Map Rendering Beyond Mapnik

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Map Rendering Beyond Mapnik

Motivation

For some reason Openstreetmap and FOSSGIS communities seem to be largely disjoint (at least outside of Germany).

While the former tend to use Mapnik for rendering, the latter usually go for Mapserver or more recently Geoserver.

So let's show the OSM crowd, what Mapserver and Geoserver can do for you :)

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Mapserver
(http://mapserver.org)

Web-mapping-software originally developed at University of Minnesota (UMN), written in C/C++

Basically a WMS and WFS Server available as:

- A cgi/fastcgi binary or apache module.
- Various script-language bindings (Perl, PHP, Python, Ruby, Java, C#).
- Also well suited for serving raster images as WMS

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Mapnik
(http://mapnik.org)

A rendering Library written in C++, not an Application itself.

Programming Interfaces are available for Python, C++ and node.js.

Applications for rendering are e.g. mod_tile+tirex/renderd from Openstreetmap and various python applications.

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Geoserver
(http://geoserver.org)

A java servlet based application server implementing various standards defined by Open Geospatial Consortium (OGC). Examples are WMS, WFS and SLD.

A programming Interface using a REST API is also provided.

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Mapserver rendering example

```
MAP
  OUTPUTFORMAT
    NAME agg
    DRIVER AGG/PNG8
    MIMETYPE "image/png"
  END
  WEB
    METADATA
      "ows_enable_request" "*"
      "wms_title"           "my mapserver"
      "wms_onlineresource" "http://myserver/path/to/mapserv"
      "ows_srs"             "epsg:3857"
    END
  END
  IMAGECOLOR "#FFFFFF"
  PROJECTION
    "init=epsg:3857"
  END
  LAYER
    TYPE POLYGON
    STATUS ON
    NAME "forest"
    GROUP "default"
    CONNECTIONTYPE POSTGIS
    CONNECTION "dbname=osm"
    DATA "way from (select way,osm_id,color from view_osm_forests) as foo using unique osm_id using srid=3857"
    PROCESSING "CLOSE_CONNECTION=DEFER"
    CLASS
      STYLE
        COLOR [color]
      END
    END
  END
END
```

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Mapnik rendering example

```
<?xml version="1.0" encoding="utf-8"?>

<!DOCTYPE Map [
<!ENTITY dbname "osm">
]>

<Map background-color="#FFFFFF" srs="+init=epsg:3857" minimum-version="2.0.0">

<Style name="forest">
    <Rule>
      <PolygonSymbolizer fill="#009900"/>
    </Rule>
</Style>

<Layer name="forest" status="on" srs="+init=epsg:3857">
  <StyleName>forest</StyleName>
  <Datasource>
    <Parameter name="type">postgis</Parameter>
    <Parameter name="dbname">&dbname;</Parameter>
    <Parameter name="estimate_extent">false</Parameter>
    <Parameter name="extent">-20037508,-19929239,20037508,19929239</Parameter>
    <Parameter name="table">(select way from view_osm_forests) as forest</Parameter>
  </Datasource>
</Layer>
</Map>
```

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Geoserver rendering example

```
<?xml version="1.0" encoding="utf-8"?>
<StyledLayerDescriptor version="1.0.0"
 xsi:schemaLocation="http://www.opengis.net/sld StyledLayerDescriptor.xsd"
 xmlns="http://www.opengis.net/sld"
 xmlns:ogc="http://www.opengis.net/ogc"
 xmlns:xlink="http://www.w3.org/1999/xlink"
 xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
  <NamedLayer>
    <Name>forest</Name>
    <UserStyle>
      <Title>Polygon</Title>
      <Abstract>a style for green forest polygons without outline</Abstract>
      <FeatureTypeStyle>
        <Rule>
          <Name>forest</Name>
          <Title>green forest polygons</Title>
          <Abstract>green forest polygons without outline</Abstract>
          <PolygonSymbolizer>
            <Fill>
              <CssParameter name="fill">
                <ogc:PropertyName>color</ogc:PropertyName>
              </CssParameter>
            </Fill>
          </PolygonSymbolizer>
        </Rule>
      </FeatureTypeStyle>
    </UserStyle>
  </NamedLayer>
</StyledLayerDescriptor>
```


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Comparison Table 1(2)

Renderer	**Mapnik**	**Mapserver**	**Geoserver**
Use values from Database for Rendering properties (linewidth, color, ...)	no	yes	yes
Adjustable units of rendered objects (meters, pixels)	no	yes	yes
Adjustable gamma in raster Output (antialiasing)	yes, per layer	Only globally	Not possible in Java2D
Arbitrary SQL queries in style	yes even bbox	yes even bbox	No

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Comparison Table 2(2)

Renderer	**Mapnik**	**Mapserver**	**Geoserver**
Automatic substitution of variables (macro function)	only in xml not carto.css	no	no
Debug output for rendering times per layer	only if compiled in debug mode	yes	no?
Clustering of features in point layers	no	yes	yes via extension
Line offset (left right)	yes, since 2.1	yes	no