

Installing Apache Cassandra on Ubuntu Xenial 16.04.1 LTS

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This “how to” describes how to install Apache Cassandra 2.2.9 on Ubuntu.

As a first step, we will confirm that we have Oracle Java version 8 installed. Use the command, “java -version” to confirm this. What you should see displayed as a result is something similar to what is shown below. If you have Java 8 installed, you can skip over the section of this “how to” that describes Java 8 installation.

```
dwalling@osboxes:~$ java -version
java version "1.8.0_121"
Java(TM) SE Runtime Environment (build 1.8.0_121-b13)
Java HotSpot(TM) 64-Bit Server VM (build 25.121-b13, mixed mode)
dwalling@osboxes:~$
```

Installing Oracle Java 8

To install Oracle Java 8, first we will add a repository to our package manager so our usual system update will download the Oracle JDK8 installer.

As a non-root user with “sudo” privileges, enter the command:

“sudo add-apt-repository ppa:webupd8team/java”

```
dwalling@osboxes:~$ sudo add-apt-repository ppa:webupd8team/java
Oracle Java (JDK) Installer (automatically downloads and installs Oracle JDK7 / JDK8 / JDK9). There are no actual
Java files in this PPA.

More info (and Ubuntu installation instructions):
- for Oracle Java 7: http://www.webupd8.org/2012/01/install-oracle-java-jdk-7-in-ubuntu-via.html
- for Oracle Java 8: http://www.webupd8.org/2012/09/install-oracle-java-8-in-ubuntu-via-ppa.html

Debian installation instructions:
- Oracle Java 7: http://www.webupd8.org/2012/06/how-to-install-oracle-java-7-in-debian.html
- Oracle Java 8: http://www.webupd8.org/2014/03/how-to-install-oracle-java-8-in-debian.html

Oracle Java 9 (for both Ubuntu and Debian): http://www.webupd8.org/2015/02/install-oracle-java-9-in-ubuntu-linux.h
tml

For JDK9, the PPA uses standard builds from: https://jdk9.java.net/download/ (and not the Jigsaw builds!).

Important!!! For now, you should continue to use Java 8 because Oracle Java 9 is available as an early access rele
ase! You should only use Oracle Java 9 if you explicitly need it, because it may contain bugs and it might not inc
lude the latest security patches! Also, some Java options were removed in JDK9, so you may encounter issues with v
arious Java apps. More information and installation instructions (Ubuntu / Linux Mint / Debian): http://www.webupd
8.org/2015/02/install-oracle-java-9-in-ubuntu-linux.html
More info: https://launchpad.net/~webupd8team/+archive/ubuntu/java
Press [ENTER] to continue or ctrl-c to cancel adding it

```

Press Enter at the prompt shown above.

When the repository is added, the public key for “Launchpad VLC” will be added to the GPG trust DB.

```
gpg: keyring '/tmp/tmp65r053yl/secring.gpg' created
gpg: keyring '/tmp/tmp65r053yl/pubring.gpg' created
gpg: requesting key EEA14886 from hkp server keyserver.ubuntu.com
gpg: /tmp/tmp65r053yl/trustdb.gpg: trustdb created
gpg: key EEA14886: public key "Launchpad VLC" imported
gpg: no ultimately trusted keys found
gpg: Total number processed: 1
gpg:      imported: 1 (RSA: 1)
OK
dwalling@osboxes:~$
```

Now, when we run our usual package manager update, the ppa.launchpad.net repository webupd8team will be included in our package search.

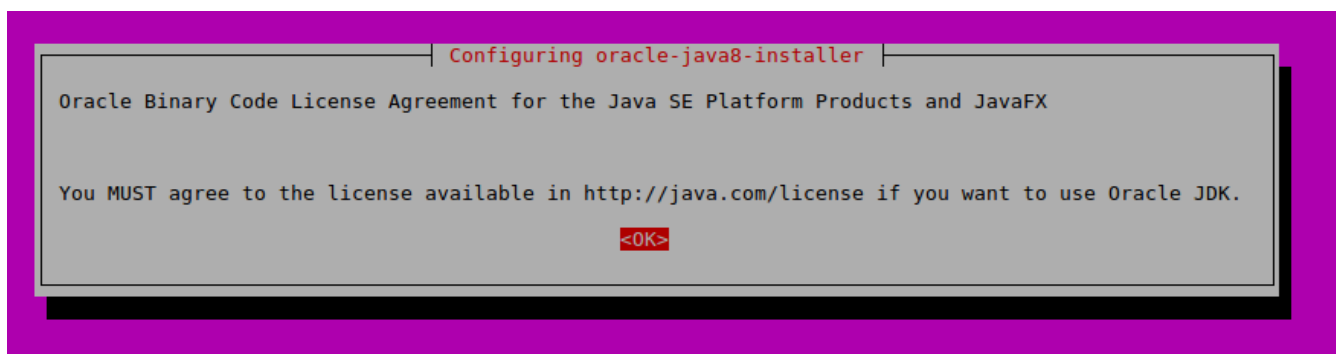
```
dwalling@osboxes:~$ sudo apt-get update
Hit:1 http://pubmirrors.dal.corespace.com/ubuntu xenial InRelease
Hit:2 http://pubmirrors.dal.corespace.com/ubuntu xenial-updates InRelease
Hit:3 http://pubmirrors.dal.corespace.com/ubuntu xenial-backports InRelease
Get:4 http://ppa.launchpad.net/webupd8team/java/ubuntu xenial InRelease [17.6 kB]
Hit:5 http://pubmirrors.dal.corespace.com/ubuntu xenial-security InRelease
Get:6 http://ppa.launchpad.net/webupd8team/java/ubuntu xenial/main amd64 Packages [2,880 B]
Get:7 http://ppa.launchpad.net/webupd8team/java/ubuntu xenial/main i386 Packages [2,880 B]
Get:8 http://ppa.launchpad.net/webupd8team/java/ubuntu xenial/main Translation-en [1,260 B]
Fetched 24.6 kB in 1s (17.0 kB/s)
Reading package lists... Done
dwalling@osboxes:~$
```

We use our package manager now to request the installation of the package “oracle-java8-set-default”.

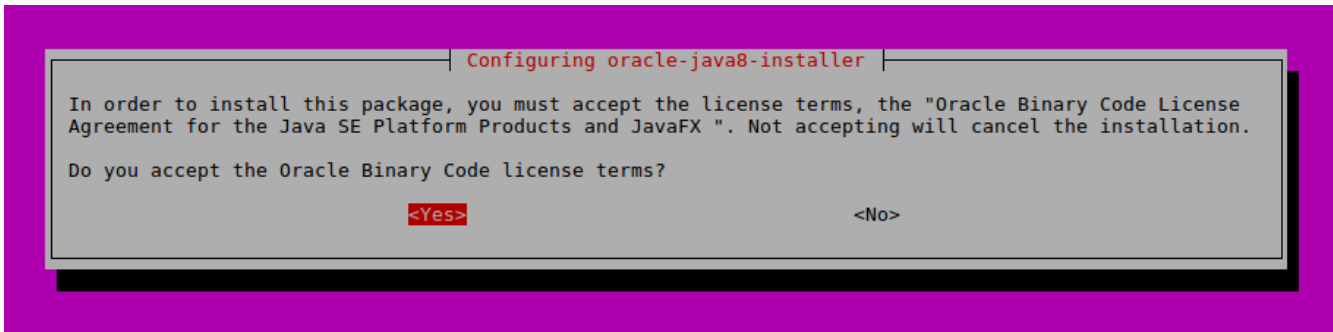
```
dwalling@osboxes:~$ sudo apt-get install oracle-java8-set-default
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  gsfontr-x11 java-common oracle-java8-installer
Suggested packages:
  binfmt-support visualvm ttf-baekmuk | ttf-unfonts | ttf-unfonts-core ttf-kochi-gothic | ttf-sazanami-gothic
  ttf-kochi-mincho | ttf-sazanami-mincho ttf-arphic-uming
The following NEW packages will be installed:
  gsfontr-x11 java-common oracle-java8-installer oracle-java8-set-default
0 to upgrade, 4 to newly install, 0 to remove and 0 not to upgrade.
Need to get 54.6 kB of archives.
After this operation, 272 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

Press Enter to accept the installation of the installer and related or required packages.

During the installation stage, you may be prompted to accept the license terms for the Java SE Platform Products and JavaFX. Click “<OK>” to accept and continue the installation.



You may also be required to accept the license terms for the Oracle Binary Code. Click on "<Yes>" to accept these terms and continue the installation.



After accepting licensing terms, the installer will download the compressed archive of the Oracle Java 8 JDK.

```
79872K ..... 46% 846K 2m53s
82944K ..... 48% 400K 2m50s
86016K ..... 49% 718K 2m43s
89088K ..... 51% 594K 2m37s
92160K ..... 53% 668K 2m31s
95232K ..... 54% 815K 2m24s
98304K ..... 56% 697K 2m17s
101376K ..... 58% 672K 2m11s
104448K ..... 60% 600K 2m6s
107520K ..... 61% 950K 1m59s
110592K ..... 63% 836K 1m53s
113664K ..... 65% 1.05M 1m46s
116736K ..... 66% 1.35M 99s
119808K ..... 68% 1.04M 93s
122880K ..... 70% 1.03M 87s
125952K ..... 72% 718K 82s
129024K ..... 73% 620K 77s
132096K ..... 75% 677K 71s
135168K ..... 77% 761K 66s
138240K ..... 78% 927K 61s
141312K ..... 80% 1.46M 55s
144384K ..... 82% 1.31M 50s
147456K ..... 84% 896K 45s
150528K ..... 85% 1.34M 39s
153600K ..... 87% 1.30M 34s
156672K ..... 89% 1.48M 29s
159744K ..... 90% 1.63M 24s
162816K ..... 92% 1.50M 19s
165888K ..... 94% 1.14M 15s
168960K ..... 96% 1.01M 10s
172032K ..... 97% 1.20M 6s
175104K ..... 99% 988K 1s
178176K ..... 100% 1.11M=4m18s

2017-03-23 15:12:40 (694 KB/s) - 'jdk-8u121-linux-x64.tar.gz' saved [183246769/183246769]

Download done.
Removing outdated cached downloads...
█
```

When this installation step completes, Oracle Java 8 JDK is installed and is set as the default java version. Don't be confused by the "Important" notice to install the "oracle-java8-set-default" package. You just did that.

```
update-alternatives: using /usr/lib/jvm/java-8-oracle/bin/xjc to provide /usr/bin/xjc (xjc) in auto mode
update-alternatives: using /usr/lib/jvm/java-8-oracle/jre/lib/amd64/libnpjp2.so to provide /usr/lib/mozilla/plugins/libjavaplugin.so (mozilla-javaplugin.so) in auto mode
Oracle JRE 8 browser plugin installed
Oracle JDK 8 installed

#####Important#####
To set Oracle JDK8 as default, install the "oracle-java8-set-default" package.
E.g.: sudo apt install oracle-java8-set-default
On Ubuntu systems, oracle-java8-set-default is most probably installed
automatically with this package.
#####

Selecting previously unselected package oracle-java8-set-default.
(Reading database ... 216440 files and directories currently installed.)
Preparing to unpack ../oracle-java8-set-default_8u121-1-webupd8-2_all.deb ...
Unpacking oracle-java8-set-default (8u121-1-webupd8-2) ...
Selecting previously unselected package gsfonnts-x11.
Preparing to unpack ../gsfons-x11_0.24_all.deb ...
Unpacking gsfonnts-x11 (0.24) ...
Processing triggers for fontconfig (2.11.94-0ubuntu1.1) ...
Setting up oracle-java8-set-default (8u121-1-webupd8-2) ...
Setting up gsfonnts-x11 (0.24) ...
dwalling@osboxes:~$
```

Now, when you run "java -version", the following should be displayed.

```
dwalling@osboxes:~$ java -version
java version "1.8.0_121"
Java(TM) SE Runtime Environment (build 1.8.0_121-b13)
Java HotSpot(TM) 64-Bit Server VM (build 25.121-b13, mixed mode)
dwalling@osboxes:~$
```

Installing Apache Cassandra

First, we will update the package manager source list by adding the distribution source for Apache Cassandra. This will have the effect of including updates to Apache Cassandra when we issue our usual "apt-get" commands to update or upgrade packages.

```
dwalling@osboxes:~$ echo "deb http://www.apache.org/dist/cassandra/debian 22x main" | sudo tee -a /etc/apt/sources
.list.d/cassandra.sources.list
deb http://www.apache.org/dist/cassandra/debian 22x main
dwalling@osboxes:~$
```

Before downloading and installing Apache Cassandra, though, there are three GPG public keys that we will need to install. For each key, this is a two-step process. First we receive the key. Second, we add the key to the local key store.

Here is the first key ...

```
dwalling@osboxes:~$ gpg --keyserver pgp.mit.edu --recv-keys F758CE318D77295D
gpg: requesting key 8D77295D from hkp server pgp.mit.edu
gpg: /home/dwalling/.gnupg/trustdb.gpg: trustdb created
gpg: key 8D77295D: public key "Eric Evans <eevans@sym-link.com>" imported
gpg: no ultimately trusted keys found
gpg: Total number processed: 1
gpg:         imported: 1 (RSA: 1)
dwalling@osboxes:~$
```

```
dwalling@osboxes:~$ gpg --export --armor F758CE318D77295D | sudo apt-key add -
OK
dwalling@osboxes:~$
```

Next, the second ...

```
dwalling@osboxes:~$ gpg --keyserver pgp.mit.edu --recv-keys 2B5C1B00
gpg: requesting key 2B5C1B00 from hkp server pgp.mit.edu
gpg: key 2B5C1B00: public key "Sylvain Lebresne (pcmanus) <sylvain@datastax.com>" imported
gpg: Total number processed: 1
gpg:         imported: 1 (RSA: 1)
dwalling@osboxes:~$ gpg --export --armor 2B5C1B00 | sudo apt-key add -
OK
dwalling@osboxes:~$
```

Finally, the third ...

```
dwalling@osboxes:~$ gpg --keyserver pgp.mit.edu --recv-keys 0353B12C
gpg: requesting key 0353B12C from hkp server pgp.mit.edu
gpg: key 0353B12C: public key "T Jake Luciani <jake@apache.org>" imported
gpg: no ultimately trusted keys found
gpg: Total number processed: 1
gpg:         imported: 1 (RSA: 1)
dwalling@osboxes:~$ gpg --export --armor 0353B12C | sudo apt-key add -
OK
dwalling@osboxes:~$
```

Next, we will attempt to install Cassandra.

As it turns out, though, there is yet another key that the installation is looking for ...

```
dwalling@osboxes:~$ sudo apt-get update
Hit:1 http://pubmirrors.dal.corespace.com/ubuntu xenial InRelease
Hit:2 http://pubmirrors.dal.corespace.com/ubuntu xenial-updates InRelease
Hit:3 http://pubmirrors.dal.corespace.com/ubuntu xenial-backports InRelease
Hit:4 http://pubmirrors.dal.corespace.com/ubuntu xenial-security InRelease
Hit:5 http://ppa.launchpad.net/webupd8team/java/ubuntu xenial InRelease
Get:6 http://dl.bintray.com/apache/cassandra 22x InRelease [3,168 B]
Ign:6 http://dl.bintray.com/apache/cassandra 22x InRelease
Get:7 http://dl.bintray.com/apache/cassandra 22x/main amd64 Packages [684 B]
Get:8 http://dl.bintray.com/apache/cassandra 22x/main i386 Packages [684 B]
Fetched 4,536 B in 2min 3s (36 B/s)
Reading package lists... Done
W: GPG error: http://dl.bintray.com/apache/cassandra 22x InRelease: The following signatures couldn't be verified because the public key is not available: NO_PUBKEY A278B781FE4B2BDA
W: The repository 'http://www.apache.org/dist/cassandra/debian 22x InRelease' is not signed.
N: Data from such a repository can't be authenticated and is therefore potentially dangerous to use.
N: See apt-secure(8) manpage for repository creation and user configuration details.
dwalling@osboxes:~$
```

So, if you encounter this error, you can use the “apt-key” command to use the package manager to install the missing key.

```
dwalling@osboxes:~$ sudo apt-key adv --keyserver keyserver.ubuntu.com --recv-keys A278B781FE4B2BDA
Executing: /tmp/tmp.BMrYzWgbtG/gpg.1.sh --keyserver
keyserver.ubuntu.com
--recv-keys
A278B781FE4B2BDA
gpg: requesting key FE4B2BDA from hkp server keyserver.ubuntu.com
gpg: key FE4B2BDA: public key "Michael Shuler <michael@pbandjelly.org>" imported
gpg: Total number processed: 1
gpg: imported: 1 (RSA: 1)
dwalling@osboxes:~$
```

The package manager's update operation now completes successfully.

```
dwalling@osboxes:~$ sudo apt-get update
Hit:1 http://pubmirrors.dal.corespace.com/ubuntu xenial InRelease
Hit:2 http://pubmirrors.dal.corespace.com/ubuntu xenial-updates InRelease
Hit:3 http://ppa.launchpad.net/webupd8team/java/ubuntu xenial InRelease
Hit:4 http://pubmirrors.dal.corespace.com/ubuntu xenial-backports InRelease
Hit:5 http://pubmirrors.dal.corespace.com/ubuntu xenial-security InRelease
Get:6 http://dl.bintray.com/apache/cassandra 22x InRelease [3,168 B]
Fetched 3,168 B in 2min 1s (26 B/s)
Reading package lists... Done
dwalling@osboxes:~$
```

With our package updates now in place, we are ready to install Cassandra.

```
dwalling@osboxes:~$ sudo apt-get install cassandra
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libopts25 ntp
Suggested packages:
  cassandra-tools ntp-doc
The following NEW packages will be installed:
  cassandra libopts25 ntp
0 to upgrade, 3 to newly install, 0 to remove and 0 not to upgrade.
Need to get 24.7 MB of archives.
After this operation, 34.7 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

Click Enter to accept the installation and continue.

```

Get:1 http://pubmirrors.dal.corespace.com/ubuntu xenial/main amd64 libopts25 amd64 1:5.18.7-3 [57.8 kB]
Get:2 http://pubmirrors.dal.corespace.com/ubuntu xenial-updates/main amd64 ntp amd64 1:4.2.8p4+dfsg-3ubuntu5.3 [520 kB]
Get:3 http://dl.bintray.com/apache/cassandra 22x/main amd64 cassandra all 2.2.9 [24.1 MB]
Fetched 24.7 MB in 2min 25s (169 kB/s)
Selecting previously unselected package libopts25:amd64.
(Reading database ... 216486 files and directories currently installed.)
Preparing to unpack .../libopts25_1%3a5.18.7-3_amd64.deb ...
Unpacking libopts25:amd64 (1:5.18.7-3) ...
Selecting previously unselected package ntp.
Preparing to unpack .../ntp_1%3a4.2.8p4+dfsg-3ubuntu5.3_amd64.deb ...
Unpacking ntp (1:4.2.8p4+dfsg-3ubuntu5.3) ...
Selecting previously unselected package cassandra.
Preparing to unpack .../cassandra_2.2.9_all.deb ...
Unpacking cassandra (2.2.9) ...
Processing triggers for libc-bin (2.23-0ubuntu7) ...
Processing triggers for systemd (229-4ubuntu16) ...
Processing triggers for ureadahead (0.100.0-19) ...
Processing triggers for man-db (2.7.5-1) ...
Setting up libopts25:amd64 (1:5.18.7-3) ...
Setting up ntp (1:4.2.8p4+dfsg-3ubuntu5.3) ...
Setting up cassandra (2.2.9) ...
Adding group `cassandra' (GID 133) ...
Done.
vm.max_map_count = 1048575
net.ipv4.tcp_keepalive_time = 300
update-rc.d: warning: start and stop actions are no longer supported; falling back to defaults
Processing triggers for libc-bin (2.23-0ubuntu7) ...
Processing triggers for systemd (229-4ubuntu16) ...
Processing triggers for ureadahead (0.100.0-19) ...
dwalling@osboxes:~$

```

The package installation actually installs Cassandra as a service to be automatically installed on system start. To confirm the installation, reboot the server and check the service status using either “systemctl” or “service”.

```

dwalling@osboxes:~$ sudo service cassandra status
● cassandra.service - LSB: distributed storage system for structured data
   Loaded: loaded (/etc/init.d/cassandra; bad; vendor preset: enabled)
   Active: active (running) since Thu 2017-03-23 15:41:21 CDT; 54s ago
     Docs: man:systemd-sysv-generator(8)
    CGroup: /system.slice/cassandra.service
            └─7433 java -ea -javaagent:/usr/share/cassandra/lib/jamm-0.3.0.jar -XX:+CMSClassUnloadingEnabled -XX:+UseThreadPrioritie
Mar 23 15:41:21 osboxes systemd[1]: Starting LSB: distributed storage system for structured data...
Mar 23 15:41:21 osboxes systemd[1]: Started LSB: distributed storage system for structured data.
lines 1-9/9 (END)

```

Apache Cassandra sets up default listeners on ports 9042 and 7000. These should be in a “LISTEN” state on system startup. You can use “netstat” to confirm this.

```

dwalling@osboxes:~$ netstat -an | grep "LISTEN "
tcp        0      0 127.0.0.1:33553        0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:9042        0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:7000        0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:9050        0.0.0.0:*               LISTEN
tcp        0      0 127.0.0.1:7199        0.0.0.0:*               LISTEN
tcp        0      0 192.168.43.220:8642   0.0.0.0:*               LISTEN
tcp6       0      0 :::21                 :::*                   LISTEN
dwalling@osboxes:~$

```

Finally, as part of the Apache Cassandra toolset, the “nodetool” command is available to report the detailed status of working Cassandra nodes. By default, we have only one node installed, on our localhost address.

```

dwalling@osboxes:~$ sudo nodetool status
Datacenter: datacenter1
=====
Status=Up/Down
|/ State=Normal/Leaving/Joining/Moving
-- Address      Load          Tokens         Owns (effective)  Host ID                               Rack
UN 127.0.0.1     97.18 KB      256            100.0%            8840985d-6732-4372-b222-f2f1cfacc240 rack1
dwalling@osboxes:~$

```

When the default node is in “Up” status and in a “Normal” state, you should be able to use the “Cassandra Query Language Shell” (cqlsh) command.

```
dwalling@osboxes:~$ cqlsh
Connected to Test Cluster at 127.0.0.1:9042.
[cqlsh 5.0.1 | Cassandra 2.2.9 | CQL spec 3.3.1 | Native protocol v4]
Use HELP for help.
cqlsh> █
```

As suggested, type “HELP” for a convenient listing of cqlsh commands and help topics.

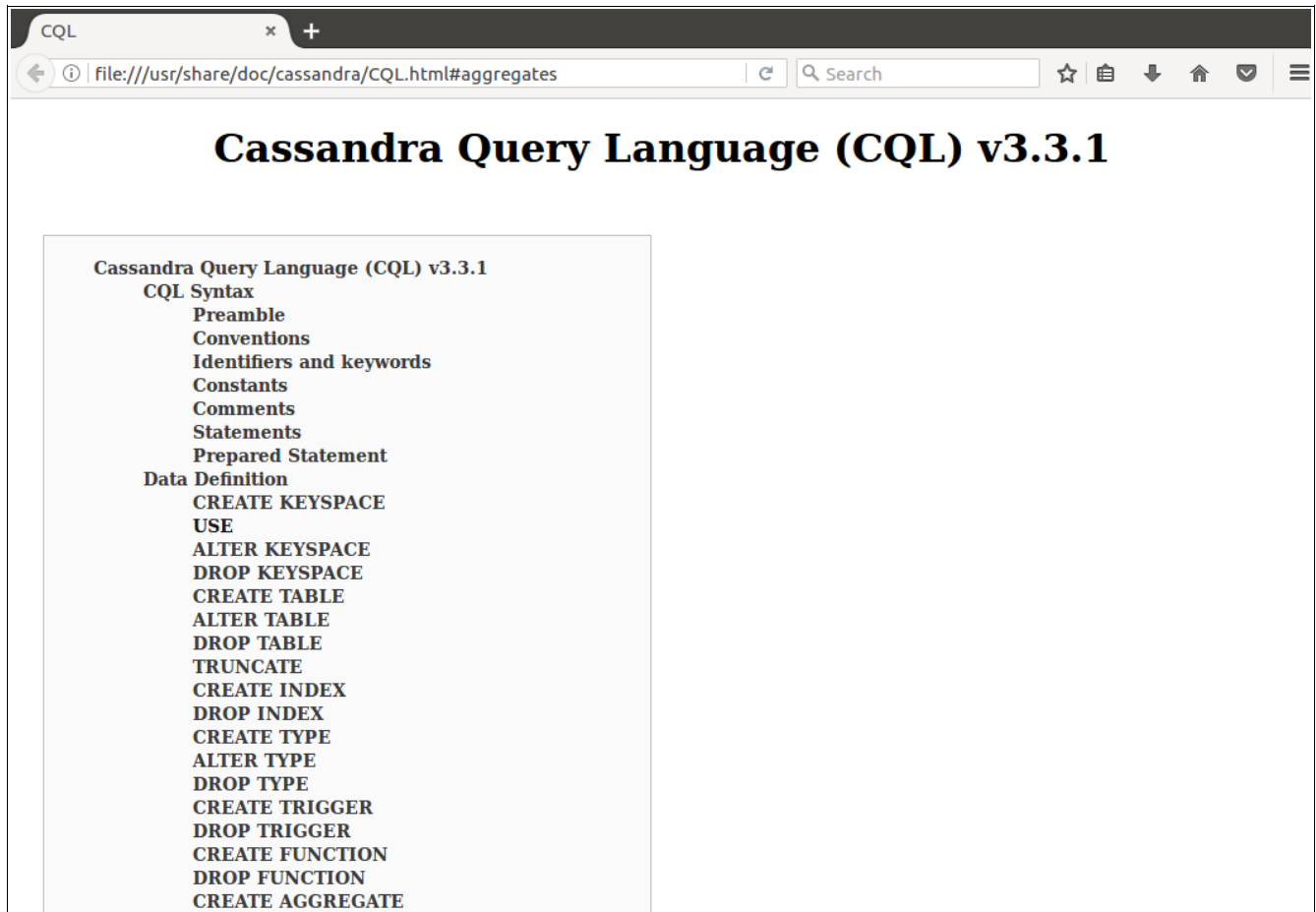
```
dwalling@osboxes:~$ cqlsh
Connected to Test Cluster at 127.0.0.1:9042.
[cqlsh 5.0.1 | Cassandra 2.2.9 | CQL spec 3.3.1 | Native protocol v4]
Use HELP for help.
cqlsh> HELP

Documented shell commands:
=====
CAPTURE  CLS          COPY  DESCRIBE  EXPAND  LOGIN  SERIAL  SOURCE  UNICODE
CLEAR    CONSISTENCY  DESC  EXIT      HELP    PAGING SHOW    TRACING

CQL help topics:
=====
AGGREGATES          CREATE_COLUMNFAMILY  DROP_INDEX          LIST_PERMISSIONS  UUID
ALTER_KEYSPACE     CREATE_FUNCTION      DROP_KEYSPACE      LIST_USERS
ALTER_TABLE        CREATE_INDEX         DROP_TABLE         PERMISSIONS
ALTER_TYPE         CREATE_KEYSPACE     DROP_TRIGGER      REVOKE
ALTER_USER         CREATE_TABLE        DROP_TYPE         SELECT
APPLY              CREATE_TRIGGER      DROP_USER         SELECT_JSON
ASCII              CREATE_TYPE         FUNCTIONS         TEXT
BATCH              CREATE_USER         GRANT             TIME
BEGIN              DATE                INSERT            TIMESTAMP
BLOB               DELETE              INSERT_JSON      TRUNCATE
BOOLEAN            DROP_AGGREGATE     INT              TYPES
COUNTER            DROP_COLUMNFAMILY  JSON             UPDATE
CREATE_AGGREGATE   DROP_FUNCTION      KEYWORDS         USE

cqlsh>
```


Interestingly, when in the cqlsh shell, entering “HELP” with a topic name, “AGGREGATES” for example, will even launch a browser instance to navigate to a local file instance of the relevant help HTML page.



Note that, by default, Cassandra files are created in a subfolder within /etc.

```
dwalling@osboxes:~$ cd /etc/cassandra
dwalling@osboxes:/etc/cassandra$ ls -al
total 96
drwxr-xr-x  3 root root  4096 Mar 23 15:41 .
drwxr-xr-x 138 root root 12288 Mar 23 15:41 ..
-rw-r--r--  1 root root  12212 Feb 15 18:50 cassandra-env.sh
-rw-r--r--  1 root root   1200 Feb 15 18:44 cassandra-rackdc.properties
-rw-r--r--  1 root root   1358 Feb 15 18:44 cassandra-topology.properties
-rw-r--r--  1 root root  44647 Feb 15 18:50 cassandra.yaml
-rw-r--r--  1 root root   2082 Feb 15 18:44 commitlog_archiving.properties
-rw-r--r--  1 root root   1193 Feb 15 18:44 logback-tools.xml
-rw-r--r--  1 root root   3785 Feb 15 18:44 logback.xml
drwxr-xr-x  2 root root  4096 Mar 23 15:41 triggers
dwalling@osboxes:/etc/cassandra$
```

Getting Started Using Cassandra

The details of the Cassandra concepts of keyspace, table, column families, etc., are beyond the scope of this “how to”. But, to get started using Cassandra, here is an example of creating a keyspace named “dev” and a table named “emp”.

Note that once the keyspace is created, you must “use” the keyspace before creating a table in the keyspace. Also note that when you are using a keyspace, the Cassandra prompt changes to include the keyspace name, in this case, “cqlsh:dev”.

```
dwalling@osboxes:~$ cqlsh
Connected to Test Cluster at 127.0.0.1:9042.
[cqlsh 5.0.1 | Cassandra 2.2.9 | CQL spec 3.3.1 | Native protocol v4]
Use HELP for help.
cqlsh> create keyspace dev
... with replication = {'class':'SimpleStrategy','replication_factor':1};
cqlsh> use dev
... ;
cqlsh:dev> create table emp (empid int primary key,
... emp_first varchar, emp_last varchar, emp_dept varchar);
cqlsh:dev> █
```

Our simple table consists of four columns: empid, emp_first, emp_last and emp_dept.

Note that Cassandra does not require defining length attributes on varchar data types.

Also, don't make assumptions about how Cassandra “orders” columns in a table. Note in the “select” query below, how the columns are reported in alphabetical order, rather than in the order given in the “create table” statement.

```
cqlsh:dev> select * from emp;

 empid | emp_dept | emp_first | emp_last
-----+-----+-----+-----
(0 rows)
cqlsh:dev> █
```

Finally, Cassandra does not like double-quotes in insert statements. Use single-quotes as shown:

```
cqlsh:dev> insert into emp (empid,emp_dept,emp_last,emp_first) values (1,'Sales','Smith','Roger');
cqlsh:dev> select * from emp;

 empid | emp_dept | emp_first | emp_last
-----+-----+-----+-----
   1 |   Sales |   Roger |   Smith
(1 rows)
cqlsh:dev> █
```