



Esri International Developer Summit  
Palm Springs, CA

# Building Windows Store and Windows Phone Apps with ArcGIS Runtime SDK

Thad Tilton - @T\_hadde\_us

Rich Zwaap - @zwaap

Morten Nielsen - @dotMorten

# Building Windows Store and Windows Phone apps with Runtime SDK

## AGENDA

- The ArcGIS Runtime
- Getting started
- Editing with the .NET Runtime
- Going offline (avoid overlap with offline session)

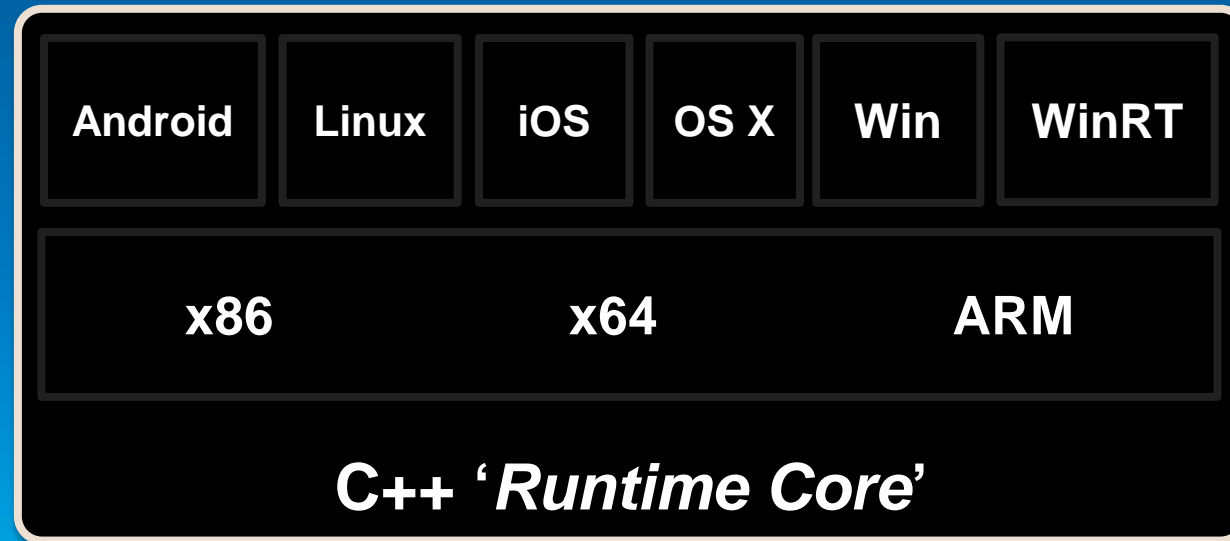
# Getting started

Thad Tilton



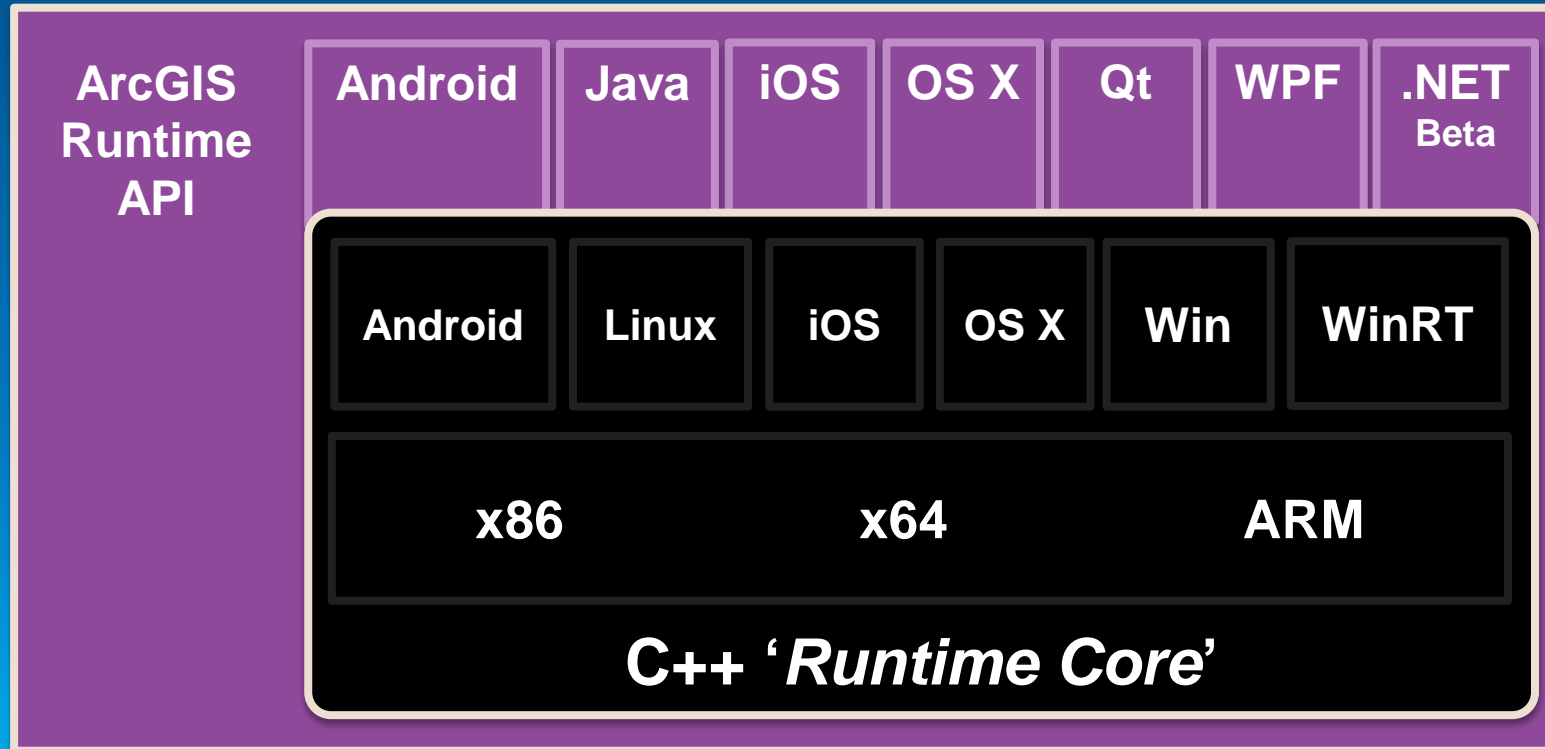
## ArcGIS Runtime overview

- **Runtime Core (C++)**
  - Small footprint, high performance
  - Core functionality: Display, geometry, data access, ...
  - Compiled for multiple platforms and architectures



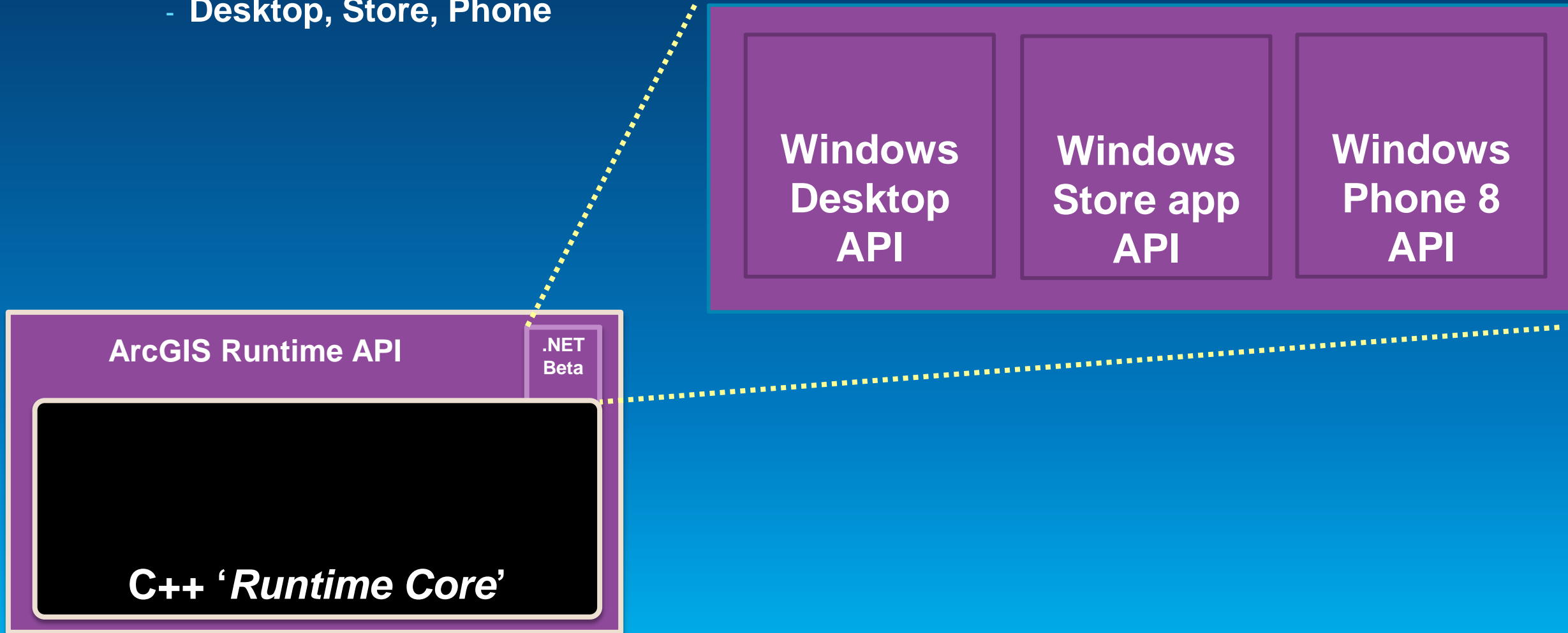
## ArcGIS Runtime overview

- Access core functionality via a native API for each platform:
  - .NET, Android, Java, etc ...
  - No need to be concerned with details of Core



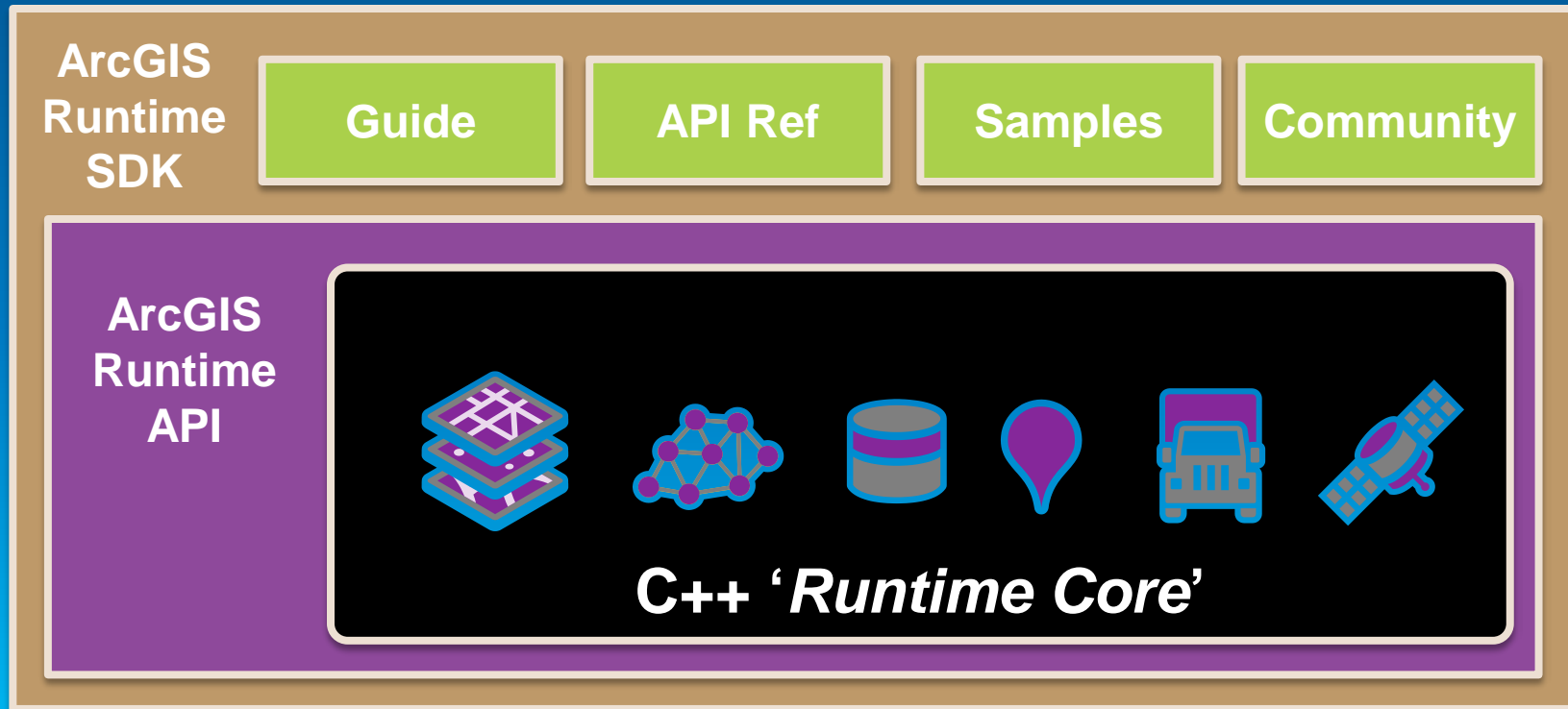
# ArcGIS Runtime overview

- .NET SDK comes with three APIs
  - Desktop, Store, Phone



# ArcGIS Runtime SDK

- Conceptual doc, API reference, samples, and the developer community
  - Start here: <http://developers.arcgis.com/net>
  - Beta community: <https://betacommunity.esri.com>
- GitHub: Samples, Toolkit, Offline app, Portal Viewer app



# Resources: ArcGIS for Developers

<http://developers.arcgis.com>

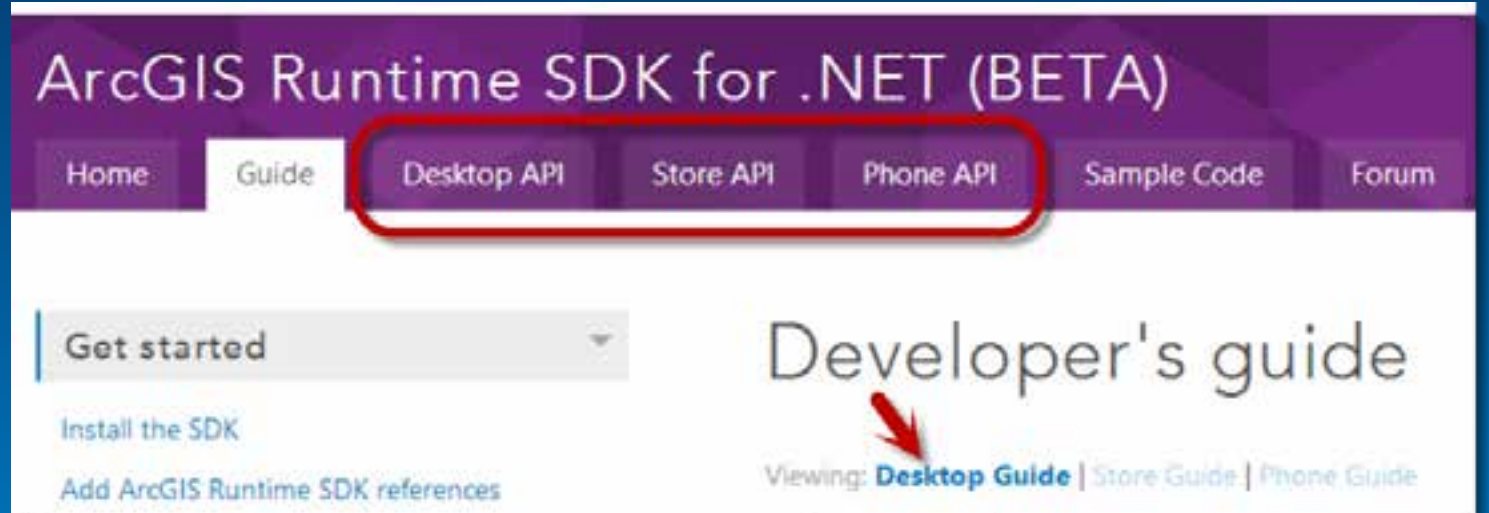
- **Free developer account**
  - **Register applications**
    - **ClientID for licensing Runtime apps at Basic level**
    - **OAuth**
  - **Hosted data**
  - **50 credits per month for development and testing**
  - **Download ArcGIS Runtime SDKs**
  - **Documentation**
- **Can also log in with an ArcGIS Online account**



# Resources: ArcGIS Runtime SDK for .NET Developer's Guide

<http://developers.arcgis.com/net/desktop/guide>

- Getting started
  - System requirements
  - Installations
- Tutorials
- High-level concepts
- View content specific to each .NET API
  - Desktop
  - Store
  - Phone
- Sign up for beta at <https://betacommunity.esri.com/>



Demo

# Developer resources

## Create a simple app



# Editing Featurelayers

(and MVVM, and the new editor,  
and location display, and devices  
and...)

Morten Nielsen

```
<esri:MapView LocationDisplay="{Binding LocationDisplay}"
    local:CommandBinder.ZoomTo="{Binding Extent}"
    <esri:Map>
        <layers:ArcGISTiledMapServiceLayer
            ServiceUri="http://services.arcgisonline.com/ArcGIS/rest/services/World/MapServer"
            <layers:GraphicsLayer GraphicsSource="Memory"
                <layers:GraphicsLayer.Renderer>
                    <symbology:SimpleRenderer>
                        <symbology:SimpleMarkerSymbol
                            <symbology:SimpleMarkerSymbol.FillColor="Red"
                                <symbology:SimpleMarkerSymbol.FillOpacity="0.5"
                                    <symbology:SimpleMarkerSymbol.OutlineColor="Red"
                                        <symbology:SimpleMarkerSymbol.OutlineWidth="2"
                                            </symbology:SimpleMarkerSymbol>
                                        </symbology:SimpleMarkerSymbol>
                                    </symbology:SimpleRenderer>
                                </layers:GraphicsLayer.Renderer>
                            </layers:GraphicsLayer>
                        <layers:GraphicsLayer GraphicsSource="Memory"
                            <layers:GraphicsLayer.Renderer>
                                <symbology:SimpleRenderer>
                                    <symbology:SimpleLineSymbol
                                        <symbology:SimpleLineSymbol.Color="Red"
                                            <symbology:SimpleLineSymbol.Width="2"
                                                </symbology:SimpleLineSymbol>
                                            </symbology:SimpleRenderer>
                                        </layers:GraphicsLayer.Renderer>
                                    </layers:GraphicsLayer>
                                </esri:Map>
                            </esri:MapView>
```

# Going Offline

Rich Zwaap



## Going Offline – Tiled Map Services

- Use `ExportTileCacheTask` to take tiled map services offline
  - `GenerateTileCacheAsync` – creates a tile package (.tpk) or compact cache
  - `DownloadTileCacheAsync` – downloads a .tpk or compact cache
  - `GenerateTileCacheAndDownloadAsync` – does both in one call

```
var task = new ExportTileCacheTask(new Uri(onlineTiledLayer.ServiceUri));
var downloadResult = await task.GenerateTileCacheAndDownloadAsync(
    generateOptions,           // Options for cache generation
    downloadOptions,          // Options for cache download
    TimeSpan.FromSeconds(3), // Frequency of status checks
    CancellationToken.None,   // Token to manage cancellation
    onGenerateUpdate,        // Callback for status updates during cache generation
    onDownloadUpdate);       // Callback for status updates during cache download
```

## Going Offline – Feature Services

- Use `GeodatabaseSyncTask` to take feature services offline
  - `GenerateGeodatabaseAsync` – creates a geodatabase
  - Use `ArcGISHttpClient` to download the result

```
GeodatabaseSyncTask gdbTask = new GeodatabaseSyncTask(new Uri(featureServiceUrl));
var result = await gdbTask.GenerateGeodatabaseAsync(
    gdbParameters,           // Parameters for the operation
    onGenerateCompleted,    // Callback to handle operation completion
    TimeSpan.FromSeconds(3), // Interval to check status
    onGenerateProgress,     // Callback to handle operation status updates
    CancellationToken.None); // Token to handle cancellation
```

DEMO

# Going Offline

Rich Zwaap

```
ic static async Task<ArcGISLocalTiledLayer>
this ArcGISMapServiceLayer onlineTile
Envelope extent,
double maxScale,
Action<string> onStatusUpdate,
string folderName = "Tiles")

onStatusUpdate("Submitting export tile job")

// Specify the export options - tile format
var generateOptions = new GenerateTileCacheOptions
{
    Format = ExportTileCacheFormat.TilePackage,
    GeometryFilter = extent,
    MaxScale = maxScale, // leaving min/maxScale
                        // to min/maxScale
};

// Create folder to hold downloaded tiles
StorageFolder downloadLocation = await ApplicationData.Current
    .LocalFolder.CreateFolderAsync("Tiles", CreationCollisionOption.OpenIfExists);

// Specify options for downloading tiles
var downloadOptions = new DownloadTileCacheOptions
```

# Sync

- Push updates from the client and download changes from the service
  - Only changes (deltas) are downloaded/uploaded
- Use `GeodatabaseSyncTask.Sync`

```
var gdbTask = new GeodatabaseSyncTask(new Uri(featureServiceUrl));
var result = await gdbTask.SyncGeodatabaseAsync(
    syncParameters, // Operation parameters
    featureLayer.FeatureTable.Geodatabase, // Geodatabase to sync
    onSyncCompleted, // Callback for completion of sync operation
    onUploadCompleted, // Callback for changes being uploaded to server
    TimeSpan.FromSeconds(3), // Frequency of sync status checks
    onStatusUpdate, // Callback for status updates
    CancellationToken.None); // Token for handling cancellation
```



DEMO

# Sync

Rich Zwaap

```
this FeatureLayer featureLayer, // The f
string featureServiceUrl,      // The f
Action<string> onStatusUpdate) // Callb

onStatusUpdate("Submitting sync request")

// Initialize geodatabase task and sync
GeodatabaseSyncTask gdbTask = new Geodat
var syncParameters = new SyncGeodatabase

// Use TaskCompletionSource to make the
TaskCompletionSource<GeodatabaseStatusIn

// Execute the sync operation
var result = await gdbTask.SyncGeodataba
syncParameters,
featureLayer.FeatureTable.Geodatabas

// Callback to handle completion of
(status, ex) =>
{
    if (ex != null) // Error occurre
    {
        tcs.TrySetException(ex); //
```

## **Related .NET ArcGIS Runtime sessions**

### **Getting Started with ArcGIS Runtime SDK for the Microsoft .NET Framework**

Monday 3:30pm - 4:30pm - Pasadena/Ventura/Sierra

### **Deploying Windows Store Applications**

Tuesday 2:30pm - 3:30pm - Mojave Learning Center

### **Deploying Windows Phone Applications**

Tuesday 5:30pm - 6:30pm - Mojave Learning Center

### **Building WPF Apps with the New .NET ArcGIS Runtime SDK**

Wednesday 10:30am - 11:30am - Pasadena/Ventura/Sierra

## **Related general ArcGIS Runtime sessions**

### **Squeezing Every Ounce of Performance from ArcGIS Runtime**

Tuesday 5:30pm - 6:30pm - Mesquite B

### **Building Offline Apps with ArcGIS Runtime SDKs—Part I**

Wednesday - 4:00pm - 5:00pm - Primrose B

### **Building Offline Apps with ArcGIS Runtime SDKs—Part II**

Wednesday - 5:30pm - 6:30pm - Primrose B

### **Offline Geocoding with ArcGIS Runtime**

2:15pm - 2:45pm - Demo Theater 1 - Oasis 1

### **Offline Network Analysis with ArcGIS Runtime**

Monday - 2:45pm - 3:15pm - Demo Theater 1 - Oasis 1

### **The Road Ahead: ArcGIS Runtime SDKs**

Thursday - 8:30am - 9:30am - Primrose A

### **Everything (or Anything) You Wanted to Know about ArcGIS Runtime SDKs**

Thursday - 10:00am - 11:00am - Primrose A



Understanding our world.