

# Design Document: Performance Testing of Apache Zookeeper

## INTRODUCTION

My project is to measure performance of Apache ZooKeeper for various application scenarios. Following are the scenarios considered:

1. A distributed file system simulation
2. A messaging system simulation
3. A distributed exclusive locking system simulation

My plan is to implement all these simulations as separate classes and have a driver configure and run tests appropriately.

## DESIGN OVERVIEW

The driver class takes the hostname and the port number of the ZooKeeper instance, and the number of threads to execute. For each simulation multiple clients are created using threads, and all execute in parallel. Each thread reports its statistics to the corresponding Runner class. The Runner class aggregates the statistics and prints them out.

### Core Classes:

- Testing: Driver class for all tests. Runs all tests deterministically, one after the other.
- LockClient: LockClient class to simulate distributed locking.
- LockRunner: Runner class for distributed locking simulation.
- QRunner: Runner class for the distributed queue simulation.
- SyncReadWrite: ReadWrite test class. All tests are tightly coupled as one test.
- SyncReadWriteRunner: The Runner class for distributed file system simulation tests.
- ZkQConsumer: Distributed Queue consumer. Meant to be run in a thread.
- ZkQProducer: Distributed Queue producer. Meant to be run in a thread.

### Core Interfaces:

- QConsumer: Every consumer must implement this.
- QProducer: Every producer must implement this.
- RunnableTest: Interface for a Runnable Test. Every test must implement this to be run by the driver.

## DETAILED DESIGN

Detailed documentation generated using JavaDoc tool is attached with the submission. Please see doc/index.html under the project source which is attached with the submission.

## CURRENT STATUS

Multithreaded implementations of distributed file system simulation and distributed queue simulation are finished. I am currently working on distributed lock simulation. I also plan to change the driver program a bit in the end, and make it more configurable by the user.

## REFERENCES:

1. ZooKeeper Recipes: <https://zookeeper.apache.org/doc/trunk/recipes.html>, Apache Software Foundation, 10/08/2014
2. Source files for ZooKeeper Recipes: <https://github.com/apache/zookeeper/tree/trunk/src/recipes>, Apache Software Foundation, 07/07/2015
3. ZooKeeper Programmer's Guide: <https://zookeeper.apache.org/doc/trunk/zookeeperProgrammers.html>, Apache Software Foundation, 10/08/2014
4. ZooKeeper API Docs: <https://zookeeper.apache.org/doc/r3.4.5/api/org/apache/zookeeper/ZooKeeper.html>, Apache Software Foundation, 11/05/2012
5. ZooKeeper Site: <http://zookeeper.apache.org/>, Apache Software Foundation