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ADO.NET VNEXT

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What's next?

- ◎ ADO.NET vNext
 - Part of VS “Orcas” release
 - .NET 3.5

The LINQ Project

C# 3.0

VB 9.0

Others...

.NET Language Integrated Query

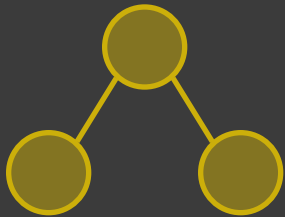
LINQ to
Objects

LINQ to
DataSets

LINQ to
SQL

LINQ to
Entities

LINQ to
XML



Objects



Relational

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<book>  
<title/>  
<author/>  
<year/>  
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</book>
```

XML

LINQ to DataSet

- DataSet fully integrated with LINQ
- Both typed and un-typed DataSets will work
- Do joins, grouping, etc. over data in DataTables
- Can create view than span multiple DataTables 😊

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Linq to DataSet

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ORM from MS in “Orcas”

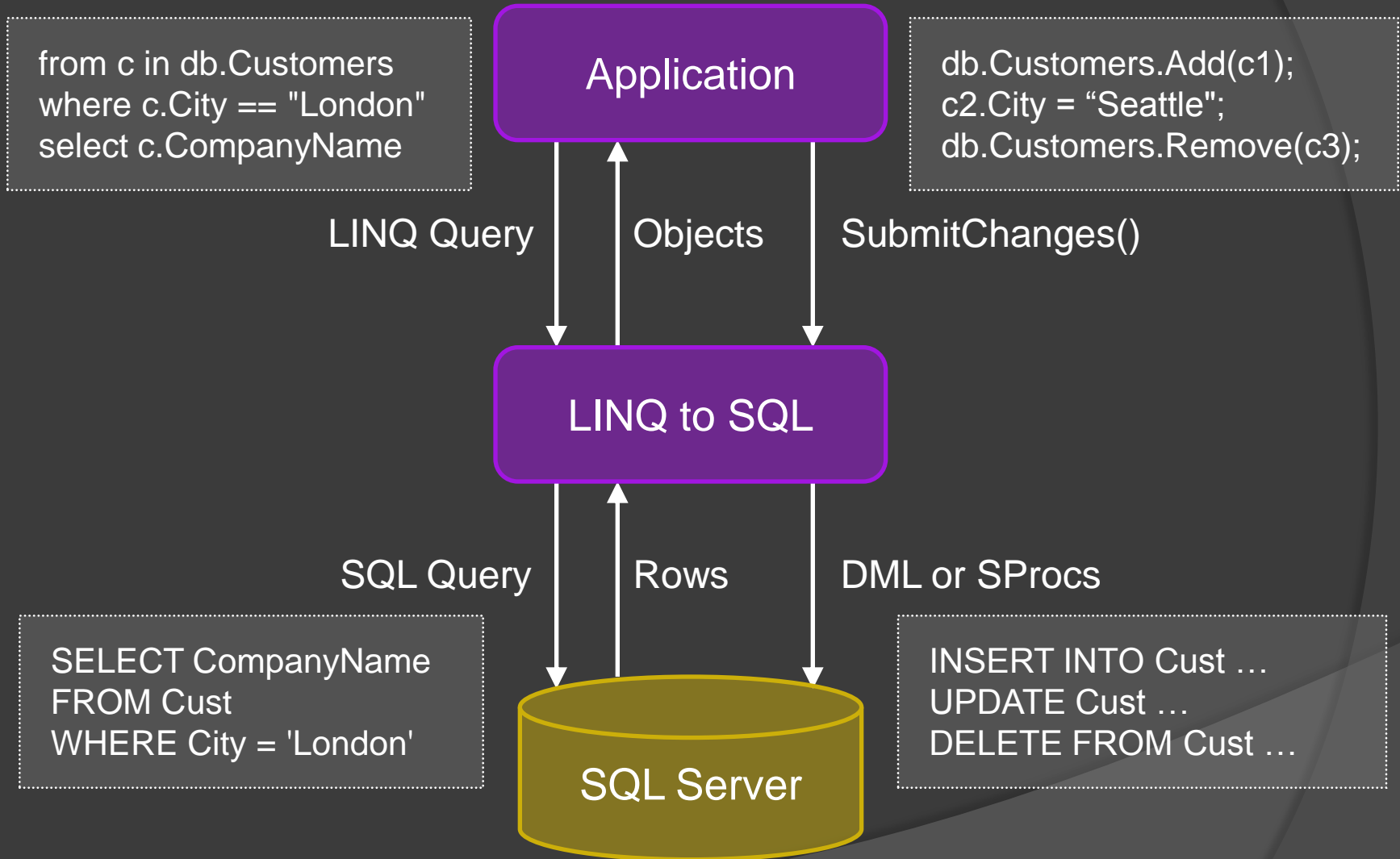
- ⦿ Linq to SQL
- ⦿ Entity Framework
 - Linq to Entities

Linq to SQL

LINQ to SQL

- Access relational data as strongly typed objects
- Language integrated query
- Works with existing infrastructure
- Unified query and transform of objects, relational, XML
- 1-1 Mapping between Tables and Entities

LINQ to SQL Architecture



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Linq query

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Features

- ◎ Change tracking
 - Updates through dynamic SQL DML or stored procedures
- ◎ Optimistic concurrency
 - Using version numbers, time stamps or previous values
 - **IsVersion attribute marked on a timestamp field enables n-tier stateless scenario😊**
- ◎ Stored procedures
 - Represented as methods on DataContext

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Linq Lazy loading

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Paging done right

- ⦿ with “skip” and “take”
 - Optimized with new row_count feature in SQL Server 2005
 - Page 1 or Page 10000 same speed
 - Query stops as soon as it has the right page size (e.g 10 rows)
 - Only the page size (e.g. 10 rows) is transferred from the DB
 - Falls back to a simpler version on SQL 2000

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Linq Paging

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Entity Framework

If We Could Choose the Schemas...

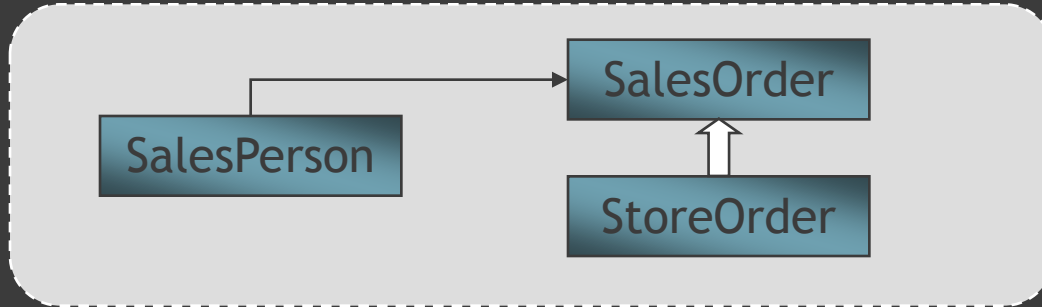
- ⦿ Database schemas are not always ideal for the application you're building
 - New applications on top of existing schemas
 - Over- or under-normalized schemas for operational or performance reasons
 - Plain reality, schemas and applications evolve over time
 - And there are practical constraints to how clean schemas can be maintained
- ⦿ Schemas tend to permeate through app code
 - Each app creates a view of the data that makes sense
 - Using sprocs, views and most often ad-hoc queries
 - App organization ends up influenced by schemas

The Entity Data Model (EDM)

- ⦿ An Entity-relationship model
- ⦿ Explicit concept of *Entity* and *Relationship*
 - Entity types can *inherit* from other entity types
- ⦿ The EDM model is effectively “executable”

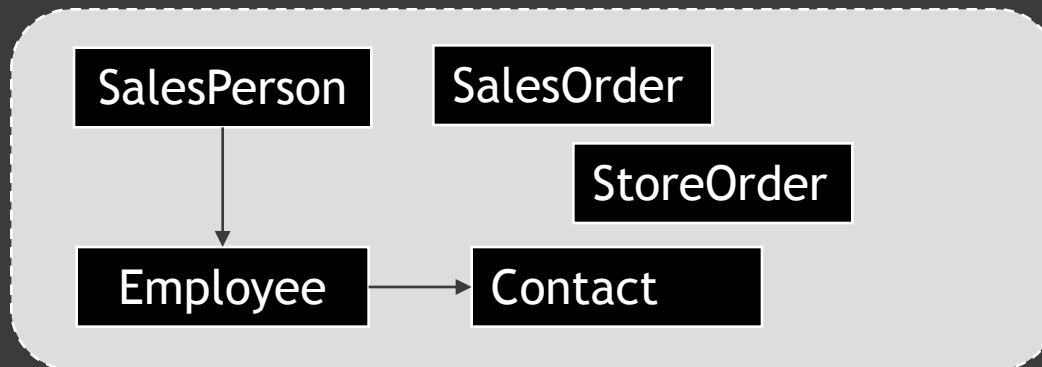
EDM and Client Views

Conceptual



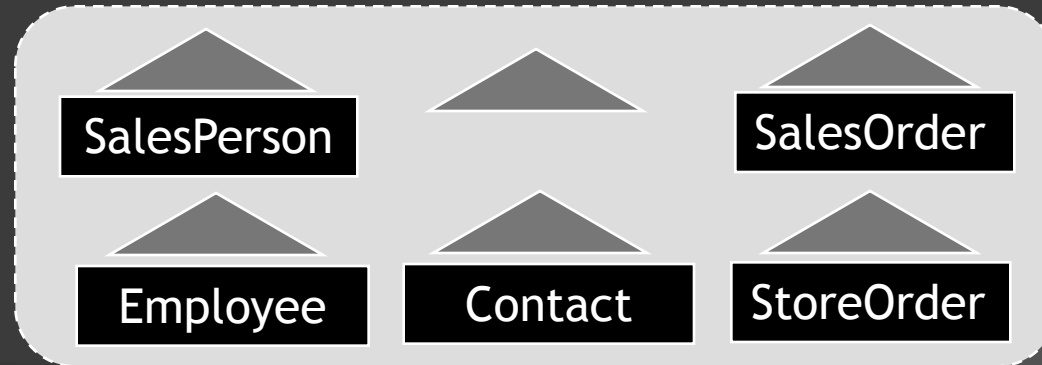
- Entities, relationships
- Referential constraints
- Shift in future apps
- Target for Entity Framework

Logical



- Tables, rows, keys
- PK/FK constraints
- Normalization
- Data independence

Physical



- Record formats, file groups
- Indexes, file partitions
- Apps unaware of this level

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Entity Framework

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Linq to SQL vs. Entity Framework

| | Linq to SQL | Entity Framework |
|--------------------------------------|-------------|-------------------------------|
| Language Extensions Support | Yes | Yes |
| Language Integrated Database Queries | Yes | Yes |
| Stored Procedures | Yes | Yes (coming in Beta1) |
| Entity Inheritance | Yes | Yes |
| Many-to-Many | No | Yes |
| Single Entity From Multiple Tables | No | Yes |
| VS Designer | Yes | Not yet (Ships after "Orcas") |

Some caveats

- Linq to SQL and Entity Framework need a dedicated Provider
 - At the moment Provider are different between Linq to SQL and EF
 - We will provide providers only for SQL Server
 - DB vendors and third party are already creating providers for Oracle, DB2, etc..
- Entity Framework will ship some months after Orcas

Summary

- ◎ DataSet
 - Powerful and easy to use but not well suited for complex projects
 - Linq adds powerful in memory querying
- ◎ DTO
 - Cost a fortune to develop
 - better off using a ORM framework
- ◎ .NET 3.5 and Orcas brings two ORMs
 - Linq to SQL
 - 1-1 mapping to DB schema
 - Entity Framework
 - The power of EDM
- ◎ I would try to avoid mixing DataSet and ORM

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