



Vector Tiles

Introduction & Usage with OGIS

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- › **Vector tile demo**

- › <https://www.mapbox.com/maps/>



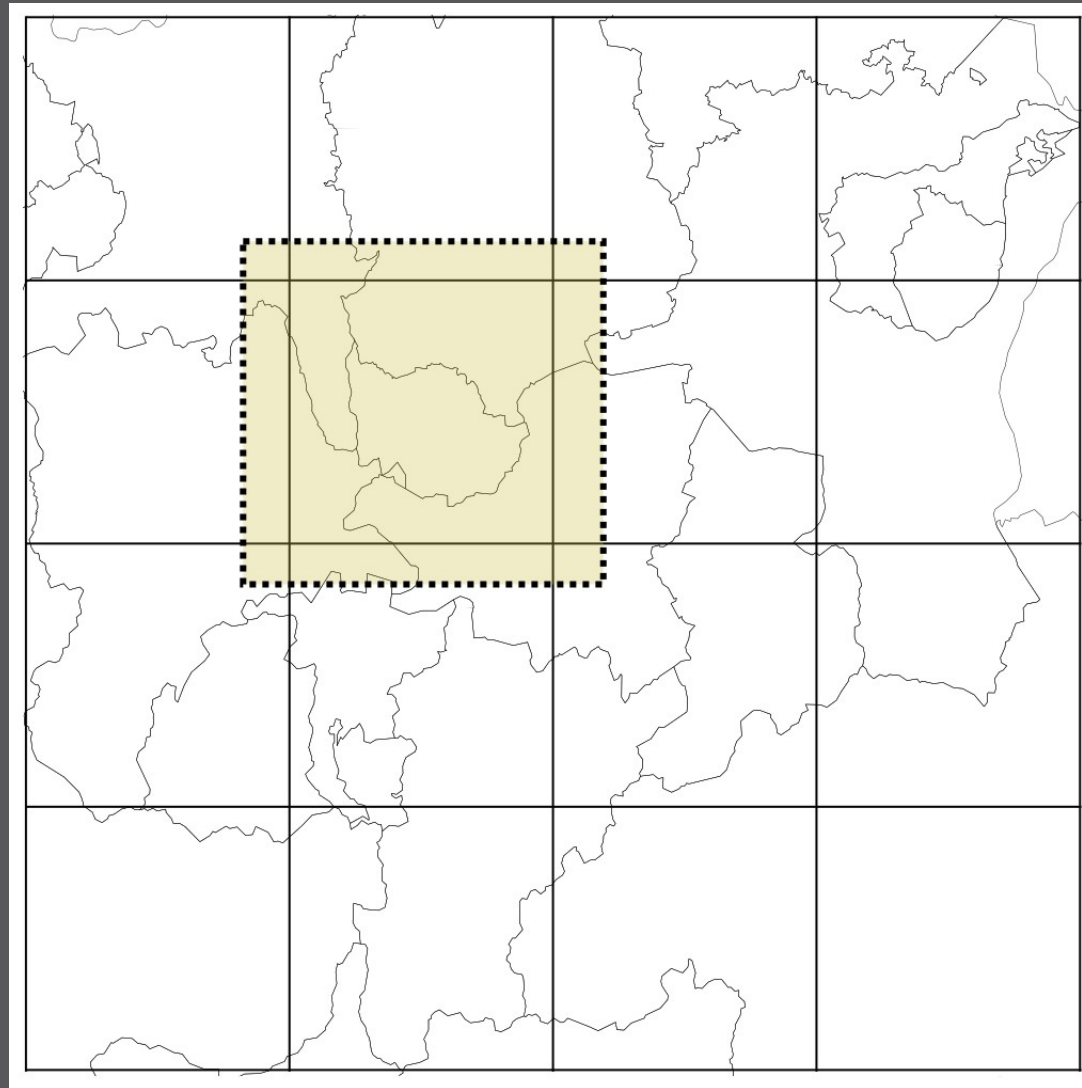
Mapbox Vector Tiles

<https://github.com/mapbox/vector-tile-spec>

- › Protocol buffer format (PBF, binary, Streamable)
- › Tiles 256x256 plus buffer
- › Geometry in screen pixel coordinates (Integers, ZigZag encoded)
- › Multipoint/Multiline/Multipolygon
- › Non-spatial attributes (optional Feature-ID)
- › Multiple layers per tile



Mapbox Vector Tiles





OSM MVT

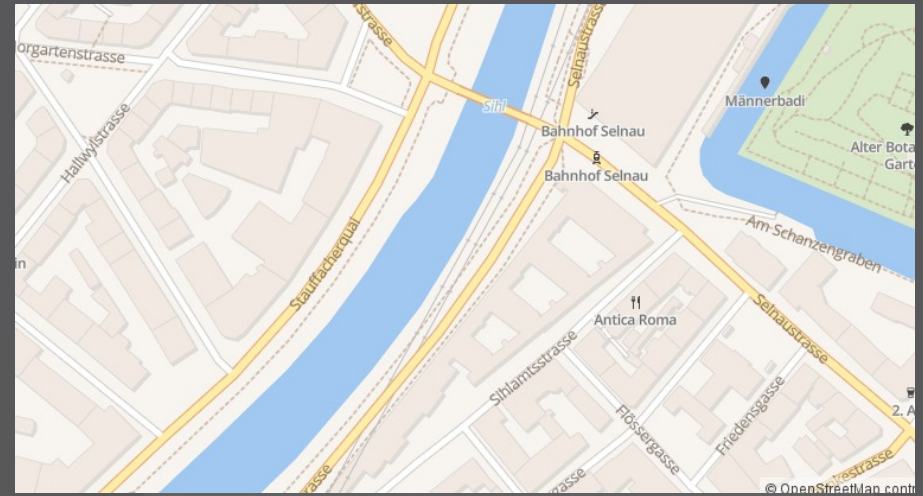
➤ OSM data set:

- Bern: 8.2 MB
- Switzerland: 402 MB
- Planet: 44 GB

➤ Offline maps!

➤ Download & Build-Tools:

- <http://osm2vectortiles.org/>
- <https://openmaptiles.org/>





WMS -> WMTS -> Vector tiles

› WMS

- › No tiling problems (labels, etc.)

› WMTS

- › Scalability
- › Caching (server and client)

› Vector Tiles

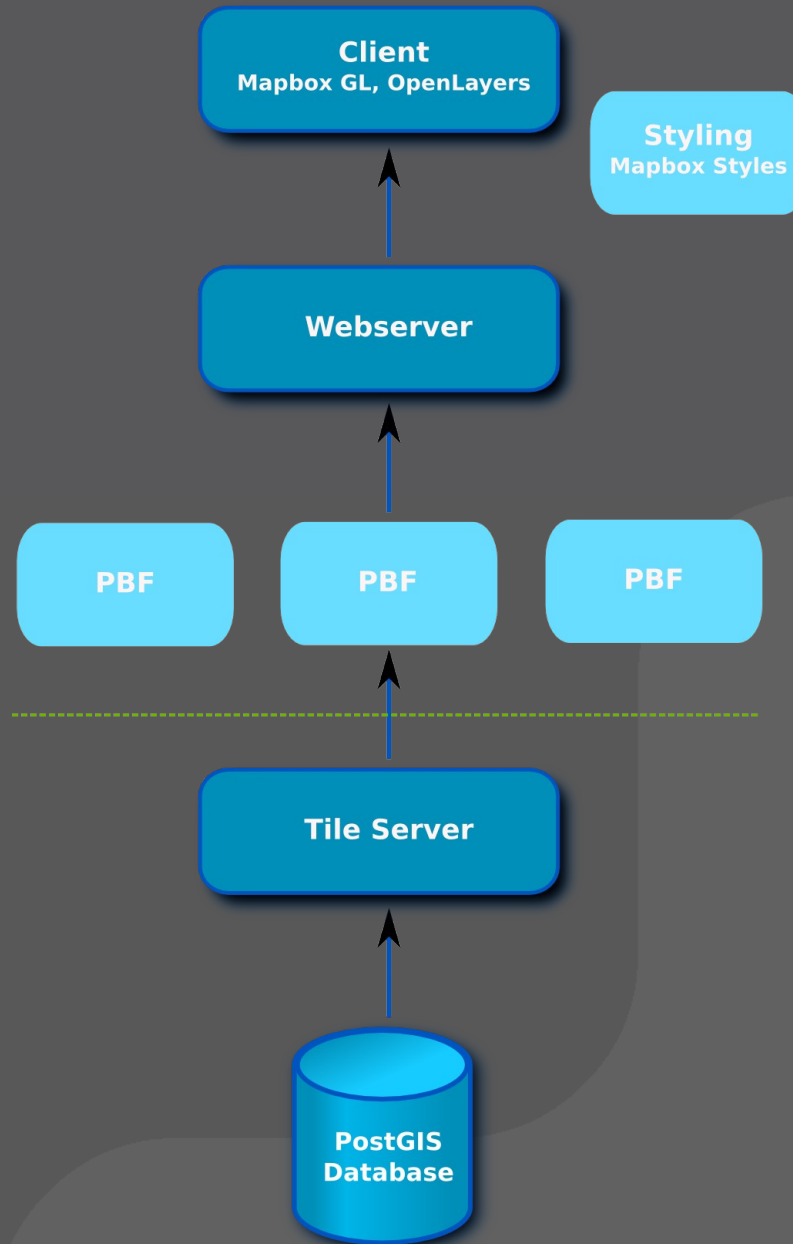
- › Scalability
- › Caching (server and client)
- › Interactivity
- › Flexible styling (client-side rendering)
- › Hi-DPI

Vector tile stack for custom data

- › node-mapnik (Kartotherian, tessera)
- › Tilezen tileserver
- › Tegola
- › t-rex
- › GeoServer
- › PostGIS ST_AsMVT

<https://github.com/mapbox/awesome-vector-tiles>

Vector tile stack for custom data



- › **Auto-detection of layers in PostGIS database**
- › **Built-in viewers for data display and inspection**
- › **Tile generation command with simple parallelization**
- › **Automatic reprojection to grid CRS**
- › **Support for custom tile grids**
- › **Single executable**



Workflow with t-rex (1)

› Installation:

- › Download binary from <https://github.com/pka/t-rex/releases>
- › Unzip

› Start server:

```
t_rex serve --dbconn postgresql://user@host/database
```



Workflow with t-rex (2)

The screenshot shows the T-Rex Vector Tile Viewer interface. The browser address bar displays the URL `127.0.0.1:6767/#`. The interface includes a sidebar on the left with a list of tile sets, a main content area with tabs for 'Info', 'Mapbox GL', 'OpenLayers', 'X-Ray', and 'Inspector', and a bottom section for code snippets.

Tile sets:

- admin_0_countries
 - admin_0_countries
- ne_10m_populated_places
 - ne_10m_populated_places
- ne_10m_populated_places_wgs84
 - ne_10m_populated_places_wgs84
- ne_10m_rivers_lake_centerlines
 - ne_10m_rivers_lake_centerlines
- ne_110m_admin_0_countries
 - ne_110m_admin_0_countries
- rivers_lake_centerlines
 - rivers_lake_centerlines

Tileset: admin_0_countries

Layers:

- admin_0_countries (POLYGON)

Endpoints:

- Tiles: http://127.0.0.1:6767/admin_0_countries/{z}/{x}/{y}.pbf
- Style JSON: http://127.0.0.1:6767/admin_0_countries.style.json
- TileJSON: http://127.0.0.1:6767/admin_0_countries.json
- Style map with [Maputnik](#)

Snippets:

- [MapBox GL JS](#)
- [OpenLayers](#)

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset='utf-8' />
    <title></title>
    <meta name='viewport' content='initial-scale=1,maximum-scale=1,user-scalable=no' />
    <script src='https://api.tiles.mapbox.com/mapbox-gl-js/v0.38.0/mapbox-gl.js'></script>
    <link href='https://api.tiles.mapbox.com/mapbox-gl-js/v0.38.0/mapbox-gl.css' rel='stylesheet' />
    <style>
      body { margin:0; padding:0; }
      #map { position:absolute; top:0; bottom:0; width:100%; }
    </style>
  </head>
```



Workflow with t-rex (3)

› Generate a configuration template:

```
t_rex genconfig --dbconn postgresql://user@host/database
```

› Run with configuration file:

```
t_rex serve --config myconfig.cfg
```



Workflow with t-rex (4)

› Generate tile cache:

```
t_rex generate --config myconfig.cfg
```

› Create MBTiles File:

```
mb-util --image_format=pbfs /tmp/mvtcache/ne ne.mbtiles
```



Styling / viewer

- › **Mapbox Styles (JSON)**
 - › Viewer:
 - › Mapbox GL JS
 - › OpenLayers 3/4
 - › Style Editor (OSS)
 - › Maputnik
- › **Mapzen Tangram Styles (YAML)**
 - › Viewer:
 - › Tangram
 - › Style Editor (OSS)
 - › Tangram Play



QGIS Plugin: Vector Tiles Reader

Server | File

Path

ID	Min. Zoom	Max. Zoom	Description
osm	12	12	

Options

- Loaded tile limit (Current extent: 4 tiles)
- Cartographic layer ordering
- Load mask layer
- Merge Tiles (slow)
- Clip each tile at bounds

Zoom Max. Zoom (12)
 (12 - 12)

- Apply predefined OpenMapTiles style

Keep dialog open

Martin Boos, HSR



OGIS Anwendertreffen 2017

More infos: <http://sourcepole.ch/kurse>



Danke!

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