

Anatomy of a Real-time Analytics Dashboard

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About the presenter



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- Event streaming, real-time analytics, and stream processing enthusiast
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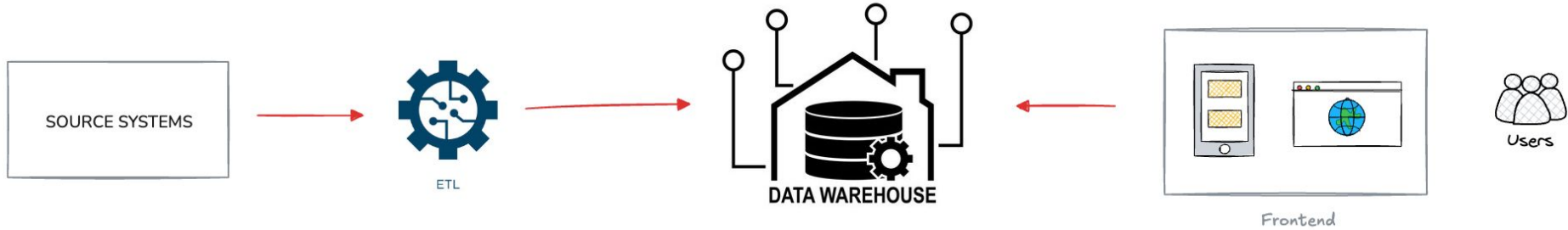
medium.com/event-driven-utopia



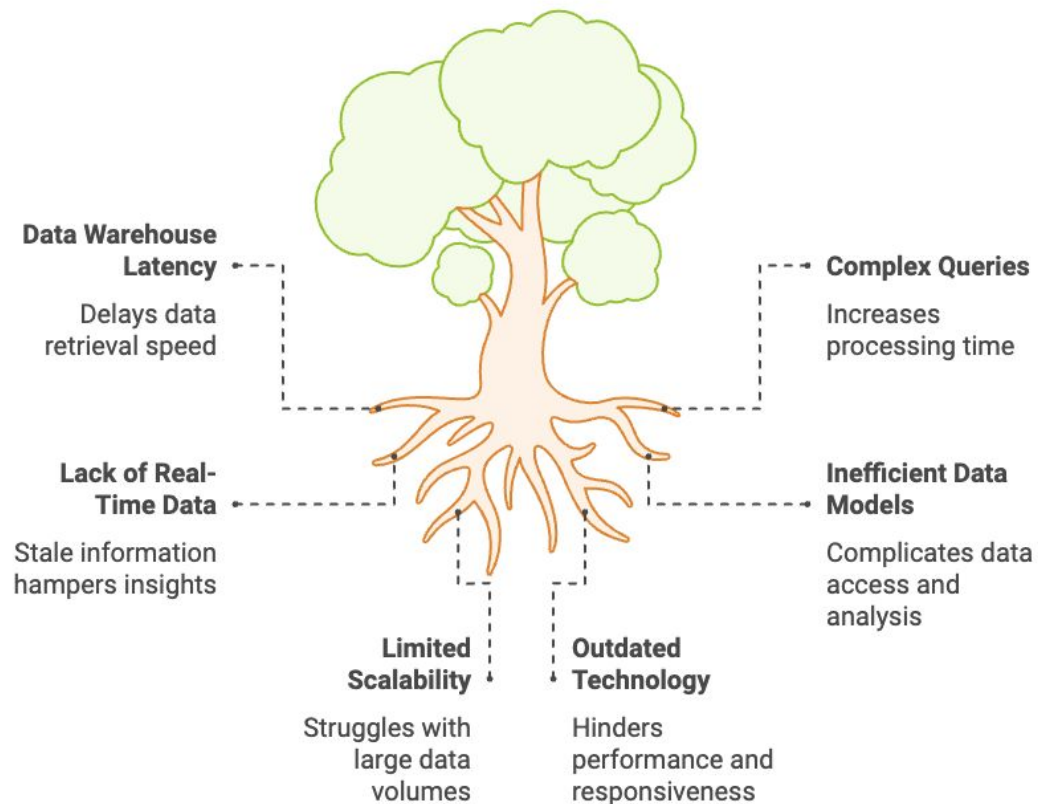
linkedin.com/in/dunithd/

Breaking it down

Typical BI dashboard



Problems



Making it real time

Let's take a use case



IoT sensor
counting vehicles

Stats



Real-time
dashboard

Metrics - Vehicle count over time

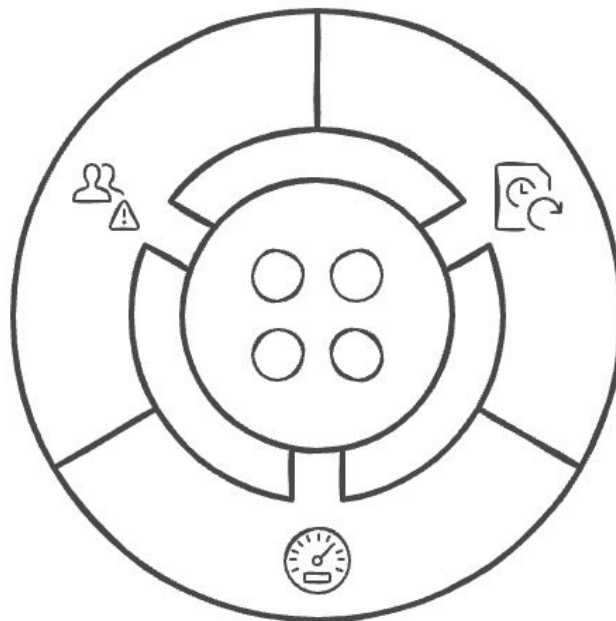


Implementation

Design goals

Concurrency

Supports multiple users simultaneously



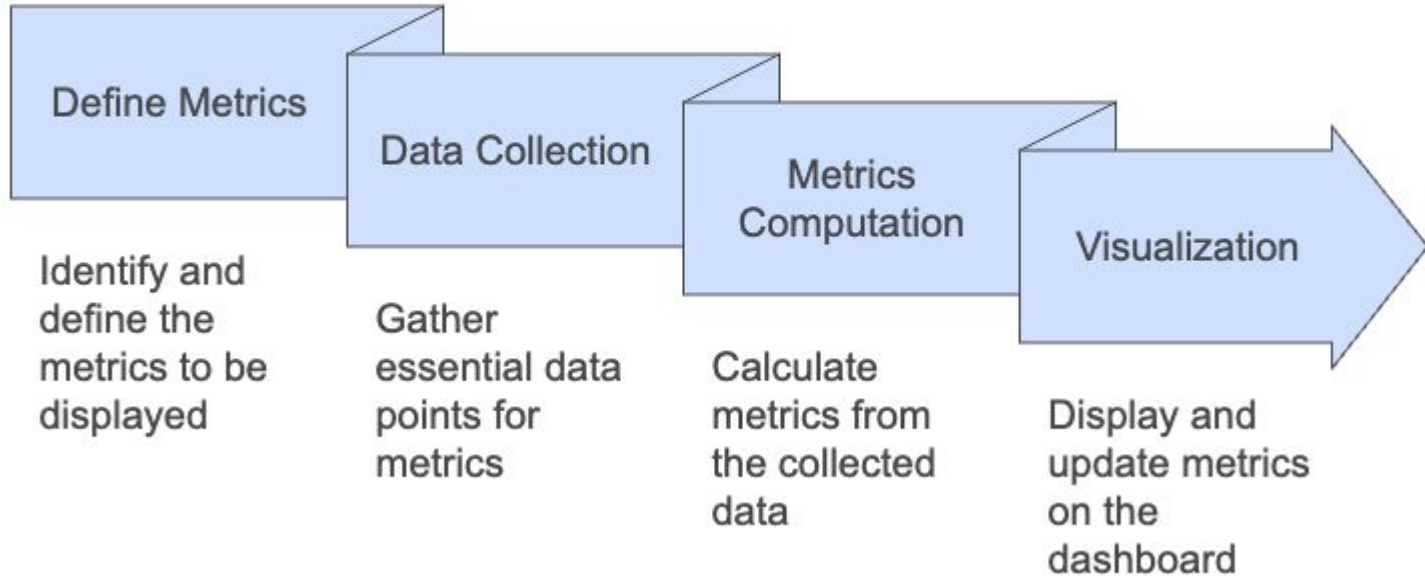
Data Freshness

Ensures metrics are up-to-date and relevant

Latency

Measures the speed of metric delivery

Real-time Dashboard Implementation Process



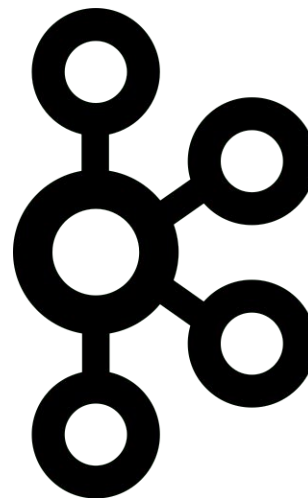
Practical concerns

- Reliability
- Scalability
- Running OLAP queries

Ingestion layer

Goals

Collect data as fast as possible
and get them ready for downstream
consumption in real-time



Streaming ETL

Data pre-processing for optimal querying.

- Cleansing
- Enrichment
- Joins
- Mapping



Serving layer

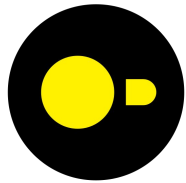
Goals

High-concurrency and low-latency
Query execution on real-time
ingested data.

High concurrency, low latency insights



Low latency, moderate concurrency insights



DuckDB

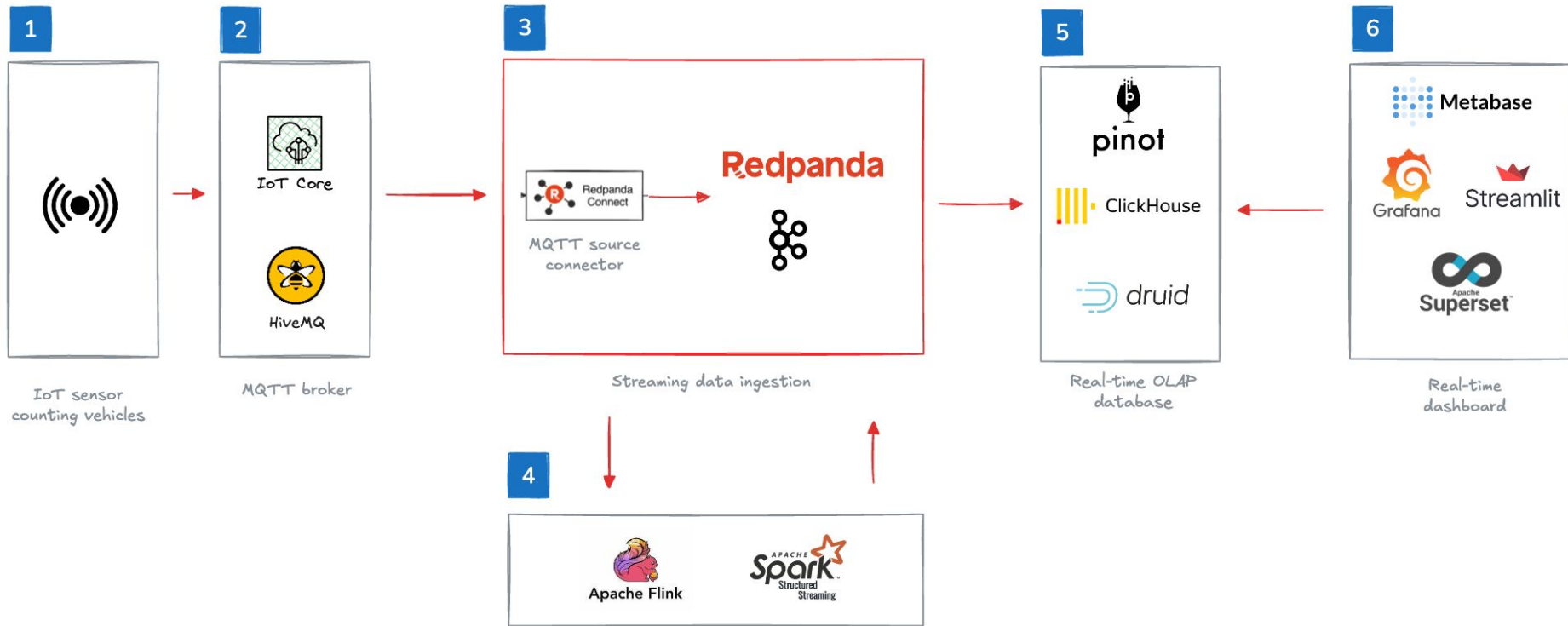


Grafana



Streamlit

Final solution

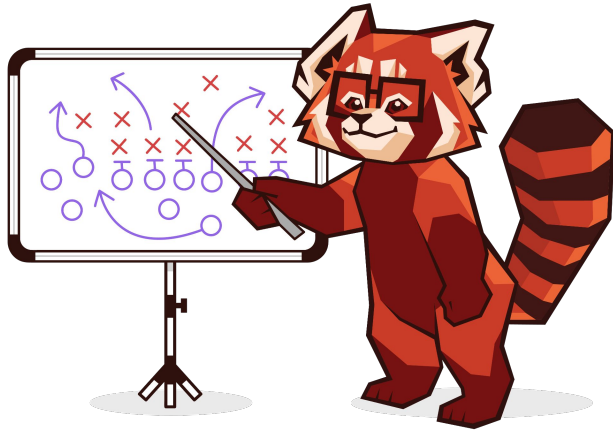


Wrap up

- Real-time dashboard promotes a high degree of data freshness, enabling actionable insights.
- Designing and implementing a real-time dashboard requires careful thinking in terms of data freshness, query latency, concurrency, and query complexity.
- You can assemble an end to end real-time dashboard solution with open source technologies.

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Thanks for joining!

Let's keep in touch

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