1010 ENEI || Xamarin Workshop

1010ENEI

Scope

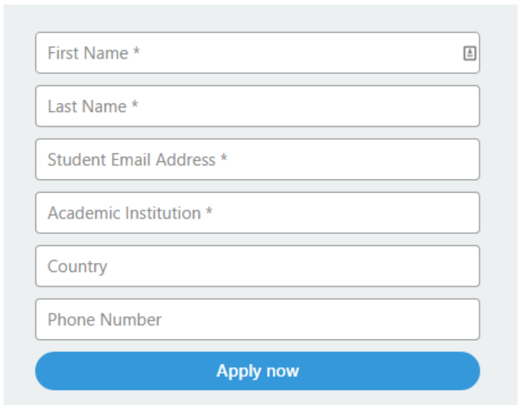
This workshop will be realized in 1010 ENEI at University of Coimbra (Portugal), March 28th 2015.

The Portuguese National Meeting of IT Students (ENEI) is an annual event which main goal is to gather the national IT student community for a few days. ENEI was designed to allow access to new knowledge as well as to promote the sharing of experience, networking and fun activities. The 10th edition will take place this year (2015) in Coimbra, from the 27th to 30th of March.

In this Xamarin Workshop, you will learn what's Xamarin and its products, how to create mobile cross-platform applications, using Xamarin, for Android, iOS and Windows. You will learn the two patterns most used in this kind of applications and at the end you will create your own 1010 ENEI Sessions App.

Requirements

You should get your own Xamarin Student License for free in xamarin.com/student.



First Name *

Last Name *

Student Email Address *

Academic Institution *

Country

Phone Number

If you are portuguese, you can read the portuguese article in Programar EMagazine: "Xamarin: Sem custos para estudantes".

Each student should:

- Have a Windows or a Mac device;
- Install Xamarin Studio;
- Install Xamarin IOS and/or Xamarin Android

- Install Xamarin Android Player or Genymotion
- Install Visual Studio Community 2013
- Install Windows Phone 8.1 SDK and Windows SDK for Windows 8.1

Note:

1. If you have a Windows device you can create Windows and Android applications. To create iOS applications is always required a Mac, and in this case you can create iOS and Android application using Xamarin Studio. With a Mac and Windows running in Parallels or VMware is possible to create the three targets at the same time (but is required a Windows Phone device to do the deploy!).
2. Xamarin Plugin for Visual Studio in only available for Business plan and for developers that participate in Open Source projects.

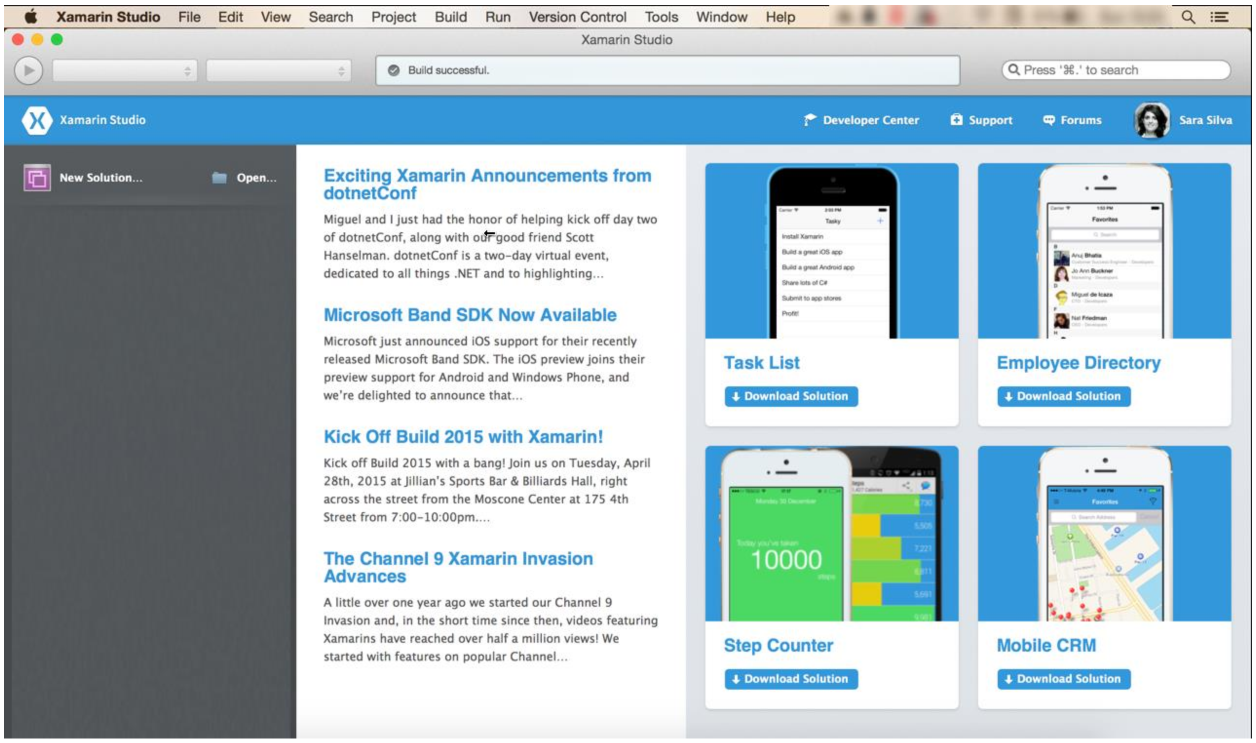
Guides

1. Create a Xamarin Forms project

The application you will create is a Xamarin Forms application, based in Portable Class Library project.

Using Xamarin Studio in Mac

Start by opening the Xamarin Studio as described in figure 1



Build successful.

Exciting Xamarin Announcements from dotnetConf

Miguel and I just had the honor of helping kick off day two of dotnetConf, along with our good friend Scott Hanselman. dotnetConf is a two-day virtual event, dedicated to all things .NET and to highlighting...

Microsoft Band SDK Now Available

Microsoft just announced iOS support for their recently released Microsoft Band SDK. The iOS preview joins their preview support for Android and Windows Phone, and we're delighted to announce that...

Kick Off Build 2015 with Xamarin!

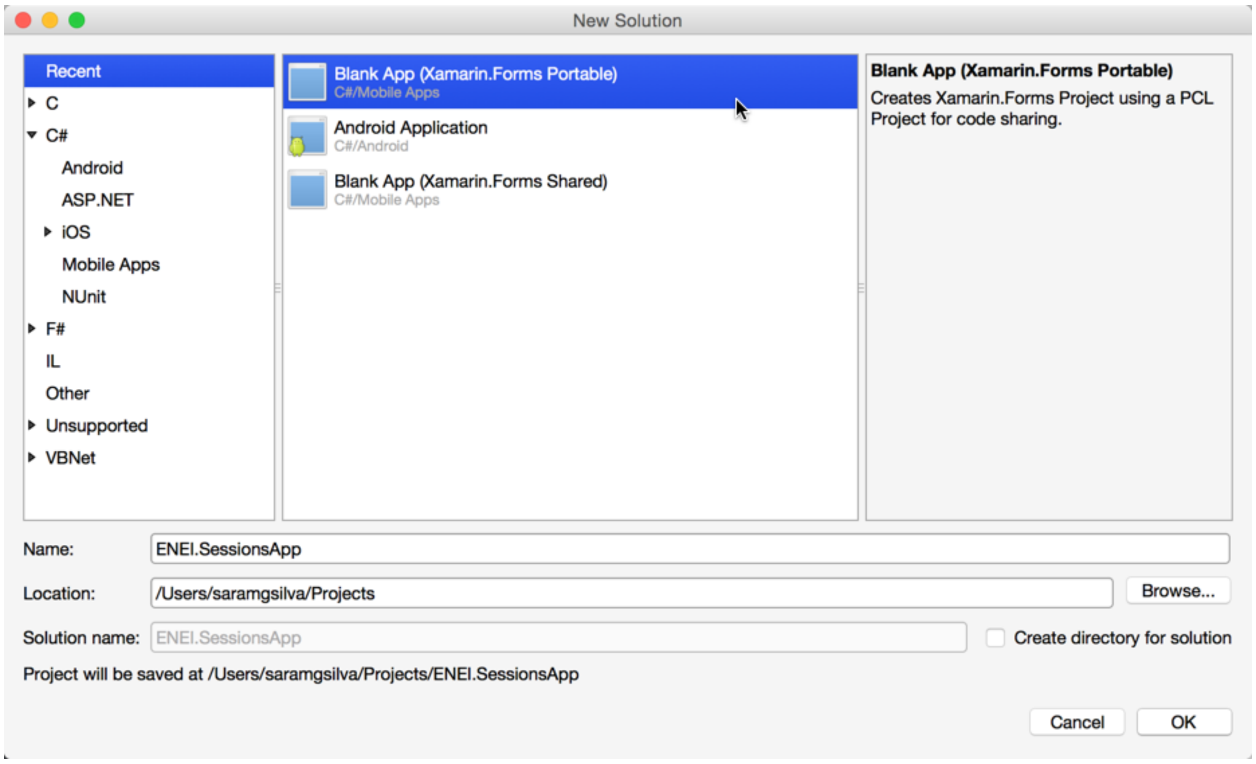
Kick off Build 2015 with a bang! Join us on Tuesday, April 28th, 2015 at Jillian's Sports Bar & Billiards Hall, right across the street from the Moscone Center at 175 4th Street from 7:00-10:00pm....

The Channel 9 Xamarin Invasion Advances

A little over one year ago we started our Channel 9 Invasion and, in the short time since then, videos featuring Xamarins have reached over half a million views! We started with features on popular Channel...

Figure 1: Xamarin Studio in a Mac

Then create a new Blank App (Xamarin Forms Portable), as following:



Blank App (Xamarin.Forms Portable)

Creates Xamarin.Forms Project using a PCL Project for code sharing.

Name: ENEI.SessionsApp

Location: /Users/saramgsilva/Projects

Solution name: ENEI.SessionsApp

☐ Create directory for solution

Project will be saved at /Users/saramgsilva/Projects/ENEI.SessionsApp

Figure 2: Creating a Blank App (Xamarin Forms Portable)

Which result will be something as described in Figure 3:

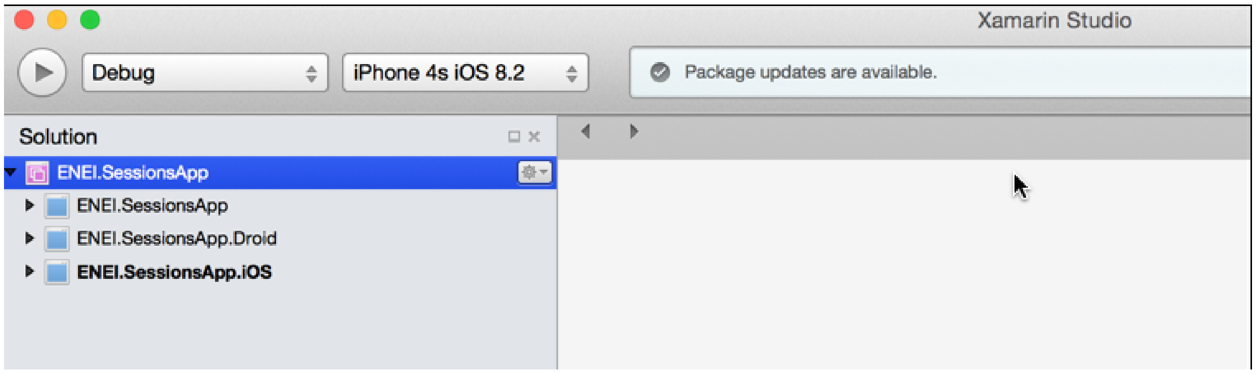


Figure 3: The ENEI.SessionsApp solution

The **ENEI.SessionApp solution** is defined by three projects:

- **ENEI.SessionsApp**: portable class library project, which will contain the shared code between targets. This project is independent of the platform;
- **ENEI.SessionsApp.Droid:** Xamarin Android project, which define the Android application and knows the Android API;
- **ENEI.SessionsApp.iOS:** Xamarin iOS project, which define the iOS application and knows the iOS API;

Now, you should update the Nuget Packages available in project. In the case described in figure 4, you only need to update the Xamarin Forms Nuget Package:

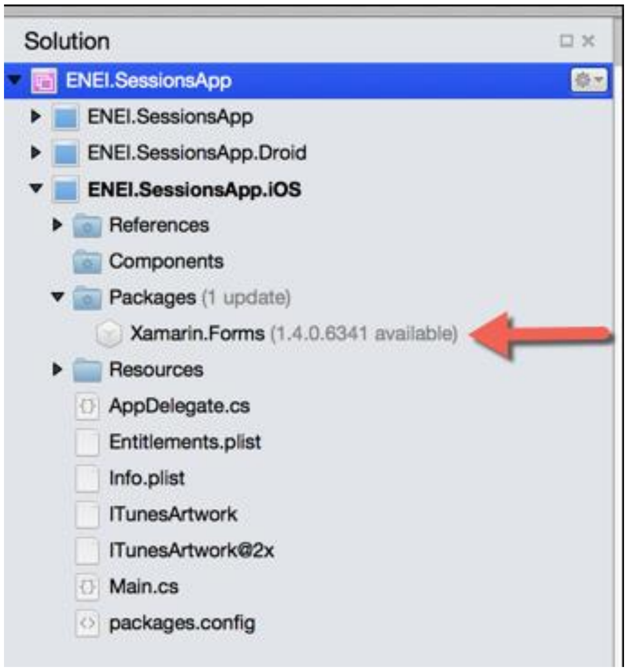


Figure 4: Xamarin Forms Nuget package to update in iOS application

To update this package you only need to open the context menu, doing a right click with the mouse and then click "Update", as described in Figure 5:

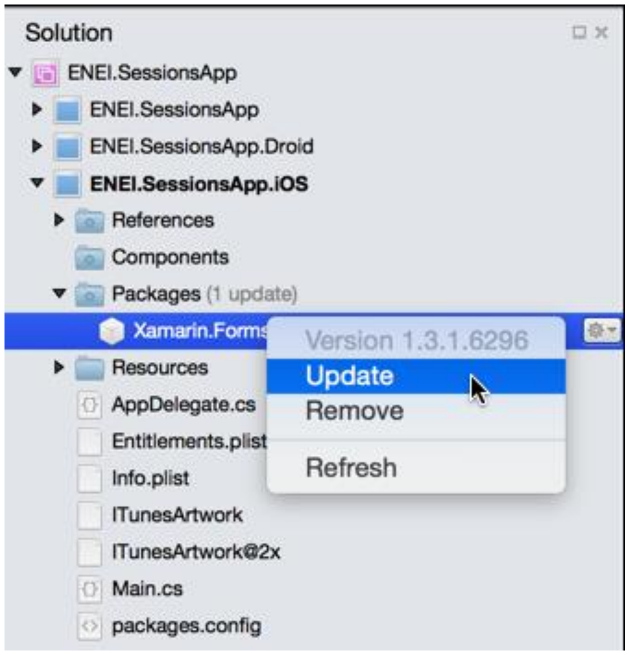


Figure 5: Updating Nuget packages

The result will be

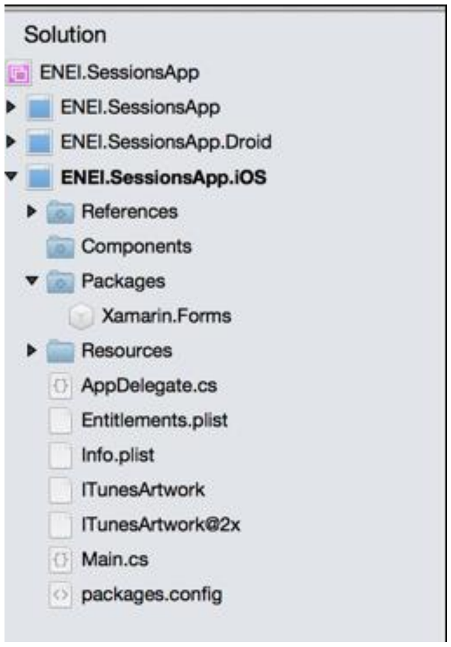
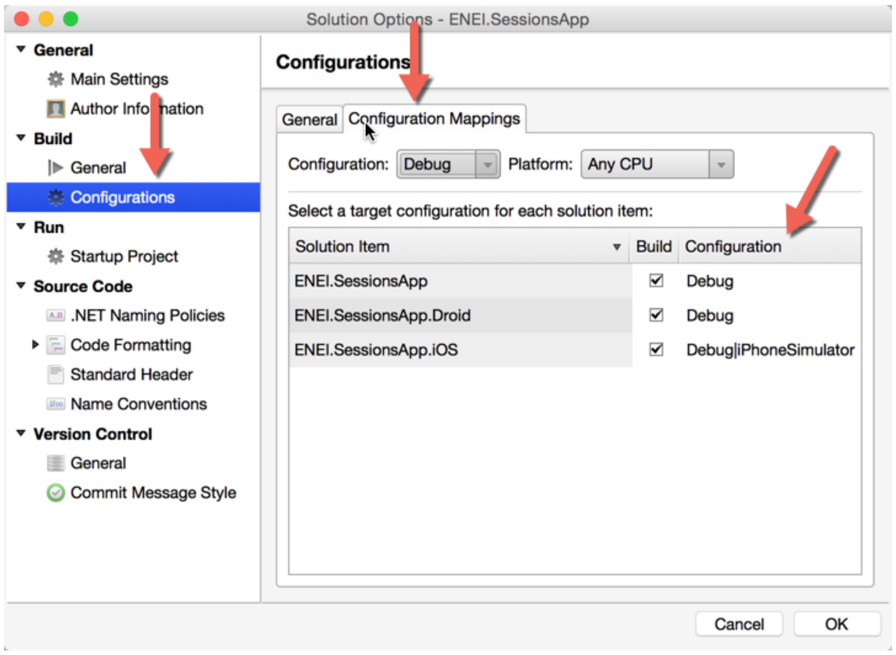


Figure 6: iOS project updated

You need to do the same in the others projects, if needed.

Before run the application, you should select the solution and define the configurations, as following:



Configurations

General | Configuration Mappings

Configuration: Debug Platform: Any CPU

Select a target configuration for each solution item:

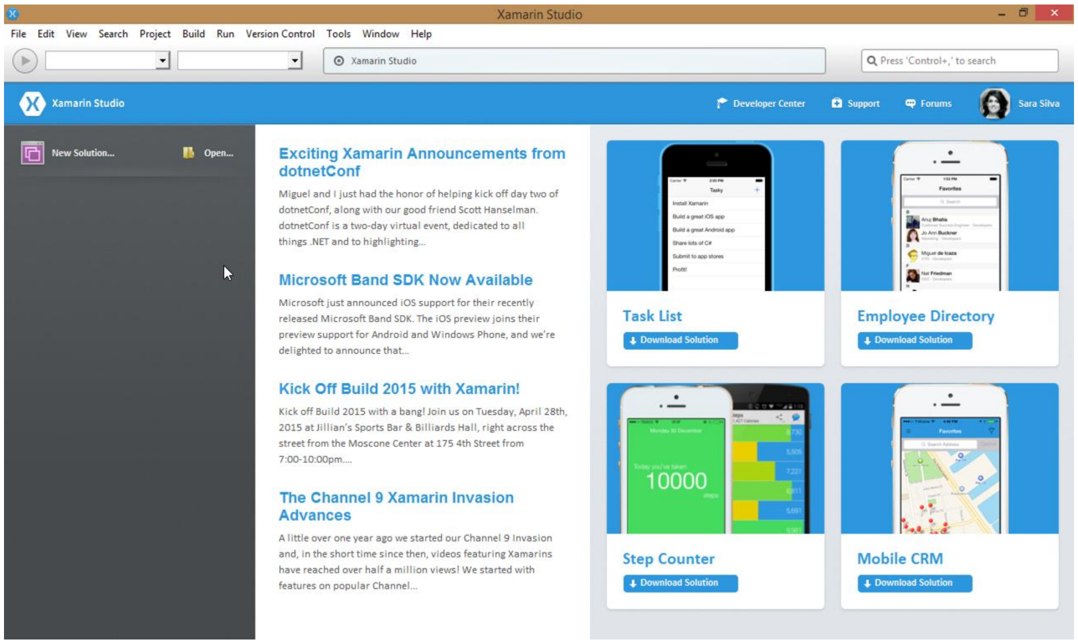
Solution Item	Build	Configuration
ENEI.SessionsApp	✓	Debug
ENEI.SessionsApp.Droid	✓	Debug
ENEI.SessionsApp.iOS	✓	Debug|iPhoneSimulator

Figure 7: Configuration Properties

Wowwww, now you are ready to create your 1010 ENEI Session app!

Using Xamarin Studio in Windows

Start by opening the Xamarin Studio as described in figure 8:



Exciting Xamarin Announcements from dotnetConf

Miguel and I just had the honor of helping kick off day two of dotnetConf, along with our good friend Scott Hanselman. dotnetConf is a two-day virtual event, dedicated to all things .NET and to highlighting...

Microsoft Band SDK Now Available

Microsoft just announced iOS support for their recently released Microsoft Band SDK. The iOS preview joins their preview support for Android and Windows Phone, and we're delighted to announce that...

Kick Off Build 2015 with Xamarin!

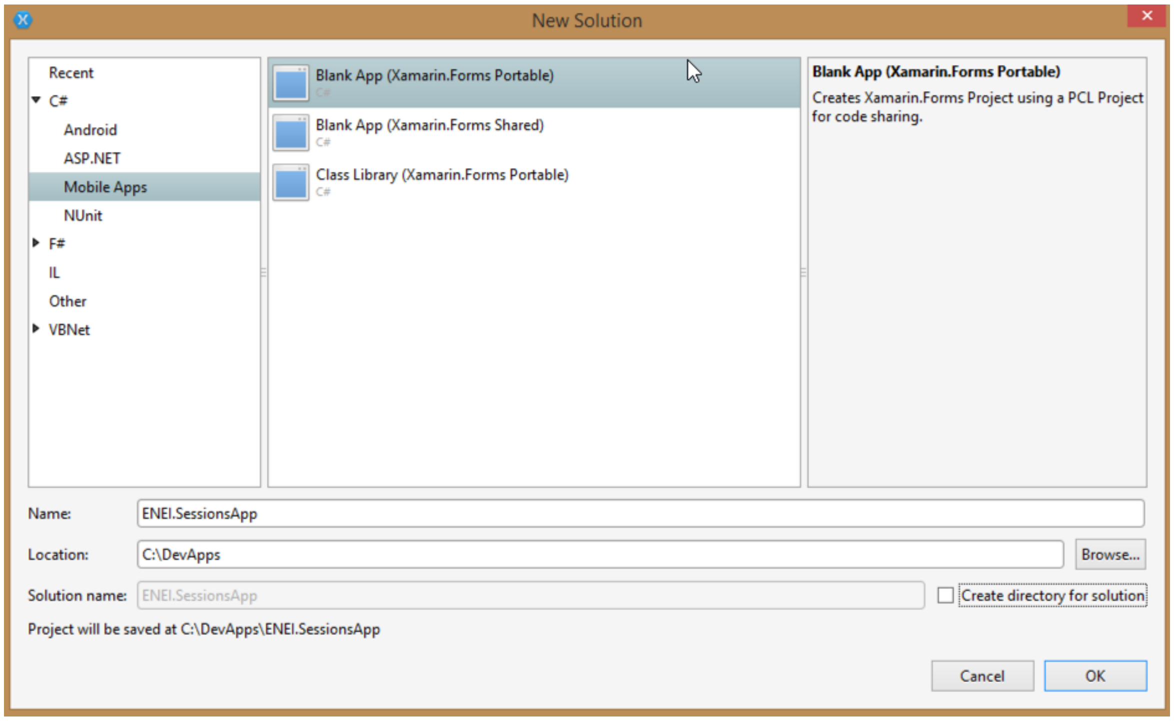
Kick off Build 2015 with a bang! Join us on Tuesday, April 28th, 2015 at Jillian's Sports Bar & Billiards Hall, right across the street from the Moscone Center at 175 4th Street from 7:00-10:00pm....

The Channel 9 Xamarin Invasion Advances

A little over one year ago we started our Channel 9 Invasion and, in the short time since then, videos featuring Xamarins have reached over half a million views! We started with features on popular Channel...

Figure 8: Xamarin Studio in Windows

Then create a new Blank App (Xamarin Forms Portable), as described in the following figure:

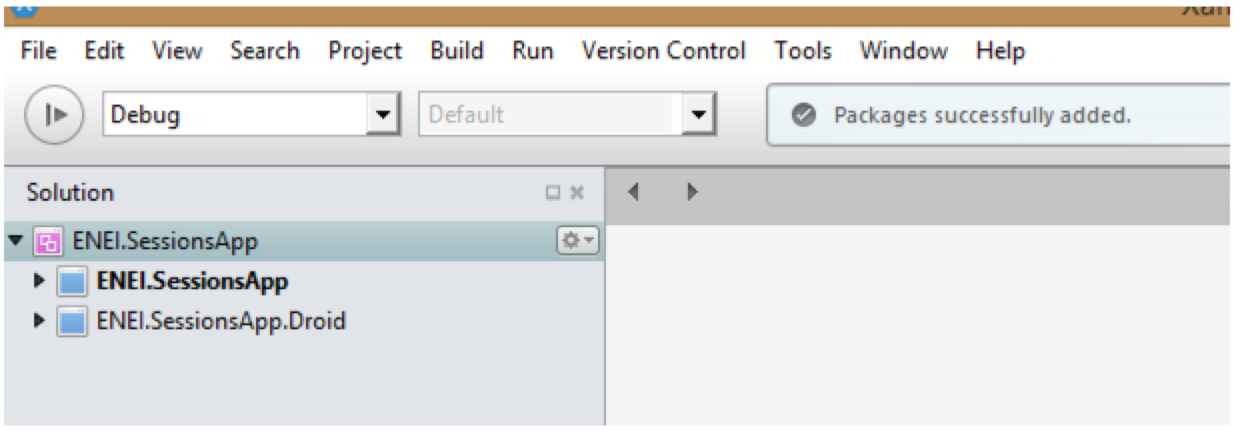

New Solution
Recent
C#
Android
ASP.NET
Mobile Apps
NUnit
F#
IL
Other
VBNet
Blank App (Xamarin.Forms Portable)
Blank App (Xamarin.Forms Shared)
Class Library (Xamarin.Forms Portable)
Browse...
Cancel
OK

Blank App (Xamarin.Forms Portable)
Creates Xamarin.Forms Project using a PCL Project for code sharing.

Name: ENEI.SessionsApp
Location: C:\DevApps
Solution name: ENEI.SessionsApp
[ ] Create directory for solution
Project will be saved at C:\DevApps\ENEI.SessionsApp

Figure 9: Creating a Blank App (Xamarin Forms Portable)

The result will be something as described in figure 10:



Packages successfully added.

Figure 10: The ENEI.SessionsApp solution

The **ENEI.SessionApp solution** is defined by two projects:

- **ENEI.SessionsApp**: portable class library project, which will contain the shared code between targets. This project is independent of the platform;
- **ENEI.SessionsApp.Droid:** Xamarin Android project, which define the Android application and knows the Android API;

Now, you should update the Nuget Packages available in the project. In the case described in figure 11, you only need to update the Xamarin Forms Nuget package and the Xamarin.Android.Support.v4 Nuget package:

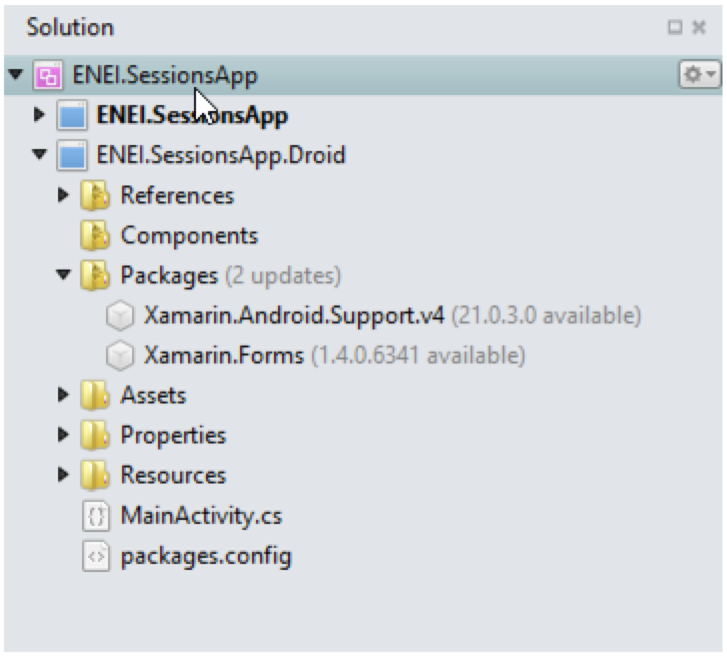


Figure 11: Nuget packages to update in Android application

To update this package you only need to open the context menu, doing a right click with the mouse and then click “Update”, as described in figure 12:

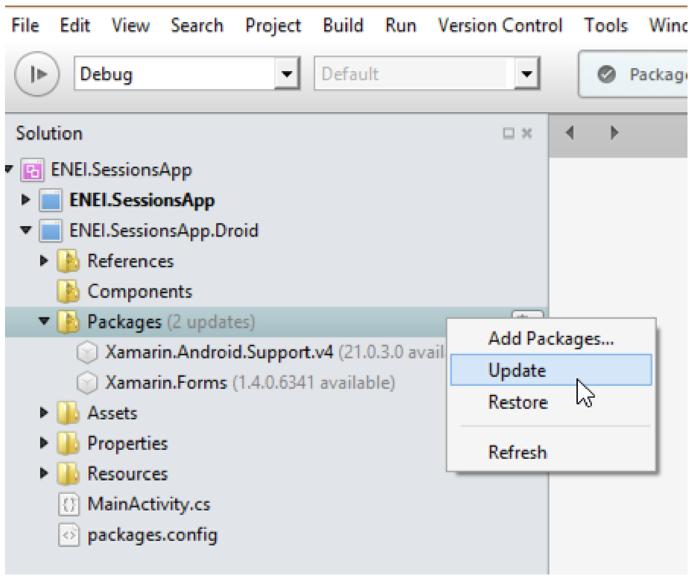


Figure 12: Updating Nuget packages

The result will be

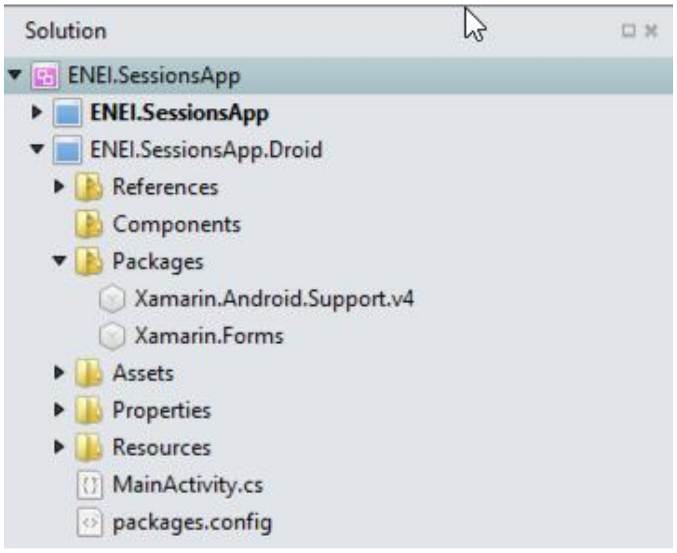

Solution
- ENEI.SessionsApp
  - ENEI.SessionsApp
  - ENEI.SessionsApp.Droid
    - References
    - Components
    - Packages
      - Xamarin.Android.Support.v4
      - Xamarin.Forms
    - Assets
    - Properties
    - Resources
    - MainActivity.cs
    - packages.config

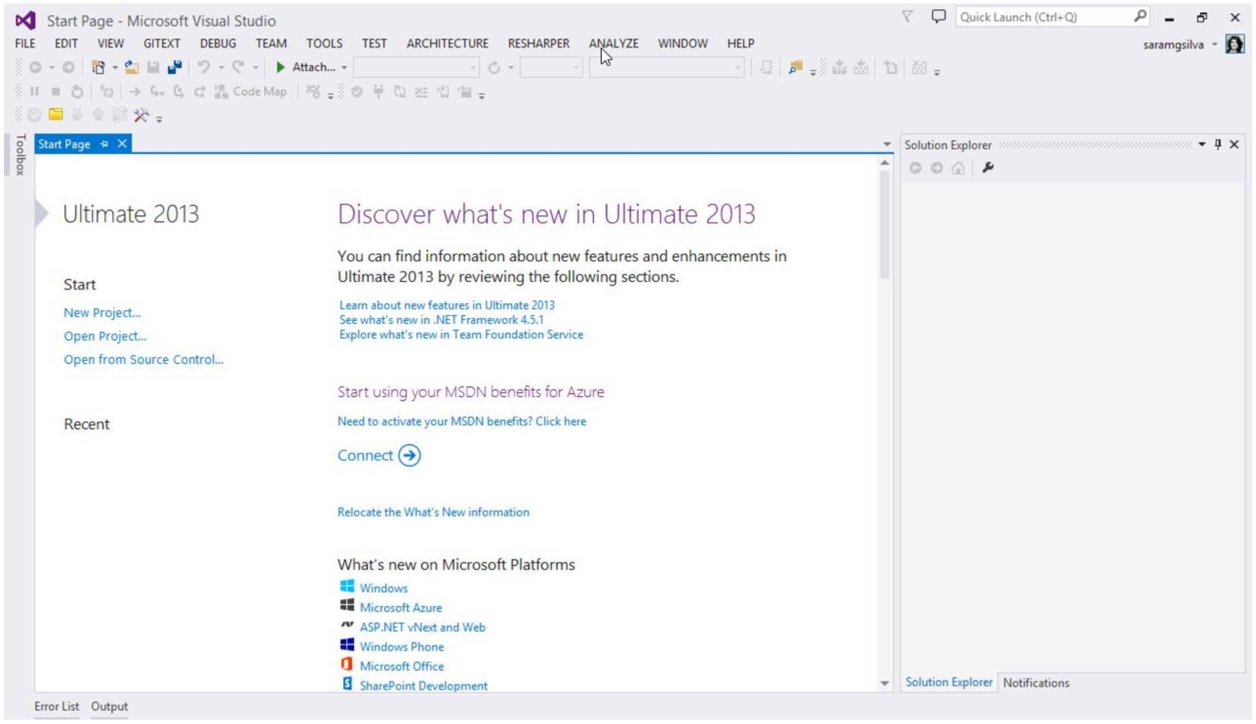
Figure 13: Android project updated

You need to do the same in the other project, if needed.

Wowwww, now you are ready to create your 1010 ENEI Session app!

Using Visual Studio in Windows

Start by opening the Visual Studio as described in figure 14



Start Page - Microsoft Visual Studio
Quick Launch (Ctrl+Q)
FILE EDIT VIEW GITEXT DEBUG TEAM TOOLS TEST ARCHITECTURE RESHARPER ANALYZE WINDOW HELP
saramgsilva
Attach...
Code Map
Toolbox
Start Page
Solution Explorer
Error List Output
Solution Explorer Notifications

Ultimate 2013

Start

New Project...

Open Project...

Open from Source Control...

Recent

Discover what's new in Ultimate 2013

You can find information about new features and enhancements in Ultimate 2013 by reviewing the following sections.

Learn about new features in Ultimate 2013

See what's new in .NET Framework 4.5.1

Explore what's new in Team Foundation Service

Start using your MSDN benefits for Azure

Need to activate your MSDN benefits? Click here

Connect

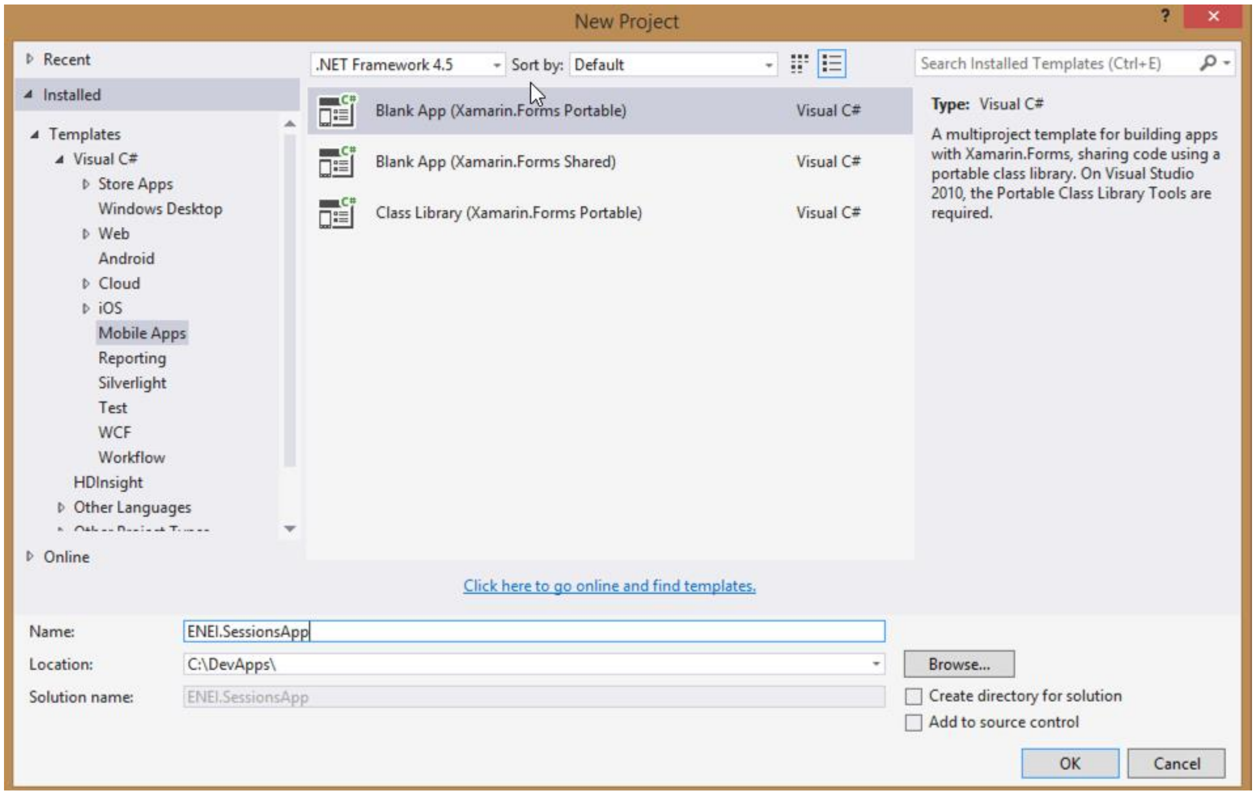
Relocate the What's New information

What's new on Microsoft Platforms

- Windows
- Microsoft Azure
- ASP.NET vNext and Web
- Windows Phone
- Microsoft Office
- SharePoint Development

Figure 14: Visual Studio 2013

And then create a new Blank App (Xamarin Forms Portable), as following:


New Project
Recent
Installed
Templates
Visual C#
Store Apps
Windows Desktop
Web
Android
Cloud
iOS
Mobile Apps
Reporting
Silverlight
Test
WCF
Workflow
HDInsight
Other Languages
Online
.NET Framework 4.5
Sort by: Default
Search Installed Templates (Ctrl+E)
Blank App (Xamarin.Forms Portable) Visual C#
Blank App (Xamarin.Forms Shared) Visual C#
Class Library (Xamarin.Forms Portable) Visual C#
Click here to go online and find templates.
Browse...
Create directory for solution
Add to source control
OK
Cancel

Type: Visual C#

A multiproject template for building apps with Xamarin.Forms, sharing code using a portable class library. On Visual Studio 2010, the Portable Class Library Tools are required.

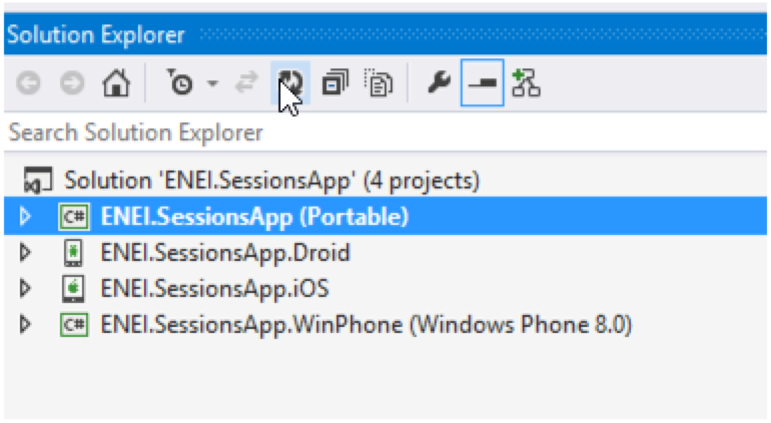
Name: ENEI.SessionsApp

Location: C:\DevApps\

Solution name: ENEI.SessionsApp

Figure 15: Creating a Blank App (Xamarin Forms Portable)

Which result will be something as described in figure 16:



Solution 'ENEI.SessionsApp' (4 projects)
ENEI.SessionsApp (Portable)
ENEI.SessionsApp.Droid
ENEI.SessionsApp.iOS
ENEI.SessionsApp.WinPhone (Windows Phone 8.0)

Figure 16: The ENEI.SessionsApp solution

The **ENEI.SessionApp solution** is defined by four projects:

- **ENEI.SessionsApp**: portable class library project, which will contain the shared code between targets. This project is independent of the platform;
- **ENEI.SessionsApp.Droid:** Xamarin Android project, which define the Android application and knows the Android API;
- **ENEI.SessionsApp.iOS:** Xamarin iOS project, which define the iOS application and knows the iOS API;
- **ENEI.SessionsApp.WinPhone**: Windows Phone project, which define the Windows Phone application and knows the Windows Phone API;

Now, you should update the Nuget Packages available in the project. This case you only need to update the Xamarin Forms Nuget Package, as described in figure 17 and figure 18:

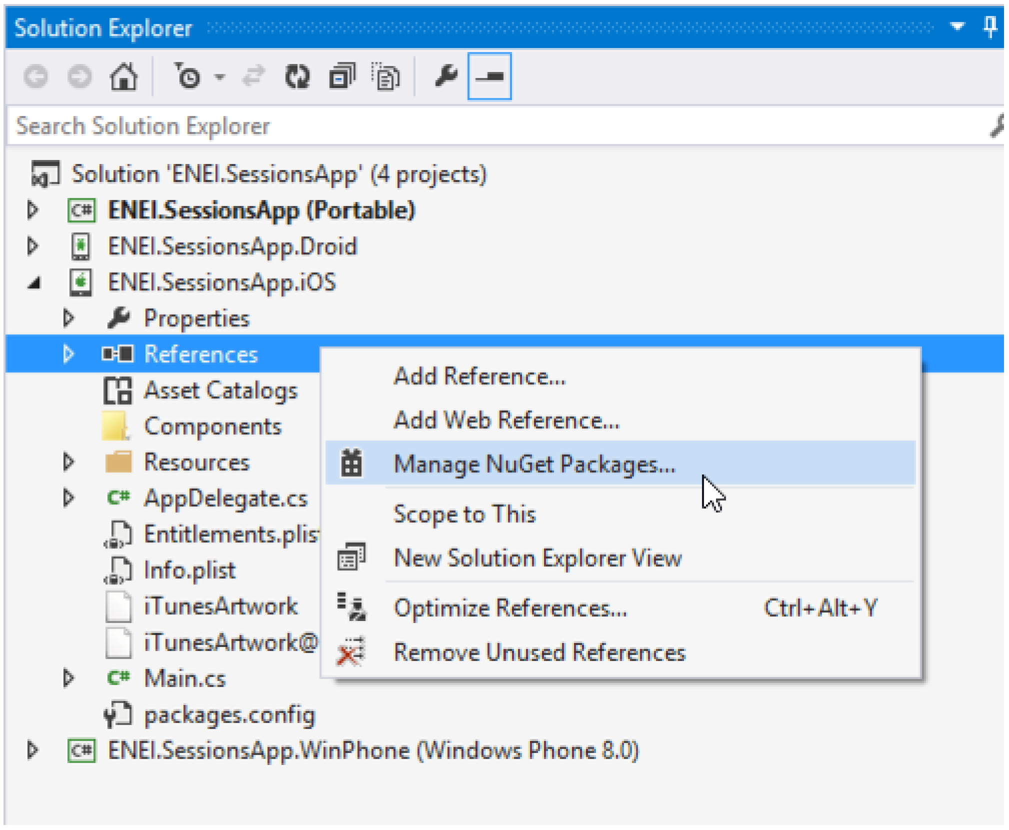
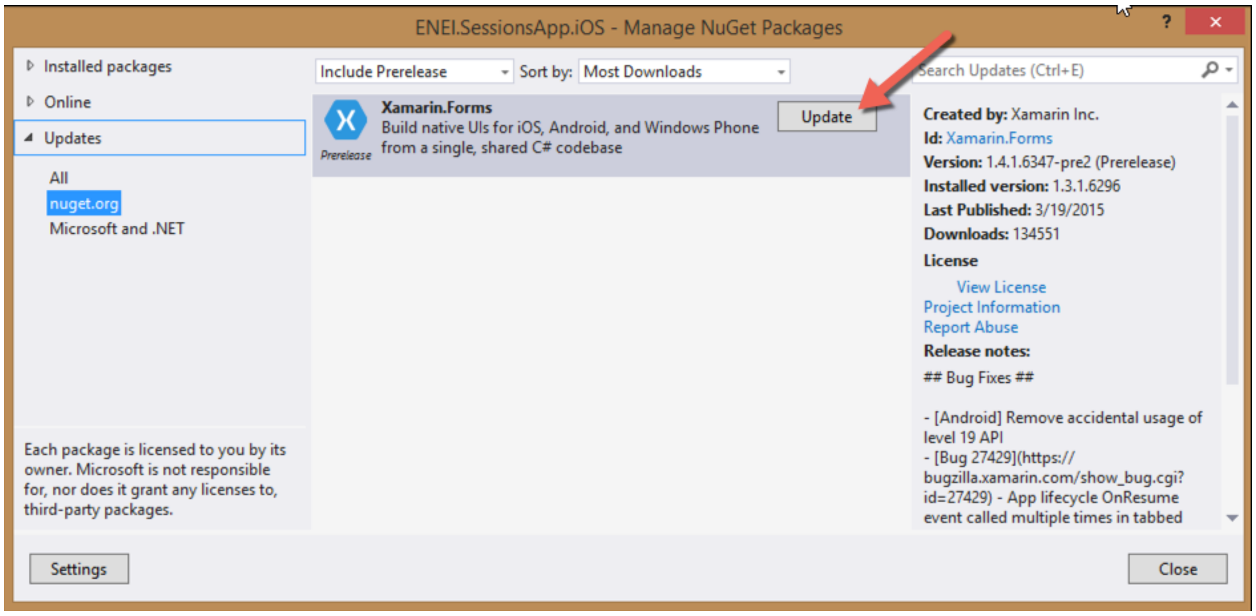


Figure 17: Opening the “Manage NuGet Package” window


ENEI.SessionsApp.iOS - Manage NuGet Packages

- Installed packages
- Online
- Updates
  - All
  - nuget.org
  - Microsoft and .NET

Include Prerelease | Sort by: Most Downloads | Search Updates (Ctrl+E)

Xamarin.Forms — Build native UIs for iOS, Android, and Windows Phone from a single, shared C# codebase — Prerelease — Update

Created by: Xamarin Inc.
Id: Xamarin.Forms
Version: 1.4.1.6347-pre2 (Prerelease)
Installed version: 1.3.1.6296
Last Published: 3/19/2015
Downloads: 134551
License
View License
Project Information
Report Abuse
Release notes:
Bug Fixes

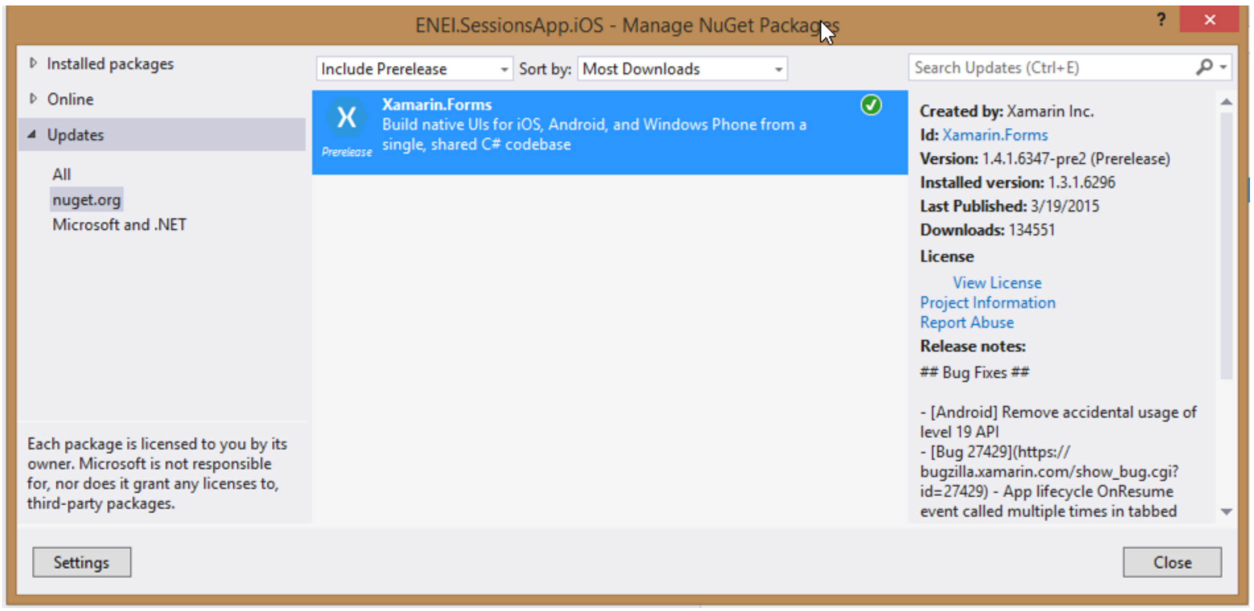
- [Android] Remove accidental usage of level 19 API
- [Bug 27429](https://bugzilla.xamarin.com/show_bug.cgi?id=27429) - App lifecycle OnResume event called multiple times in tabbed

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

Settings | Close

Figure 18: Nuget Package Manager

The result will be


ENEI.SessionsApp.iOS - Manage NuGet Packages

- Installed packages
- Online
- Updates
  - All
  - nuget.org
  - Microsoft and .NET

Include Prerelease | Sort by: Most Downloads | Search Updates (Ctrl+E)

Xamarin.Forms — Build native UIs for iOS, Android, and Windows Phone from a single, shared C# codebase — Prerelease ✓

Created by: Xamarin Inc.
Id: Xamarin.Forms
Version: 1.4.1.6347-pre2 (Prerelease)
Installed version: 1.3.1.6296
Last Published: 3/19/2015
Downloads: 134551
License
View License
Project Information
Report Abuse
Release notes:
Bug Fixes

- [Android] Remove accidental usage of level 19 API
- [Bug 27429](https://bugzilla.xamarin.com/show_bug.cgi?id=27429) - App lifecycle OnResume event called multiple times in tabbed

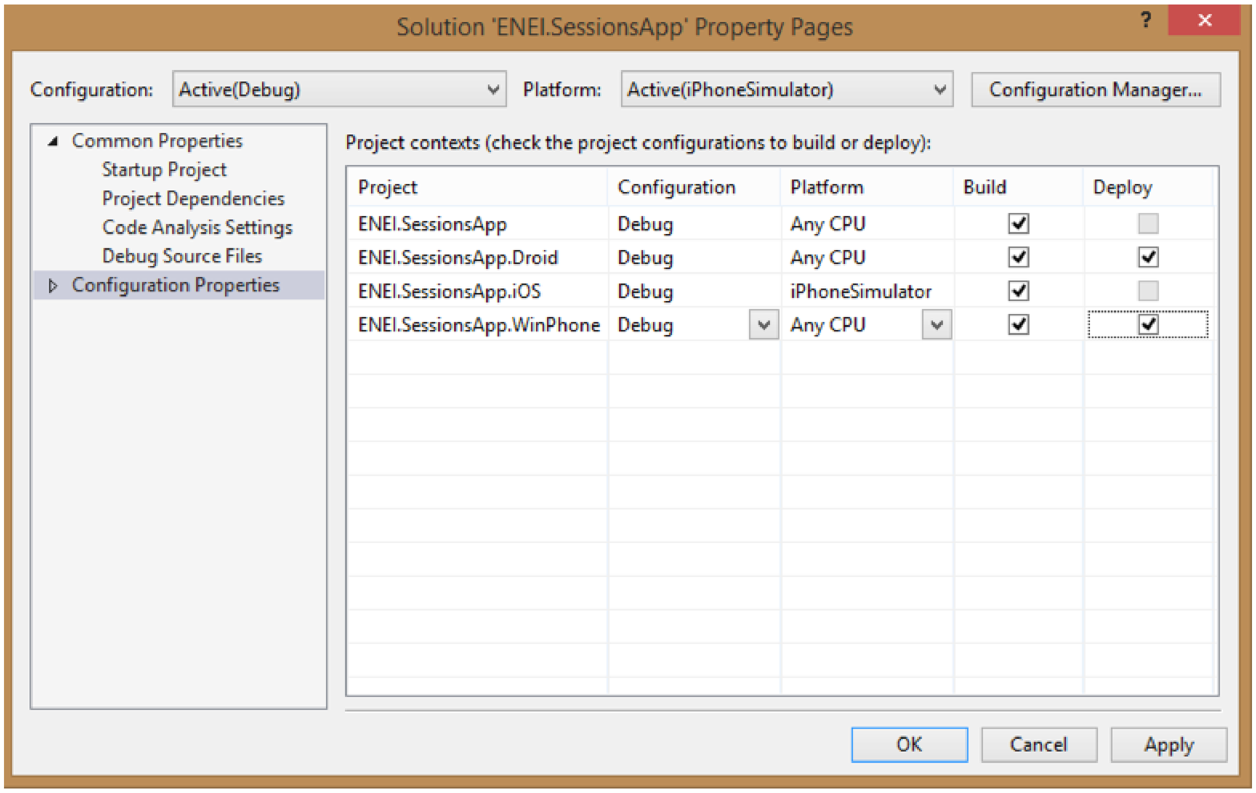
Each package is licensed to you by its owner. Microsoft is not responsible for, nor does it grant any licenses to, third-party packages.

Settings | Close

Figure 19: Xamarin Forms NuGet package updated

You need to do the same in the others project, if needed.

Before run the application, you should select the solution and define the build and deploy apps, as following:


Solution 'ENEI.SessionsApp' Property Pages

Configuration: Active(Debug) Platform: Active(iPhoneSimulator) Configuration Manager...

- Common Properties
  - Startup Project
  - Project Dependencies
  - Code Analysis Settings
  - Debug Source Files
- Configuration Properties

Project contexts (check the project configurations to build or deploy):

Project	Configuration	Platform	Build	Deploy
ENEI.SessionsApp	Debug	Any CPU	✓	
ENEI.SessionsApp.Droid	Debug	Any CPU	✓	✓
ENEI.SessionsApp.iOS	Debug	iPhoneSimulator	✓	
ENEI.SessionsApp.WinPhone	Debug	Any CPU	✓	✓

Figure 20: Configuration Properties

Wowwww you ready to create your 1010 ENEI app!

Running the application

Depending the scenario you are, you will have more or less platforms covered, here is an overview:

- **Using Xamarin Studio in a Mac:** Android + iOS Apps
- **Using Xamarin Studio in Windows**: Android Apps
- **Using Visual Studio without Xamarin plugin**: Windows Apps
- **Using Visual Studio with Xamarin plugin**: Windows, Android and iOS (*) apps.

(*) Is required a Xamarin Build Host in a Mac connect to Visual Studio.

In figure 21, is possible to see the Android, iOS and Windows Phone applications running at the same time. The Android app is running in Xamarin Android Player, iOS app is running in IPhone Simulator and Windows Phone application is running in a Lumia 1020 device (which is connect to a Windows running in a Parallels, in a Mac).

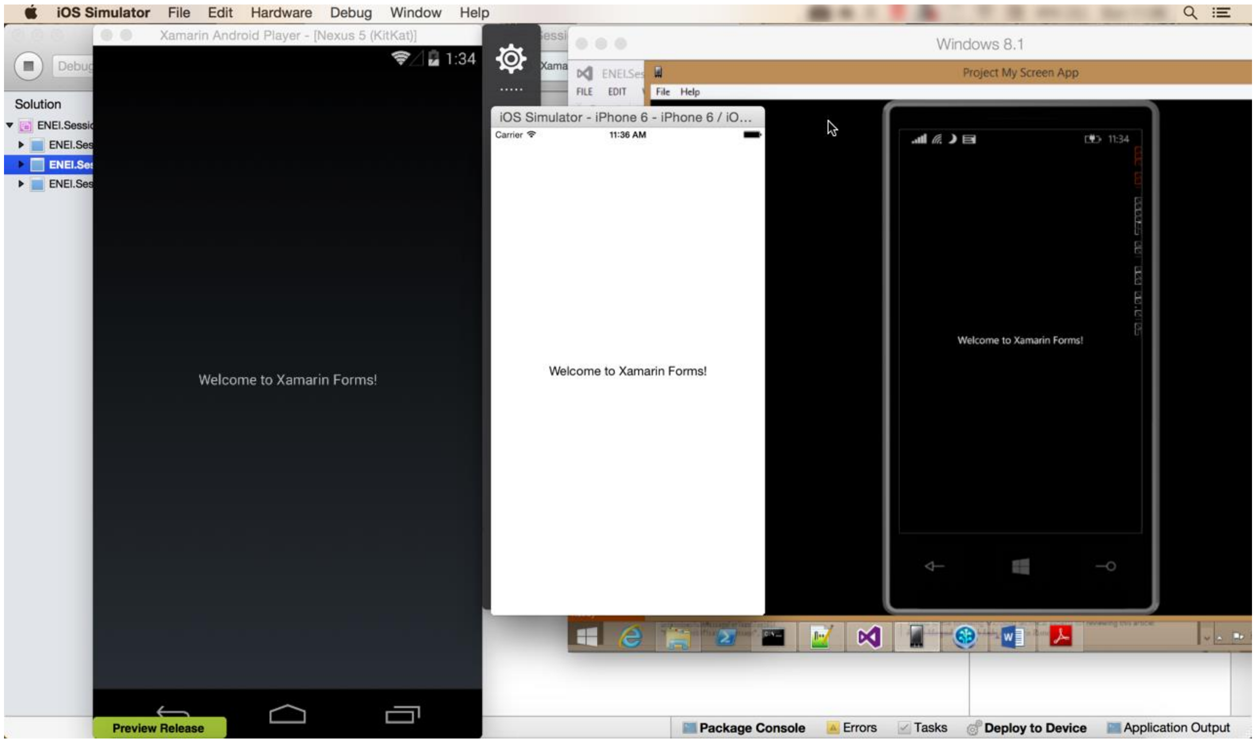

iOS Simulator File Edit Hardware Debug Window Help
Xamarin Android Player - [Nexus 5 (KitKat)]
Welcome to Xamarin Forms!
Preview Release
iOS Simulator - iPhone 6 - iPhone 6 / iO...
Welcome to Xamarin Forms!
Windows 8.1
Project My Screen App
Welcome to Xamarin Forms!
Package Console
Errors
Tasks
Deploy to Device
Application Output

Figure 21: Android, iOS and Windows Phone applications running at same time

Additional notes: Xamarin Forms initialization

Each developer should understand how Xamarin Forms app is defined. This way, developers should know:

In ENEI.SessionsApp.iOS app, more specific in AppDelegate.cs has the following code:

```
public override bool FinishedLaunching(UIApplication app, NSDictionary
options)
{
            global::Xamarin.Forms.Forms.Init();
            LoadApplication(new App());

            return base.FinishedLaunching(app, options);
}
```

Which initialize the Xamarin Forms and define which class has the start point for the Xamarin Forms App that defines the main page created with the Xamarin Forms API.

The same happens in ENEI.Sessions.Android app, more specific in MainActivity.cs:

```
protected override void OnCreate(Bundle bundle)
{
            base.OnCreate(bundle);

            global::Xamarin.Forms.Forms.Init(this, bundle);
            LoadApplication(new App());
}
```

And in ENEI.Sessions.WinPhone app, more specific in MainPage.xaml.cs

```
public MainPage()
{
            InitializeComponent();
            SupportedOrientations =
SupportedPageOrientation.PortraitOrLandscape;

            global::Xamarin.Forms.Forms.Init();
            LoadApplication(new ENEI.SessionsApp.App());
}
```

At this moment, the App.cs defined in ENEI.SessionsApp (portable class library) is defined by

```
public class App : Application
    {
        public App()
        {
            // The root page of your application
            MainPage = new ContentPage
            {
                Content = new StackLayout
                {
                    VerticalOptions = LayoutOptions.Center,
                    Children = {
                                           new Label {
                                                 XAlign =
TextAlignment.Center,
                                                 Text = "Welcome to Xamarin
Forms!"
                                           }
                                    }
                }
            };
        }

…
```

As mentioned early, the ENEI.SessionsApp will be the project, which will have the shared code between targets and it is independent of the platform. This way, in this project you will define the Model, the Views, the data source and other useful class that can be reused between platforms.

2. Create the model and data source

The model

Before create the UI, you need to define the model, for it you will define:

- **Session**: class that define a session from 1010 ENEI event
- **Speaker**: class that define a speaker

Each session should have a speaker (In real scenarios can have more than one!). Figure 22 define the class diagram from the model:

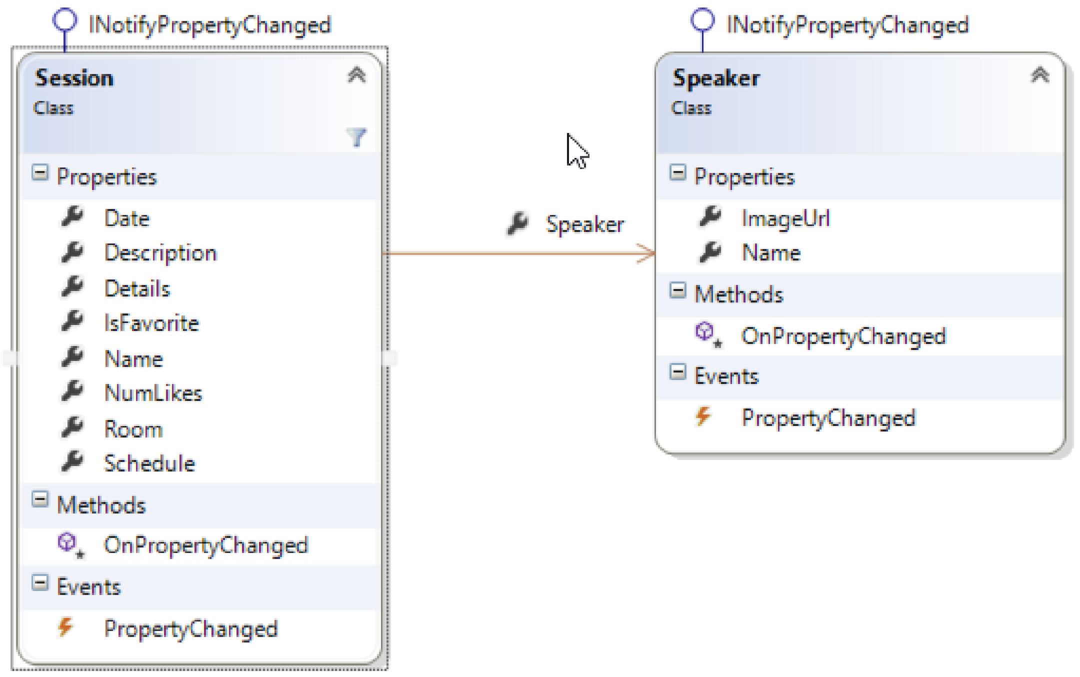


Figure 22: The model

In ENEI.SessionsApp project create the Session and the Speaker class in a “Model” folder, as described in figures 23 and 24:

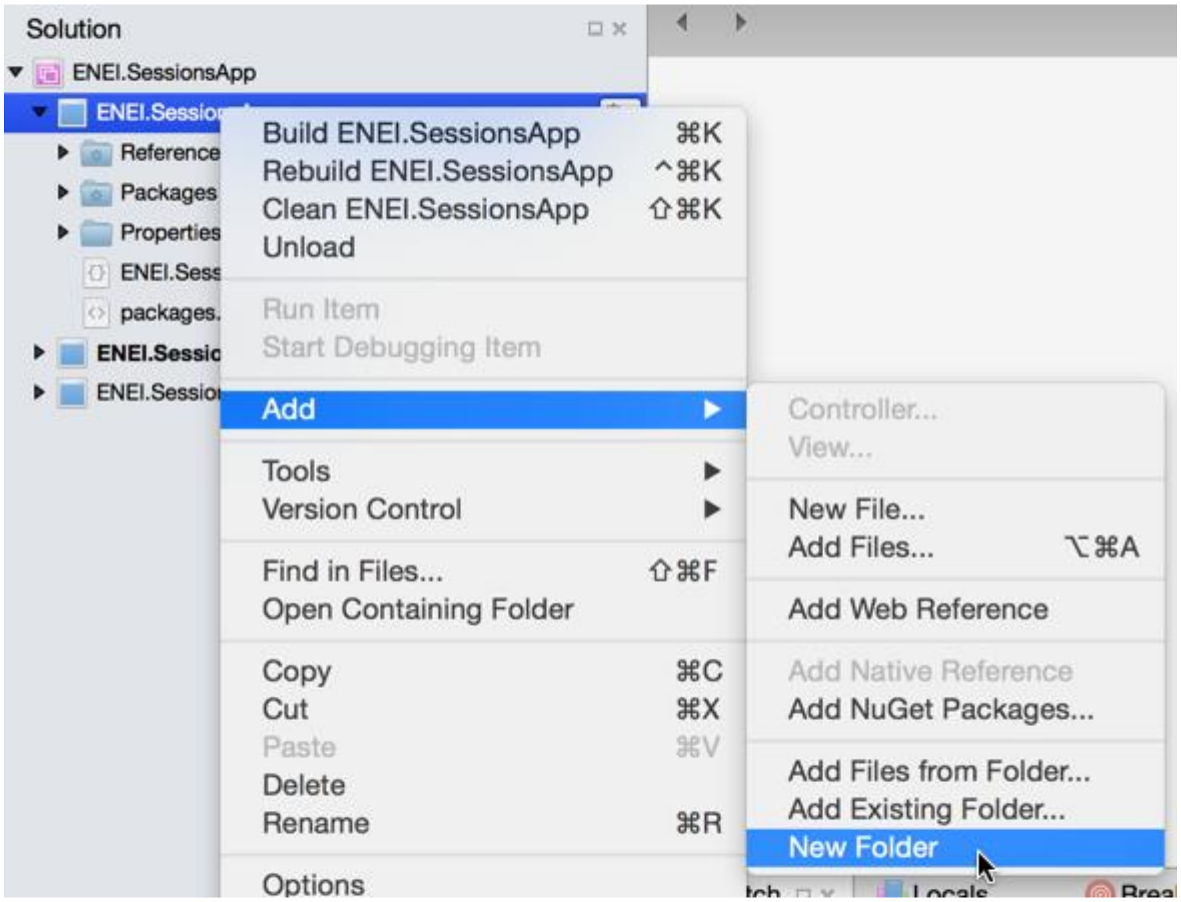


Figure 23: Creating new Folder

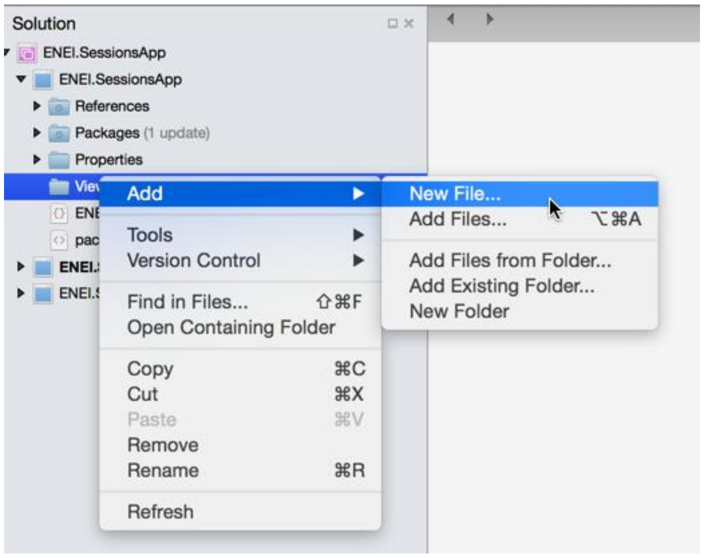


Figure 24: Adding new file

The Session class can be defined by:

```
public class Session : INotifyPropertyChanged
  {
      private int _numLikes;
      private Speaker _speaker;
      private string _date;
      private string _description;
      private string _name;
      private bool _isFavorite;
      private string _schedule;
      private string _room;

      public string Name
      {
          get { return _name; }
          set { _name = value; OnPropertyChanged(); }
      }

      public string Description
      {
          get { return _description; }
          set { _description = value; OnPropertyChanged(); }
      }

      public string Date
      {
          get { return _date; }
          set { _date = value; OnPropertyChanged(); }
      }

      public int NumLikes
      {
          get { return _numLikes; }
          set { _numLikes = value; OnPropertyChanged();}
      }

      public Speaker Speaker
      {
          get { return _speaker; }
          set { _speaker = value; OnPropertyChanged(); }
      }

      public bool IsFavorite
      {
          get { return _isFavorite; }
          set { _isFavorite = value; OnPropertyChanged();}
      }

      public string Schedule
      {
          get { return _schedule; }
          set { _schedule = value; OnPropertyChanged(); }
      }

      public string Room
      {
          get { return _room; }
          set { _room = value; OnPropertyChanged(); }
      }

      public string Details
      {
          get { return string.Format("{0} | {1} | Sala {2} ", Date, Schedule, Room); }
      }

      public event PropertyChangedEventHandler PropertyChanged;

      protected virtual void OnPropertyChanged([CallerMemberName] string propertyName = null)
      {
          var handler = PropertyChanged;
          if (handler != null) handler(this, new PropertyChangedEventArgs(propertyName));
      }
  }
```

And the Speaker class can be defined by:

```
public class Speaker : INotifyPropertyChanged
    {
        private string _name;
        private string _imageUrl;

        public string Name
        {
            get { return _name; }
            set { _name = value; OnPropertyChanged();}
        }

        public string ImageUrl
        {
            get { return _imageUrl; }
            set { _imageUrl = value; OnPropertyChanged(); }
        }

        public event PropertyChangedEventHandler PropertyChanged;

        protected virtual void OnPropertyChanged([CallerMemberName] string
propertyName = null)
        {
            var handler = PropertyChanged;
            if (handler != null) handler(this, new
PropertyChangedEventArgs(propertyName));
        }
    }
```

Both class implements the interface **INotifyPropertyChanged**, which allow notify the UI about changes in model and this way the data will be update in UI (only when is binding the model with the UI!).

The data source

The data source will define the data that will be loaded by the application, at this moment you will have hard code data, but in real scenarios you should have a file, database or services to provide it.

Get the **SessionsDataSource** class here, or create your own data.

3. Create the SessionsView

In this step, you will create the user interface to the SessionsView (which is the main page) to show the data defined in the last step.

Create the Xaml page

In Xamarin Studio, select the ENEI.SessionsApp project and create a folder called "Views", as described in figure 25 and figure 26:

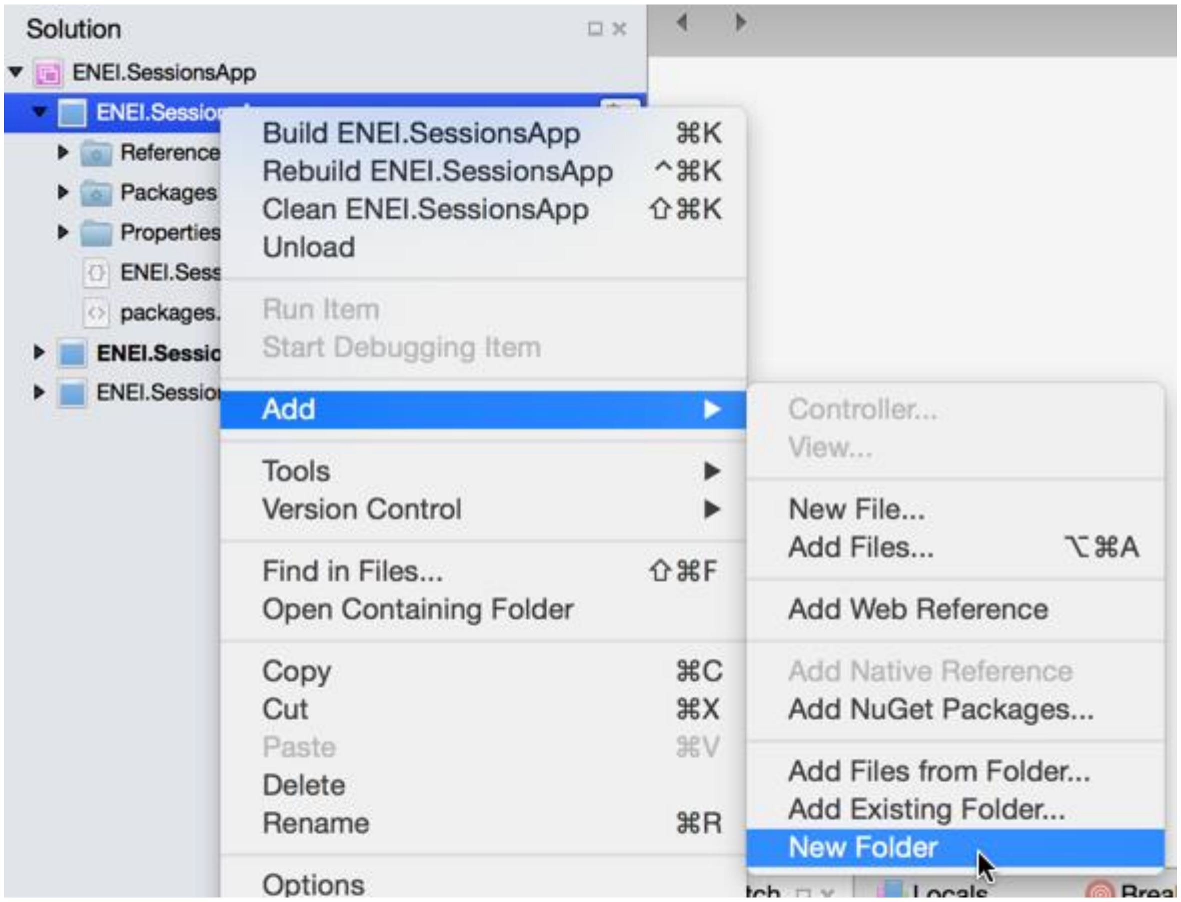


Figure 25: Creating new folder

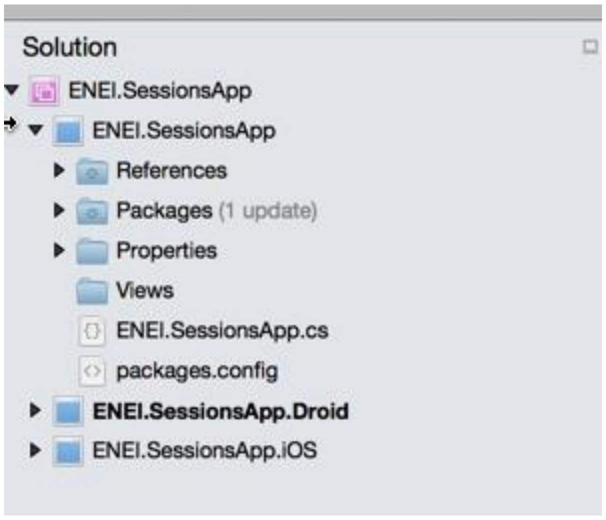


Figure 26: The Views folder in the project

Then select the folder "Views" , do a double click with the mouse to open the context and the click in "Add"> "New File..." as described in figure 27:

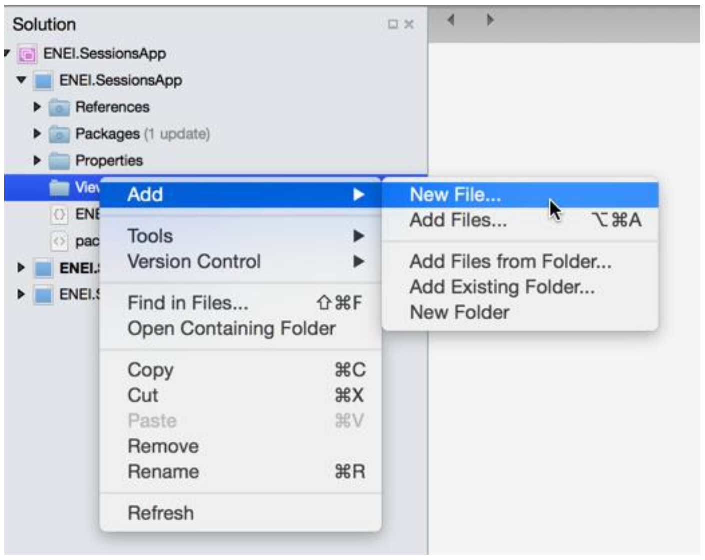
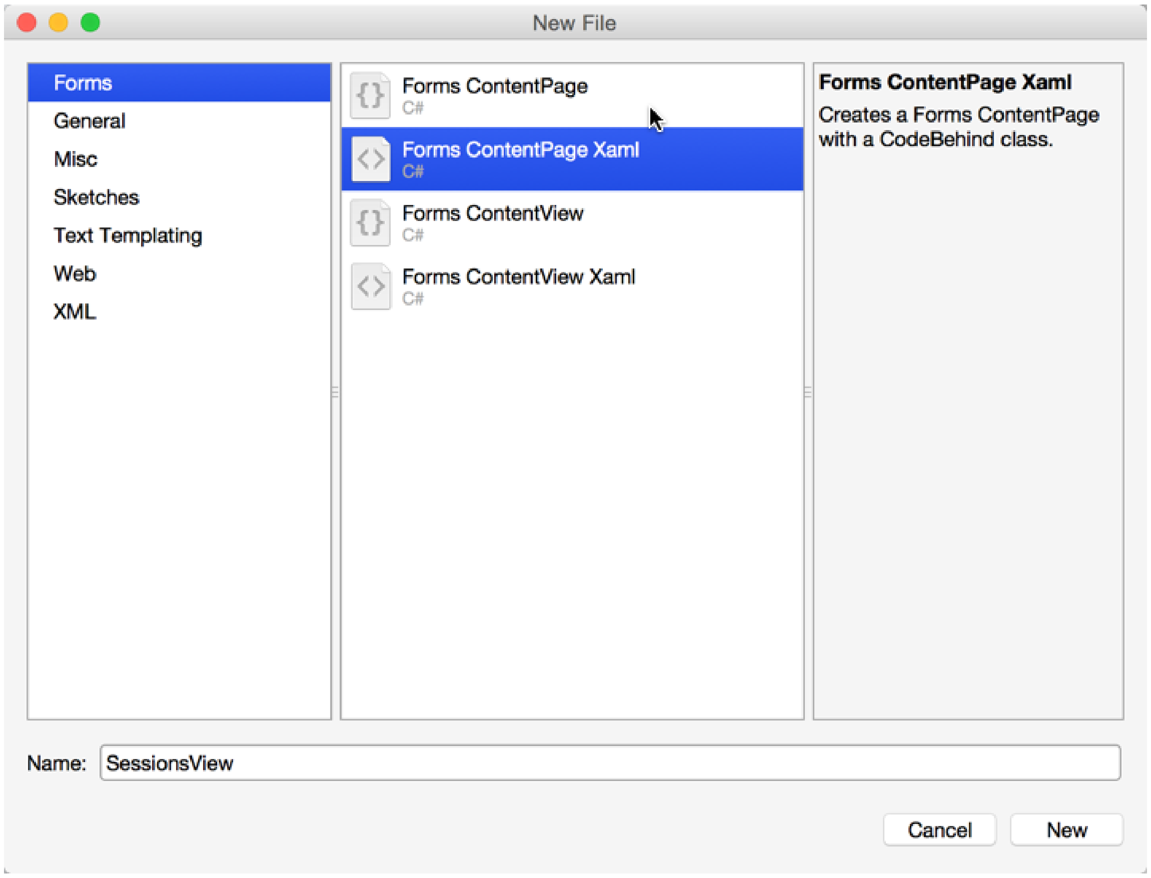


Figure 27: Add new file

Select “Forms ContentPage Xaml”, as following:



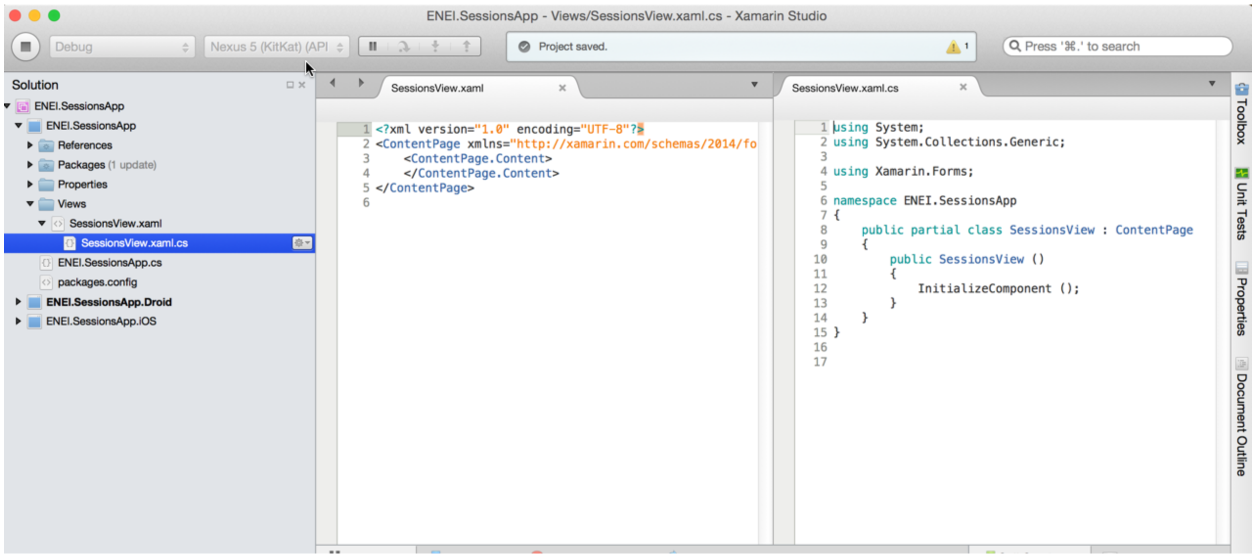
Forms ContentPage Xaml

Creates a Forms ContentPage with a CodeBehind class.

Name: SessionsView

Figure 28: Adding a Xaml page

The result will be something as following:



```xml
<?xml version="1.0" encoding="UTF-8"?>
<ContentPage xmlns="http://xamarin.com/schemas/2014/fo
    <ContentPage.Content>
    </ContentPage.Content>
</ContentPage>
```

```csharp
using System;
using System.Collections.Generic;

using Xamarin.Forms;

namespace ENEI.SessionsApp
{
    public partial class SessionsView : ContentPage
    {
        public SessionsView ()
        {
            InitializeComponent ();
        }
    }
}
```

Figure 29: The xaml page code

The SessionsView xaml is defined by:

- The **xaml file** which define the user interface
- The **cs file** which define the code behind

This approach is really useful when designers and developers work together and using MVVM pattern allow to have UI separated from the behavior of the page.

See more about Xamarin.Forms Xaml Basics.

Now let's change the App.cs in ENEI.SessionsApp to use the SessionsView:

```
public class App : Application
    {
        public App()
        {
            // The root page of your application
            MainPage = new NavigationPage(new SessionsView())
            {
                BarBackgroundColor = Color.White,
                BarTextColor = Color.Black
            };
        }
…
```

In this case, you defined the MainPage with a NavigationPage which content is defined by SessionView. The NavigationPage is required when the application required navigation between page and the application should have only one NavigationPage.

At this moment, if you run the application you will not have content and you should have something like as described in figure 30

Figure 30: The xaml page code

Now let's define the UI…

Create the Header

The first thing you should define is the **Title** and the **Icon** used in the title, this mean we will define the header of the page, something like as following:

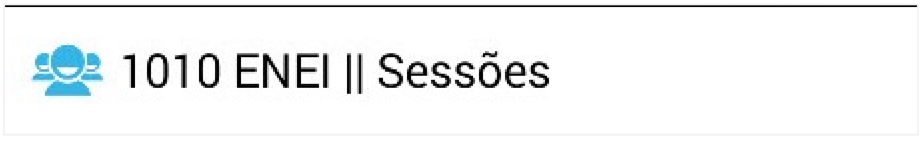

1010 ENEI || Sessões

Figure 31: The header

Defining the following code:

```
<ContentPage xmlns="http://xamarin.com/schemas/2014/forms"
             xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
             x:Class="ENEI.SessionsApp.Views.SessionsView"
             Title="1010 ENEI || Sessões"
             BackgroundColor="White"
             Icon="ic_action_users.png">
```

You will create the header but only for Android and iOS (which not show icon). This way to create the header for Windows Phone we need to create a workaround, as we will see below.

The **SessionsView** is a **ContentPage** which is a simple page provided by Xamarin Forms API (see more in Xamarin Forms Gallery). To define its content, you should use controls layouts like StackLayout or Grid, for example.

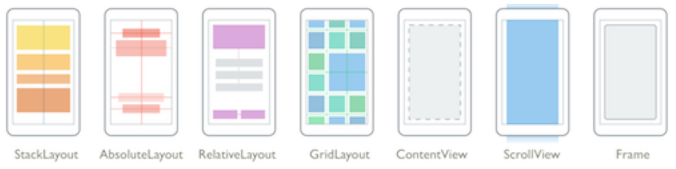


Figure 32: Control Layouts

This way, let's choose the Grid as control layout to define two rows and one columns, where:

- The first row has the header for Windows Phone (hidden to the others platforms)
- The second row has the ListView to show the sessions.

The code for it will be something like as following:

```
<?xml version="1.0" encoding="utf-8" ?>
<ContentPage xmlns="http://xamarin.com/schemas/2014/forms"
             xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
             x:Class="ENEI.SessionsApp.Views.SessionsView"
             Title="1010 ENEI || Sessões"
             BackgroundColor="White"
             Icon="ic_action_users.png">
  <Grid BackgroundColor="White">
    <Grid.RowDefinitions>
      <RowDefinition Height="Auto" />
      <RowDefinition Height="*" />
    </Grid.RowDefinitions>

    <!-- Title - Only for WP-->
    <StackLayout Grid.Row="0" Orientation="Horizontal"
Padding="20,10,0,0">
      <StackLayout.IsVisible>
        <OnPlatform Android="false"
                    WinPhone="true"
                    iOS="false"
                    x:TypeArguments="x:Boolean" />
      </StackLayout.IsVisible>
      <Image WidthRequest="48"
             HeightRequest="38"
             Source="Images/ic_action_users.png"/>
      <Label FontSize="Large" FontAttributes="Bold"
           TextColor="Black">

        <OnPlatform Android=""
                    WinPhone="1010 ENEI || Sessões"
                    iOS=""
                    x:TypeArguments="x:String" />
      </Label>
    </StackLayout>
    <!-- ListView will be defined here -->
  </Grid>
</ContentPage>
```

Defining the Images for each platform

In the last step you used the image “ic_action_users.png” which need to be add to each project (ENEI.SessionApp.Android, ENEI.SessionApp.iOS and ENEI.SessionApp.WinPhone). This way, each app will have its own images, which should be defined following the platform specifications, i.e., each image should provide the right resolution by platform.

Get the images & assets by platform here, and see more about this subject in this article.

At this moment, you should have

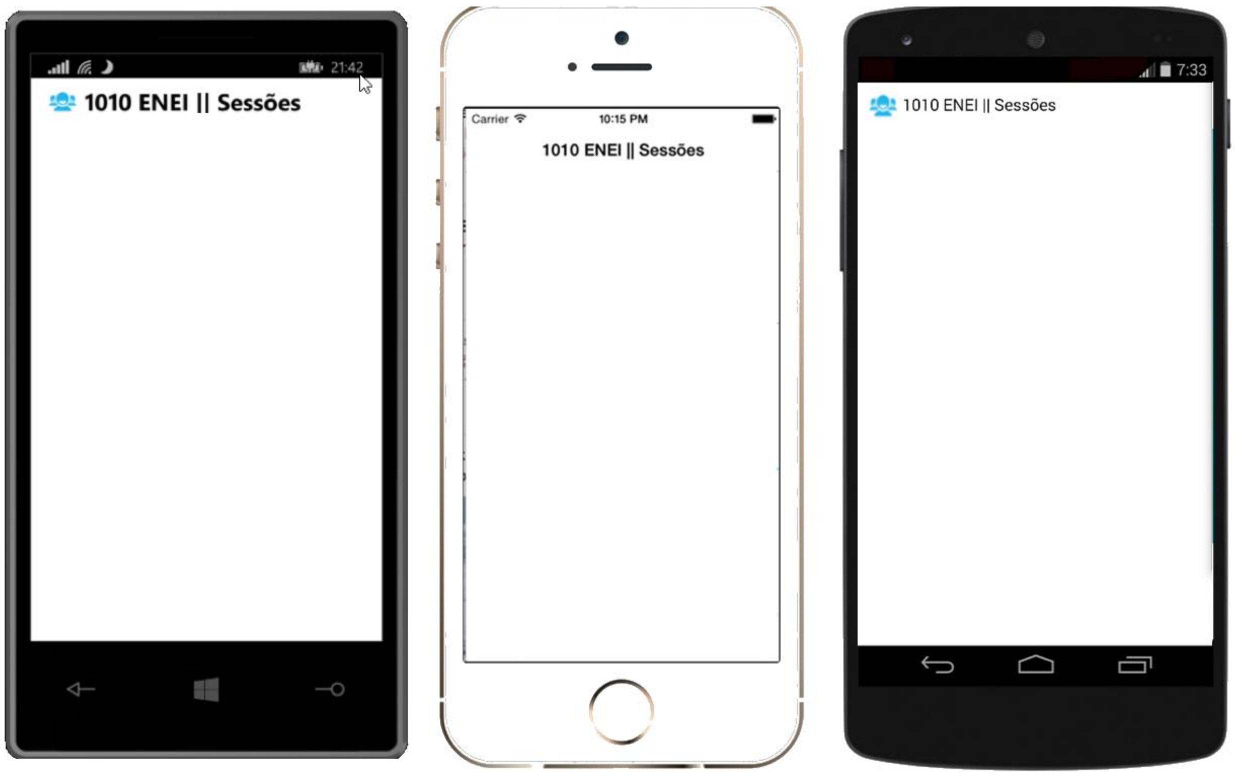


Figure 33: The Windows Phone, iOS and Android applications

Creating the Listview

The next step is to define the list of the session from the 1010 ENEI, which were defined in the topic "The Data Source".

To show the list of the session you will use a ListView which must have:

- **ItemsSource** defined with the list of sessions
- **ItemTemplate** defined with the template for each row

Let’s define the first version of the ListView as following:

```
<!-- ListView will be defined here -->
    <ListView x:Name="SessionsList"
                 Grid.Row="1"
                 ItemSelected="SessionsList_OnItemSelected"
                 ItemsSource="{Binding Sessions}"
                 SeparatorColor="#0094FF">
      <!--
                Setting the HasUnevenRows property tells the list view to
render
                each cell with a different height.
            -->
      <ListView.RowHeight>
        <OnPlatform Android="150"
                    WinPhone="180"
                    iOS="150"
                    x:TypeArguments="x:Int32" />
      </ListView.RowHeight>
    </ListView>
```

The Listview has the name “SessionsList”, which is defined in the second row of the grid which define the root content of the page, it has the “ItemSelected” subscribed to ignore the “SelectItem”, the “SeparatorColor" is defined as blue and the “ItemsSource” is binding with the “Sessions” property (which is a property from the object defined in “BindingContext”.

Data bindings allow properties of two objects to be linked so that a change in one causes a change in the other. See more about it in these article Data Binding Basics and From Data Bindings to MVVM

Each row from the ListView can be defined with static or dynamic size. In this case was defined a static size for each platform (related with screen resolution). A developer that needs to have different row’s size depending the data showed is recommended to use the property HasUnevenRows.

To complete, in code behind, you need to define the Sessions that should be an “ObservableCollection” of Session (this kind of list allow to notify the UI each time an object is removed or added in the list). You need to get the sessions from the “SessionsDataSource” and you need to define the “BindingContext”. The data should be loaded in the “OnAppearing” method and is not recommended to load it in the constructor of the page, because it will increase the time required to create the page which can create issues.

```
public partial class SessionsView : ContentPage
    {
        public SessionsView()
        {
            InitializeComponent();
            Sessions = new ObservableCollection<Session>();
            BindingContext = this;

        }

        public ObservableCollection<Session> Sessions { get; set; }

        protected override void OnAppearing()
        {
            base.OnAppearing();
            if (Sessions.Count == 0)
            {
                var sessions = SessionsDataSource.GetSessions();
                foreach (var session in sessions)
                {
                    Sessions.Add(session);
                }
            }
        }
        private void SessionsList_OnItemSelected(object sender,
SelectedItemChangedEventArgs e)
        {
            if (SessionsList.SelectedItem == null)
            {
                return;
            }

            SessionsList.SelectedItem = null;
        }
}
```

In this case, you will not use MVVM pattern, which is extremely recommended in real projects. To keep it simple the code behind will have the behavior used by UI that in a MVVM pattern is defined in the ViewModel.

Creating the ItemTemplate

The Listview has the “ItemTemplate” property that allows defining a “DataTemplate” for each row. In this case you will define a template as described in figure 34, which code will be:

```
<ListView.ItemTemplate>
         <DataTemplate>
                    <ViewCell>
                        <ViewCell.View>
                            <Grid BackgroundColor="Transparent" Padding="20,0,20,0">
                                <Grid.ColumnDefinitions>
                                    <ColumnDefinition Width="Auto" />
                                    <ColumnDefinition Width="*" />
                                </Grid.ColumnDefinitions>
                                <Grid.RowDefinitions>
                                    <RowDefinition Height="5" />
                                    <RowDefinition Height="Auto" />
                                    <RowDefinition Height="48" />
                                    <RowDefinition Height="5" />
                                </Grid.RowDefinitions>
                                <!-- Define the Image from Speaker -->
                                <Image Grid.Row="1"
                                       HorizontalOptions="StartAndExpand"
                                       Source="{Binding Speaker.ImageUrl}"
                                       VerticalOptions="Start">
                                    <Image.WidthRequest>
                                        <OnPlatform Android="50"
                                                    WinPhone="100"  iOS="50"
                                                    x:TypeArguments="x:Double" />
                                    </Image.WidthRequest>
                                    <Image.HeightRequest>
                                        <OnPlatform Android="50"
                                                    WinPhone="100" iOS="50"
                                                    x:TypeArguments="x:Double" />
                                    </Image.HeightRequest>
                                </Image>
                                <!-- Define the Image from Speaker -->
                                <StackLayout Grid.Row="1"
                                             Grid.Column="1"
                                             HorizontalOptions="FillAndExpand"
                                             Padding="10,0,0,0">
                                    <Label Font="Medium"
                                           FontAttributes="Bold"
                                           Text="{Binding Name}"
                                           TextColor="Black" />
                                    <Label Font="Medium"
                                           LineBreakMode="TailTruncation"
                                           Text="{Binding Speaker.Name}"
                                           TextColor="Black" />
                                    <Label Font="Small"
                                           LineBreakMode="TailTruncation"
                                           TextColor="Black" Text="{Binding Details}"/>
                                </StackLayout>
                                <!-- Define the menu for each session -->
                           </Grid>
                       </ViewCell.View>
                    </ViewCell>
                </DataTemplate>
      </ListView.ItemTemplate>
```

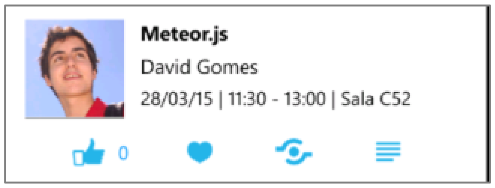
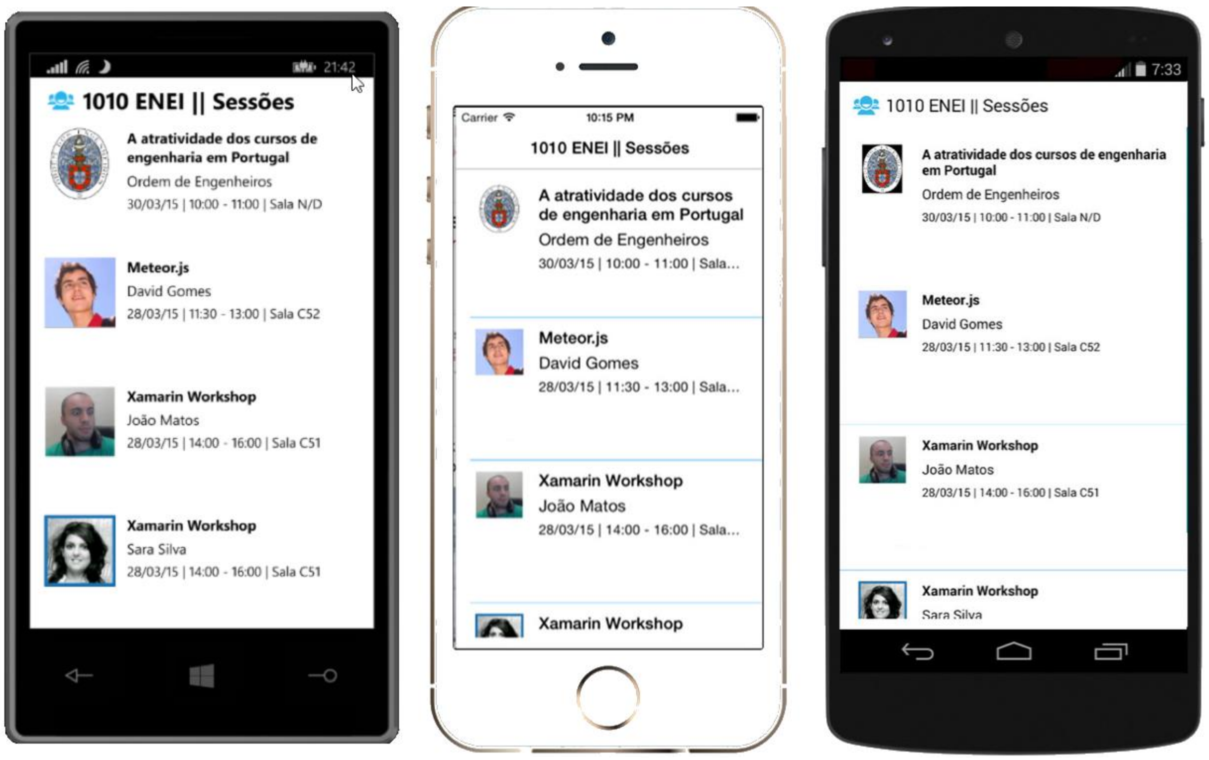

Meteor.js
David Gomes
28/03/15 | 11:30 - 13:00 | Sala C52

Figure 34: A row in listview

Running the application you will have the following:


1010 ENEI || Sessões

A atratividade dos cursos de engenharia em Portugal
Ordem de Engenheiros
30/03/15 | 10:00 - 11:00 | Sala N/D

Meteor.js
David Gomes
28/03/15 | 11:30 - 13:00 | Sala C52

Xamarin Workshop
João Matos
28/03/15 | 14:00 - 16:00 | Sala C51

Xamarin Workshop
Sara Silva
28/03/15 | 14:00 - 16:00 | Sala C51

Figure 35: The Windows Phone, iOS and Android application showing sessions from 1010 ENEI

Create the menu for each Session

To create the menu for each session as described in figure 36, you need to change the ItemTemplate defined above:

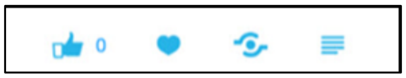


Figure 36: The session's menu

```
    <Grid Grid.Row="2" Grid.Column="0"  Grid.ColumnSpan="2" Padding="0,5,0,0">
                  <Grid.ColumnDefinitions>
                    <ColumnDefinition Width="*" /> <ColumnDefinition Width="Auto" />
                    <ColumnDefinition Width="*" /> <ColumnDefinition Width="Auto" /><ColumnDefinition Width="*"
/>
                    <ColumnDefinition Width="Auto" /> <ColumnDefinition Width="*" /><ColumnDefinition
Width="Auto" />
                    <ColumnDefinition Width="*" />
                  </Grid.ColumnDefinitions>
                  <StackLayout Grid.Column="1" Orientation="Horizontal">
                    <Image>
                      <Image.WidthRequest>
                        <OnPlatform Android="48" WinPhone="48" iOS="30"  x:TypeArguments="x:Double" />
                      </Image.WidthRequest>
                      <Image.HeightRequest>
                        <OnPlatform Android="48"  WinPhone="48" iOS="30" x:TypeArguments="x:Double" />
                      </Image.HeightRequest>
                      <Image.Source>
                        <OnPlatform x:TypeArguments="ImageSource">
                          <OnPlatform.iOS>  <FileImageSource File="ic_action_like.png" />
                          </OnPlatform.iOS>
                          <OnPlatform.Android> <FileImageSource File="ic_action_like.png" />
                          </OnPlatform.Android>
                          <OnPlatform.WinPhone><FileImageSource File="Images/ic_action_like.png" />
                          </OnPlatform.WinPhone>
                        </OnPlatform>
                      </Image.Source>
                    </Image>
                    <Label Font="Small" Text="{Binding NumLikes}" TextColor="#0094FF" VerticalOptions="Center"
/>
                  </StackLayout>
                  <Image Grid.Column="3" Source="{Binding IsFavorite, Converter={StaticResource
FavoriteImageConverter}}">
                    <Image.WidthRequest>
                      <OnPlatform Android="48" WinPhone="48" iOS="30"  x:TypeArguments="x:Double" />
                    </Image.WidthRequest>
                    <Image.HeightRequest>
                      <OnPlatform Android="48"  WinPhone="48"    iOS="30"  x:TypeArguments="x:Double" />
                    </Image.HeightRequest>
                  </Image>
                  <Image Grid.Column="5">
                    <Image.WidthRequest>
                      <OnPlatform Android="30"  WinPhone="48" iOS="30" x:TypeArguments="x:Double" />
                    </Image.WidthRequest>
                    <Image.HeightRequest>
                      <OnPlatform Android="30"  WinPhone="48" iOS="30" x:TypeArguments="x:Double" />
                    </Image.HeightRequest>
                    <Image.Source>
                      <OnPlatform x:TypeArguments="ImageSource">
                        <OnPlatform.iOS><FileImageSource File="ic_action_share_2.png" /></OnPlatform.iOS>
                        <OnPlatform.Android><FileImageSource File="ic_action_share_2.png"
/></OnPlatform.Android>
                        <OnPlatform.WinPhone>
                         <FileImageSource File="Images/ic_action_share_2.png" /></OnPlatform.WinPhone>
                      </OnPlatform> </Image.Source>  </Image>
                  <Image Grid.Column="7">
                    <Image.WidthRequest>
                      <OnPlatform Android="30" WinPhone="48" iOS="30"   x:TypeArguments="x:Double" />
                    </Image.WidthRequest>
                    <Image.HeightRequest>
                      <OnPlatform Android="30"   WinPhone="48"  iOS="30" x:TypeArguments="x:Double" />
                    </Image.HeightRequest>
                    <Image.Source>
                      <OnPlatform x:TypeArguments="ImageSource">
                        <OnPlatform.iOS>   <FileImageSource File="ic_action_list.png" />
                        </OnPlatform.iOS>
                        <OnPlatform.Android><FileImageSource File="ic_action_list.png" />
                        </OnPlatform.Android>
                        <OnPlatform.WinPhone> <FileImageSource File="Images/ic_action_list.png" />
                        </OnPlatform.WinPhone>
                      </OnPlatform>
                    </Image.Source>
                  </Image>
                </Grid>
```

The SessionDetailsView will have a similar implementation for the header as defined in SessionsView, the difference it is the title value, which will be defined by the Session's name.

The code above contains a grid with four images: Like, Favorite, Share and Details. And for each one we need to subscribe the Tap event using the "GestureRecognizers" from the Image, this way you need to define for each image its TapGesture as following:

```
<Image.GestureRecognizers>
     <TapGestureRecognizer x:Name="FavoriteGesture"
                           CommandParameter="{Binding}"
                           Tapped="FavoriteGestureRecognizer_OnTapped" />
</Image.GestureRecognizers>
```

Where the event's handler will be defined as following:

```
private void FavoriteGestureRecognizer_OnTapped(object sender, EventArgs e)
        {
            var tappedEventArg = e as TappedEventArgs;
            if (tappedEventArg != null)
            {
                var session = tappedEventArg.Parameter as Session;
                if (session != null)
                {
                    session.IsFavorite = !session.IsFavorite;
                }
            }
        }
```

Do the same for "Like" and for Share and Details we will see it in next steps.

Running the application

At this moment you should have the UI from the 1010 ENEI Sessions App as described in figure 34:

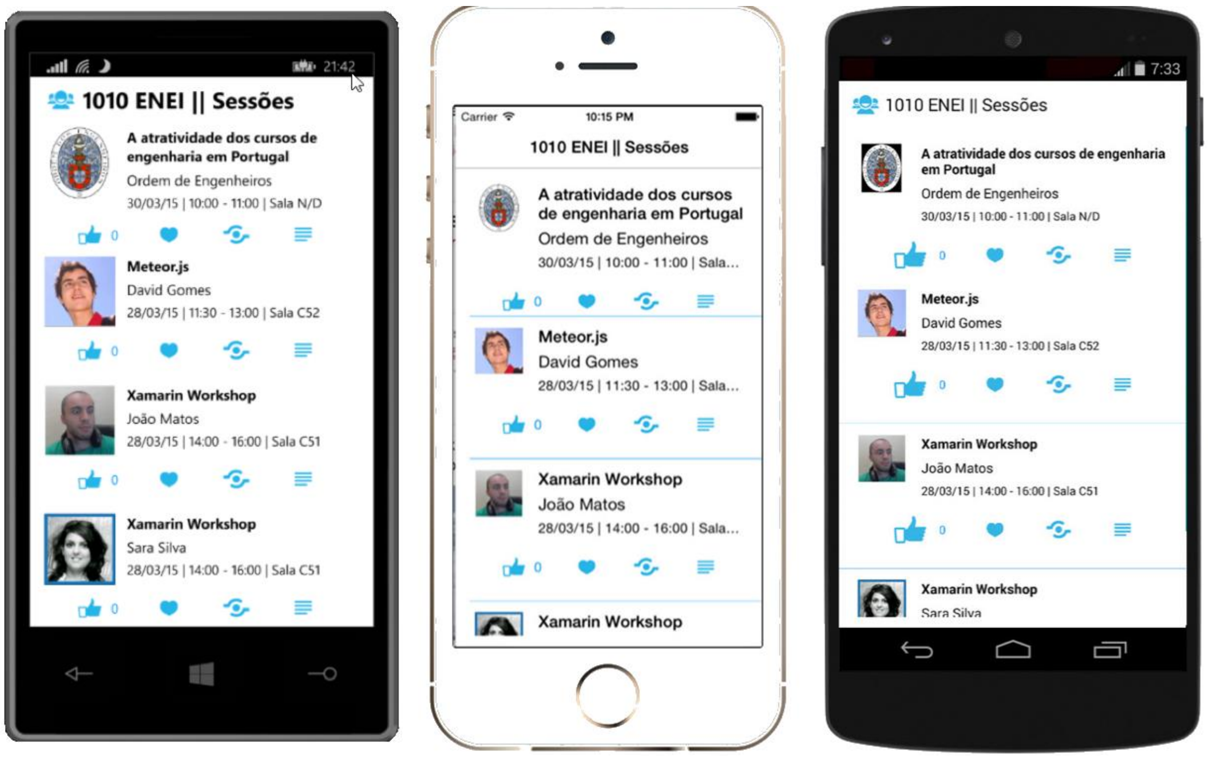

1010 ENEI || Sessões
A atratividade dos cursos de engenharia em Portugal
Ordem de Engenheiros
30/03/15 | 10:00 - 11:00 | Sala N/D
Meteor.js
David Gomes
28/03/15 | 11:30 - 13:00 | Sala C52
Xamarin Workshop
João Matos
28/03/15 | 14:00 - 16:00 | Sala C51
Xamarin Workshop
Sara Silva
28/03/15 | 14:00 - 16:00 | Sala C51

Figure 37: The Windows Phone, iOS and Android applications

4. Create the SessionDetailsView

In the last step, you created the menu for each Session and it was created the “Details” option, which has the goal to show the details from a selected session.

Let’s create the SessionDetailsView!

Create a new Xaml page, like it you did to create the SessionsView page. Then open the SessionDetailsView and you should have something as following:

```xml
<?xml version="1.0" encoding="utf-8" ?>
<ContentPage xmlns="http://xamarin.com/schemas/2014/forms"
             xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
             x:Class="ENEI.SessionsApp.Views.SessionDetailsView">

</ContentPage>
```

Then create the content, as following:

```
<?xml version="1.0" encoding="utf-8" ?>
<ContentPage x:Class="ENEI.SessionsApp.View.SessionDetailsView"
             xmlns="http://xamarin.com/schemas/2014/forms"
             xmlns:x="http://schemas.microsoft.com/winfx/2009/xaml"
             BackgroundColor="White"    Icon="ic_action_users.png">
    <StackLayout BackgroundColor="White" Spacing="20">
      <StackLayout Orientation="Horizontal" Padding="20,10,0,0">
        <StackLayout.IsVisible>
          <OnPlatform Android="false"
                      WinPhone="true" iOS="false”   x:TypeArguments="x:Boolean" />
        </StackLayout.IsVisible>
        <Image WidthRequest="48" HeightRequest="38"
Source="Images/ic_action_users.png"/>
        <Label FontSize="Large" FontAttributes="Bold" Text="{Binding Name}"
             TextColor="Black"/>
      </StackLayout>
      <StackLayout Orientation="Horizontal" Padding="20,20,20,0" Spacing="20">
            <Image HorizontalOptions="Start"
                   Source="{Binding Speaker.ImageUrl}"
                   VerticalOptions="Start">
                <Image.WidthRequest>
                    <OnPlatform Android="50" WinPhone="200" iOS="50"
                                x:TypeArguments="x:Double" />
                </Image.WidthRequest>
                <Image.HeightRequest>
                    <OnPlatform Android="50" WinPhone="200"    iOS="50"
                                x:TypeArguments="x:Double" />
                </Image.HeightRequest>
            </Image>
            <StackLayout HorizontalOptions="Start" Padding="10,0,0,0">
                <Label Font="Large"
                       HorizontalOptions="Start"
                       LineBreakMode="WordWrap"
                       Text="{Binding Speaker.Name}"
                       TextColor="Black" />
                <Label Font="Small"
                       HorizontalOptions="Start"
                       LineBreakMode="TailTruncation"
                       Text="{Binding Date}"
                       TextColor="Black" />
            </StackLayout>
        </StackLayout>

      <ScrollView VerticalOptions="FillAndExpand"  Padding="20,20,20,0">
            <Label Font="Medium"
                   HorizontalOptions="Start"
                   LineBreakMode="WordWrap"
                   Text="{Binding Description}"
                   TextColor="Black" />
        </ScrollView>
    </StackLayout>
</ContentPage>
```

And in code behind define the BindingContext and the Title, as following:

```
public partial class SessionDetailsView : ContentPage
    {
        private readonly Session _session;

        public SessionDetailsView(Session session)
        {
            _session = session;
            InitializeComponent();
            Title = session.Name;
            BindingContext = session;
        }
    }
```

This page will have the BindingContext defined with session object, but could be the page as in SessionsView.

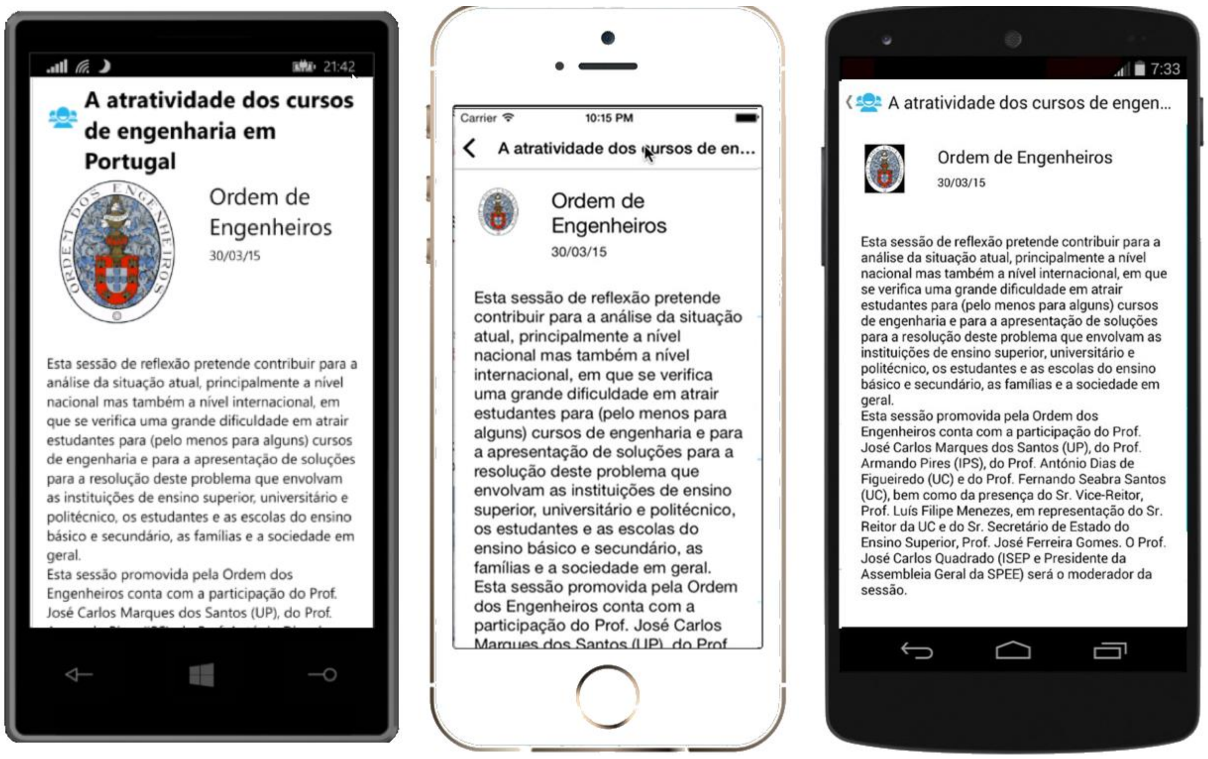
The Details gesture

Now that you have the new page created, you need to connect the both pages and it is possible through the “Detail” option for each session in Listview. This way, in the SessionsView we need to use the details gesture to navigate from the SessionsView to the SessionDetailsView, sending the selected session. The implementation can be something as following:

```
private void DetailsGesture_OnTapped(object sender, EventArgs e)
        {
            var tappedEventArg = e as TappedEventArgs;
            if (tappedEventArg != null)
            {
                var session = tappedEventArg.Parameter as Session;
                if (session != null)
                {
                    Navigation.PushAsync(new SessionDetailsView(session), true);
                }
            }
        }
```

Running the application

At this moment, you should navigate to the Session details view, which result should be as described in figure 36:



A atratividade dos cursos de engenharia em Portugal

Ordem de Engenheiros

30/03/15

Esta sessão de reflexão pretende contribuir para a análise da situação atual, principalmente a nível nacional mas também a nível internacional, em que se verifica uma grande dificuldade em atrair estudantes para (pelo menos para alguns) cursos de engenharia e para a apresentação de soluções para a resolução deste problema que envolvam as instituições de ensino superior, universitário e politécnico, os estudantes e as escolas do ensino básico e secundário, as famílias e a sociedade em geral.
Esta sessão promovida pela Ordem dos Engenheiros conta com a participação do Prof. José Carlos Marques dos Santos (UP), do Prof.

A atratividade dos cursos de en…

Ordem de Engenheiros

30/03/15

Esta sessão de reflexão pretende contribuir para a análise da situação atual, principalmente a nível nacional mas também a nível internacional, em que se verifica uma grande dificuldade em atrair estudantes para (pelo menos para alguns) cursos de engenharia e para a apresentação de soluções para a resolução deste problema que envolvam as instituições de ensino superior, universitário e politécnico, os estudantes e as escolas do ensino básico e secundário, as famílias e a sociedade em geral.
Esta sessão promovida pela Ordem dos Engenheiros conta com a participação do Prof. José Carlos Marques dos Santos (UP), do Prof

A atratividade dos cursos de engen…

Ordem de Engenheiros

30/03/15

Esta sessão de reflexão pretende contribuir para a análise da situação atual, principalmente a nível nacional mas também a nível internacional, em que se verifica uma grande dificuldade em atrair estudantes para (pelo menos para alguns) cursos de engenharia e para a apresentação de soluções para a resolução deste problema que envolvam as instituições de ensino superior, universitário e politécnico, os estudantes e as escolas do ensino básico e secundário, as famílias e a sociedade em geral.
Esta sessão promovida pela Ordem dos Engenheiros conta com a participação do Prof. José Carlos Marques dos Santos (UP), do Prof. Armando Pires (IPS), do Prof. António Dias de Figueiredo (UC) e do Prof. Fernando Seabra Santos (UC), bem como da presença do Sr. Vice-Reitor, Prof. Luís Filipe Menezes, em representação do Sr. Reitor da UC e do Sr. Secretário de Estado do Ensino Superior, Prof. José Ferreira Gomes. O Prof. José Carlos Quadrado (ISEP e Presidente da Assembleia Geral da SPEE) será o moderador da sessão.

Figure 38: The Windows Phone, iOS and Android applications

The navigation from SessionDetailsView is made using the back button provided in iOS and Android pages and by physical back button from Windows Phone, which do not require implementation.

5. Add ShareService

An application which allow to share content in social networks brings more value to the users, because allow to share with others something the user think is important or relevant. An application for events like 1010 ENEI Sessions App could not miss this feature.

Each platform has your own implementation to share content in social network. This means, we need to create an abstraction of the share feature to use it in ENEI.SessionsApp and then in each platform we need to implement that abstraction.

Let’s see how the Abstraction Pattern can be created!

In ENEI.SessionsApp project, create the interface IShareService as following:

```
    public interface IShareService
     {
         void ShareLink(string title, string status, string link);
     }
```

Then is required to create the implementation of the IShareService in each platform. Let’s define the following implementation by platform:

Windows Phone

```
[assembly: Dependency(typeof(ShareService))]
namespace ENEI.SessionsApp.WinPhone.Services
{
    public class ShareService : IShareService
    {
        public void ShareLink(string title, string status, string link)
        {
            var task = new ShareLinkTask { Title = title, Message = status, 
LinkUri = new Uri(link) };
            Device.BeginInvokeOnMainThread(() =>
            {
                try
                {
                    task.Show();
                }
                catch (Exception ex)
                {
                 // todo handle the error
                }
            });
        }
    }
}
```

Android

```
[assembly: Dependency(typeof(ShareService))]
namespace ENEI.SessionsApp.Droid.Services
{
    public class ShareService : IShareService
    {
        public void ShareLink(string title, string status, string link)
        {
            var intent = new Intent(global::Android.Content.Intent.ActionSend);
            intent.PutExtra(global::Android.Content.Intent.ExtraText,
string.Format("{0} - {1}", status ?? string.Empty, link ?? string.Empty));
            intent.PutExtra(global::Android.Content.Intent.ExtraSubject, title ??
string.Empty);
            intent.SetType("text/plain");
            intent.SetFlags(ActivityFlags.ClearTop);
            intent.SetFlags(ActivityFlags.NewTask);
            Android.App.Application.Context.StartActivity(intent);
        }
    }
}
```

iOS

```
[assembly: Dependency(typeof(ShareService))]
namespace ENEI.SessionsApp.iOS.Services
{
    public class ShareService : IShareService
    {
        public void ShareLink(string title, string status, string link)
        {
            var actionSheet = new UIActionSheet("Share on");
            foreach (SLServiceKind service in
Enum.GetValues(typeof(SLServiceKind)))
            {
                actionSheet.AddButton(service.ToString());
            }
            actionSheet.Clicked += delegate(object a, UIButtonEventArgs b)
            {
                SLServiceKind serviceKind =
(SLServiceKind)Enum.Parse(typeof(SLServiceKind),
actionSheet.ButtonTitle(b.ButtonIndex));
                ShareOnService(serviceKind, title, status, link);
            };

actionSheet.ShowInView(UIApplication.SharedApplication.KeyWindow.RootViewControlle
r.View);
        }

        private void ShareOnService(SLServiceKind service, string title, string
status, string link)
        {
            if (SLComposeViewController.IsAvailable(service))
            {
                var slComposer = SLComposeViewController.FromService(service);
                slComposer.SetInitialText(status);
                slComposer.SetInitialText(title != null ? string.Format("{0} {1}",
title, status) : status);
                if (link != null)
                {
                    slComposer.AddUrl(new NSUrl(link));
                }
                slComposer.CompletionHandler += (result) =>
                {

UIApplication.SharedApplication.KeyWindow.RootViewController.InvokeOnMainThread(()
=>
                    {

UIApplication.SharedApplication.KeyWindow.RootViewController.DismissViewController
(true, null);
                    });
                };

UIApplication.SharedApplication.KeyWindow.RootViewController.PresentViewController
(slComposer, true, null);
            }
        }
    }
}
```

This way, we are ready to call the share service in the SessionsView using DependencyService, as following:

```
private void ShareGesture_OnTapped(object sender, EventArgs e)
        {
            var tappedEventArg = e as TappedEventArgs;
            if (tappedEventArg != null)
            {
                var session = tappedEventArg.Parameter as Session;
                if (session != null)
                {
                    var shareService = DependencyService.Get<IShareService>();
                    if (shareService != null)
                    {
                        var status = string.Format("Não percas a sessão {0} de
{1}.", session.Name, session.Speaker.Name);
                        shareService.ShareLink("ENEI 2015", status,
"https://enei.pt/");
                    }
                }
            }
        }
```

The DependencyService only will get the implementation from the IShareService because the implementation from each platform was registered using:

[assembly: Dependency(typeof(ShareService))]

At this moment the 1010 ENEI Sessions App has support to share session in social network!

6. Add splah screen, name and version

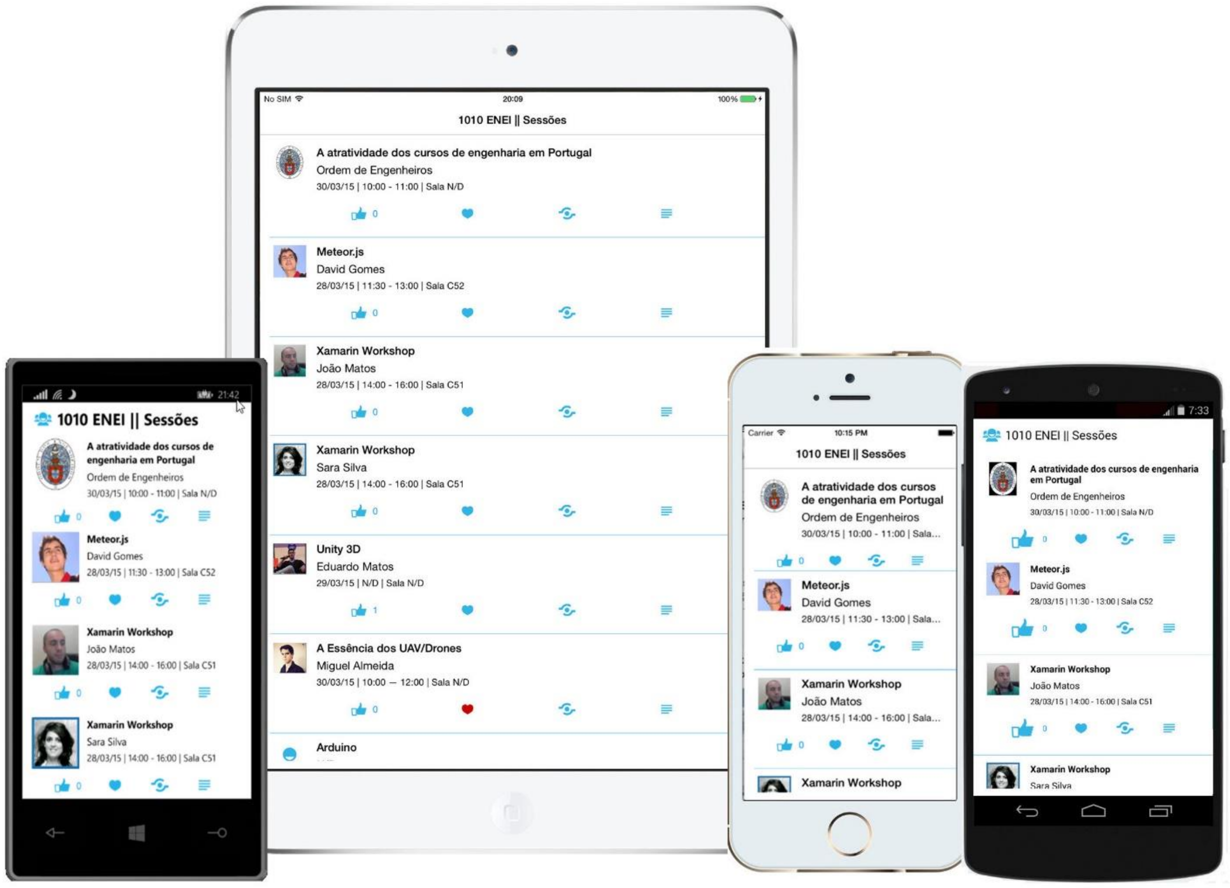
Define the splash screen

Define the name and the version for each platform

7. Add support for WinRT Apps

Wrapping Up

Xamarin Forms allow us to quickly create native applications for the different platforms with the same code base. This way, it will reduce the maintenance time and increases the time to improve the application.


1010 ENEI || Sessões
A atratividade dos cursos de engenharia em Portugal
Ordem de Engenheiros
30/03/15 | 10:00 - 11:00 | Sala N/D
Meteor.js
David Gomes
28/03/15 | 11:30 - 13:00 | Sala C52
Xamarin Workshop
João Matos
28/03/15 | 14:00 - 16:00 | Sala C51
Xamarin Workshop
Sara Silva
28/03/15 | 14:00 - 16:00 | Sala C51
Unity 3D
Eduardo Matos
29/03/15 | N/D | Sala N/D
A Essência dos UAV/Drones
Miguel Almeida
30/03/15 | 10:00 — 12:00 | Sala N/D
Arduino