Multi-Region AWS Aurora

A comparison of AWS Aurora & Continuent Tungsten for building a geo-scale, multi-region MySQL cloud back-end

By Matthew Lang, Director of Professional Services
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Welcome!

“Continuent, the MySQL Availability Company”

continuent
Introduction

Continuent, the MySQL Availability Company, provides solutions for continuous operations enabling business-critical MySQL applications to run on a global scale with zero downtime.

Agenda

This webinar will have three parts, and is expected to last no longer than 30 minutes:

- Overview of Amazon Aurora cross region
- Common challenges when using Amazon Aurora
- How can multi region MySQL deployments be improved?

Q & A

Please note this live webinar is being recorded.
Webinar Goals

We will explore how to deploy Geo-Scale MySQL* with the following design criteria:

- Local rapid-failover, automated high availability
- Geographically distributed, low-latency data with a single consolidated view
- Fast local response times for read traffic
- Ability to deploy MySQL masters in multiple regions
- No changes to application code
- Complex schema changes while keeping applications available
- Avoid provider lock-in

* MySQL is understood in a broad context, including MySQL, MariaDB, Percona Server, RDS MySQL, RDS Aurora and Google Cloud SQL
Aurora Multi-Region
Aurora Key Benefits

- Not MySQL, but MySQL 5.6/5.7-compatible
- Read Replicas
- Distributed file system
- Cross-Region Replication within AWS
- Promote remote read replica to standalone DB cluster
- Fast, in specific scenarios
Aurora Cross Region Replica

Requirements

- Source Aurora cluster
- Enable binary logging on the source Aurora cluster (quite a few settings to change)
- A VPC in the target cluster
- Database Subnet within the VPC (be sure you’re familiar with VPC’s and subnets, a lot of issues are caused here)
- Subnet should be public-accessible if machines outside of the network will access the Aurora instance!
Limitations using Aurora

- Master is single region only
- Failover disconnects application
- Long failover times (> 30 seconds)
- Innodb engine only
- Application must be read/write aware
- All data stays in AWS
- Database maintenance and schema changes will cause application outages
- Proprietary and not open source
How Do We Make It Better?
Review: Webinar Goals

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Tungsten Clustering

Continuous MySQL Operations
Zero Downtime MySQL
Multimaster MySQL
Geo-Scale MySQL
Hybrid-Cloud and Multi-Cloud MySQL
Intelligent MySQL Proxy
Most Advanced MySQL Replication
Full MySQL Support, No Application Changes
Tungsten MultiMaster Clustering

Scale to multiple Cloud Regions or datacenters
Platform-agnostic means you can span vendors and create hybrid topologies using any combination of cloud, VM and/or bare-metal servers
Active/Passive or Active/Active
Control all clusters from any node
Move the write primary from site to site with a single command when in Active/Passive mode

Active/Active Composite MultiMaster Cluster
Tungsten Composite Clustering

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Active/Passive
Control all clusters from any node
Move the write primary from site to site with a
single command when in Active/Passive mode

Active/Passive Composite Cluster
Zero Downtime Maintenance

Slave upgrade
- Shun slave
- Upgrade MySQL
- Return node to cluster
- Discard and re-provision on failure

Slave upgrade
- Repeat for remaining slave(s)

Switch
- Switch master to promote an upgraded slave

Master upgrade
- Upgrade old master
- Maintenance is now done!
## Continuent Tungsten Key Benefits as compared to Aurora

<table>
<thead>
<tr>
<th>Aurora</th>
<th>Continuent Tungsten</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not MySQL, but MySQL 5.6/5.7-compatible</td>
<td>Supports all MySQL versions (including Percona Server and MariaDB)</td>
</tr>
<tr>
<td>Read Replicas</td>
<td>Replicas available for auto read/write split, fast failover</td>
</tr>
<tr>
<td>Distributed back-end file system</td>
<td>Local filesystem, full access to local databases</td>
</tr>
<tr>
<td>Cross-Region Replication within AWS</td>
<td>Replicate to any cloud, on prem, or combination with multiple masters</td>
</tr>
<tr>
<td>Auto maintenance and interruptions</td>
<td>Zero downtime maintenance</td>
</tr>
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</table>
Tungsten Dashboard View

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Role</th>
<th>State</th>
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<th>Type</th>
<th>Connections</th>
<th>Coordinator</th>
<th>Actions</th>
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<tr>
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<td>Slave</td>
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</table>
About Continuent
Continuent, the MySQL Availability Company, provides solutions for continuous operations enabling business-critical MySQL applications to run on a global scale with zero downtime.

Continuent provides geo-distributed MySQL high availability on-premises, in hybrid-cloud, and in multi-cloud environments.

Continuent customers are leading SaaS, e-commerce, financial services, gaming and telco companies who rely on MySQL and Continuent to cost-effectively safeguard billions of dollars annual revenue.

Continuent’s database experts offer the industry’s best 24/7 MySQL support services to ensure continuous client operations.
The core Continuent Team has been building data service solutions since 2004.

In 2014 VMware acquired ‘old’ Continuent, the best-of-breed DBaaS company, to offer their own DBaaS for vCloud Air.

‘New’, independent Continuent was spun off from VMware in 2016 after VMware changed its cloud strategy.

In 2019 Continuent is ready to launch an all-new Tungsten Cloud, extending and expanding the functionality of Continuent Clustering in to the Cloud.
Proven Solutions

Our solutions handle billions of transactions per day and support businesses with billions of dollars in combined revenue:
Continuent Tungsten Solutions

**Tungsten Clustering**
Tungsten Clustering allows enterprises running business-critical MySQL database applications to cost-effectively achieve continuous operations with commercial-grade high availability (HA), geographically redundant disaster recovery (DR) and global scaling.

**Tungsten Replicator**
Tungsten Replicator supports real-time data replication from MySQL into AWS RedShift, Cassandra, ClickHouse, Elasticsearch, HDFS, Kafka and Vertica to derive insight from analytics for better business decisions and increase revenue.

* MySQL understood in a broad context, including MySQL, MariaDB, Percona Server, RDS MySQL, RDS Aurora and Google Cloud SQL
Tungsten Replicator, the core underlying technology for Continuent Tungsten, supports data replication from MySQL sources to AWS RedShift, Cassandra, ClickHouse, Elasticsearch, HDFS, Kafka and Vertica.

The same, proven replication mechanism supports data replication from clustered MySQL databases to high-performance NoSQL and data analytics engines.

Derive insight from big data for better business decisions.

Create new revenue opportunities with already existing data.
Tungsten Key Benefits

Continuous MySQL Operations
- MySQL High Availability and Disaster Recovery solution, which provides redundancy within and across data centers
- Immediate failover for maximum availability and data protection of business-critical MySQL applications
- Reduce MySQL recovery time from hours or days to mere seconds
- Dashboard provides graphical view and management of all globally distributed MySQL clusters

Zero Downtime MySQL
- Site-level and cross-site failover ensures application availability
- Upgrade hardware, software and data without taking applications offline
- MySQL compatibility means seamless migration of your data and applications
Tungsten Key Benefits

Multimaster MySQL
- Multiple geographically-distributed write masters can provide higher availability due to lack of failover between sites
- Lower-latency response times for reads for co-located application servers

Geo-Scale MySQL
- Load-balance MySQL read operations across multiple slaves, locally and globally
- Geo-distributed MySQL clusters bring data close to your application users for faster response times
- Easily add more MySQL clusters as needed for unlimited scaling, both locally or across the globe

Hybrid-Cloud and Multi-Cloud MySQL
- Deploy in the cloud, VM and bare metal environments
- Mix-and-match on-premises, private and public clouds (incl. Amazon AWS, Google Cloud and Microsoft Azure)
- Easy, seamless migration from cloud to cloud to avoid vendor lock-in in any specific cloud provider
- Withstand node, data center, zone or region failures or outages
Tungsten Key Benefits

Intelligent MySQL Proxy
- Provides intelligent traffic routing to a valid MySQL master, locally and globally
- Scale read queries via query inspection and other methods
- Application and active users do not disconnect during MySQL master failover events

Most Advanced MySQL Replication
- Filter and transform your data in-flight
- No more ETL, get real-time data feeds into your analytics
- Replicate directly into popular analytic repositories: AWS RedShift, Cassandra, ClickHouse, Elasticsearch, HDFS, Kafka and Vertica
- Unlimited real-time transactional data transfer to eliminate escalating replication cost of ETL-based alternatives
WHY: Significant Benefits

Geo-scale, Availability, Disaster Recovery

Low-latency, geo-distributed data access with a single consolidated providing fast response times for read traffic and local, rapid-failover automated high availability.

Simple administration, system visibility and stability also help create high return on investment.
Tungsten Key Benefits

Cost Savings
- Use the free open-source MySQL for your business-critical needs
- Optimize costs by selecting the most cost-effective cloud environment(s) at any given time
- Eliminate downtime risks and associated cost, also during maintenance (zero downtime maintenance operations)
- Reduce DBA time spent on admin and recovery operations, lowering your costs while increasing reliability.

Full MySQL Support, No Application Changes
- Deploy and Configure MySQL clusters in minutes
- Not “MySQL-compatible” solution. Use any of your off-the-shelf MySQL, MariaDB and Percona Server versions
- Support for all modern MySQL (5.x through 8.x) and MariaDB (5.x and 10.x) versions and features
- SSL support for all in-flight traffic
- Native MySQL support means easy and complete migration of your data and applications
## Tungsten Key Benefits

*Last, but not least...*

**Industry-Best 24/7 MySQL Customer Service**

- Highly Qualified 24/7 support. All support team members have 15 or more years of MySQL DBA and Site Reliability Experience.
- 24/7 support comes with a 1-hour SLA, with response times for urgent requests averaging less than 5 minutes.
- MySQL uptime measured in months or years.
Recap
With Continuent, you get…

Revenue protection
Revenue upside
Real-time data
Lower TCO
Stellar 24/7 customer support
Next Steps

Sign up for a private demo for your team, setup a POC, email us at sales@continuent.com

Learn more at your own pace

- Training and webinar library at www.continuent.com/videos/
- White papers at www.continuent.com/white-papers/
- Read the documentation at http://docs.continuent.com/
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