MapR Perspective Series

MAPR · **DATABASE FOR GLOBAL DATA-INTENSIVE APPLICATIONS**

HOW A MODERN SCALABLE DATABASE CAN BE A KEY ELEMENT TO OPERATIONALIZE BIG DATA WITH CONTEXTUAL USER ENGAGEMENT AND INTELLIGENT BUSINESS PROCESSES

EXECUTIVE SUMMARY

Today's digital economy demands a new way of running business. Data first thinking and real-time response are key for organizations to outperform the competition. Organizations are trying to provide contextual digital user experiences to attract, engage, and retain customers. They are spending significant efforts to modernize the core business processes, uncover real-time insights, and enable automated decision making to reduce costs and innovate faster. Data is the foundational enabler in all these next generation "data-intensive" applications and databases are the foundational components of application architecture. MapR has unique vision and database technology to enable these breakthrough applications by operational-izing data across on-premises, edge, and multi-cloud environments with no complex tradeoffs or compromises.

NEW APPLICATION CHALLENGES

Enabling digital transformation requires organizations to deal with extreme scale of data and applications. Modern applications need the ability to capture and interact with diverse types of data such as IoT and leverage them to maximize their business outcomes. In addition to deriving value from new datatypes, organizations need to move their core business applications from after-the-fact insights and processing to real-time processing and in-the-moment proactive actions by infusing ML/AI driven data intelligence. Without a scalable and reliable database technology to apply analytic insights to business in real-time, much of the value of digital transformation initiatives is lost.

TRADITIONAL AND EMERGING DATABASE TECHNOLOGIES ARE NOT ABLE TO KEEP UP

Historically, databases were not designed for building data-intensive applications. The following often come up as the key concerns in organizations when evaluating databases.

1. Databases are no longer islands. In order to enable next-generation applications, the database must be part of a broader data platform that includes analytic processing for in-place intelligence and streaming for real-time data flows to establish a continuum of data, insights, and operations coming together.

2. Database selection at organizations today is often a decision of complex tradeoffs of critical requirements. Is write ingest speed critical or read? Is data consistency or performance critical? Is it OK to lose the data because app availability is more important? Do I need wide column performance or JSON flexibility? The result is that while there are many new databases on the market, they often are used in niche purpose-built use cases or as part of auxiliary applications while most of the mission-critical business apps stay in well trusted traditional RDBMS systems not leveraging modern technology trends, thus not fully achieving the desired business transformation.
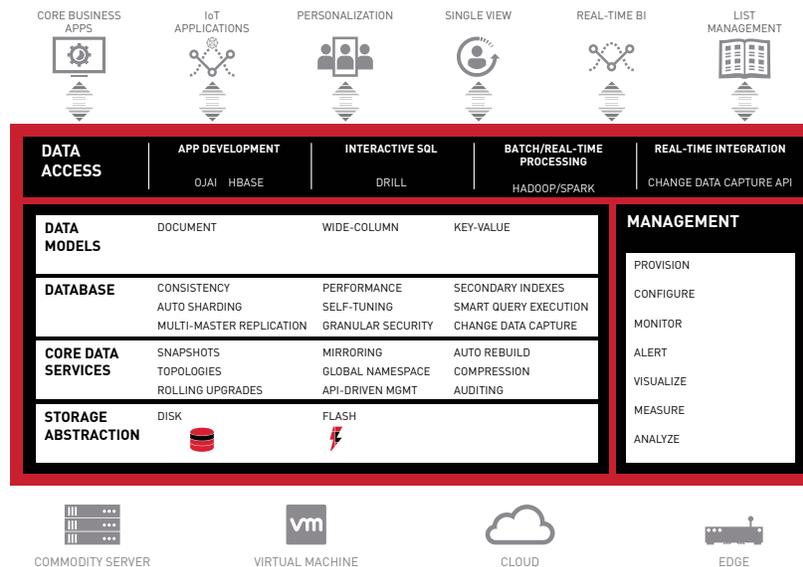
3. Every database app is a silo in its own infrastructure, which leads to hundreds to thousands of non-integrated apps—a daunting reality. Databases traditionally are not built for running multiple apps simultaneously while still meeting SLAs. The result is greater complexity and infrastructure costs and the need to interconnect these apps using fragile data pipelines.

MAPR PERSPECTIVE ON ISSUES TO CONSIDER WHEN CRAFTING A DATABASE STRATEGY

MapR has developed critical success criteria for selecting database solutions based on our experience crafting modern data management and application strategies with global organizations. These ten critical issues must be addressed in order to attain the degree of capability needed by organizations aiming to develop a core competency in operationalizing their data:

1. **Multi-Model Flexibility** to handle diverse datatypes on a unified foundation and give developers choice.

2. **Simplicity and Speed of Application Development** to embrace the JSON simplicity and schema-flexibility end to end from database to application development to query layer.

3. **Strong Data Consistency and No Data Loss** to serve as a system of record.

4. **Extreme Performance for All Workloads** to enable real-time experiences and processes. It is not sufficient to excel in either ingest speeds or read speeds.

5. **Vast Scalability** to scale in any dimension without limits and without impacting SLAs—thousands of nodes, trillions of documents, and millions of tables.

6. **Extreme High Availability** to enable "always-on" business.

7. **Global Applications** to synchronize data between an arbitrary number of separate clusters and seamlessly span on-premises, edge, and multi-cloud environments to form a global database for new age apps.

8. **Multi-Tenancy and Fine Grained Security Built In** to support a common architecture across the platform to securely run hundreds to thousands of apps without impacting each other.

9. **In-Place Analytics** to allow "in-place" data exploration, BI, machine learning, and data processing without moving data.

10. **Out-of-the-Box Global Pub/Sub Stream Transport** to ingest and process data in real time and integrate applications.

MapR-DB

| CORE BUSINESS APPS | IoT APPLICATIONS | PERSONALIZATION | SINGLE VIEW | REAL-TIME BI | LIST MANAGEMENT |

DATA ACCESS	APP DEVELOPMENT	INTERACTIVE SQL	BATCH/REAL-TIME PROCESSING	REAL-TIME INTEGRATION
	OJAI HBASE	DRILL	HADOOP/SPARK	CHANGE DATA CAPTURE API

DATA MODELS	DOCUMENT	WIDE-COLUMN	KEY-VALUE	MANAGEMENT
DATABASE	CONSISTENCY AUTO SHARDING MULTI-MASTER REPLICATION	PERFORMANCE SELF-TUNING GRANULAR SECURITY	SECONDARY INDEXES SMART QUERY EXECUTION CHANGE DATA CAPTURE	PROVISION CONFIGURE
CORE DATA SERVICES	SNAPSHOTS TOPOLOGIES ROLLING UPGRADES	MIRRORING GLOBAL NAMESPACE API-DRIVEN MGMT	AUTO REBUILD COMPRESSION AUDITING	MONITOR ALERT VISUALIZE MEASURE
STORAGE ABSTRACTION	DISK	FLASH		ANALYZE

COMMODITY SERVER   VIRTUAL MACHINE   CLOUD   EDGE

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