



将Unity游戏移植到 Windows Phone

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Coding Walkthroughs

Setup

Visual Studio & Emulator

Schedule Live Tiles

Live Tiles Notifications

XML

Player Control

XAML Integration

Navigation

Windows Gateway

Unity Plugins for WP8

File IO

Networking

In App Purchase

Collections

Sharing

Reflection

Debugging

Publishing

...& more

系统要求

Windows PC

Unity 4.3.4

Windows 8.x Professional+, 64 bit

Microsoft Visual Studio 2013 with Windows Phone 8 SDK

Windows Phone SDK 8.0 with Microsoft Visual Studio 2012 Express

Windows Phone device

unity3d.com/unity/download

windows.microsoft.com/zh-cn/windows/download-shop

visualstudio.com/downloads/download-visual-studio-vs

dev.windowsphone.com/zh-cn/downloadsdk

系统要求

Mac OSX

Boot Camp 5+

Windows 8.x Professional & up 64-bit ISO & bootable USB or Disk

Windows 7 USB/DVD download tool

microsoftstore.com/store/msusa/html/pbPage.Help_Win7_usbdvd_dwnTool

windows.microsoft.com/en-us/windows-8/install-windows-on-mac

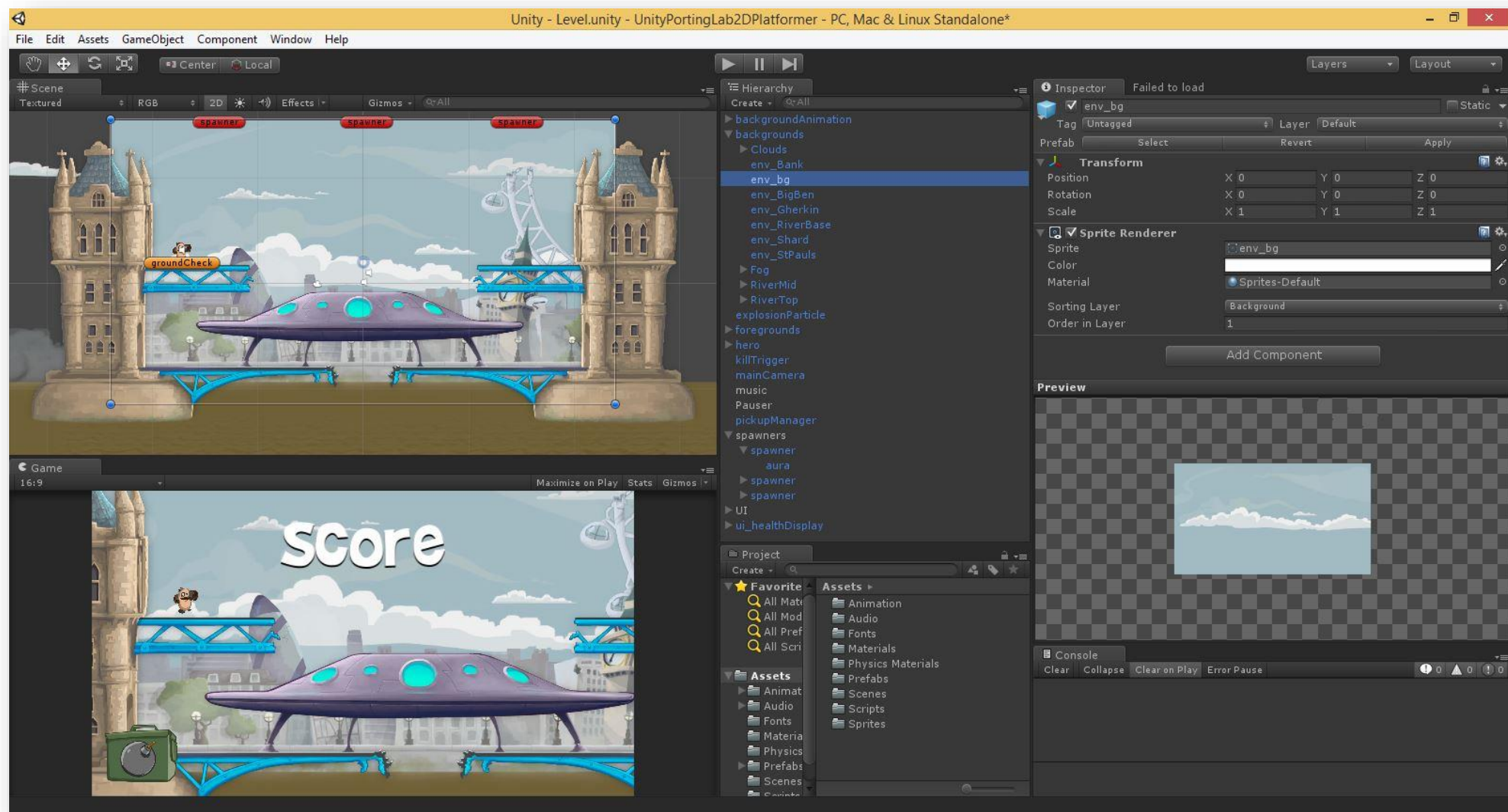
help.apple.com/bootcamp/mac/5.0/help

digitaltrends.com/computing/how-to-install-windows-8-on-a-mac/

Or: Parallels Desktop 9.0 for Mac

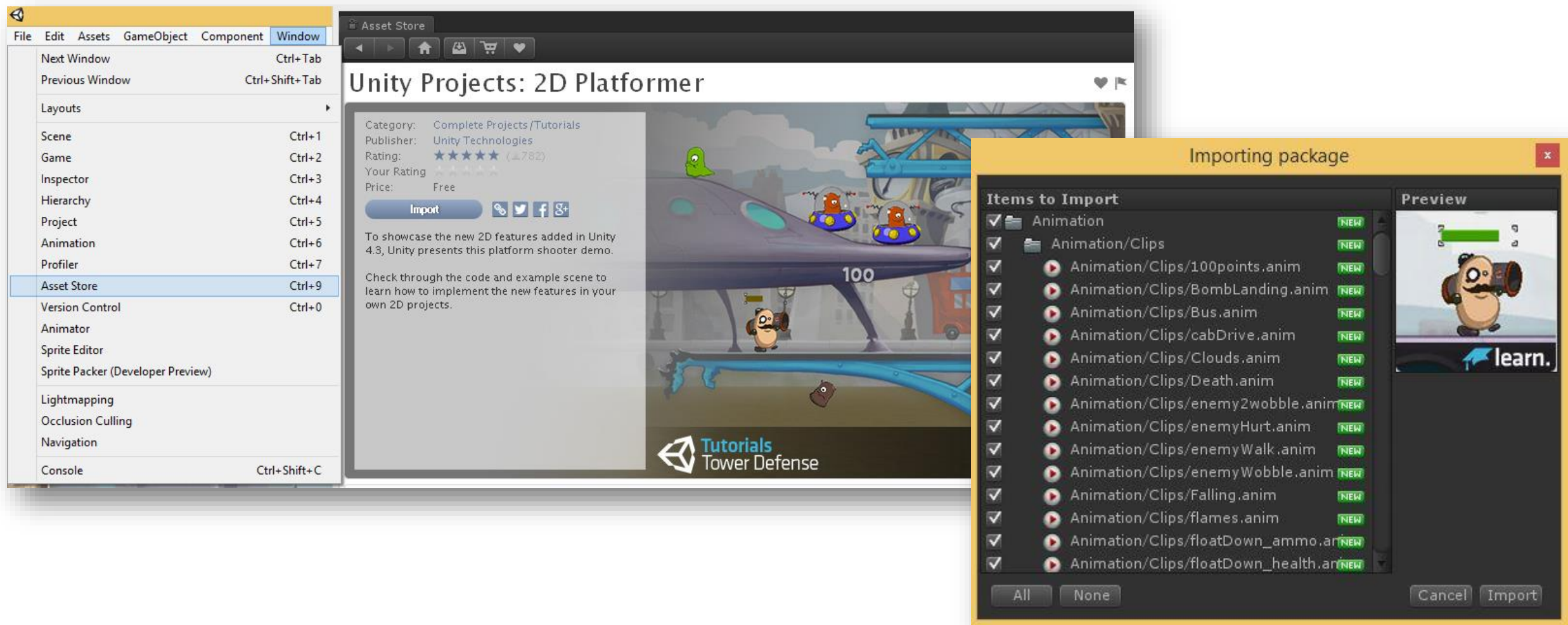
download.parallels.com/desktop/v9/ga/docs/ko_KR/Parallels%20Desktop%20User's%20Guide/36432.htm

Unity3D 编辑

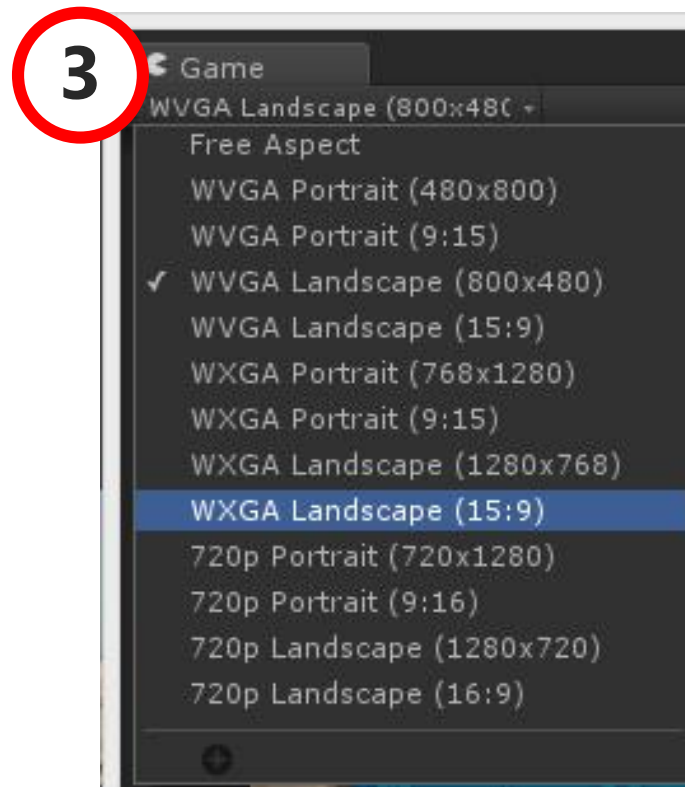
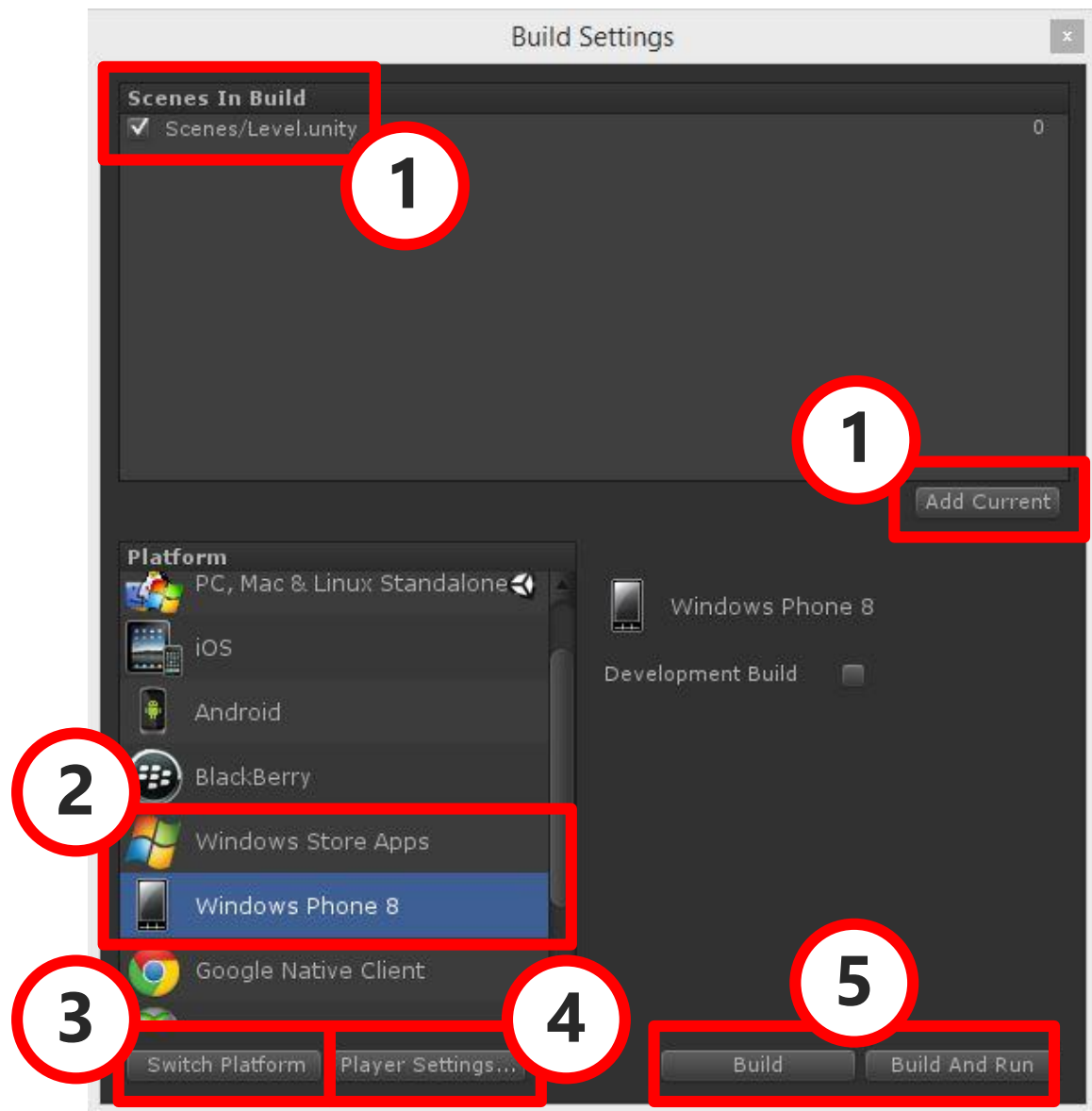


Asset Store 资源商店

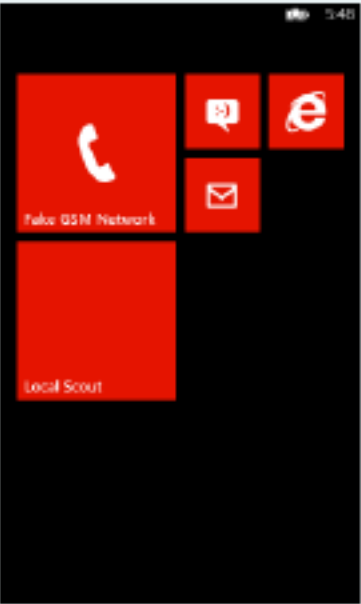
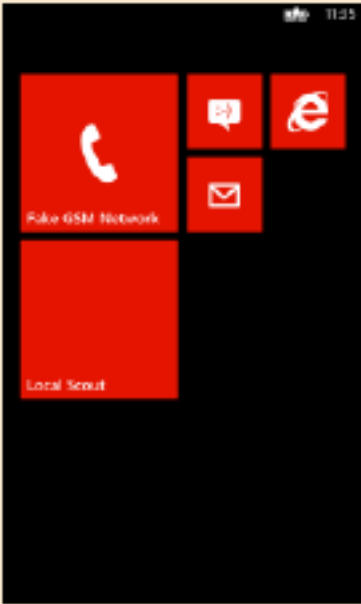
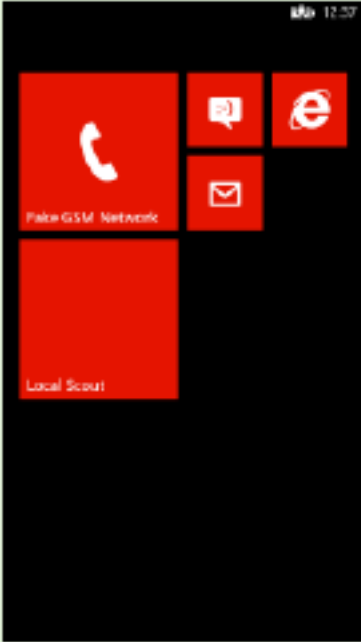
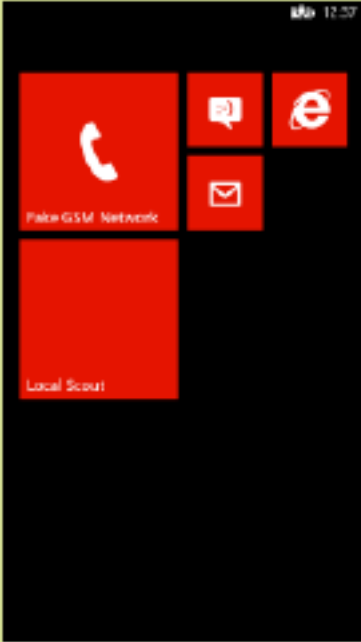
Download a sample tutorial for porting



构建设备



多种分辨率

WVGA	WXGA	720p	1080p
			
480 x 800 15:9	768 x 1280 15:9	720 x 1280 16:9	1080 x 1920 16:9

动态磁贴 Live Tiles

- Appear on your Start Screen, represents the icon for your app
- 3 Tile sizes: small, medium, and wide
- 3 Tile templates: flip, iconic, and cycle

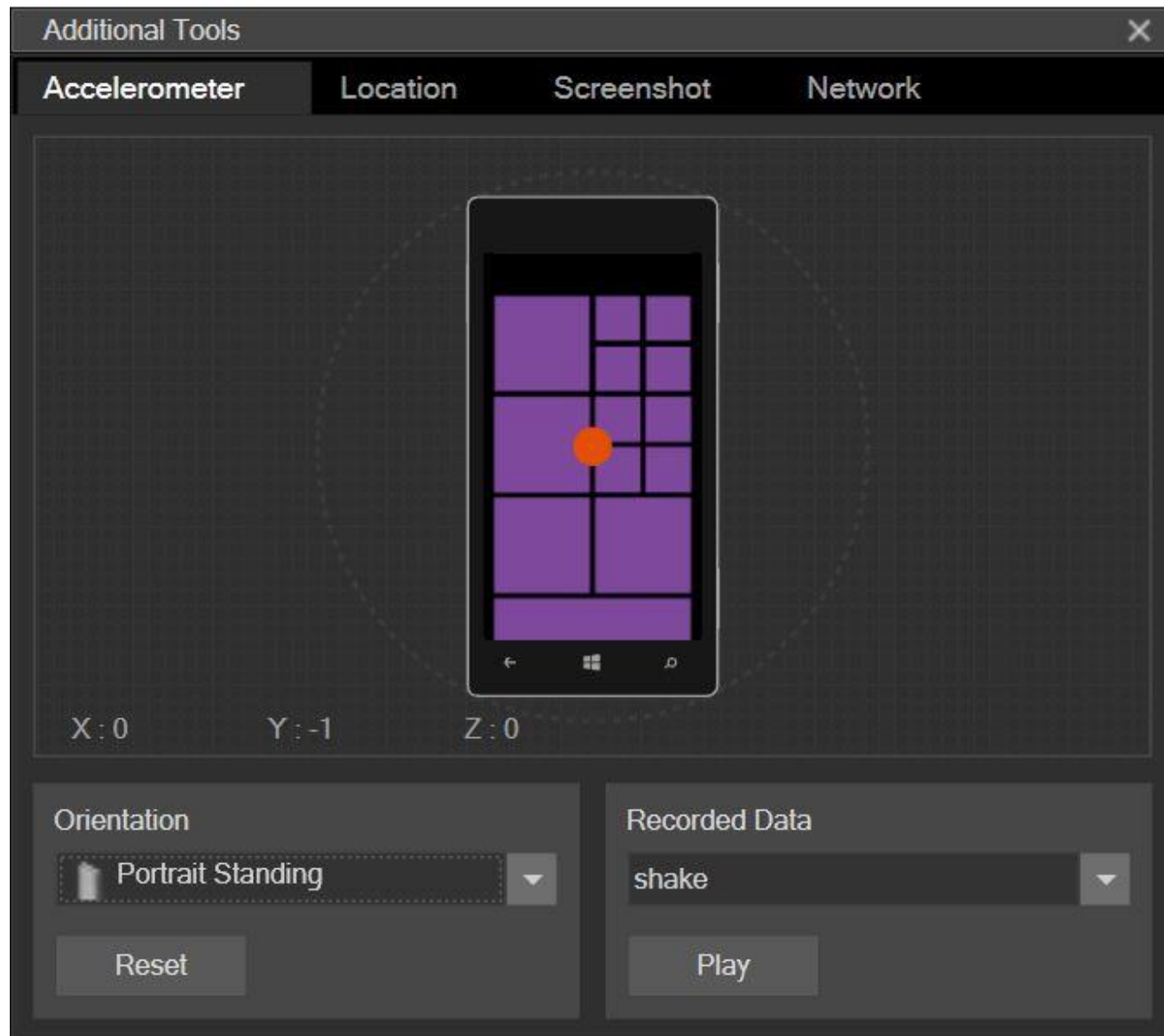
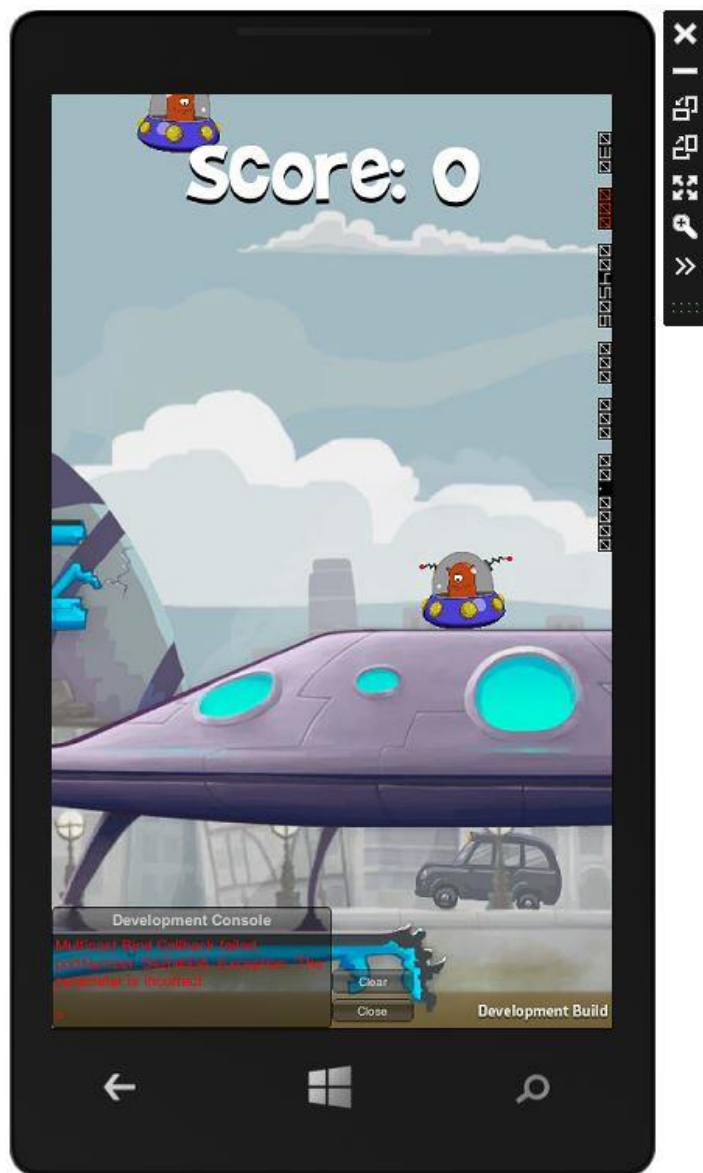
[msdn.microsoft.com/zh-cn/library/windowsphone/develop/hh202948\(v=vs.105\).aspx](http://msdn.microsoft.com/zh-cn/library/windowsphone/develop/hh202948(v=vs.105).aspx)

<http://wat-docs.azurewebsites.net/Tools>

<http://aka.ms/WSIP>

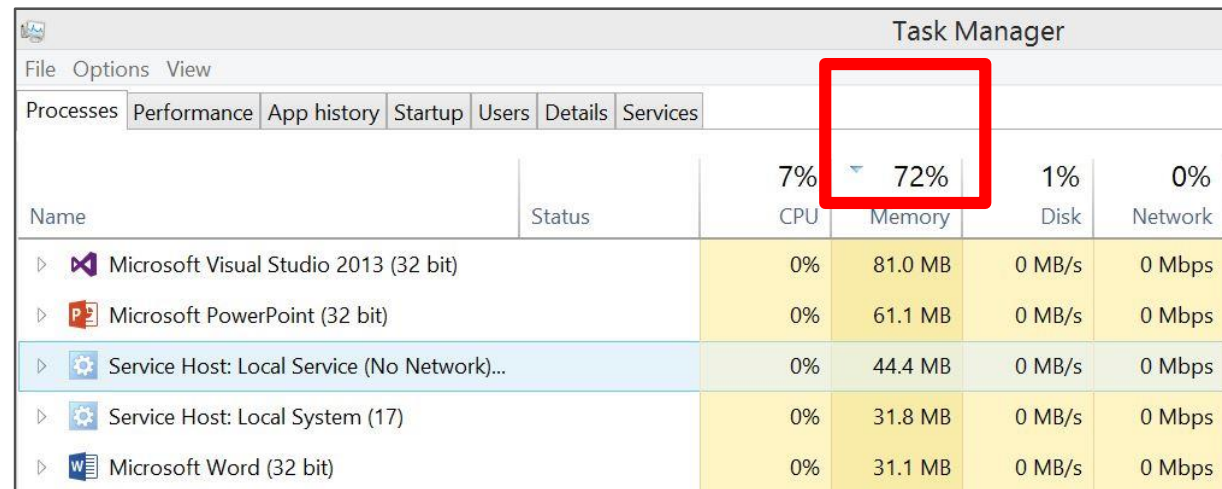


模拟器



模拟器错误

- Delete unused processes to free the total memory used.
- <http://support.microsoft.com/kb/2911380/en-us>



A screenshot of the Windows Task Manager Performance tab. The "Memory" section shows a usage of 72%, which is highlighted with a red rectangle. Below this, a table lists running processes with their CPU, Memory, Disk, and Network usage.

Name	Status	CPU	Memory	Disk	Network
Microsoft Visual Studio 2013 (32 bit)		0%	81.0 MB	0 MB/s	0 Mbps
Microsoft PowerPoint (32 bit)		0%	61.1 MB	0 MB/s	0 Mbps
Service Host: Local Service (No Network)...		0%	44.4 MB	0 MB/s	0 Mbps
Service Host: Local System (17)		0%	31.8 MB	0 MB/s	0 Mbps
Microsoft Word (32 bit)		0%	31.1 MB	0 MB/s	0 Mbps

部署错误

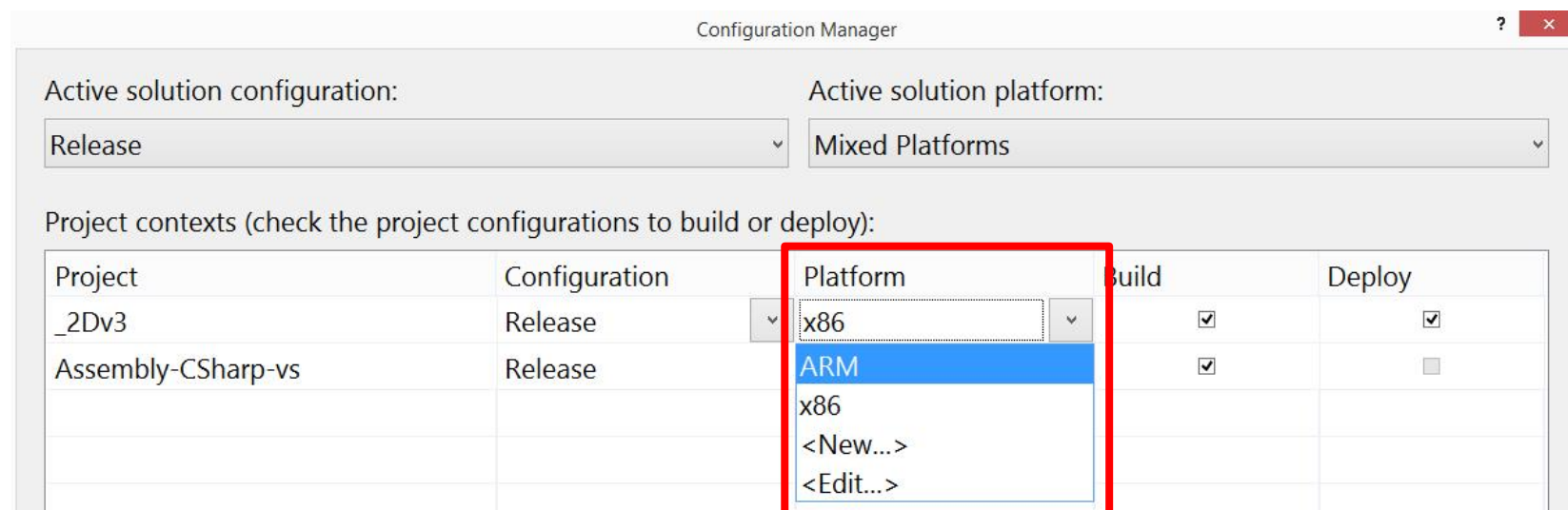
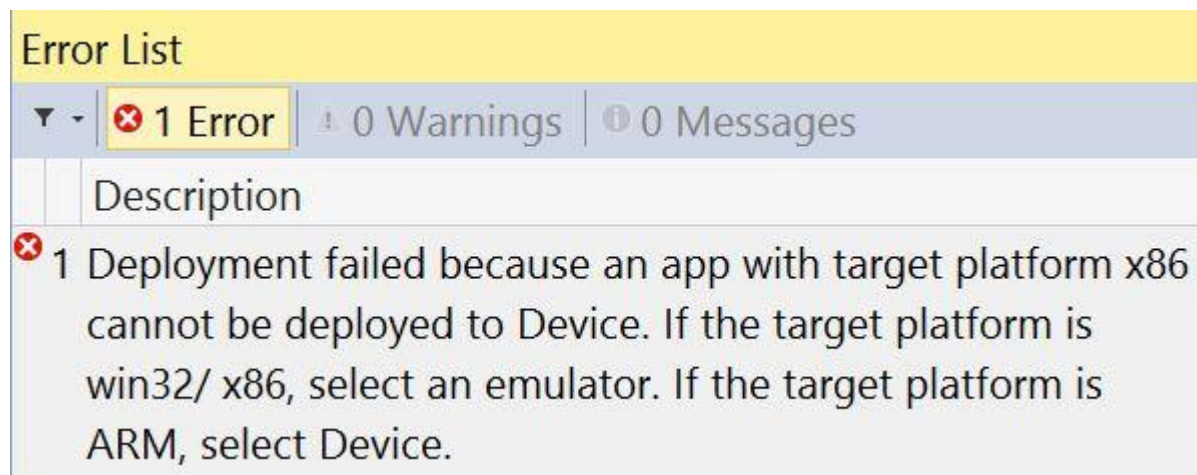
- 在手机上测试，点击绿色的Device：



- 如果爆发错误时：

- 解决方法：

- 选择ARM,手机用的processor
- 模拟器使用x86



C# .NET Framework

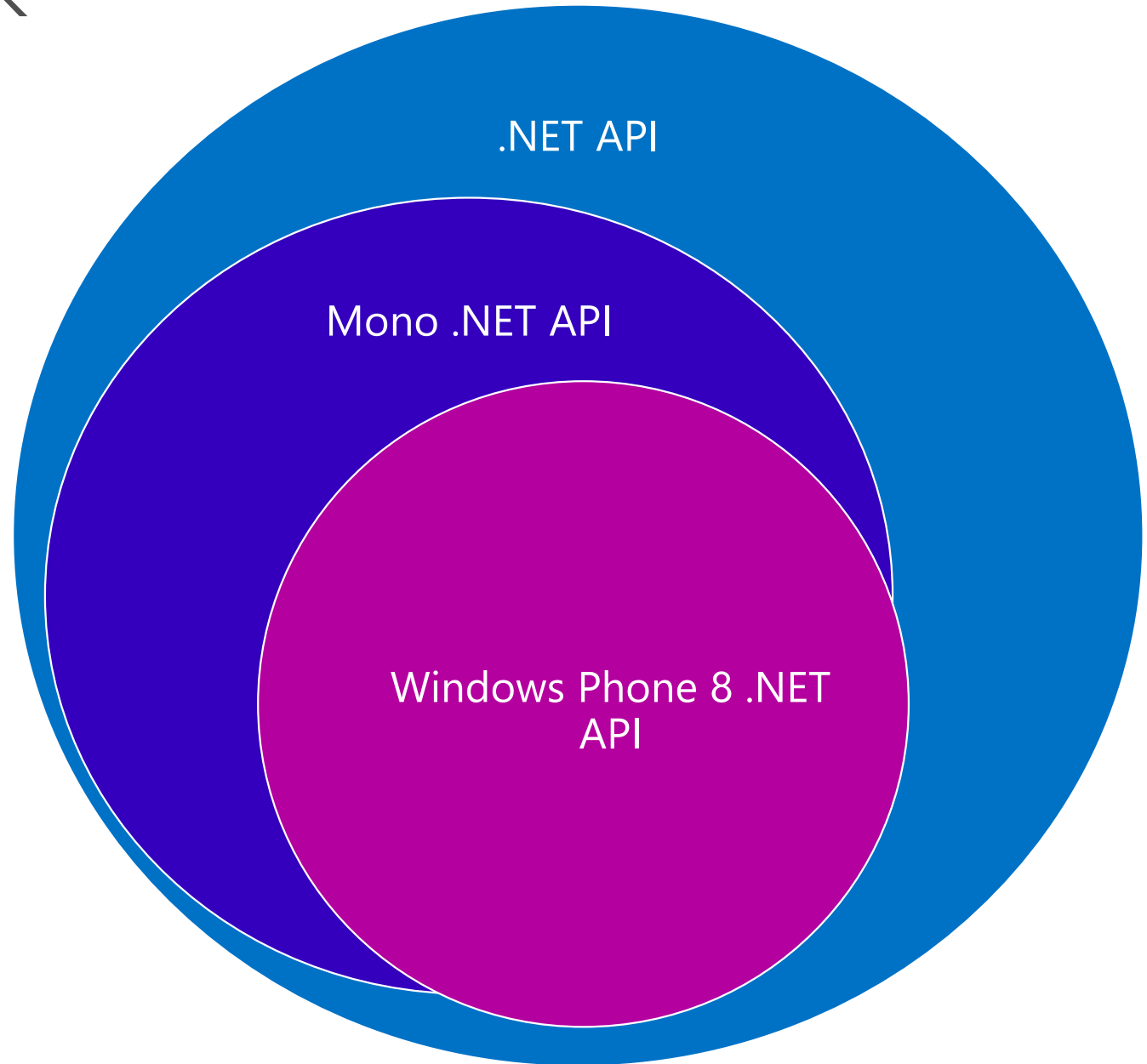
缺少的API?

Mono .NET

<https://github.com/mono/mono/tree/master/mcs/class/System/System.Net>

Windows Phone .NET

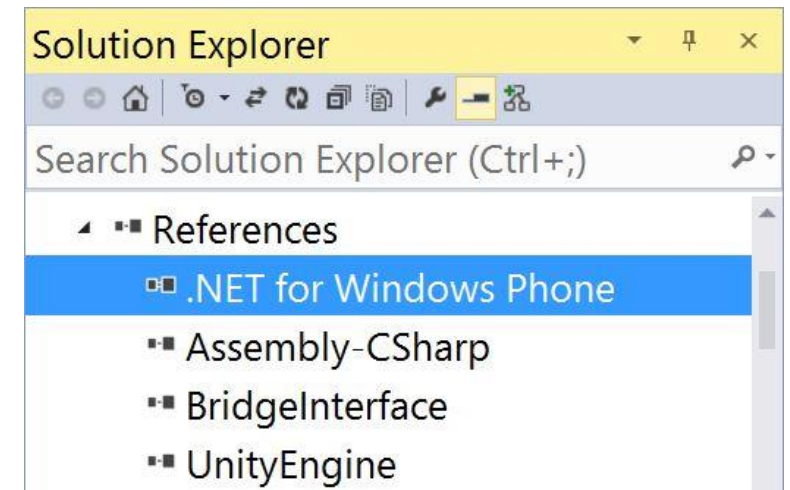
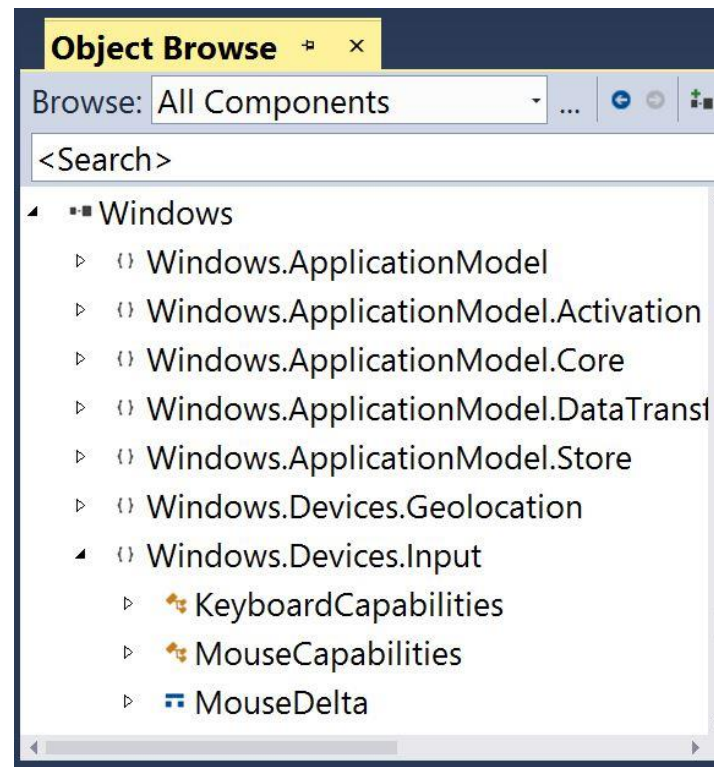
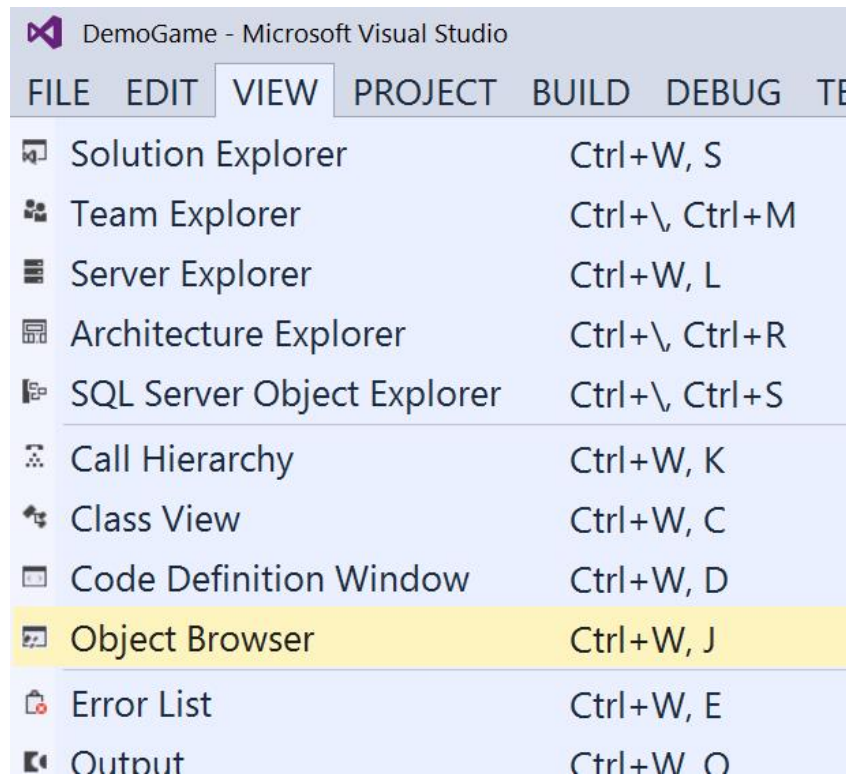
[http://msdn.microsoft.com/en-us/library/windowsphone/develop/jj207211\(v=vs.105\).aspx](http://msdn.microsoft.com/en-us/library/windowsphone/develop/jj207211(v=vs.105).aspx)



Windows Phone .NET API

For an easy method to view API references:

- Go to View ➔ Object Browser
- Or double-click .NET for Windows Phone in Solution Explorer



XML

- Available: Unity3D 4.3.3+, C# in Mono .NET
- Not Available: C# .NET for Windows Phone

- Namespace

`System.Xml.XmlDocument`

- Read XML file:

`XmlDocument.Load(file);`

<http://msdn.microsoft.com/en-us/library/system.xml.xmldocument.aspx>

XML

- Available: C# in Windows Phone 8
- Namespace

`System.Xml.Linq`

- Read XML file:

`XmlDocument.Load(file);`

<http://msdn.microsoft.com/en-us/library/system.xml.xmldocument.aspx>

XML

- Available: C# .NET for Windows Phone & Unity3D .NET for Mono

- Namespace:

`System.Xml.Serialization`

- Write to XMLfile:

```
TextWriter wr = new StreamWriter(file);  
Serialize(wr, data);
```

- Read XMLfile:

```
FileStream fs = new FileStream(file, FileMode.Open);  
Deserialize(fs);
```

<http://msdn.microsoft.com/en-us/library/system.xml.serialization.xmlserializer.aspx>

[http://wiki.unity3d.com/index.php?title=Saving and Loading Data: XmlSerializer](http://wiki.unity3d.com/index.php?title=Saving_and>Loading_Data:_XmlSerializer)

[http://wiki.unity3d.com/index.php/Save and Load from XML](http://wiki.unity3d.com/index.php/Save_and_Load_from_XML)

怎么解决API Missing的错误？

Solution 1: Unity Plugins

Solution 2: Action (void delegate):

Example: WindowsGateway.cs

Solution 3: Global instance:

Example: GameManager.cs

File IO Plugin: WP代码

```
public static async Task<string> CreateFile(StorageFolder folder, string name, string path, string contents)
{
    folder = await navigateFrom(folder, path);
    StorageFile file = await folder.CreateFileAsync(name, CreationCollisionOption.ReplaceExisting);

    using(IRandomAccessStream stream = await file.OpenAsync(FileAccessMode.ReadWrite))
    {
        using (DataWriter writer = new DataWriter(stream))
        {
            writer.WriteString(contents);
            await writer.StoreAsync();
        }
    }
    return file.Path;
}

public static void CreateFile(string filename, string content, string path = "")
{
    var task = FileHandling.CreateFile(ApplicationData.Current.LocalFolder, filename, path, content);
    task.Wait();
}
```

File IO Plugin: Unity 脚本

```
IEnumerator Start()
{
    WWW wwwBinary = new WWW("http://unityportinglab.azurewebsites.net/images/smallicon.png");
    yield return wwwBinary;
    if (wwwBinary.isDone)
    {
        byte[] fileBytes = wwwBinary.bytes;
        UnityPlugins.File.CreateFile("test.png", fileBytes, "Test");
    }
    WWW wwwText = new WWW("http://unityportinglab.azurewebsites.net/tilestemplateshort.xml");
    yield return wwwText;
    if (wwwText.isDone)
    {
        UnityPlugins.File.CreateFile("test.txt", wwwText.text, "Test/Test1");
    }
}
```

方向 Orientation

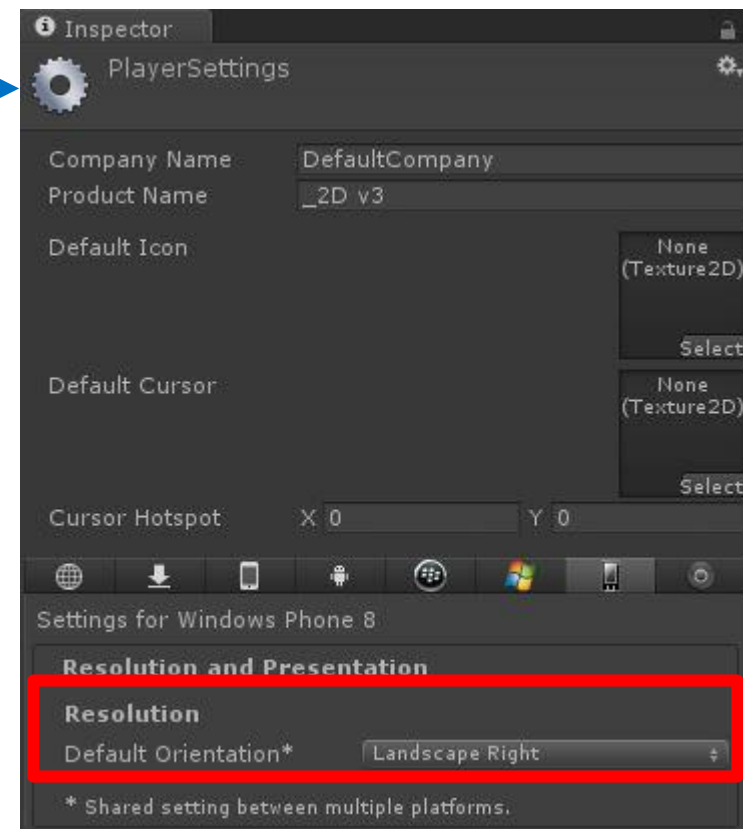
- Unity3D Player Settings

- Unity3D API 脚本：

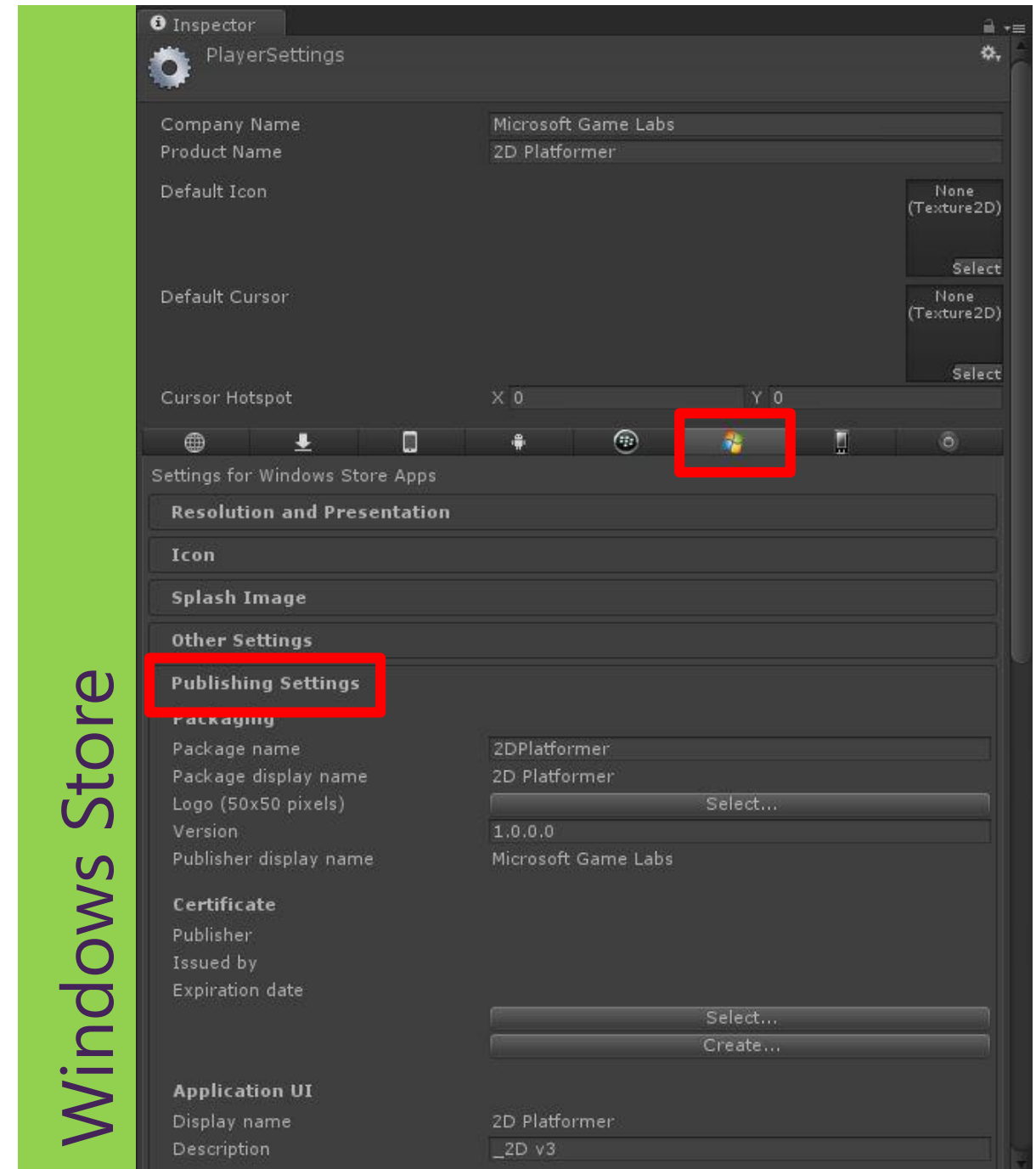
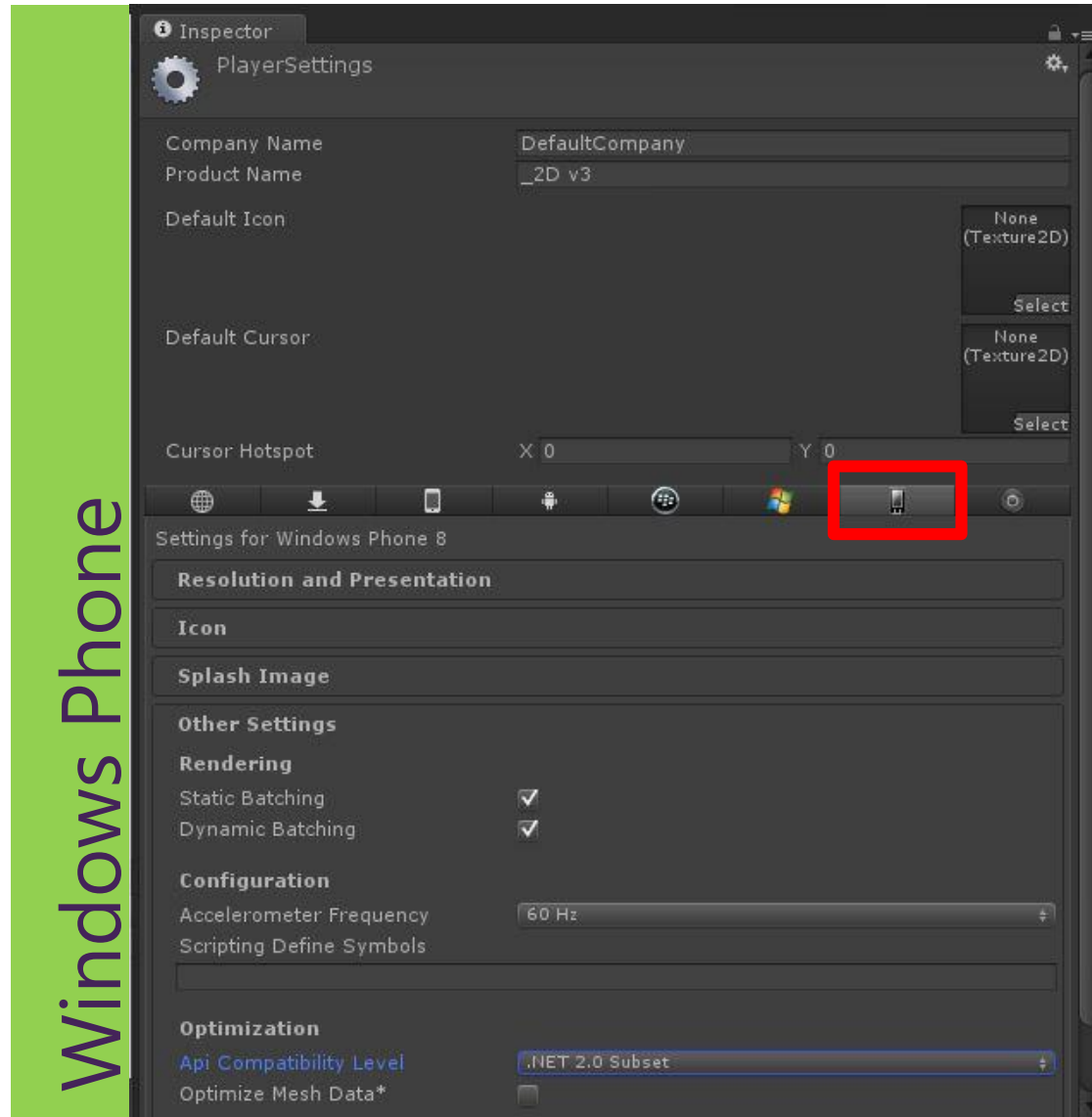
`Screen.orientation = ScreenOrientation.AutoRotation;`

- Windows Phone 工程: XAML代码

```
MainPage.xaml
<phone:PhoneApplicationPage
    x:Class="_2Dv3.MainPage"
    xmlns="http://schemas.microsoft.com/winfx/2006/xaml/presentation"
    xmlns:x="http://schemas.microsoft.com/winfx/2006/xaml"
    xmlns:phone="clr-namespace:Microsoft.Phone.Controls;assembly=Microsoft.Phone.Controls"
    xmlns:shell="clr-namespace:Microsoft.Phone.Shell;assembly=Microsoft.Phone.Shell"
    xmlns:d="http://schemas.microsoft.com/expression/blend/2008"
    xmlns:mc="http://schemas.openxmlformats.org/markup-compatibility/2006"
    mc:Ignorable="d"
    FontFamily="{StaticResource PhoneFontFamilyNormal}"
    FontSize="{StaticResource PhoneFontSizeNormal}"
    Foreground="{StaticResource PhoneForegroundBrush}"
    Orientation="Landscape"
    SupportedOrientations="Landscape"
    BackKeyPress="PhoneApplicationPage_BackKeyPress"
    OrientationChanged="PhoneApplicationPage_OrientationChanged">
```



Player Settings



内存

- 512 MB RAM for lower-memory WVGA devices
- 1 GB RAM for 720p devices
- 2 GB RAM for newer 4.5" WXGA devices, Nokia 1020
- Capabilities:
 - ID_FUNC_EXTENDED_MEM:
Unity default option for lower memory devices to run up to 180 MB
 - ID_REQ_MEMORY_300
To opt out of low memory devices

[http://msdn.microsoft.com/en-us/library/windowsphone/develop/jj681682\(v=vs.105\).aspx/html](http://msdn.microsoft.com/en-us/library/windowsphone/develop/jj681682(v=vs.105).aspx/html)

<http://forum.unity3d.com/threads/202952-Tips-and-Tricks-Make-sure-to-profile-your-phone-app-s-memory-usage!>

Code Time

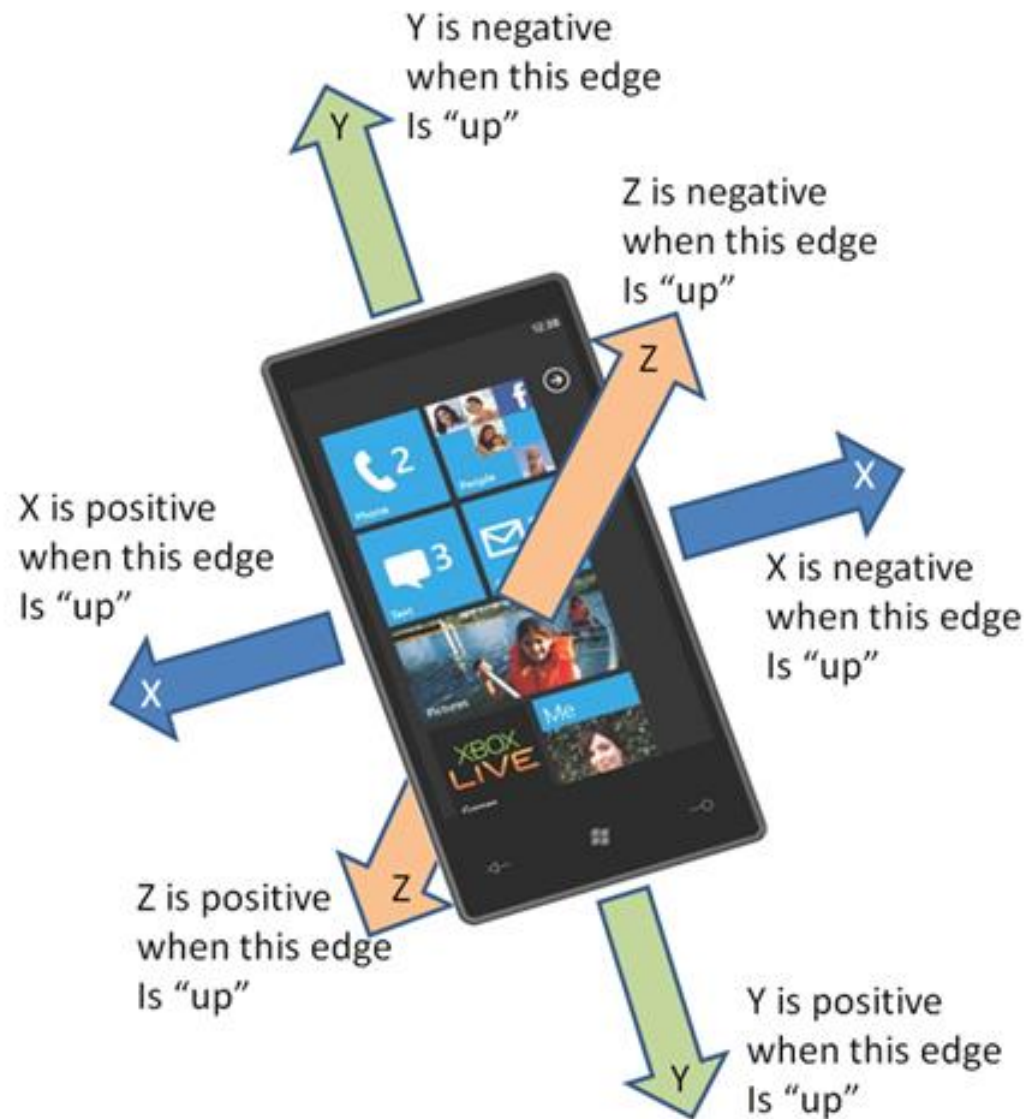
```
#if UNITY_WP8
```

```
#if UNITY_WINRT
```

```
#if (UNITY_WP8 && !UNITY_EDITOR )
```

```
#if (UNITY_WINRT && !UNITY_EDITOR )
```

重力感觉 Acceleromator



玩家动作

```
if(Application.platform == RuntimePlatform.WP8Player)
{
    MoveAmount = (PlayerSpeed * Input.acceleration.x)* Time.deltaTime;
    transform.Translate(Vector3.right * MoveAmount);
    MoveAmount = (PlayerSpeed * ((-Input.acceleration.z + 0.5f)*2)) * Time.deltaTime;
    transform.Translate(Vector3.forward * MoveAmount);
}
```

60 Hz = player movement

100 Hz = higher accuracy, higher battery usage

退后按钮

MainPage.xaml.cs

```
private void PhoneApplicationPage_BackKeyPress(object s, CancelEventArgs e)
{
    e.Cancel = UnityApp.BackButtonPressed();
    if (Main.GlobalManager != null)
    {
        string currentScene = Main.GlobalManager.CurrentScene;
        string urlXamlPage = "/Hud/" + currentScene + ".xaml";
        if (currentScene == "Main")
        {
            Main.GlobalManager.Quit();
        }
        else
        {
            NavigationService.Navigate(new Uri(urlXamlPage, UriKind.Relative));
        }
    }
}
```

退后按钮

```
public class Main : MonoBehaviour
{
    public static Main GlobalManager = null;
    private string mCurrentScene = "";
    public string CurrentScene
    {
        get { return this.mCurrentScene; }
        set { this.mCurrentScene = value; }
    }
    void Start ()
    {
        if (GlobalManager == null)
        {
            GlobalManager = this;
            CurrentScene = Application.loadedLevelName;
        }
    }
    void Quit ()
    {}
}
```

网络通信

Case 1: System.Net.WebClient

[http://msdn.microsoft.com/en-us/library/system.net.webclient\(v=vs.110\).aspx](http://msdn.microsoft.com/en-us/library/system.net.webclient(v=vs.110).aspx)

```
client = new WebClient();  
client.Headers.Set("opcode", "" + opcode);  
client.Headers.Set(KEY_GAME_SESSION, sessionId);  
client.UploadDataCompleted += new  
UploadDataCompletedEventHandler(uploadComplate);  
client.UploadDataAsync(uri, byteArray);
```

Not supported

网络通信

Case 2: System.Net.HttpWebRequest

```
// Create a new HttpWebRequest object.
```

```
HttpWebRequest request =  
(HttpWebRequest)WebRequest.Create("http://www.contoso.com/example.aspx");  
request.ContentType = "application/x-www-form-urlencoded";  
request.Method = "POST";
```

```
// start the asynchronous operation
```

```
request.BeginGetRequestStream(new AsyncCallback(GetRequestStreamCallback),  
request);
```

Not supported

网络通信

Case 3: Windows.Networking.Sockets

<http://msdn.microsoft.com/en-us/library/windows/apps/jj150599.aspx>

```
var socket = new StreamSocket();  
var writer = new DataWriter(socket.OutputStream);  
var reader = new DataReader(socket.InputStream);  
await socket.ConnectAsync(new HostName(uri.Host), "80");  
  
writer.WriteString(String.Format("GET {0} HTTP/1.1\r\nHost: {1}\r\n\r\n", uri.AbsolutePath, uri.Host));  
await writer.StoreAsync();  
  
var bytes = await reader.LoadAsync(numBytes);  
var response = reader.ReadString(bytes);  
socket.Dispose();
```

Supported!

网络通信

Case 4: Unity WWW

GET:

```
string url = "http://www.example.com";  
WWW www = new WWW(url);  
StartCoroutine(WaitForRequest(www));
```

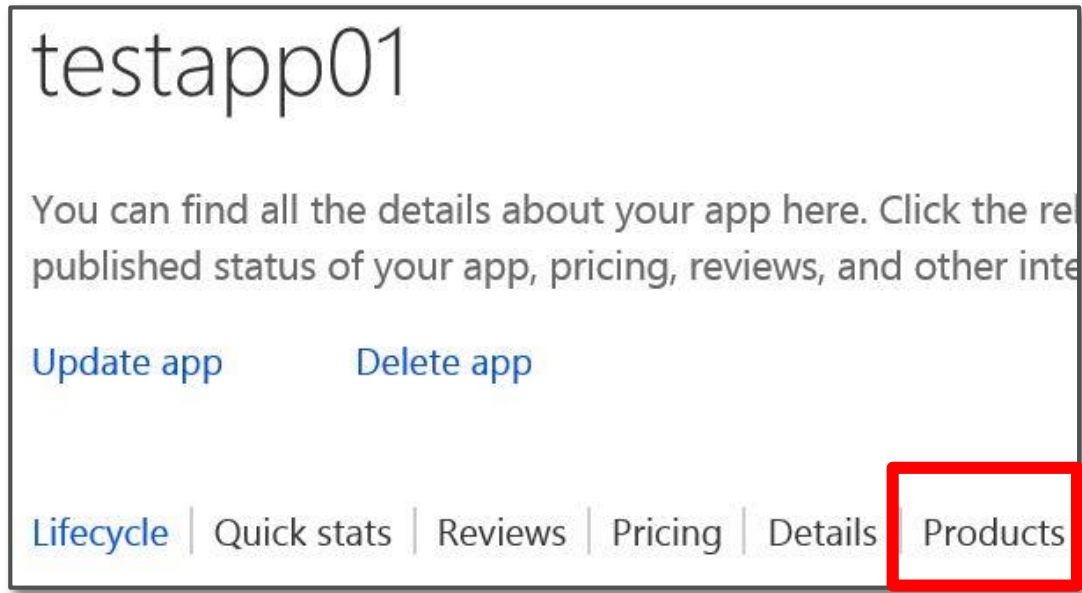
POST:

```
WWW wwwPost = new WWW(url);  
wwwPost.responseHeaders.Add("key", "value");  
StartCoroutine(WaitForRequest(www));
```

Supported!

应用内购买 IAP

- To create IAP, create an App, then add Products.
- Set App & Products to BETA mode with Price of \$0.00 for testing.
- Go to App's Details & copy Product Id to WMAppManifest.xml Packaging.
- Submit & wait ~2 hours

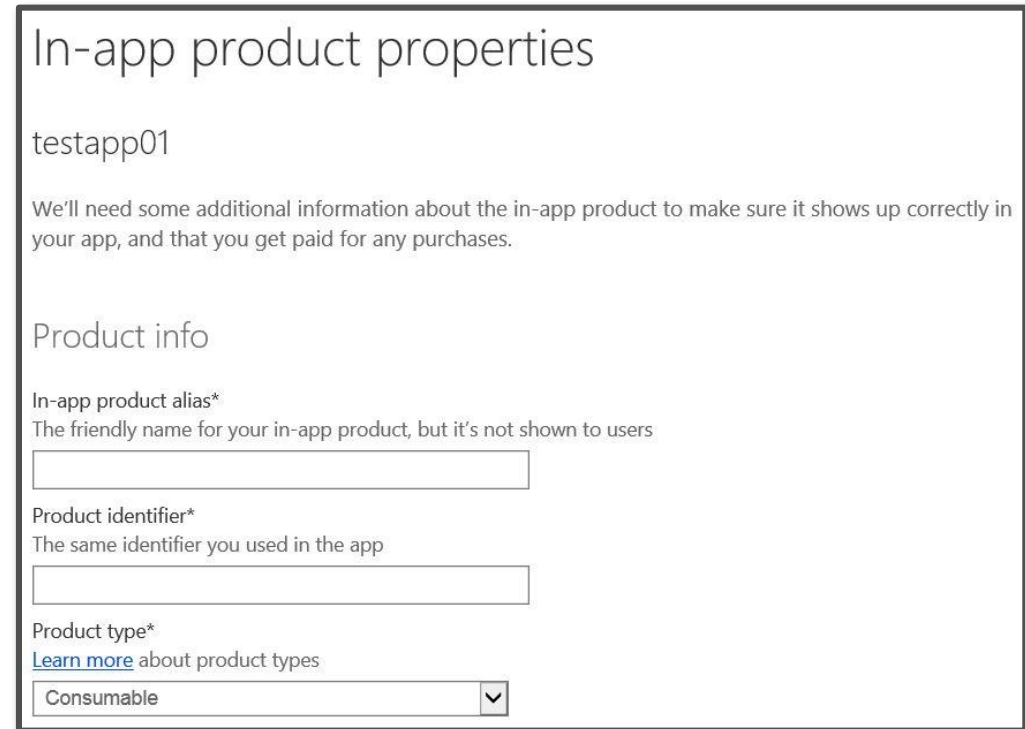


testapp01

You can find all the details about your app here. Click the relevant link to view the published status of your app, pricing, reviews, and other information.

[Update app](#) [Delete app](#)

[Lifecycle](#) | [Quick stats](#) | [Reviews](#) | [Pricing](#) | [Details](#) | **[Products](#)**



In-app product properties

testapp01

We'll need some additional information about the in-app product to make sure it shows up correctly in your app, and that you get paid for any purchases.

Product info

In-app product alias*
The friendly name for your in-app product, but it's not shown to users

Product identifier*
The same identifier you used in the app

Product type*
[Learn more](#) about product types

Consumable

<http://msdn.microsoft.com/en-us/library/windowsphone/develop/dn532254.aspx>

<http://visualstudiomagazine.com/articles/2013/07/01/in-app-purchasing-for-windows-phone-8.aspx>

应用内购买

For testing in DEBUG mode:

```
#if DEBUG
```

```
    using MockIAPLib;
```

```
    using Store = MockIAPLib;
```

```
#else
```

```
    using Store = Windows.ApplicationModel.Store;
```

```
#endif
```

[msdn.microsoft.com/en-us/library/windowsphone/develop/jj681689\(v=vs.105\).aspx](http://msdn.microsoft.com/en-us/library/windowsphone/develop/jj681689(v=vs.105).aspx)

<http://code.msdn.microsoft.com/wpapps/Mock-In-App-Purchase-33080f0c>

<http://www.getcodesamples.com/src/8B56394C/270573FF>

应用内购买

```
private const string PRODUCT_ID = "myIAPProductA";
```

```
Store.ListingInformation listInfo = await
```

```
Store.CurrentApp.LoadListingInformationAsync();
```

```
bool isPurchased =
```

```
Store.CurrentApp.LicenseInformation.ProductLicenses[PRODUCT_ID].IsActive;
```

应用内购买

- Enable in-app purchases from your app (XAML)

<http://msdn.microsoft.com/en-us/library/windowsphone/develop/dn532254.aspx>

- Enable in-app purchases of consumables (XAML)

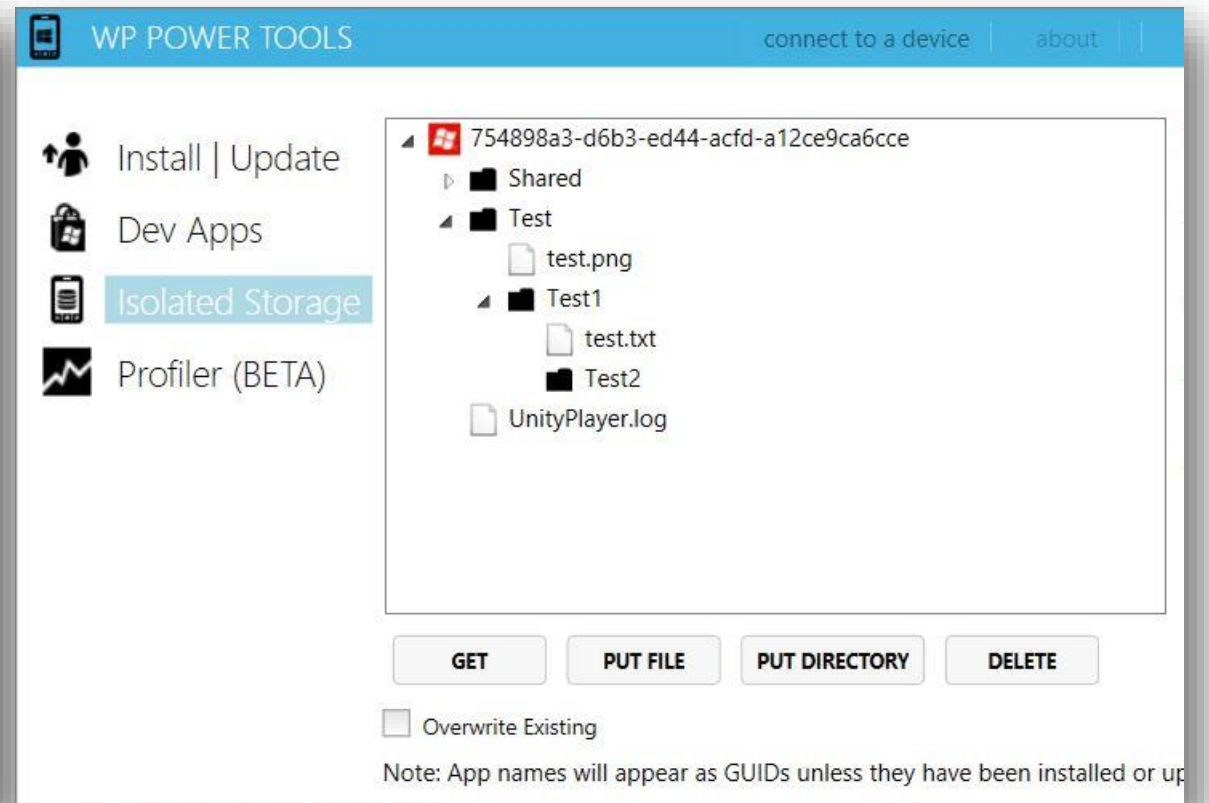
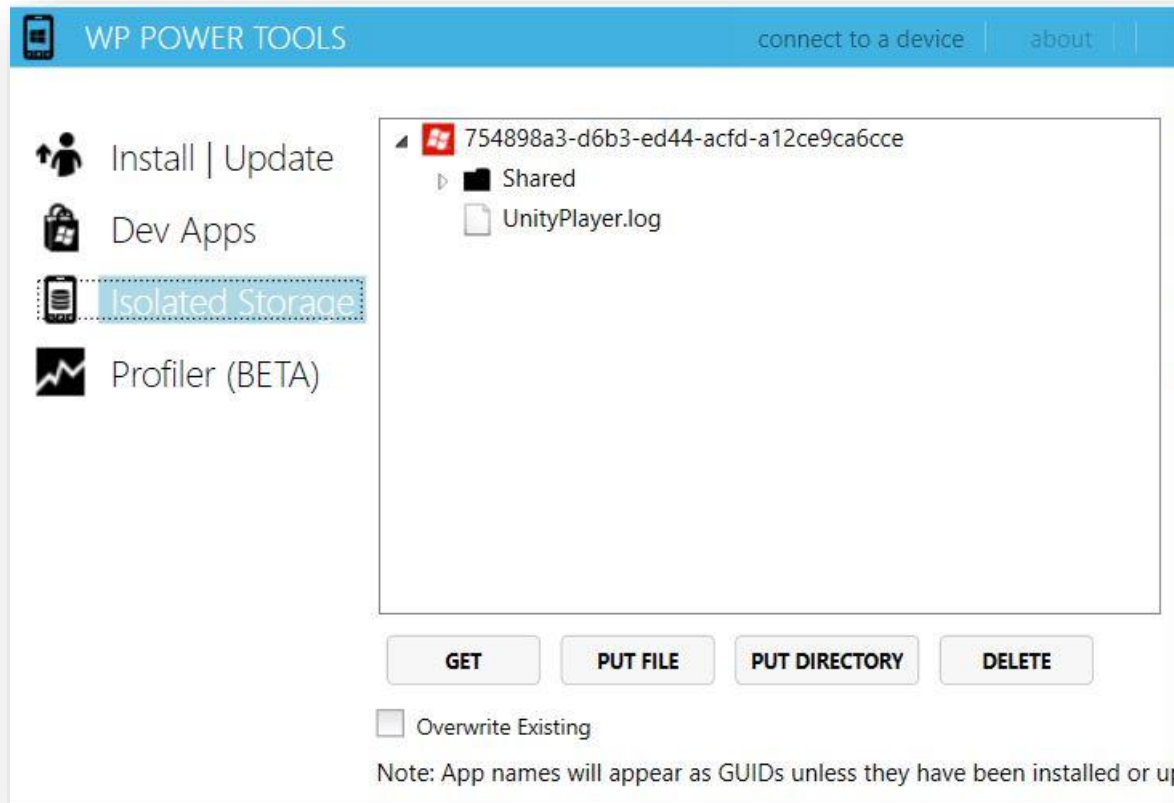
<http://msdn.microsoft.com/en-us/library/windowsphone/develop/dn532255.aspx>

- In-app purchases

<http://msdn.microsoft.com/library/windows/apps/hh694067>

System.IO

- File and Directory classes not supported.
- Create Unity plugins to access classes.
- Use Windows Phone Power Tools to view folders and files



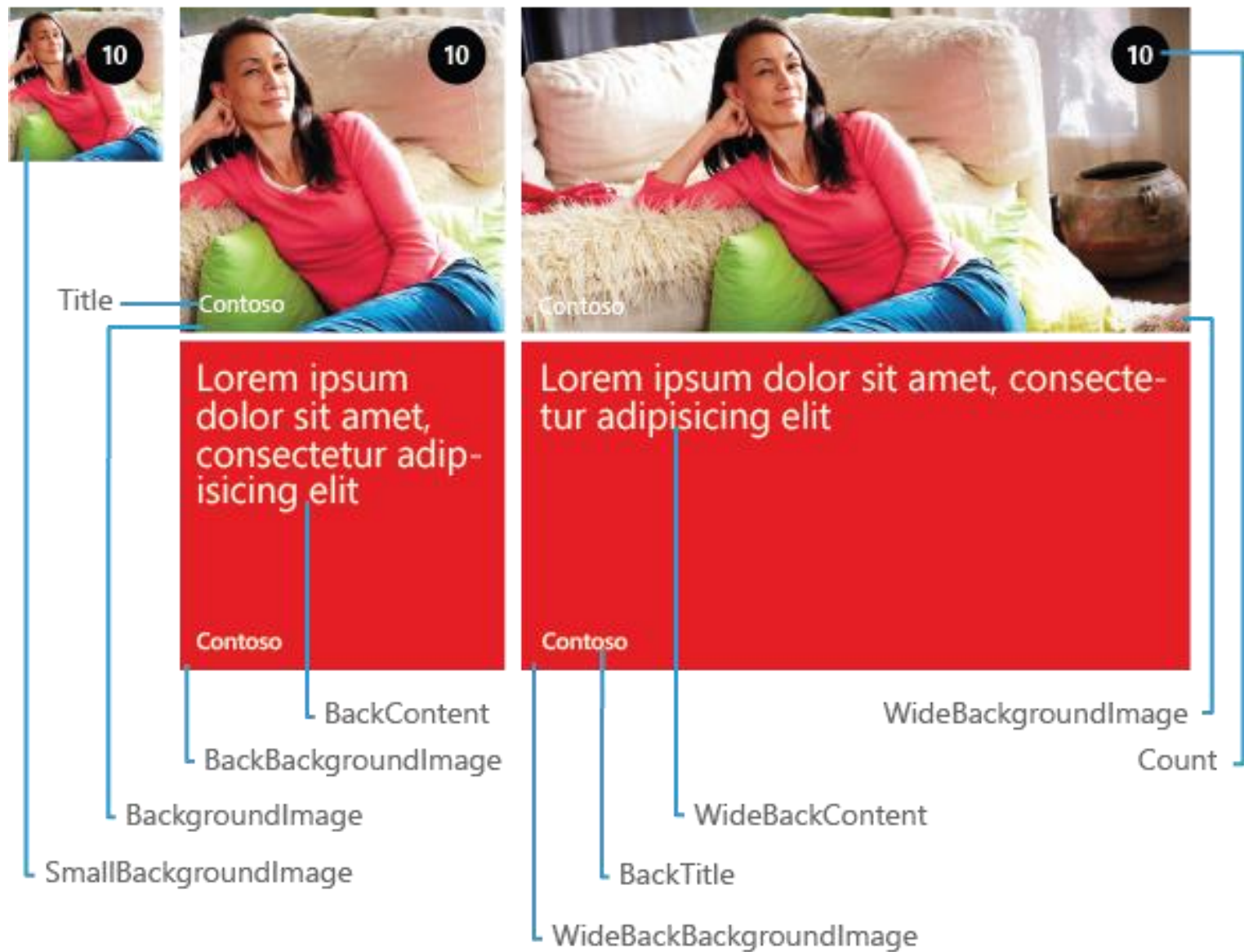
图块本地通知

- Scheduling options:
 - Update Tile once
 - Create a schedule to update a Tile indefinitely
 - Create a schedule to update a Tile for a specific number of times
 - Stop any schedule that is running
- Namespace: ShellTileSchedule

[http://msdn.microsoft.com/zh-cn/library/windowsphone/develop/jj207047\(v=vs.105\).aspx](http://msdn.microsoft.com/zh-cn/library/windowsphone/develop/jj207047(v=vs.105).aspx)

翻转图块模板

- Title
- Count
- BackContent
- WideBackContent
- SmallBackgroundImage
- BackgroundImage
- WideBackgroundImage
- BackBackgroundImage
- WideBackBackgroundImage



Tools

Developer Tools

<http://developer.windowsphone.com/en-us/getstarted/downloads>

Windows Phone Toolkit

<http://phone.codeplex.com/>

Coding4Fun Toolkit

<http://coding4fun.codeplex.com/>

Windows Phone Power Tools

<http://wptools.codeplex.com/>

Resources

Multi-resolution apps for Windows Phone 8

[http://msdn.microsoft.com/en-us/library/windowsphone/develop/jj206974\(v=vs.105\).aspx](http://msdn.microsoft.com/en-us/library/windowsphone/develop/jj206974(v=vs.105).aspx)

Introduction to multiple resolution support

[http://developer.nokia.com/community/wiki/Introduction to multiple-resolution support on Windows Phone 8 apps](http://developer.nokia.com/community/wiki/Introduction_to_multiple-resolution_support_on_Windows_Phone_8_apps)

Command Line Prompts

<https://docs.unity3d.com/Documentation/Manual/CommandLineArguments.html>

Getting Started Tutorials

2014 Building Your First Windows Game with Unity

<http://channel9.msdn.com/Events/Build/2014/2-503>

Unity3D WP8 Examples

<https://docs.unity3d.com/Documentation/Manual/wp8-examples.html>

Nokia Community

[http://developer.nokia.com/community/wiki/Getting Started with Unity 3D on Windows Phone](http://developer.nokia.com/community/wiki/Getting_Started_with_Unity_3D_on_Windows_Phone)

Microsoft Virtual Academy: Porting Unity Games to Windows 8.1 & Windows Phone 8

<http://www.microsoftvirtualacademy.com/training-courses/porting-unity-games-to-windows-8-1-windows-phone>

Porting Unity Games

<http://unity3d.com/pages/windows/porting>

Code Kwondo: Closer Look at Unity

<http://channel9.msdn.com/Events/Developer-Movement/UnityAndGaming/Part1>

Getting Started on Windows Store with Unity

<http://az527613.vo.msecnd.net/wpchallengefiles/GettingStartedWindowsStoreUnity01.pdf>

Building Windows Games with Unity

<http://channel9.msdn.com/Events/Windows-Camp/Building-Windows-Games-with-Unity>