在K8S上使用kong做服务网关

> *Kong是一个开源API网关和微服务管理层。Kong基于Nginx和lua-nginx-module（特别是OpenResty），可插拔的体系结构使其灵活而强大。*

网关的最主要的作用就是路由，各个服务的端口多且杂管理起来苦不堪言，所以有了网关来管理这些服务的转发，最出名的就是nginx，而今天要介绍的这个网关也是基于nginx的，性能非常强大，而且操作界面简单好用。下面我会来介绍在k8s上安装kong并且将一个带端口服务路由成一个不需要端口的url路径。

本文主要关注的是环境的搭建，如果想要学习kong的api请移步官方文档😄

准备镜像

kong

使用官方镜像即可

```
docker pull kong
```

konga

> *konga是kong的dashboard，如果觉得使用kong的api麻烦的话，可以使用konga来管理方便快捷。*

```
docker pull pantsel/konga
```

准备yaml文件

kong

cm.yaml

```
apiVersion: v1
kind: ConfigMap
metadata:
```

```
  name: kong-config
  namespace: kong
  labels:
    addonmanager.kubernetes.io/mode: Reconcile
data:
    nginx_kong.lua: |
        return [[
        charset UTF-8;

        > if anonymous_reports then
        ${{SYSLOG_REPORTS}}
        > end

        error_log ${{PROXY_ERROR_LOG}} ${{LOG_LEVEL}};

        > if nginx_optimizations then
        >-- send_timeout 60s;          # default value
        >-- keepalive_timeout 75s;     # default value
        >-- client_body_timeout 60s;   # default value
        >-- client_header_timeout 60s; # default value
        >-- tcp_nopush on;             # disabled until
benchmarked
        >-- proxy_buffer_size 128k;    # disabled until
benchmarked
        >-- proxy_buffers 4 256k;      # disabled until
benchmarked
        >-- proxy_busy_buffers_size 256k; # disabled
until benchmarked
        >-- reset_timedout_connection on; # disabled
until benchmarked
        > end

        client_max_body_size ${{CLIENT_MAX_BODY_SIZE}};
        proxy_ssl_server_name on;
        underscores_in_headers on;

        lua_package_path '${{LUA_PACKAGE_PATH}};;';
        lua_package_cpath '${{LUA_PACKAGE_CPATH}};;';
        lua_socket_pool_size ${{LUA_SOCKET_POOL_SIZE}};
        lua_max_running_timers 4096;
        lua_max_pending_timers 16384;
        lua_shared_dict kong                 5m;
        lua_shared_dict kong_db_cache
${{MEM_CACHE_SIZE}};
        lua_shared_dict kong_db_cache_miss 12m;
        lua_shared_dict kong_locks          8m;
        lua_shared_dict kong_process_events 5m;
```

```
        lua_shared_dict kong_cluster_events 5m;
        lua_shared_dict kong_healthchecks   5m;
        lua_shared_dict kong_rate_limiting_counters 12m;
        > if database == "cassandra" then
        lua_shared_dict kong_cassandra      5m;
        > end
        lua_socket_log_errors off;
        > if lua_ssl_trusted_certificate then
        lua_ssl_trusted_certificate
'${{LUA_SSL_TRUSTED_CERTIFICATE}}';
        > end
        lua_ssl_verify_depth ${{LUA_SSL_VERIFY_DEPTH}};

        # injected nginx_http_* directives
        > for _, el in ipairs(nginx_http_directives)  do
        $(el.name) $(el.value);
        > end

        init_by_lua_block {
            Kong = require 'kong'
            Kong.init()
        }

        init_worker_by_lua_block {
            Kong.init_worker()
        }


        > if #proxy_listeners > 0 then
        upstream kong_upstream {
            server 0.0.0.1;
            balancer_by_lua_block {
                Kong.balancer()
            }
        > if upstream_keepalive > 0 then
            keepalive ${{UPSTREAM_KEEPALIVE}};
        > end
        }

        server {
            server_name kong;
        > for i = 1, #proxy_listeners do
            listen $(proxy_listeners[i].listener);
        > end
            error_page 400 404 408 411 412 413 414 417
494 /kong_error_handler;
```

```
            error_page 500 502 503 504
/kong_error_handler;

            access_log ${{PROXY_ACCESS_LOG}};
            error_log ${{PROXY_ERROR_LOG}}
${{LOG_LEVEL}};

            client_body_buffer_size
${{CLIENT_BODY_BUFFER_SIZE}};

        > if proxy_ssl_enabled then
            ssl_certificate ${{SSL_CERT}};
            ssl_certificate_key ${{SSL_CERT_KEY}};
            ssl_protocols TLSv1.1 TLSv1.2 TLSv1.3;
            ssl_certificate_by_lua_block {
                Kong.ssl_certificate()
            }

            ssl_session_cache shared:SSL:10m;
            ssl_session_timeout 10m;
            ssl_prefer_server_ciphers on;
            ssl_ciphers ${{SSL_CIPHERS}};
        > end

        > if client_ssl then
            proxy_ssl_certificate ${{CLIENT_SSL_CERT}};
            proxy_ssl_certificate_key
${{CLIENT_SSL_CERT_KEY}};
        > end

            real_ip_header     ${{REAL_IP_HEADER}};
            real_ip_recursive  ${{REAL_IP_RECURSIVE}};
        > for i = 1, #trusted_ips do
            set_real_ip_from   $(trusted_ips[i]);
        > end

            # injected nginx_proxy_* directives
        > for _, el in ipairs(nginx_proxy_directives)
do
            $(el.name) $(el.value);
        > end

            location / {
                default_type                    '';

                set $ctx_ref                    '';
                set $upstream_host              '';
```

```
                set $upstream_upgrade            '';
                set $upstream_connection         '';
                set $upstream_scheme             '';
                set $upstream_uri                '';
                set $upstream_x_forwarded_for    '';
                set $upstream_x_forwarded_proto  '';
                set $upstream_x_forwarded_host   '';
                set $upstream_x_forwarded_port   '';

                rewrite_by_lua_block {
                    Kong.rewrite()
                }

                access_by_lua_block {
                    Kong.access()
                }

                proxy_http_version 1.1;
                proxy_set_header   Host
$upstream_host;
                proxy_set_header   Upgrade
$upstream_upgrade;
                proxy_set_header   Connection
$upstream_connection;
                proxy_set_header   X-Forwarded-For
$upstream_x_forwarded_for;
                proxy_set_header   X-Forwarded-Proto
$upstream_x_forwarded_proto;
                proxy_set_header   X-Forwarded-Host
$upstream_x_forwarded_host;
                proxy_set_header   X-Forwarded-Port
$upstream_x_forwarded_port;
                proxy_set_header   X-Real-IP
$remote_addr;
                proxy_pass_header  Server;
                proxy_pass_header  Date;
                proxy_ssl_name     $upstream_host;
                proxy_pass
$upstream_scheme://kong_upstream$upstream_uri;

                header_filter_by_lua_block {
                    Kong.header_filter()
                }

                body_filter_by_lua_block {
                    Kong.body_filter()
                }
```

```
                log_by_lua_block {
                    Kong.log()
                }
            }

            location = /kong_error_handler {
                internal;
                uninitialized_variable_warn off;

                content_by_lua_block {
                    Kong.handle_error()
                }

                header_filter_by_lua_block {
                    Kong.header_filter()
                }

                body_filter_by_lua_block {
                    Kong.body_filter()
                }

                log_by_lua_block {
                    Kong.log()
                }
            }
        }
        > end

        > if #admin_listeners > 0 then
        server {
            server_name kong_admin;
        > for i = 1, #admin_listeners do
            listen $(admin_listeners[i].listener);
        > end

            access_log ${{ADMIN_ACCESS_LOG}};
            error_log ${{ADMIN_ERROR_LOG}}
${{LOG_LEVEL}};

            client_max_body_size 10m;
            client_body_buffer_size 10m;

        > if admin_ssl_enabled then
            ssl_certificate ${{ADMIN_SSL_CERT}};
            ssl_certificate_key ${{ADMIN_SSL_CERT_KEY}};
            ssl_protocols TLSv1.1 TLSv1.2 TLSv1.3;
```

```
            ssl_session_cache shared:SSL:10m;
            ssl_session_timeout 10m;
            ssl_prefer_server_ciphers on;
            ssl_ciphers ${{SSL_CIPHERS}};
        > end

            # injected nginx_admin_* directives
        > for _, el in ipairs(nginx_admin_directives)
do
            $(el.name) $(el.value);
        > end

            location / {
                default_type application/json;
                content_by_lua_block {
                    Kong.serve_admin_api()
                }
            }

            location /nginx_status {
                internal;
                access_log off;
                stub_status;
            }

            location /robots.txt {
                return 200 'User-agent: *\nDisallow: /';
            }
        }
        > end
        ]]
```

kong.yaml

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: kong
  namespace: kong
spec:
  replicas: 1
  selector:
    matchLabels:
      app: kong
  template:
```

```
    metadata:
      labels:
        name: kong
        app: kong
    spec:
      tolerations:
      - key: "node.kubernetes.io/unreachable"
        operator: "Exists"
        effect: "NoExecute"
        tolerationSeconds: 60
      - key: "node.kubernetes.io/not-ready"
        operator: "Exists"
        effect: "NoExecute"
        tolerationSeconds: 60
      terminationGracePeriodSeconds: 0                #
异常立即删除
      initContainers:
      # hack to verify that the DB is up to date or not
      # TODO remove this for Kong >= 0.15.0
      - name: wait-for-migrations
        image: hub.sky-cloud.net/k8s/kong:1.0.3
        imagePullPolicy: IfNotPresent
        command: [ "kong", "migrations", "list" ]
        env:
        - name: KONG_ADMIN_LISTEN
          value: 'off'
        - name: KONG_PROXY_LISTEN
          value: 'off'
        - name: KONG_PROXY_ACCESS_LOG
          value: "/dev/stdout"
        - name: KONG_ADMIN_ACCESS_LOG
          value: "/dev/stdout"
        - name: KONG_PROXY_ERROR_LOG
          value: "/dev/stderr"
        - name: KONG_ADMIN_ERROR_LOG
          value: "/dev/stderr"
        - name: KONG_PG_HOST
          value: postgres-0.postgres.postgres
        - name: KONG_PG_PORT
          value: '5432'
        - name: KONG_PG_DATABASE
          value: kong
        - name: KONG_PG_USER
          value: kong
        - name: KONG_PG_PASSWORD
          value: kong
        - name: KONG_PLUGINS
```

```
          value: jwt-keycloak,oidc,acl,aws-lambda,azure-
functions,basic-auth,bot-detection,correlation-
id,cors,datadog,file-log,hmac-auth,http-log,ip-
restriction,jwt,key-auth,ldap-auth,loggly,oauth2,post-
function,pre-function,prometheus,rate-limiting,request-
size-limiting,request-termination,request-
transformer,statsd,syslog,tcp-log,udp-log,zipkin
        - name: TZ
          value: Asia/Shanghai
        resources:
          limits:
            memory: 1024Mi
          requests:
            memory: 1024Mi
        volumeMounts:
        - name: tz
          mountPath: /etc/localtime
      hostAliases:
      - ip: "192.168.1.225"
        hostnames:
        - "nginx-service"
        - "nap.sky-cloud.net"
      containers:
      - name: kong-proxy
        image: hub.sky-cloud.net/k8s/kong:1.0.3
        imagePullPolicy: IfNotPresent
        env:
        - name: KONG_PG_HOST
          value: postgres-0.postgres.postgres
        - name: KONG_PG_PORT
          value: '5432'
        - name: KONG_PG_DATABASE
          value: kong
        - name: KONG_PG_USER
          value: kong
        - name: KONG_PG_PASSWORD
          value: kong
        - name: KONG_PROXY_ACCESS_LOG
          value: "/dev/stdout"
        - name: KONG_PROXY_ERROR_LOG
          value: "/dev/stderr"
        - name: KONG_ADMIN_LISTEN
          value: '0.0.0.0:8001, 0.0.0.0:8444 ssl'
        - name: KONG_PLUGINS
```

```
          value: jwt-keycloak,oidc,acl,aws-lambda,azure-
functions,basic-auth,bot-detection,correlation-
id,cors,datadog,file-log,hmac-auth,http-log,ip-
restriction,jwt,key-auth,ldap-auth,loggly,oauth2,post-
function,pre-function,prometheus,rate-limiting,request-
size-limiting,request-termination,request-
transformer,statsd,syslog,tcp-log,udp-log,zipkin
        ports:
        - name: proxy
          containerPort: 8000
          protocol: TCP
        - name: proxy-ssl
          containerPort: 8443
          protocol: TCP
        - name: kong-admin
          containerPort: 8001
        livenessProbe:
          failureThreshold: 3
          httpGet:
            path: /status
            port: 8001
            scheme: HTTP
          initialDelaySeconds: 30
          periodSeconds: 10
          successThreshold: 1
          timeoutSeconds: 1
        readinessProbe:
          failureThreshold: 3
          httpGet:
            path: /status
            port: 8001
            scheme: HTTP
          periodSeconds: 10
          successThreshold: 1
          timeoutSeconds: 1
        volumeMounts:
        - name: tz
          mountPath: /etc/localtime
          volumeMounts:
        - name: nginx
          subPath: nginx_kong.lua
          mountPath:
/usr/share/lua/5.1/kong/templates/nginx_kong.lua
      volumes:
      - name: tz
        hostPath:
          path: /etc/localtime
```

```
      - name: nginx
        configMap:
          name: kong-config
          items:
          - key: nginx_kong.lua
            path: nginx_kong.lua
```

svc.yaml

```
apiVersion: v1
kind: Service
metadata:
  name: kong
  namespace: kong
spec:
  externalIPs:                # 暴露Service到外部IP
  - 192.168.30.51               # IP
  ports:
  - name: kong-proxy
    port: 8000
    targetPort: 8000
    protocol: TCP
  - name: kong-proxy-ssl
    port: 8443
    targetPort: 8443
    protocol: TCP
  - name: kong-admin
    port: 8001
    targetPort: 8001
    protocol: TCP
  selector:
    app: kong
```

konga

```
---
apiVersion: v1
kind: Service
metadata:
  name: konga
  namespace: kong
spec:
  externalIPs:                # 暴露Service到外部IP
  - 192.168.30.51               # IP
  ports:
```

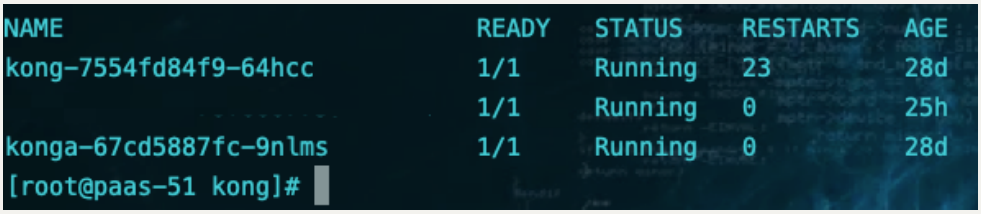
```
  - name: konga
    port: 1337
    targetPort: 1337
    protocol: TCP
  selector:
    app: konga
---

apiVersion: apps/v1
kind: Deployment
metadata:
  name: konga
  namespace: kong
spec:
  replicas: 1
  selector:
    matchLabels:
      app: konga
  template:
    metadata:
      labels:
        name: konga
        app: konga
    spec:
      tolerations:
      - key: "node.kubernetes.io/unreachable"
        operator: "Exists"
        effect: "NoExecute"
        tolerationSeconds: 60
      - key: "node.kubernetes.io/not-ready"
        operator: "Exists"
        effect: "NoExecute"
        tolerationSeconds: 60
      terminationGracePeriodSeconds: 0                #
异常立即删除
      containers:
      - name: konga
        image: hub.sky-cloud.net/k8s/konga:0.14.7
        imagePullPolicy: IfNotPresent
        env:
        - name: DB_ADAPTER
          value: "postgres"
        - name: DB_HOST
          value: "postgres-0.postgres.postgres" //配置上你
数据库的地址
        - name: DB_PORT
          value: "5432"
```

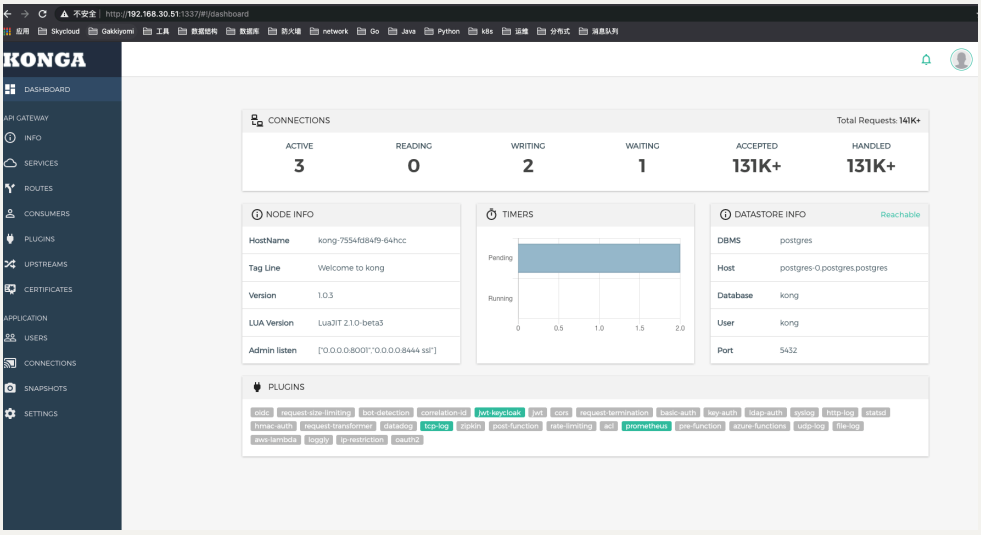
```
        - name: DB_USER
          value: "konga"
        - name: DB_PASSWORD
          value: "r00tme"
        - name: DB_DATABASE
          value: "konga"
        - name: NODE_ENV
          value: "production"
        ports:
        - name: konga
          containerPort: 1337
          protocol: TCP
        volumeMounts:
        - name: tz
          mountPath: /etc/localtime
      volumes:
      - name: tz
        hostPath:
          path: /etc/localtime
```

直接启动 `kubectl apply -f .`

查看启动情况



打开konga

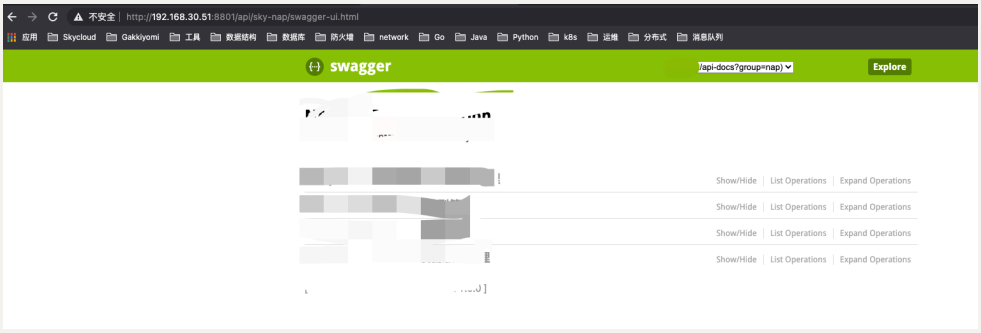


路由服务

我们启动了一个8801端口的后端服务

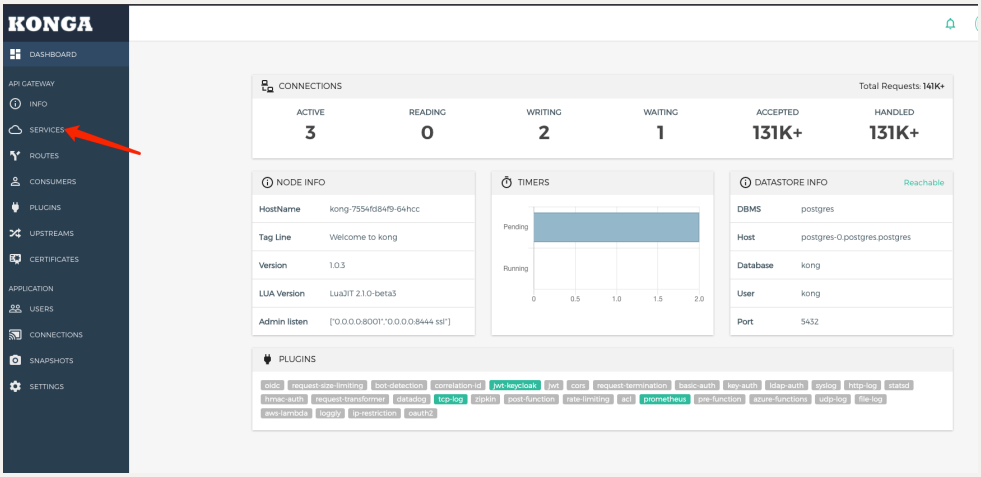
在浏览器输入`http://192.168.30.51:8801/api/sky-nap/swagger-ui.html`

我们该如何使用kong来路由他呢?

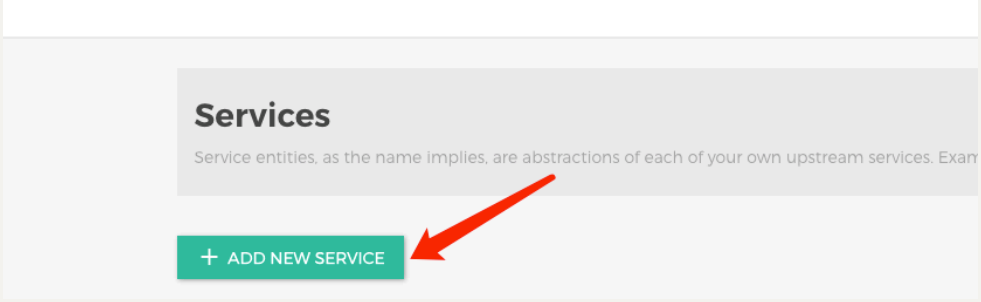


第一步

点击Service

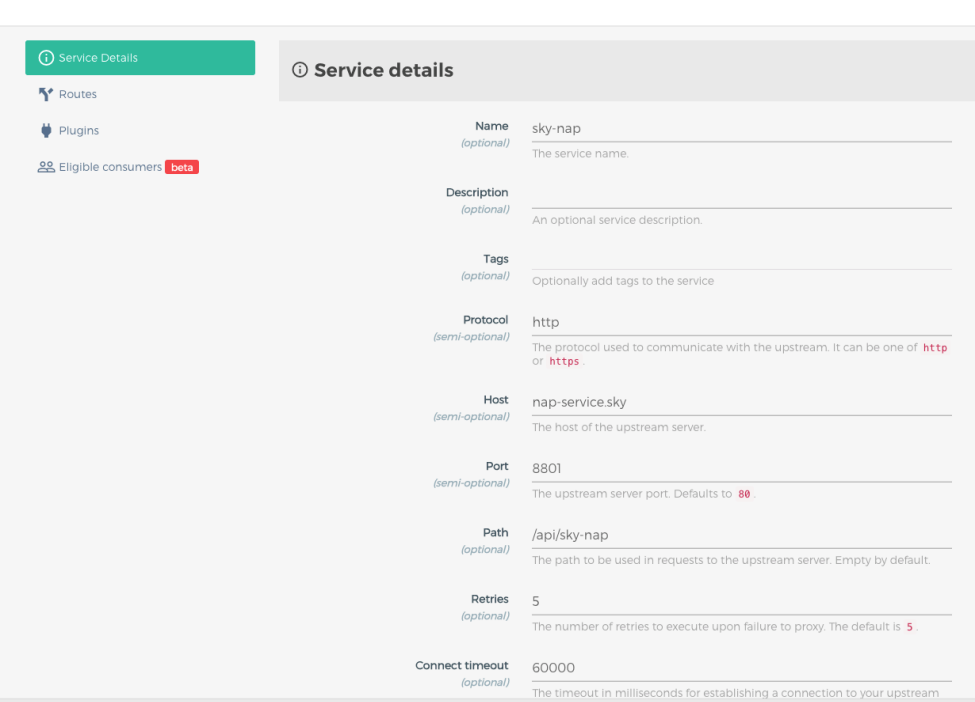


点击新增service



第二步

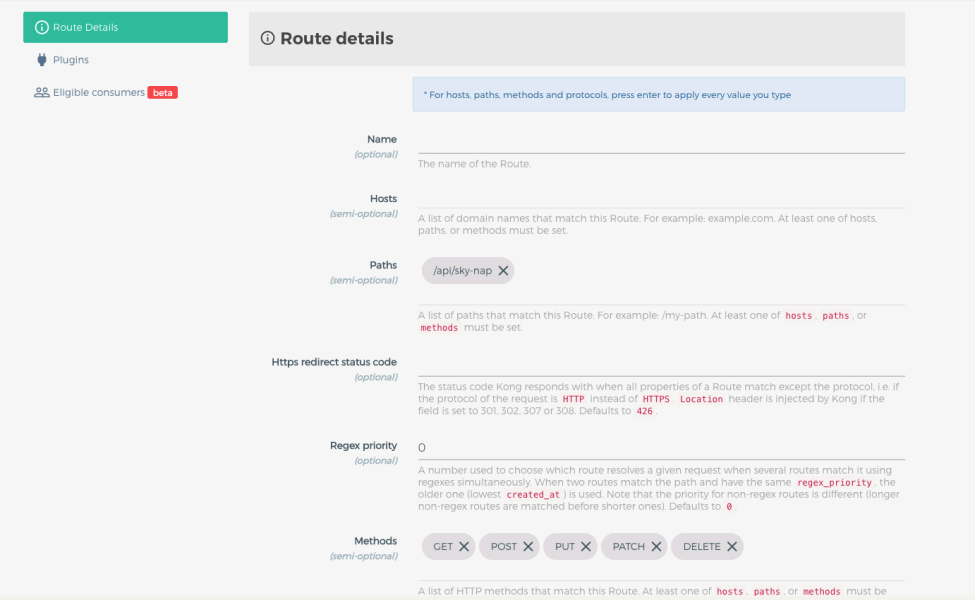
注册服务，包括这个服务的host,端口等。



第三步

点击上图的Routes,将这个服务路由到一个url路径

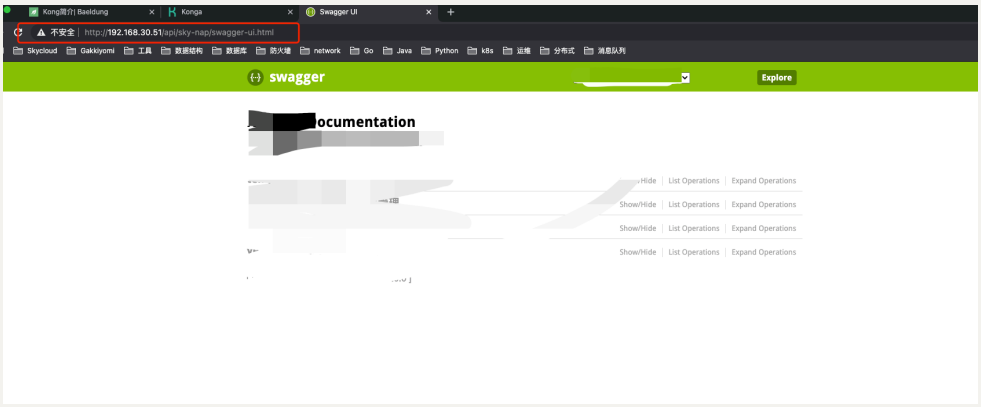
填写好Paths之后，我们就可以通过填写的这个路径来路由了



第四步

检验

在浏览器输入`http://192.168.30.51/api/sky-nap/swagger-ui.html`


Kong简介 Baeldung
Konga
Swagger UI
不安全 | http://192.168.30.51/api/sky-nap/swagger-ui.html
Skycloud
Gakkiyomi
工具
数据结构
数据库
防火墙
network
Go
Java
Python
k8s
运维
分布式
消息队列
swagger
Explore
ocumentation
Show/Hide | List Operations | Expand Operations
Show/Hide | List Operations | Expand Operations
Show/Hide | List Operations | Expand Operations
Show/Hide | List Operations | Expand Operations