Multi-Device Hybrid Apps for Visual Studio

Documentation for CTP1

Last updated: May 16, 2014

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Getting Started Guide

Description

Visual Studio has always been about helping you create great apps. Whether you are building an app for the web, a Windows device, or the desktop, Visual Studio has you covered with great functionality ranging from full code editor support to a highly integrated debugging and diagnostics experience to best-in-class tools for authoring UI.

With our **Multi-Device Hybrid Apps** release, we are taking what you love about Visual Studio further. We are giving you the ability to build hybrid apps in HTML, CSS, and JavaScript that work beautifully on Android, iOS, Windows Phone, and Windows Store. Best of all, all of this is done inside Visual Studio itself.

This document will walk you through everything the Multi-Device Hybrid Apps release provides, and how you can quickly start using it to create great apps. We'll start by looking at the Apache Cordova™ and finish with previewing your app in a variety of ways involving simulators, emulators, and tethered devices.

Let's get started!

⚠ One thing to note is that this release of the tools **is a very early preview**. This version is not feature complete, and occasionally things might not work as expected.

This release supports building apps for the following device targets:

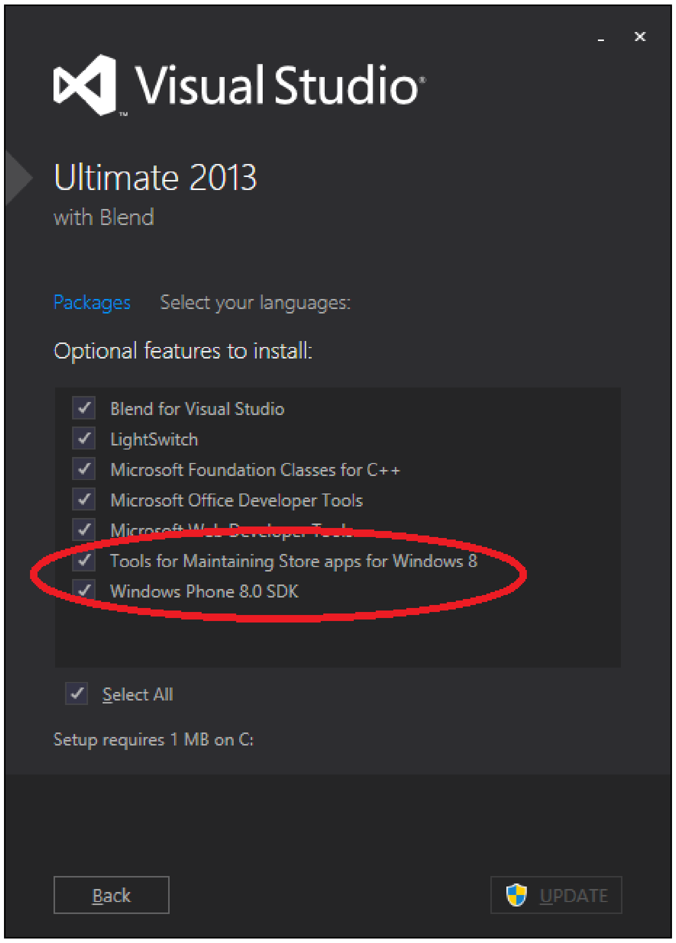
- Android 4+ (4.4 providing the optimal developer experience)
- iOS 6 & 7
- Windows 8.0 (Store)
- Windows Phone 8.0

✓ Note: Windows and Windows Phone 8.0 applications are fully compatible to run on 8.1 devices.

Requirements and Downloading the Installer

You can download the installer for Multi-Device Hybrid Apps from the Microsoft Download Center (link).

Requirements:
- Windows 8.1
- Visual Studio 2013 Update 2 - Professional, Ultimate, or Premium with the following optional features installed:
    - Tools for Maintaining Store apps for Windows 8
    - Windows Phone 8.0 SDK
    - **Note:** You can add these after installation by going to "Programs and Features" in the Windows 8.1 start screen, selecting the Visual Studio 2013 install, clicking the "Change" button, and then clicking the "Modify" button when prompted.



Optional features to install:

- ✓ Blend for Visual Studio
- ✓ LightSwitch
- ✓ Microsoft Foundation Classes for C++
- ✓ Microsoft Office Developer Tools
- ✓ Microsoft Web Developer Tools
- ✓ Tools for Maintaining Store apps for Windows 8
- ✓ Windows Phone 8.0 SDK

✓ Select All

Setup requires 1 MB on C:

For more details on how to upgrade Visual Studio, visit our website.

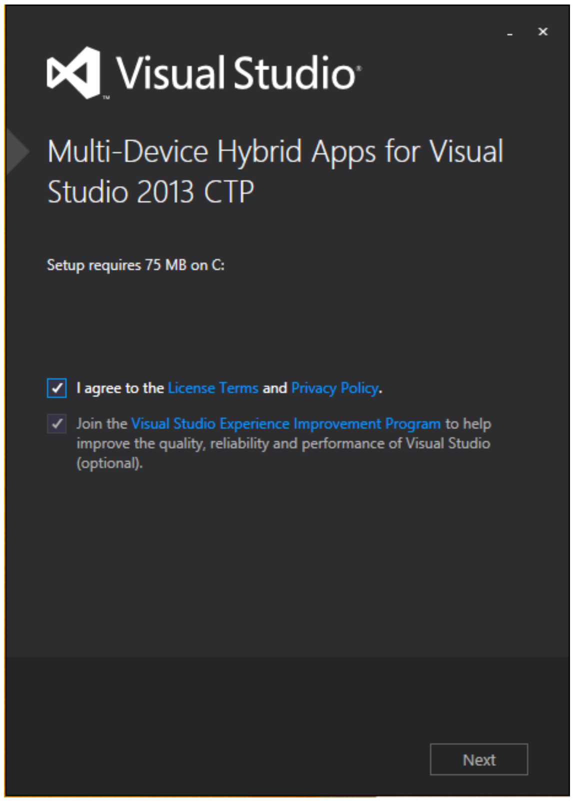
Additional system requirements vary by device platform:

- The Android emulator works best with PCs capable of installing the Intel HAXM driver (see “Improving the Performance of the Android Emulator” for details on installing it)
- Windows Phone 8 requires a Hyper-V capable PC to run the emulator
- Building for iOS and using the iOS Simulator requires a Mac capable of running Xcode 5.1

Installation

After your download completes, double-click the downloaded file to start installation.

The first step of the installer applies a patch to Visual Studio. We're just taking care of some plumbing to make the platform compatible with the extension.


Visual Studio

Multi-Device Hybrid Apps for Visual Studio 2013 CTP

Setup requires 75 MB on C:

✓ I agree to the License Terms and Privacy Policy.

✓ Join the Visual Studio Experience Improvement Program to help improve the quality, reliability and performance of Visual Studio (optional).

Multi-Device Hybrid Apps MSI

The installer will then ask permission to download certain dependencies. These are mostly open source software pre-requisites required by individual platforms or Apache Cordova to build and run your applications. Any dependencies that already exist on your system will not be re-installed (as long as the required version is present).

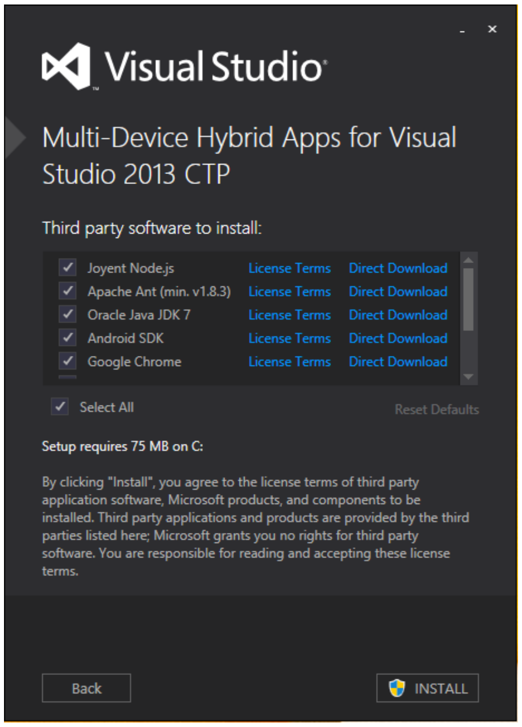
Note: If these dependencies are already on your system or you opt to install them manually, you may need to update your system path. See "[Alternate] Installing 3rd Party Software Manually" for details.

Third Party Dependencies

- Joyent Node.js – Enables Visual Studio to integrate with the Apache Cordova Command Line Interface (CLI) and Apache Ripple™ Emulator
- Git CLI – Required only if you need to manually add git URIs for plugins
- Google Chrome – Required to run the Apache Ripple emulator for iOS and Android
- Apache Ant 1.8.0+ – Required as a dependency for the Android build process

- Oracle Java JDK 7 – Required as a dependency for the Android build process
- Android SDK – Required as a dependency for the Android build process and Ripple
- SQLLite for Windows Runtime – required to add SQL connectivity to Windows apps (for the WebSQL Polyfill plugin)
- Apple iTunes – Required for deploying an app to an iOS device connected to your Windows PC

Due to the size of these dependencies, the download and install time may take more than 30 minutes. We recommend you install all dependencies to take full advantage of the extension.



Multi-Device Hybrid Apps for Visual Studio 2013 CTP

Third party software to install:

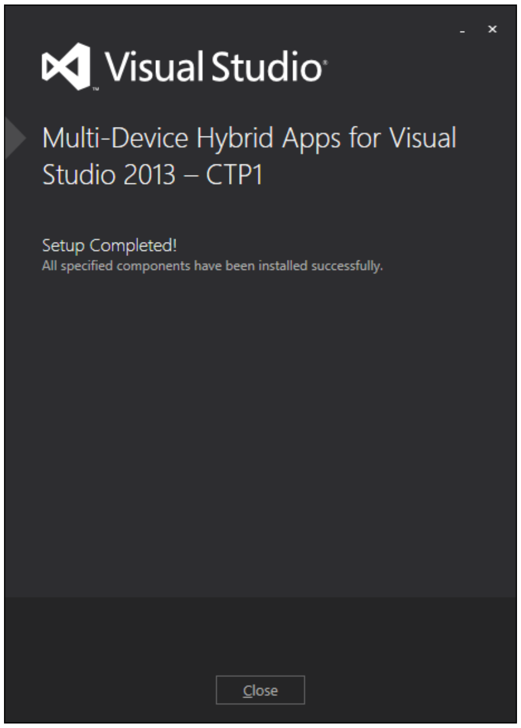
✓ Joyent Node.js	License Terms	Direct Download
✓ Apache Ant (min. v1.8.3)	License Terms	Direct Download
✓ Oracle Java JDK 7	License Terms	Direct Download
✓ Android SDK	License Terms	Direct Download
✓ Google Chrome	License Terms	Direct Download

✓ Select All

Setup requires 75 MB on C:

By clicking "Install", you agree to the license terms of third party application software, Microsoft products, and components to be installed. Third party applications and products are provided by the third parties listed here; Microsoft grants you no rights for third party software. You are responsible for reading and accepting these license terms.

Choose 3rd party dependency software



Multi-Device Hybrid Apps for Visual Studio 2013 – CTP1

Setup Completed!
All specified components have been installed successfully.

Install process completed successfully

In addition, Visual Studio will acquire Cordova tools the first time you build after installing or updating. As a result, **this initial build will take more time than normal.** You can see progress in the "Output" window.

We strongly recommend rebooting your machine after installation completes, to ensure that everything is properly installed.

Updates

Visual Studio regularly releases updates to our products and features. After installation, please open Visual Studio, from the menu bar, choose Tools, point to Extensions and Updates, and select Updates and see if there are any updates. Remember, always update to the latest version of the extension for the best possible experience.

[Alternate] Installing 3rd Party Software Manually

While we recommend you take full advantage of the automated installer, if you opt not to install one or more of the dependencies using the Multi-Device Hybrid Apps installer you can install these dependencies manually with a bit of additional configuration work. The following section will walk you through this process.

While you can install the dependencies in any order, please ensure you have Java installed and configured before you attempt to install the Android SDK.

- **Joyent Node.js (Download)**

- We suggest installing the 64-bit version

- **Google Chrome (Download)**

- **Git Command Line Tools (Download)**
  - Please ensure you select the option that adds git to your command prompt path

- **Apache Ant (Download)**
  - Download and extract Ant to a location like *C:/ant-1.x.x/*
  - Set the ANT_HOME environment to point to the above location.
  - Add to System Path: *%ANT_HOME%\bin*

- **Oracle Java 7 (Download)**

  ⚠ Android only supports the x86 version of Java
  - Set the JAVA_HOME environment variable to *C:/Program Files/Java/jdk1.7.0_55*
  - Add to System Path: *%JAVA_HOME%\bin*

- **Android SDK (Download)**

  ❗ The default install location for the Android SDK on Windows can be hard to find. Choosing to install globally for all users places it in "Program Files (x86)," otherwise it is located here: **%localappdata%\Android\android-sdk** (C:\Users\<user>\AppData\Local\Android\android-sdk)
  - Download and install the SDK
  - Update the APIs as per the default suggestion. Be sure the SDK for Android 4.4.x (API level 19) is installed.
  - Set the ADT_HOME environment variable to the SDK install location
  - Add to System Path: *%ADT_HOME%\tools;%ADT_HOME%\platform-tools*

- **Apple iTunes (x86, x64)**

- **SQLite (Download)**

Remote Build & Simulation Agent for iOS [Optional]

Currently iOS apps cannot be built on Windows and the iOS Simulator is also Mac only. Fortunately, we have provided an agent that can be setup on a remote Mac (or local if you are using a virtualization technology to host Windows) to support these scenarios.

The agent will queue up builds, so it can be used in a shared environment. It can also be configured as a personal server that can launch the iOS Simulator.

✓ This step is only required if you would like to build and deploy the app for iOS right from Visual Studio. Information on alternative ways to build and simulate iOS are covered later in this document.

This section will cover how to set up and configure a remote build agent on a Mac and how to configure Visual Studio to use this agent to build iOS apps.

Prerequisites

- Mac OS X Mavericks
- Xcode 5.1 and Xcode command line tools
- An active iOS Developer Program account with Apple, with iOS provisioning profile and signing identity configured in Xcode
- Node.js installed on the Mac

Installation

Run the following command from the Terminal app on your Mac:

```
sudo npm install -g vs-mda-remote
```

Global installation is recommended but not strictly required.

By default, the agent is geared towards being placed on a shared build server. If you wish to configure the build agent to support launching the iOS Simulator, the ios-sim node module must be installed globally on the Mac. (Additional instructions on configuring the agent to run in this configuration can be found later in this document.)

```
sudo npm install -g ios-sim
```

Setting Up the Remote Agent for Building

To start up the agent, run the following command:

```
vs-mda-remote --buildDir <server-build-directory>
```

In the above command, <server-build-directory> should be replaced with the location of a folder on your machine. Builds will be organized by build number subdirectories in this location.

This will start the agent in build server mode. An additional command line parameter is required to start up the agent for personal use with the iOS Simulator that will be covered later.

Other options include the port number to listen on, the maximum number of builds to retain on the file system (defaults to 10 and they are cleared on shutdown). For help:

```
vs-mda-remote --help
```

It is good practice to capture stdout and stderr to a file and run as a background process, the server.log would assist in troubleshooting if necessary:

```
vs-mda-remote --buildDir ~/builds > server.log 2>&1 &
```

You can also run with a configuration file instead of using command line parameters:

```
vs-mda-remote --config path-to-config-file
```

The config file should be a JSON format file with the startup options and their values without dashes in the name. An example config file is vs-mda-remote/examples/exampleConfig.json.

Setting up the Remote Agent to Support Starting the iOS Simulator

If you are using the remote agent on a personal Mac (vs a shared Mac build server), you can configure the agent to support launching the iOS Simulator on your Mac from Visual Studio.

As mentioned previously, the ios-sim node module is required globally to enable starting up the iOS Simulator from Visual Studio. Run the following command to install it:

```
sudo npm install -g ios-sim
```

The build server should then be started with the command line option --allowsEmulate=true:

```
vs-mda-remote --buildDir <server-build-directory> --allowsEmulate=true
```

When these requirements are met, the app can be deployed from Visual Studio to the simulator on the Mac running the agent.

Verifying the Agent after Setup

You can verify your config by running the following command (make sure you have the agent running from the steps above):

```
vs-mda-remote test
```

The output from should show the build number and other information about the example build that was submitted, and the progress of the build until it is complete.

Open http://localhost:3000/build/tasks in a browser - it should display information about the build and after some time its status should be complete.

Open http://localhost:3000/files in a browser - browse to the build number directory and verify that you can see directory contents.

If you started server on a port other than 3000, run the following command instead:

```
vs-mda-remote test http://localhost:<portNumber>
```

You can verify that Developer signing identity is set up correctly for Device builds (for the Debug and Release configurations from Visual Studio) by running the following command:

```
vs-mda-remote test --device
```

You can verify that Distribution signing identity is set up correctly for Device builds (for the Distribution configuration from Visual Studio) by running the following command:

```
vs-mda-remote test --device --cfg distribution
```

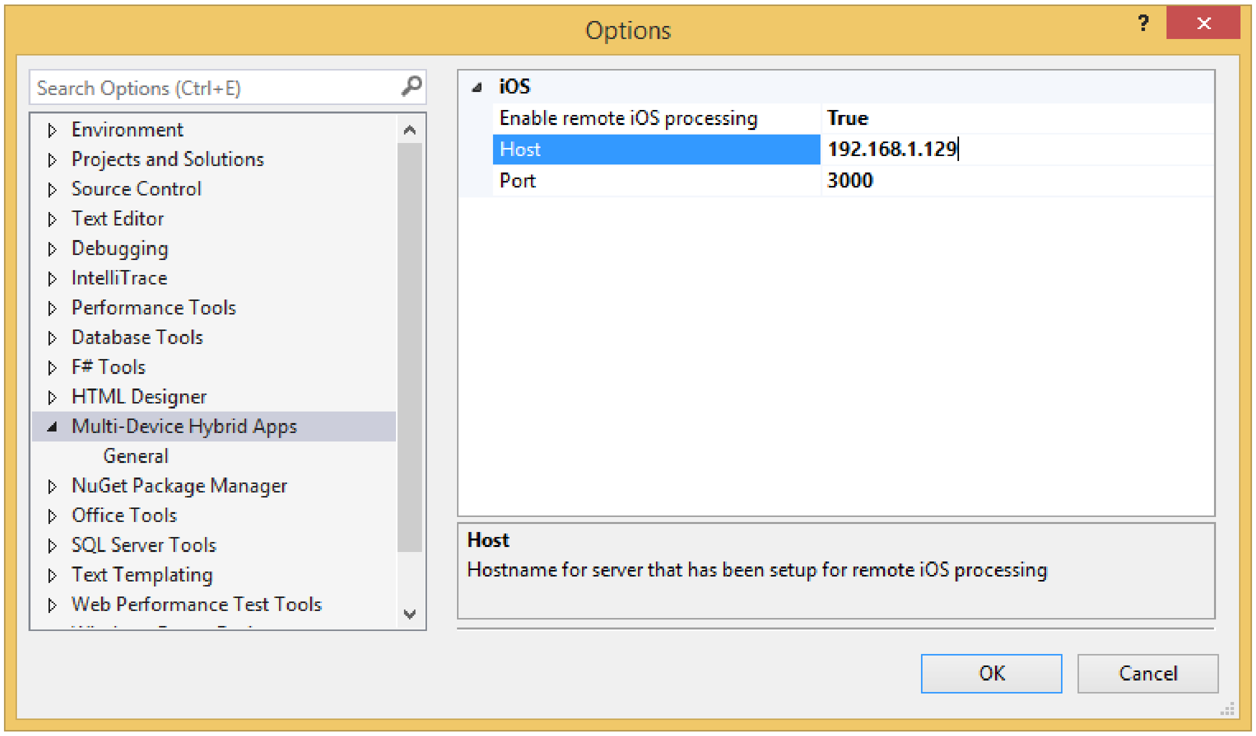
See the section on “Packaging and Signing Your App” for details on setting up provisioning and signing identities.

Some Useful Server URLs

- Web based directory and file access to builds and their files: http://localhost:3000/files
- Build tasks submitted to the build server: http://localhost:3000/build/tasks
- Build status information for a particular build (identified by a buildNumber such as 1234): http://localhost:3000/build/buildNumber

Configuring Your Remote Build Server in VS

- (On Mac) ifconfig to figure out the IP address of your Mac.
- (In Visual Studio) Add that IP address and port 3000 in **Options > Multi-Device Hybrid Apps > General.** Set Enable remote iOS processing to **True.**



iOS

Enable remote iOS processing	True
Host	192.168.1.129
Port	3000

Host
Hostname for server that has been setup for remote iOS processing

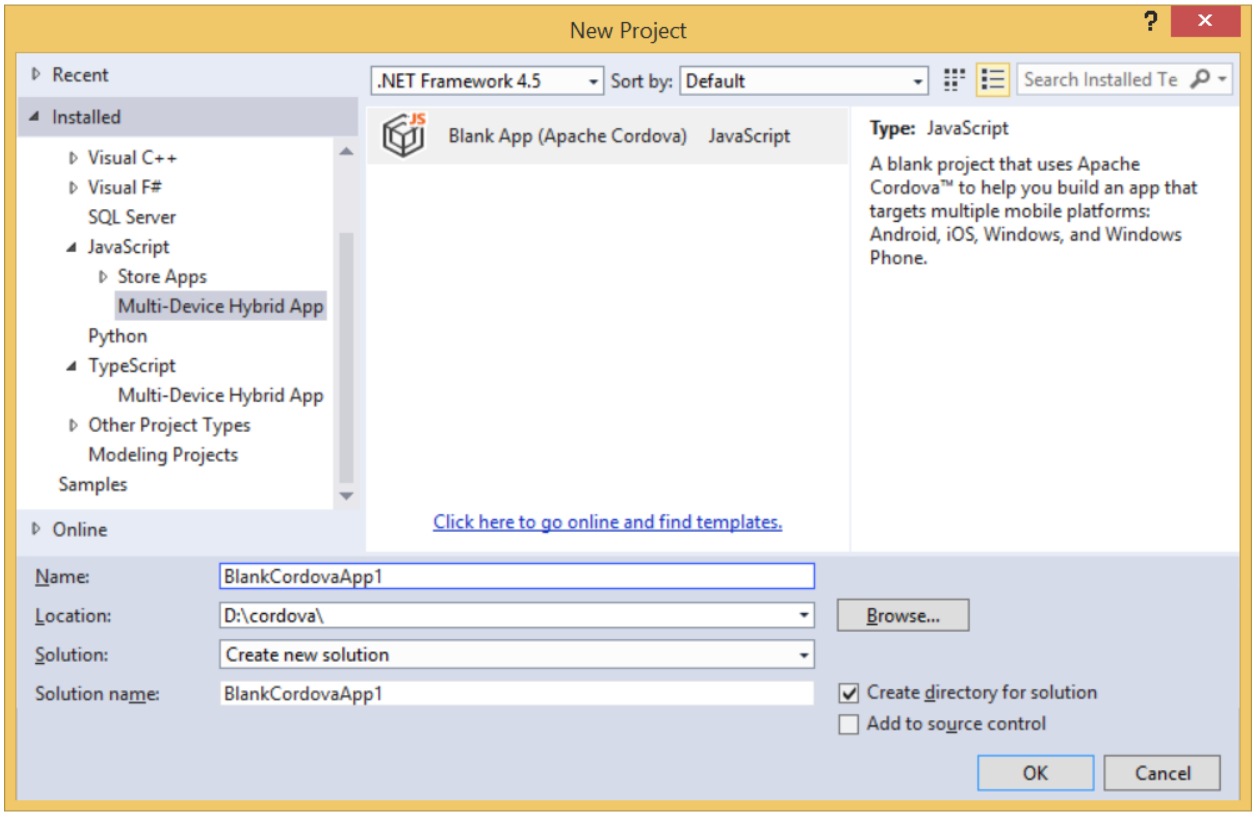
Configure VS to connect to a vs-mda-remote agent on a Mac

Building Your First Project

Starting Your First Project

This Multi-Device Hybrid Apps release provides two templates, one in JavaScript and the other in TypeScript. They are largely identical, so choosing one over the other is a matter of your language preference.

From the menu bar, choose File > New > Project.
Scroll down to the JavaScript or TypeScript section. Here, choose the “Blank App (Apache Cordova)”



Type: JavaScript

A blank project that uses Apache Cordova™ to help you build an app that targets multiple mobile platforms: Android, iOS, Windows, and Windows Phone.

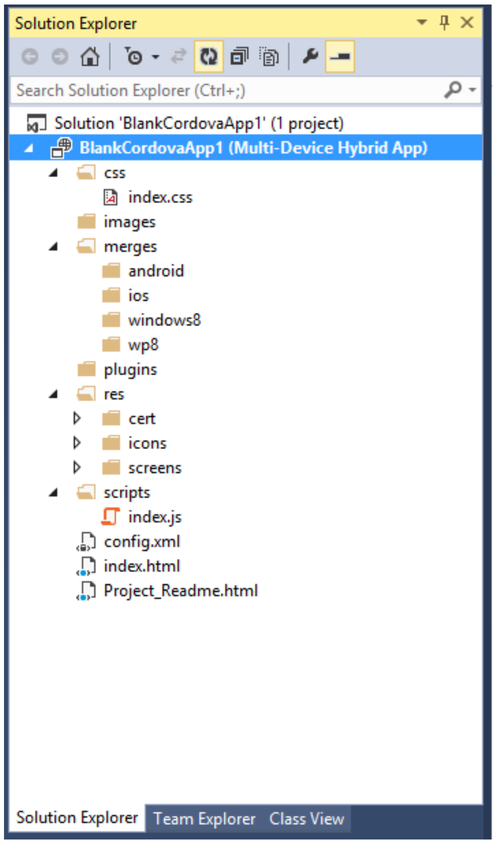
Name: BlankCordovaApp1
Location: D:\cordova\
Solution: Create new solution
Solution name: BlankCordovaApp1
[✓] Create directory for solution
[ ] Add to source control

List of project templates

Enter a name for the project and click OK. And you’re on your way!

Explaining the Project Structure

The first thing you notice after creating your project is that it resembles a normal Web application. In fact, that’s the beauty of Cordova – it takes simple Web apps and converts them to powerful, native-like apps.



Basic project structure for a Multi-Device Hybrid App

Default folders:

- css – Contains some basic CSS style sheets included with the Blank template
- images – Currently blank, proposed location for images for your app
- res – Used for platform-specific visual assets and signing certificates
  - res/cert – Folder for signing certificates and other native project overrides (see FAQ)
  - res/icons – Platform-specific icons
  - res/screens – Platform-specific splashscreens
- script – Default location for all JavaScript or TypeScript script files
- merges – Used to add platform-specific code like CSS files

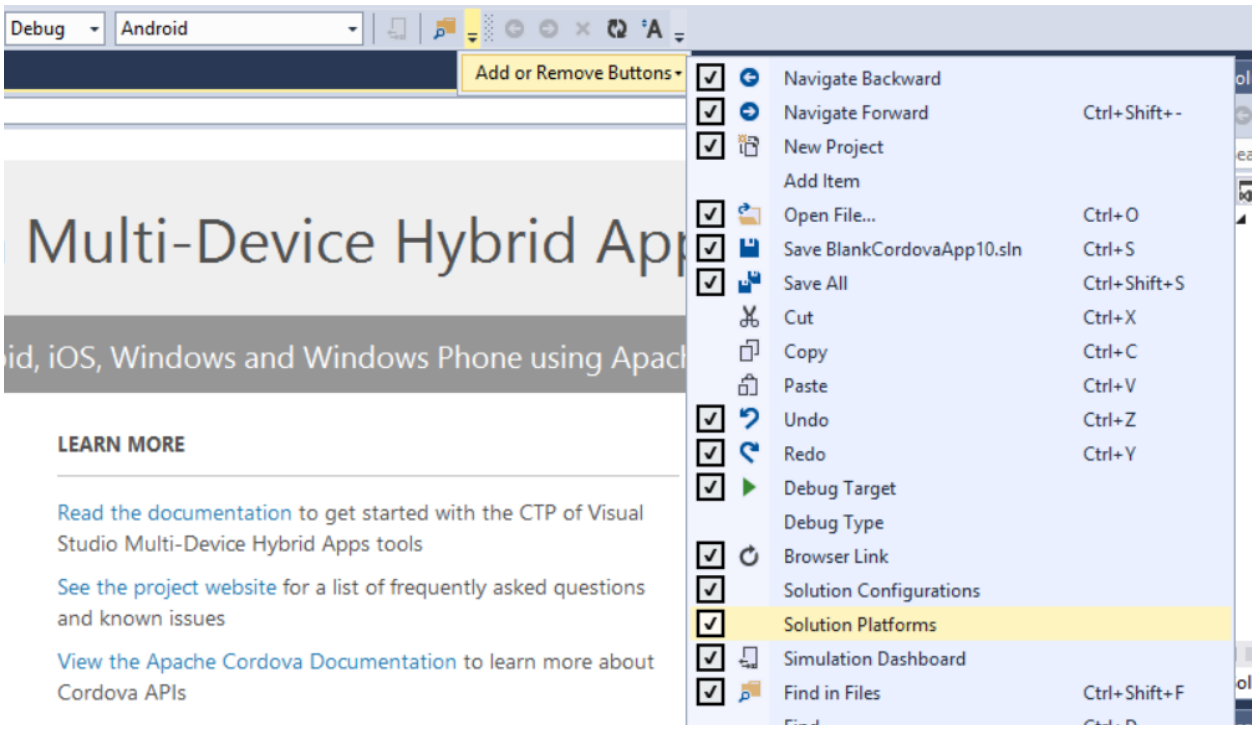
Default files:

- index.html – This is the home screen of your app; it can be modified
- config.xml – This file contains the configuration settings for your app (identical to Cordova's config.xml file but with some vs prefixed elements); clicking on this will open up the Config Designer

Running Your App on Different Platforms

To switch between target device platforms, you can simply use the "Solution Platforms" dropdown present in the Visual Studio toolbar. The "Debug Target" dropdown will then automatically update with valid options to run your app for that platform. See "Emulation, Simulation, & Deploying to Devices" for additional details.

If you have installed a fresh copy of Visual Studio 2013 Update 2, the “Solution Platforms” dropdown will be present by default, but it may not be present if you upgraded from a previous version. Fortunately, it is easy to add it into the toolbar as described here: http://support.microsoft.com/kb/2954109



Read the documentation to get started with the CTP of Visual Studio Multi-Device Hybrid Apps tools

See the project website for a list of frequently asked questions and known issues

View the Apache Cordova Documentation to learn more about Cordova APIs

Adding the “Solution Platforms” dropdown to the toolbar

Download our Sample To-Do Apps

To explore further, we recommend downloading one of the sample apps to get up and running.

• AngularJS Sample	http://go.microsoft.com/fwlink/?LinkID=398516
• BackboneJS Sample	http://go.microsoft.com/fwlink/?LinkID=398517
• WinJS Sample	http://go.microsoft.com/fwlink/?LinkID=398518

Platform Specific Configurations

There are a few ways in which the project can be configured to add device platform specific functionality and styling. This feature is optional and if no specific overrides are added, the defaults provided by our extension will be used.

Splashscreens and Other Visual Assets

The 'res' folder in your project can be used to specify visual assets based on device resolution and platform. In case this folder does not exist or was previously deleted, you can create it again.

The table below shows the various assets and the naming convention (this list is taken from the Cordova website but it shows a more updated version that includes undocumented assets as well).

Platform	Type	Start (From Documentation)	Resolution
Android	Icon	res/icons/android/icon-36-ldpi.png	36x36
Android	Icon	res/icons/android/icon-48-mdpi.png	48x48
Android	Icon	res/icons/android/icon-72-hdpi.png	72x72
Android	Icon	res/icons/android/icon-96-xhdpi.png	96x96
Android	Splashscreen	res/screens/android/screen-xhdpi-landscape.png	720x960
Android	Splashscreen	res/screens/android/screen-xhdpi-portrait.png	960x720
Android	Splashscreen	res/screens/android/screen-hdpi-landscape.png	480x640
Android	Splashscreen	res/screens/android/screen-hdpi-portrait.png	640x480
Android	Splashscreen	res/screens/android/screen-mdpi-landscape.png	320x470
Android	Splashscreen	res/screens/android/screen-mdpi-portrait.png	470x320
Android	Splashscreen	res/screens/android/screen-ldpi-landscape.png	320x426
Android	Splashscreen	res/screens/android/screen-ldpi-portrait.png	426x320
iOS	Icon	res/icons/ios/icon-57-2x.png	114x114 (Retina)
iOS	Icon	res/icons/ios/icon-57.png	57x57
iOS	Icon	res/icons/ios/icon-72-2x.png	144x144 (Retina)
iOS	Icon	res/icons/ios/icon-72.png	72x72
iOS	Icon	res/icons/ios/icon-40.png	40x40
iOS	Icon	res/icons/ios/icon-40-2x.png	80x80 (Retina)
iOS	Icon	res/icons/ios/icon-50.png	50x50
iOS	Icon	res/icons/ios/icon-50-2x.png	100x100 (Retina)
iOS	Icon	res/icons/ios/icon-76.png	76x76
iOS	Icon	res/icons/ios/icon-76-2x.png	152x152 (Retina)
iOS	Icon	res/icons/ios/icon-small.png	29x29
iOS	Icon	res/icons/ios/icon-small-2x.png	58x58 (Retina)
iOS	Splashscreen	res/screens/ios/screen-ipad-landscape.png	1024x768
iOS	Splashscreen	res/screens/ios/screen-ipad-landscape-2x.png	2048x1536
iOS	Splashscreen	res/screens/ios/screen-ipad-portrait.png	768x1024
iOS	Splashscreen	res/screens/ios/screen-ipad-portrait-2x.png	1536x2048
iOS	Splashscreen	res/screens/ios/screen-iphone-portrait-2x.png	640x960
iOS	Splashscreen	res/screens/ios/screen-iphone-portrait.png	320x480
iOS	Splashscreen	res/screens/ios/screen-iphone-568h-2x.png	640x1136
Windows Phone	Icon	res/icons/wp8/icon-62-tile.png	62x62

Windows Phone	Icon	res/icons/wp8/icon-173-tile.png	173x173
Windows Phone	Splashscreen	res/screens/wp8/screen-portrait.png	480x800
Windows Store	Icon	res/icons/windows8/logo.png	150x150
Windows Store	Icon	res/icons/windows8/smalllogo.png	30x30
Windows Store	Icon	res/icons/windows8/storelogo.png	50x50
Windows Store	Splashscreen	res/screens/windows8/splashscreen.png	620x300

Platform Specific Content (CSS, HTML, JS)

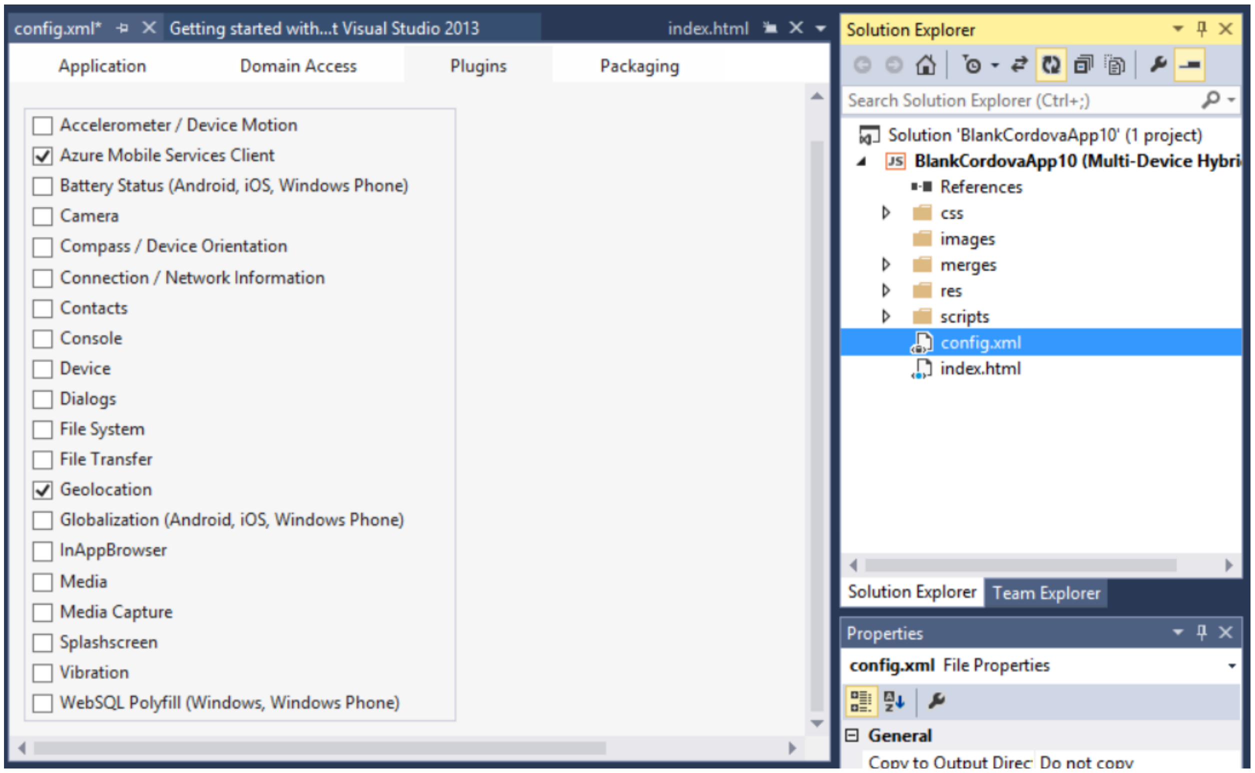
You can include platform-specific web content using the “merges” folder in your project. We do not provide any additional functionality beyond what Cordova provides. You can find details about the concept in the Apache Cordova documentation under the “Using merges to customize each platform” section. To add platform specific code, you may also right-click on your project and then select Add > Add Platform Specific Content.

Configuring your App & Managing Plugins

The majority of your app configuration is done through the config.xml file. Opening config.xml will present you with a Config Designer, but it is worth noting that you can also add valid "preference" configuration elements described in the [config.xml documentation for Cordova]() by editing the config.xml code directly.

One of the advantages of using Apache Cordova is that it provides access to native device capabilities not available to simple web apps via "plugins." The concept of a plugin is in many ways similar to a cross-platform library. They provide JavaScript APIs that can access native code and device capabilities on multiple platforms. They also take care of updating platform manifest settings to enable device capabilities where necessary. It is worth noting, however, that not all plugins are supported or needed on all device platforms.

To configure plugins in your app, double-click on the config.xml in Solution Explorer. In the Config Designer, navigate to the Plugins tab.


config.xml*
Getting started with...t Visual Studio 2013
index.html
Application
Domain Access
Plugins
Packaging
Solution Explorer
Search Solution Explorer (Ctrl+;)
Solution Explorer
Team Explorer
Properties
config.xml File Properties
General
Copy to Output Direc Do not copy

- [ ] Accelerometer / Device Motion
- [x] Azure Mobile Services Client
- [ ] Battery Status (Android, iOS, Windows Phone)
- [ ] Camera
- [ ] Compass / Device Orientation
- [ ] Connection / Network Information
- [ ] Contacts
- [ ] Console
- [ ] Device
- [ ] Dialogs
- [ ] File System
- [ ] File Transfer
- [x] Geolocation
- [ ] Globalization (Android, iOS, Windows Phone)
- [ ] InAppBrowser
- [ ] Media
- [ ] Media Capture
- [ ] Splashscreen
- [ ] Vibration
- [ ] WebSQL Polyfill (Windows, Windows Phone)

```
Solution 'BlankCordovaApp10' (1 project)
  BlankCordovaApp10 (Multi-Device Hybri
    References
    css
    images
    merges
    res
    scripts
    config.xml
    index.html
```

A list of plugins provided out-of-the-box

Adding or Removing Plugins

To add a plugin to your project, simply check the plugin from the list above. To remove a plugin, uncheck the corresponding checkbox.

Once added, the plugin code will be downloaded from the official Apache Cordova plugin repository and installed dynamically at build time.

Corresponding Changes in Config.xml

To examine changes performed in the Config Designer, right-click on the config.xml file in Solution Explorer, then choose View Code. This opens up the code view of the config file. Here you can see other settings that you setup in your Manifest Designer, including a list of plugins you've added.

Avoid making manual changes to the config.xml code view directly, unless you are certain of what you're doing. Incorrect changes can cause errors during the build process.

Updating a Plugin

The designer adds specific versions of plugins to your project to avoid unexpected API changes that may occur when the plugins are updated. However, you may also update to the latest version (or an older one) by changing the version number in the code view of the config.xml file.

Example: To update the "Camera" plugin from version 0.2.5, simply change the value

```
<vs:feature>org.apache.cordova.camera@0.2.5</vs:feature>
```

…to…

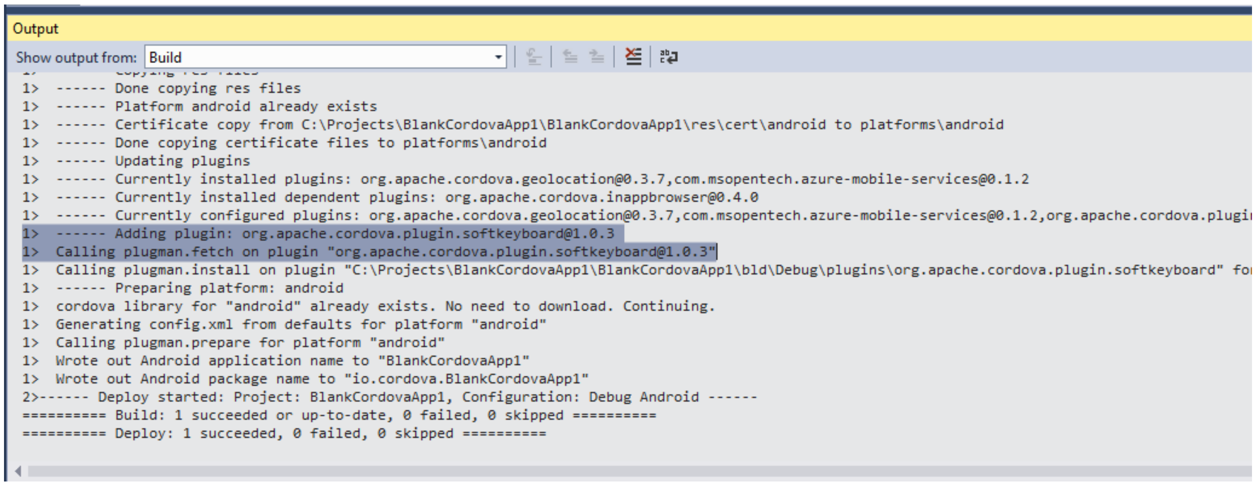
```
<vs:feature>org.apache.cordova.camera@0.2.8</vs:feature>
```

Adding plugins from plugins.cordova.io

You can add additional plugins from Cordova's plugin repository.

Example: Adding the SoftKeyboard plugin for Android

1. Right-click on the config.xml > Code View.
2. Add a line: `<vs:feature>org.apache.cordova.plugin.softkeyboard@1.0.3</vs:feature>`
3. Build the solution and see the Output window.



```
1>  ------ Done copying res files
1>  ------ Platform android already exists
1>  ------ Certificate copy from C:\Projects\BlankCordovaApp1\BlankCordovaApp1\res\cert\android to platforms\android
1>  ------ Done copying certificate files to platforms\android
1>  ------ Updating plugins
1>  ------ Currently installed plugins: org.apache.cordova.geolocation@0.3.7,com.msopentech.azure-mobile-services@0.1.2
1>  ------ Currently installed dependent plugins: org.apache.cordova.inappbrowser@0.4.0
1>  ------ Currently configured plugins: org.apache.cordova.geolocation@0.3.7,com.msopentech.azure-mobile-services@0.1.2,org.apache.cordova.plugi
1>  ------ Adding plugin: org.apache.cordova.plugin.softkeyboard@1.0.3
1>  Calling plugman.fetch on plugin "org.apache.cordova.plugin.softkeyboard@1.0.3"
1>  Calling plugman.install on plugin "C:\Projects\BlankCordovaApp1\BlankCordovaApp1\bld\Debug\plugins\org.apache.cordova.plugin.softkeyboard" fo
1>  ------ Preparing platform: android
1>  cordova library for "android" already exists. No need to download. Continuing.
1>  Generating config.xml from defaults for platform "android"
1>  Calling plugman.prepare for platform "android"
1>  Wrote out Android application name to "BlankCordovaApp1"
1>  Wrote out Android package name to "io.cordova.BlankCordovaApp1"
2>------ Deploy started: Project: BlankCordovaApp1, Configuration: Debug Android ------
========== Build: 1 succeeded or up-to-date, 0 failed, 0 skipped ==========
========== Deploy: 1 succeeded, 0 failed, 0 skipped ==========
```

Console output showing plugin being grabbed from Cordova's repository

Adding Custom Plugins & Plugins from Git Repositories

Pre-packaged plugins are extremely useful. However, in case you need to offload computationally expensive functions to native code, expose new device capabilities to your app, or apply a fix that you would prefer not to release publicly, you may want to create your own plugins. You can find more information about creating your own plugins in the Cordova documentation.

To add your own plugin using Visual Studio, simply create a "plugins" folder in your project root and add your plugin code structure in a sub-folder. The plugin will automatically be added to your app the next time you build the project. To aid in the development of new plugins, all of the contents of the plugins folder are editable. This allows you to make changes and check them into source control with the rest of your project.

It's also worth noting that this same capability can be used to add plugins not found in the plugins.cordova.io repository. While you are technically able to pull plugins directly from Git repositories by specifying a Git URI in config.xml, this will always fetch get the "edge" version of a plugin. A better approach is to download the plugin from Github (download as zip) and place an extracted copy in this same "plugins" folder in your project.

Plugins in the Config Designer

Here's a list of plugins that that are listed in the config designer out-of-the-box. When using the config designer, the plugins will be locked to a specific version to reduce the chances of unexpected problems. However, if there is a fix you need in a more recent version of a plugin, you can manually update to the latest version as described above.

Accelerometer / Device Motion [org.apache.cordova.device-motion]

Provides access to a motion sensor that detects changes in movement relative to the devices orientation. Read More

Azure Mobile Services Client [com.msopentech.azure-mobile-services]

Adds the appropriate Azure Mobile Services client library to your app for each platform and enables your app to synchronize content with an Azure Mobile Services instance. Read More

Battery Status (Android, iOS, Windows Phone 8) [org.apache.cordova.battery-status]

Enables your app to handle an event that is raised when the charge that is available in the battery increases or decreases by at least 1 percent, or when the device is connected or disconnected from a power outlet. Read More

Camera [org.apache.cordova.camera]

Enables your app to take pictures by using the default camera application of the device. Read More

Compass [org.apache.cordova.device-orientation]

Provides access to a sensor that detects the direction or heading of the device based on which way the device is pointed. Read More

Connection [org.apache.cordova.network-information]

Enables your app to determine the network connection state of the device, and the types of networks the device is connected to. Read More

Contacts [org.apache.cordova.contacts]

Provides access to the device’s Contacts database. Your app can find, add, or remove contacts. Read More

Device [org.apache.cordova.device]

Provides access to information about the hardware and software of the device. For example, this could be the model number or platform of the device. Read More

Dialogs / Notifications [org.apache.cordova.dialogs]

Enables your app to display dialog boxes. Read More

File System [org.apache.cordova.file]

Enables your app to read, write, and navigate the file system of the device. Read More

File Transfer [org.apache.cordova.file-transfer]

Enables your app to upload or download files to and from a server. Read More

Geolocation [org.apache.cordova.geolocation]

Provides information about the device's location such as latitude and longitude. Read More

Globalization [org.apache.cordova.globalization]

Enables your app to obtain information about the user’s locale and time zone, and then perform operations that are specific to that locale and time zone. Read More

InAppBrowser [org.apache.cordova.inappbrowser]

Enables your app to host a Web browser, and then perform actions in response to browser-related events such as inserting CSS into the browser window when a page loads. Read More

Media [org.apache.cordova.media]

Enables your app to play and record audio files by using the device’s default application. Read More

Media Capture [org.apache.cordova.media-capture]

Provides access to the device’s audio, image, and video capture capabilities. Read More

Splashscreen [org.apache.cordova.splashscreen]

Enables your app to show and hide the application’s splash screen. Read More

Vibration [org.apache.cordova.vibration]

Enables your app to vibrate the device. Read More

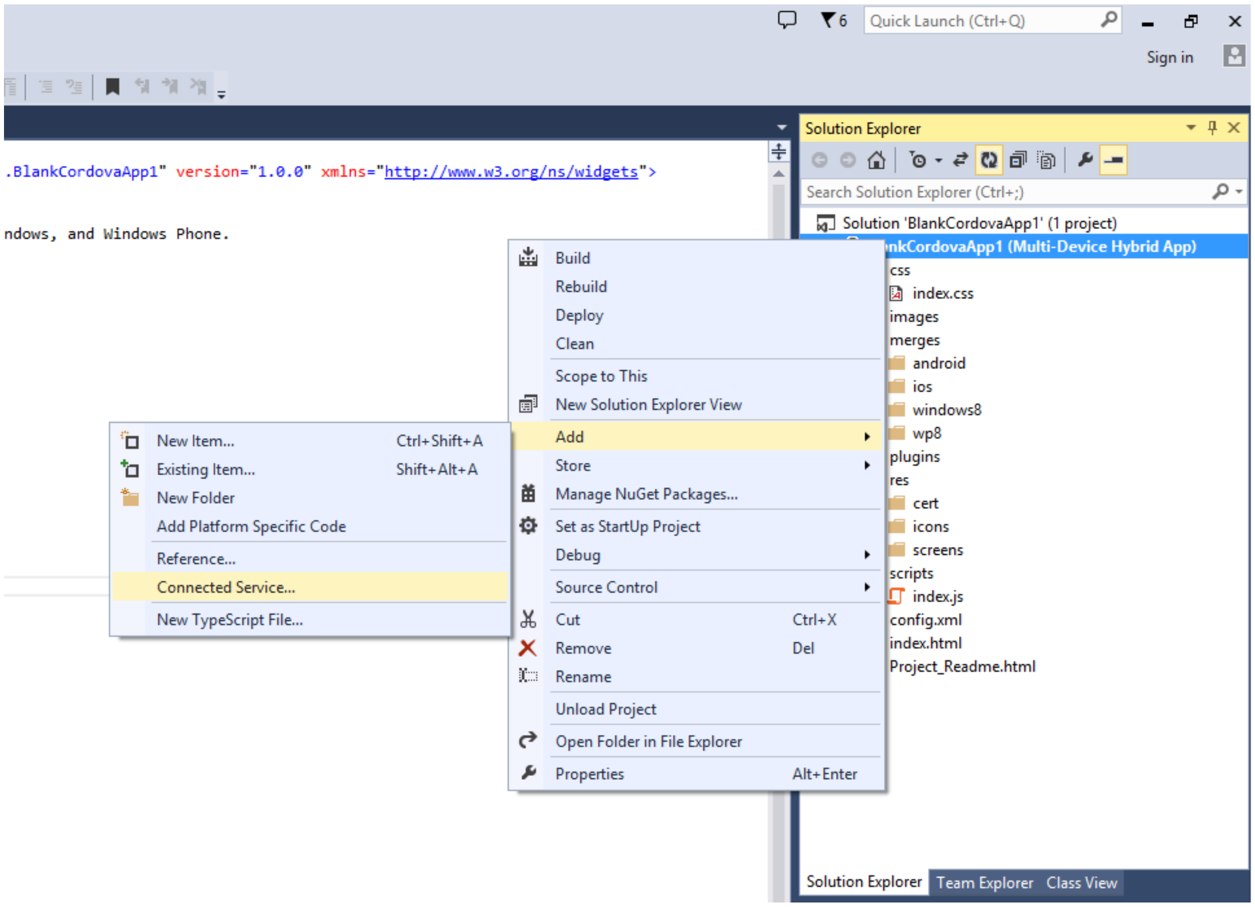
WebSQL Polyfill (Windows, Windows Phone 8) [com.msopentech.websql]

Enables WebSQL on all platforms by adding WebSQL functionality to your app on Windows and Windows Phone 8. Read More

Adding Connected Services to Your App

The Connected Service Manager allows developers to integrate Microsoft services like Office365, Azure Mobile, Application Insights, and others into their projects. It's a simple way to add these services without ever leaving Visual Studio.

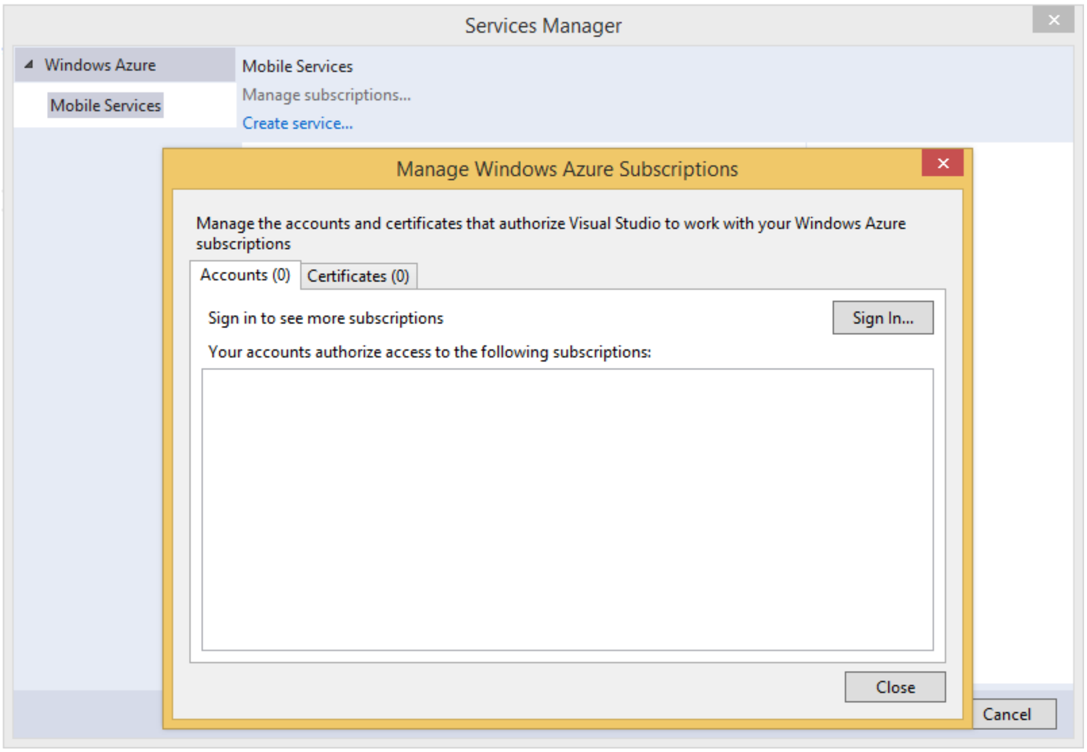
To begin, right click on your project in the Solution Explorer and choose Add > Connected Services Manager.


```
.BlankCordovaApp1" version="1.0.0" xmlns="http://www.w3.org/ns/widgets">

ndows, and Windows Phone.
```

Invoking the Connected Services Manager

Azure Mobile Services

If this is your first time using the Connected Services Manager, click "Manage subscriptions".



Manage the accounts and certificates that authorize Visual Studio to work with your Windows Azure subscriptions

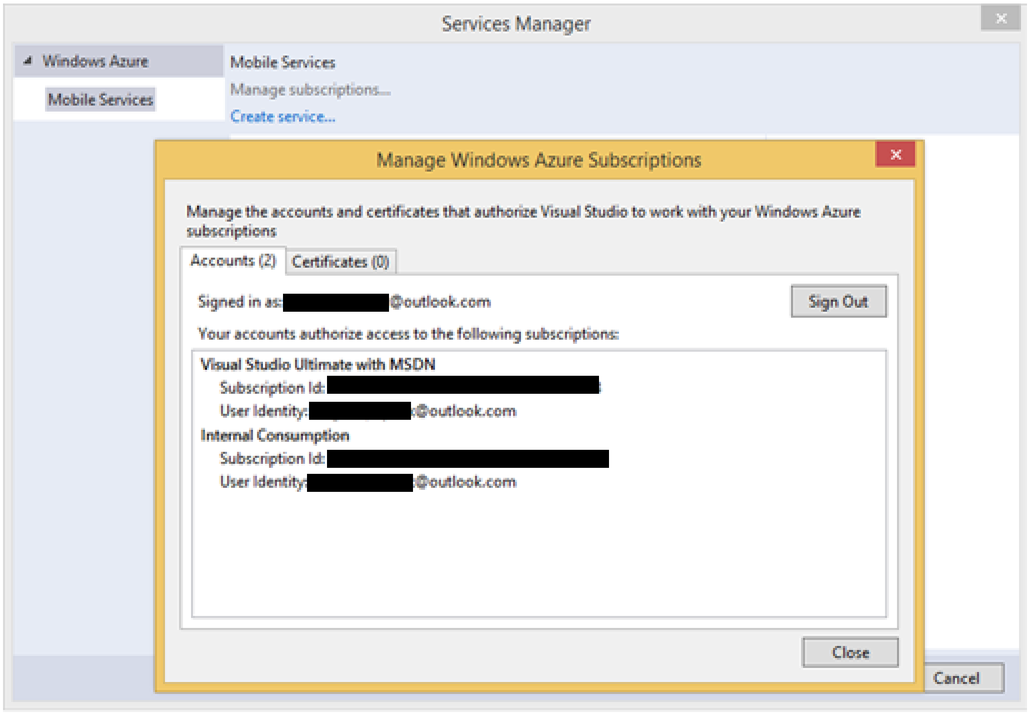
Sign in to see more subscriptions

Your accounts authorize access to the following subscriptions:

Manage subscription page

✓ If you don't have a Microsoft Azure account yet, you can create one from the Microsoft Azure portal.

Now, login with your Microsoft account to see current subscriptions associated with your account. Once done, click "OK".



Manage the accounts and certificates that authorize Visual Studio to work with your Windows Azure subscriptions

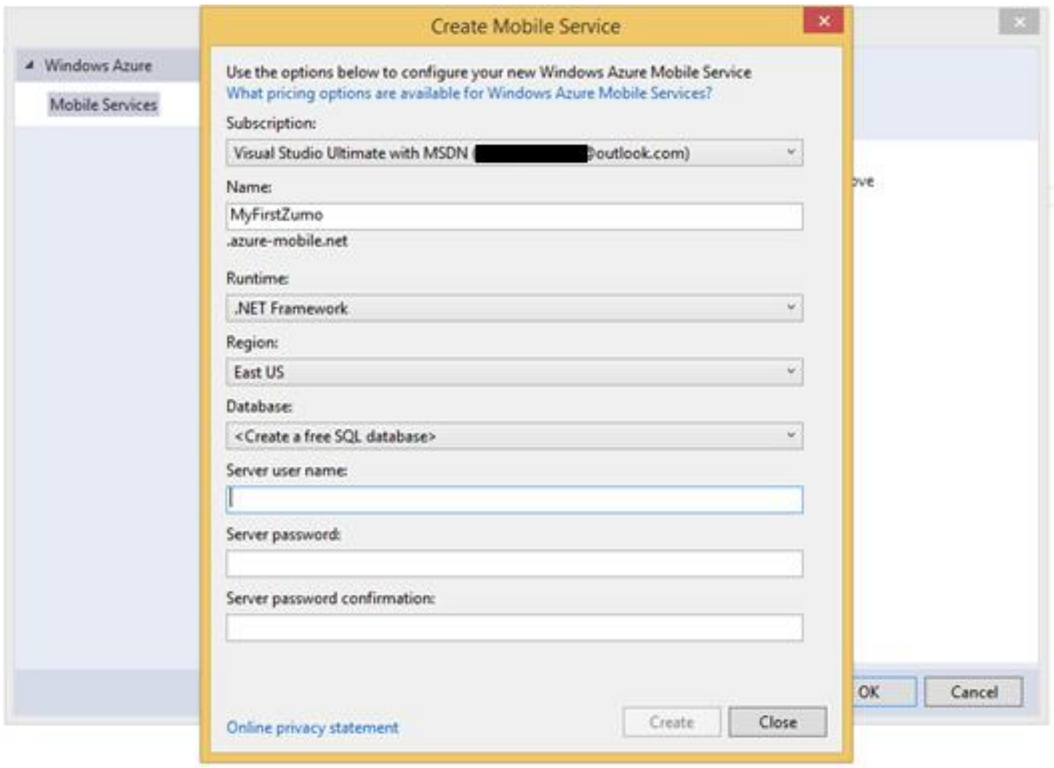
Signed in as: [redacted]@outlook.com

Your accounts authorize access to the following subscriptions:

Visual Studio Ultimate with MSDN
Subscription Id: [redacted]
User Identity: [redacted]@outlook.com
Internal Consumption
Subscription Id: [redacted]
User Identity: [redacted]@outlook.com

Current account subscriptions

You can now create a new service by clicking "New" and filling out the relevant details.



Use the options below to configure your new Windows Azure Mobile Service

What pricing options are available for Windows Azure Mobile Services?

Subscription: Visual Studio Ultimate with MSDN ([redacted]@outlook.com)

Name: MyFirstZumo

.azure-mobile.net

Runtime: .NET Framework

Region: East US

Database: <Create a free SQL database>

Server user name:

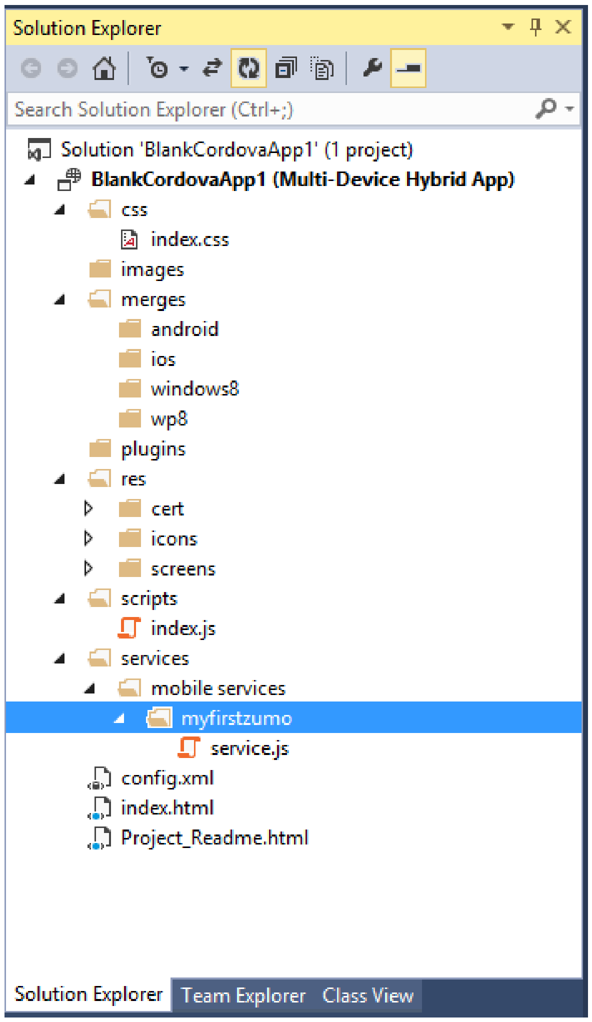
Server password:

Server password confirmation:

Creating a new Azure mobile service

Click **Create** when finished, then click **OK**.

You will notice a service.js file has been added to your project under services/<azure_service_name>/. This file contains your Azure key for accessing and using the service.

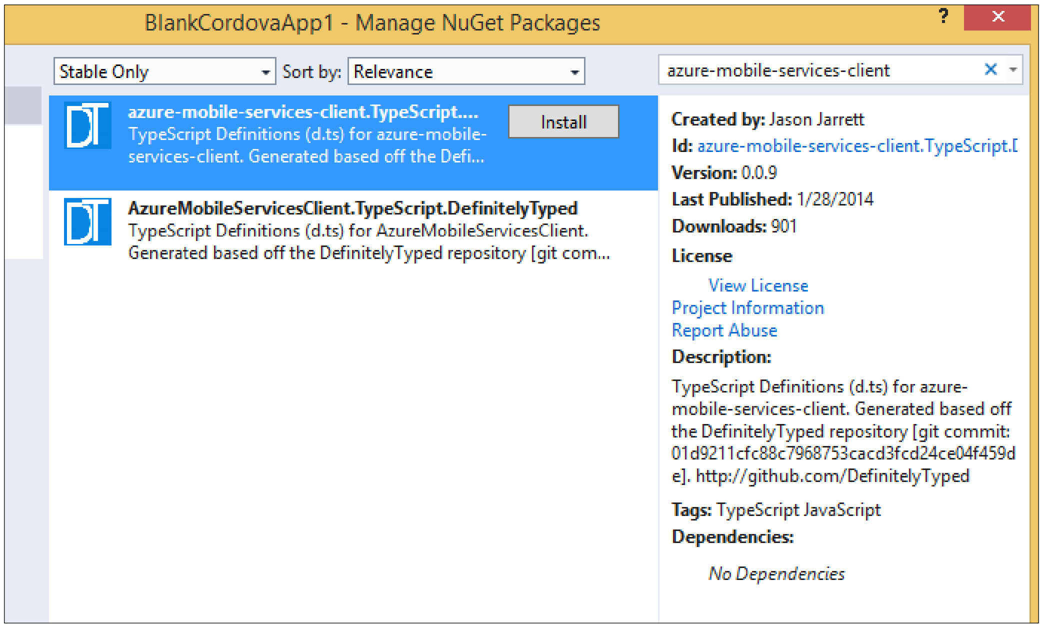


service.js file in project directory

Using Azure Mobile Services with TypeScript

If you want to use Azure Mobile Services with TypeScript you will need TypeScript Definitions (.d.ts). Fortunately, community created definitions can be found in NuGet right from Visual Studio.

Right-click on your project in Solution Explorer and select Manage NuGet Packages, then search for "**azure-mobile-services-client**" and install "azure-mobile-services-client.TypeScript.DefinitelyTyped" in your project.


BlankCordovaApp1 - Manage NuGet Packages
Stable Only
Sort by: Relevance
azure-mobile-services-client
Install

azure-mobile-services-client.TypeScript....
TypeScript Definitions (d.ts) for azure-mobile-services-client. Generated based off the Defi...

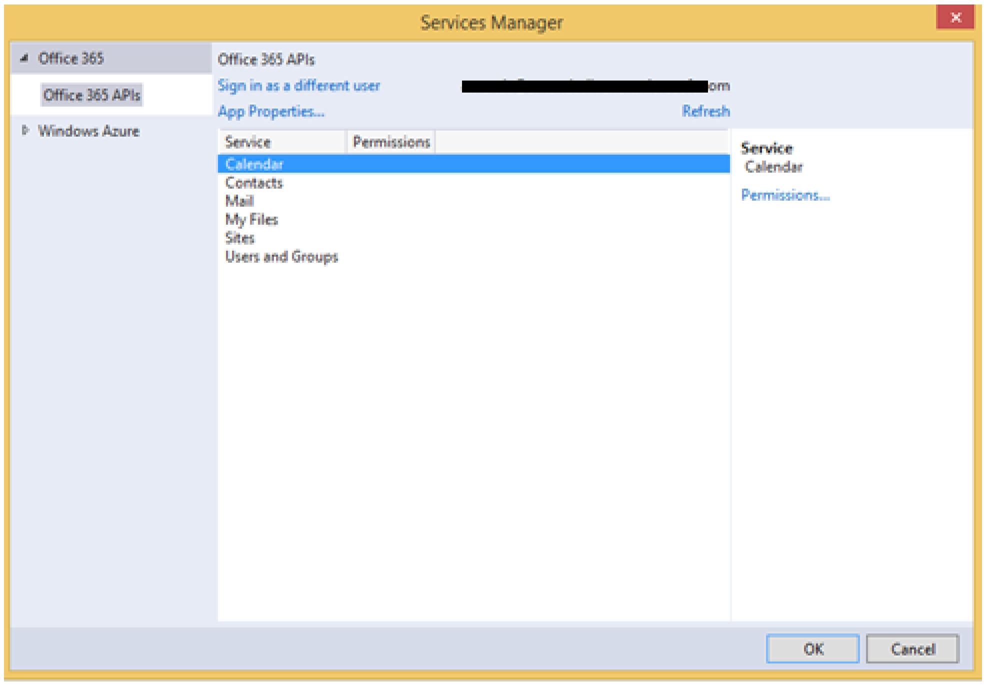
AzureMobileServicesClient.TypeScript.DefinitelyTyped
TypeScript Definitions (d.ts) for AzureMobileServicesClient. Generated based off the DefinitelyTyped repository [git com...

Created by: Jason Jarrett
Id: azure-mobile-services-client.TypeScript.[
Version: 0.0.9
Last Published: 1/28/2014
Downloads: 901
License
View License
Project Information
Report Abuse
Description:
TypeScript Definitions (d.ts) for azure-mobile-services-client. Generated based off the DefinitelyTyped repository [git commit: 01d9211cfc88c7968753cacd3fcd24ce04f459de]. http://github.com/DefinitelyTyped
Tags: TypeScript JavaScript
Dependencies:
No Dependencies

Office365

The Office365 APIs can be easily added to your project by visiting the download center here. Once you install the service, a new option should appear under your Connected Services Manager.

If this is your first time developing with Office365 services, you may want to start by reading a blog post on MSDN about Office365 API Tools for Visual Studio.



[redacted]om

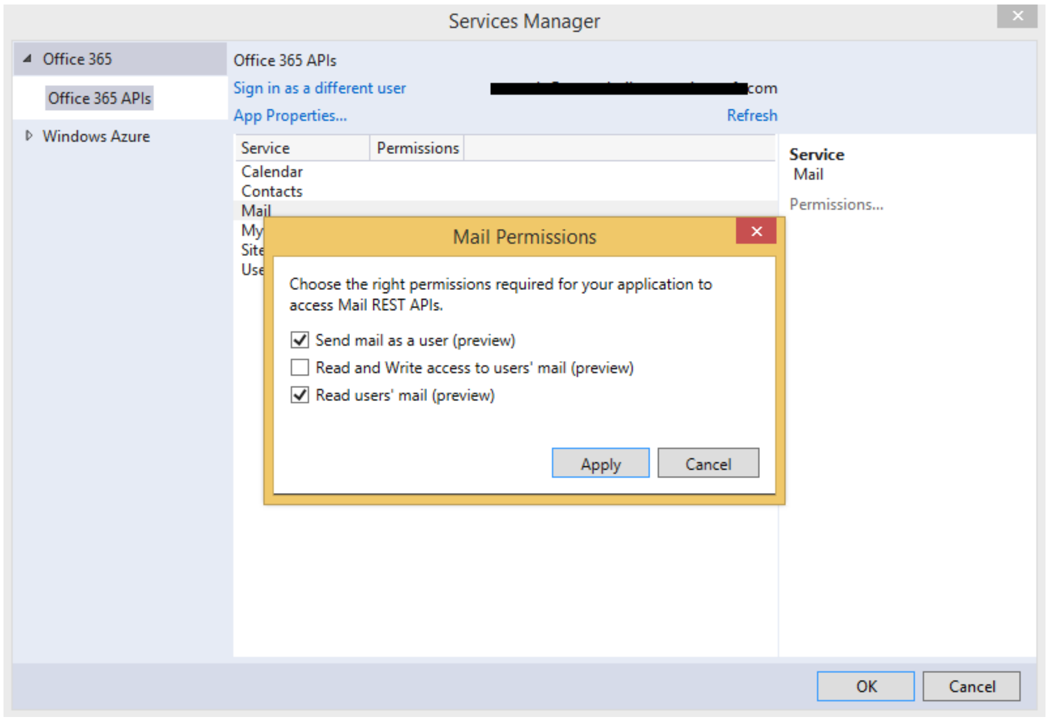
Service	Permissions
Calendar	
Contacts	
Mail	
My Files	
Sites	
Users and Groups	

Service
Calendar
Permissions...

Adding O365 APIs and configuring permissions for your project

Note: You might be asked to login to your Office365 developer account if this is the first time adding the service inside Visual Studio.

Example: Mail
The interface provides you with an option to choose multiple permissions such as “Send mail as a user”, “Read and write access to user’s mail”, and “Read user’s mail”.


Services Manager

Office 365
Office 365 APIs
Windows Azure

Office 365 APIs
Sign in as a different user [redacted]com
App Properties... Refresh

Service	Permissions
Calendar	
Contacts	
Mail	
My	
Site	
Use	

Service
Mail
Permissions...

Mail Permissions

Choose the right permissions required for your application to access Mail REST APIs.

- [✓] Send mail as a user (preview)
- [ ] Read and Write access to users' mail (preview)
- [✓] Read users' mail (preview)

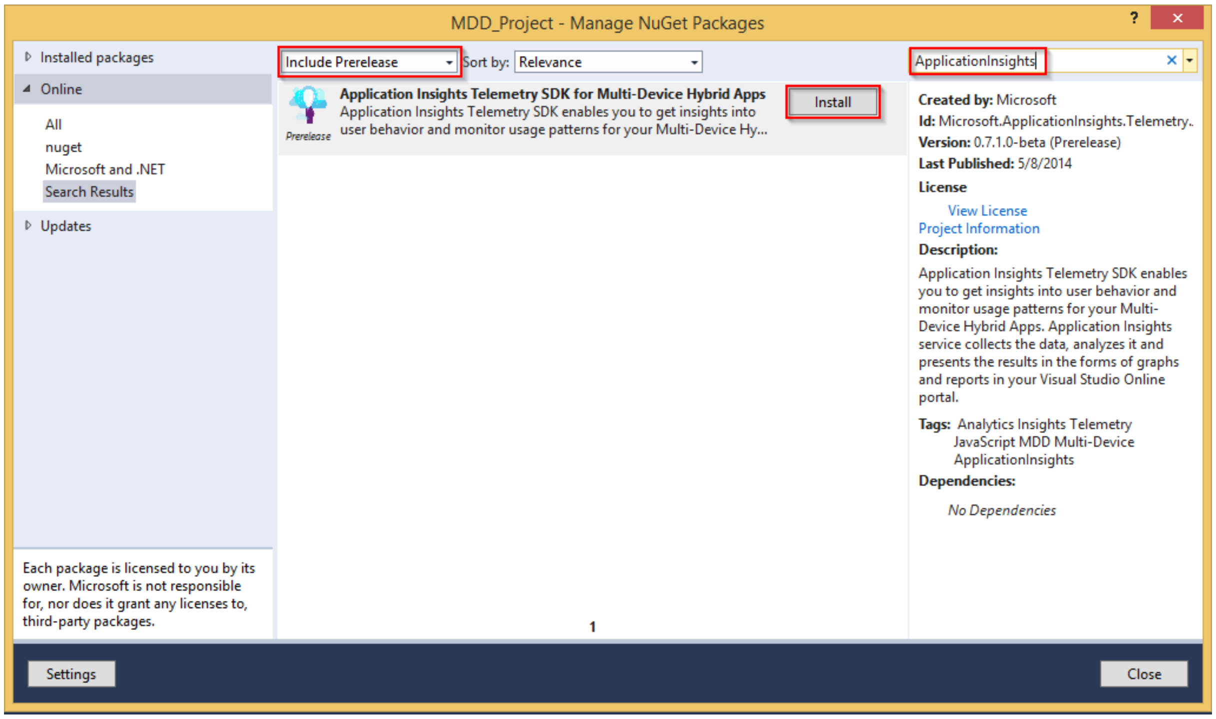
Granular permissions for Mail using the Office365 APIs

Application Insights

Application Insights provides telemetry data for your application to ensure it is available, performing, and improving. It also provides other usage metrics such as operating systems, location, unique users, and the ability to add custom events to create your own statistics.

Modifying your app to report telemetry via Application Insights requires a few steps that are described below. Integration with Application Insights is performed through the simple addition of a NuGet package that will add the Application Insights SDK to your project.

Right-click on your project in **Solution Explorer > Manage NuGet Packages**



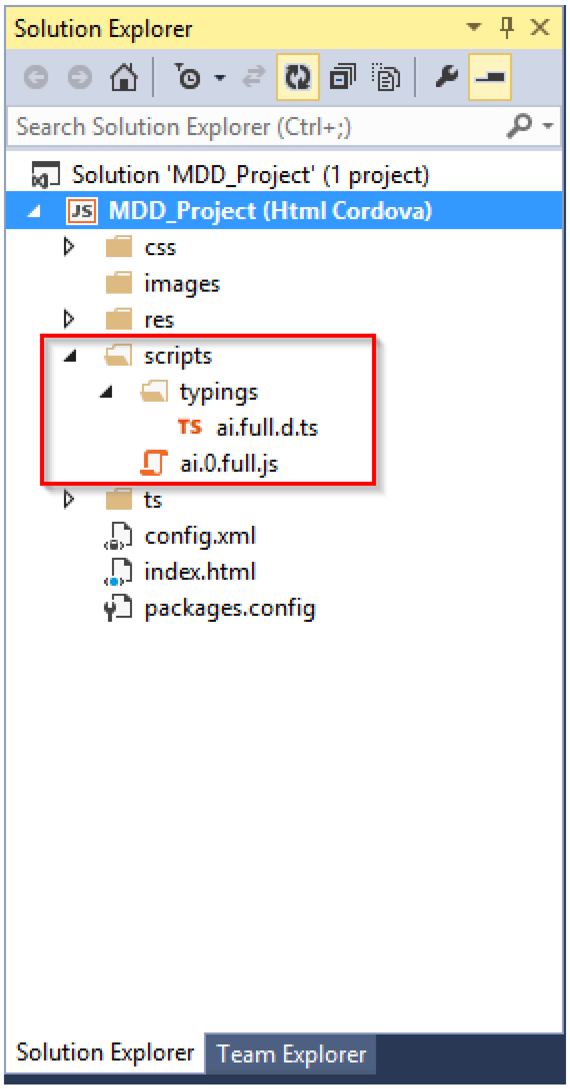
Application Insights Telemetry SDK for Multi-Device Hybrid Apps
Application Insights Telemetry SDK enables you to get insights into user behavior and monitor usage patterns for your Multi-Device Hy...

Created by: Microsoft
Id: Microsoft.ApplicationInsights.Telemetry..
Version: 0.7.1.0-beta (Prerelease)
Last Published: 5/8/2014
License
View License
Project Information
Description:
Application Insights Telemetry SDK enables you to get insights into user behavior and monitor usage patterns for your Multi-Device Hybrid Apps. Application Insights service collects the data, analyzes it and presents the results in the forms of graphs and reports in your Visual Studio Online portal.
Tags: Analytics Insights Telemetry JavaScript MDD Multi-Device ApplicationInsights
Dependencies:
No Dependencies

Each package is licensed to you by its owner. Microsoft is not responsible for, nor does it grant any licenses to, third-party packages.

Adding AppInisghts using the manage NuGet Package option

To locate the correct NuGet package please select **Include Prerelease** and search for **ApplicationInsights** in the online repository. Locate the **Application Insights SDK for Multi-Device Hybrid Apps** and install it to your project.



Post-Install of NuGet Package

Installing using the NuGet package adds two files to your project:

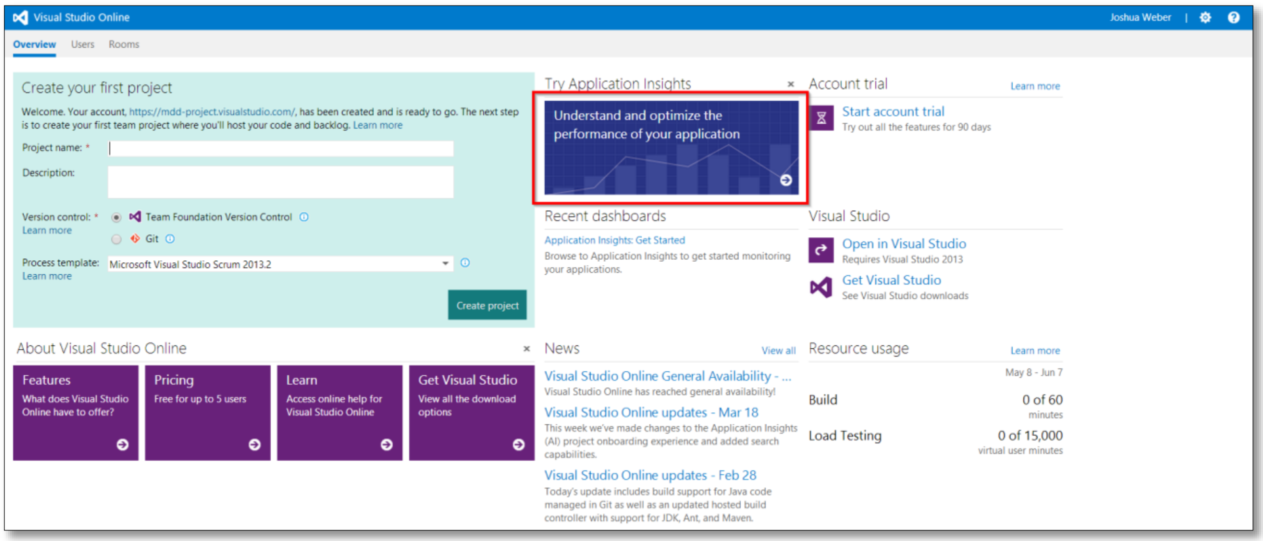
- /scripts/ai.0.full.js : JavaScript SDK file
- /scripts/typings/ai.full.d.ts : Typescript typings file

To instrument all pages within your app, add the code snippet shown below somewhere within your main template HTML page. Otherwise add the snippet inside each individual page you would like to track.

```
<script>
   var appInsights = { applicationInsightsId : "YOUR COMPONENT ID" };
</script>
<script src="ai.0.full.js"></script>
```

To complete the instrumentation, you will need to populate the property applicationInsightsId with the Component ID from your Application Insights account.

In order to fetch the Component ID, navigate to the Application Insights portal through your Visual Studio Online account (http://YourAccountName.visualstudio.com). If you don't have a Visual Studio Online account please go here to sign-up. Create a new Application for your Multi-Device Hybrid App project by clicking on the Add application grey button. Select the options for No to a Server App and Chose a Windows Phone App. Select the show instructions link. Provide an application name and click create. It is safe to ignore all other directions on this page.
Within the administration page, locate the sub-page for Keys & Downloads, and then find the correct GUID for JavaScript Usage Analytics. Use that GUID to replace the "`YOUR COMPONENT ID`" text in the ApplicationInsights JavaScript snippet.


Visual Studio Online
Joshua Weber
Overview
Users
Rooms
Create your first project
Project name: *
Description:
Version control: *
Team Foundation Version Control
Git
Process template:
Microsoft Visual Studio Scrum 2013.2
Create project
Try Application Insights
Understand and optimize the performance of your application
Account trial
Start account trial
Try out all the features for 90 days
Recent dashboards
Application Insights: Get Started
Visual Studio
Open in Visual Studio
Requires Visual Studio 2013
Get Visual Studio
See Visual Studio downloads
About Visual Studio Online
Features
What does Visual Studio Online have to offer?
Pricing
Free for up to 5 users
Learn
Access online help for Visual Studio Online
Get Visual Studio
View all the download options
News
View all
Visual Studio Online General Availability - ...
Visual Studio Online updates - Mar 18
Visual Studio Online updates - Feb 28
Resource usage
Learn more
May 8 - Jun 7
Build
0 of 60 minutes
Load Testing
0 of 15,000 virtual user minutes

Welcome. Your account, https://mdd-project.visualstudio.com/, has been created and is ready to go. The next step is to create your first team project where you'll host your code and backlog. Learn more

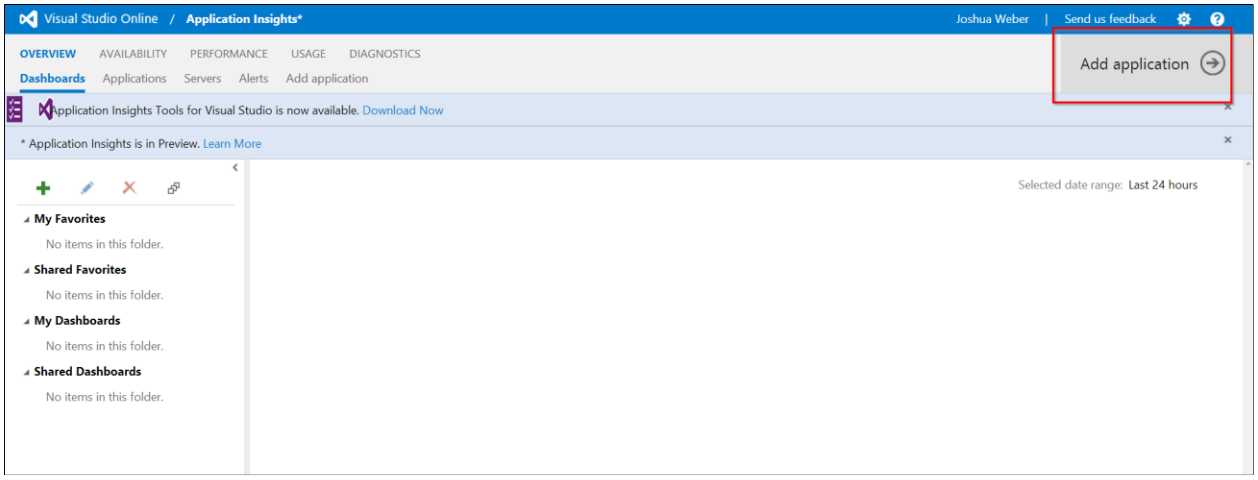
Browse to Application Insights to get started monitoring your applications.

Visual Studio Online has reached general availability!

This week we've made changes to the Application Insights (AI) project onboarding experience and added search capabilities.

Today's update includes build support for Java code managed in Git as well as an updated hosted build controller with support for JDK, Ant, and Maven.

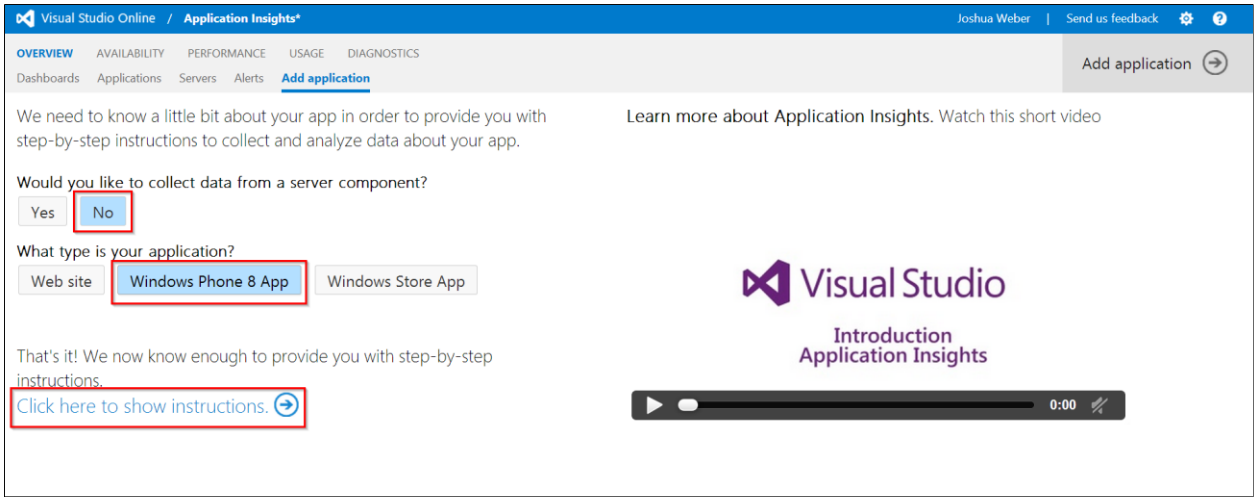
Navigate from your Visual Studio Online project to Application Insights



Application Insights Tools for Visual Studio is now available. Download Now

* Application Insights is in Preview. Learn More

Select Add application


Visual Studio Online / Application Insights*
Joshua Weber | Send us feedback
OVERVIEW AVAILABILITY PERFORMANCE USAGE DIAGNOSTICS
Dashboards Applications Servers Alerts Add application
Add application
Visual Studio
Introduction
Application Insights
0:00

We need to know a little bit about your app in order to provide you with step-by-step instructions to collect and analyze data about your app.

Would you like to collect data from a server component?

Yes [✓ No]

What type is your application?

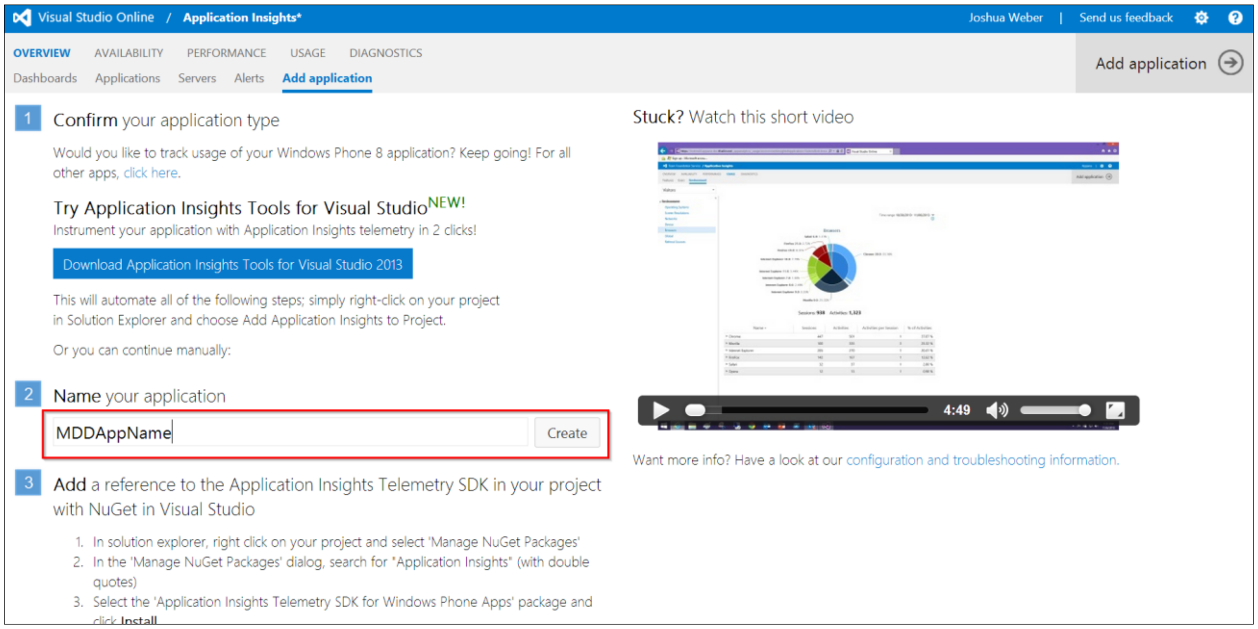
Web site [✓ Windows Phone 8 App] Windows Store App

That's it! We now know enough to provide you with step-by-step instructions.

Click here to show instructions.

Learn more about Application Insights. Watch this short video

Select the options for **No** a server component and select **Windows Phone 8 App**, then show instructions


Visual Studio Online / Application Insights*
Joshua Weber | Send us feedback
OVERVIEW AVAILABILITY PERFORMANCE USAGE DIAGNOSTICS
Dashboards Applications Servers Alerts Add application
Add application
4:49

1 Confirm your application type

Would you like to track usage of your Windows Phone 8 application? Keep going! For all other apps, click here.

Try Application Insights Tools for Visual Studio NEW!

Instrument your application with Application Insights telemetry in 2 clicks!

Download Application Insights Tools for Visual Studio 2013

This will automate all of the following steps; simply right-click on your project in Solution Explorer and choose Add Application Insights to Project.

Or you can continue manually:

2 Name your application

MDDAppName Create

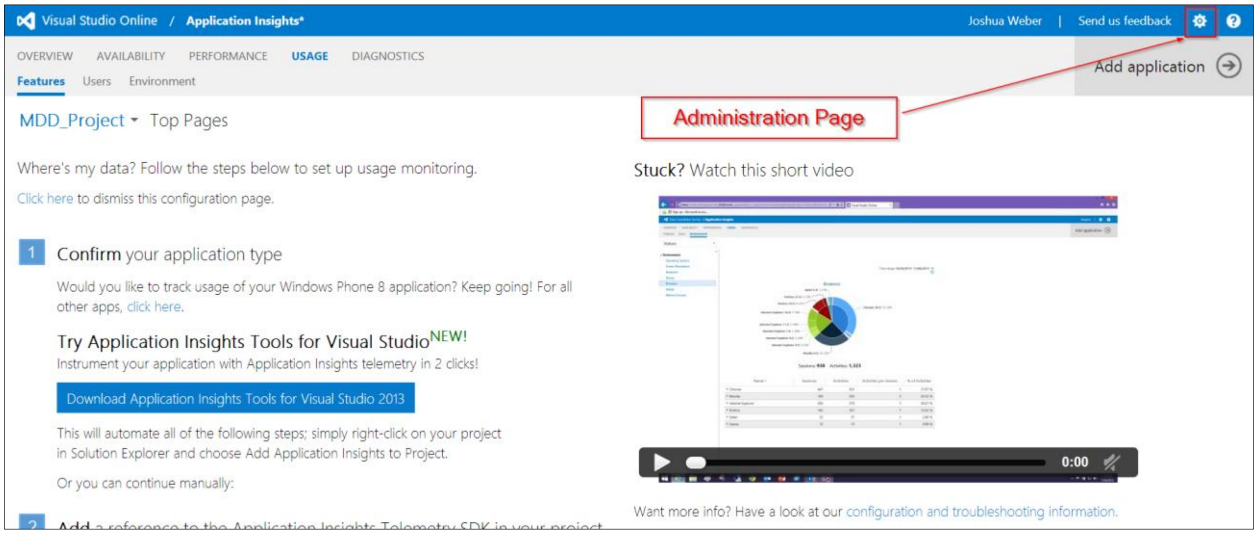
3 Add a reference to the Application Insights Telemetry SDK in your project with NuGet in Visual Studio

1. In solution explorer, right click on your project and select 'Manage NuGet Packages'
2. In the 'Manage NuGet Packages' dialog, search for "Application Insights" (with double quotes)
3. Select the 'Application Insights Telemetry SDK for Windows Phone Apps' package and click Install

Stuck? Watch this short video

Want more info? Have a look at our configuration and troubleshooting information.

Provide a name and click Create. **Note**: You can safely ignore all other directions on this page.



Where's my data? Follow the steps below to set up usage monitoring.

Click here to dismiss this configuration page.

1 Confirm your application type

Would you like to track usage of your Windows Phone 8 application? Keep going! For all other apps, click here.

Try Application Insights Tools for Visual Studio NEW!

Instrument your application with Application Insights telemetry in 2 clicks!

Download Application Insights Tools for Visual Studio 2013

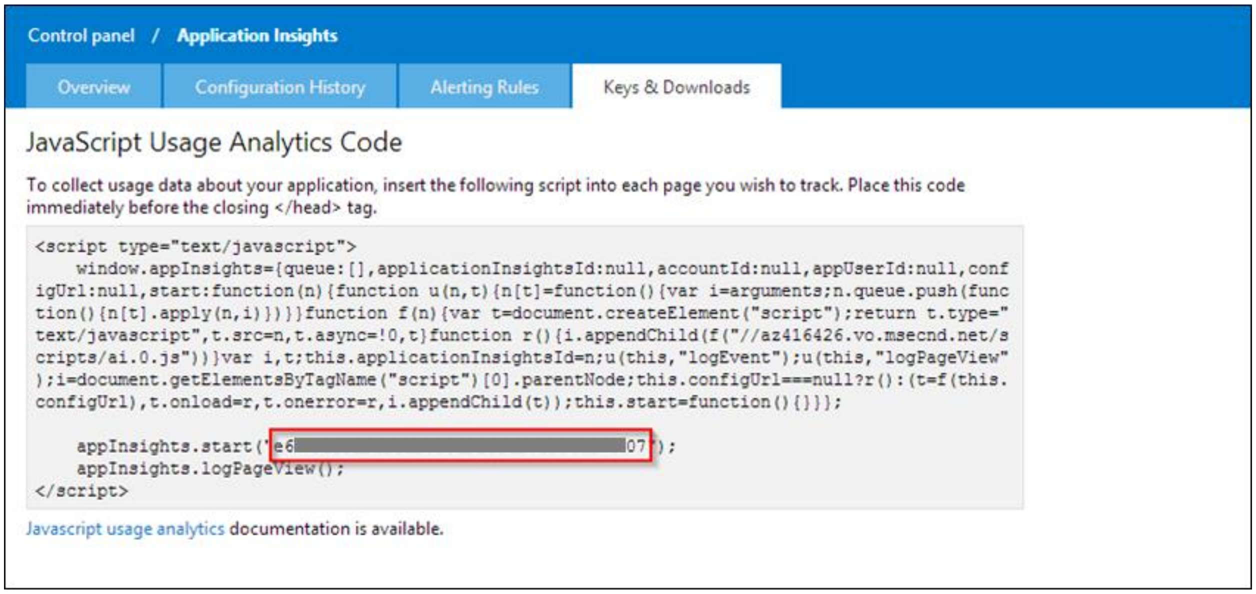
This will automate all of the following steps; simply right-click on your project in Solution Explorer and choose Add Application Insights to Project.

Or you can continue manually:

Stuck? Watch this short video

Want more info? Have a look at our configuration and troubleshooting information.

Use the Navigation Gear to get to the Administration page for your application



JavaScript Usage Analytics Code

To collect usage data about your application, insert the following script into each page you wish to track. Place this code immediately before the closing </head> tag.

```
<script type="text/javascript">
    window.appInsights={queue:[],applicationInsightsId:null,accountId:null,appUserId:null,conf
igUrl:null,start:function(n){function u(n,t){n[t]=function(){var i=arguments;n.queue.push(func
tion(){n[t].apply(n,i)})}}function f(n){var t=document.createElement("script");return t.type="
text/javascript",t.src=n,t.async=!0,t}function r(){i.appendChild(f("//az416426.vo.msecnd.net/s
cripts/ai.0.js"))}var i,t;this.applicationInsightsId=n;u(this,"logEvent");u(this,"logPageView"
);i=document.getElementsByTagName("script")[0].parentNode;this.configUrl===null?r():(t=f(this.
configUrl),t.onload=r,t.onerror=r,i.appendChild(t));this.start=function(){}}};

    appInsights.start('e6[redacted]07');
    appInsights.logPageView();
</script>
```

Javascript usage analytics documentation is available.

Under Keys & Downloads locate the section for JavaScript and copy your applicationInsightsId.

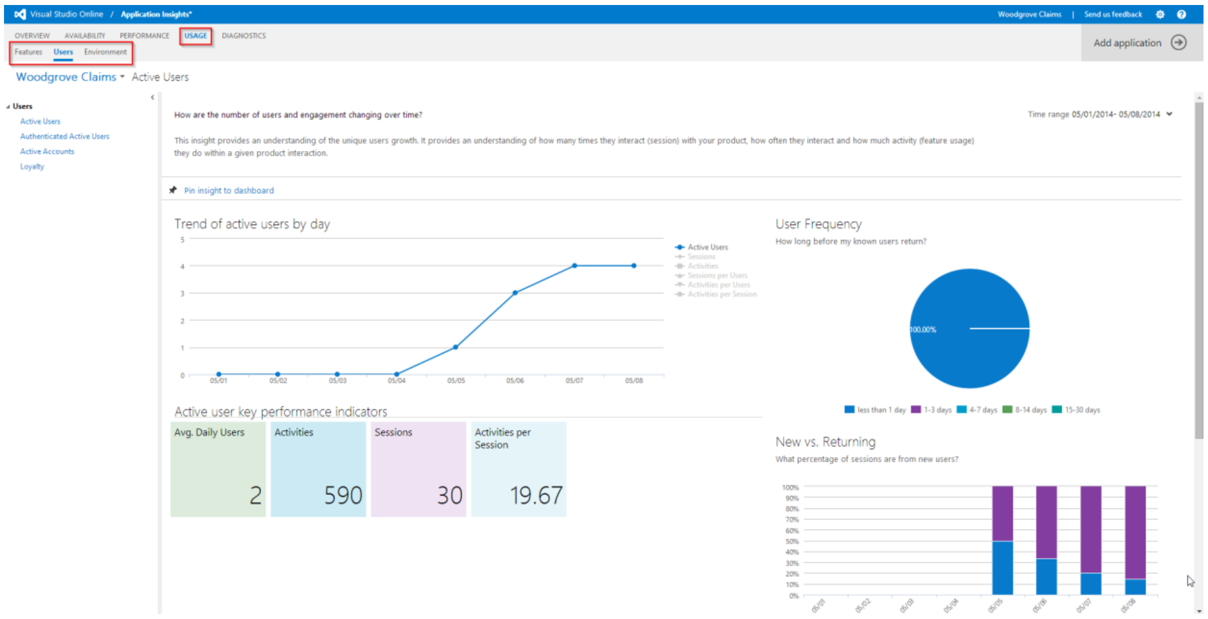
Your application is now instrumented and collecting basic telemetry. Once you run your application it will send telemetry back to Application Insights, and you will see it reflected in the graphs within 30 minutes.

To capture custom telemetry points to gain deeper insights, you can add additional telemetry logging. Below is a sample code snippet used to capture an additional telemetry data point. You can find more information on JavaScript SDK programming in the MSDN documentation.

```
<script>
        appInsights.logEvent("Multi-Device Hybrid Application Started");
</script>
```

Some pages in the Application Insights portal do not apply to Multi-Device Hybrid apps. Right now the following stats are supported by the Application Insights Telemetry SDK for Multi-Device Hybrid Apps:

- Environment – Default collection of environmental data where your app runs.
    - Operating System
        - Report located under USAGE -> Environment -> Operating Systems
    - Screen Resolution
        - Report located under USAGE -> Environment -> Screen Resolutions
    - Browser Name
        - Report located under USAGE -> Environment -> Browsers
    - Global Geo-location
        - Report located under USAGE -> Environment -> Global
    - Language
        - Report located under USAGE -> Environment -> Languages
- Users – Default collection of user statistics
    - Number of active users
    - New vs Returning User
        - Reports located under USAGE -> Users -> Active Users
    - Loyalty
    - User Engagement
        - Reports located under USAGE -> Users -> Loyalty
- Page Views – Default collection of all pages loaded by app users.
    - Reports located under USAGE -> Features -> Page Views / Top Pages
- Custom Events – Manual instrumentation to log custom app-specific events.
    - Reports located under USAGE -> Features -> Events / Event Insights



How are the number of users and engagement changing over time?

Time range 05/01/2014- 05/08/2014

This insight provides an understanding of the unique users growth. It provides an understanding of how many times they interact (session) with your product, how often they interact and how much activity (feature usage) they do within a given product interaction.

Active user key performance indicators

Avg. Daily Users	Activities	Sessions	Activities per Session
2	590	30	19.67

Sample Active Users Report under the Usage tab

Emulation, Simulation, & Deploying to Devices

Visual Studio provides a host of emulation, simulation, and device deployment options, from running the app in a browser using Apache Ripple to native emulators and physical devices.

To switch between target device platforms, you will need to use the "Solution Platforms" dropdown present in the VS toolbar. If you have installed a fresh copy of Visual Studio 2013 Update 2, it will be there by default, but it may not be present if you upgraded from a previous version. Fortunately, it is easy to add it into the toolbar as described here: http://support.microsoft.com/kb/2954109

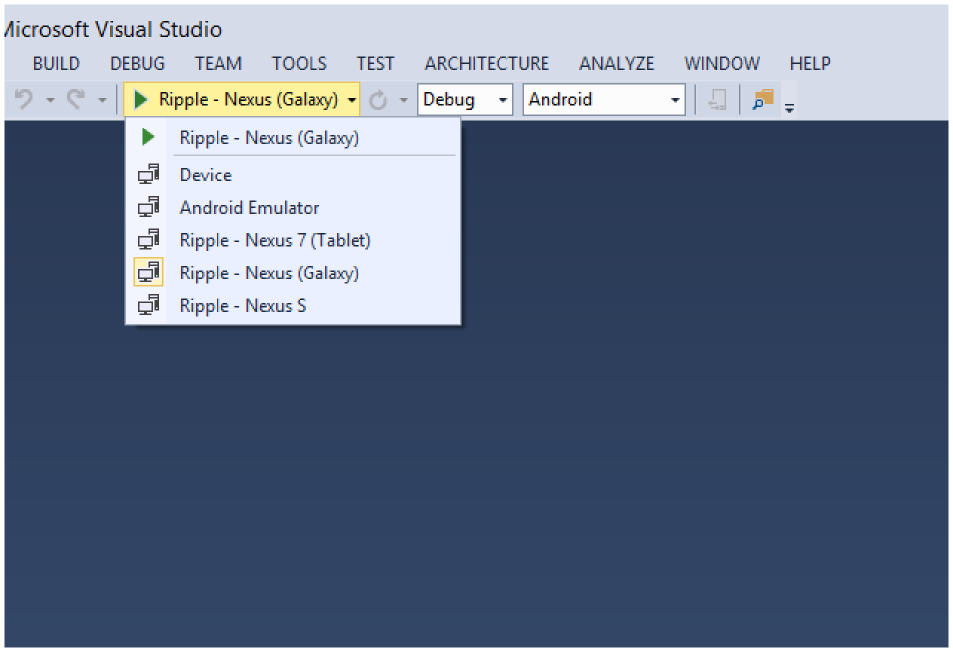
Apache Ripple Emulator

The Apache Ripple Emulator runs as a Web application inside a WebKit-based browser like Chrome. In Cordova, it can be used to simulate your app on a number of devices and platforms and provides basic support for some core Cordova plugins like Geolocation and Device Orientation.

Apache Ripple provides a quick and easy first step in authoring and validating your app (particularly triaging CSS issues) for Android and iOS, where running it as a Windows app would not provide the needed fidelity.

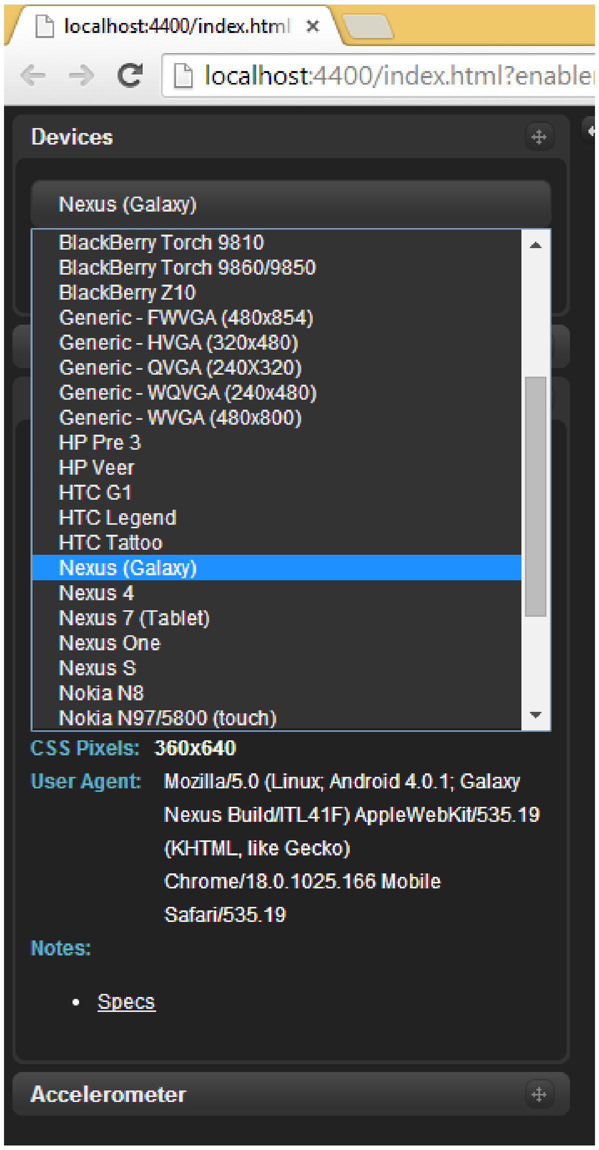
However, it's important to note that, like the iOS Simulator, Ripple is by no means complete in its emulation of Cordova APIs or native device capabilities, nor does it fully emulate the specific versions of the browser used by your app on a given device platform. It is complementary to, but does not replace, native emulator and device testing.

To begin, choose between Android/iOS and then select the intended device from the dropdown.



Ripple target option under the Android platform

While inside Chrome, you may also change the device or platform directly.



BlackBerry Torch 9810
BlackBerry Torch 9860/9850
BlackBerry Z10
Generic - FWVGA (480x854)
Generic - HVGA (320x480)
Generic - QVGA (240X320)
Generic - WQVGA (240x480)
Generic - WVGA (480x800)
HP Pre 3
HP Veer
HTC G1
HTC Legend
HTC Tattoo
Nexus (Galaxy)
Nexus 4
Nexus 7 (Tablet)
Nexus One
Nexus S
Nokia N8
Nokia N97/5800 (touch)

CSS Pixels: 360x640

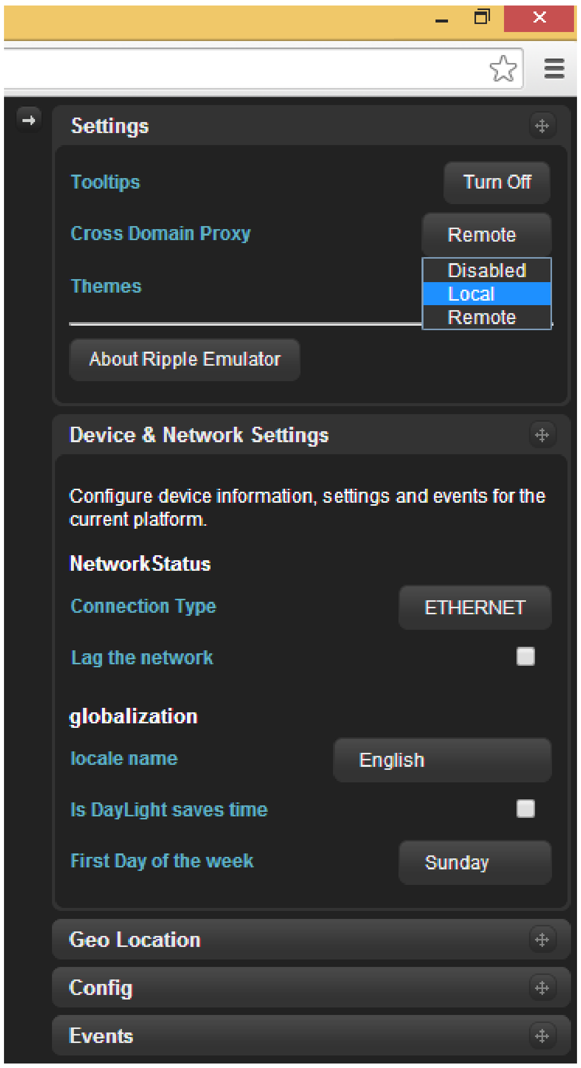
User Agent: Mozilla/5.0 (Linux; Android 4.0.1; Galaxy Nexus Build/ITL41F) AppleWebKit/535.19 (KHTML, like Gecko) Chrome/18.0.1025.166 Mobile Safari/535.19

Notes:

- Specs

Device options in Ripple

Important note: Ripple avoids cross-domain limitations in the browser by using a proxy. There are two proxies available: Remote and Local. The Remote version is cloud hosted. However, if your app is passing any sensitive data (for example Active Directory authentication tokens), we strongly recommend using the local proxy instead.


Settings

Tooltips: Turn Off

Cross Domain Proxy: Remote (Disabled / Local / Remote)

Themes

About Ripple Emulator

Device & Network Settings

Configure device information, settings and events for the current platform.

NetworkStatus

Connection Type: ETHERNET

Lag the network

globalization

locale name: English

Is DayLight saves time

First Day of the week: Sunday

Geo Location

Config

Events

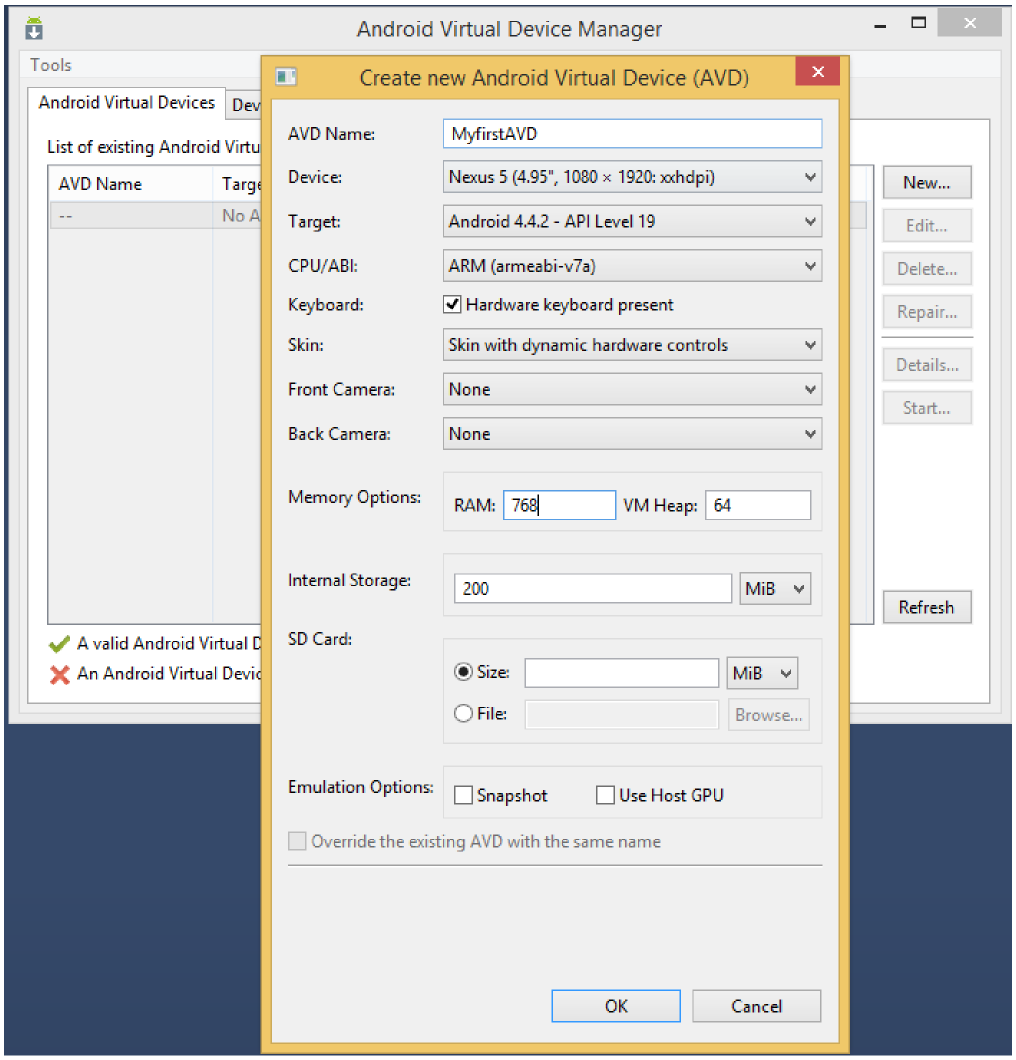
Local proxy setting in Ripple

Emulation on Android

You can also launch an Android version of your app in the native Android Emulator right from Visual Studio. Our recommendation is to use the AVD Manager to configure and start up an instance of the native Android Emulator before using Visual Studio to deploy and run your app in it. This will allow you to set specific configuration parameters to suit your target device and speed up your overall workflow.

You will need to sign your application to deploy a "release" or "distribution" version of your app, which must be, at minimum, self-signed. See the "Packaging and Signing Your App" for more information.

To begin, start the "AVD Manager." (Type "**android avd**" from the command line to get here if you don't have start menu items for it.) Click New and then choose required settings.



Create new Android Virtual Device (AVD)

AVD Name:	MyfirstAVD
Device:	Nexus 5 (4.95", 1080 × 1920: xxhdpi)
Target:	Android 4.4.2 - API Level 19
CPU/ABI:	ARM (armeabi-v7a)
Keyboard:	☑ Hardware keyboard present
Skin:	Skin with dynamic hardware controls
Front Camera:	None
Back Camera:	None
Memory Options:	RAM: 768 VM Heap: 64
Internal Storage:	200 MiB
SD Card:	● Size: MiB ○ File:
Emulation Options:	☐ Snapshot ☐ Use Host GPU

☐ Override the existing AVD with the same name

Creating a new AVD

You can then run and debug (Android 4.4) in the emulator by selecting “Android” from the Solution Platforms dropdown and “Android Emulator” from the Debug Target dropdown.

When you use the AVD Manager to configure and start up the Android emulator that you want, Visual Studio will deploy to the already running emulator. If you do not, Visual Studio will automatically start up the last AVD created.

GenyMotion™ Emulator for Android

The GenyMotion emulator is a popular replacement for the Android Emulator that comes with the Android Development Tools. However, because the Android tools see GenyMotion as a physical device, deploying to it is slightly different than the Android Emulator.

A few points to note:

- Rendering is implemented in OpenGL and you may need a **video card driver update** to enable it.

- Because of the OpenGL requirement, the Genymotion **emulator may not start if you are connected remotely**

Using GenyMotion from Visual Studio

- Start the GenyMotion emulator.
- Select "Device" as the deployment target from the dropdown in the Visual Studio.
- Now press F5 or click on the Debug toolbar button (with the Device option). This will start the app in the GenyMotion emulator and connect the debugger (for Android 4.4).
- Note that if you later want to deploy your app to a physical Android device, you will need to shut down GenyMotion first.

Improving the Performance of the Android Emulator

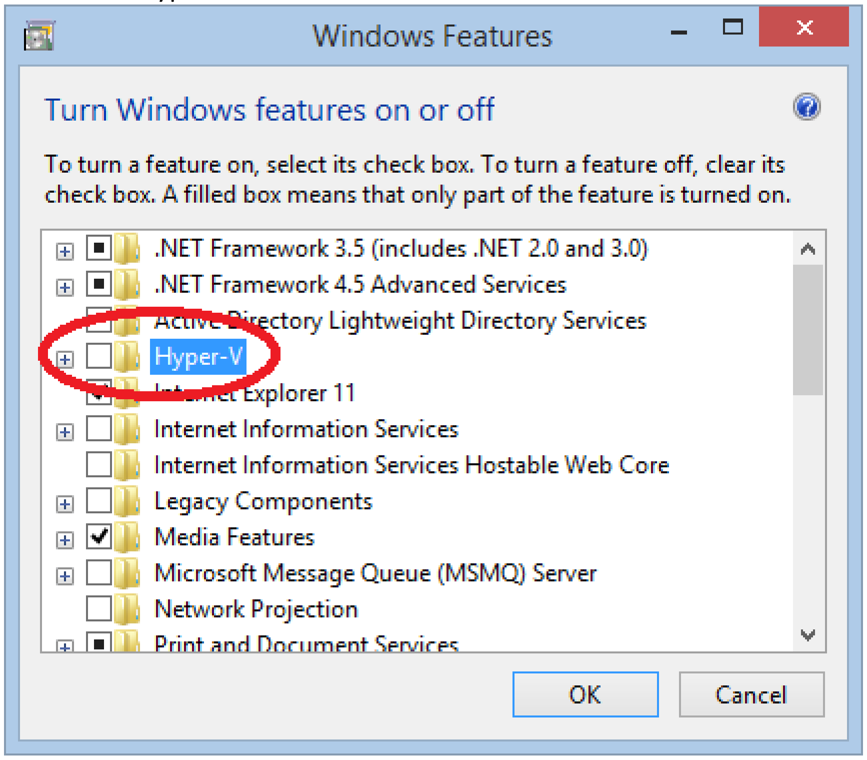
To improve the performance of the emulators included in the Android SDK and GenyMotion, you must disable Hyper-V and configure the emulator to use hardware acceleration. Note that disabling Hyper-V will prevent you from using the Windows Phone emulator. You can still deploy to a Windows Phone device.

Disable Hyper-V

Hyper-V must be fully disabled so it does not start at boot time. Shutting down VMs or stopping the Hyper-V server is not sufficient. **Note that disabling Hyper-V will prevent you from using the Windows Phone emulator**, but you can still deploy to Windows Phone devices.

Option 1

1. The simplest way to turn off Hyper-V is to enter "Turn Windows features on or off" at the start screen and uncheck "Hyper-V"



Windows Features

Turn Windows features on or off

To turn a feature on, select its check box. To turn a feature off, clear its check box. A filled box means that only part of the feature is turned on.

- [■] .NET Framework 3.5 (includes .NET 2.0 and 3.0)
- [■] .NET Framework 4.5 Advanced Services
- [ ] Active Directory Lightweight Directory Services
- [ ] Hyper-V
- [✓] Internet Explorer 11
- [ ] Internet Information Services
- [ ] Internet Information Services Hostable Web Core
- [ ] Legacy Components
- [✓] Media Features
- [ ] Microsoft Message Queue (MSMQ) Server
- [ ] Network Projection
- [■] Print and Document Services

2. Hyper-V will no longer be active after clicking “OK” and Rebooting

Option 2

An alternate method is to configure Windows to start with Hyper-V enabled or disabled via the command prompt.

Warning: Running the following commands can prevent your system from booting if not executed correctly. Exercise caution when using bcdedit commands.

1. From an elevated command prompt (Run as Administrator) **run this command**:
   ```
   bcdedit /set hypervisorlaunchtype off
   ```
2. **Reboot**

You can create a simple shell script to automate this as follows:

```
bcdedit /set hypervisorlaunchtype off
shutdown /r
```

You can turn Hyper-V on again later by executing this command and rebooting:

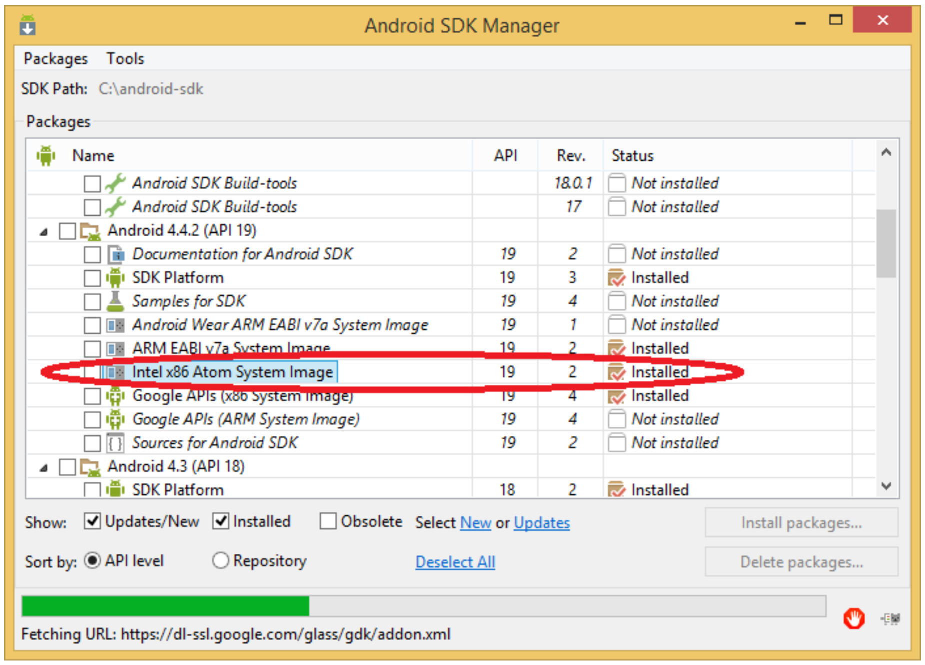
```
bcdedit /set hypervisorlaunchtype auto
```

If you are using the GenyMotion emulator, **stop here**. For additional steps that show how to set up the native Android Emulator, keep reading.

Improving Android Emulator Performance After Hyper-V is Disabled

Now that Hyper-V is disabled, you can install the Intel HAXM Driver and configure your Android AVD to take advantage of hardware acceleration if your computer has an Intel processor.

1. Go into the Android SDK Manager and validate that you have an Intel x86 Atom Android image installed for the version of Android you want to emulate. (Type "**android**" from the command line to get here if you don't have start menu items for it.)


Android SDK Manager

Packages Tools

SDK Path: C:\android-sdk

Packages

Name	API	Rev.	Status
☐ Android SDK Build-tools		18.0.1	Not installed
☐ Android SDK Build-tools		17	Not installed
☐ Android 4.4.2 (API 19)			
☐ Documentation for Android SDK	19	2	Not installed
☐ SDK Platform	19	3	Installed
☐ Samples for SDK	19	4	Not installed
☐ Android Wear ARM EABI v7a System Image	19	1	Not installed
☐ ARM EABI v7a System Image	19	2	Installed
☐ Intel x86 Atom System Image	19	2	Installed
☐ Google APIs (x86 System Image)	19	4	Installed
☐ Google APIs (ARM System Image)	19	4	Not installed
☐ Sources for Android SDK	19	2	Not installed
☐ Android 4.3 (API 18)			
☐ SDK Platform	18	2	Installed

Show: [✓ Updates/New] [✓ Installed] ☐ Obsolete Select New or Updates Install packages...

Sort by: [✓ API level] ○ Repository Deselect All Delete packages...

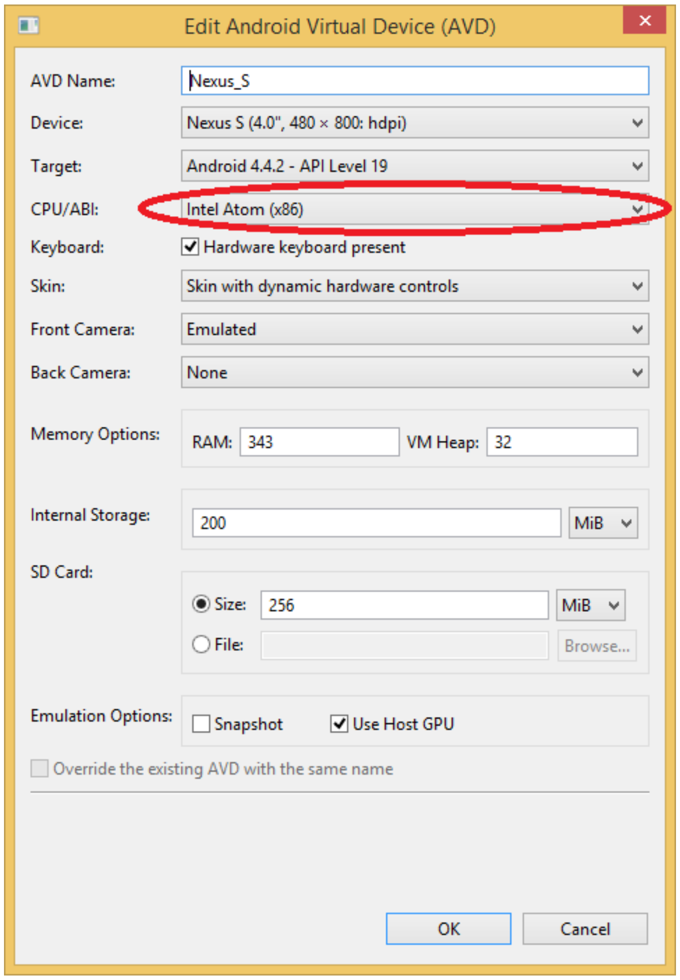
Fetching URL: https://dl-ssl.google.com/glass/gdk/addon.xml

2. Install the **Intel x86 Emulator Accelerator (HAXM) driver** (Read more)
    a. You can get the Intel x86 Emulator Accelerator (HAXM) driver by checking it under "Extras" in the Android SDK Manager (above).
    b. **NOTE**: This step only downloads the drivers

3. Once downloaded, go to where you installed the Android SDK and run the installer at: extras\intel\Hardware_Accelerated_Execution_Manager
    a. Note that this install will fail if Hyper-V is not disabled. In this scenario, an error will incorrectly state that your PC does not have Intel virtualization technology.
    b. If you still are running into problems after disabling Hyper-V, you need to validate that virtualization hardware acceleration is enabled in your BIOS and that your processor is supported.

Note: The default install location for the Android SDK on Windows can be hard to find. It is located here: **%localappdata%\Android\android-sdk**
(Ex: C:\Users\<user>\AppData\Local\Android\android-sdk)

4. Next, go into the AVD Manager and create a new image. (Type "android avd" from the command line to get here if you don't have a Start menu item.)
5. Select the Intel Atom (x86) CPU/ABI option.
6. Using Android 4.4.x (API Level 19) or higher will allow you to use the Visual Studio debugger as well



AVD Name: Nexus_S
Device: Nexus S (4.0", 480 × 800: hdpi)
Target: Android 4.4.2 - API Level 19
CPU/ABI: Intel Atom (x86)
Keyboard: [✓] Hardware keyboard present
Skin: Skin with dynamic hardware controls
Front Camera: Emulated
Back Camera: None
Memory Options: RAM: 343 VM Heap: 32
Internal Storage: 200 MiB
SD Card: [● Size: 256 MiB] File:
Emulation Options: Snapshot [✓ Use Host GPU]
Override the existing AVD with the same name

7. Click “OK” and start the emulator up to verify it is working as expected.

Running on an Android device

To run on an Android device, you also must install the appropriate device-specific OEM driver or the Google USB driver for Google Nexus devices. Google’s Android documentation provides a good pointer to manufacturer OEM drivers

Note that you will also need to sign your application to deploy a version of your app in the “Release” or “Distribution” configurations. See “Packaging and Signing Your App” for more information.

To deploy to an Android device via USB

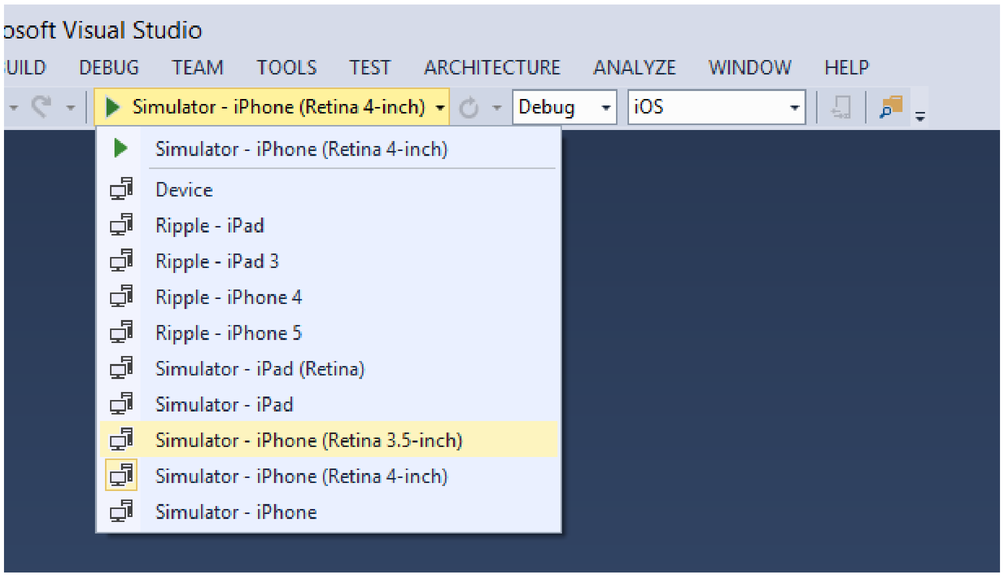
- Connect the Android device to the machine.
- Select “Device” as the Debug Target from the dropdown in Visual Studio.
- Now press F5 or click on the Debug toolbar button (with the Device option).
- Be sure to accept “Allow USB Debugging” when prompted.

Using the iOS Simulator on a Remote Mac

Before you can start your app on the iOS Simulator, you need to set up the vs-cordova-remote agent as mentioned in the “Remote Build and Simulation Agent” section. Make sure that you have the emulation enabled in the agent as described previously.

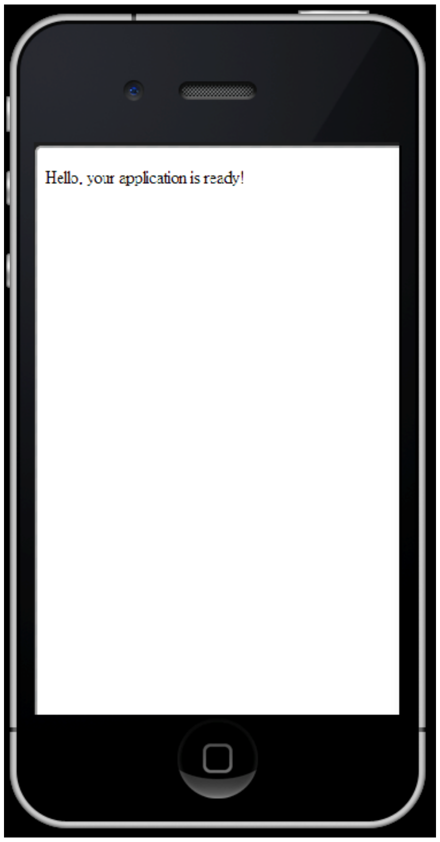
✓ Visual Studio will start up the iOS Simulator on the Mac, not your PC. Its use is recommended when you have a personal Mac device or are using virtualization technology like Parallels.

To start your app in the iOS Simulator from Visual Studio, choose iOS as the Solution Platform and choose the desired Simulator device type as the Debug Target.



iOS deployment target options

Now press F5 or click on the Debug toolbar button (with the Device option) and if your configuration is correct, a simulator shows up on the Mac running your app.



Simulator running on a Mac OS

Using iTunes to Deploy to a Physical iOS device

While Visual Studio does not currently support debugging your app on iOS, we have taken steps to make deploying your iOS app to your iOS device easier when using the vs-mda-remote agent for to build your app.

Prerequisite recap

- Install iTunes, if you did not install it with the Multi-Device Hybrid Apps extension.
- Configure the vs-mda-remote build agent on a Mac as described previously.
- Ensure that the iOS device you will be deploying to been provisioned with the same provisioning profile as the remote Mac build server you have configured. (See the instructions under the "Packaging and Signing Your App" to learn more about provisioning.)

Deploying to Your iOS Device from VS

In Visual Studio, choose iOS in the Solution Platform dropdown and then choose "Device" as the Debug target.

Press F5 or click on the Debug toolbar button (with the Device option). If your configuration is correct, iTunes will start and the built iOS app will automatically be added to (or replaced in) your library. You can then install/update the app on a connected iOS device as you would any other app.

Running Your App on Windows Phone

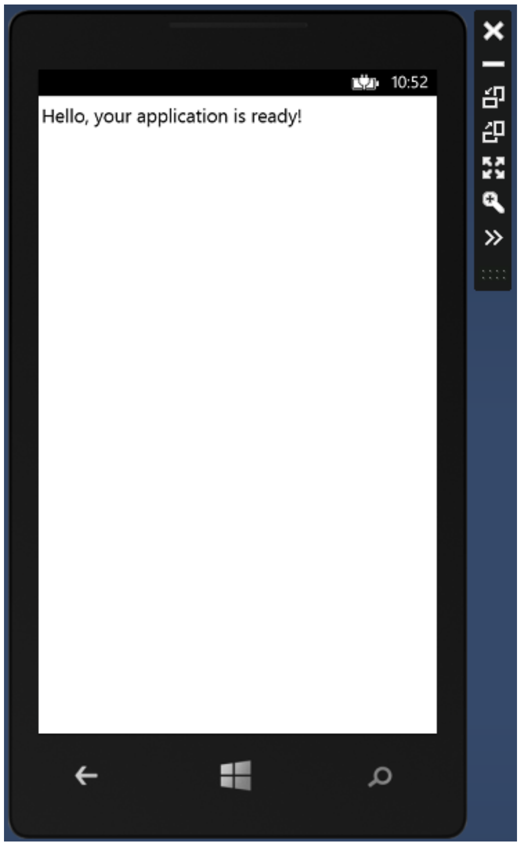
The Windows Phone options are similar to Android and iOS, except for Ripple emulation.

With this release, each time you launch (F5) your app against a Windows Phone 8.0 emulator or device target, the app deployment will appear not to complete in VS even though the app does successfully deploy and run in the emulator or on the device. The result is that you will need to **shut down the Windows Phone emulator, disconnect the device, or cancel the build when you are done testing your app.**

Launch on Emulator

Choose "Emulator…." from the Debug Target dropdown and then click on it to launch the emulator.

Hyper-V will need to be enabled to deploy to the Windows Phone emulator.



Windows Phone emulator in action

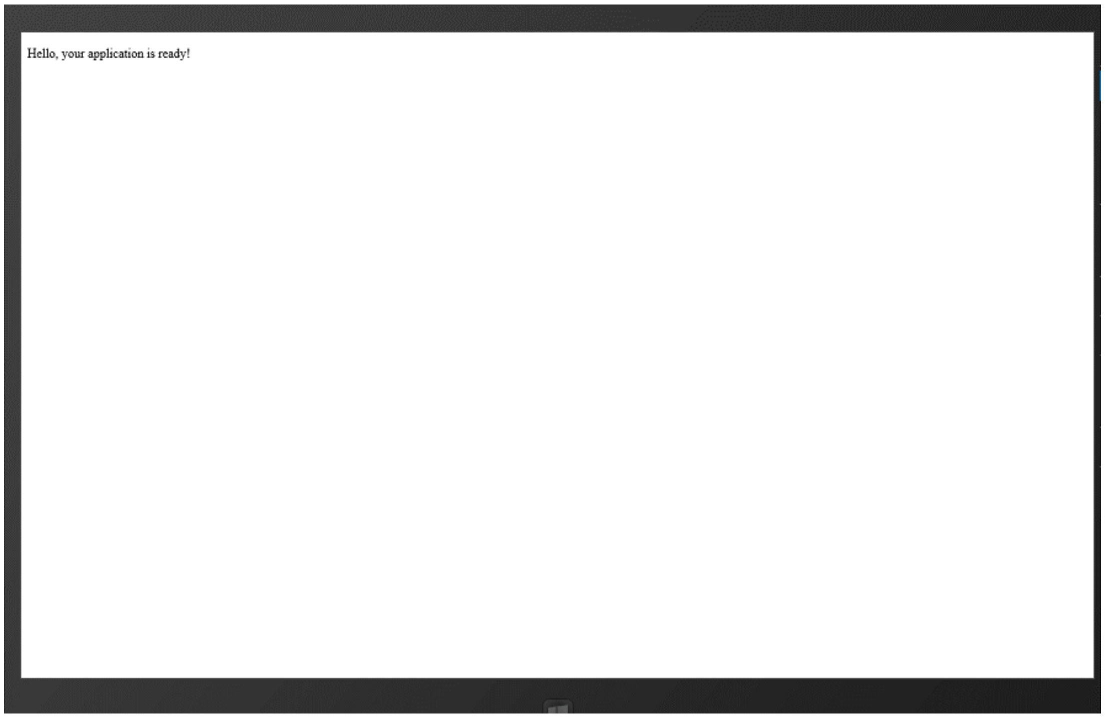
Launch on WP Device

After connecting your Windows Phone device to your machine, choose "Device" from the Debug Target dropdown and then click on it to launch to an attached device.

Running Your App on Windows

There are three options for launching your app on Windows:

- Choose “Simulator” from the Debug Target dropdown, and then click on it to launch your app in the Windows Simulator.
- Choose “Local Machine” from the Debug Target dropdown, and then click on it to launch your app locally on your machine.
- Choose “Remote Machine” from the Debug Target dropdown, and then click on it to launch your app on a remote device. See this article for more details.


Hello, your application is ready!

Windows Simulator in action

Debugging

The advantage Visual Studio brings to developing Cordova apps is a seamless and common tooling experience across app types and device platforms. However, in this release, not all device platforms can take advantage of the same Visual Studio debugger capabilities. The table below shows debugger support for different device platforms supported in this release.

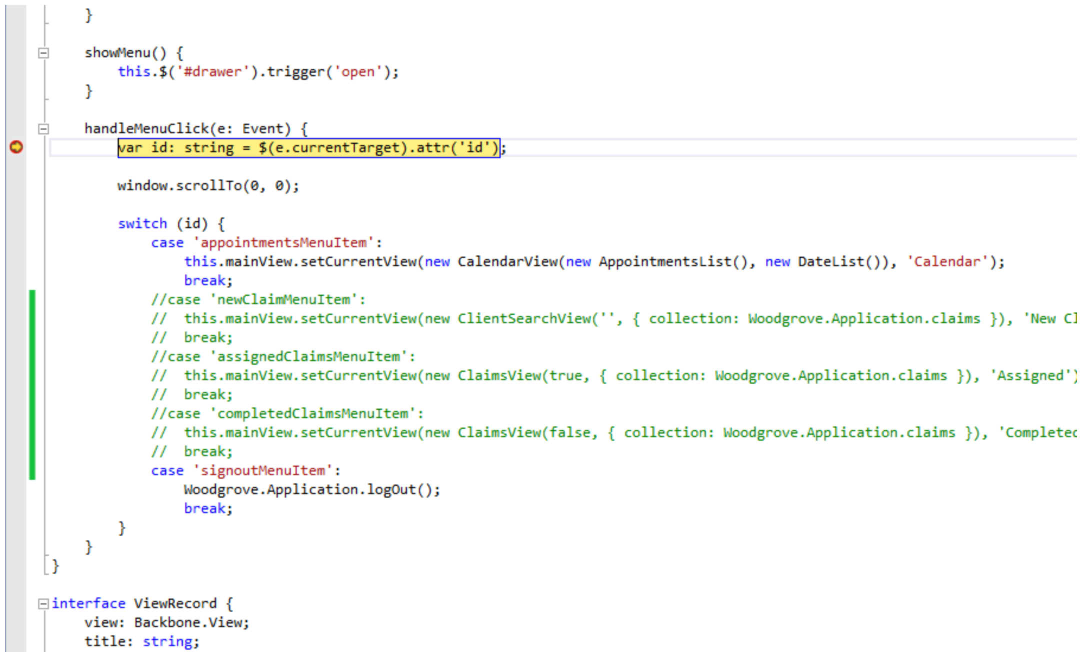
Device Type	VS Debugger Support?	JS Console messages in Output Window	Alternative
Android 4.4	Yes	Yes	
Android < 4.4	No	Yes	
iOS 6, 7	No	No	Safari (see below)
Windows 8.0 (Store)	Yes	Yes	
Windows Phone 8.0	No	No*	weinre (see below)

* Native project can be opened in VS (see below)

Note: The VS debugger will not stop at breakpoints that occur prior to the first page load in Ripple or Android 4.4 emulators or devices. However, these breakpoints will be hit after refreshing the browser (Ripple) or executing "window.location.reload()" from the JavaScript console.

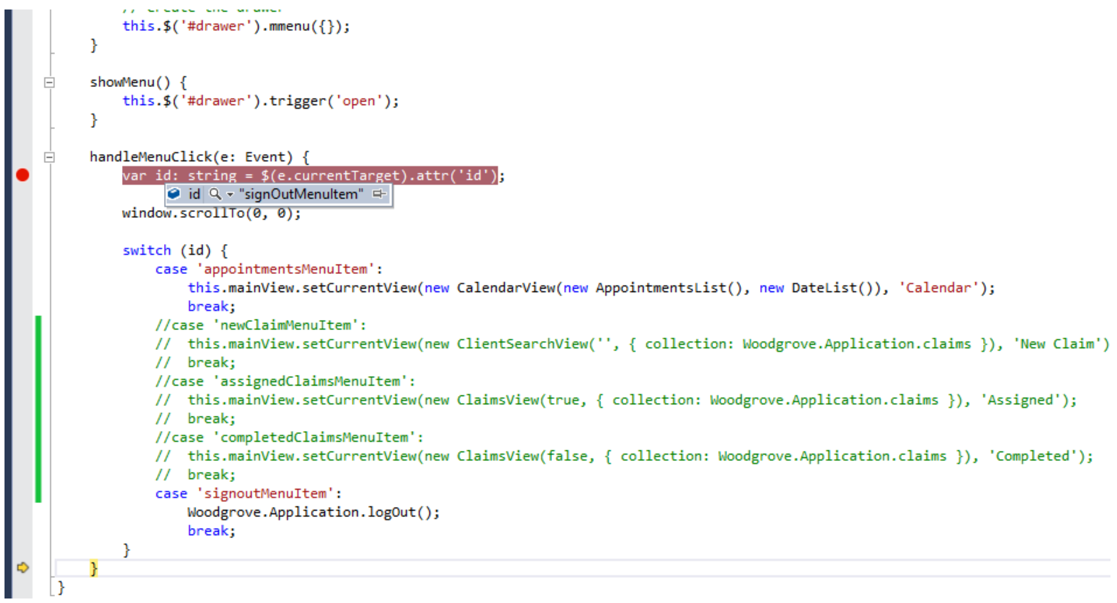
Debugging Android and iOS in Ripple

On pressing F5, Visual Studio launches the Apache Ripple simulator in a Chrome browser. This simulator is tightly integrated with Visual Studio, so any breakpoints set in your IDE will be hit just as you would expect with any other project.



```
    }

    showMenu() {
        this.$('#drawer').trigger('open');
    }

    handleMenuClick(e: Event) {
        var id: string = $(e.currentTarget).attr('id');

        window.scrollTo(0, 0);

        switch (id) {
            case 'appointmentsMenuItem':
                this.mainView.setCurrentView(new CalendarView(new AppointmentsList(), new DateList()), 'Calendar');
                break;
            //case 'newClaimMenuItem':
            //  this.mainView.setCurrentView(new ClientSearchView('', { collection: Woodgrove.Application.claims }), 'New Cl
            //  break;
            //case 'assignedClaimsMenuItem':
            //  this.mainView.setCurrentView(new ClaimsView(true, { collection: Woodgrove.Application.claims }), 'Assigned')
            //  break;
            //case 'completedClaimsMenuItem':
            //  this.mainView.setCurrentView(new ClaimsView(false, { collection: Woodgrove.Application.claims }), 'Completec
            //  break;
            case 'signoutMenuItem':
                Woodgrove.Application.logOut();
                break;
        }
    }
}

interface ViewRecord {
    view: Backbone.View;
    title: string;
```

Setting breakpoints while debugging using Ripple



```
        this.$('#drawer').mmenu({});
    }

    showMenu() {
        this.$('#drawer').trigger('open');
    }

    handleMenuClick(e: Event) {
        var id: string = $(e.currentTarget).attr('id');
            id "signOutMenuItem"
        window.scrollTo(0, 0);

        switch (id) {
            case 'appointmentsMenuItem':
                this.mainView.setCurrentView(new CalendarView(new AppointmentsList(), new DateList()), 'Calendar');
                break;
            //case 'newClaimMenuItem':
            //  this.mainView.setCurrentView(new ClientSearchView('', { collection: Woodgrove.Application.claims }), 'New Claim')
            //  break;
            //case 'assignedClaimsMenuItem':
            //  this.mainView.setCurrentView(new ClaimsView(true, { collection: Woodgrove.Application.claims }), 'Assigned');
            //  break;
            //case 'completedClaimsMenuItem':
            //  this.mainView.setCurrentView(new ClaimsView(false, { collection: Woodgrove.Application.claims }), 'Completed');
            //  break;
            case 'signoutMenuItem':
                Woodgrove.Application.logOut();
                break;
        }
    }
}
```

Breakpoint being caught in debugger in Visual Studio

Debugging Android Using the Emulator or a Device

The Visual Studio debugger also supports debugging your app in the Android emulator or on physical devices. However, this debugging experience is only available for Android 4.4. Console messages for Android versions previous to 4.4 can still be found in the Debug Output window.

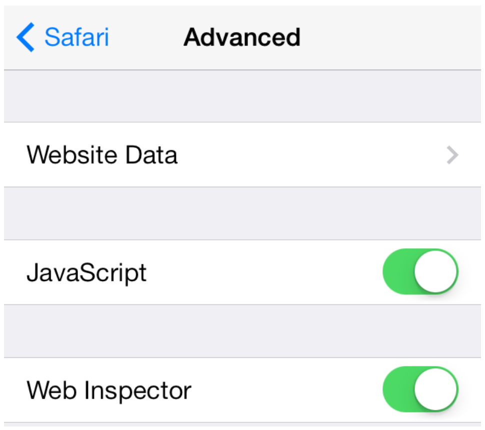
Note that not all debug and diagnostic capabilities available for Windows are available for Android currently. We will continue to improve support for Android in subsequent releases.

Debugging iOS With Safari

In this release, Visual Studio does not support debugging apps on iOS. However, the Safari browser on a Mac can be used to debug apps created using the vs-mda-remote agent. This section will cover how this can be done in a few simple steps.

Note: Only apps built using the "Debug" configuration can be debugged in Safari, not apps downloaded from the App Store.

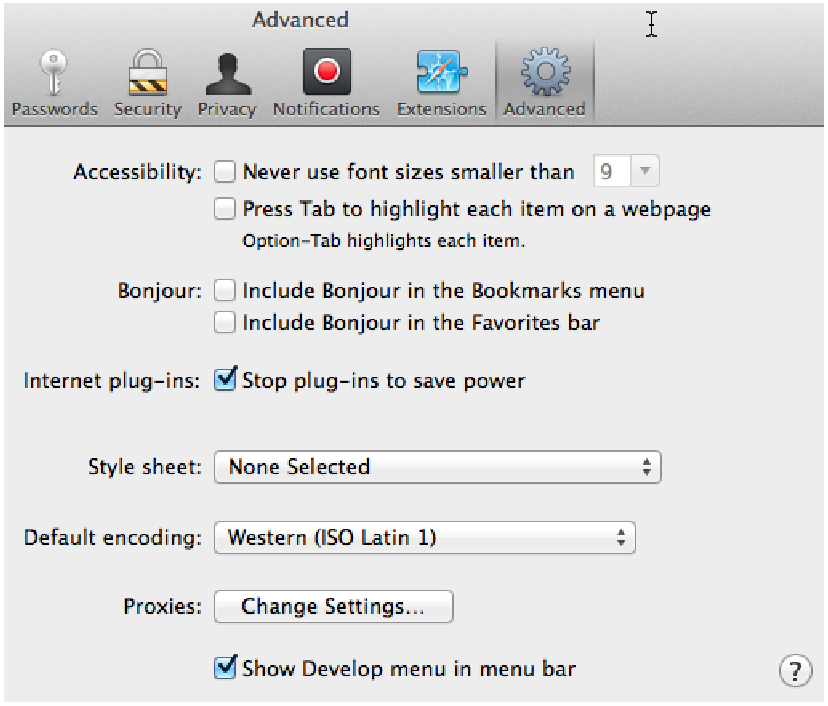
1. On your iOS device, go to Settings > Safari > Advanced and turn on the "Web Inspector" option.



JavaScript [✓ on]

Web Inspector [✓ on]

2. Next, start Safari on your Mac, open Preferences > Advanced tab and check the "Show Develop menu in menu bar" option.



Accessibility: ☐ Never use font sizes smaller than 9
☐ Press Tab to highlight each item on a webpage
Option-Tab highlights each item.

Bonjour: ☐ Include Bonjour in the Bookmarks menu
☐ Include Bonjour in the Favorites bar

Internet plug-ins: ☑ Stop plug-ins to save power

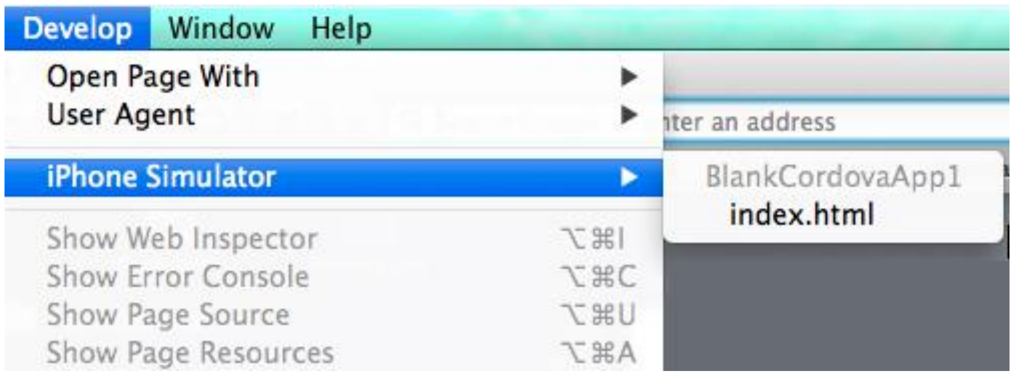
Style sheet: None Selected

Default encoding: Western (ISO Latin 1)

Proxies: Change Settings…

☑ Show Develop menu in menu bar

3. Now connect your iOS device via USB and launch the app or start it up in iOS Simulator using the vs-remote-mda agent on the Mac you intend to use to debug.
4. Once the app is running, go to Safari on the Mac and if all is well, you will see your device or the simulator under the Develop menu. Clicking on the listed web page will start up the Web Inspector.



Debugging for Windows and Windows Phone 8

For Windows applications, you can use the same tooling as you would for any WWA application. Please refer to the documentation here.

For Windows Phone 8 applications, you can use the weinre (Web Inspector Remote) project as described in this blog post from MS OpenTech. Unfortunately, in this early release, the Visual Studio debugger cannot attach to Windows Phone apps.

As an alternative to weinre, you can opt to use the Console plugin along with the generated native Windows Phone 8 project to see console output in the Output Window and to triage native code issues. See below for details on accessing the underlying Windows Phone 8 project.

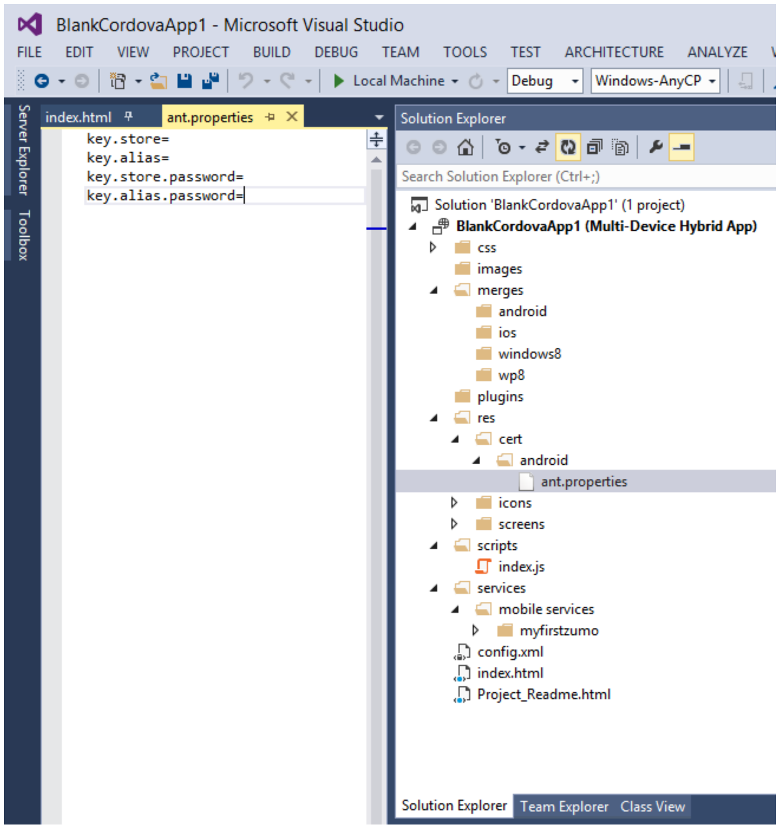
Packaging and Signing Your App

Android

Each time you build for Android, a package is created. However, extra steps will be required if you wish to sign it for distribution.

First you will need to generate a signing certificate and place it in the keystore. You can read more about generating this certificate in the Android documentation.

To use it, you will need to navigate to res\cert\android folder in the project structure and edit the ant.properties file with valid information. You can place the keystore you created in the project either in the same location or in some other location (for example, if you would prefer not to check it into source control for security reasons). Regardless, the "Key.store" property in the ant.properties file should be a relative or absolute path to the certificate file.



```
key.store=
key.alias=
key.store.password=
key.alias.password=
```

ant.properties file

Note: If you delete the ant.properties file, you may want to create a new project and copy over the file.

We will sign the package with the credentials supplied, without actually validating them, so please make sure the credentials are correct.

iOS

To generate a package that can be used on an iOS device, you will first need to sign it using a valid Apple iOS Developer account and a Mac with Xcode. These steps are described below.

Follow these steps to create a new provisioning profile and signing identity:

1. Download a provisioning profile from here.
2. Install the provisioning profile on your build machine.
3. In Xcode's "Accounts" preferences, view the details of your Apple ID (set it up if you haven't).
4. Click the '+' button to create a new "iOS Development" signing identify for the selected provisioning profile. If no provisioning profile shows up, go back to step 2 (or step 1).

When building for "Debug" or "Release" configurations using the iOS remote agent from Visual Studio, the agent will select the first valid "iOS Development" signing identity installed on your system.

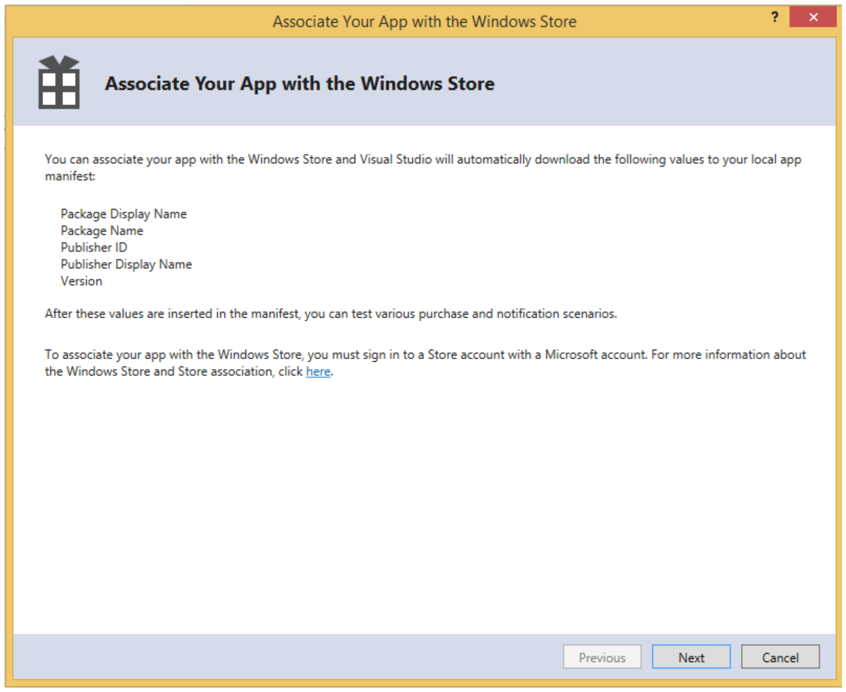
The agent will match the first "iOS Distribution" signing identity when building for "Distribution." You can follow the same instructions above to generate a distribution cert by selecting that option during step 4 above.

"Valid" in this case means the provisioning profile identifier matches your App ID. For example, a provisioning profile with id "com.foo.bar.*" would match the App ID "com.foo.bar.fizzbuzz". In many cases, developers will have a wildcard provisioning profile that matches all App IDs, in which case this isn't a problem.

✓ Read the official documentation on setting up the provisioning profile and signing identities is here.

Windows

Windows applications can be packaged for store deployment using the following steps. From the toolbar menu, choose Project > Associate App with Store.



Associate Your App with the Windows Store

You can associate your app with the Windows Store and Visual Studio will automatically download the following values to your local app manifest:

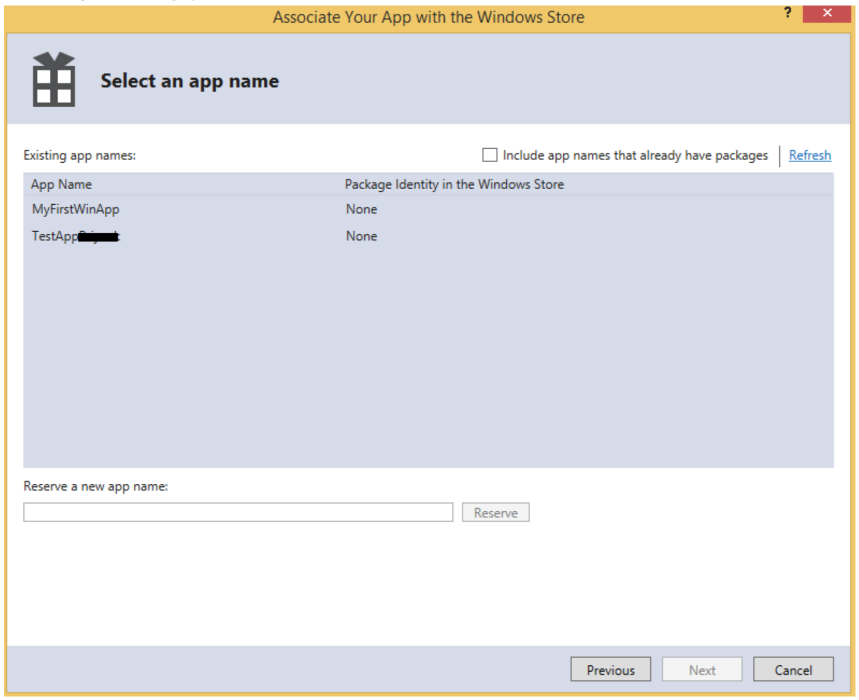
Package Display Name
Package Name
Publisher ID
Publisher Display Name
Version

After these values are inserted in the manifest, you can test various purchase and notification scenarios.

To associate your app with the Windows Store, you must sign in to a Store account with a Microsoft account. For more information about the Windows Store and Store association, click here.

Associate app with store

On being prompted, login using your Microsoft account, choose a name and click “Reserve”.



Select an app name

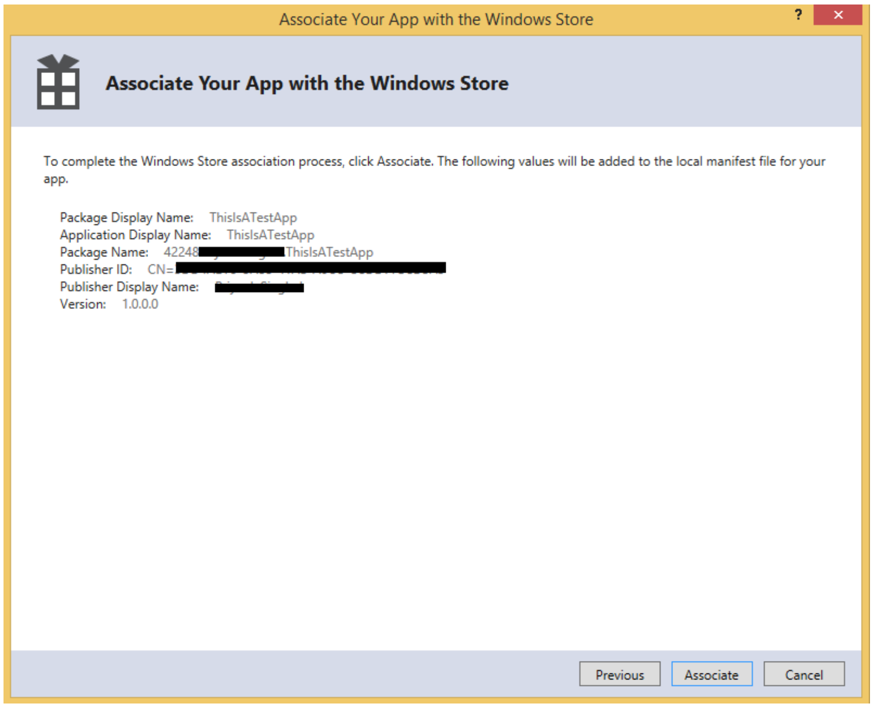
Existing app names: ☐ Include app names that already have packages | Refresh

App Name	Package Identity in the Windows Store
MyFirstWinApp	None
TestApp[redacted]	None

Reserve a new app name:

Option to reserve a name for your app

App names are required to be unique across the Windows Store.



Associate Your App with the Windows Store

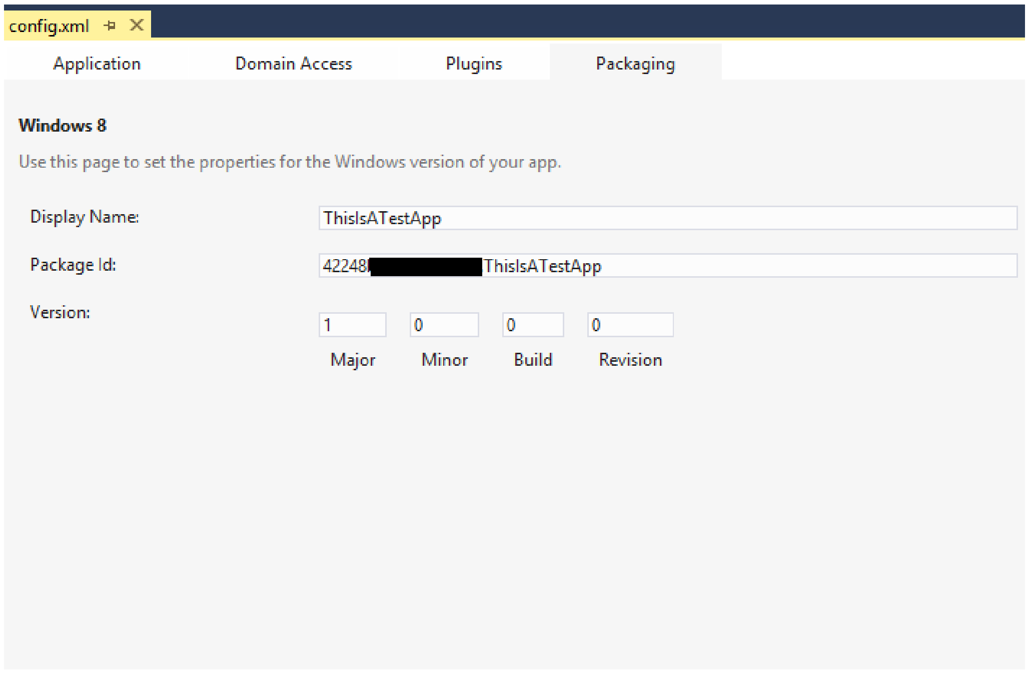
To complete the Windows Store association process, click Associate. The following values will be added to the local manifest file for your app.

Package Display Name: ThisIsATestApp
Application Display Name: ThisIsATestApp
Package Name: 42248[redacted]ThisIsATestApp
Publisher ID: CN=[redacted]
Publisher Display Name: [redacted]
Version: 1.0.0.0

Confirmation for reserving app name

Once your app name is reserved, click "**Associate**" at the bottom of the screen. Done!

To see where this name is reserved, open the Config Designer and navigating to the Packaging tab.



Windows 8

Use this page to set the properties for the Windows version of your app.

Display Name:	ThisIsATestApp
Package Id:	42248[redacted]ThisIsATestApp
Version:	1 (Major), 0 (Minor), 0 (Build), 0 (Revision)

App and package name details under Packaging tab

You will see that the name and associated package ID has been updated.

✓ Changing the app name under the “Application” tab will not affect the Windows Store app name or vice-versa. To update the Windows Store app name, please repeat the steps above.

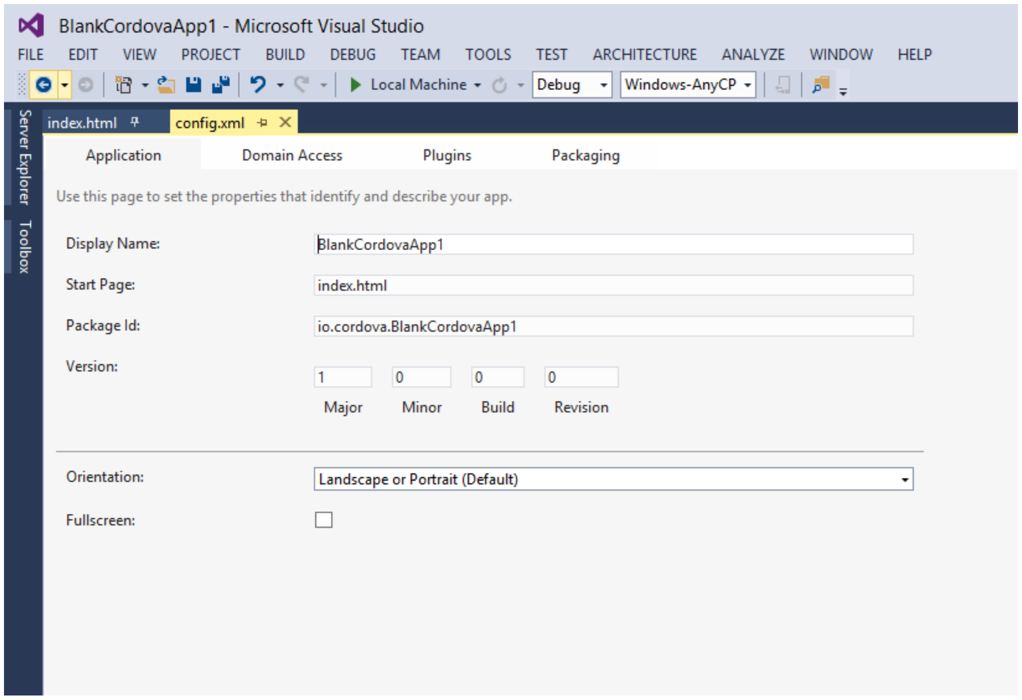
Windows Phone 8

Windows Phone 8 apps are automatically packaged and do not need to be signed at build time. You can then submit the generated XAP as described in this article.

Publishing Your App

Configure Your App for Distribution

The Config Designer can be used to configure some important settings required to publish your app. Open it by double-clicking on the config.xml file.


BlankCordovaApp1 - Microsoft Visual Studio
FILE EDIT VIEW PROJECT BUILD DEBUG TEAM TOOLS TEST ARCHITECTURE ANALYZE WINDOW HELP
Local Machine
Debug
Windows-AnyCP
Server Explorer
Toolbox
index.html
config.xml
Application
Domain Access
Plugins
Packaging

Use this page to set the properties that identify and describe your app.

Display Name: BlankCordovaApp1

Start Page: index.html

Package Id: io.cordova.BlankCordovaApp1

Version: 1 (Major) 0 (Minor) 0 (Build) 0 (Revision)

Orientation: Landscape or Portrait (Default)

Fullscreen: ☐

Application tab under Config Designer

Display Name – The name of the application as it will show up in the app store. (Note: This is not true for Windows Store. Read instructions in the previous section for more information.)

Package Id – This is a unique identifier that will identify your app on each platform (other than Windows 8) when you publish your app to a store.

Domain Access – The set of domains from which your app can access content. We recommend using the default value, "*" (which provides access to all content), during development. However, before releasing your app, you should narrow this down to the specific domains that your app needs to access. (Windows 8 does not currently use this config option.)

Version Number – You can control the version numbering through this value. Some app stores may have their own version numbering that is assigned when the app is published. However, for platforms like iOS it is important to keep this in sync with what you have configured in iTunes Connect.

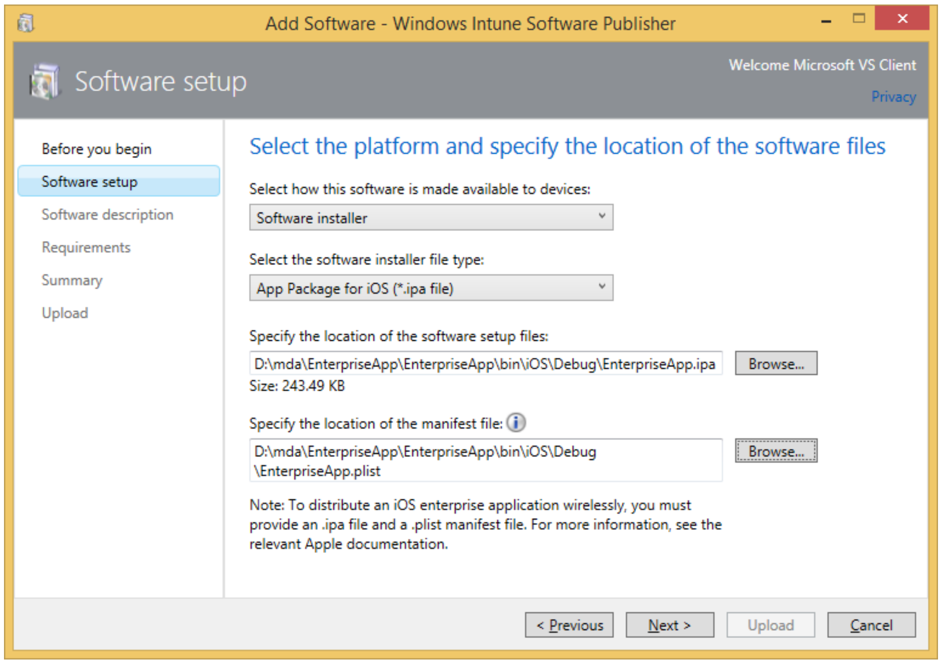
As mentioned earlier, you may "View Code" on config.xml and set additional config.xml preferences not shown here. The FAQ describes other alternate configuration options where needed.

Uploading Your App

You can access the packages you built from the "bin" folder under the project directory. When built using the Distribution configuration, you may then upload the packages to the app stores for the respective platform as required.

The process of uploading your app to a store varies by store type and platform.

Windows Intune provides an excellent cross-platform internal app store for Android, iOS, Windows, and Windows Phone. Uploading into Intune can be done via Microsoft System Center directly via the Intune management console:



Select the platform and specify the location of the software files

Select how this software is made available to devices: Software installer

Select the software installer file type: App Package for iOS (*.ipa file)

Specify the location of the software setup files: D:\mda\EnterpriseApp\EnterpriseApp\bin\iOS\Debug\EnterpriseApp.ipa

Size: 243.49 KB

Specify the location of the manifest file: D:\mda\EnterpriseApp\EnterpriseApp\bin\iOS\Debug \EnterpriseApp.plist

Note: To distribute an iOS enterprise application wirelessly, you must provide an .ipa file and a .plist manifest file. For more information, see the relevant Apple documentation.

InTune Software Upload manager

✓ You can find information about uploading your app across all supported platforms to Intune here.

For your convenience, the vs-mda-remote agent also creates a Wireless Manifest plist file that you can use to upload your iOS app into Intune and can be found in the bin folder with your ipa after a build from VS. This file can also be manually modified for use in other situations.

Uploading to public app stores varies by platform:

- For Google Play, see instructions here.
- For iOS, you can use the Application Loader to submit your app to the App Store using your build "Distribution" config ipa as described in this PDF.
- For Windows, see instructions here.
- For Windows Phone, see instructions here

Exporting a Cordova CLI Project & Accessing Native Projects

When building against device or emulator targets, Visual Studio invokes the Apache Cordova Command Line Interface (CLI) to build for the specified device platform. The resulting packages can be accessed from the "bin" folder inside the project folder on the local file system.

If you install the Cordova CLI, you can execute any CLI command against the contents of the "bld/<config>" (ex: bld/Debug) folder in your Visual Studio project. You can install the Cordova CLI by executing the following command from the Developer Command Prompt:

```
npm install -g cordova@3.4.1-0.1.0
```

There may be situations in which access to a native platform project is required. With the exception of iOS, the native project can be found under the "bld/<config>/platforms/<platform>" folder in your Visual Studio project (Ex: bld/Debug/platforms/android).

Note that edits made here will not be reflected in your Visual Studio project and the contents of this folder will be removed by a "Clean" operation in Visual Studio.

In this release there is not a supported way to use the Adobe PhoneGap™ Developer app from VS. However, the Cordova CLI supports the same "serve" command used by this app. Execute the following command from the project's "bld/<config>" folder to start it up:

```
cordova serve
```

In this release, you will need to rebuild to update content but intend to accelerate this and the Apache Ripple workflow in the future.

Extra Steps to build iOS Apps Using a Native Project

Given that iOS apps cannot be built on Windows, accessing the native project or using the Cordova CLI requires extra steps, described here.

- Install node.js on your Mac.
- Install the Cordova CLI on your Mac:

```
sudo npm install -g cordova@3.4.1-0.1.0
```

- Copy the contents of the bld/Debug, bld/Release, or bld/Distribution folder to your Mac.
- Go to the folder where you copied the contents to from the command line using the Terminal app.
- Execute the command:

```
cordova platform add ios
```

- You can then use any Cordova CLI command. For example:

```
cordova build ios
```

… or …

```
cordova emulate ios
```

In addition, inside the platforms/ios folder will be a native Xcode project

FAQs and Known Issues

Find answers to common questions on our FAQ page.

Find the updated list of bugs and fixes on our Known Issues page.

We Love Feedback

Talk to us on Twitter: @VSClientTools

File bugs on StackOverflow: #multi-device-hybrid-apps

Email us: multidevicehybridapp@microsoft.comm