DBPLUS
Performance Monitor for SQL Server
description of changes in version 2020.2

Table of Contents

Below is a list of changes to the DBPLUS Performance Monitor system for monitoring Microsoft SQL Server instances.

New in version 2020.2

1.1   *Shared Dashboard*

The new dashboard page allows the User to view all databases from every version of DBPLUS application (Oracle, SQL Server, and PostgreSQL) at the same time. The current release will include a version of Dashboard with a grid view. The Dashboard will be expanded with a view with online charts in next release.

Dashboard presentation
The Dashboard page is divided into areas:
- Information bar,
- Summary area,
- Instance area,
- Instance details.
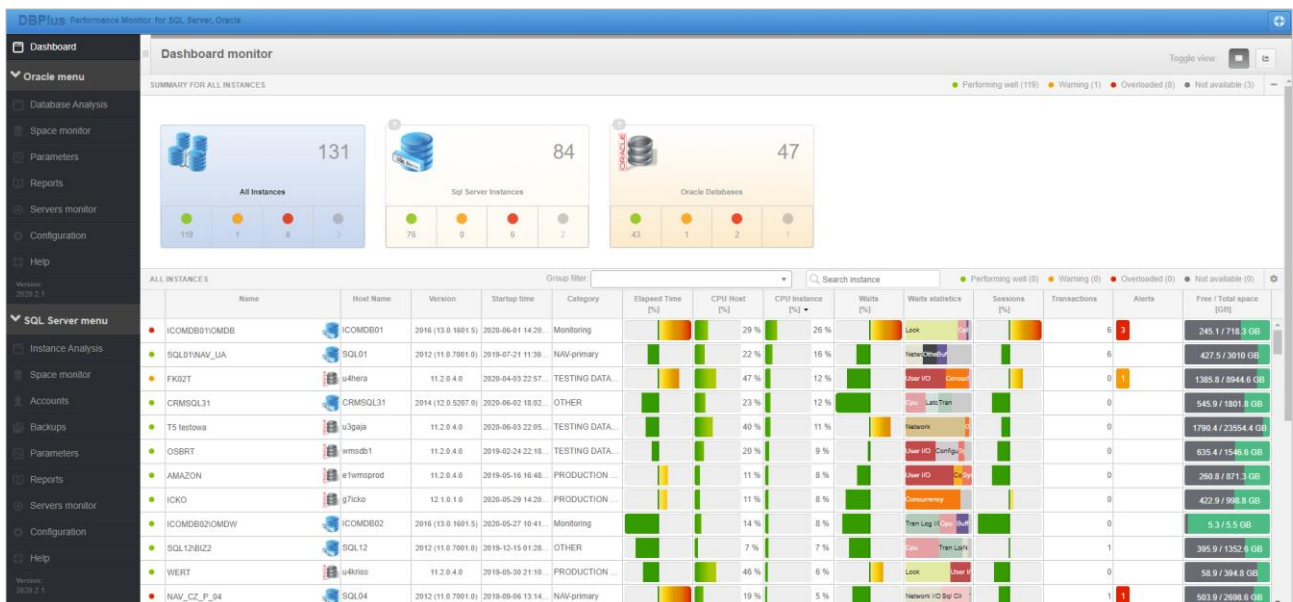
Information bar

In this part of the page, the User has the option of switching views between the old and the new version of the Dashboard page using the **Togle view** button*.*

Summary area

This contains information about connected versions of the DBPLUS application. The summary area contains aggregated information about monitored databases available on a common page. Each tile presents databases whose data is stored in separate database repositories. The User can present all databases together (All Instances) as well as each of the platforms separately. To change the view, click on the individual tile.

The tiles, apart from the platform type and name, present aggregate information on the status of monitored database instances.

Instance area

This area contains basic information about monitored databases. The view can be filtered using previously assigned groups to each of the databases - *Group filter*, as well as by enter the database name in the *Search instance* field.

Basic data on databases contain information about:

- Database status - the value is calculated based on performance indicators and alerts,
- Name – SQL instance name,
- Host Name - server name,
- Version – SQL instance version,
- Startup time – the date the database was last restarted,
- Category – categories assigned by the User in the DBPLUS application,
- Elapsed Time [%] – duration of queries based on the database in relation to the trend calculated for the last 30 days,
- CPU Host [%] – percentage of CPU utilization on the server,
- CPU [%] – percentage of CPU utilization by the database on the server,
- Waits [%] – percentage of all waits in relation to the historical trend,
- Waits statistics – ratio of top 3 statistics currently on the SQL instance,
- Sessions [%] – the number of active sessions in relation to the historical trend,
- Transactions – number of active transactions on the database,
- Alerts – alerts on the given instance in the last 2 hours,
- Free/Total space [GB] – ratio of free space to total database space.

Instance details

This area contains data on the most important performance statistics for the monitored database. If the User click on individual elements at the level of the instance area, they will receive detailed information about the given statistics at the level of instance details. For example, if User indicate a column with alerts, the user will receive detailed information about the type of alert, class, time of occurrence and information about possible next steps.

A new Dashboard page has been introduced in the latest version of the application. After enter the link, User will see the previous version of Dashboard. To go to Dashboard, click the *New dashboard* button. The new dashboard is visible at the new address:
http://computer_name/DPM/dashboard-main.aspx
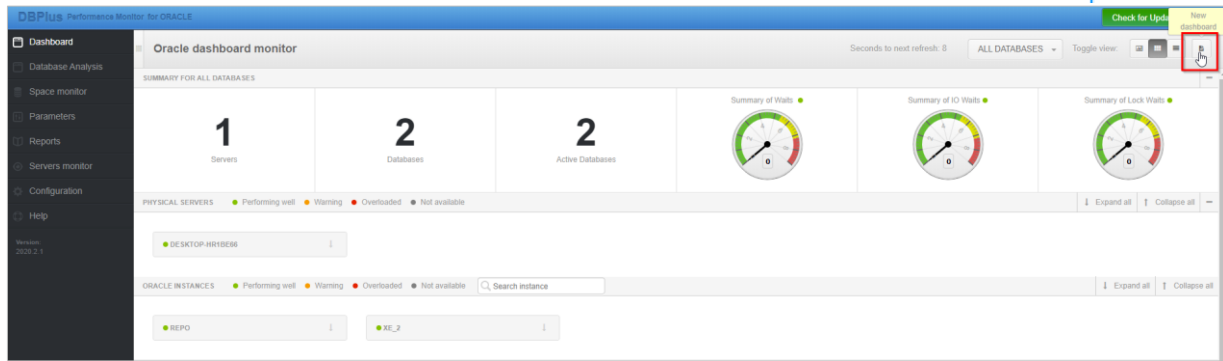
Dashboard Configuration

New dashboard page visible since 2020.2 and higher. To use the common dashboard page, each version of the DBPLUS application (for Oracle, SQL Server and PostgreSQL) that the User wants to see on the Dashboard must have a minimum version of 2020.2.

After completing the update process, the program automatically searches for the remaining versions of the application installed on the given application server. In case they meet the connection conditions they will be attached to the common Dashboard. Shared Dashboard is also possible when applications are installed on different application servers.

Common Dashboard configuration is available from the **Dbplus Configuration Wizard - Oracle** available in the Start menu. After starting the program, go to the **Application Settings** menu and then select the **Configure dashboard** option.
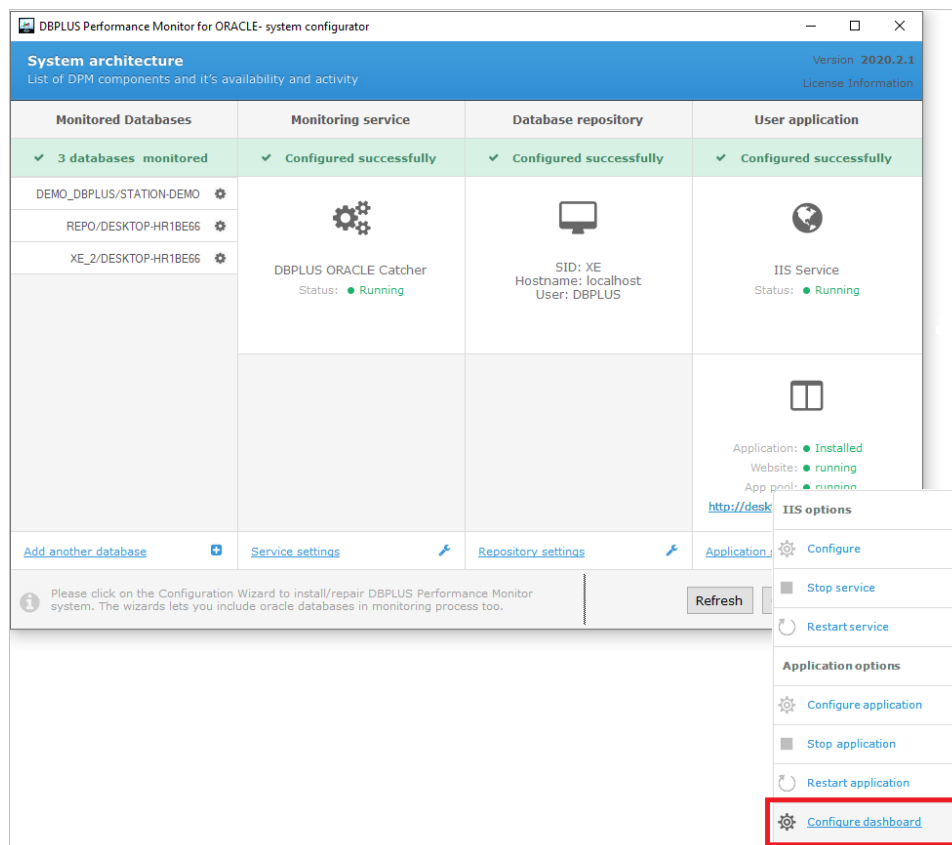
After enter the Dashboard configuration, the User can change the settings of current applications by click the [cog] button, remove previously added applications or add new applications to the common Dashboard.

To add a new application, enter the address in the *Url address* field. The address should always be entered in the format depending on the platform:

- http://server_name/DPMOracle/ (for the Oracle platform),
- http://server_name/DPM/ (for the SQL Server platform),
- http://server_name/DPMPostgres/ (for the PostgreSQL platform).

Then click the [Check] button, to verify the connection between the application servers. After successful verification, it is possible to set whether the newly added application should be part of the common Dashboard or we want it to be displayed separately. To do this, select the appropriate option in the *Dashboard Mode* field (Integrated - shared, Standalone - separate).

The User can also change the name that will be presented on the Dashboard main page, as well as in the menu on the left. To do this, simply enter the appropriate name in the *Tool name* and *Menu section label* fields*.*

1.2 *Query Object Explorer – query analysis*

In the latest version we have introduced the ability to analyze query objects - **Object Explorer**. The functionality allows to analyze in detail the objects that make up a given query, which means it speeds up performance analysis, e.g. whether the optimal index is used in the query.

Object Explorer is available from the level of query details (Show Plan Object in the SQL Details tab). To start the query explorer, first check whether the query can be optimized by click on the [Parse SQL Query] button. The analysis is not possible for queries that contain system objects or temporary objects. The current version does not support queries that use the MERGE command (support will be added in next releases).

After checking the query, go to the explorer by click [Object Explorer]. The page displays the formatted content of the query (SQL TEXT - window on the left), objects included in the query (OBJECTS FROM QUERY) and details of the given object at the bottom of the page (COLUMNS FOR SELECTED …).

The object table contains information about tables and indexes. Additionally, for easier interpretation of the query structure, additional elements have been added, such as subquery (SUBQUERY) and WHERE clause (WHERE CLAUSE). If a specific query object is selected, the components involved in the query will be highlighted in the query text (green for the table or yellow for the index).

If User select a table in query objects (OBJECTS FROM QUERY), the indexes associated with the given table will be automatically displayed with an indication of which one was used in the analyzed query (the Used in Query column). In addition, the table below will display detailed information about the columns of the table with an indication of which of them participate in the query.

Object Name	Alias Name	Object Type	Object Owner	Index Owner	Index Name	Used In Query
DBPLUS_TAB9	T9	TABLE	DBPLUS	DBPLUS	DBPLUS_TAB4_SERVER_VAR9	☐
⊟ Q	Q	SUBQUERY		DBPLUS	DBPLUS_TAB4_SNAP_ID	☐
⊟ Q	Q	SUBQUERY		DBPLUS	DBPLUS_TAB4_SERVER_10_SNAP	☐
DBPLUS_TAB4	Q	TABLE	DBPLUS	DBPLUS	DBPLUS_TAB4_SERVER_9_SNAP	☐
				DBPLUS	DBPLUS_TAB4_SERVER_ID	☑

By selecting the index that belongs to the given table, the User will receive detailed information about the columns in the index. They will also be highlighted in the content of the query where the columns appear. By indicate the individual record in the table with columns (COLUMN IN INDEX), the places where the given record appears in the query will be highlighted.

A special Column Type column has been added to the table with columns. Indicates whether the given column comes directly from the selected object or is part of e.g. a view (VIEW).

There are three types of columns:

- DIRECT – means that the column is part of the selected object,
- COMPUTATIONAL – means that the column is additionally transformed, and the value is calculated,
- BASIC – indicates that the column is from another object but is also not transformed.

If the view (VIEW) was used in the query, the query structure contains subqueries (SUBQUERY), then a special row is added to the table with objects that allows to display objects included in the view or subquery. In this line it is possible to collapse or expand lines included in each object.

1.3 *Object Size explorer*

In the latest version we have added the function of collecting information about the size and the number of rows in the objects located in the monitored SQL instance. From now on it will be possible to verify the space taken by a given object in time.

Collecting information about the size of objects is a function activated on demand by the User (disabled by default). This function due to the large number of objects for which data have to be collected, can significantly affect the size of the DBPLUS repository database. Object size data is collected at two-hour intervals and saved to the repository database.

DBPLUS recommends enabling object collection only for databases on monitored SQL instances.

Configuration

To start collect data on the size of objects, go to the main Configuration menu and select the Settings submenu, then go to the Objects Size Settings tab.

The configuration is always completed for the selected SQL instance. The configuration consists in choosing from the list of SQL instances for which the User wants to monitor objects. In the next step, set the minimum size of the object that will be monitored. The default value of 10 MB means that information about objects (e.g. tables) larger than the specified size will be collected. The last configuration step is to select the database for which the User wants to monitor the size of the objects.

To add a database to the list, click the ⊞ (plus) button on the right side of the page. Then choose the databases from the list of available ones (Note: it is not possible to select system databases).

To delete a previously selected database, just click the (minus) ⊟ button and save the changes.

Presentation in the DBPLUS application
Data on the size of selected objects can be displayed at the level of details of the monitored SQL instance by selecting the Space monitor menu from the **Object Size** tab.

Two options for searching objects:
In the *Object Size Browser* tab it is possible to display information about all objects in selected databases.
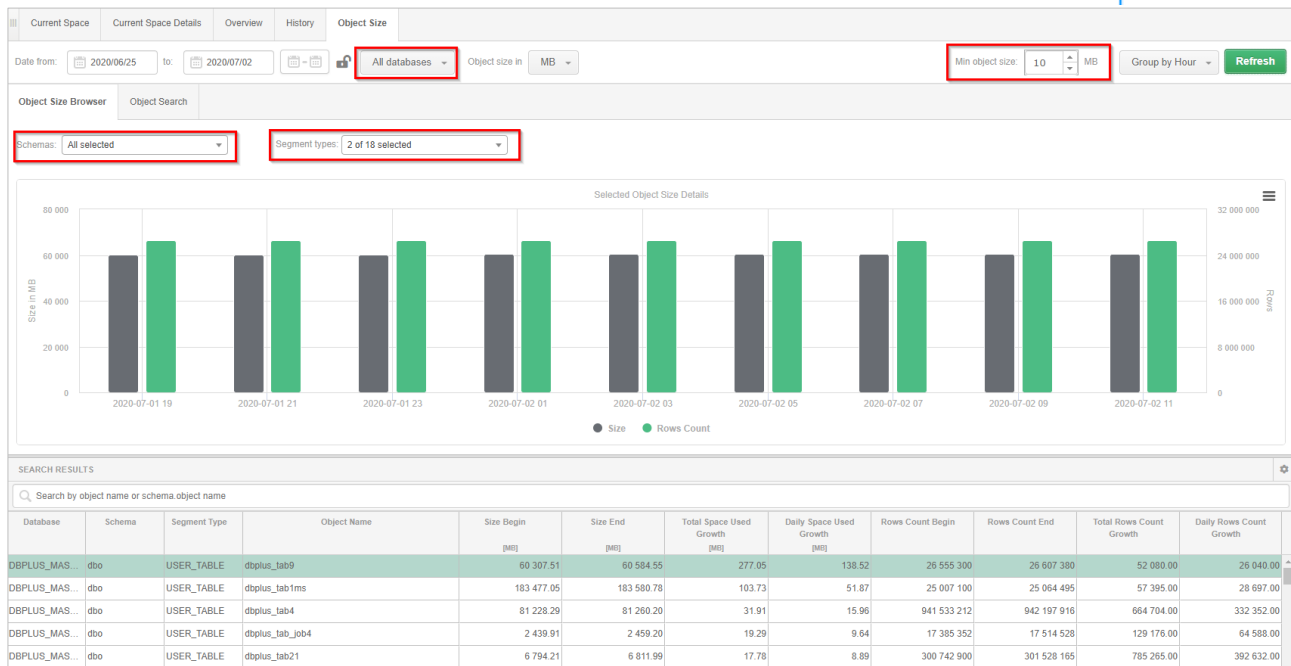
To display data, select which database to display objects for (default **All databases**). User can then limit the list to a specific scheme (All selected by default). In the next step, they can choose the type of segment they want to display from the list available in Segments types (by default, objects of the type USER_TABLE, USER_TABLE_INDEX are selected). Additionally, User can limit the list by objects larger than the indicated size by select a value in the Min object size field (given in MB units), the setting depends on what User set in the configuration at the Settings level. Data can be displayed for the indicated period and grouped by hour or day. The object's history is visible on the graph for the indicated row in the table.

The graph presents information about size (Size series) and number of rows (Rows Count series) for the selected object in the table below the graph. In addition, the table presents information on:
- Database – name of the database where the object is located,
- Schema – schema name,
- Segment Type – segment type assigned to the object,
- Object Name – object name,
- Size Begin – initial size for the first snap in the selected period,
- Size End – final size, for the last snap in the selected period,
- Total Space Used Growth – total size increase in the selected period,
- Daily Space Used Growth – daily average increase in object size over a selected period,
- Rows Count Begin – initial number of rows for the first snap in the selected period,
- Rows Count End – final number of rows for the last snap in the selected period,
- Total Rows Count Growth – total increase in the number of rows in the selected period,
- Daily Rows Count Growth – daily average increase in the number of rows in the selected period,

In the Object Search tab, it is possible to search for an object by name. To do this, enter in the search field the object_name or structure consisting of: schema.object_name (case insensitive). After typing, a list will be displayed that meets the conditions.
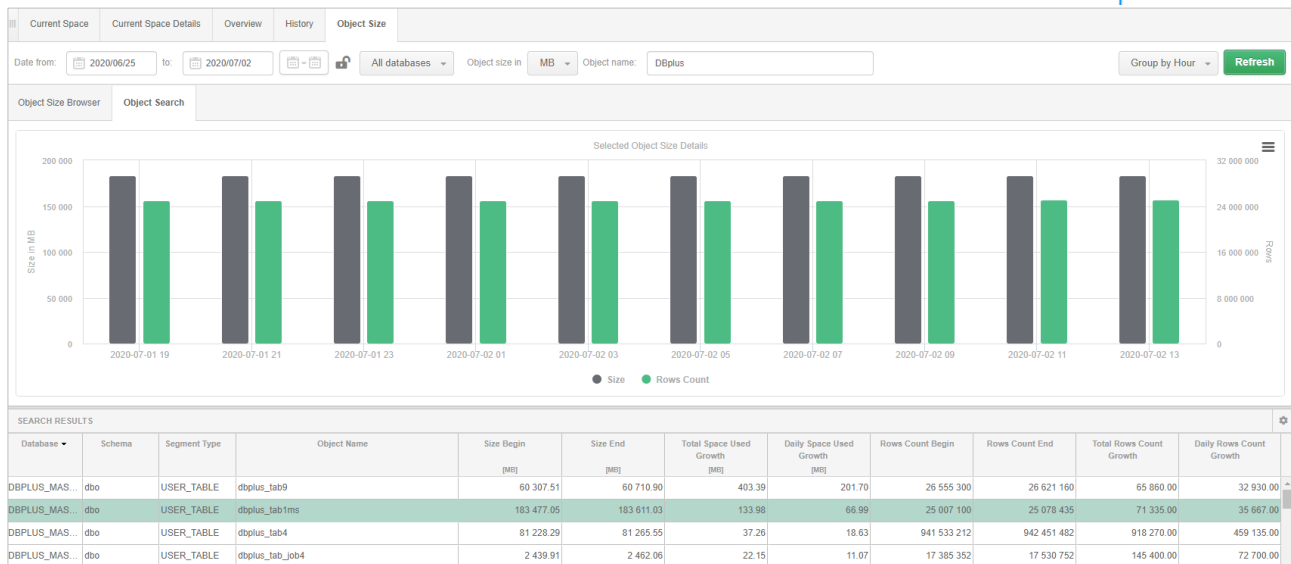
1.4 Detailed charts - Additional query analysis

In the new version, we have provided the option of in-depth query analysis. The functionality is available on the **SQL Details** page in the **Graph** tab after select the option: **Show detailed charts**. This function allows to compare any statistics of the analyzed query in combination with the performance statistics of the entire database on one page.

After selecting this option, the page shows a graph that shows statistics for a given query and graphs that shows overall performance data of the entire database, such as:

- SQL Instance Trend Statistics (Load trends)
- Performance Counter Statistics Overview
- OS Statistics
- I/O Statistics
- Memory Statistics

Data can be compared for a specific point in time and verified for all statistics on one page. By compiling many statistics in one place, the User can easily find the source of the problem that affects query performance.

In the example shown in the figure below, the change in query performance was caused by the occurrence of locks at the same time on the SQL instance, which is easy to verify by comparing the statistics for locks available in the SQL INSTANCE TREND STATISTICS chart with the duration of the given query.
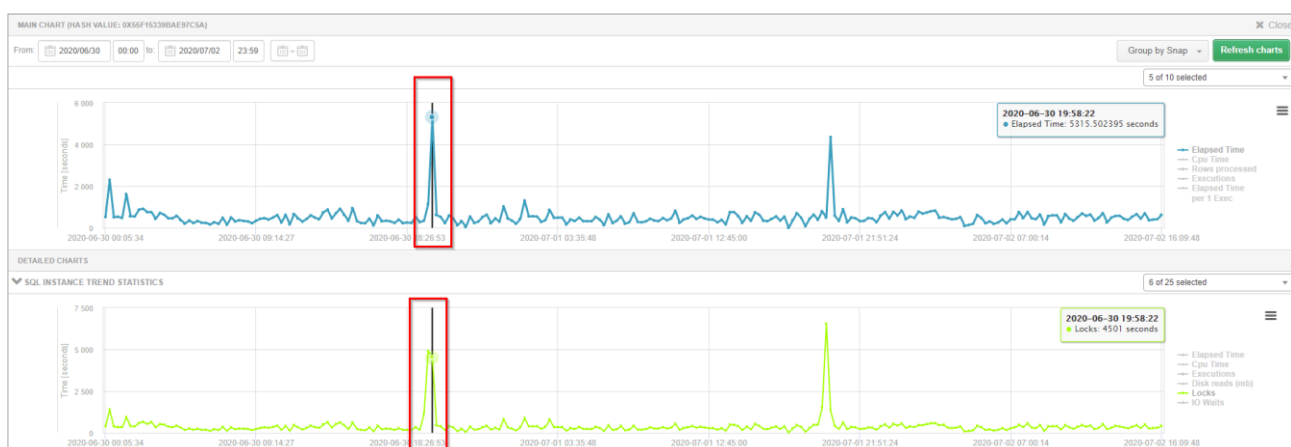
On the page, the User can add any series available for a given chart by click the dropdown button and selecting the given statistic from the list.

Charts can be freely zoomed as well as saved to a file, according to the logic available so far in the application.

1.5 *Forecasting changes in database size*

In the latest version of the application we have introduced the functionality of forecasting disk space usage in the database. This functionality will easily help each database administrator predict the size of the database and facilitate the Capacity Planning process.

To check the database capacity in the future, select **Space Monitor** from the side menu and then select **Show Storage Forecast** in the **History** tab.
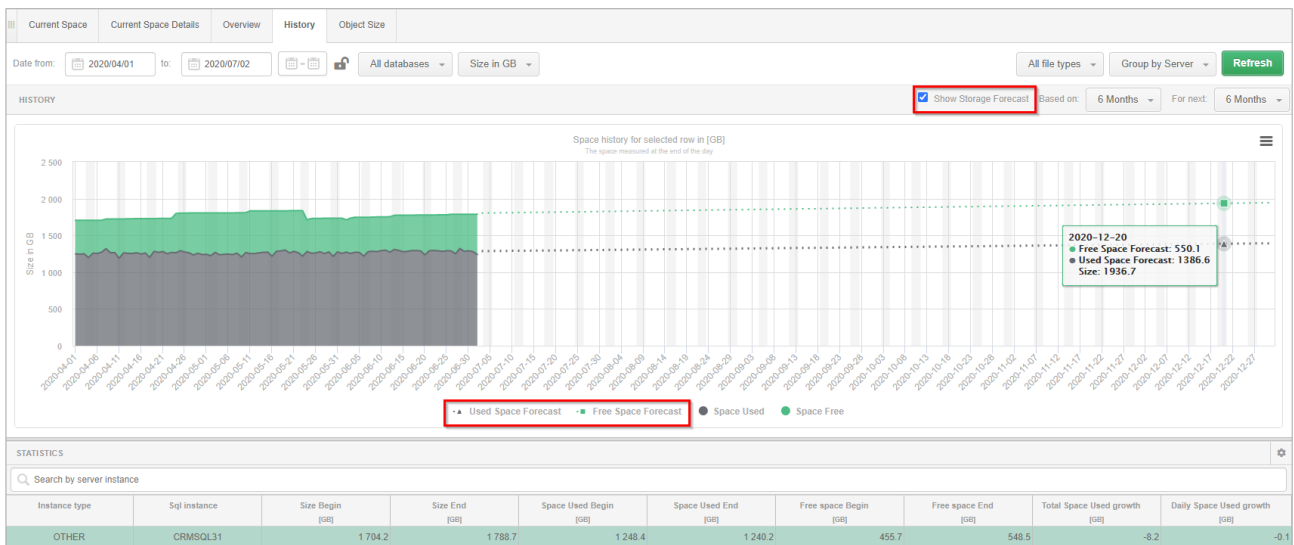
Forecasting database size is calculated based on data collected by DBPLUS applications and saved in the repository database. Forecasting can be done based on historical data from the last 3, 6 months as well as the whole year.

Similarly, User can set the forecast period for 3, 6 or 12 months in the future. After the forecast is made, the chart will display a chart with information about the future database size.

Checking the size in the future is possible for the entire SQL instance, individual databases or database files. To change the preview, simply select the appropriate grouping type and select Storage Forecast.
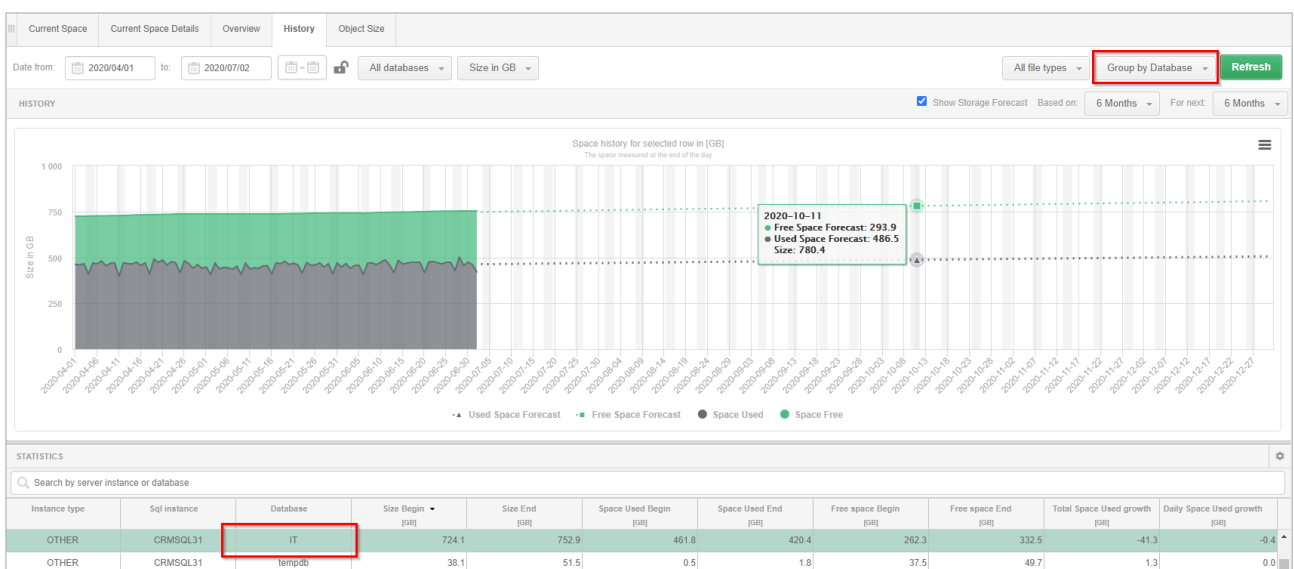
1.6   *Locks - improvements*

1.6.1   Unification of session information

In the new version of the application we have unified information about the blocking and blocked sessions available for each version of the DBPLUS application.

In the latest version, information about the blocking and blocked sessions will be presented in order:
SID >> **Session Status** >>**Wait Type** >> **Command** >>**Last Request Runtime** >>**Last Start Time** >> **User name** >> **Hostname** >>**Database** >> **Program**.

1.6.2   Session history - in-depth analysis

Another change on the lock page is the ability to quickly go to session history based on the session ID: SID. To do this, simply click the [+] button in the row with session details in the table with session details.
After User click the button, it will show that an additional menu with the option to go to session history for the selected session ID.

1.7   *Grid manager – data presentation management*

The latest release is implementing the next phase of data management presented in the tables on the pages of the DBPLUS application. In the current version, this functionality has been introduced on other pages in the application.
As a reminder, the User can change tables for pages on each column:
- The order of displayed columns,
- Visibility of columns,
- Change the format,
- Change of precision,
- Change of width.

Additionally, it is now possible to hide the Summary row on each page, using the settings available after pressing the [cog] button.

Database	Query text	Query Hash	Plan Hash	Use plan guide	Elapsed Time [Seconds]	Cpu Time [Seconds]	Io, Wait Time [Seconds]	Time per 1 exec [Seconds]	Executions	Disk reads [Blocks]	Buffer gets [Blocks]	Buffer writes [Blocks]	Rows processed
IT	INSERT INTO CRM.Zest_415_Sredni...	0x706CFAC84...	0xC6BE73...	☐	3 869.50	12 682.98	0	1 289.8320	3	1 198 854	931 089 575	111	7 108
IT	insert into #sprzedaz (sprzedaz, spolk...	0xCA9F87A56...	0x7650279...	☐	3 195.40	11 208.78	0	0.6612	4 833	32 137	4 461 880 921	28	577 078
IT	insert into #sprzedaz (sprzedaz, spolk...	0xCA9F87A56...	0x5D66116...	☐	15 571.13	9 365.26	6 205.87	18.8970	824	4 481 493	792 693 173	272	41 896
IT	INSERT INTO CRM.promocja_sprz_t...	0x047D2460E2...	0x7F1185C...	☐	4 510.40	2 853.56	1 656.84	322.1716	14	2 509 490	561 673 543	323 542	12 285 788
IT	INSERT INTO CRM.tel_do_exp (KH_...	0xBF930A5D3...	0x57E516F...	☐	2 409.04	2 222.49	186.55	344.1485	7	3 885	94 951 671	16 531	36 043
IT	UPDATE InterCars_MSCRM.dbo.ic_z...	0x7DDA3D168...	0x00C910C...	☐	2 737.99	2 162.64	575.35	547.5988	5	55 042 645	355 751 041	26 822 958	13 259 755
IT	INSERT INTO #sprzedaz (msc_id, pl...	0x13A82326A0...	0xCF01E71...	☐	430.12	1 614.76	0	0.3083	1 395	46 569	313 276 420	58	21 583
IT	CREATE NONCLUSTERED INDEX I...	0x747F394100...	0xFA3FF75F	☐	400.37	1 450.36	0	400.3718	1	3 733 943	6 827 179	1 187 996	0

1.8 *General improvements*

1.8.1 Security – database and functional profiles

To provide easier access to statistics of monitored SQL instances in the DBPLUS application, we have improved the process of assigning access profiles to users / user groups. In the latest version, it is possible to create a separate profile that gives access only to specific SQL instances available in the monitoring, and User can separately grant permissions to the functional part of the application (access to pages and functionality).

If User wants to create separately profiles that give access only to SQL instances, all they need to do is create a profile and do not grant access at the function level (**Functions rights** tab), do not select any access option. Similarly, if User wants to create a profile that contains only access to application pages, they should indicate which functionalities the User should have access to and not grant privileges at the SQL Instance level (**Instances access** tab).
When profiles are created separately for each area, remember that the user for whom you grant permissions has access to both the functions of the DBPLUS application and the SQL instance.

Of course, if User create a shared access profile with the rights to functions and databases, the function remains unchanged and is still available.

1.8.2 Index fragmentation stats

In the latest version of the application we have added information on index fragmentation. The data is available in the query details on the ***Show Plan Objects*** page. Information is available after selecting the ***Load fragmentation info*** checkbox. After loading the data, information about fragmentation is available in the statistics in the ***Properties*** tab.

1.8.3 Keep selection – save selected dates

In the new version of the application we have changed the location of the function that remembers the selected date range for which the User performs the analysis. The functionality is especially useful when User analyzes a problem that has occurred in the past, by remembering the settings, individual pages in the application will always be opened with the selected date range. To save the settings, click the padlock icon. Closed icon means that dates will be remembered on application pages.
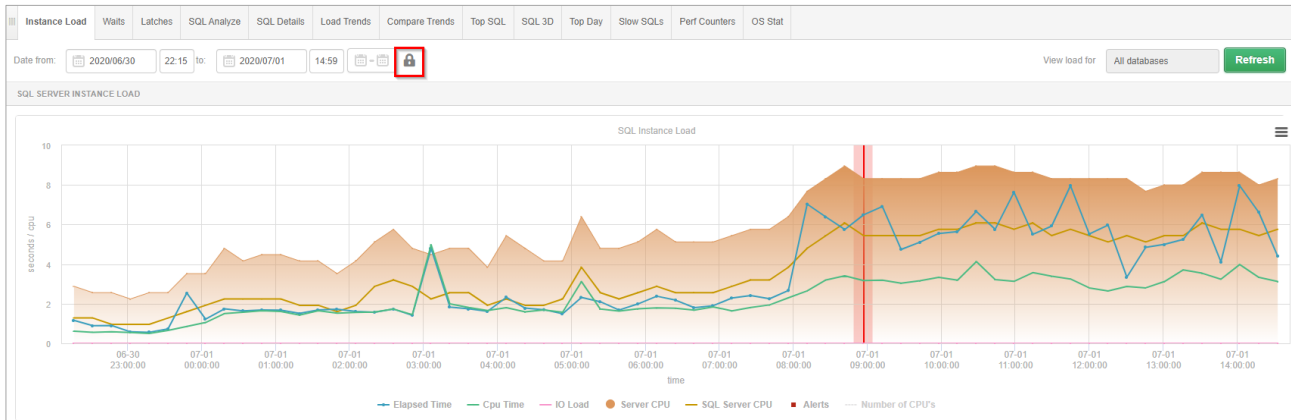
If User wants to return to the standard settings, just click the padlock icon again to turn off date storage.

1.8.4 Small fixes and improvements

1.8.4.1 Perf Counters - improved high value of the Compiled Batches ratio /% parameter

In the latest version of the application, we have corrected the problem related to the high level of Perf Counters Compiled Batches ratio /%.
Counters to calculate the Compiled Batches ratio:
· Batches request
· Sql Compilation
· Sql Re-Compilations
The analysis shows that when Re-compilation occurs, SQL also counts the event in the SQL Compilation and SQL Re-Compilations counter (i.e. counts twice). If the number of recompilations is large, then the sum of the compilations and recompilations exceeds the number of batches and hence we get a value above 100%.
In the latest version, the problem of exceeding the value above 100% should no longer occur.

1.8.4.2 Improved performance of I / O Stats page

In the latest version of the application we have corrected problems related to the I / O Stats page. In a few cases, after entering the pages, an error message related to exceeding the waiting time was displayed. The problem was related to the change in the execution plan for the query retrieving data from the repository. The problem has been corrected in the latest version.

1.8.4.3 The series order in the SQL Details chart has been improved

In the SQL Details tab, we have improved the order of the series on the graph that shows execution plans. After the changes, the order of the plans depends on the size of the statistics for the query plan.
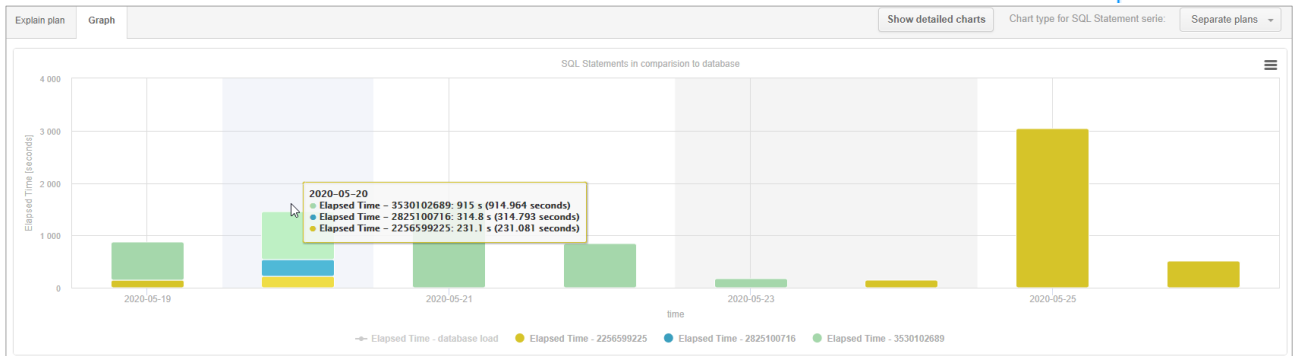
1.8.5 Check for update – information about the new version of the application

In the latest version of the application we have modified the presentation of information about new versions of the application. Information is available on the "old" version of the Dashboard screen. After verifying the availability of a newer version of the application, just click the [**Check for Updates**] button.