The SAP DBA Cockpit for Microsoft SQL Server

Applies to:
SAP NetWeaver 7.0

Summary
This article discusses the new database monitoring transaction DBACOCKPIT, which will be introduced with SAP NetWeaver 7.0 Support Stack 12. The DBACOCKPIT provides in one simple, streamlined transaction the functionality of several previous transactions like ST04, DB02, etc. You can also easily monitor remote systems from the DBACOCKPIT to easier manage multiple systems.

Author: Leslie Moser
Company: SAP Labs, LLC
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Author Bio
Leslie Moser works for SAP Labs in the Microsoft Platforms U.S. SAP NetWeaver IMS team in Redmond, WA. As part of the Redmond team, Leslie performs testing of SAP software on Microsoft SQL Server and in developing SAP tools for the SQL Server database platform. She has worked for SAP for over 9 years in Development IMS, Solution Support and Information Technology departments.
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Reasoning for the SAP DBA Cockpit

Working as a Basis Administrator requires you to have an almost encyclopedic memory of hundreds of SAP transactions. For the database alone, there is ST04 as the performance monitor, DB02 as the space monitor, DB13* for the calendar functions and many more. Each of those screens has multiple buttons and menu paths which drill down into more actions.

To reduce the complexity of your daily life, the multiple SAP database platform teams have collaborated over the last several months to move all of these functions into one main cockpit from which you can monitor and troubleshoot any SAP supported database platform: transaction DBACOCKPIT. Now whether you execute transaction DBACOCKPIT or any old transaction like ST04, DB02, or program MSSPROCS, you enter the DBACOCKPIT.

This single point of entry has other advantages than just transaction consolidation:

• **Support local and remote databases in one transaction:**
  With just one SAP NetWeaver system and DBACOCKPIT you can monitor your local database and remote databases, whether they are SAP or non-SAP databases. As long as it is one of the supported SAP database platforms (MS SQL Server, IBM DB2, Oracle, MaxDB), you can connect to and monitor it.

• **Support multiple database platforms in one transaction:**
  For those of you with multiple database vendors, the DBACOCKPIT has the same framework for each database platform (although individual screens may vary). This helps you and SAP consultants and Support staff who connect to a variety of platforms each day. And with the SAP Solution Manager being powered by SAP Netweaver, you can configure Solution Manager’s DBACOCKPIT for all your databases so you have one central point from which you can monitor.

• **Granular security to restrict access per database:**
  A new authorization concept allows you to grant varying access to users for each database connection, not just the entire transaction DBACOCKPIT. For example, Admin A can have read only access to DB1 and DB2. Admin B can have read only access to DB1 and full administrative privileges on DB2. And Admin C has full administrative privileges on both DB1 and DB2.

Specifically for SQL Server customers, for those using Microsoft SQL Server 2005 the DBACOCKPIT has new screens which take advantage of new monitoring data available in SQL Server 2005. Particularly interesting are the new Data Management Views (DM Views) for SQL statement statistics which provide much more advanced data about statement performance than before. SAP is now able to use these DM Views to provide much more effective information regarding the statement execution environment, index operations and usage, etc. For more information about DM Views in SQL Server 2005, see the SQL Server 2005 Books Online documentation that is installed with SQL Server.
We feel the transaction is such an improvement that we are releasing it with SAP NetWeaver 2004s Support Package 12 instead of waiting for the next SAP NetWeaver release. In this article we want to give a basic introduction to some of the new screens so you can see what is coming. For detailed information about all the screens and features of the DBACOCKPIT we are currently writing SAP Note 1027512 which will be released in the next two weeks. This SAP Note will have steps you need to execute after the application of Support Package 12, answers to frequently asked questions and an attachment of the full documentation for the DBACOCKPIT. So be sure to look for SAP Note 1027512 in a few weeks.

The New Authorization Concept

Before we get to the transaction itself, we first have to explain to you that an entirely new authorization concept is introduced with DBACOCKPIT and you must be aware of it. Since we integrated all the SAP database transactions into one which can remotely access other databases we felt that a more complex authorization concept was required. Once you apply SP12, there are new authorizations objects included in the role SAP_BC_DB_ADMIN_MSS. Any user with this role has the necessary authorizations to execute DBACOCKPIT. The new additions are circled in the below screenshot:

These default authorizations allows a user Display, Maintain and Analyze access to the local system and only Display access to any remote system for which you configure a connection. This role is meant for DBAs and Basis Administrators and should not be granted to a wider audience. In more complex system environments, you have to tailor the role or multiple copies of it to your specific needs. Each copy allows varying degrees of access (e.g., one less restrictive role for DBAs and Basis administrators and another Display only role for Operations or Hosting partners). For the full details on the authorization objects, be sure to read SAP Note 1027512 when it is available.
An example of a customized role is below:

| Manually  Database Multiconnect |
|-----------------|-----------------|
| Activity  | Display          |
| DBA Cockpit: Server Name | *              |
| DBA Cockpit: Database Name | AA7, EMPLOYEEDATA |
| Database User | *              |

| Manually  Database Multiconnect |
|-----------------|-----------------|
| Activity  | Display, Maintain |
| DBA Cockpit: Server Name | *              |
| DBA Cockpit: Database Name | AB7, JAVA       |
| Database User | *              |

| Manually  Database Multiconnect |
|-----------------|-----------------|
| Activity  | Display, Maintain, Analyze |
| DBA Cockpit: Server Name | <LOCAL SYSTEM> |
| DBA Cockpit: Database Name | *              |
| Database User | *              |

In this modification of the role, any user assigned this role is able to:

- Display the remote SAP system AA7 and the non-SAP system remote database EMPLOYEEDATA
- Display or maintain the remote SAP system AB7 and the non-SAP system remote database JAVA
- Display, maintain or analyze the local SAP system.

There is a fourth authorization, *Extended Maintenance*, which should be restricted from use. This authorization allows a user to execute any SQL statements on the database it is granted for. Improper use of this feature can do significant damage.
The DBA Cockpit

Now that you know the new security model, we can continue to the screenshots from an internal test system. Since we are the SQL Server porting team we have only configured SQL Server systems, but you could also see MaxDB / LiveCache, Oracle, IBM DB2 systems here.

This is the main screen after executing DBACOCKPIT. By default, you connect to your local database automatically:

The Navigation Menu tree corresponds loosely to the following old transactions:

- Performance = ST04
- Space = DB02
- Backup and Recovery = DB12
- Configuration = Some ST04 detail screens plus new ones
- Jobs = DB13 and DB13C
- Diagnostics = Some ST04 and DB02 detail screens plus new ones
If you customize your SAP profiles to allow varying degrees of display, maintain, and analyze permissions, you will note that the Navigation Menu tree in the left pane automatically disables ("gray out") certain screens based on the authorizations specified. For example, a user who has only Display access to a system sees the following:

Gray color means that screen is disabled for any reason (authorization, SQL Server release, et cetera)
You can see that the old ST04, now **Performance -> Overview**, looks relatively unchanged. But all the features that used to be available through the button titled **Detailed Analysis** are now separate screens in the tree for easier navigation:

For those running Microsoft SQL Server 2005 you have an improved SQL Statements screen with more detailed, accurate SQL Statement performance statistics. This information is provided by the new SQL Server 2005 Data Management view `sys.dm_exec_query_stats`. Now, you get performance information about each SQL statement directly from SQL Server and not somehow cached in the SAP kernel. This is information like:

- SQL statement
- Number of executions
- Total and average time
- Total physical reads and average physical reads
- Total logical reads and average logical physical reads
- Etc.
The screen looks like:

![Image of SAP DBA Cockpit for Microsoft SQL Server]

It can be sorted by a variety of key performance indicators as shown below:
Another new screen with more detailed information comes from the SQL Server 2005 Data Management view `sys.dm_db_index_operational_stats`. Now we have much more information easily available on the activity of indexes. This information like the number of inserts and deletes as well as latch and lock wait times. We have also provided pre-created filters to help you sort through the most important data as you see below:
Going back to the overall benefits of DBACOCKPIT, remember these specialized screens are also available for monitoring other systems. These can be either SAP or non-SAP databases as long as it is a database platform we support. So in this test system a connection to a very small Java database that runs on a desktop system was created. As you can see, we can largely use all the same screens on this non-SAP system:

![DBACOCKPIT Screenshots]

Performance -> Overview works fine on non-SAP systems as the data is SQL Server specific, not SAP specific.

Screens that rely on SAP specific data are disabled (like data dictionary checks or SAP dlls)

We are very excited to present this simpler, direct transaction that allows you to monitor more systems at once. More features and functions will come in the future, especially for SQL Server 2005 systems as Microsoft continues to improve their internal monitoring framework for us to use. Return to SDN for more submissions in the future about general performance tuning with DBACOCKPIT and discussions about specific screens and their usefulness.

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