```
<objects>
  <object class="ClassName">
    <property name="property_name1">Property value</property>
    <property name="property_name2">Property value</property>
  </object>
  ...
<objects>
```

You can find more examples as installed on your system and in the documentation part of the distribution. Typically these will be installed into one of the $XDG_DATA_DIR locations, such as `/usr/share/viking/` or `C:\Program Files\Viking\data` depending on the Operating System.

It is also possible to override the internal defaults e.g. to update any parameters should they change over time, by adding the values into your configuration file. When you define object group that already exists (and for Maps this means by a repeated Id key, but you may have to examine the source code to work out what the relevant Id values are) then you need to define all the other keys as well, otherwise they will be reset to the defaults.

## 18.1 Map Sources

It is possible to add new map sources. The file is `maps.xml` placed in your User Configuration File Location

An example of the file is in the distribution `doc/examples/maps.xml`. Further examples and values are online in the Maps Wiki

The `VikSlippyMapSource` allows declaration of any map source working like OpenStreetMap. It supports the following properties:

**id** this is an integer and should be unique as it used to identify the map source

**name** a string (should be unique) that is used for the OSM style cache directory name when the Map Cache directory is the default (`~/.viking-maps`)

**label** the text displayed in the map's source selection dialog

**hostname** the server's hostname (eg. "tile.openstreetmap.org")

**url** the parametrized address of the tile, in the spirit of C printf format, with 3 "%d" fields for Z, X and Y (in that order) (eg. "/%d/%d/%d.png")

> **Note**
> The full parametrized address can just be put in the URL field and the hostname field doesn't need specifying.
> e.g. "https://tile.openstreetmap.org/%d/%d/%d.png"

**custom-http-headers (optional)** Custom HTTP headers to be added to the download request. The default is none.

Multiple headers can be specified by separating each part with an '\n'.

The header allows of substition of values of the positional Z, X and Y (in that order) values, as per the *url* option above. Using multiple and/or different ordered values can be acheived via printf() positional argument specifiers. For example:

```
DNT: 1\nLine2:  %d %d %d\nReordered:  %3$d %1$d %2$d
```

**copyright (optional)** The copyright of the map source.

**license (optional)** The license of the map source.

**license-url (optional)** The URL of the license of the map source.

**zoom-min (optional)** The minimum Tiled Web Map zoom value supported by the tile server. The Default is 0 if not specified.

**zoom-max (optional)** The maximum Tiled Web Map zoom value supported by the tile server. The Default is 18 if not specified.

**lat-min (optional)** The minimum latitude value in degrees supported by the tile server. The Default is -90 degrees if not specified.

**lat-max (optional)** The maximum latitude value in degrees supported by the tile server. The Default is 90 degrees if not specified.

**lon-min (optional)** The minimum longitude value in degrees supported by the tile server. The Default is -180 degrees if not specified.

**lon-max (optional)** The maximum longitude value in degrees supported by the tile server. The Default is 180 degrees if not specified.

**file-extension (optional)** The file extension of the files on disk. The default is *.png*

If the tile source URL ends in something other than .png, then this parameter will need to match it.

This can also be useful in reading a tileset from other software which may name tiles in an alternative form, e.g. for Mobile Atlas creator it names them *.png.tile*

---

**Note**
The file types actually usable are those supported by GDK Pixbuf Library, which includes at least PNG and JPEG.

---

---

**Note**
Remember to include the beginning *'.'* when specifying this parameter.

---

**use-direct-file-access (optional)** Only use files on disk. The default is *FALSE*

This can also be useful for tilesets already on disk as it will avoid attempting to download any tiles.

Thus with this type the *hostname* and *url* parameters are not necessary and are ignored.

**offset-x (optional)** The offset of the map in the x plane (towards east) in metres. The default is 0.0 if not specified.

Use negative numbers to adjust in a westerly direction.

Typical usage would be aligning differing maps, e.g. aerial imagery may be offset from cadastral maps.

Currently this is a single value that applies to all zoom levels.

**offset-y (optional)** The offset of the map in the y plane (towards north) in metres. The default is 0.0 if not specified.

Use negative numbers to adjust in a southerly direction.

**switch-xy (optional)** Swap the X,Y values around in the URL parametrized ordering.

The default is false.

**check-file-server-time (optional)** Sends the timestamp of the tile to the server, so the server can decide whether it should send a new tile or not.

The default is false.

**use-etag (optional)** Use and compare the ETag value in determining whether to download a newer tile. The default is false.

The ETag value is stored in a separate file in the same directory as the tile to enable checking the value across multiple runs of the program.

**referer (optional)** A URL to serve as referer for the HTTP request (eg. "http://hostname/")

**follow-location (optional)** The maximum number of redirects allowed. The default is 0, i.e. no redirection. Use -1 for an unlimited number of redirects.

**tilesize-x (optional)** The tile x size. The default is 256 pixels if not specified.

**tilesize-y (optional)** The tile y size. The default is 256 pixels if not specified.

**scale (optional)** The tile scale. The scale is 1 if not specified.

> **Note**
> Use a value of 2 to represent high res tiles. Don't change the tilesize as the internal display size is still based on 256 pixels.

The `VikTmsMapSource` allows declaration of any TMS service. A TMS (Tile Map Service) is defined in Tile Map Service Specification. The configuration supports the following properties (as per `VikSlippyMapSource` above):

id
label
hostname
url
custom-http-headers (optional)
copyright (optional)
license (optional)
license-url (optional)
check-file-server-time (optional)
follow-location (optional)
referer (optional)
zoom-min (optional)
zoom-max (optional)
lat-min (optional)
lat-max (optional)
lon-min (optional)
lon-max (optional)
file-extension (optional)
scale (optional)
tilesize-x (optional)
tilesize-y (optional)
offset-x (optional)
offset-y (optional)

The `VikWmscMapSource` allows declaration of any WMS or WMS-C service. A WMS (Web Map Service) is defined in WMS Tile Caching. The configuration supports the following properties (as per `VikSlippyMapSource` above):

id
label
hostname
url
custom-http-headers (optional)
copyright (optional)
license (optional)
license-url (optional)
check-file-server-time (optional)
follow-location (optional)
referer (optional)
zoom-min (optional)
zoom-max (optional)
lat-min (optional)
lat-max (optional)
lon-min (optional)
lon-max (optional)
file-extension (optional)
scale (optional)
tilesize-x (optional)
tilesize-y (optional)
offset-x (optional)
offset-y (optional)

## 18.2 Go-to Search Engines

It is possible to add new new search engines for the "Go-To" feature. The file is `goto_tools.xml` placed in your User Configuration File Location.

An example of the file in the distribution `doc/examples/goto_tools.xml`.

Currently, there is a single object class available: `VikGotoXmlTool`. This feature allows one to declare any search engine using a XML format as result.

The related properties are:

**label** the text displayed in the Go-To dialog

**url-format** the parametrized address of the query, in the spirit of C `printf` format, with a single "%s" field (replaced by the query string)

**lat-path** XML path of the latitude (eg. `/root/parent/elem`)

**lat-attr (optional)** name of the attribute (of previous element) containing the latitude

**lon-path** XML path of the longitude (eg. `/root/parent/elem`)

**lon-attr (optional)** name of the attribute (of previous element) containing the longiude

As a facility (or readability) it is possible to set both path and attribute name in a single property, like an XPath expression. To do so, simply set both info in lat-path (or lon-path) in the following format: `/root/parent/elem@attribute`.

## 18.3 External Tools

It is possible to add new external tools. The file is `external_tools.xml` placed in your User Configuration File Location.

An example of the file in the distribution `doc/examples/external_tools.xml`.

The `VikWebtoolCenter` allows one to declare any Webtool using a logic based on center coordinates and zoom level value.

The related properties are: