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10 Common Reasons Why Your PostgreSQL Queries Are Slow (And How to Fix Them)

Ajaymaurya · Follow

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Missing Indicts
Poorly Written Quegies
Pooly Written Qurrries
Missing indgas
Missing Insgees Why Garey
2
3
Loo Scans Sequctioal Tabes
4
Too Many Orderr Issues
8
Lack Lack of Sequctioal Issues
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10 Cornmon Reasons Your and How to Fix
Over Mssy Order by Distrist
Locking
Orary Connection Issues How to ix it
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PostgreSQL is a powerful and feature-rich database, but slow queries can cripple performance if not optimized properly. Have you ever wondered why your queries take forever to execute? In this guide, we'll explore 10 common reasons why PostgreSQL queries are slow and provide actionable solutions to fix them.

1. Missing or Inefficient Indexes

Problem:
Indexes speed up query performance, but if they're missing or not used properly, queries can take significantly longer.

Fix:

- Use **EXPLAIN ANALYZE** to check if an index is being used.
- Create appropriate indexes using `CREATE INDEX` based on your query patterns
- Consider **GIN, GiST, BRIN, or B-Tree indexes** for specific use cases.

Example:

```
sql


CREATE INDEX idx_users_email ON users(email);
```

2. Poorly Written Queries

Problem:
Bad query structure can lead to excessive table scans, unnecessary joins, and redundant operations.

Fix:

- Use **SELECT only the necessary columns** instead of `SELECT *`.
- Optimize joins by ensuring proper **indexing on join columns.**
- Avoid **subqueries** when a **JOIN** or **CTE (Common Table Expression**) can do the job.

3. Lack of VACUUM and ANALYZE

Problem:
PostgreSQL doesn't automatically reclaim storage from deleted/updated rows, causing performance degradation.

Fix:

- Run **VACUUM** to clean up dead tuples.
- Use **ANALYZE** to update statistics for the query planner.
- Enable **autovacuum** for automatic maintenance.

Example:

```
sql

VACUUM ANALYZE users;
```

4. Bloated Tables and Indexes

Problem:
Over time, tables and indexes accumulate unnecessary data, leading to increased query time.

Fix:

- Regularly run `VACUUM FULL` and `REINDEX` .
- Monitor table bloat using **pg_stat_user_tables.**

Example:

```
sql

REINDEX TABLE users;
```

5. Using the Wrong Data Types

Fix:

- Use **INTEGER instead of TEXT** for numerical values.
- Use **UUID** instead of large VARCHARs for IDs.
- Prefer **TIMESTAMP** over STRING for date-related fields.

6. Too Many Sequential Scans

Problem:

Sequential scans scan entire tables, slowing down large dataset queries.

Fix:

- Add proper indexes to enforce **Index Scans** instead.
- Use **SET enable_seqscan = OFF** for testing index usage.

Example:

```
sql

SET enable_seqscan = OFF;
```

7. Locking Issues and Deadlocks

Problem:

Long-running transactions cause table locks, making queries wait indefinitely.

Fix:

- Keep transactions short and commit early.
- Use **LOCK TIMEOUT** to prevent waiting indefinitely

Example:

```
sql

SET lock_timeout = '5s';
```

8. Lack of Connection Pooling

Problem:

Excessive database connections slow down performance.

Fix:

- Use connection pooling tools like **PgBouncer**.
- Limit max connections and use **persistent connections.**

9. Overuse of ORDER BY and DISTINCT

Problem:

Sorting large datasets requires significant memory and slows down queries.

Fix:

- Create indexes on sorted columns.
- Avoid **DISTINCT** if `GROUP BY` can achieve the same

10. Incorrect PostgreSQL Configuration

Problem:

Default PostgreSQL settings may not be optimized for large workloads.

Fix:

- Adjust `shared_buffers`, `work_mem`, and `effective_cache_size`.
- Use **pg_stat_statements** to monitor slow queries.

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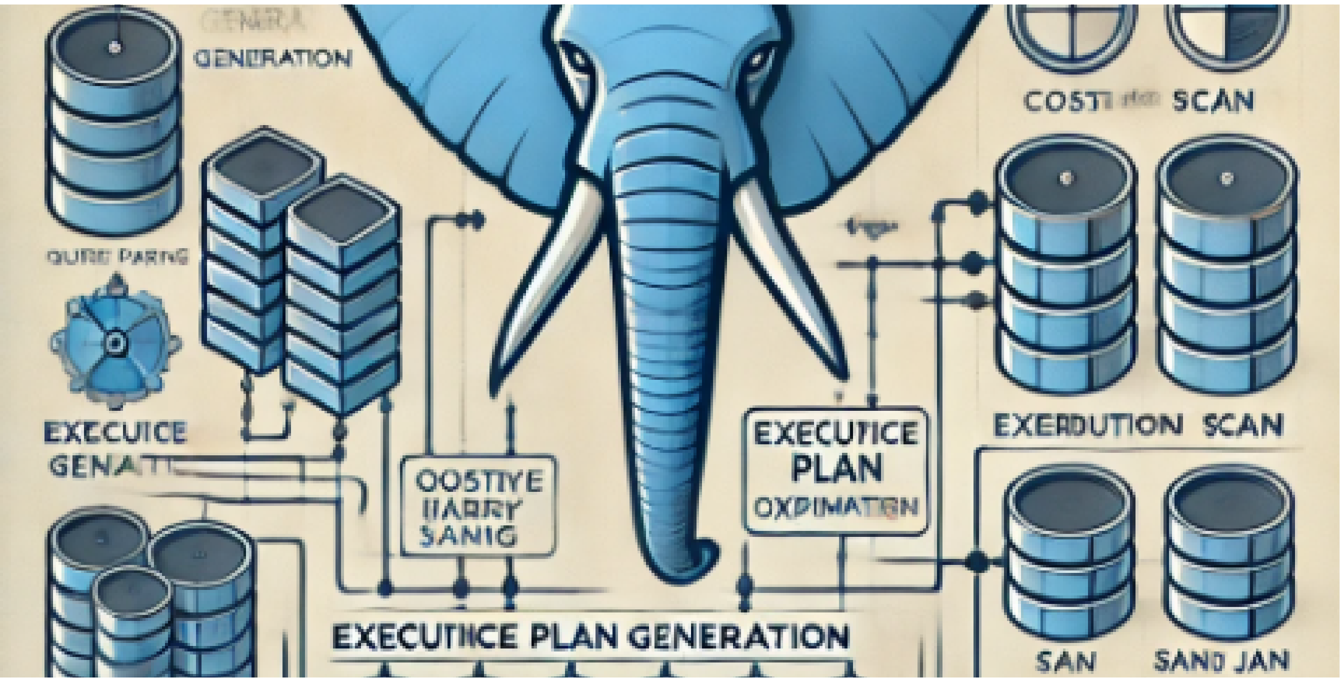

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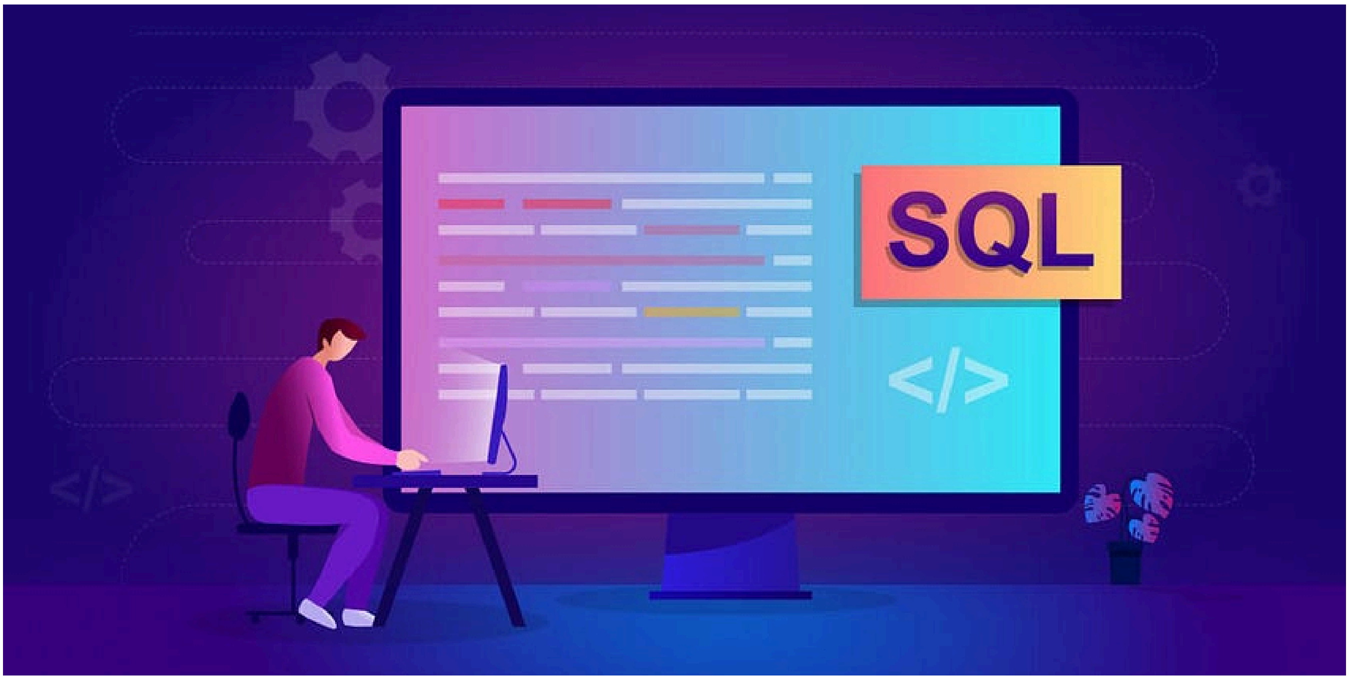

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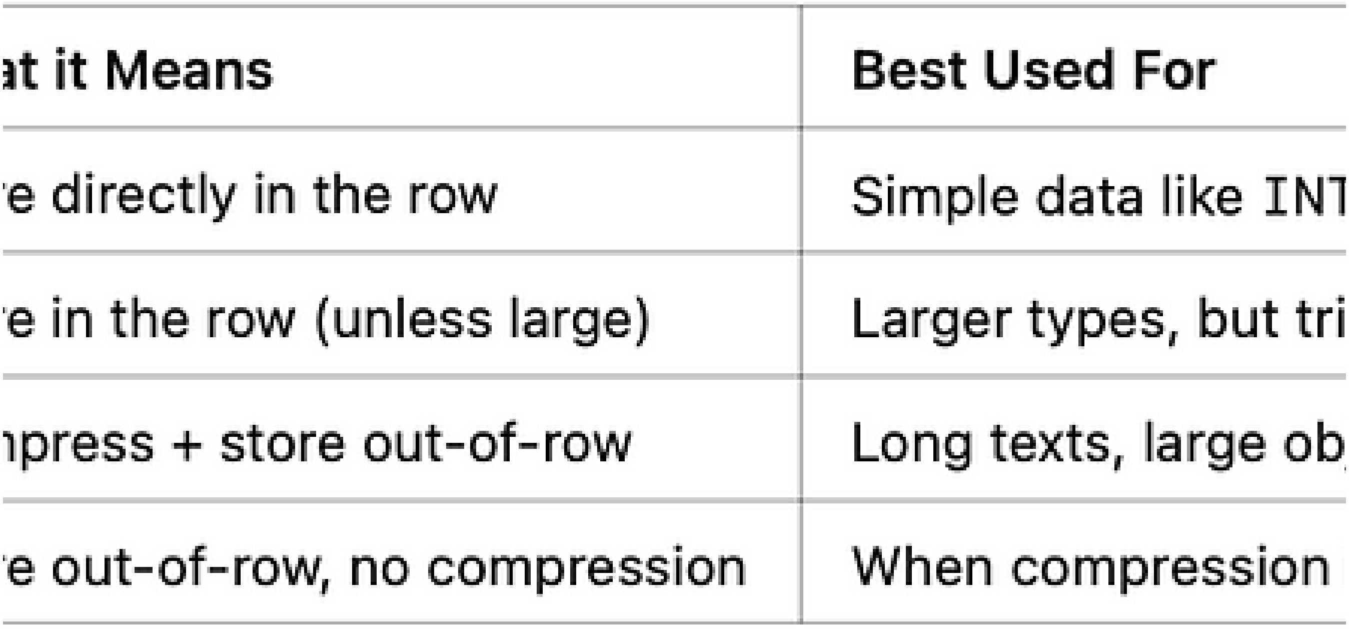

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