

Lab 02: Hazelcast

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Code (branch): *hazelcast_practice*

Task 1: Creating Nodes

First step is to create and setup the 3 members for a cluster

```
Terminal: Local (2) x Local (3) x + v
2022-05-18 13:37:41,155 [ INFO] [hz.thirsty_feistel.I0.thread-in-1] [c.h.i.s.t.TcpServerConnection]: [127.0.0.1]:5701 [dev] [5.0.3] Initialized new cluster connection between /127.0.0.1:5701 and /127.0.0.1:61301
2022-05-18 13:37:47,179 [ INFO] [hz.thirsty_feistel.priority-generic-operation.thread-0] [c.h.i.c.ClusterService]: [127.0.0.1]:5701 [dev] [5.0.3]

Members {size:3, ver:3} [
  Member [127.0.0.1]:5701 - b4556a83-6881-404c-b1a0-699d581c3203 this
  Member [127.0.0.1]:5702 - a43535be-4ed4-4cf5-a74e-302005336b92
  Member [127.0.0.1]:5703 - c1cb78f1-9b66-4587-bb3e-aba7e193a786
]
```

Task 2: Distributed Map

First, the Hazelcast client is created along with the distributed map with added 1000 values

```
distributed_map x
Starting connecting to the Hazelcast client...
Connected to the Hazelcast client
Created a distributed map
Putting 0 value to a node
Putting 1 value to a node
Putting 2 value to a node
Putting 3 value to a node
Putting 4 value to a node
Putting 5 value to a node
Putting 6 value to a node
Putting 7 value to a node
Putting 8 value to a node
```

The initial representation of the distributed data on n nodes

(The main idea is to continue storing all the information on all the nodes)

```
read_map x
Starting connecting to the Hazelcast client...
Connected to the Hazelcast client
Created a distributed map
599 599 value
529 529 value
884 884 value
596 596 value
70 70 value
457 457 value
368 368 value
660 660 value
144 144 value
```

```
read_map x
Starting connecting to the Hazelcast client...
Connected to the Hazelcast client
Created a distributed map
Total map size: 1000
```

```
read_map x
INFO for key 1
-----
size in memory : 71
creationTime : -1
expirationTime : 9223372036854775807
number of hits : -1
lastAccessedTime: -1
lastUpdateTime : -1
version : 3
key : 1
value : 1 value
```

The resulting representation of the distributed data on n-1 nodes (after removing one node)

```
Terminal: Local x Local (2) x + v
Members {size:2, ver:4} [
  Member [127.0.0.1]:5701 - b4556a83-6881-404c-b1a0-699d581c3203 this
  Member [127.0.0.1]:5702 - a43535be-4ed4-4cf5-a74e-382085336b92
]

2022-05-18 13:57:31,934 [ INFO] [hz.thirsty_feistel_cached_thread-13] [c.h.t.TransactionManagerService]: [127.0.0.1]:5701 [dev] [5.0.3] Committing/rolling-back live transactions of [127.0.0.1]:5703, UUID: c1cb78f1-9b66-4587-bb3e-aba7e193a786
```

```
read_map x
Starting connecting to the Hazelcast client...
Connected to the Hazelcast client
Created a distributed map
127 127 value
934 934 value
976 976 value
886 886 value
599 599 value
529 529 value
884 884 value
596 596 value
70 70 value
457 457 value
```

```
read_map x
Total map size: 1000

INFO for key 1
-----
size in memory : 71
creationTime : -1
expirationTime : 9223372036854775807
number of hits : -1
lastAccessedTime: -1
lastUpdateTime : -1
version : 3
key : 1
value : 1 value
```

Here we see that all the initial data is stored (all 1000 values)

Task 3: Distributed Map with Locks

```
distributed_map_with_locks x
Starting connecting to the Hazelcast client for racy update...
Starting connecting to the Hazelcast client for pessimistic update...
Starting connecting to the Hazelcast client for optimistic update...
Connected to the Hazelcast client for racy update
Connected to the Hazelcast client for optimistic update
Connected to the Hazelcast client for pessimistic update
Created a distributed map for racy update
Created a distributed map for optimistic update
Created a distributed map for pessimistic update
Starting racy update...
Starting optimistic update...
Starting pessimistic update..
Finished racy job!
Result: 1003
Finished pessimistic job!
Result: 1006
Finished optimistic job!
Result: 1998
```

Task 4: Bounded Queue

```
bounded_queue x
Starting connecting to the Hazelcast client for producer...
Starting connecting to the Hazelcast client for consumer...
Starting connecting to the Hazelcast client for producer...
Starting connecting to the Hazelcast client for consumer...
Connected to the Hazelcast client for consumer
Connected to the Hazelcast client for producer
Connected to the Hazelcast client for consumer
Connected to the Hazelcast client for producer
Created a distributed queue for [consumer]
Created a distributed queue for [producer]
Created a distributed queue for [consumer]Created a distributed queue for [producer]

Produced: 0 value at process: 0
Consumed: 0 value at process: 2
Consumed: 0 value . Process: 2
Produced: 0 value at process: 1
Consumed: 1 value at process: 3
Consumed: 1 value . Process: 3
Produced: 1 value at process: 0
```