Building Applications with the ArcGIS Runtime SDK for Windows Mobile

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What we will cover today

- ArcGIS
- What is ArcGIS Runtime SDK for Windows Mobile
- Software Development Kit
- Application SDK
  - Introduction and Key Concepts
  - Demos (MPC and App Extensions)
- Core SDK
  - Architecture
  - What’s new
  - SDK Demo Routing
- Road ahead
ArcGIS is a Complete System

Managing and working with geographic information

- Online (public or private cloud)
- Server (on premises or private cloud)
- Desktop
- Mobile/devices
- Content

Many deployment options
Esri Mobile Technologies
Mobile capabilities of the ArcGIS system

Platforms
- iOS
- Windows Phone
- Linux
- Android
- Windows Mobile
- Windows 7

Apps and APIs

Form Factors

Functionality
What is mobile GIS?

Extends the reach of ArcGIS from the office to the field

• Carry your maps to the field
• Collect and update geographic information
• Track and geo-collaborate
• Replaces paper based workflows
• Easier access to dynamic information
• Multiple users seamlessly using the same map
What are the key benefits of mobile GIS?
Leverage your investment in ArcGIS

- Improve efficiency and accuracy of field operations
- Rapid data collection and seamless data integration
- Enable free flow of information between devices/desktops
- Help to make informed and timely decisions
## Apps and SDKs

<table>
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<tr>
<th>Windows Mobile</th>
<th>Windows</th>
<th>Windows Phone 7</th>
<th>iOS</th>
<th>Android</th>
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<td>Objective C</td>
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- **Runtime SDKs**
  - Windows Mobile: .NET CF, WPF, Java
  - Windows: .NET CF, WPF, Java
  - Windows Phone 7: Silverlight
  - iOS: Objective C
  - Android: Java
  - Linux: Java

### Images
- Windows Mobile
- Windows
- Windows Phone 7
- iOS
- Android
- Linux
Mobile Applications

*ArcGIS running on ...*
ArcGIS for Mobile on Rugged Devices

Windows and Windows Mobile Devices

- Designed for harsh field conditions
- One handed/vehicle-mounted use
- Occasionally connected workflows
- High accuracy data collection
  - GPS/GNSS integration
  - Laser integration
- Replace Paper Surveys
  - Intelligent forms
  - Barcodes
- Sensor integration

Water Facilities Mapping
Asset Maintenance/Inspection
Emergency Operations
Service Requests

Land Management
The Windows Mobile platform
A strategic platform

- Customers are purchasing new devices with Windows Mobile OS today

- Vendors still releasing new devices

- Rugged devices offer advantages
  - Truly rugged (IP rated)
  - Battery life
  - Positional accuracy
  - Sensor integration
What is ArcGIS for Windows Mobile?
ArcGIS for Windows Mobile

Windows and Windows Mobile Devices

- Rapid Deployment of Maps, Apps & Projects
- Task-based, Workflow Driven User Experience
- Disconnected
- Synchronization of Data between Field & Office
- Focused Mobile Applications
- High Accuracy Data Collection
- Users have little GIS training
- Scalable to large field workforce
Mobile Project Center

- Create projects for Field Applications
- Configure workflows and data
- Project packaging
- Project verification
- Publish and share projects
  - Local
  - On-Premise Server
  - Cloud (ArcGIS.com)
Field Applications

- View and identify features
- Measure distance, areas, features
- Adhoc and pre-defined queries
- GPS/GNSS data collection
- High accuracy collection
- Forms centric editing
- Intelligent field types driven by data model
- Field validation
- GPS logging
New in 3.0

- Simplified data collection experience
- Support for geodatabase attachments
- Geometry editing (WM)
- Improved GPS/GNSS display
- Waypoint navigation
- Auto-populate of attributes
- Portal support
ArcGIS for Windows Mobile
Windows and Windows Mobile Devices

• ArcGIS Runtime SDK for Windows Mobile
  - Coarse-grained .NET API
  - Extend COTS application
  - Create focused Mobile GIS applications
  - Embed ArcGIS into existing line of business applications
  - Included in Setup
  - Help and Samples location at the Mobile Resource Center
Software Developer Kit
Software Developer Kit

Core SDK API
- Builds new field applications from scratch
- Embed GIS into existing Line-of-business applications
- Connected or occasionally connected field operations

Conceptual Documentation, API Reference, VS components & templates

Application SDK API
- Extends ready-to-deploy applications
- Creates new tasks or customizing existing functions
- Available for Windows and Windows Mobile

Sample Code
Application SDK
Application SDK

- Designed for ready-to-deploy tablet and Windows Mobile applications
- Allows developers to customize the applications
  - Changes existing tasks/functions
  - Integrates new business logic and Implementations

Custom Menu Items
- New Tasks
- Custom Map Layer
- Custom Menu Items
- And more…
Example – Simplified Fire Data Collection
Example – Provide Turn-by-Turn Navigation
Key Concepts

- **MobileApplication**
  - Represents the instance of mobile application on device
- **Project**
  - A device may contain multiple projects
  - The app can open one project at a time
- **Task**
  - Defines a workflow for field operation
  - Embeds business logic
  - Creates an entry on Select Task Page
- **Extension**
  - Changes behavior of existing Tasks or functions
  - Needs to hook up to an extensible point in framework
  - Either modifies existing workflow or introduce new business logic
Extensible Points

- Various events
- Existing Pages/Dialogs
- MapPage
- View/EditAttributesPage
- MenuDialog
- SettingsPage
- and more…
How to construct a workflow?

- MobileApplication.current.Transition()
- MobileApplication.current.ShowDialog()
Demo - Custom Task/Extension Deployment
Demo – Create wellpad Task
Demo – Environment Analysis Extension
How to Get Started?

- **Project Templates**
  - Seamless integration with Visual Studio IDE
  - Creates Task or ProjectExtension solutions
  - Supports both Windows and Windows Mobile
  - Includes VS project for MPC

- **Developer Help**
  - Discusses architecture of the framework
  - Reveals extensible points with code snippets

- **SDK Samples**
  - Demonstrates various extensible points
Core SDK
Core SDK API

- sync agents
- mobile service connection
- GPS
- map
- mobile cache
- tile cache/StreetMap
- feature source
- annotation layer
- map action
What’s new with the Core Framework at 3.0

• Attachment API
• New operations exposed in Geometries namespace (Buffer, Union, Cut…)
• Geodesic calculation
• Routing API
• API for creating indexes for SQLite database
SDK - Routing
Routing

RouterFactoryClass rfc = new RouterFactoryClass();
IRouter _route = rfc.CreateRouter(@"<PATH>\Streets.rs");

StreetMapDataset _dataset =
    new StreetMapDataset(@"<PATH>_navteq_na.navmap");
StreetMapLayer _layer = new StreetMapLayer(_dataset);
_dataset.Open();

mapControl1.MapLayers.Add(_layer);
// reverse geocode
location = _dataset.FindLocation(mapCoordinate);

// geocode
Locator locator = _dataset.Locators[0];

LocatorFilter statefilter = locator.GetNextFilter();
LocatorFilter cityfilter = locator.GetNextFilter();

List<LocatorResult> target =
    new List<LocatorResult>(housefilter.GetResults());
List<Location> result =
    List<Location>(target[0].GetLocationCandidates());
StopCollectionClass stopsCollection = new StopCollectionClass();

//Add StopClass to the StopCollectionClass
stopsCollection.Add();

IDirections directions = _route.Solve(stopsCollection, null);

IDirectionsSummary summary = directions.Summary;
IDirectionCollection directionCollection = directions.Items;
Licensing

- **ArcGIS Server Advanced Enterprise**
  - Unlimited deployments

- **ArcGIS Desktop**
  - Includes one deployment

- **Deployment packs of 5 or 50 are available**
  - ArcGIS Server Advanced Workgroup and Standard Enterprise
  - Desktop
Trimble Positions

- Just announced
- GeoCollector for ArcGIS
- Enhances data collection capabilities
  - Extension of the field applications
  - Integrates into the data collection workflow
- Positional accuracy
  - Post-processing capability
  - Real-time
Roadmap

• 3.1 Release
  - Native camera support for the Windows Field App
  - Performance improvements
  - Bug fixes

• Looking ahead
  - Improvements to the Windows Field App data collection experience
  - StreetMap routing and geocoding support in Windows Field App
  - Extend auto-populate capabilities
  - Leverage hosted feature services
User Conference

What to do and see…
Sessions To Attend

- Road Ahead – ArcGIS for Mobile Devices
  - Thursday July 26, 10:15am - Ballroom 06 B

- Developing GeoCollector Solutions for ArcGIS
  - Thursday July 26, 1:55pm - Room 01 A

- GeoCollector for ArcGIS
  - Thursday July 26, 2:20pm - Room 01 A
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