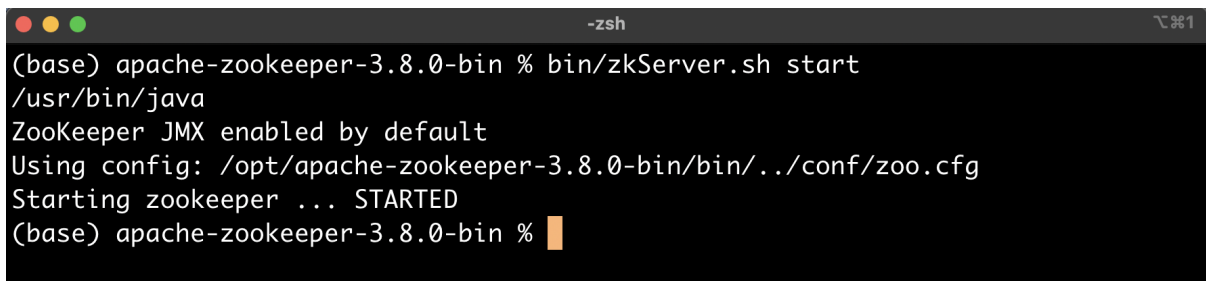


## Assignment 4 - Introduction to Apache Zookeeper

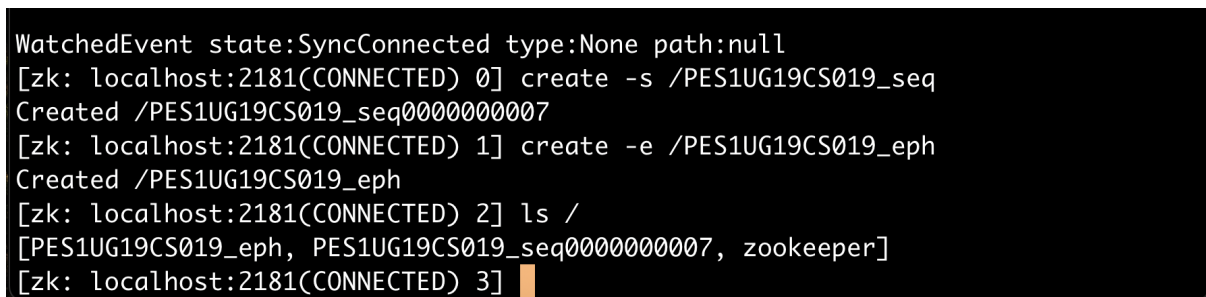
Name : Abhishek Aditya BS  
SRN : PES1UG19CS019  
Section : VI semester 'A' section

### 1a.jpg - Screenshot of Zookeeper Server having started

A terminal window titled '-zsh' with a dark background. The text inside shows the command 'bin/zkServer.sh start' being executed. The output indicates that ZooKeeper JMX is enabled by default, the configuration file is '/opt/apache-zookeeper-3.8.0-bin/bin/../conf/zoo.cfg', and the server has started successfully. The prompt '(base) apache-zookeeper-3.8.0-bin %' is visible at the end of the line.

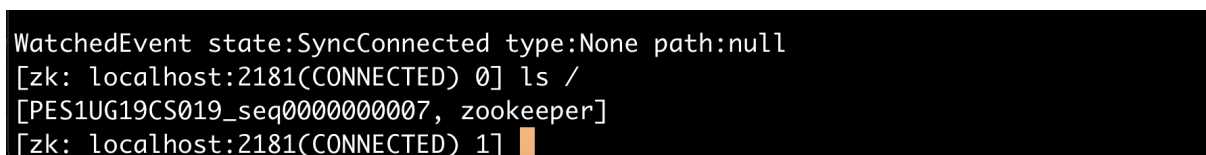
```
(base) apache-zookeeper-3.8.0-bin % bin/zkServer.sh start
/usr/bin/java
ZooKeeper JMX enabled by default
Using config: /opt/apache-zookeeper-3.8.0-bin/bin/../conf/zoo.cfg
Starting zookeeper ... STARTED
(base) apache-zookeeper-3.8.0-bin %
```

### 2a.jpg - Screenshot of Listing of the created ZNodes

A terminal window showing the output of the 'ls /' command. It lists two nodes: 'PES1UG19CS019\_seq0000000007' and 'PES1UG19CS019\_eph'. The prompt '[zk: localhost:2181(CONNECTED) 3]' is visible at the end of the line.

```
WatchedEvent state:SyncConnected type:None path:null
[zk: localhost:2181(CONNECTED) 0] create -s /PES1UG19CS019_seq
Created /PES1UG19CS019_seq0000000007
[zk: localhost:2181(CONNECTED) 1] create -e /PES1UG19CS019_eph
Created /PES1UG19CS019_eph
[zk: localhost:2181(CONNECTED) 2] ls /
[PES1UG19CS019_eph, PES1UG19CS019_seq0000000007, zookeeper]
[zk: localhost:2181(CONNECTED) 3]
```

### 2b.jpg - Screenshot of Listing of the deleted ephemeral node

A terminal window showing the output of the 'ls /' command after the ephemeral node has been deleted. Only the 'PES1UG19CS019\_seq0000000007' node is listed. The prompt '[zk: localhost:2181(CONNECTED) 1]' is visible at the end of the line.

```
WatchedEvent state:SyncConnected type:None path:null
[zk: localhost:2181(CONNECTED) 0] ls /
[PES1UG19CS019_seq0000000007, zookeeper]
[zk: localhost:2181(CONNECTED) 1]
```

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

```
[zk: localhost:2181(CONNECTED) 1] get -s /PES1UG19CS019_seq0000000007
null
cZxid = 0x38
ctime = Mon Apr 11 09:25:20 IST 2022
mZxid = 0x38
mtime = Mon Apr 11 09:25:20 IST 2022
pZxid = 0x38
cversion = 0
dataVersion = 0
aclVersion = 0
ephemeralOwner = 0x0
dataLength = 0
numChildren = 0
[zk: localhost:2181(CONNECTED) 2]
```

2d.jpg - Screenshot of Listing of all the children nodes

```
[zk: localhost:2181(CONNECTED) 6] ls /PES1UG19CS019
[Abhishek, Aditya]
[zk: localhost:2181(CONNECTED) 7]
```

3a.jpg - Screenshot of each of the clients listing all the znodes

The screenshot displays three terminal windows running Java, showing ZooKeeper logs and client commands. The top window shows logs for snapshotting, request processing, and audit disabling. The bottom three windows show client commands and responses for creating and listing znodes.

```
2022-04-11 09:46:02,593 [myid:] - INFO [main:o.a.z.s.p.FileTxnSnapLog@479] - Snapshotting: 0x5f to /opt/apache-zoo
keeper-3.8.0-bin/data/version-2/snapshot.5f
2022-04-11 09:46:02,593 [myid:] - INFO [main:o.a.z.s.ZooKeeperServer@547] - Snapshot taken in 0 ms
2022-04-11 09:46:02,596 [myid:] - INFO [ProcessThread(sid:0 cport:2181)::o.a.z.s.PrepareRequestProcessor@138] - PrepR
equestProcessor (sid:0) started, reconfigEnabled=false
2022-04-11 09:46:02,596 [myid:] - INFO [main:o.a.z.s.RequestThrottler@75] - zookeeper.request_throttler.shutdownTi
meout = 10000 ms
2022-04-11 09:46:02,602 [myid:] - INFO [main:o.a.z.s.ContainerManager@84] - Using checkIntervalMs=60000 maxPerMinu
te=10000 maxNeverUsedIntervalMs=0
2022-04-11 09:46:02,602 [myid:] - INFO [main:o.a.z.a.ZKAuditProvider@42] - ZooKeeper audit is disabled.
2022-04-11 09:46:05,753 [myid:] - INFO [SyncThread:0:o.a.z.s.p.FileTxnLog@285] - Creating new log file: log.60

WatchedEvent state:SyncConnected type:
None path:null
[zk: localhost:2181(CONNECTED) 0] crea
te /PES1UG19CS019
Created /PES1UG19CS019
[zk: localhost:2181(CONNECTED) 1] crea
te -se /PES1UG19CS019/candidate
Created /PES1UG19CS019/candidate000000
0000
[zk: localhost:2181(CONNECTED) 2] ls /
PES1UG19CS019
[candidate000000000000, candidate0000000
001, candidate00000000002]
[zk: localhost:2181(CONNECTED) 3]

, negotiated timeout = 30000
WATCHER::
WatchedEvent state:SyncConnected type:
None path:null
[zk: localhost:2181(CONNECTED) 0] crea
te -se /PES1UG19CS019/candidate
Created /PES1UG19CS019/candidate000000
0001
[zk: localhost:2181(CONNECTED) 1] ls /
PES1UG19CS019
[candidate000000000000, candidate0000000
001, candidate00000000002]
[zk: localhost:2181(CONNECTED) 2]

ca0002, negotiated timeout = 30000
WATCHER::
WatchedEvent state:SyncConnected type:
None path:null
[zk: localhost:2181(CONNECTED) 0] crea
te -se /PES1UG19CS019/candidate
Created /PES1UG19CS019/candidate000000
0002
[zk: localhost:2181(CONNECTED) 1] ls /
PES1UG19CS019
[candidate000000000000, candidate0000000
001, candidate00000000002]
[zk: localhost:2181(CONNECTED) 2]
```

### 3b.jpg - Screenshot of the Watched Event and the Zookeeper Server logs.

```
org.apache.zookeeper.server.ServerCnxn$EndOfStreamException: Unable to read additional data from client, it probably
closed the socket: address = [/0:0:0:0:0:0:1]:51768, session = 0x100038718920000
    at org.apache.zookeeper.server.NIOServerCnxn.handleFailedRead(NIOServerCnxn.java:170)
    at org.apache.zookeeper.server.NIOServerCnxn.doIO(NIOServerCnxn.java:333)
    at org.apache.zookeeper.server.NIOServerCnxnFactory$IOWorkRequest.doWork(NIOServerCnxnFactory.java:508)
    at org.apache.zookeeper.server.WorkerService$ScheduledWorkRequest.run(WorkerService.java:153)
    at java.base/java.util.concurrent.ThreadPoolExecutor.runWorker(ThreadPoolExecutor.java:1136)
    at java.base/java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:635)
    at java.base/java.lang.Thread.run(Thread.java:833)
2022-04-11 09:58:56,967 [myid:] - INFO [SessionTracker:o.a.z.s.ZooKeeperServer@632] - Expiring session 0x100038718
920000, timeout of 30000ms exceeded

[base] java

[zk: localhost:2181(CONNECTED) 1] create /PES1UG19CS019
[zk: localhost:2181(CONNECTED) 2] ls /
[PES1UG19CS019, zookeeper]
[zk: localhost:2181(CONNECTED) 3] ls /PES1UG19CS019
[candidate000000000000, candidate000000000000001, candidate000000000002]
[zk: localhost:2181(CONNECTED) 4] %
(base) apache-zookeeper-3.8.0-bin %

[base] java

mtime = Mon Apr 11 09:55:56 IST 2022
pZxid = 0x7a
cversion = 0
dataVersion = 0
aclVersion = 0
ephemeralOwner = 0x100038718920000
dataLength = 0
numChildren = 0
[zk: localhost:2181(CONNECTED) 3] WATCHER::
WatchedEvent state:SyncConnected type:
NodeDeleted path:/PES1UG19CS019/candid
ate000000000000

[base] java

-s -w /PES1UG19CS019/candidate000000
0001
null
cZxid = 0x7b
ctime = Mon Apr 11 09:56:02 IST 2022
mZxid = 0x7b
mtime = Mon Apr 11 09:56:02 IST 2022
pZxid = 0x7b
cversion = 0
dataVersion = 0
aclVersion = 0
ephemeralOwner = 0x100038718920001
dataLength = 0
numChildren = 0
[zk: localhost:2181(CONNECTED) 4]
```