OSM Carto as vector tiles

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Vector tiles

- Pyramid and zoom levels
- Individual tiles are available on Z/X/Y address
- Maps are available in Pseudo-Mercator projection (EPSG:3857)

Vector tiles

- Protocolbuffer Binary Format (pbf)

- Map size
  - World: 93 GB
  - Italy: 2.6 GB
  - Firenze: 40 MB

- Map style is rendered on client side
Style for vector tiles

- The look of the map is defined in `style.json` file that is rendered on the client side. (GL Style Specification)

- The `style.json` file contains:
  - layers
  - sources
  - glyphs
  - sprite
  - metadata
  - …

```json
1  { 
2    "id": "basic",
3    "name": "Basic",
4    "center": [ 
5      45.77,
6      3.08
7    ],
8    "zoom": 8,
9    "pitch": 0,
10   "bearing": 0,
11   "glyphs": "#",
12   "layers": [ ⋯ ],
13   "metadata": { ⋯ },
14   "sources": { ⋯ },
15   "version": 1,
16  }
```
Style editor

Create infinite number of styles with the same data!

https://cloud.mapbox.com/maps/
Languages

- Labels can be dynamically changed
- More than 70 languages supported in OpenMapTiles
Disputed borders

"filter": [
  "all",
  ["==", "admin_level", 2],
  ["==", "disputed", 1],
  ["==", "maritime", 1]
]
OpenMapTiles

- **Cartographic schema** for vector tiles
- Community-driven **open-source project**
- Applicable to any data source
  - OpenStreetMap
  - Wikidata
  - Natural Earth
- OpenMapTiles v3.13 (05-01-2022)
  - Tomas Pohanka and other contributors
- OpenMapTiles v3.14 (this fall)

[https://openmaptiles.org/](https://openmaptiles.org/)
[https://github.com/openmaptiles](https://github.com/openmaptiles)
OpenStreetMap Carto style

MapTiler Cloud
API for developers

maptiler.com/maps/openstreetmap/
Preparation

Adaptation of OSM Carto style to the OpenMapTiles schema

Collection of map properties (colors, textures, sizes, icons)

Preparing cartography on MapTiler Cloud

Collaborative work on Github in thematic branches
Colors (fill-color line-color icon-color)
Textures (fill-pattern)

["match",
"get", "subclass"],
"allotments",
"bare_rock",
"rock_overlay",
"beach",
"bog",
"wetland_bog",
"scrub",
"forest",
"leaftype_unknown",
"garden",
"plant_nursery",
"mangrove",
"wetland_mangrove",
"marsh",
"wetland_marsh",
"orchard",
"plant_nursery",
"reedbed",
"wetland_reed",
...
Landuse

["match",
 ["get", "class"],
 "railway",
 "#ebdbe8",
 "residential",
 "#e0dfdf",
 "cemetery",
 "#aacbaf",
 "military",
 "#fceaea",
 "commercial",
 "#f2dad9",
 "industrial",
 "#ebdbe8",
 "garages",
 "#dfddce",
 "retail",
 ...

["match",
 ["get", "class"],
 "military",
 "military_red_hatch",
 "cemetery",
 "grave_yard_generic",
 ""]

Icons (icon-image)

"icon-image": "{subclass}"

305 SVG icons

1 image sprite
"layout": {
    "text-font": ["Open Sans Semibold", "Open Sans Regular"],
    "text-size": {
        "base": 1.2,
        "stops": [
            [11, 10],
            [14, 14],
            [18, 16]
        ]
    },
    "text-field": "{name:latin}\n{name:nonlatin}"
},
"visibility": "visible",
"symbol-spacing": 150,
"text-max-width": 10,
"text-transform": "none"
Map usage

- **Vector tiles** *(style.json)*
- **Raster tiles** *(xyz)*
- **WMTS service**
- **Static maps API** *(PNG)*
3D map via MapLibre!
Vector tiles in QGIS

- MapTiler plugin for QGIS
- Change symbology
- Use the map as a basemap for your project in QGIS
- Print OpenStreetMap in high resolution!

[GitHub repository](https://github.com/maptiler/qgis-maptiler-plugin)
Open-source

MapLibre
https://maplibre.org/

OpenMapTiles
https://openmaptiles.org/

QGIS (tuiles vectorielles)
https://github.com/maptiler/qgis-maptiler-plugin
Ongoing discussion with the OpenStreetMap Foundation

OpenMapTiles schema for maps on openstreetmap.org

Carto style as open-source
Thanks!

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