

# SLCOE: PostgreSQL Monitoring

SLCOE PostgreSQL Monitoring v0.5

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## What is PostgreSQL?

PostgreSQL also known as Postgres is an open-source relational database management system (RDBMS) emphasizing extensibility and SQL compliance. PostgreSQL is used as the primary data store or data warehouse for many web, mobile, geospatial, and analytics applications.

## What does this Powerpack cover?

The SLCOE: PostgreSQL Monitoring Powerpack enables you to monitor PostgreSQL Configuration and Performance metrics on Linux and Windows. The Powerpack includes the following features:

- Dynamic Applications that collect data from PostgreSQL installed in Linux and Windows.
- Event Policies and corresponding alerts that are triggered when threshold meet certain status criteria.
- Device class that classifies PostgreSQL Database and Tables.

## Prerequisites for Monitoring PostgreSQL Powerpack

Before you can monitor this pack using the SLCOE: PostgreSQL Monitoring Powerpack, you must have the following information about the devices that have already been properly configured:

- IP address of the system where PostgreSQL is running.
- Username, password of Linux/Windows machine which has PostgreSQL server installed.
- The username, password for PostgreSQL database.
- SL1 version 8.14.x and higher
- Port number on which PostgreSQL is running.
- This pack supports PostgreSQL version 9.6 and above.
- This pack also supports PostgreSQL Hyper table monitoring for Linux whose DAs are disabled for now. If monitoring for the same is required, then as a prerequisite Timescale DB need to be installed in PostgreSQL server.
- PostgreSQL server user should have permission to run below queries.

```
✚ SELECT DISTINCT(d.datname), s.datid, pg_size_pretty(pg_database_size(s.datname)) AS size, sa.state FROM pg_database AS d JOIN pg_stat_database AS s ON s.datname = d.datname LEFT JOIN pg_stat_activity AS sa ON sa.datname = d.datname WHERE NOT datistemplate AND datallowconn AND s.datid = {}
```

```
✚ SELECT db.datname as db_name,numbackends, pg_database_size(stat.datid) AS db_size, tup_returned, tup_fetched, tup_inserted, tup_updated, tup_deleted,deadlocks, blks_read, blks_hit, xact_commit, xact_rollback FROM pg_database AS db JOIN pg_stat_database AS stat ON stat.datname = db.datname WHERE NOT datistemplate AND datallowconn AND stat.datid = {}
```

```
✚ SELECT DISTINCT(d.datname), s.temp_files, s.temp_bytes as temp_file_size, pl.locktype, pl.virtualtransaction, age(datfrozenxid) as max_freeze_age, current_setting('autovacuum_freeze_max_age') as autovacuum_freeze_max_age, 100 * xact_commit / NULLIF((xact_commit + xact_rollback), 0) as commit_ratio FROM pg_database AS d JOIN pg_stat_database AS s ON s.datname = d.datname LEFT JOIN pg_stat_activity AS sa ON sa.datname = d.datname LEFT JOIN pg_locks AS pl ON pl.database = s.datid WHERE NOT datistemplate AND datallowconn AND s.datid = {}
```

- ✚ **archiver:** select \* from pg\_stat\_archiver;
- ✚ **backup\_age:** select pg\_backup\_start\_time ();
- ✚ **autovacuum:** select setting as autovacuum from pg\_settings where name = 'autovacuum'
- ✚ **bg\_writer:** select \* from pg\_stat\_bgwriter;
- ✚ **oldest\_idle:** SELECT pid as idle\_pid, application\_name as app\_name, min(backend\_start) as oldest\_idle\_start\_time FROM pg\_stat\_activity where state = 'idle' group by pid, application\_name limit 1;
- ✚ **longest\_query:** SELECT now() - pg\_stat\_activity.query\_start AS query\_duration, query as longest\_query FROM pg\_stat\_activity WHERE (now() - pg\_stat\_activity.query\_start) > interval '5 minutes' order by query\_duration desc limit 5;
- ✚ **wal\_files:** elect name as wal\_file, size as wal\_file\_size from pg\_ls\_waldir(); (#v10 & above)
- ✚ **wal\_files:** select \* from pg\_ls\_dir('pg\_xlog'), pg\_size\_bytes(current\_setting('wal\_segment\_size')) as total\_size; ( version 9)
- ✚ **wal\_replay:** select pg\_last\_xact\_replay\_timestamp();,
- ✚ **stream\_delta:** select pid, usesysid, username, application\_name, client\_addr, client\_port, backend\_start, state, sync\_priority, sync\_state from pg\_stat\_replication;
- ✚ **Databases\_discovery:** select datname, datid from pg\_stat\_database;
- ✚ **Postgres\_version:** select version ();
- ✚ **Service status:** systemctl status postgresql
- ✚ **Hypertable Jobs:** SELECT \* FROM timescaledb\_information.jobs;
- ✚ **Hypertable Job stats:** SELECT job\_id, total\_runs, total\_failures, total\_successes FROM timescaledb\_information.job\_stats WHERE hypertable\_name = 'test\_table';

**NOTE:** This Powerpack has latest updates which includes following things:

1. 'State' collection object has been eliminated from SLCOE: PostgreSQL DB Configuration Dynamic App and alerts and events corresponding to it.
2. Replacing Major and Healthy events with Notice event for Disk blocks in SLCOE: PostgreSQL DB Performance DA.
3. In SLCOE: PostgreSQL Longest Query DA, Alerts, events, and corresponding threshold has been eliminated.

If Powerpack is being upgraded to latest revision, it is recommended to explicitly follow the below steps to avoid deprecated items to generate false data after update.

**Step 1:** Wrench the SLCOE: PostgreSQL DB Configuration DA in list of Dynamic Applications, Go to Collection Objects -> Select 'State' -> Select Action -> Select Delete Object -> Click on Go. This will delete the collection object.

Close Properties Collections Snippets Thresholds Alerts

Dynamic Applications [2128] | Collection Objects Guide Reset

Object Name:

Snippet Arguments:

Class Type:

String Type:

Custom Attribute:

Snippet:

Group / Usage Type:

Asset / Form Link:

Inventory Link:

Change Alerting:

Table Alignment:

Hide Object:

Description: Returns current state of database

Formula:

Save Save As  Disable Object Maintenance

Collection Object Registry

Object Name	Class Type	Class ID	Snippet Arguments	Group	ID	Asset Link	Change Alerting	Align	Edit Date	
Basic Parameters	Label (Config Group)	108		2	o_22167	--	Disabled	Center	2022-06-17 14:49:01	<input type="checkbox"/>
Database ID	Config Character	10	datid	2	o_22164	--	Disabled	Center	2022-06-17 14:49:01	<input type="checkbox"/>
Database Name	Config Character	10	db_name	2	o_22163	--	Disabled	Center	2022-06-17 14:49:01	<input type="checkbox"/>
Database Size	Config Character	10	db_size	2	o_22165	--	Disabled	Center	2022-06-17 14:49:01	<input type="checkbox"/>
State	Config Character	10	state	2	o_22166	--	Disabled	Left	2022-06-16 16:57:43	<input checked="" type="checkbox"/>

[Select Action]  Go

**Step 2:** Now go to Alerts page for same Dynamic Application (SLCOE: PostgreSQL DB Configuration) -> click on the bomb icon for both the alerts. Click on 'OK' to delete the alerts to avoid false events.

Close Properties Collections Snippets Thresholds Alerts

Dynamic Applications [2128] | Alert Objects Guide Reset

Policy Name:

Active State:

Log Message:

Maintain State:

Trigger Alert:

Save

Formula Editor

7 8 9 o\_22163: Database Name  
4 5 6 o\_22164: Database ID  
1 2 3 o\_22165: Database Size  
0 Add

r() () CE  
\*\* != ==  
/ \* >=  
- + <=

Alert Object Registry

Policy Name	Formula	State	Maintain	Events	ID	Edit Date
SLCOE: Postgres DB Configuration Database State Offline	result('o_22166', label=' o_22163')==Offline'	Enabled	Yes	⚠ Yes	a_2899	2022-06-16 16:57:44
SLCOE: Postgres DB Configuration Database State Online	result('o_22166', label='o_22163')==Online' and active(a_2899)	Enabled	No	⚠ Yes	a_2900	2022-06-16 16:57:44

**Step 3:** Wrench on SLCOE: PostgreSQL DB Performance DA, Go to threshold -> Click on the bomb icon for Disk\_blocks and Click on 'OK' to delete the threshold.

Close Properties Collections Presentations Snippets **Thresholds** Alerts

Dynamic Applications [2141] | Threshold Objects Guide Reset

Threshold Name

Override Threshold Value

Numeric Range: High [100]

Numeric Range: Low [0]

Threshold Type

Threshold Unit

Threshold Value

Save

**Threshold Object Registry**

	Name	Override	Type	Numeric Range High	Numeric Range Low	Threshold Unit	Threshold Value	ID	Date	Edit
1.	Backends	Enabled	Integer	1000	\$	100	t_966	2022-06-17 09:19:03		
2.	Database_size_percentage	Enabled	Percentage	100	\$	0	t_965	2022-06-17 09:19:03		
3.	Deadlocks	Enabled	Integer	1000	\$	500	t_967	2022-06-17 09:19:03		
4.	Disk_blocks	Enabled	Integer	1000	\$	500	t_968	2022-06-16 11:27:43		
5.	Set_Database_size_MB	Enabled	Integer	1000000	\$	500	t_964	2022-06-17 09:19:03		

Now Go to Alerts tab of same DA, click on the bomb icon for 'Postgres DB blocks number Exceed' Alert and Click on 'OK' to delete the alert.

Close Properties Collections Presentations Snippets Thresholds **Alerts**

Dynamic Applications [2141] | Alert Objects Guide Reset

Policy Name

Active State

Log Message

Maintain State

Trigger Alert

Save

Formula Editor

t\_965: Database\_size\_percentage

t\_964: Set\_Database\_size\_MB

t\_966: Backends

Add

**Registry**

Policy Name	Formula	State	Maintain	Events	ID	Edit Date
Postgres DB Backend number Exceed	result(o_22236,label='o_22234')>threshold(t_966)	Enabled	Yes	Yes	a_2909	2022-06-17 14:49:04
Postgres DB Backend number is less than threshold	result(o_22236,label='o_22234')<=threshold(t_966) and active(a_2909)	Enabled	No	Yes	a_2910	2022-06-17 14:49:04
Postgres DB Database Size Exceed	result(round(((t_964)=0) and (o_22235/(1024*1024))*100/t_964,2),label='o_22234')	Enabled	Yes	Yes	a_2908	2022-06-17 14:49:04
Postgres DB Database Size is less than threshold	result(round(((t_964)=0) and (o_22235/(1024*1024))*100/t_964,2),label='o_22234')	Enabled	No	Yes	a_2907	2022-06-17 14:49:04
Postgres DB Deadlocks number Exceed	result(o_22237,label='o_22234')>threshold(t_967)	Enabled	Yes	Yes	a_2911	2022-06-17 14:49:04
Postgres DB Deadlocks number is less than threshold	result(o_22237,label='o_22234')<=threshold(t_967) and active(a_2911)	Enabled	No	Yes	a_2912	2022-06-17 14:49:04
Postgres DB Disk blocks number Exceed	result(o_22238,label='o_22234')>threshold(t_968)	Enabled	Yes	Yes	a_2913	2022-06-16 16:57:44
Postgres DB Number of Disk blocks	result(o_22238,label='o_22234')	Enabled	Yes	Yes	a_2914	2022-06-17 14:49:04

**Step 4:** Wrench on SLCOE: PostgreSQL Instance Longest Query. Go to threshold and click on the bomb icon and click on 'OK' to delete the threshold.

Close Properties Collections Snippets **Thresholds** Alerts

Dynamic Applications [2132] | Threshold Objects Guide Reset

Threshold Name

Override Threshold Value

Numeric Range: High [100]

Numeric Range: Low [0]

Threshold Type

Threshold Unit

Threshold Value

Save

**Threshold Object Registry**

	Name	Override	Type	Numeric Range High	Numeric Range Low	Threshold Unit	Threshold Value	ID	Date	Edit
1.	Long Running Query	Enabled	Integer	120	S	Minutes	15	t_962	2022-06-17 09:19:01	

Now Go to Alerts tab of same DA and click on the bomb icon and click on 'OK' to delete the alerts to avoid false alerts.

	Policy Name	Formula	State	Maintain	Events	ID	Edit Date
1.	SLCOE: Postgres Instance Longest Query equal to threshold	result(round(("o_22186"/60),2),label= "o_22187") = threshold	Disabled	Yes	Yes	a_2902	2022-06-16 16:57:44
2.	SLCOE: Postgres Instance Longest Query Exceeded threshold	result(round(("o_22186"/60),2),label= "o_22187") > thresh	Disabled	Yes	Yes	a_2901	2022-06-16 16:57:44

**Step 5:** To delete the false events for above alerts, Go to Registry -> Events -> Event Manager page.

Search as 'SLCOE\*Postgres' in search tab. All the events corresponding to the Powerpack will be displayed. Select the below events -> Select 'Actions'-> Click on delete these Event Policies -> Click on 'Go'. Event Policies will get deleted.

Below are event policies to be deleted.

1. SLCOE: Postgres DB Configuration Database State Offline
2. SLCOE: Postgres DB Configuration Database State Online
3. SLCOE: Postgres DB Disk blocks number Exceed
4. SLCOE: Postgres Instance Longest Query equal to threshold
5. SLCOE: Postgres Instance Longest Query Exceeded threshold

	Event Policy Name	Type	State	P-Pack	Severity	Weights	ID	Policy	Time	Thresh	Edited By	Last Edited	External ID	Ext. Category
1.	SLCOE: Postgres Autovacuum is now ON	Dynamic	Enabled	Yes	Healthy	0	4964	20 Min.	0 Min.	0	em7admin	2022-05-17 14:40:01	--	--
2.	SLCOE: Postgres Autovacuum is OFF	Dynamic	Enabled	Yes	Major	0	4963	90 Min.	0 Min.	0	em7admin	2022-05-17 14:40:01	--	--
3.	SLCOE: Postgres DB Backend number Exceed	Dynamic	Enabled	Yes	Major	0	4966	90 Min.	0 Min.	0	em7admin	2022-05-17 14:40:03	--	--
4.	SLCOE: Postgres DB Backend number is less than threshold	Dynamic	Enabled	Yes	Healthy	0	4967	20 Min.	0 Min.	0	em7admin	2022-05-17 14:40:03	--	--
5.	SLCOE: Postgres DB Configuration Database State Offline	Dynamic	Disabled	Yes	Major	0	4967	90 Min.	0 Min.	0	em7admin	2022-05-16 16:57:43	--	✓
6.	SLCOE: Postgres DB Configuration Database State Online	Dynamic	Disabled	Yes	Healthy	0	4968	20 Min.	0 Min.	0	em7admin	2022-05-16 16:57:43	--	✓
7.	SLCOE: Postgres DB Database Size Exceed	Dynamic	Enabled	Yes	Major	0	4968	90 Min.	0 Min.	0	em7admin	2022-05-17 14:40:03	--	--
8.	SLCOE: Postgres DB Database Size is less than threshold	Dynamic	Enabled	Yes	Healthy	0	4965	20 Min.	0 Min.	0	em7admin	2022-05-17 14:40:03	--	--
9.	SLCOE: Postgres DB Deadlocks number Exceed	Dynamic	Enabled	Yes	Major	0	4966	90 Min.	0 Min.	0	em7admin	2022-05-17 14:40:03	--	--
10.	SLCOE: Postgres DB Deadlocks number is less than threshold	Dynamic	Enabled	Yes	Healthy	0	4970	20 Min.	0 Min.	0	em7admin	2022-05-17 14:40:03	--	--
11.	SLCOE: Postgres DB Disk blocks number Exceed	Dynamic	Disabled	Yes	Major	0	4971	90 Min.	0 Min.	0	em7admin	2022-05-16 16:57:43	--	✓
12.	SLCOE: Postgres DB Number of Disk blocks	Dynamic	Enabled	Yes	None	0	4972	20 Min.	0 Min.	0	em7admin	2022-05-17 14:40:03	--	--
13.	SLCOE: Postgres Instance Longest Query equal to threshold	Dynamic	Disabled	Yes	Healthy	0	4980	20 Min.	0 Min.	0	em7admin	2022-05-16 16:57:43	--	✓
14.	SLCOE: PostgresSQL Hypertable job failures greater than threshold	Dynamic	Enabled	Yes	Major	0	4975	90 Min.	0 Min.	0	em7admin	2022-05-17 14:40:03	--	--
15.	SLCOE: PostgresSQL Hypertable job failures less than threshold	Dynamic	Enabled	Yes	Healthy	0	4978	30 Min.	0 Min.	0	em7admin	2022-05-17 14:40:03	--	--
16.	SLCOE: PostgresSQL Windows Service status is running	Dynamic	Enabled	Yes	Healthy	0	4977	15 Min.	0 Min.	0	em7admin	2022-05-17 14:40:04	--	--
17.	SLCOE: PostgresSQL Windows Service status is stopped	Dynamic	Enabled	Yes	Major	0	4979	90 Min.	0 Min.	0	em7admin	2022-05-17 14:40:04	--	--
18.	SLCOE: PostgresSQL Instance Discovery Service status is active	Dynamic	Enabled	Yes	Healthy	0	4974	20 Min.	0 Min.	0	em7admin	2022-05-17 14:40:01	--	--
19.	SLCOE: PostgresSQL Instance Discovery Service status is inactive	Dynamic	Enabled	Yes	Major	0	4973	90 Min.	0 Min.	0	em7admin	2022-05-17 14:40:01	--	--
20.	SLCOE: PostgresSQL Instance Longest Query Exceeded threshold	Dynamic	Disabled	Yes	Major	0	4950	90 Min.	0 Min.	0	em7admin	2022-05-16 16:57:43	--	✓

## Supported OS

- The powerpack makes direct remote DB queries to the Postgres instance, so the operating system should not matter.
- It also important to note that this version of the powerpack will require you to create a SSH and SOAP/XML credential for the target machine.
- This pack supports for both Linux and Windows OS.

## Dynamic Applications shipped

In this powerpack, we have 19 Dynamic Applications (DA),

- SLCOE: PostgreSQL Instance Discovery Linux
- SLCOE: PostgreSQL Instance Discovery Windows
- SLCOE: PostgreSQL DB Configuration
- SLCOE: PostgreSQL DB Discovery
- SLCOE: PostgreSQL DB Performance
- SLCOE: PostgreSQL DB- Other
- SLCOE: PostgreSQL Instance Archiver
- SLCOE: PostgreSQL Instance Autovacuum
- SLCOE: PostgreSQL Instance Backup Age
- SLCOE: PostgreSQL Instance BG Writer
- SLCOE: PostgreSQL Instance Caching
- SLCOE: PostgreSQL Instance Idle Transaction
- SLCOE: PostgreSQL Instance Longest Query
- SLCOE: PostgreSQL Instance Streaming Replication
- SLCOE: PostgreSQL Instance WAL Files
- SLCOE: PostgreSQL Instance WAL Replay
- SLCOE: PostgreSQL DB Hypertable job Stats
- SLCOE: PostgreSQL DB Hypertable Jobs
- SLCOE: PostgreSQL DB HT Discovery

SLCOE: PostgreSQL DB Configuration:

This Dynamic Application is used to collect various configuration metrics which is available on database level.

### **Sample Output:**

Configuration Report   SLCOE: PostgreSQL DB Configuration			Actions	Reset	Guide
Snap-Shot Date [2021-08-04 06:25:00]				Snap-Shots	
Basic Parameters					
	Database ID	Database Name	Database Size		
1.	18922	please_read_me_xmg	7504 kB		

SLCOE: PostgreSQL DB Discovery:

This Dynamic application discovers all the databases within an instance.

### **Sample Output:**

- Here it displays all the databases which are discovered within an instance.

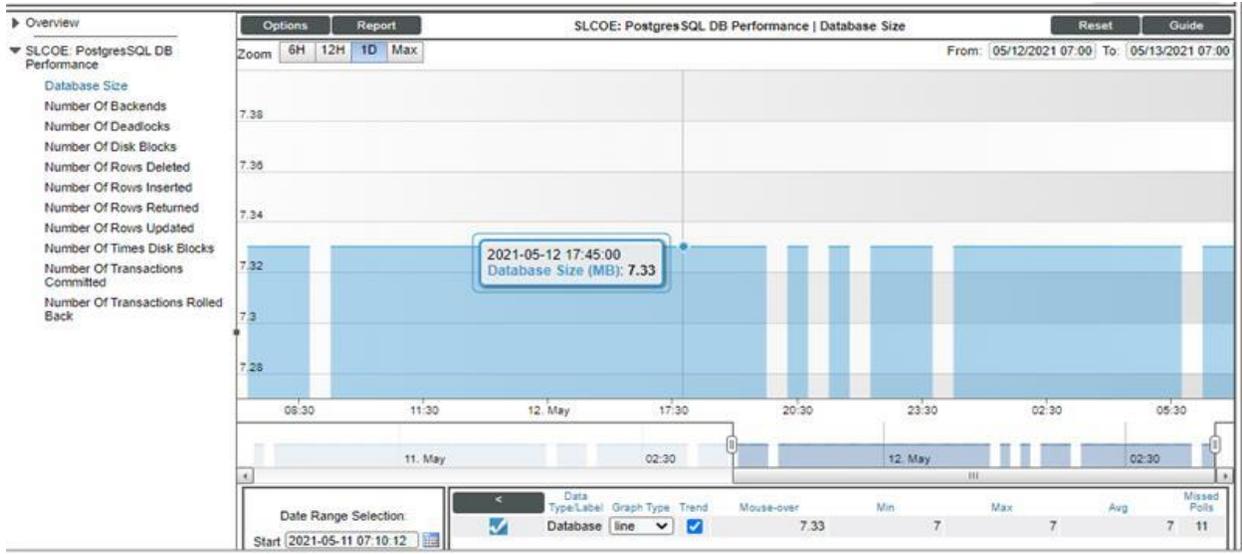
Configuration Report   SLCOE: PostgreSQL DB Discovery					Actions	Reset	Guide
Snap-Shot Date [2021-07-08 00:45:00]							Snap-Shots
<b>Database Detail</b>							
	Activity State	Database GUID	Database ID	Database Name			
1.	none	template1_1_5432	1	template1			
2.	none	template0_12344_5432	12344	template0			
3.	active	postgres_12345_5432	12345	postgres			
4.	none	test_18176_5432	18176	test			
5.	none	please_read_me_xmg_18922_5432	18922	please_read_me_xmg			
6.	none	slogic2_24002_5432	24002	slogic2			
7.	none	test2db_24842_5432	24842	test2db			
8.	none	test_parth_28354_5432	28354	test_parth			
9.	--	--	--	--			
10.	--	--	--	--			
<b>System Information</b>							
Port				Postgres & OS Detail			
1.	5432	PostgreSQL 10.6 on x86_64-redhat-linux-gnu, compiled by gcc (GCC) 8.2.1 20180905 (Red Hat 8.2.1-3), 64-bit					

### SLCOE: PostgreSQL DB Performance:

This Dynamic Application collects for the number of Backends, Deadlocks, Disk Blocks Rows Deleted, Rows Inserted, Rows Returned, Rows Updated, Disk Blocks, Transactions Committed, Transactions Rolled Back.

### Sample Output:

Run Dynamic App						
For Device [ please_read_me_xmg_18922_5432 ]   Session Complete						
72.	1	0	21847	Number Of Transactions Rolled Back	9	0
73.	=====					
74.	Performance Data for Storage:					
75.	=====					
76.	Group	Index	ObjID	ObjName	Value	RateFromCounter
77.	-----					
78.	1	'0'	21836	Database Name	u'please_read_me_xmg'	N/A
79.	1	'0'	21837	Database Size	'7683655'	N/A
80.	1	'0'	21838	Number Of Backends	'0'	N/A
81.	1	'0'	21839	Number Of Deadlocks	'0'	N/A
82.	1	'0'	21840	Number Of Disk Blocks	'702'	N/A
83.	1	'0'	21841	Number Of Rows Deleted	'0'	N/A
84.	1	'0'	21842	Number Of Rows Inserted	'91'	N/A
85.	1	'0'	21843	Number Of Rows Returned	'298086127'	N/A
86.	1	'0'	21844	Number Of Rows Updated	'2'	N/A
87.	1	'0'	21845	Number Of Times Disk Blocks	'19657697'	N/A
88.	1	'0'	21846	Number Of Transactions Committed	'559798'	N/A
89.	1	'0'	21847	Number Of Transactions Rolled Back	'9'	N/A
90.	=====					
91.	Processing app alerts...					
92.	=====					
93.	Alert ID: 2633 Name: SLCOE: Postgres DB Database Size is less than threshold					



**SLCOE: PostgreSQL DB Other:**

This Dynamic Application collects various new configuration metrics which available database level.

**Sample Output:**

Configuration Report   SLCOE: PostgreSQL DB- Other			Actions	Reset	Guide
Snap-Shot Date [2021-05-13 07:10:00]			Snap-Shots		
Freeze Age	Autovacuum Max Freeze Age	Max Freeze Age			
1.	200000000	7879524			
Collection Group [2]	Commit Ratio				
1.	200000000				
Locks	Lock Type	Virtual Transaction			
1.	--	--			
Temp File(s)	Temp File Size (Bytes)	Temp Files			
1.	0	0			

**SLCOE: PostgreSQL Instance Archiver:**

This Dynamic Application collects the Archiver details for PostgreSQL on DB instance level.

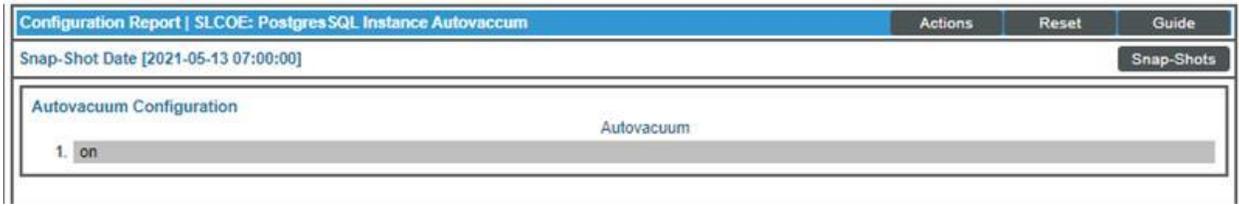
**Sample Output:**

Configuration Report   SLCOE: PostgreSQL Instance Archiver							Actions	Reset	Guide
Snap-Shot Date [2021-05-13 07:00:00]							Snap-Shots		
Ready Archives	Archived Count	Failed Count	Last Archived Time	Last Archived Wal	Last Failed Time	Last Failed Wal	Stats Reset		
1.	0	0	--	--	--	--	2020-09-22 14:58:35.259253+00		

SLCOE: PostgreSQL Instance Autovacuum:

This Dynamic Application collects the Autovacuum setting for PostgreSQL on DB instance level.

**Sample Output:**



SLCOE: PostgreSQL Instance Backup Age:

This Dynamic Application collects the Backup Label Age for PostgreSQL on DB instance level.

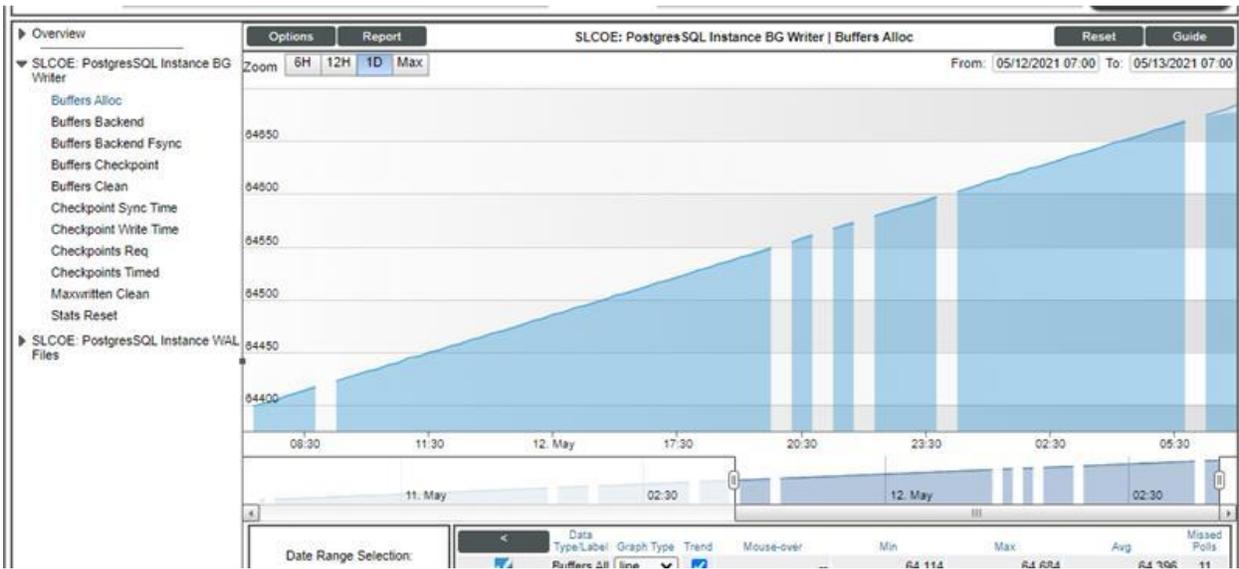
**Sample Output:**



SLCOE: PostgreSQL Instance BG Writer:

This Dynamic Application collects the Background Writer details for PostgreSQL on DB instance level.

**Sample Output:**



SLCOE: PostgreSQL Instance Caching:

This Dynamic Application caches the Postgres metrics collected by different queries, which are mentioned in the collection tab.

### Sample Output:

- Here Okay means Caching app is collecting data.

Configuration Report   SLCOE: PostgreSQL Instance Caching		Actions	Reset	Guide
Snap-Shot Date [2021-10-26 13:45:00]		Snap-Shots		
PostgreSQL Archiver	Okay			
PostgreSQL Backup Age	No Data			
PostgreSQL Autovacuum	Okay			
PostgreSQL Background Writer	Okay			
PostgreSQL Idle Transaction	Okay			
PostgreSQL Longest Query	No Data			
PostgreSQL WAL Files	Okay			
PostgreSQL WAL Replay	No Data			
PostgreSQL Stream Replication	No Data			
PostgreSQL Databases Discovery	Okay			
PostgreSQL Version	Okay			
PostgreSQL Hypertable	Okay			
PostgreSQL Hypertable Total Size	Okay			
PostgreSQL Hypertable Detailed Size	Okay			
PostgreSQL Hypertable Jobs	Okay			
PostgreSQL Hypertable Jobs Stats	No Data			

### SLCOE: PostgreSQL Instance Discovery Linux:

This Dynamic Application discover the all the PostgreSQL instances present for a server and displays their and ports and name on config tab. This app also provides the PostgreSQL Service Status and User Authentication method in Postgres- hba configuration.

**NOTE:** For authentication method metric, privilege should be added in sudoers file for ssh user to read pg\_hba.conf file. (If there is a password prompt while entering as root user.)

```
##
## Allow root to run any commands anywhere
root    ALL=(ALL)        ALL
roshan  ALL=(ALL) NOPASSWD: /bin/cat, /bin/su
## Allow members of the local group to run networking software
```

### Sample Output:

Configuration Report   SLCOE: PostgreSQL Instance Discovery Linux				Actions	Reset	Guide
Snap-Shot Date [2021-07-29 05:50:00]				Snap-Shots		
<b>Instance Detail</b>						
	Instance Name	Port	Service Status			
1.	pg_instance_5432	5432	Active			
<b>Collection Group [2]</b>						
	Authentication Method					
1.	local all all peer					
2.	host all all 127.0.0.1/32 md5					
3.	host all all ::1/128 md5					
4.	host all all 0.0.0.0/0 md5					
5.	--					

### SLCOE: PostgreSQL Instance Idle Transaction:

This Dynamic Application collects the Idle transaction details for PostgreSQL on DB instance.

### Sample Output:

Configuration Report   SLCOE: Postgres SQL Instance Idle Transaction				Actions	Reset	Guide
Snap-Shot Date [2021-05-13 07:15:00]						Snap-Shots
Oldest Idle Transaction						
	App Name	Idle pid	Oldest Idle Start Time			
1.	9376	psql	2021-05-13 09:07:42.881568+00			

**SLCOE: PostgreSQL Instance Longest Query:**

This Dynamic Application collects the longest query details for PostgreSQL on DB instance level.

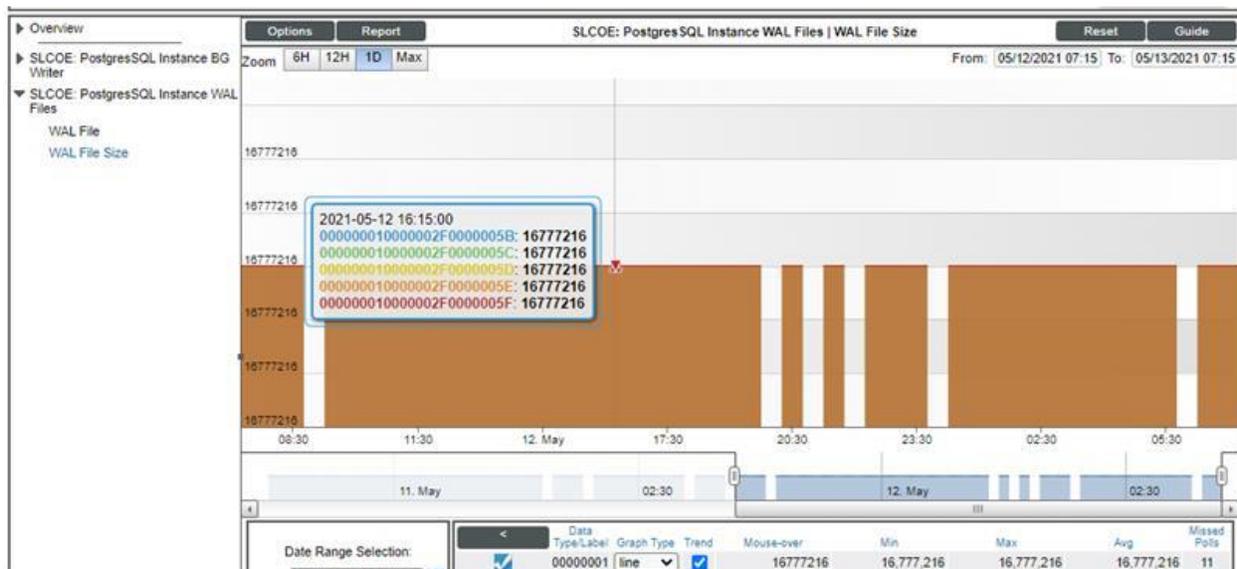
**SLCOE: PostgreSQL Instance Streaming Replication:**

This Dynamic Application collects the Streaming Replication details for PostgreSQL on DB instance level.

**SLCOE: PostgreSQL Instance WAL files:**

This Dynamic Application collects the Write Ahead Log details for PostgreSQL on DB instance level.

**Sample Output:**



**SLCOE: PostgreSQL Instance WAL Replay:**

This Dynamic Application collects the WAL Replay details for PostgreSQL on DB instance level.

**SLCOE: PostgreSQL Instance Discovery Windows:**

This Dynamic Application collects the instance details like instance name, port for PostgreSQL configured on windows

**Sample Output:**

Configuration Report   SLCOE: PostgreSQL Instance Discovery Windows				Actions	Reset	Guide
Snap-Shot Date [2021-08-04 05:45:00]						Snap-Shots
Instance Detail						
	instance_name	port	Service Status			
1.	pg_instance_5432	5432	running			
2.	--	--	--			
3.	--	--	--			
Collection Group [2]						
	Authentication Method					
1.	local all all scram-sha-256					
2.	host all all 0.0.0.0/0 scram-sha-256					
3.	host all all ::1/128 scram-sha-256					

### SLCOE: PostgreSQL DB Hypertable Jobs Stats:

This DA monitors jobs for a particular hypertable like total success, total failures etc.

### Sample Output:

Configuration Report   SLCOE: PostgreSQL DB Hypertable Job Stats				Actions	Reset	Guide
Snap-Shot Date [2021-12-11 13:31:00]						Snap-Shots
Collection Group [1]						
	Hypertable Job Id	Hypertable Job total failures	Hypertable Job total runs	Hypertable Job total success		

### SLCOE: PostgreSQL DB Hypertable Jobs:

This DA monitors job detail of a particular Hypertable of the respective database.

Configuration Report   SLCOE: PostgreSQL DB Hypertable Jobs							Actions	Reset	Guide	
Snap-Shot Date [2021-12-13 16:15:00]									Snap-Shots	
Total Hypertable Jobs										
	Hypertable Job Application Name	Hypertable Job Retry Period	Hypertable Job Schedule Interval	Hypertable Job Config	Hypertable Job Id	Hypertable Job Max Retries				
1.	Telemetry Reporter [1]	1:00:00	1 day, 0:00:00	--	1	-1				

### SLCOE: PostgreSQL DB HT Discovery:

This DA discovers all the Hypertable present in the Database.

Configuration Report   SLCOE: PostgreSQL DB HT Discovery		Actions	Reset	Guide
Snap-Shot Date [2021-12-13 16:38:00]				Snap-Shots
Hypertable Name	weather_metrics			
Hypertable Name	tremor			

**CAUTION:** This DA is disabled for now. If enabled Hyper Table Discovery DA will create component device for each Hyper table. This will load the collector being used, so if enabled, required to size the collector accordingly.

To enable the DA change the operational state to enabled. The DA will start collecting.

Close	Properties	Collections	Snippets	Thresholds	Alerts	Component	Subscribers	
Dynamic Applications [2680]   Application Successfully Updated   Properties Editor							Guide	Reset
Application Name <input type="text" value="SLCOE: PostgreSQL DB HT Discovery"/>		Version Number <input type="text" value="[Version 0.1]"/>		Abandon Collection <input type="text" value="[Default]"/>		Disable Rollup of Data <input type="checkbox"/>		
Application Type <input type="text" value="[Snippet Configuration]"/>		Operational State <input type="text" value="[Disabled]"/>		Context <input type="text" value=""/>		Component Mapping <input checked="" type="checkbox"/>		
Execution Environment <input type="text" value="[ SLCOE:Postgres ]"/>		Collector Affinity <input type="text" value="[ Root device collect ]"/>		Null Row Option <input type="text" value="[ -- values ]"/>		<input type="button" value="Save"/>		
Caching <input type="text" value="[ No caching ]"/>		Poll Frequency <input type="text" value="[Every 15 Minutes]"/>		Null Column Option <input type="text" value="[ -- values ]"/>		<input type="button" value="Save As"/>		
Device Dashboard <input type="text" value="None"/>		Description <input type="text" value="This DA discovers all the hypertables present in the respective database"/>						

## Alerts and Events

**NOTE for Threshold:** Threshold values are based on assumed values, User need to change the threshold value as per the requirement in threshold tab as shown below.

Close	Properties	Thresholds	Collections	Monitors	Schedule	Notes	Attributes
Logs	Toolbox	Interfaces	Relationships	Tickets	Redirects		
Device Name	postgres_12345_5432	Managed Type	Component Device				
ID	378	Category	Cloud Security				
Class	AWS	Sub-Class	Shield Advanced Service				
Organization	System	Uptime	0 days, 00:00:00				
Root Device	ec2-52-66-213-70	Group / Collector	CUG   em7admin				
Parent Device	pg_instance_5432						
Device Hostname							
<b>Device Thresholds</b>   SLCOE: PostgreSQL DB Configuration							
Dynamic App Thresholds   SLCOE: PostgreSQL DB Configuration							
Raw Data Retention <input type="text" value="7"/> days <input type="checkbox"/> [Default: 7]							
<input type="button" value="Save"/>							
Dynamic App Thresholds   SLCOE: PostgreSQL DB Performance							
Disk_blocks <input type="text" value="500"/> <input type="checkbox"/> [Default: 500]							
Database_size_percentage <input type="text" value="0"/> <input type="checkbox"/> [Default: 500]							
Set_Database_size_MB <input type="text" value="500"/> MB <input type="checkbox"/> [Default: 100]							
Backends <input type="text" value="100"/> <input type="checkbox"/> [Default: 500]							
Deadlocks <input type="text" value="500"/> <input type="checkbox"/> [Default: 7]							
Raw Data Retention <input type="text" value="7"/> days <input type="checkbox"/> [Default: 90]							
Hourly Rollup Retention <input type="text" value="90"/> days <input type="checkbox"/> [Default: 730]							
Daily Rollup Retention <input type="text" value="730"/> days <input type="checkbox"/> [Default: 730]							
<input type="button" value="Save"/>							
Dynamic App Thresholds   SLCOE: PostgreSQL DB- Other							
Raw Data Retention <input type="text" value="7"/> days <input type="checkbox"/> [Default: 7]							

- For threshold 'Set\_Database\_size\_MB' provide the total memory allotted for PostgreSQL database. Based on 'Set\_Database\_size\_MB' the percentage of memory used would be calculated.)
- SLCOE: PostgreSQL DB Performance:
    - Backend Number Exceed: Creates a Major event if backend number is greater than threshold and healthy event if backend number is less than threshold.
    - DB Database Size: Creates a Major event if size is greater than threshold and healthy event for less than threshold.
    - DB Number of Disk blocks read : Creates a Notice event where it notifies the number of blocks read from the disk.
-  To view Alerts, Click on Logs in Collector

Close	Properties	Thresholds	Collections	Monitors	Schedule		
Logs	Toolbox	Interfaces	Relationships	Tickets	Redirects	Notes	Attributes
Device Name	please_read_me_xmg_18922_5432			Managed Type	Component Device		
ID	275			Category	Cloud Database		
Class	PostgreSQL Database			Sub-Class	PostgreSQL Database		
Organization	System			Uptime	0 days, 00:00:00		
Root Device	ec2-52-66-213-70			Group / Collector	CUG   em7admin		
Parent Device	pg_instance_5432						
Device Hostname							

Device Logs & Messages | Messages Found [ 10,000 ]

[Search All Messages] where Message is like

	Date Time	Source	Event ID	Priority	Message
1.	2021-07-08 00:51:38	Dynamic	291227	--	SLCOE: Postgres DB (please_read_me_xmg) Disk blocks number is Greater than threshold value 500 (message repeats 71 times)
2.	2021-07-07 02:13:16	All	--	--	Event ID 234828 was cleared by user em7admin
3.	2021-07-07 02:13:16	All	--	--	Event ID 63569 was cleared by user em7admin
4.	2021-07-07 01:39:33	Dynamic	291227	--	SLCOE: Postgres DB (please_read_me_xmg) Disk blocks number is Greater than threshold value 500 (message repeats 104 times)
5.	2021-07-03 23:21:29	Dynamic	282394	--	SLCOE: Postgres DB (please_read_me_xmg) Disk blocks number is Greater than threshold value 500 (message repeats 115 times)
6.	2021-07-02 06:06:20	Internal	--	--	Completed application discovery on device (message repeats 4 times)
7.	2021-07-02 05:55:41	Dynamic	282394	--	SLCOE: Postgres DB (please_read_me_xmg) Disk blocks number is Greater than threshold value 500 (message repeats 21 times)
8.	2021-07-01 21:51:05	Dynamic	276610	--	SLCOE: Postgres DB (please_read_me_xmg) Disk blocks number is Greater than threshold value 500 (message repeats 87 times)
9.	2021-06-30 14:41:20	Dynamic	274850	--	SLCOE: Postgres DB (please_read_me_xmg) Disk blocks number is Greater than threshold value 500 (message repeats 12 times)
10.	2021-06-30 05:40:40	Dynamic	257987	--	SLCOE: Postgres DB (please_read_me_xmg) Disk blocks number is Greater than threshold value 500 (message repeats 245 times)
11.	2021-06-25 22:40:52	Dynamic	247534	--	SLCOE: Postgres DB (please_read_me_xmg) Disk blocks number is Greater than threshold value 500 (message repeats 53 times)
12.	2021-06-25 01:56:45	Dynamic	240070	--	SLCOE: Postgres DB Configuration Database ( please_read_me_xmg) State is Offline (message repeats 2 times)
13.	2021-06-25 01:38:26	Dynamic	247534	--	SLCOE: Postgres DB (please_read_me_xmg) Disk blocks number is Greater than threshold value 500
14.	2021-06-25 01:36:47	Dynamic	240070	--	SLCOE: Postgres DB Configuration Database ( please_read_me_xmg) State is Offline (message repeats 3 times)
15.	2021-06-25 01:22:35	Dynamic	247534	--	SLCOE: Postgres DB (please_read_me_xmg) Disk blocks number is Greater than threshold value 500

🔍 To view Event, click on triangle symbol which is on right side of alert and to know description of event click on info symbol which is on the right side of event.

Close	Properties	Thresholds	Collections	Monitors	Schedule		
Logs	Toolbox	Interfaces	Relationships	Tickets	Redirects	Notes	Attributes
Device Name	please_read_me_xmg_18922_5432			Managed Type	Component Device		
ID	275			Category	Cloud Database		
Class	PostgreSQL Database			Sub-Class	PostgreSQL Database		
Organization	System			Uptime	0 days, 00:00:00		
Root Device	ec2-52-66-213-70			Group / Collector	CUG   em7admin		
Parent Device	pg_instance_5432						
Device Hostname							

Device Logs & Messages | Messages Found [ 10,000 ]

[Search All Messages] where Message is like

Message

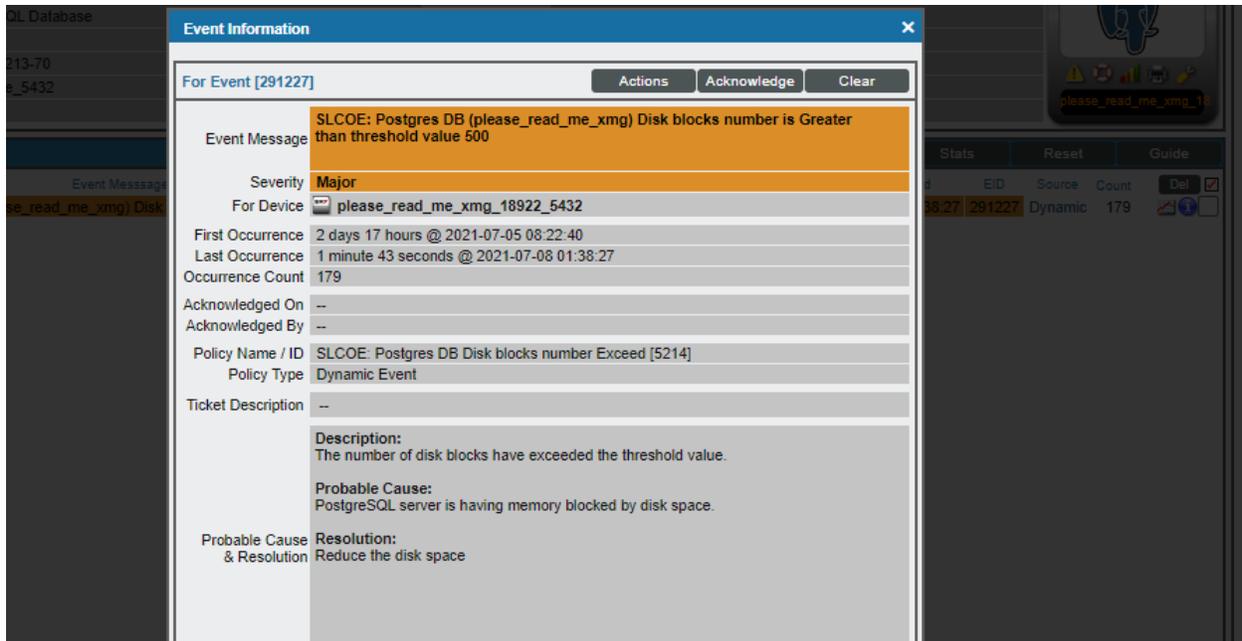
please\_read\_me\_xmg) Disk blocks number is Greater than threshold value 500 (message repeats 71 times)  
cleared by user em7admin

Close	Summary	Performance	Topology	Configs			
Logs	Events	Tickets					Organization
Device Name	please_read_me_xmg_18922_5432			Managed Type	Component Device		
ID	275			Category	Cloud Database		
Class	PostgreSQL Database			Sub-Class	PostgreSQL Database		
Organization	System			Uptime	0 days, 00:00:00		
Root Device	ec2-52-66-213-70			Group / Collector	CUG   em7admin		
Parent Device	pg_instance_5432						
Device Hostname							

Viewing Active Events

Event Message   Severity	Acknowledged	Age / Elapse	Ticket	External Ticket	Last Detected	EID	Source	Count	Del
SLCOE: Postgres DB (please_read_me_xmg) Disk blocks number is Greater than threshold value 500	<input checked="" type="checkbox"/>	2 days 17 hrs	--	--	2021-07-08 01:38:27	291227	Dynamic	179	



2. SLCOE: Postgres Autovacuum:
  - Autovacuum is OFF: Creates a Major event if autovacuum is off
  - Autovacuum is ON: Creates a Healthy event if autovacuum is on.
3. SLCOE: PostgreSQL Instance Discovery:
  - Service Status: Creates a Major event if PostgreSQL database service status is Inactive and healthy event if PostgreSQL database service status is Active.
4. SLCOE: Postgres Instance Longest Query:
  - Longest query: Creates a Major event if PostgreSQL longest query exceeds threshold and healthy event if less than threshold.
5. SLCOE: Postgres Instance WAL Files:
  - Wal File size: Creates a Notice event if WAL File size is above threshold and healthy event if less than threshold.

### Postgres Sample DCM Tree Linux:

Device Name	IP Address	Device Category	Device Class   Sub-class	DIID	Organization	Current State	Collection Group	Collection State
10.64.71.44	10.64.71.44	Servers	Linux   CentOS Linux 7 (Core)	37	System	Major	CUG	Active
pg_instance_5432	--	Servers	PostgreSQL Instance   PostgreSQL Inst 554	System	System	Notice	CUG	Active
postgres	--	Database	PostgreSQL Database   PostgreSQL D555	System	System	Minor	CUG	Active
tremor	--	Database	Hypertable   PostgreSQL DB Timescale560	System	System	Healthy	CUG	Active
weather_metrics	--	Database	Hypertable   PostgreSQL DB Timescale561	System	System	Healthy	CUG	Active
template0	--	Database	PostgreSQL Database   PostgreSQL D557	System	System	Minor	CUG	Active
template1	--	Database	PostgreSQL Database   PostgreSQL D558	System	System	Minor	CUG	Active
test	--	Database	PostgreSQL Database   PostgreSQL D556	System	System	Major	CUG	Unavailable
table_name	--	Database	Hypertable   PostgreSQL DB Timescale559	System	System	Healthy	CUG	Unavailable

## Postgres Sample DCM Tree Windows:

Device Name	IP Address	Device Category	Device Class   Sub-class	DID	Organization	Current State	Collection Group	Collection State
10.64.71.12	10.64.71.12	Servers	Microsoft   Windows Server 2016	29	System	Major	CUG	Active
pg_instance_5432	--	Unknown	Generic   Component	383	System	Major	CUG	Active
None_0_5432	--	Database	PostgreSQL Database   Postgre	384	System	Healthy	CUG	Active
postgres_13442_5432	--	Security	AWS   Shield Advanced Service	385	System	Major	CUG	Active
template0_13441_5432	--	Database	PostgreSQL Database   Postgre	386	System	Healthy	CUG	Active
template1_1_5432	--	Database	PostgreSQL Database   Postgre	376	System	Notice	CUG	Active

**Note:** Expiry Delay for Major event is set to 90 minutes whereas for Healthy event it is set to 15 minutes and Notice event is set to 30 minutes.

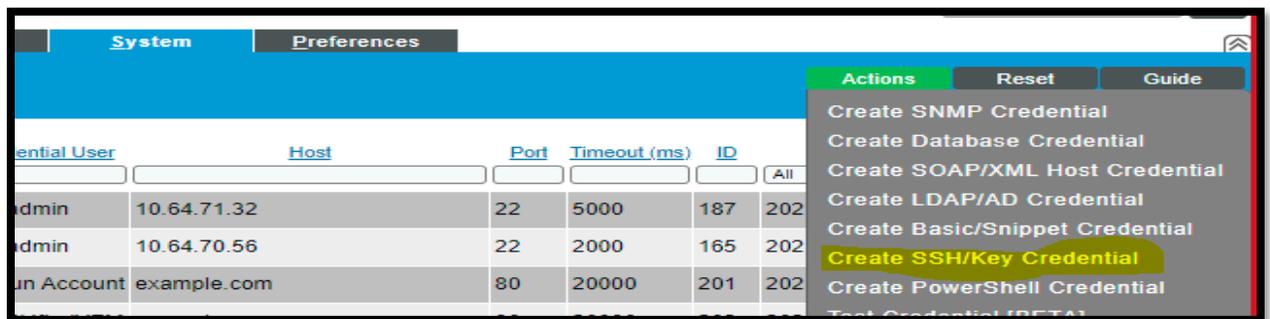
**Note:** Threshold for Alerts can be set based on requirement in 'Threshold' page of Dynamic Application.

## Configuring a SSH credential

To configure SL1 to monitor PostgreSQL Dynamic Apps, you must first create a SSH credential. This credential allows the Dynamic Applications in the Powerpack to communicate with the device.

To create a SSH credential for monitoring:

1. Go to the **Credential Management** page (System > Manage > Credentials).
2. Click the **[Actions]** menu, and then select Create SSH Credential. The **Credential Editor** page appears:



Credential Editor [99]

Edit SSH/Key Credential #99

Basic Settings

Credential Name: <CREDENTIAL NAME> 1

Hostname/IP: <HOSTNAME/IP> 2 Port: 22 3 Timeout(ms): 1000

Username: <USERNAME> 4 Password: ..... 5

Private Key (PEM Format)

Save Save As

3. In the **Profile Name** field, type a name for the credential.
4. In **Hostname/IP**, provide %D.
5. Provide **Username** and **Password** of the server whose IP address is provided.
6. Click **[Save]**.

## Configuring a SOAP/XML credential

To create a SOAP/XML credential for monitoring:

1. Go to the **Credential Management** page (System > Manage > Credentials).
2. Click the **[Actions]** menu, and then select Create SOAP/XML Credential. The **Credential Editor** page appears:

7. **Profile Name.** Friendly name to help identify the PostgreSQL instance and IP. For example, *pg\_1.2.3.4\_myInstance1\_name*. If a second instance is running on the same server, you will create second credential with a friendly profile name of *pg\_5.6.7.8\_myInstance2\_name*
8. **HTTP Auth User:** Username associated with the database instance
9. **HTTP Auth Password:** Password associated with the database instance
10. **URL:** IP address where the PostgreSQL instance resides. This field is required.
11. **HTTP Headers, Port:** Type in the PostgreSQL port
12. **HTTP Headers, Linux:** Type in the SSH credentials ID
13. **HTTP Headers, password:** Type in the SSH credentials password
14. **HTTP Headers, hba\_config:** Type in the path for hba\_config file from Linux server where PostgreSQL is configured for user authentication metric which is being monitored in instance discovery DA.
15. Click **Save**.
16. Optionally, supply values in the other fields on this page. In most cases, you can use the default values for the other fields. For a description of the fields in this page, see the **Discovery & Credentials** manual.
17. Click **[Save]**.

**Note:** In URL field, type either `<http or https://host:<port number>` OR `https://%D:<port number>`. Enter the HTTP username and password in HTTP Auth user/ Password that is needed to authenticate with the API endpoint.

## Configuring a PowerShell credential for Monitoring PostgreSQL in Windows server

To configure SL1 to monitor PostgreSQL Dynamic Apps, you must first create a PowerShell credential. This credential allows the Dynamic Applications in the Powerpack to communicate with the device.

To create a SSH credential for monitoring:

1. Go to the **Credential Management** page (System > Manage > Credentials).
2. Click the **[Actions]** menu, and then select Create PowerShell Credential. The **Credential Editor** page appears:

The screenshot shows the ScienceLogic interface for Credential Management. The page title is "Credential Management | Credentials Found [248]". A table lists four credentials:

Profile Name	Organization	BO Use	RW Use	DA Use	Type	Credential User	Host	Port	Timeout (ms)	ID
11g on windows	[all orgs]	--	--	1	Database	test	10.64.70.229	1521	0	184
11g on windows-1	[all orgs]	--	--	1	Database	test	10.64.70.229	1521	0	185
AIX - SSH	[all orgs]	--	--	3	SSH/Key	em7admin	%D	22	10000	120
aix@2437@1_2_3	[all orgs]	--	--	2	SSH/Key	slice	%D	22	6000	278

An "Actions" menu is open over the table, showing options like "Create PowerShell Credential" which is highlighted in yellow.

The screenshot shows the "Credential Editor [305]" window for editing a "PowerShell Credential #305". The form is divided into two sections:

- Basic Settings:** Includes fields for Profile Name (PostgresWindowsPowershellExample), Account Type ([ Local ]), Hostname/IP (%D), Timeout(ms) (10000), Username (username), Password (masked with dots), Encrypted ([ no ]), Port (5985), and PowerShell Proxy Hostname/IP.
- Active Directory Settings:** Includes fields for Active Directory Hostname/IP and Domain.

Buttons for "New", "Reset", "Save", and "Save As" are visible at the bottom of the form.

3. In the **Profile Name** field, type a name for the credential.
4. In **Hostname/IP**, provide %D.
5. Provide **Username** and **Password** of the server whose IP address is provided.
6. Click **[Save]**.

After creating PowerShell credentials, repeat same steps for SOAP/XML credential creation just as we did for SSH credentials.

Edit SOAP/XML Credential #303 New Reset

<b>Basic Settings</b> Profile Name: <input type="text" value="PostgreSQL_windows-SOAP_Exan"/> Content Encoding: <input type="text" value="[ text/xml ]"/> Method: <input type="text" value="[ POST ]"/> HTTP Version: <input type="text" value="[ HTTP/1.1 ]"/> URL [ http(s)://Host:Port/Path   %D = Aligned Device Address   %N = Aligned Device Host Name ] <input type="text" value="http://%D"/> HTTP Auth User: <input type="text" value="username"/> HTTP Auth Password: <input type="password" value="*****"/> Timeout (seconds): <input type="text" value="2"/>		<b>Soap Options</b> Embedded Password [%P]: <input type="text"/> Embed Value [%1]: <input type="text"/> Embed Value [%2]: <input type="text"/> Embed Value [%3]: <input type="text"/> Embed Value [%4]: <input type="text"/>
<b>Proxy Settings</b> Hostname/IP: <input type="text"/> Port: <input type="text" value="0"/> User: <input type="text"/>		<b>HTTP Headers</b> + Add a header <input type="text" value="Service:PostgreSQL"/> <input type="button" value="⊕"/> <input type="text" value="Port:5432"/> <input type="button" value="⊕"/> <input type="text" value="Powershell:272"/> <input type="button" value="⊕"/> <input type="text" value="hba_config-C:/Program Files/PostgreSQL/1"/> <input type="button" value="⊕"/>
<b>CURL Options</b> CAINFO CAPATH CLOSEPOLICY CONNECTTIMEOUT COOKIE COOKIEFILE COOKIEJAR COOKIELIST CRLF CUSTOMREQUEST DNSCACHETIMEOUT		

### Basic Settings

1. **Profile Name.** Friendly name to help identify the PostgreSQL instance and IP. For example, *pg\_1.2.3.4\_myInstance1\_name*. If a second instance is running on the same server, you will create second credential with a friendly profile name of *pg\_5.6.7.8\_myInstance2\_name*
2. **HTTP Auth User:** Username associated with the database instance
3. **HTTP Auth Password:** Password associated with the database instance
4. **URL:** IP address where the PostgreSQL instance resides. This field is required.
5. **HTTP Headers, Port:** Type in the PostgreSQL port
6. **HTTP Headers, PowerShell:** Type in the Windows credentials ID
7. **HTTP Headers, hba\_config:** Type in the path for hba\_config file from Windows server where PostgreSQL is configured for user authentication metric which is being monitored in instance discovery DA.
8. Click **Save**.

## Discovering PostgreSQL Servers

To discover PostgreSQL servers using a discovery session, perform the following steps:

1. Go to the **Discovery Control Panel** page (System > Manage > Discovery).
2. In the Discovery Control Panel, click the **[Create]** button.

The screenshot shows the 'Discovery Session Editor' interface with the following sections:

- Identification Information:** Fields for Name and Description.
- IP and Credentials:**
  - IP Address/Hostname Discovery List:** A text input field with an 'Upload File' button and a 'Browse' button.
  - SNMP Credentials:** A list of credential templates including Cisco SNMPv2, EM7 Default V2, IPSLA Example, LifeSize: Endpoint SNMP, Nexus snmp, and SNMP Public V1.
  - Other Credentials:** A list of credential templates including Cisco CUCM Example, Cisco: ACI Sample Credential 1, Citrix XenServer, EMC SMI-S Example, EMC VMAX Example, LifeSize: Endpoint SSH/CLI, and Local API.
- Detection and Scanning:**
  - Initial Scan Level:** [ System Default (recommended) ]
  - Scan Throttle:** [ System Default (recommended) ]
  - Port Scan All IPs:** [ System Default (recommended) ]
  - Port Scan Timeout:** [ System Default (recommended) ]
  - Detection Method & Port:** A list of methods including UDP: 161 SNMP, TCP: 1 - tcpmux, TCP: 2 - compressnet, TCP: 3 - compressnet, TCP: 5 - rje, TCP: 7 - echo, TCP: 9 - discard, TCP: 11 - systat, TCP: 13 - daytime, TCP: 15 - netstat, and TCP: 17 - qsd.
  - Interface Inventory Timeout (ms):** 600000
  - Maximum Allowed Interfaces:** 10000
  - Bypass Interface Inventory:** [ ]
- Basic Settings:**
  - Discover:** [ Non-SNMP ]
  - Model Devices:** [ ]
  - DHCP:** [ ]
  - Device Model Cache TTL (h):** 2
  - Collection Server PID:** [ JJA-AIO-Cisco/PLS ]
  - Organization:** [ System ]
  - Add Devices to Device Group(s):** A list containing 'None' and 'Servers'.
  - Apply Device Template:** [ Choose a Template ]

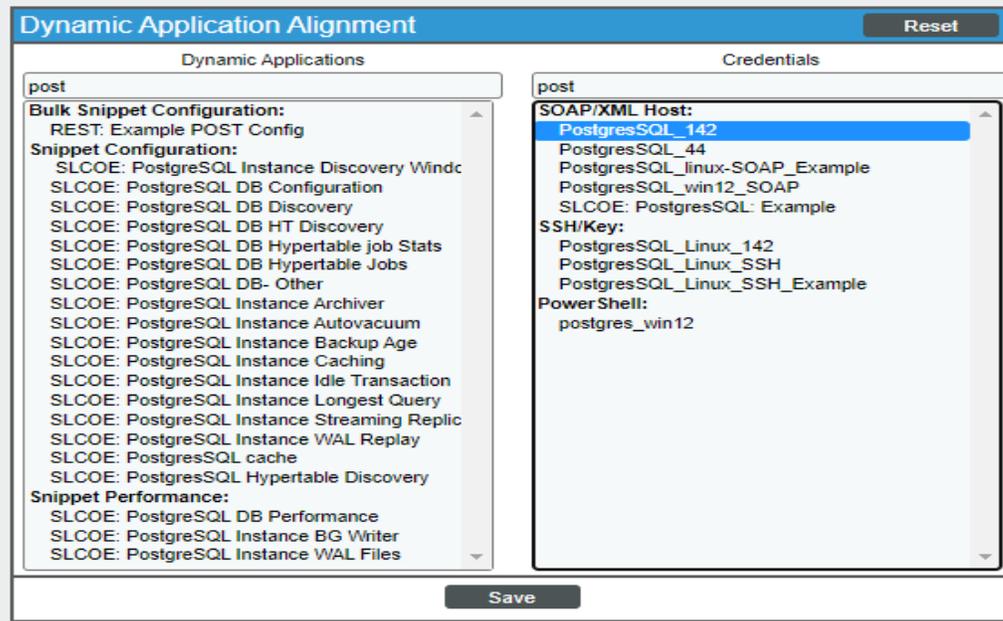
Buttons at the bottom include 'Save', 'Save As', and 'Log All'.

- Supply values in the following fields:
  - Name.** Type a name for the discovery session.
  - IP Address Discovery List.** Type the IP address for PostgreSQL server.
- Optionally, supply values in the other fields in this page. In most cases, you can use the default values for the other fields. For a description of the fields in this page, see the **Discovery & Credentials** manual.
- Click **[Save]**, then close the **Discovery Session Editor** page.
- The **Discovery Control Panel** page will refresh. Click the lightning bolt icon for the discovery session you created.
- In the pop-up window that appears, click **[OK]**. The **Discovery Session** page displays the progress of the discovery session.

## Manually Aligning Dynamic Applications

To manually align Dynamic Applications:

- From the **Device Properties** page for the device, click the **[Collections]** tab.
- Click the **[Actions]** button and then select Add Dynamic Applications. The **Dynamic Application Alignment** page appears:



3. In the **Dynamic Applications** field, select the Dynamic Application you want to align.
4. In the **Credentials** field, select the SOAP/XML credential created.
5. Repeat steps 2-4 for the remaining Dynamic Applications you want to align with the device.
6. After aligning the Dynamic Applications, click the **[Reset]** button.

**Note :** Manually align only SLCOE: PostgreSQL Instance Discovery Linux/Windows DA according to OS with corresponding SOAP/XML credentials. Remaining Das will get auto aligned and form a DCM tree.

## Powerpack Enhancements

### Version 0.5:

- Modified `dbc.autofetchall()` with `get_cred_array()` for 11.2 compatibility in SLCOE: PostgreSQL Instance Discovery Linux Dynamic Application.
- Summarization state has been 'Enabled' for all the Presentation Objects in Dynamic Applications.
- Expiry Delay for Healthy events have been updated to 15 minutes from 20 minutes.
- Enabled Alerts and Events for SLCOE: PostgreSQL DB Performance and SLCOE: PostgreSQL Instance WAL files Dynamic Application.
- Enabled Operational state for Events in SLCOE: PostgreSQL Instance WAL Files DA.

### Version 0.4 :

- Added Timescale DB Hypertable discovery and monitors Hypertable jobs for database in Linux.
- Modified SSH PEM key encryption for 10.2.x version.

### Version 0.3 :

- Added new Dynamic App for Postgres instance discovery for Windows OS.
- This pack monitors PostgreSQL metrics for both Linux and Windows.

- Added a DB query for WAL file which works for Postgres version 9.4 also.
- Added a new metric which monitors type of authentication method in pg\_hba.conf file.
- Added Service status of PostgreSQL in instance discovery app.

#### Version 0.2 :

- This pack is based on DCM architecture and monitors PostgreSQL on Linux.
- Added psycopg2 library for Postgres connection to resolve scram-authentication issue.
- Added a function get\_cred\_array\_from\_id() in instance discovery app.
- Fixed %D bug in instance discovery app.

#### Version 0.1 :

- Initial Release
- Monitors PostgreSQL for Linux OS.

#### Known Issue:

##### Version 0.5:

- Powerpack does not work for Windows if the platform version is 11.2 or higher. Kindly contact support team with a Service Request if you need the feature.

#### Onboarding Tips

- **You must enable “Enable Selective Powerpack Field Protection” field in the System > Settings > Behavior page before you upgrade the powerpack.** Since if key changes made to the powerpack, enabling this field will allow the powerpack to preserve the changes made by the user even after a powerpack upgrade.
  - ✚ For more details on this setting, please review the documentation on [Administration and Accounts > Powerpacks > Installing a Powerpack](#).

**NOTE:** Manually align the SLCOE: PostgreSQL Instance Discovery Linux/Windows Dynamic app with SOAP/XML credentials created in discovered PostgreSQL device. Once this app collects data all other apps will be auto aligned forming a DCM tree.

#### Troubleshooting

If collection/configs unable to collect data, perform below steps to rectify the issue:

- Run the appropriate Dynamic App in Debug mode for more error messages (incorrect credentials, timeout, etc.)
- Run the PostgreSQL commands provided above directly on your PostgreSQL server to see if the commands are responding correctly.
- If the Dynamic Apps are collecting data in debug mode but not during regular operations, please check for sigterms and/or collector load. Open a support case after reviewing the Knowledgebase articles.

#### Warning

If PostgreSQL DA is showing below error or warning message in debug log then below are suggested solutions:

```
('Error while connecting to PostgreSQL', OperationalError('FATAL: no pg_hba.conf entry for host "10.xx.xx.xx", user "postgres", database "postgres", SSL off\n'))
```

Add or edit your postgresql.conf as following:

```
listen_addresses = '*'
```

Add the following line as the first line of pg\_hba.conf. It allows access to all databases for all users with an encrypted password:

**Pg\_hba.conf file before edit:**

```
# TYPE DATABASE USER ADDRESS METHOD
# "local" is for Unix domain socket connections only
local all all scram-sha-256
# IPv4 local connections:
host all all 127.0.0.1/32 scram-sha-256
# IPv6 local connections:
host all all ::1/128 scram-sha-256
# Allow replication connections from localhost, by a user with the
# replication privilege.
local replication all scram-sha-256
host replication all 127.0.0.1/32 scram-sha-256
host replication all ::1/128 scram-sha-256
```

**Pg\_hba.conf file after edit:**

```
# TYPE DATABASE USER ADDRESS METHOD
# "local" is for Unix domain socket connections only
local all all md5
# IPv4 local connections:
host all all 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.
local replication all md5
host replication all 127.0.0.1/32 md5
host replication all ::1/128 md5
```

- Authentication method such as md5, scram-sha-256 is based on your requirement.

**NOTE:** PostgreSQL server restart is required after any changes made to pg\_hba.conf file. The error mentioned above may defer from server to server.

We recommend testing the Powerpack first without making any changes to pg\_hba.config file and then implement the pre-requisites if any errors in Instance aching app.

=====END OF DOCUMENT=====