

WHITE PAPER

Fraud Detection Powered By Hyperautomation

Waylay's low-code,
cloud-native
hyperautomation



INTRODUCTION

WAYLAY'S LOW-CODE, cloud-native, hyperautomation platform represents a groundbreaking evolution in financial fraud solutions, harmonizing rule-based systems with AI/ML capabilities.

Financial institutions face mounting pressure to reduce fraudulent transactions and illegitimate insurance claims, as well as to identify and report money laundering activities, all of which can result in substantial financial losses and damage to their reputation. Fraudsters, armed with state-of-the-art technologies, are persistently targeting the finance sector, which is often perceived to be conservative and slow to adapt to modern tech solutions. Consequently, these constant attacks contribute to the finance industry incurring hundreds of billions in losses annually. In order to respond to these threats, financial institutions need to move beyond hard coded and hand crafted rules to a new era of building applications using the latest advances in cloud computing and AI.

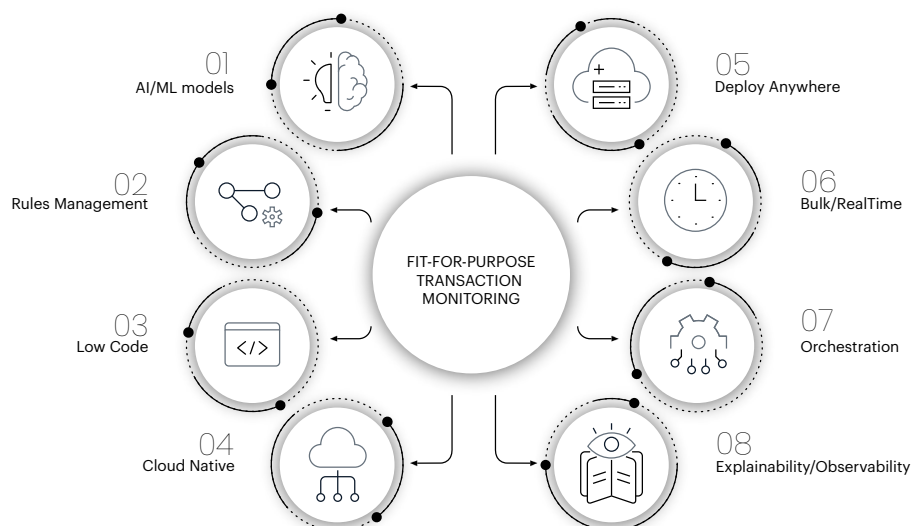
Waylay's hyperautomation platform for finance represents a groundbreaking evolution in finance solutions, harmonizing rule-based systems with AI/ML capabilities. It is a cloud native, low-code application, capable of processing large volumes of financial transactions in streaming (real-time) or batch mode. Furthermore, it seamlessly adapts to diverse environment requirements, from cloud to hybrid to private data centers. Waylay allows customers to define the sequence of checks to be performed on each transaction in a visual manner. Targeted use cases include, but are not limited to, anti-money laundering (AML) checks, fraud detection in credit-card transactions, insurance claims, invoice processing, or account reconciliation.

WAYLAY HYPERAUTOMATION PLATFORM

THE HYPERAUTOMATION AUTOMATION platform encompasses a wide range of features designed specifically for the finance sector:

- **Harmonized AI-Driven Decision Rules:** Waylay achieves the perfect synergy of subject matter decision rules and cutting-edge AI capabilities, offering a harmonious blend of expertise. Simultaneously, it empowers users to leverage programming constructs and logic for evaluating conditions based on the API's such that rules can make use of new insights in real time (e.g. compromised IP ranges, identification theft etc.).
- **Low-code automation:** empowers business users and subject matter experts to implement, test and deploy new finance algorithms in record breaking time. Furthermore, it allows for real-time adjustments and fine-tuning of AI and ML models without requiring any changes to the underlying business logic.
- **Expertly Crafted Rule Management:** Waylay's platform manages a multitude of policy rules and machine learning models, many of which are pre-packaged by our partners and finance experts like Capgemini and AWS.
- **Adaptive Deployment:** Waylay empowers banks to deploy rules either in batch or real-time modes, accommodating varying processing requirements. What sets this approach apart is that customers no longer have to manage two separate architectures: one for handling batch processing, typically conducted once a day, such as in insurance claims, and another for real-time payments or AML checks. Furthermore, as time progresses, all transaction checks can be seamlessly executed in real-time.

- **Deploy Anywhere**
 - **Multiple Cloud Providers:** Providers such as Amazon Web Services (AWS), Microsoft Azure, Google Cloud Platform (GCP), or private clouds. This flexibility allows organizations to choose the cloud provider that best suits their needs or migrate between providers as necessary.
 - **On-Premises Servers:** On-prem servers or data centers, accommodating organizations that prefer to maintain their own infrastructure or have specific compliance requirements.
 - **Hybrid Environments:** A combination of on-premises, cloud, and edge resources – seamlessly span these environments.
 - **Edge Computing:** can run in resource-constrained environments.
- **Regulatory Compliance Oversight:** The platform offers the auditing, observability, and explainability of decisions, all aligned with regulatory demands, thereby ensuring transparency and adherence.
- **Cloud Native:** Waylay harnesses the full spectrum of cloud-native capabilities, delivering unrivaled strength, adaptability, resilience, velocity, and scalability, surpassing a mere 'lift and shift' approach, and in that way, Waylay ensures scalability and resilience, facilitating the management of millions of daily transactions.



ARCHITECTURE OVERVIEW

AS A CLOUD-NATIVE and cloud-agnostic application, Waylay's finance platform can be deployed in a public cloud (AWS, Azure or GCP) or on-premises, on a Kubernetes cluster like the RedHat OpenShift Container Platform (OCP).

From there, it consumes transaction data from the banking system, usually via an intermediate dispatcher service (or gateway), as shown in Figure 1 below. The service can be an event bus like Kafka, a cloud service like AWS Kinesis or a bespoke application which is capable of calling the Waylay Finance Platform APIs in order to invoke the transaction processing rules (this is always required when running rules in the real-time mode). The same service can be used in order to guarantee that the outcomes of the rules are available in the customer's database of choice—with high transaction volume and without a data loss.

Internally, Waylay's finance platform manages the following Waylay platform components in a transparent fashion:

- The OAuth2-compatible authentication service, which supports integration with the customer's own SSO services
- A highly-scalable set of engine replicas that support stateless processing of large volume financial transactions based on configurable rule templates.
- A modern, responsive web user interface that acts as the single pane of glass for the finance platform application users.
- The flexible plugin registry that manages the execution of custom nodes in the AML rule template on AWS Lambda, Azure Functions or on Waylay's own function service.
- Native functions are general-purpose data processing functions embedded directly into the rule engine service and can provide sub-millisecond execution times for an even greater performance.
- Network ingress rules that expose the engine, authentication and plugin service APIs for use by the dispatcher service and the console, amongst others.

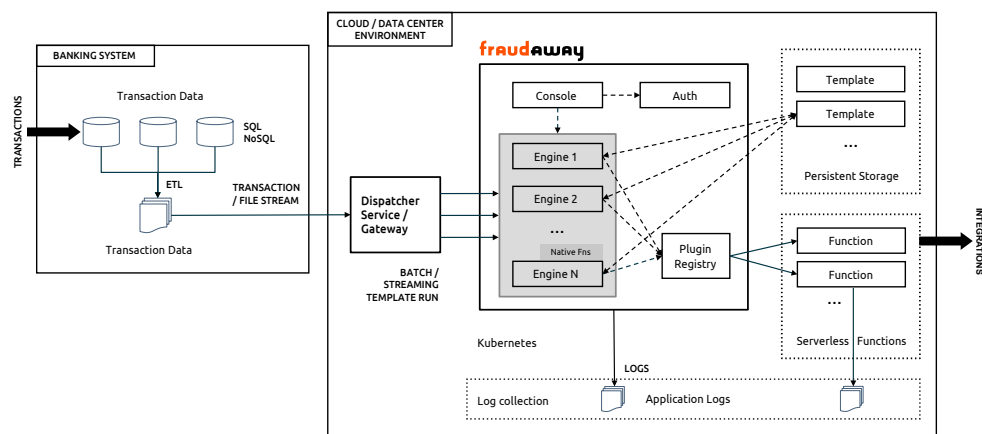


Figure 1. High-level solution architecture.

For audit purposes, logs are collected in a manner agnostic to the Waylay finance platform application, by retrieving the standard output of the application's services via sidecar containers like fluentbit or fluentd.

EXTREME SCALABILITY HORIZONTALLY SCALING MICROSERVICE ARCHITECTURE

THE ABOVE ARCHITECTURE enables Waylay's finance platform to process transactions at an unparalleled scale.

Figure 2 showcases an example that leverages the horizontal scaling of the rule engine to 15 replicas that support the batch processing of five million transactions within a two-hour window, with 40 checks per transaction. Need more power? Just add more engine instances to increase the transaction volume or decrease the overall processing times.

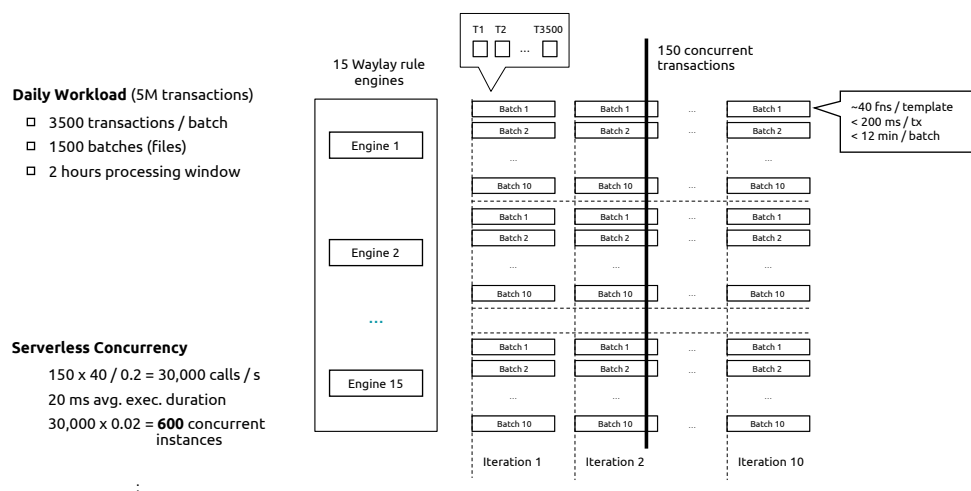


Figure 2. Large scale transaction processing example.

DEPLOYMENT BLUEPRINTS

BASED ON THE high-level architecture presented in Figure 1, the Waylay finance platform solution can be deployed in few different scenarios, either on-prem, in the hybrid mode or as a fully managed application in the cloud. The key takeaway is the flexibility owed to the cloud native architecture of the application, which allows it to be deployed in multiple private, hybrid, or public cloud environments.

HYBRID CLOUD

In the hybrid cloud deployment, all data is stored on the bank's private cloud/datacenter. The stateless processing capabilities of Waylay's finance platform allow it to process it at scale in the cloud, without retaining any sensitive information.

Figure 3 below showcases a hybrid cloud deployment based on AWS. The private cloud part of the deployment contains two major components:

- The extract, transform, and load (ETL pipeline) which is responsible for retrieving transaction information from the banking systems and preparing it in the format expected by the processing rules.
- The analytics component, which stores the transaction processing results and the associated visualization.

The public cloud part is hosted in AWS and contains the deployment of the Waylay finance platform services on EKS, configured to delegate serverless function executions to AWS Lambda. Persistence storage is implemented via S3 buckets and logs are collected using AWS CloudWatch.

To further boost performance, transaction processing results are published via AWS Kinesis Data Streams, from which they are written asynchronously to the on-prem data storage and visualization component.

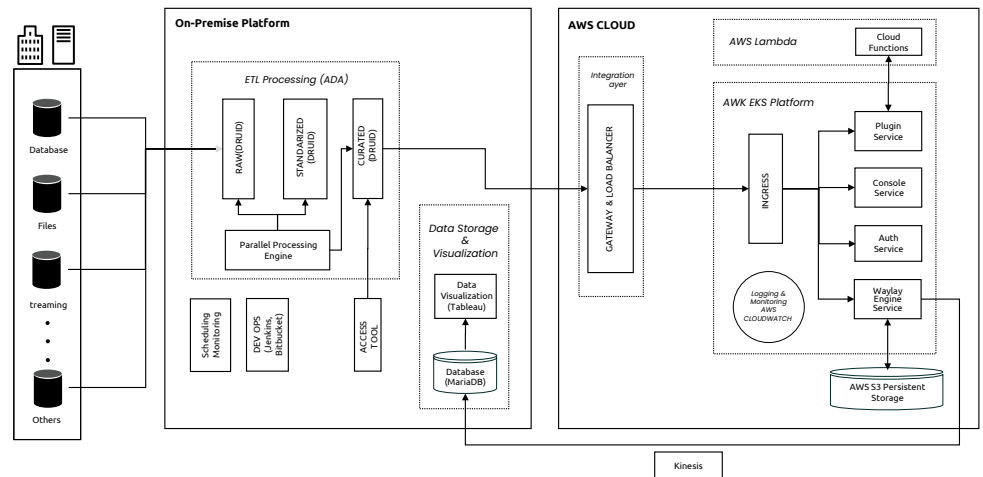


Figure 3. Waylay's finance platform hybrid-cloud deployment on

ON-PREMISES

Figure 4 below illustrates an on-premises deployment scenario based on RedHat OCP. The main differentiation compared to the public cloud deployment is the absence of public cloud services.

Compared to the hybrid scenario above, the following differences are noticed:

- In absence of out-of-the-box serverless capabilities, the Waylay functions service is deployed on Kubernetes to provide a scalable serverless functions execution environment for on-premises deployments.
- Template storage is configured to use the available OpenShift container storage instead of AWS S3.
- CloudWatch is substituted by the OpenShift logging and monitoring features of the OCP platform.
- AWS Kinesis is replaced by the Kafka event bus, which offloads transaction processing results to the appropriate data storage solution.

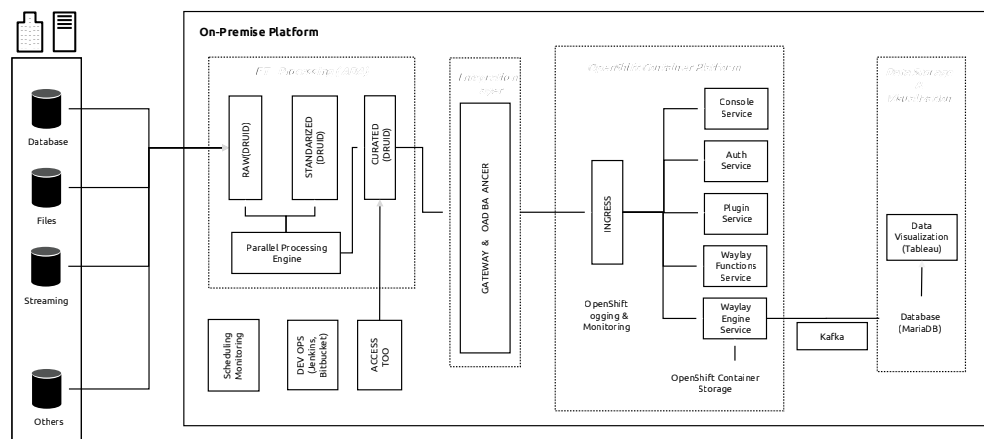


Figure 4. On-premises Waylay's finance platform deployment blue-

Both deployment scenarios rely extensively on the cloud-native and microservice architecture of the Waylay platform, inherited by the Waylay finance platform application. By leveraging separation of concerns, persistence layers, log collection, or serverless execution can be substituted via deployment configuration changes, without altering service implementations.

About FraudAway & Waylay

FraudAway is a finance-focused solution powered by Waylay's hyperautomation technology.

Waylay's, headquartered in Ghent, Belgium, operates globally with expanding teams in Europe, North America, and Asia. Our low-code solution revolutionizes automation, workflow, and complex rule integration within diverse software ecosystems. We serve diverse industries, including finance, telecom, manufacturing, connected assets, smart buildings, and logistics. The company has a suite of financial services solutions that cover all facets of the banking, payment, debt, broking and insurance markets.

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