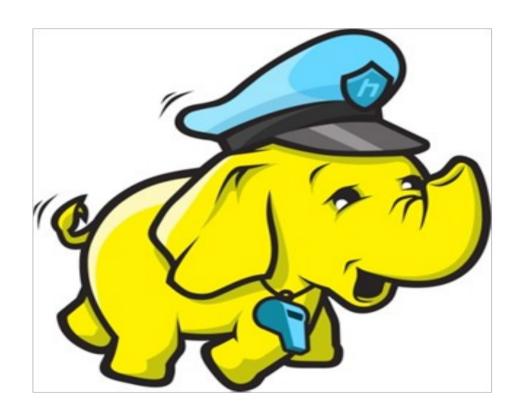# HDFS & MR Administration

For online Hadoop training, send mail to neeraj.ymca.2k6@gmail.com

Agenda

Namenode in safemode
Check the health of HDFS
Setting quota on no. of files
Clearing quota on no. of files
Setting quota on space
Clearing quota on space
Balance your HDFS
Deal with corrupt blocks
Move the corrupt files to lost+found
Delete the corrupt files
Monitoring MR Jobs
Kill MR jobs from command terminal

Namenode in safemode

After start-up, Namenode remains in safemode for some time.

You can't do write operation, while Namenode is in safemode.

Check the health of HDFS

./hadoop fsck /

```
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ pwd
/home/neeraj/local_cluster_home/hadoop-1.2.1/bin
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ ./hadoop fsck /
FSCK started by neeraj from /127.0.0.1 for path / at Sun Aug 18 14:50:51 IST 2013
..Status: HEALTHY
 Total size:       127 B
 Total dirs:       11
 Total files:      2
 Total blocks (validated):       2 (avg. block size 63 B)
 Minimally replicated blocks:    2 (100.0 %)
 Over-replicated blocks:         0 (0.0 %)
 Under-replicated blocks:        0 (0.0 %)
 Mis-replicated blocks:          0 (0.0 %)
 Default replication factor:     1
 Average block replication:      1.0
 Corrupt blocks:                 0
 Missing replicas:               0 (0.0 %)
 Number of data-nodes:           1
 Number of racks:                1
FSCK ended at Sun Aug 18 14:50:51 IST 2013 in 3 milliseconds


The filesystem under path '/' is HEALTHY
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$
```

Check the health of HDFS

./hadoop fsck /dir1

```
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ pwd
/home/neeraj/local_cluster_home/hadoop-1.2.1/bin
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ ./hadoop fsck /dir1
FSCK started by neeraj from /127.0.0.1 for path /dir1 at Sun Aug 18 15:46:19 IST 2013
.Status: HEALTHY
 Total size:     123 B
 Total dirs:     1
 Total files:    1
 Total blocks (validated):      1 (avg. block size 123 B)
 Minimally replicated blocks:   1 (100.0 %)
 Over-replicated blocks:        0 (0.0 %)
 Under-replicated blocks:       0 (0.0 %)
 Mis-replicated blocks:         0 (0.0 %)
 Default replication factor:    1
 Average block replication:     1.0
 Corrupt blocks:                0
 Missing replicas:              0 (0.0 %)
 Number of data-nodes:          1
 Number of racks:               1
FSCK ended at Sun Aug 18 15:46:19 IST 2013 in 10 milliseconds


The filesystem under path '/dir1' is HEALTHY
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$
```

Check the block health of HDFS

./hadoop fsck /dir1 -files -blocks

```
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ pwd
/home/neeraj/local_cluster_home/hadoop-1.2.1/bin
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ ./hadoop fsck /dir1 -files -blocks
FSCK started by neeraj from /127.0.0.1 for path /dir1 at Sun Aug 18 15:06:23 IST 2013
/dir1 <dir>
/dir1/sample_hadoop.txt 123 bytes, 1 block(s):  OK
0. blk_-8754226978439846901_1011 len=123 repl=1

Status: HEALTHY
 Total size:      123 B
 Total dirs:      1
 Total files:     1
 Total blocks (validated):       1 (avg. block size 123 B)
 Minimally replicated blocks:    1 (100.0 %)
 Over-replicated blocks:         0 (0.0 %)
 Under-replicated blocks:        0 (0.0 %)
 Mis-replicated blocks:          0 (0.0 %)
 Default replication factor:     1
 Average block replication:      1.0
 Corrupt blocks:                 0
 Missing replicas:               0 (0.0 %)
 Number of data-nodes:           1
 Number of racks:                1
FSCK ended at Sun Aug 18 15:06:23 IST 2013 in 1 milliseconds


The filesystem under path '/dir1' is HEALTHY
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$
```

Setting quota on no. of files

Many small files, increase the load of Namenode.

So we can put a restriction on maximum no. of files in a directory.

Clearing quota on no. of files

If we have put the restriction on number of files in a directory.

We can remove this restriction, if required.

```
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ pwd
/home/neeraj/local_cluster_home/hadoop-1.2.1/bin
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ ./hadoop fs -ls /
Found 4 items
drwxr-xr-x   - neeraj supergroup          0 2013-12-18 15:15 /home
drwxr-xr-x   - neeraj supergroup          0 2013-12-19 11:18 /input_files
drwxr-xr-x   - neeraj supergroup          0 2013-12-18 15:33 /tmp
drwxr-xr-x   - neeraj supergroup          0 2013-12-18 15:33 /user
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ ./hadoop dfsadmin -clrQuota /input_files
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$
```

Setting quota on space

We can put restriction on the size of a directory in HDFS

So that DFS Admin can control the usage of storage.

We can use m for MB, g for GB, t for TB

Clearing quota on space

If we have put the restriction on storage for directory.

We can remove this restriction, if required.


```
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ pwd
/home/neeraj/local_cluster_home/hadoop-1.2.1/bin
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ ./hadoop fs -ls /
Found 4 items
drwxr-xr-x   - neeraj supergroup          0 2013-12-18 15:15 /home
drwxr-xr-x   - neeraj supergroup          0 2013-12-19 11:18 /input_files
drwxr-xr-x   - neeraj supergroup          0 2013-12-18 15:33 /tmp
drwxr-xr-x   - neeraj supergroup          0 2013-12-18 15:33 /user
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ ./hadoop dfsadmin -clrSpaceQuota /input_files
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$
```

Balance your HDFS

Whenever we add/remove nodes from Hadoop cluster.

We need to balance the Hadoop cluster.

./hadoop balancer

```
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ pwd
/home/neeraj/local_cluster_home/hadoop-1.2.1/bin
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ ./hadoop balancer
Time Stamp               Iteration#  Bytes Already Moved  Bytes Left To Move  Bytes Being Moved
13/08/18 15:10:23 INFO net.NetworkTopology: Adding a new node: /default-rack/127.0.0.1:50010
13/08/18 15:10:23 INFO balancer.Balancer: 0 over utilized nodes:
13/08/18 15:10:23 INFO balancer.Balancer: 1 under utilized nodes:  127.0.0.1:50010
The cluster is balanced. Exiting...
Balancing took 1.019 seconds
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$
```

Deal with corrupt blocks

Blocks may get corrupt due to hardware /software failures.

MR jobs may get failed due to corrupt input data.

We need to either move or delete the corrupted data.

Corrupt blocks can be used for root cause analysis.

After deletion of corrupted blocks, the replication factor for some files decreases.

HDFS creates new replica to balance the replication factor.

Move the corrupt files to lost+found

./hadoop fsck -move

Delete the corrupt blocks

./hadoop fsck -delete

```
Terminal
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ pwd
/home/neeraj/local_cluster_home/hadoop-1.2.1/bin
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$ ./hadoop fsck -delete
FSCK started by neeraj from /127.0.0.1 for path / at Sun Aug 18 15:18:45 IST 2013
..Status: HEALTHY
 Total size:      127 B
 Total dirs:      12
 Total files:     2
 Total blocks (validated):       2 (avg. block size 63 B)
 Minimally replicated blocks:    2 (100.0 %)
 Over-replicated blocks:         0 (0.0 %)
 Under-replicated blocks:        0 (0.0 %)
 Mis-replicated blocks:          0 (0.0 %)
 Default replication factor:     1
 Average block replication:      1.0
 Corrupt blocks:                 0
 Missing replicas:               0 (0.0 %)
 Number of data-nodes:           1
 Number of racks:                1
FSCK ended at Sun Aug 18 15:18:45 IST 2013 in 4 milliseconds


The filesystem under path '/' is HEALTHY
neeraj@ubuntu:~/local_cluster_home/hadoop-1.2.1/bin$
```
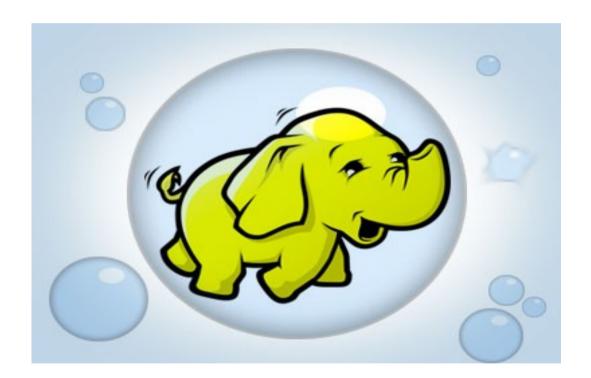
Monitoring MR Jobs

http://localhost:50030

Kill MR jobs from command terminal

./hadoop job -kill < job Id >

...Thanks...

For online Hadoop training, send mail to neeraj.ymca.2k6@gmail.com