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Enabling OData for a DevForce model allows for non-.NET clients to access the same back-end as your DevForce .NET clients. The programming model will be different from DevForce and depends on the OData client implementation on the chosen platform, but it avoids the need for developing yet another back-end or at a minimum some sort of a translation layer in front of the DevForce back-end.

In this topic, we will demonstrate how to expose a DevForce domain model through OData and access it from a client.

Getting started

Let's begin by creating a new project. We'll be using Visual Studio 2012 and creating a new ASP.NET Empty Web Application.

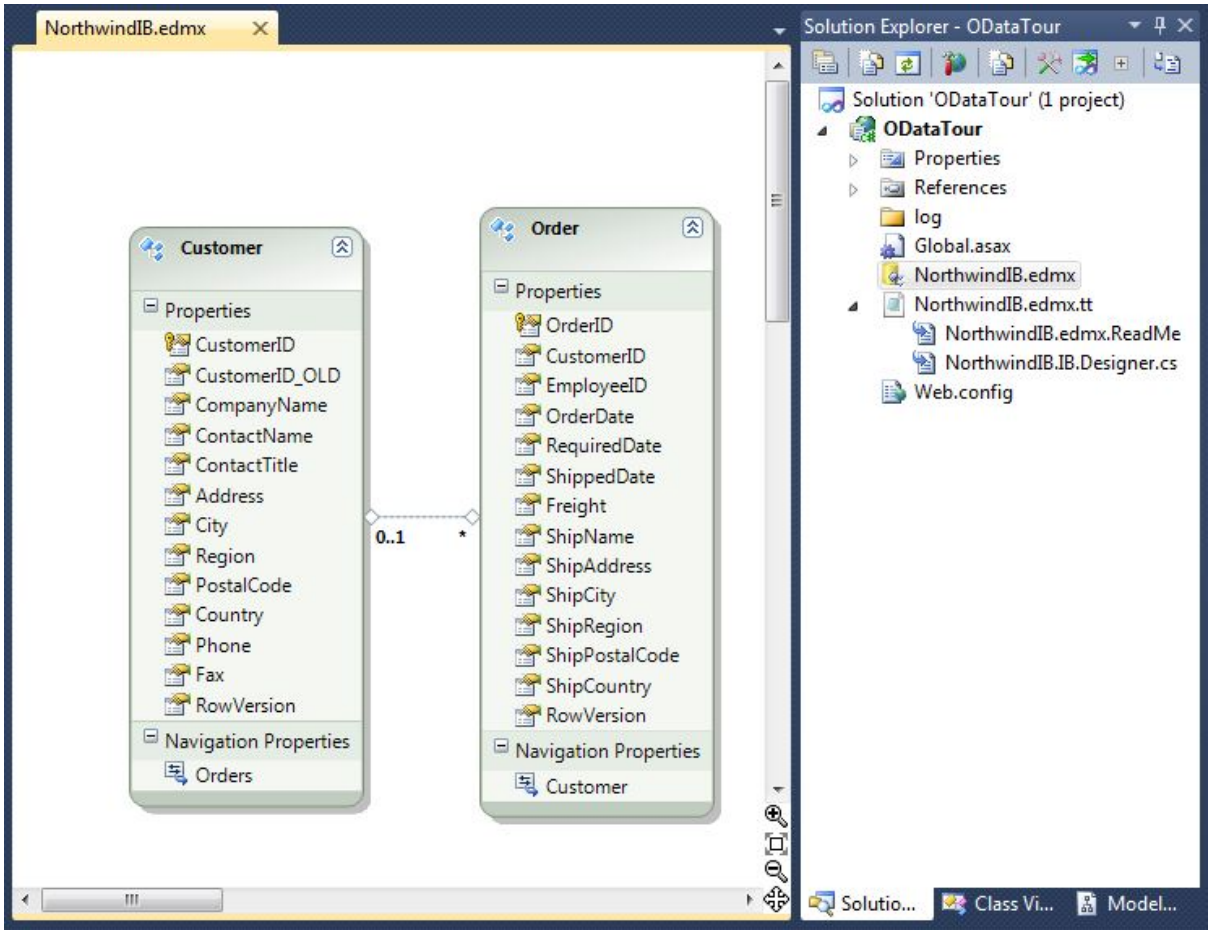
After creating the project, add the *DevForce 2012 Server* NuGet package to install the required DevForce dependencies for a DevForce EntityServer. The *EntityServer* is the middle tier of a typical n-tier DevForce application. At the end of this tutorial it will be able to serve DevForce clients as well as OData clients.

Connecting to the data

In this tutorial we are going to use our usual suspect, the NorthwindIB database. At this stage we are assuming basic familiarity with how to create a data model in DevForce. If you're new to DevForce you may first want to walk through an introductory sample, such as the Tour of DevForce Silverlight or the Tour of DevForce WPF.

We will name the model NorthwindIB, generate it from the database and select only the Customer and Order tables to keep it small and manageable.

If everything went well, the result should look like this:



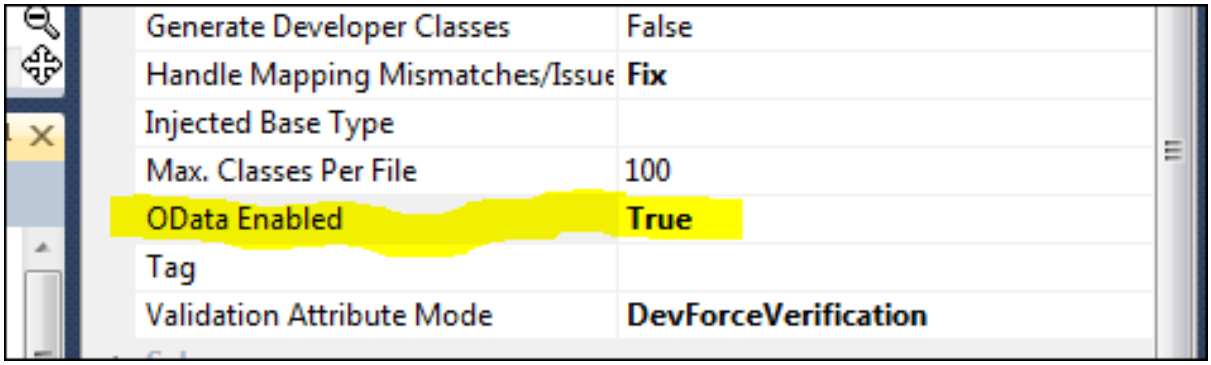
This is the data model we'll now expose as a WCF Data Service.

Enabling OData

For all intents and purposes, at this point we have a functioning DevForce back-end and could start building a DevForce client application. Instead, we are going to expose this back-end via OData with a three step process.

1. For the first step, we need to enable OData in our domain model.

Open NorthwindIB.edmx and click anywhere in the whitespace to select the model, then hit **F4** to bring up the model properties. Under the **DevForce Code Generation** category you will find a new option called **OData Enabled**. By default the option is set to **False**. Go ahead and change it to **True**, then save.



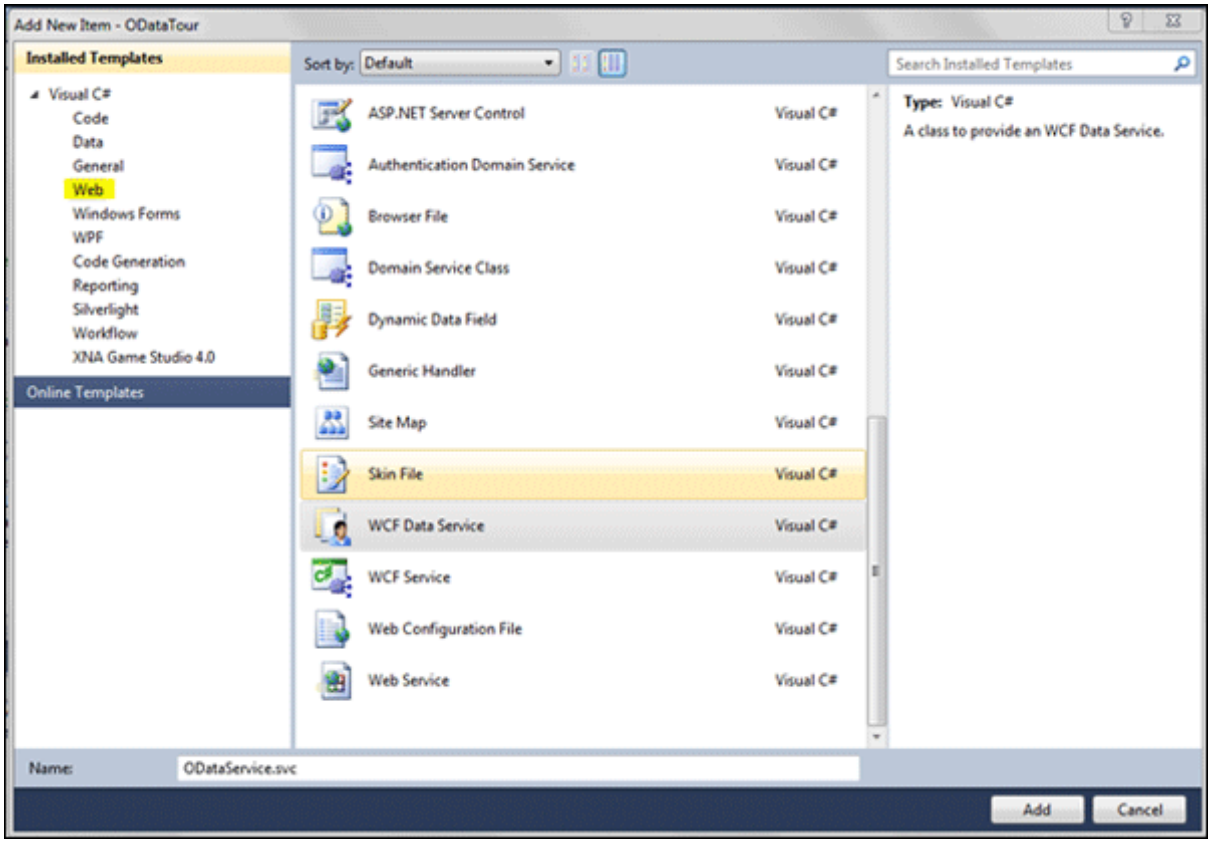
Let's look at what this option did for us. First, it added a couple of attributes to our Entity classes to make them usable in a WCF Data Service. Second, it generated a partial class for our strongly typed *EntityManager*.

Open *NorthwindIBEntities_IUpdatable.cs*. In this file, you'll find an implementation of *System.Data.Services.IUpdatable*. The WCF Data Service calls upon this implementation to handle the CUD operations. This file is generated only once, so you can make customizations without having to worry about them being overwritten.

Now, what's this WCF Data Service? The WCF Data Service is part of the .NET framework and handles all the OData mechanics. In order for the WCF Data Service to do its magic, it requires a compatible data container, which provides the actual data and supports optional updates. Enabling OData in our data model turned the *EntityManager* into just such a container. The implementation of *System.Data.Services.IUpdatable* handles the optional updates.

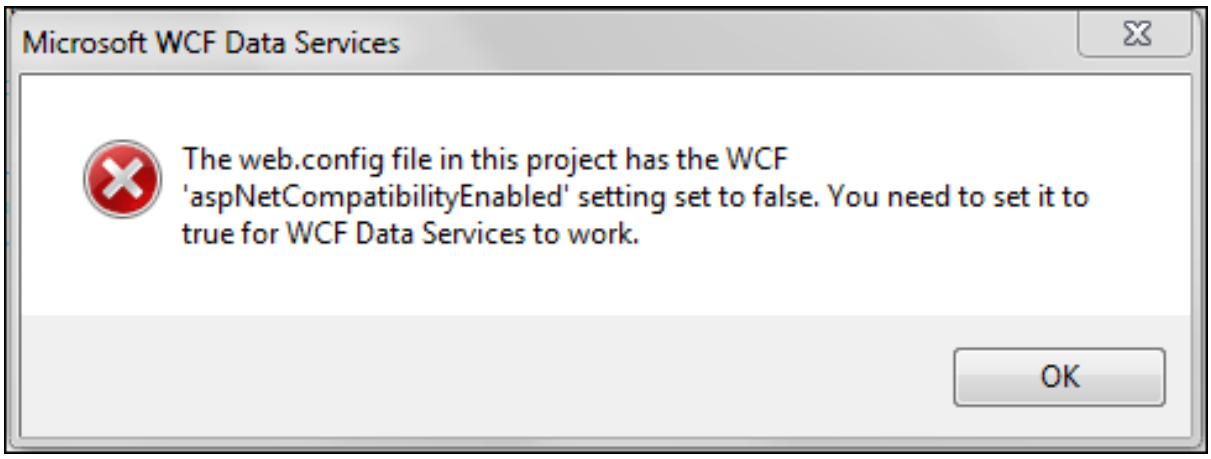
2. For the second step we need to add a WCF Data Service to our project.

Right-click on the **ODataTour** project and select **Add | New Item...**. In the **Add New Item** dialog, you will find the WCF Data Service under Web. We'll name ours ODataService and click **Add**.



If you're running Visual Studio 2013 the template name will likely be "WCF Data Service 5.6".

If you receive the following message, open the **web.config** file and change **aspNetCompatibilityEnabled** to **true**.



3. Finally, we need to define the WCF Data Service.

Open **ODataService.svc.cs** and modify the code as follows:

```
public class ODataService : DataService<NorthwindIBEntities>
{
  // This method is called only once to initialize service-wide policies.
  public static void InitializeService(DataServiceConfiguration config)
    {
      // TODO: set rules to indicate which entity sets and service operations are visible, updatable, etc.
      // Examples:
      // config.SetEntitySetAccessRule("MyEntityset", EntitySetRights.AllRead);
      // config.SetServiceOperationAccessRule("MyServiceOperation", ServiceOperationRights.All);
        config.SetEntitySetAccessRule("Customers", EntitySetRights.All);
        config.SetEntitySetAccessRule("Orders", EntitySetRights.All);
        config.DataServiceBehavior.MaxProtocolVersion = DataServiceProtocolVersion.V2;   // Or later!
    }
}
```

```
Public Class ODataService
 Inherits DataService(Of NorthwindIBEntities)
 ' This method is called only once to initialize service-wide policies.
 Public Shared Sub InitializeService(ByVal config As  _
    DataServiceConfiguration)
   ' TODO: set rules to indicate which entity sets and
   ' service operations are visible, updatable, etc.
   ' Examples:
   ' config.SetEntitySetAccessRule("MyEntityset", EntitySetRights.AllRead);
   ' config.SetServiceOperationAccessRule("MyServiceOperation",
   ' ServiceOperationRights.All);
    config.SetEntitySetAccessRule("Customers", EntitySetRights.All)
    config.SetEntitySetAccessRule("Orders", EntitySetRights.All)
    config.DataServiceBehavior.MaxProtocolVersion = DataServiceProtocolVersion.V2
 End Sub
End Class
```

Let's look at the above code. First, we specified our *EntityManager* as the data container for the service by providing it as the generic data type on the *DataService<T>* base class.

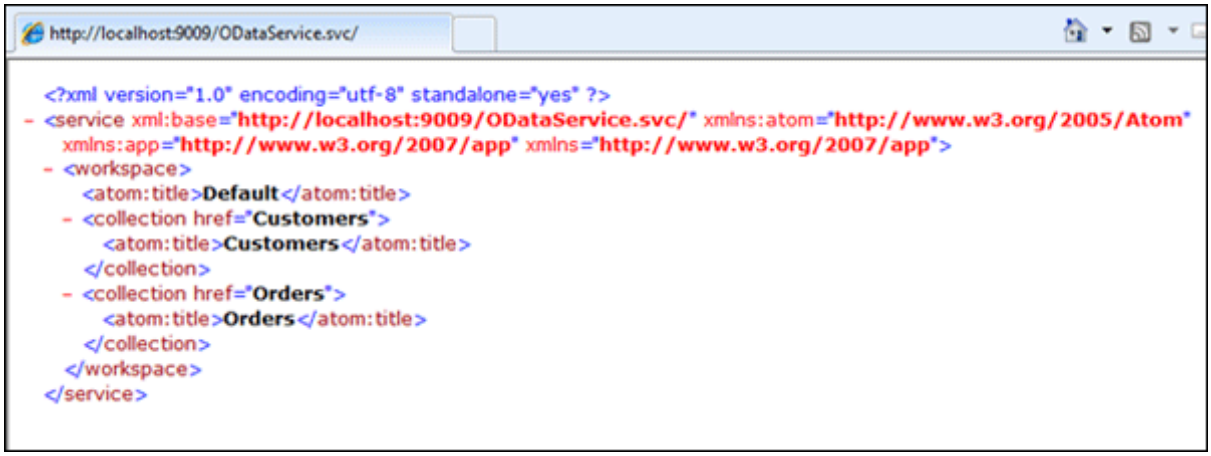
Second, we've specified that both of our entity sets, *Customers* and *Orders*, are visible and updatable.

Unknown macro: IBNote

```
The "IBNote" macro is not in the list of registered macros. Verify the spelling or contact your administrator.
```

Calling your service

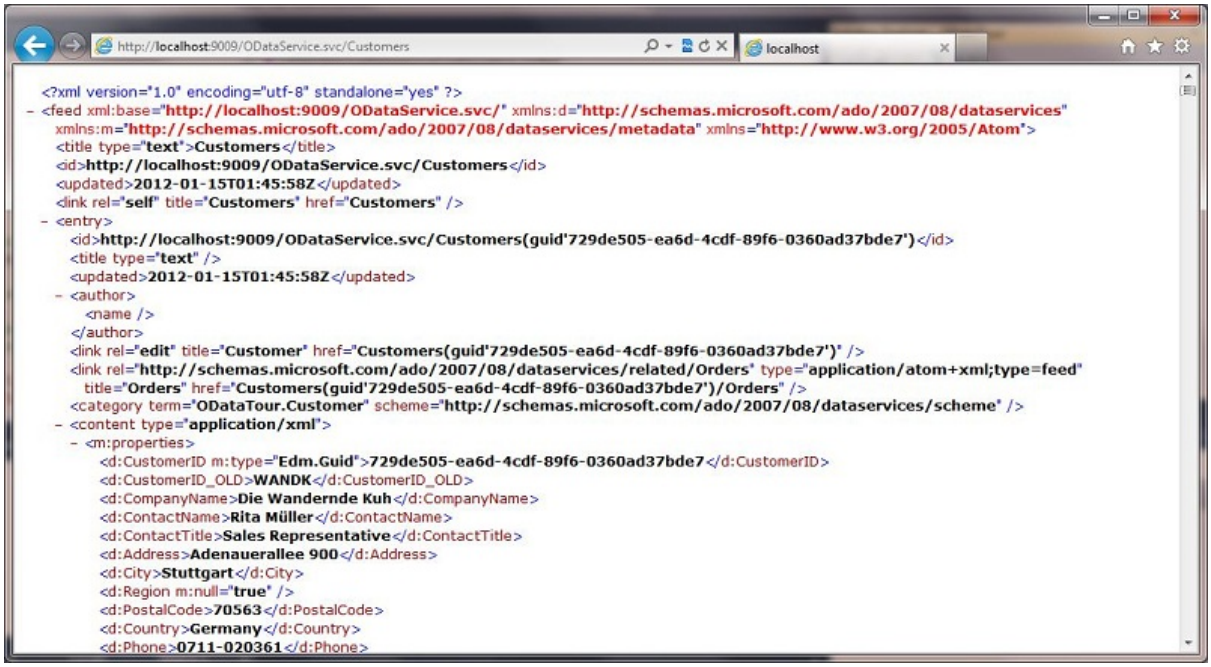
At this point we are ready to test our service. Right-click **ODataService.svc** and select **View in Browser**. If everything went well, you should receive the standard service definition response like this:



This response tells us that we have two entity sets as expected. So, let's see if we can actually query some data.

Enter the following URL in the browser's address bar:

http://localhost:9009/ODataService.svc/Customers



Depending on the browser, you may have to *view source* in order to see the raw response.

At this point, our OData service can be consumed by any client that supports OData.

Advanced topics

Service operations

You can expose server methods in your WCF Data Service too. Here we'll add a simple service operation named *GetOrdersByCity*, which as you might guess, will accept a *city* argument and return orders.

Adding the operation is easy. First we'll define a method in our *ODataService* class which returns an *IQueryable* and can be called with an HTTP GET request:

```
[WebGet]
public IQueryable<Order> GetOrdersByCity(string city) {
  var mgr = this.CurrentDataSource;
 return mgr.Orders.Where(o => o.ShipCity == city);
}
```

CurrentDataSource is an instance of the *EntityManager* we defined for the service. OData has created it for us, so all we need to do is define (and execute if we wish) the query we need. Here we use a simple LINQ query.

Next, we need to set the access to the method, which we can do in the *InitializeService* method we saw above. Here we allow read access for everyone:

```
config.SetServiceOperationAccessRule("GetOrdersByCity", ServiceOperationRights.AllRead);
```

We can test this by opening our browser and navigating to a URL such as the following:
http://localhost:9009/ODataService.svc/GetOrdersByCity?city='Berlin'

Stored procedures

We can also call stored procedures defined in our domain model using the same technique we used for service operations.

You'll first need to define the stored procedure and add it to your EDMX. Once you've done this DevForce will generate a corresponding StoredProcQuery in your model.

The *NorthwindIB* database includes a stored procedure named *Employee_sales_by_country*, so we added that to our model and DevForce obligingly generated the following:

```
public System.Collections.Generic.IEnumerable<EmployeeSalesByCountry_Result>
EmployeeSalesByCountry(System.Nullable<System.DateTime> Beginning_Date, System.Nullable<System.DateTime> Ending_Date) {
```

```
  var query=EmployeeSalesByCountryQuery(Beginning_Date, Ending_Date);
  var result=this.ExecuteQuery(query).Cast<EmployeeSalesByCountry_Result>();
 return result;
}
```

To expose this from our OData service, we need to follow the same steps as we did for the server method: 1) we define the service operation method in the *ODataService* class, and 2) we set its access.

Here we're calling the service operation *GetEmployeeSalesForPeriod*, since it better describes what it does. Since dates can be hard to pass correctly, we've also changed the arguments to strings. You'll notice we return an *IEnumerable* here too, since that's both returned by execution of the query and acceptable to the WCF Data Service.

```
[WebGet]
public IEnumerable<EmployeeSalesByCountry_Result> GetEmployeeSalesForPeriod(string startDate, string endDate) {
  var mgr = this.CurrentDataSource;
  var dt1 = DateTime.Parse(startDate);
  var dt2 = DateTime.Parse(endDate);
 return mgr.EmployeeSalesByCountry(dt1, dt2);
}
```

```
config.SetServiceOperationAccessRule("GetEmployeeSalesForPeriod", ServiceOperationRights.AllRead);
```

To test the method, open the browser and navigate to a URL such as the following:
http://localhost:9009/ODataService.svc/GetEmployeeSalesForPeriod?startDate='1/1/1996'&endDate='12/31/1996'

Securing the service

There are several was to secure your OData service. See our sample on how to use basic authentication and authorization headers.