Cheatsheet: PostgreSQL Monitoring

DATADOG

Note:
— To query these metrics, you must be logged into PostgreSQL as a user that has read access to `pg_stat_database`
— For more info on monitoring PostgreSQL performance, read http://dtdg.co/monitor-postgres

Replication and checkpoint metrics—**more info**

METRIC DESCRIPTION	QUERY
Replication delay in bytes* (version <10.x)	`SELECT abs(pg_xlog_location_diff(pg_last_xlog_receive_location(), pg_last_xlog_replay_location())) AS replication_delay_bytes;`
Replication delay in bytes (version 10.x+)	`SELECT abs(pg_wal_lsn_diff(pg_last_wal_receive_lsn(), pg_last_wal_replay_lsn())) AS replication_delay_bytes;`
Replication delay in seconds (version <10.x)	`SELECT CASE WHEN pg_last_xlog_receive_location() = pg_last_xlog_replay_location() THEN 0 ELSE GREATEST (0, EXTRACT (EPOCH FROM now() – pg_last_xact_replay_timestamp())) END;`
Replication delay in seconds (version 10.x+)	`SELECT CASE WHEN pg_last_wal_receive_lsn() = pg_last_wal_replay_lsn() THEN 0 ELSE GREATEST (0, EXTRACT (EPOCH FROM now() – pg_last_xact_replay_timestamp())) END;`
Number of checkpoints requested & scheduled	`SELECT checkpoints_req, checkpoints_timed FROM pg_stat_bgwriter;`

Read query throughput and performance metrics—**more info**

METRIC DESCRIPTION	QUERY
Number of index scans (per index and per table)	`SELECT indexrelname, relname, idx_scan FROM pg_stat_user_indexes;`
Number of sequential scans (per table)	`SELECT relname, seq_scan FROM pg_stat_user_tables;`
Rows fetched by queries (per database)	`SELECT datname, tup_fetched FROM pg_stat_database;`
Rows returned by queries (per database)	`SELECT datname, tup_returned FROM pg_stat_database;`
Bytes written temporarily to disk to execute queries (per database)*	`SELECT datname, temp_bytes FROM pg_stat_database;`

Write query throughput and performance metrics—**more info**

METRIC DESCRIPTION	QUERY
Rows inserted, updated, deleted by queries (per database)	`SELECT datname, tup_inserted, tup_updated, tup_deleted FROM pg_stat_database;`
Rows inserted, updated, deleted by queries (per table)	`SELECT relname, n_tup_ins, n_tup_upd, n_tup_del FROM pg_stat_user_tables;`
Heap-only tuple (HOT) updates (per table)	`SELECT relname, n_tup_hot_upd FROM pg_stat_user_tables;`
Total commits and rollbacks across all databases	`SELECT SUM(xact_commit) AS total_commits, SUM(xact_rollback) AS total_rollbacks FROM pg_stat_database;`

Concurrent operations metrics—**more info**

METRIC DESCRIPTION	QUERY
Locks (by table and lock mode)	`SELECT mode, pg_class.relname, count(*) FROM pg_locks JOIN pg_class ON (pg_locks.relation = pg_class.oid) WHERE pg_locks.mode IS NOT NULL AND pg_class.relname NOT LIKE 'pg_%%' GROUP BY pg_class.relname, mode;`
Deadlocks (per database)*	`SELECT datname, deadlocks FROM pg_stat_database;`
Dead rows (per table)	`SELECT relname, n_dead_tup FROM pg_stat_user_tables;`

Connection metrics—**more info**

METRIC DESCRIPTION	QUERY
Number of active connections	`SELECT COUNT(*) FROM pg_stat_activity WHERE state='active';`
Percentage of max connections in use	`SELECT (SELECT SUM(numbackends) FROM pg_stat_database) / (SELECT setting::float FROM pg_settings WHERE name = 'max_connections');`

Disk and index usage—**more info**

METRIC DESCRIPTION	QUERY
Disk space used in bytes, excluding indexes (per table)	`SELECT relname AS "table_name", pg_size_pretty(pg_table_size(C.oid)) AS "table_size" FROM pg_class C LEFT JOIN pg_namespace N ON (N.oid = C.relnamespace) WHERE nspname NOT IN ('pg_catalog', 'information_schema') AND nspname !~ '^pg_toast' AND relkind IN ('r') ORDER BY pg_table_size(C.oid) DESC;`
Number of index scans (per index and per table)	`SELECT indexrelname, relname, idx_scan FROM pg_stat_user_indexes;`

Useful psql commands

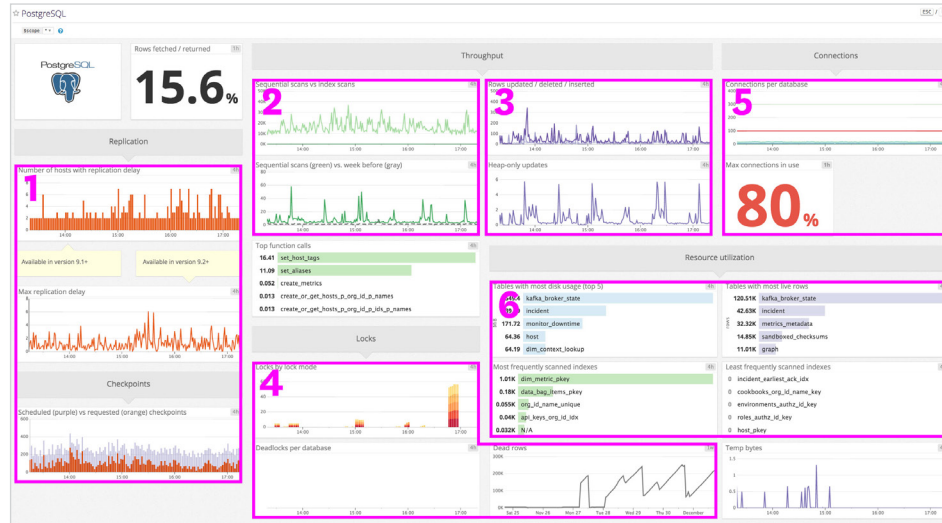|	COMMAND
Check version of PostgreSQL	`SELECT version();`
Show location of `postgresql.conf` file[1]	`SHOW config_file;`
Show location of data directory[1]	`SHOW data_directory;`
Show location of log directory (may be a path relative to data directory)[1]	`SHOW log_directory;`
List all databases	`\l`
List all tables + table size in bytes in the current database	`\dt+`
List all roles and privileges in the current database	`\du`
Check if this server is a standby (in recovery mode)	`SELECT pg_is_in_recovery();`
View connection info	`\conninfo`
Show all available `psql` commands	`\?`

*Available in version 9.2+
[1]Requires superuser privileges

Cheatsheet: PostgreSQL Monitoring with Datadog

Note:
— For metric descriptions and more info: dtdg.co/monitor-postgres

Datadog's out-of-the-box screenboard for monitoring PostgreSQL.

1. Replication and checkpoint metrics—**more info**

METRIC DESCRIPTION	DATADOG METRIC NAME
Replication delay in bytes[1]	postgresql.replication_delay_bytes
Replication delay in seconds	postgresql.replication_delay
Number of checkpoints requested & scheduled	postgresql.bgwriter.checkpoints_requested & postgresql.bgwriter.checkpoints_timed

2. Read query throughput and performance metrics—**more info**

METRIC DESCRIPTION	DATADOG METRIC NAME
Number of index scans (per index and per table)*	postgresql.index_scans
Number of sequential scans (per table)*	postgresql.seq_scans
Rows fetched by queries (per database)	postgresql.rows_fetched
Rows returned by queries (per database)	postgresql.rows_returned
Bytes written temporarily to disk to execute queries (per database)[1]	postgresql.temp_bytes

3. Write query throughput and performance metrics —**more info**

METRIC DESCRIPTION	DATADOG METRIC NAME
Rows inserted, updated, deleted by queries (per database and per table*)	postgresql.rows_inserted, postgresql.rows_updated, postgresql.rows_deleted
Heap-only tuple (HOT) updates (per table)*	postgresql.rows_hot_updated
Total commits and rollbacks across all databases	postgresql.commits + postgresql.rollbacks

4. Concurrent operations metrics—**more info**

METRIC DESCRIPTION	DATADOG METRIC NAME
Locks (by table and lock mode)	postgresql.locks
Deadlocks[1]	postgresql.deadlocks
Dead rows (per table)*	postgresql.dead_rows

5. Connection metrics—**more info**

METRIC DESCRIPTION	DATADOG METRIC NAME
Number of active connections	postgresql.connections
Percentage of max connections in use	postgresql.percent_usage_connections

6. Disk and index usage—**more info**

METRIC DESCRIPTION	DATADOG METRIC NAME
Disk space used in bytes, excluding indexes (per table)*	postgresql.table_size
Number of index scans (per index and per table)*	postgresql.index_scans

Useful psql commands

	COMMAND
Check version of PostgreSQL	SELECT version();
Show location of postgresql.conf file[2]	SHOW config_file;
Show location of data directory[2]	SHOW data_directory;
Show location of log directory (may be a path relative to data directory)[2]	SHOW log_directory;
List all databases	\l
List all tables + table size in bytes in the current database	\dt+
List all roles and privileges in the current database	\du
Check if this server is a standby (in recovery mode)	SELECT pg_is_in_recovery();
View connection info	\conninfo
Show all available psql commands	\?

*The Datadog Agent must be configured to track per-relation metrics
[1]Available in version 9.2+
[2]Requires superuser privileges