

VNA-SB-001 | Application Stack X to Application Stack Y | Client/Server Desktop to Oracle Low-Code | Redwood Clay

PowerBuilder to Oracle APEX Migration & Automated PBL Conversion

Stop maintaining brittle PowerBuilder (.pbl) desktop binaries, Citrix farms, and undocumented PowerScript triggers. Our automated AST reverse-engineering parser extracts every DataWindow query, validation rule, and window event, compiling them into governed Oracle APEX 24.2 applications, ORDS REST endpoints, and modular PL/SQL packages.

Search Queries & Scope Covered: PowerBuilder to Oracle APEX migration | PowerBuilder modernization tool | convert PowerBuilder DataWindow to web | decompile PowerBuilder PBL to SQL and PL/SQL | Appeon PowerBuilder alternative Oracle APEX | replace PowerBuilder Citrix thick client

SOURCE LEGACY STACK (STACK X)		MODERNIZED TARGET ARCHITECTURE (STACK Y)	
Sybase / Appeon PowerBuilder (.pbl, .srd, .srw, DataWindows, PowerScript)		Oracle APEX 24.2, Oracle REST Data Services (ORDS), PL/SQL Packages & AMP	
PBL & DATAWINDOW EXTRACTION	UI & BUSINESS RULE RECOVERY	CITRIX & CLIENT LICENSING SAVED	TARGET ARCHITECTURE
100% AST Parsed	70-85% Automated	\$180K-\$650K/yr	APEX 24.2 + ORDS + AMP

1. Problem Space & Architectural Bottlenecks

- Enterprise operations still rely on mission-critical PowerBuilder 6.5 through 2022 desktop applications built 15 to 25 years ago. The original authors have retired, leaving hundreds of thousands of lines of undocumented PowerScript buried inside binary .pbl libraries.
- Every PowerBuilder DataWindow (.srd) mixes SQL joins, computed columns, conditional UI formatting, and transaction state directly inside the client binary. Deploying changes requires pushing thick-client installers or maintaining expensive Citrix / RDS terminal server farms.
- Manual rewrites fail because business analysts cannot document twenty years of edge-case PowerScript validation rules found in ItemChanged, RowFocusChanged, and UpdateStart events.

2. Technical Solution & Reference Architecture

- 2.1 Automated PBL & SRD/SRW AST Parser:** Our reverse-engineering engine unpacks binary .pbl archives into ASCII source objects (.srw windows, .srd DataWindows, .sru user objects, .srm menus) and builds a complete Abstract Syntax Tree (AST) and dependency graph.
- 2.2 DataWindow-to-APEX Component Compiler:** Tabular, Grid, Freeform, and Master-Detail DataWindows are mapped directly to Oracle APEX 24.2 Interactive Grids, Interactive Reports, and Smart Filters. Computed fields and DropDownDataWindows (DDDW) become Shared List of Values (LOVs).
- 2.3 PowerScript-to-PL/SQL Pushdown:** Client-side PowerScript data manipulation and embedded SQL are refactored into compiled, unit-tested Oracle PL/SQL API packages with utPLSQL test harnesses, eliminating chatty client/server network round-trips.

- 2.4 Enterprise Governance via AMP & SQLcl: All converted APEX workspaces are wired into our Application Management Platform (AMP) for centralized SSO (OIDC/SAML), role-based access control, unified auditing, and automated SQLcl Liquibase CI/CD pipelines.
- 2.5 Query Fan-Out Rationalization & Runtime/Inference Filtering: Instead of migrating cloned reports and DataWindows 1-for-1, our AST SQL parser clusters queries by their canonical core JOIN graph, builds governed Oracle 23ai views only for those core queries, and generates dynamic WHERE clauses, faceted filters, and ad-hoc report variations at runtime and via AI inference (APEX 24.2 Smart Filters & Select AI).

3. Artifact-by-Artifact Conversion & Modernization Matrix

Legacy Artifact / Baseline Workload	Modernized Oracle / Cloud Target	Engineering Method & Outcome
PowerBuilder DataWindow (.srd - Grid / Tabular)	APEX 24.2 Interactive Grid / Interactive Report	Automated SQL & Column Metadata Compiler
Freeform DataWindow & Window Controls (.srw)	APEX Form Region + Universal Theme 42 Layout	Grid Coordinate Normalization to Responsive Flex/Grid
DropDownDataWindow (DDDW) & Code Tables	APEX Shared Components List of Values (LOV)	Deduplicated Schema-Level LOV Generator
PowerScript ItemChanged / Validate Events	APEX Dynamic Actions + PL/SQL Validation Packages	AST Rule Extraction & Server-Side Pushdown
Non-Visual User Objects (NVO / .sru)	Oracle Database PL/SQL Packages + ORDS REST APIs	AST Transpilation + utPLSQL Automated Test Suite
Composite / Nested Report DataWindows	APEX Office Print (AOP) / BI Publisher PDF Templates	Pixel-Perfect Layout & Bind Variable Mapping
Cloned Reports / Queries Differing Only by WHERE Clause or Group-By (Query Fan-Out)	Canonical Core SQL View + APEX 24.2 Runtime / AI Inference Filters	AST Join-Graph Clustering (75-90% Report Count Reduction)

4. Oracle APEX & Ancillary Engineering Toolchain

- Oracle APEX 24.2 (Universal Theme 42, Interactive Grids, Dynamic Actions, Native Approvals & Workflow)
- Viscosity Application Management Platform (AMP) for multi-app SSO, RBAC, telemetry, and error logging
- Oracle REST Data Services (ORDS) for OAuth2 REST API exposure
- Oracle SQLcl Projects & Liquibase for Git-backed schema and APEX page diffs
- utPLSQL & Selenium for automated regression verification against legacy PowerBuilder outputs

Anonymized Production Proof: For a multi-site industrial and logistics operator running 420+ PowerBuilder windows and 1,100 DataWindows over a legacy relational schema, our AST reverse-engineering pipeline extracted 100% of embedded SQL and business rules in 3 weeks, delivering a governed Oracle APEX 24.2 web platform in 16 weeks and retiring 14 Citrix servers.

5. Principal Architect Q&A

Q: How do you extract business logic trapped inside PowerBuilder ItemChanged and Clicked events?

A: Our parser decomposes .srw and .sru exports into an Abstract Syntax Tree, separating UI state changes from database validations and DML. UI state toggles become APEX Dynamic Actions, while validations and transactions are compiled into server-side PL/SQL packages.

Q: What if our PowerBuilder application runs on Sybase ASE, SQL Anywhere, or SQL Server instead of Oracle?

A: We convert both the database tier (Sybase T-SQL / Watcom-SQL to Oracle Database 23ai PL/SQL) and the PowerBuilder UI tier simultaneously, or connect APEX to your external database via ORDS REST Enabled SQL and database links during phased cutover.

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

A: The 4-page PDF Solution Brief includes the complete PowerBuilder-to-APEX AST Reference Architecture, the DataWindow-to-Interactive-Grid mapping matrix, a sample PBL complexity sizing worksheet, and a 12-week phased cutover blueprint.