Data Binding with Windows Forms 2.0

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About Brian

- Microsoft Solution Architect MVP
- Writing
  - MSDN Magazine, CoDe Magazine, The Server Side.NET, asp.netPRO, Visual Studio Magazine
  - Data Binding in Windows Forms 2.0, Addison-Wesley, January 2006
  - Smart Client Deployment with ClickOnce, Addison-Wesley, Late Summer 2006
- Speaking
  - Microsoft TechEd US, Europe, Malaysia, Visual Studio Connections, DevTeach, DevEssentials, VSLive!, INETA Speakers Bureau, MSDN Webcasts
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Agenda

- Quick Intro to Data Binding
- Intro to Data Sources Window
- Working with Data Sources
- Generating Bound UI Controls from Data Sources
- Binding Existing Controls to Data Sources
- Customizing Bound Control Types

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Data Binding
Intro

- One-way: Automatically populating controls with data
  - Set a few properties
  - No need to iterate yourself
- Two-way: Automatically propagating changes to data
  - From control to data source (client side)
  - No need to iterate and check for changes

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Data Binding
.NET support

- Core capability of .NET controls since .NET 1.0
  - Web and Windows
  - Built in at base Control level
  - Derived controls can specialize for specific scenarios
    - Ex: DataGrid supports advanced DataSet features
- Interface-based

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Data Binding
Simple and Complex

- Simple Data Binding
  - Bind a single value from a data collection to a single control property
  - Ex: CustomerName field to Text property on TextBox
- Complex Data Binding
  - Bind collection of data to control that presents multiple values from collection
  - Ex: Customers table in grid, CustomerName values in ComboBox

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Data Binding
Control Properties

- Simple Data Binding
  - Create a Binding object
    - Ties control property to data source and data member
  - Add to DataBindings collection of control
- Complex Data Binding
  - Set data source
  - Set data member (optional)
  - DisplayMember and ValueMember for ComboBox and ListBox controls

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Data Binding
Control Data Sources

- Direct
  - DataSet (Typed DataSet) / DataTable / DataView
  - Object collections
  - Objects
- Indirect (preferred)
  - BindingSource (new in .NET 2.0)

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Data Sources Window
Overview

- New in Visual Studio 2005
- Primary point of control for establishing data binding
  - Bring data sources into the project
  - Add controls to forms
  - Associate data sources with controls

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Data Sources Window
Sources

- Database
  - Launches Data Source Configuration Wizard
  - Adds Typed Data Set definition to project
  - Local SQL Express database
- Web Service
  - Interprets return type of Web service methods
- Object
  - Uses public properties and fields

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Data Sources Window
Sources

- Handles hierarchical objects
  - Child object reference (1 : 1)
  - Child collections (1 : Many)
- Presents as tree
- Drill down to desired collection / property

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Working with Data Sources
Databases

- Add New Data Source
  - Data menu or Data Sources Window
- Data Source Configuration Wizard
- Pick connection
- Pick database objects
- Generates typed data set definition

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Working with Data Sources
Web Service

- Existing Web Reference types included automatically in Data Sources
- Add New Data Source – Web Service option
- Launches Add Web Reference Wizard
- Extracts return types from Web methods
- Creates Web reference in project
- Exposes Web method return types as objects for data binding

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Working with Data Sources
Object

- Point to assembly containing type definition
- Select type from assembly
- Exposes public properties for data binding

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Demonstration #1

demo

Working with Data Sources

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Generating Bound Controls
Overview

- Each data source and member has UI controls associated with it
  - Defaults set automatically based on type and location
- Drag and drop onto form generates bound controls

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Generating Bound Controls
Default Control Types

- Collections:
  - DataGridView
  - Details (Collection of controls per field/property)
  - Custom
- Properties or fields:
  - TextBox
  - Label
  - LinkLabel
  - ComboBox
  - ListBox
  - Custom

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Demonstration #2

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Generating Bound Controls

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Binding Existing Controls
Overview

- Data sources can also be used with existing controls on a form
- Drag data source item onto control
- Designer sets appropriate data binding properties based on the source
- Creates needed members
  - BindingSources, table adapters, data sets, navigators

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Demonstration #3

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Binding to Existing Controls

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Custom Bound Controls
Overview

- Can create custom controls for use in Data Sources binding
- Presented controls based on Windows Forms Designer options settings
  - Select control types per data type
  - Based on controls currently in the Toolbox
  - Can include your custom controls

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Custom Bound Controls
Creating controls

- Requires binding attributes
  - DefaultBindingProperties – Single value control
  - LookupBindingProperties – List control
  - ComplexBindingProperties - Grid

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Additional Resources

- Data Binding in Windows Forms 2.0, Brian Noyes, Addison Wesley, 2006. http://www.amazon.com/gp/product/032126892X/104-6934263-329561?v=glance&n=283155
- Build a Data Access Layer with the Visual Studio 2005 DataSet Designer, Brian Noyes, The ServerSide.NET, http://www.theserverside.net/articles
- Tackle Complex Data Binding in Windows Forms 2.0, Brian Noyes, CoDe Magazine, Sep/Oct 2005
- Drag Once Data Binding, Steve Lasker, CoDe Magazine, Sep/Oct 2004 http://www.code-magazine.com/Article.aspx?quickid=0409051
- Drag Once Data Binding with Custom Controls, Steve Lasker, CoDe Magazine, Nov/Dec 2004 http://www.code-magazine.com/Article.aspx?quickid=0411071
- Windows Forms Object Data Binding in .NET 2.0, 15 Seconds.com, Rocky Lhotka http://www.15seconds.com/issue/040614.htm

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