

VNA-SB-008 | Database X to Database Y | Legacy Wire-Protocol Gateway & Multi-Decade Upgrade | Canyon Ochre

Oracle 7.3.4, 8i & 9i Solaris SPARC to Oracle 23ai Migration (ORA-28040 / SQL*Net V2)

Standard Oracle upgrade paths and intermediate 11g SQL*Net bridges fail when frozen 1990s Solaris/Windows client executables (OCI7 / SQL*Net 2.3.x) send deprecated Two-Task Common (TTC) opcodes and 7-byte date structs. Our purpose-built Linux wire-protocol proxy translates legacy TNS v2 (0x0134) packets directly to Oracle 23ai/26ai on Linux, letting you retire 25-year-old Sun SPARC hardware immediately.

Search Queries & Scope Covered: migrate Oracle 7.3.4 to 19c 23ai | ORA-28040 No matching authentication protocol Oracle 7 8i 9i | SQL*Net v2 to Oracle 23ai protocol gateway | retire Sun Solaris SPARC Oracle 7 database | OCI7 O3LOGON compatibility Oracle 19c 23ai

SOURCE LEGACY STACK (STACK X)		MODERNIZED TARGET ARCHITECTURE (STACK Y)	
Oracle7 (7.1.3 / 7.3.4) & Oracle8i/9i on Solaris SPARC / HP-UX (SQL*Net V2 / TNS)		Oracle Database 23ai / 26ai on Linux / OCI via Wire-Level Protocol Gateway	
CLIENT BINARY CHANGES	INTERMEDIATE 9I/11G HOPS	WIRE PROXY OVERHEAD	SPARC HARDWARE RISK
0 (100% Untouched)	0 (Direct to 23ai)	< 0.4ms per Query	100% Eliminated

1. Problem Space & Architectural Bottlenecks

- Defense, manufacturing, telecom, and utility operators still run Oracle 7.1.3 or 7.3.4 on aging Sun UltraSPARC / Solaris 2.6-8 hardware because the connecting C, Pro*C, Ada, or Forms 4.5 client binaries have no surviving source code or build toolchains.
- Oracle Database 12c, 19c, and 23ai permanently removed server-side support for SQL*Net v2 (TNS version 308), O3LOGON challenge-response authentication, and OCI7 (OOPEN/OPARSE/OEXFET) wire packets.
- Competitors propose keeping an unpatched Oracle 9i or 11g 'bridge database' alive forever with DB_LINK synonyms, which still fails on OCI7 cursor semantics, ROWID format changes (18-byte restricted vs. 10-byte extended), and LONG RAW buffers.

2. Technical Solution & Reference Architecture

- 2.1 Linux SQL*Net v2 / TTC Wire-Protocol Translator (sqlnet7-gateway):** A stateless, memory-safe Linux daemon listens on port 1521, accepts authentic TNS 308 (SQL*Net 2.3.4) handshakes, emulates O3LOGON authentication, and translates OCI7 TTC calls into modern Oracle 23ai OCI8 wire operations in real time.
- 2.2 Automatic ROWID & Datatype Shimming:** The gateway intercepts legacy 18-character BBBBBBBB.RRRR.FFFF Oracle7 restricted ROWIDs and maps them bi-directionally to Oracle 23ai extended base64 ROWIDs so legacy WHERE ROWID = :1 updates never fail.
- 2.3 Direct Schema & Character Set Uplift (US7ASCII / WE8ISO8859P1 to AL32UTF8):** We extract Oracle7 .dmp exports, sanitize legacy dictionary metadata, convert LONG/LONG RAW columns, and load directly into a Pluggable Database (PDB) on Oracle 23ai.
- 2.4 Unlock Modern Analytics & APEX on Live Legacy Data:** Once the data resides in Oracle 23ai, you can immediately build Oracle APEX 24.2 dashboards, ORDS REST APIs, and AI Vector Search on the exact same tables your legacy

1998 binaries are updating.

3. Artifact-by-Artifact Conversion & Modernization Matrix

Legacy Artifact / Baseline Workload	Modernized Oracle / Cloud Target	Engineering Method & Outcome
SQL*Net 2.0-2.3 (TNS Version 305-308) Connect Packet	Oracle Net Services 23ai (TNS Version 318+) + TLS 1.3	Wire-Level TNS Header & Capabilities Negotiation Proxy
Oracle7 O3LOGON DES Challenge-Response Auth	Oracle 23ai PBKDF2 / SHA-512 Session Pool	Gateway Credential Vault & Proxy Session Multiplexing
OCI7 TTC Opcodes (OPEN, PARSE, OEXFET)	Modern OALL8 Bundled Execute/Fetch Wire Calls	Stateful TTC Packet AST Translation
Oracle7 Restricted ROWID (00001F2A.0001.0004)	Oracle 23ai Extended ROWID (AAAR3sAAEAAAACXAAA)	DBMS_ROWID Bi-Directional Wire Interceptor
Solaris SPARC Big-Endian Physical Datafiles	Oracle 23ai Linux x86_64 / ARM64 PDB	Sanitized Logical Export/Import + Checksum Validation

4. Oracle APEX & Ancillary Engineering Toolchain

- Viscosity sqlnet7-gateway Linux Wire-Protocol Proxy & Replay Harness
- Oracle Database 23ai / 26ai (On-Premises Linux, ODA X11, or OCI Base/Autonomous DB)
- Oracle APEX 24.2 & ORDS for modernizing the UI tier *after* the database is safely off SPARC hardware
- Oracle Data Guard & RMAN for modern HA/DR protection

Anonymized Production Proof: Engineered specifically for organizations trapped on end-of-life Solaris SPARC and HP-UX servers running Oracle 7.1.3 and 7.3.4 with unmodifiable 32-bit client binaries, our wire-protocol gateway retires legacy RISC hardware in weeks without requiring a multi-year application rewrite first.

5. Principal Architect Q&A

Q: Why doesn't a standard Oracle 11g database link bridge work for all Oracle 7.3.4 clients?

A: An 11g bridge still requires maintaining an unsupported, unpatched 11.2.0.4 server, breaks when OCI7 clients inspect ROWID strings or V\$SESSION views, and doubles network latency across two database hops.

Q: Do we need the C / Pro*C / Forms 4.5 source code of our legacy client applications?

A: No. You only point the legacy client's tnsnames.ora IP address to our Linux protocol gateway. The client binary believes it is still talking to an Oracle 7.3.4 instance on Solaris.

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

A: The PDF Solution Brief contains the wire-level packet architecture diagram (TNS 0x0134 to OALL8), the ROWID and O3LOGON translation specification, and our zero-downtime cutover runbook.