Serving Geoprocessing Over the Internet: An Open Source Approach

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**Introduction**
Current and near term trends for web mapping applications are those that will serve dynamically created results from spatial analysis performed with server side geoprocessing functions based on variables defined by user input. Most geoprocessing currently online exists in the form of network routing (Google/Yahoo/Bing etc Maps), business analysis applications, and environmental applications such as watershed analysis. The next iteration of web mapping will feature the full range of standard and customized geoprocessing tools available over the Internet without the need for desktop software. This poster demonstrates one configuration of open source tools that allows for the development of web applications that serve geoprocessing functions based on user defined input.

**Demo Overview**
This demo application uses a point feature and a number as input. The point feature is created with OpenLayers, and then the coordinates of the point feature are used as the starting point for the creation of a service area based on the input distance on the street network. The application calls a geoprocessing query in PostgreSQL that creates a convex hull from the extent of the service area, and returns information about food store locations, housing, and food expenditures from within that area.

**Platform Configuration**

- **Relational Database**
  - PostgreSQL
  - Data Storage (spatial+attribute)
  - Data Query

- **Spatial Database Extension**
  - PostGIS
  - Spatial PostgreSQL
  - Spatial data types
  - Spatial query functions
  - Geoprocessing

- **GIS Web-data Publication**
  - GeoServer
  - Serve data to web
  - Different source types
  - Symbolize Layers
  - Serve Legends

- **Routing Engine**
  - pgRouting
  - Network topology creation
  - Network Routing functions
  - Shortest Path, Traveling Salesperson, etc

- **Server-side Data Processing**
  - php
  - Access database
  - Initiate queries
  - Return Data

- **Client-side web interaction**
  - JavaScript
  - Web page controls
  - Initiate AJAX functions

- **Web-mapping JavaScript Library**
  - OpenLayers™
  - Create features
  - Configure Layers
  - Create controls

- **Web Markup Language**
  - HTML
  - Base map tiles

- **Internet Juggernaut**
  - Google Maps
  - Possibly a gummy bear

The time and data for this research was generously funded by EmPower partners LLC. EmPower Partners is a social enterprise geared toward helping inner city entrepreneurs discover opportunities to start sustainable small businesses within their communities.