yugabyteDB

Building Cloud Native Spring Boot Apps with Yugabyte Cloud and Kubernetes

Marko Rajcevic

Solutions Engineer

Srinivasa Vasu

Principal Solutions Engineer

© 2021 - All Rights Reserved

Prerequisites

- If you haven't signed up yet, go sign up for Yugabyte Cloud and create a cluster: **https://cloud.yugabyte.com/register**
- Join our community Slack, and join the **#training** channel for pre- and post-workshop discussions.
  - **https://www.yugabyte.com/community/**
- Java 8 or newer (full JDK)
- Git
- Gitpod
- Github
- Minikube
- Skaffold
- An IDE of your choice (will be using VSCode)

© 2021 - All Rights Reserved

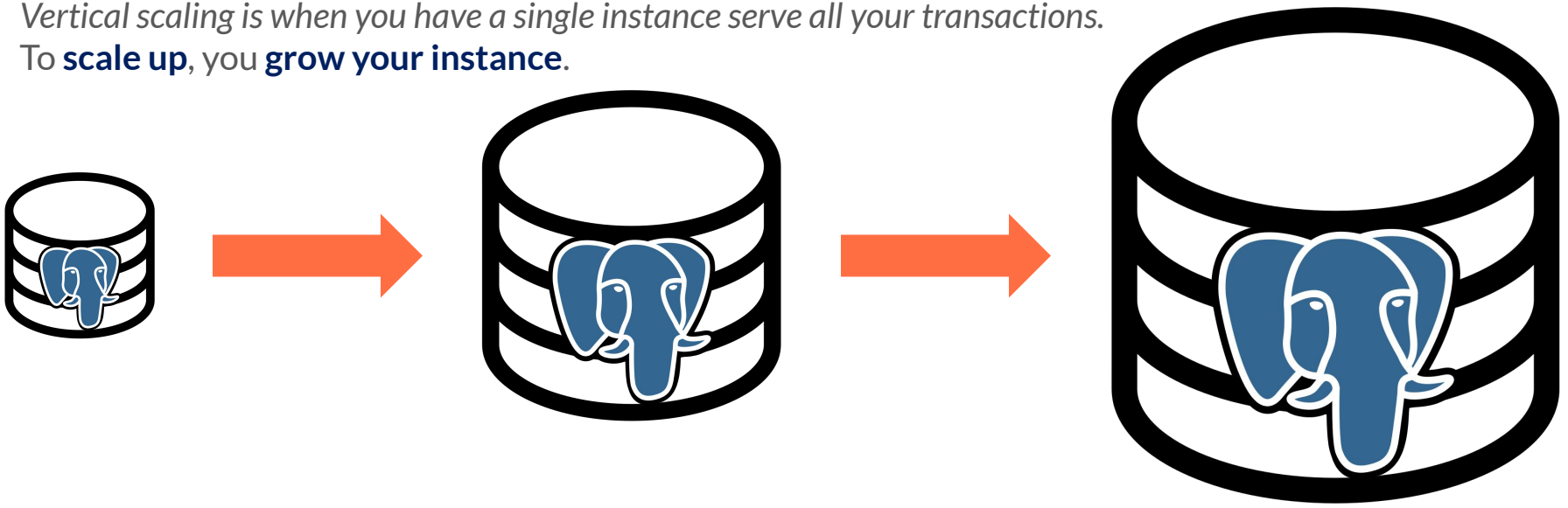
Agenda

- Before we start
  - Creating a Cloud Account
  - YugabyteDB Cluster Creation
- Scaling in a Cloud Native Architecture
- Workshop
  - Gitpod Launch
  - Yugabyte Cloud Demo
  - Deploy Spring Boot Pet Clinic application locally
  - Deploy Spring Boot Pet Clinic application using MiniKube
  - Deploy Spring Boot Pet Clinic application using Gitpod
  - Yugabyte Cloud Scaling Demo
- Additional Resources
- Q&A

© 2021 - All Rights Reserved

Vertical Scaling

Vertical scaling is when you have a single instance serve all your transactions.
To **scale up**, you **grow your instance**.



2 vCPU
2GB memory
50GB storage

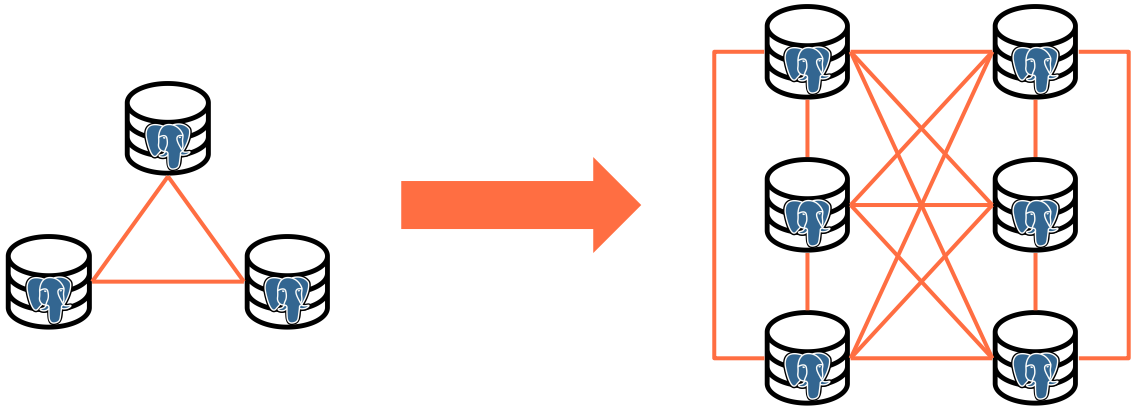
32 vCPU
128GB memory
2TB storage

96 vCPU
768GB memory
64TB storage

© 2021 - All Rights Reserved

Horizontal Scaling

Horizontal scaling is when you have a multiple instances serving your transactions.
To **scale out**, you **add instances** (called nodes).

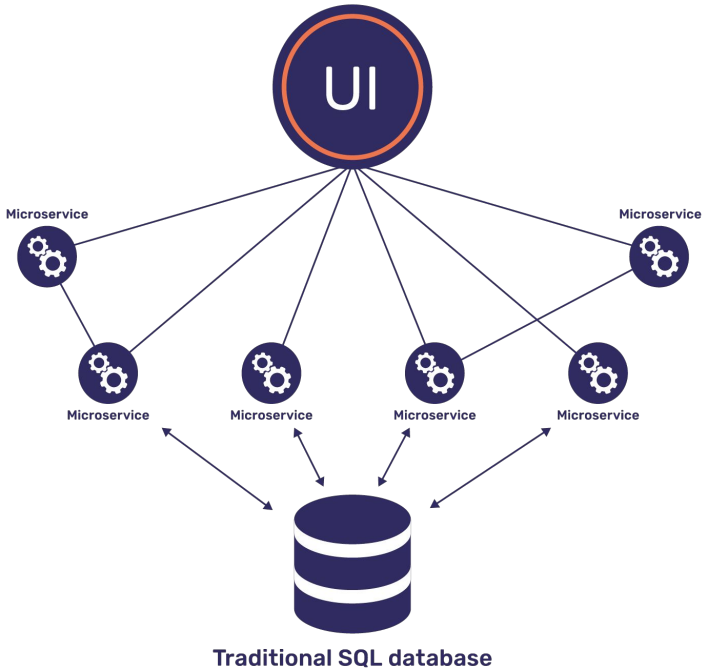


3 nodes
2 vCPU each
2GB memory each
50GB storage each

6 nodes
2 vCPU each
2GB memory each
50GB storage each

© 2021 - All Rights Reserved

Microservices demands database scalability



Connection pool exhaustion

- Database connections are expensive and are compounded by large no of microservices connecting to databases

Higher Latencies

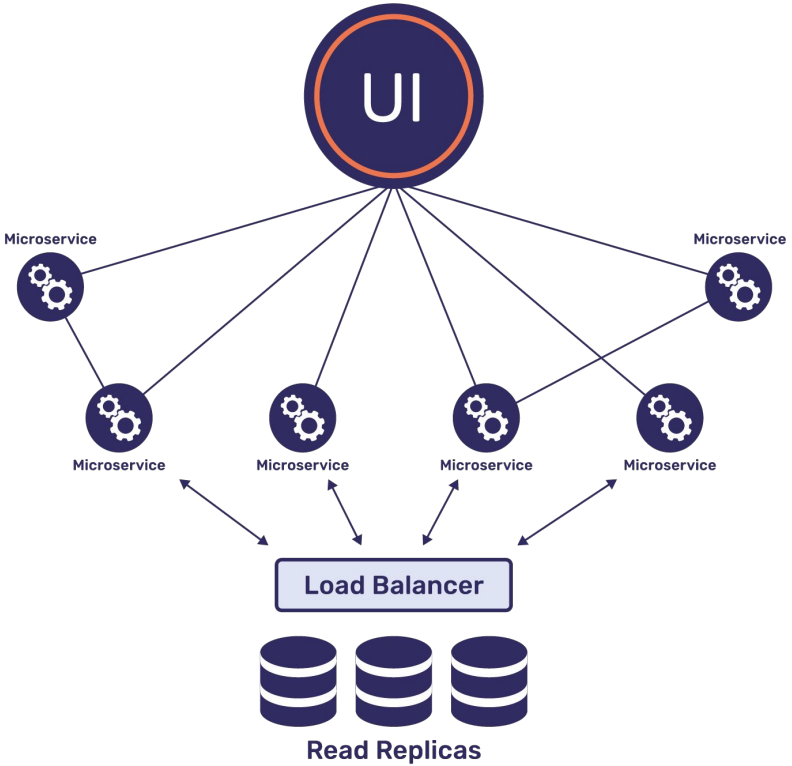
- Query response times deteriorates with insufficient resource due to query volume

Query Limiting

- DB overloading to handle spikes in application requests is mitigated by query limiting

© 2021 - All Rights Reserved

Traditional Scaling techniques



Scaling Reads using Read Replicas

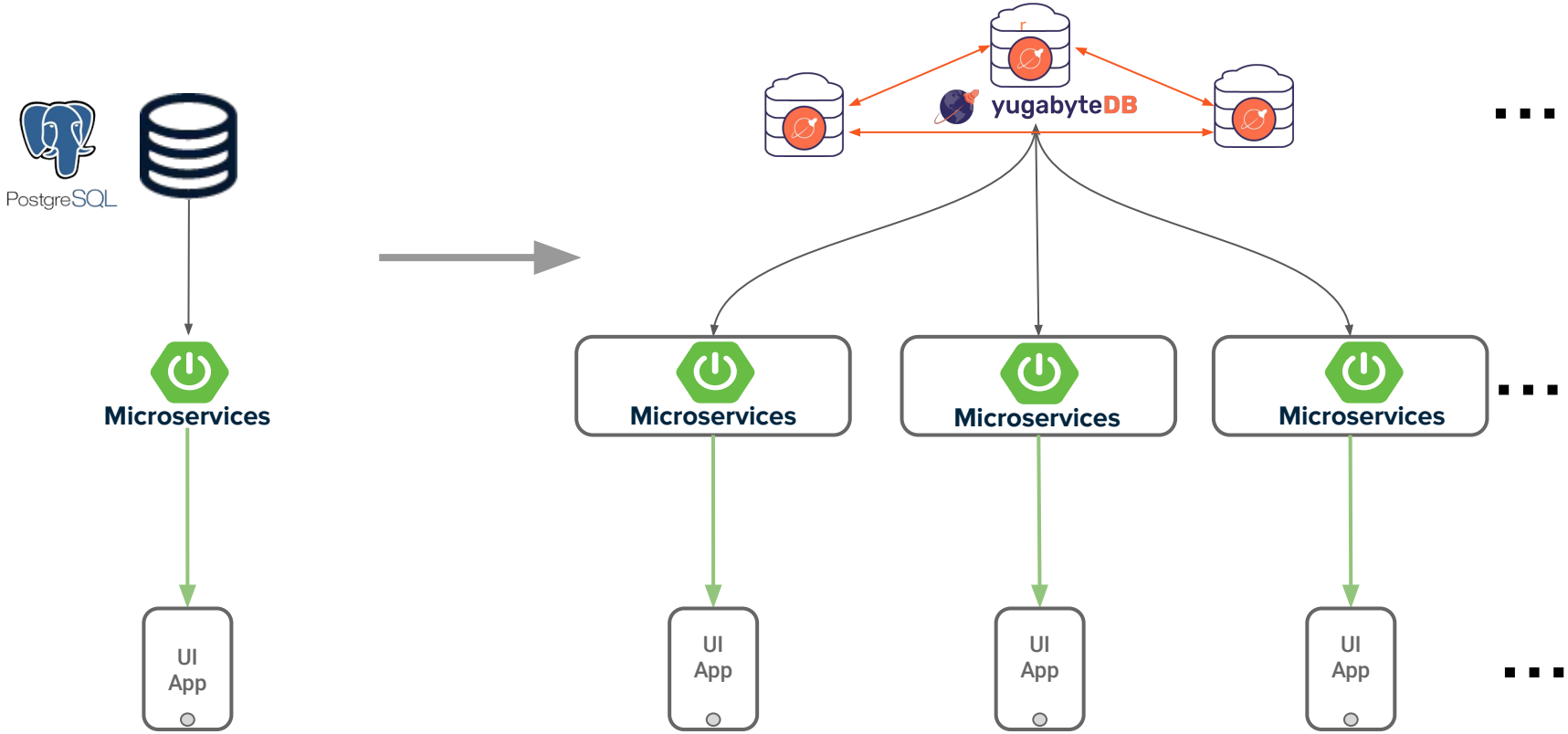
- Master node asynchronously replicates update to keep replicas in sync
- Needs maintaining of load balancers to avoid managing list of available servers by the clients

Scaling Writes Vertically

- In traditional RDBMS only single database master can take writes
- Involves using very heavy duty machines and works only up to a ceiling

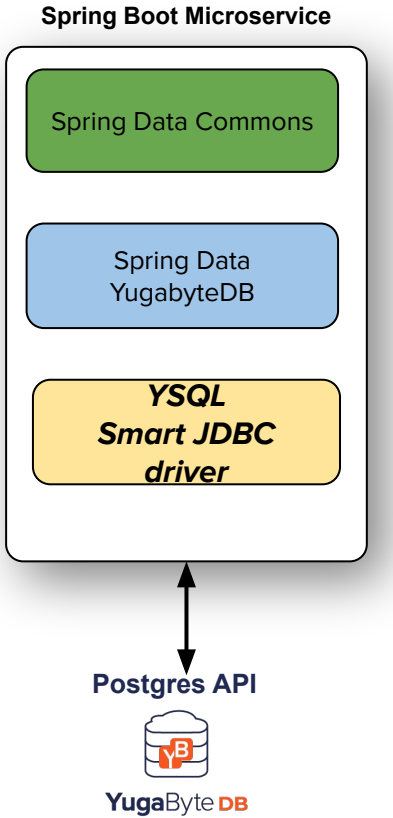
© 2021 - All Rights Reserved

Scaling out Spring microservices: Turbocharged with Yugabyte



© 2021 - All Rights Reserved

Leverage YugabyteDB with minimal changes



Cloud Native
Elasticity, Fault-Tolerance

High Performance
Low Latency Queries

Massive Scale
Millions of IOPS, TBs per Node

Deploy Anywhere
Multi-Cloud and Kubernetes

© 2021 - All Rights Reserved

Spring Data + YugabyteDB Query Support

Developers ♥ Spring Data & Spring Data ♥ YugaByte

Spring Data

YugabyteDB

Deals with Config & Boilerplate Code

Repository support for Simplified access patterns

SQL Queries

Secondary Indexes with Consistent Data

Distributed ACID Transactions

Cluster Aware JDBC Driver

Multi Cloud & Kubernetes

© 2021 - All Rights Reserved

Distributed SQL database built for cloud native applications

yugabyteDB

Distributed SQL database for transactional applications.
100% open source. Runs on any cloud.

PostgreSQL Compatibility	Resilience and High Availability
Horizontal Scalability	Geographic Distribution
ACID Transactions	Security

Admiral HRT Kroger CIPHERTRACE narvar Plume TURVO VOICELAND xignite

© 2021 - All Rights Reserved

Hands-on

Workshop

© 2021 - All Rights Reserved

Workshop Flow

- Deploy Spring Boot Pet Clinic application locally
  - Fork the source repo
  - Git clone to the local workstation/machine
  - Update the data source connectivity details
  - Build and test the app
- Deploy Spring Boot Pet Clinic application using MiniKube
  - Using Skaffold to deploy to Kubernetes
- Deploy Spring Boot Pet Clinic application using Gitpod
  - Bootstrapping in the cloud
  - Development workflow with all the bells and whistles fully integrated

© 2021 - All Rights Reserved

Additional Resources

- Spring Data YugabyteDB - https://blog.yugabyte.com/spring-data-yugabytedb-getting-started/
- Spring Guides - https://spring.io/guides
- Spring Petclinic project site - https://projects.spring.io/spring-petclinic/

Stay tuned to the YugabyteDB community Slack for more Builder Series workshops coming soon.

Get your hands on the JDBC Smart Driver! - https://docs.yugabyte.com/latest/integrations/smart-driver/

- Cluster-awareness eliminates the need for an external load balancer
- Topology-awareness helps improve performance and availability through cluster awareness

© 2021 - All Rights Reserved

Time for

Q&A

© 2021 - All Rights Reserved

yugabyteDB

Thank You

Join us on Slack: yugabyte.com/slack

Star us on Github: github.com/yugabyte/yugabyte-db