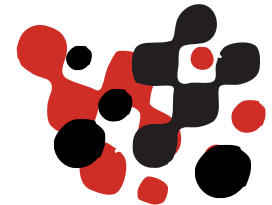


NETEYE CONFERENCE 2025

**From Infrastructure to Application:
End-to-End Observability in Kubernetes
with Elastic and NetEye**

Matteo Cipolletta, Technical Consultant Würth Phoenix



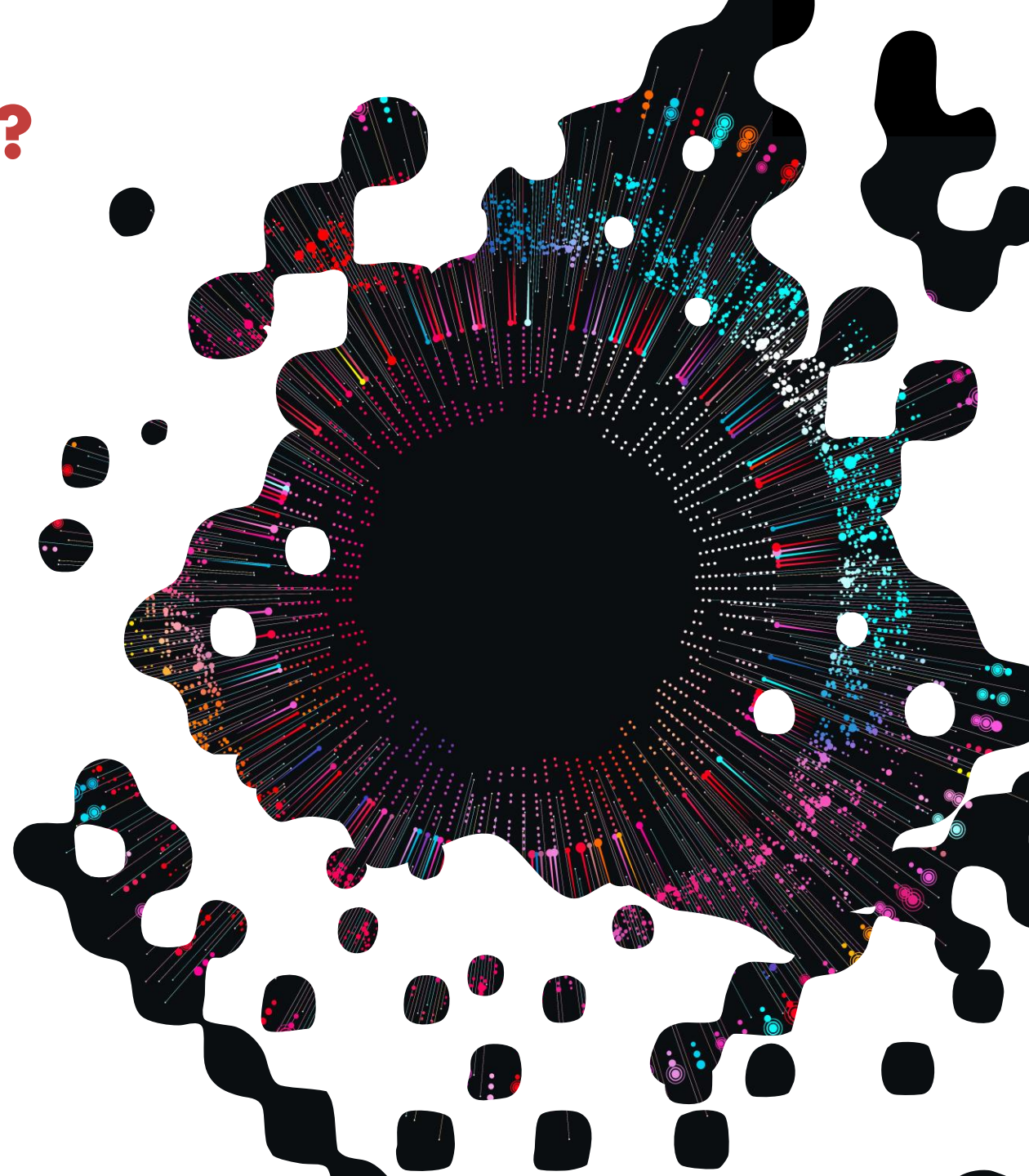
Agenda

- Introduction & Context
- The Pillars of Observability
- Elastic components in Kubernetes
- The Role of NetEye
- Architecture
- Key Takeaways

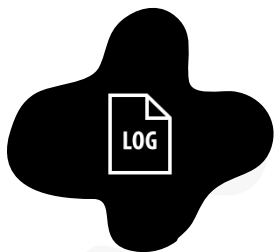


Why Observability in K8s?

- Kubernetes introduces levels of complexity (Clusters, Nodes, Pods, Namespaces, Services)
- Failures can happen at **multiple** levels: infrastructure, network and application
- Microservices make root cause detection **harder**
- Traditional monitoring tools often provide partial information
- **End-to-end** observability is critical for fast troubleshooting and reliable operations

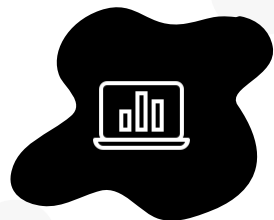


The Pillars of Observability



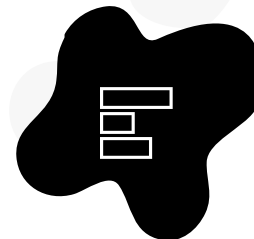
Logs

- Capture **application** and **system events**
- Provide detailed context for errors and issues
- Useful for debugging and forensic analysis



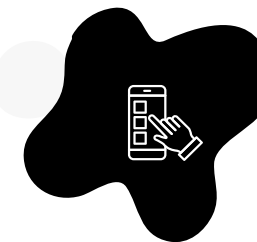
Metrics

- Numeric values over time: CPU, Memory, Latency, Throughput
- Monitor **performance** and **trends**
- Detect abnormal patterns before they lead to failures



Traces

- Follow individual requests across multiple services
- Identify **bottlenecks**, **slow transactions**, or **failed calls** in distributed applications
- Link application performance to infrastructure behavior



Synthetic Monitoring

- Simulate user journeys
- Measure availability and response times
- Detect issues proactively before impacting real users

Elastic components in Kubernetes



Elastic Agent

- Runs on every node in the cluster as DaemonSet
- Collects **logs and metrics** from pods, containers and nodes
- Sends data securely to Elasticsearch
- Scales automatically as the cluster grows
- Runs on a “cluster” level as a StatefulSet to get cluster-related metrics



Elastic APM & OpenTelemetry Agents

- Instrument application code inside pods
- Capture **traces** across services and requests
- Link performance issues with infrastructure and logs
- Monitor **throughput, latency** and **error rate** of services and linked dependencies (Databases, Redis, etc.)



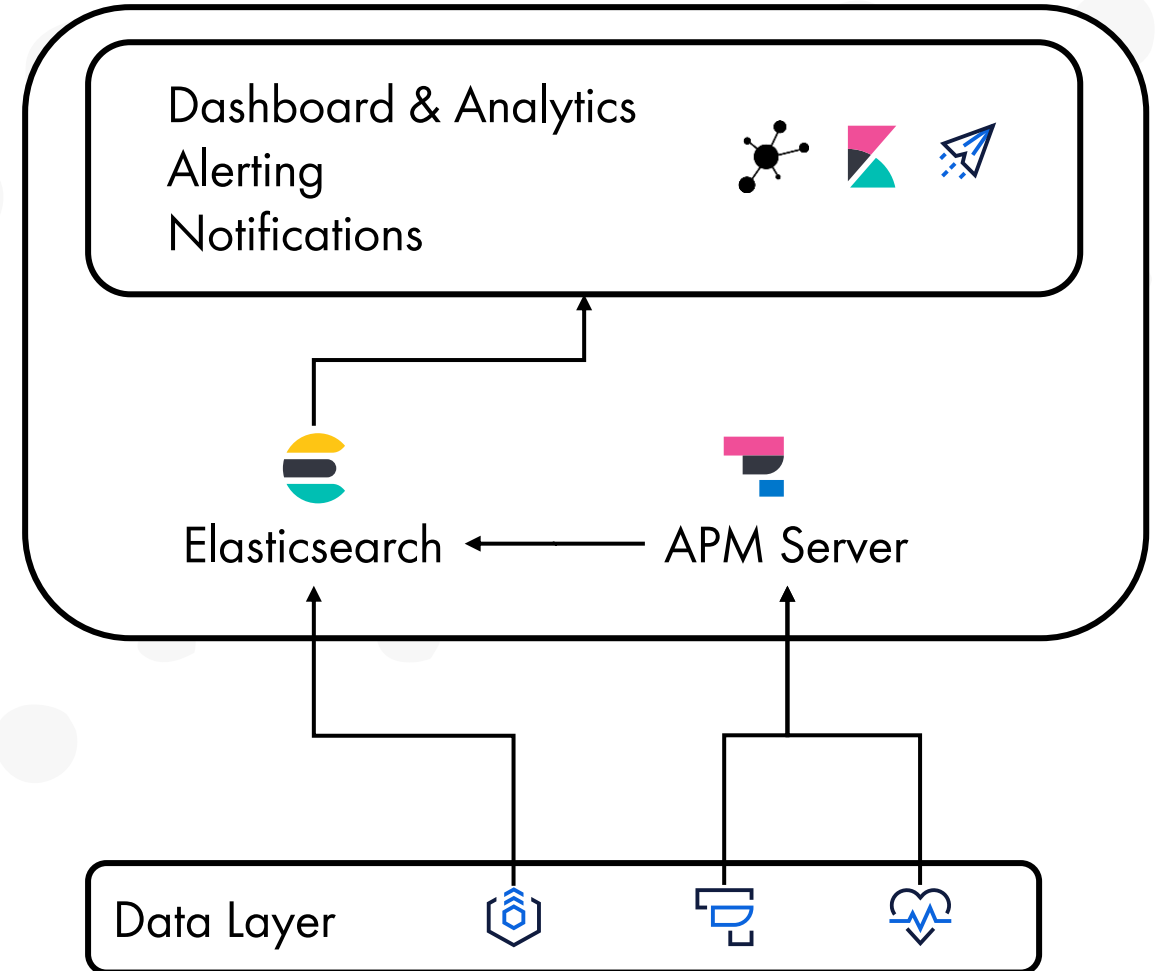
Browser Monitors & HTTP/S, TCP, and ICMP monitors

- **Simulates** real user journeys (HTTP checks, Browser interactions)
- Monitors **uptime** and **SLA compliance**
- Monitors pages response time, network request and “objects” weight (CSS, JS, Images, etc.)

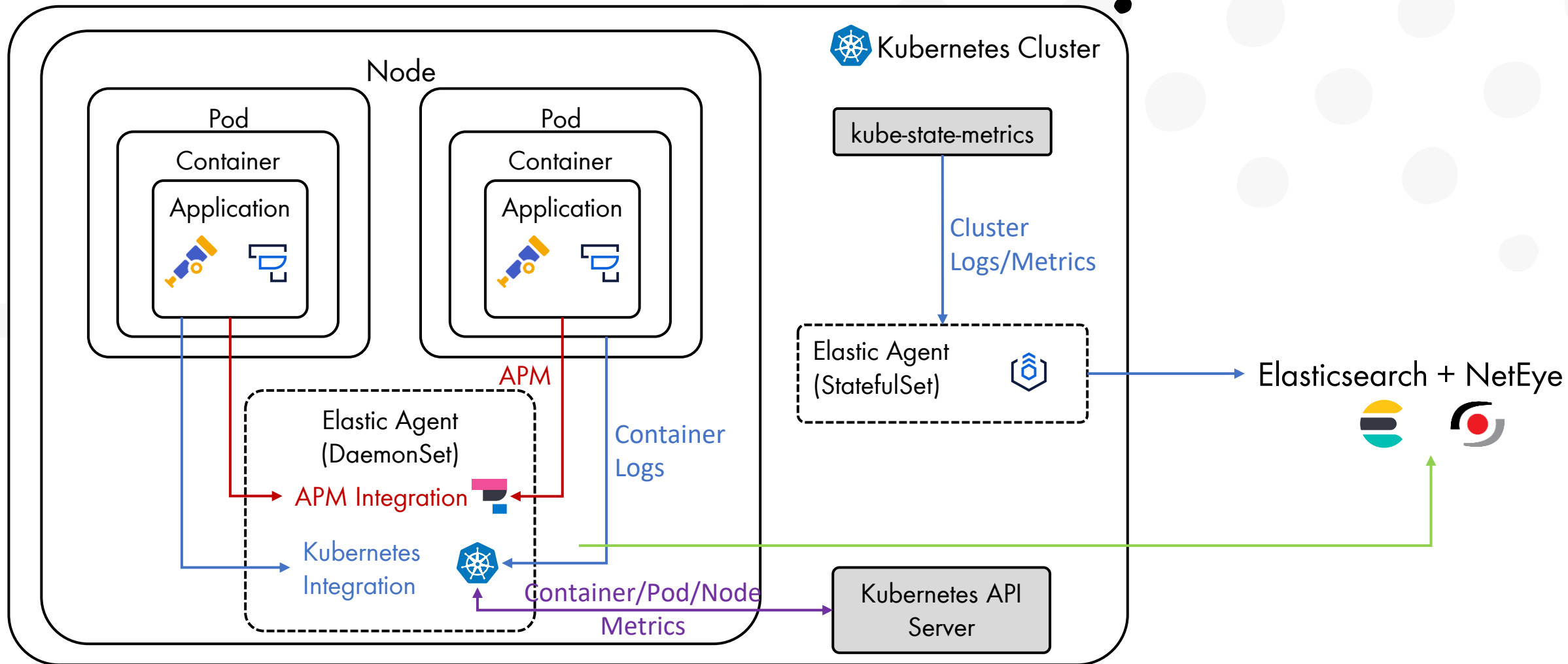


The role of NetEye

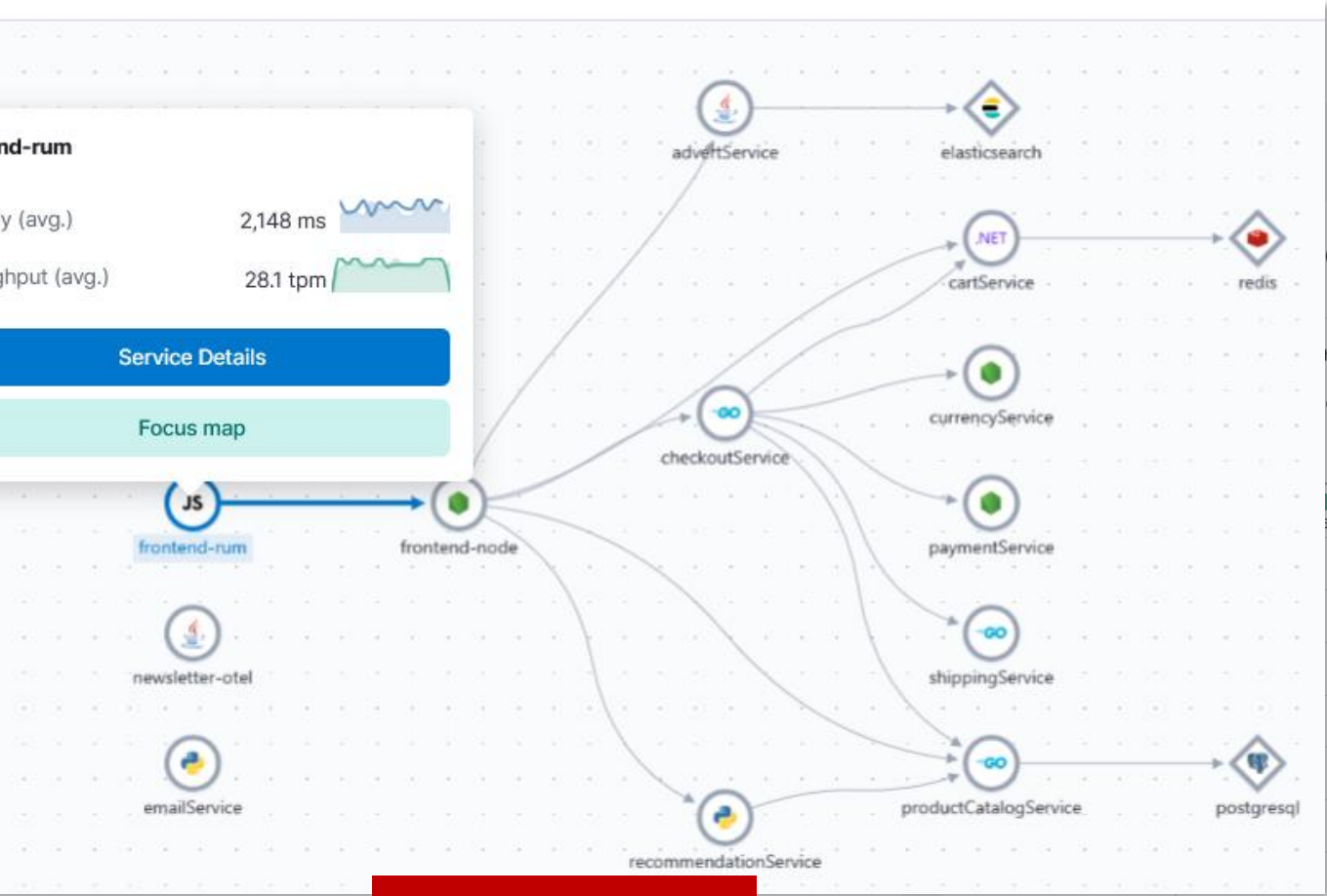
- Act as a **Unified Platform** and single entry point for DevOps, SRE and IT Operation
- NetEye **centralizes** dashboard, alerting and governance
- Elastic unify the data engine: Logs, metrics, traces and synthetics in one place
- **Integrates** and **correlates** data from multiple sources
- **Simplifies** operations and **improves** collaboration



Architecture

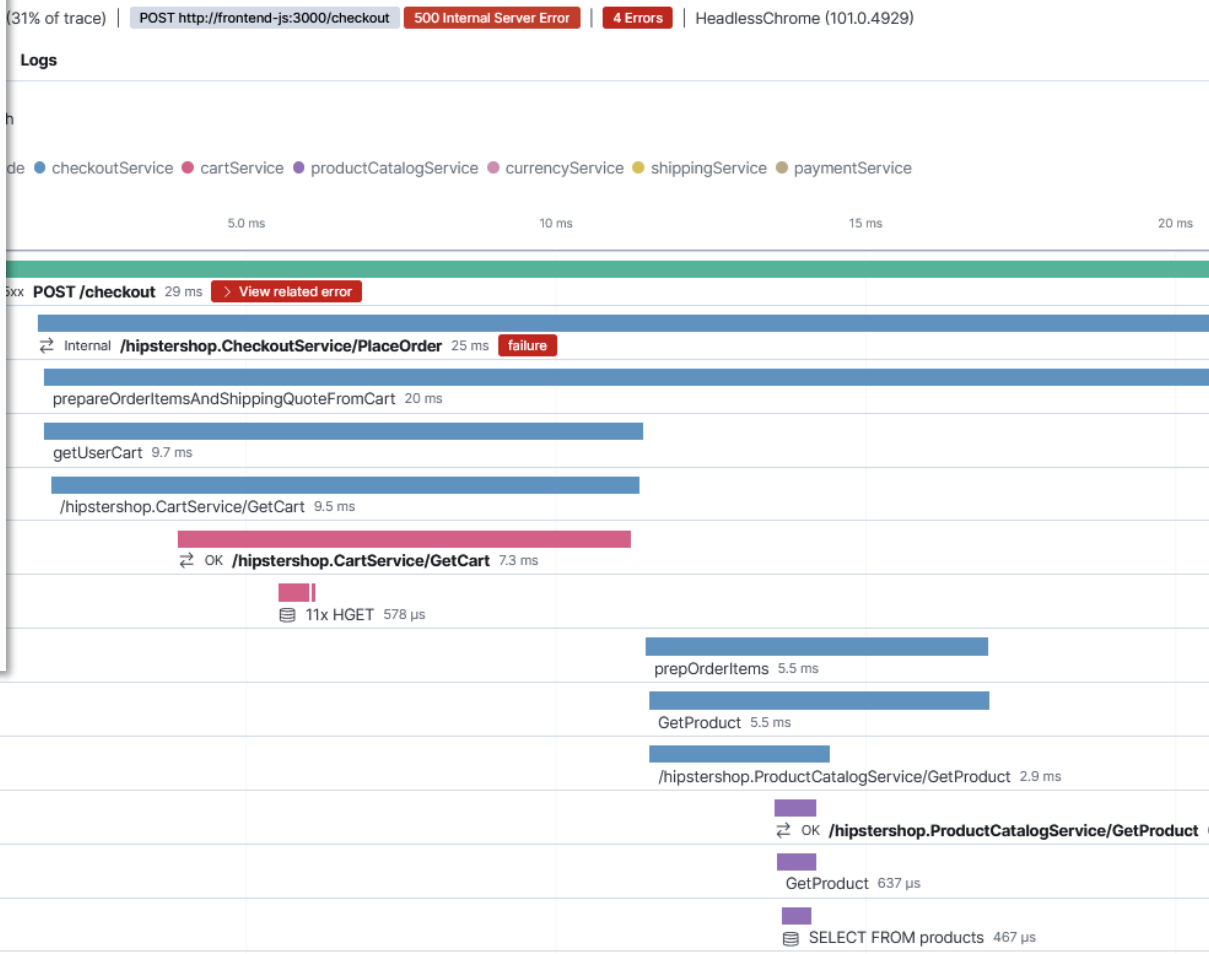


What you see - Elastic



APM - Services Map

APM - Trace Sample



What you see - NetEye

UP for 13m 6s **Kubernetes Service - Checkout PROD**
Check was successful.

UP for 13m 40s **Kubernetes Service - Payment PROD**
Check was successful.

UP for 13m 12s **Kubernetes Service - Shop PROD**
Check was successful.

UP for 26m 32s **kubernetes-node01**
Check was successful.

UP for 27m 7s **kubernetes-node02**
Check was successful.

UP for 26m 39s **kubernetes-node03**
Check was successful.

UP for 27m 14s **kubernetes-node04**
Check was successful.

UP for 27m 0s **kubernetes-node05**
Check was successful.

UP for 27m 7s **kubernetes-node06**
Check was successful.

UP for 26m 27s **kubernetes-node07**
Check was successful.

UP for 27m 6s **kubernetes-node08**
Check was successful.

Custom Service Checks

UP for 14m 0s **Kubernetes Service - Checkout PROD** (kubernetes-service-checkout-prod)

6 Services: 1 1 4

CRITICAL 5m 34s **APM - Service php-checkout-prod Failed Transaction Rate**
APM - Service Failed Transaction Rate

WARNING 0m 20s **Business Service Monitoring Status - Checkout**
Business Process WARNING: Checkout - PROD

OK 5m 35s **SLO - Service php-checkout-prod Availability**
Service availability within 98% over 30d

OK 5m 52s **SLO - Service php-checkout-prod Latency**
Service latency under 200ms

OK 14m 11s **Synthetics - API Gateway Reachability**
OK - Reachable

OK 5m 45s **Synthetics - TLS Certificate Checkout**
OK - Certificate will expire on Sat 29 Nov 2026 09:00:00 PM GMT +0000

+ NetEye built-in contacts and notifications

Business Service Monitoring (Business Process)

APM - Service php-checkout-prod Failed Transaction Rate on Kubernetes Service - Checkout PROD

Kubernetes Hosts AND

- kubernetes-node01
- kubernetes-node02
- kubernetes-node03
- kubernetes-node04
- kubernetes-node05
- kubernetes-node06
- kubernetes-node07
- kubernetes-node08

SLO - Service php-checkout-prod Availability on Kubernetes Service - Checkout PROD

SLO - Service php-checkout-prod Latency on Kubernetes Service - Checkout PROD

Synthetics - API Gateway Reachability on Kubernetes Service - Checkout PROD

Synthetics - TLS Certificate Checkout on Kubernetes Service - Checkout PROD

Key Takeaways

- **Full visibility** across all layers
- **Centralized observability** with NetEye & Elastic
- **Faster** root cause analysis
- **Scalable** monitoring architecture
- **User experience** perspective



Thank you

