



# Business Connectivity Services (BCS)



# Who am I

- Phill Duffy
- SharePoint Developer
- Joined Lightning Tools Ltd in 2008
- Worked on **Lightning Jump, BDC Alert Manager, BDC Meta Man Web Edition**
- Working on **BCS Meta Man**



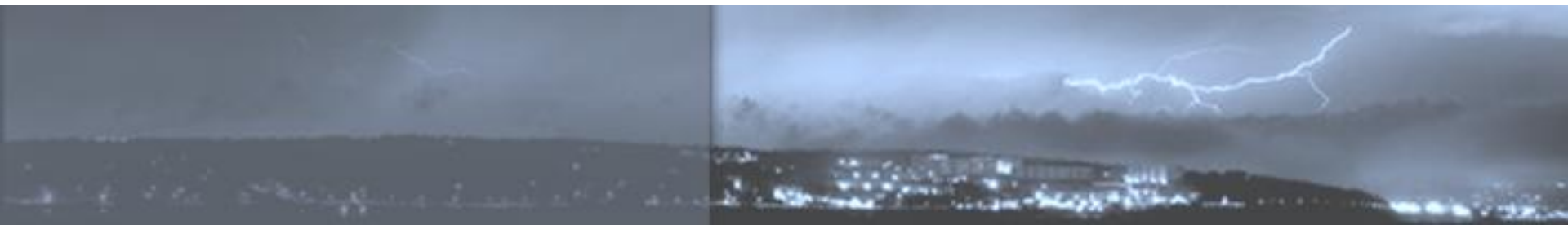
# Agenda

- Brief History Lesson
  - Business Data Catalog
- Introducing the BCS
  - What is new
  - The 3 Pillars





# BDC



# Why?

- Islands of Data



Oracle



SQL Server



Web Service



SAP



## Business Users

- Each system would typically have its own login system
- Each system looks and behaves differently
- Users can't search all Business Data in one location
- Can't relate data easily

## Developers

- Need to learn how to communicate to each system and likely to be a project on its own for customization. Time, Money and Resources

## IT

- Access is usually managed by IT. Time and Resources



# BDC : What did it give us?

- Allowed Line Of Business Data to be accessible from within SharePoint
- Security can be handled by the BDC via Central Administration
  - Security Trimmed
- OOTB Web Parts can be used to view Business Data
- Users only have 1 User Interface to learn and use
- Custom Web Parts only need to worry about 1 API
- Line of Business Data can be searched along side regular search results
- Data could be presented to users in Office Applications via Add-ins



# Scenario

SharePoint Web Part

Entity

Business Data Catalog

SQL Database



# BDC Pitfalls



- Limited to MOSS only
- Limited connection options – DB and Web Service
- Read only without custom code
- Difficult to develop complex scenarios i.e. Mash-ups





# BCS



# What is New?

- **Read-write**
- **More connectivity options**
- **Design and customization tools**
- **Rich Client integration**
- **Work online or offline**
- **Secure Store Service**



# Terminology

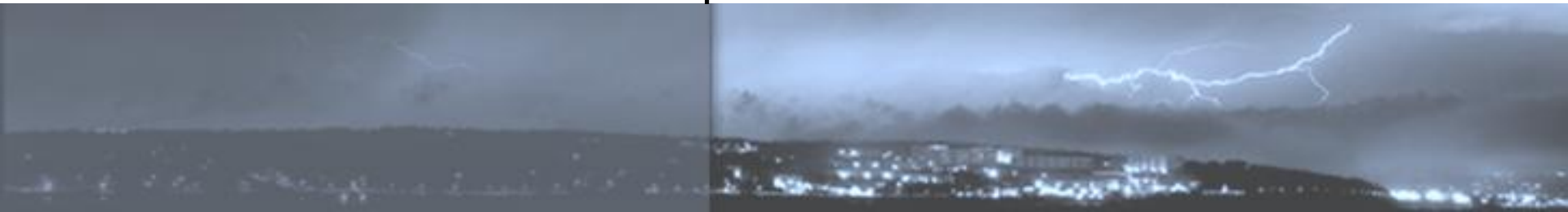
- MOSS → SharePoint Server 2010
- WSS → SharePoint Foundation 2010
- Entities → External Content Types
- Application Definition File → Model
- BDC now means Business Data Connectivity



# External Content Type



- Defines an object such as customer
- Defines fields and (CRUD) methods
- Defines how the object will behave in SharePoint and Office.
  - Map customer to Outlook contact, work in Outlook with customer like a native Outlook contact
- Manage and re-use data from a central location – Central Administration
- ECT is added to the BCS by SPD, Visual Studio or imports ECT into BDC Service as part of a Model





# The 3 BCS Pillars

Presentation

Connectivity

Tooling





# Presentation

Web Parts

Search

Office Client Applications

Custom Solutions



## External List

- Works as if you are working with SharePoint list with SharePoint Data
- Full Create, Read, Update and Delete (CRUD) capability (if the methods are defined on ECT)
- Can access via regular SPList Object Model
- Can take Offline i.e to Outlook for Contacts, Tasks, Calendars
- Data is stored in the External System
- Sort/Filter
- Standard and Customizable Views
- Extend with InfoPath Forms, Custom Columns
- No Datasheet view or RSS Feeds



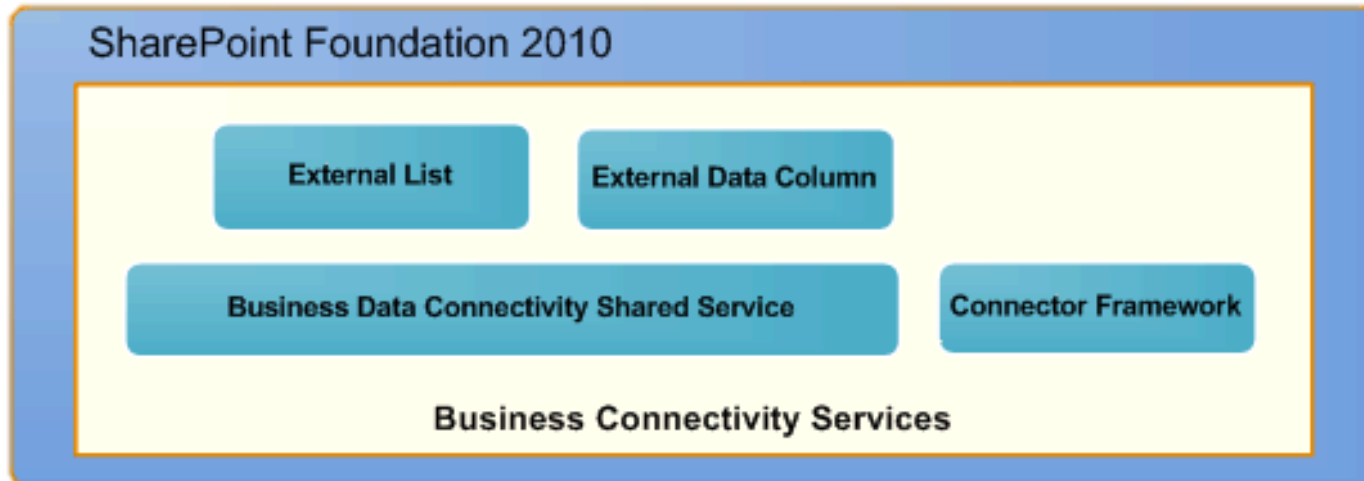
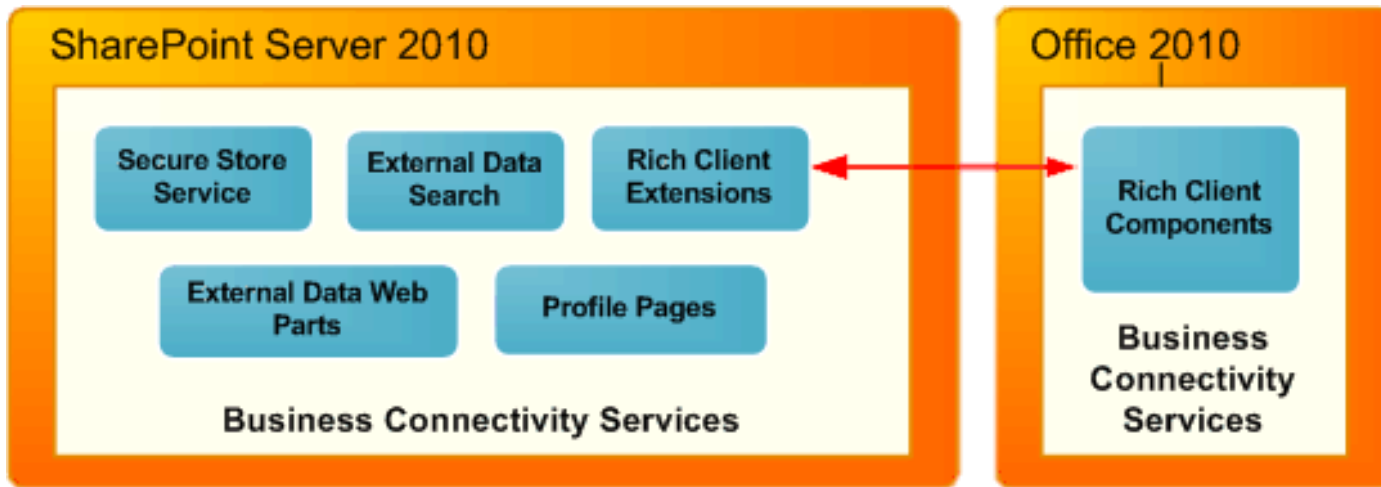
- **External Data Columns**

- Add to Standard List, use as Meta Data
- Stores a copy of the data

- **External Data Web Parts**

- Used in Dashboard type scenarios
- List, Item, Item Builder, Related List, Connectivity Filter and Chart
- Web Parts support automatic asynchronous update (AJAX)







# Quick Demo

Seeing data in SharePoint



# Search

- Display Search results from External Data along side regular search results
- Item Level Security so you can only see what you have permissions for
- Blob Support, search for Attachments
- Incremental Crawls



# Office Client Applications



- Outlook, Word, SharePoint Workspaces, Access and InfoPath can make use of External Content Types
  - Other Office Applications can be used via code
- Map to Office Types – Have you Business Data providing
  - E.g.. Outlook Contact, Tasks and Appointments
- BDC Runtime is on the client and connects to the External Data directly and not via SharePoint
- Client Cache allows disconnected and connected scenarios.

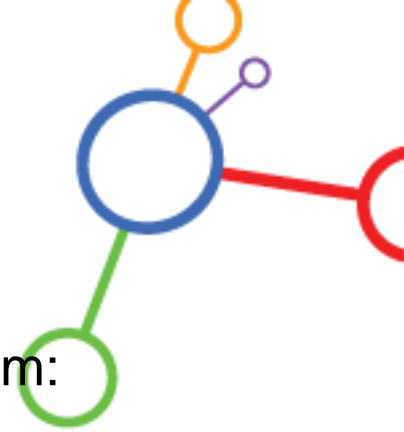


# Custom Solutions

- It is also possible using the Object Model to create custom:
  - Web Parts
  - Application Pages
  - Office Add-ins
  - Silverlight Applications \ Web Parts
  - WPF Applications
  - Win-Form Applications

There are now 2 Object Models – Client and Server

The Developer only needs to program against the BCS API and does not need to worry about where the data is coming from.





# Connectivity



# Business Data Connectivity (BDC)



## BCS Connectors

DB  
Connector

WCF\WS  
Connector

.NET  
Assembly  
Connector

Custom  
Connector

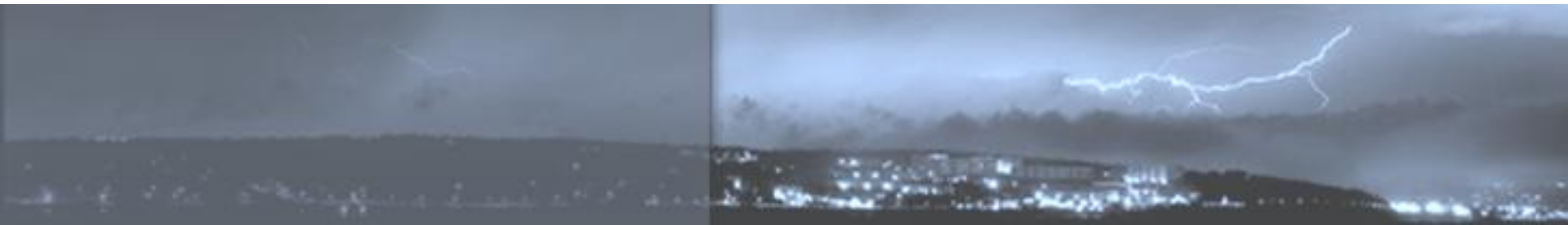




# Tooling

SharePoint Designer 2010

Visual Studio 2010



# SharePoint Designer

- No Code Solution
- Discovers connections
- Create External Content Types
- Generate and author External Lists and InfoPath Forms
- Working Live\Development with Server Directly



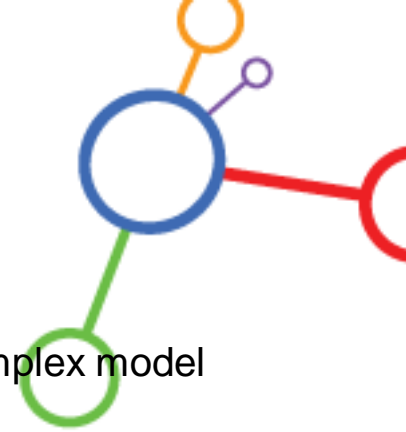


# Demo

## Intro to SharePoint Designer



# Visual Studio 2010



- Use the Business Data Connectivity Model Project Type to design your complex model
- You can create reusable components which can be re-used by power users in SharePoint Designer
- Define custom connectivity logic
- Create Add-ins for Office Applications
  - e.g. For Excel or PowerPoint which are not supported OOTB
- Creates WSP Package for Deployment
- You can now 'F5' in Visual Studio to Build > Package > Deploy and start Debugging an External Content Type



# Solution Types



- **Visual Studio**
  - Custom connectivity using .NET Assembly
    - Data aggregation from different data sources
    - Custom transformation of data
    - Customise the security
  - Use custom code to integrate any data into Office Application via the Object Model
  - Add Business Logic to the Forms
  - Create reusable components such as UI Web Parts, External Content Types and Actions to use in SharePoint Designer





# Demo

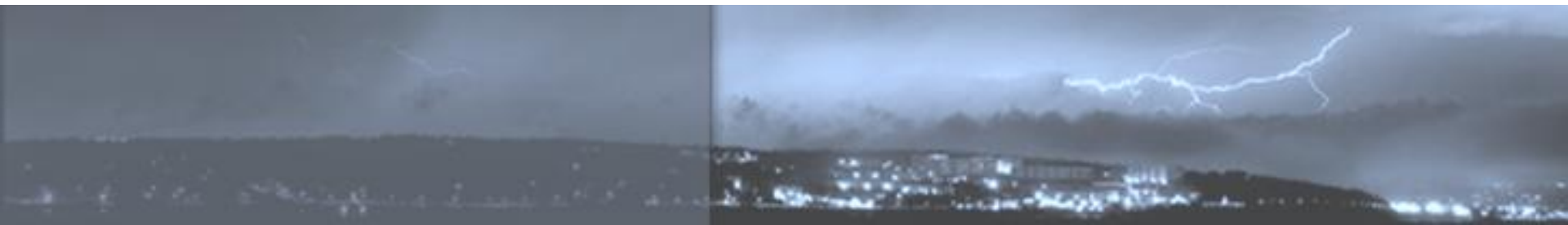
Intro to Visual Studio 2010 tool





# Demo

BCS Meta Man





Questions?



# Contact Information



- Web: [www.lightningtools.com](http://www.lightningtools.com)
- Blog: <http://www.lightningtools.com/blog/>
- Email: [support@lightningtools.com](mailto:support@lightningtools.com)
- Twitter: <http://twitter.com/lightningtools>





# Screenshots



BCS Demo - Webinar - Home - Windows Internet Explorer

http://win-a3ia0lgevo4/demo/bcs/webinar/SitePages/Home.aspx

BCS Demo - Webinar - Home

Site Actions | Browse | Page | Custom Commands

Give Feedback | System Account

BCS Demo - Webinar | Home

Home | Search this site...

Documents  
Site Pages  
Shared Documents

Lists  
Calendar  
Tasks  
Order  
Employees List

Discussions  
Team Discussion

Recycle Bin  
All Site Content

# Lightning Tools BCS Webinar

## Employees List

| <input type="checkbox"/> | EmployeeID | FirstName | LastName          | Title                        | EmailAddress                 |
|--------------------------|------------|-----------|-------------------|------------------------------|------------------------------|
| <input type="checkbox"/> | 1          | Terry     | Duffy             | VP Engineering               | Terri@adventure-works.com    |
| <input type="checkbox"/> | 2          | Jian Shuo | Wang              | Engineering Manager          | Jian@adventure-works.com     |
| <input type="checkbox"/> | 3          | Michael   | Sullivan          | Sr. Design Engineer          | Michael6@adventure-works.com |
| <input type="checkbox"/> | 4          | Sharon    | Salavaria         | Design Engineer              | Sharon1@adventure-works.com  |
| <input type="checkbox"/> | 5          | Gail      | Erickson          | Design Engineer              | Gail@adventure-works.com     |
| <input type="checkbox"/> | 6          | Jossef    | Goldberg          | Design Engineer              | Jossef@adventure-works.com   |
| <input type="checkbox"/> | 7          | Ovidiu    | Crăciun           | Sr. Tool Designer            | Ovidiu@adventure-works.com   |
| <input type="checkbox"/> | 8          | Janice    | Galvin            | Tool Designer                | Janice@adventure-works.com   |
| <input type="checkbox"/> | 9          | Thierry   | D'Hers            | Tool Designer                | Thierry@adventure-works.com  |
| <input type="checkbox"/> | 10         | Brian     | Welcker           | VP Sales                     | Brian4@adventure-works.com   |
| <input type="checkbox"/> | 14         | Stephen   | Jiang             | North American Sales Manager | Stephen@adventure-works.com  |
| <input type="checkbox"/> | 20         | Syed      | Abbas             | Pacific Sales Manager        | Syed@adventure-works.com     |
| <input type="checkbox"/> | 21         | Amy       | Alberts           | European Sales Manager       | Amy@adventure-works.com      |
| <input type="checkbox"/> | 22         | Pamela    | Ansman-Wolfe      | Sales Representative         | Pamela@adventure-works.com   |
| <input type="checkbox"/> | 23         | David     | Campbell          | Sales Representative         | David3@adventure-works.com   |
| <input type="checkbox"/> | 24         | Fernando  | Caro              | Sales Representative         | Fernando@adventure-works.com |
| <input type="checkbox"/> | 26         | Shu       | Ito               | Sales Representative         | Shu@adventure-works.com      |
| <input type="checkbox"/> | 27         | Linda     | Mitchell          | Sales Representative         | Linda1@adventure-works.com   |
| <input type="checkbox"/> | 29         | Tsvi      | Reiter            | Sales Representative         | Tsvi@adventure-works.com     |
| <input type="checkbox"/> | 31         | José      | Saraiva           | Sales Representative         | José@adventure-works.com     |
| <input type="checkbox"/> | 33         | Garrett   | Vargar            | Sales Representative         | Garrett2@adventure-works.com |
| <input type="checkbox"/> | 34         | Ranjit    | Varkey Chudukatil | Sales Representative         | Ranjit@adventure-works.com   |
| <input type="checkbox"/> | 35         | Rachel    | Valdez            | Sales Representative         | Rachel1@adventure-works.com  |
| <input type="checkbox"/> | 36         | Lynn      | Tsoflias          | Sales Representative         | Lynn1@adventure-works.com    |
| <input type="checkbox"/> | 37         | Jae       | Pak               | Sales Representative         | Jae@adventure-works.com      |

Local intranet | Protected Mode: Off | 100%

16:49  
09/12/2009

### Employees List - View Item

View

Delete Item  
 Edit Item  
 Manage

Close

|                       |                           |
|-----------------------|---------------------------|
| EmployeeID            | 1                         |
| FirstName             | Terry                     |
| AddressID             | 1                         |
| ShiftID               | 1                         |
| LastName              | Duffy                     |
| MiddleName            | Andrews                   |
| NameStyle             | No                        |
| NationalIDNumber      | 245797967                 |
| Title                 | VP Engineering            |
| HireDate              | 3/3/1998 12:00 AM         |
| BirthDate             | 9/1/1961 1:00 AM          |
| LoginID               | adventure-works\Terri     |
| EmailAddress          | Terri@adventure-works.com |
| DepartmentID          | 1                         |
| MaritalStatus         | S                         |
| EmergencyContactName  | Tad Orman                 |
| EmergencyContactPhone | 586-883-8338              |
| SalariedFlag          | Yes                       |
| Gender                | F                         |
| ManagerID             | 300                       |
| PayFrequency          | 2                         |
| BaseRate              | 63.4615                   |
| VacationHours         | 1                         |
| SickLeaveHours        | 20                        |
| SalesPersonFlag       | No                        |
| CurrentFlag           | Yes                       |
| ModifiedDate          | 12/8/2009 3:07 PM         |



### Employees List - Edit Item

Edit

Save  
 Cancel  
 Paste  
 Copy  
 Delete Item  
 Spelling

Commit    Clipboard    Actions    Spelling

Save

Cancel

FirstName \*   
 AddressID   
 ShiftID   
 LastName \*   
 MiddleName   
 NameStyle \*   
 NationalIDNumber   
 Title   
 HireDate     
 BirthDate     
 LoginID   
 EmailAddress   
 DepartmentID   
 MaritalStatus   
 EmergencyContactName   
 EmergencyContactPhone   
 SalariedFlag \*   
 Gender   
 ManagerID   
 PayFrequency   
 BaseRate   
 VacationHours \*

Order - Windows Internet Explorer  
 http://win-a3ia0lgevo4/demo/bcs/webinar/Lists/Order/AllItems.aspx

Order

Site Actions | Browse | Custom Commands | Items | List

BCS Demo - Webinar > Order : All Items

Home | Search this site...

| OrderID | Product | Product: Color | Product: Name         | Product: ProductID | Product: Size | Product: Weight | Quantity |
|---------|---------|----------------|-----------------------|--------------------|---------------|-----------------|----------|
| A NEW   | (Blank) |                | Bike wash - dissolver | 1,291              |               |                 | 1        |
| B NEW   | (Blank) | Red            | Mountain-400 Red, 48  | 58 48              |               | 27.125          | 1        |

+ Add new item

Order - New Item

Edit

Save Cancel Paste Copy Attach File

Commit Clipboard Actions

OrderID \*

Product \*

Quantity \*

You must also use S

Choose Products -- Webpage Dialog

Find Product Name helmet

| ProductID | Name                    | StandardCost | Color | Weight |
|-----------|-------------------------|--------------|-------|--------|
| 1286      | Sport-100 helmet, Blue  | 19.2445      | Blue  |        |
| 1298      | Sport-100 helmet, Red   | 19.2445      | Red   |        |
| 1299      | Sport-100 helmet, Black | 19.2445      | Black |        |

Found 3 matches.

OK Cancel

File External Content Types

Summary View Operations Design View Views

Switch Connected System Connection Properties

Edit Operation Remove Operation Operation

Set as Title Field

Create Lists & Form Lists & Forms

Go to List

Create Profile Page Profile Page

Navigation

Site Objects

- BCS Demo - Webinar
- Lists and Libraries
- Workflows
- Site Pages
- Site Assets
- Content Types
- Site Columns
- External Content Types**
- Data Sources
- Master Pages
- Site Groups
- Subsites
- All Files

External Content Types

BCSWebinarDemo.Searchable

BCSWebinarDemo.Searchable.Em...

http://win-a3ia0lgevo4/dem...

- Departments
- Employees
- Product Category
- Products

Employees

BCS Demo - Webinar External Content Types Employees

Use this page to view and manage settings for this external content type.

**External Content Type Information**

Key information about this external content type.

Name: **Employees**

Display Name: **Employees**

Namespace: **http://win-a3ia0lgevo4/demo/bcs/webinar**

Version: **1.1.0.0**

Identifiers: **EmployeeID(int32)**

Office Item Type: **Generic List**

Offline Sync for External List: **Enabled**

External System: **AdventureWorks2000**

**Permissions**

Permissions for this external content type.

| Name                         | Permissions  |
|------------------------------|--|
| lightningtools\administrator | Edit, Execute, SetPermissions, SelectableInClients |

**External Lists**

View and navigate to external lists bound to this external content type.

| Name           | URL   |
|----------------|---|
| Employees List | /demo/bcs/webinar/Lists/Employees List/Read List.aspx |

**External Content Type Operations**

Operations define the actions this external content type can take on the external data.

✔ This External Content Type has read, write, and search capabilities. You may associate it with other External Content Types by creating an Association operation from the Operations Design View.

| Name                         | Type        | Data Source Object |
|------------------------------|-------------|--------------------|
| Create                       | Create      | Employee           |
| Read Item                    | Read Item   | Employee           |
| Update                       | Update      | Employee           |
| Delete                       | Delete      | Employee           |
| Read List                    | Read List   | Employee           |
| EmployeeNavigate Association | Association | Employee           |

**Fields**

A list of the fields that were defined in the operations of this external content type.

| Field Name            | Type                             |
|-----------------------|----------------------------------|
| FirstName             | System.String                    |
| AddressID             | System.Nullable<System.Int32>    |
| ShiftID               | System.Nullable<System.Byte>     |
| LastName              | System.String                    |
| MiddleName            | System.String                    |
| NameStyle             | System.Boolean                   |
| NationalIDNumber      | System.String                    |
| Title                 | System.String                    |
| HireDate              | System.Nullable<System.DateTime> |
| BirthDate             | System.Nullable<System.DateTime> |
| LoginID               | System.String                    |
| EmailAddress          | System.String                    |
| DepartmentID          | System.Nullable<System.Int16>    |
| MaritalStatus         | System.String                    |
| EmergencyContactName  | System.String                    |
| EmergencyContactPhone | System.String                    |
| SalariedFlag          | System.Boolean                   |
| Gender                | System.String                    |
| ManagerID             | System.Nullable<System.Int32>    |
| PayFrequency          | System.Nullable<System.Byte>     |
| BaseRate              | System.Nullable<System.Decimal>  |
| VacationHours         | System.Int16                     |
| SickLeaveHours        | System.Int16                     |
| SalesPersonFlag       | System.Boolean                   |
| CurrentFlag           | System.Boolean                   |
| ModifiedDate          | System.DateTime                  |
| rowguid               | System.Guid                      |

