

FIWARE  
**Global  
Summit**

# Kong in FIWARE Systems

Protecting and monitoring endpoints

Gran Canaria, Spain  
14-15 September, 2022  
**#FIWARESummit**

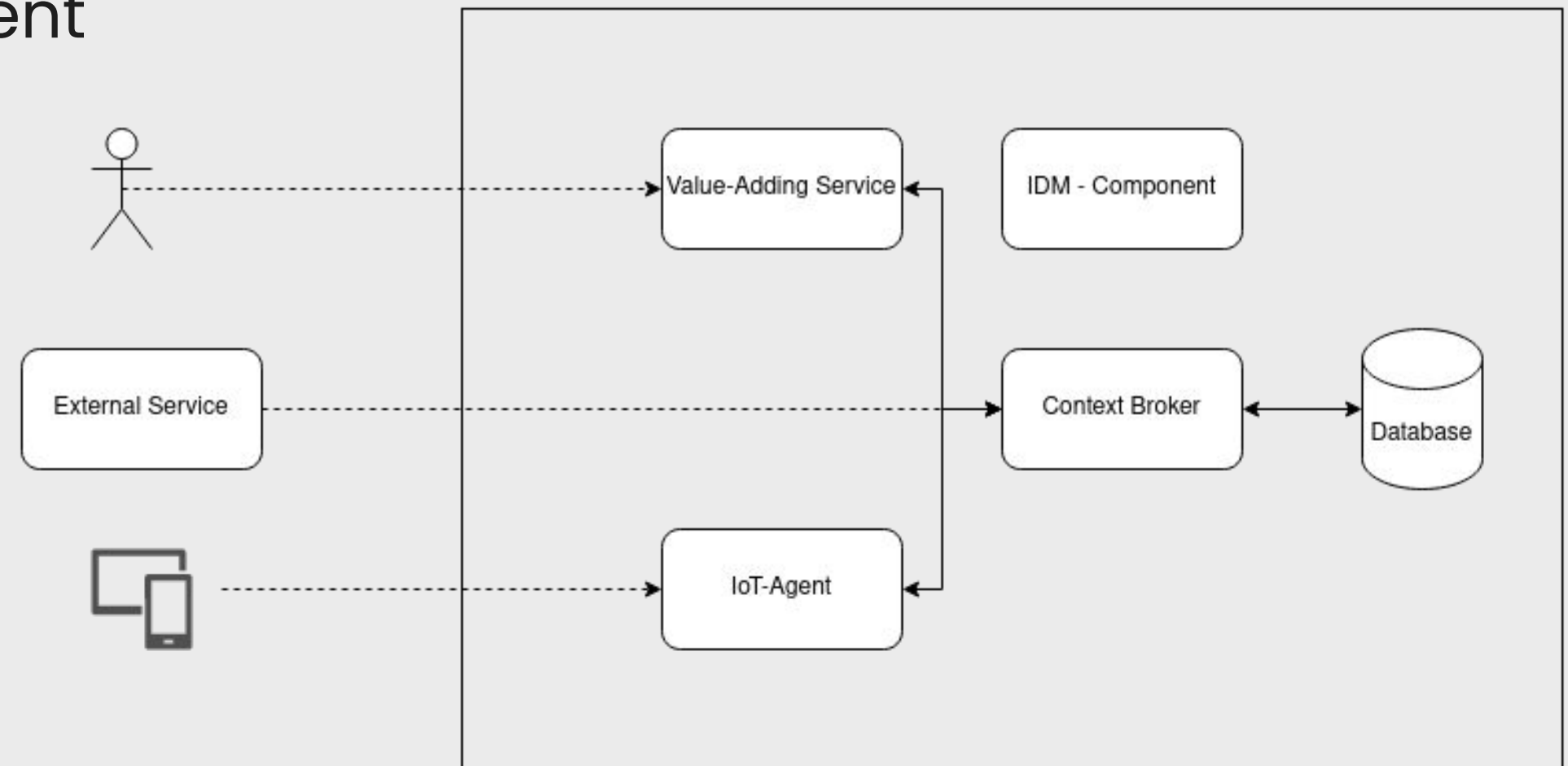
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OPEN SOURCE | OPEN  
STANDARDS  
OPEN COMMUNITY



# Role of an API-Gateway in FIWARE platforms

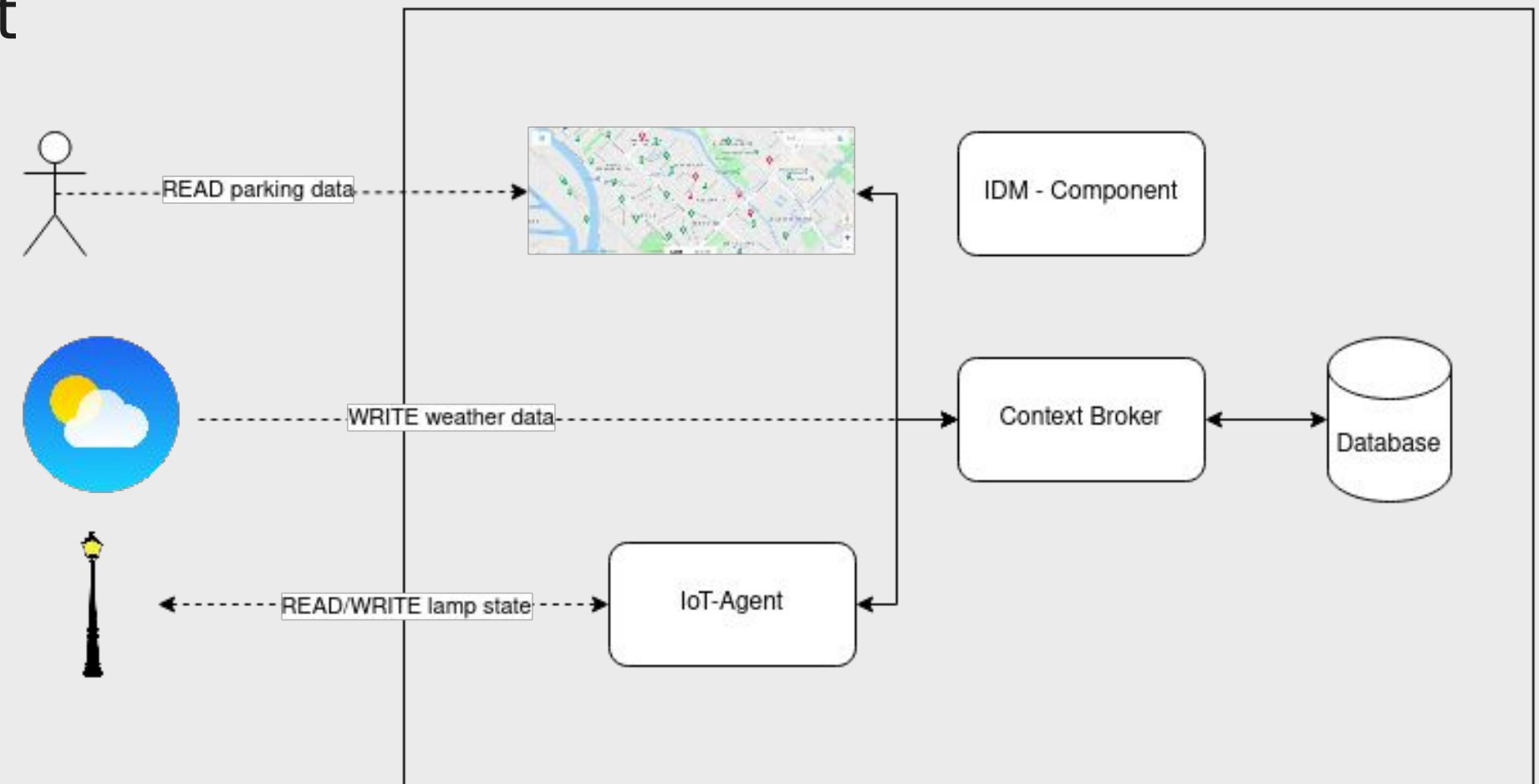
- Context Broker as central component
- Contacted from:
  - Different external actors
  - Different internal actors
  - Different loads
- No “self-defense” mechanisms



We need a component to protect the platform

# Role of an API-Gateway in FIWARE platforms

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  - Different external actors
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# Role of an API-Gateway in FIWARE platforms

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- Access control: PEP-Proxy & PDP
  - Allows to control who can access what
- Additional requirements:
  - Rate-limiting?
  - Usage-control?
  - Monitoring?



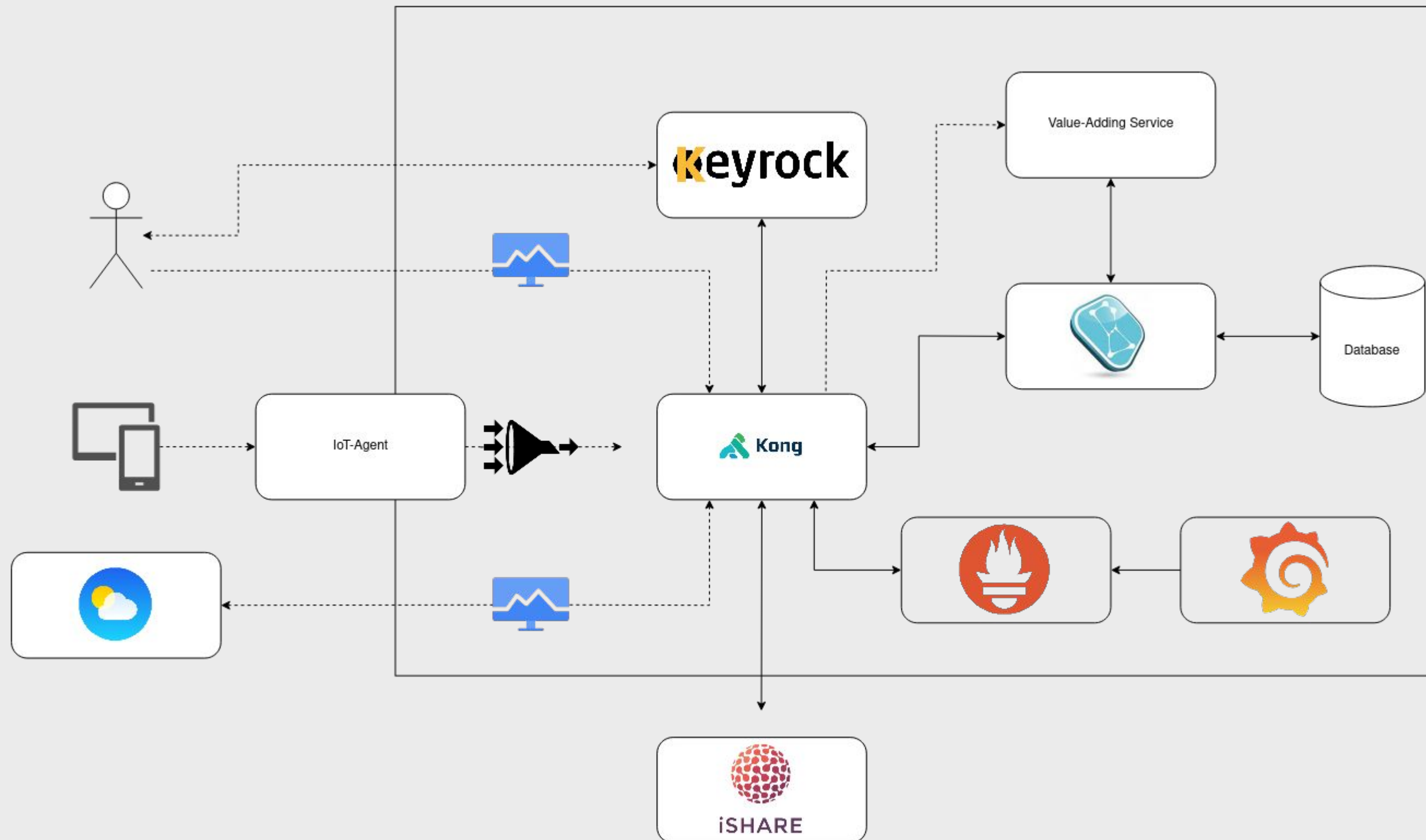
# Role of an API-Gateway in FIWARE platforms

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- Additional requirements:
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 API-Gateway as the central entry point, providing all those capabilities

# Role of an API-Gateway in FIWARE platforms



# Why Kong?

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- One of the most popular and adopted solutions in the market
- OpenSource (and Enterprise) Version available, maintained by a huge community
- Production ready deployment tools
- Plugin-support:
  - FIWARE specific functionality can be implemented as plugin
  - Supports lua, go and python
- Plugins for additional requirements available – [Kong Hub](#):
  - Rate-limiting
  - Usage monitoring

## Kong Plugin Hub

Extend Kong Connect with powerful plugins and easy integrations

All Plugins

Konnect

Third-Party

SUBSCRIPTION TIERS

Free

Plus

Enterprise

FUNCTIONALITY

Authentication

Security

Traffic Control

Serverless

Analytics & Monitoring


Transformations

Logging

Deployment


Authentication


ENTERPRISE



**Portal Application Registration**


Allow portal developers to register applications against Services


Support by:  
 Kong Inc.



**Basic Authentication**


Add Basic Authentication to your Services

Support by:  
 Kong Inc.




**HMAC Authentication**

Add HMAC Authentication to your Services

Support by:  
 Kong Inc.


ENTERPRISE

PLUS




**JWT**

Verify and authenticate JSON Web Tokens

Support by:  
 Kong Inc.


ENTERPRISE


PLUS



**Kong JWT Signer**


Verify and sign one or two tokens in a request

Support by:  
 Kong Inc.





**Key Authentication**

Add key authentication to your Services

Support by:  
 Kong Inc.

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 FIWARE

 [www.fiware.org](http://www.fiware.org)



# Running Kong

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- Multiple solutions available: [Kong - Install and run](#)
- Running with Helm on OpenShift:
  - [Kong in the FIWARE demo environment](#)
- Some details:
  - Using the official [Kong Helm-Chart](#)
  - Extended with support for OpenShift Routes
  - Pre-built [Image from FIWARE](#), already including the plugins
  - Declarative configuration, using a [ConfigMap](#)
  - Applied via GitOps - [ArgoCD](#)

# Kong as PEP-Proxy

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- Plugins for using Kong as a PEP in FIWARE:
  - [ngsi-ishare-policies](#) to enforce iTrust compliant authz/n
  - [Keyrock as PDP](#) – delegate role-based decisions to Keyrock
  - [Keycloak as PDP](#) – delegate decisions to Keycloak

# General plugin configuration

---

```
kong:
  ...
  env:
    ...
    plugins: bundled,pep-plugin,ngsi-ishare-policies
    pluginserver_names: pep-plugin
    pluginserver_pep_plugin_start_cmd: "/go-plugins/pep-plugin"
    pluginserver_pep_plugin_query_cmd: "/go-plugins/pep-plugin -dump"
    ...
  dblessConfig:
    configMap: kong-configmap
```

```
services:
- host: "fiware-orion-ld"
  name: "orion-keyrock"
  port: 1026
  protocol: http

  routes:
  - name: orion-keyrock
    paths:
    - /keyrock
    strip_path: true

  plugins:
  - name: pep-plugin
    config:
      <PLUGIN_SPECIFIC_CONFIGURATION>
```

# General plugin configuration

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- Demonstration:
  - [i4Trust configuration](#)
  - [Keyrock configuration](#)

# Monitoring

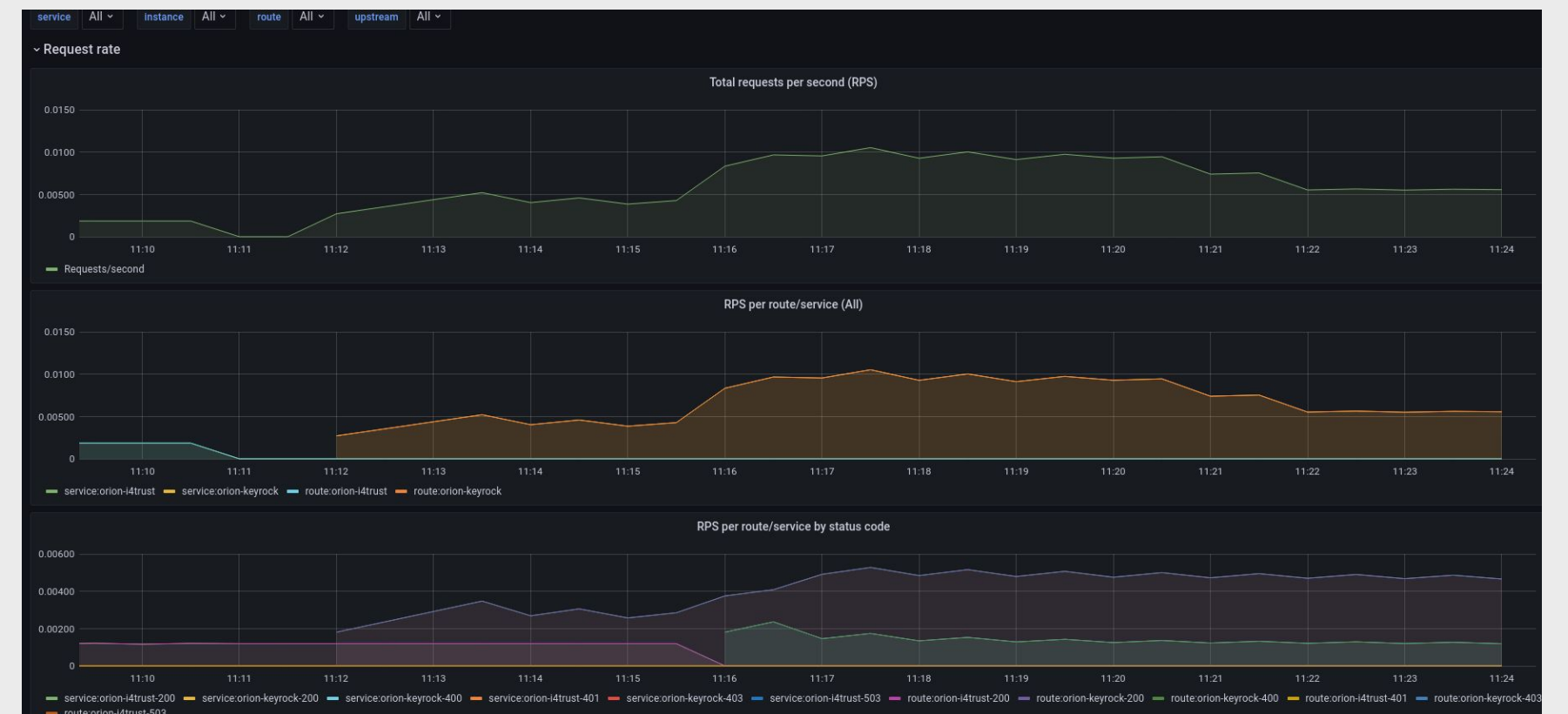
- Prometheus integration:
  - <https://docs.konghq.com/hub/kong-inc/prometheus/>
  - Configure per route and enable scraping

```
- host: "fiware-orion-ld"
  name: "orion-keyrock"
  port: 1026
  protocol: http
```

```
routes:
- name: orion-keyrock
  paths:
  - /keyrock
    strip_path: true
```

```
plugins:
- name: prometheus
```

```
kong:
  podAnnotations:
    prometheus.io/scrape: 'true'
    prometheus.io/port: '9102'
```





# Rate-limiting

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- Rate-limiting plugin:

- <https://docs.konghq.com/hub/kong-inc/rate-limiting/>
- Configure per route

```
- host: "fiware-orion-ld"
  name: "orion-keyrock"
  port: 1026
  protocol: http

routes:
- name: orion-limited
  paths:
  - /limited
    strip_path: true

plugins:
- name: rate-limiting
  config:
    minute: 3
```

# Further reading

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- More plugins: <https://docs.konghq.com/hub/>
- UI: <https://github.com/pantisel/konga>
- Plugin development:
  - [Lua](#)
  - [Go](#)



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# Thanks!

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