**Troubleshoot Zookeeper**

Components may sometime lose connection to Zookeeper. Frequent disconnects may typically be due one of the following typical symptoms or even a combination of them:

1. Network connectivity problems​
2. I/O starvation​
3. GC starvation
4. Client-side timeouts
5. Limited by maxSessionTimeout if set to too low value
6. Unrelated to Zookeeper
7. Virtual Environments - if ZK cluster is on some shared hosting, this can cause resource starvation and introduce latency.

For the typical symptomatic categories listed above, use the lists below to check if you are seeing frequent disconnects of healthy clients

​1. Network connectivity problems​:

* Use ifconfig to check a number of errors on NIC's. If high, this can account for increased latency.

2. I/O starvation​

* It's better if Zookeeper is installed on dedicated nodes when high performance is needed
* Check your HDD performance, e.g. using hdparm -tT
* Make sure that directory for ZK transaction log (/opt/mapr/zkdata by default) is on fast dedicated drive
* Property is dataLogDir in the *$ZK\_DIR*/conf/zoo.cfg
* Make sure that ZooKeeper heap size is not larger than the RAM available to avoid swapping

3. GC starvation

* ​​The symptom is frequent client disconnects and session expiration due to starvation of heartbeat thread.
* Use jstat -gc to see if there are frequent full garbage collections
* Use alternative GC collector, if issue is present, like for example ConcurrentMarkSweep. For this, put   -XX:ParallelGCThreads=8 -XX:+UseConcMarkSweepGC

4. Client-side timeouts

* Check swapping on client machines free -m.

5. Possibly increase maxSessionTimeout if set to too low value

6. If no obvious problems detected, run <https://github.com/phunt/zk-smoketest> to check if the problem is with zookeeper at all

7. Virtual Environments - if ZK cluster is on some shared hosting, this can cause resource starvation and introduce latency.