CarrotCakeCMS: Developer's Guide

Sunday, January 10, 2016

CarrotCakeCMS Overview/Installation

Initial Configuration

Either build the solution from source or decompress a binary distribution. These instructions will assume use of the binary distribution. Extract the ZIP archive and place the contents in the location where your website files will live.

Update the web.config section for `<mailSettings>` to reflect the network delivery settings appropriate for your ISP. You can leave the password field blank if you are not required to provide one or if your mail server has whitelisted your web server. This is important for password retrieval purposes. If this is not configured and you forget your password, you will have no way to get a new password sent to you.

Locate the `<CarrotCakeCMS.Web />` section in the root web.config of the provided files (found in the admin project if you are using the source files). Create the ID to identify your site. Run the SQL statement `select NEWID() as id` or you can use the Visual Studio "Create GUID" functionality, either is fine, it is just a matter of what is more convenient. A GUID is just a long hexadecimal string, so you can even edit the string and change some of the values around, just stay with the values A-F and 0-9. If you are coming from an earlier version (such as 4.2) you will need to migrate your web.config entries. Note the new custom config section defined with `<sectionGroup name="CarrotCakeCMS.Web" />`

Paste the GUID into the web.config to replace the GUID entry for `SiteID` in `<Config SiteID="" />` (this was formerly an `<appSettings />` key `CarrotSiteID`). If you are coming from an earlier version, you can comment out the old entry and copy the value into this property.

```
<CarrotCakeCMS.Web>
        <Settings>
                <Config SiteID="3BD253EA-0000-3333-BBBB-BB097C2255AA" />
        </Settings>
</CarrotCakeCMS.Web>
```

Alternately, remove the entry for `SiteID`, and open the file SiteMapping.config and add entries to map a set of domain names to different GUIDs. This will allow a single webroot to provide different content based on different domain names. This is similar to using different host headers or bindings in IIS for a single webroot has multiple domain names pointed at it.

Note: if *www.example.com* and *example.com* need to provide the same site, you will have to add entries for both in SiteMapping.config, but they can point at the same GUID entry.

Configure the database

Go to your database server and create a new database, visit your hosting provider's database control panel, or ask your hosting provider to create a database. This should be SQL 2008 or later. This can be Express, Standard, or any higher tier version.

Update the entry for the database connection in the web.config for `CarrotwareCMSConnectionString` to match your database credentials. See http://msdn.microsoft.com/en-us/library/jj653752.aspx and http://www.connectionstrings.com/sql-server-2008 for guidelines on editing the connection string.

If your SQL credentials used in the web.config have dbo/database owner (RECOMENDED) or higher rights, you can simply go to the logon page of the CMS and the tables will be created/updated for you. Before updating an existing site you should logout of the CMS administration. If you have no pre-existing users in the database, you will be prompted to create a new administrator. You can create whatever username/password you wish.

If you wish to manually deploy updates, or do not have sufficient rights from the credentials contained within the web.config, execute the scripts found within the project **CMSDBUpdater** in the source code repository. The scripts provided were generated from SQL 2008 Express, they should also work on Standard 2008 or Standard 2008 R2 etc. and later editions. They may also work on SQL 2005, but have not been tested. Application authentication is provided by SQL Membership Provider.

- **CREATE 01.sql** -- will create the application tables. Run this first. It also includes the membership provider schema and creates the security roles. You can just run this script and then go to the CMS logon page and create a new user, or you can perform step 2.
- **CREATE 02.sql** -- will create the default groups and an admin account with a default password. If you are building the application project yourself, point the web.config of the CMSAdmin project at your new database. You can fire up the ASP.Net Configuration menu in Visual Studio and use that to create additional users. You will want to read the comments in the script and potentially edit according to your needs. You should change the default password as soon as you are able so that others do not logon to your website.

Some users may experience the error "System.Data.SqlClient.SqlException: Invalid object name 'information_schema.columns'" when initially running the CMS. This is a result of SQL Server being configured for Case Sensitivity rather than Case Insensitivity. CarrotCake requires case insensitivity as not all queries will always match the database's capitalization. See also https://msdn.microsoft.com/en-us/library/ms175835.aspx

To check if this is your issue, run this SQL:

```
SELECT name, collation_name
FROM sys.databases
WHERE name = 'CarrotCMS1'     -- your database name here
```

If you see something like _CS_ in the output (ex: SQL_Latin1_General_CP1_CS_AS) you are running with case sensitivity. Your culture settings may vary.

To update the case sensitivity, run this SQL (change the CS to CI in the earlier returned culture):

```
ALTER DATABASE CarrotCMS1     -- your database name here
       COLLATE SQL_Latin1_General_CP1_CI_AS
```

This may require elevated permissions, or at least DB Owner rights.

Configure the web server (IIS)

Go to your web server and create a new website, visit your hosting provider's control panel, or ask your hosting provider to create a new site. This new site should be on a Windows server (or workstation) that has the .NET framework 3.5 SP1 installed on it. The website should be configured within an app pool that is using the .NET framework version 2.0 but only shared amongst other .NET 3.5 SP1 applications.

Some users have had luck using .NET version 4.0, but this requires an additional web.config entry for HTML editing to be performed. See information regarding `<httpRuntime requestValidationMode="2.0" />` at https://msdn.microsoft.com/library/hh882339%28v=vs.100%29.aspx as well as commenting out of several sections in the web.config section definitions (jsonSerialization, profileService, authenticationService, and roleService). If using Server 2012, or later, you should use a v4.0 app pool rather than a v3.5 one.

These are some more detailed websites on general IIS configuration:

- http://www.iisunderground.com/add-a-new-website-iis-7-5/
- http://www.iis.net/learn/manage/creating-websites
- https://support.microsoft.com/en-us/kb/323972
- https://support.microsoft.com/en-us/kb/308163

Point the website's root folder at the location you extracted the files into. The folder that contains the web.config and \bin\ directory is the root level of the website files.

This application must be the root level application in the website instance in which it runs. It cannot be run as a sub folder application at a deeper level within another website.

Run the website.

Initial Site Configuration

If, for security purposes, you want to use a different admin folder name than the default, you can search and replace in all text files (ASPX, MASTER, JS, CSS, etc.) in the /c3-admin/ folder and search for "/c3-admin/" and replace it with, say "/management/"as the new admin directory. You will need to rename the /c3-admin/ folder to /management/ and place an entry in the `<CarrotCakeCMS.Web>` section in the web.config. This property should be blank unless being used for an override. You will need to do this same search/replace each time you update the CMS site files. Users coming from earlier versions (pre version 4.3) may rename their existing /manage/ folder to /c3-admin/ prior to upload (or simply delete the folder) and overlay the new files.

```
<CarrotCakeCMS.Web>
        <Settings>
                <Config SiteID="3BD253EA-0000-3333-BBBB-BB097C2255AA" AdminFolderPath="/management/" />
        </Settings>
</CarrotCakeCMS.Web>
```

Upload the files to your hosting account once you have finished updating your web.config. This CMS should be at the root level and not within a virtual folder of an existing website (though other code can co-exist with the CMS). This is an ASP.Net 3.5 web application so make sure that your IIS configuration is set up for this version of the framework (or you can use 4.0 with some tweaks).

Visit your site, you will be greeted with an Under Construction page (if you have the correct configuration) and there is no content currently deployed, or if there are pending database updates (such as when coming from when an earlier version).

Initial Logon

Follow the management link or go directly to <*mysiteurl*>/c3-admin/ (or /management/ if using the admin override path from the earlier example) and logon using carrotadmin / carrot123 (if you have used the user creation SQL script) or any other account you might have added to the system that is a member of the "CarrotCMS Adminstrators" or "CarrotCMS Editors" role.

If there are no users in the system, you will be prompted to create the first administrative user.

Editors may manage content, but only administrators may mange/create user accounts. "CarrotCMS Editors" can only access a site that an administrator has previously associated them with. "CarrotCMS Adminstrators" can access all sites which share the same database.

Upon logon you will be taken to the site profile. You must fill in the basic information (Meta info fields can be left blank). You will need to save this data before proceeding to add content pages. Meta info provided here will be used as default if the individual page's meta fields are empty. If you are going to use RSS feeds or Canonical link headers, you must enter the Site URL (such as http://www.example.com) for your primary domain name if you have multiple domain names pointed at the same site content.

Proceed to the admin menu "pages > index> add page" and fill in the information about your first page. The first page you create will be marked as the root/homepage (if you didn't check the box when performing initial site save). You can change this by visiting the sitemap and re-ordering the pages and saving the new order.

Building out several pages and then visiting the "pages > sitemap" menu, sorting and saving will automatically number the topmost item as the homepage. You can relocate pages to be subpages of others both in the sitemap editor and by visiting the page and selecting the parent page(s) for the given page.

When you enter a new page's title, the page header and navigation text and file name will be auto generated based on the page title. You are free to go and edit the values yielded. The full filename path must be unique across a single site. Validation will happen once you leave the text box. Filenames should end in .aspx, but if you forget, it will be added for you when the page is saved. Some characters will be escaped once you save to reduce browser incompatibilities - such as spaces being interpreted differently across different browsers ex space being either '+' or '%20'. Any invalid characters will be converted to a "-" (dash) upon save. You will be warned of duplicate file names and be unable to save until resolved.

Every content page and blog post must have a template assigned to it. The template defined in /c3-admin/PlainTemplate.aspx will be used if your template file does not exist. When pages or posts are created and there is a large number of other items of the same type (page or post) sharing the same template, the most frequently used template of the working type will be preselected for new items.

Blog posts are created in much the same fashion as a content page. Blog posts support two extra pieces of meta data: Categories and Tags, but do not support sub post/parent post concepts, while content pages can be created using a parent/top/child page hierarchy. You should designate a page as the site index / blog index and apply a template with the `<carrot:PagedDataSummary />` control to expose an index of your blog posts (if using the blog or search features).

Incorporate customization

The goal of CarrotCake CMS is to be as simple as possible (a piece of cake) to integrate your custom code: be they contact forms, registration forms, custom data presentation etc. You can use as much or as little of the CarrotCake framework as you want. CarrotCake believes it should be a piece of cake to incorporate your code and should not force your design in a way that does not best suit your needs.

No HTML/CSS file splitting is needed to make your own page design. Take any intact HTML/CSS design template and include requisite ASP.Net components such as the main base class, setting the head to runat="server", adding form tags to the body, as well as adding content controls. You can take the page, top to bottom, as a complete picture rather than splitting up headers, footers, and page bodies into separate files.

Custom user controls as widgets for the front end (the publicly viewed portion of the site) lend themselves far better to be ignorant of the CMS APIs/Interfaces, and in many cases, simply creating the configuration entry that identifies the file location is sufficient for incorporation of your front-end widget modules.

At the simplest level: take a user control, place the ASCX file(s) somewhere in the site's folder structure and all required assemblies for the control in the site /bin/ directory, create configuration entry in ~/PublicControls.config (or a grouping of controls in a subfolder of ~/cmsPlugins and use Public.config), open a page in advanced edit, and drop the widget on a page in a predetermined placeholder. You can even make a user control which uses a code file rather than code behind, just be sure to deploy both the ascx and the .cs for the CodeFile.

The interfaces/base classes for the backend modules (found in the admin area) while not required, are far less likely to be avoided as there are often linkages between a table listing and individual record views, and the API provides many simple methods to create navigable links between different portions of your module.

Build your own Template

To add your own templates, study the /c3-admin/PlainTemplate.aspx and/or the Citrus Island files /citrus-island/citrus*.aspx. Take any HTML+CSS template and begin swapping out server controls for common paradigms like top menu, latest updates, category/tag lists, content areas for the server controls found in the plain template.

The first step is to set the page to use one of the CarrotCake CMS generic page classes as the first line of the ASPX or MASTER+ASPX template files.

When creating a standalone ASPX page, your page will inherit `GenericPage`.

```
<%@ Page Language="C#" AutoEventWireup="true" Inherits="Carrotware.CMS.UI.Base.GenericPage" %>
```

When you are using a master page, your master page will inherit `GenericMasterPage`.

```
<%@ Master Language="C#" AutoEventWireup="true" Inherits="Carrotware.CMS.UI.Base.GenericMasterPage" %>
```

The page that is using your master page will inherit `GenericPageFromMaster`. The `MasterPageFile` will reflect the path to your actual master page.

```
<%@ Page Title="" Language="C#" MasterPageFile="Carrot.master" AutoEventWireup="true"
Inherits="Carrotware.CMS.UI.Base.GenericPageFromMaster" %>
```

When using master pages, insert the `<asp:ContentPlaceHolder />` controls as needed in your master page and place the corresponding `<asp:Content />` in the ASPX pages as needed.

Once the template file has been set to inherit from one of the specified base classes, set the heading to `runat="server"` (ex. `<head id="Head1" runat="server">`), add a form tag to the body that is `runat="server"` (ex. `<form id="form1" runat="server">`). You can use the sample templates as an example of how to do this. Note that you should only have one matched `<form id="form1" runat="server"> </form>` tag set in any .Net webpage.

Note: If using the master page template model, some of these steps will apply to the master file and some to the ASPX file.

Page headings will automatically have their meta keyword and meta description tags added at runtime, but if for SEO purposes you want to assure the control order, simply place the meta tags where desired in the page's header area.

```
<meta name="description">
<meta name="keywords">
```

- Content areas are designated by the `<carrot:ContentContainer />` tag. You may have one or all of the three content areas in your template, they do not have to have the same name, but it is recommended. Containers that have an ID that contains the word Left, Right, or Center to map to the corresponding text body. You can specify which text body by setting values for `TextZone`, such as `TextZone="TextCenter"` for Center. In cases where the `TextZone` has been specified, any unique ID can be used.

  Controls you do not want to appear can be placed in a hidden area somewhere else in your ASPX file. This also permits easier flipping between templates, if the zones are always named the same, your content will just relocate, rather than being lost.
- Widget areas are designated by the `<carrot:WidgetContainer />` tag. The names for these containers are less important, but again, if you don't use the same name in every template in your site, your content may not appear when you change templates.

- It is recommended to place the `jquerybasic` server control (`<carrot:jquerybasic runat="server" ID="jquerybasic1" />`) as one of the first things in the page head tag so that editing in the advanced mode is least likely to have issues (by not forcing dynamic attachment of the jquery library to the page). You can specify jQuery versions (ex. `JQVersion="1.7"` or `JQVersion="1.8"`), versions 1.6 through 1.11 are available. You can disable the skin stylesheets (ex. `SelectedSkin="NotUsed"`) if you have generated your own theme from the jQuery UI website or do not need the jQuery UI themes that are embedded. There are several color schemes included so you can see if one of the out of the box ones works for you. Including jQuery in your template is optional, but recommended because of the advanced edit controls.

By default, the system targets a three column layout, thus left, right, & center content areas are baked in, as are a top & bottom left, right, & center widget zones are assumed and are the suggested areas in example templates. Additional widget zones can also be created, but are not required. You should make your widget zone names consistent across your templates so that if you change templates you will still be able to see your widgets.

It is recommended that you not hardcode paths to your template folder but instead provide something like the below so that whatever folder the skin/template resides in, the path will auto adjust (note that the stylesheets are `runat="server"` and the JavaScripts are contained in a `<asp:PlaceHolder />` and have `ThePage.TemplateFolderPath` to aid in the file path resolution). Depending on your site structure, you can certainly omit this part if it does not appear warranted.

```
<link runat="server" href="style.css" rel="stylesheet" type="text/css" />

<asp:PlaceHolder ID="myScripts" runat="server">
        <script type="text/javascript" src="<%=ThePage.TemplateFolderPath %>js/script.js"></script>
        <script type="text/javascript" src="<%=ThePage.TemplateFolderPath %>js/modernizr.js"></script>
</asp:PlaceHolder>
```

Skins/ Themes/ Templates can be placed in sub folders (one set per folder) in a folder named ~/cmsTemplates/ . Any first level sub folder of this which has a Skin.config file can be picked up on demand and can be moved around (such as renaming the folder) and redetected, thus streamlining the upload process of the skin. Simply include a Skin.config file that enumerates the ASPX files in the design set minus any folder information above the skin's folder level. The format of this skin file is identical to the structure of the ~/SiteSkins.config file. Skins defined in this way do not need to (and should not)be included in the ~/SiteSkins.config file. A MASTER page will never be the entry in your skin file, only the resulting ASPX files.

Example template directory:

~/cmsTemplates/Meadow/
/images/ <subfolder for images in the design set>
Meadow1.aspx
Meadow2.aspx
Skin.config
style.css

Skin.config contents:

```
<?xml version="1.0" encoding="utf-8" ?>
<tbl>
        <pagenames>
                <templatefile>Meadow1.aspx</templatefile>
                <filedesc>Meadow 1</filedesc>
        </pagenames>
        <pagenames>
                <templatefile>Meadow2.aspx</templatefile>
                <filedesc>Meadow 2</filedesc>
        </pagenames>
</tbl>
```

Once you have edited your template, place it somewhere within the site. It is generally recommended that your template reside in its own folder with all supporting CSS & Images contained therein. Images & CSS paths should use the absolute path (if not performing the `runat="server"` attribution) so that no matter where in the site you are, the paths will resolve on the rendered page and not result in broken images or missing stylesheets.

If you are not using the ~/cmsTemplates/ skin location, you will need to open up SiteSkins.config file and put a new entry in place that references your template file if your template will reside outside of the /cmsTemplates/ directory. Regardless of skin file location, make sure that your file name and title are XML escaped (don't use a raw ampersand the & character - use & for example) Stick to alpha numeric if you are worried about non-safe characters or otherwise are unsure.

Using the Navigation Server Controls

There are two two-level navigation server controls `<carrot:TwoLevelNavigationTemplate />` and `<carrot:TwoLevelNavigation />`. There are additional list controls for listing top-most pages, child/sub pages, and sibling pages, but as they are simple lists with only a few CSS directives, they can be used intuitively.

```
<carrot:TopLevelNavigation runat="server" ID="TopLevelNavigation1" />
<carrot:ChildNavigation CssClass="sidemenu" runat="server" ID="ChildNavigation1" />
<carrot:SiblingNavigation CssClass="sidemenu" CSSSelected="active" runat="server" ID="SiblingNavigation1" />
```

The control `<carrot:TwoLevelNavigation />` will provide a simple UL/LI output with ability to specify colors and font size which generates a simple CSS based dropdown menu. This is a good choice if you need a quick navigation menu. The auto stylesheet generation can be turned off (`AutoStylingDisabled="true"`) if you have already designed CSS markup to facilitate your menu. It also has many properties to specific the CSS names for various components like the CSS class for the selected state, sub menu UL CSS class etc. This should give you maximum control of re-styling the menu any way you want to.

The control `<carrot:TwoLevelNavigationTemplate />` allows for extra HTML markup to be added to top level or sub level nodes, just as a `<asp:Repeater />` control supports a header, footer, and item template, but for both top (`<TopNavTemplate>` and `<SubNavTemplate>`) and sub navigation levels. The default behavior will produce a simple UL/LI output. This is the best choice if you are using a third-party JavaScript or CSS menu and it requires additional HTML markup around some of the components.

The control `<carrot:ListItemWrapper />` can be placed in either the top item or sub item template and will default to the HTML "li" tag. This should generally wrap your link.

The control `<carrot:NavLinkForTemplate />` can be placed in either the top item or sub item template and will attempt to auto assign a URL or link text, and supports nested controls - allowing for additional HTML to wrap the text inside of the resulting HTML anchor tags.

The control `<carrot:ListItemNavText />` can be placed in either the top item or sub item template, it takes an enum of type `NavTextFieldName` as a parameter to return any one attribute value from the collection of pages.

```
<carrot:TwoLevelNavigation runat="server" ID="TwoLevelNavigation1" FontSize="14px" />
<carrot:TwoLevelNavigationTemplate runat="server" ID="TwoLevelNav1" />

<carrot:TwoLevelNavigationTemplate runat="server" CssClass="art-nav-inner" CSSSelected="active" ID="TwoLevelNav3" ShowSecondLevel="false">
        <TopNavHeaderTemplate>
                <ul class="art-hmenu">
        </TopNavHeaderTemplate>
        <TopNavTemplate>
                <carrot:ListItemWrapper runat="server" HtmlTagName="li" ID="ListItemWrapper1">
                        <carrot:NavLinkForTemplate ID="NavLinkForTemplate1" runat="server">
                        <span class="l"></span><span class="r"></span><span class="t">
                        <carrot:ListItemNavText runat="server" ID="ListItemNavText1" DataField="NavMenuText" /></span>
```

```
                                </carrot:NavLinkForTemplate>
                        </carrot:ListItemWrapper>
                </TopNavTemplate>
                <TopNavFooterTemplate>
                        </ul>
                </TopNavFooterTemplate>
        </carrot:TwoLevelNavigationTemplate>
```

Site Index Page

If you opt to allow site searches or use the blog feature, you will need to designate a page within the site as the Site Index Page/ Blog Index. This is done from the site info page, the same place the website identity is configured (site name, slogan, URL etc). All search results and Tag/Category/Date links will direct at this page. In order to show the matching records the `<carrot:PagedDataSummary />` control must be on this page. It supports templated data (`ITemplate`) so you can use it in the default mode or you can customize the appearance just as when using an ASP `<asp:Repeater />` item. You can determine the number of pages, turn off the pager, specific the type of data that will load by default. If being targeted by a search result, category, or tag link, it will auto flip to the right result type.

```
<carrot:PagedDataSummary ID="ResultsPage" runat="server" ContentType="Blog" PageSize="10"
CSSSelectedPage="selected" />
```

Here, the default content data has been allowed to appear, but a custom pager has been set up. Styling can be applied to present customized appearances. CSS styling tags have been applied so that the active page can be offset from the other pages. The pager supports both a postback and a querystring pattern.

```
<carrot:PagedDataSummary ID="ResultsPage" runat="server" ContentType="Blog" PageSize="10" CSSSelectedPage="selected">
        <PagerHeaderTemplate>
                <div class="pagerfooterlinks">
        </PagerHeaderTemplate>
        <PagerTemplate>
                <carrot:ListItemWrapperForPager HtmlTagName="div" ID="wrap" runat="server" CSSSelected="selectedwrap" CssClassNormal="pagerlink">
                        <carrot:NavLinkForPagerTemplate ID="lnkBtn" CSSSelected="selected" runat="server" RenderAsHyperlink="true" />
                </carrot:ListItemWrapperForPager>
        </PagerTemplate>
        <PagerFooterTemplate>
                </div>
        </PagerFooterTemplate>
</carrot:PagedDataSummary>
```

Using the Content Server Controls

A page may need to obtain data which the template may want to present in the UI. By specifying what element is desired, the appropriate data can be provided.

The `DataField` properties of the controls will prompt the user with valid values if editing in visual studio and the CMS DLL assemblies are in the folder structure. The `FieldFormat` property allows for some formatting of the output, particularly useful if you want to format some dates.

For example, to place the webpage heading in the body, drop `<carrot:ContentPageProperty />` in the page and specify the data field desired (`PageHead`) or the date the content was published on (`GoLiveDate`).

```
<carrot:ContentPageProperty runat="server" ID="ContentPageProperty1" DataField="PageHead" />
<carrot:ContentPageProperty runat="server" ID="ContentPageProperty2" DataField="GoLiveDate" FieldFormat="{0:MMMM d, yyyy}" />
```

Similarly, if the site name (`SiteName`) or slogan (`SiteTagline`) should appear use the `<carrot:SiteDataProperty />` control which will pick off the relevant pieces of information

```
<carrot:SiteDataProperty runat="server" ID="SiteDataProperty1" DataField="SiteName" />
<carrot:SiteDataProperty runat="server" ID="SiteDataProperty2" DataField="SiteTagline" />
```

To auto filter site contents by way of navigation, the `<carrot:SiteMetaWordList />` control which supports providing a list of months which had posts (listed in reverse chronological order), categories, and tags that have posts (sorted in descending order according to use). These are used as site wide navigation concepts.

```
<carrot:SiteMetaWordList ID="SiteMetaWordList1" runat="server" ContentType="Category" />
<carrot:SiteMetaWordList ID="SiteMetaWordList2" runat="server" ContentType="Tag" />
<carrot:SiteMetaWordList ID="SiteMetaWordList3" runat="server" ContentType="DateMonth" />
```

Pages that are blog posts support the `<carrot:PostMetaWordList />` control which supports providing the list of categories and tags the page has been associated with. Content pages do not have this metadata and will therefore not show any items. This control only applies to data for the page that is currently being viewed.

```
<carrot:PostMetaWordList ID="PostMetaWordList1" runat="server" ContentType="Category" />
<carrot:PostMetaWordList ID="PostMetaWordList2" runat="server" ContentType="Tag" />
```

Using the Header Controls

Each of these tags go in the page header `<head id="Head1" runat="server">` and `</head>` tags.

To provide a hint to search engines as to what your primary domain name is. It will use the Site URL from the site configuration.

```
<carrot:SiteCanonicalURL runat="server" ID="SiteCanonicalURL1" />
```

If you want to publish an RSS feed for the site, put this control in the header. This control also supports creating links when used with `RenderRSSMode` property specifying one of the link variants and placed in the body of a page.

```
<carrot:RSSFeed runat="server" ID="RSSFeed1" />
```

When the render modes specify a render as a link format, then, they can be placed in the body of the page rather than the page header. The `RenderRSSMode="ImageLink"` mode utilizes an optional parameter, ImageURI, which will allow you to specify an icon to be shown in the link, if no value is provided, a 16px square RSS icon will be served.

```
<carrot:RSSFeed runat="server" ID="RSSFeed2" RSSFeedType="BlogOnly" RenderRSSMode="TextLink" />
<carrot:RSSFeed runat="server" ID="RSSFeed3" RSSFeedType="PageOnly" RenderRSSMode="ImageLink" />
```

If you are going to do some social media interaction with services that use the OpenGraph data, this control will expose some of the common page data that Open Graph often provides.

```
<carrot:OpenGraph runat="server" ID="OpenGraph1" />
```

Build your own Widget

The project CMSInterfaces or assembly Carrotware.CMS.Interface.dll can be referenced by any of your custom widgets if you want to them to have basic information injected or have communication to the CMS when being inserted in the page. Widgets that will implement the interfaces need only reference the Carrotware.CMS.Interface.dll assembly.

The norm is to create a user control as a widget
example : `~/c3-admin/ucGenericContent.ascx`

Classes for server controls can also be utilized, prefixed with CLASS: and the class/assembly noted.
example : `CLASS:Carrotware.CMS.UI.Controls.TopLevelNavigation, Carrotware.CMS.UI.Controls`

There is also a simple base class `BaseShellUserControl` that you can use with any custom user controls that you opt to use the widget interface with. Additionally `WidgetParmDataUserControl` and `WidgetUserControl` have been created with overridable widget interface implementations.

You can also leverage the `IWidgetParmData` interface so that the properties that were set using the generic property editor will also be passed in as a `Dictionary<string, string>`. It is recommended to use the `WidgetParmData, WidgetParmDataUserControl,` or `WidgetUserControl` base classes as some parsing routines are included and should simplify assigning the values that are sent in via the interface. This will provide values that the widget can then convert at its own discretion depending on what pieces the widget developer deigns to be important.

In cases where your control doesn't play well with the edit mode - implement `IWidgetEditStatus` and when this interface passes in the edit mode, simply hide/disable those features within your component based on the flag the interface exposes.

If you opt to enable editing of the widget by way of `IWidget.EnableEdit` interface / param combo and want to provide a drop down list or checkbox list, simply tag the property with the widget attribute to map the property to the dictionary list that will provide the values.

For a multi-value property that will be presented as a checkbox list and use a `Dictionary` that will provide the available values. In this example, the property `GalleryIDs` will have the values provided from a `Dictionary` named `lstGalleryIDs`. Note that values saved will be mapped to the property key [field]|[#] (creating a unique key for each entry)- so in this example, key values might look like `GalleryIDs|0`, `GalleryIDs|1`, `GalleryIDs|2`, so keep this in mind when consuming the data. Using the `WidgetParmData` base class and the methods found in that class should simplify the consumption of the parameters. The `Description` attribute is completely optional, but can be used to provide additional information to the end user when editing properties.

```
[Description("Galleries to display")]
[Widget(WidgetAttribute.FieldMode.CheckBoxList, "lstGalleryIDs")]
public List<Guid> GalleryIDs { get; set; }
```

For a single-value property that will be presented as a drop down list and use a `Dictionary` that will provide the available values. In this example, the property `GalleryID` will have the values provided from a `Dictionary` named `lstGalleryID`.

```
[Description("Gallery to display")]
[Widget(WidgetAttribute.FieldMode.DropDownList, "lstGalleryID")]
public Guid GalleryID { get; set; }
```

Once you have built your widget (whether or not you are opting to use any of the interfaces provided), add it to the PublicControls.config file. Entries must be well-formed XML. You can also use this same format by building a Public.config in a sub folder of ~/cmsPlugins/ and leave the PublicControls.config file untouched. As with Skins, do not include the path for folder configured widgets.

```
<ctrlfile>
        <filepath>widget path or class name</filepath>
        <crtldesc>title to show in toolbar</crtldesc>
</ctrlfile>
```

To add your widget to a page, login to the management backend. Once logged in, view the page you want to insert the component into. You should see some light green boxes in the margins and in the footer. Follow the advanced edit link when you are going to load your widgets into the site.

You will get a floating toolbar which lists your widgets. You can drag and drop these into any of the widget placeholders. Each placeholder's name will appear in a dark green bar, each of your content areas will appear in a light green bar.

Individual widget toolbars can be dragged & dropped to reorder within a container or from one container to another. Widgets that expose custom edit links or just provide info that they are editable will expose edit links. If you drop the widget in one container and need it to be placed elsewhere, you can simply drag it from one container into another.

The floating toolbar also provides the ability to modify some of the core page information, like navigation link caption, page heading, and page title attributes.

Changes will be in memory (serialized to the database) until the save button from the toolbar is clicked. If you abandon your edit session for more than 2 hours, your changes will be lost. Each time you add/remove or edit a widget, the clock will get reset.

When a page is being edited, there is a "heartbeat" which will update your claim on the page so as to block other users from editing the page and overwriting your changes. If you exit the edit mode of a page or otherwise lose connection with the website more than 2 minutes, another user may then edit the page.

If your widget does not appear in the toolbar, you can visit the management homepage (the page which has the site identity information) and click the "Refresh Configs" button.

Once your widget has an entry in the PublicControls.config file or a Public.config in a sub folder of ~/cmsPlugins/, copy the ASCX file to the pre-determined location, and copy its DLL to the site's \bin\ folder.

Build your own Admin Module

The project CMSInterfaces can be referenced by any of your custom admin modules if you want to them to have basic information injected or have communication to the CMS when being inserted in the management area. Modules that will implement the interfaces need only reference the Carrotware.CMS.Interface.dll assembly.

There is also a base class `BaseShellUserControl` that you can use with any custom controls that you opt to use the admin interface with. To simplify matters, use the base class `AdminModule` which has several helper methods included.

Once you have built your module, add it to the AdminModules.config file. Again, entries must be well-formed XML. . You can also use this same format by building an Admin.config in a sub folder of ~/cmsPlugins/. As with Skins, do not include the path for folder configured widgets.

The XML format has two tiers, one tier is the top level menu to group your widgets according to functionality. You can have multiple controls within a family of modules.

```
<pluginlist>
        <pluginid> Family GUID </pluginid>
        <caption>Control Group Caption</caption>
</pluginlist>
<!-- you can have multple controls in the module family -->
< plugincontrols>
        <pluginid> Family GUID </pluginid>
        <menuorder>Integer sort order</menuorder>
        <parm>AlphaNumericIndentifier - must be unique in control family</parm>
        <plugincontrol>Control Path</plugincontrol>
        <pluginlabel> Control Caption </pluginlabel>
        <useAJAX>boolean</useAJAX>
        <visible>boolean</visible>
</plugincontrols>
```

The admin section has an AJAX spinner, some components you might want to use as admin modules may not play well when used in an AJAX panel, for example, a RDLC report file since it has its own spinner, you can specify that you do not

want to use AJAX when loading your widget. The ASP.Net file upload component also has issues with the partial postback so anything that uses file upload you will want to set the `useAJAX` parameter to false.

Once the entries for your controls have been saved to the config file, you can click the modules menu and a list of admin modules will appear. Expanding the menu will show the one or more components that make up a module.

While you do not have to implement any of the admin interfaces, it is recommended to do so permitting you to more easily navigate between a listing control and an individual record control as the interfaces allows the proper query strings to be passed amongst the controls.

Because of the AJAX that is enabled in the admin system, some JavaScript may need to be loaded by way of inserting loads of your script functions by way of `prm.add_endRequest()` else you may find some jQuery UI items do not work after posting back your page. In the example below `updateGallery()` might be a function that performs some initialization of some jQuery hooks.

```
function galleryAJAXJQuery() {
        if (typeof (Sys) != 'undefined') {
                var prm = Sys.WebForms.PageRequestManager.getInstance();
                prm.add_endRequest(function() {
                        updateGallery();
                });
        }
}

$(document).ready(function() {
        galleryAJAXJQuery();
        updateGallery();
});
```

If your module does not appear in the list on the module page, you can visit the site info page (the page which has the site identity information) and click the "Refresh Configs" button.

Once your module has an entry in the AdminModules.config file or an Admin.config in a sub folder of ~/cmsPlugins/, copy the ASCX file to the pre-determined location, and copy its DLL to the sites \bin\ folder.

The most common paradigm that calls for the use of the API is to have an index/list page that then links to a detail page that pulls the details of a single record.

First, have your index user control and individual record both inherit `AdminModule`

```
public partial class FAQAdmin : AdminModule
public partial class FAQAdminAddEdit : AdminModule
```

Now in your index control, place a link using one of the API provided methods

```
<ItemTemplate>
        <asp:HyperLink ID="lnkedit" runat="server" NavigateUrl='<%#CreateLink("FAQAdminAddEdit",
String.Format("id={0}", Eval("FaqID") )) %>'>
        <img border="0" src="/c3-admin/images/pencil.png" alt="Edit" title="Edit" style="margin-right: 20px;" />
        </asp:HyperLink>
</ItemTemplate>
```

This will create a link that will pass your specified parameter (`"id={0}"`) over the querystring and to additionally load the module manager page using the control designated in the configuration file (AdminModules.config) as `FAQAdminAddEdit`

```
<plugincontrols>
        <pluginid>5E68BD0D-75A5-4ab4-9F86-BC23D96C34B9</pluginid>
        <menuorder>1</menuorder>
        <parm>FAQAdminAddEdit</parm>
        <plugincontrol>~/cmsPlugins/FAQAdminAddEdit.ascx</plugincontrol>
        <pluginlabel>FAQ - Add</pluginlabel>
        <useajax>true</useajax>
        <visible>true</visible>
</plugincontrols>
```

In the code for the detail control, pick off a record the same as you would in a control regardless of the CMS and load whatever data you need to create the detail record.

```
ItemGuid = new Guid(Request.QueryString["id"].ToString());
```

When you save the page you can then perform redirects to other controls (similar to how one might redirect to another page) and also specific any additional parameters that should be passed along.

If, for example you allow for deletions and you need to redirect to the main list again as the record no longer exists, redirects to other controls is possible. In this case `"FAQAdmin"` designates that the control identified in the module's configuration should now be loaded with no additional querystring parameters.

```
string filePath = CreateLink("FAQAdmin");

Response.Redirect(filePath);
```

If you have just added the record and you now want to redirect to the new record with its ID being passed along. Using `ModuleName` will create a redirect using the currently loaded control and passing along an additional ID parameter.

```
string filePath = CreateLink(ModuleName, string.Format("id={0}", ItemGuid));

Response.Redirect(filePath);
```

Build your own Text Widget

Sometimes it is necessary to escape or otherwise massage text content found in the content body of a page. To this end, there is an interface (`ITextBodyUpdate`) and a configuration file (by default TextContentProcessors.config). See the example class Carrotware.CMS.UI.Controls.EmailEscapeInBody which escapes email addresses into their ASCII codes.

Create a class which implements the interface `ITextBodyUpdate`

Add an entry into the config file specifying the class and assembly location as in the example implementation

Build your DLL class and copy to the website \bin\ directory

Visit the text widget menu and turn on/off the areas you want to have the content evaluated

Using a Content Snippet

Sometimes you have some content that is fairly static and/or used in many places and would otherwise include in a hard coded fashion in your template. Rather than hard coding the content, you can use the content snippet tag to create a sluggable piece of content that will be looked up at run time. This content is versioned and can either be hard coded in a content template file or dragged and dropped as a widget into individual page by page basis.

```
<carrot:ContentSnippetText ID="ContentSnippetText1" runat="server" SnippetSlug="office-hours" />
```

The markup for the snippet's tag may be placed in any page you have been using the content page or navigation controls (pages that inherit from GenericPage, GenericPageFromMaster, and GenericMasterPage).

The snippet's slug is required to be unique (the admin UI will validate that this is so) but the name is not so constrained and is used as a hint only when trying to determine which snippet to select. They can be turned on or off, deleted, or time activated/deactivated.

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Components Utilized

Microsoft .NET framework version 3.5
About: http://www.asp.net/downloads/35-sp1

jQuery JavaScript Library
http://jquery.com/

jQuery UI
http://jqueryui.com/

http://docs.jquery.com/UI

Chosen
http://harvesthq.github.io/chosen/
Chosen, a Select Box Enhancer for jQuery and Prototype
by Patrick Filler for Harvest, http://getharvest.com
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iCheck
Damir Sultanov, http://fronteed.com/iCheck/
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jQuery Upload File Plugin
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http://hayageek.com/
MIT License, https://github.com/hayageek/jquery-upload-file/blob/master/MIT-License.txt

jQuery UI Nested Sortable - jQuery Plugin
Copyright (c) 2010-2012 Manuele J Sarfatti
https://github.com/ilikenwf/nestedSortable
Licensed under the MIT License

LinqToSqlExtensions
https://terryaney.wordpress.com/2008/04/14/batch-updates-and-deletes-with-linq-to-sql/
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ExpressionVisitor
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Silk Icon Set
Mark James, http://www.famfamfam.com/lab/icons/silk/
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http://creativecommons.org/licenses/by/2.5/

Preloaders.net
AJAX Spinners. All animated GIF and APNG images are completely free to use in all projects (web and desktop applications, freeware and commercial projects).
http://preloaders.net/

ajaxload.info
Ajaxload - Ajax loading gif generator. Generated gifs are totally free for use.
http://ajaxload.info/

normalize.css
https://github.com/necolas/normalize.css
MIT License, Copyright (c) Nicolas Gallagher and Jonathan Neal

Base64 encode / decode
https://github.com/client9/stringencoders/tree/master/javascript
Copyright (c) 2010 Nick Galbreath
MIT License https://github.com/client9/stringencoders/blob/master/javascript/base64.js

Tooltipster
http://iamceege.github.io/tooltipster/
The MIT License (MIT) Copyright (c) 2015 Caleb Jacob
https://github.com/iamceege/tooltipster

jQuery blockUI - jQuery Plugin
Examples at: http://malsup.com/jquery/block/
Copyright (c) 2007-2010 M. Alsup
Dual licensed under the MIT and GPL licenses:
http://www.opensource.org/licenses/mit-license.php
http://www.gnu.org/licenses/gpl.html

jQuery Form Plugin
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SimpleModal - jQuery Plugin
http://www.ericmmartin.com/projects/simplemodal/
Copyright (c) 2010 Eric Martin
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jQuery UI Timepicker (By François Gélinas)
http://fgelinas.com/code/timepicker/
This is a jQuery UI time picker plugin build to match with other official jQuery UI widgets.
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