Web Based GIS

A Novella
• In the Beginning, there was D2-Puff
  – A 6 year old standalone Emergency Management Application
    • Written in Visual Basic
    • Collected real-time meteorology data
    • GIS-based front-end
    • Chemical Dispersion Model
The Mandate

- US Army CSEPP said:
  - Use no commercial software.
  - Why?
    - US Army and CSEPP have been getting eaten alive by licensing fees over the years
  - How?
    - 7 ‘Sites’ attached to 11 States and 60+ municipalities
    - Would mean license fees/maintenance, for 60+ servers
    - By default a 60x multiplier
  - And also
    - Army has a preference for code they can view themselves
Challenges

• So, our issues
• Make it web-based
• Fit it as a ‘component’ of an existing application
  • Cannot be a massive, full-browser standalone app
• Build our own renderers, when need be
• Allow us to write custom widgets
  – Animation
Technology Selection

• Why and why not certain pieces of code?
• MapServer
  – the Apache HTTPD of Web Mapping
  – Another server to run
• GeoServer
  – Heroic GeoTools-based Java answer to MapServer
  – Another server to run
• MapGuide OpenSource/MapFish/MapNik
  – Terrific packages, well worth looking into
• Google/MapQuest/Yahoo Map Hacks
  – Not enough for a ‘real’ app
Solution

• So, what’d we pick?
• Client - Community MapBuilder
  – Allowed us to put a map ‘component’ into the app
  – JavaScript-based, so very, very lightweight
  – Most sophisticated client library out
  – Write our own tools
• Server - GeoTools-based renderer
  – A bit of custom code, a bit of borrowed code
  – Allowed us to build custom layers, such as chemical plumes
• Datastore – PostGIS
  – PostgreSQL’s GIS extensions have matured substantially
The Process

• Our organization had no familiarity with web-based GIS

• And, still got this turnaround:
  – Total effort: August 2005 -> December 2005, with two hurricanes in between
  – 1 developer
  – Massive effort poured into getting a GIS up and running
    – Writing the back-end
    – Integrating the front end, writing custom widgets
  – Gathering datasets with GIS personnel
The Product

• So, what did we implement?
  – Political Bounds (Counties, Cities, EPZs)
  – Terrain Data (DEM)
  – GeoTiff Renderers
  – Animated Chemical Plumes
  – Met Arrows (Wind Readings)

• Tools
  – Population Analysis (using census block data)
  – Dosage Query
  – Distance/Road Network
2005 - 2008

• Feature addition
  – Homebrewed basemaps with Google option
  – Interaction with other products (evacuation, re-entry, exposure)
  – Homebrewed caching
  – Integration of OpenLayers for tiling
  – Speeding up renderers (particularly for terrain)
• What now?
• Migration away from Community MapBuilder to GeoExt
  – OpenLayers + Ext
• Use of GeoServer and GeoWebCache for static data
The Next Generation

• Migration away from Community MapBuilder

• For Application Developers:
  – GeoExt Or something JQuery-Based?

• For the adventurous:
  – MapFish/MapNik

• For the curious:
  – Google Maps Data API
SLOSH/SAR in Florida
• If you wanted to do the same
• Spend a little time evaluating tools
• Evaluate your licensing situation
• Evaluate your technical resources (GIS personnel, programmers)
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