# Almost Perfect Service Discovery and Failover with ProxySQL and Orchestrator

*by* Jean-François Gagné
*and* Art van Scheppingen

Presented at Percona Live Online, May 2021

# Almost Perfect Service Discovery and Failover with ProxySQL and Orchestrator

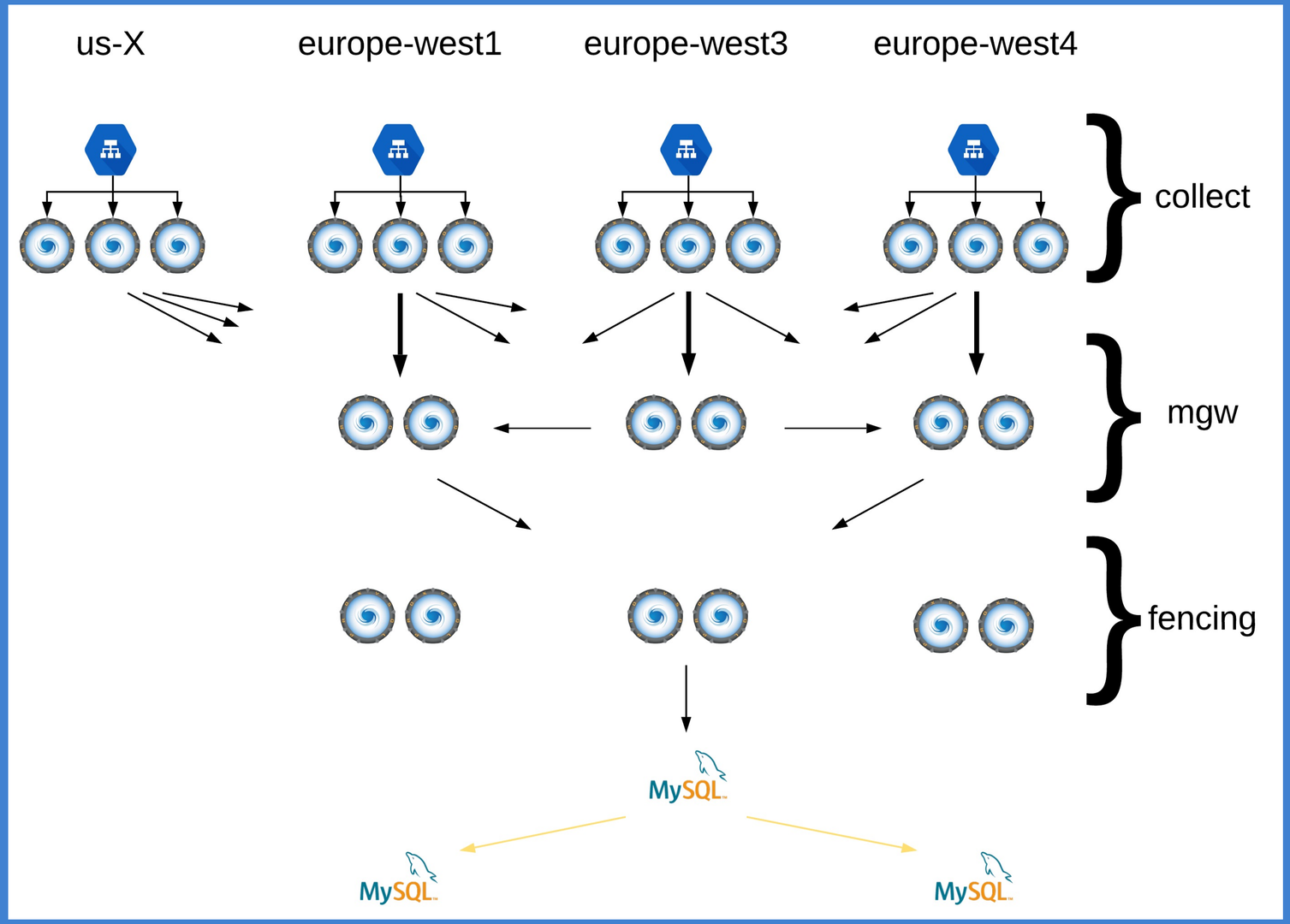
**Jean-François Gagné**

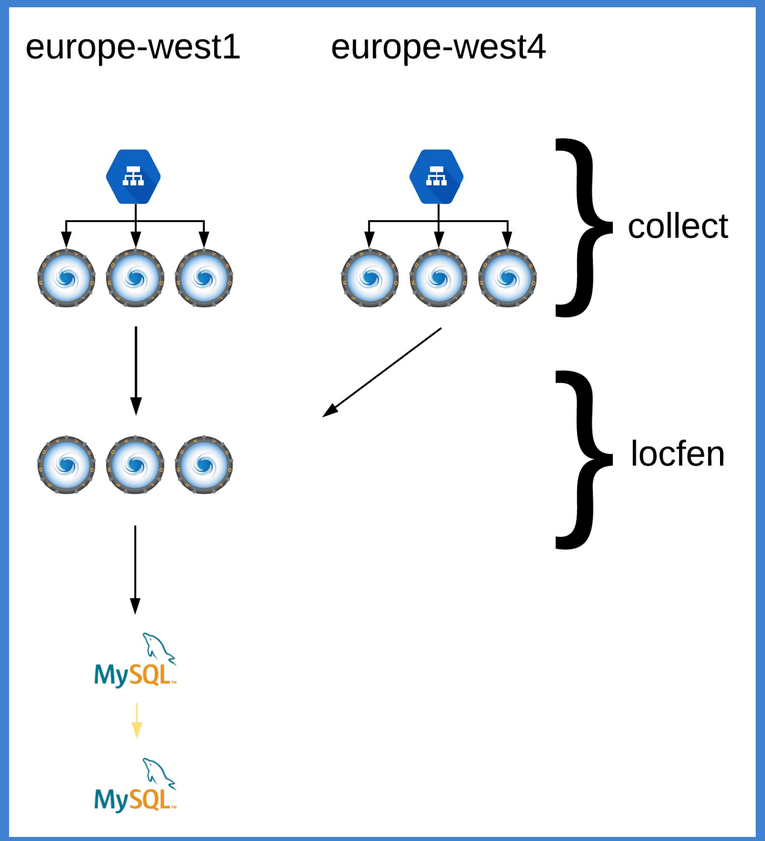
***System and MySQL Expert at HubSpot***

***jgagne AT hubspot DOT com / @jfg956***

# MySQL Service Discovery at MessageBird

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)



# Summary of part #1

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

- MySQL Primary High Availability
- Failover to a Replica War Story
- MySQL at MessageBird (Percona Server)
- MySQL Service Discovery at MessageBird (ProxySQL)
- Orchestrator integration and the Failover Process

# MySQL Primary High Availability [1 of 4]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Failing-over the primary to a replica is my favorite high availability method

- But it is not as easy as it sounds, and it is hard to automate well
- An example of complete failover solution in production: https://github.blog/2018-06-20-mysql-high-availability-at-github/

The five considerations for primary high availability:
(https://jfg-mysql.blogspot.com/2019/02/mysql-master-high-availability-and-failover-more-thoughts.html)

- Plan how you are doing primary high availability
- Decide when you apply your plan (Failure Detection – *FD*)
- Tell the application about the primary change (Service Discovery – *SD*)
- Protect against the limit of FD and SD for avoiding split-brains (Fencing)
- Fix your data if something goes wrong

# MySQL Primary High Availability [2 of 4]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Failure detection (*FD*) is the 1st part (and 1st challenge) of failing-over

- It is a very hard problem: partial failure, unreliable network, partitions, …
- It is impossible to be 100% sure of a failure, and confidence needs time
  → quick FD is unreliable, relatively reliable FD implies longer downtime

➢ Quick FD for short downtime generates false positive

Repointing is the 2nd part of failing-over to a replica:

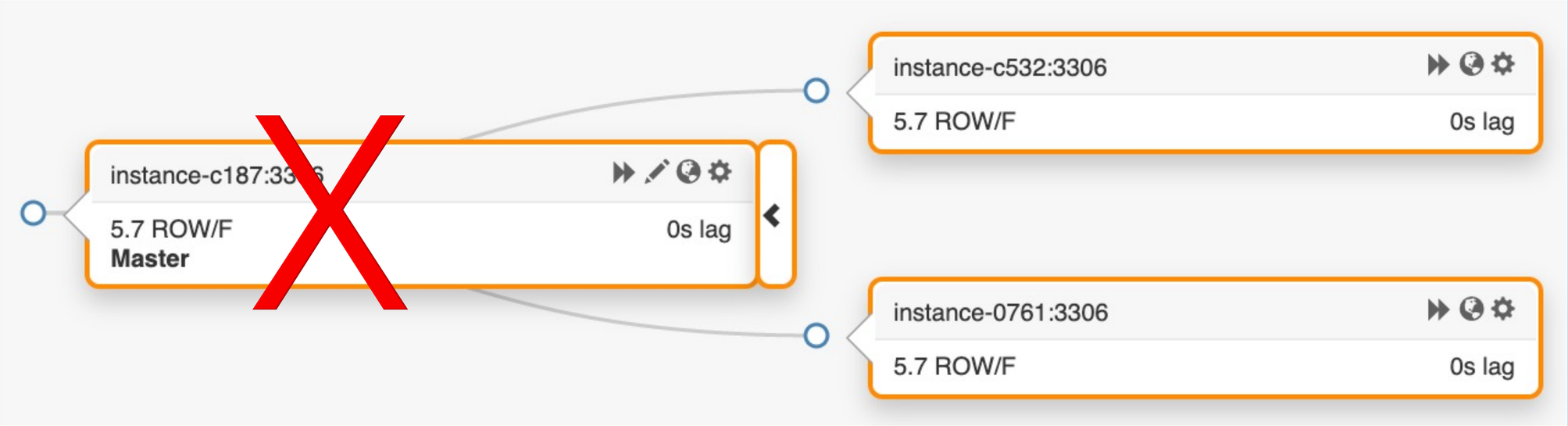
- Relatively easy with the right tools: GTID, Pseudo-GTID, Binlog Servers, …
- Complexity grows with the number of direct replicas of the primary
- Some software for repointing:
  - Orchestrator, Ripple Binlog Server,
    Replication Manager, MHA, Cluster Control, MaxScale

# MySQL Primary High Availability [3 of 4]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

What do I mean by repointing:

- In below configuration and when the primary fails,
  once one of the replica as been chosen as the new primary
  the other replica needs to be re-sourced (re-slaved) to the new primary



# MySQL Primary High Availability [4 of 4]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Service Discovery (*SD*) is the 3rd part (and 2nd challenge) of failover:

- If centralized → SPOF; if distributed → impossible to update atomically
- SD will either introduce a bottleneck (including performance limits)
- Or it will be unreliable in some way (pointing to the wrong primary)
- Some ways to implement Service Discovery: DNS, ViP, Proxy, Zookeeper, …
  http://code.openark.org/blog/mysql/mysql-master-discovery-methods-part-1-dns

➢ Unreliable FD and unreliable SD is a recipe for split-brains !

Protecting against split-brains (Fencing): Adv. Subject – not many solutions
(proxies and semi-synchronous replication might help)

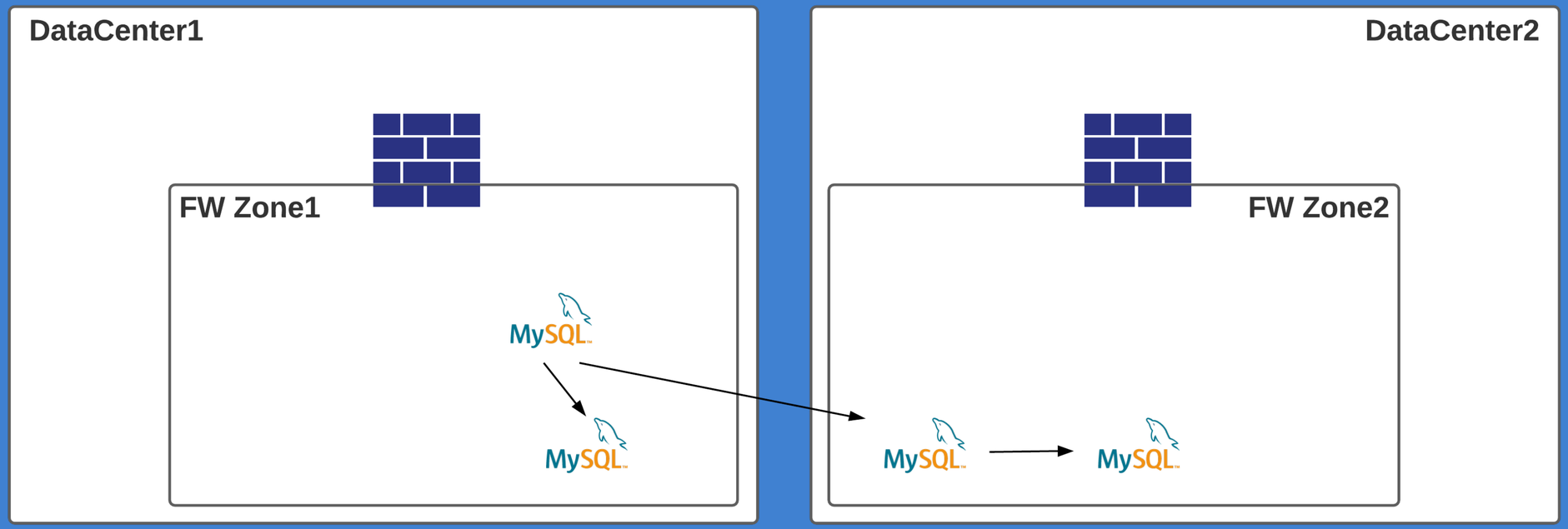
Fixing your data in case of a split-brain: only you can know how to do this !
(tip on this in the war story)

# Failover War Story [1 of 6]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Some infrastructure context:

- Service Discovery is DNS (and failure detector is Orchestrator)
- The databases are behind a firewall in two data centers

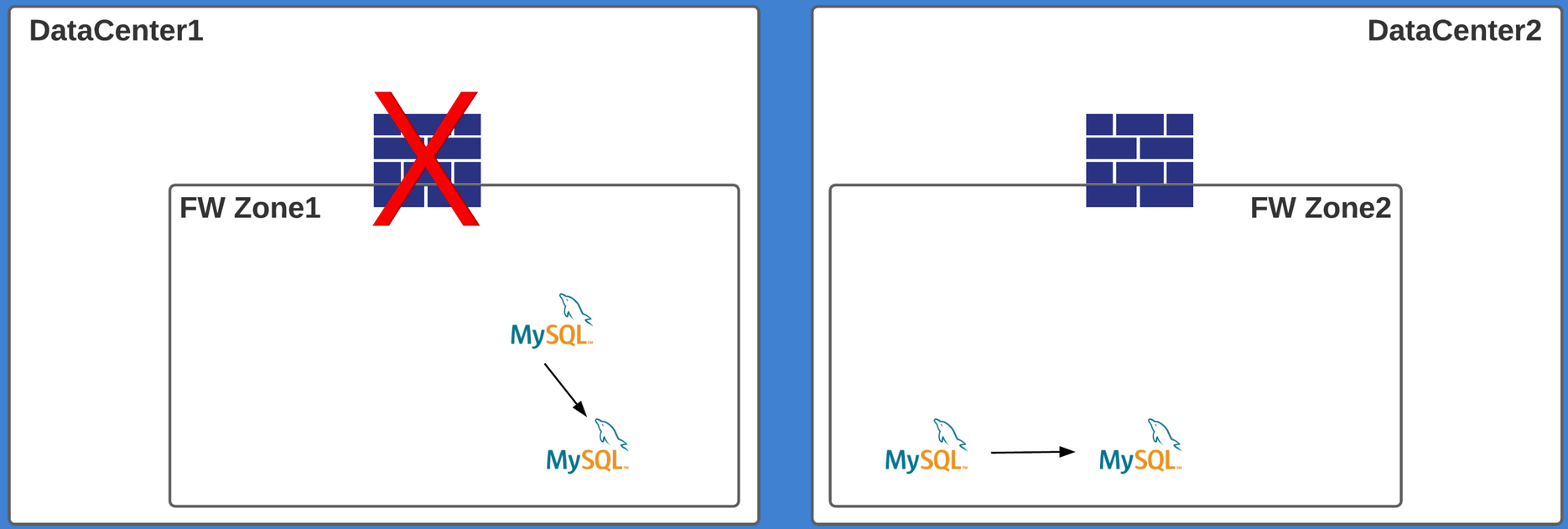


# Failover War Story [1 of 6]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Some infrastructure context:

- Service Discovery is DNS (and failure detector is Orchestrator)
- The databases are behind a firewall in two data centers
- And we have a failure of the firewall in the zone of the primary

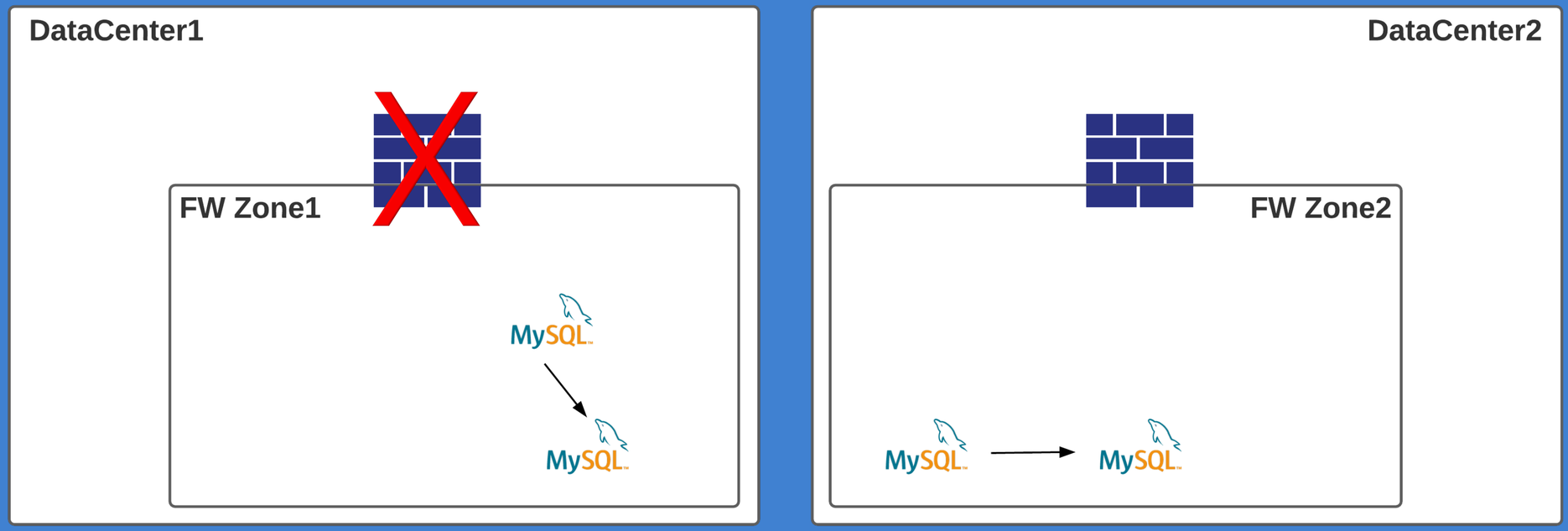


# Failover War Story [2 of 6]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Things went as planned: failed-over from Zone1 to Zone2

- New primary in zone 2: stop replication, set it read-write, update DNS, …
- Everything was ok…

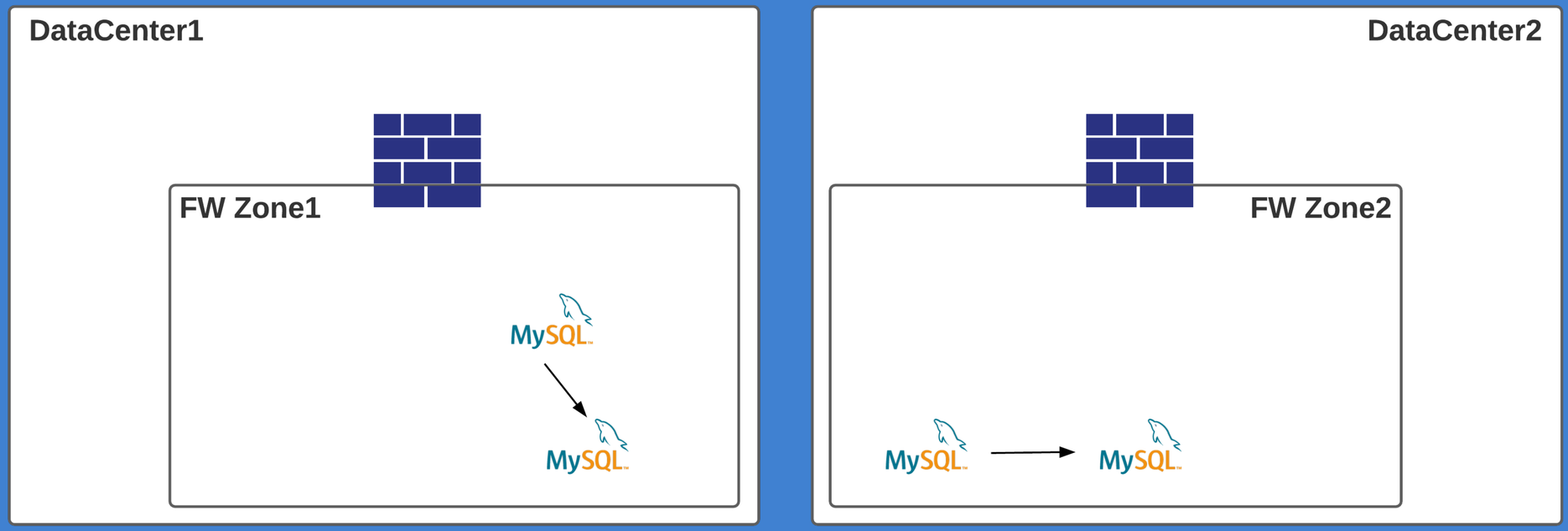


# Failover War Story [2 of 6]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Things went as planned: failed-over from Zone1 to Zone2

- New primary in zone 2: stop replication, set it read-write, update DNS, …
- Everything was ok… until the firewall came back up

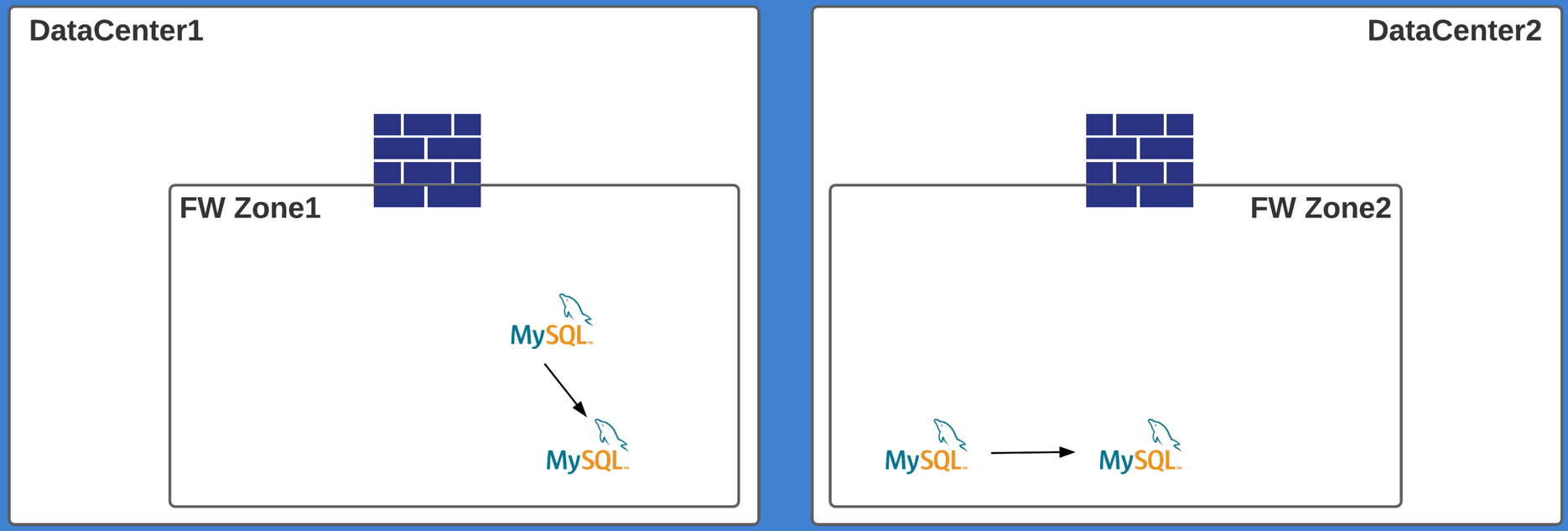


# Failover War Story [3 of 6]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Once the firewall came back up, no detectable problems

- But some intuition made me checked the binary logs of the old primary
- And I found new transactions with timestamp after the firewall recovery (and obviously this is after the failover to zone 2)

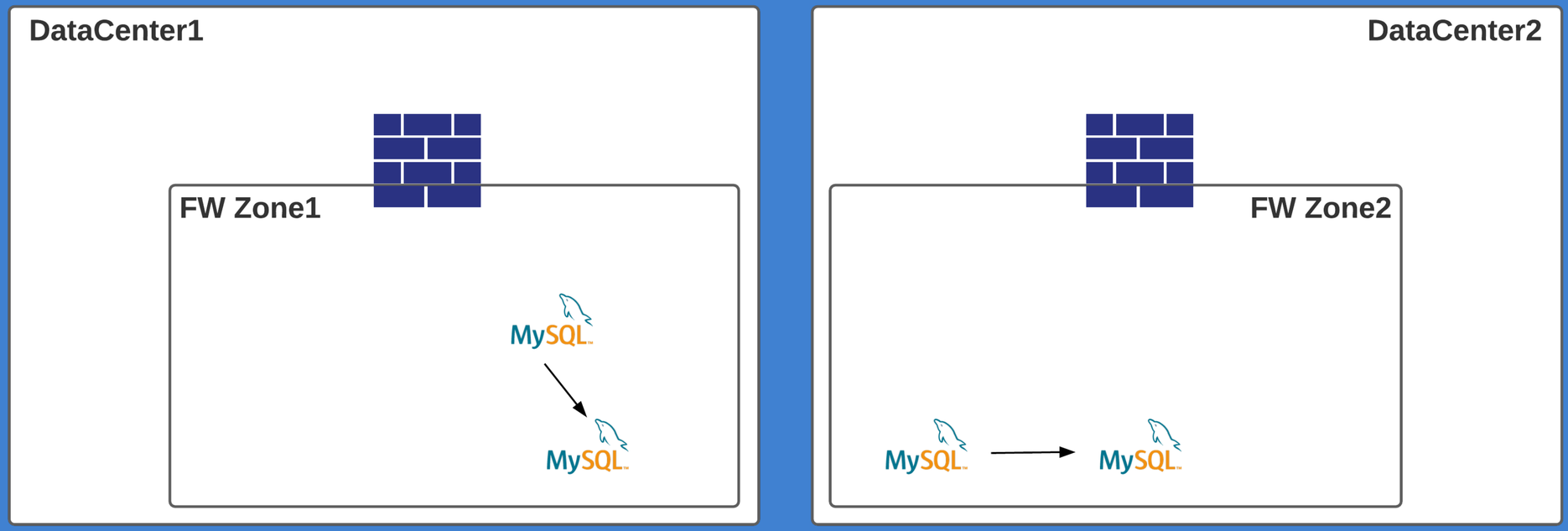


# Failover War Story [4 of 6]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

These new transactions are problematic:

- They are in the databases in zone 1, but not in zone 2
- They share common auto-increments with data in zone 2
- Luckily, there are only a few transactions, so easy to fix, but what happened ?

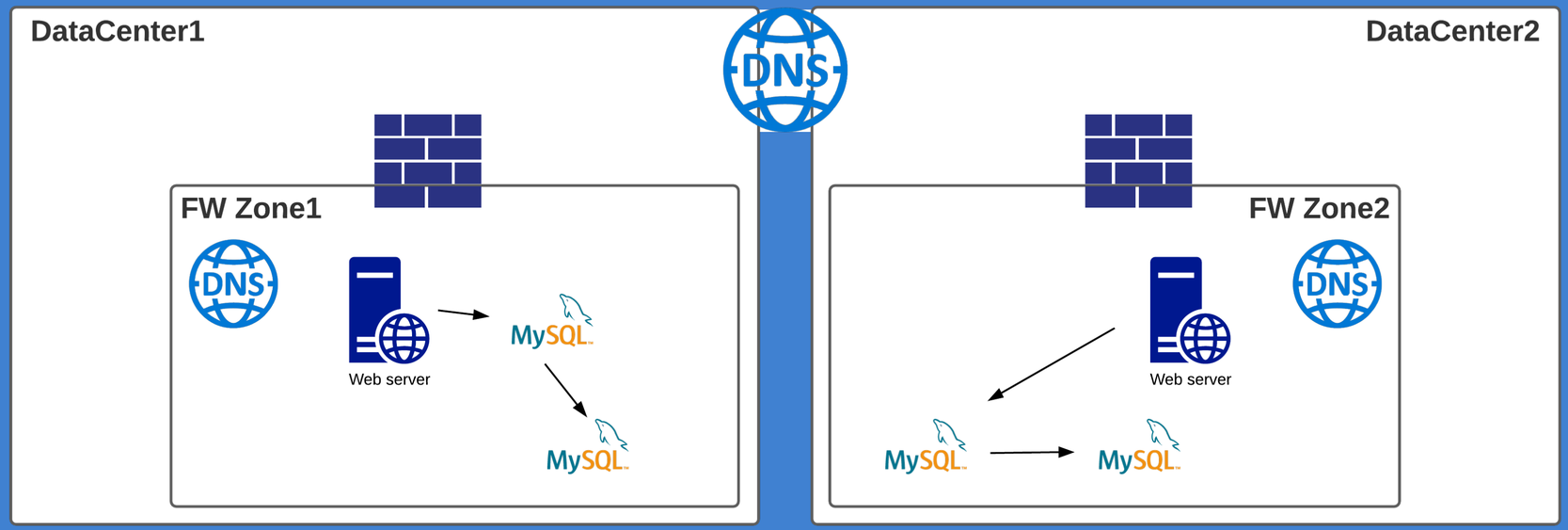


# Failover War Story [5 of 6]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

The infrastructure is a little more complicated than initially presented:

- There are web servers and local DNS behind the firewalls (fw)
- The DNS update of the failover did not reach zone 1 (because of the fw failure)
- When the firewall came back up, the web servers received traffic
  and because the DNS was not yet updated, they wrote on the old primary
- Once updated (a few seconds later), writes went to the new primary in zone 2



# Failover War Story [6 of 6]

**(Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)**

This war story was a decentralized Service Discovery causing problems

Remember that it is not a matter of “if” but “when” things will go wrong

Please share your war stories so we can learn from each-others’ experience

- GitHub has a MySQL public Post-Mortem (great of them to share this): https://blog.github.com/2018-10-30-oct21-post-incident-analysis/
- I also have another MySQL Primary Failover war story in another talk: https://www.usenix.org/conference/srecon19emea/presentation/gagne

Tip for easier data-reconciliation: use UUID instead of auto-increments

- But store UUID in an optimized way (in primary key order)
  https://www.percona.com/blog/2014/12/19/store-uuid-optimized-way/
  http://mysql.rjweb.org/doc.php/uuid

# MySQL at MessageBird [1 of 2]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

MessageBird is using MySQL 5.7 (more precisely Percona Server)

These are hosted in many Google Cloud Regions

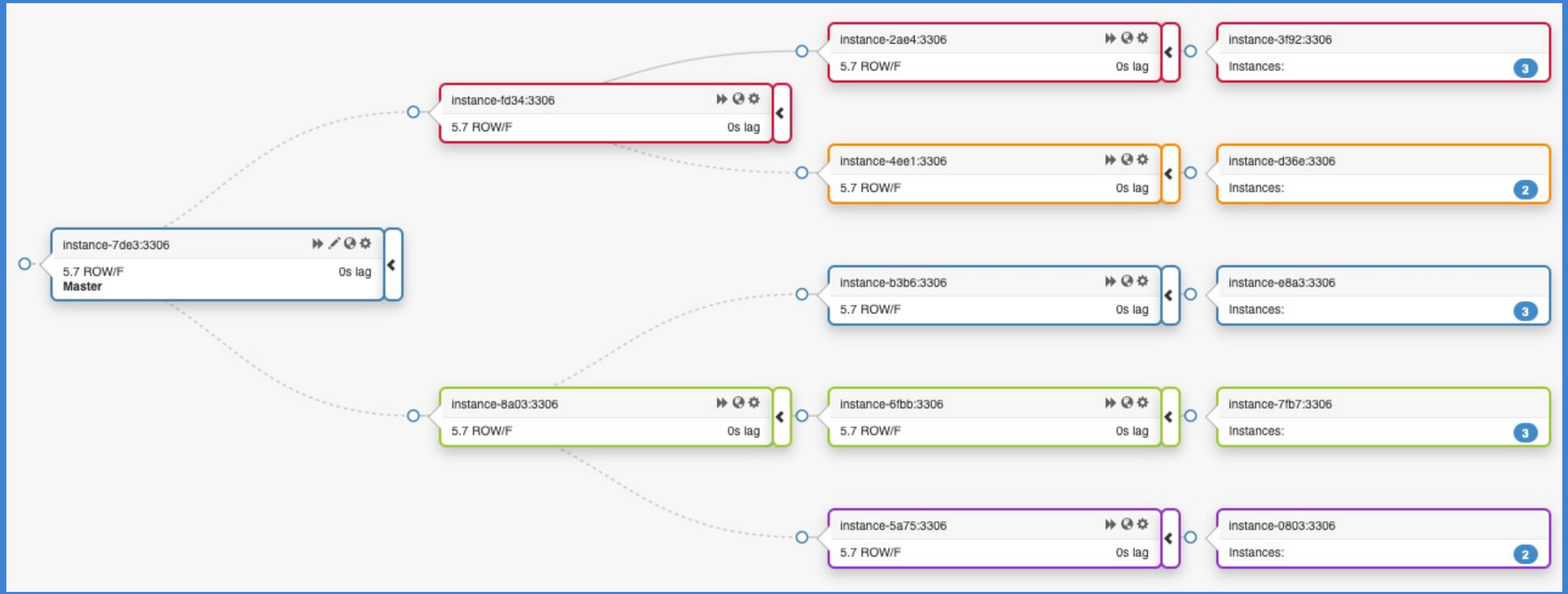
There are three types of MySQL deployments

1. Multi-region primary:
   replicas in many regions and primary potentially on many regions
2. Single-region primary with replicas in many regions
3. Primary and replicas all in a single region

# MySQL at MessageBird [2 of 2]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

This is a multi-region primary (regions are color-coded)



# MySQL Service Discovery at MessageBird [1 / 12]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Requirements for MySQL Service Discovery:

- Being able to route traffic to local replicas
- Embed some sort of fencing mechanism

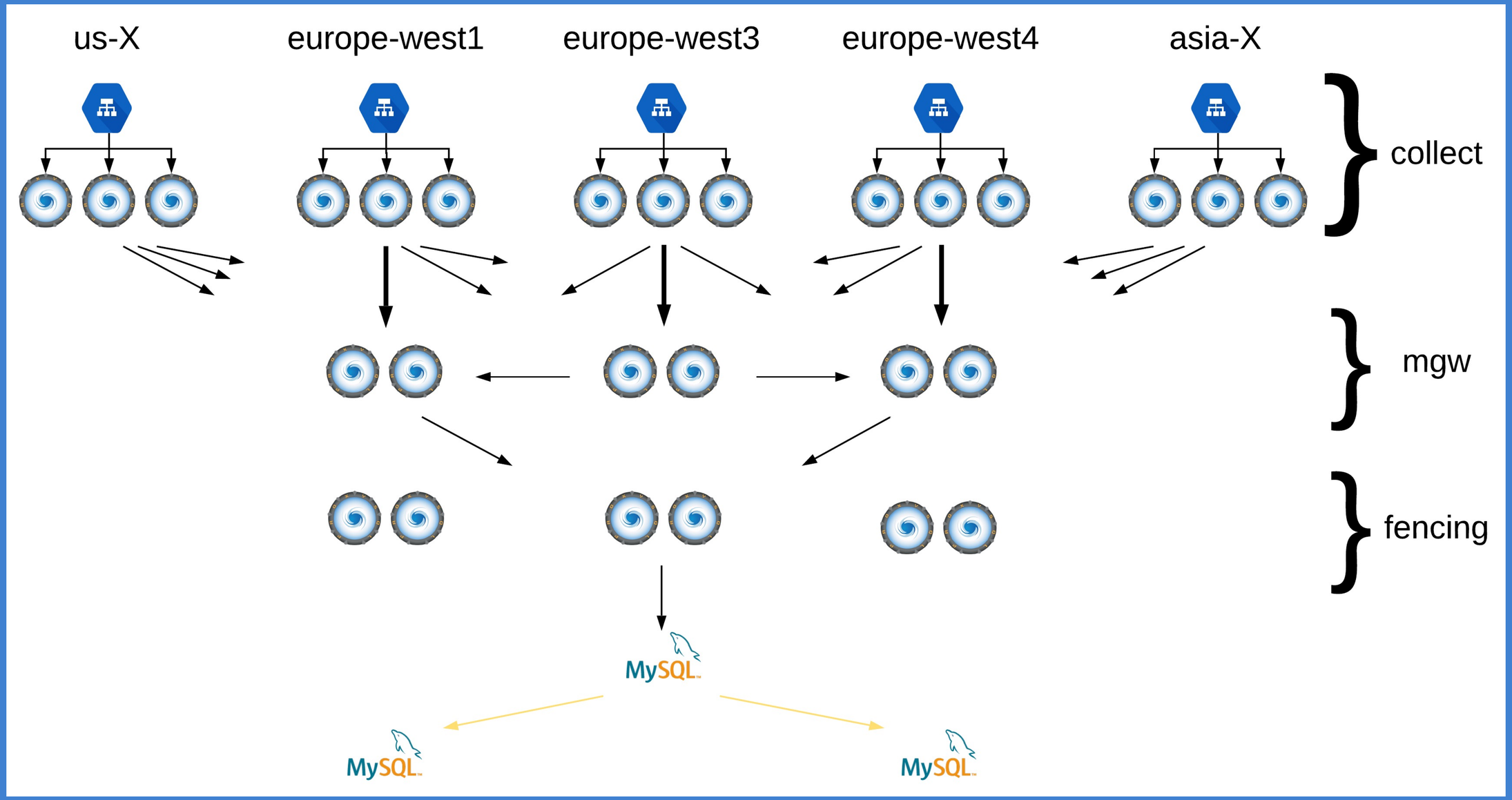
This led to a multi-layer solution using ProxySQL:

- Three layers for multi-region primary:
    1. Collect
    2. Master-Gateway (*mgw*)
    3. Fencing

For single-region, mgw and fencing are merged in local-fencing (*locfen*)

# MySQL Service Discovery at MessageBird [2 / 12]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)



# MySQL Service Discovery at MessageBird [3 / 12]

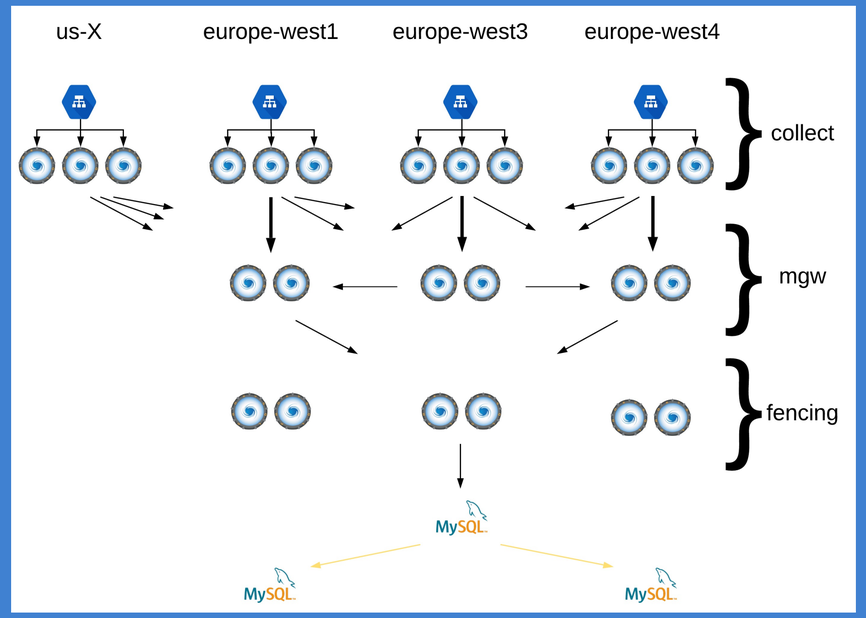
## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

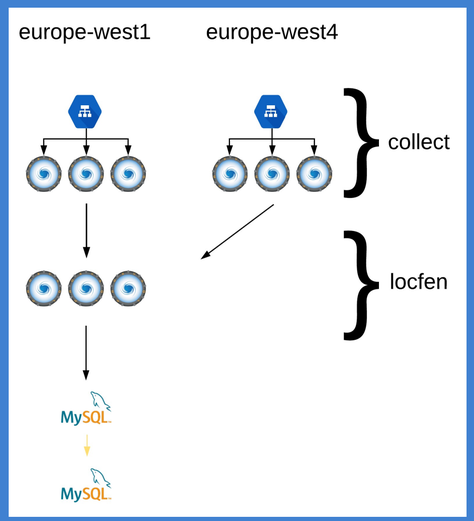
The *collect* layer is a standard entry-point design

The *fencing* layer is a natural HA way to route traffic to the primary (a single node would not be HA)

The *master-gateway* layer is the glue between collect and fencing (more about this later in the talk)

The *local-fencing* layer is the *mgw* and the *fencing* layers merged for single-region primary databases because routing to a single region does not need the *mgw* glue (three nodes for N+2 HA, more about this later in the talk)



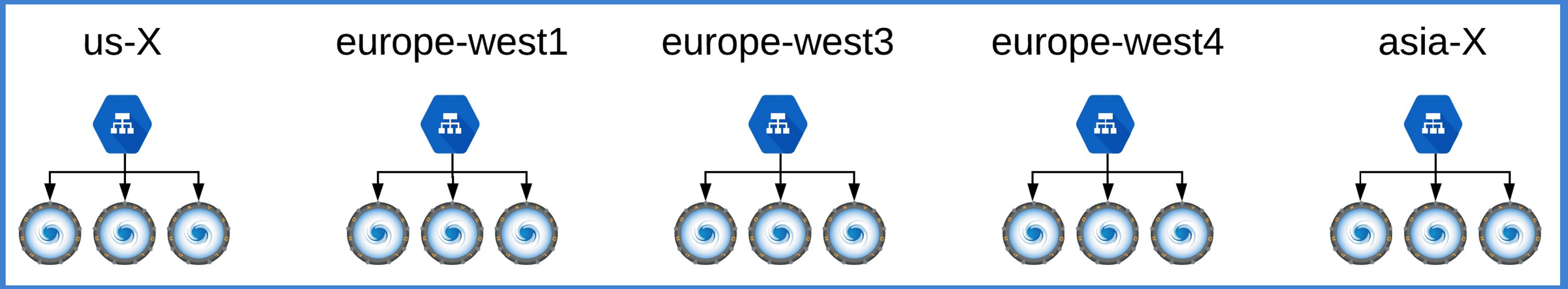



# MySQL Service Discovery at MessageBird [4 / 12]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

The *collect* is the entry-point of the MySQL Service Discovery:

- It starts with a load-balancer sending traffic to ProxySQL
- We have at least 3 instances of ProxySQL for N+2 high availability




- From here, read-only traffic is sent directly to replicas
- Primary traffic (read-write) is sent to *mgw* or *locfen*

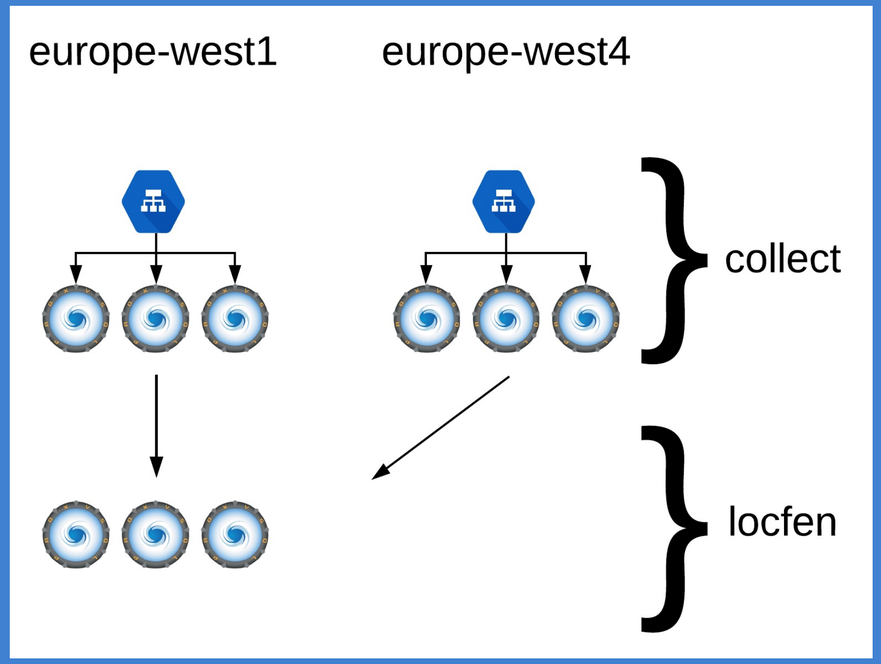
# MySQL Service Discovery at MessageBird [5 / 12]

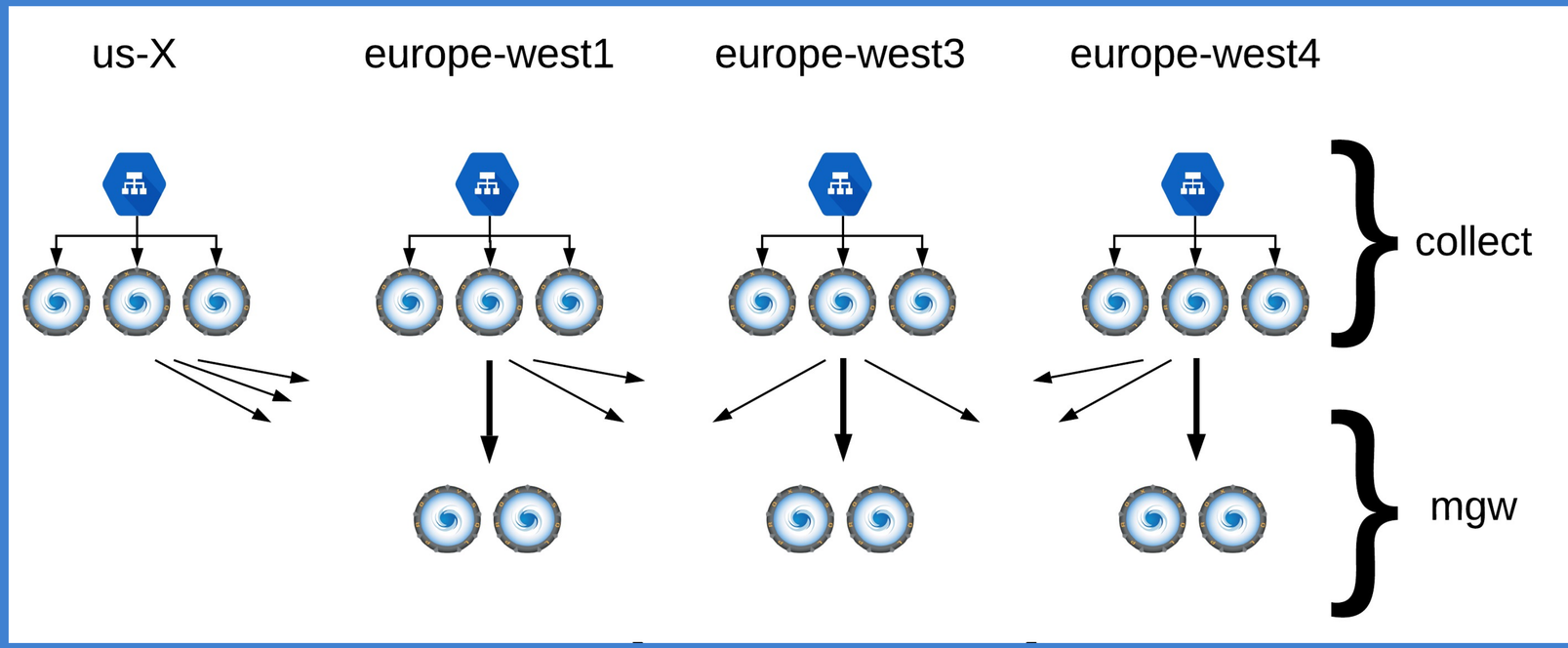
## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Routing from *collect* to *locfen* is either local or crossing a region boundary

For *mgw*, it is biased to local when a *mgw* is on the same region as *collect*

- ProxySQL routing is weight-based (no easy fallback routing)



# MySQL Service Discovery at MessageBird [6 / 12]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

The *master-gateway* is deployed on all regions potentially hosting a primary

The same way *fencing* (or *locfen*) is designed as small as possible
to reduce the update-scope of failover (to a single region) …

… *mgw* bounds the update-scope of moving the primary to another region to a continent (in this case, the three mgw regions are in Europe)
(it avoids a Planet-Scale reconfiguration of collect on failover)

… and the way *mgw* routes traffic to *fencing* protects against writing to the primary in case of network partitions

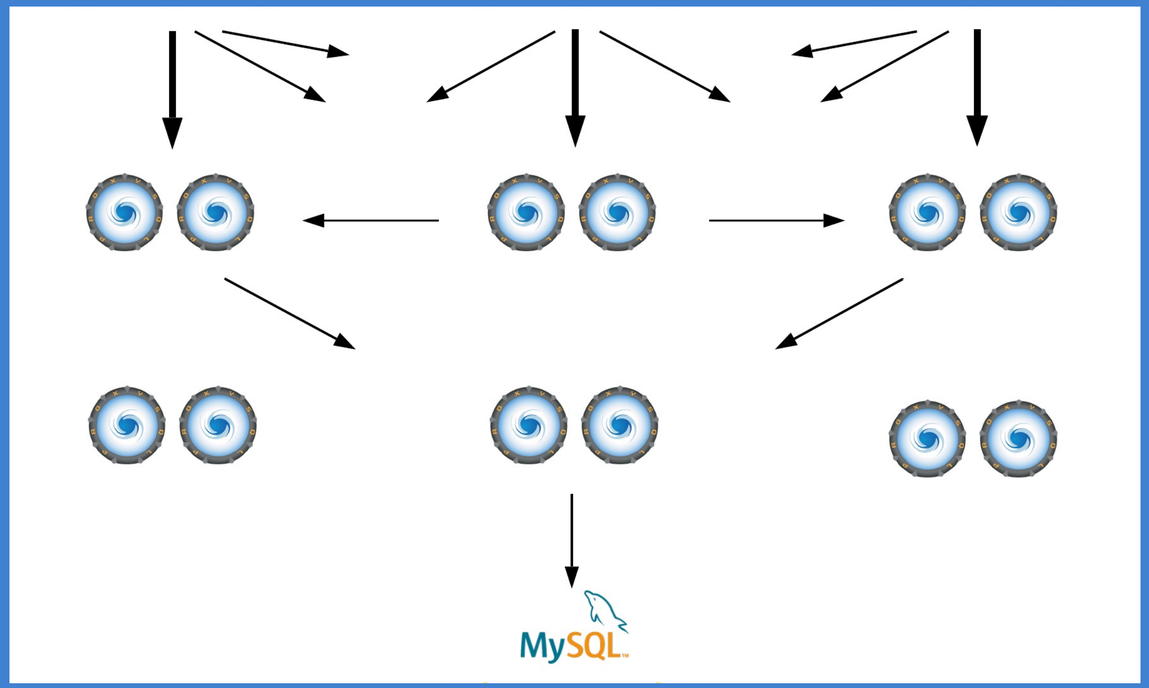
# MySQL Service Discovery at MessageBird [7 / 12]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

The *mgw* routing is as follow:

- If the primary is in a remote region, traffic is routed to *fencing* in that region
- If the primary is in the same region, traffic is routed to the other *mgw*

➢ No path to the primary not crossing a region boundary



# MySQL Service Discovery at MessageBird [8 / 12]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

No path to the primary that is not crossing a region boundary

- That might sound sub-optimal, but it is an interesting tradeoff
- It makes the best vs worse case round-trip ratio to the primary closer

Without crossing a region boundary:

- Best case (local access): ~1 ms round-trip to the primary
- Worse case (remote access): ~20 ms round-trip to the primary
- ➢ Ratio of 1 to 20

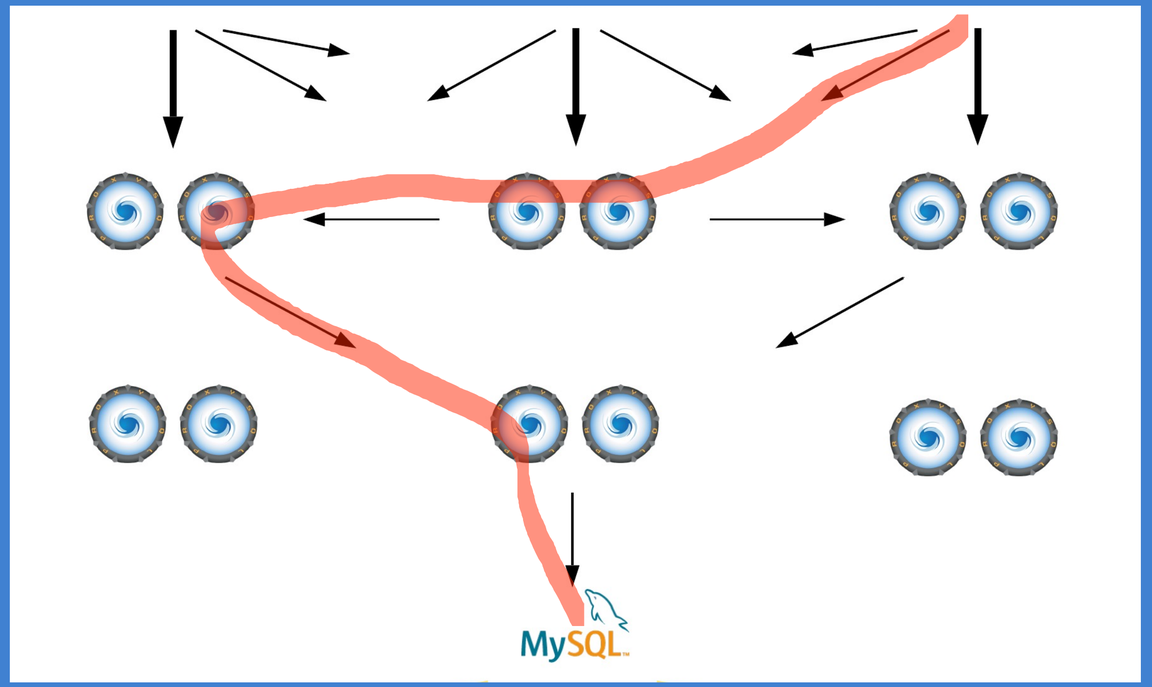
With crossing a region boundary in mgw:

- Best case (remote access): ~20 ms round-trip to the primary
- Worse case (local access): ~40 ms round-trip to the primary
- Even worse case (remote routed to mgw of the primary) 60 ms
- ➢ Ratio of 1 to 2 (3 in the worse case)

# MySQL Service Discovery at MessageBird [9 / 12]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

The worse case (which could be avoided with smarter *collect* routing)



# MySQL Service Discovery at MessageBird [10 / 12]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Avoiding low round-trip variance over optimal best-case

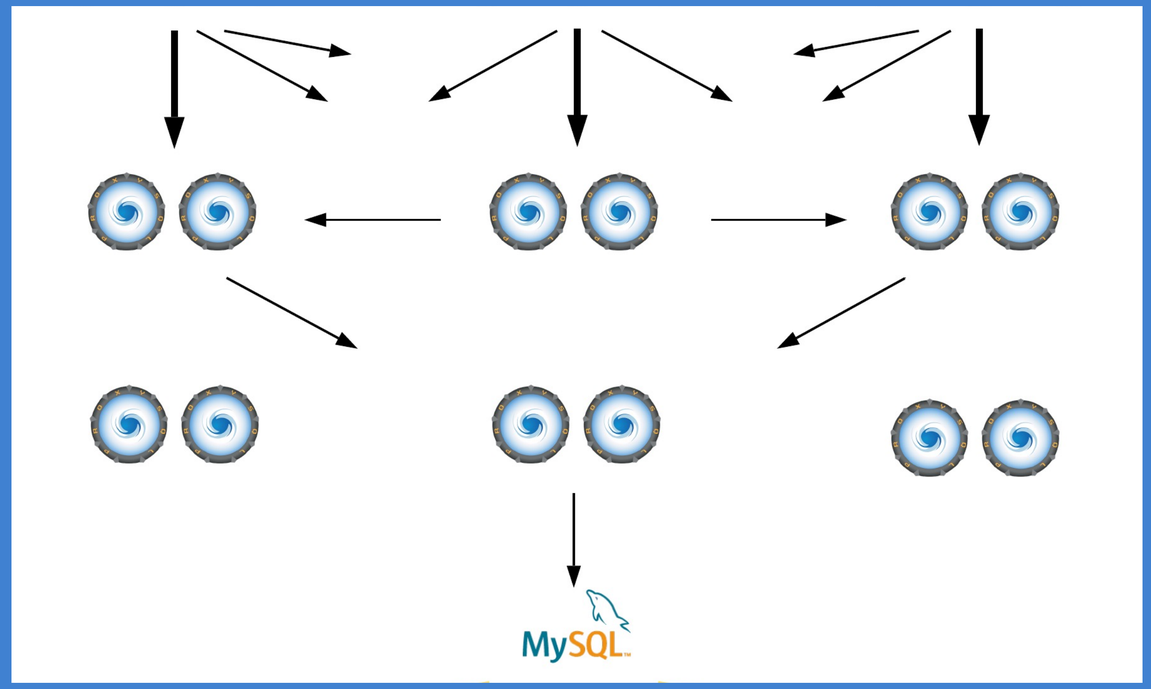
- With region-remote primary accesses, a high latency is unavoidable: when having 20 ms latency, having 40 or 60 should not be problematic
- Moving the average closer to the median avoids problems
- And in the case where most writes are local,
  it avoids surprises when the database becomes remote
- And it prevents writing to the primary in case of a network partition

# MySQL Service Discovery at MessageBird [11 / 12]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

And therefore, I claim this design has interesting tradeoff

- But it might not fit everyone's requirements



# MySQL Service Discovery at MessageBird [12 / 12]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Why only two fencing nodes and three locfen nodes:

- I like high availability N+2
- This allows a single failure to not need an immediate fix
- If a locfen node fails on Friday evening, it can wait until Monday

- A failure of one of the two fencing node looks problematic
- But we can failover to another region having two healthy nodes
- And updating two ProxySQL in case of a failover is easier than three
  (needing three locfen is something I dislike as it makes failover more fragile)

# Failover

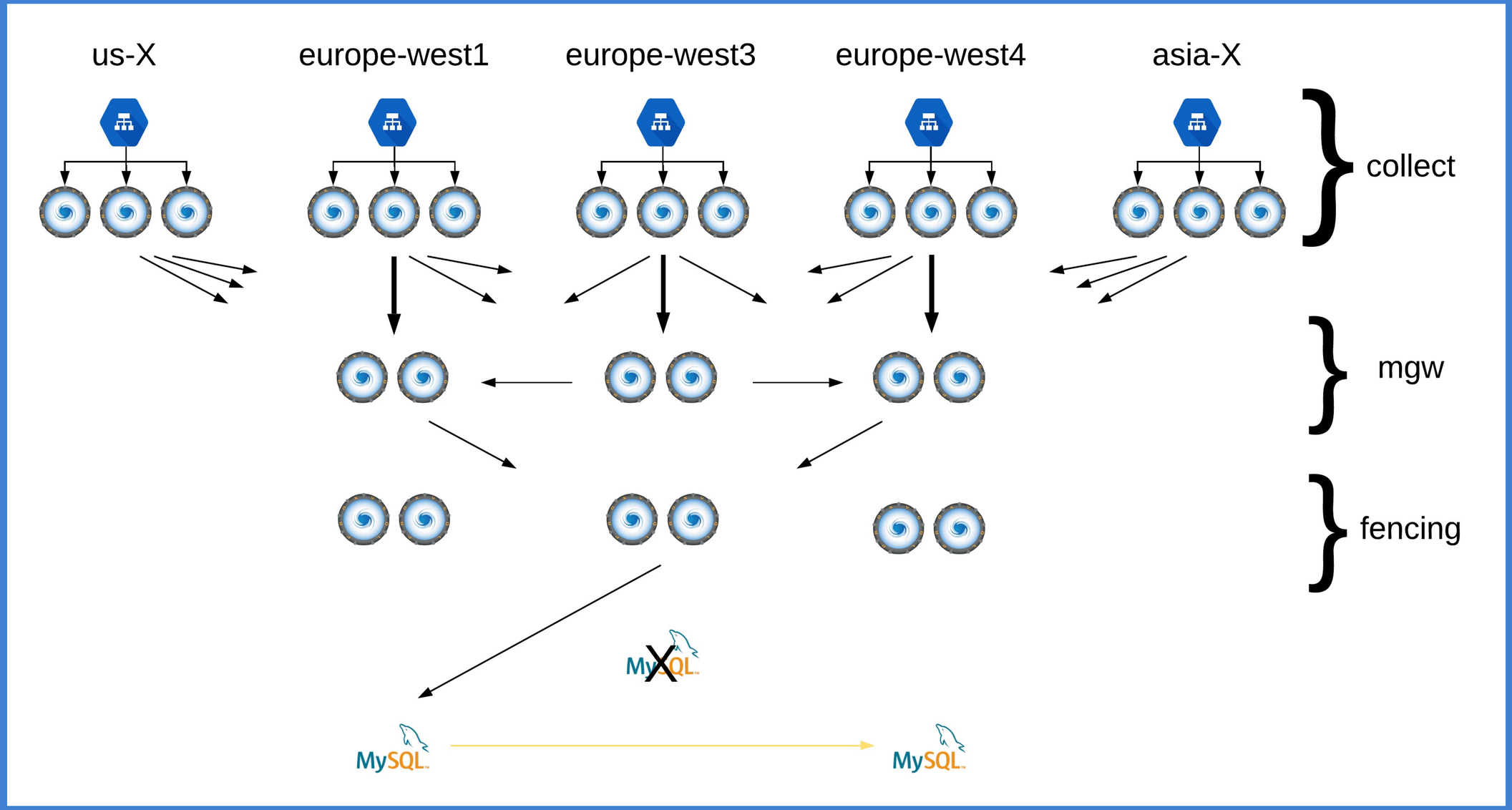
## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Failing-over is a multi-step process:

1. Detecting a failure
2. **Fencing the primary**: setting it as OFFLINE_HARD in ProxySQL
3. Regrouping replicas under the new primary
4. Waiting for replication to catch-up on the new primary
5. Making the new primary ready: stop replication, set writable, start HB, …
6. **Updating ProxySQL to point to the new primary**
7. Re-configure fencing and master-gateway if needed

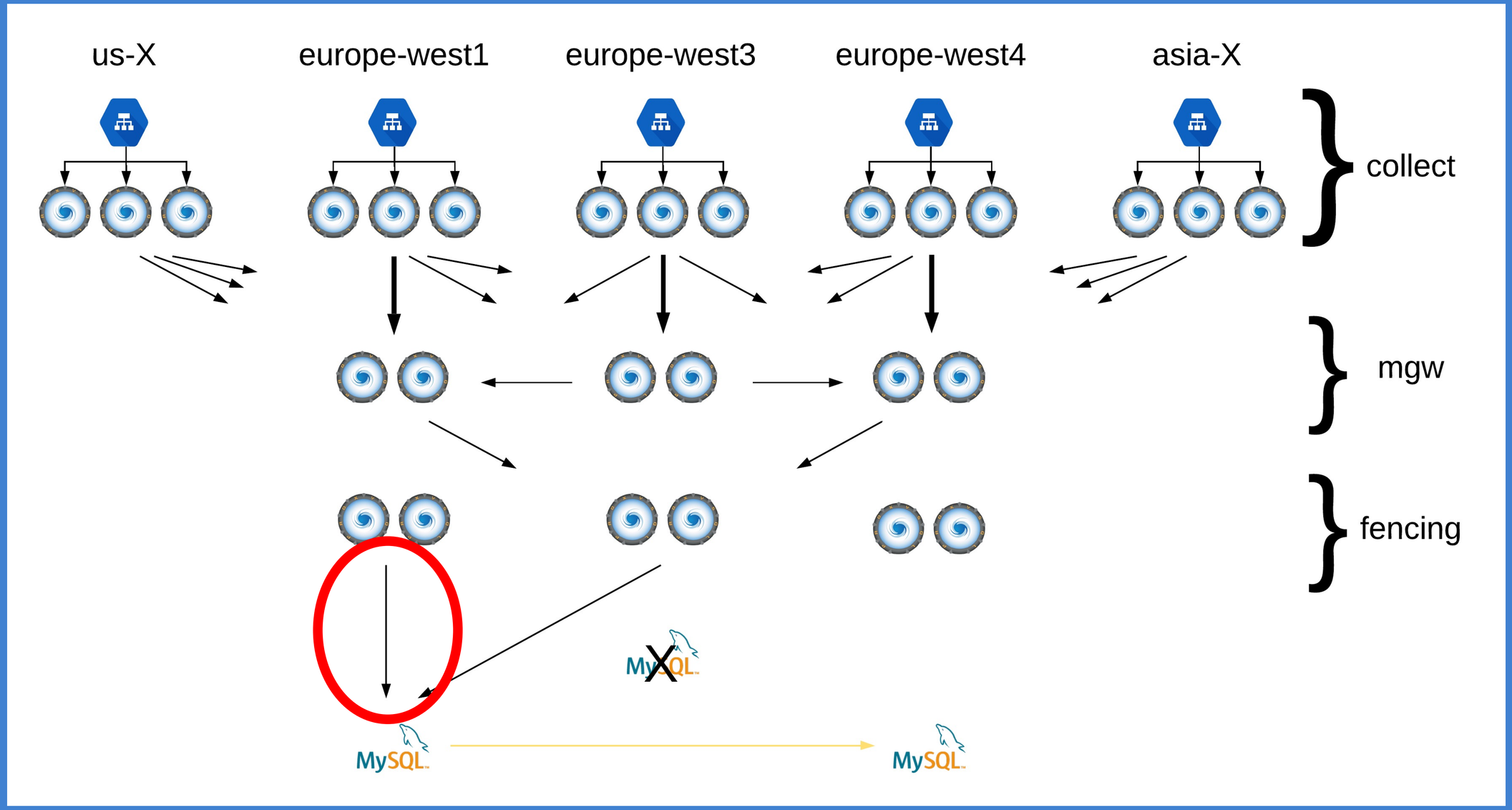
# Reconfiguring Fencing and MGW [1 of 6]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)



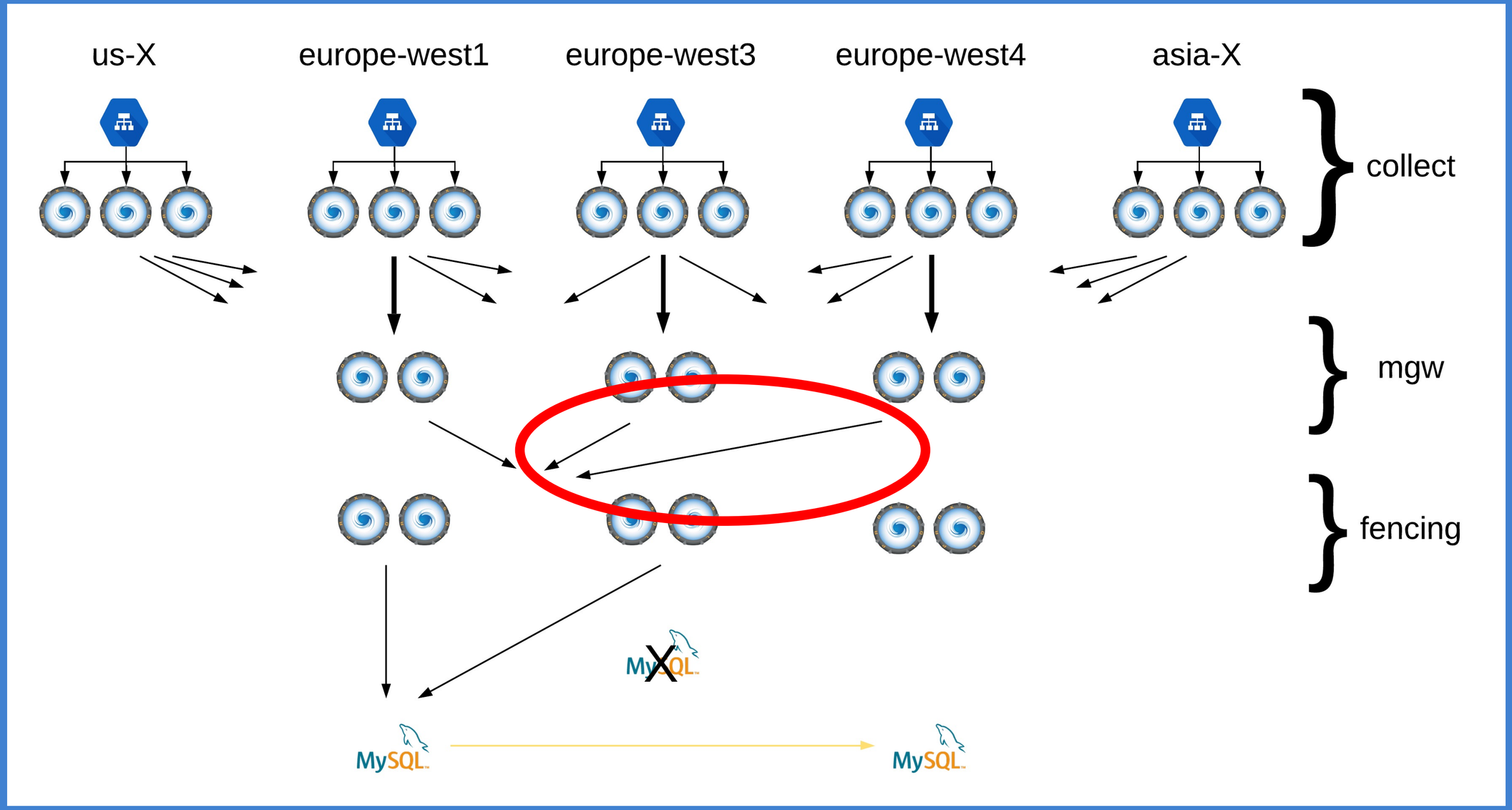
# Reconfiguring Fencing and MGW [2 of 6]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)



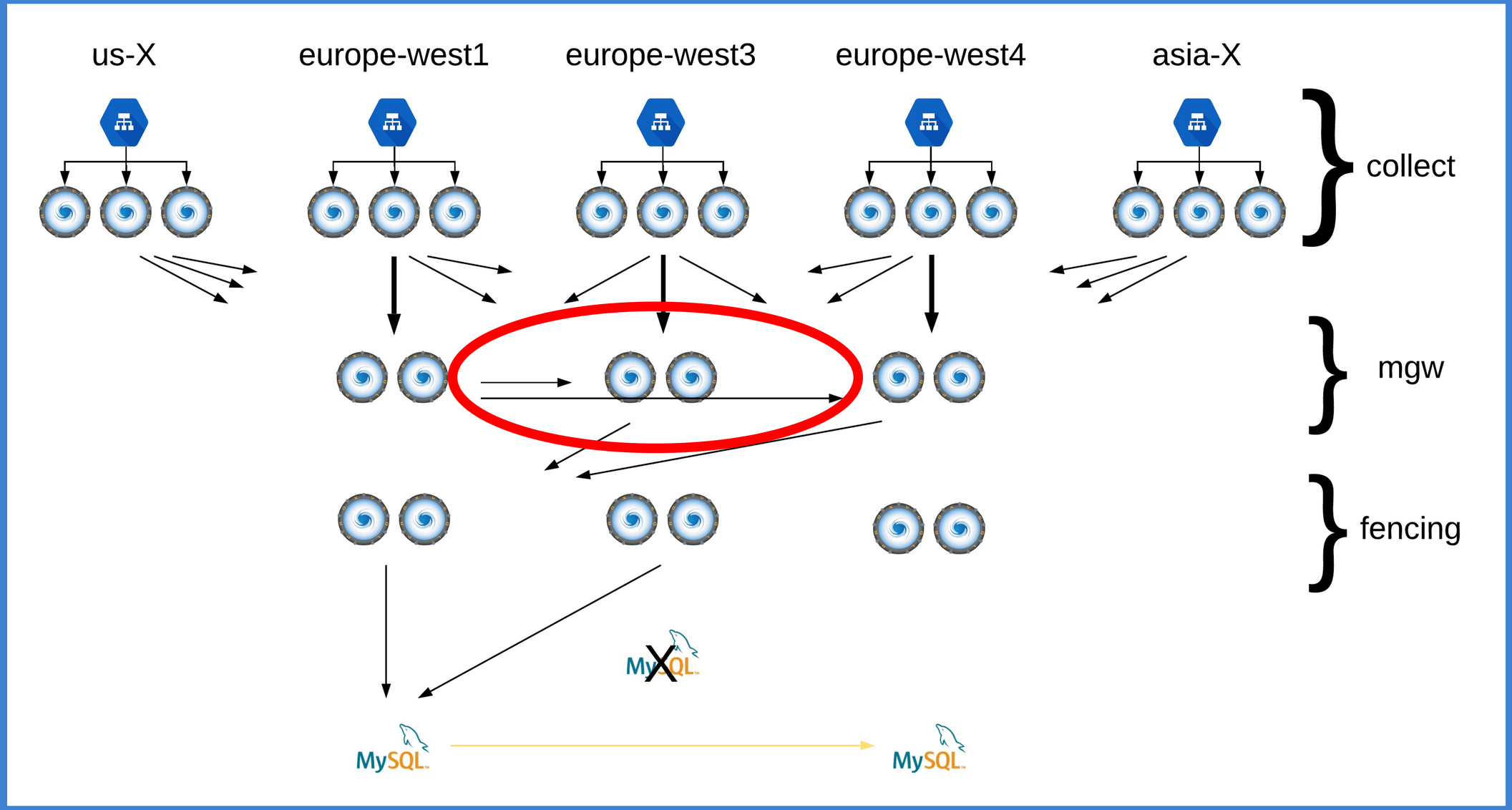
# Reconfiguring Fencing and MGW [3 of 6]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)



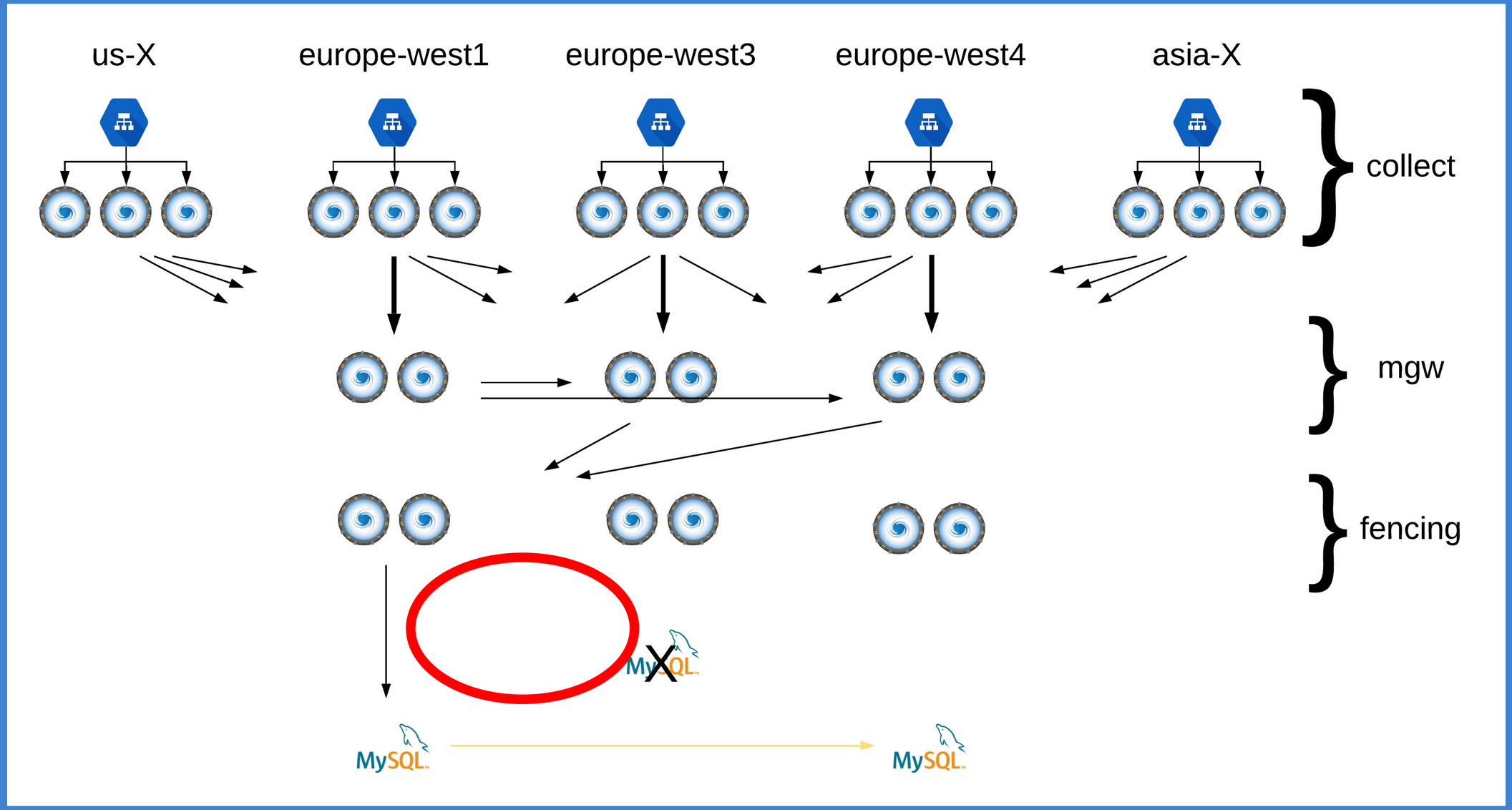
# Reconfiguring Fencing and MGW [4 of 6]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)



# Reconfiguring Fencing and MGW [5 of 6]

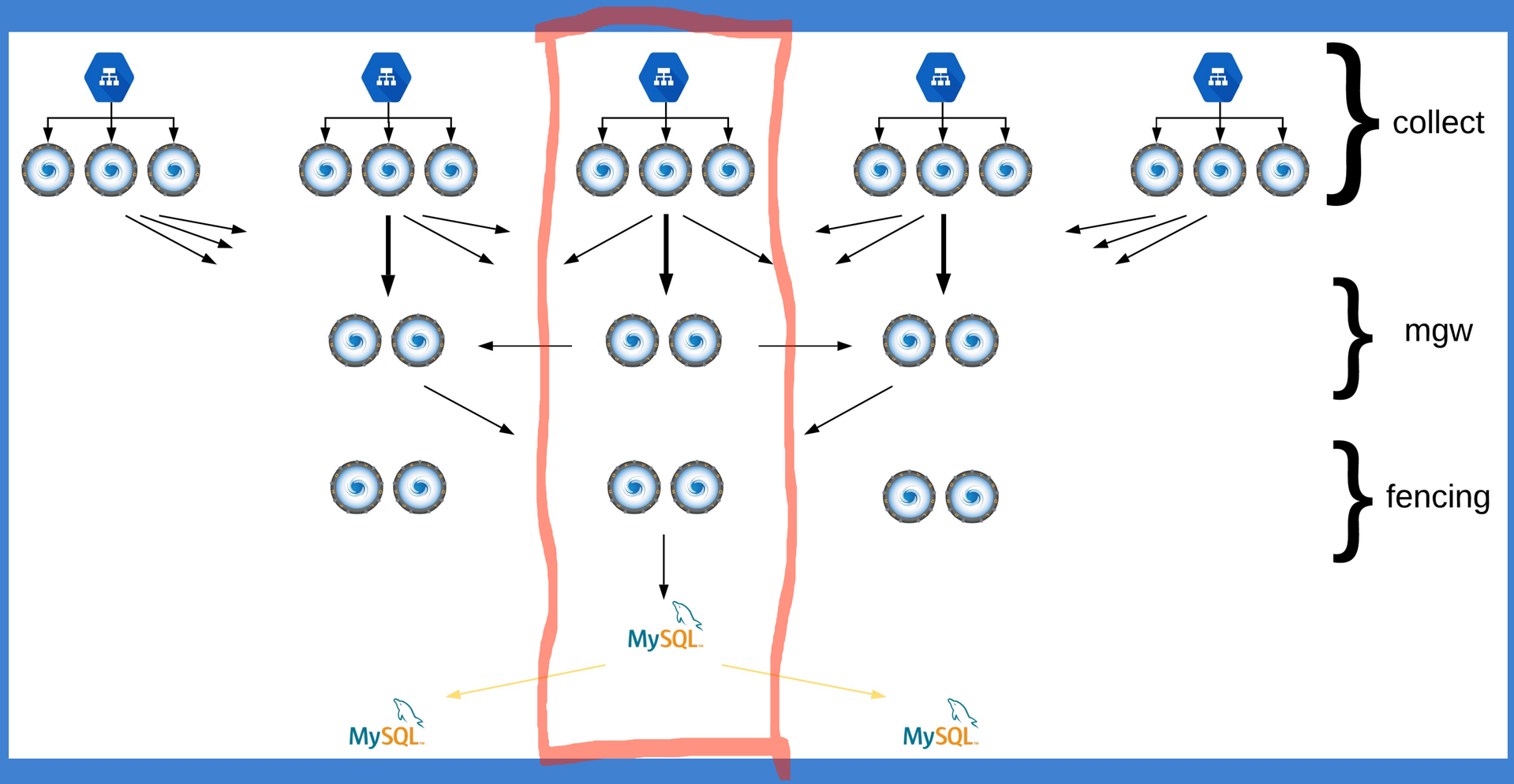
## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)



# Reconfiguring Fencing and MGW [6 of 6]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Reacting to a network partition is a similar operation



# Orchestrator integration

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

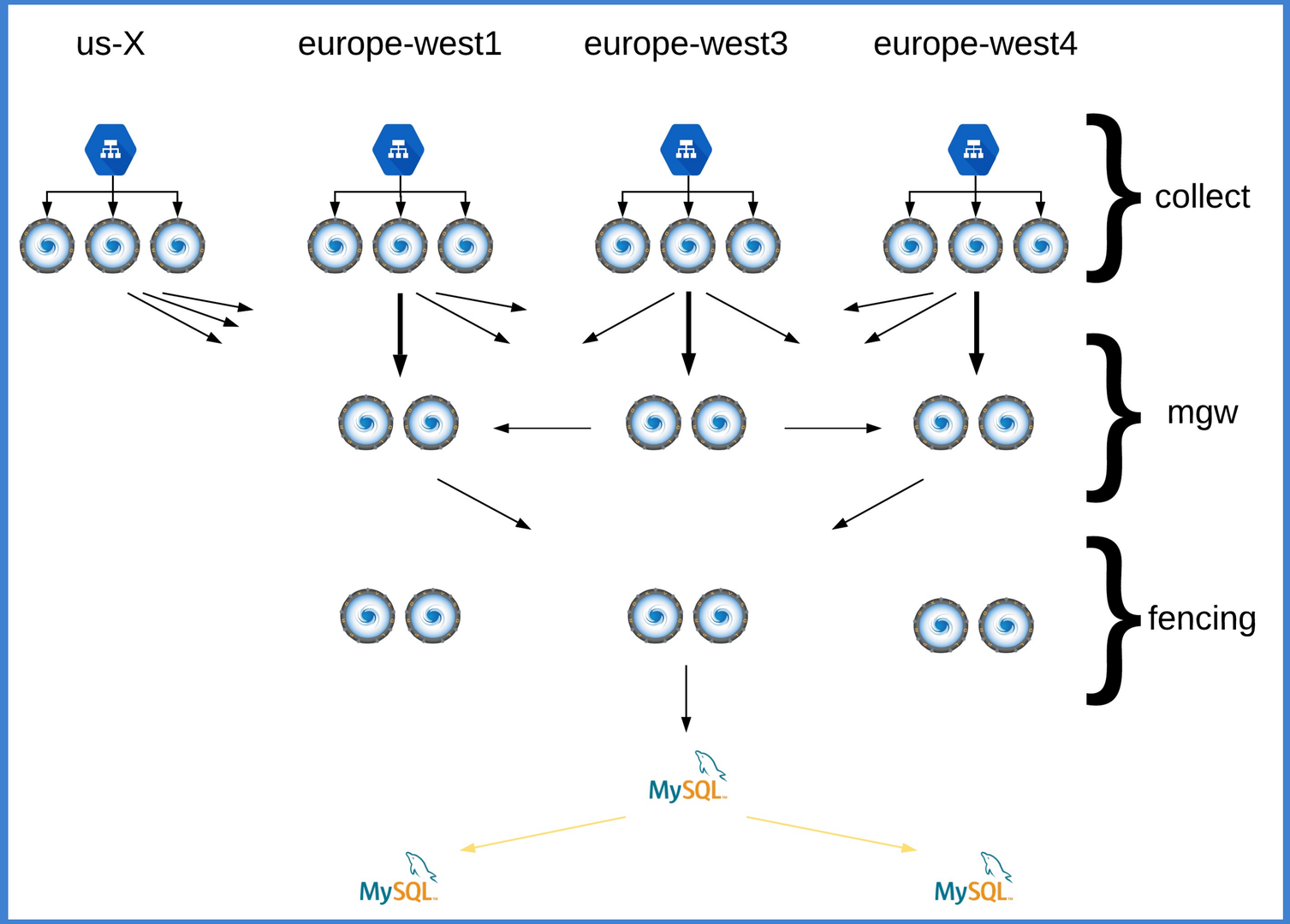
Orchestrator integration

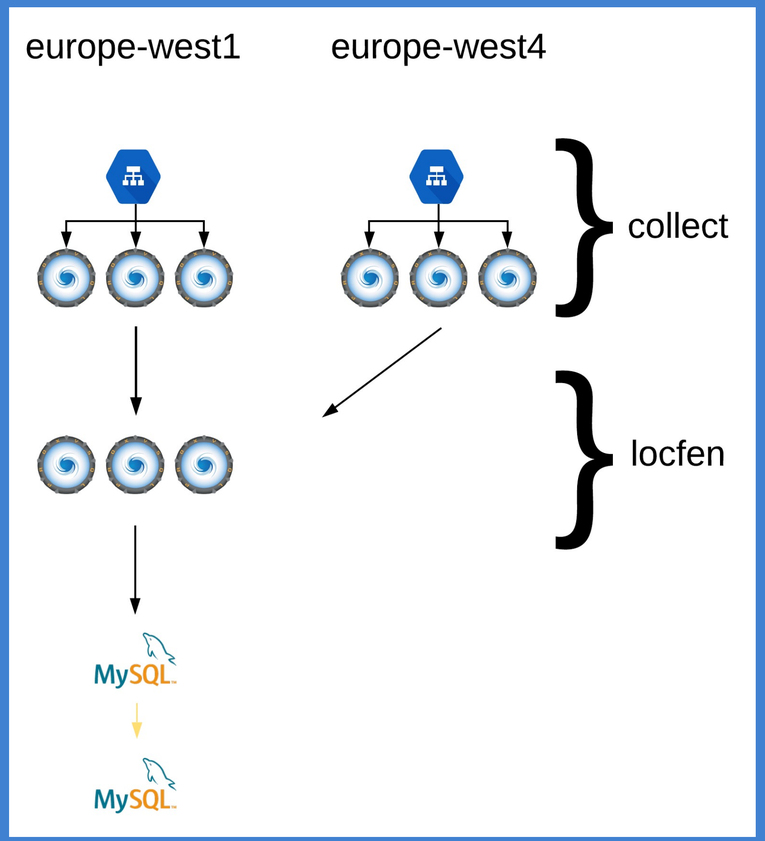
- Pre-failover hook: fence the primary in fencing (or locfen)
- Post-failover hook: update fencing (or locfen) to the new primary

- List of ProxySQL nodes (fencing or locfen)
  and the ProxySQL hostgroup are store in each databases
  which make this information available to the Orchestrator hooks

# MySQL Service Discovery at MessageBird

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)



# Almost Perfect Service Discovery and Failover with ProxySQL and Orchestrator

Art van Scheppingen
Senior Database Engineer at MessageBird
art.vanscheppingen AT messagebird DOT com

# How does it work far?

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Has been successfully in production for over two years now

- Most of our workload is on single-region primary (e.g. locfen)
- We have one cluster on multi-region primary

ProxySQL has been very stable for us

- No big issues on 1.4.x, 2.0.x and 2.1.x

# How does it work far?

**(Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)**

Easier for devs to setup connections to primary

- Point connection to ip address
- No failover handling necessary

Easier for devs to scale out reads

- Point connection to the same ip address
- Uses a different user for RO
- We can differentiate reads (read-only, read-only replica-only, etc)

# Mastering multiplexing [1 of 4]

**(Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)**

Multiplexing in ProxySQL turned out to be tricky

Without Multiplexing:

- 1 on 1 number of connections between Collect and Locfen
- Application makes a connection for each shard (8 at the moment)
- Application only uses one actively
- High number of connections means high load

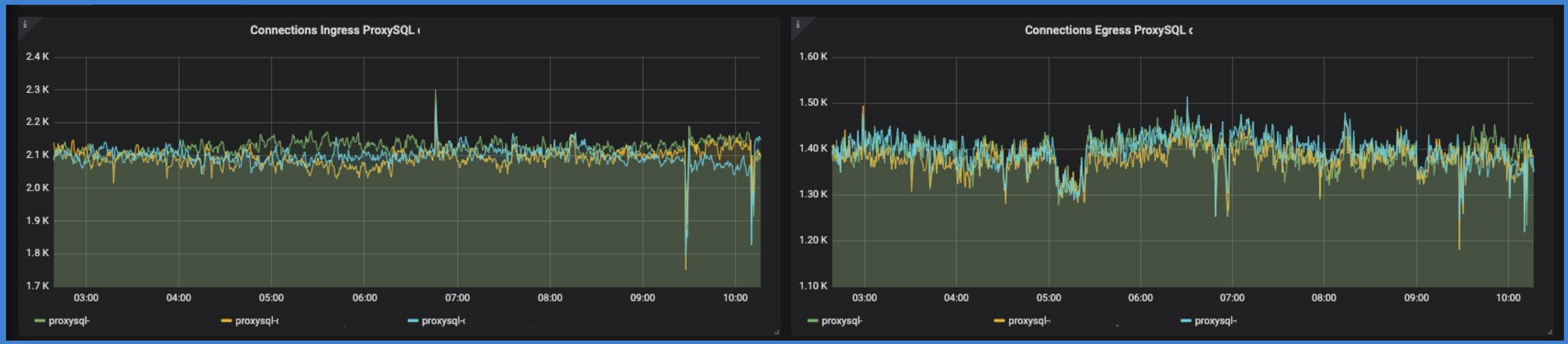
With multiplexing

- High number of connections on Collect
- Theoretically only 1/8th of the connections on Locfen
- Even lower due to less overhead on establishing connections

# Mastering multiplexing [2 of 4]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Prior to multiplexing



# Mastering multiplexing [3 of 4]

**(Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)**

We enabled multiplexing in our configuration but not much happened

ProxySQL disabled multiplexing due to an auto increment

- Bugreport on ORM that didn't handle multiplexing well (Hibernate)
- Parsing of the OK packet for auto increments
- Whenever encountered: multiplexing is affected
- mysql-auto_increment_delay_multiplex set to 5 by default
- This means for 5 consecutive queries multiplexing is disabled

# Mastering multiplexing [4 of 4]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

After mastering multiplexing

# Separation of stacks

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

We tried reusing collect and locfen as much as possible

- Centralized configuration (hostgroups and users)
- Less complexity

Expansion was inevitable

- Noisy neighbors (hostgroups)
- Reducing risk
- Better tuning for certain workloads
- Easier for maintenance
- Cascading effect to other hostgroups

Currently running 3 vertical stacks of collect and locfen

# Separation of stacks: Noisy neighbors [1 of 2]

**(Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)**

Above 50% CPU usage ProxySQL will show increased latency

- Lower CPU usage by multiplexing
- Lower CPU usage by idle-threads

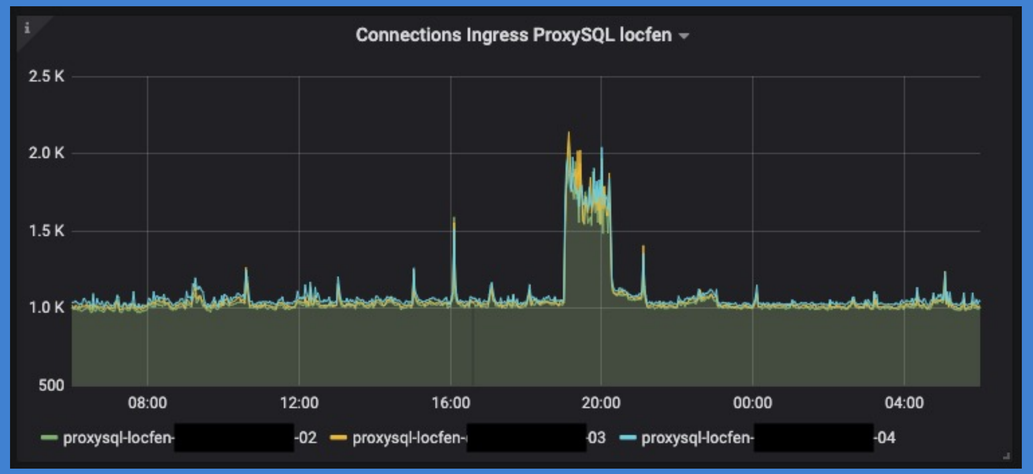
When a certain hostgroup in Locfen is under stress (1000x normal workload)

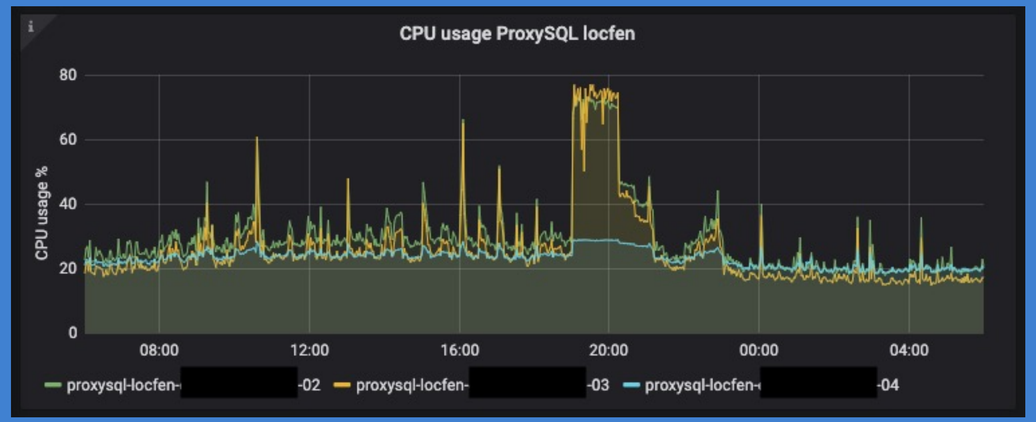
- CPU usage can get above 50%
- Latency will increase on all hostgroups
- Latency will cascade upstream to the collect layer

# Separation of stacks: Noisy neighbors [2 of 2]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Above 50% CPU usage ProxySQL will show increased latency



# Separation of stacks: Reducing risk [1 of 4]

**(Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)**

For us ProxySQL scales up to about 12K of connections per host

- After this we will hit the limits of TCP

Our Collect layer reached 7.8K connections

- If one collect host fails two remain
- Two remaining hosts will have to do an additional 3.9K connections
- Very close to our 12K limit
- Replacing a failed host now becomes an emergency operation

# Separation of stacks: Reducing risk [2 of 4]

**(Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)**

ProxySQL keeps count of connection errors (MySQL + TCP shared)

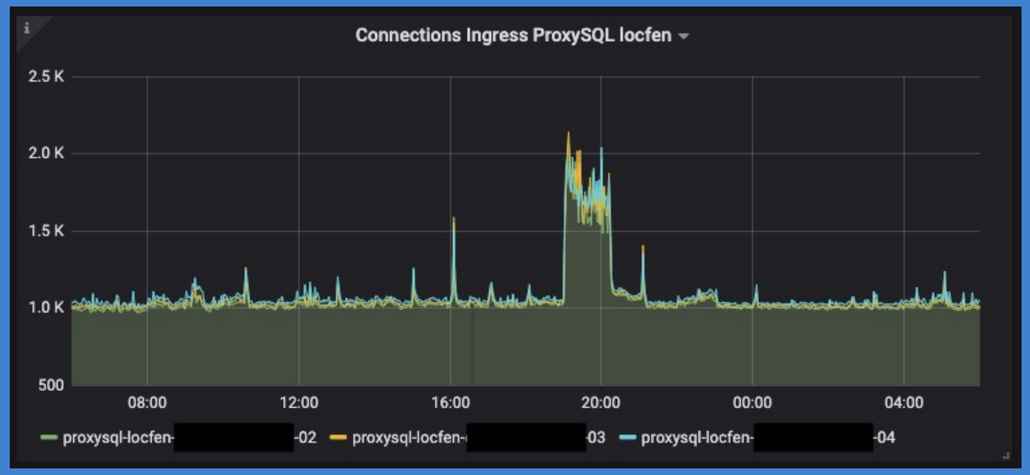
- Will shun a host if a backend becomes “less responsive” (e.g. high load)
- Happens on hostgroups with any number of hosts

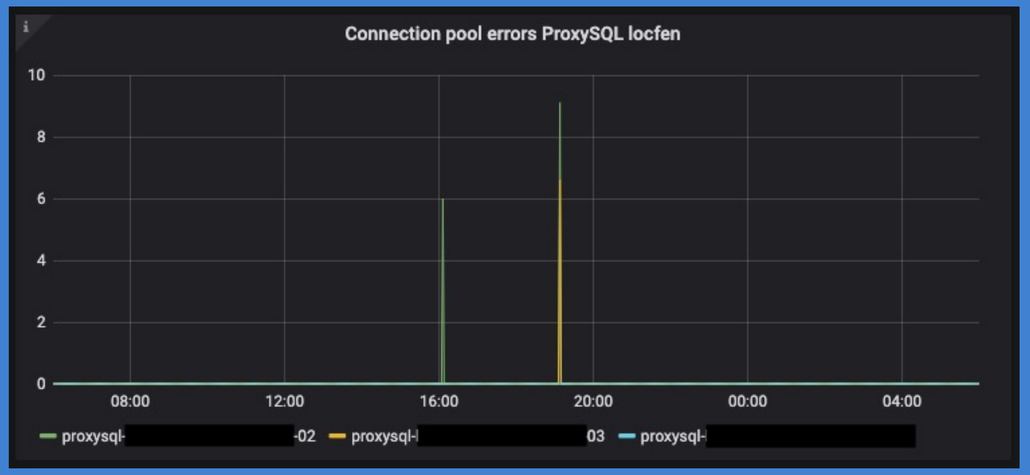
Hitting the limits of TCP

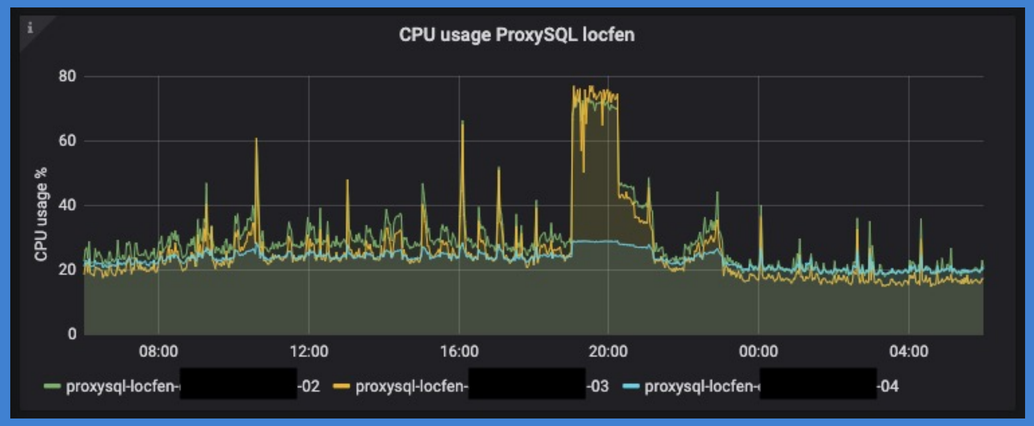
- Errors to locfen or MGW will increase
- Locfen and MGW backends will be shunned
- Established connections will also be closed

# Separation of stacks: Reducing risk [3 of 4]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

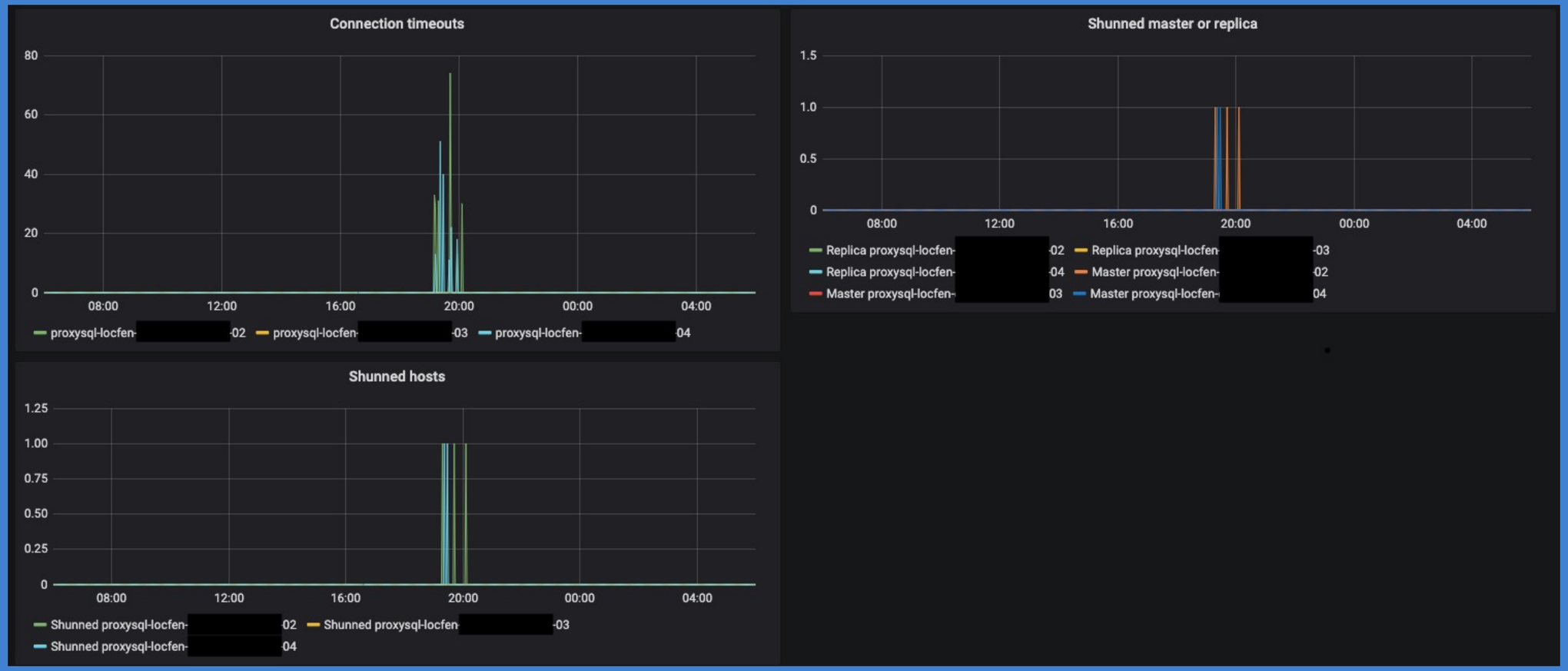


# Separation of stacks: Reducing risk [4 of 4]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)



# Shunning a primary [1 of 4]

**(Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)**

ProxySQL keeps count of connection errors (MySQL + TCP shared)

- Will shun a host if a backend becomes “less responsive” (e.g. high load)
- Happens on hostgroups with any number of hosts

Shunning a primary for 1 second will cause another torrent of connections

- Client gets a timeout and will reconnect immediately
- No available backend: new connection is “paused” up to 10 seconds
- After 1 second primary become available again
- ProxySQL has thousands of connections waiting
- Rinse and repeat…

# Shunning a primary [2 of 4]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

How to detect shunned hosts?

- ProxySQL will log a shunned host in the proxysql log
- This includes server name, error rate and duration of shun

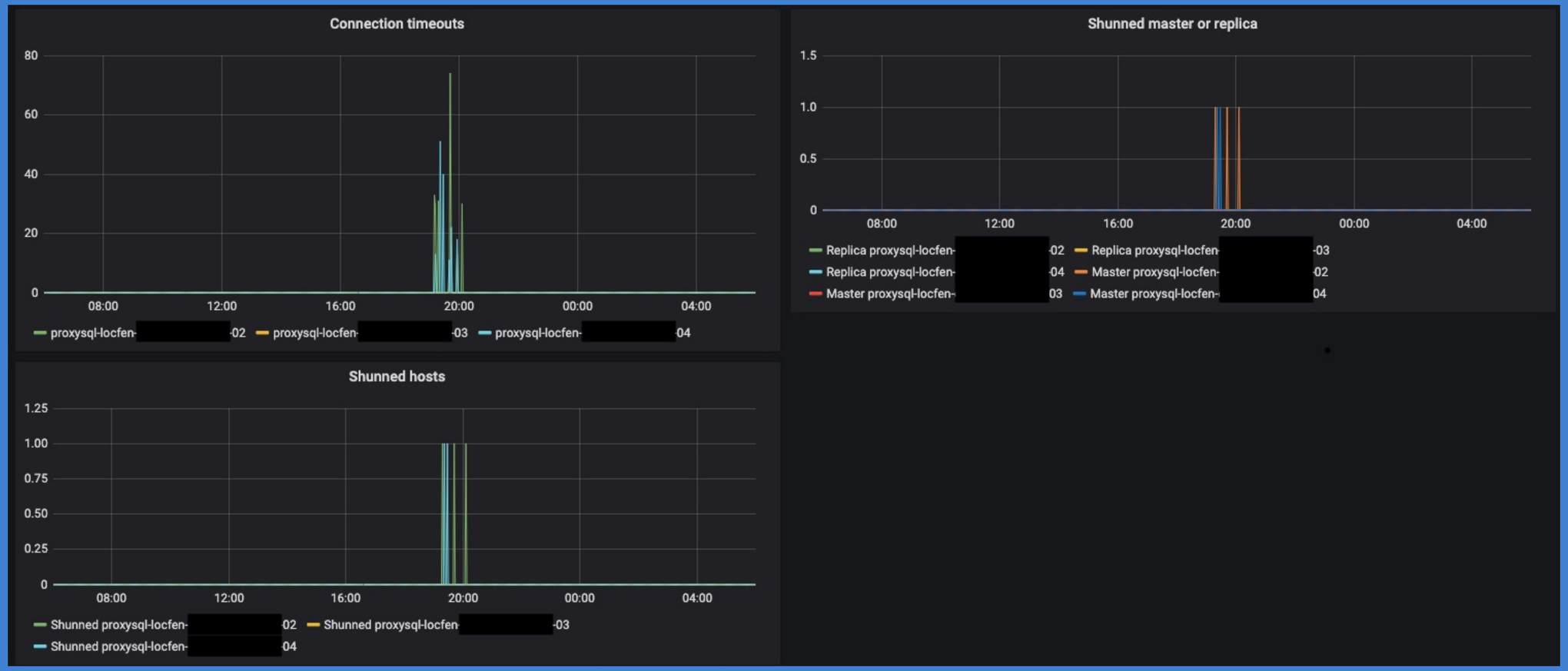
```
2020-06-11 12:01:39 MySQL_HostGroups_Manager.cpp:311:connect_error(): [ERROR] Shunning server x.x.x.x:3306 with 10 errors/sec. Shunning for 10 seconds
2020-06-11 12:01:44 MySQL_HostGroups_Manager.cpp:311:connect_error(): [ERROR] Shunning server x.x.x.x:3306 with 18 errors/sec. Shunning for 10 seconds
2020-06-11 12:01:49 MySQL_HostGroups_Manager.cpp:311:connect_error(): [ERROR] Shunning server x.x.x.x:3306 with 10 errors/sec. Shunning for 10 seconds
2020-06-11 12:01:54 MySQL_HostGroups_Manager.cpp:311:connect_error(): [ERROR] Shunning server x.x.x.x:3306 with 10 errors/sec. Shunning for 10 seconds
```

How do we get them in our graphs?

- ProxySQL log tailer
- Looks for: connection timeouts, shunned hosts, shunned due to replication lag
- Exports metrics to Prometheus every minute

# Shunning a primary [3 of 4]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)



# Shunning a primary [4 of 4]

**(Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)**

Shunning a primary for 1 second will cause an avalanche connections

- Normal latency is 10ms to 50ms
- Added latency of 1 second will decrease application throughput
- Decreased application throughput means k8s scale up workers
- k8s scale up means more incoming connections
- Rinse and repeat…

How we dealt with this:

- During some incidents we throttle down workers
- Counter intuitive: throttling down works increases throughput
- Some application workers now have a fixed ceiling

# Separation of stacks: Better tuning

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Most  ProxySQL tuning is done on a global level

Some examples:

- mysql-connection_delay_multiplex_ms
- mysql-free_connections_pct
- mysql-wait_timeout

Having a separate stack allows

- Fine tuned multiplexing configuration
- Earlier or later closing of connections
- Separate handling of (end) user connections

# Separation of stacks: maintenance

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Maintenance on Collect is scary

- Draining from GLB gracefully is ”closing after X-minutes”
- Near capacity means we run a risk when performing maintenance

Maintenance on MGW/Fencing/Locfen is scary

- Draining a host takes ages to happen
- Aggressive reuse of connections by connection pool
- Connection timeout (wait_timeout) is 8 hours
- Some applications don’t handle closing of a connection well

# Separation of stacks: cascading effect [1 of 4]

**(Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)**

Warstory: instability on one cluster swiped out many others

The instable cluster

- MySQL back_log set too low
- TCP listen overflows on primary
- ProxySQL started to shun primary

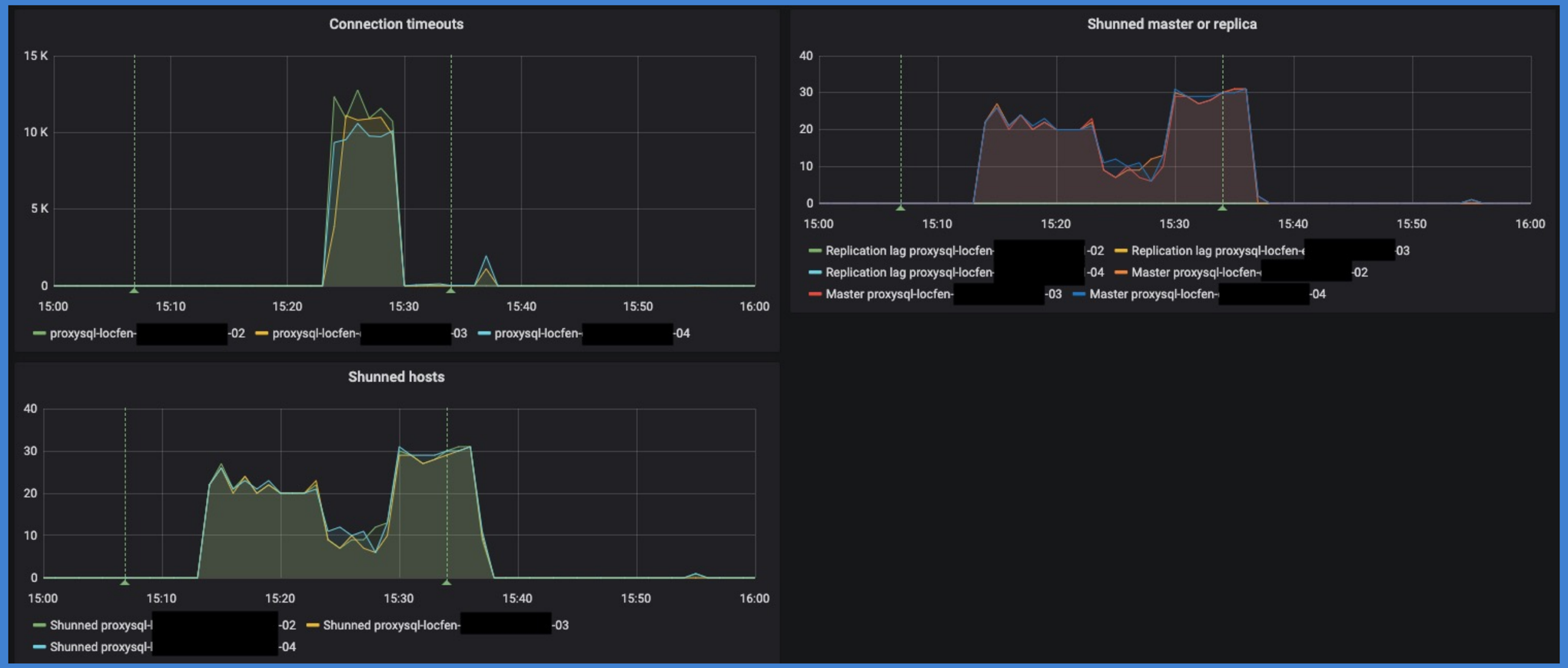
The effect

- Continuous shunning happened
- TCP listen overflows started to happen on ProxySQL
- Affected stability on other hostgroups

# Separation of stacks: cascading effect [2 of 4]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

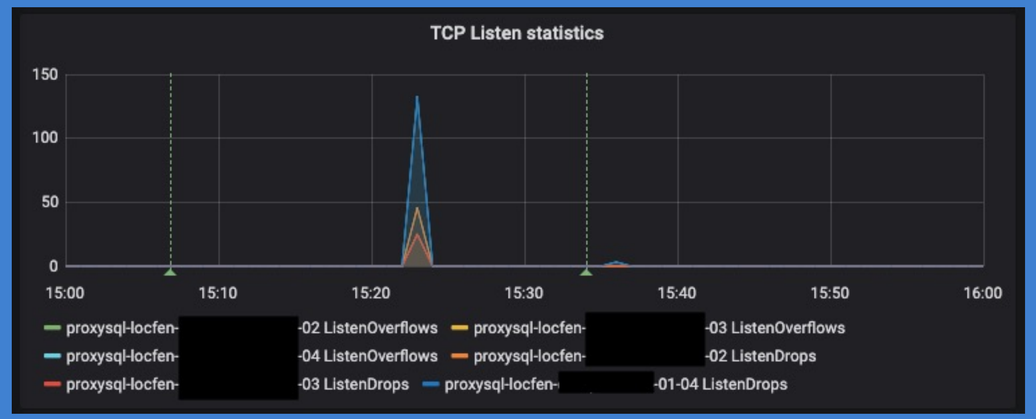
Shunning of primary causes endless shunning loop

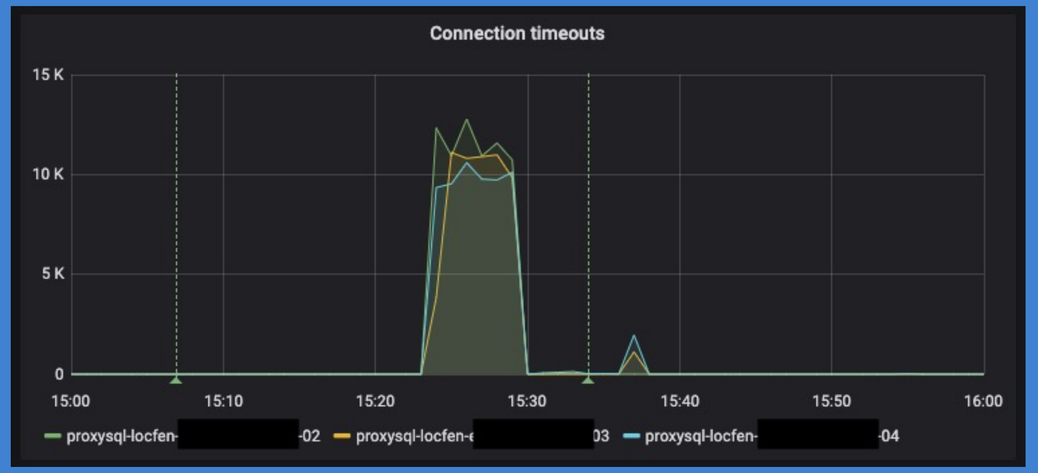


# Separation of stacks: cascading effect [3 of 4]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

Listen overflows on ProxySQL hosts make it even worse

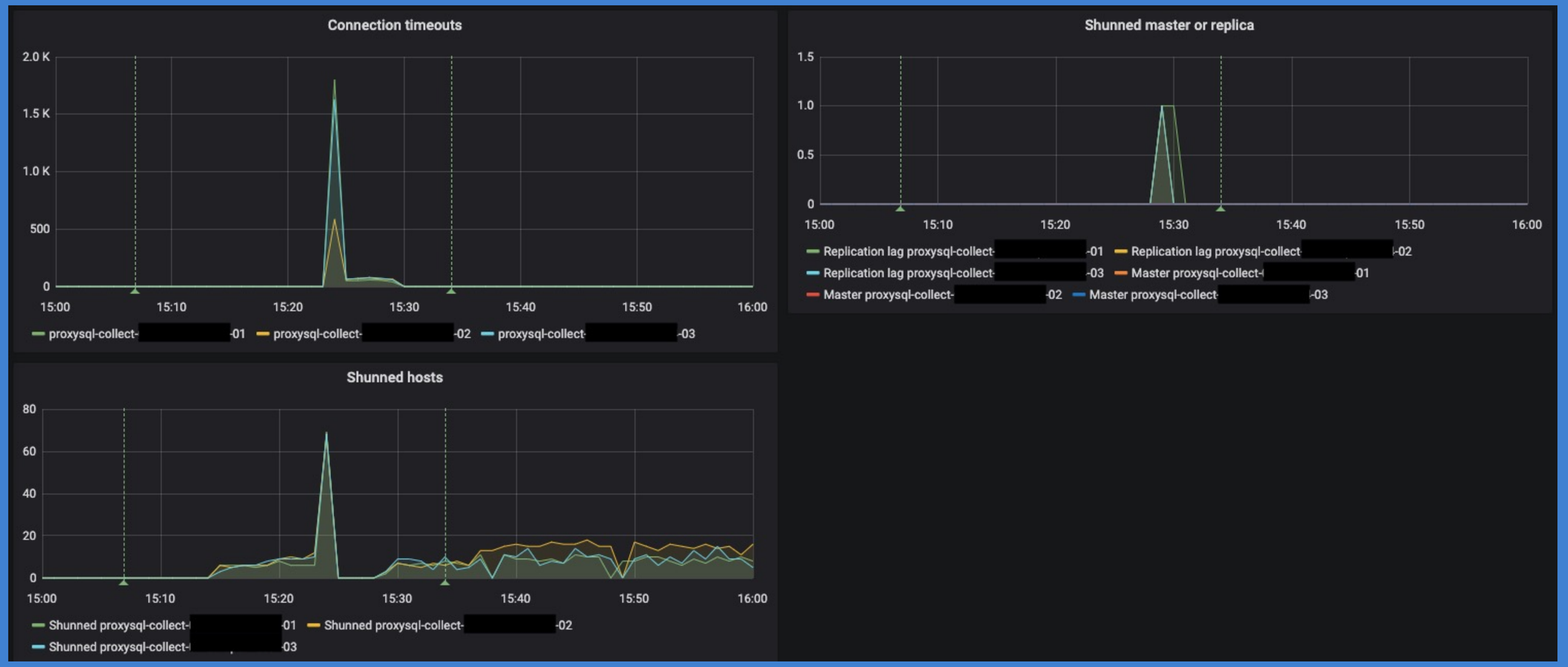


# Separation of stacks: cascading effect [4 of 4]

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

In effect Collect layer shuns Locfen layer hosts



# Other quirks: Connection contamination

## (Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)

After a client-connection closes, the connection will be reused

- Collect → Locfen
- Locfen → database

ProxySQL resets connection to initial connection parameters

What if new connection doesn’t match settings (e.g. UTF8mb4 or CET timezone?)

Will the connection between Locfen → database also change?

# Other quirks: Uneven distribution

**(Service Discovery and Failover with ProxySQL and Orchestrator – PL May 2021)**

Uneven distribution of connections/queries

- Weight influences the distribution of connections
- Reuse of existing connections is favored by ProxySQL
- Influenced by *mysql-free_connections_pct*

The variable *mysql-free_connections_pct* is a global variable

- Percentage of maximum allowed connections of a hostgroup
- Some hostgroups allow up to 3000 incoming connections
- 2% of 3000 is 60 connections, actual usage is 10 to 15
- More connections are kept open in connection pool than necessary

# Thanks !

Almost Perfect Service Discovery and Failover with ProxySQL and Orchestrator

*by* Jean-François Gagné
*and* Art van Scheppingen

Presented at Percona Live Online, May 2021