

## Practical – 03

**Aim:**Apache Cassandra Operations

- a) Install and configure Apache Cassandra in a lab environment.
- b) Create a keyspace and define a table schema.
- c) Insert data into the table.
- d) Perform CRUD operations and query data from Apache Cassandra.

**Description:** - Apache Cassandra is a highly scalable and distributed NoSQL database system designed to handle large amounts of data across multiple commodity servers without a single point of failure. Developed by Facebook and later open- sourced, Cassandra is renowned for its high availability, fault tolerance, and linear scalability, making it a popular choice for organizations dealing with vast amounts of data.

### Execution

- :
- a) Install and configure Apache Cassandra in a lab environment.

Check if you have java installed

```
openjdk version "1.8.0_392"  
OpenJDK Runtime Environment (build 1.8.0_392-8u392-ga-1~22.04-b08)  
OpenJDK 64-Bit Server VM (build 25.392-b08, mixed mode)
```

A) install java

1. Refresh:  
sudo apt-get update

```
Get:1 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]  
Hit:2 http://in.archive.ubuntu.com/ubuntu jammy InRelease  
Get:4 http://in.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]  
Hit:5 http://in.archive.ubuntu.com/ubuntu jammy-backports InRelease  
Hit:3 https://apache.jfrog.io/artifactory/cassandra-deb 41x InRelease  
Fetched 229 kB in 2s (104 kB/s)  
Reading package lists... Done  
W: https://debian.cassandra.apache.org/dists/41x/InRelease: Key is stored in legacy trusted.gpg keyring (/etc/apt/trusted.gpg), see the DEPRECATION section in apt-key(8) for details.
```

## Add the Cassandra Repository File

Add the Cassandra repository to the system's repository file.

```
echo "deb http://www.apache.org/dist/cassandra/debian 40x main" | sudo tee - a
```

```
/etc/apt/sources.list.d/cassandra.sources.list deb
```

```
http://www.apache.org/dist/cassandra/debian 41x main
```

```
snehanaik@snehanaik-VirtualBox:~$ echo "deb https://deb.debian.cassandra.apache.org
41x main" | sudo tee -a /etc/apt/sources.list.d/cassandra.sources.list
deb https://deb.debian.cassandra.apache.org 41x main
```

- install curl : `sudo apt install curl`

```
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
curl is already the newest version (7.81.0-1ubuntu1.15).
The following packages were automatically installed and are no longer required:
 chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi i965-va-driver
 intel-media-va-driver libaacs0 libaom3 libass9 libavcodec58 libavformat58
 libavutil56 libbdplus0 libblas3 libbluray2 libbs2b0 libchromaprint1
 libcodec2-1.0 libdav1d5 libflite1 libgme0 libgsm1
 libgstreamer-plugins-bad1.0-0 libigdgmm12 liblilv-0-0 libllvm15 libmfx1
 libmysofa1 libnorm1 libopenmpt0 libpgm-5.3-0 libpostproc55 librabbitmq4
 librubberband2 libserd-0-0 libshine3 libsnappy1v5 libsord-0-0 libsratom-0-0
 libsrtp1.4-gnutls libssh-gcrypt-4 libswresample3 libswscale5 libudfread0
 libva-drm2 libva-wayland2 libva-x11-2 libva2 libvdpau1 libvidstab1.1
 libx265-199 libxvidcore4 libzimg2 libzmq5 libzvbi-common libzvbi0
 mesa-va-drivers mesa-vdpau-drivers pocketsphinx-en-us systemd-hwe-hwdb
 va-driver-all vdpau-driver-all
Use 'sudo apt autoremove' to remove them.
```

To avoid issues with the repository, add the GPG key and increase the security of the repository.

- `curl - https://www.apache.org/dist/cassandra/KEYS | sudo apt-key add -`

```
| sudo apt-key add -
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload    Total   Spent    Left   Speed
0 0 0 0 0 0 0 0 0:00:01 0:00:01 0:00:01 0Warning: apt-key is deprecated. Manage keyring files in trusted.gpg.d instead (see apt-key(8)).
100 249k 100 249k 0 0 240k 0 0:00:01 0:00:01 0:00:01 240k
OK
snehanaik@snehanaik-VirtualBox:~$
```

- update and install cassandra : `sudo apt-get update`

```
Get:1 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Hit:3 http://in.archive.ubuntu.com/ubuntu jammy InRelease
Get:4 http://in.archive.ubuntu.com/ubuntu jammy-updates InRelease [119 kB]
Hit:2 https://apache.jfrog.io/artifactory/cassandra-deb 41x InRelease
Hit:5 http://in.archive.ubuntu.com/ubuntu jammy-backports InRelease
Fetched 229 kB in 2s (103 kB/s)
Reading package lists... Done
W: https://debian.cassandra.apache.org/dists/41x/InRelease: Key is stored in legacy trusted.g
pg keyring (/etc/apt/trusted.gpg), see the DEPRECATION section in apt-key(8) for details.
W: Target Packages (main/binary-amd64/Packages) is configured multiple times in /etc/apt/sour
ces.list.d/cassandra.sources.list:1 and /etc/apt/sources.list.d/cassandra.sources.list:2
W: Target Packages (main/binary-i386/Packages) is configured multiple times in /etc/apt/sourc
es.list.d/cassandra.sources.list:1 and /etc/apt/sources.list.d/cassandra.sources.list:2
W: Target Packages (main/binary-all/Packages) is configured multiple times in /etc/apt/source
s.list.d/cassandra.sources.list:1 and /etc/apt/sources.list.d/cassandra.sources.list:2
W: Target Translations (main/i18n/Translation-en_IN) is configured multiple times in /etc/apt
```

- check nodetool : `nodetool status`  
`sudo apt-get install cassandra`

```
Datcenter: datacenter1
=====
Status=Up/Down
|/ State=Normal/Leaving/Joining/Moving
-- Address      Load          Tokens   Owns (effective)  Host ID
   Rack
UN 127.0.0.1    139.49 KiB    16       100.0%             825f7984-25d3-40ce-8466-75d
381406f26 rack1
```

```
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
cassandra is already the newest version (4.1.3).
The following packages were automatically installed and are no longer required:
chromium-codecs-ffmpeg-extra gstreamer1.0-vaapi i965-va-driver
intel-media-va-driver libaacs0 libaom3 libass9 libavcodec58 libavformat58
libavutil56 libbdplus0 libblas3 libbluray2 libbs2b0 libchromaprint1
libcodecs2-1.0 libdav1d5 libflite1 libgme0 libgsm1 libgstreamer-plugins-bad1.0-0
libigdgmm12 liblilv-0-0 libllvm15 libmfx1 libmysofa1 libnorm1 libopenmpt0
libpgm-5.3-0 libpostproc55 librabbitmq4 librubberband2 libserd-0-0 libshine3
libsnappy1v5 libsord-0-0 libsratom-0-0 libsrtp1.4-gnutls libssh-gcrypt-4
libswresample3 libswscale5 libudfread0 libva-drm2 libva-wayland2 libva-x11-2
libva2 libvdpau1 libvidstab1.1 libx265-199 libxvidcore4 libzim2 libzmq5
libzvbi-common libzvbi0 mesa-va-drivers mesa-va-drivers mesa-vdpau-drivers pocketsphinx-en-us
systemd-hwe-hwdb va-driver-all vdpau-driver-all
Use 'sudo apt autoremove' to remove them.
0 upgraded, 0 newly installed, 0 to remove and 516 not upgraded.
```

- start cassandra : `sudo systemctl start cassandra`

```

cqlsh
Connected to Test Cluster at 127.0.0.1:9042
[cqlsh 6.1.0 | Cassandra 4.1.3 | CQL spec 3.4.6 | Native protocol v5]
Use HELP for help.
cqlsh>

```

b) Create a keyspace and define a table schema.

Create a KEYSPACE

```

cqlsh> CREATE KEYSPACE user WITH replication ={'class':'SimpleStrategy','replication_factor':'1'};
cqlsh> USE user
... ;
cqlsh:user>

```

Create a table

```

cqlsh:user> CREATE TABLE user(id UUID PRIMARY KEY,name TEXT,email TEXT);
cqlsh:user> SELECT * FROM USER
... ;

id | email | name
---+-----+-----
(0 rows)

```

c) Insert data into the table.

Add Values inside table

```

cqlsh:user> INSERT INTO USER(id,name,email)values(uuid(),'kanye','vul@gmail.com');
cqlsh:user> SELECT * FROM USER ;

```

id	email	name
c0dfcb3c-b036-41b6-a82d-eea104e5e719	rep@gmail.com	taylor
d0b9f4db-5cdd-4c33-bee3-090a879d00c6	lil@gmail.com	wayne
44f5a159-f943-4a4e-9b4e-d45d2eec544e	bcd@gmail.com	nicki
985844eb-e459-44a3-b00f-6e3d4681fbe7	abc@gmail.com	sneha
199b017d-6b87-472c-808b-c5a96eab63f7	vul@gmail.com	kanye

(5 rows)

Alter table



```
cqlsh:user> ALTER TABLE USER add salary INT;
cqlsh:user> SELECT * FROM USER ;
```

id	email	name	salary
c0dfcb3c-b036-41b6-a82d-eea104e5e719	rep@gmail.com	taylor	null
d0b9f4db-5cdd-4c33-bee3-090a879d00c6	lil@gmail.com	wayne	null
44f5a159-f943-4a4e-9b4e-d45d2eec544e	bcd@gmail.com	nicki	null
985844eb-e459-44a3-b00f-6e3d4681fbe7	abc@gmail.com	sneha	null
199b017d-6b87-472c-808b-c5a96eab63f7	vul@gmail.com	kanye	null

a) Perform CRUD operations and query data from Apache Cassandra.

Delete Data from table

```
cqlsh:user> TRUNCATE USER;
cqlsh:user> SELECT * FROM USER ;
```

id	email	name	salary
-----	-----	-----	-----

```
(0 rows)
```

Drop/delete table

```
cqlsh:user> DROP TABLE USER
... ;
cqlsh:user> SELECT * FROM USER ;
InvalidRequest: Error from server: code=2200 [Invalid query] message="table user does not exist"
cqlsh:user> █
```