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Pay attention to .NET Native when using Reflection (MVVM scenario)

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Among the other things, .NET Native tries to reduce the app size by analyzing the code and striping out unused .NET objects. This approach works very well, but we need to pay attention when we you work with Reflection, because in this case we must explicitly tell to .NET Native which elements are available for it.

A particular scenario occurs if we're following the MVVM pattern and we have a classic app with a GridView or a ListView and we want to invoke a command when the user clicks an item, passing the item itself to the command. With the Universal Windows Platform, this task can be accomplished using an **EventTriggerBehavoir** form XamlBehavoirs along with an **InvokeCommandAction** and an **InputConverter**:

```
1   <GridView IsItemClickEnabled="True" ItemsSource="{Binding Pe
2       <GridView.ItemTemplate>
3           <DataTemplate>
4               ...
5           </DataTemplate>
6       </GridView.ItemTemplate>
7
8       <Interactivity:Interaction.Behaviors>
9           <Interactions:EventTriggerBehavior EventName="ItemCl
10              <Interactions:InvokeCommandAction
11                  Command="{Binding ItemSelectedCommand}"
12                  InputConverter="{StaticResource EventArgsCo
13                  InputConverterParameter="ClickedItem" />
14          </Interactions:EventTriggerBehavior>
15      </Interactivity:Interaction.Behaviors>
16  </GridView>
```

At lines 9-14 we use an EventTriggerBehavior to catch the ItemClick event of the GridView and execute in response the **ItemSelectedCommand** action of the ViewModel. Thanks to InputConverter and **InputConverterParamter** (lines 12-13), this action automatically receives the clicked item as argument:

```
public sealed class EventArgsConverter : IValueConverter
{
    public object Convert(object value, Type targetType, obj
        string language)
    {
        if (value != null)
        {
            var propertyPath = parameter as string;
            if (!string.IsNullOrWhiteSpace(propertyPath))
            {
                var propertyPathParts = propertyPath.Split('
                object propertyValue = value;
                foreach (var propertyPathPart in propertyPat
                {
                    var propInfo = propertyValue.GetType().G
                        GetDeclaredProperty(propertyPathPart

                    propertyValue = propInfo.GetValue(proper
                }

                return propertyValue;
            }
        }

        return value;
    }

    public object ConvertBack(object value, Type targetType,
29            string language)
30        {
31            throw new NotImplementedException();
32        }
33    }
```

This Converter extracts the property name of the event argument that is passed as parameter (line 8, in this case **ClickedItem**) and then uses Reflection (lines 15-18) to get the actual value that will be received by the command.

This code works without problem in Debug mode, but when we switch to Release, enabling the .NET Native toolchain (that is required for app submission), if we click an item on the grid we'll get a runtime error like the following one:

> Unhandled exception at 0x77026D7E (combase.dll)

This occurs because the .NET Native toolchain has removed the ItemClickEventArgs class from the compiled code, as it hasn't found any reference to it in the code, because it is accessed only at runtime through Reflection.

So, as said at the beginning we need to tell to .NET Native to keep this type during compilation. Let's open the file **Default.rd.xml** inside the project *Properties* folder: it contains the Runtime Directives for .NET Native. All that we need is to add a declaration for the ItemClickEventArgs type:

```
1   <Directives xmlns="http://schemas.microsoft.com/netfx/2013/
2       <Application>
3           <!--
4             An Assembly element with Name="*Application*" appl
5             assemblies in the application package. The asteris
6             wildcards.
7           -->
8   
9           <Assembly Name="*Application*" Dynamic="Required All
10  
11          <!-- Add your application specific runtime directive
12          <Type Name="Windows.UI.Xaml.Controls.ItemClickEventA
13                Dynamic="Required Public" />
14  
15      </Application>
16  </Directives>
```

At lines 12-13 we have specified that we want to keep the ItemClickEventArgs type in compilation, even if it isn't statically referenced in the code. Now we can compile the app in Release mode again: this time everything will work as expected.

We can refer to MSDN documentation to get more information about the Runtime Directives Configuration File.

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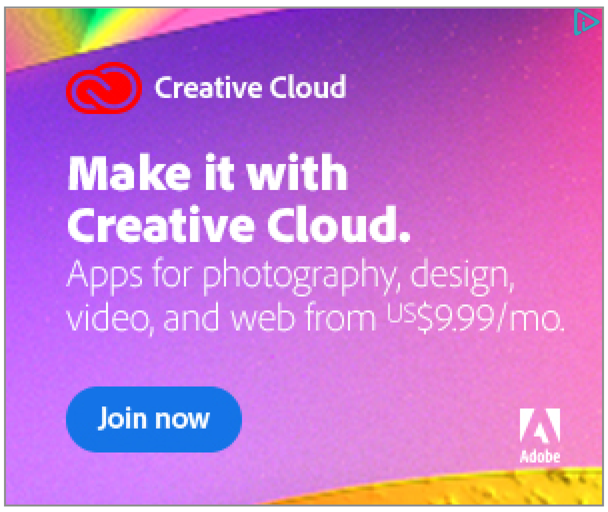
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