DBPLUS
better performance

DBPLUS
Performance Monitor for Oracle
description of changes in version 2021.2

Date: July 9, 2021

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Below is a list of changes in the DBPLUS Performance Monitor system for monitoring Oracle databases.

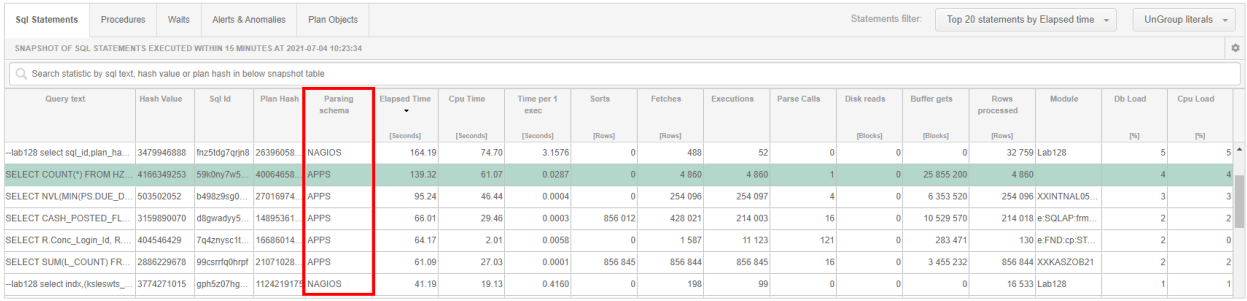
New in 2021.2

1.1. Collecting information about the OWNER and PARSING SCHEMA of the inquiry

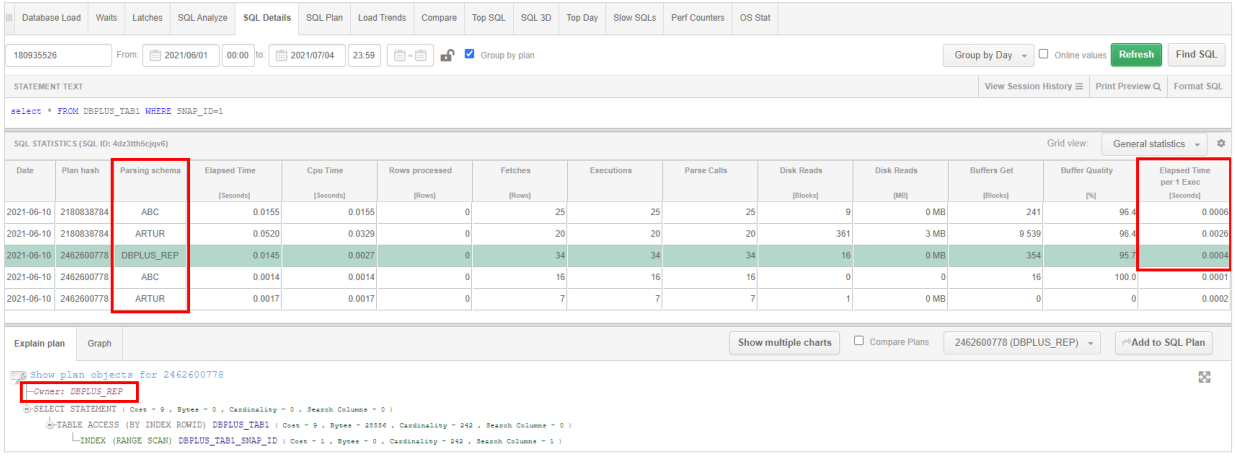
The DBPLUS Performance Monitor application collects information about queries performed in the monitored database. In the latest version of the application, we added information about:
- PARSING SCHEMA - the schema where the query was run,
- OWNER – owner of the object where the query is executed.

This information is collected during the snap procedure once every 15 minutes from the system views of Oracle databases. Adding additional information is the next step that will lead to the currently developed DBPLUS Query Advisor mechanism - which in the future will automatically display information on possible query optimization in a given database.

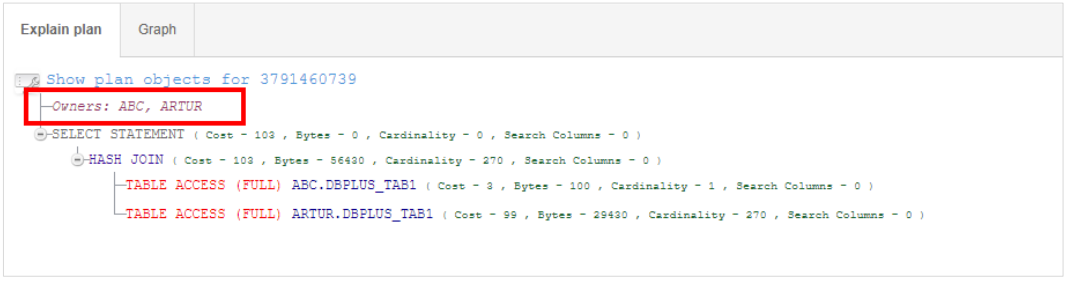
In the latest version, the information about **Parsing Schema** has been added by default to the grid presenting information about query statistics. Below is the table view in the Database Load tab:



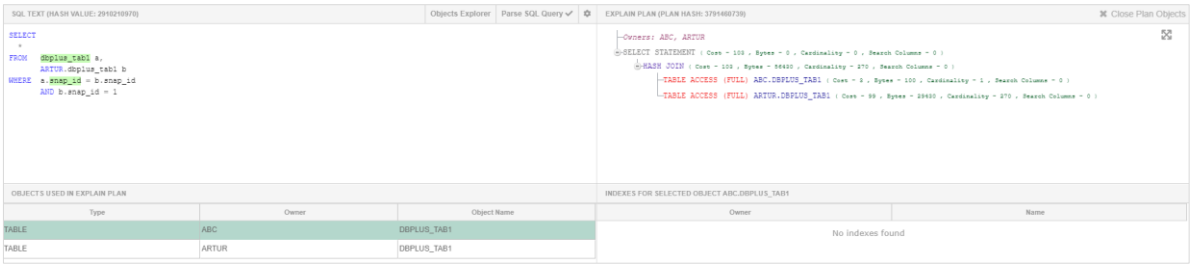
Information about the schema where the command was executed and the OWNER of the objects will allow a more accurate analysis of queries performed in the monitored database. In the case presented below: the time of a single execution of the same query for different OWNER values is an order of magnitude different between the slowest and the fastest execution of the query. This is due to the fact that the table in the other schema is several times larger than the same table in the another schemas. Such information was obtainable only when information about the OWNER of the objects participating in the query is also collected by the applications.
Below, the page view in the SQL Details tab:



If objects from different schemas are indicated in the execution plan for a given query, the information is presented in the Explain plan tab together with the execution plan.



Similarly, by presenting information on the Show Plan Objects page, using the DBPLUS query parser, the User can precisely indicate where in the query the object that belongs to the OWNER selected in the table.



1.2. Logical Standby Monitoring

Logical Standby monitoring has been added in the latest version. Online monitoring is possible in the application from the Dashboard level. Monitoring depending on the source of data download has been added in two variants:
- Standby base monitoring from the Primary base.
- monitoring of the Standby database from data directly from the Standby database.

Monitoring Logical Standby from the Primary database

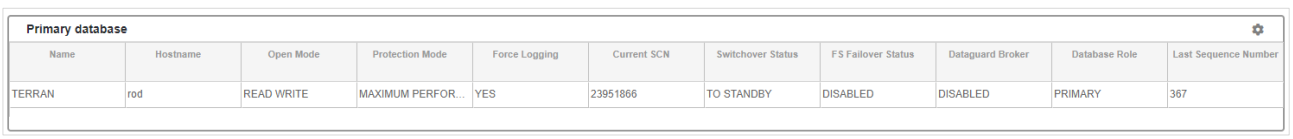
This mode is started automatically after detection of a Logical Standby configuration, when a database with the Primary role is added to the monitoring.

Information about the Standby status is visible on the Dashboard screen by clicking the Repl Status icon or selecting the **Standby Status** tab from the side menu.
Standby monitoring data is visible in two sections:

- Primary Database
- Standby Database

The Primary section has information related to monitoring the status of the Primary database from which data is replicated to the Standby databases. The section provides information about:

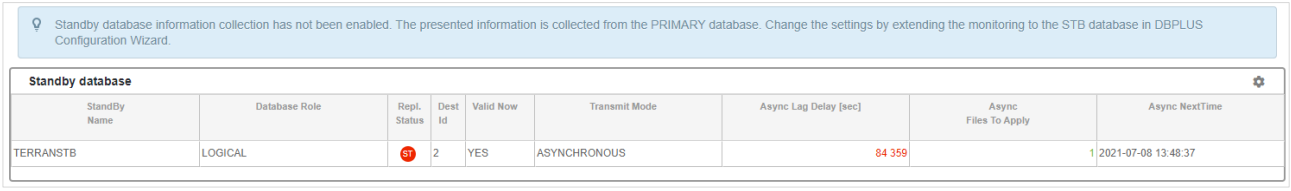
- NAME – name of database,
- HOSTNAME – database server name,
- OPEN MODE – Open Mode
- PROTECTION MODE – the data protection mode that is currently in force in the database,
- FORCE LOGGING – whether the database is in forced login mode,
- CURRENT SCN – currently processed change number, contains null if base is not in OPEN MODE,
- SWITCHOVER STATUS – indicates whether switching is allowed,
- FS FAILOVER STATUS – failover state,
- DATAGUARD BROKER – whether the DataGuard configuration is managed by a broker,
- DATABASE ROLE – database role
- LAST SEQUENCE NUMBER – the last file the sequence number on the PRIMARY database side.



Primary database

Name	Hostname	Open Mode	Protection Mode	Force Logging	Current SCN	Switchover Status	FS Failover Status	Dataguard Broker	Database Role	Last Sequence Number
TERRAN	rod	READ WRITE	MAXIMUM PERFOR...	YES	23951866	TO STANDBY	DISABLED	DISABLED	PRIMARY	367

Information on the status of Standby databases is presented in the Standby database section. All this information comes from the system views available in the Primary database, therefore it may be presented with a delay in the PRIMARY database and on the Performance Monitor application level.

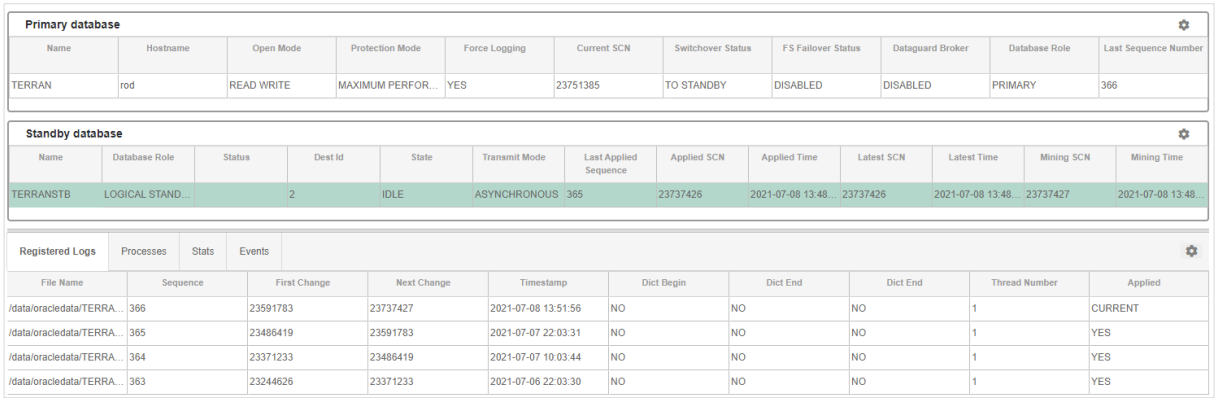

Standby database information collection has not been enabled. The presented information is collected from the PRIMARY database. Change the settings by extending the monitoring to the STB database in DBPLUS Configuration Wizard.

Standby database

StandBy Name	Database Role	Repl. Status	Dest Id	Valid Now	Transmit Mode	Async Lag Delay [sec]	Async Files To Apply	Async NextTime
TERRANSTB	LOGICAL	ST	2	YES	ASYNCHRONOUS	84 359	1	2021-07-08 13:48:37

Monitoring Logical Standby downloaded directly from the views in the Standby database

When DBPLUS monitoring includes both the PRIMARY database and the Standby database, the application detects the configuration automatically and displays information directly from the Standby database.


Primary database

Name	Hostname	Open Mode	Protection Mode	Force Logging	Current SCN	Switchover Status	FS Failover Status	Dataguard Broker	Database Role	Last Sequence Number
TERRAN	rod	READ WRITE	MAXIMUM PERFOR...	YES	23751385	TO STANDBY	DISABLED	DISABLED	PRIMARY	366

Standby database

Name	Database Role	Status	Dest Id	State	Transmit Mode	Last Applied Sequence	Applied SCN	Applied Time	Latest SCN	Latest Time	Mining SCN	Mining Time
TERRANSTB	LOGICAL STAND...		2	IDLE	ASYNCHRONOUS	365	23737426	2021-07-08 13:48...	23737426	2021-07-08 13:48...	23737427	2021-07-08 13:48...

Registered Logs | Processes | Stats | Events

File Name	Sequence	First Change	Next Change	Timestamp	Dict Begin	Dict End	Dict End	Thread Number	Applied
/data/oracledata/TERRA...	366	23591783	23737427	2021-07-08 13:51:56	NO	NO	NO	1	CURRENT
/data/oracledata/TERRA...	365	23486419	23591783	2021-07-07 22:03:31	NO	NO	NO	1	YES
/data/oracledata/TERRA...	364	23371233	23486419	2021-07-07 10:03:44	NO	NO	NO	1	YES
/data/oracledata/TERRA...	363	23244626	23371233	2021-07-06 22:03:30	NO	NO	NO	1	YES

Information about the Standby status is visible on the Dashboard screen after clicking the **Repl Status** icon or selecting the **Standby Status** tab from the side menu.
Standby monitoring data is visible in two sections:

- Primary Database
- Standby Database

The Primary Database section contains information related to standby monitoring that relates to the Primary database where data is replicated to the standby databases. The section in this configuration is completed with data that comes directly from the views from the Standby database. This information is refreshed automatically every 30 seconds, in the same way as other data displayed on the Dashboard screen. Information about the PRIMARY database is the same for each variant and is described above.

The Standby Database section contains information from the standby views. Description of the columns presented in the section:

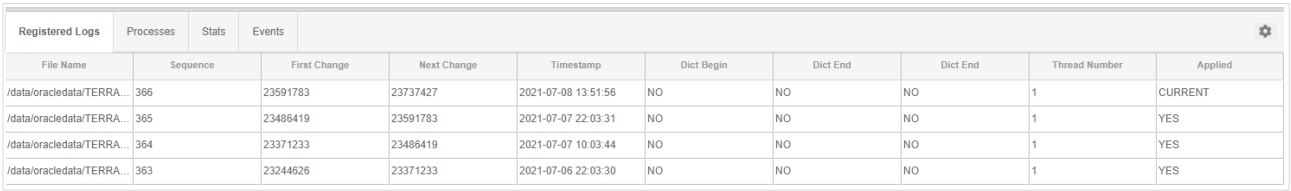
- NAME – name of Standby base,
- DATABASE ROLE – the role of the Standby base,
- STATUS – status based on DBPLUS monitoring,
- DEST ID – Standby database ID from the base PRIMARY,
- STATE – status of the data replication process to the Standby database,
- TRANSMIT MODE - data transmission type
- LAST APPLIED SEQ – sequence number that points to the last log file processed
- APPLIED SCN – all transactions below this SCN have been processed,
- APPLIED TIME – time the last transaction was processed,
- LATEST SCN – the highest SCN sent to the replication process,
- LATEST TIME – time of sending the highest SCN,
- MINING SCN – SCN number last processed by the BUILDER process,
- MINING TIME – time to process the SCN by the BUILDER process.

After selecting a specific Standby database on the list, additional tabs related to the efficiency of the data replication process to Standby are presented.

Register Logs Tab

Contains information on archived logs registered on the standby database side. Description of the columns presented in the tab:

- FILE_NAME – path and name of the archived log file,
- SEQUENCE – sequence number for a given log file on the standby side,
- FIERST_CHANGE – change number for the given log file,
- NEXT_CHANGE – revision number for the next log file,
- TIME_STAMP – log file registration time,
- DICT_BEGIN – indicates whether the beginning of the dictionary build is in this log file,
- DICT_END – indicates if the end of dictionary compilation is in this log file,
- THREAD – log file thread id,
- APPLIED – information about the status of a given log file.



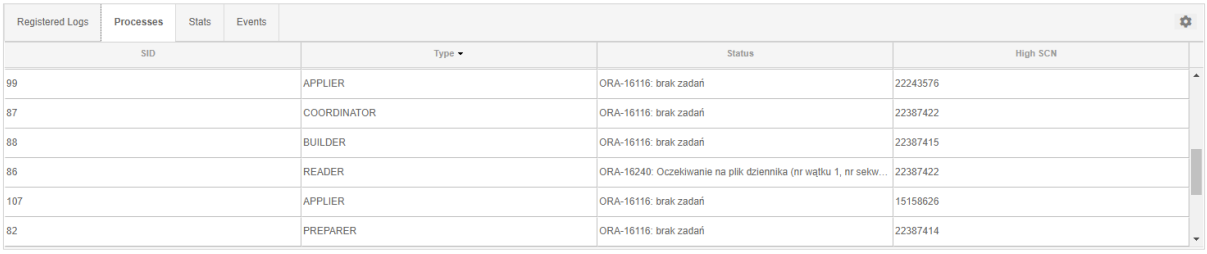
Registered Logs | Processes | Stats | Events

File Name	Sequence	First Change	Next Change	Timestamp	Dict Begin	Dict End	Dict End	Thread Number	Applied
/data/oracledata/TERRA...	366	23591783	23737427	2021-07-08 13:51:56	NO	NO	NO	1	CURRENT
/data/oracledata/TERRA...	365	23486419	23591783	2021-07-07 22:03:31	NO	NO	NO	1	YES
/data/oracledata/TERRA...	364	23371233	23486419	2021-07-07 10:03:44	NO	NO	NO	1	YES
/data/oracledata/TERRA...	363	23244626	23371233	2021-07-06 22:03:30	NO	NO	NO	1	YES

Processes Tab

It presents information about the status of services responsible for the process of data transfer to the Standby database. This view is useful for diagnosing performance problems with the data replication process in the Standby database. Description of the columns presented in the tab:

- SID – the session id for the process,
- TYPE – role a given process is responsible for in the replication process,
- STATUS – description of the current action that a given process performs,
- HIGH SCN – the highest identifier of LCRs processed by the given process.



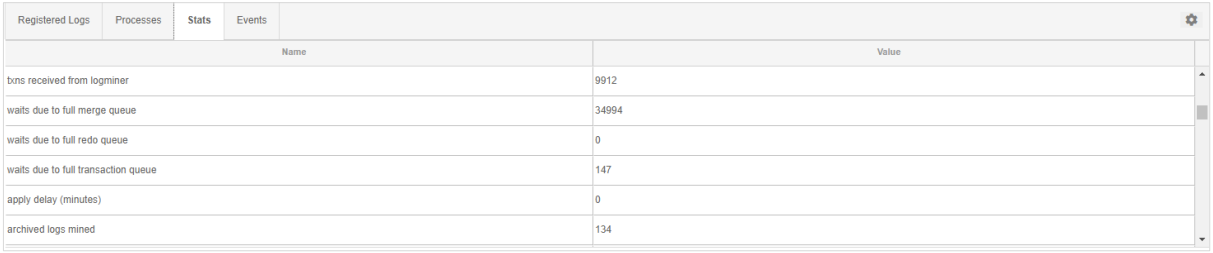
Registered Logs | Processes | Stats | Events

SID	Type	Status	High SCN
99	APPLIER	ORA-16116: brak zadań	22243576
87	COORDINATOR	ORA-16116: brak zadań	22387422
88	BUILDER	ORA-16116: brak zadań	22387415
86	READER	ORA-16240: Oczekiwanie na plik dziennika (nr wątku 1, nr sekw...	22387422
107	APPLIER	ORA-16116: brak zadań	15158626
82	PREPARER	ORA-16116: brak zadań	22387414

Stats Tab

It presents information about the current status (refreshed once every 30 seconds) of statistics related to the process of data replication to the Standby database. Description of the columns presented in the tab:

- NAME – name of the given statistic,
- VALUE – the statistic value.



Registered Logs | Processes | Stats | Events

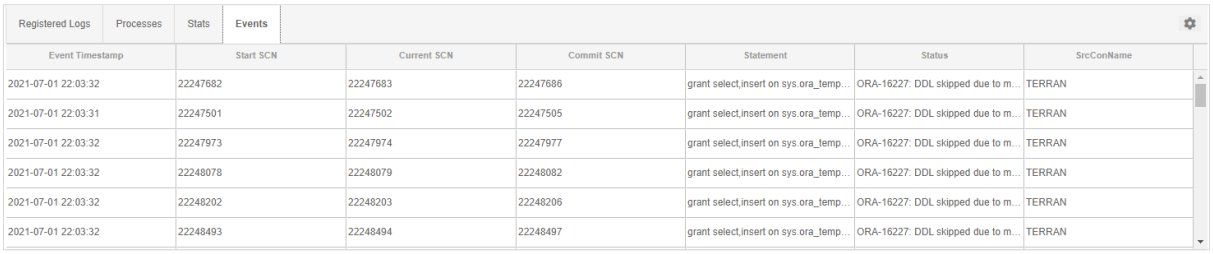
Name	Value
txns received from logminer	9912
waits due to full merge queue	34994
waits due to full redo queue	0
waits due to full transaction queue	147
apply delay (minutes)	0
archived logs mined	134

Events Tab

Contains information about events related to the processing of changes on the standby database side. This view is used to determine the cause of errors that occur while processing changes on the side of the Standby database. Description of the columns presented in the tab:

- EVENT_TIMESTAMP – time of logging an entry to the log,

- START SCN – SCN number associated with the transaction launched on the PRIMARY database side,
- CURRENT SCN – SCN number associated with the change on the PRIMARY side, if the log contains an error, the line indicates which log file contains the source of the problem,
- COMMIT SCN – SCN change number commit on the PRIMARY database side,
- STATEMENT – content of the query what was the processing at the time of the error event,
- STATUS – description of the reason for the change not being transferred to the Standby base
- SRCCONNAME – indicates the name of the PRIMARY database where the transaction was performed.

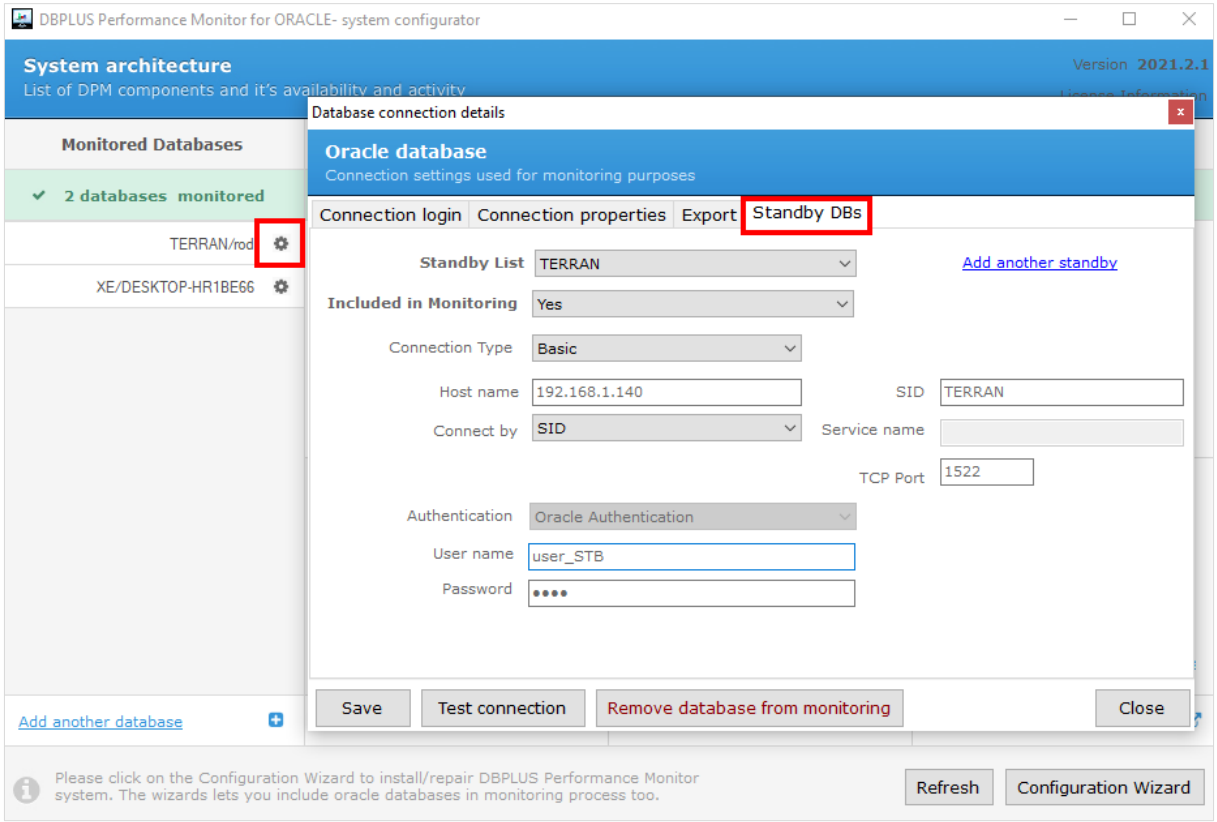


Extended monitoring – Standby database configuration

In a situation where only the PRIMARY database is added to the monitoring, the Performance Monitor application allows the User to extend the monitoring with information on Standby coming directly from the Standby database.

To do this, complete the configuration from the level of the DBPLUS Configuration Wizard installed on the Windows server together with the DBPLUS Performance Monitor application.

After starting the Configuration Wizard program, go to the PRIMARY database settings, and then from the Standby DBs tab, complete the configuration for the Standby databases. If there are many Standby bases assigned to a given PRIMARY base, add configurations for the next Standby using the Add another standby option. The user should have the minimum rights: CONNECT and SELECT_CATALOG_ROLE.

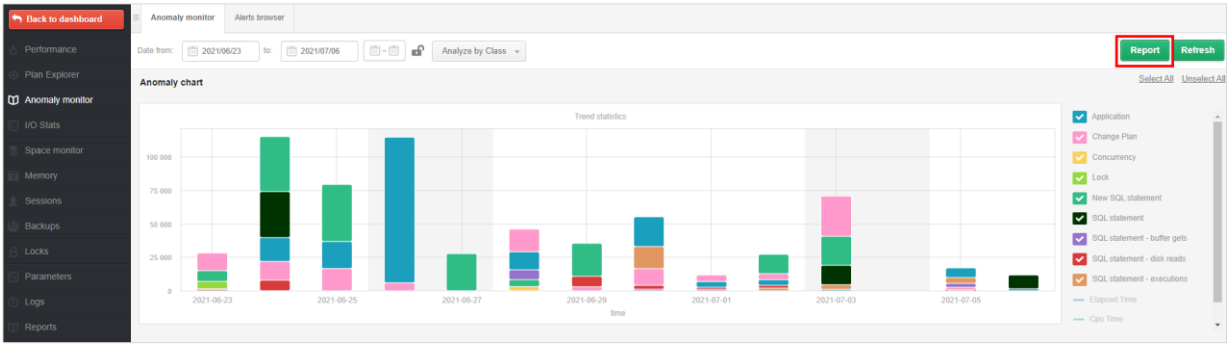


Important! Such additional configuration is not associated with the need to purchase an additional DBPLUS Performance Monitor license.

1.3. *Anomaly Monitor*

Anomaly Report

As part of the Anomaly Monitor module, which presents information about problems detected in the monitored database, a reporting module is available. The reporting module is available under the **Report** button.



A report from a given period can be generated using a saved template (TEMPLATE), which has been predefined in DBPLUS, or the User can configure his own report.
Each User can add their own templates or edit existing ones added by other Users. Predefined DBPLUS templates cannot be modified.
In the further part of the configuration, the User can set the language in which the report will be generated, the date range for which the reports will be generated, the name of the report and the file.
The report is divided into chapters that contain specific types of graphs. The chapters correspond to the charts available from the DBPLUS application. When the User selects the entire chapter using the checkbox, it will automatically not be taken into account when generating the report.

DatabaseLoad
It allows to generate a chart of database performance over a given period of time.

TopWaits
It allows to generate a chart in two variants:

- Top Waits
- Selected Waits

In the case of **Top Waits**, the chart will show the top expectations that occur in the database over a given period of time. As part of the configuration, the User may indicate the number of waits to be included in the chart and select the option that will display a summary of the data visible on the chart.
The Selected Waits option allows to generate a chart for waits specified by the User.

Loadtrends
The charts in this chapter provide a long-term presentation of the main performance statistics. Thanks to LoadTrends, it is possible to estimate whether the recent performance changes in the database are bringing the expected effect.

I/O Stats
The graphs available on the screen allow the User to report the performance of the disk array. The user can select all I / O performance indicators available in the application.

OS Stats
This chapter allows the User to generate graphs that show the utilization of the CPU on the database.

Space Size
It allows to generate a chart of the size of the monitored database. The application also allows the User to generate a graph that shows the size of the Tablespace specified by the User. Selecting the additional Show summary option will generate a summary for a given chart in a tabular form.

Main Performance Problem
This chapter was also available in previous versions of the application. Currently, it is possible to configure the visibility of query plans in the report for problems related to queries.

Update of problem classes
In the DBPLUS performance Monitor application, the Anomaly Monitor menu presents information on the problems detected in the monitored database. Problems are grouped into classes. In case of problems related to increasing a given Wait level, they will be named according to the class of the given Wait. Of course, if the problem is not related to the wait, the name of the class has been predefined by DBPLUS analysts so far.

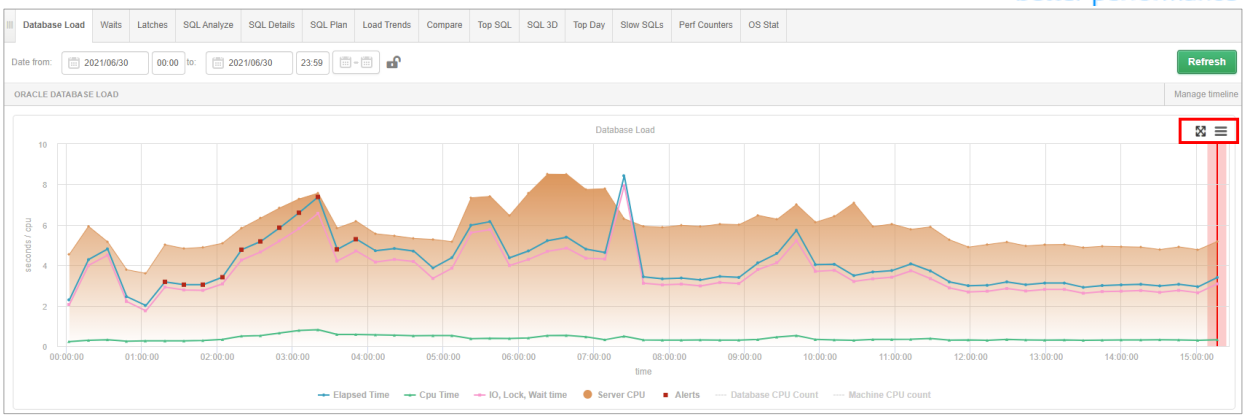
Improved Change Plan alerts
One of the most common problems with database query performance is changing the execution plan. In the Anomaly Monitor module, the application indicates when a plan change causes a performance problem. In the latest version, we have tightened the indication of performance problems about plan change in case the plan change occurs several times during a single snap. As part of the improvement, a special algorithm has been added to check whether the plans on which the query works allow raising an alert and reporting anomalies.

Note !! The report cannot be run on IE (Internet Explorer).

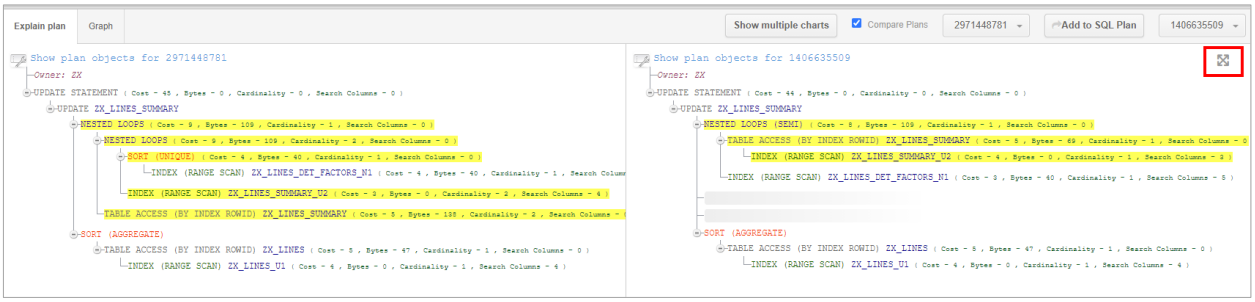
1.4. General Improvements

1.4.1. Comparing Explain Plan
In the latest version of the application, we improved the way of showing differences in plans. When the query uses many execution plans in the DBPLUS Performance Monitor application, in the SQL Details tab, it is possible to compile performance statistics for each plan as well as use the Compare plans function to compare the differences between individual execution plans.
In the application, the difference between the plans is marked in yellow. In the case when the performance plan consists of many lines, the comparison of both plans is difficult, therefore, in order to facilitate the comparison of statements, "artificial" lines are inserted in the plan in some places.

1.4.2. Full screen
An option has been added to the application that presents charts and execution plans on the entire screen. The functionality is available after clicking on the "full screen" button visible in the upper-right corner of the chart / execution plan.



The option is available for the single plan view as well as for the Compare Plans option.



After clicking on the "full screen" icon, the information contained in the inquiry plans will be displayed in full screen in a new browser window. This will greatly facilitate the possibility of analyzing query plans.

1.4.3.Small fixes and improvements

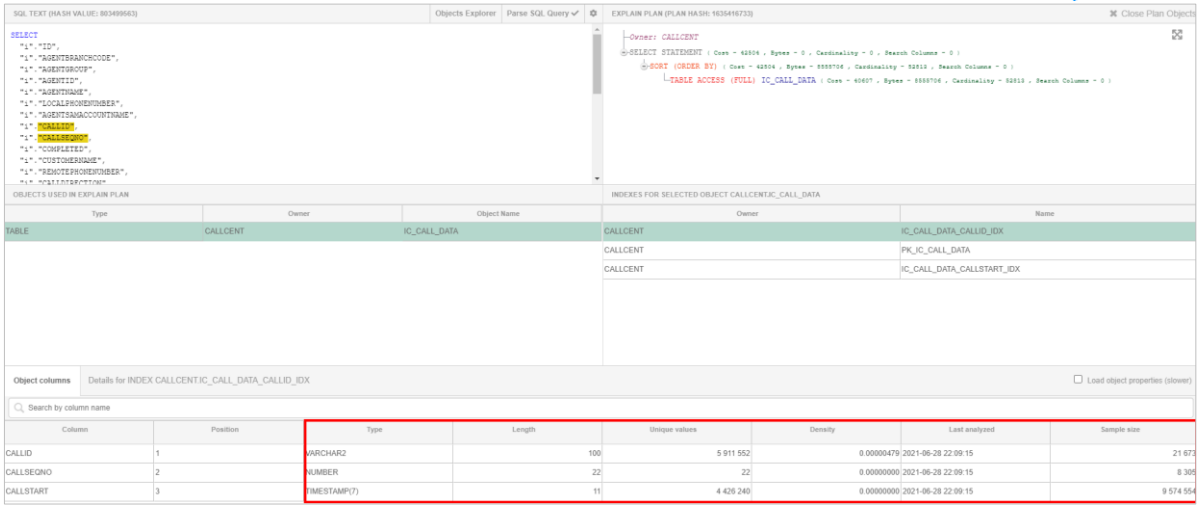
As part of the latest update, we added minor permissions and fixes:

Session history presentation in the SORT tab

On the session history screen (path: Session menu> Session / Sort / Undo history), after selecting the session identifier - SID in the filter, the SORT tab displayed an incorrect view without information about the SORT space used by the session. The problem has been corrected.

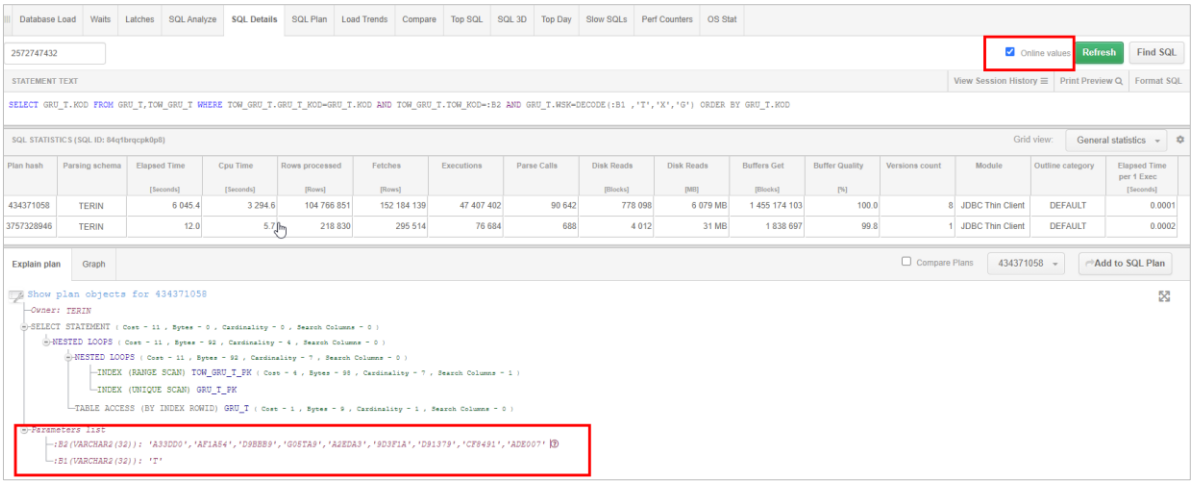
Additional information about the columns in the index

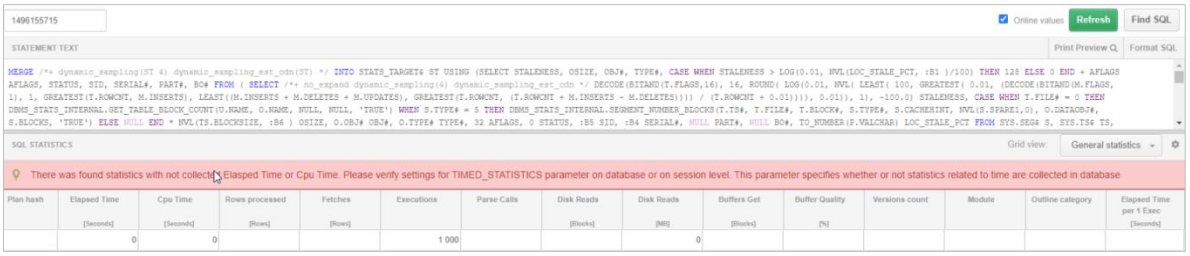
Information about the details of the columns included in the index has been added to the Show Plan Objects screen for index objects. Additional information such as "Unique value" or "Density" will help verify that the columns are correctly ordered in the index.



Presentation of the BINDs

In the SQL Details tab, to verify the parameters with which the query is triggered, display the query with the Online value option. In this case, for a given query plan (if this information is in the database), information will be presented in the Explain Plan tab. The application will present up to 10 values of each parameter.
It should be remembered that if the query is executed simultaneously from many sessions, each of them may have a different date formatting set.



SQL Details

In some customers monitoring the Oracle database, the information about the query did not have calculated basic performance statistics such as Elapsed Time or CPU Time. This is usually because the TIMED_STATISTICS parameter is set to "FALSE" at the database level. A message has been added to the SQL Details page to inform you about such an event.