Key Columns & Their Meaning

Column	Description	Example
datid	OID (object ID) of the connected database	16384
datname	Name of the connected database	mydb
pid	Process ID of the backend process	24587
leader_pid	PID of the parallel query leader (if this backend is a worker)	NULL
usesysid	OID of the user logged in	10
usename	Name of the user logged in	postgres
application_name	Name the client application sets (via application_name parameter)	psql
client_addr	IP address of the connected client	10.83.40.50
client_hostname	Hostname (if available; requires reverse DNS lookup)	client1.local
client_port	Port number of the client's connection	54022
backend_start	When the backend process started	2025-08-12 11:05:33+05:30
xact_start	Time when the current transaction started (NULL if no transaction active)	2025-08-12 11:06:00+05:30
query_start	Time when the current query started	2025-08-12 11:06:05+05:30
state_change	Last time the state column changed	2025-08-12 11:06:07+05:30
wait_event_type	Category of event backend is waiting for (e.g., Lock, LWLock, IO)	Lock
wait_event	Specific event being waited on	transactionid

What is pg_stat_activity?

- It's a system view in PostgreSQL.
- Shows information about all current sessions/queries connected to the database.
- Helps DBAs monitor:

1. Running queries
2. Idle connections
3. Locks and blocking sessions
4. Activity on primary/replica

1. state — What the session is doing overall:-

State	Meaning
active	Running a query right now.
idle	Not doing anything; waiting for the next query from the client.
idle in transaction	Transaction started but no query is running — can cause table bloat if held too long.
idle in transaction (aborted)	Transaction failed but not yet rolled back.
fastpath function call	Special fast-path function execution.
disabled	Tracking is turned off (when track_activities = off).

❖ . **How a session becomes idle:-**

- This happens when:
- There is no active transaction, and

- The client has finished sending a query but hasn't sent a new one yet.

-- Client connects

SELECT now(); -- Runs a query

-- PostgreSQL executes it, sends results back

-- Now it waits for next query → state = 'idle'

❖ Timeline:

1. Before query: state = idle (waiting for command).
2. While query runs: state = active.
3. After query finishes: no transaction open → state = idle.

 Nothing dangerous — it's like the connection is parked and waiting.

2. How a session becomes idle in transaction:-

- This happens when:
- The client starts a transaction (BEGIN),
- Runs one or more queries,
- Then pauses without committing or rolling back.

BEGIN; -- Transaction starts

SELECT * FROM orders; -- Runs a query

-- Query finishes, but transaction is still open
-- Client sends nothing → state = 'idle in transaction'

- Timeline:

1. BEGIN runs: state changes to active (executing command).
2. SELECT runs: still active.
3. Query finishes: transaction is still open → state = idle in transaction.

⚠Why dangerous?

4. Holds locks.

5. Blocks autovacuum.

6. Can block other queries until commit/rollback.

❖ Visual analogy

1. idle = You walked into a shop, bought something, and left. Now you're just standing outside waiting.

2. idle in transaction = You walked into a shop, started putting items in the cart, but you're just standing there not moving. The shop can't close the counter because you haven't checked out.

3. wait_event_type — The category of what it's waiting for:-

wait_event_type	Meaning
Client	Waiting for client to send a query or fetch results.
Lock	Waiting for a lock (row lock, table lock, etc.).
LWLock	Lightweight lock (internal synchronization, like buffer access).
IO	Waiting for disk read/write.
IPC	Waiting for inter-process communication.
Timeout	Waiting for a timeout to expire.
Activity	Waiting for some internal activity to finish.
Extension	Waiting inside an extension function.

4. wait_event — The specific thing being waited on:-

wait_event_type	wait_event	Meaning
Lock	relation	Waiting for a table-level lock.
Lock	transactionid	Waiting for another transaction to finish.
IO	DataFileRead	Waiting to read from a data file.
IO	WALWrite	Waiting to write to the WAL file.
LWLock	BufferContent	Waiting to read/write a buffer in memory.
Client	ClientRead	Waiting for client to send data.

Putting them together:-

State	wait_event_type	wait_event	Meaning
active	Lock	transactionid	Running a query but stuck waiting for another

State	wait_event_type	wait_event	Meaning
			transaction to commit/rollback.
idle in transaction	Client	ClientRead	Inside a transaction, waiting for the next query from the client.
active	IO	DataFileRead	Actively executing but waiting for disk read.

- **Quick mental picture**

1. **state → "Am I busy or idle?"**

2. **wait_event_type → "If I'm waiting, what kind of thing am I waiting for?"**

3. **wait_event → "Exactly which thing am I waiting on?"**