The GeoSharing project: Desktop edition

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Introduction

The mobile version of the GeoSharing application proposed in [LN11] fits well for mobile devices. But, because of the small screen of the Openmoko Neo FreeRunner, it does not provide an efficient way to monitor the GeoSharing users. A desktop version of the GeoSharing application working on Linux distributions has been implemented and is presented throughout this document. This application allows someone to monitor the entire MANET to which the computer is connected to (via the Wi-Fi technology) on a bigger screen than that of the Openmoko.

1 Concepts

The desktop version of the GeoSharing application is similar to the mobile one. The two main differences between these versions are the graphical interface of tangoGPS, that is more adapted for larger screens and the fact that GPS data of the computer running the desktop version of GeoSharing are not shared through the network. The same source code is used to generate the mobile and the desktop version of the GeoSharing application. The conditional compilation is used to generate both versions. Details about the compilation and the installation processes are given in Appendix A.

The tangoGPS application is already intended to work on mobile and desktop devices. No additional modification is therefore required. The modified version of tangoGPS[1] that is used in the GeoSharing project for mobile devices can be used as is for the desktop version. TangoGPS fits the GeoSharing needs for both mobile and desktop versions very well.

The mobile and desktop versions of GeoSharing are generated thanks to the same source code. However, the version used on desktops does not retrieve and share GPS coordinates through the network. The desktop version of the GeoSharing project has been tested on Ubuntu 10.10 and on Ubuntu 11.04.

2 User manual

The desktop version of the GeoSharing application is similar to the mobile version for Neo FreeRunner devices. The graphical interface provided by tangoGPS is more complete on the desktop version since there is more space to display the components. The main screen of the tangoGPS application is presented on Figure 1.

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[1] This version has been modified in order to integrate the plugins management as explained in Chapter 5 of [LN11].
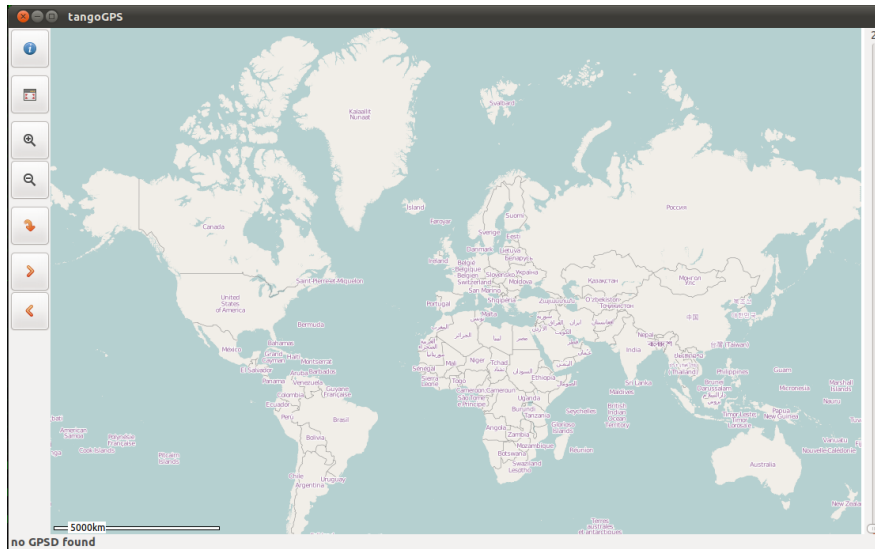
**Figure 1:** Main screen of the tangoGPS application.

From top to bottom, there are five different components on the left menu.

1. The `information` button opens a panel providing different services. It could display information from the GPS (speed, latitude, longitude, altitude, etc.). This functionality only works if the computer is equipped with a GPS device. The information panel also provides configuration facilities for tangoGPS, etc.

2. The `full-screen` button sets the map in full-screen mode.

3. The `zoom in/out` buttons zoom in or out into the map.

4. The `auto-center` button allows the user to center the map around its position. This functionality does not work unless the computer is equipped with a GPS device.

5. The `right and left arrows` allow the user to change the map repository. For that purpose, an internet connectivity is required.

On the right, the scroll bar also allows the user to zoom in or out into the map. The zoom operations require an internet connectivity to download the map details, unless the geographical details of the concerned region have already been downloaded and cached in a previous use.
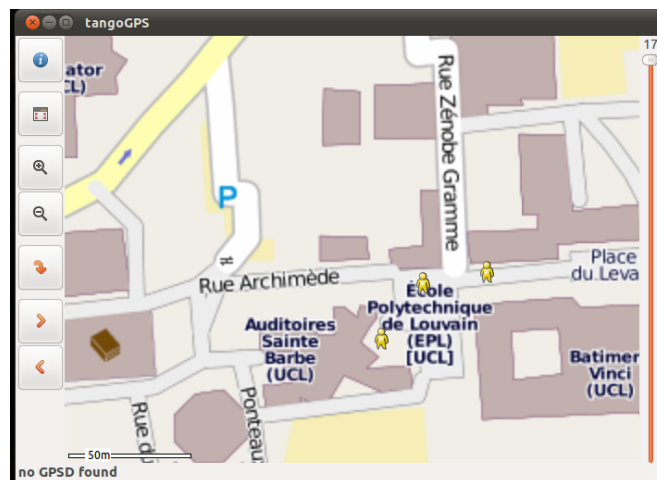
Before launching the GeoSharing application, the network manager (integrated into Ubuntu) can be used to connect the computer to the MANET. In order to launch the GeoSharing application, click anywhere on the map to make the main menu appear. Then, select the "Plugins" item which contains all the loaded plugins specified in the `tangogps_plugins.conf` configuration file located at `/etc/tangogps_plugins.conf`.

In this sub-menu, choose the "GeoSharing" item. This action will automatically start the GeoSharing application. All the GeoSharing users are displayed on the map and can be tracked in real-time.
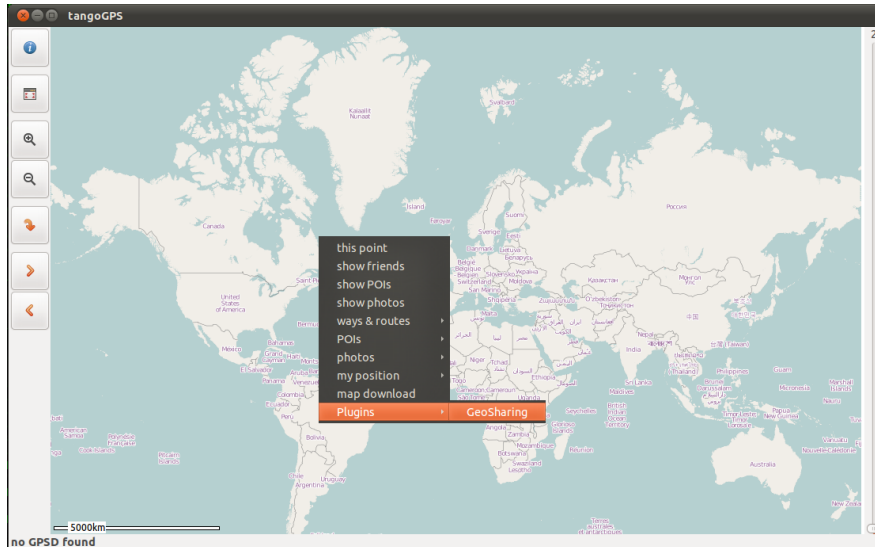
Figure 2: The GeoSharing application is launched by simply selecting the "GeoSharing" sub-menu in the "Plugins" menu.

To refine the display and get more details about the exact location of the different users, it is possible to use the zoom-in functionality provided by tangoGPS. As mentioned previously, this operation requires an internet connectivity to download and cache the geographical details of the concerned region if it has not yet been done. An overview of the working application is shown in Figure 3.

Figure 3: The desktop monitors the three users of the mobile version of the GeoSharing application.

There are two different possibilities to stop using the GeoSharing functionalities,

- selecting the "GeoSharing" item in the "Plugins" sub-menu again will stop the GeoSharing application;

- closing the tangoGPS application also stops the GeoSharing application.

Conclusion

The desktop version of the GeoSharing application provides a clear way to display and monitor all the users of the mobile version of the GeoSharing application. For this to occur all users must belong to the same network as that of the computer.

The tangoGPS application appears to be a good choice for both mobile and desktop versions of the GeoSharing applications since it is not required to use a different mapping application for the desktop version.

References

[LN11] Laurent Lamouline and Vincent Nuttin. The GeoSharing project: An Openmoko geoposition sharing system. Master's thesis, École Polytechnique de Louvain, Université catholique de Louvain, 2011.

A   Installation guide

This section is divided into three parts. The first one explains where the source files of the GeoSharing application can be retrieved and have to be extracted. The OLSRd installation and configuration is explained next. The last part explains how to install the modified version of tangoGPS on a computer and how to configure it in order for it to take the GeoSharing plugin into account.

A.1   GeoSharing installation

To install the GeoSharing application, it is only required to download the latest version of the source code at http://www.geosharing-project.org/download.php and to uncompress the archive to any location on the computer filesystem (e.g. /etc/).

A.2   OLSR dæmon installation and configuration

The OLSRd installation is performed in three steps:

1. The latest version of OLSRd can be downloaded from http://www.olsr.org, the official web site. The sources must be extracted form the archive.

2. To compile and install OLSRd, issue the following command in the main folder of OLSRd:

   ```
   make
   make install
   ```

3. To compile and install the `bmf` plugin, issue the following commands in the main folder of OLSRd:

   ```
   cd lib/bmf
   make
   make install
   ```

The OLSR dæmon and the `bmf` plugin are now installed. Nevertheless, it is still required to configure OLSRd to load the `bmf` plugin. For that purpose, it is required to modify the configuration file located at `/etc/olsrd.conf` such that the LoadPlugin and the Interface configuration looks like the the configuration bellow.

```
LoadPlugin "olsrd_bmf.so.1.7.0"
{
    # no option
}


#######################################
### OLSRd Interfaces configuration ###
#######################################
# multiple interfaces can be specified for a single configuration block
# multiple configuration blocks can be specified

# WARNING, don't forget to insert your interface names here !
Interface "wlan0"
{
    # Interface Mode is used to prevent unnecessary
    # packet forwarding on switched ethernet interfaces
    # valid Modes are "mesh" and "ether"
    # (default is "mesh")

    Mode "mesh"
}
```

A.3 TangoGPS installation and configuration

As stated previously, the modified version of tangoGPS must be used in the scope of the GeoSharing project. Any other version of tangoGPS must be uninstalled before starting the new installation process. The different installation steps are enumerated below.

1. Download the latest version of tangogps-x.x.x-modified from http://download.geosharing-project.org on the computer

2. Extract the archive content on the computer filesystem and open a terminal pointing to the folder that has just been extracted

3. Issue the following command in the tangogps-x.x.x-modified folder:

```
$ ./configure
```

4. Once the configuration process is terminated, open the Makefile located at /src/Makefile in the tangogps-x.x.x-modified directory into a text editor and add -lconfig at the end of the following lines:

```
PACKAGE_CFLAGS = [auto generated list of directories to be searched for
    header files] -lconfig
...
PACKAGE_LIBS = [auto generated list of directories to be searched for
    header files] -lconfig
```

5. Issue the following commands in the tangogps-x.x.x-modified folder:

```
$ make
$ sudo make install
```

TangoGPS is now installed on the system but it still requires some configuration to be fully operational. As for the mobile version, the tangoGPS configuration file called `tangogps_plugins.conf` must be created and placed at `/etc/tangogps_plugins.conf`. This file must be completed as follow:

```
# TangoGPS Plugins Interface
nbr_plugins = 1;

Plugin1 = {
    name        =   "GeoSharing";
    path        =   "/etc/run_geosharing.sh";
    options     =   "";
    running     =   "/tmp/geosharing.run";
};
```

The script `run_geosharing_desktop.sh` must be downloaded from http://download.geosharing-project.org and saved in `/etc/run_geosharing_desktop.sh`. It is then required to change:

```
cd /.../geo_sharing/
```

by the complete path where the sources of the GeoSharing application have been previously extracted.

To launch the desktop version of the GeoSharing project, issue the following command:

```
$ sudo tangogps
```