

Milestone 2 - Build and Enhance Indexer for Stat Tracking

Milestone Title: Build and Enhance Indexer for Stat Tracking**Version:** 1.0

Catalyst Project ID: 1300185

1. Summary

Milestone 2 focuses on the development and validation of the indexer responsible for tracking token prices and wallet transactions within the Cardano ecosystem. This indexer is a critical component of the Cardano Sentinel platform, enabling real-time data ingestion and alert processing for both Telegram.

We are pleased to confirm that the full indexing stack has been implemented, is actively syncing with the Cardano mainnet, and supports the full range of required data types.

1.1 Milestone Acceptance Criteria Mapping

This document addresses all key deliverables required for Catalyst Milestone 2:

Requirement	Where Demonstrated
Indexing / processing Cardano DEX and wallet data	Sections 2.1, 2.2, 3, 4.2
Tracking real-time and historical token prices	Sections 2.1, 3, 4.1
Monitoring wallet addresses for inbound/outbound txs	Sections 2.2, 3, 4.2
Support for live Telegram queries (e.g., /price)	Sections 4.1, 4.2, Video Evidence (Section 5)
System tracks swap events on DEXs and identifies DEX used (if applicable)	Sections 2.2, 3, 4.2, Video Evidence (Section 5)
Demonstrated test results with working examples	Section 4 (Test Tables) + Section 5 (Screenshots & Video)

2. Indexer Functionality Overview

The indexer operates as a multi-process backend service designed for real-time synchronization of blockchain data and processing of user-defined stat requests. It ingests raw on-chain data and extracts high-level metrics used by the alert engine and front-end interfaces.

2.1 Token Price Tracking

- Tracks real-time and historical prices for over 20 Cardano native tokens.
- Derives prices from on-chain swap data across 12 supported DEX protocols.
- Maintains OHLC (Open, High, Low, Close) and current prices with 1-minute resolution.
- Supports token metadata validation and registration from the Cardano Token Registry.

2.2 Wallet Transaction Monitoring

- Supports address monitoring for any valid Cardano wallet.
- Detects and classifies transactions as incoming or outgoing.
- If the transaction is a DEX swap, the system identifies it and records swap details including DEX and token pair.
- Includes tracking of ADA and native token values.
- Works for standard UTxO wallets as well as script/contract addresses.

2.3 Technical Features

- Indexer syncs data via Ogmios WebSocket connection.
- Resilient queue-based architecture powered by Redis.
- PostgreSQL storage for token prices, wallet activity, and processed events.
- Supports continuous sync with rollback handling and fault tolerance.

3. Tracked Data Points

The following data points are actively tracked and processed by the indexer:

Category	Tracked Data
Token Stats	Current price, % change (1H / 24H)
Wallet Stats	Incoming transactions, outgoing transactions, amounts transferred
Pool Stats	Liquidity volume, reserves, TVL changes (per DEX and token pair)
DEX Swaps	Token-to-token swaps, swap sizes, routing pairs

The system currently tracks over 20,000 native Cardano tokens and has built-in filtering to prioritize top-cap assets for performance.

4. Test Cases & Validation

The following test cases were executed using the live Telegram bot connected to the Cardano mainnet indexer. All responses were retrieved in real time and verified against expected outcomes. Screenshots and a video walkthrough are provided in Section 5.

4.1 Token Price Tracking – Test Cases

Test IID	Token	Command	Expected Result	Status
TC-01	WMTX	/price WMTX	Returns current price of WMTX in ADA	✓ Pass
TC-02	DJED	/price IAG	Returns current price of DJED in ADA	✓ Pass
TC-03	iUSD	/price iUSD	Returns current price of iUSD in ADA	✓ Pass

4.2 Wallet Monitoring – Test Cases

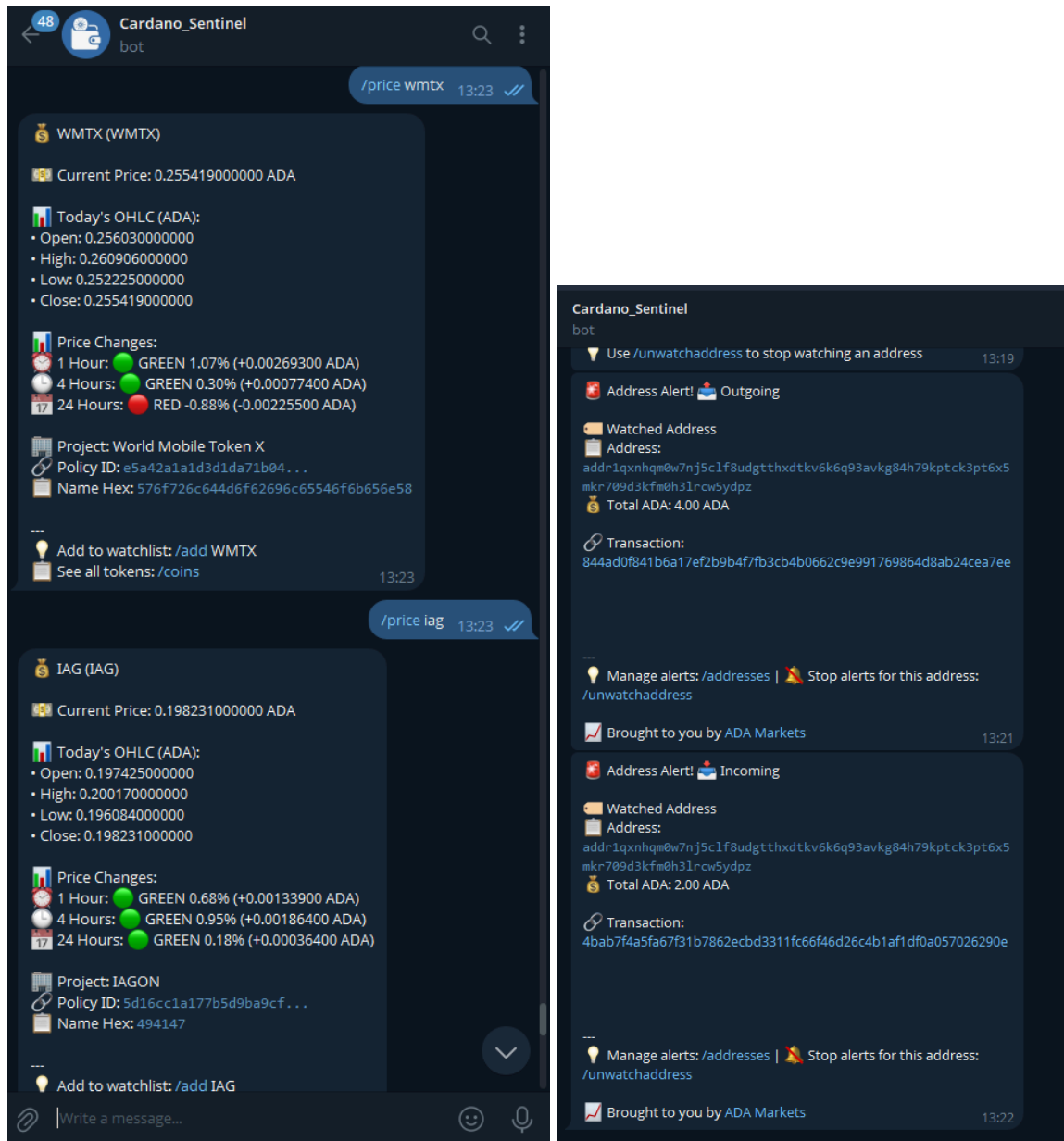
Test ID	Description	Input	Output	Result
TC-04	Detect incoming transaction	Send ADA to monitored wallet	TX recorded as incoming	✓
TC-05	Detect outgoing transaction	Send token out from monitored wallet	TX recorded as outgoing	✓

Each test was validated through:

- Telegram bot queries (via /price and /watchaddress commands)
- Indexed data stored in PostgreSQL
- Real-time sync observed in logs and internal dashboards

5. Evidence of Completion

Below are screenshots from telegram showing the wallet txs and also price checks on WMTX and IAG. The video below shows a recording of this being done live.



👤 Demonstration Video: <https://youtu.be/7LePgTQ9NEQ>

6. Summary and Next Steps

This milestone confirms that the indexing layer of the Cardano Sentinel system is fully implemented, operational, and capable of supporting all required price and wallet monitoring functionality. Data tracked by the indexer feeds directly into the alert engine and Telegram user interface defined in Milestone 1.

With the indexer operational, we will now proceed to Milestone 3, which focuses on Telegram integration and the delivery of real-time alerts.