Getting Started with Hazelcast

Working With Map Data

Grant Little

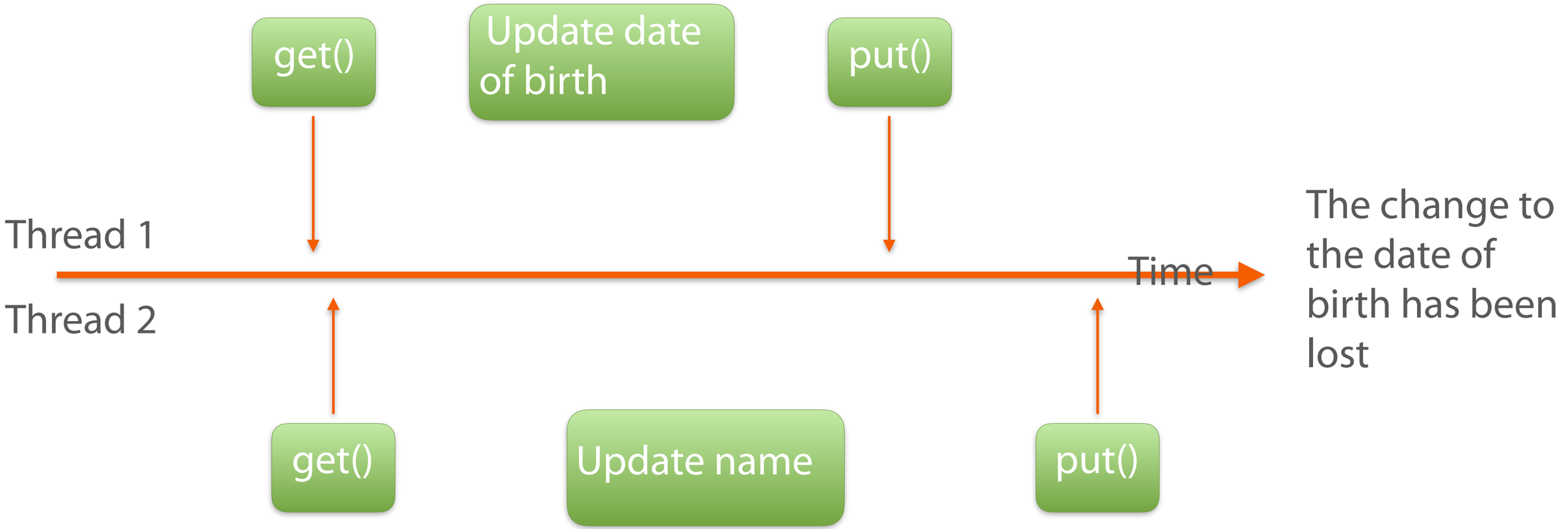
http://www.grantlittle.me

grant@grantlittle.me

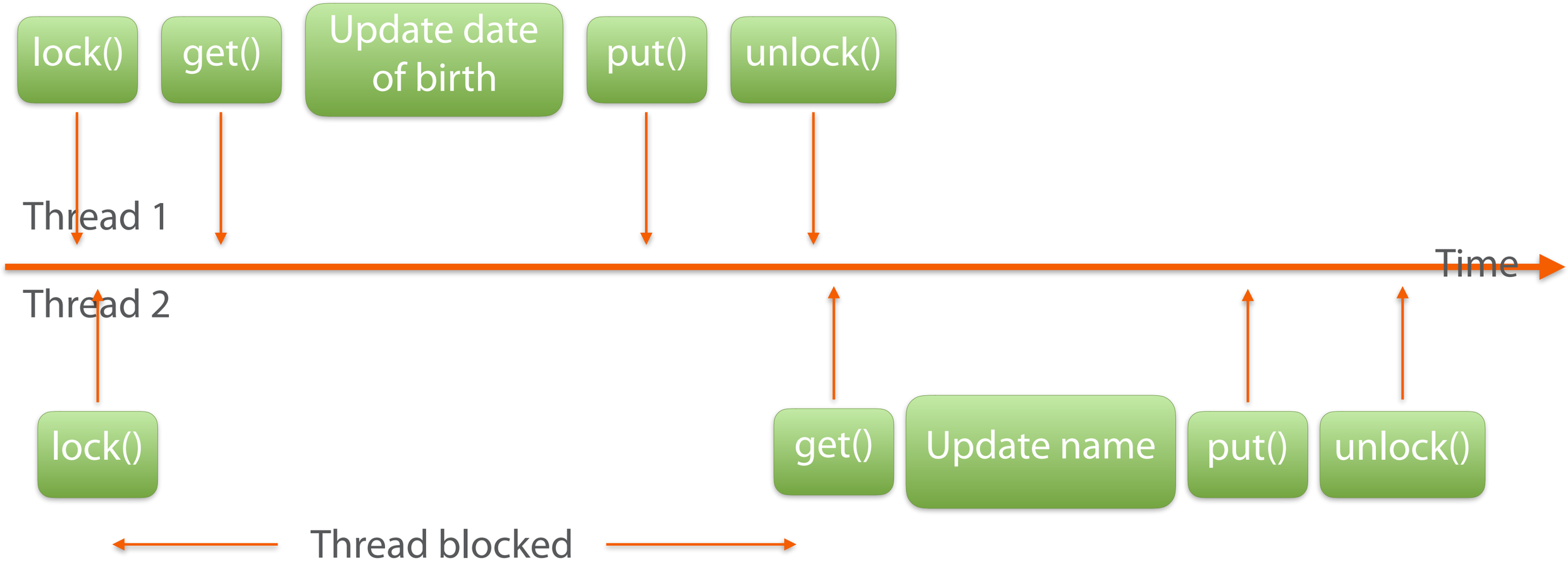
Overview

- Key level locks
- Avoiding locks - Entry Processors
- Retrieving aggregated data - Aggregators
- Keeping related data together - Data Affinity

Concurrency Issues



Why Key Locks?



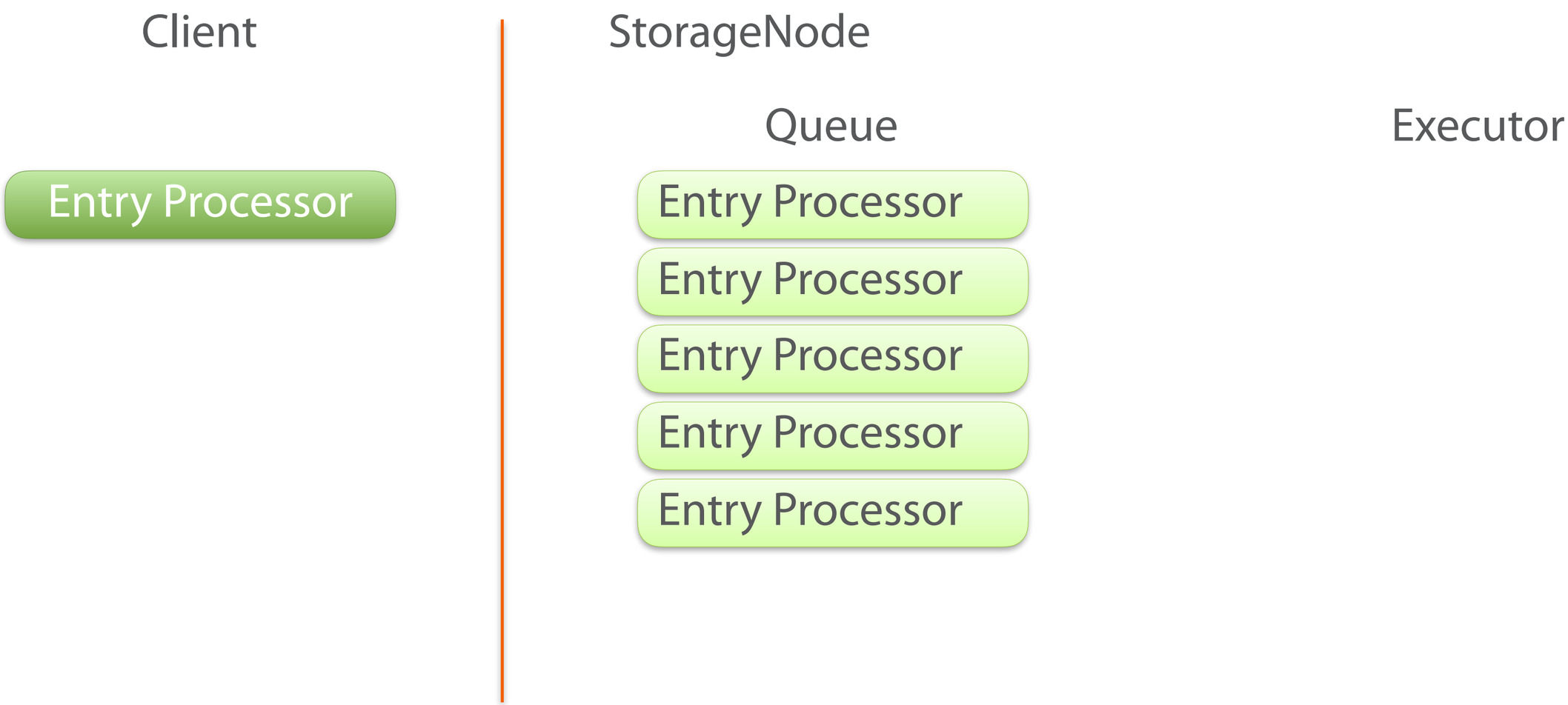
Problems with Locks?

- Create synchronisation points
  - Block other threads
- Data is pulled to the client, updated and pushed into map

Why Entry Processors?

- Data is updated directly on the storage node.
- Reduced serialised object size
- Avoid Synchronisation points in client code
- Thread safe
- Reduced complexity

Entry Processor Scheduling



Aggregators

Collect related items of data together for consumption

Sum Aggregator

Date	Amount ($)
22/10/2015	45.99
22/10/2015	123.76
23/10/2015	87.42
24/10/2015	93.99
25/10/2015	12.89
25/10/2015	33.78
Total	397.83

Total Income **397.83**

In the last 5 days

Sum Aggregator

Date	Amount ($)
21/10/2015	12.45
22/10/2015	123.76
25/10/2015	87.42
Total	223.63

Storage Node 1

Date	Amount ($)
22/10/2015	97.54
22/10/2015	365.12
23/10/2015	23.82
Total	486.48

Storage Node 2

Date	Amount ($)
21/10/2015	45.99
24/10/2015	67.99
24/10/2015	44.43
Total	158.41

Storage Node 3

	Amount ($)
Storage Node 1	223.63
Storage Node 2	486.48
Storage Node 3	158.41
Aggregated Total	868.52

Supplier Creation

- com.hazelcast.mapreduce.aggregation.Supplier
  - Supplier.all()
  - Supplier.all(PropertyExtractor pe)
  - Supplier.fromPredicate(SqlPredicate predicate)
  - Supplier.fromPredicate(SqlPredicate predicate, Supplier chainedSupplier)
  - Supplier.fromKeyPredicate(SqlPredicate predicate)
  - Supplier.fromKeyPredicate(SqlPredicate predicate, Supplier chainedSupplier)

Aggregation Creation

Average

Sum

Min

Max

Examples:

```
com.hazelcast.mapreduce.aggreation.Aggregation.integerAvg()
com.hazelcast.mapreduce.aggreation.Aggregation.bigDecimalSum()
com.hazelcast.mapreduce.aggreation.Aggregation.doubleMin()
com.hazelcast.mapreduce.aggreation.Aggregation.bigIntegerMax()
```

Documentation

Out of the Box Aggregations:-

http://docs.hazelcast.org/docs/3.5/javadoc/com/hazelcast/mapreduce/aggregation/Aggregations.html

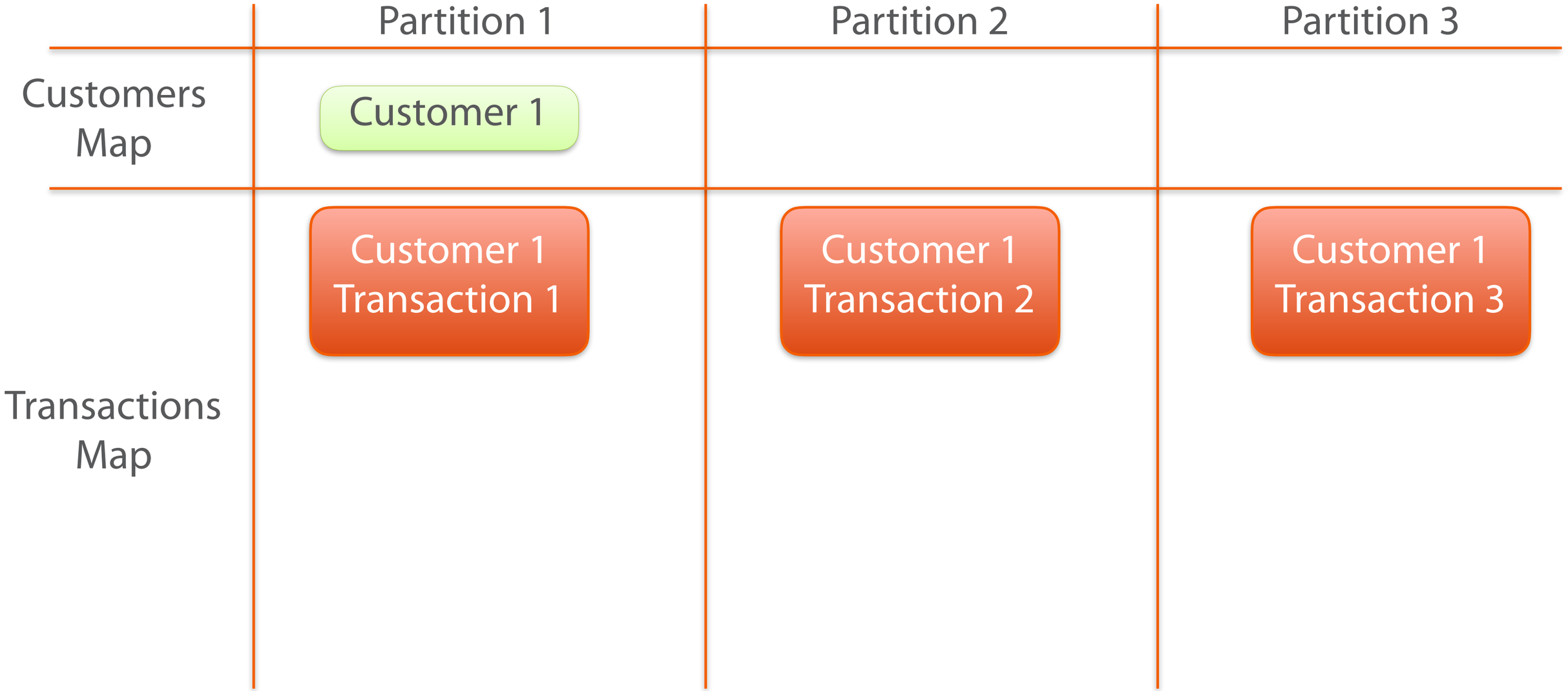
Create a Custom Aggregation:-

http://docs.hazelcast.org/docs/3.5/javadoc/com/hazelcast/mapreduce/aggregation/Aggregation.html

Suppliers:-

http://docs.hazelcast.org/docs/3.5/javadoc/com/hazelcast/mapreduce/aggregation/Supplier.html

Distributed Data



Data Affinity Example

- Customer has many addresses
  - Home
  - Work
- Use a single entry processor to retrieve customer and all their possible addresses

Module Review

- Concurrency and key level locking
- Use EntryProcessors to avoid concurrency issues
- Retrieving aggregated data
- Data Affinity - how to keep related data together for performance