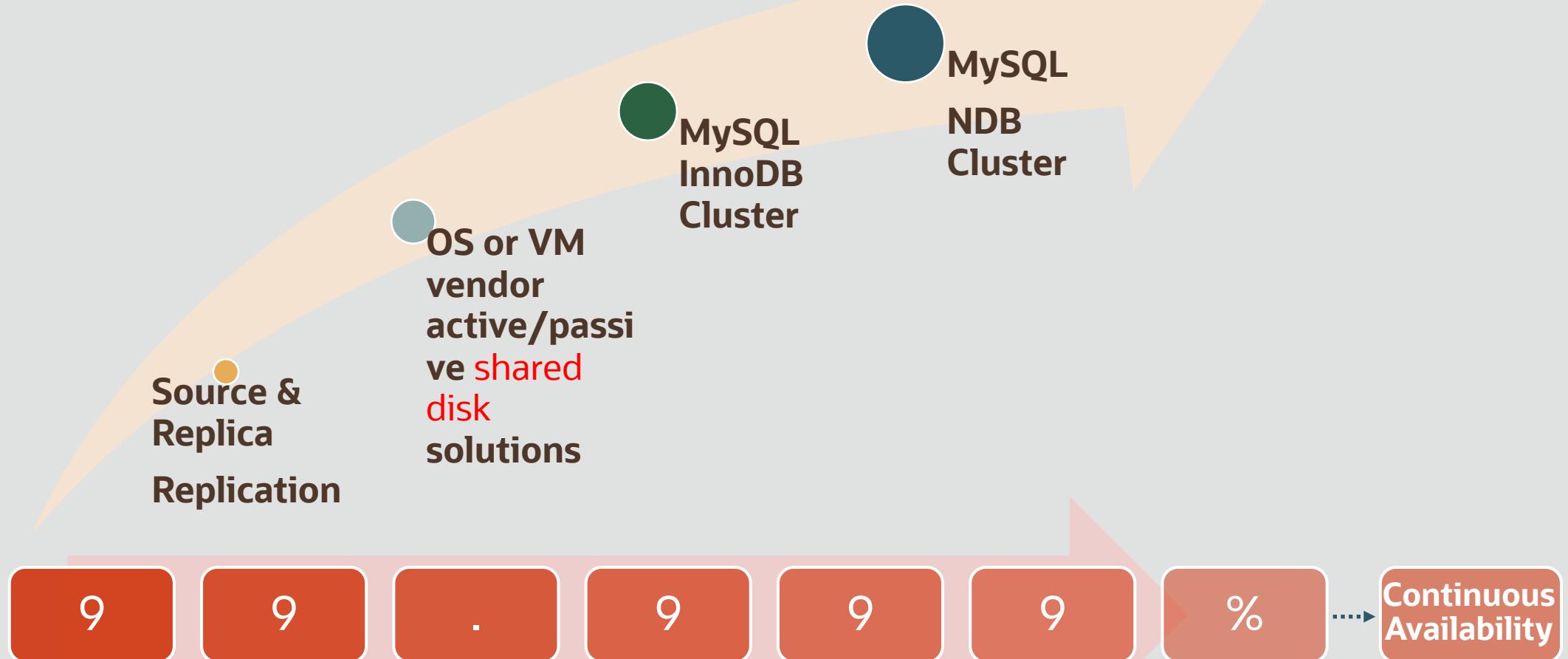
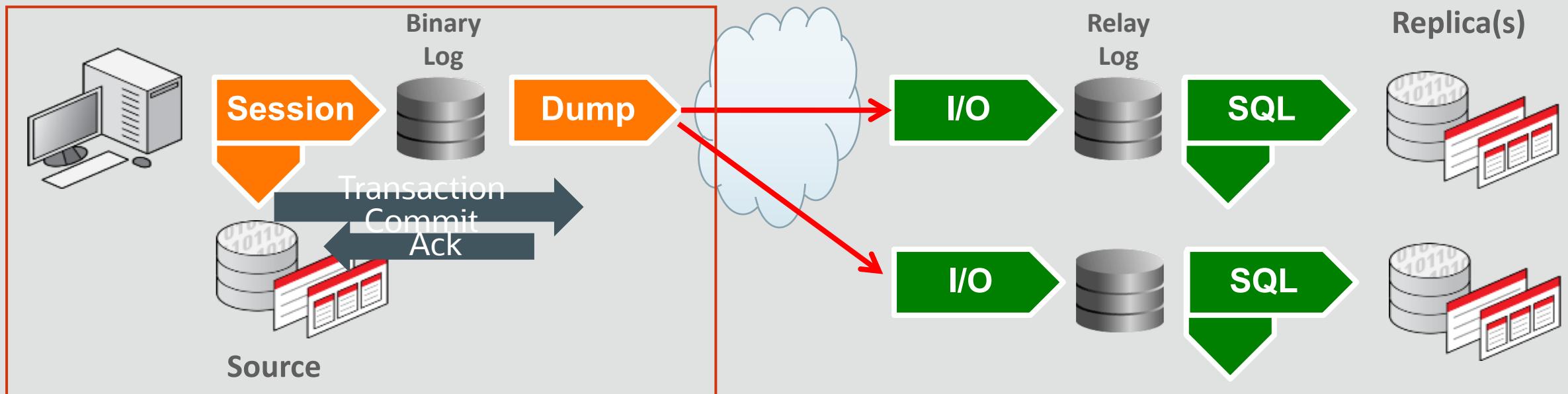


MySQL HA

High Availability: MySQL Solutions



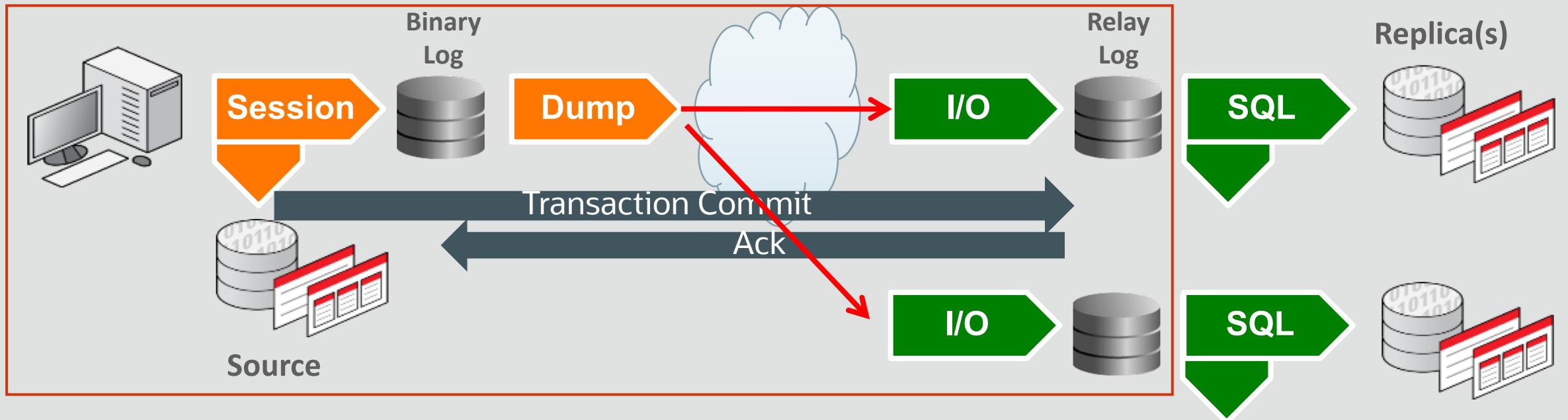
MySQL Replication – Asynchronized Replication



- Session thread updates requests to Storage Engine from application, and changes are written to binlog before apply to storage engine

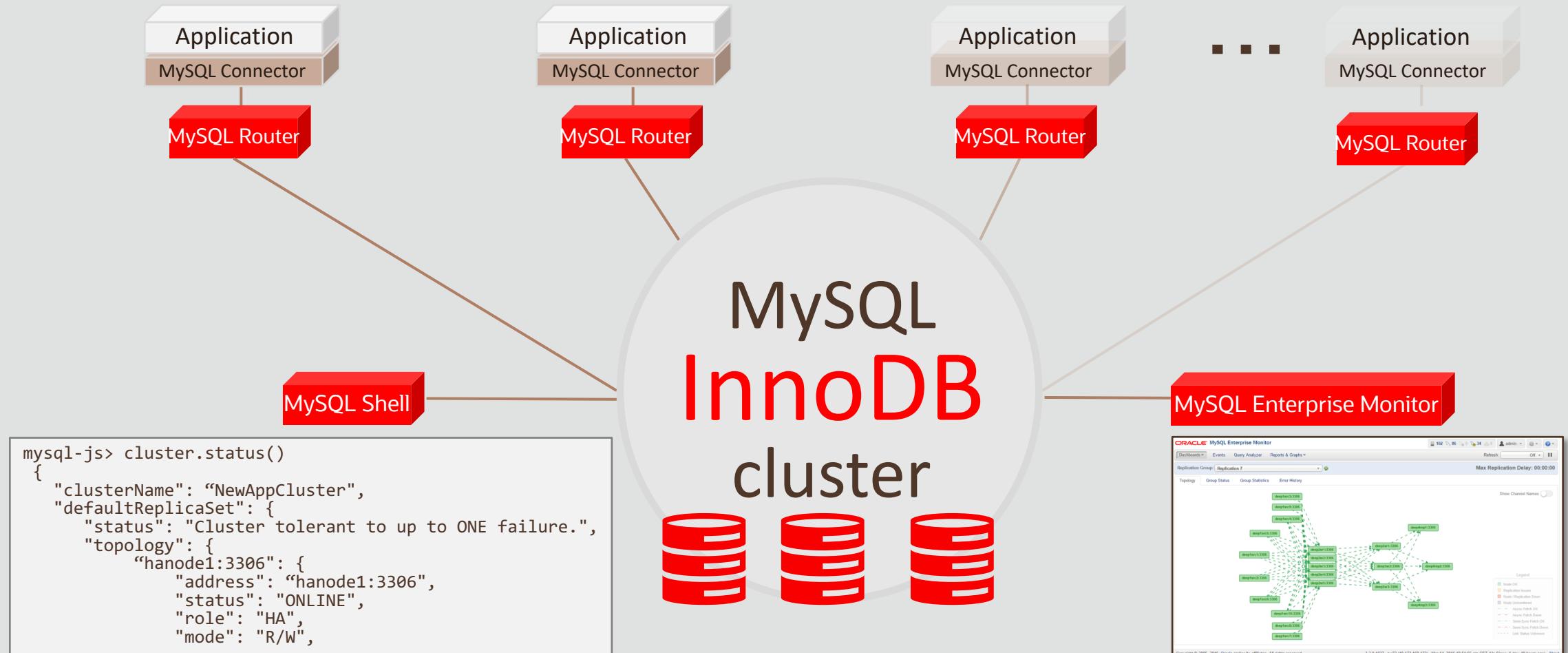
- Dump thread reads event from binlog and propagate them to slave server
- I/O thread read replication events, stores them to relay log
- SQL thread: reads relay log and applies them to storage engines

MySQL Replication – SEMI-Synchronized Replication



- Session thread updates requests to SE from application, and changes are written to binlog before apply to storage engine
- Dump thread reads event from binlog and propagate them to slave server
- I/O thread read replication events, stores them to relay log
- SQL thread: reads relay log and applies them to storage engines

MySQL InnoDB Cluster: Architecture



File Edit View History Bookmarks Tools Help

MySQL Live Demo X +

168.138.6.73/demo/index.php?demoID=3

... ⌂ ⌂ Search

Single Primary InnoDB Cluster | Worker: OFF Balance Fees Users Trans

Sender Receiver Amount Fee

127.0.0.1 (Port: 3310), Online

127.0.0.1 (Port: 3320), Online

127.0.0.1 (Port: 3330), Online

127.0.0.1 (Port: 3340), Online

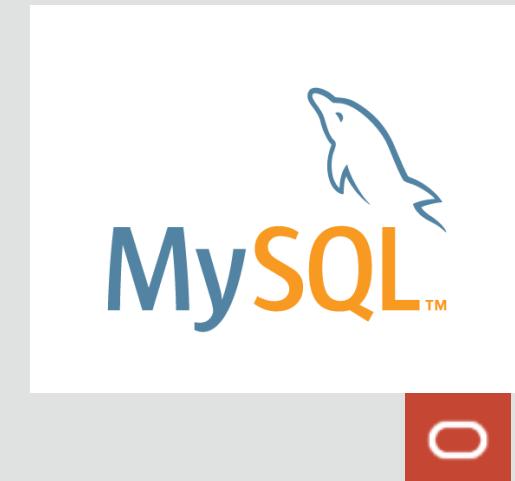
Top Dogs

2018 Ronen Baram. Distributed under GPLv3. Based on Sufee Admin Dashboard, Jquery, Bootstrap and more.

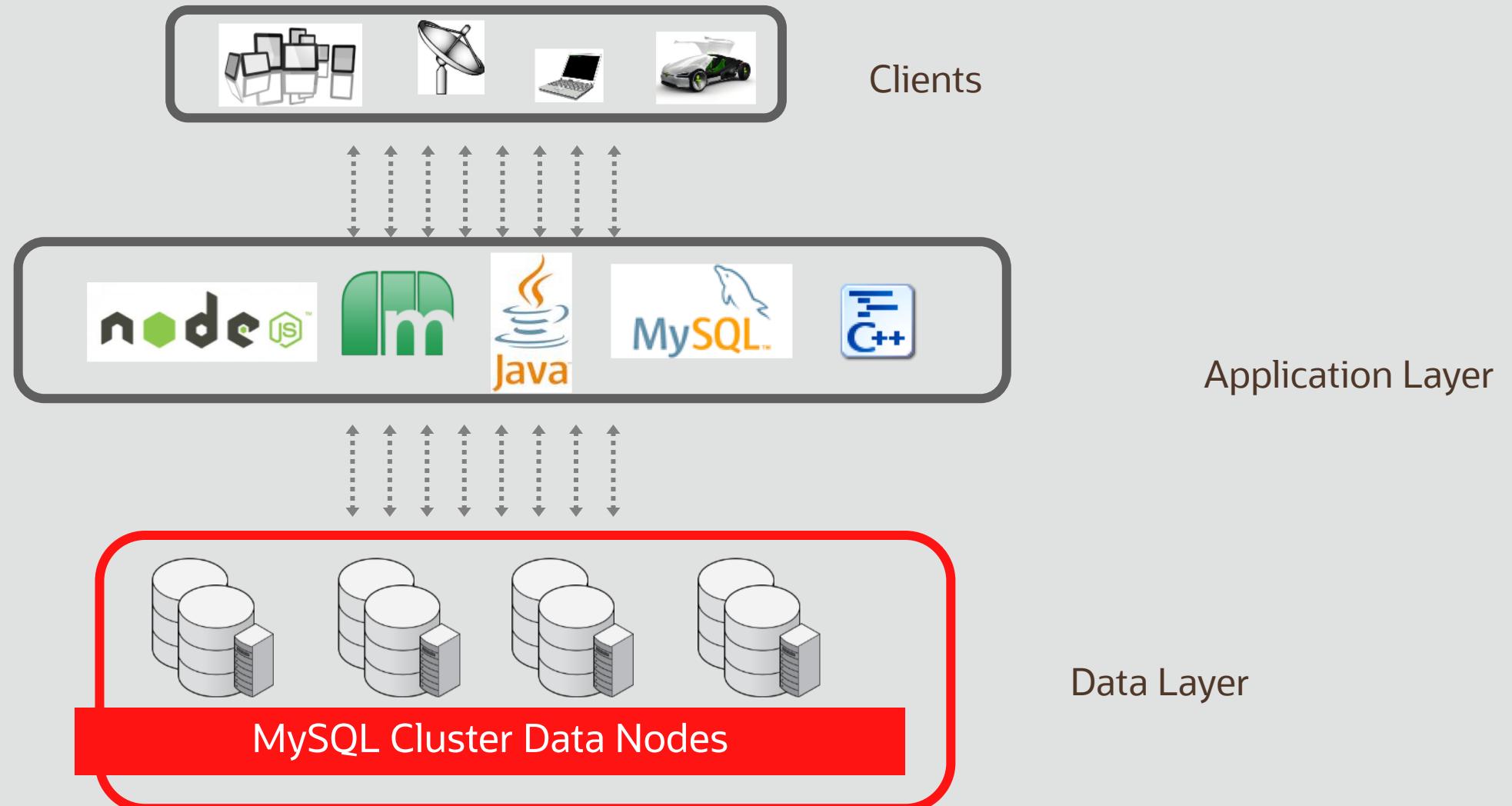
6

MySQL High Availability Solutions

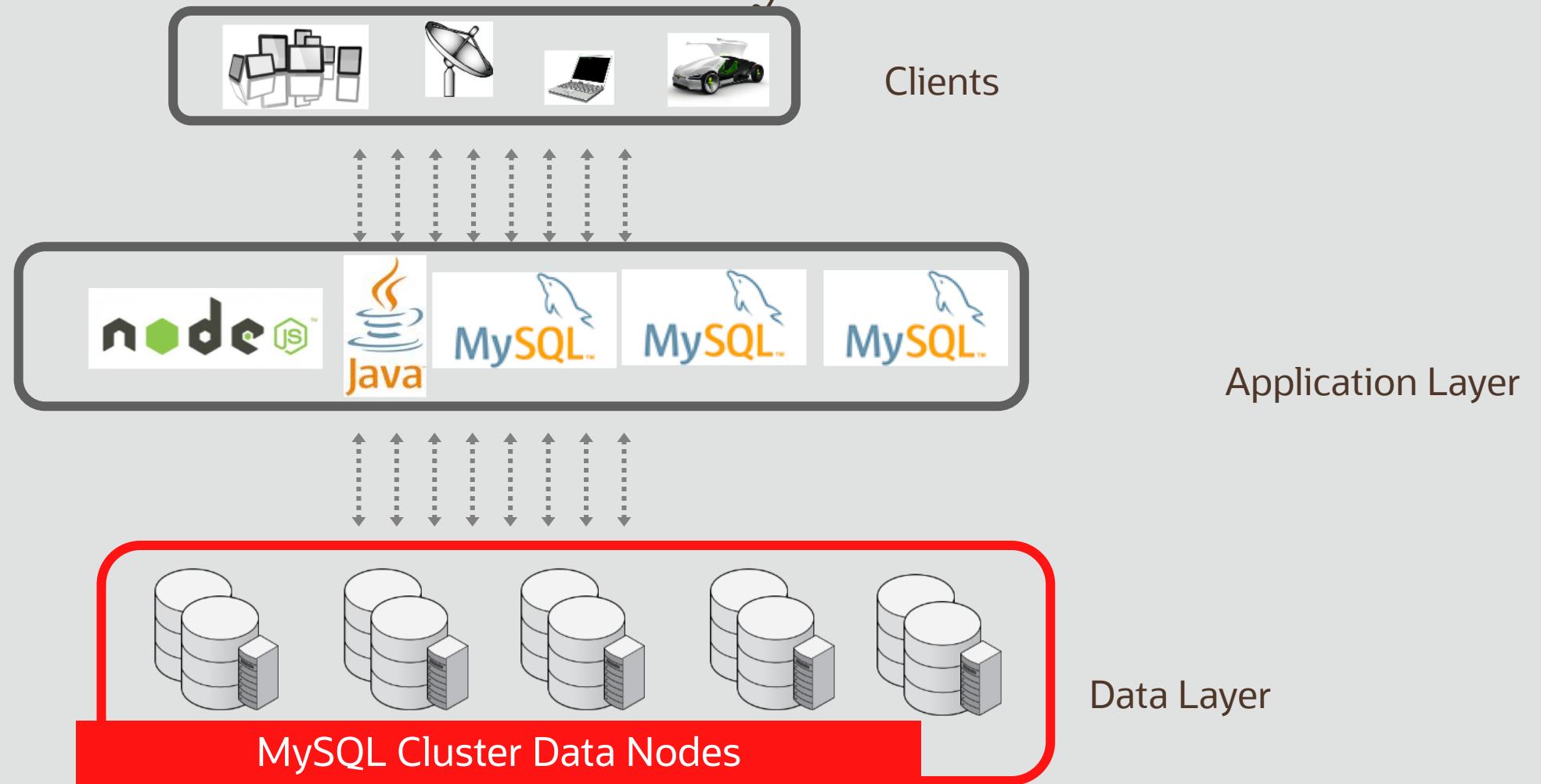
- MySQL NDB Cluster
 - NDB storage engine
 - **Memory** database
 - Automatic sharding of data
 - SQL Access via MySQL with cross shard join support
 - Native access via several API's
 - Read/write consistency
 - Read/write scalability
 - ACID and transactions
 - Recommend Min: 4 nodes
 - 2 data nodes
 - 2 (mgt + mysql nodes)
- MySQL InnoDB Cluster
 - Native to MySQL for **InnoDB**
 - MySQL Group Replication, Shell and Router
 - Write consistency & Read Scalability
 - Native CRUD API in MySQL 8
 - Group Replication Consistency in MySQL 8.0 support
 - **GTID**
 - **Recommend : Min 3 nodes**
- MySQL Replication
 - Core part of MySQL, used by almost everyone.
 - Can be used by all storage engines
 - Asynchronous and semi-sync option
 - Scales our reads



MySQL Cluster Architecture



MySQL Cluster Scalability – add more...



Automatic Data Partitioning

Table T1

ID	FirstName	LastName	Email	Phone

4 Partitions * 2 Replicas = 8 Fragments

Px Partition

P1

P2

P3

P4

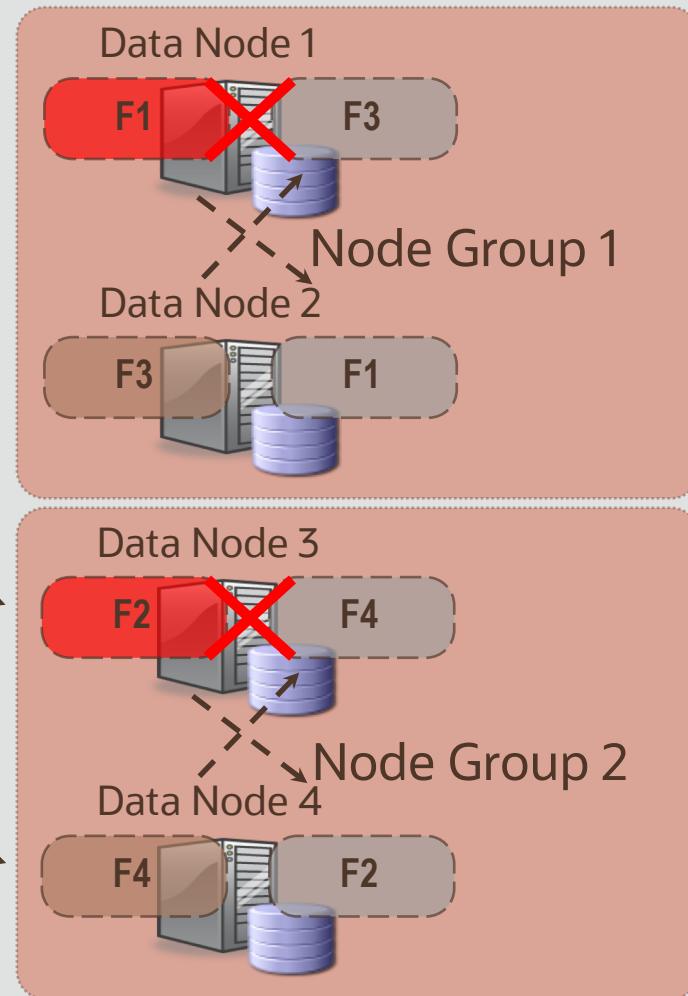
Fx

Primary Fragment

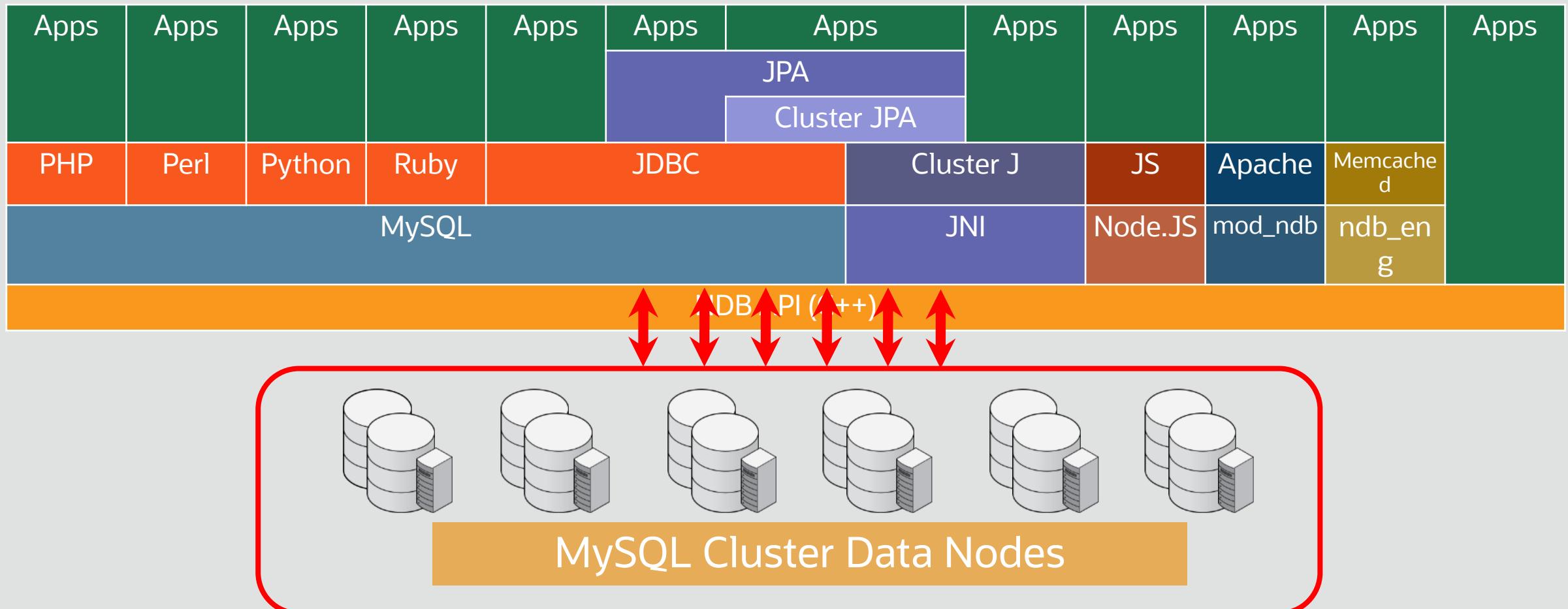
Fx

Secondary Fragment

As long as one data node in each node group is running we have a complete copy of the data



NoSQL Access to MySQL Cluster data



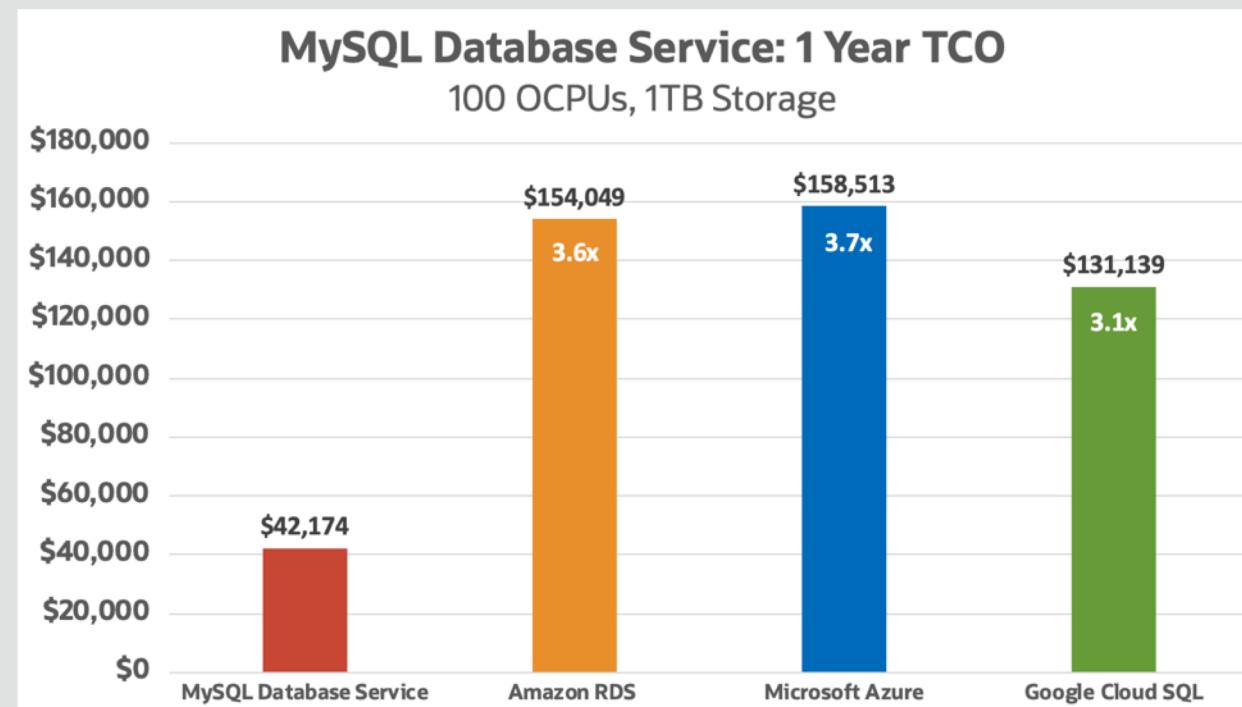
MySQL on OCI



MySQL Database Service

<https://blogs.oracle.com/mysql/introducing-the-mysql-database-service>

Built by the MySQL Engineering Team



New! MySQL Database Service

100% Developed, Managed and Supported by the MySQL Team



MySQL Database Service

100% developed, managed, and supported by the MySQL team

Easy



- Fully Managed Database Service
- Instant Provisioning
- Latest Features

Secure



- Data Protection
- Advanced security
- Latest Security Updates

Enterprise-Ready



- Built on MySQL Enterprise Edition
- On Premises Compatibility
- Built on Gen 2 Cloud Infrastructure

MySQL Database Service: Enterprise ready

Built on MySQL Enterprise Edition

- Highest reliability and security
- 24x7 Support from the MySQL Team

100% Compatible with on-premises MySQL

- Easy Path to Cloud
- Hybrid Cloud Deployments
- No Cloud Fork Lock-in

Integration with Oracle technologies

- Oracle Data Integrator, Audit Vault, Container Engine for Kubernetes...

Built on Gen 2 Cloud Infrastructure

- Core-to-edge security for enterprise workloads



MySQL Database Service: Key use cases

New Cloud Native Apps	Move Existing Workloads	Hybrid Cloud Flexibility	SaaS Applications
<ul style="list-style-type: none">• New MySQL instances in minutes• Focus on development, not DB admin• Tools & latest features for modern apps• Scale according to needs• Use open source and Oracle Cloud Native Services	<ul style="list-style-type: none">• Improve security and ability to get expert technical support• Latest updates, security fixes and features• Improve productivity• Accelerate innovation and time to market• Avoid Shadow IT	<ul style="list-style-type: none">• 100% compatible with on-premises MySQL• No lock-in into a fork or a cloud• Move and deploy workloads across cloud & on-prem• Integration into the Oracle environment• Manage environment from single pane of glass	<ul style="list-style-type: none">• Strong background as embedded database for ISVs• Focus on rapidly adding new features• Scale globally according to needs• OCI performance, availability and manageability SLAs• Expert MySQL Technical Support
#1 Database for Developers*	100% Developed, Managed, Supported by MySQL team	100% Compatible	Popular with ISVs

[*Stackoverflow survey](#)



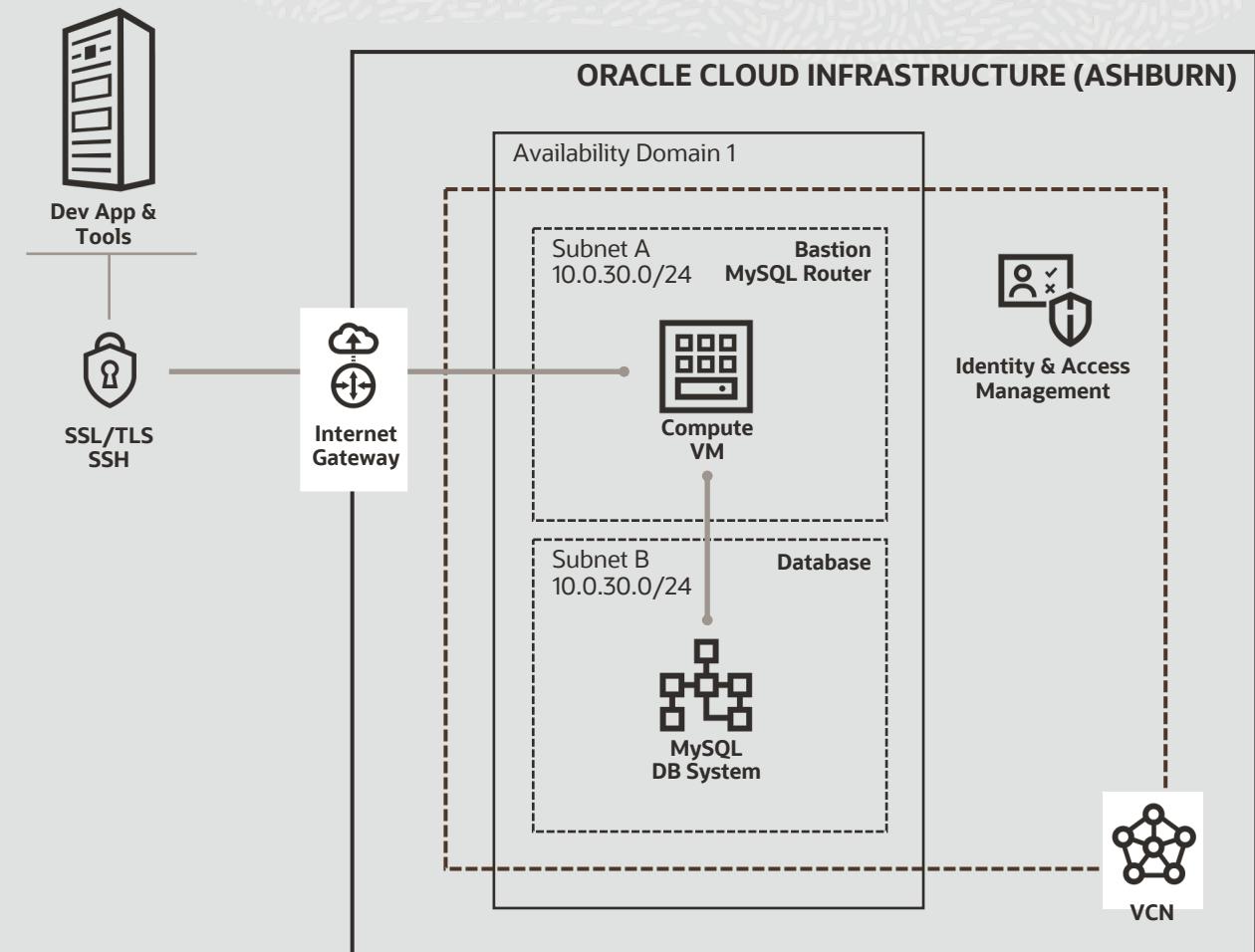
Use case 1

New Cloud Native App

Characteristics
Homegrown CRM App
Node.js Cloud Native Application
Using X-Protocol, only available in MDS
Using External App as Cloud Native Dev Environment - can move to OKE later
Development stage

Pain Points

- Want to use MySQL 8 XDev API
- Don't want to manage, no DBA
- Quick provisioning and clone



Use case 2

Moving existing workloads

Characteristics

Wordpress and Drupal applications

Customizations to support internal processes

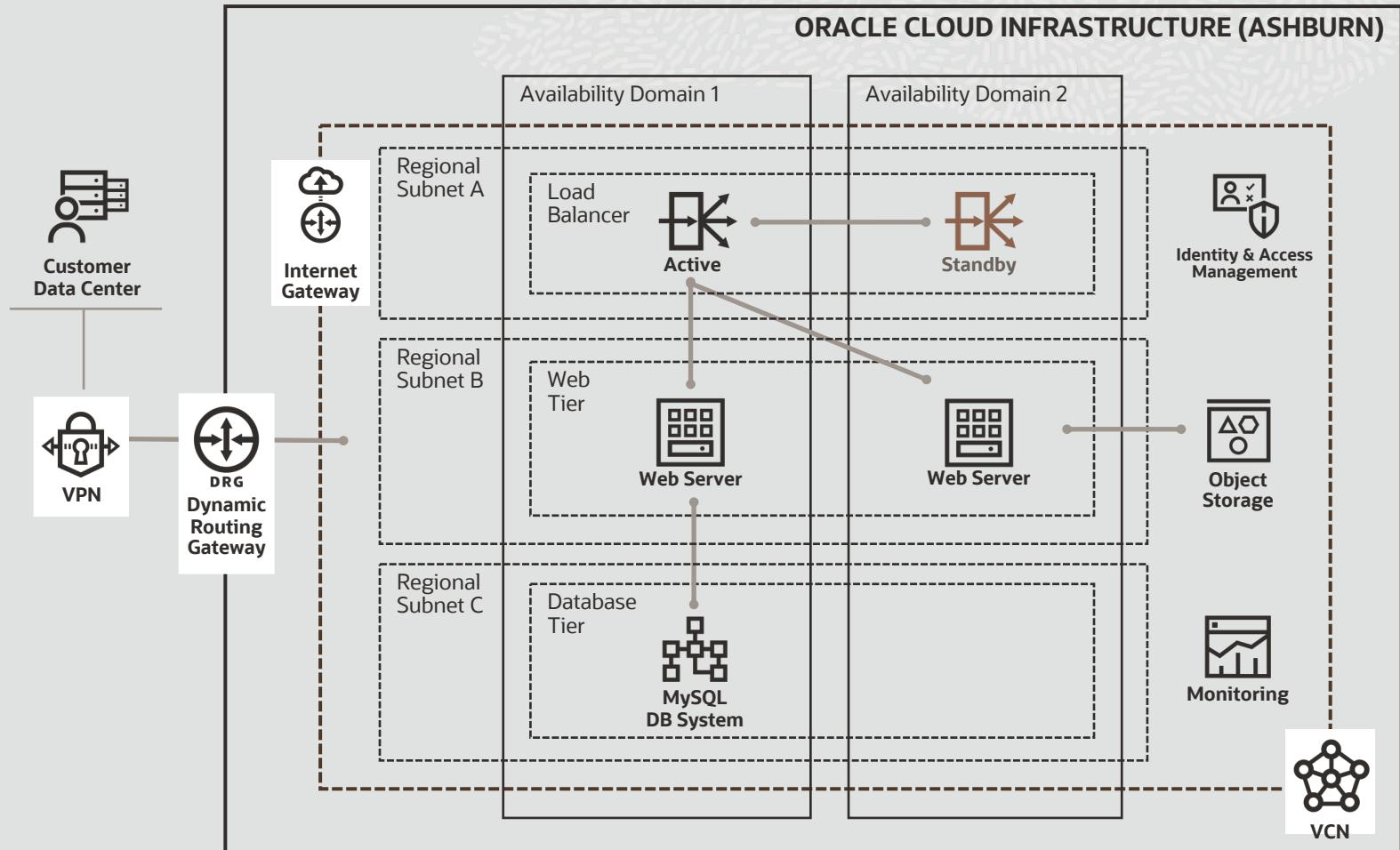
Existing OCI customer, migrating additional workloads

End user access without VPN

Gradually moving workloads to OCI

Pain Points

- Small IT staff to handle many systems
- Don't know MySQL specifics, generic Ops knowledge
- Automatic backups, Patching and Monitoring



Use case 3

Moving and modernizing existing application

Characteristics

Core application, popular website

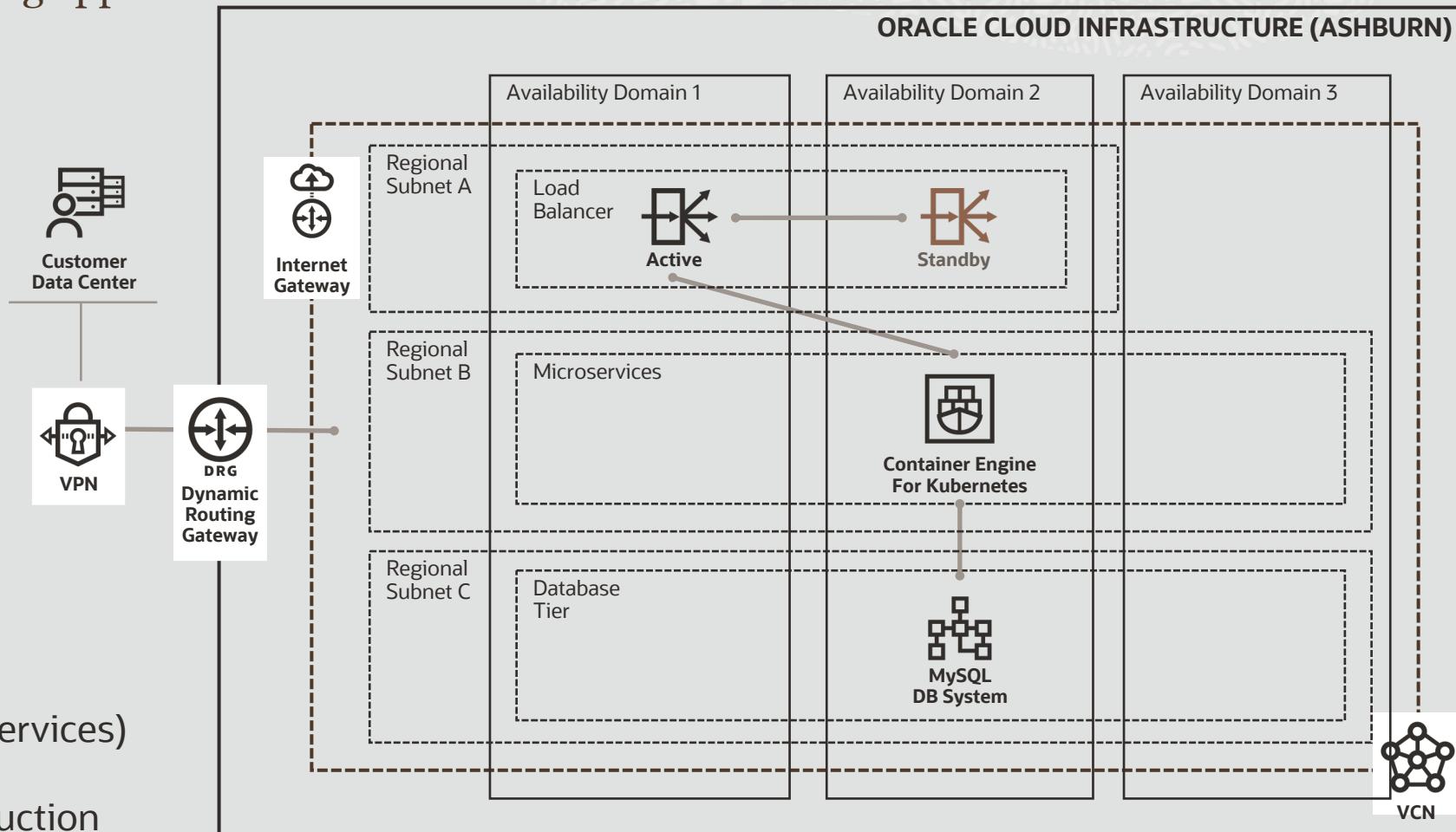
Changing the application to **microservices**

Using .Net Core on **Kubernetes (OKE)**, connecting to MDS

Development environment, getting ready to move to Prod

Pain Points

- Moving to Cloud Native (microservices)
- Don't want to manage MySQL
- Getting ready to move the production workload



Use case 4

SaaS application

Characteristics

SaaS/ISV, marketing and incentives company

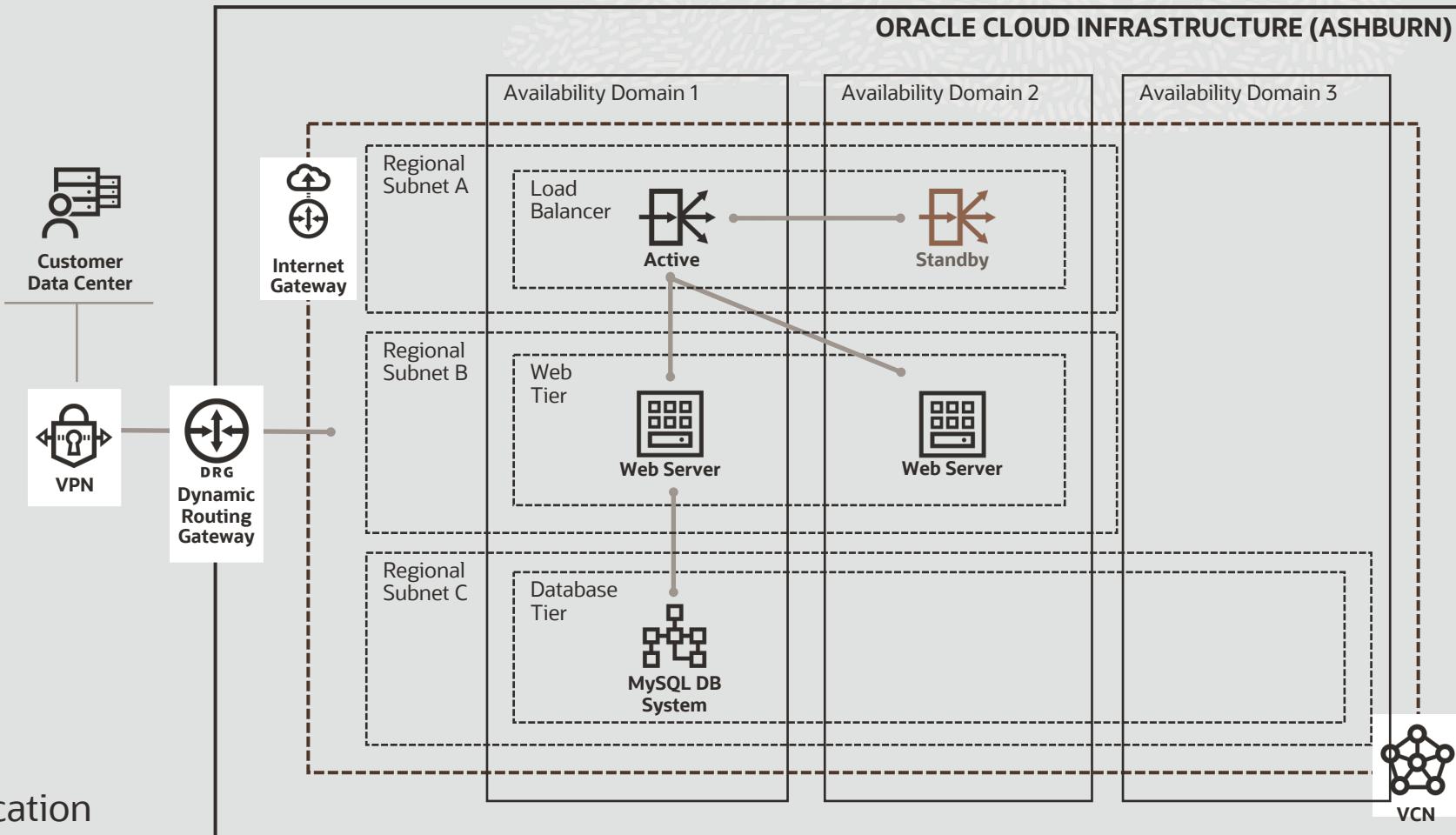
Adobe ColdFusion/IIS front end, MySQL backend (**3 DB servers**)

Consolidating co-located servers into consolidated OCI environment

PoC stage, want certify that app works with MDS

Pain Points

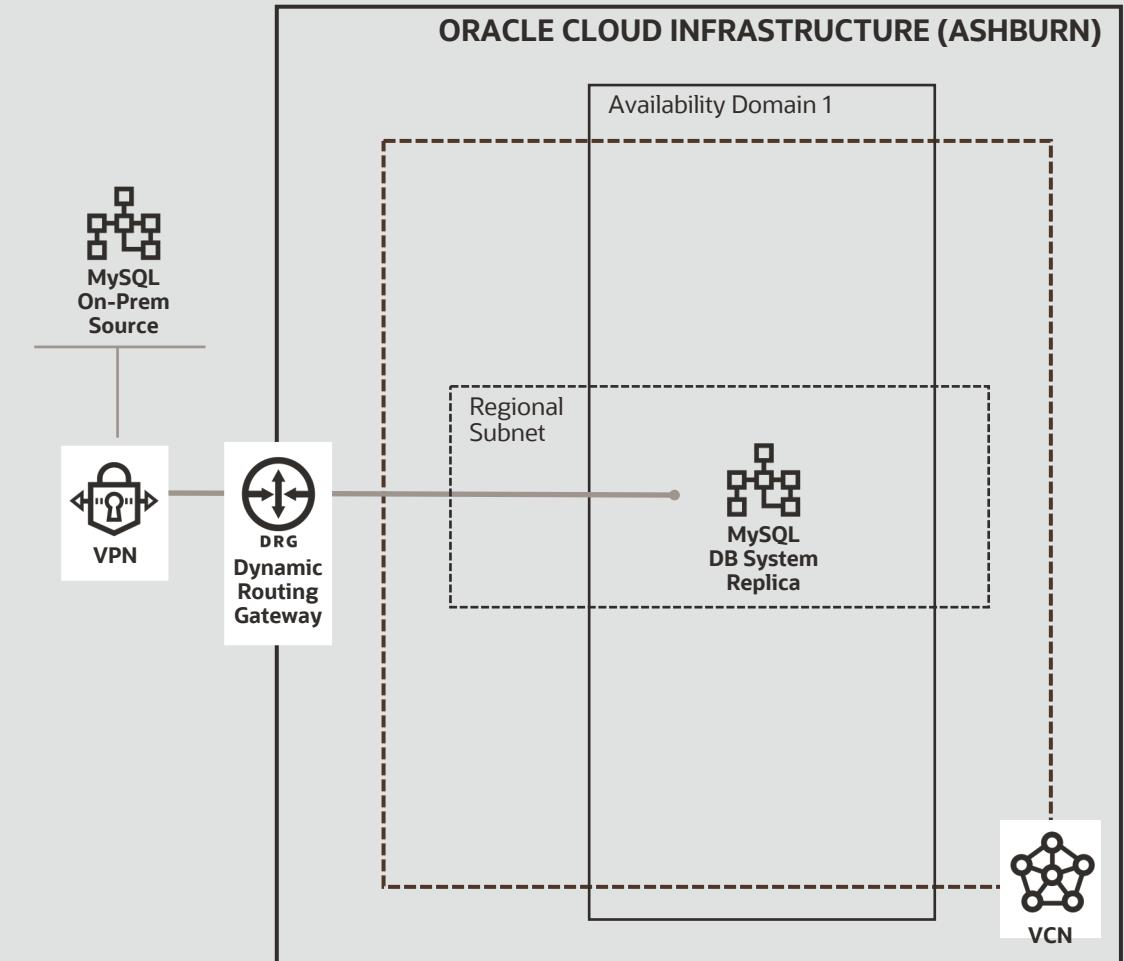
- 24x7 online end customer application
- Gradually moving workloads to the OCI
- Don't want to manage MySQL
- Future: Read replicas for internal processes, like reports



Example with the new Inbound Replication feature

Hybrid Cloud

- Inbound Replication: Source Database On-premises, Replica in OCI MDS
- Common use cases:
 - Disaster Recovery (DR) using OCI
 - Live Migrations
- Good opportunity for customers that want to start to use OCI, but don't want to move the main Database yet
- Starting Limited Availability in August, looking for candidates



A person is visible from the chest up, wearing a yellow and black horizontally striped shirt. The background is a plain, light gray.

ORACLE