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Vitess: Stateful Storage for K8s

Toliver Jue

Engineer, PlanetScale



CLOUD NATIVE
COMPUTING FOUNDATION

@vitessio

What is Vitess?



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- Sharding middleware for MySQL
- Massively scalable
- HA - Five-9's Availability
- Cloud-native



Vitess stats

Started 2010

8,000+ stars

16,000+ commits

Marquee adopters

100+ contributors

800+ Slack members

1000+ forks

Adoption



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jack @jack · Dec 8

Top Charts

Free Apps

Paid Apps



1 Cash App

Send, Spend Money,
Buy Bitcoin

OPEN



2 YouTube: Watch,
Listen, Stream

Videos, Music and Live Streams

OPEN



3 BURGER KING® App

Coupons & Mobile Order

GET



4 Instagram

Photo & Video



326

509

3.2K



Key adopters



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JD.COM

3000+ Databases, 18000+ Tablets



25% Migrated to Vitess



Square

Cash App fully runs on Vitess



Pinterest

All of advertising campaign management

The Community



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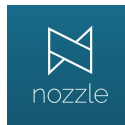
Square



HubSpot



GitHub



Quiz of Kings



AXON

BetterCloud



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Stateful Storage on Kubernetes ⇒ Vitess



Vitess



Stateful Workloads on Kubernetes?



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Kelsey Hightower ✓

@kelseyhightower

Follow



I'm always going to recommend people exercise extreme caution when running stateful workloads on Kubernetes. Most people who are asking "can I run stateful workloads on Kubernetes" don't have much experience with Kubernetes and often times the workload they are asking about.

12:10 AM - 24 Mar 2019

286 Retweets 915 Likes



31



286



915

ONE DOES NOT SIMPLY

MOVE MYSQL TO KUBERNETES

Vitess: History



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- Started 2010
- Solved YouTube's scaling problems
- Designed for Borg → Designed for K8s

Production Workloads



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Oldest, since 2016

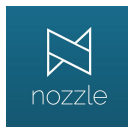


Hundreds of keyspaces



JD.COM

3000+ Databases, 18000+ Tablets
64-shards (on largest DB)



Migrates between clouds
MySQL 8.0

MYSQL MERELY ADOPTED THE CLOUD

VITESS WAS BORN IN IT

Architecture



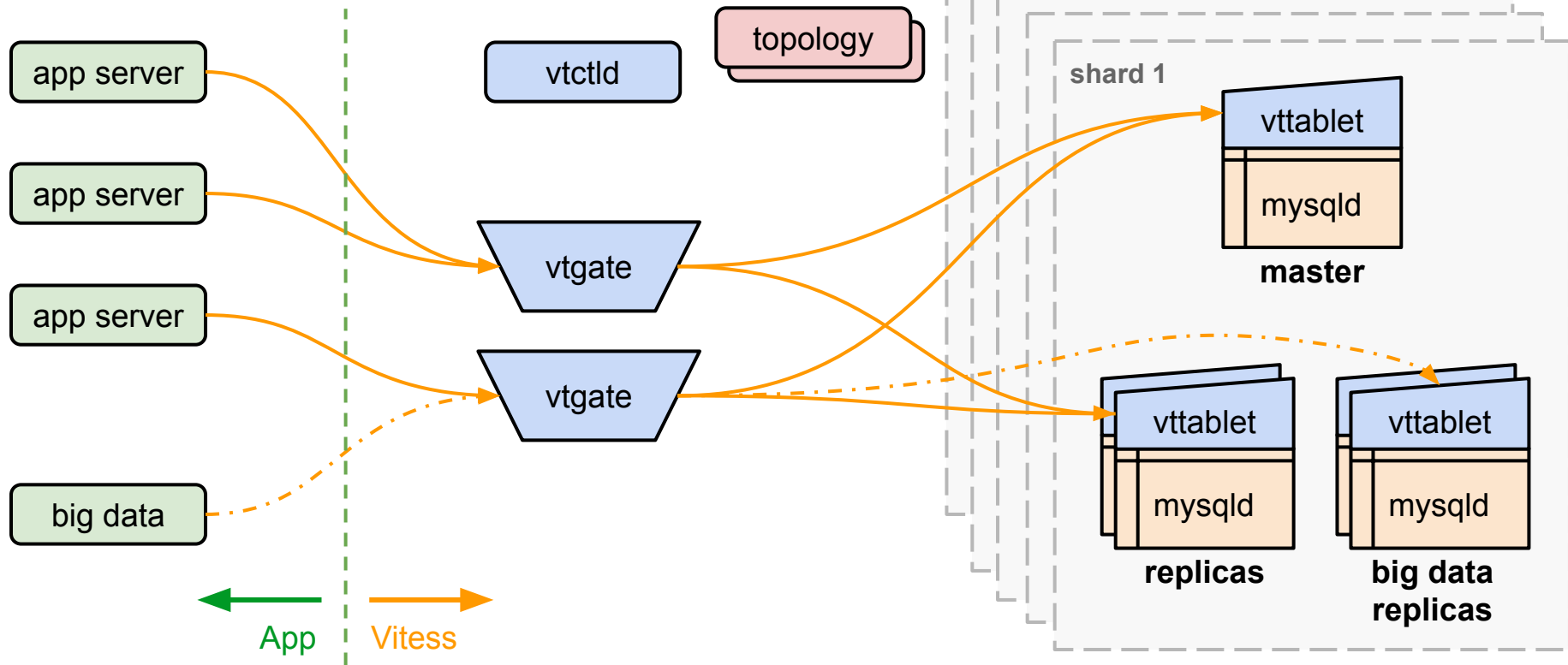
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Small Workloads



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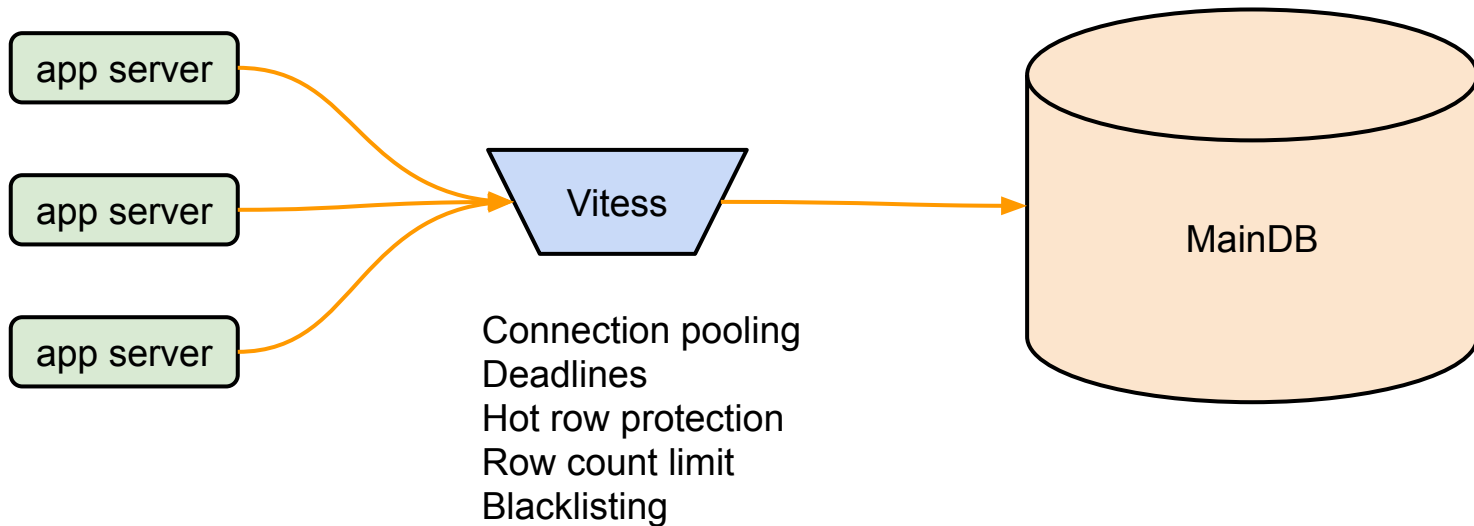


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Small Workloads



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Scalability Guardrails

- Connection pooling
- Deadlines
- Hot row protection
- Row count limits
- Blacklisting

Growing Workloads



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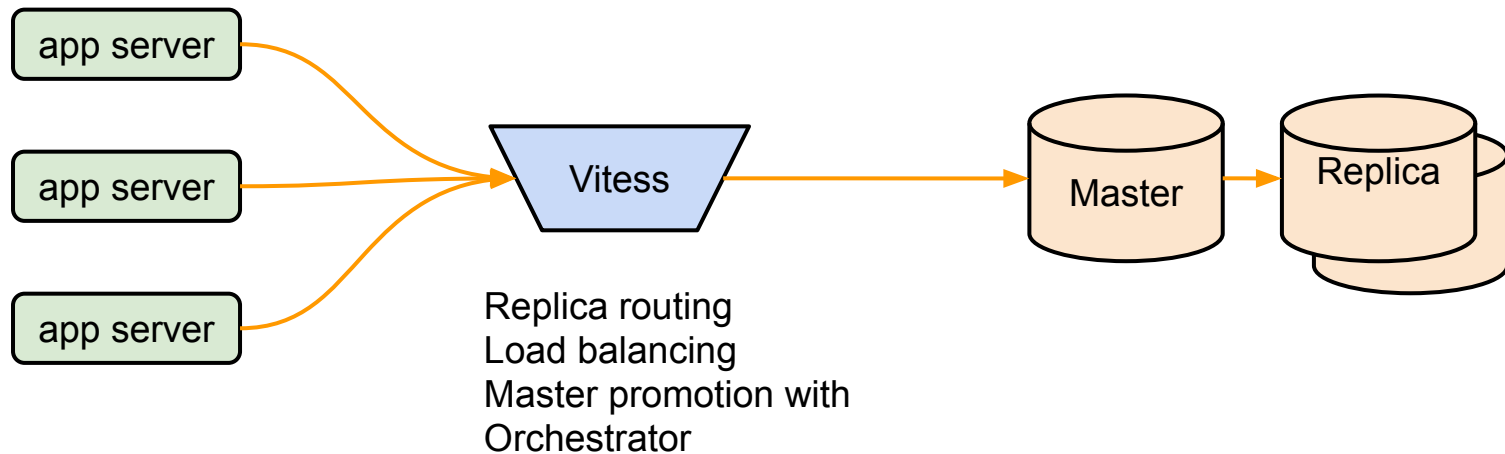


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Growing Workloads



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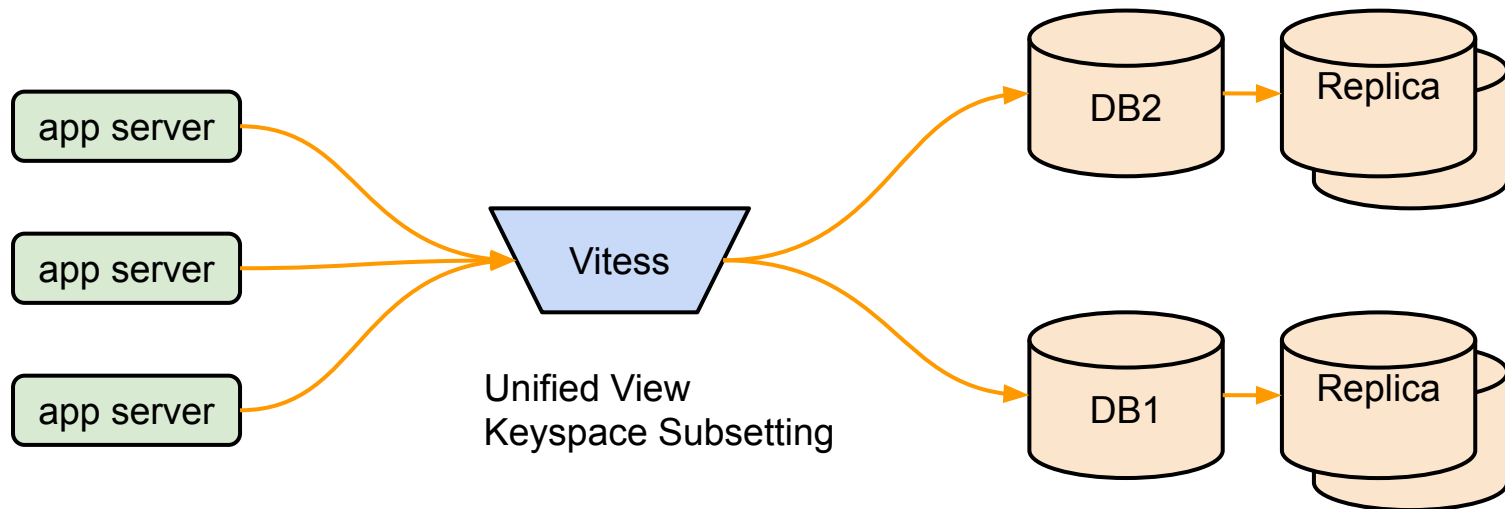


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Growing Workloads



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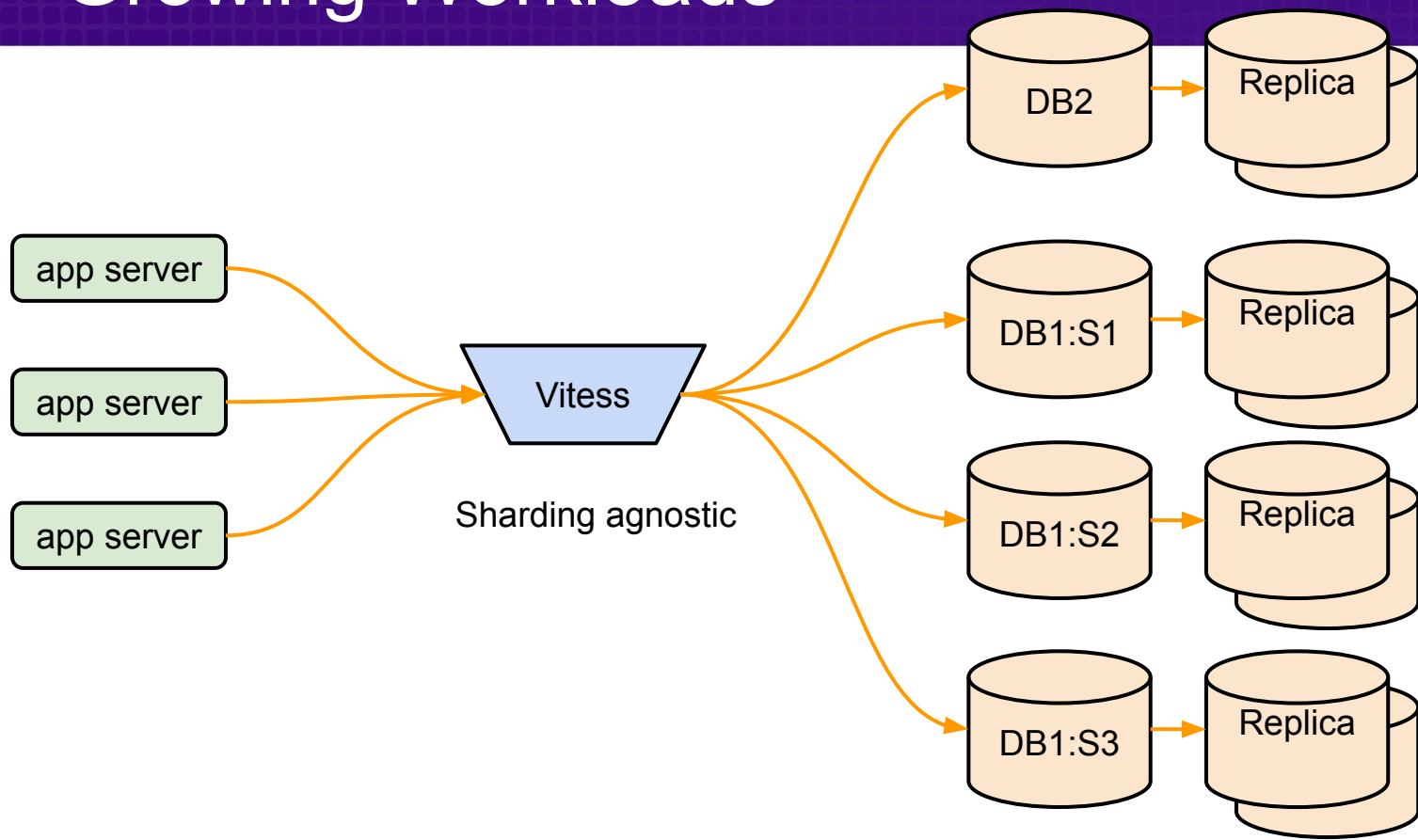


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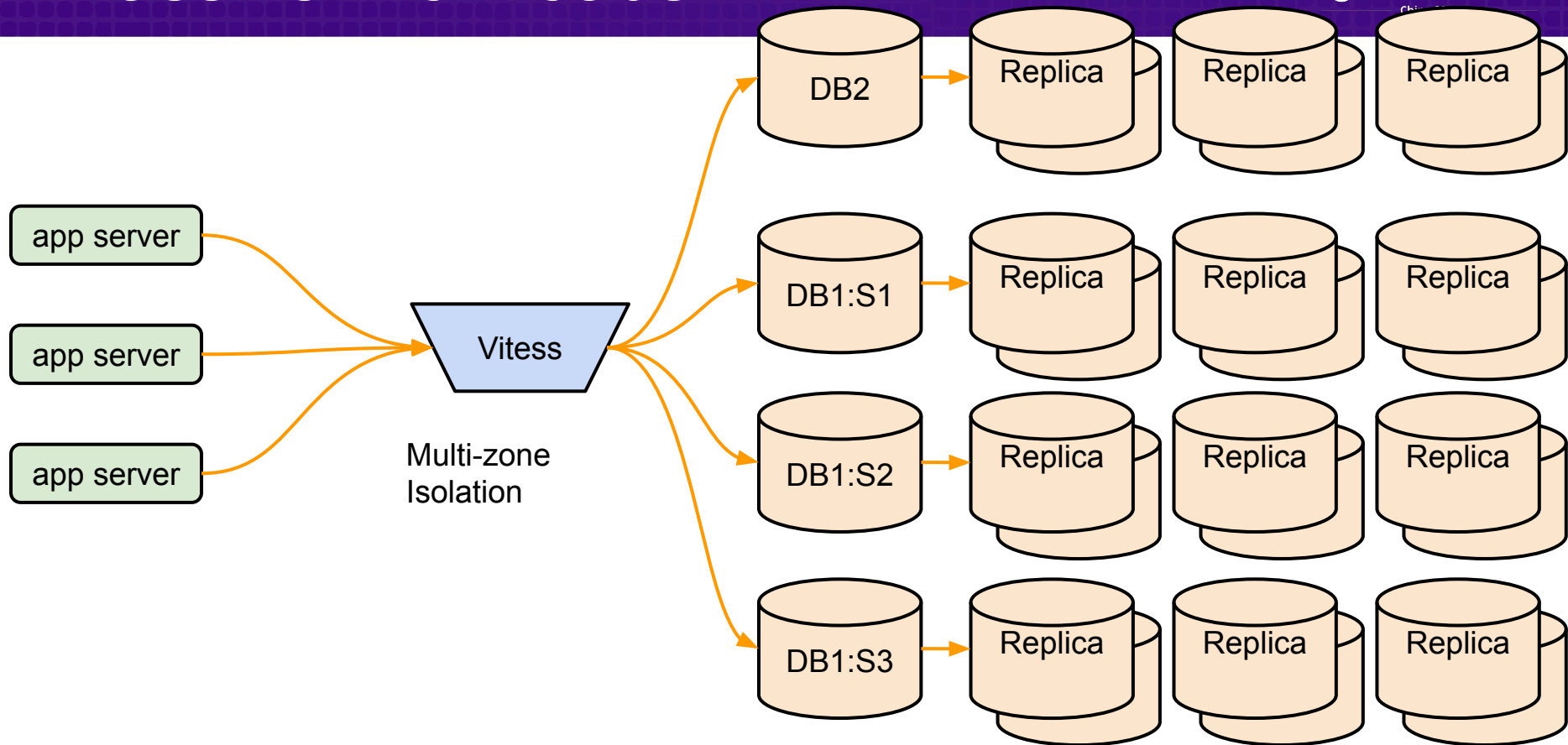


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Massive Workloads



Demo



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Marketplace schema



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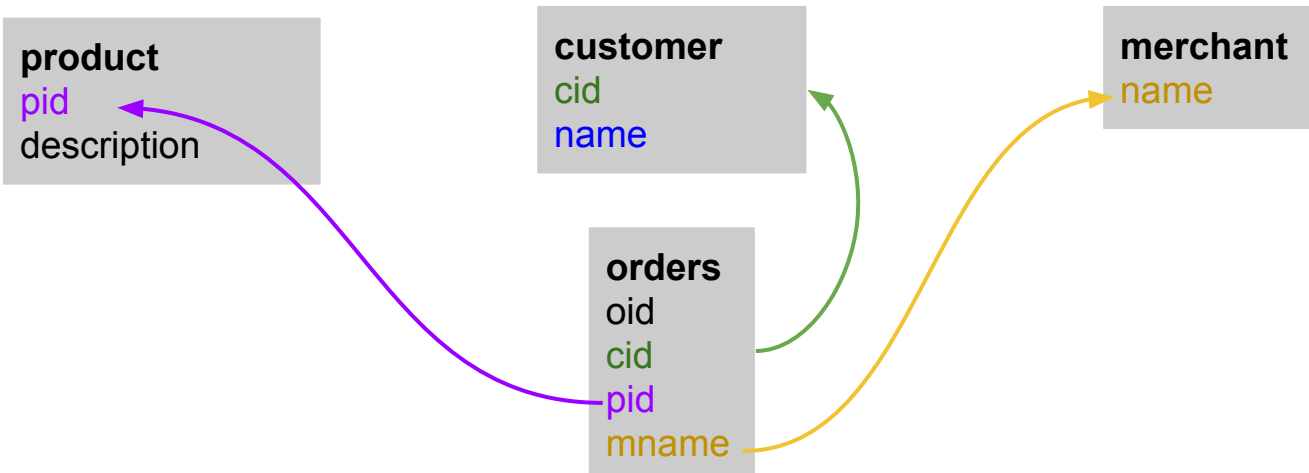


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Sharded



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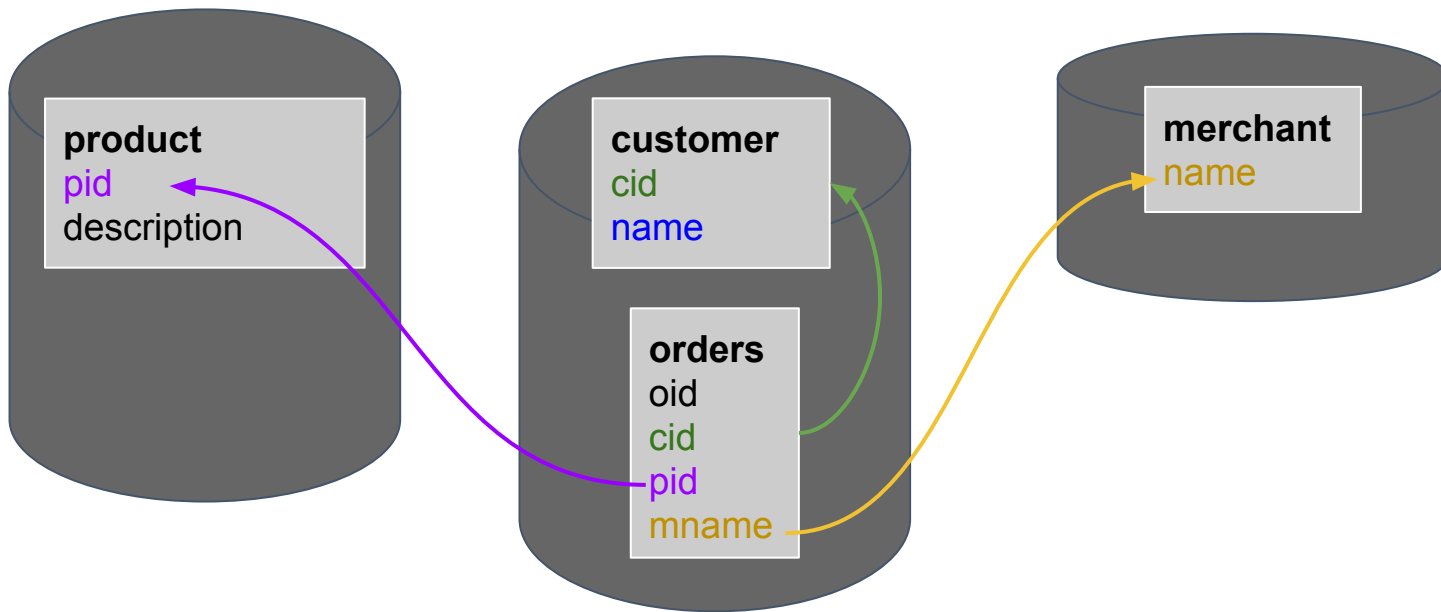


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VReplication



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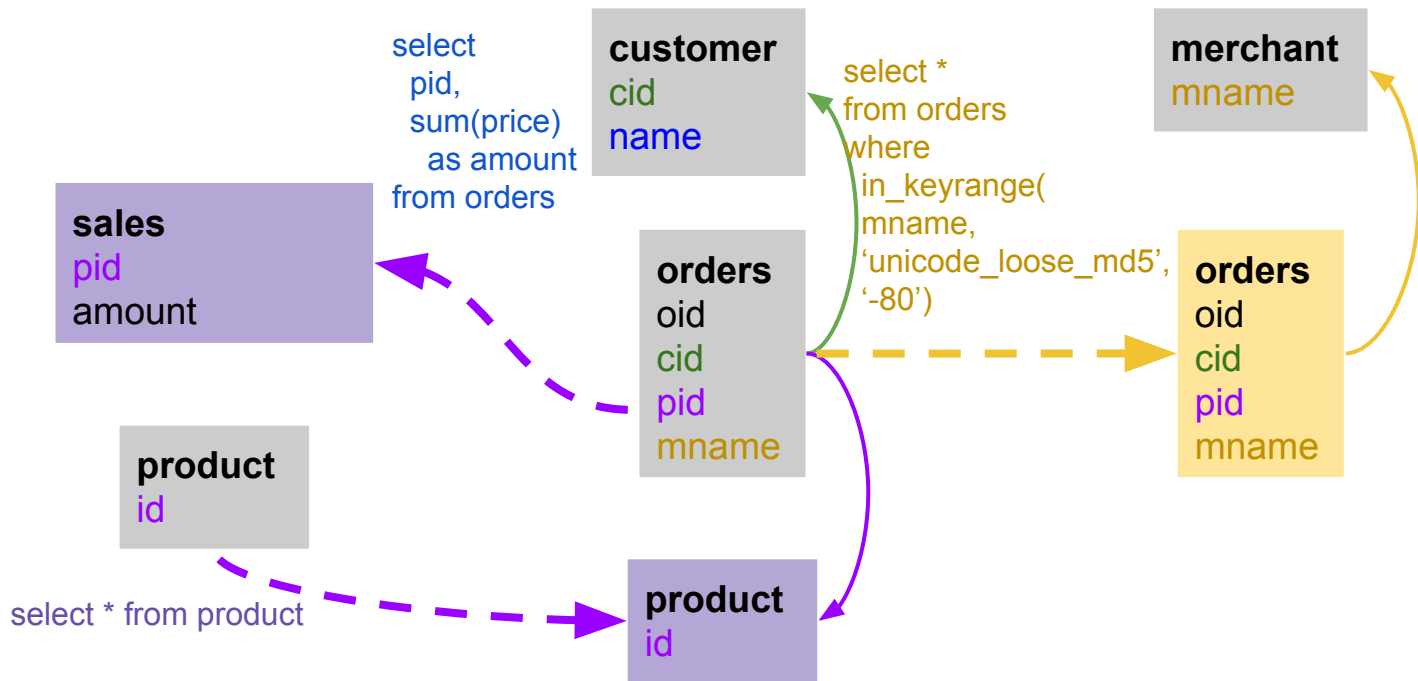


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Use cases



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- Materialized Views
- Real-time Rollups
- Resharding
- Backfilling of lookup vindexes
- Schema deployment
- Data migration
- Change notification

What's next?



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- Sign into [slack](#) channel at [vitess.io](#)
- Join WeChat group: (FIXME link/qr code)
- Bring up a cluster on laptop or kubernetes
 - <https://vitess.io/docs/tutorials/>
- Read code
 - <https://github.com/vitessio/vitess>
- [Square Cash blog posts on sharding with Vitess](#)
-  @toliver
-  @vitessio @planetscaledata