

# Crypto wallet backend for a European fintech startup

## Overview

### Custom backend development for a crypto wallet startup in Europe

Touchlane was contacted by a fintech startup that needed a tech partner to build a cloud-based backend for a crypto wallet app. The platform's goals were to help users send and receive instant crypto payments and keep tabs on their expenditures. One of the major demands was compliance with European financial regulations for handling digital currencies.

The client expected a fast and reliable backend ready for MVP release within six months. The solution covered the entire backend cycle, from architecture design and third-party integrations to security setup and AWS deployment.

## Initial task

### Description

The startup required a scalable backend that could manage thousands of concurrent cryptocurrency transactions. The backend had to adhere to financial regulations governing digital assets.

### Technology stack

- **Programming language** / Java 17
- **Build tools** / Gradle
- **Database** / PostgreSQL, Redis, DynamoDB
- **Framework** / Spring Boot 3, Spring Cloud
- **Security** / Basic Auth, OAuth2, TLS
- **Cloud platform** / AWS (ECS, Fargate, Lambda, SQS, SNS, S3, DynamoDb, Batch, Cloudwatch)
- **CI/CD** / GitLab CI
- **Testing** / JUnit, Mockito, Robot framework

## Challenges

The primary challenge of the project was to design a secure backend architecture that integrated scalability and speed from the start. The wallet had to comply with PSD2, GDPR, and emerging crypto asset regulations (MiCA). It also needed to process real-time transactions with low latency and integrate with multiple blockchain networks and third-party services for fiat on/off ramps and KYC verification. Another client request was for a flexible

infrastructure to support upcoming features like loyalty programs and additional blockchain networks.

## Development

### Phase 1. Architecture design and infrastructure setup

The project began with a detailed technical discovery phase. Touchlane engineers defined the system architecture and selected AWS as the hosting environment to achieve horizontal scalability and reliable uptime. The backend was structured around microservices to isolate payment, blockchain, user, and analytics modules.

The team configured AWS Lambda for event-driven operations and RDS for secure data storage. Basic CI/CD pipelines were introduced early to accelerate deployments and maintain version control.

### Phase 2. Core functionality implementation

The second phase focused on building and connecting the wallet's primary modules. These are:

- **User management** – secure registration and authentication with JSON Web Token
- **Crypto wallet core** – implementation of multi-currency digital wallets with encrypted private key management using AWS CloudHSM
- **Blockchain integration** – development of modular blockchain connectors with abstraction layers for networks like Ethereum and Solana
- **Transaction processing** – asynchronous operations for crypto transfers and payment confirmations
- **KYC Integration** – third-party identity verification through REST APIs
- **Notifications** – AWS SNS for real-time transaction alerts.

Each module underwent unit and integration testing to maintain reliability and transparency across API endpoints.

### Phase 3. Performance, security, and compliance

Once the main logic was ready, Touchlane conducted performance testing to validate system behavior under heavy load. The backend was optimized for concurrent request handling and designed to scale automatically based on system load with AWS Auto Scaling. Performance and stability were continuously monitored through AWS CloudWatch, Prometheus, and Grafana.

Security layers included the following:

- encryption and storage of sensitive data both in transit and at rest to provide end-to-end protection
- multi-factor authentication (2FA) for user and admin access
- secure, HSM-backed storage for all cryptographic private keys

- monitoring and alerting, anomaly detection.

The system passed internal security audits and was reviewed for GDPR compliance before production release.

## Results

Within six months, the startup launched its crypto wallet in beta across three EU countries. Load testing benchmarks showed stable performance with **up to 50,000 concurrent active users** and **sub-200 ms** average API response times. Touchlane's modular architecture also allowed the client to add new blockchain networks without disrupting existing services.

The startup secured additional investment for scaling across Europe. One of the major success factors for this was reliability and transparent transaction handling for both fiat and digital assets.