Adding Offline Customized Map Server Functionality to a CAPI Laptop

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Introduction and background

- UWSC developing collaborative interviewing process using tablets
- Chicago Communities Study required a web application with mapping functionality
  - Participants must be able to tap and select cities, towns, and neighborhoods
  - Tablet must communicate with survey instrument on laptop
  - Must run entirely offline
Web map application stack

- Browser UI (OpenLayers)
- HTTP server
- Tile cache (Eve, TileCache)
- Tile server
- Map server (Mapnik)
- Geospatial data (Shapefiles, PostGIS, KML, GeoRSS)
- Application server

http://alistapart.com/article/takecontrolofyourmaps
What do we really need?

- We are working with a known, limited geographic area (Chicagoland area)
- We can prepare the map tiles ahead of time without needing to dynamically create them using geospatial data
- If we can prepare the tiles ahead of time we only need a tile server
Web map application stack

http://alistapart.com/article/takecontrolofyourmaps
Tilestache FTW

- TileStache is “the map server”
  - Written in Python
  - A number of packages and supporting applications required
  - Some manual configuration on Windows
  - Open source
    - Allowed us to tweak the code to work with local wifi network solution

- Virtual Router on each laptop so all of this runs in its own local wifi network
Boundary layer only
Map components – boundary layer

- Boundary layer defined 866 communities
  - Started with open data provided by Cook county
  - Augmented with other data sources to include coverage for smaller townships
- Worked closely with UW Applied Population Laboratory (APL)
Boundary layer with underlying map tiles
Boundary layer with underlying map tiles
Boundary layer with underlying map tiles
Making the map tiles

• Open Street Map (OSM) data
  • Tiles produced using Mapbox TileMill
• Exported to MBTiles format
  • TileStache can render maps from MBTiles
  • MBTiles stores map tiles in a SQLite database
• Our file was only 91KB in size
• 5 zoom levels
  • Each zoom level needs about 4x more tiles
Beyond a tile server

- Dynamically drawn maps require map application server (map server and underlying geospatial data)
- Mapnik, MapServer, GeoServer, and more
- OSM data can be extracted and used locally
  - Preferably work with regional subsets
  - Entire planet dataset is nearly 40 GB compressed
- Might be easier to do on non-Windows systems
Key resources

• http://gis.stackexchange.com/questions/98490/how-do-i-serve-mbtiles-with-tilestache?
• http://blog.apps.chicagotribune.com/2011/03/08/making-maps-1/
• http://build-failed.blogspot.com/2012/03/custom-map-tiles-part-3-tilestache.html
Thank You!

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