

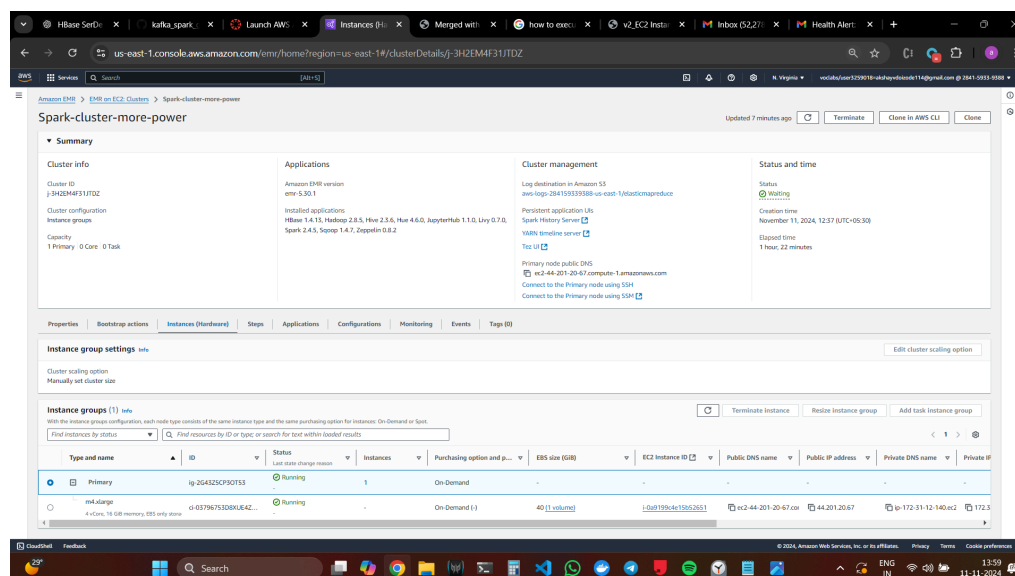
Capstone Project: Instant Health Alert System - Final-Project Submission

Introduction:

This document provides an overview and step-by-step guide for setting up and using HBase in a distributed data processing environment. The primary focus of this documentation is on the creation, configuration, and interaction with HBase tables, specifically designed for integrating with Hive and Hadoop systems.

A script to create HBase table with 3 families (attribute, limit, alert)

1. HBase Setup and Configuration:



The screenshot displays the Amazon EMR console interface for a cluster named "Spark-cluster-more-power". The cluster is in the "Waiting" status. The console shows various tabs including Summary, Properties, Bootstrapping actions, Instances (Hardware), Steps, Applications, Configurations, Monitoring, Events, and Tags (B). The "Instances (Hardware)" tab is currently selected, showing the instance group settings and a table of instances.

Type and name	ID	Status	Instances	Purchasing option and p...	EMR size (GB)	EC2 Instance ID	Public DNS name	Public IP address	Private DNS name	Private IP
Primary	ip-204222CF30T53	Running	1	On-Demand	-	-	-	-	-	-
emr-elastic	i-0379675D8KUEAZ...	Running	-	On-Demand (1)	40 (1 volume)	i-0a1785b4e15952681	ec2-44-201-20-67	44.201.20.67	ip-172-31-12-140.ec2	172.31.12.140

2. Creating HBase Tables:

Detailed steps to create and configure HBase tables, including schema design.

```
sudo -i  
hbase shell
```

```
create 'threshold_ref','attribute','limit','alert'
```

Inserting the records into Hbase

```
put 'threshold_ref', '1', 'attribute:attribute', 'heartBeat'  
put 'threshold_ref', '1', 'limit:low_age_limit', '0'  
put 'threshold_ref', '1', 'limit:high_age_limit', '40'  
put 'threshold_ref', '1', 'limit:low_value', '0'  
put 'threshold_ref', '1', 'limit:high_value', '69'  
put 'threshold_ref', '1', 'alert:alert_flag', '1'  
put 'threshold_ref', '1', 'alert:alert_message', 'Low Heart Rate than Normal'  
  
put 'threshold_ref', '2', 'attribute:attribute', 'heartBeat'  
put 'threshold_ref', '2', 'limit:low_age_limit', '0'  
put 'threshold_ref', '2', 'limit:high_age_limit', '40'  
put 'threshold_ref', '2', 'limit:low_value', '70'  
put 'threshold_ref', '2', 'limit:high_value', '78'  
put 'threshold_ref', '2', 'alert:alert_flag', '0'  
put 'threshold_ref', '2', 'alert:alert_message', 'Normal'  
  
put 'threshold_ref', '3', 'attribute:attribute', 'heartBeat'  
put 'threshold_ref', '3', 'limit:low_age_limit', '0'  
put 'threshold_ref', '3', 'limit:high_age_limit', '40'  
put 'threshold_ref', '3', 'limit:low_value', '79'  
put 'threshold_ref', '3', 'limit:high_value', '9999'  
put 'threshold_ref', '3', 'alert:alert_flag', '1'  
put 'threshold_ref', '3', 'alert:alert_message', 'Higher Heart Rate than Normal'
```

```
put 'threshold_ref', '4', 'attribute:attribute', 'bp'
put 'threshold_ref', '4', 'limit:low_age_limit', '0'
put 'threshold_ref', '4', 'limit:high_age_limit', '40'
put 'threshold_ref', '4', 'limit:low_value', '0'
put 'threshold_ref', '4', 'limit:high_value', '160'
put 'threshold_ref', '4', 'alert:alert_flag', '1'
put 'threshold_ref', '4', 'alert:alert_message', 'Low BP than Normal'

put 'threshold_ref', '5', 'attribute:attribute', 'bp'
put 'threshold_ref', '5', 'limit:low_age_limit', '0'
put 'threshold_ref', '5', 'limit:high_age_limit', '40'
put 'threshold_ref', '5', 'limit:low_value', '161'
put 'threshold_ref', '5', 'limit:high_value', '220'
put 'threshold_ref', '5', 'alert:alert_flag', '0'
put 'threshold_ref', '5', 'alert:alert_message', 'Normal'

put 'threshold_ref', '6', 'attribute:attribute', 'bp'
put 'threshold_ref', '6', 'limit:low_age_limit', '0'
put 'threshold_ref', '6', 'limit:high_age_limit', '40'
put 'threshold_ref', '6', 'limit:low_value', '221'
put 'threshold_ref', '6', 'limit:high_value', '9999'
put 'threshold_ref', '6', 'alert:alert_flag', '1'
put 'threshold_ref', '6', 'alert:alert_message', 'Higer BP than Normal'

put 'threshold_ref', '7', 'attribute:attribute', 'heartBeat'
put 'threshold_ref', '7', 'limit:low_age_limit', '41'
put 'threshold_ref', '7', 'limit:high_age_limit', '100'
put 'threshold_ref', '7', 'limit:low_value', '0'
put 'threshold_ref', '7', 'limit:high_value', '65'
put 'threshold_ref', '7', 'alert:alert_flag', '1'
put 'threshold_ref', '7', 'alert:alert_message', 'Low Heart Rate than Normal'

put 'threshold_ref', '8', 'attribute:attribute', 'heartBeat'
put 'threshold_ref', '8', 'limit:low_age_limit', '41'
put 'threshold_ref', '8', 'limit:high_age_limit', '100'
put 'threshold_ref', '8', 'limit:low_value', '66'
put 'threshold_ref', '8', 'limit:high_value', '73'
put 'threshold_ref', '8', 'alert:alert_flag', '0'
put 'threshold_ref', '8', 'alert:alert_message', 'Normal'

put 'threshold_ref', '9', 'attribute:attribute', 'heartBeat'
put 'threshold_ref', '9', 'limit:low_age_limit', '41'
put 'threshold_ref', '9', 'limit:high_age_limit', '100'
put 'threshold_ref', '9', 'limit:low_value', '74'
put 'threshold_ref', '9', 'limit:high_value', '9999'
```

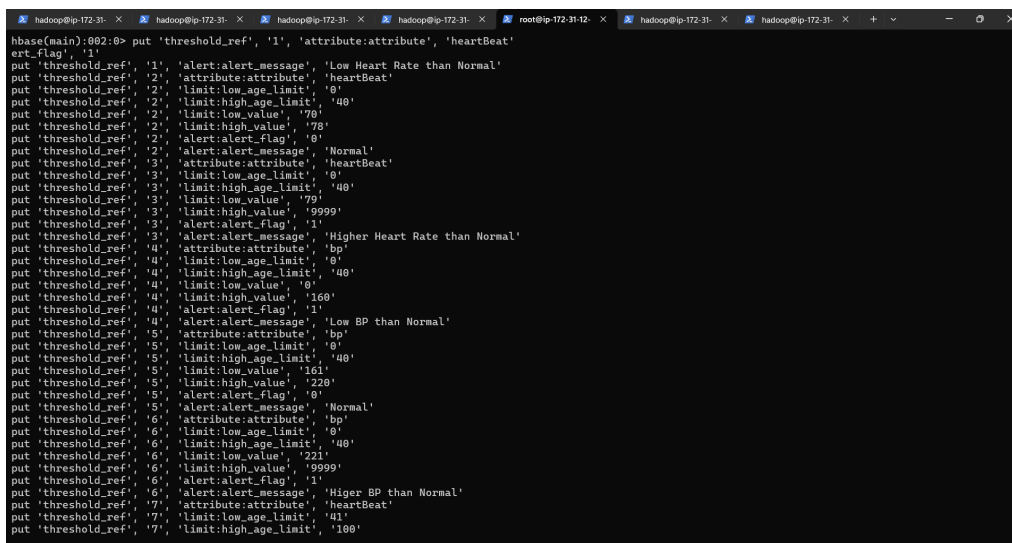
```
put 'threshold_ref', '9', 'alert:alert_flag', '1'
put 'threshold_ref', '9', 'alert:alert_message', 'Higher Heart Rate than Normal'

put 'threshold_ref', '10', 'attribute:attribute', 'bp'
put 'threshold_ref', '10', 'limit:low_age_limit', '41'
put 'threshold_ref', '10', 'limit:high_age_limit', '100'
put 'threshold_ref', '10', 'limit:low_value', '0'
put 'threshold_ref', '10', 'limit:high_value', '150'
put 'threshold_ref', '10', 'alert:alert_flag', '1'
put 'threshold_ref', '10', 'alert:alert_message', 'Low BP than Normal'

put 'threshold_ref', '11', 'attribute:attribute', 'bp'
put 'threshold_ref', '11', 'limit:low_age_limit', '41'
put 'threshold_ref', '11', 'limit:high_age_limit', '100'
put 'threshold_ref', '11', 'limit:low_value', '151'
put 'threshold_ref', '11', 'limit:high_value', '180'
put 'threshold_ref', '11', 'alert:alert_flag', '0'
put 'threshold_ref', '11', 'alert:alert_message', 'Normal'

put 'threshold_ref', '12', 'attribute:attribute', 'bp'
put 'threshold_ref', '12', 'limit:low_age_limit', '41'
put 'threshold_ref', '12', 'limit:high_age_limit', '100'
put 'threshold_ref', '12', 'limit:low_value', '181'
put 'threshold_ref', '12', 'limit:high_value', '9999'
put 'threshold_ref', '12', 'alert:alert_flag', '1'
put 'threshold_ref', '12', 'alert:alert_message', 'Higher BP than Normal'
```

Screenshot for inserting the data



```
hbase(main):002:0> put 'threshold_ref', '1', 'attribute:attribute', 'heartBeat'
put 'threshold_ref', '1', 'alert:alert_message', 'Low Heart Rate than Normal'
put 'threshold_ref', '2', 'attribute:attribute', 'heartBeat'
put 'threshold_ref', '2', 'limit:low_age_limit', '0'
put 'threshold_ref', '2', 'limit:high_age_limit', '40'
put 'threshold_ref', '2', 'limit:low_value', '79'
put 'threshold_ref', '2', 'limit:high_value', '78'
put 'threshold_ref', '2', 'alert:alert_flag', '0'
put 'threshold_ref', '2', 'alert:alert_message', 'Normal'
put 'threshold_ref', '3', 'attribute:attribute', 'heartBeat'
put 'threshold_ref', '3', 'limit:low_age_limit', '0'
put 'threshold_ref', '3', 'limit:high_age_limit', '40'
put 'threshold_ref', '3', 'limit:low_value', '79'
put 'threshold_ref', '3', 'limit:high_value', '9999'
put 'threshold_ref', '3', 'alert:alert_flag', '1'
put 'threshold_ref', '3', 'alert:alert_message', 'Higher Heart Rate than Normal'
put 'threshold_ref', '4', 'attribute:attribute', 'bp'
put 'threshold_ref', '4', 'limit:low_age_limit', '0'
put 'threshold_ref', '4', 'limit:high_age_limit', '40'
put 'threshold_ref', '4', 'limit:low_value', '0'
put 'threshold_ref', '4', 'limit:high_value', '160'
put 'threshold_ref', '4', 'alert:alert_flag', '1'
put 'threshold_ref', '4', 'alert:alert_message', 'Low BP than Normal'
put 'threshold_ref', '5', 'attribute:attribute', 'bp'
put 'threshold_ref', '5', 'limit:low_age_limit', '0'
put 'threshold_ref', '5', 'limit:high_age_limit', '40'
put 'threshold_ref', '5', 'limit:low_value', '161'
put 'threshold_ref', '5', 'limit:high_value', '220'
put 'threshold_ref', '5', 'alert:alert_flag', '0'
put 'threshold_ref', '5', 'alert:alert_message', 'Normal'
put 'threshold_ref', '6', 'attribute:attribute', 'bp'
put 'threshold_ref', '6', 'limit:low_age_limit', '0'
put 'threshold_ref', '6', 'limit:high_age_limit', '40'
put 'threshold_ref', '6', 'limit:low_value', '221'
put 'threshold_ref', '6', 'limit:high_value', '9999'
put 'threshold_ref', '6', 'alert:alert_flag', '1'
put 'threshold_ref', '6', 'alert:alert_message', 'Higer BP than Normal'
put 'threshold_ref', '7', 'attribute:attribute', 'heartBeat'
put 'threshold_ref', '7', 'limit:low_age_limit', '41'
put 'threshold_ref', '7', 'limit:high_age_limit', '100'
```

3. Data Retrieval:

```
scan 'threshold_ref'
```

```
ROW      COLUMN+CELL
1        column-alert:alert_flag, timestamp=1679727530966, value=1
1        column-alert:alert_message, timestamp=1679727530971, value
=Low Heart Rate than Normal
1        column=attribute:attribute, timestamp=1679727530926, value
=heartBeat
1        column=limit:high_age_limit, timestamp=1679727530951, valu
e=40
1        column=limit:high_value, timestamp=1679727530962, value=69
1        column=limit:low_age_limit, timestamp=1679727530947, value
=0
1        column=limit:low_value, timestamp=1679727530958, value=0
10       column=alert:alert_flag, timestamp=1679727531306, value=1
10       column=alert:alert_message, timestamp=1679727531310, value
=Low BP than Normal
10       column=attribute:attribute, timestamp=1679727531291, value
=bp
10       column=limit:high_age_limit, timestamp=1679727531297, valu
e=100
10       column=limit:high_value, timestamp=1679727531303, value=15
0
10       column=limit:low_age_limit, timestamp=1679727531294, value
=41
10       column=limit:low_value, timestamp=1679727531300, value=0
11       column=alert:alert_flag, timestamp=1679727531326, value=0
11       column=alert:alert_message, timestamp=1679727531329, value
=Normal
11       column=attribute:attribute, timestamp=1679727531312, value
=bp
11       column=limit:high_age_limit, timestamp=1679727531318, valu
e=100
11       column=limit:high_value, timestamp=1679727531323, value=18
0
11       column=limit:low_age_limit, timestamp=1679727531315, value
=41
11       column=limit:low_value, timestamp=1679727531321, value=151

8        column=alert:alert_message, timestamp=1679992681690, value
=Normal
8        column=attribute:attribute, timestamp=1679992681657, value
=heartBeat
8        column=limit:high_age_limit, timestamp=1679992681668, valu
e=100
8        column=limit:high_value, timestamp=1679992681679, value=73
8        column=limit:low_age_limit, timestamp=1679992681663, value
=41
8        column=limit:low_value, timestamp=1679992681674, value=66
9        column=alert:alert_flag, timestamp=1679992681728, value=1
9        column=alert:alert_message, timestamp=1679992681734, value
=Higher Heart Rate than Normal
9        column=attribute:attribute, timestamp=1679992681696, value
=heartBeat
9        column=limit:high_age_limit, timestamp=1679992681708, valu
e=100
9        column=limit:high_value, timestamp=1679992681722, value=99
99
9        column=limit:low_age_limit, timestamp=1679992681702, value
=41
9        column=limit:low_value, timestamp=1679992681715, value=74
12 row(s) in 0.3570 seconds
```