ArcGIS Runtime SDK for Java: Building Apps

Mark Baird

Jen Merritt

Simone Claridge

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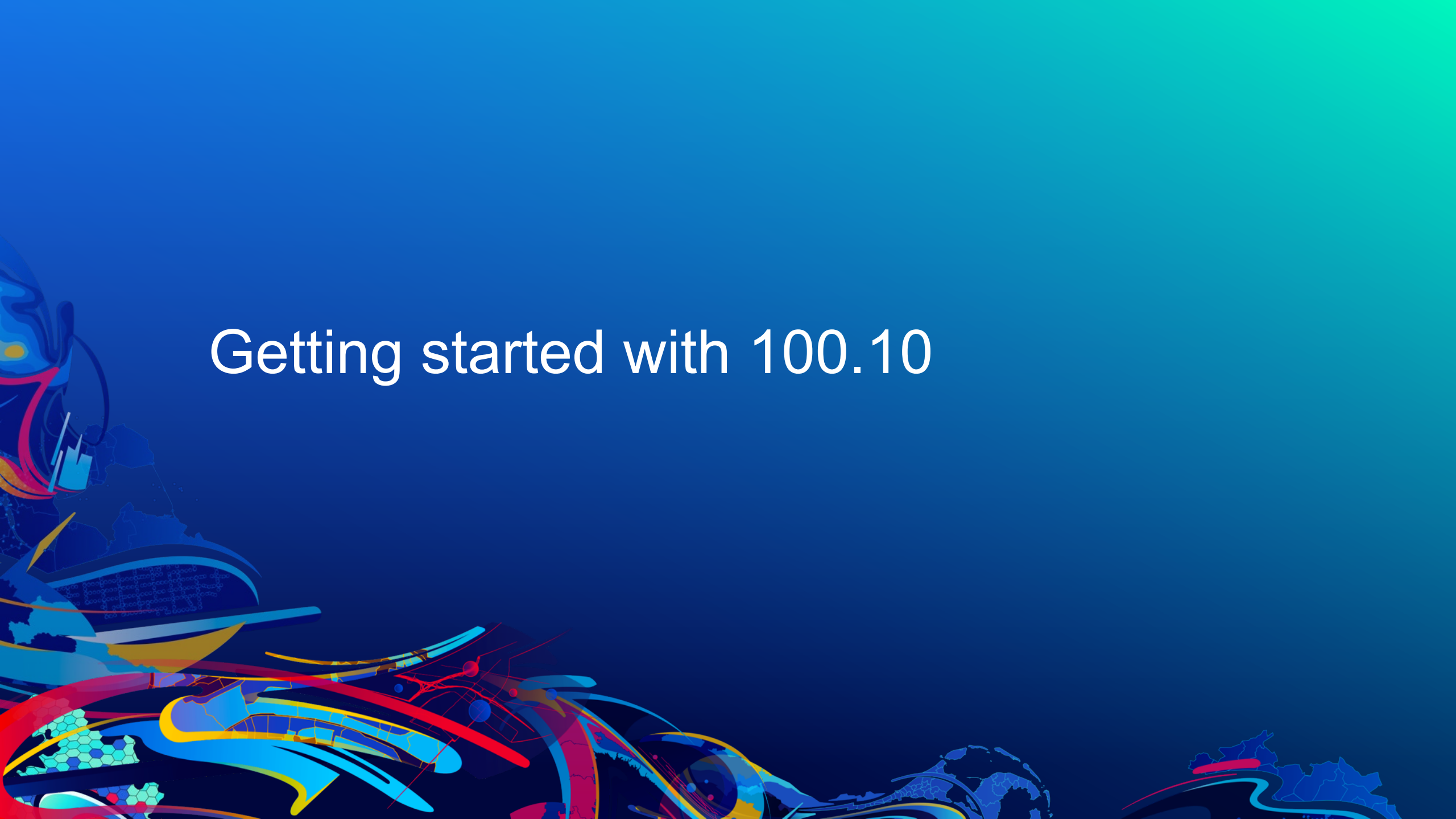
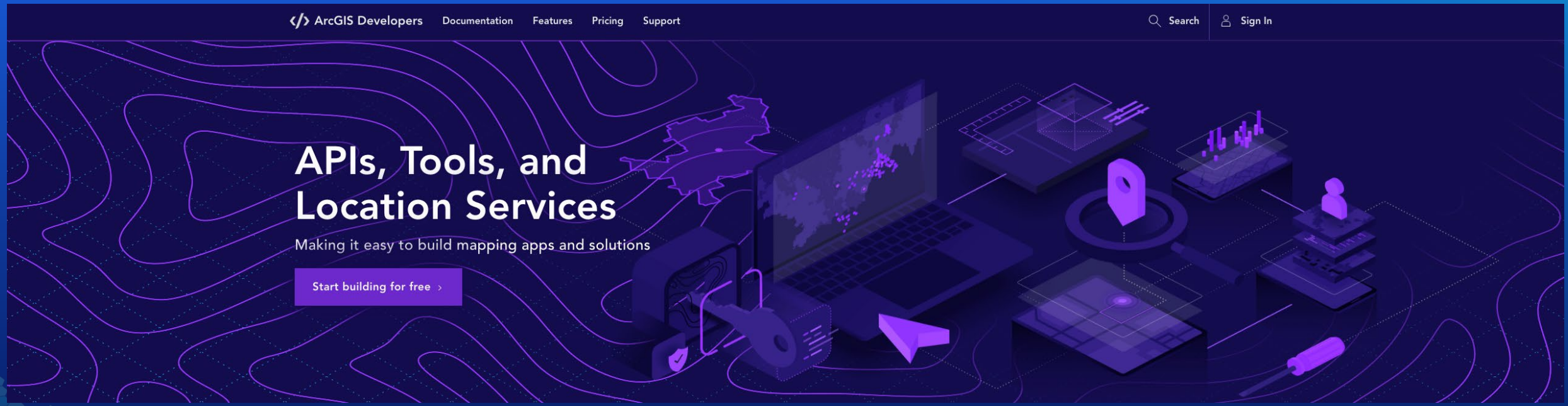
Let’s make a map-based desktop application!

- **Getting started with 100.10**
- **Java 11 / JavaFX**
- **API Keys for ArcGIS Online resources**
- **Base maps, layers and loadable pattern**
- **Graphics overlays**
- **Offline maps**
- **Licensing and deployment**

Getting started with 100.10



Developers website : developers.arcgis.com



SDK Installation

- **SDK is available in 2 ways:**
  - **Zip / tgz file with all required files**
  - **Files will be available in a Maven repository**
    - **Use Gradle scripting**
    - **Use Maven scripting**

Java 11, but moving on to 17 soon!

- **100.4 works with Java 8 and 11**
- **Subsequent releases for Java 11+ only**
- **You can choose your JRE**
  - **AdoptOpenJDK**
  - **OpenJDK**
  - **Oracle JDK**

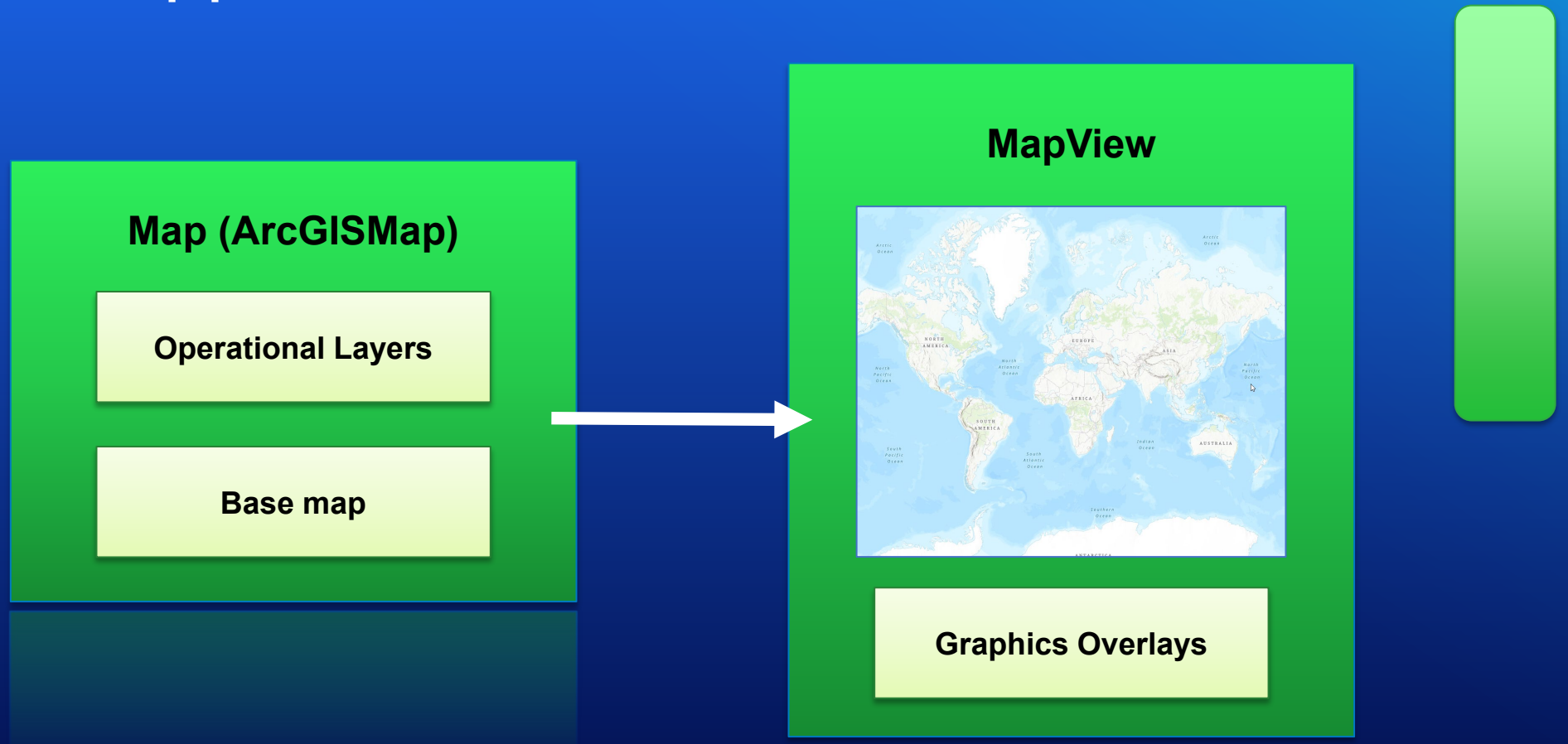
API Keys

API Keys

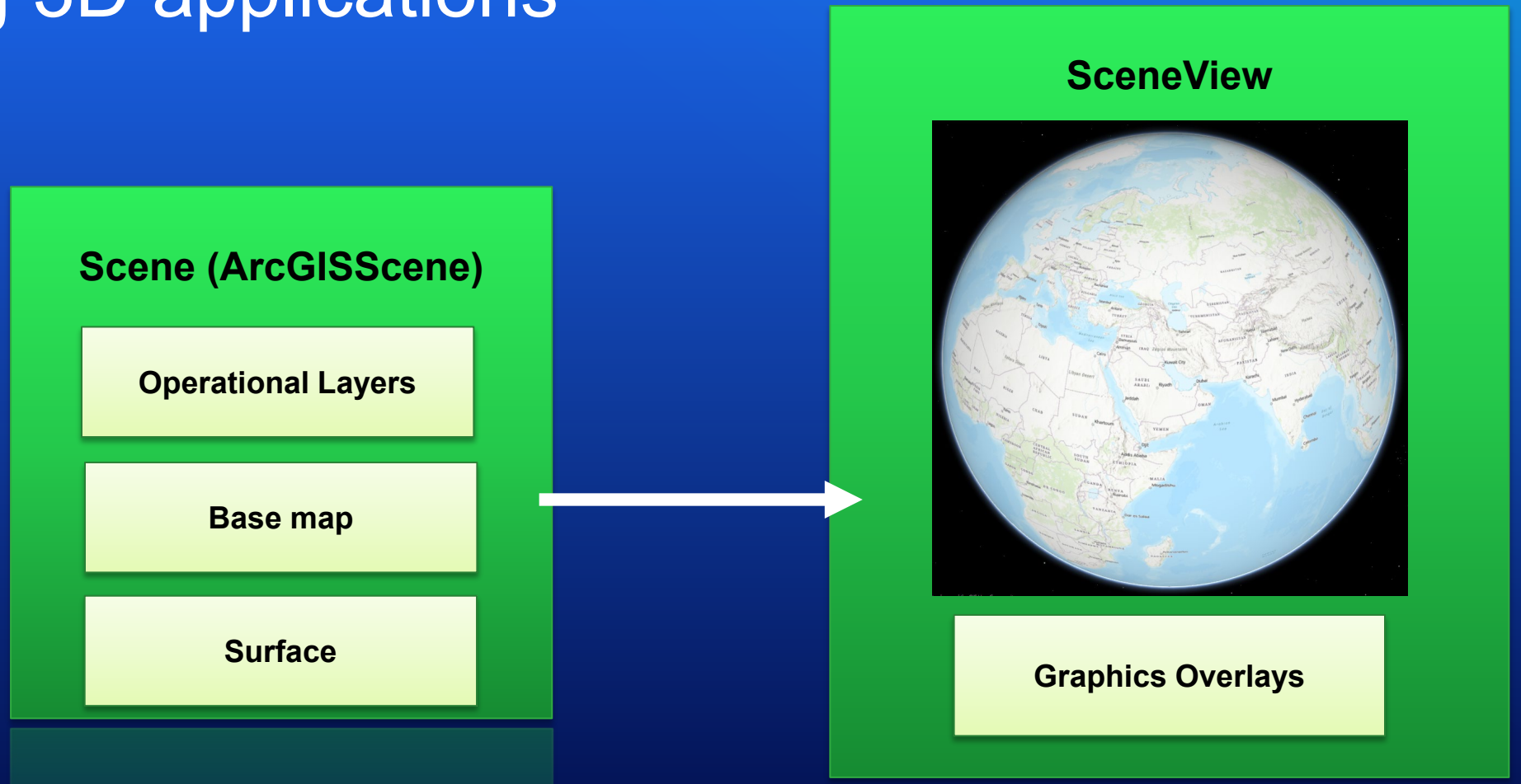
- For authenticating an app to access ArcGIS Platform services
  - Basemaps
  - Geocoding services
  - Routing services
- Not needed for your own data or services
- Available for Runtime application use and other APIs
  - JavaScript web apps
  - Leaflet, MapBox GL JS or OpenLayers
- Created through developers site dashboard

Base maps, layers and loadable pattern

Writing 2D applications



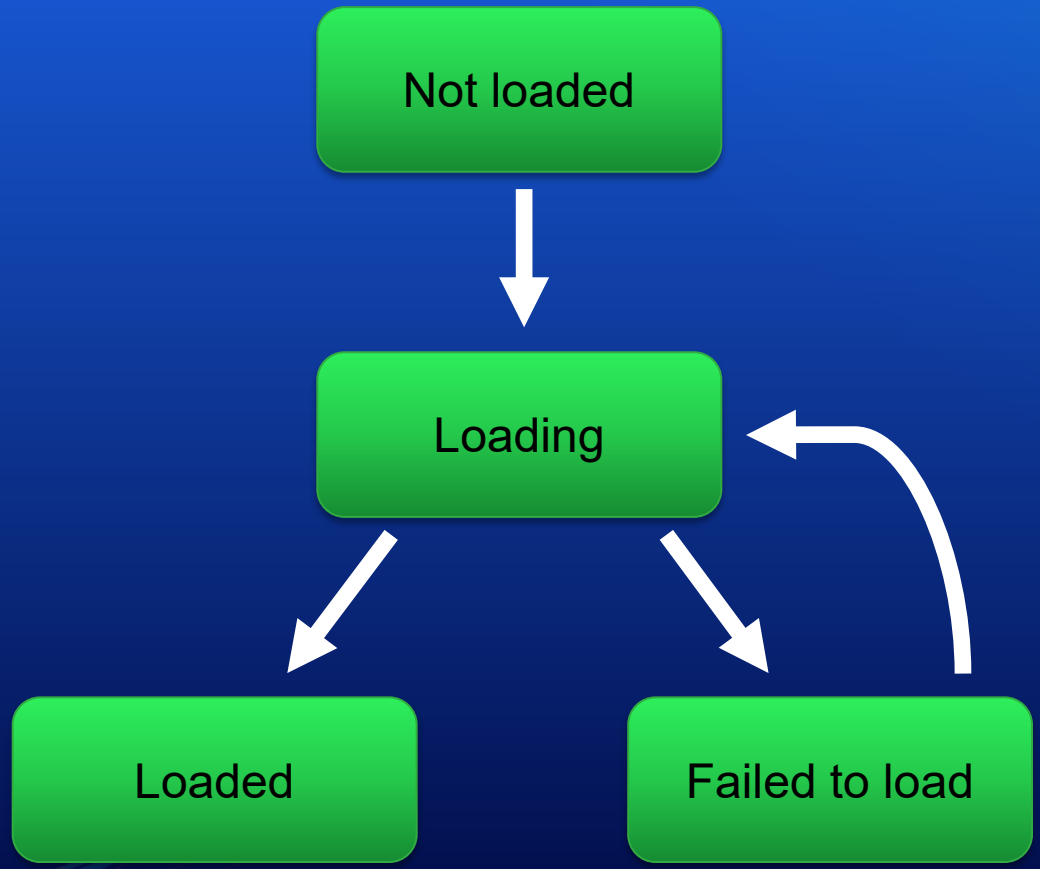
Writing 3D applications



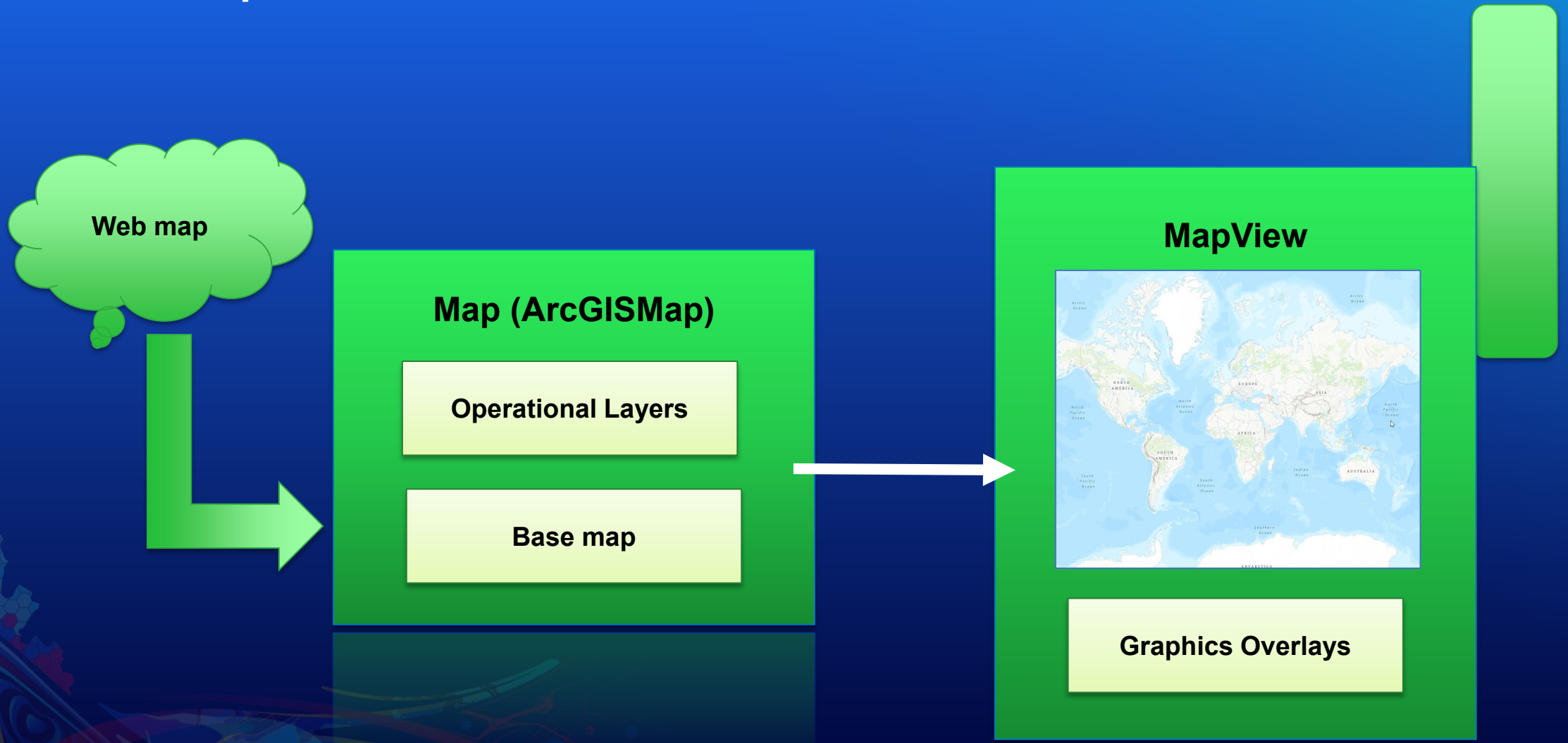
Operational layers

- **Your business data**
  - **Points, lines, polygons, text attributes, file attachments**
- **Local file formats**
  - **GeoPackages**
  - **Shapefiles**
  - **Raster data**
- **Server sources**
  - **ArcGIS Online**
  - **ArcGIS Server**
  - **OGC data (WFS etc)**

Loadable Pattern



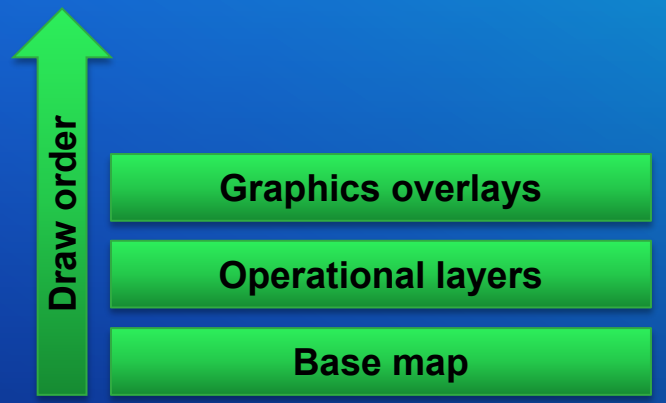
Webmaps


Web map
Map (ArcGISMap)
Operational Layers
Base map
MapView
Graphics Overlays

Graphics Overlays

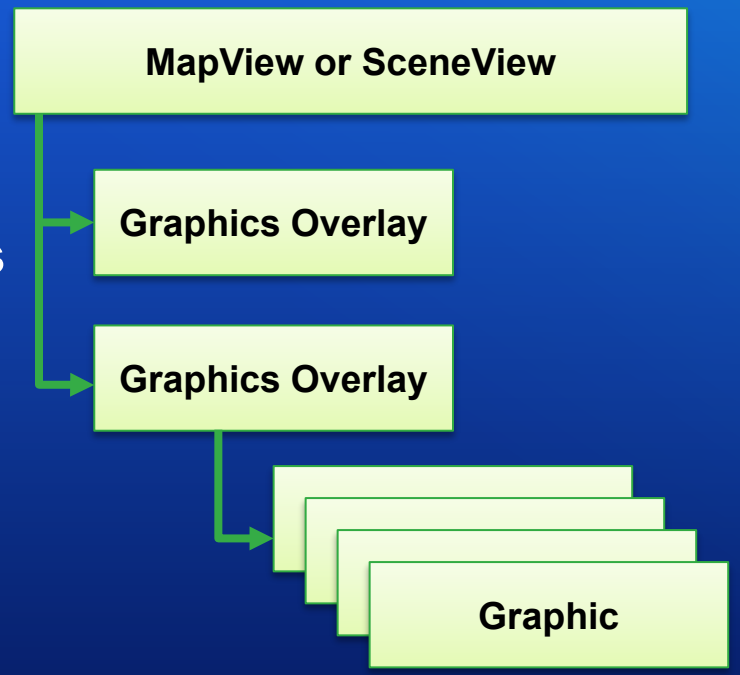
Graphics overlays

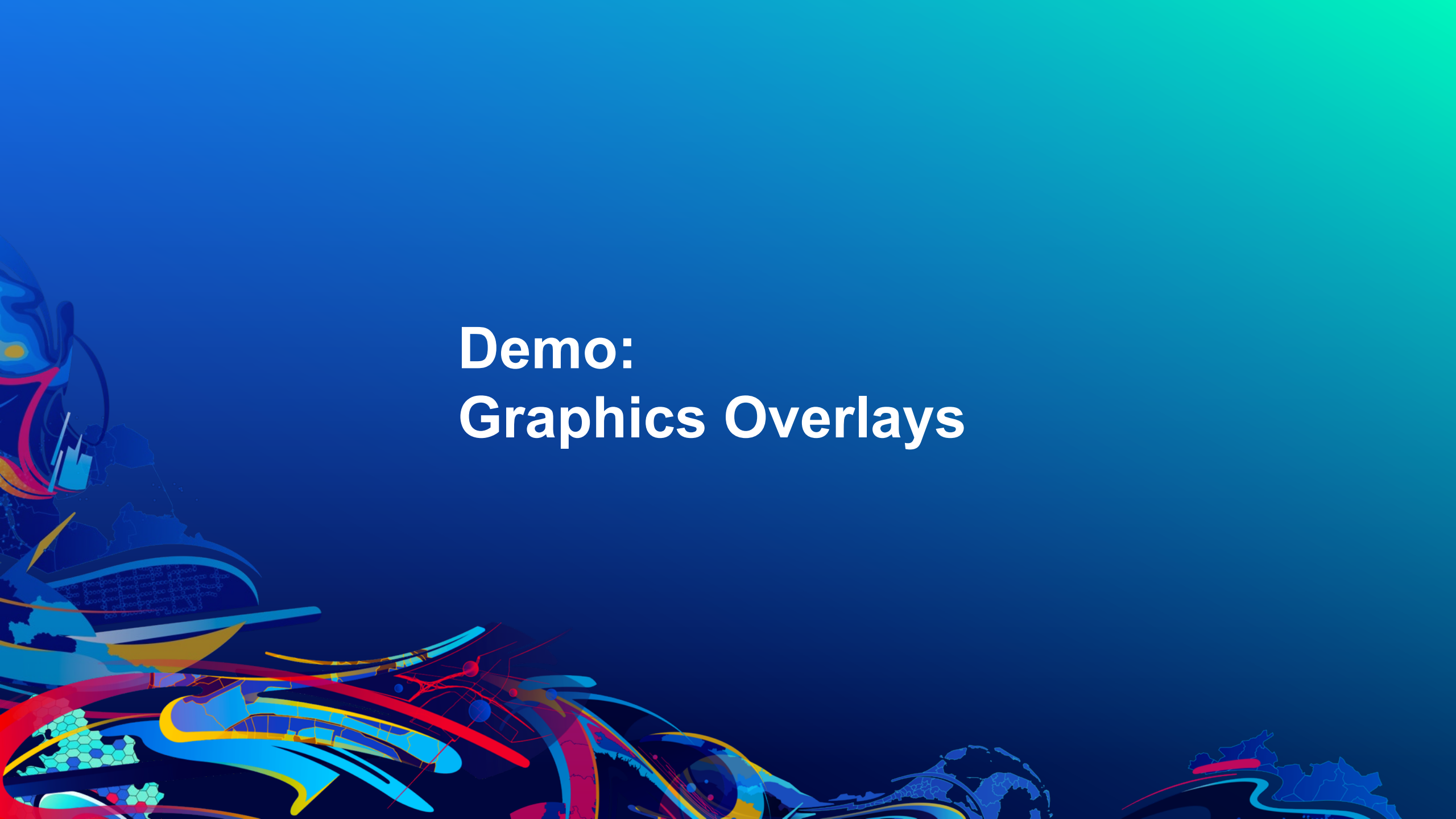
- Used to display temporary or fast updating items
- Can be used to display point, lines or polygons
- Can be rendered in the same way as feature layers
  - Symbols, Unique value renderers, etc
- Graphics overlays are part of the MapView or SceneView
- Not persisted



Graphics Overlays

- Found MapViews or SceneViews
- Can have multiple Graphics Overlays
- Graphics overlay is a container for Graphics
- Graphic is defined by:
  - Geometry (Point, line or polygon)
  - Attributes (optional)
  - Symbol
    - Specified for each graphic
    - Defined from a renderer on
- Very good for rapidly updating pictures

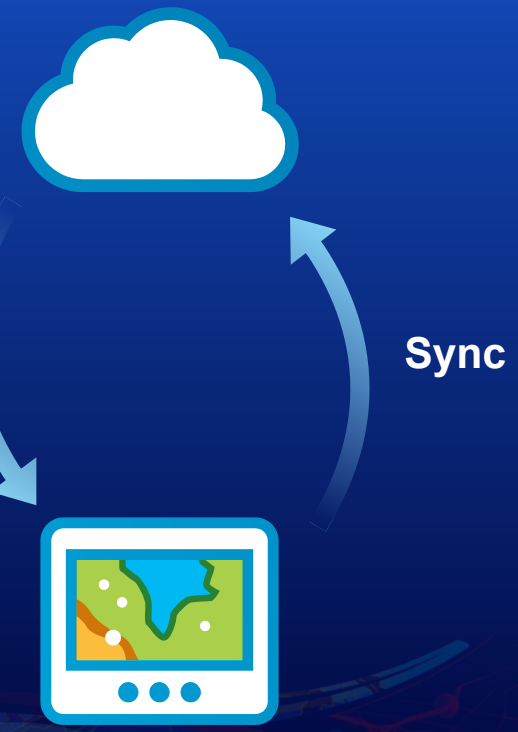



Demo:
Graphics Overlays

Offline Data

Offline

Services Pattern



Desktop Pattern

Licensing and deployment

License your application

- **Choose a license level:**
  - **Lite**
  - **Basic**
  - **Standard**
  - **Advanced**
- **See https://developers.arcgis.com/java/license-and-deployment/license/**
- **Choose license method**
  - **Named user**
  - **License code**

License code

- **Use the setLicense method before your app uses ArcGIS functionality**

```
public static void main(String[] args) {
    // set license
    ArcGISRuntimeEnvironment.setLicense("runtimelite,1000,ru

    // launch application
    Application.launch(args);
}
```

Named user licensing

- **Log into your portal to get the license key**

```
// connect to ArcSIS Online or a portal with a named user
// Note this is very insecure code and you should consider using
// something ike oAuth instead for example!
UserCredential credential =
        new UserCredential( username: "username",  password: "password");

// connect to the portal with my credential
portal = new Portal( portalUrl: "https://your-org.maps.arcgis.com/");
portal.setCredential(credential);

// load the portal
portal.loadAsync();
```

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Named user licensing (part 2)

```
// listen for the portal loaded event on a new thread
portal.addDoneLoadingListener(()-> {
    // check if the load status was successful
    if (portal.getLoadStatus() == LoadStatus.LOADED) {

        //get the license info from the server
        ListenableFuture<LicenseInfo> licenseInfoFuture = portal.fetchLicenseInfoAsync();

        licenseInfoFuture.addDoneListener(() -> {
            try {
                // get the license info
                licenseInfo = licenseInfoFuture.get();

                // apply the license to the app
                ArcGISRuntimeEnvironment.setLicense(licenseInfo);

                // save for offline use later
                savedLicenseJSON = licenseInfo.toJson();
```

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                // apply the license to the app
                ArcGISRuntimeEnvironment.setLicense(licenseInfo);

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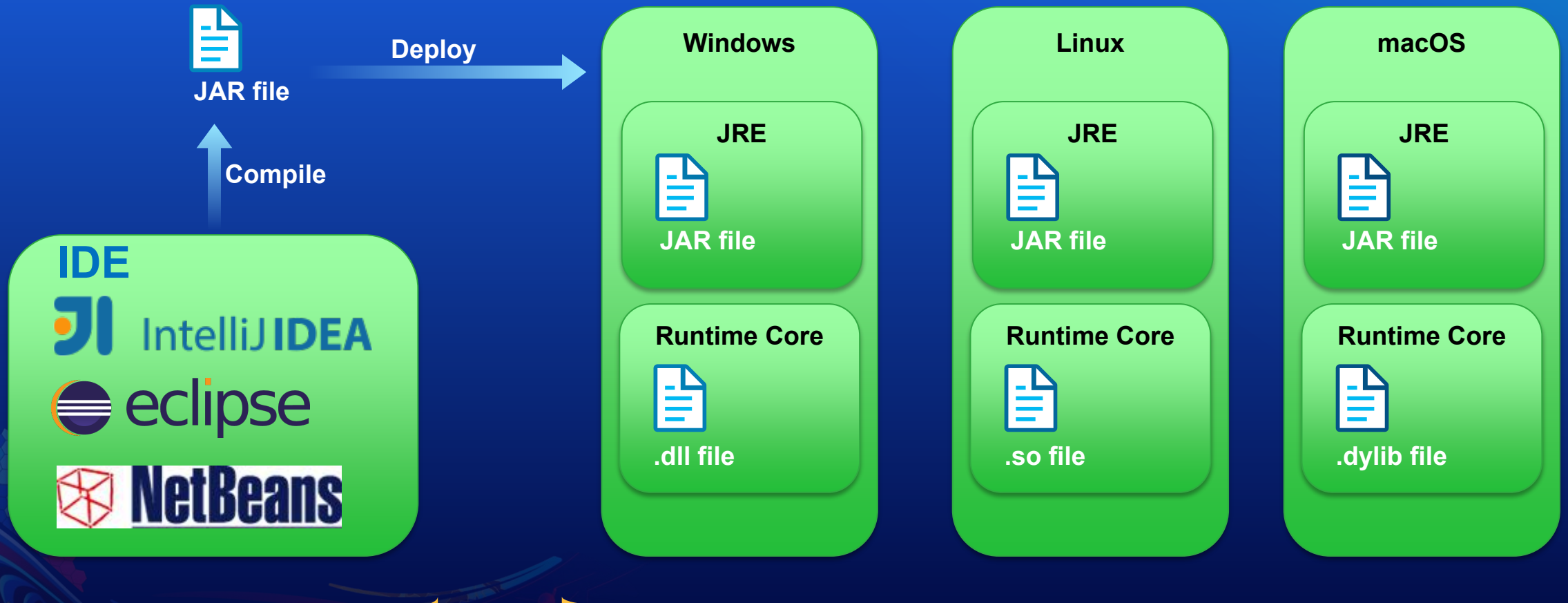
                savedLicenseJSON = licenseInfo.toJson();
```

Named user licensing (Offline)

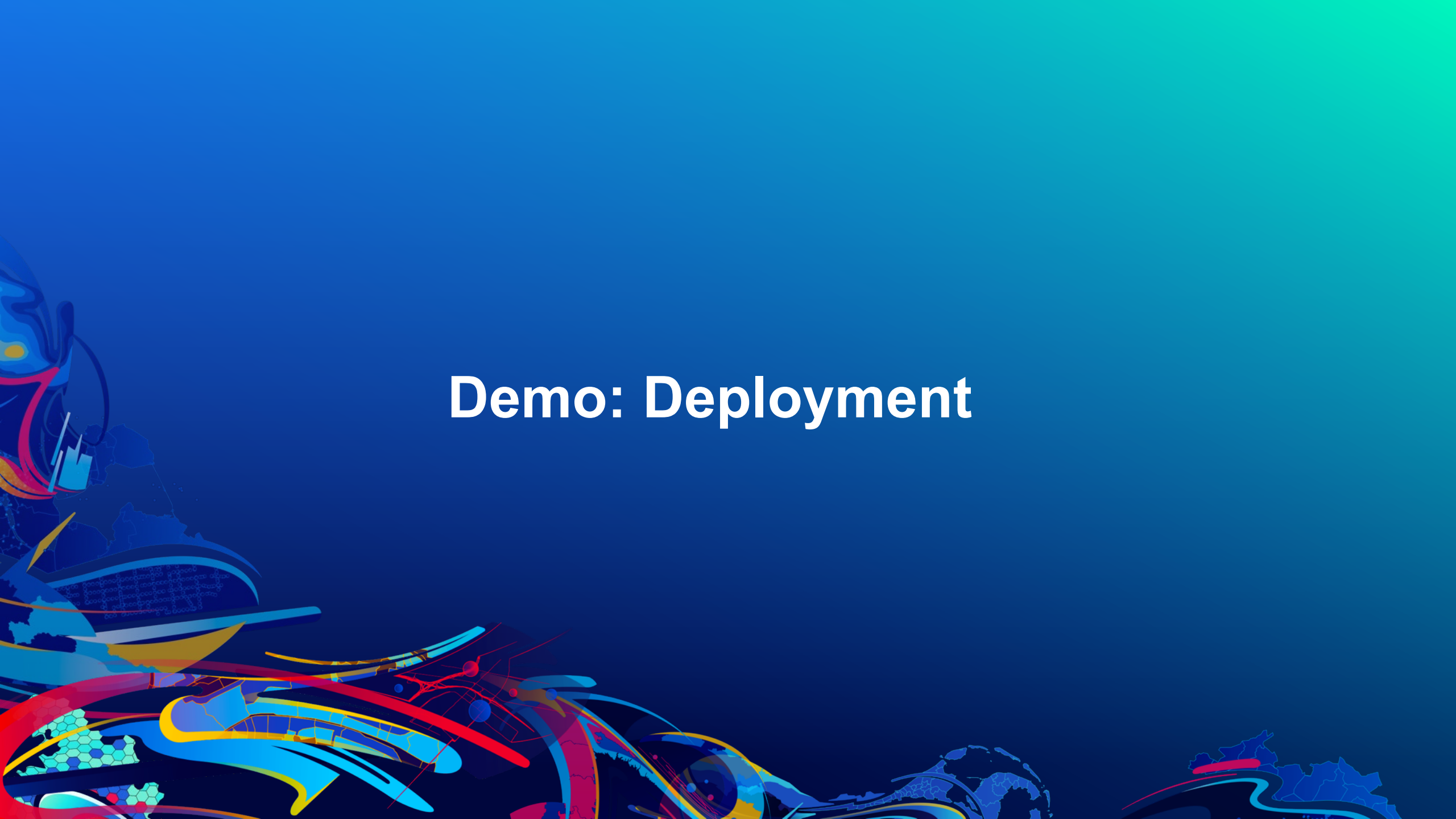
```
// create a licenseInfo from the saved licenseJSON
LicenseInfo licenseInfo = LicenseInfo.fromJson(savedLicenseJSON);

// apply the license to the app
ArcGISRuntimeEnvironment.setLicense(licenseInfo);
```

Java Runtime development and deployment



Demo: Deployment



Summary

- Cross platform Java 11 / Java FX desktop apps
- Key classes and techniques for mapping apps
- Graphics overlays
- Offline maps
- License and deployment

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