

# Pilot Program Charter: AES Fabric ETL Ingestion

The purpose of this 30-day Proof of Concept (PoC) is to validate the core architecture, ingestion throughput, data integrity, and operational maintainability of the AES Fabric ETL platform in an isolated staging environment prior to production rollout.

## Scope & Guardrails

- **In Scope:**
  - End-to-end ingestion from 2 representative source feeds.
  - Schema validation, and delivery to the datamart.
  - Baseline throughput benchmarking, error handling, and alerting integration.
- **Out of Scope:**
  - Downstream business intelligence dashboarding and ad-hoc semantic modeling.
  - Legacy system migration or historical backfill exceeding 90 days.
  - Production network VPC peering or cutover.

## Success Criteria & Key Performance Indicators (KPIs)

| Objective            | Metric / KPI                        | PoC Target           | Verification Method                   |
|----------------------|-------------------------------------|----------------------|---------------------------------------|
| Throughput & Latency | End-to-end batch ingestion          | ≥ 50,000 records/sec | Synthetic load test & log timer       |
| Data Fidelity        | Loss rate & checksum reconciliation | 0% loss; 100% match  | Row count & MD5 hash check vs. source |

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|-----------------------|-----------------------------------|-----------------------------|-----------------------------------------------|
| Error Handling        | Schema drift, malformed data      | $\leq 5$ min notification   | Injected malformed payloads (bad types/nulls) |
| Security & Compliance | Logs and audit trails             | Provides audit logs         | Audit log review                              |
| System Reliability    | Pipeline uptime during 7-day soak | $\geq 99.5\%$ uninterrupted | Manual                                        |

## 30-Day Operational Timeline

### 1.Phase 1: Environment & Network Provisioning (Days 1–5):

Prerequisites must clear security review before day 3.

- ◆ Provision isolated VPC, staging subnets, IAM service roles, and KMS encryption keys.
- ◆ Establish connection endpoints to sample source systems and destination data warehouse/lakehouse.
- ◆ Deploy base AESETL infrastructure.

### 2.Phase 2: Source Integration & Schema Mapping (Days 6–12):

- ◆ Configure ingestion connectors for the target batch files (CSV/Parquet).
- ◆ Establish contract schema registries, partition keys, and metadata tracking.
- ◆ Execute initial test batches (1,000–10,000 records) to confirm connectivity and permissions.

### 3.Phase 3: Load Testing & Error Handling Validation (Days 13–20):

- ◆ Run peak load stress tests using production volume profile.
- ◆ Execute intentional failure injection: trigger network drops, malformed JSON structures, and missing partition keys.
- ◆ Verify logs.

### 4.Phase 4: Soak Test & Production Readiness Review (Days 21–30):

- ◆ Execute a continuous 7-day steady-state run under normal data cadence.
- ◆ Conduct daily reconciliation checks comparing source hashes to destination records.
- ◆ Compile benchmark telemetry, document runbooks, and present the final Go/No-Go decision matrix.

## Operating Model & RACI Matrix

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

| Pilot Activity             | Data Eng Lead | SecOps / Infosec | Platform / DevOps | Business Sponsor |
|----------------------------|---------------|------------------|-------------------|------------------|
| Infrastructure & IAM Setup | C             | A                | R                 | I                |
| Schema Contract Definition | R             | I                | C                 | A                |
| Pipeline & Connector Build | R             | I                | C                 | I                |
| Security & Audit Sign-Off  | C             | R                | C                 | A                |
| Load Testing & Triage      | R             | I                | R                 | I                |

| Pilot Activity          | Data Eng Lead | SecOps / Infosec | Platform / DevOps | Business Sponsor |
|-------------------------|---------------|------------------|-------------------|------------------|
| Final Go/No-Go Decision | C             | C                | C                 | A                |

## Go/No-Go Decision Matrix

Evaluate the pilot across five binary checkpoints at Day 28 to determine enterprise deployment:

- ♦ **Ingestion Integrity:** No data silent corruption or dropped transactions.
- ♦ **SLA Performance:** Processing latency conforms to required schedule (Batch completes inside allocated maintenance window).
- ♦ **Cost Predictability:** Compute and storage consumption profiles match projected cloud cost estimates within  $\pm 15\%$ .
- ♦ **Zero Critical Findings:** Infosec sign-off achieved with no high or critical severity CVEs identified in pipeline components.
- ♦ **Operational Readiness:** Core support runbook complete, covering failure recovery, pipeline reruns, and schema evolution.