POSTGRESQL is an open-source, full-featured relational database. This presentation gives an overview of the Postgres 14 release.

https://momjian.us/presentations

Creative Commons Attribution License

Last updated: January 2022
1. Reduce btree index bloat
2. BRIN improvements
3. Improved snapshot scaling
4. Global query id computation
5. Add idle_session_timeout
6. Add read-only and write-only predefined roles
7. Optimizer
8. Parallel foreign table scans

Full item list at https://www.postgresql.org/docs/14/index.html
1. Reduce Btree Index Bloat
Reduce Btree Index Bloat

Internal

Leaf

Heap

M C I A G E P K W L
Reduce Btree Index Bloat

Internal

Leaf

Heap

- Page Header
- Item
- Item
- Item
- >= N
- < F
- < N
- Special

Dead

Internal and Leaf structures are shown with dead nodes indicated.

2. BRIN Improvements

- Allow multiple min/max ranges in BRIN indexes, e.g., 1-10, 30-40
- Allow bloom filters to represent distinct values in BRIN ranges
3. Improve Snapshot Scaling

Faster snapshot generation improves performance for clusters with many idle connections.

https://momjian.us/main/presentations/internals.html#mvcc
4. Global Query Id Computation

The query id used to be only by *pg_stat_statements*:

```
ALTER SYSTEM SET compute_query_id = 'on';
ALTER SYSTEM SET log_line_prefix = '%m [%p] %Q ';
ALTER SYSTEM SET log_min_duration_statement = 0;
SELECT pg_reload_conf();
pg_reload_conf
----------------
```

```
SELECT query, query_id FROM pg_stat_activity WHERE pg_backend_pid() = pid;
```

```
-----------------------------------+----------------------
query | query_id
-----------------------------------+----------------------
```

```
-8909473167852464370

```
```
\! tail -1 /u/pg/server.log
```
5. Add idle_session_timeout

Terminate idle sessions after a timeout:

```
SET idle_session_timeout = '1s';
-- wait for two seconds
SELECT 1;
```

FATAL: terminating connection due to idle-session timeout
server closed the connection unexpectedly
  This probably means the server terminated abnormally before or while processing the request.
The connection to the server was lost. Attempting reset: Succeeded.
CREATE USER user1;
CREATE USER user2 IN GROUP pg_read_all_data;
CREATE TABLE test AS SELECT 100;

\c test user1
SELECT * FROM test;
ERROR: permission denied for table test

\c test user2
SELECT * FROM test;
?column?
----------
   100
7. Optimizer

- Allow hash lookup of `IN` clause with many constants
- Increase the number of places extended statistics can be used for `OR` clause estimation
- Allow extended statistics on expressions
8. Parallel Foreign Table Scans

SQL Queries

PG FDW

Shard Parallel Access

Foreign Server

Foreign Server

Foreign Server

https://momjian.us/main/presentations/performance.html#sharding