

CASE STUDY

Performance at Scale

How we stress-tested a toll system for 10,000 trucks in real time



TIMELINE

30 Days

SCALE TESTED

10K Trucks

COVERAGE

Germany

The Challenge

A client in the road charging space needed to make sure their backend could handle thousands of trucks reporting toll data in real time—all while staying fast and reliable.

- System needed to handle 10,000 concurrent trucks across Europe
- Real-time toll data reporting with no missed transactions

- Real-time toll data reporting with no missed transactions
- Performance validation required before nationwide rollout



Our Solution

We built a custom performance testing setup using k6 to simulate 10,000 trucks traveling across Europe using realistic speeds, routes, and timing patterns. With this simulation running, we pushed their system to the limit and monitored live telemetry using OpenTelemetry and Grafana.



k6 Load Testing

Custom scripts simulating realistic truck movement patterns



OpenTelemetry

Real-time distributed tracing and metrics collection



Grafana Monitoring

Live telemetry dashboards for system visibility



Realistic Simulation

Accurate speeds, routes, and timing across Germany



The Results

Key Issues Identified Under Load



Long Database Queries

Identified slow-running queries causing bottlenecks during peak load



Overloaded APIs

API endpoints struggling under concurrent request pressure



Slow Geo-Matching Services

Geolocation matching causing latency in toll calculations



10K

Concurrent
Trucks Simulated



Faster

System
Performance



Zero

Missed Toll
Reports

Business Impact



Peace of Mind



Full Visibility

Confidence before nationwide rollout with proven system reliability

Complete observability into system behavior under real-world load



Rapid Discovery

Critical bottlenecks identified and addressed within days



Production Ready

System validated and optimized for real-world deployment



"No guesswork. Just visibility. We now have complete confidence in our system's ability to handle real-world traffic at scale."



Carsten - Engineering Lead
Road Charging Platform

Key Takeaways

Realistic Testing

Accurate simulations reveal real bottlenecks before production

Observability Matters

Live telemetry enables rapid issue identification and resolution

Proactive Approach

Finding issues in testing prevents costly production failures

Ready to stress-test your system?

Let's discuss your project

Contact

bhaskar.koley@indemantics.com