AWS re:Invent

DOP404-R

Amazon's approach to high-availability deployment

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Senior Manager
Amazon Web Services

AWS re:Invent

aws

Agenda

What is a deployment failure

How we learn from deployment failures

Release guidance

Applying the learnings

New approaches

What is a deployment failure?

What is a deployment?

What is a deployment?

Data

Scaling

Configuration

Code

Certificate

What is a deployment failure?

What is a deployment failure?

Duration

Latency

Impact

How we learn from deployment failures

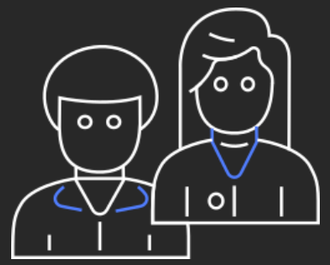
Correction of error

What happened

Root cause analysis

Supporting data and metrics

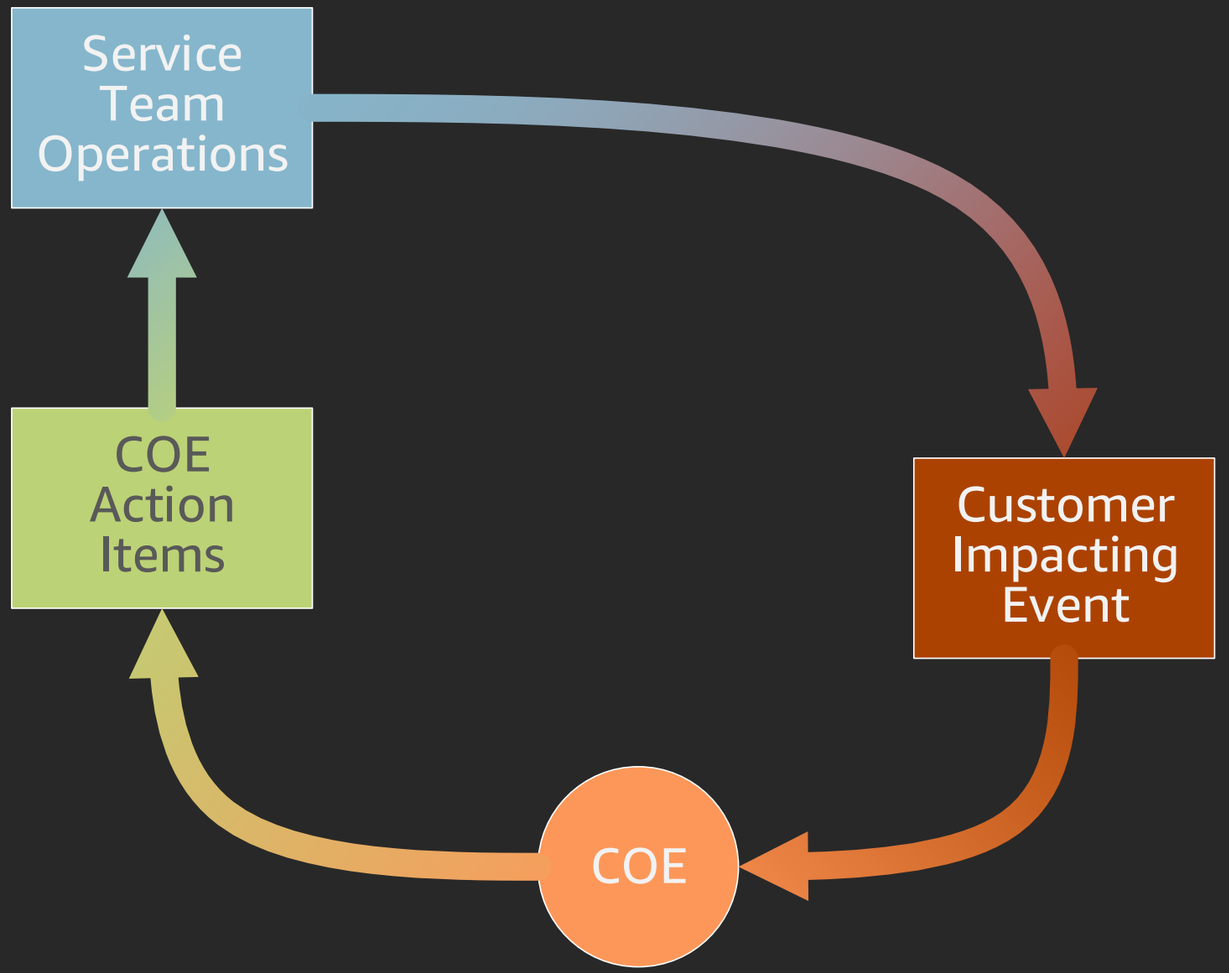
Lessons learned



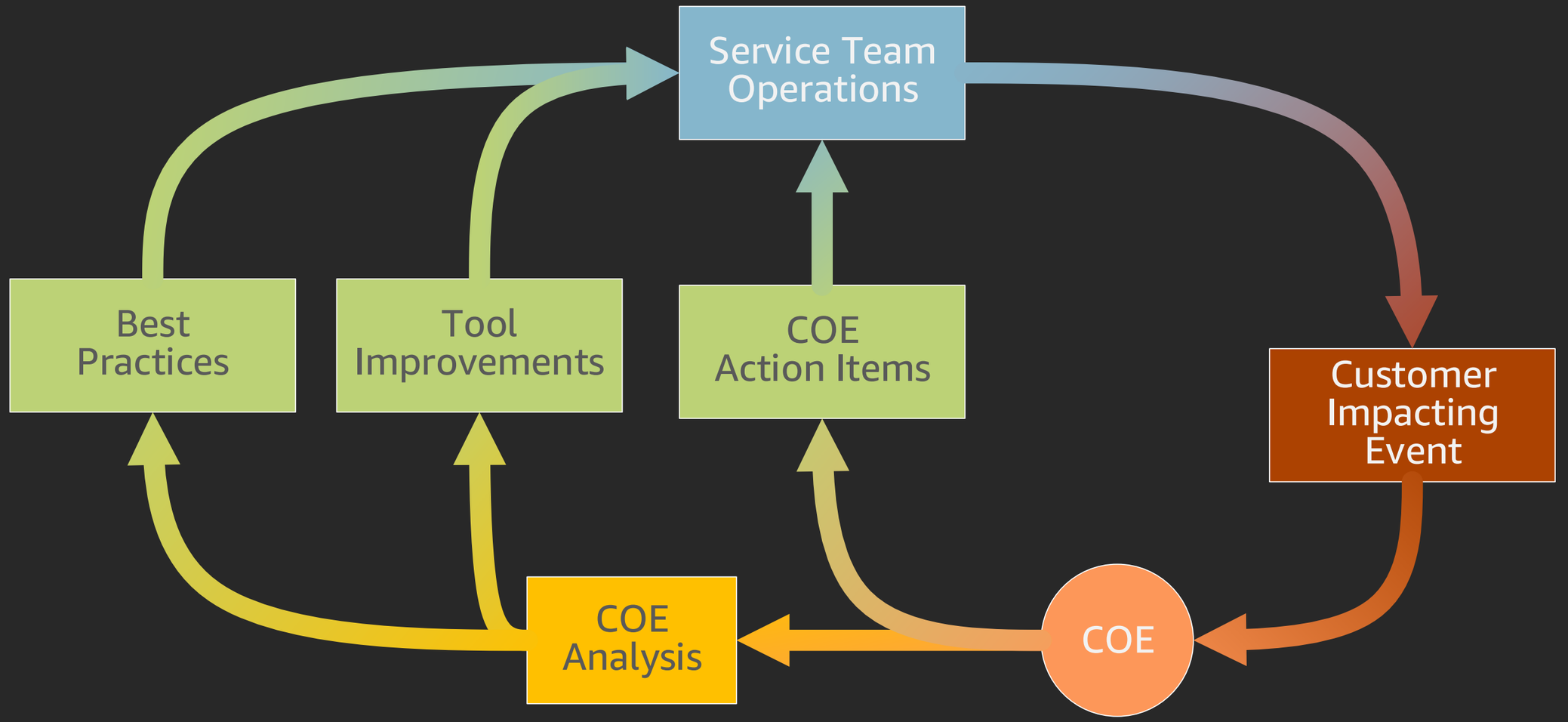
Customer impact

Corrective actions

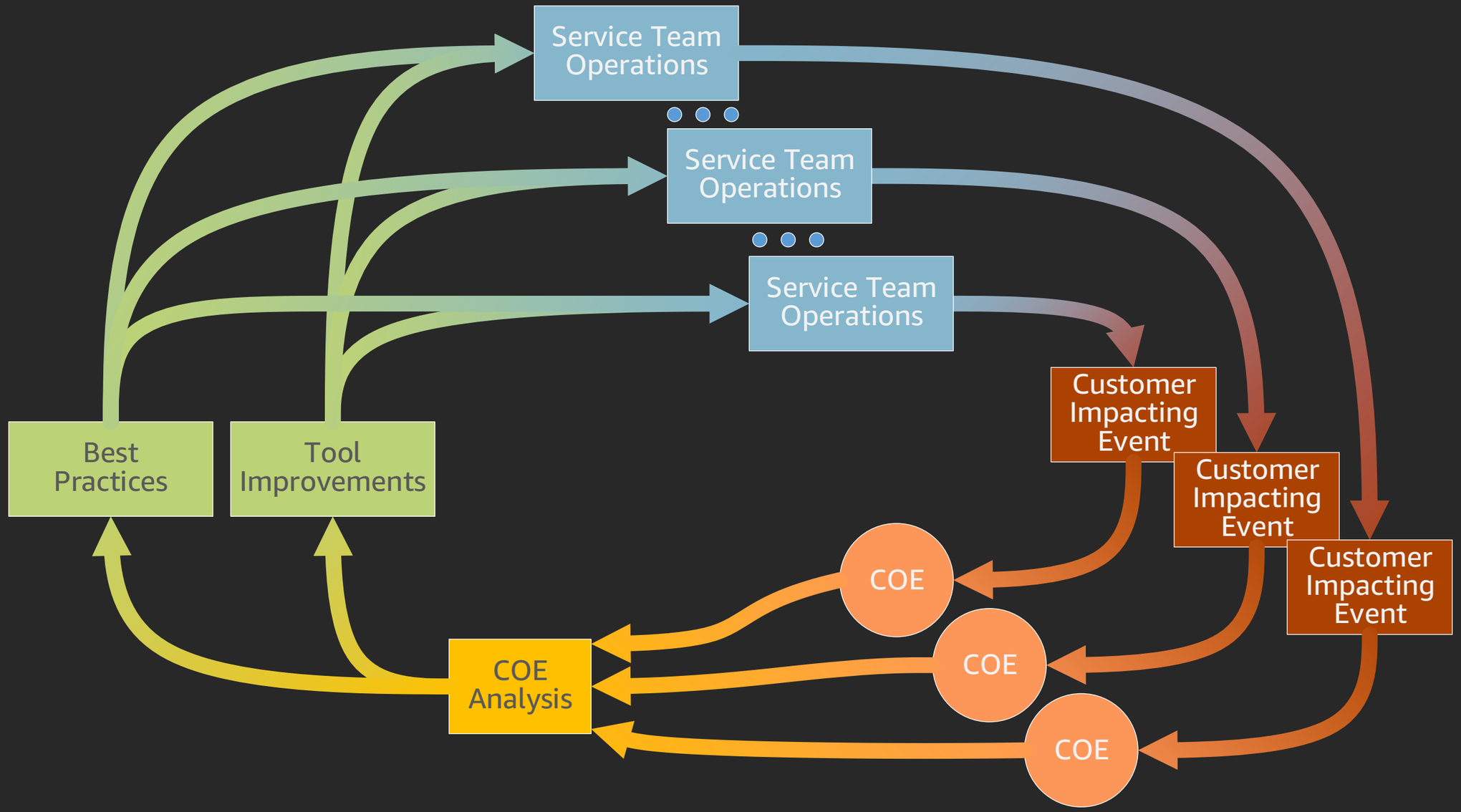
Correction of error



Organizational mechanism



Organizational mechanism



Tagging

Prevention

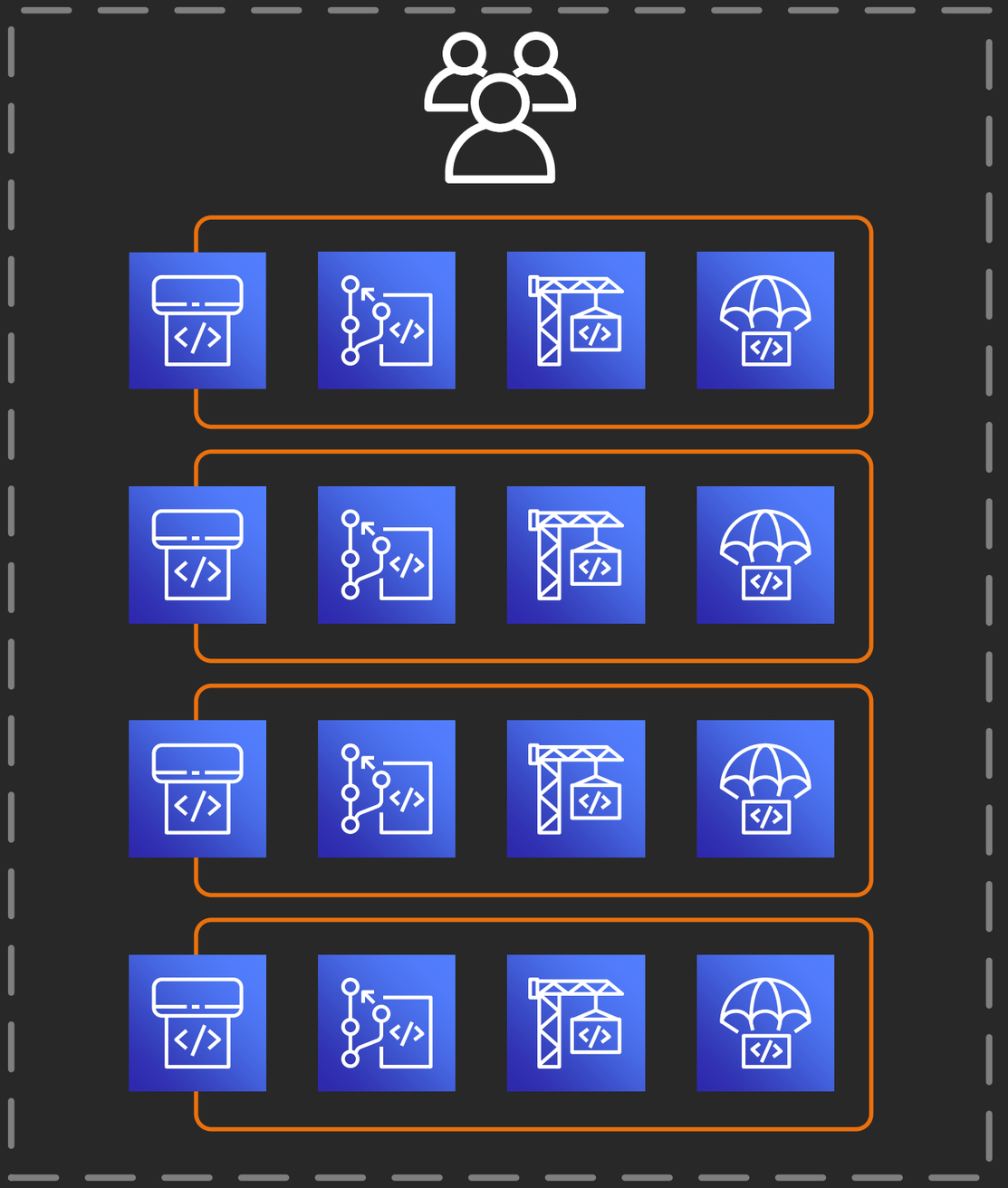
Shorter

Smaller

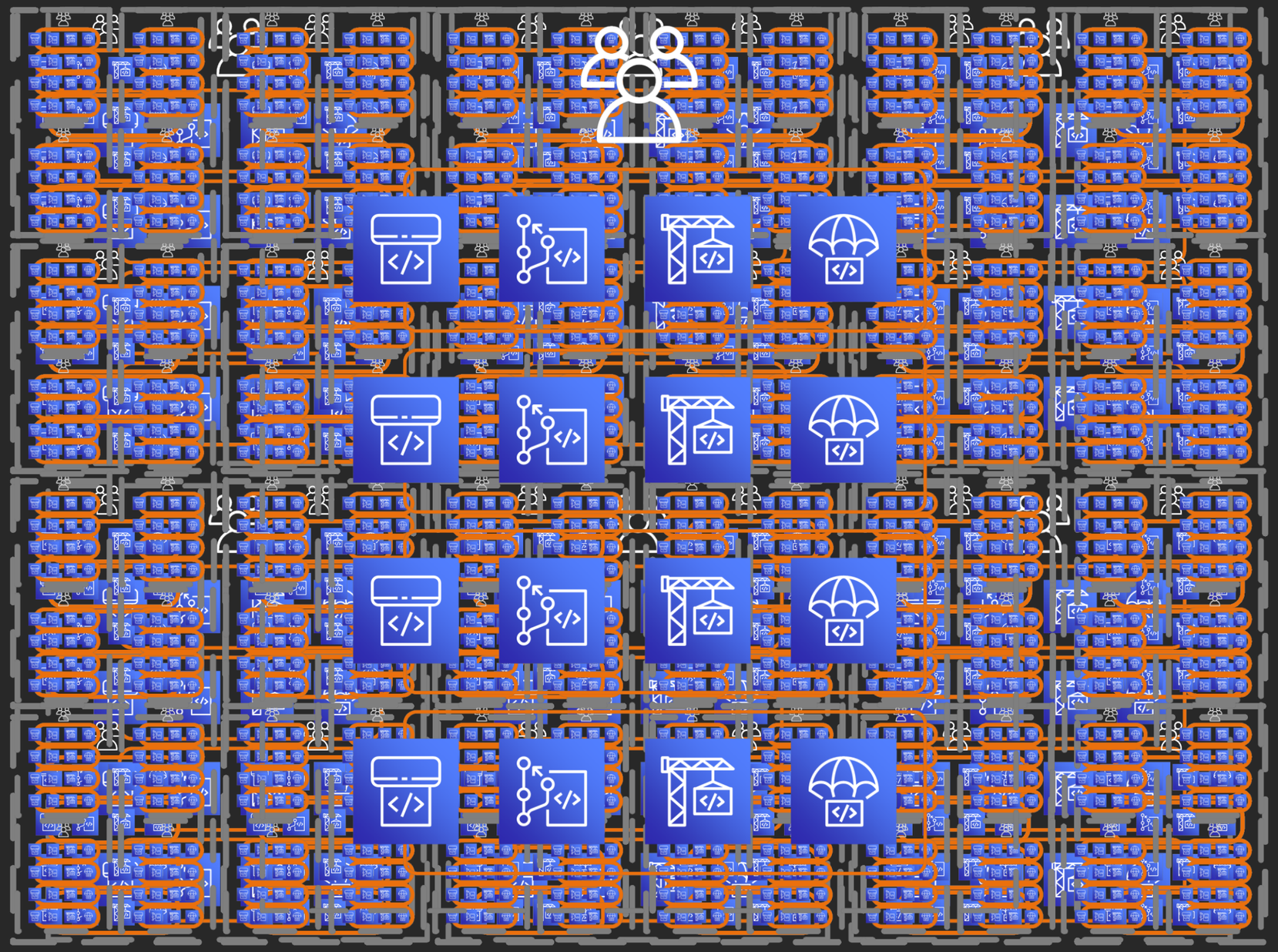
Release guidance

Two-pizza teams

- Operate independently
- Decentralized ownership
- Local process decisions
- Consistent operational standards
- Identical tools and platforms



A matter of scale

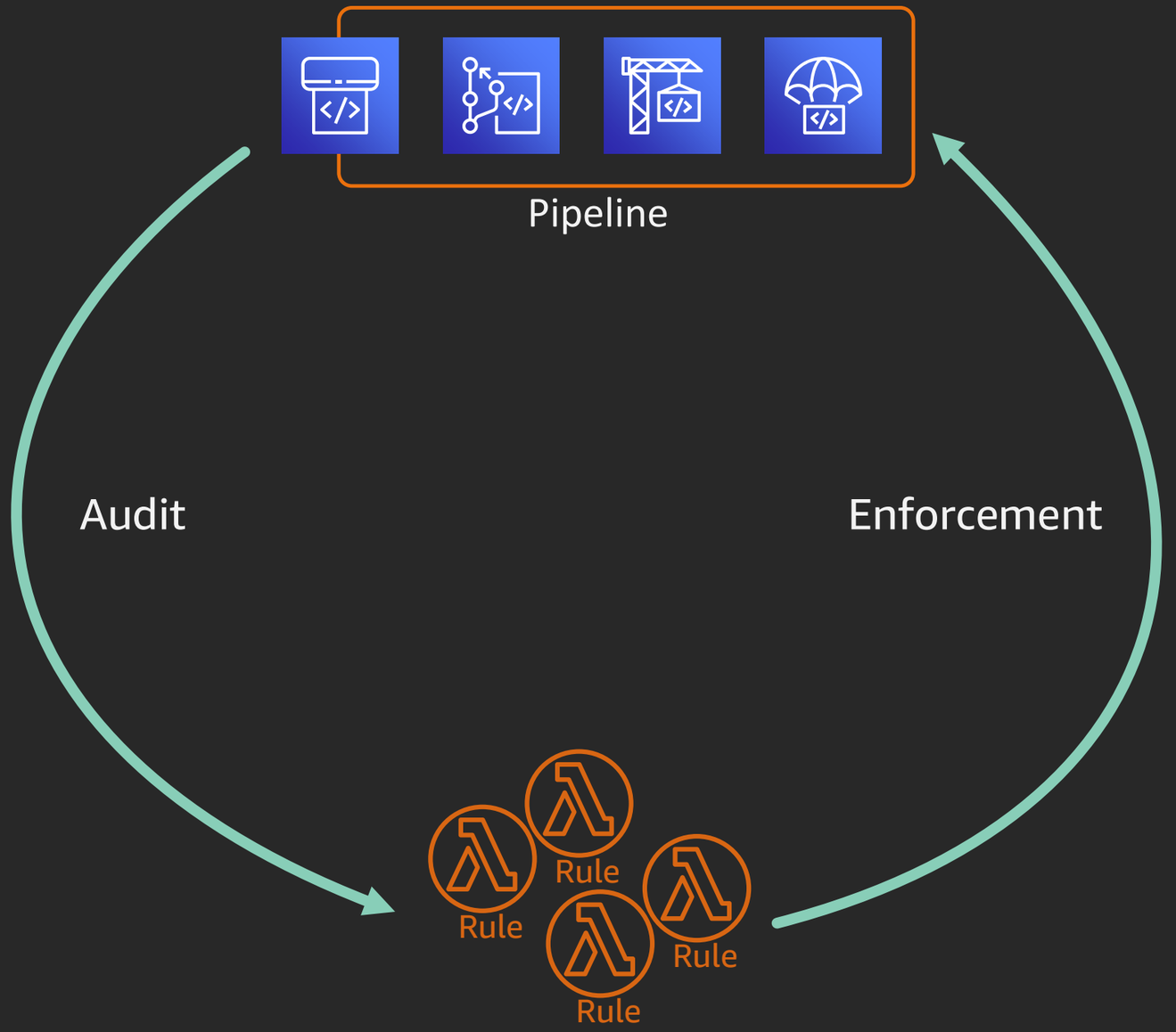


A matter of scale

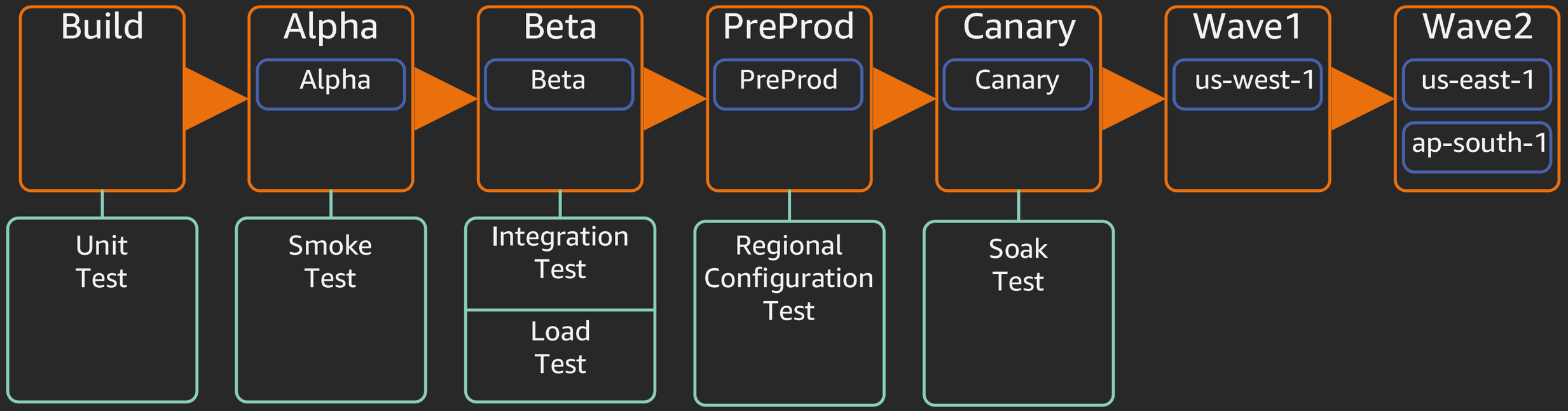
How do you continually raise the safety bar across

- 1,000s of teams?
- 10,000s of software services?
- 100,000s of deployments per month?

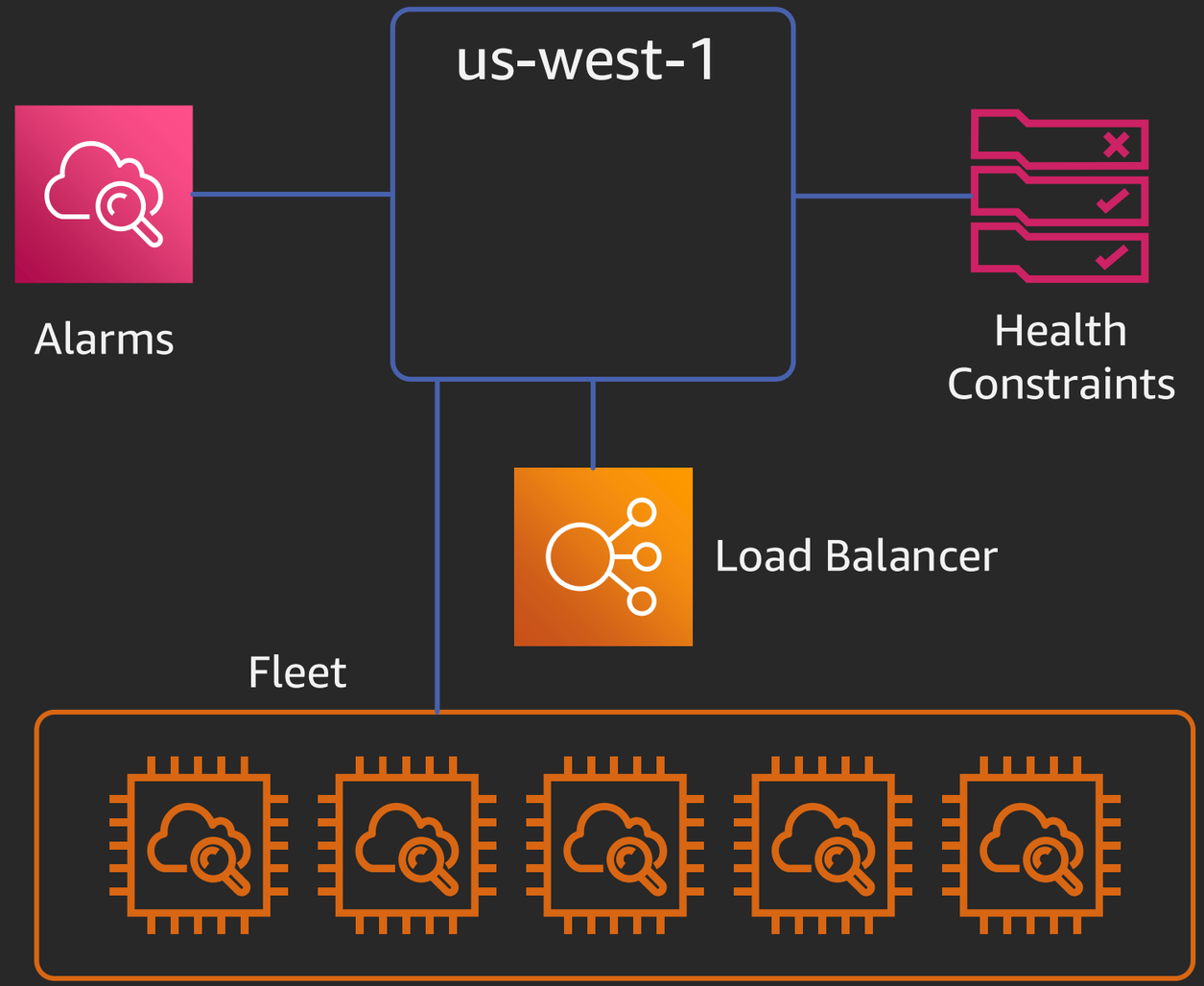
Release guidance lifecycle



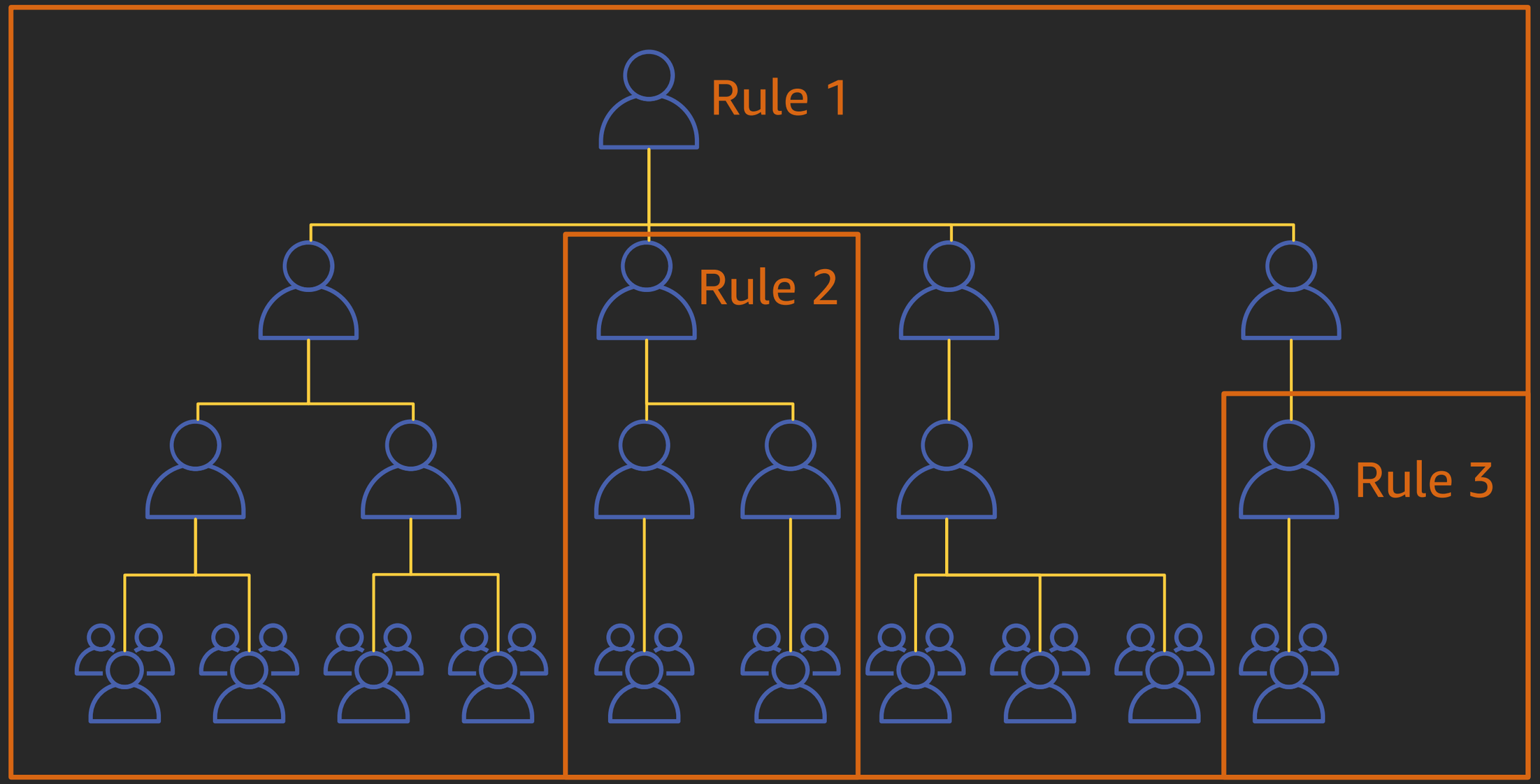
Audit


Build
Alpha
Alpha
Beta
Beta
PreProd
PreProd
Canary
Canary
Wave1
us-west-1
Wave2
us-east-1
ap-south-1
Unit Test
Smoke Test
Integration Test
Load Test
Regional Configuration Test
Soak Test

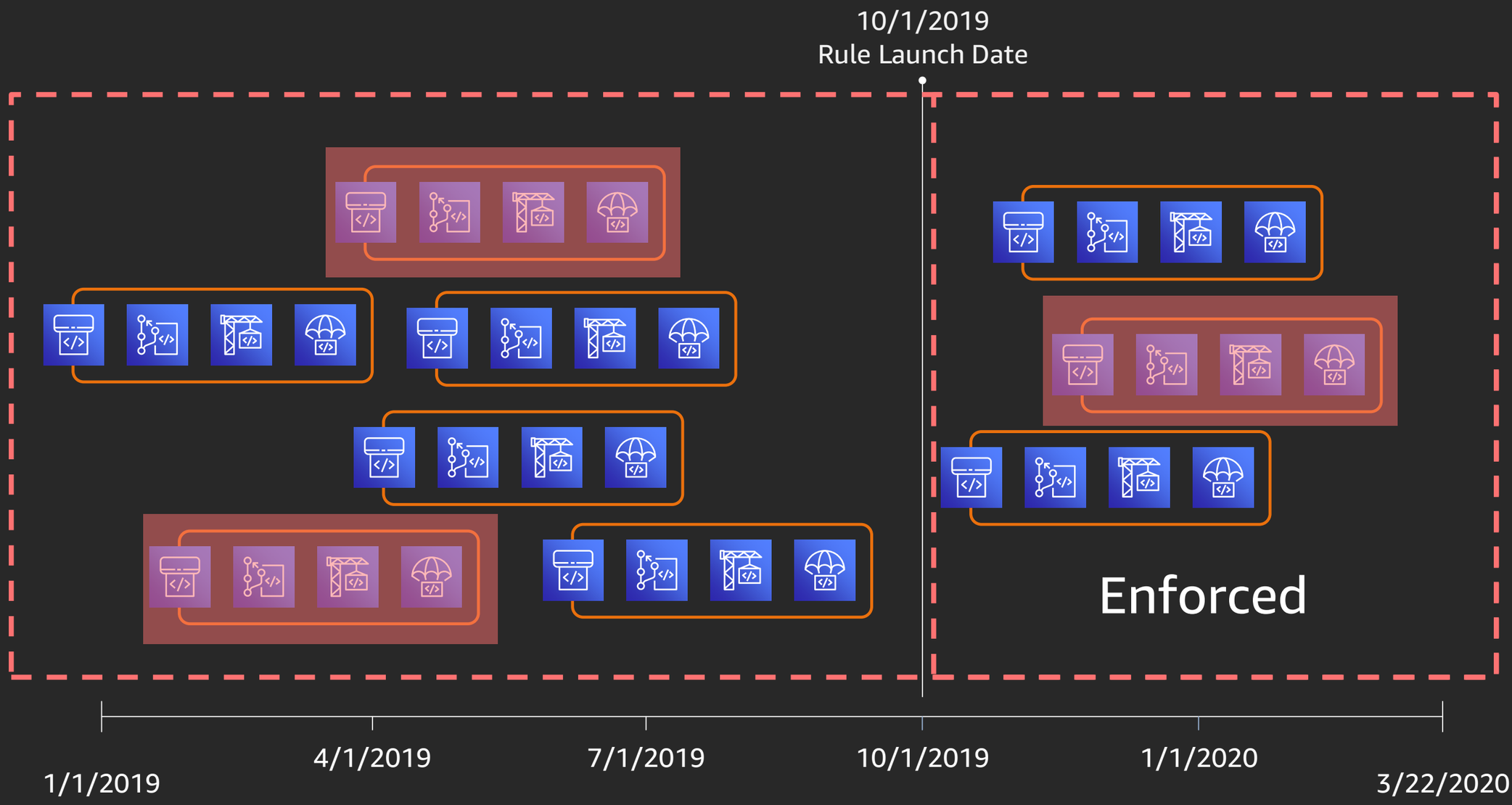
Audit



Rules



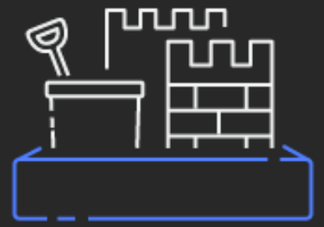
Enforcement



Dealing with the real world

Break glass

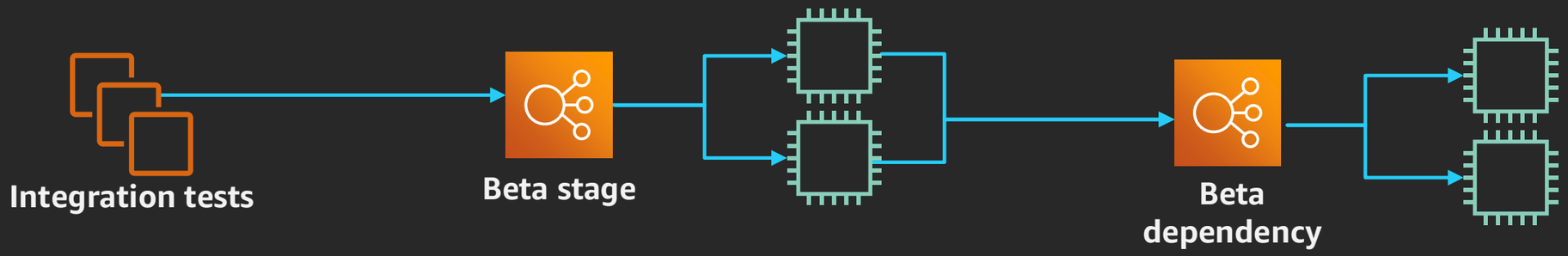
Exemption



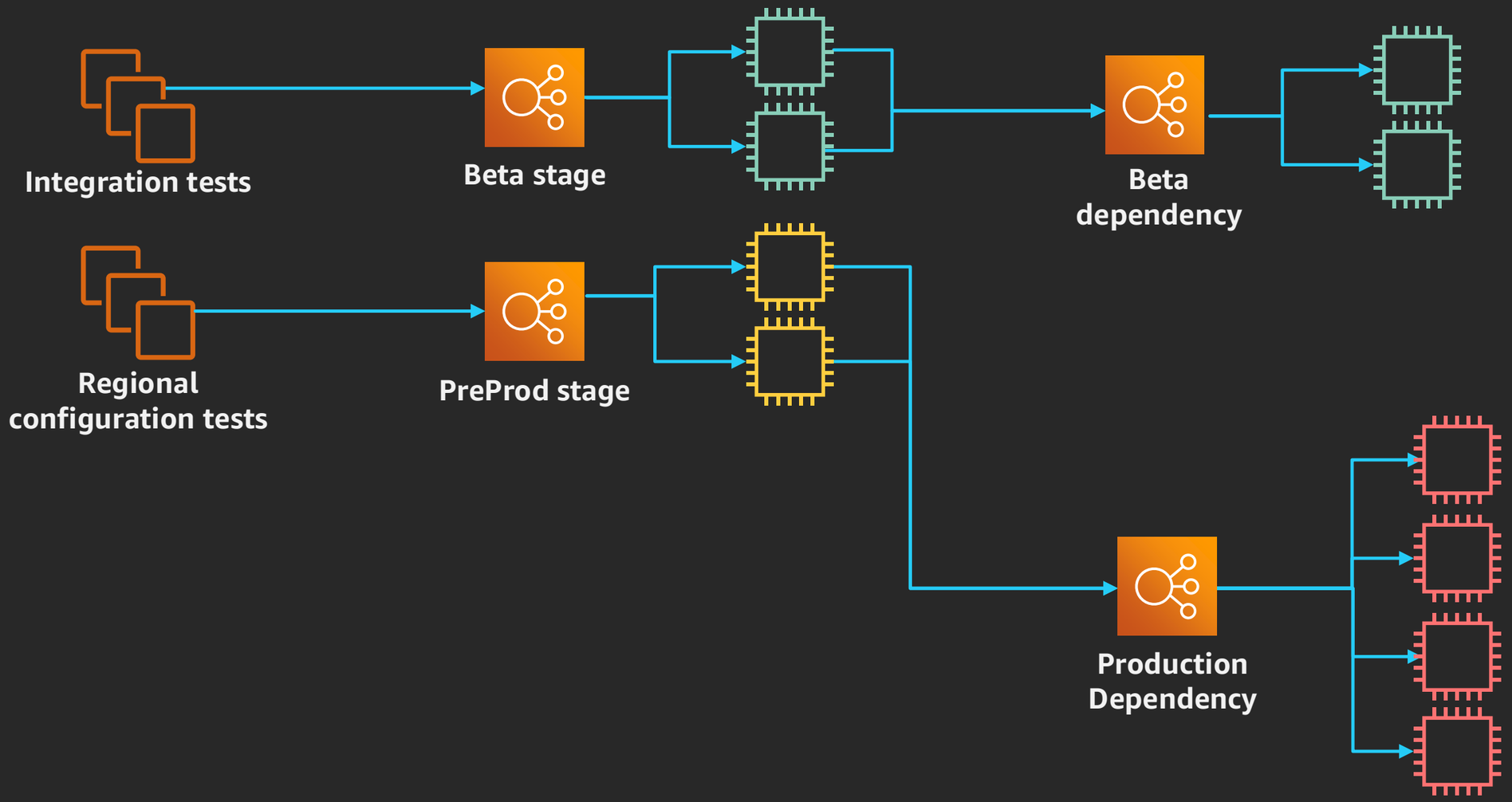
Classification

Applying the learnings

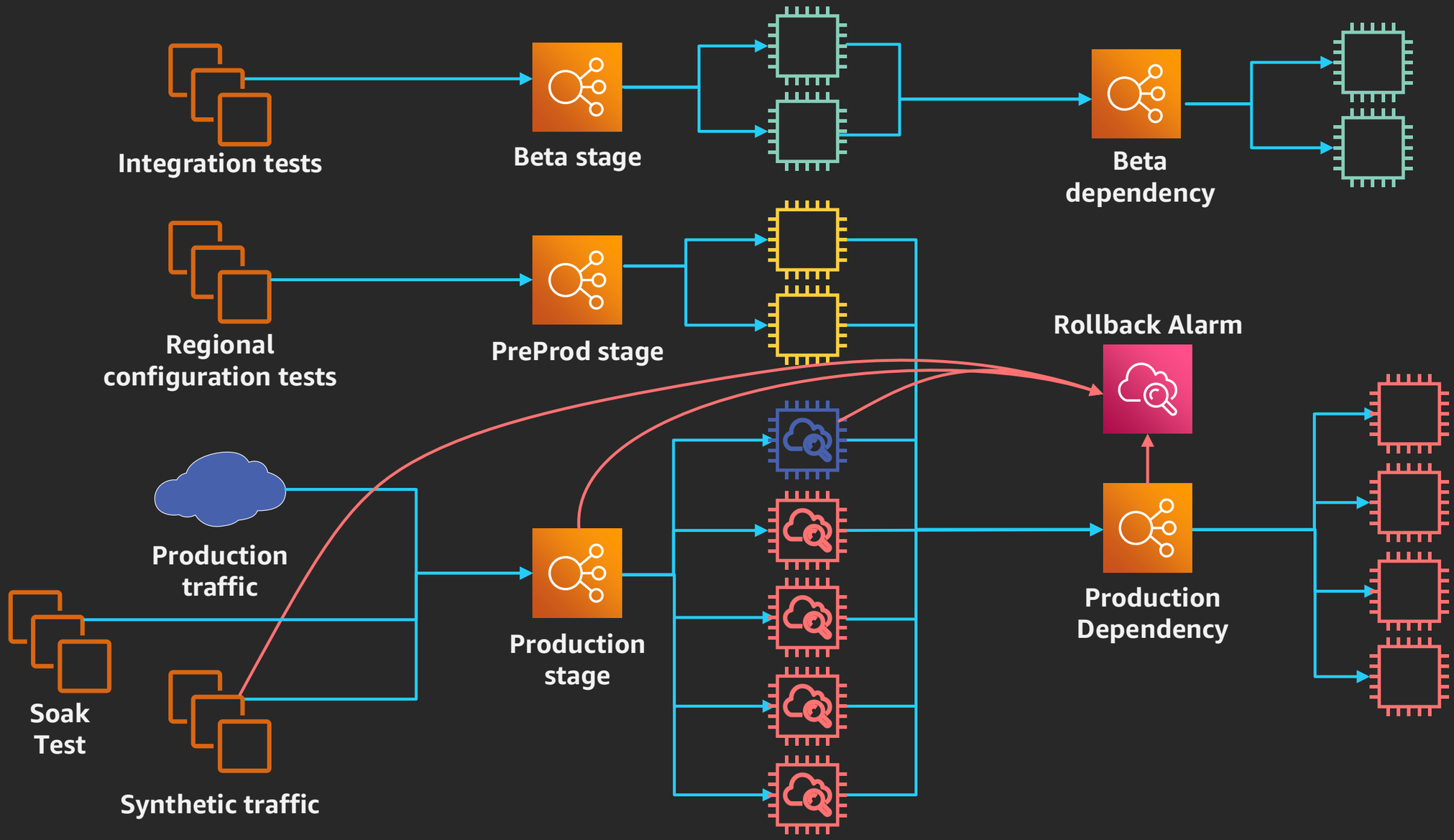
Best practices – Integration testing



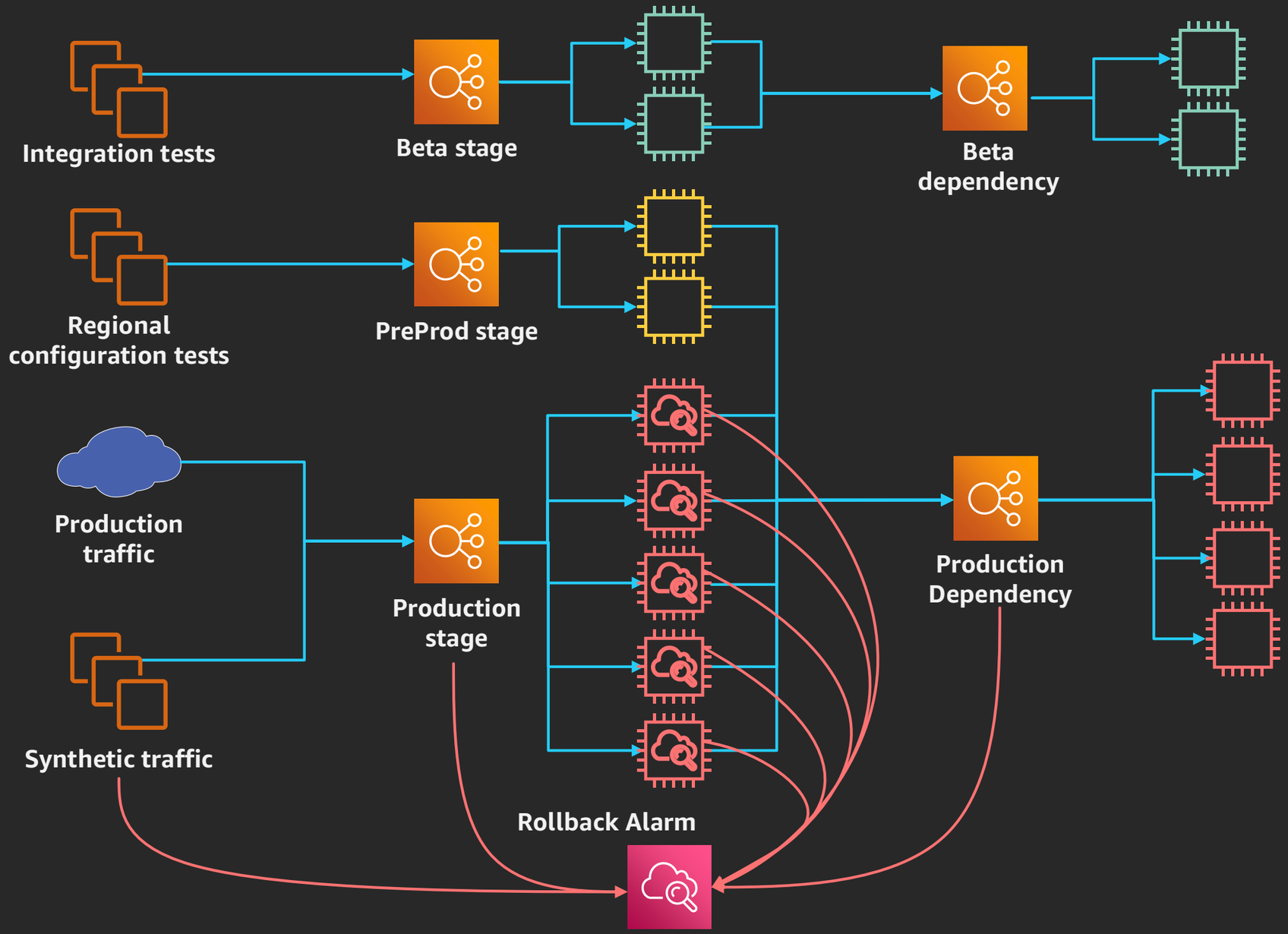
Best practices – Preproduction testing



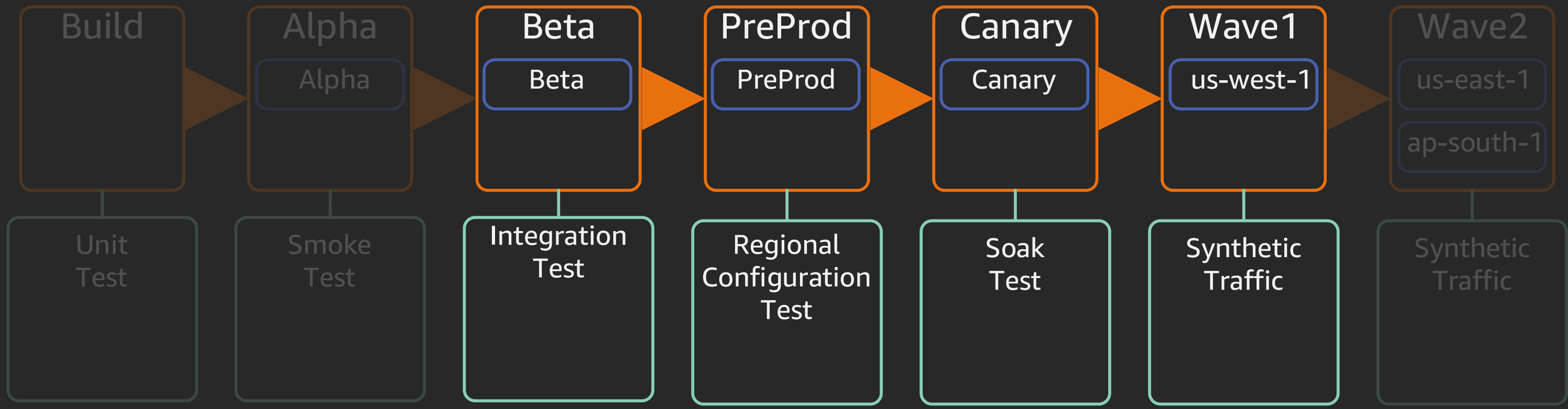
Best practices – Canary deployments



Best practices – Rollback alarms

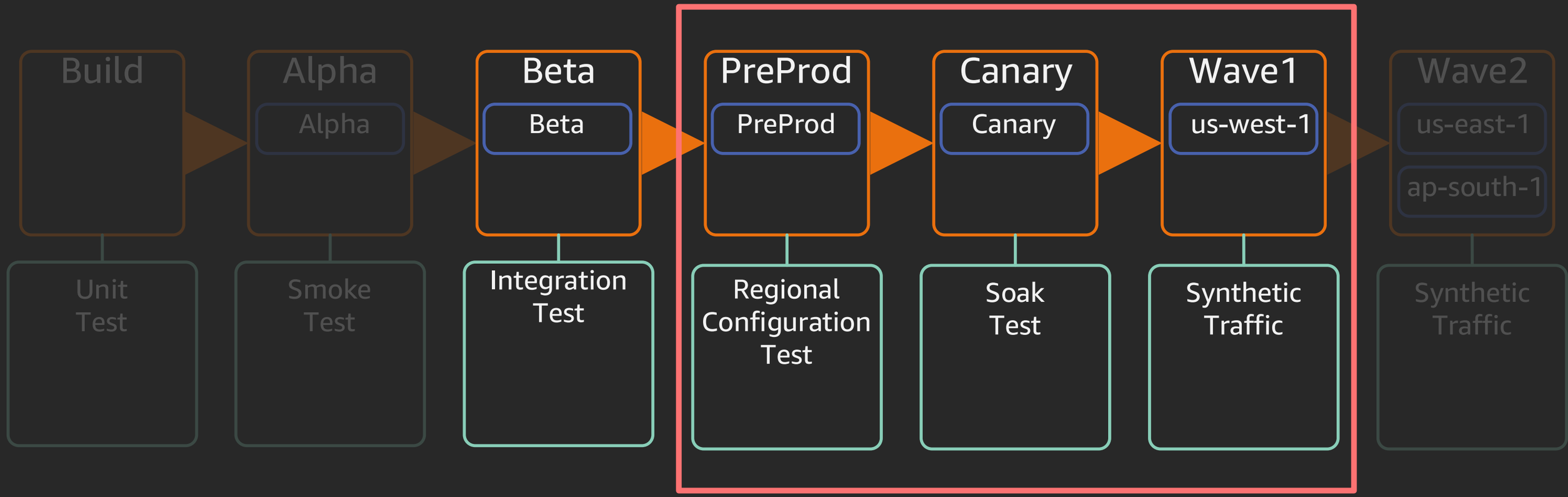


Best practices

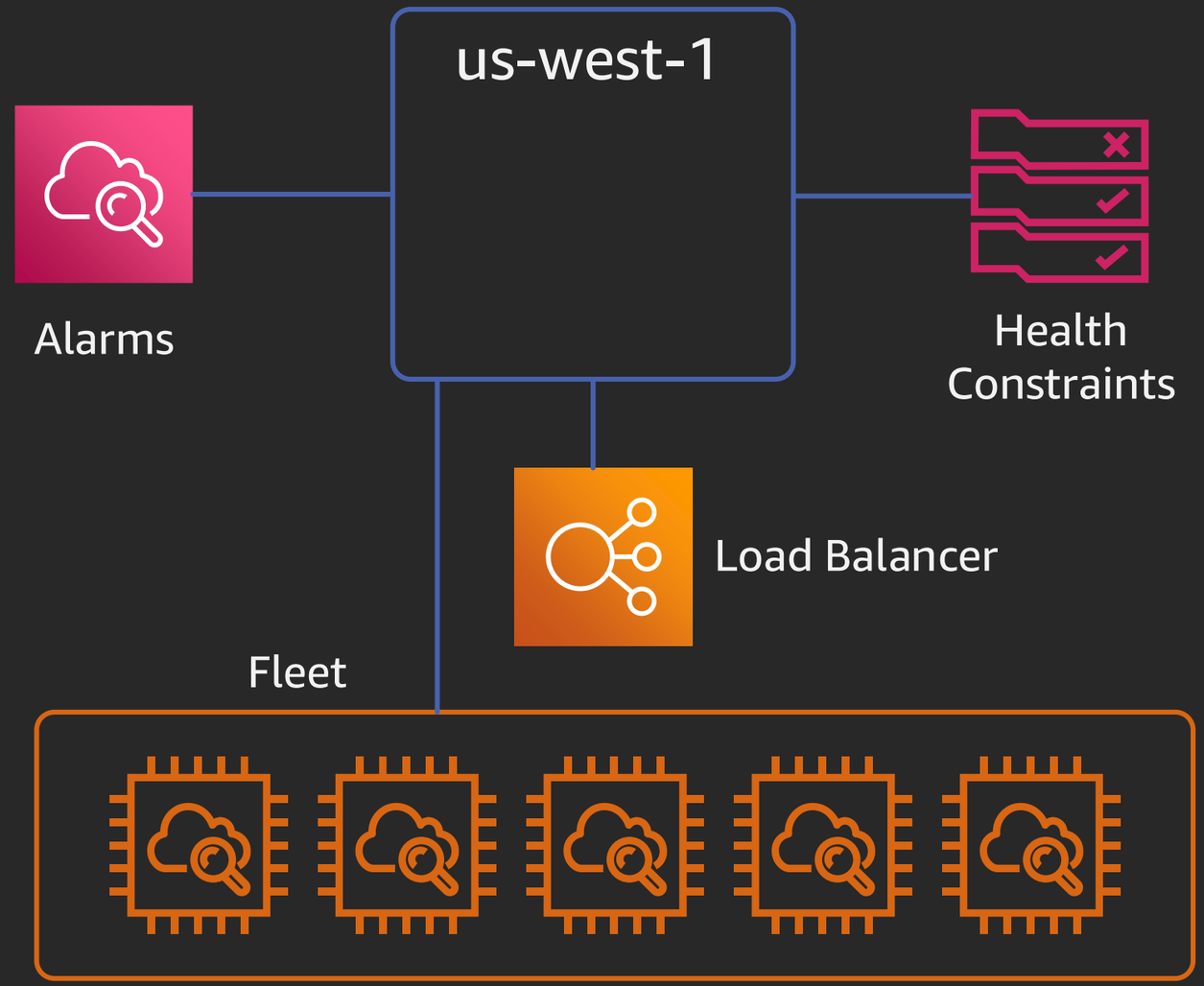


New approaches

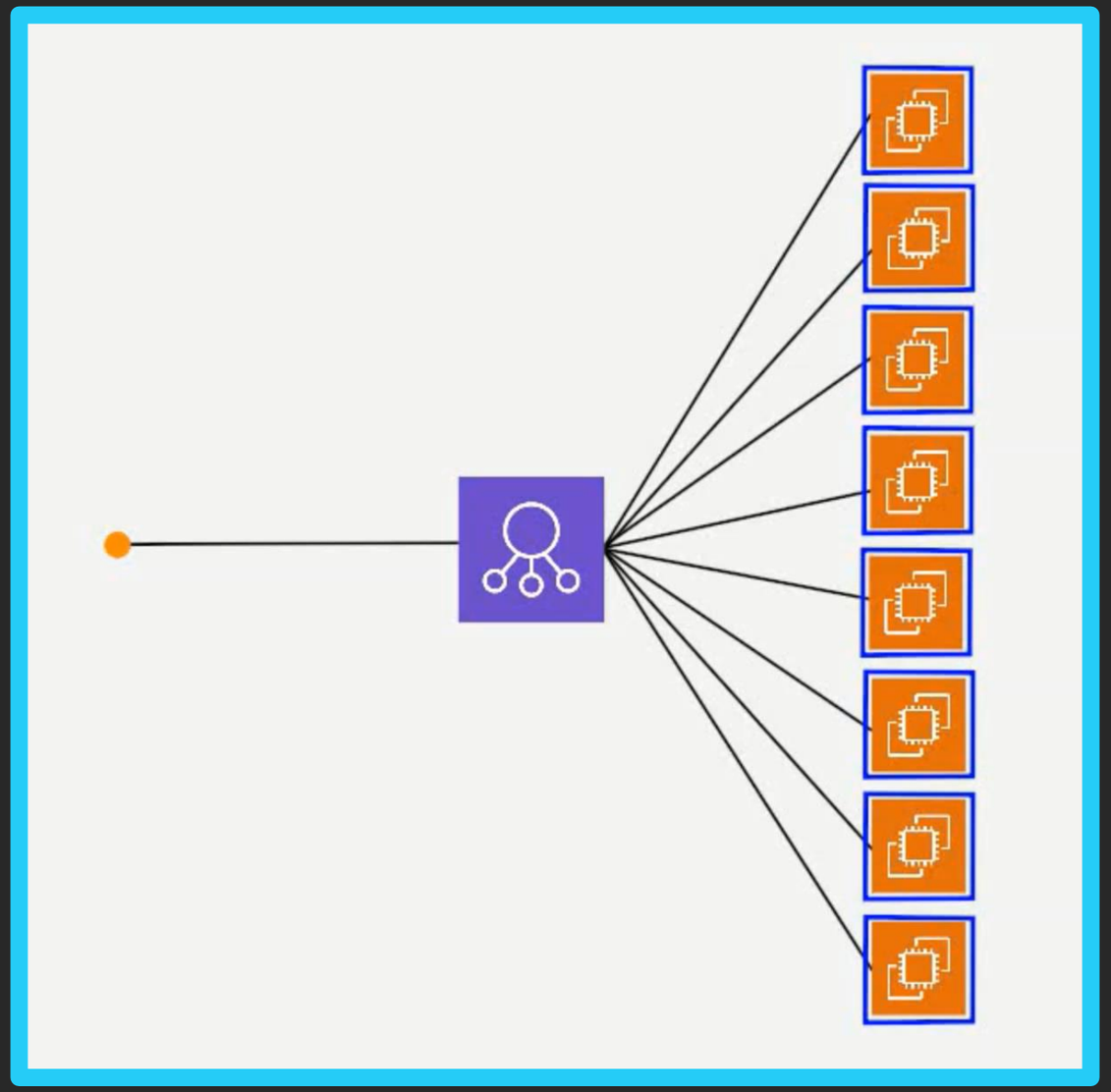
Fractional deployments



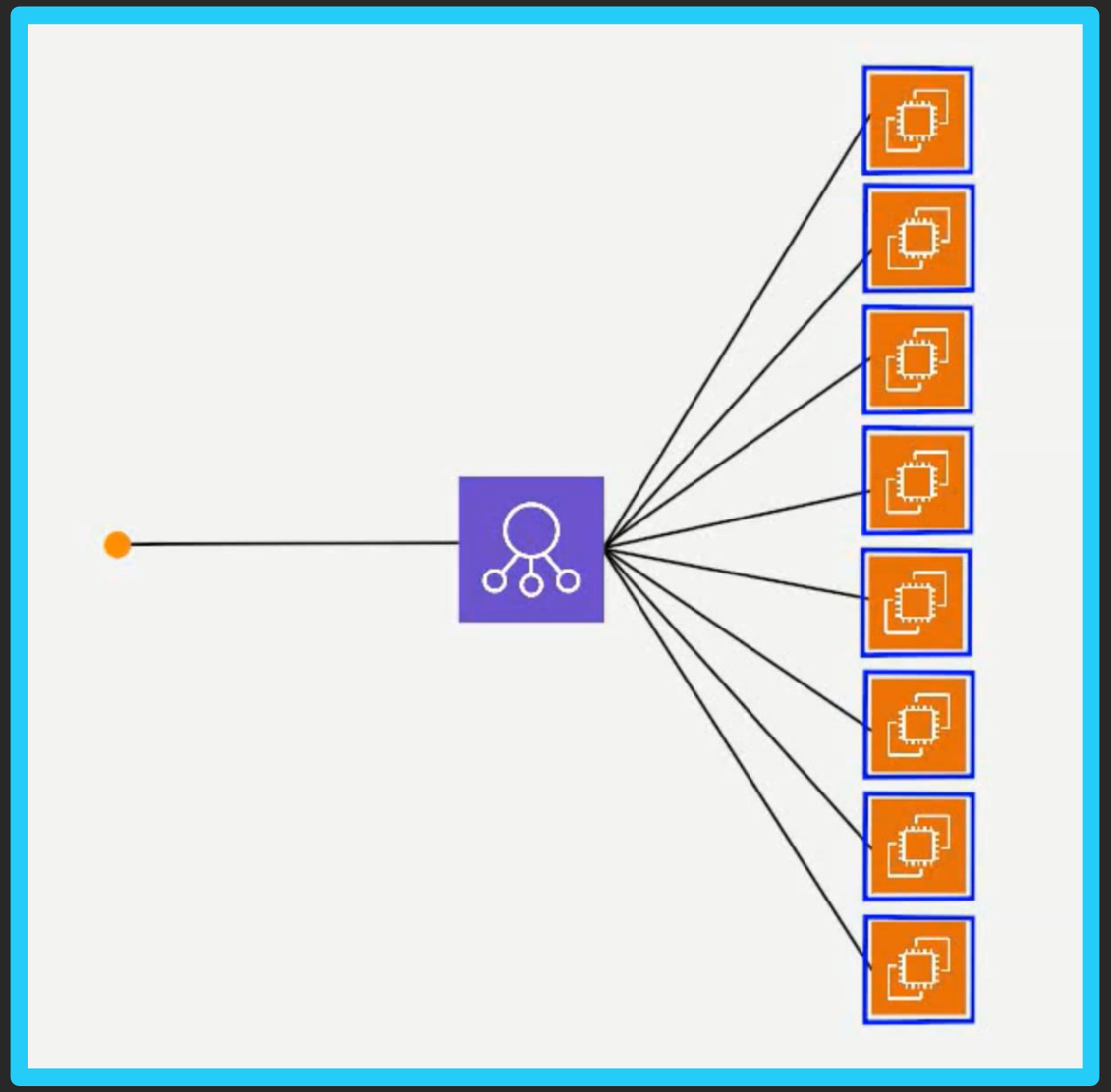
Fractional deployments



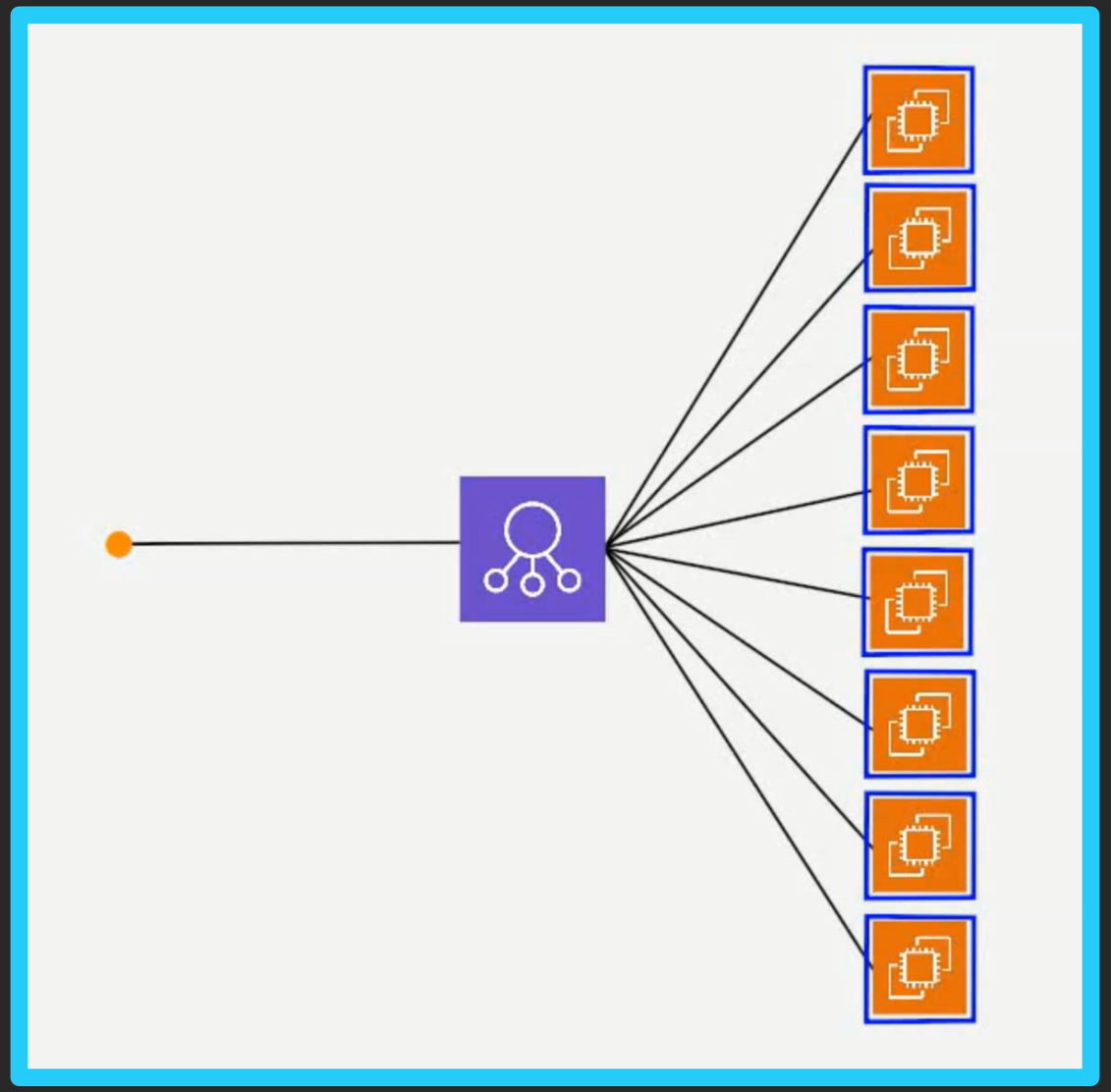
Fractional deployments – Canary



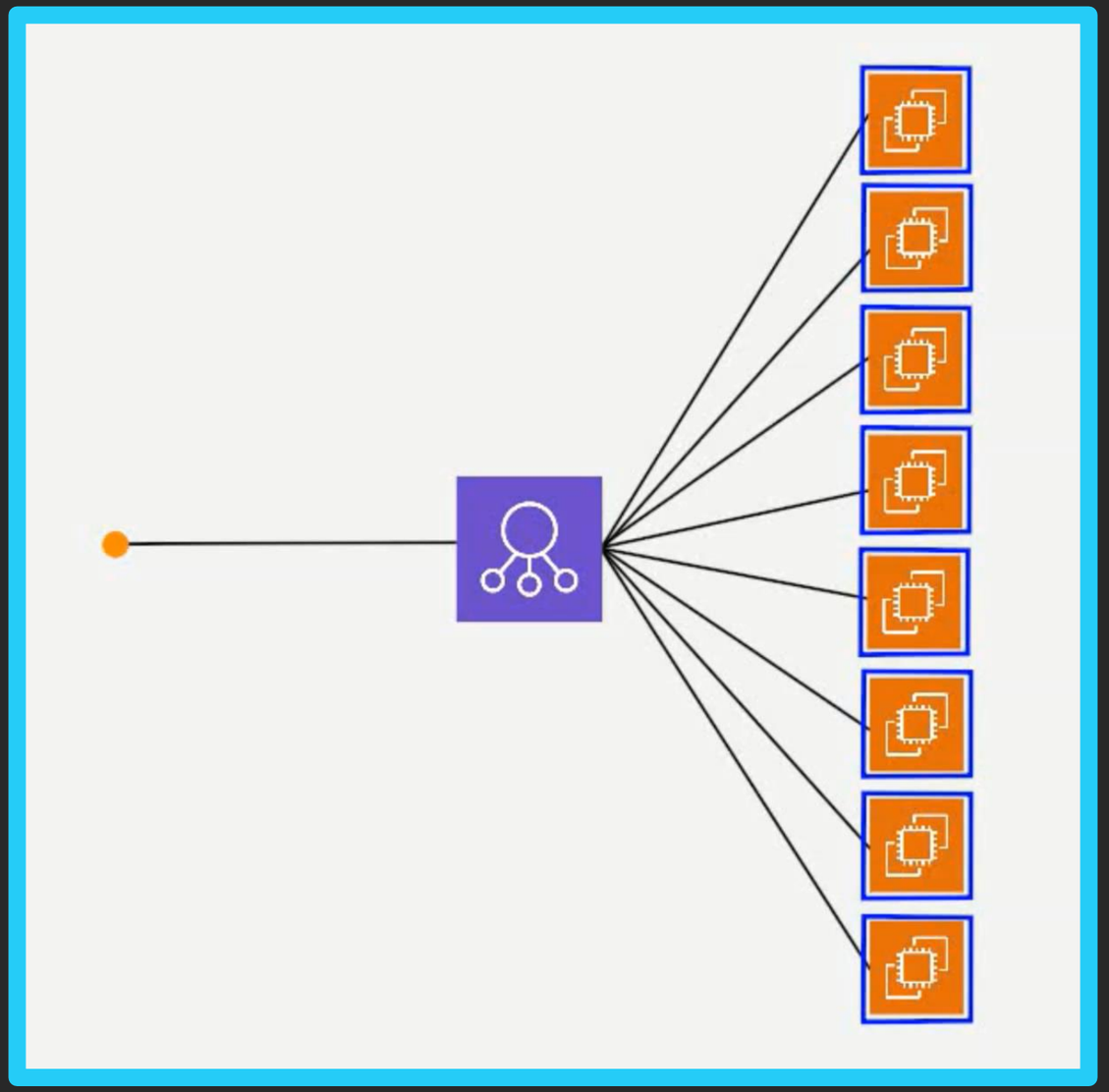
Fractional deployments – Rollback



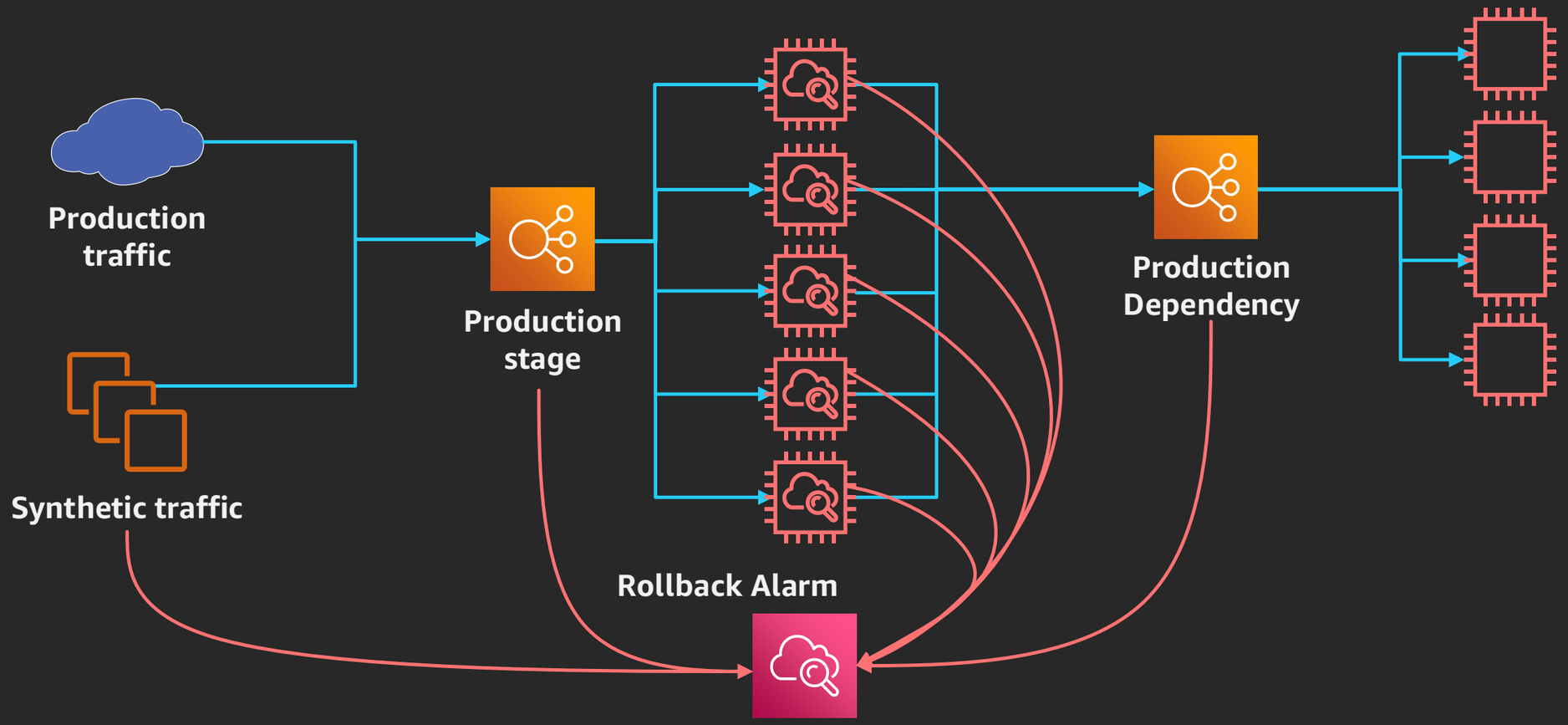
Fractional deployments – Traffic shifting



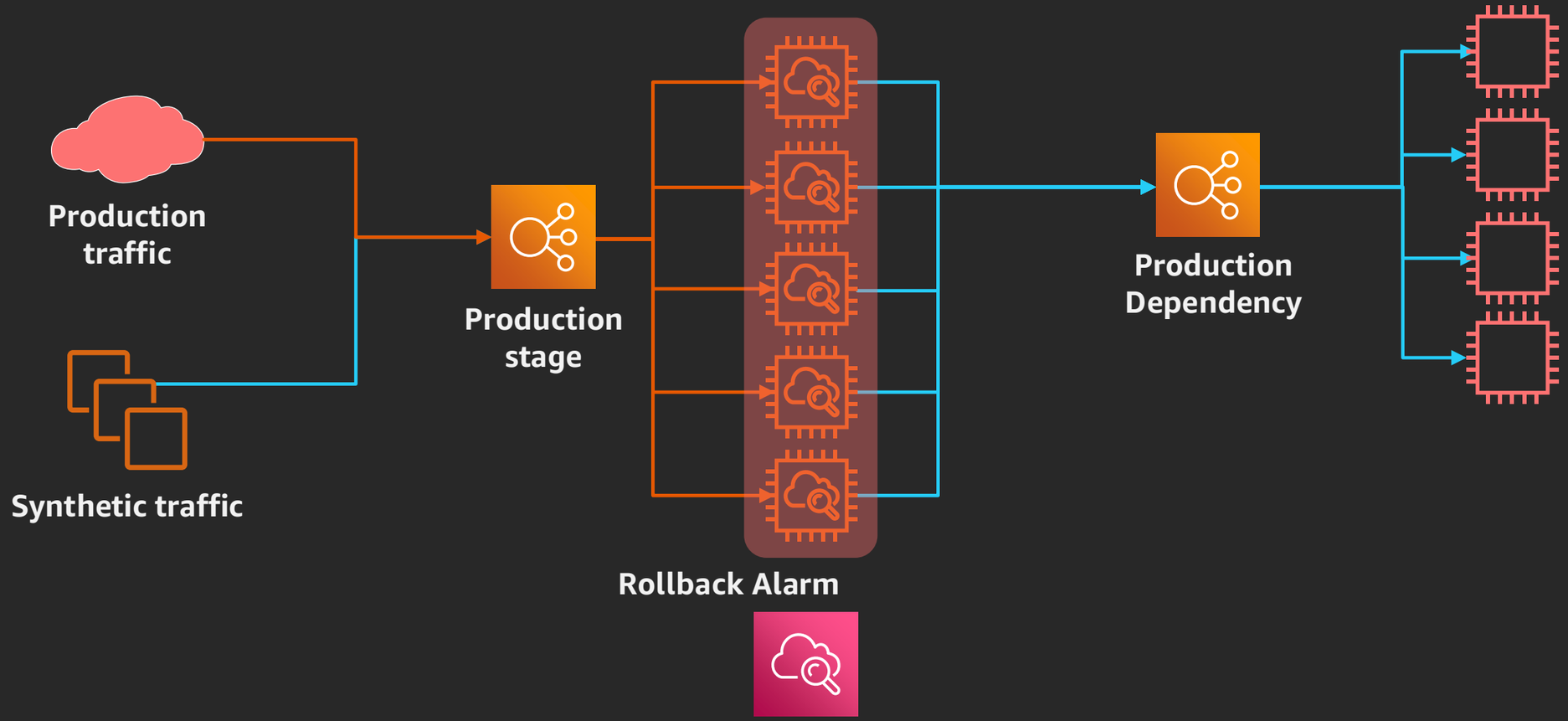
Fractional deployments – Preproduction



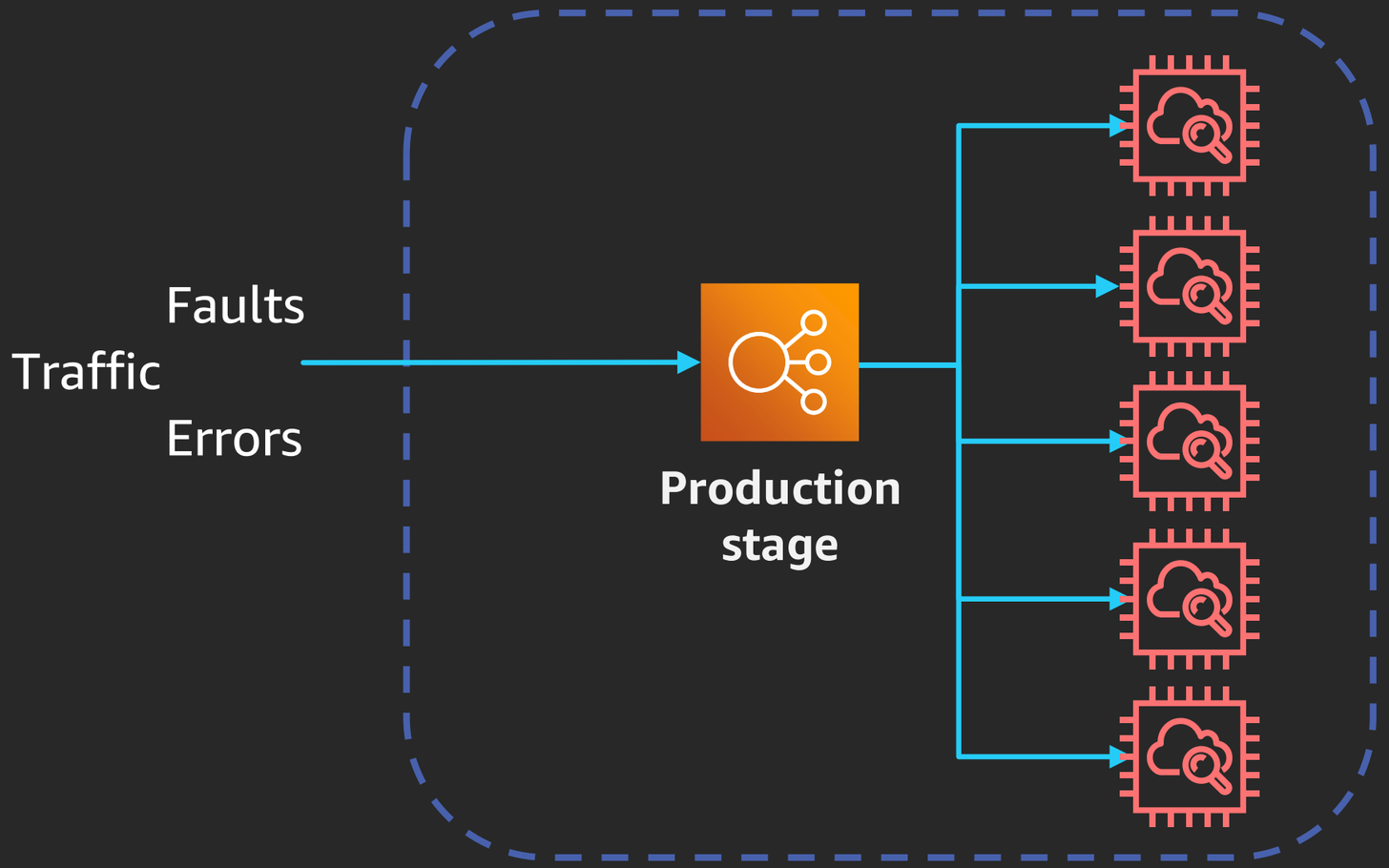
Anomaly detection



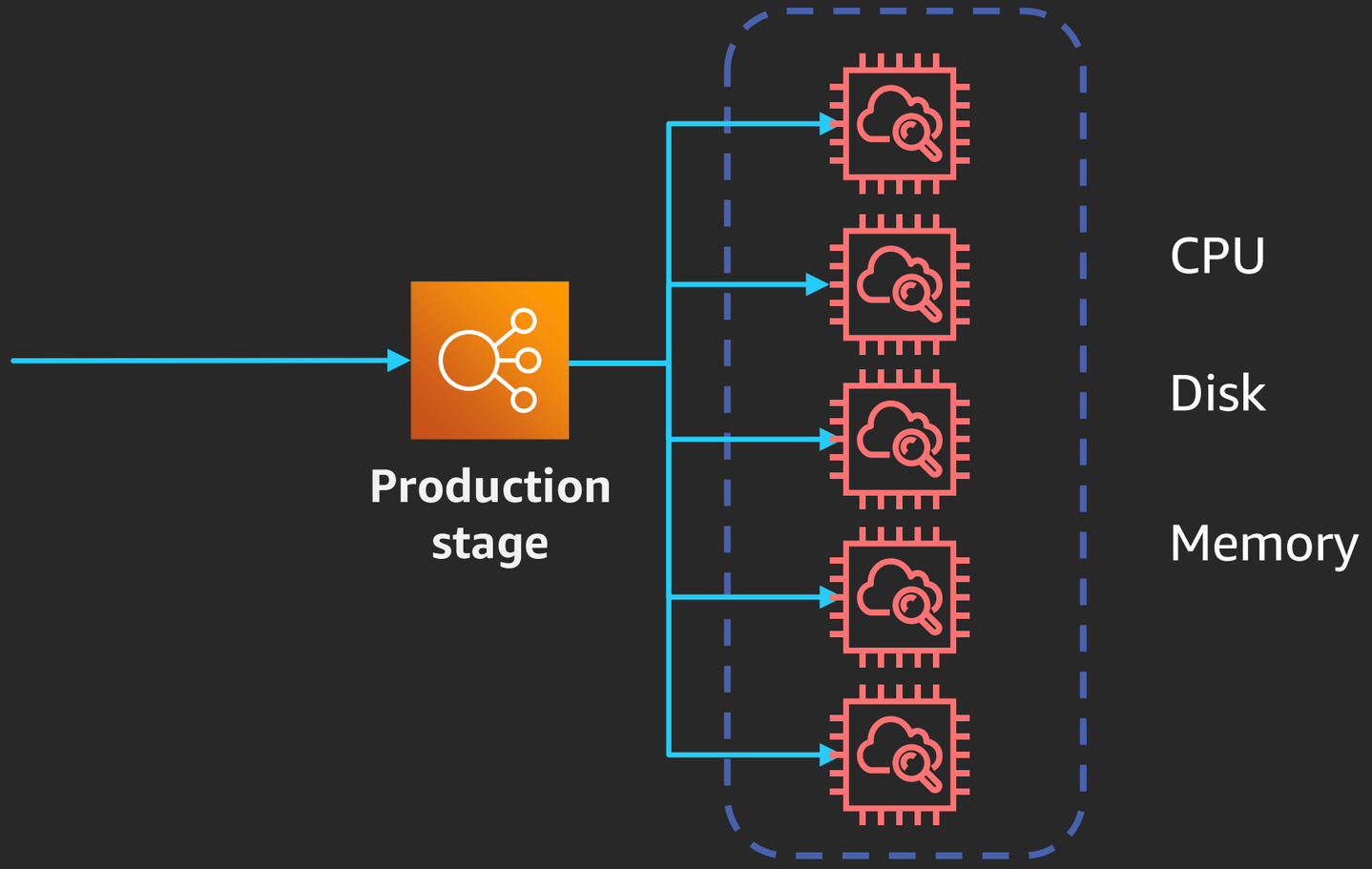
Anomaly detection



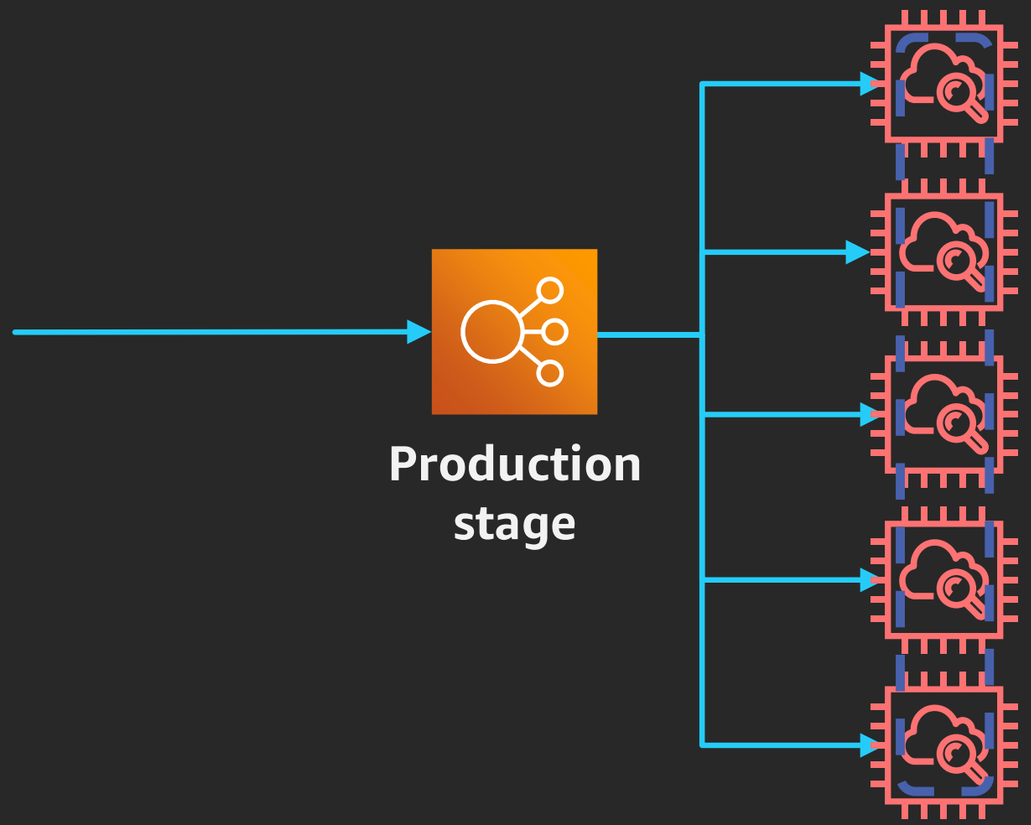
Anomaly detection – Standard service metrics



Anomaly detection – Standard instance metrics



Anomaly detection – Standard runtime metrics



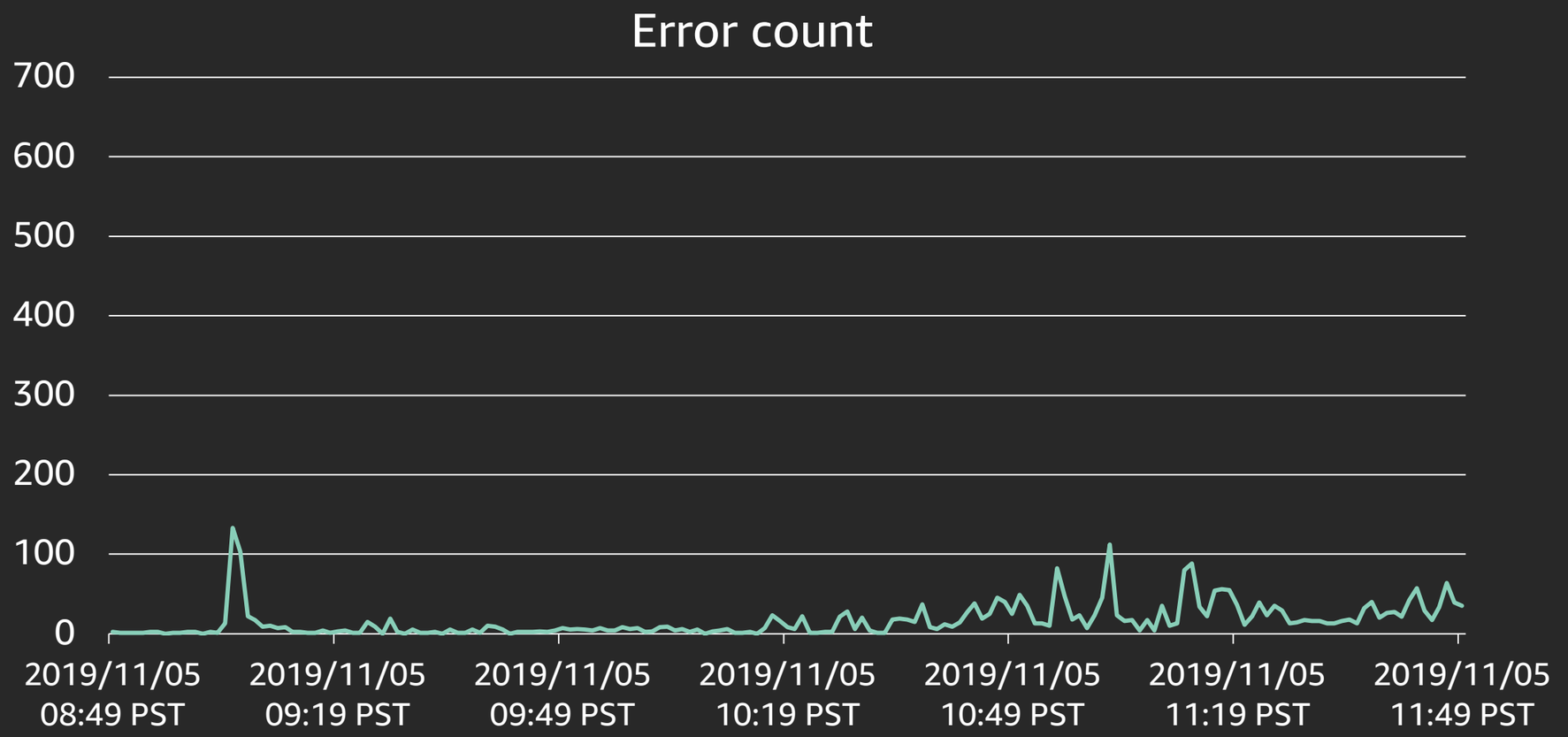
Heap

Garbage collection

Threads

Anomaly detection

Learning from metrics before deployment

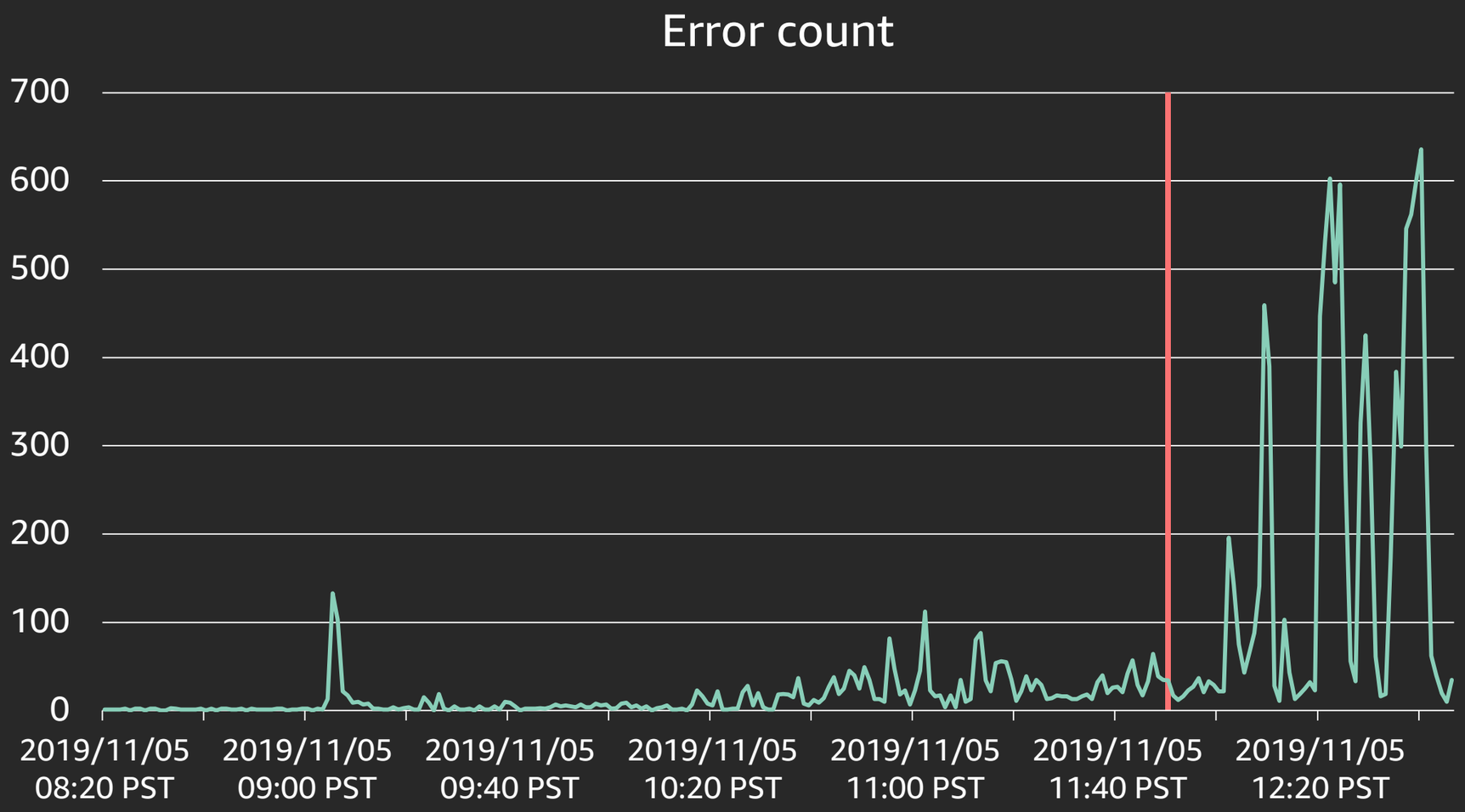


Average = 16.4

Standard deviation = 21.1

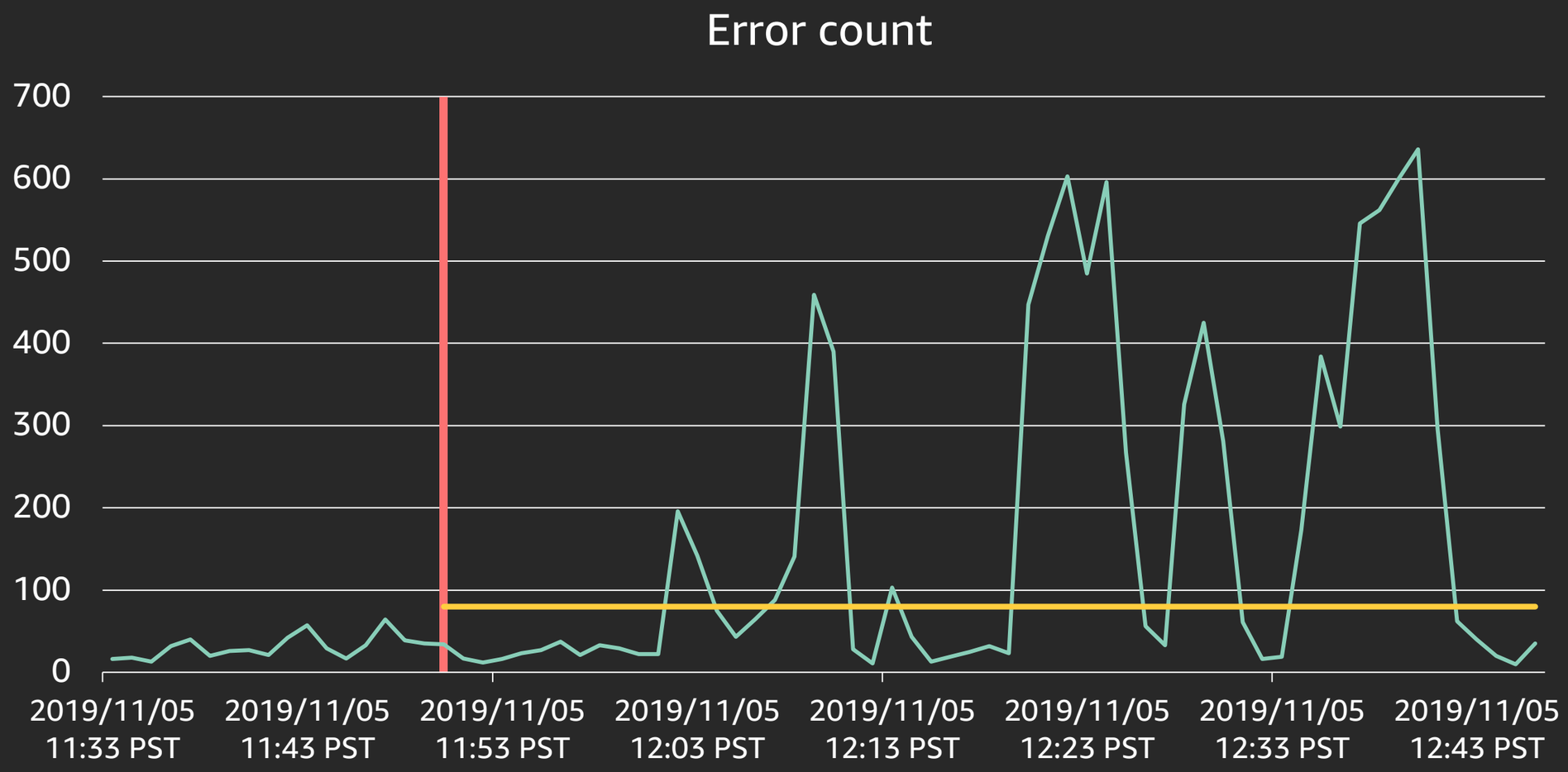
Anomaly detection

Analyzing metrics deviation during deployment

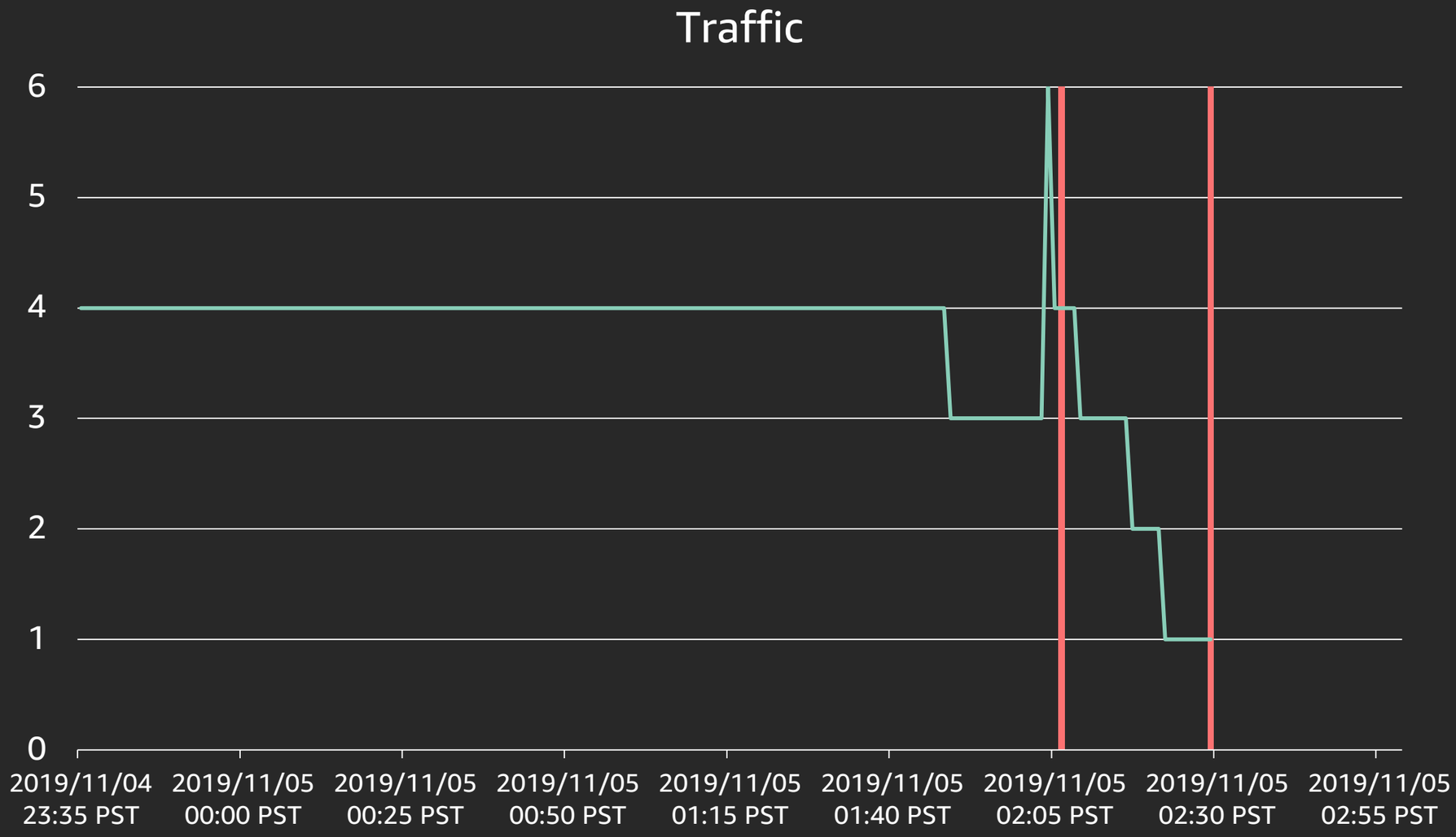


Anomaly detection

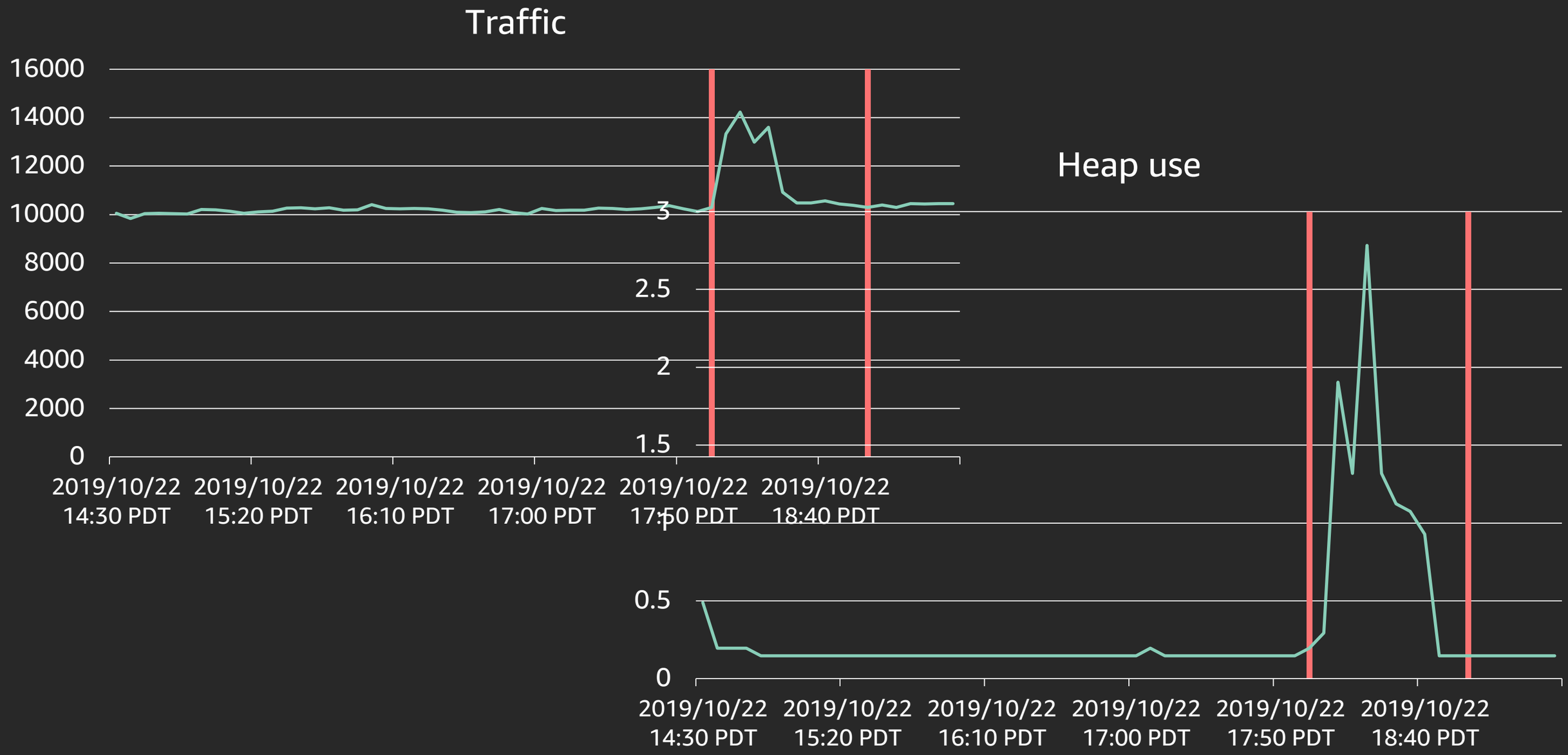
Rolling back deployment on threshold breach



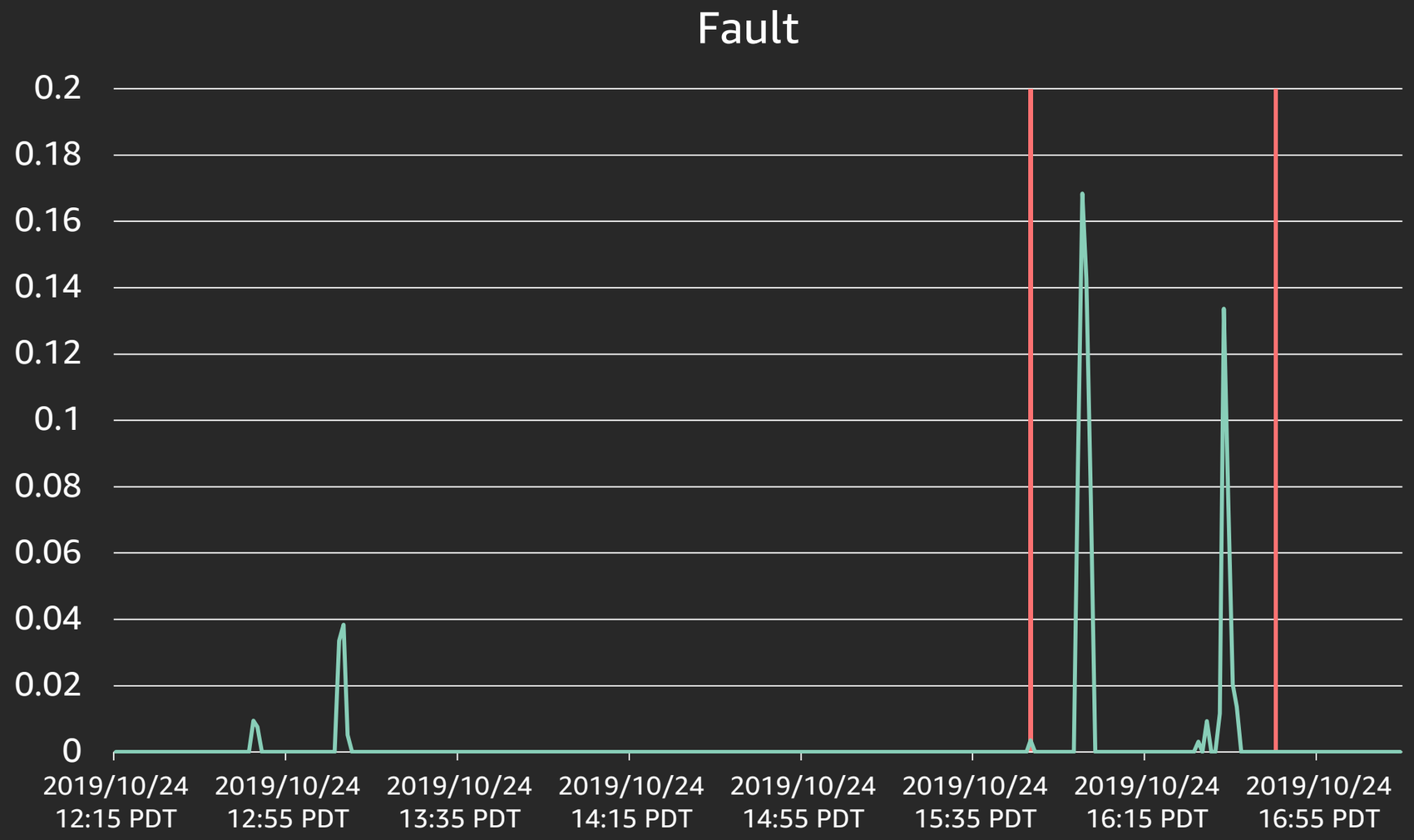
Anomaly detection – Sustained traffic drop



Anomaly detection – Multiple metrics



Anomaly detection – Fault spike



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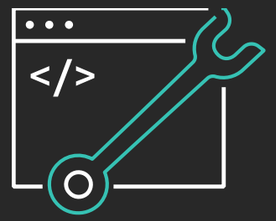

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Thank you!

Peter Ramensky

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