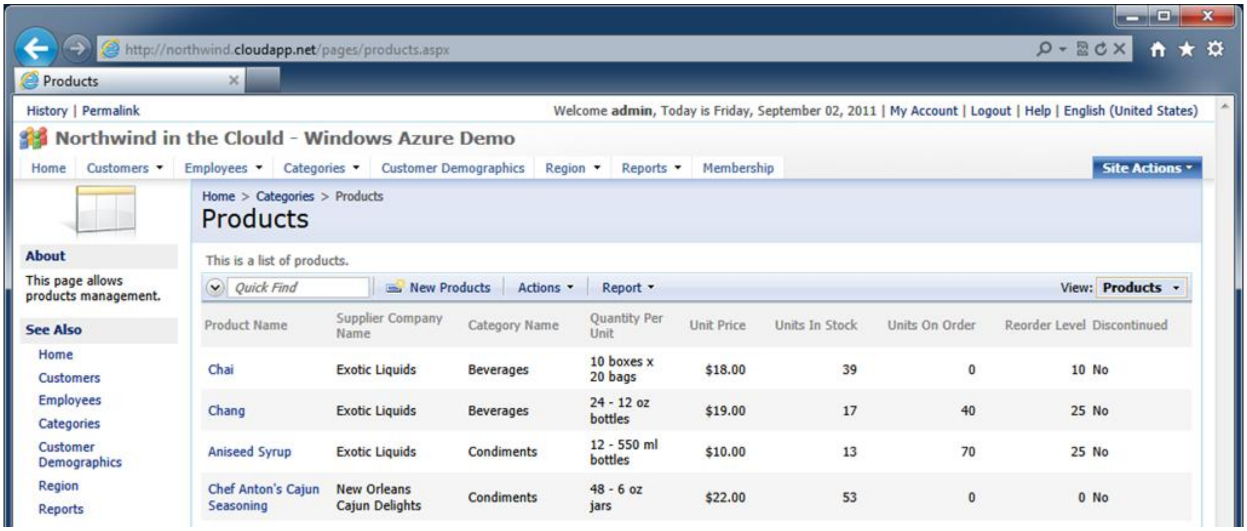
2011

USER GUIDE

URL Hashing

URL Hashing

A powerful and simple mechanism of data controller URL parameters allows easy manipulation of the page behavior in Code On Time web applications. For example, consider the *Products* page at http://northwind.cloudapp.net/pages/products.aspx. If you navigate to the page and login as admin/admin123% then you will see the following screen with a list of products.



Products

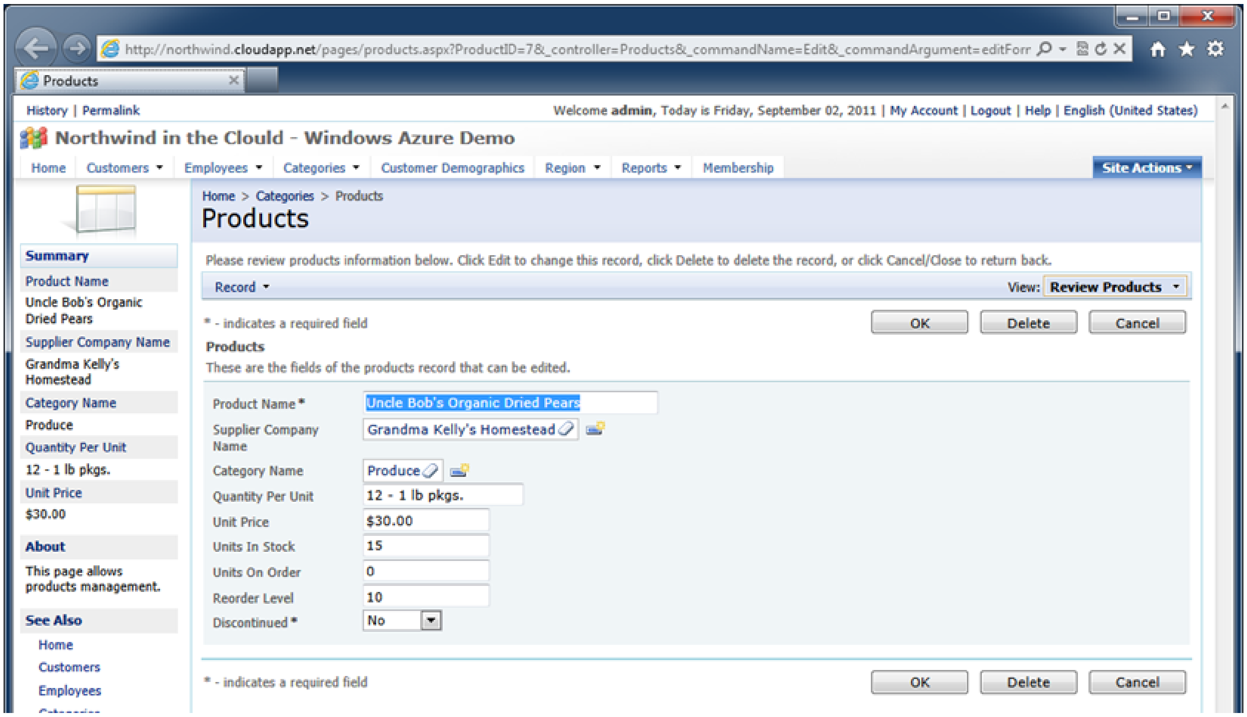
This page allows products management.

This is a list of products.

Product Name	Supplier Company Name	Category Name	Quantity Per Unit	Unit Price	Units In Stock	Units On Order	Reorder Level	Discontinued
Chai	Exotic Liquids	Beverages	10 boxes x 20 bags	$18.00	39	0	10	No
Chang	Exotic Liquids	Beverages	24 - 12 oz bottles	$19.00	17	40	25	No
Aniseed Syrup	Exotic Liquids	Condiments	12 - 550 ml bottles	$10.00	13	70	25	No
Chef Anton's Cajun Seasoning	New Orleans Cajun Delights	Condiments	48 - 6 oz jars	$22.00	53	0	0	No

If you want to navigate to a specific product then try the following link. The same page will open in edit mode on the product with the primary key equal to 7.

http://northwind.cloudapp.net/pages/products.aspx?ProductID=7&_controller=Products&_commandName=Edit&_commandArgument=editForm1



http://northwind.cloudapp.net/pages/products.aspx?ProductID=7&_controller=Products&_commandName=Edit&_commandArgument=editForm
Products
History | Permalink
Welcome admin, Today is Friday, September 02, 2011 | My Account | Logout | Help | English (United States)
Northwind in the Clould - Windows Azure Demo
Home
Customers
Employees
Categories
Customer Demographics
Region
Reports
Membership
Site Actions
Home > Categories > Products
Summary
About
See Also
Home
Customers
Employees
Record
View: Review Products
OK
Delete
Cancel

Products

Product Name	Uncle Bob's Organic Dried Pears
Supplier Company Name	Grandma Kelly's Homestead
Category Name	Produce
Quantity Per Unit	12 - 1 lb pkgs.
Unit Price	$30.00

This page allows products management.

Please review products information below. Click Edit to change this record, click Delete to delete the record, or click Cancel/Close to return back.

* - indicates a required field

Products

These are the fields of the products record that can be edited.

Product Name *	Uncle Bob's Organic Dried Pears
Supplier Company Name	Grandma Kelly's Homestead
Category Name	Produce
Quantity Per Unit	12 - 1 lb pkgs.
Unit Price	$30.00
Units In Stock	15
Units On Order	0
Reorder Level	10
Discontinued *	No

* - indicates a required field

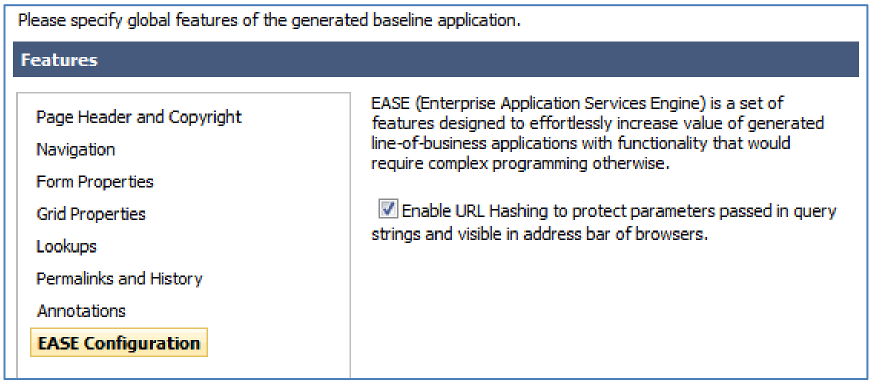
Data controller parameters offer a simple and powerful method of affecting user interface presentation. Couple that with robust *Access Control Rules,* and your web app will provide an excellent and secure mechanism of navigation to specific records.

Sometimes you may want to prevent any possibility of external commands sent to your application via URL parameters unless the commands were initiated by the web application itself or an external "friendly" source.

Enabling URL Hashing

The *Unlimited* edition of *Code On Time* offers a new feature called *URL Hashing*, which is available as a component of EASE (Enterprise Application Services Engine). The purpose of *URL Hashing* is to ensure that only encrypted commands can be passed in the URL of your web application.

Start the web application generator, select your project and click *Next* button a few times until your reach the Features page. Enable *URL Hashing* under *EASE Configuration*.



Please specify global features of the generated baseline application.

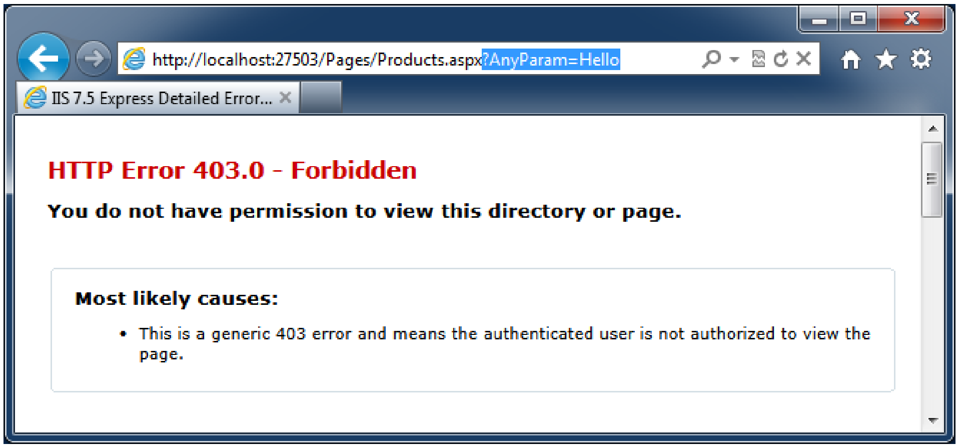
Features

- Page Header and Copyright
- Navigation
- Form Properties
- Grid Properties
- Lookups
- Permalinks and History
- Annotations
- **EASE Configuration**

EASE (Enterprise Application Services Engine) is a set of features designed to effortlessly increase value of generated line-of-business applications with functionality that would require complex programming otherwise.

☑ Enable URL Hashing to protect parameters passed in query strings and visible in address bar of browsers.

Proceed to generate the project. Navigate to any page of your web application displaying data and try passing any parameter in the URL. For example, if you are looking at *Products.aspx* page then change the URL in the address bar of the browser to *Products.aspx?AnyParam=Hello* and hit enter key to navigate to the page. You will see the following response.



http://localhost:27503/Pages/Products.aspx?AnyParam=Hello

HTTP Error 403.0 - Forbidden

You do not have permission to view this directory or page.

Most likely causes:

- This is a generic 403 error and means the authenticated user is not authorized to view the page.

All application pages are now protected and will not allow inclusion of any URL parameters.

Internal URL Parameters

Your web application may be using URL parameters for navigation. For example, let's configure a *Navigate* action in the Northwind sample:

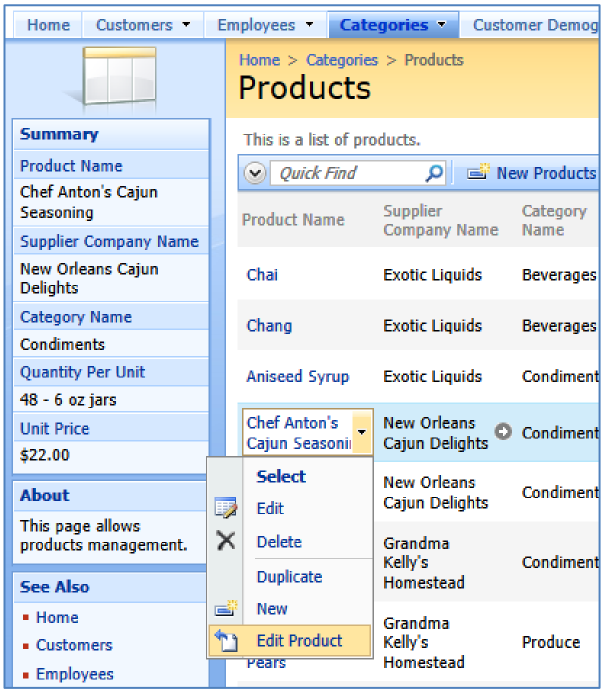
Select your project on the start page of the web app generator and click *Design*. Select *Products* data controller on *All Controllers* tab and activate *Action Groups* page.

Select action group "ag1" with the scope of *Grid* and switch to *Actions* tab. Add a new action with the following properties. Note that *Command Argument* must be entered without line breaks.

Property	**Value**
Command Name	Navigate
Command Argument	?ProductID={ProductID}&_controller=Products&_commandName=Edit&_commandArgument=editForm1
Header Text	Edit Product

The value of command argument instructs the application to navigate to the current page that hosts the data controller view and pass the *ProductID* of selected row in the URL. The other URL parameters will force the data controller to open the specified product in *editForm1* in *Edit* mode.

Save the new action, exit the *Designer* and generate your project. Navigate to *Products* page and select the context menu of a product row.



Products

This is a list of products.

Summary

Product Name: Chef Anton's Cajun Seasoning

Supplier Company Name: New Orleans Cajun Delights

Category Name: Condiments

Quantity Per Unit: 48 - 6 oz jars

Unit Price: $22.00

About

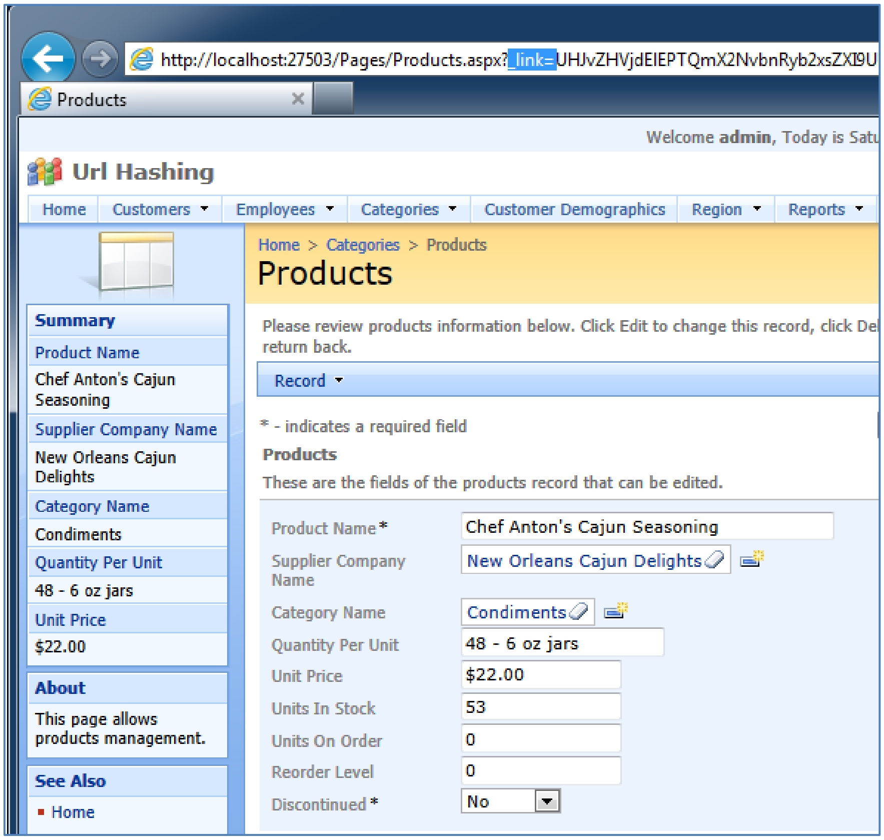
This page allows products management.

See Also

- Home
- Customers
- Employees

Product Name	Supplier Company Name	Category Name
Chai	Exotic Liquids	Beverages
Chang	Exotic Liquids	Beverages
Aniseed Syrup	Exotic Liquids	Condiment
Chef Anton's Cajun Seasoni	New Orleans Cajun Delights	Condiment
	New Orleans Cajun Delights	Condiment
	Grandma Kelly's Homestead	Condiment
Pears	Grandma Kelly's Homestead	Produce

Your browser will navigate to the currently active page with the URL that looks as follows. Notice that there is a parameter "_link" with the cryptic looking value in the address bar of the browser.



http://localhost:27503/Pages/Products.aspx?_link=UHJvZHVjdElEPTQmX2NvbnRyb2xsZXI9U

Welcome **admin**, Today is Satu

Home > Categories > Products

Products

Please review products information below. Click Edit to change this record, click De
return back.

* - indicates a required field

Products

These are the fields of the products record that can be edited.

Product Name*	Chef Anton's Cajun Seasoning
Supplier Company Name	New Orleans Cajun Delights
Category Name	Condiments
Quantity Per Unit	48 - 6 oz jars
Unit Price	$22.00
Units In Stock	53
Units On Order	0
Reorder Level	0
Discontinued*	No

Summary

Product Name	Chef Anton's Cajun Seasoning
Supplier Company Name	New Orleans Cajun Delights
Category Name	Condiments
Quantity Per Unit	48 - 6 oz jars
Unit Price	$22.00

About

This page allows products management.

See Also

- Home

The *URL Hashing* mechanism embedded in your application only allows this particular parameter and demands that the value of " _link" parameter is encrypted.

Alter any portion of the parameter or add any additional URL parameters and the request will fail to display the page with the same HTTP error code 403 displayed earlier.

External URL Parameters

Sometimes you may need to pass URL parameters from an external web application. If *URL Hashing* feature is enabled then this task becomes impossible unless you encrypt the URLs passed by external web application.

The implementation of encryption can be found in the *StringEncryptorBase* class of your application source code. The partial code below shows encryption key (Key) and initialization vector (IV). Both properties are passed by methods *Encrypt* and *Decrypt* as arguments to the default implementation of *Advanced Encryption Standard* (AES) available in Microsoft.NET Framework.

C#:

```
public class StringEncryptorBase
{

    public virtual byte[] Key
    {
        get
    {
        return new byte[] {
                253,
                124,
                8,
                201,
                31,
                27,
                89,
                . . . .
                153};
    }
    }

    public virtual byte[] IV
    {
        get
    {
        return new byte[] {
                87,
                84,
                163,
                98,
                205,
                . . . .
                112};
    }
    }

    public virtual string Encrypt(string s)
{
    . . . . . .
}

    public virtual string Decrypt(string s)
{
    . . . . . .
}
}
```

VB:

```
Public Class StringEncryptorBase

    Public Overridable ReadOnly Property Key() As Byte()
        Get
            Return New Byte() {253, 124, . . . ., 153}
        End Get
    End Property

    Public Overridable ReadOnly Property IV() As Byte()
        Get
            Return New Byte() {87, 84, 163, 98, . . . ., 112}
        End Get
    End Property

    Public Overridable Function Encrypt(ByVal s As String) As String
        . . . . .
    End Function

    Public Overridable Function Decrypt(ByVal s As String) As String
        . . . . .
    End Function
End Class
```

Copy this class to the external application and make sure to encrypt the URLs that are passed to a *Code On Time* web application with URL Hashing enabled.

You may also want to change the key and initialization vector. The default values are hard-coded and shared by all applications generated with *Unlimited* edition of *Code On Time*.

Conclusion

URL Hashing is always performed for *History* and *permalinks*. If the application is generated without *URL Hashing* enabled then the permalinks are simply encoded with base-64 encoding to mask the nature of URL parameters.

Advanced encryption with hash code validation will be performed on links create with *View Details* command and on results of any actions with *Command Name* set to *Navigate*.