

# Universal Windows Platform

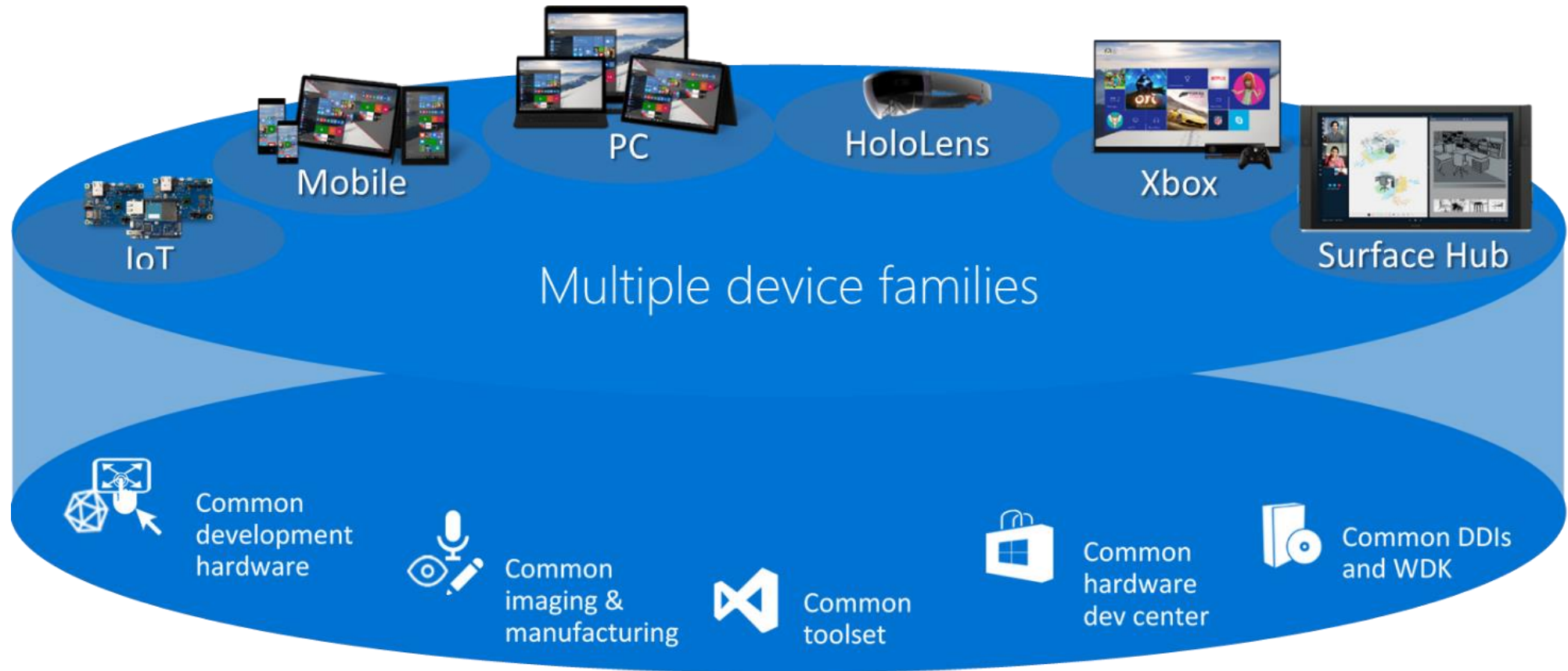
**Oleksandr Krakovetskyi**

CEO, DevRain Solutions

<http://devrain.com>

[alex.Krakovetskiy@devrain.com](mailto:alex.Krakovetskiy@devrain.com)

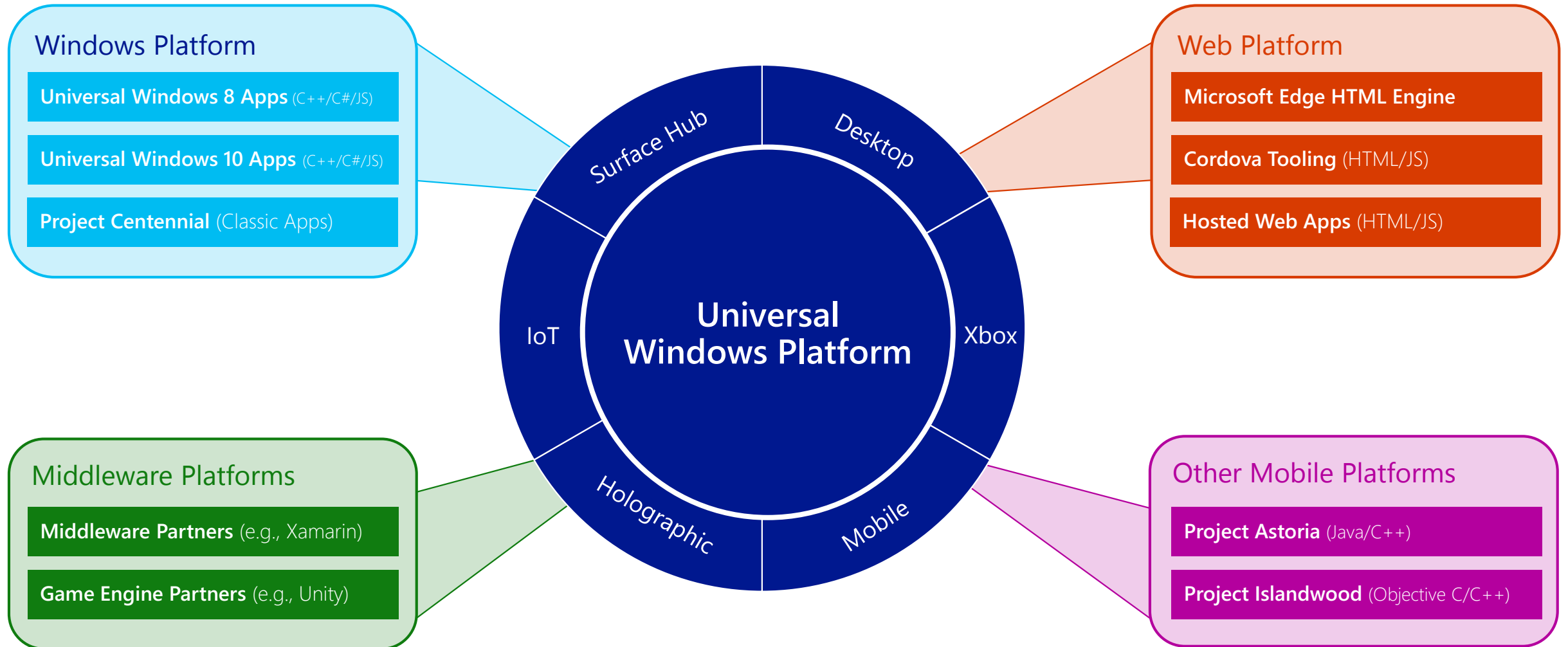
# Universal Windows Platform



One Windows Platform

# Universal Windows Platform

Wherever your code was born, you can bring it to Windows



# Universal Windows Platform Bridges

<https://dev.windows.com/en-US/uwp-bridges>

- Windows Bridge for Android ("Project Astoria") will enable you to build apps using Android code to target Windows 10 phones without having to leave your Android IDE.
- Windows Bridge for iOS ("Project Islandwood") will enable you to build a universal Windows app from within Visual Studio 2015 using your existing Objective-C code.
- Windows Bridge for Classic Windows apps ("Project Centennial") will make it possible to package and publish your current .NET and Win32-based Windows applications to the Windows Store, providing a new way of distributing and monetizing your application on Windows PCs.
- Windows Bridge for web ("Project Westminster"). Windows 10 will make it easy for you to create a Windows app that packages your website for publishing to the Store. Once installed, your website can update and call Windows APIs from JavaScript, creating a more engaging user experience.

# Windows Bridge for Android («Project Astoria»)

Helps developers port their Android apps to the Universal Windows Platform.

- The goal is to allow apps to be ported with as minimum code changes as possible, desirably none
- Both Java and native Android code (C, C++) is accepted. IDEs: IntelliJ, Android Studio and Eclipse on Windows or Mac OS X machines.
- Gradle can be used to generate builds for both Android and Windows from the same source without requiring code forking.
- The SDK comes with a Windows emulator and the code can be deployed to real devices via USB or WiFi. Debugging works as usual for any other Android application.
- KitKat is currently supported.
- Targets Android mobile apps, and they will be ported only to phones and tablets, not to HoloLens, desktop or other Windows devices.

# Windows Bridge for Android («Project Astoria»)

Helps developers port their Android apps to the Universal Windows Platform.

- The UI is converted to a native Windows one, but there are limitations on what can be done.
- Porting works by redirecting Android OS calls to their corresponding Windows operations, without introducing any intermediary VM or runtime. This is done to avoid unnecessary CPU consumption which is important on mobile devices.
- Google Play services calls - Ads, Analytics, In-app purchases and Notifications - are automatically redirected to corresponding Windows services without source code change. Bing Maps is used instead of Google Maps. Calls to Android device sensors, buttons or features, such as Contacts, Share, keyboard, are also mapped to Windows ones.
- Windows specific code, such as Live Tiles, is added using Java.

# Windows does the heavy lifting for you

We translate and redirect Android concepts to Windows concepts



Sharing



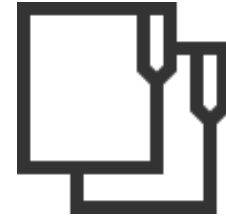
Notifications



bing ads



XBOX LIVE



File system



Camera

## User experience

- Acquisition
- Input and interaction
- App-to-app interactions
- Windowing & navigation
- Notifications and live tiles
- ...

## Cloud services

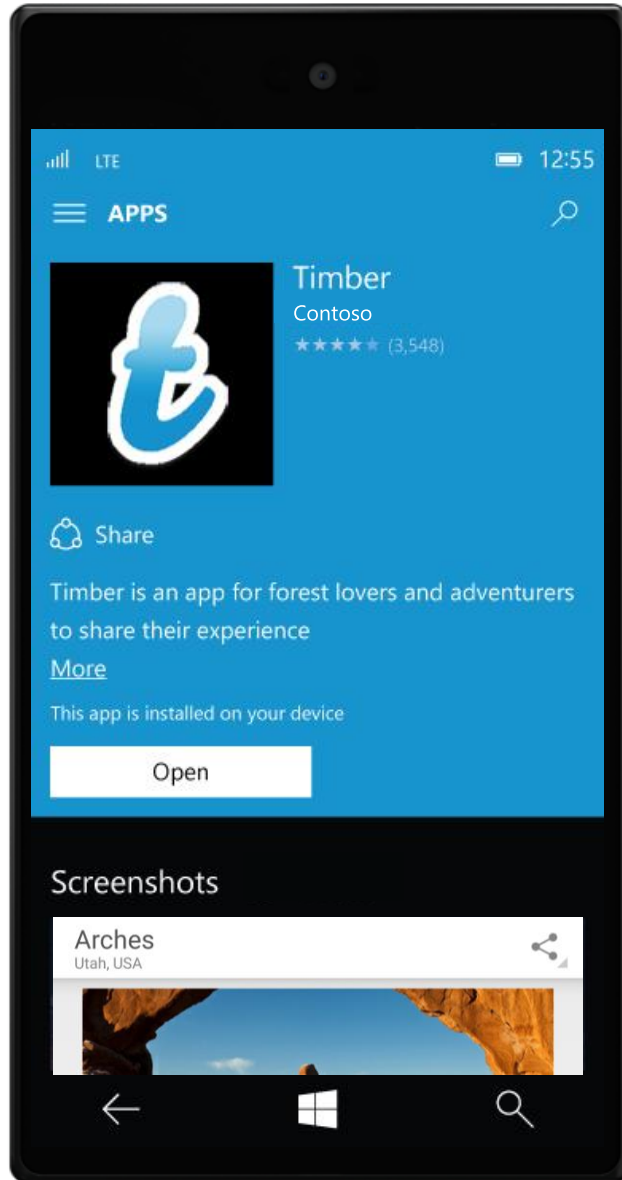
- In-App Purchases
- Ads
- Maps
- Game Services
- Analytics
- Notification service
- ...

## Platform

- File system
- Contacts, photos,...
- Sensors
- Camera
- Hardware accelerated graphics & Direct X
- ...

# User experience

Apps built with Project Astoria are Windows apps



User experience

Cloud services

Platform



Users acquire apps built with Project Astoria through the Windows Store



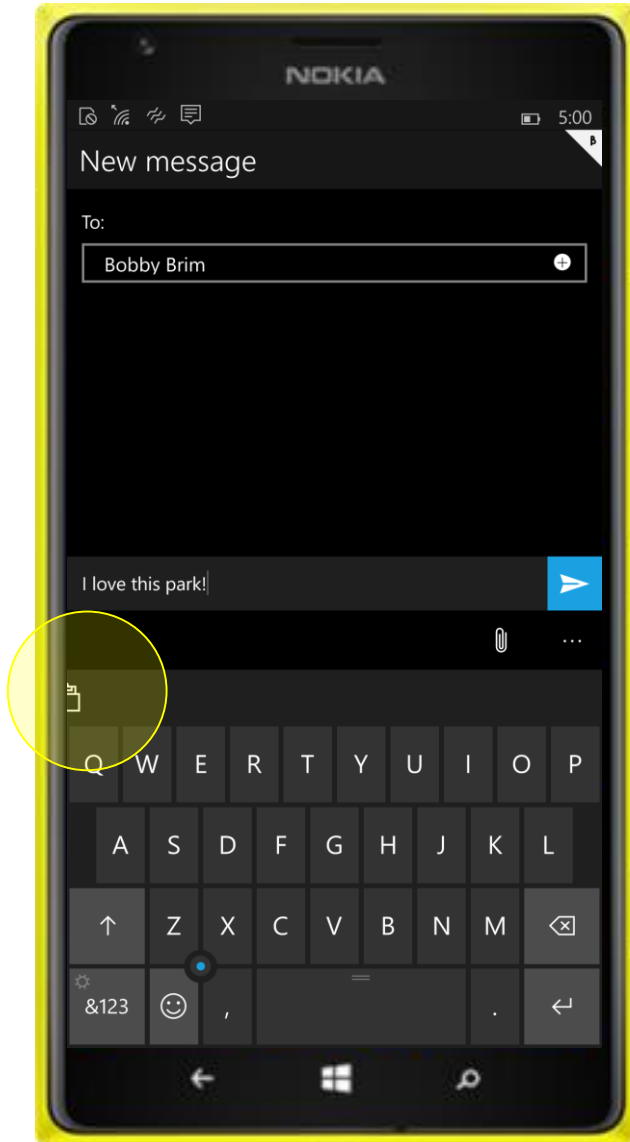
# User experience (cont'd)

Apps built with Project Astoria are Windows apps

User experience

Cloud services

Platform



v/s



# Cloud services

Windows apps built with Project Astoria use Microsoft cloud services

User experience

Cloud services

Platform

## Microsoft Services

AppInsights

MS Ads

In-app Purchases

Windows Notification Service

Xbox Live Services

Bing Maps

Windows Location services

...

- Project Astoria SDK in Java
- Use Microsoft services with minimal code change
- Get Started in Dev Center

```
dependencies {  
    compile fileTree(dir: 'libs', include: ['*.jar'])  
    androidCompile 'com.google.android.gms:play-services:6.1.71'  
    windowsCompile 'com.microsoft.services:interop:6.5.87'  
    compile 'com.android.support:appcompat-v7:19.0.0'  
    compile 'com.android.support:support-v4:19.0.0'  
}
```

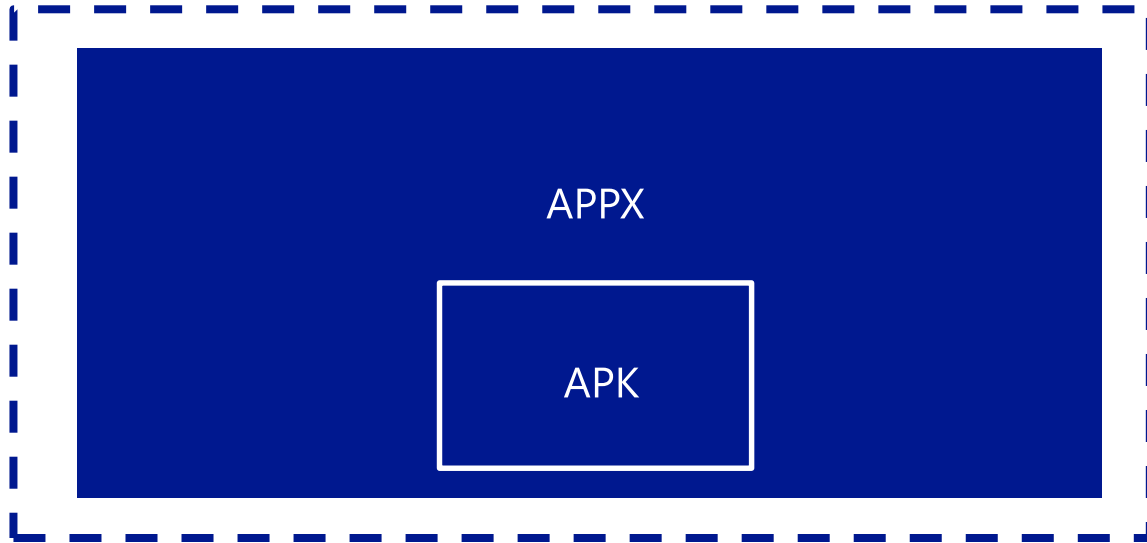
# Platform redirection

Android platform capabilities are redirected to Windows

User experience

Cloud services

Platform



"PROJECT ASTORIA" SUBSYSTEM

WINDOWS

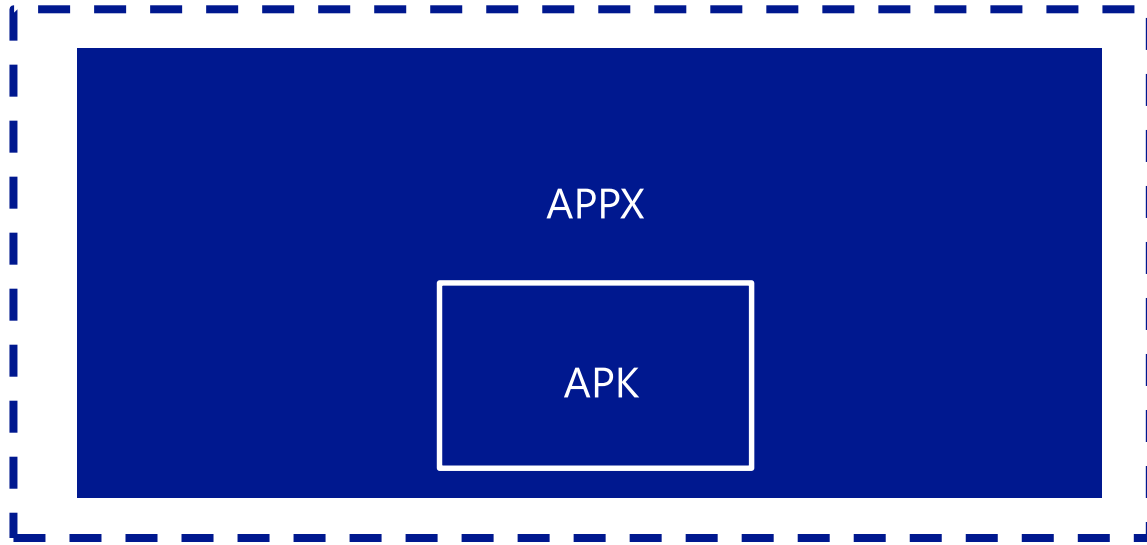
- File system
- Contacts, photos,...
- Sensors
- Camera
- Hardware accelerated graphics & Direct X
- Networking/sockets
- Application lifecycle
- Resource management
- Background execution model
- Security model

# Performance and Battery

User experience

Cloud services

Platform



"PROJECT ASTORIA" SUBSYSTEM

WINDOWS

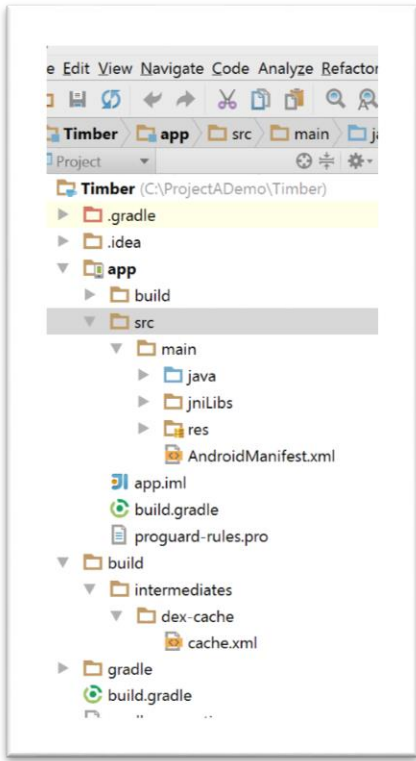
Windows resource management

Runs directly on top of Windows kernel

# Project Astoria Recap

Build a Windows app with your Android code

Your Android Code  
(Project Astoria SDK & App analysis)



Your IDE  
(Project Astoria Plugins)

IntelliJ

Android  
Studio

Eclipse

Your dev  
machine

Windows

Mac

Windows  
Magic

Live tiles



...

Your app in the  
Windows Store



# Windows Bridge for iOS (“Project Islandwood”)

Bring iOS applications to Windows

Windows Bridge for iOS (also referred to as WinObjC) is a Microsoft open source project that provides an Objective-C development environment for Visual Studio/Windows. In addition, WinObjC provides support for iOS API compatibility. With the Windows Bridge for iOS you’ll be able to:

- Import Xcode® projects into Visual Studio
- Make minimal changes to your iOS/Objective-C code to build a Windows app
- Build and debug your Objective-C code from Visual Studio
- Take advantage of great Windows services
- Extend your app to take advantage of Universal Windows Platform features

Developer Preview: <https://github.com/Microsoft/WinObjC>

# Project Centennial

Make classic Windows apps -Win32, .NET, COM- run on the Universal Platform.

There are ~16M classic apps that could be ported with Centennial.

Project Centennial does not change anything in the code, it simply does some tricks to make app packaging and deployment run properly on UWP.

The Converter analyzes an MSI file, discovers and records what the app is doing during installation, what resources installs, what modifications it performs, etc. Then, an AppX is generated, including live tiles, which developers can test and load to the Store.

More details can be found by watching this Build 2015 [session](#).

# Project Westminster (Hosted Web Apps)

Packaging of a website as a universal application

The Windows Bridge for web apps makes it easy to publish your responsive web app to the Windows Store as a Universal Windows Platform (UWP) app, while reusing your existing code and workflow.

- Easily scale your responsive web app to different devices.
- Interact with native Windows APIs from JavaScript running on your website.
- Integrate with Cortana voice commands.
- Debug your app with Microsoft Edge F12 Developer Tools.
- Track status, ratings, and reviews, see analytics, and get paid for all of your Windows app in the Windows Store.
- Updates should be pushed to web-server not the app.

```
<Applications>
  <Application
    Id="App"
    StartPage="https://flightarcade.com/">

    <uap:ApplicationContentUriRules>
      <uap:Rule Match="https://flightarcade.com/" Type="include" WindowsRuntimeAccess="all"/>
    </uap:ApplicationContentUriRules>
```



# Project Westminster (Hosted Web Apps)

Invoke UWP API from remote JavaScript code

```
if (typeof Windows !== 'undefined' &&
    typeof Windows.UI !== 'undefined' &&
    typeof Windows.UI.Notifications !== 'undefined') {

    var notifications = Windows.UI.Notifications,
        tile = notifications.TileTemplateType.tileSquare150x150PeekImageAndText01,
        tileContent = notifications.TileUpdateManager.getTemplateContent(tile),
        tileText = tileContent.getElementsByTagName('text'),
        tileImage = tileContent.getElementsByTagName('image');

    tileText[0].appendChild(tileContent.createTextNode(message || 'Demo Message'));
    tileImage[0].setAttribute('src', imgUrl || 'https://unsplash.it/150/150/?random');
    tileImage[0].setAttribute('alt', imgAlt || 'Random demo image');

    var tileNotification = new notifications.TileNotification(tileContent);
    var currentTime = new Date();
    tileNotification.expirationTime = new Date(currentTime.getTime() + 600 * 1000);
    notifications.TileUpdateManager.createTileUpdaterForApplication().update(tileNotification);
}
```

A dark blue parallelogram graphic, tilted slightly to the right, containing the text 'Q&A' in white.

Q&A

Oleksandr Krakovetskyi

CEO, DevRain Solutions

[alex.krakovetskiy@devrain.com](mailto:alex.krakovetskiy@devrain.com)