
Portable GIS Documentation

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Archaeogeek

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Portable GIS is a set of open source GIS programs designed to be run from a USB stick, in windows, with no installation or configuration. It's hosted at portablegis.xyz, where you will also find details of the latest versions of the packages included. This documentation is split into two sections:

- **User Documentation:** Using Portable GIS
- **Developer Documentation:** Setting up your own build environment for Portable GIS, from the repository at gitlab.com/archaeogeek/portable-gis. Note that currently there are only instructions for building a development environment in windows.

Problems?

- For problems with the documentation, please submit an issue at gitlab.com/archaeogeek/portable-gis-docs/issues
- For problems with the source code then please submit an issue at gitlab.com/archaeogeek/portable-gis/issues.

1.1 Portable GIS v6.0 User Documentation

1.1.1 Included software (with versions)

- QGIS (3.4.5)
- PostgreSQL (10.7)
- PostGIS (2.5)
- MS4W (4.0.0, including Mapserver 7.4)
- PgAdmin IV
- Python (2.7 and 3.7)
- Loader
- Geoserver 2.14.4 (with java jdk 1.8)
- GDAL Python Libraries (1.9)

The following utilities are also included:

- Firefox (Portable app)
- Notepad++ (Portable app)
- Foxit PDF Reader (Portable app)

Links to websites for package-specific documentation

- QGIS: <http://www.qgis.org/>

- PostgreSQL: <http://www.postgresql.org/>
- PostGIS: <http://postgis.refractory.net/>
- PgAdmin 4: <http://www.pgadmin.org/>
- MS4W: <http://www.maptools.org/ms4w>
- Python: <http://www.python.org/>
- Loader: <http://github.com/AstunTechnology/Loader>
- Geoserver: <http://geoserver.org/>

1.1.2 Installation

Portable GIS is provided as an executable or a zip file.

The executable is recommended as it will check the available space on the target drive before beginning the installation.

Note however, that it will take a significant amount of time to install, as it is limited by the write speed of the target drive (which is generally not all that fast for USB).

If installing from zip, then ensure that your final extracted file system looks like this or some elements may not work as intended:

```
|-- Drive Root
    |-- usbgis
        |-- apps
        |-- data
        |-- docs
            |-- changelog.txt
            |-- license.txt
            |-- pgis_docs.pdf
        |-- portablegis_readme.txt
        |-- portablegis.exe
        |-- Uninstall.exe
```

1.1.3 Using Portable GIS

If you installed the software from the installer to either your C drive or a removable drive such as a USB stick you should see a directory called `usbgis` and a file called `portablegis.exe`. Double-clicking on `portablegis.exe` will start the Portable GIS control panel.

Note that if installed on a USB stick, packages may take longer to load than you are used to, due to the slower speed of the USB stick!

While all care has been taken to minimise incompatibility with previously installed versions of these packages, the author cannot guarantee that problems won't occur. Portable GIS is not a "stealth" installation where no trace will be left on your hard drive, and similarly some programs may pick up dlls from your system, or values from your registry.

The Control Panel gives access to the majority of the programs contained within Portable GIS and allows you to cleanly start and stop the server-based processes Apache and PostgreSQL. You should only start and stop these using the control panel to ensure that they start and stop cleanly.

Note that Apache and PostgreSQL are installed on non-default ports (88 and 5434 respectively) to try and avoid conflict with existing installations.

1.1.4 Using the Portable GIS Control Panel

Starting the Control Panel as described above opens up a menu with three tabs:

Welcome

This tab explains where to go to get help and training.

Desktop Modules

This tab gives access to all the desk-top packages contained within Portable GIS, split into sections for Desktop GIS including PgAdmin4 (remember to turn on PostgreSQL from the Server Modules tab before starting!), Utilities, and Loader.

Server Modules

This tab allows you to switch on the server-based components of Portable GIS- Apache, Geoserver and PostgreSQL. Click the `start` radio buttons to start the packages you need. Note that your firewall might try to block these packages, but they are safe to run. Click the `stop` or `restart` radio buttons to safely restart or close these packages down. Portable GIS will close all the web services when the Control Panel is closed.

Once you have started at least the Apache server, web-based components can be accessed at <http://localhost:88/>.

Geoserver can be accessed at <http://localhost:8080/geoserver>.

Utilities

This tab gives you access to the bundled web browser, pdf reader and text editor.

1.1.5 Portable GIS-Specific Instructions

Note that these instructions relate only to the specifics of the Portable GIS setup, and are not comprehensive instructions for using the software. These can be found at the relevant project websites, listed above.

QGIS

QGIS can be started from the control panel Desktop Modules tab. QGIS includes the GRASS plugin, which is now part of the processing toolbox. Additional plugins can be installed as usual via the plugins menu.

Note that the speed at which QGIS starts up is partially determined by the number of plugins you have loaded. Disable all plugins that are not required to see a significant improvement in load times. Note that this information is stored in the windows registry, therefore it is not possible to set this as part of the default installation.

QGIS may inherit settings from other versions of qgis installed on your computer. If you have trouble starting it, then try deleting any `*.env` files from `[path to usbgis folder]\apps\qgis\bin`.

GDAL/OGR

This option opens a windows command prompt at the correct location for accessing the ogr and gdal tools with the correct environment variables set. Please note that these environment variables are set only for the session initiated using the control panel menu, so the tools may not work if accessed independently.

Python

Python 2.7 is installed from Portable Python, and Python 3.7 is installed as part of MS4W.

If you need to set custom environment variables for your python tools, create a batch file and add it to [path to usbgis folder]\apps\scripts. It will then be accessible from the “Python Scripts” button in the Desktop Modules tab in the control panel. By default this folder contains scripts for editing Loader config using Notepad++ and setting Loader environment variables.

Python 2.7

The python 2.7 interpreter can be accessed from the Desktop Modules tab in the control panel- this will start the interactive python command prompt. For use in scripts, the python executable should be used- this can be found at [path to usbgis folder]\apps\python27\App\python.exe

The python 2.7 install includes easy_install for installing additional python libraries. This can be found in [path to usbgis folder]\apps\python27\App\Scripts. Please see the python documentation for usage.

The module lxml has been included as it is a requirement for Loader to run (see below).

Python 3.7

The python 3.7 interpreter can be accessed from the Desktop Modules tab in the control panel- this will start the interactive python command prompt. For use in scripts, the python executable should be used- this can be found at [path to usbgis folder]\apps\ms4w\Python\python.exe

Loader

Loader is an Astun Technology tool that allows the simple loading of KML and GML into a postgresql database, using Python. It can be found in [path to usbgis folder]\apps\loader. It must be configured before use, using the text-based config file, loader.config. To edit this file, click “Python Scripts” in the Desktop Modules tab and run edit_loader_config.bat to load the config file in Notepad++.

Once configured, return to the “Python Scripts” button in the Desktop Modules tab, and run loader_python_vars.bat. This will set the relevant python environment variables in your command prompt session, change to the loader directory and provide some example syntax on how to run it.

Loader is currently tested with Python 2.7 only

Note that Loader will work much more quickly if a temporary working directory is set up on the C drive rather than on a removable disk. The location of this directory can be set using the Tools Menu -> “Set Working Directory” entry. This will also set an environment variable %TMPDIR% which can be used in the Loader config file as the temporary output directory. The Tools Menu -> “Empty working directory” entry will remove **any** files from the output directory.

Apache

The directory that all web pages should be installed in is as follows: [path to usbgis folder]\apps\ms4w\Apache\htdocs.

Pages in this directory (and sub folders) will be accessible via <http://localhost:88/>. There is some information on the MS4W components at http://localhost:88/README_INSTALL.htm.

To run cgi scripts, please place them in the folder: [path to usbgis folder]\apps\ms4w\Apache\cgi-bin, or edit the apache configuration files (see below) to give the server permission to execute scripts from other folders.

The apache configuration files can be found in: `[driveletter]:\apps\ms4w\Apache\conf`. Please note that changes to this file may cause apache to stop working.

PostgreSQL

PostgreSQL is set up with the following options:

- Username: pgis
- Password: pgis
- Port: 3432
- Host: localhost or 127.0.0.1
- Spatially enabled template database: template_postgis
- Data Directory: `[path to usbgis folder]\dataPGDATA`

The default credentials are set in a `pgpass.conf` file in `[path to usbgis folder]\apps\pgsql` so please edit this if you change the default credentials.

Please create new users if you wish to use this installation in a public environment.

PostgreSQL can be administered with the tool PgAdmin 4 from the control panel, or with the command line tools found here: `[path to usbgis folder]\apps\postgresql\bin`.

pgAdmin 4 is set to run on port 5436 and to open the provided portable firefox browser automatically. If this does not happen, visit `http://localhost:5436` in any browser once pgAdmin 4 has started up. If this port conflicts with software running on your computer, change edit `[path to usbgis folder]\apps\pgsql\pgAdmin 4\web\config_local.py` in a text editor and change the value of `DEFAULT_SERVER_PORT`.

Set up a connection to the database server using the credentials above, or with pgAdmin4 and postgresQL running, import them using the following command:

```
cd [path to usbgis folder]\apps\pgsql\pgAdmin 4\venv\Scripts\ python.exe ..\..\web\setup.py --load-servers ..\..\web\pg-database-server.json
```

Note that if you run this command multiple times you will end up with multiple server instances in pgAdmin 4!

Geoserver

Geoserver is set up with the standard initial options, in other words username: admin, password: geoserver. You may see a java warning when first loading- please allow java to run.

Mapserver

Mapserver 7.4 is installed in `[path to usbgis folder]\apps\ms4w\Apache\cgi-bin`. It can be tested at the browser using `http://localhost:88/cgi-bin/mapserv.exe`. Called with no additional parameters, it will display an error message.

Other Utilities

PortableGIS contains portable versions of Firefox, a text editor called Geany, and Foxit PDF Reader. These can be accessed from the relevant folders of `[path to usbgis folder]\apps` but will not launch as the default applications for web browsing, editing text or reading pdfs unless specifically set.

1.1.6 License

This product as a whole is distributed under the GNU General Public License version 3, but it is subordinate to the License Agreements of the constituent software packages. These may be more or less restrictive than the GNU GPL. Please ensure that you agree with the terms of all the licenses before using this software- these can be found in the folders for the constituent programs.

The full license can be found at: `[path to usbgis folder]\docs\license.txt`

1.2 Getting Started

This document will show you how to set up the build environment for creating an edition of Portable GIS from the component software. Unfortunately at present it's windows only but if that changes, so much the better!

1.2.1 Required Programmes

- Git
- AutoIT (to build menu)
- Universal Extractor (to extract executables)
- 7-zip (for when Universal Extractor doesn't work)
- NSIS (to build installer)

1.2.2 Folder Structure

```
|-- raw_docs
    |-- pgis_docs.rst
|-- usbgis
    |-- apps
        |-- ...
    |-- data
        |-- ...
    |-- docs
        |-- changelog.txt
        |-- license.txt
        |-- pgis_docs.pdf
|--your.ico
|--your.bmp
|--portablegis_readme.txt
|--yourinstaller.nsi
|--yourmenu.au3
|--yourmenu.exe
|--yourinstaller.exe
```

1.2.3 App Preparation

Apps that require the portable version

Geany

Download a copy of Portable Geany from portableapps.com/apps/development/geany_portable and place the executable into the `apps/geany` folder.

Firefox

Download a copy of Portable Firefox from portableapps.com/apps/internet/firefox_portable and place the executable into the `apps/firefox` folder.

PDF Reader

Download a copy of Portable Foxit Reader from portableapps.com/apps/office/foxit_reader_portable and place the executable into the `apps/pdfreader` folder.

Apps that can be included without modification

Loader

Download a zip file of Loader from github.com/AstunTechnology/Loader. Place the `Loader` folder into the `apps` folder in your Portable GIS directory.

Apps that require minor modification

Geoserver

Download the Platform Independent Binary (version 2.15.1) from 'geoserver.org' and extract the contents into the `apps` folder, in a directory called `geoserver`. Copy the contents of the `geoserver` directory from the [Portable GIS repository](#) into the same folder, overwriting as necessary.

Python 2.7

Download Python 2.7 from [Portable Python](#) and install it into `apps\python27`. Copy the contents of the `python27` directory from the [Portable GIS repository](#) into the same folder, overwriting as necessary.

(Note that Python 3.7 is included in `ms4w` below).

ms4w

Download the latest zip file of `ms4w` from ms4w.com. Extract the `ms4w` folder from within the download and place it in the `apps` folder of your Portable GIS installation. Copy the contents of the `ms4w` directory from the [Portable GIS repository](#) into the same folder, overwriting as necessary.

Apps that require a bit more work

PostgreSQL and PostGIS

PostgreSQL

Download the zip file (32bit) for PostgreSQL 10.7 from postgresql.org (the section for “Advanced Users”).

Extract the `pgsql` folder from the zip file and copy it to the apps folder.

The following credentials are assumed throughout the documentation and settings:

PostgreSQL is set up with the following options:

- Username: `pgis`
- Password: `pgis`
- Port: 3432
- Host: `localhost` or `127.0.0.1`
- Spatially enabled template database: `template_postgis`

Create a user on your pc called `pgis` with the password `pgis` and open a command prompt as that user. Change directory to the `apps\pgsql\bin` directory and initialise the db in the following manner:

```
> initdb.exe --pgdata=..\..\..\PGDATA --username=pgis --locale=english_UK
--encoding=UTF8
```

Copy the files from the `pgsql` folder in the [Portable GIS repository](#) into your `pgsql` folder, overwriting as necessary.

(At this point you should probably transfer your build to an actual USB stick so you can start postgresql using the batch file `start_pgsql.bat` and deal with any error messages).

Note that there’s a `pgpass.conf` file in `apps\pgsql` which you should edit if you change the default credentials. This is utilised by setting the `PGPASSFILE` environment variable when starting postgresql.

pgAdmin 4

PgAdmin 4 is configured to run with a fixed port of 5436 and in the provided version of firefox. To change the port number, edit `pgsql\pgAdmin 4\web\config_local.py` and change the value of `DEFAULT_SERVER_PORT`.

PostGIS

Download the zip file (currently the 2.5 version) from download.osgeo.org and extract the contents into the `pgsql` directory, overwriting if needed.

Create a new database (called, eg `template_postgis`) and in a sql window run `create extension postgis`

To make it a template execute the following:

```
UPDATE pg_database SET datistemplate = true WHERE datname =
'template_postgis'; GRANT ALL ON geometry_columns TO PUBLIC; GRANT ALL ON
spatial_ref_sys TO PUBLIC;
```

QGIS

Download 32bit stand-alone qgis installer (version 3.4.5) from the [QGIS Download Site](#) and install it on a windows pc. Copy the C:\Program Files\QGIS 3.4 folder into the apps folder, renaming it qgis, and then apply the files from the qgis folder in the [Portable GIS repository](#) to the same location, over-writing as necessary.

QGIS may inherit settings from other versions of qgis installed on your computer. If you have trouble starting it, then try deleting any *.env files from [path to usbgis folder]\apps\qgis\bin.

Java 8 jdk

Oracle's jdk8 is provided in the [Portable GIS repository](#) but if you wish to build your own follow the instructions below. These instructions originally came from [brucalipto.org](#) and are reproduced here in case that site is no longer available.

- Download a copy of the Windows 32bit (X86) jdk version 8 executable from [oracle](#)
- Open the downloaded executable with 7-zip, and the extract the tools.zip file inside to a tools folder.
- At this point you should have the following folder structure jdk_8\tools
- Open a command prompt inside the tools directory and run the following command, substituting the correct drive letter:

```
> for /r %x in (*.pack) do C:\jdk_8\tools\bin\unpack200 "%x" "%x.jar"
```

- Find and rename all the .pack.jar files present in the tools folder and subfolders:

```
> dir /B /S *.pack.jar
C:\jdk_8\tools\jre\lib\charsets.pack.jar
C:\jdk_8\tools\jre\lib\deploy.pack.jar
C:\jdk_8\tools\jre\lib\javaws.pack.jar
C:\jdk_8\tools\jre\lib\jsse.pack.jar
C:\jdk_8\tools\jre\lib\plugin.pack.jar
C:\jdk_8\tools\jre\lib\rt.pack.jar
C:\jdk_8\tools\jre\lib\ext\jfxrt.pack.jar
C:\jdk_8\tools\jre\lib\ext\localedata.pack.jar
C:\jdk_8\tools\lib\tools.pack.jar

> ren C:\jdk_8\tools\jre\lib\charsets.pack.jar charsets.jar
> ren C:\jdk_8\tools\jre\lib\deploy.pack.jar deploy.jar
> ren C:\jdk_8\tools\jre\lib\javaws.pack.jar javaws.jar
> ren C:\jdk_8\tools\jre\lib\jsse.pack.jar jsse.jar
> ren C:\jdk_8\tools\jre\lib\plugin.pack.jar plugin.jar
> ren C:\jdk_8\tools\jre\lib\rt.pack.jar rt.jar
> ren C:\jdk_8\tools\jre\lib\ext\jfxrt.pack.jar jfxrt.jar
> ren C:\jdk_8\tools\jre\lib\ext\localedata.pack.jar localedata.jar
> ren C:\jdk_8\tools\lib\tools.pack.jar tools.jar
```

- Test this has worked OK:

```
C:\jdk_8\tools\bin\java -version
java version "1.8.0-ea"
Java(TM) SE Runtime Environment (build 1.8.0-ea-b121)
Java HotSpot(TM) Client VM (build 25.0-b63, mixed mode)
```

1.2.4 Menu and Install File

Menu and Installer

Menu

The Portable GIS menu is built with AutoIT. Yes I know there are probably better things to use these days but if it ain't broke...

Download [AutoIT](#) and install on your local machine.

The Portable GIS menu source file (portablegis_xxx.au3) can be found in the [Portable GIS repository](#) and should be placed in the root of your Portable GIS installation, like so:

```
|-- raw_docs
|-- usbgis
    |-- apps
    |-- data
    |-- docs
|-- your.ico
|-- your.bmp
|-- your.jpg
|-- portablegis_readme.txt
|-- yourinstaller.nsi
|-- yourmenu.au3 <-- Here
|-- yourmenu.exe
|-- yourinstaller.exe
```

The AutoIT syntax documentation can be found at www.autoitscript.com/autoit3/docs. Recent versions of the software include a syntax checker (Au3Check).

Note your.jpg in the file tree above- this is the image referenced in the following line in the menu source code, so adjust as necessary: `GuiCtrlCreatePic('your.jpg', 96, 50, 157, 57)`

To use with Portable GIS the menu source code must be compiled into a standalone executable (.exe). Use Aut2Exe for this (available from your start menu) and supply an icon (.ico) file.

Installer

The Portable GIS installer is built with [nsis](#). Download the latest version and install on your local machine.

The Portable GIS installer source file (nsis_installer_xxx.nsi) can be found in the [Portable GIS repository](#) and should be placed in the root of your Portable GIS installation, like so:

```
|-- raw_docs
|-- usbgis
    |-- apps
    |-- data
    |-- docs
|-- your.ico
|-- your.bmp
|-- portablegis_readme.txt
|-- yourinstaller.nsi <-- Here
|-- yourmenu.au3
|-- yourmenu.exe
|-- yourinstaller.exe
```


The nsis syntax documentation can be found at nsis.sourceforge.net/Docs. Ensure that you have a path to an icon (.ico) file and a bitmap image (.bmp) for the installer header. At various places within the installer source file it is necessary to define the version of the software and the uncompressed size of the install- this is used to calculate whether there is enough space on the various drives to do an installation. There are also various file locations throughout the installer- these should be changed to match your setup.

Zip

If you wish to build a zip file, then compress the folder `usbgis`, and the files `portablegis.exe` (the menu) and `portablegis_readme.txt` into a zip file. You are advised to test it afterwards, using something like `unzip -t yourzip.zip > error.txt`. Compressing using windows file explorer definitely seems to cause errors when the zip file is tested, though it doesn't necessarily prevent extraction, installation, or use.

Building the installer takes ages. What can I say, it's a big installation.

1.2.5 Documentation

Documentation

The Portable GIS user documentation from this repository should be included in the final installation. Convert `user_docs.rst` to a pdf using something like [Cloud Convert](#) and save it as `pgis_docs.pdf` in the `usbgis\apps\docs` folder of your Portable GIS installation.

To ensure it is linked to correctly from the menu, it must be named `pgis_docs.pdf`.

The `docs` folder also contains the changelog and license text files (.txt) also linked to from the menu.

The readme file linked to from the installer should be placed in the root of your Portable GIS installation and named **`portablegis_readme.txt`**.

```
|-- raw_docs
    |-- pgis_docs.rst
|-- usbgis
    |-- apps
    |-- data
    |-- docs
        |-- changelog.txt
        |-- license.txt
        |-- pgis_docs.pdf
|-- portablegis_readme.txt
|-- ...
```