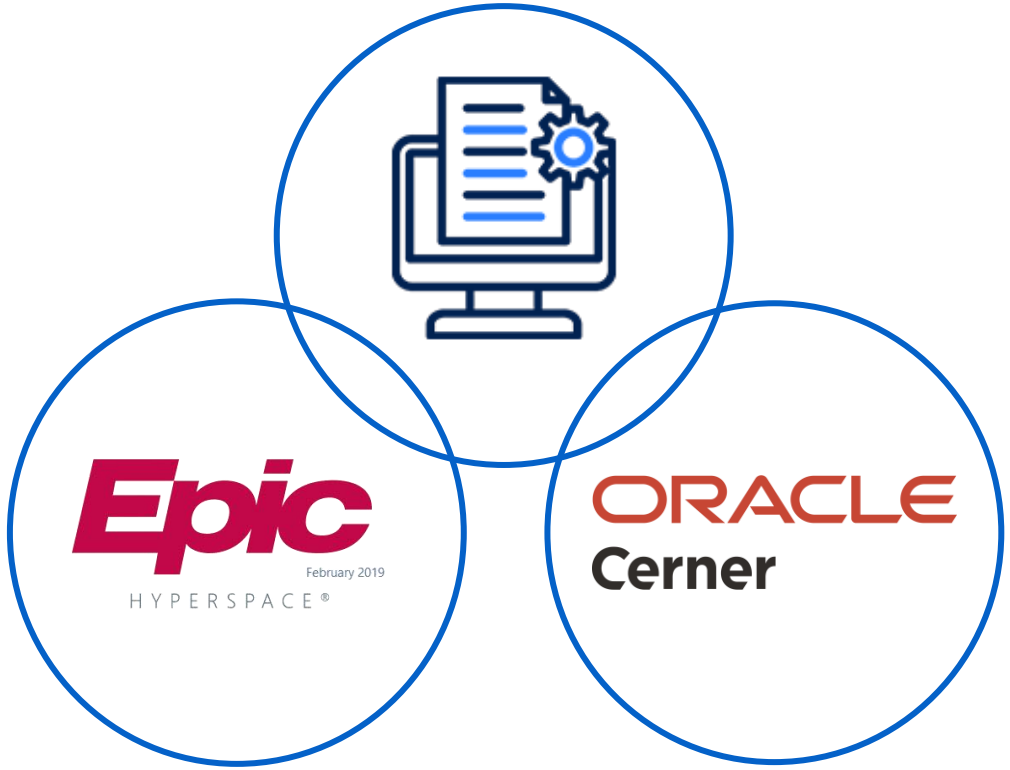
OSP

Seamless Clinical Data Transfer From Epic To Cerner Using Mirth Connect

Since 2009

Project Context

We helped a US-based client to advance interoperability by building a secure, scalable pipeline that moves clinical and administrative data from the Epic EHR into Cerner. By streamlining this one-way data flow, they could use Epic data in Cerner to drive analytics, care coordination, and population health efforts.



Scope Of Work

OSP's Solution

Implementation of an ETL (Extract, Transform, Load) framework using Mirth Connect to extract FHIR and HL7 data from EPIC EHR and load it into Oracle Cerner using Cerner's open APIs and backend ingestion services.

Deliverables

Mirth Connect Extractor Channel Configuration (EPIC)

Data Transformation Logic (FHIR/HL7 to Cerner-compatible schema)

Oracle Cerner Integration Workflow (FHIR/Batch ingestion)

Secure Transport Configuration (VPN/SFTP/REST APIs)

Logging and Monitoring Dashboard

Source Code and Deployment Scripts

UAT Documentation and Handover

Technical Workflow

1. Data Extraction from EPIC

- **Interface Engine:** Data was extracted from the EPIC Clarity database via scheduled SQL queries, orchestrated through Mirth Connect or an equivalent ETL tool, for transformation and loading into Oracle Cerner.

- **Channels:** Extractor channels were built to query and listen for updates to key FHIR resources:


Patient


Encounter


Observation


Medication


Procedure


Diagnostic Report

- **Logging:** All extractions were logged at the channel level and written to the \logs directory.

Technical Workflow

2. Transformation Layer

As Clarity is a read-only SQL reporting database, data was extracted via parameterized queries on key clinical tables and temporarily stored for transformation before loading into Cerner-compatible formats.

- **Staging Database:** Temporary storage using PostgreSQL or a staging layer compatible with Oracle Cerner's ingestion format.

- **Data Normalization:** Transformations standardized:
  - Date/Time formats
  - Code mappings (e.g., LOINC, SNOMED)
  - Flattening nested JSON (if pulling FHIR resources)
  - Field alignment with Cerner schema requirements

- **Tokenization & PHI Masking:** All sensitive fields (e.g., SSNs, MRNs) were tokenized during transformation for compliance.

Technical Workflow

3. Loading into Oracle Cerner

- **Transport Layer:**
  - For batch uploads files were transmitted via SFTP in HL7v2/CSV/XML format.
  - For real-time ingestion, we utilize Oracle Cerner Ignite APIs for FHIR resource posting (secured via OAuth2 or Cerner-issued tokens).

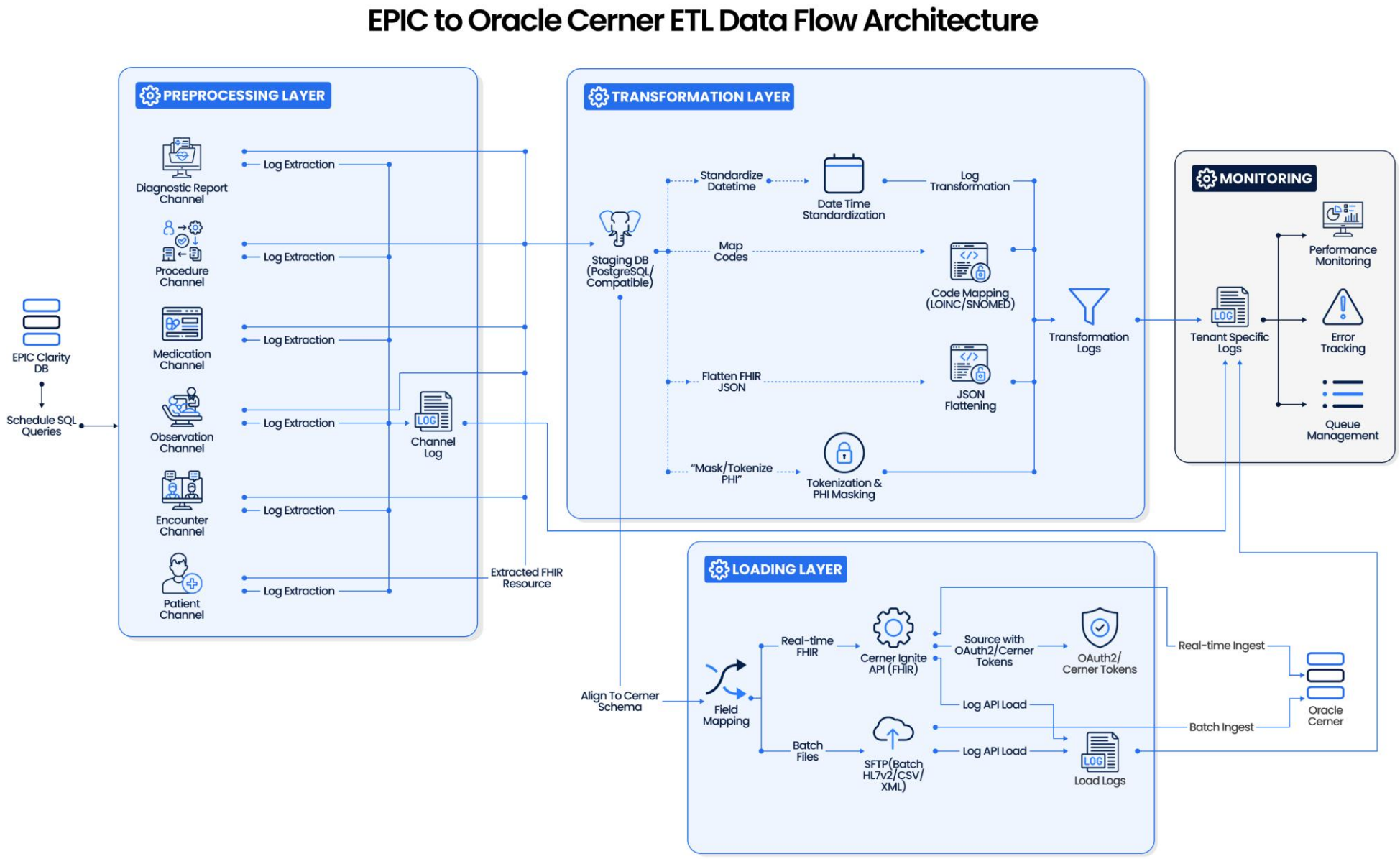
- **Field Mapping:** Each FHIR resource was mapped to a corresponding Cerner destination object or table.

4. Monitoring & Logging

- **Tenant-specific Logs:** Each activity (extract, transform, load) was logged separately.

- **Dashboards:** Transformations standardized: Custom dashboards for error tracking, queue management, and performance monitoring.

Technical Workflow



Security & Compliance

HIPAA Compliance

- SSL for all data in transit
- Encryption at rest for staging data
- Role-based access controls (RBAC)
- Session security & token expiration

Audit Logs

Complete traceability for all operations across Mirth Connect and transport scripts.

Deployment Architecture

Containerization

All components (Mirth, transformation services) were packaged in Docker containers.

Orchestration

Kubernetes-based orchestration for multi-tenant or high-availability deployment.

Credential Management

Secrets injected at runtime from the Secret Manager to avoid hardcoding.

Cloud Hosting

Deployment on AWS or Azure, depending on client infrastructure preferences.

Expected Outcomes

Reliable Data Flow

Automated extraction from Clarity enabled consistent, repeatable delivery into Cerner.

Regulatory Compliance

HIPAA-compliant through encryption, tokenization, and secure access controls.

Operational Efficiency

Minimal manual effort with faster processing via orchestration and containers.

Interoperability

Mapped data aligns with Cerner standards for analytics and care coordination.

Scalability

Architecture supports multi-EHR expansion and future integrations.

Thank You

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