Building Java Apps with ArcGIS Runtime SDK

Mark Baird and Vijay Gandhi

Technical Workshop

A step back in time…

- **Map making 50 years ago**
  - http://www.nls.uk/exhibitions/bartholomew/maps-engraver
  - http://www.nls.uk/exhibitions/bartholomew/printing

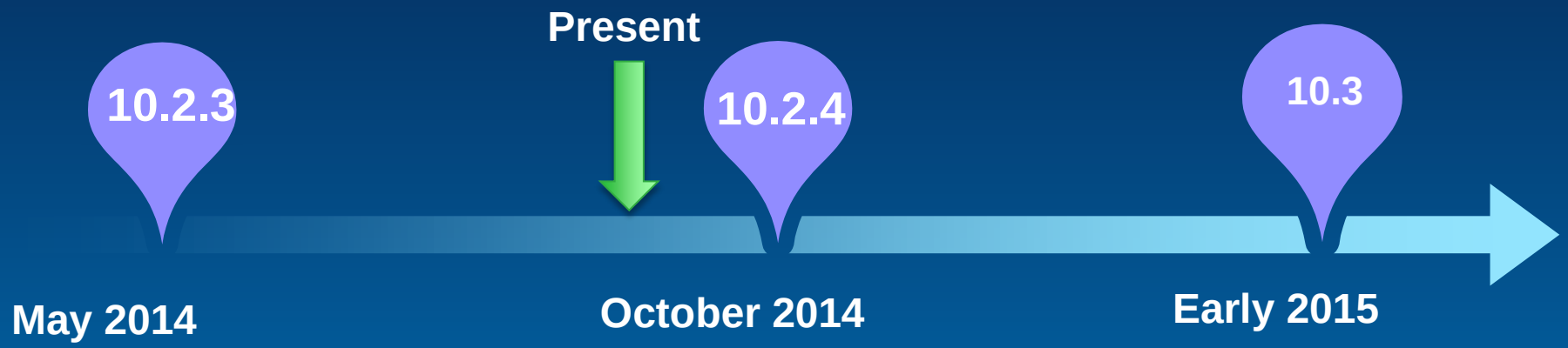
1960s

2014

Outline

- What's new in 10.2.3
- Developing an app
  - Map & Layers
  - Analysis
  - Offline
    - Taking data offline
    - Editing
    - Sync
    - Routing & Geocoding
- Deploying your app
- Road ahead
- Questions

What's new



- 10.2.3 release out now
  - free download on developers.arcgis.com
- 10.2.4 release coming soon…

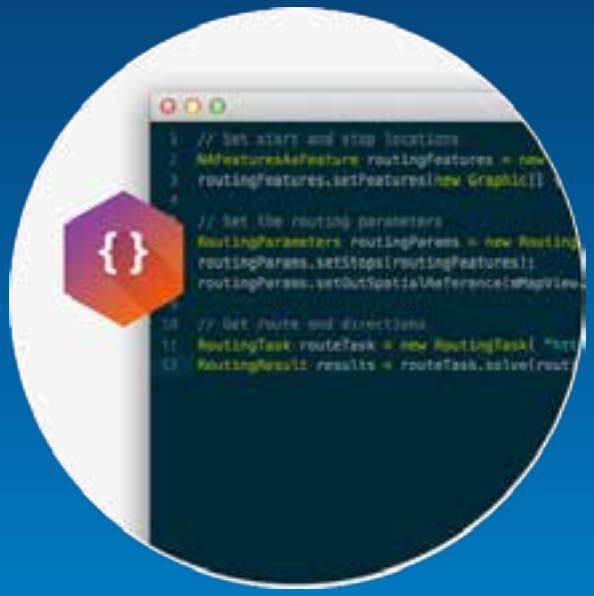
- Developers website
  - download, documentation, samples
- Offline functionality
- New licensing model

What’s new - Offline

- Tile cache
  - Use as basemap
- Cache features locally
  - Local geodatabase
  - Query, Identify
  - Edit
  - Sync edits
- Routing & Geocoding

Development & Deployment Workflow

1. Download and Install



2. Develop and Test

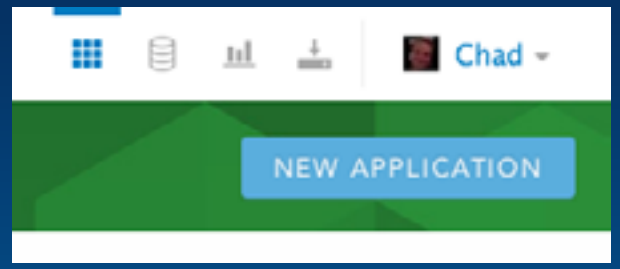
3. Deploy and Distribute

License levels and functionality

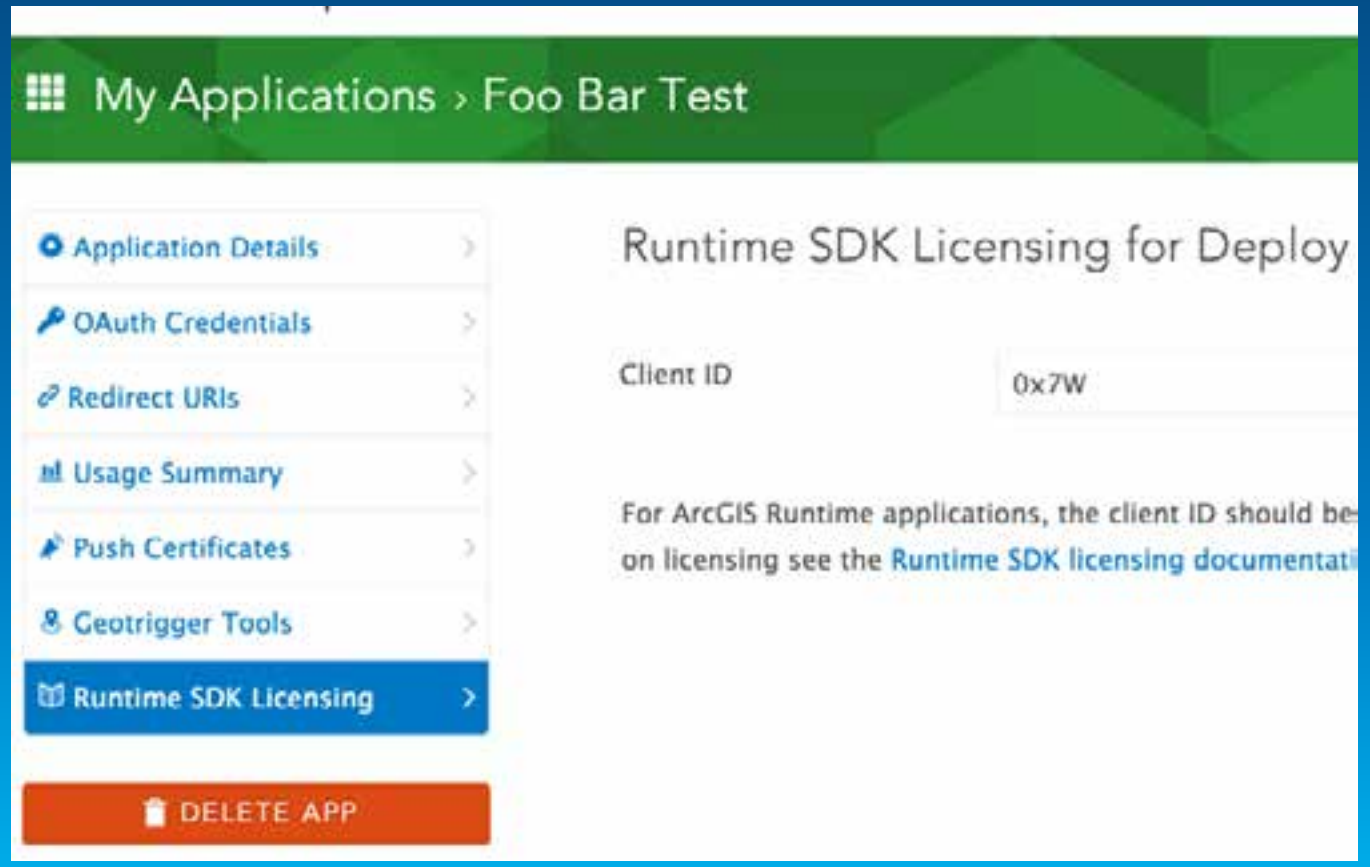
License Level	Available functionality
Developer (development and testing only)	All functionality (watermarks and debug messages will be generated, nag screens with local server *)
Basic	Connected - all functionality Offline - map viewing only
Standard	Connected and offline - all functionality, includes: • Local locators (geocoding) • Local routing • Local geodatabase editing • Local geodatabase sync operations • Local server *

*** For those SDKs that support it**

How to license your app at the basic level



- http://developers.arcgis.com
- Under Application section, create a New Application (or select existing)
- Click on Runtime SDK Licensing
- Copy the Client ID and use it to set your clientID
  - ArcGISRuntime.*setClientID("0x7W");*



How to license your app at the standard level

You have 2 options:

1. **Use an organization account (ArcGIS Online or Portal for ArcGIS)**
   - **Requires users of your app to log in with their account**

2. **Use a license string obtained from Customer Service or your international distributor**
   - **License burnt into the app**
   - **Extensions can also be added with this option**

For more info speak to sales or product management

What’s new - Functionality

- Additional GeoProcessing Tools
  - Mosaic Dataset tools!
- New toolkit
- Performance optimizations for tile services
- Popup improvements
- See https://developers.arcgis.com/java/guide/release-notes.htm

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Building an app

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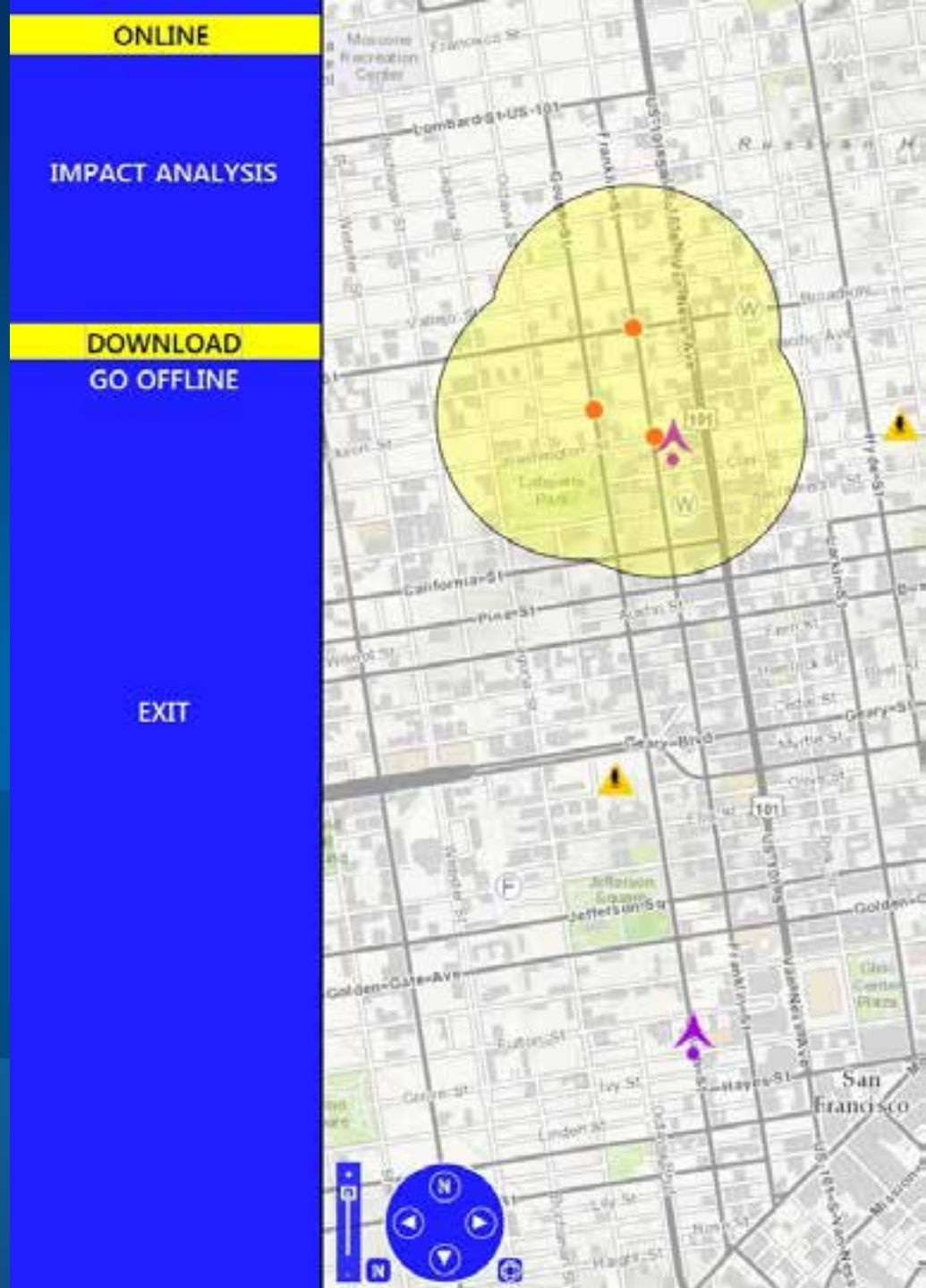

Map & Layers

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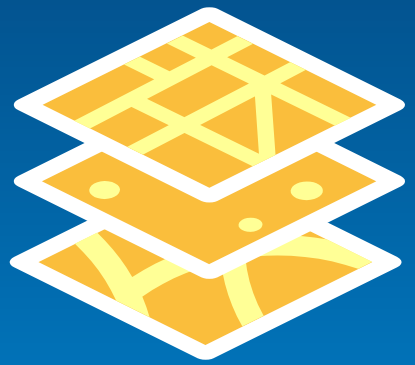
Cloud
- ArcGIS Online
- ArcGIS for Server
- OGC (WMS)
- OpenStreetMap

Local Packages
- Tiled Map
- Dynamic Map
- Geocoding
- Geoprocessing



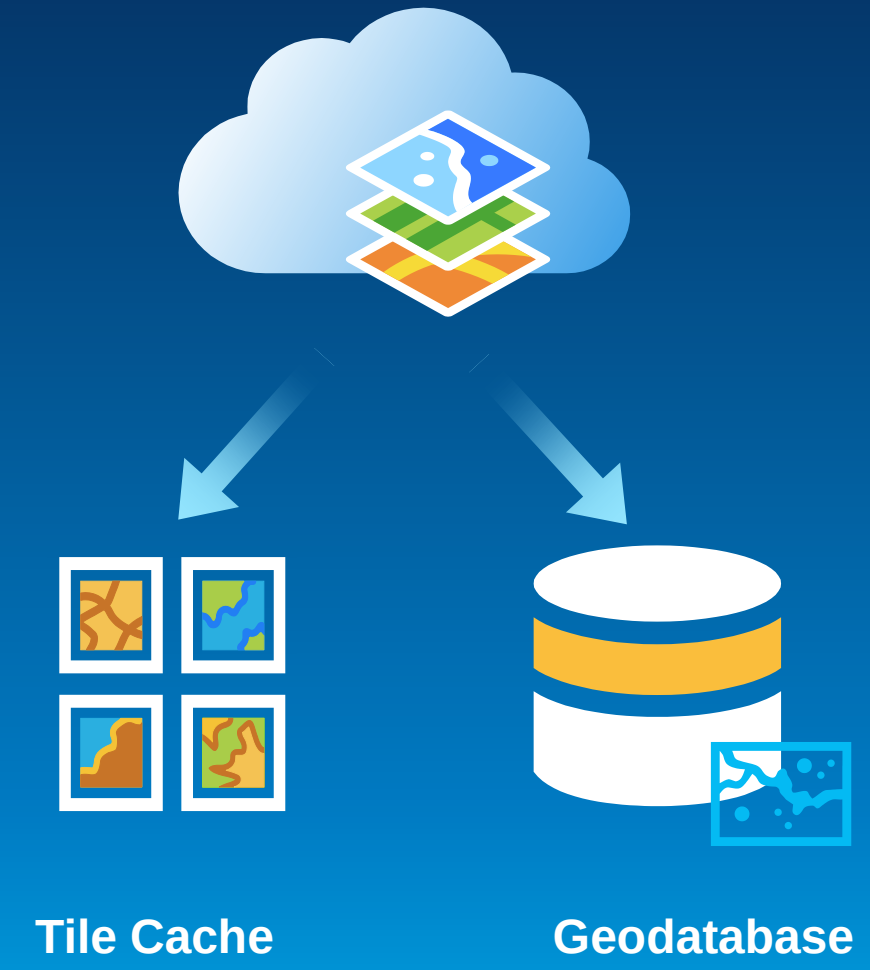
Application
- Graphics

10.2.3
- Tiled Cache
- Geodatabase

Device
- GPS

New Layers in 10.2.3

- Tile cache
  - Download tiles from server
  - Display in LocalTiledLayer
- Geodatabase
  - Download features from server
    - Editable
    - Searchable
    - Sync enabled
  - Display in FeatureLayer
  - Toolkits



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Map & Layers

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Analysis

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Analysis - Geometry Engine

Buffer

Difference

Intersect
(equals, within, contains, crosses, touches)

Union

Project

Shortest Distance

Line Length

Geodesic

Analysis - Features

- **Query**
- **Find**
- **Identify**
- **Geocoding**

- **Task based framework**

Parameters

- Attributes, geometry, etc
- Multiple spatial references

Create Task

- Online or Offline source

Execute Task

- Sync or Async

Analysis - Geoprocessing

- User-defined analysis
- Example – Project & Clip

Analysis - Geoprocessing

- Pre-built tools included in the ArcGIS System
- Examples
  - Proximity Analysis
  - Spatial Statistics
  - Viewshed
- Create your own using ModelBuilder or Python
- Available
  - Online - hosted as a geoprocessing service by ArcGIS server
  - Offline - local geoprocessing packages (GPK)
- Execute the service as a task using the API

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Analysis

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Getting Offline Data

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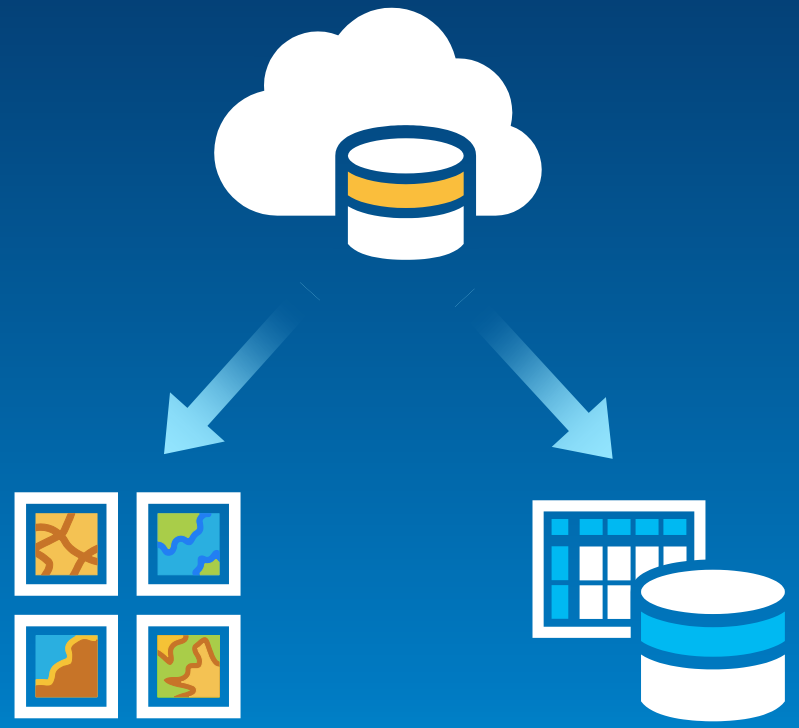
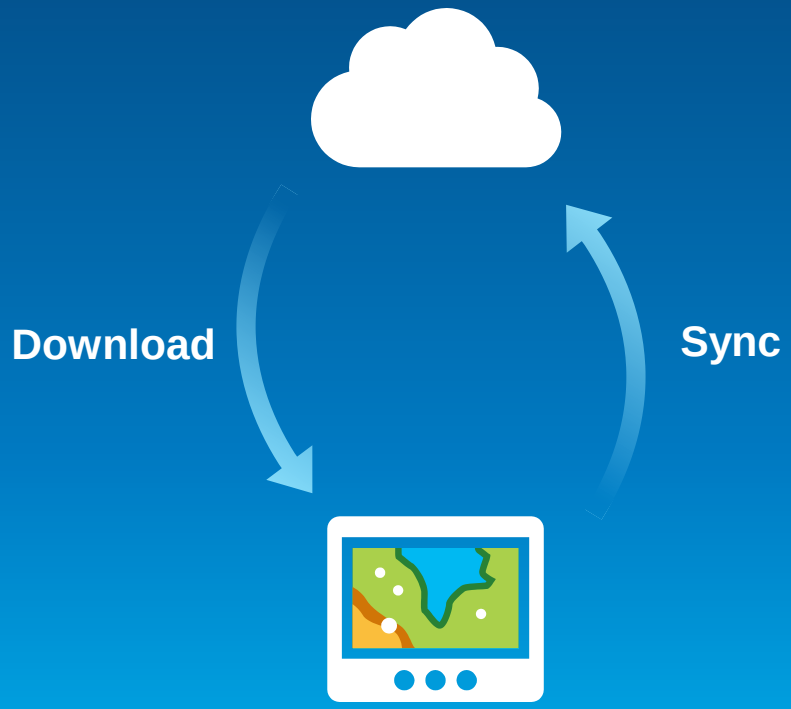


Offline

Services Pattern



Desktop Pattern

Getting an offline geodatabase

- **Simple coding steps:**
  - **Make a task : a geodatabase task**
  - **Create some parameters**
  - **Request the geodatabase using the task and parameters**
  - **Use asynchronous code to monitor progress and completion.**

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Getting Offline Data

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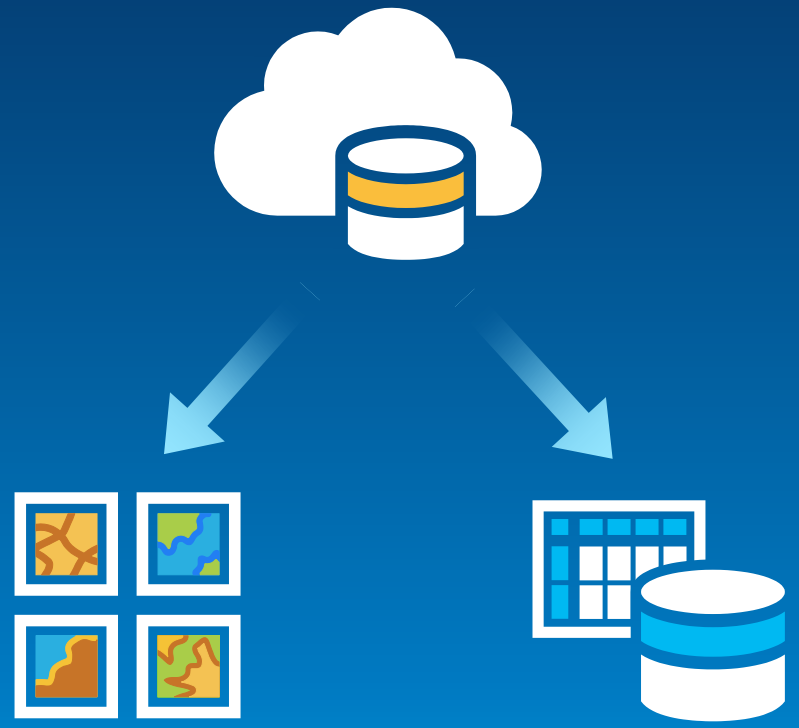

Offline Routing and Geocoding

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Offline - Routing & Geocoding

- Routing
  - Create & Share route data from ArcGIS for Desktop
  - Option to set stops, preserve order, add barriers

- Geocoding
  - Create & Share locator data from ArcGIS for Desktop
  - Geocoding & Reverse geocoding

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Routing

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Editing

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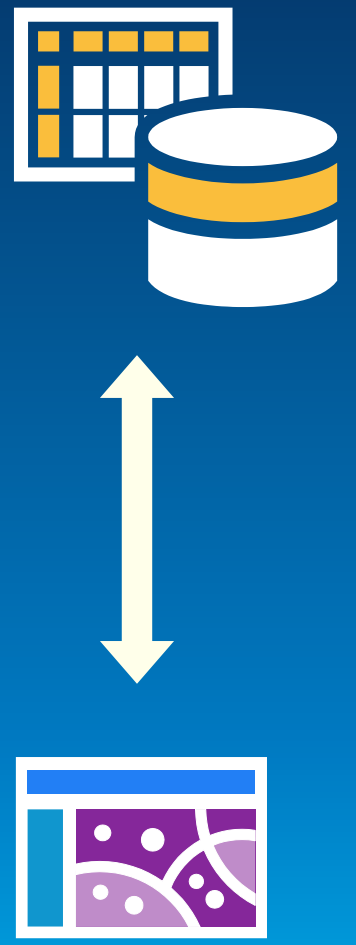


Offline - Editing

- Create, Edit, Delete Features
- Attributes, geometry & attachments
- Edit using
  - API – for fine-grained control
  - Toolkit – for rapid development
- Also works for online services

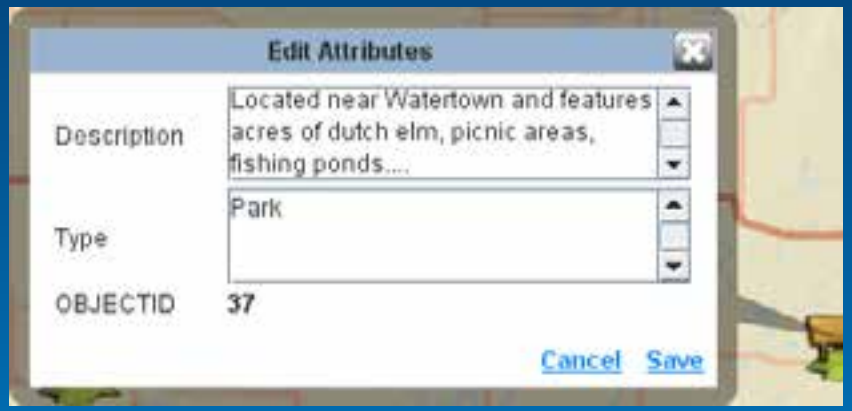
Offline – Toolkit for Editing

Template Picker
- List all feature types
- Create feature

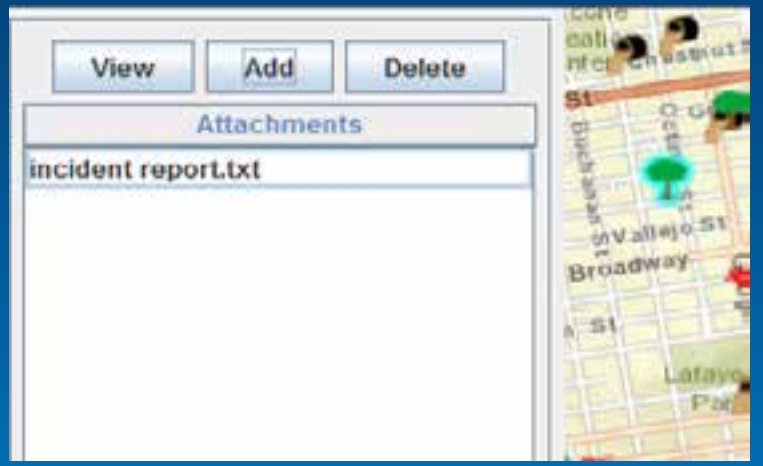
Editing Toolbar
- Highlight feature
- Create, Delete feature
- Create, Edit geometries

Drawing Overlay
- Create, Edit geometries

Offline – Toolkit for Editing



Popup
- Dialog with attributes of a feature
- Read-only and Editable



AttachmentEditor
- View, Add, Delete attachments

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Editing

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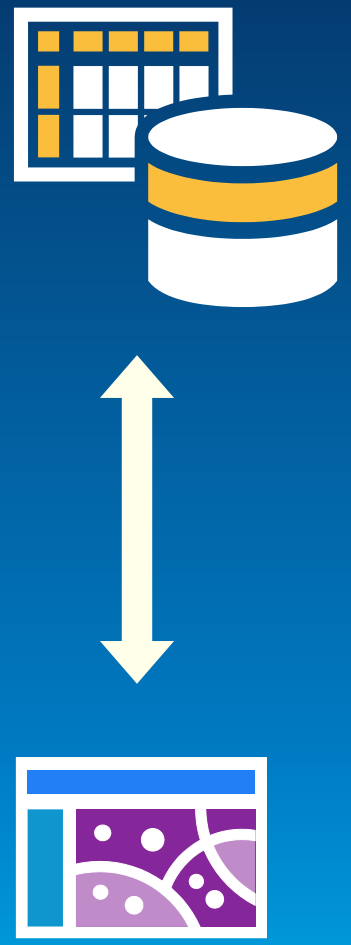

Sync

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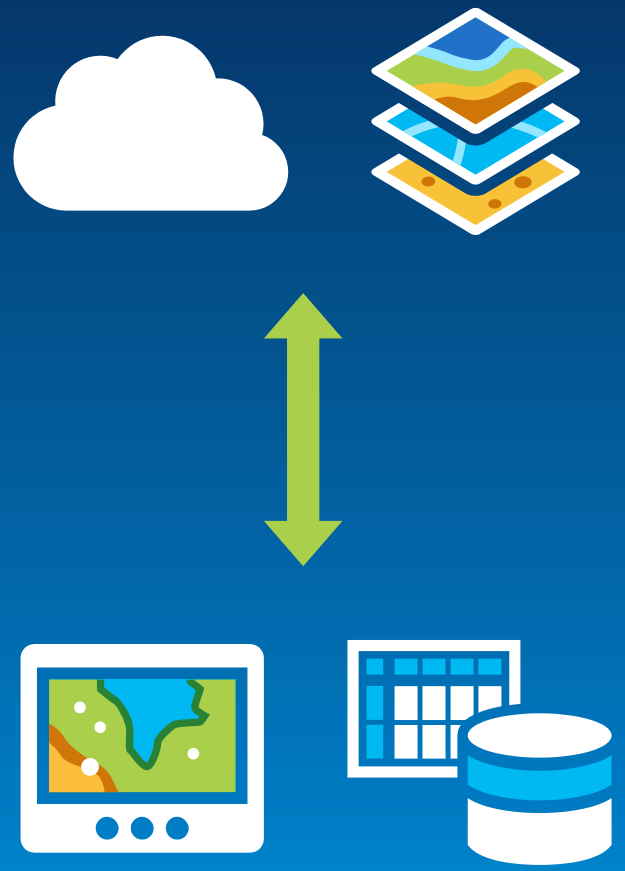


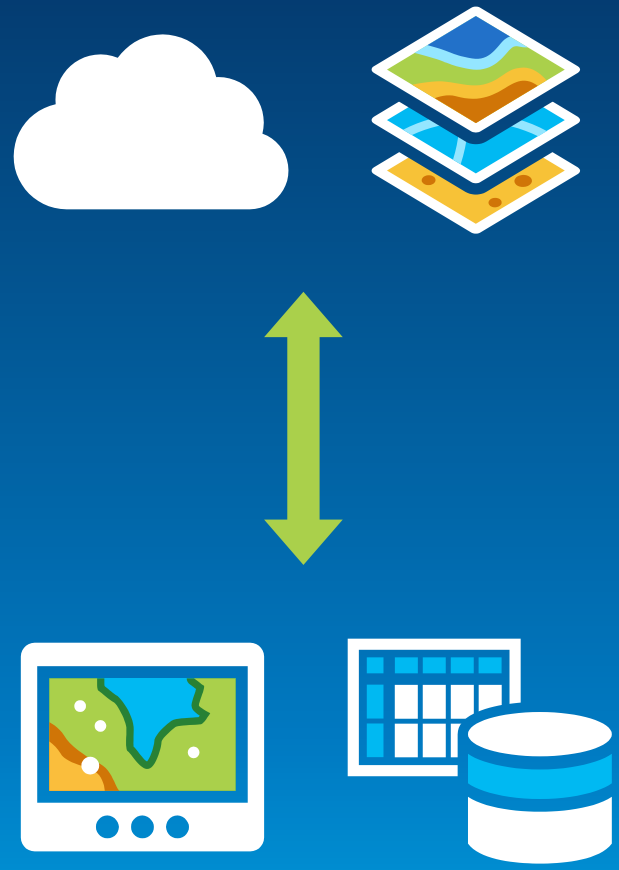
Synchronization

- 2 way process
  - Upload your edits
  - Download other changes

  Alternatively you can:

  Upload only
  - Download only

- Familiar development patters
  - Task
  - Parameters
  - Call method on task to Sync.



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Sync

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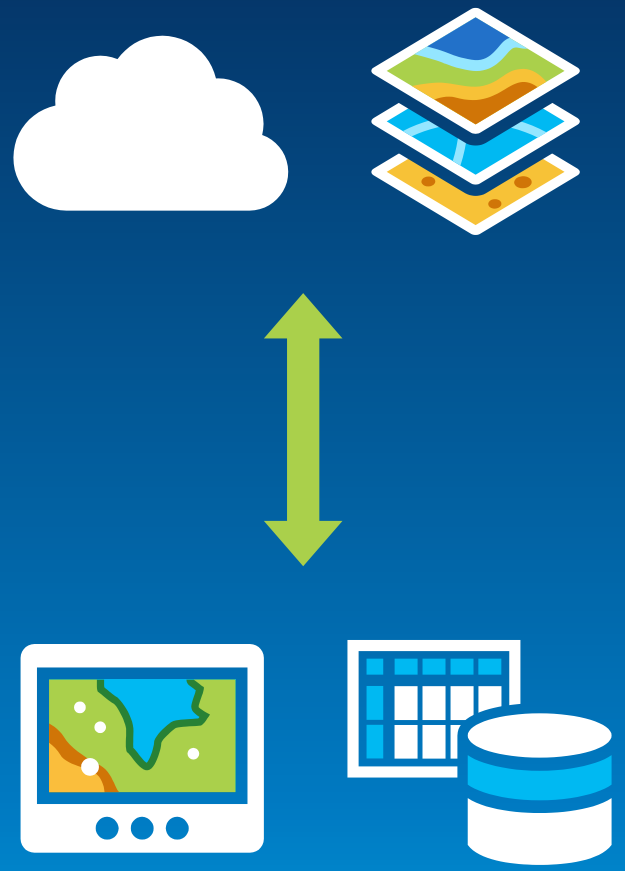

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Deployment

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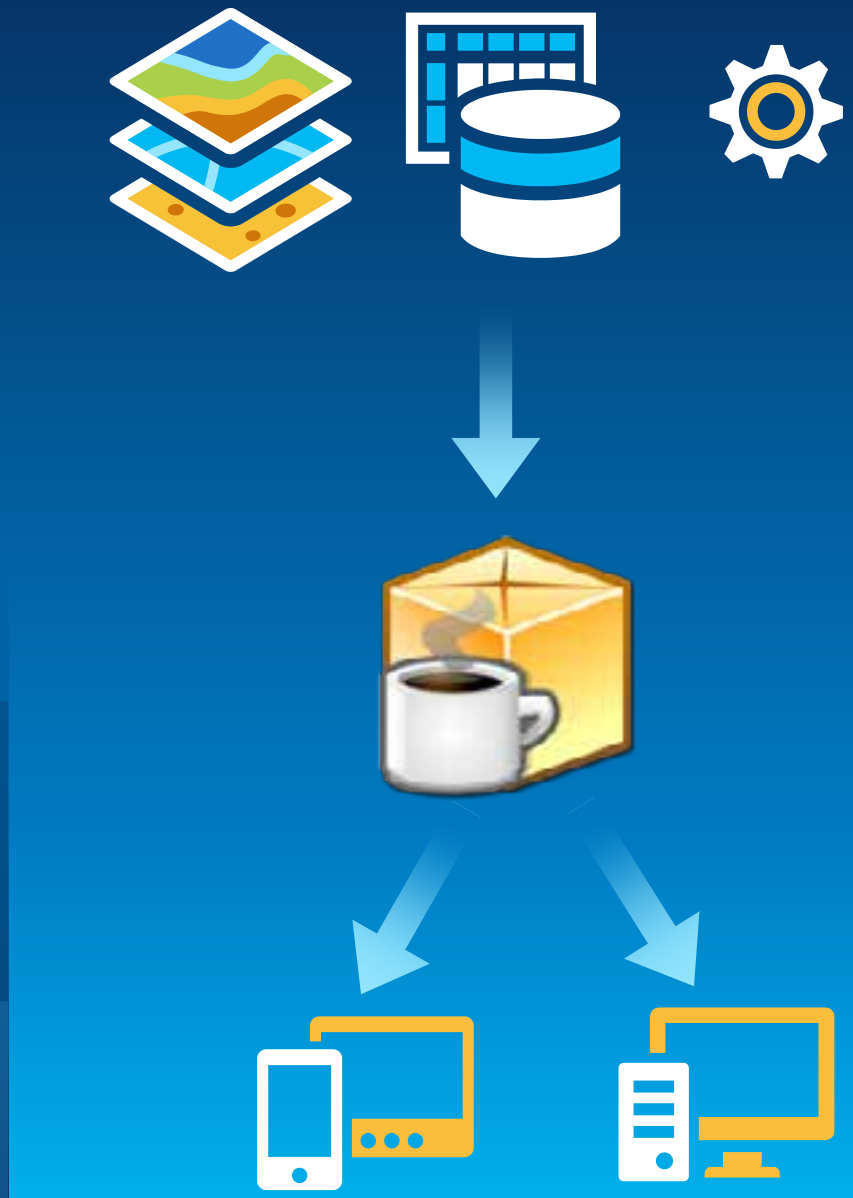

Road Ahead 10.2.4 and 10.3

- 10.2.4 (Summer)
  - Direct read of data
    - Raster data
    - Shapefiles
    - GeoPackage
    - KML
  - Samples and toolkit code on GitHub
  - Java FX control (Beta)

- 10.3 (Early 2015)
  - 3D
  - GPU based analysis

ArcGIS Runtime SDK sessions Wednesday

Session Name	Time	Location
ArcGIS Runtime SDK for Qt: Tips and Tricks	9:30am – 10:00am	Developer Island (demo theatre)
Building .NET Apps with ArcGIS Runtime SDK: Tips and Tricks	11:30am – 12:00pm	Developer Island (demo theatre)
Offline Routing and Geocoding in ArcGIS Runtime SDK	3:00pm – 3:30pm	General Theater 2 (demo theatre)
Developing Windows Desktop Apps with ArcGIS Runtime SDK for .NET	8:30am – 9:45am	Room 09

ArcGIS Runtime SDK sessions Thursday

Session Name	Time	Location
Create your own Android App Tools Using ArcGIS Runtime SDKs	9:30am – 10:00am	Developer Island (demo theatre)
Dive Deep into the Performance of the ArcGIS Runtime SDKs Core Display Architecture	10:30am – 11:00am	Developer Island (demo theatre)
10 Things you Didn't Know You Can Do with ArcGIS Runtime SDK for iOS	11:30am – 12:00pm	Developer Island (demo theatre)
Animating Thousands of Graphics and Features with ArcGIS Runtime SDK for Java SE	12:30pm – 1:00pm	Developer Island (demo theatre)
Developing Mobile Apps with ArcGIS Runtime SDK for .NET	10:15am – 11:30am	Room 05 A
ArcGIS Runtime SDKs: The Road Ahead	1:30pm – 2:45pm	Room 07 A/B

Thank you…

- **Please fill out the session survey:**

Offering ID: 1222

Online – www.esri.com/ucsessionsurveys

Paper – pick up and put in drop box

Questions?

Understanding our world.