Introducing MariaDB Platform X3 and the rise of hybrid everything

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Professional Services Consultant
MariaDB Corporation

MariaDB

Agenda

1. Hybrid workloads
2. MariaDB Platform X3
3. Scalability
4. Real-world use cases
5. Hybrid cloud
6. Database consolidation
7. Getting started with Docker

Hybrid workloads

Database workloads

Transactional

Current data

Range queries

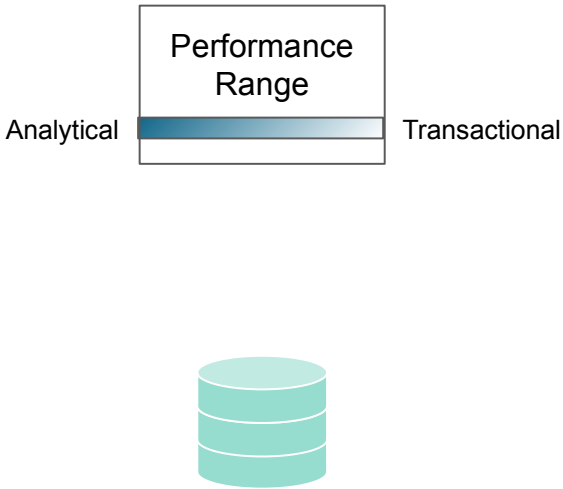
Known queries

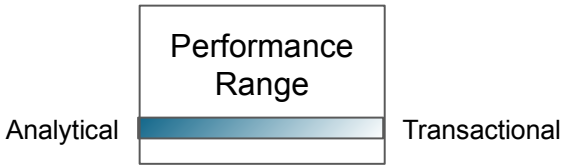
Analytical

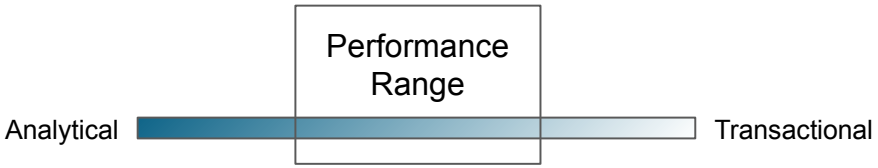
Historical data

Aggregate queries

Unknown queries


Performance Range
Analytical
Transactional


Performance Range
Analytical
Transactional


Performance Range
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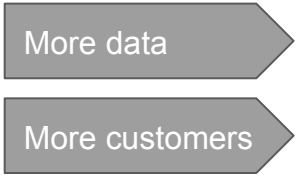
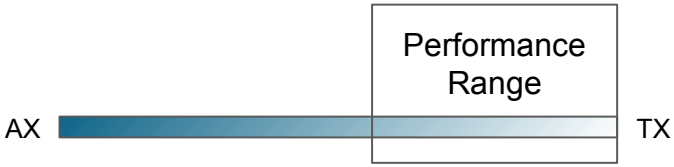
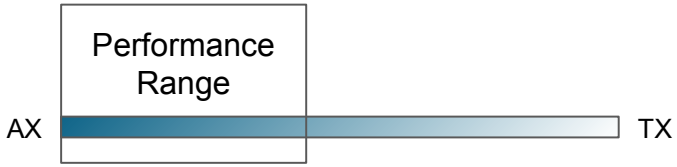

More data
More customers



Database (OLTP)

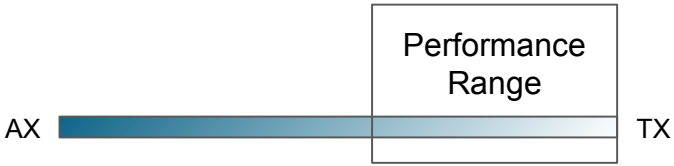


Data warehouse (OLAP)

Database workloads

Transactional	Analytical
Current data	Historical data
Range queries	Aggregate queries
Known queries	Unknown queries
Row-based storage	**Columnar storage**
Indexes	**No indexes**
Clustered/Replicated	**Distributed**

Application development



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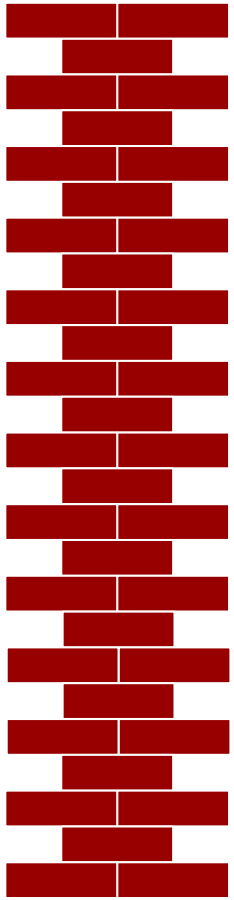
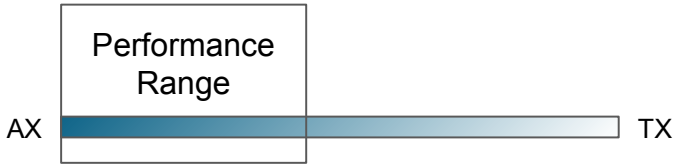


BI/reporting + data science



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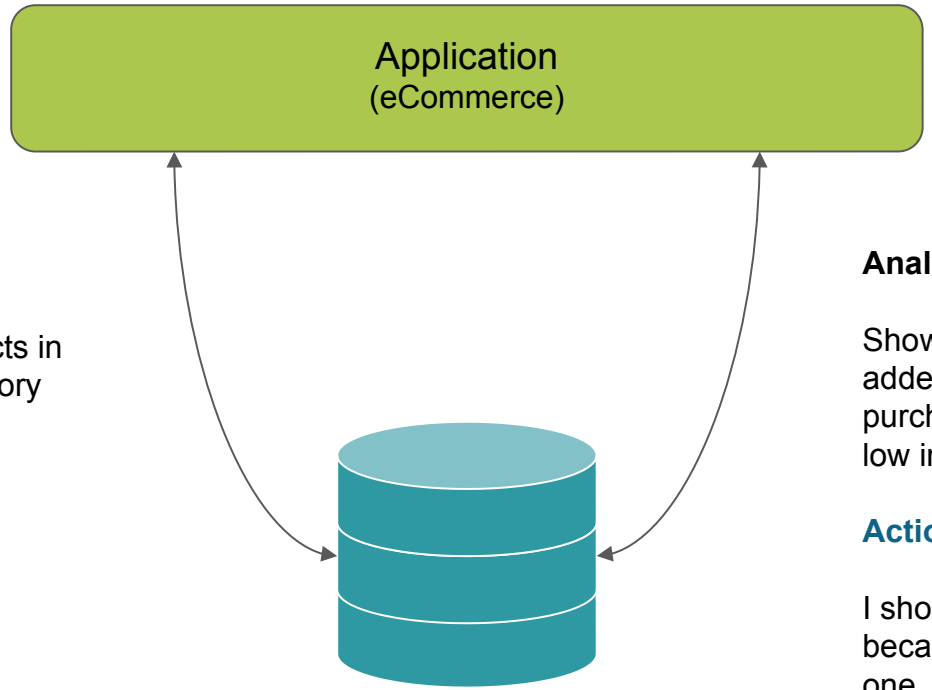


Transactional

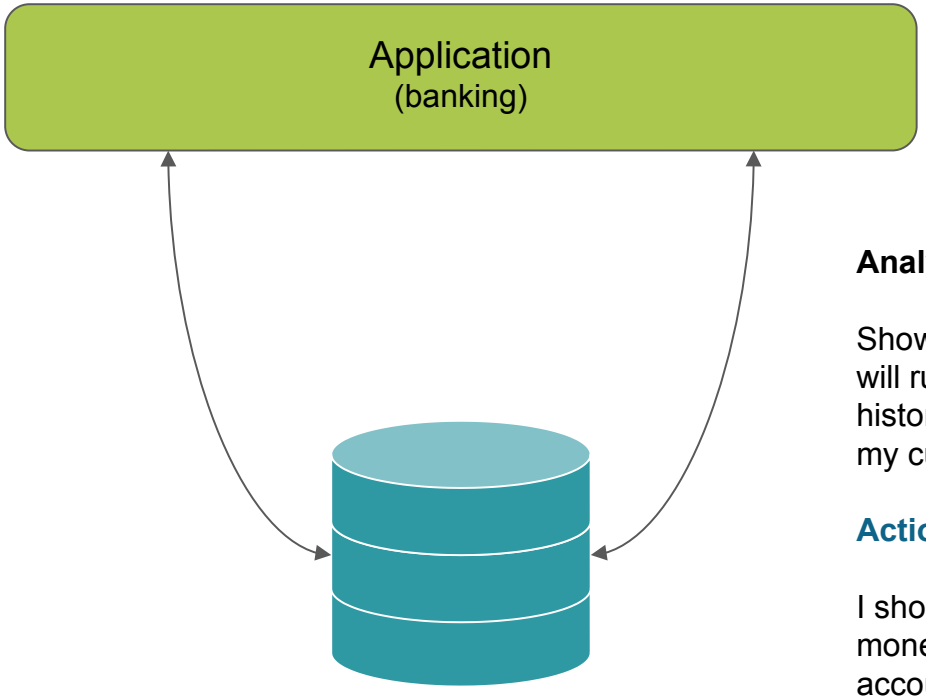
Show me all new products in the science fiction category

Analytical

Show me the top products added to shopping carts or purchased today, and with low inventory.

Actionable insight

I should buy one now because everyone wants one, and they'll be sold out by the end of the day!



Transactional

Show me all pending transactions

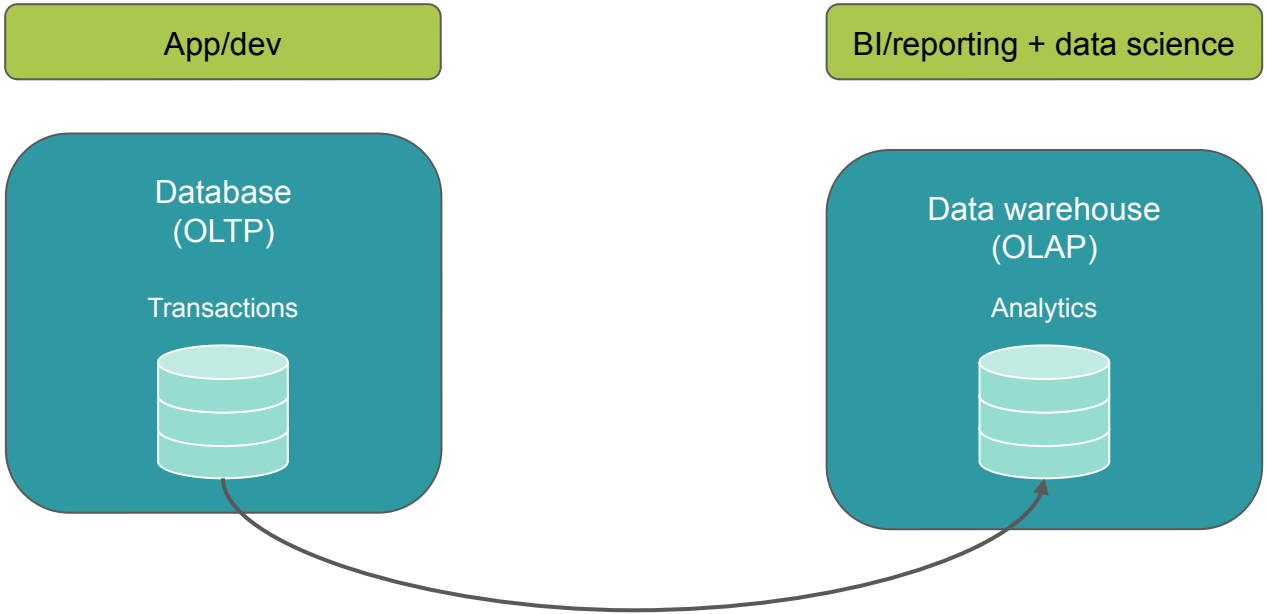
Analytical

Show me when my balance will run low based on historical transactions and my current spending rate

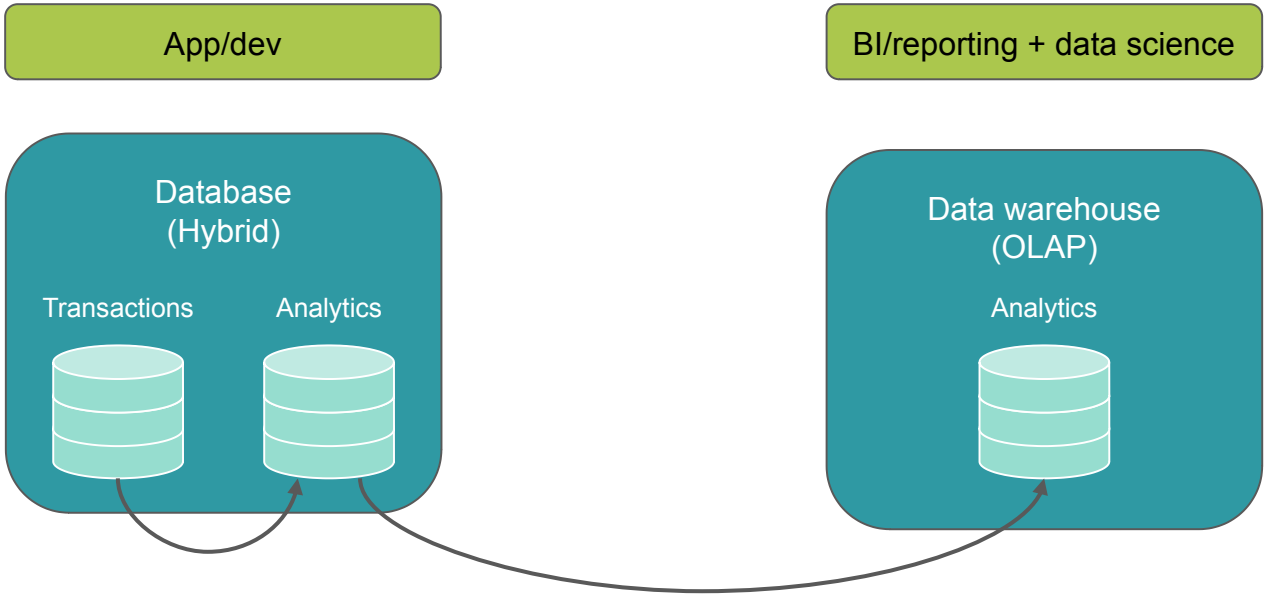
Actionable insight

I should transfer some money from my savings account to my checking account until I get paid again!

Hybrid workloads: the problem

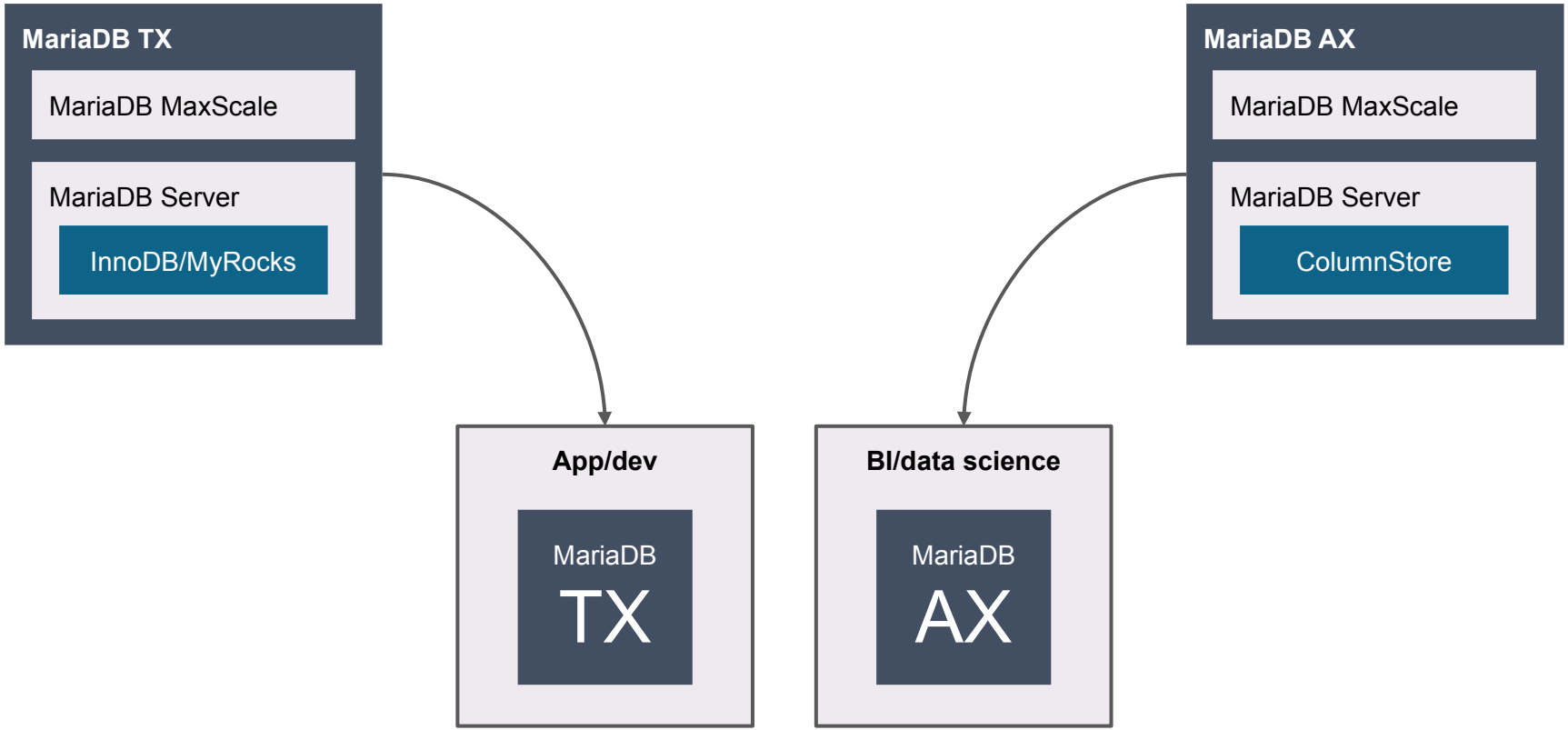


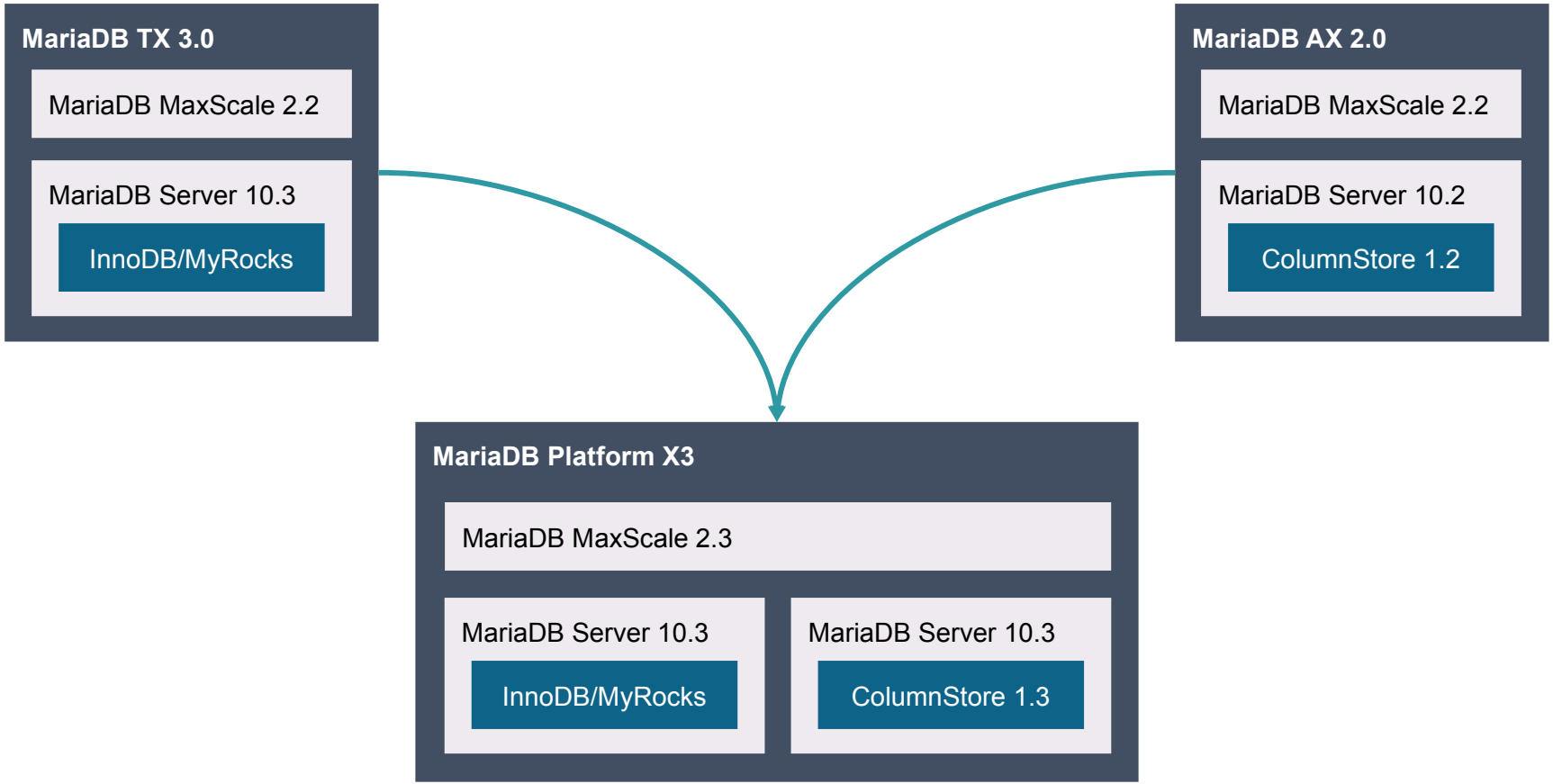
Hybrid workloads: the solution

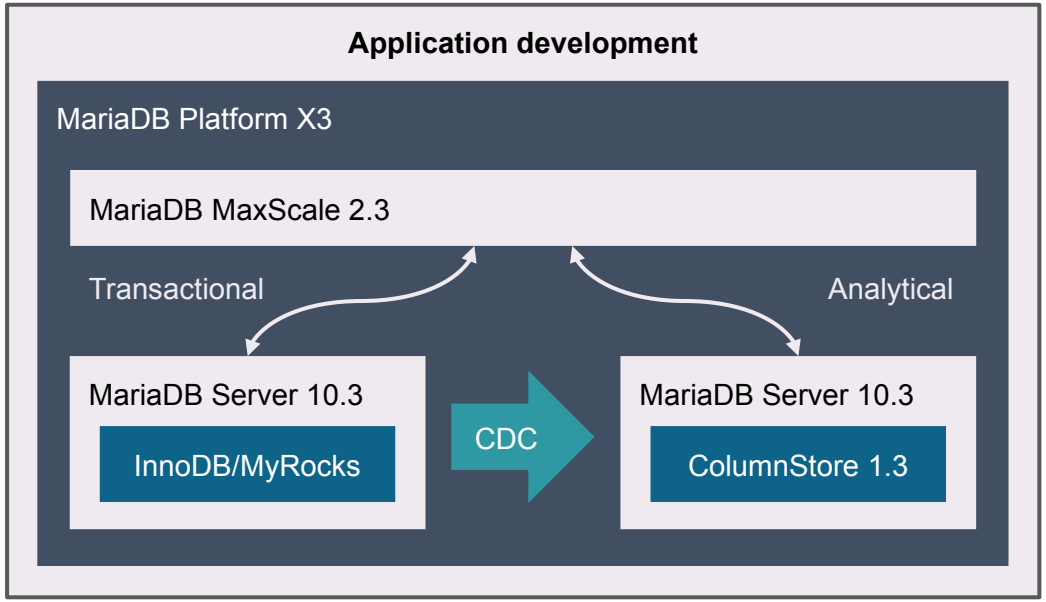


MariaDB Platform X3

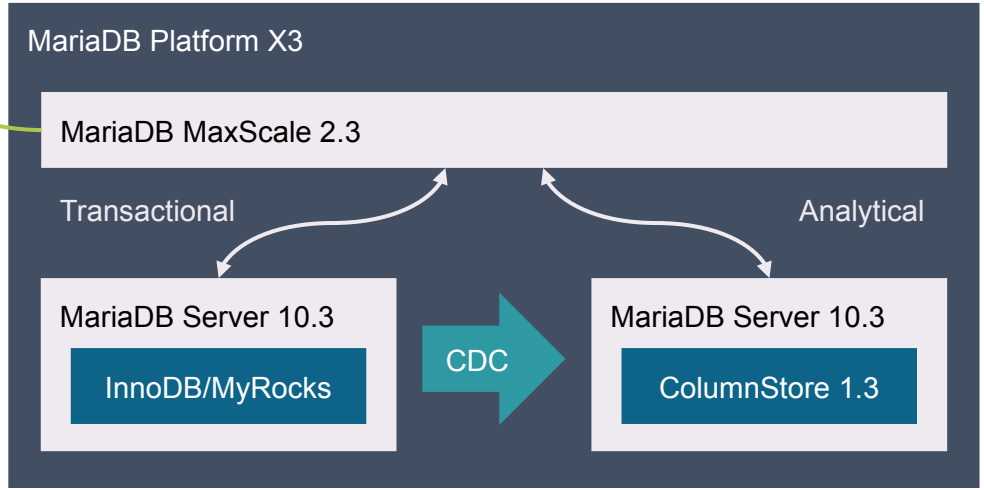
MariaDB


MariaDB TX
MariaDB MaxScale
MariaDB Server
InnoDB/MyRocks
MariaDB AX
MariaDB MaxScale
MariaDB Server
ColumnStore
App/dev
MariaDB
TX
BI/data science
MariaDB
AX


MariaDB TX 3.0
MariaDB MaxScale 2.2
MariaDB Server 10.3
InnoDB/MyRocks
MariaDB AX 2.0
MariaDB MaxScale 2.2
MariaDB Server 10.2
ColumnStore 1.2
MariaDB Platform X3
MariaDB MaxScale 2.3
MariaDB Server 10.3
InnoDB/MyRocks
MariaDB Server 10.3
ColumnStore 1.3


Application development
MariaDB Platform X3
MariaDB MaxScale 2.3
Transactional
Analytical
MariaDB Server 10.3
InnoDB/MyRocks
CDC
MariaDB Server 10.3
ColumnStore 1.3

The database proxy inspects queries and routes them to transactional and/or analytical database instances.



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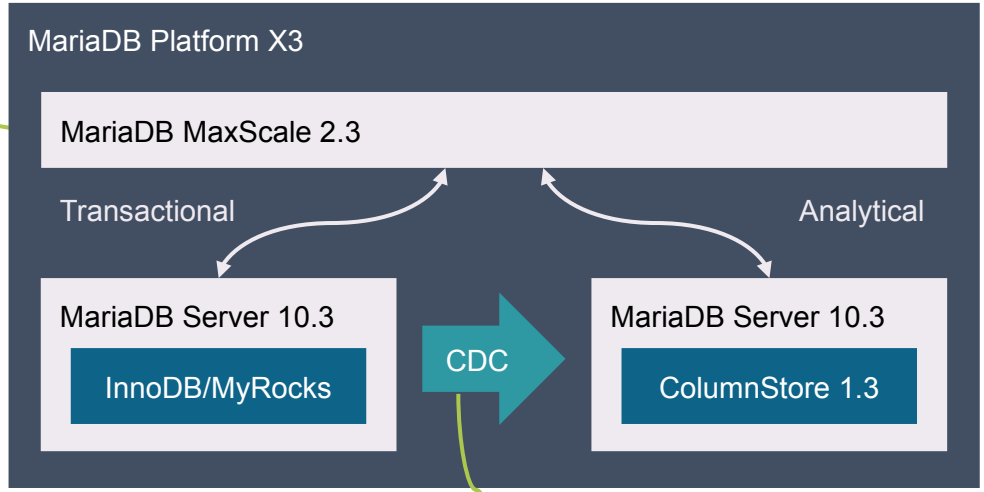
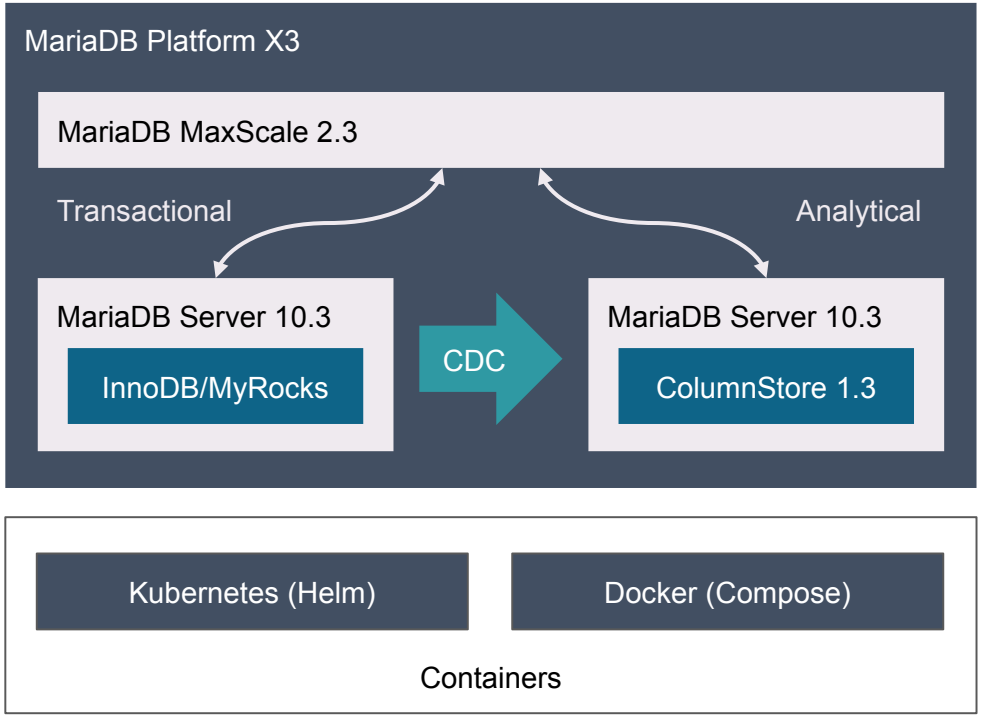
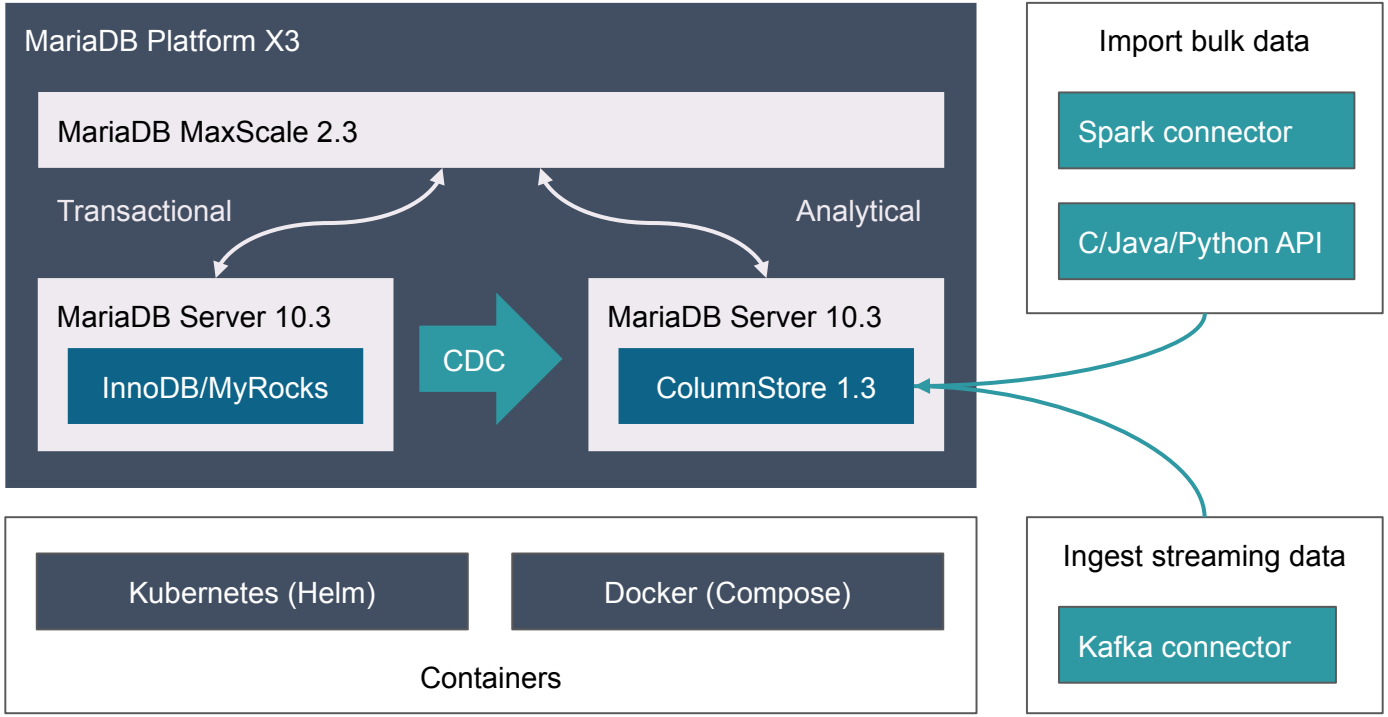
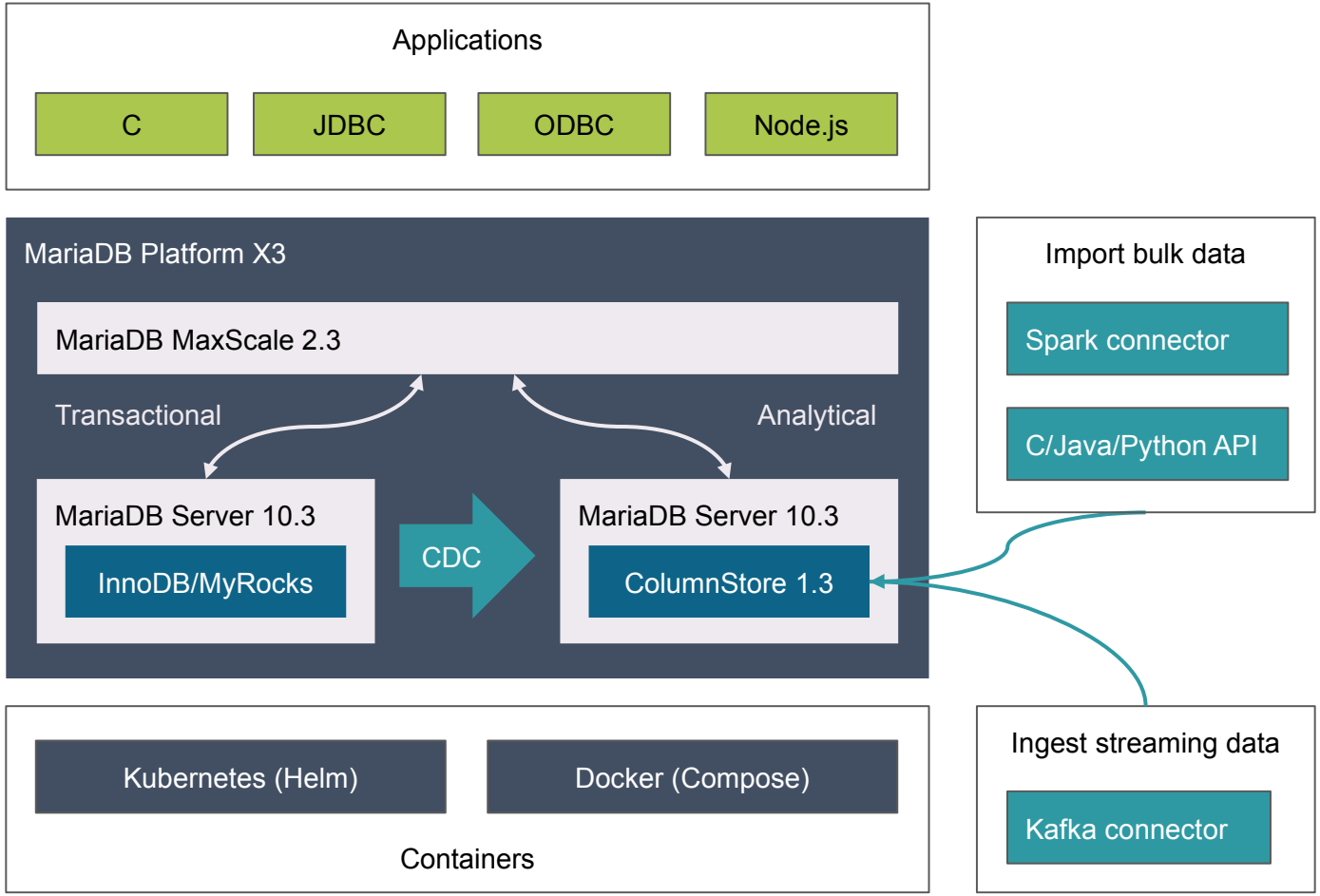


The change-data-capture stream replicates all writes from transactional databases to analytical databases within microbatches.


MariaDB Platform X3
MariaDB MaxScale 2.3
Transactional
Analytical
MariaDB Server 10.3
InnoDB/MyRocks
CDC
MariaDB Server 10.3
ColumnStore 1.3
Kubernetes (Helm)
Docker (Compose)
Containers


MariaDB Platform X3
MariaDB MaxScale 2.3
Transactional
Analytical
MariaDB Server 10.3
InnoDB/MyRocks
CDC
MariaDB Server 10.3
ColumnStore 1.3
Import bulk data
Spark connector
C/Java/Python API
Ingest streaming data
Kafka connector
Kubernetes (Helm)
Docker (Compose)
Containers


Applications
C
JDBC
ODBC
Node.js
MariaDB Platform X3
MariaDB MaxScale 2.3
Transactional
Analytical
MariaDB Server 10.3
InnoDB/MyRocks
CDC
MariaDB Server 10.3
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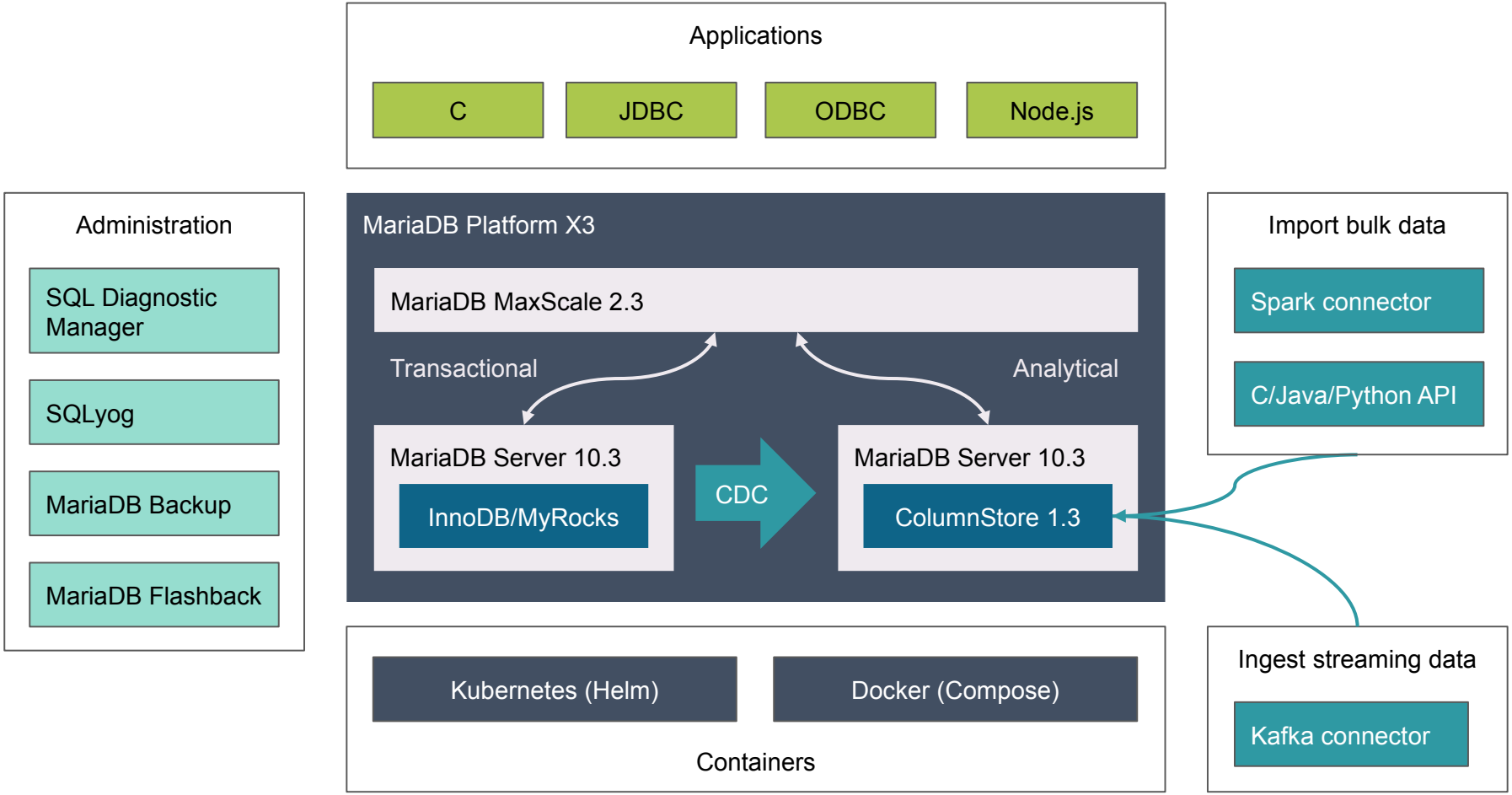

Applications
C
JDBC
ODBC
Node.js
Administration
SQL Diagnostic Manager
SQLyog
MariaDB Backup
MariaDB Flashback
MariaDB Platform X3
MariaDB MaxScale 2.3
Transactional
Analytical
MariaDB Server 10.3
InnoDB/MyRocks
CDC
MariaDB Server 10.3
ColumnStore 1.3
Import bulk data
Spark connector
C/Java/Python API
Ingest streaming data
Kafka connector
Kubernetes (Helm)
Docker (Compose)
Containers

Scalability

Hybrid workloads: why scalability is needed

Outgrowing OLTP

Applications have transactional and analytical queries

1. Constrained by limited, lightweight analytics
2. Need full analytics to create competitive features

Using historical data

Applications with lots of customers, lots of transactions

1. Limited to current or recent transaction data (months)
2. Need access to all historical data (years)

Exposing analytics

SaaS customers are becoming data-driven organizations

1. They don’t have access to their own data
2. They need to analyze it in unknown/unexpected ways

Hybrid workloads: options

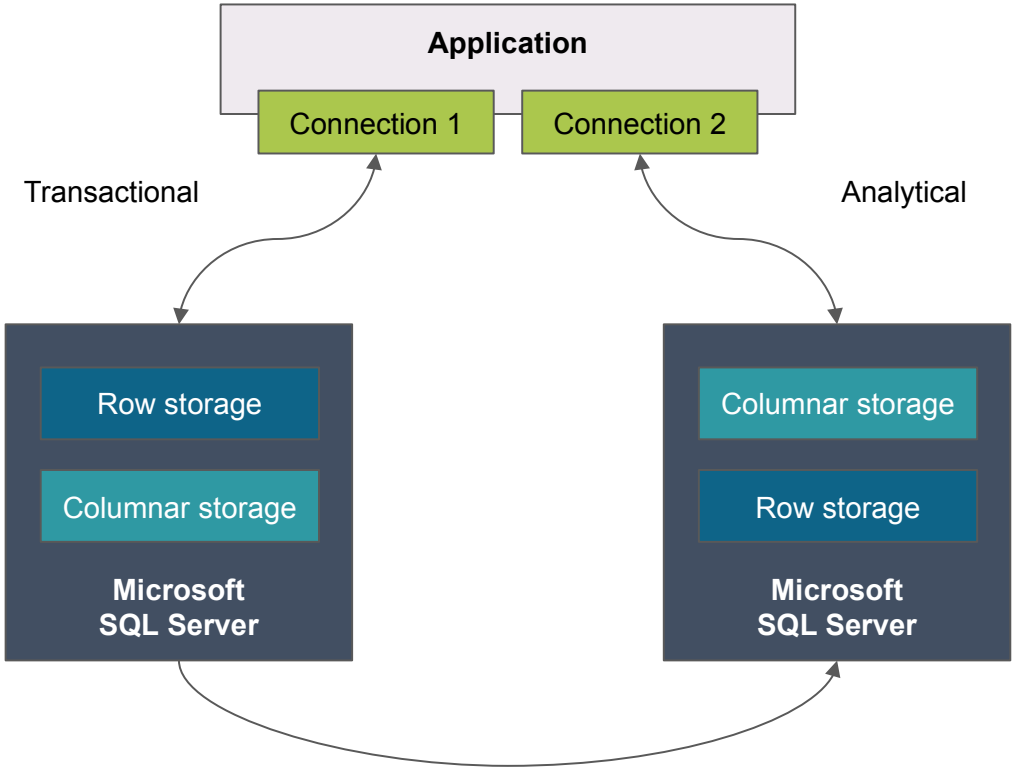
- Oracle
  - In-Memory Column Store
- Microsoft SQL Server
  - ColumnStore Indexes (Clustered or Nonclustered)
- IBM Db2
  - Shadow Tables
- MySQL Enterprise
  - None
- EnterpriseDB Postgres Platform
  - None

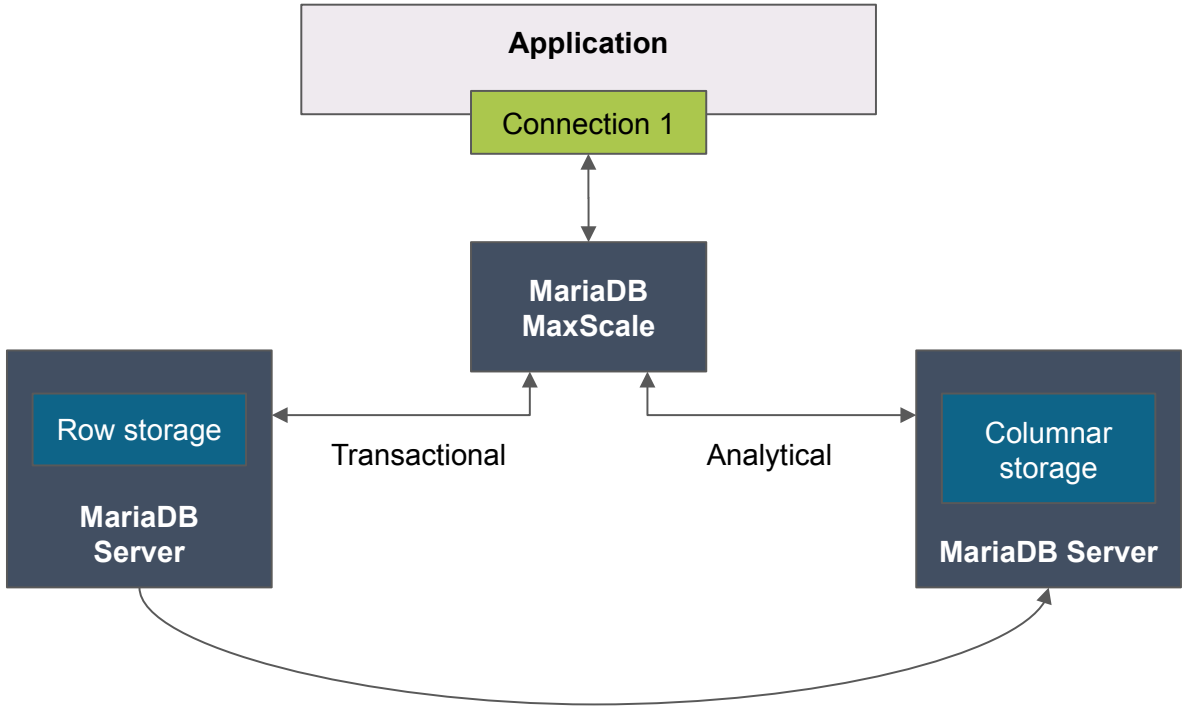
Hybrid workloads: full comparison

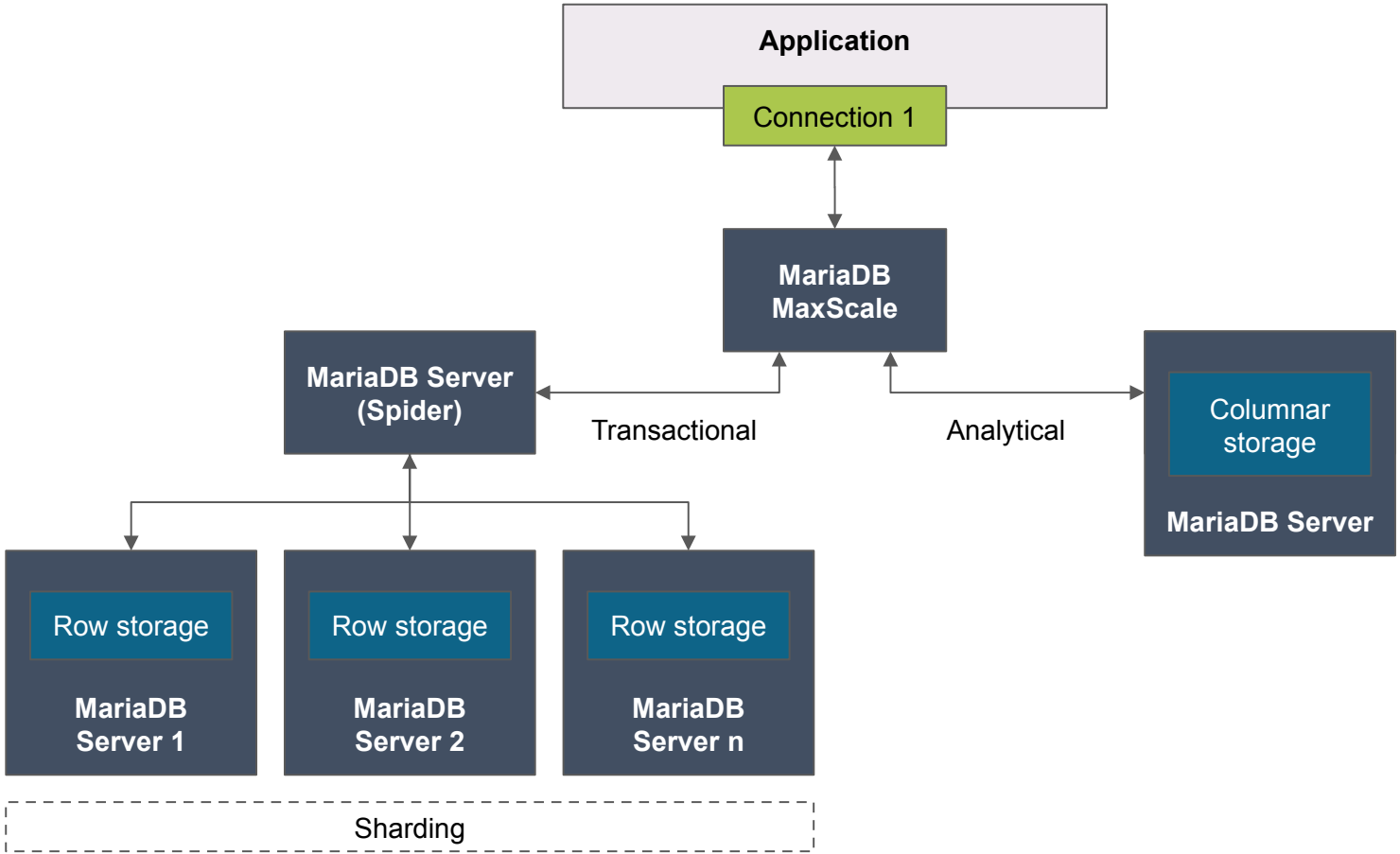
	Oracle	Microsoft	IBM *	MariaDB	MySQL	Postgres
Row storage (OLTP)	Yes	Yes	Yes	**Yes**	Yes	Yes
Sharded	Yes	No	Yes	**Yes**	No	No
Columnar storage (OLAP)	Yes	Yes	Yes	**Yes**	No	No
Disk-based	No **	Yes	Yes	**Yes**	-	-
Distributed	Yes (RAC)	No	No	**Yes**	-	-

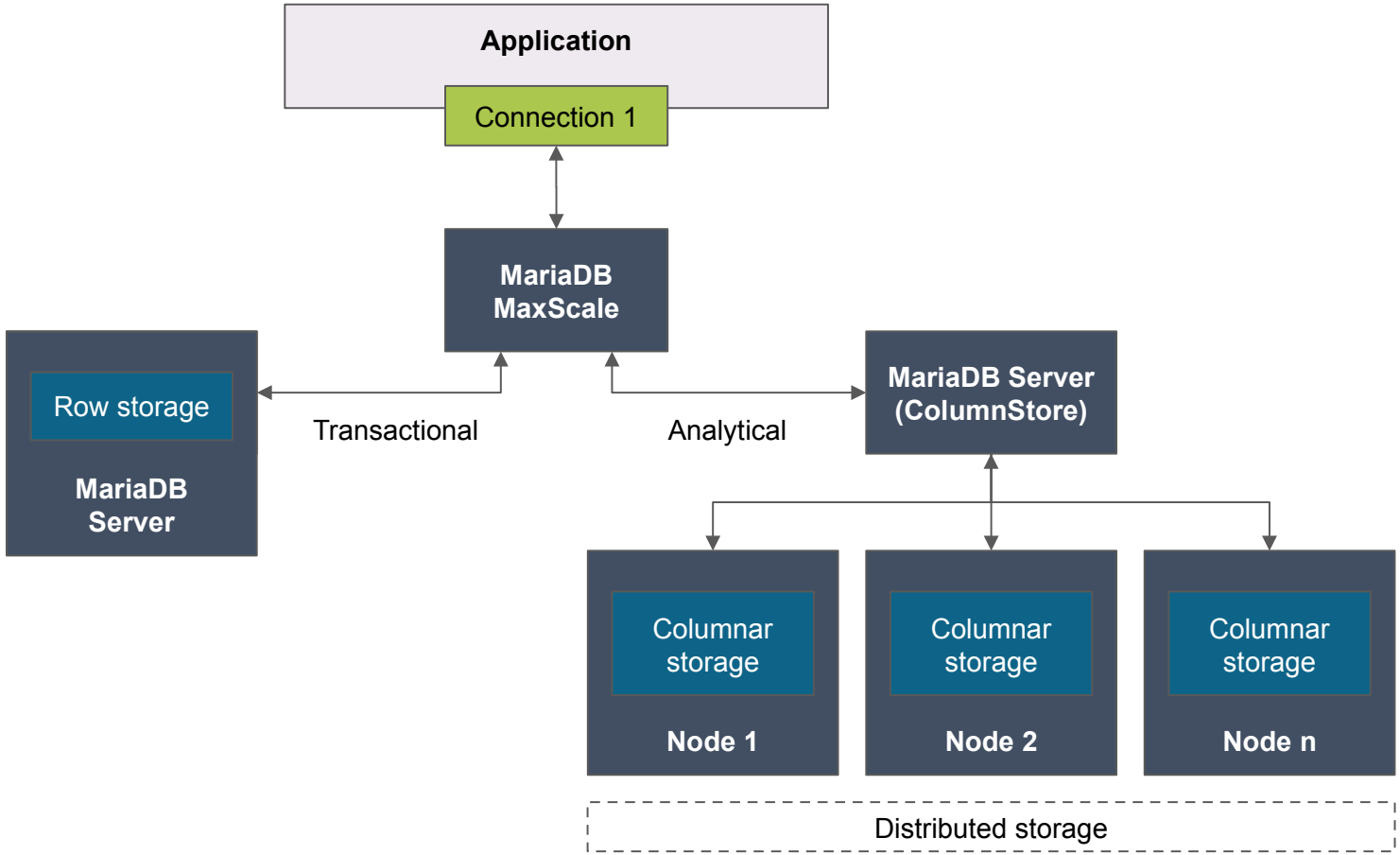
* IBM Db2 Shadow Tables, ** Oracle IM column store can read from on-disk row storage if needed

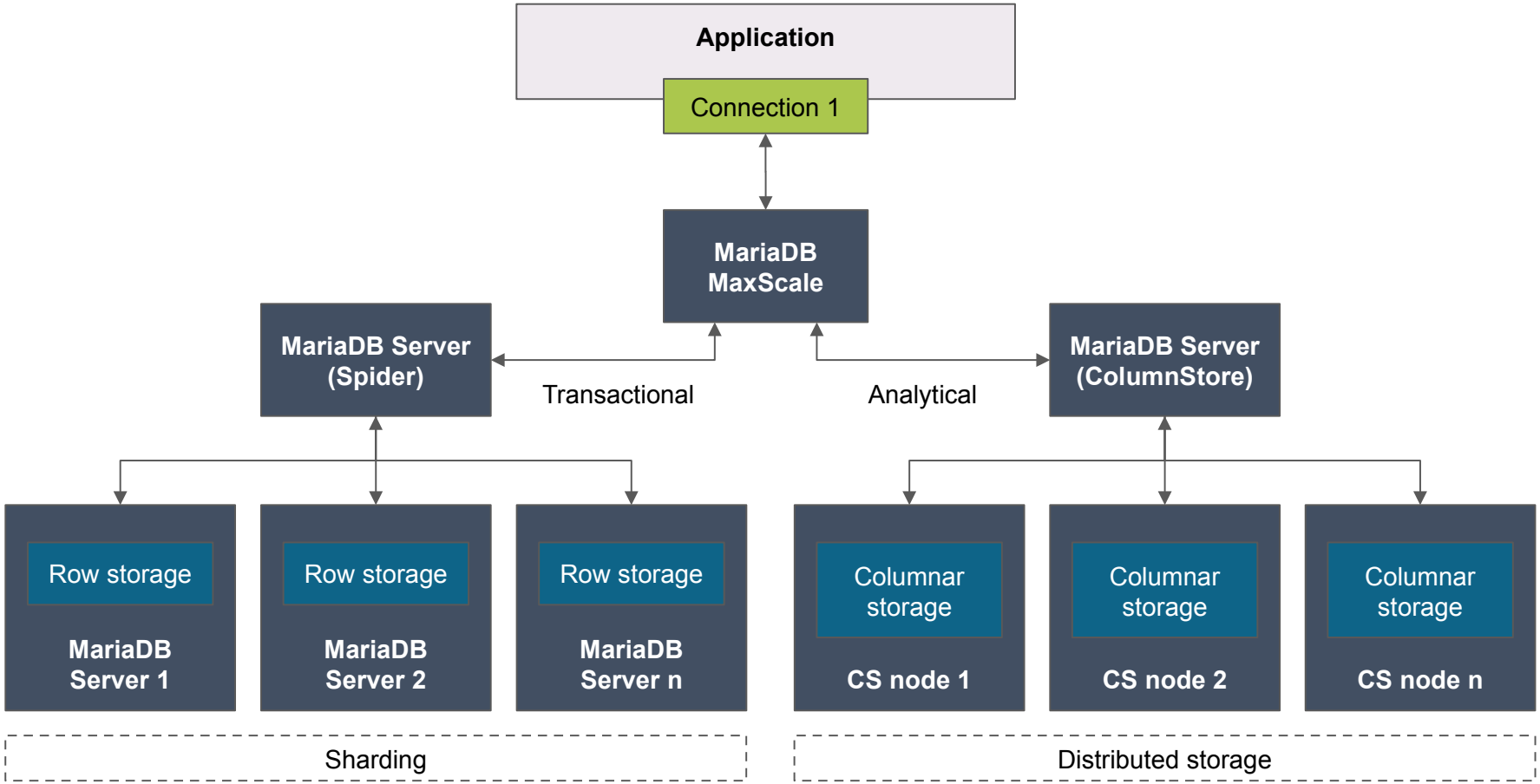
MariaDB


Application
Connection 1
Connection 2
Transactional
Analytical
Row storage
Columnar storage
Microsoft
SQL Server
Columnar storage
Row storage
Microsoft
SQL Server


Application
Connection 1
MariaDB
MaxScale
Row storage
MariaDB
Server
Transactional
Analytical
Columnar
storage
MariaDB Server


Application
Connection 1
MariaDB
MaxScale
MariaDB Server
(Spider)
Transactional
Analytical
Columnar
storage
MariaDB Server
Row storage
MariaDB
Server 1
Row storage
MariaDB
Server 2
Row storage
MariaDB
Server n
Sharding


Application
Connection 1
MariaDB MaxScale
Row storage
MariaDB Server
Transactional
Analytical
MariaDB Server (ColumnStore)
Columnar storage
Node 1
Columnar storage
Node 2
Columnar storage
Node n
Distributed storage


Application
Connection 1
MariaDB MaxScale
MariaDB Server (Spider)
Transactional
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MariaDB Server (ColumnStore)
Row storage
MariaDB Server 1
Row storage
MariaDB Server 2
Row storage
MariaDB Server n
Columnar storage
CS node 1
Columnar storage
CS node 2
Columnar storage
CS node n
Sharding
Distributed storage

Real-world use cases

Retail (market research)

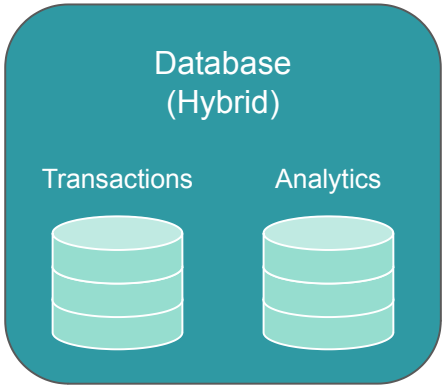
Transactional

Capture daily product prices

Update product information

Show current prices

Store current pricing data



Analytical

Show prices over time

Self-service analytics

Store historical pricing data

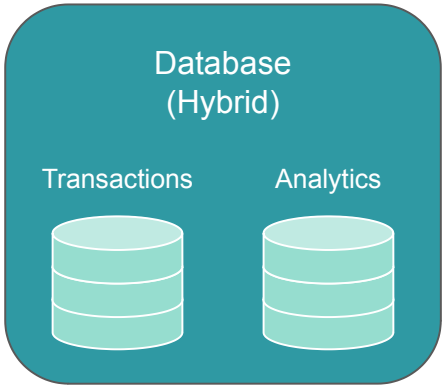
Telecommunications (IP telephony – SaaS)

Transactional

Capture call detail records

Charge by call/message

Generate bills



Analytical

Monitor usage

Identify peak periods

Estimate costs

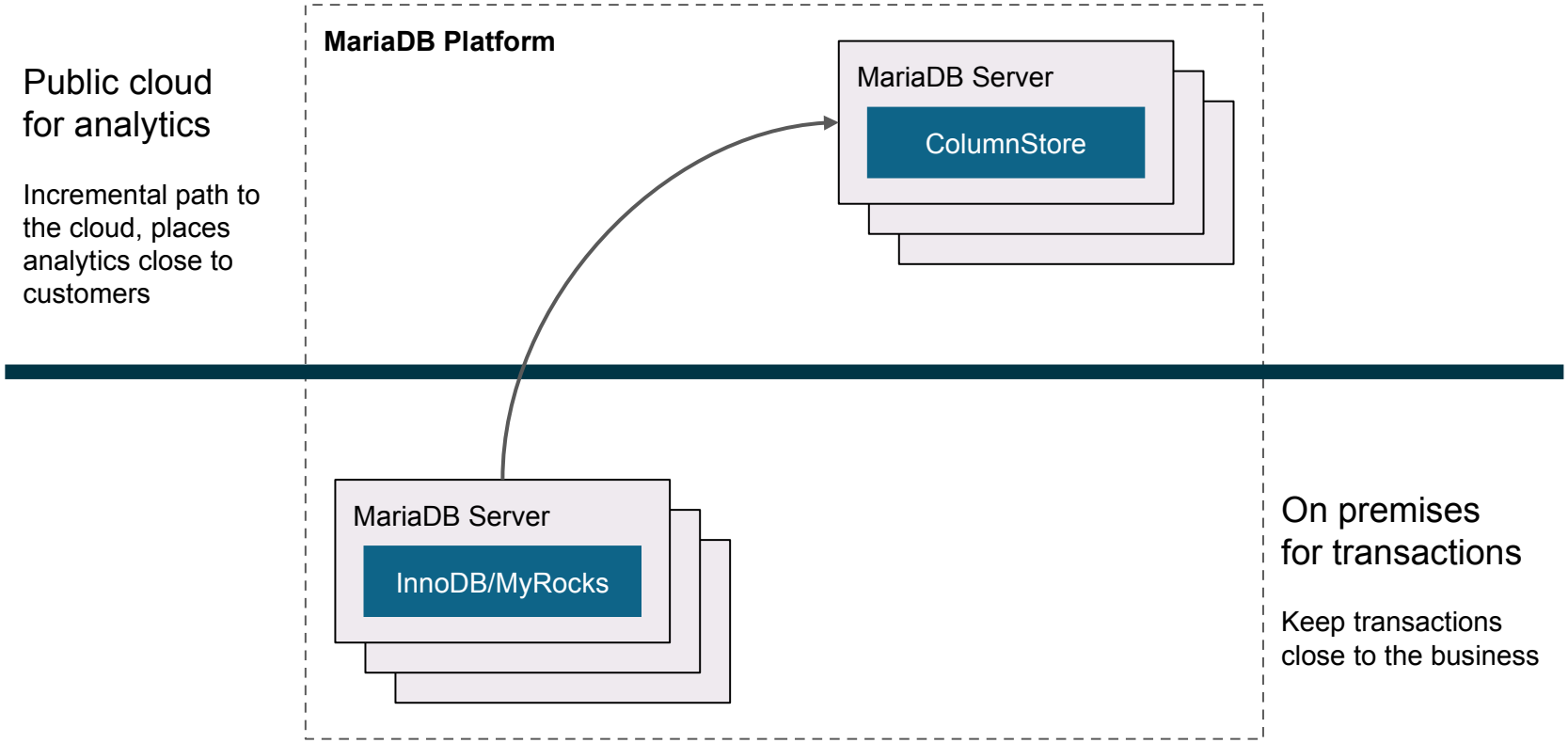
Self-service analytics

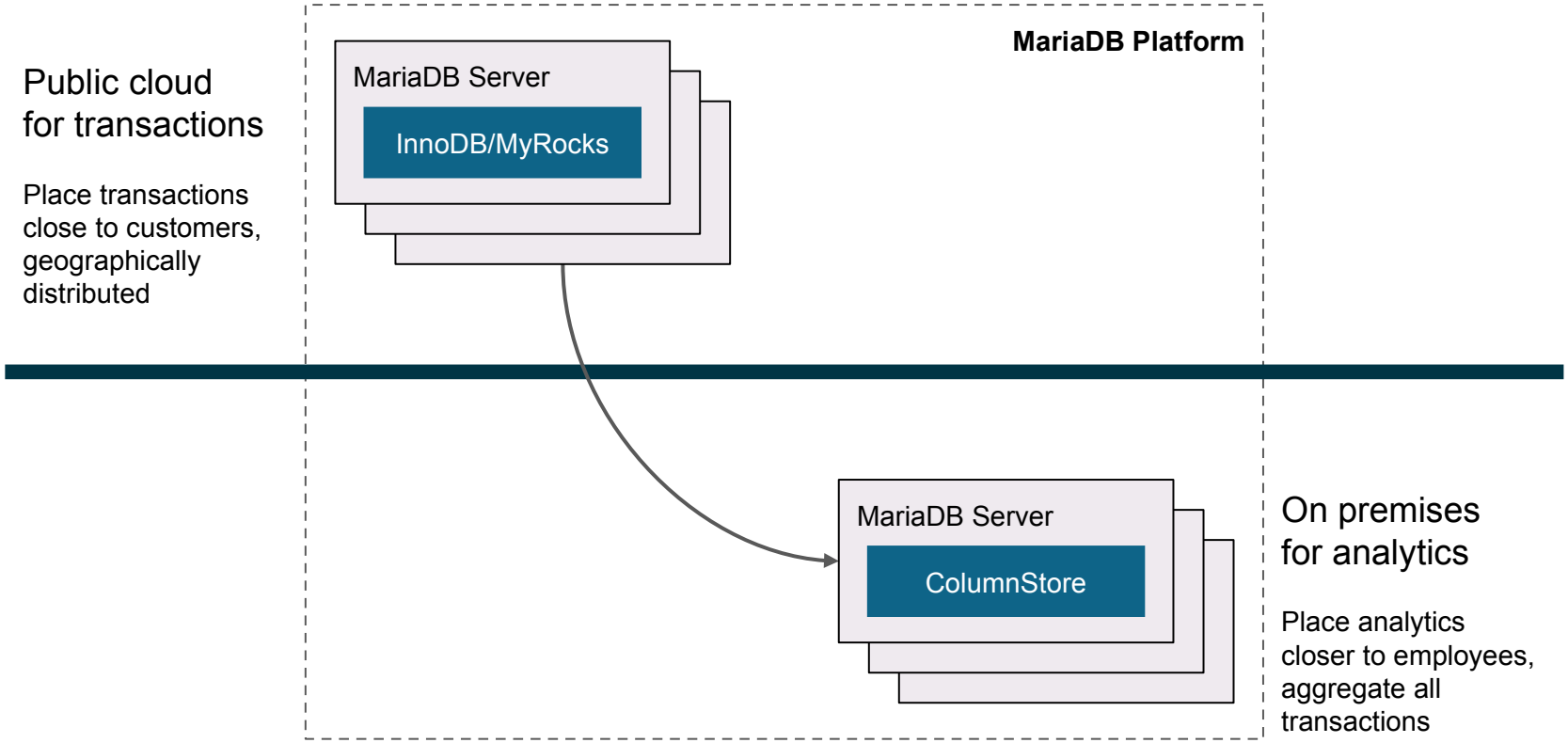
Hybrid cloud

MariaDB

Hybrid workloads: perfect for hybrid cloud

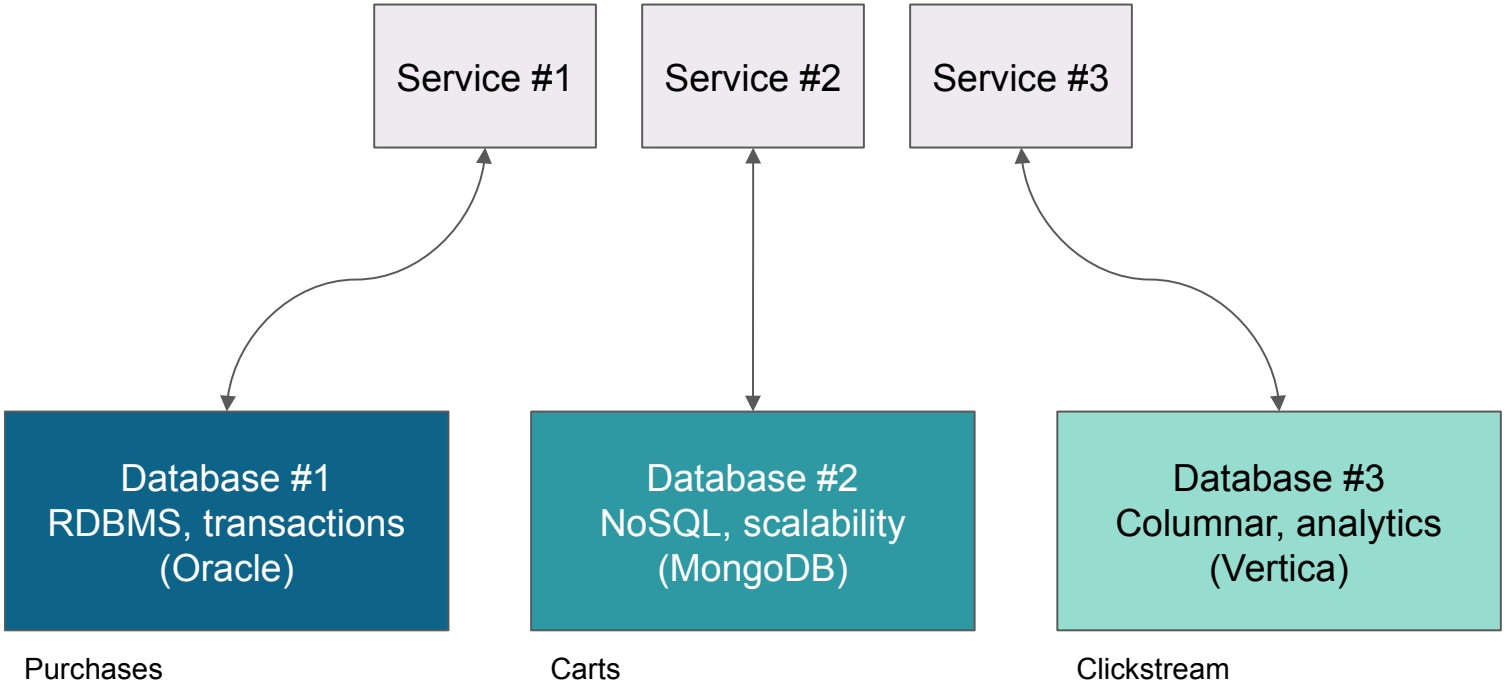
- MariaDB Platform separates and isolates different workloads
  - Run different workloads on different infrastructure
  - Place different workloads closer to different users
  - Scale different workloads on different hardware

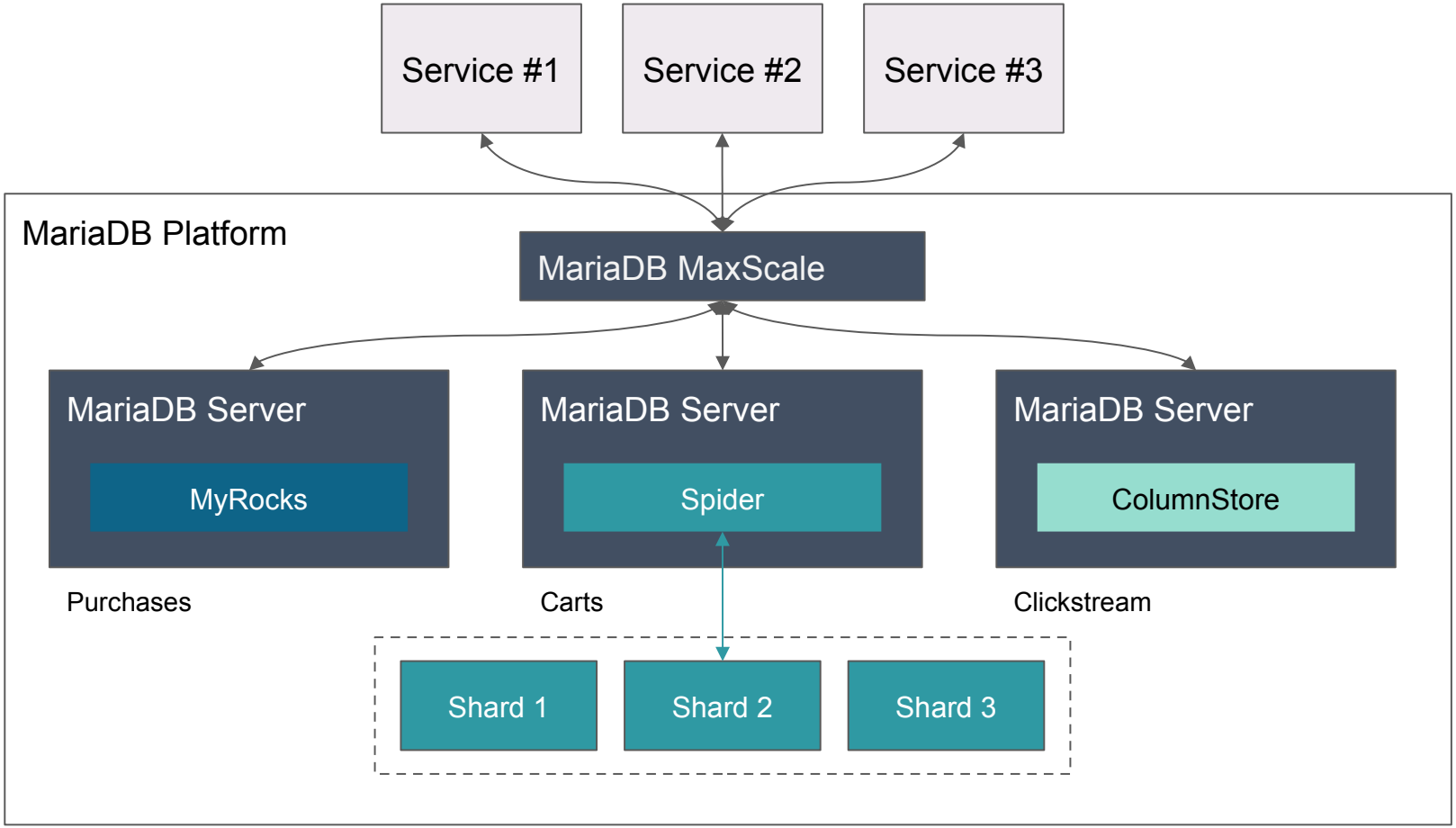

Public cloud
for analytics
Incremental path to the cloud, places analytics close to customers
MariaDB Platform
MariaDB Server
ColumnStore
MariaDB Server
InnoDB/MyRocks
On premises
for transactions
Keep transactions close to the business


MariaDB Platform
Public cloud
for transactions
Place transactions
close to customers,
geographically
distributed
MariaDB Server
InnoDB/MyRocks
MariaDB Server
ColumnStore
On premises
for analytics
Place analytics
closer to employees,
aggregate all
transactions

Database consolidation

MariaDB


Service #1
Service #2
Service #3
Database #1
RDBMS, transactions
(Oracle)
Database #2
NoSQL, scalability
(MongoDB)
Database #3
Columnar, analytics
(Vertica)
Purchases
Carts
Clickstream


Service #1
Service #2
Service #3
MariaDB Platform
MariaDB MaxScale
MariaDB Server
MyRocks
MariaDB Server
Spider
MariaDB Server
ColumnStore
Purchases
Carts
Clickstream
Shard 1
Shard 2
Shard 3

Getting started with Docker

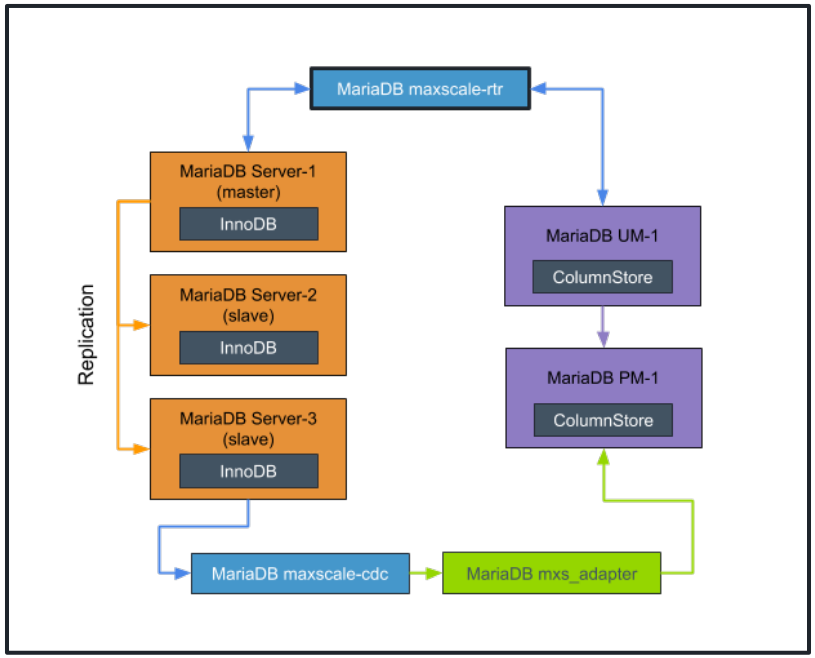
MariaDB

MariaDB Platform X3 in a container

- MariaDB Platform “in-a-box”
- Fully-configured and ready to use out of the box
- Intended as a quickstart for development
- Launched with a Docker command
- Runs on a laptop

https://github.com/mariadb-corporation/mariadb-platform-docker/tree/master/single-container

MariaDB Platform X3 in a container



MariaDB

THANK YOU!

MariaDB