

**DBPLUS Performance Monitor for**  
**Microsoft SQL Server**  
**description of changes in version 2019.1**

**Date: March 28<sup>th</sup>, 2019**

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Below we present a list of changes in the DBPLUS Performance Monitor application for monitoring Microsoft SQL Server instances.

## 1 New in 2019.1 version

### 1.1 Performance statistics browser - Perf Counters

In the new version of the application, the management of performance indicators available in the Perf Counters tab has been modified. A number of improvements have been added, i.a.:

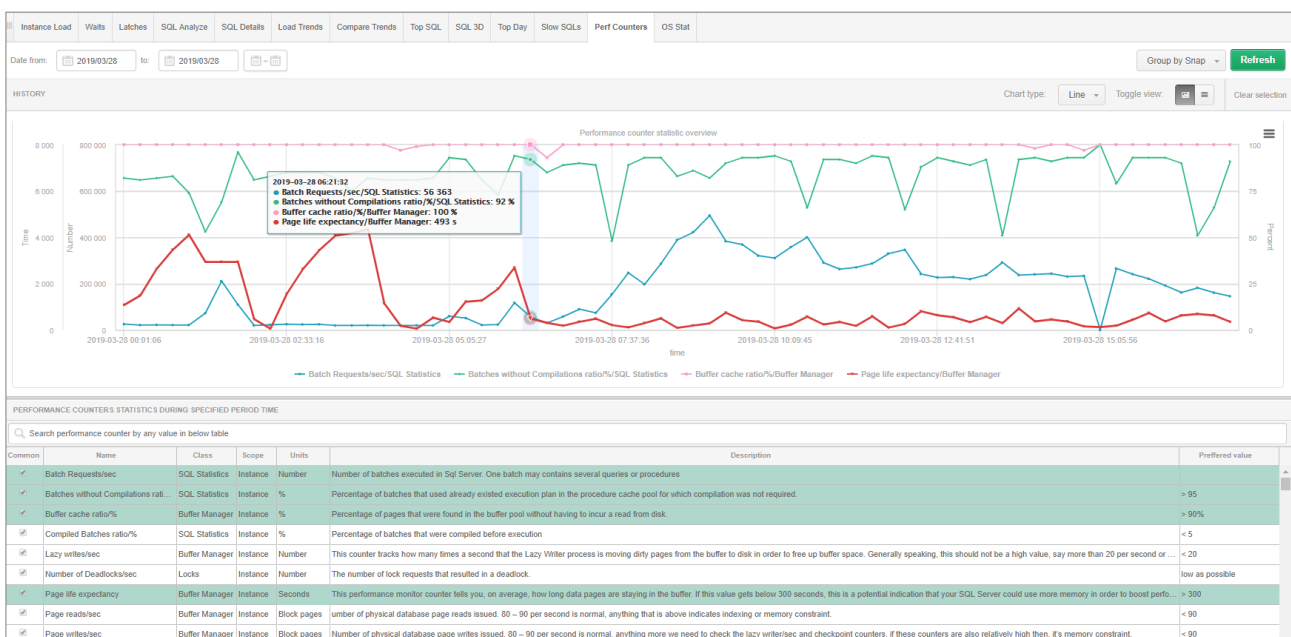
**Collect performance statistics after a day.** Until now, performance statistics for each parameter have been collected after the snap and stored for a maximum 7 days period. After the change, detailed statistics (15 minutes) are available so far for a period of 7 days. After this period, historical data is available after a day.

**Add new percentage statistics** calculated based of already defined counters. The new counters: Buffer cache ratio, Plan cache ratio, Compiled Batches ratio and Batches without Compilations ratio.

In the table, **new columns were added**: the most searched statistics (Common column), add a description of the indicators placed in the table (Description column). For some performance indicators, a description that contains the preferred values has been added (Preferred value column).

**The process of storing statistics** has been improved. After the change, the data will no longer generate as much space as before, which means that the Repository DBPLUS database will be reduced.

**A new NUMA performance indicator** has been added. The statistics are presented for each socket per processor. Modern processors have many cores per processor slot. Each socket is usually represented as a single NUMA node. The new version presents statistics for NUMA nodes.



## 1.2 Information on scheduled work and scheduled monitoring shutdowns

In the new version of the application, a function that allows to disable monitoring for a given period has been added. Turn off monitoring is available in the main menu in the Configuration> Outages settings tab.

After enter the tab, the user can view the information about scheduled shutdowns of the monitoring of the DBPLUS Performance Monitor application. On the website, only the exclusions for the current day as well as those planned in the future are visible by default. Information is available for all SQL instances. To add a new entry, click the **[Add new outage]** button.

Scheduled outages

Date from: 

2019/03/29

 to: 

Filter by instance

All instances

Refresh

INSTANCES OUTAGES SCHEDULE

Add new outage

Instance	Enabled	Period	Duration in days	Outage days	Outage hours	Reason
WIN-PVM04LTCT8A\INSTANCJA_2012_2	<input checked="" type="checkbox"/>	Outage from 2019-03-28		Everyday	Whole day	Monitoring outage in March

After click, the user can choose which instance turn off, and then can choose type of shutdown:

- one-time or recurrent,
- one or many days,
- occurs on a specific day of the week.

After select dates, user can add information about the outage reason the monitoring (it will be visible in the graphs when monitoring is interrupted). After correctly entered configuration, the new entry will be visible in the table. It must be remembered that the information about the shutdown will appear on the chart when the new / next snap is generated.

OUTAGE DEFINITION

Instance

WIN-PVM04LTCT8A\SQLEXPRESS2012

Enabled

☒

Period setting

Use begin date

☒ 2019/03/29

Use end date

☒ 2019/03/31

Days pattern and hours range

Outage day(s)

☒ Mon ☒ Tue ☒ Wed ☒ Thu ☒ Fri ☒ Sat ☒ Sun

Use range by hours for specified day(s)

☒ 10:00 - 23:59

Outage reason and description

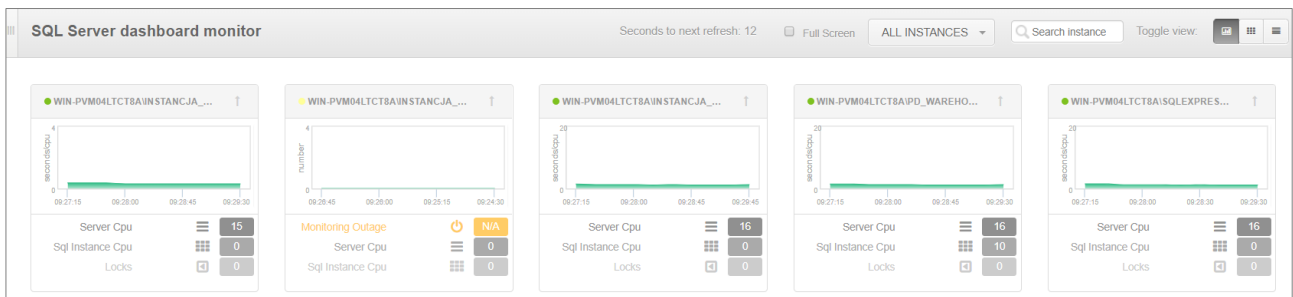
Scheduled works - Release 2019.3

OK

Cancel

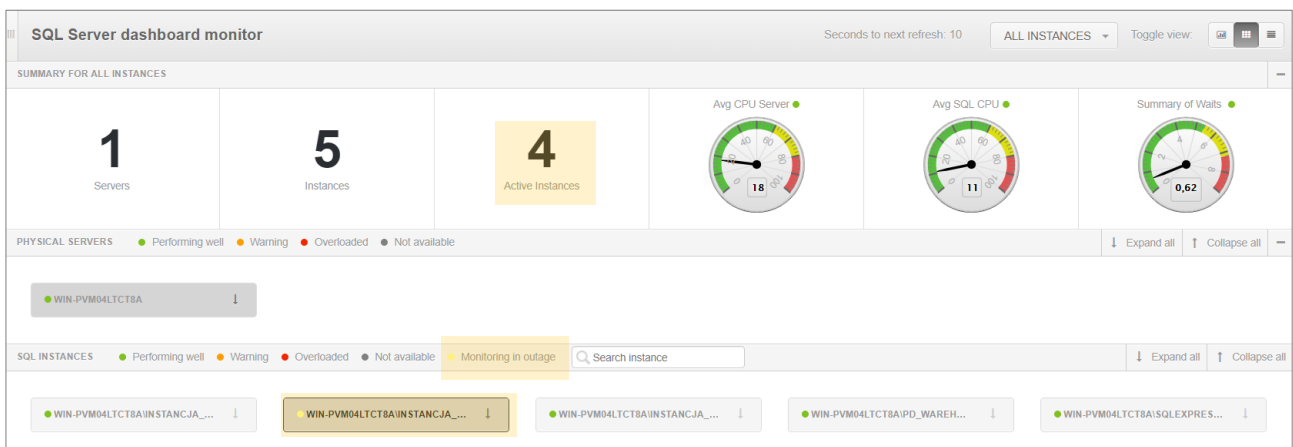
Information about turn off monitoring is visible on the Dashboard screen:

- Television mode - a yellow mark next to the database and a description of "Monitoring Outage"



### Icons view

In this view, the instance is also marked in yellow, which means a outage in monitoring. An instance where monitoring has been disabled is not included in the number of active instances.



### Grid view

SQL Server dashboard monitor

Seconds to next refresh: 8

ALL INSTANCES

Toggle view

SUMMARY FOR ALL INSTANCES

1 Servers

5 Instances

4 Active Instances

Avg CPU Server

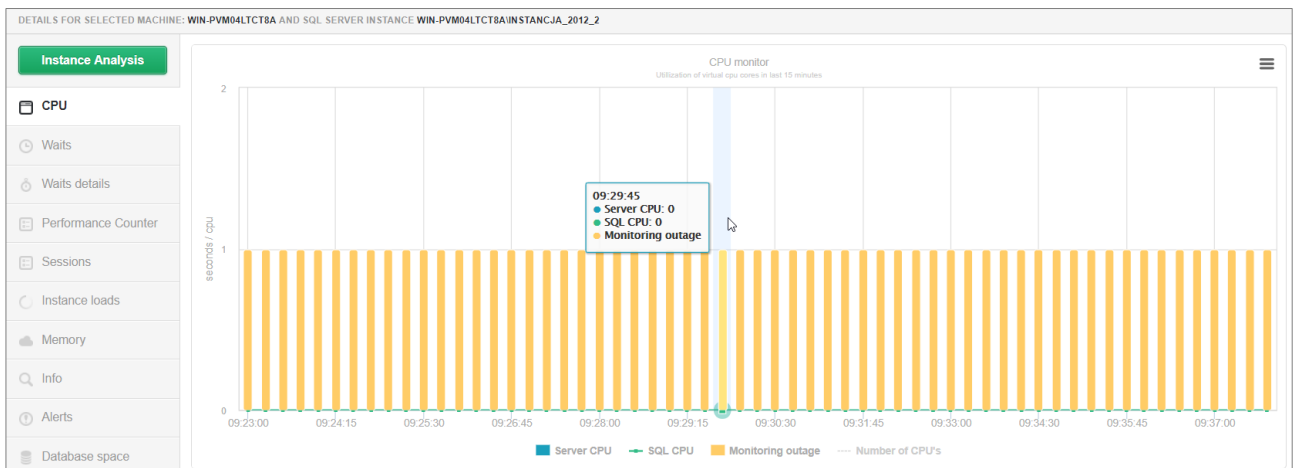
Avg SQL CPU

Summary of Waits

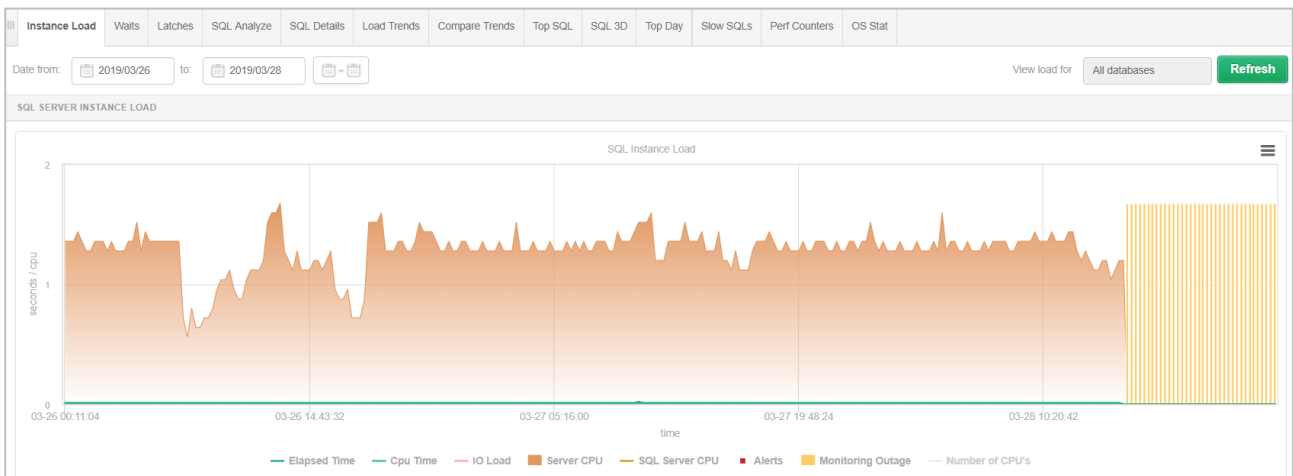
SQL INSTANCES

Server Type	Machine Name	Sql Instance Name	Active	CPU Server [%]	CPU SQL [%]	Waits [s/s]	Locks [s/s]	Alerts	Sessions	Transactions	Total space [GB]
NOT SPECIFIED	WIN-PVM04LTC...	WIN-PVM04LCTC8A\INSTANCJA_2012_2		15	0	0.00	0.00	0	0	0	0
PRODUCTION ...	WIN-PVM04LTC...	WIN-PVM04LCTC8A\IPD_WAREHOUSE	✓	15	9	0.00	0.00	0	1	0	25.7
NOT SPECIFIED	WIN-PVM04LTC...	WIN-PVM04LCTC8A\INSTANCJA_2014	✓	15	0	0.00	0.00	0	0	0	10.9
NOT SPECIFIED	WIN-PVM04LTC...	WIN-PVM04LCTC8A\INSTANCJA_2005_2	✓	15	0	0.00	0.00	0	0	0	0
PRODUCTION ...	WIN-PVM04LTC...	WIN-PVM04LCTC8A\SQLXPRESS2012	✓	15	0	0.10	0.00	0	0	1	14.3

Information about turn off the monitoring is visible in the graph of the current CPU utilization for the given instance. It is in the yellow columns form and it is additionally included in the tooltip.



Information about outage is also visible on the Instance Load chart. In case the instance is excluded from monitoring, yellow columns appear in the graph. At the moment of disable, information about the statistics is not collected.

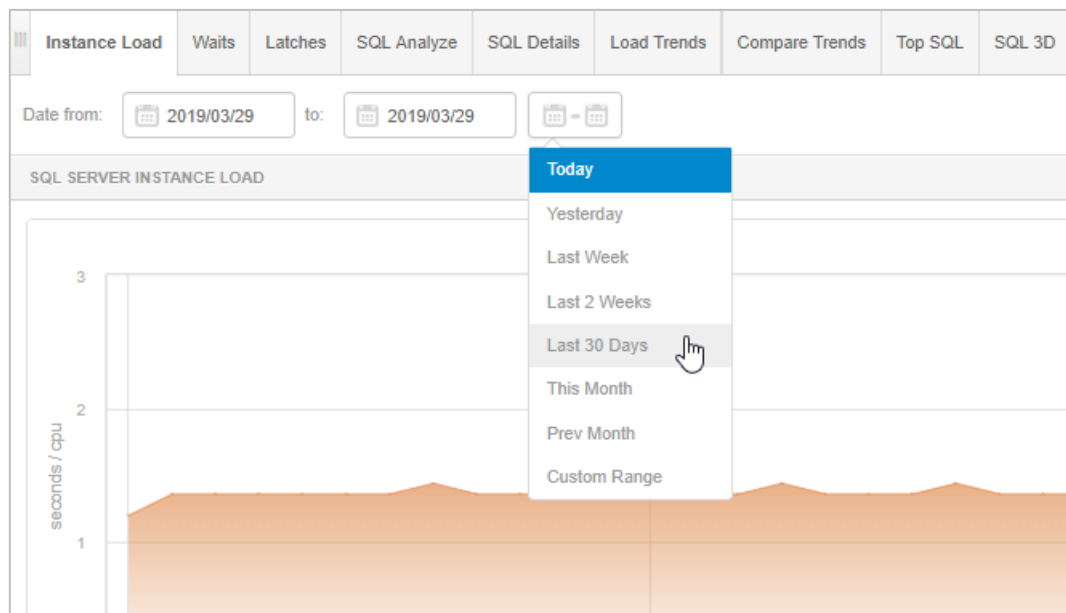


### 1.3 Quick dates selection from the calendar

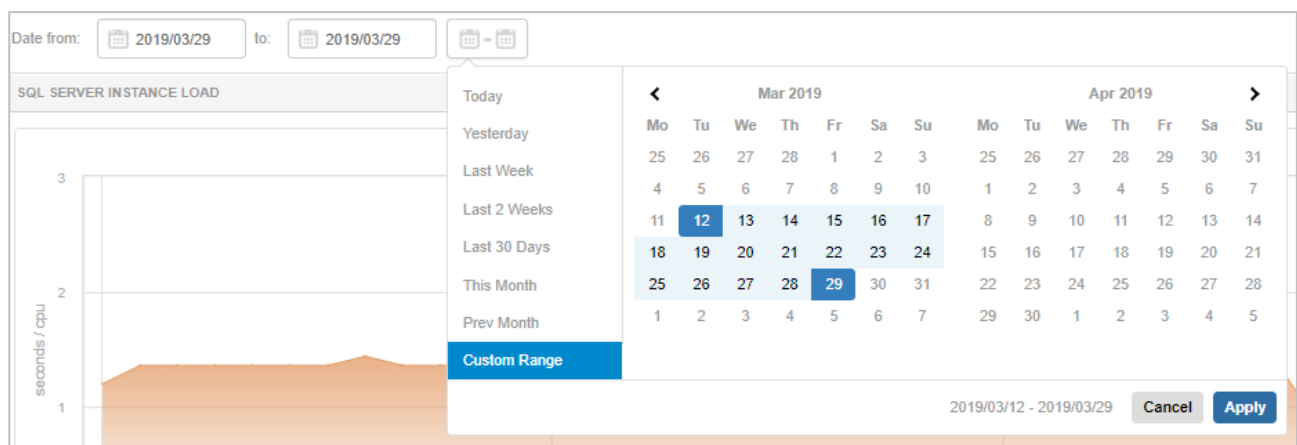
In the new version, we've added a new improvement on most main screens: quick date selection. After click the button user have few options to choose:

- Today,
- Yesterday
- Last Week,
- Last 2 Weeks,
- Last 30 days,
- This Month - the scope of the current month from 1 to the last day of the month,
- Prev Month - the scope of the previous month from 1 to the last day of the month,
- Custom Range – manually select a date range.

After select any range from the list, click the **[Refresh]** button to refresh the page. An example screen below:



To select a date range in the Custom Range, first select the start date, then choose the end date. Accept by click the **[Apply]** button.

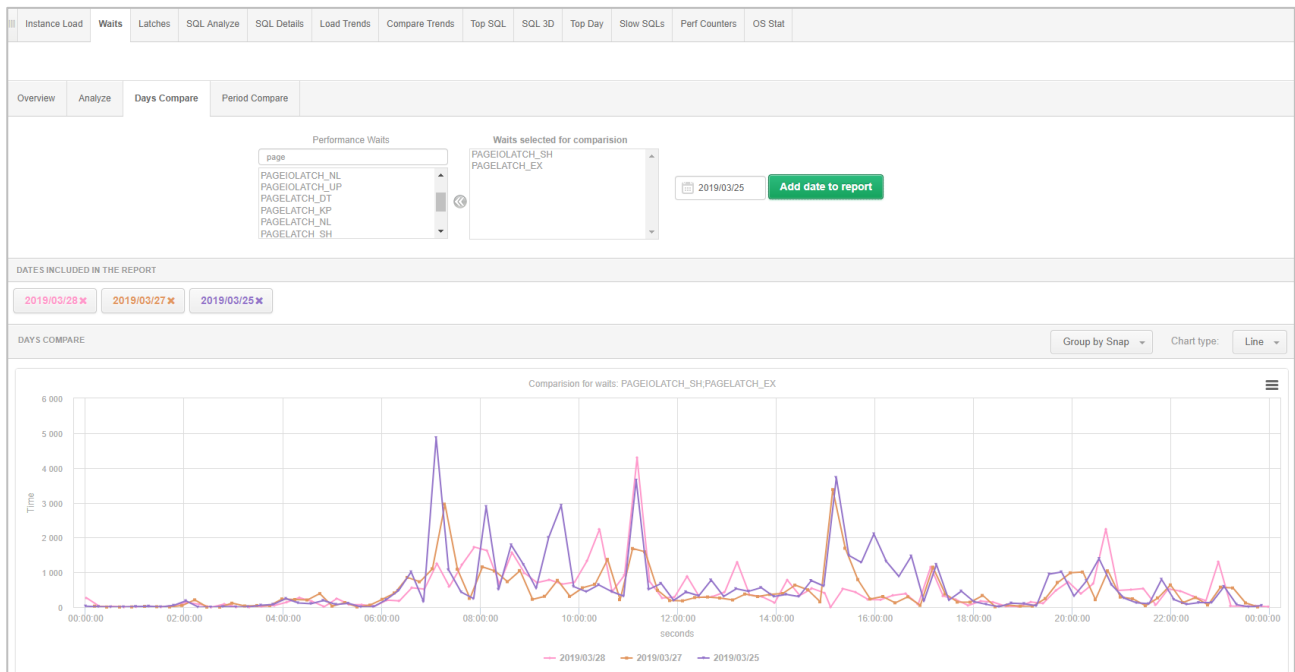


#### 1.4 Compare the wait level

In the new version of the application, we added the ability to compare the wait level in a given SQL instance. Compare is possible from the instance details in the Waits tab. Two modes are available:

- Days Compare
- Period Compare

To compare wait level, select the type of wait to be compared first (one or more types), then select specific days to compare (Days Compare) or whole period of days (Period Compare).



## 1.5 Improvements in session screens

### 1.5.1 Detection of blocked sessions (deadlock)

In the new version of the application, we added session detection functions searching for sessions stopped on **deadlock**. The information is visible on the Online session screen. If there are locks, the deadlock information will be visible in the *Blocking session* column.

Sessions

Tempdb usage sessions

Log usage sessions

Sessions history

Active sessions / Tempdb sessions / Log usage sessions history

☒

Active sessions

☒

Users only

Min elapsed time: 

0

sec. Sid:

All databases

Loginname:

Refresh

Show additional filters

SESSION LIST(LAST REFRESHED: 11:54:53)

Kill session

Logon time	Ses... Id	Query Hash	Login name	Status	Last request start time	Elapsed Time [Seconds]	Windows username	Host name	Program	Con... Info	Blocking session	Database	Wait	Wait time [Seconds]
2019-03-25 11:54:07	51	0x25D14D4E7...	MAQCH\ra...	running	2019-03-25...	0	radoslaw	MAQCH	DBPLUS P...		0	DBPLUS		0
2019-03-25 11:32:40	54	0xAE3D7FC2E...	MAQCH\ra...	running	2019-03-25...	1	radoslaw	MAQCH	Microsoft S...		57	DPD	LCK_M_U	0.56
2019-03-25 11:34:34	57	0xBCF787448...	MAQCH\ra...	running	2019-03-25...	21	radoslaw	MAQCH	Microsoft S...		54 (in deadlock)	DPD	LCK_M_U	20.46

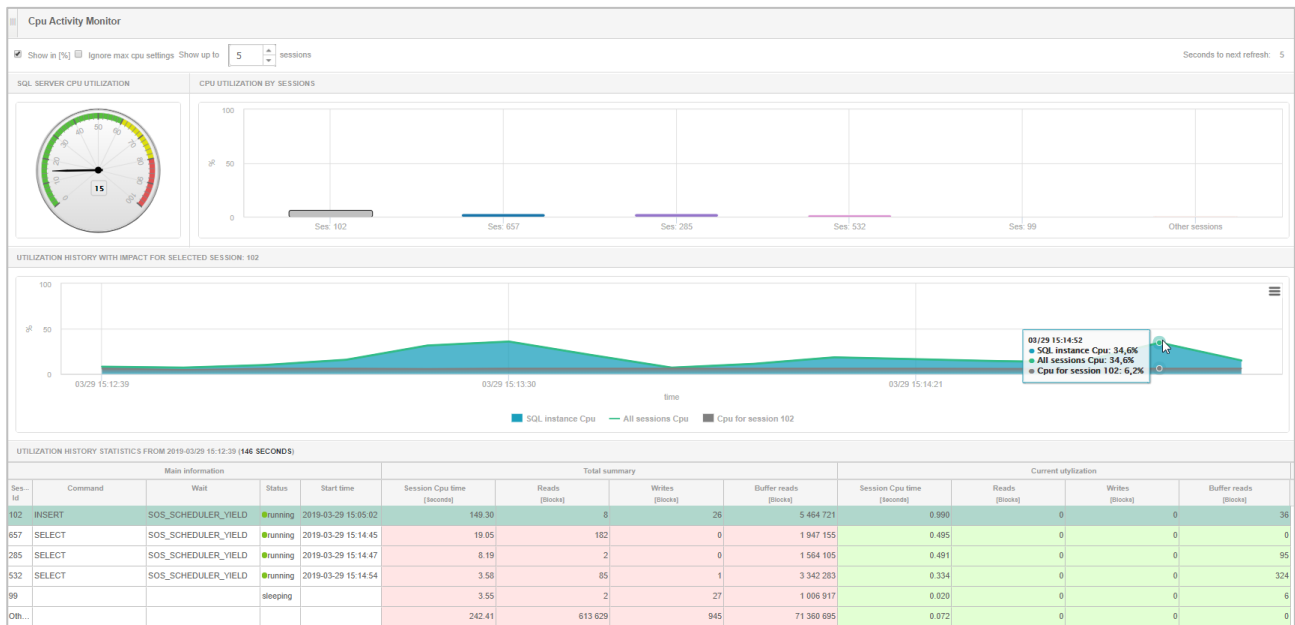
### 1.5.2 Online session monitor

In the new version of the application, the functionality of the online session monitor has been improved. The monitor provides information about the CPU utilization sessions. The monitor is refreshed automatically every 10 seconds. The monitor is activated only after enter the **CPU monitor** menu and closed after switch to the next tab.

in addition to the basic data about the user session, summary information is presented (Total summary) and for the last 10 seconds (Current utylization) about:

- Session CPU time - CPU utilization by a given session,
- Reads – number of read blocks,
- Writes – number of write blocks,
- Buffer reads – number of read blocks from buffer.





## 1.6 General Improvements

### 1.6.1 Improve the Plan Guide collection process

In the 2019.1 version, the process of collect and create change history for Plan Guide has been improved. Improvement consists in change the unique key to search changes made to the Plan Guide. The current key in the scenarios sometimes turned out to be insufficient. After the change, the problem has been removed and every change made to Plan Guide will be saved in history.

**Plan Guides Overview** Plan Guides History

Plan guides for: All databases Filter by Query Hash Include dropped plan guides Refresh

CURRENT PLAN GUIDES LIST

💡 If plan guide doesn't contain query hash information it could mean that query is executed very fast or plan guide is not used.

65546

Database	Plan Guide Id	Name	Create date	Last modify	Is Disa...	Statement text	Query Hash	Scope	Scope object name	Scope object type	Parameters	Hints	Is Dro...
NavRO_snapshot...	65546	DBPLUS_0x8F48...	2018-12-11 14:14:18	2019-03-24 07:46...	☐	SELECT TOP 1 N...	0xCF91E355C...	SQL			@0 nvarchar(10)...	OPTION(TABLE ...	☑
Navision RO	65546	DBPLUS_0x8F48...	2018-12-11 14:14:18	2018-12-11 14:14:18	☐	SELECT TOP 1 N...	0xCF91E355C...	SQL			@0 nvarchar(10)...	OPTION(TABLE ...	☐
NavRO_snapshot...	65546	DBPLUS_0x8F48...	2018-12-11 14:14:18	2019-03-23 13:40...	☐	SELECT TOP 1 N...	0xCF91E355C...	SQL			@0 nvarchar(10)...	OPTION(TABLE ...	☑

DETAILS FOR SELECTED PLAN GUIDE

SQL Text & Hints Changes history

Database	Plan Guide Id	Name	Change type	Create date	Modify date	Is Disa...	Statement text	Query Hash	Scope	Scope object name	Scope object type	Parameters	Hints
NavRO_snapsho...	65546	DBPLUS_0x8F4...	Delete	2018-12-11 14:14...	2019-03-23 13:4...	☐	SELECT TOP 1 ...	0xCF91E355C...	SQL			@0 nvarchar(10)...	OPTION(TABLE ...
NavRO_snapsho...	65546	DBPLUS_0x8F4...	Insert	2018-12-11 14:14...	2018-12-11 14:14...	☐	SELECT TOP 1 ...	0xCF91E355C...	SQL			@0 nvarchar(10)...	OPTION(TABLE ...

### 1.6.2 Summary statistics

In the latest version, summary of the data presented in the tables has been added. Summary is available for the module:

- Session (online session) – information about number of active sessions is visible

Sessions

Tempdb usage sessions

Log usage sessions

Sessions history

Active sessions / Tempdb sessions / Log usage sessions history

Active sessions

Users only

Min elapsed time:

0

sec.

Sid:

All databases

Loginname:

Refresh

Show additional filters

SESSION LIST(LAST REFRESHED: 16:27:09)

Kill session

Logon time	Ses... Id	Query Hash	Login name	Status	Last request start time	Elapsed Time [Seconds]	Windows username	Host name	Program	Context Info	Blocking session	Database	Wait	Wait time [Seconds]
2019-03-29 16:27:09	72	0x857CF2D59...	INTER\crm_isi...	running	2019-03-29 16:...	0	crm_isisinter	CRMIS32.w3w...	MSCRMw3wp		0	InterCars_MSC...		0
2019-03-29 15:53:10	150	0x713799DDC...	dbplus	running	2019-03-29 16:...	0	SQLMON	DBPLUS Perfo...			0	master		0
2019-03-29 16:27:09	260		INTER\crm_isi...	running	2019-03-29 16:...	0	crm_isisinter	CRMIS31.w3w...	MSCRMw3wp		0	InterCars_MSC...		0
2019-03-29 16:27:08	293	0x038B015C7...	INTER\crm_isi...	running	2019-03-29 16:...	1	crm_isisinter	CRMIS32.w3w...	MSCRMw3wp		0	InterCars_MSC...		0
Count sessions	7	-	-	-	-	-	-	-	-	-	-	-	-	-

SQL

Operation progress

Statistics

Waiting tasks

STATEMENT TEXT

Select convert(varchar(20),login\_time,120) as login\_time,s.session\_id as sid,s.session\_id, isnull(login\_name,' ') as login\_name,s.status, cast(s.context\_info as varchar(128)) as ci, convert(varchar(20),isnull(R.start\_time,S.last\_request\_start\_time),120) as last\_request\_start\_time, getdate() as last\_request\_current\_time, nt\_user\_name,host\_process\_id,isnull(host\_name,' ') as host\_name,isnull(program\_name,' ') as program\_name, query\_hash,

- SQL Details (query details) – the information is grouped into total (Total), medium (Avg), minimum (Min), maximum (Max) values.

To see the summary of statistics, select the new checkbox *Show Summary footer row*

Instance Load

Waits

Latches

SQL Analyze

SQL Details

Load Trends

Compare Trends

Top SQL

SQL 3D

Top Day

Slow SQLs

Perf Counters

OS Stat

0x42D6D97510DDCF15

From: 

2019/03/29

00:00

 to: 

2019/03/29

23:59

Group by plan

Group by Hour

Online values

Refresh

Find SQL

STATEMENT TEXT

SELECT [LocalizedLabelId] AS [localizedlabelid], [LocalizedLabelRowId] AS [localizedlabelrowid], [ComponentState] AS [componentstate], [SolutionId] AS [solutionid], [OverwriteTime] AS [overwritetime], [SupportingSolutionId] AS [supportingsolutionid], [LanguageId] AS [languageid], [ObjectId] AS [objectid], [ObjectColumnName] AS [objectcolumnname], [Label] AS [label], [LabelTypeCode] AS [labeltypecode], [IsManaged] AS [ismanaged], CONVERT(bigint, VersionNumber) AS [versionnumber] FROM [LocalizedLabelLogicalView] WHERE (LanguageId = @LanguageIdwhere0 AND OverwriteTime = @OverwriteTimewhere0 AND SolutionId < > @SolutionIdwhere0 AND ComponentState IN(@ComponentStatewhere0 , @ComponentStatewhere1))

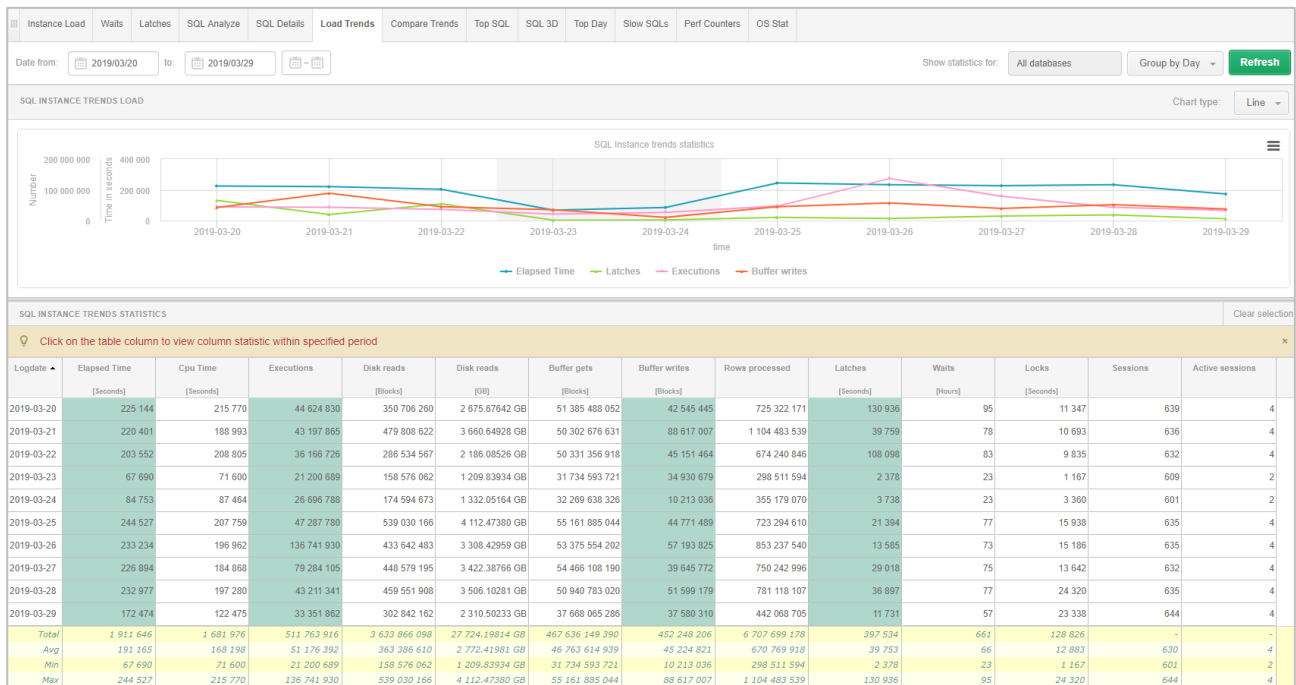
SQL STATISTICS

Show values per 1 executions

Show summary footer row

Date	Plan hash	Elapsed Time	Cpu Time	Rows processed	Executions	Disk Reads	Disk Reads	Buffers Get	Buffers Write	Buffer Quality	Elapsed Time per 1 Exec
		[Seconds]	[Seconds]			[Blocks]	[MB]	[Blocks]	[Blocks]	[%]	[Seconds]
2019-03-29 00	0xD8B9D3249...	28.5	1.1	586 459	16	7 923	62 MB	15 787	0	66.6	1.7786
2019-03-29 01	0xD8B9D3249...	17.1	0.6	331 152	6	442	3 MB	8 802	0	95.2	2.8518
2019-03-29 02	0xD8B9D3249...	5.8	0.2	110 384	2	461	4 MB	2 934	0	86.4	2.8863
2019-03-29 04	0xD8B9D3249...	16.9	0.6	286 626	8	12 162	95 MB	7 714	0	38.8	2.1077
2019-03-29 05	0xD8B9D3249...	50.6	1.8	905 005	22	11 831	92 MB	24 276	0	67.2	2.3009
Total	-	5 132.8	58.2	29 071 451	707	85 876	671 MB	808 454	0	-	-
Avg	-	320.8	3.6	1 816 966	44	5 367	42 MB	50 528	0	73.7	3.1557
Min	-	2.7	0.1	55 384	1	0	0	1 482	0	38.8	1.7786
Max	-	4 560.3	37.0	19 186 006	477	14 174	111 MB	527 336	0	100.0	9.5603

- Load Trends – the information is grouped into total (Total), medium (Avg), minimum (Min), maximum (Max) values.



When a single row is presented in the table, the summary will not be presented.

### 1.6.3 Ability to assign own name to the instance

In the latest version of the application, the option to set the instance name presented on the application pages has been added. The change can be set from the Configuration> Servers menu. User can change the names by selecting row in the list of SQL instance, displays the menu on right side. . The settings are:

- Default,
- Instance Name,
- Login@Instance Name,
- Own Name.

Instance Name format:

Enabled:

Default

Default

Connection Server Name

Instance Name

Login@Instance Name

Own Name

### 1.6.4 Improve the presentation of lock efficiency

In the new version of the application, the problem of longer loading of data on the online session screen has been corrected. The problem occurred for some versions of SQL Server and caused a change to the query plan that retrieves information about an online session. The problem has been improved and in the new version don't exist.

The problem with an error on the lock history screen has also been removed. In this case, the problem occurred at the blockade the session was open for a long time. The error message was displayed. The problem has been corrected in the latest version.

## 1.6.5 Change the way information about alerts is presented

We have modified the way of displaying information about alerts in the InstanceLoad tab. In some cases, when there were many different types of alerts in a given snap, the alert information presented below the graph displayed in an inconsistent format, which resulted in the extension of the grid. In the new version the view has been improved.

Sql Statements	Waits	Databases Load	Alerts
SNAPSHOT OF ALERTS GENERATED WITHIN 15 MINUTES AT 2019-03-30 04:04:08			
Reason description: Problem with Query CPU Time Increase cause query change plan			
Cpu Time	Alert Type: Sql Query, The measured statistic value is 8.1 times higher than allowed maximum , Statement query hash: 0xEB66BF21FD54606 +. Statistics: Cpu Time, Last value: 497.9 s, History value: 55.0 s , Faster plan found: 0x584864D61444B9AD , actual plan: 0x4E65010EDCEC4748. Statistic difference: 8.99 vs. 497.9 s		
Cpu Time	Alert Type: Load Trends, The measured statistic value is 12.1 times higher than average , Last value: 1324 s, Reference history value: 100.8 s		
Cpu Time per 1 exec	Alert Type: Sql Query, The measured statistic value is 53 % higher than allowed maximum , Statement query hash: 0xEB66BF21FD54606 +. Statistics: Cpu Time per 1 exec, Last value: 0.2139 s, History value: 0.1394 s , Faster plan found: 0x584864D61444B9AD , actual plan: 0x4E65010EDCEC4748. Statistic difference: 0.0050 vs. 0.2139 s		

## 1.6.6 Improving data loading on the SQL 3D screen

In the latest version of the application, the ergonomics of data presentation on the SQL 3D tab has been improved. The improvement consisted in changing the way of searching for queries in the repository database. After the changes, the data presented on the website is searched faster.

