



Monitoring
PostgreSQL DBMS

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1 MONITORING OF POSTGRESQL DBMS

1.1. Monitoring via plugins and modules

Once we have installed and configured Pandora FMS server, we're going to explain how to obtain information about the status and performance about a PostgreSQL server locally or remotely. With the **agent plugin**, we'll obtain GENERAL statistics data about the PostgreSQL server and SPECIFIC statistics data about each data base that stores the server, as well as the sub-process Background Writer:

- General statistics about PostgreSQL server: number of user's connections and disk space used by each database that stores the server.
- Specific statistics about each data base: number of transactions, tuples inserted and deleted, blocks of data read from disk and cache and number of active processes.
- Statistics about the sub-process of optimization and tuning for PostgreSQL data bases called BgWriter (Background Writer) as the number of Checkpoints performed.

To get the information we'll make SQL queries against the server to monitor, which contains system protected views with such information. These views are available after the activation of the sub-process The Statistics Collector in the PostgreSQL server.

More information about these processes in PostgreSQL and how to start them.

<http://www.postgresql.org/docs/9.1/interactive/monitoring-stats.html>

<http://www.postgresql.org/docs/9.1/interactive/runtime-config-statistics.html>

<http://www.postgresql.org/docs/9.1/interactive/runtime-config-resource.html#RUNTIME-CONFIG-RESOURCE-BACKGROUND-WRITER>

Dependencies of the plugin:

Server version: PostgreSQL 9.1.3 (Ubuntu)

Client version: libdbi-perl/1.612-1 libdbd-pg-perl/2.17.1-2 postgresql-client/8.4.12 pandorafms-agent-unix/ 4.0.1 perl/5.10.1

1.1.1. Configuration

In this example we'll assume that you have installed the Pandora FMS server and PostgreSQL server on different machines, with all the programs and dependencies installed correctly on the client (*Pandora Agent, interpreter of Perl, libdbi-perl, libdb-pg-perl, postgresql-client*).

To configure the system correctly to monitoring PostgreSQL through the sub-process The Statistics Collector in Pandora FMS, we have to search and edit in the PostgreSQL server the files of configuration:

- **postgresql.conf**

This is the main configuration file to the PostgreSQL server. One example of the configuration could be the next:

```
# Sets the IP address that the server listens to connect to it.
listen_addresses = '*'          # The value '*' indicates all.
password_encryption = on

#-----
# RUNTIME STATISTICS
#-----

# It monitors the queries executed by any server process:
track_activities = on

# Controls access to statistics on tables and indexes:
track_counts = on

# Controls the tracing over user defined functions:
track_functions = all          # Valores posibles: none, pl, all

# Allows a update of the title of the process every time that receives a new SQL command
in the server. It can also be displayed with the ps command.
update_process_title = on

# Sets the path to store the provisional statistics data. It can be a relative or absolute path.
The value of our configuration is the default.
stats_temp_directory = 'pg_stat_tmp'

# The last three parameters, activate the monitoring of each query and its output in the
log server. It is a tool like the getrusage() of Unix.

log_parser_stats = on
log_planner_stats = on
log_executor_stats = on
```

- **pg_hba.conf.**

This configuration file controls the authentication and the connection permits customers to PostgreSQL server. Its general format is one line for each register. Therefore we must indicate the address of the Pandora FMS agent which will execute the plugin to perform the connexion and collect data. One example of the configuration could be the next:

#	TYPE	DATABASE	USER	ADDRESS	METHOD
# "local" is for Unix domain socket connections only					
local	all	all			md5
# IPv4 local connections:					
host	all	all	127.0.0.1/32		md5
host	all	all	192.168.1.1/24		md5
host	all	all	0.0.0.0 0.0.0.0		md5
# IPv6 local connections:					
host	all	all	::1/128		md5
# Allow replication connections from localhost, by a user with the					
# replication privilege.					
host	all	all	fe80::1/128		md5

With everything set up, just reboot or reload the PostgreSQL server to take effect. From now on will be the connection between client-server and will be available the system views with access restricted to privileged users, from which we get the data.

1.1.2. Agent Plugin

How do we get the data?, We need an Agent plugin, as already above, which extracts data from existing views in the system.

The script is as follows:

```
postgresql.pl
```

http://pandorafms.com/index.php?sec=pandora&sec2=repository&lng=es&action=view_PUI&id_PUI=312

This plugin written in Perl programming language receives as input argument data connection to the server which will use the client to connect to PostgreSQL: admin and password, IPv4 address or host name, name of the data base and port. It also has an option that helps explain how it's used.

```
-d <data_base> (optional), default dbname=username  
-u <username>  
-c <password>  
-h <IP_server_PostgreSQL> (optional), default=localhost  
-p <port> (optional), default=5432  
-a (help)
```

If the execution as agent plugin is correct, you will get statistics data in a temporary data file in XML format which will send to Pandora FMS server for its standardization and storage in the DB and will create the modules directly for viewing on web console.

We must include this agent plugin in the configuration file of the Software agent of Pandora FMS: **pandora_agent.conf**. This file can be located at:

```
/etc/pandora/pandora_agent.conf
```

Once located, we'll write the next sentence to execute the plugin:

```
module_plugin <plugin-path> -u username -c password -d dbname -h direccion -p puerto  
<plugin-name>
```

We can leave without indicating the path to the agent plugin if we put it with execution permit in the following path, as the Pandora FMS agent will look there by default.

```
/etc/pandora/plugins/
chmod 700 /etc/pandora/plugins/postgresql.pl
```

Restart the Pandora FMS agent and the server will create a module for each data collected about the PostgreSQL server.

```
/etc/init.d/pandora_agent_daemon restart
```

Database							
	Active Process in: redmine	Numero de procesos activos de servidor c...		N/A - N/A	0	 101	6:46 minutos
	Blocks disks in: redmine	Numero total de bloques no acertados en ...		N/A - N/A	2,025	 101	6:46 minutos
	Blocks fetched in: redmine	Numero total de bloques leidos en la BD		N/A - N/A	813,543	 101	6:46 minutos
	Blocks hit in: redmine	Numero total de bloques acertados en cac...		N/A - N/A	811,518	 101	6:46 minutos
	Buffers_alloc	Numero de buffers asignados globalmente		N/A - N/A	6,471	 101	6:46 minutos
	Buffers_backend	Numero de buffers escritos por procesos ...		N/A - N/A	14	 101	6:46 minutos
	Buffers_Checkpoints	Numero de buffers escritos por CheckPoin...		N/A - N/A	90	 101	6:46 minutos
	Buffers_clean	Numero de buffers limpiados en la ejecuc...		N/A - N/A	0	 101	6:46 minutos
	Buffers_requested_Checkpoints	Numero de veces que BgWriter comenzo Che...		N/A - N/A	2	 101	6:46 minutos
	Buffers_timed_Checkpoints	Numero de veces que BgWriter comenzo Che...		N/A - N/A	973	 101	6:46 minutos
	Commits in: redmine	Numero total de Commits realizados en la...		N/A - N/A	11,958	 101	6:46 minutos
	Conexiones del usuario: postgr...	Numero de Conexiones del Usuario		N/A - N/A	1	 101	6:46 minutos
	Deleted in: redmine	Numero total de tuplas eliminadas en la ...		N/A - N/A	0	 101	6:46 minutos
	Espacio en disco utilizado por...	Espacio en Disco Utilizado por la BD en ...		N/A - N/A	6,095,672	 101	6:46 minutos
	Espacio en disco utilizado por...	Espacio en Disco Utilizado por la BD en ...		N/A - N/A	6,087,480	 101	6:46 minutos
	Fetched in: redmine	Numero total de tuplas buscadas en la BD		N/A - N/A	206,444	 101	6:46 minutos
	Inserted in: redmine	Numero total de tuplas insertadas en la ...		N/A - N/A	64	 101	6:46 minutos
	Returned in: redmine	Numero total de tuplas devueltas en la B...		N/A - N/A	14,505,597	 101	6:46 minutos
	Rollbacks in: redmine	Numero total de Rollbacks realizados en ...		N/A - N/A	4	 101	6:46 minutos
	Updated in: redmine	Numero total de tuplas actualizadas en l...		N/A - N/A	2	 101	6:46 minutos

Possible errors that we can find in the execution of this agent plugin according the input arguments could be:

Error message	When it is displayed
[error] Entrada no indicada correctamente para alguno de los parámetros.	<ul style="list-style-type: none"> At least of the input parameters entered as missing value. Example: <code>-u user -c -h 192.168.1.10</code>
[error] Es necesario indicar un nombre de usuario para realizar la conexión al servidor PostgreSQL.	<ul style="list-style-type: none"> The input parameter <code>-u</code> for the user has not been indicated with value.
[error] Es necesario indicar la contraseña del usuario para realizar la conexión al servidor PostgreSQL.	<ul style="list-style-type: none"> The input parameter <code>-c</code> for the password of the user has not been indicated with value.
[error] Nomenclatura en su dirección IP o nombre de equipo \$host no válida	<ul style="list-style-type: none"> The IPv4 or computer name entered is invalid for the connection.
DBI connect('usuario', 'contraseña') failed: FATAL: password authentication failed for user "usuario"	<ul style="list-style-type: none"> Authentication failure because the password doesn't match the one expected by the PostgreSQL server for that user.
DBI connect('host=IP;port=puerto'...) failed: could not connect to server: No existe ninguna ruta hasta el «host» Is the server running on host "IP" and accepting TCP/IP connections on port "puerto" ?	<ul style="list-style-type: none"> Not exists or is not running any PostgreSQL server on that IP address or host. PostgreSQL server isn't listening to request TCP/IP on that port. PostgreSQL server don't accept connection request for that client, you must configure <code>pg_hba.conf</code>. There may be a firewall activated that prevents connection enabled.
DBI connect('dbname=base_datos;host..') failed FATAL: database "base_datos" does not exist	<ul style="list-style-type: none"> Database name indicated doesn't exist. It can happen when indicating a default name and the plugin tries to connect to a named user DB. Default <code>dbname=username</code>.