Working with Data in ASP.NET 2.0 :: Displaying Binary Data in the Data Web Controls

Introduction

In the preceding tutorial we explored the two techniques for associating binary data with an application's underlying data model and used the FileUpload control to upload files from a browser to the web server's file system. We've yet to see how to associate the uploaded binary data with the data model. That is, after a file has been uploaded and saved to the file system, a path to the file must be stored in the appropriate database record. If the data is being stored directly in the database, then the uploaded binary data need not be saved to the file system, but must be injected into the database.

Before we look at associating the data with the data model, though, let's first look at how to provide the binary data to the end user. Presenting text data is simple enough, but how should binary data be presented? It depends, of course, on the type of binary data. For images, we likely want to display the image; for PDFs, Microsoft Word documents, ZIP files, and other types of binary data, providing a "Download" link is probably more appropriate.

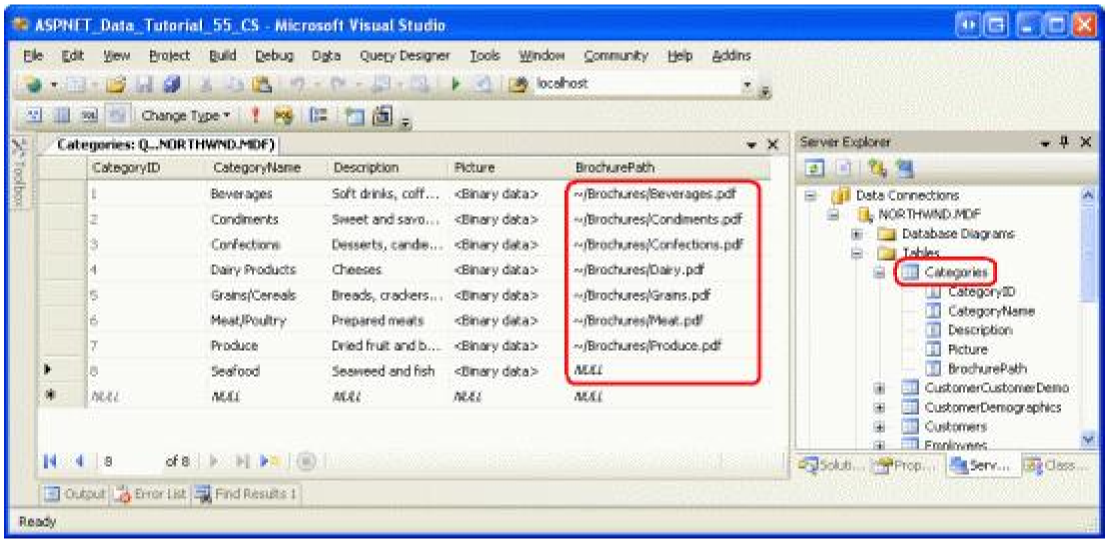
In this tutorial we will look at how to present the binary data alongside its associated text data using data Web controls like the GridView and DetailsView. In the next tutorial we'll turn our attention to associating an uploaded file with the database.

Step 1: Providing `BrochurePath` Values

The `Picture` column in the `Categories` table already contains binary data for the various category images. Specifically, the `Picture` column for each record holds the binary contents of a grainy, low-quality, 16-color bitmap image. Each category image is 172 pixels wide and 120 pixels tall and consumes roughly 11 KB. What's more, the binary content in the `Picture` column includes a 78-byte OLE header that must be stripped before displaying the image. This header information is present because the Northwind database has its roots in Microsoft Access. In Access, binary data is stored using the OLE Object data type, which tacks on this header. For now, we'll see how to strip the headers from these low-quality images in order to display the picture. In a future tutorial we'll build an interface for updating a category's `Picture` column and replace these bitmap images that use OLE headers with equivalent JPG images without the unnecessary OLE headers.

In the preceding tutorial we saw how to use the FileUpload control. Therefore, you can go ahead and add brochure files to the web server's file system. Doing so, however, does not update the `BrochurePath` column in the `Categories` table. In the next tutorial we'll see how to accomplish this, but for now we need to manually provide values for this column.

In this tutorial's download you'll find seven PDF brochure files in the `~/Brochures` folder, one for each of the categories except Seafood. I purposefully omitted adding a Seafood brochure to illustrate how to handle scenarios where not all records have associated binary data. To update the `Categories` table with these values, right-click on the `Categories` node from Server Explorer and choose Show Table Data. Then, enter the virtual paths to the brochure files for each category that has a brochure, as Figure 1 shows. Since there is no brochure for the Seafood category, leave its `BrochurePath` column's value as `NULL`.


ASPNET_Data_Tutorial_55_CS - Microsoft Visual Studio
File Edit View Project Build Debug Data Query Designer Tools Window Community Help Addins
localhost
Change Type
Categories: Q...NORTHWND.MDF)
Server Explorer
Data Connections
NORTHWND.MDF
Database Diagrams
Tables
Categories
CategoryID
CategoryName
Description
Picture
BrochurePath
CustomerCustomerDemo
CustomerDemographics
Customers
Employees
Soluti... Prop... Serv... Class...
Output Error List Find Results 1
Ready

CategoryID	CategoryName	Description	Picture	BrochurePath
1	Beverages	Soft drinks, coff...	<Binary data>	~/Brochures/Beverages.pdf
2	Condiments	Sweet and savo...	<Binary data>	~/Brochures/Condiments.pdf
3	Confections	Desserts, candie...	<Binary data>	~/Brochures/Confections.pdf
4	Dairy Products	Cheeses	<Binary data>	~/Brochures/Dairy.pdf
5	Grains/Cereals	Breads, crackers...	<Binary data>	~/Brochures/Grains.pdf
6	Meat/Poultry	Prepared meats	<Binary data>	~/Brochures/Meat.pdf
7	Produce	Dried fruit and b...	<Binary data>	~/Brochures/Produce.pdf
8	Seafood	Seaweed and fish	<Binary data>	NULL
NULL	NULL	NULL	NULL	NULL

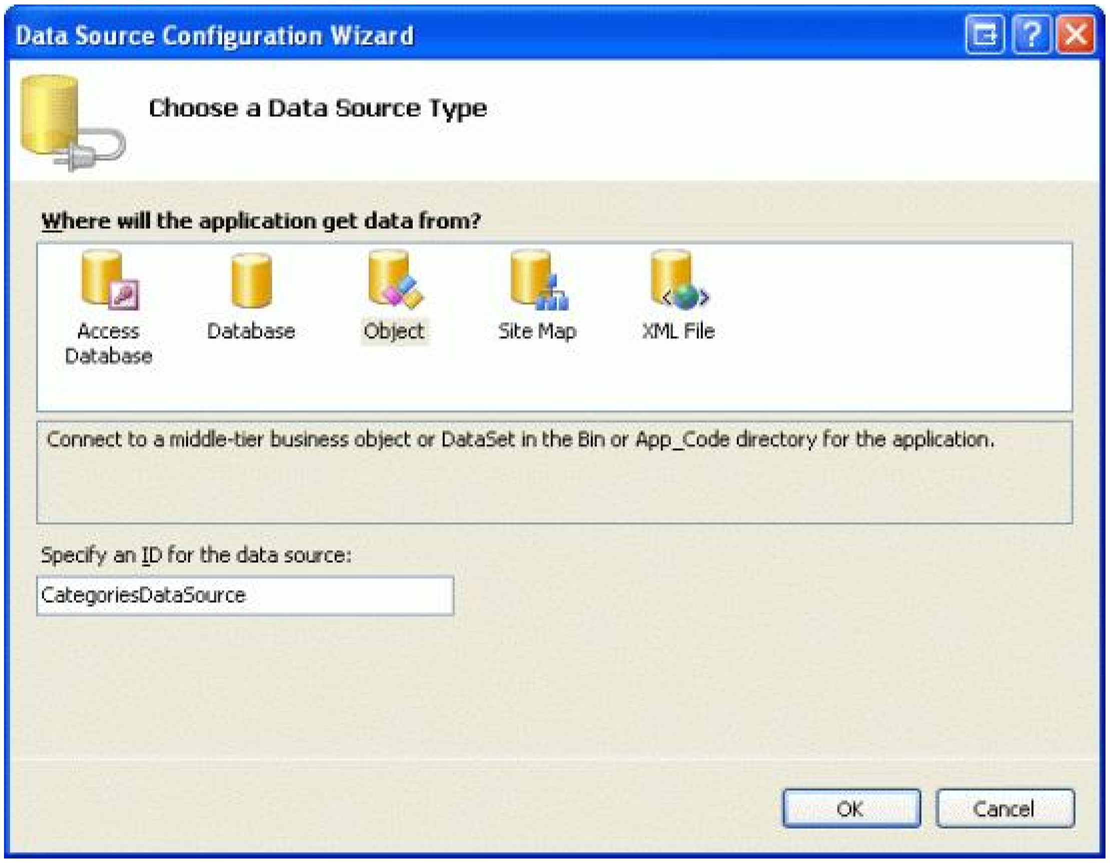
8 of 8

Figure 1: Manually Enter the Values for the `Categories` Table's `BrochurePath` Column

Step 2: Providing a Download Link for the Brochures in a GridView

With the `BrochurePath` values provided for the `Categories` table, we're ready to create a GridView that lists each category along with a link to download the category's brochure. In Step 4 we'll extend this GridView to also display the category's image.

Start by dragging a GridView from the Toolbox onto the Designer of the `DisplayOrDownloadData.aspx` page in the `BinaryData` folder. Set the GridView's `ID` to `Categories` and through the GridView's smart tag, choose to bind it to a new data source. Specifically, bind it to an ObjectDataSource named `CategoriesDataSource` that retrieves data using the `CategoriesBLL` object's `GetCategories()` method.



Data Source Configuration Wizard

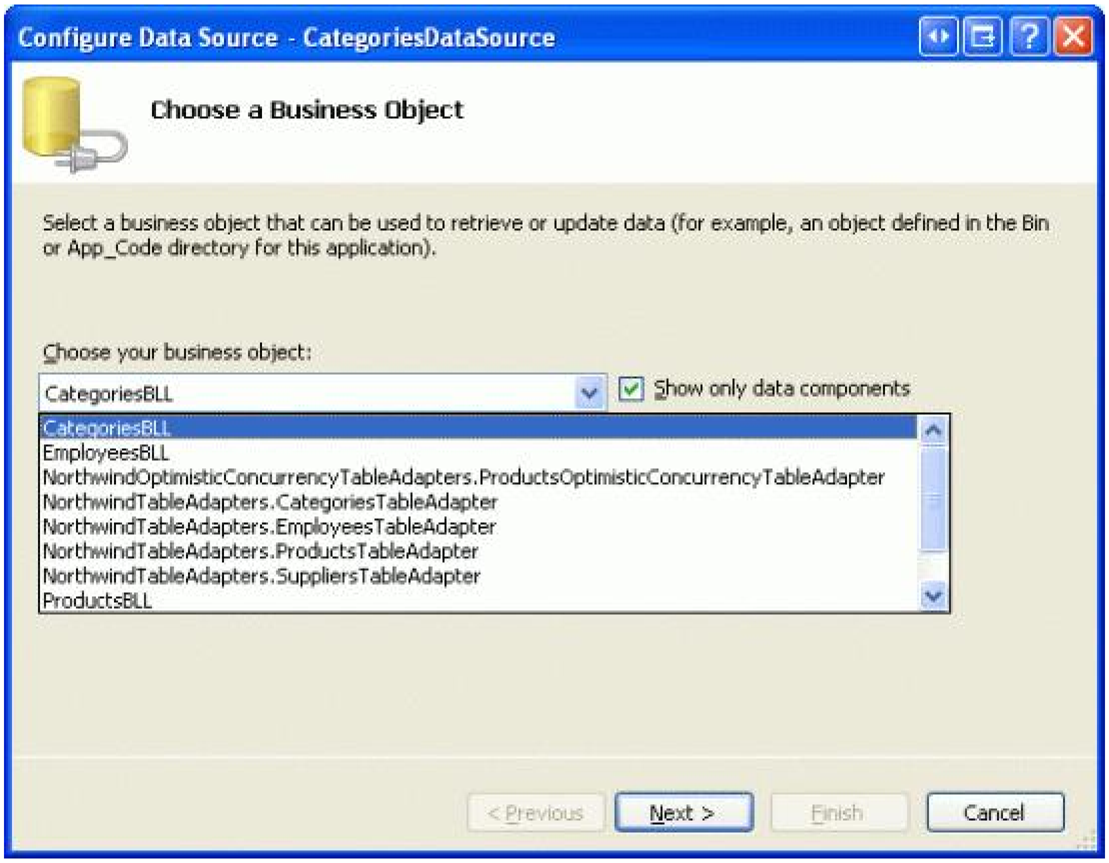
Choose a Data Source Type

Where will the application get data from?

Connect to a middle-tier business object or DataSet in the Bin or App_Code directory for the application.

Specify an ID for the data source: CategoriesDataSource

Figure 2: Create a New ObjectDataSource Named `CategoriesDataSource`


Configure Data Source - CategoriesDataSource

Choose a Business Object

Select a business object that can be used to retrieve or update data (for example, an object defined in the Bin or App_Code directory for this application).

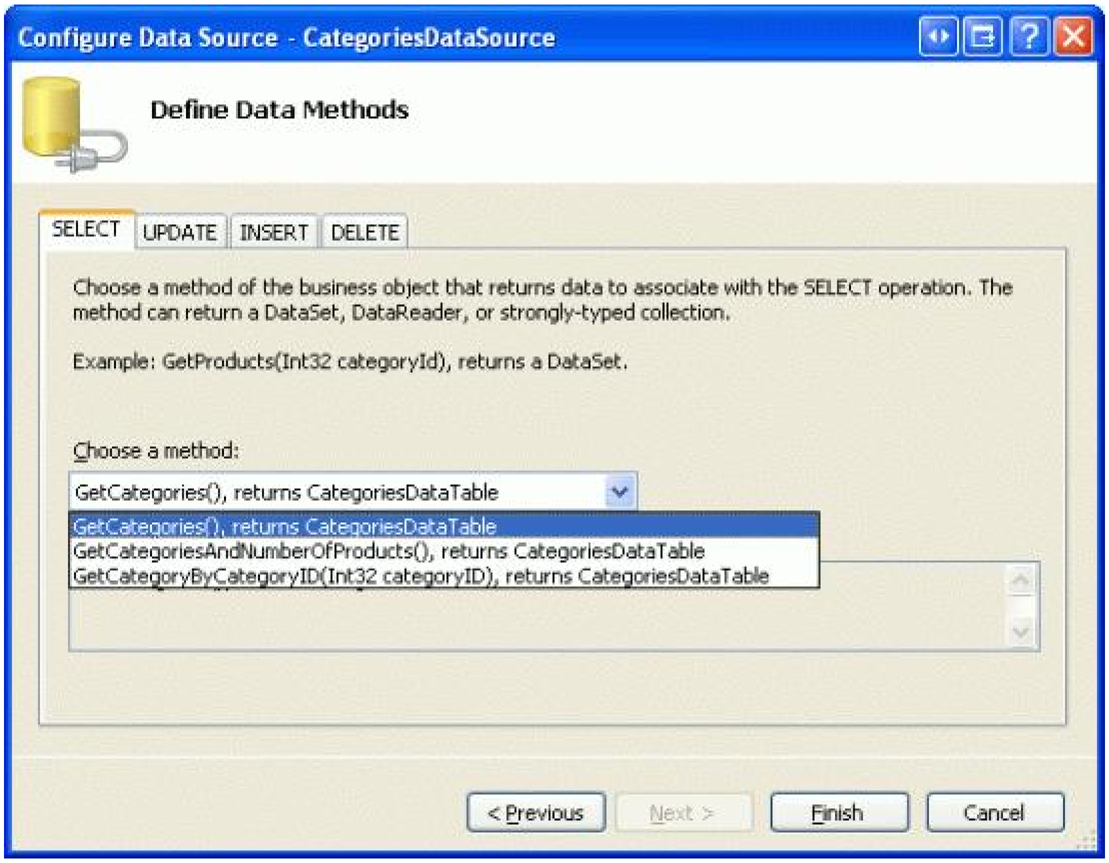
Choose your business object:

CategoriesBLL

[✓] Show only data components

```
CategoriesBLL
EmployeesBLL
NorthwindOptimisticConcurrencyTableAdapters.ProductsOptimisticConcurrencyTableAdapter
NorthwindTableAdapters.CategoriesTableAdapter
NorthwindTableAdapters.EmployeesTableAdapter
NorthwindTableAdapters.ProductsTableAdapter
NorthwindTableAdapters.SuppliersTableAdapter
ProductsBLL
```

Figure 3: Configure the ObjectDataSource to Use the `CategoriesBLL` Class



Choose a method of the business object that returns data to associate with the SELECT operation. The method can return a DataSet, DataReader, or strongly-typed collection.

Example: GetProducts(Int32 categoryId), returns a DataSet.

Choose a method:

GetCategories(), returns CategoriesDataTable

GetCategories(), returns CategoriesDataTable
GetCategoriesAndNumberOfProducts(), returns CategoriesDataTable
GetCategoryByCategoryID(Int32 categoryID), returns CategoriesDataTable

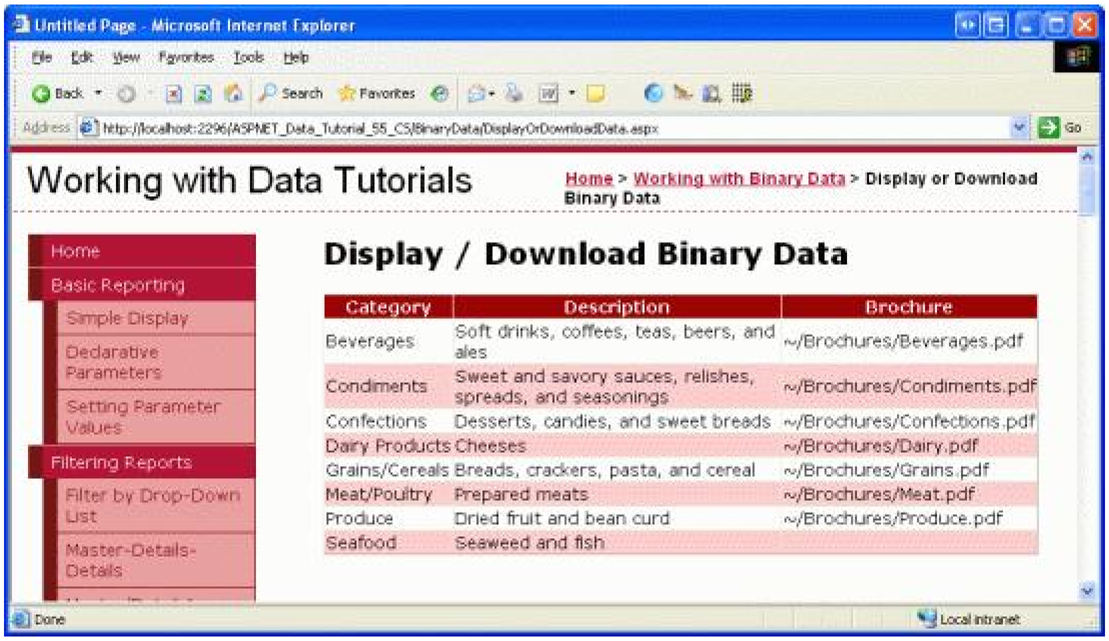
Figure 4: Retrieve the List of Categories Using the `GetCategories()` Method

After completing the Configure Data Source wizard, Visual Studio will automatically add a BoundField to the `Categories` GridView for the `CategoryID`, `CategoryName`, `Description`, `NumberOfProducts`, and `BrochurePath` `DataColumns`. Go ahead and remove the `NumberOfProducts` BoundField since the `GetCategories()` method's query does not retrieve this information. Also remove the `CategoryID` BoundField and rename the `CategoryName` and `BrochurePath` BoundFields' `HeaderText` properties to "Category" and "Brochure", respectively. After making these changes, your GridView and ObjectDataSource's declarative markup should look like the following:

```
<asp:GridView ID="Categories" runat="server"
    AutoGenerateColumns="False" DataKeyNames="CategoryID"
    DataSourceID="CategoriesDataSource" EnableViewState="False">
    <Columns>
        <asp:BoundField DataField="CategoryName" HeaderText="Category"
            SortExpression="CategoryName" />
        <asp:BoundField DataField="Description" HeaderText="Description"
            SortExpression="Description" />
        <asp:BoundField DataField="BrochurePath" HeaderText="Brochure"
            SortExpression="BrochurePath" />
    </Columns>
</asp:GridView>

<asp:ObjectDataSource ID="CategoriesDataSource" runat="server"
    OldValuesParameterFormatString="original_{0}"
    SelectMethod="GetCategories" TypeName="CategoriesBLL">
</asp:ObjectDataSource>
```

View this page through a browser (see Figure 5). Each of the eight categories is listed. The seven categories with `BrochurePath` values have the `BrochurePath` value displayed in the respective BoundField. Seafood, which has a `NULL` value for its `BrochurePath`, displays an empty cell.

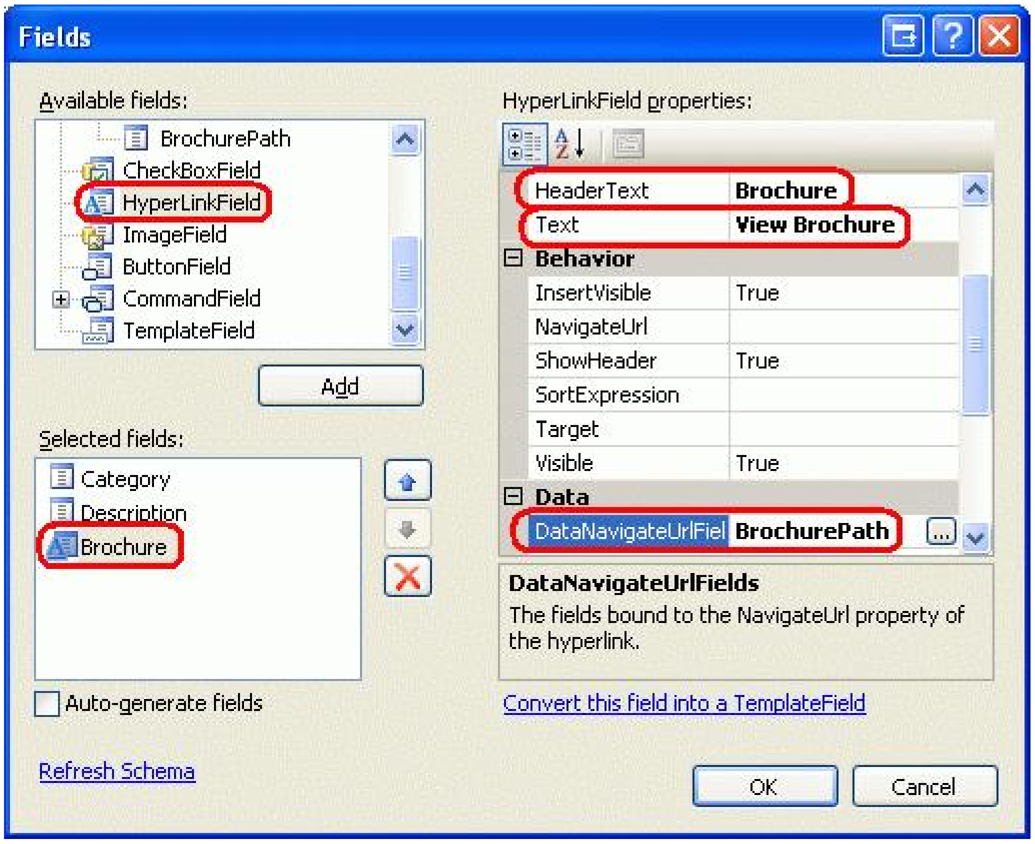

Untitled Page - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost:2296/ASPNET_Data_Tutorial_55_CS/BinaryData/DisplayOrDownloadData.aspx
Go
Working with Data Tutorials
Home > Working with Binary Data > Display or Download Binary Data
Home
Basic Reporting
Simple Display
Declarative Parameters
Setting Parameter Values
Filtering Reports
Filter by Drop-Down List
Master-Details-Details
Done
Local intranet

Display / Download Binary Data

Category	Description	Brochure
Beverages	Soft drinks, coffees, teas, beers, and ales	~/Brochures/Beverages.pdf
Condiments	Sweet and savory sauces, relishes, spreads, and seasonings	~/Brochures/Condiments.pdf
Confections	Desserts, candies, and sweet breads	~/Brochures/Confections.pdf
Dairy Products	Cheeses	~/Brochures/Dairy.pdf
Grains/Cereals	Breads, crackers, pasta, and cereal	~/Brochures/Grains.pdf
Meat/Poultry	Prepared meats	~/Brochures/Meat.pdf
Produce	Dried fruit and bean curd	~/Brochures/Produce.pdf
Seafood	Seaweed and fish	

Figure 5: Each Category's Name, Description, and `BrochurePath` Value is Listed

Rather than displaying the text of the `BrochurePath` column, we want to create a link to the brochure. To accomplish this, remove the `BrochurePath` BoundField and replace it with a HyperLinkField. Set the new HyperLinkField's `HeaderText` property to "Brochure", its `Text` property to "View Brochure", and its `DataNavigateUrlFields` property to `BrochurePath`.


Fields

Available fields:

Selected fields:

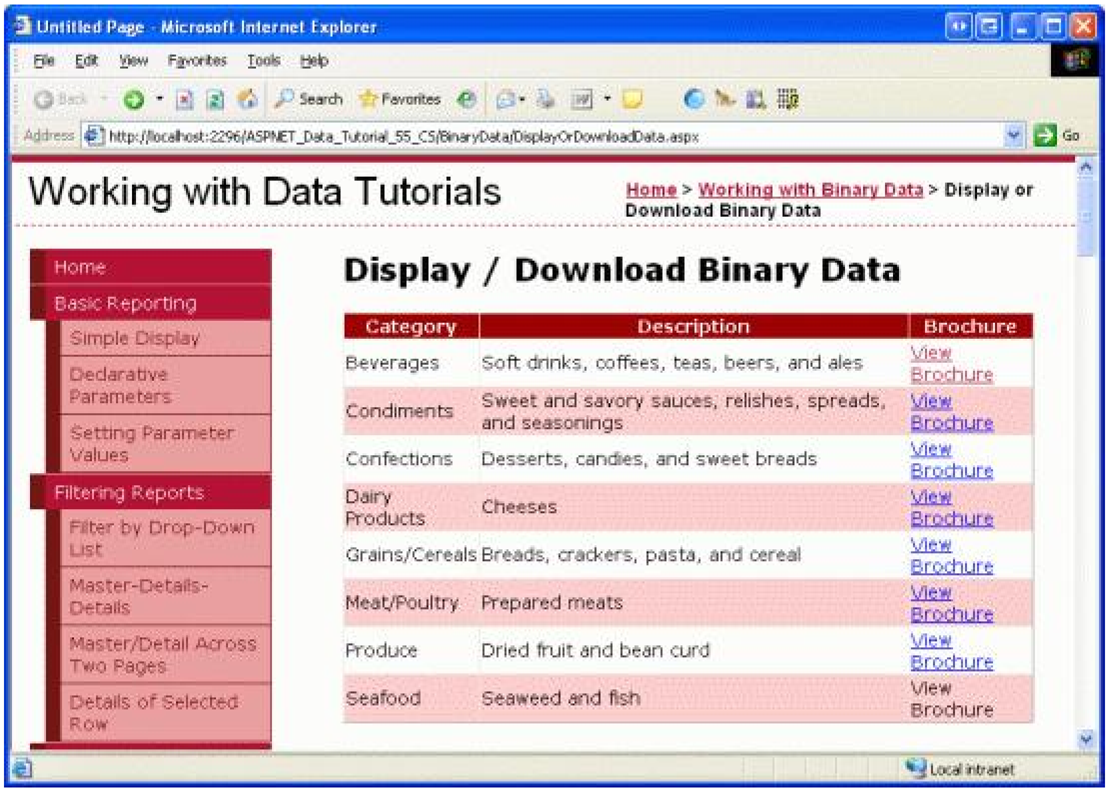
HyperLinkField properties:

HeaderText	Brochure
Text	View Brochure
Behavior	
InsertVisible	True
NavigateUrl	
ShowHeader	True
SortExpression	
Target	
Visible	True
Data	
DataNavigateUrlFiel	BrochurePath

DataNavigateUrlFields
The fields bound to the NavigateUrl property of the hyperlink.

Figure 6: Add a HyperLinkField for `BrochurePath`

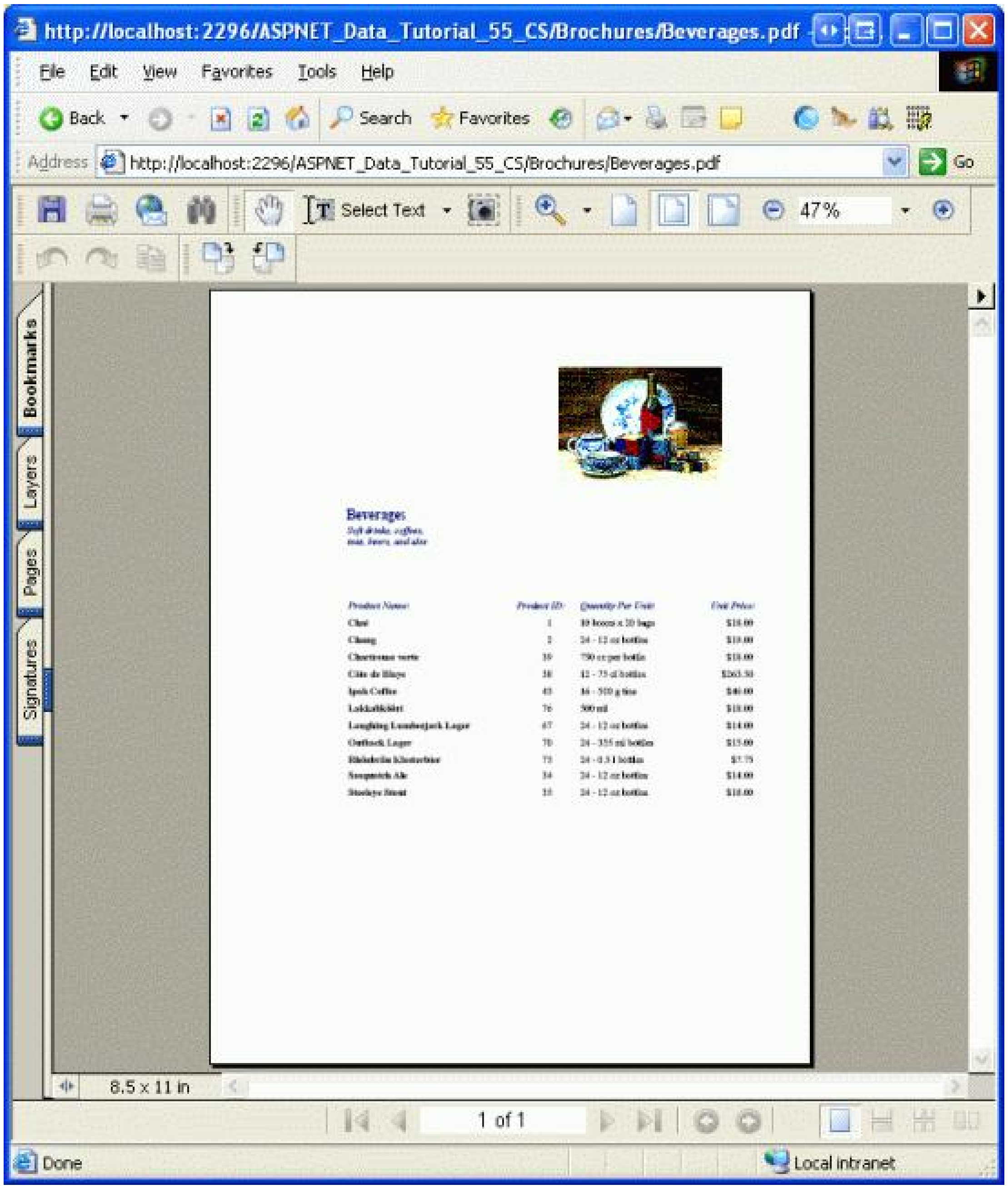
This will add a column of links to the GridView, as Figure 7 shows. Clicking a “View Brochure” link will either display the PDF directly in the browser or prompt the user to download the file, depending on whether a PDF reader is installed and the browser’s settings.


Untitled Page - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://localhost:2296/ASPNET_Data_Tutorial_55_CS/BinaryData/DisplayOrDownloadData.aspx
Working with Data Tutorials
Home > Working with Binary Data > Display or Download Binary Data
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
Local intranet

Display / Download Binary Data

Category	Description	Brochure
Beverages	Soft drinks, coffees, teas, beers, and ales	View Brochure
Condiments	Sweet and savory sauces, relishes, spreads, and seasonings	View Brochure
Confections	Desserts, candies, and sweet breads	View Brochure
Dairy Products	Cheeses	View Brochure
Grains/Cereals	Breads, crackers, pasta, and cereal	View Brochure
Meat/Poultry	Prepared meats	View Brochure
Produce	Dried fruit and bean curd	View Brochure
Seafood	Seaweed and fish	View Brochure

Figure 7: A Category's Brochure Can Be Viewed by Clicking the "View Brochure" Link



Beverages
Soft drinks, coffees, teas, beers, and ales

Product Name:	*Product ID:*	*Quantity Per Unit:*	*Unit Price:*
Chai	1	10 boxes x 20 bags	$18.00
Chang	2	24 - 12 oz bottles	$19.00
Chartreuse verte	39	750 cc per bottle	$18.00
Côte de Blaye	38	12 - 75 cl bottles	$263.50
Ipoh Coffee	43	16 - 500 g tins	$46.00
Lakkalikööri	76	500 ml	$18.00
Laughing Lumberjack Lager	67	24 - 12 oz bottles	$14.00
Outback Lager	70	24 - 355 ml bottles	$15.00
Rhönbräu Klosterbier	75	24 - 0.5 l bottles	$7.75
Sasquatch Ale	34	24 - 12 oz bottles	$14.00
Steeleye Stout	35	24 - 12 oz bottles	$18.00

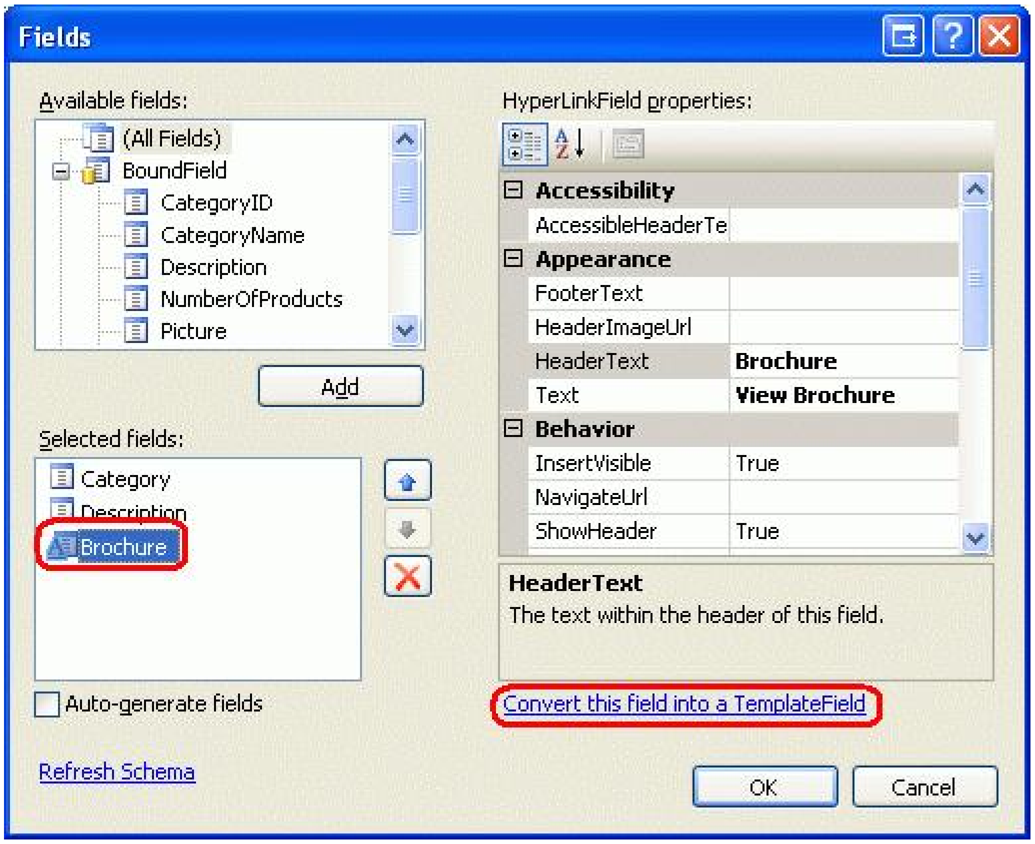
Figure 8: The Category's Brochure PDF is Displayed

Hiding the "View Brochure" Text for Categories Without a Brochure

As Figure 7 shows, the `BrochurePath` HyperLinkField displays its `Text` property value ("View Brochure") for all records, regardless of whether there's a non-`NULL` value for `BrochurePath`. Of course, if `BrochurePath` is `NULL`, then the link is displayed as text only, as is the case with the Seafood category (refer back to Figure 7). Rather than displaying the text "View Brochure", it might be nice to have those categories without a `BrochurePath` value display some alternate text, like "No Brochure Available."

In order to provide this behavior, we need to use a TemplateField whose content is generated via a call to a page method that emits the appropriate output based on the `BrochurePath` value. We first explored this formatting technique back in the Using TemplateFields in the GridView Control tutorial.

Turn the HyperLinkField into a TemplateField by selecting the `BrochurePath` HyperLinkField and then clicking on the “Convert this field into a TemplateField” link in the Edit Columns dialog box.



Accessibility	
AccessibleHeaderTe	
Appearance	
FooterText	
HeaderImageUrl	
HeaderText	**Brochure**
Text	**View Brochure**
Behavior	
InsertVisible	True
NavigateUrl	
ShowHeader	True

HeaderText
The text within the header of this field.

Figure 9: Convert the HyperLinkField into a TemplateField

This will create a TemplateField with an `ItemTemplate` that contains a HyperLink Web control whose `NavigateUrl` property is bound to the `BrochurePath` value. Replace this markup with a call to the method `GenerateBrochureLink`, passing in the value of `BrochurePath`:

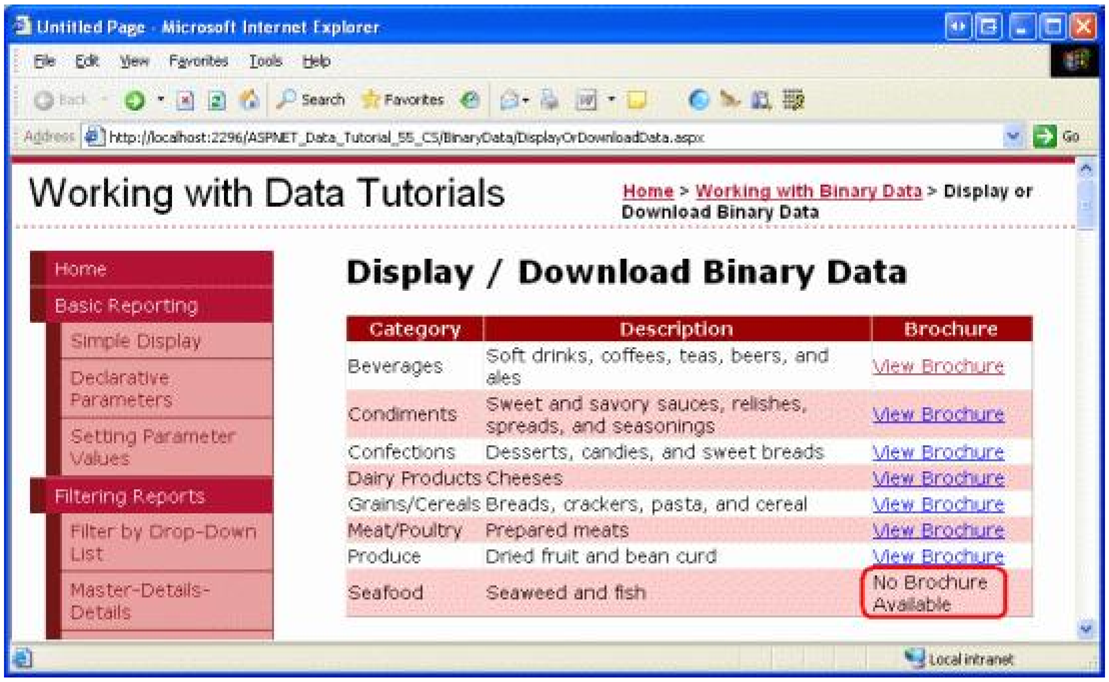
```
<asp:TemplateField HeaderText="Brochure">
    <ItemTemplate>
        <%# GenerateBrochureLink(Eval("BrochurePath")) %>
    </ItemTemplate>
</asp:TemplateField>
```

Next, create a `protected` method in the ASP.NET page’s code-behind class named `GenerateBrochureLink` that returns a `string` and accepts an `object` as an input parameter.

```
protected string GenerateBrochureLink(object BrochurePath)
{
    if (Convert.IsDBNull(BrochurePath))
        return "No Brochure Available";
    else
        return string.Format(@"<a href=""{0}"">View Brochure</a>",
            ResolveUrl(BrochurePath.ToString()));
}
```

This method determines if the passed-in `object` value is a database `NULL` and, if so, returns a message indicating that the category lacks a brochure. Otherwise, if there is a `BrochurePath` value, it's displayed in a hyperlink. Note that if the `BrochurePath` value is present it's passed into the `ResolveUrl(`*`url`*`)` method. This method resolves the passed-in *url*, replacing the ~ character with the appropriate virtual path. For example, if the application is rooted at `/Tutorial55`, `ResolveUrl("~/Brochures/Meats.pdf")` will return `/Tutorial55/Brochures/Meat.pdf`.

Figure 10 shows the page after these changes have been applied. Note that the Seafood category's `BrochurePath` field now displays the text "No Brochure Available".



Untitled Page - Microsoft Internet Explorer

Address: http://localhost:2296/ASPNET_Data_Tutorial_55_CS/BinaryData/DisplayOrDownloadData.aspx

Working with Data Tutorials

Home > Working with Binary Data > Display or Download Binary Data

- Home
- Basic Reporting
  - Simple Display
  - Declarative Parameters
  - Setting Parameter Values
- Filtering Reports
  - Filter by Drop-Down List
  - Master-Details-Details

Display / Download Binary Data

Category	Description	Brochure
Beverages	Soft drinks, coffees, teas, beers, and ales	View Brochure
Condiments	Sweet and savory sauces, relishes, spreads, and seasonings	View Brochure
Confections	Desserts, candies, and sweet breads	View Brochure
Dairy Products	Cheeses	View Brochure
Grains/Cereals	Breads, crackers, pasta, and cereal	View Brochure
Meat/Poultry	Prepared meats	View Brochure
Produce	Dried fruit and bean curd	View Brochure
Seafood	Seaweed and fish	No Brochure Available

Figure 10: The Text "No Brochure Available" is Displayed for Those Categories Without a Brochure

Step 3: Adding a Web Page to Display a Category's Picture

When a user visits an ASP.NET page, they receive the ASP.NET page's HTML. The received HTML is just text and does not contain any binary data. Any additional binary data, such as images, sound files, Macromedia Flash applications, embedded Windows Media Player videos, and so forth, exist as separate resources on the web server. The HTML contains references to these files, but does not include the actual contents of the files.

For example, in HTML the `<img>` element is used to reference a picture, with the `src` attribute pointing to the image file like so:

```
<img src="MyPicture.jpg" ... />
```

When a browser receives this HTML, it makes another request to the web server to retrieve the binary contents of the image file, which it then displays in the browser. The same concept applies to any binary data. In Step 2, the brochure was not sent down to the browser as part of the page's HTML markup. Rather, the rendered HTML provided hyperlinks that, when clicked, caused the browser to request the PDF document directly.

To display or allow users to download binary data that resides within the database, we need to create a separate web page that returns the data. For our application, there's only one binary data field stored directly in the database

– the category's picture. Therefore, we need a page that, when called, returns the image data for a particular category.

Add a new ASP.NET page to the `BinaryData` folder named `DisplayCategoryPicture.aspx`. When doing so, leave the "Select master page" checkbox unchecked. This page expects a `CategoryID` value in the querystring and returns the binary data of that category's `Picture` column. Since this page returns binary data and nothing else, it does not need any markup in the HTML section. Therefore, click on the Source tab in the lower left corner and remove all of the page's markup except for the `<%@ Page %>` directive. That is, `DisplayCategoryPicture.aspx`'s declarative markup should consist of a single line:

```
<%@ Page Language="C#" AutoEventWireup="true"
    CodeFile="DisplayCategoryPicture.aspx.cs"
    Inherits="BinaryData_DisplayCategoryPicture" %>
```

If you see the `MasterPageFile` attribute in the `<%@ Page %>` directive, remove it.

In the page's code-behind class, add the following code to the `Page_Load` event handler:

```
protected void Page_Load(object sender, EventArgs e)
{
    int categoryID = Convert.ToInt32(Request.QueryString["CategoryID"]);

    // Get information about the specified category
    CategoriesBLL categoryAPI = new CategoriesBLL();
    Northwind.CategoriesDataTable categories =
        categoryAPI.GetCategoryWithBinaryDataByCategoryID(categoryID);
    Northwind.CategoriesRow category = categories[0];

    // Output HTTP headers providing information about the binary data
    Response.ContentType = "image/bmp";

    // Output the binary data
    // But first we need to strip out the OLE header
    const int OleHeaderLength = 78;
    int strippedImageLength = category.Picture.Length - OleHeaderLength;
    byte[] strippedImageData = new byte[strippedImageLength];
    Array.Copy(category.Picture, OleHeaderLength,
        strippedImageData, 0, strippedImageLength);

    Response.BinaryWrite(strippedImageData);
}
```

This code starts by reading in the `CategoryID` querystring value into a variable named `categoryID`. Next, the picture data is retrieved via a call to the `CategoriesBLL` class's `GetCategoryWithBinaryDataByCategoryID(`*`categoryID`*`)` method. This data is returned to the client by using the `Response.BinaryWrite(`*`data`*`)` method, but before this is called, the `Picture` column value's OLE header must be removed. This is accomplished by creating a `byte` array named `strippedImageData` that will hold precisely 78 characters less than what is in the `Picture` column. The `Array.Copy` method is used to copy the data from `category.Picture` starting at position 78 over to `strippedImageData`.

The `Response.ContentType` property specifies the MIME type of the content being returned so that the browser knows how to render it. Since the `Categories` table's `Picture` column is a bitmap image, the bitmap MIME type is used here (image/bmp). If you omit the MIME type, most browsers will still display the image correctly because they can infer the type based on the contents of the image file's binary data. However, it's prudent to include the

MIME type when possible. See the Internet Assigned Numbers Authority's website for a complete listing of MIME media types.

With this page created, a particular category's picture can be viewed by visiting `DisplayCategoryPicture.aspx?CategoryID=categoryID`. Figure 11 shows the Beverages category's picture, which can be viewed from `DisplayCategoryPicture.aspx?CategoryID=1`.

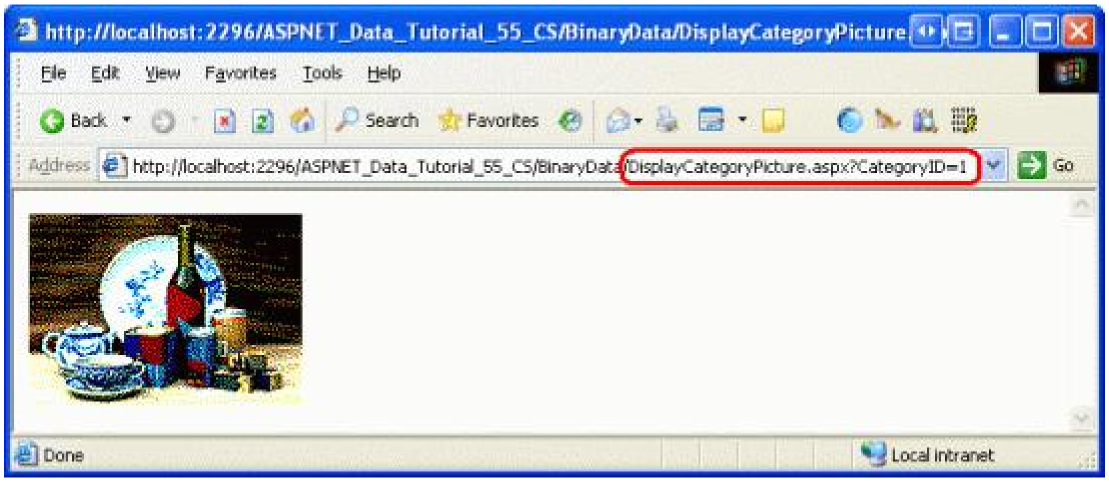

http://localhost:2296/ASPNET_Data_Tutorial_55_CS/BinaryData/DisplayCategoryPicture
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost:2296/ASPNET_Data_Tutorial_55_CS/BinaryData/DisplayCategoryPicture.aspx?CategoryID=1
Go
Done
Local intranet

Figure 11: The Beverages Category's Picture is Displayed

If, when visiting `DisplayCategoryPicture.aspx?CategoryID=categoryID`, you get an exception that reads "Unable to cast object of type 'System.DBNull' to type 'System.Byte[]'", there are two things that may be causing this. First, the `Categories` table's `Picture` column does allow `NULL` values. The `DisplayCategoryPicture.aspx` page, however, assumes there is a non-`NULL` value present. The `Picture` property of the `CategoriesDataTable` cannot be directly accessed if it has a `NULL` value. If you do want to allow `NULL` values for the `Picture` column, you'd want to include the following condition:

```
if (category.IsPictureNull())
{
    // Display some "No Image Available" picture
    Response.Redirect("~/Images/NoPictureAvailable.gif");
}
else
{
    // Send back the binary contents of the Picture column
    // ... Set ContentType property and write out ...
    // ... data via Response.BinaryWrite ...
}
```

The above code assumes that there's some image file named `NoPictureAvailable.gif` in the `Images` folder that you want to display for those categories without a picture.

This exception could also be caused if the `CategoriesTableAdapter`'s `GetCategoryWithBinaryDataByCategoryID` method's `SELECT` statement has reverted back to the main query's column list, which can happen if you are using ad-hoc SQL statements and you've re-run the wizard for the TableAdapter's main query. Check to ensure that `GetCategoryWithBinaryDataByCategoryID` method's `SELECT` statement still includes the `Picture` column.

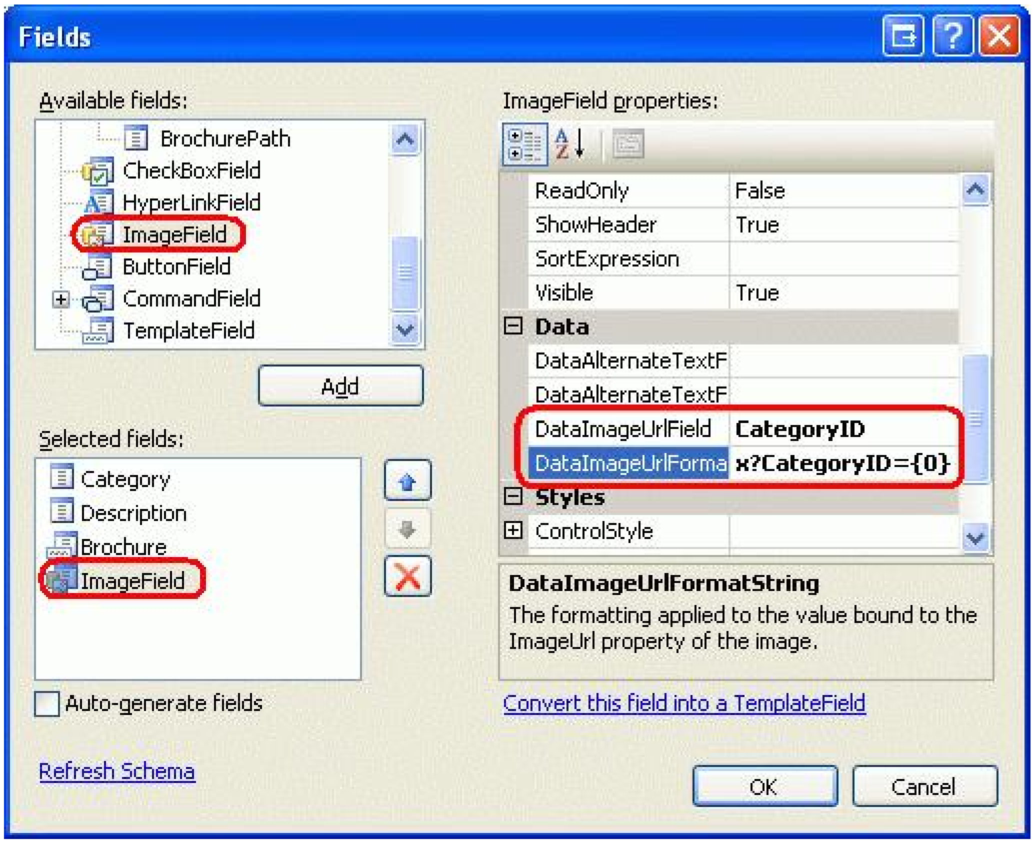
Note: Every time the `DisplayCategoryPicture.aspx` is visited, the database is accessed and the specified category's picture data is returned. If the category's picture hasn't changed since the user has last viewed it, though, this is wasted effort. Fortunately, HTTP allows for *conditional GETs*. With a conditional GET, the client making the HTTP request sends along an `If-Modified-Since` HTTP header that provides the date and time the client last retrieved this resource from the web server. If the content has not changed since this specified date, the web server may respond with a Not Modified status code (304) and forgo sending back the requested resource's content. In short, this technique relieves the web server from having to send back content for a resource if it has not been modified since the client last accessed it.

To implement this behavior, however, requires that you add a `PictureLastModified` column to the `Categories` table to capture when the `Picture` column was last updated as well as code to check for the `If-Modified-Since` header. For more information on the `If-Modified-Since` header and the conditional GET workflow, see HTTP Conditional GET for RSS Hackers and A Deeper Look at Performing HTTP Requests in an ASP.NET Page.

Step 4: Displaying the Category Pictures in a GridView

Now that we have a web page to display a particular category's picture, we can display it using the Image Web control or an HTML `<img>` element pointing to `DisplayCategoryPicture.aspx?CategoryID=`*`categoryID`*. Images whose URL is determined by database data can be displayed in the GridView or DetailsView using the ImageField. The ImageField contains `DataImageUrlField` and `DataImageUrlFormatString` properties that work like the HyperLinkField's `DataNavigateUrlFields` and `DataNavigateUrlFormatString` properties.

Let's augment the `Categories` GridView in `DisplayOrDownloadData.aspx` by adding an ImageField to show each category's picture. Simply add the ImageField and set its `DataImageUrlField` and `DataImageUrlFormatString` properties to `CategoryID` and `DisplayCategoryPicture.aspx?CategoryID={0}`, respectively. This will create a GridView column that renders an `<img>` element whose `src` attribute references `DisplayCategoryPicture.aspx?CategoryID={0}`, where {0} is replaced with the GridView row's `CategoryID` value.



ReadOnly	False
ShowHeader	True
SortExpression	
Visible	True
DataAlternateTextF	
DataAlternateTextF	
DataImageUrlField	CategoryID
DataImageUrlForma	x?CategoryID={0}

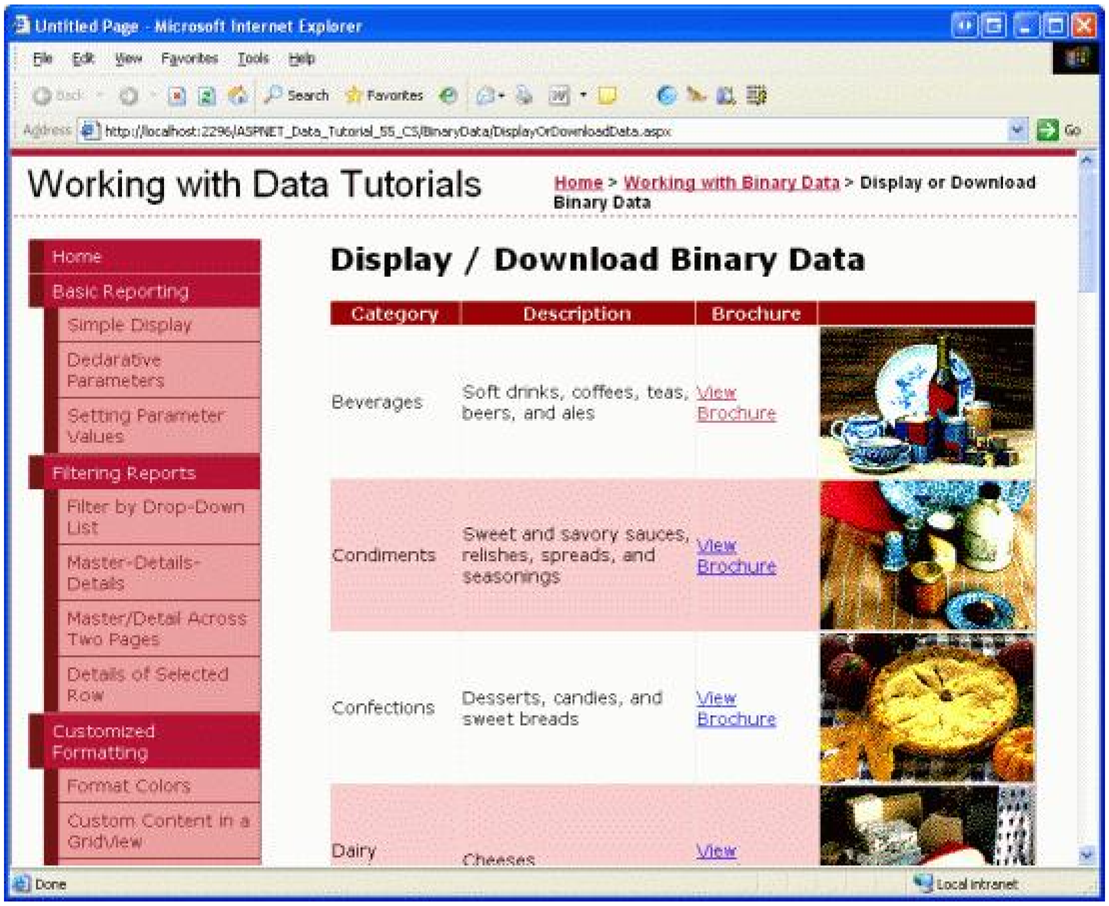
DataImageUrlFormatString
The formatting applied to the value bound to the ImageUrl property of the image.

Figure 12: Add an ImageField to the GridView

After adding the ImageField, your GridView's declarative syntax should look like soothe the following:

```
<asp:GridView ID="Categories" runat="server" AutoGenerateColumns="False"
    DataKeyNames="CategoryID" DataSourceID="CategoriesDataSource"
    EnableViewState="False">
    <Columns>
        <asp:BoundField DataField="CategoryName" HeaderText="Category"
            SortExpression="CategoryName" />
        <asp:BoundField DataField="Description" HeaderText="Description"
            SortExpression="Description" />
        <asp:TemplateField HeaderText="Brochure">
            <ItemTemplate>
                <%# GenerateBrochureLink(Eval("BrochurePath")) %>
            </ItemTemplate>
        </asp:TemplateField>
        <asp:ImageField DataImageUrlField="CategoryID"
            DataImageUrlFormatString="DisplayCategoryPicture.aspx?CategoryID={0}">
        </asp:ImageField>
    </Columns>
</asp:GridView>
```

Take a moment to view this page through a browser. Note how each record now includes a picture for the category.


Untitled Page - Microsoft Internet Explorer
File Edit View Favorites Tools Help
http://localhost:2296/ASPNET_Data_Tutorial_55_CS/BinaryData/DisplayOrDownloadData.aspx
Working with Data Tutorials
Home > Working with Binary Data > Display or Download Binary Data
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
Done
Local intranet

Display / Download Binary Data

Category	Description	Brochure	
Beverages	Soft drinks, coffees, teas, beers, and ales	View Brochure	
Condiments	Sweet and savory sauces, relishes, spreads, and seasonings	View Brochure	
Confections	Desserts, candies, and sweet breads	View Brochure	
Dairy	Cheeses	View	

Figure 13: The Category's Picture is Displayed for Each Row

Summary

In this tutorial we examined how to present binary data. How the data is presented depends on the type of data. For the PDF brochure files, we offered the user a "View Brochure" link that, when clicked, took the user directly to the PDF file. For the category's picture, we first created a page to retrieve and return the binary data from the database and then used that page to display each category's picture in a GridView.

Now that we've looked at how to display binary data, we're ready to examine how to perform insert, updates, and deletes against the database with the binary data. In the next tutorial we'll look at how to associate an uploaded file with its corresponding database record. In the tutorial after that, we'll see how to update existing binary data as well as how to delete the binary data when its associated record is removed.

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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