



# Operations Dashboard for ArcGIS: Extending the Functionality

Jay Chen

Kylie Donia

Tif Pun

Technical Workshop

Operations Dashboard in 45 seconds

Customizing? Use add-ins!

# Agenda

Developing add-ins

Sharing add-ins

Sneak Peek

Questions?

# Operations Dashboard

In 45 seconds

**Zion National Park**

Zion National Park was designated in 1909 and known for its views, canyons, mountains, and the pin River.

more about Zion National Park, see [this website](#).  
more about Utah, see [this website](#).

### Shuttle System

Zion Canyon Scenic Drive is accessible by shuttle bus through October, and on weekends in November.

For the shuttle bus schedule and map [here](#).

### Details of Selected Visitor Center

#### Zion Human History Museum

Name: Zion Human History Museum  
Closed On: December 24, 2014  
Open Daily: Yes

### Trail lengths

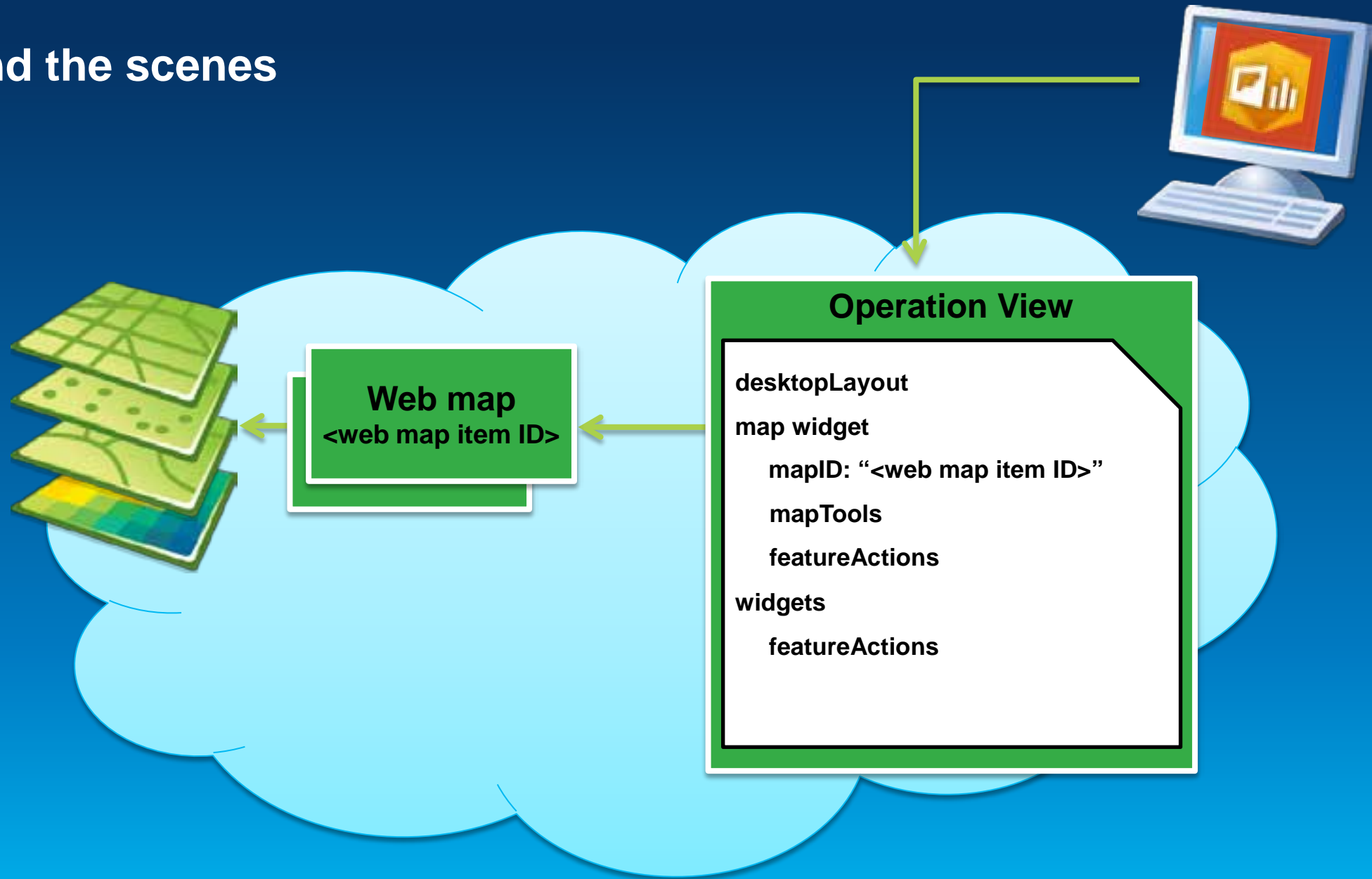
Trail Name	Length (miles)
East Rim Trail	5.88
West Rim Trail	3.80
Hop Valley	3.67
Connector Trail	3.60
Chinle	3.37
Hop Valley	2.79
Wildcat Canyon	2.71
Deertrap Mountain	2.68
La Verkin Creek	2.34

Trail lengths bar chart: The chart shows a single bar for the range 0.00 - 1.18 with a value of approximately 80. The y-axis ranges from 0 to 80.

# Summary of Dashboard

- **Author**
  - **Create an operation view**
  - **Add widgets, map tools, and feature actions**
  - **Configure them**
- **User**
  - **Gets relevant information**


# Behind the scenes





# Customizing? Use add-ins!

Manage Add-ins





**Ops Dashboard Addin UC 2014**  
Created by: tif\_appsdemo  
Date: 7/14/2014 9:38:02 PM  
Digital Signature: None  
[Details](#)


An addin with a multi-value summary widget, a profile graph widget, a profile graph feature action, and a Search Photo Map Tool

My Documents\ArcGIS\AddIns\OperationsDashboard  
\\a6f53297de7463d9bfde44b9304f940


### Widgets

-  **Profile Graph**  
Use this widget to create a profile graph based on a map sketch or a feature.
-  **Multi-Value Summary**  
A summary widget that displays the maximum, average, minimum and/or sum of a certain field

### Map Tools

-  **Search Flickr Photos**  
Search photos from Flickr using on the current map extent

### Feature Actions

-  **Generate Profile Graph**  
Use this feature action to create a profile graph. Profile Graph Widget is required.

Remove

Close

## Types of add-ins

### Map tools

- On map toolbar
- Interact with map

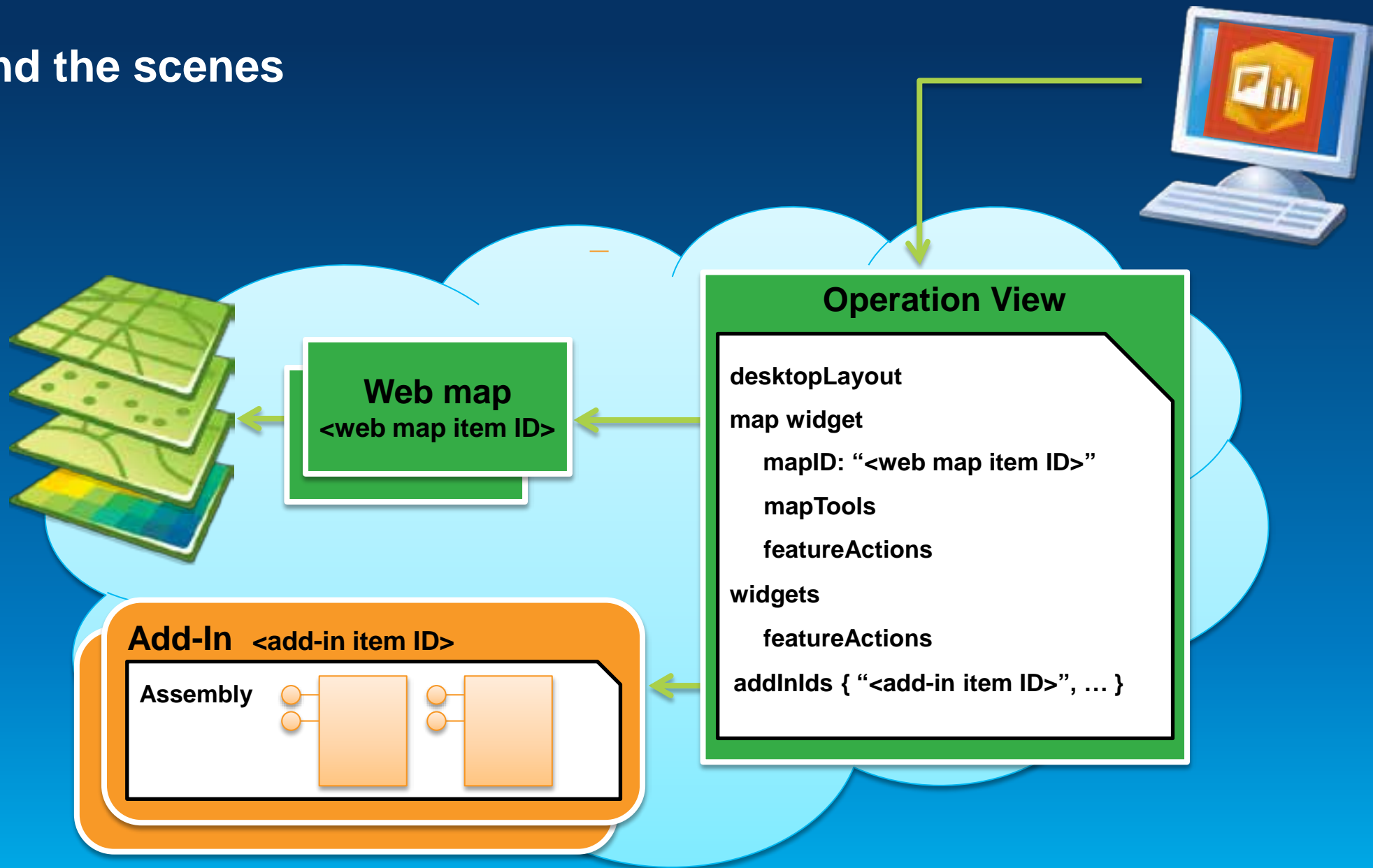
### Widgets

- Show information
- Work with a set of data

### Feature actions

- Act on a single feature
- Available through map and other widgets

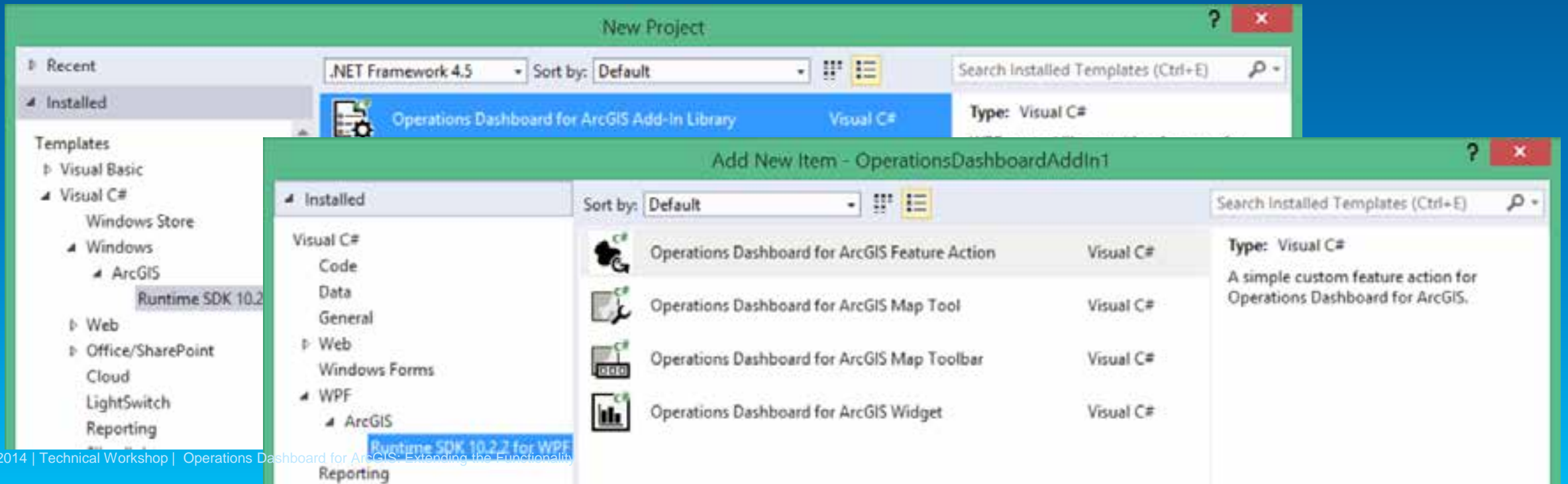
# Behind the scenes





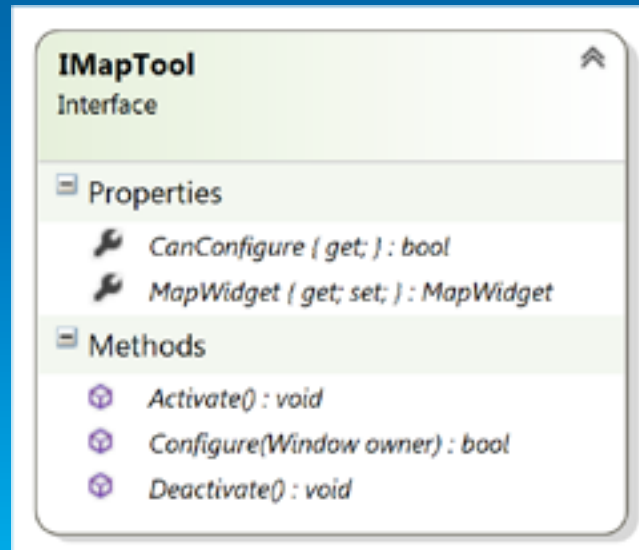
# Overview

- ArcGIS Runtime SDK for WPF
- Visual Studio 2012 or 2013 & .NET 4.5 or later
- Use templates
- Implement ESRI.ArcGIS.OperationsDashboard interface(s)
- Two audiences: author configures, user executes



# Building custom map tools

- Appear on map toolbars
- Use to interact with the map
- Can use a temporary toolbar
- IMapTool & IMapToolbar interfaces



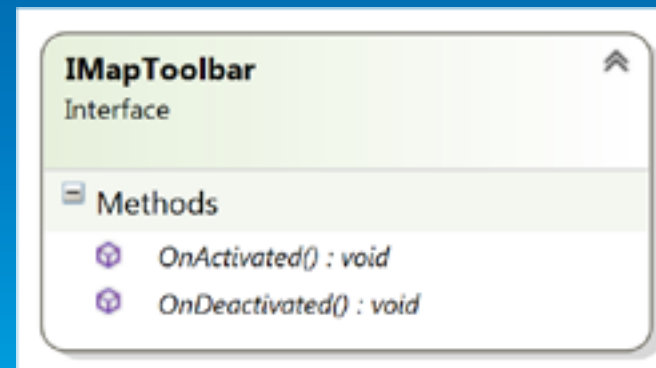
**IMapTool**  
Interface

Properties

- CanConfigure* ( get; ) : bool
- MapWidget* ( get; set; ) : MapWidget

Methods

- Activate*() : void
- Configure*(Window owner) : bool
- Deactivate*() : void



**IMapToolbar**  
Interface

Methods

- OnActivated*() : void
- OnDeactivated*() : void

# Show images

Custom map tool



# Building custom widgets

- Dockable window
- Implements IWidget interface
- Most are tied to a data source

**IDataSourceConsumer**  
Interface

Properties

- `DataSourceIds { get; } : string[]`

Methods

- `OnRefresh(DataSource dataSource) : void`
- `OnRemove(DataSource dataSource) : void`

**IWidget**  
Interface

Properties

- `CanConfigure { get; } : bool`
- `Caption { get; set; } : string`
- `Id { get; set; } : string`

Methods

- `Configure(Window owner, IList<DataSource> dataSources) : bool`
- `OnActivated() : void`
- `OnDeactivated() : void`

# Multi-value summary widget

Custom widget

The screenshot shows a map of Zion National Park with a multi-value summary widget. The widget title is "Average and max shuttle waiting time". The data source is "Zion National Park - Shuttle Bus" and the value field is "Minutes Late". The operations selected are "Maximum" and "Average". The widget displays the following results:

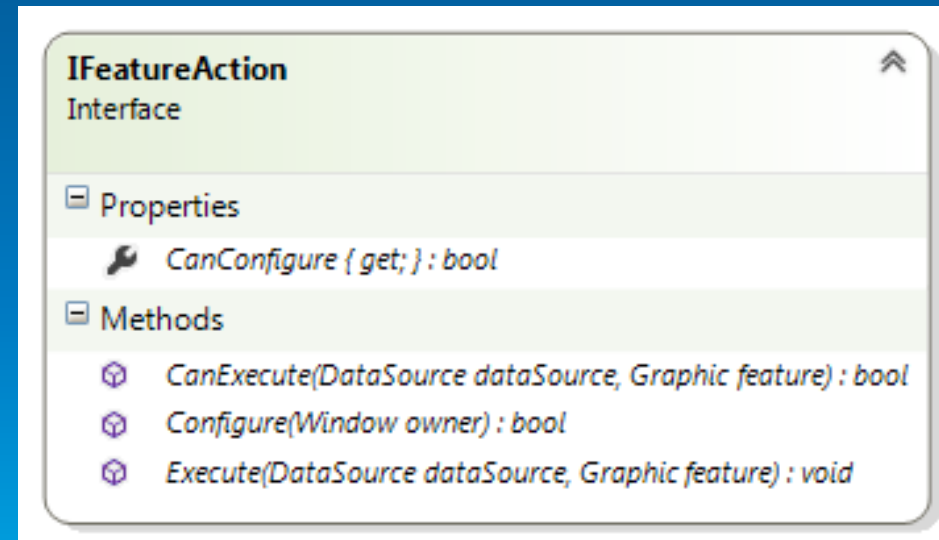
Operation	Value
Maximum	5 minutes
Average	2 minutes

The "Configure Multi-Value Summary" dialog box is also visible, showing the configuration options:

- Title: Average and max shuttle waiting time
- Data Source: Zion National Park - Shuttle Bus
- Value Field: Minutes Late
- Operations:  Maximum,  Minimum,  Average,  Sum
- Leading Text: (empty)
- Trailing Text: minutes

# Building custom feature actions

- Shown on right-click
- No UI
- Command on a single feature
- Implement IFeatureAction



The screenshot displays the IFeatureAction interface definition in a development environment. The interface is titled "IFeatureAction" and is categorized as an "Interface". It is organized into two main sections: "Properties" and "Methods".

**IFeatureAction**  
Interface

**Properties**

- CanConfigure { get; } : bool*

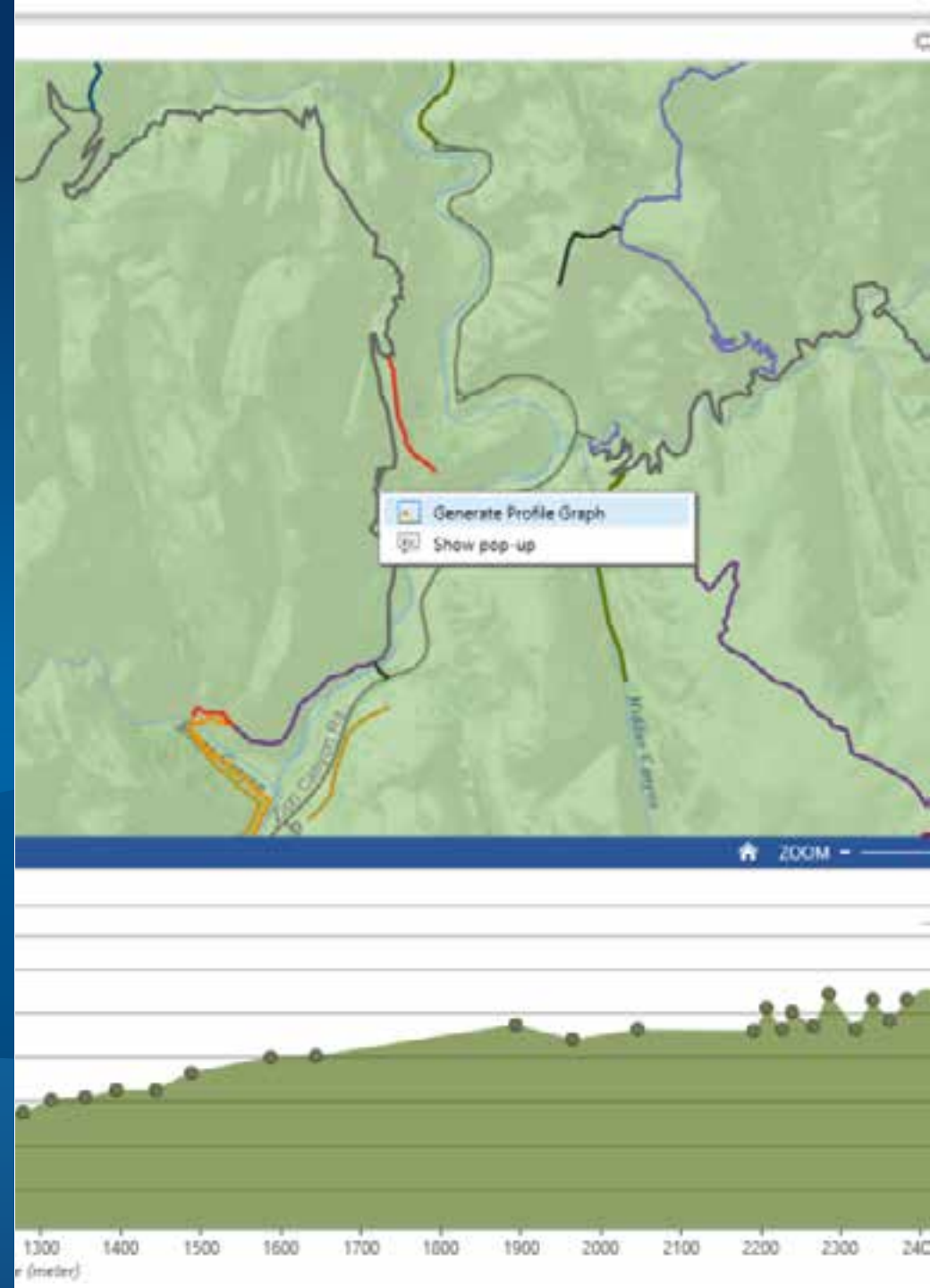
**Methods**

- CanExecute(DataSource dataSource, Graphic feature) : bool*
- Configure(Window owner) : bool*
- Execute(DataSource dataSource, Graphic feature) : void*



# Generate profile graph

Custom feature action

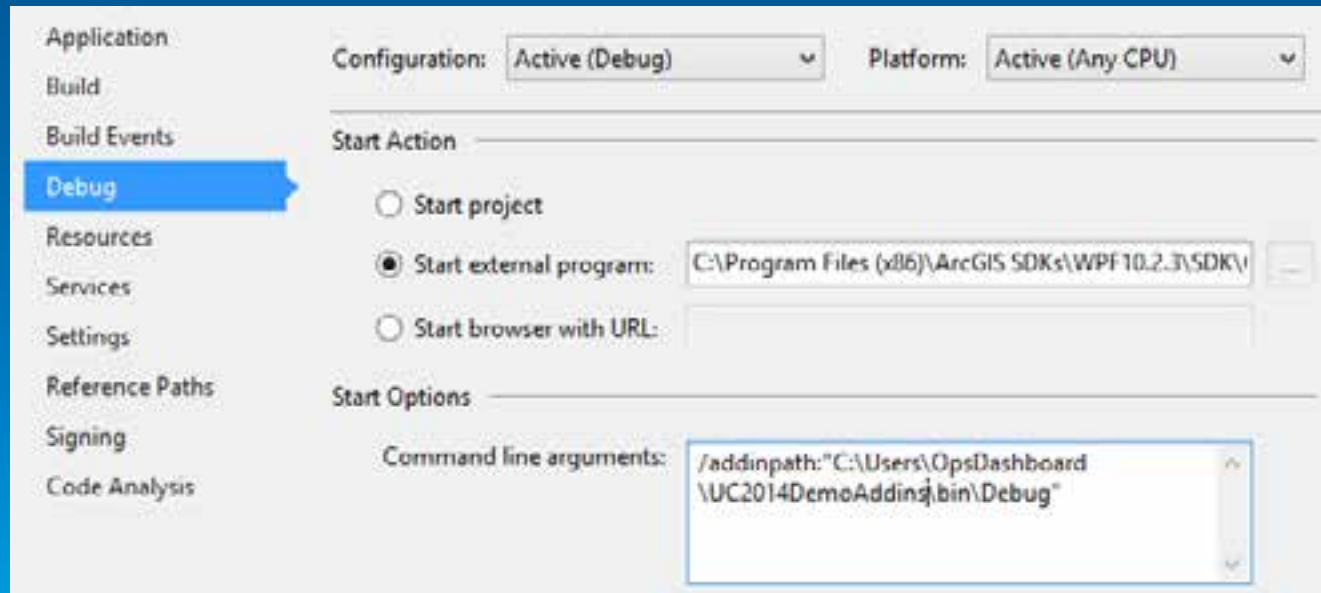


# Development tips

- **Support configuration**
- **Make use of:**
  - **Data sources**
  - **Map widgets**
  - **Other custom widgets**
  - **Built-in Dashboard styles**
- **Familiarize with WPF SDK & Dashboard samples**
- **Use templates (configured for testing)**

# Testing add-ins

- Templates already configured for testing
- Uses a copy of the app included in the SDK



# Sharing & Updating add-ins

## People

Share this operation view with others

Choose who you want to have access to this operation view

- Everyone
- Apps Demo Organization

The members of these groups:

- Operations Dashboard Demos
- Using Dashboard DS 2014
- Operations Dashboard Addins Group

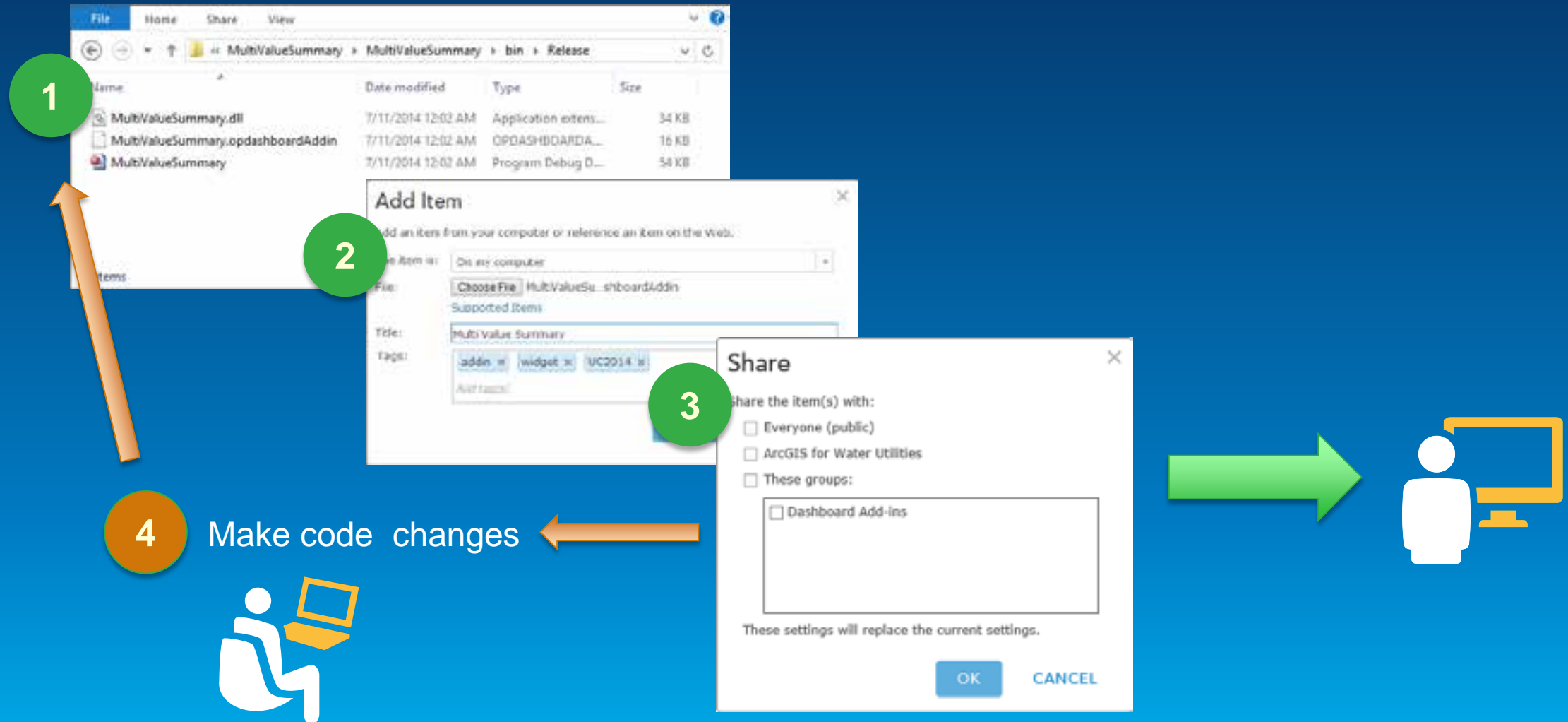
## Referenced items

Apply sharing settings to the referenced items

 Drought Dashboard	Shared
 World Traffic Service	Public
NEXRAD Base Reflectivity (WMS)	Public



# Sharing & updating add-ins



# Sneak Peek

## The Future of Dashboard Development

```
js x appConfig.js x operationsView.js x configure.html x Widget.js

ull,
: false,

function () {
  ller.on("receiveMessage", this._receiveMessage.bind(this));

function () {
  ame: "initialize"

  deferred for external resolution
  d = new Deferred();

  he host and wait for the configuration
  ller.postMessage(msg).then(function (resolvedValue) {

  the internal properties with the configuration
  vedValue && resolvedValue.properties !== undefined)
  nfig = JSON.parse(resolvedValue.properties);

  e the external deferred so the initialization of the widget can
  resolve();

  the external initialization is finished we need to setup the dat
  is.consumeDataSource().then(function () {
  re truly initialized at this point
  Initialized = true;

  diately update the widget with the data source
  s.dataSource)
  emit("dataSourceUpdated", this.dataSource);

is));

), function (err) {
  d to inform that something went wrong
  reject(err);
  });
```



# Cross-platform Extensibility Framework

- **Create add-ins to extend Operations Dashboard with custom Widgets, Map Tools, and Feature Actions**
- **Add-ins are Web Apps**
- **Written in JavaScript, HTML5, CSS**
- **Add-ins will reference the ArcGIS API for JavaScript to define necessary add-in objects**
- **Target 10.3 Release**

# Cross-platform Extensibility Framework (cont.)

- **Developer**

- Write HTML/JavaScript Add-in web app using ArcGIS API for JavaScript
- Host the web app on a on-premise web server (**url**)
- Web app **url** to be referenced as Ops Dashboard *Web Add-in* item in portal

- **Author of Operation Views**

- Browse and use an Ops Dashboard *Web Add-in* within an operation view
- The operation view contains the reference to the Ops Dashboard *Web Add-in* item

- **User**

- When opening an operation view, Operations Dashboard (Windows / Browser) accesses the *Web Add-in* item and gets the **url** to the Add-in web app
- *Web Add-in* loaded in a Web Browser control (Windows app), or iFrame element (browser app)
- Web Add-in is sandboxed

# Thank You!

**Thurs. 3:15pm** ArcGIS Apps: The Road Ahead

<http://doc.arcgis.com/en/operations-dashboard/>

<http://links.esri.com/wpfsdk>

Session & sample code: <http://esri.github.io/>

Survey Offering ID: 1400

[www.esri.com/ucsessionsurveys](http://www.esri.com/ucsessionsurveys)



Understanding our world.