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INTRODUCTION

GENERAL

This document provides all the information needed to install, evaluate and deploy this KWizCom product:

- Introduction
- Installation Guide
- Administrator Guide
- FAQ
- Version Release Notes
Many customers require cross site collection/cross web application aggregation to retrieve business information stored in SharePoint. When trying to implement such aggregation capabilities, there is a need to overcome the following challenges:

- **No API for cross site collection queries**
  SharePoint provides an API only for cross site queries. This means that cross S.C queries require custom implementation (development).

- **Cross site collection queries’ performance degradation**
  Aggregation of several S.C’s involves separate queries (each for every S.C), and then a merging operation of the results. This means that the performance is linearly-dependent on the number of site collections, and also of the merged data.

- **Memory usage in cross site query**
  Even running a simple SPSiteDataQuery to get information from a single site collection can be very expensive in server resources such as CPU, and memory. Depending on the number of lists and sites that are participating in the query, this single line of code can easily allocate 400MB, 600MB or more from the available RAM of the WFE server. Having 2 users running the same query at the same time will double that memory allocation just for them. This can sometimes result in crashing the entire application pool, affecting the overall performance of the server, and the only solution for this (query throttling to limit the number of items in queries) may resolve this issue but affect the results.

- **Heavy aggregations affect other user’s browsing experience**
  Running aggregation that take a long time and consume server resources affect all other users. This is because it is executed by the same application pool that serves all other users browsing the SharePoint WFE.
The KWizCom’s Aggregation Caching Feature solves these issues by providing a centrally-managed aggregation mechanism. That mechanism allows administrators to configure the requested aggregations, and to store the results in a farm-level cache.

This allows the KWizCom List Aggregator web part (professional edition) and other consumers (using public API) to use the cached data to display aggregation results to users without gathering them in real-time.

The caching feature instead runs on a monitored SharePoint Timer Job which can be run on a dedicated application server, leaving your WFE free to service end user requests, as intended.

The timer job produces a per-rule report and a “last job run” report, which allows administrators to analyze and optimize the aggregation rules, as well as to monitor issues and identify rules that are taking too long to run. Administrators can easily disable a specific rule from being updated (temporary or permanently) and subscribe to alerts when rules report errors during update, or when rules take longer than a certain amount of minutes to run.
SOLUTION COMPONENTS

The solution includes the following modules:

1. **Aggregation Caching Job Feature**
   This Farm feature creates the job and supporting backend list that stores all the aggregation rules.

2. **Aggregation Caching Rules Settings list**
   This central list is used to store and manage the aggregation caching rules. Each aggregation caching rule defines a query (aggregation). An aggregation caching rule includes:
   a. A query
   b. Scope
   c. User account used to run the query
   d. Period of running the query (and refreshing the cache)

3. **Aggregation Caching Job**
   This job runs the aggregation caching rules, and stores the results in the cache. Each rule can be executed by a thread, or serially one after another by the job.

CACHE IMPLEMENTATION

Once an aggregation caching rule has been executed by the job, its returned results are cached in the following way:

1. The results are merged (in case a rule includes several sources that need to be aggregated) into a DataTable object (in memory), along with other supporting information (such as, column ordering, grouping and more).
2. Serialize the object into XML, and compress it using ZIP.
3. Save the compressed file as an attachment to the rule list item.

When the List Aggregator web part (or any other consumer) needs to display cached results of selected Aggregation Caching Rule, it performs the following:

1. De-compress the compressed file attached to the caching rule’s list item.
2. De-Serialize the XML file and load data to a DataTable object.
3. Bind the web part’s grid display to the DataTable object.

These steps occur on every end user operation, which requires the List Aggregator web part to refresh the display:

- Sorting
- Filtering
- Page navigation
- Grouping
- Refreshing the entire page

This means that whenever the cache is refreshed (by the aggregation caching job, or manually by a user), any of those user-actions will cause the web part to display the results from the latest cache.

### KEY FEATURES

<table>
<thead>
<tr>
<th>Feature</th>
<th>SharePoint Discussion Boards feature</th>
<th>SharePoint 2007 /2010</th>
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</thead>
<tbody>
<tr>
<td>Enable configuring cross site collection and cross web application queries</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Execute aggregations by a central job that can be deployed apart from WFE servers that serve the users</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cache aggregation results in a farm-level cache</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Cache is accessible through API for custom web part to use</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Enable end-users to manually refresh the Aggregation cache</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Centrally manage and monitor aggregation rules to better protect your server resources</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Works with KWizCom List Aggregator web part (Professional Edition.)</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
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INSTALLATION GUIDE

SOFTWARE REQUIREMENTS

SERVER REQUIREMENTS
- SharePoint 2007 / WSS 3.0 or
- SharePoint Server/Foundation 2010

CLIENT REQUIREMENTS
- Windows Vista/7
- Microsoft Internet Explorer 7+, Mozilla Firefox (Latest version), Google Chrome (Latest version).

INSTALLATION PROCEDURE

SHAREPOINT 2007

1. Log in as SharePoint administrator account to your SharePoint front-end server.
2. Download the product’s latest evaluation version from KWizCom’s internet web site. This evaluation version is fully functional for 30 days. Further details about product activation can be found in the Administrator guide (next section).
3. Unzip the product’s zip file on your SharePoint server.
4. Double-click the .msi file in order to begin the web installation.
5. When the installation process is complete it will recycle all application pools automatically.

SHAREPOINT 2010

1. Log in as SharePoint administrator account to your SharePoint front-end server.
2. Download the product’s latest evaluation version (zip file) from KWizCom’s internet web site. This evaluation version is fully functional for 30 days.
3. Extract the zip file content on your local disk.
4. You will find 2 .WSP files: The product’s WSP file and KWizCom’s foundation WSP file.
   If you don’t already have the KWizCom Foundation latest version installed - install and deploy the KWizCom Foundation .WSP file in a farm level (All web applications) by using the standard
SharePoint’s deployment tools (stsadm, powershell, Central admin).

**IMPORTANT:**
You need to install KWizCom Foundation in a global scope, including the Central Admin’s web application.

Install and deploy the product’s .WSP file in the required level (Farm, web application) – according to your needs, by using the standard SharePoint’s deployment tools (stsadm, powershell, Central Admin).

**Remark:** Installation and deployment of standard SharePoint .WSP packages are described in Microsoft website:

POST INSTALLATION

SHAREPOINT 2007

1. After completing the installation, you will see a new KWizCom entry in Windows Start -> All Programs -> KWizCom-> KWizCom Enterprise Aggregation Caching Feature

2. Activate the SharePoint Aggregation Caching Farm feature in Central Admin.

SHAREPOINT 2010

1. After completing the package installation and deployment, activate the SharePoint Aggregation Caching Farm feature in Central Admin.
UN-INSTALLATION PROCEDURE

SHAREPOINT 2007

1. Log in as local admin to your SharePoint front-end server.
2. Go to Control Panel and double-click Add or Remove Programs.
3. Select SharePoint Discussion Boards entry and click Remove button.
4. Click Yes to approve the removal of the component.
5. Once the product was un-installed, close the Add or Remove Programs screen.

SHAREPOINT 2010

1. Retract the solution using SharePoint central admin or by using stsadm/powershell command line.
ADMINISTRATION GUIDE

This section describes all administration activities related to KWizCom Aggregation Caching feature, including: Product license activation, initial setup, configuration and maintenance.

PRODUCT ACTIVATION

KWizCom products are available for evaluation prior to purchase.

This way you can try our components and verify that they indeed meet your needs. Each evaluation version contains all features of the component’s production version. The only difference between the versions is that the evaluation version is time-limited and will operate for a period of one month.

Once you decide to purchase a KWizCom component you will need to order and then to activate the product. The steps that need to be taken next are listed below.

SHAREPOINT 2007

1. Order the product on the KWizCom website – www.KWizCom.com, or contact our sales team at sales@kwizcom.com.

2. After the order was made, activate your installed evaluation version through the Product Activation Request page on KWizCom’s web site: http://www.kwizcom.com/ProductReg. You will have to copy your Product Code (you will see the product code on the “About” product page):
3. Get the component activation key – this key will be sent to you by email once your order is processed.

4. Activate your installed evaluation version -

   click Start -> All Programs -> KWizCom -> SharePoint Aggregation Caching Feature -> Activate SharePoint Aggregation Caching Feature.

SHAREPOINT 2010

1. Order the product on the KWizCom website – www.KWizCom.com, or contact our sales team at sales@kwizcom.com.

2. After the order was made, you can activate your installed evaluation version. Activation is done by the following steps:

   a. Open SharePoint Central Admin. On the main “Central Administration” page, you will see the “KWizCom Features Administration” icon:
b. Click the **KWizCom Product Licenses Management** link. You will be redirected to a page that allows you to manage all your installed KWizCom products' licenses:

![KWizCom Product Licenses Management](image)

c. Click the “Manage License” link next to the product that you wish to activate. You will be redirected to that product's license management page:
d. Click on the “Request product code and start your evaluation now” link, under the required license type (Farm, Web application, Site Collection). A product code will be generated and displayed as in the following screenshot:

![Product Activation Request](img)

e. Copy the product code.

f. Browse the **Product Activation Request page** on KWizCom’s web site: [http://www.kwizcom.com/ProductReg](http://www.kwizcom.com/ProductReg).
Copy your Product Code into the “Product Code” field, and after you fill-out all other form fields, click “Send Activation Request button.

g. Once your order is confirmed, you will receive the Activation Code for your product by email.

h. Copy the activation code into the “Activation Code” field in the product’s license management page and click “Activate now!” link.

That’s it! Your product is now fully activated.
COMPONENT LOCALIZATION

Every KWizCom component comes with localization utility called "Resource File Editor" that enables translation of the component user interface to any required language.

This section describes this utility and the translation process.

RESOURCE FILE EDITOR UTILITY STRUCTURE

In SharePoint 2007, this utility displays the following dialog that enables the administrator to translate every displayed string (captions, menu items, user-messages) to the required target language. You can either translate the strings yourself or upload a translation resource file which will automatically translate all component strings in the strings grid.
The application displays 2 controls:

- **"Select Culture" drop-down** – contains a list of target languages.
- **Strings grid** – This grid contains all the strings displayed by the component. The grid includes 3 columns:
  a. **Internal Name** – This column displays the internal name of each string (read only).
  b. **Default Value** – The default displayed value in English (read only).
  c. **Localized Value** – The translated value in the selected language. This is where you enter the required translated value.

Click the "Load" button and select the proper translation resource file and the strings will be translated. Click "Create" and a resource file will be created. If you wish to translate the strings yourself, click "Create" once you finish translating all the component strings. This resource file will automatically be used by the component upon changing the user language on your server.

**For example**: In an MS SharePoint-based component, you should create a site using your required SharePoint Language Pack. According to the SharePoint site language, the relevant language's resource file will be used by the component.

---

**TRANSLATING A KWIZCOM COMPONENT**

**SharePoint 2007**

1. On your Windows task bar, select:

   Start->All Programs->KWizCom->SharePoint Cascading Lookup Plus Field Type->SharePoint Cascading Lookup Plus Resource Editor

2. Select your target language on the "Select Culture" drop-down list.
3. To import an existing resource file - Click "Load" and upload the translations resource file.
4. For translation to any other language-Translate all the displayed strings in the strings grid by entering a translated value in the "Localized Value" column.
5. Click the "Create"/"Update" button in order to create/save a resource file for the selected target language.

6. If you want to create additional resource files for more target languages, simply repeat stages 2-5 for each language.

7. Close the utility by clicking the "Close" button.

**SharePoint 2010**

1. Go to: C:\Program Files\Common Files\Microsoft Shared\Web Server Extensions\14\Resources.

2. Copy the product’s resource file: KWizCom.SharePoint.WebParts.EnterpriseAggregationCaching.resx to a new resource file, and add to its name the requested language’s suffix.
   
   Example: to create a French resource file, copy the file to the following file name: 
   KWizCom.SharePoint.WebParts.EnterpriseAggregationCaching.fr-FR.resx

3. Update the copied resource file and replace the English strings with the translated strings. The translatable strings are located inside the `<data name>` nodes, in their `<value>` attributes.
   
   Example:
   
   `<data name="btnAccept" xml:space="preserve">
   <value>Accept Changes</value>
   </data>`

4. Save the new resource file.

---

**USE THE COMPONENT IN YOUR PREFERRED LANGUAGE**

All KWizCom components use .NET localization mechanism. This means that a KWizCom component will automatically use a language resource file according to the displayed application’s language (this is true for all types of components).

---

**FEATURE INITIAL SETUP**
After you install & deploy the product, and activate the farm feature (see “Post Installation” section), you will see a new link in the Central Admin main page, called: “Enterprise Aggregation Caching Job Settings”:

Click this link, you’ll be redirected to the following page:
This page is used to configure the following initial settings:

- Create the Aggregation Caching Rules list – this is done by configuring the location where you wish this list to be created. Simply select the web application, site collection and web site where the list will be created.
- Enable multi-threading – the Aggregation caching job can run the aggregation caching rules in 2 ways:
  1. Multi-threaded – Aggregation caching rules are executed in parallel by allocating each its own thread.
  2. Single-threaded – Aggregation caching rules are executed one after another.

If server resources allow it, you should check the “Enable multi-thread support”, which provides better response (but consumes more server resources)

After saving the configured settings in the 1st time, the following will happen:

1. The Aggregation caching rules list will be created in the defined SharePoint site.
2. The KWizCom Enterprise Aggregation Caching job will start every 1 minute and check if there are any active aggregation caching rules in the Aggregation Caching Rules list that it needs to execute.

That’s it, initial setup is complete!

You can now proceed to creating new aggregation caching rules.
CREATING AND MANAGING AGGREGATION CACHING RULES

Aggregation caching rules are simply list items in the Aggregation caching rules list, where each defines an aggregation that is executed by the Aggregation caching job.

After the job executes an aggregation caching rule it serializes the result-set into an xml file. The xml file is then compressed and saved as an attachment in the Aggregation rule list item (and this is the cache).

The following sections describe the administration tasks of creating and managing these aggregation caching rules.
CREATING A NEW AGGREGATION CACHING RULE

Add a new item to the Aggregation caching rules list and the following New Item form will show up:

<table>
<thead>
<tr>
<th>Title *</th>
</tr>
</thead>
<tbody>
<tr>
<td>List type *</td>
</tr>
<tr>
<td>Specify your own value</td>
</tr>
<tr>
<td>Site naming pattern</td>
</tr>
<tr>
<td>List naming pattern</td>
</tr>
<tr>
<td>Aggregation view url</td>
</tr>
<tr>
<td>Aggregated sites</td>
</tr>
<tr>
<td>Aggregation user account</td>
</tr>
<tr>
<td>Aggregation period</td>
</tr>
<tr>
<td>Allow manual cache refresh</td>
</tr>
<tr>
<td>Start time</td>
</tr>
<tr>
<td>End time</td>
</tr>
<tr>
<td>Active</td>
</tr>
</tbody>
</table>

Save  Cancel
You need to fill-out the following fields:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
</table>
| Title                      | Provide a descriptive name for the rule (a name that describes what this rule aggregates).  
**Example:** “Milestones awaiting approval”                                                                                                               |
| List Type                  | Select the type of list that you wish to aggregate. The drop-down control displays all existing out-of-the-box list definitions.  
You can also type a custom list definition (one that you’ve developed), in the following format: [List Definition ID]|[Title].  
**Example:** if you wish to aggregate custom Wiki Plus libraries (part of KWizCom’s Wiki Plus solution), you should type: “40100|WikiPlus” |
| Site naming pattern        | In order to further restrict you aggregation scope, you can define a site naming pattern. This will instruct the aggregation job to look only for sites that comply with that naming pattern and only items in these sites will be aggregated.  
You can include “*” in your pattern.  
**Example:** type “Project*” to have this rule aggregate only sites that their name starts with “Project” string. |
| List naming pattern        | In order to further restrict you aggregation scope, you can define a list naming pattern. This will instruct the aggregation job to look only for lists/libraries that comply with that naming pattern and only items in these lists will be aggregated.  
You can include “*” and “?” wildcard in your pattern.  
**Example:** If you wish to aggregate tasks, but you need to aggregate items only from specific tasks lists, you can simply type these lists’ names, separated by “;” |
| Aggregation view url       | Type the url of a list view that will be used to query (aggregate) items.  
You can create that view wherever you want. This view is used as a query definition, according to its defined columns, sorting, filtering, grouping and item limit configurations. |
| Aggregated sites           | This field defines the scope of aggregation.  
Fill out the addresses of the aggregated sites, followed by the aggregation scope.  
The input should be in the following pattern:  
Url1,Scope1  
Url2,Scope2  
...  
Where: |
<table>
<thead>
<tr>
<th><strong>Url</strong></th>
<th>url of a site</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Scope</strong></td>
<td>0, 1, 2 or 3, where:</td>
</tr>
<tr>
<td>0</td>
<td>selected site</td>
</tr>
<tr>
<td>1</td>
<td>Selected site and sub-sites</td>
</tr>
<tr>
<td>2</td>
<td>Entire site collection</td>
</tr>
<tr>
<td>3</td>
<td>Entire web application</td>
</tr>
</tbody>
</table>

**Example:**
If you wish to aggregate items across your entire farm, you should include all web applications:

- `http://wepapp1`, 3
- `http://wepapp2`, 3
- `http://wepapp3`, 3

**Aggregation user account**
The aggregation will use this user’s credentials to retrieve (aggregate) items. Use an account that has at least Read permissions, otherwise you will get “Access Denied” errors and the aggregation will fail.

**Aggregation period**
Select the period (minutes) of this rule execution. A rule should be executed no less than every 5 minutes.

**Allow manual cache refresh**
Check this property if you wish to allow end-users to be able to manually refresh the cache.
If this property is checked, end-users viewing aggregated data by using the KWizCom List Aggregator web part (Professional Edition), will be able to click the “Refresh Cache” icon to trigger a manual cache refresh.

**Start time**
You can define a time frame in which this rule will be processed by the Aggregation Caching job.
Enter the time to start running this job (hh:mm) in 24Hrs format, or leave it empty to run it from 00:00.

**End time**
You can define a time frame in which this rule will be processed by the Aggregation Caching job.
Enter the time to stop running this job (hh:mm) in 24Hrs format, or leave it empty to run it until 00:00.

**Active**
Check this property to make this Aggregation Caching rule active.
The aggregation caching job processes active rules, and executes the ones that should
be executed according to their defined period and last run time.

After you fill out and save the new aggregation caching rule item, it is validated by an event handler. If there are errors found, the new aggregation caching rule item will be in error status, and you will see it under the “Invalid Rules” list view.

**Example:**
The following screenshot shows an aggregation caching rule with invalid settings for the “Aggregation sites” field: (it has a scope value of 5 which is invalid)

When saving this Aggregation caching rule, it will appear in the “Invalid Rules” view and will become inactive:
The “Job run status” field will show you the exact error details (both for validation errors and for aggregation run-time error).

**MANAGING EXISTING AGGREGATION CACHING RULES**

The management of aggregation caching rules is all done through the aggregation caching rules list.

Looking at the “Active Rules” view, you can see the rules that are being periodically executed by the Aggregation caching job.

For every aggregation caching rule in this list you can see its status and last run details such as:

- How many items were aggregated
- When was the last successful run of the rule
- How long it took to execute the rule.

By monitoring this list you can see which aggregation caching rules consume more resources (longer execution time), and change their execution time, scope to match your requirements.
MANUALLY RUNNING AN AGGREGATION CACHING RULE

As mentioned before, aggregation caching rules are periodically executed (each according to its configured run period) by the Aggregation Caching job.

As an administrator, you can also manually run a required aggregation caching rule (if you wish to manually refresh the cache or you wish to test that aggregation caching rule).

To manually run an aggregation caching rule, simply edit the rule. In its edit form you will see at the bottom of the form the “Queued for manual update” checkbox:

Check that property and click “Save”.

The rule should be executed by the Aggregation Caching job as soon as it wakes up (The aggregation caching job starts every 1 minute).

After few minutes refresh the Aggregation caching rules list view to see the updated status of the executed rule.
AGGREGATION CACHING JOB LOG

The aggregation caching job starts every 1 minute and processes all active aggregation caching rules.

During each such run cycle, the job logs its executions steps and issues that occur during that cycle. You can the last job’s run log in the Enterprise Aggregation Caching Job Settings page (in Central Admin):

```
Enable multi-threading
By default, caching job runs each rule in separate thread to maximize resource usage of your server. In some cases, depends on server load, this may return unexpected errors in caching results. In that case, you can turn off multi-thread support. Possible reasons are usually limited server resources such as CPU and memory.

Enable multi-thread support

Last operation log
Log from last job run

KWizCom Enterprise Aggregation Caching

5:36:35 PM: Job started
5:36:35 PM: Got jobs list
5:36:35 PM: Got active rules view
5:36:35 PM: Got 5 active rules from view
5:36:35 PM: Queue thread for rule: 3
5:36:35 PM: Skipping item 2000 tasks (3). Rule is scheduled for next run at 5:46:06 PM
5:36:35 PM: Queue thread for rule: 4
5:36:35 PM: Skipping item 300 items (4). Rule is scheduled for next run at 2:04:10 PM
5:36:35 PM: Queue thread for rule: 2
5:36:35 PM: Waiting for 1 threads to finish...
5:36:35 PM: Skipping item recent 200 tasks (grouped) (2). Rule is scheduled for next run at 2:03:03 PM
5:36:45 PM: Still waiting for 0 threads to finish...
5:36:45 PM: All threads finished running.

5:36:45 PM: Job finished
```
FAQ

WHAT DOES THE “ENTERPRISE AGGREGATION CACHING FEATURE” DO?

This feature provides a centrally managed aggregation and caching services. This enables end-users to run heavy, cross site collection and even cross web application aggregations, and get results in fast response time, and with minimal load on the SharePoint web front-end servers.

Trying to run these heavy, cross web application aggregations in real-time requires custom development and also consumes too many server resources.

HOW CAN I USE THIS AGGREGATION CACHING FEATURE AS AN END-USER?

As a SharePoint end-user, you need to use the KWizCom List Aggregator web part (Professional edition), or any other custom web part that connects to KWizCom’s Aggregation caching feature’s API.

IN WHICH SHAREPOINT VERSION THIS FEATURE IS AVAILABLE?

All SharePoint versions!

WSS 3.0/Moss 2007 and SharePoint 2010 Foundation/Server.
## VERSION RELEASE NOTES

### Primary Software

| Version | 1.1.00 (SharePoint 2007)  
| 10.1.00 (SharePoint 2010) |
| Base Version | n/a |
| Release Date | TBD |

### Sub-Modules

<table>
<thead>
<tr>
<th>Module</th>
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## VERSION HISTORY

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<th>CR#</th>
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<td>Version 1.1.10. 10.1.00 – Base version</td>
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TECHNICAL SUPPORT

You can obtain technical support using any of the following methods:

The KWizCom Web site

The KWizCom website: www.KWizCom.com contains up-to-date, valuable information, including:

- Answers to frequently asked questions (FAQ's) about our products – usability and technical questions.
- Product updates, which provide you with bug fixes and new features.

The Web Form

For technical support through the Internet, please complete and submit our support web form on our web site. For more information on technical support, please review our support programs page.

KWizCom’s global network of experts is always standing by, waiting to provide a rapid response for each customer query.