

Cloud Computing Assignment 4

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Section: D

Screenshot Outputs:

1a: Screenshot of Zookeeper Server having started.

```
pes2ug20cs216@pop-os: /opt/apache-zookeeper-3.8.0-bin/conf$ cd ..
pes2ug20cs216@pop-os: /opt/apache-zookeeper-3.8.0-bin$ bin/zkServer.sh start
/usr/bin/java
ZooKeeper JMX enabled by default
Using config: /opt/apache-zookeeper-3.8.0-bin/bin/../conf/zoo.cfg
Starting zookeeper ... STARTED
pes2ug20cs216@pop-os: /opt/apache-zookeeper-3.8.0-bin$
```

2a: Screenshot of Listing of the created Znodes

```
WatchedEvent state:SyncConnected type:None path:null
[zk: localhost:2181(CONNECTED) 0] create -s /pes2ug20cs216_seq "a sequential node"
Created /pes2ug20cs216_seq0000000000
[zk: localhost:2181(CONNECTED) 1] create -e /pes2ug20cs216_eph "an ephemeral node"
Created /pes2ug20cs216_eph
[zk: localhost:2181(CONNECTED) 2] ls
ls [-s] [-w] [-R] path
[zk: localhost:2181(CONNECTED) 3] ls /
[pes2ug20cs216_eph, pes2ug20cs216_seq0000000000, zookeeper]
[zk: localhost:2181(CONNECTED) 4]
```

2b: Screenshot of Listing of the deleted ephemeral node

```
WatchedEvent state:SyncConnected type:None path:null
[zk: localhost:2181(CONNECTED) 0] ls /
[pes2ug20cs216_seq0000000000, zookeeper]
[zk: localhost:2181(CONNECTED) 1]
```

2c: Screenshot of Data and Metadata associated with the created sequential znode.

```
[zk: localhost:2181(CONNECTED) 2] set /pes2ug20cs216_seq0000000000 "updated"
[zk: localhost:2181(CONNECTED) 3] get -s /pes2ug20cs216_seq0000000000
updated
cZxid = 0x4
ctime = Fri Mar 24 09:44:38 IST 2023
mZxid = 0x9
mtime = Fri Mar 24 09:50:47 IST 2023
pZxid = 0x4
cversion = 0
dataVersion = 1
aclVersion = 0
ephemeralOwner = 0x0
dataLength = 7
numChildren = 0
[zk: localhost:2181(CONNECTED) 4]
```

2d: Screenshot of Listing of all the children nodes

```
[zk: localhost:2181(CONNECTED) 4] create /pes2ug20cs216
Created /pes2ug20cs216
[zk: localhost:2181(CONNECTED) 5] create /pes2ug20cs216/naren "childnode"
Created /pes2ug20cs216/naren
[zk: localhost:2181(CONNECTED) 6] create /pes2ug20cs216/chandrashekhar "childnode"
Created /pes2ug20cs216/chandrashekhar
[zk: localhost:2181(CONNECTED) 7] ls /pes2ug20cs216
[chandrashekhar, naren]
[zk: localhost:2181(CONNECTED) 8]
```

3a: Screenshot of each of the clients listing all the znodes

```
pes2ug20cs216@pop-os: /opt/apache-zookeeper-3.8.0-bin
2023-03-24 10:00:01,692 [myid:] - INFO [main:o.a.z.s.p.FileTxnSnapLog@372] - 14 txns loaded in 42 ms
2023-03-24 10:00:01,693 [myid:] - INFO [main:o.a.z.s.ZKDatabase@289] - Snapshot loaded in 77 ms, highest zxid is 0x10, digest is 3864835430
2023-03-24 10:00:01,696 [myid:] - INFO [main:o.a.z.s.p.FileTxnSnapLog@479] - Snapshotting: 0x10 to /opt/apache-zookeeper-3.8.0-bin/data/version-2/snapshot.10
2023-03-24 10:00:01,699 [myid:] - INFO [main:o.a.z.s.ZooKeeperServer@547] - Snapshot taken in 3 ms
2023-03-24 10:00:01,727 [myid:] - INFO [ProcessThread(sid:0 cport:2181)::o.a.z.s.PreRequestProcessor@138] - PreRequestProcessor (sid:0) started, reconfigEnabled=false
2023-03-24 10:00:01,728 [myid:] - INFO [main:o.a.z.s.RequestThrottler@75] - zookeeper.request_throttler.shutdownTimeout = 10000 ms
2023-03-24 10:00:01,767 [myid:] - INFO [main:o.a.z.s.ContainerManager@84] - Using checkIntervalMs=60000 maxPerMinute=10000 maxNeverUsedIntervalMs=0
2023-03-24 10:00:53,413 [myid:] - INFO [SyncThread:0:o.a.z.s.p.FileTxnLog@285] - Creating new log file: log.11

[zk: localhost:2181(CONNECTED) 4] create /pes2ug20cs216
Created /pes2ug20cs216
[zk: localhost:2181(CONNECTED) 5] create -s -e /pes2ug20cs216/candidate
Created /pes2ug20cs216/candidate0000000000
[zk: localhost:2181(CONNECTED) 6] ls /pes2ug20cs216
[candidate0000000000, candidate0000000001, candidate0000000002]
[zk: localhost:2181(CONNECTED) 7]

[zk: localhost:2181(CONNECTED) 12] create -s -e /pes2ug20cs216/candidate
Created /pes2ug20cs216/candidate0000000001
[zk: localhost:2181(CONNECTED) 13] ls /pes2ug20cs216
[candidate0000000000, candidate0000000001, candidate0000000002]
[zk: localhost:2181(CONNECTED) 14]

[zk: localhost:2181(CONNECTED) 2] create -s -e /pes2ug20cs216/candidate
Created /pes2ug20cs216/candidate0000000002
[zk: localhost:2181(CONNECTED) 3] ls /pes2ug20cs216
[candidate0000000000, candidate0000000001, candidate0000000002]
[zk: localhost:2181(CONNECTED) 4]
```

3b: Screenshot of the Watched Event and the Zookeeper Server logs.

```
pes2ug20cs216@pop-os: /opt/apache-zookeeper-3.8.0-bin
2023-03-24 10:00:01,692 [myid:] - INFO [main:o.a.z.s.p.FileTxnSnapLog@372] - 14 txns loaded in 42 ms
2023-03-24 10:00:01,693 [myid:] - INFO [main:o.a.z.s.ZKDatabase@289] - Snapshot loaded in 77 ms, highest zxid is 0x10, digest is 3864835430
2023-03-24 10:00:01,696 [myid:] - INFO [main:o.a.z.s.p.FileTxnSnapLog@479] - Snapshotting: 0x10 to /opt/apache-zookeeper-3.8.0-bin/data/version-2/snapshot.10
2023-03-24 10:00:01,699 [myid:] - INFO [main:o.a.z.s.ZooKeeperServer@547] - Snapshot taken in 3 ms
2023-03-24 10:00:01,727 [myid:] - INFO [ProcessThread(sid:0 cport:2181)::o.a.z.s.PreRequestProcessor@138] - PreRequestProcessor (sid:0) started, reconfigEnabled=false
2023-03-24 10:00:01,728 [myid:] - INFO [main:o.a.z.s.RequestThrottler@75] - zookeeper.request_throttler.shutdownTimeout = 10000 ms
2023-03-24 10:00:01,767 [myid:] - INFO [main:o.a.z.s.ContainerManager@84] - Using checkIntervalMs=60000 maxPerMinute=10000 maxNeverUsedIntervalMs=0
2023-03-24 10:00:53,413 [myid:] - INFO [SyncThread:0:o.a.z.s.p.FileTxnLog@285] - Creating new log file: log.11

WATCHER::
WatchedEvent state:Closed type:None path:null
2023-03-24 10:14:50,569 [myid:] - INFO [main:o.a.z.s.ZooKeeperServer@1232] - Session: 0x1000048e1630002 closed
2023-03-24 10:14:50,571 [myid:] - INFO [main:EventThread:0:a.z.s.ClientCnxn$EventThread@568] - EventThread shut down for session: 0x1000048e1630002
2023-03-24 10:14:50,573 [myid:] - ERROR [main:o.a.z.s.u.ServiceUtils@42] - Exiting JVM with code 0
pes2ug20cs216@pop-os: /opt/apache-zookeeper-3.8.0-bin$

- Session: 0x1000048e1630001 closed
2023-03-24 10:15:00,428 [myid:] - INFO [main-EventThread:0:a.z.s.ClientCnxn$EventThread@568] - EventThread shut down for session: 0x1000048e1630001
2023-03-24 10:15:00,431 [myid:] - ERROR [main:o.a.z.s.u.ServiceUtils@42] - Exiting JVM with code 0
pes2ug20cs216@pop-os: /opt/apache-zookeeper-3.8.0-bin$

ephemeralOwner = 0x1000048e1630001
dataLength = 0
numChildren = 0
[zk: localhost:2181(CONNECTED) 5]
WATCHER::
WatchedEvent state:SyncConnected type:NodeDeleted path:/pes2ug20cs216/candidate0000000001
```

3c: Screenshot of the old leader coming back and having a new sequence number.

```
pes2ug20cs216@pop-os: /opt/apache-zookeeper-3.8.0-bin
2023-03-24 10:00:01,692 [myid:] - INFO [main:o.a.z.s.p.FileTxnSnapLog@372] - 14 txns loaded in 42 ms
2023-03-24 10:00:01,693 [myid:] - INFO [main:o.a.z.s.ZKDatabase@289] - Snapshot loaded in 77 ms, highest zxid is 0x10, digest is 3864835430
2023-03-24 10:00:01,696 [myid:] - INFO [main:o.a.z.s.p.FileTxnSnapLog@479] - Snapshotting: 0x10 to /opt/apache-zookeeper-3.8.0-bin/data/version-2/snapshot.10
2023-03-24 10:00:01,699 [myid:] - INFO [main:o.a.z.s.ZooKeeperServer@547] - Snapshot taken in 3 ms
2023-03-24 10:00:01,727 [myid:] - INFO [ProcessThread(sid:0 cport:2181)::o.a.z.s.PreRequestProcessor@138] - PreRequestProcessor (sid:0) started, reconfigEnabled=false
2023-03-24 10:00:01,728 [myid:] - INFO [main:o.a.z.s.RequestThrottler@75] - zookeeper.request_throttler.shutdownTimeout = 10000 ms
2023-03-24 10:00:01,767 [myid:] - INFO [main:o.a.z.s.ContainerManager@84] - Using checkIntervalMs=60000 maxPerMinute=10000 maxNeverUsedIntervalMs=0
2023-03-24 10:00:53,413 [myid:] - INFO [SyncThread:0:o.a.z.s.p.FileTxnLog@285] - Creating new log file: log.11

[main-SendThread(localhost:2181):o.a.z.ClientCnxn$SendThread@1444] - Session establishment complete on server localhost/127.0.0.1:2181, session id = 0x1000048e1630003, negotiated timeout = 30000
WATCHER::
WatchedEvent state:SyncConnected type:None path:null
[zk: localhost:2181(CONNECTED) 0] create -s -e /pes2ug20cs216/candidate
Created /pes2ug20cs216/candidate0000000003
[zk: localhost:2181(CONNECTED) 1]

- Session: 0x1000048e1630001 closed
ephemeralOwner = 0x1000048e1630001
dataLength = 0
numChildren = 0
[zk: localhost:2181(CONNECTED) 5]
WATCHER::
2023-03-24 10:15:00,428 [myid:] - INFO [main-EventThread:o.a.z.ClientCnxn$EventThread@568] - EventThread shut down for session: 0x1000048e1630001
2023-03-24 10:15:00,431 [myid:] - ERROR [main:o.a.z.u.ServiceUtils@42] - Exiting JVM with code 0
pes2ug20cs216@pop-os: /opt/apache-zookeeper-3.8.0-bin$
[0] 0: bash
```