

DBPLUS
Performance Monitor for PostgreSQL
description of changes in version 2021.3

Date: October 8, 2021

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Below is a list of changes in the DBPLUS Performance Monitor system for monitoring PostgreSQL instances.

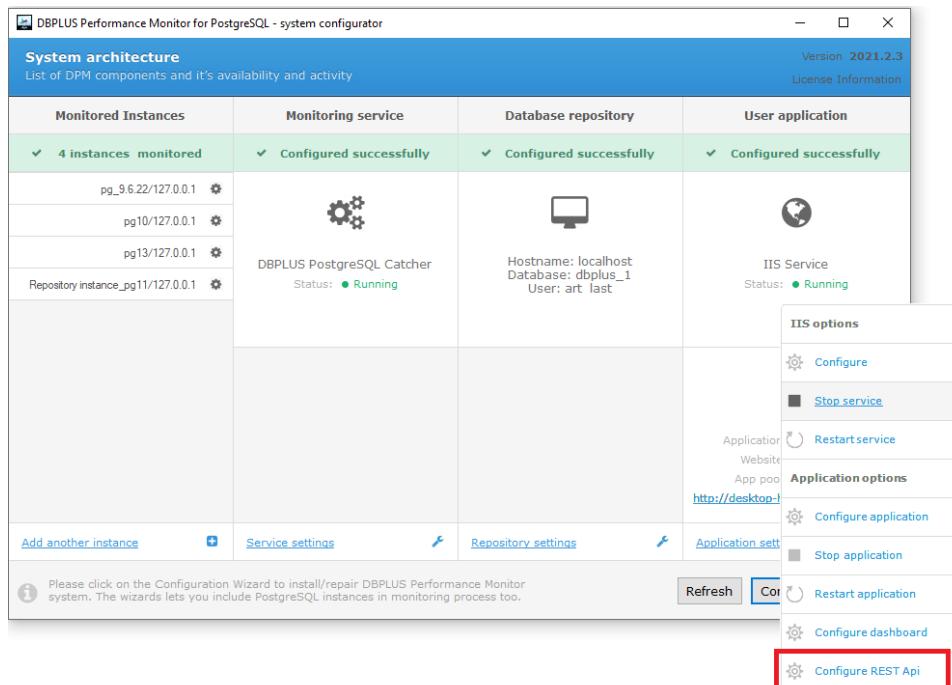
New In version 2021.3

1 REST API – Performance Monitor

The REST API module is available in the DBPLUS Performance Monitor application from version 2021.3.1 for each of the monitored database platforms.

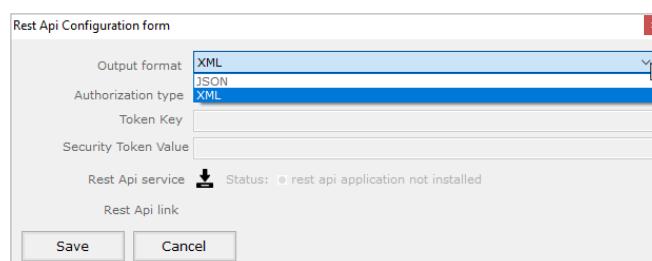
1.1. Configuration

To run REST API functions for a given platform, go to the **Application settings** menu from the configurator and then select **Configure REST Api**.



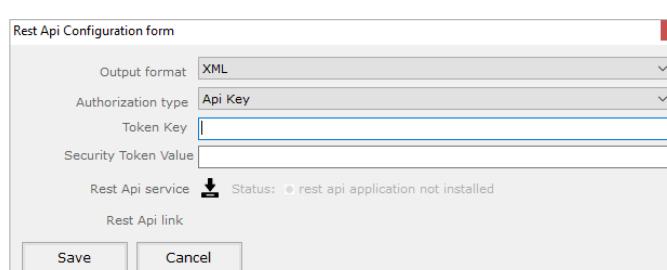
As part of the configuration, the User can set the format - **Output format** in which the information will be returned using the API. Options to choose from:

- **JSON**
- **XML**



Then the User can configure the authorization type. Options:

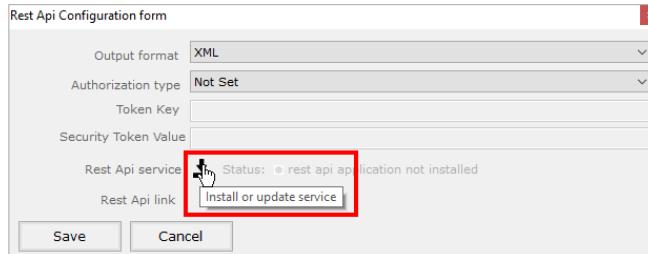
- **Not Set** – no authorization
- **API Key** – key authorization



If User choose the **Api Key** option, they must complete additional fields:

- **Token Key** – key name
- **Security Token Value** – the password for the key

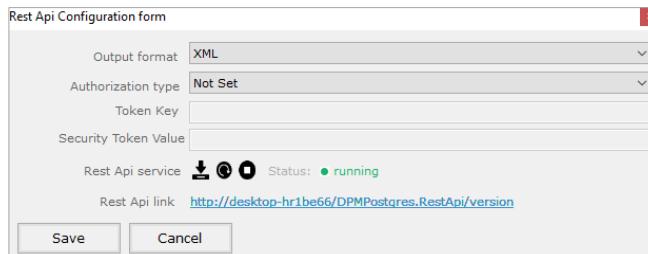
For the first configuration or when the DBPLUS Rest API application has been removed, click the [**Install or update service**] button.



After installing the Rest API application, Status: **running** and the link to the application - Rest Api link should be displayed:

<http://hostname/DPMPostgres.RestApi/version>

Clicking the link will run the version method that checks the version of the Performance Monitor application currently installed on the Windows server.



When a port other than the standard 80 is used within the Performance Monitor application, the link will contain, in addition to the hostname, information about the configured port. Below is an example for port 82:

<http://hostname:82/DPMPostgres.RestApi/version>

1.1.1. Additional information

Domain authentication is not supported in the current version.

Setting the Security option at the Performance Monitor application level is not currently supported in the Rest API.

General description of integration:

- Filters do not support LIKE '% ... %'
- All filters are optional and do not need to be specified in the api call
- Date format: yyyy-mm-dd hh24:mi:ss
- In special cases, the website may return a field that does not apply to a given database platform, e.g. PostgreSQL - we leave it so that there is consistency between different platforms,

Each database platform has a separate REST API. Depending on the platform, the link calling the REST API will be different:

- For Oracle:
<http://hostname/DPMOracle.RestApi/>
- For SQL SERVER
<http://hostname/DPM.RestApi/>
- For PostgreSQL
<http://hostname/DPMPostgres.RestApi/>

1.2. REST API call

In order to call the appropriate method, the appropriate method must be completed in the link that calls the REST API for the platform indicated. For example, below is a call to the **instancelist** method for the SQL SERVER platform.

An example of calling a method:

<http://hostname/DPM.RestApi/instancelist>

The call will return information about all instances connected to DBPLUS monitoring on the MS SQL platform.

The REST API allows to call a method with additional parameters. For this purpose, User can call the given method adding parameters for the link. For example, calling the **instancelist** method for the ORACLE platform with additional parameters:

- **Id** – internal database identifier in DBPLUS
- **Category** – category assigned to the database

An example of calling a method:

<https://hostname/DPMOracle.RestApi/instancelist?id=70&category=OTHER>

1.3. REST API DBPLUS call methods

1.3.1. Version

| | |
|---|---|
| Method | GET |
| Database platform | PostgreSQL, Oracle, MS SQL |
| Address | /version |
| Action | Gets the version and name of the monitored database platform |
| Input data: null | |
| Output data: | |
| ProductVersion | The version of the Performance Monitor application for your database platform |
| ToolName | Name of the DBPLUS application |
| Example [xml]: | |
| <Root xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"> | |
| <ProductVersion>2021.2.3</ProductVersion> | |
| <ToolName>MonitoringPOSTGRES</ToolName> | |
| </Root> | |
| Example [JSON]: | |
| { "ProductVersion": "2021.2.3", "ToolName": "MonitoringPOSTGRES" } | |

1.3.2. Instance list

| | |
|--------------------------|---|
| Method | GET |
| Database platform | PostgreSQL, Oracle, MS SQL |
| Address | /instancelist |
| Action | Retrieves information about instances / databases added to the monitoring configuration (connected and not connected) |
| Input data: | |
| MonitoringEnabled | Instances / databases monitoring included: <ul style="list-style-type: none"> ▪ true ▪ false |
| id | Instance ID |
| category | DBPLUS category assigned to the instance / database |
| Hostname | Host name |
| name | Instance name or connection name or base SID |
| Output data: | |

| | |
|----------------------|---|
| InstanceList | Instance list |
| InstanceInfoRecord | Instance details |
| ServerId | Server Id in the DBPLUS repository |
| HostName | Host name |
| InstanceName | Instance name |
| DisplayedName | Name displayed in the DBPLUS application |
| InstanceId | Instance ID |
| Category | DBPLUS category assigned to the instance / database |
| Version | Instance / database version |
| MonitoringEnabled | Instances / databases monitoring included: <ul style="list-style-type: none"> ▪ True ▪ False |
| DbplusMonitoringUser | User designated for monitoring |

Example [xml]:

```
<Root xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
<InstanceList>
<InstanceInfoRecord>
<ServerId>1</ServerId>
<HostName>10.123.212.51</HostName>
<InstanceName>psqlrepo</InstanceName>
<DisplayedName>psqlrepo</DisplayedName>
<InstanceId>psqlrepo</InstanceId>
<Category>DBUX PRODUCTION</Category>
<Version>11.5 (Debian 11.5-1+deb10u1)</Version>
<MonitoringEnabled>true</MonitoringEnabled>
<DbplusMonitoringUser>dbplusrepo</DbplusMonitoringUser>
</InstanceInfoRecord>
<InstanceInfoRecord>
<ServerId>10</ServerId>
<HostName>10.125.1.20</HostName>
<InstanceName>prodbddb01</InstanceName>
<DisplayedName>prodbddb01</DisplayedName>
<InstanceId>prodbddb03</InstanceId>
<ServerType>PRODUCTION DATABASE</ServerType>
<Version>13.1</Version>
<MonitoringEnabled>true</MonitoringEnabled>
<DbplusMonitoringUser>dbplusmon</DbplusMonitoringUser>
</InstanceInfoRecord>
</InstanceList>
</Root>
```

Example [JSON]:

```
{"InstanceList":[{"HostName":"SQL11","InstanceName":"SQL11\\SQLMDR","DisplayedName":"SQL11\\SQLMDR","InstanceId":"SQL11\\SQLMDR","Category":"OTHER","Version":"2012","MonitoringEnabled":true,"DbplusMonitoringUser":"dbplus","ServerId":104,"StringServerId":"104"}]}
```

1.3.3. Dashboard status

| | |
|-------------------|---|
| Method | GET |
| Database platform | PostgreSQL, Oracle, MS SQL |
| Address | /dashboard |
| Action | Retrieves information about the statistics presented on the DBPLUS Dashboard screen |

| Input data: | |
|------------------------------|---|
| isactive | Connection status |
| id | Instance ID |
| category | DBPLUS category assigned to the instance / database |
| Hostname | Host name |
| name | Instance name or connection name or base SID |
| Output data: | |
| InstanceList | Instance list |
| InstanceInfoRecord | Instance record |
| ToolName | Name of the DBPLUS application |
| ServerId | Server ID |
| HostName | Host Name |
| InstanceName | Instance name |
| Category | DBPLUS category assigned to the instance / database |
| Version | Instance / database version |
| ProcesorsNumber | Number of processors * for PostgreSQL it returns null |
| InstanceProcesorsNumber | The number of processors assigned to the instance * for PostgreSQL it returns null |
| IsActive | Active connection to the DBPLUSCATCHER service: <ul style="list-style-type: none"> ▪ True ▪ False |
| IsOutage | Is the instance / database currently in Outage: <ul style="list-style-type: none"> ▪ True ▪ False |
| ActiveStatus | Instance / database status based on DBPLUS: <ul style="list-style-type: none"> ▪ -1 – Not connected ▪ 0 – instance in Outage status ▪ 1 – Performing Well ▪ 2 - Warning ▪ 3 - Critical |
| AlwaysOn_ActiveStatus | Always On status based on DBPLUS: <ul style="list-style-type: none"> ▪ -1 – Not connected ▪ 0 – instance in Outage status ▪ 1 – Performing Well ▪ 2 - Warning ▪ 3 – Critical ▪ Null – returned for Oracle, PostgreSQL versions |
| FailoverCluster_ActiveStatus | FailoverCluster status based on DBPLUS: <ul style="list-style-type: none"> ▪ -1 – Not connected ▪ 0 – instance in Outage status ▪ 1 – Performing Well ▪ 2 – Warning ▪ 3 – Critical ▪ Null – returned for Oracle, PostgreSQL versions |
| StandBy_ActiveStatus | Status Standby based on DBPLUS: <ul style="list-style-type: none"> ▪ -1 – Not connected ▪ 0 – instance in Outage status ▪ 1 – Performing Well ▪ 2 – Warning ▪ 3 – Critical ▪ Null – returned for MS SQL, PostgreSQL versions |

| | |
|-------------------------------|---|
| UtilizationCPUServer | Server CPU usage [s/1s] * for PostgreSQL it returns null |
| UtilizationCPUInstance | Instance CPU usage [s/1s] * for PostgreSQL it returns null |
| UtilizationWaits | Waits Level [s/1s] |
| UtilizationWaitsIO | Waits IO Level [s/1s] |
| UtilizationWaitsLock | Lock level [s/1s] |
| UtilizationWaitsPercent | Waits Level [%] * for PostgreSQL it returns null |
| UtilizationWaitsIOPercent | Waits IO Level [%] * for PostgreSQL it returns null |
| UtilizationWaitsLockPercent | Lock level [%] * for PostgreSQL it returns null |
| UtilizationWaitsOther | Waits Other level [s/1s] |
| UtilizationCPUServerPercent | Server CPU usage [%] * for PostgreSQL it returns null |
| UtilizationCPUInstancePercent | Instance CPU usage [%] * for PostgreSQL it returns null |
| UtilizationSessionsActive | The number of active sessions |
| UtilizationSessionsLocked | The number of blocked sessions |
| UtilizationTransactions | the number of transactions |
| SpaceInfo | Information about the use of disk space |
| Total | Total Usage |
| Used | Occupied space |
| Free | Free space |
| ReasonAlertCritical | Number of Critical alerts for the last 2 hours |
| ReasonAlertWarning | Number of Warning alerts for the last 2 hours |
| Logdate | Date when the data was generated |
| ContainsAlwaysOn | Includes Always On: <ul style="list-style-type: none">▪ True▪ False▪ Null - returned for Oracle, PostgreSQL versions |
| ContainsFailoverCluster | Includes Failover Cluster: <ul style="list-style-type: none">▪ True▪ False▪ Null - returned for Oracle, PostgreSQL versions |
| ContainsStandBy | Includes Standby: <ul style="list-style-type: none">▪ True▪ False▪ Null - returned for MS SQL, PostgreSQL versions |
| ErrorInfo | Error information. |

Example [xml]:

```
<Root xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
<InstanceList>
<InstanceInfoRecord>
<ToolName>MonitoringMSSQL</ToolName>
<ServerId>70</ServerId>
<HostName>CRMSQL31</HostName>
<InstanceName>CRMSQL31</InstanceName>
<Category>OTHER</Category>
<Version>2014 (12.0.5207.0)</Version>
<ProcesorsNumber>16</ProcesorsNumber>
<InstanceProcesorsNumber>16</InstanceProcesorsNumber>
```

```

<CPUMachineSupported>true</CPUMachineSupported>
<CPUInstanceSupported>true</CPUInstanceSupported>
<IsActive>true</IsActive>
<IsOutage>false</IsOutage>
<ActiveStatus>1</ActiveStatus>
<AlwaysOn_ActiveStatus>-1</AlwaysOn_ActiveStatus>
<FailoverCluster_ActiveStatus>-1</FailoverCluster_ActiveStatus>
<StandBy_ActiveStatus>-1</StandBy_ActiveStatus>
<Replication_ActiveStatus>-1</Replication_ActiveStatus>
<UtilizationCPUserver>2.08</UtilizationCPUserver>
<UtilizationCPUinstance>2.08</UtilizationCPUinstance>
<UtilizationWaits>2.4</UtilizationWaits>
<UtilizationWaitsIO>0.14</UtilizationWaitsIO>
<UtilizationWaitsLock>0</UtilizationWaitsLock>
<UtilizationWaitsPercentToCpu>15</UtilizationWaitsPercentToCpu>
<UtilizationWaitsIOPercentToCpu>1</UtilizationWaitsIOPercentToCpu>
<UtilizationWaitsLockPercentToCpu>0</UtilizationWaitsLockPercentToCpu>
<UtilizationWaitsOther>2.26</UtilizationWaitsOther>
<UtilizationCPUserverPercent>13</UtilizationCPUserverPercent>
<UtilizationCPUinstancePercent>13</UtilizationCPUinstancePercent>
<UtilizationWaitsPercent>20</UtilizationWaitsPercent>
<UtilizationSessionsActive>4</UtilizationSessionsActive>
<UtilizationSessionsInactive>0</UtilizationSessionsInactive>
<UtilizationSessionsLocked>0</UtilizationSessionsLocked>
<UtilizationTransactions>0</UtilizationTransactions>
<SpaceInfo>
<ServerId>70</ServerId>
<Total>2206.3</Total>
<Used>1550.7</Used>
<Free>655.6</Free>
</SpaceInfo>
<ReasonAlertCritical>0</ReasonAlertCritical>
<ReasonAlertWarning>0</ReasonAlertWarning>
<Logdate>2021-08-23 11:20:30</Logdate>
<ContainsAlwaysOn>false</ContainsAlwaysOn>
<ContainsFailoverCluster>false</ContainsFailoverCluster>
<ContainsStandBy>false</ContainsStandBy>
<ContainsReplica>false</ContainsReplica>
<ErrorInfo/>
</InstanceInfoRecord>
</InstanceList>
</Root>
```

Example [JSON]:

```
{"InstanceList": [{"IsActive":true,"IsOutage":false,"ActiveStatus":1,"AlwaysOn_ActiveStatus":-
1,"FailoverCluster_ActiveStatus":-
1,"StandBy_ActiveStatus":null,"UtilizationCPUserver":3.2,"UtilizationCPUinstance":1.12,"UtilizationWaits":5.39,"UtilizationWaitsIO":1.26,"UtilizationWaitsLock":0.01,"UtilizationWaitsOther":4.12,"UtilizationCPUserverPercent":20,"UtilizationCPUinstancePercent":7,"UtilizationWaitsPercent":34,"UtilizationWaitsIOPercent":8,"UtilizationWaitsLockPercent":0,"UtilizationSessionsActive":4,"UtilizationSessionsLocked":0,"UtilizationTransactions":0,"Logdate":"2021-09-01 14:52:15","ContainsAlwaysOn":false,"ContainsFailoverCluster":false,"ContainsStandBy":null,"InstanceName":"CRMSQL31","HostName":"CRMSQL31","ProcesorsNumber":16,"InstanceProcesorsNumber":16,"Version":"2014 (12.0.5207.0)","ServerId":70,"ToolName":"MonitoringMSSQL","Category":"OTHER","SpaceInfo":{"Total":2207.1,"Used":1493.1,"Free":714.0,"UsedPercent":68,"FreePercent":32},"ReasonAlertCritical":0,"ReasonAlertWarning":0,"ErrorInfo":""}]}]
```

1.3.4. Alert Information

| | |
|---|---|
| Method | GET |
| Database platform | PostgreSQL, Oracle, MS SQL |
| Address | /alerts |
| Action | Gets information about alerts in the monitored instance |
| Input data: | |
| server_id | Instance ID |
| date_from | Date from which the alerts will be downloaded In format [YYYY:RR:DD HH:MM:SS] |
| date_to | Date to which alerts will be downloaded In format [YYYY:RR:DD HH:MM:SS] |
| No parameters on the input means that information about alerts for the last 2 hours is being downloaded | |
| Output data: | |
| ProblemsList | List of problems |
| ProblemInfoRecord | Details of the problem |
| ReasonId | The ID of the problem |
| ServerId | Instance / database ID |
| Class | Problem class |
| Name | Name of the event related to the problem |
| AlertsList | List of alerts |
| Alert | Information about the alert |
| AlertType | Alert type |
| AlertStatus | Alert status: <ul style="list-style-type: none">▪ Critical▪ Warning |
| AlertId | Internal DBPLUS identifier of the alert |
| AlertStatisticName | The name of the statistics associated with the alert |
| Message | Alert message |
| QueryHashIdentifier | ID of the query associated with the alert |
| IsQueryAlert | Is an alert associated with the query: <ul style="list-style-type: none">▪ True▪ False |

Example [xml]:

```

<Root xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
<ProblemsList>
<ProblemInfoRecord>
<ReasonId>5329529</ReasonId>
<Logdate>2021-08-23 12:32:17</Logdate>
<ServerId>100</ServerId>
<Class>Lock</Class>
<Name>High LCK_M_IX event</Name>
<AlertsList>
<Alert>
<AlertType>Sql Query</AlertType>
<AlertStatus>Critical</AlertStatus>
<AlertId>query_et</AlertId>
<AlertStatisticName>Elapsed Time</AlertStatisticName>
<Message>Alert Type: Sql Query, The measured statistic value is 27,1 times higher than allowed maximum , Statement query hash: 0xCAA8349B9AB73044, Statistics: Elapsed Time, Last value: 304,0 s, History value: 10,8 s </Message>
<QueryHashIdentifier>0xCAA8349B9AB73044</QueryHashIdentifier>
<IsQueryAlert>true</IsQueryAlert>
</Alert>
<Alert>
<AlertType>Sql Query</AlertType>
<AlertStatus>Critical</AlertStatus>
```

```
<AlertId>query_et1</AlertId>
<AlertStatisticName>Elapsed Time per 1 exec</AlertStatisticName>
<Message>Alert Type: Sql Query, The measured statistic value is 17,7 times higher than allowed maximum , Statement query hash: 0xCAA8349B9AB73044, Statistics: Elapsed Time per 1 exec, Last value: 0,3436 s, History value: 0,0183 s </Message>
<QueryHashIdentifier>0xCAA8349B9AB73044</QueryHashIdentifier>
<IsQueryAlert>true</IsQueryAlert>
</Alert>
</AlertsList>
</ProblemInfoRecord>
</ProblemsList>
</Root>
```

Example [JSON]:

```
{"ProblemsList": [{"ReasonId": 5335636, "Logdate": "2021-09-01 17:07:02", "ServerId": 203, "Class": "Lock", "Name": "High LCK_M_U event", "AlertsList": [{"AlertType": "Sql Query", "AlertStatus": "Critical", "AlertId": "query_et1", "AlertStatisticName": "Elapsed Time", "Message": "Alert Type: Sql Query, The measured statistic value is 2,3 times higher than allowed maximum , Statement query hash: 0xD388D40A35DB4D8F, Statistics: Elapsed Time, Last value: 671,9 s, History value: 205,8 s", "QueryHashIdentifier": "0xD388D40A35DB4D8F", "IsQueryAlert": true}, {"AlertType": "Sql Query", "AlertStatus": "Critical", "AlertId": "query_et1", "AlertStatisticName": "Elapsed Time per 1 exec", "Message": "Alert Type: Sql Query, The measured statistic value is 5,5 times higher than allowed maximum , Statement query hash: 0xD388D40A35DB4D8F, Statistics: Elapsed Time per 1 exec, Last value: 0,0070 s, History value: 0,001077 s", "QueryHashIdentifier": "0xD388D40A35DB4D8F", "IsQueryAlert": true}]}]}
```

2 Anomaly Monitor

As part of the latest version of Anomaly monitor, we have introduced a number of fixes and improvements in the anomaly search module in the monitored instance. The most important changes are presented below:

- Improved search and presentation of information about the session being the main blocker.

The change is to improve the search for the session that is the root cause of the lockout problem. Information is always presented about the session blocking other sessions whose sum of waiting time is the highest in a given time interval.

- Improved New Statements detection - support for the same query versions.

The Anomaly Monitor feature alerts users to new database queries that affect performance. When a new query (with a new identifier) starts in the database, the application will analyze the content of the query and verify that a similar query has not been run before.

- Problem with the presentation of the Space Size chart on the Anomaly report.
- New detection to increase the wait trend without affecting instance performance.

The latest version of Anomaly Monitor verifies and checks the trends of top waits in the monitored instance. When there is an increase in the duration of one of the top waits, Users will receive information about it and about queries related to the wait.

- Improved detection for queries that have constant performance issue.

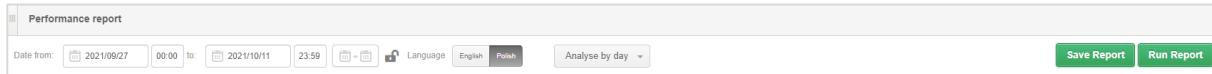
For queries for which performance degradation occurs daily at certain times or at fixed intervals (e.g., it performs a constant business process), for such cases, additional logic is performed, performance is compared over a longer period of time, and if no performance degradation is found, no problem is reported efficient.

3 Performance Report

The ability to generate a new report has been added to the latest version of the application. The report contains information about the most important performance statistics for a given instance. Contains data on top queries performed in the instance in a selected period of time.

The report is available at the detail level of a given instance in the **Reports - Performance report menu**. The previous report, which contained information about top queries, is available to be generated in the **Top heavy queries menu**.

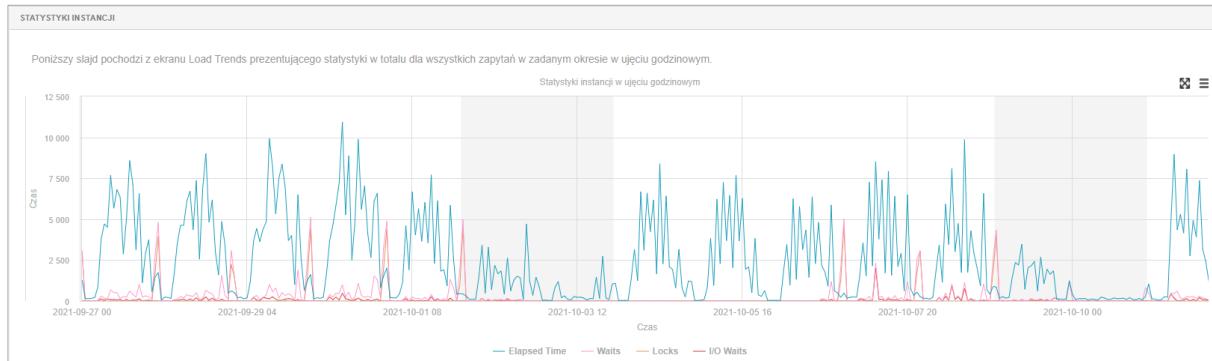
The report can be generated for the selected period, as well as there is option to choose the language version. Additionally, we can set the accuracy of the generated charts (option by day and by hour). The report generation starts after clicking **Run Report**. The report is visible in the application. Saving the report as *.docx is available after clicking the **Save Report** button.



The report contains information about:

- General instance description (includes basic parameters)
- Performance description

- instance statistics that show the total duration of queries, waiting time, IO waiting, locks.



- top wait stats

- Performance description for the last 6 months
- Top queries

This chapter presents information on the most burdensome queries in the analyzed period:

- the text of the query,
- characteristics,
- summary of statistics for the selected period,
- graph of duration statistics for a selected period,
- performance plans or plans.

4 Small fixes and improvements

5.1. Improvement of the charts in the Top heavy queries report

We have corrected the problem of presenting some graphs while the report is being generated. The graphs in the report were not generating correctly in some versions of browsers. The problem has been fixed in the latest version.

In the latest version of the application, due to the addition of a new report, the current name of the report has been changed from **Performance Report** to **Top heavy queries**.

5.2. Instance Restart Browser

From the latest version, the Performance Monitor application will collect information about restarting the instance. This information can be obtained by clicking on the icon in the upper right corner of the screen on the level of instance details.

| INSTANCE RESTART HISTORY | | X Close |
|--------------------------|------------|----------------|
| Date from: | 2021/05/01 | to: 2021/10/11 |
| Restart time ▾ | | |
| 2021-10-09 23:05:53 | | |
| 2021-10-02 23:05:52 | | |
| 2021-09-25 23:05:50 | | |
| 2021-09-18 23:05:50 | | |
| 2021-09-16 04:01:01 | | |
| 2021-09-11 23:07:06 | | |
| 2021-09-07 13:19:41 | | |
| 2021-09-04 23:06:41 | | |
| 2021-08-28 23:06:50 | | |