

DBPLUS  
Performance Monitor for PostgreSQL  
description of changes in version 2021.4

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Below is a list of changes to the DBPLUS Performance Monitor system for PostgreSQL instance monitoring.

## New in 2021.4

### 1 Support for PostgreSQL version 14

Support for PostgreSQL version 14 has been added in the latest version of the Performance Monitor application. The latest version of the PostgreSQL 14 platform was released on September 30, 2021. Version 14 includes a number of changes related to the monitoring of queries performed in the monitored PostgreSQL instance.

One of the main changes that has been added is related to the calculation of the queryid in the session view `pg_stat_activity`. Depending on the settings of the `"compute_query_id"` parameter (auto by default) in the system view, a query identifier will be assigned to the given query session. The query ID is not populated by the database for each session.

Until version 14, the query identifier was not completed by the PostgreSQL database, the visibility of the identifier was provided by a mechanism comparing queries performed within the session with queries stored in the repository database.

Another change is related to changes in the system view containing information about the statistics of queries performed in the PostgreSQL instance. The change consists in adding a `Toplevel` column. This change affects the uniqueness of the query identifier, which as of version 14 is not a unique value within the database. From this version on, each query can contain two versions in the system view, marked in the `Toplevel` column with the values `[true / false]`. For the correct presentation of information, the ability to view query statistics for both versions (`Toplevel` and `Nested`) has been added on the SQL Details page. Switching between versions is possible after changing in the new `Version` field.

The change applies to both the Online view (where data is read directly from the instance) as well as information stored in the DBPLUS repository.

The screenshot shows the 'SQL Details' page for a query with ID 489723800811613358. The query text is `SELECT set_config('1,42,43') FROM pg_settings WHERE name = '44'`. A dropdown menu labeled 'Version' is highlighted with a red box, showing 'Top Level' and 'Nested' options. Below the query text is a table of SQL statistics with columns: 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, and Elapsed Time per 1 Exec. The table shows two rows of data. Below the table is an 'Explain plan' section with a tree view showing the query plan for plan ID 3185495973.

### 2 REST API – Performance Monitor

In the latest version of the application, we have added new methods to the REST API:

- get information about Outage,
- Outage management,
- Management of DBPLUS instance monitoring

#### 2.1. REST API call

To call a method for a given platform, the appropriate method must be completed in the link that calls the REST API. For example, below is calling the outages method for the PostgreSQL platform. For example, below is calling the outages method for the PostgreSQL platform. An example of calling a method:

<https://hostname/DPMPostgreSQL.RestApi/outages>

Due to the use of the POST method for managing monitoring instances, it is recommended to use the **https** protocol for the DBPLUS Performance Monitor application (applies to the application itself as well as the Rest

API) and to use additional authorization using the *Security Token* available in the DBPLUS Rest API configuration.

## 2.2. Calling methods

### 2.2.1. Get information about Outage

<b>Method</b>	GET
<b>Database platform</b>	PostgreSQL, Oracle, MS SQL
<b>URL</b>	/outages
<b>Action</b>	Getting information about temporary instance exclusions from DBPLUS monitoring
<b>Input data:</b> n/d	
<b>Output data:</b>	
OutageList	Outage list
OutageRecord	Outage record
OutageId	Outage ID
ServerId	Server ID in the DBPLUS repository
Enabled	Outage status
DateFrom	The date from Outage is effective. Format [YYYY:MM:DD]
DateTo	The date to Outage is effective. Format [YYYY:MM:DD]
TimeFrom	Time from Outage is effective. Format [hh:mm]
TimeTo	Time to Outage is effective. Format [hh:mm]
Description	Description
Monday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Tuesday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Wednesday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Thursday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Friday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Saturday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Sunday	The day of the week that Outage is enabled: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
<b>Example [xml]:</b>	
<pre> &lt;Root&gt;   &lt;OutageList&gt;     &lt;OutageRecord&gt;       &lt;OutageId&gt;7&lt;/OutageId&gt;       &lt;ServerId&gt;16&lt;/ServerId&gt;       &lt;Enabled&gt;&gt;true&lt;/Enabled&gt;       &lt;DateFrom&gt;2021-12-13&lt;/DateFrom&gt;       &lt;DateTo&gt;2021-12-21&lt;/DateTo&gt; </pre>	

```

    <TimeFrom />
    <TimeTo />
    <Description> Test cut-off </Description>
    <Monday>false</Monday>
    <Tuesday>true</Tuesday>
    <Wednesday>false</Wednesday>
    <Thursday>true</Thursday>
    <Friday>false</Friday>
    <Saturday>true</Saturday>
    <Sunday>false</Sunday>
  </OutageRecord>
  <OutageRecord>
    <OutageId>8</OutageId>
    <ServerId>14</ServerId>
    <Enabled>true</Enabled>
    <DateFrom />
    <DateTo />
    <TimeFrom />
    <TimeTo />
    <Description> Scheduledwork </Description>
    <Monday>true</Monday>
    <Tuesday>true</Tuesday>
    <Wednesday>true</Wednesday>
    <Thursday>true</Thursday>
    <Friday>true</Friday>
    <Saturday>true</Saturday>
    <Sunday>true</Sunday>
  </OutageRecord>
</OutageList>
</Root>

```

**Example [JSON]:**

```

{"OutageList": [{"OutageId": 7, "ServerId": 16, "Enabled": true, "DateFrom": "2021-12-13", "DateTo": "2021-12-21", "TimeFrom": "", "TimeTo": "", "Description": "Test cut-off", "Monday": false, "Tuesday": true, "Wednesday": false, "Thursday": true, "Friday": false, "Saturday": true, "Sunday": false}, {"OutageId": 8, "ServerId": 14, "Enabled": true, "DateFrom": "", "DateTo": "", "TimeFrom": "", "TimeTo": "", "Description": "Scheduledwork", "Monday": true, "Tuesday": true, "Wednesday": true, "Thursday": true, "Friday": true, "Saturday": true, "Sunday": true}]}

```

**2.2.2. Outage management**

<b>Method</b>	POST
<b>Database platform</b>	PostgreSQL, Oracle, MS SQL
<b>URL</b>	/outagemanage
<b>Action</b>	Outage management. It allows to set up, modify or remove a temporary exclusion of a given instance from monitoring
<b>Input data:</b>	
Action	Action To Do: <ul style="list-style-type: none"> <li>▪ insert</li> <li>▪ update</li> <li>▪ delete</li> </ul>
OutageId	Outage ID * value ignored for "insert" action
ServerId	Server ID in the DBPLUS repository * value ignored in the case of "update", "delete" actions
Enabled	Outage Status:

	<ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
DateFrom	The date from Outage is effective. Format [YYYY:MM:DD]
DateTo	The date to Outage is effective. Format [YYYY:MM:DD]
TimeFrom	Time from Outage is effective. Format [hh:mm]
TimeTo	Time to Outage is effective. Format [hh:mm]
Description	Description
Monday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Tuesday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Wednesday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Thursday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Friday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Saturday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Sunday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>

**Output data:**

Action	Action performed: <ul style="list-style-type: none"> <li>▪ insert</li> <li>▪ update</li> <li>▪ delete</li> </ul>
Response	Response record
Status	Reply status: <ul style="list-style-type: none"> <li>▪ OK</li> <li>▪ ERROR</li> </ul>
Message	Error Messenger * completed value for Status = ERROR
OutageId	Outage ID * value ignored for "insert" action
ServerId	Server ID in the DBPLUS repository * value ignored in the case of "update", "delete" actions
Enabled	Outage status
DateFrom	The date from Outage is effective. Format [YYYY:MM:DD]
DateTo	The date to Outage is effective. Format [YYYY:MM:DD]
TimeFrom	Time from Outage is effective. Format [hh:mm]
TimeTo	Time to Outage is effective. Format [hh:mm]
Description	Description
Monday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Tuesday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Wednesday	The day of the week that Outage is activated:

	<ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Thursday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Friday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Saturday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
Sunday	The day of the week that Outage is activated: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>

### Delete Outage scenario

Example [xml]– the input data:

```
<Root>
<Action>delete</Action>
<OutageId>20</OutageId>
<ServerId>16</ServerId>
<Enabled>>true</Enabled>
<DateFrom>2021-12-13</DateFrom>
<DateTo>2021-12-18</DateTo>
<TimeFrom/>
<TimeTo/>
<Description>Planned change</Description>
<Monday>>true</Monday>
<Tuesday>>true</Tuesday>
<Wednesday>>true</Wednesday>
<Thursday>>true</Thursday>
<Friday>>true</Friday>
<Saturday>>true</Saturday>
<Sunday>>true</Sunday>
</Root>
```

Example [xml] Delete Outage – the output data:

```
<Root>
  <OutageId>20</OutageId>
  <ServerId>16</ServerId>
  <Enabled>>true</Enabled>
  <DateFrom>2021-12-13</DateFrom>
  <DateTo>2021-12-18</DateTo>
  <TimeFrom />
  <TimeTo />
  <Description>Planned change</Description>
  <Monday>>true</Monday>
  <Tuesday>>true</Tuesday>
  <Wednesday>>true</Wednesday>
  <Thursday>>true</Thursday>
  <Friday>>true</Friday>
  <Saturday>>true</Saturday>
  <Sunday>>true</Sunday>
  <Action>delete</Action>
  <Response>
    <Status>OK</Status>
```

```
<Message />
</Response>
</Root>
```

Create Outage scenario.

Example [JSON]– the input data:

```
{
  "action": "insert",
  "outageId": ,
  "serverId": 16,
  "enabled": true,
  "dateFrom": "2021-12-20",
  "dateTo": "2021-12-23",
  "timeFrom": "11:20",
  "timeTo": "12:20",
  "description": " Scheduled work",
  "monday": true,
  "tuesday": true,
  "wednesday": true,
  "thursday": true,
  "friday": true,
  "saturday": true,
  "sunday": true
}
```

Example [JSON] – the output data:

```
{
  "action": "insert",
  "response": {
    "status": "OK",
    "message": ""
  },
  "outageId": 12,
  "serverId": 16,
  "enabled": true,
  "dateFrom": "2021-12-20",
  "dateTo": "2021-12-23",
  "timeFrom": "11:20",
  "timeTo": "12:20",
  "description": " Scheduled work",
  "monday": true,
  "tuesday": true,
  "wednesday": true,
  "thursday": true,
  "friday": true,
  "saturday": true,
  "sunday": true
}
```

### 2.2.3. Managing the monitoring of instances in DBPLUS

Method	POST
Database platform	PostgreSQL, Oracle
URL	/instancemanage
Action	Managing the monitoring of instances in DBPLUS. It allows to add or remove an instance from DBPLUS monitoring.

**Input data:**

Action	Action to do: <ul style="list-style-type: none"> <li>▪ insert</li> <li>▪ delete</li> </ul>
ServerId	Internal identifier of PostgreSQL instance in DBPLUS repository * value ignored for "insert" action
SSLMode	SSL Mode connection: 0= Disable 1= Prefer 2= Require * value provided for Postgres version only
TrustSelfSignedSSLCerts	Trust self-signed certificates <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul> *value provided for Postgres version only
ConnectionType	Connection type: <ul style="list-style-type: none"> <li>▪ basic</li> <li>▪ TNS</li> </ul> *value provided for Oracle version only
HostName	Host name or IP
ConnectionName	Connection name *value provided for Postgres version only
DefaultDatabase	Default database *value provided for Postgres version only
Sid	Database identifier *value provided for Oracle version only
ServiceName	Service Name *value provided for Oracle version only
UseMonitoringUserOnly	Connect with existing user *value provided for Oracle version only
TCPPort	Port
UserMonitoring	Monitoring user data
UserName	User name
Password	Password
InternalAuthentication	Domain Authorization
DBARole	SYSDBA role: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul> *value provided for Oracle version only
CreateUser	Create new monitoring user: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
UserAdmin	User Admin data
UserName	User name
Password	Password
InternalAuthentication	Domain Authorization
DBARole	SYSDBA role: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul> *value provided for Oracle version only
UserMonitoringTablespace	Monitoring user Tablespace *value provided for Oracle version only
UserMonitoringTempTablespace	Monitoring user Temp Tablespace *value provided for Oracle version only
UserMonitoringProfile	Monitoring user Profile *value provided for Oracle version only

**Output data:**

Response	Response record
Status	Status: <ul style="list-style-type: none"> <li>▪ OK</li> <li>▪ ERROR</li> </ul>
Message	Error Message *value provided for Status=ERROR only
Action	Action to do: <ul style="list-style-type: none"> <li>▪ insert</li> <li>▪ delete</li> </ul>
ServerId	Internal identifier of PostgreSQL instance in DBPLUS repository * value ignored for "insert" action
SSLMode	SSL Mode connection: 0= Disable 1= Prefer 2= Require * value provided for Postgres version only
TrustSelfSignedSSLCerts	Trust self-signed certificates <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> <li>▪ *value provided for Postgres version only</li> </ul>
ConnectionType	Connection type: <ul style="list-style-type: none"> <li>▪ basic</li> <li>▪ TNS</li> </ul> *value provided for Oracle version only
HostName	Host name or IP
ConnectionName	Connection name *value provided for Postgres version only
DefaultDatabase	Default database *value provided for Postgres version only
Sid	Database identifier *value provided for Oracle version only
ServiceName	Service Name *value provided for Oracle version only
UseMonitoringUserOnly	Connect with existing user *value provided for Oracle version only
TCPPort	Port
UserMonitoring	Monitoring user data
UserName	User name
Password	Password
InternalAuthentication	Domain Authorization
DBARole	SYSDBA role: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul> *value provided for Oracle version only
CreateUser	Create new monitoring user: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul>
UserAdmin	User Admin data
UserName	User name
Password	Password
InternalAuthentication	Domain Authorization
DBARole	SYSDBA role: <ul style="list-style-type: none"> <li>▪ true</li> <li>▪ false</li> </ul> *value provided for Oracle version only
UserMonitoringTablespace	Monitoring user Tablespace *value provided for Oracle version only

UserMonitoringTempTablespace	Monitoring user Temp Tablespace *value provided for Oracle version only
UserMonitoringProfile	Monitoring user Profile *value provided for Oracle version only

**Scenario for adding a PostgreSQL instance with creating a monitoring user.**

**Example [xml] – the input data:**

```
<Root>
  <Action>insert</Action>
  <ServerId>1</ServerId>
  <HostName>127.0.0.1</HostName>
  <ConnectionName>pg10</ConnectionName>
  <DefaultDatabase>postgres</DefaultDatabase>
  <TCPPort>5433</TCPPort>
  <UserAdmin>
    <UserName>postgres</UserName>
    <Password>pass</Password>
  </UserAdmin>
  <CreateUser>true</CreateUser>
  <UserMonitoring>
    <UserName>dbmon</UserName>
    <Password>pass</Password>
  </UserMonitoring>
</Root>
```

**Example [xml] the output data:**

```
<Root>
  <Action>insert</Action>
  <Response>
    <Status>OK</Status>
    <Message />
  </Response>
  <ServerId>1</ServerId>
  <HostName>127.0.0.1</HostName>
  <TCPPort>5433</TCPPort>
  <UserAdmin>
    <InternalAuthentication>true</InternalAuthentication>
    <UserName>postgres</UserName>
    <Password>pass</Password>
    <DBARole>false</DBARole>
  </UserAdmin>
  <CreateUser>true</CreateUser>
  <UserMonitoring>
    <InternalAuthentication>true</InternalAuthentication>
    <UserName>dbmon</UserName>
    <Password>pass</Password>
    <DBARole>false</DBARole>
  </UserMonitoring>
  <ConnectionName>pg10</ConnectionName>
  <DefaultDatabase>postgres</DefaultDatabase>
  <SSLMode>0</SSLMode>
  <TrustSelfSignedSSLCerts>false</TrustSelfSignedSSLCerts>
  <UserMonitoringAsSuperuser>false</UserMonitoringAsSuperuser>
</Root>
```

Scenario of removing an instance from monitoring.

Example [xml] the input data:

```
<Root>
  <Action>delete</Action>
  <ServerId>21</ServerId>
</Root>
```

Example [xml] the output data:

```
<Root>
  <Action>delete</Action>
  <Response>
    <Status>OK</Status>
    <Message />
  </Response>
  <ServerId>21</ServerId>
  <TCPPort>0</TCPPort>
  <CreateUser>>false</CreateUser>
  <SSLMode>0</SSLMode>
  <TrustSelfSignedSSLCerts>>false</TrustSelfSignedSSLCerts>
  <UserMonitoringAsSuperuser>>false</UserMonitoringAsSuperuser>
</Root>
```

## 3 Bug fixes and improvements

### 3.1. View database information

In the latest version, the problem with presenting information about the database name in the Performance Monitor application has been corrected. The problem was showing a blank value in the column with the name or presentation "Not specified" in the statistics summary.

One of the problems was related to saving database name and ID changes to history in DBPLUS repository. The problem has been fixed, the information about renaming or identifying databases will be refreshed every 15 minutes.

Another fix was that the application does not support information about "*shared objects*" that are not assigned to any of the databases. Information about shared objects is stored in the pg\_stat\_statements (database statistics) view but does not bind to the databases (pg\_database view), which resulted in a problem presentation in the summary view.

### 3.1. IIS bug fix at Configuration Wizard level

In the latest version of the application, we fixed the problem of displaying the IIS error at the Configuration Wizard level. The issue was with the message: "*The underlying connection was closed: An unexpected error occurred on a receive.*". The problem has been fixed, the message should not appear in the latest version.

### 3.2. Fix the problem with refreshing permissions

The problem related to refreshing monitoring user rights has been fixed. The problem was related to the scenario in which the monitoring user's rights were revoked by the same user. In such a case, the operation ended with an error. The problem has been corrected.

The problem with creating the dbplus *explain\_dpm* function (used to generate execution plans) has also been fixed.

### 3.3. Problem with connecting to monitoring an instance created from the source

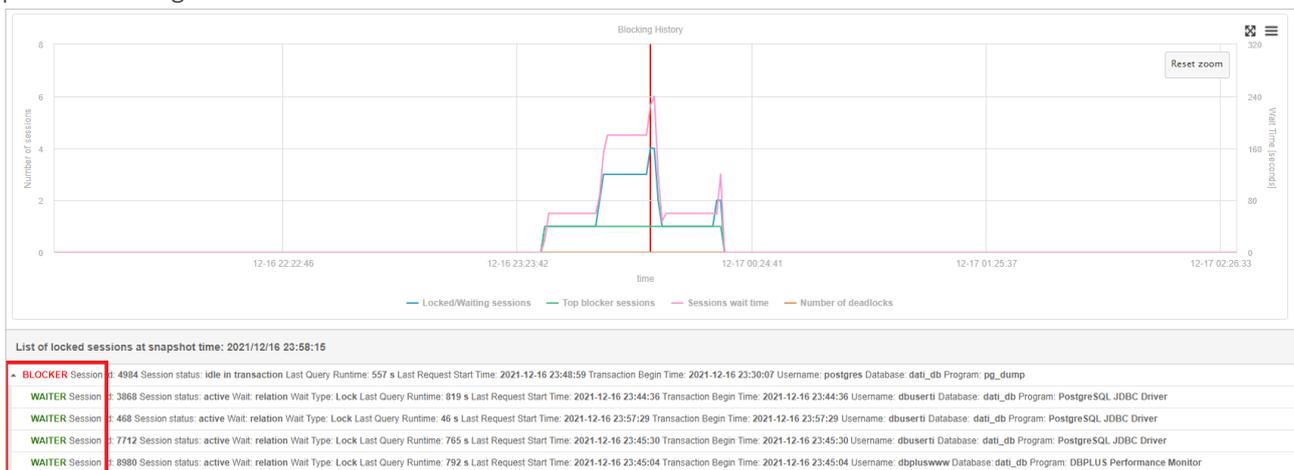
In the latest version of the application, we have improved the mechanism of adding new PostgreSQL instances to monitoring in the application. When the PostgreSQL instance was created from the "Source

Code", information about installed extensions required by Performance Monitor was misread. The problem has been fixed.

### 3.4. Improvements to the Locks screen

In the latest version of the application, the presentation of locks on the **Locks** screen has been improved at the level of PostgreSQL instance details. The change concerns the mechanism of identifying the session that causes the blockage.

Another change concerns the additional marking in the "tree" which sessions cause blockades (**BLOCKERS**), and which ones are blocked (**WAITERS**). The change will make it easier to determine the cause of the lock problem for a given instance.



An additional change is adding information on the number of blocked sessions. After selecting a blocking session, the details will be displayed with information on the number of blocked sessions.