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Title of Experiment: To study Hbase shell perform CRUD(create, read, update and delete) operations on table.

Objective of Experiment: The objective of this experiment is to familiarize students or participants with HBase's shell commands and their practical application to perform CRUD (Create, Read, Update, Delete) operations on a table within an HBase database

Outcome of Experiment: Thus, we got familiarized to various HBase commands and executed them in the HBase shell

Problem Statement: In a world where big data is becoming increasingly important, it is essential to have a good grasp of NoSQL databases like HBase. The problem at hand is the need to perform CRUD operations on an HBase table using the HBase shell.

Description / Theory:

HBase can be defined as an open-source, distributed, and scalable NoSQL database system designed for storing and managing vast amounts of data across a distributed cluster of commodity hardware. It is characterized by its ability to handle both structured and semi-structured data, its high scalability, and its seamless integration with the Hadoop ecosystem for processing and analyzing large datasets. HBase is often used in applications that require fast and efficient data storage and retrieval, making it a valuable tool in the world of big data and real-time data processing.



Program & Output:

Performing CRUD Operations in Hbase.

- Enter “hbase shell” in terminal

```
[cloudera@quickstart ~]$ hbase shell
2023-09-14 08:05:59,722 INFO [main] Configuration.deprecation: hadoop.native.lib
is deprecated. Instead, use io.native.lib.available
HBase Shell; enter 'help<RETURN>' for list of supported commands.
Type "exit<RETURN>" to leave the HBase Shell
Version 1.2.0-cdh5.12.0, rUnknown, Thu Jun 29 04:42:07 PDT 2017
```

```
hbase(main):001:0> █
```

- Create student table as shown below:

```
hbase(main):001:0> create 'student','s_name','rollno'
0 row(s) in 1.4340 seconds
```

```
=> Hbase::Table - student
hbase(main):002:0> █
```

- To see an already existing table use the following command:

```
hbase(main):005:0* list
TABLE
student
1 row(s) in 0.0260 seconds
```

- Use the following command to see the details of student table:

```
hbase(main):009:0* describe 'student'
Table student is ENABLED
student
COLUMN FAMILIES DESCRIPTION
{NAME => 'rollno', DATA_BLOCK_ENCODING => 'NONE', BLOOMFILTER => 'ROW', REPLICATION_SCOPE
=> '0', VERSIONS => '1', COMPRESSION => 'NONE', MIN_VERSIONS => '0', TTL => 'FOREVER', KEE
P_DELETED_CELLS => 'FALSE', BLOCKSIZE => '65536', IN_MEMORY => 'false', BLOCKCACHE => 'tru
e'}
{NAME => 's_name', DATA_BLOCK_ENCODING => 'NONE', BLOOMFILTER => 'ROW', REPLICATION_SCOPE
=> '0', VERSIONS => '1', COMPRESSION => 'NONE', MIN_VERSIONS => '0', TTL => 'FOREVER', KEE
P_DELETED_CELLS => 'FALSE', BLOCKSIZE => '65536', IN_MEMORY => 'false', BLOCKCACHE => 'tru
e'}
2 row(s) in 0.1210 seconds
```

- Insert Data in table:

```
hbase(main):010:0> put 'student','1','s_name','Heramb'
0 row(s) in 0.0520 seconds
```



-
- Update roll numbers for the same

```
hbase(main):015:0> put 'student','5','rollno','5'  
0 row(s) in 0.0210 seconds
```

```
hbase(main):016:0> put 'student','4','rollno','4'  
0 row(s) in 0.0030 seconds
```

```
hbase(main):017:0> put 'student','3','rollno','3'  
0 row(s) in 0.0040 seconds
```

```
hbase(main):024:0> scan 'student'  
ROW COLUMN+CELL  
1 column=rollno:, timestamp=1694704898353, value=1  
4 column=rollno:, timestamp=1694704880448, value=4  
4 column=s_name:, timestamp=1694704846369, value=Shaunak
```

- Delete Record

```
hbase(main):028:0> delete 'student','1','s_name'  
0 row(s) in 0.0190 seconds
```

```
hbase(main):029:0> scan 'student'  
ROW COLUMN+CELL  
1 column=rollno:, timestamp=1694704898353, value=1  
2 column=rollno:, timestamp=1694704892679, value=2
```

General Commands:

```
hbase(main):035:0> whoami  
cloudera (auth:SIMPLE)  
groups: cloudera, default
```

```
hbase(main):037:0> version  
1.2.0-cdh5.12.0, rUnknown, Thu Jun 29 04:42:07 PDT 2017
```

```
hbase(main):036:0> status  
1 active master, 0 backup masters, 1 servers, 0 dead, 3.0000 average load
```

Data Definition Language:

```
hbase(main):038:0> disable 'student'  
0 row(s) in 2.2840 seconds
```

```
hbase(main):047:0> exists 'student'  
Table student does not exist  
0 row(s) in 0.0130 seconds
```

```
hbase(main):044:0> disable 'student'  
0 row(s) in 2.2500 seconds
```

```
hbase(main):045:0> drop 'student'  
0 row(s) in 1.2740 seconds
```



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```
hbase(main):039:0> is_enabled 'student'
false
0 row(s) in 0.0220 seconds

hbase(main):040:0> enable 'student'
0 row(s) in 1.2890 seconds

hbase(main):041:0> is_disabled 'student'
false
```

Data Manipulation Language:

```
hbase(main):032:0> count 'student'
4 row(s) in 0.0430 seconds
```

Results and Discussions:

In the practical session, we conducted a hands-on exploration of HBase using its shell commands to perform various CRUD (Create, Read, Update, Delete) operations. We also examined general commands and data definition and manipulation commands.