Vector Tiles

Introduction & Usage with QGIS

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Demo

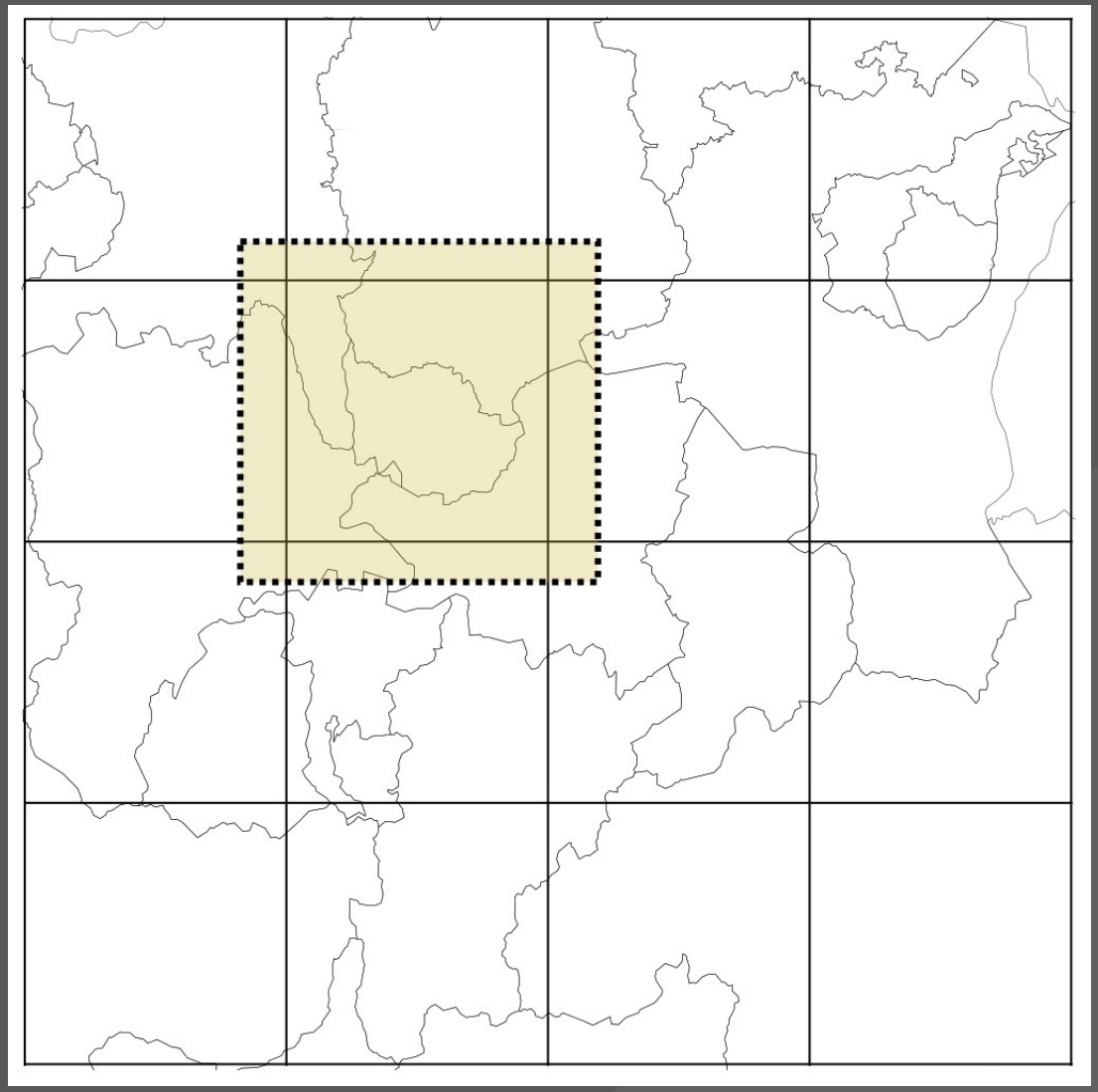
- **Vector tile demo**
  - https://www.mapbox.com/maps/

Mapbox Vector Tiles

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

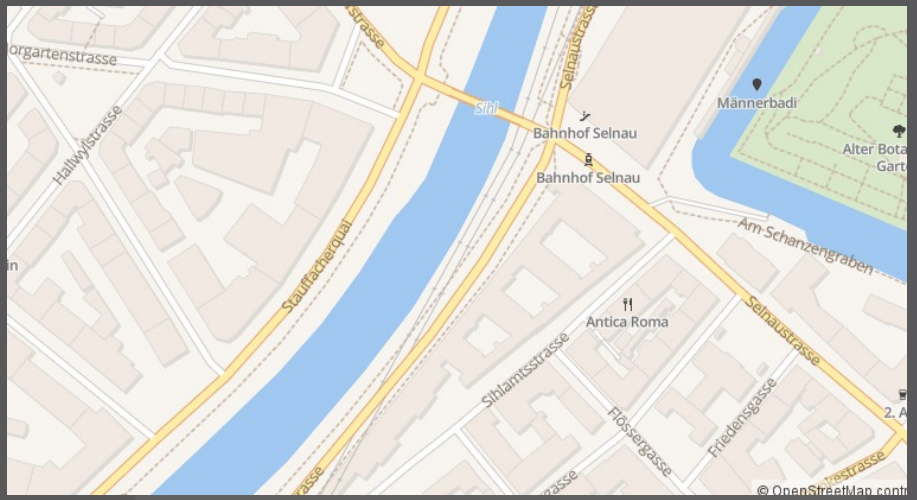
- Protocol buffer format (PBF, binary, Streamable)
- Tiles 256x256 plus buffer
- Geometry in screen pixel coordinates (Integers, ZigZag encoded)
- Multipoint/Multiline/Multipolygon
- Non-spatial attributes (optional Feature-ID)
- Multiple layers per tile

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

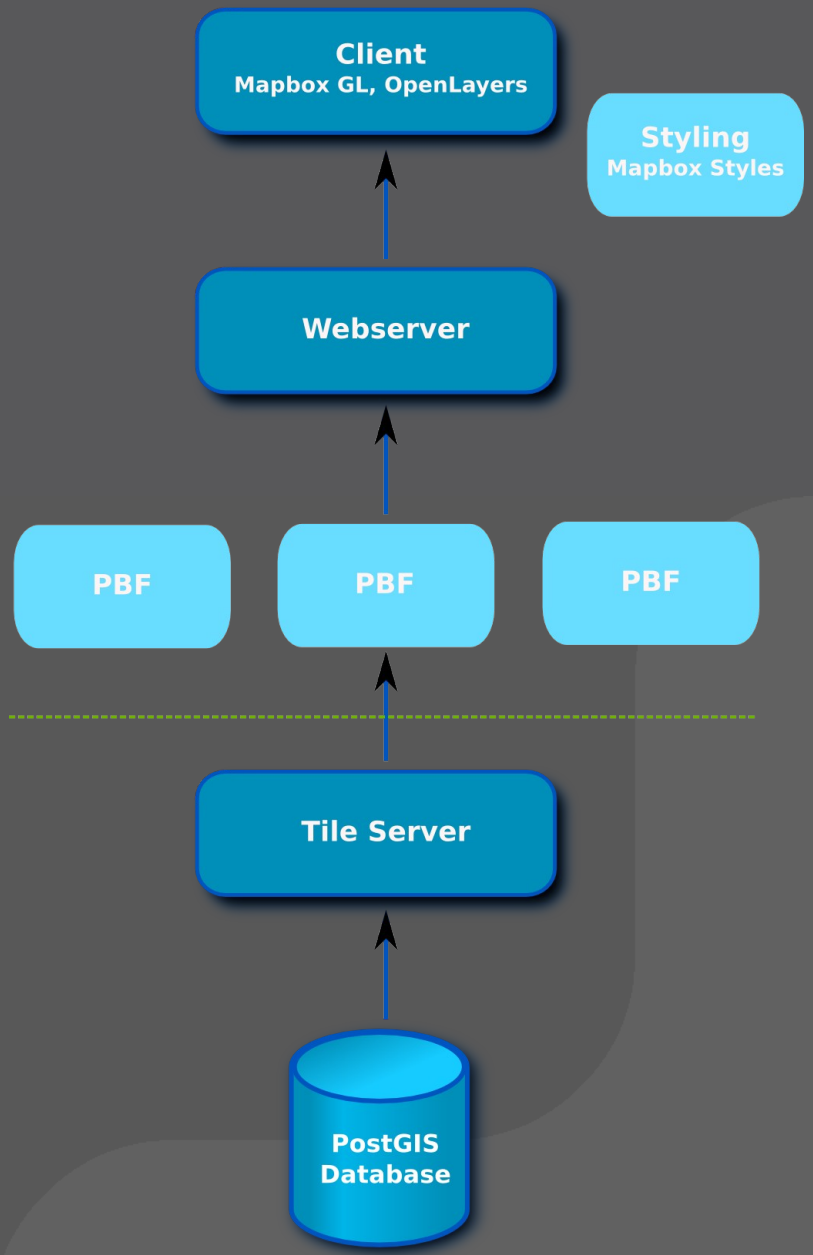
- **WMS**
  - No tiling problems (labels, etc.)
- **WMTS**
  - Scalability
  - Caching (server and client)
- **Vector Tiles**
  - Scalability
  - Caching (server and client)
  - Interactivity
  - Flexible styling (client-side rendering)
  - Hi-DPI

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



t-rex

- 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

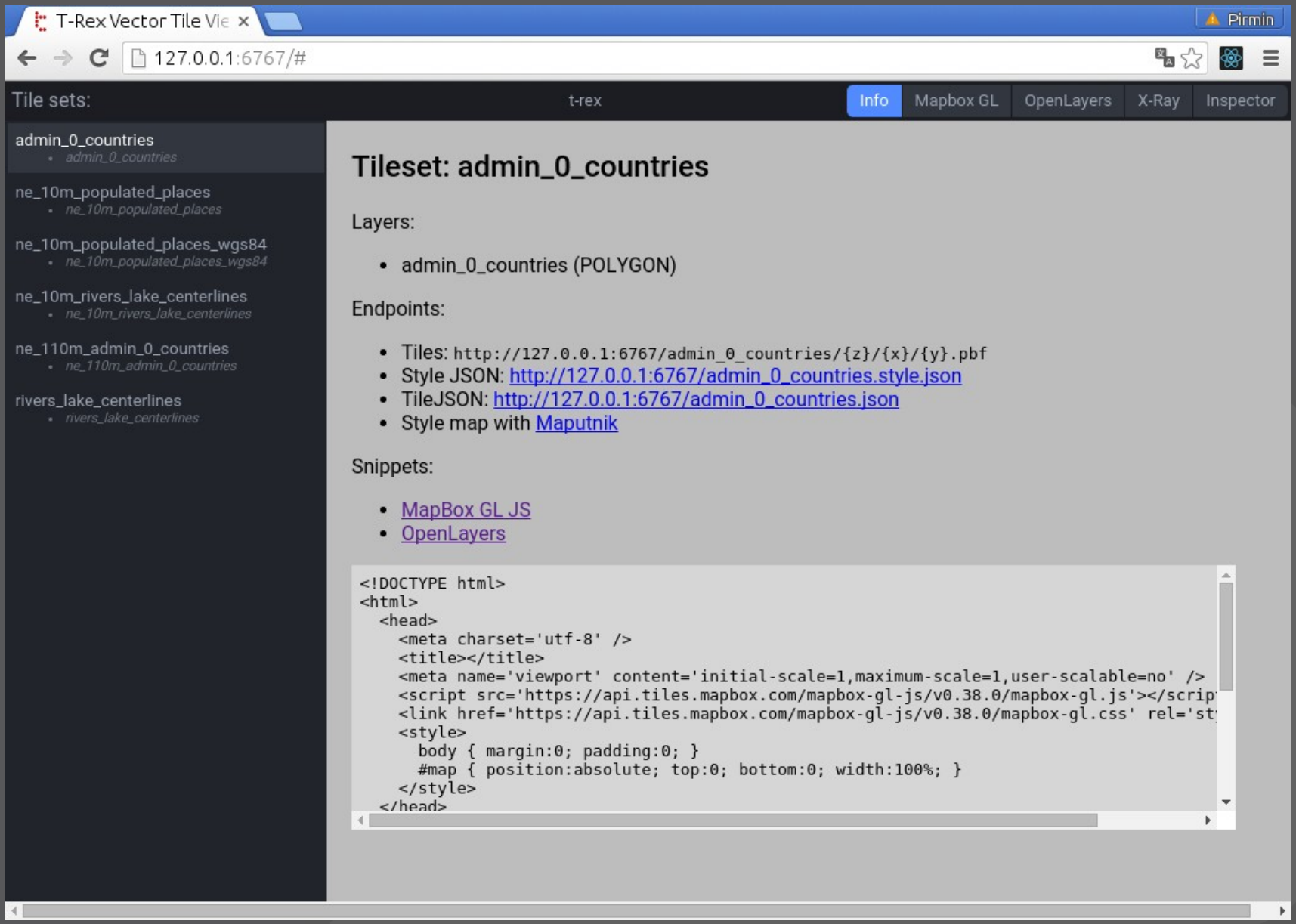
Workflow with t-rex (1)

- **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)



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
```

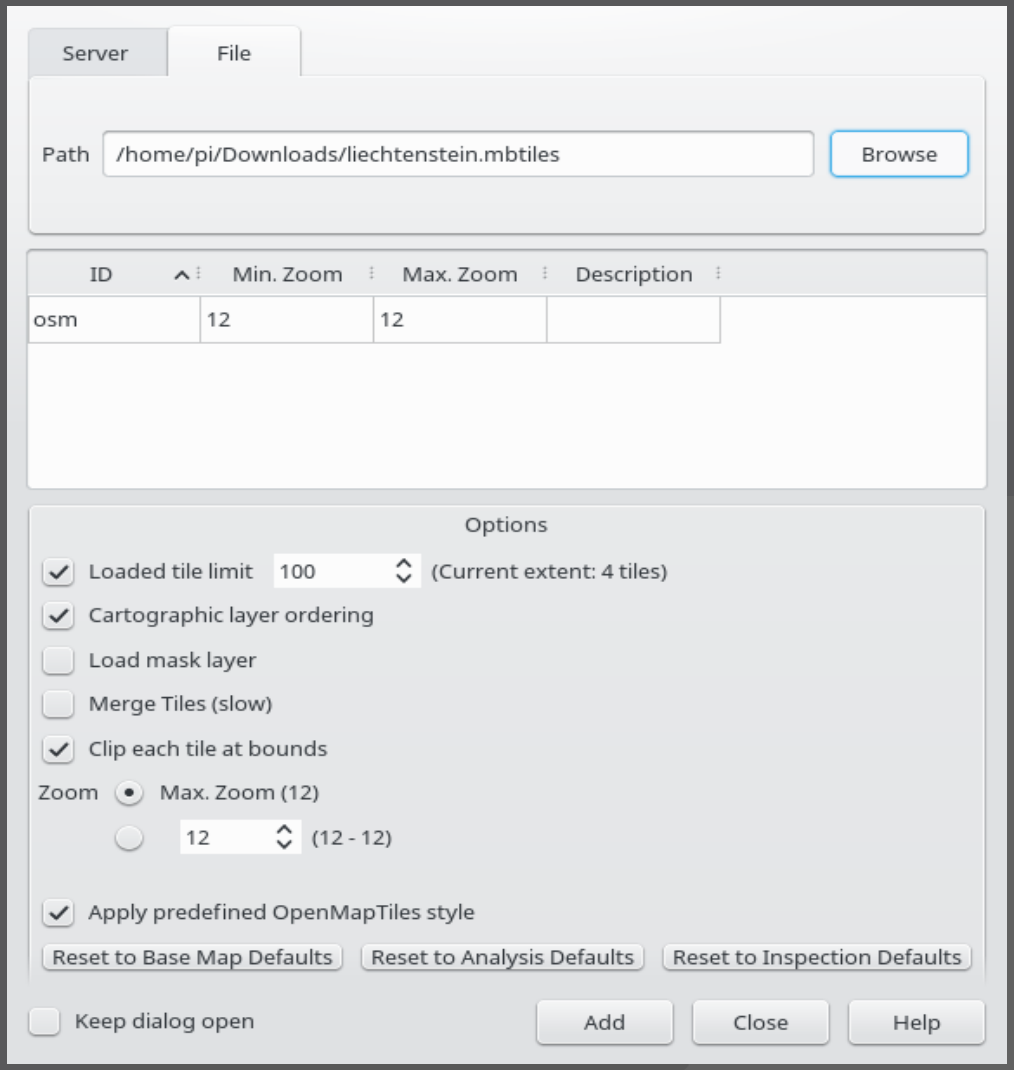
- **Create MBTiles File:**

```
mb-util --image_format=pbf /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



Martin Boos, HSR

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

Danke!

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