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

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

Internal

Leaf

Heap

Page Header | Item | Item | Item
---|---|---|---

<= N

< F | < N | Special

Page Header | Item | Item | Item
---|---|---|---

A | C | Special

Page Header | Item | Item | Item
---|---|---|---

E

G | K | Special

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

Internal

Leaf

Heap

Page Header Item Item Item

>= N

< F < N Special

Dead

Dead

Dead

M C I A G E P K W L
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
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`

```sql
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();
```

```
t
```

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

```
<table>
<thead>
<tr>
<th>query</th>
<th>query_id</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-8909473167852464370</td>
</tr>
</tbody>
</table>
```

```
\! tail -1 /u/pg/server.log
2021-07-08 21:42:05.007 EDT [31560] -8909473167852464370 LOG: duration: 1.195 ms statement: SELECT ...
5. Add `idle_session_timeout`

Terminate idle sessions after a timeout:

```sql
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
Conclusion

https://momjian.us/presentations

https://www.flickr.com/photos/thomasletholsen/