

Language Integrated Query (LINQ)

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Introduction

- We use many different types of query
 - SQL, XQuery/XPath, DataView row filters, etc.
- Maybe we could enhance productivity by...
 - Deciding on one query expression syntax
 - Enabling compilers to check queries & results
 - Allow extensibility to target all kinds of data

Agenda

- C#3 and VB9 Language Enhancements
 - Building to LINQ to Objects
- LINQ to XML
- LINQ to SQL
- LINQ to DataSets

C#3 and VB9

- Ship with Visual Studio 2008
- Contain language features that enable LINQ
- Necessary for LINQ, but not sufficient...
- Also need .NET FX 3.5
 - Contains a lot of new classes that make LINQ work – we'll see some later

demo

New Language Features – LINQ to objects



Language Innovations

var contacts =

from c in customers

where c.City == "Hove"

select new { c.Name, c.Phone };

Query
expressions

Local variable
type inference

var contacts =

customers

.Where(c => c.City == "Hove")

.Select(c => new { c.Name, c.Phone });

Lambda
expressions

Extension
methods

Anonymous
types

Object
initializers

demo

LINQ to XML



LINQ to XML

- Creating XML
 - Constructors lend themselves to nesting
 - Can use LINQ (over anything) to build XML
- Querying
 - Use normal *axes* from XML infoset
 - Get full power of query expressions over XML
 - Select, where, group by, etc.
- Xml Namespaces

demo

LINQ to SQL



LINQ to SQL

- DataContext is the central class
- Use code-gen for ORM
- SQL is only submitted when needed
- Parent-child relationships are respected
 - Control of deferred loading
- Can insert/update/delete
 - Transactionally, with concurrency checks

demo

LINQ to DataSet



LINQ to DataSet

- Query expressions over in-memory data
- Works with untyped or typed DataSets
- If query returns some kind of DataRow: -
 - Can yield results as a DataView
 - ...and therefore databind to those results

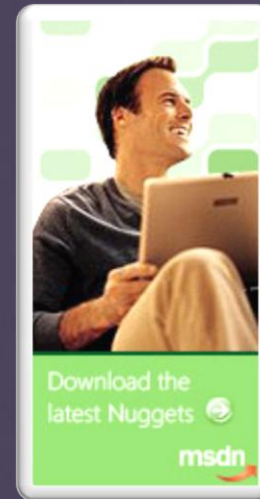
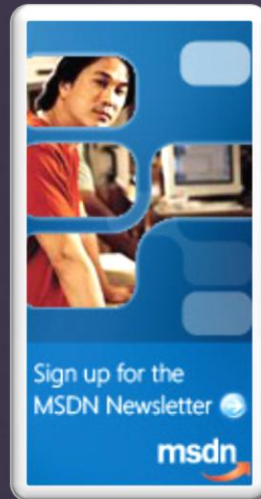
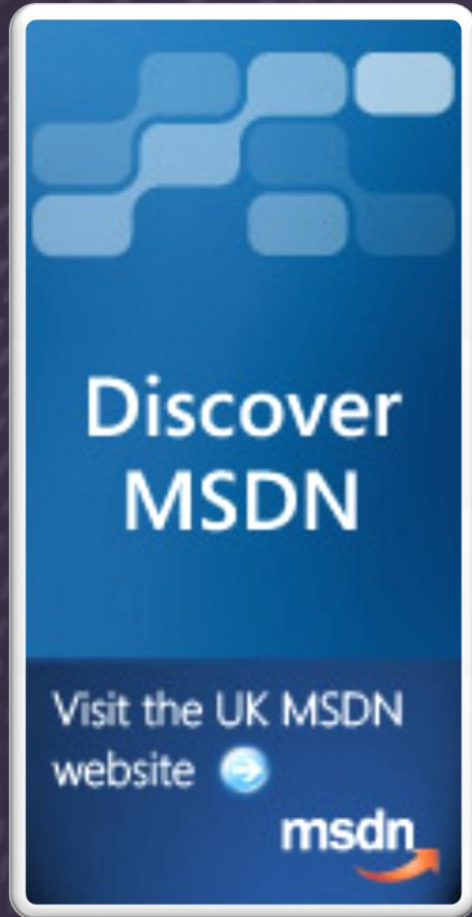
That's LINQ

- A combination of new language features, and new fx3.5 classes (with extension methods)
- A common query expression syntax
- Freedom to implement across different kinds of data
- It's TYPED...
 - The compiler can check your queries
 - The compiler can check your results

For more information

- Today's sample code via
 - <http://www.martinparry.com>
- MSDN Nuggets by Mike Taulty
 - <http://www.microsoft.com/uk/msdn/nuggets>

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