

Exercise 6: Basic Map Styling with SLD

Goal

The goal of this exercise is to familiarize yourself with the basics of the WMS and SLD standards, and to integrate the published WMS layers in Leaflet.

Part 1: WMS Requests

In the first part of the exercise you should familiarize yourself with the WMS requests. For this purpose you are going to use a simple Web browser as WMS Client (instead of QGIS).

Make a correct GetCapabilities request (as explained in the course) at the endpoint URL:

http://localhost/cgi-bin/qgis_map_server/qgis_map_serv.cgi? and list the layers and styles that you configured on the server (they should be identical to the names of the layers and styles that you have configured in the previous exercise).

Now copy the GetMap request below in your Web browser. Then change the values of the various parameters and observe the results (Note: since you configured the layer and style names it is possible that none of your configured layers is named „land_ocean_ice” with style “default” - so please use the layers and styles from your configuration).

[http://localhost/cgi-bin/qgis_map_server/qgis_map_serv.cgi?
SERVICE=WMS&Version=1.3.0&REQUEST=GetMap&LAYERS=land_ocean_ice&STYLES=default&BBOX=28.9709,-
26.2812,72.1967,46.7388&FORMAT=image/png&WIDTH=1041&HEIGHT=600&SRS=EPSG:4326](http://localhost/cgi-bin/qgis_map_server/qgis_map_serv.cgi?SERVICE=WMS&Version=1.3.0&REQUEST=GetMap&LAYERS=land_ocean_ice&STYLES=default&BBOX=28.9709,-26.2812,72.1967,46.7388&FORMAT=image/png&WIDTH=1041&HEIGHT=600&SRS=EPSG:4326)

Finally, please create new GetMap requests for a few of the other layers available on the server and test them in the browser.

Part 2: Study and Customize the Published Layers Using SLD

Study the content of the “admin.sld” file generated in exercise 5 and get familiar with the Styled Layer Descriptor syntax for point, line and polygon geometries.

Try different symbolizations (e.g. different colors, eliminate or add Stroke or Fill elements like shown in the lecture) by manually customizing the SLD content and check the results by making new GetMap requests in the web browser.

Part 3: Integration of WMS Layers in your Leaflet Map

Every web mapping framework has a simple way of integrating WMS services and Leaflet is no exception. Based on your experience so far, please study the leaflet documentation about how to integrate the WMS layers that you published. You can use the last version of your map as a starting point. Please add the individual WMS layers in the layer control.

NB: you will not be able to add any of the original raster layers using the WMS. This instance of qgis mapserver cannot reproject raster images. The leaflet framework uses EPSG:3857 and the original raster data are in EPSG:4326 (you might consider reprojecting the raster to serve them as WMS)

Discussion of the Exercise

What could be the two major problems with integrating many tiled WMS layer in a Leaflet map? To illustrate one of the issues, manually add a Text Symbolizer for the cities in the “admin.sld” file and check how your Leaflet map displays the labels (eventually you may have to slightly increase the font size).

Indeed, the main motivation of leaflet is to provide basic functionality that works perfectly, without necessarily supporting every user case. However, WMS layers are widely use for small scale applications and the problems arise in two ways when loading many layers individually from the a same source:

- the default tile size will result in many duplicate labels for vector-backed layers; and
- the browser can be overwhelmed when using a large tile size or displaying many layers at once.

Various workarounds have been proposed to address some of these issues, most notably in [Leaflet.NonTiledLayer](#). A new plugin is being developed to bring all of these concepts and more into a single, comprehensive WMS plugin for Leaflet: (see <https://github.com/heigeo/leaflet.wms>).

Congratulations, you now possess a basic understanding of the WMS and SLD standards and how they can be used in Web mapping!