

```
/// *****  
start-all.sh >>> 하둡 데몬들 실행시킴  
jps >>> 실행중인 하둡 데몬들(자바 프로세서) 확인  
/// *****
```

```
chosun@chosun-VirtualBox:~/hadoop$ start-all.sh  
starting namenode, logging to /home/chosun/hadoop-1.2.1/libexec/./logs/hadoop-chosun-namenode-chosun-VirtualBox.out  
WARNING: An illegal reflective access operation has occurred  
WARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/home/chosun/hadoop-1.2.1/hadoop-core-1.2.1.jar) to method sun.security.krb5.Config.getInstance()  
WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtil  
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations  
WARNING: All illegal access operations will be denied in a future release  
chosun@localhost's password:  
localhost: starting datanode, logging to /home/chosun/hadoop-1.2.1/libexec/./logs/hadoop-chosun-datanode-chosun-VirtualBox.out  
localhost: WARNING: An illegal reflective access operation has occurred  
localhost: WARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/home/chosun/hadoop-1.2.1/hadoop-core-1.2.1.jar) to method sun.security.krb5.Config.getInstance()  
localhost: WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtil  
localhost: WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations  
localhost: WARNING: All illegal access operations will be denied in a future release  
chosun@localhost's password:  
localhost: starting secondarynamenode, logging to /home/chosun/hadoop-1.2.1/libexec/./logs/hadoop-chosun-secondarynamenode-chosun-VirtualBox.out  
localhost: WARNING: An illegal reflective access operation has occurred  
localhost: WARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/home/chosun/hadoop-1.2.1/hadoop-core-1.2.1.jar) to method sun.security.krb5.Config.getInstance()  
localhost: WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtil  
localhost: WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations  
localhost: WARNING: All illegal access operations will be denied in a future release  
starting jobtracker, logging to /home/chosun/hadoop-1.2.1/libexec/./logs/hadoop-chosun-jobtracker-chosun-VirtualBox.out  
WARNING: An illegal reflective access operation has occurred  
WARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/home/chosun/hadoop-1.2.1/hadoop-core-1.2.1.jar) to method sun.security.krb5.Config.getInstance()  
WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtil  
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations  
WARNING: All illegal access operations will be denied in a future release  
chosun@localhost's password:  
localhost: starting tasktracker, logging to /home/chosun/hadoop-1.2.1/libexec/./logs/hadoop-chosun-tasktracker-chosun-VirtualBox.out  
localhost: WARNING: An illegal reflective access operation has occurred  
localhost: WARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/home/chosun/hadoop-1.2.1/hadoop-core-1.2.1.jar) to method sun.security.krb5.Config.getInstance()  
localhost: WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtil  
localhost: WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations  
localhost: WARNING: All illegal access operations will be denied in a future release
```

```
chosun@chosun-VirtualBox:~/hadoop$ jps  
6913 SecondaryNameNode  
1857 org.eclipse.equinox.launcher_1.5.300.v20190213-1655.jar  
7313 Jps  
6489 NameNode  
7019 JobTracker  
7228 TaskTracker  
6702 DataNode
```

```
/// *****  
1987.csv.bz2 파일 압축풀기 : bzip2 -d 1987.csv >>> 1987.csv파일 확인  
HomeWorkEX6_1.jar 파일은 보조 정렬 jar파일
```

```
/// *****  
chosun@chosun-VirtualBox:~/hadoop$ ls  
1987.csv  MyMy.jar  bin  contrib  hadoop-client-1.2.1.jar  hadoop-test-1.2.1.jar  vy.xml  pids  webapps  CHANGES.txt  
MyMyMy.jar  build.xml  dataexpo  hadoop-core-1.2.1.jar  hadoop-tools-1.2.1.jar  lib  sbin  wordcount_output  
HomeWorkEX6_1.jar  NOTICE.txt  c++  docs  hadoop-examples-1.2.1.jar  input.txt  libexec  share  
LICENSE.txt  README.txt  conf  hadoop-ant-1.2.1.jar  hadoop-minicluster-1.2.1.jar  ivy  logs  src
```

```
chosun@chosun-VirtualBox:~/hadoop$ hadoop fs -ls
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/home/chosun/hadoop-1.2.1/hadoop-core-1.2.1.jar) to method sun.security.krb5.Config.getInstance()
WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtil
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations
WARNING: All illegal access operations will be denied in a future release

Found 6 items
-rw-r--r--    1 chosun supergroup      15 2019-04-09 22:24 /user/chosun/20154215.txt
drwxr-xr-x   - chosun supergroup      0 2019-04-08 21:44 /user/chosun/MyMY
-rw-r--r--    1 chosun supergroup 533922063 2019-04-08 21:50 /user/chosun/MyMy
drwxr-xr-x   - chosun supergroup      0 2019-04-09 21:06 /user/chosun/conf
drwxr-xr-x   - chosun supergroup      0 2019-04-08 22:13 /user/chosun/delay
drwxr-xr-x   - chosun supergroup      0 2019-04-09 20:59 /user/chosun/wordcount_output
/// ***** ///
```

HW\_0429 디렉토리 생성 >>> 1987.csv파일 업로드

```
/// ***** ///
```

```
chosun@chosun-VirtualBox:~/hadoop$ hadoop fs -mkdir HW_0429
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/home/chosun/hadoop-1.2.1/hadoop-core-1.2.1.jar) to method sun.security.krb5.Config.getInstance()
WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtil
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations
WARNING: All illegal access operations will be denied in a future release

chosun@chosun-VirtualBox:~/hadoop$ hadoop fs -ls
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/home/chosun/hadoop-1.2.1/hadoop-core-1.2.1.jar) to method sun.security.krb5.Config.getInstance()
WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtil
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations
WARNING: All illegal access operations will be denied in a future release
```

```
Found 7 items
-rw-r--r--    1 chosun supergroup      15 2019-04-09 22:24 /user/chosun/20154215.txt
drwxr-xr-x   - chosun supergroup      0 2019-04-29 21:20 /user/chosun/HW_0429
drwxr-xr-x   - chosun supergroup      0 2019-04-08 21:44 /user/chosun/MyMY
-rw-r--r--    1 chosun supergroup 533922063 2019-04-08 21:50 /user/chosun/MyMy
drwxr-xr-x   - chosun supergroup      0 2019-04-09 21:06 /user/chosun/conf
drwxr-xr-x   - chosun supergroup      0 2019-04-08 22:13 /user/chosun/delay
drwxr-xr-x   - chosun supergroup      0 2019-04-09 20:59 /user/chosun/wordcount_output
```

```
chosun@chosun-VirtualBox:~/hadoop$ hadoop fs -put 1987.csv HW_0429
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/home/chosun/hadoop-1.2.1/hadoop-core-1.2.1.jar) to method sun.security.krb5.Config.getInstance()
WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtil
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations
WARNING: All illegal access operations will be denied in a future release
```

```
chosun@chosun-VirtualBox:~/hadoop$ hadoop fs -ls HW_0429
WARNING: An illegal reflective access operation has occurred
WARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/home/chosun/hadoop-1.2.1/hadoop-core-1.2.1.jar) to method sun.security.krb5.Config.getInstance()
WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtil
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations
WARNING: All illegal access operations will be denied in a future release
```

```
Found 1 items
-rw-r--r--    1 chosun supergroup 127162942 2019-04-29 21:21 /user/chosun/HW_0429/1987.csv
```

```
chosun@chosun-VirtualBox:~/hadoop$
/// ***** ///
```

jar 파일 실행  
HW\_0429 디렉토리의 1987.csv파일을 jar파일로 처리한 것을 HW\_delay\_sort에 저장  
DelayCountWithDateKey는 클래스 이름

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/// ***** ///
```

chosun@chosun-VirtualBox:~/hadoop\$ hadoop jar HomeWorkEX6\_1.jar DelayCountWithDateKey HW\_0429 HW\_delay\_sort

WARNING: An illegal reflective access operation has occurred  
WARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/home/chosun/hadoop-1.2.1/hadoop-core-1.2.1.jar) to method sun.security.krb5.Config.getInstance()  
WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtil  
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations  
WARNING: All illegal access operations will be denied in a future release  
19/04/29 21:22:38 INFO input.FileInputFormat: Total input paths to process : 1  
19/04/29 21:22:38 INFO util.NativeCodeLoader: Loaded the native-hadoop library  
19/04/29 21:22:38 WARN snappy.LoadSnappy: Snappy native library not loaded  
19/04/29 21:22:38 INFO mapred.JobClient: Running job: job\_201904292119\_0001  
19/04/29 21:22:39 INFO mapred.JobClient: map 0% reduce 0%  
19/04/29 21:22:56 INFO mapred.JobClient: map 47% reduce 0%  
19/04/29 21:22:59 INFO mapred.JobClient: map 100% reduce 0%  
19/04/29 21:23:07 INFO mapred.JobClient: map 100% reduce 33%  
19/04/29 21:23:09 INFO mapred.JobClient: map 100% reduce 100%  
19/04/29 21:23:09 INFO mapred.JobClient: Job complete: job\_201904292119\_0001  
19/04/29 21:23:09 INFO mapred.JobClient: Counters: 35  
19/04/29 21:23:09 INFO mapred.JobClient: Map-Reduce Framework  
19/04/29 21:23:09 INFO mapred.JobClient: Spilled Records=4139511  
19/04/29 21:23:09 INFO mapred.JobClient: Map output materialized bytes=27596752  
19/04/29 21:23:09 INFO mapred.JobClient: Reduce input records=1379837  
19/04/29 21:23:09 INFO mapred.JobClient: Virtual memory (bytes) snapshot=6271221760  
19/04/29 21:23:09 INFO mapred.JobClient: Map input records=1311827  
19/04/29 21:23:09 INFO mapred.JobClient: SPLIT\_RAW\_BYTES=230  
19/04/29 21:23:09 INFO mapred.JobClient: Map output bytes=24837066  
19/04/29 21:23:09 INFO mapred.JobClient: Reduce shuffle bytes=27596752  
19/04/29 21:23:09 INFO mapred.JobClient: Physical memory (bytes) snapshot=673533952  
19/04/29 21:23:09 INFO mapred.JobClient: Reduce input groups=2  
19/04/29 21:23:09 INFO mapred.JobClient: Combine output records=0  
19/04/29 21:23:09 INFO mapred.JobClient: Reduce output records=0  
19/04/29 21:23:09 INFO mapred.JobClient: Map output records=1379837  
19/04/29 21:23:09 INFO mapred.JobClient: Combine input records=0  
19/04/29 21:23:09 INFO mapred.JobClient: CPU time spent (ms)=20210  
19/04/29 21:23:09 INFO mapred.JobClient: Total committed heap usage (bytes)=455081984  
19/04/29 21:23:09 INFO mapred.JobClient: DelayCounters  
19/04/29 21:23:09 INFO mapred.JobClient: scheduled\_arrival=60437  
19/04/29 21:23:09 INFO mapred.JobClient: early\_arrival=419697  
19/04/29 21:23:09 INFO mapred.JobClient: not\_available\_departure=19685  
19/04/29 21:23:09 INFO mapred.JobClient: early\_departure=199892  
19/04/29 21:23:09 INFO mapred.JobClient: scheduled\_departure=520606  
19/04/29 21:23:09 INFO mapred.JobClient: not\_available\_arrival=23500  
19/04/29 21:23:09 INFO mapred.JobClient: File Input Format Counters  
19/04/29 21:23:09 INFO mapred.JobClient: Bytes Read=127167038  
19/04/29 21:23:09 INFO mapred.JobClient: FileSystemCounters  
19/04/29 21:23:09 INFO mapred.JobClient: HDFS\_BYTES\_READ=127167268  
19/04/29 21:23:09 INFO mapred.JobClient: FILE\_BYTES\_WRITTEN=82971639  
19/04/29 21:23:09 INFO mapred.JobClient: FILE\_BYTES\_READ=55193522  
19/04/29 21:23:09 INFO mapred.JobClient: HDFS\_BYTES\_WRITTEN=90  
19/04/29 21:23:09 INFO mapred.JobClient: Job Counters  
19/04/29 21:23:09 INFO mapred.JobClient: Launched map tasks=2  
19/04/29 21:23:09 INFO mapred.JobClient: Launched reduce tasks=1  
19/04/29 21:23:09 INFO mapred.JobClient: SLOTS\_MILLIS\_REDUCES=9890  
19/04/29 21:23:09 INFO mapred.JobClient: Total time spent by all reduces waiting after reserving slots (ms)=0  
19/04/29 21:23:09 INFO mapred.JobClient: SLOTS\_MILLIS\_MAPS=38041  
19/04/29 21:23:09 INFO mapred.JobClient: Total time spent by all maps waiting after reserving slots (ms)=0  
19/04/29 21:23:09 INFO mapred.JobClient: Data-local map tasks=2  
19/04/29 21:23:09 INFO mapred.JobClient: File Output Format Counters  
19/04/29 21:23:09 INFO mapred.JobClient: Bytes Written=0

MR-Job Result:0

chosun@chosun-VirtualBox:~/hadoop\$

/// \*\*\*\*\*  
HW\_delay\_sort 디렉토리 파일 확인  
출발 지연, 도착 지연 처리 데이터 확인  
/// \*\*\*\*\*

chosun@chosun-VirtualBox:~/hadoop\$ **hadoop fs -ls HW\_delay\_sort**  
WARNING: An illegal reflective access operation has occurred  
WARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/home/chosun/hadoop-1.2.1/hadoop-core-1.2.1.jar) to method sun.security.krb5.Config.getInstance()  
WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtil  
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations  
WARNING: All illegal access operations will be denied in a future release  
Found 5 items

<u>-rw-r--r--</u>	<u>1</u>	<u>chosun supergroup</u>	<u>0</u>	<u>2019-04-29 21:23</u>	<u>/user/chosun/HW_delay_sort/_SUCCESS</u>
<u>drwxr-xr-x</u>	<u>-</u>	<u>chosun supergroup</u>	<u>0</u>	<u>2019-04-29 21:22</u>	<u>/user/chosun/HW_delay_sort/_logs</u>
<u>-rw-r--r--</u>	<u>1</u>	<u>chosun supergroup</u>	<u>45</u>	<u>2019-04-29 21:23</u>	<u>/user/chosun/HW_delay_sort/arrival-r-00000</u>
<u>-rw-r--r--</u>	<u>1</u>	<u>chosun supergroup</u>	<u>45</u>	<u>2019-04-29 21:23</u>	<u>/user/chosun/HW_delay_sort/departure-r-00000</u>
<u>-rw-r--r--</u>	<u>1</u>	<u>chosun supergroup</u>	<u>0</u>	<u>2019-04-29 21:23</u>	<u>/user/chosun/HW_delay_sort/part-r-00000</u>

chosun@chosun-VirtualBox:~/hadoop\$  
**chosun@chosun-VirtualBox:~/hadoop\$ hadoop fs -cat HW\_delay\_sort/arrival-r-00000**  
WARNING: An illegal reflective access operation has occurred  
WARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/home/chosun/hadoop-1.2.1/hadoop-core-1.2.1.jar) to method sun.security.krb5.Config.getInstance()  
WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtil  
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations  
WARNING: All illegal access operations will be denied in a future release

1987,10265658  
1987,11255127  
1987,12287408

chosun@chosun-VirtualBox:~/hadoop\$  
**chosun@chosun-VirtualBox:~/hadoop\$ hadoop fs -cat HW\_delay\_sort/departure-r-00000**  
WARNING: An illegal reflective access operation has occurred  
WARNING: Illegal reflective access by org.apache.hadoop.security.authentication.util.KerberosUtil (file:/home/chosun/hadoop-1.2.1/hadoop-core-1.2.1.jar) to method sun.security.krb5.Config.getInstance()  
WARNING: Please consider reporting this to the maintainers of org.apache.hadoop.security.authentication.util.KerberosUtil  
WARNING: Use --illegal-access=warn to enable warnings of further illegal reflective access operations  
WARNING: All illegal access operations will be denied in a future release

1987,10175568  
1987,11177218  
1987,12218858

chosun@chosun-VirtualBox:~/hadoop\$