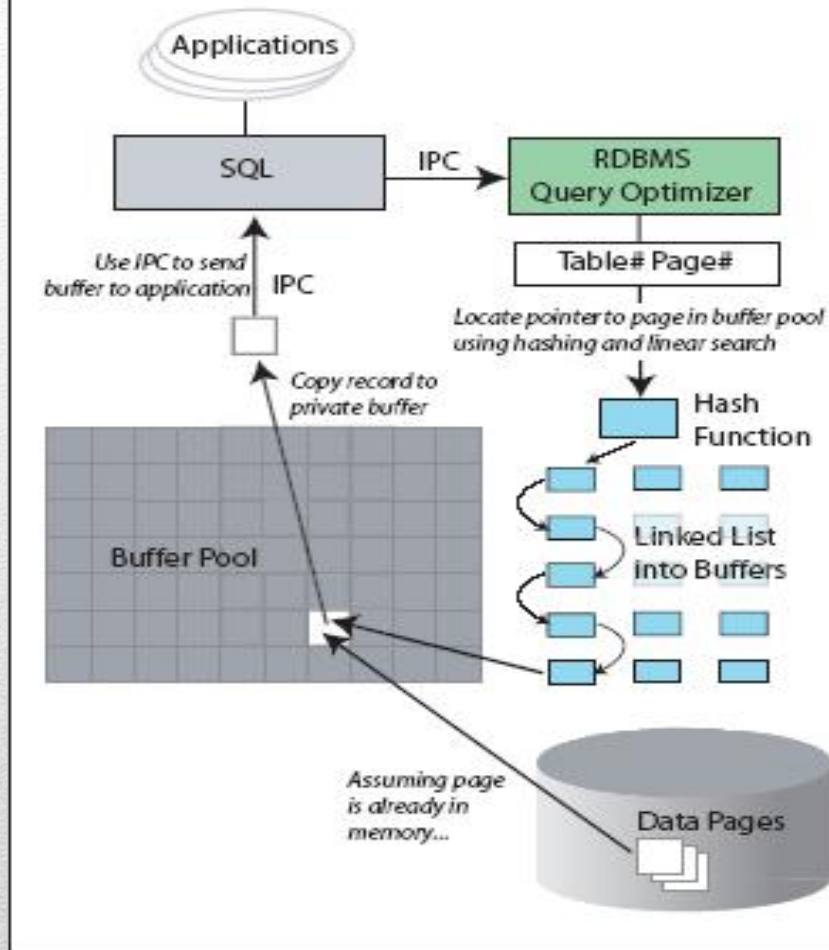


- System with GigaBytes, TeraBytes becomes common
- Avoid frequently touching disk IO

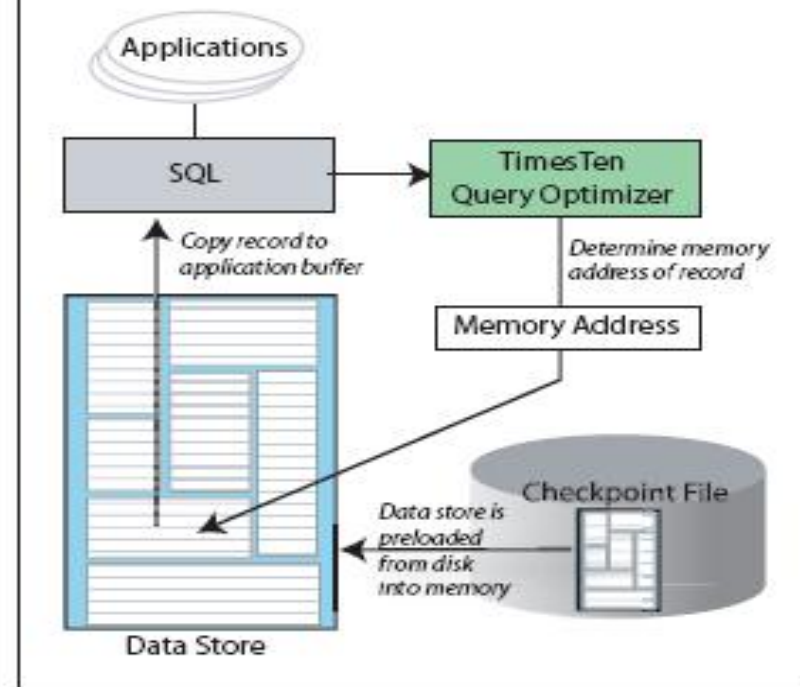
# Why in-memory?

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## Disk-Based RDBMS

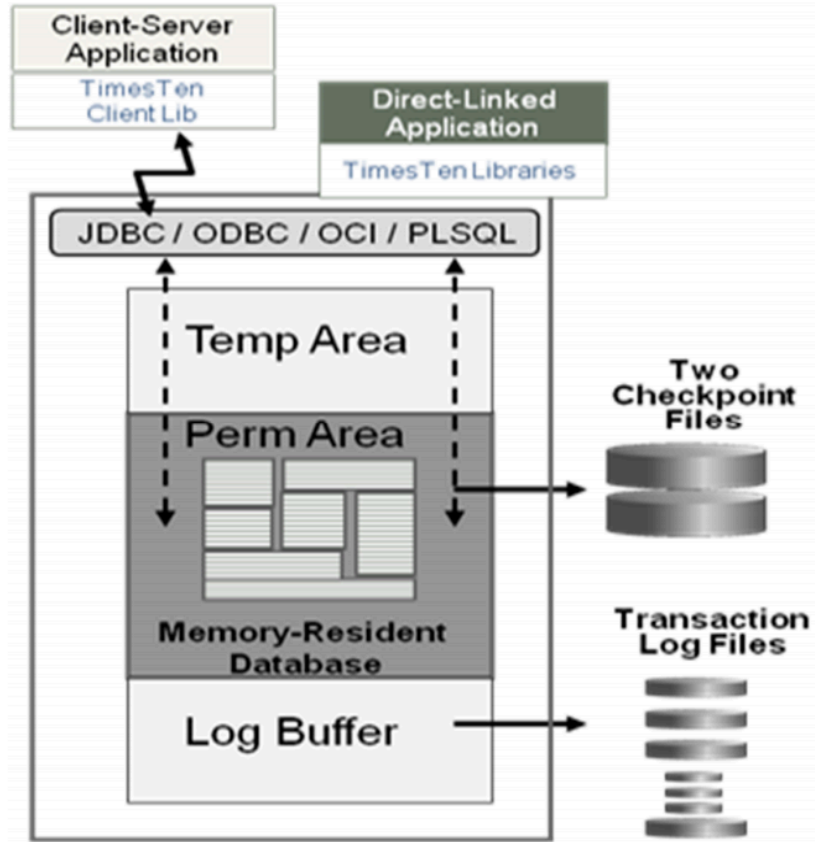


## TimesTen



# Basic Architecture





(a) Basic structure

# Basic Architecture

- Row format v.s. column format
- Columnar compression
- Index reduction

# Storage Manager Design

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## Row Store v. Column Store

Record #	Name	Address	City	State
0003623	ABC	125 N Way	Cityville	PA
0003626	Newburg	1300 Forest Dr.	Troy	VT
0003647	Flotsam	5 Industrial Pkwy	Springfield	MT
0003705	Jolly	529 S 5th St.	Anywhere	NY

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# Storage Manager Design

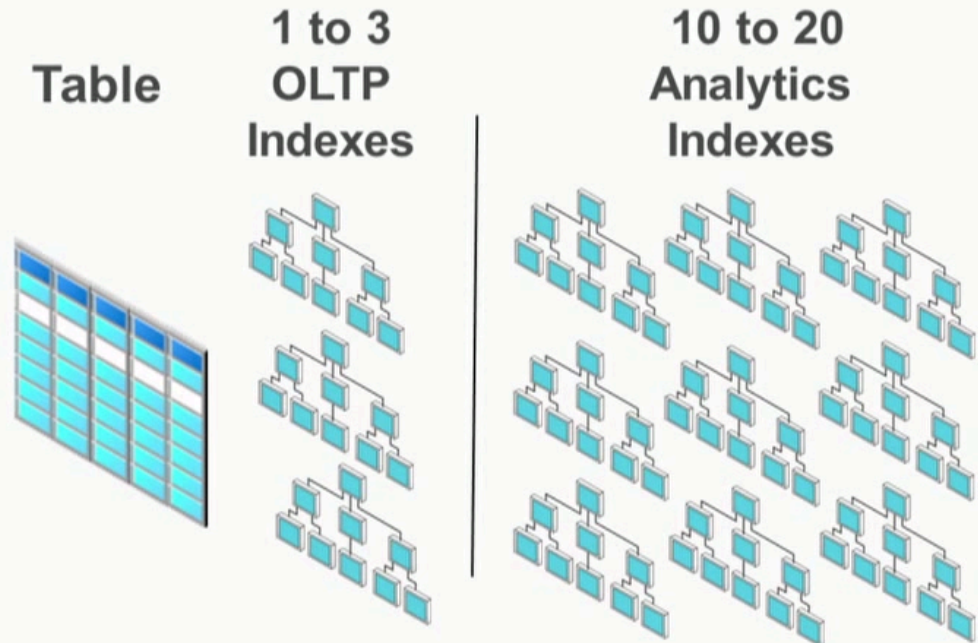
- Columnar compression
- Space-saving mechanism
- Improve query processing

# Storage Manager Design

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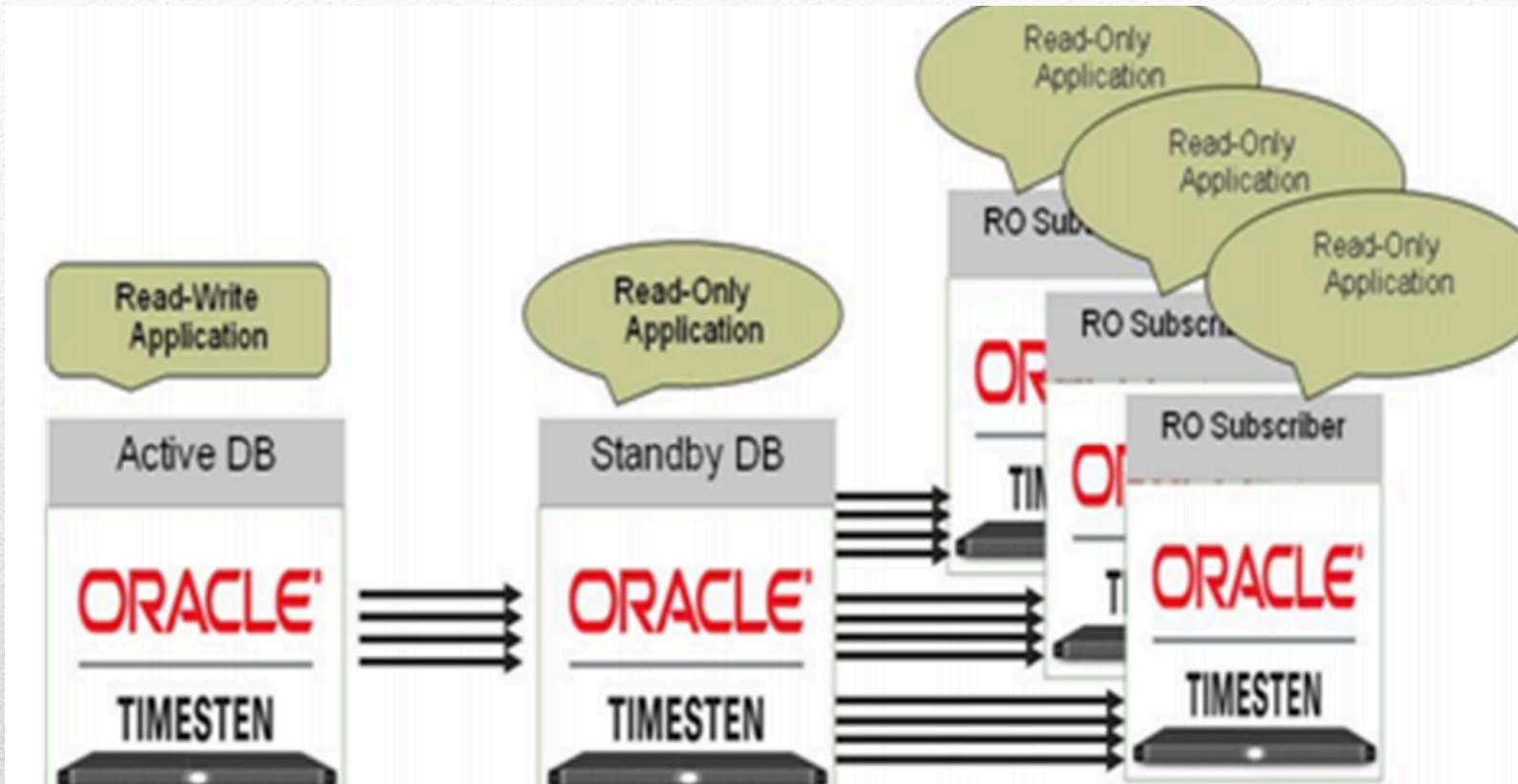


- Most OLTP Indexes (e.g. ERP) are only used for analytic queries
- Inserting one row into a table requires updating 10-20 analytic indexes: **Slow!**
- Indexes only speed up anticipated queries & reports



## Index Reduction

# Storage Manager Design



# TimesTen Replication

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- High availability
- Log-based
- 2-safe replication
- Replication tracks

# TimesTen Replication

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- Multi-threaded Logging mechanism
- Checkpoint files
- Read-committed isolation

# Transactional durability

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- Full-feature SQL
- Standard API
- ACID properties
- High-availability mechanisms

# Advantages

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Questions?

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