




# vbug


## .NET Developer Conference 2007

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Microsoft Campus, Reading, UK

Databinding in WPF  
Ken Spencer


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## Intro to data binding with WPF



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## Figuring out the data binding model




- Database?
- XML?
- Objects?
- UI Elements?

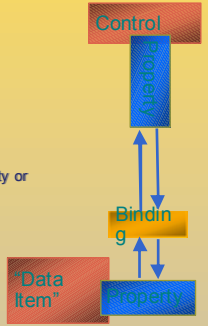
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## Data Binding Overview




- Target
  - Any property, any element
- Source
  - CLR Object
  - WPF Element
  - ADO.NET
  - XML
- Dynamic
  - INotifyPropertyChanged, DependencyProperty or Property Descriptor
- Multiple models
  - One Time
  - One Way
  - Two Way
- Value Converter



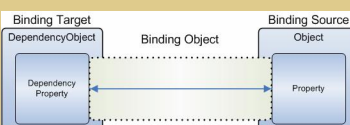
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## Data Binding Concepts




- Binding Components
  - Target Object
  - Target Property
  - Binding Source
  - Path
- Target Property Must be a dependency property



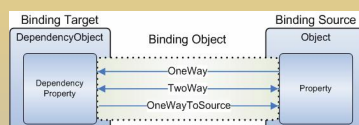
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## Binding Modes



- OneWay
- TwoWay
- OneWayToSource
- OneTime



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## Triggers

- Method of notification in databinding
  - What's changed
  - How notifications are triggered
  - And so forth

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## What Triggers Updates

- Triggering supported by TwoWay or OneWayToSource mode of binding
- Dependency property or INotifyPropertyChanged
- UpdateSourceTrigger property
  - LostFocus/PropertyChanged/Explicit

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## Explicit Trigger Control

- Use UpdateSource on the Binding Expression object
  - Triggers update
  - For instance

```
Dim Binding as BindingExpression
Binding = element.GetBindingExpression(elementtype.property)
Binding.UpdateSource()
```

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## Binding to Business Classes

- Properties must be public
  - Can't bind to non-public members
- TwoWay binding requires implementing INotifyPropertyChange interface

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## Binding to Business Classes

- INotifyPropertyChange
  - Contained in System.ComponentModel
  - Must implement PropertyChangedEventHandler
  - Must raise PropertyChanged event when properties get updated
  - UpdateSourceTrigger dictates when property is updated from UI Element

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## Binding in Code

- Binding Function
 

```
Sub SetupDataBinding(ByVal thisCustomersPropertyClassList As List(Of CustomersPropertyClass))
    CustomerNameTextBox.SetBinding(TextBox.TextProperty,
    GetBinding(thisCustomersPropertyClassList, "CompanyName"))
    With CustomerComboBox
        .IsSynchronizedWithCurrentItem = True
        .DisplayMemberPath = "CompanyName"
        .ItemsSource = thisCustomersPropertyClassList
    End With
End Sub
```
- Support Function
 

```
Private Function GetBinding(ByVal thisCustomersPropertyClassList As List(Of
CustomersPropertyClass), ByVal PropertyToBind As String) As Binding
    Dim thisBinding As Binding
    Dim thisObjectDP As New ObjectDataProvider
    thisObjectDP.ObjectInstance = thisCustomersPropertyClassList
    thisBinding = New Binding(PropertyToBind)
    thisBinding.Source = thisObjectDP
    thisBinding.Mode = BindingMode.TwoWay
    Return thisBinding
End Function
```

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## Clearing Bindings


- `BindingOperations.ClearAllBindings`
  - Clears all bindings for the element
- `BindingOperations.ClearBinding`
  - Clears one binding
    - ❖ Say the Text property binding
- Its important to call one of the Clear methods to change a binding
  - You can't just change a property as the triggers and so forth are still there

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## Getting it to work

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## Binding in Markup



```

<Image Source="truck.png"
Canvas.Left=
"{Binding Path=Value,
ElementID=horzPos}"/>
<Slider Orientation=
"Horizontal"
Name="horzPos"
Value="40"/>

```

```

{Binding Path=Value, ElementName=horzPos}

```

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## Object Data Providers

- Add to resource dictionary
  - Named source objects
- Use with resource binding
  - `{StaticResource theCars}`

```

<Window>
<Window.Resources>
<ObjectDataProvider
x:Key="myData"
ObjectType="
{x:Type Foo}" />
</Window.Resources>

```

```

<TextBlock.TextContent="{Binding Path=Bar,
Source={StaticResource myData} }" />

```

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## Provide Data From Code

- May be easier to load data in codebehind
- Can set `DataContext` in code

```

Foo myDataObject = new Foo();
myDataObject.Bar = 42;

// Set DataContext
myWindow.DataContext = myDataObject;

```



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## Binding to Business Objects, etc.

- `Source`
  - Flexible
  - Bind to business object directly
  - Bind to resources
- `RelativeSource`
  - Binds to a resource relatively
  - Control where and what
- `DataContext`
  - Handy when you have several elements to bind
  - Set once for window and bind everything to it
  - Property of many elements
    - ❖ Window, StackPanel, ...

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## Binding to XML

```

<XmlDataProvider
  x:Key="cars"
  XPath="/Cars/Car"
  Source="cars.xml"
/>
  
```

```



cars.xml
<Cars>
  <Car Make="Ford"
      Model="F-150">
    <Image>truck.png</Image>
  </Car>
  <Car> ... </Car>
</Cars>
  
```

```

<TextBlock
  TextContent="{Binding XPath=@Make,
                  Source={StaticResource
cars}}" />
  
```

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## Databases and Web Services

- No special support required
- Use object binding
  - DataSet/DataTable support the TypeDescriptor system



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## Data Templates

```

class Car
{
  string Image {get;set}
  string Model {get;set}
}
  
```



BMW M3

```

<DataTemplate x:Key="carTemplate">
  <Border BorderBrush="Blue" BorderThickness="2" Background="LightGray"
    Margin="10" Padding="15,15,5,5">
    <StackPanel>
      <Image HorizontalAlignment="Center" Source="{Binding Path=Image}" />
      <Border HorizontalAlignment="Center" BorderBrush="Wavy"
        Background="#000" BorderThickness="1" Margin="10" Padding="3">
        <TextBlock FontSize="18" Text="{Binding Path=Model}" />
      </Border>
    </StackPanel>
  </Border>
</DataTemplate>
  
```

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## DataGrids?

- Use the Grid or Lists in WPF
- 3<sup>rd</sup> Party
  - Xceed DataGrid
    - ❖ Powerful
    - ❖ Free (best part)

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## Why did you use code?

- Hm?
  - Why bind in code?
  - I am not sold on doing everything in markup
  - Code is reusable
  - Remember spaghetti code?

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## VS Addins

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## Testing



- Setup Unit tests
- Run them
- Should work every time
  - Once you have tested the tools output, it works