Slow is Down and Down is Dead:

Using GridGain's Multi Data Center Replication to build a bullet-proof application.

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Tell ‘em what you are going to tell ‘em

What is Apache Ignite and GridGain?

Who needs multi- datacenter replication?

Why is using multi-datacenter replication essential for my modern data intensive application?

Where can I deploy it?

How does it work?

When should I do it?

But first… a word from our sponsor….

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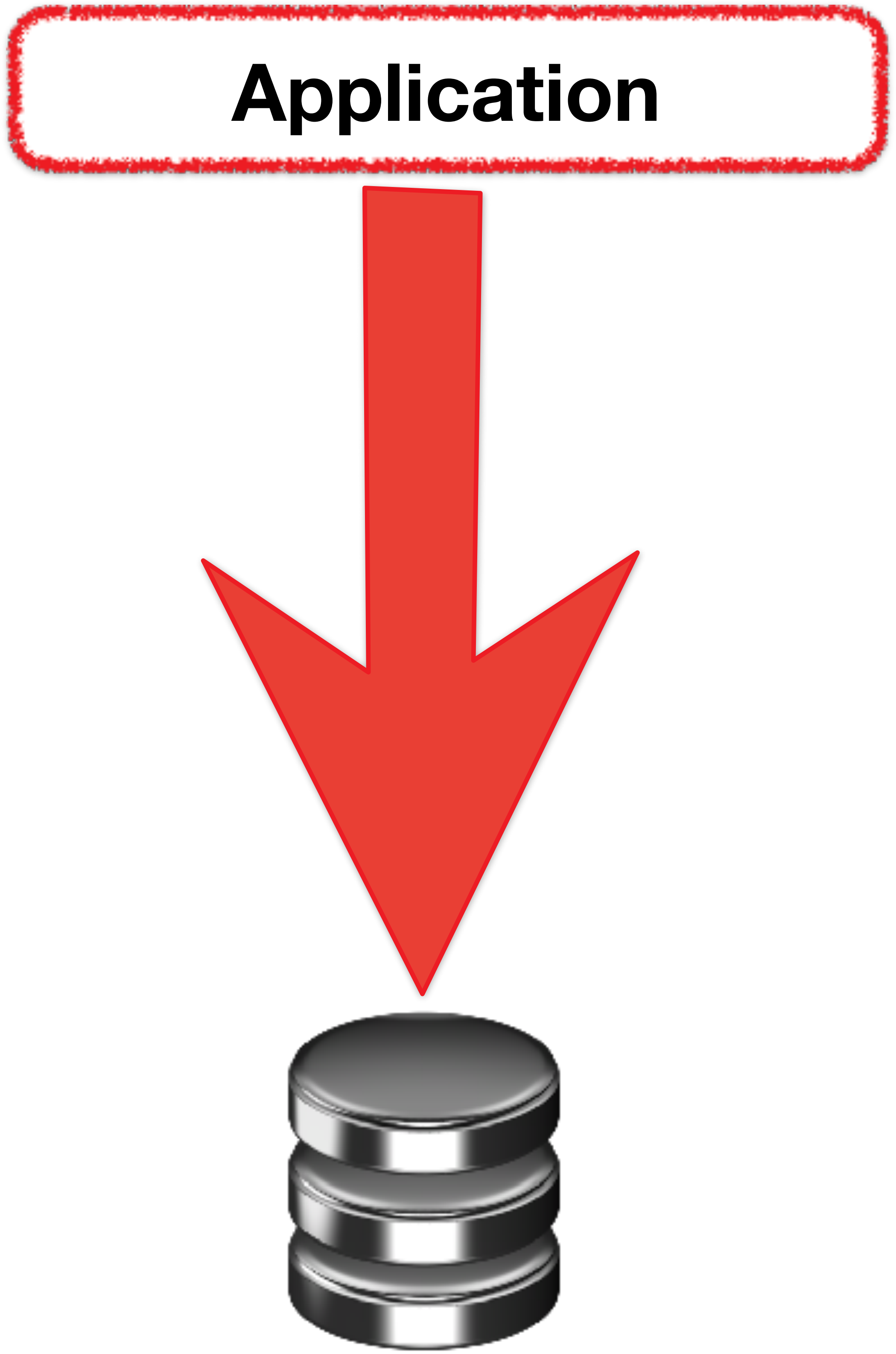
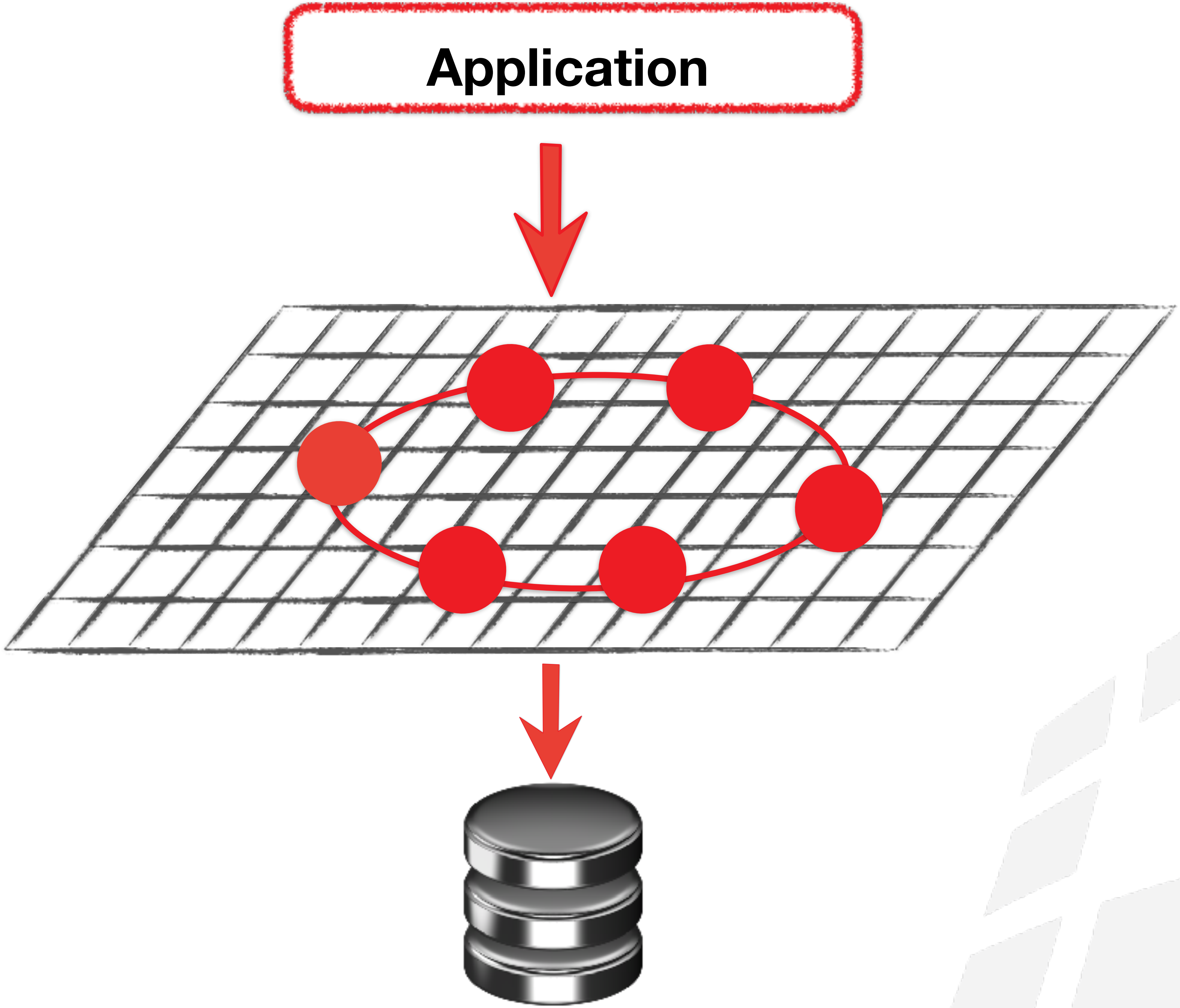
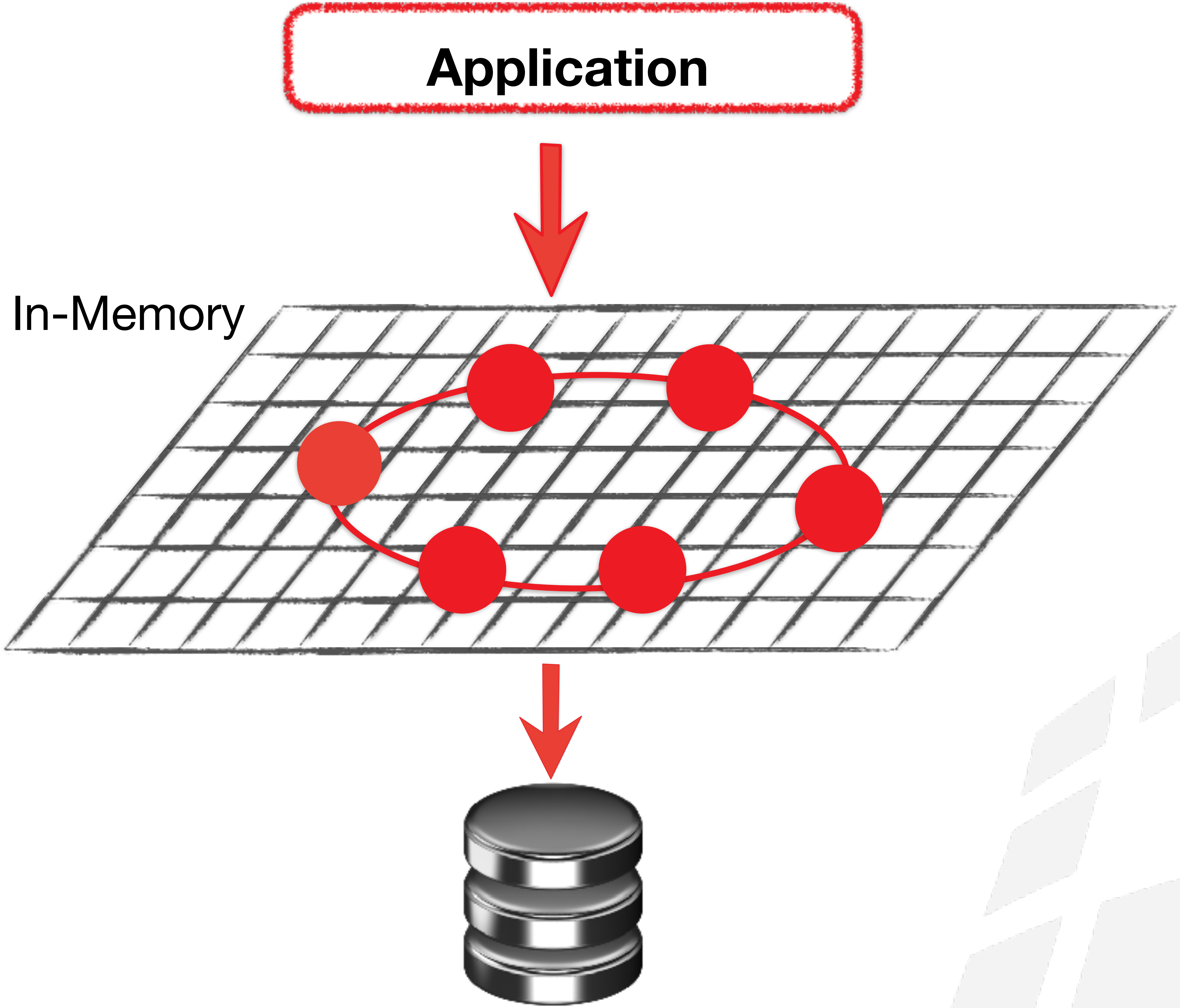


Application

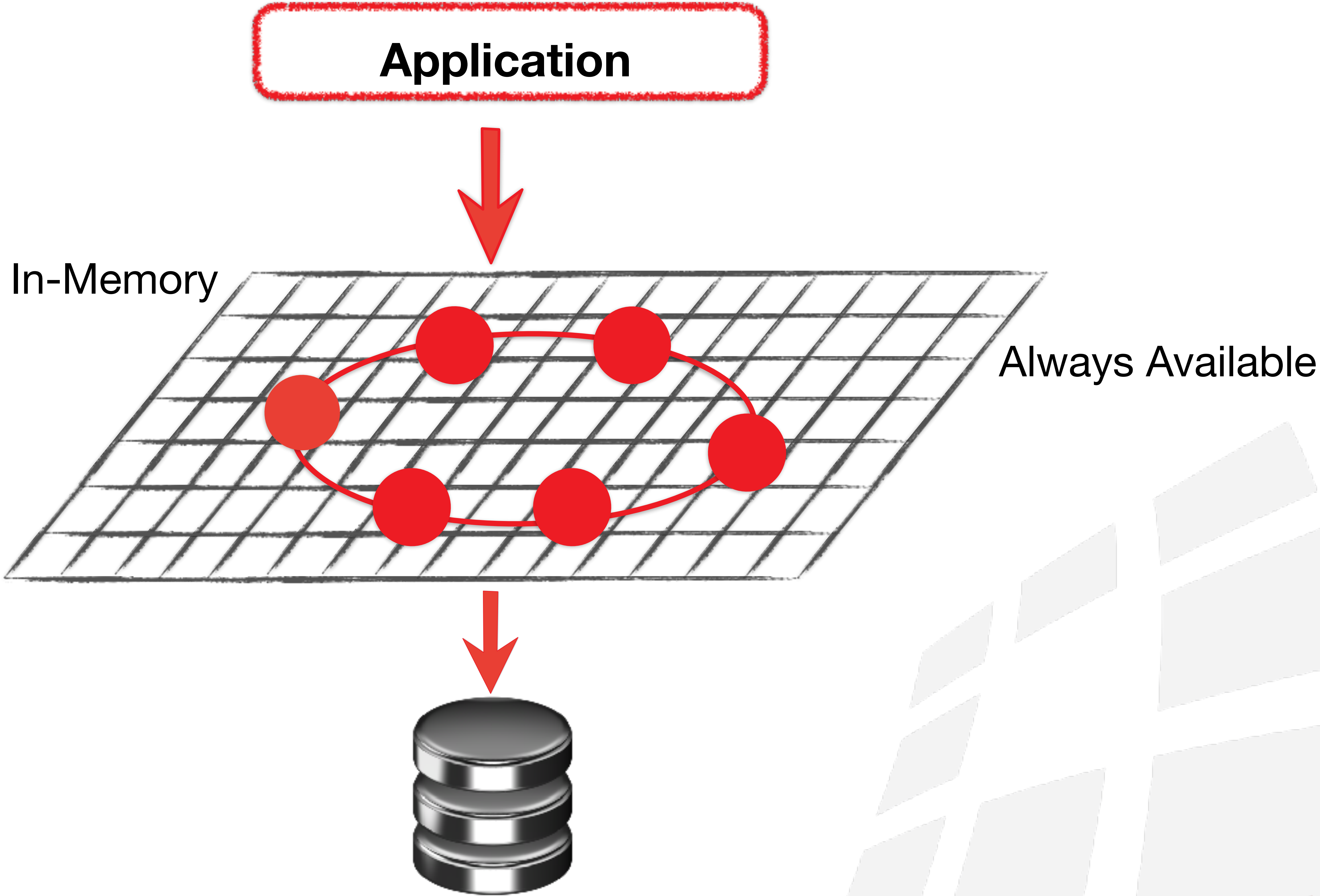


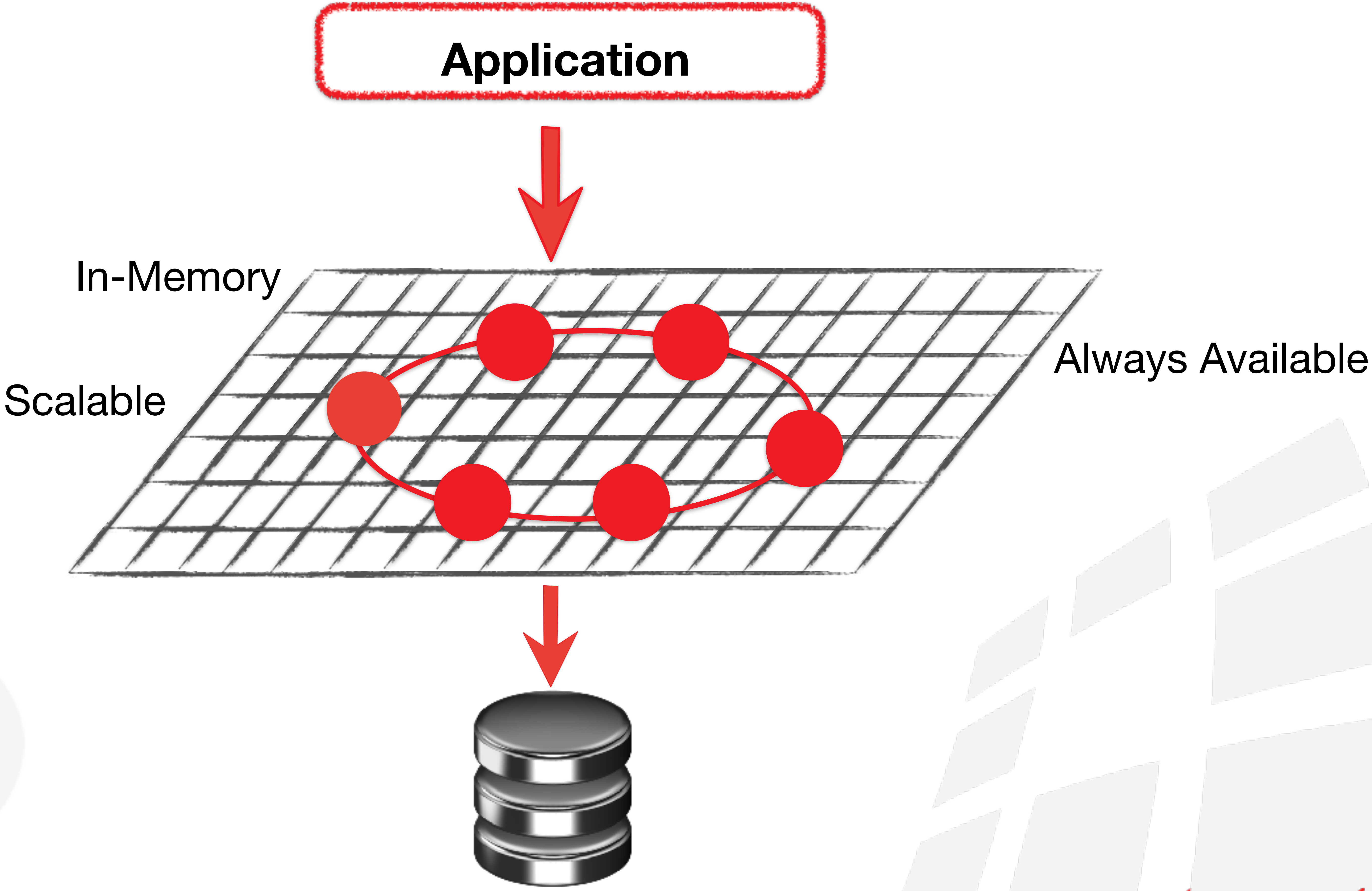
Application

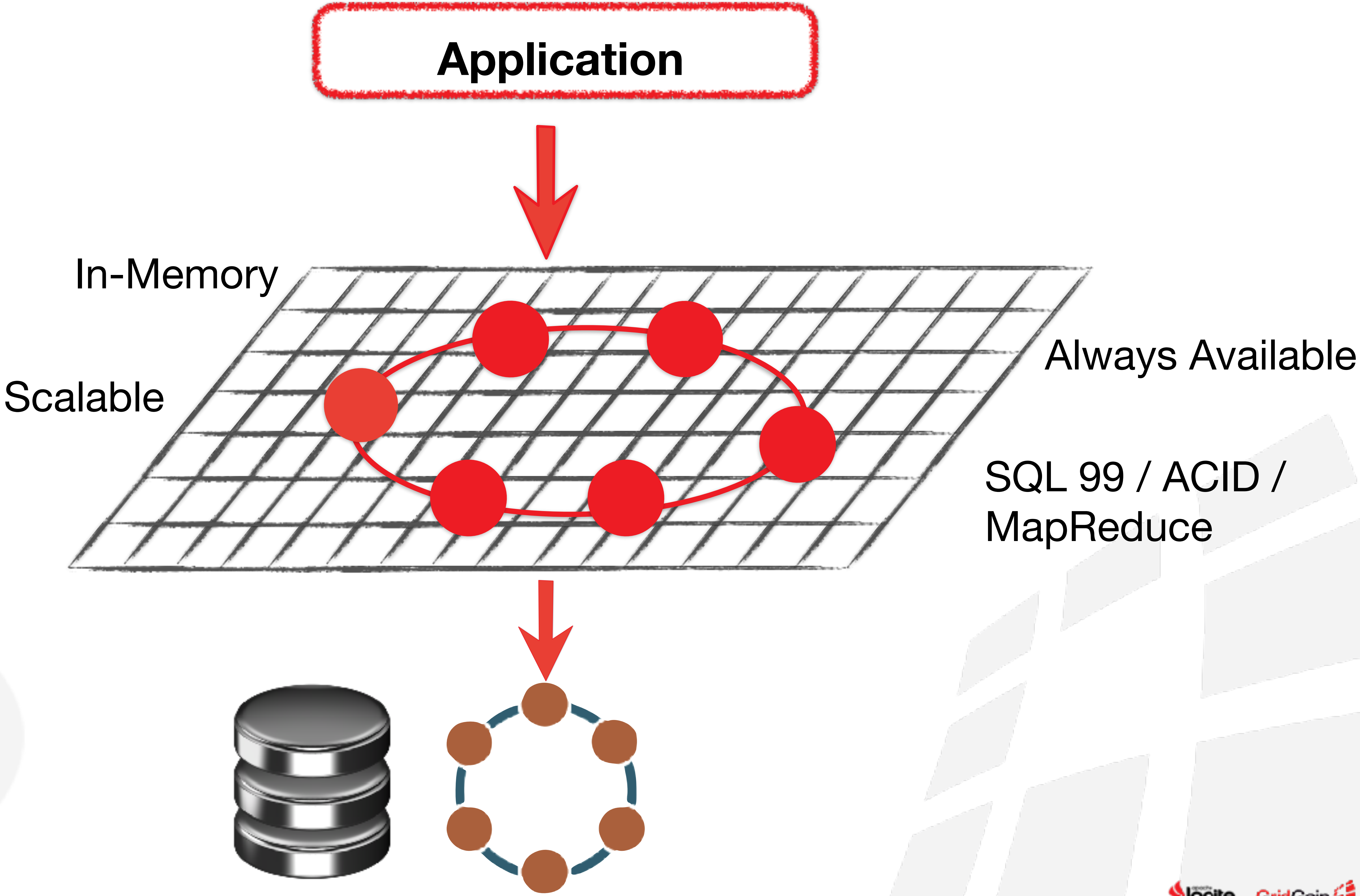


Application

In-Memory


Application
In-Memory
Always Available


Application
In-Memory
Scalable
Always Available



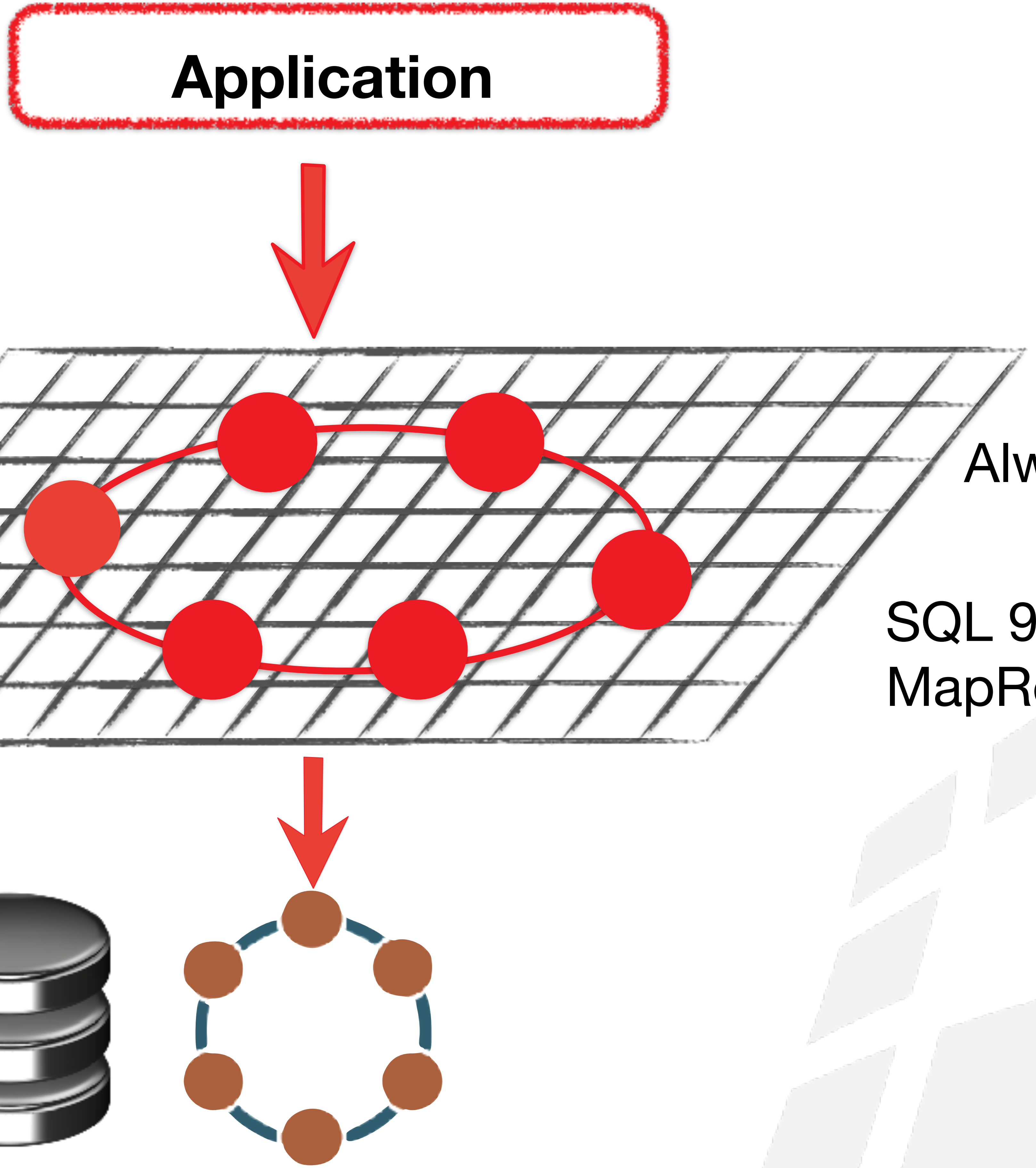
Application

In-Memory

Scalable

Always Available

SQL 99 / ACID / MapReduce



Application

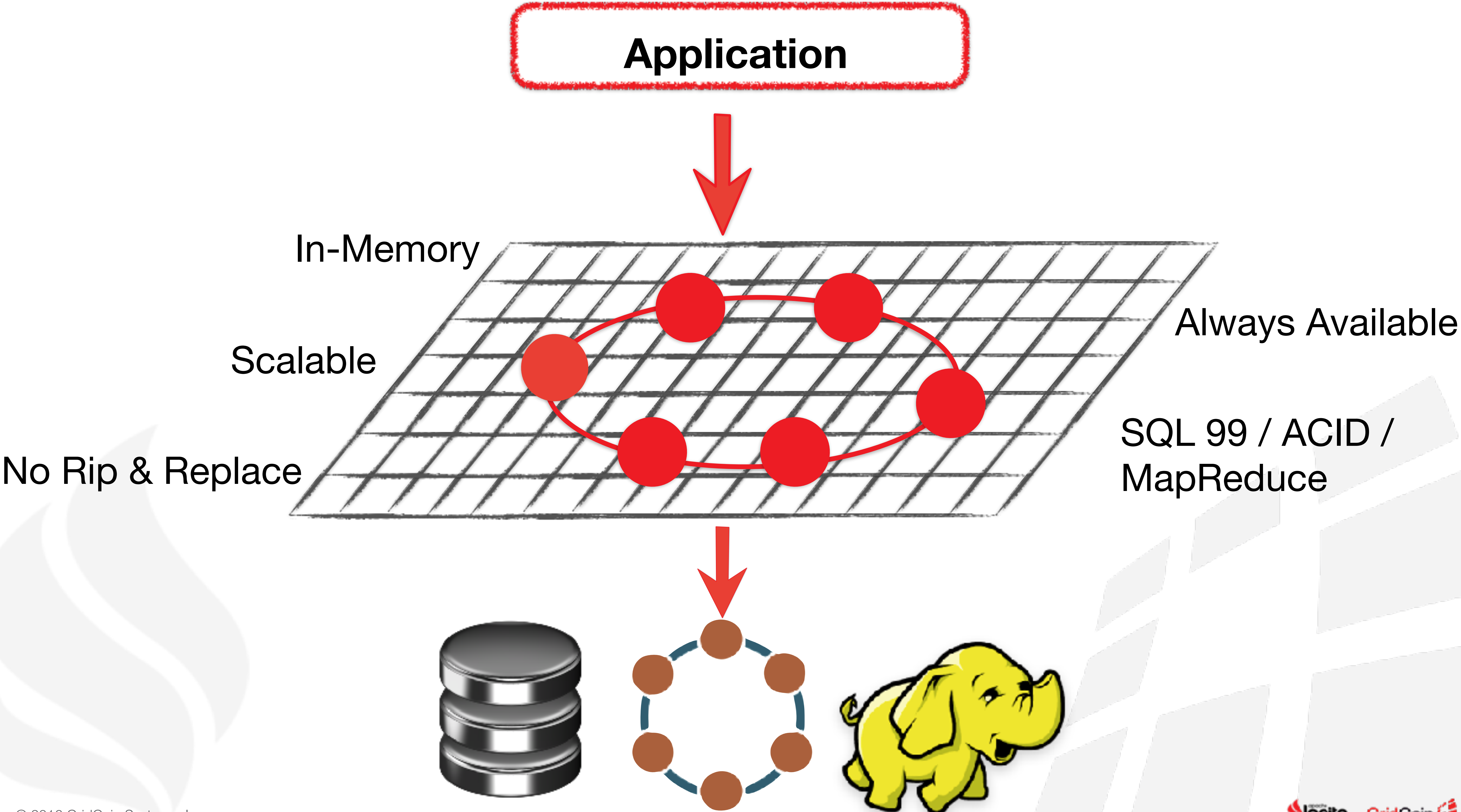
In-Memory

Scalable

No Rip & Replace

Always Available

SQL 99 / ACID /
MapReduce



Application

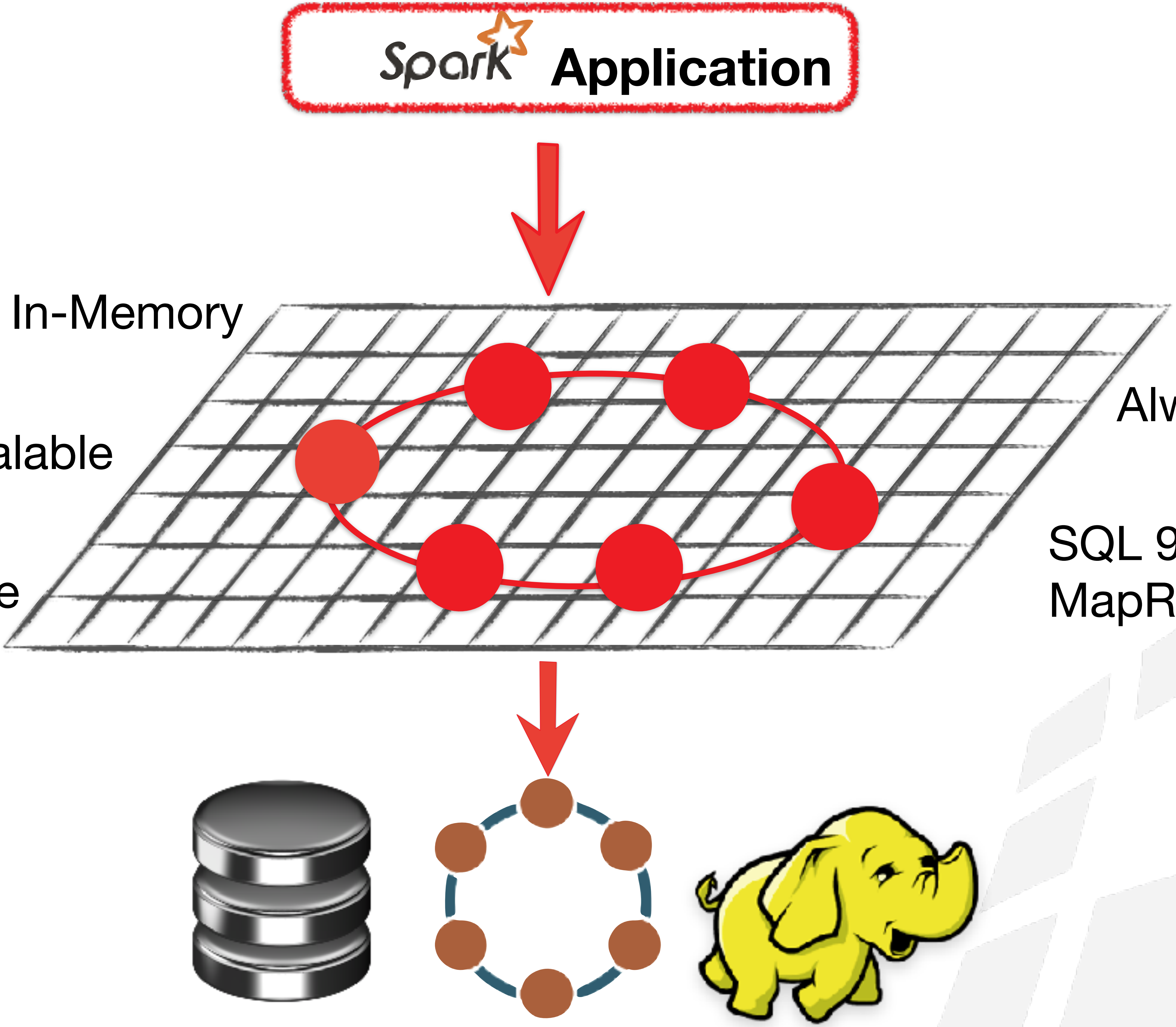
In-Memory

Scalable

No Rip & Replace

Always Available

SQL 99 / ACID / MapReduce



Spark Application

In-Memory

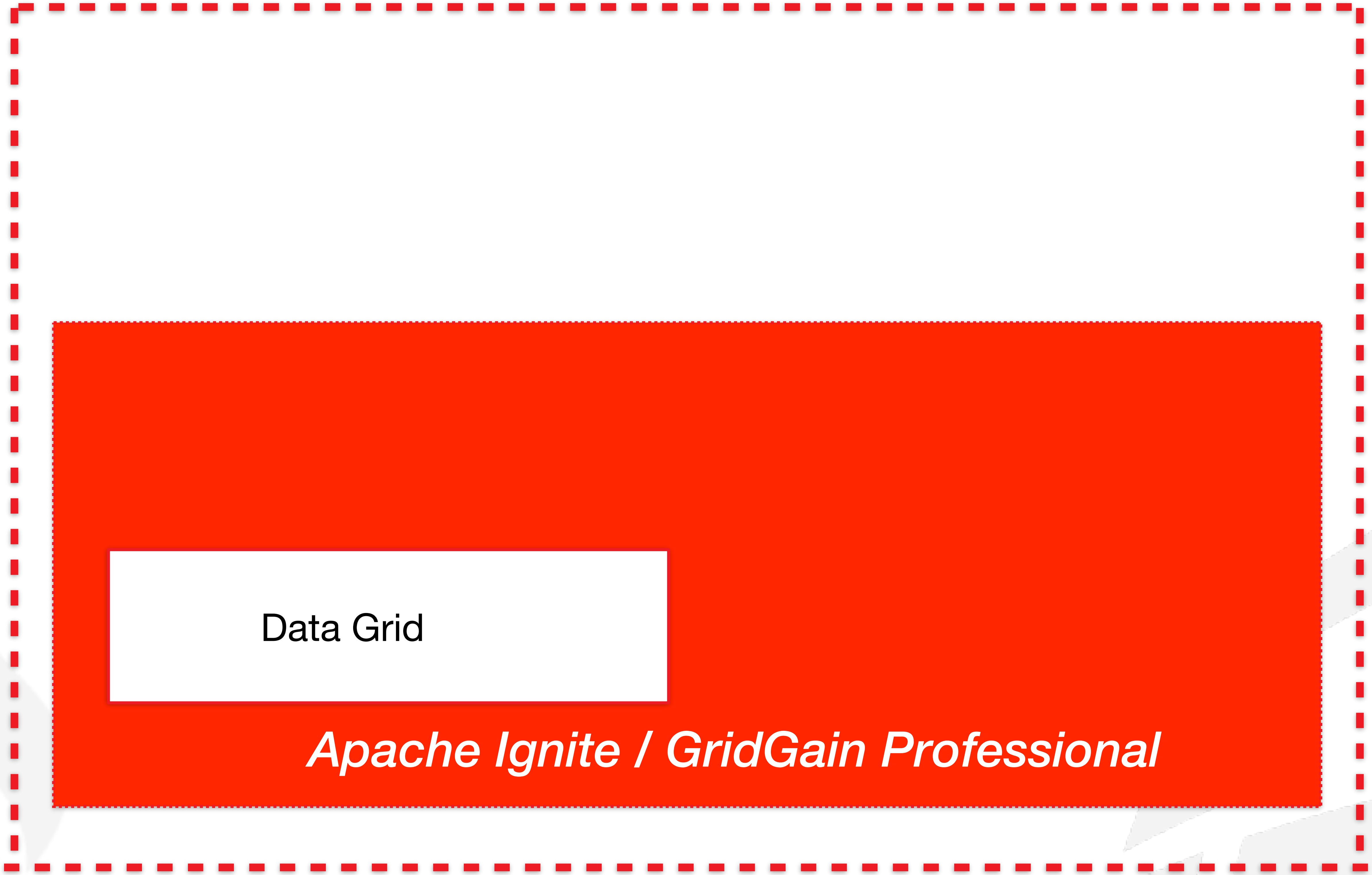
Scalable

No Rip & Replace

Always Available

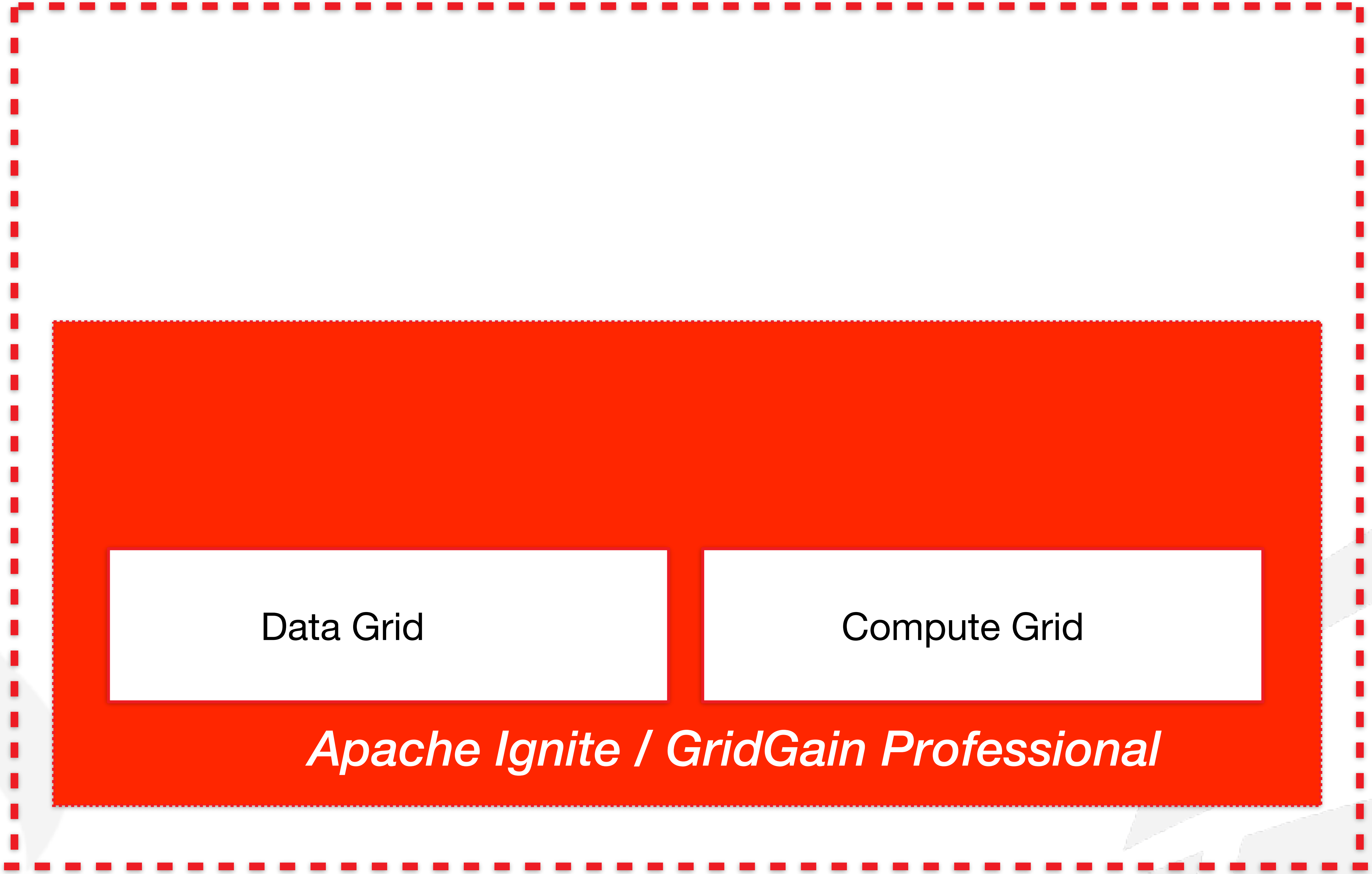
SQL 99 / ACID / MapReduce

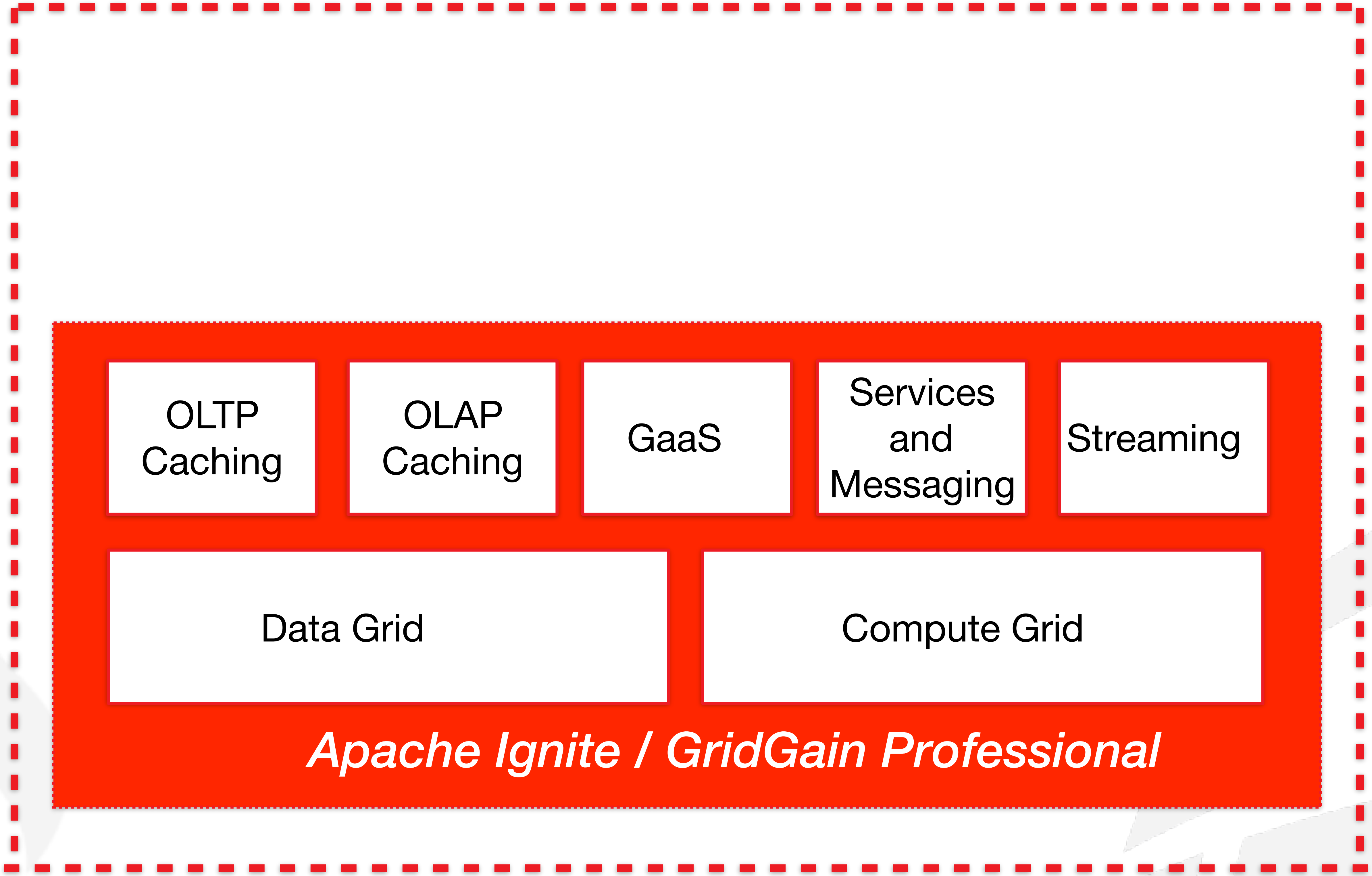
Apache Ignite / GridGain Professional



Data Grid

Apache Ignite / GridGain Professional


Data Grid
Compute Grid
Apache Ignite / GridGain Professional



OLTP Caching

OLAP Caching

GaaS

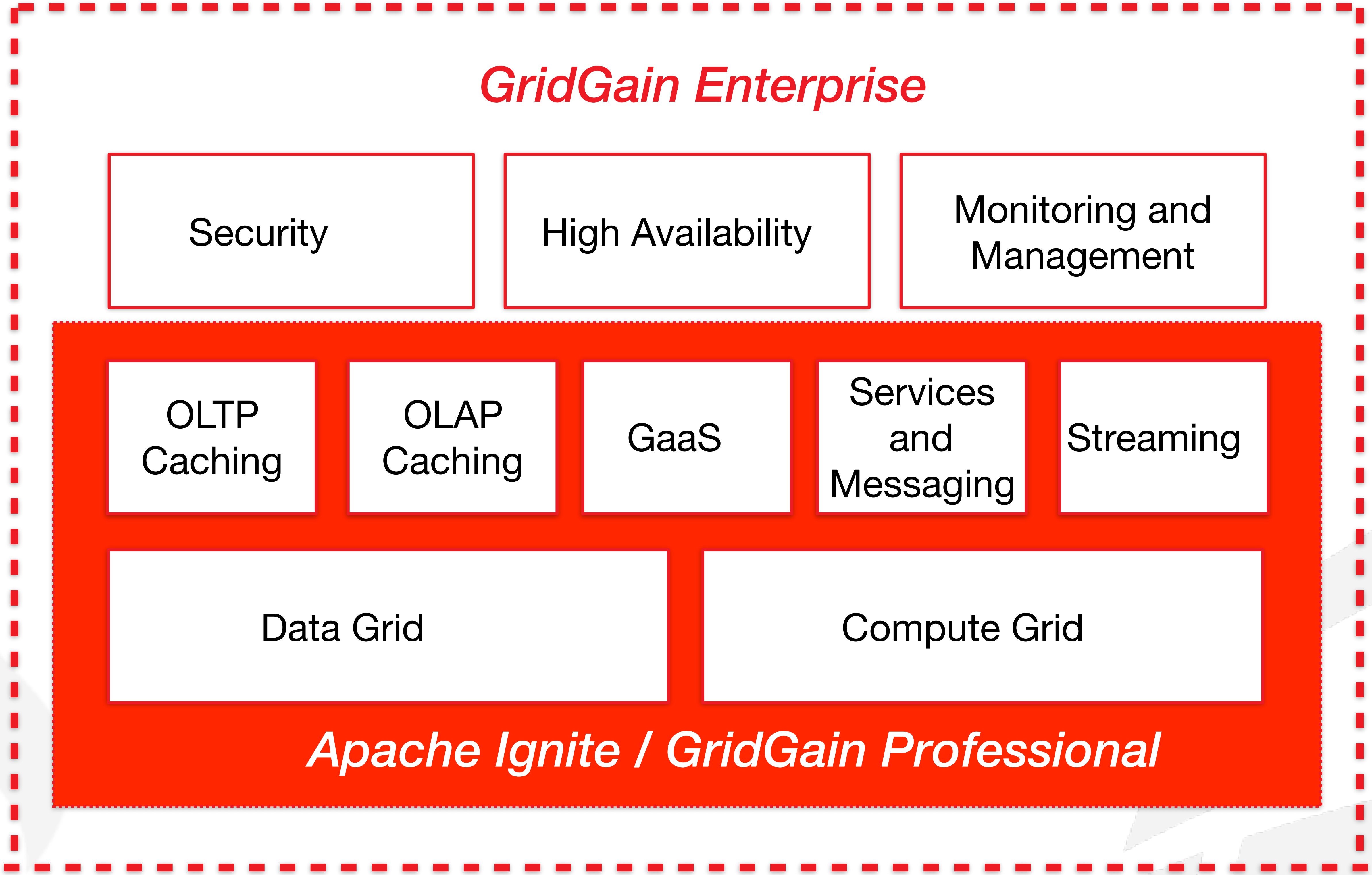
Services and Messaging

Streaming

Data Grid

Compute Grid

Apache Ignite / GridGain Professional



GridGain Enterprise

Security

High Availability

Monitoring and Management

OLTP Caching

OLAP Caching

GaaS

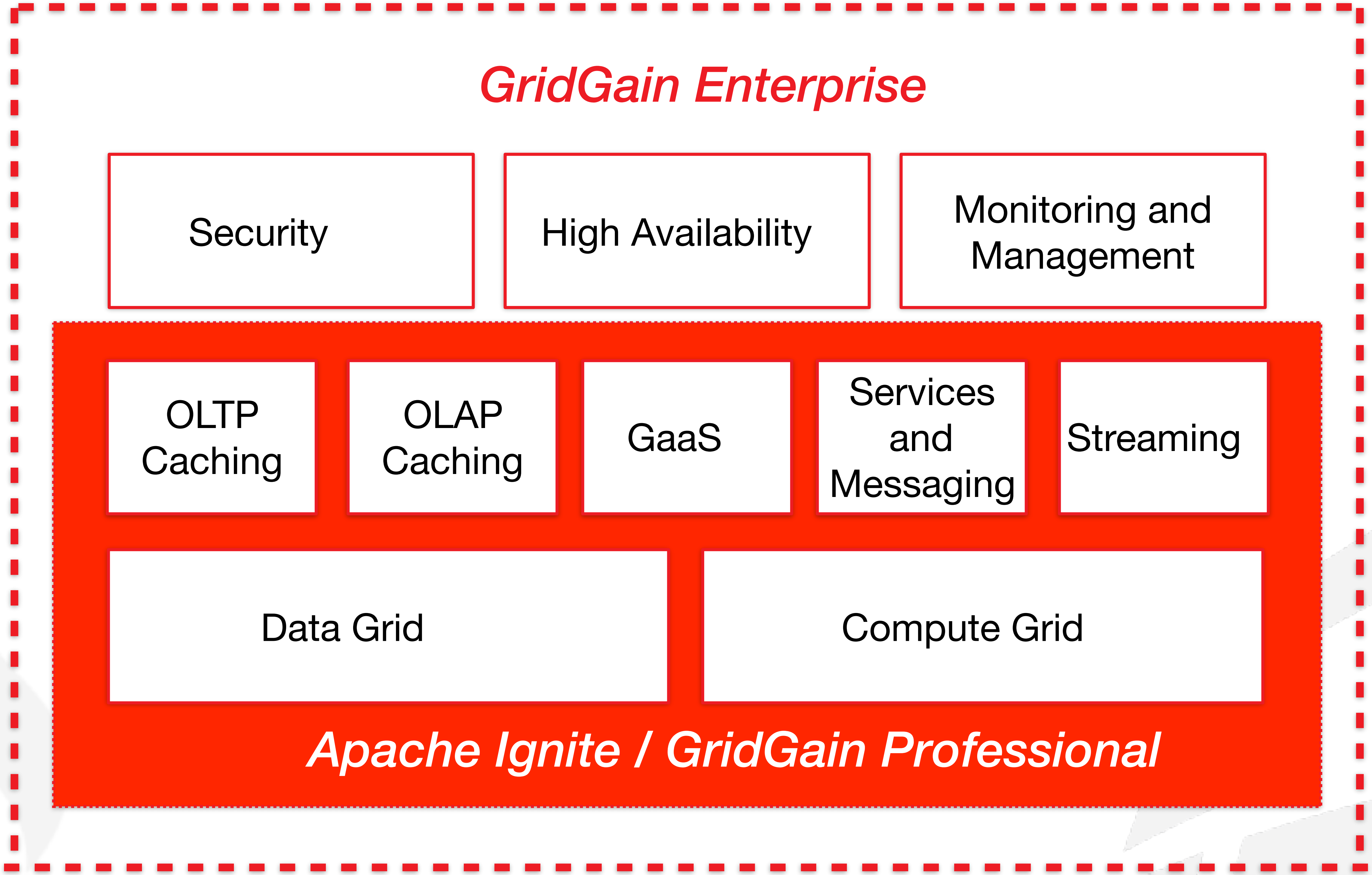
Services and Messaging

Streaming

Data Grid

Compute Grid

Apache Ignite / GridGain Professional



GridGain Enterprise

Security

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OLTP Caching

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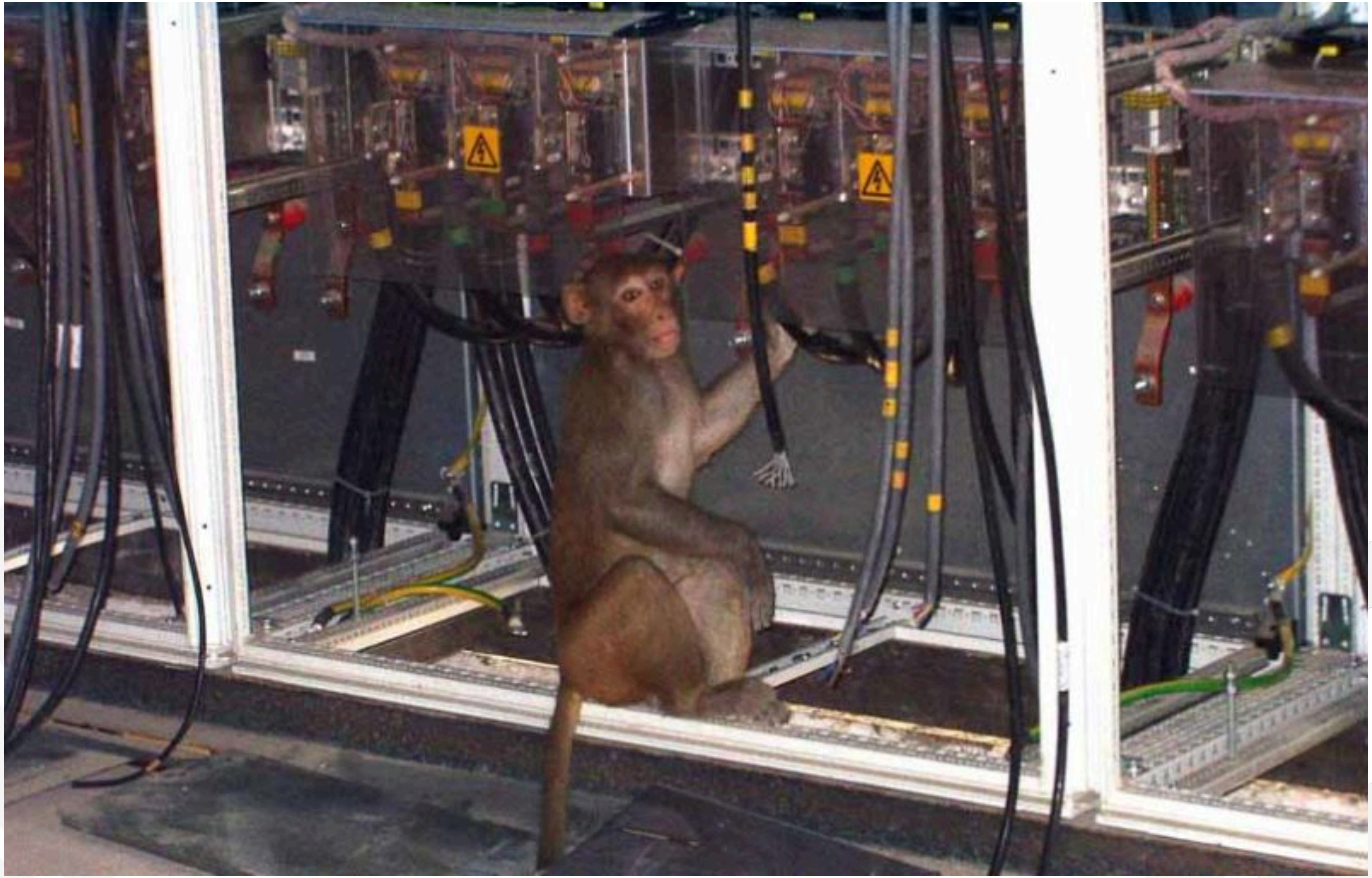
Streaming

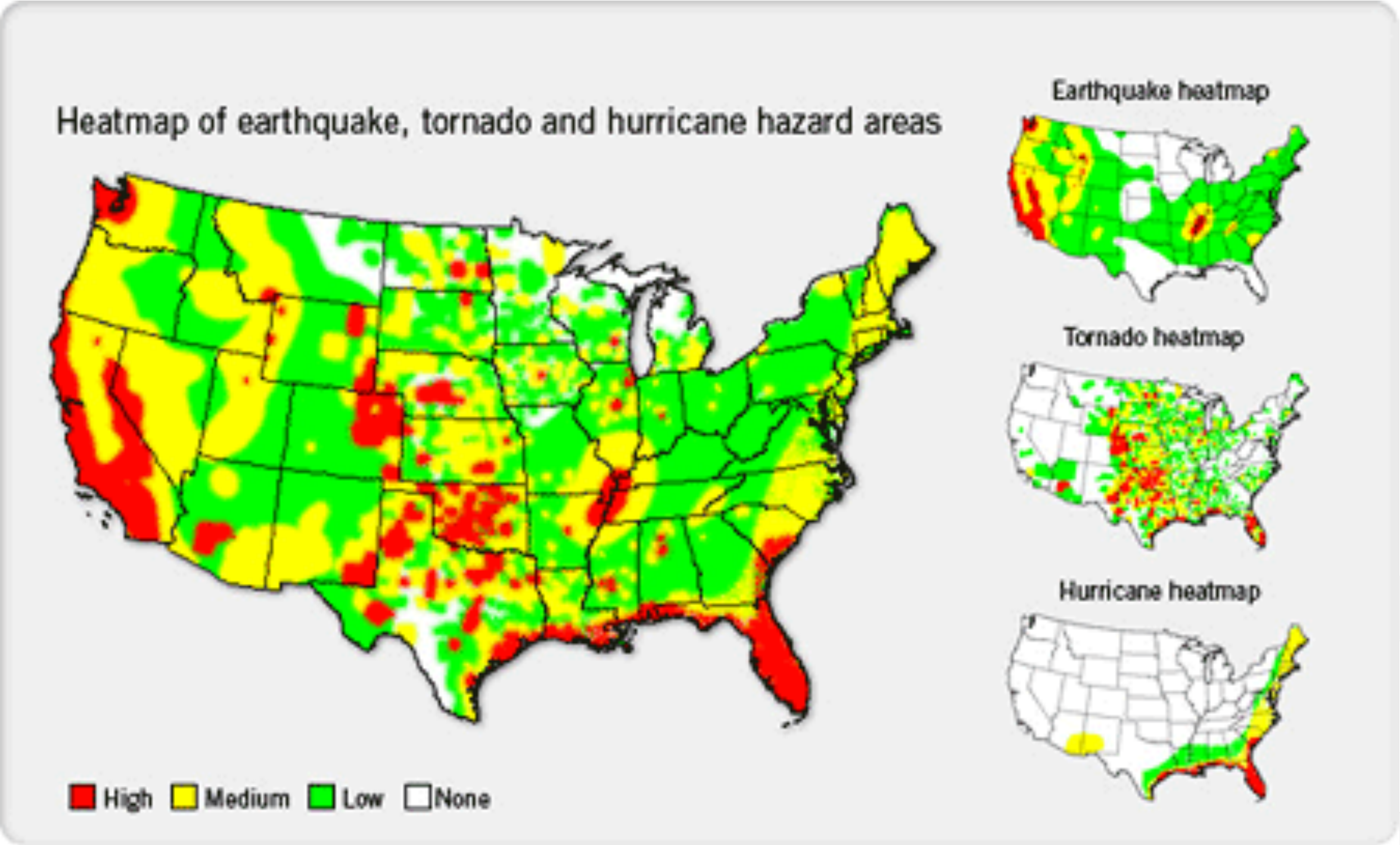
Data Grid

Compute Grid

Apache Ignite / GridGain Professional

CODE DET
MONITOR
NORMAL
DISABLE
FAIL





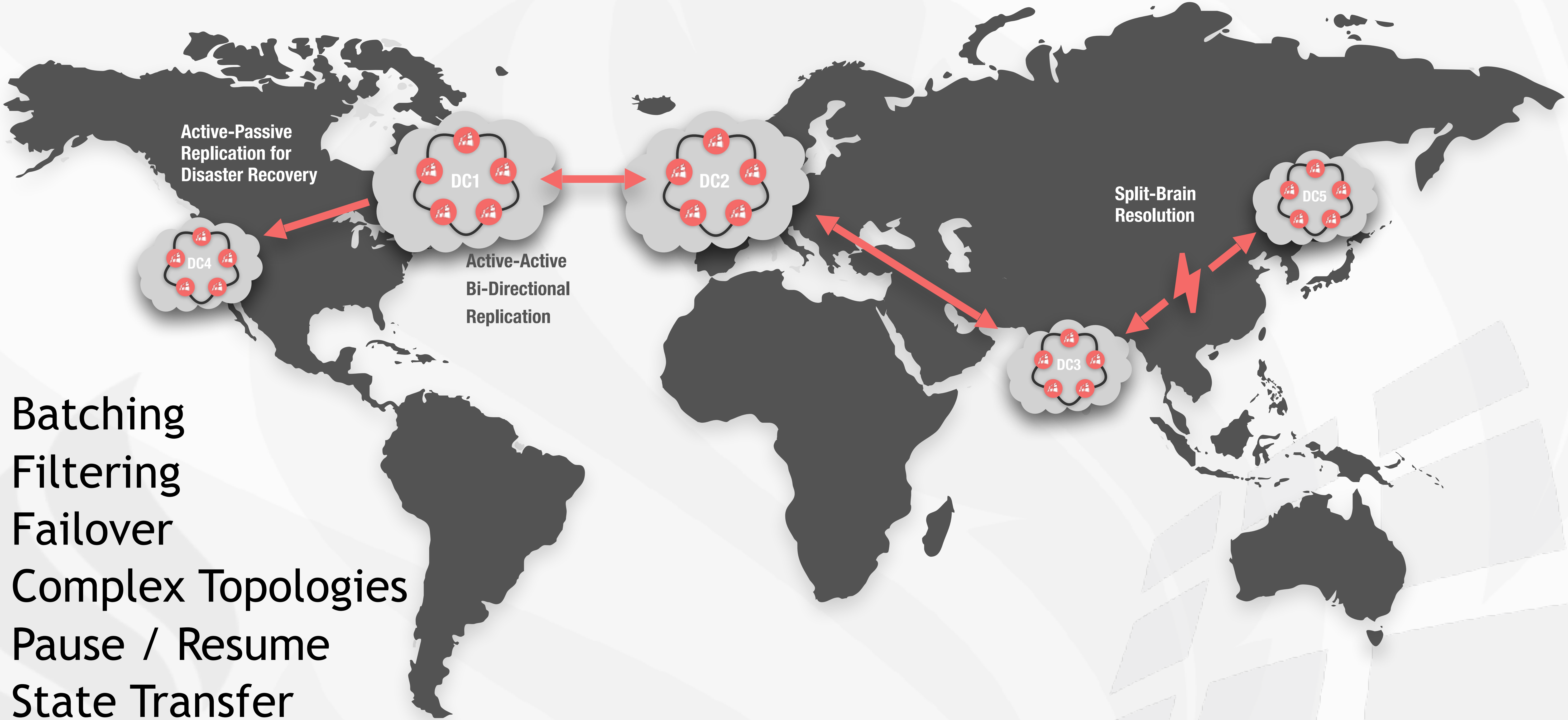
Heatmap of earthquake, tornado and hurricane hazard areas

Earthquake heatmap

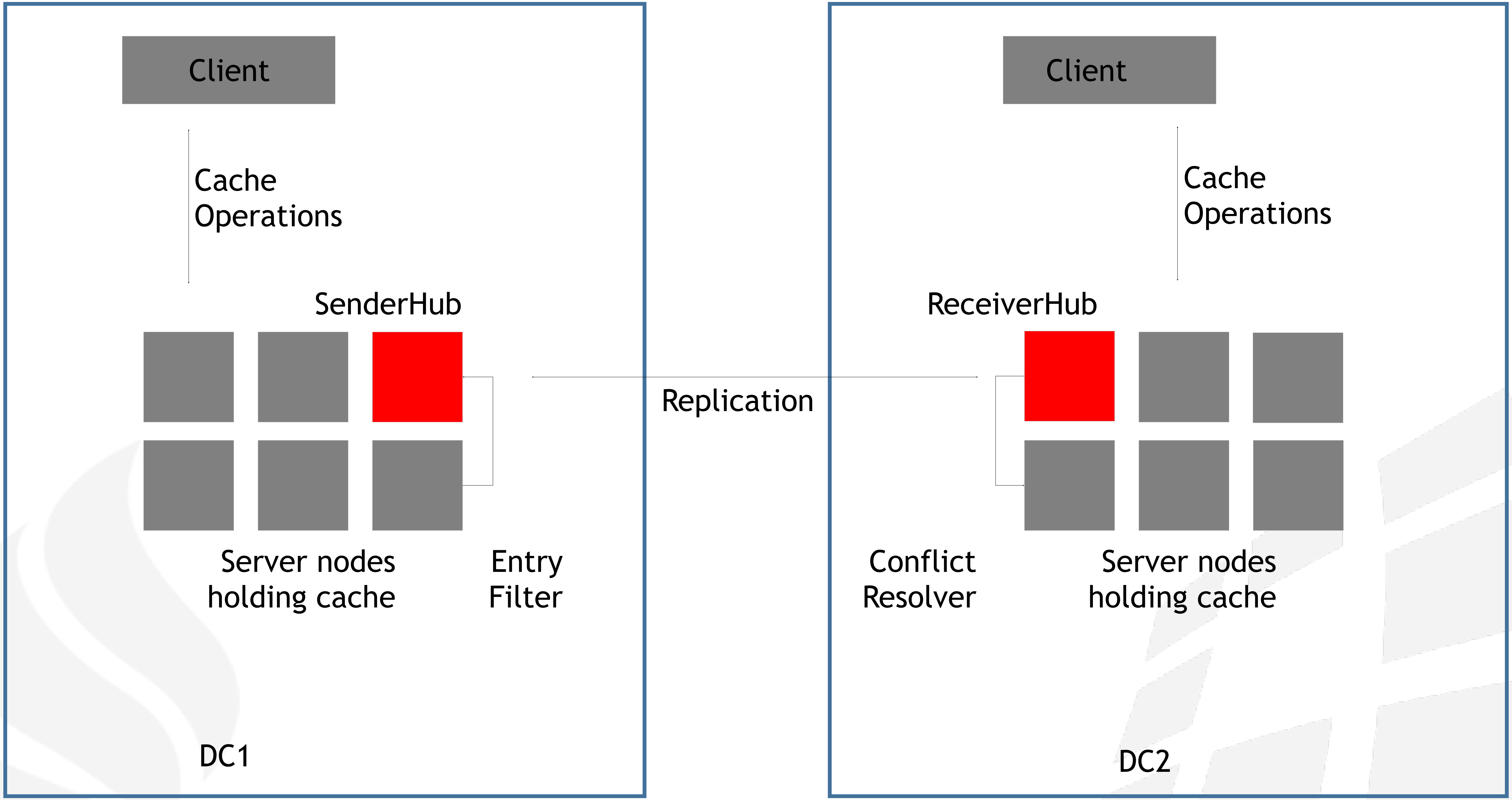
Tornado heatmap

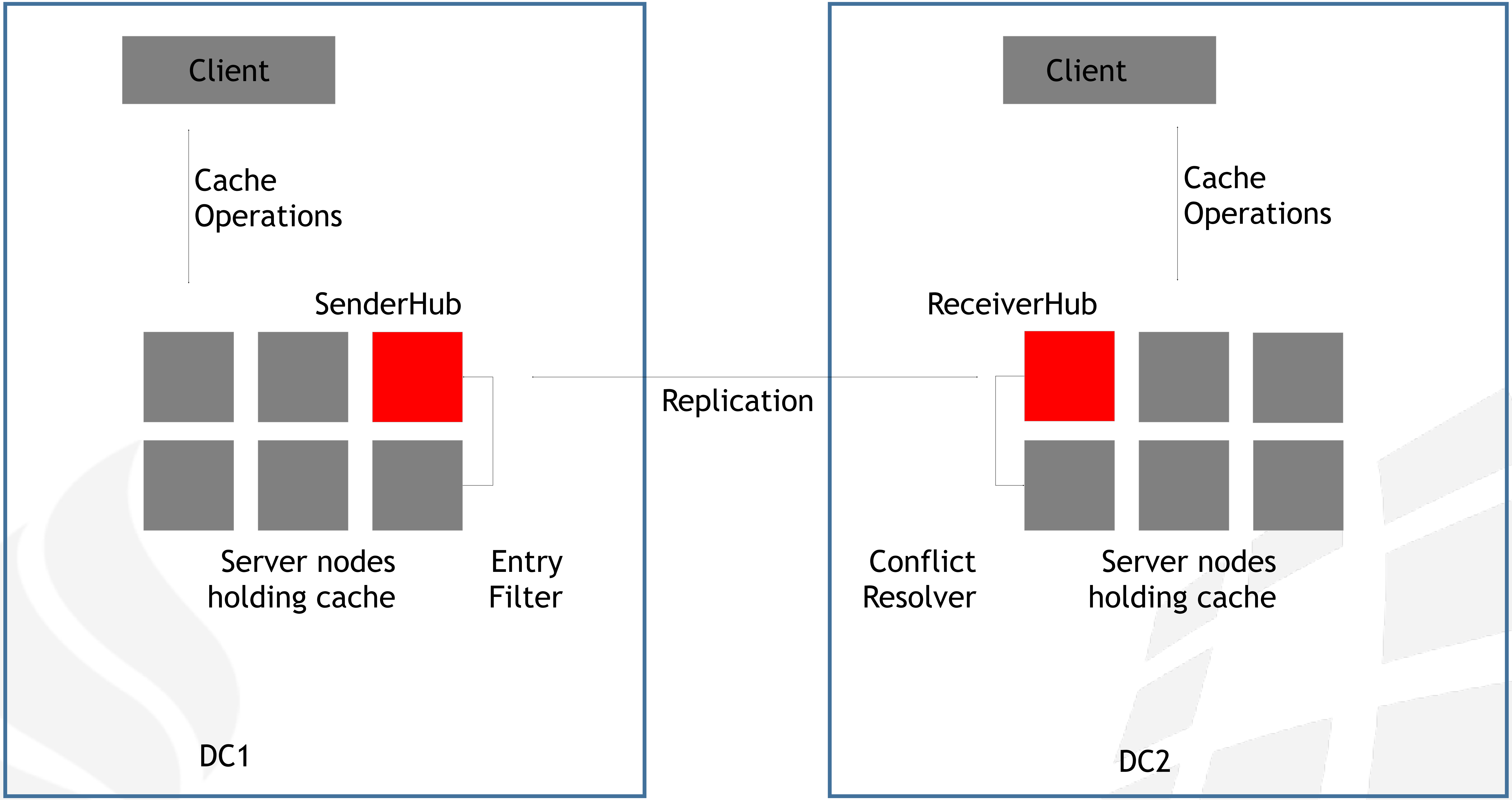
Hurricane heatmap

ON-PREMISE
CLOUD



- Batching
- Filtering
- Failover
- Complex Topologies
- Pause / Resume
- State Transfer


Client
Cache Operations
SenderHub
Server nodes holding cache
Entry Filter
DC1
Replication
Client
Cache Operations
ReceiverHub
Conflict Resolver
Server nodes holding cache
DC2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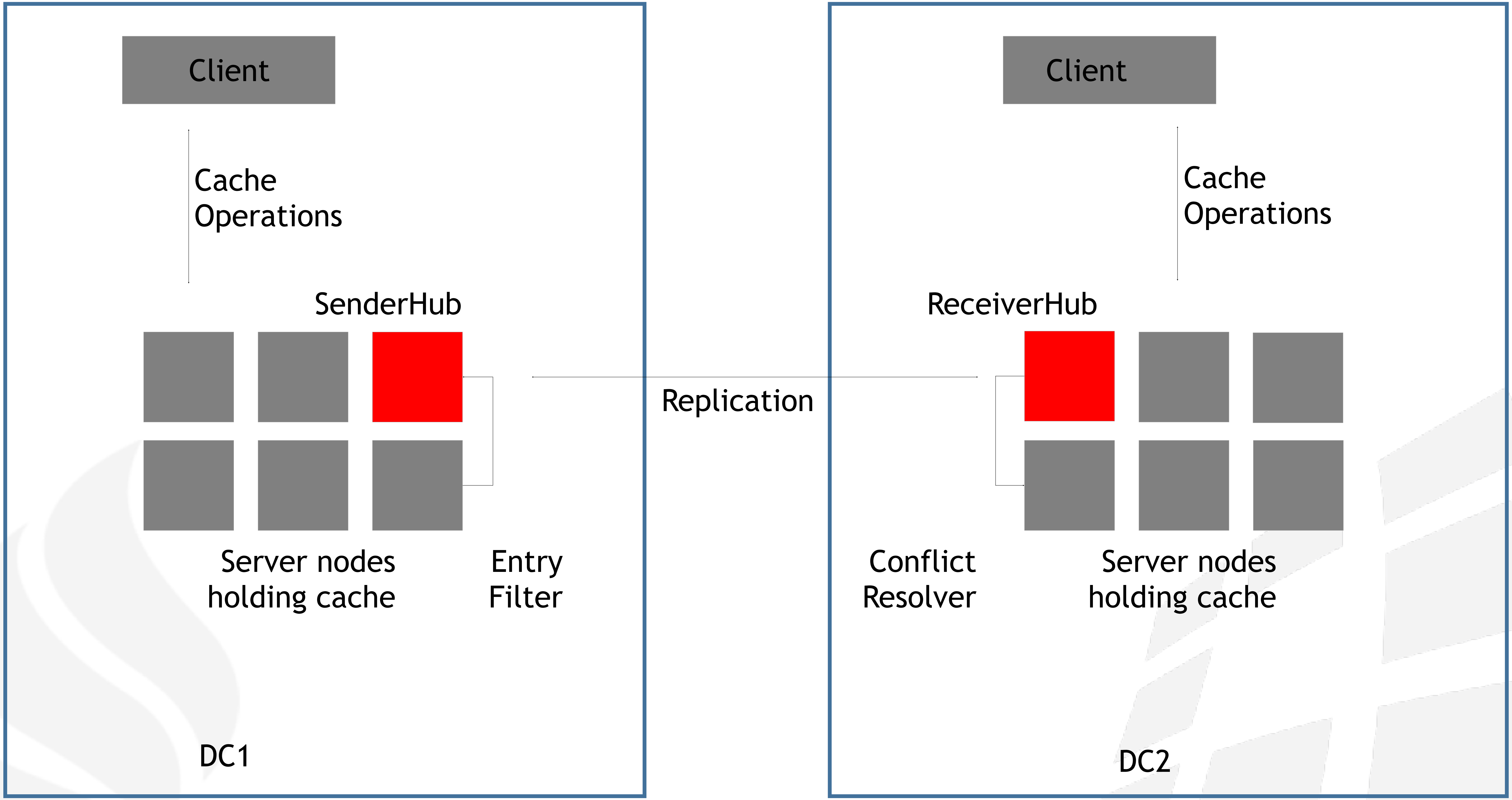
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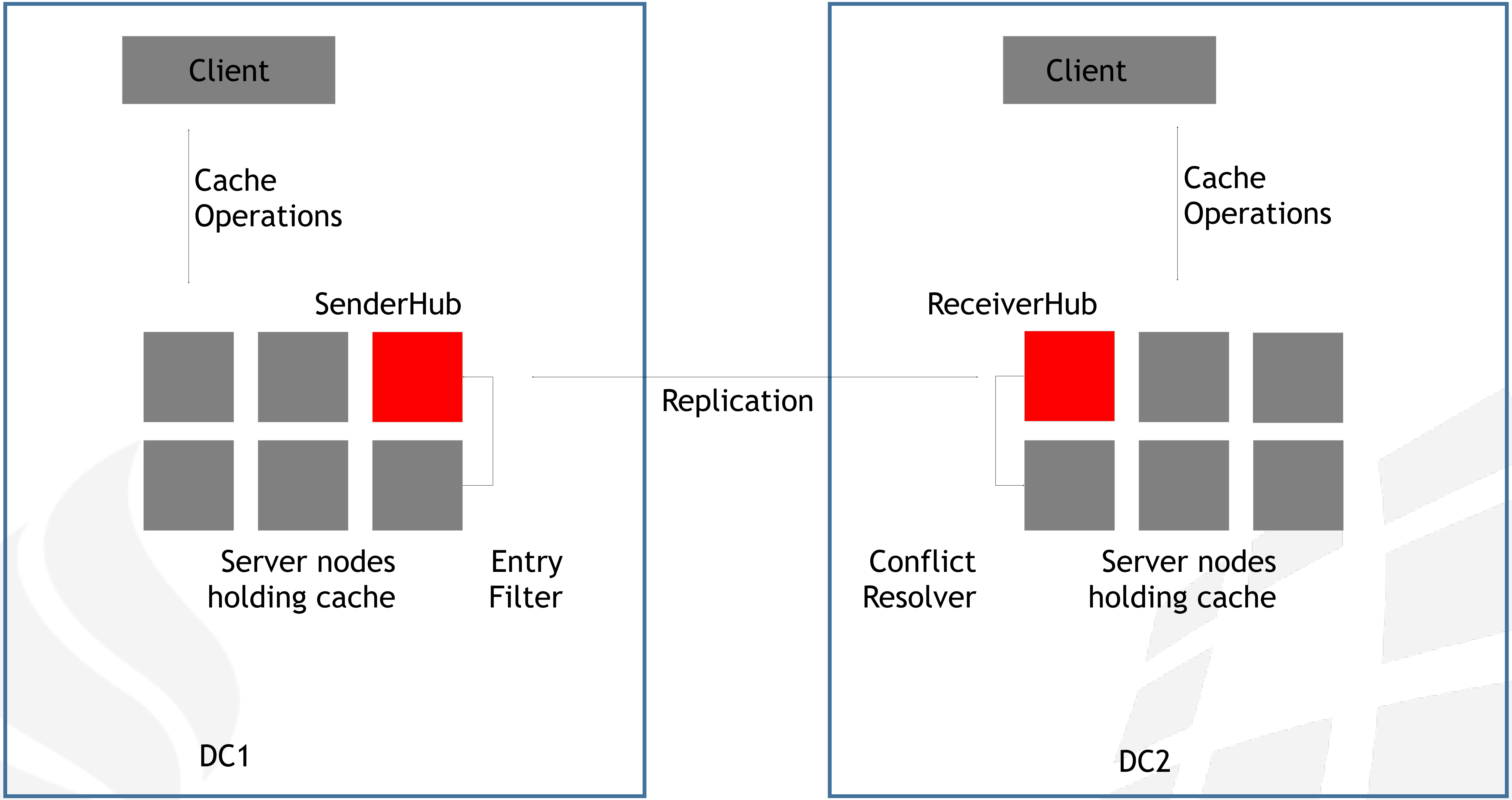
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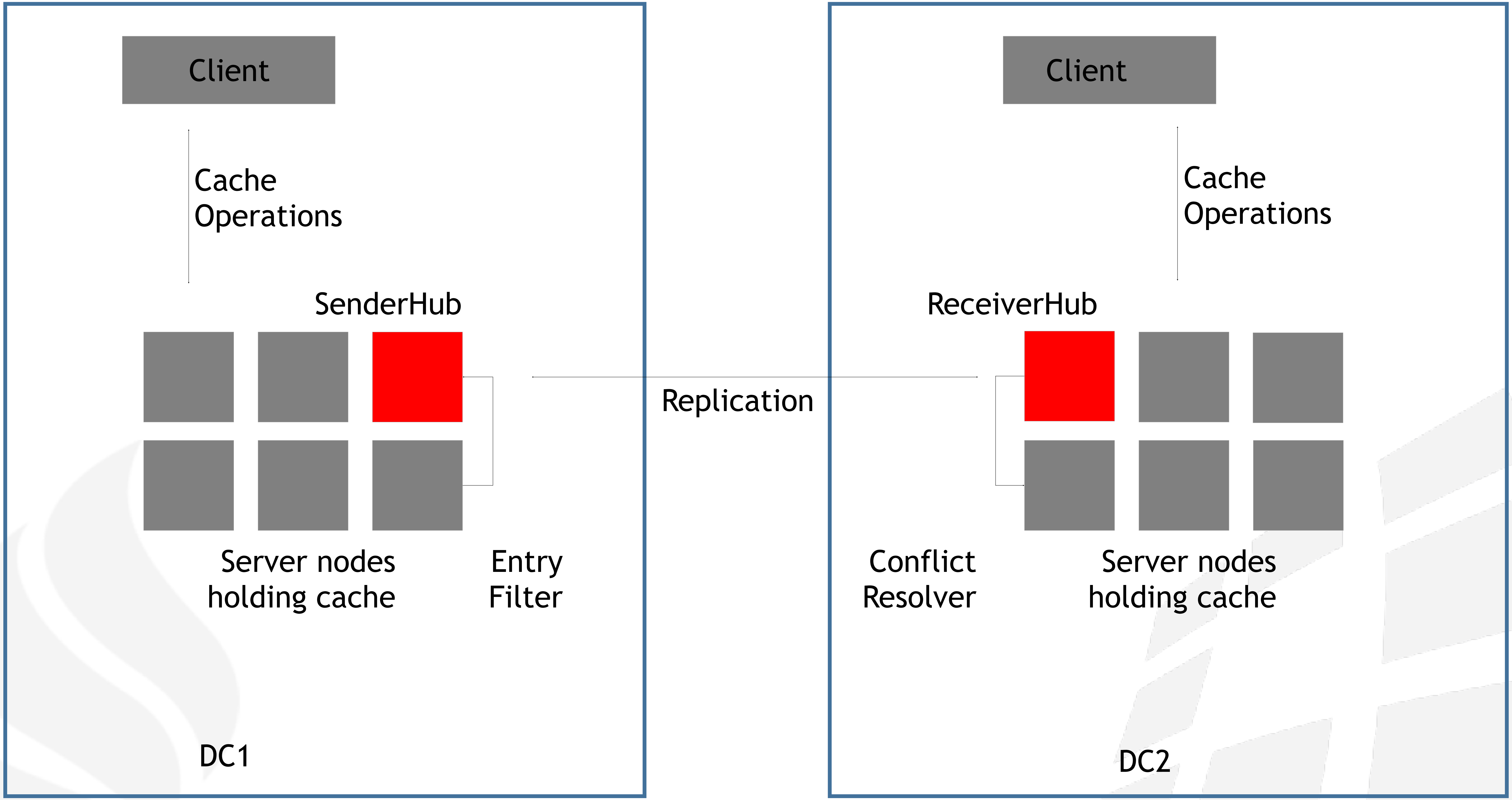
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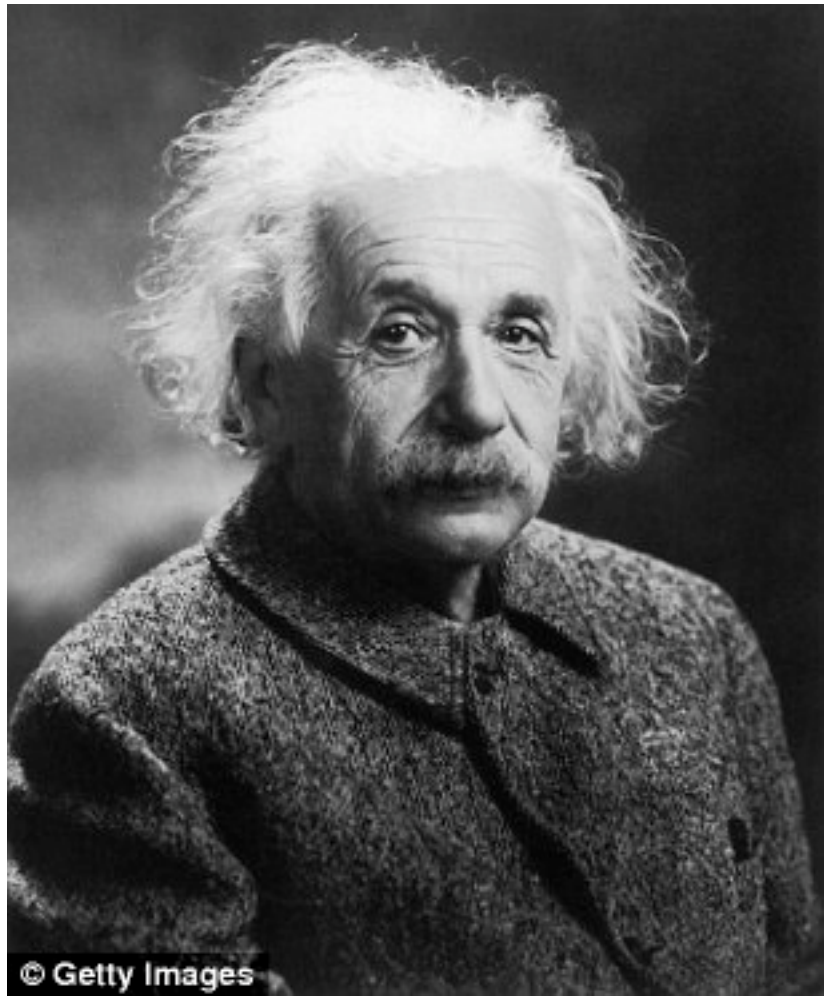
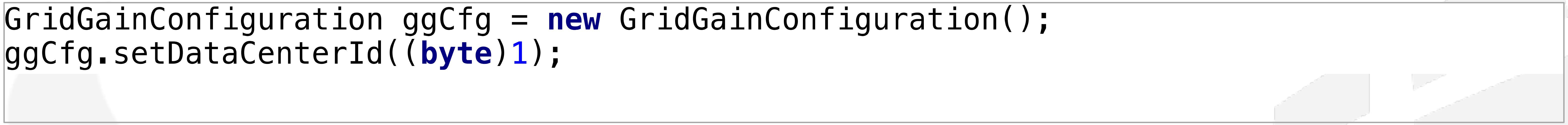
Physics. It’s a thing.


© Getty Images

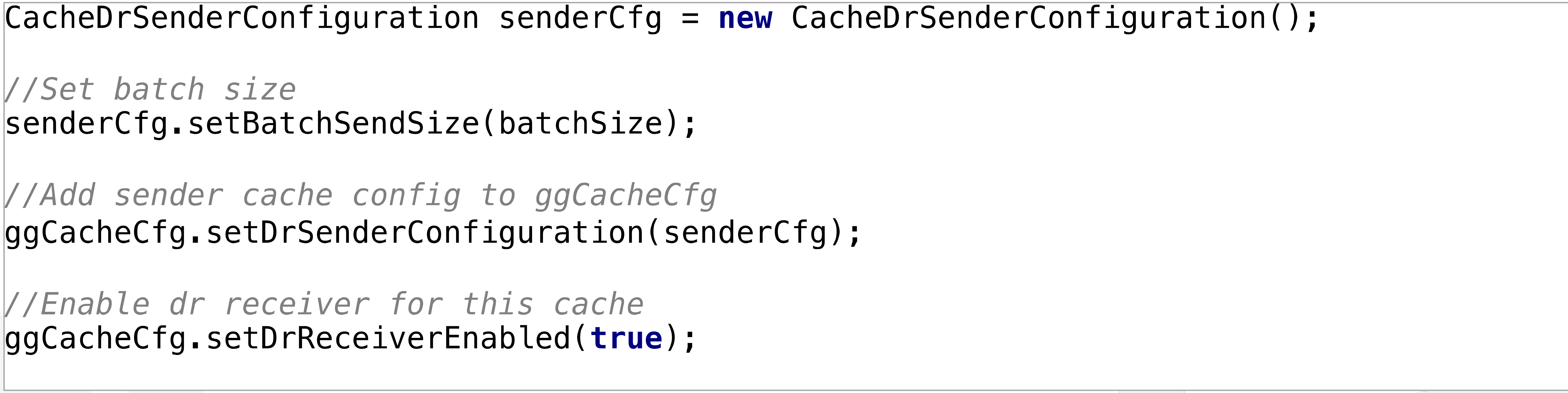
Speed of Light.
186,000 mps.
Not just a good idea…
it’s the law

GridGainConfiguration contains methods for configuring Multi-DC replication. To define a datacenter ID:



```java
GridGainConfiguration ggCfg = new GridGainConfiguration();
ggCfg.setDataCenterId((byte)1);
```

Configure a Sender Cache using **CacheDrSenderConfiguration.** Be sure to set the **batch size** to determine the max entries before SenderHub sends data



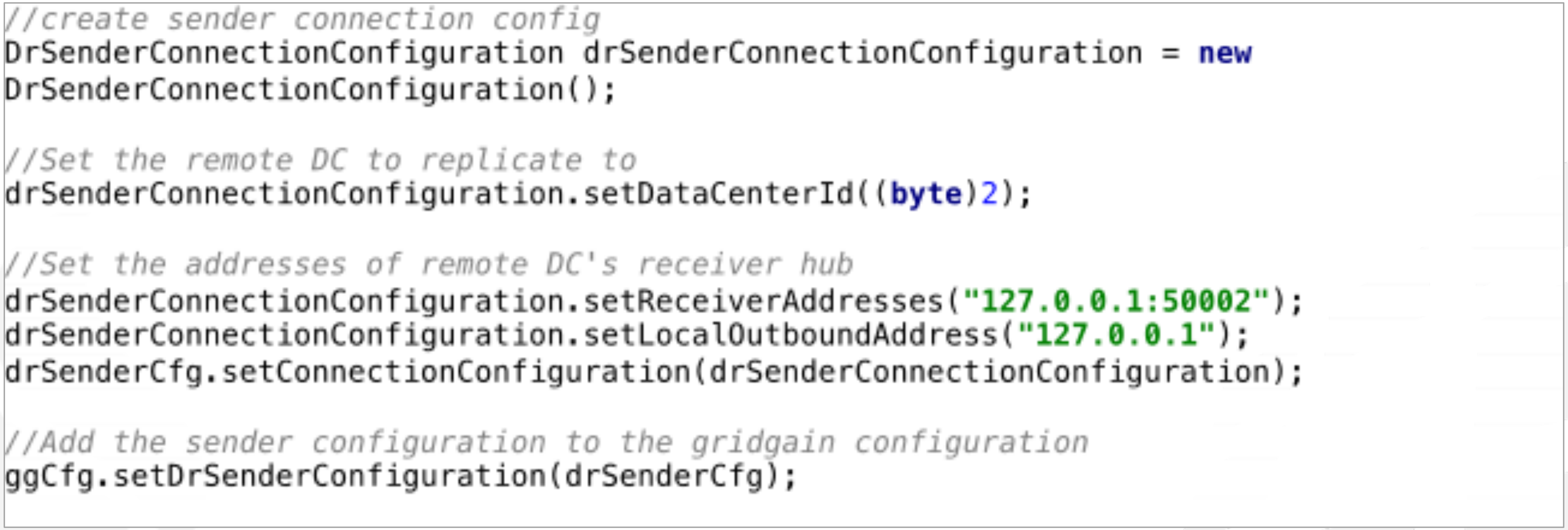
```
CacheDrSenderConfiguration senderCfg = new CacheDrSenderConfiguration();

//Set batch size
senderCfg.setBatchSendSize(batchSize);

//Add sender cache config to ggCacheCfg
ggCacheCfg.setDrSenderConfiguration(senderCfg);

//Enable dr receiver for this cache
ggCacheCfg.setDrReceiverEnabled(true);
```

Configure a Sender Hub using **DrSenderConfiguration.**



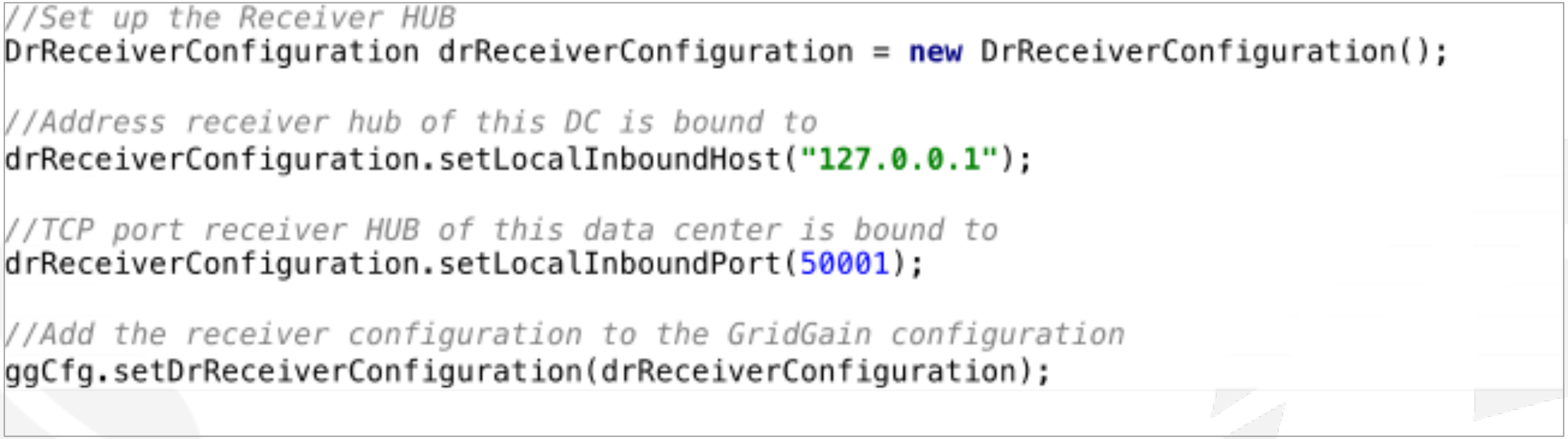
```
//create sender connection config
DrSenderConnectionConfiguration drSenderConnectionConfiguration = new
DrSenderConnectionConfiguration();

//Set the remote DC to replicate to
drSenderConnectionConfiguration.setDataCenterId((byte)2);

//Set the addresses of remote DC's receiver hub
drSenderConnectionConfiguration.setReceiverAddresses("127.0.0.1:50002");
drSenderConnectionConfiguration.setLocalOutboundAddress("127.0.0.1");
drSenderCfg.setConnectionConfiguration(drSenderConnectionConfiguration);

//Add the sender configuration to the gridgain configuration
ggCfg.setDrSenderConfiguration(drSenderCfg);
```

Configure a Receiver Hub using **DrReceiverConfiguration**.



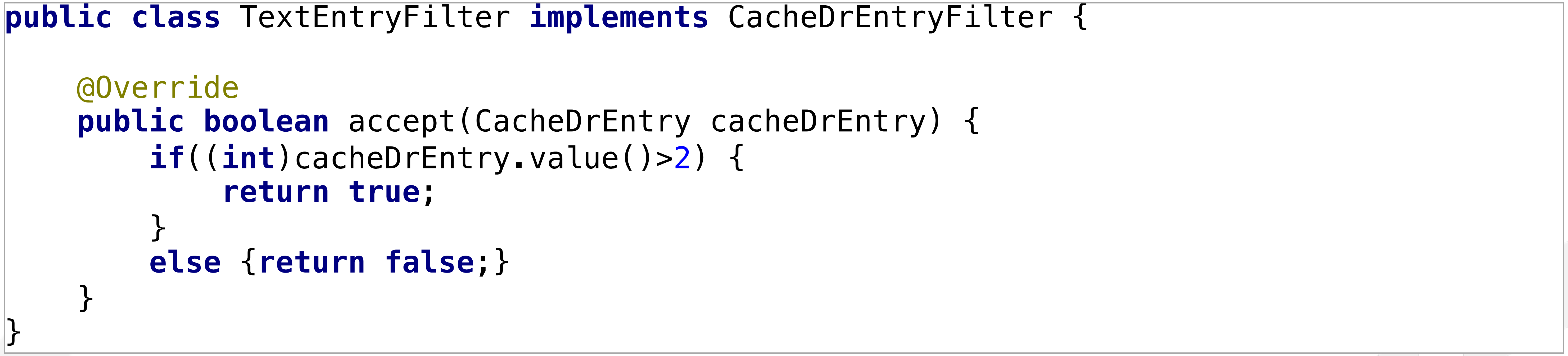
```
//Set up the Receiver HUB
DrReceiverConfiguration drReceiverConfiguration = new DrReceiverConfiguration();

//Address receiver hub of this DC is bound to
drReceiverConfiguration.setLocalInboundHost("127.0.0.1");

//TCP port receiver HUB of this data center is bound to
drReceiverConfiguration.setLocalInboundPort(50001);

//Add the receiver configuration to the GridGain configuration
ggCfg.setDrReceiverConfiguration(drReceiverConfiguration);
```

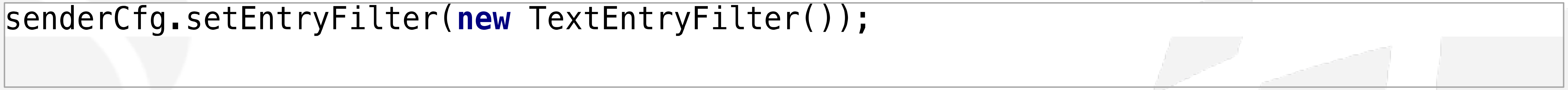
Replication Filtering



```
public class TextEntryFilter implements CacheDrEntryFilter {

    @Override
    public boolean accept(CacheDrEntry cacheDrEntry) {
        if((int)cacheDrEntry.value()>2) {
            return true;
        }
        else {return false;}
    }
}
```

Set using Sender Configuration



```
senderCfg.setEntryFilter(new TextEntryFilter());
```

Conflict Resolution

```
public class ChronologicalConflictResolver implements CacheConflictResolver {

    @Override public void resolve(CacheConflictContext ctx) {
        if (ctx.oldEntry().globalTime() > ctx.newEntry().globalTime())
            ctx.useOld();
        else
            ctx.useNew();
    }
}
```

☑ NOW
□ LATER

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GOT QUESTIONS?

Thank you for joining us. Follow the conversation.

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