**The code contains a series of commands to install and configure the Nominatim geocoding software on a Linux server. Here is a breakdown of each command :**

*%userName should be replaced by userprofile%*

1. sudo apt install -y python3-behave

Installs the Python Behave package.

1. sudo apt install -y php-codesniffer

Installs the PHP CodeSniffer package.

1. sudo apt install -y phpunit

Installs the PHP Unit Testing package.

1. sudo apt install -y pylint

Installs the Python Pylint package.

1. sudo python38 -m pip install -y python-dotenv

Installs the Python dotenv package.

1. sudo apt install -y osm2pgsql

Installs the OSM2PGSQL tool for working with OpenStreetMap data.

1. sudo apt install -y cmake

Installs the CMake build system.

1. sudo snap install -y cmake

Installs an additional version of CMake from the Snap store.

1. sudo apt install -y python3-pip

Installs Python 3 pip package manager.

1. sudo apt install -y acl

Installs the Access Control Lists package for managing file permissions.

1. sudo pip install -U pytest

Upgrades the Python pytest package.

1. sudo apt install -y php-cgi unzip recode

Installs additional PHP packages.

1. sudo apt install -y apache2 libapache2-mod-php

Installs the Apache web server and the PHP module for Apache.

1. sudo apt install -y net-tools

Installs a package containing various network tools.

1. sudo apt-get install -y osmctools

Installs the OSMCTools package for working with OpenStreetMap data.

1. sudo apt install -y php-cgi

Installs an additional PHP package required by Nominatim.

1. sudo apt install -y build-essential cmake g++ libboost-dev libboost-system-dev libboost-filesystem-dev libexpat1-dev zlib1g-dev libbz2-dev libpq-dev liblua5.3-dev lua5.3 postgresql-server-dev-14 postgresql-14-postgis-3 postgresql-contrib-14 postgresql-14-postgis-3-scripts php-cli php-pgsql php-intl libicu-dev python3-dotenv python3-psycopg2 python3-psutil python3-jinja2 python3-icu python3-datrie

Installs various libraries and dependencies required by Nominatim.

1. sudo useradd -d /srv/nominatim -s /bin/bash -m nominatim

Creates a new system user named "nominatim" with a home directory of "/srv/nominatim".

1. export USERNAME=nominatim and export USERHOME=/srv/nominatim

Set environment variables for the username and home directory of the nominatim user.

1. visudo

Opens the sudoers configuration file for editing.

1. %userName ALL=(ALL) ALL

%nominatim ALL=(ALL) ALL

%postgres ALL=(ALL) ALL

Add new entries to the sudoers configuration file granting various privileges to the "userName", "nominatim", and "postgres" users.

1. sudo chmod a+x $USERHOME

This changes the permissions of the home directory of the current user to allow execution of files.

1. sudo setfacl -R -m u:postgres:rwx /srv/nominatim/

This grants read, write, and execute permissions to the user "postgres" on the directory "/srv/nominatim/" and all its contents.

1. sudo systemctl restart postgresql

This restarts the PostgreSQL database service.

1. sudo -u postgres -i

This switches to the user "postgres" and opens a new interactive shell.

1. sudo -u postgres createuser -s $USERNAME

This creates a PostgreSQL user with superuser privileges and the same name as the current user.

1. sudo -u postgres createuser www-data

This creates a PostgreSQL user named "www-data".

1. su username

This switches to a user named "username".

1. sudo -i

This opens a new interactive shell with root privileges.

1. export USERNAME=nominatim

This sets an environment variable named "USERNAME" to "nominatim".

1. export USERHOME=/srv/nominatim

This sets an environment variable named "USERHOME" to "/srv/nominatim".

1. cd $USERHOME

This changes the current directory to the value of the "USERHOME" environment variable.

1. wget https://nominatim.org/release/Nominatim-4.2.0.tar.bz2

This downloads the Nominatim source code.

1. tar xf Nominatim-4.2.0.tar.bz2

This extracts the downloaded archive.

1. mkdir build

This creates a new directory named "build".

1. cd build

This changes the current directory to "build".

1. sudo cmake /srv/nominatim/Nominatim-4.2.0

This configures the Nominatim build using CMake.

1. sudo make

This compiles the Nominatim source code.

1. sudo make install

This installs Nominatim on the system.

1. cd ..

This changes the current directory to the parent directory of "build".

1. mkdir /srv/nominatim/nominatim-project

This creates a new directory named "nominatim-project" in "/srv/nominatim/".

1. mkdir /srv/nominatim/nominatim-project/website

This creates a new directory named "website" inside "/srv/nominatim/nominatim-project/".

1. sudo setfacl -R -m u:nominatim:rwx /srv/nominatim/

This grants read, write, and execute permissions to the user "nominatim" on "/srv/nominatim/" and all its contents.

1. sudo setfacl -R -m u:postgres:rwx /srv/nominatim/

This grants read, write, and execute permissions to the user "postgres" on "/srv/nomin

1. mkdir nominatim-planet

creates a new directory called nominatim-planet in the current working directory.

1. cd /srv/nominatim/nominatim-planet

changes the current working directory to /srv/nominatim/nominatim-planet.

1. export PROJECT\_DIR=/srv/nominatim/nominatim-planet

exports the environment variable PROJECT\_DIR and sets it to /srv/nominatim/nominatim-planet.

1. cd $PROJECT\_DIR

changes the current working directory to the value of the PROJECT\_DIR environment variable.

1. wget https://www.nominatim.org/data/wikimedia-importance.sql.gz

downloads a compressed SQL file from the specified URL.

1. wget https://download.geofabrik.de/asia/india-latest.osm.pbf

downloads a compressed OpenStreetMap data file for India from the specified URL.

1. sudo -u postgres -i

switches to the postgres user and starts a new interactive shell session as that user.

1. nano /etc/postgresql/14/main/postgresql.conf

opens the PostgreSQL configuration file in the Nano text editor.

1. listen\_addresses = 'localhost'

shared\_buffers = 2GB

maintenance\_work\_mem = 10GB

autovacuum\_work\_mem = 2GB

work\_mem = 50MB

effective\_cache\_size = 24GB

synchronous\_commit = off

max\_wal\_size = 1GB

checkpoint\_timeout = 10min

checkpoint\_completion\_target = 0.9

The subsequent lines modify various configuration settings for PostgreSQL, such as listen\_addresses, shared\_buffers, maintenance\_work\_mem, autovacuum\_work\_mem, work\_mem, effective\_cache\_size, synchronous\_commit, max\_wal\_size, checkpoint\_timeout, and checkpoint\_completion\_target.

1. su userName

switches to the userName user.

1. sudo -i

starts a new interactive shell session with elevated privileges.

1. sudo systemctl restart postgresql

restarts the PostgreSQL service.

1. sudo -u postgres -i

switches to the postgres user and starts a new interactive shell session as that user.

1. cd

changes the current working directory to the home directory of the current user.

1. nominatim import --osm-file /srv/nominatim/nominatim-planet/india-latest.osm.pbf 2>&1 | tee setup.log

This command imports the OpenStreetMap data file india-latest.osm.pbf located in /srv/nominatim/nominatim-planet/ to the Nominatim database. The 2>&1 | tee setup.log part of the command redirects both the standard output and standard error of the command to the file setup.log and also prints them on the terminal.

1. nominatim admin --check-database

This command checks if the Nominatim database is configured properly and ready to use.

1. nominatim import --continue indexing

This command continues the indexing of the imported data.

1. nominatim admin --check-database

This command checks the Nominatim database again to ensure it is still functioning properly.

1. cd /srv/nominatim/nominatim-planet/

This command changes the current directory to /srv/nominatim/nominatim-planet/.

1. nominatim refresh --wiki-data --importance 2>&1 | tee setup.log

This command updates the Nominatim database with the latest wiki data and importance scores. The 2>&1 | tee setup.log part of the command redirects both the standard output and standard error of the command to the file setup.log and also prints them on the terminal.

1. nominatim admin --check-database

This command checks the Nominatim database again to ensure it is still functioning properly.

1. cp -r /var/lib/postgresql/website/ /srv/nominatim/nominatim-project/

This command copies the Nominatim website files from the default location /var/lib/postgresql/website/ to the new location /srv/nominatim/nominatim-project/.

1. su userName

This command switches to the user userName.

1. sudo -i

This command elevates the privileges of the user to the superuser level.

1. sudo tee /etc/apache2/conf-available/nominatim.conf << EOFAPACHECONF

<Directory "/srv/nominatim/nominatim-project/website">

Options FollowSymLinks MultiViews

AddType text/html .php

DirectoryIndex search.php

Require all granted

</Directory>

Alias /nominatim /srv/nominatim/nominatim-project/website

EOFAPACHECONF

sudo tee /etc/apache2/conf-available/nominatim.conf << EOFAPACHECONF: This command creates and opens a new file /etc/apache2/conf-available/nominatim.conf and redirects the input from the following lines until it encounters EOFAPACHECONF into the file.

<Directory "/srv/nominatim/nominatim-project/website">: This line specifies the directory where the Nominatim website files are located.

Options FollowSymLinks MultiViews: This line enables the FollowSymLinks and MultiViews options for Apache.

AddType text/html .php: This line associates the .php file extension with the text/html MIME type.

DirectoryIndex search.php: This line specifies the default page to load when accessing the Nominatim website.

Require all granted: This line grants access to all users.

</Directory>: This line closes the <Directory> tag.

Alias /nominatim /srv/nominatim/nominatim-project/website

This line creates an alias for the Nominatim website URL.

EOFAPACHECONF: This line marks the end of the input redirection.

1. sudo -u postgres -i

This command switches to the postgres user.

1. a2enconf nominatim

This command enables the Apache2 configuration file for the Nominatim service. a2enconf is a tool for enabling Apache2 configuration files, and nominatim is the name of the configuration file that needs to be enabled.

1. systemctl restart apache2

This command restarts the Apache2 web server. systemctl is a command for managing system services in a Linux system, and apache2 is the name of the service that needs to be restarted.

1. systemctl status apache2

This command displays the status of the Apache2 web server. systemctl is again used to manage the service, and status is an option that tells the command to display the current status of the service.

1. systemctl restart postgresql

This command restarts the PostgreSQL database service. postgresql is the name of the service that needs to be restarted.

1. nominatim serve

This command starts the Nominatim service. nominatim is the name of the service, and serve is a command that starts the service. Nominatim is an open-source tool used for geocoding and reverse geocoding of addresses.

1. **run-: localhost/nominatim => OK**
2. **localhost/nominatim/reverse.php?format=json&lat=27.1750090510034&lon=78.04209025**