



Data Binding in WPF

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About Brian

- n Chief Architect, IDesign Inc. (www.idesign.net)
- n Microsoft Regional Director / MVP
- n Publishing
 - ┆ Developing Applications with Windows Workflow Foundation, LiveLessons training DVD, June 2007.
 - ┆ Smart Client Deployment with ClickOnce, Addison Wesley, January 2007
 - ┆ Data Binding in Windows Forms 2.0, Addison Wesley, January 2006
 - ┆ MSDN Magazine, MSDN Online, CoDe Magazine, The Server Side .NET, asp.netPRO, Visual Studio Magazine
- n Speaking
 - ┆ Microsoft TechEd US, Europe, Malaysia, Visual Studio Connections, DevTeach, INETA Speakers Bureau, MSDN Webcasts
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Agenda



- n Data sources
- n Data binding overview
- n Managing bound data
- n Data templates
- n Master details
- n Data providers

Data sources



- n Data binding data sources are always objects in memory
 - ┆ Single objects
 - ┆ Collections of objects
 - ┆ DataSets
- n Populating in memory data objects is not data binding
 - ┆ Data access
- n WPF changes nothing about how to do data access in .NET
 - ┆ LINQ might



Data Binding Interfaces

- n Data binding in WPF (and Windows Forms) is all based on interfaces
 - ┆ IEnumerable
 - ┆ Basic iteration pattern of .NET
 - ┆ IList
 - ┆ Indexed, ordered collection
 - ┆ INotifyPropertyChanged
 - ┆ Allows objects to notify when property values are changed
 - ┆ INotifyCollectionChanged
 - ┆ Allows collections to notify when contained items change
 - ┆ ICollectionView
 - ┆ Navigation, sorting, filtering, and grouping of items in a collection



ObservableCollection<T>

- n The collection of choice for data bound custom objects (entities)
 - ┆ Implements INotifyPropertyChanged and INotifyCollectionChanged
 - ┆ Participates with 100% fidelity in WPF data binding

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Data Binding Overview



- n One-way data binding:
 - ┆ Taking data from an in-memory object and automatically presenting it through control properties on the screen
- n Two-way data-binding:
 - ┆ One-way data binding +
 - ┆ Taking changes made by the user and automatically writing them into the underlying bound data object



Data Binding in WPF

- n Rich infrastructure for binding control properties to objects and collections
- n Loosely coupled model
 - ┆ Control does not need to know anything about the type it is being bound to
- n Can generate UI based on bound collections
 - ┆ Like ASP.NET



DataContext

- n Dependency property defined on FrameworkElement
- n Provides ambient data source for an element and its children
- n May be set to a collection or an individual object
- n Flows down the element hierarchy to child elements
- n Picked up by bindings on child elements



Bindings

- n Tie a property on an object to a value source for that property
- n Example:
 - ┆ Text property on TextBox
- n Pick up DataContext on element or parent if set
 - ┆ DataContext knows current item if collection



Binding Properties

- n Path – property path on source object
- n Source – can set source object specifically by reference
- n RelativeSource – can set source object through relative path reference
- n ElementName – set to specific element in the element hierarchy by name
- n IsAsync – does the data binding asynchronously from main UI rendering
- n Mode – allows you to specify one or two way data binding
- n Converter – specify a converter type that will be called to coerce values



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Managing bound data

- n ICollectionView
 - ┆ Defines API for managing data collection
 - ┆ Navigation
 - ┆ Sorting/Searching/Filtering/Grouping
 - ┆ Similar to IBindingList in Windows Forms
- n CollectionViewSource
 - ┆ Obtain a collection view from a collection
 - ┆ Can wrap any IList or IListSource
 - ↳ Ex: DataSet / DataTable



Value Conversion

- n Converter property on Binding
- n Class that implements IValueConverter
- n Implement Convert and ConvertBack methods
- n Can provide a parameter from the calling code



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Data Templates

- n Reusable chunks of XAML that can be emitted during data binding
- n Can be defined through resources or on control itself
- n Copy of template gets “spit out” by ItemsControl derived class for each item in a data bound collection
 - ┆ Much like Repeater and DataList in ASP.NET



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Master-details binding

- n Binding paths are relative to the data context or source
- n Single level: select parent item, see child collection
 - ┆ Set data context to parent collection
 - ┆ Set path of child control to child collection property
- n Multi-level
 - ┆ Use two CollectionViewSource objects
 - ┆ First tied to parent collection
 - ┆ Second tied to child collection
 - ┆ Use relative Path property on Binding to pick the child/grandchild collection



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Data Providers

- n ObjectDataProvider
 - ┆ Creates source object (with parameterized constructor)
 - ┆ Point to a source method on object
 - ┆ ObjectType, MethodName properties
- n XmlDataProvider
 - ┆ Bind to a chunk of XML
 - ┆ Source, XPath properties



Resources

- n Beatriz Coza Blog: <http://www.beacosta.com/blog/index.php?paged=4>
- n Programming WPF 2nd Edition, Chris Sells and Ian Griffiths, O'Reilly
<http://www.amazon.com/Programming-WPF-Chris-Sells/dp/0596510373>
- n WPF Unleashed, Adam Nathan, Sams Publishing, www.adamnathan.net/wpf
- n Essential WPF, Chris Anderson, Addison Wesley, <http://www.simplegeek.com/book>
- n Programming Windows Presentation Foundation, Chris Sells and Ian Griffiths, O'Reilly & Associates,
<http://www.amazon.com/Programming-Windows-Presentation-Foundation-Chris/dp/0596101139>
- n Application = Code + Markup, Charles Petzold, MS Press,
<http://www.charlespetzold.com/wpf>.
- n .NET Rocks! TV: <http://dnrtv.com> (episodes 56,59)
- n Data Binding with Windows Forms 2.0, Brian Noyes, Addison Wesley
<http://www.softinsight.com/databindingbook>

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