


WCF RIA Services

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About Brian

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Publishing

Developers Guide to Microsoft Prism 4,
O'Reilly & Assoc., March 2011

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

Speaking

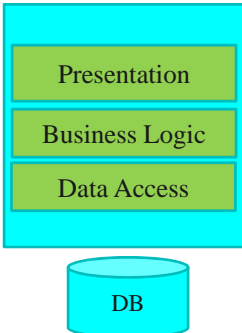
Microsoft TechEd US, Europe, Malaysia,
Visual Studio Connections, DevTeach,
INETA Speakers Bureau, MSDN Webcasts

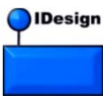
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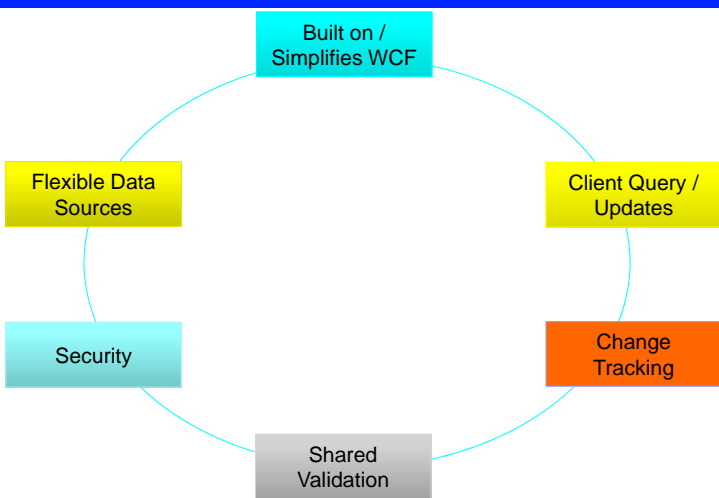
WCF RIA Services Overview

- Simplifies building N-tier Line of Business (LOB) applications
 - Highly dependent on push pull of data
 - Can use for non-CRUD operations as well
- Architecture and tools for building the glue code between the client and the back end
 - Streamlined pipeline for data and operations between client and server
 - Clients: Silverlight & ASP.NET
 - Future releases: ASP.NET client side JavaScript (WCF JQuery)



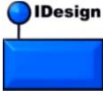


The Benefits



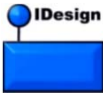
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graph TD
    A[Built on / Simplifies WCF] --- B[Client Query / Updates]
    B --- C[Change Tracking]
    C --- D[Shared Validation]
    D --- E[Security]
    E --- F[Flexible Data Sources]
    F --- A
  
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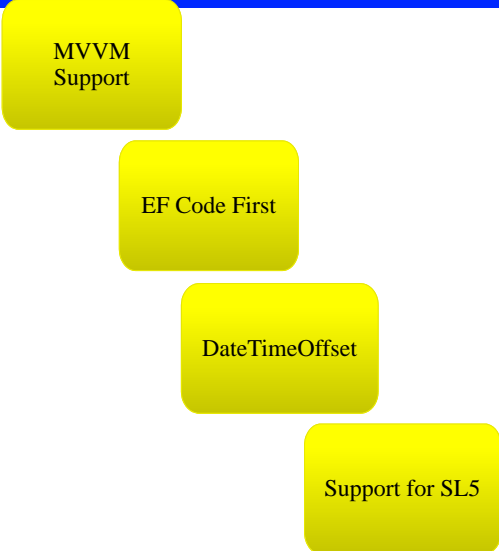


What do you need?

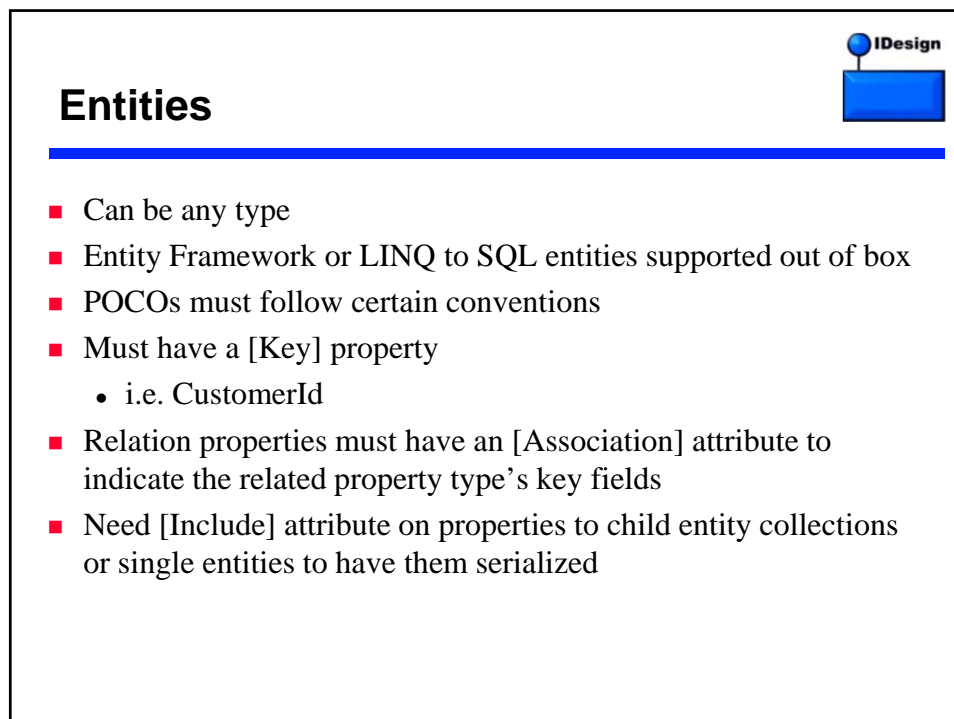
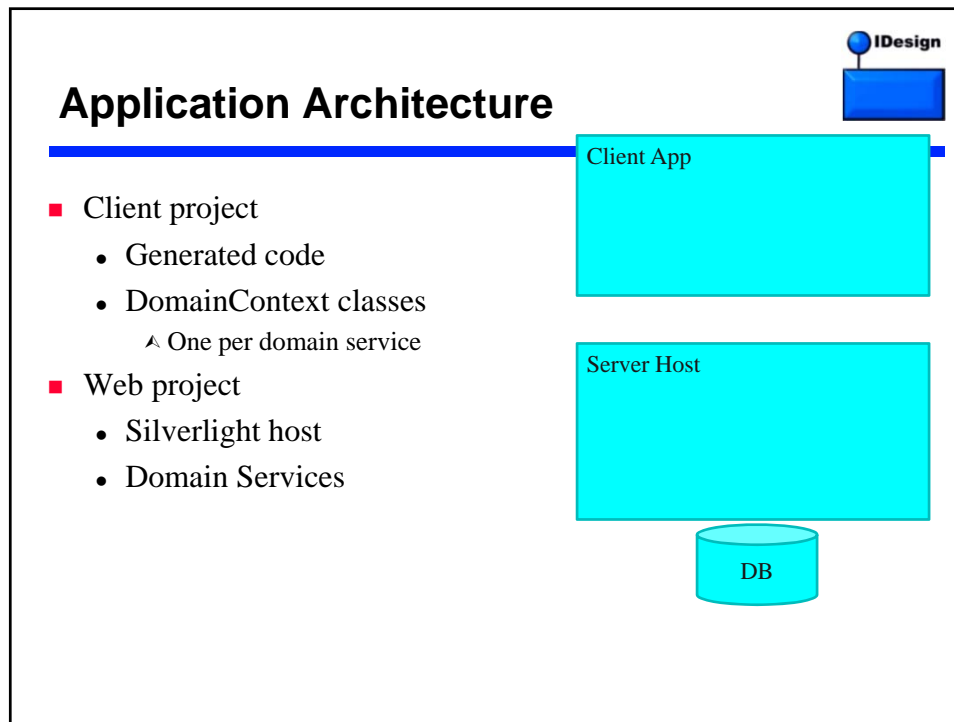
- Silverlight Tools for Visual Studio 2010
 - RTW Core bits (v1)
- RIA Services Toolkit
 - Other endpoint types (SOAP, JSON)
 - ASP.NET support for consuming domain service in process
- WCF RIA Services SP1 (shipped with VS 2010 SP1)
 - Complex types support for child objects
 - Sharing entities across domain services
 - Better data binding to client collection types
 - Various other improvements

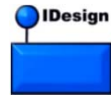


Coming Soon in SP2



- MVVM Support
- EF Code First
- DateTimeOffset
- Support for SL5





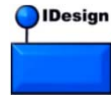
Metadata Classes

- Define a partial class for the entity type
- Define a nested metadata class inside the entity type
 - Not required, but convention
 - “Buddy class”
- Add a MetadataType attribute on the entity partial class to tie in the metadata type
- Add attributes to properties on the metadata type that match the entity properties
- Those attributes show up on the client entity type or influence entity transmission
 - Validation
 - Include
 - Exclude
 - Composition



Query Operations

- Read operations
 - Return object, IEnumerable<T>, IQueryable<T>
 - ▲ IQueryable<T> and LINQ provider required for deferred execution
 - Query attribute on methods - optional
 - ▲ IsComposable=false when returning single entity
 - ▲ ResultLimit to constrain maximum items returned to client



Loading Data on the Client

- Allow you to execute a DomainContext method to query data
 - Including updates
- Drag/drop data binding is VS 2010
- Supports parameterized queries
- Supports sorting, grouping, filtering, paging
- Not a good fit with MVVM
 - Puts query “logic” into the view



Loading Data on Client

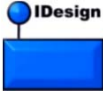
- DomainContext.Load method
 - Pass an EntityQuery<T>
 - Can modify the expression tree on client if target method in DomainService returns IQueryable<T>
- Executes asynchronously
- Bind to entity collection for automatic update via INotifyCollectionChanged
- Pass async callback to be notified and work with results or handle errors yourself
- Can work with returned LoadOperation<T> for async notification as well

IQueryable<T> and Deferred Execution

- RIA Services serializes the expression tree from the client the server
- LINQ operations specified by the expression tree are executed on the server
- When the underlying provider supports it (i.e. Entity Framework and LINQ to SQL), deferred execution goes all the way to the DB

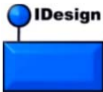
Querying Relations

- Domain service needs to return related entities
 - i.e. Customer – Orders
 - Entity Framework:
ObjectContext.Customers.Include(“Orders”)
- Entity metadata type needs [Include] attribute on related property



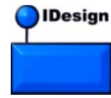
Update Operations

- Entity changes are cached in the client DomainContext until SubmitChanges called
 - Contains an EntityContainer that tracks changes
- Sent as a batch to the service
 - Including original version for optimistic concurrency
- Service executes batch, calling Insert, Update, and Delete methods with one entity per method call



Update Operations

- Naming convention in domain service to identify methods
 - Insert: InsertXXX, AddXXX, CreateXXX
 - Update: UpdateXXX, ModifyXXX, ChangeXXX
 - Delete: DeleteXXX, RemoveXXX
 - Where XXX is an entity type name
- Attributes exist for explicit declaration of intent
 - Insert, Update, Delete attributes



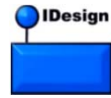
RIA Services and MVVM

- MVVM is all about separating interaction logic code from the view
- DomainDataSource is specifically geared towards putting query logic in the view in a declarative fashion
 - Impedance mismatch
- DomainContext can be used in the view model directly
 - Problems: Testability, Separation of Concerns
- DomainContext can be hidden in a service / repository
 - Lose the flexibility of the programming model from the view model's perspective
 - Fair amount of work to abstract the programming model



WCF RIA Services Security

- Can use even if you don't use WCF RIA Services for normal service needs
- Allows the client to login via a service
- Supports Windows or Username credentials out of the box
- Leverages Membership/Roles/Profile providers
- Establishes a client side security context
 - Principal / Identity of the authenticated user
 - Roles information
 - Personalization information
- Uses cookies for credential transmission
- Extensible for other credential types and security look up



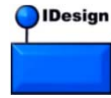
Using WCF RIA Services Security

- Add an AuthenticationDomainService to your Silverlight host Web Site
- Configure Membership/Role/Profile providers or Windows auth on the host web site
- Set up Client WebContext Authentication
- Login or Load user
 - Async service call
- Client principal initialized and ready to use client side



Securing WCF RIA Domain Services Calls

- If you are using WCF RIA Services for service calls
- Add [RequiresAuthentication] to service
- Add [RequiresRole] to service methods
- Can capture user principal in service
 - Use for programmatic role checks and logic



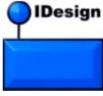
Personalizing with RIA Services

- User type associated with AuthenticationDomainService
- Security context of user transferred to client side on Login or Load
- Additional properties on User type treated as entity data
 - Transferred as well
- Set up Profile provider
 - Web host config settings
 - Property declarations that map to User type properties



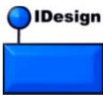
Services Under The Covers

- WCF service created at runtime based on domain service
- REST style
- Binary encoding
- Address scheme:
 - [BaseURI] + [DomainServiceNameWithNamespace].svc with all "." in the DomainServiceNameWithNamespace replaced by "_"
- Client proxy code generated at compile time
- Generated service contracts:
 - Query methods return QueryResult<T>
 - CUD methods signature:
 - ▲ ChangeSet SubmitChanges(ChangeSet changeSet)



Exposing OData, SOAP, JSON

- You can expose your domain services via:
 - OData
 - △ REST – ATOM standard
 - △ Read only
 - SOAP
 - △ BasicHttpBinding
 - JSON
 - △ REST – JSON serialization



Resources

- WCF RIA Services series:
<http://www.silverlightshow.net/items/WCF-RIA-Services-Part-1-Getting-Started.aspx>
- E-Book:
http://www.silverlightshow.net/ebooks/wcf_ria_services.aspx

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