

# DBPLUS Performance Monitor<sup>™</sup> for PostgreSQL<sup>®</sup>

User's Manual





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# 1 Introduction

# What is DBPLUS Performance Monitor?

**DBPLUS Performance Monitor**<sup>™</sup> tool is the software used for monitoring and analyzing the Oracle, MS SQL Server and PostreSQL.

Using DBPLUS Performance Monitor, you can:

- track trends of database server load and the individual components: Wait, I/O and other,
- identify performance issues of PostgreSQL databases,
- track trends of performance SQL queries,
- analyze data and present them in graphical form,
- watch in real time active user sessions,
- observe the status of full and incremental databases backups,
- troubleshoot a non-optimal SQL queries,
- report database problems

and many, many more...

Question:

# "Why do database work too slow in any specified period of time?"

will never be left without an answer!



# 1.1 DBPLUS Technical Support

Technical support provides the access to new software updates published 4 times a year as well as to engineers' - help in PostgreSQL database diagnosis (by using **DBPLUS Performance Monitor** software).

### 1.2 System architecture

The system is designed in client-server architecture and in the presented solution we can distinguish the following components:

- SQL Instances a list of SQL instance covered by the monitoring,
- Server program an application running as a windows service, which consists of a set of
  procedures performed on individual SQL Instances. The aim of the program is to run periodically
  procedures, which are responsible for collecting basic data about SQL servers' performance.
  According to the DBPLUS nomenclature, program is called DBPLUSPOSTGRESCATCHER
  and one-up cycle within the service DBPLUSPOSTGRESCATCHER is called "a snap".
- **Repository** selected SQL instances stores performance statistics of monitored SQL instances. Collected statistics are the result of the work of **DBPLUSCATCHER** service.
- Application this is a client of the system, which implements user interface which allows to implement functionality of the system, i.e. monitoring review, performance analysis, query execution statistics reports, the current sessions of database, chart of server load, etc. The application is made in web technology using IIS application server and it is accessible from a web browser.

DBPLUS Performance Monitor requires the installation and configuration of each of the elements to ensure full functionality of the solution. Below we present a general model of the system:

DBPLUS Performance Monitor for POS	TGRES - system configurator		- 🗆 × Version 2019.1.2		
List of DPM components and it's av					
Monitored Instances	Monitored Instances Monitoring service Database repository				
✓ 2 instances monitored	✓ Configured successfully ✓ Configured successfully		✓ Configured successfully		
Postgres 10/127.0.0.1			0		
Repository instance/127.0.0.1	Q;		Ø		
	DBPLUS Postgres Catcher Status: • Running	Hostname: 127.0.0.1 Database: repozytorium User: dbolus mon	IIS Service Status: • Running		
			Application: • Installed Website: • running App pool: • running http://desktop-hr1be66/DPMPostgres		
Add another instance	Service settings	Repository settings	Application settings		
Please click on the Configuration system. The wizards lets you incl	Wizard to install/repair DBPLUS Perform ude postgres instances in monitoring pro	ance Monitor cess too.	Refresh Configuration Wizard		

IMPORTANT: Application DBPLUS Performance Monitor requires the installation and configuration on any given server / computer in the company. During normal use of application, system does not require any installation on the user's local computers.



# 1.3 System requirements

Parameter	Description
Monitoring of PostgreSQL	Supported types of monitored PostgreSOL instances:
instances	• All versions of PostareSOL are monitored (starting from
	version 9.4 and above)
Server operating system	Servers:
with installed DBPLUS	Windows Server 2008 and above
PERFORMANCE MONITOR	Also:
software	Windows 7 and above
	Additional requirements
	<ul> <li>.NET Framework 4.0 (installer on a server)</li> </ul>
	<ul> <li>User with Administrator privileges</li> </ul>
	Scale and layout:
	Screen resolution: 800x600 and above
	Text Size 100%
	On the server / computer with DBPI US PERFORMANCE
	MONITOR software is not required to install PostgreSQL
	components.
Server's hardware	• 4 CPU
requirements with	• 8 GB RAM
installed DBPLUS Monitor	HD – no requirements
(20 PostgreSQL instances)	
	When monitoring 20 PostgreSQL instances:
	<ul> <li>DBPLUSPOSTGRESCATCHER Monitoring Service</li> </ul>
	consumes at a level 2 GB RAM, IIS do 500 MB RAM.
	Assign 4 CPU due to the multithreading services, monitoring a
	number of instances, plus user applications.
The impact of the system	<ul> <li>DBPLUS Software up to 30 MB.</li> </ul>
to PostgroSOL servers	The system generates an average load of less than 1% dependent of
to Postgreoge servers	generally accepted quality of databases
	Repository Instance:
	As a result of the installation of repository on a selected database, the
	system sets up:
	<ul> <li>Database with DBPLUS objects – tables, functions.</li> </ul>
	<ul> <li>User with permissions to read system views and execute</li> </ul>
	query plan.
	Attention! The DBPLUS database user doesn't have permission to
	read data from the schemas of other database users.
	Monitoring instance:
	As a result of inclusion in the monitoring process a specific instance it
	is set up the user used only to connect with a given instance
User interface	The user application is accessible from a web browser. Supported
	browsers include:
	<ul> <li>Internet Explorer (ver. 9 and above)</li> </ul>
	Google Chrome
	Mozilla Firefox
	• Opera
	Edge



# 1.4 Installation of DBPLUS Performance Monitor

DBPLUS Performance Monitor is available on DBPLUS server through the provided link. User can install DBPLUS Performance Monitor by double-clicking downloaded EXE file: *dpmPostgresInstaller.exe* 



By clicking "Next" we get information about the license:



License Agreement         Please review the license terms before installing DBPLUS Performance Monitor for         PostgreSQL.         Press Page Down to see the rest of the agreement.								
License Agreement for DBPLUS Performance Monitor <sup>™</sup> software This document, hereinafter referred to as the License, contains provisions on rules of use of the DBPLUS Performance Monitor <sup>™</sup> software (hereinafter referred to as the Software) binding the DBPLUS company Dariusz Markowski (hereinafter referred to as DBPLUS) and the USER of DBPLUS Performance Monitor <sup>™</sup> software (hereinafter referred to as USER) By installing the DBPLUS viewer								
If you accept the terms of the agreement, click I Agree to continue. You must accept the agreement to install DBPLUS Performance Monitor for PostgreSQL.           Nullsoft Install System v3.01            < Back         I Agree         Cancel								

In order to continue installation, you should read and accept the terms of the license.

The next step is to select the directory, where DBPLUS Performance Monitor will be installed. Default directory is <u>"C:\Program Files (x86)\DBPLUS.Postgres"</u>

🔄 DBPLUS Performance Monitor for PostgreSQL Setup	_		$\times$
Choose Install Location Choose the folder in which to install DBPLUS Performance Monitor	for Postgre	SQL.	
This will install DBPLUS Performance Monitor for PostgreSQL on yo directory	our computer	r. Choose a	3
Destination Folder C:\Program Files (x86)\DBPLUS.Postgres	В	rowse	
Space required: 16.0MB Space available: 97.8GB Nullsoft Install System v3.01			
< Back	Install	Ca	ncel



After the correct installation User will receive the following information:



The installation process is completed by pressing "Finish" button. By default, we start system configurator, which will carry out the further process of installing individual components of the system or configuration.

Installed DBPLUS Performance Monitor program is in the menu (view for Windows 10 Pro):

"Start" >"→"DBPLUS POSTGRES folder"



The following tools are available after the correct installation:

- 1. DBPLUS Configuration Wizard.
- 2. Uninstall.



# 2 System configuration

In the first stage you must set up a system on the server with **DBPLUS Performance Monitor** <sup>™</sup> installed, in order to:

- Create a DBPLUS repository in the selected PostgreSQL instance, which will store all the information about PostgreSQL instances performance,
- Add PostgreSQL servers in the monitoring process,
- Configuration monitoring service DBPLUSPOSTGRESCATCHER responsible for gathering information about individual instances performance,
- User Application configuration.

To perform the above tasks, the system requires the rights of the database user with superuser role.

This is required to configure the Repository database. To this end, we indicate one PostgreSQL instance, where a new DBPLUS database user (name to be chosen) will be created. Technical tables will be created there in the same database schema.

When a PostgreSQL instance is added for monitoring, an existing database user is created (or indicated). A user with superuser permissions is required. High powers are required to:

- collecting statistics on a monitored PostgreSQL instance,
- estimation of the execution plan for monitored queries,
- visibility of query texts in the pg\_stat\_activity view.

After completing these steps, the application will be available to user from a web browser.

#### 2.1 The main configurator screen

On the server, where software has been installed, by clicking Start> DBPLUS POSTGRES>DBPLUS Configuration Wizard we open a window with the system management tool:

#### DBPLUS Performance Monitor for POSTGRES - system configurator.

Below is a view of the configurator after installing the application and starting the configurator.



🗶 DBPLUS Performance Monitor for POSTGRES - system configurator - 🗆 🗙							
System architecture         Version 2019.1.2           List of DPM components and it's availability and activity         License (Registration Required)							
Monitored Instances	User application						
No instances found	No instances found		✗ Service stoped				
	DBPLUS Postgres Catcher Status:   Status:  Stopped	Not installed	IIS Service Status:   Stopped				
			Application: • Installed Website: • stopped App pool: • running http://desktop-hr1be66/DPMPostgres				
Add another instance	Service settings	Repository settings	Application settings				
Please click on the Configuration system. The wizards lets you inc	Wizard to install/repair DBPLUS Perform Jude postgres instances in monitoring pro	ance Monitor cess too,	Refresh Configuration Wizard				

The main window shows the system architecture and informs i.a.:

- number of monitored PostgreSQL instances (Monitored Instances),
- place in which monitoring data is stored (Database Repository),
- installation / configuration of individual components of system, for example:
  - o lack of monitored PostgreSQL instances
  - user application installed or not, application services status (IIS website, application pool),
  - if the monitoring service is enabled.

.

In order to perform basic system configuration, click **[Configuration Wizard]** button and - as a result - user get the window to configure individual components.



<b>elcome to DBPI</b> is wizard helps you to	LUS Performance Mon o install DPM system compon	itor Installation W ents on the current mach	/izard nine	
Automatically th machine.	ere were selected those com	ponents which might be r	not installed or need re-co	onfiguration on current
The configurator	r collects all information durin	ng wizard process and wo	uld apply changes after f	inal confirmation at the
last stop!				
lease select the co	omponents you want to in	stall or repair its conf	iguration	
200 C		0		
aAeth			LLL I	))
DBPLUS Catcher	Install DBPLUS	Configure IIS	Configure DPM	Include/Add Postgre instance to
Service monitor	database repository	placorn	application	monitoring process
Selected	Selected	Selected	Selected	Select

By default, Application selects components that require configuration by default. User can always reconfigure e.g. a monitoring service or add another (not included so far) PostgreSQL Instances to monitoring.

As part of the configuration, the application will perform:

- Create the DBPLUS database repository
- Run IIS role/service on the current machine
- Configure DBPLUSPOSTGRESCATCHER monitoring
- Configure user application DPM Application.

# 2.2 Setting up DBPLUSPOSTGRESCATCHER monitoring service

DBPLUSPOSTGRESCATCHER is a program that runs as a service of Windows. In the current version, the service can run using a local account.

The DBPLUSPOSTGRESCATCHER service configuration screen during installation:



DBPLUS Performance Mo	onitor - Installation Wizard			×			
DBPLUS POSTGRES Catcher - windows service responsible for postgres instances monitoring Specify if service should be ran in context of windows/domain account or using local system account							
Catcher	R	epository	Арр	Finish			
<ul> <li>For DBPLUSPOSTGRESCATCHER service it can be used:         <ul> <li>Local system account</li> <li>Windows/Domain account.</li> </ul> </li> <li>On the database level system uses only internal postgres users.         <ul> <li>Remarks:</li> <li>Please do not use account with administrator privileges. it's not required</li> </ul> </li> <li>Set an user account which will be used by the DBPLUSPOSTGRESCATCHER service</li> </ul>							
	Login type Username Password	Local System Account					
Step 1 from 6			В	ack Continue			

Click on the **[Continue]** button to advance to the next configuration stage.

NOTE: All settings - made in the components of system - are ultimately confirmed in the final step of the configuration creator.



#### 2.3 System Repository configuration

The DBPLUS PERFORMANCE MONITOR system repository is a set of tables that must be created on the selected database in the PostgreSQL instance. The repository configuration consists of three steps:

- indicate of the PosgreSQL instance the repository will be installed,
- select the database the DBPLUS tables will be installed,
- create a monitoring user.

### 2.3.1 PostgreSQL Instances Configuration

For this purpose, please provide:

- Connection name (any)
- Host name,
- TCP Port,
- Default maintenance database for the PostgreSQL instance default Database.
- User with superuser roles the data is given once during the installation, it is not saved and used anywhere.

DBPLUS Performance Monitor - Installation Wizard X								
DBPLUS database repository Specify database where repository user can be installed								
Catcher	Rep	ository	IIS	Арр	Finish			
You need to specify the database server where dbplus repository would be located. Database details like name, files and any specific features you can select in the next following steps								
Connection nam	e Repository instance							
Host nam	e 125.45.8.98							
TCP Po	rt 5432							
Default Databas	e postgres							
Set an user ac It will be used to	count with superuser r	<b>ights.</b> g objects instalation on selec	ted instance					
	Authentication	Postgres Authentication	$\sim$					
	Username	postgres						
	Password ••••							
		Test credentials						
Step 2 from 3	7			Back	Continue			



The DBPLUS Performance Monitor application to collect information about query statistics requires to turn on "pg\_stat\_statements" extension in the monitored PostgreSQL instance.

For this purpose, on the server where the PostgreSQL instance is installed, find the configuration file of the instance (for Windows 10 and PostgreSQL instances), the default path is: C:\Program Files\PostgreSQL\11\data\postgresql.conf).

In the next step you need to make changes according to the instructions below.

Warning	×
On the specified postgres instance there is NOT LOADED pg_stat_statements extension!!!	
Be aware that the instance with repository will not be monitorred correctly until extension is installed.	
Add the following entries to your postgres.conf file (run [SHOW config_file] statements to get directory path to configuration file):	
<pre>#</pre>	
<pre># Increase the max size of the query strings Postgres records track_activity_query_size = 2048</pre>	
pg_stat_statements.max = 10000	
# Track statements generated by stored procedures as well pg_stat_statements.track = all	
#	
The postgres instance restart might be required to apply changes!	
ОК	

After making modifications to the configuration file, you must restart the PostgreSQL instances to make the changes ready.

We go to the next configuration step by clicking the [Continue] button.

#### 2.3.2 Selection of the Repository database

The next step in the repository configuration is selecting the database where the DBPLUS technical tables will be created. All performance statistics of the monitored databases will be stored there.



DBPLUS Performance Monitor - Installation Wizard X							
DBPLUS database repository Specify an database details used for repository purposes							
Catcher	Repository	IIS	Арр	Finish			
You need to specify the database which will be used a system repository. We strongly advise to use separate database for Dbplus objects, but you can also use existing one. For new database, please specify its name and tablespace location							
Create new data	base and tablespace						
Database template       template0       Tablespace name       dbplus_repo2         Database name       repozytorium       Location directory       C:/Program Files/PostgreSQL/11/data/dbplus_repo2							
Use existing data	base	Use existing t	ablespace				
Database name	Use existing database testowa V	Existing Tablespace	Use existing tables	space			
Step 3 from 7			Back	Continue			

Two possibilities are available:

- Create new database and tablespace
- Use existing database

You can also create a new tablespace (Use existing tablespace).

# 2.3.3 Creating a monitoring user

The next step is to select the database user for monitoring. This user will be used as the owner of the repository database. These are two options:

- Use existing login
- Create new login/user

Clicking the [Continue] button accepts the selection and proceeds to the next stage of configuration.



DBPLUS Performanc	e Monitor - Installation Wizard				×	
<b>DBPLUS database repository</b> Specify login account which will be used by DBPLUSCATCHER service and user application to connect to database						
Catcher	Repository		IIS	Арр	Finish	
You need DBPLUS P We strong doesn't es Specified procedure	You need to specify the user which will be used for connection purposes by DBPLUSPOSTGRESCATCHER service and DBPLUS Performance Monitor application We strongly recomend to use the same user account as specified for DBPLUSPOSTGRESCHATCHER service. If login doesn't exist, then please to create the new one. Specified login would be set as an owner for database repository. In addition it would get grants to executes system procedures or read system views on the postgres instance					
Create new lo	gin/user					
	Authentication	Postgres auther	ntication $\vee$			
	User name	dbplus_mon				
	Password	••••				
Use existing login						
Use existing user User name postgres ~ Password Test credentials						
Step 4 from 7	7			Back	Continue	



# 2.4 *IIS service configuration*

Launching of the IIS service on the server is required to run the user interface. The creator shows following features of IIS application server that will be installed. If the "**Missing IIS features components**" box is empty, no other configuration is required.

DBPLUS Performance	ce Monitor - Installat	ion Wizard				$\times$
IIS Service	Configuration					
Catcher		Repository		IIS	Арр	Finish
IIS service is r Following feature RequestFiltering DirectoryBrows HttpProtocol Authorization	required to make es will be turned o gBinaries e	<b>DBPLUS Perfor</b> In the current mac	mance Monitor aj	oplication runnin	g	^
HttpLoggingBin ISAPIExtension ProcessModelLi W3SVC ADSICompatibil RequestFiltering WMICompatibili ProcessModel HttpCache AuthorizationBin	aries sBinaries braries lity g ity naries					~
Missing IIS fea	atures componer	nts				
No any missing	components four	nd				^
						$\checkmark$
Step 5 from 3	7				Back	Continue

# 2.4.1 Configuration of SSL in the IIS (additional option)

In case you want to enable the SSL functions in the DBPLUS Performance Monitor application, you need to perform the steps on the server with the installed DBPLUS software:

- 1. Run the IIS Manager (Internet Information Manager) from the command line with the **inetmgr** command
- 2. For the selected server, find the **Server Certificates** icon and enter to generate or import a certificate





3. Generation of the certificate on the IIS server (in case we don't have it). Run options according to the below screenshots.

Nation Servio	ces (IIS) Manager		
SQLMON	•		🖬 🖂 🟠 I 🕐 🗝
<u>File V</u> iew <u>H</u> elp			
Connections Start Page SQLMON (IC(rmakuch) Application Pools Sites	Server Certificate Use this feature to request and many can use with Web sites configured fo Name	Sage certificates that the Web server r SSL. Issued To	Actions Import Create Certificate Request Complete Certificate Request Create Domain Certificate Create Self-Signed Certificate Help Online Help
Ready			• <u>1</u> .:

Create of the certificate.



Create Self-Signed Ce	rtificate	? ×
Specify	Friendly Name	
Specify a file name for for signing:	the certificate request. This information can be sent to a certi	ificate authority
Specify a friendl <u>y</u> nam	e for the certificate:	
dbplus_certyfikat		or court
Internet Information Serv	ices (115) Manager	
Internet Information Server  SquMON File View Help	ices (IIS) Manager	
Internet Information Server         Image: Server	ices (II5) Manager	Actions
Internet Information Server     Source Ser	tices (115) Manager	Actions Import Create Certificate Request Create Certificate Request Create Domain Certificate Create Self-Signed Certificate View Export Remove Remove Help Online Help

4. Certificates import (in case the certificate was not generated directly on the IIS server). We run according to the following screens:



📬 Internet Information Serv	ices (IIS) Manager		
SQLMON	•		📃 🖾 🔛 🔛 🕶
<u>F</u> ile ⊻iew <u>H</u> elp			
Connections	Server Certification	es age certificates that the Web server or SSL. Issued To I:	Actions Import Create Certificate Request Complete Certificate Request Create Domain Certificate Create Self-Signed Certificate Phelp Online Help Online Help
Ready			San 1997 -

Import Certificate ? 🗙
⊆ertificate file (.pf×):
Password:
Allow this certificate to be exported
OK. Cancel

Pass the password if the certificate was exported with a password

5. Edit bindings

Update the link for the DBPLUS Website. Click on the site, then chose Edit Bindings option.



🖡 Server Manager		
File Action View Help		
Server Manager (SQLMON) Internet Information	vices (IIS) Manager	
🗏 🗑 Web Server (IIS)	10N → Sites → DBPLUS Website SSL →	🖬 🖾 🖾 I 🕢 👻
Connections     Features     Diagnostics	DBPLUS Website SSL Home	Actions
Configuration  Task Scheduler  Mindows Firewall with Adve SQLMON (IC\rmal	Filter:	Edit Permissions
Services     Application PC     Application PC     Sites     WII Control     WII Control     Bellos     Coal Users and Groups	ASP.NET	Bindings Basic Settings
E Storage     E Storage     E      Constant with the storage	Average     A	View Applications View Virtual Directories
	Add Application	Manage Web Site
	Add Virtual DirectoryNET Users Application Connection Settings Strings	▶ Start
	Edit Bindings	Stop
	Manage Web Site   Manage Web Site  Manag	Browse Web Site
	Refresh     Renove	Advanced Settings
	Rename ht View	Configure 🗾

In the Site Bindings window, add a new link specifying the SSL protocol and select the certificate previously created or imported as on screen below:

ections							
🔒   🖄   🍯	ite Bindin	gs	-	_		<u>? x</u>	
Start Page	Туре	Host Name	Port	IP Address	Binding	Add	
SQLMON (:	http		3000	*			<b>F</b>
- Sites						Edit,	-
🗄 😔 DB						Remove	1
		Add	Site Bind	ling			? ×
		T	ype:	IP address:		Port:	
		h	ttps	All Unassign	ned	• 443	
		н	ost name:				
		Γ					
		S:	SL certifical	te:			
			bplus_certy	/fikat		View	
		Machir					
						OK Ca	ancel
		Features v	/iew // a C	ontent view			

As a result, we receive:

Site Bindi	ngs				? X
Type http	Host Name	Port 3000	IP Address	Binding	<u>A</u> dd
https		443	*		<u>E</u> dit
					<u>R</u> emove
					B <u>r</u> owse
•				▶	
					Close



Remove settings with the http type. On the configured DBPLUS Website, we click the restart (Refresh button).

# 2.5 User application configuration

Another element is the creation of user interface objects. Belong to them:

- Authentication Type:
  - o LocalSystem,
  - $\circ$  LocalService,
  - o NetworkService,
  - Windows Domain Account,
  - ApplicationPoolIdentity

When choosing login type = LocalService there is no need to enter username and password, the service will work on the default user for Windows (LocalService)

- Parameters:
  - Port number (default 80)
  - o Binding property /Host Name
  - Access to application whether users at the login to the site will be authorized (login and password) or not.

DBFE05 Ferformance Monitor - Installation	Wizard			$\times$		
DBPLUS Performance Monitor - user application Specify settings for web user application						
Catcher	Repository	IIS	Арр	Finish		
<ul> <li>Specifing the user account user DBPLUSPOSTGRESCATCHER co It's required to use the same us application).</li> <li>You can specify the port for http application. Any access and user</li> </ul>	for connection purposes by appli- infiguration or installation database ser type/account for mentioned co p protocol and turn on/off windows er privileges to the application you	eation client, is ava e repository mponents (DBPLU authentication for can manage direc	ilable during SPOSTGRESCATCHE users who would a tly in the application	ER service, IIS coess the		
Login type Username Password	LocalService	✓	it user			
Port Bioding property	80	Tes	st port			
Host name	desktop-hr1be66					
Access to application	Anonymous authentication	~				
Application path	C:\Program Files (x86)\DBPLU	S.Po Select a	application	Continue		

As a result of the entire setup process completion, application will be available at the following url:



#### http://server\_name:port\_number/DPMPostgres

If the system will be running on port 80, link will be as follows:

#### http://server\_name/DPMPostgres

Click on the [Continue] button to proceed the next step

### 2.6 *Configuration summary*

The last configuration step is to confirm all settings according to steps defined in the configurator. The final screen shows a configuration summary.

**Attention!** In addition, there is a Repository installation script available, by clicking on [Repository installation script] it is possible to save it on the disk.

#### To confirm changes, click on [Finish] button.

DBPLUS Performanc	DBPLUS Performance Monitor - Installation Wizard X						
DBPLUS Performance Monitor for Postgres Summary of wizard configuration process before final confirmation							
Catcher		Repository		IIS	Арр	Finish	
During the cont DBPLUSPOSTG - Configure se DBPLUS reposit Create databa For connection During installat - Ins IIS Service Turn ON IIS fea IIS DPM applica Configure appli LocalService	figuration wizard RESCATCHER wink rvice to use the a tory database se [repozytorium purposes it will be toin it will be don tall database obj	process you select dows service account: ) on hostname [1: be used a user [dl e following operate ects rent machine	ct to install/re-co	nfigure following	system componer ** ** ** ** ** **	nts: ^	
Access to web	Access to web application will use anonymous authentication						
Step 7 from 7	7		Repositor	y installation scrip	ot Back	Finish	

At the end of the configuration status of the installation will be shown:





As a result, system configuration main window looks like below:

DBPLUS Performance Monitor for POS	TGRES - system configurator		- 🗆 X
System architecture List of DPM components and it's av	ailability and activity		Version 2019.1.2
Monitored Instances	Monitoring service	Database repository	User application
✓ 1 instances monitored	✓ Configured successfully	✓ Configured successfully	✓ Configured successfully
Repository instance/127.0.0.1	DBPLUS Postgres Catcher Status: • Running	Hostname: 127.0.0.1 Database: repozytorium User: dbolus mon	IIS Service Status: • Running
			Application: • Installed Website: • running App pool: • running http://desktop-hr1be66/DPMPostgres
Add another instance	Service settings	Repository settings	Application settings
Please click on the Configuration system. The wizards lets you incl	Wizard to install/repair DBPLUS Perform ude postgres instances in monitoring pro	ance Monitor cess too.	Refresh Configuration Wizard

From the above sample screen, we can read that DBPLUS system PEROFRMANCE MONITOR is:

- Installed on a server DESKTOP-HR1BE66 (link to the application in the lower right corner),
- all components are properly configured (the bar with information "Configured successfully")
- appropriate services are running:
  - o DBPLUSPOSTGRESCATCHER a service responsible for database monitoring,
  - IIS, Website, App pool which means that the application is available to the user.
- We have 1 monitored PostgreSQL instance,
- Information from the monitoring of all instances (currently one) are stored in "repository" database in server 127.0.0.1 and connects from the user *dbplus\_mon*.
- Interface / User application is available at <u>http://desktop-hr1be66/DPMPostgres</u>

Note: in the case when a port number used to configure the application is other than [80], the link to the application will contain the port number. For example, if the port [81] is used, the link to the application will be as follows <a href="http://127.0.0.1:81/DPMPostgres">http://127.0.0.1:81/DPMPostgres</a>



# 3 Additional functionalities

# 3.1 Add PostgreSQL Instance for monitoring

After the initial configuration, you can proceed to add more PostgreSQL instances for monitoring. For this purpose, in the main System Configurator window click **[Add Another instance]** button.

BBPLUS Performance Monitor for POS	IGRES - system configurator		- 🗆 X
System architecture List of DPM components and it's av	ailability and activity		Version 2019.1.2
Monitored Instances	Monitoring service	Database repository	User application
✓ 1 instances monitored	✓ Configured successfully	✓ Configured successfully	✓ Configured successfully
Repository instance/127.0.0.1 🔅	DBPLUS Postgres Catcher Status: • Running	Hostname: 127.0.0.1 Database: repozytorium User: dbolus mon	IIS Service Status: • Running
			Application: • Installed Website: • running App pool: • running http://desktop-hr1be66/DPMPostgres
Add another instance	Service settings	Repository settings	Application settings
Please click on the Configuration system. The wizards lets you incl	Wizard to install/repair DBPLUS Perform ude postgres instances in monitoring pro	ance Monitor cess too.	Refresh Configuration Wizard

**IMPORTANT:** If the **[Add another instance]** button is not available, this is the result of the lack of a license for a certain number of instances.

The second option to add PostgreSQL instance for monitoring is click [Configuration Wizard] button and select the component [Include / Add SQL instance to monitoring process]



DBPLUS Performance Moni	tor - Installation Wizard			×				
Welcome to DBPI This wizard helps you t	Welcome to DBPLUS Performance Monitor Installation Wizard This wizard helps you to install DPM system components on the current machine							
Automatically th machine. The configurator last step.	ere were selected those com collects all information durin	ponents which might be ng wizard process and wo	not installed or need re-co ould apply changes after fi	onfiguration on current inal confirmation at the				
Please select the co	omponents you want to in	stall or repair its conf	iguration					
¢°								
DBPLUS Catcher service monitor	Install DBPLUS database repository	Configure IIS platform	Configure DPM application	Include/Add Postgres instance to monitoring process				
Select	Select	Select	Select	Selected				
Selected compone	Selected components: 1 of 5 Back Continue							

In both cases as a result, we go to the wizard to add a new database. In the first step user need to enter basic information about new instance:

- Connection name (any),
- Host name,
- TCP Port,
- Default maintenance database for the PostgreSQL instance default Database.
- User with superuser roles the name is given once during the installation, it is not saved and used anywhere.

The DBPLUS Performance Monitor application to collect information about query statistics requires to turn on "pg\_stat\_statements" extension in the monitored PostgreSQL instance.

For this purpose, on the server where the PostgreSQL instance is installed, find the configuration file of the instance (for Windows 10 and PostgreSQL instances), the default path is: C:\Program Files\PostgreSQL\11\data\postgresql.conf).

In the next step you need to make changes according to the instructions below.



Varning	>
On the specified postgres instance there is NOT LOADED pg_stat_statements extension!!!	
Be aware that the instance with repository will not be mo correctly until extension is installed.	onitorred
Add the following entries to your postgres.conf file (run config_file) statements to get directory path to configura	[SHOW tion file):
<pre>#shared_preload_libraries = 'pg_stat_statements'</pre>	
# Increase the max size of the query strings Postgres re track_activity_query_size = 2048	cords
pg_stat_statements.max = 10000	
# Track statements generated by stored procedures as pg_stat_statements.track = all	well
#	
The postgres instance restart might be required to apply	changes!
	OK

After modifications to the configuration file, you must restart the PostgreSQL instances to make the changes ready. Click the [**Continue**] button will take you to the next configuration step.

DBPLUS Performance Monitor - Installation Wizard	×
Include/Add postgres instance to monitoring process Specify a postgres instance and account with admin rights which lets wizard to do conf	iguration
Instance	
You need to specify the postgres instance that would be included in the monitor You can skip this step and every time you can add/remove the database to/from	ing process. m monitoring process.
Connection namePostgres10Host namelocalhostTCP Port5433Default Databasepostgres	
Set an user account with administrator rights. It will be used to perform user creation on selected instance	
Authentication       Postgres Authentication          Username       postgres          Password       ••••          Test credentials	
Step 1 from 3	Back Continue



Connecting a new instance for monitoring, it is possible to create a new database user or use existing one. This user will be used to collect statistics from the monitored instance (DBPLUSPOSTGRESCATCHER service will log in to this user).

DBPLUS Performance Monitor - Installation Wizard			×			
Include/Add postgres instance to monitor Specify a postgres instance and account with admin righ	<b>pring process</b> Its which lets wizard to do conf	guration				
Instance						
You need to specify the user which will be used for connection purposes by DBPLUSPOSTGRESCATCHER service. We strongly recomend to create new user and to not use an account with system privileges. For specified user, it would be grant rights to read system views on the monitored database						
Create new login/user						
Authentication	Postgres authentication	$\sim$				
User name	db_mon					
Password	••••					
Use existing login						
	Use existing user					
User name	postgres	$\sim$				
Password						
	Test credentials					
Step 1 from 3			Back Continue			

After click [Continue] button, it shows the final screen being the summary of configuration process.



DBPLUS Performance Monitor - Installation V	Vizard	×					
DBPLUS Performance Monitor Summary of wizard configuration proce	r for Postgres ss before final confirmation						
In	stance	Finish					
During the configuration wizard process you select to install/re-configure following system components: Add postgres instance to monitoring process The postgres instance alias: [Postgres10:localhost] For connection purposes it will be used an user [db_mon] Please click on [Finish] button to complete wizard operation							
Step 3 from 3		Back Finish					
	Installation status × Installation completed successfully OK						

Click **[Finish]** button to add an instance to monitoring. As a result, changes are visible in the system configuration main window - DBPLUS Performance Monitor supports two PostgreSQL instances.



DBPLUS Performance Monitor for POS	TGRES - system configurator		- 🗆 X
System architecture List of DPM components and it's av	ailability and activity		Version 2019.1.2 License Information
Monitored Instances	Monitoring service	Database repository	User application
✓ 2 instances monitored	✓ Configured successfully	✓ Configured successfully	✓ Configured successfully
Postgres 10/127.0.0.1	Sete		
Repository instance/127.0.0.1	<b>Q</b> 2		<b>S</b>
	DBPLUS Postgres Catcher Status: • Running	Hostname: 127.0.0.1 Database: repozytorium User: dbolus mon	IIS Service Status: • Running
			Application: • Installed Website: • running App pool: • running http://desktop-hr1be66/DPMPostgres
Add another instance	Service settings	Repository settings	Application settings
Please click on the Configuration system. The wizards lets you incl	Wizard to install/repair DBPLUS Perform ude postgres instances in monitoring pro	ance Monitor cess too.	Refresh Configuration Wizard

Click the link to the application (in this case, <u>http://desktop-hr1be66/DPMPostgres</u>) an application with monitored instances will be displayed:

DBPIUS Better performan	tor POSTGRES					0
Dashboard	Postgres dashboard m	onitor		Seconds to next re	fresh: 10 ALL INSTANCES	- Toggle view.
Instance Analysis						
Space monitor	SUMMART FOR ALL INSTANCES					
Parameters	2	2	2	0	0	0
Reports	Servers	Instances	Active Instances	Active Sessions	Waits [s/1s]	Locking Waits [s/1s]
<ul> <li>Servers monitor</li> </ul>	PHYSICAL SERVERS Performing	g well 🔸 Warning 🔸 Overloaded	Not available			1 Expand all 1 Collapse all -
Configuration						
Help	• 127.0.0.1	1 • localhost				
Werslow: 2019.1.2	POSTGRES INSTANCES  Perform  Postgres10	ing well • Warning • Overloaded	Not available     Search instance	c		1 Expand all 1 Collapse all

## 3.1.1 Add an PostgreSQL instance without a Superuser (AWS)

In the latest application User has the ability to add instances to monitoring without having to indicate a user with Superuser privileges. Necessity for the Postgres version in a "cloud" solution (eg AWS).

# Warning! For postgreSQL versions lower than 10, it is not possible to add an instance to the monitoring without the Superuser role.

For PostgreSQL versions higher than or equal to version 10, the administrator user must have the permissions: grant connect to all databases located in the instance that we want to monitor and the roles pg\_read\_all\_settings.



To start, add instances as before using the [Add another instance] button, on the newly opened page we complete the details of connection details by entering the login and password of the user with administrator privileges but not Superuser.

DBPLUS Performance Monitor -	Installation Wizar	d							×
Include/Add Postgro Specify a PostgreSQL instar	eSQL instan	<b>ce to mo</b> with admin	nitoring rights whic	proces h lets wiza	<b>s</b> ard to do				
	Instan	ce						Finish	
You need to specify t You can skip this step	the PostgreSQL i	nstance tha e you can ae	t would be dd/remove	included in the datab	n the mor	nitoring pr	ocess. pring proce	255.	
Connection name Host name TCP Port Default Database	Postgres_10.6 localhost 5433 postgres		Permissio	The user [ can gener monitorin Do you wa	n dbplus] dc ate further g. ant to conf	esn't have rissues wit tinue with (	SUPERUSER h including current use	R privileges instance in r and its pr	and it n ivileges?
Set an user account will It will be used to perform	th administrate user creation o	or rights. n selected i	r				Tak		Nie
A	uthentication	Postgres	Authentica	ition	$\sim$				
U	sername	dbplus							
Ρ	assword	Te	est creder	itials					
Step 1 from 3								Back	Continue

If you move to the next page, you will see a message that Superuser has not been authorized by the user designated as the administrator. In this case, continue with the installation.

The next screen when creating a user will also display a warning about the lack of Superuser role by the administrator, in this case you should also accept and continue the installation. The next step will be a window with a summary of the installation. After clicking the [Finish] button we finish the installation process.

#### 3.2 *Modifying existing user's privileges*

In application the User has option of changing the privileges of an existing user indicated in the monitoring. We use refreshing when the monitoring user does not have access to all databases on the instance or we want to change the currently granted permissions.

Refreshing privileges is also useful if you need to grant additional permissions that have not been previously granted (or have been revoked) and are needed to display data correctly.

To modify the privileges, open the "DBPLUS Configuration Wizard" program, then go to the settings of the given instance by clicking the button next to the PostgreSQL instance name for which you want to refresh / grant permission. Then click the **[Refresh privileges]** button.



DBPLUS Performance Monitor for Post	reSQL - system configurator			_	
System architecture List of DPM components and it's ava					sion <b>2020.1.1</b> se Information
Monitored Instances	Monitoring service	e Datahase	renository	User annlica	ation
✓ 2 instances monitored	PostgreSQL instand	ce			
Postgres 10_repo/127.0.0.1	Connection settings used	for monitoring purposes			
postgres9.6/127.0.0.1	Connection login Conn	nection properties Export			
	Included in Monitoring	Yes	~		
	Connection name	postgres9.6			
	Host name	localhost			
	TCP Port	5434			
	Database name	postgres			
	Authentication	Postgres Authentication	$\sim$		
	User name	dplus9			
	Password	••••			
			_		
	Save Test conn	nection Refresh privilege	s Remove insta	ance	Close
Add another instance	Service settings	Repository setting	<u>s</u>	Application settings	C
Please click on the Configuration V system. The wizards lets you inclu	Vizard to install/repair DBPLU: de PostgreSQL instances in m	IS Performance Monitor nonitoring process too.	[	Refresh Configura	tion Wizard

On the next screen we provide user data with sysadmin privileges for a given instance to authorize and update changes.

User refresh privileges		x		
<b>Postgres Instance refres</b> Instance is refreshing user privile	<b>hing user privileges</b> ges (in case of broken)			
Instance details				
Server SQL Instance	postgres9.6:localhost			
Login for refreshing	dplus9			
Features and privileges				
Use [SUPERUSER] role for m	nonitoring login/user (recommended)			
Sysadmin connection credent	tials (for instance)			
Authentication	Postgres Authentication $\qquad \qquad \lor$	_		
Username	postgres			
Password	••••			
Test connection Refresh user privileges Close				

The screen shows the current privileges of the given monitoring user. Checking or unchecking a given option grants or withdraws the given rights. To make changes, confirm by clicking the **[Refresh user privileges]** button.



# 4 System Upgrade

The DBPLUS maintenance support provides the access to new software updates that are published 4 times a year, as well as to DBPLUS engineers help PostgreSQL instance diagnostics using **DBPLUS Performance Monitor** <sup>™</sup> software.

System upgrade combines with two steps:

- Run the installation file (which goes the same as the first installation process)
- Upgrade of database objects repository on DBPLUS user to the latest version.

Attention! The upgrade process involves running the dpmPostgreSQLInstaller.exe file containing the newest version of the application. Remember to select exactly the same folder you used during the first installation.

# 4.1 Upgrade to the latest version

In order to go through the upgrade process, user must run DBPLUS Configuration Wizard, which also start automatically after installation. In the result:

DBPLUS Performance Monitor for ORA System architecture List of DPM components and it's av	CLE- system configurator vailability and activity		Version 3.0.1				
Monitored Databases	Monitoring service	Database repository	User application				
✓ 1 databases monitored	✓ Configured successfully	Vpgrade required	✓ Configured successfully				
MAQCH/XE 🏶	00		٢				
DBPLUS Object Upgrade       IIS Service         There is newer version available (3.0.1). Do you want to run installer to upgrade existing DBPLUS repository database?       IIS Service         Tak       Nie							
			Application: • Installed Website: • running App pool: • running https://MAQCH:4433/DPMOracle				
Add another database	Service settings	Repository settings	Application settings				
Please click on the Configuration Wizard to install/repair DBPLUS Performance Monitor system. The wizards lets you include oracle databases in monitoring process too.           Upgrade         Refresh         Configuration Wizard							

System automatically detects the need to update to the latest version. We accept the dialog box and we run the wizard that will guide us through the upgrade process.

In case of interruption upgrade process, user can always return to it by click **[Upgrade]** in the main system configurator window.

As the first screen we have information about new system version, to which application will be upgrade.



The upgrade procedure applies to updating objects only in the database on which the DBPLUS repository is located.

Accept changes by click the **[Continue]** button. The system informs about operations that the DBPLUS database user will perform in the repository database. Approve changes by click the **[Finish]** button.

Depending on the version, the upgrade process can take from a few seconds to 1-3 minutes. Finally, user receive information about the status of the entire process.

In	stallation status
	Upgrade process completed succesfully
	ОК

Click [OK] button to close the system configurator window.



# 5 <u>License</u>

The license is linked to the application server with the DBPLUS Performance Monitor software installed.

System license includes:

- Time of system availability The number of monitored PostgreSQL instances.
- It contains an automatically generated computer code.

DBPLUS Perform	ance Monitor for POSTGR	ES - system configurato	)r				
System architecture         Versio           List of DPM components and it's availability and activity         License Information							
Monitore	License Information						×
✓ 2 instanc	DBPLUS Performance Monitor for POSTGRES License information						sfully
Pos	License Status						
Repository in	Computer Code	6127-3597-6225-4D	FF-2D23	License Valid			
	Type: Valid License License Days Left: UNLIMITED Expiration Date: UNLIMITED Licensed Computer code: 6127-3597-6225-4DFF-2D23 Licensed To: Artur DBPLUS Limit to number of monitored instances: 3 License allows upgrade to version: 2019.4.1						
	Online Request	Offline request					
	Use below form to register your license online. The license is created based on your computer code, client key is genereted automatically. It can take several minutes/hours to generate the license file. You can continue to work with software and next time you run Dbplus Configuration Wizard, the license file will be available for download.						
	Client Key	R306-03M4-E7G2-	-Z3Y4	Requested Lic	ense	~	<u>1Postgres</u>
	Client Name/Company	Artur DBPLUS		Number of insta	nces	Unlimited	
Add another inst	Email address						<u>s</u>
Please click system. The			Se	end license request	Downloa	d license file	Wizard
						Close	]

#### Information about license is available from the configurator, i.e. DBPLUS Configuration Wizard

After installation, the system works in the trial version. This period continues 30 days and the system is available in full functionality. By the end of the period you must register the license in order to continue working with the program. This can be done in two ways:

- Send a license request from the form by click the [Send license request] button (Internet access required on the machine) or
- Sending computer code by e-mail (Computer Code, shown in the figure above).


## 6 Working with program

The user interface is accessible from a web browser at the previously configured address. The default page of the system is a Dashboard shows the current performance of the monitored PostgreSQL instances.

#### 6.1 "Dashboard"

After start **DBPLUS Performance Monitor**<sup>™</sup> web application, it opens a dashboard that shows the current performance of monitored POSTGRESQL instances.

DBPIUS Better performan	os for POSTORES					۲
Dashboard	Postgres dashboard n	ionitor		Seconds to nex	refresh 1 ALL INSTANCES	- Toggle view
Instance Analysis						
Space monitor	SUMMART FOR ALL INS IANGES					
Parameters	1	1	1	1	1.11	1.11
Reports	Servers	Instances	Active Instances	Active Sessions	Waits [s/1s]	Locking Waits [s/1s]
Servers monitor	PHYSICAL SERVERS    Performing	g well 🔸 Warning 🔹 Overloaded	Not available			1 Expand all 1 Collapse all -
Configuration						
🔿 Help	localhost	1				
Version: 2019.1.2	POSTGRES INSTANCES	ming well . Warning . Overloaded	Not available     Q. Search instan	ce		L Expand all T Collapse all
	Repository instance	1				
	DETAILS FOR SELECTED MACHINE: LO	CALHOST AND POSTGRES INSTANCE	REPOSITORY INSTANCE			
	Instance Analysis	1		Waits Waits statistics in Last 15 minutes		=
	() Waits	0				
	👌 Waits details					

Dashboard is divided into areas:

- information bar
- summaries for all instances area
- physical servers' area,
- PostgreSQL instances area,
- details for the selected instance.

#### 6.1.1 Information bar

Postgres dashboard monitor	Seconds to next refresh: 1	ALL INSTANCES 👻	Toggle view:		
----------------------------	----------------------------	-----------------	--------------	--	--

User can switch between dashboard and different view using the button on the information bar. List of available views:

- Icon View displays monitored servers / databases as icons (default)
- o Grid View databases are displayed in a grind / table view
- **Television Mode** shows PostgreSQL instances in a form of developed icons with automatically switching performance indicators.

Additionally, user is informed how much time is left until next Dashboard refresh with the most recent data about the current performance of all monitored instances.



Users can change display information's about database instances via the drop-down menu in the information bar. The database type can be freely defined and assigned in the Configuration> Instances menu, described later in this chapter.

			C	
Seconds to next refresh: 2	ALL INSTANCES -	Toggle view:		
	ALL INSTANCES			
	PRODUCTION DATABASE Not specified		-	

In case when information bar changes colour from blue to orange – means that the program will go into alarm mode. Causes:

- insufficient space in the DBPLUS repository database,
- DBPLUSPOSTGRESQLCATHER service doesn't work.

#### Insufficient space at repository database

When there is no place in the database schema which is the repository to collect data, a message will appear. The toolbar on Dashboard page turns orange and a lack of space message "Repository Space Warning" about lack of space will be shown.

## DBPLUSPOSTGRESCATHER service doesn't work

Detection of a monitoring problem will result that bar change to orange on the Dashboard page and the message "Monitoring service is not running" display.

To fix the problem check if there are any errors on the application server with the installed DBPLUS Client and restart the DBPLUSPOSTGRESCATHER service.

DBPIUS Better performance	e for POSTGRES					N	fonitoring service not running 💽 🚭	
Dashboard	Postgres dashboard n	nonitor		Secon	Nonitoring service is not running.			
Instance Analysis		CORY DEVELOPMENT				Please go to machine with DBPLUS tool	and check/start the	
Space monitor	JUNINART FOR INSTANCE TITH CATE	JORT DEVELOPMENT				DBPLUSPUSTGRESCATCHER Service.		
Parameters	1	1	1	0		0	0	
1 Reports	Servers	Instances	Active Instances	Active Sessions		Waits [s/1s]	Locking Waits [s/1s]	
<ul> <li>Servers monitor</li> </ul>	PHYSICAL SERVERS    Performing	ng well	Not available				↓ Expand all ↑ Collapse all -	
Configuration								
Help	Iocalhost							
Version:								
2019.1.1	POSTGRES INSTANCES    Perfor	ming well 😑 Warning 🗧 Overloaded	Not available     Q Search instance	e			Expand all     Collapse all	

## 6.1.2 The Summary area

The main area presents a general summary of:

- Number of monitored servers and instances
- Number of active instances
- Number of databases on all instances
  - Active Sessions,
  - Level of waits
  - Locking Waits



Postgres dashboard n	nonitor		Seconds to next	refresh: 6 ALL INSTANCES	▼ Toggle view: III III III
SUMMARY FOR ALL INSTANCES					-
1	1	1	3	0.19	0.17
Servers	Instances	Active Instances	Active Sessions	Waits [s/1s]	Locking Waits [s/1s]

From the summary area, it's easy to tell if the wait level is high and whether user should still look for a problem.

## 6.1.3 Servers and instances area

In Physical servers part, user see the icon of servers run POSTGRESQL instance. By click the icon of any server in the instance area, the POSTGRESQL instances that work on a given machine will be highlighted.

PHYSICAL SERVERS	Performing well	Warning • Overloaded	Not available		↓ Expand all	1 Collapse all	- 1
• 127.0.0.1	1	localhost	Ļ				
POSTGRES INSTANCES	<ul> <li>Performing well</li> </ul>	Warning     Overloaded	Not available	Q. Search instance	1 Expand	tall † Collap	pse all
Nowy postgres	Ļ	Postgres11	Ļ				

The icon of each server or instance can be expanded by click the "arrow" or the [**Expand All**] button. At the instance area level, user can see exactly which PostgreSQL instance has the highest level of wait.

PH	YSICAL SERVERS	Performing well	Warning • Overloaded	Not available		↓ Expand all	Collapse all
	• 127.0.0.1	Ť	Iocalhost	Ť			
	Active sessions	• 0.0	Active sessions	• 0.0			
	Waits	• 0.0 s/1s	Waits	• 0.0 s/1s			
	I/O Waits	● 0.0 s/1s	I/O Waits	• 0.0 s/1s			
	Lock Waits	• 0.0 s/1s	Lock Waits	• 0.0 s/1s			
	HYSICAL SERVERS       • Performing well       • Not available       I       Expand all       I       Coltapse all       -         • 127.0.0.1       I       • Iocalhost       I       Active sessions       • 0.0         Waits       • 0.0 5/15       I/O Waits       • 0.0 5/15       I/O Waits       • 0.0 5/15         Lock Waits       • 0.0 5/15       I/O Waits       • 0.0 5/15       I/O Waits       • 0.0 5/15         OSTGRES INSTANCES       • Performing well       • Warning       • Overloaded       • Not available       Q Search instance       I       Expand all       I       Coltapse all         • Nowy postgres       I       • Postgres11       I       Active sessions       • 0.0       yris       • 0.0 5/15         I/O Waits       • 0.0 5/15       I/O Waits       • 0.0 5/15       I/O Waits       I/O Waits						
PO	STGRES INSTANCES	Performing well	• Warning • Overloaded	Not avail	ble Q. Search instance	↓ Expan	i all † Collapse all
	Nowy postgres	1	Postgres11	Ť			
			Active sessions	• 0			
			Waits	● 0.0 s/1s			
			I/O Waits	• 0.0 s/1s			
			Lock Waits	● 0.0 s/1s			

Additional options:

 Ability to search instance - the search option is available in every version of the Dashboard. This is useful to monitor more instances.

POSTGRES INSTANCES • Performing	g well 🔸 Warning 🔸 Overloaded 🔹 Not available	Q 11	↓ Expand all	† Collapse all
Postgres11				



P	OSTGRES INSTA	NCES Q Searc	h instance								
s	ierver Type	Machine	Instance	e Active	Waits [s/1s]	IO Waits [s/1s]	Locks [s/1s]	Alerts	Sessions	Transactions	Total space [GB]
PRO	ODUCTION DAT	127.0.0.1	Nowy postgres	×.	0.00 🗢	0.00 🗢	0.00 🗢	0	1	0	0
DE\	VELOPMENT	localhost	Postgres11	8	0.00 •	0.00 •	0.00 •	0	0	0	0

- In the Grid view, table that shows the current instance performance has options:
  - the ability to change the width of the columns
  - o in the case of more records, scrolling the data does not hide the table header
  - use arrows to navigate between instances.

## 6.1.4 Details of PostgreSQL database performance

In order to analyze the current load, click on the icon of PostgreSQL instance. As a result, the bottom dashboard area reloads and presents details of the selected instance.



Available information:

- current level of waits and lock Waits tab,
- on what waits instance spend time Waits details tab,
- IO statistics and Buffer Cache Hit Ratio level IO stats tab,
- execution statistics Execution stats tab,
- number of sessions and their status Sessions details tab,
- PostgreSQL instance load Instance Load tab,
- view basic information about instance Info tab,
- check Alerts Alerts tab,
- the size of the database in the instance Database space tab.

Waits, IO, queries information is presented here in the horizon of the last 15 minutes. For example, on the Waits chart follow information:

- I/O waits read of disk devices,
- Locks wait time for queries on blockades,
- Waits total wait time.

Chart means that at a specific moment in time (the time read from the X-axis), all users (active sessions) waited for the query result indicated number of seconds (the result read from the Y axis). IO waits and Locks categories help to state why sessions stay idle.



## All series are visible by default:



After click the Waits, IO Waits series, only the Lock series is visible (next click on the legend bar, it will display the selected series again).



## IMPORTANT: the level of expectations is calculated per one second.

Details about waits can be found in the Waits details tab.





The next available tab is IO Stats. There is information about the number of blocks read from the disk (Blocks read), the number of read blocks from the memory buffer (Blocks hit), read times IO (IO Time) and Buffer Cache Hit Ratio.









The next tab provides information about the status and number of sessions run on the PostgreSQL instance.





**Instance Load** is one of the modules used by DBPLUS engineers to analyze performance. Chart shows data for the last 24 hours.



Chart consists of the following series:

- Elapsed Time shows the summary time all users are waiting on the result of a query at a given second of time. On the graph for the displayed point Elapsed Time is 1,46 seconds, which can be interpreted as follows:
  - 3 users launched different queries 2 users waited for 0.5 second, 3th user waited 0,46 second,
- Wait time wait time for query execution,
- Wait IO time time when queries waited for IO,
- Lock time time when queries were blocked by other queries,
- IO read time
- IO write time
- Alerts alert states.

For better readability of the chart:

- User can click to disable (or enable) given series of the chart it can be done in the area of the chart legend
- User can zoom the chart





## Here is an example of a chart in the narrower time horizon (after zooming a part of the chart)

Dashboard also allows the user to view basic information about the monitored Postgres instances, among others:

- Server type (set by the user in DPM),
- Path to the PostgreSQL configuration file,
- Path to the PostgreSQL instance data file,
- Path to the PostgreSQL instance log file
- Size of the data block,
- Maximum number of connections,
- Status of the autovacuum parameter,
- Server version number,
- Number of databases in the PostgreSQL instance,
- Number of tablespaces.

#### User get it after click on the Info tab:

DETAILS FOR SELECTED MACHINE	E: LOCALHOST AND POSTGRES IN	STANCE POSTGRES11		
Instance Analysis	Q Basic information	on	• Last chan	ges
Waits	Parameter           Server type           s           config_file           data_directory           log_directory           tats           block_size           etails           autovacuum	Value	Date change	Description
	Server type	PRODUCTION DATABASE	2019-01-28	Server parameter
ô Waits details	config_file	C:/PostgreSQL/data/pg10/postgresql.conf	01:17:52	Parameter contig_file changed to C:/PostgreSQL/data/pg10/postgresql.conf
<ul> <li>IO stats</li> </ul>	data_directory	C:/PostgreSQL/data/pg10	2019-01-28	Last tablespace created
	log_directory	C:/POSTGR~1/data/logs/pg10	00:56:30	pg_default
Execution stats	block_size	8192	2019-01-28 00:56:30	Last database created template1
E Sessions details	max_connections	100		
C. Instance load	autovacuum	on		
	server_version	10.2		
Q Info	Databases count	10		
<ol> <li>Alerts</li> </ol>	Tablespaces count	3		
0 /10/10				
Database space				

When user click in the **Database space** can get to know the current size of database on instance (size is expressed in MB). The data on the chart show the information about the space used (Space Used),



space free (Space Free) and the space the database file can be extended to the maximum (Note: it is impossible to check available space on the disk).



## 6.1.5 Dashboard – various forms of presentation

Dashboard is available in 3 modes, switched by click [**Toggle View**] icon in the top right corner. Available modes:





Grid View - shows instances in the table form



Postgres	s dashboard	monitor				Seconds to ne	xt refresh: 7	ALL INSTANCE	S 🔻 Toggle vie	ew:
SUMMARY FOR A	ALL INSTANCES									-
	<b>n</b>	2		2		4		0		0
	2	5	•	5				U		U
Se	ervers	Instances	Active	Instances	Activ	e Sessions	W	/aits [s/1s]	Locki	ing Waits [s/1s]
POSTGRES INST	ANCES Q Sear	ch instance								
Server Type	Machine	Instance	Active	Waits [s/1s]	IO Waits [s/1s]	Locks [s/1s]	Alerts	Sessions	Transactions	Total space [GB]
PRODUCTION DA	127.0.0.1	Nowy postgres	¥.	0.00 •	0.00 •	0.00 •	0	0	0	0
DEVELOPMENT	localhost	Postgres11	¥	0.00 •	0.00 •	0.00 •	0	1	0	0
NOT SPECIFIED	localhost	postgres_10	<b>e</b>	0.00 •	0.00 •	0.00 •	0	0	0	0
DETAILS FOR SE	ELECTED MACHINE:	LOCALHOST AND POSTGRES INSTANCE POS	TGRES_10							
Instance	Analysis				Databa	se space				=
		8		The	space used by all databas	es for currently selected inst	tance			_
Waits		7,4				7,3			7,3	
👌 Waits deta	ails							- 8		
O IO stats		0								

**Television Mode** – shows instances in the icons form with automatically switching performance indicators.

ostgres dashboard	d monitor		Seconds to next refresh	1 🔲 Full Screen	ALL INSTANCES 👻	Q Search instance	Toggle view:	
Nowy postgres	t	● postgres_10	Postgres11	t				
4 0 0 14.57.15 14.58.00 14.58.4	5 14:59:30	4 0 0 14:59:15 14:57:00 14:57:45 14:58	4 90 0 1457:15 1458:00	14.58.45 14.58.30				
Locks Active sessions Waits		Active sessions III 0 Waits Q 0 Locks I 0	Locks Active sessions Waits					

## 6.1.6 Additional functionalites

#### 6.1.6.1 Quick access to session history for queries

In the application User has the ability to quickly go to session history for a given query. In the DBPLUS Performance Monitor application, the [+] button will always appear when the Query hash query identifier is presented (after press this button a window with available actions appears). In the new version, apart from the option to go to the SQL Details screen, the option to go to session history has been added.





After pressing the button, a session history window dedicated to the given query is opened. The window always opens in the context of a given day (sysdate). The user also has the option of applying several filters available so far on the session history screen.

A quick transition to the session history screen speeds up the analysis of the performance of a given query and enables, e.g. identification of the User who performs the analyzed query.

The option of going to session history by pressing the button available on the bar above the query text has been added to the SQL Details screen.

## 6.1.6.2 Format SQL text queries

On each page where the query text is presented, a [SQL Format] button has been added, after which query text will be formatted.

Sol Stat	iments Waits Alerts												Statement	filter Ton	0 statements by I	Flansod time	
SNAPSH	OT OF SQL STATEMENTS EXECUT	ED WITHIN 15 M	ENUTES AT 202	80-83-30 85:11:31													
Q, Sea	ch statistic by sqi text, query ident	ifier in below sn	apshot table														
Database	Query text	Query Id	Plan id 🔺	Elapsed Time	IO time	Time per 1 exec	Executions	Rows processed	Number of users	Elks hit	Diks read	Diks dirtied	ERa written	Temp bika read	Temp bika written	Load	
				[1000041]	[Seconds]	[Beconds]		(Rows)		[Elocks]	[Biotka]	[Blocks]	[Blocks]	[Blocks]	[Elocis]	[9]	
condb	select this_id as id1_30_0_, t	2161876968	1611921262	0.10	0	0.0000	8 598	3 609	1	20.936	0		D	0	0		1
jira	SELECT ID, LINKTYPE, SOU	3731873393	172474093	1.47	0	0.0000	34 918	1 457 606	1	1 142 783	0		D	0	0	1	9
jra	SELECT SOURCE_NAME, SI	1573320096	19084822	0.24	0	0.0000	11 021	63 361	1	85 290	0		D	0	0		3
fra	SELECT COALESCE(sum(se.	348328801	1971115792	0.04	0	0.0137	3	3	1	393	0		0	0	0		۰.
STATEM	INT TEXT FOR QUERY ID: 3483288	01														Format SQL	~
SELECT COALE COALE COALE COALE COALE FROM	SCE (STM (seq_tup_read),#1) SCE (STM (idx_tup_fetch),#2) SCE (STM (idx_tup_red),#5) SCE (STM (n_tup_upd),#4) SCE (STM (n_tup_de1),#5) SCE (STM (n_tup_bct_upd),#6) pg_stat_user_tables	25 segress 25 idxfets 25 inserte 25 updates 25 deletes 25 hotupde	t, ih, id, t, t,														

#### 6.1.6.3 Grid manager

The ability to change settings will be introduced in stages. First part are introduced changes on the **Load Trends** and **SQL Details** pages.

The User for these tables on the pages can change for each of the columns:

- 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 press the **[cog]** icon. As before, the data contained in the grid can be freely exported to a file.



## The order of displayed columns

To change the order of columns, click on the header of the column, hold down the mouse button, drag the columns and drop them to the desired place on the table.

POSTGRE	SQL TRENDS STA	ATISTICS																Clear selection	1
Logdate	Elapsed Time	Executions	Active sessions	Biks n	Hilke Hirdard	Blks written	Temp blks written	Wait time	IO time	Lock time	Rollbacks	Tuples returned	Rows	No of temp files	Data writen to temp	Blk read time	Blk write time	Biks hit	
	[Seconds]					[Elocks]	[Elocks]	[Seconds]	[Seconds]	[Seconds]			[Rows]		[MB]	[Seconds]	[Seconds]	[Blocks]	
2020-02-28	409.030	86 827	0	0 44.0	locks] 29 689	0	28 188	0	0	0	3 751	22 097 964	455 787	37	220 MB	0	0	2 331 374	
2020-03-02	78.360	55 821	0	313	22 70	5 0	22 127	0	0	0	2 760	16 272 699	308 416	29	173 MB	0	0	1 497 210	
2020-03-03	158.780	60 155	0	344	22 25	0	21 274	0	0	0	2 974	17 803 563	310 732	28	166 MB	0	0	1 599 230	
2020-03-04	217.670	59 481	0	6 151	20 756	5 0	20 668	0	0	0	2 937	20 901 482	338 158	27	161 MB	0	0	1 796 034	
2020-03-05	151.890	63 469	0	0 1 003	23 097	r 0	22 964	1	C	0	3 087	23 357 777	352 929	30	179 MB	0	0	1 863 128	
2020-03-06	166.140	61 587	0	633	22 912	2 0	22 924	0	0	0	2 839	25 747 499	359 203	30	179 MB	0	0	1 987 850	
2020-03-09	77.110	51 877	c	9 496	21 084		20 720	0	c	0	2 574	15 619 704	279 140	27	162 MB	0	0	1 466 907	
2020-03-10	110.700	59 781	0	369	24 667	r 0	23 790	0	0	0	2 944	18 680 150	305 760	31	186 MB	0	0	1 665 009	
2020-03-11	83.500	48 204	0	0 525	20 303	s 0	19 157	0	0	0	2 397	16 038 215	260 606	25	150 MB	0	0	1 411 514	
2020-03-12	107.870	67 061	0	12 030	26 495	5 0	26 892	0	0	0	3 119	25 940 476	369 647	35	210 MB	0	0	2 059 855	

#### Visibility of columns

To hide a column, right-click on the column header to be hidden. A popup menu will open where the Hide column button should be selected. The indicated column is hidden.

POSTGRES	SQL TRENDS	STATI STIC S									
Logdate	Elapsed Time ▲	Rows	Executions	Blks hit	Blks read	Blks dirtied	Blks written	Temp blks read	Temp blks written	Wa	it time
	[Seconds]	[Rows]		[Blocks]	[Blocks]	[Block:	Blks dirtied co	lumn propertie	es	×	econds]
2020-03-09	77.11	279 140	51 877	1 466 907	496	21 (	Linite form		Blocks		0
2020-03-02	78.36	308 416	55 821	1 497 210	313	22 7	Units forma	au			0
2020-03-11	83.50	260 606	48 204	1 411 514	525	20 3	Number form	nat	tandard	*	0
2020-03-12	107.87	369 647	67 061	2 059 855	12 030	26 4	Precision		0	-	0
2020-03-10	110.70	306 760	59 781	1 665 009	369	24 6		Hide colu	m		0
2020-03-05	151.89	352 929	63 469	1 863 128	1 003	23 (	L		Ŀ		1
2020-03-03	158.78	310 732	60 155	1 599 230	344	22 2		Арріу			0
2020-03-06	166.14	359 203	61 587	1 987 850	633	22.9	12 0	22 954	22 924		0

To reveal a column, click the **[cog]** button in the upper right corner of the table. After the popup menu open, select the **[Show hidden columns]** option, then indicate the column you want to rediscover in the table. The uncovered column will appear last on the right side of the table.

POSTGRES	QL TRENDS \$1	ATISTICS														Hit	iden colurr	กร	_	Grid op	lons	_	ction 🖸	
Logdate	Elapsed Time ▲	Rows	Blks hit	Blks dirtied	Temp blks read	Temp blks written	IO time	Active sessions	Sessions	Connectio	Commits	Rollbacks	Tuples returned	Tuples fetched	Tuples inserted	Tup upda		5 <b>b</b>		Show	idden colur	nns	Blk write time	1
	[Seconds]	[Rows]	[Blocks]	[Blocks]	[Blocks]	[Blocks]	[Seconds]													Shi			[Seconds]	1
2020-03-09	77.11	279 140	1 466 907	21 084	20 747	20 720	0	0	10	221	34 014	2 574	15 619	1 695 148	23 612									0
2020-03-02	78.36	308 416	1 497 210	22 705	22 156	22 127	0	0	1	255	36 694	2 760	16 272	1 680 252	25 262	10 +	Lock time		_	Restor			1.1.1	0
2020-03-11	83.50	260 606	1 411 514	20 303	19 182	19 157	0	0	10	205	31 745	2 397	16 038	1 369 643	21 825	9 2 3	21 418	0	25	Export				0
2020-03-12	107.87	369 647	2 059 855	26 495	26 927	26 892	0		10	292	43 992	3 119	25 940	2 164 687	29 605	12 373	3 24 629	0	35	Export				0
2020-03-10	110.70	306 760	1 665 009	24 667	23 821	23 790	0	0	10	257	39 351	2 944	18 680	1 594 995	26 992	11 49	5 13 382	0	31	186 ME	(	) O		0
2020-03-05	151.89	352 929	1 863 128	23 097	22 994	22 964	0	0	16	421	41 915	3 087	23 357	1 867 391	28 029	11 35	3 20 597	0	30	179 ME		> 0		0
2020-03-03	158.78	310 732	1 599 230	22 259	21 302	21 274	0	0	1;	278	39 813	2 974	17 803	1 414 794	27 081	11 20	12 110	0	28	166 ME		0 0		0
2020-03-06	166.14	359 203	1 987 850	22 912	22 954	22 924	0	0	14	359	41 954	2 839	25 747	2 045 668	25 653	10 32	21 641	0	30	179 ME		0 0		0
2020-03-04	217.67	338 158	1 795 034	20 756	20 695	20 668	0		1	377	41 7 16	2 937	20 901	1 660 824	23 435	9 5 1	19 064	0	27	161 ME		0 0		6

## Change of data format / precision

To change the data format settings, precision, right-click on the column heading where you want to change the data. After making changes, save the changes by click **[Apply]** button.

POSTGRES	SQL TREM	IDS STATISTICS																
Logdate	Elapse Time	d Rows	Blks hit	Blks dirtied •	Temp blks read	Temp blks written	IO time	Active sessions	Sessions	Connecti	Commits	Rollbacks	Tuples returned	Tuples fetched	Tuples inserted	Tuples updated	Tuples deleted	Conflicts
	[Secon	Elapsed Time co	lumn propertie:	s X	[Blocks]	[Blocks]	[Seconds]											
2020-03-02	4		Soci	onde –	•	0	0	C	1	87	10 974	47	893 425	46 707	0	0	0	0
2020-03-03	5	Time format	Jec	01103 +	0	0	0	C	1	94	10 642	51	908 387	47 850	0	0	0	0
2020-03-04	6	Number format	Stan	idard 👻	0	0	0	0	2	122	11 043	67	909 159	48 982	0	0	0	0
2020-03-05	6	Precision	4	4 -	0	0	0	C	2	108	11 673	68	965 965	55 008	0	0	0	0
2020-03-06	5		Uido oolum		0	0	0	0	1	90	11 349	62	943 042	53 902	0	0	0	0
2020-03-09	5	_	Hide Colum		0	0	0	C	1	81	10 212	44	831 409	43 034	0	0	0	0
2020-03-10	7	Restore d	efaults	Apply	0	0	0	0	1	93	11 712	48	949 987	49 221	0	0	0	0
2020-03-11	52	2.77 13 902	17 053	0	0	0	0	C	1	75	9 442	40	765 231	39 834	0	0	0	0
2020-03-12	71	1.77 19 490	20 008	0	0	0	0	0	1	105	13 232	61	1 085 776	57 771	0	0	0	0
2020-03-13	21	1.96 6.680	6 982	0	0	0	0	C	1	36	4 524	23	368 729	19 262	0	0	0	0
2020-03-16	33	3.76 8 902	9 152	0	0	0	0	0	1	48	6 038	28	494 780	26 137	0	0	0	0

## Change of width

To change the column width, click the column edge, hold and move it to the right or left to change the width. The current solution used in the DBPLUS application adjusts the width of the columns to the width of the screen. Therefore, with many columns in the table, the width of the columns will always be converted in proportion to the width of the screen.

POSTGRES	QL TRENDS STA	TISTIC S					_													Clear sel	lection	0
Logdate	Elapsed Time	Rows	Biks hit	Blks dirtied	Temp blks read	Temp blks written	•[•		Sessions	Tuples	Tuple update	d Tuple	s Conflic	ts No of tem files	p Data writer to temp	Deadlocks	Blk read tim	e Bik write time	Exect	utions with	Biks ritten	
	[Seconds]	[Rows]	[Blocks]	[Blocks]	[Blocks]	[Blocks]		Selond	4						(ME)		[Seconds]	[Seconds]		- P	[Blocks]	
2020-03-02	49.93	16 120	16 510	0	0		-	•	1	0	(	) (	0 0	0	0	0	0	0	8	109	0	
2020-03-03	55.78	15 605	17 161	0	0		0	0	1	0	(	) (	0 0	0	0	0	0	0	7	342	0	
2020-03-04	69.25	18 808	48 363	0	0		0	0	2	0	(	) (	0 0	0	0	0	0	0	8	305	0	
2020-03-05	63.48	18 113	27 936	i 0	0		0	0	2	0	(	) (	0 0	0	0	0	0	0	8	568	0	
2020-03-05	55.19	16 672	17 567	0	0		0	0	1	0	(	) (	0 0	0	0	0	0	0	8	379	0	
2020-03-09	52.05	15 005	15 398	0	0		0	0	1	0	(	) (	0	0	0	0	0	0	7	547	0	
2020-03-10	72.16	17 223	17 570	0	0		0	0	1	0	(	) (	0 0	0	0	0	0	0	8	563	0	
2020-03-11	52.77	13 902	17 053	0	0		0	0	1	0	(	) (	0 0	0	0	0	0	0	8	304	0	
2020-03-12	71.77	19 490	20 008	. 0	0		0	0	1	0	(	) (	0 0	0	0	0	0	0	9	316	0	
2020-03-13	21.96	6 680	6 982	. 0	0		0	0	1	0	(	) (	0	0	0	0	0	0	3	362	0	

## Storage of table configurations

The configuration for each of the tables is saved in two ways: at the browser cache level on the user's computer or in the repository database.

In order to permanently save the settings to the repository database, Windows authorization must be enabled in the DBPLUS Performance Monitor application (enabled at the Configuration Wizard level), and the Security module (Menu Configuration> Setings: Security "ON") must be started. The settings are saved for all monitored instances for each user separately.

## **Restore default settings**

If User need to return to the default settings, they can do this by click the cog button and select **[Restore grid defaults]**.

SQL S	TATISTICS											G	Grid options	10
	Date	Plan Id	Elapsed Time -	Biks read time	Biks write time	Executions	Blks hit	Biks read	Biks dirtied	Blks written	Rows per 1 Exec	Biks hit per 1 Exec	Show hidden columns	
			[Seconds]	[Seconds]	[Seconds]		[Blocks]	[Blocks]	[Blocks]	[Blooks]	[Rows]	[Blocks]	Show summary row	
2020-0	3-16 10:09:01	2626426938	2.9	. c	0	60	60	0	0	0	1.00	1.00	Restore grid defaults	9 î
2020-0	3-16 10:39:21	2626426938	2.8	c	0	60	60	0	0	0	1.00	1.00	Event and	н –
2020-0	3-16 10:24:11	2626426938	2.6	c	0	60	60	0	0	0	1.00	1.00	Export give	50
2020-0	3-16 13:10:11	2626426938	2.4	0	0	59	59	0	0	0	1.00	1.00	Export grid with formatted data	59 🗸

At any time, the User can restore the default setting for a given column by click on **the [Restore defaults]** button for a given column.

## 6.1.6.4 Remembering settings on the screen

The function works at the level of database details (Instance Analysis) and consists in remembering the last selection / indication or filter that is selected or searched by the User on a given page in the application.

If we have a "clickable" chart presented on the page, the selected snap indication on the chart is remembered.





Remembering works only within a given database and after the analysis (exiting to Dashboard or changing the database to another one) the application returns to the default settings.

This feature is based on remembering and saving information at the user's session level. Clearing the browser cache returns to the default settings.

## 6.1.6.5 Quick access to session history for queries

In the DBPLUS Performance Monitor application, the [+] button will always appear when the Query hash query identifier is presented (after press this button a window with available actions appears). In the new version, apart from the option to go to the SQL Details screen, the option to go to session history has been added.



After pressing the button, a session history window dedicated to the given query is opened. The window always opens in the context of a given day (sysdate). The user also has the option of applying several filters available so far on the session history screen.

A quick transition to the session history screen speeds up the analysis of the performance of a given query and enables, e.g. identification of the User who performs the analyzed query.



The option of going to session history by pressing the button available on the bar above the query text has been added to the SQL Details screen.



## 6.2 *"Instance Analysis" Menu*

## 6.2.1 "Performance" Menu – Instance Analysis

Dashboard of the DBPLUS System Performance Monitor allows the user to track the performance of PostgreSQL instances, and show how it looked over the last 15 minutes or the last 24 hours. For a detailed analysis of the load at any given moment in time, and seek answers to questions like:

- Why database run slow?
- Why user had problems in the application 3 days ago at 15:48?
- Why my report performed 15 minutes?
- etc.

... Enter the module Instance Analysis and there are two options:

• On the left side of the menu, click on [Instance Analysis] shows a list of PostgreSQL instances.



Display the detail of the instance after it has been selected on the Dashboard.

DBPIUS Better performan	ce for POSTGRES		٢
Dashboard	Postgres dashboard monitor     Seconds to next refresh: 11     ALL INSTANCES	Toggle view:	
Postgres11	PHYSICAL SERVERS	↓ Expand all ↑ Co	illapse all –
Space monitor	• 127.0.0.1		
Parameters			
1 Reports	POSTGRES INSTANCES    Performing well  Varning  Overloaded  Not available  Search instance	↓ Expand all	Collapse all
<ul> <li>Servers monitor</li> </ul>	Postgres10     Postgres11		
Configuration			
Help	DETAILS FOR SELECTED MACHINE: LOCALHOST AND POSTGRES INSTANCE POSTGRES10		
Version: 2019.1.2	Instance Analysis Online Executions statistics Exercise of the state o		Ξ
	ⓒ Waits		600
	👌 Waits details 5		- 500
	( 10 stats 4		400
	Execution stats		71
	E Sessions details		300

6.2.1.1 "Instance Load" Tab

**Instance Load** is a screen that shows the load of PostgreSQL instances over time. In the Performance module, there is the option to modify the date range (unlike the Dashboard). First, user can here:



- Check the load of the instance in the wider horizon e.g. today, yesterday, a month or even 3.5 years ago,
- Look at the SQL queries / commands, which generated the load
- Asses what SQL instance did at this time i.a. if performed a lot of disk operations, whether there were locks, etc.

**Instance Load** screen consists of:

- filtration fields fields of dates by which user define the period in which they want to check- the load
- chart presents data for selected statistics,
- the load information at a given moment of time:
  - list of queries with execution statistics,
  - waits what SQL Instance was doing at the time to perform queries
  - load from the point of view of databases on instances

Chart consists of:

- Elapsed Time shows the summary time all users wait on the result of a query at a given second of time.
- Wait time total wait time of queries in a given second of time
- Wait IO time queries wait time for I/O tasks
- Lock time time the queries wait in a second
- IO read time data read time (by the queries),
- IO write time data write time (by the queries),
- Alerts the number of alerts for a given snap.



The chart is "clickable" - click on the selected part / section will refresh the bottom of the screen with information about requests and waits that generated the data load.

Data for chart of the Instance load is calculated by monitoring service DBPLUSCATCHER - a component of the DBPLUS Performance Monitor. Monitoring Service performs a few procedures examining SQL instance performance. The result of the operation of these procedures is a snapshot (snap) that is created every 15 minutes.

After click on the selected point in time, the lower part of the screen is refreshed, information about queries and waits.





## If user scroll down the screen, they get information about queries performed in a given snap:

																					_
III Instan	e Load Waits	SQL Analyz	e SQL Detai	ls Load Trend	ls Compare	Top SQL	SQL 3D	Top Day	Slow SQLs												
Sql State	ments Waits	Alerts												S	tatement	s filter:	Top 2	0 statem	ents by Elapsed tir	me 👻	
SNAPSHO	T OF SQL STATEM	IENTS EXECUT	ED WITHIN 15 N	INUTES AT 2019	02-24 11:26:54																
Q, Sear	ch statistic by sql t	ext, query ident	ifier in below sn	apshot table																	
Database	Query	lext	Query Id	Plan Id	Elapsed Time	-	IO time		Time per 1 exec	Executions	Rows processed	Number of users	Blks hit	Blks read	Blks dirtied	Blks written	Temp blks read	Temp blks written	Load		
					[Seconds]		[Seconds]		[Seconds]		[Rows]		[Blocks]	[Blocks]	[Blocks]	[Blocks]	[Blocks]	[Blocks]	[%]		
test1	delete from com	oany where id=	\$ 916570963	3002378863		405.00		0	23.8234	17	17		1 85	(	3	0	0	0		60	i
test1	update company	set name=\$1 v	2822124546	2237371182		231.00		0	17.769	13	13		1 65	(	0	0	0	0		34	
test1	select * from con	npany where ag	1081976770	2992165428		20.07		0	0.5904	4 34	27 543		1 28 417		0	0	0	0		3	
test1	select * from con	npany limit \$1	1692819300	4780478		13.76		0	0.724	19	18 786		1 242	(	0	0	0	0		2	
test1	select count(*) fr	om company	2288847016	476246813		2.04		0	0.679	3	3		1 251 424		1	0	0	0		0	
dbplus	select \$1 as dati	d, \$2 as datnan	2188545525	757239870		0.72		0	0.012	59	59		1 59	(	0	0	0	0		0	
dbplus	SELECT d.datna	me AS name,	3331111092	3400241738		0.37		0	0.366	1	10		1 41	(	0	0	0	0		0	
dbplus	update dbplus_ta	ab8 as t8 set nu	r 4139114734	2680283919		0.22		0	0.1120	2	90		1 112 623	3	102	0	0	0		0	
dbplus	select var1,num	,dat1 from dbp	u 597822173	1691200454		0.13		0	0.062	i 2	15 298		1 372	. (	1	0	0	0		0	¥
STATEME	NT TEXT FOR HAS	H VALUE: 9165	70963																		
delete :	rom company w	here id=\$1																			
EXPLAIN	PLAN FOR PLAN H	IASH: 30023788	63																		
Sho	w plan objec	ts for 30	2378863																		
-Dat	abase: testi																				
-Del	ete on company	(cost=0.43	8.45 rows=1 wi	deh=6)																	
	-Index Scan u	sing company	/_pkey on co	mpany (cost=0.	438.45 zows=	l width=6)															
L	-index Co	nor (10 = 1																			

These are 3 additional sub-tabs:

- SQL Statements,
- Waits,
- Alerts.

#### 6.2.1.1.1 SQL Statements

**SQL Statements** is the query statistics presented in the form of a table. System displays the most aggravating question for the duration of Elapsed Time by default. The method of display can be changed if user view a complete list of queries that participated in the load.

The table with queries:

Sort on any column



Search e.g. after a part of the query text

The table contains information from the pg\_stat\_statements

- Database name of the database where the query was activated,
- Query Text full text of SQL command,
- Query Id –
- Plan id an identifier of execution plan generated by DBPLUS PM,
- Elapsed Time the duration in seconds for all query executions within last 15 minutes
- IO Time time spent on reading / saving blocks
- **Time per 1 exec** duration of query for a single execution (seconds),
- Executions number of executions of the query in last 15 minutes,
- Rows processed number of rows returned by the query in last 15 minutes,
- Number of users the number of users performing queries in a given period of time,
- Blks hit number of read blocks from memory by the queries
- Biks read number of read blocks from disks by the queries
- **Blks dirtied** the number of "dirty" blocks
- Blks written the number of written blocks by the queries
- Temp blks read number of temporary blocks read by the queries,
- Temp blks written number of temporary blocks written by queries,
- Load percentage of the duration of a given query in relation to other queries during the last 15 minutes.

IMPORTANT - in PostgreSQL statistics are counted after the query. In the case of a long-time query (e.g. more than 1 hour), the information about the query will appear only in the snap in which the query has been completed and all statistics will be counted for the entire query.

In the column Query ID (each line presents statistics of the execution) shows [Plus] button

Sql Stater	nents	Waits	Alerts							
SNAPSHO	t of sql	STATEME	NTS EXECUTE	ED WITHIN 15 N	IINUTES AT 2	2019-02-24 11:	26:54			
Q Searc	h statistic	by sql text	t, query identif	fier in below sn	apshot table					
Database		Query tex	ct	Query	Id	Plan Id	Elapsed Time 👻	IO time	Time per 1 exec	
							[Seconds]	[Seconds]	[Seconds]	
test1	delete fr	om compai	ny where id=\$	916570963		3002378863	405.00	0	23.8234	
test1	update o	company se	et name= <mark>\$1</mark> w	2822124546		2237371182	231.00	0	17.7692	
test1	select *	from compa	any where age	e 1081976770		2992165428	20.07	0	0.5904	
test1	select *	from compa	any limit \$1	1692819300	+	4780478	13.76	0	0.7241	
test1	select co	ount(*) from	n company	2288847016		476246813	2.04	0	0.6790	
dbplus	select \$	1 as datid,	\$2 as datnam	2188545525	, ,	757239870	0.72	0	0.0121	
dbplus	SELECT	r d.datnam	e AS name, C	3331111092		3400241738	0.37	0	0.3660	
dbplus	update o	dbplus_tab	8 as t8 set nur	r 4139114734		2680283919	0.22	0	0.1120	
•										1

When user click on **[Plus]** it shows additional context menu, which allows for detailed analysis of a query, discussed in the **"SQL Details" section.** 



Sql State	ments	Waits	Alerts								
SNAPSHO	T OF SQL	. STATEMEI	NTS EXECUTE	ED WITHIN 15 MIN	UTES AT 3	2019-02-24 11:	26:54				
Q Searc	h statistic	by sql text	t, query identi	fier in below snap	shot table	)					
Database		Query tex	ct	Query Id		Plan Id	Elapsed Time	•	IO time	Time per 1 exec	
							[Seconds]		[Seconds]	[Seconds]	
test1	delete fr	om compa	ny where id=\$	916570963		3002378863		405.00	0	23.8234	
test1	update (	company se	et name= <mark>\$1</mark> w	2822124546		2237371182		231.00	0	17.7692	
test1	select *	from compa	any where ag	1081976770		2992165428		20.07	0	0.5904	
test1	select *	from compa	any limit \$1	1692819300	+	4780478		13.76	0	0.7241	
test1	select c	ount(*) from	n company	2288847016		Query: 169281	9300	2.04	0	0.6790	
dbplus	select \$	1 as datid,	\$2 as datnam	2188545525				0.72	0	0.0121	
dbplus	SELECT	F d.datnam	e AS name, C	3331111092				0.37	0	0.3660	
dbplus	update (	dbplus_tab	8 as t8 set nu	4139114734		2680283919		0.22	0	0.1120	
•						1					

If user select "Add to query hash list", user move a query identifier to the clipboard with a list of queries for later analysis of specific queries.

Below the slide of 4 queries added to the analysis in **SQL Details** functionality.

	Instand	e Load	Waits	SQL Analyze	SQL Details	Load Tre	ends Com	npare Top SQL	SQL 3	D Top Day	Slow SQL
Click on Query Id to × analyze Query Performance Details	Sql State	ments	Waits	Alerts	D WITHIN 15 MIN	UTES AT 20	19-02-24 11:2	26:54			
<ul> <li>Query Identifiers list</li> </ul>	Q Searc	ch statisti	c by sql te	xt, query identif	ier in below snaps	shot table					
18272832	Database		Query te	ext	Query Id		Plan Id	Flapsed Tim	•	IO time	
916570963	Database		Query a		autory ru			mapped title		10 1110	
2822124546								[Seconds]		[Seconds]	
2188545525	test1	delete f	rom compa	any where id=\$	916570963	3	3002378863		405.00		0
	test1	update	company :	set name=\$1 w	2822124546	2	2237371182		231.00		0
	test1	select *	from com	pany where age	1081976770	2	2992165428		20.07		0
	test1	select *	from com	pany limit \$1	1692819300		1700/70		13.76		0
	test1	select c	ount(*) fro	m company	2288847016		Query: 169281	19300	2.04		0
	dbplus	select \$	1 as datid	, \$2 as datnam	2188545525	V			0.72		0
	dbplus	SELEC	T d.datnar	me AS name, C	3331111092	A	dd to qu <mark>e</mark> r	y identifiers list	0.37		0
	dbplus	update	dbplus_tal	b8 as t8 set nur	4139114734	2	2680283919		0.22		0
	4	1			1						İ
	STATEME	NT TEXT	FOR HASH	H VALUE: 91657	0963						
	delete f	rom con	npany wh	ere id=\$1							

In the **SQL Statements tab**, after select a row in the table with queries is presented the full text of the query with the execution plan. Click on query will refresh

information about the content and the query plan.



STATEMENT TEXT FOR HASH VALUE: 1081976770

select \* from company where age = \$1 limit \$2

EXPLAIN PLAN FOR PLAN HASH: 2992165428

```
Show plan objects for 2992165428
Database: test1
-Limit (cost=0.42..4.28 rows=1 width=68)
-Index Scan using idx_company_age on company (cost=0.42..30795.28 rows=8001 width=68)
-Index Cond: (age = 1)
```

Available information in the (Explain plan):

- Name of the database in which the query is performed
- Algorithm of the explain plan
- List of parameters (example parameter values) used when compile the first explain plan.

In the area of the explain plan, there is a link with allows to display statement script with filled parameters

STATEMENT TEXT FOR HASH VALUE: 1081976770
<pre>select * from company where age = \$1 limit \$2</pre>
EXPLAIN PLAN FOR PLAN HASH: 2992165428
Show plan objects for 2992165428
Explain plan options
Show statement script with filled parameters
-Index Cond: (age = 1)

User click on the **Show plan objects for** ... link, user is moved to the screens that allows analysis of the objects take part in the query, i.a.:

- what tables, indexes participated in the execution of the query
- how the engine referred to the given objects
  - seek for data (seek)
  - o read full data (scan index or table)
- whether the query was performed in multithreaded mode
- what mechanism was used to download and connect "data" from objects:
  - Nested Loop



• Hash / Merge Join connection

## By click the Show Plan Objects link, user receive:

SQL TEXT				EXPLAIN PLAN		20			
update company r	et name-él where id-é2			- Detablase: testi () Detablase testi using companyjkay on company (user).411.09 rew?i usin%*12) Lindex Cond: (1d = 1)					
OBJECTS USED IN E	XPLAIN PLAN			INDEXES FOR SELECTED OBJECT PUBLIC.COMPANY					
	Туре	Schema	Object Name	Name					
TABLE		public	company	company_pkey					
INDEX		public	company_pkey	idx_company_name					
				iot_company_age					
Object columns	Details for TABLE public.comp	any				Load object properties (slower)			
	Column Type		Position	Is nullable	Unique values	Most common values			
id	integer		1	NO	-1				
name		text	2	NO	James; Paul; Mark; David; Allen; Teddy; Kim				
age integer			3	NO	819	25; 32; 27; 22; 24; 344; 23; 87; 702; 93; 248; 299; 538; 61			
address character(50)			4	YES	6	Houston ; Texas ; California ; Rich-Mond ; Norway ; South-			
salary		real	5	YES	6	10000; 20000; 65000; 85000; 15000; 45000			

In the window user has information about the query text and the explain plan. Below user can see areas:

**Objects Used in Explain Plan** – a list of all objects used by the query in the explain plan

**Indexes for selected object** – list of indexes for selected table - row selected in the "Objects Used in Explain Plan"

Area consists of 3 tabs (Load object properties checkbox selected):

- a) Object Columns a list of the individual columns of the selected object, with information: column name, data type, column id, density (the lower density, the higher selectivity of the column)
- b) Info DDL command that creates the object,
- c) **Properties** additional properties of selected object

When the explain plan is analyzed, pay attention to:

- Limit the choice of data, or of the data with the where clause and table joins
- Whether the request is with parameters or literals
- The operation the PostgreSQL engine chose to retrieve/download data
- Whether the table has appropriate indexes

## 6.2.1.1.2 Waits

**Waits** tab shows the expectations PostgreSQL instance was spending time. The data is presented in graphical and tabular form.

The graph shows the duration for each second of the selected snapshot (time 15 minutes) of each type of wait / wait that occurred at that time on the instance.



Sql Statements	Waits	Alerts									
SNAPSHOT OF W	AITS EXECU	TED WITHIN	15 MINUTES AT 2019-02-24 16:42:07								
				Waits by type	=						
Locktransaction	nid —										
OliveboliveBhi											
Client.Clientwi	ne -										
	0				1						
Q. Search by any value in below walts table											
			Name	Wait time per 1 second [Seconds]	Total wait time for snapshot [Seconds]						
Lock:transactionid				0.8250	742.459						
Client:ClientWrite				0.0025	2.226						

A table is located below the graph with columns:

- Name the name of wait
- Wait time per 1 second (sec.) Duration of wait type in seconds
- Total wait time for snapshot (sec.) the total duration of wait type in the snapshot (15 minutes)

## 6.2.1.1.3 Alerts

The next tab is **Alerts** - this tab contains performance messages for a given snapshot.

## 6.2.1.2 *"Waits" tab*

**Waits** tab shows the duration of waits, which occurred at a time for all sessions on PostgreSQL Instance. The module consists of two elements available in the sub-tabs:

- > Overview allows to review wait times at a given time or for a selected snapshot,
- Analyze gives the opportunity to analyze individual waits over time.

The Overview sub-tab shows the duration of wait time that occurred at a given time. Depend on the select the Toggle View option, data can be presented in graphic form or in the form of a table.

Waits screen in a similar way to Instance Load screen, consists of the fields:

- filtration fields fields of dates by which user define the period in which user want to become familiar with the expectations / waits of the instance
- graph presents the level of waits
- detailed information about waits in a given moment of time

The Y axis of the graph illustrates (in seconds for a given second) time of all waits that occurred during the period shown on the X-axis. X-axis of the graph shows the period waits were occurred.





## After switch the view with [Toggle view] user get:



Similar like in the screen **[Instance Load]**, **[Waits]** chart is "clickable". Click on the part of the graph (its point) will show user waits summary, appropriate for a snapshot in time.





Above chart gives information:

- **Total waits in period** what the instance does during the day (the default) or a selected period limited by dates in the filter
- Waits for selected snapshot what Instance does during the last snap

The system also allows to analyze individual Waits - the frequency, length and time of occurrence. To do this, click on the subtab **"Analyze":** 

User can analyze performance waits or all waits grouped by day, hour, snapshot. "SQL Analyze" tab.

## 6.2.1.3 "SQL Analyze" Tab

**SQL Analyze** functionality presents an additional view of Instance load. As with the **Instance Load** chart, user has a graph that shows duration of queries in the PostgreSQL Instance.

The screen consists of areas:

- Filtration fields:
  - date and time fields by which the time is determine in which users can to familiarize themselves with the instance load
- the graph shows Elapsed Time statistic,
- cumulative statistic broken down into queries that generated a specific load in a given period.
- after indicate the row in the table user have information about the text and the query plan





Graphs Y-axis shows the number of seconds for each second of duration of the query in PostgreSQL instance database.

The X-axis represents the time at which the query caused the utilization of Database' server. Differences that can show up between the load shown in the Instance Load graph, and utilization statistics of the Database' server from the operating system side, arise due to including in the chart all kinds of waits, which is not shown in the operating system. The graph shows a full picture or performances, not just time.

On the example screenshot after click the first query, user see the share in the instance load for a given period presented with an accuracy of 15 minutes of samples.

Table in **StatementsSQL** tab shows statistics for each query:

- Database name of the database where the query was activated,
- Query Text full text of SQL command,
- Query Id an identifier of a query
- Plan id an identifier of execution plan generated by DBPLUS PM,
- Elapsed Time the duration in seconds for all query executions within last 15 minutes
- IO Time time spent on reading / saving blocks
- Time per 1 exec- duration of query for a single execution (seconds),
- Executions number of executions of the query in last 15 minutes,
- Rows processed number of rows returned by the query in last 15 minutes,
- Number of users the number of users performing queries in a given period of time,
- Blks hit number of read blocks from memory by the queries
- Blks read number of read blocks from disks by the queries
- Blks dirtied the number of "dirty" blocks
- Blks written the number of written blocks by the queries
- Temp blks read number of temporary blocks read by the queries,
- Temp blks written number of temporary blocks written by queries,

**IMPORTANT: SQL** Analyze screen maintains similar functionality to the Instance Load:

- Click on a query row (not including the load graph) will display the full text of the query and its execution plan
- Next to the query identifier the [Plus] button is located, which adds a query to the clipboard with a list of queries



SQL STAT	SQL STATEMENT'S EXECUTED DURING SPECIFIED PERIOD TIME												
Q Searc	ch query statistics by sql text or qu	ery identifier in	below table										
Database	Query text	Plan Id	Elapsed Time		IO time	Time per 1 exec	Executions	Rows pro					
				[Seconds]		[Seconds]	[Seconds]		[Ro				
test1	update company set name=\$1 w	Query: 2822	124546	7 828.80	0	22.2452	1 251						
test1	delete from company where id=\$	916570963	duoij. Lott	2	7 325.87	0	21.3650	1 279					
test1	select * from company limit \$1	1692819300	View sql d	etails	1 211.67	0	0.7127	1 700					
test1	select * from company where age	1081976770	Add to que	ery identifiers list	941.81	0.36	0.5391	1 747					
test1	select count(*) from company	2288847016	476246813		281.04	0	0.5091	552					
dbplus	select \$1 as datid, \$2 as datnam	2188545525	757239870		72.68	0	0.0141	5 145					
dbplus	update dbplus_tab8 as t8 set nur	4139114734	2680283919		14.83	0.01	0.0862	172					
dbplus	select var1,num1,dat1 from dbplu	597822173	1691200454		7.24	0	0.0421	172					
STATEME	NT TEXT FOR LAST SELECTED QU	JERY ID: 282212	24546										
update c	company set name=\$1 where	id=\$2											

It is worth to note that for individual components of the screen user can change the height - this applies to i.a.: charts, data tables, query text controls, execution plan.

## 6.2.1.4 "SQL Details" Tab

**SQL Details** tab shows detailed information about the query: execution plan, whether the request has changed execution plan, the number of returner records, the number of executions etc.

This information provides the opportunity to decide whether it makes sense to optimize query and assess participation in the instance load.

In the latest version we have changed the default settings in the application related to the default chart made available on the Graph tab on the SQL Details page.

This chart presents the statistics selected in the table, broken down into explain plans. If the query is made based on several plans, each query explain plan will be marked with a different color in the table and bar in the chart. To change the chart type and return to the previous version, select a different chart type, e.g. Column.





#### SQL Details column type graph:

III Instance Load	Waits	SQL Analyze	SQL Deta	ils Load Trends	Compare Top	SQL SQL 3	D Top Day	Slow SQLs	i -								
3848703752		rom: 👘 2019	0/02/25	0:00 to: 🗐 2019/	02/25 23:59	Group by pl	lan hash						Group by	Snap 👻 🗐 Onl	ine values Refresh	Find SQL	•
STATEMENT TEL	α																
select * from	tleet * from company where id between 41 and 42 limit 43																
SQL STATISTICS	sex stavistics 🔲 Show values per t executions																
Date	Plan	ld Elapa	ed Time 👻	Blks read time	Blks write time	Execution	8	Rows	Biks hit	Biks read	Blks dirtied	Biks written	Buffer Quality	Temp blks read	Temp blks write	Elapsed Time per 1 Exec	
		[3	econds]	[Seconds]	[Seconds]			[Rows]	[Blocks]	[Elocks]	[Blocks]	[Blocks]	[9]	[Blocks]	[Blocks]	[Seconds]	
2019-02-25 07:57	:43 32364	49923	0.1	0		0	24	25 435	526	0	0	0	100.0	0	0	0.0057	^
2019-02-25 07:42	42 32364	49923	0.1	0		0	23	23 681	466	0	0	0	100.0	0	0	0.0054	
2019-02-25 09:27	47 32364	49923	0.1	0		0	22	21 524	467	0	0	(	100.0	0	0	0.0046	-
Explain plan	plan pan Graph Chart type for SQL Statement serie: Column +																
Please cl In addition	ick a colur n you can	nn to see its s click on the s	tatistics in t erie for who	he chart area le Database to ma	ike comparision I	between SQL	Statement	and Databas	e for specified colu	mn							×
								SQL	Statements in compar	ision to Instance						=	
800																	
600																	
[Jequinu] II		_						-	1.	11	.11						
200 -				h				ıŀ	111	Hı						ш	
2019-02-2	5 00:12:25			2019-02-25	02:12:30			2019-02-25 04:	12:34 Ein	10	2019-02-25 06:12:	18	2	019-02-25 08:12:44			
	Instance had for Dink ht • 50L Statement Dink ht																

"SQL Details" tab is divided into areas:

- Clipboard with a list of query IDs (hidden and developed as a result of click the green button in the left side of the screen) - the queries to the clipboard are added from screens:
  - Performance ->Instance Load
  - Performance ->SQL Analyze
  - Performance ->Top SQL
  - Performance ->SQL 3D
  - Performance ->Top Day
  - Performance ->Slow SQLs

٩
Q       Click on Query Id to       ×         analyze Query       Performance Details
<ul> <li>Query Identifiers list</li> </ul>
18272832
916570963
2822124546
2188545525
597822173
3848703752 🗸

# IMPORTANT: List of queries is remembered under proper Instance for specified User. That list can be saved to file or opened again.

- Filters area and the way to display statistics for:
  - Specified Query ID of the query
  - o Selected date range
  - Group statistic by snap, hour, day, etc.



- Navigation buttons which allow to:
  - Refresh the screen,
  - Search another query [Find SQL],
  - Show the statistic of queries in report.

III Instance Load	Waits	SQL Analyze	SQL Details	Load Trends	Compare	Top SQL	SQL 3D	Top Day	Slow SQLs		
3848703752	F	from: 💼 2019	02/25 00:00	to: 2019/	02/25 23	:59 🗹 Gr	oup by plan	hash		Group by Snap 🔹 📴 Online values Refresh Find SQL	- 9

Select checkbox **Online Values** and click the [**Refresh**] button will present statistic online for a query by information which are available in the system view *pg\_stat\_statement*.

**Online values** option allows Users to display current information about queries stored in the PostgreSQL Instance buffer. Information about queries in other tabs is presented for a 15-minut period. For this screen, data is read directly from the instance.

To check whether the query is performed now, after supply the Query Hash identifier, activate the **Online Values** checkbox and click the **[Refresh]** button to observe the value in the columns Execution, Elapsed Time. If the values change, it means that the query still executes. If the values are fixed, the query stop run.

Filter **Group by period** - shows statistics for a given query grouped according to the choice:

- No group by period selection date ranges from 1 to 20 days of the month will show summary statistics for the selected period
- **Month** shows statistic broken down by months
- **Day** shows statistics broken down by day
- **Hour** shows statistics broken down by one hour
- o Snap shows statistics broken down by snapshots periods of 15 minutes

11	Instance Lo	oad Waits	SQL Analyze	e SQL Details	Load Trend	ls Compare	e Top SQL	SQL 3D	Top Day Slo	w SQLs						
	3848703752												I Onl	ine values	efresh Fi	nd SQL
	STATEMENT	TEXT														
	select * from company where id between \$1 and \$2 limit \$3															
	SQL STATISTICS Show values per 1 executions															
	Plan Id	Database	User	Elapsed Time	Blks read time	Blks write time	Executions	Rows	Blks hit	Blks read	Blks dirtied	Blks written	Buffer Quality	Temp blks read	Temp blks write	Elapsed Time per 1 Exec
				[Seconds]	[Seconds]	[Seconds]		[Rows]	[Blocks]	[Blocks]	[Blocks]	[Blocks]	[%]	[Blocks]	[Blocks]	[Seconds]
3	236449923	test1	tester	33.1	528.5	0	9 097	9 103 24	6 184 48	5 127	0	0	99.9	0	0	0.0036
	Explain plan	Graph													3236	449923 👻
	Show g	olan objec	cts for 32	36449923												
	Databa	se: test1														
	Stanit (corro.4.).8.45 courst utilhre8)															
	0	Lindex Co	ond: ((id >=	= 1) AND (id ·	<= 1))											
_																

 Area with query text - where user can control the height of the window, i.a. convenient for longer query content

STATEMENT TEXT	
<pre>select var1,num1,dat1 from dbplus_tab_users d where d.server_id = \$1 and numd = \$2 order by dat1 desc</pre>	

Detailed statistics of performance in the form of a table (the ability to change the table height).



SQL STATISTICS	oL STATISTICS Show values per 1 executions														
Date	Plan Id	Elapsed Time	Blks read time	Blks write time	Executions	Rows	Blks hit	Blks read	Blks dirtied	Blks written	Buffer Quality	Temp blks read	Temp blks write	Elapsed Time per 1 Exec	
		[Seconds]	[Seconds]	[Seconds]		[Rows]	[Blocks]	[Blocks]	[Blocks]	[Blocks]	[%]	[Blocks]	[Blocks]	[Seconds]	
2019-02-25 00:12:25	3236449923	0.0	0	0	17	16 602	351	0	0	0	100.0	0	0	0.0020	
2019-02-25 00:27:26	3236449923	0.1	0	0	23	22 928	500	0	0	0	100.0	0	0	0.0029	
2019-02-25 00:42:27	3236449923	0.0	0	0	18	18 993	374	0	0	0	100.0	0	0	0.0024	
2019-02-25 00:57:27	3236449923	0.0	0	0	15	14 468	302	0	0	0	100.0	0	0	0.0023	
2019-02-25 01:12:27	3236449923	0.1	0	0	22	22 918	472	0	0	0	100.0	0	0	0.0028	
2019-02-25 01:27:28	3236449923	0.1	0	0	20	21 023	434	0	0	0	100.0	0	0	0.0027	

- Statistics show: Plan Id DBPLUS internal identifier of the query plan,
- Elapsed Time total time (sec) of query duration in the selected time,
- Blks read time time to read the data block
- o Blks write time time to write the data block
- o Executions the number of query executions in the selected time
- o Rows- the number of rows processed by the query in the selected time I
- Blks hit number of read blocks from memory by the queries
- Blks read number of read blocks from disks by the queries
- Blks dirtied number of dirtied blocks
- o Blks written number of written blocks by the queries
- Buffer Quality percentage of buffer usage
- Temp blks read number of temporary blocks read
- Temp blks write number of temporary blocks write
- Elapsed time per 1 Exec duration of a single query execution in the selected time.
- Explain Plan (Explain Plan tab selected).

Explain plan	Graph	323644	9923 -
Database	an objec : test1 ost=0.438	rts for 3236449923	
ig-Inde	-Index Co	<pre>sing company_pkey on company (cost=0.438.45 rows=1 width=68) ond: ((id &gt;= 1) AND (id &lt;= 1))</pre>	

 Graphic presentation (with the SQL Statement Loads tab selected) of any indicator / column from the statistics table.





## When click the **SQL Statement Load** tab, user can see the load generated by the given query (line / yellow area) against the background of the total instance load:



## Enter query ID in the field: Enter Query Id

1	Instance Load	Waits	SQL Analyze	SQL Details	Load Trends	Compare	Top SQL	SQL 3D	Top Day	Slow SQLs					
ſ	916570963	1	From: 201	9/02/24 00:00	to: 📰 2019	9/02/24 23	:59 🗹 Gi	oup by plan	hash		Group by Snap 👻	Online values	Refresh	Find SQL	

displays statistics for given query identifier with filters set.

**IMPORTANT:** If User does not know and do not has any query ID and clipboard with a list of queries is empty, they can:

- go to one of the screens (Instance Load, SQL Analyze, Top SQL, SQL 3D, Top Day), where user can search suboptimal/long-lasting query,
- click on the [Find SQL] to search for a specific query (search by its text)

#### **Explain Plan Tab**

Shows the query explain plan. If there is more than one for the query then user can click on the Compare plans checkbox, which will display two explain plans - it makes it easier to find differences between them, which in turn are highlighted in yellow:

Explain plan	Graph		Compare Plans 1305347756 - 2677408220
Database	an objec : dbplus an using x Cond:	ts for 1305347756 Øplug <u>tab opg usage</u> 1 on doplug <u>tab opg usage o menet k. 116 menet weakering</u> (server_id = 1) AND (dati > '2019-02-20 letiot47'ritiksetamp without time zonej)	<pre>Show plan objects for 2677408220  Database: dplus back for a /pre>

- In the control of the execution plan is available: Link with additional options for text and explain plan,
- Link **Show Plan Objects**, which allows analyze the explain plan.

## 6.2.1.4.1 Explain plan options

In the area of the explain plan, there is a link 💯 that allows to perform operations:



- Show statement script with filled parameters,
- Generate & Estimate plan.

Explain plan	Graph
Explain pla	an objects for 1305347756 an options
⊖ Show sta	tement script with filled parameters (cost=0.288.29 rows=1 width=632) t1 > '2019-02-25 15:04:00'::timestamp without time zone))
Generate	e & Estimate plan

III Instance I		0.01 41	001 0-1-11-	Local Treads		7	0.01 0.0	T D	010.01												
III Instance D	ad waits	SQL Analyze	SQL Details	Load Trends	Compare	TOP SQL	SQL 3D	TOP Day	SIOW SQLS												
414511336																		🗹 Onlin	e values	Refresh	Find SQL
STATEMENT	ALEMENT TEXT																				
select to_ dbplus_tab select max WHERE x.se AND x.logd	<pre>select to_nhar(c2.logdate,44) as logdate ,sum(num2) num2,sum(num3) num3 from dps]um_tabl_mine_s t1. Usgdate from dpplum_tabl_mine_s x MEMEEX .servery id = 11 MEMEEX .servery id = 12 MEX .server</pre>																				
SQL STATIST	SQL STATISTICS 🔲 Show values per 1 executions																				
Plan Id	Database	User	Elapsed Time	Blks read tim	e Biks	s write time	Execution	ons	Rows		Blks hit	Blks read		Blks dirtied	Blks written		Buffer Quality	Temp blks read	Terr	np blks write	Elapsed Time per 1 Exec
			[Seconds]	[Seconds]		[Seconds]			[Rows]		[Blocks]	[Blocks]		[Blocks]	[Blocks]		[%]	[Blocks]		[Blocks]	[Seconds]
520541563	dbplus	dbplus	1	1	43.5		)	20		201	378		5	1	0	0	98.7		0	0	0.0569
Explain plar	Graph																				520541563 👻
Databa -Databa -Databa	<pre>Show plan objects for 520541563 DEtabase: dplis @GroupAggregate (static fit is an even widdowid) @GroupAggregate (static fit is an even widdowid) @Group Rey: (to, char(fit.logater, 'YTTY-M6-DD'::text))</pre>																				
	-Sor	t Key: (to_c	char(t2.logdat	e, 'YYYY-MM-D	D'::text)	)															
		Nested Loo	D (cost=0.5716	.64 rows=1 widt	=76)																
	O-Join Filter: (2:logdet = (use(x.logdet)))     O-Joine filter: (2:logdet) = (use(x.logdet))																				
			Sort (		rows=1 wid	sh=40)															
				ort Key: (to_	char(x.lo	gdate, '''	YYYY-MM-DI	'''::te	ext))												
				-Index Only	Scan usi	ing idx_dbp	lus_tab2_	size_s_2	2 on dbplus_	tab2	_8128_8 X (cost=	0.278.29 rows=1	t wie	ith=40)	logdate < 1001	0-02	-27 00:06:271		thout -	time conell	
				index	cona: (()	server_10	- 1) AND (	roguate	- >2019-0;	6-21	05.00:3/*::t189	secamp without	CIL	we zone) AND (	Logdate < 1201	5-02	-21 03:00:37*	Wiscamp Wi	choue t	sime zone))	

By click **Show statement scripts** with filled parameters, a new T-SQL block appears in the new window:

- Reference to the database
- Parameter declarations and set their value
- Statement with replaced parameter values



Another function is Generate & Estimate plan



This is a useful function when explain plans contain badly substituted parameters or there are no substituted parameters. In this case, an error is visible in place of the query plan, e.g. incorrect query syntax.

III Instance	Load Waits	SQL Analyze	SQL Details Load 1	Frends Compare	Top SQL SQL :	3D Top Day	Slow SQLs			
414511336	3	From: 2019/02	/27 00:00 to:	2019/02/27 23	:59 🗹 Group by	plan hash				
STATEMEN	IT TEXT									
select to dbplus_ta select ma WHERE x.s AND x.log	o_char(t2.ld ab2_size_s t ax(x.logdate server_id = gdate > = \$2	ogdate,\$4) as log 22, ( 2) as logdate fro \$1 2	date ,sum(num2) : om dbplus_tab2_si:	num2,sum(num3) n ze_s x	um3 from					
SQL STATI	STICS 🗌 S	how values per 1 ex	recutions							
Date	Plan Id	Elapsed Time	Blks read time	Blks write time	Executions	Rows		Blks hit	Blks read	Blks
		[Seconds]	[Seconds]	[Seconds]		[Rows]		[Blocks]	[Blocks]	Į.
2019-02-27	0	0.0	0	C	)	1	8	28	C	)
Explain pl	lan Graph									
Data 4280	plan obje base: dbplu 3: column "	ects for 52054: s t2.logdate" must	1563 appear in the GR	COUP BY clause or	r be used in an	aggregate fu	nction, er	ror in posit:	ion: 24	

In this case, verify that the parameters used to execute the query plan is correct and that all is completed. Too correct the query plan, go to the Generate & Estimate plan. Complete the missing parameters or correct existing ones.

PLA	N GENERATOR		×
		Statement text	select to_char( <u>12,logdate</u> , \$0) as logdate ,sum( <u>num2</u> ) <u>num2</u> ,sum( <u>num3</u> ) <u>num3</u> from <u>dbplus_tab2</u> _size_s <u>t2</u> , (         select max( <u>x,logdate</u> ) as logdate from <u>dbplus_tab2</u> _size_s <u>x</u> WHERE <u>x_server_id</u> = \$1         AND <u>x_logdate</u> < \$3       group by to_char( <u>x_logdate</u> , \$4)       ) <u>x</u> where <u>12_server_id</u> = \$5 and <u>12_logdate</u> = <u>x_logdate</u> GROUP BY to_char( <u>12_logdate</u> , <u>YYYY</u> -MM- <u>DD</u> )       (x
		Database	dbplus
			Save parameter values         Generate plan         Cancel
PAI	RAMETERS		EXPLAIN PLAN
	Туре	Value	-Database: dbplus
\$0	Varchar	YYYY-MM-DD	42803: column "t2.logdate" must appear in the GROUP BY clause or be used in an aggregate fu
\$1	Number	1	
\$2	Datetime	2019-02-27 09	
\$3	Datetime	2019-02-27 09	
\$4	Varchar	-DD'	
\$5	Number		
			<

After complete the parameter list, save the changes by click the **Save parameter values** button. Then the correct plan for the given query will be generated.



III Instance L	.oad Waits	SQL Analyze	SQL Details	Load Trends	Compare	Top SQL	SQL 3D	Top Day S	ow SQLs						
414511336												🗹 On	line values	efresh Fi	nd SQL
STATEMENT	STATEMENT TEXT														
select to dbplus_tak select max WHERE x.se AND x.logo	<pre>select to_char(t2.logdate,\$4) as logdate ,sum(num2) num3 from dpplum_tab2_size_s t2, ( select max(x.logdate) as logdate from dbplum_tab2_size_s x NMERE x.server_id = \$1 AND x.logdate &gt; = \$2</pre>														
SQL STATIS	SQL STATISTICS Show values per 1 executions														
Plan Id	Database	User	Elapsed Time	Blks read time	Blks write time	Executions	Rows	Blks hit	Biks read	Blks dirtied	Blks written	Buffer Quality	Temp blks read	Temp blks write	Elapsed Time per 1 Exec
			[Seconds]	[Seconds]	[Seconds]		[Rows]	[Blocks]	[Blocks]	[Blocks]	[Blocks]	[%]	[Blocks]	[Blocks]	[Seconds]
520541563	dbplus	dbplus	1.5	178.1	0	24	23	3 4	61 1	6 11	0	96.7	0	0	0.0617
Explain pla	Explain plan Graph 520541563 *														
Show	plan obje	ets for 52	0541563												
e Group	<pre>Patabase: dbplus Database: dbplus GroupAggregate (cost=16.6516.65 row=1 width=96) Group Key: (to_chat(t2.logdate, 'YYYY-MM-DD':text)) Group Key: (to_chat(t2.logdate, 'YYYY-MM-DD':text)) Group Key: (to_chat(t2.logdate, 'YYYY-MM-DD':text)) Group Key: (to_chat(t2.logdate, 'YYYY-MM-DD':text)) Group Key: (to_chat(t2.logdate, 'YYY-MM-DD':text)) Group Key: (to_chat(t2.log</pre>														

6.2.1.4.2 Show Plan Objects functionality

The functionality of **Show Plan Objects** is available on screens where the query text and the execution plan are visible. After click the link with the same name, the window is opened:

SQL TEXT			c vMete c.retrerid = 41 and c.dst1 > 42           Schema         Object Name           public         Schema			EXPLAIN PLAN					
select * from db	oplus_tab	_cpu_usage	c where c.server_id = 41 and	c.dat1 > €2		-ottokser diplin  shoteks Econ unio diplin_tak_popursegi on diplin_tak_popursege 0 (unref.if.1.8 nort venerta) L-Index Condi ((server_id = 1) ADD (dati > '2019-02-05 15:04:00':rtimestamp without time zone))					
OBJECTS USED IN E	EXPLAIN PL	AN				INDEXES FOR SELECTED OBJECT PUBLIC.DBPLUS_TAB_CPU_USAGE_1					
	Type Schema			ma	Object Name	Name					
INDEX			public		dbplus_tab_cpu_usage_1	dbplus_tab_cpu_usage_2					
TABLE			public		dbplus_tab_cpu_usage	dbplus_tab_cpu_usage_1					
Object columns	Info	Properties	Details for INDEX public.dbplus_ta	b_cpu_usage_1			Load object properties (slower)				
		Column			Position	Unique values	Most common values				
server_id					1						
dat1					2						

By click the **Show plan objects for** ... link, user is moved to the screens that allow analyze the objects that participate in the query:

- What tables, indexes were when the query was executed?
- How the engine referred to the given objects?
- Was the query performed in multithreaded mode?
- What kind of mechanism was used to download and connect "data" from objects:
  - o Nested Loop
  - Hash/Merge Join

The window contains information about the query text and the execution plan as well as information about:



## Objects Used in Explain Plan – a list of all objects used by the query in given execution plan

**Indexes for selected object**– list of indexes for selected table - row selected in the "Objects Used in Explain Plan"

3 tabs in the area (checkbox Load object properties checked):

- a) Object Columns a list of individual columns of the selected object, along with information: column name, data type, id columns, density (the lower density - the higher selectivity of the column)
- b) **Info** DDL command create the given object,
- c) **Properties** additional properties of selected object

## 6.2.1.4.3 Searching for queries in SQL Details

In the SQL Details screen, the [Find SQL] button is available, allow the user to search for queries:

- Search a fragment of the query text,
- Find queries that change the execution plan,
- Search for queries that are active in the selected period (omitting another period)

In each case, the list of search queries contains information:

- Query Id query ID, with the [Plus] button, which allows user to add a specific ID to the list of queries
- Last execution date last day when query was made,
- Elapsed Time duration of query,
- Executions number of executions
- IO time time spent on reading / writing blocks,
- Rows processed number of returned rows,
- Blks hit number of read blocks from memory
- Blks read number of read blocks from disks
- Blks dirtied number of "dirty" blocks
- Blks written number of written blocks
- Temp blks read number of temporary blocks read by queries,
- Temp blks written number of temporary blocks written by queries,
- Query text query text.

Each tab allows user to search for queries within a certain time period. When user search for a query after a fragment of the query text, they can enter several expressions in the search field. The result will be returned in two grids:

- FIND RESULT FOR EXACT QUERY TEXT MATCHING WITH -result exactly like the typed in part,

- FIND RESULT FOR **SIMILAR** QUERY TEXT MATCHING WITH –similar result contain the phrases entered



Statomor	at by taxt											×	
Statemer	it by text	se	lect * from (	pg stat									
Plan Flip-	Flop Statemer	nts											
New statements			from:	2019/02/25	00:00 Date to	201	9/02/25	23:59 Max	. returned stater	ments: 100			
Search													
FIND RESU	LTS FOR EXACT	QUERY TEXT MA	TCHING WI	TH SELECT * FF	ROM PG_STAT								
Query Id	Last execution date	Elapsed Time [Seconds]	IO time [Seconds]	Executions	Rows processed [Rows]	Blks hit [Blocks]	Blks read [Blocks]	Blks dirtied [Blocks]	Blks written [Blocks]	Temp blks read [Blocks]	Temp blks written [Blocks]	Query te	
2828282953	2019/02/25	2.39	0	63	630	63	0	0	0	0	0	select *	
2952862856	2019/02/25	0.90	0	63	63	0	0	0	0		0	select *	
4												Þ	
FIND RESU	LTS FOR SIMILA	R QUERY TEXT M	ATCHING V	VITH SELECT%*	%FROM%PG_STAT								
Query Id	Last execution date	Elapsed Time [Seconds]	IO time [Seconds]	Executions	Rows processed [Rows]	Blks hit [Blocks]	Blks read [Blocks]	Blks dirtied [Blocks]	Blks written [Blocks]	Temp blks read [Blocks]	Temp blks written [Blocks]	Query te:	
1149331173	2019/02/25	1.92	0	80	78	207	0	0	0	0	0	select q.	
2317907690	2019/02/25	1.17	0	3 767	10 181	0	0	0	0	0	0	select ca	

With the **Plan Flip-Flop Statements** tab selected, a search for queries that have changed the plan of execution in a given period.

For queries that change the explain plan, additional information is grouped:

- Statistics with a summary for all performance plans on which the query worked,
- Slowest plan statistics summary
- Fastest plan statistics summary
- Comparison between Slowest and Fastest
- Possible time reductions for queries statistic.

Below is an example of the search results for those questions that will change the execution plan within one week:

View of the area's Total statistics, Slowest plan statistics:
## DBPLUS<sup>™</sup> better performance

Statement by text		Date from:	2010/02/18	Date to:	2010/02/25	22:50				×			
Plan Flip-Flop Stat	teme	Date Ironi.	2013/02/18		2013/02/23	23.33							
New statements									(	Search			
FIND RESULTS													
				Т	otal statistics		Slowest plan statistics						
Query Id		Query f	lext	Elapsed Time 👻	Executions	Number of plans	Plan Id	Elapsed Time	Executions	Elapsed Time Per 1 exec			
				[Seconds]				[Seconds]		[Seconds]			
4139114734	update db	plus_tab8 as t8 se	t num11 = t8.num11 + t4.nu	97.29	856	2	2979494333	11.50	98	0.1			
172827488	select coal	lesce(r_s.var1,\$2)	as var1, ss.var7 as var2, t2	72.06	3	2	2176099901	32.74	1	32.7			
1720256591	DELETE F	ROM dbplus_tab	_sessions WHERE ctid = ar	44.81	67 090	2	1018538233	43.02	60 153	0.0			
2533289700	DELETE F	ROM dbplus_tab	_cpu_usage WHERE ctid =	34.45	67 090	2	2623212990	32.97	58 526	0.0			
3169426278	DELETE F	ROM dbplus_tab	_waits WHERE ctid = any (a	26.45	67 090	2	751750294	22.52	48 512	0.0			
2122691603	insert into	dbplus_tab8 ( ser	ver_id,dat1, num1,num2,nu	8.84	855	4	4104500066	1.28	90	0.0			
1749764993	insert into	dbplus_tab8sd_da	ay (server_id, dat1, qs_num	6.14	509	2	277037531	5.97	464	0.0			
2868835096	select * fro	om dbplus_tab_cp	u_usage c where c.server_i	2.97	1 824	2	2677408220	2.84	1 687	0.0			
1504620578	select * FF	ROM dbplus_tab1	_ext t10 where t10.server_	1.63	854	2	383050935	0.28	45	0.0			
3876793342	insert into	dbplus tab17 (sna	ap id,logdate, server id,var	1.44	1 142	2	1675441822	1.04	806	0.0			

## View of the areas Fastest plan statistics, Slowest vs. Fastest, Estimation statistics.

Slowest plan	statistics			Fastest plan	statistics	Slo	west vs Fastest	Estimation statistics		
Elapsed Time	Executions	Elapsed Time Per 1 exec	Plan Id	Elapsed Time	Executions	Elapsed Time Per 1 exec	Times faster	Elapsed Time Per 1 exec difference	Elapsed Time to reduce	
[seconds]		[seconds]		[seconds]		[seconds]		[seconds]	[Seconds]	
11.50	98	0.1174	2680283919	85.78	758	0.1132	1	0.0042	0.4145	Ê
32.74	1	32.7450	1532008776	39.31	2	19.6550	2	13.0900	13.0900	
43.02	60 153	0.0007	1371767627	1.79	6 937	0.0003	3	0.0005	27.5330	
32.97	58 526	0.0006	2556213323	1.48	8 564	0.0002	3	0.0004	22.8772	
22.52	48 512	0.0005	1264340238	3.92	18 578	0.0002	2	0.0003	12.2738	
1.28	90	0.0142	1795420420	1.32	158	0.0083	2	0.0059	1.7210	
5.97	464	0.0129	681720614	0.17	45	0.0038	3	0.0090	4.1925	
2.84	1 687	0.0017	1305347756	0.14	137	0.0010	2	0.0007	1.1766	
0.28	45	0.0062	1738785768	1.35	809	0.0017	4	0.0045	0.2020	
1.04	806	0.0013	3843479467	0.40	336	0.0012	1	0.0001	0.0815	Ŧ

An important area of the **Flip-Flop Statements** plan screen is the *Statistics Estimation*. The columns **Elapsed Time to reduce**, is a calculation about the possible reduction of time for the case when the query would work to be disabled on the fastest explain plan.

Below is the result of an example search query run on a specific day (not run in earlier days) - (**New statements**). This is a particularly useful functionality to search queries after changes: upload the code of a new version of a database-based application.



Statemen	it by text		Olalamani avan	ded is period							×
Plan Flip-	Flop Statement	S	Date from	2019/02/24	00:00 Da	te to 📰 2	019/02/25	23:59 Min	. elapsed time (sec	): 100 🔺	
New stat	ements		And statement n	ot executed in the pe	eriod range						
			Date from:	2019/02/01	00:00 Da	te to: 📰 🕯	2019/02/02	23:59			Search
FIND RESU	LTS										
Query Id	Elapsed Time [Seconds]	IO time [Seconds]	Executions	Rows processed [Rows]	Blks hit [Blocks]	Biks read [Blocks]	Blks dirtied [Blocks]	Blks written [Blocks]	Temp blks read [Blocks]	Temp blks written [Blocks]	Query text
2188545525	138.68	(	9 570	9 570	9 570	0	0	0	0	0	select \$1 as datid, \$2 as

## 6.2.1.5 "Load Trends" Tab

#### Load Trends tab allows to get detailed information on trends in PostgreSQL Instance.



The page consists of three components:

- Filter with the date range and group option
- Graph presents certain indicators over time
- The table of statistics

Information displayed on the graph can be shown in groups of:

- No group by period –selection of date range
- **Month –** statistics broken for months
- Day statistics broken by day
- Hour statistics broken by one hour
- Snap statistics broken by 15 minutes

Load Trends Statistics include the information:

- Logdate represents the point in time for which the statistics are presented (i.a.: day, hour, minutes, entire period)
- Elapsed time total length of time in seconds of all queries for the selected group period
- Executions number of performances of all searches for the selected group period
- Rows- number of rows processed by all queries for the selected group period
- Blks hit number of read blocks by gueries from the memory,
- Blks read number of read blocks by queries from discs
- Blks dirtied number of "dirty" blocks
- Blks written number of blocks written by queries,
- Temp blks read number of temporary blocks read by queries,
- Temp blks written number of temporary blocks written by queries
- Wait time wait time in a selected time unit,
- IO time time of readings / writings in a selected time,



- Active sessions average of active sessions in a selected period,
- Sessions number of sessions for a given period,
- Connections number of connected users in a given period,
- Commits number of approved transactions,
- Rollbacks number of withdrawn transactions,
- Tuples returned number of rows returned by queries,
- Tuples fetched number of rows downloaded by queries,
- Tuples inserted number of rows inserted by queries
- Tuples deleted number of rows deleted by queries,
- Conflicts number of queries canceled due to conflicts with recovery.
- No of temp files number of temporary files created by queries.,
- Temp files written amount total amount of data written to temporary files by queries,
- Deadlocks number of detected deadlocks,
- Blk read time time spent reading data file blocks,
- Blk write time time spent writing data file blocks.

Click selected columns present their behavior as function of time:



Change the graph type to 'Area' results in Graph changes to the example below:





In the filter area there is a control that allows display statistics for a specific database - statistics are displayed for all databases by default.

## 6.2.1.6 "Compare" Tab

The **Compare** tab allows user to compare trends for performance statistics and compare days (Compare Days tab) or periods (Compare Periods) for specific performance parameters.

Example list of individual days:



The above chart presents the Elapsed Time statistics grouped after a snap for selected 3 days and compiled for comparison. User can choose any performance statistics described on the **Load Trends** tab.



## 6.2.1.7 "Top SQL" Tab

The **Top SQL** tab allows user to report the most-demanding queries depend on a specific performance indicator. The system can examine the most difficult queries in terms of Elapsed Time, the number of read data, the number of blocks processed from memory and reading of Temp files.

The queries are presented in the form of several graphs in descending order according to the Blk hit statistics (number of blocks read from the memory) of the selected period of time (or other selected indicator).



From the **Top SQL** screen, any query can be easily added to the **SQL Details** by click the [**Plus**] button next to the query identifier and click the options:

- SQL View details to move to the SQL Details screen and analyze specific query
- Add to query hash list to add the query to the clipboard with a list of questions for further analysis

Top sql statements					Draw bar: Biks
2288847016	Z 🚺 4139114734	2533289700	2 💼 1081976770	1720256591	3169426278
281391699	2427812712	1820844867	2974629432	3173184952	2446841853
2122691603	2609177302	2801348858	1574275923	2648385676	1504620578
🗹 🛑 3833019335	2 748174447				
2288847016 + 2 Query: 228	3847016				
View sql o	details	2019-02-26 02:11:02	2019-02-26 04:11:06	2019-02-26 06:11:10	2019-02-26 08:11:16
4139114734 Add to qu	ery identifiers list				
	2010 02 25 02 10 50	2000 00 00 00 00 00 00	2010 02 25 04 44 05	000000000000000000000000000000000000000	

Using checkboxes in the legend, user can delete individual charts from the Top SQL view:



III Instance Load Waits	SQL Analyze SQL Details Load Trend	ds Compare Top SQL SQL 3D Top Day	Slow SQLs		
Date from: 2019/02	//26 00:00 to: 2019/02/26 23:5	9			Group by Snap 👻 Refresh
			Hide additional filters		
Single chart height: 10	00px ~			Enable Axis legend	
Top sql statements					Draw bar: Biks hit 👻
☑         2288847016           ☑         281391699           ☑         2122691603           ☑         3833019335	<ul> <li>■ 41391147</li> <li>② ■ 24278127</li> <li>③ ■ 26091773</li> <li>③ ■ 26091773</li> <li>③ ■ 74817444</li> </ul>	34	8 ■ 1081976770 9 ■ 294629432 9 ■ 1574275923	<ul> <li>✓ ■ 1720256591</li> <li>✓ ■ 317316492</li> <li>✓ ■ 2648385676</li> </ul>	<ul> <li>2169426278</li> <li>2446841853</li> <li>1504620578</li> </ul>
1081976770	Biks Ht				
1720256591	2019-02-26 00:10:56	2019-02-26 02:11:02	2019-02-26 04:11:06	2019-02-26 06:11:10	2019-02-25 08:11:16
3169426278	2019-02-26 00:10:56	2019-02-26 02-11:02	2019-02-26 04.11.06	2019-02-26 06:11:10	2019-02-25 08:11:16

## 6.2.1.8 "SQL 3D" Tab

The **SQL 3D** tab contains the same functionality as in the **Top SQL** tab. The module allows user to verify the most-demanding queries depend on whether user is interested in - the execution time, the number of read data, the number of blocks processed from memory and other performance statistics.

Inquiries are presented in the form of one graph in a 3D view in decreasing order according to the duration of the query in the selected period (or another selected indicator).



The settings icon is available in the upper right corner. It allows user to control the graph. User can easily add an interesting query to the SQL Details module by click on the chart series and select options:

- View SQL Details to switch to the SQL Details screen and analyze a specific query
- Add to query hash list to add a query to the clipboard with a list of queries for further analysis





Using check boxes in the legend, user can delete individual charts from the SQL 3D view, similarly as in the **TopSQL** tab.

## 6.2.1.9 " Top Day" Tab

Top Day window allows to view top queries for Elapsed Time and track their behavior changes.



On the above slide, presented top queries in the last one week and the share of the first query impact against the load of entire instance.

#### Conclusion: optimization selected queries instance load can be reduced by 50%!!!

Table with top queries contains:

- Date the date the query was made,
- Database database where the query is performed,
- Query text
- Query Id PostgreSQL query ID,
- Elapsed Time the total execution time of the PostgreSQL query
- IO Time total IO read time,



- Time per 1 exec the time of a single query execution,
- Executions number of executions at a time
- Rows processed rows returned by the query at a particular time,
- Number of users the number of unique users that perform the given query,
- Other....

Below the table is text of the selected query. By check the query in the table, user can add statistic to chart **Instance Load** and observe changes of its influence on the overall load of the instance.

It is important to remember about the possibility of a detailed analysis of a specific query by click on the [Plus] button next to the query identifier.

#### 6.2.1.10 " Slow SQLs" Tab

The **Slow SQLs** window allows to display grouped statistics of queries at a time. An additional filter is **Min elapsed execution time**, which allows to filter out queries (below a certain value).

Below is an example that presents monthly statistics when the Elapsed Time is over 200 seconds.

III Instanc	e Load Waits SQL Analyze	SQL Details	Load Tren	ds Compare	Top SQL	SQL 3D	Top Day	Slow SQLs										
Date from:	2019/02/25 to:	2019/02/25											Mir	n elapsed	execution	n time	00	seconds Refresh
SQL STAT	EMENTS EXECUTED DURING SPE	CIFIED PERIOD	TIME															
Q, Sear	Q, Bearch statistic by query list or query lid																	
Database	Query text	Query Id	Plan Id	Elapsed Time •	•	IO time		Time per 1 exec	Executions	Rows processed	Number of users	Blks hit	Blks	Blks	Blks	Temp	Temp	Load
	(Secondel (Secondel		a	[Seconds]		Rows1		[Blocks]	[Blocks]	IBlocks1	IBlocks1	read IBlocks1	written	1961				
test1	update company set name=\$1 w	2822124546	2237371182	30 9	18.93		0	21.0907	1 466	1 466		7 330	0	117	0	0	0	
test1	delete from company where id=\$	916570963	3002378863	29 7	13.04		0	21.6252	1 374	1 374		6 870	0	123	0	0	0	
test1	select * from company limit \$1	1692819300	4780478	14	02.11		0	0.7179	1 953	1 954 749		25 126	0	0	0	0	0	
test1	select * from company where ag	1081976770	2992165428	9	72.49		0	0.5165	1 883	1 355 985		1 400 52	0	0	0	0	0	
test1	select count(*) from company	2288847016	476246813	3	95.62		0	0.6143	644	644		53 972 3	0	45	0	0	0	
STATEME	NT TEXT FOR QUERY ID: 2822124	i46																
update o	company set name=\$1 where	id=62																
EXPLAIN	PLAN FOR PLAN ID: 2237371182																	
Dat Out	<pre>Show plan objects for 2237371182 Potestasse: test: Optputs company (new=0.4.5.4.6.4 new=1 widsh=10) Sticks Scan using company (new=0.4.5.4.6 new=1 widsh=10)</pre>																	

Below the table there is the content of the query and the execution plan for the selected statistics.

Notice: remember about the possibility of a detailed analysis of a specific query by click the [Plus] button on the query.

## 6.2.2 Anomaly Monitor Menu

On the site, the user can view information about alerts that have occurred for a given instance. The browser is available from the level of the Instance Analysis> Anomaly Monitor instance.

#### 6.2.2.1.1 Reasons Analysis

The Anomaly Monitor module has been improved in the new version of the application. The method of alert detection and presentation has been modified. After enter the screen, a graph from the last 14 days is presented where a performance problem occurred. The date range can be freely modified. By default, the screen presents problems grouped by class (Analyze by Class), it is also possible to change the presentation and group them by reason of problems (Analyze Reason).





Problems on the chart are marked by colored icons (a different color for each class / reason). For further analysis, select the indicated day on which the problems occurred. After select a specific day (point on the graph) a detailed graph for a given day will be presented with an indication of the point at which performance problems occurred. Each point on the graph represents a given snap (15 minutes). By select a point on the chart, the user will receive information on statistics that have been exceeded at the moment as well as information on the cause of the problem.



In the new version, the Anomaly monitor module has been extended with problem detection, which additionally analyzes database performance at a given time and presents the result of this analysis in the form of a problem. This module is embedded in the application code and is not user configurable. The current alert mechanism works all the time independently of the detection mechanism.

_												
	PROBLEMS REPORTED IN	SPECIFIED TIME 2019-12-04 19:55:28										
	ncrease of query processing time caused by locks											
	Class	Lock										
8	Reason details & action	Following process was the multi blocker session that generated locking. Logitate: 2019-12-04 19:55:22, Sessiond: 308, Usermanne: INTERsrowing, J. Status: running, OS User: srvomsql, Program: SQLAgent - TSQL JobStep (Job 0xBH1C4134C2AF6E40A8CE6BF6FDA1C259 : Step 1), Transaction log record count: 1308317, Last Request Runtime: 1704 a, Transaction begin: 2019-12-04 19:20:33, Transaction log size: 8554 HB										
1	Additional information	Please go to Locks->Locks history module and analyze blocking cases at specified time.										
	Lock Time	Alert Type: Load Trends, The measured statistic value is 134 % higher than average . Last value: 8872 s., Reference history value: 3784 s										
	Elapsed Time	Alert Type: Load Trends, The measured statistic value is 90 % higher than average, Last value: 13564 s, Reference history value: 7140 s										

As part of defining causes of the problem in the Alerts settings menu in the "Reasons & Problems definitions" tab for a given cause of the problem, user can specify and add a detailed description of the problem with an indication of the place for detailed analysis.



Main descripti	on	Data writes time	problem caused by slow I/O response
Reason Clas	s	I/O 👻	
Details descript Hints for further ar	tion nalysis	Slow data writes menu.	problem is <u>detected</u> . For <u>detailed verification</u> , go to the I/O <u>Analyze</u> tab in the I/O Stats
Calculation Ty	ре	Based on Tren	ds
Enabled	l	2	
es & Formulas	Notification	s & Conditions	
AND OR			Add rule Add group
Trends:	Elapsed Time	•	Delete
AND	OR		Add rule Add group Delete
	IO:Single E	lock Write time	Delete
	IO:Write tin	ne 🔻	Delete

#### 6.2.2.1.2 Reasons Overwiew

As part of this tab, the application allows you to view problems in one set. We can choose the same filters as for the Reasons Analysis tab and additionally the option of marking / deselecting grouping after the Cause.

III Reasons Analysis	Reasons Overview											
Date from: 20	18/12/03 to: 2018	112/17 Show reason type 🐼 Trends 🗎 Online Using Query Hash: Enter query hash	Group by reason Refresh									
		Hide additional	filers									
Search by name Performance probler Increase of waits eve Problem - wait: PAGI Performance probler Performance probler Performance probler	Reasons list n for specified SQL Statements nfls (couse of Locks) on datable EIOLATCH_SH n for specified SQL Statements n for specified SQL Statements	Reasons selected to litter	Alerts latt Alerts selected to filter									
REASONS & ALERTS	OVERVIEW											
Logdate		Re	ason name									
	I/O/Data reads time problem	caused by slow I/O response										
	Read time	Alert Type: I/O Stat, The measured statistic value is 2.6 times higher than allowed maximum , Last value: 32871 s, Reference history value: 9204 s										
2018-12-14 14:26:23	Single MB Read time	Alert Type: I/O Stat, The measured statistic value is 64 % higher than allowed maximum , Last value: 0.0425 s	s, Reference history value: 0.0258 s									
	Elapsed Time	Alert Type: Load Trends, The measured statistic value is 5.6 times higher than average , Last value: 482.8 s, $\ensuremath{N}$	Reference history value: 72.8 s									
	I/O/Increase of query proce	using time caused by slow I/O response										
	Single MB Write time	Alert Type: I/O Stat, The measured statistic value is 3.5 times higher than allowed maximum , Last value: 0.10	00 s, Reference history value: 0.0224 s									
2018-12-14 14:26:23	Single MB Read time	Alert Type, I/O Stat, The measured statistic value is 64 % higher than allowed maximum, Last value: 0.0425 s, Reference history value: 0.0258 s										
	Cpu Time	Alert Type: Load Trends, The measured statistic value is 11 times higher than average , Last value: 437.5 s, Reference history value: 36.3 s										

Depending on the checkbox [Group by reason], alert data will be displayed in various lists:

selected

REASONS & ALERTS	REASONS & ALERTS OVERVIEW												
Logdate		Reason name											
	I/O/Data writes time probler	Data writes time problem caused by slow I/O response											
	Single Block Write time	gle Block Write time Alert Type: I/O Stat, The measured statistic value is 10.5 times higher than allowed maximum , Last value: 1.87 s, Reference history value: 0.1623 s											
	Write time	Alert Type: I/O Stat, The measured statistic value is 2.6 times higher than allowed maximum , Last value: 10137 s, Reference history value: 2849 s											
2018-12-02 06:32:14	Wait Event Time	Alert Type: Load Trends, The measured statistic value is 119 % higher than average , Wait. log file sync, Last value: 60.6 s, Reference history value: 27.6 s											
	Elapsed Time	Alert Type: Load Trends, The measured statistic value is 66 % higher than average , Last value: 1769 s, Reference history value: 1067 s											

• unselected



REASONS & ALERT	S OVERVIEW				
Logdate	Reason	Level	Alert name	Hash value	Message
2018-12-02 06:32:14	I/O/Data writes time problem caused by slow I/O response	Critical	Single Block Write time		Alert Type: I/O Stat, The measured statistic value is 10.5 times higher than allowed maximum , Last value: 1.87 s, Reference history value: 0.1623 s
2018-12-02 06:32:14	I/O/Data writes time problem caused by slow I/O response	Critical	Write time		Alert Type: I/O Stat, The measured statistic value is 2.6 times higher than allowed maximum , Last value: 10137 s, Reference history value: 2849 s
2018-12-02 06:32:14	I/O/Data writes time problem caused by slow I/O response	Critical	Wait Event Time		Alert Type: Load Trends, The measured statistic value is 119 % higher than average , Wait: log file sync, Last value: 60.6 s, Reference history value: 27.6 s
2018-12-02 06:32:14	I/O/Data writes time problem caused by slow I/O response	Warning	Elapsed Time		Alert Type: Load Trends, The measured statistic value is $66$ % higher than average , Last value: 1769 s, Reference history value: 1067 s
2018-12-02 06:32:14	I/O/Increase of query processing time caused by slow I/O response	Critical	Single Block Write time		Alert Type: I/O Stat, The measured statistic value is 10.5 times higher than allowed maximum , Last value: 1.87 s, Reference history value: 0.1623 s



## 6.2.3 "I/O Stats" Menu

The screen is accessed from the menu and is used to analyze the performance of disk components. "I/O Analyze" functionality allows to see any performance problems on disk devices, i.a. compare the performance of records and readings for individual days, hours, 15 minutes. The data is available in a collective way for the entire instance as well as broken down into individual databases.



The area is divided into:

- Filter area with date range and additional filters
  - A graph presents specific indicators
    - Table showing statistics:
    - o Reads the number of reads,
    - Read time time to read blocks,
    - Write time time to write blocks,
    - Block Read Time time to read data blocks

**Group by period** - shows statistics for a given grouped according to the choice:

- Day –
- Hour –
- **Snap** periods of 15 minutes,
- **No group by period**, the sum for the selected period for the database, data files or table space, depending on the filter used, will be shown.

**Days Compare** and **Period Compare** tabs are also available. On the tabs, user can compare data for days, or compare individual monitored periods.



## 6.2.4 "Space Monitor" Menu

The Space Monitor module allows storage analysis. Three options are provided:

- Display the current size data in the instance
- Detailed information on database (broken down by database in instance),
- The history Instance size change in table and graphical form

**IMPORTANT:** <u>Space Monitor</u> module is also accessible from the main page. This allows to analyze the space used by all/ other Instances.

## 6.2.4.1 "Instance Size" Tab

The Instance Size tab shows the current instance size (default in GB).



The page shows information about the data occupancy in the whole instance, broken down by day. There is also information on the data increment in the day, week and month perspective.

## 6.2.4.2 "Last Snap Databases Size" Tab

In the Last Snap Databases Size window, the user can check the current size of each database available in the PostgreSQL Instance.



III Instance Size	Last Snap Datab	ases Size	Databases	history																				
																				Datal	oases size in	MB -	Refr	esh
DATABASES GRA	PH																							
								Last s	nap databas	es size (sna	p date 2019-	02-26 16:58:5	6)											≡
test1 -													• Total size: 1 174,7MB											
dbplus -		_	I																					
baza testowa –																								
postgres -																								
radzio																								
cvwzag -																								
pihsvc -																								
radek																								
template1 -																								
template0 -																								
	0 50 1	100 150	200	250	300	350 4	100	450	500	550 (	ioo 6 Size in MB	50 700		750	500	850	900	950	1 000	1 050	1 100	1 150	1 200	1 250
										Tota	l size													
LAST SNAP DATA	BASES SIZE (SNAP DA	TE 2019-02-26 1	6:58:56)																					
Q. Search by da	itabase name																							
	Database name				Total size					Daily Gro	wth				Wee	kly Growth					Monthly	Growth		
test1							1 174	.7	0				0	0 0					0	0 0.3				
dbplus							166	4	11.4				11.4					6	3.7	/ 157.0				
baza testowa	testowa 7							.6					0						0					0

## 6.2.4.3 "Databases history" Tab

On the **Databases history** screen, historical data on the size of databases in the monitored instance on days are made available.



The chart area is refreshed after click the indicated line from the table below (for this case it is a dbplus database on a given PostgreSQL Instance).

Occupancy statistics can also be displayed on an hourly basis.



## 6.2.5 "Bg Writer Stats" Tab

The tab contains information available in the pg\_stat\_bgwriter view. This view has information about the *background writer* and *checkpointer* processes run in PostgreSQL.



Statistics in the table:

- Checkpoints\_timed Number of scheduled checkpoints that have been performed,
- Checkpoints\_requests Number of requested checkpoints,
- Checkpoint write time Total amount of time that has been spent in the portion of checkpoint processing where files are written to disk,
- Checkpoint sync time Total amount of time that has been spent in the portion of checkpoint process where files are synchronized to disk,
- Buffers checkpoint Number of buffers written during checkpoints
- Buffers clean Number of buffers written by the background writer
- Buffers max written clean Number of times the background writer stopped a cleaning scan because it had written too many buffers
- Buffers beckend Number of buffers written directly by a backend,
- Buffers backend fsync Number of times a backend had to execute its own fsync call (normally the background writer handles those even when the backend does its own write)
- Buffers allocation Number of buffers allocated

Attention! The data in the rows contain incremental values for a given time unit.

## 6.2.6 "Sessions" Menu

**Sessions** functionality presents information about sessions in the PostgreSQL Instances. Available tabs in the Session menu:

- Sessions online sessions in a given database displayed by filters,
- Session with transactions sessions in the transaction,
- Session history information about number of sessions in the PostgreSQL Instance
- Active Session history field allows user to search:
  - o What queries the program / user runs
  - Which users the specified query hash is run



## 6.2.6.1 "Sessions" Tab

The Session tab shows session information on the PostgreSQL Instance.

III Sessio	ns S	Session with transaction	s Sessions histor	y Active Se	ssion hist	огу									
<ul> <li>Active</li> </ul>	sessions	<ul> <li>Users only Min ela</li> </ul>	psed time: 0	sec. Pid:								All databases	• Username:	Refre	sh
							She	ow additiona	l filters						
SELECT S	ESSION (	AST REFRESHED: 14:4	6:19) Kill session												
Logon time	Pid	Transaction start	Query start	Query Id	Databas	Usernam	Status	Elapsed Time [Seconds]	Host	Applicati	Wait type	Wait		Statement	
2019-02-27	13 10632	2019-02-27 14:57:12	2019-02-27 14:57:12		dbplus	dbplus	active	0		DBPLUS			select * from pg	_stat_activity psa where 1=1 and psa.s	tate = \$
SQL															
STATEME	NT TEXT														
select *	from p	g_stat_activity p:	sa where 1=1 and	psa.state = :	\$1 and	(psa.dat	id is not	null and	d psa.u	sename i	s not null)				
EXPLAIN	PLAN														
Show	) plan abase: c	objects Bplus													
.Nes	ed Loop	Left Join (cost=1	.263.42 rows=1 wid	:h=440)											
6	Join F.	ilter: (s.datid =	d.oid)												
	e-na	Hash Cond: (u.c	id = a usesuaid)	/6)											
		-Seq Scan o	n pg authid u (cos	t=0.001.07 r	ows=7 wid	ith=68)									
		L <sub>Filter</sub>	: (rolname IS NO	F NULL)											
		-Hash (cost=:	1.251.25 rows=1 wis	ith=312)											
		-Functi	on Scan on pg_ste	at_get_activi	ty s (c	ost=0.00.	.1.25 rows-	1 width=31							

The tabular part presents information:

- Logon Time time of user log into database
- Pid user session ID,
- Transaction start transaction start date,
- Query start query start date,
- QueryID
- Database
- Username username in the SQL Instance,
- Status status of the session,
- Elapsed Time duration of the query,
- Host the name of the machine from which the log to the database took place (the parameter in the configuration file must be enabled log\_hostname = on the PostgreSQL Instance),
- Application the name of the application from which the log into the database took place,
- Wait type wait type,
- Wait wait name for the session,
- Statement query text.

Below the table there are tabs presents detailed information for the selected session: SQL command text and explain plan.

The **SQL** tab shows the SQL query text and the execution plan. The information is displayed after click on the record for the session:



SQL
STATEMENT TEXT
select * from pg_stat_activity psa where 1=1 and psa.state = \$1 and (psa.datid is not null and psa.usename is not null)
EXPLAIN PLAN
Database: dbplus Nested Loop Left Join (cost=1.263.42 rows=1 width=440)
-Hash Join (cost=1.262.37 rows=1 width=376)
Hash Cond: (u.oid = s.usesysid)
<pre>Seq Scan on pg_authid u (cost=0.001.07 rows=7 width=68)</pre>
Seq Scan on pg_database d (cost=0.001.02 rows=2 width=68)

# 6.2.6.2 The [*Kill Session*] button allows user to kill the selected session. "Session with transactions" Tab

The screen displays sessions using the log entry. The screen contains the same information about the user's session as it is visible on the screen in the **Session** tab.

## 6.2.6.3 "Session history" Tab

The tab in the form of a graph presents the number of sessions and active sessions in a given time period.



## 6.2.6.4 "Active Session history" Tab

This tab shows detailed historical information about open sessions at a specified time. The data presents three basic data sets:

- Active sessions,
- Sessions that use the log file.



III Sessions	Session with transa	ctions Sessio	ns history Ac	tive Session hist	tory								
From: 20	19/02/27 00:00 to	2019/02/2	7 23:59 Us	ing Query Id:	inter query id	Usernar	ne: Enter u	sername	Pid:			Refresh	
					Show a	dditional filters (1 filte	r(s) active)						
SESSIONS HIS	TORY										Toggle view		
	Logd	ate				Active Sessions -				Idle sessions with	transaction		
2019/02/27 13:31	1:44							4				2	
2019/02/27 10:19	9:12							4				2	
2019/02/27 01:32	2:22							4				2	
2019/02/27 01:10	D:21							4				2	
2019/02/27 13:46	6:45							3				1	-
Sessions													
Pid	Query Id	User	Statement	Database	Application	Status	Wait type	Wait	Elapsed Time [Seconds]	Query Start	Transaction Start	Blocking Pid	
6276	916570963	tester	delete from comp	test1	dbplus	active	Lock	transactionid	8	2019/02/27 01:32:14	2019/02/27 01:32:14	13244	
13244	916570963	tester	delete from comp	test1	dbplus	idle in transaction	Client	ClientRead	31	2019/02/27 01:31:51	2019/02/27 01:31:51		
18284	885422775	dbplus	insert into dbplus	dbplus	DBPLUS Perform	idle in transaction	Client	ClientRead	0	2019/02/27 01:32:22	2019/02/27 01:32:22		
12416	2288847016	tester	select count(*) fro	test1	dbplus	active			0	2019/02/27 01:32:22	2019/02/27 01:32:22		
17908	2288847016	tester	select count(*) fro	test1	dbplus	active			0	2019/02/27 01:32:22	2019/02/27 01:32:22		
3440	2288847016	tester	select count(*) fro	test1	dbplus	active			0	2019/02/27 01:32:22	2019/02/27 01:32:22		
· · · · · · · · · · · · · · · · · · ·													

The main table contains snapshots performed in 60 second intervals (default setting of the module according to the parameter available in the **Configuration** option). Each snapshot contains information:

- Number of active sessions,
- Number of sessions using log files.

Click the table record presents details for the selected snapshot in the **Sessions** tab:

- Pid user session ID,
- **QueryID** query ID,
- User username in the SQL Instance,
- Statement query text,
- Database
- Application the name of the application from which the logging into the database took place,
- **Status** status of the session,
- Wait type
- Wait wait name for the session,
- Elapsed Time duration of the query,
- Query start query start date,
- Transaction start transaction start date,
- Blocking Pid information about the identifier of the blocking session.

The application has ability to search information about the user's session using a given type of validity. User start the search by press the "Hide additional filters" button and then from the list of available waits they add the ones they want to view.

After press the Refresh button, only those sessions that wait, for a wait selected by the user from the list will be presented in the given period. At the same time, user can also select other filters, e.g. PID session ID or QueryID.



III Sessions Se	ession with trans	actions Sessi	ons history	Active Session	n history								
From: 2019/02	/27 00:00	to: 2019/02/	23:59	Using Query Id:	Enter query	rid	Username:	Enter usern	ame	Pid:			Refresh
						Hide a	ditional filters						
Client ClientWrite	Client Waits selected to intering Application:												
Sessions													
Logdate	Pid	Query Id	User	Statement	Database	Application	Status	Wait type	Wait	Elapsed Time	Query Start	Transaction Start	Blocking Pid
2019-02-27 00:00:18	13244		tester	update compar	test1	dbplus	idle in transa	Client	ClientRead	61	2019/02/26 23:59:18	2019/02/26 23:59:18	
2019-02-27 00:00:18	18284	885422775	dbplus	insert into dbpl	dbplus	DBPLUS Perfo	idle in transa	Client	ClientRead	0	2019/02/27 00:00:18	2019/02/27 00:00:18	
2019-02-27 00:01:18	18284	885422775	dbplus	insert into dbpl	dbplus	DBPLUS Perfo	idle in transa	Client	ClientRead	0	2019/02/27 00:01:18	2019/02/27 00:01:18	
2019-02-27 00:01:18	6276	916570963	tester	delete from co	test1	dbplus	idle in transa	Client	ClientRead	54	2019/02/27 00:00:25	2019/02/27 00:00:25	
2019-02-27 00:02:18	12416	2288847016	tester	select count(*)	test1	dbplus	idle in transa	Client	ClientRead	22	2019/02/27 00:01:56	2019/02/27 00:01:56	
2019-02-27 00:02:18	18284	885422775	dbplus	insert into dbpl	dbplus	DBPLUS Perfo	idle in transa	Client	ClientRead	0	2019/02/27 00:02:18	2019/02/27 00:02:18	
2019-02-27 00:02:18	13244	916570963	tester	delete from con	test1	dbplus	idle in transa	Client	ClientRead	22	2019/02/27 00:01:57	2019/02/27 00:01:57	

On the page that present the history of the session, user can also view information in the form of a graph. To do this, switch to the graph view on the website, as in the picture below.

Pid:		Refresh	
	Toggle view:		
Idle sessions with transaction			
		2	•
		2	

The data in the graph are presented for 1-minute samples. The graph presents information on active sessions and sessions in the transaction:





## 6.2.7 "Locks" Menu

The lock module consists tabs:

- Locks history allow to track blockades in time
- Online Locks allow the current block analysis on the PostgreSQL Instance
- Locked Objects show a list of objects on which locks are currently locked.

#### 6.2.7.1 "Locks history" Tab

The page contains information about the history of blockades occurring in the past. The screen consists of the areas:

- The filter bar over the date range
- A graph shows the locks in time
- Tree of blocked sessions refreshed after click on the fragment / given point of the chart
   at the top of the tree, blocking sessions are shown
  - $\circ$   $\;$  in nodes below, waiting sessions blocked by sessions in the parent node
- Details for the selected session:
  - SQL Statement for session PID:\* the content of the query performed within a given session
  - Sessions Details information on the session, i.a.: transaction open time, type of transaction, etc.

#### An example lock screen:

List of locked sessions at snapshot time: 2019-02/26 18:15:02									
Session Id: 13244 Session status: idle in transaction Wait: ClientRead Wait Type: Client Last Query Runtime: 82037,9 s	Last Start Time: 2019-02-26 18:13:39 Username: tester Program: dbplus								
Session Id: 6276 Session status: active Wait: transactionid Wait Type: Lock Last Query Runtime: 81989,9 s Last Start	Time: 2019-02-26 18:14:27 Username: tester Program: dbplus								
SQL STATEMENT FOR SESSION PID: 13244									
delete from company where id=4644866									
SESSION DETAILS									
Pid	13244								
Database	test1								
UserName	tester								
Status	idle in transaction								
Program	dbplus								
Query start	2019-02-26 18:13:39								
Transaction begin time	2019-02-26 18:13:39								
Wait	ClientRead								
Wait Type	Client								

## 6.2.7.2 "Online Locks" Tab

Online Locks tab consists of the area:

- Database filter bar (defaults block for all bases)
- List of locked sessions section list of blocked sessions.
- The section is built in the form of the tree, where:
  - At the top of the tree, block sessions are shown
    - o In nodes below, wait sessions are blocked by sessions in the parent node
- Details for the selected session:
  - SQL Statement for session PID:\* query text performed in a given session
    - Sessions Details transaction open time, transaction type, etc.



### 6.2.7.3 Locked objects Tab

The tab contains information about currently ongoing locks on open transactions on the PostgreSQL database server.

III Locks history	Online Locks Loc	cked objects										
												Refresh
List of locked of	ojects											Kill session
Q If you want to	kill blocker session,	please select specified I	ine and click on Kill s	ession button								x
Database	User	Application	Pid	Lock Type	Lock Mode	Granted	Fastpath	Relation OID	Relation name	Page	Tuple	Virtualxid
dbplusrepo	dbplusrepo	DBPLUS Performanc	28812	relation	AccessShareLock	true	true	16939	dbplus_tab4_server_9_snap			
dbplusrepo	dbplusrepo	DBPLUS Performanc	28812	relation	RowExclusiveLock	true	true	16939	dbplus_tab4_server_9_snap			
dbplusrepo	dbplusrepo	DBPLUS Performanc	28812	relation	AccessShareLock	true	true	16938	idx_dbplus_tab4_server_id			
dbplusrepp	dbplusrepo	DBPLUS Performanc	28812	relation	RowExclusiveLock	true	true	16938	idc_dbplus_tab4_server_id			
dbplusrepo	dbplusrepo	DBPLUS Performanc	28812	relation	AccessShareLock	true	true	16937	dbplus_tab4_snap_id			
dbplusrepo	dbplusrepo	DBPLUS Performanc	28812	relation	RowExclusiveLock	true	true	16937	dbplus_tab4_snap_id			
dbplusrepo	dbplusrepo	DBPLUS Performanc	28812	relation	AccessShareLock	true	true	16533	dbplus_tab4			
dbplusrepp	dbplusrepo	DBPLUS Performanc	28812	relation	RowExclusiveLock	true	true	16533	dbplus_tab4			
	dbplusrepo	DBPLUS Performanc	28812	virtuabid	ExclusiveLock	true	true					10/73232

#### 6.2.8 "Parameters" Menu

System allows to view and report changes of instances parameters and databases. Each function presents current status of parameters and their changes over time. Example screens below:

Status of parameters that contain the "host" word.

III Parameters Ov	verview Parameters His	story				
Param name	host	Param value				Refresh
PARAMETERS LIS	TS					
Par	ram name	Setting value	Unit		Category	Short description
log_hostname		on			Reporting and Logging / What to Log	Logs the host name in the connection logs.
HISTORY FOR SEL	ECTED PARAMETER					
		Date change			Setting value	
2019/02/27 15:46:48	3		0	n		
2019/02/22 15:55:14	ŧ		0	ff		

History of parameter changes shows what PostgreSQL instance parameters were changed in during a period:

III Parameters Overview Parame	eters History				
Date from: 2019/02/22 to:	2019/02/27 Param nam	Param	value		Refresh
PARAMETERS LISTS					
Param name	Setting value	Unit	Category	Short description	Date change
allow_system_table_mods	off		Developer Options	Allows modifications of the structure of s	2019/02/22 15:55:14
application_name	DBPLUS Performance Monitor		Reporting and Logging / What to Log	Sets the application name to be reported	2019/02/22 15:55:14
archive_command	(disabled)		Write-Ahead Log / Archiving	Sets the shell command that will be calle	2019/02/22 15:55:14
archive_mode	off		Write-Ahead Log / Archiving	Allows archiving of WAL files using arch	2019/02/22 15:55:14
archive_timeout	0	s	Write-Ahead Log / Archiving	Forces a switch to the next WAL file if a	2019/02/22 15:55:14
array_nulls	on		Version and Platform Compatibility / Pre	Enable input of NULL elements in arrays	2019/02/22 15:55:14
authentication_timeout	60	s	Connections and Authentication / Authentication	Sets the maximum allowed time to comp	2019/02/22 15:55:14
autovacuum	on		Autovacuum	Starts the autovacuum subprocess.	2019/02/22 15:55:14
autovacuum_analyze_scale_factor	0.1		Autovacuum	Number of tuple inserts, updates, or dele	2019/02/22 15:55:14
autovacuum_analyze_threshold	50		Autovacuum	Minimum number of tuple inserts, update	2019/02/22 15:55:14



IMPORTANT: The parameter module is also available from the main menu level after exit the Instance Analysis performance module. Then the system allows to analyze parameters for all monitored PostgreSQL instances at the same time.



## 6.2.9 "Logs" Menu

The Logs module allows the user to:

- DBPLUS procedure statistics
- Procedure Errors
- Plan Parsing log

## 6.2.9.1 Process collecting data for monitoring

In the latest version of the application, the presentation of information on the times of collecting data from monitored databases by the DBPLUSPOSTGRESCATCHER Windows service has been more detailed. This information relates to the procedure for monitoring the database at 15-minute intervals.

The data, as before, is available in the Logs tab at the detail level of the given database. From this version, by clicking on a row in the Snaps table runtime procedure, the User will receive detailed information on the next steps that make up the monitoring procedure.

🔊 Back to dashboard	Dbplus procedure statistics Proc	edure Errors SQL Server logs									
	Date from: 2020/03/29 10:	iii - iii									Refresh
	DBPLUS PROCEDURE STATISTICS										
	Snap procedure run time			Snap	details at 2020-03-29 18:06:16						
I/O Stats	Date	Work time	Status	INTERNU	AL PROCEDURES RUN TIME						
Space monitor	2020-03-29 18:06:16	, provide ,	•	Step	Step Procedure				End	Duration [Seconds]	Status
Memory	2020-03-29 17:51:01		•		1 Check last database restart		282	0-03-29 18:06:16	2020-03-29 18:06:16	0.078	• *
0 Geosium	2020-03-29 17:35:46		• •		2 Waits events statistics		202	0-03-29 18:06:16	2020-03-29 18:06:16	0.125	
2 00334410	2020-03-29 17:20:32		4 •		3 Latches statistics		202	0-03-29 18:06:16	2020-03-29 18:06:16	0.078	
Jobs	2020-03-29 17:05:17		6 •		4 Databases tiles information		202	0-03-29 10:06:16	2020-03-29 18:05:16	0.094	
Backups	2020-03-29 16:50:03		5 •		5 Database size (total, used, free space)		202	0-03-29 18:06:16	2020-03-29 18:06:16	0.094	
A Locks	2020-03-29 16:34:49		۰ ،		6 VO operation statistics				2020-03-29 18:06:16	0.094	•
	2020-03-29 16:19:35		٠ ،		7 Memory informations (buffer, procedure caches size)				2020-03-29 18:05:17	0.109	•
Parameters	2020-03-29 16:04:21		4 •		8 Query statistics (queries procedures) including sql text and plans		202	0-03-29 18:06:17	2020-03-29 18:06:17	0.578	•
O Logs	2020-03-29 15:49:07		s •		9 Merge Query statistics to day view		202	0-03-29 18:06:17	2020-03-29 18:06:17	0.016	•
C Reports	2020-03-29 15:33:53		4 •	1	0 Merge I/O operations to day view		202	0-03-29 18:06:17	2020-03-29 18:06:17	0.016	•
	2020-03-29 15:18:39		• •	1	1 Instance parameters informations		202	0-03-29 18:06:17	2020-03-29 18:06:17	0.078	• •
Westion: 2020.1.1	2020-03-29 15:03:25		6 •	DETAILS	5 FOR INTERNAL PROCEDURE: CHECK LAST DATABASE RESTART						
Login Khaborutze	2020-03-29 14:48:10		s •		Statistics	Type	Counter value	Start	End	Timer	Duration econds)
	2020-03-29 14:32:56		7 •	Read & W	rite data for: CatchinstanceRestart	Timer		2020-03-29 18:0	06:16 2020-03-29 18	06:16	0.078
	2020-03-29 14:17:42		7 •								
	2020-03-29 14:02:29		5 •								
	2020-03-29 13:47:14		5 •								
	2020-03-29 13:32:00		5 •	ERROR	LOGS FOR SELECTED STEP: CHECK LAST DATABASE RESTART						
	2020-03-29 13:16:47		5 •	• De	ste	Log mes	sage				
	Average time				No errors fou	nd					
	Min time Max time	11									
	Count snaps	71									

Then, by pointing to the step (in the Snap details table), the User receives information about the duration of the procedure and the number of rows processed (information available only for certain steps).

INTERN	AL PROCEDURES RUN TIME						
Step -	Procedure			Start	End	Duration [Seconds]	Status
	1 Check last database restart		2019-	12-23 15:39:09	2019-12-23 15:39:09	0	•
	2 Waits events statistics		2019-	12-23 15:39:09	2019-12-23 15:39:09	0.452	•
	3 Latches statistics		2019-	12-23 15:39:09	2019-12-23 15:39:10	0.140	•
	4 Operating system information		2019-	12-23 15:39:10	2019-12-23 15:39:10	0.016	•
	5 Query statistics (queries,procedures) including sql text and plans	2019-	12-23 15:39:10	2019-12-23 15:39:14	4.727	•	
	6 Database size (total, used, free space)		2019-	12-23 15:39:14	2019-12-23 15:39:14	0	•
	7 I/O operation statistics		2019-	12-23 15:39:14	2019-12-23 15:39:14	0.140	•
	8 Memory informations (SGA including shared pool, db cache size)		2019-	12-23 15:39:14	2019-12-23 15:39:15	0.328	•
	9 Merge Query statistics to day view		2019-	12-23 15:39:15	2019-12-23 15:39:16	1.279	•
	10 Merge I/O operations to day view		2019-	12-23 15:39:16	2019-12-23 15:39:16	0.078	•
	11 Parameters informations		2019-	12-23 15:39:16	2019-12-23 15:39:16	0.094	•
DETAIL	S FOR INTERNAL PROCEDURE: WAITS EVENTS STATISTICS						
	Statistics	Туре	Counter value	Start 🕶	End	Timer	Duration
Read data	3	Timer		2019-12-23 15	:39:09 2019-12-23 15	:39:09	
Write data	1	Timer		2019-12-23 15	39:09 2019-12-23 15	39:09	

Information about the status of a given snap is contained in the Status column. If the monitoring process run correctly, a green dot will be displayed in the column.



If one of the monitoring procedure steps has not been performed or has been interrupted and the step concerned is not critical, the User receives information about the reason for the interruption of the step and the status of the entire snap is presented in orange.

Procedure statistics	Procedure Errors										
Date from: 2019/12/2	3 to: 📋 2019/12/23										Refresh
DBPLUS PROCEDURE STAT	ISTICS										
Snap procedure run ti	me		Snap details at 2	019-12-23 14:06:23							
Date	Work time	Status	INTERNAL PROCEDU	RES RUN TIME							
2019-12-23 16:08:03	0	• running	Step	Procedure			Start	End		Duration [Seconds]	Status
2019-12-23 15:52:49	23.15.52.49 1 • 1 Check list database restart									0	•
2019-12-23 15:37:38	1	•	2 Waits even	ts statistics		2019-	12-23 14:05:23	2019-12-23 1	4:06:23	0.047	•
2019-12-23 15:22:23	4	•	3 Latches sta	tistics		2019-	12-23 14:05:23	2019-12-23 1	4:06:23	0.031	•
2019-12-23 15:07:09	2	•	4 Operating	system information		2019-	12-23 14:06:23	2019-12-23 1	4:06:23	0.016	
2019-12-23 14:51:56	1	•	5 Query stat	stics (queries,procedures) including sql text and plans		2019-	12-23 14:06:23	2019-12-23 1	4:06:23	0.671	
2019-12-23 14:36:43	1	•	6 Database s	itze (fotal, used, free space)		2019-	12-23 14:06:23	2019-12-23 1	4:14:45	501.122	•
2019-12-23 14:21:29	4	•	7 I/O operation	on statistics		2019-	12-23 14:14:45	2019-12-23 1	4:14:45	0.281	•
2019-12-23 14:06:23	503	•	8 Memory int	ormations (SGA including shared pool, db cache size)		2019-	19-12-23 14:14:45 2019-		4:14:45	0.125	
2019-12-23 13:51:10	1	•	9 Merge Que	ry statistics to day view		2019-	2019-12-23 14:14:45 2019-		2019-12-23 14:14:45		•
2019-12-23 13:35:56	1	•	10 Merge I/O	operations to day view		2019-	12-23 14:14:45	2019-12-23 14:14:45		0.031	•
2019-12-23 13:20:43	4	•	11 Parameters	s informations		2019-	12-23 14:14:45	2019-12-23 1	4:14:45	0.062	• •
2019-12-23 13:05:30	1	•	DETAILS FOR INTERN	IAL PROCEDURE: DATABASE SIZE (TOTAL, USED, FREE SPACE)							
2019-12-23 12:50:16	1	•		Statistics	Туре	Counter value	Start		End	Timer [5	Duration econds]
2019-12-23 12:35:03	1	•	Read data		Timer		2019-12-23 14	06:23			0
2019-12-23 12:19:49	4	•	Write data		Timer						0
2019-12-23 12:04:42	404	•	Rows processed		(	1					
2019-12-23 11:49:29	1	•									
2019-12-23 11:34:16	1	· · .	ERROR LOGS FOR SE	LECTED STEP: DATABASE SIZE (TOTAL, USED, FREE SPACE)							
2019-12-23 11:19:02	4	•	Date	Log mess	ige	10	des FROM DR		DOLID D	Alle Idlineard as	1 -1 0000111
Average time	Average time 55 . 2019-12-23 14 14.45 Enter reported in following program: StandardSnap: Catch/IODBSce. Execution for query SELECT /* ALL_ROWS Y file_d. m/(Sum(tytes),0) bytes FROM DBA_three_space GROUP BY file_d timeout-ed at DBPLU.										

If there was a problem with the connection at the time of the monitoring procedure or the problem concerned a critical step for a given procedure, the status information is written in red.

DBPLUS PROCEDURE STAT	TISTICS							
Snap procedure run t	ime		Snap details at 2	019-12-23 16:15:00				
Date	Work time + [Seconds]	Status	INTERNAL PROCEDU	RES RUN TIME				
2019-12-23 16:15:00		•	. Step	Procedure		Start	End	Duration Status (Seconds)
2019-12-23 16:00:00		•	1 No any ste	eps executed for specified snapshot				0 •
2019-12-23 15:45:00		•						
2019-12-23 15:30:00		•						
2019-12-23 15:15:00		•						
2019-12-23 15:00:00		•						
2019-12-23 14:45:00		•						
2019-12-23 14:30:00		•						
2019-12-23 14:15:00		•						
2019-12-23 14:00:00		•						
2019-12-23 13:45:00		•						
2019-12-23 13:30:00		•						
2019-12-23 13:15:00		•	DETAILS FOR INTER	AAL PROCEDURE				
2019-12-23 13:00:00		•		Statistics	Type Counter	value Start	End	Timer Duration [Seconds]
2019-12-23 12:45:00		•		Please select internal procedure				
2019-12-23 12:30:00		•						
2019-12-23 12:15:00		•						
2019-12-23 12:00:00		•						
2019-12-23 11:45:00		•	ERROR LOGS FOR S	ELECTED SNAPSHOT				
2019-12-23 11:30:00		•	Date	Log message				
Average time	0		2019-12-23 16:10:03	Error reported in following program: SessionsUndoLockSort: SnapRunnerLocks.Run. ORA-12541: TNS: No listener	r at OracleInternal.Co	nnectionPool.PoolManager	3.Get(ConnectionString	/ csWithDiffOrNewPwd,
Min time Max time	0		2019-12-23 16:10:05	Error reported in following program: Dashboard: SnapRunner.DashboardSnapQueries. ORA-12541: TNS: No listen	er at DBPLUS.Catch	er.facade.SQLFacadeDash	board.DashboardSnapC	Jueries(Boolean deleteOI
Count snaps	65		2019-12-23 16:10:34	Error reported in following program: SessionsUndoLockSort: SnapRunnerLocks.Run. ORA-12541: TNS: No listener	r at OracleInternal.Co	nnectionPool.PoolManager	3.Get(ConnectionString	csWithDiffOrNewPwd,

If the monitoring procedure is in progress, this information is visible in the status (running) field, as well as the Online steps refresh button is visible, after which the information on the monitoring procedure progress is refreshed.



Procedure statistics	Procedure Errors										
Date from: 2019/12/2	24 lo: 🗊 2019/12/24									R	efresh
DBPLUS PROCEDURE STAT	ISTICS								_		
Snap procedure run time Snap details at 2019-				tails at 2019-12-24 10:28:11 with selected currently exe	cuted step					Online steps r	efresh
Date	Work time	Status	INTERNA	INAL PROCEDURES RUN TIME							
2019-12-24 10:28:11	7	• running	. Step		Procedure			Start	End	Duration [Seconds]	Status
2019-12-24 10:12:59	35	•		Check last database restart			201	9-12-24 10:28:11 2	019-12-24 10:28:11	0	•
2019-12-24 09:57:46	72	•	2	Waits events statistics			201	9-12-24 10:28:11 2	019-12-24 10:28:16	5.444	•
2019-12-24 09:42:34	35	•	1.1	3 Latches statistics 2					019-12-24 10:28:17	0.234	•
2019-12-24 09:27:21	34	•	1	4 Operating system information					019-12-24 10:28:17	0.047	•
2019-12-24 09:12:09	33	•		5 Query statistics (queries, procedures) including sql text and plans 2019-12-3						0.858	
2019-12-24 08:56:57	61	•									
2019-12-24 08:41:42	35	•									
2019-12-24 08:26:29	45	•									
2019-12-24 08:11:16	32	•									
2019-12-24 07:56:03	65	•									
2019-12-24 07:40:51	30	•									
2019-12-24 07:25:38	34	•	DETAILS	OR INTERNAL PROCEDURE: WAITS EVENTS STATISTICS							
2019-12-24 07:10:25	31	•		Statistics		Type	Counter value	Start	End	Timer Dur	ration
2019-12-24 06:55:13	60	•	Read data			Timer		2019-12-24 10:28:11	2019-12-24 10:28	16	0
2019-12-24 06:40:00	29	•	Write data			Timer		2019-12-24 10:28:16	5 2019-12-24 10:28	16	0
2019-12-24 06:24:47	32	•	Rows proce	sed		Counter	63	2			
2019-12-24 06:09:34	38	•									
2019-12-24 05:54:21	45	•	ERRORL	GS FOR SELECTED STEP: WAITS EVENTS STATISTICS							
2019-12-24 05:39:09	84	•			Log me	68400					

In addition, all problems related to the monitoring procedure are available in the form of a list on the Procedure Errors tab.

Information on the monitoring procedure is also included in the form of a file on the application server. The file contains information about the last snap performed on a given database. The file is in the folder: C: \ ProgramData \ DBPLUS \ DPM.Postgres.Web\ Snap

Each file is marked with a digit assigned to the database when it is included in the monitoring (dbplus\_central\_servers table in the DBPLUS schema in the repository database).

🕌 Snap								
G - Computer	<ul> <li>Local Disk (C:) → ProgramDate</li> </ul>	a • DBPLUS • DPM.Orade.Web • Snap				👻 😝 Search Snap	2	
Organize 💌 🧾 Open 💌	Print New folder						)= • 🔟 😧	
🔆 Favorites	Name ^	Date modified	Туре	Size				
🧮 Desktop	1			33 KB				
🔉 Downloads	2	12/23/2019 4:24 PM	Text Document	33 KB				
🔛 Recent Places	21	12/23/2019 4:25 PM	Text Document	33 KB				
🕞 Libraries	22	/// 1 - Notepad						- 🗆 ×
Documents	82	File Edit Format View Help						
J Music	83	xml version="1.0"?					(a	
E Pictures	101	<pre><snapprocedurestatisticcolle <status="">Success</snapprocedurestatisticcolle></pre>	ctor xmins:xsc	= nttp://www.	ws.org/2001/XMLSchema"	xmins:xsi="nttp://www.w3.org	/2001/XMLSchema-in:	stance >
📑 Videos	121	<procedureslogs></procedureslogs>						
	123	<pre><shapprocedurescatistics <serverid="">0</shapprocedurescatistics></pre>						
📜 Computer	124	<status>Completed<th>tus&gt;</th><th>a la a da cara a c</th><th></th><th></th><th></th><th></th></status>	tus>	a la a da cara a c				
🚢 Local Disk (C:)	- 124	<starttime>2019-12-23T</starttime>	16:25:10.95842	8+01:00 <th>'tTime&gt;</th> <th></th> <th></th> <th></th>	'tTime>			
	125	<endtime>2019-12-23T16</endtime>	:25:10.958428+	-01:00 <th>1e&gt;</th> <th></th> <th></th> <th></th>	1e>			
🙀 Network	141	<countersstatlist></countersstatlist>	·					
	161	<includeinlog>true<th>cludeInLog&gt;</th><th></th><th></th><th></th><th></th><th></th></includeinlog>	cludeInLog>					
	181	<snapprocedurestatistic< th=""><th>xs1:type="Snap</th><th>ProcedureStat</th><th>isticCatchStandardStats</th><th>"&gt;</th><th></th><th></th></snapprocedurestatistic<>	xs1:type="Snap	ProcedureStat	isticCatchStandardStats	">		
	201	<serverid>0</serverid>	ture					
	241	<methodname>CatchWaits</methodname>	tats <th>me&gt;</th> <th></th> <th></th> <th></th> <th></th>	me>				
	281	<starttime>2019-12-23T <endtime>2019-12-23T16</endtime></starttime>	16:25:10.95842	8+01:00 <th>'tTime&gt;</th> <th></th> <th></th> <th></th>	'tTime>			
	282	<countersmeasurelist></countersmeasurelist>	.25.11.0052203	+01.00 <th>ille&gt;</th> <th></th> <th></th> <th></th>	ille>			
	202	<snapcounterbasic th="" xs<=""><th>i:type="SnapCo</th><th>ounterTimeMeas</th><th>sure"&gt;</th><th></th><th></th><th></th></snapcounterbasic>	i:type="SnapCo	ounterTimeMeas	sure">			
	203	<starttime>2019-12</starttime>	-23T16:25:10.9	58428+01:00<	/StartTime>			
	284	<endtime>2019-12-2</endtime>	3T16:25:10.974	0281+01:00 <th>IndTime&gt;</th> <th></th> <th></th> <th></th>	IndTime>			
	285	<lastendtime>2019-3</lastendtime>	12-23T16:25:10	.9740281+01:0	)0			
	286	<totalduration></totalduration>						
	287	<snapcounterbasic th="" xs<=""><th>i:type="SnapCo</th><th>unterTimeMeas</th><th>sure"&gt;</th><th></th><th></th><th></th></snapcounterbasic>	i:type="SnapCo	unterTimeMeas	sure">			
	288	<countername>Write</countername>	data <th>Name&gt;</th> <th>/startTimes</th> <th></th> <th></th> <th></th>	Name>	/startTimes			
	289	<endtime>2019-12-2</endtime>	3T16:25:11.005	2283+01:00 </th <th>indTime&gt;</th> <th></th> <th></th> <th></th>	indTime>			
	290	<firststarttime>20 <lastendtime>2019~</lastendtime></firststarttime>	19-12-23T16:25	:10.9740281+0 0052283+01:0	01:00			
	202	<totalduration></totalduration>			o of Easternan miles			
	292							
	293	<countersstatlist></countersstatlist>						
	294	<snapcounterbasic th="" xs<=""><th>i:type="SnapCo processed//Cou</th><th>unterNumber":</th><th>*</th><th></th><th></th><th></th></snapcounterbasic>	i:type="SnapCo processed//Cou	unterNumber":	*			
	301	<value>59</value>	processed (, coo	incer names				
	302							
1 1	ate modified: 12/23/2019 4:25 P	<includeinlog>true<th>cludeInLog&gt;</th><th></th><th></th><th></th><th></th><th></th></includeinlog>	cludeInLog>					
Text Document	Size: 32.2 KB	<sctread> <countername>Read da</countername></sctread>	ta <th>ie&gt;l</th> <th></th> <th></th> <th></th> <th></th>	ie>l				
		<starttime>2019-12-2</starttime>	3T16:25:10.958	428+01:00 <th>artTime&gt;</th> <th></th> <th></th> <th></th>	artTime>			
		<pre><end:1me>2019-12-23T <firststarttime>2019</firststarttime></end:1me></pre>	10:25:10.97402 -12-23T16:25:1	.0.958428+01:0	111me> )O			
		<lastendtime>2019-12</lastendtime>	-23T16:25:10.9	740281+01:00	<pre></pre>			
		<iotalburation></iotalburation>						-
		3						F /

#### 6.2.10 "Reports" Menu

> The Reports module contains the following report Performance Report

## 6.2.10.1 Performance Report

The report presents the performance of the SQL Instances in the selected time period. The report contains information about:



- Top queries operating in the database for:
  - Duration: Elapsed Time,
  - High time IO,
  - High block reads,
  - High Block Hit,
  - Number of performances.
- List of top waits

## 6.3 Space monitor Menu

**Space Monitor** module allows users to analyze the storage space on servers. The module is divided into two basic groups:

- Display the current database size,
- A history of change size in tabular and graphical form.

In this menu, user can collectively verify information on disk space usage for all instances connected to monitoring.

## 6.4 Parameters Menu

The page allows to view and report changes instance parameters and databases over time. Additional options are available in the menu on the left:

- Instance Parameters instance parameters,
- **Instance extensions** other instance extensions.

The window presents the current status of parameters and their changes over time. From this level, it is possible to view information about given parameters simultaneously for all instances connected to monitoring.

Extensions overview	Extensions overview										
SELECT SERVER				1 item set	lected	SPECIFIC FILTERS	-				
Overview	Q Search item by name			· · ·	×	Extension name					
<ul> <li>History</li> </ul>	ALL INSTANCES										
- Thoras y	PRODUCTION DATABASE					Default value					
	postgres11										
	<ul> <li>Not specified</li> </ul>	▲ Not specified									
	ePostgres				~	Refresh					
REPORTRESULTS											
Instance type	Instance	Extension name	Default version	Installed version		Comment					
Not specified	ePostgres	adminpack	2.0	2.0	admini	strative functions for PostgreSQI	ł				
Not specified	ePostgres	amcheck	1.1		function	ns for verifying relation integrity					
Not specified	ePostgres	autoinc	1.0		functio	ns for autoincrementing fields					
Not specified	ePostgres	bloom	1.0		bloom	access method - signature file ba	as				
Not specified	ePostgres	btree_gin	1.3		suppor	t for indexing common datatypes					
Not specified	ePostgres	btree_gist	1.5		suppor	t for indexing common datatypes					
HISTORY FOR SELECTED EXTENSION	1										
Date c	hange	Defau	Installed value								
2019/02/22 15:55:14		2.0	2.0								



## 6.5 Reports Menu

In this menu, the application allows user to make reports based on data from monitored servers. The "Load trends" report refers to the values of the main statistics calculated for each PostgreSQL instance. As part of this report, user can compare statistics for multiple instances at the same time.



## 6.6 Servers Monitor Menu

## 6.6.1 Application architecture

The screen of the DBPLUS Performance Monitor system is available from the main menu, i.e. **Servers monitor -> Application architecture**. The module allows user to check:

- List of monitored PostgreSQL instances,
- Monitoring service activity,
- In which instance / database there is a system repository.

PostgreSQL instances are available in the area on the left. There is information about:

- when the last snapshot for the monitored PostgreSQL instance was made
- when was the last activity of the PostgreSQL instance (connection from the monitoring service with the PostgreSQL instance).

In the middle area there is information about the current state of the DBPLUSPOSTGRESCATCHER monitoring service. There is such information as:

- Is the service run
- Last activity of the service
- Memory utilization on the machine where the monitoring service works.
- Processor usage by monitoring service.

Below the statistics user can check the historical status of the service for a given time.

On the right side there is information about the SQL instance where the DBPLUS Performance Monitor repository is located.

An example screens



Application architecture							
List of monitored instances			Monitoring service		Dbplus Performance Monitor		
Instance name	Last snapshot date	Last activity					
ePostgres	2019/02/28 14:32:45	2019/02/28 14:34:30		6			
postgres11	2019/02/28 14:32:54	2019/02/28 14:34:30	3424				
			DEBI US Bestares	Patabar	E E		
			DBFLUS Posigres (	Catcher			
		_	Service status	Running			
			Last service activity	2019-02-28 14:34:20	Repository Information		
			Machine Total Memory	16375 MB	Hostname: localhost		
			Machine Memory Usage	11178 MB	Database: dbplus User: dbplus		
			DBPLUSCATCHER Memory Usage	38 MB			
			DBPLUSCATCHER CPU Usage	0,2 %			
			Refresh View service	ce activity			
Postgres Instance is monitored     Postgres Instan	ce is disabled (to enab	le please go to Configu	e Postgres Insta	nce is not available or DBPLU	S POSTGRES Catcher service is not running		

# In the slide below is the history of the DBPLUSCATCHER service activity, after click the **[View service** activity] button:

MACHINE LO	OAD AND DBPLUS C	CATCHER	SERVICE ACTIVITY														х
Date from:	2019/02/28	to:	2019/02/28													Re	efresh
20 000																10	Ē
16 000							<u></u>		-0							- 8	4
[Byl] Atoma w 8 000	0 -				19-02- Memory •: Total •: Mem •: Mem	28 08:02:2 informatio Memory: 1 ory Used b ory Used b	3 n 16375 MB y All processes y CATCHER: 35	: 11283.9 MB .9 MB	^ - D							6	S CPU 2
4 000	0.				CPU into •: Num •: CPU I Other in •: Num	ber of CPU: Usage by Ca Iformation ber of mon	: 8 cpu's ATCHER: 0 cpu itored instance	's s: 2 database(!	0							- 2	1
0	00.00.00 01	1:00:00	02.00.00	03.00.00 04.0	0.00 05;0	00.00	06:00:00	07:00:00 time	08 00 00	09.00.00	10:00:00	11:00:00	12:00:00	13.00.00	14 00:00	0	D
			Total Memory	- Memory Used b	/ All processes	— Mem	iory Used by CA		lumber of C	ри 🌔 сри	Usage by CATC	HER - Num	ber of monitore	d instances			

#### 6.6.2 Schedules outages

After enter the tab, the user has the opportunity to view information about scheduled monitoring shutdowns. On the website, only the exclusions for the current day as well as those scheduled in the future are visible by default. User information can be viewed for all databases as well as for a specific database.

To add a new entry, click the [Add new outage] button.

Scheduled outages								
Date from: 📋 2018/11/26 to: 👘 Filter by database -								
DATABASES OUTAGES SCHEDULE Add new								
Outages information and its schedules are refreshed within 15 minutes.								
Database	Enabled	Period	Outage days	Outage hours	Reason			
FK08T	*	From 2018-11-24 to 2018-11-28	Every Sat, Sun	between 17:00 - 17:20	Outage module testing			
FK08T	1	From 2018-11-26 to 2018-11-26	Every Mon	between 14:40 - 15:00	testowe wyłączenie monitoringu			

After click, the user selects for which base he is to be switched off, and then chooses whether the shutdown is to be:



- one-time or cyclical,
- is supposed to last one or many days,
- is supposed to appear on a specific day of the week.

After select, add information about the reason for the shutdown and accept configurations. After the 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		X
Instance	ePostgres -	
Enabled	<b>e</b>	
Period setting		
Use begin date	☑ 📰 2019/02/28	
Use end date	2019/02/28	
Days patern and hours range		
Outage day(s)	🖉 Mon 🖉 Tue 🖉 Wed 🖉 Thu 🖉 Fri 🖉 Sat 🖉 Sun	
Use range by hours for specified day(s)	☑ 17:00 - 17:20	
Outage reason and description		
	OK Cancel	

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

- in Television mode a yellow mark next to the database and a description of "Monitoring Outage",
- in Icons view.

In this view the base is also marked in yellow, which means a break in monitoring. As well as the base where monitoring has been disabled, it is not included in the number of active databases.

in Grid view, the row in the table is yellow

Information about turn off is also visible on the Instance Load chart. In case the instance is excluded from monitoring, yellow vertical bars are drawn in the chart. At the moment of turning off, information about the statistics is not collected.

## 6.6.3 Scheduled works

After enter the tab, user can view information about the upcoming scheduled work. On the page, only works for the current day and those scheduled in the future are visible by default. The information can be viewed for all PostgreSQL instances. The functionality is created to present information about scheduled work that can affect the performance of the database. To add a new entry, click the **[Add new work or tag]** button.

Scheduled works & timeline tags								
Date from: 2018/11/26 tx: Filter by database All databases -								
PLANNED WORKS & TIMELINE TAGS SCHEDULE Add								
Q Planned works, timeline tags are visible on Database load, Loa	ad Trends charts for specified databases			×				
Database	Timeline	Work title	Details & Description					
FK08T	2018-11-26 10:56	Wgranie poprawek	Praca testowa					
FK08T	2018-11-26 13:20	wgranie poprawek 2	Praca testowa					



After click, user can choose for which database the planned work should be registered, and then select whether the shutdown should be:

• Single or long period

After select the scope, user can add information about the "tag title" field (visible later in the chart), and add detailed information about the planned work, then accept the configuration. After the correctly entered configuration, the new entry will be visible in the table. It must be remembered that information about scheduled work will appear on the chart when the new / next snap is generated.

WORK / TIMELINE TAG DEFINITION		X
Instance	ePostgres *	
Timeline setting		
Use period range	×	
Begin date	2019/02/28 14:39	
End date	2019/02/28 23:59	
Work / tag description		
Release 2019.1		
Wdrożenie nowego kodu aplikacji		
		1,
	OK Cancel	

Information on scheduled work is shown in the Instance Load chart in the form of points (single events) or horizontal stripes in the case of long-term work. After indicate the point / bar, the information about the scope and the topic of the planned work will be displayed. If work is planned in the future, information about the work will be visible as a point on the right side of the chart.

Additionally, from the Instance Load level user can manage implementations by click the **[Manage timeline]** button.

#### 6.6.4 Logs

On this page it is possible to suspect logs related to the operation of the DBPLUS Performance Monitor application over the period.

After entering the Logs overview tab, the User will be presented with default logs saved in the Repository database (Standard DB Log), that contain information about problems with possible monitoring.

The User will also have the option of displaying information available in the logs available locally on the application server (Local file log). Information about problems is saved there when it is not possible to save this information in the repository database.

The next log concerns information related to the application update process. This file is created during the application upgrade process (downloading the new version). We save information about changes made to the data model as well as the update process.

In addition, information about the size of the file is displayed for each file.



DBPlus Performance Mon							
Dashboard	Logs overview Deletion procedure runtime						
Instance Analysis							
Space monitor		Standard DB log					
Parameters	ERBORLOGS File stor: 0.00 MB	Local file log (used when repository is not available) Upgrade log					
the second of	Upgrade to version 2020.1.1 started at 18.03.2020 16.37.56						
U Reports							
<ul> <li>Servers monitor</li> </ul>	18.03.2020 18.37.57 - Number of statements to execute is: 12						
Application architecture	18.03.2020 18.37 57, (Execution success = True), statement: after table dbplus_central_servers add column num6 int default 0;						
Logs	3.2020 16.27:57. (Execution success = True), statement: create lable displar_parameters_stange (verif hot, server_je) int default 0 mult, ver2 loct mult )						
<ul> <li>Configuration</li> </ul>	18.03 2020 16.37.57, (Execution success = True), statement: create table deplus_snaps_bib1 ( snap_bib1, serve_id integer, logdate timestamp, id integer, num1 integer, var1 varchar(64), num2 int, dat1 timestamp, dat2 timestamp, numv numer	ric(21.3))					
C. Heb	18.03.2020 18.27 57, (Execution success = True), statement: create table depixe_snaps_tab2 ( snap.jd bigint, server_id integer, logdate timestamp, parent_jd integer, num1 integer, var1 varchan(64), dot1 timestamp, dat2 timestamp, numv numerici	(21,3))					
	18.03.2020 16.37.57, (Execution success = True), statement: create index (di_dophis_inneps_tab1_1 on dtophis_inneps_tab1_(innep_id)						
Second 2020.1.1	18.03.2020 16.37.57, (Execution success = True), statement: create index idi_dbplus_snaps_tab1_2 on dbplus_snaps_tab1 (server_id, snap_idi, kt)						
	18.03.2020 16.37.57, (Execution success = True), statement: create index ids./dbpks_snaps_tab2_1 on dbpkus_snaps_tab2_(trap_id)						
	18 03 2020 16 37 57, (Execution success = True), statement: create index ids_dbplus_inneps_fab2_2 on dbplus_snaps_tab2(server_id, snap_id, parent_id)						
	18.03.2020 16.37 57, (Execution success = True), statement ALTER TABLE dtplus_lab6s ADD COLUMN num_status integer						
	18.03.2020 16.37.57, (Execution success = Tnie), statement: TRUNCATE TABLE displas_emicg						
	18.03.2020 16.37.57, (Execution success = True), statement ALTER TABLE diplus_emiog ADD COLUMN SNAP_D bigint						
	18.03.2020 18.37.57, (Execution success = True), statement. CREATE INDEX ids_ettplus_entog_3 ON dbplus_entog_3 ON dbplus_entog_3 ON dbplus_entog.jd)						

#### 6.7 Menu Configuration

#### 6.7.1 Settings

Parameterization the DBPLUSPOSTGRESCATCHER service is available from the **Configuration-**>**Settings**. Depends on the quality of queries and the type of problems in the system, options are enabled:

- o Number of storage days for the retail history of PostgreSQL Instances performance,
- $\circ$   $\;$  The time interval between the collection of blocking samples,
- Query plans monitoring

Settings Dashboard Icon settings	Dashboard Tv Parameters								
Q List of configuration parameters. P	Q List of configuration parameters. Please click on the edit button to change parameter value.								
APPLICATION PARAMETERS									
Parameter	Value	Description							
DASHBOARD_ANIMATE_PARAMETERS	ON	Setting is valid for DPM dashboard displayed in television mode. Based on it each sql server icon can toggle/animate automatically its parameters like (server cpu, waits, sessions, etc.)	Edit						
KEEP_SNAPSHOT_HISTORY_DAYS	30	Number of days how long to keep detail statistics for sql statement executions, waits, latches, performance counters.	Edit						
LOCKING_SNAPSHOT_FREQUENCY	60	The interval time in seconds between each snapshot of locks made by DBPLUSPOSTGRESCATCHER service. The parameter can be setup separately for each instance. In a case of frequent locks, please consider lower value for LOCKING_SNAPSHOT_FREQUENCY. In a case of rarely occured locks, please use bigger value for it.	Edit						
LOGGING_MODE	ON	Parameter used for debugging mode. By default it should be set to OFF.	Edit						
MONITOR_EXPLAIN_PLANS	ON	Parameter which switch ON/OFF the module to estimate explain plans for most heavy statements run on the instance.	Edit						
PLANS_TO_GENERATE_PER_SNAP	50	Number of most heavy queries for which system will estimate explain plans - Estimation is done in every snapshot.	Edit						
SECURITY	OFF	Application can work in SECURITY mode set to ON or to OFF. It means that application uses (or doesnt use) user authentication. Setting the SECURITY to on, it requires at least one user created.	Edit						

**IMPORTANT**: The selected parameters can be set at the general level or for specific SQL instances. This applies to the parameters:

INSTANCE PARAMETERS - PLEASE SELE	CT A DATA	BASE ePostgres *	
Parameter	Value	Description	
LOCKING_SNAPSHOT_FREQUENCY	60	The interval time in seconds between each snapshot of locks made by DBPLUSPOSTGRESCATCHER service. The parameter can be setup separately for each instance. In a case of frequent locks, please consider lower value for LOCKING_SNAPSHOT_FREQUENCY. In a case of rarely occured locks, please use bigger value for it.	Edit

## 6.7.2 Instances

On the page it is possible to configure which PostgreSQL instances should be monitored. User set the instance type. The correct type set for each instance allows the user to use this group in various functions of the DBPLUS Performance Monitor, i.a.: Space Monitor, when the size of instances assigned to a given group is presented.



On the website it is also possible to set, i.a.:

- instance type assignment
- instance visibility in monitoring
- additional information how to connect the instance to the DBPLUS Performance Monitor application

View postgres instances and its connections											
INSTANCE SETTING	INSTANCE SETTINGS										
Default Instance Na	Default Instance Name Format. User@Hostname.Port *										
POSTGRES INSTAN	CE LIST				DETAILS FOR S	ELECTED INS	TANCE				
Q Search by nam	e				Basic	Conne	ction properties				
Host name	Connection name	Used instance name	Туре	Enabled							
localhost	ePostgres	ePostgres	Not Specified	<b>e</b>	Connection	name	ePostgres				
localhost	Repository instance	postgres11	PRODUCTION DATABASE	ø	Hostnamo		localbect				
					Tiostianie		localitost				
					TCP Port		5444				
					Type:		Not specified 💌				
					Instance Na format:	ime	Connection name 👻				
					Enabled:		Yes 👻				
						Sa	ve details				

#### 6.7.3 Reference lists

This tab contains the system dictionaries used in the application. Existing dictionary data can be freely modified.

Reference types management								
Q List of references list used to assign categories for postgres instances and its databases. Please click on the list from left site to see items belong to specified reference.								
REFERENCE REFERENCE LIST ITEMS								
List Name	Enter the name for new item	Add item						
Server types	Name							
	PRODUCTION DATABASE	Edit ×						
Reason class	TESTING DATABASE	Edit						
	DEVELOPMENT	Edit ×						
	TEMPORARY	Edit ×						
	OTHER	Edit ×						

### 6.7.4 Security

This tab provides the option of setting access for a user, group of users or profiles (templates - set of rights). Access is granted at the SQL Instance level and at the level of available pages in the menu.



Security - Management of application rights									
USER OBJECTS IN THE APPLICATION Add new object				DETAILS AND PRIVILEGES FO	OR SELECTED OBJECT				
Enter the object name to search			Object name ADMIN						
Name	Name Type Permissions								
ADMIN	PROFILE	Own	m	Object Type PROFIL					
DBPLUS_ADMINS_MSSQL GROUP Own		$\overline{\mathbb{III}}$	Permissions Type Use ow	sissions Type Use own permissions -					
iclabogusze USER Own									
iclimakuch	USER	Own	T 5- Functions rights Databases access		UnSelect All	Select All			
INTER SQL DBPlus GROUP Own		0 Dafault shiret minilage to functions for All databases							
				Dashboard     Kspace monitor     Harddisk sy     Kotabase sy     Kotabase sy     Kotabase sy     Kotabase sy     Kotabase sy     Kackups hi:     Kackups hi:     Kackups hi:     Kservers par     Kservers par     Kservers par     Kservers par     Kservers par     Kservers par	pace pace ints story rameters operties parameters				ŕ

In order to create a new object, for example a profile (PROFILE), click on [Add new object], then select the object type "PROFILES" and name the object.

NEW OBJECT		
Object name	ADMIN	
Object Type	PROFILE -	
	Add new object Cancel	

To assign permissions to a given object, select it from the list on the left side of the screen. After click on the object on the right side, the page with the access configuration will display.

First user needs to choose whether the permissions will be:

- own (Use own permissions).
- inherited (inherited permissions form parents).

DETAILS AND PRIVILEGES FOR SELECTED OBJECT							
Object name	DESKTOPVARTUR						
Object Type	USER 👻						
Permissions Type	Use own permissions 👻						

#### 6.7.4.1 Own permissions

When user select own permissions, they have three tabs to configure permissions:

- Function rights,
- Databases access,
- Local privileges

Functional settings allow user to give rights to pages or functionality in the application at the global level for a given user / group or profile for all sql instances. User can override these rights by granting custom permissions for a specific instance. Custom permissions can only be changed for the **Instance Analysis** 



module. Custom permission is superordinate to a given Instance in relation to functional rights. If you assign custom permissions, the (permissions overwritten) message will be displayed.

•••• Functions rights	Instances access	E Local privileges							
Q Default object privileges to functions for All instances									
<ul> <li>Dashboard</li> <li>Space monitor</li> <li>Parameters</li> <li>Instance p</li> <li>Instance q</li> <li>Reports</li> <li>Load trend</li> <li>Servers monito</li> <li>Applicatio</li> <li>Logs</li> <li>Configuration</li> <li>Settings</li> <li>Instances</li> <li>Reference</li> <li>Security</li> <li>Alert setti</li> <li>Outages s</li> <li>Timeline s</li> </ul>	parameters extensions ds r n architecture s lists ngs etting etting ettings								
⊿ I Help									
About	About								
Manual									
Instance Analys	sis								

In addition, user can restrict access to specific databases. To do this, in the **Instances access** tab, select the appropriate check boxes for a chosen Instance or select ALL\_INSTANCES. If certain bases are restricted, this will also limit the **Local privileges** tab.



## 6.7.4.2 Inherited permissions form parents

If user choose inherited rights, they can specify which profile or profiles to use for a given user or user group. Each profile contains a list of objects and access to which. Grant permissions to multiple profiles for the user will result in the entitlement for a given user being the sum of rights for selected profiles.



Profiles assigment							
9 Perr	missions to inherited from assigned profiles						
Access	Profile Name						
	ADMIN						
	ADMIN2						
	ADMIN3						

Attention! In order to enable the functionality of limited access to the application, user have to change the settings at the level of the DBPLUS Configuration Wizard> Applications settings> Applications Options> Configure. As well as change the status of the SECURITY parameter to "ON".

Dashboard	III Settings Dashboard Icon settings	Dashboard Tv Parameters			
Database Analysis	Q List of configuration parameters. F	lease click on the edit button to change para	ameter value.	x	
Space monitor	APPLICATION PARAMETERS				
Parameters	Parameter	Value	Description		
1 Reports					
<ul> <li>Servers monitor</li> </ul>	SECURITY	ON V	Application can work in SECURITY mode set to ON or to CFF. It means that application uses (or doesn't use) user authentication. Setting the SECURITY to on, it requires at least one user created.		
Configuration					
- Settings - Databases	DASHBOARD_ANIMATE_PARAMETERS	ON	Setting is valid for DPM dashboard displayed in television mode. Based on it each sql server icon can toggle/animate automatically its parameters like (server cpu, waits, sessions, etc.)	Edit	
References lists     Security	LOCKING_SNAPSHOT_FREQUENCY	300	The interval time in seconds between each inspirated of locks made by DBPLUS CATCHER service. The parameter can be setup separately for each instance. In a case of frequent locks, please consider lower value for LOCKINO_SINAPSHOT_FREQUENCY. In a case of ranny occured locks, please use bigger value for it.	Edit	

The next step is to enable the mechanism to authenticate in the application by change the SECURITY parameter in the **Configuration-> Settings option** 

## 6.7.5 Alert Settings

The alert module is available from the main menu, i.e. **Configuration-> Alert settings**. From this tab users can:

- Parameter settings related to mail i.a. data of the mail server and account from which alert messages will be sent,
- Make general module settings,
- Define alerts,
- Specify the list of alert recipients.

## 6.7.5.1 "Mail settings" Tab

For the information about an alert to be sent via email, user must configure the SMTP server settings.

As part of the configuration, users have the option to set the frequency of send information about the event, depend on the configuration it is from 1 minute to 1 hour.



Mail settings	General settings	Alerts definition	Reasons & Problems definition	Events subscription				
Q List of email configuration parameters.								
	🗹 Send ale	erts by mail						
Mail Agent Interva	once per	5 minutes		~				
SMTP Mail server	pop3-dbpl	uskonto.ogicom.pl						
Port	587							
Sender email add	iress alert@dbp	lus.pl						
	🗹 smtp au	thentication						
Username	alert@dbp	lus.pl						
Password	•••••							
	enable S	SL						
Test mail address			Q Seno	l test mail				
	Sa	ve mail settings						

## IMPORTANT: Email alerts for all instances are sent from one email account.

## 6.7.5.2 "General settings" Tab

In this tab, users can make general settings of the alert module. User has the option to configure parameters related to the alert mechanism.

DBPIUS Better performance for POSTGRES									
Dashboard	III Mail settings Gener	ral settings Alerts	definition Re	asons & Problems definition	Events subscription				
Instance Analysis									
Space monitor	than	Elapsed Time greater 200 - seconds Alerts would only be ran if the elapsed time for all sql statements would take at least seconds in duration of 15 minutes (snapshot time) than							
Parameters	History Days	🕑 Mon 🕑 Tue	🕑 Wed 🕑	Thu 🕑 Fri 🔲 Sat 🛙	3 Sun				
1 Reports		We recomend to sel	ect working days o	nly					
Servers monitor	Number of Days Back	30 A How k	ong history would b	e included in snapshot alerts c	alculation				
Configuration	III HIStory								
- Settings	STATEMENTS SETTINGS								
<ul> <li>Instances</li> <li>References lists</li> <li>Security</li> </ul>	Number of Top Queries to check	Number of Top Queries 10 + chosen by Elapsed time + How many top statements from each snapshot would be check by Alert Engine to check							
Alert settings	Number of Days Back in History	7 A How le	ong statement histo	ory would be included in snaps	hot alerts calculation				
Version:	WAIT EVENTS SETTINGS								
2015-114	Number of Top Waits to check	5							
	Number of Days Back in History	7 A How la	ong wait history wo	uld be considered in snapshot	alerts calculation				
				Save settings					

• Elapsed Time greater than – alerts will be calculated when in a given snap-time the duration for all queries exceeds 400 seconds


- **History Days** define the days of the week that will be considered when performance problems are checked.
- **Number of Days Back in History** The number of historical days based on the system will test the performance of the current day.

Statements Settings:

- Number of Top Queries to check the number of top queries in individual snaps to be tested for performance problems, Chosen by Elapsed Time - the choice the Elapsed Time queries statistics will be selected
- **Number of Days Back in History** The number of historical days based on system will analyze the performance of top queries on the current day.

Wait Events Settings:

- **Number of Top Waits to check –** used to handle waits calculated based on the trend. The number of top waits depends on this parameter is taken into account for the calculation.
- Number of Days Back in History how many days back, are considered for the calculation of history.

#### 6.7.5.3 "Alerts definition" Tab

Define alerts in the application has been divided into two stages:

- selection and configuration of appropriate CRITICAL / WARNING thresholds for a given type of alert,
- a rule definition based on configured alerts, and the attribution of the cause of the problem.

Website displays the information in columns:

- type of alert,
- description of the alert,
- availability,
- warning level,
- critical level.

III Mail setti	ings General settings	Alerts definition	Reasons & Problems definition	Events subscription					
								Refrest	n
Contemporation Contemporatio Contemporation Contemporation Contemporation Contemp	f alerts which apply to all US.Catcher monitoring s	instances. Please b ervice up to 15 minu	e aware that Online alerts are outes	calculated every 30 sec	conds other alerts every 15 minutes. Any change	s in below	r lists are recognizes	by	×
ALERTS CO	NFIGURATION							Add new a	alert
Alert type			Alert descri	ption		Enabled	Level value WARNING	Level value CRITICAI	L
Online	Alert if instance is not availa	able			1	×			Â
Online	Total Waits				2		200 %	400 %	
Online	Lock waits				2		200 %	400 %	
Load Trends	Elapsed Time				2	8	50 %	100 %	
Load Trends	Wait time				2	Ø	50 %	100 %	
Load Trends	Lock time				7	Ø	20 %	50 %	
Sql Query	New Statement Elapsed Tir	me			₽		20 %	50 %	
Sql Query	Blocks write time				P		50 %	100 %	
							1		

The website presents only alerts that have been added to the configuration. If the alert has not been configured, please add it when use the **[Add new alert]** button.



\$

50 %

1

100 %

Alerts can be configured for all instance or for a dedicated instance. At any time, user can delete the previously configured alert by use the [Key] button and select an option "Delete", this will delete the given alert from the configured list.

The second option is to disable the alert by unmark the "**Enabled**" checkbox. This can also be done by press the [**Key**] button and select the Edit option.

Depend on the type of alert, threshold values are set in various ways.

Collect data about problems in the application has been divided into 5 alert categories:

- Online alerts calculated every 30 seconds,
- Load Trends alerts calculated every 15 minutes based on general performance statistics,
- Alerts type IO Stats calculated every 15 minutes based on read / write statistics from / to disk devices,
- Sql Query alerts calculated every 15 minutes based on statistics of top queries,

Alerts can be defined at the general level (for all bases) and at the level of individual databases. Two alarm thresholds can be defined for each alert:

- WARNING event warning alert level
- CRITICAL event high alert level critical alert

For example: setting for the Load Trends category for the Elapsed Time alert.

Load Trends Cpu Time

If the Elapsed time utilization of the server exceeds 50%

 $\rightarrow$  generate an alert at the warning level,

Main list of alerts is presented below:

III Mail sett	Ings General settings Alerts definition	Reasons & Problems definition	Events subscription							
									Refresh	
List of service	f alerts which apply to all oracle databases. se up to 15 minutes	Please be aware that Online ale	ts are calculated ever	ry 30 seconds other alerts every 1	15 minutes. Any changes in belo	w lists are i	recognizes	by DBPLUS.Catche	r monitoring >	¢
ALERTS CO	NFIGURATION								Add new ale	ert
Alert type 🔺			Alert description				Enabled	Level value waRNING	Level value CRITICAL	
IO Stats	Single Block Write time					1.74		20 %	50 %	*
Load Trends	Elapsed Time		Г	Provide the second second	1	2	×.	50 %	100 %	
Load Trends	Wait Time			Alertami	<	P	Ø	30 %	80 %	
Load Trends	Lock Time					2	ø	20 %	50 %	
Load Trends	Wait Event Time - [log file sync]					P	¥	50 %	100 %	
Load Trends	Cpu Time					P	¥	50 %	100 %	
Load Trends	Wait Event Time - [TCP Socket%]					1	1	50 %	100 %	
Load Trends	Wait Event Time - [db file sequential read]					1	ø	50 %	100 %	
List of Those	f alerts on the instance level which are spec a alerts which are marked in light gray color,	ific for particular database. Below are inherited from main configur	v settings overwrite m ation	ain configuration.	Możliwość przywrócen	ia			\$	¢
INSTANCE A	ALERTS CONFIGURATION - PLEASE SELECT A DAT	ABASE EBAZY (1 alert/s over	written) - Aler pozi	ty definiowane na omie bazy danych	ustawień ogólnych			Add net	Restore defaul	lts
Alert type		Ale	ert description			Enabled	Override	Level value WARNING	Level value CRITICAL	
Online	Alert if database is not available				2		×			^
Online	Total Waits				2	ø		200 %	400 %	

## 6.7.5.3.1 Online Alerts

The Online list includes alerts:



- Active Sessions number of active sessions
- Alert if database is not available.
- IO Waits waits related to IO readings
- Number of Active Sessions with Elapsed Time longer than the number of active sessions with a duration longer than ... seconds
- Lock waits lock type expectations.
- Custom alert calculated based on sql statement an alert calculated based on a freely arranged query
- **Specific Waits –** the ability to indicate selected wait (any)
- **Total Waits** all expectations together.
- **Specific Wait** an alert for a specific expectation

The example alert tab of the alert:

ALERT DEFINITIO	DN							
Ale	ert	Online			Lato	hes		-
Enat	bled	Z						
Alert Levels	Notifications & Co	onditions Oth	er settings					
Set	level to WARNING	when Latches is	above		100	% of max f	rom history	
Set	level to CRITICAL	when Latches is a	above		200	% of max f	rom history	
	History co	mparision		compare wit	h maximum valu	ie 👻		
400 WAR	RNING alert if paran CRITICAL alert if va Sample day load	n value above 100 lue above 200 % I for Latches	%					
					-			
00:00:00	03:00:00	06:00:00	09:00:00	12:00:00 time	15:00:00	18:00:00	21:00:00	
			ОК	Cancel				

Note! The field specify the type of alert (Online, Load Trends, IO Stats, Sql Query) is changeable only when new definition is created. When re-editing the alert, the field is in read-only mode. Depend on the rule chosen, the list of available and required fields to be completed is changed.

For the alert: Specific Wait should be completed - the name of the wait for which the alert should react.



ALERT DEFINIT	ION			X
A	lert	Or	iline 👻	Specific wait 👻
Ena Wait	abled name	Vou can use % ch	aracter to run alert with like	Re condition
Alert Levels	Notifications & C	onditions	Other settings	3
Set le	vel to WARNING wi	nen Specific	: wait is above wait is above	4 s 10 s
				OK Cancel

Example will appear in the presented example:

an alert warning when the sum of expectations with a name contain reads exceeds at least 4 seconds / 1 second (a valid alert is not calculated here in percent).

critical alert when the sum of expectations with the name contain reads exceeds at least 10 seconds / 1 second (a valid alert is not calculated here in percent).

For the alert: Custom alert calculated based on sql statement, enter the query text.

ALERT DEFINIT	ION			
A	lert	O	nline 🔻	Custom alert calculated based on sql statement
Ena	abled			
Sql statement query		Select con a.last_cal	unt(*) from v\$sess I_et>500	sion a ,v\$ <u>transaction</u> b where <u>a saddr=b ses_addr</u> and a status=' <u>INACTIVE</u> ' and
		The sql statemen database with db	t will be calculated every 3 plus repository	30 seconds and needs to return single value which will be compare to alert level values. The test is made on Test query
Alert Levels	Notifications &	Conditions	Other settings	
Set leve Set leve	10 40			
				OK Cancel

# **IMPORTANT**: the query must return a single-column record. The alert will occur when the value returned by the query exceeds the thresholds accord to the given definition.

An example will appear in the presented example:

alert warning when the number of inactive sessions with an open transaction in the database exceeds at least 10 sessions



For the alert: Online:IO waits, defines standard parameters, i.e.

- Alert thresholds WARNING, CRITICAL
- The way of calculate and reaction of the History Comparison event (comparison of the performance of a given parameter with the history)
  - Compare to average value in similar time the performance of a parameter is compared to the statistics history at similar times
  - Compare with maximum value the performance of a parameter is compared with the maximum values that were present for a given statistic.

The screen with the option of **History Comparison** set to Compare to average value in similar time:

ALERT DEFINIT	ION							
A	lert		ne 🔹		Server CPL	J utilization		Ŧ
Ena	abled	✓						
Alert Levels	Notifications & C	conditions	Other settings					
Set level to	o WARNING when !	Server CPU ut	ilization is above		32	% of max f	from history	
Set level t	o CRITICAL when §	Server CPU ut	lization is above		82	% of max f	from history	
	History c	omparision		compare wit	h maximum valu	ue 👻		
200 WA 100	RNING alert if para CRITICAL alert if van mple day load for Se	m value above alue above 82 erver CPU utili:	32 % % Lation					
00:00:00	03:00:00	06:00:00	09:00:00	12:00:00 time	15:00:00	18:00:00	21:00:00	
			OK	Cancel				

#### An example with the **History Comparison** option set to *Compare with maximum value*:





This slide will showcase:

Alert warning when the disposal of server processors will be 47% greater than the maximum historical value.

Critical alert when the utilization of server processors will be 90% greater than the maximum historical value.

In the alert edit tab, additional settings can be found in the Notification & Condition tab:

- Mail Notification Interval how often to generate an email notification when an alert occurs
- **Number of snapshots to check** the number of 30 seconds of snapshots in which there must be a "problem" for a given parameter. If a given statistic, e.g. Total Waits stays at a high level and exceeds the alert threshold by X snapshots, then the system will generate an alert
- Use Low Constant Value the minimum value that must be met first. According to the example screen below within the dashboard snapshot (started in a 30-second cycle) the value of all wait-time must be at least 30 seconds.
- Use High Constant Value the value at which the alert will always be generated, even if the WARNING, CRITICAL alert thresholds are not met.

Alert Levels	Notifications & Conditions	Other settings	
	Alert Calculation Interval		once per 30 seconds
	Mailing Notification Interva	l	once per 5 minutes 👻
Filter conditions			
	Use Low Constant Value		30 s. Every alert with value below entered will be skipped
	Use High Constant Value		60 s. Every alert with value above entered will be shown
Snapshot condi	tions		
	Number of snapshot to che	ck	5 in which property must exceed alert level value

#### 6.7.5.3.2 Load Trends, I/O Stats Alerts type

The Load Trends, I / O Stats rules refer to performance indicators available on website (functionalities) with the same names.

The edit tab for this alert:



	lert	Load Tre	nds 👻		Elapse	d Time	
Ena	abled	✓					
ert Levels	Notifications &	Conditions	Other settings				
Set le	vel to WARNING v	when Elapsed Tir	ne is above	0	20	% of histor	ry average
Set le	vel to CRITICAL v	vhen Elapsed Tin	ne is above		60	% of histor	ry average
	History	comparision		compare to	average value i	n similar time	-
200 WA	RNING alert if par	am value above 2	0 %				
	CRITICAL alert if Sample day load	value above 60 % for Elapsed Time					
100 -							
100 -							
100 - 0 00:00:00	03:00:00	06:00:00	09:00:00	12:00:00	15:00:00	18:00:00	21:00:00

The user specifies in the form:

- Alert type (according to the indicators given above)
- Is enabled

0

- Own name Other settings tab
- Message format Other settings tab
- E-mail settings spam protection in case of an ongoing alert –Notification & Conditions tab
- When and with what threshold an alert will occur:
  - The rule is calculated as a percentage.
  - The alert will occur when the given alert threshold is exceeded by X% in relation to the average over the past period.
    - In the **Filter condition** section, user have additional filter settings, i.a.:
      - Use Low Constant Value e.g., alert when Elapsed Time will deteriorate from X% in relation to the average, but in a situation where Elapsed Time is greater than 500 seconds.
      - Use High Constant Value as above

Below are some examples of definitions for the **Elapsed Time** parameter - with the option of **History Comparison** set to Compare to average value in similar time:



As above, the other load occurs during business hours and outside business hours. For example:



The duration of all queries, i.e. Elapsed Time at 08:00, is historically 1000 s in a 15-minute snapshots.

The duration of all queries, i.e. Elapsed Time at 12:00, is historically 5000 seconds in a 15-minute snapshots.

Alert warning type WARNING for a defined threshold> = 20% will occur at 08:00, when the duration of all queries exceeds 1200 seconds, while around 12:00, when Elapsed time exceeds 6000 seconds.

For the second case with the History Comparison option set to Compare with maximum value:



In this example:

WARNING for the defined threshold> = 20% will occur only if the duration of all queries exceeds 6000 seconds (reference to the maximum value of the day) regardless of the time of day.

#### 6.7.5.3.3 Sql Query alerts type

SQL Query rules apply to performance indicators available for SQL queries and contain a similar list as for Load Trends.

For SQL queries, the system allows users to alter indicators:

- Execution
- Elapsed Time
- Elapsed Time Per 1 Exec
- New Statement Elapsed Time
- Rows
- Blocks hit
- Blocks read
- Blocks dirtied
- Blocks written
- Temp blocks read
- Temp blocks written
- Blocks read time
- Blocks write time

The SQL Query Alert Definition tab:



A	lert	Sql	Query -	E	Elapsed Time p	er 1 exec	-
Ena	abled	•					
lert Levels	Notifications & C	Conditions	Other settings				
Set level to	WARNING when E	lapsed Tim	e per 1 exec is above		□ 10	% of max from history	
Set level to	CRITICAL when EI	apsed Time	e per 1 exec is above	0	40	% of max from history	
	w Plan Changes O	nlv					

In the form, the user specifies similar parameters as in the alert definition for Load Trends statistics, IO Stats. In addition, user can indicate whether the alert reacts only when the execution plan is changed - the **Show Plan Changes Only flag (if the indicator has deteriorated in relation to the history).** 

For example, the alert definition for e.g. Elapsed Time with the change plan check option enabled will be presented and configured separately than the Elapsed Time alert without this option selected.

۵		III Mail se	ttings General settings	Alerts definition	Reasons & Problems definition	Events subscription								
۵											Refresh	Ē		
		ALERTS C	ALERTS CONFIGURATION Add new ai											
1		Alert type •		Alert description Enabled Level value WARNING Level value CRIT										
Φ		Sql Query	Execution											
۲		Sql Query	Elapsed Time (for plan ch	anges only)	1	ø	50 %	100 %						
¢	Configuration	Sql Query	Elapsed Time per 1 exec	for plan changes only)						50 %	100 %			
		Sql Query	Disk reads (for plan chan	es only)				1	Ø	50 %	100 %			
		Sql Query	Execution (for plan chang	es only)				2		50 %	100 %			
	Alert settings	Load Trends	Elapsed Time	Elapsed Time 20 50 % 100										
0	Help	Load Trends	Wait Time					2		30 %	80 %			

This change allows the user to more precisely define problem definitions that cause the performance of the instance to deteriorate.

For alerts with the New Statement prefix, the thresholds are determined at the level of the share in the database load.

ALERT DEFINITI	ION							
AI	Alert		Query 👻		New Sta	atement Ela	apsed Time	*
Ena	abled	•						
Alert Levels	Notifications & C	conditions	Other settings					
Set level to WA	ARNING when New	Statement	Elapsed Time is a	above		10	% of database load	
Set level to CF	RITICAL when New	Statement	Elapsed Time is a	bove		40	% of database load	
				OK Can	cel			

The application allows the dependence of an alert instance on the general trend (for the entire database) for a given statistic in the snap. This option is only available for SQL Query type alerts. For the configuration shown in the picture below, this means for the SQL Query Rows processed type alarm:

 the alarm will be skipped if the value of Rows processed for a given snap for a specific Query Hash is below 10 and if the number of returned rows processed for a given query is less than 15% of all returned rows for queries (the number depends on the Number of Top Queries to



check). Additionally, the condition of exceeding the WARNING / CRITICAL alarm threshold must be met.

• the alarm will occur if the value of Rows processed for the given snap in the query is above 25%. The alarm will occur even if the alarm threshold has not been exceeded (then WARNING will occur with the Above max constant comment ...).

ALERT DEFINIT	ION					
A	lert	Sql Q	uery 🔻		Rows processed	-
Ena	abled					
Alert Levels	Notifications &	Conditions	Other settings			
	Alert Calcu	lation Interval		once per 15	minutes	
Filter conditions						
	Use Low C	Constant Value		10	Every alert with value below entered will be skipped	
	Use High (	Constant Value		25	Every alert with value above entered will be shown	
	Query impact	on load is abo	ve		15 %	
			OF	Can	cel	

#### 6.7.5.3.4 Alert setting at the PostgreSQL Instance level

The list of alerts can be set for each base independently. Alerts are inherited from general settings by default. If any alert parameter is changed then the information appears in the Override column about overriding this rule.

#### As the example below:

ALERTS	CONFIGURATION						Add new ale	ert
Alert type	Alert description	Enabled	Enabled Level value WARNING			Level value CRITICA		
Online	Alert if database is not available							^
Online	Number of active sessions with Elapsed time longer than 0,03 seconds		2			5		
QListof	alerts on the instance level which are specific for particular database. Below settings overwrite main configuration							×
Those	v Los to aleito un se sissin se reve minut ale specific to particular undiadese. Deven settingo versimite mani configuration. Those aleits which are marked in lingit gay color, are inherited from mail configuration.							
IN STANCE A	NSTANCE A LERTS CONFIGURATION - PLEASE SELECT AN INSTANCE WIN-PVM04LTCT8AI/SQLEXPRESS (1 alort/s overwritten) *							aults
Alert type	Alert description		Enabled	Override	Level value W	ARNING Let	el value CRITICA	L
Online	Alert if database is not available (test)	1						Î
Online	Total Waits	1			200 9	6	400 %	

The system will generate an alert for all instances except this one. At the indicated Instance Alert level, *Alert if database is not available,* has been disabled (Enabled = false).

#### 6.7.5.4 "Reasons and Problems definition" Tab

The next stage of alarm configuration consists of assigned rules and defined the dedicated cause of the problem. Screen below shows an example of a list of alarms defined by DBPLUS analysts by default. Definitions can be assigned at a general level to all databases or create dedicated definitions for selected databases.



III Mail setti	ings	General settings	Alerts definition	Reasons & Problems de	finition	Event	s subscription	
							Re	fresh
List of recog	f perform nizes by	ance problems v DBPLUS.Catch	which apply to all o er monitoring servi	pracle databases. Please ice up to 15 minutes	be awa	are that O	nline issues are calculated every 30 seconds other problems every 15 minutes. Any changes in below lists	are ×
REASON & I	PROBLEM	S CONFIGURATION	i.				Add new	definition
Туре	Class		Reason/Problem	description		Enabled		
Trends	Lock	Problems couse	locking wait		P	a)	Trends:Lock Time AND Trends:Wait Event Time	*
Trends	I/O	Problems with Disk reads increase couse query change plan			: p	af.	( Trends:Cpu Time AND Trends:Elapsed Time ) AND ( ( SQLQuery:Cpu Time (for plan changes only) AND SQLQuery:Cpu	Time pe
Trends	Other	Problems with Query CPU Time Increase couse query change plan		:_p	af.	Trends:Cpu Time AND ( SQLQuery:Cpu Time per 1 exec (for plan changes only) OR ( SQLQuery:Cpu Time (for plan change	ies only)	
Trends	Other	Problems couse	Query CPU Time Inci	rease	:_p	ď	Trends:Cpu Time AND ( SQLQuery:Cpu Time AND SQLQuery:Cpu Time per 1 exec )	
Online	Online	Increase of waits	events (couse of Loc	ks) on databse in last 3 minu	ites 💋	ď	Online:Lock waits	
Trends	Other	Problems couse	wait: PAGEIOLATCH	SH		ď	Trends:Wait Time AND Trends:Wait Event Time - [PAGEIOLATCH_SH]	
Trends	I/O	Problems couse	increase Executions :	and Disk Reads.	:_p	ď	(Trends:Cpu Time AND Trends:Elapsed Time ) AND ( (SQLQuery:Cpu Time AND SQLQuery:Cpu Time per 1 exec AND S	QLQuer

To add a new rule, first define the reason for the problem (Reason description) for which the rule will be defined. Next, choose the type of calculation (Calculation type) - based on the trend or online and Reason class.

Reason descrip	otion N	letwork problen	n not cause	ed by I/O dis	sk storeage iss	ues				
Calculation Ty	rpe	Based on Trer	nds							
Reason Clas	s	I/O 👻								
Enabled	<ul><li>✓</li></ul>									
ules & Formulas	Notifications &	& Conditions								
AND OR								Add rule	Add group	
Trends:	Wait Event Time	e - [TCP Sock	ət%] 💌						Delete	J
AND	OR						Add rule	Add group	Delete	
	AND OR	J					Add rule	Add group	Delete	
	NO	T:IO:Disk read	s 💌						Delete	
	NO	T:IO:Single Blo	ock Read t	ime 👻					Delete	
ules preview: Trends ND NOT:10:Single BI	:Wait Event Time ock Write time ) )	- [TCP Socket	%] <mark>AND ( (</mark>	NOT:IO:Dis	k reads AND	NOT:IO:Sing	le Block Re	ad time ) OR (	NOT:IO:Disk v	wri
				ок	Cancel					

The most important element of the configuration is to create the cause of the problem and then define the appropriate rules based on alerts. To add a configuration, from the previously defined alerts (Alerts definition tab), create a rule using groups (Add group), AND, OR operators. In some cases, it is necessary to use negation, they are presented in the list of alerts marked in red and start with the NOT operator.



Rules & F	ormulas Notifications & Conditions		
AND	OR		Add rule Add group
	Trends:Elapsed Time 👻		Delete
-	Trends:Wait Event Time - [log file parallel write] Trends:Wait Event Time - [log file sync]	٠	
	Trends:Wait Event Time - [read by other session]		Add rule Add group Delete
	Trends:Wait Event Time - [TCP Socket%]		
	NOT:IO:Block writes		Delete
	NOT:IO:Disk reads		
	NOT:IO:Disk writes		
	NOT:IO:Read time		Delete
	NOTIO:Single Block Read time		
	NOTIO:Single Block write time		
	NOT:SOLOuen/Dick reade		
	NOT:SOLOuery:Elansed Time		Delete
Rules prev	NOT:SQLQuery:Elapsed Time per 1 exec		AND IO:Read time ) AND NOT:IO:Disk reads AND NOT:SQLQuery:Disk
reads	NOT:SQLQuery:Execution		
	NOT:SQLQuery:New Statement Cpu Time		
	NOT:SQLQuery:New Statement Elapsed Time		Cancel
	NOT SOL Query Rows processed		

When user define the rule, correctly select the operators and complete all added alarms, the rule will be displayed below.

Rules preview: ( Trends:Elapsed Time AND Trends:Wait Time AND Trends:Execution ) AND ( NOT:SQLQuery:New Statement Cpu Time OR
NOT:SQLQuery:New Statement Elapsed Time ) AND NOT:IO:Single Block Read time AND SQLQuery:Elapsed Time

## 6.7.5.5 "Events subscription" Tab

In the last tab of the module user has the ability to manage the list of recipients, i.a. people who will receive alert messages.

111	Mail settings	General settings	Alerts definition	Reasons & Problems definition	Events subscription					
								Refresh		
V List of email address of user/groups that would be notify if any alert occur. Any changes in below list are recognizes by DBPLUS Catcher monitoring service up to 15 minutes										
EMAIL SUBSCRIPTION LIST Add new email a										
Sql Instance Email address										
A	instances						email_alarmowy@dbplus.pl	Edit Delete		

On the subscribers list can:

- a single email address or multiple addresses separated by a separator
- assigned recipient's email address to all or selected databases.

SUBSCRIPTION EMA	IL FORM						
SQL Instance	All instances						
Email adress list	email@alarmowy@dbplus.p						
	You can use ; character to add several addresses						
	OK Cancel						

#### 6.7.5.6 Visibility of alerts

Alerts are visible from the Anomaly Monitor menu and from the:

- Dashboard Level:
  - o the base icon contains information about the number of alert and critical alerts
  - o after select a given SQL instance in the Alerts and Instance Load tab
  - after click [Instance Analysis] on the Instance Load graph
- o if any Alert have occurred on the Elapsed Time line, relevant information is displayed about their number
  - after click on a given time point (snapshot) a list of alerts is displayed



### 6.8 Help Menu

The site contains information about licenses and information about changes in applications made in the last year.

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