Dataflow for Real-Time Anomaly Detection

Dataflow architecture that ensures low latency predictions even when the decision cycles of ML & GenAI models are long
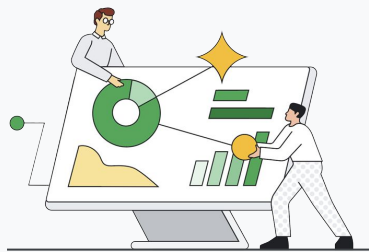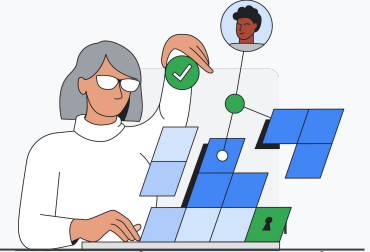
Proactive issue identification

External threats can be marked and neutralized before they escalate and bring down your systems
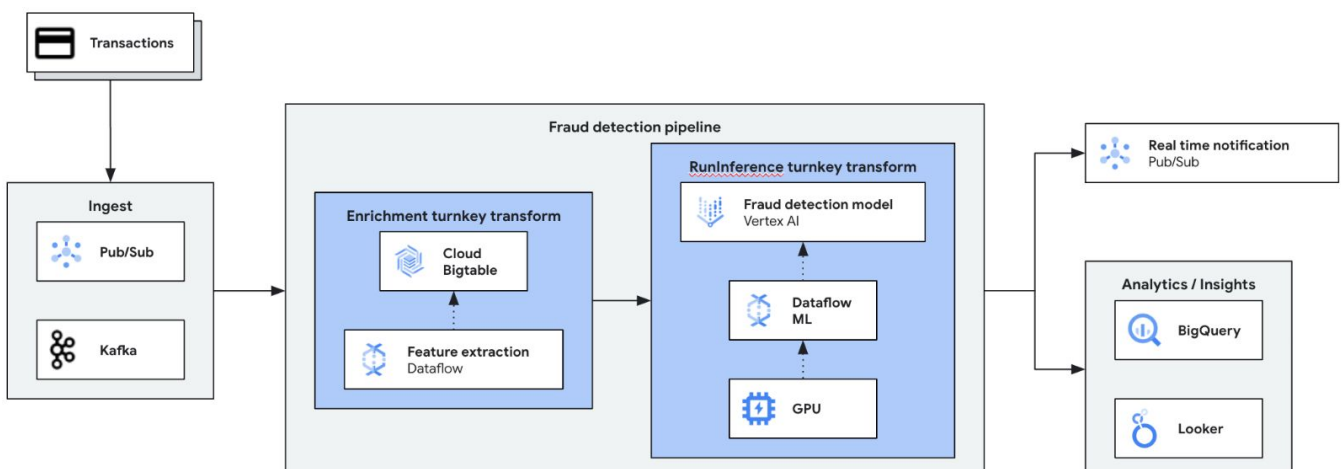
Enhanced security

Building a security perimeter based on real-time data allows you to respond to bad actors as they emerge.

Fraud detection & prevention

transaction patterns in real-time and prevent fraudulent activites, which will reduce the need for tedious reconciliations later and save your organization costly overhead.

TBD – describe extract, transform, and load

Transactions

Ingest
- Pub/Sub
- Kafka

Fraud detection pipeline

Enrichment turnkey transform
- Cloud Bigtable
- Feature extraction — Dataflow

RunInference turnkey transform
- Fraud detection model — Vertex AI
- Dataflow ML
- GPU

- Real time notification — Pub/Sub

Analytics / Insights
- BigQuery
- Looker

Dataflow can deliver on the Anomaly Detection in Real-Time

1 Financial Services

Use Cases
- Real-time personalized recommendations
- Dynamic pricing responding in real-time to fluctuating demand & inventory levels

Value
- Improve customer satisfaction and increase retention rates
- Maximize revenue per user

2 Software & Tech

Use Cases
- Analyze transaction patterns, user behavior, and other data points
- Agents powered by generative AI based on individual user data and goals

Value
- Identify & flag fraudulent activities
- Personalized financial reports, investment recommendations, and retirement planning scenarios
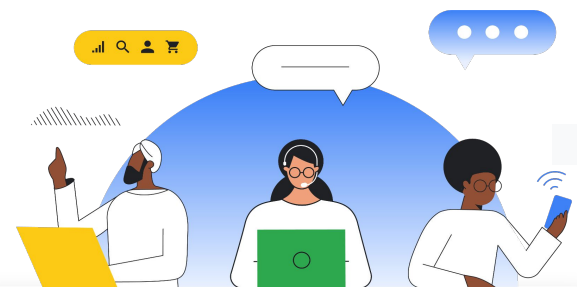
3 Telecommunications

Use Cases
- Integrate generative AI capabilities into product experience
- Analyse real-time data on user behavior & viewing patterns

Value
- Help creators enhance user-generated content
- Make personalized content recommendations

Why Dataflow

- Innovate with **Google's Dataflow** unified stream and batch data processing

- **Build and scale fast** with our open-source compatibility

- Help accelerate time-to-production with **enterprise-ready streaming**

Technical benefits

- Developer ease of use with turnkey transforms and Notebooks integration
- Advanced stream processing: state & timer APIs, side inputs, connectors ...
- Cost efficiency: Right-fitting, GPU support
- Open-source: support for running inference with Gemma and strong integration with Tensorflow Extended

> **Telus** built a streaming anomaly detection system using Pub/Sub, Dataflow, and BigQuery ML to detect, mitigate, and prevent cybersecurity threats from their fast-growing network
>
> **Equifax** built a data fabric using Dataflow and BigQuery with a superior security posture that automatically detects and neutralizes security threats against data breaches
>
> **Exabeam** evaluates millions of events per second across hundreds of machine learning models using Dataflow to power their cloud-scale cybersecurity platform

Learn More ↗

Let's get started

- **Align on goals** for developer efficiency and key use cases
- Review reference architecture and **implementation checklist**
- Engage with **Google Cloud Consulting** or certified **Google Cloud Partner**
- Activate Google Cloud Consulting service packages to **streamline implementation**

Learn more today ↗