Build Custom Data Bound Objects and Collections

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About Brian

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• Writing
  ▪ Data Binding in Windows Forms 2.0, Addison Wesley, January 2006
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  ▪ Microsoft TechEd US, Europe, Malaysia, Visual Studio Connections, DevTeach, INETA Speakers Bureau, MSDN Webcasts
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Agenda

• Business Entities and Collection Overview
• Key Data Binding Interfaces
• Defining Custom Business Entity Types
• Defining Custom Entity Collections
• Enhancing the Framework Collections
• Binding to Custom Objects in Windows Forms 2.0

Business Entity Type Overview

• Custom types that you write
• Contain business entity data
  ▪ Instance data that transitions more than one layer in your architecture
  ▪ Logically related data supporting one or more use case in your application
• Classes with:
  ▪ Fields / Member Variables (Data holders)
  ▪ Properties (Data API)
  ▪ Operations / Methods (Validation, custom logic, etc.)
  ▪ Interface implementations (supporting usage scenarios)
Business Entity Collection Overview

- Containers for zero to many instances of business entity types
- Should be type safe and homogeneous containers for a given type
- Implement specific interfaces for specific scenarios
- Based on generic collection types in .NET 2.0

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Key Data Binding Collection Interfaces

- **IEnumerable**
  - Basic iteration pattern in .NET
  - Implement IEnumerable / IEnumerator
  - Use iterators in C# 2.0 for more compact code
- **IList**
  - Ordered, indexed collection that supports Windows Forms complex data binding
- **IBindingList**
  - Supports change notification, sorting, searching
- **IBindingListView**
  - Supports advanced sorting (multi-property) and filtering

Key Data Binding Entity Interfaces

- **INotifyPropertyChanged**
  - Change notifications to clients or containers
- **IEditableObject**
  - Transacted changes to object
- **IDataErrorInfo**
  - Error containment and notification
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Creating Entity Types

• Declare class
• Implement properties
  ▪ Code snippets
• Implement interfaces
  ▪ Requires property modifications
• Implement logic
  ▪ Often requires property modifications
  ▪ May cause bound controls not to sync properly
• Automate!!
  ▪ Base Classes
  ▪ Code Snippets
  ▪ CodeRush
  ▪ CodeSmith
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Custom Entity Collections

• Prior to .NET 2.0
  ▪ CollectionBase + lots of work + lots of duplicated code!!
• .NET 2.0 – Generic collections
  ▪ List<T> - IList implementation
  ▪ BindingList<T> - partial IBindingList implementation
• Derive a custom type from the generic collection
  ▪ Cleaner API, somewhere to add behavior
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Extending BindingList<T>

- Sorting, Searching not implemented
  - Stubbed out and overridable
- Custom construction for objects sometimes needed
  - IBindingList.AddNew override needed
  - Default implementation just calls default constructor
Extending BindingList<T>

- Implementation of IBindingListView may be desirable
  - Multi-property sorts
  - Filtering of contained data
- Some things generalizable, some not
- My BindingListView<T> class gets you most of the way there

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Putting the code to work

- BindingSource component binds well to custom objects and collections
  - If they support the right interfaces
- Data Sources window in Visual Studio supports drag and drop data binding of custom objects as well

Summary

- Bindable objects and collections much easier in .NET 2.0
- Harness the power of generic collections
- Automate business entity type declarations
Resources

- Data Binding in Windows Forms 2.0, Addison Wesley, January 2006
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