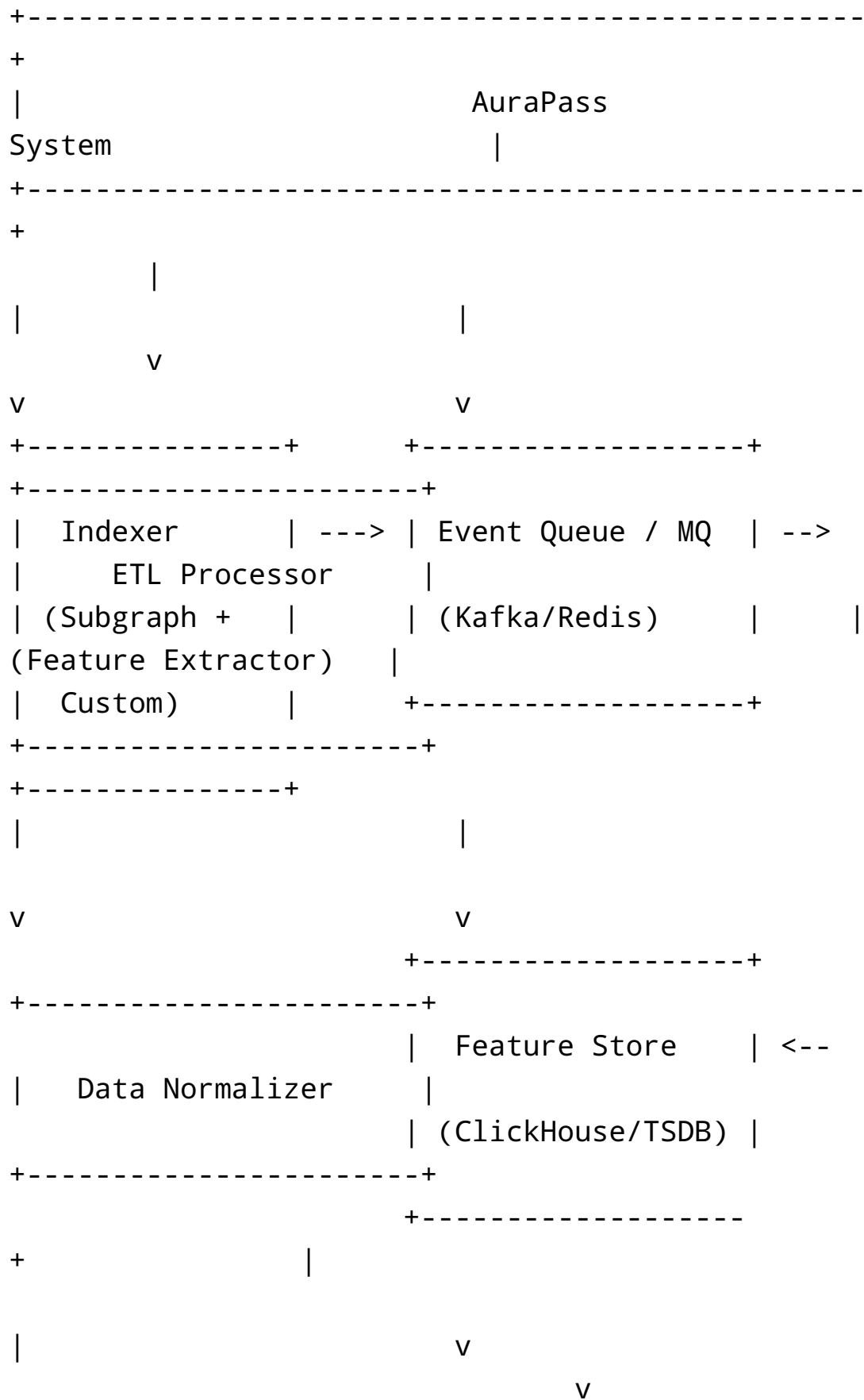
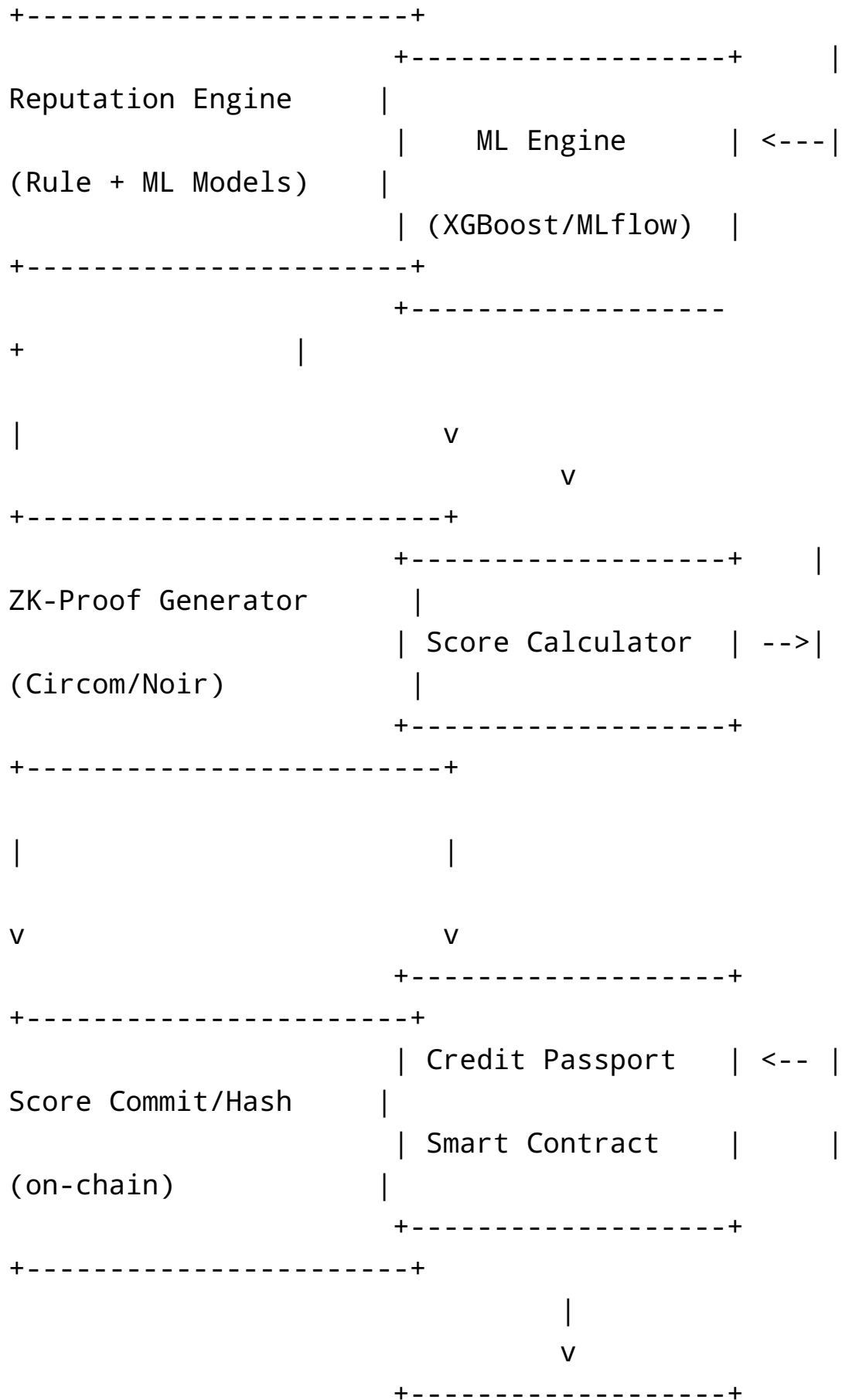


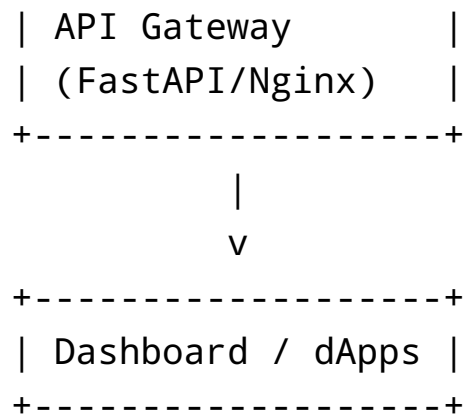
AuraPass — Component Diagram (Developer Version)

Diagram ini menjelaskan komponen teknis utama AuraPass dan hubungan antar sistem, sehingga developer dapat memahami struktur keseluruhan secara modular.

1. High-Level Component Diagram







2. Penjelasan Komponen

2.1 Indexer Layer

Subgraph (The Graph)

- Menangkap event ERC20, ERC721, smart-contract standar.
- Optimized untuk query historical.

Custom Indexer

- Real-time event listener (ethers.js WebSocket RPC).
- Memproses event non-standar.

Output: normalized blockchain events.

2.2 Event Queue / Message Broker

- Kafka / Redis Streams digunakan sebagai buffer event.
- Menjamin urutan event.
- Mendukung parallel workers (consumer groups).

2.3 ETL Processor

Extract

- menerima event raw dari MQ.

Transform

- mapping event → fitur (tx_count, inflow, stable_ratio, dsb).

Load

- simpan fitur terstruktur ke Feature Store.
-

2.4 Feature Store

- Tempat penyimpanan feature vector.
- ClickHouse: high-speed analytical queries.
- TimescaleDB opsional untuk time-series.

Digunakan oleh ML Engine, Rule Engine, dan Dashboard.

2.5 Reputation Engine

Terdiri dari dua subkomponen:

Rule-based Scoring Engine

- Aturan deterministik (misal: active user +20, risky -40).

ML Model Engine

- Model supervised (XGBoost, LightGBM).
- Dilatih dari historical feature store.

Output gabungan → score final.

2.6 ZK-Proof Generator

- Mengambil score/hash dari Reputation Engine.
 - Menghasilkan proof (zkSNARK / Plonk).
 - Output berupa proof.json + publicSignals.
-

2.7 Credit Passport Smart Contract

Menyimpan:

- score_hash
- nullifier (anti-replay)
- update timestamp
- events untuk verifikasi

Kontrak hanya menyimpan *hash*, bukan data sensitif.

2.8 API Gateway

Backend utama: - GET /credit/{wallet} - GET /proof/{wallet} - GET /history/{wallet} - POST /verify

Berkomunikasi dengan Score Service, Proof Service, dan DB.

2.9 Dashboard / Frontend

- Menampilkan kartu kredit on-chain.
 - Status PoH, badges, reputation graph.
 - Analitik score dan proof status.
-

3. Interaksi Antar Komponen (Overview)

Indexer → MQ → ETL → Feature Store → Reputation Engine → ZK Layer → Smart Contract → API → Dashboard/Apps

Jika kamu mau, aku bisa buat: - **Sequence Diagram (lebih detail)** - **Deployment Diagram (infrastruktur AWS/Hetzner/VPS)** - **Architecture Overview Slide (pitch-deck style)**