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# 3. Understanding HBase (NoSQL) database basics in 7 steps

Posted on June 18, 2016 by Arulkumaran Kumaraswamipillai



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Extends [Getting started with HBase](#). HBase is a NoSQL database. HBase is a columnar database.

## #1. In HBase, you create the Table & column-families

“**create**” command to create a table with column families. You can later on use “**alter**” to add more column families.

```
1
2 hbase(main):006:0>create 'eai_systems', 'i', 'a'
3
```

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Add column family “m” to the table “eai\_systems”

```
1
2 hbase(main):053:0> alter 'eai_systems', NAME => '
3
```

**table name** is “eai\_systems”

**Column-families** are “i” and “a”, it is a best practice to keep the column-family & column qualifier names as short as possible.

## #2. Each column family can have variable number of column qualifiers or columns

**Columns** are basically name/value pairs grouped as “column families”. HBase is a columnar database, where you can have variable number of columns. If your application has a variable schema where each row is slightly different, then you should look at a columnar database like HBase. **Table** “eai\_systems” with a **row-key** of “222” has variable columns as shown below. “**put**” command insert records.

```
1
2 put 'eai_systems', '222', 'i:target_system', 'Pay
3 put 'eai_systems', '222', 'i:request_destination'
4 put 'eai_systems', '222', 'i:request_path', '/mya
5 put 'eai_systems', '222', 'a:time_to_live_in_days
6
```

—**column qualifiers** or **columns** under column family “i” are:

target\_system, request\_destination, and request\_path.

—**qualifiers** or **column names** under column family “a” is:

time\_to\_live

## #3. Each table must contain a “row key” as a primary key

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```

1
2 --row key 222
3 put 'eai_systems', '222', 'i:target_system', 'Pa
4 put 'eai_systems', '222', 'i:request_destination
5 put 'eai_systems', '222', 'i:request_path', '/my
6 put 'eai_systems', '222', 'a:time_to_live_in_day
7
8 -row key 555
9 put 'eai_systems', '555', 'i:target_system', 'In
10 put 'eai_systems', '555', 'i:request_destination
11 put 'eai_systems', '555', 'i:request_path', '/my
12 put 'eai_systems', '555', 'i:invoice_id', 'INV23
13 put 'eai_systems', '555', 'i:customer_id', 'CUST
14

```

## #4. You can view your records via “get” commands

Each column will have a timestamp.

```

1
2 hbase(main):020:0> get 'eai_systems', '222'
3
4 COLUMN                                CELL
5 a:time_to_live_in_days                timestamp=1465341958
6 i:request_destination                 timestamp=1465341941
7 i:request_path                        timestamp=1465341949
8 i:target_system                       timestamp=1465341933
9
10 4 row(s) in 0.0600 seconds
11

```

```

1
2 hbase(main):028:0> get 'eai_systems', '555'
3
4 COLUMN                                CELL
5 i:customer_id                         timestamp=1465342001
6 i:invoice_id                          timestamp=1465341992
7 i:request_destination                 timestamp=1465341973
8 i:request_path                        timestamp=1465341983
9 i:target_system                       timestamp=1465341964
10
11 5 row(s) in 0.0180 seconds
12

```

Get only specific columns

```

1
2 hbase(main):037:0> get 'eai_systems', '222', {COL
3
4 COLUMN                                CELL
5 i:target_system                       timestamp=14653419337
6
7 1 row(s) in 0.0190 seconds
8

```

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```

1
2 hbase(main):048:0> get 'eai_systems', '555', {COL
3
4 COLUMN                                CELL
5 i:invoice_id                          timestamp=14653419921
6
7 1 row(s) in 0.0210 seconds
8

```

## #5. You can view your records via “scan” commands

The “get” command uses a “scan” command under the covers. To get a range of rows

```

1
2 hbase(main):015:0> scan 'eai_systems', { STARTROW
3
4 ROW                                COLUMN+CELL
5 555                                column=i:customer_id
6 555                                column=i:invoice_id,
7 555                                column=i:request_des
8 555                                column=i:request_pat
9 555                                column=i:target_syst
10 555                                column=m:count, time
11
12 1 row(s) in 0.0260 seconds
13

```

you can specify range. The scan ranges are not inclusive, and the logic is start <= **row key** < end.

```

1
2 hbase(main):015:0> scan 'eai_systems', { STARTROW
3

```

To scan the whole table

```

1
2 hbase(main):016:0> scan 'eai_systems'
3
4 ROW                                COLUMN+CELL
5 222                                column=a:time_to_liv
6 222                                column=i:request_des
7 222                                column=i:request_pat
8 222                                column=i:target_syst
9 222                                column=m:count, time
10
11 555                                column=i:customer_id
12 555                                column=i:invoice_id,
13 555                                column=i:request_des

```

```

14 555 column=i:request_pat
15 555 column=i:target_syst
16 555 column=m:count, time
17
18 2 row(s) in 0.0500 seconds
19

```

### Scan for specific columns

```

1
2 hbase(main):011:0> scan 'eai_systems', {COLUMNS
3
4 ROW COLUMN+CELL
5 222 column=i:request_pat
6 222 column=i:target_syst
7 555 column=i:request_pat
8 555 column=i:target_syst
9
10 2 row(s) in 0.3000 seconds
11

```

## #6. You can filter by column values

```

1
2 hbase(main):010:0> scan 'eai_systems', {COLUMNS
3
4 ROW COLUMN+CELL
5 555 column=i:request_pat
6 555 column=i:target_syst
7 555 column=m:count, time
8
9 1 row(s) in 0.0280 seconds
10

```

There are other commands like “count” to count the records that you can refer to HBase shell reference documentation.

## #7. Represents the above columnar table in excel

A	B	C	D	E	F	G	H
Row Key							m
222	time_to_live_in_days=30	request_destination=PAYROLL_REQ_QUEUE	request_path=/myapp/raw/payroll/10a1	target_system=Payroll			count=5
555		request_destination=INVOICING_REQ_QUEUE	request_path=/myapp/raw/invoicing/10a1	target_system=Invoicing	customer_id = CUST123	invoice_id = INV2345	count = 10
	column-family						
	named-value pairs						
	row keys						

HBase table with column families, name/value pairs and row keys

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