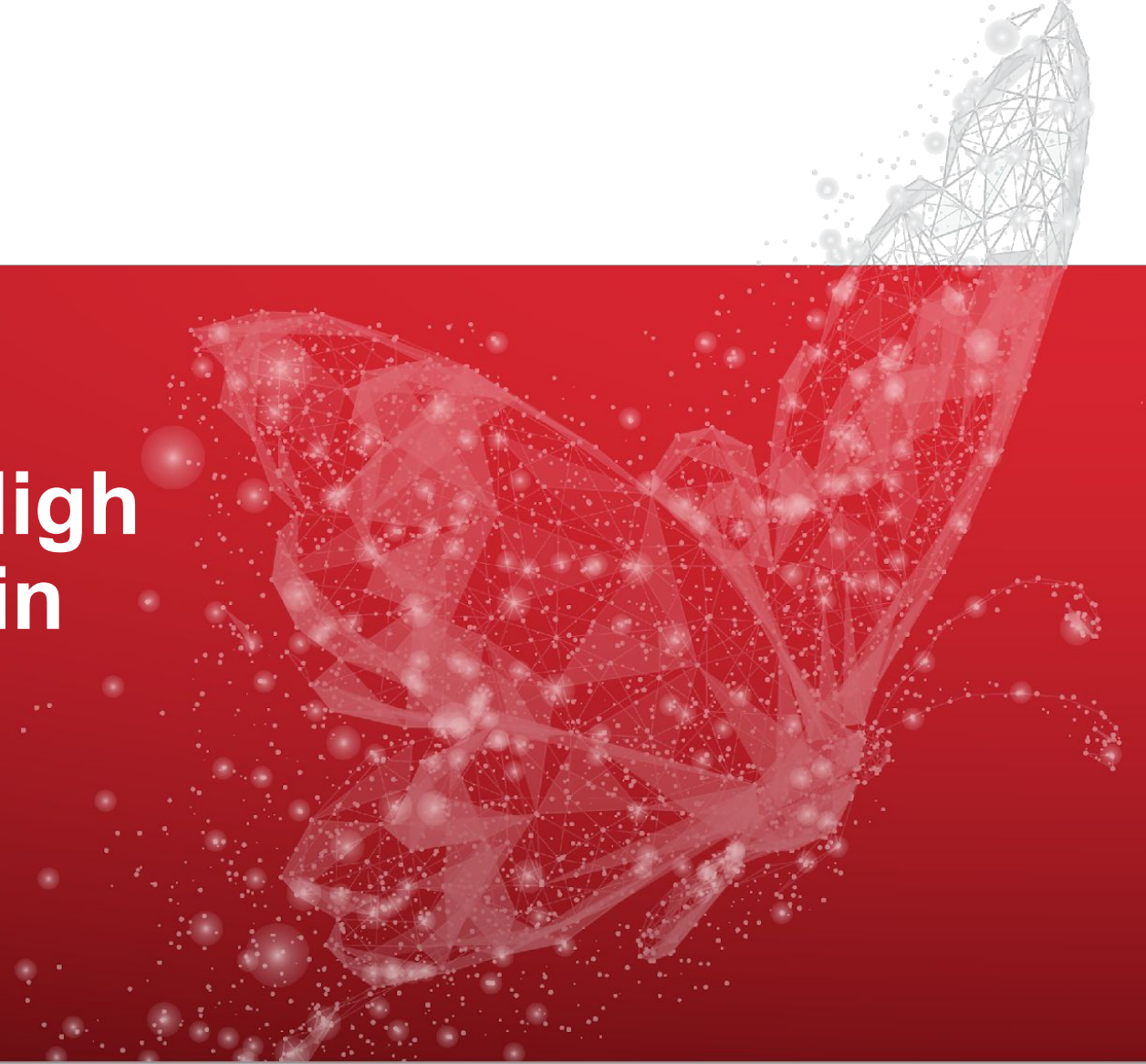# Using DR to Ensure High Availability of GridGain Clusters

Konstantin Orlov
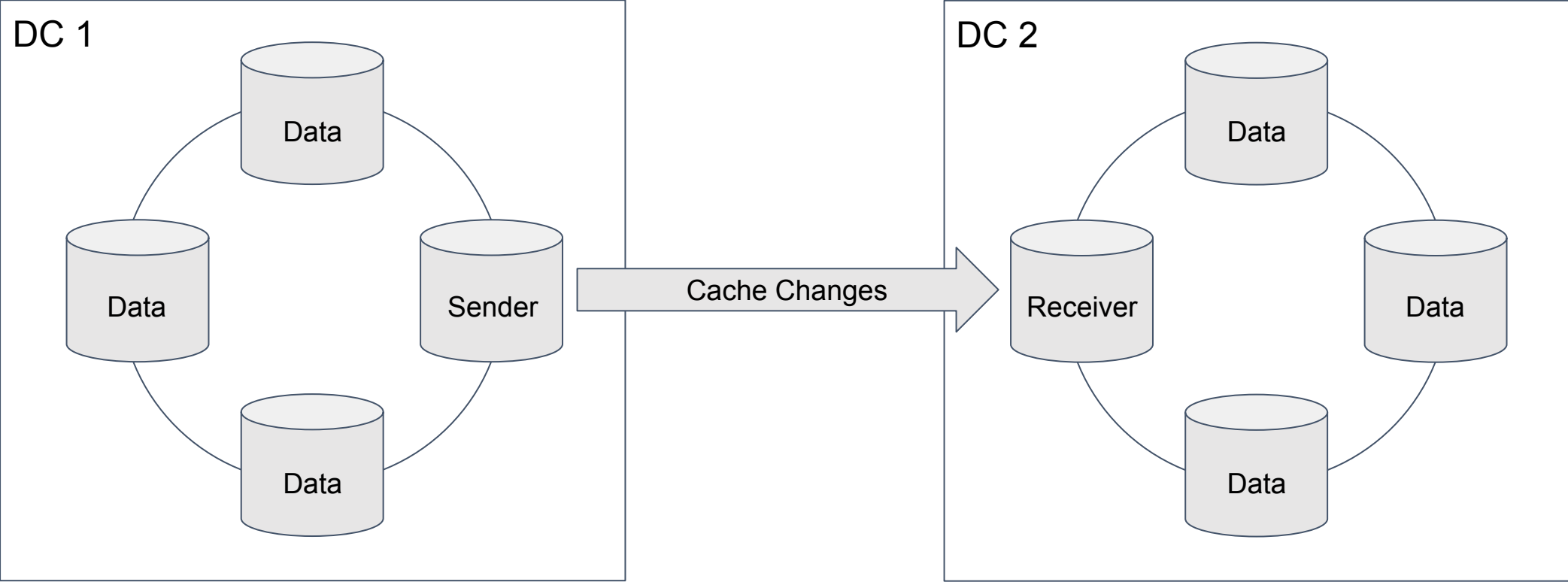
May 13

Part 1. Concepts and Terms

GridGain

What Is The Data Center Replication

DC 1

Data

Data

Sender

Cache Changes

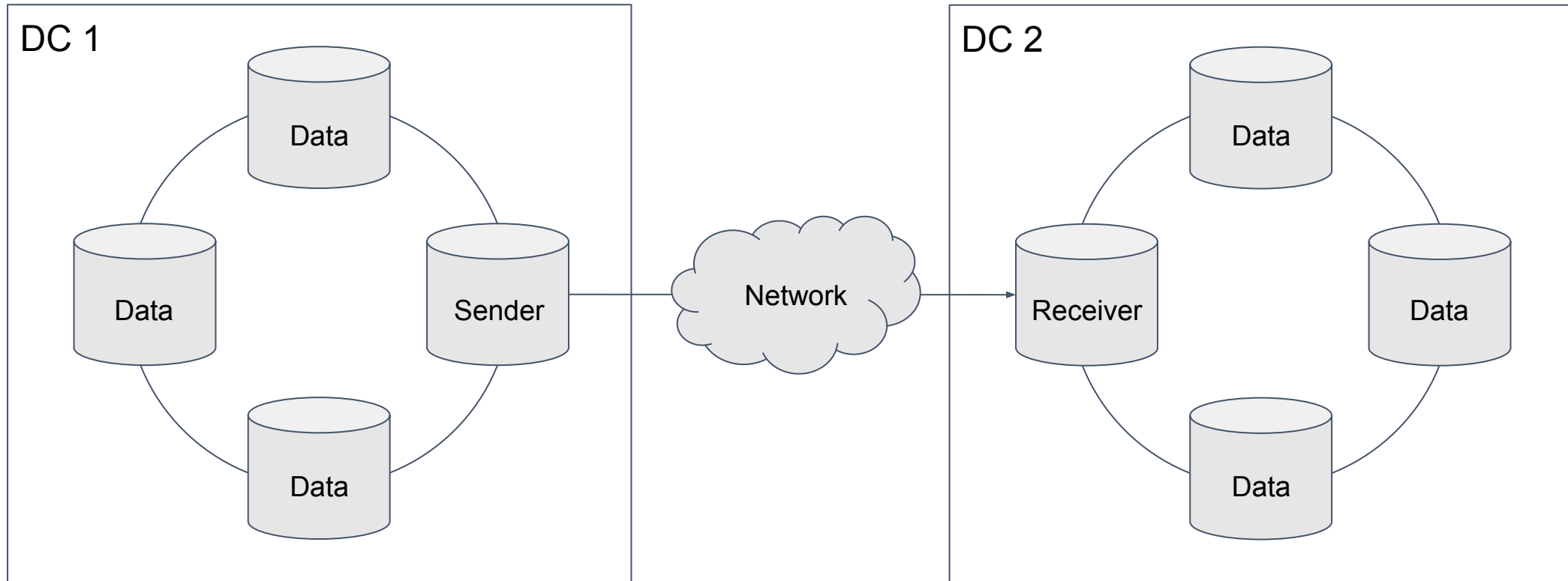Receiver

DC 2

Data

Data

Data

GridGain

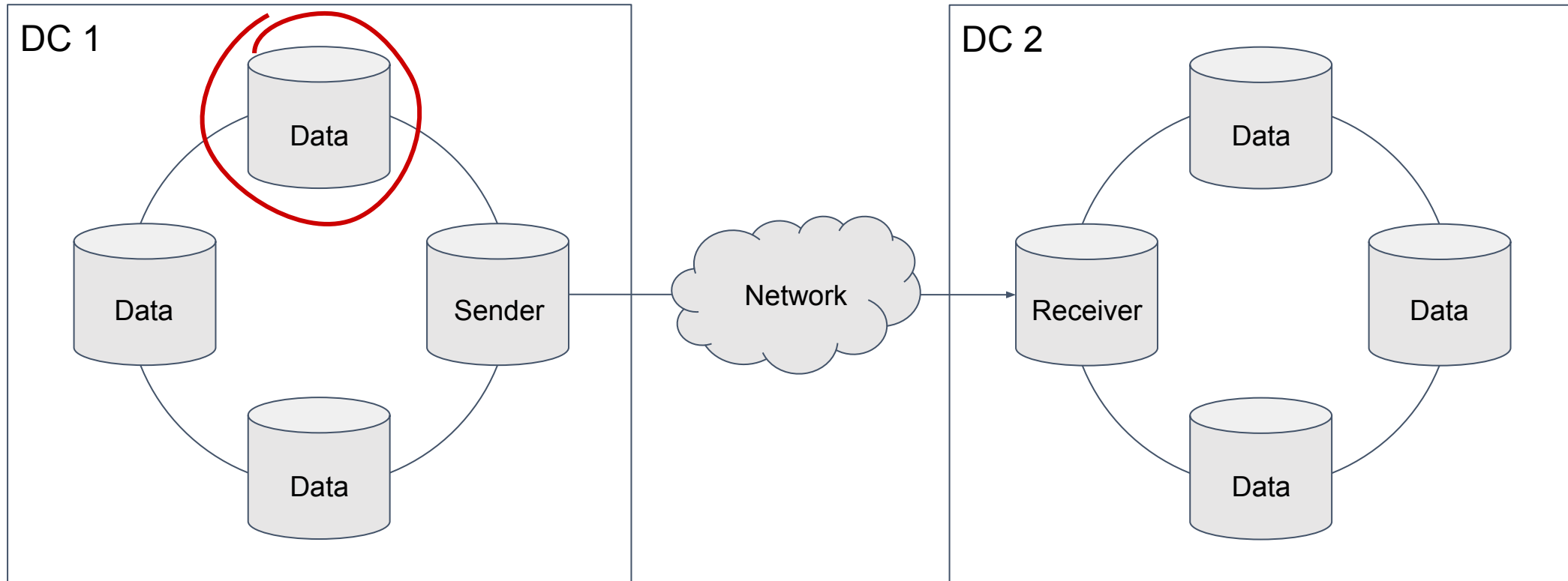# When Should You Use Replication

- When you need an online replica for recovery
- When you need a read-only replica for OLAP
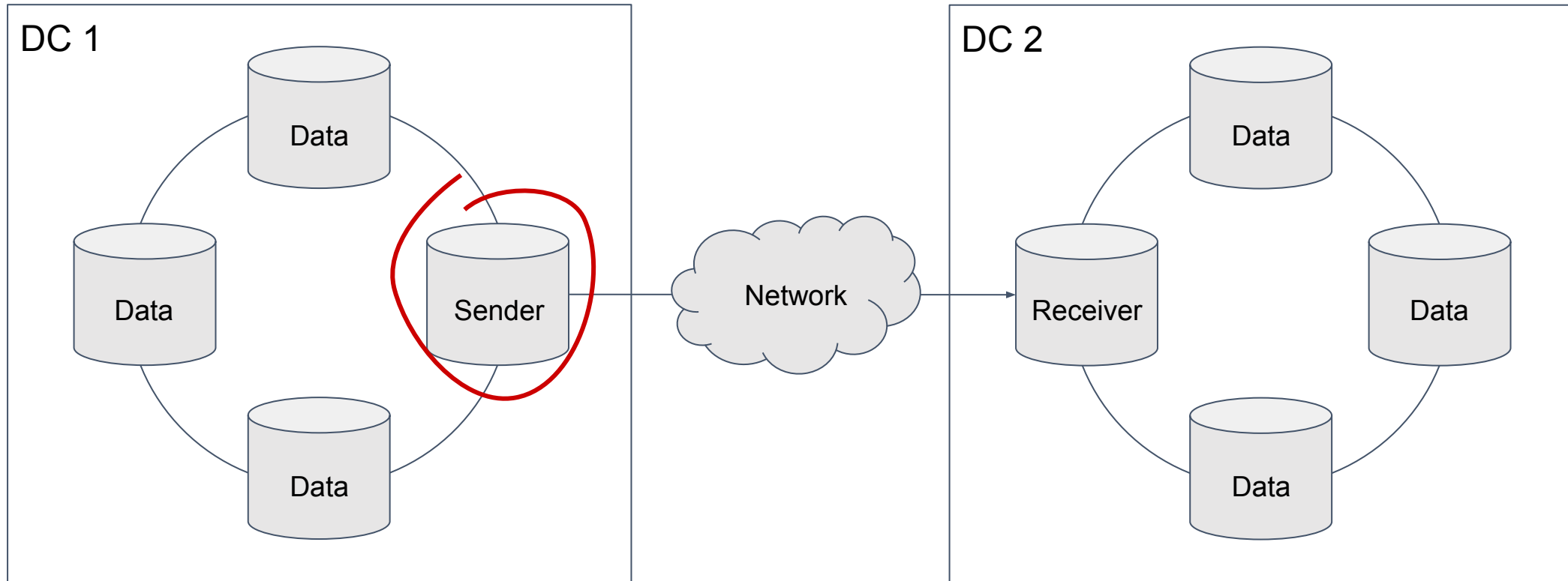- When you need an active replica for load balancing

Data Center Replication Parts
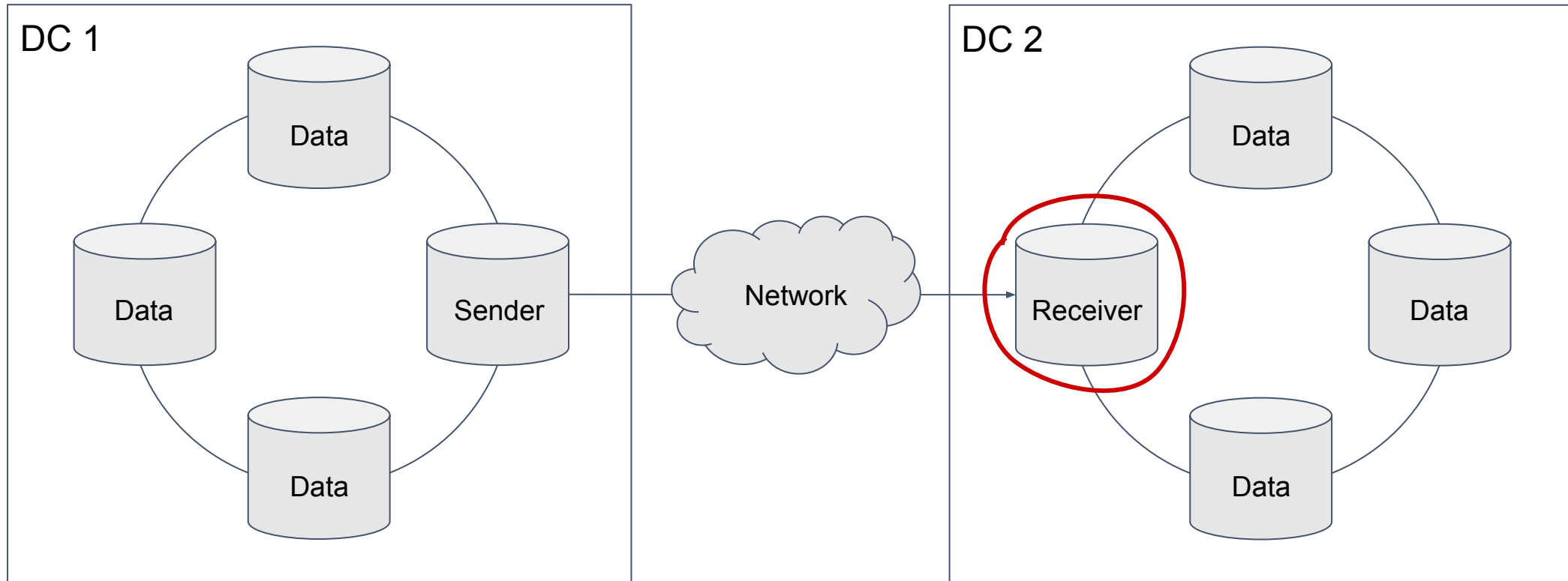
Data Center Replication Parts

Data Center Replication Parts

Data Center Replication Parts

Part 2. Demo

GridGain

Scenario 1. Preconditions

- Replication mode is active-passive
- Replication is started
- Cache is empty

GridGain

Scenario 1. Configuration Key Points

- All nodes have a GridGainConfiguration with proper dataCenterId configured
- At least one node from the active topology has a proper DrSenderConfiguration
- At least one node from the passive topology has a proper DrReceiverConfiguration
- Replicated cache has a proper GridGainCacheConfiguration

GridGain

- Replication mode is active-passive
- Replication is started
- Cache is NOT empty when replication starts up

Scenario 2. Replication limitations

- State transfer is required if replications starts on non-empty cache
- Cache in remote DC should be empty since state transfer does not transfers removes

GridGain

Scenario 3. Preconditions

- Replication mode is active-active
- Replication is started on both sides
- Cache is empty on both sides

GridGain

Scenario 3. Configuration Key Points

- All nodes have a GridGainConfiguration with proper dataCenterId configured
- At least one node from both topologies has a proper DrSenderConfiguration
- At least one node from both topologies has a proper DrReceiverConfiguration
- Cache configuration has a proper GridGainCacheConfiguration with conflict resolver configured

Scenario 4. Preconditions

- Replication mode is active (doesn't matter)
- Replication is started
- Cache is empty on both sides

GridGain

Scenario 4. Conclusion

GridGain has no standard mechanism to handle failover.

Possible approaches to handle it:

- Reconnection to another topology
- Keeping connections to several topologies and switching between them
- Mixing both approaches

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Part 3. Known issues

GridGain

Occasionally data nodes fail with OOM

CacheDrSenderConfiguration#setBatchSendFrequency

CacheDrSenderConfiguration#setBatchSendSize

CacheDrSenderConfiguration#setMaxBatches

CacheDrSenderConfiguration#setStateTransferThreadsCount

GridGain

Occasionally senders fail with OOM

DrSenderConfiguration#setMaxQueueSize
DrSenderConfiguration#setFullStateTransferBufferSize

Replication stops when FST is running

CacheDrSenderConfiguration#setStateTransferThrottle
CacheDrSenderConfiguration#setStateTransferThrottleBytes
CacheDrSenderConfiguration#setBatchSendFrequency
CacheDrSenderConfiguration#setBatchSendSize
DrSenderConfiguration#setMaxQueueSize

Links

DR documentation

gridgain.com/docs/latest/administrators-guide/data-center-replication/introduction

GridGain Webinars

gridgain.com/resources/webinars

Demo

github.com/GridGain-Demos/gridgain-data-center-replication-demo