The UniGrid is a user control that displays data in a highly customizable and flexible table. Also provides many additional features:

- Built-in support for loading and displaying Kentico data
- Ordering
- Filtering
- Paging
- Row selection
- Predefined or custom action buttons for rows
- Transformations of the data displayed in columns

The UniGrid is used extensively in the Kentico administration interface. You can only use the UniGrid within Kentico web projects, but it is possible to display data from external data sources.

Note: Using the UniGrid control beyond its most basic functions requires knowledge of programming and the Kentico API.

Getting started

The following is a step-by-step tutorial that shows how to display a table containing all users from the Kentico database using the UniGrid control, and implement a custom action button:

1. Create a **Web form** named *User_UniGrid.aspx* in your web project (the code in the example assumes that you add the file into a subfolder named *UniGridExample*).
2. Add the following directives to the beginning of the web form's markup to register the UniGrid control:

```
<%@ Register src="~/CMSAdminControls/UI/UniGrid/UniGrid.ascx" tagname="UniGrid"
tagprefix="cms" %>
<%@ Register Namespace="CMS.UIControls.UniGridConfig" TagPrefix="ug" Assembly="
CMS.UIControls" %>
```

3. Add the following code into the content area of the page (inside the *<form>* element):

```
<div class="cms-bootstrap">

        <asp:ScriptManager ID="manScript" runat="server" ScriptMode="Release"
EnableViewState="false" />
        <asp:Label runat="server" ID="lblInfo" EnableViewState="false" Visible="
false" />

        <cms:UniGrid ID="UserGrid" runat="server" />

</div>
```

This adds the following controls:

- The **ScriptManager** control is required by the UniGrid control. The sample code manually adds the script manager to be functional as a standalone example. The *ScriptManager* is typically included on your website's master page, so you do not need to add it in real-world scenarios.
- A standard **Label** that will be used to display information messages. The label is not necessary for the functioning of the UniGrid, but can be very convenient, for example to display error messages.
- The **UniGrid** control itself (without any configuration for now).

The **cms-bootstrap** class is required if you wish to use the default UniGrid styles (including font icons).

4. Extend the definition of the UniGrid control according to the markup below:

```
<cms:UniGrid ID="UserGrid" runat="server" ObjectType="cms.user" Columns="UserID, 
UserName" OrderBy="UserName">

        <GridActions>
                <ug:Action Name="view" Caption="$General.View$" FontIconClass="
icon-eye" FontIconStyle="allow" />
        </GridActions>

        <GridColumns>
                <ug:Column Source="UserName" Caption="$general.username$" Width="
100%" />
        </GridColumns>

</cms:UniGrid>
```

The basic configuration example above defines a single action (view) and one column containing user names. The control retrieves the data from user objects, which is achieved by setting the **ObjectType** property to *cms. user*.

For more details and a full account of the configuration options you can specify for the UniGrid, see:

- Configuration
- Reference - UniGrid definition

5. Switch to the web form's code behind (*User_UniGrid.aspx.cs*) and add the following code:

Note: Adjust the name of the class according to the location of your web form.

```
using System;

using CMS.Helpers;
using CMS.Membership;
using CMS.Base.Web.UI;

public partial class UniGridExample_User_UniGrid : System.Web.UI.Page
{
        protected void Page_Load(object sender, EventArgs e)
        {
                // Registers the default CSS and JavaScript files onto the page
(used to style the UniGrid)
                CssRegistration.RegisterBootstrap(Page);
                ScriptHelper.RegisterBootstrapScripts(Page);

                // Assigns a handler for the OnAction event
                UserGrid.OnAction += userGrid_OnAction;
        }

        /// <summary>
        // Handles the UniGrid's OnAction event.
        /// </summary>
        protected void userGrid_OnAction(string actionName, object actionArgument)
        {
                // Implements the logic of the view action
                if (actionName == "view")
                {
                        // Stores the values of the actionArgument argument
(UserID)
                        int userId = ValidationHelper.GetInteger(actionArgument,
0);

                        // Gets a UserInfo object representing the user with the
given ID
                        UserInfo ui = UserInfoProvider.GetUserInfo(userId);

                        // If the user exists
                        if (ui != null)
                        {
                                // Sets the information label to display the full
name of the viewed user
                                lblInfo.Visible = true;
                                lblInfo.Text = "Viewed user: " + HTMLHelper.
HTMLEncode(ui.FullName);
                        }
                }
        }
}
```

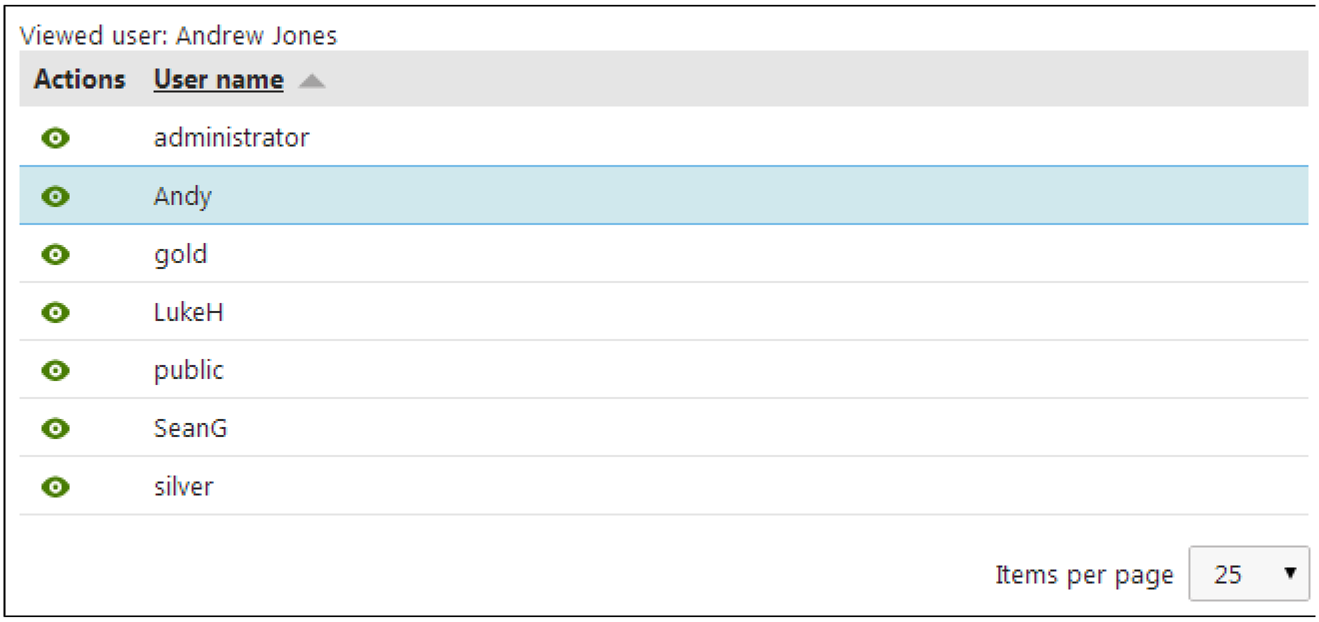
This code demonstrates how to implement the logic of a UniGrid action. **OnAction** event handlers have the following parameters:

- **string actionName** - identifies which action raised the event. This example only has one action, but the UniGrid control often contains more in real scenarios. The name passed into the parameter is set through the UniGrid's definition in the **Name** attribute of individual **Action** elements.
- **object actionArgument** - passes the value of a data source column from the UniGrid row for which the action was used. The column can be specified through the configuration in the **commandargument** attribute of individual **Action** elements, otherwise the first column in the data source is used by default.

This example only displays the full name of the viewed user in the label above the UniGrid when the view button is clicked. You can implement any required action in a similar fashion.

6. Save the web form and its code behind file.
7. Right-click the web form in the Solution explorer and select **View in Browser**.

The resulting page displays a table containing user names and view action buttons. If you click the view action, the full name of the user on the given row appears above the grid.



Viewed user: Andrew Jones

Actions	User name
👁	administrator
👁	Andy
👁	gold
👁	LukeH
👁	public
👁	SeanG
👁	silver

Implementing custom functionality

The following tutorial extends the example in the Getting started section. This section demonstrates how to add custom functionality to action buttons and columns using handlers of the **OnExternalDataBound** event:

1. Open the web form from the previous section and its code behind file.
2. Modify the UniGrid control's definition as shown in the following markup:

```
<cms:UniGrid ID="UserGrid" runat="server" ObjectType="cms.user" Columns="UserID,
UserName" OrderBy="UserName">

        <GridActions>
                <ug:Action Name="view" Caption="$General.View$" FontIconClass="
icon-eye" FontIconStyle="allow" ExternalSourceName="view_modify" />
        </GridActions>

        <GridColumns>
                <ug:Column Source="UserName" Caption="$general.username$" Width="
100%" ExternalSourceName="user_modify" />
        </GridColumns>

</cms:UniGrid>
```

This defines the **ExternalSourceName** attributes that identify actions or columns in the *OnExternalDataBound* handler, where the required custom functionality is implemented.

3. Switch to the code behind file and add a **using** statement for the *System.Data* namespace:

```
using System.Data;
```

4. Extend the **Page_Load** method to assign a handler to the UniGrid's **OnExternalDataBound** event:

```
protected void Page_Load(object sender, EventArgs e)
{
        // Registers the default CSS and JavaScript files onto the page (used to
style the UniGrid)
        CssRegistration.RegisterBootstrap(Page);
        ScriptHelper.RegisterBootstrapScripts(Page);

        // Assigns a handler for the OnAction event
        UserGrid.OnAction += userGrid_OnAction;

    // Assigns a handler for the OnExternalDataBound event
    UserGrid.OnExternalDataBound += userGrid_OnExternalDataBound;
}
```

5. Define the **userGrid_OnExternalDataBound** handler:

```
/// <summary>
/// Handles the Unigrid's OnExternalDataBound event.
/// </summary>
protected object userGrid_OnExternalDataBound(object sender, string sourceName,
object parameter)
{
        switch (sourceName)
        {
                // Implements custom logic for the view action
                case "view_modify":

                        // Gets the value of the UserName column from the current
data row
                        string userName = ValidationHelper.GetString
(((DataRowView)((GridViewRow)parameter).DataItem).Row["UserName"], "");

                        // If the user is the administrator
                        if (userName == "administrator")
                        {
                                // Gets the CMSGridActionButton object of the
view  action that is being processed
                                CMSGridActionButton button =
((CMSGridActionButton)sender);

                                // Disables the action button
                                button.Enabled = false;
                        }

                        break;

        // Implements custom logic for the UserName column
        case "user_modify":

            // Returns modified user names to be displayed in the UniGrid
            return Convert.ToString(parameter) + " - modified";
    }

    return parameter;
}
```

This code demonstrates how to implement custom functionality for UniGrid actions and columns. **OnExternalDataBound** event handlers have the following parameters:

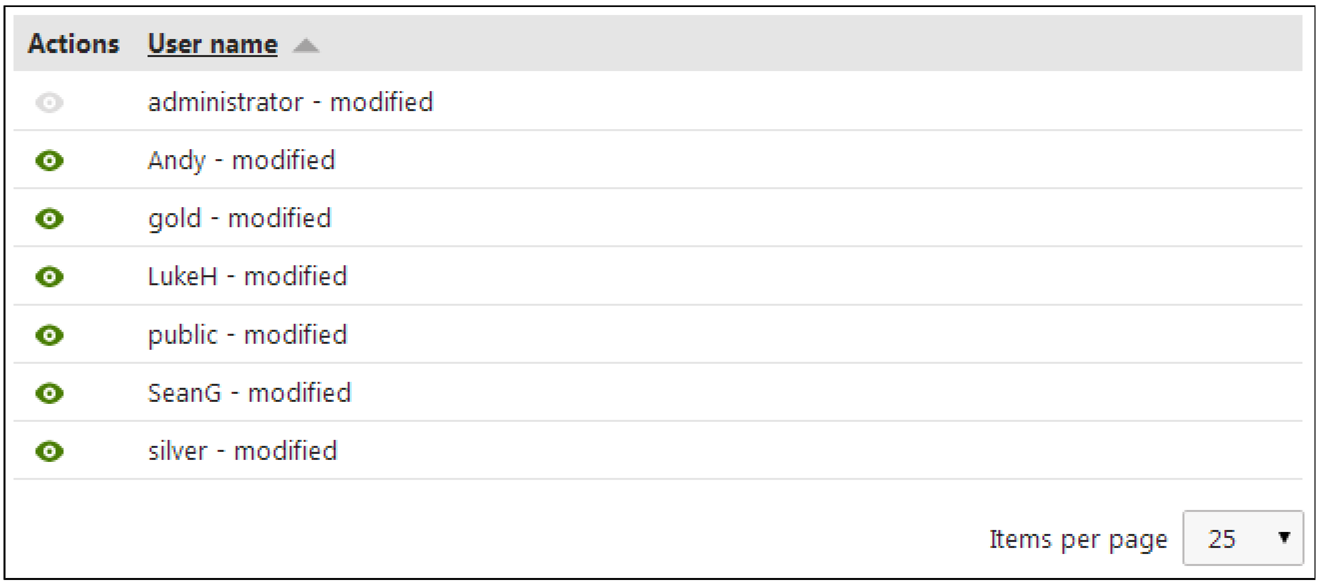
- **object sender** - for actions, the sender passes a **CMSGridActionButton** (for font icons) or **CMSImageButton** (for standard image files) object representing the action's button. For columns, the sender contains a DataControlFieldCell object that represents the column's cell on the currently processed row.
- **string sourceName** - identifies the action or column for which the functionality is implemented. The name passed into this parameter is defined in the UniGrid's definition in the **ExternalSourceName** attribute of individual **Action** or **Column** elements.
- **object parameter** - passes the value in the corresponding column cell. If the column uses the ##ALL## macro as its source, the parameter contains a DataRowView object representing the entire row that is being processed. For actions, the parameter always contains a GridViewRow representation of the current row.

The example modifies the **view** action to be disabled for the UniGrid row containing the user named *administrator*, and also alters the values displayed in the **UserName** column for all rows. You can implement any custom functionality for actions or columns in a similar fashion.

6. Save the web form and its code behind file.
7. Right-click the web form in the Solution explorer and select **View in Browser**.

The resulting page displays a table just like in the previous example, but:

- All values in the **User name** column are modified
- The view action for the administrator user is grayed out and disabled



Actions	User name ▲
	administrator - modified
●	Andy - modified
●	gold - modified
●	LukeH - modified
●	public - modified
●	SeanG - modified
●	silver - modified

Items per page 25

Configuration

You can set the following properties for the UniGrid control:

Property name	Description	Sample value

Columns	Specifies the columns that the control loads from the data source. By default, the values of the first column are passed as the **actionArgument** parameter of the UniGrid's **OnAction** event handlers. You can override this column in the definition by specifying a column name in the **commandargument** attribute of individual **<action>** elements.	
Complete WhereCon dition	Gets the WHERE clause used by the SQL query that loads the UniGrid's data, including any modifications applied by the filter.	
DataSource	Gets or sets the *DataSet* object containing the data that the UniGrid displays. You can alternatively assign the UniGrid's data through: • The control's **ObjectType** or **Query** properties • The **objecttype** or **query** elements in the UniGrid definition	
DelayedRel oad	If enabled, the control does not load data automatically during the **Load** event of the page. In this case, you need to call the **ReloadData()** method manually.	
FilterDirect oryPath	Path to the control (.ascx file) that the UniGrid uses instead of the default filter. The default relative path is *~/CMSAdminControls/UI/UniGrid/Filters/.*	
FilteredZer oRowsText	Text that the UniGrid displays if no rows remain after applying the filter.	
FilterLimit	Sets the minimum number of rows that must be displayed in the UniGrid for the filter to appear. The default value is loaded from the **CMSDefaultListingFilterLimit** web.config key.	

FilterForm	Allows you to access the form that defines the default UniGrid filter. You can specify the names of filtering fields in the UniGrid's definition through the **fieldname** attribute of individual **<filter>** elements.
	
	For example:
	
	`// Hides a filtering field from the default UniGrid filter UniGrid.`
	`FilterForm.FieldsToHide.Add("fieldName");`	

GridName	Specifies the name of an external XML file that defines the structure and behavior of the UniGrid control. See Reference - UniGrid definition.	
GridView	Allows you to access the internal **GridView** control encapsulated by the UniGrid.	
HideContr olForZeroR ows	Indicates whether the control is hidden when no rows are loaded from the data source. The control is not hidden if the empty data is the result of applying the filter.	
ImageDire ctoryPath	Path to the directory that contains images used by the control. The default value is *~/App_Themes /Default/Images/Design/Controls/UniGrid/Actions*.	

NamedColumns	Gets a dictionary mapping custom names to *DataControlField* objects that represent the columns of the UniGrid. This can be used to access the grid's columns in your code. You can specify the names of columns in the UniGrid's definition through the **columnname** attribute of individual **<column>** elements. For example: `UniGrid.NamedColumns["column1"].Visible = false;` When executed, this code hides the column named *column1*.	
ObjectType	Defines the type of the objects that the UniGrid loads as the data source and displays. To find a list of available object type values, open the **System** application in the Kentico administration interface and select the **Object types** tab. Alternatively, you can set the UniGrid's object type data source in the definition through the **<objecttype>** element. **Note**: This approach is not supported for objects representing pages. In these cases, you can load the required data by specifying an appropriate query through the **Query** property.	
OrderBy	The ORDER BY clause that determines the default order of the UniGrid load when the page is first loaded.	
Pager	Can be used to access the UniGridPager control used for paging.	
PageSize	Can be used to override the default values offered by the page size selector in the pager. Values must be separated by commas. You can use the *##ALL##* value to add an option that lists all available rows on a single page (not recommended if you have objects with a very large number of records). The default value is *5,10,25,50,100*.	"10,20,50"
Query	Specifies the name of the query that retrieves data from the Kentico database to be displayed by the UniGrid control. Enter the name in format: *<class name>.<query name>*. Alternatively, you can specify the query in the UniGrid's definition through the **<query>** element.	"cms.user.selectallview"
SelectedItems	Gets or sets the currently selected rows in the UniGrid (as an ArrayList).	
ShowActionsMenu	Indicates whether the header of the actions column offers a context menu that provides the option to export the data displayed in the grid into various formats (Excel, CSV or XML) and reset the UniGrid view (item filtering, ordering and paging).	

ShowObjectMenu	If enabled, the UniGrid automatically provides the default object actions for the displayed items. This requires the data source of the UniGrid to be an object type, specified either through the *<objecttype>* element or the **ObjectType** property. The following object actions are available: • Export • Backup • Restore • Destroy Some types of objects do not support all of the actions. The UniGrid does not add the actions if there is another action specified with a **contextmenu** attribute, or in cases where there are no actions at all defined for the grid. The default value is *true*.	
SortDirect	The ORDER BY clause reflecting the current row sorting being used by the UniGrid.	
TopN	Specifies the maximum amount of rows that the UniGrid loads from the data source.	
WhereCondition	Gets the WHERE clause of the SQL query that loads the UniGrid's data without modifications applied by the filter.	
ZeroRowsText	Text shown if no records are found. This text is not visible when the control is hidden by the **HideControlForZeroRows** property.	"No records found."

You can handle the following events for the UniGrid:

Event name	Description
OnAction	Occurs when one of the UniGrid's actions is used. The name of the given action is passed as a parameter to the handlers of the event.
OnExternalDataBound	Occurs after data is loaded. You can use this event to implement a custom design or functionality for UniGrid columns, including the action column.
OnBeforeDataReload	This event can be used to perform any actions before the *ReloadData()* method is executed.
OnAfterDataReload	This event can be used to perform any actions after the *ReloadData()* method is executed.

You can also modify the behavior of all UniGrid instances throughout the system by adding the following application keys to the *appSettings* section of your *web.config* file:

Note: The web.config keys listed below only define default global settings. You can override the values for individual UniGrid controls.

Key	Description	Sample value

CMSDefaultListingFilterLimit	Determines the minimum number of items that must be included in UniGrid listings in order for the filter to be visible. The UniGrid only displays the filter if the number of listed items is greater than or equal to this value. The default value is *25*.	<add key="CMSDefaultListingFilterLimit" value="40" />
CMSDefaultPageSizeOptions	Sets the options available in the page size selector for UniGrid listings (the *Items per page* setting). Values must be separated by commas. You can use the *##ALL##* value to add an option that lists all available rows on a single page (not recommended if you have objects with a very large number of records). The default value is *5,10,25,50,100*.	<add key="CMSDefaultPageSizeOptions" value="50,200" />
CMSDefaultListingPageSize	Sets the initial page size (the *Items per page* setting) of UniGrid listings. If the value is not included among the options defined by the **CMSDefaultPageSizeOptions** key, the system automatically inserts the value as an additional option. The default value is *25*.	<add key="CMSDefaultListingPageSize" value="50" />
CMSListingShowFirstLastButtons	If enabled, the UniGrid pagers include the first and last page link buttons if there is a large enough number of items. The default value is *false*.	<add key="CMSListingShowFirstLastButtons" value="true" />
CMSListingShowDirectPageControl	If enabled, the UniGrid pagers display a textbox that allows users to change the page directly by entering a number. The default value is *true*.	<add key="CMSListingShowDirectPageControl" value="false" />