RetroShare: Writing Plugins

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1 Introduction

So you have been using RetroShare for a while, and as a computer programmer, you want to add your favourite plugin to share with others.

Where to start?

Well, that is the purpose of this guide. It will provide a guide for developing it and getting it working with RetroShare with the least amount of effort possible.

This was written as a plugin was being developed, so the screen shots displayed are for that plugin.

2 Concepts

There are 2 parts to a plugin:

1. services - can often run under RetroShare-NoGui
2. GUI - Loaded by RetroShare-GUI to interact with it's service or other parts of

Most existing plugins have both, but can be one or the other, depending on the needs of the plugin.

There are 3 types of Service:

1. services based on friend communication eg VoIP
2. services based on turtle router eg ZeroReserve
3. services based on cache exchange eg LinksCloud

Common Parts:

1. Serialiser - messages that you want to send over the network. Serialisation is normally done by hand in RS, but there are other ways. Both simple string encoding and JSON have been used.
2. Service interface - When loading a plugin, Retroshare provides a list of interfaces, to access Forums, Channels, DHT, Discovery, Messages, Files or other parts of retroshare. Though these interfaces are declared extern, they should be accessed from

All non-cache based plugins working in the 0.5.* version and releases, will continue to work with 0.6 which changes to a new system using GXS. Anything that interacts with Forums/Channels (such as feedreader and WSRS) will need to make some changes.

3 Important Things

3.1 Language

RetroShare is written in c++ with some parts in c. You need to have a good understanding of c++.

It will be possible to add other features from other languages that can be called from c/c++ and return values into the calling program eg Haskell.

Another alternative is to use WSRS or PYRS both of which are available from github.

3.2 Tools and Libraries

3.2.1 QtCreator

QtCreator is a free tool that can be used to develop the project, as well as editing, and compiling to create a library as either a *.so for Gnu/Linux or *.dll for Windows or *.so for Mac.

3.2.2 Editor

Many programmers use vim (from `http://www.vim.org/`) with some addons to make editing easier and faster, especially on older, slower computers. You can get a complete collection of plugins and settings for vim from `https://github.com/morpheusbeing/vim`.

Emacs is another editor that can be used.

3.2.3 Libraries

Unless your plugin is very complicated, all the required libraries should be available on your computer if you can compile a working version of RetroShare.

3.2.4 Version Control

At present, RetroShare uses svn for its version control. If you are compiling your own, you will understand the use of the *svn up* command on Gnu/Linux or on MS Windows or on MAC OS.

For a project like this, git and `https://github.com` is a good option to manage a local and remote repository. Most of the current plugins have a git repository.

For example, the FriendMap plugin, using the KDE Marble development libraries is found at `https://github.com/chozabu/FriendMap`.

You will need to create an account if you don't have one, and create a repository to store your code in. This allows you to keep an offsite copy of your work, as well as allowing for collaboration. There are many useful tutorials on using git, but essentially it is as follows:

1. Login or create an account at `https://github.com`.
2. Create a new repository (best to use the same name with same character case as your plugin name).
3. cd into the plugin folder you are working with
4. create a README.md file and edit the contents of it.
5. Initialise your local repository:

   ```
   git init
   ```

6. Add the file you just created to your repository:

   ```
   git add readme.md
   ```

7. Commit the changes made into your repository:

   ```
   git commit -a -m "first commit"
   ```

8. Map your repository to the remote repository using the command:

   ```
   git remote add origin https://github.com/[your user name]/[your plugin].git
   ```

9. Now add any other files you have created. To add a folder, just use the folder name, and will track all the files.
10. Now copy your repository to the remote :

    ```
    git push -u origin master
    ```

11. Now check the status of local git:

    ```
    git status
    ```

More Information About git For more information about using git, check the internet for tutorials and information.

You can find a good, one page cheat sheet at `https://github.com/AlexZeitler/gitcheatsheet`.

For a git reference that can be found on internet or download or installed on your computer visit `http://www-cs-students.stanford.edu/~blynn/gitmagic/`.

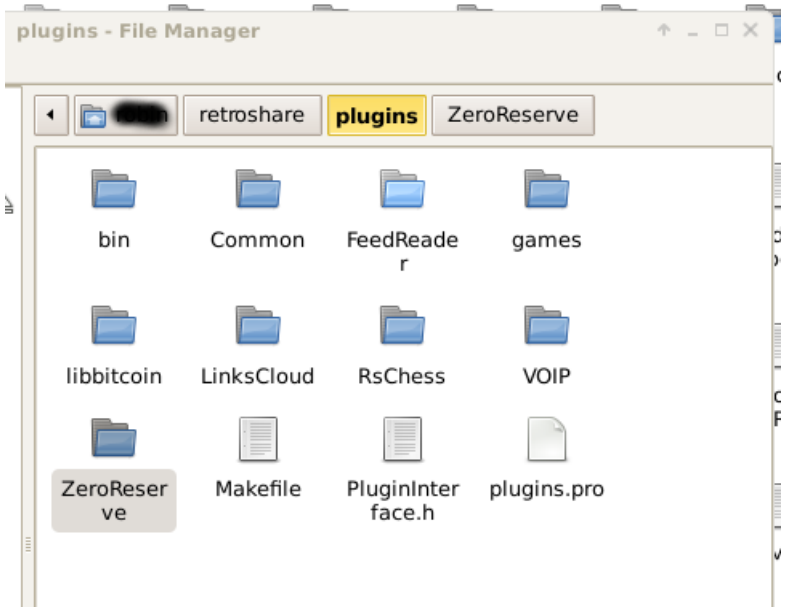

Figure 1: Folder Structure For Plugin

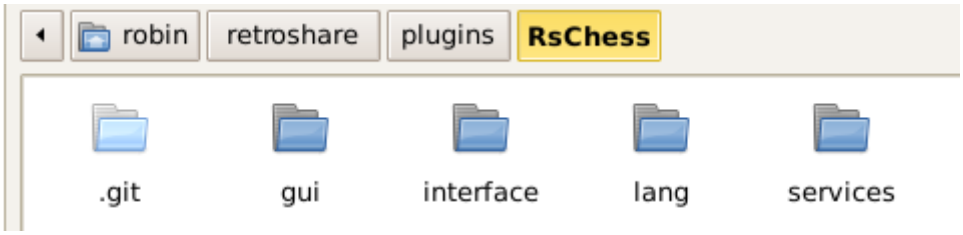

Figure 2: Sub-folders for the plugin (suggested)

3.3 Structure

It is possible to put all the files in one folder of the plugin name so that it is ~/retroshare/plugins[your plugin] as shown in 1

As a suggestion, establish some folders in you plugin to store various parts of your project into (refer to 2)

You will notice a folder .git - this is for versioning control - refer to 3.2.4.

You should also create the .gitignore file now to prevent some issues with including unwanted files in the version control. Refer to .gitignore8.

3.3.1 gui folder

This folder contains parts only loaded by RetroShare-GUI for the user to interact with. EG the forum

3.3.2 interface folder

Some of the larger, more complicated plugins, have all the interface code stored in this directory.

3.3.3 services folder

Anything here should be loadable by RetroShare-NOGUI. For example, the forum service that syncs messages with other people

3.3.4 lang folder

This folder contains all the files required for translating the strings used in the plugin to the appropriate user language.

3.4 Coding Style

4 Putting It Together

4.1 Serialiser

4.2 How To Set Icon

5 readme.md

When creating your repository on github, it is a good idea to create this file at the same.

It should contain at least the following information:

1. What the plugin is for
2. Licence for the plugin
3. Required libraries and their repositories (where they can be obtained from) in the readme.md file.
4. Compiling and installation instructions for all of the platforms that the plugin

6 Example

This is a simple example that just displays a popup message.

7 Documentation Processes

RetroShare uses doxygen to comment all of the code. Good comments make it easier for people who come behind you to understand the code and to find and fix issues or make improvements.

There are several different styles of doxygen coding that can be used.

Refer to `http://www.doxygen.org/` for more information relating to Doxygen.

The @ and \ are interchangeable.

7.1 Blocks

Blocks are the basic units of documentation for Doxygen from Doxygen home page. At first it will feel like overkill to use blocks, but realize that Doxygen was initially designed to operate on header and source files, and then the blocks of documentation would be before the definition or declaration of the methods, functions, etcetera. Doxygen is used to operating on blocks, and that's why we need to reproduce them in our dox files.

Blocks should adhere to the following standards:

- All blocks open with

  /*!

- and close with

  */

- The documentation is placed in between these markers.
- All the contents in between the markers is indented by tabs.
- The tab length should be four.
- Between blocks, there should be two empty lines.
- The maximum width of the contents between blocks is 80 columns. Try not to cross this limit, because it will severely limit readability.

Example

```
/*!
        \brief Append an item to the list.
    \detail More detailed description.
    \param item The item to add.
    \retval true The item was appended.
    \retval false Item was not appended, since resizing the list failed.
\sa AddItem(void *item, int32 index)
*/
```

7.2 File Header

```
/*!
  \file thing.ext
  Description of the file

  \author Jake Smith
  \version 1.0
  \date 1999
  \remarks starts a remarks paragraph, leave empty line after.
  \bug A known bug

*/
```

7.3 Function

```
/*!
   \brief Brief (one-line) description of function

   Extended description (may extend over several lines).

   @code
   NSString *example = @"example string!";
   @endcode

   We can also use lists.

     - item 1
     - item 2

   @param first Description of first param
   @param second Description of second param
   @return Description of returned value
   @retval describes the return value of the function
```

```
    @exception e Description of e
    @throw Same as exception
    @attention Starts an attention paragraph

    @warning Bad things can happen

    @todo Something to be done

    @note Using on your birthday will provide a bonus

    @see [name-list]
*/
```

7.4 Class

```
/*!
  \class


*/
```

8 Appendix A - Basic .gitignore

As plugins are generally created and managed by QtCreator, the following is a basic .gitignore file contents:

```
# C++ objects and libs
*.slo
*.lo
*.o
*.a
*.la
*.lai
*.so
*.dll
*.dylib

# Qt-extensions
*.pro.user
*.pro.user.*
moc_*.cpp
qrc_*.cpp
ui_*.h
Makefile*
```

```
*-build-*

# QtCreator
*.autosave
```

Having this in the folder makes managing git a whole lot easier.

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