Mapping and Beyond
Adding Geospatial Capabilities to Java Applications

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Agenda

Goals
- Enable developers to add geospatial capabilities to Java applications
- Introduce geospatial capabilities (mapping, LBS, etc.)
- Highlight useful tools/APIs available
- Provide examples and demonstrations

Presentation Outline
- Mapping, Visualization, and Imagery
- Location-Based Services & Geospatial Rules Processing
About ObjectFX

ObjectFX provides Java-based software tools and services for adding geospatial capabilities to enterprise applications.

**Our Primary Products:**

**SpatialFX**

Geospatial visualization service and development platform

**SpatialRules**

Rule-based platform for analyzing spatial and temporal data

- Corporate HQ in Minneapolis, MN
- Government offices in Columbia, MD and Reston, VA
- Commercial business focused on transportation, OEM, and enterprise systems
- Software deployed in multiple US government programs with a focus on DoD and Intelligence
- Sales and services staff with TS and above security clearances
Mapping, Visualization, and Imagery
Maps

• Maps simply display a location or area

• Extremely popular thanks to Google, Yahoo!, and MapQuest

• Relatively easy to add to most applications
  – Applicable to many business domains (as long as “where” is relevant)

• Adds a significant visual aid for little effort
Map Examples
Tools & APIs

For nearly all APIs, most work is done in JavaScript executing in the browser
- Simple to add on to a page, but...
- Bloats the client with code and data
- Adds to download and browser execution time
- Performs poorly when large business data sets are needed
- Developers are on their own for server-side integration

Complex applications with server-side needs are served better by SpatialFX/SpatialTools
- Provides an extensible framework to add remoting, custom behavior, data access, and image rendering
SpatialFX Web Mapping Tools (WMT)

- Map and image visualization components
- Fluid user experience (drag-to-pan, etc.)
- Specifically designed for web applications
- Integrate data from multiple sources
- Client or server integration options
- Built-in drawing
- Customizable popup look and feel
WMT Server-Side Components

Browser

Primary Application

SpatialTools/WMT

Data Stores

DataAccessors

Remote Services

MapOperations
Composite Maps (Multiple Layers)

- Mix images and data from multiple sources
- Control refresh / update individually
- Add, remove, show, hide dynamically

Fetch from different sources and services:
- Weather
- WMS
- Aircraft and Vessel Data
- NAVTEQ Street Data
- DigitalGlobe Image Service
Custom Data Accessors & Operations

• Data Accessors
  – Extension points to access custom data sources
  – Databases, files, remote and/or proprietary services
  – Implement the DataAccessor interface. One significant method:
    QueryResult execute(Query query)
  – Features returned are automatically rendered

• Operations
  – Extension points to add custom, server-side behavior
  – Subclass the abstract class MapOperation. One significant method:
    MapOperationResult execute(MapView mapView, MapOperationRequest request)
  – Implement custom behavior in the execute method
Mapping Summary

• Relevant to many business domains (very likely yours)
• Simple and easy to add
• Be careful of putting too much on the client/browser in complex applications
Beyond Mapping
Location, Location, Location

- Maps are great, but there's much more possible
  - Maps are primarily just visualization
- Location is becoming more important
- Knowing the location of something is more available and affordable
  - GPS & mobile devices ubiquitous
  - Strong support from sites, platforms
- New opportunities for applications and developers
These all have locations
...and they can all be located
So, how do we turn this...
...into useable information?
Spatio-temporal Rules Conceptual View

- Spatial Reasoning
- Inside?
- Outside?
- Cluster?
- Exit?
- Entry?
- Interacts?
- Other Properties...
- Distance?

- Spatio-temporal Rules Engine

- Events and Notifications

- Software Systems
  - Human Decision-Makers

- Business and Mission Data
  - Static Spatial Data
  - TBD

Intelligently manage the flood of spatial information
Capabilities - Proximity

“within 1 mile”

“within 4000 ft”

2D

3D
Capabilities - Within Area

“within” area
Capabilities - Enter/Exit Boundaries

“entered” France

“exited” France
Capabilities – Clustering (anywhere)

3 of a kind linked by proximity
Tracks come within 1 nautical mile of each other within 30 minutes.
Possibilities / Scenarios

• With these capabilities, there are so many new areas for applications:

- Dr. Niles is at Unity Medical Center As of 11:27 AM
- Jill departed school zone at 2:35 PM
- Tornado Warning near you
- Joe is 2 blocks away
SpatialRules Demo
Questions
Thank you!

Contact me at
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