Working with real-time data

Agenda

- Introduction
- Managing
- Visualizing
- Analyzing
- Client Applications
Introduction

Adam Mollenkopf
Working with real-time data

Common Applications

Mobile Resource Management
Assets
Vehicles

People

Environmental Sensors
Lightning
Seismic
Hydrographic

National Security
Border Protection
Defense
Intelligence

Defense
Working with real-time data

Enabling ArcGIS with real-time data and analysis

Real-time data

Tracking Server

ArcGIS Server

Desktop Applications

Web Applications

Mobile Applications
Managing real-time data

Adam Mollenkopf
Bringing real-time data in

Data Links acquire real-time data from tracked entities and transfers them to Tracking Server.
Bringing real-time data in

Data Messages coming into Tracking Server must have a format that matches a Message Definition in order to be processed.

The Generic Input Data Link allows text (CSV or XML) data messages to be pushed into Tracking Server.

### 'Bus' Message Definition:

<table>
<thead>
<tr>
<th>Name</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>trackId</td>
<td>String</td>
</tr>
<tr>
<td>observedTime</td>
<td>TimeStamp</td>
</tr>
<tr>
<td>shape</td>
<td>Point</td>
</tr>
<tr>
<td>panic</td>
<td>Boolean</td>
</tr>
</tbody>
</table>

**Bus**

| Bus1       | 7/5/11 9:00:00 AM | -116.28178, 32.555702 | false |

This data is processed by Tracking Server, which converts the data format to match the defined 'Bus' message structure.
Applying analysis to real-time data

Actions apply **analysis** and **operations** to incoming messages as they are received by Tracking Server.

A **Filter** action keeps (or discards) messages that meet the criteria of attributes or location.

**Real-time data**

```
<message id="Bus">
  <field>bus1</field>
  <field>7/5/11 9:00:00 AM</field>
  <field>-116.28178, 32.555702</field>
  <field>false</field>
</message>
```

**‘Bus’ Message Definition:**

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**Actions include:**
- Filter
- Data Modification
- Email Alert
- Data Partition
- Data Summary
Tracking Server Utilities

The **Tracking Simulator** sends **Data Messages** into Tracking Server. The **Data Message Viewer** receives messages from Tracking Server. Tracking Server is configured via **Tracking Manager**.
Demo: Managing real-time data

Adam Mollenkopf
Visualizing real-time data

David Kaiser
Real-time GIS Patterns

Dynamic
something that moves

Discrete
something that “just happens”

Stationary
stands still but records changes

Change
change or growth

- Planes
- Vehicles
- Animals
- Satellites
- Storms

- Crimes
- Lightning
- Accidents

- Weather Stations
- Traffic Sensors

- Population
- Distribution
- Fire Perimeter
Real-time Mapping

- Rendering of Live Feature Data
- Track-Aware Symbology
- Actions
Tracking Symbology Options

- Smooth tracks
- Multiple attribute display
- Directional Vector
- Most Current
Demo: Visualizing real-time data

David Kaiser
Analyzing real-time data

David Kaiser
Analyzing real-time data

Detecting Conditions

- Actions run pre-configured analysis

- Symbols can be triggered based on ‘Action’
  - E.g. when a track intersects a polygon
Analyzing real-time data

Alerting

- Tracking Server actions run in server context
- Broadcast e-mail alert
- Perform data modification
- Call external application
Demo: Analyzing real-time data

David Kaiser
Desktop applications with real-time data

The Tracking Client API enables desktop applications to monitor entities through time, as they move or change.
Web applications with real-time data

The Tracking Client API enables web applications to monitor entities through time, as they move or change.
Demo: Tracking Viewer for Flex

Adam Mollenkopf
Mobile Applications with real-time data

The **Tracking Client API** enables mobile applications to monitor entities through time, as they move or change.
Demo: Android Mobile Sample

Adam Mollenkopf
Tracking @10.1

- Tracking Analyst @10.1
  - Single list of tracks across multiple layers
  - Proactively monitor services
  - Generate track statistics for analysis

- Tracking Server @10.1
  - Tracking Widget for ArcGIS Viewer for Flex
  - Apply spatial filters to conserve client resources
  - Industry Standards support: KML, JSON
  - Application Templates for Tracking
Summary

- Esri Tracking Solutions:
  - enable ArcGIS with real-time data and analysis
  - provides capabilities for Managing, Visualizing, and Analyzing real-time data
  - can be applied in a variety of environments including:
    - Desktop, Web, and Mobile
  - offers unified functionality across a variety of developer platforms including:
    - .NET, Java, Qt C++ (new)
    - Flex, Silverlight, JavaScript (new)
Resources to get started

- **ArcGIS Tracking Analyst:**

- **Resource Center for Tracking Server:**
  [http://resources.arcgis.com/](http://resources.arcgis.com/) (click ‘Tracking Server’)

- Please submit a session survey: