ArcGIS Runtime

An Introduction

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ESRI EUROPEAN DEVELOPER SUMMIT

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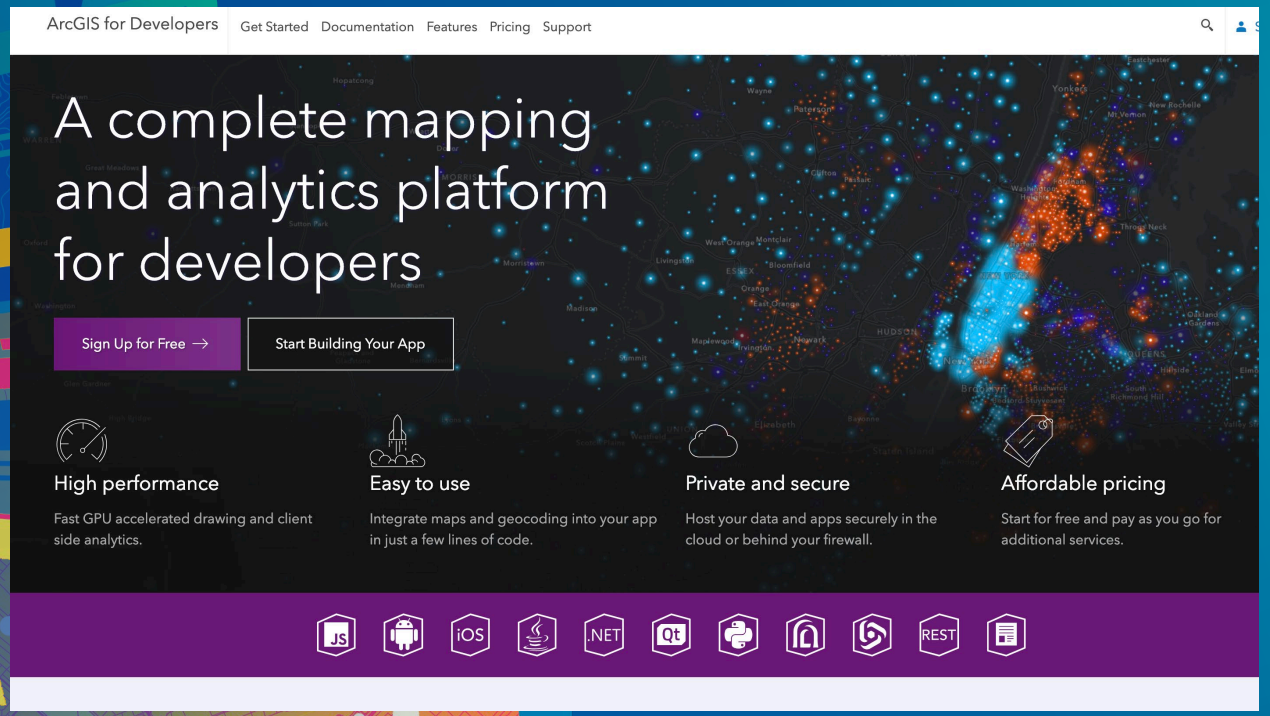
Agenda

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



Getting Started

John

ArcGIS Runtime Designed for Web GIS

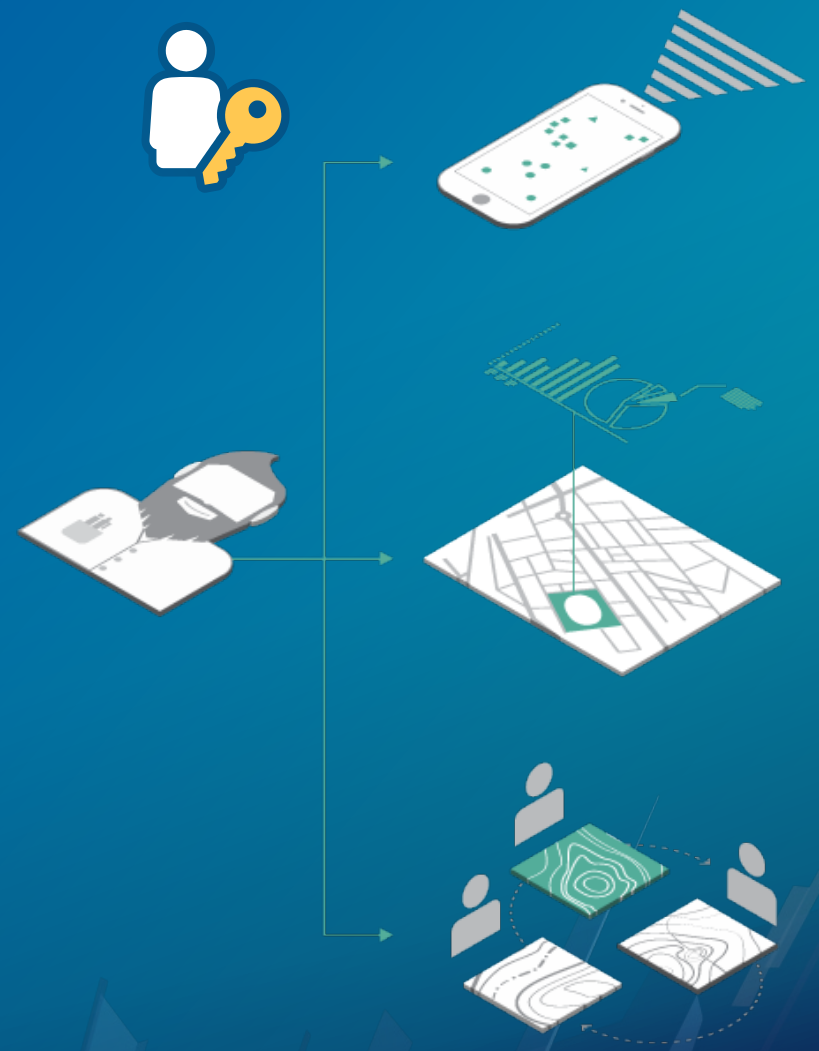
Working with the GeoInformation Model – Maps and Layers

- 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

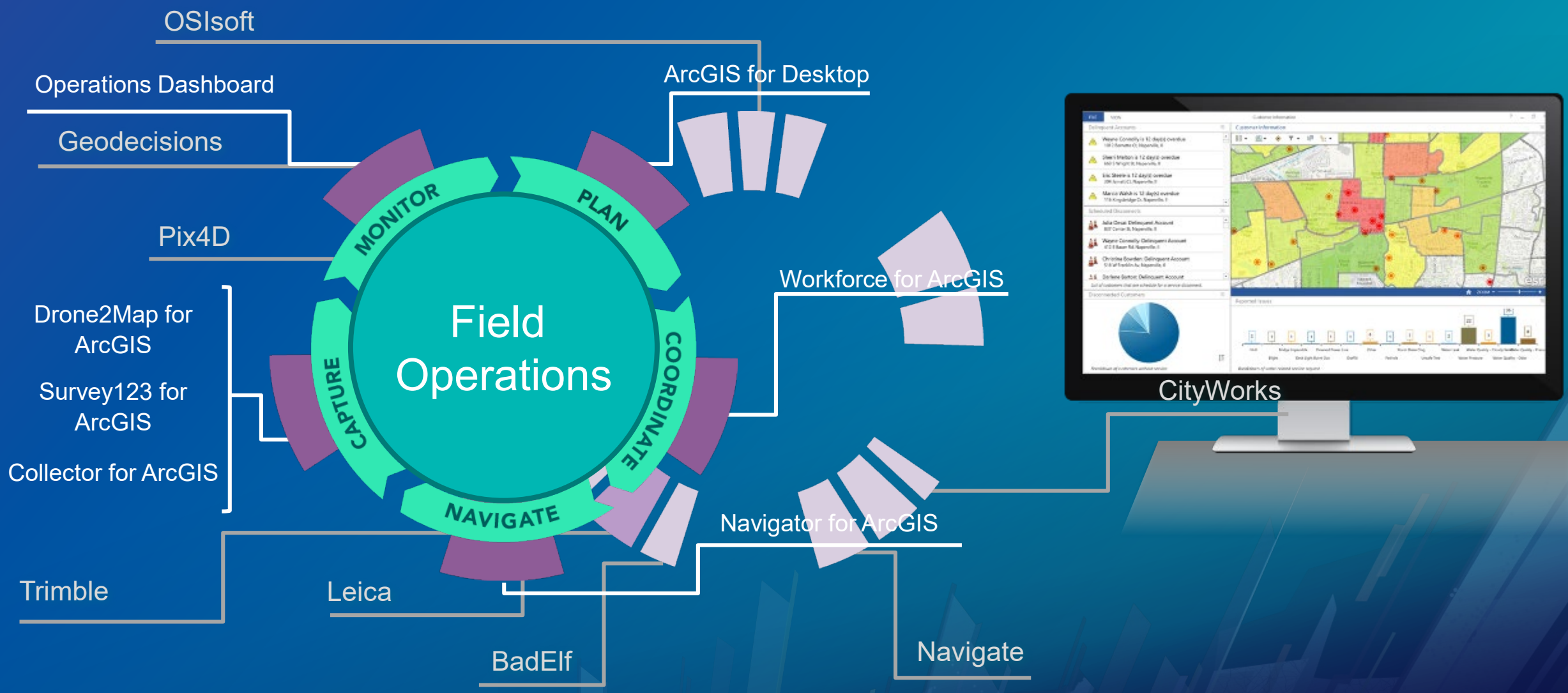
Working with the GeoInformation Model – ArcGIS Identity

- 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



ArcGIS Runtime SDKs

Supporting Native App Development

- Supports 6 platforms
  - Android, iOS, macOS, Linux, Universal Windows Platform and Windows
- 5 APIs
  - .Net, Android, iOS, Java 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

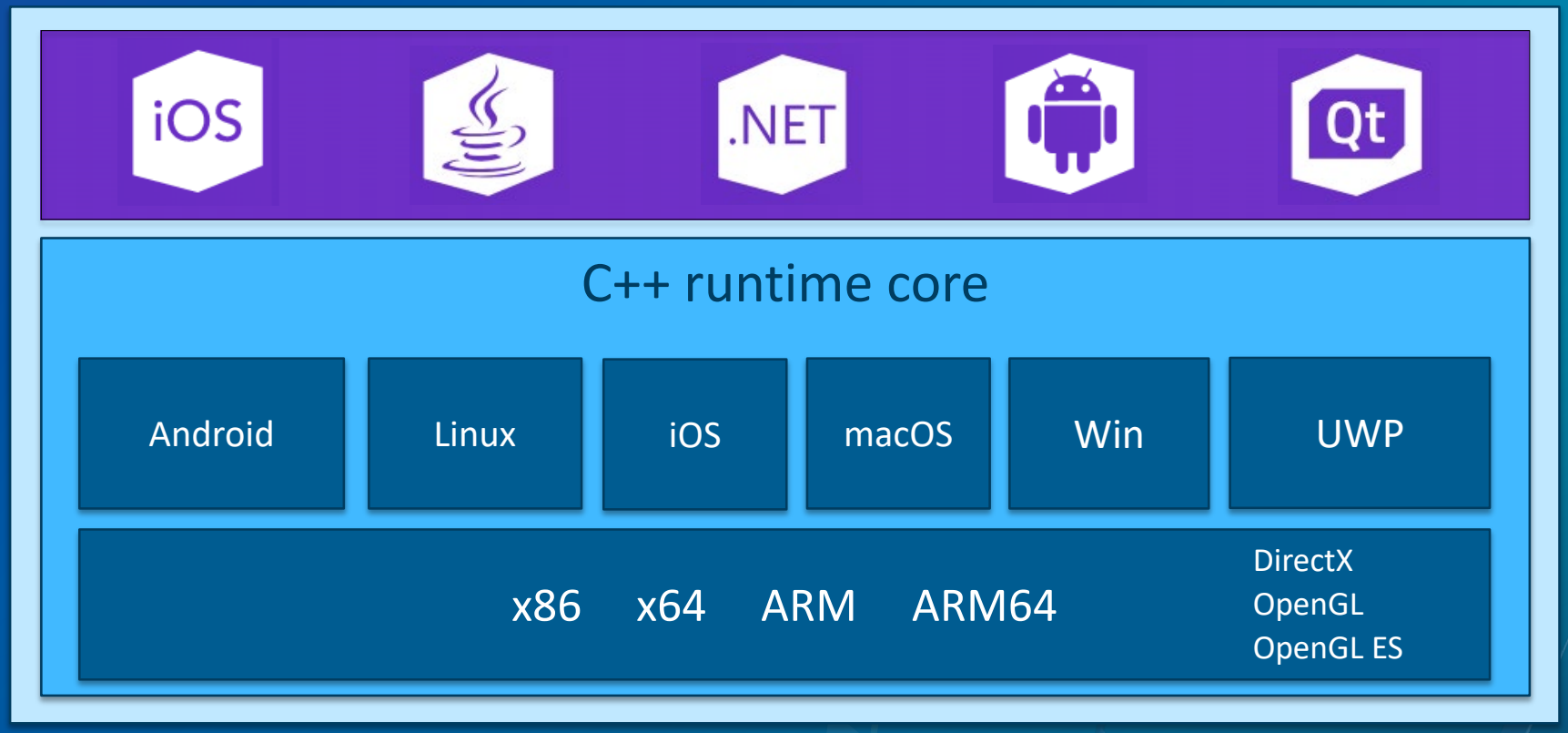
ArcGIS Runtime SDKs

Why Build a Native App?

- Only native apps give the best possible 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
- Tiled Layer
- Scene Layer
- Point Cloud layer
- Integrated Mesh Layer
- Vector Tile Layer
- Service Image Tiled Layer
- 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

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
- Annotation Layer
- KML Layer
  - Full OGC KML 2.2 + extensions
  - Editable if nodes are not from a network link
- 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 for disadvantaged environments
  - Take maps and layers offline using on-demand or pre-planned workflows

Where Do Maps Come From?

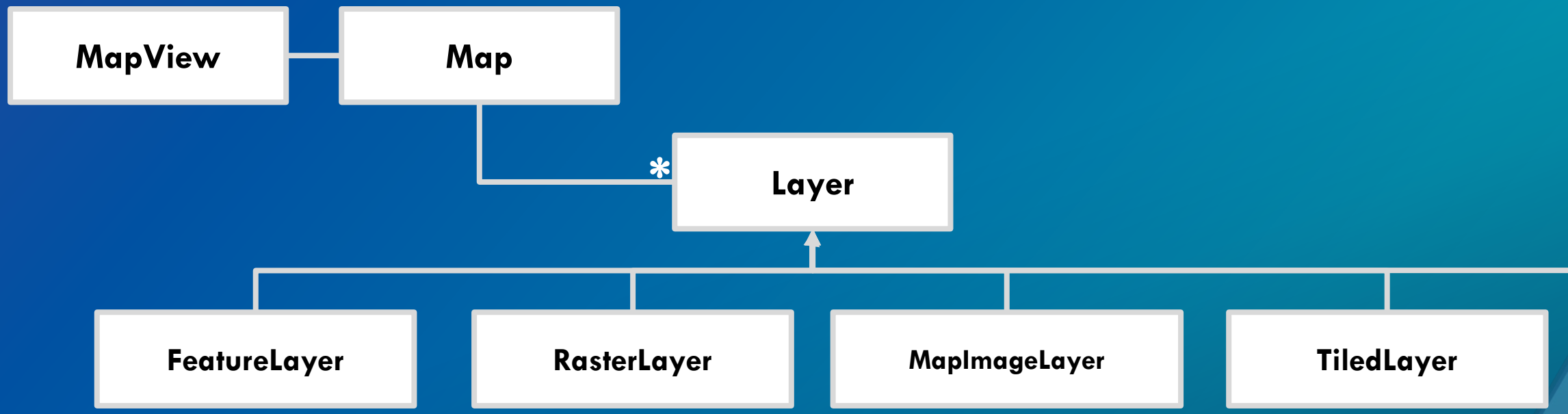
- Portal (web maps)
  - Create with a PortalItem or URL
- Pro (mobile maps)
  - Access maps inside a Mobile Map Package
- From disk (mobile maps)
  - Create with a LocalItem or a Path
- You!
  - Create a map in code
  - Save to a portal
    - Web maps and mobile maps will be different portal item types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

Maps and Layers

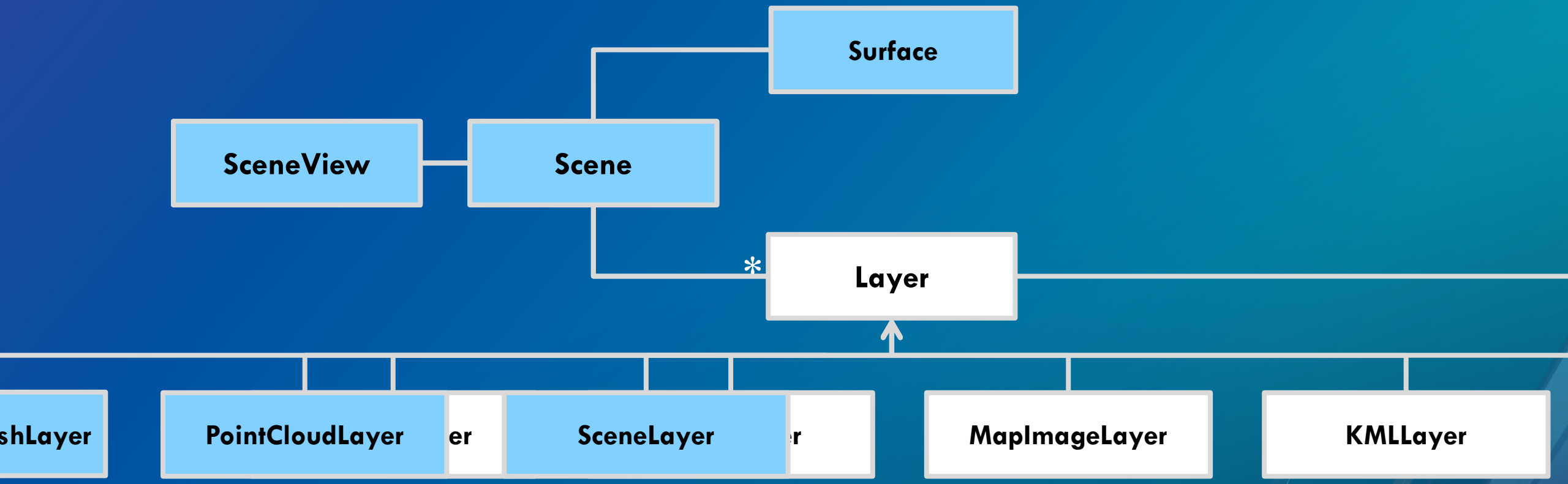


ArcGIS Runtime SDKs

Working with 3D Content

- High performance on Desktops, laptops and mobile devices
- All 2D layers work in 3D
- Support for specific 3D content
  - Terrain
  - 3D features
  - Models
  - Integrated meshes
  - Point clouds
- Interactive analysis tools
  - Viewshed
  - Line of sight
  - Measure

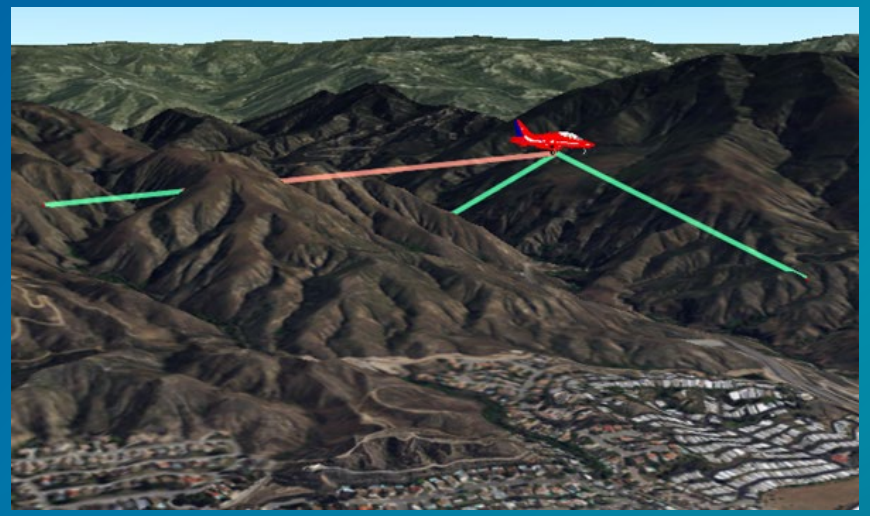
Runtime 3D Mapping API

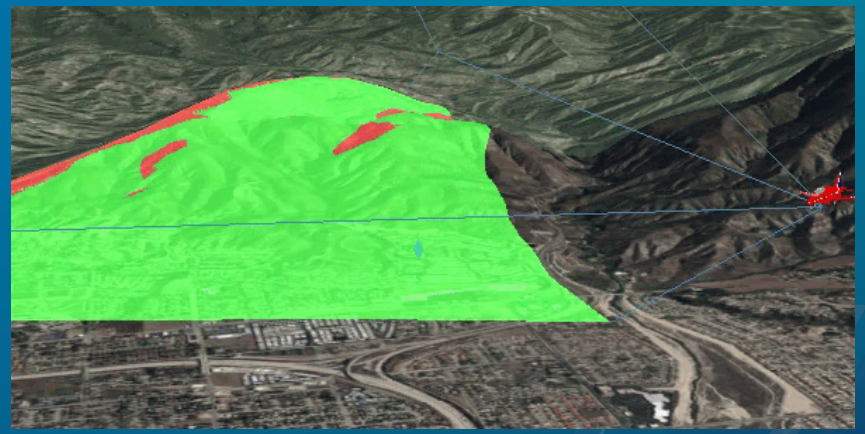


ArcGIS Runtime SDKs

Analysis

- Works with services
  - Geoproessing
  - Network analyst
- Local Engines
  - Geometry
  - Projection
  - Network
- Interactive 3D Analysis





Navigation

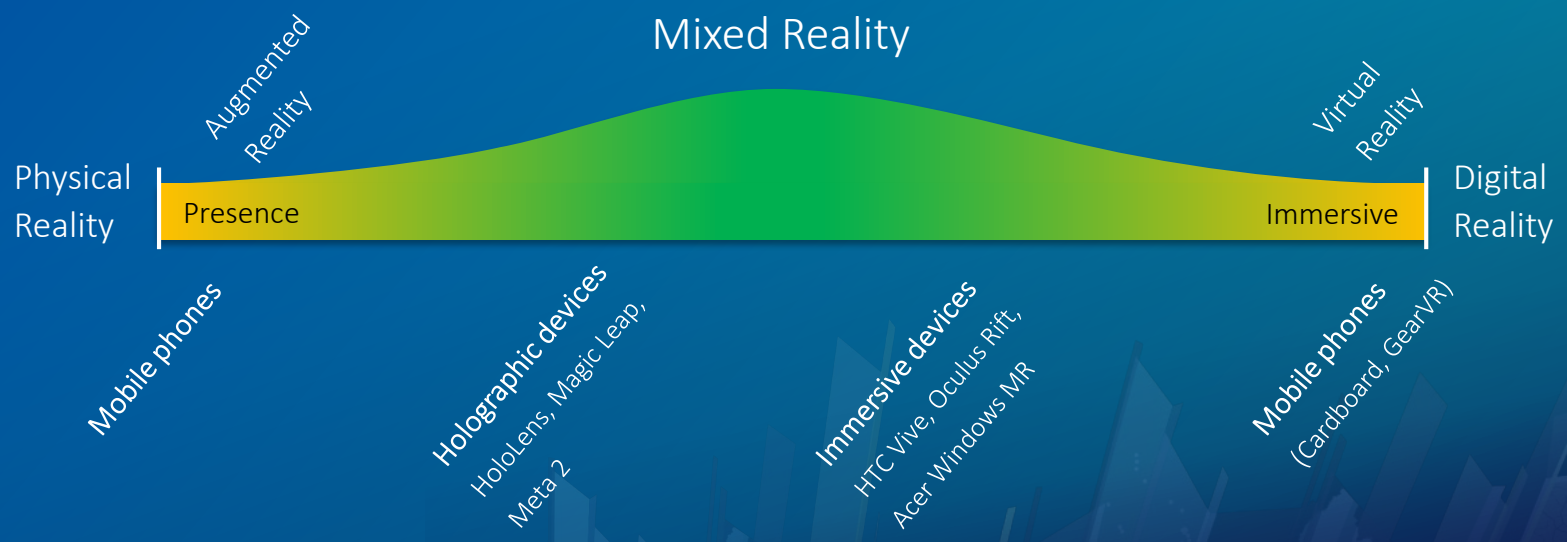
- Turn by turn voice commands
- Alerts for upcoming maneuvers
- Automatic re-routing when of route*
- Supports network services and Mobile Map Packages

* Not available when connected to ArcGIS Online Network Service

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

- Released as part of 100.6
- Enhance existing ArcGIS Runtime SDKs
  - Integrated with the ArcGIS Platform
  - 3D already supported on all platforms/devices
  - Native apps able to access sensors/controllers
- Supporting smartphones

ArcGIS Runtime

Local Server

- Local server is a ‘mini’ ArcGIS server dedicated to one client App
  - Runs in the same security context as 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

John

ArcGIS Runtime SDKs

Ultimate Performance

- Device capabilities continue to grow
- Harnessing this power is critical for tomorrows 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

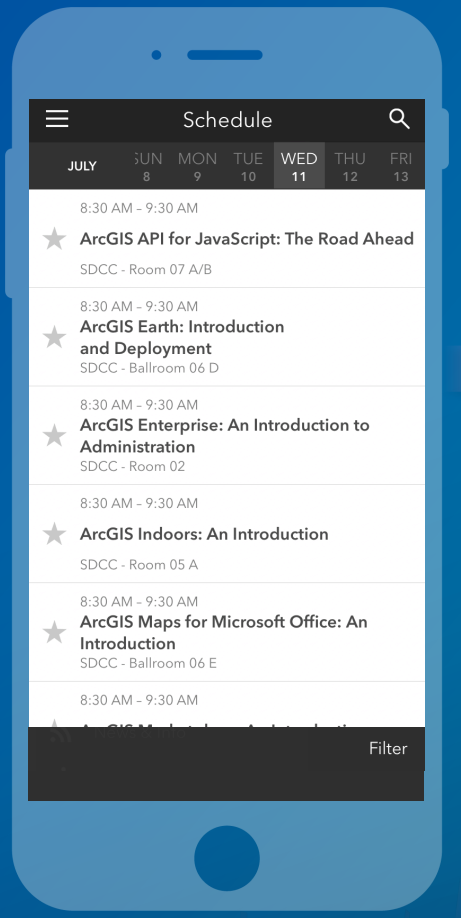
- Lite
  - View maps, scenes and layers from the platform, simple routing and place finding
- Basic
  - Simple feature editing (connected or disconnected),authoring maps, creating groups, sharing and navigation
- Standard
  - Local data access and Local Server
- Advanced
  - Direct connect to SDE, Mosaic datasets, advanced GP tools

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

Please Take Our Survey on the App

Download the Esri Events app and find your event

Select the session you attended



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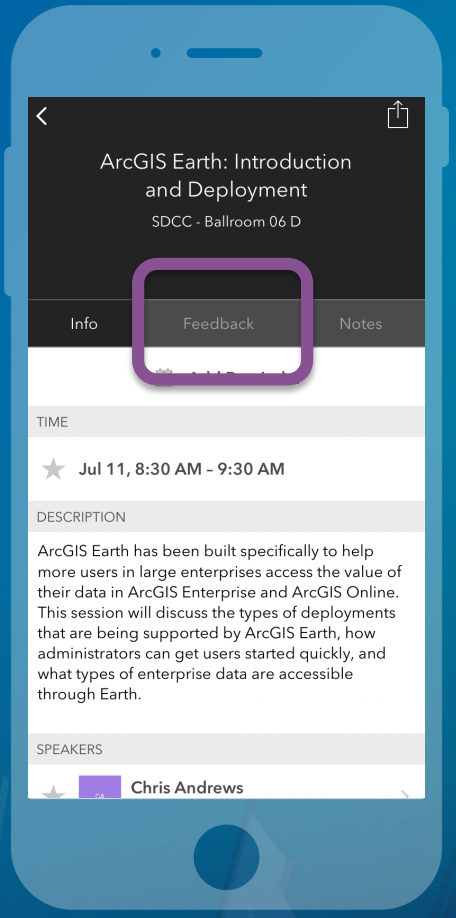
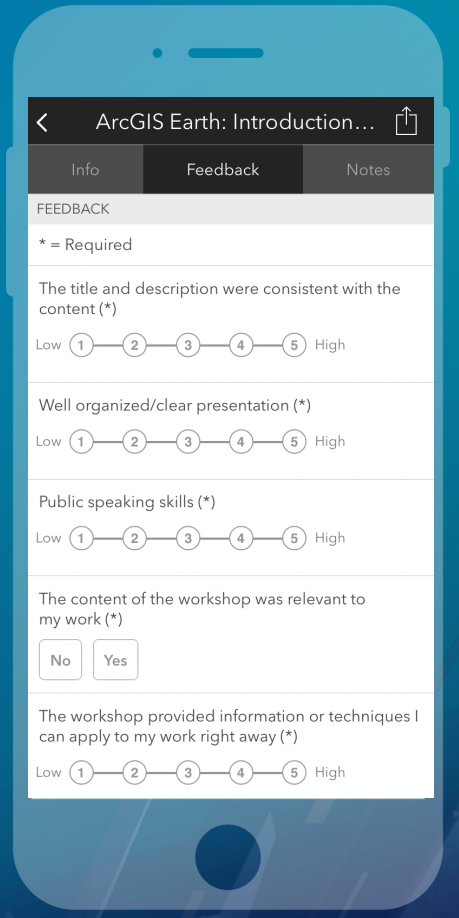


Complete answers and select “Submit”



Questions?

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