


PharmaCorp Mexico

Oracle Database Migration to OCI

ExaCS Migration — Exadata X6 to OCI



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Prepared with OCI Deal Accelerator

This document is provided for informational purposes only. Actual results may vary.

Executive Summary

PharmaCorp Mexico operates 3 Oracle databases (EBS R12, SAP, DW) on on-premises Exadata X6 hardware approaching end-of-life. Hardware refresh costs \$1.8M and locks into 5 more years of on-prem operations. Migration to OCI ExaCS provides 30%+ cost reduction, eliminates hardware lifecycle management, improves DR posture (RPO<15min, RTO<1h), and enables SOX compliance alignment with Oracle-managed infrastructure patching.

Current State

- 3 Oracle DBs on Exadata X6 (EBS R12 prod, SAP, Data Warehouse)
- 200 concurrent users, peak during fiscal close
- 2TB total data across all databases
- No DR — single site in Mexico City data center
- Manual patching quarterly — SOX audit finding pending
- HW refresh due in 6 months (\$1.8M quote)

Target State

OCI ExaCS X11M in Queretaro (prod) with Data Guard standby in Sao Paulo for cross-region DR. Hub-spoke networking via DRG, dual FastConnect 10Gbps for redundancy, WAF for web applications, OCI Vault for TDE key management. SOX compliance via automated patching and audit logging.

Timeline: Migration Q3-Q4 2026 (16 weeks) — conditional on board approval Q2

Service Tiering

Each tier drives HA/DR topology, backup strategy, isolation model, and support level.

Workload	Tier	Uptime	RTO	RPO
EBS R12 Production	Platinum	99.99%	1 hour	15 minutes
SAP Database	Gold	99.95%	4 hours	1 hour
Data Warehouse	Silver	99.9%	8 hours	4 hours

Architecture Principles

Design

- **D-01 Operational Simplicity** — Prefer managed services with automated patching
- **D-05 HA for Business Continuity** — Design for HA proportional to business impact
- **D-06 Defense in Depth** — Multiple security layers, not single perimeter

Deployment

- **P-01 Infrastructure as Code** — All infrastructure defined in Terraform

Architecture Overview

Dual-region ExaCS deployment: Queretaro (primary) + Sao Paulo (DR standby). Hub-spoke networking with DRG provides segmented VCNs for each workload tier. Dual FastConnect 10Gbps from Mexico City provides redundant connectivity. WAF protects EBS web tier. OCI Vault manages TDE encryption keys externally. Key components: - ExaCS X11M Quarter Rack in Queretaro (3 databases) - Data Guard to ExaCS standby in Sao Paulo (EBS + SAP) - Hub VCN with DRG for inter-spoke routing - Dual FastConnect 10Gbps from Mexico City DC - WAF for EBS R12 web access - OCI Vault for TDE key management (SOX) - OCI Logging + Audit for compliance

Architecture Decisions

Decision	Rationale
Use ExaCS instead of ADB-S for all 3 databases	EBS R12 requires OS-level access for patches and customizations. SAP on Oracle requires specific Oracle features not available on ADB-S. DW benefits from ExaCS storage performance. All 3 share the same Exadata infrastructure for cost efficiency.
Active Data Guard from Queretaro to Sao Paulo	RPO<15min requires real-time redo shipping. Sao Paulo provides geographic separation for disaster scenarios. Data Guard supports automatic failover with FSDR for RTO<1h.
Hub VCN with DRG for inter-spoke routing and segmentation	SOX requires network segmentation between environments. Hub-spoke with DRG provides centralized security controls (WAF, NSG) while isolating workloads.
Two 10Gbps FastConnect circuits from Mexico City	Single FastConnect is a documented single point of failure. Dual circuits provide redundancy for the EBS production workload.
External key management via OCI Vault instead of Oracle Wallet	SOX requires separation of duties for encryption key management. OCI Vault provides FIPS 140-2 Level 3 HSM-backed key storage.

High Availability & Disaster Recovery

Primary in Queretaro with Active Data Guard to Sao Paulo. FSDR orchestrates failover for RTO<1h. EBS and SAP databases replicated; DW rebuilt from backup in DR scenario (Silver tier — 8h RTO acceptable).

Component	Technology	RTO	RPO
Platinum — EBS R12	ExaCS + Active Data Guard + FSDR automatic failover	1 hour	15 minutes
Gold — SAP	ExaCS + Active Data Guard	4 hours	1 hour
Silver — DW	ExaCS + RMAN backup to Object Storage	8 hours	4 hours

Security & Compliance

✓ SOX — automated patching, audit logging, separation of duties

Identity

- OCI IAM with federated identity (SAML 2.0 to corporate AD)
- Separate admin compartments per environment
- MFA required for all admin operations
- Break-glass emergency access procedures

Network

- Hub-spoke VCN with DRG — workload isolation
- WAF for EBS R12 web tier
- NSG rules per spoke — deny-all default
- Dual FastConnect — no public internet exposure

Data Protection

- TDE encryption at rest with OCI Vault (FIPS 140-2 L3)
- Encryption in transit (TLS 1.2+ / native Oracle Net encryption)
- Data Guard redo encryption

Monitoring

- OCI Audit for all API calls (SOX)
- OCI Logging for network flows
- Database Audit with Unified Auditing
- OCI Events + Notifications for security alerts

Environment Catalogue

Environment	Tier	Databases	OCPUs	Isolation
				Dedicated Exadata infrastructure
				Dedicated Exadata infrastructure
				Shared infrastructure, separate compartment

Cost Optimization

- DR standby runs at 70% — Active Data Guard requires matching shape
- Pre-prod uses DBCS VMs, not ExaCS — sufficient for functional testing
- Dev/Test environment excluded — customer uses on-prem for dev

Cost Estimate

Component	Monthly (PAYG)	Monthly (BYOL)	Notes
ExaCS X11M Quarter Rack — Queretaro (Prod)	\$18,500	\$8,200	2 DB servers, 3 storage servers, BYOL
ExaCS X11M Quarter Rack — Sao Paulo (DR)	\$18,500	\$8,200	ADG standby, BYOL
ADB-S 16 ECPU (DW alternative — future)	\$2,400	\$1,200	Optional — migrate DW to ADB-S in Phase 2
FastConnect 10Gbps Dual	\$3,060		2 x \$1,530/month
OCI Vault	\$500		HSM-backed key management
Object Storage (50TB backup)	\$1,200		RMAN backups + DW backup
WAF + Logging + Monitoring	\$800		WAF for EBS web tier + audit logging
TOTAL	\$45,000	\$23,200	BYOL saves 48%

Assumptions:

- BYOL assumes existing Oracle Database EE licenses with active support
- ExaCS pricing based on current OCI list prices
- DR standby at full rate (ADG requires active compute)
- No middleware licensing included (EBS app tier on compute VMs)
- FastConnect partner charges not included

Cost Comparison: On-Prem HW Refresh vs OCI Migration

Component	On-Prem Refresh (5yr)	OCI ExaCS BYOL	Delta
Infrastructure (hardware/cloud)	\$1,800,000 upfront	\$278,400/yr	Break-even at 3.2 years
Annual Support & Maintenance	\$220,000/yr	Included in OCI	-100%
DR Infrastructure	\$0 (no DR today)	\$98,400/yr	New capability — no DR today
Data Center (power/cooling/space)	\$80,000/yr	\$0	-100%
DBA Operations (patching)	\$60,000/yr (part-time DBA)	\$0 (automated)	-100%
TOTAL ANNUAL (year 1)	\$2,160,000	\$376,800	-83%
TOTAL 3-YEAR TCO	\$2,880,000	\$1,130,400	-\$1.75M (61%)

Migration Approach

Phase	Timeline	Key Activities
Phase 1: Foundation		
Phase 2: EBS Migration		
Phase 3: SAP + DW Migration		
Phase 4: Cutover + Decommission		

Migration Tools: Oracle Zero Downtime Migration (ZDM), Data Guard Broker for DR setup, FSDR for failover orchestration, Terraform OCI provider for IaC

Downtime Approach: Planned 4-hour maintenance window for final cutover per database

Operational Responsibilities (Co-Managed)

Activity	Customer	Oracle / Partner
ExaCS Infrastructure Patching	I	R
Database Patching (quarterly)	R	C

Activity	Customer	Oracle / Partner
Data Guard Monitoring	R	C
Backup & Recovery	C	R
Security (IAM, NSG, Vault)	R	C
SOX Audit Evidence	R	C
Capacity Planning	R	C
Incident Response (Sev1)	R	C

R = Responsible | A = Accountable | C = Consulted | I = Informed

Risk Register

Risk	Severity	Mitigation
EBS R12 customizations may require OS-level changes post-migration	HIGH	Inventory all customizations pre-migration; test in Pre-Prod
FastConnect provisioning delay (partner-dependent)	MEDIUM	Start FastConnect provisioning in Phase 1 week 1; IPSec VPN as interim
SAP certification on ExaCS version	MEDIUM	Verify SAP Note for ExaCS X11M support before migration
Data Guard network latency Queretaro-Sao Paulo	LOW	Test redo apply lag; async mode acceptable for SAP (Gold tier)
SOX audit during migration window	MEDIUM	Maintain dual-write during transition; both systems auditable

Well-Architected Scorecard

Pillar	Score	Status
Security & Compliance	24/26	✓ Pass
Reliability & Resilience	7/8	■ Pass with Recommendations
Performance & Cost	5/5	✓ Pass
Operational Efficiency	9/10	■ Pass with Recommendations
Distributed Cloud	—	— N/A

Top Recommendations

- 45/49 checks passed — strong architecture for regulated workload
- Add runbook for Data Guard failover testing (quarterly DR drill)
- Consider OCI Database Management for centralized fleet monitoring
- Define capacity growth plan for fiscal close peak periods

Validated against Oracle Well-Architected Framework — docs.oracle.com/en/solutions/oci-best-practices/

Next Steps

1. Board approval for OCI migration budget — CFO — by 2026-05-15
2. Provision OCI tenancy + ExaCS in Queretaro — Carlos Mendoza — by 2026-06-01
3. Start FastConnect provisioning with partner — Network team — by 2026-06-01
4. EBS customization inventory and Pre-Prod testing — DBA team — by 2026-06-15
5. Schedule SOX audit coordination meeting — Compliance — by 2026-06-01

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