

## Приложение 2

### Настройка сервера PostgreSQL

В PostgreSQL существует большое количество параметров, влияющих на работу СУБД. Параметры позволяют управлять потреблением ресурсов, настраивать работу серверных процессов и многое другое. Например, при помощи параметра `max_connections` можно ограничить количество одновременных подключений к серверу. Полный список и описание параметров конфигурации: <https://postgrespro.ru/docs/postgresql/13/runtime-config.html> (<https://postgrespro.ru/docs/postgresql/13/runtime-config.html>).

Для установки параметров, в первую очередь, используются файлы конфигурации. Если не определено иное, значения, установленные в этих файлах, действуют для всего экземпляра СУБД. Ряд параметров можно установить для сеансов в отдельной базе данных или для сеансов отдельного пользователя. Такие установки будут иметь предпочтение перед файлами конфигурации. Мы подробнее коснемся этого варианта в следующих темах курса. Наконец, многими параметрами можно управлять на уровне отдельного сеанса, прямо во время работы.

Основной конфигурационный файл — `postgresql.conf`. Расположение файла задается при сборке PostgreSQL. По умолчанию файл располагается в каталоге с данными (PGDATA), но пакетные дистрибутивы обычно размещают этот файл в другом месте, в соответствии с правилами, принятыми в конкретной ОС.

Ввод [26]:

1 !echo 314159 | sudo -S ls -l "/etc/postgresql/15/main/"

[sudo] password for evgeny: total 60  
drwxr-xr-x 2 postgres postgres 4096 May 7 15:53 conf.d  
-rw-r--r-- 1 postgres postgres 315 May 7 15:53 environment  
-rw-r--r-- 1 postgres postgres 143 May 7 15:53 pg\_ctl.conf  
-rw-r----- 1 postgres postgres 5005 May 7 15:59 pg\_hba.conf  
-rw-r----- 1 postgres postgres 1636 May 7 15:53 pg\_ident.conf  
-rw-r--r-- 1 postgres postgres 29725 May 7 15:53 postgresql.conf  
-rw-r--r-- 1 postgres postgres 317 May 7 15:53 start.conf

Ввод [29]:

```
1 # Вот содержимое стандартного файла конфигурации.
2 # Большинство настроек в нем закомментированы,
3 # так как являются настройками по-умолчанию.
4 # При необходимости их изменения можно внести
5 # изменения в данный файл или воспользоваться
6 # предоставленным АПИ
7
8 !echo 314159 | sudo -S cat "/etc/postgresql/15/main/postgresql.conf"
```

[illegible]

```

#client_connection_check_interval = 0      # time between checks for client
                                           # disconnection while running queries;
                                           # 0 for never

# - Authentication -

#authentication_timeout = 1min              # 1s-600s
#password_encryption = scram-sha-256       # scram-sha-256 or md5
#db_user_namespace = off

# GSSAPI using Kerberos
#krb_server_keyfile = 'FILE:${sysconfdir}/krb5.keytab'
#krb_caseins_users = off

# - SSL -

ssl = on
#ssl_ca_file = ''
ssl_cert_file = '/etc/ssl/certs/ssl-cert-snakeoil.pem'
#ssl_crl_file = ''
#ssl_crl_dir = ''
ssl_key_file = '/etc/ssl/private/ssl-cert-snakeoil.key'
#ssl_ciphers = 'HIGH:MEDIUM:+3DES:!aNULL' # allowed SSL ciphers
#ssl_prefer_server_ciphers = on
#ssl_ecdh_curve = 'prime256v1'
#ssl_min_protocol_version = 'TLSv1.2'
#ssl_max_protocol_version = ''
#ssl_dh_params_file = ''
#ssl_passphrase_command = ''
#ssl_passphrase_command_supports_reload = off

#-----
# RESOURCE USAGE (except WAL)
#-----

# - Memory -

shared_buffers = 128MB                    # min 128kB
                                           # (change requires restart)
#huge_pages = try                         # on, off, or try
                                           # (change requires restart)
#huge_page_size = 0                       # zero for system default
                                           # (change requires restart)
#temp_buffers = 8MB                       # min 800kB
#max_prepared_transactions = 0            # zero disables the feature
                                           # (change requires restart)
# Caution: it is not advisable to set max_prepared_transactions nonzero unless
# you actively intend to use prepared transactions.
#work_mem = 4MB                           # min 64kB
#hash_mem_multiplier = 2.0                # 1-1000.0 multiplier on hash table work_mem
#maintenance_work_mem = 64MB              # min 1MB
#autovacuum_work_mem = -1                  # min 1MB, or -1 to use maintenance_work_mem
#logical_decoding_work_mem = 64MB         # min 64kB
#max_stack_depth = 2MB                    # min 100kB
#shared_memory_type = mmap                # the default is the first option
                                           # supported by the operating system:
                                           #   mmap
                                           #   sysv
                                           #   windows
                                           # (change requires restart)
dynamic_shared_memory_type = posix         # the default is usually the first option
                                           # supported by the operating system:
                                           #   posix
                                           #   sysv
                                           #   windows
                                           #   mmap
                                           # (change requires restart)
#min_dynamic_shared_memory = 0MB           # (change requires restart)

# - Disk -

#temp_file_limit = -1                     # limits per-process temp file space
                                           # in kilobytes, or -1 for no limit

# - Kernel Resources -

#max_files_per_process = 1000              # min 64
                                           # (change requires restart)

# - Cost-Based Vacuum Delay -

#vacuum_cost_delay = 0                     # 0-100 milliseconds (0 disables)
#vacuum_cost_page_hit = 1                  # 0-10000 credits
#vacuum_cost_page_miss = 2                 # 0-10000 credits
#vacuum_cost_page_dirty = 20               # 0-10000 credits
#vacuum_cost_limit = 200                   # 1-10000 credits

```

[illegible]

[illegible]

```

#wal_retrieve_retry_interval = 5s      # time to wait before retrying to
#recover_min_apply_delay = 0          # retrieve WAL after a failed attempt
# minimum delay for applying changes during recovery

# - Subscribers -

# These settings are ignored on a publisher.

#max_logical_replication_workers = 4    # taken from max_worker_processes
# (change requires restart)
#max_sync_workers_per_subscription = 2  # taken from max_logical_replication_workers

#-----
# QUERY TUNING
#-----

# - Planner Method Configuration -

#enable_async_append = on
#enable_bitmapscan = on
#enable_gathermerge = on
#enable_hashagg = on
#enable_hashjoin = on
#enable_incremental_sort = on
#enable_indexscan = on
#enable_indexonlyscan = on
#enable_material = on
#enable_memoize = on
#enable_mergejoin = on
#enable_nestloop = on
#enable_parallel_append = on
#enable_parallel_hash = on
#enable_partition_pruning = on
#enable_partitionwise_join = off
#enable_partitionwise_aggregate = off
#enable_seqscan = on
#enable_sort = on
#enable_tidscan = on

# - Planner Cost Constants -

#seq_page_cost = 1.0                  # measured on an arbitrary scale
#random_page_cost = 4.0               # same scale as above
#cpu_tuple_cost = 0.01                # same scale as above
#cpu_index_tuple_cost = 0.005         # same scale as above
#cpu_operator_cost = 0.0025           # same scale as above
#parallel_setup_cost = 1000.0         # same scale as above
#parallel_tuple_cost = 0.1            # same scale as above
#min_parallel_table_scan_size = 8MB
#min_parallel_index_scan_size = 512kB
#effective_cache_size = 4GB

#jit_above_cost = 100000              # perform JIT compilation if available
# and query more expensive than this;
# -1 disables
#jit_inline_above_cost = 500000       # inline small functions if query is
# more expensive than this; -1 disables
#jit_optimize_above_cost = 500000     # use expensive JIT optimizations if
# query is more expensive than this;
# -1 disables

# - Genetic Query Optimizer -

#geqo = on
#geqo_threshold = 12
#geqo_effort = 5                      # range 1-10
#geqo_pool_size = 0                   # selects default based on effort
#geqo_generations = 0                 # selects default based on effort
#geqo_selection_bias = 2.0            # range 1.5-2.0
#geqo_seed = 0.0                     # range 0.0-1.0

# - Other Planner Options -

#default_statistics_target = 100      # range 1-10000
#constraint_exclusion = partition     # on, off, or partition
#cursor_tuple_fraction = 0.1         # range 0.0-1.0
#from_collapse_limit = 8
#jit = on                             # allow JIT compilation
#join_collapse_limit = 8              # 1 disables collapsing of explicit
# JOIN clauses
#plan_cache_mode = auto               # auto, force_generic_plan or
# force_custom_plan
#recursive_worktable_factor = 10.0    # range 0.001-1000000

#-----
# REPORTING AND LOGGING

```

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#-----

# - Where to Log -

#log_destination = 'stderr'          # Valid values are combinations of
                                     # stderr, csvlog, jsonlog, syslog, and
                                     # eventlog, depending on platform.
                                     # csvlog and jsonlog require
                                     # logging_collector to be on.

# This is used when logging to stderr:
#logging_collector = off              # Enable capturing of stderr, jsonlog,
                                     # and csvlog into log files. Required
                                     # to be on for csvlogs and jsonlogs.
                                     # (change requires restart)

# These are only used if logging_collector is on:
#log_directory = 'log'                # directory where log files are written,
                                     # can be absolute or relative to PGDATA
#log_filename = 'postgresql-%Y-%m-%d_%H%M%S.log' # log file name pattern,
                                     # can include strftime() escapes
#log_file_mode = 0600                # creation mode for log files,
                                     # begin with 0 to use octal notation
#log_rotation_age = 1d                # Automatic rotation of logfiles will
                                     # happen after that time. 0 disables.
#log_rotation_size = 10MB            # Automatic rotation of logfiles will
                                     # happen after that much log output.
                                     # 0 disables.
#log_truncate_on_rotation = off       # If on, an existing log file with the
                                     # same name as the new log file will be
                                     # truncated rather than appended to.
                                     # But such truncation only occurs on
                                     # time-driven rotation, not on restarts
                                     # or size-driven rotation. Default is
                                     # off, meaning append to existing files
                                     # in all cases.

# These are relevant when logging to syslog:
#syslog_facility = 'LOCAL0'
#syslog_ident = 'postgres'
#syslog_sequence_numbers = on
#syslog_split_messages = on

# This is only relevant when logging to eventlog (Windows):
# (change requires restart)
#event_source = 'PostgreSQL'

# - When to Log -

#log_min_messages = warning           # values in order of decreasing detail:
                                     # debug5
                                     # debug4
                                     # debug3
                                     # debug2
                                     # debug1
                                     # info
                                     # notice
                                     # warning
                                     # error
                                     # log
                                     # fatal
                                     # panic

#log_min_error_statement = error      # values in order of decreasing detail:
                                     # debug5
                                     # debug4
                                     # debug3
                                     # debug2
                                     # debug1
                                     # info
                                     # notice
                                     # warning
                                     # error
                                     # log
                                     # fatal
                                     # panic (effectively off)

#log_min_duration_statement = -1      # -1 is disabled, 0 logs all statements
                                     # and their durations, > 0 logs only
                                     # statements running at least this number
                                     # of milliseconds

#log_min_duration_sample = -1         # -1 is disabled, 0 logs a sample of statements
                                     # and their durations, > 0 logs only a sample of
                                     # statements running at least this number
                                     # of milliseconds;
                                     # sample fraction is determined by log_statement_sample_rate

```



```

#log_statement_sample_rate = 1.0      # fraction of logged statements exceeding
                                       # log_min_duration_sample to be logged;
                                       # 1.0 logs all such statements, 0.0 never logs

#log_transaction_sample_rate = 0.0    # fraction of transactions whose statements
                                       # are logged regardless of their duration; 1.0 logs all
                                       # statements from all transactions, 0.0 never logs

#log_startup_progress_interval = 10s  # Time between progress updates for
                                       # long-running startup operations.
                                       # 0 disables the feature, > 0 indicates
                                       # the interval in milliseconds.

# - What to Log -

#debug_print_parse = off
#debug_print_rewritten = off
#debug_print_plan = off
#debug_pretty_print = on
#log_autovacuum_min_duration = 10min  # log autovacuum activity;
                                       # -1 disables, 0 logs all actions and
                                       # their durations, > 0 logs only
                                       # actions running at least this number
                                       # of milliseconds.

#log_checkpoints = on
#log_connections = off
#log_disconnections = off
#log_duration = off
#log_error_verbosity = default        # terse, default, or verbose messages
#log_hostname = off
log_line_prefix = '%m [%p] %q%u@d '  # special values:
                                       # %a = application name
                                       # %u = user name
                                       # %d = database name
                                       # %r = remote host and port
                                       # %h = remote host
                                       # %b = backend type
                                       # %p = process ID
                                       # %P = process ID of parallel group leader
                                       # %t = timestamp without milliseconds
                                       # %m = timestamp with milliseconds
                                       # %n = timestamp with milliseconds (as a Unix epoch)
                                       # %Q = query ID (0 if none or not computed)
                                       # %i = command tag
                                       # %e = SQL state
                                       # %c = session ID
                                       # %l = session line number
                                       # %s = session start timestamp
                                       # %v = virtual transaction ID
                                       # %x = transaction ID (0 if none)
                                       # %q = stop here in non-session
                                       #       processes
                                       # %% = '%'
                                       # e.g. '<%u%%d> '

#log_lock_waits = off                 # log lock waits >= deadlock_timeout
#log_recovery_conflict_waits = off    # log standby recovery conflict waits
                                       # >= deadlock_timeout
#log_parameter_max_length = -1        # when logging statements, limit logged
                                       # bind-parameter values to N bytes;
                                       # -1 means print in full, 0 disables
#log_parameter_max_length_on_error = 0 # when logging an error, limit logged
                                       # bind-parameter values to N bytes;
                                       # -1 means print in full, 0 disables
#log_statement = 'none'               # none, ddl, mod, all
#log_replication_commands = off
#log_temp_files = -1                 # log temporary files equal or larger
                                       # than the specified size in kilobytes;
                                       # -1 disables, 0 logs all temp files

log_timezone = 'Asia/Singapore'

#-----
# PROCESS TITLE
#-----

cluster_name = '15/main'              # added to process titles if nonempty
                                       # (change requires restart)
#update_process_title = on

#-----
# STATISTICS
#-----

# - Cumulative Query and Index Statistics -

#track_activities = on

```

```

#track_activity_query_size = 1024      # (change requires restart)
#track_counts = on
#track_io_timing = off
#track_wal_io_timing = off
#track_functions = none                # none, pl, all
#stats_fetch_consistency = cache

# - Monitoring -

#compute_query_id = auto
#log_statement_stats = off
#log_parser_stats = off
#log_planner_stats = off
#log_executor_stats = off

#-----
# AUTOVACUUM
#-----

#autovacuum = on                      # Enable autovacuum subprocess? 'on'
#                                     # requires track_counts to also be on.
#autovacuum_max_workers = 3           # max number of autovacuum subprocesses
#                                     # (change requires restart)
#autovacuum_naptime = 1min             # time between autovacuum runs
#autovacuum_vacuum_threshold = 50      # min number of row updates before
#                                     # vacuum
#autovacuum_vacuum_insert_threshold = 1000 # min number of row inserts
#                                     # before vacuum; -1 disables insert
#                                     # vacuums
#autovacuum_analyze_threshold = 50     # min number of row updates before
#                                     # analyze
#autovacuum_vacuum_scale_factor = 0.2  # fraction of table size before vacuum
#autovacuum_vacuum_insert_scale_factor = 0.2 # fraction of inserts over table
#                                     # size before insert vacuum
#autovacuum_analyze_scale_factor = 0.1 # fraction of table size before analyze
#autovacuum_freeze_max_age = 200000000 # maximum XID age before forced vacuum
#                                     # (change requires restart)
#autovacuum_multixact_freeze_max_age = 400000000 # maximum multixact age
#                                     # before forced vacuum
#                                     # (change requires restart)
#autovacuum_vacuum_cost_delay = 2ms    # default vacuum cost delay for
#                                     # autovacuum, in milliseconds;
#                                     # -1 means use vacuum_cost_delay
#autovacuum_vacuum_cost_limit = -1     # default vacuum cost limit for
#                                     # autovacuum, -1 means use
#                                     # vacuum_cost_limit

#-----
# CLIENT CONNECTION DEFAULTS
#-----

# - Statement Behavior -

#client_min_messages = notice          # values in order of decreasing detail:
#                                     #   debug5
#                                     #   debug4
#                                     #   debug3
#                                     #   debug2
#                                     #   debug1
#                                     #   log
#                                     #   notice
#                                     #   warning
#                                     #   error
#search_path = '$user', public         # schema names
#row_security = on
#default_table_access_method = 'heap'
#default_tablespace = ''               # a tablespace name, '' uses the default
#                                     # 'pglz' or 'lz4'
#default_toast_compression = 'pglz'   # a list of tablespace names, '' uses
#                                     # only default tablespace
#check_function_bodies = on
#default_transaction_isolation = 'read committed'
#default_transaction_read_only = off
#default_transaction_deferrable = off
#session_replication_role = 'origin'
#statement_timeout = 0                 # in milliseconds, 0 is disabled
#lock_timeout = 0                     # in milliseconds, 0 is disabled
#idle_in_transaction_session_timeout = 0 # in milliseconds, 0 is disabled
#idle_session_timeout = 0             # in milliseconds, 0 is disabled
#vacuum_freeze_table_age = 150000000
#vacuum_freeze_min_age = 50000000
#vacuum_failsafe_age = 1600000000
#vacuum_multixact_freeze_table_age = 150000000
#vacuum_multixact_freeze_min_age = 5000000
#vacuum_multixact_failsafe_age = 1600000000

```

```

#bytea_output = 'hex'                # hex, escape
#xmlbinary = 'base64'
#xmloption = 'content'
#gin_pending_list_limit = 4MB

# - Locale and Formatting -

datestyle = 'iso, dmy'
#intervalstyle = 'postgres'
timezone = 'Asia/Singapore'
#timezone_abbreviations = 'Default'   # Select the set of available time zone
                                      # abbreviations. Currently, there are
                                      #   Default
                                      #   Australia (historical usage)
                                      #   India
                                      # You can create your own file in
                                      # share/timezonesets/.
#extra_float_digits = 1               # min -15, max 3; any value >0 actually
                                      # selects precise output mode
#client_encoding = sql_ascii          # actually, defaults to database
                                      # encoding

# These settings are initialized by initdb, but they can be changed.
lc_messages = 'en_SG.UTF-8'          # locale for system error message
                                      # strings
lc_monetary = 'en_SG.UTF-8'          # locale for monetary formatting
lc_numeric = 'en_SG.UTF-8'           # locale for number formatting
lc_time = 'en_SG.UTF-8'              # locale for time formatting

# default configuration for text search
default_text_search_config = 'pg_catalog.english'

# - Shared Library Preloading -

#local_preload_libraries = ''
#session_preload_libraries = ''
#shared_preload_libraries = ''       # (change requires restart)
#jit_provider = 'llvmjit'            # JIT library to use

# - Other Defaults -

#dynamic_library_path = '$libdir'
#extension_destdir = ''              # prepend path when loading extensions
                                      # and shared objects (added by Debian)
#gin_fuzzy_search_limit = 0

#-----
# LOCK MANAGEMENT
#-----

#deadlock_timeout = 1s
#max_locks_per_transaction = 64      # min 10
                                      # (change requires restart)
#max_pred_locks_per_transaction = 64 # min 10
                                      # (change requires restart)
#max_pred_locks_per_relation = -2    # negative values mean
                                      # (max_pred_locks_per_transaction
                                      # / -max_pred_locks_per_relation) - 1
#max_pred_locks_per_page = 2         # min 0

#-----
# VERSION AND PLATFORM COMPATIBILITY
#-----

# - Previous PostgreSQL Versions -

#array_nulls = on
#backslash_quote = safe_encoding     # on, off, or safe_encoding
#escape_string_warning = on
#lo_compat_privileges = off
#quote_all_identifiers = off
#standard_conforming_strings = on
#synchronize_seqscans = on

# - Other Platforms and Clients -

#transform_null_equals = off

#-----
# ERROR HANDLING
#-----

#exit_on_error = off                 # terminate session on any error?
#restart_after_crash = on            # reinitialize after backend crash?
#data_sync_retry = off               # retry or panic on failure to fsync

```

```

# recovery_init_sync_method = fsync          # data?
                                              # (change requires restart)
                                              # fsync, syncfs (Linux 5.8+)

#-----
# CONFIG FILE INCLUDES
#-----

# These options allow settings to be loaded from files other than the
# default postgresql.conf.  Note that these are directives, not variable
# assignments, so they can usefully be given more than once.

include_dir = 'conf.d'                      # include files ending in '.conf' from
                                              # a directory, e.g., 'conf.d'
#include_if_exists = '...'                  # include file only if it exists
#include = '...'                            # include file

#-----
# CUSTOMIZED OPTIONS
#-----

# Add settings for extensions here

```

Ввод [34]:

```

1 # Чтобы увидеть все незакомментированные строки
2 # конфигурационного файла, можно обратиться к
3 # представлению pg_file_settings:
4
5 !psql -U postgres -c "SELECT sourceline, name, setting, applied FROM pg_file_settings"

```

sourceline	name	setting	applied
42	data_directory	/var/lib/postgresql/15/main	t
44	hba_file	/etc/postgresql/15/main/pg_hba.conf	t
46	ident_file	/etc/postgresql/15/main/pg_ident.conf	t
50	external_pid_file	/var/run/postgresql/15-main.pid	t
64	port	5432	t
65	max_connections	100	t
67	unix_socket_directories	/var/run/postgresql	t
105	ssl	on	t
107	ssl_cert_file	/etc/ssl/certs/ssl-cert-snakeoil.pem	t
110	ssl_key_file	/etc/ssl/private/ssl-cert-snakeoil.key	t
127	shared_buffers	128MB	t
150	dynamic_shared_memory_type	posix	t
241	max_wal_size	1GB	t
242	min_wal_size	80MB	t
559	log_line_prefix	%m [%p] %q%u@%d	t
597	log_timezone	Asia/Singapore	t
604	cluster_name	15/main	t
711	datestyle	iso, dmy	t
713	timezone	Asia/Singapore	t
727	lc_messages	en_SG.UTF-8	t
729	lc_monetary	en_SG.UTF-8	t
730	lc_numeric	en_SG.UTF-8	t
731	lc_time	en_SG.UTF-8	t
734	default_text_search_config	pg_catalog.english	t

(24 rows)

Ввод [44]:

```
1 # Действующие значения всех параметров
2 # доступны в представлении pg_settings.
3 # Вот что в нем содержится, например,
4 # для параметра work_mem:
5
6 !psql -U postgres -c "SELECT name, setting, unit FROM pg_settings"
```

name	setting	unit
allow_in_place_tablespace	off	
allow_system_table_mods	off	
application_name	psql	
archive_cleanup_command		
archive_command	(disabled)	
archive_library		
archive_mode	off	
archive_timeout	0	s
array_nulls	on	
authentication_timeout	60	s
autovacuum	on	
autovacuum_analyze_scale_factor	0.1	
autovacuum_analyze_threshold	50	
autovacuum_freeze_max_age	200000000	
autovacuum_max_workers	3	
autovacuum_multixact_freeze_max_age	400000000	
autovacuum_naptime	60	s
autovacuum_vacuum_cost_delay	2	ms
autovacuum_vacuum_cost_limit	-1	
autovacuum_vacuum_insert_scale_factor	0.2	
autovacuum_vacuum_insert_threshold	1000	
autovacuum_vacuum_scale_factor	0.2	
autovacuum_vacuum_threshold	50	
autovacuum_work_mem	-1	kB
backend_flush_after	0	8kB
backslash_quote	safe_encoding	
backtrace_functions		
bgwriter_delay	200	ms
bgwriter_flush_after	64	8kB
bgwriter_lru_maxpages	100	
bgwriter_lru_multiplier	2	
block_size	8192	
bonjour	off	
bonjour_name		
bytea_output	hex	
check_function_bodies	on	
checkpoint_completion_target	0.9	
checkpoint_flush_after	32	8kB
checkpoint_timeout	300	s
checkpoint_warning	30	s
client_connection_check_interval	0	ms
client_encoding	UTF8	
client_min_messages	notice	
cluster_name	15/main	
commit_delay	0	
commit_siblings	5	
compute_query_id	auto	
config_file	/etc/postgresql/15/main/postgresql.conf	
constraint_exclusion	partition	
cpu_index_tuple_cost	0.005	
cpu_operator_cost	0.0025	
cpu_tuple_cost	0.01	
cursor_tuple_fraction	0.1	
data_checksums	off	
data_directory	/var/lib/postgresql/15/main	
data_directory_mode	0700	
data_sync_retry	off	
DateStyle	ISO, DMY	
db_user_namespace	off	
deadlock_timeout	1000	ms
debug_assertions	off	
debug_discard_caches	0	
debug_pretty_print	on	
debug_print_parse	off	
debug_print_plan	off	
debug_print_rewritten	off	
default_statistics_target	100	
default_table_access_method	heap	
default_tablespace		
default_text_search_config	pg_catalog.english	
default_toast_compression	pglz	
default_transaction_deferrable	off	
default_transaction_isolation	read committed	
default_transaction_read_only	off	
dynamic_library_path	\$libdir	
dynamic_shared_memory_type	posix	
effective_cache_size	524288	8kB
effective_io_concurrency	1	
enable_async_append	on	
enable_bitmapscan	on	
enable_gathermerge	on	
enable_hashagg	on	
enable_hashjoin	on	
enable_incremental_sort	on	
enable_indexonlyscan	on	
enable_indexscan	on	

enable_material	on	
enable_memoize	on	
enable_mergejoin	on	
enable_nestloop	on	
enable_parallel_append	on	
enable_parallel_hash	on	
enable_partition_pruning	on	
enable_partitionwise_aggregate	off	
enable_partitionwise_join	off	
enable_seqscan	on	
enable_sort	on	
enable_tidscan	on	
escape_string_warning	on	
event_source	PostgreSQL	
exit_on_error	off	
extension_destdir		
external_pid_file	/var/run/postgresql/15-main.pid	
extra_float_digits	1	
force_parallel_mode	off	
from_collapse_limit	8	
fsync	on	
full_page_writes	on	
geqo	on	
geqo_effort	5	
geqo_generations	0	
geqo_pool_size	0	
geqo_seed	0	
geqo_selection_bias	2	
geqo_threshold	12	
gin_fuzzy_search_limit	0	
gin_pending_list_limit	4096	kB
hash_mem_multiplier	2	
hba_file	/etc/postgresql/15/main/pg_hba.conf	
hot_standby	on	
hot_standby_feedback	off	
huge_page_size	0	kB
huge_pages	try	
ident_file	/etc/postgresql/15/main/pg_ident.conf	
idle_in_transaction_session_timeout	0	ms
idle_session_timeout	0	ms
ignore_checksum_failure	off	
ignore_invalid_pages	off	
ignore_system_indexes	off	
in_hot_standby	off	
integer_datetimes	on	
IntervalStyle	postgres	
jit	on	
jit_above_cost	100000	
jit_debugging_support	off	
jit_dump_bitcode	off	
jit_expressions	on	
jit_inline_above_cost	500000	
jit_optimize_above_cost	500000	
jit_profiling_support	off	
jit_provider	llvmjit	
jit_tuple_deforming	on	
join_collapse_limit	8	
krb_caseins_users	off	
krb_server_keyfile	FILE:/etc/postgresql-common/krb5.keytab	
lc_collate	en_SG.UTF-8	
lc_ctype	en_SG.UTF-8	
lc_messages	en_SG.UTF-8	
lc_monetary	en_SG.UTF-8	
lc_numeric	en_SG.UTF-8	
lc_time	en_SG.UTF-8	
listen_addresses	localhost	
lo_compat_privileges	off	
local_preload_libraries		
lock_timeout	0	ms
log_autovacuum_min_duration	600000	ms
log_checkpoints	on	
log_connections	off	
log_destination	stderr	
log_directory	log	
log_disconnections	off	
log_duration	off	
log_error_verbosity	default	
log_executor_stats	off	
log_file_mode	0600	
log_filename	postgresql-%Y-%m-%d_%H%M%S.log	
log_hostname	off	
log_line_prefix	%m [%p] %q%u@d	
log_lock_waits	off	
log_min_duration_sample	-1	ms
log_min_duration_statement	-1	ms
log_min_error_statement	error	
log_min_messages	warning	
log_parameter_max_length	-1	B

log_parameter_max_length_on_error	0	B
log_parser_stats	off	
log_planner_stats	off	
log_recovery_conflict_waits	off	
log_replication_commands	off	
log_rotation_age	1440	min
log_rotation_size	10240	kB
log_startup_progress_interval	10000	ms
log_statement	none	
log_statement_sample_rate	1	
log_statement_stats	off	
log_temp_files	-1	kB
log_timezone	Asia/Singapore	
log_transaction_sample_rate	0	
log_truncate_on_rotation	off	
logging_collector	off	
logical_decoding_work_mem	65536	kB
maintenance_io_concurrency	10	
maintenance_work_mem	65536	kB
max_connections	100	
max_files_per_process	1000	
max_function_args	100	
max_identifier_length	63	
max_index_keys	32	
max_locks_per_transaction	64	
max_logical_replication_workers	4	
max_parallel_maintenance_workers	2	
max_parallel_workers	8	
max_parallel_workers_per_gather	2	
max_pred_locks_per_page	2	
max_pred_locks_per_relation	-2	
max_pred_locks_per_transaction	64	
max_prepared_transactions	0	
max_replication_slots	10	
max_slot_wal_keep_size	-1	MB
max_stack_depth	2048	kB
max_standby_archive_delay	30000	ms
max_standby_streaming_delay	30000	ms
max_sync_workers_per_subscription	2	
max_wal_senders	10	
max_wal_size	1024	MB
max_worker_processes	8	
min_dynamic_shared_memory	0	MB
min_parallel_index_scan_size	64	8kB
min_parallel_table_scan_size	1024	8kB
min_wal_size	80	MB
old_snapshot_threshold	-1	min
parallel_leader_participation	on	
parallel_setup_cost	1000	
parallel_tuple_cost	0.1	
password_encryption	scram-sha-256	
plan_cache_mode	auto	
port	5432	
post_auth_delay	0	s
pre_auth_delay	0	s
primary_conninfo		
primary_slot_name		
promote_trigger_file		
quote_all_identifiers	off	
random_page_cost	4	
recovery_end_command		
recovery_init_sync_method	fsync	
recovery_min_apply_delay	0	ms
recovery_prefetch	try	
recovery_target		
recovery_target_action	pause	
recovery_target_inclusive	on	
recovery_target_lsn		
recovery_target_name		
recovery_target_time		
recovery_target_timeline	latest	
recovery_target_xid		
recursive_worktable_factor	10	
remove_temp_files_after_crash	on	
restart_after_crash	on	
restore_command		
row_security	on	
search_path	"\$user", public	
segment_size	131072	8kB
seq_page_cost	1	
server_encoding	UTF8	
server_version	15.6 (Debian 15.6-0+deb12u1)	
server_version_num	150006	
session_preload_libraries		
session_replication_role	origin	
shared_buffers	16384	8kB
shared_memory_size	143	MB
shared_memory_size_in_huge_pages	72	



shared_memory_type	mmap	
shared_preload_libraries		
ssl	on	
ssl_ca_file		
ssl_cert_file	/etc/ssl/certs/ssl-cert-snakeoil.pem	
ssl_ciphers	HIGH:MEDIUM:+3DES:!aNULL	
ssl_crl_dir		
ssl_crl_file		
ssl_dh_params_file		
ssl_ecdh_curve	prime256v1	
ssl_key_file	/etc/ssl/private/ssl-cert-snakeoil.key	
ssl_library	OpenSSL	
ssl_max_protocol_version		
ssl_min_protocol_version	TLSv1.2	
ssl_passphrase_command		
ssl_passphrase_command_supports_reload	off	
ssl_prefer_server_ciphers	on	
standard_conforming_strings	on	
statement_timeout	0	ms
stats_fetch_consistency	cache	
superuser_reserved_connections	3	
synchronize_seqscans	on	
synchronous_commit	on	
synchronous_standby_names		
syslog_facility	local0	
syslog_ident	postgres	
syslog_sequence_numbers	on	
syslog_split_messages	on	
tcp_keepalives_count	0	
tcp_keepalives_idle	0	s
tcp_keepalives_interval	0	s
tcp_user_timeout	0	ms
temp_buffers	1024	8kB
temp_file_limit	-1	kB
temp_tablespace		
TimeZone	Asia/Singapore	
timezone_abbreviations	Default	
trace_notify	off	
trace_recovery_messages	log	
trace_sort	off	
track_activities	on	
track_activity_query_size	1024	B
track_commit_timestamp	off	
track_counts	on	
track_functions	none	
track_io_timing	off	
track_wal_io_timing	off	
transaction_deferrable	off	
transaction_isolation	read committed	
transaction_read_only	off	
transform_null_equals	off	
unix_socket_directories	/var/run/postgresql	
unix_socket_group		
unix_socket_permissions	0777	
update_process_title	on	
vacuum_cost_delay	0	ms
vacuum_cost_limit	200	
vacuum_cost_page_dirty	20	
vacuum_cost_page_hit	1	
vacuum_cost_page_miss	2	
vacuum_defer_cleanup_age	0	
vacuum_failsafe_age	1600000000	
vacuum_freeze_min_age	50000000	
vacuum_freeze_table_age	150000000	
vacuum_multixact_failsafe_age	1600000000	
vacuum_multixact_freeze_min_age	5000000	
vacuum_multixact_freeze_table_age	150000000	
wal_block_size	8192	
wal_buffers	512	8kB
wal_compression	off	
wal_consistency_checking		
wal_decode_buffer_size	524288	B
wal_init_zero	on	
wal_keep_size	0	MB
wal_level	replica	
wal_log_hints	off	
wal_receiver_create_temp_slot	off	
wal_receiver_status_interval	10	s
wal_receiver_timeout	60000	ms
wal_recycle	on	
wal_retrieve_retry_interval	5000	ms
wal_segment_size	16777216	B
wal_sender_timeout	60000	ms
wal_skip_threshold	2048	kB
wal_sync_method	fdatasync	
wal_writer_delay	200	ms
wal_writer_flush_after	128	8kB
work_mem	4096	kB

xmlbinary		base64	
xmloption		content	
zero_damaged_pages		off	
(353 rows)			

Изменить параметры конфигурации можно глобально для всего кластера, изменив соответствующий параметр в файле настроек или с помощью команды:

```
ALTER SYSTEM SET <параметр> TO <значение>
```

Сбросить параметр можно так:

```
ALTER SYSTEM RESET <параметр>
```

Или сбросить все параметра установленные ранее:

```
ALTER SYSTEM RESET ALL
```

Более подробно в документации <https://postgrespro.ru/docs/postgresql/13/sql-alterssystem.html> (<https://postgrespro.ru/docs/postgresql/13/sql-alterssystem.html>).