

# Emerging Data Technologies

## OData, WCF & ADO.NET Entity Framework

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# Goals

- Overview of the Microsoft Data Stack
- Introduction to ADO.NET Entity Framework
- Answers to common “depth” questions
- Focus on real-world scenarios
- Provide insight to future direction

# Microsoft Data

OData

Poco

REST

***XML***

Entity  
Framework

ATOM

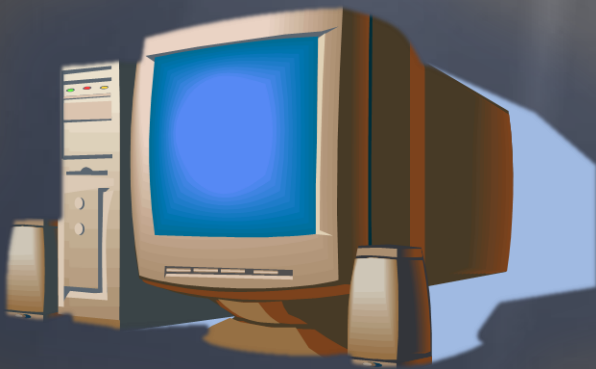
JSON

RIA

# Agenda

- Client

- REST & OData
- ATOM
- JSON



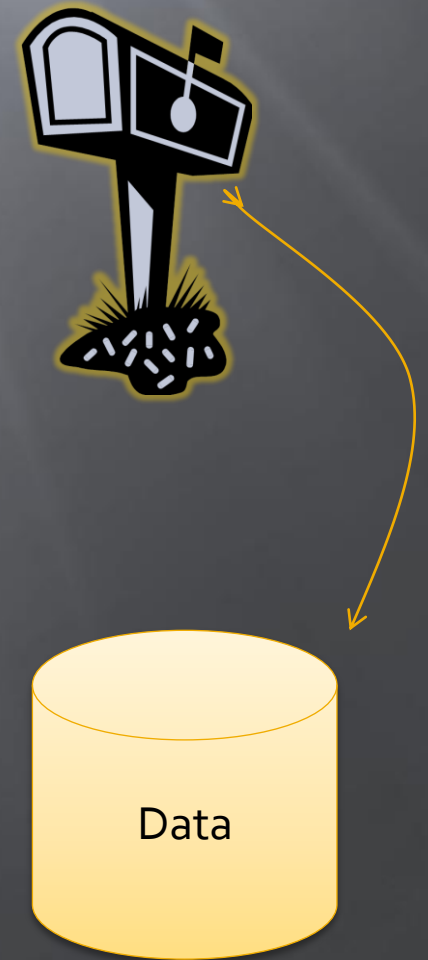
- Server

- WCF Data Services
- ADO.NET Entity Framework
- RIA Services



# Microsoft Data Stack

- REST vs ODBC
  - Representation State Transfer
  - Addressable resource – i.e. URL  
[http://northwind.com/data.svc/Customers\('ALFKI'\)](http://northwind.com/data.svc/Customers('ALFKI'))
- OData – fka Astoria
  - Implementation of WCF Data Services
  - IDataService implementation
- WCF Data Services
- RIA Services



# OData Sources

- Visit <http://odata.org> for complete list
- Available sources include:
  - SharePoint
  - Facebook Insights
  - Netflix
  - Twitter
  - IBM Web Sphere
  - Vancouver Street Parking
  - Dbpedia
  - SQL Azure
  - TechEd 2010
  - MIX 10
  - Codename Dallas
  - Stack Overflow
  - Server Fault
  - + more coming

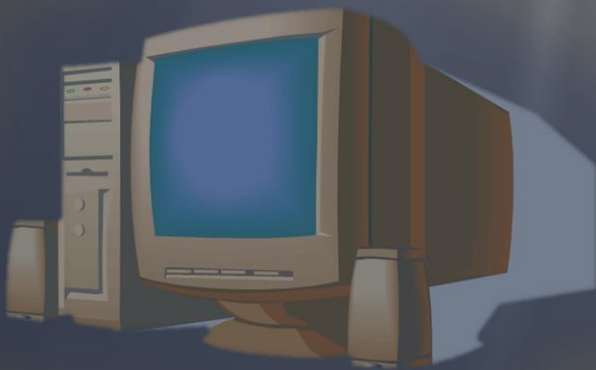
# DEMO

OData

# Agenda

- Client

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# WCF Data Services

## ■ Implementation of IDataService

```
public class PocoData : DataService< PresenterData >
{
    // This method is called only once to initialize service-wide policies.
    public static void InitializeService(DataServiceConfiguration config)
    {
        config.SetEntitySetAccessRule("*", EntitySetRights.AllRead);
        config.SetServiceOperationAccessRule("*", ServiceOperationRights.All);

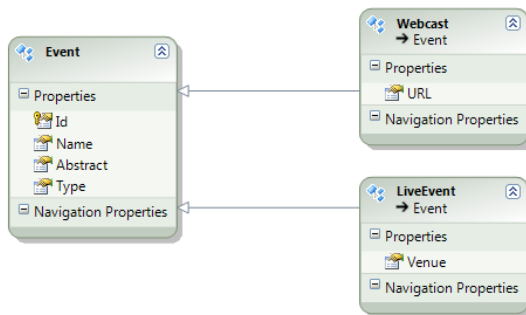
        config.DataServiceBehavior.MaxProtocolVersion = DataServiceProtocolVersion.V2;
    }
}
```

## ■ Expose functions & methods with [WebGet]

```
[WebGet]
public List<string> SayHello()
{
    return new List<string>() { "Hello world", "whee!" };
}
```

# Entity Framework

- Object modeling layer
- Logical representation of Physical schema
  - Create from Database
  - Start from scratch



MyEvents			
Column Name	Data Type	Allow Nulls	
<b>Id</b>	int	<input type="checkbox"/>	
Title	nvarchar(MAX)	<input type="checkbox"/>	
Abstract	nvarchar(MAX)	<input checked="" type="checkbox"/>	
Type	nvarchar(MAX)	<input checked="" type="checkbox"/>	
Room	nvarchar(MAX)	<input checked="" type="checkbox"/>	
URL	nvarchar(MAX)	<input checked="" type="checkbox"/>	
SpeakerName	nvarchar(MAX)	<input checked="" type="checkbox"/>	

UserGroups			
Column Name	Data Type	Allow Nulls	
GroupID	int	<input type="checkbox"/>	
GroupName	nvarchar(255)	<input type="checkbox"/>	
MtgLoc	nvarchar(255)	<input checked="" type="checkbox"/>	
AddrLine1	nvarchar(255)	<input checked="" type="checkbox"/>	
AddrLine2	nvarchar(255)	<input checked="" type="checkbox"/>	
City	nvarchar(50)	<input checked="" type="checkbox"/>	
State	nvarchar(50)	<input checked="" type="checkbox"/>	
Zip	nvarchar(50)	<input checked="" type="checkbox"/>	
GroupURL	nvarchar(255)	<input checked="" type="checkbox"/>	
Lat	decimal(18, 6)	<input checked="" type="checkbox"/>	
Long	decimal(18, 6)	<input checked="" type="checkbox"/>	

# Overview

- Part of .NET 4.0 Framework
- Visual Studio 2010 Designer support
- Flexible implementation allows many approaches
  - Generate from Database
  - “Model First”
  - “Code First”
- Provides “Logical” to “Physical” abstraction

# DEMO

## Intro to EF

# EF Mapping Capabilities

- **Inheritance**
  - Table per Hierarchy
  - Table per Type
  - Table per Concrete Type
  - Hybrids
- **Many entities to one table**
- **Stored Procedures**
- Many tables to one entity
- Abstract Entities
- Associations within EntitySets
- Associations across EntitySets
- Store-side discriminators
- EDM-side discriminators
- QueryViews, Defining Query, CommandText

# Summary

- REST and OData provide a simple, easy to use way of addressing data exposed in the real world
- The industry is adopting OData and embracing it in .NET, AJAX, Silverlight, iPhone, and other emerging platforms
- WCF Data Services implement the IDataService interface making it very easy to create and host an OData service
- ADO.NET Entity Framework provides a comprehensive platform for building the Data Layer for n-tier applications

# Additional Resources and Announcements

- MSDN Data Developer Center:  
<http://msdn.com/data>
- ADO.NET Team Blog:  
<http://blogs.msdn.com/adonet>
- OData Blog:  
<http://odata.org/blog>
- WCF Data Services Team Blog:  
<http://blogs.msdn.com/astoriateam>
- EF Design Blog:  
<http://blogs.msdn.com/efdesign>
- Data Platform Development Forums:  
<http://msdn.com/data> and click on the “Forums” tab
- Patterns and Testability:  
<http://bit.ly/learnef4test>, <http://bit.ly/ef4wpfsample>