Introduction to BW Workspaces and its usage with SAP BusinessObjects BI Tools

Applies to:
SAP NetWeaver Business Warehouse 7.3, powered by SAP HANA or SAP BW Accelerator (BWA)
SAP BusinessObjects BI 4.1
SAP BusinessObjects Analysis, edition for Microsoft Office 1.4

Summary:
This document will give you a step-by-step overview about creating providers in BW Workspaces, uploading data to it and also show you how to leverage BW Workspaces in SAP BusinessObjects BI tools.

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INTRODUCTION
A common requirement from the business is the ability to easily upload and enhance data that resides in SAP NetWeaver BW. Imagine that you, as a business user, just got some interesting new data from a source that has not been integrated into SAP BW. You and some of your colleagues at your department would benefit from that data being loaded into SAP BW, but for that you need to ask IT to create a whole data model and ETL process for that. Furthermore it is only you and some of your colleagues that would benefit from the new source being loaded to SAP BW, to make things more complex, some of the new fields or tables could change soon anyway.

This situation creates a conflict between IT and the business, exactly here is where BW Workspaces come into play and bridge the gap between Business and IT. A BW Workspace is a dedicated area inside SAP BW that is used to upload departmental data and even combine it with central data from SAP BW (e.g. from a Multiprovider). The IT department would create and host a space for a business department, from there, the Business can take over and use that space to upload local data in a flexible way. Other scenarios for BW Workspaces include rapid prototyping in SAP BW.

Prerequisites
BW Workspaces are saved in-memory and therefore your SAP BW needs to run on an accelerated version, at least:
- SAP NetWeaver BW 7.3 SP 5 Powered by HANA or
- SAP NetWeaver BW 7.3 SP 5 with BW Accelerator 7.2 (BWA, f.k.a. BIA)

You can upload data to a BW Workspace, through one of the following two tools:
- SAP BusinessObjects Analysis, edition for Microsoft Office 1.3 with SAP NetWeaver BW 7.3 SP 7 (Notice the SP level difference). This method is simple and easy to use, it fits into the role of a business user.
- NetWeaver BusinessClient (Transaction NWBC). Gives you more control about how to upload and merge data. This option fits into the role of a key user.

Products with similar names
In the SAP BI world there are different products with similar names, here an overview in order to avoid any potential confusion arising from similar names:
- Analysis Workspace
  - Reports that you create with SAP BusinessObjects Analysis, edition for OLAP, are called Analysis Workspaces
- BI Workspace
  - A BI Workspace is an embedded application in BI LaunchPad that allows you to create modular view of different reports from different types.
- BW Workspace
  - A BW Workspace is a dedicated area inside SAP BW that is used to upload local or departmental data, and even combine local data with central data

This paper discusses the latter concept.
PROVIDERS IN A BW WORKSPACE

A BW Workspace is a dedicated area in SAP BW, in which data is uploaded into different kinds of providers. There are three different types of providers in a BW Workspace:

- **Local Provider**
  A local provider represents local data that has been uploaded directly into a BW Workspace.

- **Central Provider**
  A central provider is an InfoProvider from your SAP BW System. In a BW System with BWA, you can only select InfoProviders that have a BWA Index. Notice that there is no data being replicated from an InfoProvider when you set it as Central Provider, it means only that the InfoProvider is exposed to the Workspace.

- **Composite Provider**
  A composite Provider allows you to join data from a local provider with a central provider. Starting with SAP BW 7.4 the relevance of Composite Providers has increased as a composite provider now allows you to combine data from SAP HANA and SAP BW. As an example, you could leverage a composite provider in order to join (or Union) data from a SAP BW Multiprovider and a HANA Table. Authorization object for working with composite providers S_RS_CPRO.

A new authorization object S_RS_WSPAC has been introduced for working with BW Workspaces. Data in BW Workspaces is saved in a HANA Analytical Index or in a BWA Index. Data in a HANA Analytical Index is stored on column store in SAP HANA.

There are three new role templates for BW Workspaces starting with SAP BW 7.3 SP 5:

- BW Workspace Administrator (S_RS_TWSPA)
- BW Workspace Designer (S_RS_TWSPD)
- BW Workspace Query User (S_RS_TWSPQ)

And one role for the end user:

- SAP_BW_WORKSPACE_DESIGNER

CREATING A BW WORKSPACE

The process of setting up a Workspace inside SAP BW is a role that fits into IT. Later on, the business can use this Workspace to upload de-centralized local data to SAP BW. The first step you need to do is to create a Workspace in SAP BW in transaction RSWSP:

After entering a name for the Workspace, click Create.
You are now presented with different options for the Workspace (refer to figure 2), for example you can set an expiry date that will limit the lifetime of a Workspace. Similarly, you can specify the maximum amount of memory in Megabytes and the maximum amount of local providers that a Workspace can hold.
Although optional, I choose to set a Workspace prefix named SCN for a better overview later on. Be aware that the Prefix will be automatically appended to the technical name of the Local and Composite Provider and all its dimensions and key figures.

![Figure 2: Options for creating a Workspace](image)

After setting the desired options, click save and then activate. Your BW Workspace is now ready to be used as container for data in form of providers.
CREATING A LOCAL PROVIDER

There are two possibilities available for you in order to upload local data to a BW Workspace:

- SAP BusinessObjects Analysis, edition for Microsoft Office
- NetWeaver Business Client

Let’s start by taking a look at the first option and then move along to the second option.

Uploading data with SAP BusinessObjects Analysis, edition for Microsoft Office

After starting Analysis, edition for Microsoft Office, you can start by typing in some values in the Excel spreadsheet that you would like to upload. After selecting the corresponding range, you can hit Create:

You will now be presented with a dialog in order to log in to the relevant system. After logging in, you can select the BW Workspace where you would like to upload the data:

After hitting OK, you can proceed with configuring the local provider.
Figure 5: Local Provider Settings

In this dialog, you can set among others, a name and description for your local provider. Note that the technical name is preceded by the prefix of the Workspace that was configured in transaction `RSWSP`. Proceed with Next.

Figure 6: Insert local provider

In the next dialog, you can choose if you would like to create a connection to your new local provider and insert it into the current workbook.
After clicking *OK*, you can navigate through your local provider, as you would do with any other data source like a BEx Query or a SAP HANA view:

<table>
<thead>
<tr>
<th>Country</th>
<th>Material</th>
<th>Comment</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARG</td>
<td>MATERIAL1</td>
<td>Comment1</td>
<td>10,000</td>
</tr>
<tr>
<td>COL</td>
<td>MATERIAL2</td>
<td>Comment2</td>
<td>11,000</td>
</tr>
<tr>
<td>DEU</td>
<td>MATERIAL3</td>
<td>Comment3</td>
<td>12,000</td>
</tr>
<tr>
<td><strong>Overall Result</strong></td>
<td></td>
<td></td>
<td><strong>33,000</strong></td>
</tr>
</tbody>
</table>

![Figure 7: Analysis pane of a local provider](image)

Note that the technical names of the newly created characteristics also contain the prefix of the Workspace.

When inserting a new Data source, Analysis allows you to browse all the Workspaces in your SAP BW system by type:

![Figure 8: Tree view of BW Workspaces in Analysis](image)

Note that by clicking on the plus sign next to a Workspace, the dialog window will show you all BEx queries that have been created on that specific provider. After these steps, you have now uploaded data into a BW Workspace from Analysis Edition for Microsoft Office.
Uploading data with NetWeaver Business Client

After taking a look into the process of uploading data into a BW Workspace from Analysis, let’s review the process of uploading data through the NetWeaver Business Client. First step is to log in to the ABAP stack of your SAP BW instance and execute transaction NWBC and enter/select the role SAP_BW_WORKSPACE_DESIGNER. You are now presented with the start screen:

![Figure 9: Initial screen of BW Workspace designer in NetWeaver Business Client](image)

In order to upload data, you need to create a local provider. As discussed earlier, a local provider’s data resides in the SAP BW server, do not be confused because of the name local in it. After clicking on Create Local Provider, you are able to define the source (File in our case):

![Figure 10: Define source for local Provider](image)

After selecting Start, you can configure some details of the source file:
Figure 11: Settings for the local file

Click on Browse to select the flat File in CSV format, afterwards click Transfer File. Notice that in After selecting Next, you can configure which columns and the type of data to be uploaded:
Now you select *Upload Data* and your data will now be uploaded. The next screen displays a summary of the process:
Optionally, you can display a preview of the uploaded data by hitting Display Data.
You have now created a local provider using the NetWeaver Business Client.

For central usage, you can now create a BEx query on top of your local provider, independently if you created the local provider with Analysis or NWBC.
CREATING A CENTRAL PROVIDER

InfoProviders that have an index created on BWA (transaction RSDDB) or SAP HANA can be assigned to be Central Providers. Note that the index building is only needed when running SAP BW with BWA, this step is obsolete with SAP HANA. A Central Provider is composed of only SAP BW Objects but it is needed in order to combine data from a local provider with central data from SAP BW. In order to create a central provider, go to transaction RSWSP, go to the corresponding Workspace, click on tab Central Providers and drag & drop an InfoProvider to the right hand side of the screen:

![Create a central provider](image)

Figure 14: Create a central provider

Afterwards you need to save and activate the BW Workspace.

After you have assigned an InfoProvider as central Provider, you can optionally further define which of its Dimensions, Characteristics and Key Figures are usable for the BW Workspace.
CREATING A COMPOSITE PROVIDER

A composite provider gives you the flexibility of combining departmental data from a local provider with central data from SAP BW. So far in this paper we have created a local provider with information about prices of materials in specific countries:

<table>
<thead>
<tr>
<th>Country</th>
<th>Material</th>
<th>Comment</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARG</td>
<td>MATERIAL1</td>
<td>Comment1</td>
<td>10</td>
</tr>
<tr>
<td>COL</td>
<td>MATERIAL2</td>
<td>Comment2</td>
<td>11</td>
</tr>
<tr>
<td>DEU</td>
<td>MATERIAL3</td>
<td>Comment3</td>
<td>12</td>
</tr>
</tbody>
</table>

*Figure 15: Data from Local provider*

The central provider created in the last section, contains information about quantities sold of materials in specific countries:

<table>
<thead>
<tr>
<th>Country</th>
<th>Material</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARG</td>
<td>MATERIAL1</td>
<td>10</td>
</tr>
<tr>
<td>COL</td>
<td>MATERIAL2</td>
<td>20</td>
</tr>
<tr>
<td>DEU</td>
<td>MATERIAL3</td>
<td>30</td>
</tr>
</tbody>
</table>

*Figure 16: Data from Central Provider*

In this section, we will take a look at the process that will merge a local provider with a central provider by creating a new composite provider that contains information about prices and quantities.

There are two possibilities available for you in order to create a composite provider in a BW Workspace:

- SAP BusinessObjects Analysis, edition for Microsoft Office
- NetWeaver Business Client

As an alternative you can also use transaction RSLIMO or the context menu of an InfoArea for Composite Provider maintenance, however in that case, the Composite Provider will not be assigned to a specific Workspace.

Analysis authorizations are leveraged as usual in a Composite Provider.

Creating a Composite Provider with SAP BusinessObjects Analysis, edition for Microsoft Office

After starting Analysis, edition for Microsoft Office, select *Insert* and select a BEx query that was created on top of an InfoProvider that was defined as central provider. After selecting any cell of the result of the query, the button *Add* becomes active:
In this example, we are interested in enriching the current dataset with pricing information, this means we would like to add a key figure to the current data that resides in SAP BW. Analysis will not offer a specific entry for adding key figures, so you need to select the entry *Data Records*.

Now you will be prompted to select a local provider in order to merge it with the data from the BEx query selected before:
After selecting the corresponding local provider, you are now prompted to enter the name of a Provider and Data Source:

The name of the Provider is the name of the composite provider. The name of the data source is the name of a new transient BEx Query that Analysis will automatically create for you. It is important to mention here that the transient query is not released for external access, and because of the nature of transient queries, it cannot be edited in the BEx query designer.
Figure 22: Inserting a new data source from the Central Provider

Figure 23: Data from the Central Provider
Creating a Composite Provider using NWBC

Log in into the ABAP stack of your SAP BW instance and execute transaction NWBC and enter/select the role SAP_BW_WORKSPACE_DESIGNER. In the welcome screen, select Create CompositeProvider, you are now presented with the following screen:

![Create CompositeProvider](http://example.com/image.png)

**Figure 24: Create a Composite Provider**

In this case, without selecting a Query, hit Start. In the next screen, you are now able to select which providers you would like to merge together. Be aware that only local providers and central providers are available in this screen.
Enter a Name for your composite provider. After selecting the local and central providers that you would like to merge, select Next.

In the next step, you can configure the type of join between the providers. There is a table view and Graphical view that you can choose from. After making your selection, hit Next.
Optionally you can let the system generate a proposal for the joins. If you choose to do so by hitting *Generate Proposal* a dialog window will appear with different settings for the proposal generation:

![Figure 27: Proposals in order to create a Composite Provider](image)
In the next step, you can edit your fields if you would like to. Optionally you can also see a preview of the data by clicking on Display Data. In order to proceed with the next step, click Next.

Figure 28: Editing fields for a Composite Provider

In the next screen you can optionally let the system create a BEx query for you on top of your composite provider. You can always create a BEx query later on directly in the BEx query designer. Hit Next to proceed:

Figure 29: Creating a BEx query on a Composite Provider

In this step you can review the steps until now. Hit Save and Activate in order to create the composite provider:
You have now successfully created a composite provider through the NetWeaver Business Client.
HOW TO LEVERAGE BW WORKSPACES IN BI4

While some of the BI4 Client tools are able to access providers from BW Workspaces directly, some others do not have that ability. Here an overview of how BI4 Tools can access BW Workspaces:

<table>
<thead>
<tr>
<th>BI4 Tool</th>
<th>Method of access to BW Workspace</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAP BusinessObjects Analysis, edition for Microsoft Office</td>
<td>Direct. A tree is shown of the workspace with all its data sources:</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Select Data Source" /></td>
</tr>
<tr>
<td>SAP BusinessObjects Analysis, edition for OLAP</td>
<td>Direct. Entering a keyword you will be able to find all datasources of your BW Workspace:</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Open Data Source" /></td>
</tr>
<tr>
<td>SAP BusinessObjects Design Studio</td>
<td>Direct. Entering a keyword you will be able to find all datasources of your BW Workspace:</td>
</tr>
<tr>
<td></td>
<td><img src="image" alt="Open Data Source" /></td>
</tr>
</tbody>
</table>
For the BI4 Tools that do not offer direct connectivity to providers in BW Workspaces, you need to create a BEx query on top of the local or composite provider. The BEx Query Designer will allow you to create a BEx Query on top of a local or composite provider from the BW Workspace:
After selecting your local provider, you can create the BEx query as with any other provider:

Figure 31: Creation of BEx Query on top of local provider in BW Workspace

Figure 32: BEx Query on top of local provider in BW Workspace
Access to HANA Analysis Processes (new in SAP BW 7.4) with target defined as analytical index, can be accessed the same way as described above for providers in a Workspace, as this HANA Analysis Processes (HAP) and Providers from BW Workspaces are both saved as analytical indexes.