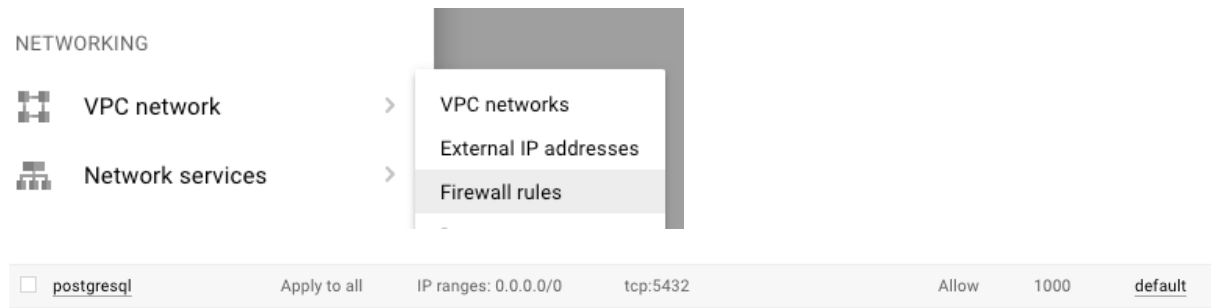


Performing the variant where instead of using default Google SQL instance for PostgreSQL, rather install and configure PostgreSQL database into a manually created Google VM:

<https://cloud.google.com/community/tutorials/setting-up-postgres>

A: STEPS



```
Connected, host fingerprint: sha256:2948 00:03:30:5D:62:21:AC:8B:02:81:60:1F:59:EC:10:0E:36:EF:50:84
Welcome to Ubuntu 14.04.5 LTS (GNU/Linux 4.4.0-98-generic x86_64)
```

* Documentation: <https://help.ubuntu.com/>

System information as of Sun Nov 12 21:07:08 UTC 2017

System load: 0.23 Memory usage: 1% Processes: 60
Usage of /: 11.2% of 9.81GB Swap usage: 0% Users logged in: 0

Graph this data and manage this system at:
<https://landscape.canonical.com/>

Get cloud support with Ubuntu Advantage Cloud Guest:
<http://www.ubuntu.com/business/services/cloud>

0 packages can be updated.
0 updates are security updates.

Your Hardware Enablement Stack (HWE) is supported until April 2019.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

```
jy82398n@postgres-tutorial:~$ sudo apt-get update
Ign http://us-central1.gce.archive.ubuntu.com trusty InRelease
Get:1 http://us-central1.gce.archive.ubuntu.com trusty-updates InRelease [65.9 kB]
Hit http://us-central1.gce.archive.ubuntu.com trusty-backports InRelease
Hit http://us-central1.gce.archive.ubuntu.com trusty Release.gpg
Hit http://us-central1.gce.archive.ubuntu.com trusty Release
Ign http://archive.canonical.com trusty InRelease
Get:2 http://archive.canonical.com trusty Release.gpg [916 B]
Get:3 http://archive.canonical.com trusty Release [9,359 B]
Get:4 http://us-central1.gce.archive.ubuntu.com trusty-updates/main Sources [407 kB]
Get:5 http://us-central1.gce.archive.ubuntu.com trusty-updates/restricted Sources [6,322 B]
Get:6 http://us-central1.gce.archive.ubuntu.com trusty-updates/universe Sources [194 kB]
Get:7 http://security.ubuntu.com trusty-security InRelease [65.9 kB]
```

individual files in /usr/share/doc/*/*copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

```
jy82398n@postgres-tutorial:~$ sudo apt-get update
Ign http://us-central1.gce.archive.ubuntu.com trusty InRelease
Get:1 http://us-central1.gce.archive.ubuntu.com trusty-updates InRelease [65.9 kB]
Hit http://us-central1.gce.archive.ubuntu.com trusty-backports InRelease
Hit http://us-central1.gce.archive.ubuntu.com trusty Release.gpg
Hit http://us-central1.gce.archive.ubuntu.com trusty Release
Ign http://archive.canonical.com trusty InRelease
Get:2 http://archive.canonical.com trusty Release.gpg [916 B]
Get:3 http://archive.canonical.com trusty Release [9,359 B]
Get:4 http://us-central1.gce.archive.ubuntu.com trusty-updates/main Sources [407 kB]
Get:5 http://us-central1.gce.archive.ubuntu.com trusty-updates/restricted Sources [6,322 B]
Get:6 http://us-central1.gce.archive.ubuntu.com trusty-updates/universe Sources [194 kB]
Get:7 http://security.ubuntu.com trusty-security InRelease [65.9 kB]
Get:8 http://us-central1.gce.archive.ubuntu.com trusty-updates/multiverse Sources [7,764 B]
Get:9 http://us-central1.gce.archive.ubuntu.com trusty-updates/main amd64 Packages [1,036 kB]
Get:10 http://us-central1.gce.archive.ubuntu.com trusty-updates/restricted amd64 Packages [17.2 kB]
Get:11 http://us-central1.gce.archive.ubuntu.com trusty-updates/universe amd64 Packages [432 kB]
Get:12 http://us-central1.gce.archive.ubuntu.com trusty-updates/multiverse amd64 Packages [14.9 kB]
Get:13 http://us-central1.gce.archive.ubuntu.com trusty-updates/main Translation-en [511 kB]
Get:14 http://archive.canonical.com trusty/partner amd64 Packages [5,361 B]
Get:15 http://us-central1.gce.archive.ubuntu.com trusty-updates/multiverse Translation-en [7,760 B]
Get:16 http://us-central1.gce.archive.ubuntu.com trusty-updates/restricted Translation-en [4,031 B]
Get:17 http://us-central1.gce.archive.ubuntu.com trusty-updates/universe Translation-en [234 kB]
Get:18 http://us-central1.gce.archive.ubuntu.com trusty-backports/main Sources [9,710 B]
Get:19 http://us-central1.gce.archive.ubuntu.com trusty-backports/restricted Sources [28 B]
Get:20 http://us-central1.gce.archive.ubuntu.com trusty-backports/universe Sources [35.4 kB]
Get:21 http://archive.canonical.com trusty/partner Translation-en [4,207 B]
Get:22 http://us-central1.gce.archive.ubuntu.com trusty-backports/multiverse Sources [1,898 B]
Hit http://us-central1.gce.archive.ubuntu.com trusty-backports/main amd64 Packages
Hit http://us-central1.gce.archive.ubuntu.com trusty-backports/restricted amd64 Packages
Hit http://us-central1.gce.archive.ubuntu.com trusty-backports/universe amd64 Packages
Hit http://us-central1.gce.archive.ubuntu.com trusty-backports/multiverse amd64 Packages
Hit http://us-central1.gce.archive.ubuntu.com trusty-backports/main Translation-en
Hit http://us-central1.gce.archive.ubuntu.com trusty-backports/multiverse Translation-en
Hit http://us-central1.gce.archive.ubuntu.com trusty-backports/restricted Translation-en
Hit http://us-central1.gce.archive.ubuntu.com trusty-backports/universe Translation-en
Get:23 http://us-central1.gce.archive.ubuntu.com trusty/main Sources [1,064 kB]
```

```
jy82398n@postgres-tutorial: ~ - Google Chrome
Secure | https://ssh.cloud.google.com/projects/cogent-bison-182100/zones/us-central1-c/instances/postgres-tutorial?authuser=0&hl=en_GB&projectNumber=641638149341

Preparing to unpack .../postgresql-9.3+154ubuntu1.1_all.deb ...
Unpacking postgresql (9.3+154ubuntu1.1) ...
Selecting previously unselected package postgresql-client.
Preparing to unpack .../postgresql-client-9.3+154ubuntu1.1_all.deb ...
Unpacking postgresql-client (9.3+154ubuntu1.1) ...
Selecting previously unselected package postgresql-contrib-9.3.
Preparing to unpack .../postgresql-contrib-9.3_9.3.19-0ubuntu0.14.04_amd64.deb ...
Unpacking postgresql-contrib-9.3 (9.3.19-0ubuntu0.14.04) ...
Selecting previously unselected package postgresql-contrib.
Preparing to unpack .../postgresql-contrib-9.3+154ubuntu1.1_all.deb ...
Unpacking postgresql-contrib (9.3+154ubuntu1.1) ...
Processing triggers for man-db (2.6.7.1-1ubuntu1) ...
Processing triggers for ureadahead (0.100.0-16) ...
Setting up libxslt1.1:amd64 (1.1.28-2ubuntu0.1) ...
Setting up libossp-uuid16 (1.6.2-1.3ubuntu1) ...
Setting up libpq5 (9.3.19-0ubuntu0.14.04) ...
Setting up postgresql-client-common (154ubuntu1.1) ...
Setting up postgresql-client-9.3 (9.3.19-0ubuntu0.14.04) ...
update-alternatives: using /usr/share/postgresql/9.3/man/man1/psql.1.gz to provide /usr/share/man/man1/psql.1.gz (psql.1.gz) in auto mode
Setting up ssl-cert (1.0.33) ...
Setting up postgresql-common (154ubuntu1.1) ...
Adding user postgres to group ssl-cert

Creating config file /etc/logrotate.d/postgresql-common with new version
Building PostgreSQL dictionaries from installed myspell/hunspell packages...
Removing obsolete dictionary files:
 * No PostgreSQL clusters exist; see "man pg_createcluster"
Setting up postgresql-client (9.3+154ubuntu1.1) ...
Processing triggers for ureadahead (0.100.0-16) ...
Setting up postgresql-9.3 (9.3.19-0ubuntu0.14.04) ...
Creating new cluster 9.3/main ...
   config /etc/postgresql/9.3/main
   data   /var/lib/postgresql/9.3/main
   locale en_US.UTF-8
   port   5432
update-alternatives: using /usr/share/postgresql/9.3/man/man1/postmaster.1.gz to provide /usr/share/man/man1/postmaster.1.gz (postmaster.1.gz) in auto mode
 * Starting PostgreSQL 9.3 database server
Setting up postgresql (9.3+154ubuntu1.1) ...
Setting up postgresql-contrib-9.3 (9.3.19-0ubuntu0.14.04) ...
Setting up postgresql-contrib (9.3+154ubuntu1.1) ...
Processing triggers for libc-bin (2.19-0ubuntu6.13) ...
jy82398n@postgres-tutorial:~$

root@postgres-tutorial: ~ - Google Chrome
Secure | https://ssh.cloud.google.com/projects/cogent-bison-182100/zones/us-central1-c/instances/postgres-tutorial?authuser=0&hl=en_GB&projectNumber=641638149341

Unpacking postgresql-contrib (9.3+154ubuntu1.1) ...
Processing triggers for man-db (2.6.7.1-1ubuntu1) ...
Processing triggers for ureadahead (0.100.0-16) ...
Setting up libxslt1.1:amd64 (1.1.28-2ubuntu0.1) ...
Setting up libossp-uuid16 (1.6.2-1.3ubuntu1) ...
Setting up libpq5 (9.3.19-0ubuntu0.14.04) ...
Setting up postgresql-client-common (154ubuntu1.1) ...
Setting up postgresql-client-9.3 (9.3.19-0ubuntu0.14.04) ...
update-alternatives: using /usr/share/postgresql/9.3/man/man1/psql.1.gz to provide /usr/share/man/man1/psql.1.gz (psql.1.gz) in auto mode
Setting up ssl-cert (1.0.33) ...
Setting up postgresql-common (154ubuntu1.1) ...
Adding user postgres to group ssl-cert

Creating config file /etc/logrotate.d/postgresql-common with new version
Building PostgreSQL dictionaries from installed myspell/hunspell packages...
Removing obsolete dictionary files:
 * No PostgreSQL clusters exist; see "man pg_createcluster"
Setting up postgresql-client (9.3+154ubuntu1.1) ...
Processing triggers for ureadahead (0.100.0-16) ...
Setting up postgresql-9.3 (9.3.19-0ubuntu0.14.04) ...
Creating new cluster 9.3/main ...
   config /etc/postgresql/9.3/main
   data   /var/lib/postgresql/9.3/main
   locale en_US.UTF-8
   port   5432
update-alternatives: using /usr/share/postgresql/9.3/man/man1/postmaster.1.gz to provide /usr/share/man/man1/postmaster.1.gz (postmaster.1.gz) in auto mode
 * Starting PostgreSQL 9.3 database server
Setting up postgresql (9.3+154ubuntu1.1) ...
Setting up postgresql-contrib-9.3 (9.3.19-0ubuntu0.14.04) ...
Setting up postgresql-contrib (9.3+154ubuntu1.1) ...
Processing triggers for libc-bin (2.19-0ubuntu6.13) ...
jy82398n@postgres-tutorial:~$ sudo -s
root@postgres-tutorial:~# sudo -u postgres psql postgres
psql (9.3.19)
Type "help" for help.

postgres=# \password postgres
Enter new password:
Enter it again:
postgres=# CREATE EXTENSION adminpack;
CREATE EXTENSION
postgres=#
```

Firewall

Google Cloud Platform console showing Firewall rules for project 'cogent-bison-182100'. The left sidebar lists VPC networks, External IP addresses, Firewall rules (selected), Routes, VPC network peering, and Shared VPC. The main panel displays a table of firewall rules under the 'Ingress' tab.

Name	Targets	Source filters	Protocols/ports	Action	Priority	Network
datalab-network-allow-ssh	Apply to all	IP ranges: 0.0.0.0/0	tcp:22	Allow	1000	datalab-network
postgres-tutorial	Apply to all	IP ranges: 100.1.114.177/32	tcp:5432	Deny	1000	default
default-allow-http	http-server	IP ranges: 0.0.0.0/0	tcp:80	Allow	1000	default
default-allow-https	https-server	IP ranges: 0.0.0.0/0	tcp:443	Allow	1000	default
default-allow-icmp	Apply to all	IP ranges: 0.0.0.0/0	icmp	Allow	65534	default
default-allow-internal	Apply to all	IP ranges: 10.128.0.0/9	tcp:0-65535, udp:0-65535, 1 more	Allow	65534	default
default-allow-rdp	Apply to all	IP ranges: 0.0.0.0/0	tcp:3389	Allow	65534	default
default-allow-ssh	Apply to all	IP ranges: 0.0.0.0/0	tcp:22	Allow	65534	default

Taskbar: Homework 3 - a...docx, groceries.csv, 08 - Association ...ipynb, IS665 - Associatio...pdf, 07 - Clustering.ipynb, Show all. System clock: 4:39 PM, 11/12/2017.

pgAdmin III interface showing the 'postgres' database selected in the Object browser. The 'Depends' tab is active, displaying a table with columns: Type, Name, and Restriction. The SQL pane shows the following SQL script:

```
-- Database: postgres
-- DROP DATABASE postgres;

CREATE DATABASE postgres
WITH OWNER = postgres
ENCODING = 'UTF8'
TABLESPACE = pg_default
LC_COLLATE = 'en_US.UTF-8'
LC_CTYPE = 'en_US.UTF-8'
CONNECTION LIMIT = -1;
```

Retrieving details on database postgres... Done. postgres on postgres@35.193.65.186:5432 1.6 secs

D:

```
root@postgres-tutorial: ~ - Google Chrome
Secure | https://ssh.cloud.google.com/projects/cogent-bison-182100/zones/us-central1-c/instances/postgres-tutorial?authuser=0&hl=en_GB&projectNumber=641638149341

Command 'xwd' from package 'x11-apps' (main)
Command 'od' from package 'coreutils' (main)
owd: command not found
jy82398n@postgres-tutorial:/etc/postgresql/9.3/main$ pwd
/etc/postgresql/9.3/main
jy82398n@postgres-tutorial:/etc/postgresql/9.3/main$ /etc/postgresql/9.3/main/pg_hba.conf
/etc/postgresql/9.3/main/pg_hba.conf: line 85: local: can only be used in a function
/etc/postgresql/9.3/main/pg_hba.conf: line 90: local: can only be used in a function
host: couldn't get address for 'all': not found
host: couldn't get address for 'all': not found
jy82398n@postgres-tutorial:/etc/postgresql/9.3/main$ cd
jy82398n@postgres-tutorial:~$ ls
commands.txt
jy82398n@postgres-tutorial:~$ sudo -s
root@postgres-tutorial:~# service postgresql status
9.3/main (port 5432): online
root@postgres-tutorial:~# sudo -u postgres psql postgres
psql (9.3.19)
Type "help" for help.

postgres=# password
postgres=# lqaz!QAZ
postgres=# \password postgres
Enter new password:
Enter it again:
postgres=# service postgresql status
postgres=# netstat -an|grep 5432
postgres=# ^C
postgres=# ^C
postgres=# ^C
postgres=# ^C
postgres=# exit
postgres=# \q
root@postgres-tutorial:~# netstat -an|grep 5432
tcp        0      0 0.0.0.0:5432          0.0.0.0:*             LISTEN
tcp6       0      0 :::5432              :::*                   LISTEN
unix 2      [ ACC ]     STREAM  LISTENING   14566   /var/run/postgresql/.s.PGSQL.5432
root@postgres-tutorial:~#
```

pg_hba.conf

```
postgres=# \password postgres
Enter new password:
Enter it again:
postgres=# service postgresql status
postgres=# netstat -an|grep 5432
postgres=# ^C
postgres=# ^C
postgres=# ^C
postgres=# ^C
postgres=# exit
postgres=# \q
root@postgres-tutorial:~# netstat -an|grep 5432
tcp        0      0 0.0.0.0:5432          0.0.0.0:*             LISTEN
tcp6       0      0 :::5432              :::*                   LISTEN
unix 2      [ ACC ]     STREAM  LISTENING   14566   /var/run/postgresql/.s.PGSQL.5432
root@postgres-tutorial:~# service postgresql status
9.3/main (port 5432): online
root@postgres-tutorial:~# exit
exit
jy82398n@postgres-tutorial:~$ service postgresql status
9.3/main (port 5432): online
jy82398n@postgres-tutorial:~$ sudo service postgresql restart
* Restarting PostgreSQL 9.3 database server [ OK ]
jy82398n@postgres-tutorial:~$ service postgresql status
9.3/main (port 5432): online
jy82398n@postgres-tutorial:~$ service postgresql stop
* Stopping PostgreSQL 9.3 database server [ fail ]
* Error: You must run this program as the cluster owner (postgres) or root
jy82398n@postgres-tutorial:~$ sudo -s
root@postgres-tutorial:~# service postgresql stop
* Stopping PostgreSQL 9.3 database server [ OK ]
root@postgres-tutorial:~# service postgresql start
* Starting PostgreSQL 9.3 database server [ OK ]
root@postgres-tutorial:~# service postgresql status
9.3/main (port 5432): online
root@postgres-tutorial:~# hostname
postgres-tutorial
root@postgres-tutorial:~#
```

pg_hba.conf

RazorSQL - Postgres tutorial

File Edit Search DB Tools Connections SQL Results Tools Code View Window Help

*Postgres tutorial

Database

- postgres
 - Schemas
 - information_schema
 - Tables
 - sql_features
 - Columns
 - feature_id varchar
 - feature_name varchar
 - sub_feature_id varchar
 - sub_feature_name varchar
 - is_supported varchar(3)
 - comments varchar
 - Indexes
 - Triggers
 - Constraints
 - sql_implementation_info
 - sql_languages
 - sql_packages
 - sql_parts
 - sql_sizing
 - sql_sizing_profiles
 - Views
 - _pg_foreign_data_wrappers
 - _pg_foreign_servers
 - _pg_foreign_table_columns
 - _pg_foreign_tables
 - _pg_user_mappings
 - administrable_role_authorizations
 - applicable_roles
 - attributes
 - character_sets
 - check_constraint_routine_usage

```
select * from station;
INSERT INTO station VALUES('A1','1');
INSERT INTO station VALUES('A2','1');
INSERT INTO station VALUES('A3','1');
INSERT INTO station VALUES('A4','2');
INSERT INTO station VALUES('A5','3');
INSERT INTO station VALUES('A6','1');
INSERT INTO station VALUES('A7','2');
INSERT INTO station VALUES('A8','2');
INSERT INTO station VALUES('A9','3');
select * from station_location;
INSERT INTO station_location VALUES('A1',0,0,5);
INSERT INTO station_location VALUES('A2',0,5,5);
INSERT INTO station_location VALUES('A3',0,10,5);
INSERT INTO station_location VALUES('A4',0,15,5);
INSERT INTO station_location VALUES('A5',0,20,5);
INSERT INTO station_location VALUES('A6',0,25,5);
INSERT INTO station_location VALUES('A7',0,30,5);
INSERT INTO station_location VALUES('A8',0,35,5);
INSERT INTO station_location VALUES('A9',0,40,5);
```

212/845 Ln. 6 Col. 38 Lines: 21 INSERT WRITABLE \n Cp1252 Delimiter:

@ tables @ station @ station 2 @ station_location @ station_location ...

OFF

station_name	location_x	location_y	location_z
1 A1	0	0	5
2 A2	0	5	5
3 A3	0	10	5
4 A4	0	15	5
5 A5	0	20	5
6 A6	0	25	5
7 A7	0	30	5
8 A8	0	35	5
9 A9	0	40	5

11:13:44:107 Executing Statement ... Done. Query Time: 0.031 Row Count: 9