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1 Introduction

The Business Process Operations (BPO) functionality within SAP Solution Manager offers the possibility to monitor the availability and reliability of business processes that have been maintained in a solution landscape. BPO offers a wide range of different monitors for different business areas as well as cross application monitors, e.g. IDoc monitoring.

The Application Operations (AO) functionality within SAP Solution Manager offers the possibility to monitor technical aspects of systems, databases, interfaces, jobs etc.

The OCC Alert Reporting Analysis is an additional feature which can be used within BPO and AO. It is based on the Business Warehouse (BW) functionality and the Monitoring Application Infrastructure (MAI) included in Solution Manager as a SAP NetWeaver 7.1 system and is available as of SP13 – on demand also as downport via SAP Note for SP12.

It enables you to:

- Vizualize the number of alerts per alert status\(^1\) for a specific BPO or AO context in graphical charts for a period of time
- Display the number of red and yellow alerts\(^2\), alert instances and incidents for a specific BPO or AO context split up by rating in graphical charts for a period of time
- Display the number of confirmed alerts for a specific BPO or AO context split up by incident creation in graphical charts for a period of time
- Display the maximum and average duration until alert confirmation for a specific BPO or AO context split up by rating in graphical charts for a period of time
- Visualize daily and monthly trends in numbers of alert groups, alert instances, incidents, confirmed alerts with and without incidents and maximum duration until alert group confirmation

With OCC Alert Reporting Analysis in SAP Solution Manager 7.1 as of SP13 replaces the functionality of the BPO Alert Reporting Analysis with SAP Solution Manager 7.1 as of SP12 as described in the BPO Alert Reporting Setup Guide.

As the BPO Alert Reporting the OCC Alert Reporting covers the following functionality

- Accesses the unified MAI storage locations
- Relies on the unified MAI data transfer
- Uses the UI5 user interface, enabling mobile access
- Uses the twincube concept inkl. automated housekeeping
- Remembers the selection criteria recently used for the cube accesses

Additionally to the BPO Alert Reporting the OCC Alert reporting

- Combines the display of BPO and AO Alerts in one application
- Simplifies the data selection by providing the filter criteria in dynamic dropdown fields (theese replace the BPO context selection in the entry screen)

\(^1\) As up to SAP Solution Manager 7.1 SP13 the current alert status is not loaded to the cube, the alert status is derived from the availability of a processing and confirmation user.

\(^2\) As known from the Alert Inbox the expression “Alert” in OCC Alert Reporting is used equivalent with “Alert Group”, meaning a group of alert instances or events (refering to the classical BPMon Alerts) not changing the rating within a certain time frame.
• Has an enhanced default analysis scope
• Enables drill up and down to Alert Name (AO only) and System
• Enables optional data enrichment
• Enables to handover selection criteria by enhancing the link with parameters
• Enables printing of the main charts

The data accesses are realized technically as RFC queries (The queries are not related to BI Content) working on the collected and stored data in the BW. They are called by oData services within an UI5 dashboard which can be accessed directly following an URL in a web browser.

The OCC Alert Reporting dashboard graphics allows tracking

• BPO and AO alerts (see Figure 1)
• The overall number of alerts per status\(^3\) (see Figure 2)
• The overall number of confirmed alerts with or without incident and split up by alert name(AO only), managed object and system (see Figure 3 and Figure 9)
• The number of red and yellow alerts, instances and incidents drilled down by alert name(AO only), managed object and system (see Figure 4, Figure 5 and Figure 6)
• The maximum and average duration in minutes, until red and yellow rated alerts have been confirmed, alert name(AO only), managed object and system (see Figure 7 and Figure 8)
• The daily and monthly trend of alert, instance and incident numbers for any alert name and managed object combination (see Figure 10)
• The daily and monthly trend for the maximum and average duration until alert group confirmation for any alert name and managed object combination
• The daily and monthly trend for the confirmed alerts with or without incidents for any alert name and managed object combination (see Figure 11)

---

\(^3\) As up to SAP Solution Manager 7.1 SP13 the current alert status is not loaded to the cube, the alert status is derived from the availability of a processing and confirmation user.
Figure 2 - Number of Alerts per Status

Figure 3 - Number of Confirmed Alerts with or without Incident
Figure 4 – Number of Alerts per Managed Object and System

Figure 5 - Number of Alert Instances per Managed Object and System with Show Numbers

Figure 6 - Number of Alerts with Incidents per Managed Object and System with Monitor
Figure 7 - Maximum Number of Minutes from Alert Creation to Confirmation per Alert Name, Managed Object and System

Figure 8 - Average Number of Minutes from Alert Creation to Confirmation per Alert Name and Managed Object

Figure 9 - Number of Confirmed Alerts with or without Incidents per Managed Object
Figure 10 - Number of Red and Yellow Alerts with Incidents over Time for a specific Managed Object and Alert Name Combination

Figure 11 - Number of Confirmed Alerts with or without Incidents over Time for a specific Managed Object and Alert Name Combination
The runtime of the oData routines are influenced by the accessed data volume in BW and the amount of
data loaded to and processed in the frontend (see Figure 12 and Figure 13). Therefore it is recommended to
use as restrictive selection criteria as possible by choosing

- A smaller timeframe\(^4\) and
- For the BPO Alert Reporting view: The BPO context for a specific BPO Solution\(^5\) in SAP Solution
  Manager
- For the AO Alert Reporting view: The managed object type and the alert category

The data analysis is done based on Managed Object level. A drilldown to alert name (AO only) and system is
possible. On the detailed view a drill down to days and months is possible.

---

4 According to the twin cube concept, the data are stored as daily and monthly records. According to the
default housekeeping settings in the SOLMAN_SETUP the daily records are kept at least 90 days. That is
why the OCC Alert Reporting switches to monthly display with horizons larger than this setting.

5 All BPO solutions migrated to MAI are shown, for which the user is authorized. The recently selected
solution is saved as a user-specific setting and reloaded, when the user is calling the OCC Alert Reporting
again.
### Figure 14 – BPO Sub Selection on the Loaded Frontend Data

<table>
<thead>
<tr>
<th>Monitor:</th>
<th>CRM Sales Documents</th>
<th>Show Visible Lines: 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managed Object</td>
<td>Sales</td>
<td>✓ Show Numbers</td>
</tr>
<tr>
<td>System:</td>
<td>ST7 200</td>
<td>Monitor</td>
</tr>
</tbody>
</table>

### Figure 15 - AO Sub Selection on the Loaded Frontend Data

<table>
<thead>
<tr>
<th>Alert Name:</th>
<th>Bad average dialog response time</th>
<th>Show Visible Lines: 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Managed Object:</td>
<td>ABAP</td>
<td>✓ Show Numbers</td>
</tr>
<tr>
<td>System:</td>
<td>SQ7</td>
<td></td>
</tr>
</tbody>
</table>
2 Setup

In order to use the OCC Alert Reporting Analysis Reporting, **technical monitoring should have been activated and a productive BPO solution should already be available** in SAP Solution Manager so that the monitoring data extraction and analysis can be performed. It is strongly recommended to configure, generate and activate BPO in a solution before going on with the activation process as described in the subsequent chapters.

**DISCLAIMER:**
Please use this Setup-Guide for OCC Alert Reporting Analysis at your own risk. All our recommendations regarding the activation of this functionality are based on our general experience and maybe are not valid for your specific implementation, especially when you are already using the BW component in SAP Solution Manager. In this case, please consult and involve the people already working with BW in the target system to make sure that all functions in BW keep working.

2.1 Prerequisites

2.1.1 SAP Solution Manager System Release

Using the OCC Alert Reporting Analysis feature, implementing the current releases and support packages for the ST and ST-BCO components is mandatory. We recommend the following releases as an absolute minimum configuration:

<table>
<thead>
<tr>
<th>Software Component</th>
<th>Release</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST</td>
<td>SAP Solution Manager</td>
<td>710</td>
</tr>
<tr>
<td>ST-BCO</td>
<td>BI Content for SAP Solution Manager</td>
<td>710</td>
</tr>
</tbody>
</table>

On demand ask your Technical Quality Manager for a SAP Note which is downporting the 710 SP13 functionality for 710 SP12.

2.1.2 BW components already activated

Before setting up OCC Alert Reporting feature, you need to find out if Business Warehouse (BW) in your SAP Solution Manager is already being used.

This can be checked in table “RSADMINA” on your SAP Solution Manager system, which can be accessed by transaction SE16 directly. If the table is empty, no usage of BW components was activated before and the client for BW usage can be chosen freely.

If an entry already exists, a BW client was already set before. You have to use the client defined in column “BWMANDT” for all further setup activities. Otherwise, inconsistencies in the BW part might occur later on during activation process.

If no entry exits, choose the BW client. Which client to choose, depends on your authorization concept for the clients in your SAP Solution Manager system. We recommend using the SAP Solution Manager client (already in use for BPO) for BW activation and to use SolMan Setup (i.e. the automated Solution Manager Configuration tool) for the activation process.

---

2.1.3 Solution Manager Configuration: Configuration User and RFC Connection

During the BPO setup (“System Preparation” and “Basic Configuration” and “Managed System Configuration” and “Technical Monitoring” see Figure 16) a configuration user is created automatically. The system assigns roles and authorizations to this setup user automatically for:

- Performing the Technical Setup of OCC Alert Reporting
- Performing BW reporting (data analysis, display trend analysis and alerting)
- Displaying Dashboards

Alternatively, you can also use the Solution Manager Administrator user (for example SOLMAN_ADMIN).

Figure 16 - Solution Manager Configuration

To enable the data transfer from SAP Solution Manager to BW an RFC Connection is required, which is also part of the automatic Solution Manager Configuration.

Find more information on the automatic user creation concept in the Security Guide in section 8.2.
2.2 Activation

The following chapters describe the activation process of the OCC Alert Reporting functionality via the solution manager setup functionality. The activation is usually done automatically. Despite of that it is also possible to do the activation manually.

If any problems arise during activation, please refer to chapter 3 Troubleshooting of this document.

2.2.1 Automatic OCC Alert Reporting Setup

The OCC Alert Reporting consists of a Business Server Page (BSP) containing the java script files, which are generating the user interface in HTML5 (UI5) and calling the relevant methods of the oData service in ABAP.

These elements are activated automatically in the basic configuration of the SOLMAN_SETUP (see Figure 17). To check, whether the BSP and the oData Service have been triggered for activation successfully, see “Basic Configuration” → “5 Configure Automatically” → “Activate Services”. In the log entry “SM_BASIC_SETTINGS_3” hit the link “Show”. Find in the popup the following services:

- /sap/bc/bsp/sap/sap_bpm_alrep
- /sap/opu/odata/sap/sap_bpm_alrep_srv

This means that these two services have been activated in the transaction SICF.

As a third step the oData Service needs to be assigned to a system alias. This is done automatically with “Basic Configuration” → “5 Configure Automatically” → “Activate Piece List”. If the system alias in your system is LOCAL, you shall now be able now to start BPO Alert Reporting. If the system alias is different, please check the section 2.2.2

2.2.2 Manual OCC Alert Reporting Setup

Despite of the automatic OCC Alert Reporting activation it is possible to do the activation steps manually. Usually you might consider these steps only, if you are not sure, whether the automatic activation has been performed.

The main transaction to activate and maintain the oData Service is transaction /IWFND/MAINT_SERVICE. Search for the technical name of the service SAP_BPM_ALREP_SRV (see Figure 18). If the ICF node ODATA does not show a green traffic light, activate if with “ICF Node”  “Activate” (see Figure 19).

In order to make OCC Alert Reporting to work there shall be assigned a valid System Alias. Usually this System Alias is LOCAL. If you have performed the automatic setup, you will find this entry already in there. It might happen that in your system the system alias has been named differently. In those cases it is really easy to correct the system alias.

To check the System Alias used in your system, hit the button “Customizing” (see Figure 20). If there is an entry displayed, check whether the value help of the field SAP System Alias contains the value LOCAL. If not, there shall be a similar local system entry. If there is no entry or one with a non-existing system alias, remember the Service Doc. Identifier and Version (SAP_BPM_ALREP_SRV_0001 version 1) and hit the button “New Entries”. Enter the Service Doc. Identifier, the Version, and the correct SAP System Alias from 7 After the activation in transaction SICF the two paths default_host/sap/bc/bsp/sap/sap_bpm_alrep and default_host/sap/opu/odata/sap/sap_bpm_alrep_srv shall be activated. Grey font means inactive, black means active. In order to activate right-click sap_bpm_alrep (respective sap_bpm_alrep_srv) and choose “Activate Service”. 
the value help and activate flag default system. Save the entry. View again the customizing of the system alias assignment. If there had been an entry before, you shall see now two entries. Keep only the new entry and save again.

Now you shall be able now to start OCC Alert Reporting.

![Figure 18 - Activated Service in Transaction /IWFND/MAINT_SERVICE](image1)

![Figure 19 - Activate BSP](image2)
2.2.3 BPMon Customizing Settings

If you are using SAP Solution Manager 7.1 SP13, please make sure that for each monitoring object the BW Granularity is set to “Long” (see Figure 21). Otherwise no daily and monthly data will be stored in the MAI Infocubes and the alert data cannot be shown in BPO Alert Reporting View of the OCC Alert Reporting.

In order to check or maintain these setting, go via the Business Process Operations work center to the “Setup Business Process Monitoring” (see Figure 22). In the context navigation select your solution → “Business Scenarios”. Then choose the business scenario, business process and step and select the monitoring object you want to transfer the alerts for (see Figure 23). Click on the monitoring object and hit tab “Further Settings”.

If you change the BW Granularity make sure that you generate and activate the monitoring object again.
Figure 22 - Access the BPMon Settings via the Work Center "Business Process Operations (New)"

Figure 23 - Business Process Monitoring Setup
2.3 Execution of OCC Alert Reporting

The OCC Alert Reporting can be accessed via button “Reporting” in the Alert Inbox of the SAP Solution Manager Work Center “Business Process Operations (New)” (see Figure 24).

![Figure 24 - Entry Point for OCC Alert Reporting](image)

The general syntax of the link is `https://<server>:<port>/sap/bc/bsp/sap/sap_bpm_alrep/index.htm`. The OCC Alert Reporting is starting initially with the BPO Alert Reporting tab and the first Solution in the list. If the user changes the initial selection criteria, the system remembers the settings, with which the user left the screen and opens up with exactly these settings at another call.

If certain parameters are added to the link, it is possible to make the OCC Alert Reporting loading its data directly with these parameters and not with the initial ones or the ones the user was using last time.

The following parameters might be added to the link:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Meaning</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>tab</td>
<td>The Tab BPO or AO</td>
<td>?tab=W1_BPO</td>
</tr>
<tr>
<td>Parameter</td>
<td>Description</td>
<td>Value</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------------------------</td>
<td>------------------------------</td>
</tr>
<tr>
<td>tab</td>
<td>Alert Category</td>
<td>WI_AO</td>
</tr>
<tr>
<td>?aCat</td>
<td>Alert Category</td>
<td>PERFORM</td>
</tr>
<tr>
<td>?aCat</td>
<td>Alert Category</td>
<td>AVAIL</td>
</tr>
<tr>
<td>moTyAO</td>
<td>Managed Object Type</td>
<td>T_SYSTEM</td>
</tr>
<tr>
<td>date_from</td>
<td>Userdefined time period</td>
<td>20141201&amp;date_to=20141220</td>
</tr>
<tr>
<td>?date_from</td>
<td></td>
<td></td>
</tr>
<tr>
<td>?date_to</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sid</td>
<td></td>
<td>Q3A</td>
</tr>
</tbody>
</table>

The parameters can be added to the link with a “?” . If you want to add more than one parameter the parameters need to be concatenated with a “&”. The sequence of the parameters is not relevant.

Example:

https://<server>:<port>/sap/bc/bsp/sap_bpm_alrep/index.htm?tab=WI_AO&sid=Q3A&date_from=20141201&date_to=20141220

The parameters which are not mentioned are loaded initially or if available according to the user’s last settings, when he left the screen.
2.4 Monitor the Data Transfer

The alert transfer to BW is performed via the MAI which is using the Extractor Framework (EFWK). General information, how the EFWK is working can be found in the documentation of Solution Manager – Extraction Framework.

For OCC Alert Reporting there is the extractor E2E_ALM_EXTRACTOR, which can be monitored within the transaction SOLMAN_SETUP → Solution Manager Administration (see Figure 25). In the Solution Manager Administration window select “Infrastructure” (see Figure 26).

Figure 25 - Solution Manager Configuration entry screen
In the menu select Framework → Extractor Framework (see Figure 27). To find the extractor, show in the extractor overview table the filter line and enter in column Name “Alert Management Reporting”. The status of the extractor shall be green. If not, select the extractor and view the messages per extractor run and find out in which extractor phase the error occurred (see Figure 28).
Figure 28 - View the Status of the Alert Management Reporting Extractor
2.5 Housekeeping

The housekeeping is running fully automatic according to the twin cube concept. Find further specific information at the SAP Help Portal in section “Alert Management Reporting in SAP Solution Manager”.

The lifetimes, meaning how long the alert groups are stored in the MAI Infocubes, you can find in SOLMAN_SETUP in the “Technical Monitoring” → “2.5 Housekeeping” (see Figure 29).

Figure 29 - Storage Lifetimes of Alert Groups in the Infocubes
3 Troubleshooting

When activating or working with the OCC Alert Reporting, you might face technical issues for which we want to provide you – according to our experience – a short description how to analyze them.

If you face technical issues which are not included in this chapter, please feel free to create an OSS message on component SV-SMG-MON-BPM, providing a detailed description of your issue.

NOTE: To speed up message processing make sure beforehand that you have installed the latest fixes.

3.1 Analyze Activation Issues

3.1.1 The OCC Alert Reporting Link Returns with an Error

Check if the service is working at all:
- Call transaction SE38
- Run Program /IWFND/SUTIL_SERVICE_TEST (see Error! Reference source not found.)
- Enter External Service Name: SAP_BPM_ALREP_SRV
- Enter Version: 1
- Hit Execute

Figure 30 – Service Explorer (Program /IWFND/SUTIL_SERVICE_TEST)
If the status code is OK, the service is running. If the service is not running, check whether the BSP and the oData service are really active and the system alias is set correctly. Find the procedure in section 2.2.2 Manual OCC Alert Reporting Setup.

3.2 Analyze Display Errors

3.2.1 Slider in the Table Column Header is Corrupted

How to identify:
The slider in the table’s column header is corrupt.

Reason for the problem:
The screen is built up automatically by the frontend. This is called rendering. In case that the rendering is started, before the data processing in the frontend has finished, the controls might not be able to finish rendering in time.

How to solve:
For the moment there is just a workaround available. If you identify a corrupt slider, click twice on the right hand side of the screen “Additional Functions” to open and close the panel again. With each opening and closing of this panel the rendering is started with a short time delay. This will invalidate the sliders and the system will rebuild them.

3.2.2 Table Sorting is not Adapted to the Screen Size

How to identify:
You opened the OCC Alert Reporting with a small screen and enlarged it later to full screen.

Reason for the problem:
The screen is built up automatically by the frontend. This is called rendering. At the moment a change of the screen size does not invalidate neither the tables nor the container where they are in.

**How to solve:**
Go on working. If you for example enter a managed object filter string text the tables will be rebuilt and with that the width is recalculated.

With new selection conditions or drill down options also the width of the controls in the pie container are recalculated.

3.2.3 **Table Printouts do not Show Up the Chart Bars**

**How to solve:**
Activate the printing of background images, which is a setting in the printing preview.

3.2.4 **Pie Printouts do not Show Up Completely on the Print Preview Screen**

**How to solve:**
Wait until the frontend completed the rendering, meaning the pie has been rebuilt and is visible now on the screen completely. It this is done, click on the the printer icon to start the printing preview (Google Crome).

3.2.5 **How can the Tables be Adapted to the Page Size of the Printout?**

This application not optimized on a specific page formatting. Anyway you might play around a bit with the “Show visible lines” parameter in the main screen, the horizontal and vertical format parameters in the pre-printing screen and the horizontal and vertical format parameter in the printer settings of the browser.

### 3.3 Analyze Browser Errors

Open the OCC Alert Reporting link with the recommended Google Crome Browser and hit Ctrl+Shift+I. Check whether any errors have been listed in the console. Identify whether the error is related to the oData Service or to the Java Script Files.

3.3.1 **Identify and Debug oData Errors**

**How to identify:**
After opening the console as described above, you might see in red text a loading ressource error, where the server did not respond with 200 (OK). These are errors which occur within an ABAP routine in the SAP System, the oData service is calling with a specific link (see Figure 32).

To identify the root cause, you need to debug the ABAP routine.

![Console](image)

**Figure 32 - oData errors are showing up as a link to an SAP system**

**How to debug:**
Right-click and open the link in a new window. Analyze the link regarding service and method name.

For example:

- https://ldai1sd7.wdf.sap.corp:44389/sap/opu/odata/sap/SAP_BPM_ALREP_SRV/AlertGroups/?$filter=context_guid%20eq%20'0050569A041A1EE2AAA0A6B6E4E99778%20and%20date_to%20eq%20'20140117%20and%20date_from%20eq%20'20140110%20and%20tableid%20eq%201


  2) The service and method name SAP_BPM_ALREP_SRV/AlertGroups/

  3) The calling filter parameters which will be evaluated in the method

     /?$filter=context_guid%20eq%20'0050569A041A1EE2AAA0A6B6E4E99778%20and%20date_to%20eq%20'20140117%20and%20date_from%20eq%20'20140110%20and%20tableid%20eq%201

- This means the link is performing method ALERTGROUPS_GET_ENTITYSET of class CL_SAP_BPM_ALREP_DPC_EXT.

To debug, please enter transaction SE80 and set a breakpoint in CL_SAP_BPM_ALREP_DPC_EXT→ALERTGROUPS_GET_ENTITYSET (see Figure 33).

Delete the cache and rerun the link, which you analyzed just now.

Debug the coding and see where the dump occurs.

![Figure 33 – Set a Breakpoint in CL_SAP_BPM_ALREP_DPC_EXT→ALERTGROUPS_GET_ENTITYSET in Transaction SE80](image)

NOTE: In the same way you can analyze performance issues and start a ST12 trace in order to see where the runtime is spent.
3.3.2 Identifying and Debugging Errors in Java Script Files

How to identify:
All other errors do not have this link as described in section 3.3.1, but describe a problem with a coding line (here: line 48 of the generic source file cs.js).

How to debug in the JS files:
Click on the coding reference (here cs.js:48).
In the tab Sources this coding now has opened
Set a break-point by clicking on the left hand side of the line (see Figure 34).
Reload the page (Right-click → Empty Cache and Hard Reload).
Check the contents of the variables and debug step by step.

Figure 34 - Breakpoint in the JS file

3.4 Performance Analysis

How to trace the performance:
Open the BPO Alert Reporting link with the recommended Google Crome Browser and hit Ctrl+Shift+I.
Reload the page (Right-click → Empty Cache and Hard Reload).
Open the tab Network to see,
- long running activities
- pending (=waiting) actions
- what is loaded new from the system or had been cached
If the oData routines (ABAP) have a long runtime (compare section 3.3.1), do an ST12 trace.
3.5 Data Analysis

How to identify:
You see entries for a managed object for the given time frame in cube 0SMALMMP1, but not in BPO Alert Reporting.

How to analyze:
Find out the MAI GUID in „Context Name Hash“.
- Transaction RSA1
- Right-Click on the Multi Provider 0SMALMMP1 → Display Data
- View the characteristic 0ALM_CTXHSH for the mentioned record
→ Copy the MAI GUID

Find out the context for the managed object
- Open in Transaction SE80 method GET_WHERE_USED_BY_OBJECT_ID in class CL_AGS_BPM_RUNTIME_SERVICE
- Hit button Test/Execute
- For interface IF_AGS_BPM_RUNTIME SERVICE click on “Edit interface view”
- Execute method GET_WHERE_USED_BY_OBJECT_ID
- Enter the MAI GUID in field IV_OBJECT_ID and hit execute (F8)
→ Find in table ET_PARENT_CONTEXT- CONTEXT_NAME the context information where you shall find the managed object.
→ Open in BPO Alert Reporting this context and see whether the data are displayed.