

VNA-SB-012 | Database X to Database Y | Polyglot Database Right-Sizing & Cross-Engine Engineering | Redwood River

Oracle to PostgreSQL & AlloyDB Migration vs. Oracle SE2 / ODA License Right-Sizing

Not every workload belongs on the same database tier. When architectural mandates require moving departmental schemas, reporting views, or microservice backends from Oracle to PostgreSQL or Google AlloyDB, our database engineers know both engines at the internals level. Even better: before you spend \$2M rewriting complex PL/SQL packages that PostgreSQL cannot match, we benchmark whether right-sizing onto Oracle SE2 or ODA saves more money in 1/10th the time.

Search Queries & Scope Covered: Oracle to PostgreSQL migration | convert Oracle PL/SQL packages to PostgreSQL PL/pgSQL | Oracle to Google AlloyDB migration | Ora2Pg complex view and CONNECT BY conversion | reduce Oracle Enterprise Edition license cost without rewriting

SOURCE LEGACY STACK (STACK X)		MODERNIZED TARGET ARCHITECTURE (STACK Y)	
Oracle Database Views, Schemas & Departmental Workloads		PostgreSQL / AlloyDB / Cloud SQL OR Right-Sized Oracle SE2 / ODA	
AUTOMATED VIEW & DDL PORTING	PL/SQL TO PL/PGSQL ANALYSIS	ALTERNATIVE LICENSE SAVE (ODA/SE2)	ZERO-DOWNTIME SYNC
Ora2Pg + AST Engine	Package Complexity Score	50-80% Without Rewrite	GoldenGate / Logical CDC

1. Problem Space & Architectural Bottlenecks

- Organizations often attempt 'all-or-nothing' Oracle-to-PostgreSQL migrations using generic cloud-vendor contractors who underestimate Oracle-specific features: Package state variables, Autonomous Transactions (`PRAGMA AUTONOMOUS_TRANSACTION`), Global Contexts (`SYS_CONTEXT`), Advanced Queuing (`DBMS_AQ`), and complex analytical view hierarchies.
- Meanwhile, many tier-2 and tier-3 databases sitting on expensive Enterprise Edition cores actually use zero EE-only features and could be legally right-sized to Oracle Standard Edition 2 (SE2) or consolidated on an Oracle Database Appliance (ODA) without rewriting a single line of code.
- When workloads *do* move to PostgreSQL / AlloyDB / AWS Aurora, poorly translated views (`CONNECT BY`, `DECODE`, `NVL`, outer join `(+)` syntax) suffer 10x performance degradation under PostgreSQL's MVCC vacuum model.

2. Technical Solution & Reference Architecture

- 2.1 Phase 0 Workload & License Reality Audit:** We scan `DBA_FEATURE_USAGE_STATISTICS`, PL/SQL package AST complexity, and SQL plan profiles across your fleet to segment databases into: (A) Clean candidates for PostgreSQL / AlloyDB conversion, and (B) High-complexity PL/SQL / APEX workloads where ODA Capacity-on-Demand or SE2 right-sizing delivers higher ROI.
- 2.2 Automated View & SQL Dialect Refactoring:** For workloads moving to PostgreSQL / AlloyDB, our AST engine rewrites Oracle legacy outer joins `(+)`, hierarchical `START WITH ... CONNECT BY` queries into ANSI recursive

CTEs (``WITH RECURSIVE``), ``MERGE`` statements, and materialized views.

2.3 PL/SQL Package Decomposition to Schema-Scoped PL/pgSQL: Oracle Packages are mapped to PostgreSQL schemas with session-scoped GUC variables replacing package globals and connection-pool-safe transaction handlers.

2.4 Bi-Directional CDC & Read-Replica Offload: Using Oracle GoldenGate or SharePlex, we stream real-time changes from Oracle to PostgreSQL / AlloyDB / BigQuery to power external microservices without impacting core ERP transactions.

3. Artifact-by-Artifact Conversion & Modernization Matrix

Legacy Artifact / Baseline Workload	Modernized Oracle / Cloud Target	Engineering Method & Outcome
Oracle Hierarchical Queries (<code>`CONNECT BY PRIOR`</code>)	PostgreSQL / AlloyDB ANSI <code>`WITH RECURSIVE`</code> CTEs	Automated AST Query Rewrite & Cycle Detection
Oracle PL/SQL Packages & Package Body State	PostgreSQL Schemas + <code>`PL/pgSQL`</code> Functions + Custom GUCs	State Decoupling & Procedural Transpilation
Oracle <code>`PRAGMA AUTONOMOUS_TRANSACTION`</code> Audit Logs	PostgreSQL <code>`dblink`</code> / Background Worker or Outbox Pattern	Connection-Pool-Safe Asynchronous Logging
High-Cost EE Databases Using Zero EE Features	Oracle Standard Edition 2 (SE2) or ODA Capacity-on-Demand	Zero-Rewrite License Reduction (60-80% TCO Drop)

4. Oracle APEX & Ancillary Engineering Toolchain

- Viscosity Cross-Engine SQL/PLSQL AST Analyzer & ``Ora2Pg`` Enterprise Pipeline
- Oracle GoldenGate & Quest SharePlex for heterogeneous Oracle-to-Postgres CDC
- Google AlloyDB for PostgreSQL, Cloud SQL, and AWS Aurora PostgreSQL
- Oracle Database Appliance (ODA X11) & Oracle Standard Edition 2 (SE2) for zero-rewrite license optimization

Anonymized Production Proof: For a national furniture manufacturer and a defense R&D engineering lab, we executed targeted conversions of complex Oracle view hierarchies and application schemas to alternative cloud databases while simultaneously right-sizing core Oracle Enterprise footprints to cut annual support costs without business disruption.

5. Principal Architect Q&A

Q: Why hire an Oracle-specialized engineering firm to help with an Oracle-to-PostgreSQL migration?

A: PostgreSQL specialists rarely understand the subtle semantics of Oracle PL/SQL packages, optimizer hints, ``SYS_CONTEXT``, and date/number implicit conversions. Because our architects know Oracle internals deeply, we spot and solve the 15% of Oracle idioms that break standard ``Ora2Pg`` migrations.

Q: When should we keep a workload on Oracle instead of converting to PostgreSQL?

A: If a database contains 50,000+ lines of tight PL/SQL business logic or powers an Oracle APEX application, rewriting it in Postgres + React costs 5x to 10x more than consolidating it onto an Oracle Database Appliance (ODA) with Capacity-on-Demand licensing.

Q: What is included in the downloadable PDF Solution Brief?

A: The PDF Solution Brief includes the Oracle-vs-PostgreSQL Internals Translation Matrix, the `DBA\_FEATURE\_USAGE\_STATISTICS` right-sizing script, and a TCO model comparing Rewrite-to-Postgres vs. ODA Consolidation.