

VNA-SB-013 | Database X to Database Y | Zero-Downtime Cross-Version & Cross-Cloud Replication | Redwood Sandstone

Zero-Downtime Oracle Database Migration with GoldenGate 23ai & Quest SharePlex

Mission-critical retail, healthcare, financial, and manufacturing databases cannot tolerate a 12-hour weekend outage for an OS migration, character-set conversion, or cloud cutover. We architect non-invasive Change Data Capture (CDC) pipelines using Oracle GoldenGate 23ai Microservices and Quest SharePlex with automated fallback failback protection.

Search Queries & Scope Covered: zero downtime Oracle database upgrade GoldenGate | migrate GoldenGate Classic to GoldenGate 23ai Microservices | Quest SharePlex vs Oracle GoldenGate license cost | OCI Managed GoldenGate bi-directional active-active replication | upgrade Oracle 11g 12c to 19c 23ai without outage

SOURCE LEGACY STACK (STACK X)		MODERNIZED TARGET ARCHITECTURE (STACK Y)	
Oracle 11g / 12c / 19c, SQL Server, DB2 & MySQL On-Premises		OCI GoldenGate 23ai Microservices, Quest SharePlex & Active-Active Cloud	
CUTOVER OUTAGE WINDOW	REPLICATION LAG SLA	ROLLBACK SAFETY	SUPPORTED TOPOLOGIES
< 2 Minutes	Sub-Second CDC	Instant Reverse Sync	Oracle / SQL / Postgres

1. Problem Space & Architectural Bottlenecks

- Upgrading multi-terabyte Oracle 11g/12c databases to 19c/23ai or moving across operating systems (Solaris/AIX to Linux) via traditional export/import or RMAN restore requires hours of application downtime.
- Classic GoldenGate command-line (`ggsci`) deployments suffer from complex pump-trail management, firewall port sprawl, and undetected row divergence when DDL changes occur mid-flight.
- Teams paying for full Oracle GoldenGate licenses solely for Oracle-to-Oracle Standby/Reporting replication are often unaware that Quest SharePlex can deliver identical log-based replication at a fraction of the annual maintenance cost.

2. Technical Solution & Reference Architecture

- 2.1 OCI GoldenGate 23ai Microservices & Hub Architecture:** We deploy hub-and-spoke REST-managed GoldenGate Microservices (`ServiceManager`, `AdminServer`, `DistributionServer`, `ReceiverServer`) over TLS 1.3 with zero agent installation required on source database hosts.
- 2.2 Bi-Directional Active-Active & Instant Rollback Cutover:** During cutover, we reverse replication (`Replicat` -> `Extract`) from the new 23ai database back to the legacy 11g/12c/19c source so that if any application anomaly occurs during the first 72 hours, traffic can switch back with zero data loss.
- 2.3 Automated Row-Level Veridata / Checksum Reconciliation:** Continuous in-flight data comparison validates 100% row and LOB parity between source and target tables while users remain online.
- 2.4 SharePlex License Cost Optimization:** For organizations seeking to reduce GoldenGate support renewals on Oracle-to-Oracle or Oracle-to-Postgres pipelines, our certified SharePlex practice executes seamless replication replacements.

3. Artifact-by-Artifact Conversion & Modernization Matrix

Legacy Artifact / Baseline Workload	Modernized Oracle / Cloud Target	Engineering Method & Outcome
GoldenGate Classic Architecture (`ggsci` + Collector)	GoldenGate 23ai Microservices + OCI Managed GoldenGate	REST-API Automation & Trail File Migration
Multi-Hour Data Pump (`expdp`/`impdp`) Outages	Online Initial Instantiation (`SCN`-locked) + CDC Catchup	Zero-Outage Cutover Switchover
One-Way Blind Cutover Risk	Bi-Directional Reverse Fallback Replication	Conflict Detection & Resolution (CDR) Rules
High-Cost Reporting / Standby Sync Licenses	Quest SharePlex or GoldenGate CPU Right-Sizing	Log-Based Redo Parsing Optimization

4. Oracle APEX & Ancillary Engineering Toolchain

- Oracle GoldenGate 23ai Microservices Architecture & OCI Managed GoldenGate
- Oracle GoldenGate Veridata for live in-flight table checksum reconciliation
- Quest SharePlex for cost-optimized Oracle-to-Oracle and heterogeneous replication
- Oracle Data Guard, Active Data Guard (ADG), and Application Continuity

Anonymized Production Proof: From high-volume national quick-service restaurant chains processing thousands of POS transactions per minute to global manufacturing and telecommunications databases, our replication architects have executed hundreds of zero-downtime GoldenGate and SharePlex migrations across Oracle 11g, 12c, 19c, and 23ai.

5. Principal Architect Q&A

Q: How do you prevent primary-key or sequence collisions during bi-directional fallback?

A: We configure odd/even or staggered sequence intervals (`INCREMENT BY 2`), UTC timestamp conflict detection and resolution (CDR), and automated Oracle Net Application Continuity draining during the 60-second cutover window.

Q: When should we choose Quest SharePlex vs. Oracle GoldenGate?

A: Oracle GoldenGate 23ai is ideal for heterogeneous cloud hubs, OCI native integration, and complex microservices meshes. Quest SharePlex is often the highest-ROI choice for straightforward Oracle-to-Oracle or Oracle-to-Postgres HA/reporting pipelines where license cost reduction is the primary driver.

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

A: The PDF Solution Brief includes the Zero-Downtime SCN Instantiation & Reverse-Fallback Runbook, the GoldenGate Classic-to-Microservices migration checklist, and a GoldenGate vs. SharePlex TCO comparison matrix.