

MapOSMatic: city maps for the masses

Thomas & Maxime PETAZZONI

SOTM

July 11th, 2010



Outline

- ① The story
- ② MapOSMatic
- ③ Behind the web page
- ④ Pain points
- ⑤ Future work
- ⑥ Conclusion

Who we are

Thomas

Embedded Linux engineer at
Free-Electrons

Maxime

Embedded Linux engineer at
MontaVista Software

The others: David Decotigny, David Mentré, Frédéric Lehobey, Gaël Utard, Pierre Mauduit, Maxime Hadjinlian, and a dozen other contributors!

Original idea

« It would be great to be able to use OpenStreetMap data to generate city maps such as the ones we can see in town signs and in folded maps. »

Gilles Lamiral, OSM contributor of Bretagne, France

Public city maps



Folded maps



History

- Most of the development takes place through *hackfests*:
 - gatherings of 4-6 hackers during a week;
 - dedicated to the development of MapOSMatic.

- **Initial hackfest in August 2009:**
 - Six OSM contributors, no knowledge of PostgreSQL, PostGIS, Mapnik and OSM data structure, and in just five days, MapOSMatic was born
 - Limited to France, no support for languages other than French and English, very basic user interface, OSM data never updated

History (2)

- **Second hackfest in December 2009:**
 - Worldwide coverage, daily updates, i18n infrastructure, revamped user interface, Nominatim-based search, amenities in index

- **Third hackfest to take place in August 2010!**
- Regular but low-traffic development outside the hackfests (UI improvements, R-to-L languages support, etc.)

Features

- **On-demand rendering** of city maps, composed of a Mapnik rendering of the location overlaid by a grid, and an index of the streets and amenities geo-referenced with the grid.
- Outputs to PDF, SVG and PNG. CSV also available for the index.
- Locations are specified:
 - by **administrative boundaries**. We rely on Nominatim to find the association between a city name and the corresponding administrative boundary. The knowledge of the shape of the city allows us to shade out areas outside of the city;
 - or by **geographic coordinates** with a slippy map.
- Language-dependent processing of street names to provide useful sorting.
 - *Rue du Moulin* → *Moulin (Rue du)*, under letter *M*
- All code available under the Affero GPLv3 licence

Home page

MapOSMatic

Your free city maps!

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Introduction

MapOSMatic is a free software web service that allows you to generate maps of cities using [OpenStreetMap](#) data. A city map is made of two pages:


- The map itself, splitted in squares allowing to easily look for streets;
- An index of the streets with references to the squares on the map.

The generated maps are available in PNG, PDF and SVG formats and are ready to be printed.


As the data used to generate maps is coming from [OpenStreetMap](#), you can freely (under the [terms of OpenStreetMap license](#)) reuse, sell, modify, ... the generated maps.

[➔ Create map](#)

[📄 More details](#)




City Map
PNG - PDF - SVGZ



Streets index
PNG - PDF - SVGZ

Random map



crozon

Latest news

- MapOSMatic talk at Libre Software Meeting, France
published 1 month, 2 weeks ago
- Recent updates in MapOSMatic
published 3 months, 1 week ago
- MapOSMatic talk proposal submitted for SOTM 2010
published 3 months, 2 weeks ago
- Two months of MapOSMatic improvements
published 3 months, 3 weeks ago
- Major improvements to MapOSMatic
published 5 months, 3 weeks ago

Contact

Mail: contact@maposmatic.org
IRC: #maposmatic on irc.freenode.net

Thomas & Maxime PETAZZONI (SOTM)

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Map creation: selecting a city

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Generate your own map

MapOSMatic covers the whole world but we need contributors to translate and adapt the few parts of MapOSMatic that are country specific.

To select the city to be rendered, two modes are available:

- Using an administrative boundary. It allows to get a map with precise boundaries of the city when such limits are available in the database. Otherwise, you need to use a bounding box.
- Using a traditional bounding box.

Once the rendering is submitted, you will be brought to a page giving the status of your rendering request. As soon as the rendering is completed (that might take some time depending on the queue length), this page will contain links to the generated map.

Area selection mode:

- Administrative boundary
 Bounding box

City name:

- Girona, Catalunya, España
- Girona, Catalunya, España
- Girona, Catalunya, España, Europe

Wondering why you can't choose some of these results?
Their administrative boundaries are missing from the OSM database.
Look at the [FAQ](#) for more details.

Random map



Port-au-Prince

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Map creation: select an index language, and go!

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Area selection mode:

Administrative boundary
 Bounding box


City name:

Girona, Catalunya, España

Map Index Language: Espanya (CA)

Generate

Random map



Port-au-Prince

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Map creation, by bounding box

- Administrative boundary
- Bounding box

Title of the map:

 Map Index Language:

Bounding box:


 →

Latitude and longitude of the top left and bottom right corners of the area to render.

You can use **shift+drag** to zoom on a specific area of the map. If you only want to render part of what the slippy map shows, you can use **control+drag** to draw the limits of the area to render.

Illingen, Enzkreis, Regierungsbezirk
Karlsruhe, Baden-Württemberg,
Deutschland

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Rendering queue


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English


Girona, Catalunya, España



Rendering:
Rendering submitted Wednesday 30 Jun 2010, 15:07:36.
In queue, position 1.

» Refresh the status (the page will refresh automatically every 10 seconds until the rendering is completed).

Random map



Dortmund Nord

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Rendering results


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Girona, Catalunya, España

 You have been redirected to a similar map, rendered less than 24 hours ago.




Rendering:


Rendering submitted Wednesday 30 Jun 2010, 15:30:24.
Completed on Wednesday 30 Jun 2010, 15:32:00 (rendering took 1 minute).

Files:

- Map: [PNG](#) (7.9 MB), [SVGZ](#) (7.4 MB), [PDF](#) (12.0 MB)
- Index: [PNG](#) (3.9 MB), [SVGZ](#) (228.4 KB), [PDF](#) (51.2 KB), [CSV](#) (35.7 KB).



Random map



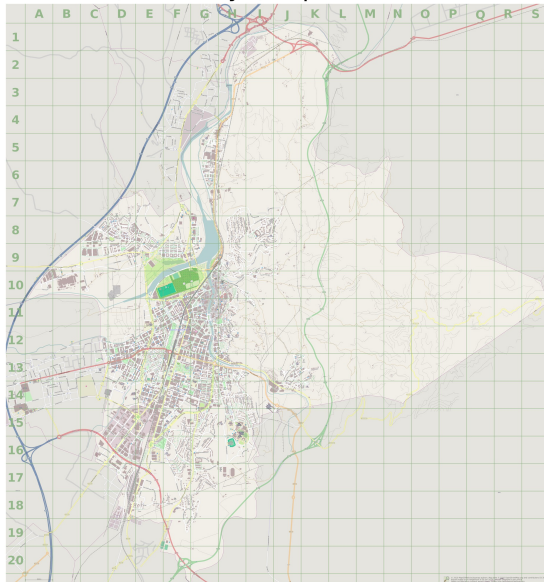
Bad Windsheim, Neustadt a.d.Aisch-Bad Windsheim, Regierungsbezirk Mittelfranken, Freistaat Bayern, Deutschland

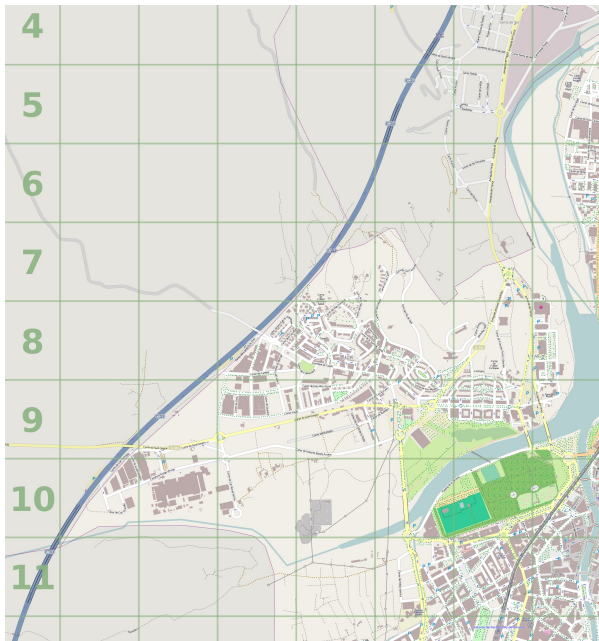
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published 3 months, 3 weeks ago

Examples

Girona, Catalunya, España





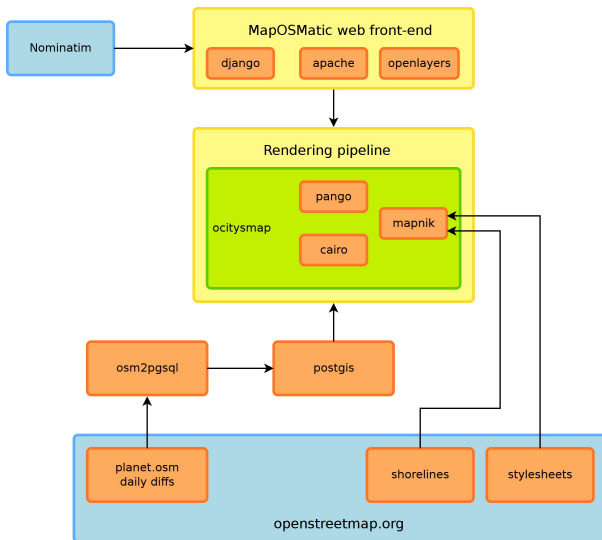
20 de Juny (Avinguda del)	Z		Francesc Palau i Quer (Carner del)	G-H14
		F-G11	Francesc Pi i Margall (Passatge del)	D-E13
	B		Francesc Roges (Carner del)	F11
8 de Juliol de 1809 (Carner del)		H7_B	Francesc Romaguera (Carner del)	H14-15
8 de Març de 1908 (Carner del)	A	E17	Francesc Sureda (Carner del)	G-H10
			Federic Montseny i Mañé (Carner del)	F16-17
Abecedadors (Carner dels)		G11	Fructos Geribert i Badellà (Carner del)	J13
Adri (Carner d')		C-09		G
Agutí; Pera i Planells (Mirador d')		H9	Gabriel Roura i Gübbers (Carner del)	F14_01-02
Agutí; Riera i Pau Dr. (Carner d')		H4	Galícia (Carner del)	E18
Aiguaviva (Carner d')		C-015	Gaspar Casal Dr. (Carner del)	G-01
Albacant (Carner d')		E14_16	General Fournà (Carner del)	G-10
Albacore (Carner d')		E14	General Maravà (Plaça del)	G11
Albi (Carner d')		E15_G17	General Mendoza (Passatge del)	G11-12
Almanys (Carner dels)		H10	General O'Connell (Carner d')	H8
Alfred Nobel (Carner d')		D8	General Penza (Passatge del)	H11
Almogueres (Carner dels)		H10_11	George Orwell (Plaça del)	H13
Alps (Carner dels)		D8	Georges Méliès (Carner del)	I14
Alvarez de Castro (Carner del)		F-G11	George Stephenson (Carner del)	D-E16
Andaluzia (Carner d')		D8	Germanus Binegats (Carner dels)	G11
Andalusia (Carner d')		D8	Germanus Lumière (Carner dels)	I13-14
Andreu Tàrrer i Santamaria (Carner d')		G-H13	Germine Sibot (Plaça dels)	D8
Angela Biveran (Carner d')		H18	Olivera (Plaça del)	C9
Angel Marsà i Beca (Carner d')		G6	Gracia (Plaça de)	I14
Angel Serradell i Pérez (Carner d')		H14	Gracia (Passatge del)	H8
Anselm Clavel (Carner d')		G10	Gran Canària (Carner del)	G05
Antic Roca Dr. (Carner d')		G13	Gran Via de Juny i	G10-12
Anticà (Carner (Carnerets))		A-C-10	Grup Germans Sabat	D-7
Anton Agustina (Carner d')		G-H14	Grup Girana per Girón	H13
Antonia Adrich i Pascual (Carner d')		F12	Grup la Creueta	I14-15
Antoni Bernés i Gübbers (Carner d')		C-D16	Grup Pere Major	G05
Antoni Canet (Carner d')		F15	Grup Tere Gübbers	H11_111
Antoni Gavà; Corret (Carner d')		E-13	Grup Vila-ova	I13_114
Antoni Rovira Virgili (Carner d')		E12	Guillem Boffi (Carner del)	E12
Antoni Sureda i Matallós (Carner d')		E8_79	Guillem Calbetre (Carner del)	E-21
Araçó (Carner del)		D-F18	Guillem Miral (Carner del)	G11
Artillers (Carner dels)		E10	Gudúscua (Carner del)	E18
Artorias (Carner d')		E17_18		I
Aurora Bertran i Salazar (Carner d')		I13-14	Ibària (Carner d')	F11-12
Avellà Arts i Genier, "Flaner" (Carner d')	B	F15	Ignasi Bosch (Carner del)	G13
			Ignasi Iglesias (Carner d')	H9
Bacà (Carner del)		G11-12	Impressors Bro (Carner dels)	F11
Balen (Carner del)		F12	Impressors Orús (Carner dels)	F11
Baix (Carner del)		D12	Isabel la Catòlica (Carner d')	H12
Baladrreu (Carner del)		E13	Isabel Vila i Pujol (Plaça d')	D13
Baladrreu (Passatge del)		E13		J
Balmes (Carner del)		F12_13	Jacint Verdaguer i Santalo (Plaça de)	G11
Balsau (Carner del)		H10	Juanes Ribot i Fozells (Carner del)	E11
Banyoles (Carner dels)		G11	Juanes Marquès (Carner del)	G14
Barcelona (Carner del)		D18_114	Juanes Marquès i Casanova (Carner del)	G14
Barranc (Carner del)		I13_131	Juanes Miral Masà (Carner del)	G18
Bassegoda (Carner del)		D12-13	Juanes Pol i Ponsa (Carner del)	C18
Basimenes (Carner del)		D-11	Juanes Ross i Martí (Carner del)	G9-10
Belbair (Carner del)		G9_H10	Juanes Roca i Desboch (Carner del)	G12
Bel-lac (Plaça dels)		G11	l'Campus Artístic (Plaça del)	H13
Belferrà (Carner del)		H10	Joan Alsina (Carner del)	F14
Belfuig (Carner del)		I_8	Joan Amador i Gelot (Carner del)	E-16
Berenguer Canocor (Carner del)		G10	Joan Badà i Casañas (Carner del)	D8_89
Berenguer de Palol (Carner del)		B_9	Joan Baptista Tomàs i Bastons (Carner del)	G14
Bernat Boudas (Carner del)		E11_111	Joan Brososa (Plaça del)	F11
Bessadà (Carner del)		G11	Joan Bruguera (Carner del)	G13
Bescanó (Carner del)		C-09	Joan Carmentis i Vigneaux (Carner del)	H13-14
Bisbau (Carner del)		E14	Joan Tarter i Oriols (Carner del)	H10
Blabe de Castaña (Carner del)		H10	Joan Gaspar Roca i Julià (Carner del)	G12
Bisla Llorensana (Carner del)		F-122	Joan Josep Tharros i Vidal (Carner del)	F-09
Bisbe Sillva (Carner del)		F13-12	Joan Maragall (Carner del)	F12_01-02
Blauferredà (Carner del)		F9	Joan Maria Pou i Camps (Carner del)	F14
Bonafina de Puça (Carner del)		F11_G11	Joan Masó i Valder (Carner del)	E12
Bonaventura Camerina i Peralta (Carner del)		G-H10	Joan Miró i Ferrà (Carner del)	D8-9
Bosquet (Carner del)		E8-9	Joan Oliver i Soler; Agustí Pere Quantafugat (Carner del)	C8
Bou d'Or (Carner del)		I_7	Joan Planas i Castañer (Carner del)	F13
Bu i Barroja Xiberta (Carner del)		F13-14	Joan Pons (Carner del)	E11
Bullador (Carner del)		C-49	Joan Regia (Carner del)	G13
	C		Joan Roca i Pinet (Carner del)	F13-14
Caà (Carner del)		D8	Joan Sabatè; Passatge (Carner del)	C-08
Calderers (Carner dels)		G10	Joan Tardis i Bru (Carner del)	F13
Calvet i Rubalcaba (Plaça del)		G12	Joan Tardis i Caballera (Carner del)	D-E16
Canal de Can Carneres		E7	Joan Vilas i Bona (Carner del)	I16
Canal de la Font de l'Abat		F8_09	Joanmà Bofet i Sots (Carner del)	H13-14
Canal de l'Església de Montyck		H9	Joanmà Maria Masramon i de Ventós (Carner del)	G14
Canal del Palco dels Seantes		H12	Joanmà Pla i Cargol (Carner del)	G-H11
Canal del Pla de Dal		F7-8	Joanmà Pla i Domènec (Plaça del)	G12
Canal Gicó (Plaça del)		G6	Joanmà Riera i Bertran (Carner del)	F15
Canal del de Fomells (Carner del)		F17_G17	Joanmà Roura i Orús (Carner del)	H13-14
Canals de Camps		D-113	Joanmà Vilatorrada (Carner del)	E11_111
Campardà (Passatge del)		D-E13	Jocs Olímpics de Barcelona (Carner dels)	G16-17
Camp de la Boteria (Carner del)		E8-9	Joan Lempin (Carner del)	H10
Camp de la Creu (Carner del)		C8	Josep Aguilera i Martí (Carner del)	G15
Camp de la Plana (Carner del)		F13	Josep Ametller i Vilas (Carner del)	G13
Camp de les Lloses (Carner del)		D14-17	Josep Bosch i Puy; "Poulet" (Carner del)	H14
Camp de Mart (Carner del)		F10-11	Josep Canal i Roquet (Carner del)	F14
Camp de l'Or (Carner del)		B_38	Josep Carner i Pla-Guàrd (Passatge del)	F12-17
Canal de l'Or (Carner del)		F14_101	Josep Clari i Ayats (Carner del)	H13-14

Architecture

MapOSMatic is composed of:

- 1 the **MapOSMatic web service**, implemented using the Django web framework.
 - Uses OpenLayers for the slippy map and Nominatim for the administrative boundary search;
 - Stores rendering request into a database.
- 2 the **OcitySMap** Python module that generates the map and index according to area coordinates, administrative area name or OSM polygon ID.
- 3 the **MapOSMatic daemon**, which:
 - processes pending rendering requests from the database with **OcitySMap**;
 - updates the database to inform the **MapOSMatic** web front-end that the rendering has been completed.

Architecture



Details on OcitySMap

- Uses Mapnik to generate the map using the default OSM stylesheet and print the grid and labels. The Mapnik stylesheet queries the PostGIS database for OSM data.
- Queries the PostGIS database to find the streets and amenities corresponding to each square of the grid.
- Uses Pango and Cairo to generate the index. The page formatting in columns is done manually with Cairo.
- Cairo is finally used to integrate the map and the index into a frame with the map title and to generate the final output files.

Infrastructure

- MapOSMatic runs on a dedicated hosted server with:
 - Dual core E2180 @ 2GHz Intel machine
 - 2 GB RAM
 - 3.5 GB swap
 - 1x 250 GB SATA-II hard drive
 - Ubuntu 9.04 x86_64
- We're currently moving to a bigger, faster server because:
 - The OSM database size has grown considerably and nearly doubled in the past 9 months (and it's not slowing down, but keep it up, contributors!)
 - The duration of each daily update is soon going to be longer than a day (16 to 20 hours avg)

Some statistics

- Planet OSM database: 177 GB
- 4000 unique visitors per month
- 50 rendered maps/day avg.

⇒ **15,000 maps rendered since September, 2009**

Standing on the shoulders of giants

- Power of F/OSS software: in just a few days, it was possible to learn, understand and set up an OSM application such as MapOSMatic
- MapOSMatic is 1400 lines of Python and OcitySMap is 2000 lines of Python. The rest is a bit of HTML/JavaScript for the web front-end and the translations
- First-level dependencies (PostgreSQL, PostGIS, Apache, Mapnik, etc.) of MapOSMatic stand for more than 600.000 lines of code. We've written only 0.5% of this to create our application.

OSM data

- Usage of administrative boundaries at the city level is not yet widespread. Few OSM communities in the world have started importing administrative boundaries.
- Inconsistent `admin_level`:
 - In France, all cities use `admin_level=8`
 - In Germany, some use 4, some 6 and others 8, depending on the city's importance
 - Other countries have different rules
- Insufficient information to generate a correctly sorted street index.
 - *Rue Paul Verlaine* is indexed at *Paul Verlaine (Rue)*
 - We should have *Verlaine (Rue Paul)* (Verlaine being the family name). Cannot be done automatically, needs additional OSM data/tagging.
- Only one language for street/city names imported by `osm2pgsql`. HStore?

Mapnik

- When streets are small, Mapnik doesn't render their labels. Problematic since those streets are visible in the index but not on the map.
- Mapnik consumes too much memory to render large PNG maps.

Future work

- **On the map:**
 - legend
 - additional and configurable POIs and layers (in connection with Chimère ?)
- **Rendering options:**
 - paper size selection
 - splitted map on several pages
 - configurable styles
- **Infrastructure changes:**
 - new server
 - use Osmosis for minutely updates
 - rendering optimizations
- *Your feature!*

Conclusion

- We would like to thank the OSM community for having created the data and tools that allowed applications such as MapOSMatic to be created
- We hope that MapOSMatic is useful as another example of why OpenStreetMap and free geographical data are nice, and hope to make it even more useful in the future
- **And once again, MapOSMatic is free software, so please join the game! We have a mailing-list, Git repository and IRC channel!**

① <http://www.maposmatic.org>

② <irc://irc.freenode.net/#maposmatic>