Praveen Madupu
Mb: +91 98661 30093
Sr. Database Administrator

Real-time scenario-based PostgreSQL DBA + Performance Tuning & Optimization interview questions.

PostgreSQL Installation & Configuration

1. How do you install PostgreSQL on Linux and configure it for production?
2. What steps do you take to configure postgresql.conf for a new instance?
3. How do you choose the right block size during initialization?
4. When would you use tablespaces, and how do you configure them?
5. How do you enable SSL connections in PostgreSQL?
6. What parameters must you tune after fresh installation for performance?
7. How do you configure multiple PostgreSQL instances on the same host?
8. How do you configure PostgreSQL for NUMA-based systems?
9. How do you configure PostgreSQL to use huge pages?
10. How do you tune max_connections and work_mem for high concurrency?

Database Creation & Management

11. How do you create a database with a specific collation and encoding?
12. How do you clone a PostgreSQL database efficiently?
13. How do you move a database to a different tablespace?
14. How do you rename a database with minimal downtime?
15. How do you drop a database that has active connections?
16. How do you enforce connection limits per database?
17. How do you create template databases for standardization?
18. How do you configure database-level logging?
19. How do you monitor database size growth over time?
20. How do you restore a single schema from a full backup?

User Management & Security

21. How do you implement row-level security in PostgreSQL?
22. How do you enforce password policies for users?
23. How do you restrict a user to read-only access?
24. How do you detect and block brute-force login attempts?
25. How do you enable SCRAM-SHA-256 authentication?
26. How do you audit DDL changes in PostgreSQL?
27. How do you prevent superusers from bypassing RLS?
28. How do you configure pg_hba.conf for security best practices?
29. How do you allow LDAP authentication for PostgreSQL?
30. How do you detect users with unused accounts?

Backup & Recovery

31. How do you take a logical backup of only one schema?
32. How do you take consistent backups of a multi-TB database?
33. How do you configure point-in-time recovery (PITR)?
34. How do you perform incremental backups with pgBackRest?

35. How do you test recovery speed in a large production system?
36. How do you backup large LOBs efficiently?
37. How do you restore a single table from WAL files?
38. How do you encrypt PostgreSQL backups?
39. How do you ensure backups don't impact production performance?
40. How do you validate backup integrity automatically?

Performance Tuning – Query Level

41. How do you analyze a slow query using EXPLAIN?
42. How do you use EXPLAIN (ANALYZE, BUFFERS) for tuning?
43. How do you identify queries causing high CPU usage?
44. How do you detect implicit type casting in queries?
45. How do you tune queries that frequently use JOIN on large tables?
46. How do you optimize queries using CTEs vs. subqueries?
47. How do you handle slow queries with many OR conditions?
48. How do you improve query performance using partial indexes?
49. How do you detect sequential scans causing slowdowns?
50. How do you tune queries suffering from parameter sniffing?

Performance Tuning – Indexing

51. How do you identify unused indexes?
52. How do you find duplicate indexes in PostgreSQL?
53. How do you decide between B-tree, BRIN, and GiST indexes?
54. How do you tune queries with GIN indexes on JSONB columns?
55. How do you detect index bloat?
56. How do you rebuild bloated indexes online?
57. How do you tune multi-column indexes for performance?
58. How do you optimize index usage for range queries?
59. How do you handle high write overhead due to indexing?
60. How do you ensure covering indexes reduce I/O?

Performance Tuning – Memory & Cache

61. How do you tune shared_buffers for large databases?
62. How do you configure work_mem for analytics queries?
63. How do you detect memory bottlenecks using pg_stat_activity?
64. How do you tune effective_cache_size for OLTP workloads?
65. How do you detect buffer cache hit ratio problems?
66. How do you reduce disk I/O using caching strategies?
67. How do you handle queries spilling into temporary files?
68. How do you detect memory leaks in PostgreSQL queries?
69. How do you tune autovacuum memory usage?
70. How do you monitor backend memory allocation?

Performance Tuning – Storage & I/O

71. How do you detect I/O bottlenecks in PostgreSQL?
72. How do you configure WAL files on SSDs for performance?
73. How do you reduce checkpoint I/O spikes?
74. How do you detect slow queries due to random I/O?
75. How do you tune PostgreSQL on NVMe storage?
76. How do you configure tablespaces to optimize I/O?
77. How do you use pg_stat_io to troubleshoot performance?
78. How do you minimize WAL write amplification?
79. How do you distribute data files across multiple disks?
80. How do you tune fsync settings for performance vs. safety?

Vacuum & Autovacuum

81. How do you detect autovacuum not running properly?
82. How do you tune autovacuum thresholds for large tables?
83. How do you prevent autovacuum from blocking queries?
84. How do you analyze dead tuples in PostgreSQL?
85. How do you reduce bloat without downtime?
86. How do you schedule manual VACUUM FULL safely?
87. How do you monitor autovacuum progress in real time?
88. How do you prevent autovacuum from consuming too much I/O?
89. How do you tune freeze settings for long-lived tables?
90. How do you deal with XID wraparound issues?

High Availability & Replication

91. How do you configure streaming replication in PostgreSQL?
92. How do you detect replication lag?
93. How do you tune synchronous replication performance?
94. How do you configure logical replication for specific tables?
95. How do you failover PostgreSQL manually?
96. How do you set up automatic failover with Patroni?
97. How do you re-synchronize a failed replica quickly?
98. How do you detect replication slot bloat?
99. How do you configure cascading replication?
100. How do you ensure replicas can be promoted safely?

Partitioning & Large Tables

101. How do you implement range partitioning for time-series data?
102. How do you move data from parent to child partitions efficiently?
103. How do you optimize queries across partitions?
104. How do you detect partition pruning not working?
105. How do you monitor partition size growth?
106. How do you re-partition an existing large table?

107. How do you implement hash partitioning for load balancing?
108. How do you archive partitions efficiently?
109. How do you gather stats only on active partitions?
110. How do you handle global indexes with partitions?

Monitoring & Logging

111. How do you monitor slow queries in PostgreSQL?
112. How do you configure log rotation for PostgreSQL?
113. How do you detect blocked sessions in real time?
114. How do you set up pg_stat_statements for query analysis?
115. How do you find top queries by I/O consumption?
116. How do you detect deadlocks from logs?
117. How do you analyze WAL activity from logs?
118. How do you configure log_statement for specific users?
119. How do you integrate PostgreSQL monitoring with Prometheus?
120. How do you monitor replication health using pg_stat_replication?

Locking & Concurrency

121. How do you detect deadlocks in PostgreSQL?
122. How do you resolve long-running locks blocking queries?
123. How do you configure deadlock_timeout for troubleshooting?
124. How do you analyze lock contention from pg_locks?
125. How do you prevent locking issues in batch jobs?
126. How do you tune row-level locking for updates?
127. How do you detect application-level lock misuse?
128. How do you avoid lock escalation in PostgreSQL?
129. How do you handle blocking due to foreign key checks?
130. How do you analyze lightweight lock contention?

Maintenance & Housekeeping

131. How do you schedule database reindexing?
132. How do you archive old partitions automatically?
133. How do you purge WAL files older than X days?
134. How do you schedule regular health checks?
135. How do you automate schema consistency checks?
136. How do you schedule auto stats gathering?
137. How do you enforce daily vacuuming policies?
138. How do you rotate pg_stat_statements history?
139. How do you manage log cleanup with pg_rotate_logfile()?
140. How do you automate disk usage monitoring?

Upgrades & Migrations

141. How do you upgrade PostgreSQL from 12 to 15 with minimal downtime?
142. How do you use pg_upgrade in link mode for large databases?
143. How do you rollback an upgrade if something goes wrong?
144. How do you migrate PostgreSQL from on-premises to AWS RDS?
145. How do you minimize downtime while migrating using logical replication?
146. How do you handle extension incompatibilities during an upgrade?
147. How do you migrate PostgreSQL from Windows to Linux?
148. How do you migrate databases between different major versions?
149. How do you test application compatibility before an upgrade?
150. How do you deal with collation changes between versions?

WAL & Checkpoint Management

151. How do you configure WAL archiving for PITR?
152. How do you reduce WAL generation in bulk loads?
153. How do you tune checkpoint_timeout for performance?
154. How do you monitor WAL directory growth?
155. How do you detect WAL write stalls?
156. How do you clean up orphan WAL files?
157. How do you tune wal_compression for replication efficiency?
158. How do you troubleshoot high WAL activity during updates?
159. How do you configure synchronous_commit for balance between durability and speed?
160. How do you handle WAL corruption?

Query Optimization – Advanced

161. How do you tune queries with window functions?
162. How do you optimize queries using LATERAL joins?
163. How do you debug performance issues with CTE inlining?
164. How do you optimize DISTINCT queries on large datasets?
165. How do you improve performance of EXISTS vs. IN queries?
166. How do you rewrite correlated subqueries for better performance?
167. How do you analyze parallel query execution?
168. How do you force the planner to use a specific join method?
169. How do you use query hints with pg_hint_plan?
170. How do you reduce sort memory usage in ORDER BY queries?

Indexing – Advanced

171. How do you use partial indexes to reduce index size?
172. How do you tune GIN indexes for full-text search?
173. How do you use BRIN indexes for time-series data?
174. How do you maintain GIN indexes for JSONB queries?
175. How do you detect when an index is never used?
176. How do you drop redundant indexes safely?

177. How do you optimize composite indexes for query workload?
178. How do you build an index concurrently without downtime?
179. How do you compress large indexes for space savings?
180. How do you analyze index usage with pg_stat_all_indexes?

Parallelism & Scaling

181. How do you enable parallel queries in PostgreSQL?
182. How do you tune parallel_workers for large queries?
183. How do you check if a query is running in parallel?
184. How do you debug queries that fail to use parallelism?
185. How do you use parallelism in vacuum and index builds?
186. How do you tune JIT compilation for analytical workloads?
187. How do you balance CPU allocation between OLTP and OLAP?
188. How do you configure PostgreSQL to use all CPU cores?
189. How do you prevent parallelism from overloading I/O?
190. How do you analyze parallel query plans in EXPLAIN?

Replication – Deep Dive

191. How do you resync a standby without reinitializing it completely?
192. How do you enable replication slots for logical decoding?
193. How do you detect replication lag from WAL differences?
194. How do you use pg_receivewal for archiving?
195. How do you reinitialize a broken replica efficiently?
196. How do you configure multiple replicas for high availability?
197. How do you avoid replication lag in high-write workloads?
198. How do you configure bidirectional logical replication?
199. How do you replicate only selected tables with filters?
200. How do you monitor replication slots for bloat?

Connection & Pooling

201. How do you detect idle connections consuming resources?
202. How do you configure connection pooling with PgBouncer?
203. How do you analyze connection spikes during peak load?
204. How do you configure max_connections for large systems?
205. How do you balance autovacuum workers vs. user connections?
206. How do you manage connection storms after downtime?
207. How do you monitor connection usage per application?
208. How do you prevent one user from consuming all connections?
209. How do you configure connection pooling in Patroni?
210. How do you detect connection leaks in applications?

Partitioning – Advanced

211. How do you merge multiple partitions into one?

212. How do you detach a partition for archiving?
213. How do you detect missing partitions in a range?
214. How do you enable foreign key constraints across partitions?
215. How do you tune queries across 100+ partitions?
216. How do you handle vacuuming of inactive partitions?
217. How do you load balance inserts across hash partitions?
218. How do you drop old partitions automatically?
219. How do you use pg_partman for partition automation?
220. How do you detect when partition pruning fails?

Monitoring – Advanced

221. How do you set up custom pg_stat_statements views?
222. How do you configure log_min_duration_statement dynamically?
223. How do you monitor query execution times per user?
224. How do you detect functions causing high CPU load?
225. How do you monitor replication delay in bytes and time?
226. How do you monitor lock contention continuously?
227. How do you set up alerts for autovacuum freezes?
228. How do you monitor index bloat proactively?
229. How do you detect runaway queries before they finish?
230. How do you analyze system catalog usage by queries?

Locks & Deadlocks – Advanced

231. How do you identify deadlock cycles from pg_locks?
232. How do you configure deadlock logging for analysis?
233. How do you prevent long transactions from blocking DDLs?
234. How do you analyze advisory lock usage?
235. How do you prevent deadlocks in batch jobs?
236. How do you detect lock escalation patterns?
237. How do you handle pg_cancel_backend vs. pg_terminate_backend safely?
238. How do you monitor long-held locks continuously?
239. How do you tune application code to minimize lock contention?
240. How do you resolve deadlocks in multi-tenant databases?

Maintenance – Advanced

241. How do you schedule nightly vacuum without impact?
242. How do you rebuild indexes in rolling fashion?
243. How do you automate health checks with cron jobs?
244. How do you detect schema drift between environments?
245. How do you automate orphan table cleanup?
246. How do you rotate pg_audit logs daily?
247. How do you enforce table ownership policies?
248. How do you archive pg_stat_activity history?

249. How do you enforce naming conventions on objects?
250. How do you schedule pg_repack for minimal downtime?

High Availability Tools

251. How do you configure Patroni for automatic failover?
252. How do you configure etcd/Consul for Patroni cluster?
253. How do you test failover without data loss?
254. How do you configure load balancer with HAProxy for PostgreSQL?
255. How do you integrate PgBouncer with Patroni?
256. How do you automate switchover in repmgr?
257. How do you monitor failover history in Patroni logs?
258. How do you ensure split-brain prevention in HA setups?
259. How do you configure synchronous_standby_names safely?
260. How do you analyze failover times in production?

Cloud & Containerization

261. How do you run PostgreSQL in Docker for production?
262. How do you persist data across container restarts?
263. How do you monitor PostgreSQL in Kubernetes with Operators?
264. How do you configure PostgreSQL on AWS RDS for performance?
265. How do you use AWS Aurora PostgreSQL for HA?
266. How do you migrate PostgreSQL to Google Cloud SQL?
267. How do you back up PostgreSQL in Azure Flexible Server?
268. How do you scale PostgreSQL in Kubernetes horizontally?
269. How do you manage secrets for PostgreSQL in Kubernetes?
270. How do you monitor PostgreSQL pods in Prometheus?

JSON & Advanced Data Types

271. How do you optimize JSONB queries with indexes?
272. How do you extract nested JSON fields efficiently?
273. How do you tune GIN indexes for JSON workloads?
274. How do you store and query large JSON documents?
275. How do you analyze performance of JSON functions?
276. How do you design hybrid JSON + relational schemas?
277. How do you detect slow queries involving JSONB operators?
278. How do you partition tables containing JSONB data?
279. How do you enforce schema validation for JSONB fields?
280. How do you optimize indexing for UUID fields?

Extensions & Tools

281. How do you install and configure pg_stat_statements?
282. How do you use pg_repack to rebuild bloated tables?
283. How do you configure pg_partman for partitioning?

284. How do you use pg_audit for regulatory compliance?
285. How do you configure PostGIS for spatial queries?
286. How do you optimize queries using cube/ltree extensions?
287. How do you monitor queries with pgBadger reports?
288. How do you enable pg_stat_io in PostgreSQL 15+?
289. How do you configure timescaledb for time-series workloads?
290. How do you secure extensions from unauthorized use?

Security – Advanced

291. How do you enable row-level auditing for sensitive tables?
292. How do you detect privilege escalation by users?
293. How do you enforce SSL-only connections at server level?
294. How do you secure PostgreSQL superuser access?
295. How do you detect failed login attempts continuously?
296. How do you encrypt PostgreSQL data at rest?
297. How do you configure pgcrypto for column encryption?
298. How do you enforce client certificates for authentication?
299. How do you detect schema changes by unauthorized users?
300. How do you prevent SQL injection at DB level?

Disaster Recovery

301. How do you design a DR strategy for PostgreSQL?
302. How do you implement backup + standby site DR setup?
303. How do you validate DR site failover speed?
304. How do you configure cross-region replication?
305. How do you test PITR at DR site regularly?
306. How do you ensure WAL archiving in multi-DC setup?
307. How do you rebootstrap DR site after corruption?
308. How do you monitor RPO/RTO metrics for DR?
309. How do you automate failover to DR site?
310. How do you replicate logical slots to DR?

Large Databases (VLDB)

311. How do you manage PostgreSQL with >10TB data?
312. How do you optimize vacuum for large databases?
313. How do you partition VLDBs for better manageability?
314. How do you monitor bloat in multi-TB tables?
315. How do you handle index rebuilds in VLDBs?
316. How do you split backups for large databases?
317. How do you use parallel pg_dump for VLDB?
318. How do you reduce WAL volume in VLDB updates?
319. How do you plan schema design for VLDB?
320. How do you monitor query patterns in VLDBs?

Troubleshooting – Advanced

321. How do you analyze ORA- equivalent errors in PostgreSQL logs?
322. How do you detect queries causing memory leaks?
323. How do you debug I/O bottlenecks using pg_stat_io?
324. How do you troubleshoot autovacuum freeze issues?
325. How do you debug slow startup after crash recovery?
326. How do you analyze kernel-level bottlenecks affecting PostgreSQL?
327. How do you detect PostgreSQL bugs causing crashes?
328. How do you troubleshoot replication lag in multi-hop setups?
329. How do you debug background writer performance issues?
330. How do you detect WAL corruption early?

Performance Benchmarks

331. How do you run pgbench for OLTP benchmarking?
332. How do you benchmark PostgreSQL for analytics workloads?
333. How do you simulate connection storms in test systems?
334. How do you analyze pgbench results?
335. How do you tune PostgreSQL for 1M TPS?
336. How do you design benchmark tests for DR failover?
337. How do you benchmark JSON queries?
338. How do you measure WAL generation under load?
339. How do you test scaling with 1000+ connections?
340. How do you run benchmarks in Kubernetes clusters?

Query Caching & Materialization

341. How do you implement query caching at DB level?
342. How do you design materialized views for performance?
343. How do you refresh materialized views incrementally?
344. How do you detect stale data in materialized views?
345. How do you partition materialized views for scalability?
346. How do you optimize refresh strategy during peak hours?
347. How do you handle locking during refreshes?
348. How do you integrate caching with PgBouncer?
349. How do you optimize queries using temporary summary tables?
350. How do you combine partitioning + materialized views?

Optimizer & Statistics

351. How do you analyze query misestimation issues?
352. How do you tune default_statistics_target?
353. How do you gather stats on large partitioned tables?
354. How do you use extended statistics for correlated columns?
355. How do you restore old statistics after a regression?
356. How do you detect missing statistics in system catalogs?

357. How do you analyze histograms for query misplans?
358. How do you configure auto-analyze thresholds?
359. How do you collect statistics for foreign tables?
360. How do you debug CBO misestimation issues?

Advanced Topics

361. How do you configure FDW for cross-DB queries?
362. How do you optimize queries with dblink vs. FDW?
363. How do you monitor queries across sharded databases?
364. How do you configure Citus for horizontal scaling?
365. How do you shard PostgreSQL manually without Citus?
366. How do you configure logical sharding with FDW?
367. How do you detect slow queries across distributed systems?
368. How do you partition FDW tables?
369. How do you secure FDW connections?
370. How do you handle stats collection for FDW?

Auditing & Compliance

371. How do you log all DDL changes for compliance?
372. How do you configure pg_audit for HIPAA/GDPR compliance?
373. How do you monitor access to sensitive columns?
374. How do you detect unauthorized schema changes?
375. How do you enforce fine-grained audit policies?
376. How do you encrypt audit logs?
377. How do you detect tampering of PostgreSQL logs?
378. How do you schedule audit report generation?
379. How do you monitor SELECT queries on sensitive data?
380. How do you ensure compliance with data retention laws?

OS & System-Level Tuning

381. How do you tune Linux kernel parameters for PostgreSQL?
382. How do you configure huge pages for memory optimization?
383. How do you tune I/O schedulers for PostgreSQL workloads?
384. How do you optimize NUMA settings for PostgreSQL?
385. How do you analyze CPU usage distribution across queries?
386. How do you configure disk caching at OS level?
387. How do you configure transparent huge pages for PostgreSQL?
388. How do you monitor Linux-level I/O latency?
389. How do you configure RAID for PostgreSQL storage?
390. How do you tune kernel.shmmax for PostgreSQL?

Developer & DBA Collaboration

391. How do you enforce query review process before deployment?
392. How do you provide developers query performance feedback?
393. How do you prevent developers from bypassing best practices?
394. How do you design database code review checklists?
395. How do you analyze application ORM queries?
396. How do you prevent N+1 query problems from ORM?
397. How do you guide developers on indexing strategy?
398. How do you test new features in staging safely?
399. How do you enforce coding standards on DB objects?
400. How do you provide query tuning training to developers?

Monitoring Tools & Dashboards

401. How do you configure pgAdmin for performance monitoring?
402. How do you integrate PostgreSQL with Grafana dashboards?
403. How do you visualize query performance trends?
404. How do you configure pgwatch2 for monitoring?
405. How do you set up Nagios alerts for PostgreSQL?
406. How do you configure Zabbix templates for PostgreSQL?
407. How do you monitor WAL archiving in Prometheus?
408. How do you integrate ELK stack with PostgreSQL logs?
409. How do you configure check_pgactivity plugin?
410. How do you design custom dashboards for query metrics?

Miscellaneous Advanced Scenarios

411. How do you configure hot standby feedback to avoid query cancelation?
412. How do you manage pg_stat_activity in multi-tenant environments?
413. How do you throttle autovacuum in busy hours?
414. How do you configure statement_timeout for specific users?
415. How do you detect hidden locks in system catalogs?
416. How do you reassign ownership of objects in bulk?
417. How do you trace client IPs of heavy queries?
418. How do you limit temp file usage by sessions?
419. How do you manage schemas in multi-tenant databases?
420. How do you enforce query timeouts at pooler level?

PostgreSQL New Features

421. How do you use pg_stat_io in PostgreSQL 15?
422. How do you optimize vacuum strategy in PostgreSQL 14?
423. How do you use MERGE statement introduced in PostgreSQL 15?
424. How do you tune parallel vacuum in PostgreSQL 13+?
425. How do you use incremental sort in PostgreSQL 13?

426. How do you use stored generated columns in PostgreSQL 12?
427. How do you analyze JIT compilation improvements?
428. How do you use REINDEX CONCURRENTLY in PostgreSQL 12+?
429. How do you configure partition-wise joins in PostgreSQL?
430. How do you use SQL/JSON path expressions?

Advanced HA & Scaling

431. How do you configure multi-primary replication in PostgreSQL?
432. How do you set up BDR (Bi-Directional Replication)?
433. How do you design active-active PostgreSQL clusters?
434. How do you configure Pgpool-II load balancing?
435. How do you detect replication conflicts in multi-master?
436. How do you prevent conflicts in write scaling?
437. How do you analyze write latency in HA setups?
438. How do you use quorum-based commit in synchronous replication?
439. How do you design zero-downtime migration to HA cluster?
440. How do you integrate PostgreSQL HA with Consul?

Special Workloads

441. How do you tune PostgreSQL for OLTP workloads?
442. How do you tune PostgreSQL for OLAP workloads?
443. How do you optimize PostgreSQL for time-series workloads?
444. How do you configure PostgreSQL for IoT scale data?
445. How do you tune PostgreSQL for geospatial queries?
446. How do you configure PostgreSQL for financial transactions?
447. How do you optimize PostgreSQL for mixed workloads?
448. How do you configure PostgreSQL for batch data processing?
449. How do you optimize PostgreSQL for machine learning workloads?
450. How do you tune PostgreSQL for microservices?

System Reliability

451. How do you detect memory leaks in PostgreSQL?
452. How do you troubleshoot kernel OOM kills of PostgreSQL?
453. How do you configure PostgreSQL crash recovery tests?
454. How do you detect transaction ID wraparound risk?
455. How do you configure logical replication after crash?
456. How do you ensure WAL shipping during network outage?
457. How do you configure watchdog for PostgreSQL?
458. How do you automate PostgreSQL restart after crash?
459. How do you design PostgreSQL to survive hardware failure?
460. How do you monitor checksum failures?

Query Workload Management

461. How do you detect queries exceeding memory limits?
462. How do you prioritize queries with workload manager?
463. How do you configure Resource Queues for queries?
464. How do you enforce CPU limits on queries?
465. How do you detect temp file spillover queries?
466. How do you configure workload isolation for tenants?
467. How do you analyze batch queries vs. interactive queries?
468. How do you tune cost parameters for query distribution?
469. How do you monitor workload mix in real time?
470. How do you auto-kill long queries using event triggers?

Future-Proofing & Best Practices

471. How do you plan PostgreSQL schema for 10-year growth?
472. How do you validate indexing strategy periodically?
473. How do you enforce automatic partition management?
474. How do you automate database capacity forecasting?
475. How do you detect schema changes impacting queries?
476. How do you plan migration to future PostgreSQL versions?
477. How do you integrate PostgreSQL with CI/CD pipelines?
478. How do you perform continuous load testing?
479. How do you evaluate PostgreSQL vs. other DBs periodically?
480. How do you track database technical debt?

Final Advanced Questions (481–500)

481. How do you configure failover slots for logical replication?
482. How do you tune max_parallel_workers_per_gather for analytics?
483. How do you configure background worker processes safely?
484. How do you monitor buffer cache hit ratio effectively?
485. How do you configure PostgreSQL with SAN storage?
486. How do you tune PostgreSQL for SSD vs. HDD?
487. How do you manage PostgreSQL upgrades across 50+ clusters?
488. How do you enforce retention on WAL archives?
489. How do you configure archiving in cloud object stores?
490. How do you analyze pg_stat_progress_vacuum output?
491. How do you debug PostgreSQL network latency?
492. How do you tune checkpoint_completion_target effectively?
493. How do you configure PostgreSQL for hybrid cloud?
494. How do you analyze parallel index build logs?
495. How do you configure PostgreSQL with LDAP authentication?
496. How do you optimize PostgreSQL for Kubernetes StatefulSets?
497. How do you ensure zero-downtime schema migrations?
498. How do you test application failover during deployments?

Praveen Madupu
Mb: +91 98661 30093
Sr. Database Administrator

499. How do you tune PostgreSQL autovacuum for Amazon RDS?
500. How do you prepare PostgreSQL for future Postgres 16 features?

PostgreSQL Administration, Performance Tuning & Optimization Interview Questions into **difficulty levels (Basic / Intermediate / Advanced)** so you can use them step by step for interviews, bootcamps, or mock sessions.

🎯 **Categorized PostgreSQL Interview Questions (500)**

🔷 **Basic Level (Good for 0–2 years experience)**

👉 Covers installation, basic administration, user management, and simple tuning. (~150 Qs)

Installation & Config

1–10

Database Creation & Management

11–20

User Management & Security

21–30

Backup & Recovery

31–40

Basic Query Performance

41–50

Basic Indexing

51–60

Basic Memory Tuning

61–70

Basic Storage & I/O

71–80

Vacuum & Autovacuum (Intro)

81–90

Replication (Foundations)

91–100

👉 Total Basic: **100 questions**

🔷 **Intermediate Level (3–6 years experience)**

👉 Covers query analysis, indexing strategies, vacuum tuning, replication, partitioning, and monitoring. (~200 Qs)

Vacuum & Autovacuum Advanced

101–110

Partitioning & Large Tables

111–120

Monitoring & Logging

121–130

Locking & Concurrency

131–140

Maintenance & Housekeeping

141–160

Query Optimization – Advanced
161–180
Index Optimization – Advanced
181–200
Memory & Cache – Advanced
201–220
Storage, WAL & Checkpoint Tuning
221–240
Replication – Advanced (Streaming + Logical)
241–260
HA & Failover (Patroni, Repmgr, etc.)
261–280
Partitioning Advanced & Table Sharding
281–300
👉 Total Intermediate: **200 questions**

🔷 **Advanced Level (7+ years experience / Architect)**

👉 Covers distributed systems, scaling, HA, workload management, cloud, OS tuning, enterprise features. (~200 Qs)
Advanced HA & Scaling
301–320
Disaster Recovery & PITR Advanced
321–340
Advanced Query & Execution Plan Internals
341–360
Parallelism & JIT Tuning
361–380
Extensions & Special Workloads
381–400
Cloud, Containers & Kubernetes
401–420
OS & Kernel Tuning
421–440
Postgres 12–16 Features & New Optimizations
441–460
Enterprise Multi-Cluster Management
461–480
Future-Proofing, Technical Debt, CI/CD, Automation
481–500
👉 Total Advanced: **200 questions**

📊 **Summary by Difficulty**

- **Basic** → 100 Qs (Installation, Security, Backups, Simple Tuning)

Praveen Madupu
Mb: +91 98661 30093
Sr. Database Administrator

- **Intermediate** → 200 Qs (Vacuum, Indexing, Partitioning, HA, Monitoring)
- **Advanced** → 200 Qs (Scaling, DR, Cloud, OS tuning, Future-proofing)
- **Grand Total** → ✅ 500 Questions

Praveen Madupu
Mb: +91 98661 30093
Sr. Database Administrator

PostgreSQL Interview Question Bank (500)

🟢 Basic Level (0–2 years, Foundations) – 100 Qs

Installation & Configuration

1. How do you install PostgreSQL on Linux and configure it for production?
2. What steps do you take to configure postgresql.conf for a new instance?
3. How do you choose the right block size during initialization?
4. When would you use tablespaces, and how do you configure them?
5. How do you enable SSL connections in PostgreSQL?
6. What parameters must you tune after fresh installation for performance?
7. How do you configure multiple PostgreSQL instances on the same host?
8. How do you configure PostgreSQL for NUMA-based systems?
9. How do you configure PostgreSQL to use huge pages?
10. How do you tune max_connections and work_mem for high concurrency?

Database Creation & Management

11. How do you create a database with a specific collation and encoding?
12. How do you clone a PostgreSQL database efficiently?
13. How do you move a database to a different tablespace?
14. How do you rename a database with minimal downtime?
15. How do you drop a database that has active connections?
16. How do you enforce connection limits per database?
17. How do you create template databases for standardization?
18. How do you configure database-level logging?
19. How do you monitor database size growth over time?
20. How do you restore a single schema from a full backup?

User Management & Security

21. How do you implement row-level security in PostgreSQL?
22. How do you enforce password policies for users?
23. How do you restrict a user to read-only access?
24. How do you detect and block brute-force login attempts?
25. How do you enable SCRAM-SHA-256 authentication?
26. How do you audit DDL changes in PostgreSQL?
27. How do you prevent superusers from bypassing RLS?
28. How do you configure pg_hba.conf for security best practices?
29. How do you allow LDAP authentication for PostgreSQL?
30. How do you detect users with unused accounts?

Backup & Recovery

31. How do you take a logical backup of only one schema?
32. How do you take consistent backups of a multi-TB database?
33. How do you configure point-in-time recovery (PITR)?

34. How do you perform incremental backups with pgBackRest?
35. How do you test recovery speed in a large production system?
36. How do you backup large LOBs efficiently?
37. How do you restore a single table from WAL files?
38. How do you encrypt PostgreSQL backups?
39. How do you ensure backups don't impact production performance?
40. How do you validate backup integrity automatically?

Query Performance (Intro)

41. How do you analyze a slow query using EXPLAIN?
42. How do you use EXPLAIN (ANALYZE, BUFFERS) for tuning?
43. How do you identify queries causing high CPU usage?
44. How do you detect implicit type casting in queries?
45. How do you tune queries that frequently use JOIN on large tables?
46. How do you optimize queries using CTEs vs. subqueries?
47. How do you handle slow queries with many OR conditions?
48. How do you improve query performance using partial indexes?
49. How do you detect sequential scans causing slowdowns?
50. How do you tune queries suffering from parameter sniffing?

Indexing (Intro)

51. How do you identify unused indexes?
52. How do you find duplicate indexes in PostgreSQL?
53. How do you decide between B-tree, BRIN, and GiST indexes?
54. How do you tune queries with GIN indexes on JSONB columns?
55. How do you detect index bloat?
56. How do you rebuild bloated indexes online?
57. How do you tune multi-column indexes for performance?
58. How do you optimize index usage for range queries?
59. How do you handle high write overhead due to indexing?
60. How do you ensure covering indexes reduce I/O?

Memory & Cache (Intro)

61. How do you tune shared_buffers for large databases?
62. How do you configure work_mem for analytics queries?
63. How do you detect memory bottlenecks using pg_stat_activity?
64. How do you tune effective_cache_size for OLTP workloads?
65. How do you detect buffer cache hit ratio problems?
66. How do you reduce disk I/O using caching strategies?
67. How do you handle queries spilling into temporary files?
68. How do you detect memory leaks in PostgreSQL queries?
69. How do you tune autovacuum memory usage?
70. How do you monitor backend memory allocation?

Storage & I/O (Intro)

71. How do you detect I/O bottlenecks in PostgreSQL?
72. How do you configure WAL files on SSDs for performance?
73. How do you reduce checkpoint I/O spikes?
74. How do you detect slow queries due to random I/O?
75. How do you tune PostgreSQL on NVMe storage?
76. How do you configure tablespaces to optimize I/O?
77. How do you use pg_stat_io to troubleshoot performance?
78. How do you minimize WAL write amplification?
79. How do you distribute data files across multiple disks?
80. How do you tune fsync settings for performance vs. safety?

Vacuum & Autovacuum (Intro)

81. How do you detect autovacuum not running properly?
82. How do you tune autovacuum thresholds for large tables?
83. How do you prevent autovacuum from blocking queries?
84. How do you analyze dead tuples in PostgreSQL?
85. How do you reduce bloat without downtime?
86. How do you schedule manual VACUUM FULL safely?
87. How do you monitor autovacuum progress in real time?
88. How do you prevent autovacuum from consuming too much I/O?
89. How do you tune freeze settings for long-lived tables?
90. How do you deal with XID wraparound issues?

Replication (Intro)

91. How do you configure streaming replication in PostgreSQL?
92. How do you detect replication lag?
93. How do you tune synchronous replication performance?
94. How do you configure logical replication for specific tables?
95. How do you failover PostgreSQL manually?
96. How do you set up automatic failover with Patroni?
97. How do you re-synchronize a failed replica quickly?
98. How do you detect replication slot bloat?
99. How do you configure cascading replication?
100. How do you ensure replicas can be promoted safely?

🟡 **Intermediate Level (3–6 years, Real-time Troubleshooting) – 200 Qs**

Vacuum & Autovacuum (Advanced)

101. How do you handle vacuum operations on very large partitioned tables?
102. How do you balance autovacuum cost delay and cost limit?
103. How do you detect when autovacuum is not keeping up?

104. How do you schedule manual vacuums without locking?
105. How do you configure aggressive vacuuming for high-write tables?
106. How do you avoid long freezes during vacuuming?
107. How do you track autovacuum worker activity per table?
108. How do you prevent autovacuum from impacting query performance?
109. How do you tune autovacuum for append-only workloads?
110. How do you mitigate vacuum storms after bulk deletes?

Partitioning & Large Tables

111. How do you implement range partitioning for time-series workloads?
112. How do you manage list partitioning for multi-tenant databases?
113. How do you migrate a large non-partitioned table into partitions?
114. How do you implement sub-partitioning (multi-level partitioning)?
115. How do you optimize queries with partition pruning?
116. How do you handle indexes across multiple partitions?
117. How do you monitor query performance on partitions vs parent?
118. How do you detach and archive old partitions automatically?
119. How do you merge partitions back into a single table?
120. How do you ensure partition constraints are always enforced?

Monitoring & Logging

121. How do you set up pg_stat_statements for workload analysis?
122. How do you log queries running longer than X seconds?
123. How do you find queries consuming the most I/O?
124. How do you configure PostgreSQL logs to capture deadlocks?
125. How do you set up log rotation to avoid disk filling?
126. How do you integrate PostgreSQL metrics with Prometheus/Grafana?
127. How do you detect table-level hot spots from monitoring views?
128. How do you log changes for auditing without logical decoding?
129. How do you capture application name in PostgreSQL logs?
130. How do you monitor WAL generation in real time?

Locking & Concurrency

131. How do you identify the blocking query in a lock wait chain?
132. How do you detect and resolve deadlocks quickly?
133. How do you configure deadlock_timeout effectively?
134. How do you troubleshoot heavy exclusive lock usage?
135. How do you minimize lock contention on high-traffic tables?
136. How do you analyze lock contention using pg_locks?
137. How do you tune isolation levels to balance concurrency vs consistency?
138. How do you detect application code that causes long locks?
139. How do you prevent foreign key locks from blocking inserts?
140. How do you analyze lightweight locks (LWLocks) contention?

Maintenance & Housekeeping

141. How do you plan index maintenance (rebuild/reindex) in production?
142. How do you identify tables that require frequent reindexing?
143. How do you manage pg_stat_statements history cleanup?
144. How do you detect and drop unused schemas?
145. How do you clean up orphaned sequences?
146. How do you monitor temporary file usage growth?
147. How do you configure scheduled VACUUM FULL jobs safely?
148. How do you schedule statistics refresh after bulk loads?
149. How do you purge old WAL archives automatically?
150. How do you manage log cleanup using pg_rotate_logfile()?
151. How do you detect schema drift in multi-environment setups?
152. How do you automate size-based partition detachment?
153. How do you enforce daily DB health checks?
154. How do you rotate query statistics regularly?
155. How do you prevent temporary schema abuse by applications?
156. How do you track schema object growth over time?
157. How do you identify abandoned replication slots?
158. How do you manage disk growth due to TOAST tables?
159. How do you clean up orphaned large objects?
160. How do you plan for regular DB consistency checks?

Query Optimization – Advanced

161. How do you tune queries suffering from bad join orders?
162. How do you use enable_seqscan=false for debugging?
163. How do you detect missing statistics affecting queries?
164. How do you rewrite queries to improve parallelism?
165. How do you optimize queries with many subqueries?
166. How do you reduce nested loop join overhead?
167. How do you optimize queries with window functions?
168. How do you tune queries using DISTINCT ON?
169. How do you optimize queries using lateral joins?
170. How do you optimize queries with recursive CTEs?
171. How do you tune queries involving JSONB operators?
172. How do you optimize geospatial queries with PostGIS?
173. How do you optimize queries using FILTER in aggregates?
174. How do you reduce execution time of analytic functions?
175. How do you detect implicit cross joins?
176. How do you tune queries with GROUPING SETS, CUBE, ROLLUP?
177. How do you optimize queries using EXISTS vs IN?
178. How do you tune queries involving text pattern searches?
179. How do you optimize queries with UNION vs UNION ALL?

180. How do you rewrite queries to leverage covering indexes?

Index Optimization – Advanced

181. How do you implement partial indexes for specific workloads?
182. How do you optimize functional indexes for expressions?
183. How do you use BRIN indexes for time-series workloads?
184. How do you optimize GIN indexes on text search?
185. How do you analyze index usage with pg_stat_user_indexes?
186. How do you detect duplicate indexes across schemas?
187. How do you tune fillfactor for high-update tables?
188. How do you use INCLUDE columns in indexes?
189. How do you optimize multi-column index ordering?
190. How do you choose between HASH and BTREE indexes?
191. How do you identify indexes never scanned?
192. How do you optimize covering indexes for SELECT only queries?
193. How do you rebuild indexes with minimal downtime?
194. How do you manage index-only scans performance?
195. How do you minimize index write amplification?
196. How do you compress indexes effectively?
197. How do you use bloom filters in indexing?
198. How do you avoid index bloat from HOT updates?
199. How do you handle indexes on partitioned tables?
200. How do you drop redundant indexes safely?

🟡 **Intermediate Level (continued from 200)**

Memory & Cache – Advanced (201–220)

201. How do you tune work_mem differently for OLTP vs OLAP queries?
202. How do you detect when queries are spilling to disk (temporary files)?
203. How do you tune shared_buffers on systems with >128GB RAM?
204. How do you balance effective_cache_size with OS-level caching?
205. How do you analyze memory usage per backend connection?
206. How do you prevent runaway queries from consuming all memory?
207. How do you troubleshoot excessive temp file usage?
208. How do you optimize join-heavy queries using hash joins?
209. How do you configure maintenance_work_mem for parallel VACUUMs?
210. How do you tune parallel queries' memory allocation?
211. How do you analyze buffer hit ratios in pg_statio views?
212. How do you prevent large sorts from exhausting memory?
213. How do you adjust memory settings when using connection pooling?
214. How do you monitor and tune background writer settings?
215. How do you optimize work_mem for queries with multiple sorts?
216. How do you detect when shared buffers are too small?
217. How do you configure temp tablespaces to handle large sorts?

218. How do you tune memory for queries with CTE materialization?
219. How do you handle memory-intensive queries in mixed workloads?
220. How do you use pg_buffercache to analyze buffer usage?

Storage, WAL & Checkpoint Tuning (221–240)

221. How do you detect WAL write bottlenecks?
222. How do you configure wal_compression for high-write workloads?
223. How do you tune checkpoint_timeout vs checkpoint_completion_target?
224. How do you minimize WAL volume during bulk inserts?
225. How do you troubleshoot high WAL generation from autovacuum?
226. How do you analyze WAL archive lag in streaming replication?
227. How do you detect replication slots consuming excessive disk?
228. How do you plan WAL archiving in cloud storage?
229. How do you prevent checkpoint spikes impacting latency?
230. How do you handle WAL corruption scenarios?
231. How do you optimize full-page writes trade-offs?
232. How do you tune wal_buffers effectively?
233. How do you monitor WAL flush times?
234. How do you reduce WAL bloat in frequently updated tables?
235. How do you configure synchronous_commit for durability vs performance?
236. How do you detect WAL bottlenecks with pg_stat_wal?
237. How do you handle WAL growth during logical replication?
238. How do you test restore consistency from WAL archives?
239. How do you manage WAL recycling efficiently?
240. How do you tune max_wal_size and min_wal_size?

Replication – Advanced (241–260)

241. How do you implement cascading replication?
242. How do you set up synchronous replication with multiple standbys?
243. How do you detect replication lag in real-time?
244. How do you optimize replication slots for logical decoding?
245. How do you troubleshoot replication slot retention?
246. How do you configure delayed standbys for PITR?
247. How do you handle failover in synchronous replication setups?
248. How do you use pglogical for multi-master replication?
249. How do you resync a standby without full base backup?
250. How do you handle large table sync during logical replication?
251. How do you detect and fix replication conflicts?
252. How do you analyze replication lag causes (network vs write)?
253. How do you configure multiple standbys for HA load balancing?
254. How do you rebuild replication after WAL corruption?
255. How do you manage logical replication across major versions?
256. How do you optimize replication performance on slow links?

257. How do you monitor logical replication apply latency?
258. How do you tune synchronous replication quorum mode?
259. How do you test switchover without downtime?
260. How do you configure pgpool/repmgr with replication?

HA & Failover (261–280)

261. How do you automate failover using Patroni?
262. How do you configure virtual IPs for failover handling?
263. How do you set up watchdog in pgpool for HA?
264. How do you manage split-brain scenarios in HA?
265. How do you monitor failover triggers proactively?
266. How do you validate failover procedures regularly?
267. How do you tune election timeouts in HA clusters?
268. How do you perform controlled switchover with minimal downtime?
269. How do you configure fencing to avoid dual primaries?
270. How do you tune DCS (etcd/Consul/Zookeeper) for Patroni?
271. How do you integrate PgBouncer with failover automation?
272. How do you simulate HA failover scenarios for DR drills?
273. How do you detect silent failovers?
274. How do you ensure app reconnects quickly after failover?
275. How do you configure quorum-based HA decision-making?
276. How do you integrate PostgreSQL HA with cloud load balancers?
277. How do you restore sync replication after failover?
278. How do you minimize failover impact on long transactions?
279. How do you track RPO/RTO for HA vs DR?
280. How do you validate HA during major version upgrades?

Partitioning Advanced & Sharding (281–300)

281. How do you implement hash partitioning for balanced distribution?
282. How do you design global indexes for partitioned tables?
283. How do you optimize foreign keys across partitions?
284. How do you manage partition pruning efficiency?
285. How do you use pg_partman for automated partitioning?
286. How do you shard PostgreSQL with Citus?
287. How do you decide between partitioning vs sharding?
288. How do you migrate an unpartitioned table to sharded setup?
289. How do you query across shards efficiently?
290. How do you manage cross-shard transactions?
291. How do you rebalance shards after node addition?
292. How do you handle data movement between shards?
293. How do you optimize global aggregates across partitions?
294. How do you manage foreign tables in FDW sharding?
295. How do you secure partitioned/sharded architectures?

296. How do you monitor shard-level performance?
297. How do you design indexes for distributed queries?
298. How do you handle partition key skew?
299. How do you design backup strategy for sharded DB?
300. How do you optimize parallel queries on sharded setups?

🔴 Advanced Level (7+ years)

Advanced HA & Scaling (301–320)

301. How do you design multi-region HA architecture for PostgreSQL?
302. How do you implement active-active setup with conflict resolution?
303. How do you configure HA with Kubernetes StatefulSets?
304. How do you tune Patroni failover in high-latency networks?
305. How do you scale out read replicas efficiently?
306. How do you handle sequence synchronization across replicas?
307. How do you set up HA in cloud-native Postgres (Aurora, AlloyDB)?
308. How do you reduce write amplification in multi-master setups?
309. How do you use Pgpool-II for HA load balancing?
310. How do you analyze network partition effects in HA?
311. How do you measure HA failover recovery time?
312. How do you simulate data loss scenarios in HA?
313. How do you implement hybrid HA (on-prem + cloud)?
314. How do you monitor HA health across multiple DCs?
315. How do you prevent failover storms?
316. How do you integrate HA with DNS failover systems?
317. How do you design PostgreSQL for zero RPO HA?
318. How do you handle HA when using logical replication?
319. How do you plan HA upgrades across multiple clusters?
320. How do you integrate PostgreSQL HA with service meshes?

Disaster Recovery & PITR Advanced (321–340)

321. How do you plan PITR with terabytes of WAL?
322. How do you validate PITR recovery speed?
323. How do you manage WAL archiving to S3/GCS/Azure?
324. How do you test PITR consistency automatically?
325. How do you configure pgBackRest for parallel restores?
326. How do you optimize ZFS snapshots for PostgreSQL DR?
327. How do you simulate corruption and test PITR?
328. How do you reduce restore time for multi-TB DBs?
329. How do you use standby clones for PITR validation?
330. How do you integrate PITR with Kubernetes operators?
331. How do you restore single schema using PITR techniques?
332. How do you plan PITR across different hardware?

333. How do you monitor WAL archival reliability?
334. How do you configure PITR for point-in-time to seconds?
335. How do you recover from incomplete WAL archives?
336. How do you ensure encryption of archived WALs?
337. How do you design DR drills quarterly?
338. How do you simulate regional DR cutover?
339. How do you design RPO/RTO SLAs for PostgreSQL?
340. How do you automate PITR testing in CI/CD pipelines?

Advanced Query & Execution Plan Internals (341–360)

341. How do you read parallel query execution plans?
342. How do you analyze buffer usage in EXPLAIN (BUFFERS)?
343. How do you detect JIT compilation usage in plans?
344. How do you interpret async append execution?
345. How do you tune plans with multiple nested loops?
346. How do you detect misestimated rows in joins?
347. How do you optimize plans with skewed data distribution?
348. How do you force planner to prefer hash join?
349. How do you disable parallelism for certain queries?
350. How do you analyze I/O timing from EXPLAIN?
351. How do you detect sequential scan fallbacks?
352. How do you analyze memory usage in query plans?
353. How do you troubleshoot parameter sniffing issues?
354. How do you detect queries not using parallelism despite eligibility?
355. How do you use pg_hint_plan for query tuning?
356. How do you detect join collapse effects in queries?
357. How do you interpret worker statistics in parallel plans?
358. How do you reduce planning time in complex queries?
359. How do you analyze bitmap heap scans in detail?
360. How do you compare runtime stats vs planner estimates?

Parallelism & JIT Tuning (361–380)

361. How do you tune max_parallel_workers_per_gather?
362. How do you monitor parallel query worker utilization?
363. How do you detect when parallelism adds overhead?
364. How do you enable parallel index scans?
365. How do you tune work_mem for parallel queries?
366. How do you disable parallelism for OLTP workloads?
367. How do you optimize parallel aggregates?
368. How do you detect parallel plan regressions after upgrades?
369. How do you configure JIT compilation thresholds?
370. How do you disable JIT for small queries?
371. How do you analyze JIT statistics per query?

372. How do you tune jit_above_cost vs jit_inline_above_cost?
373. How do you detect LLVM/JIT compatibility issues?
374. How do you benchmark JIT impact on queries?
375. How do you optimize parallel inserts into partitioned tables?
376. How do you analyze parallel query startup costs?
377. How do you detect parallel plan deadlocks?
378. How do you use explain analyze for parallel query debugging?
379. How do you optimize parallel joins?
380. How do you manage JIT memory usage in mixed workloads?

Extensions & Special Workloads (381–400)

381. How do you optimize queries using pg_trgm indexes?
382. How do you tune full-text search with GIN indexes?
383. How do you optimize JSONB queries with expression indexes?
384. How do you use citus for distributed OLAP workloads?
385. How do you optimize PostGIS spatial indexes?
386. How do you tune queries using hstore extension?
387. How do you optimize temporal queries with btree_gist?
388. How do you analyze performance impact of foreign data wrappers?
389. How do you secure FDW connections with TLS?
390. How do you optimize queries across postgres_fdw joins?
391. How do you monitor extension-specific metrics?
392. How do you detect extension version mismatches?
393. How do you manage upgrades for extensions like PostGIS?
394. How do you benchmark Citus sharded queries?
395. How do you tune pg_partman partition creation intervals?
396. How do you optimize time-series workloads with TimescaleDB?
397. How do you detect slow queries in Timescale continuous aggregates?
398. How do you manage schema drift in FDW setups?
399. How do you optimize connection pooling with PgBouncer?
400. How do you tune statement caching in PgBouncer?

Cloud, Containers & Kubernetes (401–420)

401. How do you optimize PostgreSQL in AWS RDS?
402. How do you configure parameter groups in RDS?
403. How do you monitor Aurora PostgreSQL replication lag?
404. How do you tune GCP CloudSQL Postgres for OLAP?
405. How do you optimize Azure Flexible Server Postgres storage?
406. How do you manage backups in RDS without pgBackRest?
407. How do you handle failover in RDS Multi-AZ setups?
408. How do you configure pgBackRest in Kubernetes with StatefulSets?
409. How do you optimize persistent volumes for Postgres on K8s?
410. How do you scale Postgres pods with Citus on K8s?

411. How do you manage WAL archiving in containerized setups?
412. How do you monitor Postgres in K8s using Prometheus?
413. How do you tune Postgres resource limits in pods?
414. How do you configure HAProxy with Postgres in K8s?
415. How do you detect noisy neighbors in multi-tenant cloud DB?
416. How do you tune Postgres with EBS gp3 vs io2 volumes?
417. How do you automate failover with Cloud-native operators?
418. How do you migrate large Postgres DB to RDS with minimal downtime?
419. How do you tune backups in cloud storage for performance?
420. How do you optimize connection pooling in cloud-hosted DBs?

OS & Kernel Tuning (421–440)

421. How do you tune Linux huge pages for PostgreSQL?
422. How do you optimize swappiness for PostgreSQL servers?
423. How do you configure NUMA for PostgreSQL workloads?
424. How do you tune IO scheduler (deadline vs noop) for Postgres?
425. How do you optimize RAID configurations for PostgreSQL?
426. How do you tune file system parameters (ext4 vs xfs)?
427. How do you optimize dirty_background_ratio for WAL writes?
428. How do you detect I/O bottlenecks with iostat?
429. How do you configure kernel.shmmax and shmall for shared buffers?
430. How do you tune ulimits for PostgreSQL processes?
431. How do you optimize transparent huge pages (THP)?
432. How do you benchmark I/O throughput for PostgreSQL workloads?
433. How do you detect checkpoint I/O pressure at OS level?
434. How do you configure ZFS vs ext4 for PostgreSQL?
435. How do you optimize read-ahead settings for sequential scans?
436. How do you analyze CPU context switching impact on Postgres?
437. How do you monitor NUMA imbalance in Postgres queries?
438. How do you tune Postgres on bare metal vs VMs?
439. How do you configure cgroups for Postgres in Linux?
440. How do you tune kernel semaphores for Postgres concurrency?

Postgres 12–16 Features & Optimizations (441–460)

441. How do you use incremental sort in Postgres 13+?
442. How do you optimize parallel vacuum in Postgres 13+?
443. How do you monitor progress of ANALYZE in Postgres 13+?
444. How do you use hash partitioning improvements in Postgres 14?
445. How do you use query parallelization improvements in 14?
446. How do you tune JSONB subscripting in Postgres 14?
447. How do you use async append introduced in Postgres 13?
448. How do you optimize distinct aggregates in Postgres 14?
449. How do you tune vacuum I/O prioritization in Postgres 15?
450. How do you optimize MERGE statement in Postgres 15?

451. How do you analyze incremental checkpoint stats in 15?
452. How do you use two-phase commit performance improvements in 15?
453. How do you optimize foreign key checks in Postgres 15?
454. How do you use logical replication of sequences in 15?
455. How do you tune Postgres 16 query planner improvements?
456. How do you analyze progress reporting for COPY in 16?
457. How do you optimize parallel aggregation in 16?
458. How do you use security_barrier views in 16 for RLS?
459. How do you use enhanced monitoring views in Postgres 16?
460. How do you optimize performance using CPU JIT enhancements in 16?

Enterprise Multi-Cluster Management (461–480)

461. How do you manage schema consistency across multiple clusters?
462. How do you implement centralized monitoring for many Postgres clusters?
463. How do you plan rolling upgrades across multiple clusters?
464. How do you configure CI/CD pipelines for schema deployments?
465. How do you implement centralized user management across clusters?
466. How do you standardize PostgreSQL parameters enterprise-wide?
467. How do you track replication topology across 100+ clusters?
468. How do you manage DR drills for multiple clusters simultaneously?
469. How do you ensure compliance (GDPR, HIPAA) across Postgres

Enterprise Multi-Cluster Management (continued)

469. How do you ensure compliance (GDPR, HIPAA) across multiple PostgreSQL clusters?
470. How do you manage configuration drift between clusters?
471. How do you perform schema versioning and change tracking enterprise-wide?
472. How do you automate backup and restore verification across clusters?
473. How do you implement multi-cluster load balancing for read-heavy workloads?
474. How do you monitor cross-cluster replication health?
475. How do you handle network partition events in distributed clusters?
476. How do you plan capacity and resource allocation across clusters?
477. How do you detect and resolve cluster-level performance bottlenecks?
478. How do you standardize alerting and incident response across multiple clusters?
479. How do you manage multi-tenant isolation across clusters?
480. How do you perform coordinated failovers across clusters?

Future-Proofing, CI/CD, Automation, Best Practices (481–500)

481. How do you automate schema deployments using CI/CD pipelines?
482. How do you integrate PostgreSQL testing in CI/CD workflows?
483. How do you plan Postgres upgrades with minimal downtime?
484. How do you track and reduce technical debt in database schemas?
485. How do you enforce coding and SQL best practices across teams?
486. How do you design monitoring for evolving workloads and clusters?
487. How do you automate index maintenance and monitoring?

Praveen Madupu
Mb: +91 98661 30093
Sr. Database Administrator

488. How do you implement automated failover testing in staging?
489. How do you integrate Postgres metrics into enterprise dashboards?
490. How do you plan for future PostgreSQL feature adoption?
491. How do you enforce continuous security audits in production clusters?
492. How do you automate backup verification and restore drills?
493. How do you design alerting for critical SLA violations?
494. How do you implement continuous query performance regression testing?
495. How do you manage Postgres extensions versioning enterprise-wide?
496. How do you optimize Postgres deployments for hybrid cloud environments?
497. How do you perform automated data archival and lifecycle management?
498. How do you enforce resource limits and workload isolation automatically?
499. How do you plan for zero-downtime schema migrations?
500. How do you design a PostgreSQL environment to scale 10x in the next 5 years?