

One Identity Manager

Web Designer and Web Portal Changes

This document provides an overview of changes in Web Designer and Web Portal in comparison to previous versions. It also provides assistance for migrating web projects from prior One Identity Manager versions.

Compiling web projects with customizations

To ensure the consistency of web project customizations made in prior versions, it is important to enable **enhanced checking** during compilation.

To enable enhanced checks, perform the following steps

1. Open Web Designer and connect to the database.
2. Open the **Connection > Settings** menu item.
3. Open the **Compiling and debugging** tab.
4. Check the box **Perform enhanced check**.
5. Close the dialog.
6. Compile the web project.
7. Open the **Tasks** tab and review the list of warnings and errors.

Updating web applications

NOTE:

- Starting with version 7.1 One Identity Manager includes a new full-text search engine for improved search performance. You must have an application server installed with the search service. For more information, see [Integrating full-text search](#) on page 12.
- Ensure that the application server is updated before you update the Web Portal.

To update the Web Portal to version 8.2

- To update the Web Portal automatically, connect to the monitoring site `http://<servername>/<application>/monitor` in a browser and start the web application update.
- To manually update the Web Portal, uninstall the existing Web Portal and install the Web Portal again.

For more information, see the *One Identity Manager Installation Guide*.

Changes in Web Designer and in Web Portal 8.0

This section provides an overview of changes in Web Designer and in Web Portal 8.0 in comparison to previous versions.

[General changes](#)

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[VI.WebRuntime.dll API changes](#)

[Changes to standard Web Portal components](#)

General changes

Change of UI component library

This version of the Web Portal ships without the Quest User Interface (QUI) framework.

While QUI was never part of the public API surface and was not intended to be called directly, any custom code that does call the QUI API must be rewritten.

Hyper Views

The contents of a Hyper View have historically been defined as Web Designer components (e.g. VI_Common_HyperView_Person). Because this has been the cause for code duplication and inconsistencies, the definition stored in the DialogTree table is now used directly for all Hyper Views displayed in the Web Portal. The definitions within the Web Designer components have been deleted.

However, the components themselves still exist. Any extensions should work as before. However, it is strongly recommended that you re-test any existing extension to Hyper View components.

Customizing CSS

The component VI_Styles_RendererSettings_Default stores most of the default CSS code. This component has changed as a consequence of product rebranding and the implementation of the mobile layout. Specifically, a lot of new CSS code supports mobile devices.

If you have a custom copy of this component, it is strongly recommended that you delete this custom copy and re-implement the changes using extensions.

As a general rule, this component should never be replaced, but only extended.

New grid control list view mode

The grid control now supports a new list view mode that supports mobile devices.

The grid control will render both table views and list views of the same data. Using CSS media queries, only one of the views is displayed at any given time, depending on the display size.

The list view mode can work in different ways, which can be defined on every grid.

- Automatic mode. In this mode, the control uses the column definitions to automatically create a list view.
- Manual mode. In this mode, you can explicitly define the contents of each list item, independently from the table view.
- Disabled mode. In this mode, the list view is not rendered.

If you need to disable list view mode globally for all grids, you can set the VI_Common_GridListViewDisabled configuration setting to **true**.

If you have defined any grid controls in custom code, or if you have made any modifications to existing grid controls, it is strongly recommended that you test the affected forms on mobile devices.

Secure Token Server

This version of Secure Token Server (STS) is a rebrand and is not backwards compatible. It contains breaking changes for any integrators.

The following is an overview of changed settings.

- Configuration Scope is now `urn:rsts:sts:config`.
- The OAuth2 scope for obtaining an Admin access token is now `rsts:sts:primaryproviderid:rsts`.
- Base type for Provider Configurations:
`RSts.Sts.ProviderConfiguration`
- Built-in Provider Configuration types:
`RSts.Sts.AzureConfiguration`
`RSts.Sts.DefenderCloudConfiguration`
`RSts.Sts.LdapConfiguration`
`RSts.Sts.RadiusConfiguration`
`RSts.Sts.ActiveDirectoryConfiguration`
- Base type for Claim Definitions:
`RSts.Sts.ClaimDefinition`
- Built-in Claim Definition types:
`RSts.Sts.RoleClaimDefinition`
`RSts.Sts.AttributeClaimDefinition`
- OData Configuration setting annotations:
`RSts.Sts.Required`
`RSts.Sts.Secret`
`RSts.Sts.Description`
- Login page CSS class name change to `.defenderCloudDiv`.
- Days until password expires claim type changed to `urn:rsts/daysUntilPasswordExpires`.
- Encrypted password claim type changed to `urn:rsts/encryptedPassword`.
- The Windows Service name changed to `RedistributableSecureTokenServer`.
- The Windows Event Log name changed to `Secure Token Server`.
- The Event Log Source names are `RSTS` and `RSTS Audit`. If you had written an `RSts.exe.config` file with `TraceListeners` in it, you would change to:
`<source name="RSTS" switchValue="All">`
and

- ```
<source name="RSTS Audit" switchValue="All">
```
- The Windows Performance Counter application category name changed to STS. And the providers category is just STS Providers.
  - The default value of the STS Issuer Name setting is urn:RSTS/identity.
  - The default SSL certificate (if one doesn't already exist) and Signing certificate is now CN=Redistributable STS Demo.

## Default.aspx

The file Default.aspx is no longer being installed. Any bookmarks that directly point to this file are no longer valid.

This change has been made because the software updating mechanism cannot manage updates for this file.

## Web SQL database search functions

The Web SQL `sqlsearch` functions are used to build `WHERE` clauses to filter a table by a search query. In the past, these filters were always evaluated by the database server. These functions now use the external search index where available.

The search results may be slightly different due to syntax differences between SQL and Lucene. The database filter functionality is only provided as a fallback and should be considered deprecated.

It is recommended to index all columns that were previously used in `sqlsearch` functions. To do this, set the **Index weighting** property on the column using the Designer tool.

### SqlSearch used on a table

If at least one column of the specified table is indexed, then the search index is queried. Otherwise, the table is filtered on the database server using a `LIKE` query, using the columns that are part of the table's display pattern. The search column configuration in Web Designer is not used anymore.

### SqlSearch used on a column

If the column is indexed, then the search index is queried. Otherwise, the SQL Server will filter the database using a `LIKE` query.

It is advised to test any usages of the `sqlsearch` functions in custom code after migration

## Web control: VI.WebRuntime.WebControls.GridBlock

The GridRowAlternateCssClass property has been removed. All current browsers support flexible styling of odd or even rows. The default value for this property was **GridRowAlternate**.

Replace any styles associated with this CSS class with CSS rules using the appropriate pseudo-class:

```
.Grid tr:nth-child(odd) { /* insert rules for odd rows */ }
.Grid tr:nth-child(even) { /* insert rules for even rows */ }
```

## Using the rebranding helper tool

Because of rebranding requirements, some identifiers used by the web controls and the Web Portal have changed:

- CSS class names
- HTML attribute names
- Javascript API names
- URL parameter names

As a general rule, the product now uses the **imx** prefix to identify One Identity Manager specific declarations.

There is a command-line tool that changes the identifiers in a web project. To use the tool, the web project must exist in a folder structure. The tool is called `WebDesigner.RebrandingHelper.exe` and is provided in the `QBM\dvd\AddOn\RebrandingHelper` folder. It does not need to be installed.

### To preview the changes

- Use the **P** keyword (for preview), such as:  
`WebDesigner.RebrandingHelper.exe "c:\some\path" "xml" "" P`

### To change the files

- Run the same command again using the **C** keyword (for change):  
`WebDesigner.RebrandingHelper.exe "c:\some\path" "xml" "" C`

## Known Issues

### Known issue with using the menu control in the Web Designer preview

When the mouse hovers over a main menu item, the item's child menu opens. In the Web Designer preview, the user has to click on the item to open the sub menu instead.

The background and foreground colors of the menu also show slight differences. Furthermore, opening one menu does not reliably close the other menu items.

This bug only occurs when using the Web Designer preview browser. A stand-alone Internet Explorer and all other supported browsers do not exhibit this bug. This is a bug in a third-party component.

## VI.WebRuntime.dll API changes

The following public classes have been removed from the public API of VI.WebRuntime.dll.

- The namespaces VI.WebRuntime.Data.History and VI.WebRuntime.Data.UiAction have been moved to the Composition API, and renamed to QBM.CompositionApi.History and QBM.CompositionApi.UiAction respectively.
- The VI.WebRuntime.WebControls.ReportControl class has been removed. Any code that directly uses this class should use VI.WebRuntime.WebControls.ReportMobileControl instead.
- The VI.WebRuntime.DbObjectSaveInfo class has been removed. It was only intended for internal use.

## Changes to standard Web Portal components

### Removed components

| Component name          | Remarks           |
|-------------------------|-------------------|
| VI_BookmarksMenu_Mobile | Not used anymore. |
| VI_OptionsMenu          | Not used anymore. |

# Changed components

## **VI\_Employee\_Edit and VI\_Employee\_PreEdit**

The VI\_Employee\_Edit component is now used for creation of new employees only. If a VID\_Person parameter of an existing person is passed to this component, the component will redirect to VI\_Common\_ObjectSheet\_Person.

Any extensions to VI\_Employee\_Edit that should affect existing employee records must be moved/copied to VI\_Employee\_EditMasterData or VI\_Common\_ObjectSheet\_Person.

The VI\_Employee\_PreEdit component is only called for new Person objects.

## **VI\_ITShop\_AnswerQuestions**

A new isRequest parameter has been added to distinguish between IT Shop and attestation inquiries. Add this parameter to any custom usages of this module.

# Deprecated components

The following Web Designer components should be considered deprecated. They may be removed in a future version.

- VI\_Common\_HyperView\_ShapePerObject
- VI\_Common\_HyperView\_ShapeList

# Removed virtual functions

These virtual functions have been removed. You can safely remove any mapping that refers to one of these functions.

| Component                       | Virtual function                                                | Remarks                                                      |
|---------------------------------|-----------------------------------------------------------------|--------------------------------------------------------------|
| VI_Common_PropertyEditor        | LayoutPanelLayoutName()<br>ColumnCount()                        | These properties are no longer useful and have been removed. |
| VI_Common_PropertyViewer        | LayoutPanelLayoutName()<br>ColumnCount()                        | These properties are no longer useful and have been removed. |
| VI_Interfaces_ColumnEditor_Edit | DisplayAsLinkOnly()                                             | This property was out of use.                                |
| VI_ITShop_ProlongateOrCancel    | CanNavigateBack()<br>IsForCancellation()<br>IsForProlongation() | These properties were out of use.                            |

## Removed virtual nodes

| Component                    | Node identifier |
|------------------------------|-----------------|
| VI_ITShop_ProlongateOrCancel | NavigateBack    |
| QBM_FormTemplate_Base        | ContentMobile   |

## Removed virtual collections

These virtual collections have been removed. You can safely remove any mapping collections that refer to these collections.

| Component                | Collection name | Remarks                    |
|--------------------------|-----------------|----------------------------|
| VI_ITShop_DirectDecision | PWODecisionStep | Changed to QERWorkingStep. |

## Removed virtual properties

| Component                | Property            | Remarks                        |
|--------------------------|---------------------|--------------------------------|
| VI_ITShop_DirectDecision | uid_pwodecisionstep | Renamed to uid_qerworkingstep. |

## Added virtual properties

| Component                              | Property        | Remarks                                                                      |
|----------------------------------------|-----------------|------------------------------------------------------------------------------|
| VI_Attestation_History_Filter          | headline        | This property should contain the title to be displayed within the component. |
| VI_Compliance_ExceptionApproval_Filter |                 |                                                                              |
| VI_ITShop_OrderHistory_Filter          |                 |                                                                              |
| VI_QERPolicy_ExceptionApproval_Filter  |                 |                                                                              |
| VI_Roles_RoleAssignmentNew             | objectkeyparent | This property should contain the object key of the owner object.             |

## Removed configuration keys

The following configuration keys have been removed

- VI\_Common\_DarkIcons
- VI\_ITShop\_FieldsInOverview

The following configuration keys manage colors that are not used in the rebranded design.  
Any customizations to one of these keys will be lost.

- VI\_Common\_Color\_DarkGray
- VI\_Common\_Color\_Blue\_4
- VI\_Common\_Color\_Blue\_5
- VI\_Common\_Color\_Blue\_6
- VI\_Common\_Color\_Blue\_7
- VI\_Common\_Color\_Blue\_8
- \*\_Color\_Palette\_Blue\_Dark
- \*\_Color\_Palette\_Blue\_Med
- \*\_Color\_Palette\_Blue\_Bright
- \*\_Color\_Palette\_Blue\_Tile\_BG
- \*\_Color\_Palette\_Blue\_Rollover
- \*\_Color\_Palette\_Gray\_Light
- \*\_Color\_Palette\_Gray\_ButtonOrBG
- \*\_Color\_Palette\_Gray\_Inactive
- \*\_Color\_Palette\_Gray
- \*\_Color\_Palette\_Gray\_Med
- \*\_Color\_Palette\_Gray\_Dark\_Alerting
- \*\_Color\_Palette\_Gray\_Dark\_Panel
- \*\_Color\_Palette\_Gray\_Dark
- \*\_Color\_Palette\_Gray\_Framework
- \*\_Color\_Palette\_Gray\_Darkest

## Changed configuration keys

The following keys have been renamed.

| <b>Old name</b>        | <b>New name</b>    |
|------------------------|--------------------|
| *_Color_Palette_Violet | QBM_Primary_Violet |
| *_Color_Palette_Red    | QBM_Primary_Red    |
| *_Color_Palette_Orange | QBM_Primary_Orange |
| *_Color_Palette_Yellow | QBM_Primary_Yellow |
| *_Color_Palette_Green  | QBM_Primary_Green  |
| *_Color_Palette_Blue_* | QBM_Primary_Blue   |
| *_Color_Palette_White  | QBM_Primary_White  |
| *_Color_Palette_Black  | QBM_Primary_Black  |
| *_Color_Palette_Gray   | QBM_Primary_Gray   |

## Changes in Web Designer and in Web Portal 7.1

This section provides an overview of changes in Web Designer and in Web Portal 7.1 in comparison to previous versions.

- [Updating assembly bindings to One Identity Manager version 7.1](#)
- [Integrating full-text search](#)
- [General changes](#)
- [Changes to standard objects](#)
- [VI.WebRuntime.dll API changes](#)

## Updating assembly bindings to One Identity Manager version 7.1

This section applies only if you did not install a new web application using the One Identity Manager installation tool. For more information, see [Updating web applications](#) on page 2.

If you did not install a new web application using the One Identity Manager installation tool, it is necessary to edit any existing web applications' web.config file when upgrading to version One Identity Manager 7.1.

Open the web.config file in a text editor and insert the following text beneath the tag

<assemblyBinding>:

<dependentAssembly>

```

<assemblyIdentity name="System.Web.Http" publicKeyToken="31bf3856ad364e35"
culture="neutral" />
<bindingRedirect oldVersion="0.0.0.0-5.2.2.0" newVersion="5.2.3.0" />
</dependentAssembly>
<dependentAssembly>
<assemblyIdentity name="System.Net.Http.Formatting"
publicKeyToken="31bf3856ad364e35" culture="neutral" />
<bindingRedirect oldVersion="0.0.0.0-5.2.2.0" newVersion="5.2.3.0" />
</dependentAssembly>
<dependentAssembly>
<assemblyIdentity name="Microsoft.Data.OData"
publicKeyToken="31bf3856ad364e35" culture="neutral" />
<bindingRedirect oldVersion="0.0.0.0-5.6.0.0" newVersion="5.6.4.0" />
</dependentAssembly>
<dependentAssembly>
<assemblyIdentity name="Microsoft.Data.Edm" publicKeyToken="31bf3856ad364e35"
culture="neutral" />
<bindingRedirect oldVersion="0.0.0.0-5.6.0.0" newVersion="5.6.4.0" />
</dependentAssembly>
<dependentAssembly>
<assemblyIdentity name="System.Spatial" publicKeyToken="31bf3856ad364e35"
culture="neutral" />
<bindingRedirect oldVersion="0.0.0.0-5.6.0.0" newVersion="5.6.4.0" />
</dependentAssembly>

```

## Integrating full-text search

This section applies only if you did not install a new web application using the One Identity Manager installation tool.

One Identity Manager includes a new full-text search engine for improved search performance. The Web Portal queries the search index service which must be installed as part of a new application server installation.

There are two options to migrate an existing Web Portal:

1. If the Web Portal uses an application server connection, make sure that the application server installation is running a search index service. Otherwise, search will not work.
2. If the Web Portal uses a direct database connection, open `WebDesigner.ConfigFileEditor.exe` and connect to the application.

On the **Search service** tab, you have the option to define an application server to connect to. The web application will continue using the direct database connection and will only use the application server connection when a search operation is performed.

## General changes

### Using entities in Web Designer collections

Web projects now compile directly to the asynchronous VI.DB entity layer. Database-bound Web Designer collections now contain entities (**IEntity** objects) instead of **IColElem**/**ISingleDbObject** objects.

### Choosing the entity load type

Selecting the correct entity load type can have a significant impact on application performance. The new Web Designer node type **Database access** options allows selecting the best load type for every use case. See the *One Identity Manager Web Designer Reference Guide* for this node type for more information on the different options.

It is recommended to load read-only entities first, and then convert an entity to a writable or interactive entity only when required. The new Web Designer action node type **Create interactive entities** can be used to convert an entity of any type into an interactive one, which can be used to set values or call customizer methods.

### Change to Web SQL GetObjectKey() function

When calling this function on proxy objects (such as **UNSGroup**), in previous versions the key of the proxy entity was returned (such as <Key><T>UNSGroup</T><P>...</P></Key>).

Because this key is an artificial key that mostly cannot be used for database comparisons, the function was changed to return the key of the proxy entity instead, which will include the actual object type (such as <Key><T>ADSGroup</T><P>...</P></Key>).

### Removed ListView control

The **ListView** control has been removed. Any **ListView** nodes will still be displayed in Web Designer, however the compiler will generate an error when it encounters a **ListView** node.

It is strongly recommended to replace any usage of the **ListView** control in custom web components before migrating to One Identity Manager 7.1.

## ComboBox control behavior

The **combobox** control now automatically refreshes itself when the associated filter condition changes.

## Properties moved to attributes

Some Web Designer properties correspond directly to attributes of the resulting HTML nodes. Those properties have been moved to attribute nodes. The following node types are affected:

- ALT attribute: Image
- TITLE attribute: Container, Label, Button, LinkContainer
- STYLE attribute: Container, Label, Image, Cell, Button, LinkContainer

## Enhanced object sheets for groups

In previous versions, the `VI_Common_ObjectSheet` module offered a read-only view of a group object. The module uses `VI_Interfaces_ObjectSwitch_ObjectSheet` components to show a view depending on the type of the group.

The group components have been upgraded to allow for editing if the logged on user is an owner of the group. By default, this means that the user must be either:

- A member of the owner role associated with the group's service item, or
- A member of the administrator role for the group's target system or container.

This affects all groups that map to the `UNSGroup` view.

## Passing entities to components

If you have defined an object sheet component for an object type, an entity of that type is passed to the component at runtime.

The actual loading usually happens in the `VI_Common_ObjectSheet` module. For performance reasons, this module now loads entities in read-only mode instead of the interactive mode.

This is a change that may require modifications to existing components. If your object sheet component implements editing functionality, you will need to convert the read-only entity into an interactive entity first.

As a general rule, components should not presume that entities being passed were loaded in any particular mode. Furthermore, converting to an interactive entity should happen at the last possible moment.

If your component requires an entity to be interactive, your component should create an interactive entity. If the entity is already an interactive entity, no actual conversion happens, so there are no side effects of doing multiple conversions.

## Change to compliance simulation in the shopping cart

By default, users will not be able to submit a shopping cart if at least one request will cause a non-approvable compliance violation.

To restore the behavior of previous versions, set the `VI_ITShop_AllowRequestsWithNonResolvableViolations` configuration parameter to **true**.

## Changes to standard objects

### Removed components

| Component name                                                          | Description                                                                                                                                                       |
|-------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <code>VI_History_ChangeLog_CommonView</code>                            | These components were unused and obsolete in Web Designer 7.0 after the re-implementation of the history views. The components have been removed in this release. |
| <code>VI_History_ChangeLog_Generic</code>                               |                                                                                                                                                                   |
| <code>VI_History_ChangeLog_Person</code>                                |                                                                                                                                                                   |
| <code>VI_History_StateComparison_Org</code>                             |                                                                                                                                                                   |
| <code>VI_History_StateComparison_Person</code>                          |                                                                                                                                                                   |
| <code>VI_History_StateComparison_Person_MasterData</code>               |                                                                                                                                                                   |
| <code>VI_History_StateComparison_Person_Memberships_Generic</code>      |                                                                                                                                                                   |
| <code>VI_History_StateComparison_Person_Responsibilities_Generic</code> |                                                                                                                                                                   |
| <code>VI_History_StateOverview</code>                                   |                                                                                                                                                                   |
| <code>VI_History_StateOverview_Grid</code>                              |                                                                                                                                                                   |
| <code>VI_History_StateOverview_Person</code>                            |                                                                                                                                                                   |
| <code>VI_Compliance_ExceptionApproval_ListView</code>                   | These components are obsolete due to the removal of the <b>ListView</b> control.                                                                                  |
| <code>VI_Common_ListView_Item</code>                                    |                                                                                                                                                                   |
| <code>VI_Common_WebPart_HighRiskOverview</code>                         | Not used anymore.                                                                                                                                                 |
| <code>VI_Attestation_Edit_EmployeeCertification</code>                  | The functionality of this component has                                                                                                                           |

| Component name | Description                                                                  |
|----------------|------------------------------------------------------------------------------|
|                | been moved to the new VI_Attestation_Detail_EmployeeCertification component. |

## Removed virtual functions

| Component                                      | Virtual function                     | Remarks                                                                      |
|------------------------------------------------|--------------------------------------|------------------------------------------------------------------------------|
| VI_Attestation_AttestationRuns_SendReminder    | OptionalFilterAttestationRuns()      | Use the ListOfAttestationRuns() function to pass a list of attestation runs. |
| VI_Attestation_AttestationRun_PendingApprovers | UID_AttestationPolicy()<br>RunDate() | Use the UID_AttestationRun() function instead.                               |
| VI_ITShop_ProductSelection_ReferenceUser       | PersonForOrder()                     | Use the PersonsForOrder collection to supply the request recipients.         |

## Removed virtual nodes

| Component                         | Node identifier    | Remarks                |
|-----------------------------------|--------------------|------------------------|
| VI_ITShop_AccProductGroupSelector | AdditionalControls | Not supported anymore. |
| VI_ITShop_AccProductGroupList     | SetSearchType      | Not required anymore.  |

## Removed virtual collections

These virtual collections have been removed. You can safely remove any mapping collections that refer to these collections.

| Component                                   | Collection name | Remarks                                                                      |
|---------------------------------------------|-----------------|------------------------------------------------------------------------------|
| VI_Attestation_AttestationRuns_SendReminder | attestationruns | Use the ListOfAttestationRuns() function to pass a list of attestation runs. |

## Removed virtual properties

| Component                                   | Property                                                | Remarks                                                                      |
|---------------------------------------------|---------------------------------------------------------|------------------------------------------------------------------------------|
| VI_Attestation_AttestationRuns_SendReminder | uid_attestationpolicy<br>rundate                        | Use the ListOfAttestationRuns() function to pass a list of attestation runs. |
| VI_Interfaces_ObjectSwitch_Object_Overview  | xobjectkey                                              | Not required anymore.                                                        |
| VI_ITShop_AccProductGroupList               | accproductwhereclause                                   | Not required anymore.                                                        |
| VI_ITShop_AccProductGroupSelector           | accproductwhereclause<br>searchtype                     | Not required anymore.                                                        |
| VI_Roles_AttestationCasesForObject          | xobjectkey                                              | Not required anymore.                                                        |
| VI_Roles_Membership                         | tablename<br>pk<br>display<br>xobjectkey<br>isforitshop | Not required anymore.                                                        |
| VI_Roles_UNSGroupInUNSGroup                 | tablename                                               | Not required anymore.                                                        |

## VI.WebRuntime.dll API changes

The API changes were made mainly to support the new object layer including asynchronous operations. This has a couple of effects:

1. Methods have been replaced by asynchronous implementations, and renamed to include an **async** suffix. For some methods, synchronous wrapper methods are available as extension methods. To use these methods, add a `using VI.WebRuntime.Compatibility;` directive to the consuming code.
2. Synchronous events have been replaced by `IAsyncObservable<T>` implementations of the observer pattern.
3. Methods that expect legacy argument types have been changed to support their successors:
  - a. `IColDef --> IMetaColumn`
  - b. `ITableDef --> IMetaTable`
  - c. `IConnection --> ISession`

Note that this list is not exhaustive. For example, it does not include overriding method implementations that have been removed.

The list also does not include new interface members. For more information on a specific interface member, see the *One Identity Manager Web Runtime documentation*.

## Removed types

The following publicly visible types have been removed.

| Full Name                                                 | Migration path                                                               |
|-----------------------------------------------------------|------------------------------------------------------------------------------|
| VI.WebRuntime.AjaxLoadMoreCommand                         | Support for the ListView control has been removed.                           |
| VI.WebRuntime.BaseActionSegment                           | Removed because of asynchronous implementation.                              |
| VI.WebRuntime.BaseMultipartLoop                           | Removed because of asynchronous implementation.                              |
| VI.WebRuntime.Communication<br>.BaseRequestSessionHandler | Not intended to be called directly.                                          |
| VI.WebRuntime.Communication.IRouteConfig                  | Not intended to be called directly.                                          |
| VI.WebRuntime.Data .CollectionHierarchyDataSource         | Use the IControlDataSource implementations to obtain hierarchical data.      |
| VI.WebRuntime.Data<br>.DataSourceListViewFilterFormMethod | Support for the ListView control has been removed.                           |
| VI.WebRuntime.Data.DbHierarchyDataSource                  | Use the IControlDataSource implementations to obtain hierarchical data.      |
| VI.WebRuntime.Data.History.DeleteAction                   | Moved to the VI.WebRuntime.Data.UiAction namespace.                          |
| VI.WebRuntime.Data.History.DeleteDirectAssignment         | Moved to the VI.WebRuntime.Data.UiAction namespace.                          |
| VI.WebRuntime.Data.History.HistoryRestoreActionRunner     | Moved to the VI.WebRuntime.Data.UiAction namespace and renamed ActionRunner. |

| Full Name                                                   | Migration path                                                                             |
|-------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| VI.WebRuntime.Data.History<br>.IHistoryRestoreActionContext | Moved to the<br>VI.WebRuntime.Data.UiAction<br>namespace and renamed<br>IUiActionContext.  |
| VI.WebRuntime.Data.History.IHistoryRollbackAction           | Moved to the<br>VI.WebRuntime.Data.UiAction<br>namespace and renamed<br>IUiAction.         |
| VI.WebRuntime.Data.History.ImpossibleRollbackAction         | Moved to the<br>VI.WebRuntime.Data.UiAction<br>namespace and renamed<br>ImpossibleAction.  |
| VI.WebRuntime.Data.History.PropertyRollback                 | Moved to the<br>VI.WebRuntime.Data.UiAction<br>namespace and renamed<br>SetPropertyAction. |
| VI.WebRuntime.Data.IHierarchyDataSource                     | Use the IControlDataSource<br>implementations to obtain<br>hierarchical data.              |
| VI.WebRuntime.Data.IWhereClauseFilterCondition              | Use IWhereClauseFilter<br>instead.                                                         |
| VI.WebRuntime.Data.WhereClauseFilterCondition               | Use<br>IWhereClauseFilterCondition<br>instead.                                             |
| VI.WebRuntime.DataRowLoop                                   | Removed because of<br>asynchronous<br>implementation.                                      |
| VI.WebRuntime.GenericActionSegment                          | Removed because of<br>asynchronous<br>implementation.                                      |
| VI.WebRuntime.IActionSegment                                | Removed because of<br>asynchronous<br>implementation.                                      |
| VI.WebRuntime.IListViewHost                                 | Support for the ListView<br>control has been removed.                                      |
| VI.WebRuntime.IoC<br>.UnityPerCallContextLifetimeManager<T> | Not intended to be called<br>directly.                                                     |
| VI.WebRuntime.ListViewHost                                  | Support for the ListView<br>control has been removed.                                      |

| Full Name                                               | Migration path                                                          |
|---------------------------------------------------------|-------------------------------------------------------------------------|
| VI.WebRuntime.MultiSelectCollection                     | Removed, not in use.                                                    |
| VI.WebRuntime.RowValueUpdateHandler                     | Removed, not in use because the events have been replaced by observers. |
| VI.WebRuntime.Services.ClientErrorLogService            | Renamed to ClientLogService,                                            |
| VI.WebRuntime.WebControls.IFilterInformationBar         | Not intended to be called directly.                                     |
| VI.WebRuntime.WebControls.IListViewAction               | Support for the <b>ListView</b> control has been removed.               |
| VI.WebRuntime.WebControls.IListViewColumn               | Support for the <b>ListView</b> control has been removed.               |
| VI.WebRuntime.WebControls.JqmDataTransitionType         | jQuery Mobile is not used anymore.                                      |
| VI.WebRuntime.WebControls.JqmGenericControl             | jQuery Mobile is not used anymore.                                      |
| VI.WebRuntime.WebControls.JqmLinkButtonControl          | jQuery Mobile is not used anymore.                                      |
| VI.WebRuntime.WebControls.JqmListViewControl            | jQuery Mobile is not used anymore.                                      |
| VI.WebRuntime.WebControls.JqmPopupControl               | jQuery Mobile is not used anymore.                                      |
| VI.WebRuntime.WebControls.Angular.ListViewFilterControl | Support for the <b>ListView</b> control has been removed.               |
| VI.WebRuntime.WebControls.IListView                     | Support for the <b>ListView</b> control has been removed.               |
| VI.WebRuntime.WebControls.IListViewItem                 | Support for the <b>ListView</b> control has been removed.               |
| VI.WebRuntime.WebControls.ListView                      | Support for the <b>ListView</b> control has been removed.               |
| VI.WebRuntime.WebControls.ListViewAction                | Support for the <b>ListView</b> control has been removed.               |
| VI.WebRuntime.WebControls.ListViewColumn                | Support for the <b>ListView</b> control has been removed.               |
| VI.WebRuntime.WebControls.ListViewItem                  | Support for the <b>ListView</b> control has been removed.               |

| Full Name               | Migration path                                  |
|-------------------------|-------------------------------------------------|
| VI.WebRuntime.WhileLoop | Removed because of asynchronous implementation. |

## Removed type members

| Full Name                                                                              | Migration path                                                                                                     |
|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|
| VI.WebRuntime.ActionQueue..ctor()                                                      | Not intended to be called externally.                                                                              |
| VI.WebRuntime.ActionQueue.QueueAction (Action)                                         | The method expects an additional parameter (HttpContextBase). Also note support for tasks in the QueueTask method. |
| VI.WebRuntime.AdhocColumn . DatabaseSourceColumn                                       | Type changed from IColDef to IMetaColumn.                                                                          |
| VI.WebRuntime.AdhocColumn .RaiseRowUpdated(IDataRow,DbVal,DbVal)                       | Replaced by RaiseRowUpdatedAsync.                                                                                  |
| VI.WebRuntime.AdhocColumn .RowInvalidated(EventHandler <EventArgs<IDataRow>>)          | Event replaced by IAsyncObservable object.                                                                         |
| VI.WebRuntime.AdhocColumn.GetValue (IDataRow)                                          | Replaced by GetValueAsync.                                                                                         |
| VI.WebRuntime.AdhocColumn.RowUpdated (RowValueUpdateHandler)                           | Event replaced by IAsyncObservable object.                                                                         |
| VI.WebRuntime.ApplicationInfo .GetMenuStructure                                        | Type changed IMenuStructureProvider.                                                                               |
| VI.WebRuntime.ApplicationInfo .UserSessionCount                                        | Removed.                                                                                                           |
| VI.WebRuntime.ApplicationInfoGroup..ctor ()                                            | Not intended to be called externally.                                                                              |
| VI.WebRuntime.BaseRuntimeTable . ObjectSaved(EventHandler<EventArgs<IDataRow>>)        | Event replaced by IAsyncObservable object.                                                                         |
| VI.WebRuntime.BaseRuntimeTable . PermissionChanged(EventHandler <EventArgs<DataCell>>) | Event replaced by IAsyncObservable object.                                                                         |
| VI.WebRuntime.BaseRuntimeTable . RowDeleted(EventHandler<EventArgs<IDataRow>>)         | Event replaced by IAsyncObservable object.                                                                         |

| Full Name                                                                                | Migration path                                                                                  |
|------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| VI.WebRuntime.BaseRuntimeTable .RowDisplayChanged(EventHandler<EventArgs<IDataRow>>)     | Event replaced by IAsyncObservable object.                                                      |
| VI.WebRuntime.BaseRuntimeTable .RowInserted(EventHandler<EventArgs<IDataRow>>)           | Event replaced by IAsyncObservable object.                                                      |
| VI.WebRuntime.BaseRuntimeTable .RowInserting(EventHandler<EventArgs<IDataRow>>)          | Event replaced by IAsyncObservable object.                                                      |
| VI.WebRuntime.BaseRuntimeTable .RowUpdated(RowValueUpdateHandler)                        | Event replaced by IAsyncObservable object.                                                      |
| VI.WebRuntime.BaseRuntimeTable .RowUpdating(RowValueUpdateHandler)                       | Event replaced by IAsyncObservable object.                                                      |
| VI.WebRuntime.BaseRuntimeTable .AddDeferredDeletion(Func<IDataRow ,Boolean>)             | Removed. Call DeleteDbObjectsAsync with DeletionMode.DeleteDeferred to add a deferred deletion. |
| VI.WebRuntime.BaseRuntimeTable .BulkOperation(EventHandler<EventArgs<IRuntimeTable>>)    | Event replaced by IAsyncObservable object.                                                      |
| VI.WebRuntime.BaseRuntimeTable .DatabaseTable                                            | Moved to the IDbObjectStore interface.                                                          |
| VI.WebRuntime.BaseRuntimeTable .DataStateChanged(EventHandler<EventArgs<IRuntimeTable>>) | Event replaced by IAsyncObservable object.                                                      |
| VI.WebRuntime.BaseRuntimeTable .EnsurePrimaryKeyFilled(IDataRow)                         | Replaced by EnsurePrimaryKeyFilledAsync.                                                        |
| VI.WebRuntime.BaseRuntimeTable .Invalidate(EventHandler<EventArgs<IRuntimeTable>>)       | Event replaced by IAsyncObservable object.                                                      |
| VI.WebRuntime.BaseRuntimeTable .OnRowInserted(IDataRow)                                  | Replaced by OnRowInsertedAsync.                                                                 |
| VI.WebRuntime.BaseRuntimeTable .OnRowInserting(IDataRow)                                 | Replaced by OnRowInsertingAsync.                                                                |
| VI.WebRuntime.BaseRuntimeTable .RaiseDataStateChanged(IRuntimeTable)                     | Replaced by RaiseDataStateChangedAsync.                                                         |
| VI.WebRuntime.BaseRuntimeTable .RaisePermissionChanged(DataCell)                         | Replaced by RaisePermissionChangedAsync.                                                        |

| Full Name                                                                                            | Migration path                                                                                          |
|------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|
| VI.WebRuntime.BaseRuntimeTable<br>.RaiseRowUpdated(IDataRow, IDataColumn<br>, DbVal, DbVal)          | Replaced by RaiseRowUpdatedAsync.                                                                       |
| VI.WebRuntime.BaseRuntimeTable<br>.RaiseTableInvalidated()                                           | Replaced by<br>RaiseTableInvalidatedAsync.                                                              |
| VI.WebRuntime.BaseRuntimeTable<br>.SetDeletionFlag(Func<IDataRow, Boolean>)                          | Removed. Call Entity.MarkForDeletion<br>to mark an entity for deletion.                                 |
| VIWebRuntime.BaseRuntimeTable.ThrowBulk<br>EventsChanged(EventHandler<br><EventArgs<IRuntimeTable>>) | Event replaced by IAsyncObservable<br>object.                                                           |
| VI.WebRuntime.BaseRuntimeTable.Delete<br>(Func<IDataRow, Boolean>, DeletionMode)                     | Removed. Use one of the Delete<br>extension methods in the<br>VI.WebRuntime.Compatibility<br>namespace. |
| VI.WebRuntime.BaseRuntimeTable.Delete<br>(IDataRow)                                                  | Removed. Use one of the Delete<br>extension methods in the<br>VI.WebRuntime.Compatibility<br>namespace. |
| VI.WebRuntime.BaseRuntimeTable.Insert<br>(ColumnInsertValues)                                        | Replaced by InsertAsync.                                                                                |
| VI.WebRuntime.BaseRuntimeTable.Insert<br>(ResultSet, Int32, ColumnInsertValues)                      | Replaced by InsertAsync.                                                                                |
| VI.WebRuntime.BaseRuntimeTable.Save<br>(IEnumerable<IDataRow>)                                       | Removed. Use one of the Save<br>extension methods in the<br>VI.WebRuntime.Compatibility<br>namespace.   |
| VI.WebRuntime.BaseRuntimeTable.SuspendB<br>ulkEvents()                                               | Return type changed to<br>IAsyncActionBlock.                                                            |
| VI.WebRuntime.BaseTableRow .<br>RowValueUpdated (RowValueUpdateHandler)                              | Event replaced by IAsyncObservable<br>object.                                                           |
| VI.WebRuntime.BaseTableRow .<br>RowValueUpdating (RowValueUpdateHandler)                             | Event replaced by IAsyncObservable<br>object.                                                           |
| VI.WebRuntime.BaseTableRow<br>.BeginTransaction()                                                    | Replaced by the IAsyncTransactable<br>implementation.                                                   |
| VI.WebRuntime.BaseTableRow<br>.CommitTransaction()                                                   | Replaced by the IAsyncTransactable<br>implementation.                                                   |
| VI.WebRuntime.BaseTableRow                                                                           | Moved to the IDbObjectRow interface.                                                                    |

| <b>Full Name</b>                                                                        | <b>Migration path</b>                                                                              |
|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| .DatabaseTable                                                                          |                                                                                                    |
| VI.WebRuntime.BaseTableRow<br>.RollbackTransaction()                                    | Replaced by the IAsyncTransactable implementation.                                                 |
| VI.WebRuntime.BaseTableRow<br>.TransactionOpen                                          | Replaced by the IAsyncTransactable implementation.                                                 |
| VI.WebRuntime.BaseTableRow.SetForeignKey<br>(IDbObjectRow,IDataColumn)                  | Replaced by an extension method SetForeignKey[Async] in the VI.WebRuntime.Compatibility namespace. |
| VI.WebRuntime.BaseTableRow.SetValue<br>(String, Object)                                 | Replaced by SetValueAsync.                                                                         |
| VI.WebRuntime.BaseTableRow.SetValueSafe<br>(IDataRow, IDataColumn, Object)              | Replaced by SetValueSafeAsync.                                                                     |
| VI.WebRuntime.CallActionFormMethod<br>.Execute(HttpContextBase, IFormRenderPart )       | Replaced by ExecuteAsync.                                                                          |
| VI.WebRuntime.ColumnEditorService<br>.GetComponent(IDataColumn, RowCursor<br>, Boolean) | Replaced by GetComponentAsync.                                                                     |
| VI.WebRuntime.ColumnEditorService<br>.RegisterComponent(IColDef, Boolean , String)      | Argument type changed from IColDef to IMetaColumn.                                                 |
| VI.WebRuntime.ColumnEditorService.GetKey<br>(IColDef, Boolean)                          | Argument type changed from IColDef to IMetaColumn.                                                 |
| VI.WebRuntime.ColumnEditorService.GetKey<br>(IDataColumn, IDDataRow, Boolean)           | Replaced by GetKeyAsync.                                                                           |
| VI.WebRuntime.ColumnInsertValues<br>.ChangeRow(IDDataRow)                               | Replaced by ChangeRowAsync.                                                                        |
| VI.WebRuntime.ColumnProxy .<br>RowInvalidated(EventHandler<br><EventArgs<IDDataRow>>)   | Event replaced by IAsyncObservable object.                                                         |
| VI.WebRuntime.ColumnProxy<br>.DatabaseSourceColumn                                      | Type changed from IColDef to IMetaColumn.                                                          |
| VI.WebRuntime.ColumnProxy<br>.ForeignKeyColumn                                          | Type changed to IMetaColumn.                                                                       |
| VI.WebRuntime.ColumnProxy<br>.RaiseRowUpdated(IDDataRow, DbVal, DbVal)                  | Replaced by RaiseRowUpdatedAsync.                                                                  |
| VI.WebRuntime.ColumnProxy                                                               | Replaced by SetBaseColumnValueAasync.                                                              |

| <b>Full Name</b>                                                                     | <b>Migration path</b>                                                                                                               |
|--------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| .SetBaseColumnValue(IDataRow)                                                        |                                                                                                                                     |
| VI.WebRuntime.ColumnProxy.RowUpdated(RowValueUpdateHandler)                          | Event replaced by IAsyncObservable object.                                                                                          |
| VI.WebRuntime.ColumnProxy.GetValue(IDataRow)                                         | Replaced by GetValueAsync.                                                                                                          |
| VI.WebRuntime.ColumnProxy.SetValue(IDataRow, Object)                                 | Replaced by SetValueAsync.                                                                                                          |
| VI.WebRuntime.Communication.IRequestModuleInfo.UserSession                           | Converted to a get-only property.                                                                                                   |
| VI.WebRuntime.Compilation.CodeGenProjectBase.GetAssemblyVersionString()              | Replaced by VersionString.                                                                                                          |
| VI.WebRuntime.Compilation.CodeGenProjectBase.SourceCodeDirectory                     | Converted to a get-only property.                                                                                                   |
| VI.WebRuntime.Compilation.CodeGenProjectBase.GetTempBaseDirectory()                  | Not intended to be called directly.                                                                                                 |
| VI.WebRuntime.Compilation.CodeGenProjectBase.IsRtmCompatible                         | Removed because this flag was only meaningful for version 7.0.1. Assume value to be false.                                          |
| VI.WebRuntime.ConfigDocument.CookieDomain                                            | Support for cookie domains has been removed.                                                                                        |
| VI.WebRuntime.ConfigDocumentMono.CookieDomain                                        | Support for cookie domains has been removed.                                                                                        |
| VI.WebRuntime.ConfigurableAdhocColumn.ForeignKeyColumn                               | Type changed from IColDef to IMetaColumn.                                                                                           |
| VI.WebRuntime.CRVViewTable.LoadRelatedObjects()                                      | Replaced by LoadRelatedObjectsAsync.                                                                                                |
| VI.WebRuntime.CRVViewTable.Load(DbObjectLoadInfo, ILoadTableOptions)                 | Replaced by LoadAsync.                                                                                                              |
| VI.WebRuntime.CRVViewTable.SetSource(IColDef, IRuntimeTable, IEnumerable<IDDataRow>) | Replaced by SetSourceAsync.                                                                                                         |
| VI.WebRuntime.Data.ColumnValueBasicValidator.Validate(IAjaxResponse)                 | Replaced by ValidateAsync. Also, the parameter has been removed and return type has been changed to Task<IValidationErrorResponse>. |

| <b>Full Name</b>                                                                                                                         | <b>Migration path</b>                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|
| VI.WebRuntime.Data<br>.DynamicColumnValidator.Validate<br>(IDataRow)                                                                     | Replaced by ValidateAsync.                                                                                                          |
| VI.WebRuntime.Data.CollectionDataSource<br>.BeginIndex                                                                                   | Moved to the IDataSourceLevel interface.                                                                                            |
| VI.WebRuntime.Data.CollectionDataSource<br>.CanHaveChildren(IDataRow)                                                                    | Replaced by CanHaveChildrenAsync.                                                                                                   |
| VI.WebRuntime.Data.CollectionDataSource<br>.CurrentPage                                                                                  | Moved to the IDataSourceLevel interface.                                                                                            |
| VI.WebRuntime.Data.CollectionDataSource<br>.GetData(Int32,Int32,Boolean,Boolean<br>,IEnumerable<IDataSourceFilter>,IDataRow<br>,Boolean) | Moved to the IDataSourceLevel interface and replaced by GetDataAsync.                                                               |
| VI.WebRuntime.Data.CollectionDataSource<br>.GetHierarchyDataSource()                                                                     | Removed, not supported anymore.                                                                                                     |
| VI.WebRuntime.Data.CollectionDataSource<br>.GetTotalCount()                                                                              | Moved to the IDataSourceLevel interface and replaced by GetTotalCountAsync.                                                         |
| VI.WebRuntime.Data.CollectionDataSource<br>.GetTotalCount(IDataRow)                                                                      | Moved to the IDataSourceLevel interface and replaced by GetTotalCountAsync.                                                         |
| VI.WebRuntime.Data.CollectionDataSource<br>.HasAnyData()                                                                                 | Moved to the IDataSourceLevel interface and replaced by HasAnyDataAsync.                                                            |
| VI.WebRuntime.Data.ColumnFilterProvider<br>.Columns                                                                                      | Type changed to<br>IEnumerable<IMetaColumn>.                                                                                        |
| VI.WebRuntime.Data.ColumnFilterValueList<br>.ToSqlFilterString(IConnection)                                                              | Parameter type changed to ISession.                                                                                                 |
| VI.WebRuntime.Data.ColumnHierarchyFilter<br>.ToSqlFilterString(IConnection)                                                              | Parameter type changed to ISession.                                                                                                 |
| VI.WebRuntime.Data.ColumnValueValidator<br>.Validate(IAjaxResponse)                                                                      | Replaced by ValidateAsync. Also, the parameter has been removed and return type has been changed to Task<IValidationErrorResponse>. |
| VI.WebRuntime.Data.ComparisonFilterValue<br>.ToSqlFilterString(IConnection)                                                              | Parameter type changed to ISession.                                                                                                 |
| VI.WebRuntime.Data.DbDataSource<br>.CanHaveChildren(IDataRow)                                                                            | Replaced by CanHaveChildrenAsync.                                                                                                   |
| VI.WebRuntime.Data.DbDataSource<br>.CurrentPage                                                                                          | Moved to the IDataSourceLevel interface.                                                                                            |

| <b>Full Name</b>                                                                                                                                          | <b>Migration path</b>                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| VI.WebRuntime.Data.DbDataSource<br>.GetHierarchyDataSource()                                                                                              | Removed, not supported anymore.                                                            |
| VI.WebRuntime.Data.DbDataSource<br>.GetTotalCount()                                                                                                       | Moved to the <b>IDataSourceLevel</b> interface and replaced by <b>GetTotalCountAsync</b> . |
| VI.WebRuntime.Data.DbDataSource<br>.HasAnyData()                                                                                                          | Moved to the <b>IDataSourceLevel</b> interface and replaced by <b>HasAnyDataAsync</b> .    |
| VI.WebRuntime.Data.DbDataSource.Table                                                                                                                     | Type changed to <b>IDbObjectStore</b> .                                                    |
| VI.WebRuntime.Data.DbDataSource..ctor<br>(IDataSourceTable<DbObjectLoadInfo><br>,String,Boolean,Int32)                                                    | First argument type changed to <b>IDbObjectStore</b> .                                     |
| VI.WebRuntime.Data.DbDataSource.GetData<br>(Int32,Int32,Boolean,Boolean,IEnumerable<br><IDataSourceFilter>,IDataRow,Boolean)                              | Moved to the <b>IDataSourceLevel</b> interface and replaced by <b>GetDataAsync</b> .       |
| VI.WebRuntime.Data.DynamicValidator<br>.Validate(IAjaxResponse)                                                                                           | Replaced by <b>ValidateAsync(IDataRow</b><br>row).                                         |
| VI.WebRuntime.Data.History.AssignColumn<br>.GetComparisonAsync(ISession,String<br>,DateTime,IEnumerable<IHistoryEvent><br>,ITranslator,CancellationToken) | Parameter 2 type changed from string to <b>IEnumerable&lt; IDbObjectKey&gt;</b> .          |
| VI.WebRuntime.Data.ICollectionValidator<br>.Validate(IDataRow)                                                                                            | Replaced by <b>ValidateAsync</b> .                                                         |
| VI.WebRuntime.Data.IControlDataSource<br>.GetHierarchyDataSource()                                                                                        | Removed, not supported anymore.                                                            |
| VI.WebRuntime.Data.IControlDataSource<br>.HasAnyData()                                                                                                    | Moved to the <b>IDataSourceLevel</b> interface and replaced by <b>HasAnyDataAsync</b> .    |
| VI.WebRuntime.Data.IDataFilterProvider<br>.Columns                                                                                                        | Type changed to <b>IEnumerable&lt;IMetaColumn&gt;</b> .                                    |
| VI.WebRuntime.Data.IDataGroupDescription<br>.GetCountInGroupAsync(IConnection)                                                                            | Parameter type changed to <b>ISession</b> .                                                |
| VI.WebRuntime.Data.IDataGroupProvider<br>.GetDataGroupDescriptions()                                                                                      | Replaced by <b>GetDataGroupDescriptionsAsync</b> .                                         |
| VI.WebRuntime.Data.IDataGroupProvider<br>.GetDataGroupDescriptions(Boolean)                                                                               | Replaced by <b>GetDataGroupDescriptionsAsync</b> .                                         |
| VI.WebRuntime.Data.IDataSourceBase<br>.CanHaveChildren(IDataRow)                                                                                          | Replaced by <b>CanHaveChildrenAsync</b> .                                                  |
| VI.WebRuntime.Data.IDataSourceBase                                                                                                                        | Moved to the <b>IDataSourceLevel</b> interface                                             |

| Full Name                                                                                     | Migration path                                                                                                                                                                                |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| .GetData(Int32,Int32,Boolean,Boolean<br>,IEnumerable<IDataSourceFilter>,IDataRow<br>,Boolean) | and replaced by <code>GetDataAsync</code> .                                                                                                                                                   |
| VI.WebRuntime.Data.IDataSourceBase<br>.GetTotalCount(IDataRow)                                | Moved to the <code>IDataSourceLevel</code> interface<br>and replaced by <code>GetTotalCountAsync</code> .                                                                                     |
| VI.WebRuntime.Data.IDataSourceFilter<br>.ToSqlFilterString(IConnection)                       | Parameter type changed to <code>ISession</code> .                                                                                                                                             |
| VI.WebRuntime.Data.IGroupedDataSource<br>.GetGroups()                                         | Replaced by <code>GetGroupsAsync</code> .                                                                                                                                                     |
| VI.WebRuntime.Data.IGroupedDataSource<br>.GetGroups(Boolean)                                  | Replaced by <code>GetGroupsAsync</code> .                                                                                                                                                     |
| VI.WebRuntime.Data.IPagedData<br>.GetTotalCount()                                             | Replaced by <code>GetTotalCountAsync</code> .                                                                                                                                                 |
| VI.WebRuntime.Data.IValidationGroup<br>.Validate()                                            | Replaced by <code>ValidateAsync</code> .                                                                                                                                                      |
| VI.WebRuntime.Data.IValueValidator<br>.Validate<br>(IAjaxResponse)                            | Replaced by <code>ValidateAsync</code> .<br>Additionally, the parameter has been<br>removed and the return type has been<br>changed to<br><code>Task&lt;IValidationErrorResponse&gt;</code> . |
| VI.WebRuntime.Data.StringFilterBase<br>.GetSqlFilterString(IConnection,IColDef<br>,String)    | Parameter type changed from<br><code>IConnection</code> to <code>ISession</code> and from<br><code>IColDef</code> to <code>IMetaColumn</code> .                                               |
| VI.WebRuntime.Data.StringFilterBase<br>.ToSqlFilterString(IConnection)                        | Parameter type changed to <code>ISession</code> .                                                                                                                                             |
| VI.WebRuntime.Data.StringPrefixFilter<br>.GetSqlFilterString(IConnection,IColDef<br>,String)  | Parameter type changed from<br><code>IConnection</code> to <code>ISession</code> and from<br><code>IColDef</code> to <code>IMetaColumn</code> .                                               |
| VI.WebRuntime.Data.StringSuffixFilter<br>.GetSqlFilterString(IConnection,IColDef<br>,String)  | Parameter type changed from<br><code>IConnection</code> to <code>ISession</code> and from<br><code>IColDef</code> to <code>IMetaColumn</code> .                                               |
| VI.WebRuntime.Data.StringTermsFilter<br>.GetSqlFilterString(IConnection,IColDef<br>,String)   | Parameter type changed from<br><code>IConnection</code> to <code>ISession</code> and from<br><code>IColDef</code> to <code>IMetaColumn</code> .                                               |
| VI.WebRuntime.Data.ValidationGroup<br>.Validate()                                             | Replaced by <code>ValidateAsync</code> .                                                                                                                                                      |
| VI.WebRuntime.Data.WhereClauseFilter                                                          | Parameter type changed to <code>ISession</code> .                                                                                                                                             |

| Full Name                                                                                                | Migration path                                                                                                                                    |
|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| . ToSqlFilterString(IConnection)                                                                         |                                                                                                                                                   |
| VI.WebRuntime.DatabaseColumn . RowInvalidated(EventHandler<EventArgs<IDataRow>>)                         | Event replaced by IAsyncObservable object.                                                                                                        |
| VI.WebRuntime.DatabaseColumn . RowUpdated(RowValueUpdateHandler)                                         | Event replaced by IAsyncObservable object.                                                                                                        |
| VI.WebRuntime.DatabaseColumn . DatabaseSourceColumn                                                      | Type changed from IColDef to IMetaColumn.                                                                                                         |
| VI.WebRuntime.DatabaseColumn . RaiseRowUpdated(IDataRow,DbVal,DbVal)                                     | Replaced by RaiseRowUpdatedAsync.                                                                                                                 |
| VI.WebRuntime.DatabaseColumn.GetValue(IDataRow)                                                          | Replaced by GetValueAsync.                                                                                                                        |
| VI.WebRuntime.DatabaseColumn.SetValue(IDataRow, Object)                                                  | Replaced by SetValueAsync.                                                                                                                        |
| VI.WebRuntime.DataRowStore.AddToRowList(IDataRow)                                                        | Replaced by AddToRowListAsync.                                                                                                                    |
| VI.WebRuntime.DataRowStore.Insert(ColumnInsertValues)                                                    | Replaced by InsertAsync.                                                                                                                          |
| VI.WebRuntime.DbObject . PermissionChanged(EventHandler<EventArgs<DataCell>>)                            | Event replaced by IAsyncObservable object.                                                                                                        |
| VI.WebRuntime.DbObject . TransactionOpen                                                                 | Replaced by the IAsyncTransactable implementation.                                                                                                |
| VI.WebRuntime.DbObject . CreateFromObjectWithParameter(IRuntimeTable, ISingleDbObject, IDialogParameter) | Not intended to be directly called. Use IDbObjectStore.InsertEntityAsync to add an entity to a collection.                                        |
| VI.WebRuntime.DbObject . GetDatabaseObjectDisplay(Boolean)                                               | Use Entity.Display or Entity.LongDisplay.                                                                                                         |
| VI.WebRuntime.DbObject . HasColElemFkDisplayValues                                                       | Removed because IColElem is not used anymore.                                                                                                     |
| VI.WebRuntime.DbObject . HasSingleObject                                                                 | Removed because ISingleDbObject is not used anymore. Examine the wrapped entity to determine whether it is fully loaded, writable or interactive. |
| VI.WebRuntime.DbObject . RollbackTransaction()                                                           | Replaced by the IAsyncTransactable implementation.                                                                                                |

| <b>Full Name</b>                                                                 | <b>Migration path</b>                                                                                      |
|----------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| VI.WebRuntime.DbObject.Saved(EventHandler)                                       | Event replaced by IAsyncObservable object.                                                                 |
| VI.WebRuntime.DbObject..ctor(IRuntimeTable,DbObjectKey)                          | Not intended to be directly called. Use IDbObjectStore.InsertEntityAsync to add an entity to a collection. |
| VI.WebRuntime.DbObject..ctor(IRuntimeTable,IColDbObject,IColElem)                | Not intended to be directly called. Use IDbObjectStore.InsertEntityAsync to add an entity to a collection. |
| VI.WebRuntime.DbObject..ctor(IRuntimeTable,ISingleDbObject)                      | Not intended to be directly called. Use IDbObjectStore.InsertEntityAsync to add an entity to a collection. |
| VI.WebRuntime.DbObject.BeginTransaction()                                        | Replaced by the IAsyncTransactable implementation.                                                         |
| VI.WebRuntime.DbObject.CollElem                                                  | Removed because IColElem is not used anymore. Use the Entity property to obtain the entity.                |
| VI.WebRuntime.DbObject.Collection                                                | Removed because IColDbobject is not used anymore.                                                          |
| VI.WebRuntime.DbObject.CommitTransaction()                                       | Replaced by the IAsyncTransactable implementation.                                                         |
| VI.WebRuntime.DbObject.CreateFrom(IRuntimeTable,DbObjectKey)                     | Not intended to be directly called. Use IDbObjectStore.InsertEntityAsync to add an entity to a collection. |
| VI.WebRuntime.DbObject.CreateFrom(IRuntimeTable,IColDbObject,IColElem)           | Not intended to be directly called. Use IDbObjectStore.InsertEntityAsync to add an entity to a collection. |
| VI.WebRuntime.DbObject.CreateFrom(IRuntimeTable, IDbObjectRow)                   | Not intended to be directly called. Use IDbObjectStore.InsertEntityAsync to add an entity to a collection. |
| VI.WebRuntime.DbObject.CreateFrom(IRuntimeTable,ISingleDbObject,DialogParameter) | Not intended to be directly called. Use IDbObjectStore.InsertEntityAsync to add an entity to a collection. |
| VI.WebRuntime.DbObject.DatabaseTable                                             | Removed; use the Entity.TableName property to obtain the database table name.                              |
| VI.WebRuntime.DbObject.GetObjectWalker(String)                                   | Removed, use the generic method.                                                                           |

| <b>Full Name</b>                                                                             | <b>Migration path</b>                                                                                                    |
|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| VI.WebRuntime.DbObject.GetObjectWalker<T>(String)                                            | Replaced by the extension method VI.WebRuntime.Compatibility.GetObjectWalkerAsync.                                       |
| VI.WebRuntime.DbObject .IsDeleted()                                                          | Removed, use the Entity.IsDeleted property.                                                                              |
| VI.WebRuntime.DbObject.IsLoaded()                                                            | Removed, use the Entity.IsLoaded property.                                                                               |
| VI.WebRuntime.DbObject.Save()                                                                | Removed. Use one of the Save extension methods in the VI.WebRuntime.Compatibility namespace.                             |
| VI.WebRuntime.DbObject.SetValue(String ,Object)                                              | Replaced by SetValueAsync.                                                                                               |
| VI.WebRuntime.DbObject.SingleObject                                                          | Removed, use the Entity property to obtain the wrapped entity. Also see the section "Using entities in Web collections". |
| VI.WebRuntime.DbObject.TableDef                                                              | Renamed to DatabaseTable; type changed to IMetaTable.                                                                    |
| VI.WebRuntime.DbObjectLoadInfo .DbTableName                                                  | Removed, use the Select property instead.                                                                                |
| VI.WebRuntime.DbObjectLoadInfo .DbWhereClause                                                | Removed, use the Select property instead.                                                                                |
| VI.WebRuntime.DbObjectLoadInfo .DisplayPattern                                               | Removed, use the Select property instead.                                                                                |
| VI.WebRuntime.DbObjectLoadInfo .OrderBy                                                      | Removed, use the Select property instead.                                                                                |
| VI.WebRuntime.DbObjectRelationViewBase .InsertRowIfNew(IColElem,IColDBObject ,IDBObjectRow&) | Not intended to be called externally.                                                                                    |
| VI.WebRuntime.DbObjectRelationViewBase .Invalidate()                                         | Replaced by InvalidateAsync.                                                                                             |
| VI.WebRuntime.DbObjectRelationViewBase .LoadRelatedObjects()                                 | Replaced by LoadRelatedObjectsAsync.                                                                                     |
| VI.WebRuntime.DbObjectRelationViewBase .Recalculate()                                        | Replaced by RecalculateAsync.                                                                                            |

| Full Name                                                                                                                    | Migration path                                                                                                                                                                                                                    |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| VI.WebRuntime.DbObjectRelationViewBase .RelationColumn                                                                       | Removed; now implemented by the inheriting classes as required.                                                                                                                                                                   |
| VI.WebRuntime.DbObjectRelationViewBase .SetSourceInternal<br>(IRuntimeTable,IEnumerable<IDataRow>,ICo IDef,Func <ITableDef>) | Replaced by SetSourceInternalAsync. Type argument changed from IColDef to IMetaColumn, and ITableDef to IMetaTable.                                                                                                               |
| VI.WebRuntime.DbObjectStore . DbCollection                                                                                   | Removed because IColDbObject is not used anymore.                                                                                                                                                                                 |
| VI.WebRuntime.DbObjectStore .AddDeferredDeletion(Func<IDataRow ,Boolean>)                                                    | Removed. Call DeleteDbObjectsAsync with DeletionMode.DeleteDeferred to add a deferred deletion.                                                                                                                                   |
| VI.WebRuntime.DbObjectStore .AddRowsFromHistory(DateTime,String ,Object)                                                     | Replaced by AddRowsFromHistoryAsync.                                                                                                                                                                                              |
| VI.WebRuntime.DbObjectStore .CreateDialogParameters(IDbObjectRow ,String,DbObjectStore,String)                               | Replaced by an extension method:<br><pre>public static void CreateDialogParameters(this IDbObjectStore psetTable,<br/> IDbObjectRow row, string objectKeyParent, IDbObjectStore parameterTable, string newParameterSetName)</pre> |
| VI.WebRuntime.DbObjectStore .FillFromFKRelation(IDataRow,IDataColumn ,String,ILoadTableOptions)                              | Moved to the extension method FillFromFKRelationAsync.                                                                                                                                                                            |
| VI.WebRuntime.DbObjectStore .HandleDeferredDeletions()                                                                       | Replaced by HandleDeferredDeletionsAsync.                                                                                                                                                                                         |
| VI.WebRuntime.DbObjectStore .InsertFromXml(String,Int32 ,ColumnInsertValues)                                                 | Use the new XmlDbObjectImporter class to import entities from a XML representation.                                                                                                                                               |
| VI.WebRuntime.DbObjectStore .JumpToHistoryDate(DateTime,IEnumerable <IDataRow>)                                              | Replaced by JumpToHistoryDateAsync.                                                                                                                                                                                               |
| VI.WebRuntime.DbObjectStore .LoadDbCollection(ILoadTableOptions ,IColDbObject)                                               | Call LoadAsync to load entities and add them to the collection.                                                                                                                                                                   |
| VI.WebRuntime.DbObjectStore .PrepareDbColObject(IColDbObject)                                                                | Removed because IColDbObject is not used anymore.                                                                                                                                                                                 |

| <b>Full Name</b>                                                                       | <b>Migration path</b>                                                                                                    |
|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| VI.WebRuntime.DbObjectStore .SetDeletionFlag(Func<IDataRow, Boolean>)                  | Removed. Call Entity.MarkForDeletion to mark an entity for deletion.                                                     |
| VI.WebRuntime.DbObjectStore.AddRows (IColDBObject,DbObjectLoadInfo ,ILoadTableOptions) | Call InsertRowAsync to add a new entity to the collection; or LoadAsync to load entities and add them to the collection. |
| VI.WebRuntime.DbObjectStore.AddRows (IColDBObject,ILoadTableOptions)                   | Call InsertRowAsync to add a new entity to the collection; or LoadAsync to load entities and add them to the collection. |
| VI.WebRuntime.DbObjectStore.Insert (ColumnInsertValues)                                | Replaced by InsertAsync.                                                                                                 |
| VI.WebRuntime.DbObjectStore.InsertRow ( IDbObjectRow)                                  | Replaced by InsertRowAsync.                                                                                              |
| VI.WebRuntime.DbObjectStore.Load (DbObjectLoadInfo,ILoadTableOptions)                  | Replaced by LoadAsync.                                                                                                   |
| VI.WebRuntime.DbObjectStore.Loaded (EventHandler)                                      | Event replaced by IAsyncObservable object.                                                                               |
| VI.WebRuntime.DbObjectStore.OnLoaded()                                                 | Replaced by OnDataLoadedAsync.                                                                                           |
| VI.WebRuntime.DialogParameterObjectProxy                                               | This class no longer inherits from IDbObjectRow and is not intended to be called directly.                               |
| VI.WebRuntime.DialogParameterValueColumn .SetValue(IDataRow, Object)                   | Replaced by SetValueAsync.                                                                                               |
| VI.WebRuntime.DownloadFormMethod.Execut e (HttpContextBase,IFormRenderPart)            | Replaced by ExecuteAsync.                                                                                                |
| VI.WebRuntime.ExpressionColumnBase .RowInvalidated(EventHandler <EventArgs<IDataRow>>) | Event replaced by IAsyncObservable object.                                                                               |
| VI.WebRuntime.ExpressionColumnBase .RowUpdated(RowValueUpdateHandler)                  | Event replaced by IAsyncObservable object.                                                                               |
| VI.WebRuntime.ExpressionColumnBase .DatabaseSourceColumn                               | Type changed from IColDef to IMetaColumn.                                                                                |
| VI.WebRuntime.ExpressionColumnBase .GetValue(IDataRow)                                 | Replaced by GetValueAsync.                                                                                               |
| VI.WebRuntime.ExpressionColumnBase .Invalidate(IDataRow)                               | Replaced by InvalidateAsync.                                                                                             |
| VI.WebRuntime.ExpressionColumnBase                                                     | Replaced by InvalidateAllRowsAsync.                                                                                      |

| <b>Full Name</b>                                                                                                         | <b>Migration path</b>                                                                                                                                  |
|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------|
| .InvalidateAllRows()                                                                                                     |                                                                                                                                                        |
| VI.WebRuntime.ExpressionColumnBase.SetValue(IDataRow, Object)                                                            | Replaced by SetValueAsync.                                                                                                                             |
| VI.WebRuntime.ExpressionColumnBase.query                                                                                 | Type changed to Func<IDataRow, CancellationToken, Task<object>>.                                                                                       |
| VI.WebRuntime.ExpressionColumnUpdater.RaiseDataEventOccurred(IRuntimeTable, IDataColumn, IDDataRow)                      | Replaced by RaiseDataEventOccurredAsync.                                                                                                               |
| VI.WebRuntime.ExpressionEvent.RaiseDataEventOccurred(IRuntimeTable, IDataColumn, IDDataRow)                              | Replaced by RaiseDataEventOccurredAsync.                                                                                                               |
| VI.WebRuntime.ExtensionMethods.GetDbCount(IConnection, String, String, IEnumerable<IDataParameter>, Boolean)             | Replaced by GetDbCountAsync; first argument type changed from IConnection to ISession.                                                                 |
| VI.WebRuntime.ExtensionMethods.InvalidateAllColumnsData(IDDataRow)                                                       | Replaced by InvalidateAllColumnsDataAsync.                                                                                                             |
| VI.WebRuntime.ExtensionMethods.PreloadDisplayValueCache(IDataColumn, Boolean, CancellationToken)                         | Replaced by PreloadDisplayValueCacheAsync.                                                                                                             |
| VI.WebRuntime.ExtensionMethods.PreloadDisplayValueCache(IDataColumn, IEnumerable<IDDataRow>, Boolean, CancellationToken) | Replaced by PreloadDisplayValueCacheAsync.                                                                                                             |
| VI.WebRuntime.ExtensionMethods.PreventEnhancingByJqm (AttributeCollection)                                               | jQuery Mobile is not used anymore.                                                                                                                     |
| VI.WebRuntime.ExtensionMethods.PreventEnhancingByJqm(HtmlTextWriter)                                                     | jQuery Mobile is not used anymore.                                                                                                                     |
| VI.WebRuntime.ExtensionMethods.Delete(IRuntimeTable)                                                                     | Use one of the Delete/DeleteAsync extension methods in VI.WebRuntime.Compatibility; see also the section “Using entities in Web Designer collections”. |
| VI.WebRuntime.ExtensionMethods.Save(IEnumerable<IDDataRow>)                                                              | Use one of the Save/SaveAsync extension methods in VI.WebRuntime.Compatibility; see also the section “Using entities in Web Designer collections”.     |
| VI.WebRuntime.FileUploadFormMethod                                                                                       | Replaced by ExecuteAsync.                                                                                                                              |

| <b>Full Name</b>                                                                                                        | <b>Migration path</b>                                            |
|-------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|
| .Execute(HttpContextBase,IFormRenderPart )                                                                              |                                                                  |
| VI.WebRuntime.FKViewTable<br>.LoadRelatedObjects()                                                                      | Replaced by LoadRelatedObjectsAsync.                             |
| VI.WebRuntime.FKViewTable.SetSource<br>(IRuntimeTable,IEnumerable<IDataRow><br>,IColDef)                                | Replaced by SetSourceAsync.                                      |
| VI.WebRuntime.FormMethods<br>.MultiFormMethod.Execute(HttpContextBase<br>,IFormRenderPart)                              | Replaced by ExecuteAsync.                                        |
| VI.WebRuntime.FormMethods<br>.MultiFormMethod.Execute(IDictionary<br><String,String>,IFormRenderPart<br>,IAjaxResponse) | Replaced by ExecuteAsync.                                        |
| VI.WebRuntime.FormMethods<br>.ReportExportPdfMethod.Execute<br>(HttpContextBase,IFormRenderPart)                        | Replaced by ExecuteAsync.                                        |
| VI.WebRuntime.FormMethods<br>.ReportExportXlsMethod.Execute<br>(HttpContextBase,IFormRenderPart)                        | Replaced by ExecuteAsync.                                        |
| VI.WebRuntime.GenericControlFormMethod<br>.Execute(HttpContextBase,IFormRenderPart )                                    |                                                                  |
| VI.WebRuntime.GenericRowListUpdater<br>.RaiseDataEventOccurred(IRuntimeTable<br>,IDataColumn,IDataRow)                  | Replaced by<br>RaiseDataEventOccurredAsync.                      |
| VI.WebRuntime.GenericRowListUpdater .ctor<br>(Action,Func<IEnumerable<IDataRow>> )                                      | First argument type changed to<br>Func<CancellationToken, Task>. |
| VI.WebRuntime.IApplicationInfo<br>.GetMenuStructure                                                                     | Type changed to<br>IMenuStructureProvider.                       |
| VI.WebRuntime.IApplicationInfo<br>.UserSessionCount                                                                     | Removed.                                                         |
| VI.WebRuntime.IConfigDocument.CookieDom<br>ain                                                                          | Support for cookie domains has been<br>removed.                  |
| VI.WebRuntime.IDataColumn .<br>RowInvalidated(EventHandler<br><EventArgs<IDataRow>>)                                    | Event replaced by IAsyncObservable<br>object.                    |
| VI.WebRuntime.IDataColumn<br>.DatabaseSourceColumn                                                                      | Type changed from IColDef to<br>IMetaColumn.                     |

| Full Name                                                                      | Migration path                                                                                     |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| VI.WebRuntime.IDataColumn .RaiseRowUpdated(IDataRow,DbVal,DbVal)               | Replaced by RaiseRowUpdatedAsync.                                                                  |
| VI.WebRuntime.IDataColumn. RowUpdated (RowValueUpdateHandler)                  | Event replaced by IAsyncObservable object.                                                         |
| VI.WebRuntime.IDataColumn.GetValue (IDataRow)                                  | Replaced by GetValueAsync.                                                                         |
| VI.WebRuntime.IDataColumn.SetValue (IDataRow, Object)                          | Replaced by SetValueAsync.                                                                         |
| VI.WebRuntime.IDataRow . RowValueUpdated (RowValueUpdateHandler)               | Event replaced by IAsyncObservable object.                                                         |
| VI.WebRuntime.IDataRow . RowValueUpdating (RowValueUpdateHandler)              | Event replaced by IAsyncObservable object.                                                         |
| VI.WebRuntime.IDataRow.DatabaseTable ()                                        | Moved to the IDbObjectRow interface.                                                               |
| VI.WebRuntime.IDataRow.SetForeignKey (IDbObjectRow,IDataColumn)                | Replaced by an extension method SetForeignKey[Async] in the VI.WebRuntime.Compatibility namespace. |
| VI.WebRuntime.IDataRow.SetValue(String ,Object)                                | Replaced by SetValueAsync.                                                                         |
| VI.WebRuntime.IDataSourceTable<T> . Loaded(EventHandler)                       | Event replaced by IAsyncObservable object.                                                         |
| VI.WebRuntime.IDataSourceTable<T>.Load(T ,ILoadTableOptions)                   | Replaced by LoadAsync.                                                                             |
| VI.WebRuntime.IDbColumnAdapterFactory .GetColumnAdapter(IColDef,IRuntimeTable) | First argument type changed from IColDef to IMetaColumn.                                           |
| VI.WebRuntime.IDbObjectRow . HasColElemFkDisplayValues()                       | Removed because IColElem is not used anymore. Use the Entity property.                             |
| VI.WebRuntime.IDbObjectRow .Collection                                         | Removed because IColDbObject is not used anymore. Use the Entity property.                         |
| VI.WebRuntime.IDbObjectRow .GetDatabaseObjectDisplay(Boolean)                  | Call Entity.Display or Entity.LongDisplay.                                                         |
| VI.WebRuntime.IDbObjectRow .GetObjectWalker<T>(String)                         | Replaced by the extension method GetObjectWalkerAsync.                                             |
| VI.WebRuntime.IDbObjectRow .HasSingleObject                                    | Removed because IColDbObject is not used anymore. Use the Entity property.                         |
| VI.WebRuntime.IDbObjectRow                                                     | Event replaced by IAsyncObservable                                                                 |

| Full Name                                                                                          | Migration path                                                                               |
|----------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| .PermissionChanged(EventHandler<EventArgs<DataCell>>)                                              | object.                                                                                      |
| VI.WebRuntime.IDbObjectRow.SingleObject                                                            | Removed because IColDbObject is not used anymore. Use the Entity property.                   |
| VI.WebRuntime.IDbObjectRow.CollElem                                                                | Removed because ICollElem is not used anymore.                                               |
| VI.WebRuntime.IDbObjectRow.IsDeleted                                                               | Removed, use the Entity.IsDeleted property.                                                  |
| VI.WebRuntime.IDbObjectRow.IsLoaded                                                                | Removed, use the Entity.IsLoaded property.                                                   |
| VI.WebRuntime.IDbObjectRow.Save()                                                                  | Removed. Use one of the Save extension methods in the VI.WebRuntime.Compatibility namespace. |
| VI.WebRuntime.IDbObjectRow.Saved(EventHandler)                                                     | Event replaced by IAsyncObservable object.                                                   |
| VI.WebRuntime.IForm.ListViewHost                                                                   | Support for the <b>ListView</b> control has been removed.                                    |
| VI.WebRuntime.IForm.RedirectToMenuItem(String, Boolean, IEnumerable<KeyValuePair<String, String>>) | Replaced by RedirectToMenuItemAsync.                                                         |
| VI.WebRuntime.IFormMethod.Execute(HttpContextBase, IFormRenderPart)                                | Replaced by ExecuteAsync.                                                                    |
| VI.WebRuntime.IFormMethodAjax.Execute(IDictionary<String, String>, IFormRenderPart, IAjaxResponse) | Replaced by ExecuteAsync.                                                                    |
| VI.WebRuntime.ILoadTableOptions.PrepareBulkLoad                                                    | Use EntityCollectionLoadType.Bulk to load complete entities.                                 |
| VI.WebRuntime.IMenuItem.Tooltip                                                                    | Changed to get-only for consistency reasons.                                                 |
| VI.WebRuntime.IModule.GetRequestParameter(String)                                                  | Moved to an extension method in VI.WebRuntime.                                               |
| VI.WebRuntime.IModule.Recalculate()                                                                | Replaced by RecalculateAsync.                                                                |
| VI.WebRuntime.IoC.IObjectFactory.RouteHandlerFunc                                                  | Not intended to be called directly.                                                          |
| .WebRuntime.IoC.IObjectFactory FormFunc()                                                          | Not intended to be called directly.                                                          |

| Full Name                                                                                    | Migration path                                                                                 |
|----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| VI.WebRuntime.IRuntimeTable . RowDeleted<br>(EventHandler<EventArgs <IDataRow>>)             | Event replaced by IAsyncObservable object.                                                     |
| VI.WebRuntime.IRuntimeTable . BulkOperation<br>(EventHandler<br><EventArgs<IRuntimeTable>>)  | Event replaced by IAsyncObservable object.                                                     |
| VI.WebRuntime.IRuntimeTable<br>.DatabaseTable                                                | Moved to the IDbObjectStore interface.                                                         |
| VI.WebRuntime.IRuntimeTable<br>.DataStateChanged(EventHandler<br><EventArgs<IRuntimeTable>>) | Event replaced by IAsyncObservable object.                                                     |
| VI.WebRuntime.IRuntimeTable .Invalidated<br>(EventHandler<EventArgs<br><IRuntimeTable>>)     | Event replaced by IAsyncObservable object.                                                     |
| VI.WebRuntime.IRuntimeTable .ObjectSaved<br>(EventHandler<EventArgs <IDataRow>>)             | Event replaced by IAsyncObservable object.                                                     |
| VI.WebRuntime.IRuntimeTable<br>.PermissionChanged(EventHandler<br><EventArgs<DataCell>>)     | Event replaced by IAsyncObservable object.                                                     |
| VI.WebRuntime.IRuntimeTable<br>.RowDisplayChanged(EventHandler<br><EventArgs<IDataRow>>)     | Event replaced by IAsyncObservable object.                                                     |
| VI.WebRuntime.IRuntimeTable .RowInserted<br>(EventHandler<EventArgs <IDataRow>>)             | Event replaced by IAsyncObservable object.                                                     |
| VI.WebRuntime.IRuntimeTable .RowInserting<br>(EventHandler<EventArgs <IDataRow>>)            | Event replaced by IAsyncObservable object.                                                     |
| VI.WebRuntime.IRuntimeTable .RowUpdated<br>(RowValueUpdateHandler)                           | Event replaced by IAsyncObservable object.                                                     |
| VI.WebRuntime.IRuntimeTable .RowUpdating<br>(RowValueUpdateHandler)                          | Event replaced by IAsyncObservable object.                                                     |
| VI.WebRuntime.IRuntimeTable.Delete<br>(IDataRow)                                             | Removed. Use one of the Delete extension methods in the VI.WebRuntime.Compatibility namespace. |
| VI.WebRuntime.IRuntimeTable.Delete(Func<br><IDataRow,Boolean>,DeletionMode)                  | Removed. Use one of the Delete extension methods in the VI.WebRuntime.Compatibility namespace. |

| <b>Full Name</b>                                                                                       | <b>Migration path</b>                               |
|--------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| VI.WebRuntime.IRuntimeTable.Insert<br>(ColumnInsertValues)                                             | Replaced by InsertAsync.                            |
| VI.WebRuntime.IRuntimeTable.Insert<br>(ResultSet,Int32,ColumnInsertValues)                             | Replaced by InsertAsync.                            |
| VI.WebRuntime.IRuntimeTable.SuspendBulkEvents()                                                        | Return type changed to IAsyncActionBlock.           |
| VI.WebRuntime.ISqlHelper<br>.GetSqlSearchColumns(ITableDef)                                            | Argument type changed from ITableDef to IMetaTable. |
| VI.WebRuntime.ISqlHelper<br>.GetSqlSearchString(String,IColDef ,String)                                | Argument type changed from IColDef to IMetaColumn.  |
| VI.WebRuntime.ISqlHelper<br>.GetSqlSearchString(String,IColDef<br>,String,Boolean,Boolean)             | Argument type changed from IColDef to IMetaColumn.  |
| VI.WebRuntime.ISqlHelper<br>.GetSqlSearchString(String,ITableDef ,String)                              | Argument type changed from ITableDef to IMetaTable. |
| VI.WebRuntime.ISqlHelper<br>.GetSqlSearchString(String,ITableDef )                                     | Argument type changed from ITableDef to IMetaTable. |
| VI.WebRuntime.ITablePermission .<br>PermissionsChanged(EventHandler<br><EventArgs<ITablePermission>>)  | Event replaced by IAsyncObservable object.          |
| VI.WebRuntime.ITablePermissions .<br>PermissionsChanged(EventHandler<br><EventArgs<ITablePermission>>) | Event replaced by IAsyncObservable object.          |
| VI.WebRuntime.ITableStore .<br>DataSourceChanged(EventHandler<br><EventArgs<IDataSourceBase>>)         | Event replaced by IAsyncObservable object.          |
| VI.WebRuntime.ITableStore<br>.NotifyDataSourceUpdated(IDataSourceBase )                                | Replaced by NotifyDataSourceUpdatedAsync.           |
| VI.WebRuntime.ITableStore.Recalculate()                                                                | Replaced by RecalculateAsync.                       |
| VI.WebRuntime.ITableStore.SetValue<br>(ITableStoreColumn,IDataRow,Object)                              | Replaced by SetValueAsync.                          |
| VI.WebRuntime.IValueChangeEvent<br>.ValueChanged(RowValueUpdateHandler)                                | Event replaced by IAsyncObservable object.          |
| VI.WebRuntime.IValueChangeEvent<br>.ValueChanging(RowValueUpdateHandler )                              | Event replaced by IAsyncObservable object.          |
| VI.WebRuntime.IValueMetadata                                                                           | Type changed from IColDef to                        |

| <b>Full Name</b>                                                                                               | <b>Migration path</b>                                                                        |
|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| .ForeignKeyColumn                                                                                              | IMetaColumn.                                                                                 |
| VI.WebRuntime.IValueMetadata<br>.ForeignKeyDynamicTables                                                       | Type changed to<br>IEnumerable<IMetaTable>.                                                  |
| VI.WebRuntime.IValueMetadata<br>.GetDataState(IDataRow)                                                        | Replaced by GetDataStateAsync.                                                               |
| VI.WebRuntime.IValueMetadata<br>.GetDisplayValue(IDataRow)                                                     | Replaced by GetDisplayValueAsync.                                                            |
| VI.WebRuntime.IView.Invalidate()                                                                               | Replaced by InvalidateAsync.                                                                 |
| VI.WebRuntime.IView.Recalculate()                                                                              | Replaced by RecalculateAsync.                                                                |
| VI.WebRuntime.JavascriptBaseFormMethod<br>.Execute(HttpContextBase,IFormRenderPart )                           | Replaced by ExecuteAsync.                                                                    |
| VI.WebRuntime.LoadTableOptions<br>.PrepareBulkLoad                                                             | Use EntityCollectionLoadType.Bulk to<br>load complete entities.                              |
| VI.WebRuntime.LocalColumn .RowInvalidated<br>(EventHandler <EventArgs<IDataRow>>)                              | Event replaced by IAsyncObservable<br>object.                                                |
| VI.WebRuntime.LocalColumn.GetValue<br>(IDataRow)                                                               | Replaced by GetValueAsync.                                                                   |
| VI.WebRuntime.LocalColumn.RowUpdated<br>(RowValueUpdateHandler)                                                | Event replaced by IAsyncObservable<br>object.                                                |
| VI.WebRuntime.LocalColumn.SetValue<br>(IDataRow, Object)                                                       | Replaced by SetValueAsync.                                                                   |
| VI.WebRuntime.MemberRelation<br>.ChangeMemberStatus(IDataRow, String<br>, Boolean)                             | Replaced by ChangeMemberStatusAsync.                                                         |
| WebRuntime.MemberRelation<br>.MemberStatusChangedBulk<br>(EventHandler<EventArgs<MemberRelatio<br>n>> )        | Event replaced by IAsyncObservable<br>object.                                                |
| VI.WebRuntime.MemberRelation<br>.RaiseMemberStatusBulk()                                                       | Replaced by<br>RaiseMemberStatusBulkAsync.                                                   |
| VI.WebRuntime.MemberRelation<br>.ResetChanges()                                                                | Replaced by ResetChangesAsync.                                                               |
| VI.WebRuntime.MemberRelation..ctor<br>(IConnection, IDDataRow, IDataColumn<br>, DbObjectStore, String, String) | Argument type changed from<br>IConnection to ISession and from<br>IDDataRow to IDbObjectRow. |
| VI.WebRuntime.MemberRelation.LoadMember                                                                        | Replaced by LoadMembersAsync.                                                                |

| <b>Full Name</b>                                                                                                  | <b>Migration path</b>                                                                                            |
|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| s ()                                                                                                              |                                                                                                                  |
| VI.WebRuntime.MemberRelation.Owner                                                                                | Type changed to IDbObjectRow.                                                                                    |
| VI.WebRuntime.MemberRelation.SaveChange                                                                           | Replaced by SaveChangesAsync.                                                                                    |
| s ()                                                                                                              |                                                                                                                  |
| VI.WebRuntime.MemberRelationColumn<br>.CandidateTable                                                             | Type changed to string.                                                                                          |
| VI.WebRuntime.MemberRelationColumn<br>.GetMemberRelation(IDataRow)                                                | Replaced by GetMemberRelationAsync.                                                                              |
| VI.WebRuntime.MemberRelationColumn<br>.SetSource(String, String)                                                  | Replaced by SetSourceAsync.                                                                                      |
| VI.WebRuntime.MemberRelationColumn<br>ColumnRelation                                                              | Type changed to<br>VI.WebRuntime.ColumnRelation.                                                                 |
| VI.WebRuntime.MenuItem.Tooltip                                                                                    | Type changed to Func<string>.                                                                                    |
| VI.WebRuntime.MenuItemBase<br>.MenuItemClicked(EventHandler<br><EventArgs<MenuItemClick>>)                        | Event replaced by the IAsyncObservable<br>property Click.                                                        |
| VI.WebRuntime.MenuItemBase.Condition                                                                              | Removed because the value was not<br>used.                                                                       |
| VI.WebRuntime.MenuItemBase.ExecuteAction<br>(IForm, IDDataRow)                                                    | Replaced by ExecuteActionAsync.                                                                                  |
| VI.WebRuntime.MenuItemBase.Redirect<br>(IForm, IDDataRow, Boolean, IEnumerable<br><KeyValuePair<String, String>>) | Replaced by RedirectAsync.                                                                                       |
| VI.WebRuntime.MenuStructure.FindItem<br>(String)                                                                  | Moved to an extension method in<br>VI.WebRuntime.                                                                |
| VI.WebRuntime.Module.GetRequestParameter<br>(String)                                                              | Moved to an extension method in the<br>VI.WebRuntime namespace.                                                  |
| VI.WebRuntime.Module.Recalculate()                                                                                | Replaced by RecalculateAsync.                                                                                    |
| VI.WebRuntime.ObjectImageFormMethod<br>.Execute(HttpContextBase, IFormRenderPart )                                | Replaced by ExecuteAsync.                                                                                        |
| VI.WebRuntime.ObjectKeyBulkLoader<br>.Dispose()                                                                   | This class does not implement<br>IDisposable anymore; call LoadAsync<br>instead to load the results.             |
| VI.WebRuntime.ObjectKeyBulkLoader<br>.InsertObjectKey(IDDataRow<br>, ResolveMNOBJECTMode, IDataColumn             | Replaced by InsertObjectKeyAsync. The<br>ResolveMNOBJECTMode argument has<br>been moved to the ResolveObjectMode |

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|----------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------|
| ,ColumnInsertValues)                                                                                                 | property.                                                                                                            |
| VI.WebRuntime.ObjectKeyBulkLoader<br>.InsertObjectKey(ResolveMNOBJECTMode<br>,DbObjectKey,ColumnInsertValues,String) | Replaced by InsertObjectKeyAsync. The ResolveMNOBJECTMode argument has been moved to the ResolveObjectMode property. |
| VI.WebRuntime.ObjectKeyBulkLoader..ctor<br>(DbObjectStore)                                                           | Type changed to IDbObjectStore.                                                                                      |
| VI.WebRuntime.ObjectKeyBulkLoader.Table                                                                              | Type changed to IDbObjectStore.                                                                                      |
| VI.WebRuntime.ObjectReferenceService<br>.GetComponent(String,String)                                                 | Replaced by GetComponentAsync.                                                                                       |
| VI.WebRuntime.ObjectReferenceService<br>.GetComponentName(String,DbObjectKey)                                        | Replaced by an extension method.                                                                                     |
| VI.WebRuntime.ObjectReferenceService<br>.GetComponentName(String,String)                                             | Replaced by GetComponentNameAsync.                                                                                   |
| VI.WebRuntime.ObjectReferenceService<br>.Setup(IApplicationInfo)                                                     | Not intended to be called directly.                                                                                  |
| VI.WebRuntime.ObjectReferenceService. .ctor<br>(IApplicationInfo)                                                    | Not intended to be called directly.                                                                                  |
| VI.WebRuntime.ObjectUpdater<TObj,TProp><br>.RaiseDataEventOccurred(IRuntimeTable<br>,IDataColumn,IDataRow)           | Replaced by<br>RaiseDataEventOccurredAsync.                                                                          |
| VI.WebRuntime.ObjectViewProperty<T> .<br>RowInvalidated(EventHandler<br><EventArgs<IDataRow>>)                       | Event replaced by IAsyncObservable object.                                                                           |
| VI.WebRuntime.ObjectViewProperty<T> .<br>RowUpdated(RowValueUpdateHandler)                                           | Event replaced by IAsyncObservable object.                                                                           |
| VI.WebRuntime.ObjectViewProperty<T> .<br>DatabaseSourceColumn                                                        | Type changed from IColDef to IMetaColumn.                                                                            |
| VI.WebRuntime.ObjectViewProperty<T><br>.GetValue(IDataRow)                                                           | Replaced by GetValueAsync.                                                                                           |
| VI.WebRuntime.ObjectViewProperty<T><br>.RaiseRowUpdated(IDataRow,DbVal,DbVal)                                        | Replaced by RaiseRowUpdatedAsync.                                                                                    |
| VI.WebRuntime.ObjectViewProperty<T><br>.SetValue(IDataRow,Object)                                                    | Replaced by SetValueAsync.                                                                                           |
| VI.WebRuntime.ObjectViewRow<T> .                                                                                     | Replaced by the IAsyncTransactable                                                                                   |

| <b>Full Name</b>                                                                          | <b>Migration path</b>                                    |
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| TransactionOpen                                                                           | implementation.                                          |
| VI.WebRuntime.ObjectViewRow<T>.BeginTransaction()                                         | Replaced by the IAsyncTransactable implementation.       |
| VI.WebRuntime.ObjectViewRow<T>.CommitTransaction()                                        | Replaced by the IAsyncTransactable implementation.       |
| VI.WebRuntime.ObjectViewRow<T>.DatabaseTable                                              | Moved to the IDbObjectTable interface.                   |
| VI.WebRuntime.ObjectViewRow<T>.RollbackTransaction()                                      | Replaced by the IAsyncTransactable implementation.       |
| VI.WebRuntime.ObjectViewTable<T>.Insert(ColumnInfoInsertValues)                           | Replaced by InsertAsync.                                 |
| VI.WebRuntime.PopupHost.PopupClosed(EventHandler<EventArgs<PopupInfo>>)                   | Type changed to EventHandler<EventArgs<PopupCloseInfo>>. |
| VI.WebRuntime.PopupHost.ClosePopup()                                                      | Added argument of type HttpContextBase.                  |
| VI.WebRuntime.PopupInfo.PopupClosedWithPendingActions(EventHandler<EventArgs<PopupInfo>>) | Event replaced by IAsyncObservable object.               |
| VI.WebRuntime.PopupInfo.PopupClosed(EventHandler<EventArgs<PopupInfo>>)                   | Event replaced by IAsyncObservable object.               |
| VI.WebRuntime.RedirectUserMenu.Execute()                                                  | Method now returns a Task object.                        |
| VI.WebRuntime.ResultSetRow.RowValueUpdated(RowValueUpdateHandler)                         | Event replaced by IAsyncObservable object.               |
| VI.WebRuntime.ResultSetRow.RowValueUpdating(RowValueUpdateHandler)                        | Event replaced by IAsyncObservable object.               |
| VI.WebRuntime.ResultSetRow.TransactionOpen                                                | Replaced by the IAsyncTransactable implementation.       |
| VI.WebRuntime.RuntimeDisplayColumn.DatabaseSourceColumn                                   | Type changed from IColDef to IMetaColumn.                |
| VI.WebRuntime.Services.SessionTempFileHandler.ProcessRequest(HttpContextBase)             | Replaced by ProcessRequestAsync.                         |
| VI.WebRuntime.SessionModule.GetMenuStructure                                              | Type changed to IMenuStructureProvider.                  |
| VI.WebRuntime.SessionModule                                                               | Replaced by ReloadMenuStructureAsync.                    |

| <b>Full Name</b>                                                                                         | <b>Migration path</b>                                                      |
|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| .ReloadMenuStructure()                                                                                   |                                                                            |
| VI.WebRuntime.SqlHelper<br>.GetDisplayPatternColumns(String ,ITableDef)                                  | Argument type changed from ITableDef to IMetaTable.                        |
| VI.WebRuntime.SqlHelper<br>.GetSqlSearchColumns(ITableDef)                                               | Argument type changed from ITableDef to IMetaTable.                        |
| VI.WebRuntime.SqlHelper<br>.GetSqlSearchString(String,IColDef ,String)                                   | Argument type changed from IColDef to IMetaColumn.                         |
| VI.WebRuntime.SqlHelper<br>.GetSqlSearchString(String,IColDef<br>,String,Boolean,Boolean)                | Argument type changed from IColDef to IMetaColumn.                         |
| VI.WebRuntime.SqlHelper<br>.GetSqlSearchString(String,ITableDef<br>,Boolean,Boolean)                     | Argument type changed from ITableDef to IMetaTable.                        |
| VI.WebRuntime.SqlHelper<br>.GetSqlSearchString(String,ITableDef ,String)                                 | Argument type changed from ITableDef to IMetaTable.                        |
| VI.WebRuntime.SqlHelper<br>.GetSqlSearchString(String,ITableDef<br>,String,Boolean,Boolean)              | Argument type changed from ITableDef to IMetaTable.                        |
| VI.WebRuntime.SqlHelper<br>.GetSqlSearchString(String,ITableDef)                                         | Argument type changed from ITableDef to IMetaTable.                        |
| VI.WebRuntime.TablePermissionBase<br>.PermissionsChanged(EventHandler<br><EventArgs<ITablePermission>>)  | Event replaced by IAsyncObservable object.                                 |
| VI.WebRuntime.TablePermissionBase<br>.RaisePermissionsChanged()                                          | Replaced by RaisePermissionsChangedAsync.                                  |
| VI.WebRuntime.TimedAction.ExecuteAction                                                                  | Type changed to Func<CancellationToken, Task>.                             |
| VI.WebRuntime.UpdateFormMethod.Execute<br>(HttpContextBase,IFormRenderPart)                              | Replaced by ExecuteAsync.                                                  |
| VI.WebRuntime.UpdateFormMethod.Execute<br>(IDictionary<String,String><br>,IFormRenderPart,IAjaxResponse) | Replaced by ExecuteAsync.                                                  |
| VI.WebRuntime.UpdaterBase<br>.RaiseDataEventOccurred(IRuntimeTable<br>,IDataColumn,IDataRow)             | Replaced by RaiseDataEventOccurredAsync.                                   |
| VI.WebRuntime.UserSession.Log(LogLevel<br>,String)                                                       | Removed; call the extension method<br>VI.WebRuntime.IUserSession.GetLogSes |

| Full Name                                                                                                                       | Migration path                                                               |
|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|
| VI.WebRuntime.UserTable<br>.GetLimitedSqlDataReader(String<br>, IEnumerable<QueryParameter>)                                    | sion to obtain a session-specific logger.<br>Replaced by GetLimitedSqlAsync. |
| VI.WebRuntime.UserTable. Loaded<br>(EventHandler)                                                                               | Event replaced by IAsyncObservable<br>object.                                |
| VI.WebRuntime.UserTable.Load(IDataReader<br>, ILoadTableOptions)                                                                | Replaced by LoadAsync.                                                       |
| VI.WebRuntime.ValueMetadata<br>.ForeignKeyColumn                                                                                | Type changed from IColDef to<br>IMetaColumn.                                 |
| VI.WebRuntime.ValueMetadata<br>.ForeignKeyColumnFunc(Func<IColDef>)                                                             | Type changed from IColDef to<br>IMetaColumn.                                 |
| VI.WebRuntime.ValueMetadata<br>.GetDisplayValue(IDataRow)                                                                       | Replaced by GetDisplayValueAsync.                                            |
| VI.WebRuntime.ValueMetadata.GetDataState<br>(IDataRow)                                                                          | Replaced by GetDataStateAsync.                                               |
| VI.WebRuntime.VariableTable.Delete<br>(IDataRow)                                                                                | Replaced by DeleteAsync.                                                     |
| VI.WebRuntime.VariableTable.Insert<br>(ColumnInsertValues)                                                                      | Replaced by InsertAsync.                                                     |
| VI.WebRuntime.View.Invalidate()                                                                                                 | Replaced by InvalidateAsync.                                                 |
| VI.WebRuntime.View.Recalculate()                                                                                                | Replaced by RecalculateAsync.                                                |
| VI.WebRuntime.ViewUpdater<br>.RaiseDataEventOccurred(IRuntimeTable<br>, IDataColumn, IDDataRow)                                 | Replaced by<br>RaiseDataEventOccurredAsync.                                  |
| VI.WebRuntime.WebControls.<br>ActivatorControl.ActionToExecute                                                                  | Return type changed to<br>Func<CancellationToken, Task>.                     |
| VI.WebRuntime.WebControls<br>.ControlChangeUpdaterBase<T><br>.RaiseDataEventOccurred(IRuntimeTable<br>, IDataColumn, IDDataRow) | Replaced by<br>RaiseDataEventOccurredAsync.                                  |
| VI.WebRuntime.WebControls<br>.DialogImageSource..ctor(ITableDef<br>, ImageSize)                                                 | Replaced argument type ITableDef by<br>IMetaTable.                           |
| VI.WebRuntime.WebControls<br>.FilterByTableSelection .ParentConnectColumn                                                       | Type changed from IColDef to<br>IMetaColumn.                                 |

| <b>Full Name</b>                                                                                                              | <b>Migration path</b>                                                            |
|-------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| VI.WebRuntime.WebControls<br>.FilterByTableSelection.TargetTable                                                              | Type changed from ITableDef to IMetaTable.                                       |
| VI.WebRuntime.WebControls<br>.GridBlockContent.DataSourceBase                                                                 | Type changed to IDatasourceLevel.                                                |
| VI.WebRuntime.WebControls<br>.IFilterByTableSelection.TargetTable                                                             | Type changed from ITableDef to IMetaTable.                                       |
| VI.WebRuntime.WebControls.<br>IWebDesignerGeneratedControl.InitCompon<br>ent                                                  | A second optional parameter of type CancellationToken was added.                 |
| VI.WebRuntime.WebControls<br>.RenderPartIterationUpdater<br>.RaiseDataEventOccurred(IRuntimeTable<br>, IDataColumn, IDataRow) | Replaced by RaiseDataEventOccurredAsync.                                         |
| VI.WebRuntime.WebControls<br>.RenderPartUpdater .RaiseDataEventOccurred<br>(IRuntimeTable ,IDataColumn,IDataRow)              | Replaced by RaiseDataEventOccurredAsync.                                         |
| VI.WebRuntime.WebControls.Angular<br>.IMasterDetailControl .FixedDetailPane                                                   | Removed, not supported anymore.                                                  |
| VI.WebRuntime.WebControls.Angular<br>.IMasterDetailControl .HasFixedOrientation                                               | Removed because the orientation of the master-detail view is managed by CSS.     |
| VI.WebRuntime.WebControls.Angular<br>.IMasterDetailControl. Orientation                                                       | Removed because the orientation of the master-detail view is managed by CSS.     |
| VI.WebRuntime.WebControls.Angular<br>.MasterDetailControl<br>.TabletScreensMediaQuery                                         | Removed because the sizing of the master-detail view is managed entirely by CSS. |
| VI.WebRuntime.WebControls.Angular<br>.MasterDetailControl .HasFixedOrientation                                                | Removed because the orientation of the master-detail view is managed by CSS.     |
| VI.WebRuntime.WebControls.Angular<br>.MasterDetailControl<br>.SmallScreensMediaQuery                                          | Removed because the sizing of the master-detail view is managed entirely by CSS. |
| VI.WebRuntime.WebControls.Angular<br>.MasterDetailControl.FixedDetailPane                                                     | Removed, not supported anymore.                                                  |
| VI.WebRuntime.WebControls.Angular<br>.MasterDetailControl.Orientation                                                         | Removed because the orientation of the master-detail view is managed by CSS.     |
| VI.WebRuntime.WebControls.BaseScripts.<br>LocalIpForRemoteDebugging                                                           | Direct support for remote client debugging has been removed.                     |

| Full Name                                                                              | Migration path                                                |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------|
| VI.WebRuntime.WebControls.BaseScripts.EnableRemoteDebugging                            | Direct support for remote client debugging has been removed.  |
| VI.WebRuntime.WebContols.TreeBlock.DataSource                                          | Type changed from IHierarchyDataSource to IControlDataSource. |
| VI.WebRuntime.WebSql.GetMRCandidateTable (IConnection,ITableDef,String)                | Argument type changed from ITableDef to IMetaTable.           |
| VI.WebRuntime.WebSql.SendFileDownload (IFormRenderPart,String,String,Boolean ,String)  | Additional optional parameter HttpContextBase appended.       |
| VI.WebRuntime.WebSql.SendFileDownload (IFormRenderPart,String,String,Boolean ,Byte []) | Additional optional parameter HttpContextBase appended.       |
| VI.WebRuntime.WebSql.WriteFile(String ,String)                                         | Additional optional parameter HttpContextBase appended.       |

## Changes in Web Designer and in Web Portal 7.0

This section provides an overview of changes in Web Designer and Web Portal 7.0 in comparison to previous versions.

### Migrating customized projects

#### Loading objects that were migrated from versions prior to 6.1

Web Designer 7.0 supports loading objects that were last saved in Web Designer 6.1. However, when attempting to load an object that was last saved in a version prior to 6.1, you may see the following error message:

"The model version <X> of the object <Y> is unknown. Please verify that you are using the correct product version for your database."

**To migrate these objects, perform the following steps**

1. Open Web Designer and authenticate to the database.
2. Select the menu item **Migration assistant**.
3. In the migration assistant, there will be some items that start with **Migrate XML document**. Select these items and click **Run selected tasks**.
4. You are now able to load the objects in Web Designer.

## Table-dependent references

Table-dependent references have been replaced by object-dependent references. This may affect all web projects that were defined in versions up to (and including) 6.1.

**To create object-dependent references for these web projects, perform the following steps**

1. Open Web Designer and authenticate to the database.
2. Select the menu item **Migration assistant**.
3. In the migration assistant, there will be some items that start with **Create object-dependent references**. Select these items and click **Run selected tasks**.

## Handling compiler error messages

This section provides details about some common error messages that you may see when first compiling a web project with custom components.

**Message:** The return type of the function <x> is ambiguous.

**Details:** All functions must have well-defined return types. In some cases, the types of the argument must also be made explicit.

**Solution:** Double-click the error message to select the function definition. Select the proper return data type of the function.

If the function has any arguments, define the argument type in the function signature. For example, if the function has the signature Process(inputParameter), add the argument type **string**. The new function signature reads: Process(string inputParameter).

**Message:** There is no cursor defined on the collection <x>

**Details:** In previous versions, it was allowed for cursors to be used implicitly. All cursors must now be explicitly declared.

**Solution:** You may see this message when you are referencing an implicit cursor below one of these node types:

- Virtual node mapping
- Local component
- Function

Double-click the error message to select the node, then look for the closest parent node that corresponds to one of these node types. Note that this can be the node itself. Right-click the node and add a cursor declaration for the collection.

**Message:** The component must implement the interface <xx>.

**Details:** In Web Designer 8.2, components that are used as object-dependent references or column editors must explicitly implement the corresponding component interface.

**Solution:** Double-click the error message to select the node. Look for the **Component interface** node and select it. Assign the interface that is named in the error message.

**Message:** The module <xx> was not found

**Details:** Some modules have been removed from the Web Portal.

**Solution:** Remove the reference to the module.

**Message:** The function {0} is not marked as a property iteration function.

**Details:** Functions that are used in property iterations must be explicitly marked as such.

**Solution:** Double-click the error message to select the function definition. Mark the function as a property iteration function.

## Changes to Web SQL functions

### Removed Web SQL functions

- The GetToXML function has been removed.
- The Eval function has been removed.

### Semantic changes

The following Web SQL functions have changed their internal implementation. This may cause unexpected behavior in custom components that rely on details of the old implementation.

- The TranslateColumn function does not recognize % as a place holder character anymore. This change was made to increase performance for the general case, where place holders are not required.

- The Concat function now behaves differently when the input set is empty. In the case where the input does not contain any rows, the result is not NULL but an empty string.
- The GetViPrimaryKey function has been removed. It is no longer necessary to handle the special case where an artificial internal primary key was created for database objects. Use the PrimaryKeyfunction instead.

## Changed features

### Run arbitrary SQL statements

Due to security considerations, it is not recommended to run arbitrary SQL statements from the web application layer. When the web application is installed on the new application server, an exception is generated when any SQL statements are performed.

This change affects all Database query type collections defined in Web Designer components.

All SQL statements must be encapsulated as **predefined SQL statements** (QBMLimitedSQL-type objects) and stored in the database. Refer to the *One Identity Manager Configuration Guide* for more information on how to define predefined SQL statements.

For additional security, predefined SQL statements must be assigned to permission groups. Running of predefined SQL statements always occurs with the permissions of the user who is logged in to the web application can.

Note that WHERE clauses, as well as the WebSQL functions Exists and GetSingleProperty, are not considered arbitrary SQL statements and may be used as before.

## Removed features

- The drop down container control has been removed.
- The drop down button control does not support sub menu items anymore.
- The control events Click a control, Move parent container, Expand/collapse grids and Flush client commands have been removed.
- The Allow special HTML sequences property on the label control has been removed.
- The Skip condition for this band property on the grid control has been removed.
- The Filter condition for nodes to be expanded property on the grid control has been removed.
- On the Fill collection action, the Load candidates for M:N relation option has been removed.

- Special pages that were defined as raw HTML are no longer supported. Specifically, the login page, logout page and the error page cannot be defined as raw HTML.
- Configuration parameters with the type Expression are no longer supported.
- The Report Viewer node type does not support directly exporting a PDF file. To directly transmit a compiled report as a PDF file, see the component VI\_Common\_ShowReport for an implementation example.
- The ability to record and run scripts in Web Designer has been removed.

## Property write protection

The semantics of the write protection functionality has been modified.

When defining a write protection on a property, the write protection will affect all controls bound to that property. Previously, only controls defined in the sub tree of the write protection node were affected. This change was made to reduce ambiguity in some situations, and to allow for cleaner separation of UI and permission-related code.

If you have both read-only and read-write use cases in a component, you can define a so-called proxy property to build a read-only proxy property.

## Boolean values and NULL

In versions up to 6.1, the internal data storage allowed for Boolean-typed values to be NULL. This is no longer the case, and the C# non-nullable System.Boolean type is now used.

WebSQL expressions such as IsNull(BooleanFunction(), true) are now considered invalid and will generate the following compiler error:

"The expression is of type System.Boolean and is never NULL."

## Modified session timeout handling

Previous versions included a heartbeat functionality to keep a user's session open as long as the browser window was open. This was implemented by sending a ping from the browser to the server. As this may cause heavy server load in certain scenarios, this feature has been removed.

As a consequence, the session timeout configured for the web application will now cause inactive sessions to time out, even if the user's browser window is still open.

## Selectable IT Shop products

There are two minor changes to the requestable products filter in the Web Portal, managed by the VI\_ITShop\_AccProduct\_Filter configuration key .

- By default, IT Shop products (AccProduct) that are not assigned to any service category are not displayed as requestable products (e.g. the delegation product).
- Assignment resources (objects in the QERAssign table) are displayed as requestable products in the IT Shop.

## Object collection and selection components

As mentioned above, the grid and tree controls now support true on-demand loading of data.

In previous versions, it was necessary to load a collection before displaying its content in a grid or a tree. This is no longer necessary. If you configure a control to use the database as its data source, the control will then automatically load the required data. (The control will never remove objects from the collection, it only adds new ones.)

- The grid control implements page-based loading. By default, only the first page of objects is loaded. Grouping works the same way: only the data required for the selected group is loaded.
- The tree control implements hierarchical loading. By default, only the first level of the hierarchical structure objects is loaded. When expanding a tree node, the next level of the data structure is loaded.

It is important to note two consequences of this new mode.

- At any time, the collection will only hold a subset of the logical data set. Depending on how the user has configured paging and filtering on the control, the collection will only hold the data which is displayed. For example, the logical data set could consist of all PersonWantsOrg objects for a specific employee. If you configure a database-bound grid, only PersonWantsOrg required to display the first grid page will be present in the collection after the page is first rendered. If you need to perform an operation on all PersonWantsOrg objects, you will need to manually load them.
- Data events will be raised for every load operation. Specifically, insert and bulk-load events will be raised whenever a paging, sorting or filtering operation causes new objects to be added to the collection.

The standard components have been changed as follows in order to benefit from performance improvements.

- Object collection components are now expected to load the data that they need to display. There is no need to load data into a collection before the collection is given to an object collection component. Instead, just supply the TableName() and DbWhereClause() functions and the object collection component will load and display the data accordingly.
- Object selection components do not actually load the data anymore. Object selection components are expected to provide a WHERE clause, without loading data.

Object selection and Object collection components are designed to work well with each other. The WHERE clause supplied by the object selection component can be directly mapped to the object collection component, so that a change to the WHERE clause triggers a refresh of the data display.

The standard component VI\_Edit\_FK provides an implementation example of this model. For more information about the data source API, refer to the documentation for the `VI.WebRuntime.Data.DbDataSource` class.

## Removed control layout properties

The following control layout properties are no longer supported. References to these properties will result in Web Designer compilation errors. In some cases, the properties have been renamed and references will need to be updated to reflect the new name.

| Control   | Property                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Grid band | ImagePagingBack<br>ImagePagingForward<br>CsvSeparator<br>Image_SortDesc<br>Image_SortAsc<br>Image_SortNone<br>PagesInSelector<br>CssClassNameContainerResizeInactive<br>CssClassNameContainerResize<br>UseSplitTables<br>IconPlus<br>IconWhite<br>IconMinus<br>RenderSortingWithCss<br>CssClassNameSortImage<br>CssClassNameNaviCell<br>CssClassNameAutoFilterText<br>CssClassNameFilter<br>InteriorNaviCell<br>AutoFilterMode<br>AutoNormalizeLayout (is now called DoNotAutoNormalizeLayout) |
| Tree band | TreeLevelCssClassPrefix<br>LineMode<br>ShowRootLines                                                                                                                                                                                                                                                                                                                                                                                                                                           |

| <b>Control</b> | <b>Property</b>                                                                                                                                                                                                                                                                                                                                                                                             |
|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                | IndentationWidth<br>CssClassNameContent<br>CssClassNameBlockDiv                                                                                                                                                                                                                                                                                                                                             |
| Label          | AppendImage                                                                                                                                                                                                                                                                                                                                                                                                 |
| Button         | AppendImage<br>CssClassNameContainer                                                                                                                                                                                                                                                                                                                                                                        |
| Table          | WrapInContainer<br>CssClassNameWrapper                                                                                                                                                                                                                                                                                                                                                                      |
| Container      | Wrap (is now called AutoGenSubContainers)                                                                                                                                                                                                                                                                                                                                                                   |
| TextBox        | CssClassNameWatermark<br>CssClassNameTextarea<br>CssClassNameMandatory (is now called CssClassNameIfMandatory)<br>CssClassName (is now called CssClass)                                                                                                                                                                                                                                                     |
| Drop down list | CssClassName (is now called CssClass)                                                                                                                                                                                                                                                                                                                                                                       |
| Radio button   | CssClassName (is now called CssClass)                                                                                                                                                                                                                                                                                                                                                                       |
| Date control   | CssClassNameTableNavigation<br>CssClassNameTableDays<br>CssClassNameHeaderRow<br>CssClassNameCellDefault<br>CssClassNameCellSelected<br>CssClassNameCellCurrent<br>CssClassNameCellCurrentAndSelected<br>CssClassNameDayLink<br>CalendarTable<br>DateSelectBox<br>CalendarNavigationlink<br>CalendarTableDays<br>CalHeaderCell<br>CalHeaderRow<br>ButtonCSSName<br>NoEnterDateManual<br>CssClassNameTextBox |

| Control      | Property                                                                                                                               |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------|
|              | CssClassNameButton<br>CssClassNameCalendar                                                                                             |
| Layout panel | RowCssClass (is now called CssClassNameRow)<br>CellCssClass (is now called CssClassNameCell)<br>RenderMode (is now called IsTableMode) |
| Tab control  | CssClassNameNaviCell<br>RenderMode                                                                                                     |

## Changes to standard objects

### Removed configuration keys

The following configuration keys have been removed.

| Configuration key                                                                                                                                                                                                                                                                                                                                          | Remarks                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| VI_History_StateOverview_Person_MembershipTables                                                                                                                                                                                                                                                                                                           | The list of tables is now defined as a function.                                                                                |
| VI_History_StateOverview_Person_EntitlementTables                                                                                                                                                                                                                                                                                                          | The list of tables is now defined as a function.                                                                                |
| VI_Reporting_DefaultTemplate                                                                                                                                                                                                                                                                                                                               | The name of the default report template is now stored in the configuration parameter <b>QER   RPS   DefaultReportTemplate</b> . |
| VI_Common_Color_SmallButton_Font<br>VI_Common_Color_LinkAndHeader<br>VI_Common_Color_Link_Hover<br>VI_Common_Color_Gradient_WebPart1<br>VI_Common_Color_Gradient_WebPart2<br>VI_Common_Color_Gradient_Generic1<br>VI_Common_Color_Gradient_Generic2<br>VI_Common_Color_HeadingColor<br>VI_Common_Color_Border_LightGray<br>VI_Common_Color_Border_DarkGray | The configuration keys have been removed due to layout changes.                                                                 |

| <b>Configuration key</b>                       | <b>Remarks</b> |
|------------------------------------------------|----------------|
| VI_Common_Color_Border_Gray                    |                |
| VI_Common_Color_Border_Blue                    |                |
| VI_Common_Color_Border_Header                  |                |
| VI_Common_Color_Border_SmallGroup              |                |
| VI_Common_Color_Border_SeparatorLine           |                |
| VI_Common_Color_PagingComponent_Border         |                |
| VI_Common_Color_VeryLightGray                  |                |
| VI_Common_Color_Deactivated                    |                |
| VI_Common_Color_Background_Signaled            |                |
| VI_Common_Color_ShapeSignaled                  |                |
| VI_Common_Color_FKControl_LimitExceeded        |                |
| VI_Common_Color_Hyperview_Separator            |                |
| VI_Common_Color_Combobox_Item_Hover_Background |                |
| VI_Common_Color_Combobox_Item_Hover_Font       |                |
| VI_Common_Color_ErrorBox_TitleFont             |                |
| VI_Common_Color_UserNotification_Background    |                |
| VI_Common_Color_UserNotification_Border        |                |
| VI_Common_Color_Background_Calendar_Day        |                |
| VI_Common_Color_Background_Calendar_Header     |                |
| VI_Common_Color_Font_Calendar_Header           |                |
| VI_Common_Color_Font_Calendar_Day_Hover        |                |
| VI_Common_Color_TreeItemSelected_or_Hover      |                |
| VI_Common_Color_TreeItemHover_Border           |                |
| VI_Common_Color_DropDown_Calendar_Background   |                |
| VI_Common_Color_Popup_Background               |                |
| VI_Common_Color_Popup_Border                   |                |
| VI_Common_ChartTitle                           |                |
| VI_Common_Chart_Background                     |                |
| VI_Common_Color_GridRow_Hover_Background       |                |
| VI_Common_Color_GridRow_StaticBelow_Background |                |
| VI_Common_Color_GridHeader_Font                |                |
| VI_Common_Color_GridHeader_Border              |                |
| VI_Common_Color_GridTable_Border               |                |

| Configuration key                                 | Remarks |
|---------------------------------------------------|---------|
| VI_Common_Color_Tab_Inactive_Gradient_Color1      |         |
| VI_Common_Color_Tab_Inactive_Gradient_Color2      |         |
| VI_Common_Color_Tab_Inactive_Background           |         |
| VI_Common_Color_Tab_Inactive_Font                 |         |
| VI_Common_Color_Tab_Border                        |         |
| VI_Common_Color_Tab_Active_Background             |         |
| VI_Common_Color_Tab_Active_Link                   |         |
| VI_Common_Color_Tab_Link                          |         |
| VI_Common_Color_NoScript_Link                     |         |
| VI_Common_Color_NoScript_ButtonFont               |         |
| VI_Common_Color_Dojo_DropDownButton_Hover         |         |
| VI_Common_Color_Dojo_DropDownButton_Focused       |         |
| VI_Common_Color_Dojo_Menu_Border                  |         |
| VI_Common_Color_Dojo_Menu_Background              |         |
| VI_Common_Color_Dojo_Menu_Focused_Font            |         |
| VI_Common_PleaseWait_Border                       |         |
| VI_Common_Color_Menu_Font                         |         |
| VI_Common_Color_MenuOpenItems_Font                |         |
| VI_Common_Color_ToolBarButton_Font                |         |
| VI_Common_Color_ColorBaseHighlight                |         |
| VI_Common_Color_Button_Border                     |         |
| VI_Common_Color_Button_Font                       |         |
| VI_Common_Color_Button_Font_Secondary             |         |
| VI_Common_Color_Button_Font_Disabled              |         |
| VI_Common_Color_Button_Blue_Background_Default1   |         |
| VI_Common_Color_Button_Blue_Background_Default2   |         |
| VI_Common_Color_Button_Blue_Background_Hover1     |         |
| VI_Common_Color_Button_Blue_Background_Hover2     |         |
| VI_Common_Color_Button_Blue_Background_Disabled   |         |
| VI_Common_Color_Button_Blue_Border_Focused        |         |
| VI_Common_Color_Button_Silver_Background_Default1 |         |
| VI_Common_Color_Button_Silver_Background_Default2 |         |
| VI_Common_Color_Button_Silver_Background_Hover1   |         |

| <b>Configuration key</b>                          | <b>Remarks</b> |
|---------------------------------------------------|----------------|
| VI_Common_Color_Button_Silver_Background_Hover2   |                |
| VI_Common_Color_Button_Silver_Background_Disabled |                |
| VI_Common_Color_Button_Silver_Border_Focused      |                |
| VI_Common_Color_Button_Silver_Border_default      |                |

## Removed modules

| <b>Module name</b>                | <b>Description</b>                                                                                                                    |
|-----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| VI_ActionHistory_Main             | All modules corresponding to overview pages in version 6.1 have been removed from the application.                                    |
| VI_Approvals_Main                 |                                                                                                                                       |
| VI_Audit_Main                     |                                                                                                                                       |
| VI_BusinessOwner_Main             |                                                                                                                                       |
| VI_Compliance_Main                | The navigation control has been updated to allow for direct access to all menu items.                                                 |
| VI_Compliance_Policies_Main       |                                                                                                                                       |
| VI_Compliance_RuleViolations_Main |                                                                                                                                       |
| VI_Employee_Main                  |                                                                                                                                       |
| VI_Infosystem_Main                |                                                                                                                                       |
| VI_ITShop_Main                    |                                                                                                                                       |
| VI_MyData_Main                    |                                                                                                                                       |
| VI_MyData_MyPassword_Main         |                                                                                                                                       |
| VI_QAM_Taxonomy_Main              |                                                                                                                                       |
| VI_RelatedApplications_Main       |                                                                                                                                       |
| VI_Infosystem_DashboardWithObject | The Infosystem module has been removed from the application.                                                                          |
| VI_Reportingsubscription          | The module is not referenced anymore. Instead of referencing this module, use a reference to the VI_Reportingsubscriptions component. |
| VI_Roles_SPSResources             | Not required anymore.                                                                                                                 |
| VI_QAM_CategorizationManager      | Not required anymore.                                                                                                                 |

# Removed components

| Component name                                        | Description                                                                                                |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| VI_Attestation_Display_WizardParameter_Domain         | The attestation policy wizard has been updated to use more generic components.                             |
| VI_Attestation_Edit_WizardParameter_AERole            | As a result, these components are not required anymore.                                                    |
| VI_Attestation_Edit_WizardParameter_Department        |                                                                                                            |
| VI_Attestation_Edit_WizardParameter_Domain            |                                                                                                            |
| VI_Attestation_Edit_WizardParameter_ESet              |                                                                                                            |
| VI_Attestation_Edit_WizardParameter_Locality          |                                                                                                            |
| VI_Attestation_Edit_WizardParameter_Org               |                                                                                                            |
| VI_Attestation_Edit_WizardParameter_Person            |                                                                                                            |
| VI_Attestation_Edit_WizardParameter_ProfitCenter      |                                                                                                            |
| VI_Attestation_Edit_WizardParameter_QAMCategory       |                                                                                                            |
| VI_Attestation_Edit_WizardParameter_QAMClassification |                                                                                                            |
| VI_Attestation_Edit_WizardParameter_QAMDuG            |                                                                                                            |
| VI_Attestation_Edit_WizardParameter_QAMTrustee        |                                                                                                            |
| VI_Attestation_Edit_WizardParameter_UNSAccount        |                                                                                                            |
| VI_Attestation_Edit_WizardParameter_UNSCContainer     |                                                                                                            |
| VI_Attestation_Edit_WizardParameter_UNSGGroup         |                                                                                                            |
| VI_Attestation_Edit_WizardParameter_XProxyContext     |                                                                                                            |
| VI_Common_HyperView_Default                           | This component is now named VI_HyperView_Default.                                                          |
| VI_Common_HyperView_Ressource                         | The Ressource table has been replaced with the new tables QERResource, QERReuse, QERReuseUS and QERAssign. |
| VI_Common_ObjectSelection_Default                     | This component is now named VI_ObjectSelection_Default.                                                    |
| VI_Common_ObjectSheet_Default                         | This component is now named VI_ObjectSheet_Default.                                                        |
| VI_Common_SearchPerson                                | These components implement object searching, which has been replaced as                                    |
| VI_Common_SearchPersonPopup                           |                                                                                                            |
| VI_Common_SelectDocumentNumber                        |                                                                                                            |

| <b>Component name</b>                                   | <b>Description</b>                                                                                       |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| VI_Common_SelectorHardware                              | much as possible by flexible filtering. As a result, these search components are not required anymore.   |
| VI_Common_SelectorPerson                                |                                                                                                          |
| VI_QAM_QAMDUG_Search                                    |                                                                                                          |
| VI_QAM_QAMDUG_SearchListing                             |                                                                                                          |
| VI_Reporting_SelectorPerson                             |                                                                                                          |
| VI_Common_UserMessages                                  | The notification messages are now rendered in the form type objects. This component is not used anymore. |
| Vi_Delegation_GridColumns_SecondLevel                   | The component is not used anymore.                                                                       |
| VI_Edit_FK_Generic                                      | The component is not used anymore.                                                                       |
| VI_Edit_FK_Generic_Tree                                 | The component is not used anymore.                                                                       |
| VI>Edit_Special_AttestationPolicy_UID_AttestationObject | The component is not used anymore.                                                                       |
| VI>Edit_Special_URL                                     | The component is not used anymore.                                                                       |
| VI_Common_ObjectQuickInfo                               | The component is not used anymore.                                                                       |
| VI_Infosystem_ChartWithObject                           | The info system menu item has been removed. See the new component VI_Common_ChartWithObject.             |
| VI_Infosystem_DashboardLoadData                         | The info system menu item has been removed. See the new component VI_Common_DashboardLoadData.           |
| VI_Infosystem_Dashboard_List                            | The info system menu item has been removed. See the new component VI_Common_Chart.                       |
| VI_ITShop_ObjectDisplayCheckStatus                      |                                                                                                          |
| VI_ITShop_PwoDecisionHistory                            | The request workflow history view has been updated. This                                                 |

| <b>Component name</b>                                                                                                                                                                                                                                                                                                                                                                                                            | <b>Description</b>                                                                                                                                   |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                  | component is not used anymore.                                                                                                                       |
| VI_ObjectEdit_Ressource                                                                                                                                                                                                                                                                                                                                                                                                          | Removed because the Ressource table has been removed from the data model.                                                                            |
| VI_ObjectEdit_QAMClassificationRule                                                                                                                                                                                                                                                                                                                                                                                              | Classification rule editing is not implemented in the classification web server component.                                                           |
| VI_ProductEditor_Clone_ShoppingCartItem_Default<br>VI_ProductEditor_Details_AccProduct_Default<br>VI_ProductEditor_Details_PersonWantsOrg_Default<br>VI_ProductEditor_Details_PersonWantsOrg_NewManager<br>VI_ProductEditor_Details_ShoppingCartItem_Default<br>VI_ProductEditor_Insert_ShoppingCartItem_Default<br>VI_ProductEditor_Verify_ShoppingCartItem_Default<br>VI_ProductEditor_Verify_ShoppingCartItem_RequestNewGroup | The names of these components have changed. The "ProductEditor_" part of the component names has been removed to improve component name consistency. |
| VI_QAMDUG_Search                                                                                                                                                                                                                                                                                                                                                                                                                 | The component is not used anymore.                                                                                                                   |
| VI_QAM_Dashboard_CategoryAndFileType                                                                                                                                                                                                                                                                                                                                                                                             | This component is now named VI_QCS_Dashboard_CategoryAndFileType.                                                                                    |
| VI_QAM_Dashboard_ResourceByFileType                                                                                                                                                                                                                                                                                                                                                                                              | This component is now named VI_QCS_Dashboard_ResourceByFileType.                                                                                     |
| VI_QAM_QAMDUGExplorer                                                                                                                                                                                                                                                                                                                                                                                                            | The component is not used anymore.                                                                                                                   |
| VI_QAM_QAMDUGOmnibox                                                                                                                                                                                                                                                                                                                                                                                                             | The component is not used anymore.                                                                                                                   |
| VI_QAM_QAMDUG_PathLoader                                                                                                                                                                                                                                                                                                                                                                                                         | The component is not used anymore.                                                                                                                   |
| VI_QAM_ResourceAccessRequests                                                                                                                                                                                                                                                                                                                                                                                                    | The component is not used anymore.                                                                                                                   |
| VI_QAM_RiskIndexEditor                                                                                                                                                                                                                                                                                                                                                                                                           | The component is not used                                                                                                                            |

| <b>Component name</b>      | <b>Description</b>                                               |
|----------------------------|------------------------------------------------------------------|
|                            | any more.                                                        |
| VI_Common_LanguageSelector | Removed because the application now supports multiple languages. |

## Removed virtual functions

| <b>Component</b>                    | <b>Virtual function</b> | <b>Remarks</b>                                                                                    |
|-------------------------------------|-------------------------|---------------------------------------------------------------------------------------------------|
| VI_Common_CompactLabel              | UsageKey()              | Not required anymore.                                                                             |
| VI_Edit_Multiselect                 | IntroducingText()       | Not required anymore.                                                                             |
| VI_Edit_Multiselect                 | UsageKey()              | Not required anymore.                                                                             |
| VI_Edit_Multiselect_SelectRecursive | UsageKey()              | Not required anymore.                                                                             |
| VI>Edit_MR                          | RemoveOldCandidates()   | Not required anymore.                                                                             |
| VI_Attestation_History_Filter       | popuptitle()            | Not required anymore.                                                                             |
| VI_Common_DecisionControl           | CanDecide()             |                                                                                                   |
| VI_Common_DecisionControl           | AllowApprove()          | Now stored as a flag on the EditTable collection.                                                 |
| VI_Common_DecisionControl           | AllowDeny()             | Now stored as a flag on the EditTable collection.                                                 |
| VI_Common_PropertyEditor            | SizeType()              | Use the LayoutPanelLayoutName() function to dynamically assign different property editor layouts. |
| VI_Responsibilities_Memberships     | externalFilter()        | Not required anymore.                                                                             |
| VI_Responsibilities_Memberships     | externalOrgRootFilter() | Not required anymore.                                                                             |
| VI_Action_AdditionalApprover        | PopupStyles()           | Not required anymore.                                                                             |

| <b>Component</b>                               | <b>Virtual function</b>                                                  | <b>Remarks</b>                                                                           |
|------------------------------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| VI_Action_DenyApproval                         | PopupStyles()                                                            | Not required anymore.                                                                    |
| VI_Action_InsteadOfApprover                    | PopupStyles()                                                            | Not required anymore.                                                                    |
| VI_ITShop_AccProductGroupList                  | PersonForOrder()                                                         | Removed as it is now possible to make a request for more than one employee.              |
| VI_ITShop_AccProductGroupSelector              | PersonForOrder()                                                         | Removed as it is now possible to make a request for more than one employee.              |
| VI_ITShop_CartPatternApply                     | PersonForOrder()                                                         | Removed as it is now possible to make a request for more than one employee.              |
| VI_ITShop_PersonWantsOrg_GridColumns           | DisplayPersonInserted()<br>ShowCancelOrder()<br>ShowRequestInformation() | Not supported anymore.                                                                   |
| VI_ITShop_ApprovalItem                         | AdditionalFilter()                                                       | Not supported anymore.                                                                   |
| VI_ITShop_AssignmentInfo                       | CustomStyles()                                                           | Not supported anymore.                                                                   |
| VI_Attestation_Display_WizardParameter_Generic | OWExpressionDisplay()<br>ColumnNamePK()<br>TableName()<br>MultiLine()    | Not required anymore.                                                                    |
| VI_ITShop_CartCalculateCheckStatus             | ITShopOrgForShoppingCartItem()                                           | Not required anymore.                                                                    |
| VI_Popup                                       | PopupStyles()                                                            | Use the <code>CssClass()</code> function to dynamically assign a CSS class to the popup. |
| VI_ITShop_WebPart_Top5Attestation              | DecisionType()<br>HeadLine()<br>HideDecisionButton()                     | Removed because the component does not directly trigger actions anymore.                 |

| <b>Component</b>                 | <b>Virtual function</b>                              | <b>Remarks</b>                                                                                                   |
|----------------------------------|------------------------------------------------------|------------------------------------------------------------------------------------------------------------------|
| VI_ITShop_WebPart_Top5Decisions  | DecisionType()<br>HeadLine()<br>HideDecisionButton() | Removed because the component does not directly trigger actions anymore.                                         |
| VI_ITShop_CartOverview           | ShowHeader()<br>ShowToForLater()                     | Removed because these actions are implemented in the detail pane, not in the grid view.                          |
| VI_MessageBox                    | MessageBoxStyle()                                    | Removed property, use the IsDestructiveAction() function to switch between different styles.                     |
| VI_ITShop_PwoOverviewGrid        | PWOWhereClause()                                     | Renamed to DbWhereClause() for consistency.                                                                      |
| VI_ITShop_PwoOverviewGrid        | NoItemsText()<br>TitleText()<br>ShowCancelOrder()    | Not required anymore.                                                                                            |
| VI_Common_HyperView_ShapeList    | ShapeBaseColor()                                     | The ability to set colors for individual HyperView shapes has been removed. Use the ColorKey() function instead. |
| VI_Common_HyperView_Shape        | ShapeBaseColor()                                     | The ability to set colors for individual HyperView shapes has been removed. Use the ColorKey() function instead. |
| VI_Attestation_AttestationCase   | DisplayLinkToApprovalPage()                          | Not required anymore.                                                                                            |
| VI_ITShop_AddCartItem            | autoITShopOrg()                                      | Not required anymore.                                                                                            |
| VI_ITShop_AccProduct_GridColumns | HideServiceCategory()                                | The column is not displayed by default.                                                                          |
| VI_Roles_                        | TypeFilter()                                         | Not required anymore.                                                                                            |

| <b>Component</b>          | <b>Virtual function</b>                        | <b>Remarks</b>                                        |
|---------------------------|------------------------------------------------|-------------------------------------------------------|
| EntitlementDetective      |                                                |                                                       |
| VI_Roles_                 | EvaluationContext()                            | Not required anymore.                                 |
| EntitlementUsageDetective |                                                |                                                       |
| VI_QAM_ResourceView       | Filter()                                       | Replaced by the virtual function QamDugWhereClause(). |
| VI_Compliance_            |                                                |                                                       |
| ExceptionApprovalGrid     | showaudit()<br>setuseraudit()<br>showhistory() | Not required anymore.                                 |

## Removed virtual nodes

| <b>Component</b>                     | <b>Node identifier</b>        | <b>Remarks</b>                                                                    |
|--------------------------------------|-------------------------------|-----------------------------------------------------------------------------------|
| VI_ITShop_CartOverview               | MoveToForLater<br>MoveToOrder | Removed because actions are implemented in the detail pane, not in the grid view. |
| VI_ITShop_PersonWantsOrg_GridColumns | AdditionalActions             | Removed because actions are implemented in the detail pane, not in the grid view. |
| VI_ITShop_PwoOverviewGrid            | AdditionalActions             | Removed because actions are implemented in the detail pane, not in the grid view. |
| VI_ITShop_QueryToPerson              | OnAfterQueryToPerson          |                                                                                   |
| VI_Roles_                            |                               |                                                                                   |
| AttestationCasesForObject            | HeadLineIfData                |                                                                                   |

## Removed virtual collections

These virtual collections have been removed. You can safely remove any mapping collections that refer to these collections.

| <b>Component</b>       | <b>Collection name</b> |
|------------------------|------------------------|
| VI_ITShop_ApprovalItem | Accproduct             |
|                        | Pwodecisionhistory     |
|                        | Pwohelperpwo           |

| <b>Component</b>                       | <b>Collection name</b>                                                                |
|----------------------------------------|---------------------------------------------------------------------------------------|
|                                        | pwodecisionstep                                                                       |
| VI_ITShop_PersonWantsOrg_GridColumns   | Accproduct<br>Pwodecisionhistory<br>pwohelperpwo                                      |
| VI_ITShop_PersonWantsOrg_Information   | Pwodecisionhistory                                                                    |
| VI_Attestation_AttestationCase         | AttestationPolicy                                                                     |
| VI_Attestation_History_Filter          | AttestationCase<br>AttestationPolicy                                                  |
| VI_Compliance_ExceptionApproval_Filter | Personinnoncompliance<br>Compliancerule                                               |
| VI_Compliance_ExceptionApprovalGrid    | compliancerule                                                                        |
| VI_Compliance_GridColumn_RuleSeverity  | compliancerule                                                                        |
| VI_Compliance_RuleSeverityIndicator    | compliancerule                                                                        |
| VI_ITShop_AccProductGroupList          | Accproductcandidate                                                                   |
| VI_ITShop_AccProductGroupSelector      | Accproductcandidate<br>parentvars                                                     |
| VI_ITShop_CartOverview                 | Accproduct<br>Personwantsorg<br>Compliancechecksimpleobjects<br>compliancechecksimple |
| VI_ITShop_OrderHistory_Filter          | Accproductgroup<br>Personwantsorg                                                     |
| VI_ITShop_PwoOverviewGrid              | Pwodecisionhistory<br>Accproduct                                                      |
| VI_QERPolicy_ExceptionApproval_Filter  | Qerpolicyhasobject                                                                    |
| VI_UNS_RequestNewGroup                 | shoppingcartitem                                                                      |
| VI_QAM_RequestAccess                   | shoppingcartitem                                                                      |

## Removed virtual properties

| Component                              | Property                                               | Remarks                                              |
|----------------------------------------|--------------------------------------------------------|------------------------------------------------------|
| VI_ITShop_AccProductGroupList          | Anzahl                                                 | Not required anymore.                                |
| VI_ITShop_AccProductGroupSelector      | Anzahl<br>Showonlythis<br>canorderforsomebodyelse      | Not required anymore.                                |
| VI_Common_DecisionHistory              | DecisionRule                                           | Renamed to UID_DecisionRule for consistency reasons. |
| VI_ITShop_PersonWantsOrg_GridColumns   | UID_AccProduct                                         | Not required anymore.                                |
| VI_ITShop_PwoOverviewGrid              | UID_AccProduct                                         | Not required anymore.                                |
| VI_Compliance_ExceptionApproval_Filter | DisplayStatus<br>DisplayNonCompliance                  | Not required anymore.                                |
| VI_Edit_Multiselect                    | UsageKey                                               | Not required anymore.                                |
| VI_Delegation_HistoryGrid              | TableName                                              | Not required anymore.                                |
| VI_ITShop_CalculatePWOComplianceCheck  | DbObjectKey1<br>DbObjectKey2                           | Replaced by the new DbObjectKey property.            |
| VI_Reporting_ParameterEdit             | HasPredefinedRange<br>QueryWhereClauseResulting        | Not required anymore.                                |
| VI_Delegation_GridColums_FirstLevel    | Display<br>TooltipDisplay                              | Not required anymore.                                |
| VI_Common_CompactLabel                 | Display                                                | Not required anymore.                                |
| VI_MyData_ChallengeLossRoleMembership  | uid_accproduct<br>checkstatus                          | Not required anymore.                                |
| VI_Roles_RoleAssignmentNew             | pkselected<br>display<br>uid_unscontainer<br>tablename | Not required anymore.                                |

# About us

One Identity solutions eliminate the complexities and time-consuming processes often required to govern identities, manage privileged accounts and control access. Our solutions enhance business agility while addressing your IAM challenges with on-premises, cloud and hybrid environments.

## Contacting us

For sales and other inquiries, such as licensing, support, and renewals, visit <https://www.oneidentity.com/company/contact-us.aspx>.

## Technical support resources

Technical support is available to One Identity customers with a valid maintenance contract and customers who have trial versions. You can access the Support Portal at <https://support.oneidentity.com/>.

The Support Portal provides self-help tools you can use to solve problems quickly and independently, 24 hours a day, 365 days a year. The Support Portal enables you to:

- Submit and manage a Service Request
- View Knowledge Base articles
- Sign up for product notifications
- Download software and technical documentation
- View how-to videos at [www.YouTube.com/OneIdentity](https://www.YouTube.com/OneIdentity)
- Engage in community discussions
- Chat with support engineers online
- View services to assist you with your product

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### **Legend**

 **WARNING:** A WARNING icon highlights a potential risk of bodily injury or property damage, for which industry-standard safety precautions are advised. This icon is often associated with electrical hazards related to hardware.

 **CAUTION:** A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

One Identity Manager Web Designer and Web Portal Changes  
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