



internet

in a

BOX





Where in the World is Internet-in-a-Box?

Daniel Krol

**Featuring Avni Khatri
and Adam Holt**

Where I come from

OpenStreetMap editing

Prepping / Off-The-Grid Open Data

Desert Atlas (Self-hosted OSM on Sandstorm)

Libre Boston / Internet-in-a-Box

Internet-in-a-Box

Schools, Libraries, Clinics

Low Internet Access

Custom Needs

(Preppers too!)



Internet-in-a-Box

Wikipedia

TED Talks

Khan Academy

OpenStreetMap



Internet-in-a-Box

Install yourself (or buy)

Download content

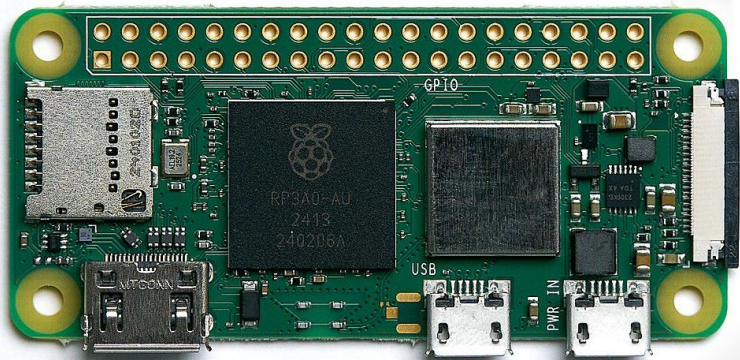
WiFi hotspot

Open source (of course)



Works on Dirt Cheap Devices!

Raspberry Pi Zero 2 W



Raspberry Pi 500



...and All Sorts of Devices!



“Old” IIAB Maps (2019/2020)

One tile set – no updates in sight

More “from the ground up”

Okay performance on Zero 2 W

Bandwidth / storage more expensive back then

New Maps (2025 'til infinity)

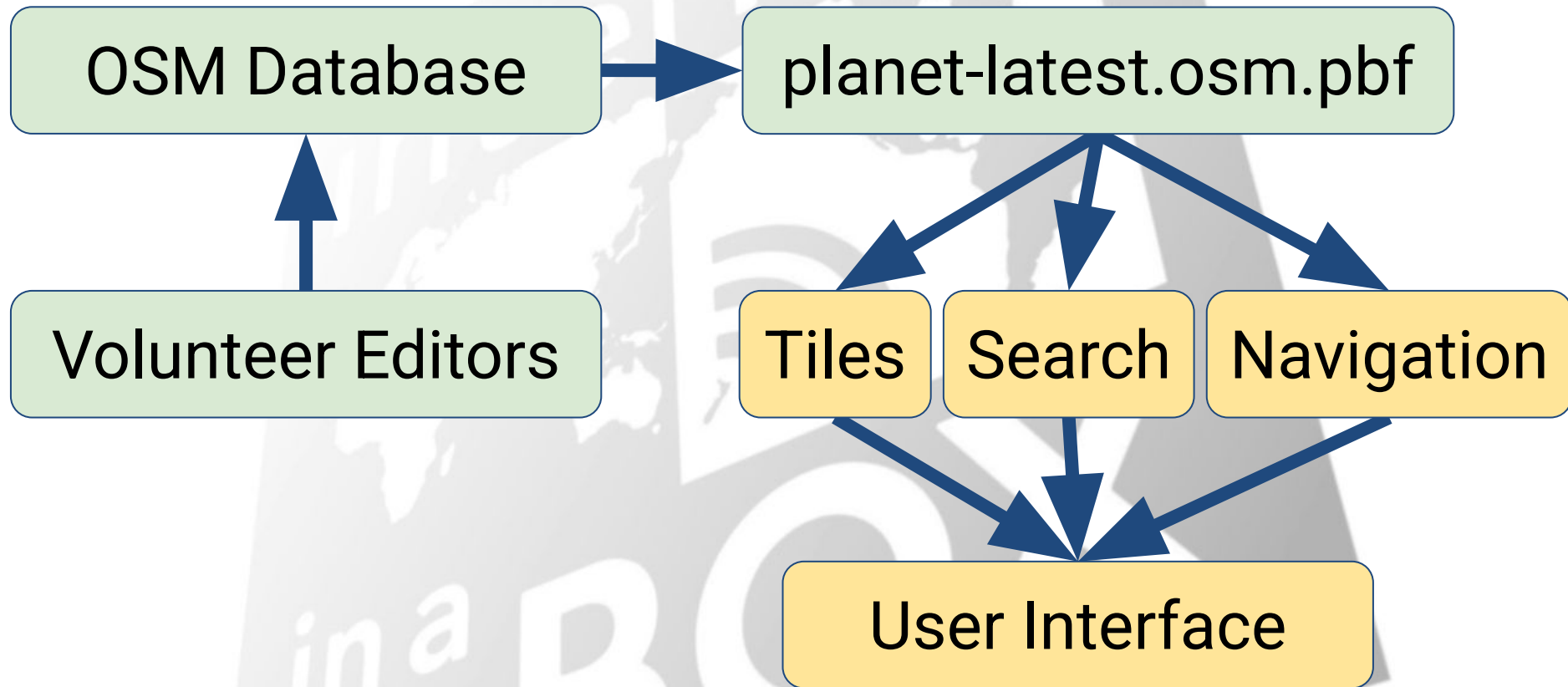
More off-the-shelf options available

Focus on performance and UI

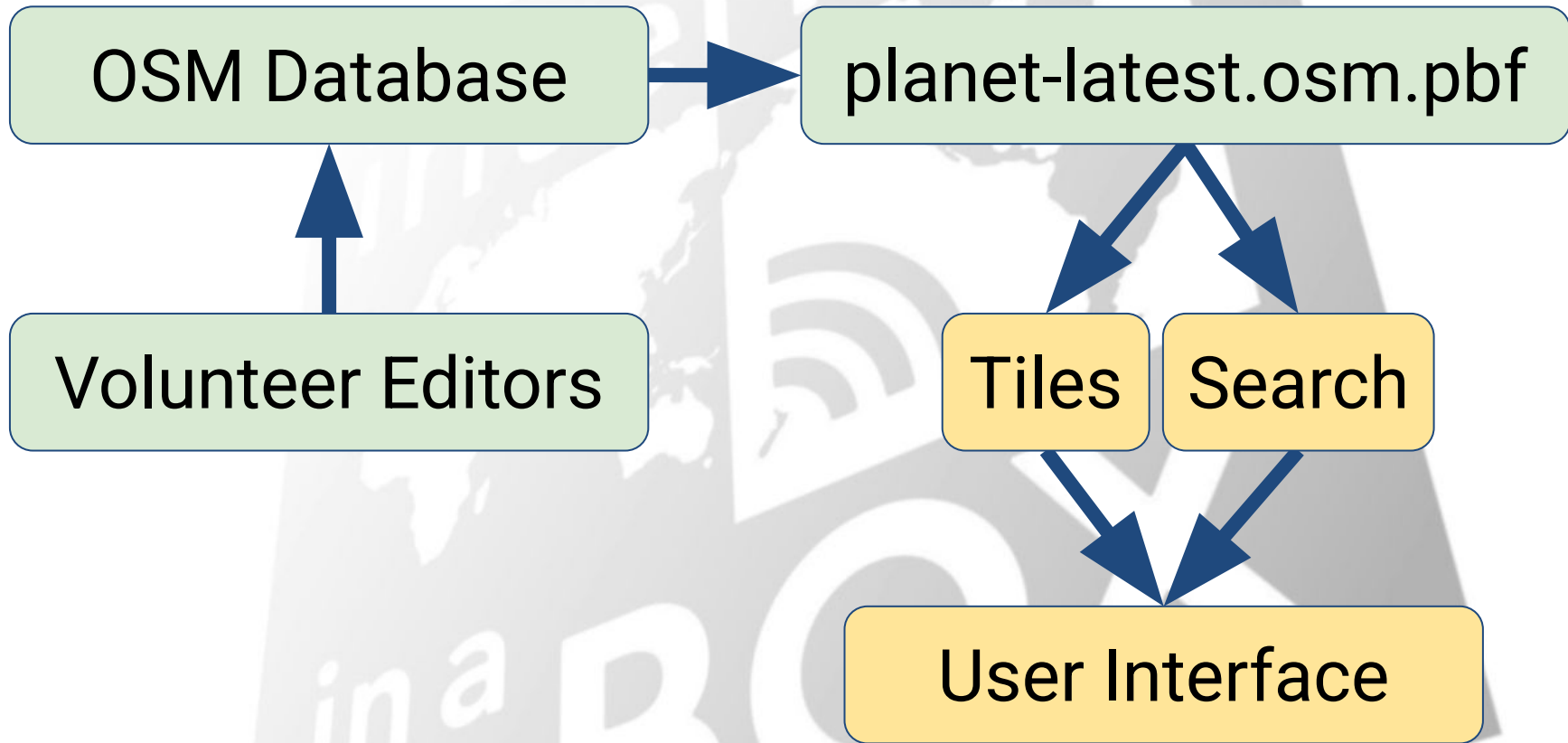
More powerful search

Up-to-date Maps

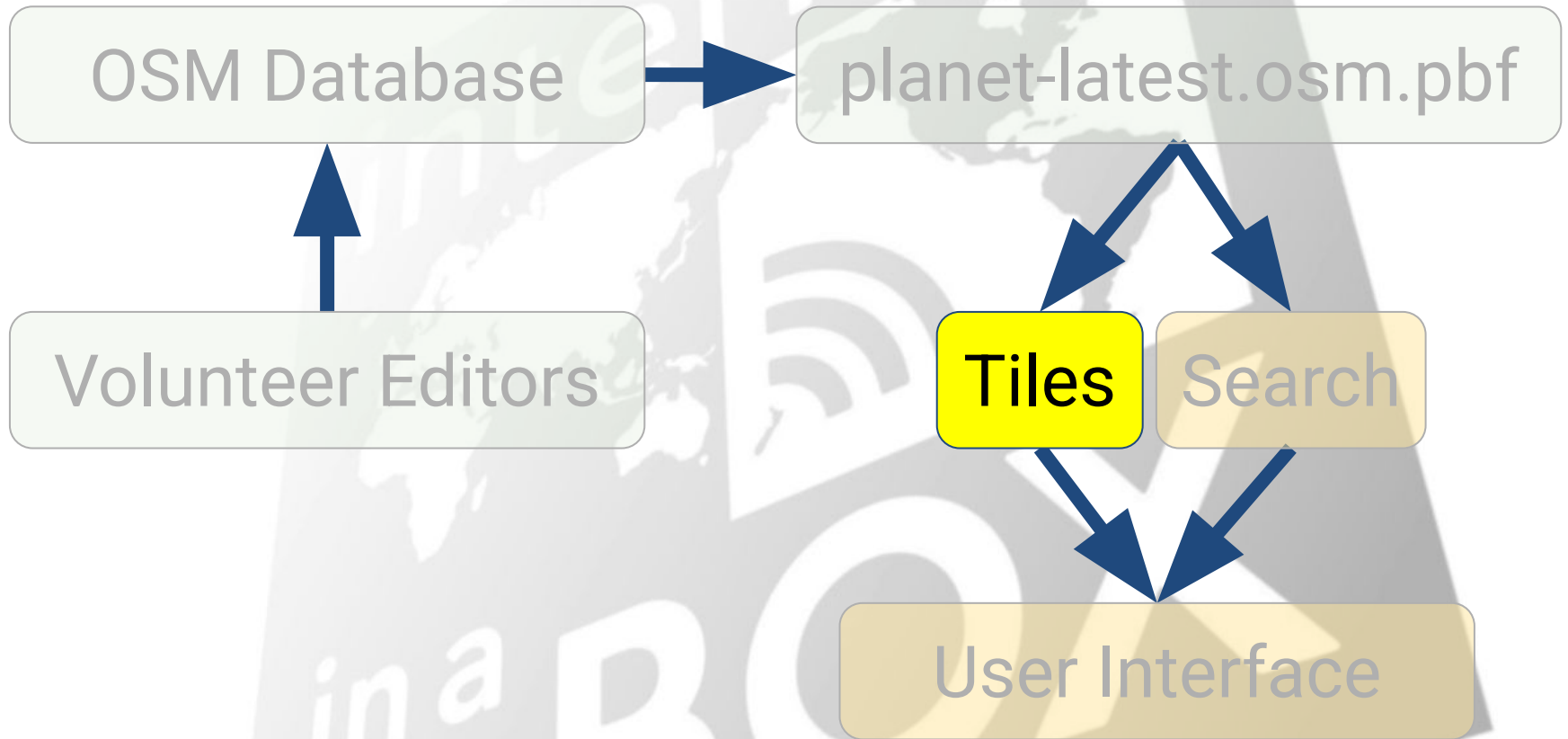
OpenStreetMap



OpenStreetMap



OpenStreetMap



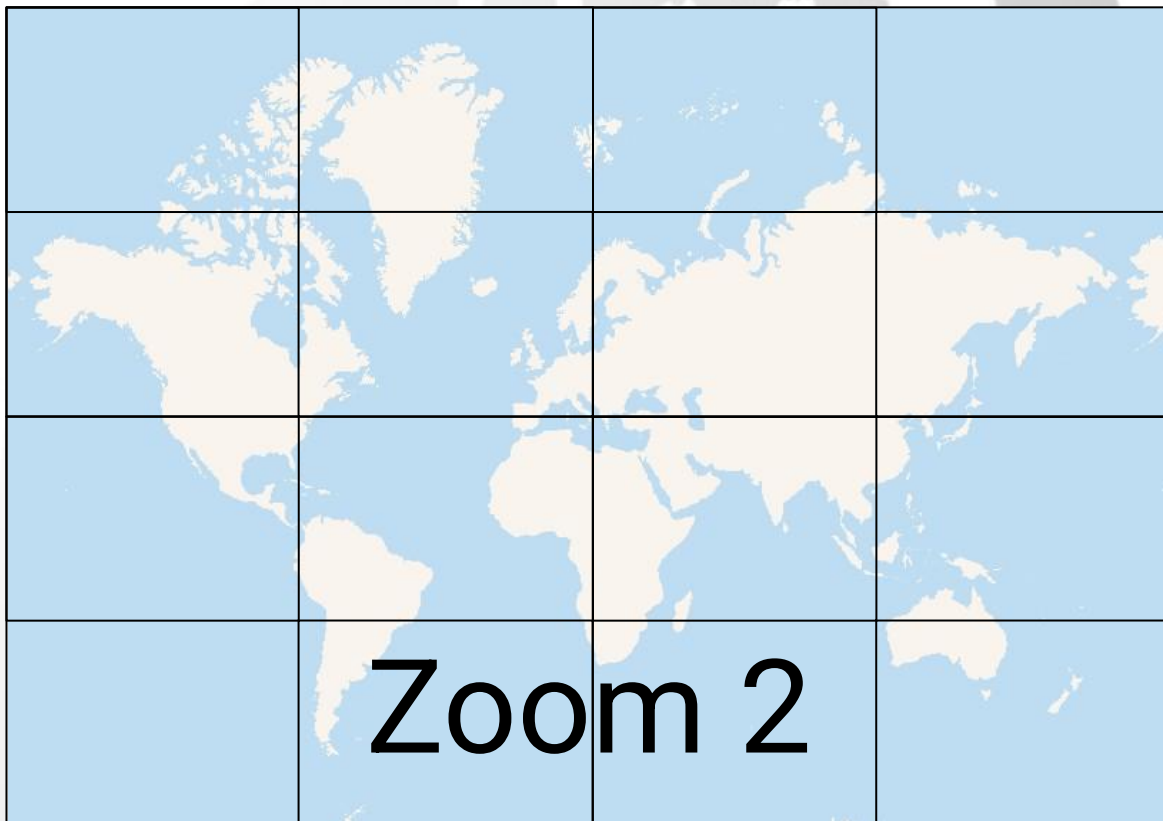
Tiles



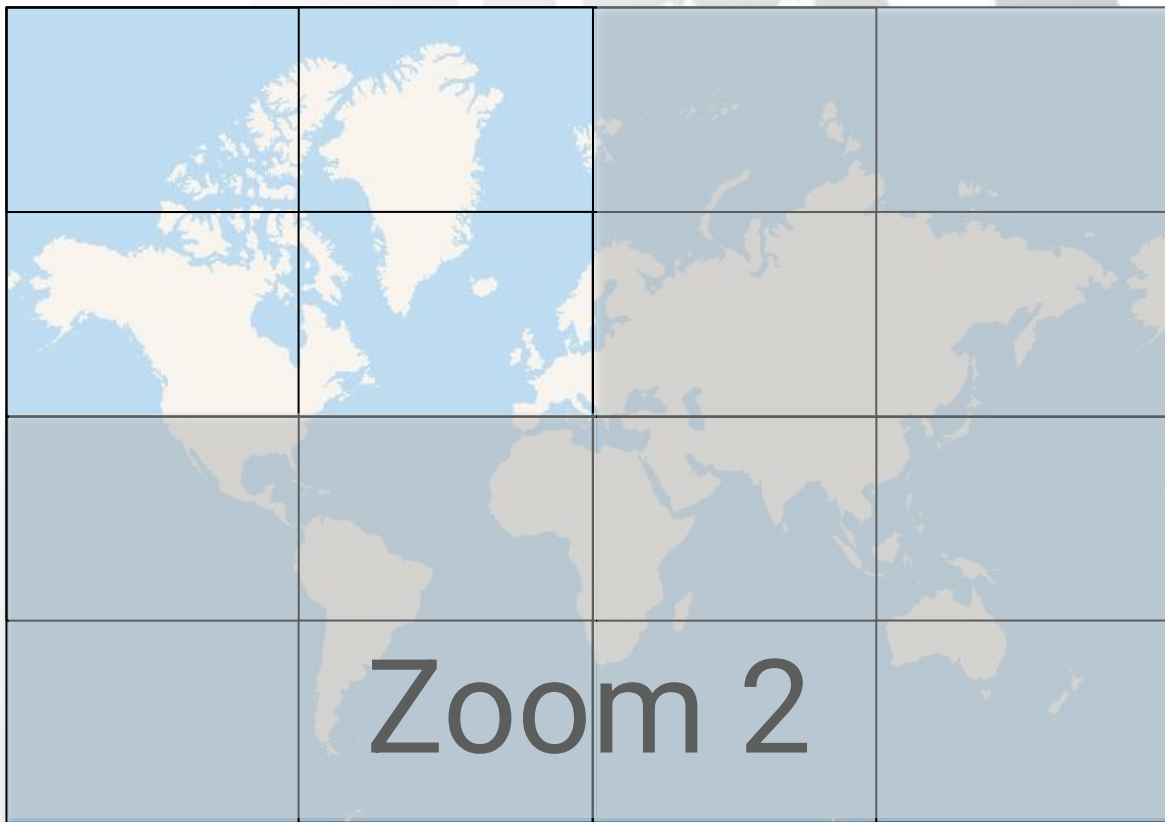
Tiles



Tiles



Tiles



Tiles



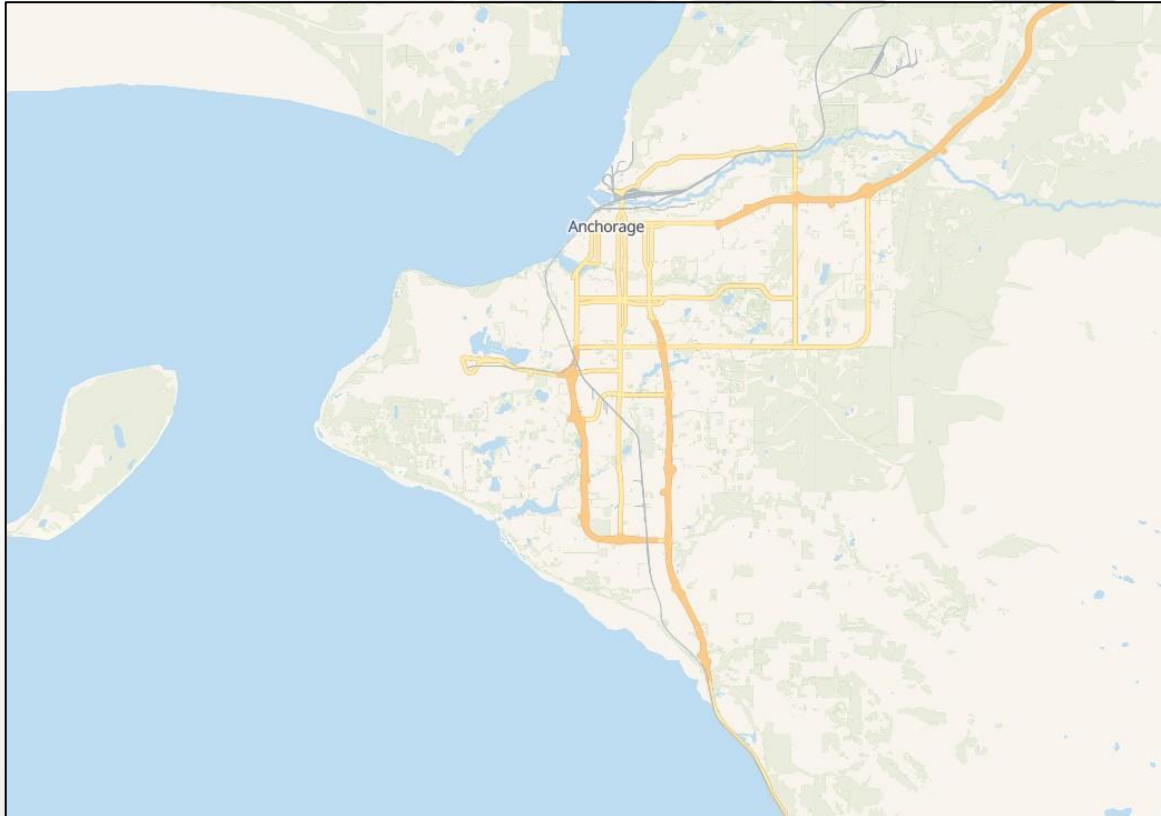
Tiles



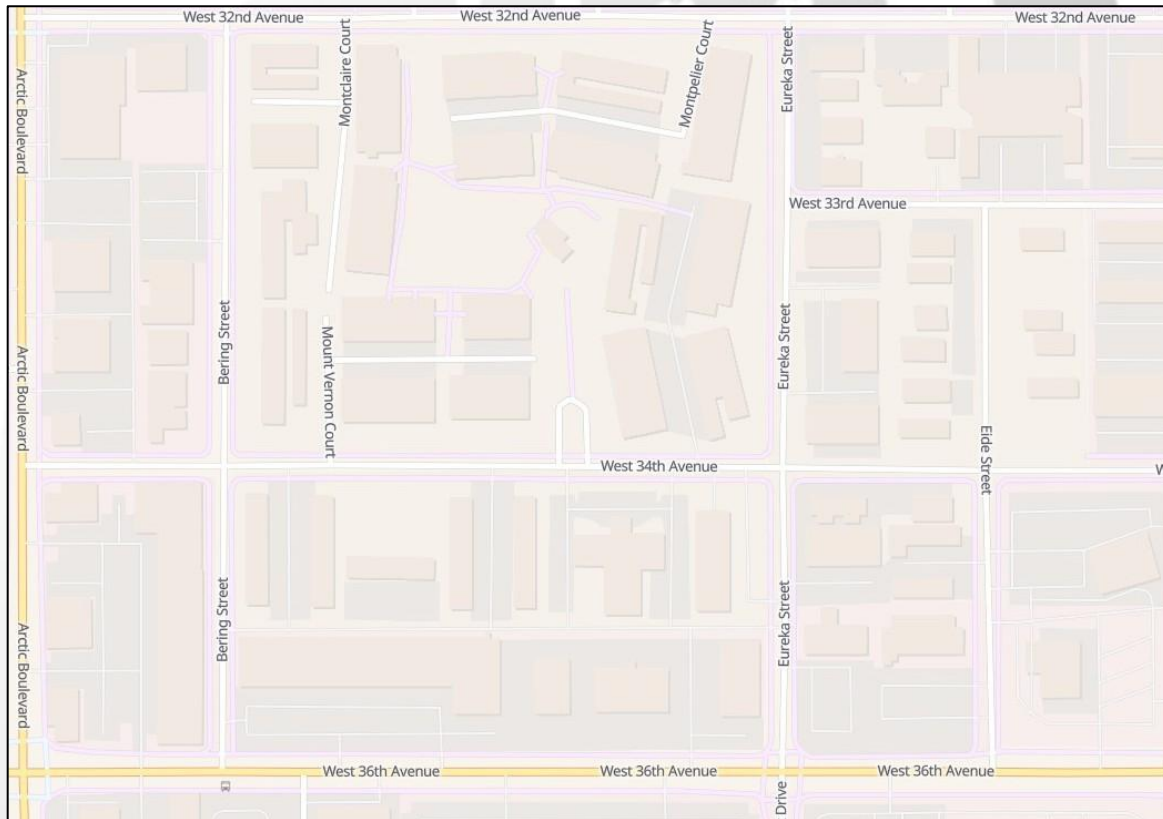
Tiles



Tiles



Tiles

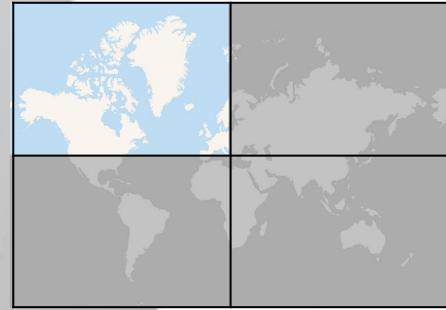


Tiles

Data Formats

Vector: MVT, MLT

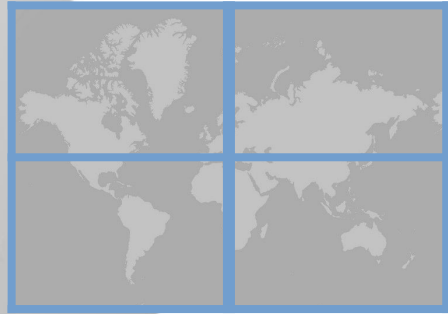
Raster: PNG, JPEG, WebP,
AVIF



Tiles

Container Formats

“Pyramid” structure



MBTiles: Tile server

PMTiles: Static w/ range requests

Vector Tiles

Format

MVT, MLT – How data is represented.

Schema

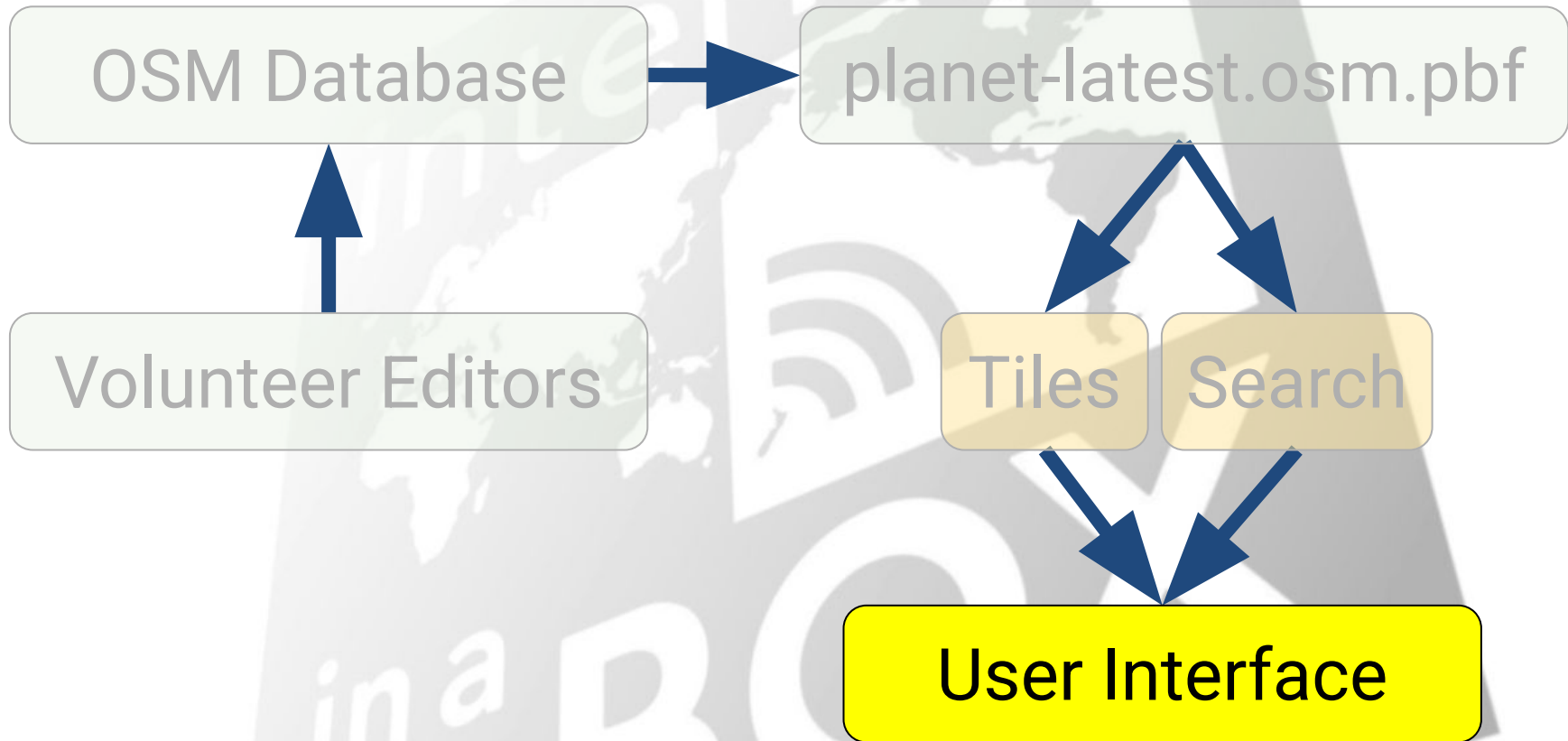
What elements and attributes?

How does OSM map onto them?

Style

How to display elements and attributes?

OpenStreetMap



MapLibre

Browser and mobile libraries

Vector maps/styles or raster maps

Overlays

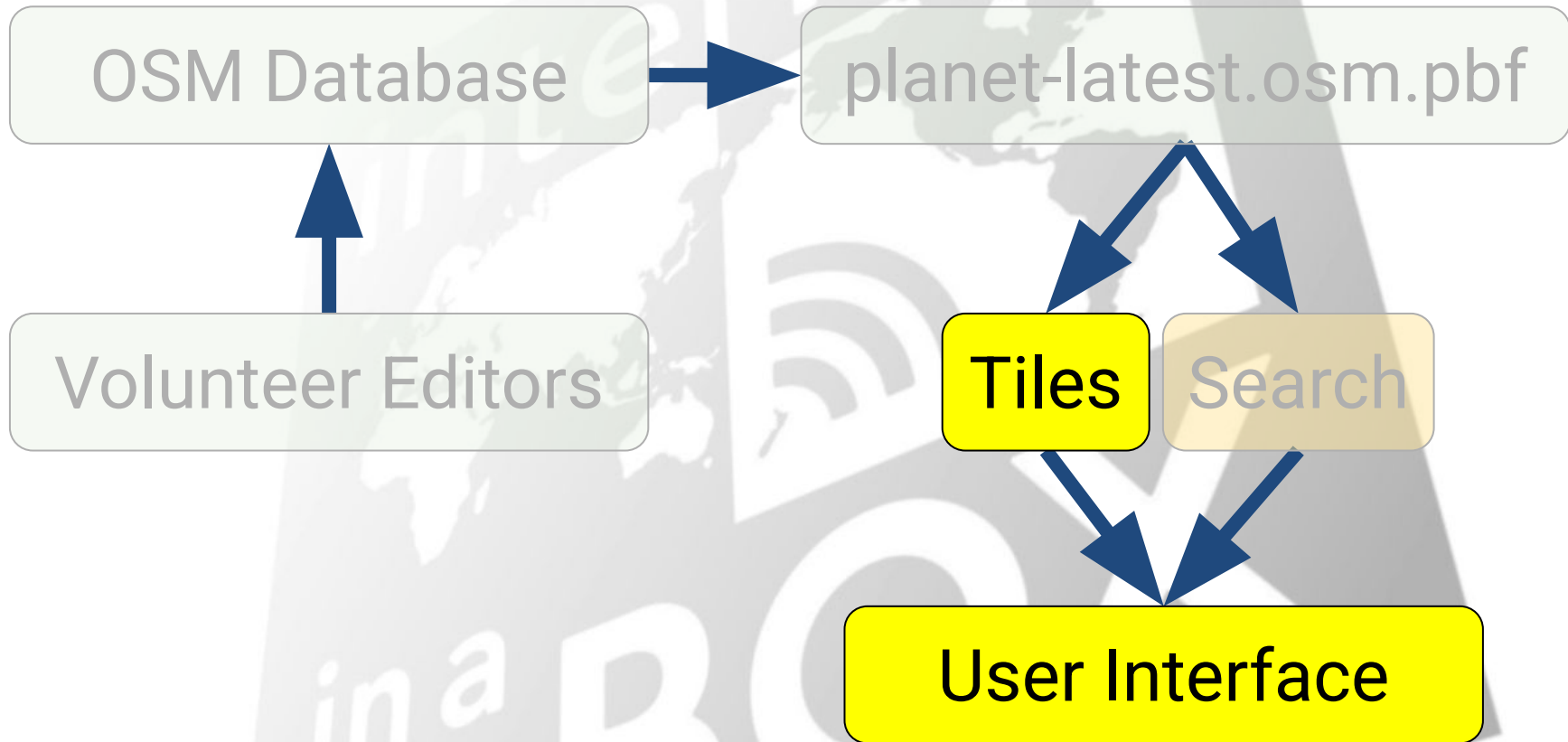
UI framework

Maps.black

by Svante Richter



OpenStreetMap



Maps.black



Maplibre Tiles: (Vector) street, satellite, terrain

Opinionated Maplibre UI wrapper

Trivial setup

Monthly data updates (massive!)

Maps.black

MapLibre (library)

Display
Vector Tiles

Handle Container
Formats

User
Interface

Data Generation

Monthly
Vector Map

Satellite
Imagery

Terrain
Map

Integration
(easy setup)

Maps.black



1) Serve Static Files:

- 3 PMTiles files: street, satellite, terrain
- 1 map fonts/styles file
- 2 JavaScript files
- Index.html

2) Tweak NGINX config

Maps.black



Map data available in 3 schemas:

- OpenMapTiles (we use this)
- Protomaps
- Shortbread Tiles

Many styles available

Maps.black Customizations





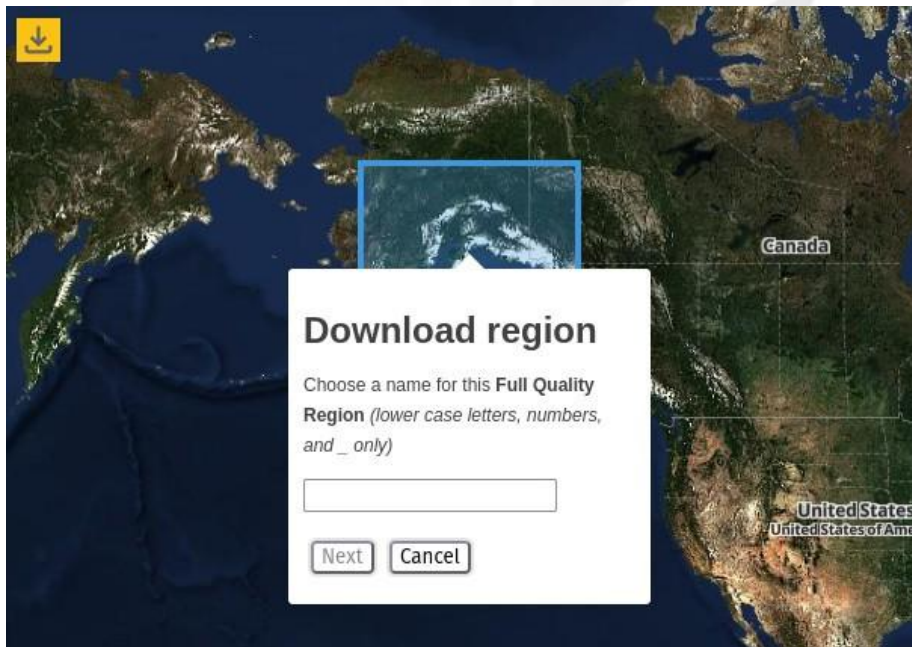
Maps.black Customizations



```
maps_vector_quality: "osm-z9"  
maps_satellite_zoom: 7  
maps_terrain_zoom: 8
```



Maps.black Customizations



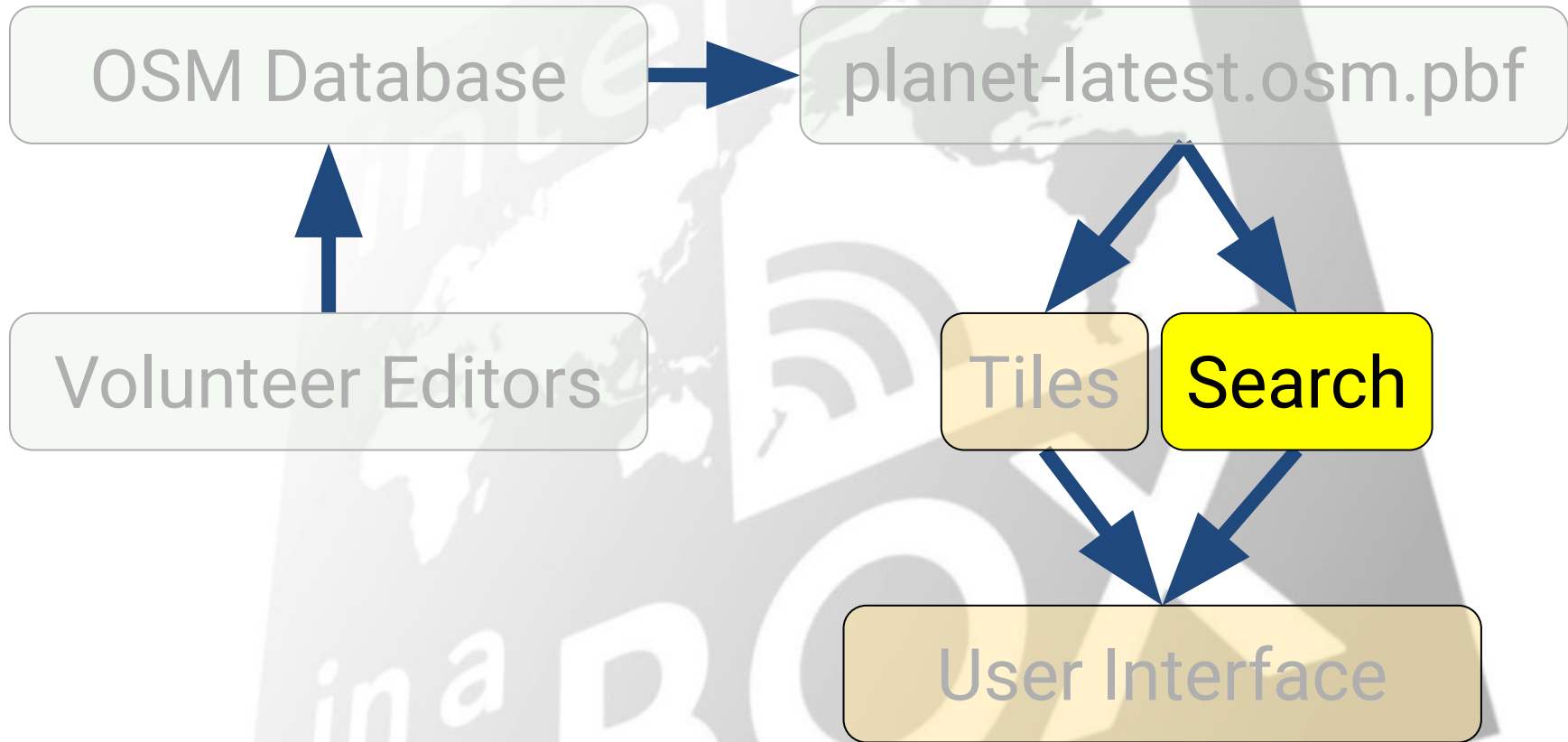
Maps.black Challenges



Overlaying Regions

Callbacks, not `map.onload`

OpenStreetMap



Search

Nominatim: PostgreSQL/SQLite

Photon: OpenSearch/Elasticsearch

Airmail

Search

Nominatim (SQLite)

Faster than Postgres on Raspberry Pi?

“Experimental”

Convenient to distribute

Search

Nominatim (SQLite)

Administrative Boundaries
+ Natural Features

Usable on Raspberry Pi 500

Search DIY

SQLite/FTS5

Fully static? I found something...

Static Search

yor.json.gz:

```
...  
{  
  "lat": "40.71427",  
  "lon": "-74.00597",  
  "pop": "8804190",  
  "name": "New York City",  
  "admin1": "New York",  
  "country": "US"  
},  
{  
  "lat": "53.60371",  
  "lon": "-113.42757",  
  "pop": "3836",  
  "name": "York",  
  "admin1": "Alberta",  
  "country": "CA"  
},  
...
```


Just JSON files

Super fast on Zero 2 W

Small db so far

Import bookmarks...



 Search the web



Wikipedia



YouTube



Reddit



Add-ons for
Firefox



Add Shortcut



In the coming months...

Static Search Fixes/Optimizations

Add nature, monuments, etc to Static Search

Add Static Search to Full Quality Regions (?)

Aspirations...

Wikipedia / Wikivoyage / Wikidata Integration

Custom data (“bookmarks”)

Horizontal data sharing (“Syncweb”, mesh)

Live Demo



Come check out our booth!

Questions

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github.com/iiab/iiab/discussions