



API Gateway workshop with Kong





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Intro

Software Craftsmanship

Software Practitioner at สยามชำนาญกิจ พ.ศ. 2556

Agile Practitioner and Technical at SPRINT3r

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Java and Bigdata

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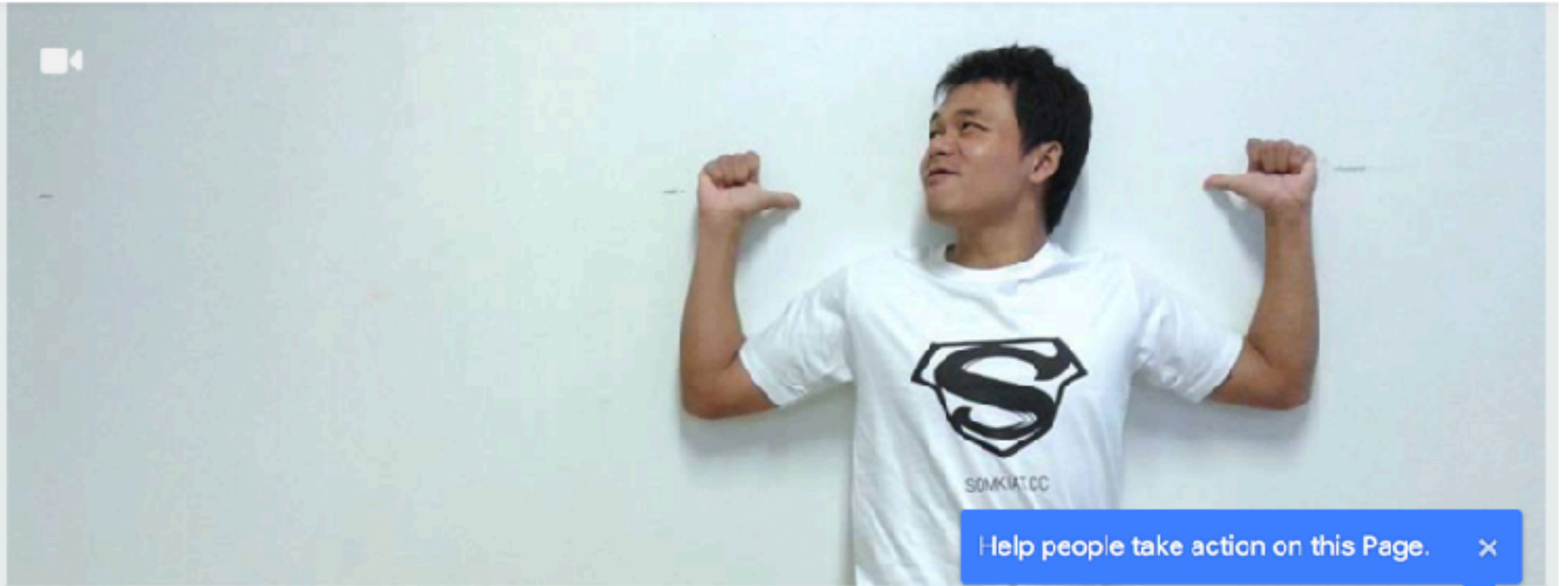
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**[https://github.com/up1/
course-api-gateway](https://github.com/up1/course-api-gateway)**



Let's



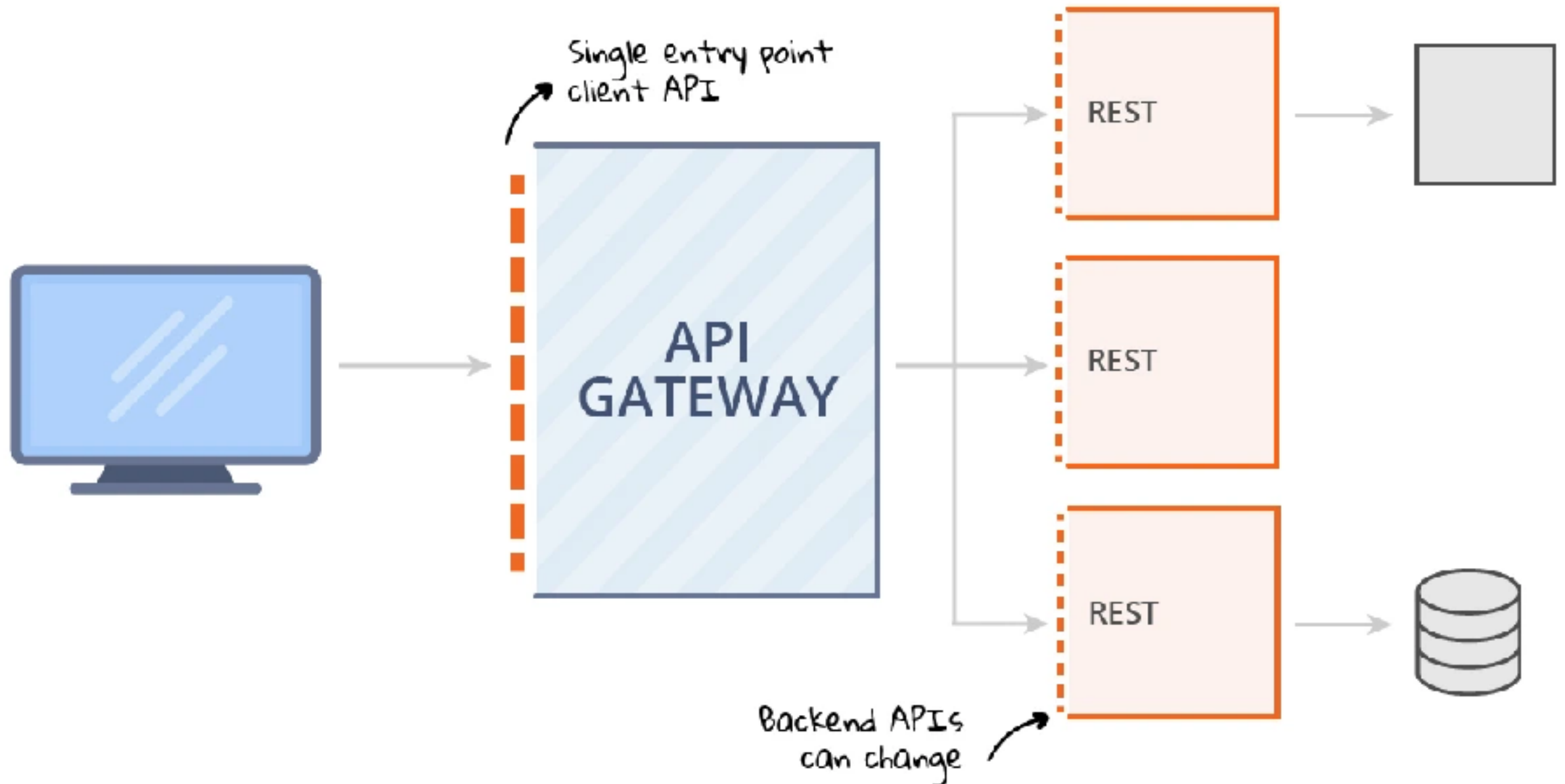
Kong



API Gateway



API Gateway



API Gateway

Authentication and Authorization

Rate limit

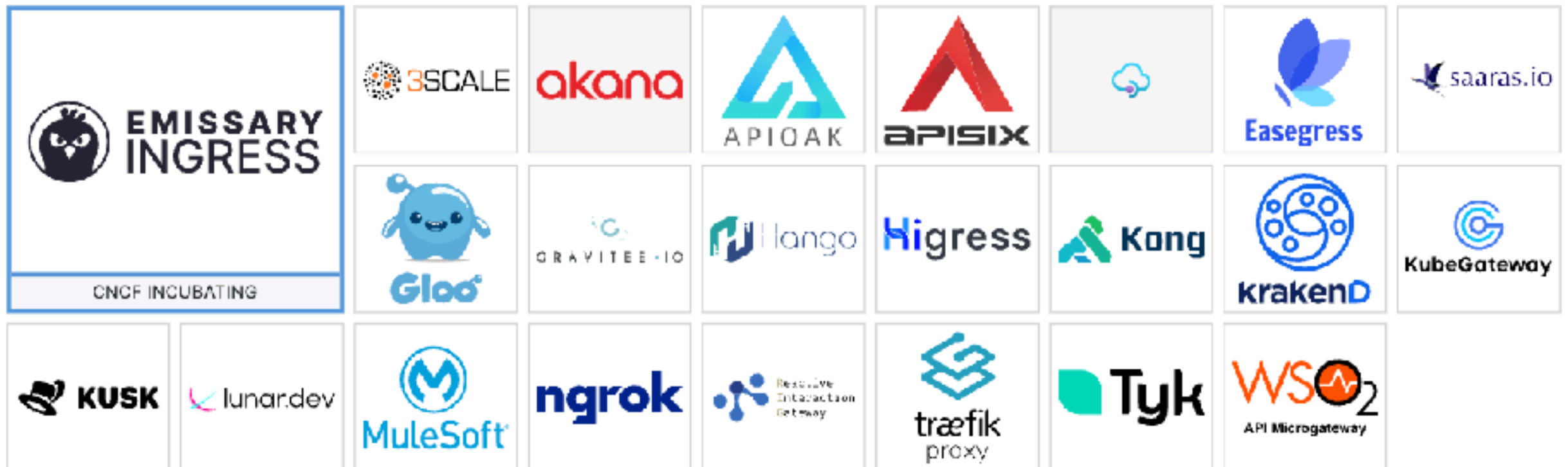
Circuit breaker

Load balancer

Metric, Tracing, Logging



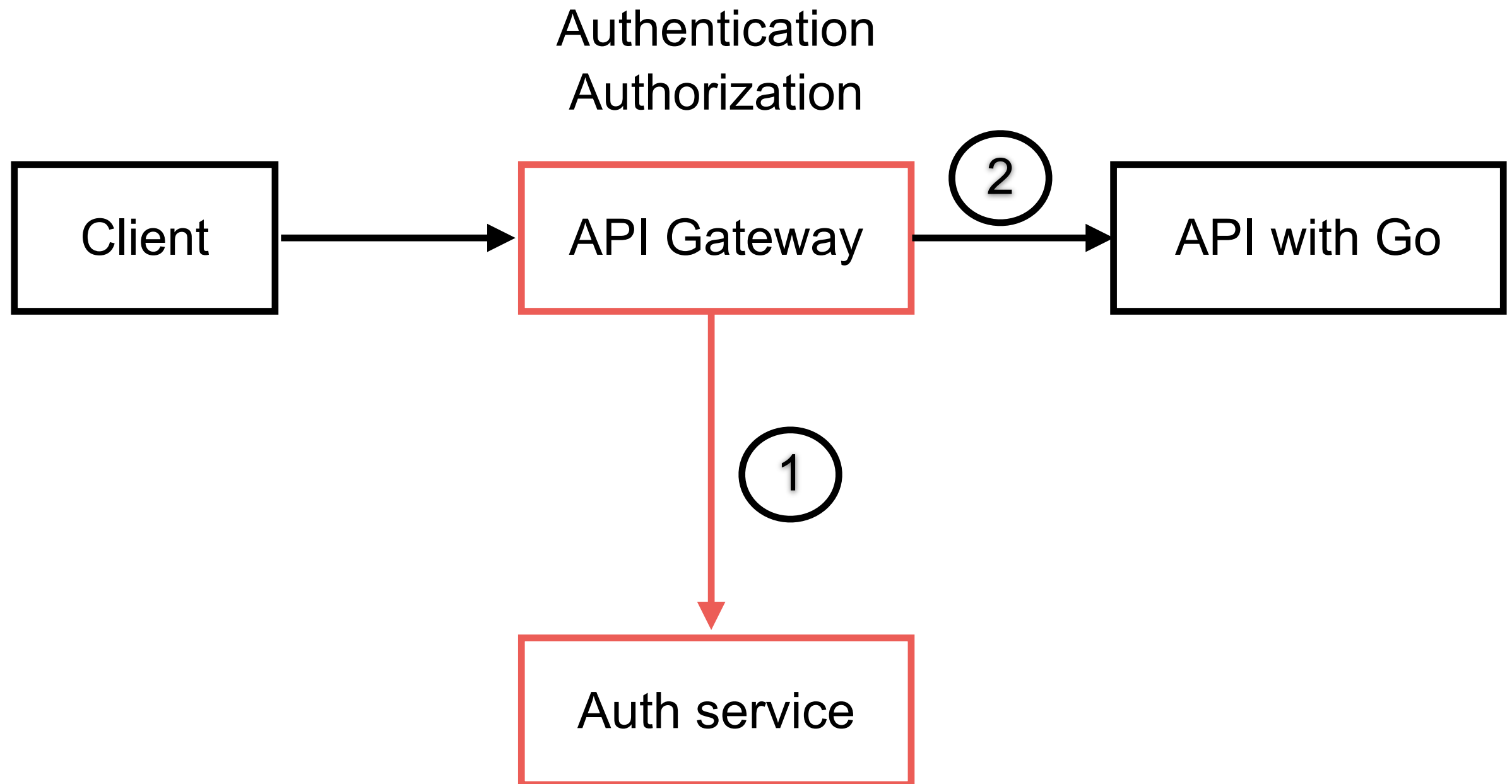
API Gateway



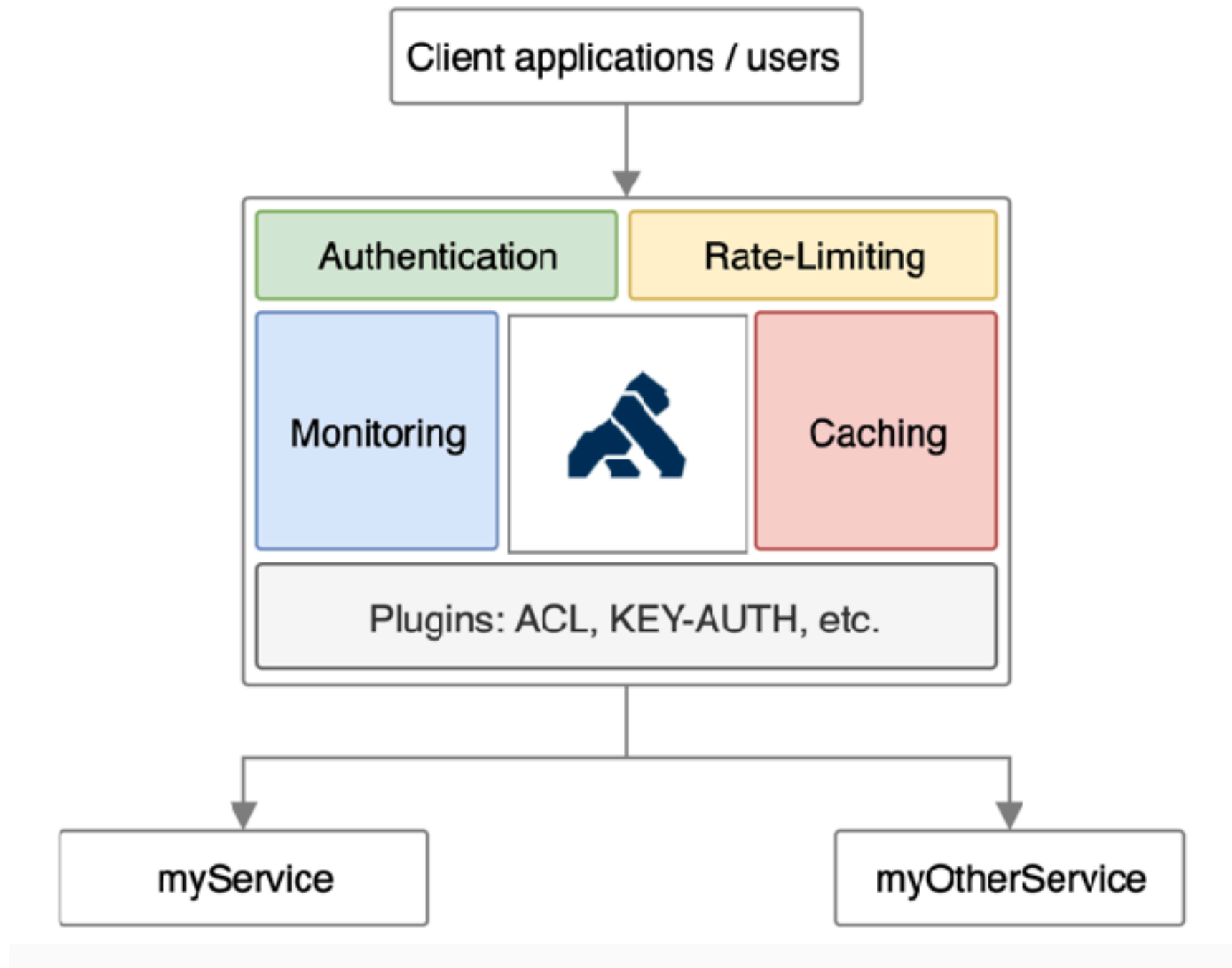
<https://landscape.cncf.io/guide#orchestration-management--api-gateway>



Project Structure



Kong API Gateway



<https://konghq.com/>



Install Kong

Kong server

Database

Kong manager



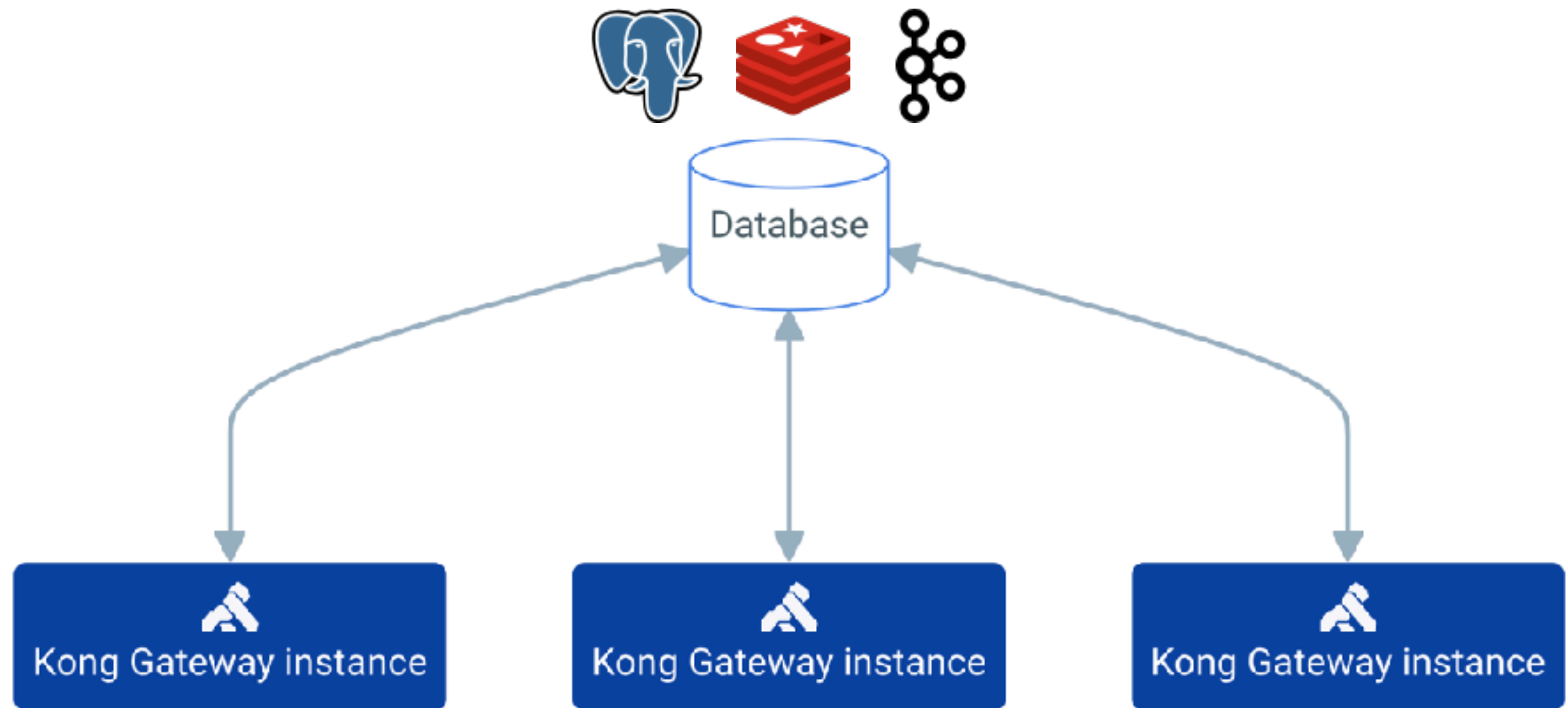
Kong Topologies

Traditional database mode
DB-less and declarative mode
Konnect
Hybrid mode

<https://docs.konghq.com/gateway/3.7.x/production/deployment-topologies/>



Traditional database mode



<https://docs.konghq.com/gateway/3.7.x/production/deployment-topologies/>



DB-less



<https://docs.konghq.com/gateway/3.7.x/production/deployment-topologies/>



Verify Kong Server

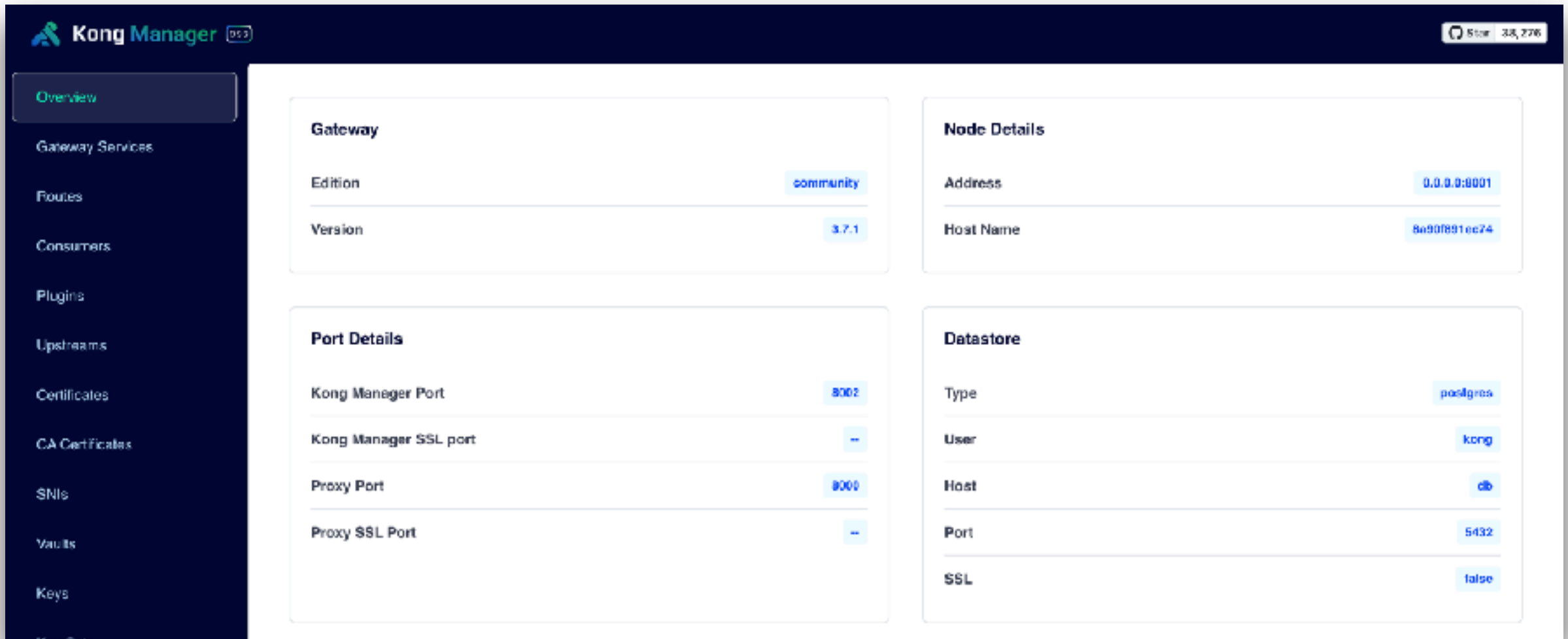
```
curl --head localhost:8001
```

```
HTTP/1.1 200 OK
Date: Wed, 03 Jul 2024 15:27:27 GMT
Content-Type: application/json; charset=utf-8
Connection: keep-alive
Access-Control-Allow-Origin: *
Access-Control-Allow-Credentials: true
Content-Length: 14319
X-Kong-Admin-Latency: 7
Server: kong/3.7.1
```



Kong manager

localhost:8002



The screenshot displays the Kong Manager web interface. The left sidebar contains navigation links: Overview (selected), Gateway Services, Routes, Consumers, Plugins, Upstreams, Certificates, CA Certificates, SNIs, Vaults, and Keys. The main content area is divided into four panels:

- Gateway**
 - Edition: community
 - Version: 3.7.1
- Node Details**
 - Address: 0.0.0.0:8001
 - Host Name: 8a90f891ec24
- Port Details**
 - Kong Manager Port: 8002
 - Kong Manager SSL port: --
 - Proxy Port: 8000
 - Proxy SSL Port: --
- Datastore**
 - Type: postgres
 - User: kong
 - Host: db
 - Port: 5432
 - SSL: false

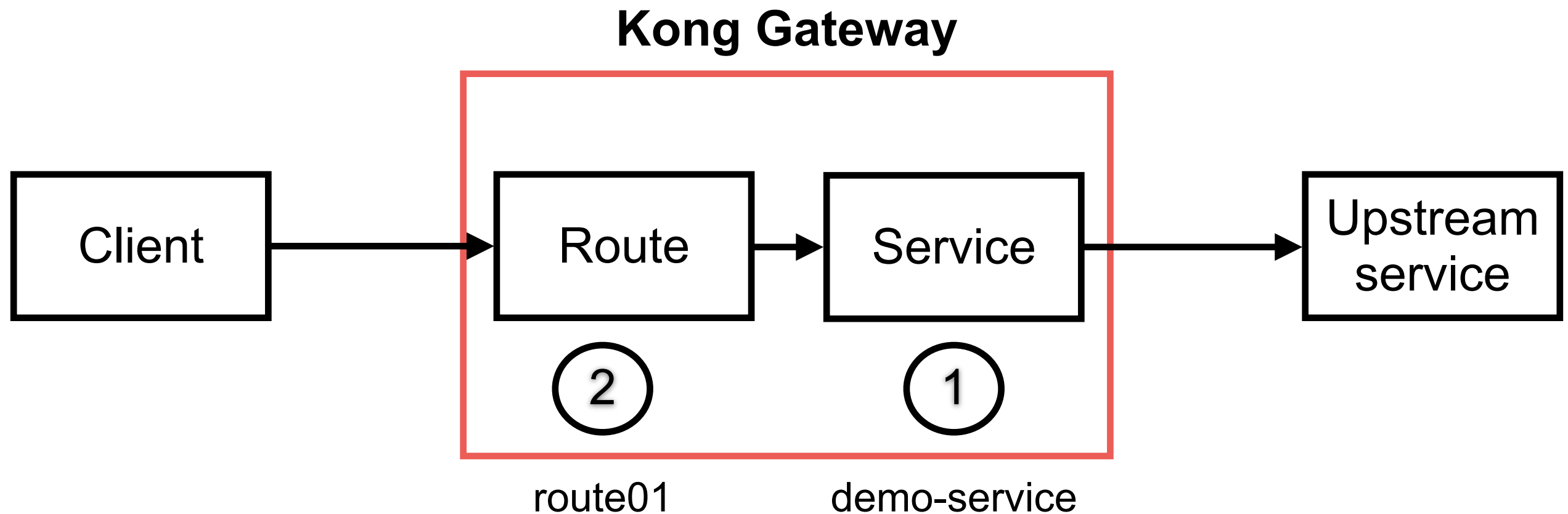
<https://docs.konghq.com/gateway/3.7.x/kong-manager/>



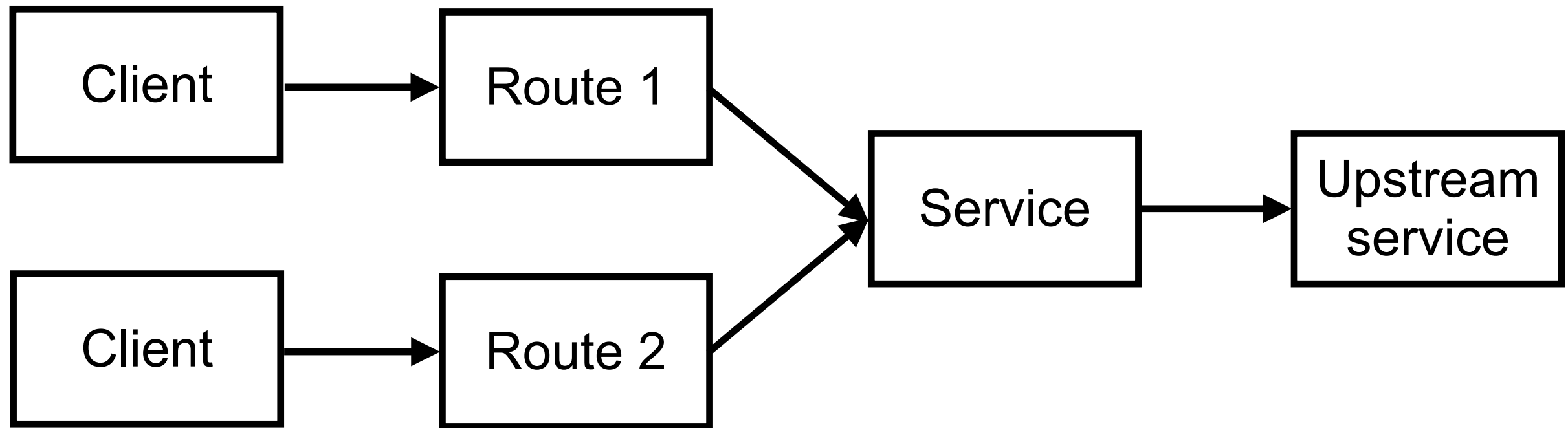
Services and Routes



Services and Routes

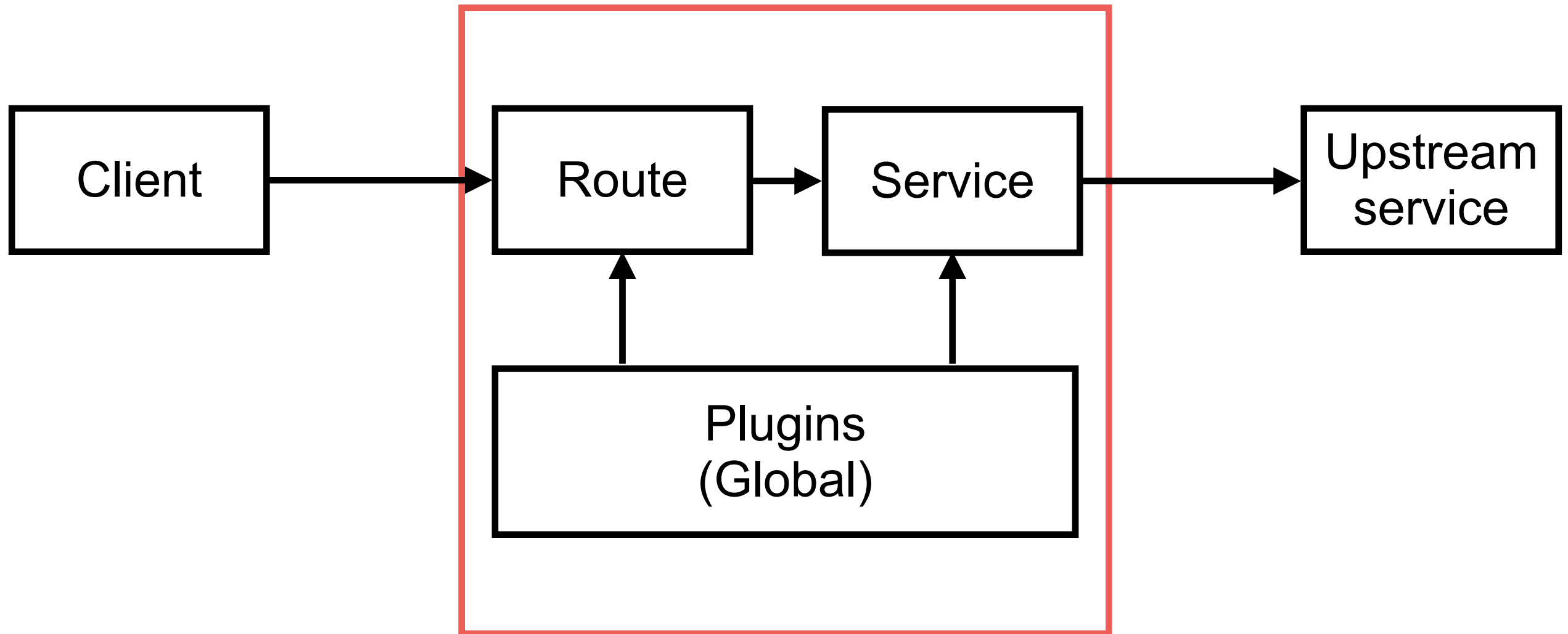


Service can have many routes



Add plugins

Kong Gateway



<https://docs.konghq.com/hub/kong-inc/file-log/>



Kong plugins

Welcome to Kong Plugin Hub

Extend Kong Gateway and Kong Konnect with powerful plugins and easy integrations

[Plugin Overview](#) | [Compatibility](#) | [License tiers](#)

Filter plugins x Tiers Functionality 1 Support by Compatibility

Authentication

Basic Authentication

OSS

Add Basic Authentication to your services

Support by: Kong Inc.

HMAC Auth

OSS

Add HMAC Authentication to your services

Support by: Kong Inc.

JWE Decrypt

KONNECT PAID ENTERPRISE

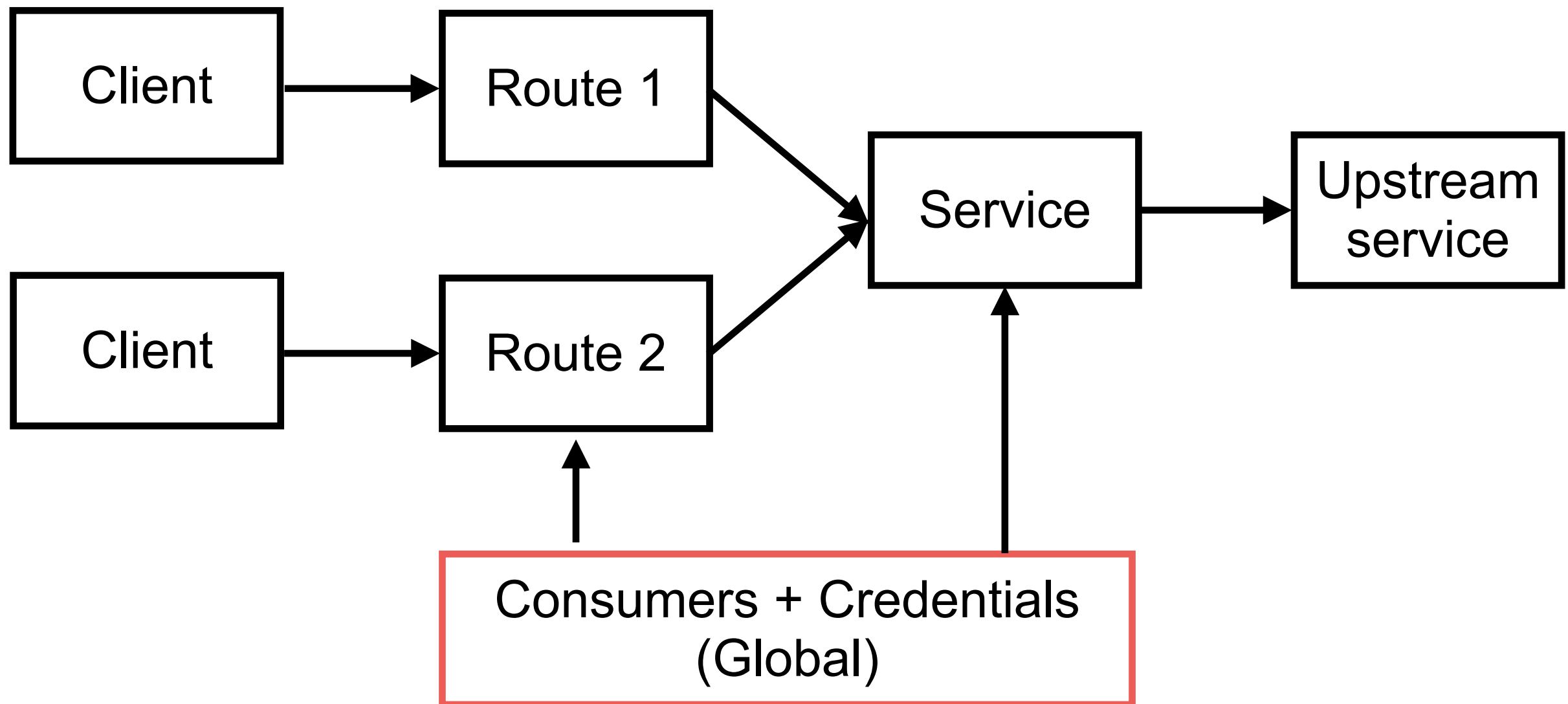
Decrypt a JWE token in a request

Support by: Kong Inc.

<https://docs.konghq.com/hub/>

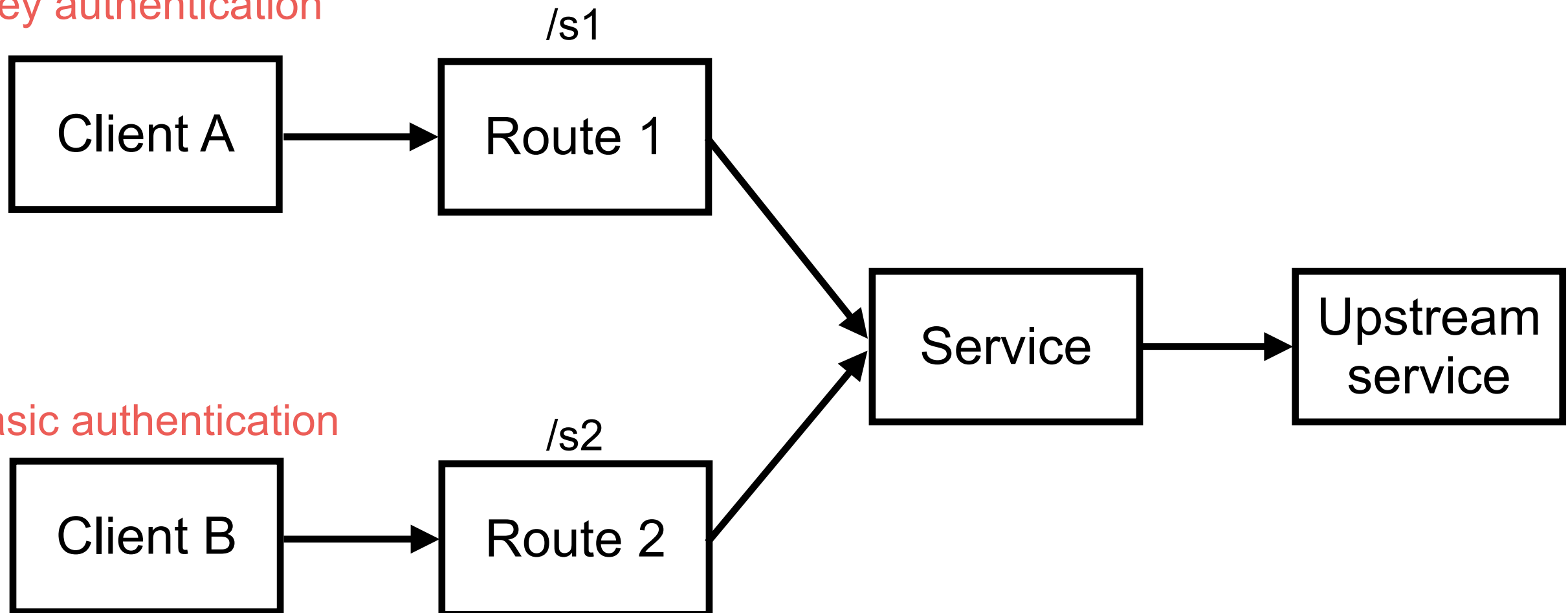


Add authentication !!

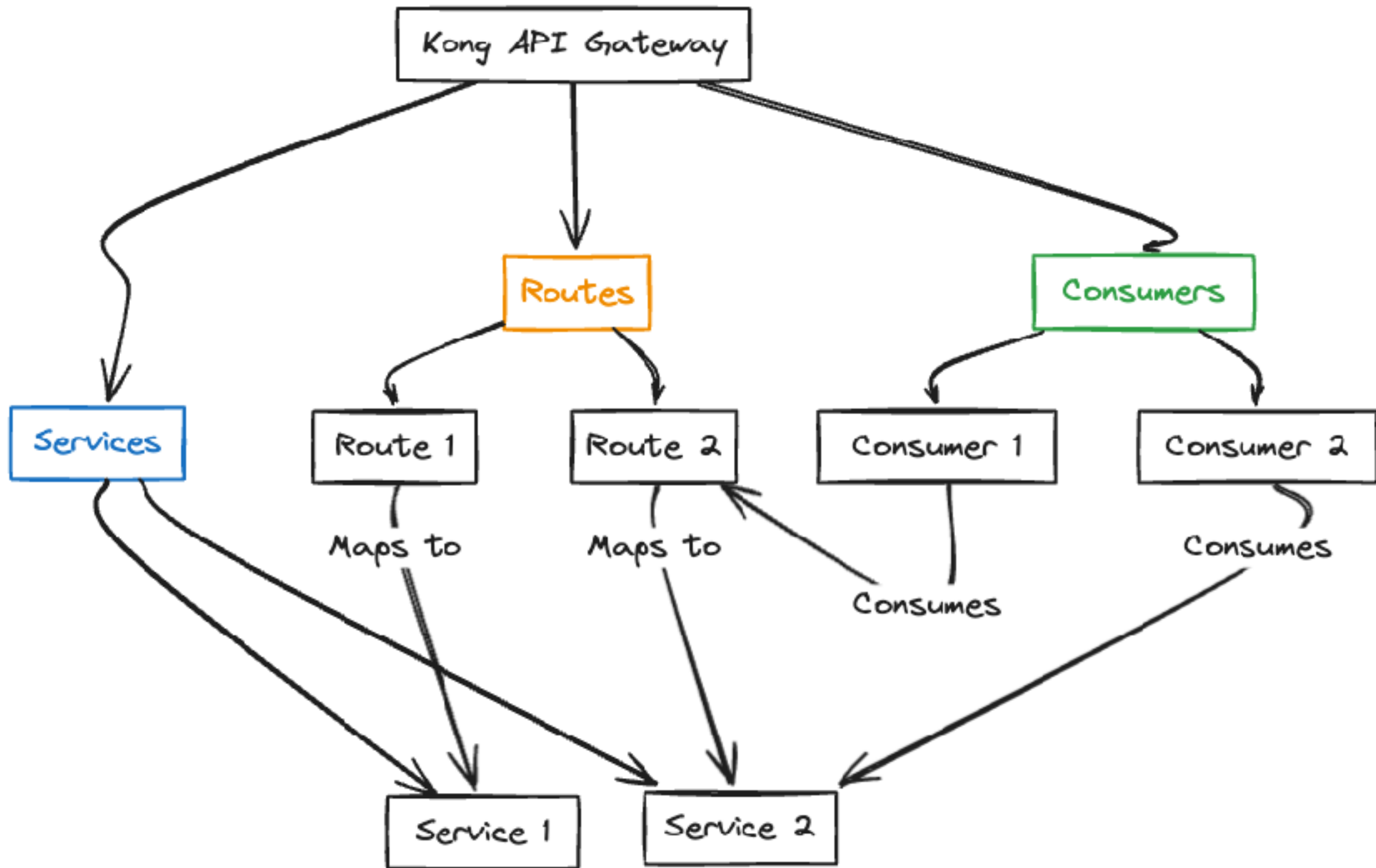


Use case

Key authentication

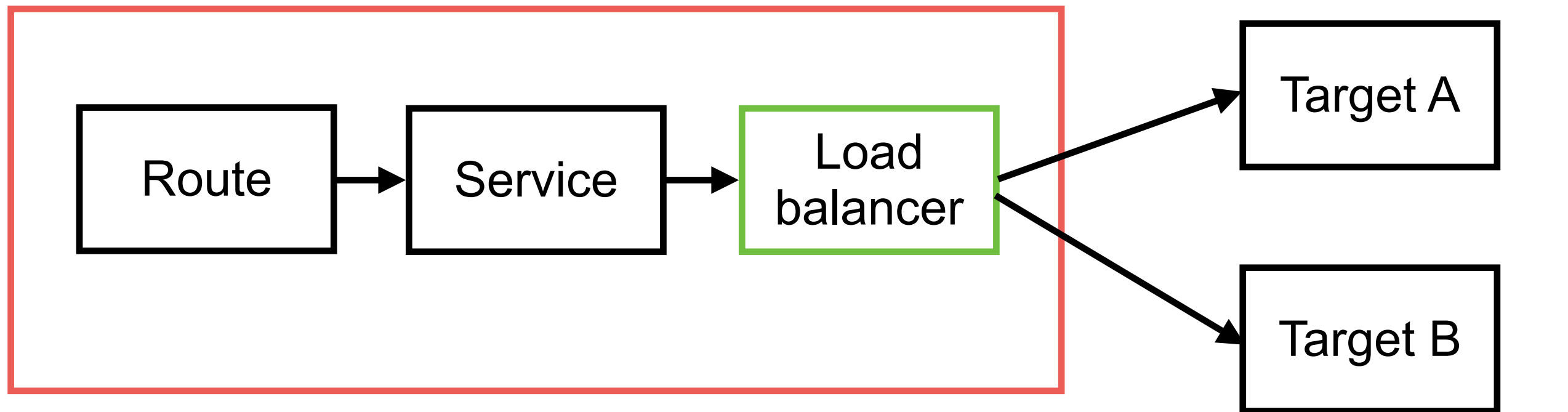


Summary



Load balancing

Kong Gateway



<https://docs.konghq.com/gateway/latest/get-started/load-balancing/>



Load balance algorithms

Round robin

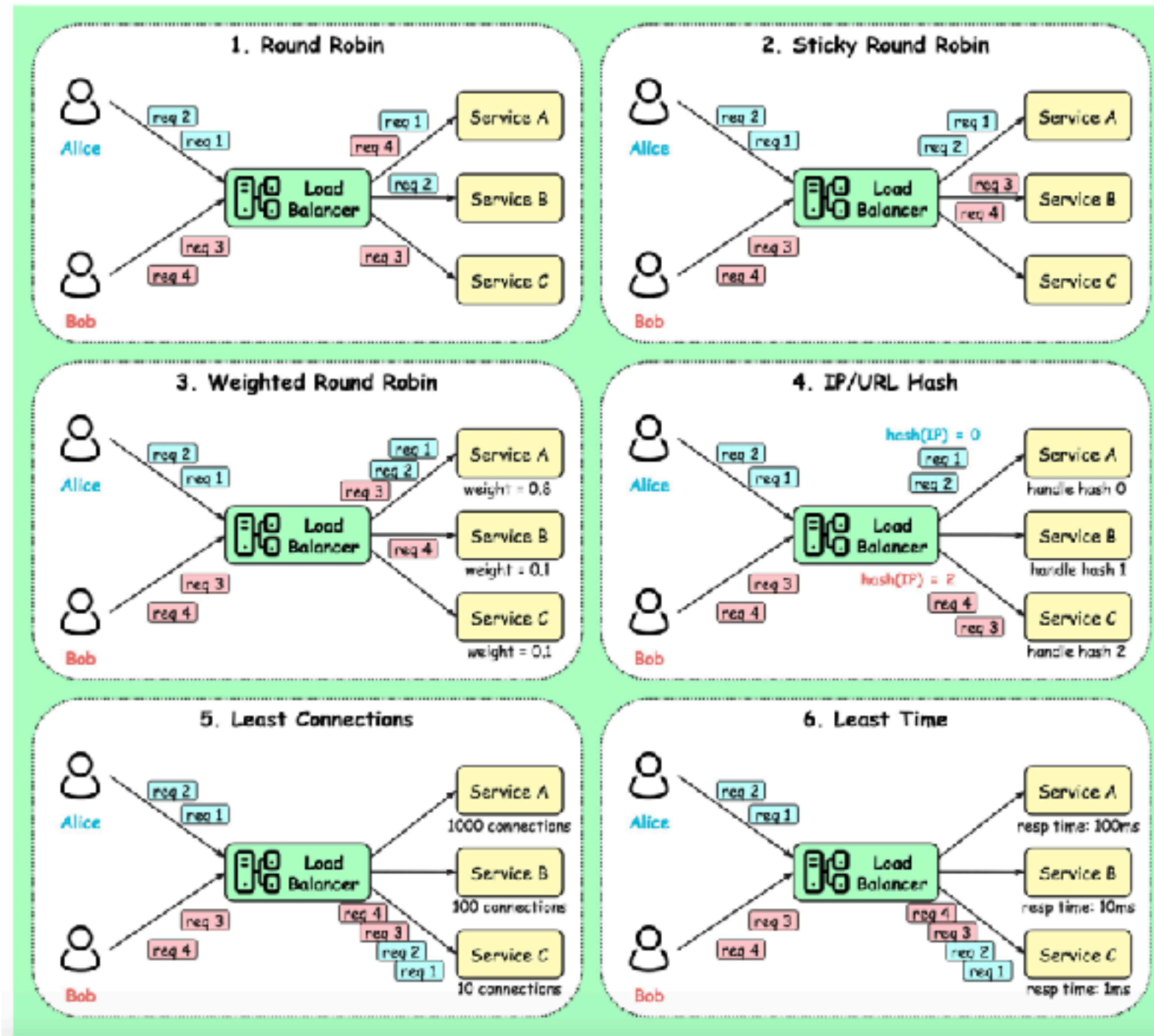
Least connections

Consistent hashing

Latency



Load balance algorithms



<https://blog.bytebytego.com/p/ep47-common-load-balancing-algorithms>



Observable Service



Observable Service

Application
metric

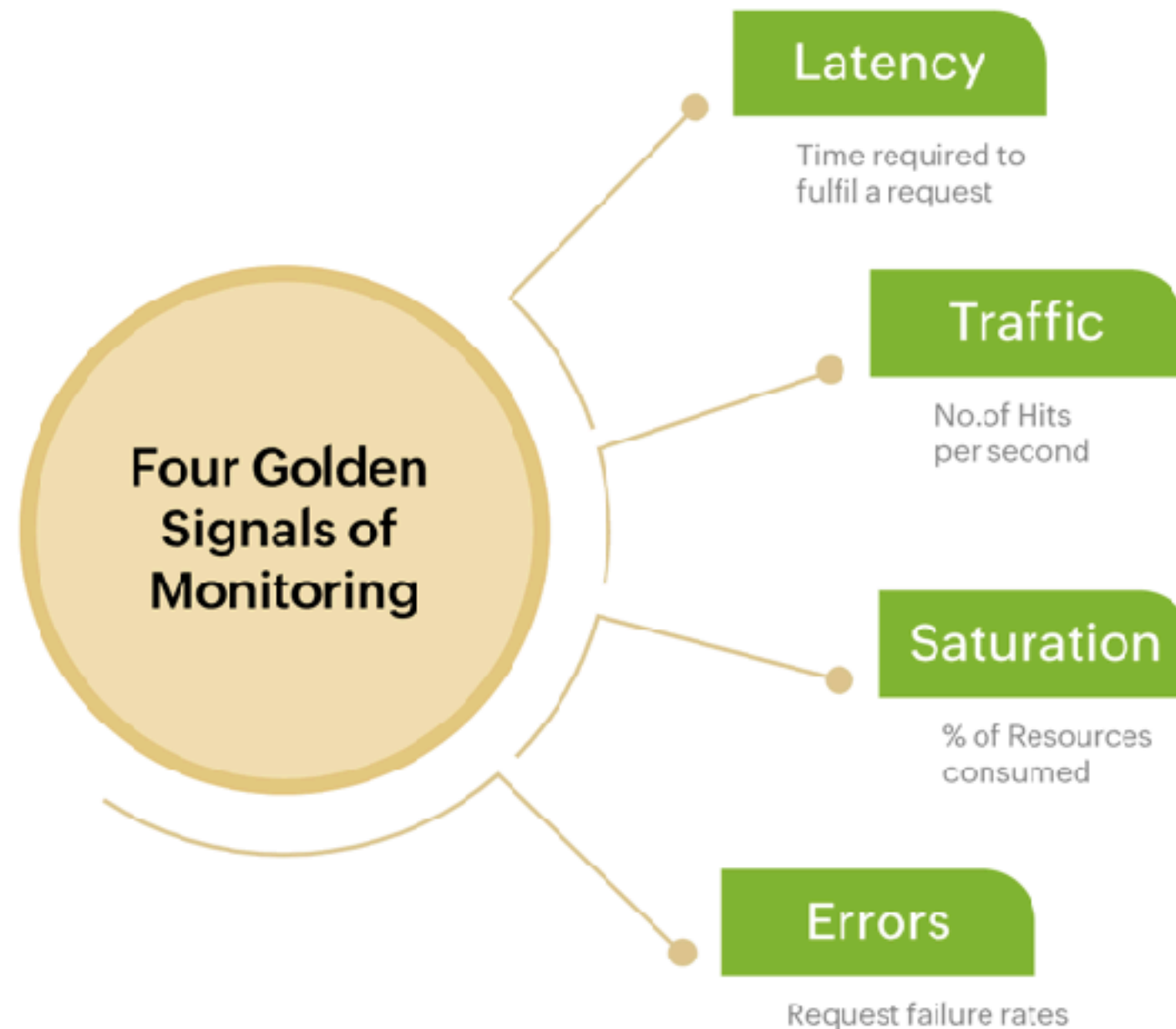
Distributed
tracing

Log aggregation

Exception
tracking



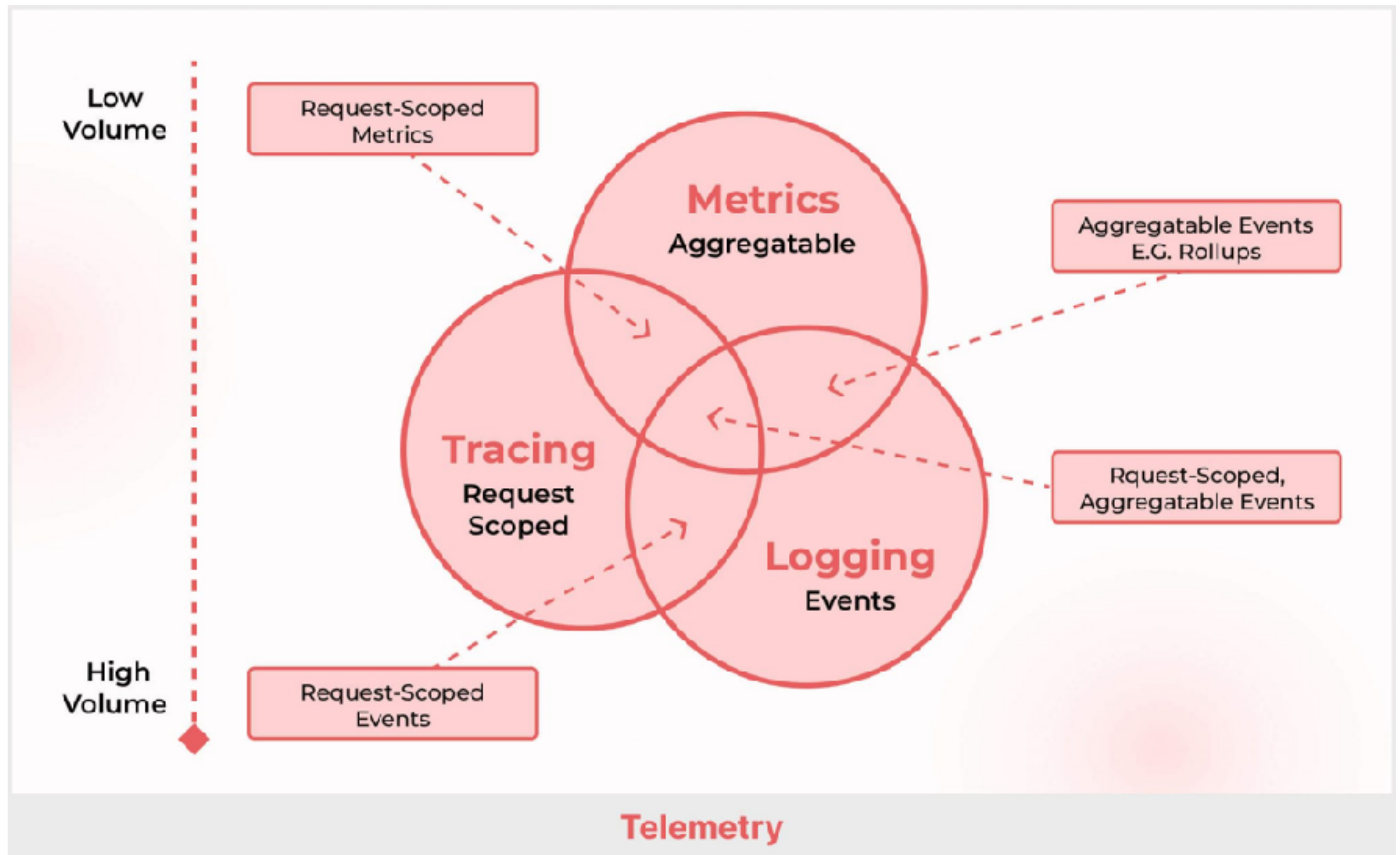
The 4 Golden Signals



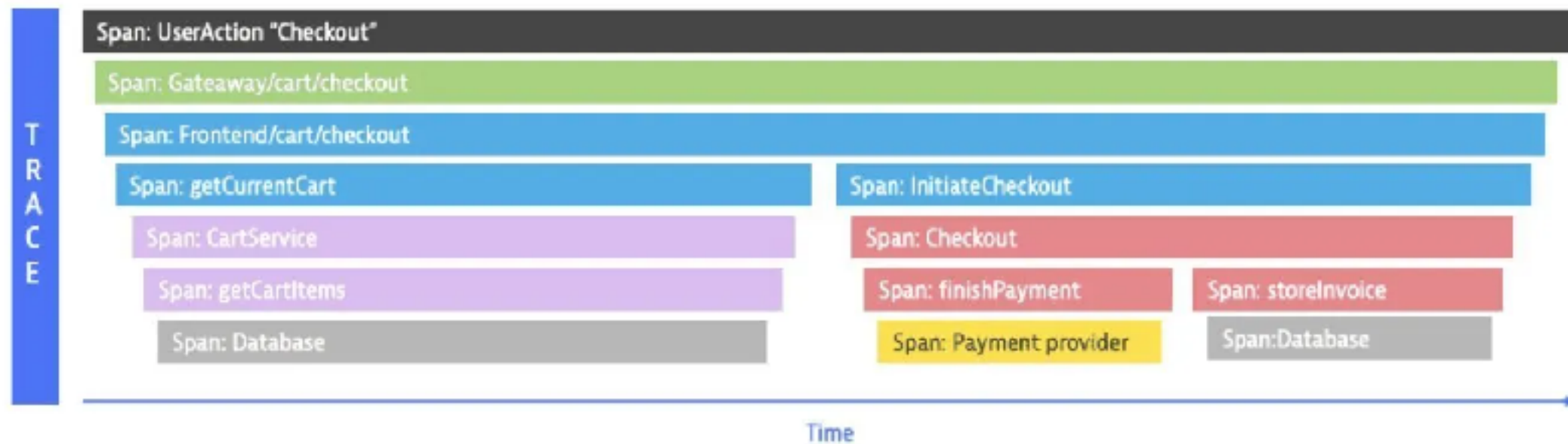
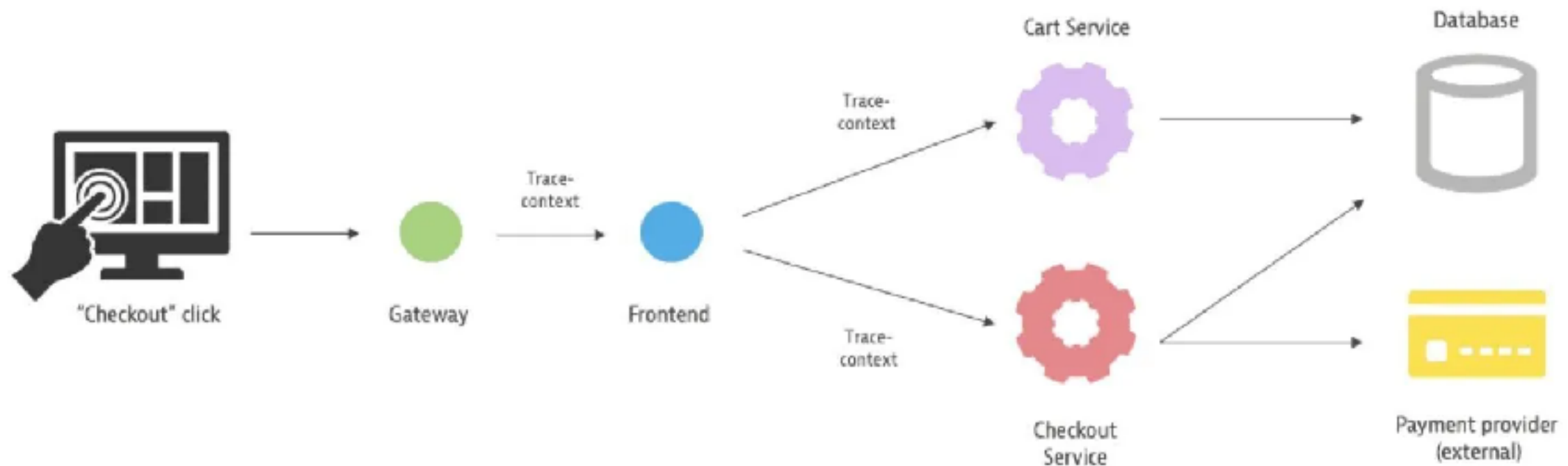
<https://sre.google/sre-book/monitoring-distributed-systems/>



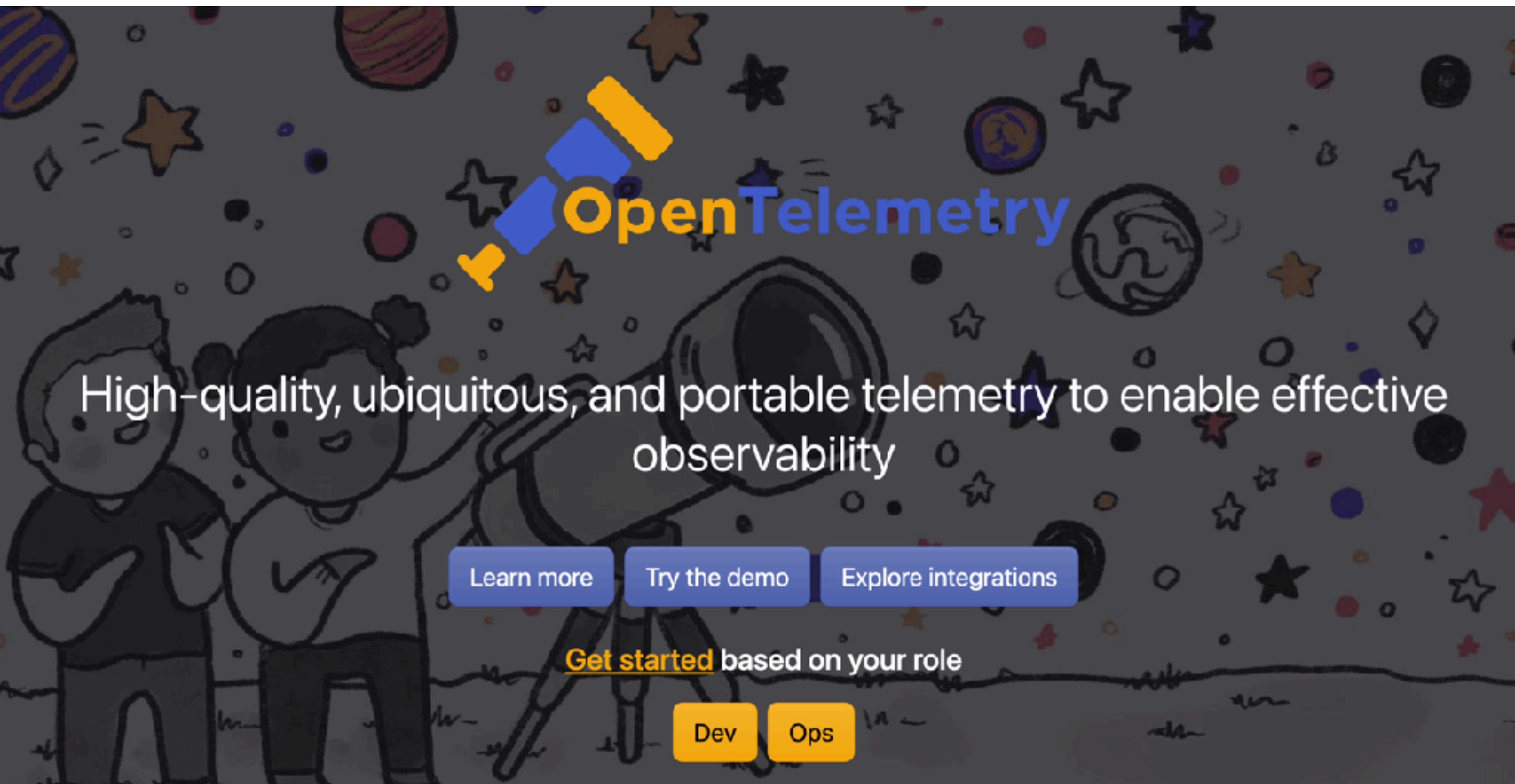
3 Pillars of Observability



Tracing



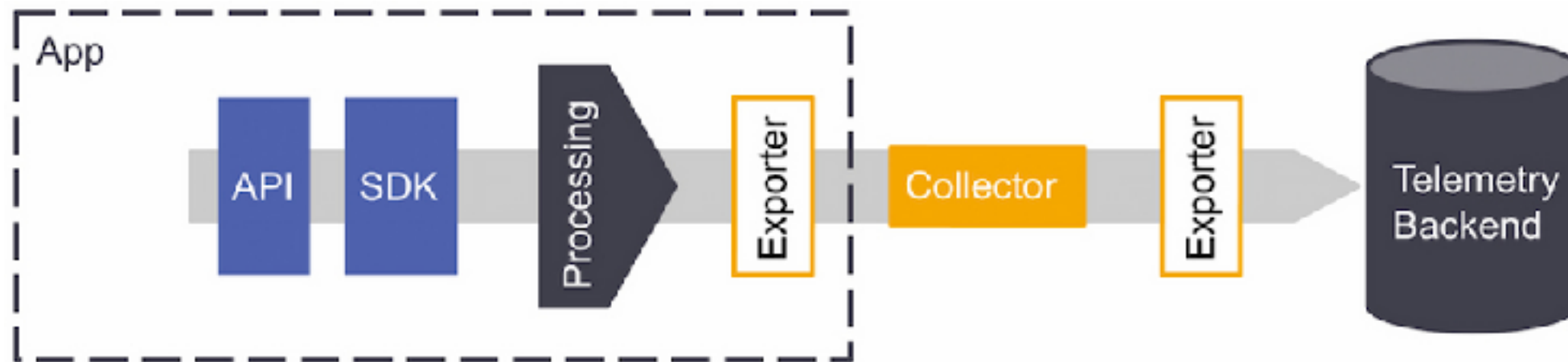
OpenTelemetry



<https://opentelemetry.io/>



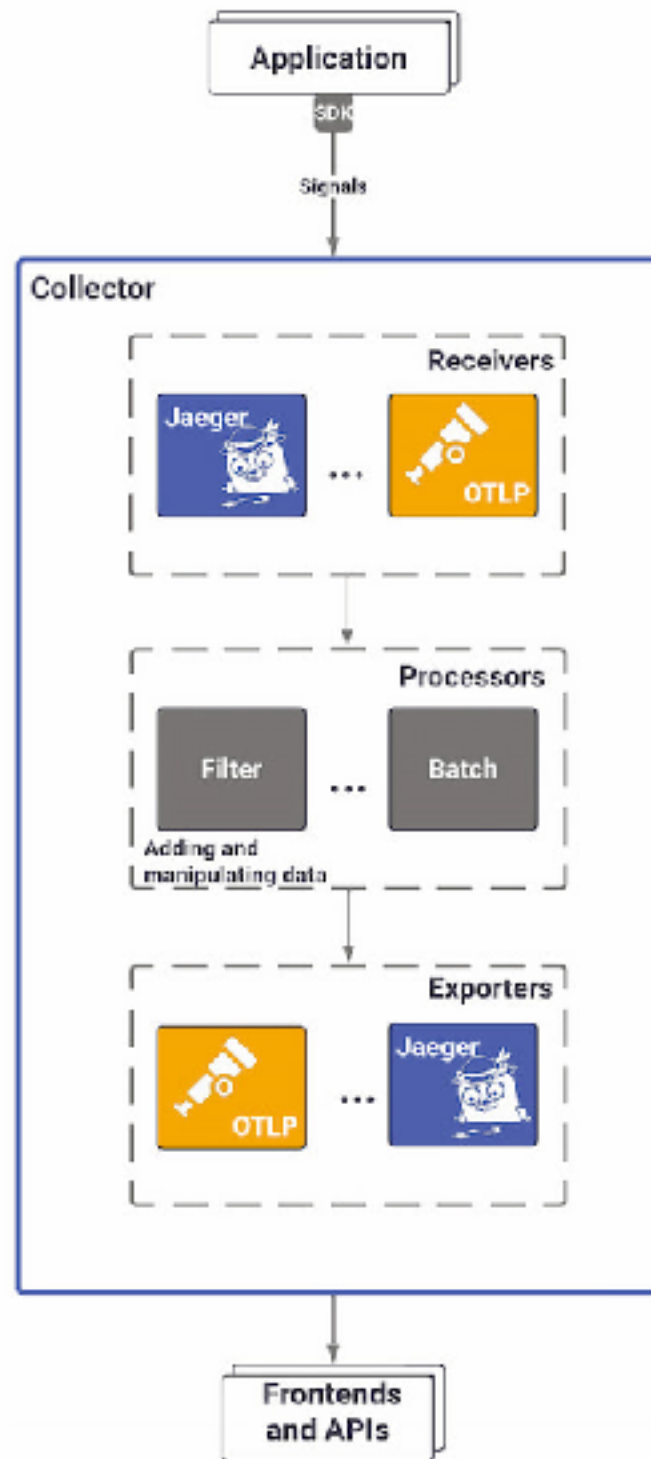
OpenTelemetry Structure



<https://dzone.com/refcardz/getting-started-with-opentelemetry>



OpenTelemetry Structure



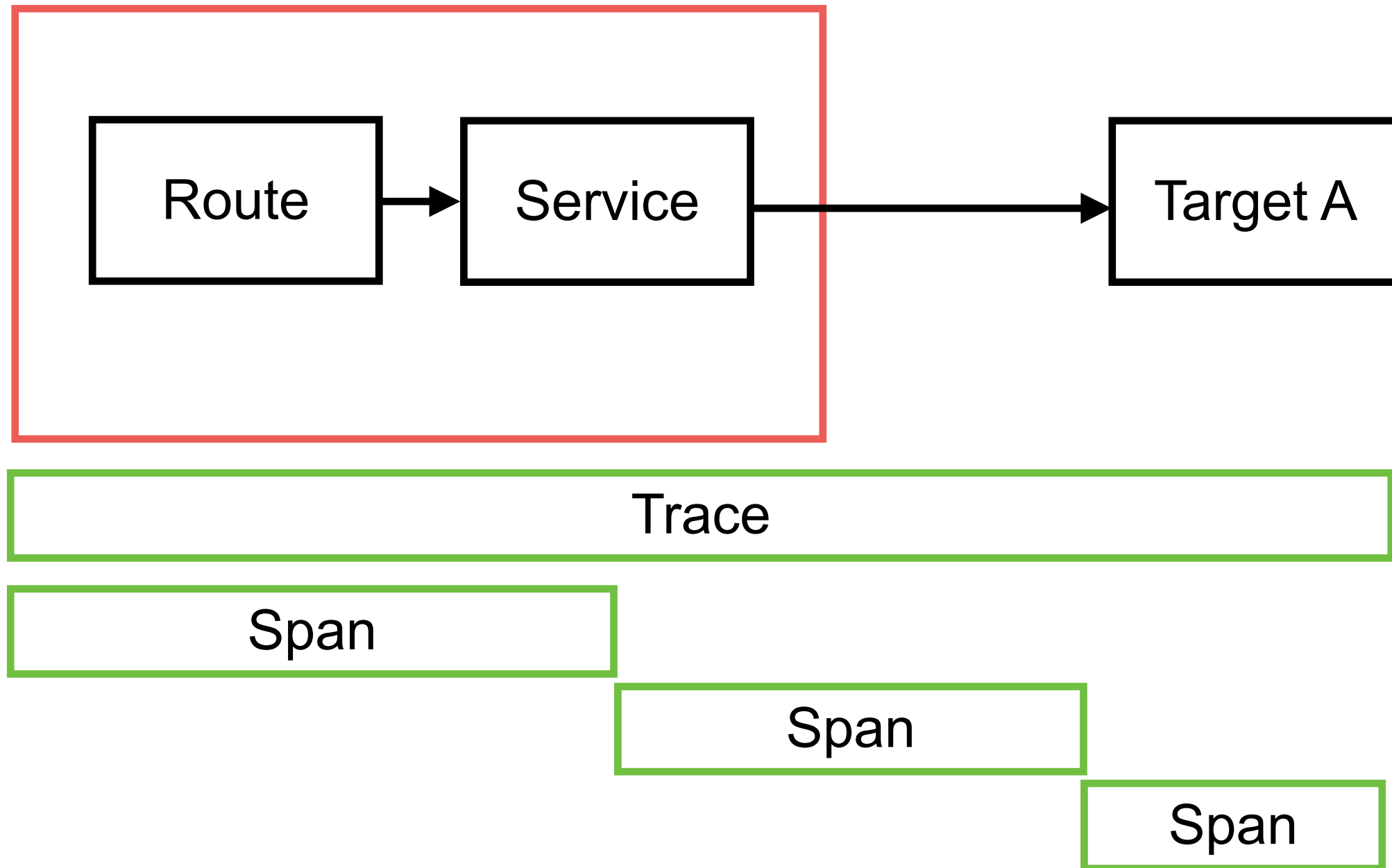
<https://dzone.com/refcardz/getting-started-with-opentelemetry>



Distributed Tracing

Kong Gateway

Target Upstream



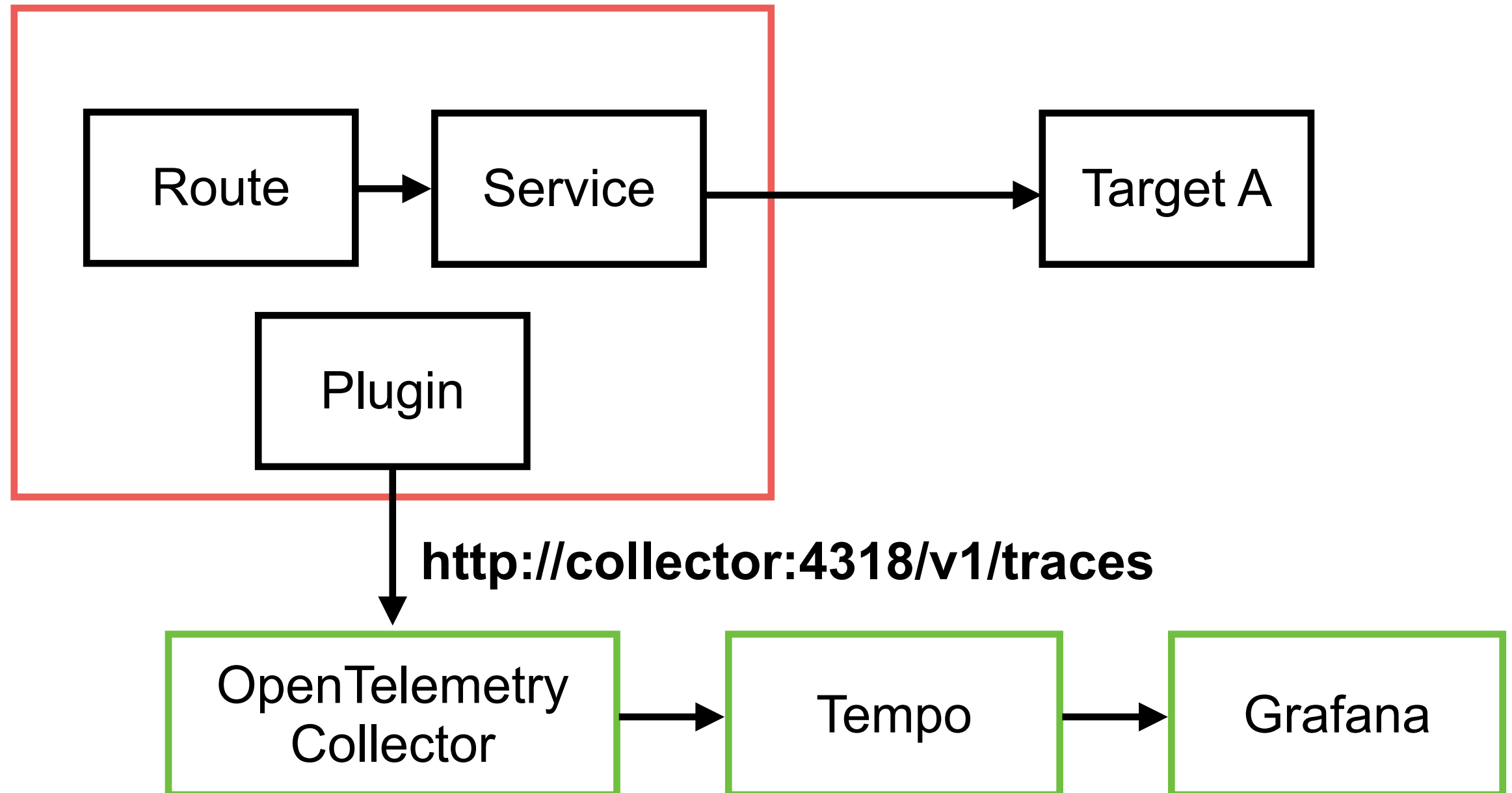
<https://docs.konghq.com/hub/kong-inc/opentelemetry/>



Distributed Tracing

Kong Gateway

Target Upstream



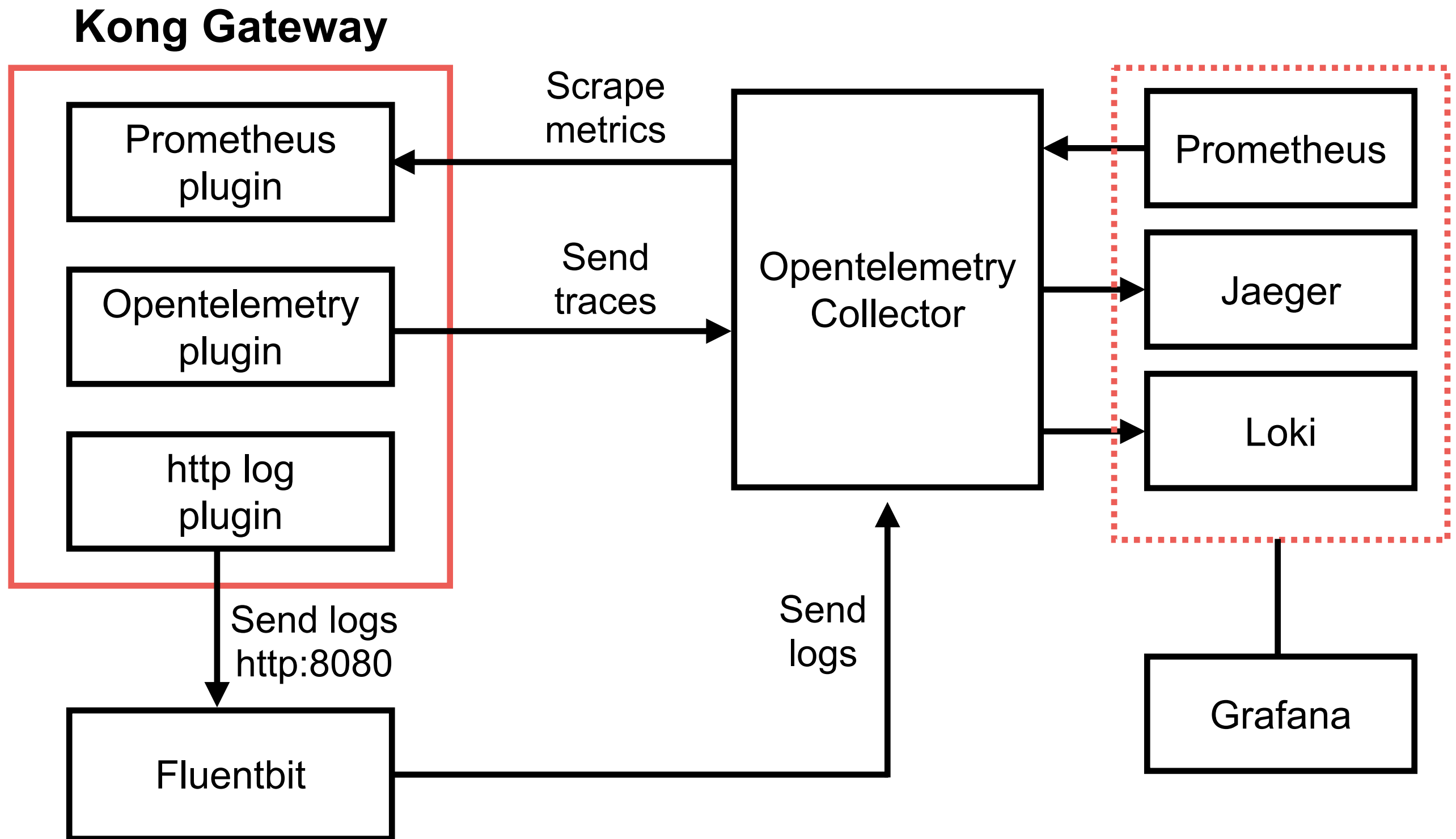
<https://github.com/grafana/docker-otel-lgtm>



Observable Workshop



Architecture



Kong plugins

Kong Manager 1.9.0 Star 18,200

Plugins

Plugins allow you to extend Kong's capabilities with features like rate limiting, authentication, and logging. [Learn more](#)

Filter by exact instance name or ID + New Plugin

Name	Applied To	Enabled	Tags
OpenTelemetry	Global	<input checked="" type="checkbox"/>	-
HTTP Log	Global	<input checked="" type="checkbox"/>	-
Prometheus	Global	<input checked="" type="checkbox"/>	-

<https://docs.konghq.com/hub/>



deck

Manage Kong in Declarative way

<https://docs.konghq.com/deck>



Working with deck

