Getting started with CartoWeb

Creating and customizing a new project

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CartoWeb Introduction

- www.cartoweb.org :
  - CartoWeb is ready-to-use
  - CartoWeb is a framework for building advanced and customized applications

- Easy to configure
  - .ini files
  - Smarty templates
  - Mapserver mapfiles
- Extensible
  - Adding new functionalities using plugins
  - Separating generic and specific development using projects

Summary

1. Getting started
2. Configuration files (.ini)
3. Templates and resources customization
4. Layers definition and hierarchy

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5. Queries and hilight
6. Annotations
7. Print
8. Authentication and access control
9. Table rules

Starting point

- Installation on Windows : see http://cartoweb.org/doc/cw3.3/xhtml/user.install.html#user.install.win32
- Downloads at http://cartoweb.org/downloads.html
- Steps
  - Install WAMP
  - Install Gettext
  - Launch cartoweb-setup-3.3.0.exe
  - Launch cartoweb-demo-setup-3.3.0.exe
  - Restart apache
- Your PC is now in this state.
- Results
  - Folder **`C:/wamp/www/cartoweb3`**
  - http://localhost/cartoweb3/htdocs : web root of CartoWeb
  - http://localhost/cartoweb3/htdocs/client.php : raw development interface
  - http://localhost/cartoweb3/htdocs/demoCW3.php : working demo

Creating the project foss4g

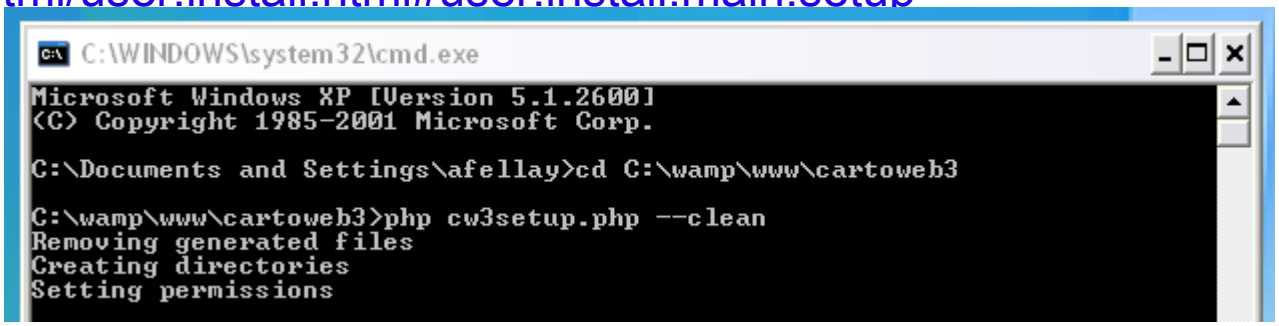
- Geodata installation
  - Unzip the archive data.zip into **`C:/wamp/`**
- Project installation
  - Copy the folder foss4g into **`C:/wamp/www/cartoweb3/projects`**
  - Go to **`C:/wamp/www/cartoweb3/htdocs/`**
  - Make a copy of demoCW3.php with name foss4g.php.
  - Edit it and change the project name.

```
<?php
$_ENV['CW3_PROJECT'] = 'foss4g';
require_once('client.php');
?>
```

- In a production environment, you'd have to configure your web server so that only the folder htdocs is externally visible.
- You still have to launch the setup script.

Setup script cw3setup.php

- See http://cartoweb.org/doc/cw3.3/xhtml/user.install.html#user.install.main.setup
- Open a command window.
- **`cd C:\wamp\www\cartoweb3`**
- **`php cw3setup.php`** + options
- Most current options
  - --help : name and use of all options
  - --clean : deletes all generated files (images, caches)
  - --install : installs CartoWeb
  - --base-url : in conjunction with --install; url giving access to the web root of CartoWeb
  - --project : in conjunction with --install; restricts the action to a project

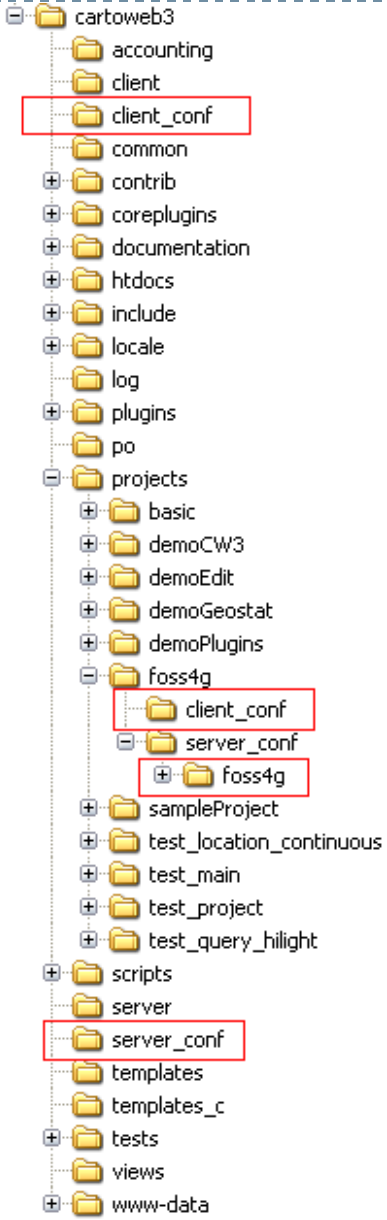


- In our case

```
php cw3setup.php --install --base-url
  http://localhost/cartoweb3/htdocs --project foss4g
```

- You can now access http://localhost/cartoweb3/htdocs/foss4g.php

.ini configuration files



- Locations
  - Upstream .ini files are in the folders client_conf and server_conf.
  - Project .ini files are in the folders foss4g/client_conf (client-side configuration) and foss4g/server_conf/foss4g (server-side configuration).
- How it works
  - If the value of a parameter is given in a project, this value overrides the default value given in the upstream CW configuration files.
  - Otherwise, the upstream value is used.
- Documentation
  - The files and the parameters within are documented in the user manual : http://cartoweb.org/doc/cw3.3/xhtml/cartoweb.user.html

Simple parametrization

- images.ini | client-side

  http://cartoweb.org/doc/cw3.3/xhtml/user.images.html

  - Modify allowed mapsizes, and default mapsize.
- location.ini | client-side

  http://cartoweb.org/doc/cw3.3/xhtml/user.location.html

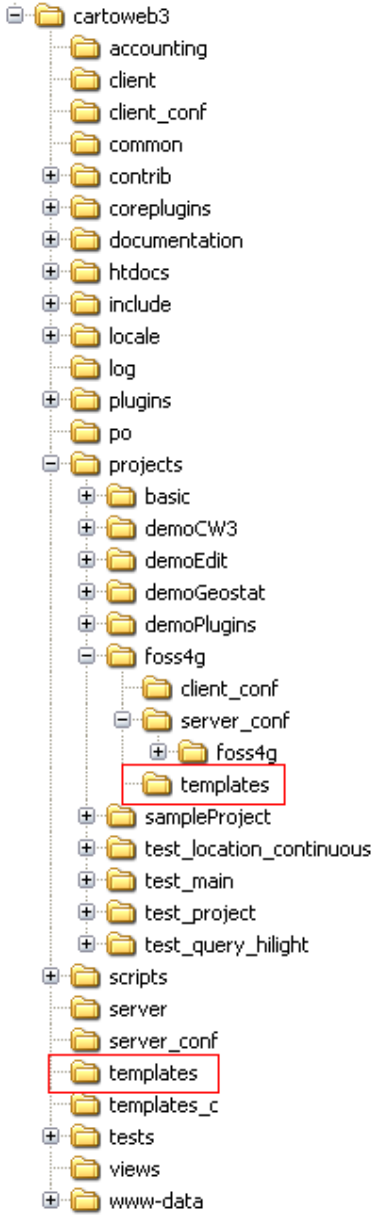
  - Modify panRatio.
  - Hide "recentering on coordinates".
- location.ini | server-side
  - Modify allowed scales, and default scale.
  - Add a new shortcut for Austria.
- Don't forget

```
php cw3setup.php --clean
```

and reset_session

so that your modifications are taken into account.

Templates customization



- Locations
  - Upstream templates are in the folder *templates*.
  - Project templates are in the folder *foss4g/template*.
  - The main template is the file *cartoclient.tpl*.
  - Bits of templates may be handled by the relevant plugins; see e.g. *coreplugins/layers/templates*. More examples later.
- How it works
  - A project template replaces the corresponding upstream template.
- Documentation
  - The handling of the CW Smarty templates is documented in the user manual : http://cartoweb.org/doc/cw3.3/xhtml/user.template.html

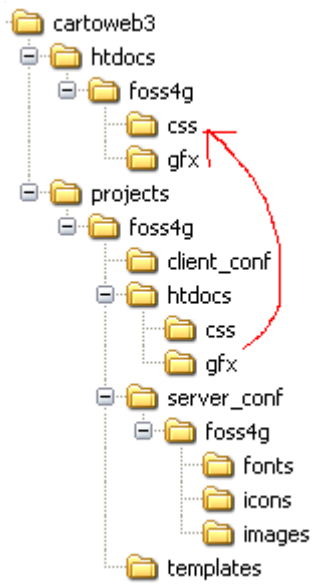
Customizing cartoclient.tpl

- In the project foss4g, create a folder *templates*.
- Copy the upstream main template (*templates/cartoclient.tpl*) into this new folder.
- Edit this file and make your modifications. For example, change the title and remove the debug messages (around line 150).
- You can edit a .tpl file like a simple html, considering the Smarty variables as constants.
- The handling of external resources (images, js, css) is described later.
- Empty the CW caches.

```
php cw3setup.php --clean
```

- If necessary, empty your browser's cache (usually with F5).

Adding resources



- Locations
  - Upstream resources are in the folders *htdocs/gfx* (for images), *htdocs/css* (style sheets) and *htdocs/js* (javascripts).
  - Project resources mirror the upstream hierarchy.
  - Some resources are directly available in the relevant plugins; for instance the icon of the zoom-in tool is to be found at *coreplugins/location/htdocs/gfx/zoomin.gif*.
- How it works
  - Project resources replace the corresponding upstream resources.
  - Resources have to be externally visible (through http), i.e. they must be under the upstream htdocs; the setup script (with the option --install) makes the necessary copies.

Adding resources to cartoclient.tpl

- In the project foss4g, create a folder *htdocs*.
- In this folder, create a folder *gfx* and a folder *css*
- Copy the files *logofoss4g.png* and *logofoss4g.css* into their respective folder
- Edit cartoclient.tpl
  - link the new css (in the head)

```
<link rel="stylesheet" type="text/css" href="{r type=css}foss4g.css{/r}" title="stylesheet" />
```

  - integrate the new image somewhere

```
<img src="{r type=gfx}logofoss4g.png{/r}" alt="foss4g" border="0"/>
```

- These examples demonstrate the use of the resource tags {r}.
- Launch the install script and empty the CW caches

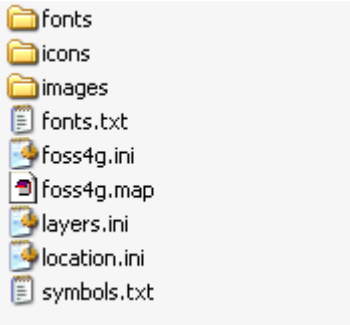
```
php cw3setup.php --install --base-url
  http://localhost/cartoweb3/htdocs --project foss4g
php cw3setup.php --clean
```

- If necessary, empty your browser's cache (usually with F5).

Layers configuration

- Location

- The layer configuration files are in folder server_conf/foss4g.
- These files are
  - the mapfile *foss4g.map* and its annexes (symbols, fonts...),
  - *layers.ini*, defining the hierarchy,
  - *foss4g.ini*, defining the initial state of the application.



- Documentation

- Mapserver deserves a few workshops for its own sake. http://mapserver.gis.umn.edu/docs should be in your bookmarks' list.
- For the CartoWeb part of the configuration, see http://cartoweb.org/doc/cw3.3/xhtml/user.layers.html.

Layers tree

- The layers hierarchy is defined in *layers.ini*.
- Two types of CW layers :
  - Layers : they correspond 1-to-1 to Mapserver layers, defined in the mapfile.
  - LayerGroups : they contain individual Layers or other LayerGroups.
- Thanks to the notion of LayerGroup, a hierarchy with infinite depth is possible (only two levels in Mapserver).
- At the top, there is always a LayerGroup called root.

Parameters for a Layer

- Mandatory :
  - layers.LAYER_ID.className = Layer
  - layers.LAYER_ID.msLayer = mapserver_layer

- Optional :
  - layers.LAYER_ID.label = label
  - layers.LAYER_ID.icon = image file [must be stored in folder icons]
  - layers.LAYER_ID.link = url

Parameters for a LayerGroup

- Mandatory :
  - layers.LAYER_ID.className = LayerGroup
  - layers.LAYER_ID.children = layerId1, layerId2, layerId3
- Optional :
  - layers.LAYER_ID.label = label
  - layers.LAYER_ID.icon = image file
  - layers.LAYER_ID.link = url
  - layers.LAYER_ID.aggregate = true|false
  - layers.LAYER_ID.rendering = tree|block|radio|dropdown

Example of layers.ini

```
layers.root.className = LayerGroup
layers.root.children =  background, contour, physical, human
layers.root.rendering = block

layers.background.className = LayerGroup
layers.background.children = raster, borders
layers.background.rendering = radio
layers.background.label = Background

layers.raster.className = Layer
layers.raster.label = Relief
layers.raster.msLayer = raster

layers.borders.className = Layer
layers.borders.label = Borders
layers.borders.msLayer = borders
.....
```

Initial map state

- Configuration of the initial state of the application (selected layers, location)
- Defined in *foss4g.ini*

  http://cartoweb.org/doc/cw3.3/xhtml/user.config.html#user.config.server.maps_config.initial
- Possible properties for Layers and LayerGroups
  - selected
  - hidden
  - frozen
- Only for LayerGroups
  - unfolded
- Initial location given by a bbox "xmin, ymin, xmax, ymax"

```
mapInfo.initialMapStates.default.location.bbox = "72705, 1620431, 1197822, 2677441"
mapInfo.initialMapStates.default.layers.raster.selected = true
```

Practical exercise

Using the ready-to-use Mapserver layers in the file *layers for mapfile.txt*, build the layers.ini file corresponding to the layers hierarchy described in *layers tree.pdf*.

Structure	Visible label
root	
background	
raster	*Relief*
borders	*Borders*
contour	*Contour lines*
physical	*Physical geography*
hydrography	*Hydrography*
sea	*Sea*
lakes	*Lakes*
rivers	*Rivers*
mountains	*Mountains*
summits	*Summits*
glaciers	*Glaciers*
human	*Human geography*
populated_places	*Populated places*
built_up	*Built-up areas*
towns	*Towns*
transport	*Transports*
railways	*Railways*
airports	*Airports*

Layer group
Layer

Enabling a plugin

- Core plugins are always enabled.
- Extension plugins must be explicitly enabled.
- Client plugins are enabled in *client_conf/client.ini*.

```
loadPlugins = auth, exportPdf
```

- Server plugins are enabled in *server_conf/foss4g/foss4g.ini*.

```
mapInfo.loadPlugins = hilight, exportPdf
```

- Some plugins are both client-side and server-side.

Making a layer queryable

- In mapfile foss4g.map, insert

```
TEMPLATE "ttt"
```

, ttt being a dummy string

  into every queryable layer.

- This enables the standard Mapserver queries and hilight.
- To set which attributes are to be displayed, add a metadata

```
METADATA
  "query_returned_attributes" "spaces separated list"
END
```

- Make the layers included in the list *foss4g queries.pdf* queryable, and set the query_returned_attributes values.
- Documentation

  http://cartoweb.org/doc/cw3.3/xhtml/user.query.html

CartoWeb queries and hilight

- CartoWeb supports persistent queries as well as independent hilighting options for every layer.
- Enable the server plugin hilight.
- Add a *query.ini* file in the server-side configuration, and set

  drawQueryUsingHilight = true
- In the client-side *query.ini*, check that

  persistentQueries = true
- In the mapfile *foss4g.map*, insert into every layer the metadata

  "id_attribute_string" "OGC_FID"
- The data must contain a real ID attribute.

CartoWeb queries and hilight

- You can now define a hilight layer for every queryable layer.
- It is a normal Mapserver layer; it must be named *abc_hilight*, where *abc* is the name of the non-hilighted layer.
- It is not included in the layers hierarchy (layers.ini).
- Depending on the hilight effect you want, it can be included before or after the initial layer.
- You can find ready-to-use hilight layers in the file *hilight layers.txt*.
- Add the new symbol to *symbols.txt*. It is used in the layer airports_hilight.
- Documentation

  http://cartoweb.org/doc/cw3.3/xhtml/user.query.html#user.query.mapfile.hilight

Enabling the outline plugin

- Enable the plugin outline in *client_conf/client.ini.*
- Enable the plugin outline in *server_conf/foss4g/foss4g.ini*.
- Enable the plugin mapOverlay in *server_conf/foss4g/foss4g.ini*.
- Insert the config file outline.ini into *server_conf/foss4g*.
- This file sets the Mapserver layers to be used by the plugin, for points, lines and polygons.
- The corresponding layers (ready-to-use in *outline layers.txt*) must exist in the mapfile.
- You can customize them.
- Try to add new symbols for point features.
- Documentation

  http://cartoweb.org/doc/cw3.3/xhtml/user.annotate.html

Customizing a plugin template

- As an example, we'll remove the hexadecimal color values in the outline tab.
- Copy the upstream outline template (*cartoweb3/plugins/outline/templates/outline.tpl*) in the project. The spelling and the path must be identical.
- Edit the template.
- Empty the caches.

Enabling the PDF export

- Enable the plugin exportPdf in *client_conf/client.ini*.
- Enable the plugin exportPdf in *server_conf/foss4g/foss4g.ini*.
- You need an *exportPdf.ini* (client-side).
- An example is available.
- Starting from this example, try playing around with the blocks, the formats...
- Be sure to test the mode pdfRotate.
- Documentation

  http://cartoweb.org/doc/cw3.3/xhtml/user.pdf.html

Enabling access control

- A security mechanism implementing the concepts of users, roles and permissions is available.
- Enable the plugin auth in *client_conf/client.ini*.
- You need a *auth.ini* file to define the users and their roles.
- An example is provided.
- Try adding new users and new roles.
- The special roles *anonymous*, *loggedIn*, and *all* are pre-built.
- To generate the md5sum of the passwords, this site may come in handy :

  http://pajhome.org.uk/crypt/md5/
- Documentation

  http://cartoweb.org/doc/cw3.3/xhtml/user.security.html

Global access control

- To restrict access to the application to certain users, you have to explicitly give the list of the allowed roles.
- In *client_conf/client.ini*, add a parameter

```
securityAllowedRoles = loggedIn
```

[default is all]

- With this setting, only authenticated users are allowed.

Access control to layers

- It is possible to make some layers available only to some roles.
- You need a *layers.ini* config file on the client-side, with the parameter

```
applySecurity = true
```

- Then go to the mapfile, and, for each protected layer, add the following metadata :

```
METADATA
  "exported_values" "security_view"
  "security_view" "roles list"
END
```

- For a LayerGroup, edit *layers.ini* (server-side), and add

```
layers.LAYER_ID.metadata.security_view = roles list
```

Access control to printing

- Printing may be completely restricted to some users.
- In *exportPdf.ini*, edit the parameter :

```
general.allowedRoles = roles list
```

- You can also restrict the use of some print formats to some users.
- In *exportPdf.ini*, edit the parameters :

```
formats.FORMAT_ID.allowedRoles = roles list
```

Modifying the query results table

- So-called tableRules plugins allow you to modify the content of the query result tables. For example, you can generate hyperlinks, include images, or even make a request to a distant database to display more info about the selected features.
- It's slightly more complex than configuring standard plugins, since you have to write some php code.
- Documentation
  http://cartoweb.org/doc/cw3.3/xhtml/dev.newplugin.html#dev.newplugin.special.tables
- We show here an example on the layer airports, by making an hyperlink with the content of the column NAM.
- Copy the folder *foss4gTableRules* in the *plugins* of the project.
- Enable the plugin foss4gTableRules in *client_conf/client.ini*.

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