## 练习1: Flushes and Compactions

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| hbase(main):006:0> create 'mytable',NAME=>'cf',VERSIONS=>3  0 row(s) in 2.2810 seconds  hbase(main):008:0> flush 'mytable'  0 row(s) in 0.3760 seconds  hbase(main):009:0> put 'mytable','row1','cf:col','foo'  0 row(s) in 0.1340 seconds  hbase(main):011:0> flush 'mytable'  0 row(s) in 0.4400 seconds |
| **#可以看到都一个文件**  [ian@h1 ~]$ hdfs dfs -ls -R /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf  -rw-r--r-- 1 ian supergroup 4906 2018-08-01 16:34 /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/6b051aab448b4496af70663ee4c92474 |
| hbase(main):012:0> put 'mytable','row2','cf:col','too'  0 row(s) in 0.0090 seconds  hbase(main):013:0> flush 'mytable'  0 row(s) in 0.7490 seconds |
| **#可以看到都两个文件**  [ian@h1 ~]$ hdfs dfs -ls -R /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf  -rw-r--r-- 1 ian supergroup 4906 2018-08-01 16:35 /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/1aa2f94542a443f1ac2b892210c72884  -rw-r--r-- 1 ian supergroup 4906 2018-08-01 16:34 /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/6b051aab448b4496af70663ee4c92474  **#查看文件内容**  [ian@h1 ~]$ hbase hfile --printkv --file hdfs://h1:9000/hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/6b051aab448b4496af70663ee4c92474  SLF4J: Class path contains multiple SLF4J bindings.  SLF4J: Found binding in [jar:file:/home/ian/installed/hbase/lib/slf4j-log4j12-1.7.5.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: Found binding in [jar:file:/home/ian/installed/hadoop/share/hadoop/common/lib/slf4j-log4j12-1.7.10.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: See http://www.slf4j.org/codes.html#multiple\_bindings for an explanation.  SLF4J: Actual binding is of type [org.slf4j.impl.Log4jLoggerFactory]  2018-08-01 16:37:30,026 INFO [main] hfile.CacheConfig: Created cacheConfig: CacheConfig:disabled  K: row1/cf:col/1533112474031/Put/vlen=3/seqid=5 V: foo  Scanned kv count -> 1 |
| hbase(main):014:0> major\_compact 'mytable'  0 row(s) in 0.0860 seconds |
| **#变回了一个文件**  [ian@h1 ~]$ hdfs dfs -ls -R /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf  -rw-r--r-- 1 ian supergroup 4941 2018-08-01 16:38 /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/b12e07ef4aa4403d8db7cc9931495cae  **#查看文件内容**  [ian@h1 ~]$ hbase hfile --printkv --file hdfs://h1:9000/hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/b12e07ef4aa4403d8db7cc9931495cae  SLF4J: Class path contains multiple SLF4J bindings.  SLF4J: Found binding in [jar:file:/home/ian/installed/hbase/lib/slf4j-log4j12-1.7.5.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: Found binding in [jar:file:/home/ian/installed/hadoop/share/hadoop/common/lib/slf4j-log4j12-1.7.10.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: See http://www.slf4j.org/codes.html#multiple\_bindings for an explanation.  SLF4J: Actual binding is of type [org.slf4j.impl.Log4jLoggerFactory]  2018-08-01 16:38:53,371 INFO [main] hfile.CacheConfig: Created cacheConfig: CacheConfig:disabled  K: row1/cf:col/1533112474031/Put/vlen=3/seqid=5 V: foo  K: row2/cf:col/1533112515743/Put/vlen=3/seqid=10 V: too  Scanned kv count -> 2 |
| **#查看Write Ahead Log**  [ian@h1 ~]$ hbase hlog hdfs://h1:9000/hbase/WALs/h2,16020,1532513475389/h2%2C16020%2C1532513475389..meta.1533111172710.meta  SLF4J: Class path contains multiple SLF4J bindings.  SLF4J: Found binding in [jar:file:/home/ian/installed/hbase/lib/slf4j-log4j12-1.7.5.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: Found binding in [jar:file:/home/ian/installed/hadoop/share/hadoop/common/lib/slf4j-log4j12-1.7.10.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: See http://www.slf4j.org/codes.html#multiple\_bindings for an explanation.  SLF4J: Actual binding is of type [org.slf4j.impl.Log4jLoggerFactory]  Writer Classes: ProtobufLogWriter  Cell Codec Class: org.apache.hadoop.hbase.regionserver.wal.WALCellCodec  Sequence=72 , region=1588230740 at write timestamp=Wed Aug 01 16:28:34 CST 2018  row=mytable,,1533112113539.1a70be711154321068b158fdef4454e3., column=info:regioninfo  Sequence=73 , region=1588230740 at write timestamp=Wed Aug 01 16:28:34 CST 2018  row=mytable,,1533112113539.1a70be711154321068b158fdef4454e3., column=info:regioninfo  row=mytable,,1533112113539.1a70be711154321068b158fdef4454e3., column=info:server  row=mytable,,1533112113539.1a70be711154321068b158fdef4454e3., column=info:serverstartcode  row=mytable,,1533112113539.1a70be711154321068b158fdef4454e3., column=info:seqnumDuringOpen  Sequence=74 , region=1588230740 at write timestamp=Wed Aug 01 16:29:57 CST 2018  row=mytable,,1533112113539.1a70be711154321068b158fdef4454e3., column=info:  Sequence=75 , region=1588230740 at write timestamp=Wed Aug 01 16:30:04 CST 2018  row=mytable,,1533112203632.1ae1b85d43f326f0aae64a3cbc84b2ca., column=info:regioninfo  Sequence=76 , region=1588230740 at write timestamp=Wed Aug 01 16:30:04 CST 2018  row=mytable,,1533112203632.1ae1b85d43f326f0aae64a3cbc84b2ca., column=info:regioninfo  row=mytable,,1533112203632.1ae1b85d43f326f0aae64a3cbc84b2ca., column=info:server  row=mytable,,1533112203632.1ae1b85d43f326f0aae64a3cbc84b2ca., column=info:serverstartcode  row=mytable,,1533112203632.1ae1b85d43f326f0aae64a3cbc84b2ca., column=info:seqnumDuringOpen  Sequence=79 , region=1588230740 at write timestamp=Wed Aug 01 16:34:40 CST 2018  row=\x00, column=METAFAMILY:HBASE::FLUSH  Sequence=80 , region=1588230740 at write timestamp=Wed Aug 01 16:34:40 CST 2018  row=\x00, column=METAFAMILY:HBASE::FLUSH |

## 练习2: Compactions and Data

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| hbase(main):015:0> put 'mytable','row3','cf:col','row3value'  0 row(s) in 0.0220 seconds  hbase(main):016:0> flush 'mytable'  0 row(s) in 0.7820 seconds  hbase(main):017:0> major\_compact 'mytable'  0 row(s) in 0.0630 seconds |
| **#使用hfile –printkv确认row3数据是否存在**  [ian@h1 ~]$ hdfs dfs -ls -R /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf  -rw-r--r-- 1 ian supergroup 4984 2018-08-01 17:10 /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/01d98929abcf4a8d988f330660640e1d  [ian@h1 ~]$ hbase hfile --printkv --file hdfs://h1:9000/hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/01d98929abcf4a8d988f330660640e1d  SLF4J: Class path contains multiple SLF4J bindings.  SLF4J: Found binding in [jar:file:/home/ian/installed/hbase/lib/slf4j-log4j12-1.7.5.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: Found binding in [jar:file:/home/ian/installed/hadoop/share/hadoop/common/lib/slf4j-log4j12-1.7.10.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: See http://www.slf4j.org/codes.html#multiple\_bindings for an explanation.  SLF4J: Actual binding is of type [org.slf4j.impl.Log4jLoggerFactory]  2018-08-01 17:11:30,823 INFO [main] hfile.CacheConfig: Created cacheConfig: CacheConfig:disabled  K: row1/cf:col/1533112474031/Put/vlen=3/seqid=5 V: foo  K: row2/cf:col/1533112515743/Put/vlen=3/seqid=10 V: too  K: row3/cf:col/1533113195669/Put/vlen=9/seqid=16 V: row3value  Scanned kv count -> 3 |
| hbase(main):018:0> deleteall 'mytable','row3'  0 row(s) in 0.0500 seconds  **hbase(main):020:0> flush 'mytable'**  **0 row(s) in 0.7420 seconds** |
| **#使用hfile –printkv确认row3数据存在**  [ian@h1 ~]$ hbase hfile --printkv --file hdfs://h1:9000/hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/01d98929abcf4a8d988f330660640e1d  SLF4J: Class path contains multiple SLF4J bindings.  SLF4J: Found binding in [jar:file:/home/ian/installed/hbase/lib/slf4j-log4j12-1.7.5.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: Found binding in [jar:file:/home/ian/installed/hadoop/share/hadoop/common/lib/slf4j-log4j12-1.7.10.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: See http://www.slf4j.org/codes.html#multiple\_bindings for an explanation.  SLF4J: Actual binding is of type [org.slf4j.impl.Log4jLoggerFactory]  2018-08-01 17:16:33,198 INFO [main] hfile.CacheConfig: Created cacheConfig: CacheConfig:disabled  K: row1/cf:col/1533112474031/Put/vlen=3/seqid=5 V: foo  K: row2/cf:col/1533112515743/Put/vlen=3/seqid=10 V: too  **K: row3/cf:col/1533113195669/Put/vlen=9/seqid=16 V: row3value**  Scanned kv count -> 3  [ian@h1 ~]$ hdfs dfs -ls -R /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf  -rw-r--r-- 1 ian supergroup 4984 2018-08-01 17:10 /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/01d98929abcf4a8d988f330660640e1d  -rw-r--r-- 1 ian supergroup 5079 2018-08-01 17:16 /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/def6a5cadf6e425793b2227f4c9e30f2  [ian@h1 ~]$ hbase hfile --printkv --file hdfs://h1:9000/hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/def6a5cadf6e425793b2227f4c9e30f2  SLF4J: Class path contains multiple SLF4J bindings.  SLF4J: Found binding in [jar:file:/home/ian/installed/hbase/lib/slf4j-log4j12-1.7.5.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: Found binding in [jar:file:/home/ian/installed/hadoop/share/hadoop/common/lib/slf4j-log4j12-1.7.10.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: See http://www.slf4j.org/codes.html#multiple\_bindings for an explanation.  SLF4J: Actual binding is of type [org.slf4j.impl.Log4jLoggerFactory]  2018-08-01 17:17:08,592 INFO [main] hfile.CacheConfig: Created cacheConfig: CacheConfig:disabled  K: row3/cf:/1533114974811/DeleteFamily/vlen=0/seqid=22 V:  Scanned kv count -> 1 |
| **#使用hfile –printkv确认row3数据存在**  [ian@h1 ~]$ hdfs dfs -ls -R /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf  -rw-r--r-- 1 ian supergroup 4941 2018-08-01 17:20 /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/45472beb375e407b991b322006d96d35  [ian@h1 ~]$ hbase hfile --printkv --file hdfs://h1:9000/hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/45472beb375e407b991b322006d96d35  SLF4J: Class path contains multiple SLF4J bindings.  SLF4J: Found binding in [jar:file:/home/ian/installed/hbase/lib/slf4j-log4j12-1.7.5.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: Found binding in [jar:file:/home/ian/installed/hadoop/share/hadoop/common/lib/slf4j-log4j12-1.7.10.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: See http://www.slf4j.org/codes.html#multiple\_bindings for an explanation.  SLF4J: Actual binding is of type [org.slf4j.impl.Log4jLoggerFactory]  2018-08-01 17:20:52,840 INFO [main] hfile.CacheConfig: Created cacheConfig: CacheConfig:disabled  K: row1/cf:col/1533112474031/Put/vlen=3/seqid=5 V: foo  K: row2/cf:col/1533112515743/Put/vlen=3/seqid=10 V: too  Scanned kv count -> 2 |
| hbase(main):022:0> put 'mytable','row4','cf:col','first data'  0 row(s) in 0.0180 seconds  hbase(main):023:0> put 'mytable','row4','cf:col','2nd data'  0 row(s) in 0.0090 seconds  hbase(main):024:0> put 'mytable','row4','cf:col','third data'  0 row(s) in 0.0070 seconds  hbase(main):025:0> put 'mytable','row4','cf:col','4th data'  0 row(s) in 0.0060 seconds  hbase(main):027:0> flush 'mytable'  0 row(s) in 0.7250 seconds |
| **#注意：在major\_compact之前已经只剩下3条数据！！！**  [ian@h1 ~]$ hbase hfile --printkv --file hdfs://h1:9000/hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/a766a995d70e407ba534918ee8948507  SLF4J: Class path contains multiple SLF4J bindings.  SLF4J: Found binding in [jar:file:/home/ian/installed/hbase/lib/slf4j-log4j12-1.7.5.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: Found binding in [jar:file:/home/ian/installed/hadoop/share/hadoop/common/lib/slf4j-log4j12-1.7.10.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: See http://www.slf4j.org/codes.html#multiple\_bindings for an explanation.  SLF4J: Actual binding is of type [org.slf4j.impl.Log4jLoggerFactory]  2018-08-01 17:24:22,771 INFO [main] hfile.CacheConfig: Created cacheConfig: CacheConfig:disabled  K: row4/cf:col/1533115424842/Put/vlen=8/seqid=31 V: 4th data  K: row4/cf:col/1533115418800/Put/vlen=10/seqid=30 V: third data  K: row4/cf:col/1533115411683/Put/vlen=8/seqid=29 V: 2nd data  Scanned kv count -> 3 |
| hbase(main):028:0> major\_compact 'mytable'  0 row(s) in 0.0690 seconds |
| [ian@h1 ~]$ hdfs dfs -ls -R /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf  -rw-r--r-- 1 ian supergroup 5061 2018-08-01 17:27 /hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/6fd107862c7240a3a973e313d18507b0  [ian@h1 ~]$ hbase hfile --printkv --file hdfs://h1:9000/hbase/data/default/mytable/1ae1b85d43f326f0aae64a3cbc84b2ca/cf/6fd107862c7240a3a973e313d18507b0  SLF4J: Class path contains multiple SLF4J bindings.  SLF4J: Found binding in [jar:file:/home/ian/installed/hbase/lib/slf4j-log4j12-1.7.5.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: Found binding in [jar:file:/home/ian/installed/hadoop/share/hadoop/common/lib/slf4j-log4j12-1.7.10.jar!/org/slf4j/impl/StaticLoggerBinder.class]  SLF4J: See http://www.slf4j.org/codes.html#multiple\_bindings for an explanation.  SLF4J: Actual binding is of type [org.slf4j.impl.Log4jLoggerFactory]  2018-08-01 17:28:02,073 INFO [main] hfile.CacheConfig: Created cacheConfig: CacheConfig:disabled  K: row1/cf:col/1533112474031/Put/vlen=3/seqid=5 V: foo  K: row2/cf:col/1533112515743/Put/vlen=3/seqid=10 V: too  K: row4/cf:col/1533115424842/Put/vlen=8/seqid=31 V: 4th data  K: row4/cf:col/1533115418800/Put/vlen=10/seqid=30 V: third data  K: row4/cf:col/1533115411683/Put/vlen=8/seqid=29 V: 2nd data  Scanned kv count -> 5 |