

Что в чёрном ящике?

Или как понять, что требует оптимизации в БД

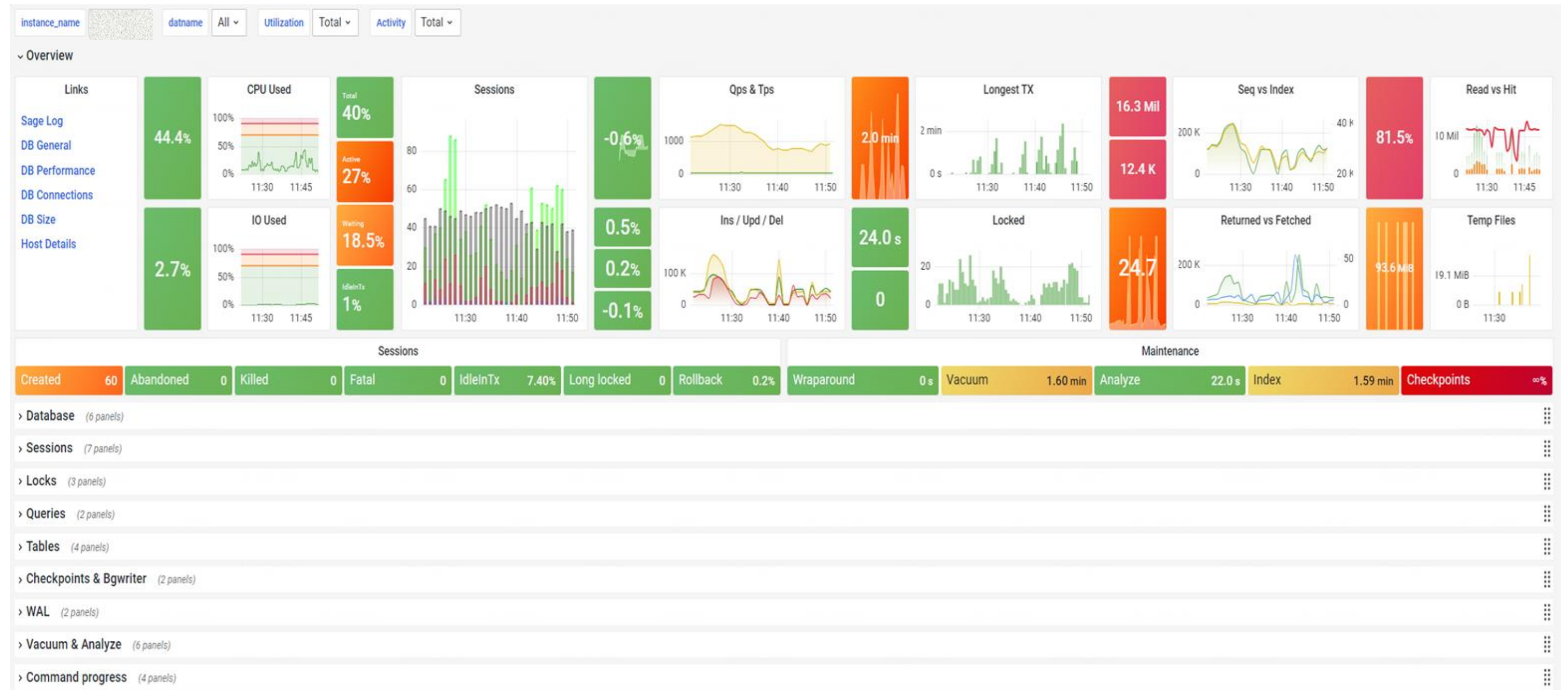


Обзор дашбордов БД PostgreSQL

➡ DB Performance -> Overview

Links

- ➡ DB General
- ➡ DB Connections
- ➡ DB Size
- ➡ Host Details
- ➡ DB Performance



➡ DB Performance -> Overview

Links

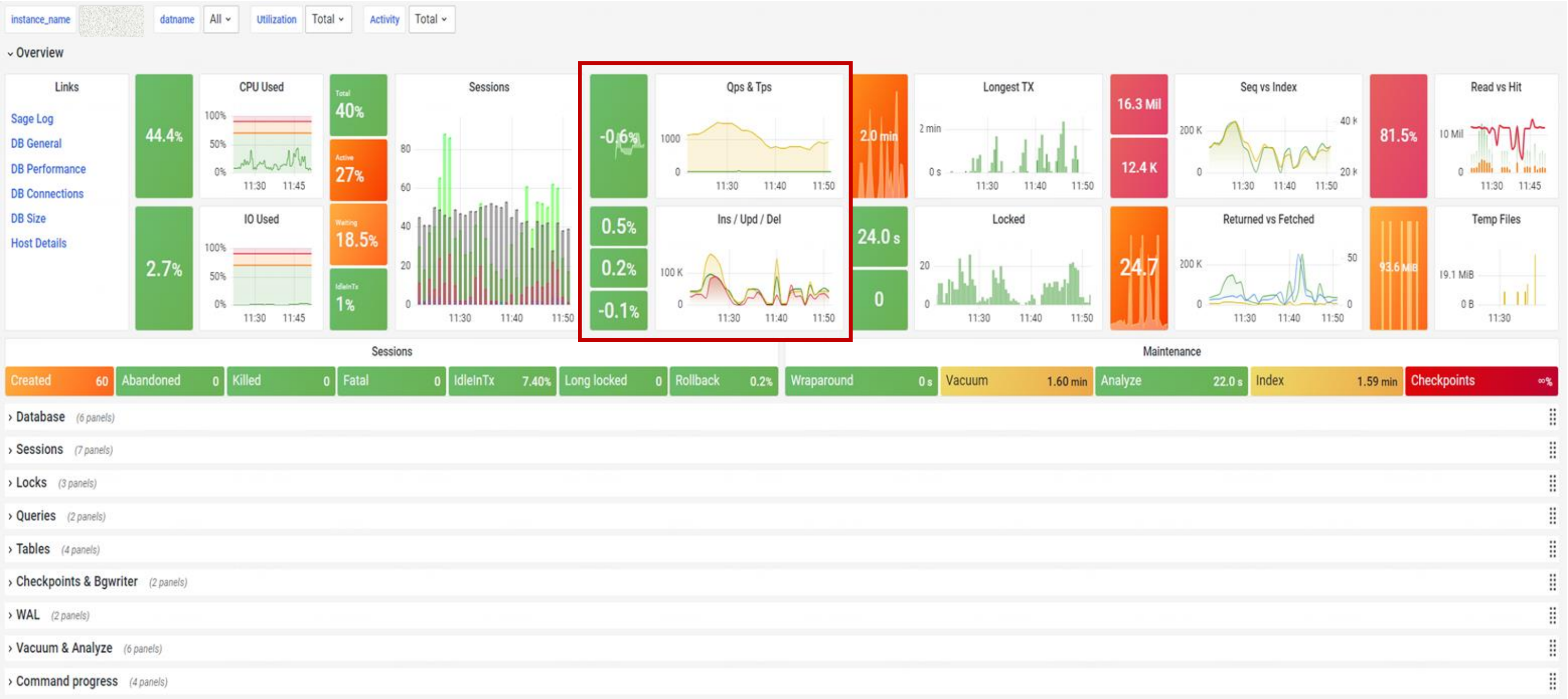
- ➡ DB General
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➡ DB Performance -> Overview

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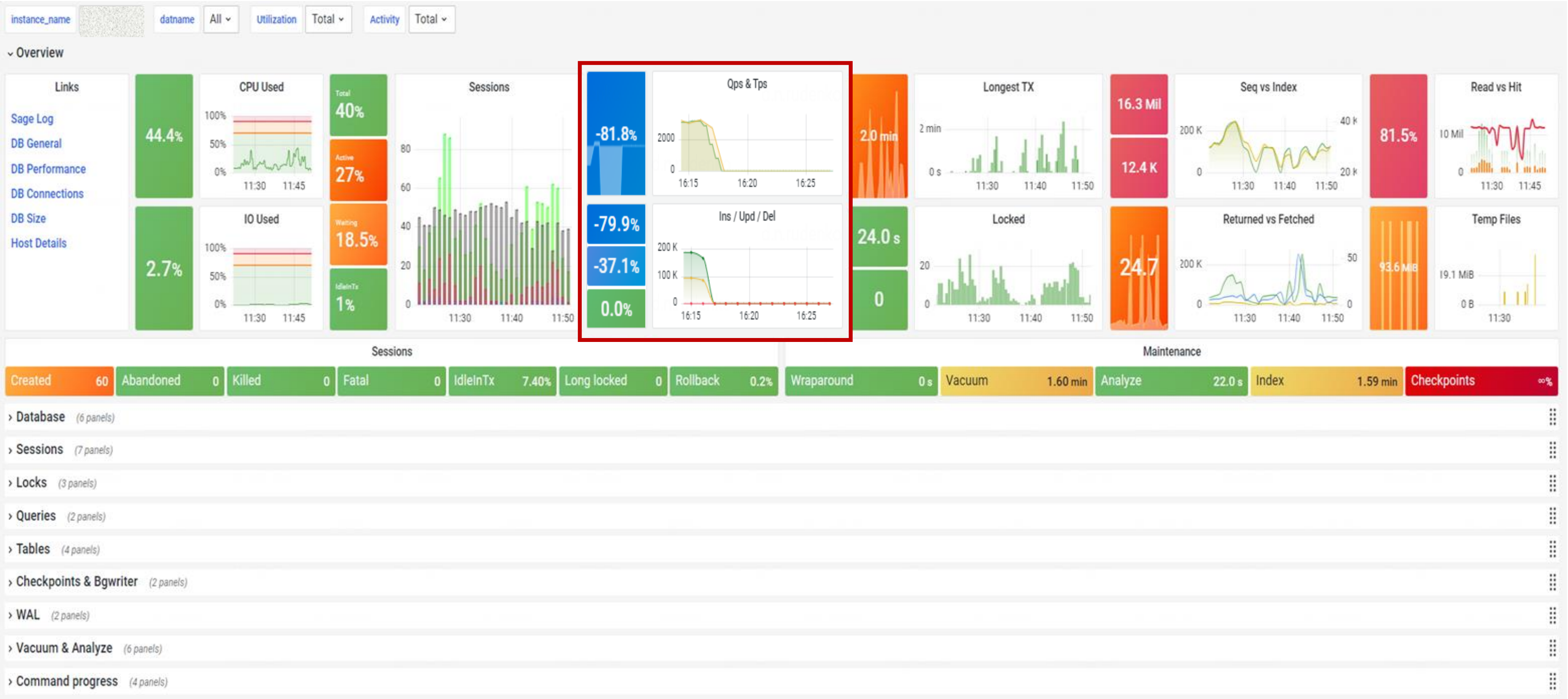
- ➡ DB General
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➡ DB Performance -> Overview

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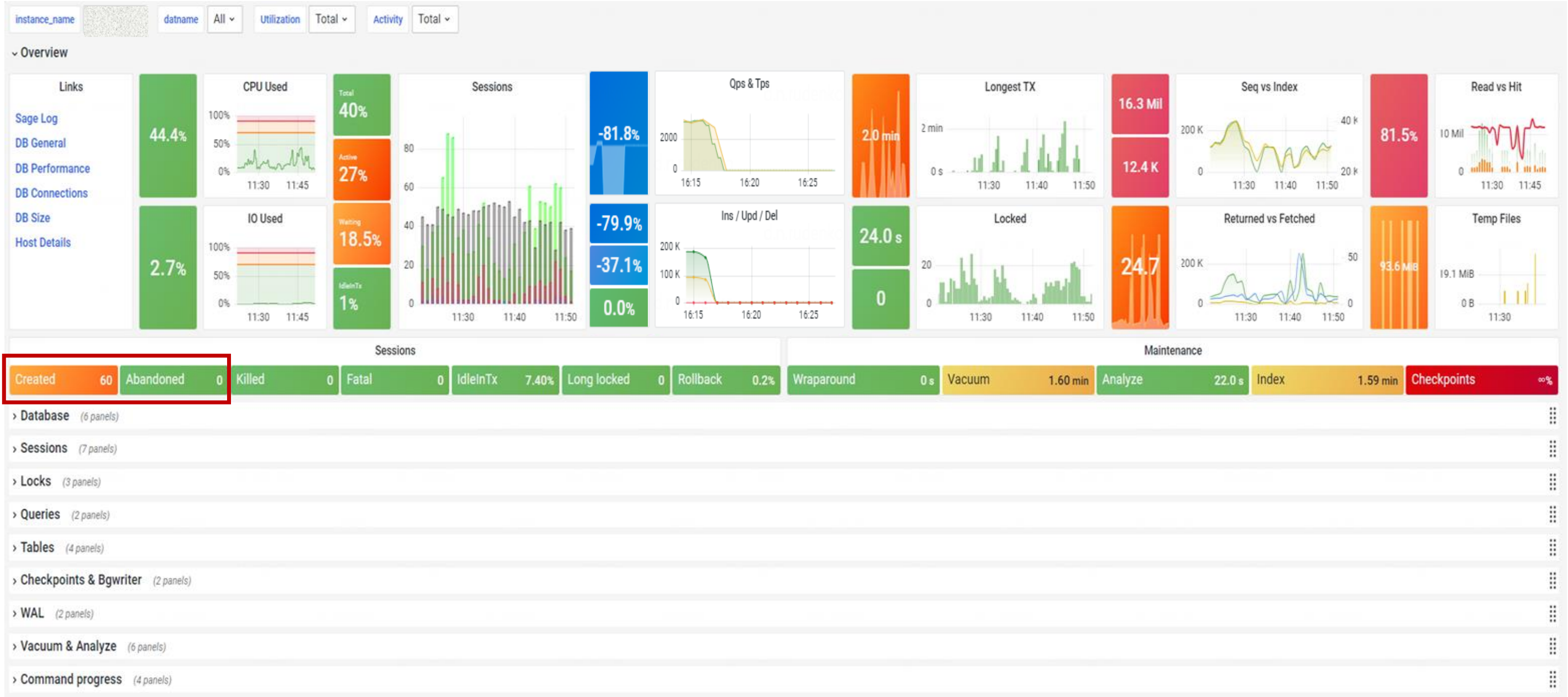
- ➡ DB General
- ➡ DB Connections
- ➡ DB Size
- ➡ Host Details
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➡ DB Performance -> Overview

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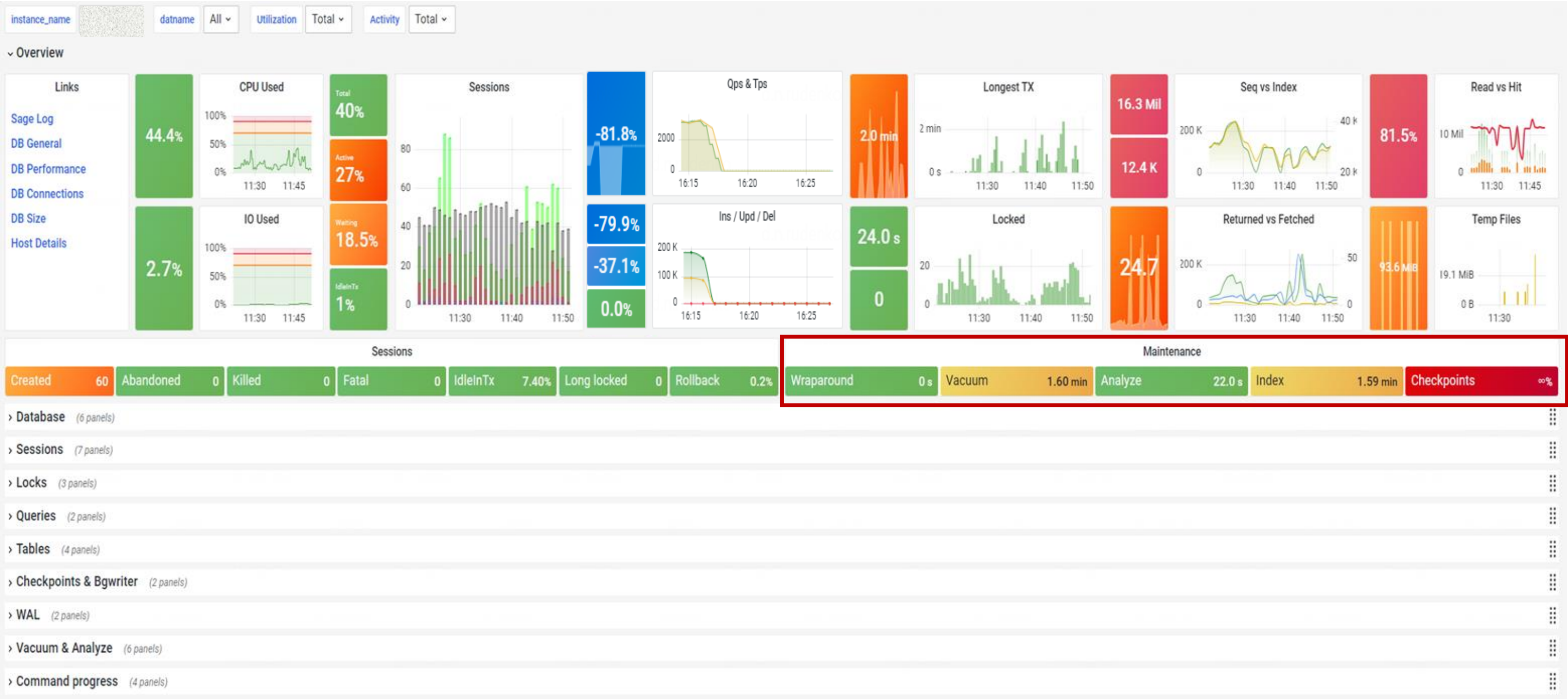
- ➡ DB General
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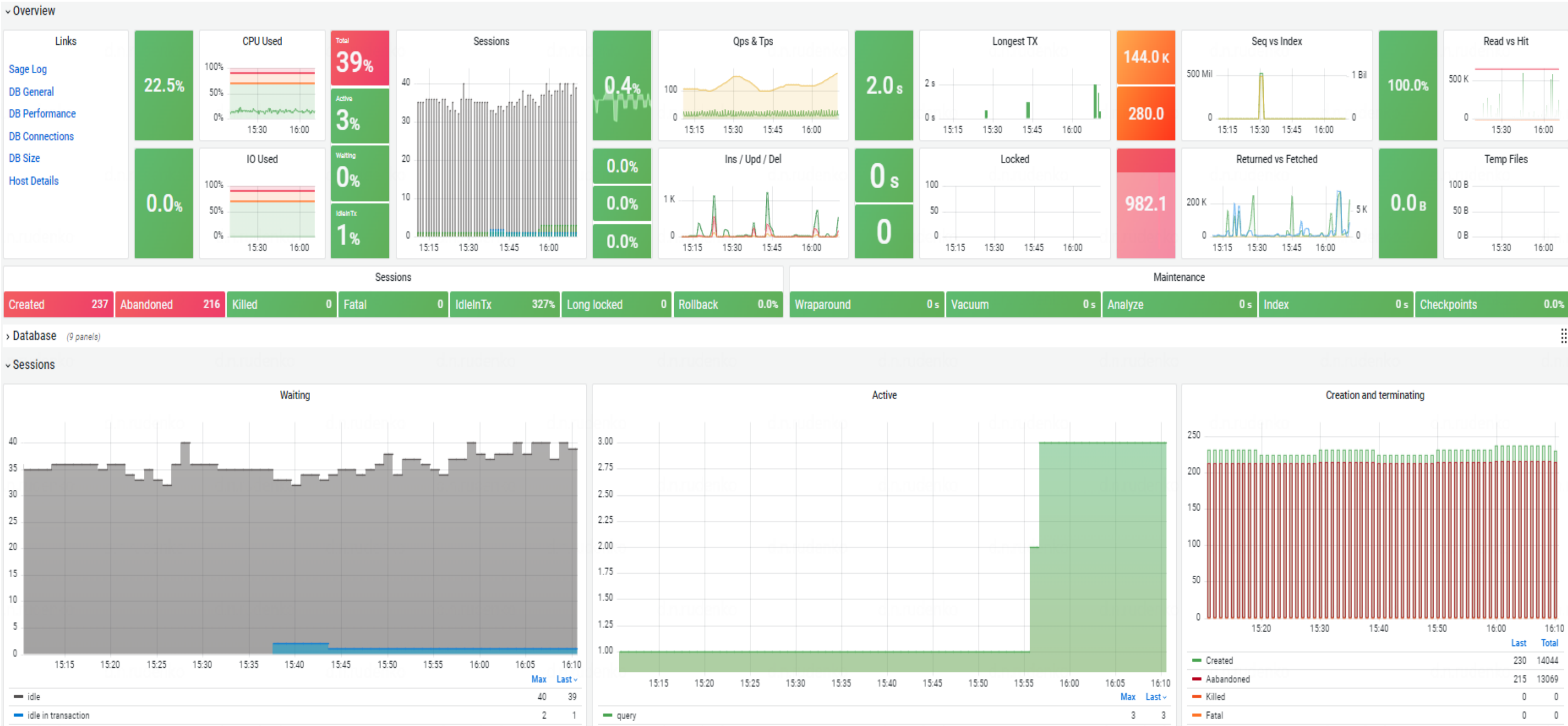
➡ DB Performance -> Overview

Links

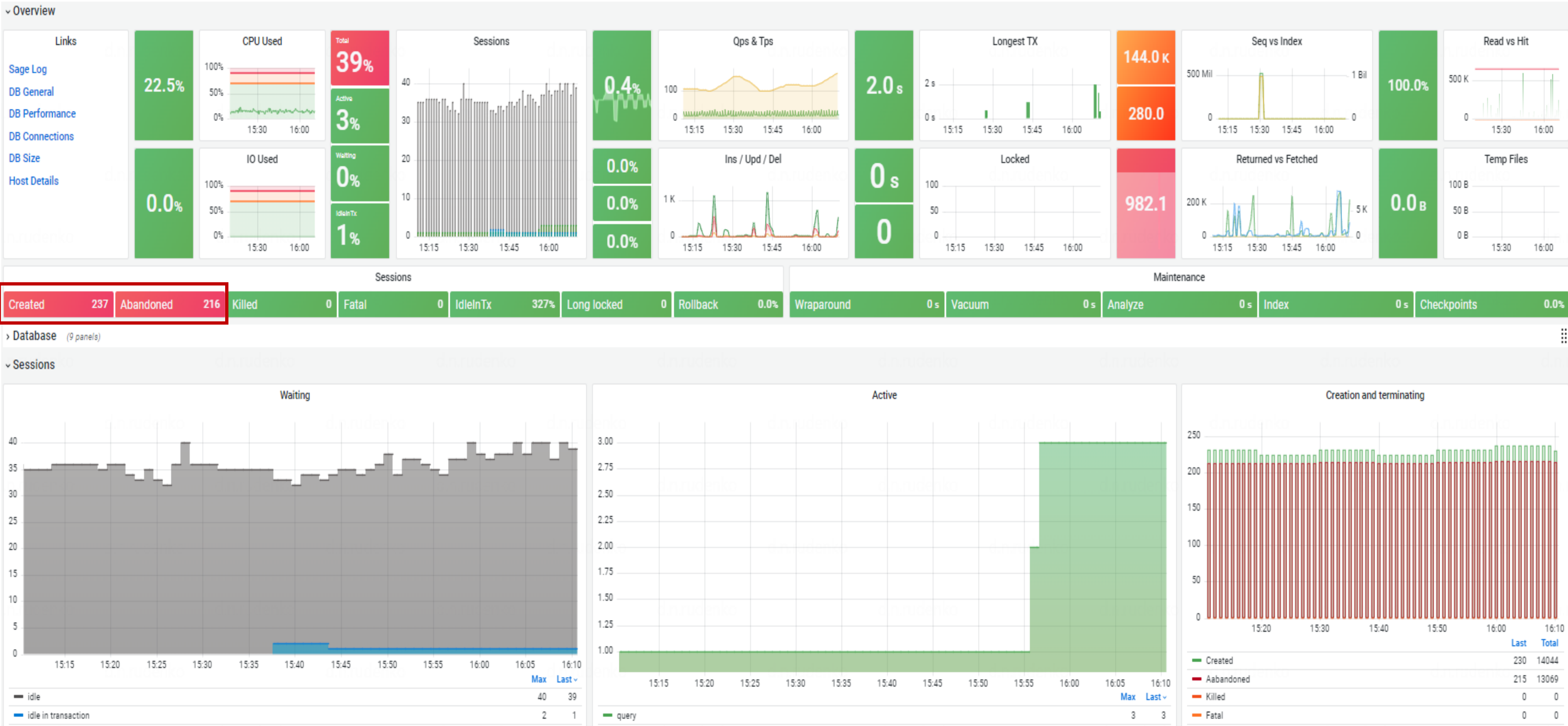
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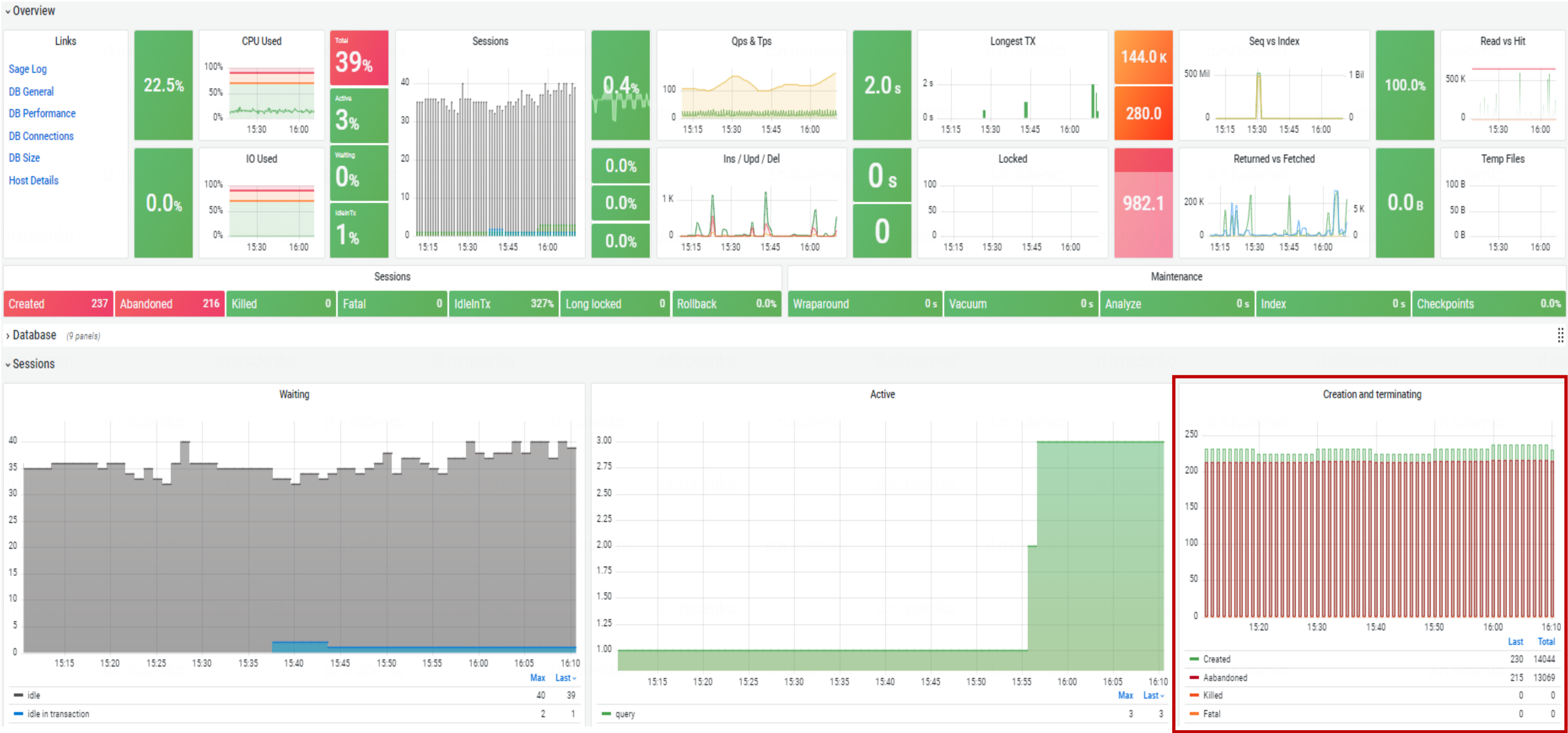
Пример 1. Проблема с сессиями



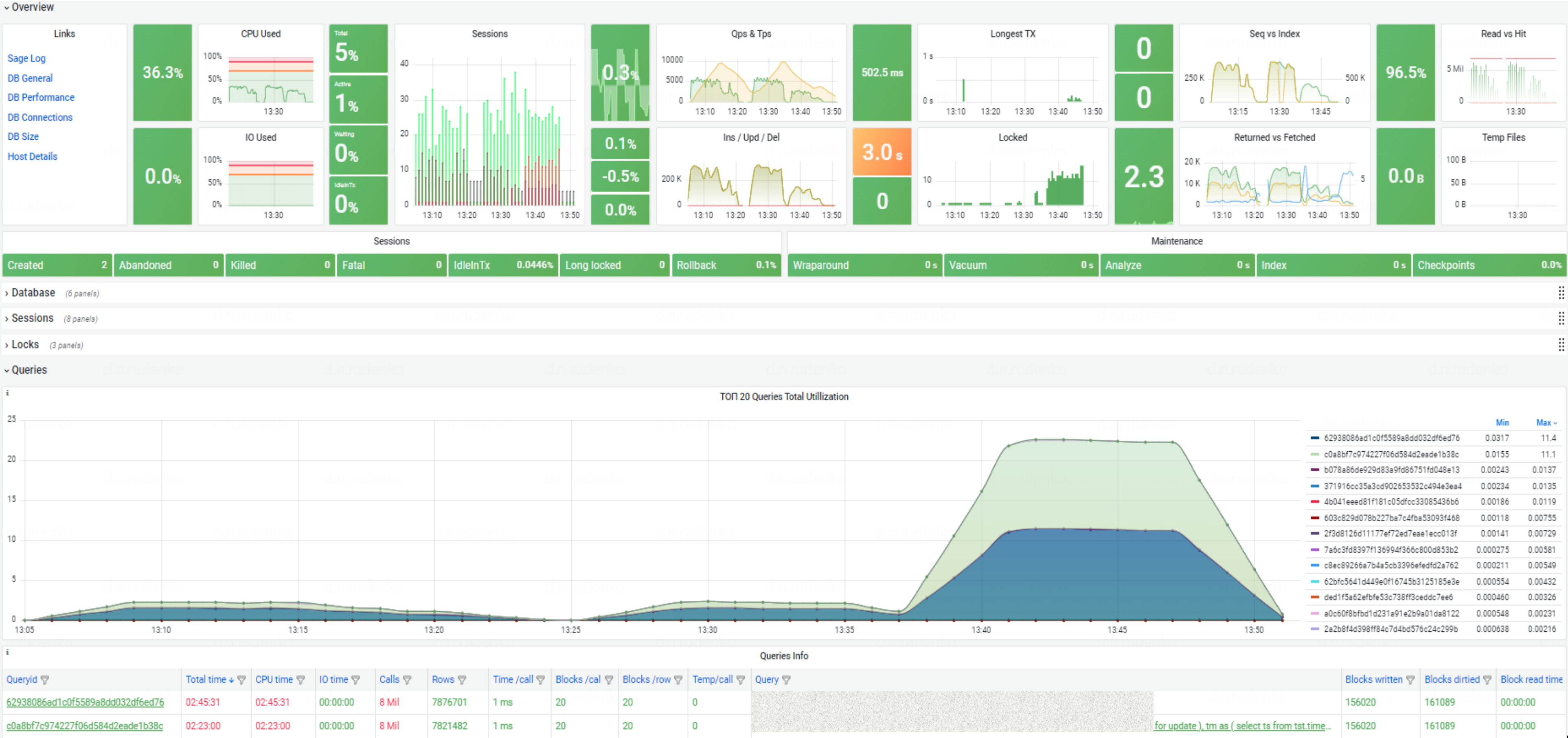
Пример 1. Проблема с сессиями



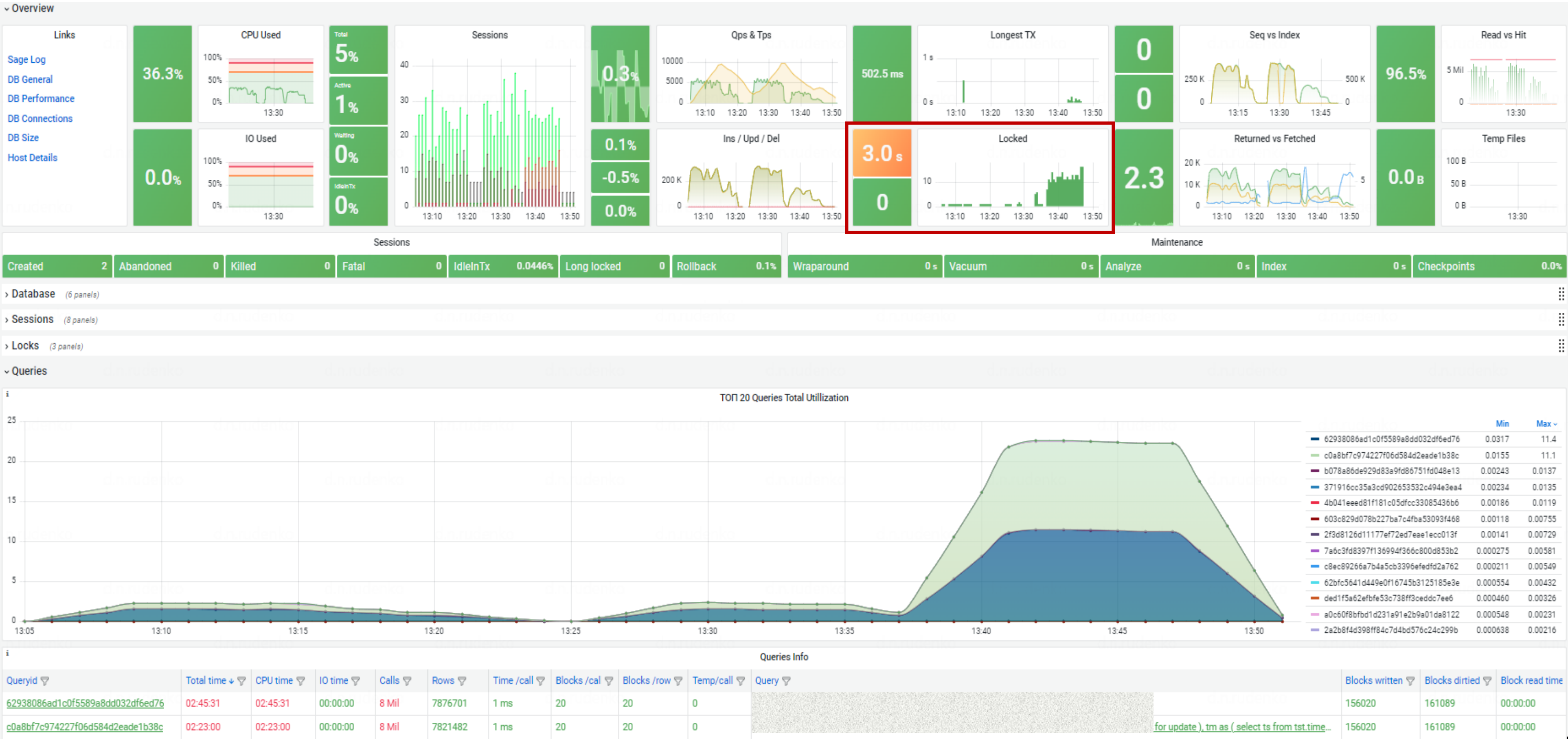
Пример 1. Проблема с сессиями



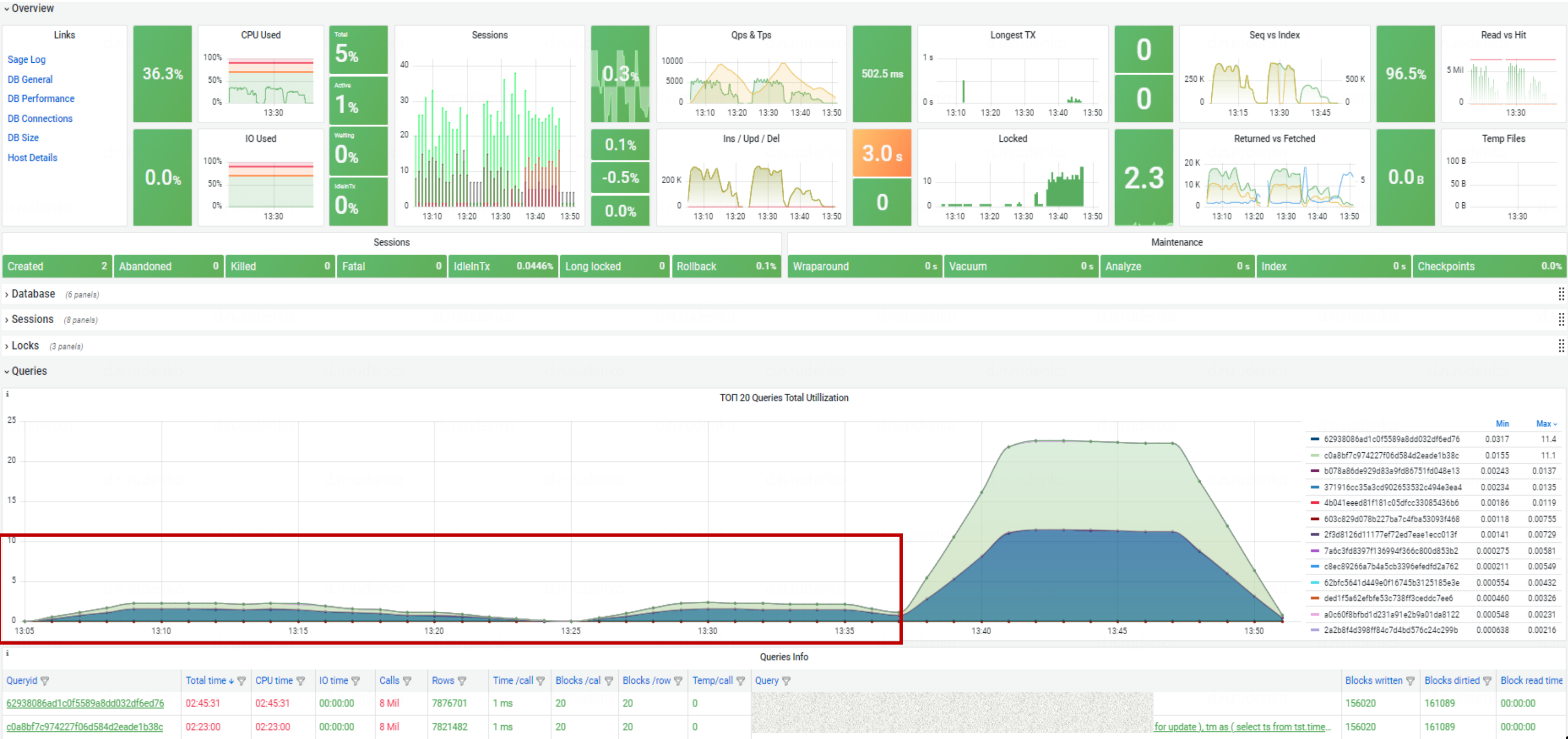
Пример 2. Проблема с блокировками



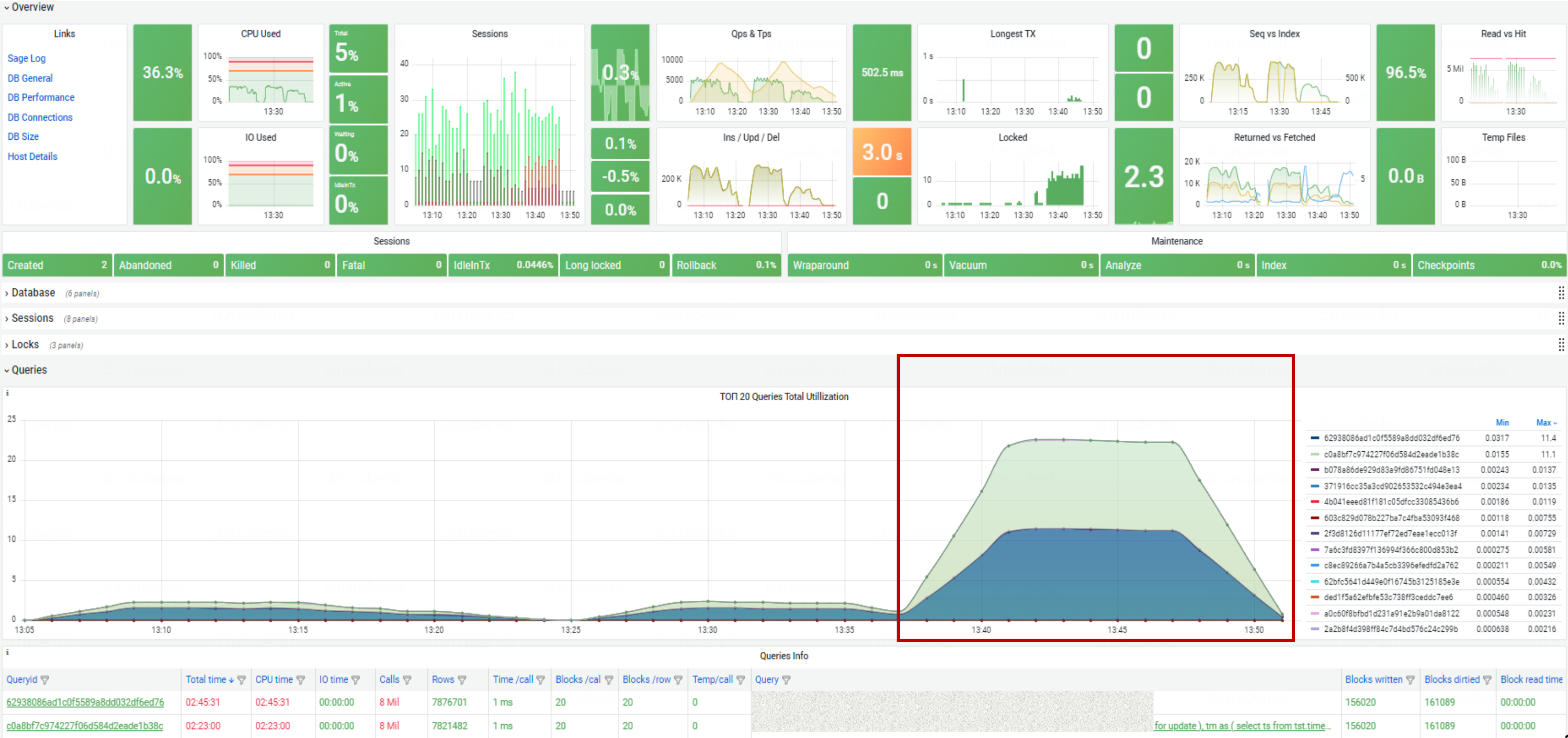
Пример 2. Проблема с блокировками



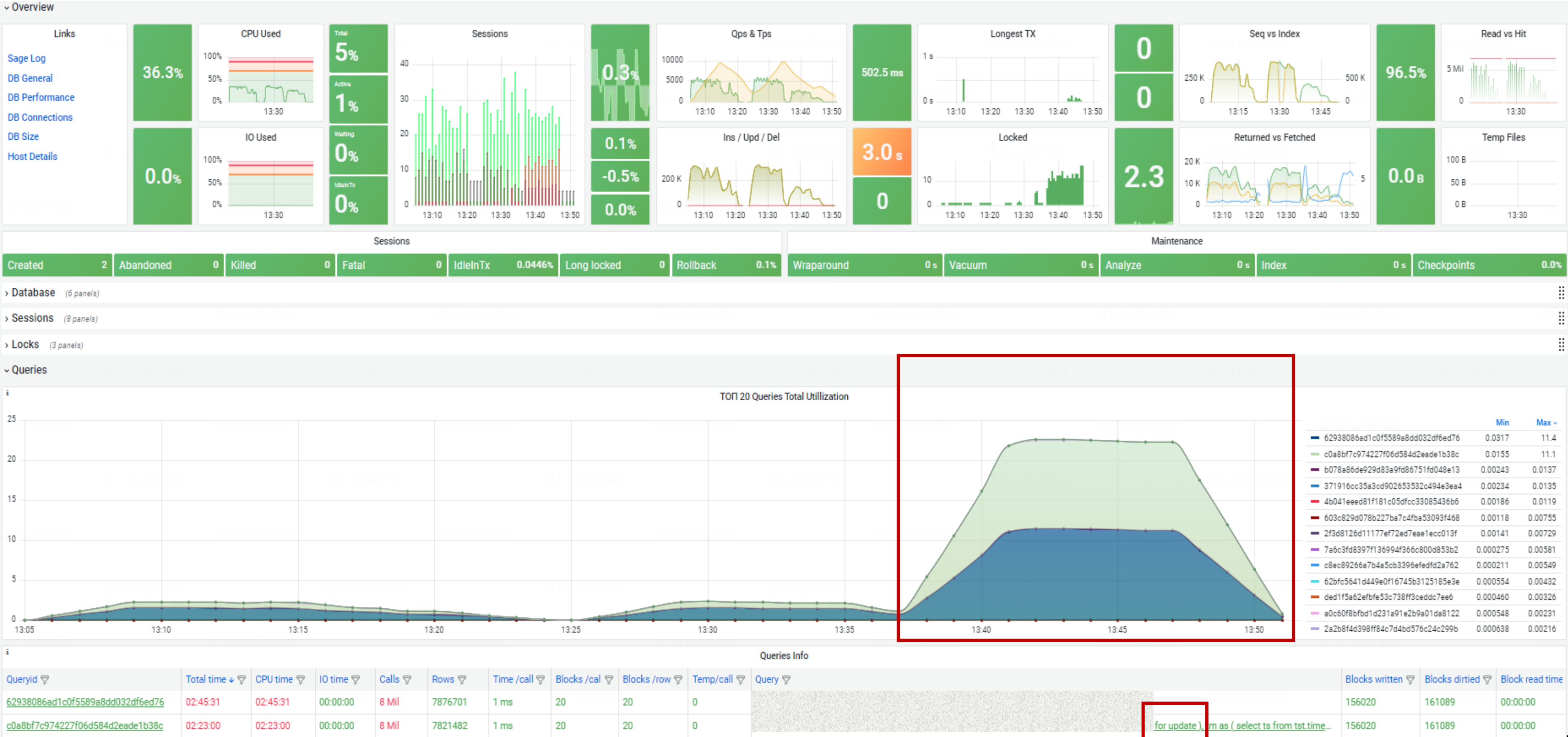
Пример 2. Проблема с блокировками



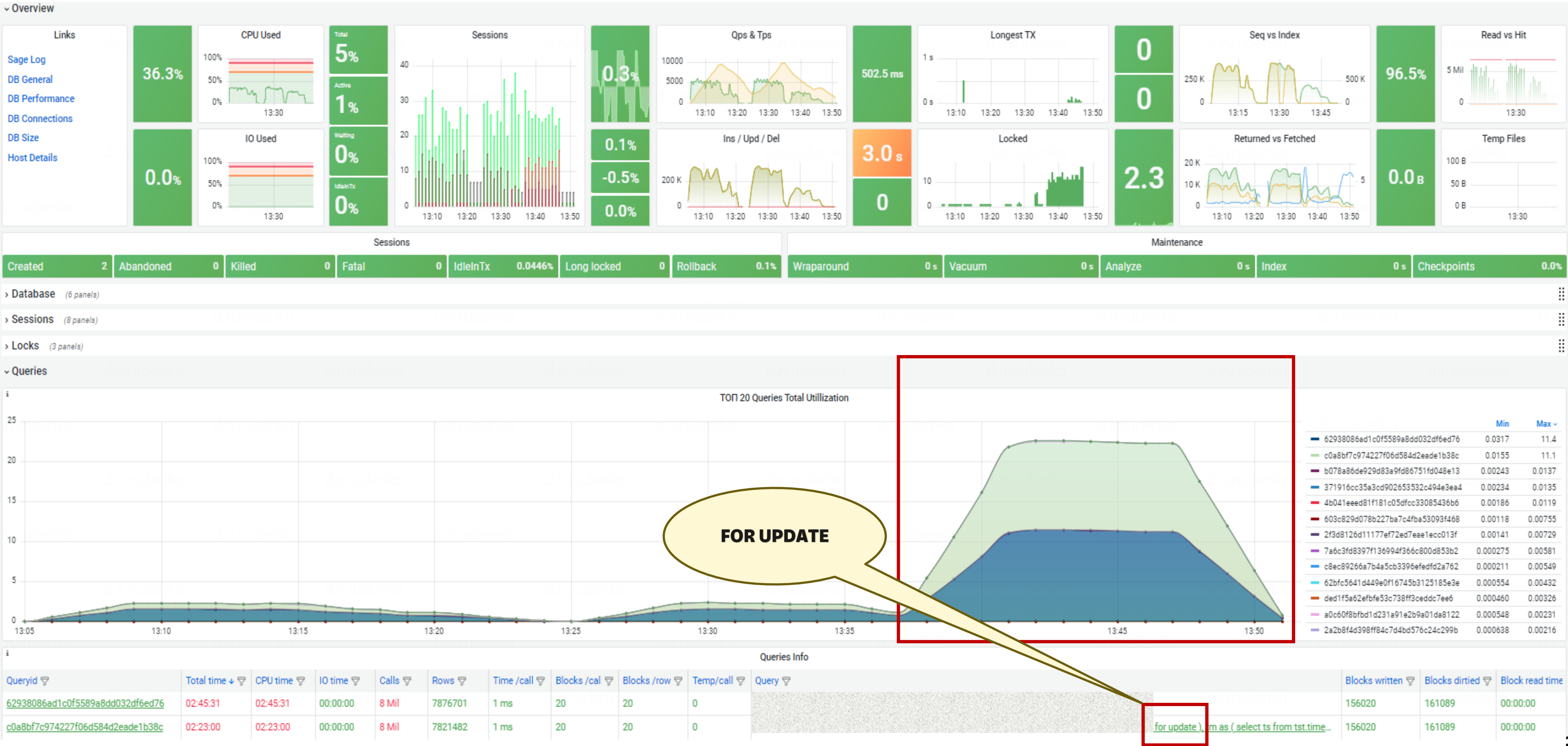
Пример 2. Проблема с блокировками



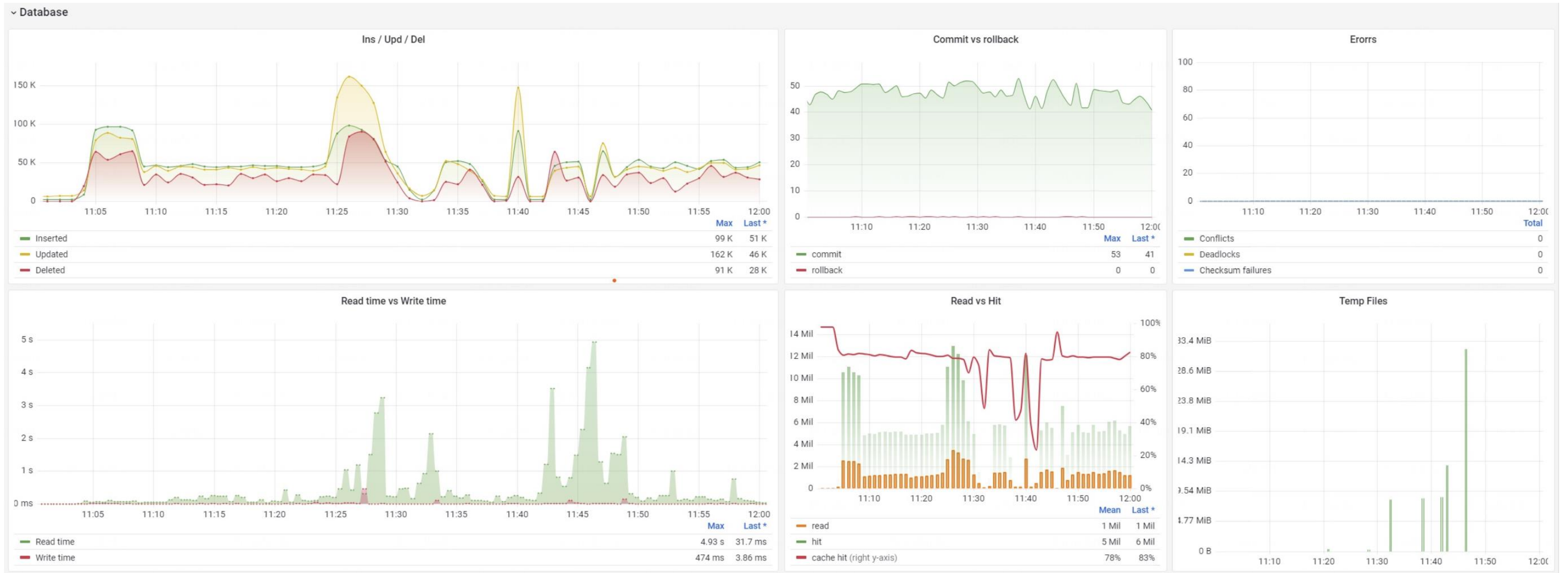
Пример 2. Проблема с блокировками



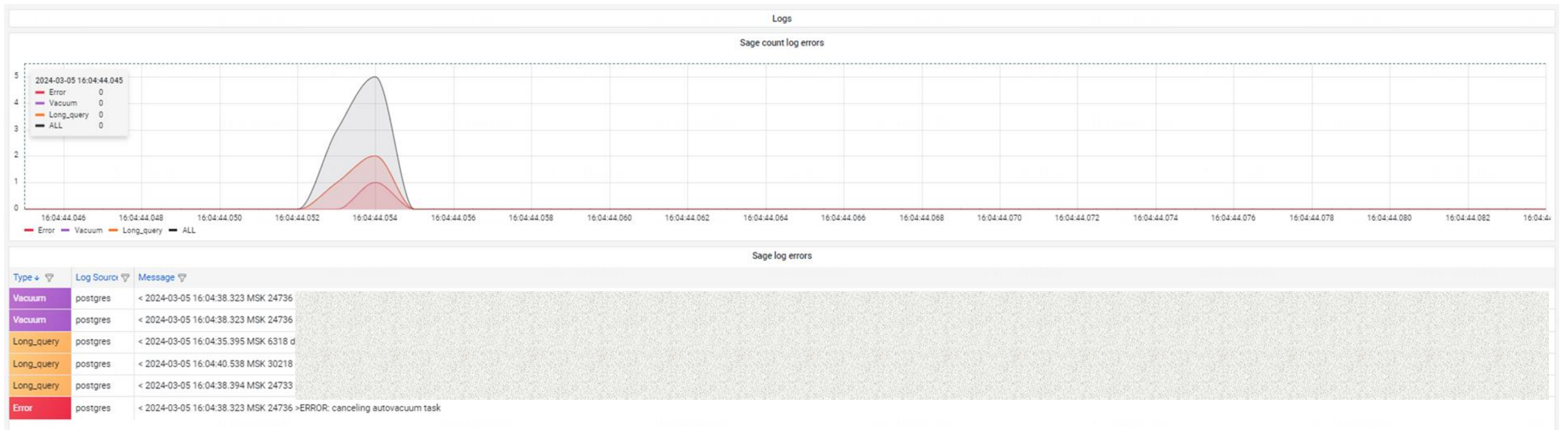
Пример 2. Проблема с блокировками



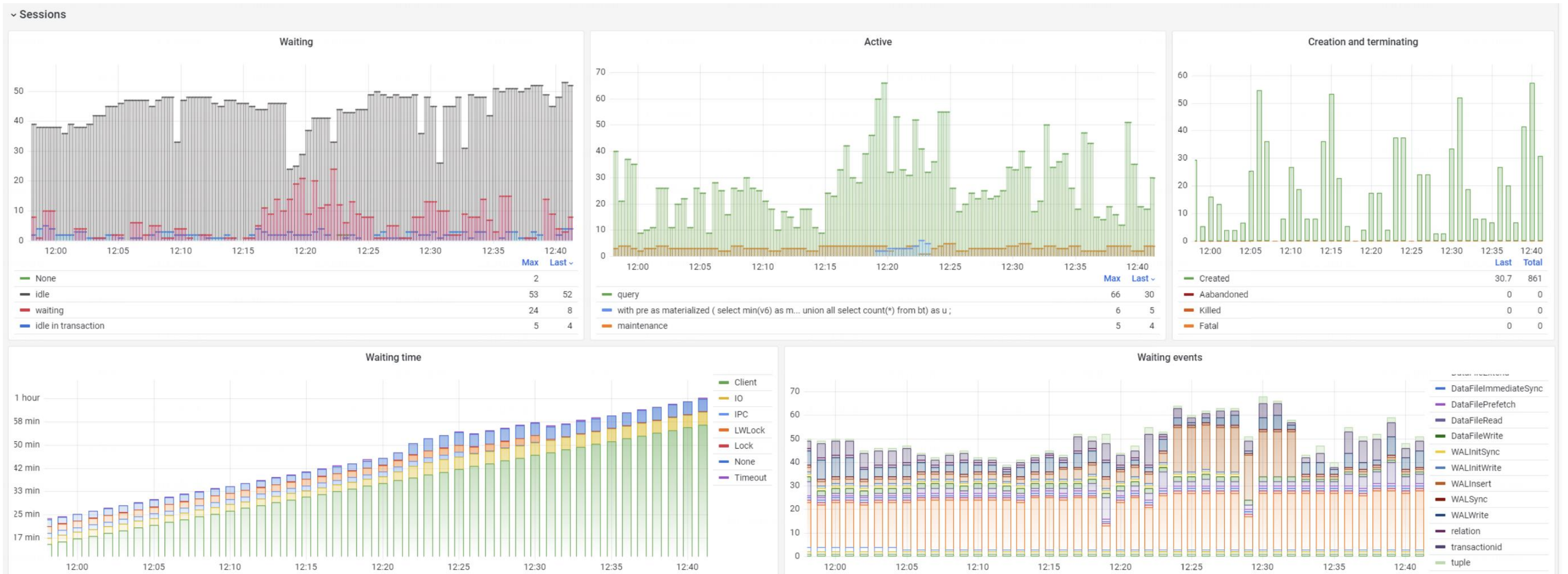
➡ DB Performance → Database



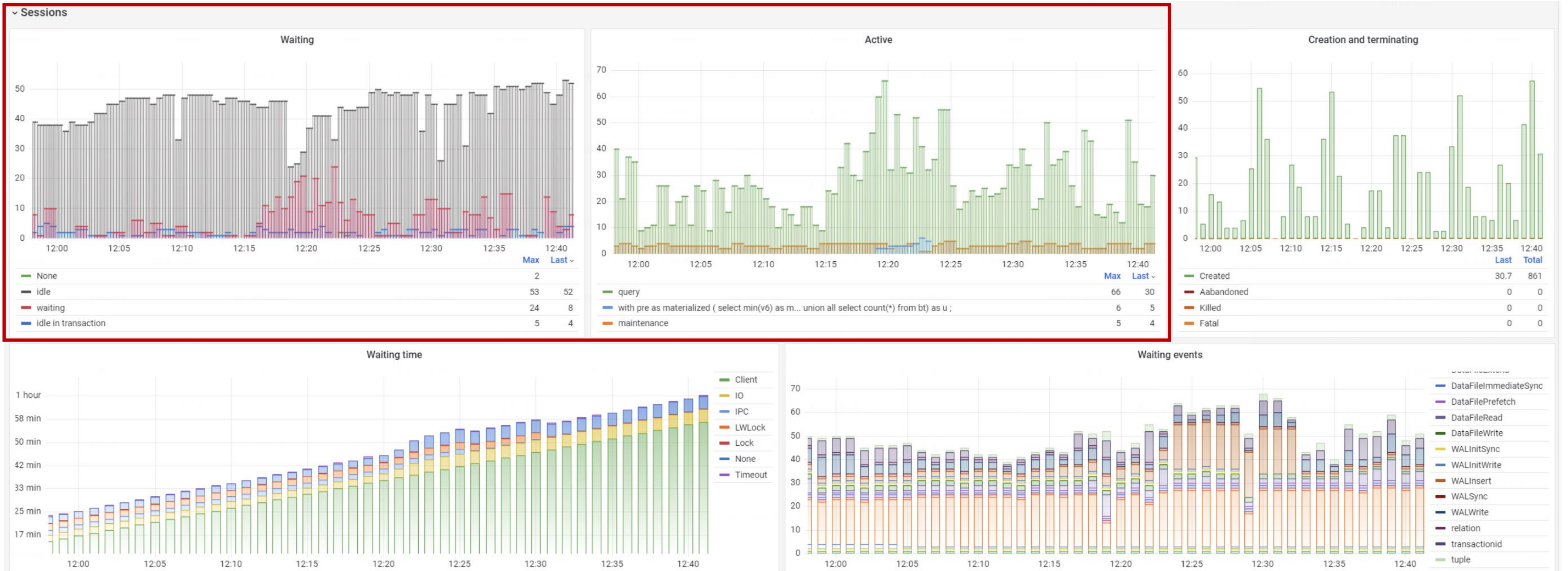
➡ DB Performance → Database



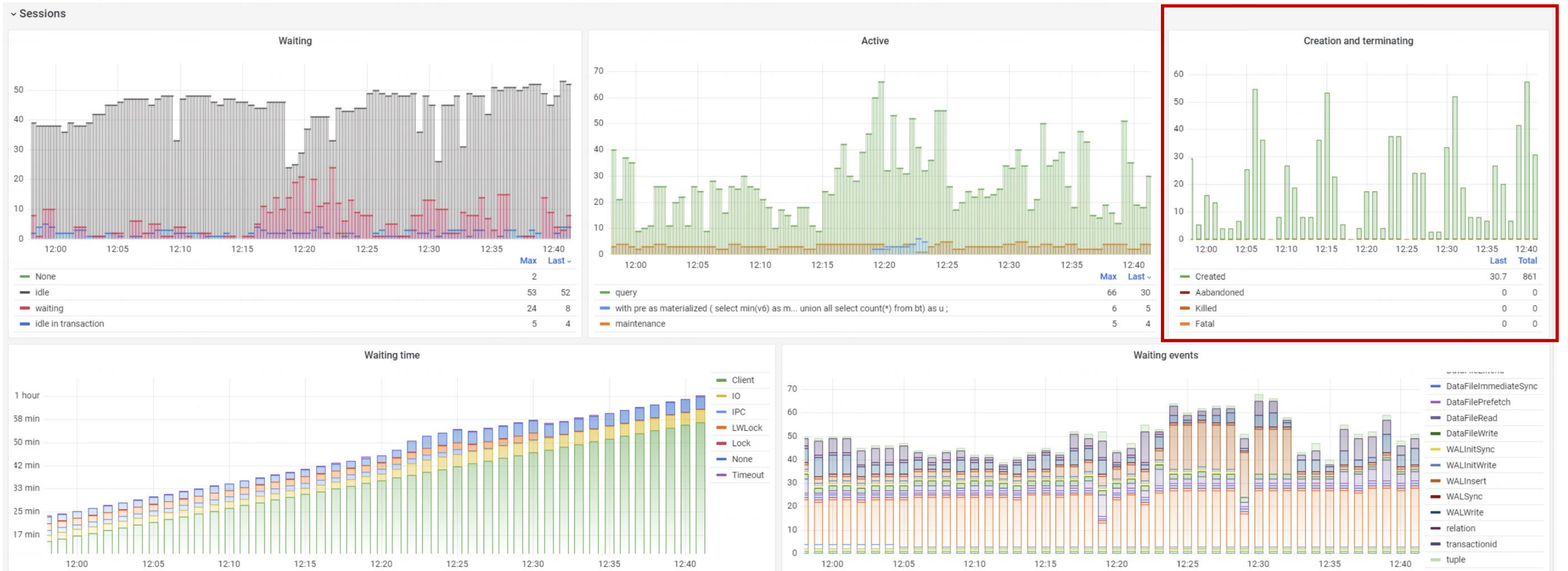
➡ DB Performance → Session



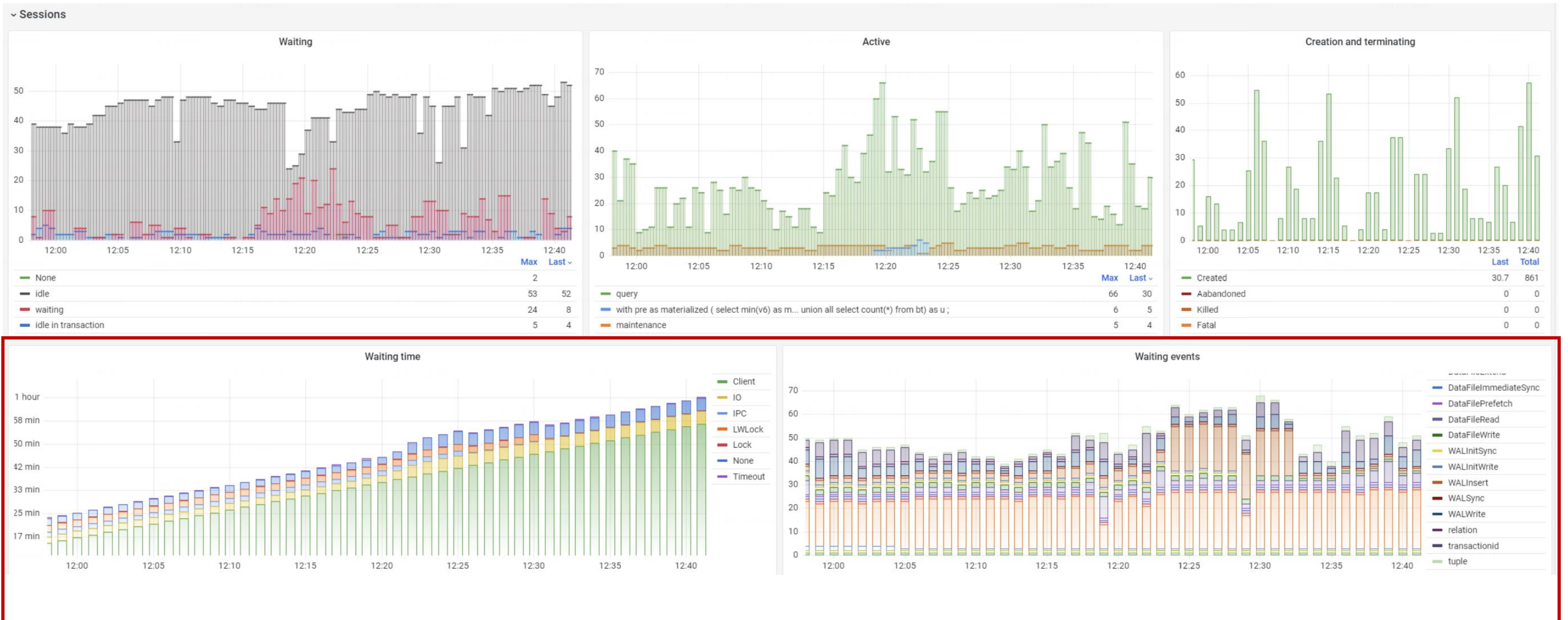
➡ DB Performance → Session



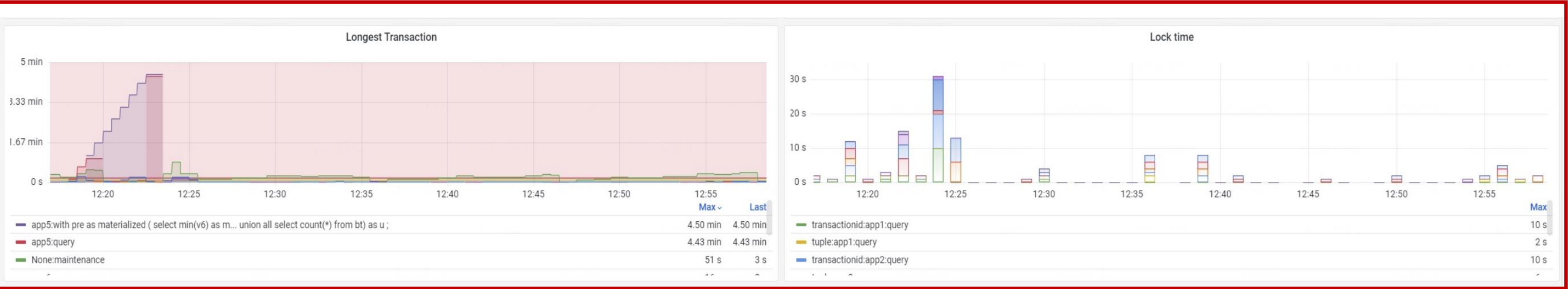
➡ DB Performance → Session



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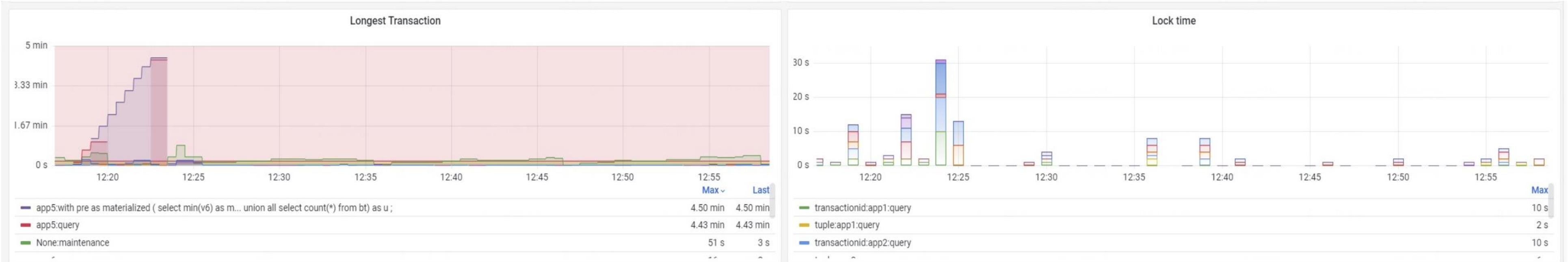


➡ DB Performance → Session



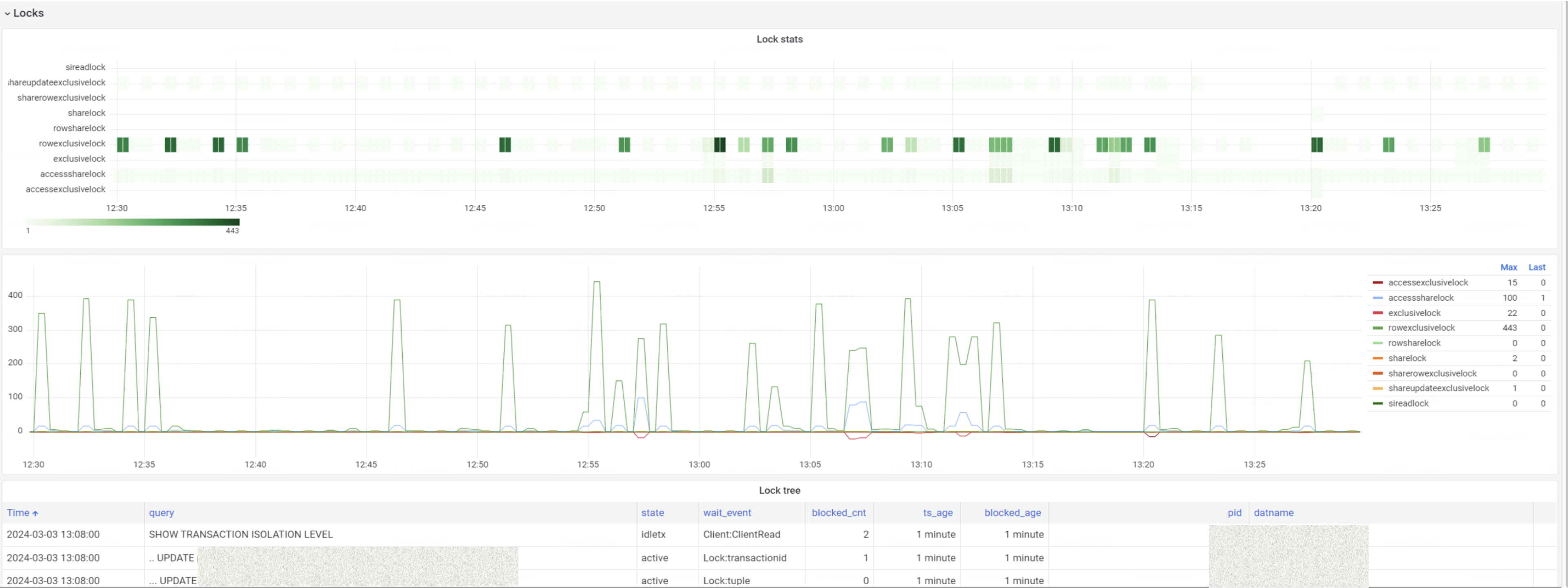
Activity										
Time	Datname	Username	State	Wait event type	Wait event	Total	Xact time	Query time	State time	Query
2024-03-03 12:18:24			active	IO	BufFileWrite	1	35 s	35 s	35 s	query
2024-03-03 12:18:43			active	None	None	1	54 s	54 s	54 s	query
2024-03-03 12:18:49			active	IO	DataFileRead	1	1 min	1 min	1 min	query
2024-03-03 12:18:58			active	IO	WALWrite	1	2 s	2 s	2 s	query
2024-03-03 12:21:43			active	IO	BufFileWrite	1	3.90 min	3.90 min	3.90 min	with pre as materialized
2024-03-03 12:22:13			active	IO	BufFileRead	1	4.40 min	4.40 min	4.40 min	with pre as materialized
2024-03-03 12:22:15			None	None	None	2	4.43 min	0 s	0 s	query
2024-03-03 12:22:19			active	IO	DataFileRead	2	4.50 min	4.50 min	4.48 min	with pre as materialized
2024-03-03 12:22:19			active	None	None	1	4.50 min	4.50 min	4.50 min	with pre as materialized
2024-03-03 12:23:44			active	LWLock	WALInsert	1	10 s	10 s	10 s	query
2024-03-03 12:32:07			active	IO	WALWrite	1	3 s	1 s	1 s	query

➡ DB Performance → Session

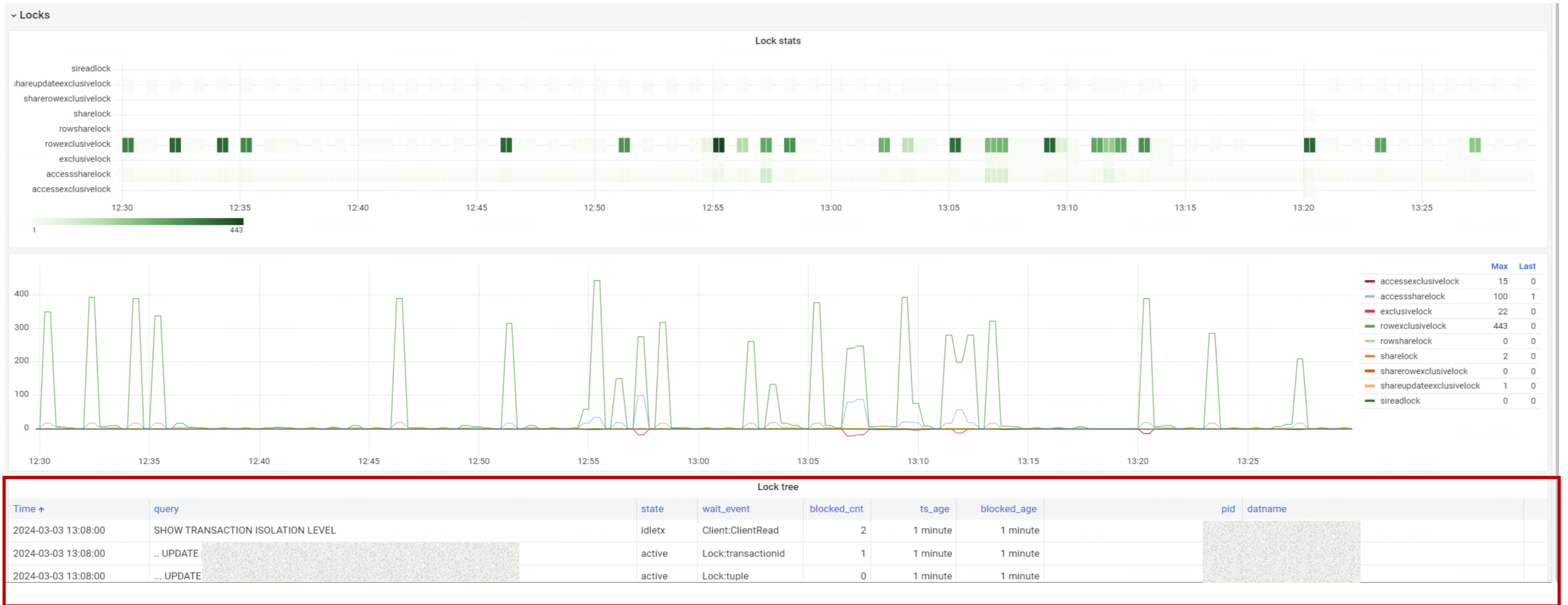


Activity										
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2024-03-03 12:22:15			None	None	None	2	4.43 min	0 s	0 s	query
2024-03-03 12:22:19			active	IO	DataFileRead	2	4.50 min	4.50 min	4.48 min	with pre as materialized
2024-03-03 12:22:19			active	None	None	1	4.50 min	4.50 min	4.50 min	with pre as materialized
2024-03-03 12:23:44			active	LWLock	WALInsert	1	10 s	10 s	10 s	query
2024-03-03 12:32:07			active	IO	WALWrite	1	3 s	1 s	1 s	query

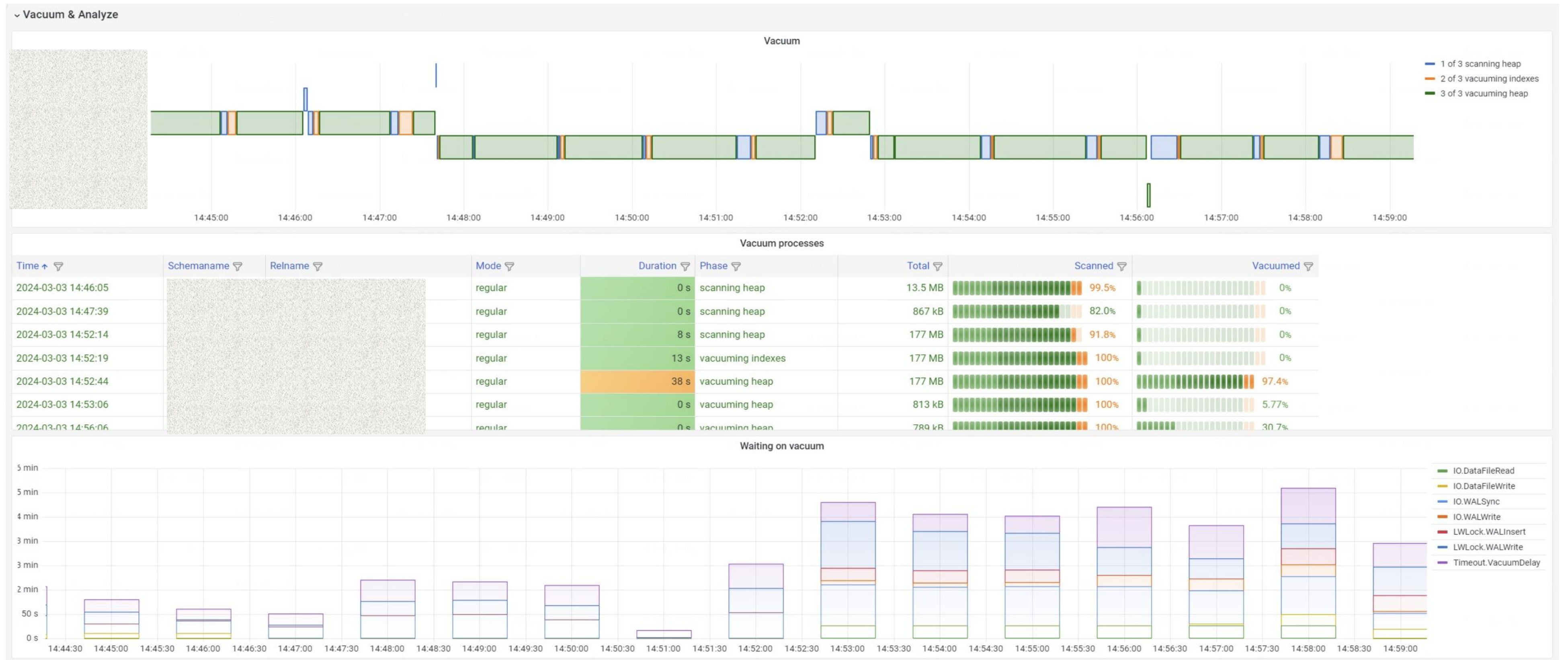
➡ DB Performance -> Locks



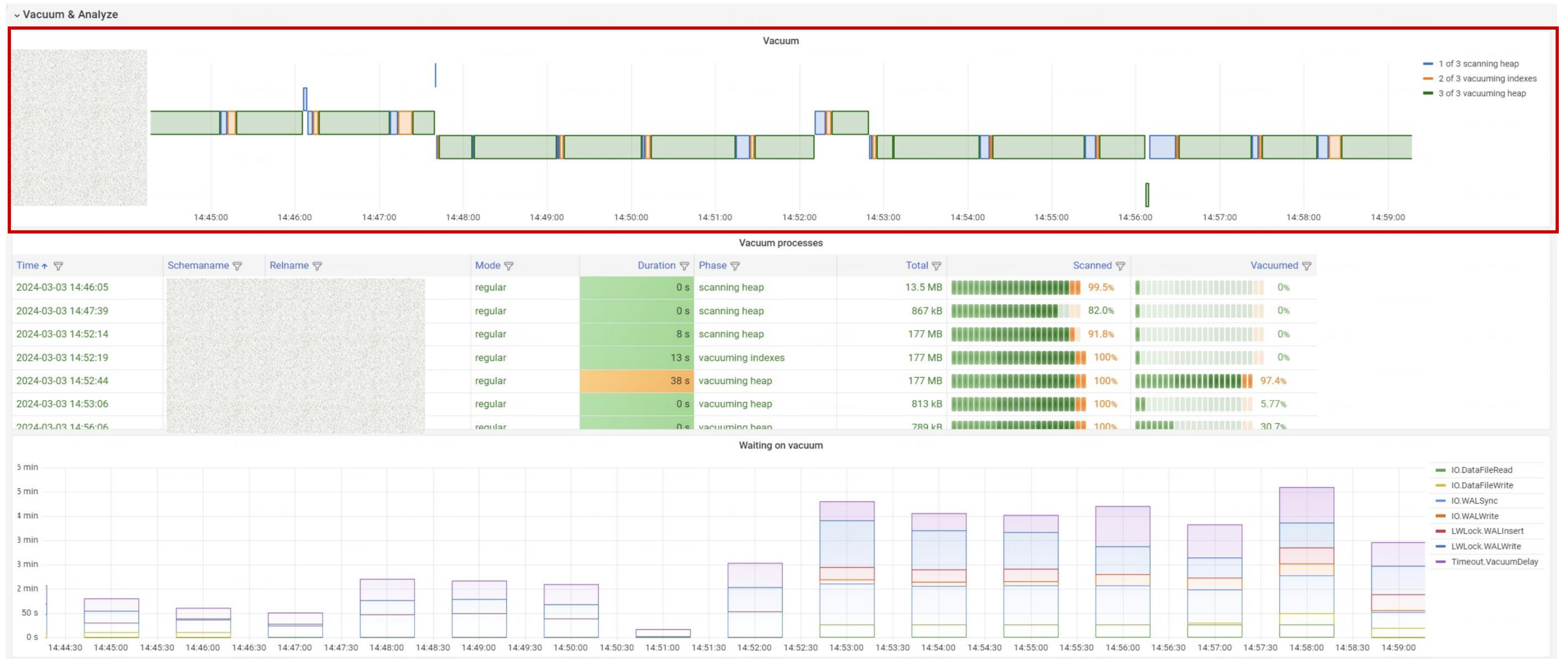
➡ DB Performance → Locks



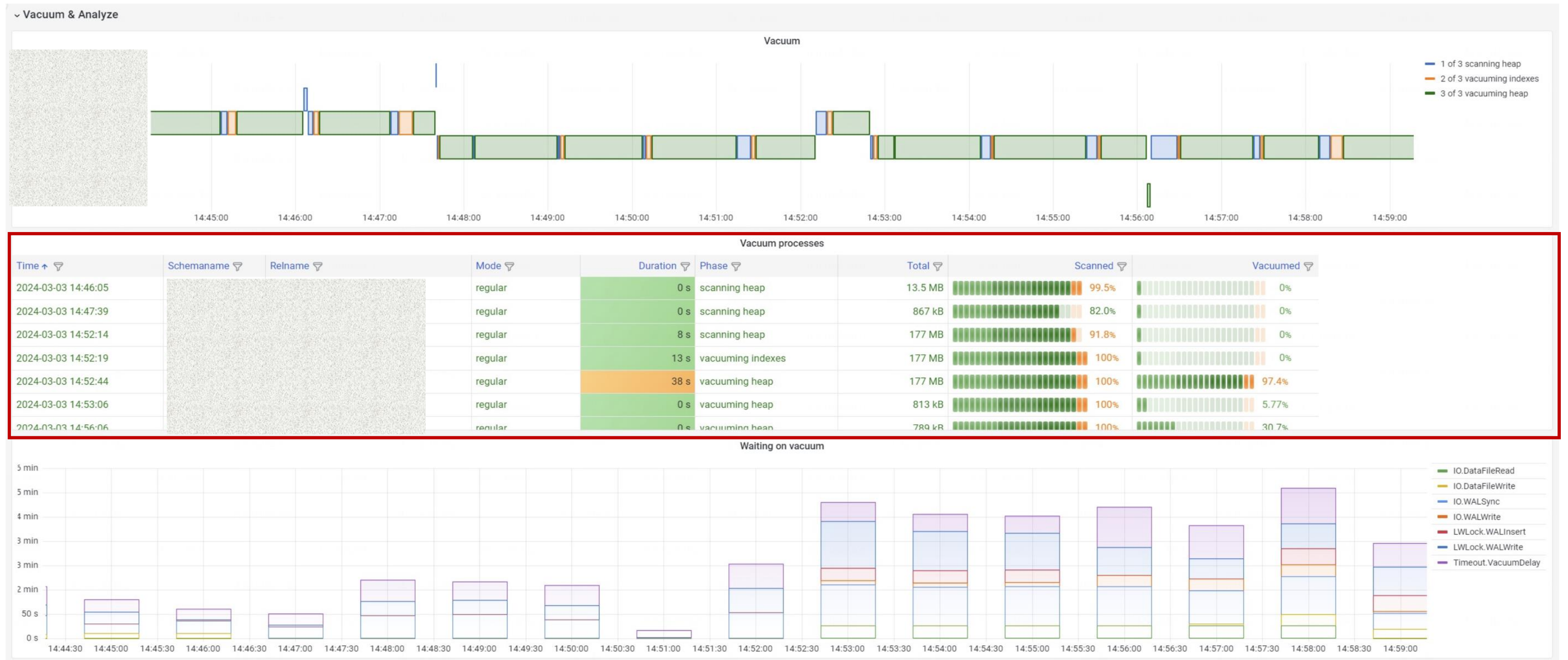
➡ DB Performance –> Vacuum & Analyze



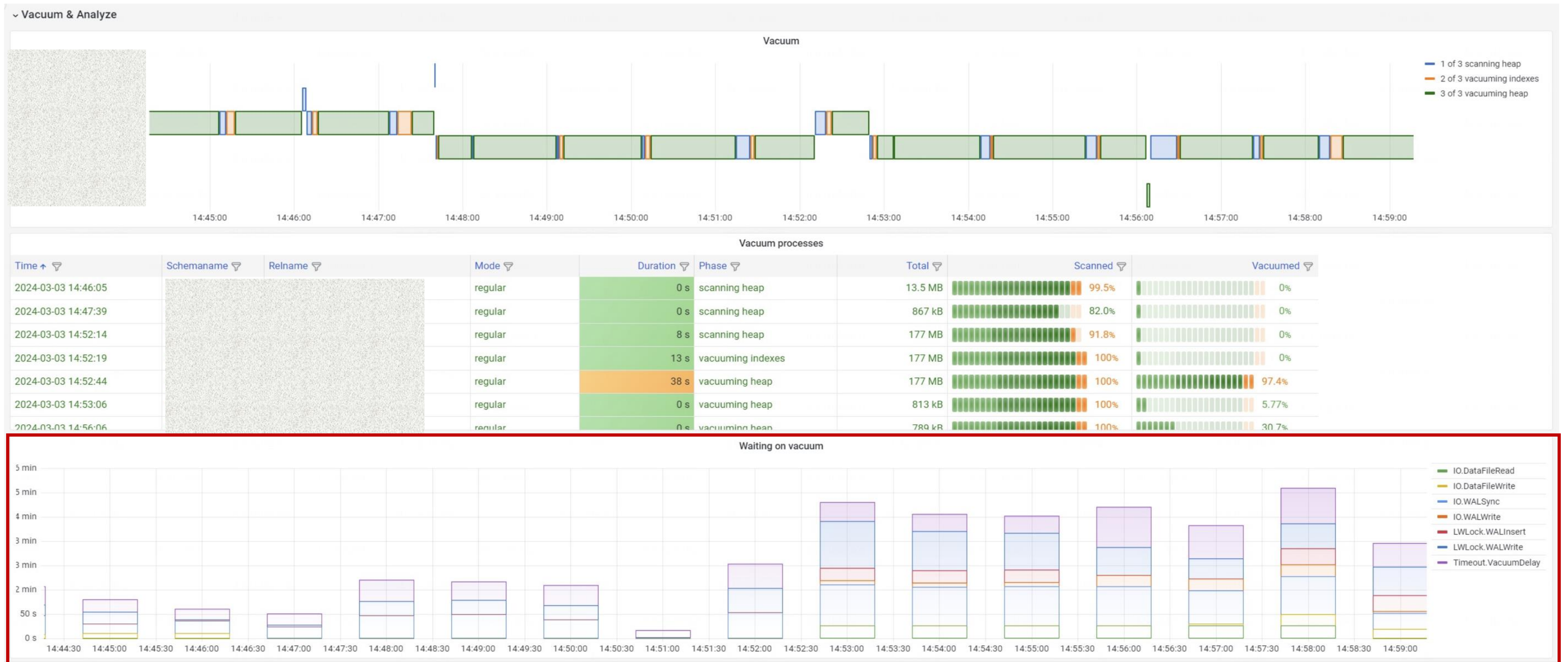
➡ DB Performance -> Vacuum & Analyze



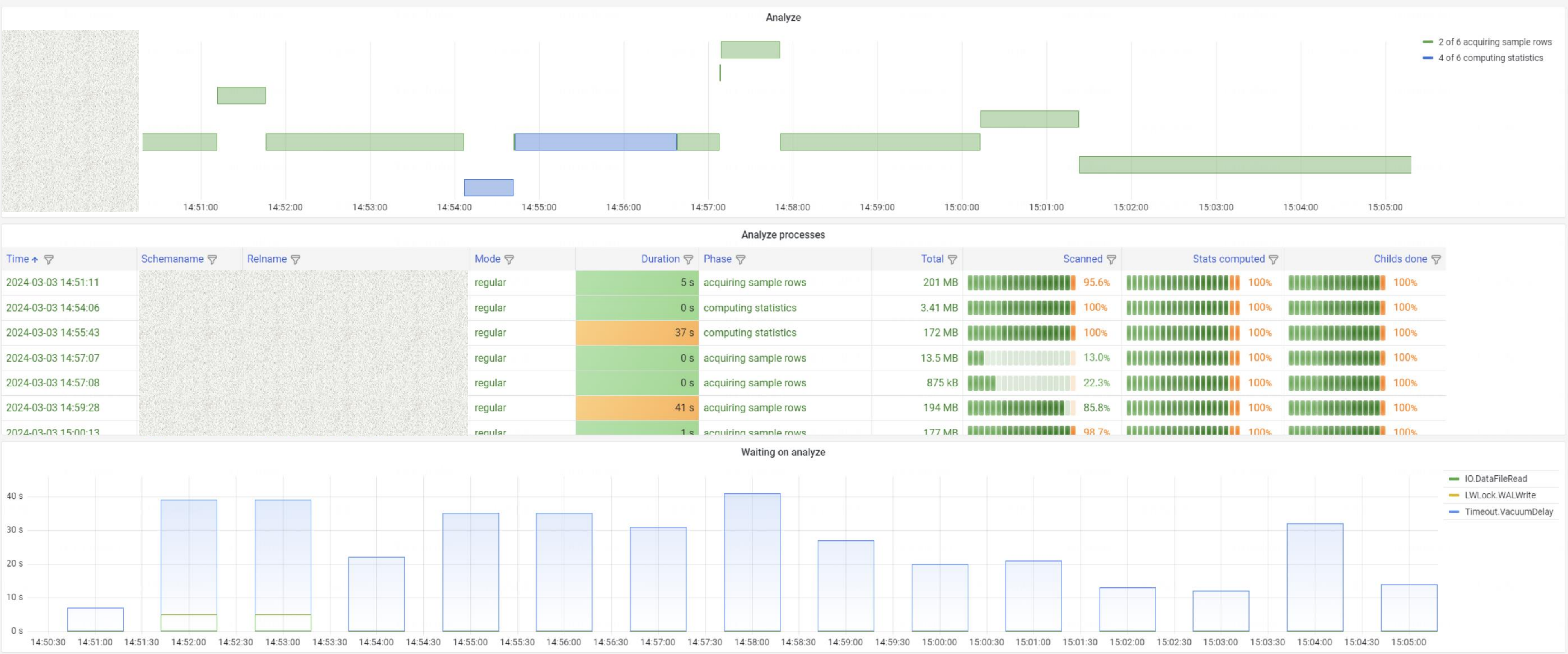
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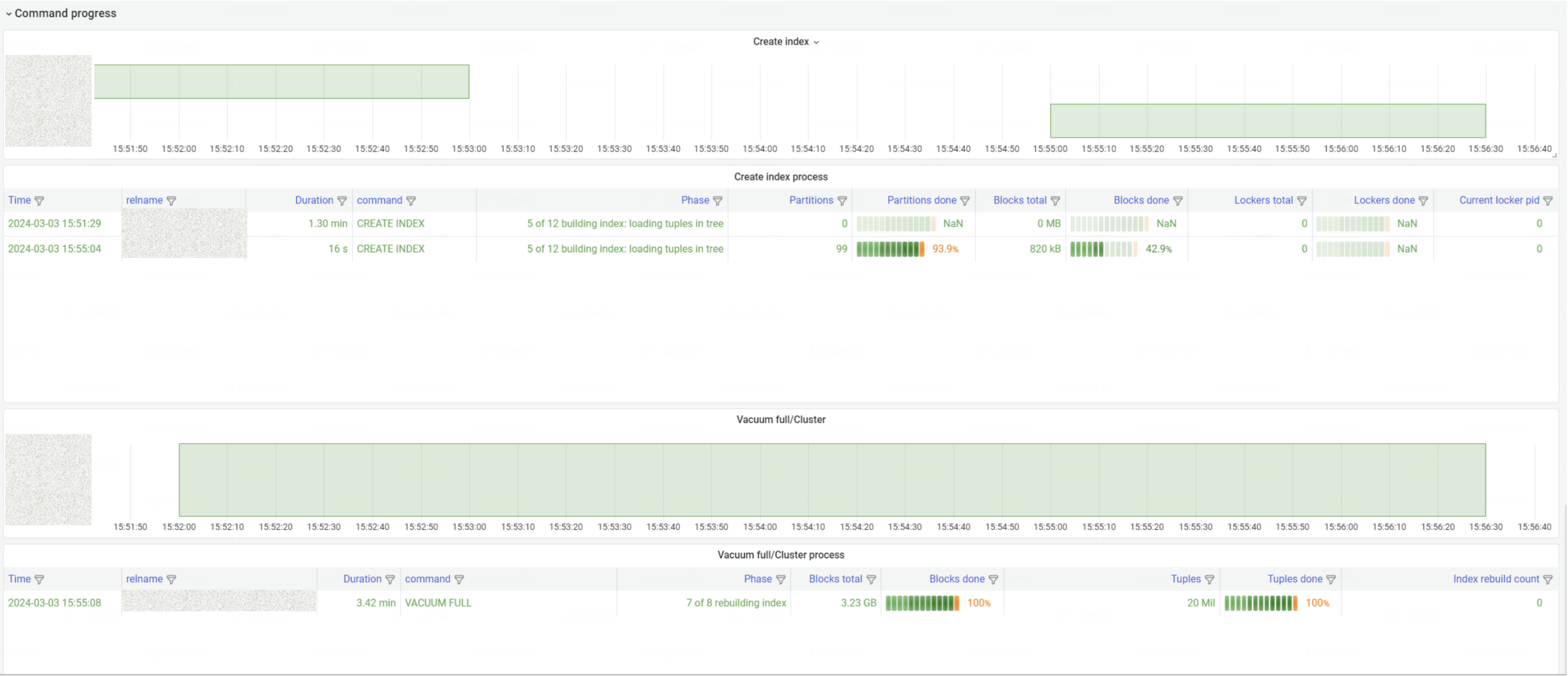
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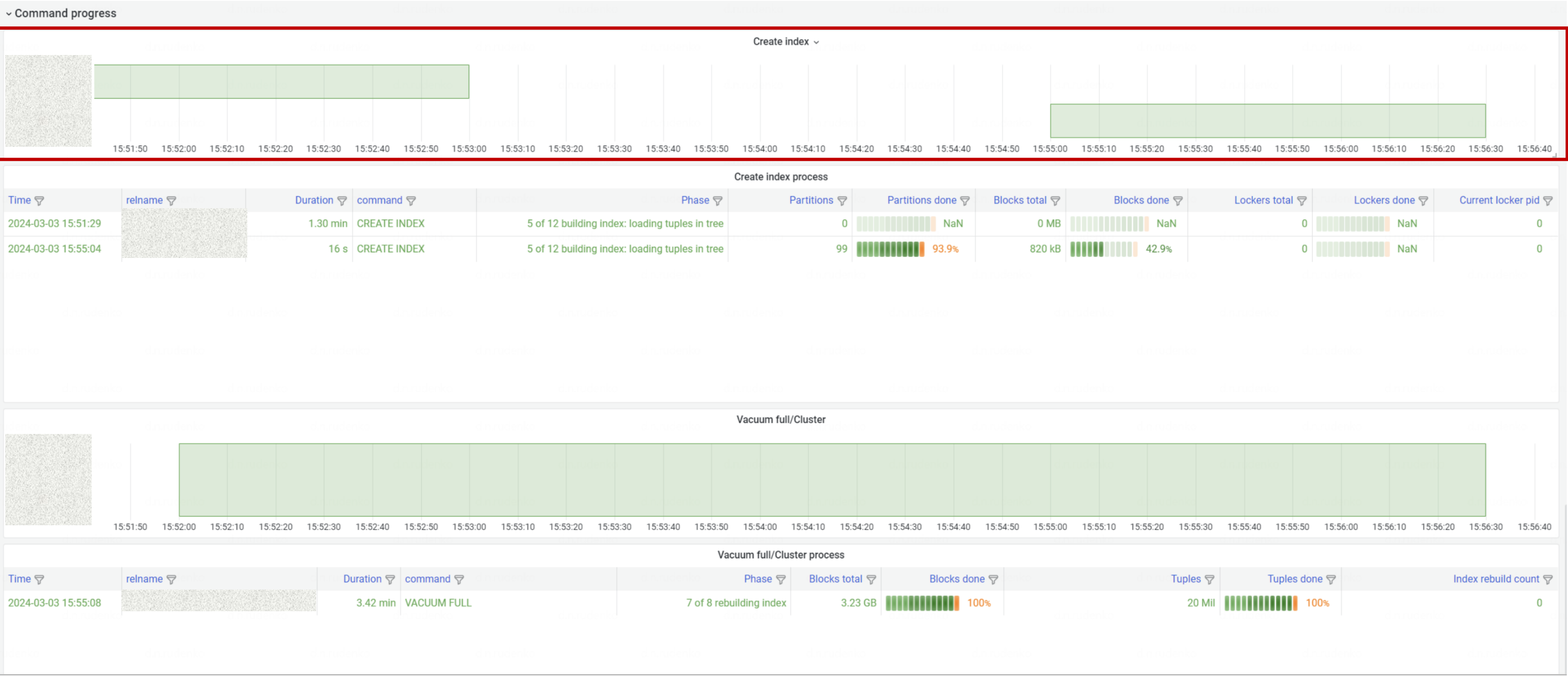
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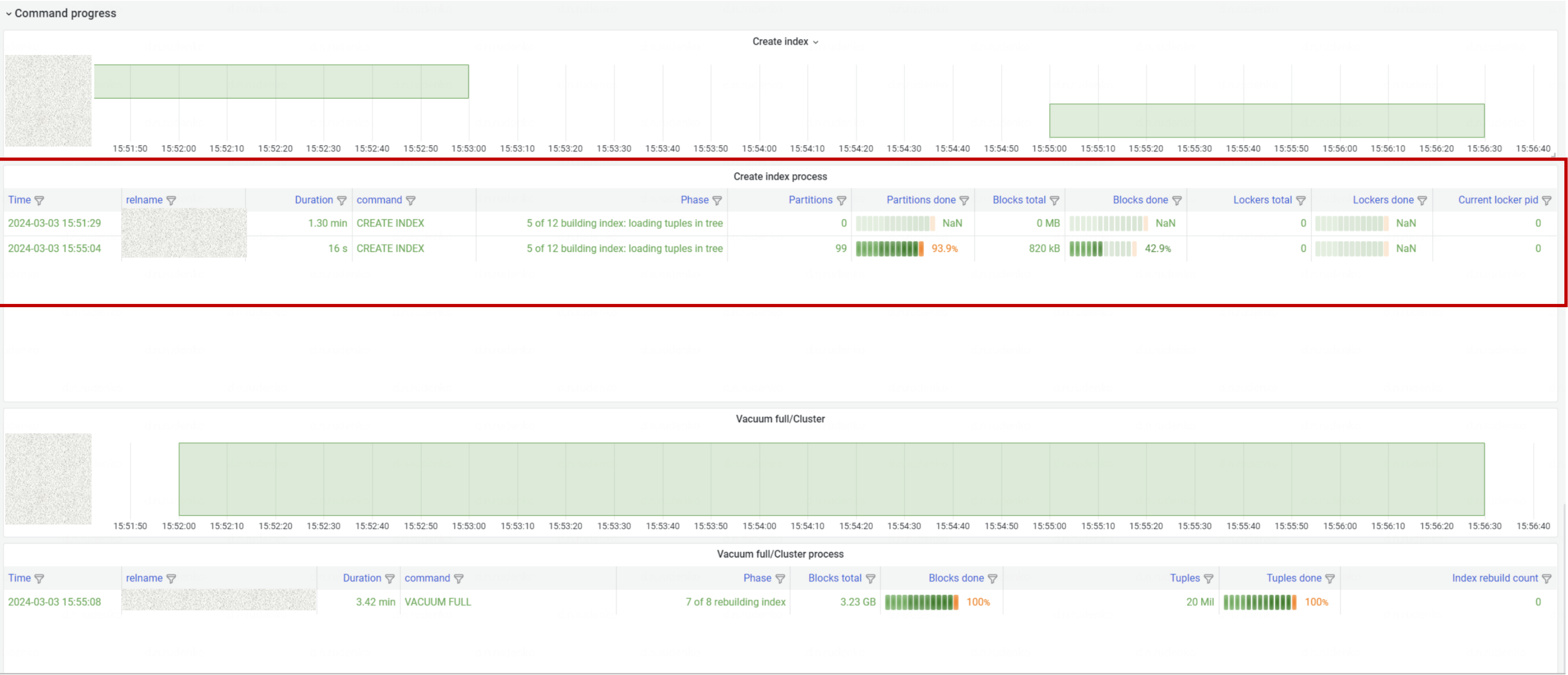
DB Performance → Command progress



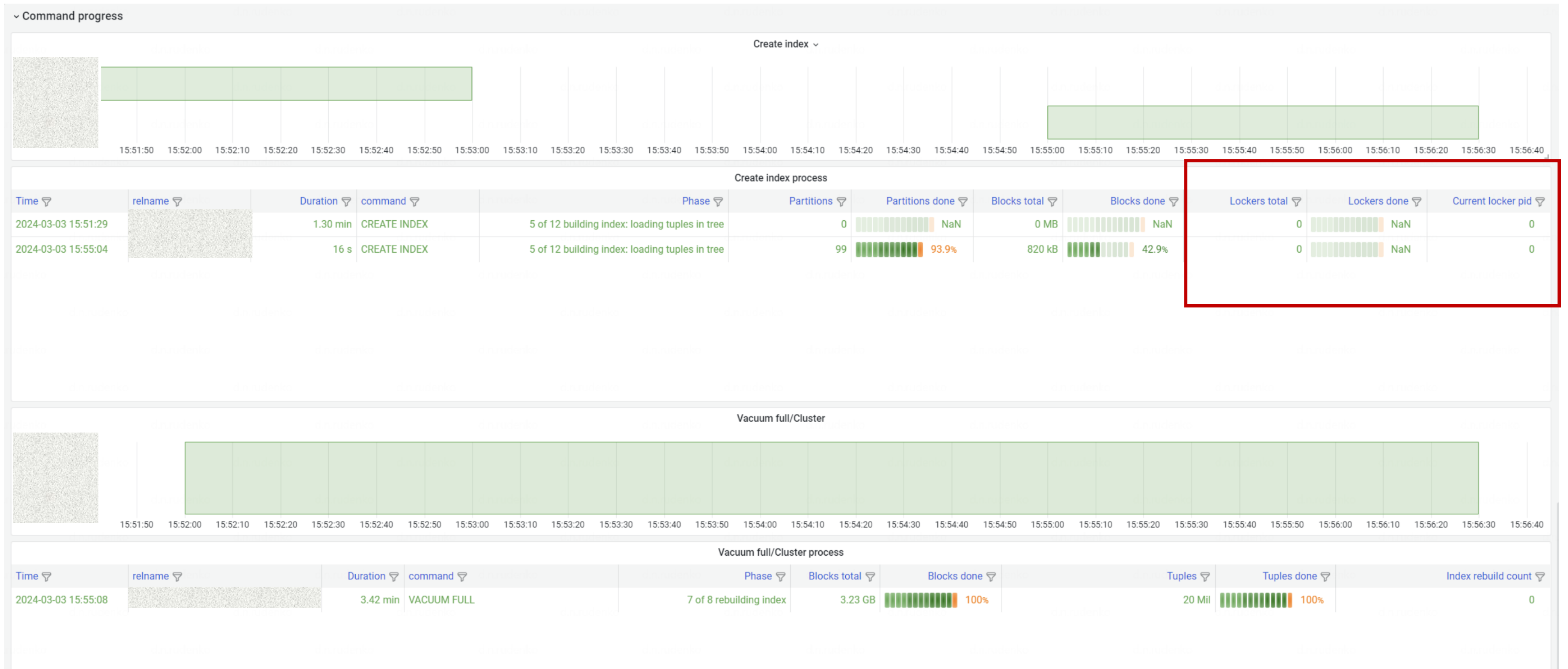
➡ DB Performance → Command progress



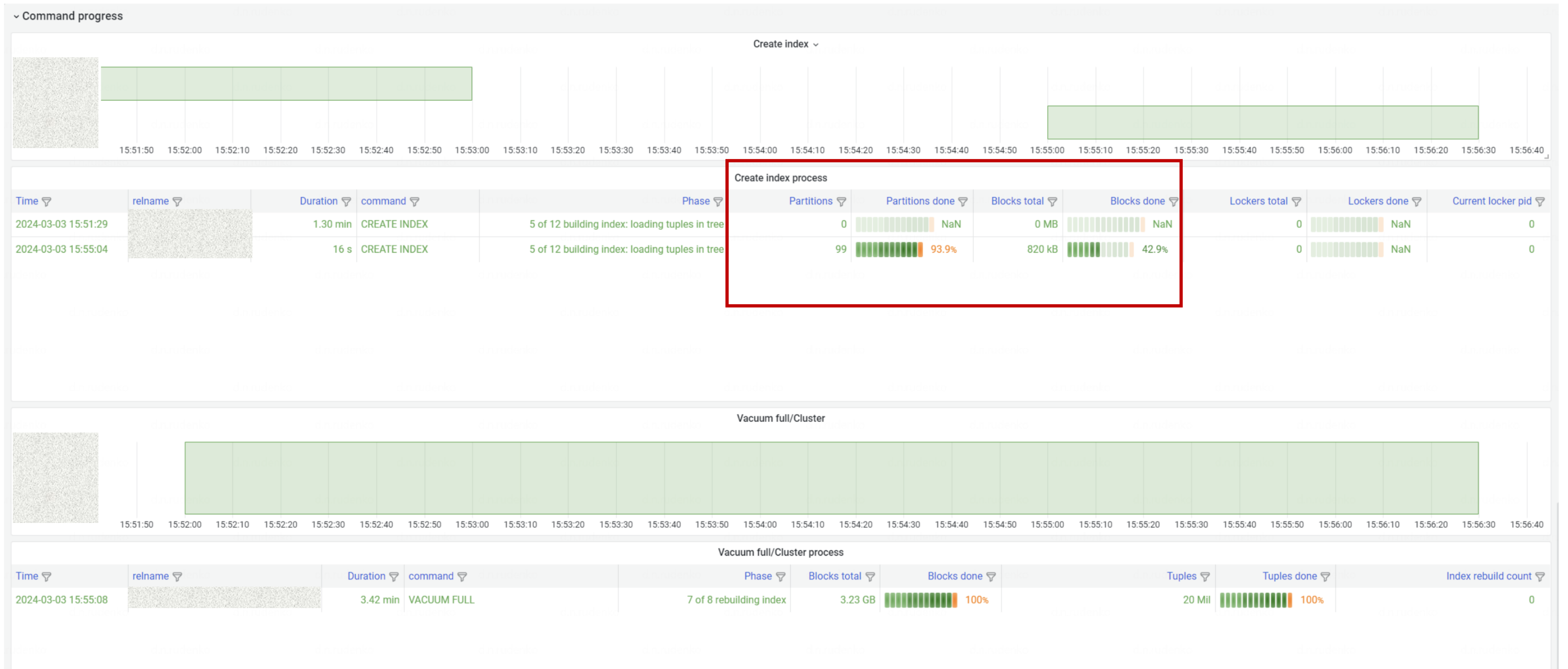
➡ DB Performance → Command progress



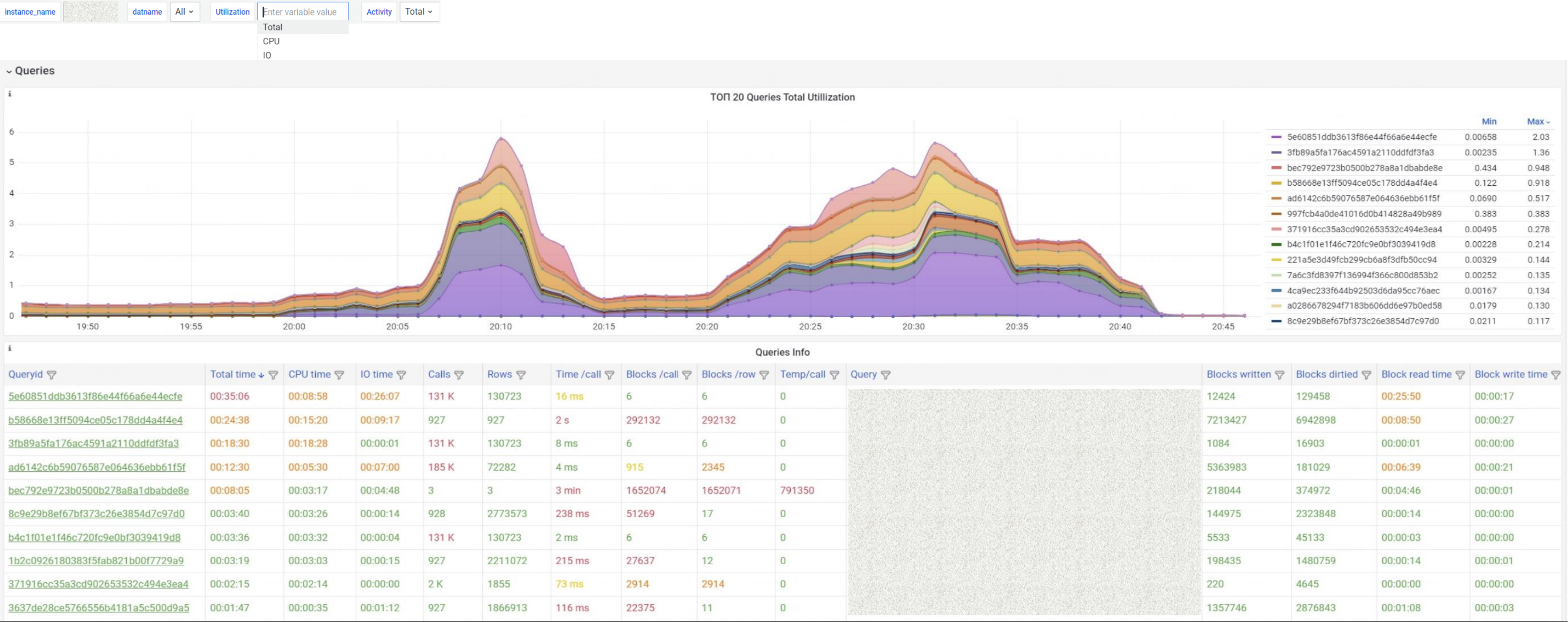
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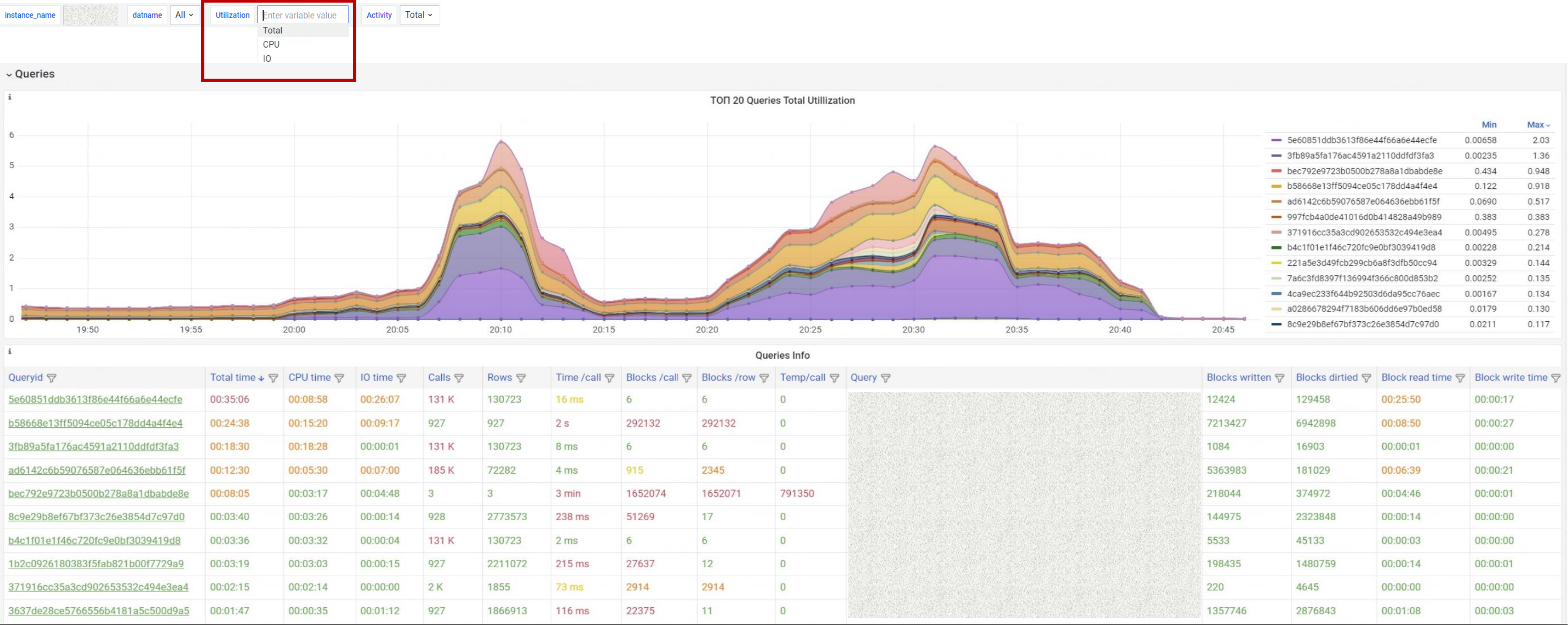
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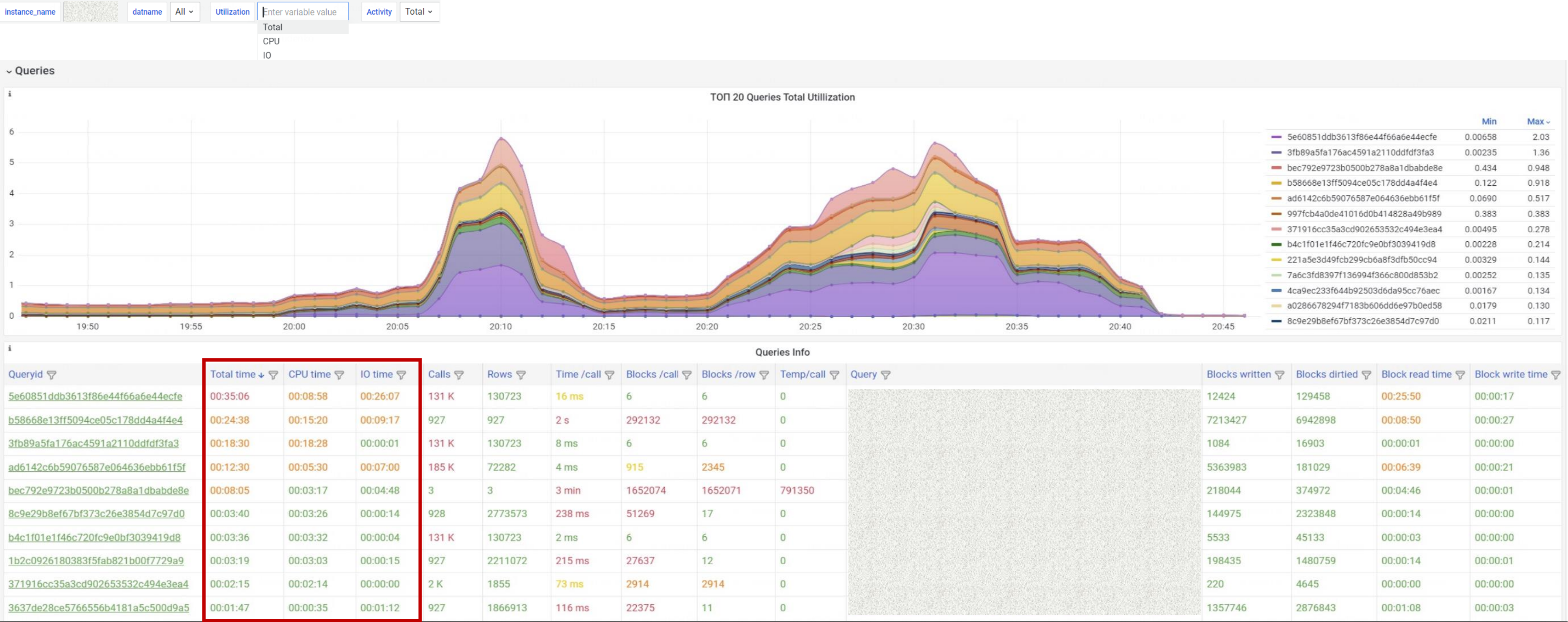
➡ DB Performance -> Queries



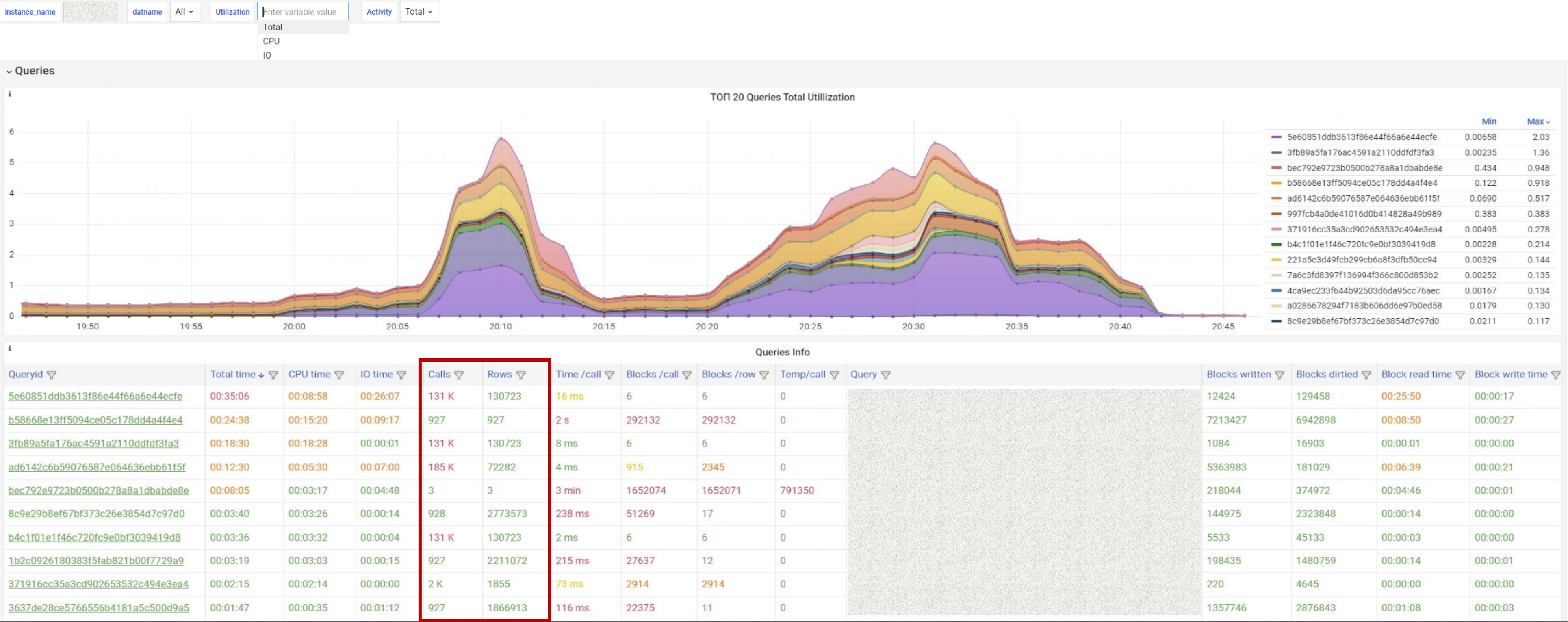
DB Performance -> Queries



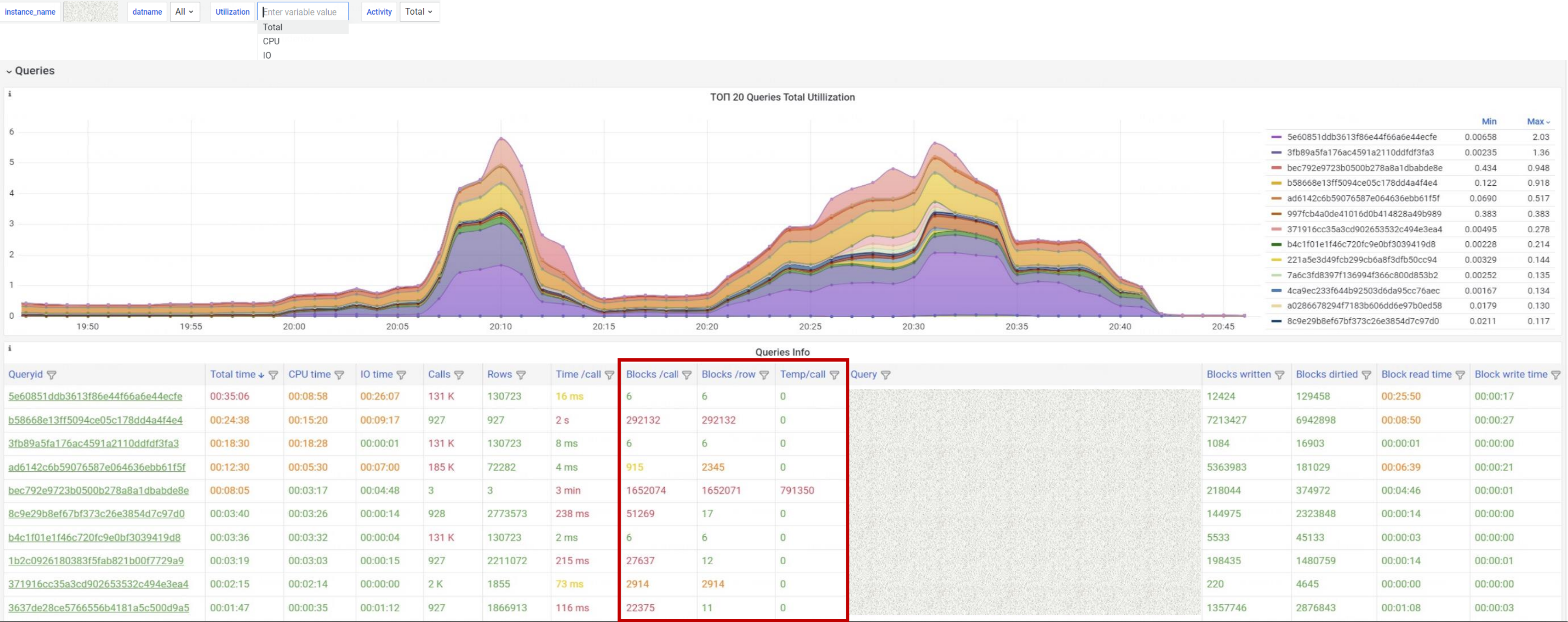
➡ DB Performance -> Queries



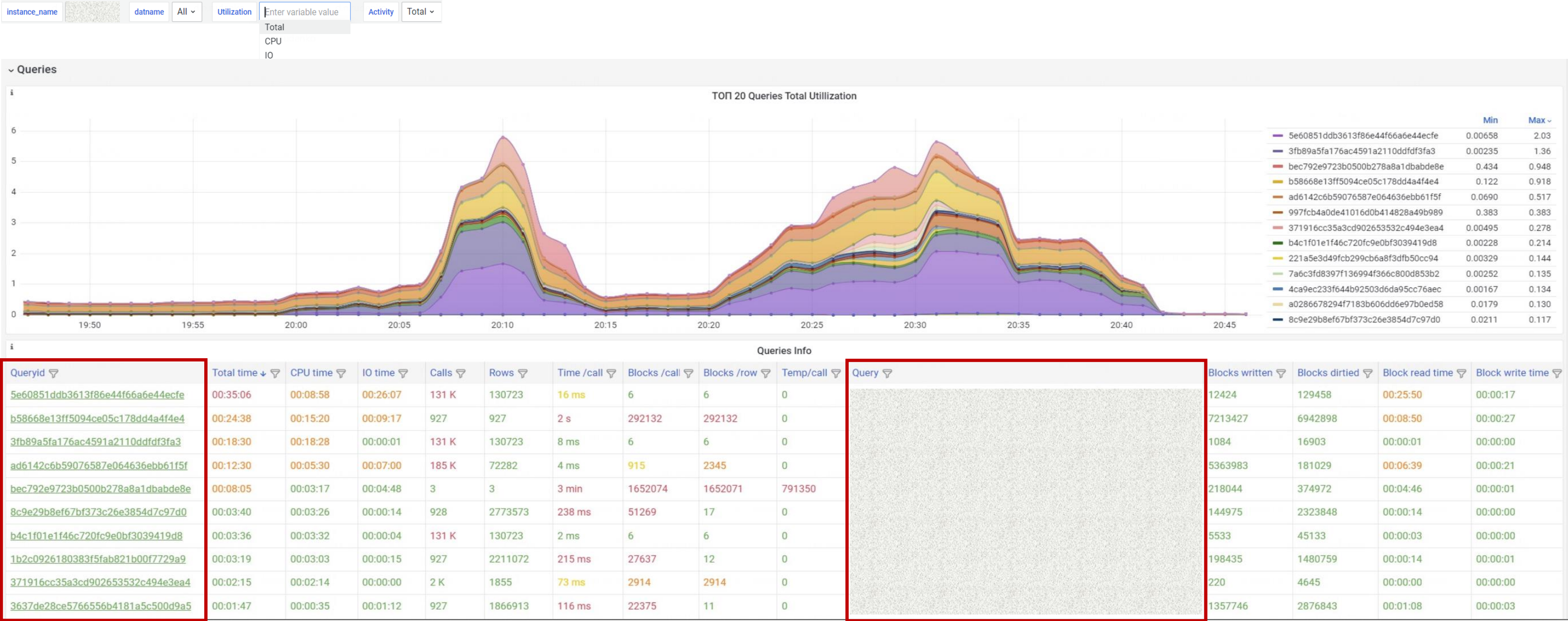
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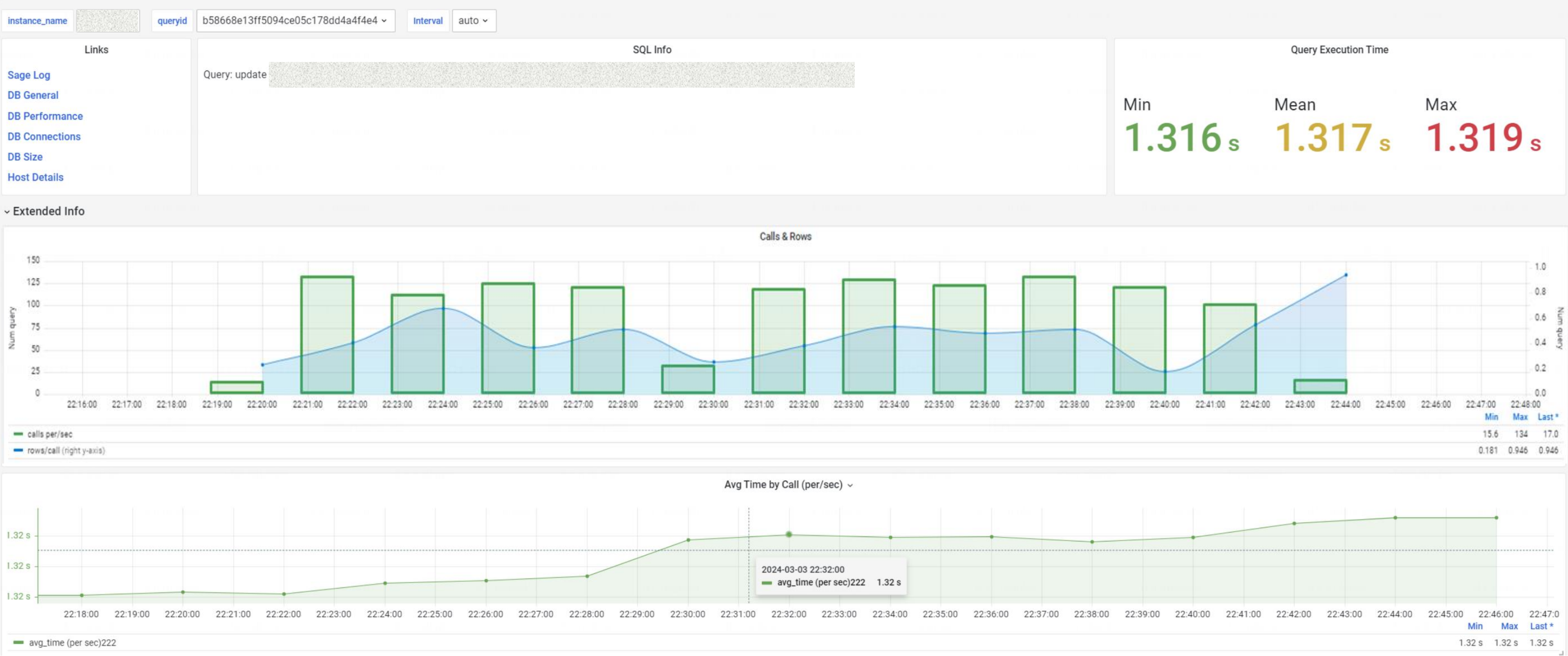
DB Performance -> Queries



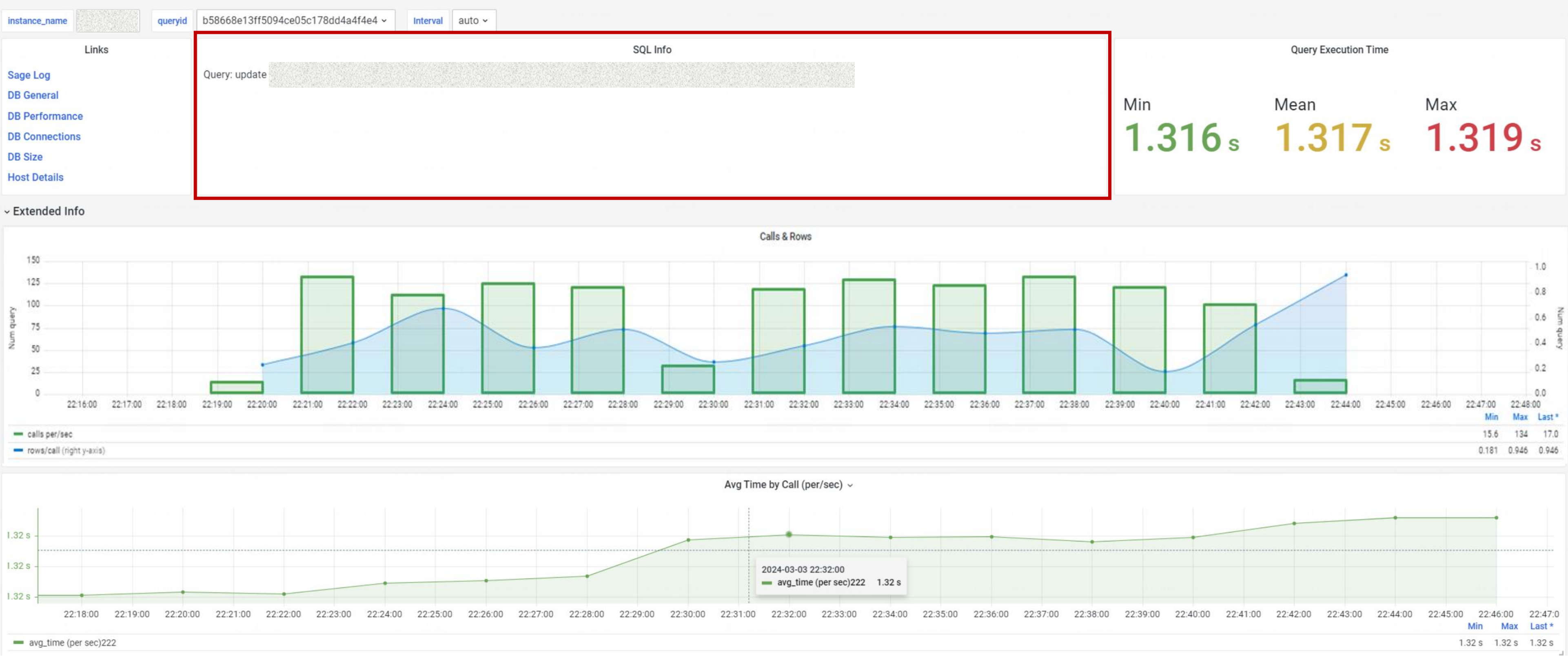
➡ DB Performance -> Queries



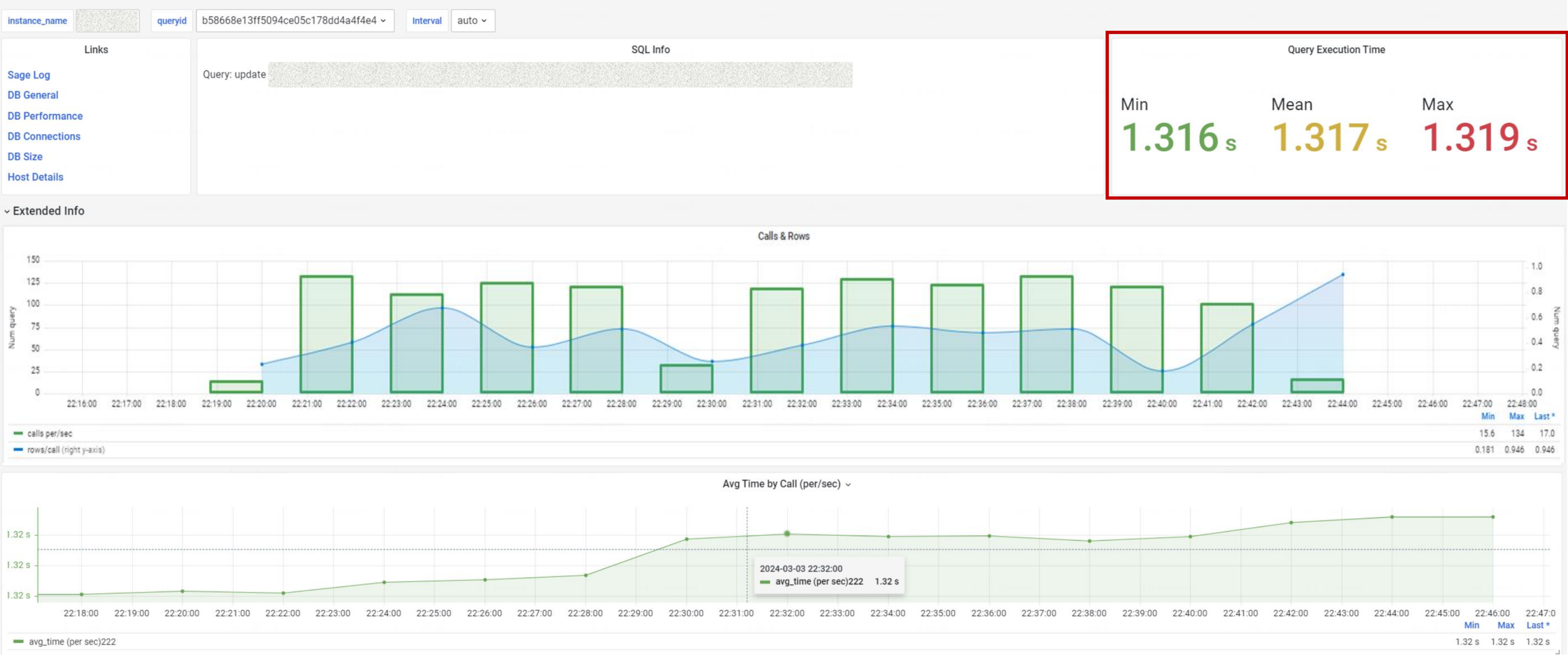
DB Performance query details



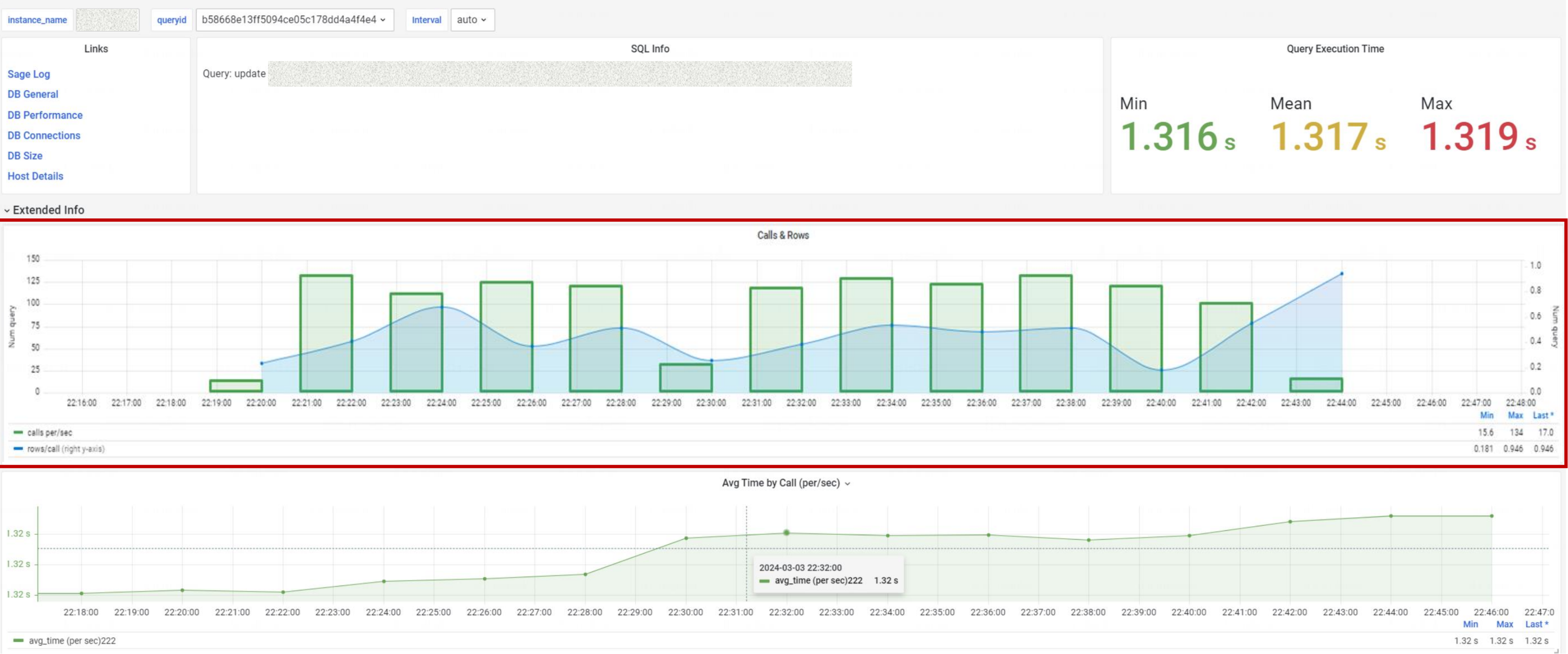
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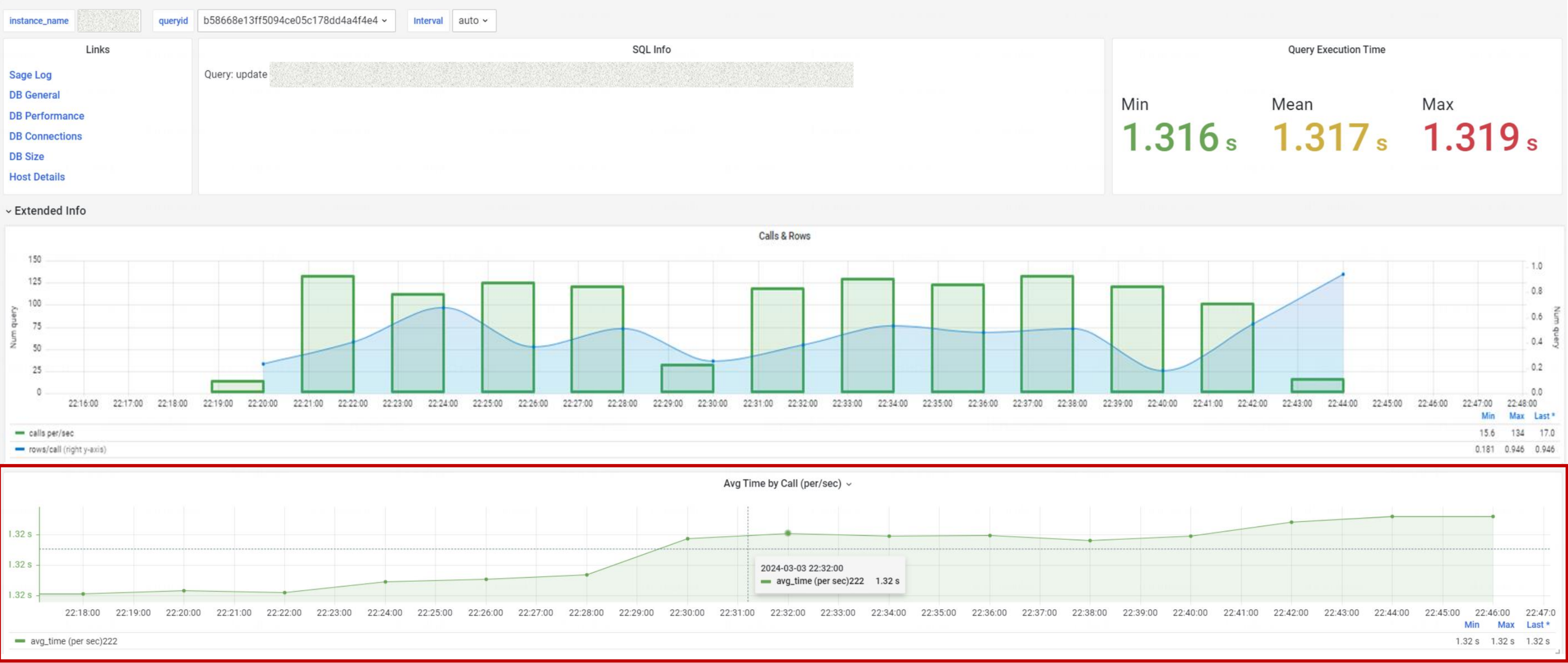
➡ DB Performance query details



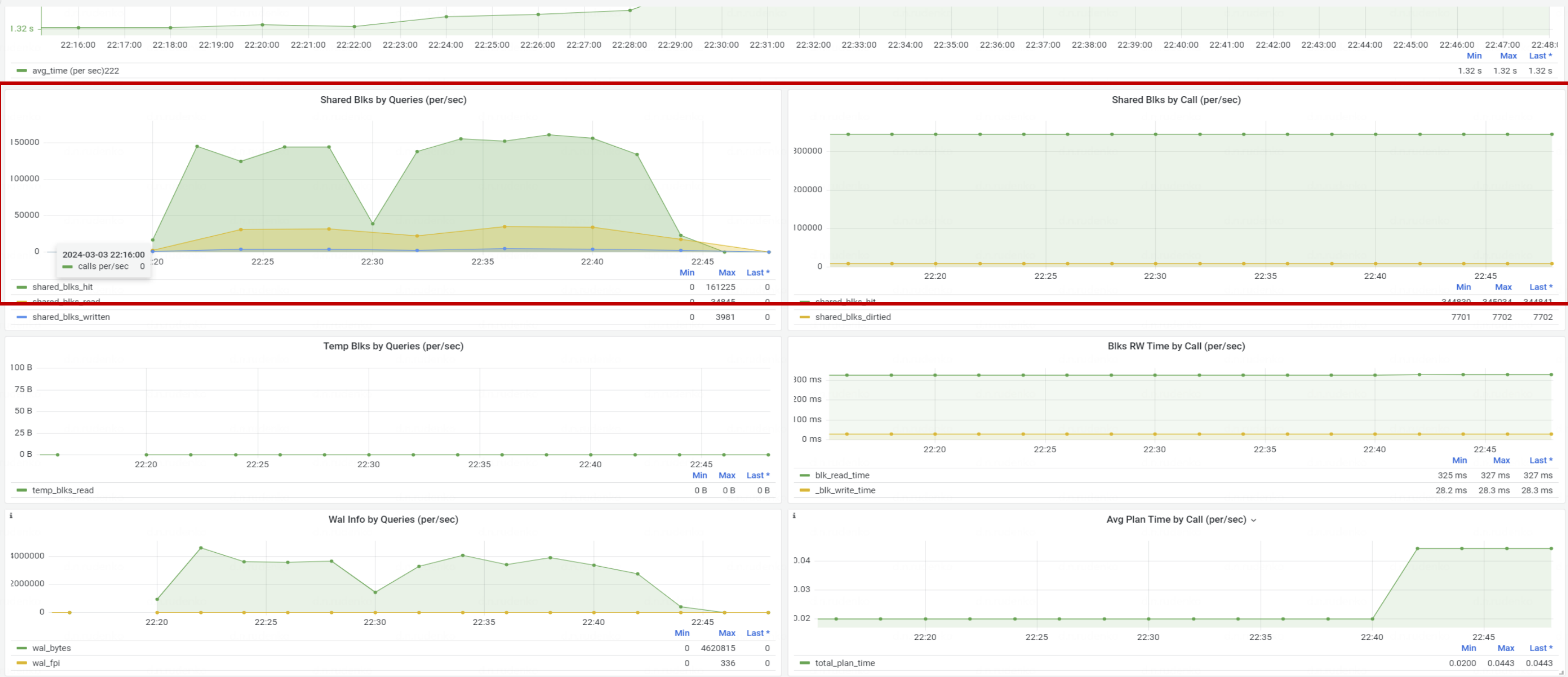
DB Performance query details-> Extended Info



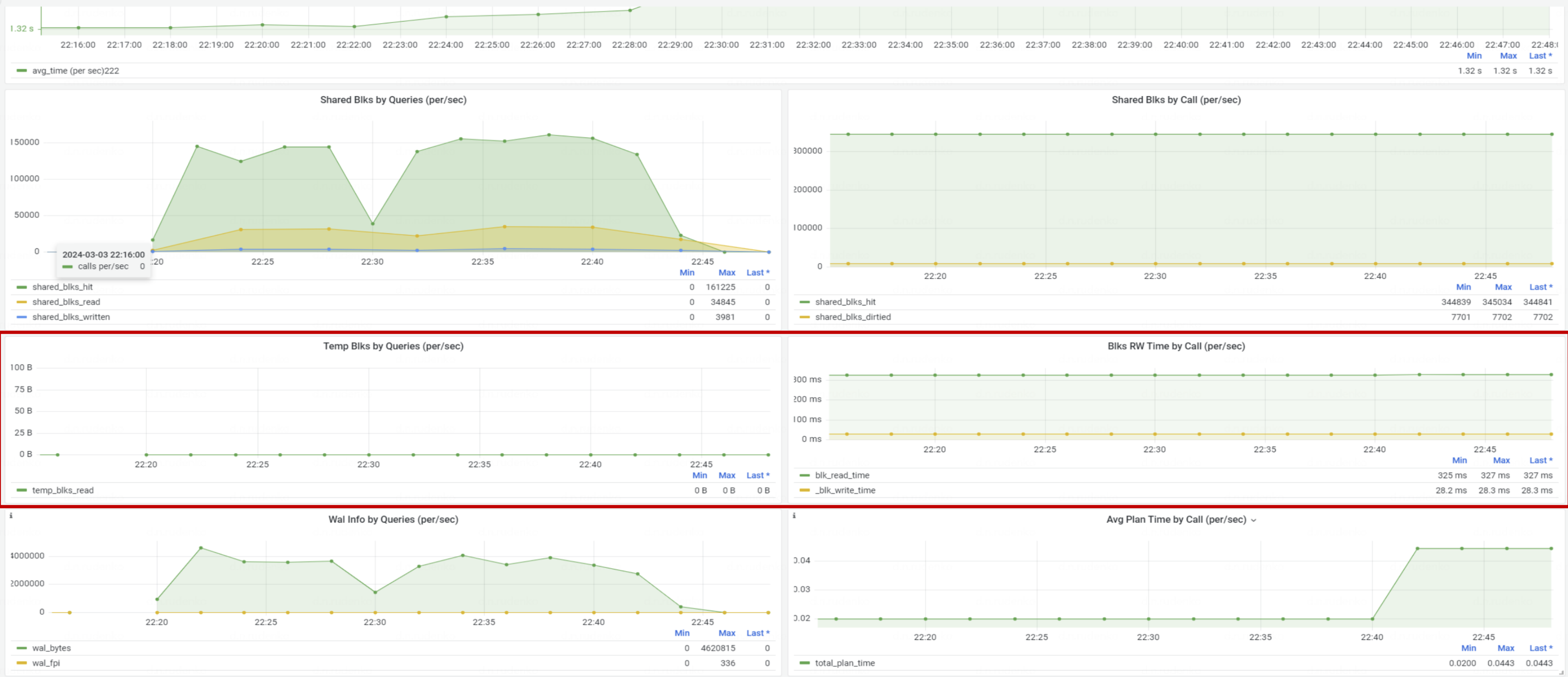
DB Performance query details-> Extended Info



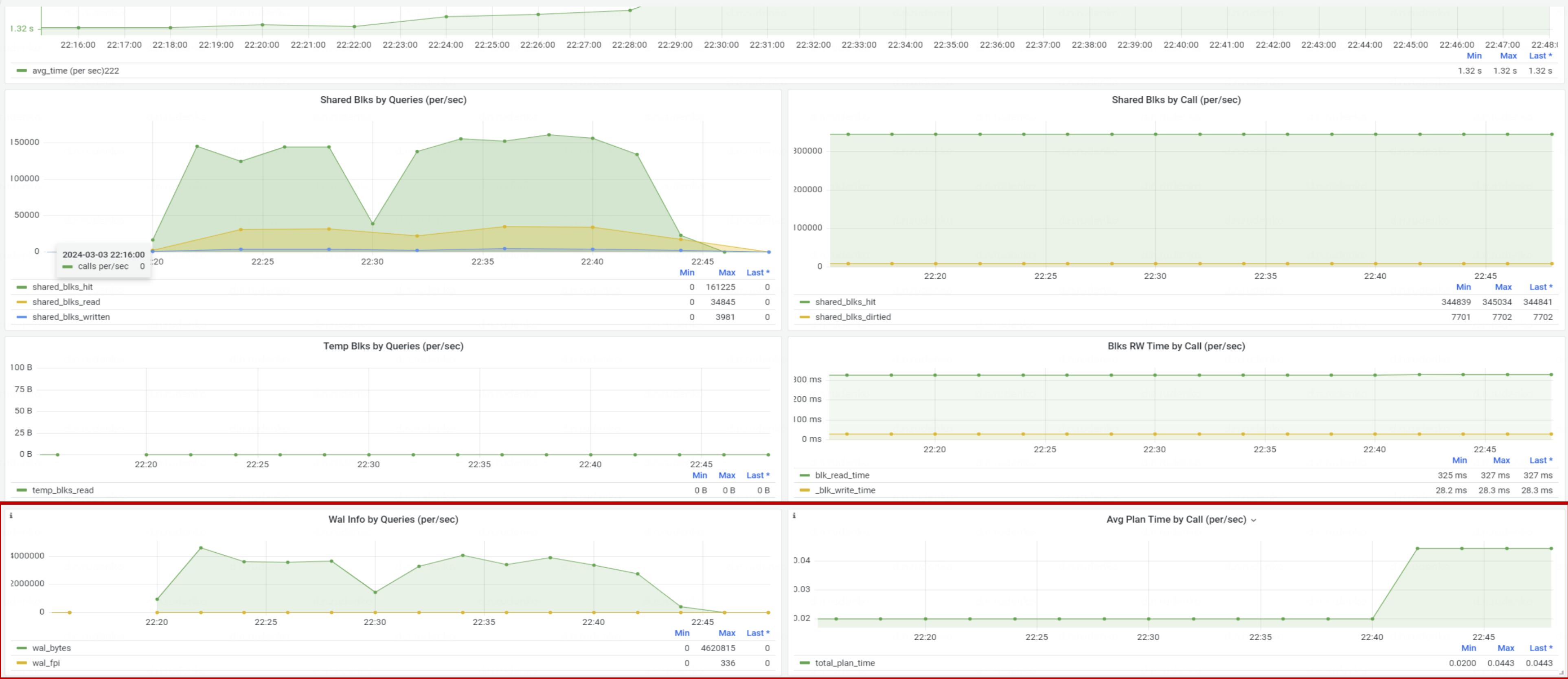
DB Performance query details-> Extended Info



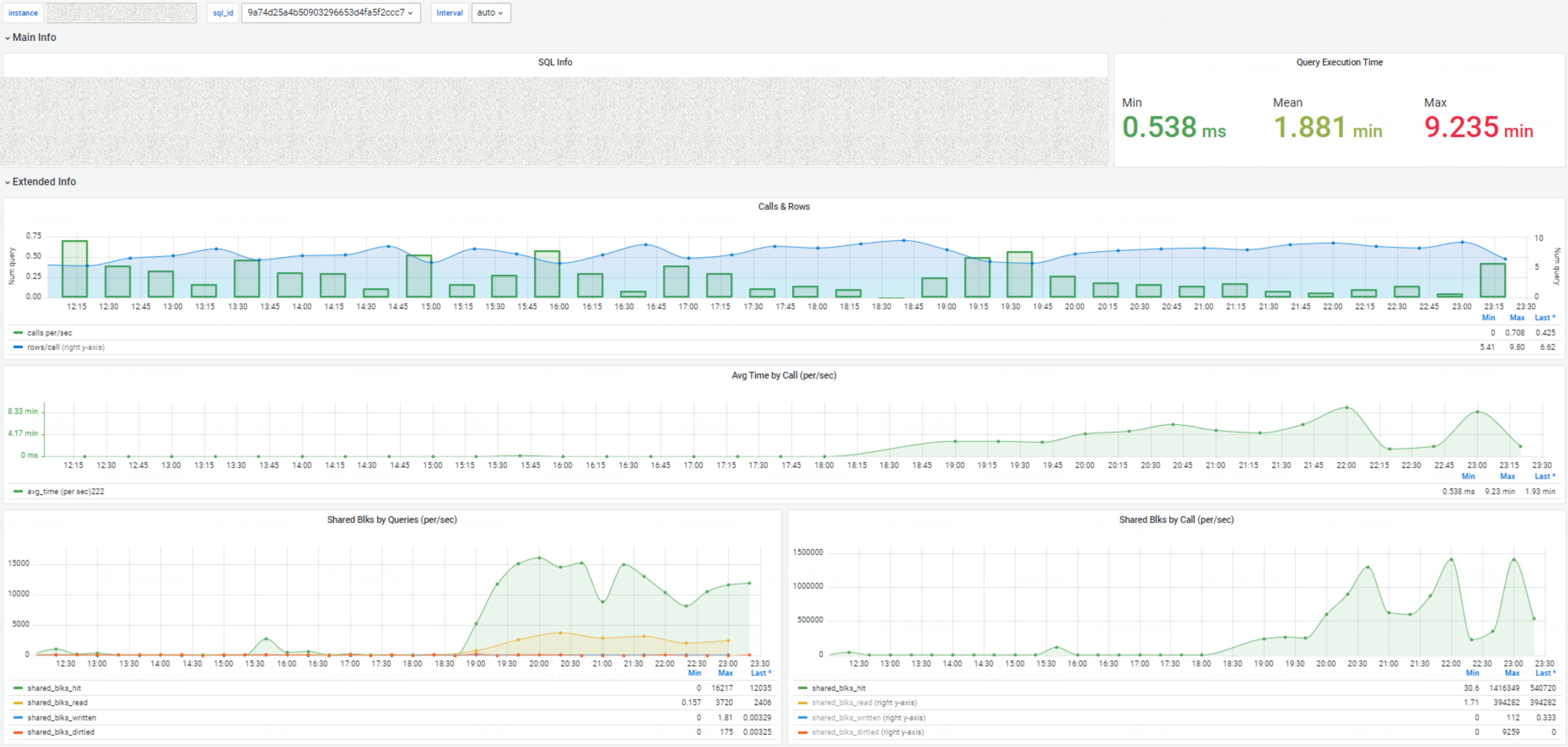
DB Performance query details-> Extended Info



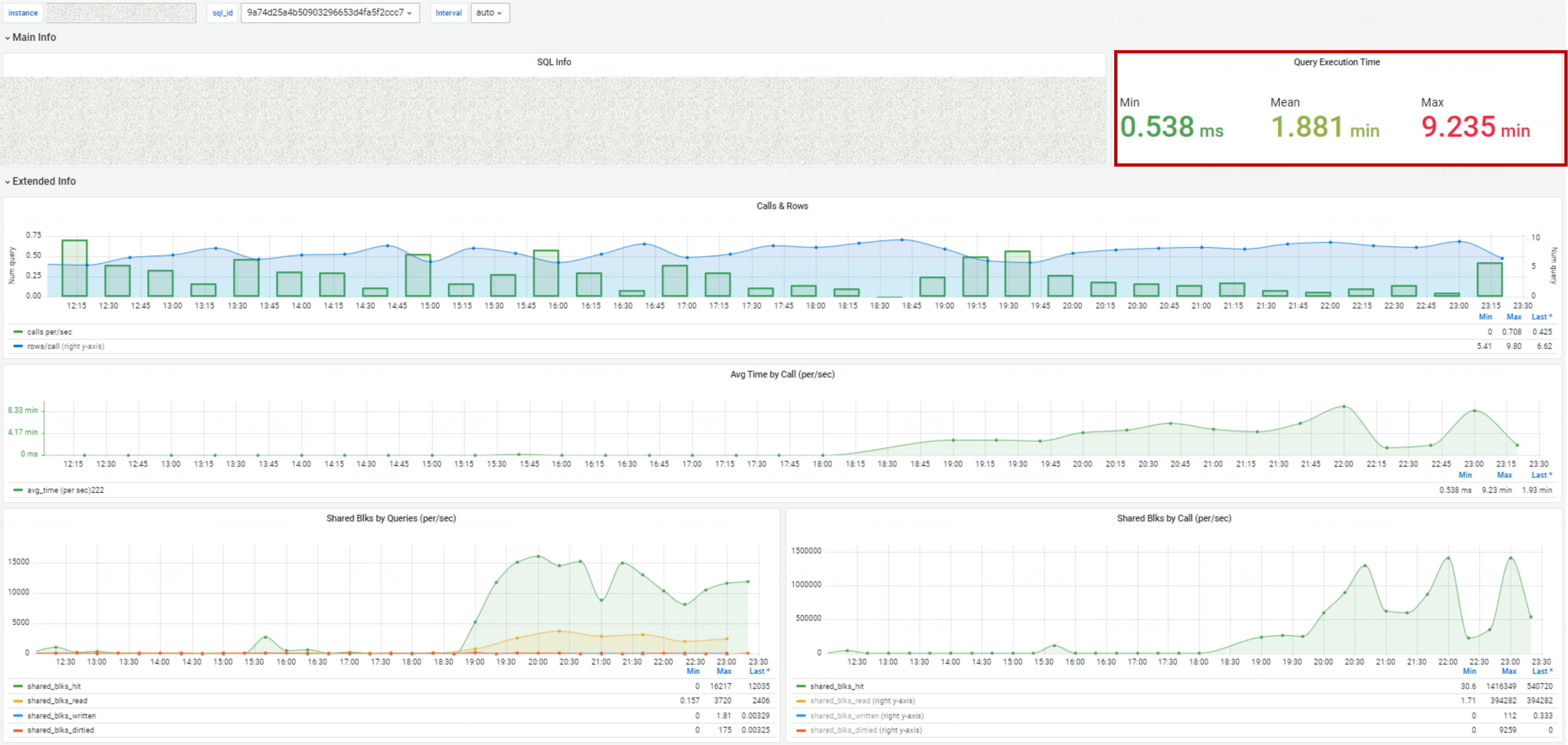
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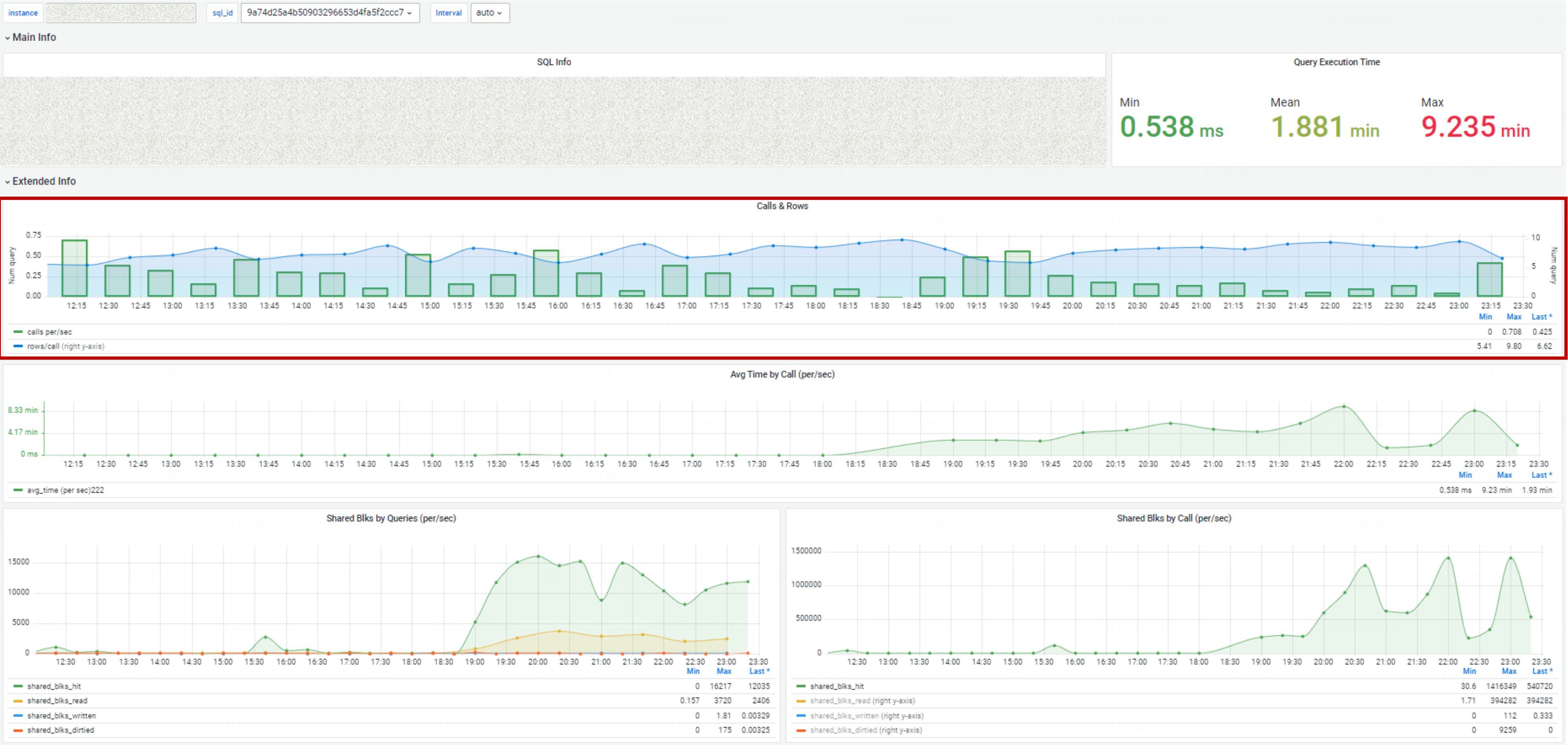
Пример 3. Изменился план запроса



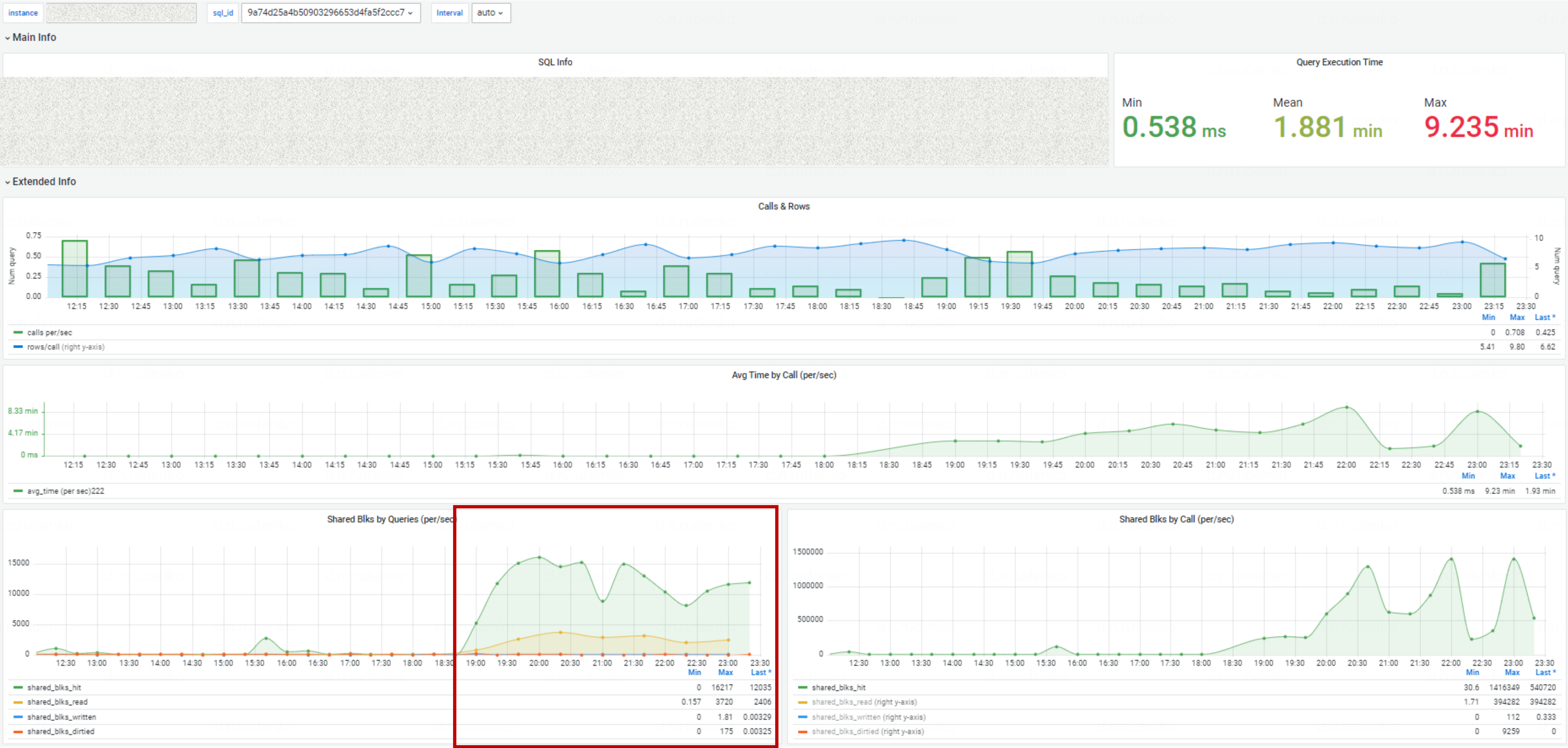
Пример 3. Изменился план запроса



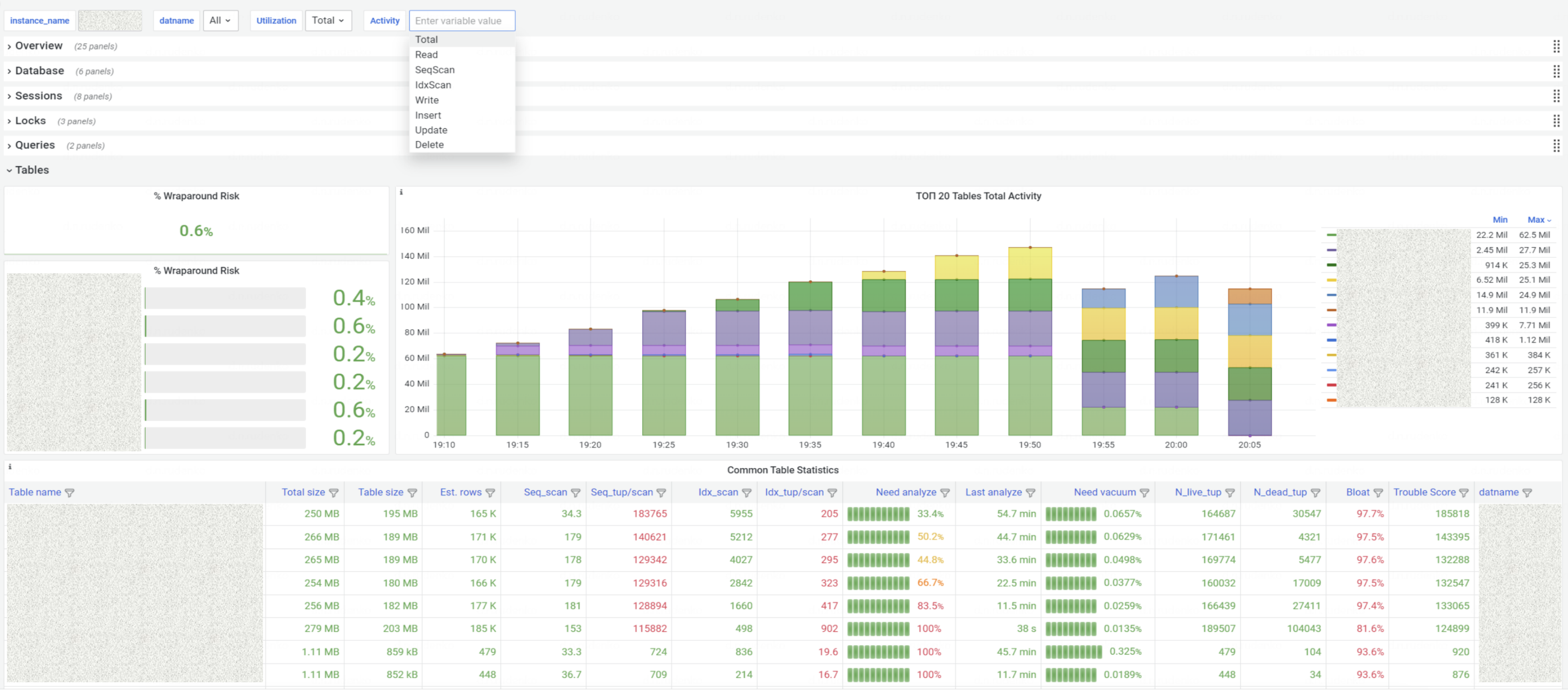
Пример 3. Изменился план запроса



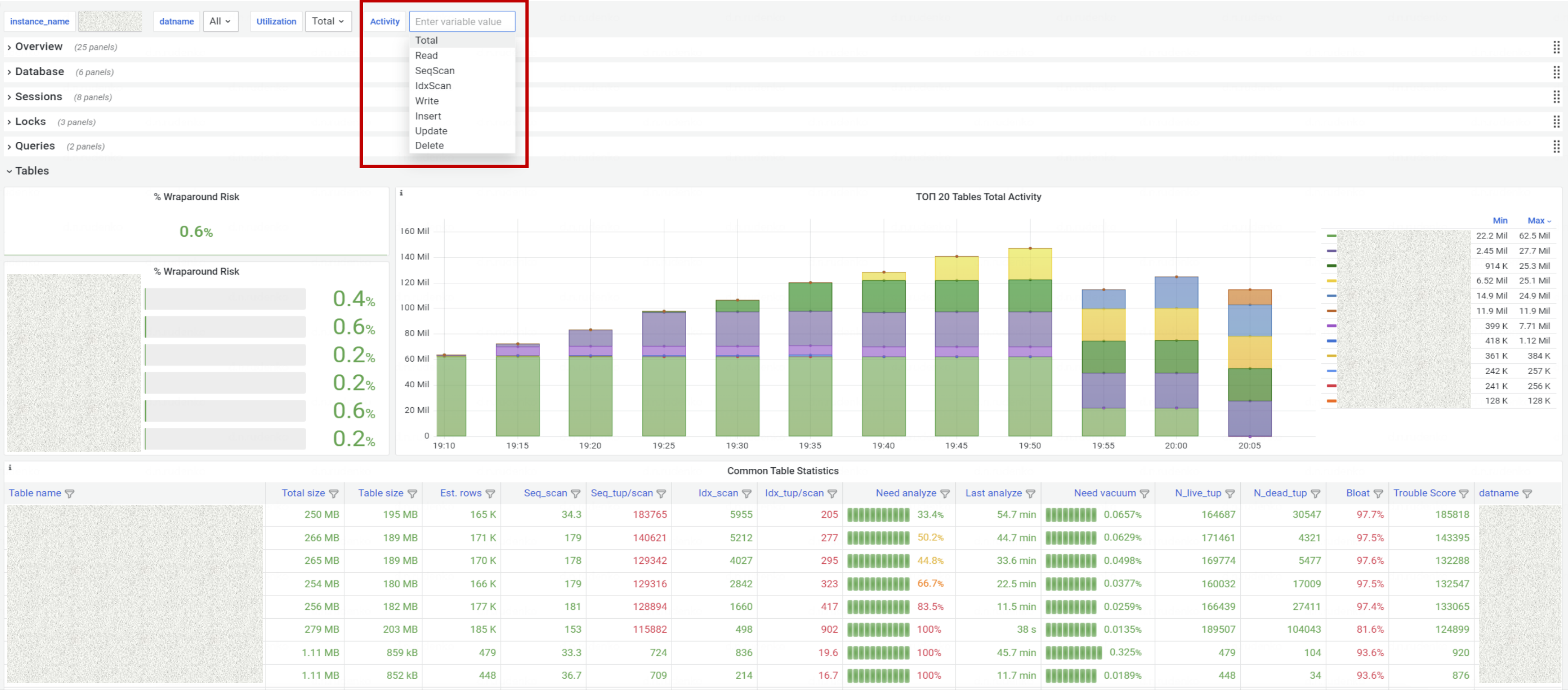
Пример 3. Изменился план запроса



➡ DB Performance -> Tables



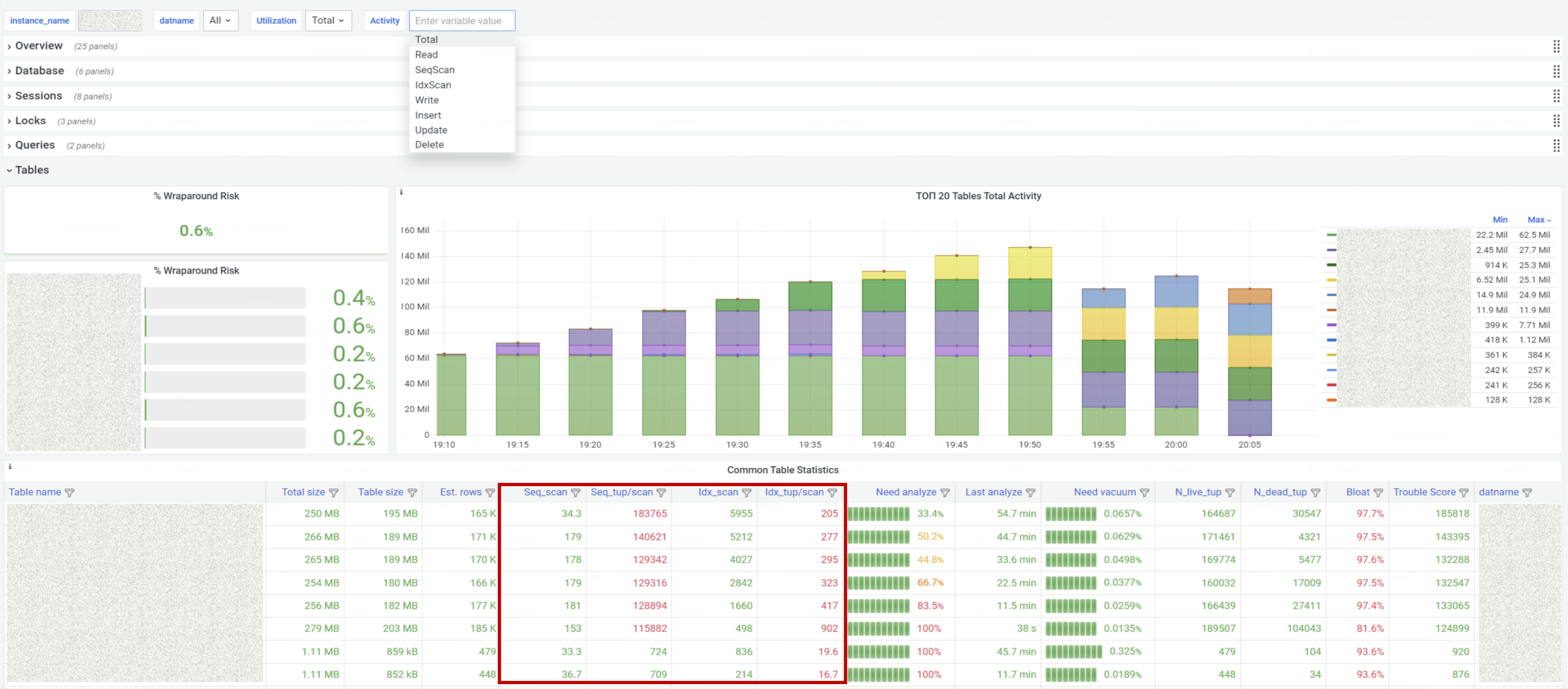
➡ DB Performance -> Tables



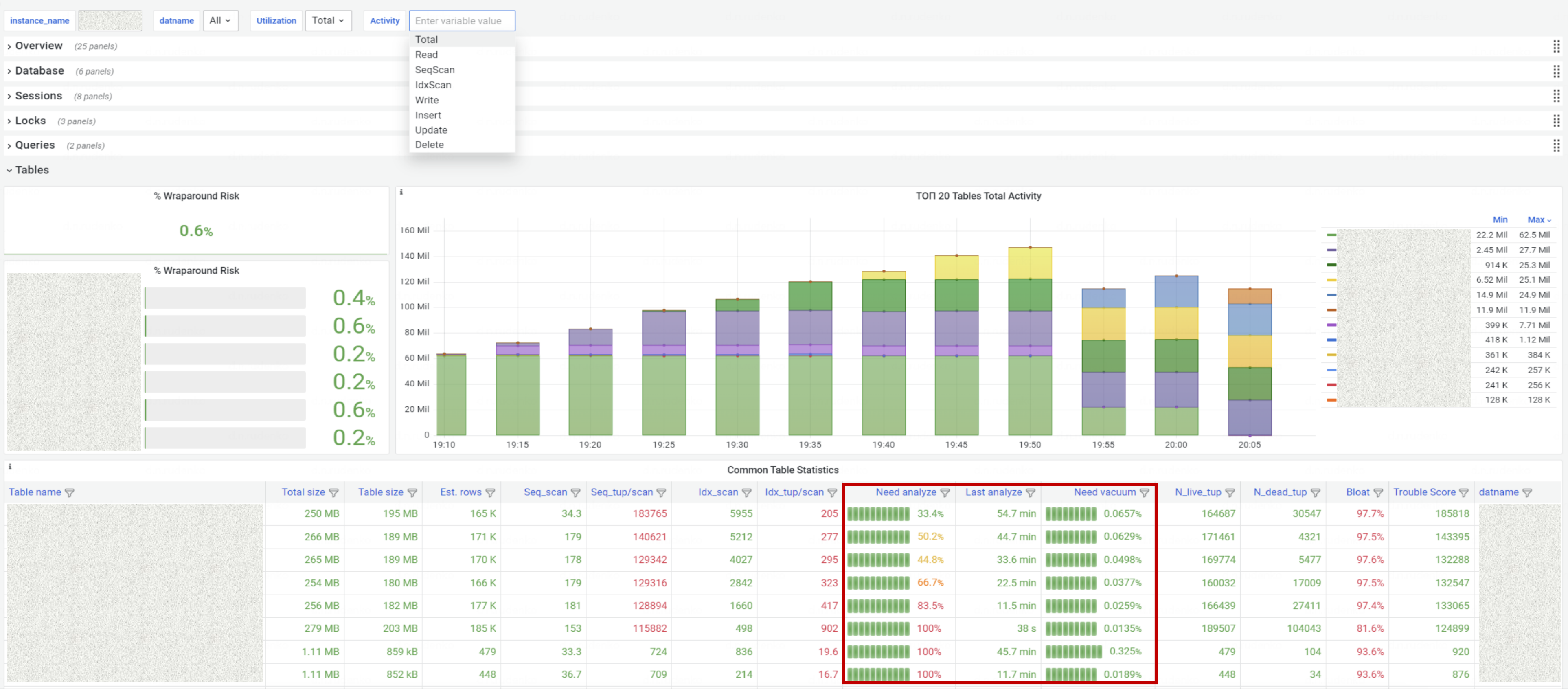
Common Table Statistics

Table name	Total size	Table size	Est. rows	Seq_scan	Seq_tup/scan	Idx_scan	Idx_tup/scan	Need analyze	Last analyze	Need vacuum	N_live_tup	N_dead_tup	Bloat	Trouble Score	datname
	250 MB	195 MB	165 K	34.3	183765	5955	205	33.4%	54.7 min	0.0657%	164687	30547	97.7%	185818	
	266 MB	189 MB	171 K	179	140621	5212	277	50.2%	44.7 min	0.0629%	171461	4321	97.5%	143395	
	265 MB	189 MB	170 K	178	129342	4027	295	44.8%	33.6 min	0.0498%	169774	5477	97.6%	132288	
	254 MB	180 MB	166 K	179	129316	2842	323	66.7%	22.5 min	0.0377%	160032	17009	97.5%	132547	
	256 MB	182 MB	177 K	181	128894	1660	417	83.5%	11.5 min	0.0259%	166439	27411	97.4%	133065	
	279 MB	203 MB	185 K	153	115882	498	902	100%	38 s	0.0135%	189507	104043	81.6%	124899	
	1.11 MB	859 kB	479	33.3	724	836	19.6	100%	45.7 min	0.325%	479	104	93.6%	920	
	1.11 MB	852 kB	448	36.7	709	214	16.7	100%	11.7 min	0.0189%	448	34	93.6%	876	

➡ DB Performance -> Tables



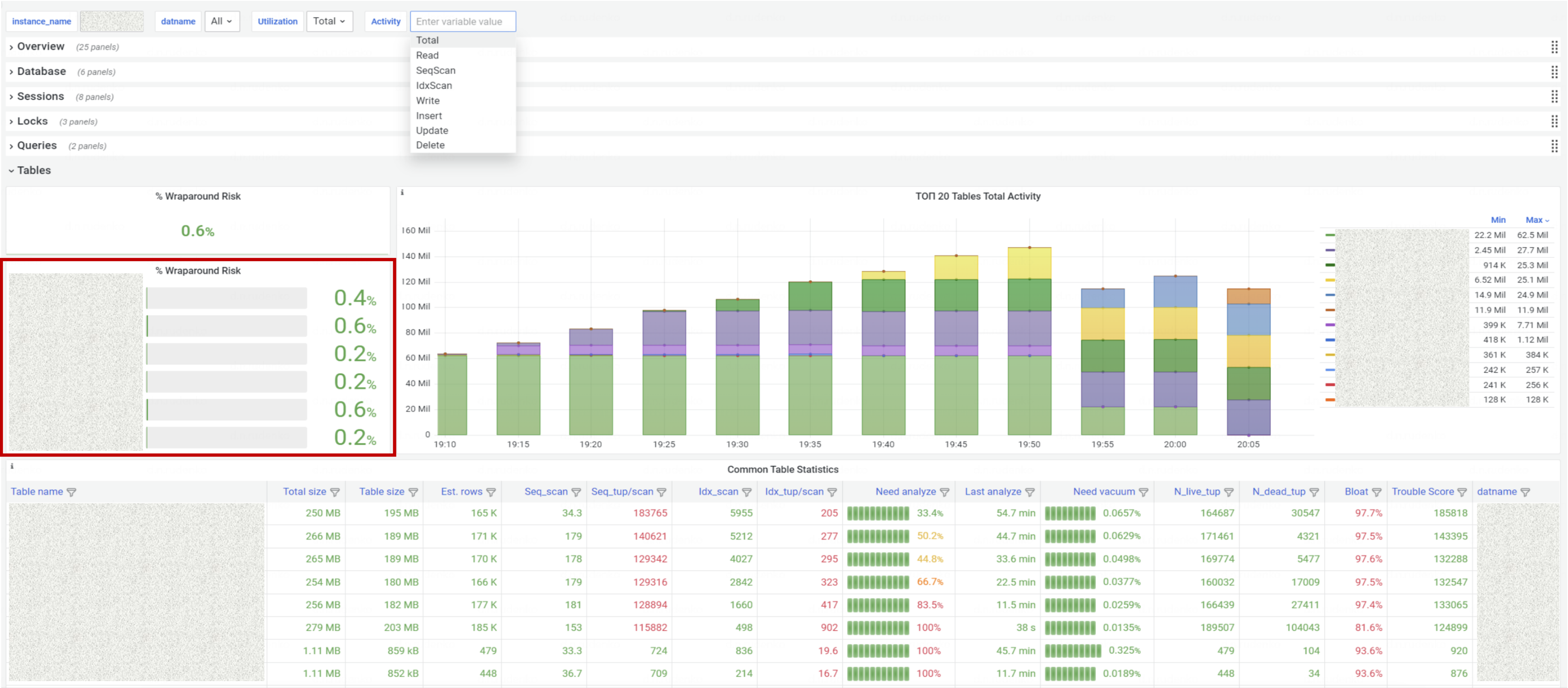
➡ DB Performance -> Tables



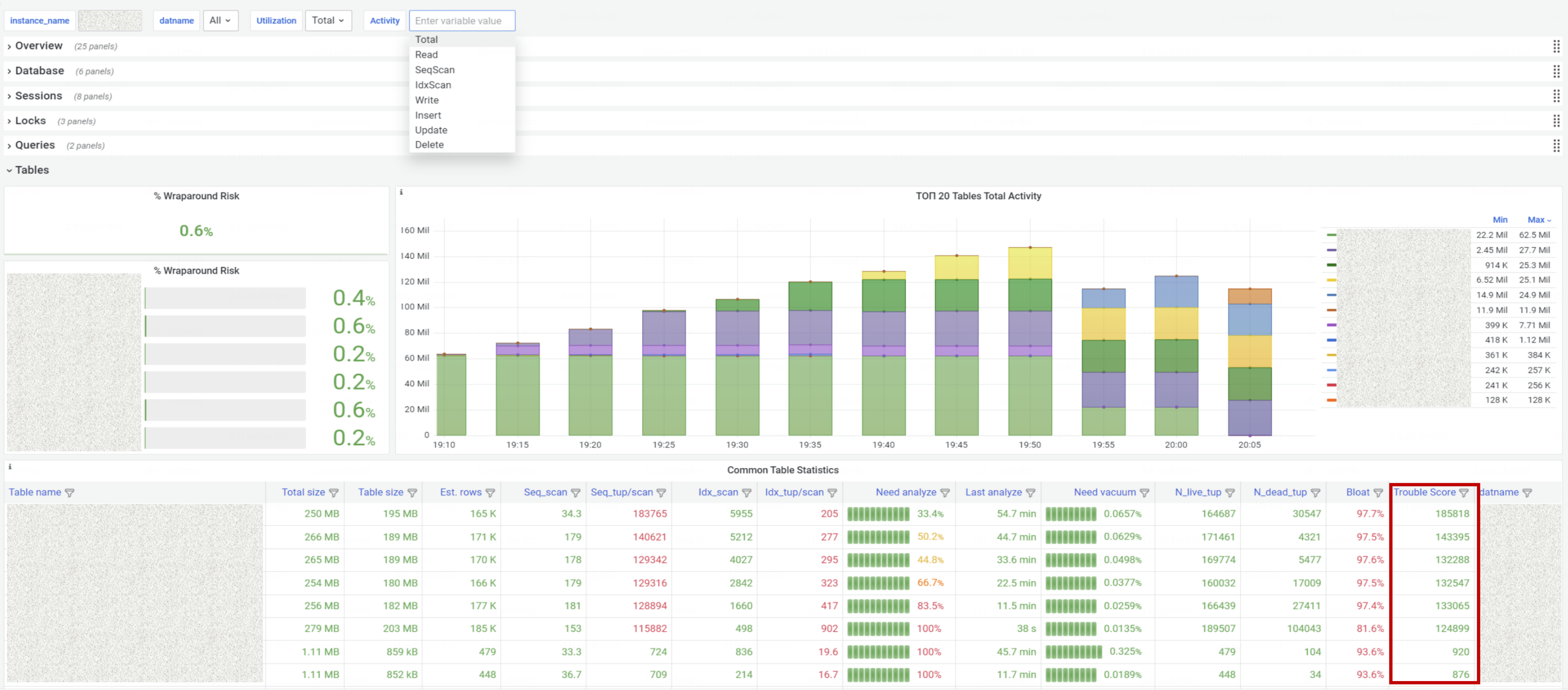
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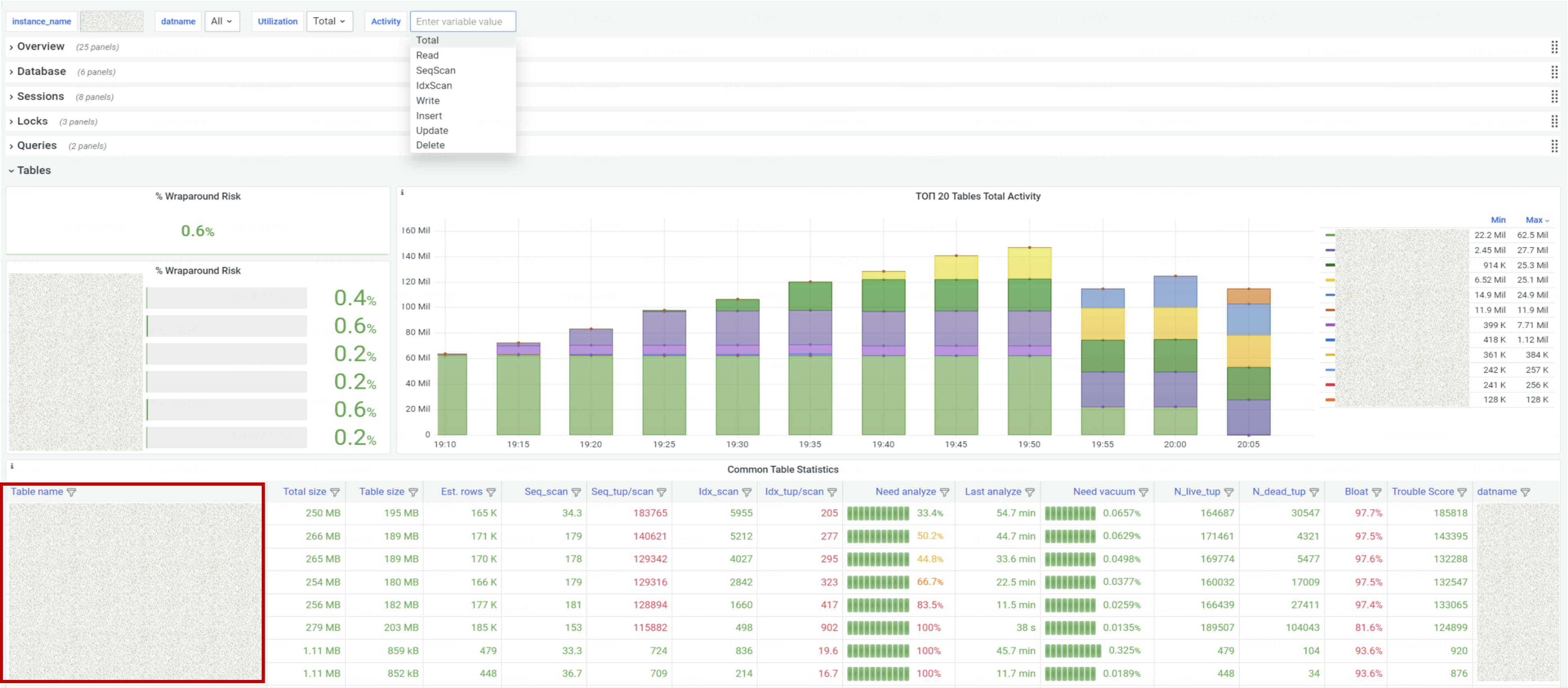
➡ DB Performance -> Tables



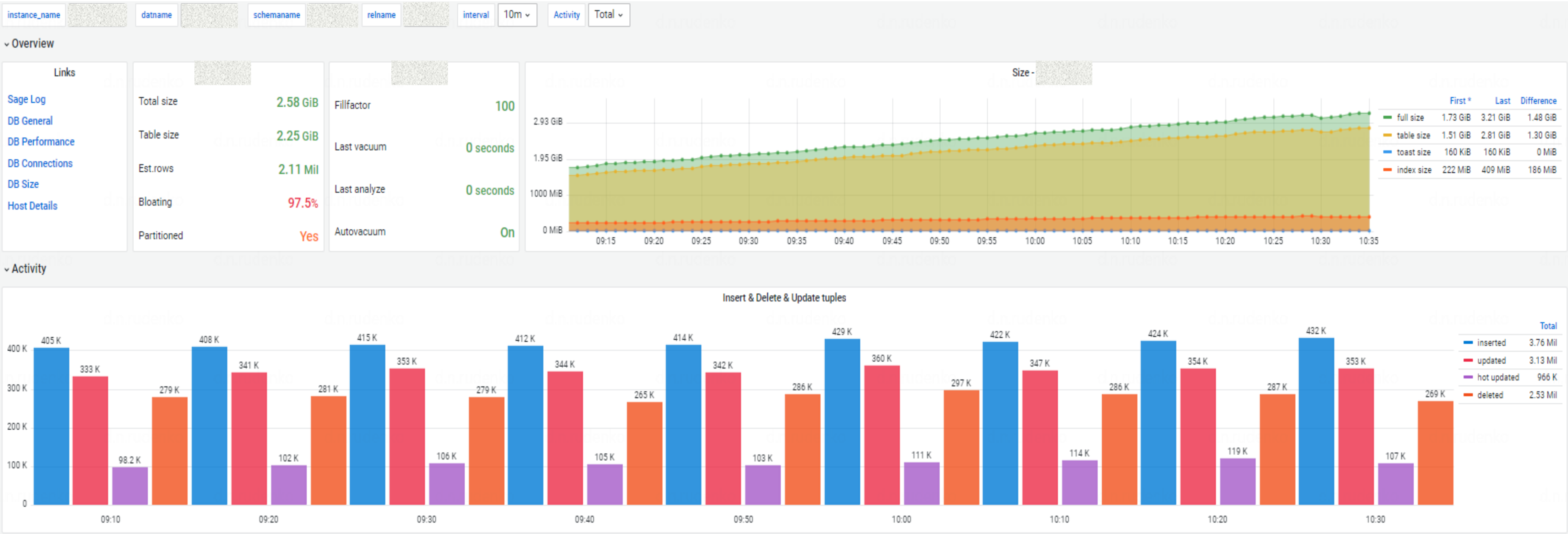
Common Table Statistics

Table name	Total size	Table size	Est. rows	Seq_scan	Seq_tup/scan	Idx_scan	Idx_tup/scan	Need analyze	Last analyze	Need vacuum	N_live_tup	N_dead_tup	Bloat	Trouble Score	datname
	250 MB	195 MB	165 K	34.3	183765	5955	205	33.4%	54.7 min	0.0657%	164687	30547	97.7%	185818	
	266 MB	189 MB	171 K	179	140621	5212	277	50.2%	44.7 min	0.0629%	171461	4321	97.5%	143395	
	265 MB	189 MB	170 K	178	129342	4027	295	44.8%	33.6 min	0.0498%	169774	5477	97.6%	132288	
	254 MB	180 MB	166 K	179	129316	2842	323	66.7%	22.5 min	0.0377%	160032	17009	97.5%	132547	
	256 MB	182 MB	177 K	181	128894	1660	417	83.5%	11.5 min	0.0259%	166439	27411	97.4%	133065	
	279 MB	203 MB	185 K	153	115882	498	902	100%	38 s	0.0135%	189507	104043	81.6%	124899	
	1.11 MB	859 kB	479	33.3	724	836	19.6	100%	45.7 min	0.325%	479	104	93.6%	920	
	1.11 MB	852 kB	448	36.7	709	214	16.7	100%	11.7 min	0.0189%	448	34	93.6%	876	

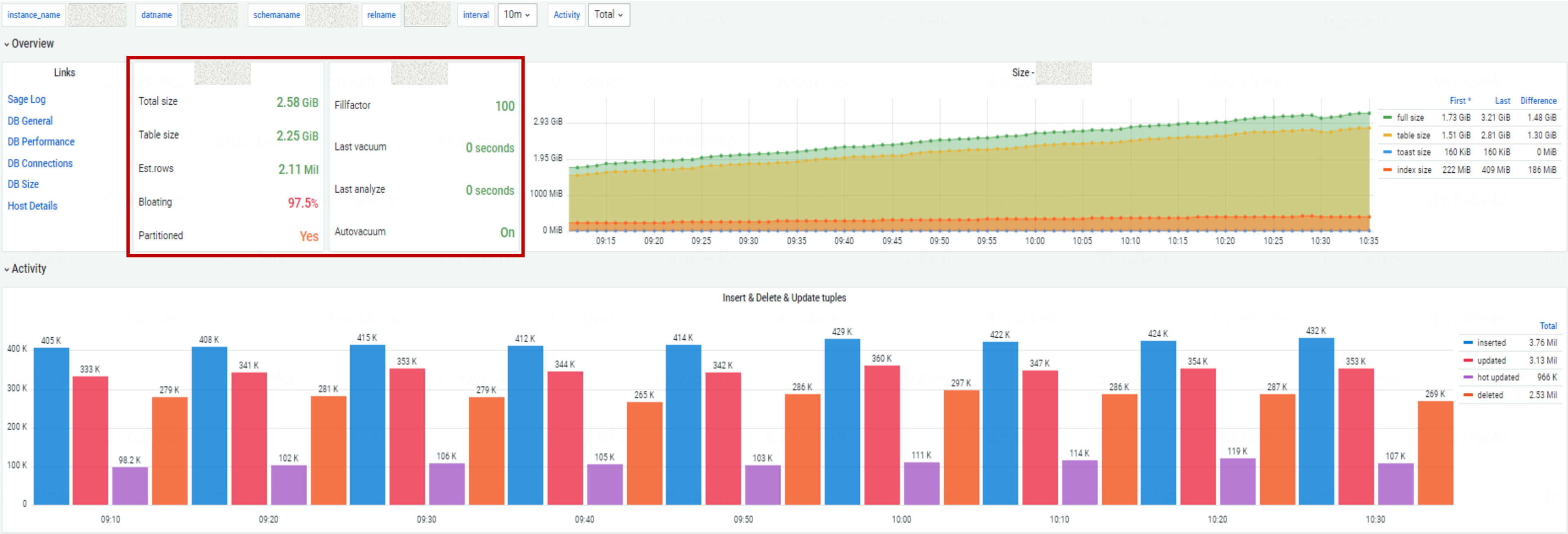
➡ DB Performance -> Tables



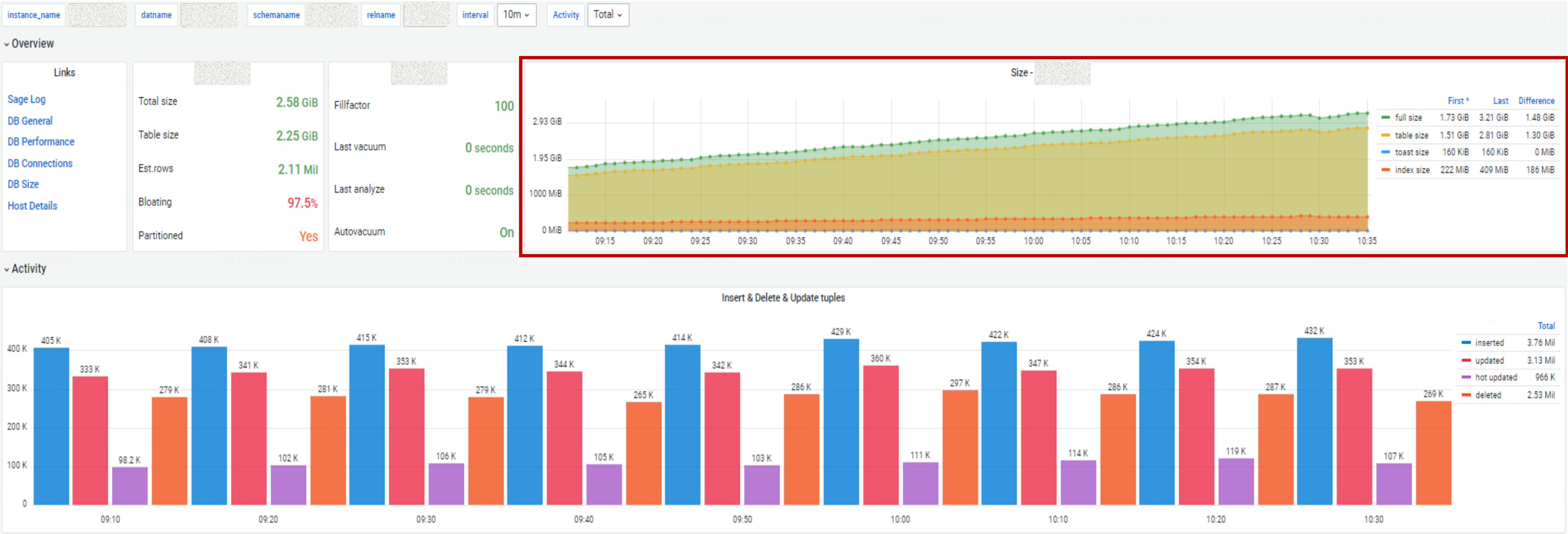
➡ DB Performance table details



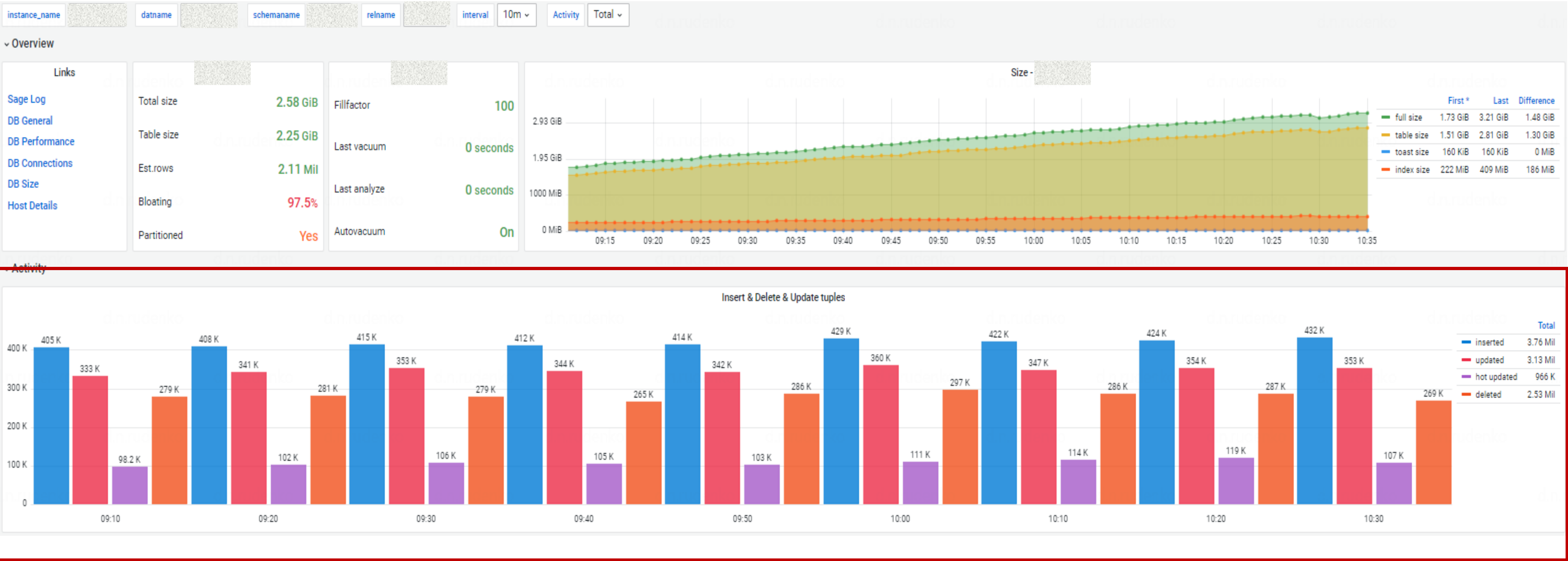
➡ DB Performance table details



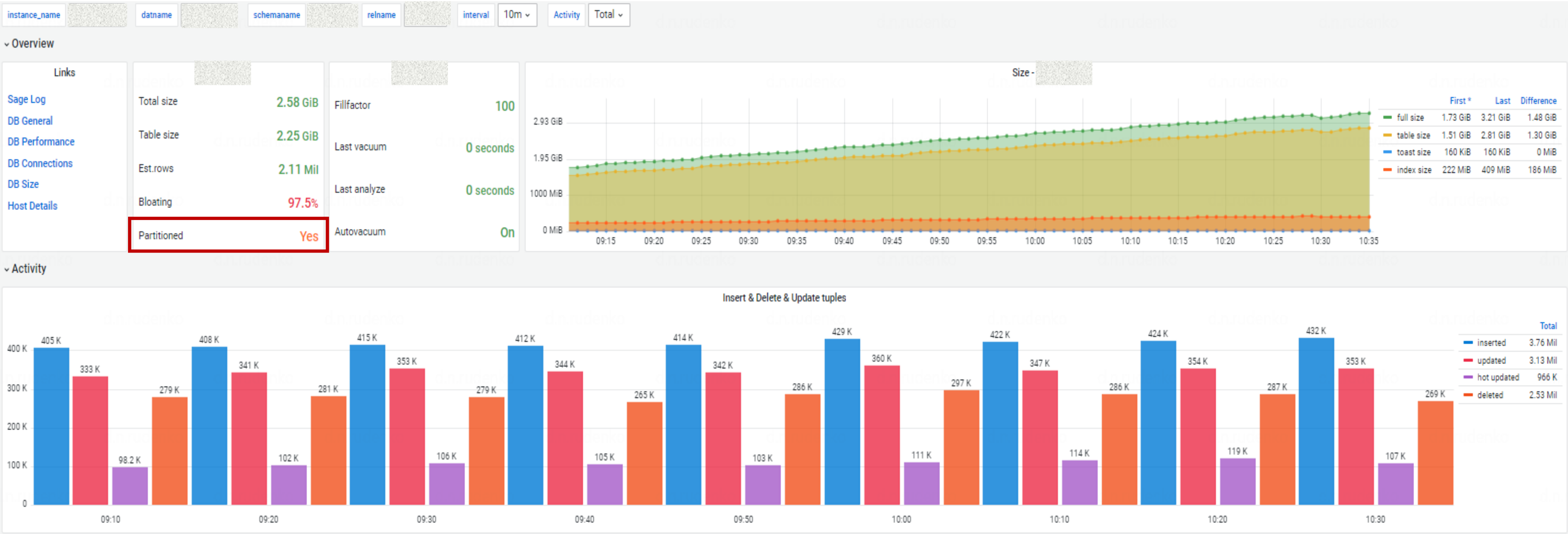
➡ DB Performance table details



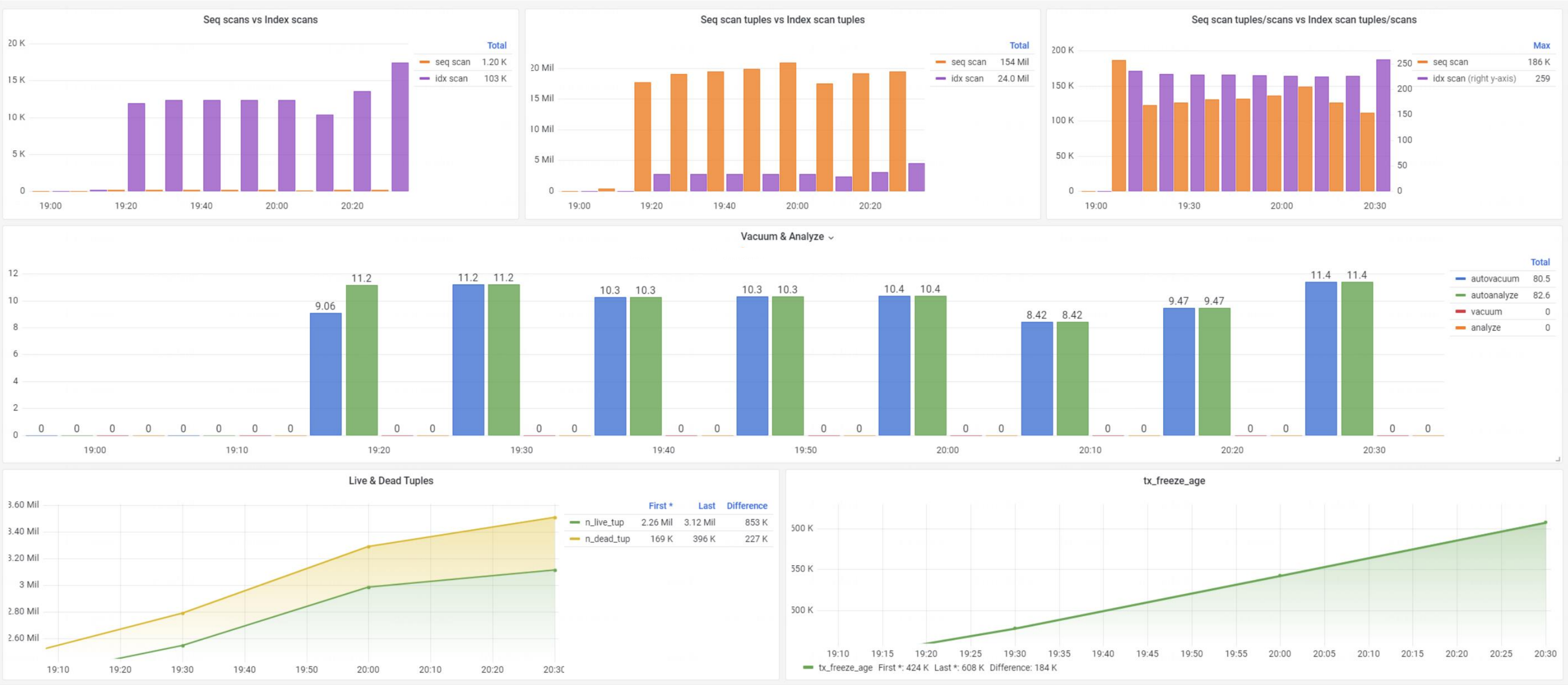
➡ DB Performance table details



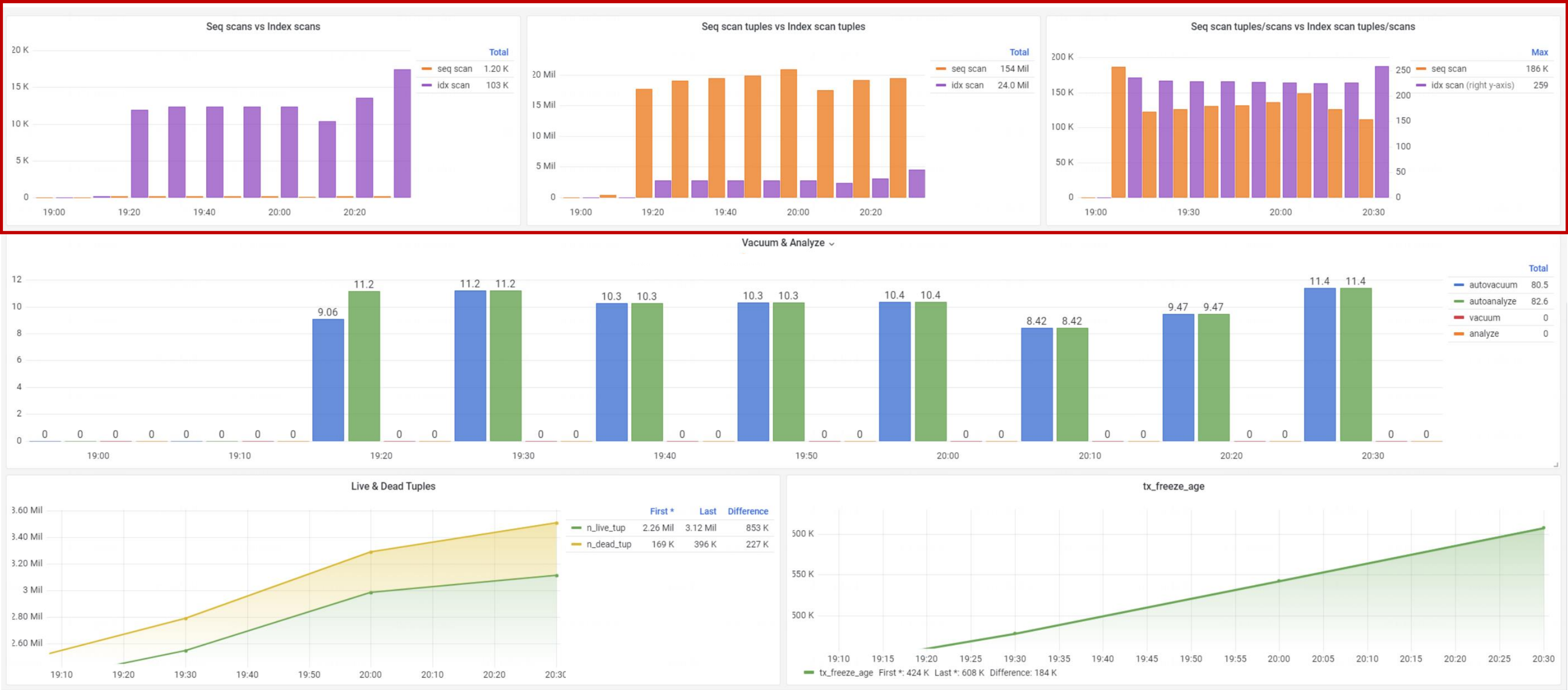
➡ DB Performance table details



➡ DB Performance table details → Activity



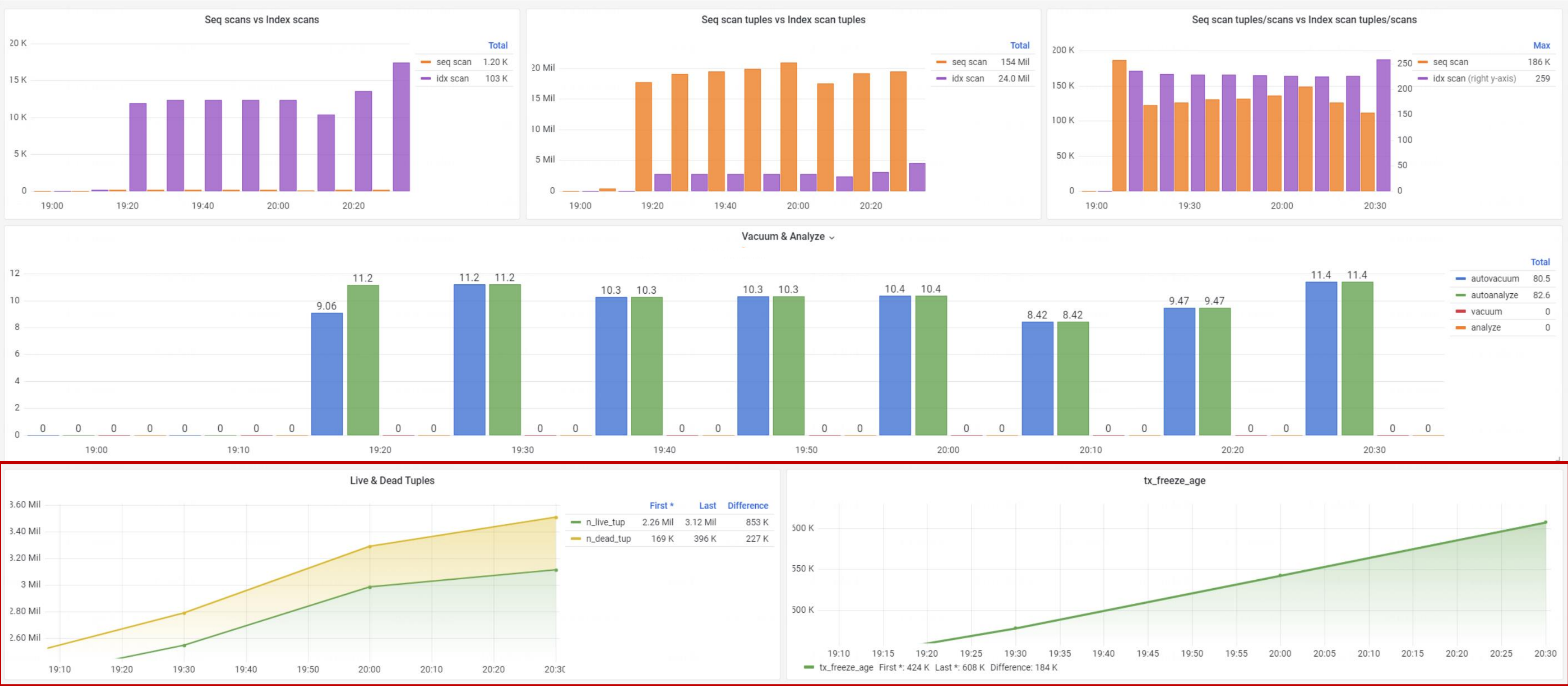
➡ DB Performance table details → Activity



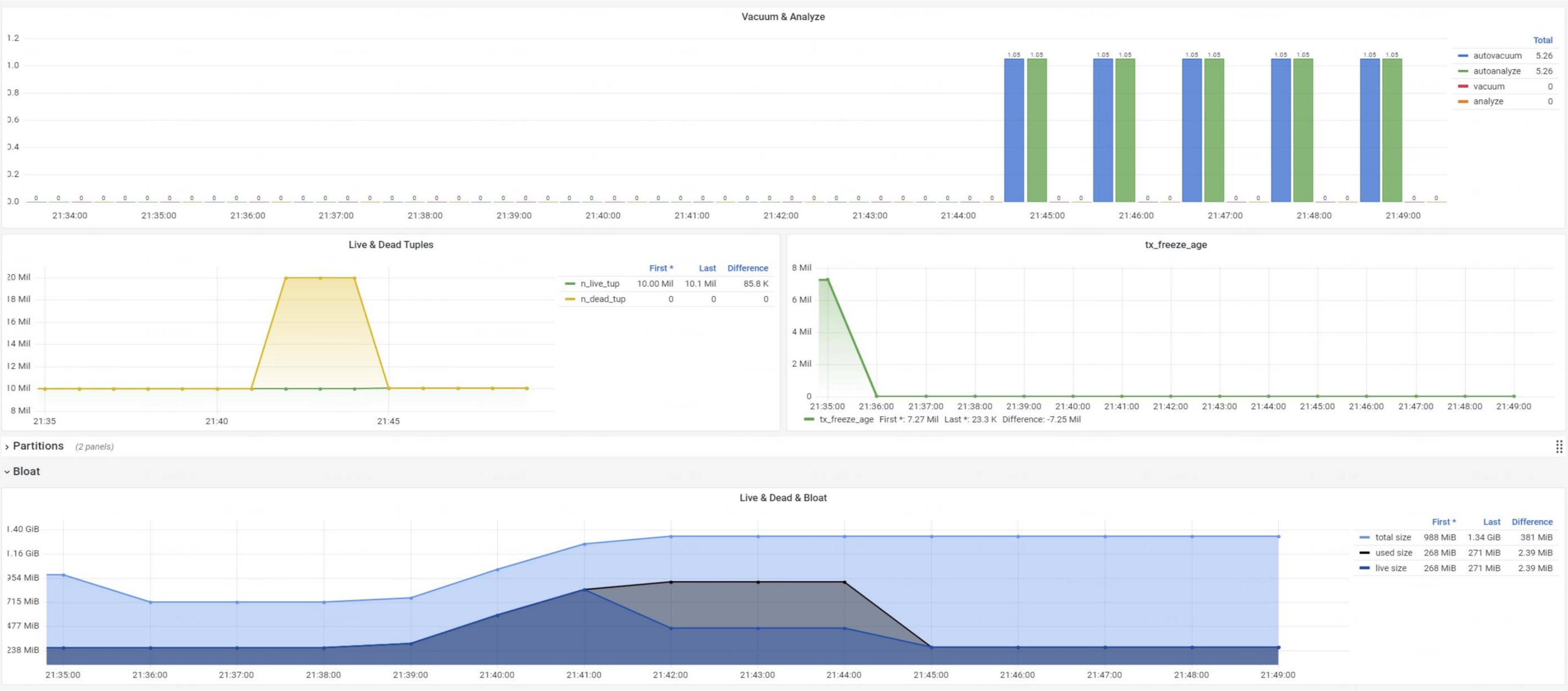
➡ DB Performance table details -> Activity



➡ DB Performance table details → Activity



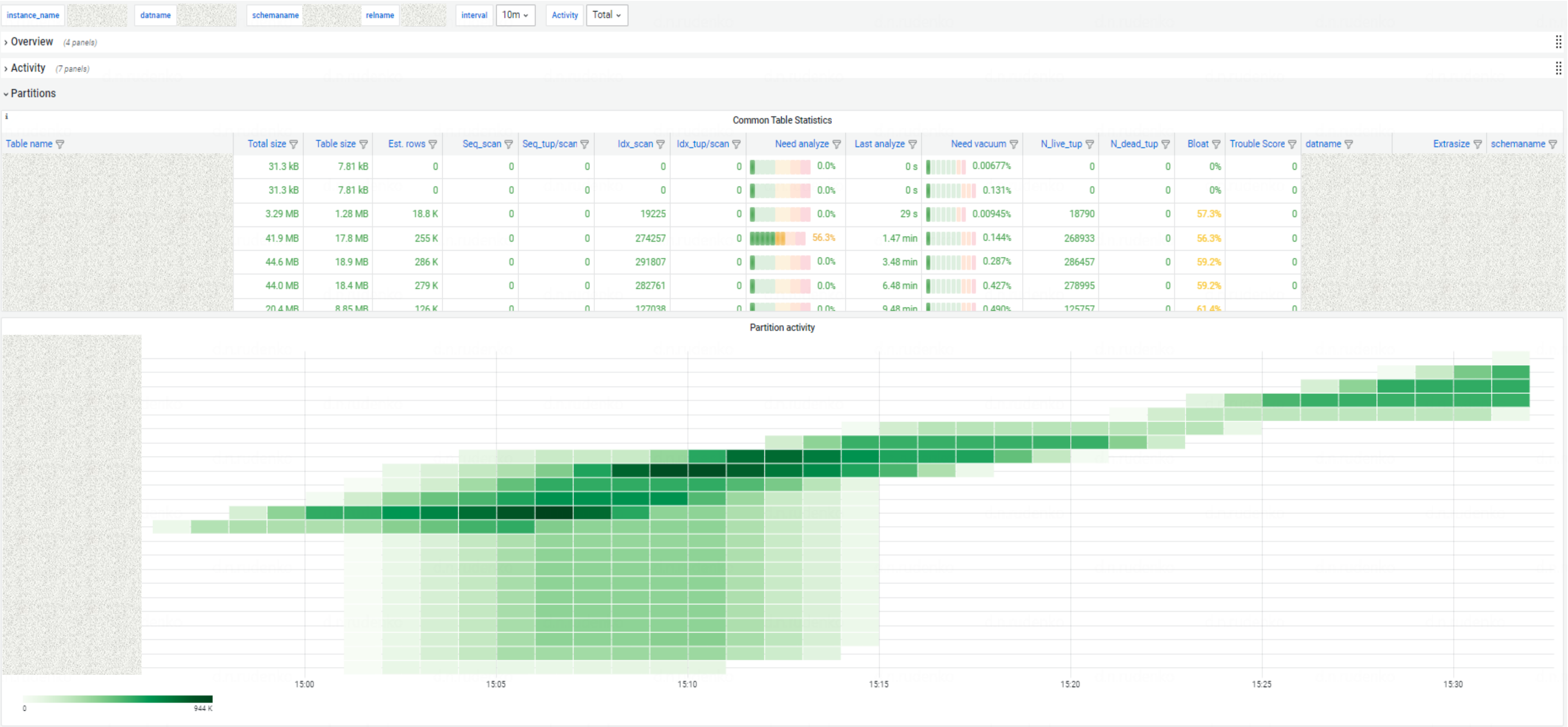
DB Performance table details -> Bloat info



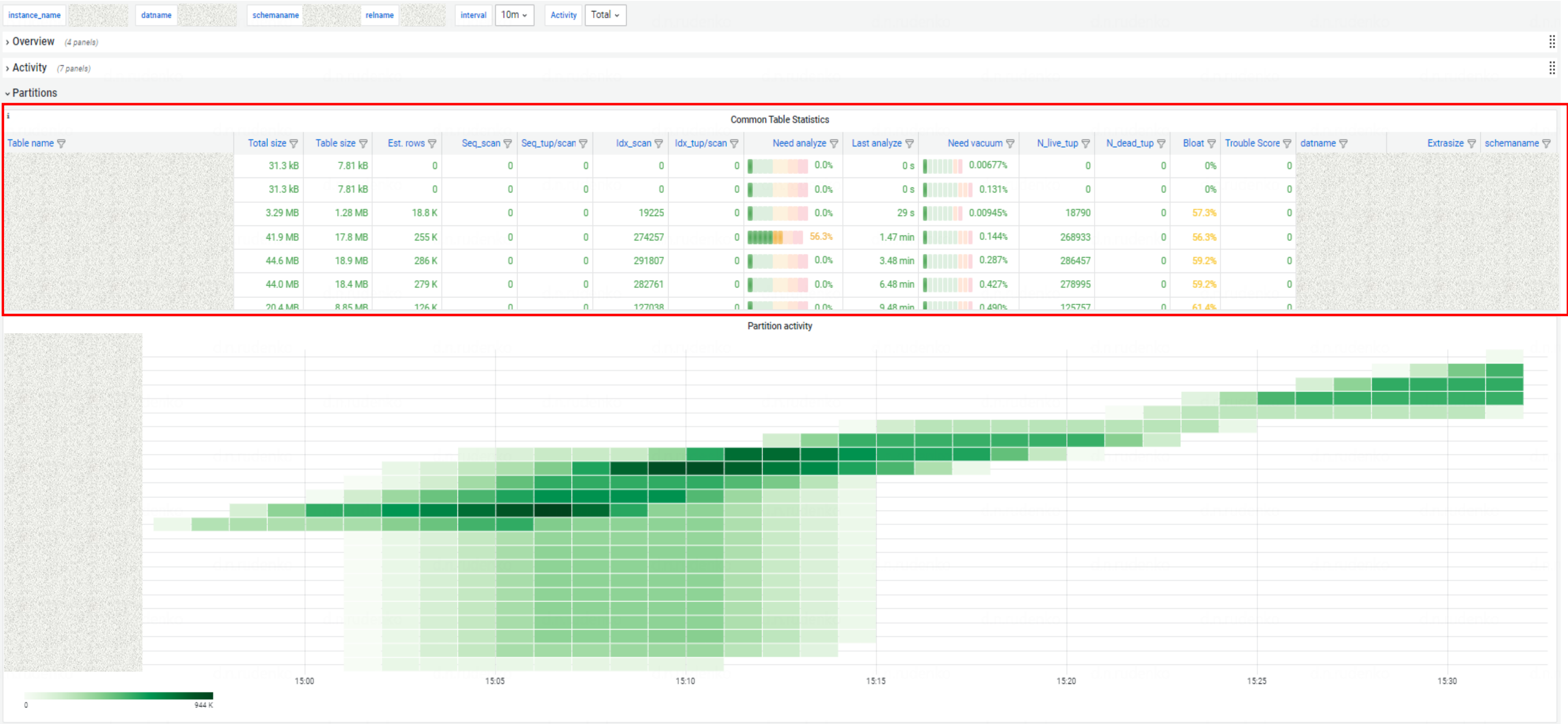
➡ DB Performance table details -> Bloat info



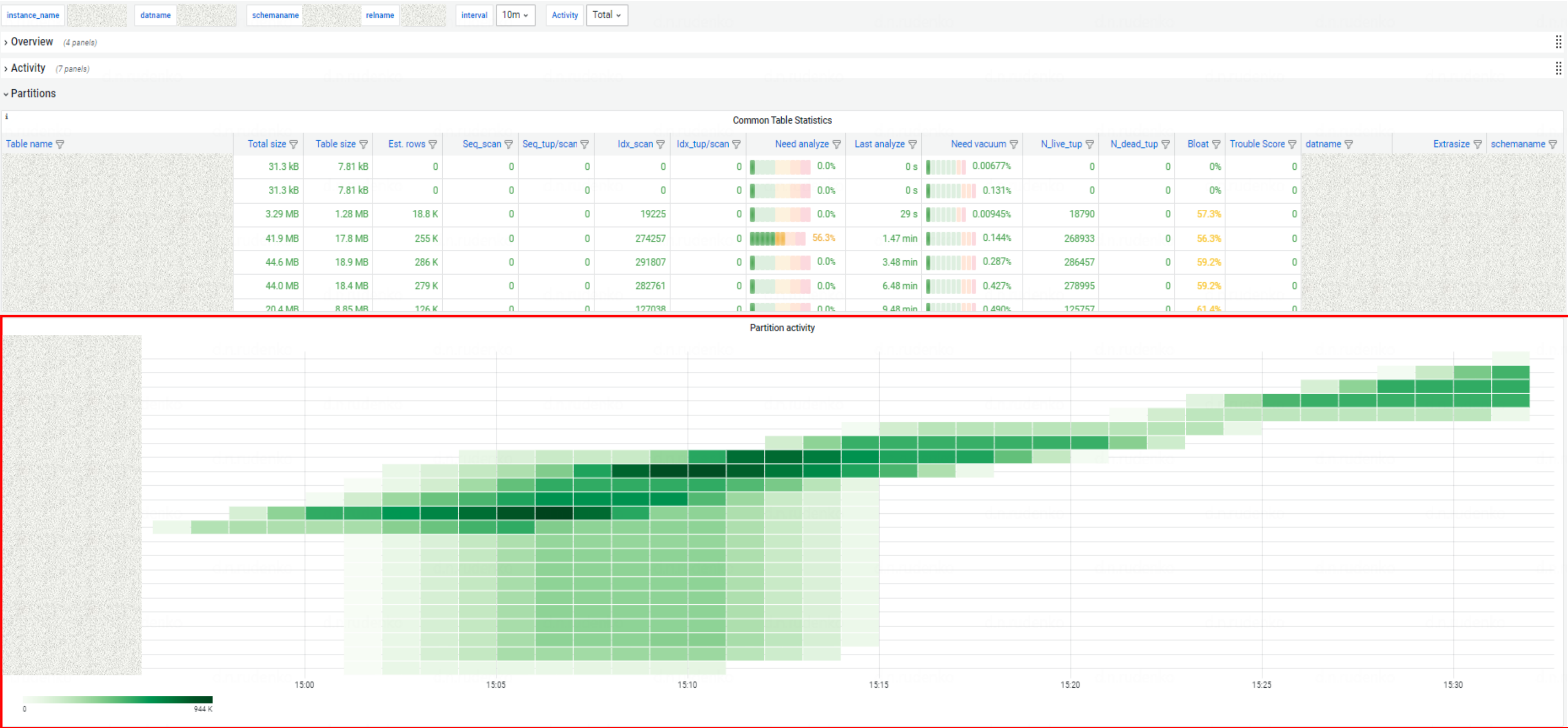
DB Performance table details -> Partition



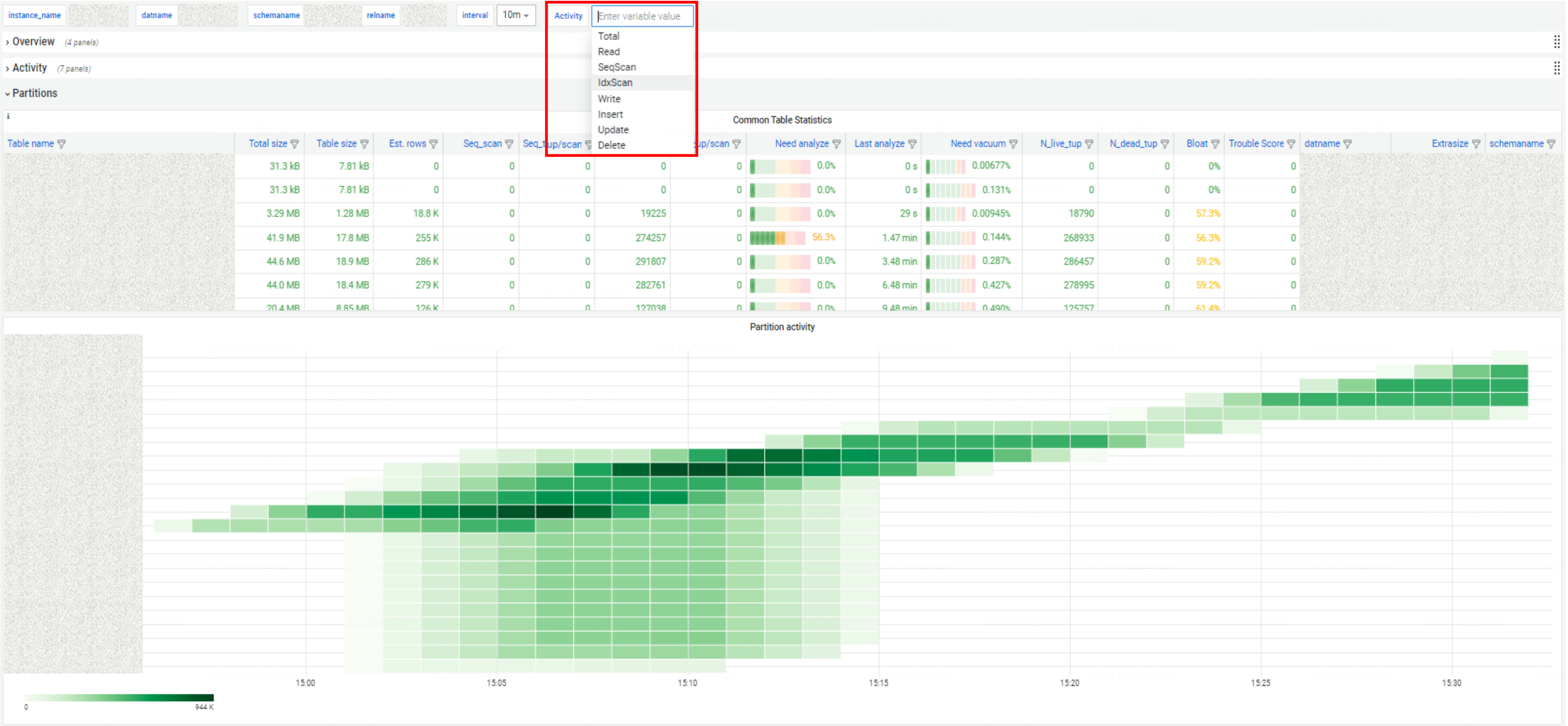
➡ DB Performance table details -> Partition



DB Performance table details -> Partition



DB Performance table details -> Partition



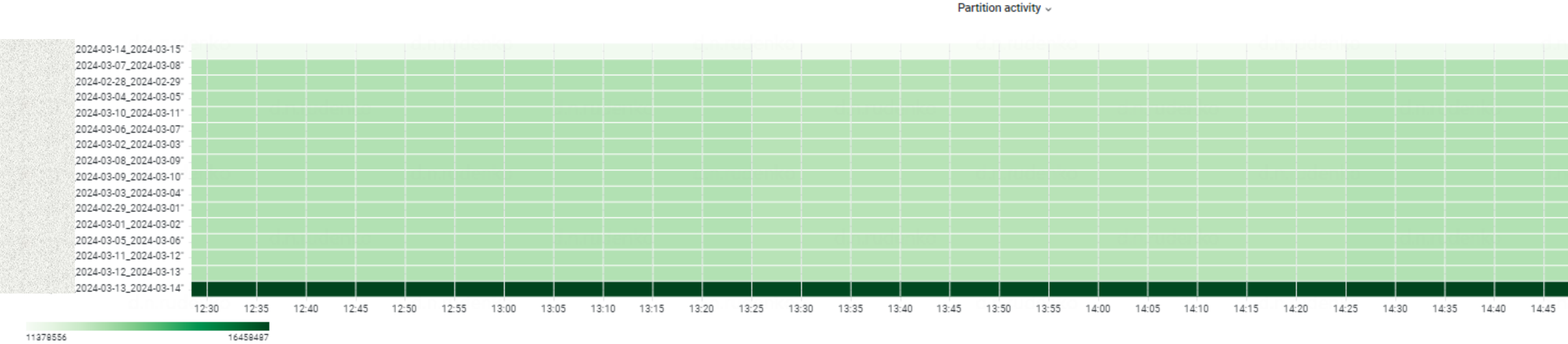
Пример 4. Нет ограничения по партициям

Partitions

ActivityIdxScan

Common Table Statistics

Table name	Total size	Table size	Est. rows	Seq_scan	Seq_tup/scan	Idx_scan	Idx_tup/scan	Need analyze	Last analyze	Need vacuum	N_live_tup	N_dead_tup	Bloat
2024-02-29_2024-03-01"	6.11 GB	2.88 GB	16.1 Mil	0	0	12907921	0	41.4%	1.80 week	49.8%	16080569	0	85%
2024-03-01_2024-03-02"	6.12 GB	2.88 GB	16.0 Mil	0	0	12907921	0	0.7%	1.66 week	11.2%	15984163	0	85%
2024-03-02_2024-03-03"	5.69 GB	2.67 GB	14.9 Mil	0	0	12907921	0	26.4%	1.52 week	76.4%	14860763	0	85%
2024-03-03_2024-03-04"	5.30 GB	2.48 GB	13.8 Mil	0	0	12907921	0	21.2%	1.37 week	44.8%	13824205	0	85%
2024-03-04_2024-03-05"	5.90 GB	2.77 GB	15.4 Mil	0	0	12907921	0.000279	8.4%	1.23 week	7.40%	15427404	0	85%
2024-03-05_2024-03-06"	6.11 GB	2.86 GB	15.7 Mil	0	0	12907921	0	20.6%	1.09 week	68.4%	15744528	0	85%
2024-03-06_2024-03-07"	6.13 GB	2.87 GB	16.0 Mil	0	0	12907921	0	29.5%	6.61 day	31.1%	15975962	0	85%
2024-03-07_2024-03-08"	6.53 GB	3.07 GB	17.1 Mil	0	0	12907921	0.000770	19.7%	5.61 day	90.5%	17051624	0	85%
2024-03-08_2024-03-09"	5.57 GB	2.62 GB	14.6 Mil	0	0	12907921	0	5.9%	4.60 day	57.5%	14584367	0	85%



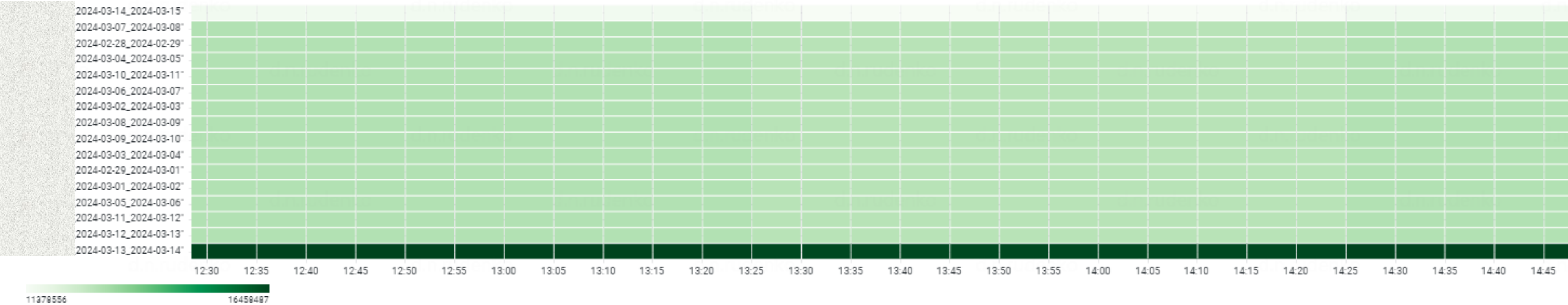
Пример 4. Нет ограничения по партициям

Partitions

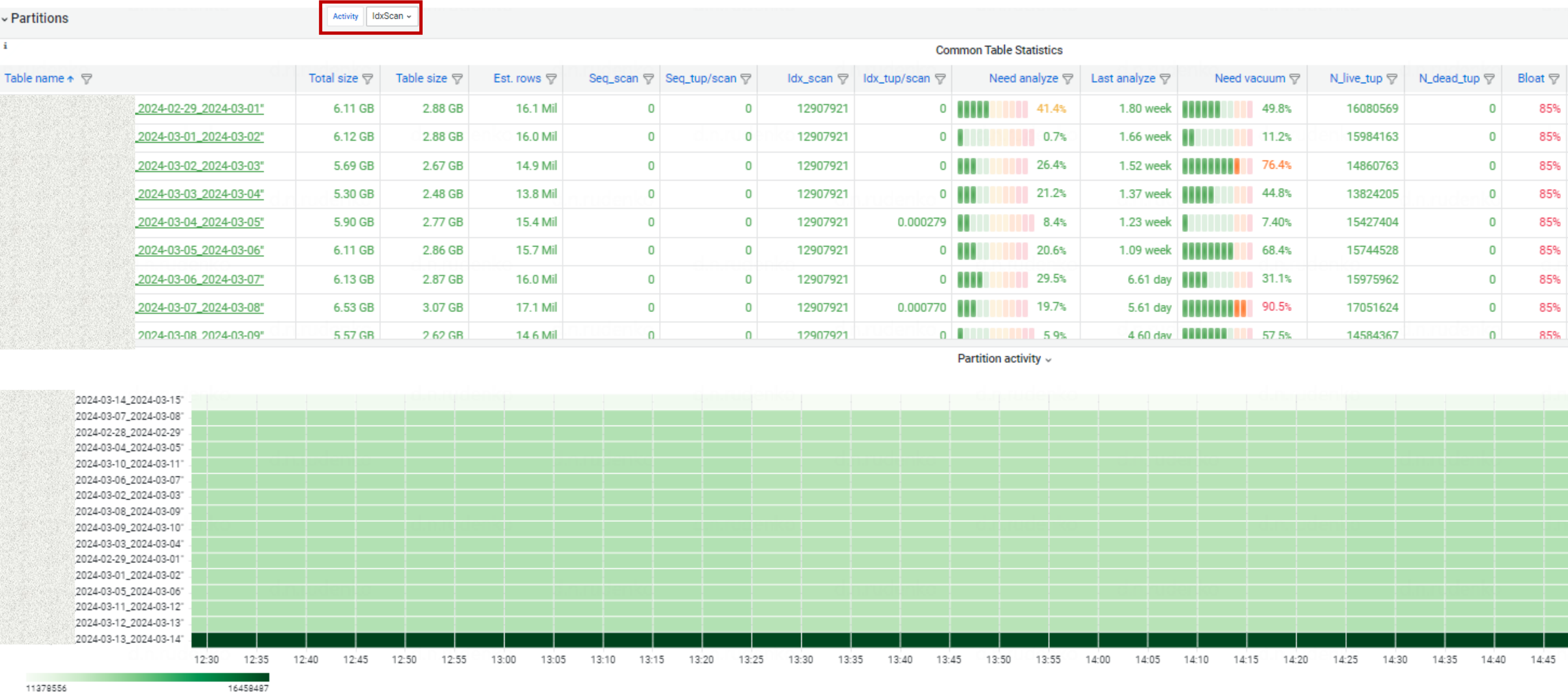
ActivityIdxScan

Common Table Statistics

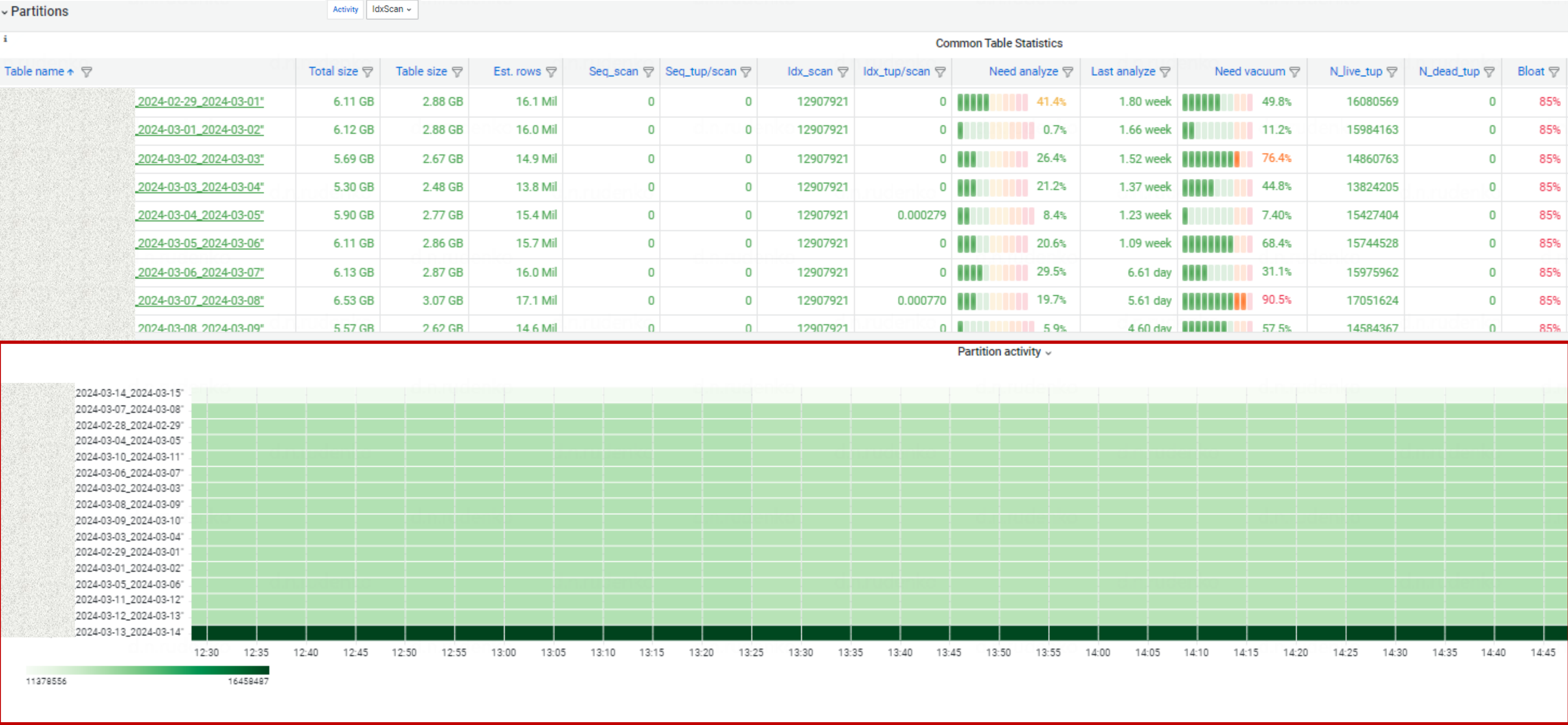
Table name		Total size	Table size	Est. rows	Seq_scan	Seq_tup/scan	Idx_scan	Idx_tup/scan	Need analyze	Last analyze	Need vacuum	N_live_tup	N_dead_tup	Bloat
	2024-02-29_2024-03-01"	6.11 GB	2.88 GB	16.1 Mil	0	0	12907921	0	41.4%	1.80 week	49.8%	16080569	0	85%
	2024-03-01_2024-03-02"	6.12 GB	2.88 GB	16.0 Mil	0	0	12907921	0	0.7%	1.66 week	11.2%	15984163	0	85%
	2024-03-02_2024-03-03"	5.69 GB	2.67 GB	14.9 Mil	0	0	12907921	0	26.4%	1.52 week	76.4%	14860763	0	85%
	2024-03-03_2024-03-04"	5.30 GB	2.48 GB	13.8 Mil	0	0	12907921	0	21.2%	1.37 week	44.8%	13824205	0	85%
	2024-03-04_2024-03-05"	5.90 GB	2.77 GB	15.4 Mil	0	0	12907921	0.000279	8.4%	1.23 week	7.40%	15427404	0	85%
	2024-03-05_2024-03-06"	6.11 GB	2.86 GB	15.7 Mil	0	0	12907921	0	20.6%	1.09 week	68.4%	15744528	0	85%
	2024-03-06_2024-03-07"	6.13 GB	2.87 GB	16.0 Mil	0	0	12907921	0	29.5%	6.61 day	31.1%	15975962	0	85%
	2024-03-07_2024-03-08"	6.53 GB	3.07 GB	17.1 Mil	0	0	12907921	0.000770	19.7%	5.61 day	90.5%	17051624	0	85%
	2024-03-08_2024-03-09"	5.57 GB	2.62 GB	14.6 Mil	0	0	12907921	0	5.9%	4.60 day	57.5%	14584367	0	85%



Пример 4. Нет ограничения по партициям



Пример 4. Нет ограничения по партициям



DB Performance table details -> Query & Index

instance_name

datname

schemaname

relname

interval

10m

Activity

Total

> Overview

(3 panels)

> Activity

(7 panels)

> Partitions

(2 panels)

> Bloat

(1 panel)

> Indexes

Indexes info

Index name	Columns	Size	Size (delta)	Idx_scan	Idx_scan (delta)	Idx_tup_read (delta)	Idx_tup_fetch (delta)	Is_Invalid	Is_Primary	Is_Unique	indexdef
		46.0 MiB	33.7 MiB	2	0	0	0	No	No	No	CREATE INDEX x ON
		16.5 MiB	14.3 MiB	230	217	2 Mil	354 K	No	Yes	Yes	CREATE UNIQUE INDI

> Queries

Queries Info

Queryid	Total time	CPU time	IO time	Calls	Rows	Time /call	Blocks /call	Blocks /row	Temp blocks /call	Query	Blocks written	Blocks dirtied	Block read
ad6142c6b59076587e064636ebb61f5f	00:06:25	00:02:40	00:03:44	82 K	29073	5 ms	1068	3015	0	update	2298907	76227	00:03:35
8c9e29b8ef67bf373c26e3854d7c97d0	00:01:38	00:01:32	00:00:06	410	1228719	241 ms	51534	17	0	insert in	68647	1051262	00:00:06
1b2c0926180383f5fab821b00f7729a9	00:01:34	00:01:27	00:00:06	410	983779	231 ms	28022	12	0	update	87628	674658	00:00:06
3637de28ce5766556b4181a5c500d9a5	00:01:00	00:00:17	00:00:42	410	839835	146 ms	25341	12	0	delete f	636315	1249552	00:00:40
17f05ea35bda30eafd9cfb554f41277d	00:00:01	00:00:01	00:00:00	2	0	674 ms	599	1208	0	create t	0	80	00:00:00
5fdafa73ac4eb6bc762efc67dbe40f5c	00:00:00	00:00:00	00:00:00	2	0	16 ms	291	587	0	drop tab	0	36	00:00:00

➡ DB Performance table details → Query & Index

instance_name

datname

schemaname

relname

interval

10m

Activity

Total

> Overview

(3 panels)

> Activity

(7 panels)

> Partitions

(2 panels)

> Bloat

(1 panel)

<div>Indexes

Indexes info

Index name	Columns	Size	Size (delta)	Idx_scan	Idx_scan (delta)	Idx_tup_read (delta)	Idx_tup_fetch (delta)	Is_Invalid	Is_Primary	Is_Unique	indexdef
		46.0 MiB	33.7 MiB	2	0	0	0	No	No	No	CREATE INDEX x ON
		16.5 MiB	14.3 MiB	230	217	2 Mil	354 K	No	Yes	Yes	CREATE UNIQUE INDI

<div>Queries

i

Queries Info

Queryid	Total time	CPU time	IO time	Calls	Rows	Time /call	Blocks /call	Blocks /row	Temp blocks /call	Query	Blocks written	Blocks dirtied	Block read
ad6142c6b59076587e064636ebb61f5f	00:06:25	00:02:40	00:03:44	82 K	29073	5 ms	1068	3015	0	update	2298907	76227	00:03:35
8c9e29b8ef67bf373c26e3854d7c97d0	00:01:38	00:01:32	00:00:06	410	1228719	241 ms	51534	17	0	insert ir	68647	1051262	00:00:06
1b2c0926180383f5fab821b00f7729a9	00:01:34	00:01:27	00:00:06	410	983779	231 ms	28022	12	0	update	87628	674658	00:00:06
3637de28ce5766556b4181a5c500d9a5	00:01:00	00:00:17	00:00:42	410	839835	146 ms	25341	12	0	delete f	636315	1249552	00:00:40
17f05ea35bda30eafd9cfb554f41277d	00:00:01	00:00:01	00:00:00	2	0	674 ms	599	1208	0	create t	0	80	00:00:00
5fdafa73ac4eb6bc762efc67dbe40f5c	00:00:00	00:00:00	00:00:00	2	0	16 ms	291	587	0	drop tab	0	36	00:00:00

100%

100%

100%

100%

100%

100%

100%

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100%

100%

100%

DB Performance table details -> Query & Index

instance_name

datname

schemaname

relname

interval

10m

Activity

Total

> Overview

(3 panels)

> Activity

(7 panels)

> Partitions

(2 panels)

> Bloat

(1 panel)

< Indexes

Indexes info

Index name	Columns	Size	Size (delta)	Idx_scan	Idx_scan (delta)	Idx_tup_read (delta)	Idx_tup_fetch (delta)	Is_Invalid	Is_Primary	Is_Unique	indexdef
		46.0 MiB	33.7 MiB	2	0	0	0	No	No	No	CREATE INDEX x ON t
		16.5 MiB	14.3 MiB	230	217	2 Mil	354 K	No	Yes	Yes	CREATE UNIQUE INDEX

< Queries

Queries Info

Queryid	Total time	CPU time	IO time	Calls	Rows	Time /call	Blocks /call	Blocks /row	Temp blocks /call	Query	Blocks written	Blocks dirtied	Block read
ad6142c6b59076587e064636ebb61f5f	00:06:25	00:02:40	00:03:44	82 K	29073	5 ms	1068	3015	0	update t	2298907	76227	00:03:35
8c9e29b8ef67bf373c26e3854d7c97d0	00:01:38	00:01:32	00:00:06	410	1228719	241 ms	51534	17	0	insert into t	68647	1051262	00:00:06
1b2c0926180383f5fab821b00f7729a9	00:01:34	00:01:27	00:00:06	410	983779	231 ms	28022	12	0	update t	87628	674658	00:00:06
3637de28ce5766556b4181a5c500d9a5	00:01:00	00:00:17	00:00:42	410	839835	146 ms	25341	12	0	delete from t	636315	1249552	00:00:40
17f05ea35bda30eafd9cfb554f41277d	00:00:01	00:00:01	00:00:00	2	0	674 ms	599	1208	0	create table t	0	80	00:00:00
5fdafa73ac4eb6bc762efc67dbe40f5c	00:00:00	00:00:00	00:00:00	2	0	16 ms	291	587	0	drop table t	0	36	00:00:00

Пример 5. Отсутствует индекс

instance_name

datname

schemaname

relname

interval10m

Activity

Total

Overview

Links

Sage Log

DB General

DB Performance

DB Connections

DB Size

Host Details

Total size101 MiB

Table size34.6 MiB

Est.rows391 K

Bloating69.6%

PartitionedNo

Fillfactor100

Last vacuum3 hours

Last analyze2 hours

AutovacuumOn

Size

100 MiB

75 MiB

50 MiB

25 MiB

0 MiB

08:40

08:50

09:00

09:10

09:20

09:30

09:40

09:50

10:00

10:10

10:20

10:30

10:40

10:50

11:00

11:10

11:20

11:30

full size101 MiB101 MiB0 MiB

table size34.6 MiB34.6 MiB0 MiB

toast size8 KiB8 KiB0 MiB

index size66.8 MiB66.8 MiB0 MiB

Activity7 panels

Partitions2 panels

Bloat1 panel

Indexes

Indexes info

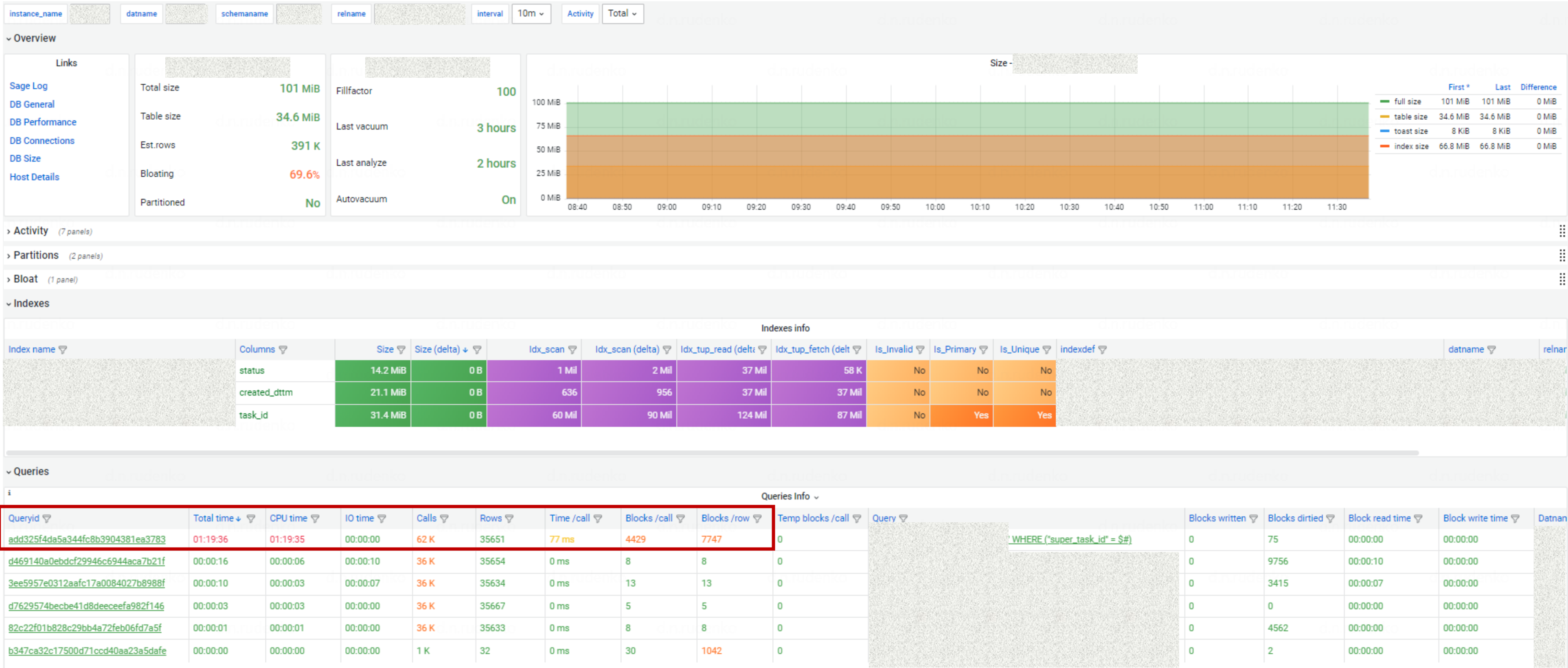
Index name	Columns	Size	Size (delta)	Idx_scan	Idx_scan (delta)	Idx_tup_read (delta)	Idx_tup_fetch (delta)	Is_Invalid	Is_Primary	Is_Unique	indexdef	datname	relname
	status	14.2 MiB	0 B	1 Mil	2 Mil	37 Mil	58 K	No	No	No			
	created_dttm	21.1 MiB	0 B	636	956	37 Mil	37 Mil	No	No	No			
	task_id	31.4 MiB	0 B	60 Mil	90 Mil	124 Mil	87 Mil	No	Yes	Yes			

Queries

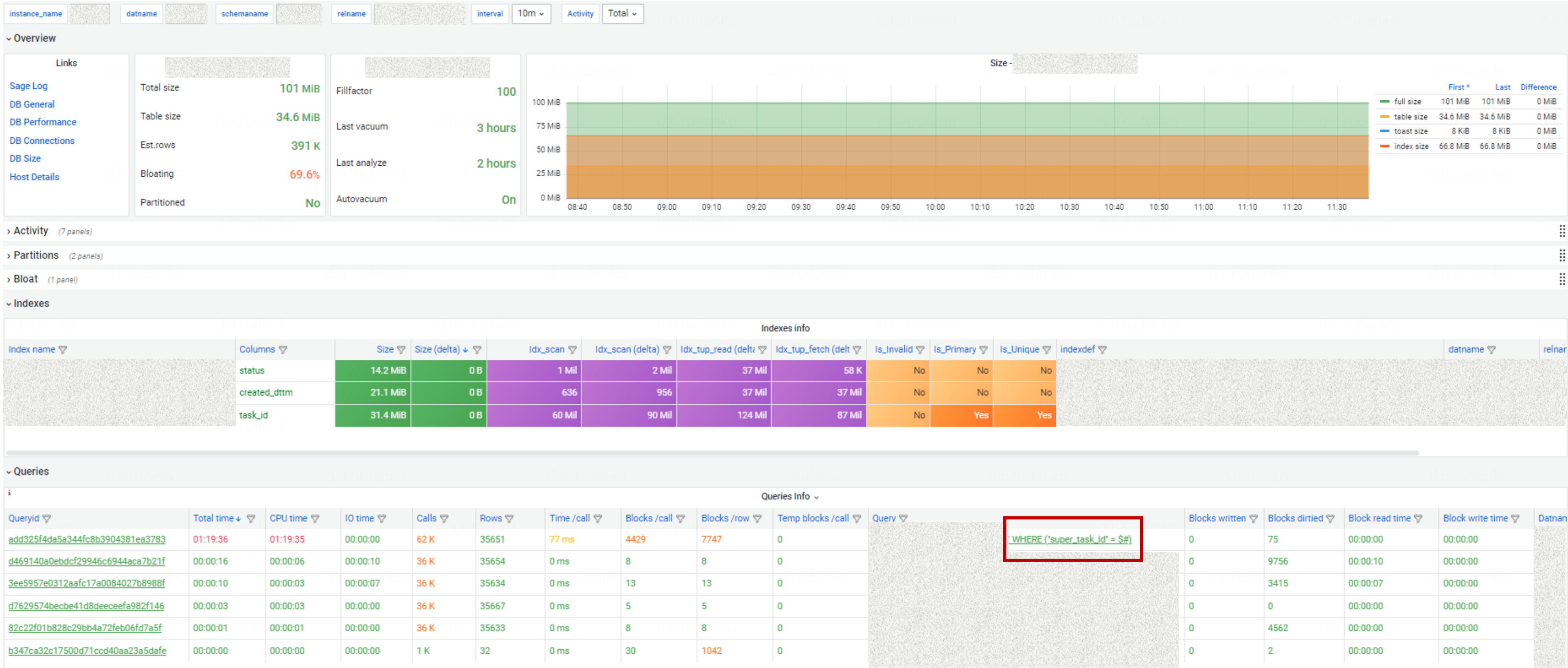
Queries Info

Queryid	Total time	CPU time	IO time	Calls	Rows	Time /call	Blocks /call	Blocks /row	Temp blocks /call	Query	Blocks written	Blocks dirtied	Block read time	Block write time	Dataname
add325f4da5a344fc8b3904381ea3783	01:19:36	01:19:35	00:00:00	62 K	35651	77 ms	4429	7747	0	WHERE ("super_task_id" = \$#)	0	75	00:00:00	00:00:00	
d469140a0ebdcf29946c6944aca7b21f	00:00:16	00:00:06	00:00:10	36 K	35654	0 ms	8	8	0		0	9756	00:00:10	00:00:00	
3ee5957e0312aafc17a0084027b8988f	00:00:10	00:00:03	00:00:07	36 K	35634	0 ms	13	13	0		0	3415	00:00:07	00:00:00	
d7629574becbe41d8deceefa982f146	00:00:03	00:00:03	00:00:00	36 K	35667	0 ms	5	5	0		0	0	00:00:00	00:00:00	
82c22f01b828c29bb4a72feb06fd7a5f	00:00:01	00:00:01	00:00:00	36 K	35633	0 ms	8	8	0		0	4562	00:00:00	00:00:00	
b347ca32c17500d71ccd40aa23a5dafe	00:00:00	00:00:00	00:00:00	1 K	32	0 ms	30	1042	0		0	2	00:00:00	00:00:00	

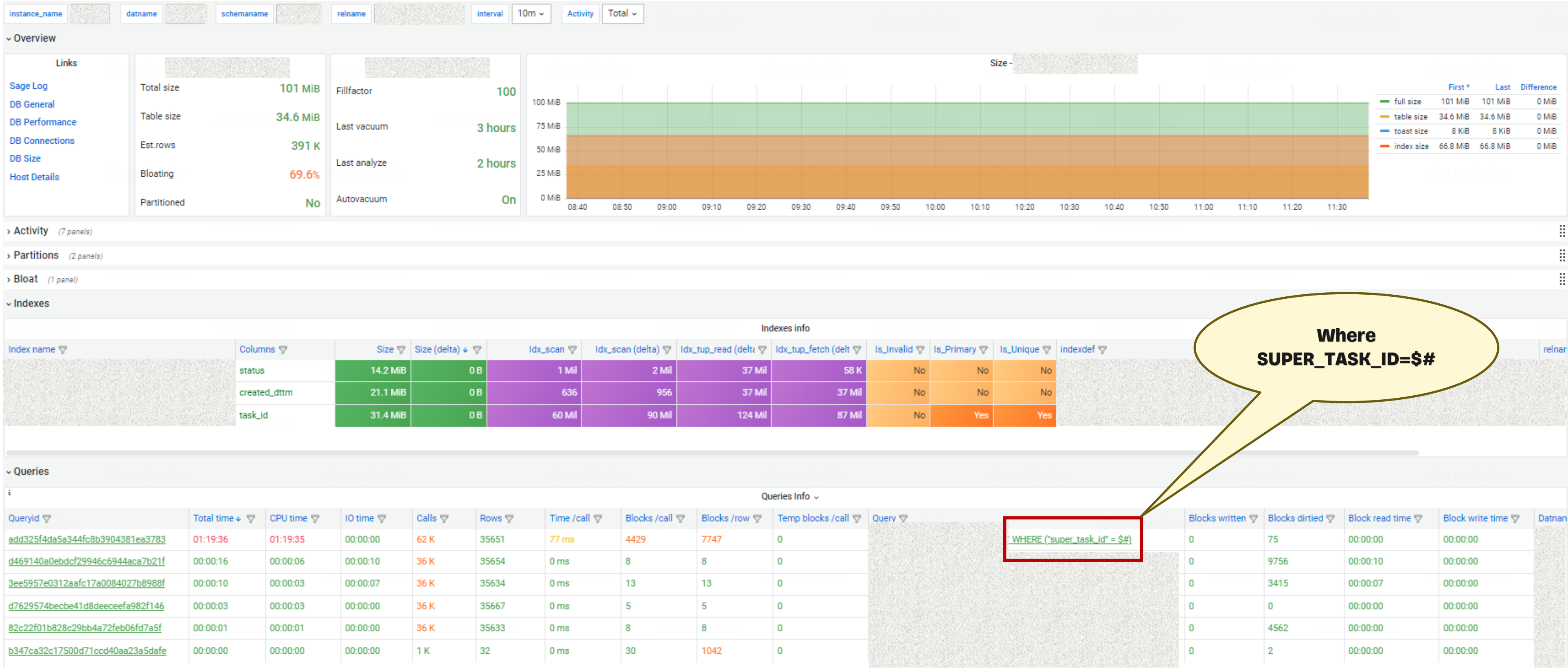
Пример 5. Отсутствует индекс



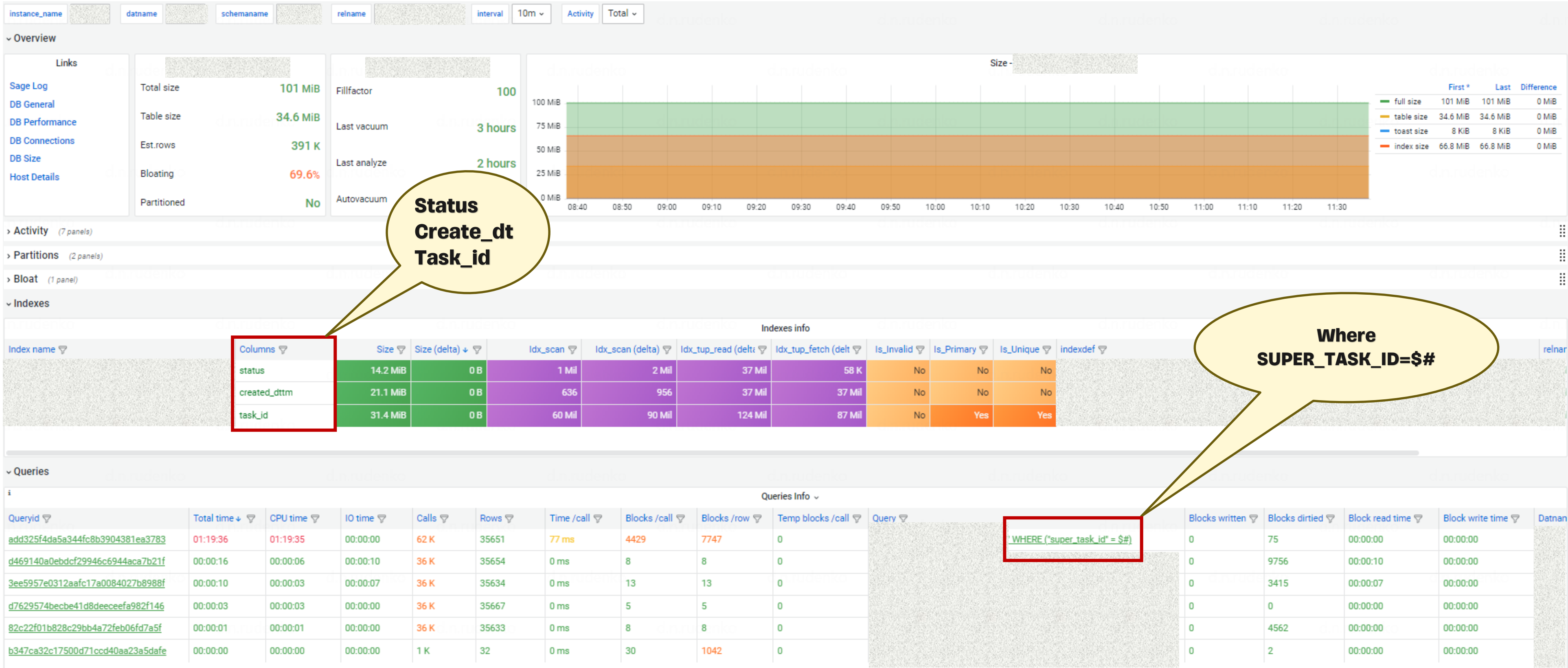
Пример 5. Отсутствует индекс



Пример 5. Отсутствует индекс



Пример 5. Отсутствует индекс



Подведём ИТОГИ



Новый мониторинг позволяет:

- Получить общую информацию о нагрузке на БД
- Выявить наиболее ресурсоемкие запросы и какие именно ресурсы потребляются
- Выявить таблицы к которым осуществляется не эффективный доступ к данным и понять как исправить ситуацию
- Следить за прогрессом длительно выполняемыми процессами



Планы по развитию

- Добавить информацию по полям таблицы и выжимку со статистикой по ним
- Отдельный дашборд по индексу
- Сбор планов и их автоматический анализ

**Спасибо
за внимание!**

