



FreeGIS.net Software Distribution

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The FreeGIS.net Virtual Machine

Introduction

The FreeGIS.net Virtual Machine is a solid proof of the applicability of the work done in the FreeGIS.net project.

In the scope of this project many activities were undertaken to reach this point. Among them are

- the analysis and implementation of the features required by INSPIRE in MapServer, a leading map generating software. Of particular interest were the implementation of multilingual capabilities a improvements in the layer structure as exposed through WMS. A detailed report on this work item is the subject of a separate report included in this DVD.
- the analysis and implementation of many additions to HALE, a powerful data harmonization and transformation tool, including substantial improvements in the scalability and performance of the software. This work is described in major detail in a report of it's own.
- numerous enhancements to the GisClient web mapping software, which is used as a gentle shell for most of the included server side GIS software.
- packaging many GIS software packages for the popular RPM package manager found in current enterprise Linux distributions.

Working installation of the above mentioned software in the FreeGIS.net Virtual Machine.

Prerequisites

The FreeGIS.net software is distributed as a VMware virtual machine. To run this virtual machine, a software like VMware Player, which is free, or VMware Workstation, is needed. Both products can be downloaded from the VMware site at <https://my.vmware.com/web/vmware/downloads>. The virtual machine image was created with VMware Workstation 9. Thus, at least VMware workstation 9 or VMware Player 5 should be used.

Further, your PC should allow have enough free memory to run a VM machine with 1 GB of RAM.

How to run

- download the zip archive to your local hard drive in your PC
- unzip the archive into your computer's hard drive.
- start your VMware application (Workstation or Player)
- open the virtual machine image and start the virtual machine

- wait until the virtual machine finishes its boot process and the web browser window is shown

At this point, it is possible to navigate through the map, using your mouse to pan around, the mouse wheel to zoom in or zoom out.

More technical details

The FreeGIS.net Software Distribution is built on CentOS 6. In addition some packages from the Enterprise Linux GIS (http://wiki.osgeo.org/wiki/Enterprise_Linux_GIS) project are used. Finally, for the missing pieces some software packages were custom build.

The virtual machine is configured to get the network information from a DHCP server, if such a service is available in your local network. Anyway, the browser, the web application and the database communicate over an address which is local to the virtual machine, in technical jargon known as “localhost”. This should allow to use all applications from within the virtual machine, even without a valid network configuration.

Exploring the content of the Virtual Machine

The virtual machine is configured to allow you to start immediately to explore its contents. The software is installed and configured to access immediately the local services and data.

Web mapping

When the virtual machine starts up, an internet browser should open on <http://127.0.0.1/map/>, showing a map of South Tirol (IT) and Graubünden (CH). Using the map, exploring the data, zooming in and zooming out should be intuitive and feed your curiosity.

The more adventurous users may even like to configure the drawing instruction of the map, going into the GisClient Author at <http://127.0.0.1/gisclient33/public/>. The credentials for the author are set to admin/freegis.

A more detailed manual of the web mapping application can be found on the DVD.

Desktop GIS

QGIS is probably the most used Open Source Desktop GIS application, at the moment and thus included in the FreeGIS.net Reference Implementation.

A detailed presentation of QGIS can be found on <http://www.qgis.org>.

We will limit ourself to mention QGIS as an excellent client to OGC web services.

WMS – Web Map Service

The WMS is the OGC standard for publishing maps over the internet. The most common result of a WMS request is a bitmap image representing a geographical map.

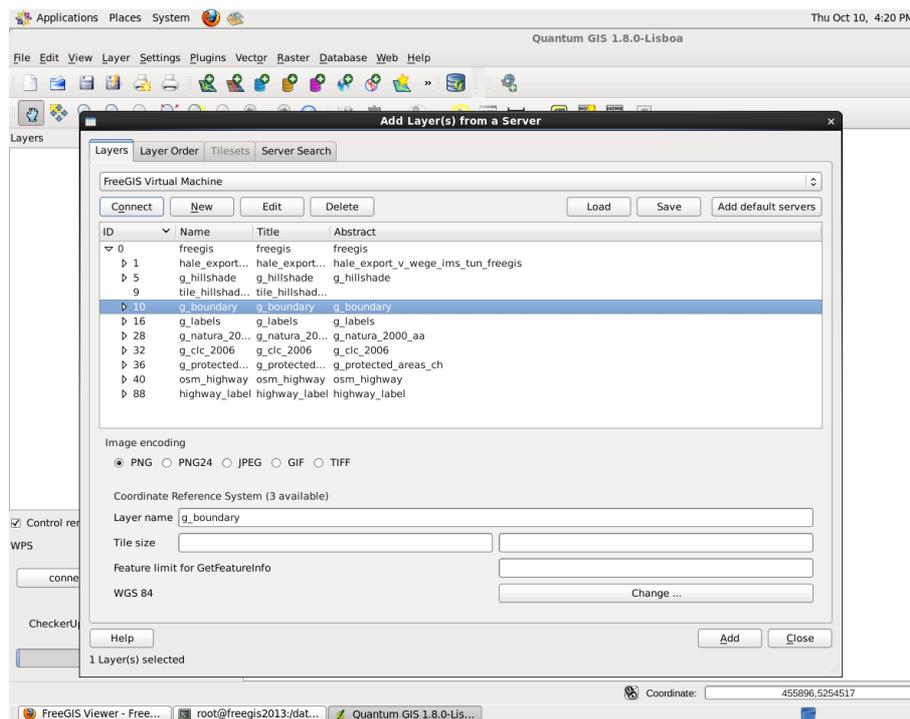
Once that the virtual machine has started, QGIS can be launched from the top menu “Applications”, submenu “Education”, selecting the menu item “Quantum GIS”.

Once that QGIS has started, go to the menu “Layers” and click on “Add WMS layer”.

Select “WMS FreeGIS.net VM” from the pull down menu and click on “Connect”. A list of available layers appears.

Select some of them, click on “Add” and close the dialog.

The selected data should show in the QGIS main window



A note for the more expert users: the endpoint for the WMS is

<http://127.0.0.1/gisclient33/public/services/ows.php?>

[PROJECT=freegis&MAP=freegis&service=WMS&VERSION=1.1.1](http://127.0.0.1/gisclient33/public/services/ows.php?PROJECT=freegis&MAP=freegis&service=WMS&VERSION=1.1.1)

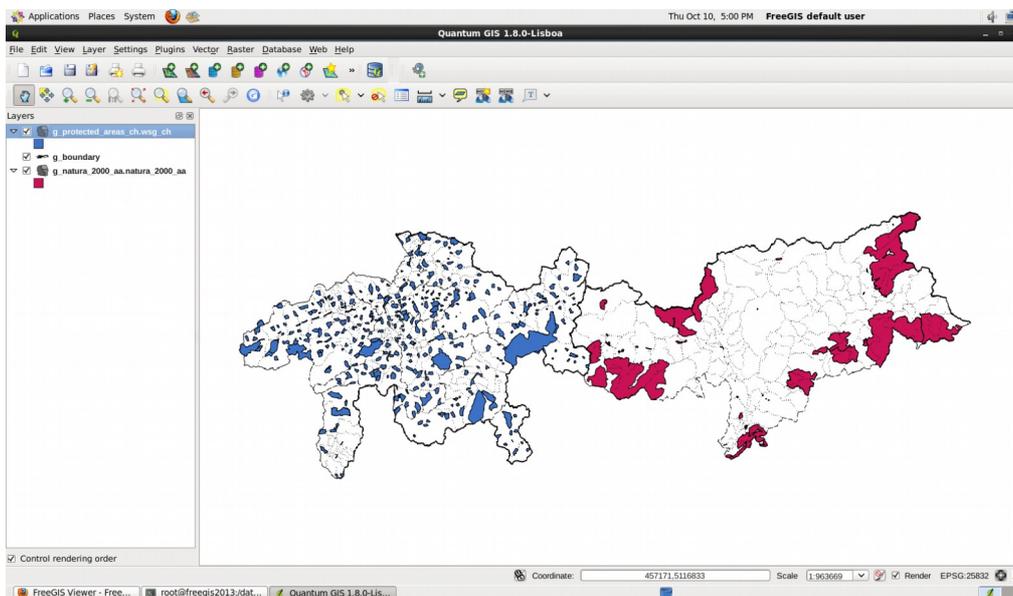
WFS – Web Feature Service

While WMS produces nice, colorful maps, thus does some operation or rendering on the data, WFS is usually used to download the raw vector data together with the alphanumeric attributes. In the world of Geographic Information Systems (GIS), the combination of geometry and alphanumeric attribute data is called feature. WFS serves data and not images.

WFS layers can be added in the following way:

- * select "Layer" / "Add WFS Layer ...", select
- * chose "WMS FreeGIS.net VM"
- * click "Connect" to get a list of all configured layers
- * select some of the layers and click "Apply"

WMS and WFS layers can be freely mixed in QGIS, allowing a rich mix of data views, like in the the following picture, where the administrative outlines were obtained from the local WMS and the colored polygons were served by the local WFS:



PostGIS

The vector data in FreeGIS.net VM, which is contained in a PostGIS database, can be accessed directly, adding a PostGIS layer. This can be done selecting the "Layer" / "Add PostGIS Layers..." menu item. The database can be accessed as user "freegis" with password "freegisx".

pgAdmin is another application for accessing the data in the database. pgAdmin can be opened selecting the menu item “Applications” / “Programming” / “pgAdmin III”.

Hale

A working installation of Hale is included in the virtual machine. Since the learning curve of HALE is rather steep, an example project is included. Starting from the example project, the user can get his feet wet, playing around with the many possibilities of this complex software package.

GeoNetwork

We wanted to keep the virtual machine runnable by a large number of PCs and set the available memory to 1 GB.

Since GeoNetwork would by itself be barely happy with this amount of memory, let alone when sharing the memory with the other FreeGis applications and the installed desktop environment, the installed GeoNetwork will not start automatically when the virtual machine boots up.

To start GeoNetwork simply open a terminal and type:

```
sudo service tomcat6 start
```

To access to the administrative parts of tomcat, log in as user "freegis" identified by the password "freegis2013"

GeoNetwork should then be available at <http://127.0.0.1/geonetwork>.

Additional Information

Over the life time of the FreeGIS.net project, several documentats were produced. This information is included in the DVD and is also available on the FreeGIS.net web site at www.freegis.net.

Part of this documentation are technical documents outlining the scope of the project, proposing solutions to the addressed problems and slides from the presentations held at numerous events.

Summary

As shown in the very short descriptions above, the FreeGIS.net Reference Implementation allows you to dive into the world of Open Source GIS very quickly and get quickly a sense for the current State of the Art in this field.

We gave a particular emphasis to the aspect of publishing geographic data, in order to proof that a wide range of publishing scenarios are possible with the technology currently available. We hope that the FreeGIS.net Reference Implementation will be another incentive to publish existing geographic data sets using industry standards, allowing a rich and diversified and innovative reuse of existing data.