



## SAP BusinessObjects Analysis, edition for OLAP Administrator Guide

- SAP BusinessObjects 4.0 Feature Pack 3

2012-03-15

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## Document History

The following table provides an overview of the most important document changes.

Version	Date	Description
SAP BusinessObjects Analysis, edition for OLAP 4.0	November 2010	Initial release.
SAP BusinessObjects Analysis, edition for OLAP 4.0 Feature Pack 3	March 2012	Added support for SAP HANA and other data sources. <a href="#">Data source connection settings</a> Added configuration setting for jumplinks. <a href="#">mda-client.properties parameters</a> Added SSO support for PCM 7.5. <a href="#">Authentication</a>



# Introduction to SAP BusinessObjects Analysis, edition for OLAP

## 2.1 Components of Analysis, edition for OLAP

SAP BusinessObjects Analysis, edition for OLAP is a query and analysis tool that business analysts in your organization can use to analyze your organization's multidimensional data. Users access Analysis from within the BI launch pad in SAP BusinessObjects Business Intelligence platform (the "BI platform"), and then create, save, and share their analysis workspaces in the BI platform repository. Once the workspaces are saved to the repository, other analysts or business users can work with those analyses over any web connection.

Analysis administrators configure and maintain the Multi-Dimensional Analysis Service (MDAS), manage access rights, set up connections to OLAP data sources, manage workspace and data source objects in the BI platform repository, and perform many other administrative tasks.

SAP BusinessObjects Analysis, edition for OLAP comprises these components:

- [Analysis client](#)
- [Analysis Multi-Dimensional Analysis Service](#)

**Note:**

SAP BusinessObjects Analysis, edition for Microsoft Office, although related very closely to SAP BusinessObjects Analysis, edition for OLAP, has its own documentation set, including its own administrator guide.

### 2.1.1 Analysis client

The Analysis client application is the end-user component of SAP BusinessObjects Analysis, edition for OLAP. It is installed with SAP BusinessObjects Business Intelligence platform, and is accessed from within the BI launch pad.

Data analysts use the Analysis client application to perform their data-analysis work and save their analyses to the BI platform.

Users need only an internet connection, web browser software, and sufficient rights, to access the BI platform system and create or view Analysis workspaces.

## 2.1.2 Analysis Multi-Dimensional Analysis Service

Analysis includes a Java BI platform service called the Multi-Dimensional Analysis Service (MDAS). The MDAS is installed with SAP BusinessObjects Business Intelligence platform, and is administered from within the BI platform's Central Management Console (CMC).

The MDAS processes analysis requests from the Analysis client, retrieves OLAP data from the OLAP server, adds formatting, filtering, and highlighting information to the data, and sends the processed data back to the client application for display.

The MDAS is a service within an Adaptive Processing Server (APS). The APS can be configured and managed in the Central Management Console (CMC). For more information about the APS and CMC, see the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

## 2.2 About this guide

### 2.2.1 The documentation set

The documentation set comprises these guides and online help information:

#### **SAP BusinessObjects Analysis, edition for OLAP Administrator Guide**

This guide contains detailed information that is useful to a system administrator when installing, configuring, and administering Analysis.

#### **SAP BusinessObjects Analysis, edition for OLAP User Guide**

This guide contains the conceptual information, procedures, and reference material required to use Analysis.

#### **SAP BusinessObjects Analysis, edition for OLAP Online Help**

The online help is optimized to provide quick answers for everyday tasks in Analysis.

This Administrator Guide is a supplement to the *SAP BusinessObjects Business Intelligence Platform Administrator Guide* and *SAP BusinessObjects Business Intelligence Platform Installation Guide*, and provides information to help you administer an Analysis installation. The information in the BI platform guides applies to all SAP BusinessObjects servers and services, including the Multi-Dimensional Analysis Service. Consult the BI platform guides if you cannot find the information you seek in this guide.

For a description of the BI platform components and installation instructions, and for installation instructions for Analysis, see the *SAP BusinessObjects Business Intelligence Platform Installation Guide* and *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

For information on performance optimization see the *SAP BusinessObjects Business Intelligence Platform 4.0 Sizing Guide*.

**Note:**

- Throughout this guide, the term "UNIX" is used to refer to all UNIX-related platforms collectively.
- SAP BusinessObjects Analysis, edition for Microsoft Office, although related very closely to SAP BusinessObjects Analysis, edition for OLAP, has its own documentation set, including its own administrator guide.

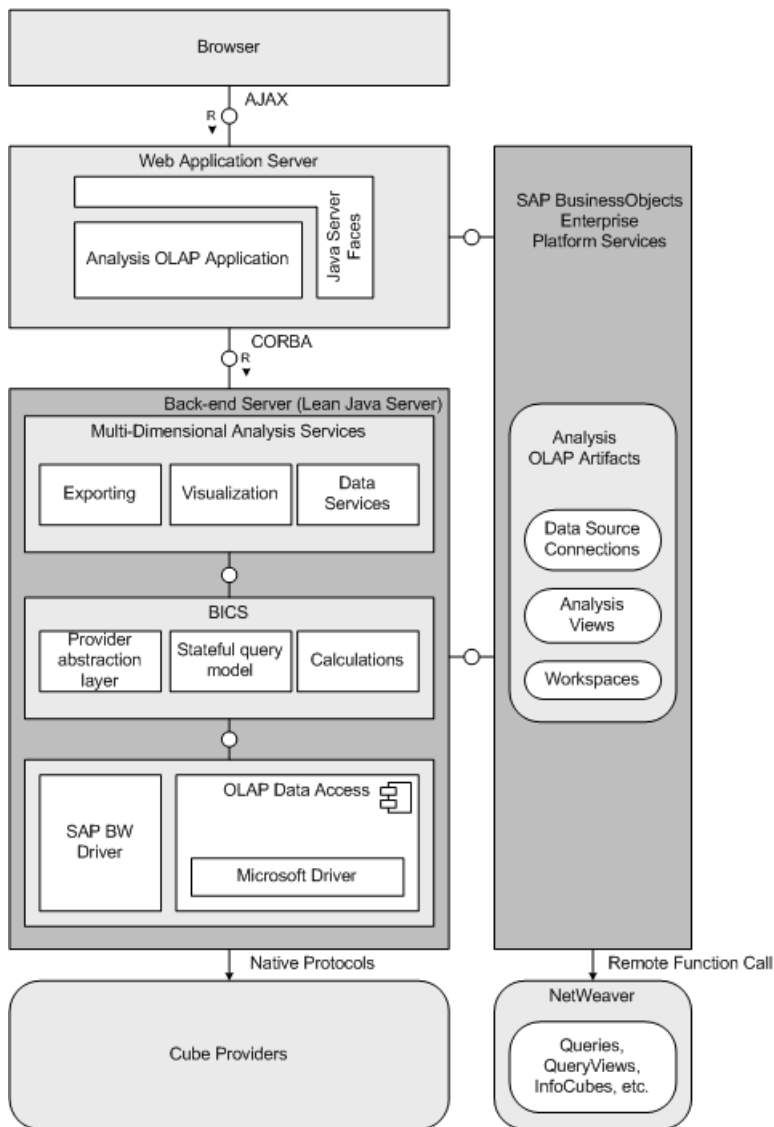
## **2.2.2 Who should read this guide**

This guide is intended for system administrators. You need administrator rights to administer SAP BusinessObjects Analysis, edition for OLAP and SAP BusinessObjects Business Intelligence platform.



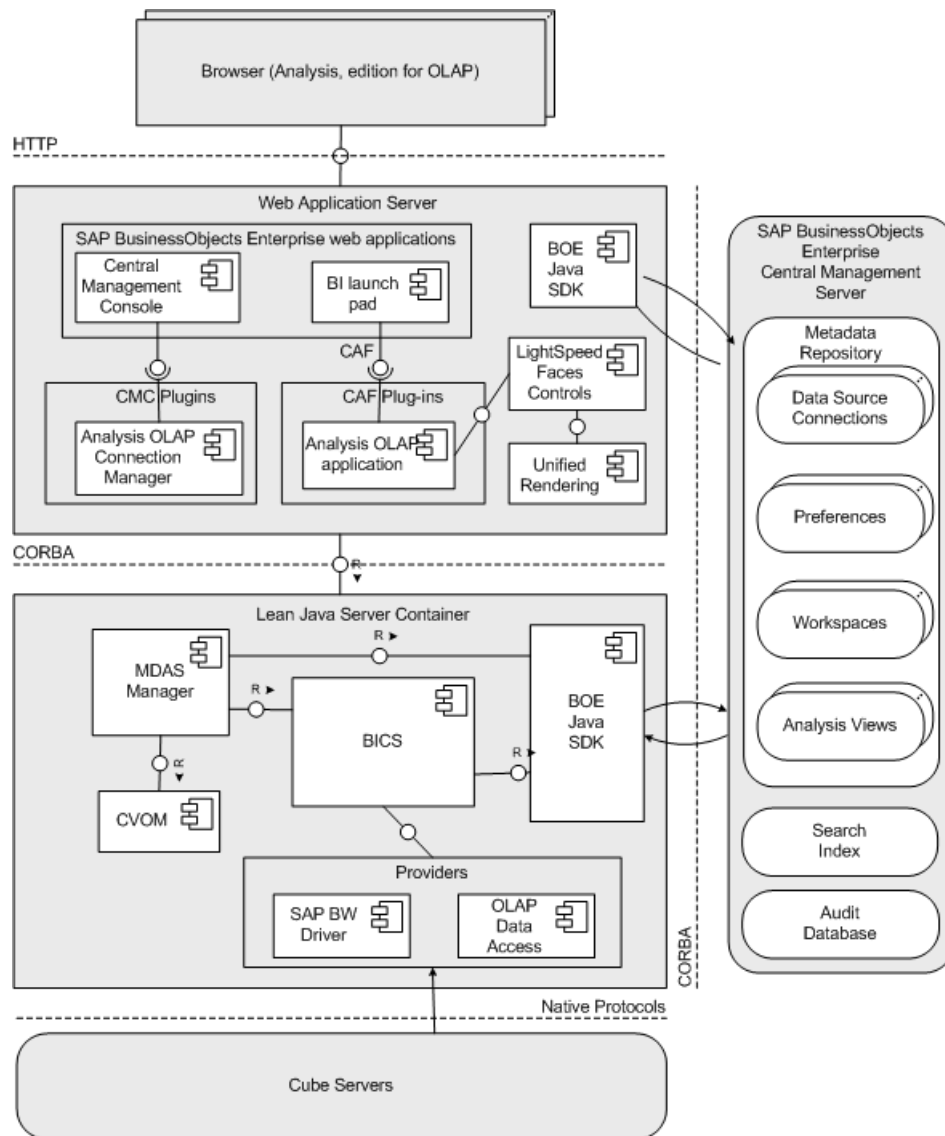
# Architecture

## 3.1 Analysis architecture diagram



### 3.2 SAP BusinessObjects Business Intelligence platform deployment model

SAP BusinessObjects Analysis, edition for OLAP fits into the broader BI platform architecture as a client-server setup with connections at the server and database levels to other BI platform servers.



### **3.3 Multi-Dimensional Analysis Service**

The Multi-Dimensional Analysis Service is fully integrated with the BI platform. Like the other BI platform servers and services, it registers itself with the Central Management Server (CMS). Once registered, it is available for consumption by the Analysis web client.

The MDAS provides BI platform client applications such as Analysis, edition for OLAP with an extensible and efficient framework for accessing multi-dimensional (OLAP) data. It not only provides access to multi-dimensional data but also converts the raw data into various XML packages, which the requesting client application then renders into a specific presentation format: Excel spreadsheet, PDF, or Analysis crosstabs and charts.

#### **3.3.1 Server failover**

You may run multiple MDAS instances to accommodate a large number of users, or to provide redundancy if an MDAS should fail for any reason. If an MDAS fails, users on the failed MDAS are automatically moved to another available MDAS. Where possible, the failed user sessions are recovered and restored on the other MDAS. If the server fails before an action is completed, users may need to redo their last actions when their sessions are moved to a new MDAS.

If an MDAS fails, and if other MDAS services do not have sufficient remaining capacity to accommodate the user sessions from the failed MDAS, the failed workspaces are autosaved to the Inbox folder in the BI platform, and those users are sent a notification. The users can later reload their workspaces and continue with their analyses.



# Installation and Configuration

## 4.1 Administrative tools

### 4.1.1 Central Management Console (CMC)

The Central Management Console (CMC) is a web-based administration tool for managing Analysis data sources and workspaces, user accounts, rights, folders, and server settings. You also use the CMC to perform all MDAS administrative tasks. You must be a BI platform administrator to access the CMC.

### 4.1.2 Central Configuration Manager (CCM)

The Central Configuration Manager (CCM) is a server-management tool that allows you to configure servers for your SAP BusinessObjects products on Windows. For Analysis, use the CCM to start and stop the Server Intelligence Agent (SIA). For all other administrative tasks, use the Central Management Console.

#### Related Topics

- [Starting and stopping the Server Intelligence Agent](#)
- [Central Management Console \(CMC\)](#)

## 4.2 Installation notes

Analysis, edition for OLAP is installed as part of the SAP BusinessObjects Business Intelligence platform suite of products. For more information about installing products in that suite, including Analysis, edition for OLAP, see the *SAP BusinessObjects Business Intelligence Platform Installation Guide*.

For information about platforms supported by Analysis, see <http://www.sdn.sap.com/irj/boc/articles>.

An Adaptive Processing Server instance is created automatically during installation. When deploying to production, the recommended deployment method is to create another Adaptive Processing Server instance that contains only the MDAS, auditing, and monitoring services. For more information, see the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

For information about configuring IIS for connecting to Microsoft Analysis Services data sources, see [IIS configuration for MSAS connectivity](#).

**Note:**

- Before users can begin working with Analysis, you must create at least one data source object. For information about creating Analysis data source objects, see [Creating OLAP data source connections](#).
- After installing Analysis, you may have to configure the `fonts.xml` file to have properly-rendered charts. For details on how to do this, see [Post-installation configuration of fonts](#).
- You may also have to configure your web application server. For more information, see [Web application server configuration](#).

## 4.3 Data sources

Analysis requires a connection to a supported OLAP data source, such as SAP BW, or Microsoft Analysis Services. Therefore, you must create at least one data source object before analysts can begin using Analysis to analyze data.

## 4.4 Web application server configuration

The supported web application servers do not require any special configuration to work properly with Analysis, with these exceptions:

- Sun Java System Application Server 9.1

Add `-Xmx1024m -XX:MaxPermSize=256m` as additional options to the JVM.

- JBoss Application Server 4.2.3 & 5.0 GA

In the `run.conf` file, add this line:

```
JAVA_OPTS="-server -Xmx1024m -XX:MaxPermSize=512m -
Dsun.rmi.dgc.client.gcInterval=3600000 -Dsun.rmi.dgc.server.gcInter
val=3600000"
```

## 4.5 Post-installation configuration of fonts

If you need to use a Unicode font such as Japanese, or if you are running a UNIX platform, you must make a manual change to view charts correctly. The font being used can be changed by editing `fonts.xml`.

On Windows, the `fonts.xml` file is located in this folder: `C:\Program Files (x86)\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\java\pjs\services\MDAS\resources\com\businessobjects\multidimensional\services`

On UNIX, the `fonts.xml` file is located in this directory: `<SAP BusinessObjects Business Intelligence platform installation directory>/sap_bobj/enterprise_xi40/java/pjs/services/MDAS/resources/com/businessobjects/multidimensional/services`

Add the new font definition to `fonts.xml` and then set the `universalFontName` attribute in `fonts.xml` to the name of the new font.

Here is a sample Windows file listing:

```
<?xml version="1.0" encoding="UTF-8"?>
<!--
  MDAS Font Configuration
  Replace paths to font with the correct path for the installed system
  example of some locale mapping
  =====
  English - "en"
  French - "fr"
  German - "de"
  Italian - "it"
  Japanese - "ja"
  Korean - "ko"
  Chinese - "zh"
-->
<fon:ServerFonts
  universalFontName="Arial"
  xmlns:fon="http://www.businessobjects.com/xml/schema/analysis/multidimensional/services/fonts/server">
  <fon:Font
    name="Arial"
    caption="Arial"
    resourceUrl="file://C:/WINDOWS/Fonts/ARIAL.TTF"
    type="TrueType"
    locale="en" />
  <fon:Font
    name="MS Mincho"
    caption="MS Mincho"
    resourceUrl="file://C:/WINDOWS/Fonts/MSMINCHO.TTC"
    type="TrueTypeCollection"
    locale="ja" />
  <fon:Font
    name="MingLiU"
    caption="MingLiU"
    resourceUrl="file://C:/WINDOWS/Fonts/mingliu.ttc"
    type="TrueTypeCollection"
    locale="zh" />
</fon:ServerFonts>
```

## 4.6 Firewall port usage

This table lists the servers and port numbers used by Analysis:

Servers	Port Requirements	Default Value
CMS	CMS name server port	6400
Multi-Dimensional Analysis Service (MDAS)	MDAS request port	Auto-assign
Input FRS	Input FRS Request Port	Auto-assign

For more information, see the section “Securing the BI platform” in the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

## 4.7 Cloning Analysis server deployments

The Multi-Dimensional Analysis Service is hosted by an Adaptive Processing Server (APS). You can clone an existing APS, or create a new APS containing an MDAS and other services. You can also clone an entire distributed MDAS deployment. This can be useful, for example, if you’ve set up a test environment, and then want to transfer the test environment to production.

For details on how to clone Analysis servers and deployments, see the section “Server Administration” in the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

## 4.8 Export limit

To prevent excessively large exports to Excel, CSV, and PDF, the default export limit is set to 100,000 data values.

Depending on the amount of memory used by the MDAS, it is possible to safely increase this value if the default limit is insufficient. The value can be changed by modifying the following property in the file `mdas.properties`:

```
multidimensional.services.export.cells.limit=100000
```

- On Windows, `mdas.properties` is found at this location:

```
C:\Program Files (x86)\SAP BusinessObjects\SAP BusinessObjects Enterprise
XI 4.0\java\pjs\services\MDAS\resources\com\businessobjects\multidimension
al\services
```

- On UNIX, `mdas.properties` is found at this location:

```
sap_bobj/enterprise_xi40/java/pjs/services/MDAS/resources/com/businessob
jects/multidimensional/services
```

## 4.9 Session timeout settings

### Client-side timeout settings

Because the Analysis client runs within the BI launch pad, which runs within the web server container, always ensure that the web server timeout is greater than or equal to the BI launch pad timeout.

In the `web.xml` files, locate the following XML block and change the timeout values (in minutes) as desired:

```
<session-config>
<session-timeout>20</session-timeout>
</session-config>
```

Your changes will take effect after you delete the old web server work directory and restart the web server.

- On Windows (assuming that your deployment uses the Tomcat web server), the client-side timeout settings are stored in these files:
  - **Web server:** `C:\Program Files (x86)\SAP BusinessObjects\Tomcat6\conf\web.xml`  
The session timeout setting is located in the **Default Session Configuration** section.
  - **BI launch pad:** `C:\Program Files (x86)\SAP BusinessObjects\Tomcat6\webapps\BOE\WEB-INF\web.xml`
- On UNIX (assuming that your deployment uses the Tomcat web server) the client-side timeout settings are stored in these files:
  - **Web server:** `<SAP BusinessObjects Business Intelligence platform installation directory>/sap_bobj/tomcat/conf/web.xml`  
The session timeout setting is located in the **Default Session Configuration** section.
  - **BI launch pad:** `<SAP BusinessObjects Business Intelligence platform installation directory>/sap_bobj/tomcat/webapps/BOE/WEB-INF/web.xml`

### Server-side timeout setting

Ensure that the server-side timeout value is greater than the client-side timeout value.

- On Windows, the server-side timeout setting is stored in this file: `C:\Program Files (x86)\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\java\pjs\services\MDAS\resources\com\businessobjects\multidimensional\services\mdas.properties`

- On UNIX, the server-side timeout setting is stored in this file: <SAP BusinessObjects Business Intelligence platform installation directory>/sap\_bobj/enterprise\_xi40/java/pjs/services/MDAS/resources/com/businessobjects/multidimensional/services/mdas.properties

## 4.10 Accessibility

Analysis provides an accessibility mode for users with visual or motor impairments. For information on how to turn on accessibility mode, see the *Analysis User Guide*.

## 4.11 SAP Notes required

### Updates when using SAP BW data sources

For best performance when using SAP BW data sources, refer to SAP Note 1498007, which details required updates for your system. These updates resolve several known issues and add new capabilities, such as case-insensitive search in the Analysis client.

### "Show levels" and "Create favorite filter"

"Show levels" and "create favorite filter" are available only on BW server 7.0.1 and above for performance reasons.

For SAP BW 7.0.1 SP3 or SP4, SAP note 1436426 is required.

## 4.12 Configuration for SAP HANA data sources

If you plan to use SAP HANA data sources, you must first perform some manual configuration steps:

### Windows

1. Using the Central Management Console (CMC), stop the Adaptive Processing Server (APS) that hosts the MDAS. For more information about the APS and CMC, see the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.
2. Run the `hdbinst` installation program found in the SAP HANA client installation directory.
3. Copy the file `ngdbc.jar` from the SAP HANA client installation directory (for example, `C:\Program Files (x86)\sap\hdbclient\`) to the `java\pjs\services\MDAS\lib\external` subfolder of the BI platform installation folder. If the default BI platform installation folder is used, the destination folder is: `C:\Program Files (x86)\SAP BusinessObjects\SAP BusinessObjects Enterprise XI 4.0\java\pjs\services\MDAS\lib\external`.

**Note:**

You will need to create the `external` subfolder under the `java\pjs\services\MDAS\lib` folder.

4. Restart the Adaptive Processing Server.

**SUSE Linux**

1. Using the Central Management Console (CMC), stop the Adaptive Processing Server (APS) that hosts the MDAS. For more information about the APS and CMC, see the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.
2. Switch to the `hdbclient` installer path.
3. Change permissions on the `sdbrun` file in the SAP HANA client installer folder by typing `chmod 777 sdbrun`.
4. Install the SAP HANA client by performing these steps:
  - a. Type the command `su`.
  - b. Invoke the SAP HANA client installer by typing `./hdbinst -1 client`.
  - c. Type the command `exit su`.
5. Copy the file `ngdbc.jar` from the `/usr/sap/hdbclient32/` folder to the `SAP BusinessObjects Enterprise XI 4.0/java/lib/external/` folder.
6. Restart the Adaptive Processing Server.

**Red Hat Enterprise Linux**

1. Using the Central Management Console (CMC), stop the Adaptive Processing Server (APS) that hosts the MDAS. For more information about the APS and CMC, see the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.
2. Add a new temporary user, named "temp".
3. Log out from the console terminal and log back in as "temp".
4. Download and install the 32-bit version of `libstdc++` for Red Hat Enterprise Linux (the SAP HANA installer requires the 32-bit library).
5. Switch to the `hdbclient` installer path.
6. Change permissions on the `hdbinst` file in the SAP HANA client installer folder by typing `chmod 777 hdbinst`.
7. Change permissions on the `sdbrun` file in the SAP HANA client installer folder by typing `chmod 777 sdbrun`.
8. Install the SAP HANA client by performing these steps:
  - a. Type the command `su`.
  - b. Invoke the SAP HANA client installer by typing `./hdbinst -a client`.
  - c. Type the command `exit su`.
9. Copy the file `ngdbc.jar` from the `/usr/sap/hdbclient32/` folder to the `SAP BusinessObjects Enterprise XI 4.0/java/lib/external/` folder.
10. Restart the Adaptive Processing Server.



# Security

## 5.1 Configuring the MDAS for Secure Sockets Layer (SSL)

The MDAS communicates with other BI platform servers and web servers using a communication mechanism called CORBA (Common Object Request Broker Architecture). CORBA can be configured to use SSL, a security protocol used to create an encrypted connection for sending sensitive data over CORBA.

For more information about configuring SSL for BI platform servers and services, including the MDAS, see the “Configuring servers for SSL” section of the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.



# Rights Management

## 6.1 Overview of rights and access levels

Users need certain rights to perform their tasks in Analysis. For example, if a user wants to modify a workspace, then the Edit right must be granted to that user. If a user must save workspaces to certain folders locally or across a network, then that user must be granted sufficient permissions to the folder the workspace is to be saved to.

To create new workspaces, users must be granted the “Create Analysis Workspace” right for the Analysis application, in the Central Management Console (CMC). If users are not granted this right, they are still able to view and edit existing workspaces if they are granted the View and Edit rights.

In addition to being able to grant or deny specific rights, you can assign access levels to users or groups. Access levels allow you to set common security levels quickly and uniformly rather than requiring that individual rights be set individually.

You can use the Central Management Console to add users and groups, and to set rights and access levels for various components of the product suite, including Analysis workspaces and connections.

## 6.2 Create Analysis Workspace right

Users must be granted the “Create Analysis Workspace” right before they can create new workspaces.

### 6.2.1 To grant the right to create an Analysis workspace

1. Start the Central Management Console (CMC).  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.
2. Log on to the CMC.
3. In the Manage area in the CMC, select **Applications**.

4. Select **Analysis Application** and click **Manage > User Security**.  
The "User Security" dialog box appears.
5. Select a user or group and click **Assign Security**.
6. On the **Advanced** tab, click **Add/Remove Rights**.
7. Expand **Application**, and click **Analysis Application**.
8. Grant the "Create Analysis Workspace" right.

## 6.3 Rights for Analysis objects

Analysis workspace and data source objects support the General object rights in the Central Management Console; however, not all of the General rights are relevant to Analysis objects. For example, scheduling rights are irrelevant to Analysis objects because Analysis objects are not scheduled in the BI platform.

### OLAP Connections folder rights

- The "View" right controls whether a user can see the data source in the Central Management Console, or in the list of available data sources when creating a new Analysis workspace.
- The "Edit" right controls whether a user can edit the data source object in the CMC.
- Denying the "View" right to the OLAP Connections folder for a specific user means that the user cannot view or use any OLAP connections in Analysis.
- Denying the "View" right to a specific OLAP data source object means that a user cannot view an Analysis workspace based on that data source.

### Create Analysis Workspace right

- For users to be able to create workspaces, they must be granted this right in the Central Management Console.

### View right on workspace

- If the "View" right is denied for a specific workspace, then a user cannot open that workspace. In addition, if the OLAP data source used in the workspace is denied to that user, the workspace will not load.

### Rights for sending workspaces to Inboxes


If users want to send Analysis workspaces to other BI platform users' Inboxes, they need to be granted the "View" and "Add objects to the folder" rights to those Inboxes.

In addition to assigning rights, you can use one of the predefined access levels to grant sets of rights to users, or you can define access levels appropriate to your organization's users. For more information about access levels, see [Access levels for Analysis objects](#). If you prefer to grant and deny rights individually, select the Advanced access level.

### Note:

For more information about how to use the Central Management Console to set access levels and rights for various components of the product suite, including Analysis objects, see the section "Setting Rights" in the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

### 6.3.1 To set the rights for an Analysis object

1. Start the Central Management Console.  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.
2. If you are prompted, enter your user name and password.
3. Click the type of object you want to assign rights for (for example, **Folders** or **Servers**).
4. From the list of objects that appears, click the single object you want to assign rights for.
5.  Click **Manage user security**.
6. If you want to add a user or group to the list of users who have rights to the object, click **Add Principals**.
7. Select the user or group whose rights you want to set, and click **Assign Security**.
8. Click the **Advanced** tab.
9. Click **Add/Remove Rights**.
10. Select the rights, and then click **Apply** or **OK** to save the changes.

**Note:**

For more information about how to use the Central Management Console to set access levels and rights for various components of the product suite, including Analysis objects, see the section "Setting Rights" in the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

### 6.4 Access levels for Analysis objects

Access levels grant sets of object rights. Most users' access requirements can be met by the proper choice of access level.

**Example:**

For example, the View access level grants users a set of rights appropriate for viewing and editing Analysis workspaces, and saving them to folders that they have Edit rights to (their Favorites folder for example), but not for saving them to the original folder. The View access level therefore prevents original workspaces from being overwritten.

Or, if you want to grant users the rights to view workspaces and also save changes back to the original files, you can assign the Full Control access level instead of explicitly granting both the "View objects" and "Edit objects" rights.

---

Analysis objects support the standard access levels in the Central Management Console; however, not all access levels are relevant to Analysis objects:

- **No Access:** Users cannot access the object.
- **View:** Users can view the object, modify it, and save it to a folder that they have Edit rights to, but not save it to the original folder.
- **Schedule:** This access level has no effect on Analysis objects, because Analysis objects are not scheduled in the BI platform.
- **View On Demand:** Similar to the View access level. For some SAP BusinessObjects applications, the set of rights provided by the View On Demand access level differs from the set of rights provided by the View access level, but for Analysis, the View and View On Demand access levels are equivalent.

**Note:**


Objects from other SAP BusinessObjects applications, such as Crystal Reports, can be "refreshed" or "viewed on demand" against an updated data source. Analysis objects do not need to be refreshed because the data displayed in Analysis is always the latest data.

- **Full Control:** Users have full administrative control of the object.

**Note:**

You may not want to grant the Full Control access level to many users, because users may unintentionally overwrite the original versions of workspaces saved by analysts. Instead, use the View access level.

## 6.4.1 To set the access level for an Analysis object

1. Start the Central Management Console.  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.
2. If you are prompted, enter your user name and password.
3. Click the type of object you want to set access levels for (for example, **Folders** or **Servers**).
4. From the list of objects that appears, click the single object you want to set access levels for.
5.  Click **Manage user security**.
6. If you want to add a user or group to the list of users who have rights to the object, click **Add Principals**.
7. Select the user or group whose access level you want to set, and click **Assign Security**.
8. In the Available Access Levels list, select an access level for that user or group and move it to the Assigned Access Levels list.  
If you want to set advanced (detailed) access rights for a user, click the **Advanced** tab.
9. Click **Apply** or **OK** to save the changes.

**Note:**

For more information about how to use the Central Management Console to set access levels and rights for various components of the product suite, including Analysis objects, see the section “Setting Rights” in the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

## 6.5 Data access

Analysis offers the flexibility to control which users are able to view or create workspaces, and also which data they can view. This control is in addition to any inherent data security provided by the OLAP server. To enable access to data, you must grant users appropriate rights to the OLAP Connections folder and subfolders, or to specific data source objects.

By default, the access level for the “Everyone” group is set to “No Access” for the OLAP Connections folder. This setting results in these effects for Analysis end users (non-administrators):

- New Analysis workspaces cannot be created.
- End users cannot use any Analysis data sources; therefore, any existing Analysis workspaces will fail to open.
- The OLAP Connections page in the Central Management Console is unavailable.

If you want to allow end users access to specific Analysis data sources, grant those users the “View” access level for those data sources only.

Because rights assigned to a child object override inherited rights, end users can access Analysis data sources if they have been granted the “View” access level for individual data sources, even if their access to the folder containing that data source is set to “No Access”.

If you grant the “View” access level for the OLAP Connections folder to end users, they inherit the “View” access level for the Analysis data source objects inside the folder. If you do not want to allow end users access to a specific data source, you can assign the “No Access” access level to that data source object.


These combinations allow you to control who can and cannot create new Analysis workspaces and Analysis data source objects, plus also control who can view which Analysis-related data.

**Note:**

Folder management and security on OLAP connections can be managed from both the OLAP Connections page and the Connections page in the CMC. Thus, security assigned on a particular folder impacts all children of that folder even if the connections are to relational data and not OLAP data. For example, restricting rights at the root level implies that the restriction encompasses all subfolders and connections within the root folder; not just OLAP connections.

For more information about how to use the Central Management Console to set access levels for various components of the product suite, including Analysis elements such as workspaces and data source objects, see the section “Setting Rights” in the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

## 6.5.1 To set access rights to the OLAP Connections folder

1. Start the Central Management Console.  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.
2. Log on to the Central Management Console.
3.  In the "Organize" area in the CMC, select **OLAP Connections**.
4. Click **Manage > Top-Level Security > All Connections**.
5. Select a user or group in the list, and then click **Assign Security**.
6. Assign the appropriate access levels, or click the "Advanced" tab to assign specific rights. (Access levels are groups of rights.)  
Users need at least "View" rights to the OLAP Connections folder to create an Analysis workspace.
7. Click **Apply** or **OK** to save your changes.



### Related Topics

- [Overview of rights and access levels](#)

## 6.6 Changing access to Analysis workspaces

After publishing a workspace, you can use the CMC to change its access permissions.

### 6.6.1 To change access to workspaces

1. Start the Central Management Console.  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.
2. Log on to the Central Management Console.
3.   In the Organize area in the CMC, select **Folders** or **Personal Folders**.
4. Expand the folder list as needed to locate the workspace whose properties you want to edit.

5. Select the workspace, and click **Manage > User Security**.
6. Click the User or Group name for which you want to change the access, and then click **Assign Security**.
7. Assign the appropriate access levels or rights, and then click **OK**.

**Note:**

If either of the inheritance check boxes is selected, the assigned access levels or rights may be superseded by the inherited access. For more information about assigning rights and access levels, see the section “Setting Rights” in the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.



# MDAS Maintenance

## 7.1 Starting and stopping the Server Intelligence Agent

The Server Intelligence Agent (SIA) manages all BI platform servers and services, including the MDAS. When you start the BI platform, the SIA is started automatically, as are any BI platform servers that are configured to start when the SIA starts.

Also, the SIA properties, for example the Logon As account or the Startup Type, are propagated to all of the servers that run under the SIA.

On Windows, you use the Central Configuration Manager (CCM) to start and stop the SIA. On all supported UNIX platforms, you run the scripts `startservers.sh` and `stopservers.sh` from a command prompt to start and stop the SIA.

For more information about the Server Intelligence Agent, see the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

## 7.2 Starting and stopping the Multi-Dimensional Analysis Service

There may be occasions when you need to stop or start the MDAS manually.

For example, if you have configured a cluster of MDAS instances, you may want to start or stop the individual instances depending on load conditions.

For more information about starting and stopping BI platform servers and services, including the MDAS, see the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

## 7.3 Restarting the Multi-Dimensional Analysis Service

There may be occasions when you need to restart the MDAS.

For example:

- The configuration files have changed and need to be reloaded.

- An administrator changes the port and interface name, and a restart is required before the changes take effect.
- The MDAS has encountered an error condition that it cannot recover from.

For more information about restarting BI platform servers and services, including the MDAS, see the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

## 7.4 Enabling and disabling an MDAS instance

When you disable a BI platform server, you prevent it from receiving and responding to new requests, but you do not actually stop the server process. This is especially useful when you want to allow a server to finish processing all of its current requests before you stop it completely.

When you disable an MDAS instance, the service still continues running as a service, but will not accept any new requests from Analysis or the Central Management Console (CMC).

When you enable a running MDAS instance, the MDAS instance accepts new requests from Analysis or the CMC; for example, creating a connection.

For more information about enabling and disabling BI platform servers and services, including the MDAS, see the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

## 7.5 Adding and removing MDAS instances

You can create more than one running MDAS instance. You can either create a new MDAS by specifying its parameters, or you can create a new MDAS based on an existing MDAS. Once you have added a new MDAS instance, you must start and enable it.

For more information about adding and removing BI platform servers and services, including the MDAS, see the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

### Related Topics

- [Cloning Analysis server deployments](#)
- [Starting and stopping the Multi-Dimensional Analysis Service](#)
- [Restarting the Multi-Dimensional Analysis Service](#)
- [Enabling and disabling an MDAS instance](#)

## 7.6 Configuration files for the MDAS Server

You can edit these MDAS configuration files to customize your Analysis deployment:

- [MDAS configuration file—mdas.properties](#).
- [MDAS client configuration file—mdaclient.properties](#)

The configuration files can be found at these locations:

- On Windows:

```
C:\Program Files (x86)\SAP BusinessObjects\Tomcat6\webapps\BOE\WEB-INF\config\default
```

- On UNIX:

```
<BI platform install directory>/tomcat/webapps/BOE/WEB-INF/config/default
```

### 7.6.1 MDAS configuration file—mdas.properties

You can configure the behavior of an individual MDAS instance by modifying parameters in its associated `mdas.properties` file. Parameters include the server timeout, the maximum number of cells to export to Excel, as well as various parameters used for development and testing purposes that should not be changed or referenced in a production environment.

It is recommended that you do not edit the `mdas.properties` file unless you fully understand the effect each parameter has on MDAS operation.

Any changes made to this configuration file will not take effect until the next time the MDAS is restarted.

#### 7.6.1.1 mdas.properties file listing

```
# Turn this value to false in deployed
environments to ensure the
# server is not using xml validation. This value should be true in
# development environments.
multidimensional.services.server.xml.use_validation=false

# Flag indicating whether or not xml data returned by
# MDAS should be pretty printed. This helps debugging
# but slows performance
multidimensional.services.server.xml.prettyprint=false

# none, info, verbose.
multidimensional.services.transport.trace.level=none
```

```

# The number of milliseconds before idle session is closed by the session
# monitor.
# Default time is set to 30 minutes
multidimensional.services.server.session.monitor.idle.timeout=1800000

# The upper bound on the number of cells that may be exported to csv,
# excel, etc. As exporting large data sets requires large amounts of
# memory the size of the export is limited. Increasing this
# threshold may cause the server to run out of memory. Please
# coordinate changes to this value with your memory settings and
# expected user load.
multidimensional.services.export.cells.limit=100000

# Boolean flag indicating whether or not query chunking is enabled
multidimensional.services.query.chunking.enabled=true

# For logging BICS profile data purpose, set it to true.
multidimensional.services.bics.profiling.enabled=false

# Leave an empty line at the end of the file for unix.

```

## 7.6.2 MDAS client configuration file—mdaclient.properties

The `mdaclient.properties` file contains the following parameters:

- The number of rows returned before making another server request.
- The number of columns returned before making another server request.
- The visibility of row, column, and cell count information.
- The setting for selecting whether the "Jumplink" dialog box always uses member keys, or uses the "Display as" setting from the Layout panel.

### 7.6.2.1 mdaclient.properties parameters


```

# Configure the number of rows the Crosstab will request before making another request to the server.
# Zero based value means that to fetch say 60 rows, the value should be set to 59.
crosstab.rowsize=199
# Configure the number of columns the Crosstab will request before making another request to the server.
# Zero based value means that to fetch say 40 columns, the value should be set to 39.
crosstab.columnsize=99
# Configure the visibility of the Row, Column and Cell count information at the top of the Crosstab.
# true is on and false is off
crosstab.showcountinfo=true
#Configure whether the Jumplinks dialog will use member keys, rather than the member display strings shown
in the UI.
#true causes the dialog to use the keys, false causes the dialog to use the strings presented in the UI.
#This property only takes effect if the server supports keys (i.e., SAP BW). If not, the dialog will always
use the
#UI display strings.
crosstab.jumplink.overridewithkey=true

```

## 7.7 MDAS properties and metrics

In the CMC, you can access MDAS metrics, and configure MDAS properties. To access the metrics and properties, perform these steps:

1.  In the Organize area in the CMC, select **Servers**.
2. Select **Service Categories > Analysis Services**.
3. Double-click the Adaptive Processing Server instance.

You can now configure the MDAS properties, or access the Metrics page from the navigation pane.

### 7.7.1 Properties page

The Properties page contains settings for the Adaptive Processing Server and its running services, including the MDAS.

For more information about server properties, see the “Server Properties Appendix” in the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

#### Multi Dimensional Analysis Service properties

- "Maximum Client Sessions": This setting defines the maximum number of sessions that can simultaneously be open on a given MDAS. When the number of open sessions reaches this number, any additional attempts to start Analysis sessions result in a “server unavailable” error message. You can change this value to optimize MDAS performance, depending on your needs and available hardware, but increasing the value may result in performance issues for both the MDAS and the database server.
- "Maximum number of cells returned by a query": This setting allows an administrator to control the maximum number of cells returned to the user in a single query. The user is prevented from executing a query that returns an extremely large number of cells, consuming a large amount of memory. If the user's query exceeds this cell limit, the user receives an error message.
- "Maximum number of members returned when filtering": This setting allows an administrator to control the number of members retrieved when filtering by member. A very large number of retrieved members can consume a large amount of memory.

These are some situations that can cause a large number of members to be retrieved:

- Open the “Filter by member” panel with a large flat list.
- Open the “Filter by member” panel with a large hierarchy, and with the tree fully expanded.
- Expand a parent member that has many children.
- View the leaf members level.
- Find members using the asterisk wildcard character “\*”.

## 7.7.2 Metrics page

The Metrics page displays information about the Adaptive Processing Server and its running services, including the MDAS.

For more information about server metrics, see the “Server Metrics Appendix” in the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

### **Multi Dimensional Analysis Service metrics**

- "Session Count": This setting indicates the current number of connections from the Analysis client(s) to the MDAS. Note that if a client has several workspaces open, each workspace represents a connection that has not timed out.
- "Query Count": The number of data requests that are open between the Analysis client and the database server(s). Note that an active query may be between any of the active sessions and any of the active data sources.
- "Cube Count": This setting indicates the number of data sources that are being used to supply data to the connections (as indicated above by the number of active sessions) that have not timed out.

# Data Source Connections

## 8.1 Creating OLAP data source connections

Before users can begin working with business data in Analysis, edition for OLAP, you must create connections to OLAP data sources for them to add to their Analysis workspaces.

An OLAP data source connection is a BI platform repository object that contains all the information that is required for Analysis to connect to an OLAP data source. This connection object is then linked to an Analysis workspace.

You can create connections to individual OLAP cubes or SAP BW queries, or to data source systems containing many cubes and queries. If a user adds a data source system connection to a workspace, the user must then choose an individual cube or query from the system.

You create new Analysis data source connection objects and manage existing connection objects in the Central Management Console (CMC). Connections can be saved to a single folder, or you can create subfolders to help you group your connection objects together and administer access rights. For example, you could create a folder for SAP BW data source connections, and another folder for Microsoft Analysis Services data source connections, and grant users access to only one of the folders.

Once you have created data source connections, these data sources appear in the list of data sources in the "Open Data Source" dialog box in the Analysis web client, and are available for your users to add to their workspaces.



### Note:

- In the Analysis client application, all data sources are shown in a flat list even if you organize them by folders in the CMC.
- OLAP connections are shared with other applications, such as SAP Crystal Reports, SAP BusinessObjects Web Intelligence, and the Information Design Tool.

### Related Topics

- [IIS configuration for MSAS connectivity](#)
- [Managing Analysis data source connections](#)



### 8.1.1 To create a new connection object for a data source system

1. Start the Central Management Console.  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.
2. Log on to the Central Management Console.
3.  In the Organize area in the CMC, select **OLAP Connections**.
4. Select the folder where you want your new connection to be placed.  
You can select the Connections folder or any subfolder, or create a new subfolder.
5.  Click **New Connection**.
6. Type a Name and optionally type a Description for your connection.
7. Select an OLAP provider from the list.
8. Enter the provider-specific server information, such as the server name.
9. Select an authentication type.
10. Click **Save** to create the connection.  
The connection is now available for users to add to a workspace.

#### **Related Topics**

- [Data source connection settings](#)
- [Finding a cube or query](#)
- [Authentication](#)

## **8.1.2 To create a new connection object for a cube or a query**

1. Start the Central Management Console.  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.
2. Log on to the Central Management Console.
3.  In the Organize area in the CMC, select **OLAP Connections**.
4. Select the folder where you want your new connection to be placed.  
You can select the Connections folder or any subfolder, or create a new subfolder.
5.  Click **New Connection**.
6. Type a Name and optionally type a Description for your connection.
7. Select an OLAP provider from the list.
8. Enter the provider-specific server information, such as the server name.
9. Click **Connect**.

10. If necessary, enter your credentials and click **OK**.
11. In the "Cube Browser", select the cube or query that you want to use for this connection, and then click **Select**.  
You can manually browse through the folders in the Cube Browser to locate your cube or query, or you can search for it.
12. Select an authentication type.
13. Click **Save** to create the connection.  
The connection is now available for users to add to a workspace.

#### **Related Topics**

- [Data source connection settings](#)
- [Finding a cube or query](#)
- [Authentication](#)

### **8.1.3 Finding a cube or query**

The Cube Browser provides search capabilities to help you locate a cube or SAP BW query within a data source system.


#### **Searching in the Cube Browser**

You can type a search string in the text field at the top of the Cube Browser to find a cube or SAP BW query.

#### **Note:**

For SAP BW data sources, you can view data sources by **Caption** or **Name**. This choice does not affect the search itself. If you receive search results that do not appear to relate to your search terms, toggle between **Name** and **Caption** to see the relevant results for your search terms.

If no cubes or queries match the search string, "No cubes found." is displayed.

 Use the **Return to Cube List** button to clear the search results and return to the full data source list.

Analysis uses the same search techniques as popular internet search engines:

Search String	Search Result
sales	<p>Finds all cubes and queries whose names contain the word sales, such as sales reports and store sales.</p> <p><b>Note:</b> If you search for sales, your search will not find a cube named sales2008. To find sales2008, you could search for sales*. See the section <i>Using wildcards in your search</i>.</p>
"sales reports"	<p>Finds only cubes and queries whose names contain the exact text inside the quotation marks.</p> <p>In this example, the search would find sales reports but not sales and purchase reports.</p>
sales reports	<p>Multiple terms include an implicit AND, so in this example, the search would find all cubes and queries whose names contain both the words sales and reports:</p> <ul style="list-style-type: none"> <li>• sales reports</li> <li>• sales and purchase reports</li> </ul>
sales OR reports	<p>Finds cubes and queries whose names contain either the word sales or the word reports.</p> <p>The OR must be capitalized.</p> <p>In this example, the search would find cubes and queries with these names:</p> <ul style="list-style-type: none"> <li>• sales reports</li> <li>• purchase reports</li> <li>• reports</li> <li>• store sales</li> </ul>

**Note:**



Search terms are not case-sensitive. Searching for sales is the same as searching for Sales or SALES or saLEs.

**Using wildcards in your search**

You can use wildcard characters in your search string.

Wildcard	Represents
*	Represents a string of zero or more characters. For example, a search for sales* finds both sales and sales2008.

## 8.1.4 To copy a connection object

1. Start the Central Management Console.  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.
2. Log on to the Central Management Console.
3.  In the Organize area in the CMC, select **OLAP Connections**.
4. Select the connection that you want to copy.
5.  Click **Copy Connection**.
6. Type a Name and optionally type a Description for your connection.  
You can choose to save the copied connection now, or make changes to the connection settings.
7. Click **Save** to create the connection.  
The connection is now available for users to add to a workspace.

### Related Topics

- [Data source connection settings](#)

## 8.1.5 Authentication

You can set the type of authentication to use when users create new workspaces or log on to existing workspaces.

You can choose from the following authentication types when you create an Analysis connection in the CMC:

### Prompt

When this type is selected for the connection, the end user will be prompted with a dialog box to enter a username and password when Analysis initiates the connection.

### Note:

The username and password are not encrypted by Analysis. To protect usernames and passwords, you must enable SSL on your web application server.

### SSO (single sign-on)

With the single sign-on option selected, the user signs on once to the BI launch pad, and then is able to connect to the back-end servers in Analysis without having to enter the username and password

again. Analysis (through the MDAS) automatically retrieves the credentials from the current BI launch pad session and passes them to the server.

These OLAP providers support single sign-on:

Provider	Authentication
SAP BW	SAP authentication including Secure Network Communications
Microsoft Analysis Services	Windows Active Directory
SAP BusinessObjects Planning and Consolidation	Enterprise
SAP BusinessObjects Extended Analytics (v10 only)	Windows Active Directory, LDAP, or Enterprise
SAP BusinessObjects Profitability and Cost Management	Enterprise

For Microsoft Analysis Services, single sign-on works only if the following conditions are true:

1. SAP BusinessObjects Business Intelligence platform is configured correctly for Active Directory authentication in a Java environment. See the *SAP BusinessObjects Business Intelligence Platform Administrator Guide* and the technical brief *Configuring Active Directory Authentication using Java Application Servers* for more information.
2. All CMS and MDAS instances must be started with the identical domain account. This service account must be trusted for delegation in Active Directory.
3. The user signs on to the BI launch pad using the Active Directory authentication plug-in.

### Pre-defined


With this option selected, the administrator enters a specific username and password which will be stored as part of the connection object. The stored username and password will always be used to authenticate to the back-end server when this connection object is accessed from Analysis. Like single sign-on, this authentication type does not require the end user to enter a username and password in Analysis. However, because the same credentials are used for every user who accesses the cube through this connection, this option is not always suitable.

## 8.2 Changing connection settings

If you have an existing connection to an OLAP data source, but the connection details have changed, you can change the connection settings. Note that you need to have sufficient folder rights to edit a connection.

## 8.2.1 To change connection settings


1. Start the Central Management Console.  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.

2. Log on to the Central Management Console.
3.  In the Organize area in the CMC, select **OLAP Connections**.

A list of existing connections is displayed.

### Note:

If no connections are listed, you need to create a new OLAP connection to allow your data analysts to begin working with Analysis workspaces.

4.  Select the connection that you want to edit, and click **Edit Connection**.

### Note:

If you do not have "Add objects to the folder" permission in the BI platform system, you cannot edit a connection, and the Edit Connection button is unavailable.

You can now change the contents of any of the fields to reconfigure your OLAP connection.

5. Click **Save** to save the new connection settings.

### Related Topics

- [Creating OLAP data source connections](#)
- [Data source connection settings](#)

## 8.3 Deleting a connection

If a data source connection is no longer being used, you can delete the connection.


### Note:

If you delete a connection that is still being used by any workspaces, those workspaces are rendered inoperable. Therefore, you should verify in the Central Management Console that no workspaces use a connection before you delete that connection.

**Related Topics**

- [Displaying a list of workspaces that use a data source connection](#)


**8.3.1 To delete a connection**

1. Start the Central Management Console.  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.
2. Log on to the Central Management Console.
3.  In the Organize area in the CMC, select **OLAP Connections**.  
A list of existing connections is displayed.
4. Select the connection that you want to delete.
5. From the menu, select **Manage > Delete**.

**8.4 Moving a connection to another folder**

You can move data source connections between folders in the CMC.

**8.4.1 To move a connection object**

1. Start the Central Management Console.  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.
2. Log on to the Central Management Console.
3.  In the Organize area in the CMC, select **OLAP Connections**.
4. Select the connection that you want to move.
5. Click **Organize > Move To**.
6. Select a destination folder, and then click **Move**.

## 8.5 Data source connection settings

This section describes the provider-specific connection settings for all supported OLAP data sources:

- [Connection settings for SAP NetWeaver Business Warehouse data sources](#)
- [Connection settings for Microsoft Analysis Services data sources](#)
- [Connection settings for SAP BusinessObjects Profitability and Cost Management data sources](#)
- [Connection settings for SAP BusinessObjects Extended Analytics data sources](#)
- [Connection settings for SAP BusinessObjects Planning and Consolidation data sources](#)
- [Connection settings for SAP HANA data sources](#)

For more information, refer to the documentation for those products.

### 8.5.1 Connection settings for SAP NetWeaver Business Warehouse data sources

#### Connecting to an application server

To connect directly to an SAP BW application server, choose **Server** for Server Type. The following information is required to establish a connection to an application server:

- System: The three-character SAP system ID
- Server: Name or IP address of the application server
- System Number
- Client: The three digit client number

#### Connecting to a logon group

You can leverage SAP load balancing by connecting to a logon group. To connect to a logon group, choose **Group** for Server Type. The following information is required to establish a connection to a logon group:

- System: The three character SAP system ID
- Group Name: Name of the logon group
- Message Server: Name or IP address of the message server
- Client: The three digit client number

#### Setting a language

The language field accepts a two character ISO language code. For example, enter EN for English, DE for German, or FR for French. The language code you enter here will be used when connecting to the server in order to choose a data source.

You can also choose whether or not to save the language code as part of the data source connection object. If you choose to save the language, then all Analysis workspaces that reference that data source will log in with the specified language.

If you choose not to save the language, then Analysis workspaces that reference the data source will log in with the language of the user's active BI platform session.

### Authentication types

The following authentication types are supported for SAP BW data sources:

- Prompt

Prompt the user for an SAP username and password to authenticate to the data source.

- SSO

When the user opens an Analysis workspace, the application retrieves the SAP logon information from the user's current BI platform session. The user is not prompted to enter a username or password.

For this option to work, SAP BusinessObjects Business Intelligence platform must be configured correctly for SAP authentication. Refer to the "Authenticating into SAP BusinessObjects Business Intelligence platform" section in the *SAP BusinessObjects Business Intelligence Platform Administrator Guide* for more details.

- Pre-defined

Connect to the data source with the SAP username and password saved as part of the connection.

## 8.5.2 Connection settings for Microsoft Analysis Services data sources

These connection settings are configurable with Microsoft OLAP data sources such as Microsoft SQL Server Analysis Services 2005:

Setting	Description
Server Information	Connect to a cube on an Analysis Services server by providing the URL to the IIS instance that processes XMLA requests for the server. For example: <code>http://&lt;IIS servername&gt;/olap/msmdpump.dll</code> , where <code>&lt;IIS servername&gt;</code> is the name of your IIS server. You can use <code>localhost</code> as the IIS server name if everything is installed on one server.

Setting	Description
Authentication type	<p>Set the type of authentication to use when users create new workspaces or log on to existing workspaces. These options are available:</p> <ul style="list-style-type: none"> <li>• Prompt Always prompt users for logon credentials.</li> <li>• SSO (single sign-on) Uses the credentials that users enter when they log on to their BI launch pad sessions.</li> <li>• Pre-defined Always use the username and password that were specified when the connection was created by the administrator.</li> </ul>

For more information, see Microsoft's documentation for Analysis Services, which is available either as part of your Microsoft SQL Server Analysis Services installation, or on the MSDN Website at <http://msdn.microsoft.com/library/>.

For information about configuring HTTP access to SQL Server Analysis Services, see this Microsoft article: <http://technet.microsoft.com/en-us/library/cc917711.aspx>.

### 8.5.3 Connection settings for SAP BusinessObjects Profitability and Cost Management data sources

These connection settings are configurable with Profitability and Cost Management data sources:

Setting	Description
Server Information	Connect to a cube on a Profitability and Cost Management server by providing the URL to the web server that processes XMLA requests for the server.

Setting	Description
Authentication type	<p>Set the type of authentication to use when users create new workspaces or log on to existing workspaces. These options are available:</p> <ul style="list-style-type: none"> <li>• Prompt</li> </ul> <p>Always prompt users for logon credentials.</p> <ul style="list-style-type: none"> <li>• SSO (single sign-on)</li> </ul> <p>Uses the credentials that users enter when they log on to their BI launch pad sessions.</p> <ul style="list-style-type: none"> <li>• Pre-defined</li> </ul> <p>Always use the username and password that were specified when the connection was created by the administrator.</p>

For more information, see the documentation for Profitability and Cost Management.

## 8.5.4 Connection settings for SAP BusinessObjects Extended Analytics data sources

These connection settings are configurable with Extended Analytics data sources:

Setting	Description
Server Information	Connect to a cube on an Extended Analytics server by providing the URL to the web server that processes XMLA requests for the server.
Authentication type	<p>Set the type of authentication to use when users create new workspaces or log on to existing workspaces. These options are available:</p> <ul style="list-style-type: none"> <li>• Prompt</li> </ul> <p>Always prompt users for logon credentials.</p> <ul style="list-style-type: none"> <li>• SSO (single sign-on) (available with Extended Analytics version 10 only)</li> </ul> <p>Uses the credentials that users enter when they log on to their BI launch pad sessions.</p> <ul style="list-style-type: none"> <li>• Pre-defined</li> </ul> <p>Always use the username and password that were specified when the connection was created by the administrator.</p>

For more information, see the documentation for Extended Analytics.

## 8.5.5 Connection settings for SAP BusinessObjects Planning and Consolidation data sources

These connection settings are configurable with Planning and Consolidation data sources:

Setting	Description
Server Information	Connect to a cube on a Planning and Consolidation server by providing the URL to the web server that processes XMLA requests for the server.
Authentication type	<p>Set the type of authentication to use when users create new workspaces or log on to existing workspaces. These options are available:</p> <ul style="list-style-type: none"> <li>• Prompt Always prompt users for logon credentials.</li> <li>• SSO (single sign-on) Uses the credentials that users enter when they log on to their BI launch pad sessions.</li> <li>• Pre-defined Always use the username and password that were specified when the connection was created by the administrator.</li> </ul>

For more information, see the documentation for Planning and Consolidation.

## 8.5.6 Connection settings for SAP HANA data sources

These connection settings are configurable with SAP HANA data sources:

Setting	Description
Server Information	Connect to a cube on an SAP HANA server by providing the URL to the web server that processes XMLA requests for the server.

Setting	Description
Authentication type	<p>Set the type of authentication to use when users create new workspaces or log on to existing workspaces. These options are available:</p> <ul style="list-style-type: none"> <li>• Prompt</li> </ul> <p>Always prompt users for logon credentials.</p> <ul style="list-style-type: none"> <li>• Pre-defined</li> </ul> <p>Always use the username and password that were specified when the connection was created by the administrator.</p>

For more information, see the documentation for SAP HANA.

## 8.6 Managing Analysis data source connections

The Central Management Console (CMC) is a web-based administration tool for managing Analysis data source connections and workspaces, user accounts, rights, folders, server settings, and license keys. You must be a BI platform administrator to access the CMC.

See the *SAP BusinessObjects Business Intelligence Platform Administrator Guide* for information about logging on to the CMC.

In the CMC, you can change the properties of saved Analysis data source connection objects. You can also view a list of workspaces that use the data source.


### 8.6.1 Editing the title and description of an Analysis data source connection

In the CMC, you can change the title and description properties of saved Analysis data source connection objects.

#### 8.6.1.1 To change the properties of existing data source connection objects

1. Start the Central Management Console.


For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.

2. Log on to the Central Management Console.
3.  In the Organize area in the CMC, select **OLAP Connections**.  
A list of all data source connections is displayed.
4. Double-click a connection to open its Properties page.
5. Make the desired changes and then click **Save**.

## 8.6.2 Displaying a list of workspaces that use a data source connection

An Analysis data source connection can be used by several workspaces. Before you delete a connection, verify that the list of workspaces using that connection is empty.


### 8.6.2.1 To see a list of workspaces that use a data source connection

1. Start the Central Management Console.  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.
2. Log on to the Central Management Console.
3.  In the Organize area in the CMC, select **OLAP Connections**.
4. Select a data source connection and click **Actions > Workspaces**.  
Alternatively, you can right-click the connection and select **Workspaces**.  
The list of workspaces that currently use the data source connection is displayed.

## 8.6.3 Changing access to Analysis data source connections

After saving a data source connection to the BI platform, you can use the CMC to change its access permissions.

### 8.6.3.1 To change access to data source connections

1. Start the Central Management Console.  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.
2. Log on to the Central Management Console.
3.  In the Organize area in the CMC, select **OLAP Connections**.
4. Select a data source connection and click **Manage > User Security**.  
Alternatively, you can right-click the data source connection and select **User Security**.
5. Click the User or Group name for which you want to change the access, and then click **Assign Security**.
6. Assign the appropriate access levels or rights, and then click **OK**.

**Note:**

If either of the inheritance check boxes is selected, the assigned access levels or rights may be superseded by the inherited access. For more information about assigning rights and access levels, see the section “Setting Rights” in the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

### 8.6.4 Replacing an Analysis data source connection



In some situations, you may want to replace the data source used by a workspace with another one. Reasons for replacing a data source include the following:

- The data source used by the workspace was deleted, and users can no longer open that workspace.
- You want to edit some data source connection details (for example, to connect to a different server) but do not want to modify the existing data source connection object. Instead, you want to create a new data source connection and update the workspace to use the new connection.

#### 8.6.4.1 To replace a data source connection

1. Start the Central Management Console.

For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.

2. Log on to the Central Management Console.
3.   In the Organize area in the CMC, select **Folders** or **Personal Folders**.
4. Expand the folder list as needed to locate the workspace whose connection you want to replace.
5. Select the workspace and then select **Connections** from the **Actions** menu.
6. Click **Replace Connection** at the top of the connections listing page.
7. In the **Current Connection** column, find the connection that you want to replace, and then in the **Replace With** column, click the arrow to the right of the connection name to open a list of available connections.
8. Choose a replacement connection from this list.
9. If you want to apply the changes to all workspaces that use the same connection, select the **Apply changes to all workspaces** option.
10. Click **Save** and then **Close**.

Once the connection is replaced, open the workspace in the BI launch pad to verify that the workspace is linked to the new connection.

**Note:**

- The current connection and the new connection must have the same data layout.
- All connections in an Analysis workspace must be different. If you replace multiple connections with the same new connection, you must ensure that all connections are different. If all connections are not different, the workspace will not open.
- When you select the **Apply changes to all workspaces** option, workspaces that already use the new connection will not be changed.



# Managing Workspaces

## 9.1 Overview



The Central Management Console (CMC) is a web-based administration tool for managing Analysis data source connections and workspaces, user accounts, rights, folders, server settings, and license keys. You must be a BI platform administrator to access the CMC.

From the CMC, you can change the properties of a saved Analysis workspace.

## 9.2 Editing the title, description, and keywords of an Analysis workspace

You can use the CMC or BI launch pad to edit the title, description, and keywords of an Analysis workspace that has been published to SAP BusinessObjects Business Intelligence platform.

### 9.2.1 To edit the title, description, and keywords of an Analysis workspace in the CMC

1. Start the Central Management Console.  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > BusinessObjects Business Intelligence platform > Central Management Console**.
2. Log on to the Central Management Console.
3.   In the Organize area in the CMC, select **Folders** or **Personal Folders**.
4. Expand the folder list as needed to locate the workspace whose properties you want to edit, and then double-click the title of the workspace to open the Properties page.
5. Make the desired changes and then click **Save**.



## 9.2.2 To edit the title, description, and keywords of an Analysis workspace in the BI launch pad

1. Start the BI launch pad and log on.  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > SAP BusinessObjects Business Intelligence platform Java BI Launch Pad**.
2. Click the **Documents** tab.
3. Expand the folder list as needed to locate the workspace whose properties you want to edit, and then select the workspace title.
4. Click **View > Properties** to open the Properties page.
5. Make the desired changes and then click **OK**.

## 9.3 Displaying a list of connections linked to the workspace

An Analysis workspace can be linked to several data source connection objects.

### 9.3.1 To see a list of connection objects linked to the workspace

1. Start the Central Management Console.  
For example, on Windows, click **Start > Programs > SAP BusinessObjects Business Intelligence platform 4.0 > SAP BusinessObjects Business Intelligence platform > Central Management Console**.
2. Log on to the Central Management Console.
3.   In the Organize area in the CMC, select **Folders** or **Personal Folders**.
4. Expand the folder list as needed to locate the workspace whose connections you want to view.
5. Select the workspace, and click **Actions > Connections**.  
All connection objects that are linked to the workspace are listed.

# Scaling and Performance

## 10.1 Clustering MDAS instances

The Multi-Dimensional Analysis Service is inherently memory bound. As the number of users increases, so does the number of queries that must be handled, and therefore so does the MDAS memory requirements.

For this reason, you may want to cluster multiple MDAS instances together. Analysis automatically identifies and makes use of clustered MDAS instances without further configuration.

For more information about clustering BI platform servers and services, including the MDAS, see the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

For more information on memory optimization, see the *SAP BusinessObjects Business Intelligence Platform 4.0 Sizing Guide*.

## 10.2 Load balancing

Like other BI platform services, you can install multiple MDAS instances. Once you have installed the MDAS on a single machine, you can create multiple MDAS instances on that machine using the Central Management Console.

You can also choose to install the MDAS on different machines to distribute the load.

For more information about clustering BI platform servers and services, including the MDAS, see the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

### Related Topics

- [Server failover](#)
- [Clustering MDAS instances](#)

## **10.3 Optimizing performance**

Analysis performance can be optimized by following the recommendations described in the *SAP BusinessObjects Business Intelligence Platform 4.0 Sizing Guide*.

# Monitoring and Logging

## 11.1 Auditing

Auditing is a feature of the BI platform that allows administrators to keep a record of significant events on BI platform servers and applications, such as opening data source connections and modifying workspaces. The recorded information helps you to understand what information is being accessed, how it's being accessed and changed, and who is performing these operations.

Analysis registers an auditing event whenever one of the following operations occurs:

- A new workspace or analysis view is created.
- A workspace or analysis view is saved.
- A workspace or analysis view is deleted.
- A workspace or analysis view is viewed.
- A workspace or analysis view is exported to a different format.
- A connection to an MDAS is established.
- A connection to an MDAS is closed.
- A connection to a data source is established.
- A connection to a data source is closed.

For more information about auditing, see the “Auditing” section in the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.

## 11.2 Trace logging

Tracing allows system administrators and support personnel to monitor the performance of BI platform components (servers and web applications) and the activity that occurs within the monitored components.

Traces are recordings of events that occur during the operation of a monitored component. System-level messages generated by BI platform servers are traced and written to log files. These log files are used by system administrators to monitor performance or to debug problems.

For more information about tracing, see the section “Managing and Configuring Logs” in the *SAP BusinessObjects Business Intelligence Platform Administrator Guide*.



# Microsoft Analysis Services Considerations

## 12.1 IIS configuration for MSAS connectivity

To configure IIS for MSAS connectivity, perform the following steps.

**Note:**

These steps are based on Microsoft Windows Server 2008 R2. To configure IIS in Microsoft Windows Server 2003, refer to this Microsoft TechNet article: <http://technet.microsoft.com/en-us/library/cc917711.aspx>.

1. [Copy required files](#)
2. [Create an Application Pool](#)
3. [Create a Virtual Directory](#)
4. [Configure Security](#)
5. [Set up a Web Service Extension](#)

Once these steps have been completed, you can create new connections to MSAS data sources.

**Related Topics**

- [Creating OLAP data source connections](#)
- [Connection settings for Microsoft Analysis Services data sources](#)

### 12.1.1 Copy required files

It is assumed that the Windows server has already been configured for the Web Server (IIS) role. You can confirm or add this role by using the Server Manager. Click **Start > Run** and type `ServerManager.msc`.

1. Create a new folder inside `c:\inetpub\wwwroot` named `olap`.
2. Copy the folder and files inside the SSAS `isapi` folder to the IIS `olap` folder.

For example, if SQL Server 2008 R2 is installed, then copy everything inside `c:\program files\microsoft sql server\msas10.mssqlserver\olap\bin\isapi` to `c:\inetpub\wwwroot\olap`. The `olap` folder should now contain a `Resources` folder and two files: `msmdpump.dll` and `msmdpump.ini`.

3. Start the IIS Manager: click **Start > Run** and type inetmgr.
4. In the Connections panel, expand “Sites” and then expand “Default Web Site”, and verify that a folder named `olap` has been added.

### 12.1.2 Create an Application Pool

1. In the Connections panel, right-click “Application Pools” and select “Add Application Pool”.
2. In the “Add Application Pool” dialog box, enter the following information and then click OK:

Name	olap
.NET Framework version	.NET Framework v2.0.50727
Managed pipeline mode	Classic
Start application pool immediately	select this option

3. In the Connections panel, click “Application Pools” and verify that the “olap” application pool now appears in the “Application Pools” panel.
4. Right-click the “olap” application pool and select “Advanced Settings”.
5. In the “General” category, set “Enable 32-Bit Applications” to “False”.
6. In the “Process Model” category, set the “Identity” to “NetworkService”, and then click OK.

### 12.1.3 Create a Virtual Directory

1. If IIS Manager is not already running, start it: click **Start > Run** and type inetmgr.
2. In the Connections panel, expand “Sites” and then expand “Default Web Site”.
3. Right-click the `olap` folder and choose “Add Virtual Directory”.
4. In the “Add Virtual Directory” dialog box, enter the following information and then click OK:

Alias	olap
Physical path	c:\inetpub\wwwroot\olap

5. In the Connections panel, right-click the “olap” folder and choose “Convert to Application”.
6. In the Add Application dialog box, select “olap” for the “Application pool” and then click OK.

### 12.1.4 Configure Security

Multiple authentication options are available.

- Anonymous authentication is enabled by default but should be turned off, unless there is no plan to use any of the SSAS security features. With Anonymous authentication enabled, SSAS has no way of differentiating between different users. However, enabling Anonymous authentication can be useful when troubleshooting connectivity issues.
  - Basic authentication requires a username and password to be entered. It is mandatory that Basic authentication be enabled when defining OLAP connections in the CMC. Once the connections have been defined, Basic authentication can be disabled.
  - Windows authentication is the most secure authentication, and is recommended. It must be enabled to configure single sign-on (SSO).
1. In the Connections panel, select the “olap” application.  
This is the folder that you converted to an application in the “Create a Virtual Directory” step.
  2. Choose the Features View, and open “Authentication” in the “IIS” features category.
  3. Disable “Anonymous Authentication”, and enable “Basic Authentication” and “Windows Authentication”.

### 12.1.5 Set up a Web Service Extension

1. In the Connections panel, select the “olap” application.
2. Choose the Features View, and open “Handler Mappings” in the “IIS” features category.
3. Right-click in an empty area with nothing selected, and choose “Add Script Map”.
4. In the “Add Script Map” dialog box, enter the following information and then click OK:

Request path	*.dll
Executable	c:\inetpub\wwwroot\olap\msmdpump.dll
Name	olap

5. Click “Request Restrictions”, and then in the Verbs tab select “All verbs”.
6. Click Yes when prompted to allow the ISAPI extension.

## 12.2 Analysis, edition for OLAP and Analysis Services security

This section explains how to set up the SAP BusinessObjects services to be able to authenticate to Microsoft Analysis Services.

## 12.2.1 Analysis Services role security

SQL Server Analysis Services security architecture is built on Microsoft Windows authentication. To access data in Analysis Services, users must connect with an account that can be authenticated by Microsoft Windows. Analysis Services does not recognize user accounts created in the native SQL Server Database (relational) Engine security system, such as the built-in administrator's account "sa". After authenticating the user, Analysis Services checks the security roles that the user belongs to, to determine which cubes, dimensions, members and cell values to return.

To allow users to view data in an Analysis Services cube from Analysis, you must first define the appropriate security roles on the target cube.

### 12.2.1.1 To define a security role in Analysis Services 2005 or 2008

1. Open Microsoft SQL Server Management Studio and connect to the Analysis Services instance.
2. Expand the folder structure for the database.
3. Right-click the **Roles** folder and select **New Role**.
4. Enter a name for the role in the **Role Name** field and select the **Read Definition** checkbox so the users have read rights.
5. Click **Membership** in the left pane and click **Add** to add the list of domain users that will be given read access to the database.

**Note:**

If there are a large number of users, it may be more efficient to create a group within Active Directory for OLAP access and add all the users to the group, then simply add the group to the list.

6. Select the appropriate user permissions by clicking **Data Sources**, **Cubes**, **Cell Data**, **Dimensions**, **Dimension Data** and **Mining Structures** to decide what areas the users will have read access to.

**Note:**

The extent of how much of the data you want users to have access to is dependent on the reports being created and security within your organization and security should be planned accordingly.

## 12.2.2 Finding more information

### **Analysis Services security and authentication**

- For more information about Kerberos, see this page: <http://technet.microsoft.com/en-us/library/cc753173%28WS.10%29.aspx>
- Guide to enabling Kerberos Event logging for troubleshooting: <http://support.microsoft.com/kb/q262177/>
- Information about using SQL Profiler 2005 for tracing login usernames while troubleshooting: <http://msdn2.microsoft.com/en-us/library/ms187929.aspx>
- SQL Server 2005/Analysis Services Service Pack downloads: <http://technet.microsoft.com/en-us/sqlserver/bb331754.aspx>
- SQL Server 2008/Analysis Services Service Pack downloads: <http://support.microsoft.com/kb/968382>

### **Calculation solve order**

- Microsoft's explanations of solve order for Analysis Services 2005: <http://msdn2.microsoft.com/en-us/library/ms145539.aspx>



# Converting Workspaces to Analysis

## 13.1 Converting workspaces from Voyager to Analysis, edition for OLAP

If you are moving from Voyager to Analysis, edition for OLAP, use the upgrade management tool to convert your Voyager workspaces to the Analysis format. The upgrade management tool is provided with SAP BusinessObjects Business Intelligence platform.

**Note:**

If you are using Voyager XI Release 2, or XI 3.0, you will need to first upgrade to XI 3.1 before converting to the current version of Analysis.

The upgrade management tool provides two upgrade options; a complete upgrade or an incremental upgrade:

- Complete upgrade

The complete upgrade process converts all objects of all types. Minimal effort and interaction are required, but the process can take many hours to complete.

- Incremental upgrade

The incremental upgrade process allows you to choose which objects to convert. The objects are grouped by type, so that you can select all Voyager workspaces for example.

Because Analysis data source connections are formatted differently from Voyager connections, Voyager objects will fail to convert when the complete upgrade is performed. Therefore, before you convert your Voyager workspaces, you will need to manually recreate your Voyager data source connections in SAP BusinessObjects Business Intelligence platform 4.0.

You can perform the upgrade in one of two ways:

- Perform a complete upgrade first. All Voyager objects will fail to convert but other objects will migrate successfully. After the complete upgrade finishes, manually recreate your Voyager data source connections in the CMC in SAP BusinessObjects Business Intelligence platform 4.0. Then perform an incremental upgrade for Voyager workspaces.
- Manually recreate your Voyager data source connections in the CMC in SAP BusinessObjects Business Intelligence platform 4.0. Then perform a complete upgrade.

**Note:**

When you manually recreate your data source connections, the Analysis connection names used in XI 4.0 must be the same as the Voyager connection names used in XI 3.1.

For more information, see the *SAP BusinessObjects Business Intelligence Platform Upgrade Guide*, and the white paper on converting Voyager workspaces to Analysis, edition for OLAP.

## More Information

Information Resource	Location
SAP product information	<a href="http://www.sap.com">http://www.sap.com</a>
SAP Help Portal	<p> <a href="http://help.sap.com/businessobjects">http://help.sap.com/businessobjects</a>                      Access the most up-to-date English documentation covering all SAP BusinessObjects products at the SAP Help Portal:  <a href="http://help.sap.com/bobi">http://help.sap.com/bobi</a> (Business Intelligence)  <a href="http://help.sap.com/boepm">http://help.sap.com/boepm</a> (Enterprise Performance Management)  <a href="http://help.sap.com/boeim">http://help.sap.com/boeim</a> (Enterprise Information Management)                 </p> <p>                     Certain guides linked to from the SAP Help Portal are stored on the SAP Service Marketplace. Customers with a maintenance agreement have an authorized user ID to access this site. To obtain an ID, contact your customer support representative.                 </p> <p>                     To find a comprehensive list of product documentation in all supported languages, visit: <a href="http://help.sap.com/boall">http://help.sap.com/boall</a>.                 </p>

Information Resource	Location
SAP Support Portal	<p><a href="http://service.sap.com/bosap-support">http://service.sap.com/bosap-support</a></p> <p>The SAP Support Portal contains information about Customer Support programs and services. It also has links to a wide range of technical information and downloads. Customers with a maintenance agreement have an authorized user ID to access this site. To obtain an ID, contact your customer support representative.</p> <p>[Sean McGregor - Feb 2012] [Updating this More Information page to align with new help portal goals. Product pages on help.sap.com now contain links to release notes, install guides, PAM, and other support portal materials so I've removed all this content below and merged the "Online customer support" row that previously existed at the bottom into this row which had the same URL above.]</p> <ul style="list-style-type: none"> <li>• Installation guides: <a href="https://service.sap.com/bosap-instguides">https://service.sap.com/bosap-instguides</a></li> <li>• Release notes: <a href="http://service.sap.com/releasenotes">http://service.sap.com/releasenotes</a></li> </ul> <p>The SAP Service Marketplace stores certain installation guides, upgrade and migration guides, deployment guides, release notes and Supported Platforms documents. Customers with a maintenance agreement have an authorized user ID to access this site. Contact your customer support representative to obtain an ID. If you are redirected to the SAP Service Marketplace from the SAP Help Portal, use the menu in the navigation pane on the left to locate the category containing the documentation you want to access.</p>
Developer resources	<p><a href="http://www.sdn.sap.com/irj/sdn/bi-sdk-dev">http://www.sdn.sap.com/irj/sdn/bi-sdk-dev</a></p> <p><a href="https://www.sdn.sap.com/irj/sdn/businessobjects-sdklibrary">https://www.sdn.sap.com/irj/sdn/businessobjects-sdklibrary</a></p>
SAP BusinessObjects articles on the SAP Community Network	<p><a href="http://www.sdn.sap.com/irj/boc/articles">http://www.sdn.sap.com/irj/boc/articles</a></p> <p>These articles were formerly known as technical papers.</p>
Notes	<p><a href="https://service.sap.com/notes">https://service.sap.com/notes</a></p> <p>These notes were formerly known as Knowledge Base articles.</p>
Forums on the SAP Community Network	<p><a href="https://www.sdn.sap.com/irj/scn/forums">https://www.sdn.sap.com/irj/scn/forums</a></p>
Training	<p><a href="http://www.sap.com/services/education">http://www.sap.com/services/education</a></p> <p>From traditional classroom learning to targeted e-learning seminars, we can offer a training package to suit your learning needs and preferred learning style.</p>

Information Resource	Location
Consulting	<a href="http://www.sap.com/services/bysubject/businessobjectsconsulting">http://www.sap.com/services/bysubject/businessobjectsconsulting</a> Consultants can accompany you from the initial analysis stage to the delivery of your deployment project. Expertise is available in topics such as relational and multidimensional databases, connectivity, database design tools, and customized embedding technology.



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