

Relationships Extended Demonstrations

This document guides you through setting up all 6 scenarios that are handled by the Relationships Extended module in a step by step fashion. The 6 scenarios covered are:

1. Related Pages (Both Orderable AdHoc Relationships and Unordered Relationships)
2. Node Categories (using CMS.TreeNode)
3. Node Categories (using a Custom Joining Table)
4. Object to Object binding with Ordering
5. Node to Object binding with Ordering
6. Node to Object binding without Ordering.

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Installation

1. Install the RelationshipsExtended NuGet package into your CMS Project on your site's solution. Make sure to select the RelationshipsExtended package that has a major version # that matches your Kentico Version (ex 10.0.6 = Kentico 10, 11.0.6 = Kentico 11, etc).
 - a) <https://docs.microsoft.com/en-us/nuget/consume-packages/ways-to-install-a-package>
2. Run your Kentico site after the NuGet package finishes installation.
 - a) Check the event log after installing, you will see a MODULEINSTALLED if it installed correctly.
 - b) Ignore the RelationshipsExtended-ErrorSettingForeignKeys on the first run, as this runs before the class gets an opportunity to install. You should not see this on subsequent application starts.
3. If you are on Kentico version 10, please also go to System -> Macros -> Signatures and resign your macros.

If you have enough privileges, you should now see a “Relationship Name Extended” user interface under the Configuration section in the Kentico Admin menu. You should also now have access to the Macro namespaces RelHelper (along with RelEnums and some other classes which are used internally).

If you wish to install the Demo module, you can go to Sites within the Kentico Menu, [Import Sites or Objects] and select the RelationshipsExtendedDemo_SiteImport.zip file.

If you only want to see the code files themselves, you can unzip the Demo_CodeFilesOnly.zip file.

Setting up Related Pages

Preparations – Creating Banner and Quote Page Types

1. Go to the Page Types in the Kentico Menu
2. Create a new Page Type: Banner
 1. Page Type Display Name: Banner
Namespace: Demo
Name: Banner
[Next]
 2. Add new field:
Field Name: BannerName
Data Type: Text
Size: 200
Required: True
Field Caption: Name
[Save]
 3. Add new field:
Field Name: BannerText
Data Type: Text
Size: 200
Required: False
Field Caption: Banner Text
[Save]
 4. Hit [Next] and set Page Name Source to BannerName.
 5. Hit [Next] add Folder to the Parent Types, then hit Next until you Finish

3. Create a new Page Type: Quote

1. Page Type Display Name: Quote

Namespace: Demo

Name: Quote

[Next]

2. Add new field:

Field Name: QuoteName

Data Type: Text

Size: 200

Required: True

Field Caption: Name

[Save]

3. Add new field:

Field Name: QuoteText

Data Type: Text

Size: 200

Required: False

Field Caption: Quote Text

[Save]

4. Add new field:

Field Name: QuoteAuthor

Data Type: Text

Size: 50

Required: False

Field Caption: Author

[Save]

5. Hit [Next] and set Page Name Source to QuoteName.

6. Hit [Next] add Folder to the Parent Types, then hit [Next] until you [Finish]

4. Go to Pages, and create a folder under the Root "Site Objects"

5. Create two folders underneath Site Objects, "Banners" and "Quotes"

6. Under the Banners Folder, create 3 banners with Names "Banner 1" "Banner 2" "Banner 3" and text "Sample Text 1" "Sample Text 2" and "Sample Text 3"

7. Under the Quotes Folder, create 3 quotes with names "Golden Rule" "Relativity" and "Sonic" with Text "Do unto others as you would have them do unto you" (Author Jesus), "E=mc2" (Author Albert Einstein) and "Yo, buttnik!" (Author "Sonic the Hedgehog")

Create Relationships

1. Go to Relationship Names Extended in the Kentico Menu

2. Create a new Relationship Name: Banner

1. Display Name: Banners

Code Name: Banners

Relationship Is Adhoc: True

[Save]

3. Create a new Relationship Name: Quotes

1. Display Name: Quotes
Code Name: Quotes
Relationship Is Adhoc: False
[Save]
4. Go to Modules in the Kentico menu, and create a new Module
 1. Module Display Name: Demo
Module Code Name: Demo
Module Version: 1.0.0
 2. Go to the Sites tab and add it to the current site.
5. Go to the User Interfaces tab of the Demo Module
6. Go to CMS-> Administration -> Content Management -> Pages -> Edit (Click on Edit)
7. Click the + Icon to add a new User Interface
 1. DisplayName: Demo
Page Template: Vertical Tabs
[Save]
 2. Go to the Properties tab of this UI element
Tab Extender: RelationshipsExtended
Tab Extender: RelationshipsExtended.RelationshipVerticalTabExtender (Enables Auto Hide of Relationship UI)
[Save]
8. Click the + icon to add a new User Interface below the Demo UI you just created
 1. DisplayName: Banners
Page Template: Edit Relationship
[Save]
 2. Go to the Properties tab of this UI element
Relationship Name: Banners
Allow Switch Sides: False
Max Relationships: Empty
Left Side Macro: {% CurrentDocument.ClassName != "Demo.Banner" @%}
Right Side Macro: {% CurrentDocument.ClassName == "Demo.Banner" @%}
Auto Hide Tab: True
Show New Button: True
New Page Type: Banner
Parent Node Alias Path: /Site-Objects/Banners
Selector Type: Tree Selector
Allowed Page Types: Banner
Display Name Format: {% BannerName %}
Hover Over/ToolTip: {% BannerText %}
Where Condition:
Starting Paths: /Site-Objects/Banners
Tree Selector Mode: Add Individually
[Save]
9. Click on the Demo UI element again and hit the + icon to add another UI element
 1. DisplayName: Quotes
Page Template: Edit Relationship
[Save]

2. Go to the Properties tab of this UI element
 - Relationship Name: Quotes
 - Allow Switch Sides: False
 - Max Relationships: Empty
 - Left Side Macro: {% CurrentDocument.ClassName != "Demo.Quote" @%}
 - Right Side Macro: {% CurrentDocument.ClassName == "Demo.Quote" @%}
 - Auto Hide Tab: True
 - Show New Button: False
 - Selector Type: Uni Selector
 - Allowed Page Types: Banner
 - Display Name Format: {% NodeName %}
 - Hover Over/ToolTip: Author: {% QuoteAuthor %}, Text: {% QuoteText %}
 - Where Condition:
 - Object Site Name: #current
 - Additional Columns: QuoteName, QuoteAuthor, QuoteText
 - Search Columns: QuoteName, QuoteAuthor, QuoteText
 - Tree Selector Mode: Add Individually
 - [Save]

Relate Banners / Quotes to Page

1. Go to Pages in the Kentico Menu and create a new page under the Root node.
2. Name: "Relationship Test" and click "Create a blank page" so it creates an ad-hoc template.
3. Go to the new Demo tab (right of Properties) and go to Banners
 1. Add the 3 banners by clicking on them.
 2. Drag the Banner 3 to the first position
 1. Also, hover over the Banners and you'll see the Sample Text
4. Go to the Quotes tab next
 1. Hit "Select"
 2. Search for "Jesus" and only the Golden Rule will show (filtering by additional columns)
 3. Hover over the element to see the Author and text
 4. Select all 3 Quotes, and again you can hover and see the text. You can delete and re-add if you wish.
5. FOR PORTAL: Click on the Design Tab
 1. Add a Repeater (for the banners)
 1. Web part Control ID: Banner
 - Path: /%
 - Page Type: Demo.Banner
 - Transformation: New Text/XML (<p>{% BannerName %}: {% BannerText %}</p>)
 - Main Page: Display Pages Related to the Current Page
 - Main page is on the left side: True
 - Relationship Name: Banners
 - [Save and close]
 2. You'll now see the 3 banners with Banner 3 first (the order that you set)
 2. Add a repeater (For the quotes)

1. Web part Control ID: Quotes
 Path: /%
 Page Type: Demo.Quote
 Order By: NewID() (random ordering)
 Transformation: New Text/XML (<p>"{%QuoteText%}" ~{%QuoteAuthor%}</p>)
 Main Page: Display Pages Related to the Current Page
 Main page is on the left side: True
 Relationship Name: Quotes
 Cache Minutes: 0
 Partial Cache Minutes: 0

2. Now you'll see the Quotes you have selected randomized

6. FOR MVC

1. To retrieve banners:

```
new DocumentQuery("Demo.Banner").InRelationWith(TheCurrentNodeGUID, "Banners", RelationshipSideEnum.Left)
```
2. To retrieve Quotes:

```
new DocumentQuery("Demo.Quote").InRelationWith(TheCurrentNodeGUID, "Quotes", RelationshipSideEnum.Left).OrderBy("NEWID()")
```

Node Categories – Using CMS.TreeCategory

This demo assumes you have performed the Create Relationships demo and will leverage the Banners and Quotes that were created during it.

1. Go to Categories in the Kentico Menu
 1. Create a new Category directly under “Categories”
 Category Name: Regions
 2. Under the Regions Category, add “Global” “USA” and “Canada” (with matching CodeNames)
2. Go to Modules in the Kentico Menu and edit the Demo Module
 1. Go to the User Interface tab
 2. Go to CMS → Administration → Content Management → Pages → Edit → Demo (click on Demo)
 3. Hit the + symbol to add a new UI
 Display Name: Regions
 Page Template: Edit Categories
 [Save]
 4. Go to the Properties Tab
 Root Category: Regions
 Display Mode: Searchable List
 Minimum Categories: 1
 Maximum Categories: (leave empty)
 Save Mode: Set Node Categories
3. Go to the Pages UI, navigate under your Site-Objects/Banners, and select Banner 1
4. Under the Demo tab, select the new Regions
 Select Global and Save
5. Select Banner 2, and under the Regions tab select USA
6. Select Banner 3, and under the Regions tab select Canada

7. FOR PORTAL

1. Go to the Test Page and click on the Design Tab
2. Edit the Banner Repeater
Where Condition: Hit the Black arrow to enter Macro mode, then put in
`{% RelHelper.GetNodeCategoryWhere("USA,Global") @%}`
[Save]
3. You will now see only the banners that had either Global or USA (so Banner 3 no longer is showing)

8. For MVC

1. `new DocumentQuery("Demo.Banner").InRelationWith(TheCurrentNodeGUID, "Banner", RelationshipSideEnum.Left).Where(RelHelper.GetNodeCategoryWhere(new string[] { "Global", "USA" }));`

Node Categories – Using custom Join Table

This demo assumes you have performed the Create Relationships demo and will leverage the Banners and Quotes that were created during it.

Preparations: Creation of Node-to-Category Joining table

1. Go to Modules in the Kentico Menu and Edit the Demo Module [Created earlier]
2. Go to the Classes Tab and create a new class
 1. Class display Name: Node Regions
Namespace: Demo
Class: NodeRegion
[Next]
 2. Table Name: Demo_NodeRegion
Primary Key Name: NodeRegionID
Is M:N table: false
Include NodeRegionGuid field: False
Include NodeRegionLastModified field: False
[Next]
 3. Add a new field:
Field name: NodeID
Data Type: Integer number
Required: True
Reference to: Node
Reference Type: Binding
Field Caption: Node
[Save]
 4. Add a new field:
Field name: RegionCategoryID
Data Type: Integer number
Required: True
Reference to: Content Category
Reference Type: Binding
Field Caption: Region Category
[Save]
 5. [Next], [Finish]

6. Go to the Code Tab, and hit [Save Code]
 1. Recommended that you store your Module Classes in a Class Library project.
<https://docs.kentico.com/k12/custom-development/creating-custom-modules#Creatingcustommodules-Compilingmodulecodeintoassemblies>
 2. You should ensure that your Binding class works properly with Kentico staging, please see [Enabling Staging on Node-to-Object Bindings](#)

Adding the custom Node-Category UIs

1. Go back to the Demo Module, and click on the “User Interface” tab
 1. Go to CMS → Administration → Content Management → Pages → Edit → Demo
 1. If you do not have a Demo from the previous examples, create one with a Page Template of Vertical Tabs
 2. Add a new User Interface under Demo
Display Name: Regions (Custom Binding)
Page template: Edit Categories
[Save]
 3. In the Properties tab of this new UI Element
Root Category: Regions
Display Mode: Tree Structure
Expand to Nth Level: 1
Only Leafs Selectable: True
Parent Selects Children: True
Minimum Categories: 1
Maximum Categories: (blank)
Save Mode: To Joining Table
This Object Foreign Key: NodeID
Foreign Key Source: Current Page
Join Table Code Name: Demo.NodeRegion
Join Table Left Field Name: NodeID
Join Table Right Field Name: RegionCategoryID
Field Save Type: Category Ids
[Save]
 4. [Optional] Since we want a minimum of 1 category, we need to also add a Field without Database representation on the Form itself so when they add a new item, it forces them to also add a Category. You do not need to have this unless you want to ensure at least 1 is selected.
 1. Go to Page Types and Edit Banner Page Type
 2. Go to Fields, and Add a new Field
Field Type: Field without database representation
Field Name: BannerRegions
Data Type: Text
Size: 200
Field Caption: Banner Regions
Form Control: Advanced Category Selector (RE)
[Hit the Advanced under the Editing control settings]
Root Category: Regions
Display Mode: Tree Structure
Expand to Nth Level: 1
Only Leafs Selectable: True

Parent Selects Children: True
Minimum Categories: 1
Maximum Categories: (blank)
Save Mode: To Joining Table
This Object Foreign Key: NodeID
Foreign Key Source: Current Page
Join Table Code Name: Demo.NodeRegion
Join Table Left Field Name: NodeID
Join Table Right Field Name: RegionCategoryID
Field Save Type: Category Ids
[Save]

Testing

1. Go to Pages in the Kentico Menu, and navigate to the Site Objects → Banners
2. Create a new Banner
Name: Banner 4
Banner Text: Sample Text 4
3. Attempt to save without setting regions, you will see it won't let you save unless you have at least 1 region.
4. Add USA to the Regions, and Save
5. Go to the Demo UI Tab and select Regions (Custom Binding)
6. Attempt to remove the USA Category, again you will see it requires at least 1
7. Select USA and Global and hit Set Categories
8. Back on the Form Tab you'll see the Banner Regions is showing the 2 categories.
9. PORTAL
 1. Go to the Test Page's Design Tab, and Edit the Banners Repeater
WHERE Condition: {% RelHelper.GetBindingCategoryWhere("Demo.NodeRegion", "NodeID", "NodeID", "RegionCategoryID", "USA,Global") @%}
Relationship: Do not use Relationships (May have been set from previous demo)
10. MVC:

```
new DocumentQuery("Demo.Banner").Where(RelHelper.GetBindingCategoryWhere("Demo.NodeRegion", "NodeID", "NodeID", "RegionCategoryID", new string[] { "USA", "Global" }));
```

Binding Object to Object with Ordering

Preparations: Create 2 Object Classes with CRUD UI, and Binding Class

1. Go to Modules in the Kentico Menu and edit the Demo Module
2. Go to the Classes Tab and create a new class
 1. Class display Name: Foo
Namespace: Demo
Class: Foo
[Next]
[Next]
 2. Add a new Field
Field name: FooDisplayName
Data Type: Text

Size: 200
Required: True
Field Caption: Foo Name
[Save]

3. Add a new Field

Field name: FooCodeName
Data Type: Text
Size: 200
Required: True
Unique: True
Field Caption: Code Name
Form Control: Code Name
Require Identifier Format: True
[Save]

4. [Next], [Finish]

5. Go to the Code Tab, and hit [Save Code]

1. Recommended that you store your Module Classes in a Class Library project.
<https://docs.kentico.com/k12/custom-development/creating-custom-modules#Creatingcustommodules-Compilingmodulecodeintoassemblies>
2. You should ensure that your Binding class works properly with Kentico staging, please see
<https://docs.kentico.com/k12/custom-development/creating-custom-modules/setting-the-type-information-for-module-classes/enabling-export-and-staging-for-the-data-of-classes#Enablingexportandstagingforthedataofclasses-Enablingstagingsupport>

3. Go to the Classes Tab and create a new class

1. Class display Name: Bar

Namespace: Demo
Class: Bar
[Next]
[Next]

2. Add a new Field

Field name: BarDisplayName
Data Type: Text
Size: 200
Required: True
Field Caption: Bar Name
[Save]

3. Add a new Field

Field name: BarCodeName
Data Type: Text
Size: 200
Required: True
Unique: True
Field Caption: Code Name
Form Control: Code Name
Require Identifier Format: True
[Save]

4. [Next], [Finish]

5. Go to the Code Tab, and hit [Save Code]
 1. Recommended that you store your Module Classes in a Class Library project.
<https://docs.kentico.com/k12/custom-development/creating-custom-modules#Creatingcustommodules-Compilingmodulecodeintoassemblies>
 2. You should ensure that your Binding class works properly with Kentico staging, please see
<https://docs.kentico.com/k12/custom-development/creating-custom-modules/setting-the-type-information-for-module-classes/enabling-export-and-staging-for-the-data-of-classes#Enablingexportandstagingforthedataofclasses-Enablingstagingsupport>
4. Go to the Classes Tab and create a new class
 1. Display Name: Foo Bars
Namespace: Demo
Class: FooBar
[Next]
 2. Is M:N Table: False
Include FooBarGuid Field: False
Include FooBarLastModified Field: False
[Next]
 3. Add a new Field
Field Name: FooID
Data Type: Integer Number
Required: True
Reference to: ObjectType.Demo_foo
Reference type: Binding
Field Caption: Foo
[Save]
 4. Add a new Field
Field Name: BarID
Data Type: Integer Number
Required: True
Reference to: ObjectType.Demo_bar
Reference type: Binding
Field Caption: Bar
[Save]
 5. Add a new Field
FieldName: FooBarOrder
Data Type: integer Number
Required: True
Field Caption: Order
[Save]
 6. [Next], [Finish]
 7. Go to the Code Tab, and hit [Save Code]
 1. Recommended that you store your Module Classes in a Class Library project.
<https://docs.kentico.com/k12/custom-development/creating-custom-modules#Creatingcustommodules-Compilingmodulecodeintoassemblies>
 2. You should ensure that your Binding class works properly with Kentico staging, please see
<https://docs.kentico.com/k12/custom-development/creating-custom-modules/setting-the-type-information-for-module-classes/enabling-export-and-staging-for-the-data-of-classes#Enablingexportandstagingforthedataofclasses-Enablingstagingsupport>

5. Go to the User Interfaces tab on the Demo Module

1. Navigate to CMS → Administration → Custom [click on Custom]

2. Create a new User Interface

1. Display Name: Foo

Page Template: Object Listing

[Save]

2. Go to the Properties Tab

Object type: ObjectType.demo_foo

[Save]

3. Create a UniGrid XML in the App_Data\CMSModules\Demo\UI\Grids\Demo_Foo\default.xml

```
<grid>
  <actions parameters="FooID">
    <action name="edit" caption="$general.edit$" fonticonclass="icon-edit" fonticonstyle="allow" />
    <action name="#delete" caption="$general.delete$" fonticonclass="icon-bin" fonticonstyle="critical"
confirmation="$general.confirmdelete$" />
  </actions>
  <columns>
    <column source="FooDisplayName" caption="Name" wrap="false" />
    <column cssclass="filling-column" />
  </columns>
  <objecttype name="demo.foo" />
  <options></options>
</grid>
```

3. Click on the Foo UI element you just made, and add a new UI element under it

1. Display Name: New Foo

Page Template: New/Edit Object

[Save]

4. Click on the Foo UI Element you made, and add a new UI element under it

1. Display Name: Edit Foo

Page Template: Vertical Tabs

[Save]

2. Go to the properties tab

Display Breadcrumbs: True

[Save]

5. Click on the Edit Foo UI Element you just made, add a new UI Element under it

1. Display Name: General

Code Name: Foo_General

Page Template: New/Edit Object

[Save]

6. Click on the Custom UI Element and add a new UI Element under it

1. Display Name: Bar

Page Template: Object Listing

[Save]

2. Go to the Properties Tab

Object Type: ObjectType.Demo_Bar

[Save]

3. Create a UniGrid XML Definition in the App_Data\CMSModules\Demo\UI\Grids\Demo_Bar\default.xml

```
<grid>
  <actions parameters="BarID">
    <action name="edit" caption="$general.edit$" fonticonclass="icon-edit" fonticonstyle="allow" />
    <action name="#delete" caption="$general.delete$" fonticonclass="icon-bin" fonticonstyle="critical"
confirmation="$general.confirmdelete$" />
  </actions>
  <columns>
    <column source="BarDisplayName" caption="Name" wrap="false" />
    <column cssclass="filling-column" />
  </columns>
  <objecttype name="demo.bar" />
  <options></options>
</grid>
```

7. Click on the Bar UI element you just created and add a new UI Element under it

1. Display Name: New Bar
Page Template: New/Edit Object
[Save]

8. Click on the Bar UI Element you just created and add a new UI Element under it

1. Display Name: Edit Bar
Page Template: New/Edit Object
[Save]
2. Go to the Properties Tab
Display Breadcrumbs: True
[Save]

Add Ordering to Binding class

1. In Visual Studios, open your FooBarInfo.cs file

1. In the New ObjectTypeInfo declaration, add these properties

```
IsBinding = true,
OrderColumn = "FooBarOrder"
```

2. Override the TypeInfo's GetSiblingsWhereCondition

```
protected override WhereCondition GetSiblingsWhereCondition()
{
    return new WhereCondition(string.Format("FooID = {0}", this.FooID));
}
```

3. Implement the IOrderableBaseInfo, IBindingBaseInfo interfaces with these methods:

```
public void SetObjectOrder(int Order)
{
    Generalized.SetObjectOrder(Order);
    SetObject();
}
public void SetObjectOrderRelative(int PositionChange)
{
    Generalized.SetObjectOrder(PositionChange, true);
    SetObject();
}
public void MoveObjectUp()
{
    Generalized.MoveObjectUp();
    SetObject();
}
public void MoveObjectDown()
{
    Generalized.MoveObjectDown();
    SetObject();
}
public string ParentObjectReferenceColumnName()
{
    return "FooID";
}
```

```
public string BoundObjectReferenceColumnName()
{
    return "BarID";
}
```

2. In Visual Studios, open your FooBarInfoProvider.cs file

1. Adjust the SetFooBarInfoInternal method to set the Order if not present

```
protected virtual void SetFooBarInfoInternal(FooBarInfo infoObj)
{
    // Customization 1 - On Insert or update, check and set the Order
    if (ValidationHelper.GetInteger(infoObj.GetValue("FooBarOrder"), -1) <= 0)
    {
        infoObj.FooBarOrder = GetFooBars().WhereEquals("FooID", infoObj.FooID).Count + 1;
    }
    SetInfo(infoObj);
}
```

2. Adjust the DeleteFooBarInfoInternal method to reorder upon delete:

```
protected virtual void DeleteFooBarInfoInternal(FooBarInfo infoObj)
{
    DeleteInfo(infoObj);
    // Customization 2, on deletion re-order
    // Initialize Order, the infoObj should still exist in memory and only needed the Generalized portion
    infoObj.Generalized.InitObjectsOrder(null);
}
```

Add Binding UI

- Go to Modules in the Kentico Menu and edit the Demo module
- Go to the User Interfaces tab, and navigate to CMS → Administration → Custom → Foo → Edit Foo [Click on Edit Foo]
- Create a new UI Element under Edit Foo
 - Display Name: Bars
Page Template: Edit binding (Tree+Order Support)
[Save]
 - Go to the Properties Tab
Bind on Primary Node Only: False
Binding Object Type: ObjectType.Demo_FooBar
Target Object Type: ObjectType.Demo_Bar
Where Condition: FooID = {% Convert.ToInt(UIContext.ObjectID, 0) @%}
[Save]

Testing

- Go to Bar from the Kentico Menu, and add 3 Bar's (Bar 1, Bar 2, Bar 3)
- Go to Foo from the Kentico Menu, and add 3 Foo's (Foo 1, Foo 2, Foo 3)
- Edit the Foo 1, and go to the Bars tab
 - Add some Bars to the Foo 1
 - Order the Foo's
 - Try going to another Foo (Foo 2), and you'll see no bars, until you add them.
- PORTAL
 - You can find the Foo's with the given Bars using the Macro
{% RelHelper.GetBindingWhere("Demo.FooBar", "Demo.Bar", "FooID", "FooID", "BarID", "Bar2,Bar3") @%}
- MVC

1. You can find the Foo's with the given Bars using this

```
new ObjectQuery("Demo.Foo").Where(ReIHelper.GetBindingWhere("Demo.FooBar", "Demo.Foo", "FooID", "FooID", "BarID",  
new string[] { "Bar2", "Bar3" }));
```

Node to Object Binding w/ Ordering

This Demo assumes you have completed the Binding Object to Object with Ordering steps as it leverages Module classes and UI elements created within it.

Add Orderable binding object

1. Go to Modules in the Kentico menu, and edit the Demo module
2. On the classes tab, create a new class
 1. DisplayName: Node Foos
Namespace: Demo
Class: NodeFoo
[Next]
 2. Is M:N Table: False
Include NodeFooGuid field: False
Include NodeFooLastModified field: False
[Next]
 3. Add a new Field
Field Name: NodeID
Data Type: Integer number
Required: True
Reference to: Node
Reference Type: Binding
Field Caption: Node
[Save]
 4. Add a new Field
Field Name: FooID
Data Type: Integer number
Required: True
Reference To: ObjectType.Demo_Foo
Reference Type: Binding
Field Caption: Foo
[Save]
 5. Add a new Field
Field Name: NodeFooOrder
Data Type: Integer number
Required: True
Field Caption: Order
[Save]
 6. [Next], [Finish]
 7. Go to the Code Tab, and hit [Save Code]
 1. Recommended that you store your Module Classes in a Class Library project.
<https://docs.kentico.com/k12/custom-development/creating-custom-modules#Creatingcustommodules-Compilingmodulecodeintoassemblies>

2. You should ensure that your Binding class works properly with Kentico staging, please see [Enabling Staging on Node-to-Object Bindings](#)

8. In Visual Studios, open your NodeFooInfo.cs file

1. In the New ObjectTypeInfo declaration, add these properties

```
IsBinding = true,  
OrderColumn = "FooBarOrder"
```

2. Override the TypeInfo's GetSiblingsWhereCondition

```
protected override WhereCondition GetSiblingsWhereCondition()  
{  
    return new WhereCondition(string.Format("FooID = {0}", this.FooID));  
}
```

3. Implement the IOrderableBaseInfo, IBindingBaseInfo interfaces with these methods

```
public void SetObjectOrder(int Order)  
{  
    Generalized.SetObjectOrder(Order);  
    SetObject();  
}  
public void SetObjectOrderRelative(int PositionChange)  
{  
    Generalized.SetObjectOrder(PositionChange, true);  
    SetObject();  
}  
public void MoveObjectUp()  
{  
    Generalized.MoveObjectUp();  
    SetObject();  
}  
public void MoveObjectDown()  
{  
    Generalized.MoveObjectDown();  
    SetObject();  
}  
public string ParentObjectReferenceColumnName()  
{  
    return "NodeID";  
}  
public string BoundObjectReferenceColumnName()  
{  
    return "FooID";  
}
```

1. In Visual Studios, open the NodeFooInfoProvider.cs file

1. Adjust the SetNodeFooInfoInternal method to set the Order if not present

```
protected virtual void SetNodeFooInfoInternal (NodeFooInfo infoObj)  
{  
    // Customization 1 - On Insert or update, check and set the Order  
    if (ValidationHelper.GetInteger(infoObj.GetValue("NodeFooOrder "), -1) <= 0)  
    {  
        infoObj.NodeFooOrder = GetNodeFoos().WhereEquals("NodeID ", infoObj.NodeID).Count + 1;  
    }  
    SetInfo(infoObj);  
}
```

2. Adjust the DeleteNodeFooInfoInternal method to reorder upon delete

```
protected virtual void DeleteNodeFooInfoInternal(NodeFooInfo infoObj)  
{  
    DeleteInfo(infoObj);  
    // Customization 2, on deletion re-order  
    // Initialize Order, the infoObj should still exist in memory and only needed the Generalized portion  
    infoObj.Generalized.InitObjectsOrder(null);  
}
```

Add UI Element

1. Go to Modules in Kentico and edit the Demo Module

2. Go to the User Interfaces and navigate to CMS → Administration → Content Management → Pages → Edit → Demo (click on Demo)
3. Add a new UI Element
Display Name: Foos
Page Template: Edit Bindings (Tree+Order Support)
[Save]
4. Go to the Properties Tab
Object type: Node
Bind on Primary Node Only: True
Binding object type: ObjectType.demo_nodefoo
Target Object type: ObjectType.demo_foo
Where condition: NodeID = {% Convert.ToInt(QueryString.NodeID, -1) %}
[Save]

Testing

1. Go to the Pages within Kentico
2. Click on your Test Page
3. Under the Demo tab, select Foos

Node to Object Binding w/out Ordering

This Demo assumes you have completed the Binding Object to Object with Ordering steps as it leverages Module classes and UI elements created within it.

Preparations: Create Baz class and Node-Baz binding class

1. Go to Modules in the Kentico Menu and edit the Demo Module
2. Go to Classes and Create a new Class
 1. Display Name: Baz
Namespace: Demo
Code Name: Baz
[Next]
[Next]
 2. Add a new Field:
Field name: BazDisplayName
Data Type: Text
Size: 200
Required: True
Field Caption: Name
[Save]
 3. Add a new Field:
Field name: BazCodeName
Data Type: Text
Size: 200
Required: True
Field Caption: Code Name
Form control: Code name
[Save]

4. [Next] [Finish]
5. Go to the Code Tab, and hit [Save Code]
 1. Recommended that you store your Module Classes in a Class Library project.
<https://docs.kentico.com/k12/custom-development/creating-custom-modules#Creatingcustommodules-Compilingmodulecodeintoassemblies>
 2. You should ensure that your Binding class works properly with Kentico staging, please see
<https://docs.kentico.com/k12/custom-development/creating-custom-modules/setting-the-type-information-for-module-classes/enabling-export-and-staging-for-the-data-of-classes#Enablingexportandstagingforthedataofclasses-Enablingstagingsupport>
3. Go to the Classes and Create a new Class
 1. Display Name: Node Bazs
Namespace: Demo
Class: NodeBaz
[Next]
 2. Is M:N table: False
Include NodeBazGuid field: False
Include NodeBazLastModified field: False
[Next]
 3. Create a new Field
Field Name: NodeID
Data Type: Integer number
Required: True
Reference to: Node
Reference type: Binding
Field Caption: Node
[Save]
 4. Create a new Field
Field Name: BazID
Data Type: Integer number
Required: True
Reference to: ObjectType.Demo_Baz
Reference type: Binding
Field Caption: Baz
[Save]
5. [Next] [Finish]
6. Go to the Code Tab, and hit [Save Code]
 1. Recommended that you store your Module Classes in a Class Library project.
<https://docs.kentico.com/k12/custom-development/creating-custom-modules#Creatingcustommodules-Compilingmodulecodeintoassemblies>
 2. You should ensure that your Binding class works properly with Kentico staging, please see [Enabling Staging on Node-to-Object Bindings](#)
7. In Visual Studios, open the NodeBazInfo.cs class, and add to the new ObjectTypeInfo:
IsBinding = `true`
4. Go to the User Interface tab
5. Navigate to CMS → Custom, click on Custom

6. Add a new User Interface
 1. Display Name: Baz
Page Template: Object Listing
[Save]
 2. Properties
Object Type: ObjectType.Demo_Baz
[Save]
7. Add a new User Interface beneath the Baz one you just created
 1. Display Name: New Baz
Code name: NewBaz
Page Template: New / Edit Object
[Save]
8. Add a new User Interface beneath the Baz one you created
 1. Display Name: Edit Baz
Code Name: EditBaz
Page Template: New / Edit Object
[Save]
 2. Go to the properties tab
Display Breadcrumbs: True
9. Create a UniGrid XML Definition at /App_Data/CMSModules/Demo/UI/Grids/Demo_Baz/default.xml


```
<grid>
  <actions parameters="BazID">
    <action name="edit" caption="$general.edit$" fonticonclass="icon-edit" fonticonstyle="allow" />
    <action name="#delete" caption="$general.delete$" fonticonclass="icon-bin" fonticonstyle="critical"
confirmation="$general.confirmdeldelete$" />
  </actions>
  <columns>
    <column source="BazDisplayName" caption="Name" wrap="false" />
    <column cssclass="filling-column" />
  </columns>
  <objecttype name="demo.baz" />
  <options></options>
</grid>
```

Add UI Element

1. In the Demo Module, go to User Interface
2. Navigate to CMS → Administration → Content management → Pages → Edit → Demo (Click on Demo)
3. Create a new User Interface
 1. Display Name: Bazs
Page Template: Edit bindings (Tree+Order Support)
[Save]
 2. Go to the properties tab
Object Type: Node (cms.node)
Bind on Primary Node Only: True
Binding Object Type: ObjectType.Demo_NodeBaz
Target Object type: ObjectType.Demo_Baz
Where condition: NodeID = {% Convert.ToInt(QueryString.NodeID, 0) @} %}
[Save]

Testing

1. Go to the Baz in the Kentico Menu
 1. Create 3 Bazes (Baz 1, Baz 2, Baz 3)
2. Go to the Pages and click on your test page
3. Go to the Demo tab → Bazes
 1. Add a couple Bazes
 2. Remove a couple
 3. Click on another page and you can add more Baz there
4. PORTAL:
 1. You can find the Nodes with the given Bazes using the Macro
`{% RelHelper.GetBindingWhere("Demo.NodeBaz", "demo.baz", "NodeID", "NodeID", "BazID", "Baz2,Baz3") %}`
 2. You can get the given Node's Baz's through a simple where condition of
BazID in (Select BazID from Demo_NodeBaz where NodeID = '{% CurrentDocument.NodeID %}')
5. MVC
 1. You can find the Nodes with the given Bars using this
`new DocumentQuery().Where(RelHelper.GetBindingWhere("Demo.NodeBaz", "demo.baz", "NodeID", "NodeID", "BazID", new string[] { "Baz2", "Baz3" }));`
 2. You can find the Baz's for the given NodeID using
`BazInfoProvider.GetBazes().WhereIn("BazID", NodeBazInfoProvider.GetNodeBazes().WhereEquals("NodeID", TheNodeID).Select(x => x.BazID).ToList());`

OR

```
BazInfoProvider.GetBazes().Where(string.Format("BazID in (Select BazID from Demo_NodeBaz where NodeID = {0})", NodeID));
```

Enabling Staging on Node-to-Object Bindings

While normal object to object bindings can be easily staged with their parent through setting the Synchronization Settings properly on the TypeInfo, binding to a parent Node requires manual handling. Below are the steps to enable Staging on Bound objects (such as Node Regions or Node Baz).

Preparations: Add InitializationModule

1. Create a new file at App_Code/CMSModules/Demo/DemoInitializationModule.cs

```
using CMS;
using CMS.Base;
using CMS.DataEngine;
using CMS.DocumentEngine;
using CMS.Synchronization;
using Demo;
using System.Data;
using System.Linq;
using CMS.EventLog;
using System.Collections.Generic;
using RelationshipsExtended;
using CMS.Taxonomy;
[assembly: RegisterModule(typeof(DemoInitializationModule))]
public class DemoInitializationModule : Module
{
    public DemoInitializationModule() : base("DemoInitializationModule") { }
    protected override void OnInit()
    {
        base.OnInit();
    }
}
```

```

    // Custom Items here
}
}

```

Set Staging Settings to bind objects to Document

By default, if you set the Binding object's SynchronizationSettings.LogSynchronization to SynchronizationTypeEnum.LogSynchronization, each time you add or remove a binding, an individual staging task is generated. This can be less than desirable though because you can't re-sync a node and its bindings, they are disconnected. The following section shows you how to make it where Node to object bindings will instead append their data to Document Update tasks, so when you push a document, it pushes all the relationships with it, and allows you to re-synchronize a node with its bound objects by simply resynchronizing that page.

Node Baz (Node to Object), Node Foo (Node to Object w/Order), Node Regions (Node to Object)

1. In Visual Studios, open the various info files (NodeBazInfo.cs, NodeFooInfo.cs, NodeRegionInfo.cs)

1. In the new ObjectTypeInfo declaration, add this:


```

SynchronizationSettings = {
    // Logging is handled separately
    LogSynchronization = SynchronizationTypeEnum.None
},

```

Trigger Document Updates on Binding Inset/Update/Delete

Node Baz & Node Regions (Node to Object w/out Binding)

1. Add the following to the DemoInitializationModule's OnInit();


```

// Manually Trigger document update staging task.
NodeBazInfo.TYPEINFO.Events.Insert.After += NodeBaz_Insert_Or_Delete_After;
NodeBazInfo.TYPEINFO.Events.Delete.After += NodeBaz_Insert_Or_Delete_After;

// Manually Trigger document update staging task.
NodeRegionInfo.TYPEINFO.Events.Insert.After += NodeRegion_Insert_Or_Delete_After;
NodeRegionInfo.TYPEINFO.Events.Delete.After += NodeRegion_Insert_Or_Delete_After;

```
2. Add the following methods to the DemoInitializationModule


```

private void NodeBaz_Insert_Or_Delete_After(object sender, ObjectEventArgs e)
{
    RelHelper.HandleNodeBindingInsertUpdateDeleteEvent(((NodeBazInfo)e.Object).NodeID, "demo.nodebaz");
}
private void NodeRegion_Insert_Or_Delete_After(object sender, ObjectEventArgs e)
{
    RelHelper.HandleNodeBindingInsertUpdateDeleteEvent(((NodeRegionInfo)e.Object).NodeID, "demo.noderegion");
}

```

Node Foo (Node to Object w/ Ordering)

1. Add the following to the DemoInitializationModule's OnInit();


```

// Manually Trigger document update staging task.
NodeFooInfo.TYPEINFO.Events.Insert.After += NodeFoo_Insert_Or_Update_Or_Delete_After;
NodeFooInfo.TYPEINFO.Events.Update.After += NodeFoo_Insert_Or_Update_Or_Delete_After;
NodeFooInfo.TYPEINFO.Events.Delete.After += NodeFoo_Insert_Or_Update_Or_Delete_After;

```
2. Add the following method to the DemoInitializationModule


```

private void NodeFoo_Insert_Or_Update_Or_Delete_After(object sender, ObjectEventArgs e)
{
    RelHelper.HandleNodeBindingInsertUpdateDeleteEvent(((NodeFooInfo)e.Object).NodeID, "demo.nodefoo");
}

```

Add Node-binding data to Document Staging Task Data

Note that in this example, we combined all 3 into one call, you should be able to understand the code and adjust as needed.

1. Add the following to the DemoInitializationModule's OnInit();


```

// Manually add items to Document Update task
StagingEvents.LogTask.Before += LogTask_Before;

```

2. Add the following method to the DemolInitializationModule

```
private void LogTask_Before(object sender, StagingLogTaskEventArgs e)
{
    RelHelper.UpdateTaskDataWithNodeBinding(e, new NodeBinding_DocumentLogTaskBefore_Configuration[]
    {
        new NodeBinding_DocumentLogTaskBefore_Configuration(new NodeBazInfo(), "NodeID = {0}"),
        new NodeBinding_DocumentLogTaskBefore_Configuration(new NodeFooInfo(), "NodeID = {0}"),
        new NodeBinding_DocumentLogTaskBefore_Configuration(new NodeRegionInfo(), "NodeID = {0}")
    });
}
```

Manually handle the Node to Object data on Task Processes

Note that in this example, we again combined all the items into a single method.

Please pay special attention to how the Node-to-Object binding with Ordering has additional logic

Make sure your target environment has this same Code files and database objects for it to processes properly.

1. Add the following to the DemolInitializationModule's OnInit()

```
// Manually handle the Staging Task and processes our Node bound objects
StagingEvents.ProcessTask.After += ProcessTask_After;
```

2. Add the following method to the DemolInitializationModule

```
private void ProcessTask_After(object sender, StagingSynchronizationEventArgs e)
{
    if (e.TaskType == TaskTypeEnum.UpdateDocument)
    {
        // First table is the Node Data
        DataTable NodeTable = e.TaskData.Tables[0];
        if (NodeTable != null && NodeTable.Columns.Contains("NodeGUID"))
        {
            // Get node ID
            TreeNode NodeObj = new DocumentQuery().WhereEquals("NodeGUID", NodeTable.Rows[0]["NodeGUID"]).FirstObject;
            // Don't want to trigger updates as we set the data in the database, so we won't log synchronizations
            using (new CMSActionContext() {LogSynchronization = false, LogIntegration = false})
            {
                #region "Node Baz (Node object w/out Ordering)"
                // Get NodeBaz and Handle
                List<int> BazIDs = RelHelper.NewBoundObjectIDs(e, "demo.nodebaz", "NodeID", "BazID", BazInfo.TYPEINFO);
                NodeBazInfoProvider.GetNodeBazes().WhereEquals("NodeID", NodeObj.NodeID).WhereNotIn("BazID",
                BazIDs).ForEachObject(x => x.Delete());
                List<int> CurrentBazIDs = NodeBazInfoProvider.GetNodeBazes().WhereEquals("NodeID", NodeObj.NodeID).Select(x =>
                x.BazID).ToList();
                foreach (int NewBazID in BazIDs.Except(CurrentBazIDs))
                {
                    NodeBazInfoProvider.AddTreeToBaz(NodeObj.NodeID, NewBazID);
                }
                #endregion
                #region "Node Region (Node object w/out Ordering)"
                // Get NodeRegion and Handle
                List<int> RegionCategoryIDs = RelHelper.NewBoundObjectIDs(e, "demo.nodeRegion", "NodeID", "RegionCategoryID",
                CategoryInfo.TYPEINFO);
                NodeRegionInfoProvider.GetNodeRegions().WhereEquals("NodeID", NodeObj.NodeID).WhereNotIn("RegionCategoryID",
                RegionCategoryIDs).ForEachObject(x => x.Delete());
                List<int> CurrentRegionCategoryIDs = NodeRegionInfoProvider.GetNodeRegions().WhereEquals("NodeID",
                NodeObj.NodeID).Select(x => x.RegionCategoryID).ToList();
                foreach (int NewRegionCategoryID in RegionCategoryIDs.Except(CurrentRegionCategoryIDs))
                {
                    NodeRegionInfoProvider.AddTreeToCategory(NodeObj.NodeID, NewRegionCategoryID);
                }
                #endregion
                #region "Node Foo (Node object with Ordering)"
                // Get NodeFoo and Handle
                List<int> FooIDInOrders = RelHelper.NewOrderedBoundObjectIDs(e, "demo.nodeFoo", "NodeID", "FooID",
                "NodeFooOrder", FooInfo.TYPEINFO);
                NodeFooInfoProvider.GetNodeFoods().WhereEquals("NodeID", NodeObj.NodeID).WhereNotIn("FooID",
                FooIDInOrders).ForEachObject(x => x.Delete());
                List<int> CurrentFooIDs = NodeFooInfoProvider.GetNodeFoods().WhereEquals("NodeID", NodeObj.NodeID).Select(x =>
                x.FooID).ToList();
                foreach (int NewFooID in FooIDInOrders.Except(CurrentFooIDs))
                {

```

```

        NodeFooInfoProvider.AddTreeToFoo(NodeObj.NodeID, NewFooID);
    }
    // Now handle the ordering
    for (int FooIndex = 0; FooIndex < FooIDInOrders.Count; FooIndex++)
    {
        int FooID = FooIDInOrders[FooIndex];
        NodeFooInfo CurrentObj = NodeFooInfoProvider.GetNodeFooInfo(NodeObj.NodeID, FooID);
        if (CurrentObj != null && CurrentObj.NodeFooOrder != (FooIndex + 1))
        {
            CurrentObj.SetObjectOrder(FooIndex + 1);
        }
    }
    #endregion
}
} else if (NodeTable == null || !NodeTable.Columns.Contains("NodeGuid"))
{
    EventLogProvider.LogEvent("E", "DemoProcessTask", "No Node Table Found", eventDescription: "First Table in the
incoming Staging Task did not contain the Node GUID, could not processes.");
}
}
}
}

```