Server Migration Plan

Phase 2 - LATAM Region Consolidation

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Prepared by:	d4rkm4tter (Infrastructure Lead)
Approved by:	de4thPawn (Operations Director)
DBA Lead:	N. Reyes
Target Date:	February 15, 2026
Hard Deadline:	March 1, 2026

1. Objective

Consolidate all LATAM region infrastructure from the current multi-provider architecture to a single datacenter in Mexico City (Vultr MEX). This migration aims to reduce operational costs by 74%, improve latency for the primary user base, and simplify the operational topology ahead of the planned infrastructure refresh in Q2 2026.

2. Current Architecture

Server	Provider	Location	Specs	Monthly Cost	Status
app-latam-01	DigitalOcean	NYC-3	4 vCPU / 8GB	$48	Active
app-latam-02	Hetzner	Ashburn	4 vCPU / 8GB	$7	Active
db-latam-01	AWS RDS	us-east-1	db.t3.xlarge	$120	Active
cache-01	Vultr	Mexico City	1 vCPU / 2GB	$12	Active
staging-01	Linode	Dallas	2 vCPU / 4GB	$24	Idle
				TOTAL: $211/month	

The current architecture evolved organically over 18 months as services were added to whichever provider had available capacity. This has resulted in unnecessary complexity, cross-provider latency (~80ms average to primary user base), inconsistent security policies, and difficulty maintaining backups across providers. DBA N. Reyes has also noted that the AWS RDS instance is significantly over-provisioned for current workload.

3. Target Architecture

Server	Provider	Location	Specs	Monthly Cost	Role
prod-01	Vultr	Mexico City	2 vCPU / 4GB	$24	Primary
prod-02	Vultr	Mexico City	2 vCPU / 4GB	$24	Standby
				TOTAL: $48/month	

Each node runs the full stack via Docker Compose: Nginx reverse proxy, application server (Gunicorn), MariaDB, and Redis cache. Prod-02 operates as a warm standby with MariaDB replication from prod-01. N. Reyes will configure GTID-based replication for simplified failover. Estimated latency to primary user base drops from ~80ms to ~15ms.

4. Migration Schedule

Phase	Task	Owner	ETA	Dependencies
Prep	Provision Vultr instances	d4rkm4tter	Feb 1-3	Budget approval
Prep	Deploy Docker Compose stack	d4rkm4tter	Feb 3-5	Instances ready
Prep	Configure MariaDB replication	N. Reyes	Feb 5-7	Stack deployed
Prep	Load testing (simulated traffic)	d4rkm4tter	Feb 8-10	Replication verified
Prep	Lower DNS TTL to 300s	d4rkm4tter	Feb 13	Load test passed
Migrate	Final database sync from RDS	N. Reyes	Feb 15 02:00	Maintenance window
Migrate	DNS cutover to Vultr IPs	d4rkm4tter	Feb 15 02:30	DB sync complete
Migrate	Service verification	IR-Alpha	Feb 15 03:00	DNS propagated
Migrate	Monitor errors and latency	ALL	Feb 15 03:00-06:00	Services verified
Validate	72-hour monitoring period	d4rkm4tter	Feb 15-18	Cutover complete
Cleanup	Decommission old instances	d4rkm4tter	Feb 20	Validation passed

5. Risk Assessment

Risk	Likelihood	Impact	Mitigation	Owner
Data loss during sync	LOW	CRITICAL	Snapshots every 6hrs during migration	N. Reyes
DNS propagation delay	MEDIUM	MEDIUM	Low TTL 48hrs before cutover	d4rkm4tter
Performance issues	LOW	HIGH	Load testing before migration	d4rkm4tter
Docker compatibility	LOW	MEDIUM	Test environment mirrors prod	d4rkm4tter
Replication lag	MEDIUM	MEDIUM	Monitor lag, pause if >30s	N. Reyes
Security misconfiguration	LOW	HIGH	Post-migration audit (ref AUDIT methodology)	V. Korolev

6. Database Migration Details

N. Reyes has prepared the following database migration strategy:

Phase 1 (Pre-migration): Set up MariaDB on prod-01 with identical schema. Configure GTID replication from AWS RDS to prod-01 MariaDB. Allow replication to reach steady state (estimated 2-4 hours for initial sync of ~15GB database). Verify data consistency with pt-table-checksum.

Phase 2 (Cutover): During the maintenance window, stop writes to RDS. Wait for replication lag to reach zero. Verify final consistency. Update application config to point to local MariaDB. Restart application services. Verify read/write functionality.

Phase 3 (Post-cutover): Configure replication from prod-01 to prod-02 for redundancy. Set up automated backups (daily full + hourly incremental) to Vultr block storage. Configure monitoring alerts for replication lag, connection count, and slow queries. N. Reyes will be on-call for 72 hours post-cutover.

7. Rollback Plan

If critical issues are detected during the 72-hour validation period:

1. Revert DNS records to old provider IPs (propagation: ~5min with low TTL). 2. Old instances remain active in read-only mode throughout validation. 3. If rollback occurs after writes to new infrastructure, N. Reyes will replay binlog to synchronize old instances. 4. Under no circumstances should old instances be terminated before February 20. 5. Rollback decision authority: d4rkm4tter for technical issues, de4thPawn for business-impacting decisions.

8. Cost Analysis

Item	Current	Target	Savings
Compute (monthly)	$91	$48	$43
Database (monthly)	$120	$0 (local)	$120
Total monthly	$211	$48	$163
Annual savings			$1,956
Migration cost (one-time)		$0 (engineer time only)	

During the validation period (Feb 15-20), both old and new infrastructure will run simultaneously, resulting in a temporary cost of ~$259. This is budgeted and approved.

9. Docker Compose Stack

The production stack on each node will consist of the following services:

Service	Image	Resources	Ports	Notes
nginx	nginx:1.24-alpine	256MB / 0.5 CPU	80, 443	Reverse proxy + TLS termination
app	custom:latest	1GB / 1 CPU	8000 (internal)	Gunicorn with 4 workers
mariadb	mariadb:10.11	1.5GB / 1 CPU	3306 (localhost)	GTID replication enabled
redis	redis:7-alpine	256MB / 0.25 CPU	6379 (localhost)	maxmemory 128MB, LRU eviction
watchtower	watchtower:latest	128MB / 0.1 CPU	-	Auto-update containers

Total resource allocation per node: ~3.1GB RAM, ~2.85 CPU cores. This leaves approximately 900MB RAM and 1.15 CPU cores as headroom on the 4GB/2vCPU instances. N. Reyes has verified that MariaDB's buffer pool at 1GB is sufficient for the current dataset size (~15GB) given the working set is approximately 2GB.

10. Security Considerations

Post-migration security tasks: 1) UFW firewall configuration allowing only 80, 443, and SSH from approved IPs. 2) Redis and MariaDB bound to localhost only (no external exposure). 3) TLS certificates via Let's Encrypt with automated renewal. 4) SSH key-only authentication (per policy SEC-041). 5) Docker daemon configured to not expose API socket. 6) Full security audit by V. Korolev following AUDIT-2026-0003 methodology within 14 days of migration.

11. Monitoring Setup

Monitoring stack will be deployed on mgmt-01 (existing, not migrated): Prometheus for metrics collection (scrape interval: 15s), Grafana for dashboards, AlertManager for notifications via Slack and email. Key metrics monitored: CPU/RAM/disk utilization, HTTP response times (p50, p95, p99), error rates, MariaDB replication lag, Redis memory usage and hit rate, certificate expiration countdown.

External monitoring via UptimeRobot (free tier) will provide independent availability checks from multiple geographic locations. Alerts configured for: HTTP 5xx responses, response time >2s, SSL certificate issues, complete downtime.

12. Post-Migration Checklist

Item	Responsible	Verified
All services responding on new infrastructure	d4rkm4tter	[ ]
Database replication lag < 1s	N. Reyes	[ ]
TLS certificates valid and auto-renewing	d4rkm4tter	[ ]
Firewall rules match approved policy	V. Korolev	[ ]
Monitoring and alerting functional	d4rkm4tter	[ ]
Backup system operational (tested restore)	N. Reyes	[ ]

Old instances confirmed read-only	d4rkm4tter	[ ]
Documentation updated with new IPs/hostnames	d4rkm4tter	[ ]
Team briefed on new architecture	de4thPawn	[ ]
DR procedures updated	d4rkm4tter	[ ]
