

DSpace

A new way of handling geolocation based information

iggy & chrono



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Question

"If life were a just computer game with awesome sensory input, which standard game features would be missing in our interface in order to play it well, especially when playing in groups?"

Interface View

Image Street - boring

Interface View

Image Street - boring Image Street - DSpaced

Talk-Contents

Who we are?

What do we want?

What do we have?

Basemaps

Overlays

Navigation

DSpace Client

What do we need?

1. Who we are?

Who we are?



chrono0 chrono

JavaScript



elf-pavlik elf Pavlik

<https://gitorious.org/~elf-pavlik> perpetual-tripper@wwelves.org JavaScript, Ruby, CoffeeScript



yggi Sebastian Steuer

iggy@yggi.de Python, JavaScript, Shell



alice-wl alice

PHP, Shell, Python



nilclass Niklas Cathor

Hamburg JavaScript, Ruby, Shell

2. What do we want?

What do we want?

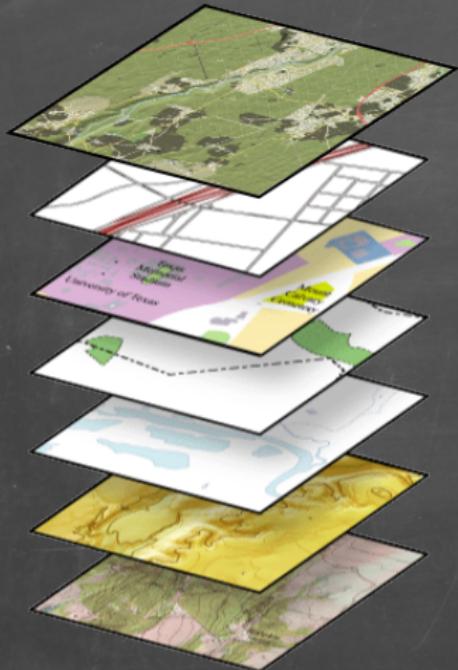
Staging our wants

Something like a standard

Increase the likelihood and efficiency of adding/sharing information by introducing a standardized framework like the W3c in 1993.

- ▶ Federation
- ▶ Free
- ▶ Open Source
- ▶ Loose Bindings
- ▶ Modular Extensions

Open Basemaps



Basemap Tile Assembly:

- ▶ Roads (OSM)
- ▶ Land Usage (OSM)
- ▶ Boundaries (OSM)
- ▶ Hydrography (OSM/External)
- ▶ Topography (NASA/DLR SRTM)
- ▶ Land Imagery (NASA Blue Marble)

Basemap Properties

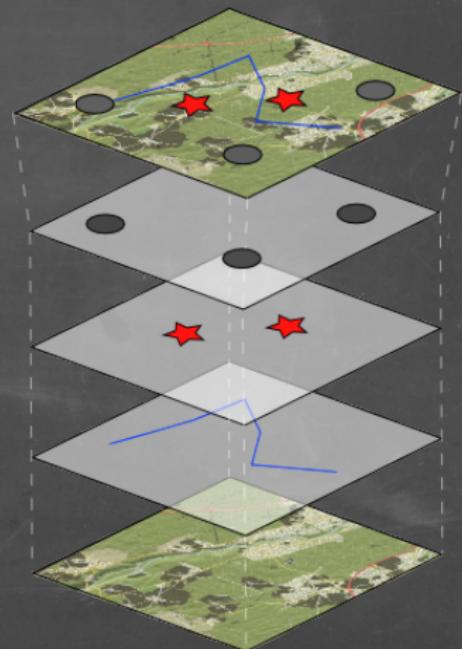


- ▶ Static/Longterm data retention & validity
- ▶ General interest
- ▶ Only one basemap is visible at a time
- ▶ Composition based on region/application
- ▶ Updates are resource intensive
- ▶ Server based rendering

Overlays

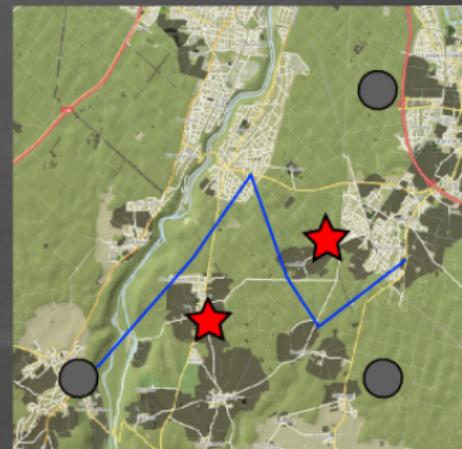
Basemap + Overlay Assembly:

- ▶ POIs
- ▶ Real-Time Location tracking
- ▶ Waypoints on a route (Navigation)
- ▶ User/Overlay selected Basemap



Overlay Properties

- ▶ Collections of things at locations
- ▶ Public or private
- ▶ Can be very dynamic (Real-Time)
- ▶ Many can be overlayed at a time
- ▶ User-generated and -updated
- ▶ Very fast & cheap updates
- ▶ Suited for browser/client rendering



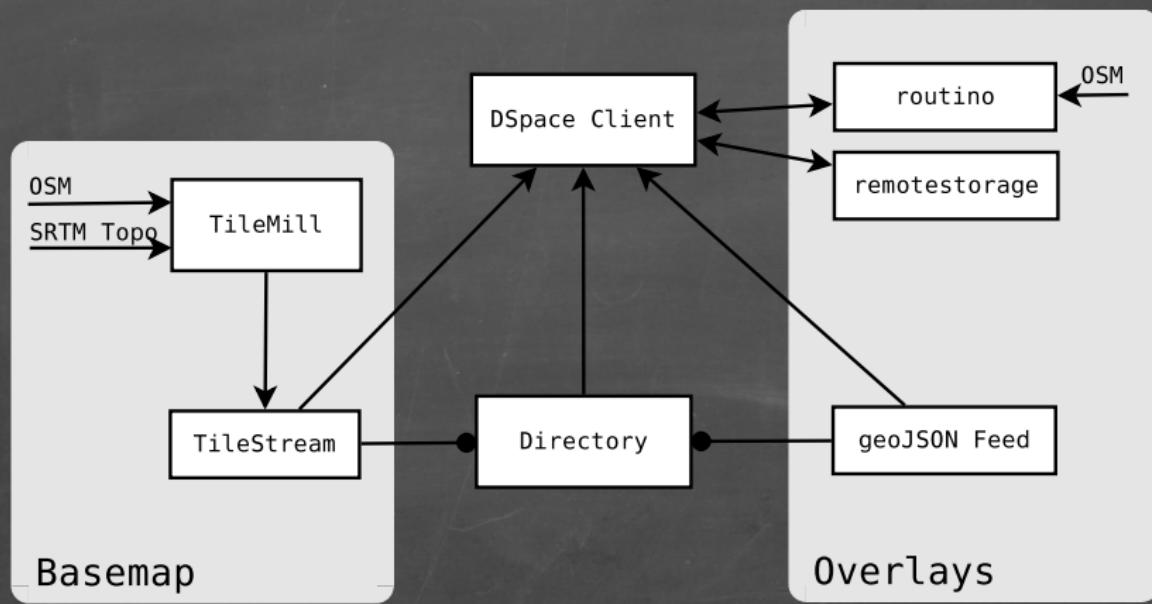
Overlay ideas

- ▶ Urban Management
 - ▶ Emergency Response Management (First Responder Setup)
 - ▶ Hitchhiking (linking drivers/hikers in a sector - hitchwiki.org)
 - ▶ Real-Time public transportation information
 - ▶ Real-Time risk distribution
- ▶ Resource Management
 - ▶ Food Mapping/Sharing (mundraub/foodshare.org)
 - ▶ Dumpster Diving (trashwiki.org)
 - ▶ Fleet Management
 - ▶ Open Access Mapping (openwifimap.net)
- ▶ Organizing Events
 - ▶ Public congress/camp Overlay for visitors
 - ▶ Private engel Overlays for orga

Even more Overlay ideas

- ▶ Realtime Semantic Mapping Heat mapping twitter hashtags (i.e. heatmap #earthquake to find current EQ reports and positions)
- ▶ Private group overlays for the area of activity (i.e. MuCCC)
- ▶ Drone GCS Interfacing Localization and interactive Mission/WayPoint Management
- ▶ Entertainment Geocaching, AR-MMORPGs, AR-MMO-Strategy-Games
- ▶ Open Network Access Mapping Access Points (<http://openwifimap.net>)-<http://map.pberg.freifunk.net/> + ham-radio repeater information
- ▶ ADS-B Airplane Mapping Overlay
- ▶ Use your imagination

Architecture Overview



3. What do we have?

What do we have?

Staging our haves

3. What do we have?

What do we have?

Before we start to re-invent the wheel, let's have a look at what other generous people already have developed and shared with the rest of humankind.

What do we have?



TileMill



BACKBONE.JS



DLR



REMOTE
STORAGE



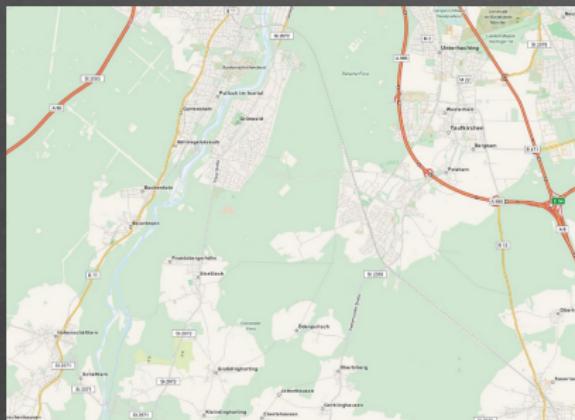
CGIAR CSI
Consortium for Spatial Information



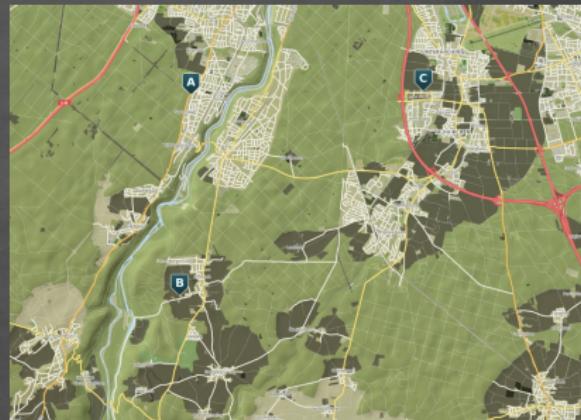
And many more projects by countless people who provide open-source software and data to merge and assemble into DSpace

Why not use OpenStreetMap Map-Servers?

Not everything is in OSM:



Not everything belongs in OSM:



- ▶ Topography
- ▶ Aerial Imagery
- ▶ All non-STREETmap data

- ▶ Tracking
- ▶ Personal/Private POIs
- ▶ Dynamic/Real-Time data

Map Forge

- ▶ NodeJS
- ▶ Mapnik + TileMill + OSM-Bright
- ▶ PostgreSQL + PostGIS + imposm
- ▶ OpenStreetMap data
- ▶ NASA/CGIAR SRTM SIR-C-Band V41 90m Topo data
- ▶ DLR SRTM X-Band SAR 25m Topo data (+/- 60 coverage)
- ▶ TerraSAR-X/TanDEM-X data (Future)

```
imposm -U gisuser -d gis -m \
/tmp/osm-bright/imposm-mapping.py --overwrite-cache --read --write --optimize \
--deploy-production-tables planet-latest.osm.pbf
```

Map Forge Screenshot

Include picture of Map Forge in action

Map Delivery

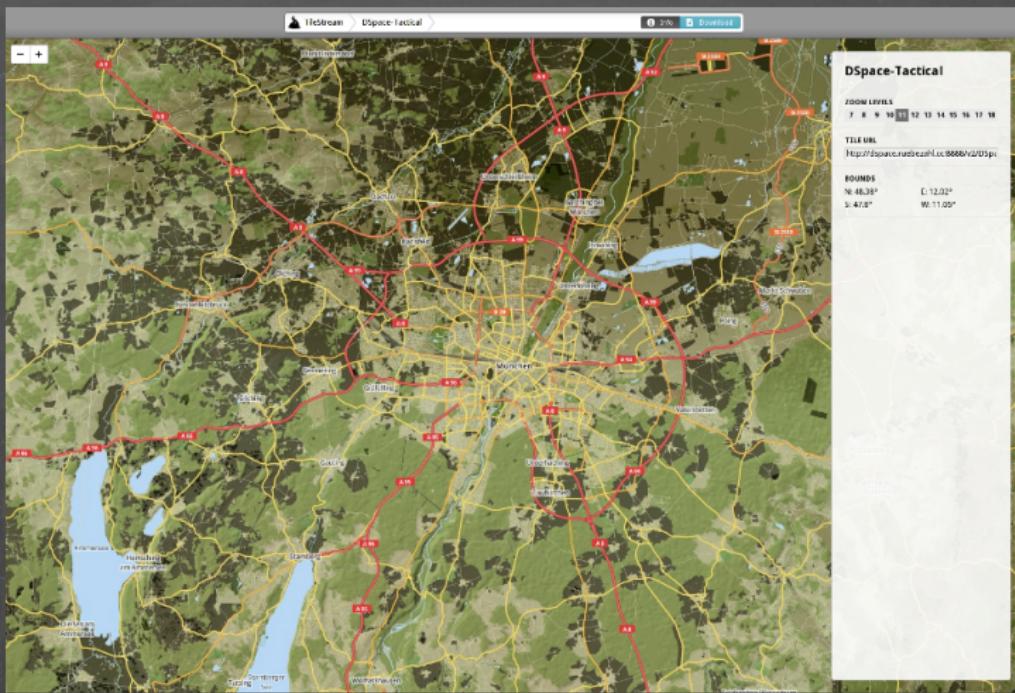
TileStream is also written in NodeJS and very easy to set up:

- ▶ Copy maps from TileMill to your TileStream map folder
- ▶ Start TileStream*

```
$ cp /tmp/my_map_from_tilemill.mbtiles /home/tilestream/maps/  
$ ./index.js --host my.fully.qualified.domainname --tiles=/home/tilestream/maps/  
Started [Server Tile].  
Started [Server Core:8888].
```

*Obviously, this should be running as a service :)

Live DEMO of the TileStream WebUI



Read-Only Overlays

- ▶ Simple HTTP GeoJSON Feed
- ▶ SpaceAPI

Read-Write Overlays

- ▶ remotestorage.io

Navigation

- ▶ Routino
- ▶ OpenStreetMap dump as basis (just like TileMill)

DSpace Client

Introduction on the Client now we have nice basemaps and sources for overlays
presentation comes together in the client

Client

Technologies:

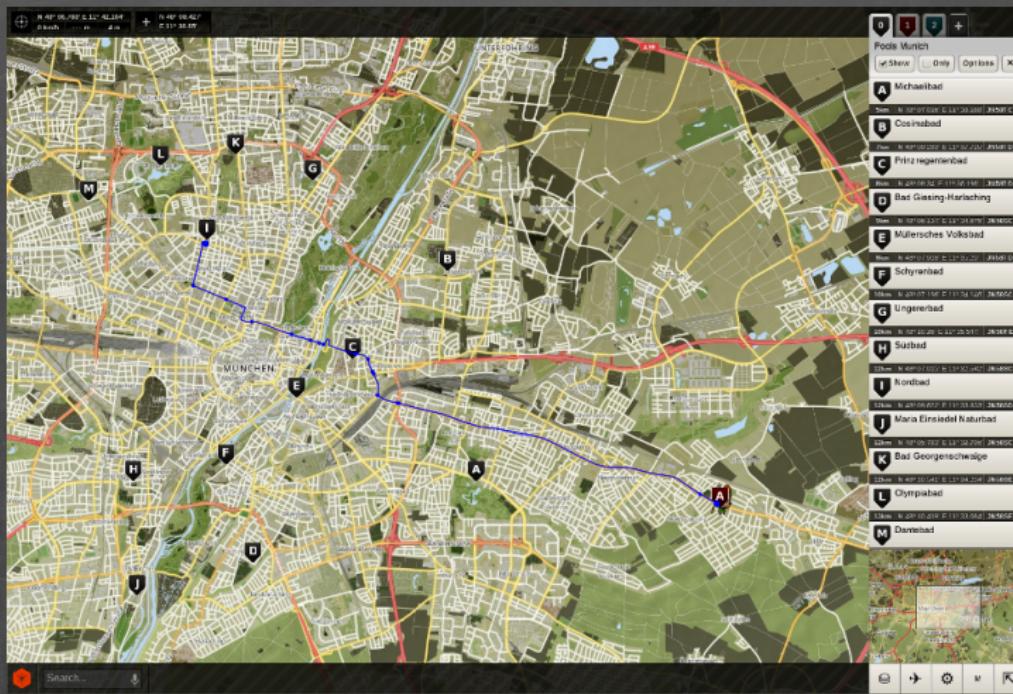
- ▶ HTML5/JavaScript
- ▶ ModestMaps

Focus on:

- ▶ As lightweight as possible
- ▶ Powerful Plugin-API
- ▶ Mobile Readiness/Integration

Assembled, built and packaged with NodeJS.

DSpace Client Live DEMO



NPM Package Overview

```
almond@0.2.4
backbone@0.9.10
bean@1.0.3
bonzo@1.3.5
csso@1.3.7
domready@0.2.11
+ ender@1.1.0
+ ender-js@0.4.4-1 extraneous
handlebars@1.0.8
  optimist@0.3.5
    wordwrap@0.0.2
  uglify-js@1.2.6
morpheus@0.6.7
qwery@3.4.1
requirejs@2.1.4
reqwest@0.6.4
underscore@1.4.4
```

Comfortable Build Process

```
# make init
Rebuilding GIT submodules... [OK]
Building local deps... [OK]
Building AMD Deps... [OK]
Assembling JS components... [OK]

# make deps
Building Ender... [OK]
Building local deps... [OK]
Building AMD Deps... [OK]
Assembling JS components... [OK]

# make build
Building Ender... [OK]
Building local deps... [OK]
Building AMD Deps... [OK]
Assembling JS components... [OK]
Cleaning up build/... [OK]
Build & minify dspace-client.js... [OK]
Copying Assets... [OK]
Copying Plugin Assets... [OK]
Merging and compressing dspace-client.css... [OK]
>>> Client build complete
```

Ops friendly deploy

Easy and structured deployment leaves flexibility for different setups and simple rewrites.

```
+ assets
  + css
  - dspace-client.js
  + icons
  + images
index.html
+ plugins
  + remotestorage
    + assets
      - remoteStorageIcon.svg
      - style.css
  + search
    + assets
```

What do we need?

Staging our needs

Directory Server

Federated searchable ranked, geobounded, tagged list of basemaps and overlay feeds ...

Client

more overlay functionality (polygons, 3D, translated images ...)
mobile integration (ios, android, glass) Overlay browser

Collaboration

People forging and serving basemaps for their area
People exposing existing geodata as dspace overlay feeds
People helping with docs, bugs, issues, features (mostly on the client for now)

4. What do we need?

Utopia

Augmented Reality glasses (contact lens FTW!) ...

4. What do we need?

THEEND

Thanks for your attention.
Discussion