Xamarin Evolve 2014

Data Binding in Xamarin.Forms: not your dad's binding

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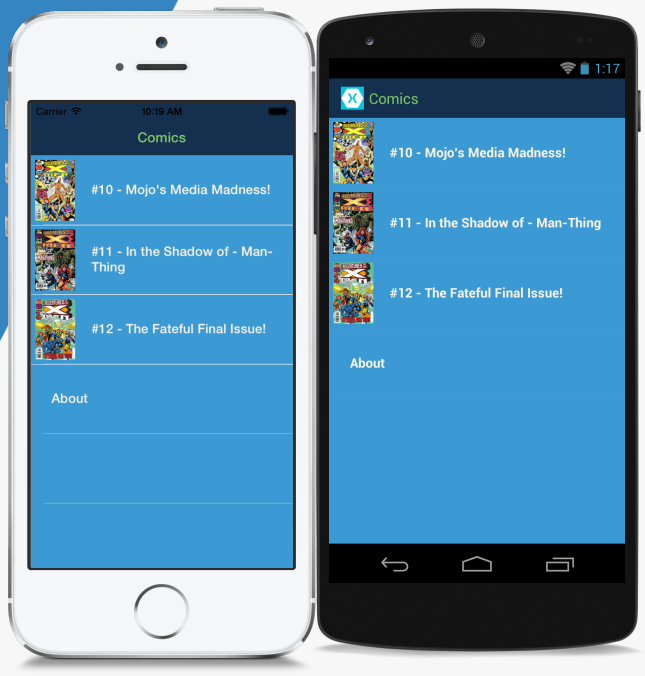
Agenda

1. Mapping Data to Visuals
2. Creating Binding in
   a. Code
   b. XAML
3. The Binding Context
4. Property Change Notifications



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Mapping Data to Visuals

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Apps are driven by data

Most applications display and manipulate data in some form

- Cloud-based
- Internally generated

Classes created to represent data are often referred to as Models

- can also refer to "entity" objects

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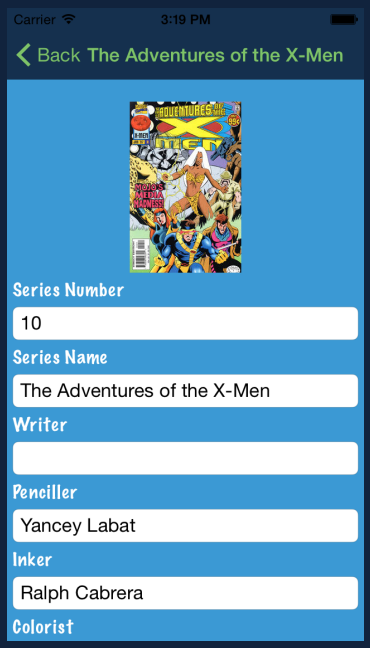
Models > Visuals

Code maps data from models to the screen

```
SeriesNameLbl = new Label {
  Text = Language.SeriesName,
  ...
} ;

SeriesNameEntry = new Entry{
  Text = _comicBook.SeriesName
} ;
```



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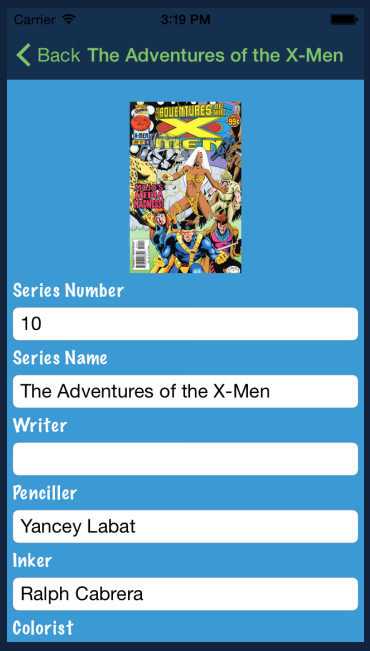
Models > Visuals

...and provide interactivity / behavior

```
SeriesNameEntry.TextChanged += (sender, e) => {
      if (!e.NewTextValue
        .Equals(_comicBook.SeriesName)){
          _comicBook.SeriesName = e.NewTextValue;
      }
} ;
```



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Data Binding

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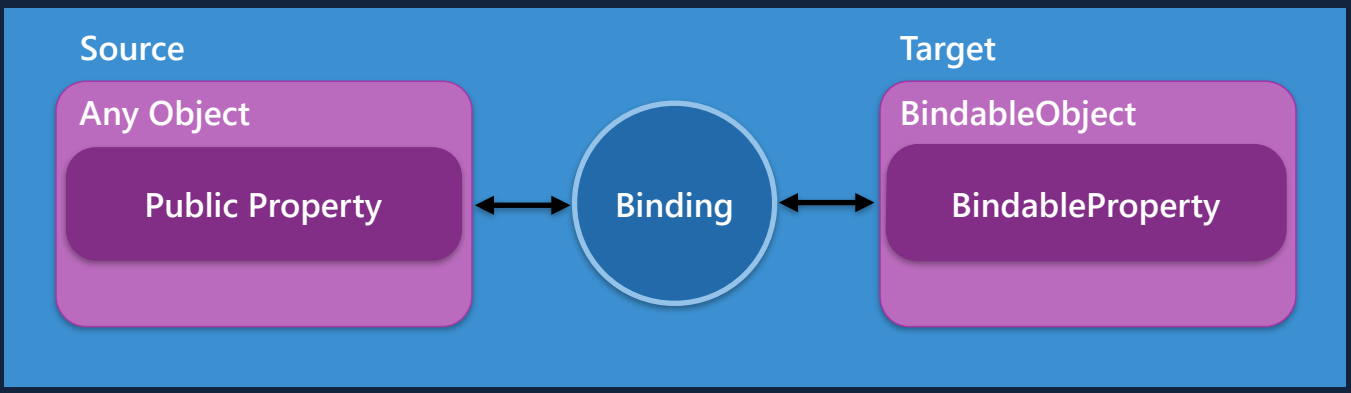
Data Binding

Data Binding involves creating a loose relationship between a source property and a target property, source and target are unaware of each other.



Binding acts as an *intermediary* – moving the data to and from the source and target.

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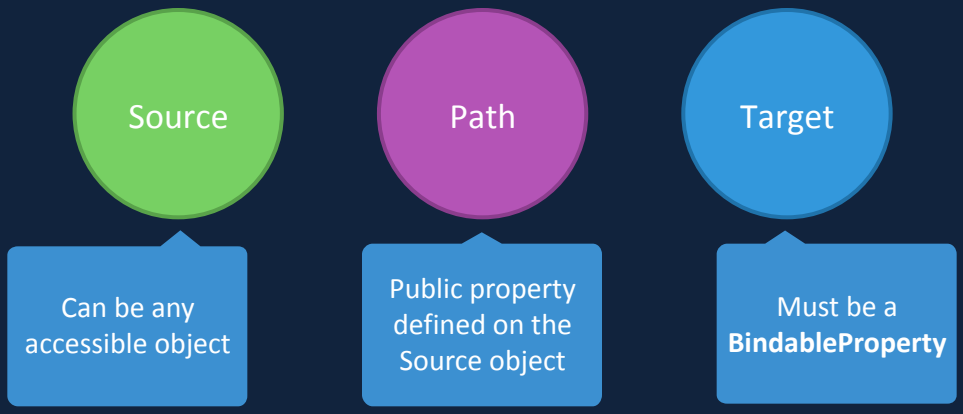
Creating Bindings

Bindings require three pieces of information



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Creating bindings [source]

```
void ExampleBindingSetup (){
    ComicBook comicBook = new ComicBook() {SeriesName = "The Avengers"};

    Entry seriesNameEntry = new Entry();

    seriesNameEntry.BindingContext = comicBook;

    Binding seriesNameB

    seriesNameEntry.Set                                    Binding);
}
```

ComicBook is the ***data source*** and is set as the **BindingContext** for the entry, all bindings applied to the control will look here for the data

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Creating bindings [source]

```
void ExampleBindingSetup (){
    ComicBook comicBook = new ComicBook() {SeriesName = "The Avengers"};

    Entry seriesNameEntry = new Entry();

    seriesNameEntry.BindingContext = comicBook;

    Binding seriesNameBinding = new Binding("SeriesName");

    seriesNameEntry.SetBinding(Entry.TextProperty, seriesNameBinding);
}
```

Binding object defines the ***property path*** to get the source data from, can use "." for overall source object

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Creating bindings [source]

```
void ExampleBindingSetup (){
    ComicBook comicBook = new ComicBook() {SeriesName = "The Avengers"};

    Entry seriesNameEntry = new Entry();

    seriesNameEntry.BindingContext = comicBook;

    Binding seriesNameBinding = new Binding("SeriesName");

    seriesNameEntry.SetBinding(Entry.TextProperty, seriesNameBinding);
}
```

Binding is associated to the target property using the **BindableObject.SetBinding** method

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Creating bindings [XAML]

Create bindings in XAML with {Binding} markup extension

```
<StackLayout Padding="20" Spacing="20">

    <StackLayout.Resources>
        <ResourceDictionary>
            <ComicBook x:Key="avengers" Name="The Avengers" ... />
        </ResourceDictionary>
    </StackLayout.Resources>

    <Entry  BindingContext="{StaticResource avengers}"
            Text="{Binding Name}" />
    ...
</Sta
```

Source

Target property

Path as 1st unnamed target

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Demo

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The Binding Context

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Binding to model objects

- Source for a binding can be any public property on any object
- Common to use model object to represent data for UI
- Data is then mapped from the model to the UI using bindings

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Utilizing BindingContext

- Many screens pull data from a singular object – mapping different properties to UI controls
- BindingContext would be the same for every control on the page in this case

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BindingContext inheritance

BindingContext is automatically inherited from parent to child

```
public partial class XamlBinding : ContentPage
{
     public XamlBinding (ComicBookViewModel comicBookVM)
     {
          BindingContext = comicBookVM;

          InitializeComponent ();
     }
}
```

Can set the BindingContext ***once*** on the root page and it is then ***assigned*** to ***every control*** (child) on that page

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Creating two-way bindings

- Typically want data to flow in both directions
  - source > target (always happens)
  - target > source (optional)

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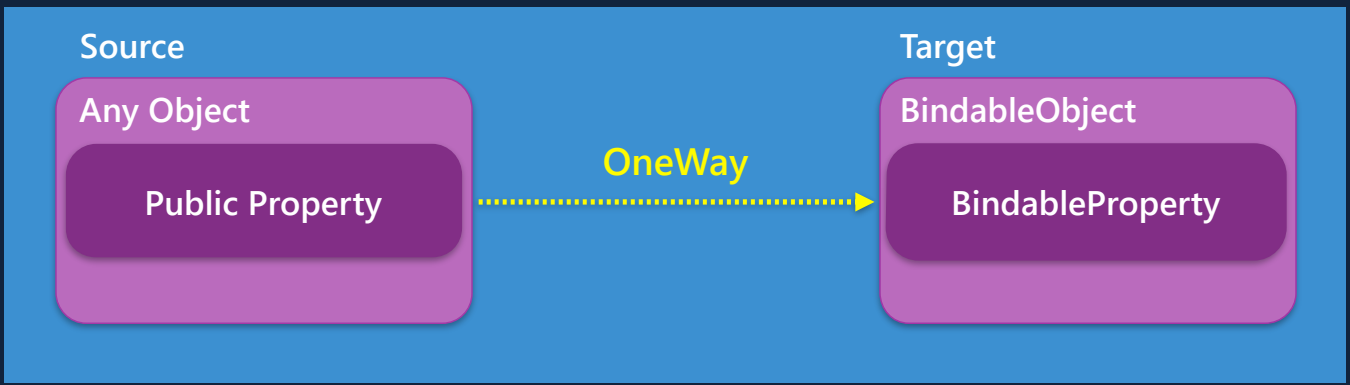
Binding Modes

Binding Mode controls the direction of the data transfer



BindingMode.Default is the default value and it decides the mode based on the target property preference – either ***OneWay*** or ***TwoWay***

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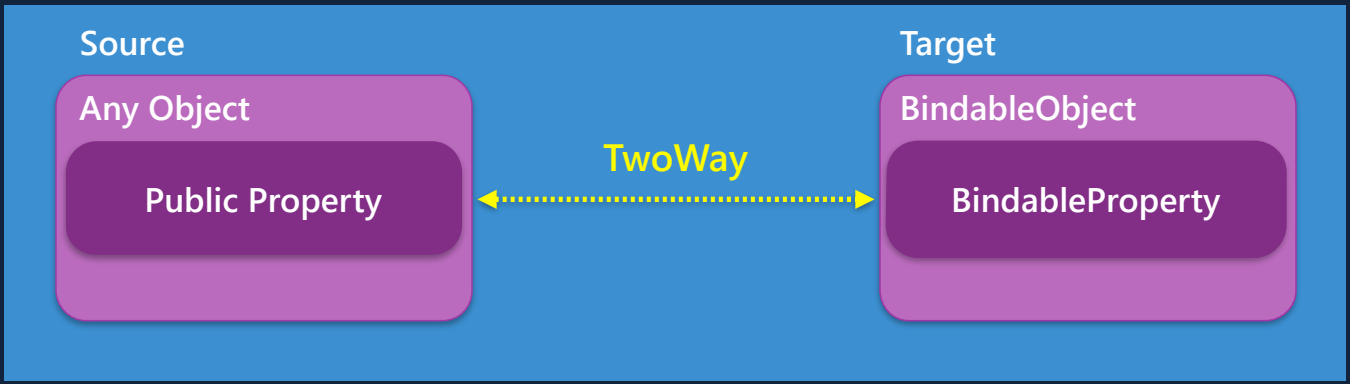
Binding Modes

Binding Mode controls the direction of the data transfer



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Binding Modes

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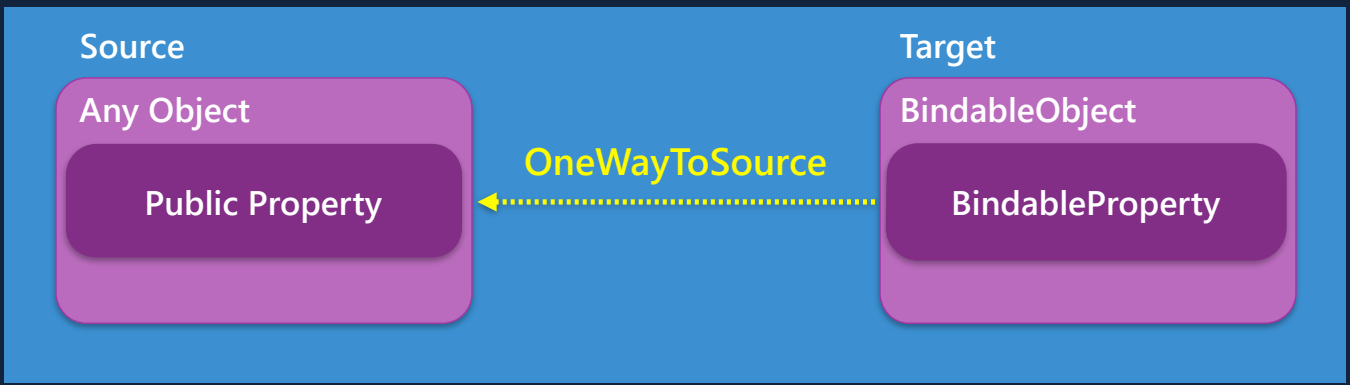

BindingMode.Default is the default value and it decides the mode based on the target property preference – either ***OneWay*** or ***TwoWay***

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Default Binding Mode

Default binding mode is property-specific, most are one-way by default with a few exceptions that default to two-way

```
DatePicker.Date
Entry.Text
ListView.SelectedItem
MultiPage<T>.SelectedIte
Picker.SelectedIndex
SearchBar.Text
Stepper.Value
Switch.IsToggled
TimePicker.Time
```

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Property Changes

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Pushing changes to the UI

One-Way and Two-Way bindings always update the UI when the source property is changed

```
public class ComicBook {
      public ComicBook () {}

      public int SeriesNumber  { get; set; }
      public string SeriesName  { get; set; }
      public string Writer  { get; set; }
      public string Penciller  { get; set; }
      public string Inker  { get; set; }
      public string Colorist  { get; set; }
      public string Letterer  { get; set; }
      public string Editor  { get; set; }
      public string StoryTitle  { get; set; }
      public string Character { get; set; }
      public string ISBN { get; set; }
      public string Barcode { get; set; }
      public string ImageSmall { get; set; }
      public string Url { get; set; }
}
```

Update: comicBook.Writer = "Chris van Wyk";

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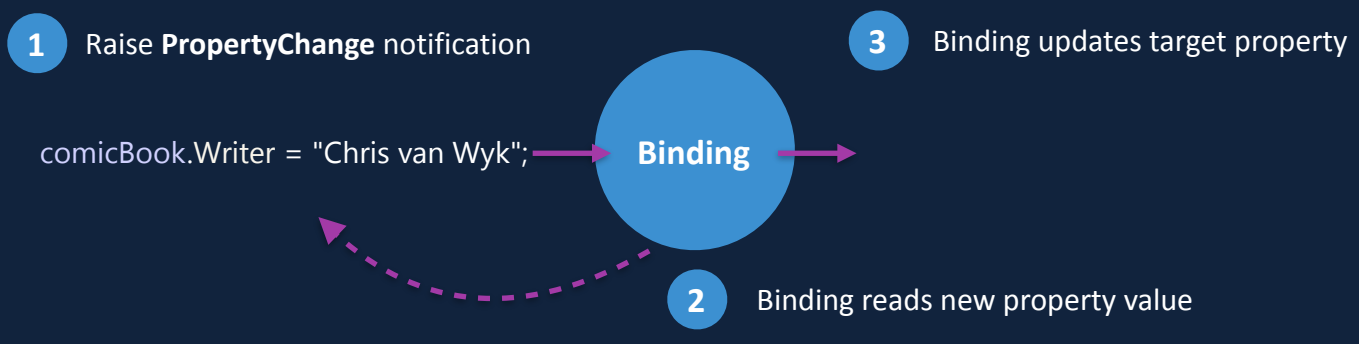
INotifyPropertyChanged

INotifyPropertyChanged provides change notification contract, should be implemented by any modifiable model object you bind to

```
namespace System.ComponentModel
{
     public interface INotifyPropertyChanged
     {
          event PropertyChangedEventHandler PropertyChanged;
     }
}
```


INPC + Bindings

Binding will subscribe to the **PropertyChanged** event and update the target property when it sees the source property notification



Demo

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Summary

- Mapping Data to Visuals
- Creating Bindings in Code
- Creating Bindings in XAML
- Working with Binding Context
- Binding Modes
- Property Change Notifications

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