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Support your strategic initiatives with ML-powered optimization

provice DynaTaste 2022

2022 April 27th

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Agenda

- The problem
- Enter Akamas
- A real-world case
- Conclusions and Q&A

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VP Product Mgmt & Business Dev

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The problem

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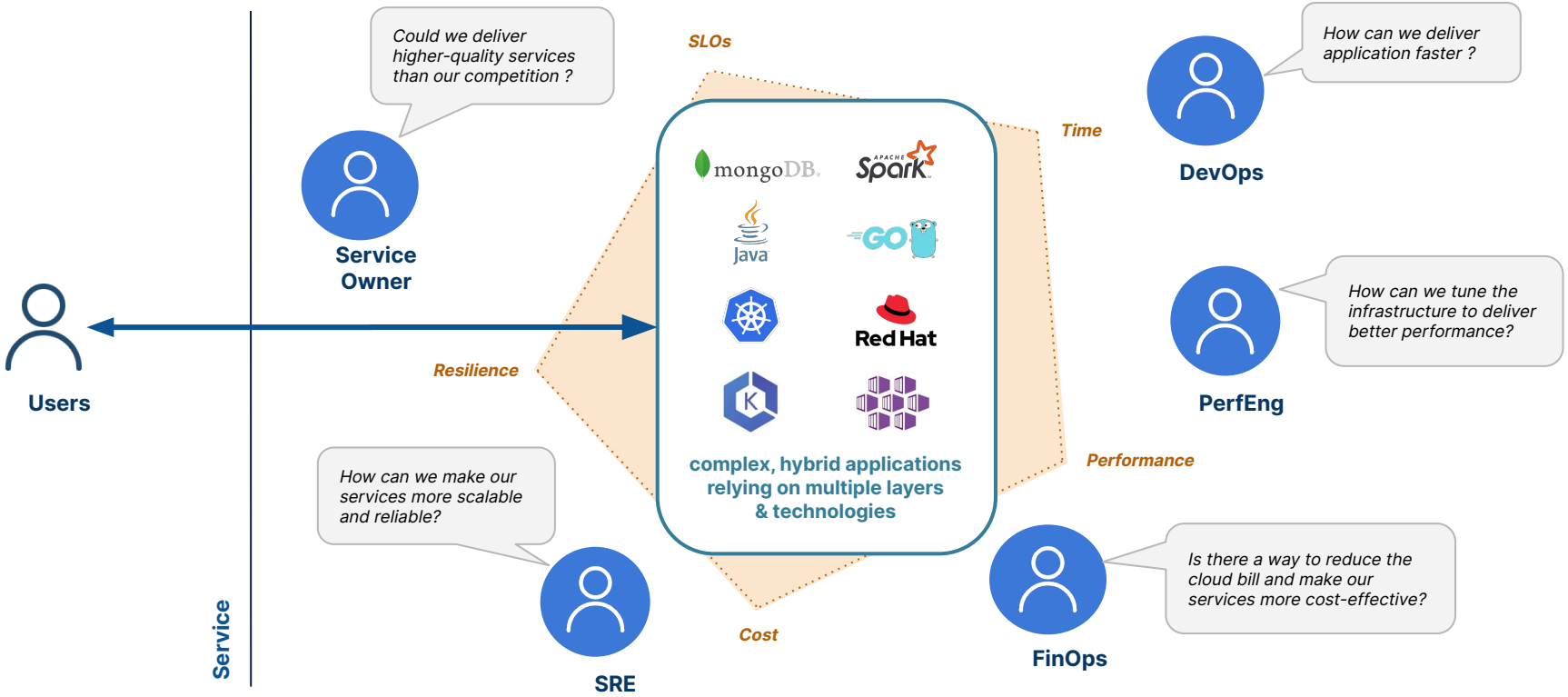
The challenge: align IT to Business



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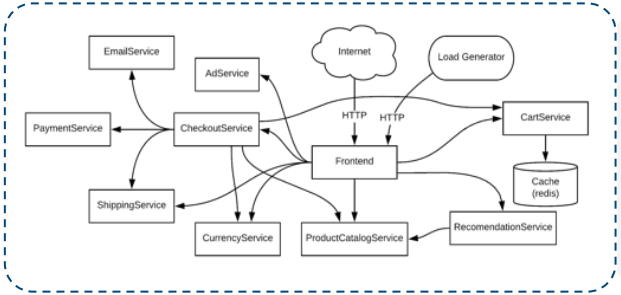
The challenge of cloud-native apps

Kubernetes microservices applications



dozens or hundreds of microservices

IBM WebSphere · Apache Spark · mongoDB · elasticsearch · Java · Go · Red Hat · ubuntu · aws · Azure · Google Cloud

Tunable parameters

- Application Runtime (each microservice)
- Resource requests (each microservice)
- Resource limits (each microservice)
- Replicas & Auto-Scaling policies
- …

hundreds or thousands of parameters

how to balance performance, resilience & cost?

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Enter Akamas

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Akamas autonomous optimization principles

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Full-Stack

any application, any middleware, any database, any cloud - any system

Smart

patented AI quickly identifying optimal configurations beyond any manual tuning

Goal-oriented

custom-defined goals translating SLOs and business & technical constraints

Closed-loop

recommended changes with human-in-the-loop or fully automated within-the-pipe

Safe

parameter boundaries, incremental changes and constraint violation detection

Akamas full-stack approach

Application-level

- **Application**
  Threads, queues, policies, ...
- **Framework**
  App Server, DBMS, Spark settings, ...
- **Runtime**
  JVM Memory size, GC settings, ...
- **K8s Pod / Container**
  Resource requests & limits, replicas, ...

Infrastructure-level

- **Node OS**
  Network, Disk, CPU, Mem settings
- **Node HW / Cloud instance type**

HUNDREDS/THOUSANDS OF TUNABLE PARAMETERS AND KPIs

full-stack optimization

illustrative - sample technologies

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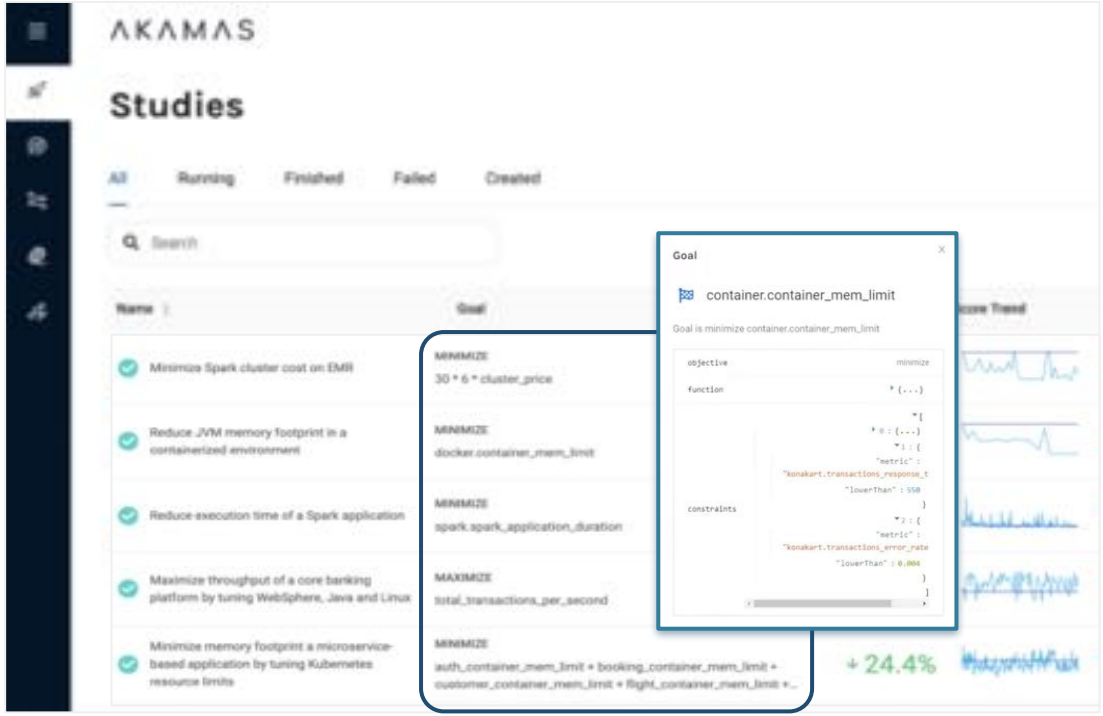
Akamas optimization goals and constraints



declarative, custom-defined goals & constraints

MINIMIZE resource usage WITH throughput >= 1000

MINIMIZE response time WITH <= error_rate (BL) + 5%

MINIMIZE cloud cost WITH trans/sec = BL + 5%

MAXIMIZE throughput / heap-size
WITH <= err_rate (BL) AND throughput = BL +5%

any formula on one or more metrics (absolute and wrt baseline)

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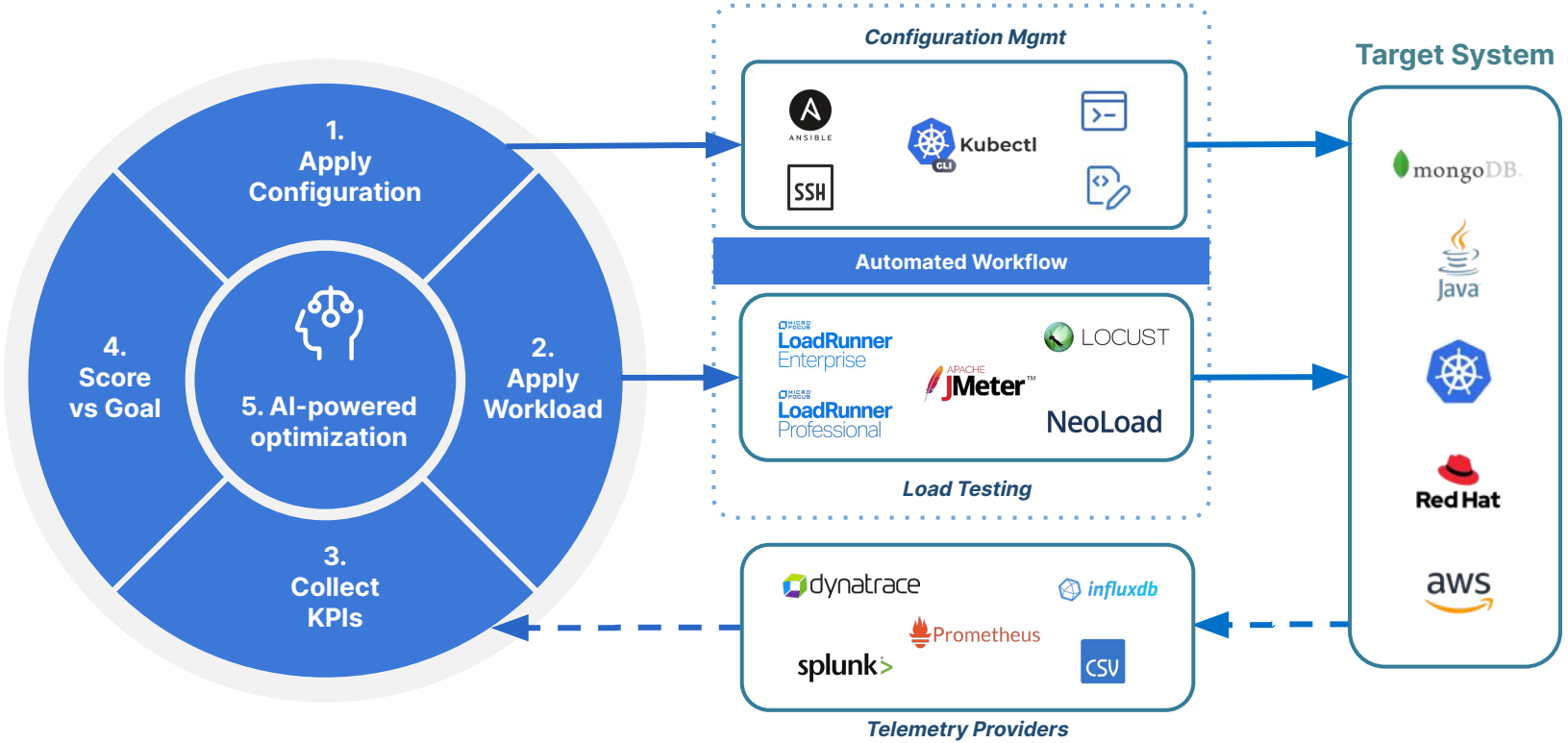
Akamas high-level architecture (offline)



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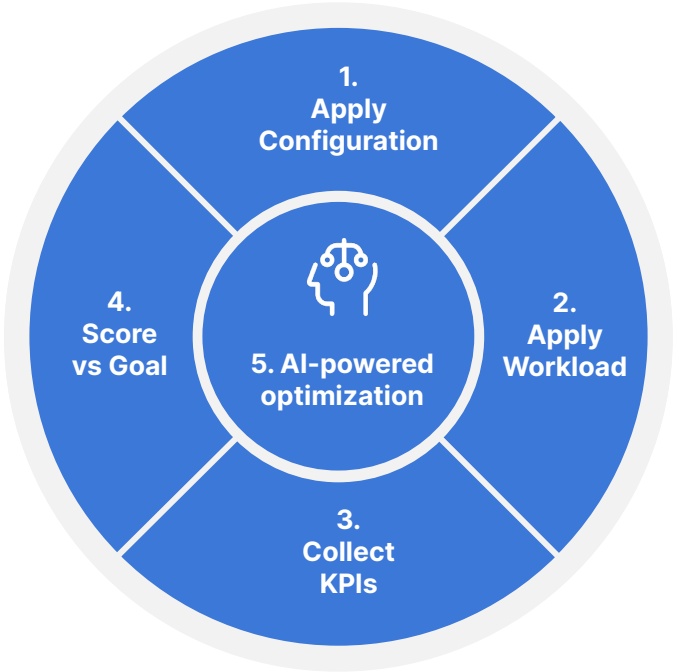
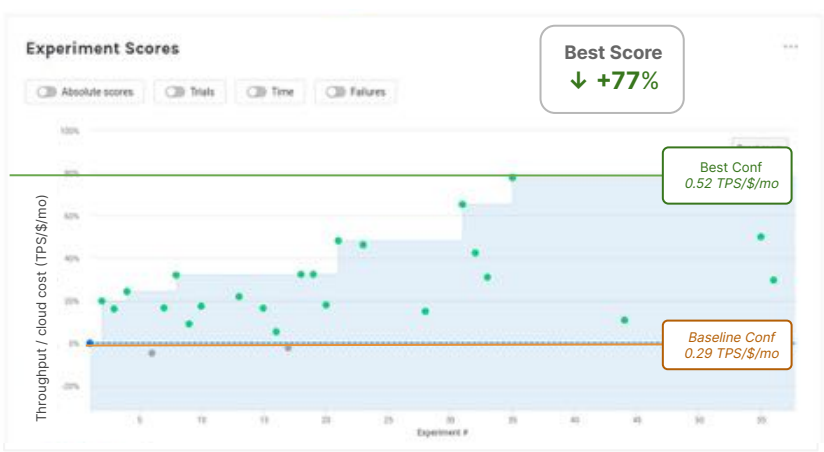
Akamas smart exploration



Goal: maximize transaction / monthly cost



~35 experiments / ~24 hours elapsed to identify optimal configuration

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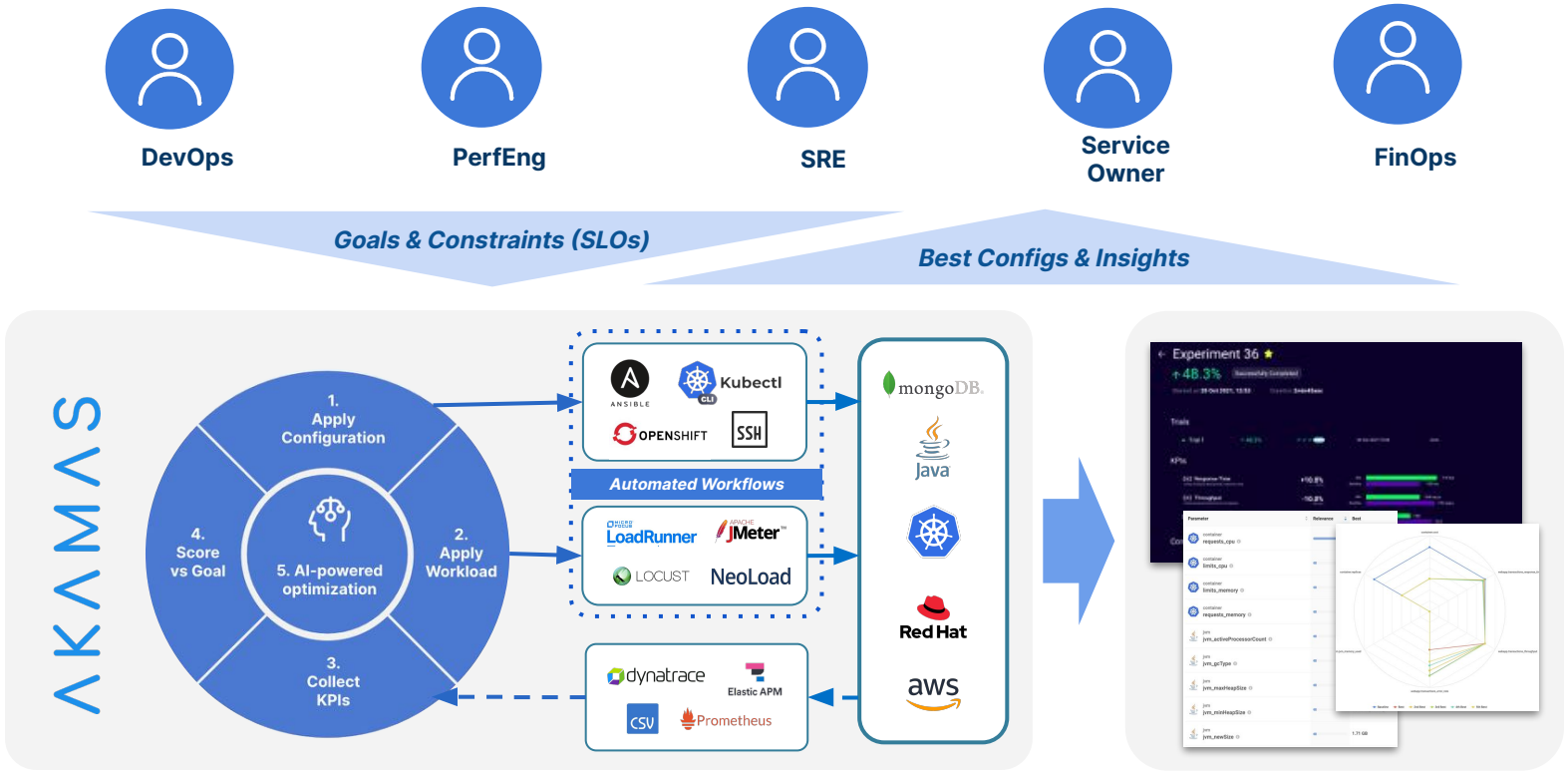
Akamas enables a new decision-support



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Akamas optimization in the CI/CD pipeline

Jenkins

keptn dynatrace

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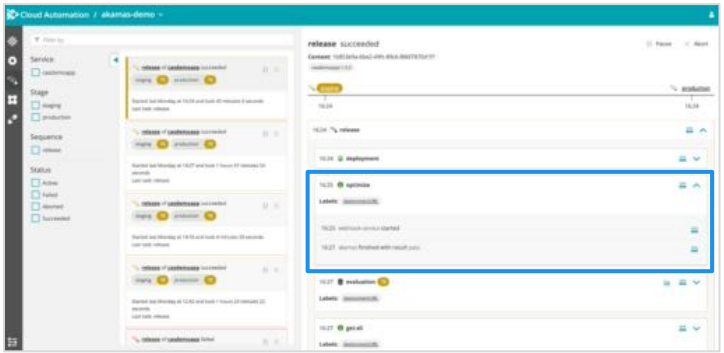

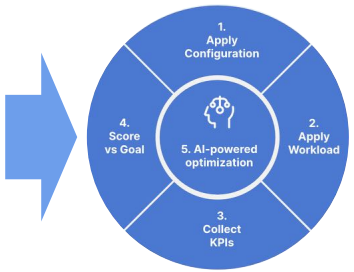

optimal configuration identified by Akamas

*Akamas **Continuous Optimization** (**CO**) triggered in the **CI/CD pipeline***
triggered during release process (under Quality Gates) or as remediation response

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Key customers & metrics

Service Throughput

+30%

increase in transactions/seconds with the same infrastructure resources

Service Quality

-70%

decrease in response time with lower fluctuations and peaks

Cost Reduction

-60%

decrease in infrastructure/cloud costs with the same application performance

Operational Efficiency

-80%

savings in engineering time spent for manual tuning tasks

TripActions
lastminute.com
vodafone
Sabre
italiaonline
enel
nexi
sia
UniCredit
RAIFFEISEN
CEDACRI GROUP

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A real-world case

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Real-world case: challenges

TeamSystem®

European leader in accounting, payroll & business management software

1,7M
users

400M
invoices / year

B2B Stateless Authorization Service

Java

- Digital Service App
- Digital Service App
- Digital Service App

Azure Kubernetes Service (AKS)

AWS Elastic Kubernetes Service (EKS)

frequent updates dictated by business & regulatory compliance

2 months spent for tuning a single Kubernetes microservice

need to lower cloud bills and improve cost-efficiency

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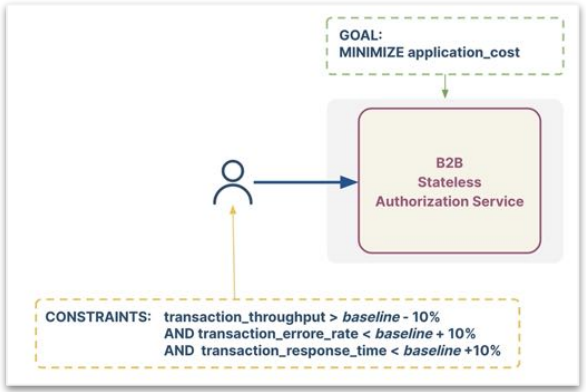
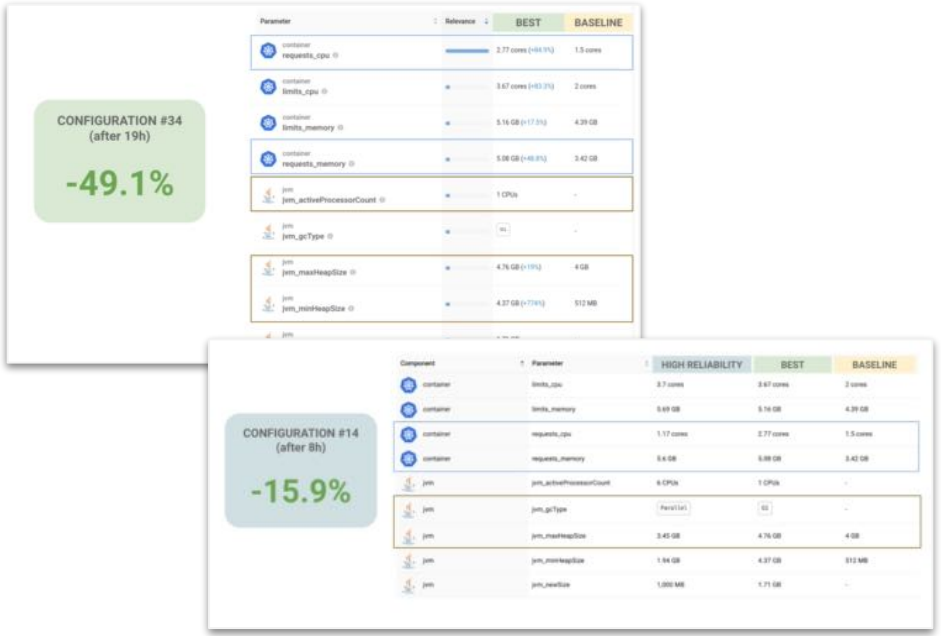
Akamas results

TeamSystem®

Goals & Constraints (SLOs)



Reduced Cost



Improved Resilience

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Conclusions and Q&A

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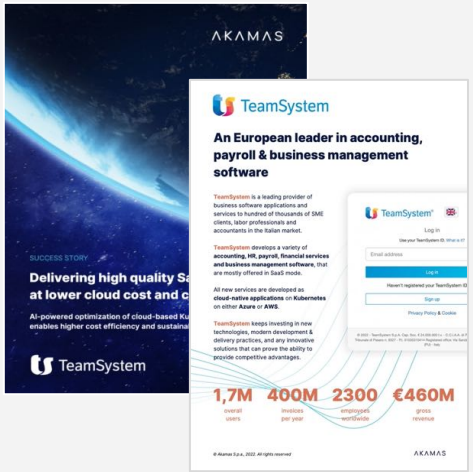
Your next steps

1

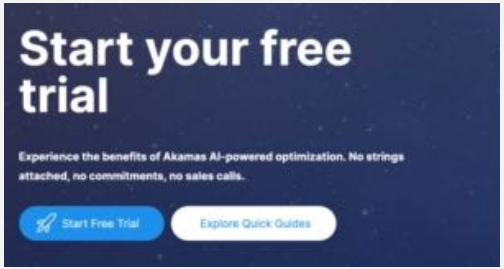


[Download the Case Study]

2

[Read Gartner Peer Insights]

3



[Free Trial]

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