
AcuGIS GeoHelm

Release 0.4.3

acugis

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1.1 Overview

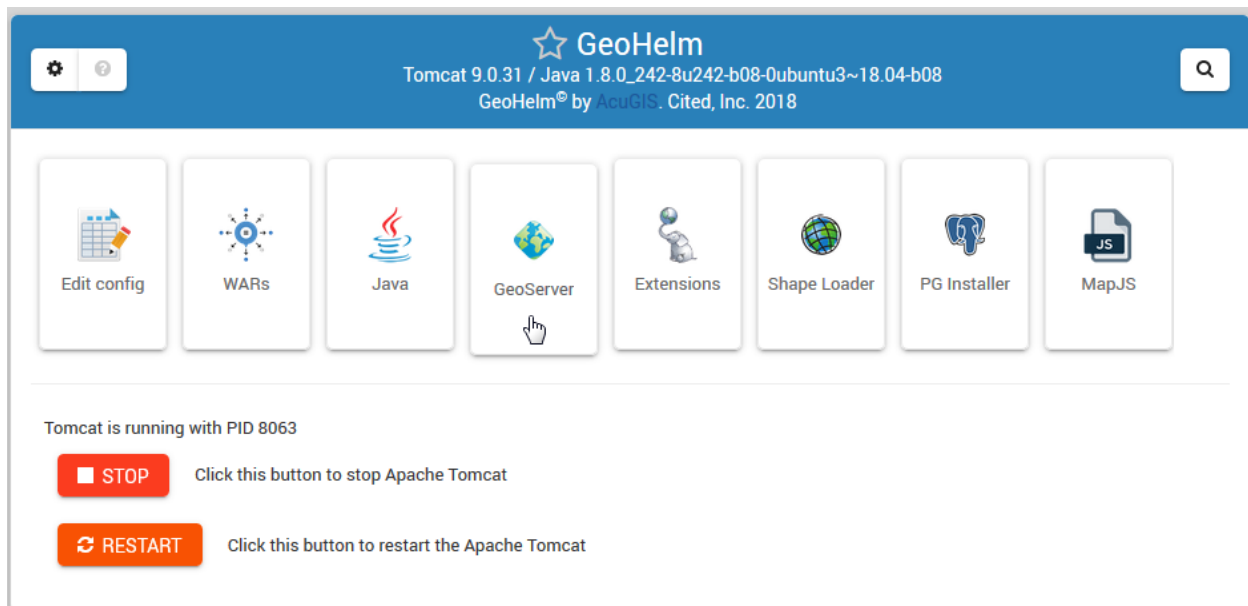
GeoHelm is a Webmin Module that allows you to build a full Open Source GIS stack quickly and easily.

GeoHelm installs and configures PostgreSQL, PostGIS, GeoServer (optionally), Tomcat, and JDK.

It includes a panel for managing all aspects of the service.

GeoHelm can be installed on CentOS 7 or 8 or Ubuntu 18.

All installed components are non-forked and un-modified and installed via the projects archive.



1.2 System Requirements

- CentOS 8 or
- Ubuntu 18
- Webmin
- 1 GB Ram
- 10 GB SSD

1.3 Authors

- David Ghedini
- Kaloyan Petrov

1.4 Components

PostgreSQL

PostGIS

Apache Tomcat

OpenJDK

GeoServer

1.5 Open Source

GeoHelm is Free, Open Source Software.

GNU GENERAL PUBLIC LICENSE v3

CHAPTER 2

Webmin

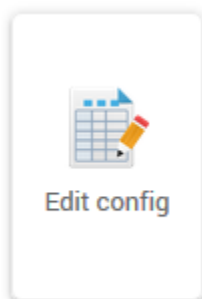
Webmin can be accessed via:

```
https://yourdomain.com:10000
```


Table of Contents

- *General*
 - *Edit Config*
 - *Apps*
 - *Java*
 - *MapJS*

3.1 Edit Config



The Config tab is used to edit the following files:

```
server.xml  
web.xml  
context.xml
```

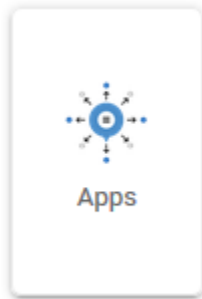
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```
tomcat-users.xml  
setenv.sh
```

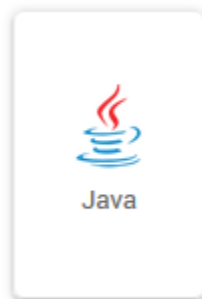
These files can, of course, be edited via the file system or VI as well.

3.2 Apps



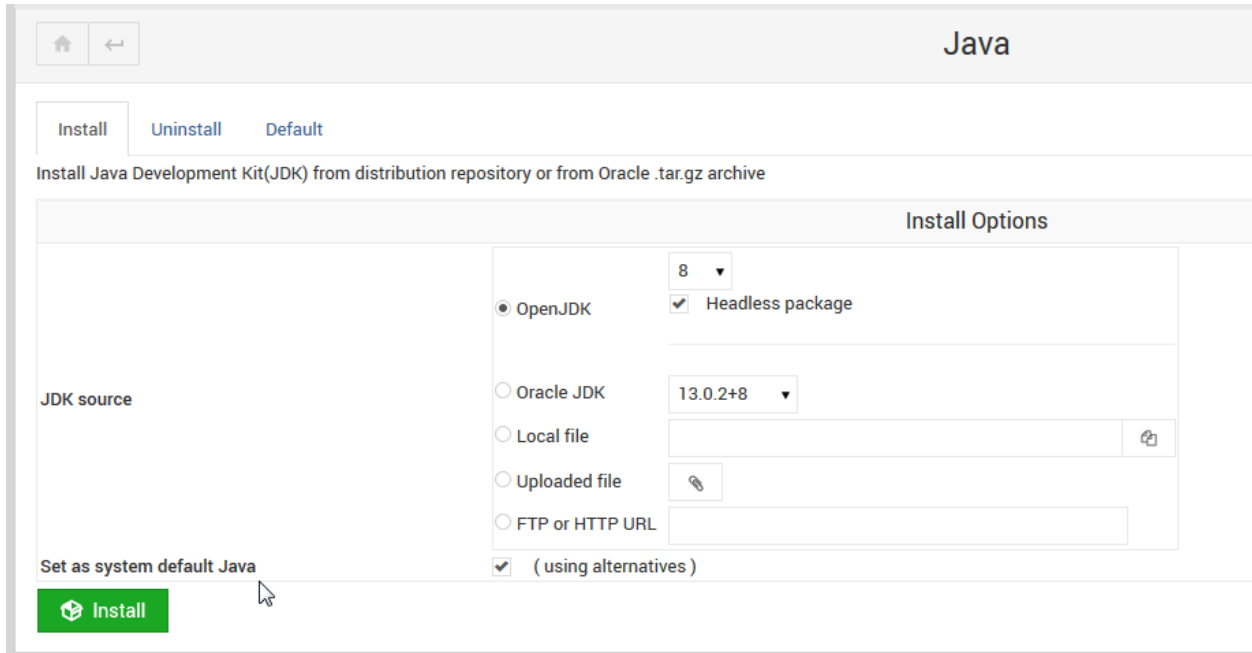
The Apps manager allows you to deploy, undeploy, and redeploy WAR files in Apache Tomcat

3.3 Java



The Java tab is used during installation as well as for updating of JDK.

It can also be used to un-install the selected JDK and replace it with a new version.



Note: When installing or removing, there is an option to set as System default.

3.4 MapJS

The MapJS tab is simply a file browser for viewing and editing both OpenLayers and LeafletJS files.

Table of Contents

- *Apache Tomcat*
 - *Layout*
 - *Starting and Stopping*
 - *Init Script*
 - *Version*

4.1 Layout

For installations done using the Wizard, the Apache Tomcat (CATALINA) home directory is:

```
/home/tomcat/apache-tomcat-v/
```

Where `apache-tomcat-v` is the version you chose to install.

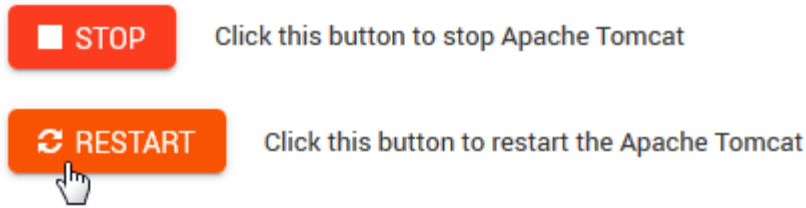
The `CATALINA_HOME` variable is set both in the Tomcat init script as well as `setenv.sh` files.

4.2 Starting and Stopping

There are two ways to start/stop/restart Tomcat.

1. Via Module, using the Stop/Start/Restart buttons as shown below:

Tomcat is running with PID 8063



2. Via SSH, using the following commands

```
1 /etc/init.d/tomcat { start | stop | restart | status }
```

4.3 Init Script

The Tomcat init script is located in /etc/init.d and has the following content.

```
1  #!/bin/bash
2  ### BEGIN INIT INFO
3  # Provides:          tomcat
4  # Required-Start:   $network
5  # Required-Stop:    $network
6  # Default-Start:    2 3 4 5
7  # Default-Stop:     0 1 6
8  # Short-Description: Start/Stop Tomcat server
9  ### END INIT INFO
10
11 # Source function library.
12 . /etc/environment;    #Catalina variables
13 . $CATALINA_HOME/bin/setenv.sh
14
15 RETVAL=$?
16
17 function start(){
18 echo "Starting Tomcat"
19 /bin/su - tomcat $CATALINA_HOME/bin/startup.sh
20 RETVAL=$?
21 }
22
23 function stop(){
24 echo "Stopping Tomcat"
25 /bin/su - tomcat -c "$CATALINA_HOME/bin/shutdown.sh 60 -force"
26 RETVAL=$?
27 }
28
29 case "$1" in
30 start)
31     start;
32 ;;
33 stop)
34     stop;
35 ;;
```

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```
36 restart)
37     echo "Restarting Tomcat"
38 stop;
39     start;
40 ;;
41 status)
42
43     if [ -f "${CATALINA_PID}" ]; then
44         TOMCAT_PID=$(cat "${CATALINA_PID}")
45         echo "Tomcat is running with PID ${TOMCAT_PID}";
46         RETVAL=1
47     else
48         echo "Tomcat is not running";
49         RETVAL=0
50     fi
51     ;;
52 *)
53     echo $"Usage: $0 {start|stop|restart|status}"
54     exit 1
55 ;;
56 esac
57 exit $RETVAL
```

4.4 Version

GeoHelm has been tested with Tomcat 8.x and 9.x

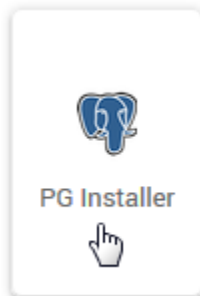
Table of Contents

- *PostgreSQL*
 - *Repository Manager*
 - *File Locations*
 - *The pg_hba.conf File*
 - *The postgresql.conf File*
 - *Version*
 - *Webmin PostgreSQL Module*

5.1 Repository Manager

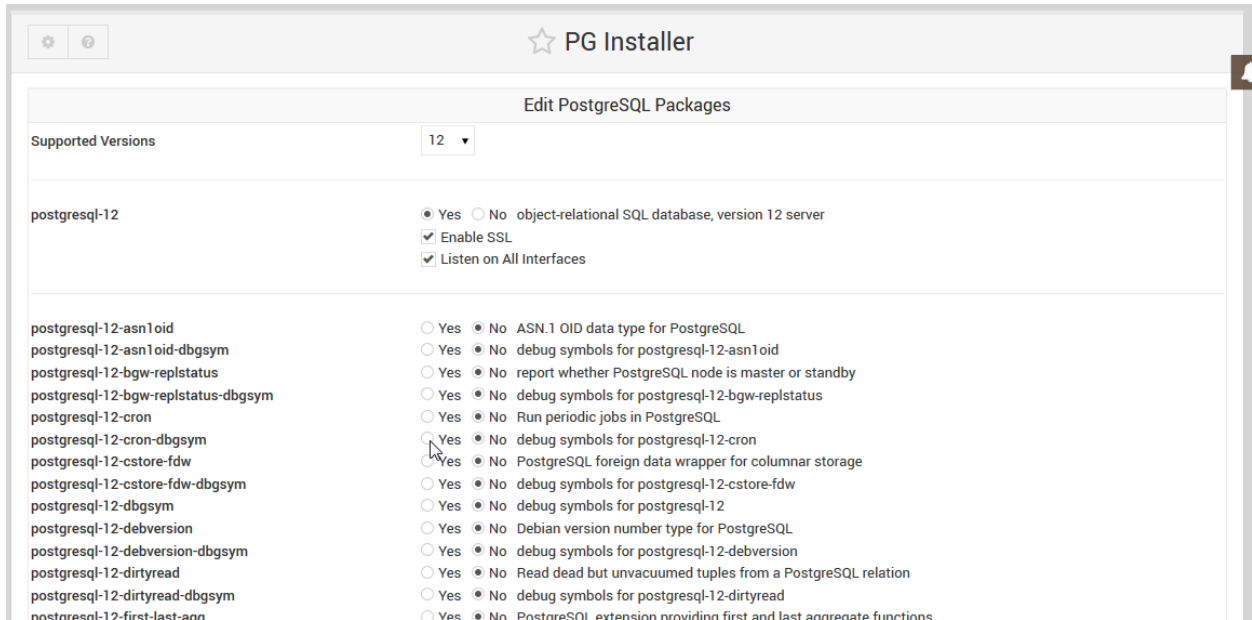
The Repository installer and manager allows you to install your selected version of the PostgreSQL Repository.

It can be access via the Pg Installer tab as shown below:



You can also use the manager to install and update packages as well.

As certain packages require EPEL for CentOS, the EPEL repository is installed as well when installing on CentOS.



5.2 File Locations

On CentOS, the PostgreSQL config directory is located at:

```
/var/lib/pgsql/12/data
```

On Ubuntu, the PostgreSQL directory is located at:

```
/etc/postgresql/12/main
```

5.3 The pg_hba.conf File

On installation via the Wizard, PostgreSQL is configured for use with SSL and uses md5 authentication for all users and databases.

```

1  local   all all                                     trust
2  host    all all 127.0.0.1          255.255.255.255 md5
3  host    all all 0.0.0.0/0                        md5
4  host    all all ::1/128                md5
5  hostssl all all 127.0.0.1          255.255.255.255 md5
6  hostssl all all 0.0.0.0/0                        md5
7  hostssl all all ::1/128                md5

```

5.4 The postgresql.conf File

On installation via the Wizard, PostgreSQL is configured to accept connections on all interfaces as well as SSL connections.

```
1  #-----  
2  # CONNECTIONS AND AUTHENTICATION  
3  #-----  
4  
5  # - Connection Settings -  
6  
7  listen_addresses = '*'  
8  )  
9  
10  
11 # - SSL -  
12  
13 ssl = on
```

Above are excerpts.



5.5 Version

GeoHelm has been tested with PostgreSQL 10, 11 and 12.

5.6 Webmin PostgreSQL Module

On installation, the native PostgreSQL Database Server module is also activated.

It is located under Servers > PostgreSQL Database Server



 


★ PostgreSQL Database Server


PostgreSQL version 12.2 (With schemas)

PostgreSQL Databases

SELECT ALL INVERT SELECTION CREATE A NEW DATABASE


postgres




template0



template1


SELECT ALL INVERT SELECTION CREATE A NEW DATABASE


DROP SELECTED DATABASES

User, Groups and Permissions


PostgreSQL
Users


PostgreSQL
Groups


Allowed Hosts


Granted
Privileges

STOP POSTGRESQL SERVER Click this button to stop the PostgreSQL database server on your system. This will prevent any users or programs from database, including this Webmin module.

Table of Contents

- *PostGIS*
 - *Installing PostGIS*
 - *Command Line*
 - *Extensions Tool*

6.1 Installing PostGIS

PostGIS can be enabled on your PostgreSQL database via the Extension tab or via Command Line.

6.2 Command Line

To install via command line:

1. Connect to PostgreSQL

```
1 root@geohelm:~# su - postgres
2 postgres@geohelm:~$ psql
3 psql (12.2 (Ubuntu 12.2-2.pgdg18.04+1))
4 Type "help" for help.
5
6 postgres=#
```

2. If you have not created a database, create one now.

```
1 postgres=# create database geohelm;
2 CREATE DATABASE
3 postgres=#
```

3. Connect to your database.

```
1 postgres=# \c geohelm
2 You are now connected to database "geohelm" as user "postgres".
3 geohelm=#
```

4. Install the PostGIS extension.

```
1 geohelm=# create extension postgis;
2 CREATE EXTENSION
3 geohelm=#
```

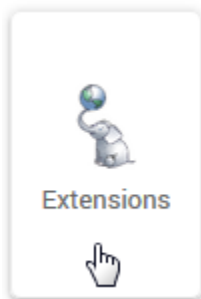
Note: GeoHelm also includes `fuzzy_match_string`, `tiger`, `postgis_topology`.

5. Verify the installation via command line or the PostgreSQL Management Page

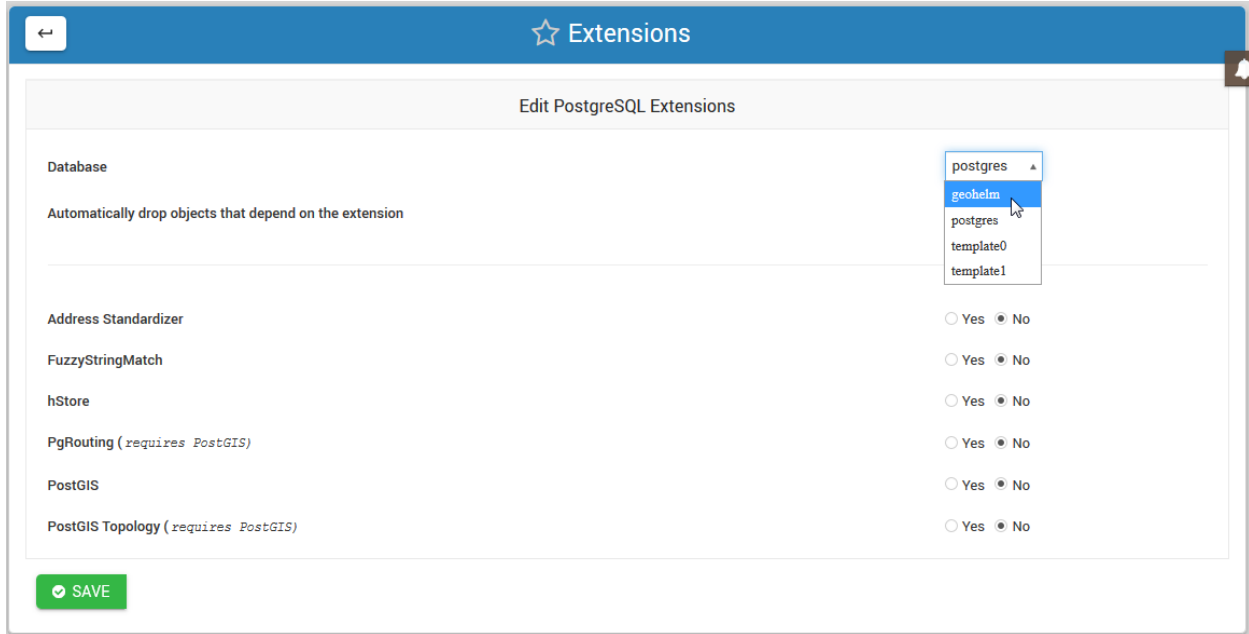
```
1 geohelm=# \d
2          List of relations
3 Schema |          Name          | Type  | Owner
4 -----+-----+-----+-----
5 public | geography_columns     | view  | postgres
6 public | geometry_columns      | view  | postgres
7 public | raster_columns        | view  | postgres
8 public | raster_overviews      | view  | postgres
9 public | spatial_ref_sys       | table | postgres
10 (5 rows)
```

6.3 Extensions Tool

To install using the PostGIS/PgRouting Extension installer, click on the Extensions tab as shown below.

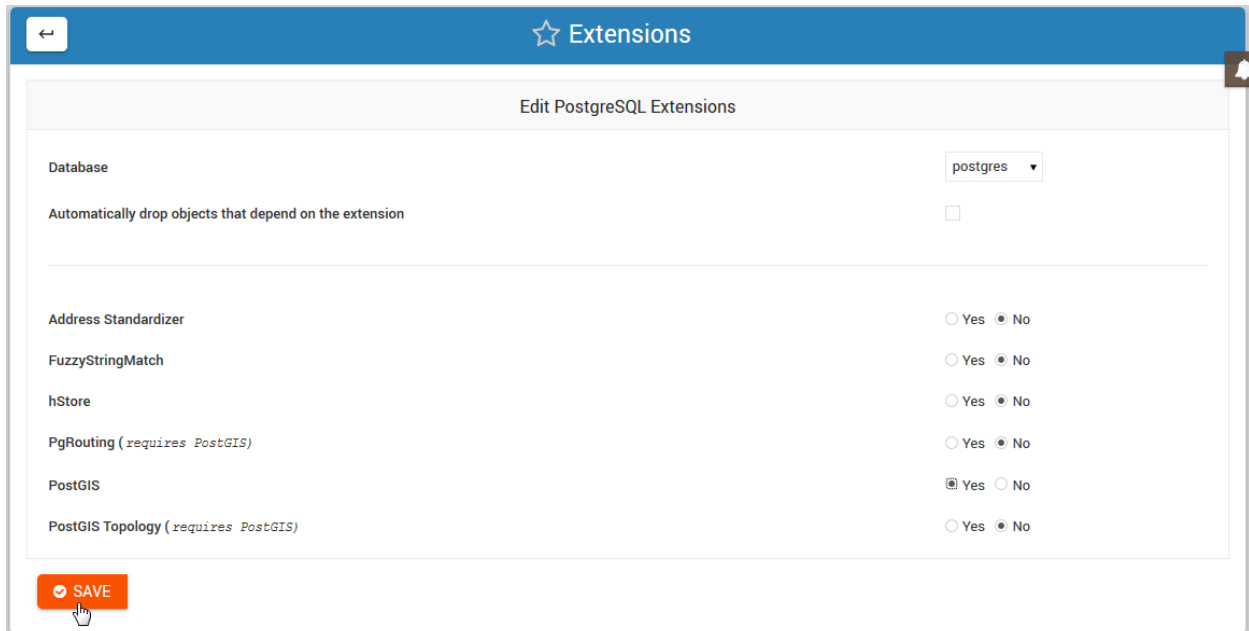


1. Select the target database from the drop-down as shown below.



Note: You must FIRST install PostGIS prior to installing any other of the listed extensions.

2. Tick the PostGIS select button and then click the Save button as show below:



3. Once PostGIS has been installed on a target database, you can then return to install additional extensions:

← Extensions

Edit PostgreSQL Extensions

Database postgres ▾

Automatically drop objects that depend on the extension

Address Standardizer Yes No

FuzzyStringMatch Yes No

hStore Yes No

PgRouting (requires PostGIS) Yes No

PostGIS Yes No

PostGIS Topology (requires PostGIS) Yes No

SAVE

Note: You can also un-install Extensions using above.

Table of Contents

- *PgRouting*
 - *Installing PgRouting*
 - *Command Line*
 - *Extensions Tool*

7.1 Installing PgRouting

PgRouting can be enabled on your PostgreSQL database via the Extension tab or via Command Line.

Note: PostGIS must be enabled prior to installing PgRouting

7.2 Command Line

To install via command line:

1. Connect to PostgreSQL

```
1 root@geohelm:~# su - postgres
2 postgres@geohelm:~$ psql
3 psql (12.2 (Ubuntu 12.2-2.pgdg18.04+1))
4 Type "help" for help.
5
6 postgres=#
```

2. If you have not created a database, create one now.

```
1 postgres=# create database geohelm;
2 CREATE DATABASE
3 postgres=#
```

3. Connect to your database.

```
1 postgres=# \c geohelm
2 You are now connected to database "geohelm" as user "postgres".
3 geohelm=#
```

4. Install the PostGIS extension.

```
1 geohelm=# create extension postgis;
2 CREATE EXTENSION
3 geohelm=#
```

5. Install the PgRouting extension.

```
1 geohelm=# create extension pgrouting;
2 CREATE EXTENSION
3 geohelm=#
```

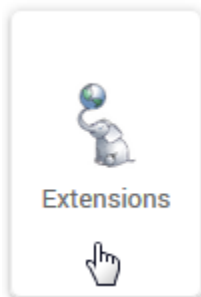
Note: GeoHelm also includes `fuzzy_match_string`, `tiger`, `postgis_topology`.

5. Verify the installation via command line or the PostgreSQL Management Page

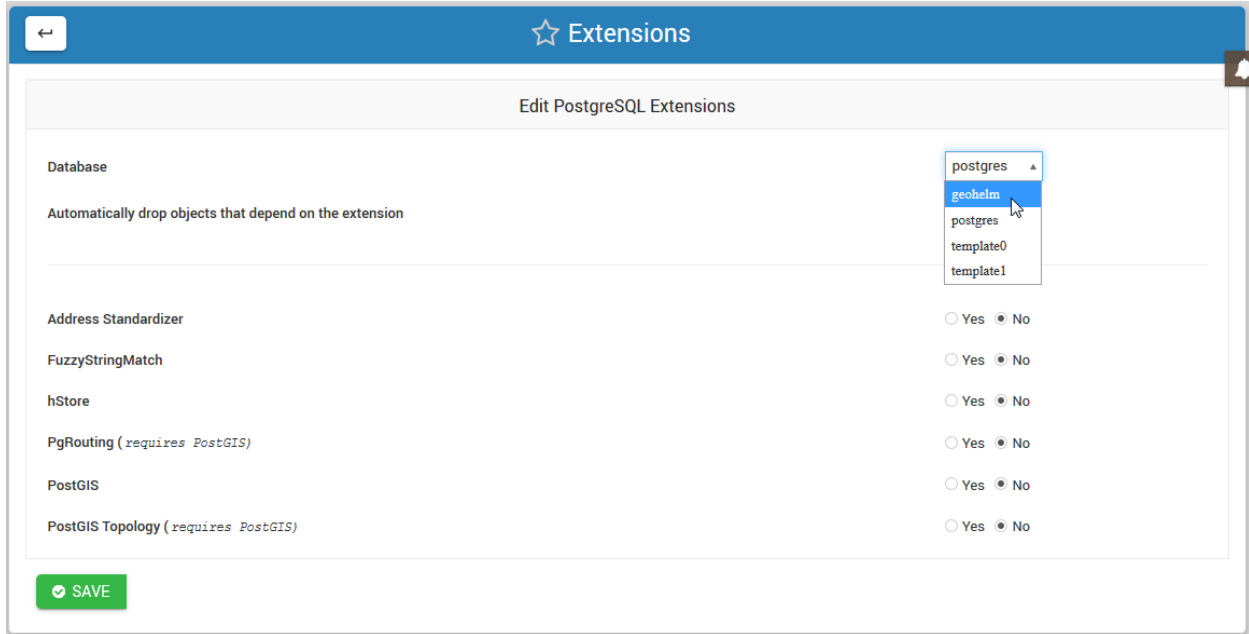
```
1 geohelm=# \d
2          List of relations
3 Schema |          Name          | Type  | Owner
4 -----+-----+-----+-----
5 public | geography_columns     | view  | postgres
6 public | geometry_columns      | view  | postgres
7 public | raster_columns        | view  | postgres
8 public | raster_overviews      | view  | postgres
9 public | spatial_ref_sys       | table | postgres
10 (5 rows)
```

7.3 Extensions Tool

To install using the Extension installer, click on the Extensions tab as shown below.

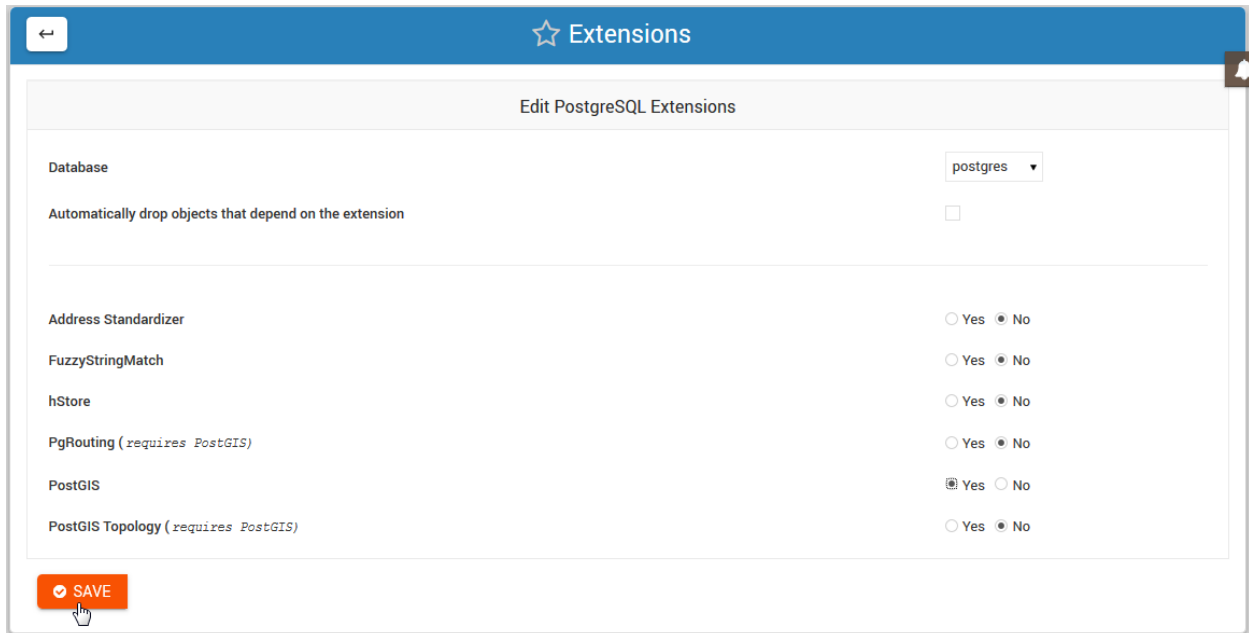


1. Select the target database from the drop-down as shown below.



Note: You must FIRST install PostGIS prior to installing PgRouting.

2. Tick the PostGIS select button and then click the Save button as show below:



3. Once PostGIS has been installed on a target database, you can then return to install PgRouting:

← Extensions

Edit PostgreSQL Extensions

Database postgres ▾

Automatically drop objects that depend on the extension

Address Standardizer Yes No

FuzzyStringMatch Yes No

hStore Yes No

PgRouting (requires PostGIS) Yes No

PostGIS Yes No

PostGIS Topology (requires PostGIS) Yes No

SAVE

Note: You can also un-install Extensions using above.

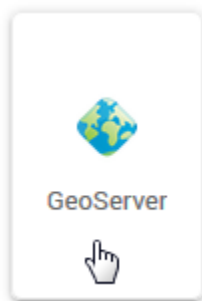
Table of Contents

- *GeoServer*
 - *Overview*
 - *Location*
 - *Geoserver Extensions*
 - *Data Directory*

8.1 Overview

GeoHelm installs the latest, stable version of GeoServer.

The GeoServer tab checks that GeoServer is installed.



If not, it can be installed using the “Install Now” button.

This will install the latest, stable version of GeoServer.

Important: GeoServer is an optional component on the GeoHelm Java Version.

If you do not wish to install it, simply do not do so.

8.2 Location

By default, GeoServer is installed at `/home/tomcat/apache-tomcat-<version>/webapps/geoserver`

To make upgrading easier, you should always change the GeoServer Data Directory location.

To install GeoServer extensions, see our guide

As we can see above, the creation of our NewReports Directory has been added to the directory structure. This is true for all directories and sub directories added.

8.3 Geoserver Extensions

GeoServer Extensions can be installed as below.

Below, we are installing the MapFish Print Module via SSH.

1. Switch to user tomcat

```
1 su - tomcat
```

2. Change to the GeoServer `/lib` directory (adjust for your own file path)

```
1 cd /home/tomcat/apache-tomcat-8.5.15/webapps/geoserver/WEB-INF/lib
```

3. Download the desired extension, making sure to match the version to your GeoServer version

```
1 wget http://sourceforge.net/projects/geoserver/files/GeoServer/2.16.2/extensions/  
↪geoserver-2.16.2-printing-plugin.zip
```

4. Unzip the downloaded file

```
1 unzip -q geoserver-2.16.2-printing-plugin.zip
```

5. Remove the zip file

```
1 rm -f geoserver-2.16.2-printing-plugin.zip
```

6. Restart Tomcat for the extension to take effect.

Note: Some components, such as GDAL, require additional configuration.

8.4 Data Directory

To make GeoServer more portable and easier to upgrade, you should change the GeoServer data directory.

Follow the instructions below, substituting your own paths and file names.

1. Stop Tomcat

2. Connect via SSH and move the data directory as below: (Important: the target directory - 'geo_data' below - should not exist.)

```
1 mv /home/tomcat/apache-tomcat-8.5.15/webapps/geoserver/data/ /var/lib/geo_data/
```

3. Add the following to your GeoServer web.xml file:

```
1 <context-param>
2   <param-name>GEOSERVER_DATA_DIR</param-name>
3   <param-value>/var/lib/geo_data</param-value>
4 </context-param>
5
6 <context-param>
7   <param-name>GEOSERVER_REQUIRE_FILE</param-name>
8   <param-value>/var/lib/geo_data/global.xml</param-value>
9 </context-param>
```

4. Start Tomcat

You should log into GeoServer and verify that your workspaces, etc.. are accesible.

Table of Contents

- *Shape Loader*
 - *Shape Loader Tool*
 - *Load via Shape File Loader*
 - *Load via Comamnd Line*
 - *Troubleshooting*
 - *Documentation*

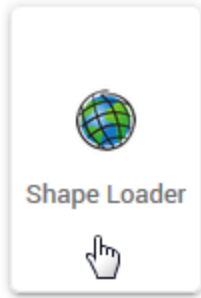
9.1 Shape Loader Tool

GeoHelm includes a shp2pgsql tool that can used to load shape files into PostGIS via Webmin.

1. Load using the Shape File Loader.
2. Load using command line.

9.2 Load via Shape File Loader

Click the Shape File Loader tab as shown below



The load options are displayed below.

←
☆ Shape Loader

Add shape to an existing database, with PostGIS extension

Database	<input type="text" value="geohelm"/>
Load Type	<input type="text" value="-c Creates a new table and populates it"/>
Set SRID (defaults to 0)	<input type="text" value="0"/>
Database Username	<input type="text" value="postgres"/>
Schema	<input type="text" value="public"/> or <input type="text" value="New schema name"/>
Table	<input type="text" value=""/> or <input type="text" value="New table name"/>
Shape source (.zip)	<input checked="" type="radio"/> Local file <input style="width: 150px;" type="text"/> <input type="button" value="📎"/> <input type="radio"/> Uploaded file <input type="button" value="📎"/> <input type="radio"/> FTP or HTTP URL <input style="width: 150px;" type="text"/>

Load options:

- Load Using Copy rather than Insert
- Use Geography Type
- Preserve Case of Column Names
- Create a spatial index on the geocolumn
- Create Simple Geometries
- Only import DBF file

Also select if load will be into a new Schema and, in the case of New Table creation, the table name to be created.

Load Options

Database: select the database you wish to load the shape file to.

Load Type: Create, Drop, Append, or Prepare

Set SRID: Defaults to 0 if not set

Database Username: Select the user who will own the data

Schema: Select an existing schema or create a new schema.

Table: Select an existing table or create new one

Shape File Source: Local, Upload, or FTP/HTTP

9.3 Load via Comamnd Line

Usage

shp2pgsql usage can be found using the 'shp2pgsql' command:

9.4 Troubleshooting

If the above commands produce 'shp2pgsql command not found', do the following:

On Ubuntu:

```
root@geohelm:~# apt install postgis
```

On CentOS

```
root@geohelm:~# yum install postgis3_utils
```

9.5 Documentation

Below are resources to get started with ogr2ogr and gdal_translate:

- [Refractions Documentation](#)
- [Boston GIS Cheatsheet](#)

Table of Contents

- *Snapshots*
 - *Edit Config*
 - *Apps*
 - *Java*
 - *MapJS*

10.1 Edit Config



postgresql/snapshot/_static/config-tab.png

The Config tab is used to edit the following files:

```
server.xml
web.xml
context.xml
tomcat-users.xml
setenv.sh
```

These files can, of course, be edited via the file system or VI as well.

10.2 Apps



postgresql/snapshot/_static/apps-tab.png

The Apps manager allows you to deploy, undeploy, and redeploy WAR files in Apache Tomcat

10.3 Java



postgresql/snapshot/_static/java-tab.png

The Java tab is used during installation as well as for updating of JDK.

It can also be used to un-install the selected JDK and replace it with a new version.



postgresql/snapshot/_static/java-installed.png

Note: When installing or removing, there is an option to set as System default.

10.4 MapJS

The MapJS tab is simply a file browser for viewing and editing both OpenLayers and LeafletJS files.

Table of Contents

- *Clone*
 - *Overview*
 - *Location*
 - *Geoserver Extensions*
 - *Data Directory*

11.1 Overview

GeoHelm installs the latest, stable version of GeoServer.

The GeoServer tab checks that GeoServer is installed.



postgresql/clone/_static/geoserver-tab.png

If not, it can be installed using the “Install Now” button.

This will install the latest, stable version of GeoServer.

Important: GeoServer is an optional component on the GeoHelm Java Version.

If you do not wish to install it, simply do not do so.

11.2 Location

By default, GeoServer is installed at `/home/tomcat/apache-tomcat-<version>/webapps/geoserver`

To make upgrading easier, you should always change the GeoServer Data Directory location.

To install GeoServer extensions, see our guide

As we can see above, the creation of our NewReports Directory has been added to the directory structure. This is true for all directories and sub directories added.

11.3 Geoserver Extensions

GeoServer Extensions can be installed as below.

Below, we are installing the MapFish Print Module via SSH.

1. Switch to user tomcat

```
1 su - tomcat
```

2. Change to the GeoServer /lib directory (adjust for your own file path)

```
1 cd /home/tomcat/apache-tomcat-8.5.15/webapps/geoserver/WEB-INF/lib
```

3. Download the desired extension, making sure to match the version to your GeoServer version

```
1 wget http://sourceforge.net/projects/geoserver/files/GeoServer/2.16.2/extensions/  
→geoserver-2.16.2-printing-plugin.zip
```

4. Unzip the downloaded file

```
1 unzip -q geoserver-2.16.2-printing-plugin.zip
```

5. Remove the zip file

```
1 rm -f geoserver-2.16.2-printing-plugin.zip
```

6. Restart Tomcat for the extension to take effect.

Note: Some components, such as GDAL, require additional configuration.

11.4 Data Directory

To make GeoServer more portable and easier to upgrade, you should change the GeoServer data directory.

Follow the instructions below, substituting your own paths and file names.

1. Stop Tomcat
2. Connect via SSH and move the data directory as below: (Important: the target directory - 'geo_data' below - should not exist.)

```
1 mv /home/tomcat/apache-tomcat-8.5.15/webapps/geoserver/data/ /var/lib/geo_data/
```

3. Add the following to your GeoServer web.xml file:

```
1 <context-param>
2   <param-name>GEOSERVER_DATA_DIR</param-name>
3   <param-value>/var/lib/geo_data</param-value>
4 </context-param>
5
6 <context-param>
7   <param-name>GEOSERVER_REQUIRE_FILE</param-name>
8   <param-value>/var/lib/geo_data/global.xml</param-value>
9 </context-param>
```

4. Start Tomcat

You should log into GeoServer and verify that your workspaces, etc.. are accesible.

Table of Contents

- *Restore*
 - *Installing PgRouting*
 - *Command Line*
 - *Extensions Tool*

12.1 Installing PgRouting

PgRouting can be enabled on your PostgreSQL database via the Extension tab or via Command Line.

Note: PostGIS must be enabled prior to installing PgRouting

12.2 Command Line

To install via command line:

1. Connect to PostgreSQL

```
1 root@geohelm:~# su - postgres
2 postgres@geohelm:~$ psql
3 psql (12.2 (Ubuntu 12.2-2.pgdg18.04+1))
4 Type "help" for help.
5
6 postgres=#
```

2. If you have not created a database, create one now.

```
1 postgres=# create database geohelm;
2 CREATE DATABASE
3 postgres=#
```

3. Connect to your database.

```
1 postgres=# \c geohelm
2 You are now connected to database "geohelm" as user "postgres".
3 geohelm=#
```

4. Install the PostGIS extension.

```
1 geohelm=# create extension postgis;
2 CREATE EXTENSION
3 geohelm=#
```

5. Install the PgRouting extension.

```
1 geohelm=# create extension pgrouting;
2 CREATE EXTENSION
3 geohelm=#
```

Note: GeoHelm also includes `fuzzy_match_string`, `tiger`, `postgis_topology`.

5. Verify the installation via command line or the PostgreSQL Management Page


```
1 geohelm=# \d
2          List of relations
3 Schema |          Name          | Type | Owner
4 -----+-----+-----+-----
5 public | geography_columns     | view | postgres
6 public | geometry_columns      | view | postgres
7 public | raster_columns        | view | postgres
8 public | raster_overviews      | view | postgres
9 public | spatial_ref_sys       | table | postgres
10 (5 rows)
```

12.3 Extensions Tool

To install using the Extension installer, click on the Extensions tab as shown below.




1. Select the target database from the drop-down as shown below.



postgresql/restore/_static/postgis-select-db.png


Note: You must FIRST install PostGIS prior to installing PgRouting.

2. Tick the PostGIS select button and then click the Save button as show below:



postgresql/restore/_static/postgis-enable.png

3. Once PostGIS has been installed on a target database, you can then return to install PgRouting:



postgresql/restore/_static/postgis-install-more.png

Note: You can also un-install Extensions using above.

Table of Contents

- *MapStore2*
 - *Installing PgRouting*
 - *Command Line*
 - *Extensions Tool*

13.1 Installing PgRouting

PgRouting can be enabled on your PostgreSQL database via the Extension tab or via Command Line.

Note: PostGIS must be enabled prior to installing PgRouting

13.2 Command Line

To install via command line:

1. Connect to PostgreSQL

```
1 root@geohelm:~# su - postgres
2 postgres@geohelm:~$ psql
3 psql (12.2 (Ubuntu 12.2-2.pgdg18.04+1))
4 Type "help" for help.
5
6 postgres=#
```

2. If you have not created a database, create one now.

```
1 postgres=# create database geohelm;
2 CREATE DATABASE
3 postgres=#
```

3. Connect to your database.

```
1 postgres=# \c geohelm
2 You are now connected to database "geohelm" as user "postgres".
3 geohelm=#
```

4. Install the PostGIS extension.

```
1 geohelm=# create extension postgis;
2 CREATE EXTENSION
3 geohelm=#
```

5. Install the PgRouting extension.

```
1 geohelm=# create extension pgrouting;
2 CREATE EXTENSION
3 geohelm=#
```

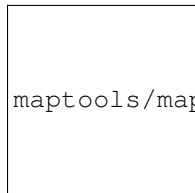
Note: GeoHelm also includes `fuzzy_match_string`, `tiger`, `postgis_topology`.

5. Verify the installation via command line or the PostgreSQL Management Page

```
1 geohelm=# \d
2          List of relations
3 Schema |          Name          | Type | Owner
4 -----+-----+-----+-----
5 public | geography_columns     | view | postgres
6 public | geometry_columns      | view | postgres
7 public | raster_columns        | view | postgres
8 public | raster_overviews      | view | postgres
9 public | spatial_ref_sys       | table | postgres
10 (5 rows)
```


13.3 Extensions Tool

To install using the Extension installer, click on the Extensions tab as shown below.



maptools/mapstore2/_static/postgis-tab.png

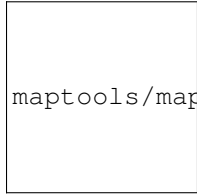
1. Select the target database from the drop-down as shown below.



maptools/mapstore2/_static/postgis-select-db.png

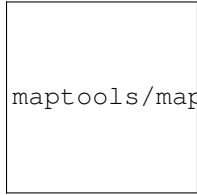
Note: You must FIRST install PostGIS prior to installing PgRouting.

2. Tick the PostGIS select button and then click the Save button as show below:



maptools/mapstore2/_static/postgis-enable.png

3. Once PostGIS has been installed on a target database, you can then return to install PgRouting:



maptools/mapstore2/_static/postgis-install-more.png

Note: You can also un-install Extensions using above.

Table of Contents

- *Lizmap*
 - *Installing PostGIS*
 - *Command Line*
 - *Extensions Tool*

14.1 Installing PostGIS

PostGIS can be enabled on your PostgreSQL database via the Extension tab or via Command Line.

14.2 Command Line

To install via command line:

1. Connect to PostgreSQL

```
1 root@geohelm:~# su - postgres
2 postgres@geohelm:~$ psql
3 psql (12.2 (Ubuntu 12.2-2.pgdg18.04+1))
4 Type "help" for help.
5
6 postgres=#
```

2. If you have not created a database, create one now.

```
1 postgres=# create database geohelm;
2 CREATE DATABASE
3 postgres=#
```

3. Connect to your database.

```
1 postgres=# \c geohelm
2 You are now connected to database "geohelm" as user "postgres".
3 geohelm=#
```

4. Install the PostGIS extension.

```
1 geohelm=# create extension postgis;
2 CREATE EXTENSION
3 geohelm=#
```

Note: GeoHelm also includes `fuzzy_match_string`, `tiger`, `postgis_topology`.

5. Verify the installation via command line or the PostgreSQL Management Page

```
1 geohelm=# \d
2          List of relations
3 Schema |          Name          | Type | Owner
4 -----+-----+-----+-----
5 public | geography_columns     | view | postgres
6 public | geometry_columns      | view | postgres
7 public | raster_columns        | view | postgres
8 public | raster_overviews      | view | postgres
9 public | spatial_ref_sys       | table | postgres
10 (5 rows)
```

14.3 Extensions Tool

To install using the PostGIS/PgRouting Extension installer, click on the Extensions tab as shown below.



maptools/lizmap/_static/postgis-tab.png

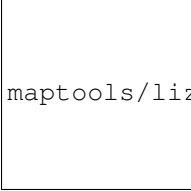
1. Select the target database from the drop-down as shown below.



maptools/lizmap/_static/postgis-select-db.png

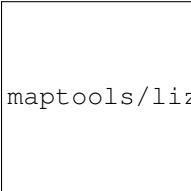
Note: You must **FIRST** install PostGIS prior to installing any other of the listed extensions.

2. Tick the PostGIS select button and then click the Save button as show below:



`maptools/lizmap/_static/postgis-enable.png`

3. Once PostGIS has been installed on a target database, you can then return to install additional extensions:



`maptools/lizmap/_static/postgis-install-more.png`

Note: You can also un-install Extensions using above.

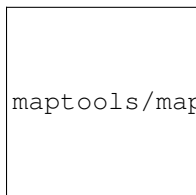
Table of Contents

- *MapBender*
 - *Overview*
 - *Location*
 - *Geoserver Extensions*
 - *Data Directory*

15.1 Overview

GeoHelm installs the latest, stable version of GeoServer.

The GeoServer tab checks that GeoServer is installed.



maptools/mapbender/_static/geoserver-tab.png

If not, it can be installed using the “Install Now” button.

This will install the latest, stable version of GeoServer.

Important: GeoServer is an optional component on the GeoHelm Java Version.

If you do not wish to install it, simply do not do so.

15.2 Location

By default, GeoServer is installed at `/home/tomcat/apache-tomcat-<version>/webapps/geoserver`

To make upgrading easier, you should always change the GeoServer Data Directory location.

To install GeoServer extensions, see our guide

As we can see above, the creation of our NewReports Directory has been added to the directory structure. This is true for all directories and sub directories added.

15.3 Geoserver Extensions

GeoServer Extensions can be installed as below.

Below, we are installing the MapFish Print Module via SSH.

1. Switch to user tomcat

```
1 su - tomcat
```

2. Change to the GeoServer /lib directory (adjust for your own file path)

```
1 cd /home/tomcat/apache-tomcat-8.5.15/webapps/geoserver/WEB-INF/lib
```

3. Download the desired extension, making sure to match the version to your GeoServer version

```
1 wget http://sourceforge.net/projects/geoserver/files/GeoServer/2.16.2/extensions/  
→geoserver-2.16.2-printing-plugin.zip
```

4. Unzip the downloaded file

```
1 unzip -q geoserver-2.16.2-printing-plugin.zip
```

5. Remove the zip file

```
1 rm -f geoserver-2.16.2-printing-plugin.zip
```

6. Restart Tomcat for the extension to take effect.

Note: Some components, such as GDAL, require additional configuration.

15.4 Data Directory

To make GeoServer more portable and easier to upgrade, you should change the GeoServer data directory.

Follow the instructions below, substituting your own paths and file names.

1. Stop Tomcat
2. Connect via SSH and move the data directory as below: (Important: the target directory - 'geo_data' below - should not exist.)

```
1 mv /home/tomcat/apache-tomcat-8.5.15/webapps/geoserver/data/ /var/lib/geo_data/
```

3. Add the following to your GeoServer web.xml file:

```
1 <context-param>
2   <param-name>GEOSERVER_DATA_DIR</param-name>
3   <param-value>/var/lib/geo_data</param-value>
4 </context-param>
5
6 <context-param>
7   <param-name>GEOSERVER_REQUIRE_FILE</param-name>
8   <param-value>/var/lib/geo_data/global.xml</param-value>
9 </context-param>
```

4. Start Tomcat

You should log into GeoServer and verify that your workspaces, etc.. are accesible.

Table of Contents

- *Other*
 - *Repository Manager*
 - *File Locations*
 - *The pg_hba.conf File*
 - *The postgresql.conf File*
 - *Version*
 - *Webmin PostgreSQL Module*

16.1 Repository Manager

The Repository installer and manager allows you to install your selected version of the PostgreSQL Repository.

It can be access via the Pg Installer tab as shown below:



maptools/other/_static/postgresql-tab.png

You can also use the manager to install and update packages as well.

As certain packages require EPEL for CentOS, the EPEL repository is installed as well when installing on CentOS.



maptools/other/_static/PostgreSQL-Repo-Manager.png

16.2 File Locations

On CentOS, the PostgreSQL config directory is located at:

```
/var/lib/pgsql/12/data
```

On Ubuntu, the PostgreSQL directory is located at:

```
/etc/postgresql/12/main
```

16.3 The pg_hba.conf File

On installation via the Wizard, PostgreSQL is configured for use with SSL and uses md5 authentication for all users and databases.

```
1  local  all  all                                     trust
2  host   all  all  127.0.0.1          255.255.255.255 md5
3  host   all  all  0.0.0.0/0         md5
4  host   all  all  ::1/128           md5
5  hostssl all  all  127.0.0.1          255.255.255.255 md5
6  hostssl all  all  0.0.0.0/0         md5
7  hostssl all  all  ::1/128           md5
```

16.4 The postgresql.conf File

On installation via the Wizard, PostgreSQL is configured to accept connections on all interfaces as well as SSL connections.

```
1  #-----
2  # CONNECTIONS AND AUTHENTICATION
3  #-----
4
5  # - Connection Settings -
6
7  listen_addresses = '*'
8  )
9
10
11 # - SSL -
12
13 ssl = on
```

Above are excerpts.

16.5 Version

GeoHelm has been tested with PostgreSQL 10, 11 and 12.

16.6 Webmin PostgreSQL Module

On installation, the native PostgreSQL Database Server module is also activated.

It is located under Servers > PostgreSQL Database Server



maptools/other/_static/webmin-postgresql.png

Table of Contents

- *Intro*
 - *Edit Config*
 - *Apps*
 - *Java*
 - *MapJS*

17.1 Edit Config



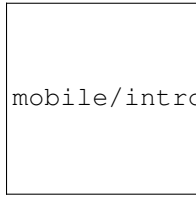
mobile/intro/_static/config-tab.png

The Config tab is used to edit the following files:

```
server.xml  
web.xml  
context.xml  
tomcat-users.xml  
setenv.sh
```

These files can, of course, be edited via the file system or VI as well.

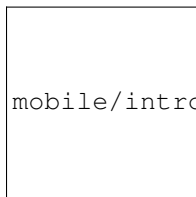
17.2 Apps



mobile/intro/_static/apps-tab.png

The Apps manager allows you to deploy, undeploy, and redeploy WAR files in Apache Tomcat

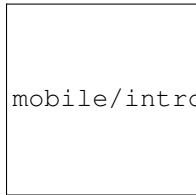
17.3 Java



mobile/intro/_static/java-tab.png

The Java tab is used during installation as well as for updating of JDK.

It can also be used to un-install the selected JDK and replace it with a new version.



mobile/intro/_static/java-installed.png

Note: When installing or removing, there is an option to set as System default.

17.4 MapJS

The MapJS tab is simply a file browser for viewing and editing both OpenLayers and LeafletJS files.

Table of Contents

- *Data Sources*
 - *Installing PgRouting*
 - *Command Line*
 - *Extensions Tool*

18.1 Installing PgRouting

PgRouting can be enabled on your PostgreSQL database via the Extension tab or via Command Line.

Note: PostGIS must be enabled prior to installing PgRouting

18.2 Command Line

To install via command line:

1. Connect to PostgreSQL

```
1 root@geohelm:~# su - postgres
2 postgres@geohelm:~$ psql
3 psql (12.2 (Ubuntu 12.2-2.pgdg18.04+1))
4 Type "help" for help.
5
6 postgres=#
```

2. If you have not created a database, create one now.

```
1 postgres=# create database geohelm;
2 CREATE DATABASE
3 postgres=#
```

3. Connect to your database.

```
1 postgres=# \c geohelm
2 You are now connected to database "geohelm" as user "postgres".
3 geohelm=#
```

4. Install the PostGIS extension.

```
1 geohelm=# create extension postgis;
2 CREATE EXTENSION
3 geohelm=#
```

5. Install the PgRouting extension.

```
1 geohelm=# create extension pgrouting;
2 CREATE EXTENSION
3 geohelm=#
```

Note: GeoHelm also includes `fuzzy_match_string`, `tiger`, `postgis_topology`.

5. Verify the installation via command line or the PostgreSQL Management Page

```
1 geohelm=# \d
2          List of relations
3 Schema |          Name          | Type | Owner
4 -----+-----+-----+-----
5 public | geography_columns     | view | postgres
6 public | geometry_columns      | view | postgres
7 public | raster_columns        | view | postgres
8 public | raster_overviews      | view | postgres
9 public | spatial_ref_sys       | table | postgres
10 (5 rows)
```


18.3 Extensions Tool

To install using the Extension installer, click on the Extensions tab as shown below.



mobile/datasources/_static/postgis-tab.png


1. Select the target database from the drop-down as shown below.



mobile/datasources/_static/postgis-select-db.png


Note: You must FIRST install PostGIS prior to installing PgRouting.

2. Tick the PostGIS select button and then click the Save button as show below:



mobile/datasources/_static/postgis-enable.png

3. Once PostGIS has been installed on a target database, you can then return to install PgRouting:



mobile/datasources/_static/postgis-install-more.png

Note: You can also un-install Extensions using above.

Table of Contents

- *Forms*
 - *Installing PostGIS*
 - *Command Line*
 - *Extensions Tool*

19.1 Installing PostGIS

PostGIS can be enabled on your PostgreSQL database via the Extension tab or via Command Line.

19.2 Command Line

To install via command line:

1. Connect to PostgreSQL

```
1 root@geohelm:~# su - postgres
2 postgres@geohelm:~$ psql
3 psql (12.2 (Ubuntu 12.2-2.pgdg18.04+1))
4 Type "help" for help.
5
6 postgres=#
```

2. If you have not created a database, create one now.

```
1 postgres=# create database geohelm;
2 CREATE DATABASE
3 postgres=#
```

3. Connect to your database.

```
1 postgres=# \c geohelm
2 You are now connected to database "geohelm" as user "postgres".
3 geohelm=#
```

4. Install the PostGIS extension.

```
1 geohelm=# create extension postgis;
2 CREATE EXTENSION
3 geohelm=#
```

Note: GeoHelm also includes `fuzzy_match_string`, `tiger`, `postgis_topology`.

5. Verify the installation via command line or the PostgreSQL Management Page

```
1 geohelm=# \d
2          List of relations
3 Schema |          Name          | Type | Owner
4 -----+-----+-----+-----
5 public | geography_columns     | view | postgres
6 public | geometry_columns      | view | postgres
7 public | raster_columns        | view | postgres
8 public | raster_overviews      | view | postgres
9 public | spatial_ref_sys       | table | postgres
10 (5 rows)
```

19.3 Extensions Tool

To install using the PostGIS/PgRouting Extension installer, click on the Extensions tab as shown below.



mobile/forms/_static/postgis-tab.png

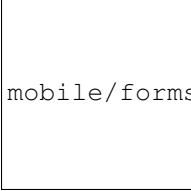
1. Select the target database from the drop-down as shown below.



mobile/forms/_static/postgis-select-db.png

Note: You must **FIRST** install PostGIS prior to installing any other of the listed extensions.

2. Tick the PostGIS select button and then click the Save button as show below:



mobile/forms/_static/postgis-enable.png

3. Once PostGIS has been installed on a target database, you can then return to install additional extensions:



mobile/forms/_static/postgis-install-more.png

Note: You can also un-install Extensions using above.

Table of Contents

- *Mobile Users*
 - *Repository Manager*
 - *File Locations*
 - *The pg_hba.conf File*
 - *The postgresql.conf File*
 - *Version*
 - *Webmin PostgreSQL Module*

20.1 Repository Manager

The Repository installer and manager allows you to install your selected version of the PostgreSQL Repository.

It can be access via the Pg Installer tab as shown below:



mobile/users/_static/postgresql-tab.png

You can also use the manager to install and update packages as well.

As certain packages require EPEL for CentOS, the EPEL repository is installed as well when installing on CentOS.



mobile/users/_static/PostgreSQL-Repo-Manager.png

20.2 File Locations

On CentOS, the PostgreSQL config directory is located at:

```
/var/lib/pgsql/12/data
```

On Ubuntu, the PostgreSQL directory is located at:

```
/etc/postgresql/12/main
```

20.3 The pg_hba.conf File

On installation via the Wizard, PostgreSQL is configured for use with SSL and uses md5 authentication for all users and databases.

```
1 local all all trust
2 host all all 127.0.0.1 255.255.255.255 md5
3 host all all 0.0.0.0/0 md5
4 host all all ::1/128 md5
5 hostssl all all 127.0.0.1 255.255.255.255 md5
6 hostssl all all 0.0.0.0/0 md5
7 hostssl all all ::1/128 md5
```

20.4 The postgresql.conf File

On installation via the Wizard, PostgreSQL is configured to accept connections on all interfaces as well as SSL connections.

```
1 #-----
2 # CONNECTIONS AND AUTHENTICATION
3 #-----
4
5 # - Connection Settings -
6
7 listen_addresses = '*'
8 )
9
10
11 # - SSL -
12
13 ssl = on
```

Above are excerpts.

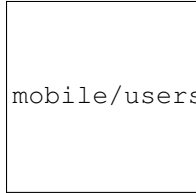
20.5 Version

GeoHelm has been tested with PostgreSQL 10, 11 and 12.

20.6 Webmin PostgreSQL Module

On installation, the native PostgreSQL Database Server module is also activated.

It is located under Servers > PostgreSQL Database Server



mobile/users/_static/webmin-postgresql.png

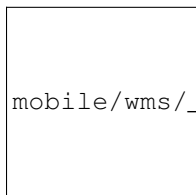
Table of Contents

- *WMS*
 - *Overview*
 - *Location*
 - *Geoserver Extensions*
 - *Data Directory*

21.1 Overview

GeoHelm installs the latest, stable version of GeoServer.

The GeoServer tab checks that GeoServer is installed.



`mobile/wms/_static/geoserver-tab.png`

If not, it can be installed using the “Install Now” button.

This will install the latest, stable version of GeoServer.

Important: GeoServer is an optional component on the GeoHelm Java Version.

If you do not wish to install it, simply do not do so.

21.2 Location

By default, GeoServer is installed at `/home/tomcat/apache-tomcat-<version>/webapps/geoserver`

To make upgrading easier, you should always change the GeoServer Data Directory location.

To install GeoServer extensions, see our guide

As we can see above, the creation of our NewReports Directory has been added to the directory structure. This is true for all directories and sub directories added.

21.3 Geoserver Extensions

GeoServer Extensions can be installed as below.

Below, we are installing the MapFish Print Module via SSH.

1. Switch to user tomcat

```
1 su - tomcat
```

2. Change to the GeoServer /lib directory (adjust for your own file path)

```
1 cd /home/tomcat/apache-tomcat-8.5.15/webapps/geoserver/WEB-INF/lib
```

3. Download the desired extension, making sure to match the version to your GeoServer version

```
1 wget http://sourceforge.net/projects/geoserver/files/GeoServer/2.16.2/extensions/  
→geoserver-2.16.2-printing-plugin.zip
```

4. Unzip the downloaded file

```
1 unzip -q geoserver-2.16.2-printing-plugin.zip
```

5. Remove the zip file

```
1 rm -f geoserver-2.16.2-printing-plugin.zip
```

6. Restart Tomcat for the extension to take effect.

Note: Some components, such as GDAL, require additional configuration.

21.4 Data Directory

To make GeoServer more portable and easier to upgrade, you should change the GeoServer data directory.

Follow the instructions below, substituting your own paths and file names.

1. Stop Tomcat
2. Connect via SSH and move the data directory as below: (Important: the target directory - 'geo_data' below - should not exist.)


```
1 mv /home/tomcat/apache-tomcat-8.5.15/webapps/geoserver/data/ /var/lib/geo_data/
```

3. Add the following to your GeoServer web.xml file:

```
1 <context-param>
2   <param-name>GEOSERVER_DATA_DIR</param-name>
3   <param-value>/var/lib/geo_data</param-value>
4 </context-param>
5
6 <context-param>
7   <param-name>GEOSERVER_REQUIRE_FILE</param-name>
8   <param-value>/var/lib/geo_data/global.xml</param-value>
9 </context-param>
```

4. Start Tomcat

You should log into GeoServer and verify that your workspaces, etc.. are accesible.

Table of Contents

- *Mobile Apps*
 - *Overview*
 - *Location*
 - *Geoserver Extensions*
 - *Data Directory*

22.1 Overview

GeoHelm installs the latest, stable version of GeoServer.

The GeoServer tab checks that GeoServer is installed.



mobile/mobileapps/_static/geoserver-tab.png

If not, it can be installed using the “Install Now” button.

This will install the latest, stable version of GeoServer.

Important: GeoServer is an optional component on the GeoHelm Java Version.

If you do not wish to install it, simply do not do so.

22.2 Location

By default, GeoServer is installed at `/home/tomcat/apache-tomcat-<version>/webapps/geoserver`

To make upgrading easier, you should always change the GeoServer Data Directory location.

To install GeoServer extensions, see our guide

As we can see above, the creation of our NewReports Directory has been added to the directory structure. This is true for all directories and sub directories added.

22.3 Geoserver Extensions

GeoServer Extensions can be installed as below.

Below, we are installing the MapFish Print Module via SSH.

1. Switch to user tomcat

```
1 su - tomcat
```

2. Change to the GeoServer `/lib` directory (adjust for your own file path)

```
1 cd /home/tomcat/apache-tomcat-8.5.15/webapps/geoserver/WEB-INF/lib
```

3. Download the desired extension, making sure to match the version to your GeoServer version

```
1 wget http://sourceforge.net/projects/geoserver/files/GeoServer/2.16.2/extensions/  
→geoserver-2.16.2-printing-plugin.zip
```

4. Unzip the downloaded file

```
1 unzip -q geoserver-2.16.2-printing-plugin.zip
```

5. Remove the zip file

```
1 rm -f geoserver-2.16.2-printing-plugin.zip
```

6. Restart Tomcat for the extension to take effect.

Note: Some components, such as GDAL, require additional configuration.

22.4 Data Directory

To make GeoServer more portable and easier to upgrade, you should change the GeoServer data directory.

Follow the instructions below, substituting your own paths and file names.

1. Stop Tomcat
2. Connect via SSH and move the data directory as below: (Important: the target directory - 'geo_data' below - should not exist.)

```
1 mv /home/tomcat/apache-tomcat-8.5.15/webapps/geoserver/data/ /var/lib/geo_data/
```

3. Add the following to your GeoServer web.xml file:

```
1 <context-param>
2   <param-name>GEOSERVER_DATA_DIR</param-name>
3   <param-value>/var/lib/geo_data</param-value>
4 </context-param>
5
6 <context-param>
7   <param-name>GEOSERVER_REQUIRE_FILE</param-name>
8   <param-value>/var/lib/geo_data/global.xml</param-value>
9 </context-param>
```

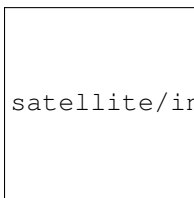
4. Start Tomcat

You should log into GeoServer and verify that your workspaces, etc.. are accesible.

Table of Contents

- *Intro*
 - *Edit Config*
 - *Apps*
 - *Java*
 - *MapJS*

23.1 Edit Config



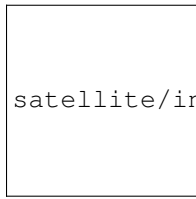
satellite/intro/_static/config-tab.png

The Config tab is used to edit the following files:

```
server.xml
web.xml
context.xml
tomcat-users.xml
setenv.sh
```

These files can, of course, be edited via the file system or VI as well.

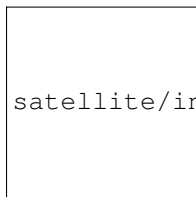
23.2 Apps



satellite/intro/_static/apps-tab.png

The Apps manager allows you to deploy, undeploy, and redeploy WAR files in Apache Tomcat

23.3 Java



satellite/intro/_static/java-tab.png

The Java tab is used during installation as well as for updating of JDK.

It can also be used to un-install the selected JDK and replace it with a new version.



satellite/intro/_static/java-installed.png

Note: When installing or removing, there is an option to set as System default.

23.4 MapJS

The MapJS tab is simply a file browser for viewing and editing both OpenLayers and LeafletJS files.

Table of Contents

- *Projects*
 - *Overview*
 - *Location*
 - *Geoserver Extensions*
 - *Data Directory*

24.1 Overview

GeoHelm installs the latest, stable version of GeoServer.

The GeoServer tab checks that GeoServer is installed.



satellite/projects/_static/geoserver-tab.png

If not, it can be installed using the “Install Now” button.

This will install the latest, stable version of GeoServer.

Important: GeoServer is an optional component on the GeoHelm Java Version.

If you do not wish to install it, simply do not do so.

24.2 Location

By default, GeoServer is installed at `/home/tomcat/apache-tomcat-<version>/webapps/geoserver`

To make upgrading easier, you should always change the GeoServer Data Directory location.

To install GeoServer extensions, see our guide

As we can see above, the creation of our NewReports Directory has been added to the directory structure. This is true for all directories and sub directories added.

24.3 Geoserver Extensions

GeoServer Extensions can be installed as below.

Below, we are installing the MapFish Print Module via SSH.

1. Switch to user tomcat

```
1 su - tomcat
```

2. Change to the GeoServer `/lib` directory (adjust for your own file path)

```
1 cd /home/tomcat/apache-tomcat-8.5.15/webapps/geoserver/WEB-INF/lib
```

3. Download the desired extension, making sure to match the version to your GeoServer version

```
1 wget http://sourceforge.net/projects/geoserver/files/GeoServer/2.16.2/extensions/  
→geoserver-2.16.2-printing-plugin.zip
```

4. Unzip the downloaded file

```
1 unzip -q geoserver-2.16.2-printing-plugin.zip
```

5. Remove the zip file

```
1 rm -f geoserver-2.16.2-printing-plugin.zip
```

6. Restart Tomcat for the extension to take effect.

Note: Some components, such as GDAL, require additional configuration.

24.4 Data Directory

To make GeoServer more portable and easier to upgrade, you should change the GeoServer data directory.

Follow the instructions below, substituting your own paths and file names.

1. Stop Tomcat
2. Connect via SSH and move the data directory as below: (Important: the target directory - `'geo_data'` below - should not exist.)

```
1 mv /home/tomcat/apache-tomcat-8.5.15/webapps/geoserver/data/ /var/lib/geo_data/
```

3. Add the following to your GeoServer web.xml file:

```
1 <context-param>
2   <param-name>GEOSERVER_DATA_DIR</param-name>
3   <param-value>/var/lib/geo_data</param-value>
4 </context-param>
5
6 <context-param>
7   <param-name>GEOSERVER_REQUIRE_FILE</param-name>
8   <param-value>/var/lib/geo_data/global.xml</param-value>
9 </context-param>
```

4. Start Tomcat

You should log into GeoServer and verify that your workspaces, etc.. are accesible.

Table of Contents

- *Sentinel Hub*
 - *Installing PgRouting*
 - *Command Line*
 - *Extensions Tool*

25.1 Installing PgRouting

PgRouting can be enabled on your PostgreSQL database via the Extension tab or via Command Line.

Note: PostGIS must be enabled prior to installing PgRouting

25.2 Command Line

To install via command line:

1. Connect to PostgreSQL

```
1 root@geohelm:~# su - postgres
2 postgres@geohelm:~$ psql
3 psql (12.2 (Ubuntu 12.2-2.pgdg18.04+1))
4 Type "help" for help.
5
6 postgres=#
```

2. If you have not created a database, create one now.

```
1 postgres=# create database geohelm;
2 CREATE DATABASE
3 postgres=#
```

3. Connect to your database.

```
1 postgres=# \c geohelm
2 You are now connected to database "geohelm" as user "postgres".
3 geohelm=#
```

4. Install the PostGIS extension.

```
1 geohelm=# create extension postgis;
2 CREATE EXTENSION
3 geohelm=#
```

5. Install the PgRouting extension.

```
1 geohelm=# create extension pgrouting;
2 CREATE EXTENSION
3 geohelm=#
```

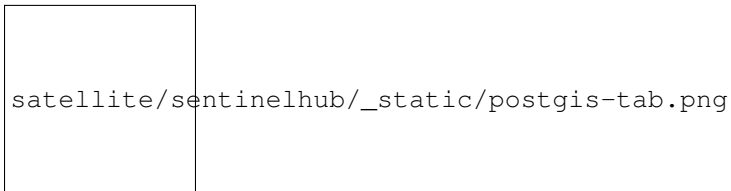
Note: GeoHelm also includes `fuzzy_match_string`, `tiger`, `postgis_topology`.

5. Verify the installation via command line or the PostgreSQL Management Page

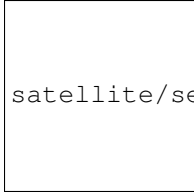
```
1 geohelm=# \d
2          List of relations
3 Schema |          Name          | Type | Owner
4 -----+-----+-----+-----
5 public | geography_columns     | view | postgres
6 public | geometry_columns      | view | postgres
7 public | raster_columns        | view | postgres
8 public | raster_overviews      | view | postgres
9 public | spatial_ref_sys       | table | postgres
10 (5 rows)
```

25.3 Extensions Tool

To install using the Extension installer, click on the Extensions tab as shown below.




1. Select the target database from the drop-down as shown below.



satellite/sentinelhub/_static/postgis-select-db.png


Note: You must FIRST install PostGIS prior to installing PgRouting.

2. Tick the PostGIS select button and then click the Save button as show below:



satellite/sentinelhub/_static/postgis-enable.png

3. Once PostGIS has been installed on a target database, you can then return to install PgRouting:



satellite/sentinelhub/_static/postgis-install-more.png

Note: You can also un-install Extensions using above.

Table of Contents

- *Maps*
 - *Installing PostGIS*
 - *Command Line*
 - *Extensions Tool*

26.1 Installing PostGIS

PostGIS can be enabled on your PostgreSQL database via the Extension tab or via Command Line.

26.2 Command Line

To install via command line:

1. Connect to PostgreSQL

```
1 root@geohelm:~# su - postgres
2 postgres@geohelm:~$ psql
3 psql (12.2 (Ubuntu 12.2-2.pgdg18.04+1))
4 Type "help" for help.
5
6 postgres=#
```

2. If you have not created a database, create one now.

```
1 postgres=# create database geohelm;
2 CREATE DATABASE
3 postgres=#
```

3. Connect to your database.

```
1 postgres=# \c geohelm
2 You are now connected to database "geohelm" as user "postgres".
3 geohelm=#
```

4. Install the PostGIS extension.

```
1 geohelm=# create extension postgis;
2 CREATE EXTENSION
3 geohelm=#
```

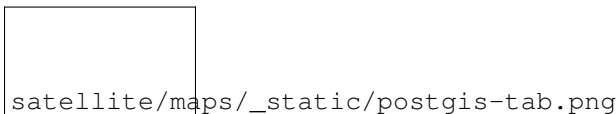
Note: GeoHelm also includes `fuzzy_match_string`, `tiger`, `postgis_topology`.

5. Verify the installation via command line or the PostgreSQL Management Page

```
1 geohelm=# \d
2          List of relations
3 Schema |          Name          | Type | Owner
4 -----+-----+-----+-----
5 public | geography_columns     | view | postgres
6 public | geometry_columns      | view | postgres
7 public | raster_columns        | view | postgres
8 public | raster_overviews      | view | postgres
9 public | spatial_ref_sys       | table | postgres
10 (5 rows)
```

26.3 Extensions Tool

To install using the PostGIS/PgRouting Extension installer, click on the Extensions tab as shown below.



satellite/maps/_static/postgis-tab.png

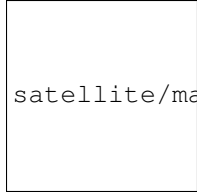
1. Select the target database from the drop-down as shown below.



satellite/maps/_static/postgis-select-db.png

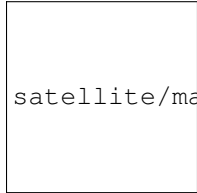
Note: You must **FIRST** install PostGIS prior to installing any other of the listed extensions.

2. Tick the PostGIS select button and then click the Save button as show below:



satellite/maps/_static/postgis-enable.png

3. Once PostGIS has been installed on a target database, you can then return to install additional extensions:



satellite/maps/_static/postgis-install-more.png

Note: You can also un-install Extensions using above.

Table of Contents

- *Home Page*
 - *Web App*
 - *Troubleshooting*

27.1 Web App

A simple Bootstrap web application is installed to `/var/www/html` during the set up Wizard.

The web application contains links to the Login page, GeoServer, OpenLayers Demo, LeafletJS Demo, and Docs.

AcuGIS GeoHelm [Home](#) [Docs](#) [LOGIN](#)

Get Started
Your GeoHelm instance is now ready for use.
You can remove this application at any time.

GeoServer
Your GeoServer instance can now be accessed.

OpenLayers Demo
We have created an OpenLayers demo for you.
This example uses your GeoServer instance.

Leaflet Demo
We have created a Leaflet demo for you.
This example uses your GeoServer instance.

Suite Login
You can access your AcuGIS Suite control panel here or via the Login button at top.

Docs [>](#)
GeoHelm documentation and tutorials.

27.2 Troubleshooting

If links on the home page do not function properly, check the index.html page to verify that links are pointing to your IP or hostname.

Table of Contents

- *OpenLayers*
 - *Demo App*
 - *Structure and Code*
 - *Version*
 - *Troubleshooting*

28.1 Demo App

A simple OpenLayers demo app using OpenLayers and GeoServer is available via the Home Page.

Click the OpenLayers link on the home page or navigate to:

<https://yourdomain.com/OpenLayersDemo.html>

28.2 Structure and Code

```
1 <html>
2 <head>
3 <title>OpenLayer Demo</title>
4
5 <link rel="stylesheet" href="OpenLayers/ol.css" type="text/css">
6
7 <script src="OpenLayers/ol.js"></script>
```

(continues on next page)

```
8     </head>
9     <body>
10    <div id="map" class="map"></div>
11    <script>
12    var layers = [
13    new ol.layer.Tile({
14      source: new ol.source.OSM()
15    }),
16    new ol.layer.Image({
17      extent: [-13884991, 2870341, -7455066, 6338219],
18      source: new ol.source.ImageWMS({
19
20        //Replace 'localhost' below with your server IP or hostname
21
22        url: 'http://localhost/geoserver/wms',
23        params: {'LAYERS': 'topp:states'},
24        ratio: 1,
25        serverType: 'geoserver'
26      })
27    })
28    ];
29    var map = new ol.Map({
30      layers: layers,
31      target: 'map',
32      view: new ol.View({
33        center: [-10997148, 4569099],
34        zoom: 4
35      })
36    });
37    </script>
38    </body>
39    </html>
```

28.3 Version

By default, the latest version of OpenLayers is installed by the Wizard

28.4 Troubleshooting

If the included OpenLayers demo does not render, or renders only the base map, check the following:

1. Be sure you have the correct IP or hostname in the `/var/www/html/OpenLayersDemo.html` page
2. Be sure you have started GeoServer
3. If both of above are eliminated, restart Apache HTTP Server

Table of Contents

- *LeafletJS*
 - *Demo App*
 - *Structure and Code*
 - *Version*
 - *Troubleshooting*

29.1 Demo App

A simple LeafletJS demo app using OpenLayers and GeoServer is available via the Home Page.

Click the LeafletJS link on the home page or navigate to:

<https://yourdomain.com/LeafletDemo.html>

29.2 Structure and Code

```
1 <html lang="en">
2 <head>
3 <meta charset="utf-8">
4 <meta http-equiv="X-UA-Compatible" content="IE=edge">
5 <meta name="viewport" content="initial-scale=1,user-scalable=no,maximum-scale=1,
↳width=device-width">
6 <title>Example Leaflet</title>
```

(continues on next page)

(continued from previous page)

```

7     <link rel="stylesheet" href="https://unpkg.com/leaflet@1.1.0/dist/leaflet.css"
8     integrity="sha512-
↳wcw6ts8Anuw10Mzh9Ytw4pylW8+NAD4ch3lqm9lzasTxg0GFeJgoAtxuCLREZSC5lUXdVyo/
↳7yfsqFjQ4S+aKw=="
9     crossorigin=""/>
10
11    <script src="https://unpkg.com/leaflet@1.1.0/dist/leaflet.js"
12    integrity="sha512-
↳mNqn2Wg7tSToJhvHcqfzLMU6J4mkOImSPTxVZAdo+lCPlk+GhZmYgACEe0x35K7YzW1zJ7XyJV/
↳TT1MrdXvMcA=="
13    crossorigin=""></script>
14    </head>
15    <style>
16    body {
17    padding: 0;
18    margin: 0;
19    }
20    html, body, #map {
21    height: 100%;
22    }
23    </style>
24    <body>
25    <div id="map"></div>
26    <script>
27    var map = L.map('map').setView([0, 0], 2);
28    var osmUrl='http://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png';
29    var osmAttrib='Data © <a href="http://openstreetmap.org">OpenStreetMap</a>
↳contributors';
30    var osm = new L.TileLayer(osmUrl, {minZoom: 2, maxZoom: 8, attribution:
↳osmAttrib});
31    map.addLayer(osm);
32    //change localhost below to your IP or hostname
33    var wmsLayer= L.tileLayer.wms("http://localhost/geoserver/wms", {
34    layers: 'topp:states',
35    format: 'image/png',
36    transparent: true
37    });
38    map.addLayer(wmsLayer);
39    </script>
40    </html>

```

29.3 Version

By default, the latest version of LeafletJS is installed by the Wizard

29.4 Troubleshooting

If the included LeafletJS demo does not render, or renders only the base map, check the following:

1. Be sure you have the correct IP or hostname in the `/var/www/html/Leaflet.html` page
2. Be sure you have started GeoServer
3. If both of above are eliminated, restart Apache HTTP Server

The screenshots in the documentation use a Material Design CSS Extension we created.

This can be added directly to Webmin > Configuration > Webmin Themes

In addition to making the screens a bit more vivid, it also increases the size of objects on the page as well as padding, making it easier to work with

```

1  .row.icons-row .icons-container {
2  border-radius: 25px!important;
3  -webkit-filter: none!important;
4  filter: none!important;
5  }
6
7  html[data-theme="brown"] #sidebar {
8  background:
9  darkslategray!important;}
10
11 .panel-default>.panel-heading {
12 color: #fff;
13 background-color: rgb(0, 188, 212)!important;text-align:left !important;
14
15 }
16
17 .panel-default>.panel-heading, .panel-default {
18 border-top-left-radius: 5px !important;
19 border-top-right-radius: 5px !important;
20 }
21 .panel-default , .panel{
22 border-bottom-left-radius: 5px !important;border-top:0 !important;border-top-
↪width: 0px;
23 border-bottom-right-radius: 5px !important;
24 box-shadow: 0 2px 2px 0 rgba(0,0,0,.14), 0 3px 1px -2px rgba(0,0,0,.12), 0 1px_
↪5px 0 rgba(0,0,0,.2);
25 }
26

```

(continues on next page)

```

27     .row.icons-row .icons-container:not(.highlighted) {
28     border-radius: 5px !important;
29     background: rgb(255, 255, 255) !important;
30     box-shadow: 0 2px 2px 0 rgba(0,0,0,.14), 0 3px 1px -2px rgba(0,0,0,.12), 0 1px_
↪5px 0 rgba(0,0,0,.2);
31     }
32
33     h2.form-signin-heading {
34     display: none !important;
35     }
36
37     i.wbm-webmin {
38     display: none !important;
39     }
40
41     .card {
42     font-size: .875rem;
43     font-weight: 400
44     }
45
46     .btn:not(.btn-round), button.btn:not(.btn-round), .csf-container input[type=
↪'submit']:not(.btn-round), .csf-container button.input:not(.btn-round), input[type=
↪'submit']:not(.btn-round) {
47     text-align: center;
48     vertical-align: middle;
49     font-size: 1rem;
50     line-height: 1.5;
51     border-radius: 0.325em !important;
52     transition: color .15s ease-in-out,background-color .15s ease-in-out,border-
↪color .15s ease-in-out,box-shadow .15s ease-in-out;
53     text-transform: uppercase;
54     cursor: pointer;
55     border: 0;
56     outline: 0;
57     transition: box-shadow .2s cubic-bezier(.4,0,1,1),background-color .2s cubic-
↪bezier(.4,0,.2,1),color .2s cubic-bezier(.4,0,.2,1) !important;
58     will-change: box-shadow,transform;
59     color: rgba(0,0,0,.87);
60     background-color: rgb(255, 255, 255);
61     border-color: rgb(204, 204, 204) !important;
62     box-shadow: 0 2px 2px 0 rgba(0,0,0,.14), 0 3px 1px -2px rgba(0,0,0,.2), 0 1px_
↪5px 0 rgba(0,0,0,.12) !important;
63     margin-left: 0 !important;
64     margin-right: 0 !important
65     }
66
67     html[data-script-name*='settings-editor_read.cgi'] #content .CodeMirror+.ui_form_
↪end_buttons .btn {
68     margin-left: 0 !important;
69     margin-right: 0 !important
70     }
71
72     html[data-script-name*='settings-editor_read.cgi'] #content .CodeMirror+.ui_form_
↪end_buttons td:last-child .btn {
73     margin-left: 0 !important;
74     margin-right: 5px !important
75     }

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76
77   .btn-group .btn, .btn {
78     box-shadow: 0 2px 2px 0 rgba(0,0,0,.14), 0 3px 1px -2px rgba(0,0,0,.2), 0 1px_
↪5px 0 rgba(0,0,0,.12);
79   }
80
81   .btn-group>.btn:first-child:not(:last-child):not(.dropdown-toggle) {
82     border-top-right-radius: 0 !important;
83     border-bottom-right-radius: 0 !important;
84   }
85
86   .btn-group>.btn:last-child:not(:first-child):not(.dropdown-toggle) {
87     border-top-left-radius: 0 !important;
88     border-bottom-left-radius: 0 !important;
89   }
90
91   body .btn.btn-primary {
92     color: rgb(255, 255, 255) !important;
93     background-color: rgb(63, 81, 181) !important;
94     border-color: rgb(63, 81, 181) !important;
95   }
96   body .btn.btn-default {
97     color: rgba(0, 0, 0, 0.87);
98     background-color: rgba(153, 153, 153, 0.2);
99     border-color: rgba(153, 153, 153, 0.2);
100  }
101  body .btn.btn-success {
102    color: rgb(255, 255, 255) !important;
103    background-color: rgb(76, 175, 80) !important;
104    border-color: rgb(76, 175, 80) !important;
105  }
106
107  .btn.btn-secondary {
108    color: rgb(255, 255, 255) !important;
109    background-color: rgb(108, 117, 125) !important;
110    border-color: rgb(108, 117, 125) !important;
111  }
112
113  .btn.btn-info, .btn.btn-inverse, .btn.ui_link.btn-inverse, .btn-tiny, .ui_link.
↪btn.btn-inverse.btn-tiny.ui_link_replaced, .btn-inverse {
114    color: rgb(255, 255, 255) !important;
115    background-color: rgb(3, 169, 244) !important;
116    border-color: rgb(3, 169, 244) !important;
117  }
118
119  .btn.btn-info:hover, .btn.btn-inverse:hover, .btn.ui_link.btn-inverse:hover, .btn-
↪tiny:hover, .ui_link.btn.btn-inverse.btn-tiny.ui_link_replaced:hover, .btn-
↪inverse:hover,
120
121  .btn.btn-inverse:hover, .btn.ui_link.btn-inverse:hover, .btn-tiny:hover, .ui_
↪link.btn.btn-inverse.btn-tiny.ui_link_replaced:hover, .btn-inverse:hover{
122    border-color: rgb(255, 255, 255) !important;background-color: rgb(3, 169, 244) !
↪important;
123  }
124
125  .btn:hover {
126    cursor: pointer !important;

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127     }
128     .btn.btn-warning {
129     color: rgb(255, 255, 255) !important;
130     background-color: rgb(255, 87, 34) !important;
131     border-color: rgb(255, 87, 34) !important;
132     }
133
134     .btn.btn-danger {
135     color: rgb(255, 255, 255) !important;
136     background-color: rgb(244, 67, 54) !important;
137     border-color: rgb(244, 67, 54) !important;
138     }
139
140     .alert-success {
141     color: rgb(40, 91, 42);
142     background-color: rgb(219, 239, 220);
143     border-color: rgb(205, 233, 206);
144     }.alert-danger {
145     color: rgb(127, 35, 28);
146     background-color: rgb(253, 217, 215);
147     border-color: rgb(252, 202, 199);
148     }.alert-primary {
149     color: rgb(33, 42, 94);
150     background-color: rgb(217, 220, 240);
151     border-color: rgb(201, 206, 234);
152     }.alert-secondary {
153     color: rgb(56, 61, 65);
154     background-color: rgb(226, 227, 229);
155     border-color: rgb(214, 216, 219);
156     }.alert-warning {
157     color: rgb(133, 45, 18);
158     background-color: rgb(255, 221, 211);
159     border-color: rgb(255, 208, 193);
160     }.alert-info {
161     color: rgb(2, 88, 127);
162     background-color: rgb(205, 238, 253);
163     border-color: rgb(184, 231, 252);
164     }.alert-light {
165     color: rgb(127, 127, 127);
166     background-color: rgb(253, 253, 253);
167     border-color: rgb(252, 252, 252);
168     }.alert-dark {
169     color: rgb(34, 34, 34);
170     background-color: rgb(217, 217, 217);
171     border-color: rgb(202, 202, 202);
172     }
173     #right-side-tabs .btn-tiny.ui_submit.ui_form_end_submit, #content #system-status_
↪ .btn-tiny.ui_submit.ui_form_end_submit {
174     line-height: 21px;
175     padding: 5px 12px !important;    height: 32px !important;
176     }
177     .table-subtable tbody tr td, .panel-body .table-subtable tr th, .panel-body .
↪ table-subtable tr td, .table-subtable tbody tr td, .panel-body tr th, .panel-body_
↪ tr td {
178     padding: .75rem !important;
179     }
180

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181     body.csf .dataTables_filter input[type='search'], body .dataTables_filter_
↪input[type='search'], .csf-container input[type='text'], .csf-container input[type=
↪'search'], .csf-container input, .csf-container select, input[id^='CSF'],_
↪input[type='button'], input[type='reset'], input[name]:not([type='image
↪']):not([type='checkbox']):not([type='radio']):not(.btn):not(.session_login),_
↪input[name]:not([type='image']):not(.sidebar-search):not([type='button']):not([type=
↪'checkbox']):not([type='radio']):not(.btn), .csf-container input[type='text'], .csf-
↪container input[type='search'], .chooser_button, .form-control {
182         font-size: 1rem;
183         box-sizing: content-box;
184         width: 100%;
185         height: 3rem;
186         margin: 0;
187         padding: 0;
188         -webkit-transition: box-shadow .3s,border .3s;
189         transition: box-shadow .3s,border .3s;
190         border: none;
191         border-bottom: 1px solid rgb(158, 158, 158);
192         border-radius: 0;
193         outline: 0;
194         background-color: rgba(0, 0, 0, 0);
195         box-shadow: none;font-size:16px;padding-left:5px;padding-right:5px;
196     }
197
198     input[name]:not([type='image']):not([type='checkbox']):not([type='radio']):not(.
↪btn):not(.session_login):focus, input[name]:not([type='image']):not(.sidebar-
↪search):not([type='button']):not([type='checkbox']):not([type='radio']):not(.
↪btn):focus, .csf-container input[type='text']:focus, .csf-container input[type=
↪'search']:focus, .chooser_button:focus, .form-control:focus{
199         border-bottom-width:2px;border-bottom-color :   rgb(63, 81, 181)
200     }
201
202     li.user-link, li.user-link span, li.user-link, li.user-link i {
203         background: rgb(85, 189, 212);
204         color: rgb(255, 255, 255) !important;
205         border-radius: 5px !important;
206         border: 0 !important;
207         line-height: 18px;
208     }
209     html[data-theme="brown"] #sidebar .form-group .form-control.sidebar-
↪search::placeholder{
210         color:#bbb !important
211     }
212     html[data-theme="brown"] #sidebar .form-group .form-control.sidebar-search{
213         color: #fff!important;
214     }

```

Above can be pasted into Theme Extensions

CHAPTER 31

Security

Below are common items for securing your instance.

Disable root login Change SSH port to non-standard (22) port Change Webmin port to non-standard (10000) port
Install IP Tables Restrict access to Webmin to your IP Disable all services not in use

Note: All Tomcat services are owned and run by user tomcat with minimal privileges.

32.1 Contributing

We welcome all contributors.

While any code contributions are welcome, areas that could use improvement are:

- Providing feedback
- Email Formatting
- iReport Library Updates

32.2 Issues

If you've found a bug, let us know.

32.3 Pull Requests

Create a fork of our repo.

To submit a pull request for a **new feature**:

1. Run the tests. Every pull request for a new feature should have an accompanying unit test and docs changes.
2. Create a new branch off of the *master* branch for your feature.
3. Add a test (or multiple tests) for your feature.
4. Add your new feature.
5. Push to your fork and submit the pull request.

To submit a **bug fix**:

1. Create a new branch off of the *master* branch.
2. Add a test that demonstrates the bug.
3. Make the test pass.
4. Push to your fork and submit the pull request!

To submit a **documentation fix**:

1. Create a new branch off of the *master* branch.
2. Add your documentation fixes (no tests required).
3. Push to your fork and submit the pull request!