What is Hbase?

Need for Hbase?

Features?

How it is different from Hive?

Data Model?

What is columnFamilies?

What is RegionServer?

Modes of Hbase?

Architecture?

DDL and DML?

**Which code is used to open a connection in HBase?**

## ****Explain deletion in HBase? Mention what are the three types of tombstone markers in HBase?****

When you delete the cell in HBase, the data is not actually deleted, but a tombstone marker is set, making the deleted cells invisible.  HBase deleted are actually removed during major compaction.

Three types of tombstone markers are there:

* Version delete marker: For deletion, it marks a single version of a column
* Column delete marker: For deletion, it marks all the versions of a column
* Family delete marker: For deletion, it marks of all columns for a column family

Column Family is a collection of columns, whereas row is a collection of column families.

<https://wiki.apache.org/hadoop/Hbase/FAQ_Operations>

<https://wiki.apache.org/hadoop/Hbase/FAQ>

Hbase commands:

1. **hbase(main):001:0> status**

1 active master, 0 backup masters, 6 servers, 0 dead, 2.6667 average load

**2. hbase(main):002:0> status 'simple'**

active master: qbda1node02.suntrust.com:60000 1510626228211

0 backup masters

6 live servers

qbda1node06.suntrust.com:60020 1513093088861

requestsPerSecond=0.0, numberOfOnlineRegions=6, usedHeapMB=20, maxHeapMB=48, numberOfStores=16, numberOfStorefiles=17, storefileUncompressedSizeMB=8, storefileSizeMB=8, compressionRatio=1.0000, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=608174, writeRequestsCount=1833, rootIndexSizeKB=16, totalStaticIndexSizeKB=7, totalStaticBloomSizeKB=35, totalCompactingKVs=73793, currentCompactedKVs=73793, compactionProgressPct=1.0, coprocessors=[AccessController, MultiRowMutationEndpoint, RegionAuditCoProcessor, SecureBulkLoadEndpoint, TokenProvider]

qbda1node07.suntrust.com:60020 1513150037366

requestsPerSecond=0.0, numberOfOnlineRegions=0, usedHeapMB=331, maxHeapMB=12966, numberOfStores=0, numberOfStorefiles=0, storefileUncompressedSizeMB=0, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=0, writeRequestsCount=0, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=0, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, coprocessors=[]

qbda1node09.suntrust.com:60020 1511041214425

requestsPerSecond=0.0, numberOfOnlineRegions=6, usedHeapMB=630, maxHeapMB=12966, numberOfStores=17, numberOfStorefiles=15, storefileUncompressedSizeMB=81, storefileSizeMB=81, compressionRatio=1.0000, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=63756, writeRequestsCount=3990, rootIndexSizeKB=104, totalStaticIndexSizeKB=69, totalStaticBloomSizeKB=96, totalCompactingKVs=249105, currentCompactedKVs=249105, compactionProgressPct=1.0, coprocessors=[AccessController, RegionAuditCoProcessor, SecureBulkLoadEndpoint, TokenProvider]

qbda1node08.suntrust.com:60020 1513204847491

requestsPerSecond=0.0, numberOfOnlineRegions=0, usedHeapMB=2615, maxHeapMB=12966, numberOfStores=0, numberOfStorefiles=0, storefileUncompressedSizeMB=0, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=0, writeRequestsCount=0, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=0, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, coprocessors=[]

qbda1node10.suntrust.com:60020 1513181968803

requestsPerSecond=0.0, numberOfOnlineRegions=0, usedHeapMB=2773, maxHeapMB=12966, numberOfStores=0, numberOfStorefiles=0, storefileUncompressedSizeMB=0, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=0, writeRequestsCount=0, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=0, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, coprocessors=[]

qbda1node05.suntrust.com:60020 1511992766000

requestsPerSecond=0.0, numberOfOnlineRegions=4, usedHeapMB=219, maxHeapMB=554, numberOfStores=8, numberOfStorefiles=9, storefileUncompressedSizeMB=70, storefileSizeMB=70, compressionRatio=1.0000, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=34698, writeRequestsCount=72, rootIndexSizeKB=60, totalStaticIndexSizeKB=35, totalStaticBloomSizeKB=65, totalCompactingKVs=232526, currentCompactedKVs=232526, compactionProgressPct=1.0, coprocessors=[AccessController, RegionAuditCoProcessor, SecureBulkLoadEndpoint, TokenProvider]

0 dead servers

Aggregate load: 0, regions: 16

hbase(main):003:0> status 'summary'

1 active master, 0 backup masters, 6 servers, 0 dead, 2.6667 average load

hbase(main):004:0> status 'detailed'

version 1.2.0-cdh5.9.0

1 regionsInTransition

{64afb6ee75df8fe1c18ef08d16885573 state=PENDING\_OPEN, ts=1513118313141, server=null}

active master: qbda1node02.suntrust.com:60000 1510626228211

0 backup masters

master coprocessors: [AccessController, MasterAuditCoProcessor]

6 live servers

qbda1node06.suntrust.com:60020 1513093088861

requestsPerSecond=22.0, numberOfOnlineRegions=6, usedHeapMB=32, maxHeapMB=48, numberOfStores=16, numberOfStorefiles=17, storefileUncompressedSizeMB=8, storefileSizeMB=8, compressionRatio=1.0000, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=608774, writeRequestsCount=1833, rootIndexSizeKB=16, totalStaticIndexSizeKB=7, totalStaticBloomSizeKB=35, totalCompactingKVs=73793, currentCompactedKVs=73793, compactionProgressPct=1.0, coprocessors=[AccessController, MultiRowMutationEndpoint, RegionAuditCoProcessor, SecureBulkLoadEndpoint, TokenProvider]

"Test\_Metadata,,1490003821655.f136e35a1f55ac8e8ece611f1c51fdfe."

numberOfStores=2, numberOfStorefiles=2, storefileUncompressedSizeMB=0, lastMajorCompactionTimestamp=0, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=488, writeRequestsCount=0, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=0, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, completeSequenceId=-1, dataLocality=0.53376067

"hbase:acl,,1490313957557.baa16d2695711d11ef070348cc4e33bf."

numberOfStores=1, numberOfStorefiles=2, storefileUncompressedSizeMB=0, lastMajorCompactionTimestamp=1512994548933, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=16, writeRequestsCount=0, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=0, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, completeSequenceId=-1, dataLocality=1.0

"hbase:meta,,1"

numberOfStores=1, numberOfStorefiles=2, storefileUncompressedSizeMB=0, lastMajorCompactionTimestamp=1513117800938, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=556986, writeRequestsCount=1, rootIndexSizeKB=1, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=0, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, completeSequenceId=1750, dataLocality=1.0

"r2ra:m\_test\_data,,1494285686313.a0b1a15e99fe3f46b95976b1d7d4f564."

numberOfStores=4, numberOfStorefiles=3, storefileUncompressedSizeMB=0, lastMajorCompactionTimestamp=0, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=6400, writeRequestsCount=0, rootIndexSizeKB=1, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=3, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, completeSequenceId=-1, dataLocality=0.28391376

"r2ra:metadatatestcdh9,,1497731797699.2e1198030eb1bb686150ab98ec499e49."

numberOfStores=5, numberOfStorefiles=4, storefileUncompressedSizeMB=2, lastMajorCompactionTimestamp=0, storefileSizeMB=2, compressionRatio=1.0000, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=7000, writeRequestsCount=0, rootIndexSizeKB=3, totalStaticIndexSizeKB=1, totalStaticBloomSizeKB=8, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, completeSequenceId=-1, dataLocality=0.61954933

"r2ra:process,,1501037973596.c3977c8ada703ad2412ee4de37892ea3."

numberOfStores=3, numberOfStorefiles=4, storefileUncompressedSizeMB=6, lastMajorCompactionTimestamp=1513184478193, storefileSizeMB=6, compressionRatio=1.0000, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=37884, writeRequestsCount=1832, rootIndexSizeKB=11, totalStaticIndexSizeKB=6, totalStaticBloomSizeKB=24, totalCompactingKVs=73793, currentCompactedKVs=73793, compactionProgressPct=1.0, completeSequenceId=50750, dataLocality=1.0

qbda1node07.suntrust.com:60020 1513150037366

requestsPerSecond=0.0, numberOfOnlineRegions=0, usedHeapMB=338, maxHeapMB=12966, numberOfStores=0, numberOfStorefiles=0, storefileUncompressedSizeMB=0, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=0, writeRequestsCount=0, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=0, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, coprocessors=[]

qbda1node09.suntrust.com:60020 1511041214425

requestsPerSecond=0.0, numberOfOnlineRegions=6, usedHeapMB=648, maxHeapMB=12966, numberOfStores=17, numberOfStorefiles=15, storefileUncompressedSizeMB=81, storefileSizeMB=81, compressionRatio=1.0000, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=63756, writeRequestsCount=3990, rootIndexSizeKB=104, totalStaticIndexSizeKB=69, totalStaticBloomSizeKB=96, totalCompactingKVs=249105, currentCompactedKVs=249105, compactionProgressPct=1.0, coprocessors=[AccessController, RegionAuditCoProcessor, SecureBulkLoadEndpoint, TokenProvider]

"r2ra:Audit,,1499971831126.c002ce9fddf91a9ca404029d70184fd3."

numberOfStores=4, numberOfStorefiles=7, storefileUncompressedSizeMB=30, lastMajorCompactionTimestamp=1513186479549, storefileSizeMB=30, compressionRatio=1.0000, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=49029, writeRequestsCount=3985, rootIndexSizeKB=68, totalStaticIndexSizeKB=49, totalStaticBloomSizeKB=64, totalCompactingKVs=248962, currentCompactedKVs=248962, compactionProgressPct=1.0, completeSequenceId=54562, dataLocality=1.0

"r2ra:dktest\_table,,1491396732280.9d163de544420ef252fb85fa14e4cf10."

numberOfStores=1, numberOfStorefiles=0, storefileUncompressedSizeMB=0, lastMajorCompactionTimestamp=0, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=0, writeRequestsCount=0, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=0, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, completeSequenceId=-1, dataLocality=0.0

"r2ra:dktest\_table1,,1491397432305.e5757016f1370a252eb2a46beea99bfb."

numberOfStores=1, numberOfStorefiles=0, storefileUncompressedSizeMB=0, lastMajorCompactionTimestamp=0, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=0, writeRequestsCount=0, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=0, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, completeSequenceId=-1, dataLocality=0.0

"r2ra:maskrules,,1499972536567.b07e481d4f0e9dac73a6d49e394ca61c."

numberOfStores=1, numberOfStorefiles=1, storefileUncompressedSizeMB=0, lastMajorCompactionTimestamp=0, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=2562, writeRequestsCount=0, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=0, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, completeSequenceId=-1, dataLocality=0.0

"r2ra:metadata1,,1499796833907.b743b0281cad44b304384f230379e240."

numberOfStores=5, numberOfStorefiles=4, storefileUncompressedSizeMB=51, lastMajorCompactionTimestamp=1499815776989, storefileSizeMB=51, compressionRatio=1.0000, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=6300, writeRequestsCount=0, rootIndexSizeKB=36, totalStaticIndexSizeKB=20, totalStaticBloomSizeKB=32, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, completeSequenceId=-1, dataLocality=0.021915277

"stage:fdr,,1513085581539.a16cdabacd8fab509f10fdbce8b56d9f."

numberOfStores=5, numberOfStorefiles=3, storefileUncompressedSizeMB=0, lastMajorCompactionTimestamp=1513176017562, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=5865, writeRequestsCount=5, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=0, totalCompactingKVs=143, currentCompactedKVs=143, compactionProgressPct=1.0, completeSequenceId=55, dataLocality=1.0

qbda1node08.suntrust.com:60020 1513204847491

requestsPerSecond=0.0, numberOfOnlineRegions=0, usedHeapMB=2623, maxHeapMB=12966, numberOfStores=0, numberOfStorefiles=0, storefileUncompressedSizeMB=0, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=0, writeRequestsCount=0, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=0, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, coprocessors=[]

qbda1node10.suntrust.com:60020 1513181968803

requestsPerSecond=0.0, numberOfOnlineRegions=0, usedHeapMB=2783, maxHeapMB=12966, numberOfStores=0, numberOfStorefiles=0, storefileUncompressedSizeMB=0, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=0, writeRequestsCount=0, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=0, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, coprocessors=[]

qbda1node05.suntrust.com:60020 1511992766000

requestsPerSecond=0.0, numberOfOnlineRegions=4, usedHeapMB=222, maxHeapMB=554, numberOfStores=8, numberOfStorefiles=9, storefileUncompressedSizeMB=70, storefileSizeMB=70, compressionRatio=1.0000, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=34698, writeRequestsCount=72, rootIndexSizeKB=60, totalStaticIndexSizeKB=35, totalStaticBloomSizeKB=65, totalCompactingKVs=232526, currentCompactedKVs=232526, compactionProgressPct=1.0, coprocessors=[AccessController, RegionAuditCoProcessor, SecureBulkLoadEndpoint, TokenProvider]

"r2ra:metadata,,1501702880587.1d33f85ef38129ae6c276c25d094db13."

numberOfStores=5, numberOfStorefiles=6, storefileUncompressedSizeMB=70, lastMajorCompactionTimestamp=1513071497830, storefileSizeMB=70, compressionRatio=1.0000, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=22490, writeRequestsCount=72, rootIndexSizeKB=60, totalStaticIndexSizeKB=35, totalStaticBloomSizeKB=64, totalCompactingKVs=232526, currentCompactedKVs=232526, compactionProgressPct=1.0, completeSequenceId=29582, dataLocality=0.9999433

"r2ra:personal,,1506370868461.296a43b488d6dcf0b9952230f7dfce6c."

numberOfStores=1, numberOfStorefiles=1, storefileUncompressedSizeMB=0, lastMajorCompactionTimestamp=0, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=132, writeRequestsCount=0, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=0, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, completeSequenceId=-1, dataLocality=0.0

"r2ra:security,,1501037991415.5b3da0425ec14c156f2f666217fcd820."

numberOfStores=1, numberOfStorefiles=1, storefileUncompressedSizeMB=0, lastMajorCompactionTimestamp=1506837485119, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=10704, writeRequestsCount=0, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=1, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, completeSequenceId=-1, dataLocality=0.0

"test\_issue,,1490022501040.d88938bf838856b1b2cb92feed27f90e."

numberOfStores=1, numberOfStorefiles=1, storefileUncompressedSizeMB=0, lastMajorCompactionTimestamp=1491927951834, storefileSizeMB=0, memstoreSizeMB=0, storefileIndexSizeMB=0, readRequestsCount=1372, writeRequestsCount=0, rootIndexSizeKB=0, totalStaticIndexSizeKB=0, totalStaticBloomSizeKB=0, totalCompactingKVs=0, currentCompactedKVs=0, compactionProgressPct=NaN, completeSequenceId=-1, dataLocality=0.0

0 dead servers