

Come Make a Map!

Completely Custom, Open Source Maps with TileMill



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Open Source Bridge 2013 • Portland, Oregon



tinyurl.com/tilemill

Your Host

- I work for MapBox
- I don't have a traditional GIS background
- Bit of an amateur map-maker
- Mostly doing iOS dev these days
- ~14 years contributing to open source

MapBox

- Ecosystem around fast, beautiful maps
- We charge for cloud hosting (high availability)
- Produce lots of open source code

MapBox

mapbox (MapBox) · GitHub

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Repositories Members Find a Repository... All Sources Forks Mirrors

mapbox.js MapBox Javascript API Last updated an hour ago JavaScript ★ 288 ⚡ 65

tilemill A modern map design studio. Last updated 15 hours ago JavaScript ★ 1,349 ⚡ 181

tilemill-builder-osx Build script for portable, complete Mac version of TileMill Last updated 15 hours ago Shell ★ 3 ⚡ 0

maki POI Icon Set Last updated 16 hours ago JavaScript ★ 505 ⚡ 49

tilelive-vector JavaScript ★ 12 ⚡ 3

MapBox mapbox

Washington DC <http://www.mapbox.com> Joined on Feb 04, 2011

116 public repos 26 members

Goal: Custom Map

- Portland food carts
 - Over 500 licensed
 - Carts, streets, transit, parks, ATMs
- Mobile
- Interactive
- Offline-capable



caroundtheworld.com

Types of Geo Data

- Shapefile - vector, proprietary, common
- GeoJSON - simple text
- KML - XML, kinda sprawly
- Rasters/GeoTIFF (pixel data)
- OpenStreetMap (XML/PBF)
- SQLite (not necessary geo)
- PostGIS (geo RDBMS)



Getting Data

- Open government - civicapps.org, developer.trimet.org
- Create your own
 - GeoJSON
 - KML (XML)
- Cart data: foodcartsportland.com map (KML export)

Geo Utilities

- GDAL - gdal.org
 - MIT-licensed open source
 - Command-line tools & libraries
- Quantum GIS- qgis.org
 - GPL-licensed open source
 - “GIS system”



TileMill

- Geographic design studio
- BSD-licensed open source
- Node.js (yes, on the desktop)
- Runs on Linux, Mac, Windows
- mapbox.com/tilemill



TileMill

Geography Class

style.mss X labels.mss X rainbow.mss X +

```

1  ****
2
3 This file is responsible for assigning colors to each country. Color
4 assignment is mostly manual. Not taking advantage of Natural Earth's
5 'MAP_COLOR' field because it did not exist when I started, and at any
6 rate I want a smaller palette :)
7 ****
8
9
10 @white: #F0F8FF; /* blue-tinted, for Antarctica */
11 @red: #fdaf6b;
12 @orange: #fdc663;
13 @yellow: #fae364;
14 @green: #d3e46f;
15 @turquoise: #aadb78;
16 @blue: #a3cec5;
17 @purple: #ceb5cf;
18 @pink: #f3c1d3;
19 @f00: #f00;
20
21 /* Coastlines */
22 #country::land-glow-inner[zoom>=0] {
23   line-color:@line;
24   line-opacity:0.8;
25   line-join:round;
26   [zoom=0] { line-width:1.2; }
27   [zoom=1] { line-width:1.6; }
28   [zoom=2] { line-width:2; }
29   [zoom>2] { line-width:2.4; }
30 }
31
32 #country::land-glow-outer[zoom>1] {
33   line-color:@line;
34   line-width:5;
35   line-opacity:0.1;
36   line-join:round;
37 }
38
39 #country::fill[zoom>=0] {
40   [ADM0_A3='ABW'] { polygon-fill:@purple; }
41   [ADM0_A3='AFG'] { polygon-fill:@red; }
42   [ADM0_A3='AGO'] { polygon-fill:@yellow; }
43   [ADM0_A3='AIA'] { polygon-fill:@blue; }
44   [ADM0_A3='ALB'] { polygon-fill:@purple; }

```

Layers

- #country-interaction
- #paper
- #cities
- #country-name
- #geo-lines
- #glacier
- #admin-0-line-land.border.country
- #admin-0-line-disputed.border.disputed

ZOOM 4

Editor Projects Manual Plugins Settings

Save Export

★ country capital city

CartoCSS

- It's like, well, CSS
- Reference at mapbox.com/carto
- Allows for realtime editing of features

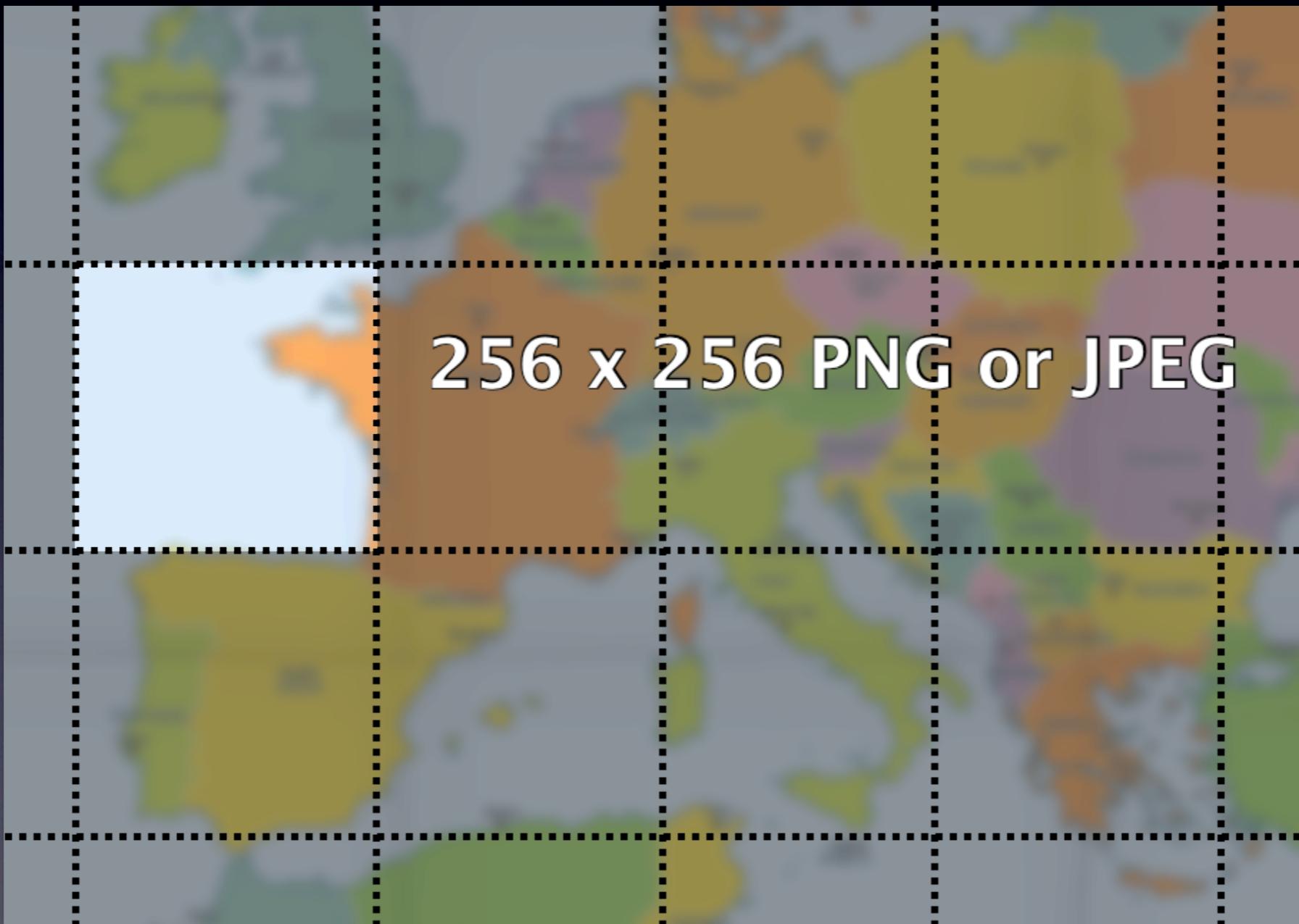
```
#streets {  
  line-width: 1.0;  
  line-color: gray;  
  line-opacity: 0.5;  
  
  [zoom >= 17] {  
    line-width: 10.0;  
    text-name: "[STREETNAME]";  
    text-face-name: "Verdana Regular";  
    text-fill: white;  
    text-opacity: 0.5;  
    text-min-distance: 200.0;  
    text-placement: line;  
  }  
  
  [zoom = 18] {  
    line-width: 20.0;  
  }  
  
  [zoom >= 19] {  
    line-width: 30.0;  
  }  
}
```

Packaging & Distributing

- Size
- Ease of transfer
- Robustness
- Cross-platform capability

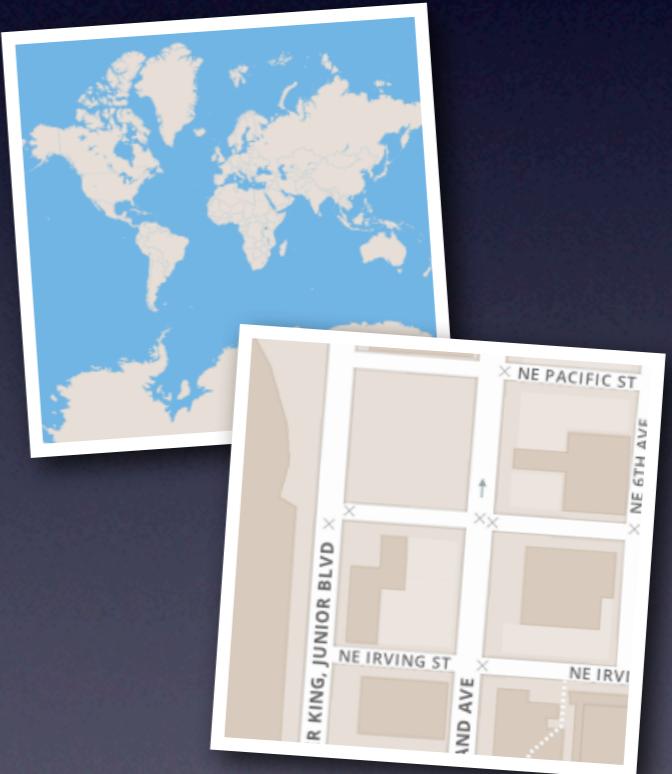


Map Tiles



The Problem With Tiles

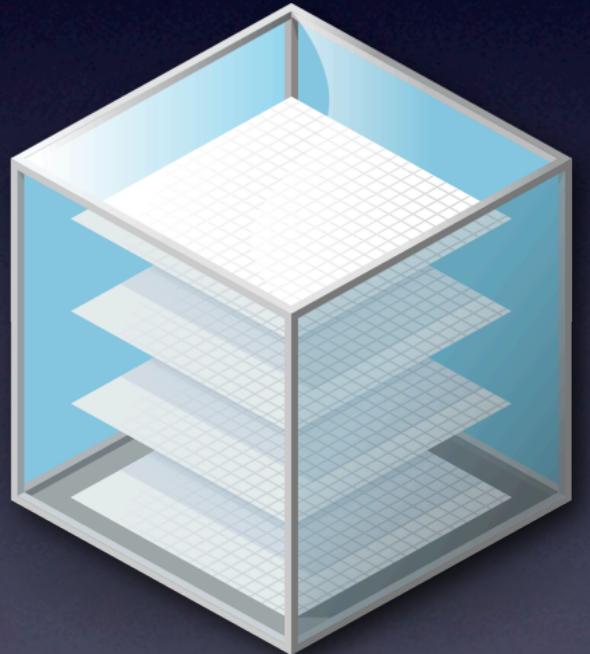
- Can easily number in the millions
- Zoom level 0
 - One 256x256 tile (4^0)
- Zoom level 17
 - **17,179,869,184** tiles (4^{17})
- Difficult to transfer reliably





What is MBTiles?

- Originated from this scale problem
 - Especially on mobile (USB & net)
 - Essentially just SQLite with blobs
 - Index by tile **z/x/y**
 - Add metadata, optimizations



Mobile Use

- MBTiles works for tile serving
 - MapBox cloud hosting, TileStache
- But what about offline use?
 - MBTiles can be used directly!
 - MapBox iOS SDK (BSD-licensed)



Let's Make a Map!

Conclusion

- The open source toolchain is there
- Portability problems have been solved
- The democratization of maps is at hand!
- Also: maps are fun



Thanks!

- Reach me: justin@mapbox.com and [@incanus77](https://twitter.com/incanus77)
- MapBox: mapbox.com and [@mapbox](https://twitter.com/mapbox)
- Slides and project files up at github.com/incanus/osb13

