Hello,

Here illustrates how to reproduce a simple MittOS experiment. Please notice that some stages require hard-code.

1. Install libraries required for compiling MongoDB, Linux kernel, and YCSB
2. format /dev/sda4, /dev/sdb, with ext4 format
3. mount /home/sda_mount on /dev/sda4, mount /home/sdb_mount on /dev/sdb.
4. (on 3 MongoDB servers) put MongoDB-MittCFQ.tar under /home/sda_mount; and linux source code (wget https://cdn.kernel.org/pub/linux/kernel/v4.x/linux-4.8.12.tar.xz)
(on YCSB client machine) put YCSB source code in /home/sda_mount
5. (on 3 MongoDB servers)merge linux_patch (see attachment) into linux source code (see patch.sh); compile kernel (make defconfig; make - j8; sudo make modules_install install;) ; modify /etc/default/grub by adding/updating GRUB_CMDLINE_LINUX_DEFAULT="elevator=cfq"
6. (on 3 MongoDB servers) sudo update-grub2; sudo grub-reboot 0; sudo reboot; after reboot, do not forget to remount /home/sda_mount and /home/sdb_mount
7. (on YCSB client machine) replace the original MongoDBClient.java with the new one (see attachment); then modify the "String url = "mongodb://pc706.emulab.net:27018/ycsb?w=1"; String url2 = "mongodb://pc708.emulab.net:27018/ycsb?w=1"; String url3 = "mongodb://pc712.emulab.net:27018/ycsb?w=1";" with your MongoDB servers' URL
8. (on YCSB client machine) open pom.xml in YCSB directory and add <checkstyle.skip>true</checkstyle.skip> under <properties>; then compile
9. (on 3 MongoDB servers) start mongod server by "./mongod -- nojournal --dbpath /home/sdb_mount/data/ --shardsvr --replSet "rs1" -- quiet --slowms 10000 --oplogSize 16"; and put them in the same replica
10. (on YCSB client) ./bin/ycsb load mongodb -s -P workloads/workload_random_uniform
11. (on 3 MongoDB servers) shutdown MongoDB; cp -r /home/sdb_mount/data/ /home/sdb_mount/backup

12. (on 3 MongoDB servers) install vmtouch in /home/sda_mount/. (On first MongoDB server node - the one you specified as String url in MongoDBClient.java) Put noise.zip (see attachment) there, compile the noise by "g++ noise-nodeX.c -std=c++11 -lpthread -o noise.o"
// steps below can be repeated
13. (on 3 MongoDB servers) clean the memory with clear_memory.sh (see attachment)
14. vmtouch -vt /home/sdb_mount/data/*;
15. start the MongoDB cluster again with "sudo ionice -c2 ./mongod -- nojournal --dbpath /home/sdb_mount/data/ --shardsvr --replSet "rs1" -- quiet --slowms 10000 --oplogSize 16".
If start returns error, try deleting mongod.lock in dbpath
16. (optional) run the noise on the first MongoDB server by "sudo ionice -c2 ./noise.o"
17. run ycsb workload to collect data, you can add more IO if you like
18. Shutdown mongod server and noise process