ArcGIS Runtime
An Introduction
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Agenda

- Getting Started
- Solution building strategies
- Developing Apps to work with Web GIS
- Runtime SDKs and supported platforms
- Architecture
- Functionality
- Licensing and deployment
Getting Started

David
ArcGIS Runtime Designed for Web GIS
Working with the GeoInformation Model - Maps and Layers

- The GeoInformation Model is the information model of WebGIS
- Content can be authored using online Map Viewer or ArcGIS Pro
  - Complex advanced visualizations easily created with Smart Mapping
  - Capabilities such as popups, bookmarks and slides supported
- The API for working with raw services is the same as content authored
  - No capabilities are lost
- Working with Maps, Scenes and Layers are more productive than the raw services
- Apps can be updated on the fly with new content via the maps they open
ArcGIS Runtime Designed for Web GIS

Working with the GeoInformation Model - ArcGIS Identity

- Users have a unique secure identity
- Content saved under user name
- Users can be assigned special privileges
- Users can share or keep content private
- Organize users, content and services
- Find, upload, share, configure, secure
Esri Apps and Your Apps Working Together

A Field Apps Example

Field Operations

- OSIsoft
- Operations Dashboard
- Geodecisions
- Pix4D
- Drone2Map for ArcGIS
- Survey123 for ArcGIS
- Collector for ArcGIS
- Trimble
- Leica
- BadElf
- ArcGIS for Desktop
- Workforce for ArcGIS
- Navigator for ArcGIS
- CityWorks
- Navigate
ArcGIS Runtime SDKs
Supporting Native App Development

• Supports 6 platforms
  - Android, iOS, macOS, Linux, Universal Windows Platform and Windows

• 6 APIs
  - .Net, Android, iOS, Java, macOS and Qt

• Allows you to select the development environment of your choice
  - Integrates with your solution
  - Makes you productive

• Your users benefit from the optimum solution
ArcGIS Runtime SDKs
Why Build a Native App?

- Only native apps can give the best performance
- Fully leverage device capabilities
- Access all peripherals via their native SDKs
- Best debugging experience
- Offline use of ArcGIS
ArcGIS Runtime SDKs
An Architecture Designed to Maximize Performance and Reuse
ArcGIS Runtime SDKs
C++ Core has Advantages

- C++ core and hardware accelerated rendering offer best performance available
- Performance of C++ core is independent from API chosen
- Common conceptual model across all public APIs
- Capabilities the same across all APIs and devices*
- Public APIs can vary to conform to their platform norms

* Dependent on device support
ArcGIS Runtime SDKs
Working with Layers from Services

• Feature layer
• Raster layer
• Map Image Layer
• Scene Layer
• Vector tiles
• OGC services
  - WMTS, WMS, KML and WFS*
• Rich symbology with smart mapping
• Layers are created from items or in code connecting directly to the service

* Release in Q1 2019
ArcGIS Runtime SDKs
Layers from Local GIS Data

• Feature Layer with vector data
  - Mobile Geodatabase, GeoPackage, Shapefile
  - Read and write

• ENC Layer - S57 with S52 symbology

• Raster Layer
  - Mosaic dataset, GeoPackage,
  - Raster file formats: ASRP/USRP, CRF, DTED, GeoTIFF/TIFF, HFA, HRE, IMG, JPEG, JPEG2000, NITF, PNG, RPF, SRTM (HGT), USGS DEM
  - Apply raster renderers and raster functions

• KML Layer
  - Full OGC KML 2.2 + extensions

• Mobile Map Packages
• Scene Layer Packages
• Vector Tile Basemaps
ArcGIS Runtime SDKs
Working with Maps

• Working with maps
  - Maps are a central API component
    - Build a Map, display it in a MapView
    - Maps are created from items or code

• Platform sharing of maps and layers
  - Share & consume maps from Portal, ArcGIS Pro or other apps
  - Share maps and layers in Mobile Map Packages

• Offline maps and layers
  - Take maps and layers offline using on-demand or pre-planned workflows
Where Do Maps Come From?

- Portal (web maps)
  - Create with a PortalItem or URL
- Pro (mobile maps)
  - Access maps inside a Mobile Map Package
- From disk (mobile maps)
  - Create with a LocalItem or a Path
- You!
  - Create a map in code
  - Save to a portal
    - Web maps and mobile maps will be different portal item types
  - Save locally
ArcGIS Runtime SDKs
Offline Mapping Workflows

• Build everything up in code and raw data on the device
  + Provides most flexibility and data type options
  - Development intensive and less flexibility after deployment

• Author Maps and Scenes in ArcGIS Pro and share via Packages
  + Productive authoring experience with advanced cartographic options
  - Read only maps and data

• Author map for use within Online or Enterprise and take offline using on-demand workflow
  + Productive authoring experience with little overhead to support offline use
  + Supports data editing with sync
  - Must consider performance impacts when there are a large number of field users

• Author map for use within Online or Enterprise and take offline using on pre-planned workflow
  + Productive authoring experience with a small amount of upfront cost for defining offline areas
  + Supports data editing with sync
  ± Field areas are restricted to admin selected areas
ArcGIS Runtime SDKs
Working with 3D Content

- High performance on Desktops, laptops and mobile devices
- All 2D layers work in 3D
- Specific 3D layers for 3D content
  - Terrain
  - 3D features
  - Models
  - Integrated meshes
- Interactive analysis tools
  - Viewshed
  - Line of sight
  - Measure
Runtime 3D Mapping API
ArcGIS Runtime SDKs

Analysis

• Works with services
  - Geoprocessing
  - Network analyst

• Local Engines
  - Geometry
  - Projection
  - Network

• Interactive 3D Analysis
ArcGIS Runtime SDKs
Augmented Reality and Virtual Reality

- Developers want to use their authoritative GIS content and analytics across the mixed reality spectrum
- Critical needs for usability
  - Virtual reality needs high fidelity and responsive performance
  - Augmented reality needs positional accuracy
ArcGIS Runtime SDKs
Supporting Mixed Reality

• Enhance existing ArcGIS Runtime SDKs
  - Integrated with the ArcGIS Platform
  - 3D already supported on all platforms/devices
  - Native apps able to access sensors/controllers

• Currently in private beta
ArcGIS Runtime
Local Server

- Local server is a ‘mini’ ArcGIS server dedicated to one client App
- Supports Windows and Linux desktops
- Support for ArcGIS Desktop and ArcGIS Pro packages
- For advanced analytical workflows
- Useful when integrating with ArcGIS Desktop workflows
- Independent SDK
  - Works with .Net, Java and Qt SDKs
Functionality Review

David
ArcGIS Runtime SDKs
Ultimate Performance

- Device capabilities continue to grow
- Harnessing this power is critical for tomorrow's Apps
- Runtime core brings it all together
  - Display
  - Data access
  - Analytics
- Apps that use large data volumes updating in real-time are now possible
Deploying Apps using ArcGIS Runtime
Technical and Business Considerations

• Technical
  - Deploy runtime binaries and supporting resources (runtime core with API) along with your app and any supporting resources required by your app
  - If using Local Server, build and deploy an appropriate Local Server deployment using the tools in the SDK

• Business
  - Revenue generating apps that use ArcGIS Online data or services require a commercial deployment license
  - Review functionality and select license level required
  - Chose the appropriate licensing method for your App
    - ArcGIS Identity
      - Apps that extend or compliment ArcGIS
    - Embedded license
      - Standalone apps
  - Credit bearing services require credit plan
Deploying Apps using ArcGIS Runtime

License Levels

• Lite
  - View maps, scenes and layers from the platform, simple routing and place finding

• Basic
  - Simple feature editing (connected or disconnected), authoring maps, creating groups and sharing

• Standard
  - Local data access and Local Server

• Advanced
  - Direct connect to SDE, Mosaic datasets, advanced GP tools

• Analysis Extension
  - Available with Standard and Advanced levels
  - Spatial, 3D and Network Analysis tools
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