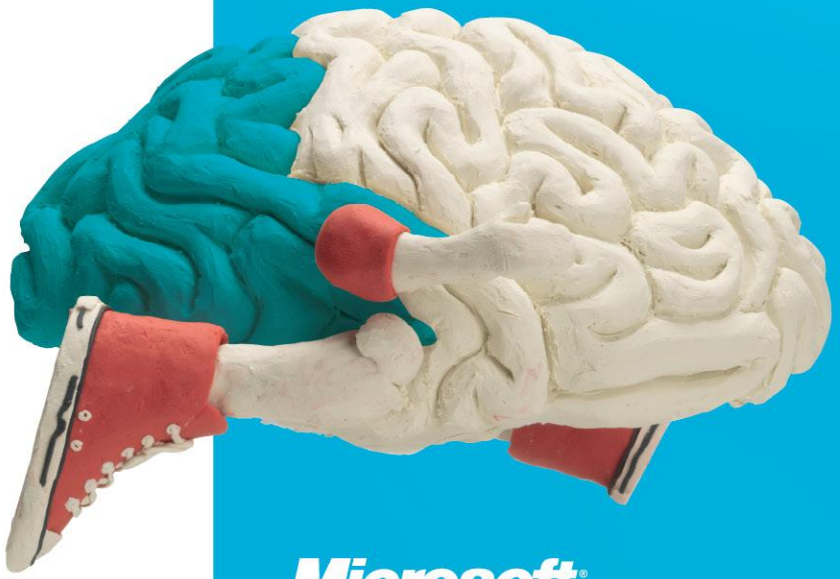
{**Energize**} your brain

DevDays 09

LINQ & SharePoint Development

Mirjam van Olst

May 29th 2009



Microsoft

www.microsoft.nl/devdays

About me

- Mirjam van Olst
- SharePoint Architect @ Macaw
- Organizer for SDN and DIWUG
- Dutch…
- Blog => www.sharepointblogs.com/mirjam
- Writing articles and presenting regularly
- And this month => cover model…
  - Check out the new SDN magazine at the SDN booth

LINQ & SharePoint Development

This presentation:

- Shows some of the possible scenarios where you can use LINQ for SharePoint development
- Points out the pitfalls to watch out for
- Demonstrates the use of a custom LINQ provider for SharePoint

Agenda

- LINQ
- Querying SharePoint data
  - Querying SharePoint Lists
  - Multiple data sources
- LINQ & the SharePoint Web Services
- Custom LINQ Providers for SharePoint
- Conclusion

What is LINQ?

- Language extension
- Extends your favorite languages (C# and VB)
- Uses a lot of the new language features in ASP.NET
- Used to query data from different data sources using the same syntax
  - Objects in memory
  - XML
  - Databases

LINQ and the SharePoint Object Model

- The SharePoint Object Model uses collections
  - SPWebCollection
  - SPListCollection
  - SPListItemCollection
- Collections are objects in memory
- Most SharePoint collections inherit from SPBaseCollection
- SPBaseCollection implements the iCollection interface
- LINQ to Objects can be used to query iCollections

Querying SharePoint lists with CAML

- XML-based language that is used in SharePoint to define the fields and views used in sites and lists
- New language skills required for .NET developers
- No IntelliSense or strongly typed objects
- Only items that match the filter terms will be retrieved from the database

```
SPQuery query = new SPQuery();
query.Query = String.Format("
<Where><And>
<Contains><FieldRef Name='Tags' /><Value
    Type='Text'>{0}</Value></Contains>
<IsNotNull><FieldRef Name='URL' /></IsNotNull>
</And></Where>
<OrderBy>
<FieldRef Name='PostedOn' Ascending='TRUE' />
</OrderBy>", _filter);

SPListItemCollection listItemsColl = resourceList.GetItems(query);
```

vs-d-mirjam-1....SQLQuery1.sql* | Object Explorer Details

```
exec sp_executesql N'  SELECT TOP 2147483648 t1.[Type] AS c0,UserData.[ntext2],
UserData.[datetime1],t2.[tp_ID] AS c5c7,UserData.[tp_ItemOrder],
t1.[TimeLastModified] AS c15,UserData.[tp_Created],
UserData.[tp_HasCopyDestinations],UserData.[tp_ModerationStatus],
UserData.[tp_Level],UserData.[nvarchar1],UserData.[nvarchar6],
t2.[nvarchar1] AS c5c6,t3.[nvarchar1] AS c11c6,UserData.[tp_WorkflowInstanceID],
t1.[Id] AS c3,UserData.[ntext1],t3.[tp_Created] AS c11c10,
UserData.[tp_HasAttachment],t1.[DirName] AS c14,t1.[MetaInfo] AS c2,
UserData.[nvarchar3],UserData.[tp_Modified],t2.[nvarchar5] AS c5c9,
UserData.[tp_UIVersion],UserData.[tp_ID],UserData.[tp_CopySource],
UserData.[nvarchar5],t2.[tp_Created] AS c5c10,t3.[nvarchar5] AS
c11c9,t1.[TimeCreated] AS c13,UserData.[tp_InstanceID],UserData.[tp_GUID],
CASE WHEN DATALENGTH(t1.DirName) = 0 THEN t1.LeafName
WHEN DATALENGTH(t1.LeafName) = 0 THEN t1.DirName
ELSE t1.DirName + N''/'' + t1.LeafName END
AS c1,UserData.[tp_Author],t2.[nvarchar4] AS c5c8,UserData.[tp_Editor],
t3.[nvarchar4] AS c11c8,UserData.[tp_UIVersionString],t1.[LeafName]
AS c12,UserData.[nvarchar2],UserData.[tp_ContentType],
```

Results | Messages

	c0	ntext2	datetime1	c5...	tp_ItemOrder	c15	tp
1	0	Performance is a very important aspect of an Int...	2007-09-09 22:00:00.000	1	100	2009-04-10 15:28:00.000	20
2	0	The page payload is the combined total size of ...	2008-11-14 23:00:00.000	1	200	2009-04-10 15:31:47.000	20
3	0	Usually collaboration sites (team sites) and WC...	2009-01-31 23:00:00.000	1	700	2009-04-10 16:09:00.000	20

Querying SharePoint lists with LINQ

- No new language skills required
- Easier to read and write
- Hidden danger though!
  - All items will be retrieved from the database
  - Filtering is achieved by iterating through all items and comparing the items to the where clause
  - For larger collections this can have major performance implications

```
var resourceListItems =
from SPListItem item in resourceList.Items
where item[“Tags”] .ToString().ToLower().Contains(_filter)
          && item[“URL”].ToString().Length > 0
orderby item[“PostedOn”] ascending
```

vs-d-mirjam-1....SQLQuery1.sql* | Object Explorer Details

```
exec sp_executesql N'  SELECT TOP 2147483648 t1.[Type] AS c0,UserData.[ntext2],
UserData.[datetime1],t2.[tp_ID] AS c5c7,UserData.[tp_ItemOrder],
t1.[TimeLastModified] AS c15,UserData.[tp_Created],
UserData.[tp_HasCopyDestinations],UserData.[tp_ModerationStatus],
UserData.[tp_Level],UserData.[nvarchar1],UserData.[nvarchar6],
t2.[nvarchar1] AS c5c6,t3.[nvarchar1] AS c11c6,
UserData.[tp_WorkflowInstanceID],t1.[Id] AS c3,
UserData.[ntext1],t3.[tp_Created] AS c11c10,UserData.[tp_HasAttachment],
t1.[DirName] AS c14,t1.[MetaInfo] AS c2,UserData.[nvarchar3],
UserData.[tp_Modified],t2.[nvarchar5] AS c5c9,UserData.[tp_UIVersion],
UserData.[tp_ID],UserData.[tp_CopySource],UserData.[nvarchar5],t2.[tp_Created]
AS c5c10,t3.[nvarchar5] AS c11c9,t1.[TimeCreated] AS c13,
UserData.[tp_InstanceID],UserData.[tp_GUID],CASE
```

Results | Messages

	c0	ntext2	datetime1	c5...	tp_ItemOrder	c15
1	0	Performance is a very important aspect of an Interne...	2007-09-09 22:00:00.000	1	100	2009-04-10 15:28:00.000
2	0	The page payload is the combined total size of all fil...	2008-11-14 23:00:00.000	1	200	2009-04-10 15:31:47.000
3	0	I keep getting sandbagged by folks on the topic of t...	2008-12-25 23:00:00.000	1	300	2009-04-10 15:42:42.000
4	0	If you want to use UserControls in SharePoint web p...	2009-02-10 23:00:00.000	1	400	2009-04-10 15:54:20.000
5	0	To prevent any trouble with your custom site definiti...	2008-10-06 22:00:00.000	1	500	2009-04-10 16:04:01.000
6	0	The question of Microsoft SQL Server 2005 Databa...	2008-07-31 22:00:00.000	1	600	2009-04-10 16:07:33.000
7	0	Usually collaboration sites (team sites) and WCM fun...	2009-01-31 23:00:00.000	1	700	2009-04-10 16:09:00.000
8	0	After teaching some of the MCM-SharePoint class la...	2009-03-22 23:00:00.000	1	800	2009-04-10 16:13:03.000
9	0	If you look hard enough you can find several articles...	2009-03-07 23:00:00.000	1	900	2009-04-10 16:15:08.000

Using the best of both Worlds

- Use CAML queries to filter the data
  - Only data that will be used is retrieved from the database
- Use LINQ queries for sorting and adding results to a collection
  - Easier to read the code and no foreach loops

```
SPQuery camlQuery = new SPQuery();
camlQuery.Query = String.Format(“
<Where><And>
<Contains><FieldRef Name=‘Tags’ /><Value
    Type=‘Text’>{0}</Value></Contains>
<IsNotNull><FieldRef Name=‘URL’ /></IsNotNull>
</And></Where>
”, _filter);

var resourceItemsCollection = from SPListItem item in
    resourceList.GetItems(camlQuery)
orderby item[“PostedOn”] ascending
```

vs-d-mirjam-1....SQLQuery1.sql* | Object Explorer Details

```
exec sp_executesql N'  SELECT TOP 2147483648 t1.[Type] AS c0,UserData.[ntext2],
UserData.[datetime1],t2.[tp_ID] AS c5c7,UserData.[tp_ItemOrder],
t1.[TimeLastModified] AS c15,UserData.[tp_Created],
UserData.[tp_HasCopyDestinations],UserData.[tp_ModerationStatus],
UserData.[tp_Level],UserData.[nvarchar1],UserData.[nvarchar6],
t2.[nvarchar1] AS c5c6,t3.[nvarchar1] AS c11c6,UserData.[tp_WorkflowInstanceID],
t1.[Id] AS c3,UserData.[ntext1],t3.[tp_Created] AS c11c10,
UserData.[tp_HasAttachment],t1.[DirName] AS c14,t1.[MetaInfo] AS c2,
UserData.[nvarchar3],UserData.[tp_Modified],t2.[nvarchar5] AS c5c9,
UserData.[tp_UIVersion],UserData.[tp_ID],UserData.[tp_CopySource],
UserData.[nvarchar5],t2.[tp_Created] AS c5c10,t3.[nvarchar5] AS
c11c9,t1.[TimeCreated] AS c13,UserData.[tp_InstanceID],UserData.[tp_GUID],
CASE WHEN DATALENGTH(t1.DirName) = 0 THEN t1.LeafName
WHEN DATALENGTH(t1.LeafName) = 0 THEN t1.DirName
ELSE t1.DirName + N''/'' + t1.LeafName END
AS c1,UserData.[tp_Author],t2.[nvarchar4] AS c5c8,UserData.[tp_Editor],
t3.[nvarchar4] AS c11c8,UserData.[tp_UIVersionString],t1.[LeafName]
AS c12,UserData.[nvarchar2],UserData.[tp_ContentType],
```

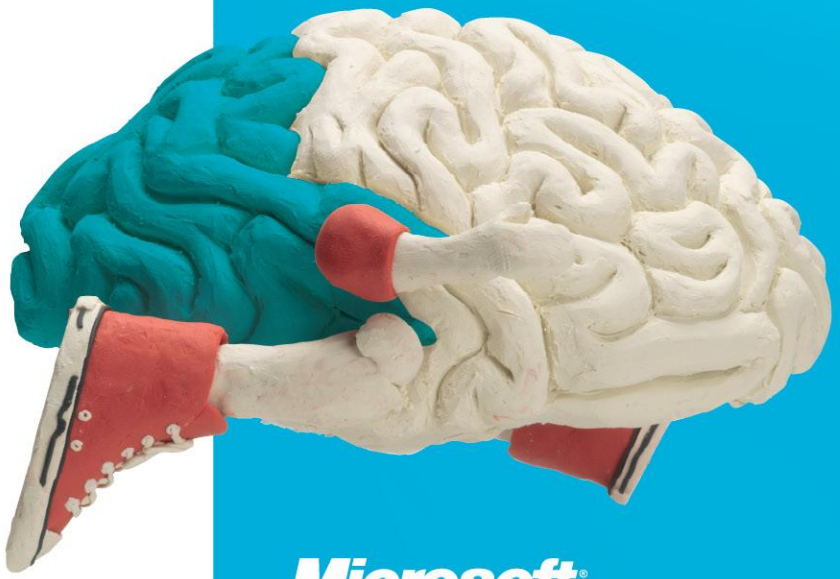
Results | Messages

	c0	ntext2	datetime1	c5...	tp_ItemOrder	c15	tp
1	0	Performance is a very important aspect of an Int...	2007-09-09 22:00:00.000	1	100	2009-04-10 15:28:00.000	20
2	0	The page payload is the combined total size of ...	2008-11-14 23:00:00.000	1	200	2009-04-10 15:31:47.000	20
3	0	Usually collaboration sites (team sites) and WC...	2009-01-31 23:00:00.000	1	700	2009-04-10 16:09:00.000	20

DevDays 09

{**Energize**} your brain

DEMO



Microsoft

www.microsoft.nl/devdays

Multiple data sources

- Combining data from different data sources
- For instance combining data from:
  - A SharePoint list and Live Search results
  - A SharePoint list and an XML file
  - A database and an array in memory
- Use LINQ query operators like UNION and JOIN

LINQ & SharePoint web services

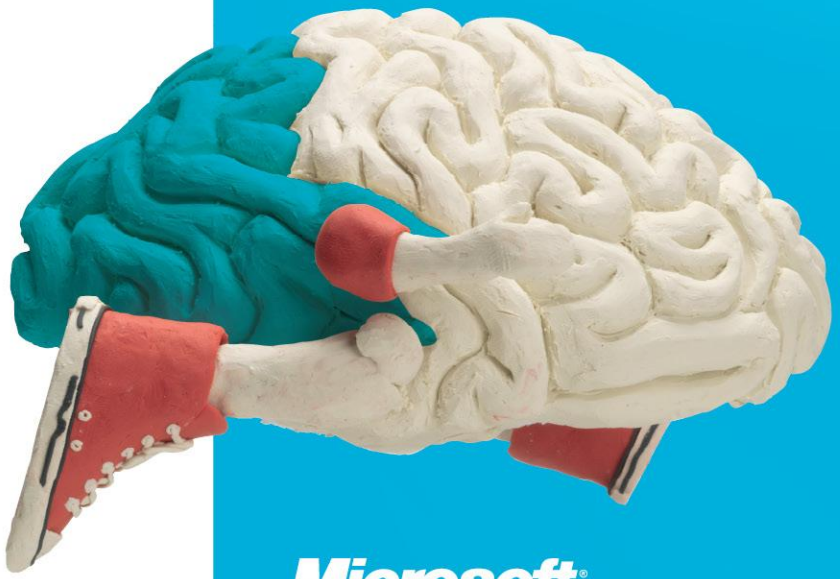
- Possible scenario: a Silverlight web part
- Web services return XML
- XML needs to be parsed
- Don’t use Xpath…use LINQ!
- Same syntax, intellisense and easy to read and write
- You still need to understand what the structure of the returned XML looks like though…

```
<listitems …>
  <rs:data ItemCount="1">
    <z:row ows_ID="3"
      ows_Created="2009-02-18T14:41:09Z"
      ows_EncodedAbsWebImgUrl
   ="http://<siteurl>/Barcelona/_w/<imagename1>.jpg"
      ows_EncodedAbsThumbnailUrl ="
   http://<siteurl>/Barcelona/_t/<imagename1>.jpg "
      … />
</rs:data>
</listitems>
```

DevDays 09

{**Energize**} your brain

DEMO



Microsoft

www.microsoft.nl/devdays

LINQ extensions

- Two ways to extend LINQ
- Creating or adjusting query operators
  - Use Extension methods
  - Implement the LINQ query expression pattern
  - Pretty straight forward
- Writing your own LINQ providers
  - More complex
  - Others have done the work:
    - LINQ to SharePoint
    - Linq4SP

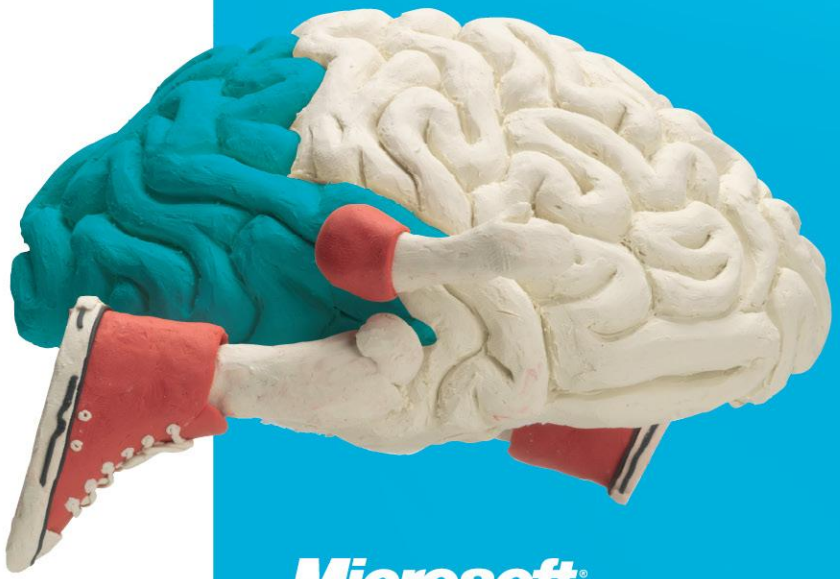
LINQ to SharePoint

- Add in for Visual Studio that adds a new filetype => “LINQ to SharePoint” file
- Wizard for selecting lists and libraries that you want to query
- LINQ to SharePoint translates LINQ queries to CAML
- Abstraction layer on top of SharePoint
- Alpha release on codeplex
- Commercial alternative: Linq4SP

DevDays 09

{**Energize**} your brain

DEMO



Microsoft

www.microsoft.nl/devdays

Conclusion

- LINQ can be used for SharePoint development in several scenario's
  - Querying List Items
  - Using the SharePoint Web Services
  - Combining data from different data sources
- Stay alert when using LINQ and the SharePoint object model
- Custom LINQ providers for SharePoint can prove valuable
- Get ready for the future, check out LINQ!

Next steps…

- Book: LINQ in Action
- LINQ to SharePoint
  - http://linqtosharepoint.codeplex.com/
  - http://msevents.microsoft.com/cui/WebCastEventDetails.aspx?culture=en-US&EventID=1032352642&CountryCode=US
- Start using LINQ for SharePoint development!

{**Energize**} your brain

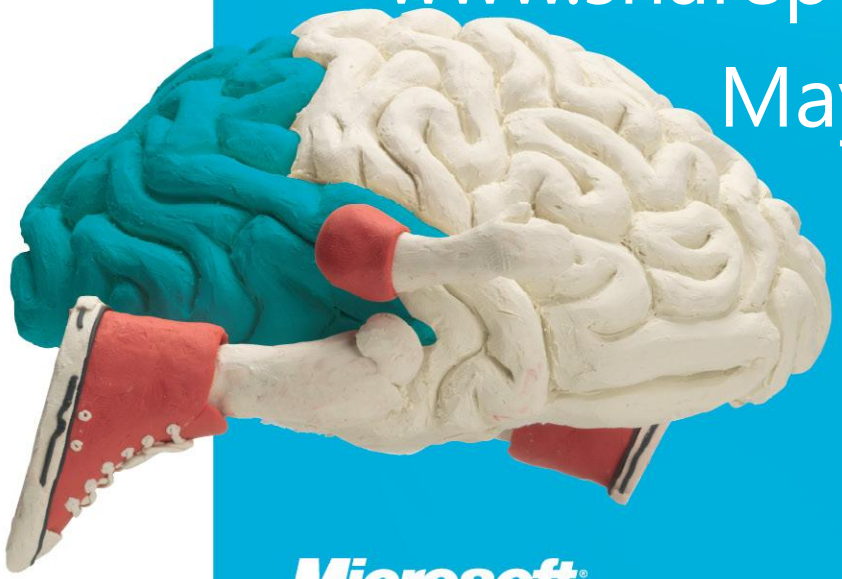
DevDays 09

LINQ & SharePoint Development

Mirjam van Olst

www.sharepointblogs.com/mirjam

May 29th 2009



Microsoft

www.microsoft.nl/devdays