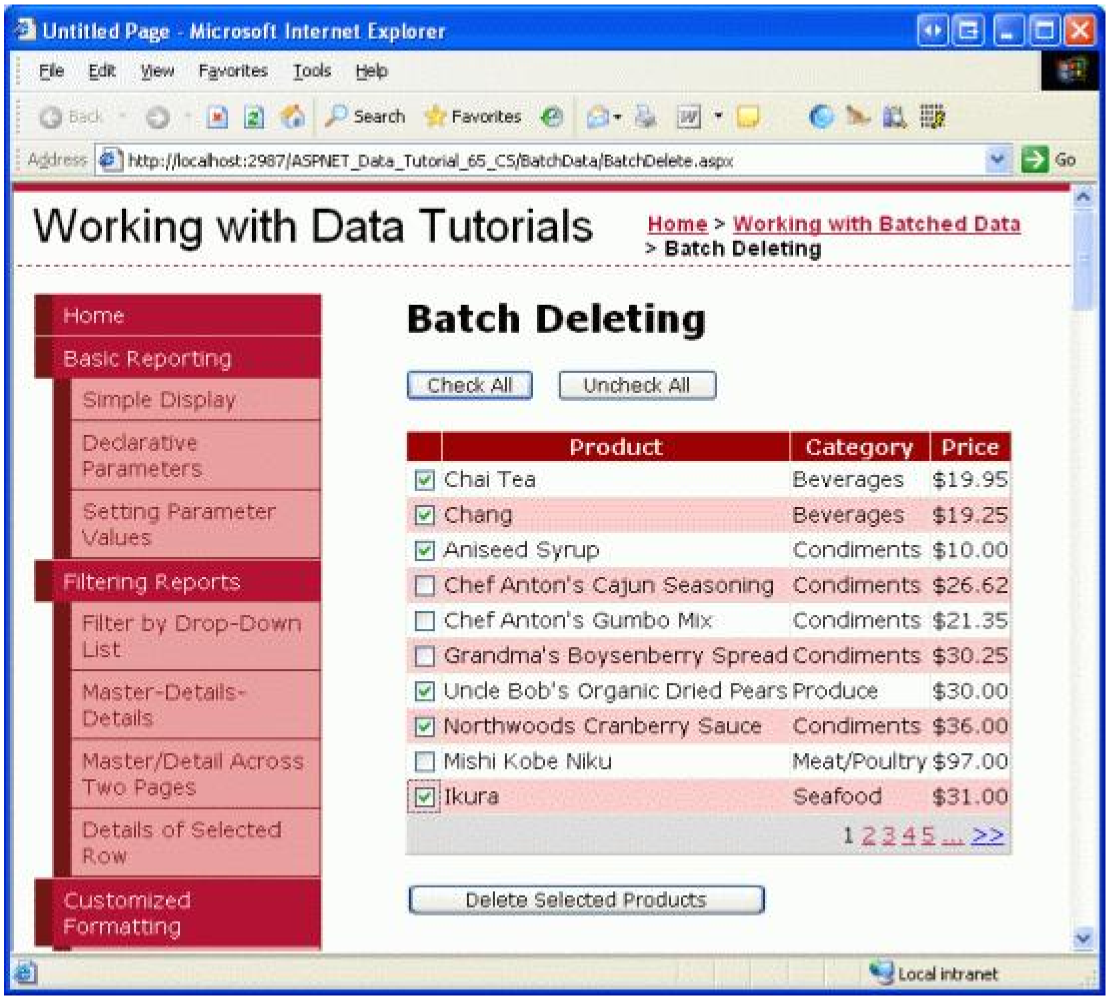
Working with Data in ASP.NET 2.0 :: Batch Deleting

Introduction

The preceding tutorial explored how to create a batch editing interface using a fully-editable GridView. In situations where users are commonly editing many records at once, a batch editing interface will require far fewer postbacks and keyboard-to-mouse context switches, thereby improving the end user's efficiency. This technique is similarly useful for pages where it is common for users to delete many records in one go.

Anyone who has used an online email client is already familiar with one of the most common batch deleting interfaces: a checkbox in each row in a grid with a corresponding "Delete All Checked Items" button (see Figure 1). This tutorial is rather short because we've already done all of the hard work in previous tutorials in creating both the web-based interface and a method to delete a series of records as a single atomic operation. In the Adding a GridView Column of Checkboxes tutorial we created a GridView with a column of checkboxes and in the Wrapping Database Modifications within a Transaction tutorial we created a method in the BLL that would use a transaction to delete a `List<T>` of `ProductID` values. In this tutorial, we will build upon and merge our previous experiences to create a working batch deleting example.



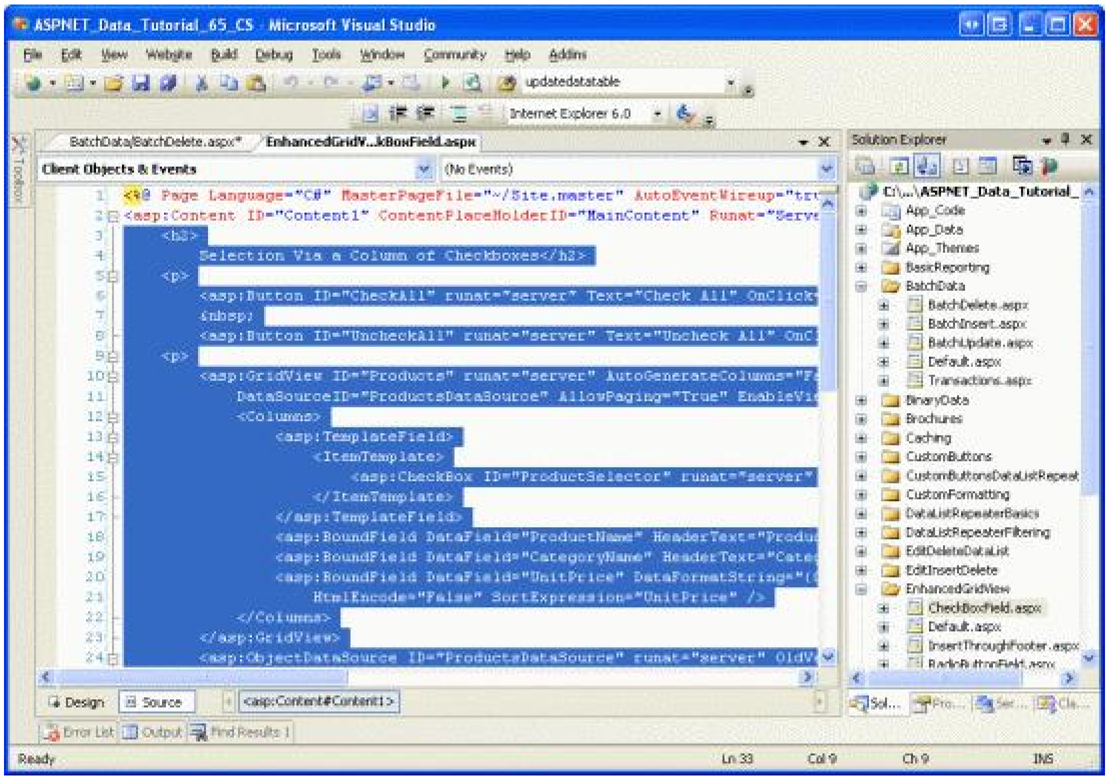
	Product	Category	Price
✓	Chai Tea	Beverages	$19.95
✓	Chang	Beverages	$19.25
✓	Aniseed Syrup	Condiments	$10.00
☐	Chef Anton's Cajun Seasoning	Condiments	$26.62
☐	Chef Anton's Gumbo Mix	Condiments	$21.35
☐	Grandma's Boysenberry Spread	Condiments	$30.25
✓	Uncle Bob's Organic Dried Pears	Produce	$30.00
✓	Northwoods Cranberry Sauce	Condiments	$36.00
☐	Mishi Kobe Niku	Meat/Poultry	$97.00
✓	Ikura	Seafood	$31.00

1 2 3 4 5 ... >>

Figure 1: Each Row Includes a Checkbox

Step 1: Creating the Batch Deleting Interface

Since we already created the batch deleting interface in the Adding a GridView Column of Checkboxes tutorial, we can simply copy it to `BatchDelete.aspx` rather than creating it from scratch. Start by opening the `BatchDelete.aspx` page in the `BatchData` folder and the `CheckBoxField.aspx` page in the `EnhancedGridView` folder. From the `CheckBoxField.aspx` page, go to the Source view and copy the markup between the `<asp:Content>` tags as shown in Figure 2.



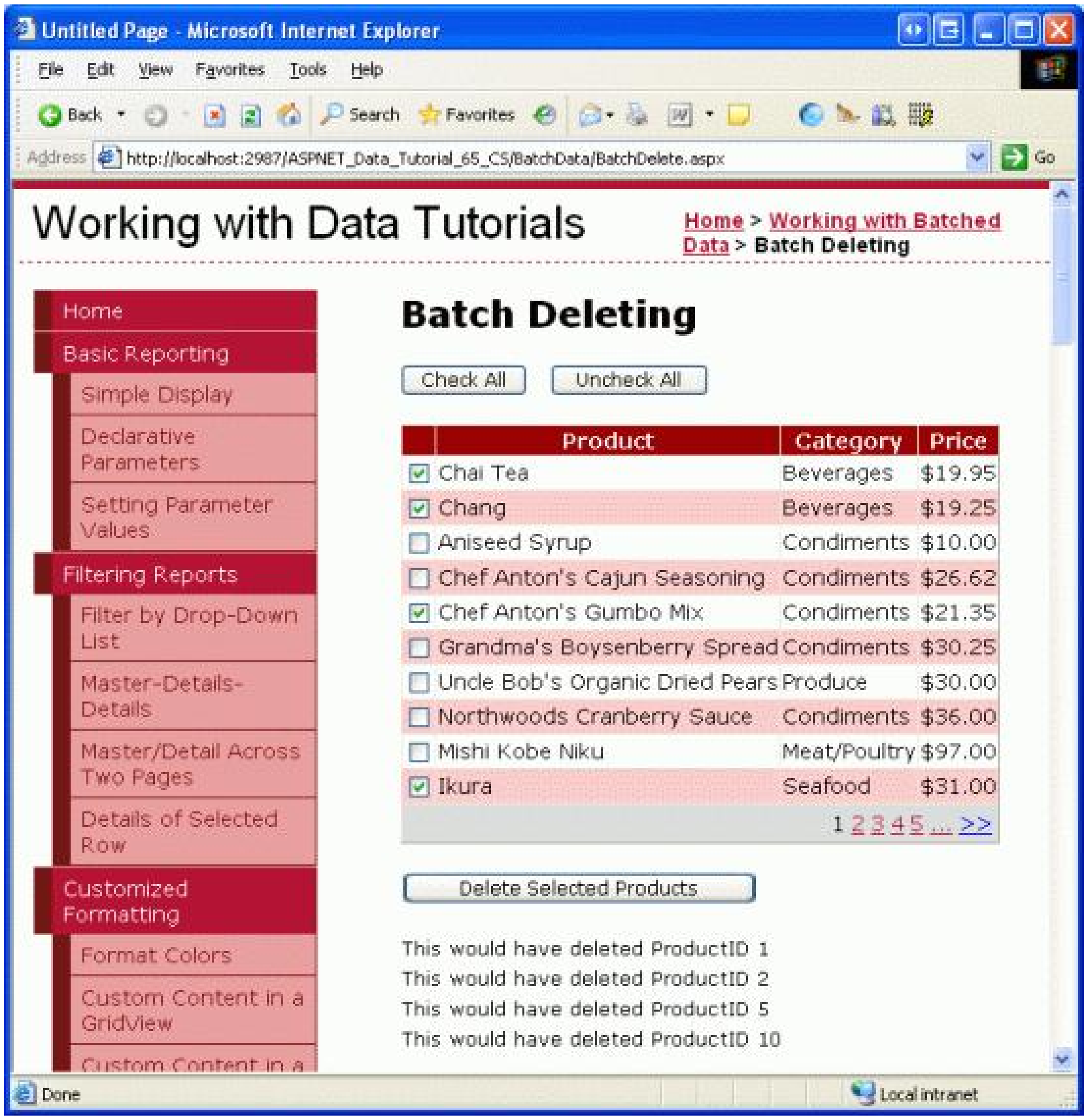
```
<%@ Page Language="C#" MasterPageFile="~/Site.master" AutoEventWireup="tru
<asp:Content ID="Content1" ContentPlaceHolderID="MainContent" Runat="Serve
    <h2>
        Selection Via a Column of Checkboxes</h2>
    <p>
        <asp:Button ID="CheckAll" runat="server" Text="Check All" OnClick=
        &nbsp;
        <asp:Button ID="UncheckAll" runat="server" Text="Uncheck All" OnC
    <p>
        <asp:GridView ID="Products" runat="server" AutoGenerateColumns="Fa
            DataSourceID="ProductsDataSource" AllowPaging="True" EnableVi
            <Columns>
                <asp:TemplateField>
                    <ItemTemplate>
                        <asp:CheckBox ID="ProductSelector" runat="server"
                    </ItemTemplate>
                </asp:TemplateField>
                <asp:BoundField DataField="ProductName" HeaderText="Produ
                <asp:BoundField DataField="CategoryName" HeaderText="Cate
                <asp:BoundField DataField="UnitPrice" DataFormatString="{
                    HtmlEncode="False" SortExpression="UnitPrice" />
            </Columns>
        </asp:GridView>
        <asp:ObjectDataSource ID="ProductsDataSource" runat="server" OldV
```

Figure 2: Copy the Declarative Markup of `CheckBoxField.aspx` to the Clipboard

Next, go to the Source view in `BatchDelete.aspx` and paste the contents of the clipboard within the `<asp:Content>` tags. Also copy and paste the code from within the code-behind class in `CheckBoxField.aspx.cs` to within the code-behind class in `BatchDelete.aspx.cs` (the `DeleteSelectedProducts` Button's `Click` event handler, the `ToggleCheckState` method, and the `Click` event handlers for the `CheckAll` and `UncheckAll` Buttons). After copying over this content, the `BatchDelete.aspx` page's code-behind class should contain the following code:

```
using System;
using System.Data;
using System.Configuration;
using System.Collections;
using System.Web;
using System.Web.Security;
using System.Web.UI;
using System.Web.UI.WebControls;
using System.Web.UI.WebControls.WebParts;
using System.Web.UI.HtmlControls;

public partial class BatchData_BatchDelete : System.Web.UI.Page
{
    protected void DeleteSelectedProducts_Click(object sender, EventArgs e)
    {
        bool atLeastOneRowDeleted = false;

        // Iterate through the Products.Rows property
        foreach (GridViewRow row in Products.Rows)
        {
            // Access the CheckBox
            CheckBox cb = (CheckBox)row.FindControl("ProductSelector");
            if (cb != null && cb.Checked)
            {
                // Delete row! (Well, not really...)
                atLeastOneRowDeleted = true;

                // First, get the ProductID for the selected row
                int productID = Convert.ToInt32(Products.DataKeys[row.RowIndex].Value);

                // "Delete" the row
                DeleteResults.Text += string.Format
                    ("This would have deleted ProductID {0}<br />", productID);

                //... To actually delete the product, use ...
                //ProductsBLL productAPI = new ProductsBLL();
                //productAPI.DeleteProduct(productID);
                //............................................
            }
        }

        // Show the Label if at least one row was deleted...
        DeleteResults.Visible = atLeastOneRowDeleted;
    }

    private void ToggleCheckState(bool checkState)
    {
        // Iterate through the Products.Rows property
        foreach (GridViewRow row in Products.Rows)
        {
            // Access the CheckBox
            CheckBox cb = (CheckBox)row.FindControl("ProductSelector");
            if (cb != null)
                cb.Checked = checkState;
        }
    }

    protected void CheckAll_Click(object sender, EventArgs e)
    {
        ToggleCheckState(true);
    }

    protected void UncheckAll_Click(object sender, EventArgs e)
    {
        ToggleCheckState(false);
        }
    }
```

After copying over the declarative markup and source code, take a moment to test `BatchDelete.aspx` by viewing it through a browser. You should see a GridView listing the first ten products in a GridView with each row listing the product's name, category, and price along with a checkbox. There should be three buttons: "Check All", "Uncheck All", and "Delete Selected Products". Clicking the "Check All" button selects all checkboxes, while "Uncheck All" clears all checkboxes. Clicking "Delete Selected Products" displays a message that lists the `ProductID` values of the selected products, but does not actually delete the products.



Batch Deleting

	Product	Category	Price
✓	Chai Tea	Beverages	$19.95
✓	Chang	Beverages	$19.25
☐	Aniseed Syrup	Condiments	$10.00
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☐	Uncle Bob's Organic Dried Pears	Produce	$30.00
☐	Northwoods Cranberry Sauce	Condiments	$36.00
☐	Mishi Kobe Niku	Meat/Poultry	$97.00
✓	Ikura	Seafood	$31.00
			1 2 3 4 5 ... >>

```
This would have deleted ProductID 1
This would have deleted ProductID 2
This would have deleted ProductID 5
This would have deleted ProductID 10
```

Figure 3: The Interface from `CheckBoxField.aspx` has been Moved to `BatchDeleting.aspx`

Step 2: Deleting the Checked Products Using Transactions

With the batch deleting interface successfully copied over to `BatchDeleting.aspx`, all that remains is to update the code so that the "Delete Selected Products" button deletes the checked products using the `DeleteProductsWithTransaction` method in the `ProductsBLL` class. This method, added in the Wrapping Database Modifications within a Transaction tutorial, accepts as its input a `List<T>` of `ProductID` values and deletes each corresponding `ProductID` within the scope of a transaction.

The `DeleteSelectedProducts` Button's `Click` event handler currently uses the following `foreach` loop to iterate through each GridView row:

```
// Iterate through the Products.Rows property
foreach (GridViewRow row in Products.Rows)
{
    // Access the CheckBox
    CheckBox cb = (CheckBox)row.FindControl("ProductSelector");
    if (cb != null && cb.Checked)
    {
        // Delete row! (Well, not really...)
        atLeastOneRowDeleted = true;

        // First, get the ProductID for the selected row
        int productID = Convert.ToInt32(Products.DataKeys[row.RowIndex].Value);

        // "Delete" the row
        DeleteResults.Text += string.Format
            ("This would have deleted ProductID {0}<br />", productID);

        //... To actually delete the product, use ...
        //ProductsBLL productAPI = new ProductsBLL();
        //productAPI.DeleteProduct(productID);
        //............................................
    }
}
```

For each row, the `ProductSelector` CheckBox Web control is programmatically referenced. If it is checked, the row's `ProductID` is retrieved from the `DataKeys` collection and the `DeleteResults` Label's `Text` property is updated to include a message indicating that the row was selected for deletion.

The above code does not actually delete any records as the call to the `ProductsBLL` class's `Delete` method is commented out. Were this delete logic to be applied, the code would delete the products but not within an atomic operation. That is, if the first few deletes in the sequence succeeded, but a later one failed (perhaps due to a foreign key constraint violation), an exception would be thrown but those products already deleted would remain deleted.

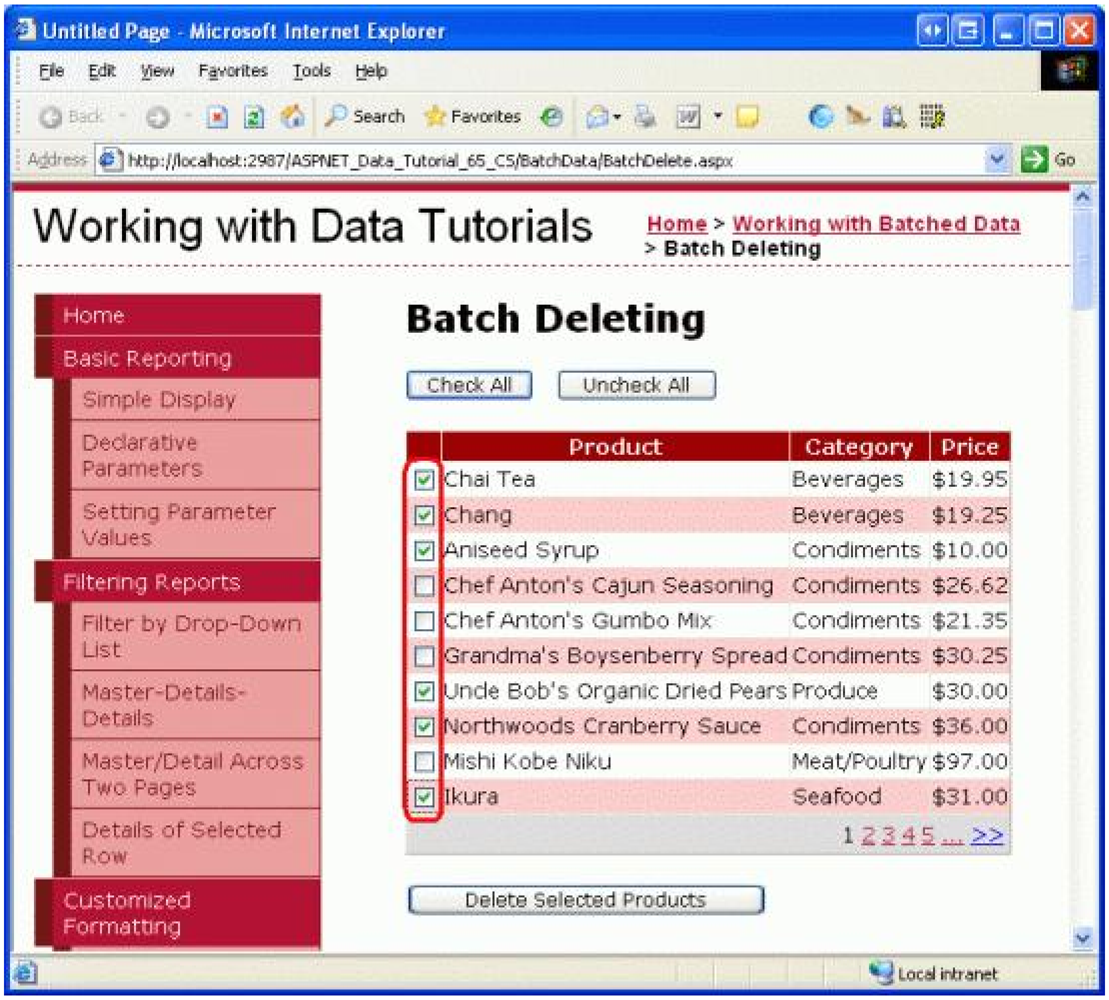
In order to assure atomicity, we need to instead use the `ProductsBLL` class's `DeleteProductsWithTransaction` method. Because this method accepts a list of `ProductID` values, we need to first compile this list from the grid and then pass it as a parameter. We first create an instance of a `List<T>` of type `int`. Within the `foreach` loop we need to add the selected products' `ProductID` values to this `List<T>`. After the loop this `List<T>` must be passed to the `ProductsBLL` class's `DeleteProductsWithTransaction` method. Update the `DeleteSelectedProducts` Button's `Click` event handler with the following code:

```
protected void DeleteSelectedProducts_Click(object sender, EventArgs e)
{
    // Create a List to hold the ProductID values to delete
    System.Collections.Generic.List<int> productIDsToDelete =
        new System.Collections.Generic.List<int>();

    // Iterate through the Products.Rows property
    foreach (GridViewRow row in Products.Rows)
    {
        // Access the CheckBox
```

```
            CheckBox cb = (CheckBox)row.FindControl("ProductSelector");
            if (cb != null && cb.Checked)
            {
                // Save the ProductID value for deletion
                // First, get the ProductID for the selected row
                int productID = Convert.ToInt32(Products.DataKeys[row.RowIndex].Value);

                // Add it to the List...
                productIDsToDelete.Add(productID);

                // Add a confirmation message
                DeleteResults.Text += string.Format
                    ("ProductID {0} has been deleted<br />", productID);
            }
        }

        // Call the DeleteProductsWithTransaction method and show the Label
        // if at least one row was deleted...
        if (productIDsToDelete.Count > 0)
        {
            ProductsBLL productAPI = new ProductsBLL();
            productAPI.DeleteProductsWithTransaction(productIDsToDelete);

            DeleteResults.Visible = true;

            // Rebind the data to the GridView
            Products.DataBind();
        }
    }
```

The updated code creates a `List<T>` of type `int` (`productIDsToDelete`) and populates it with the `ProductID` values to delete. After the `foreach` loop, if there is at least one product selected, the `ProductsBLL` class's `DeleteProductsWithTransaction` method is called and passed this list. The `DeleteResults` Label is also displayed and the data rebound to the GridView (so that the newly-deleted records no longer appear as rows in the grid).

Figure 4 shows the GridView after a number of rows have been selected for deletion. Figure 5 shows the screen immediately after the "Delete Selected Products" button has been clicked. Note that in Figure 5 the `ProductID` values of the deleted records are displayed in the Label beneath the GridView and those rows are no longer in the GridView.


Untitled Page - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost:2987/ASPNET_Data_Tutorial_65_CS/BatchData/BatchDelete.aspx Go
Working with Data Tutorials
Home > Working with Batched Data > Batch Deleting
Home
Basic Reporting
Simple Display
Declarative Parameters
Setting Parameter Values
Filtering Reports
Filter by Drop-Down List
Master-Details-Details
Master/Detail Across Two Pages
Details of Selected Row
Customized Formatting
Check All
Uncheck All
Delete Selected Products
Local intranet

Batch Deleting

	Product	Category	Price
✓	Chai Tea	Beverages	$19.95
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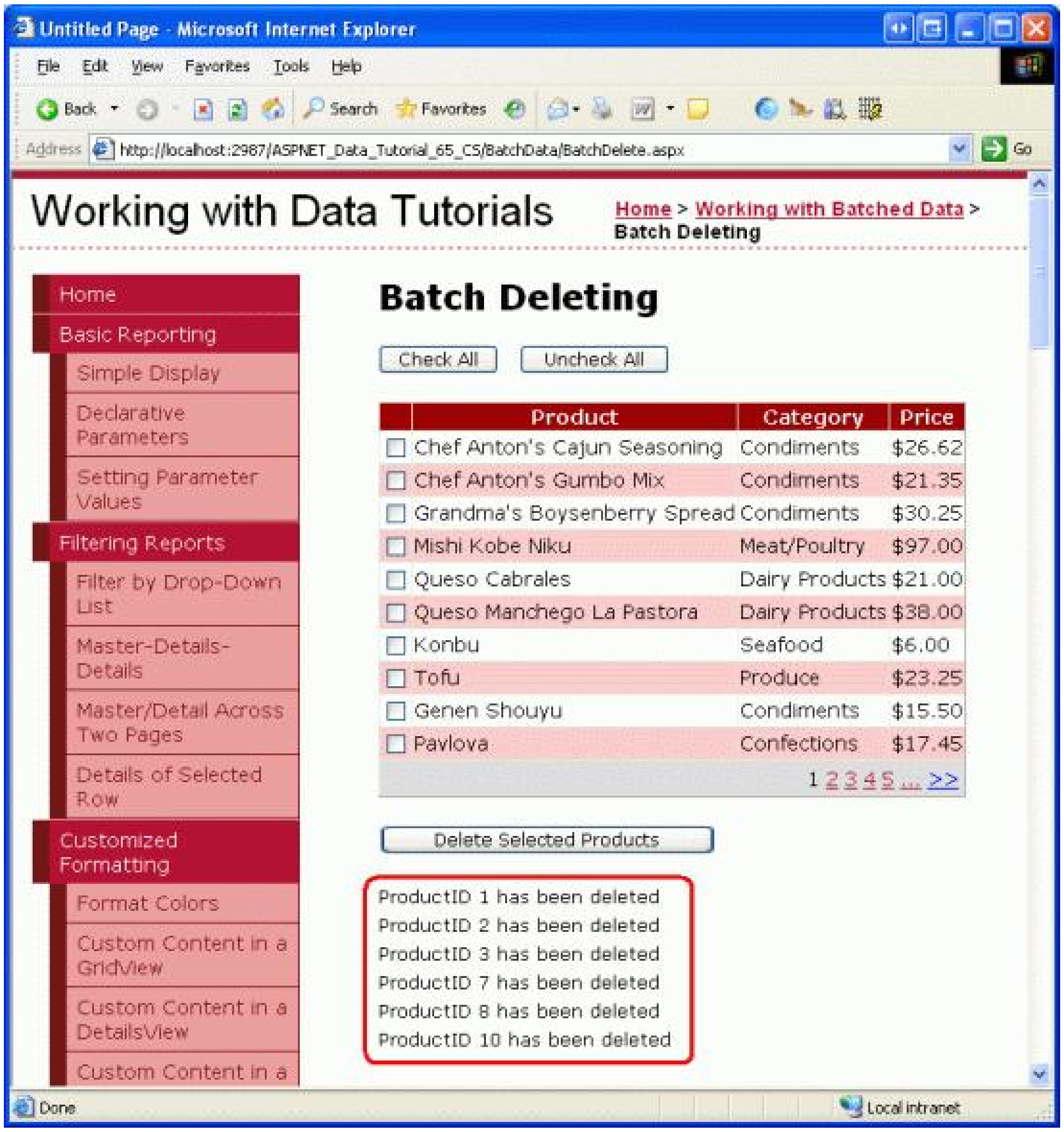
✓	Uncle Bob's Organic Dried Pears	Produce	$30.00
✓	Northwoods Cranberry Sauce	Condiments	$36.00
☐	Mishi Kobe Niku	Meat/Poultry	$97.00
✓	Ikura	Seafood	$31.00
			1 2 3 4 5 ... >>

Figure 4: The Selected Products Will Be Deleted


Untitled Page - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost:2987/ASPNET_Data_Tutorial_65_CS/BatchData/BatchDelete.aspx
Go
Working with Data Tutorials
Home > Working with Batched Data > Batch Deleting
Home
Basic Reporting
Simple Display
Declarative Parameters
Setting Parameter Values
Filtering Reports
Filter by Drop-Down List
Master-Details-Details
Master/Detail Across Two Pages
Details of Selected Row
Customized Formatting
Format Colors
Custom Content in a GridView
Custom Content in a DetailsView
Custom Content in a
Batch Deleting
Check All
Uncheck All
Delete Selected Products
Done
Local intranet

	Product	Category	Price
☐	Chef Anton's Cajun Seasoning	Condiments	$26.62
☐	Chef Anton's Gumbo Mix	Condiments	$21.35
☐	Grandma's Boysenberry Spread	Condiments	$30.25
☐	Mishi Kobe Niku	Meat/Poultry	$97.00
☐	Queso Cabrales	Dairy Products	$21.00
☐	Queso Manchego La Pastora	Dairy Products	$38.00
☐	Konbu	Seafood	$6.00
☐	Tofu	Produce	$23.25
☐	Genen Shouyu	Condiments	$15.50
☐	Pavlova	Confections	$17.45
			1 2 3 4 5 ... >>

```
ProductID 1 has been deleted
ProductID 2 has been deleted
ProductID 3 has been deleted
ProductID 7 has been deleted
ProductID 8 has been deleted
ProductID 10 has been deleted
```

Figure 5: The Deleted Products' `ProductID` Values are Listed Beneath the GridView

Note: To test the `DeleteProductsWithTransaction` method's atomicity, manually add an entry for a product in the `Order Details` table and then attempt to delete that product (along with others). You will receive a foreign key constraint violation when attempting to delete the product with an associated order, but note how the other selected products' deletions are rolled back.

Summary

Creating a batch deleting interface involves adding a GridView with a column of checkboxes and a Button Web control that, when clicked, will delete all of the selected rows as a single atomic operation. In this tutorial we built such an interface by piecing together work done in two previous tutorials, Adding a GridView Column of Checkboxes and Wrapping Database Modifications within a Transaction. In the first tutorial we created a GridView with a column of checkboxes and in the latter we implemented a method in the BLL that, when passed a `List<T>` of `ProductID` values, deleted them all within the scope of a transaction.

In the next tutorial we'll create an interface for performing batch inserts.

Happy Programming!

About the Author

Scott Mitchell, author of seven ASP/ASP.NET books and founder of 4GuysFromRolla.com, has been working with Microsoft Web technologies since 1998. Scott works as an independent consultant, trainer, and writer. His latest book is *Sams Teach Yourself ASP.NET 2.0 in 24 Hours*. He can be reached at mitchell@4GuysFromRolla.com. or via his blog, which can be found at http://ScottOnWriting.NET.

Special Thanks To…

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