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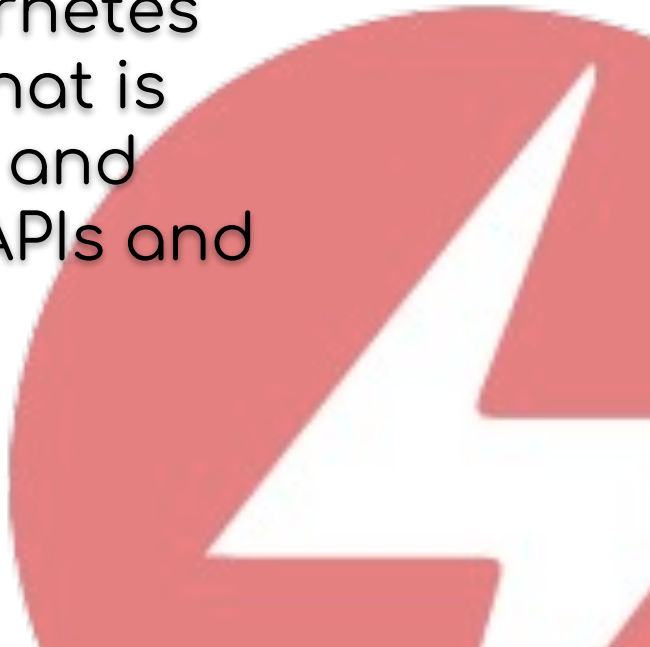
Desenvolvimento para Kubernetes

Alexandre Mioranza

TDC - 2019

Kubernetes is an open source orchestrator for deploying containerized applications. It was originally developed by Google, inspired by a decade of experience deploying scalable, reliable systems in containers via application-oriented APIs.

An **Operator** is a method of packaging, deploying and managing a Kubernetes application. A Kubernetes application is an application that is both deployed on Kubernetes and managed using the Kubernetes APIs and kubectl tooling.



Alex Garzão muito obrigado!

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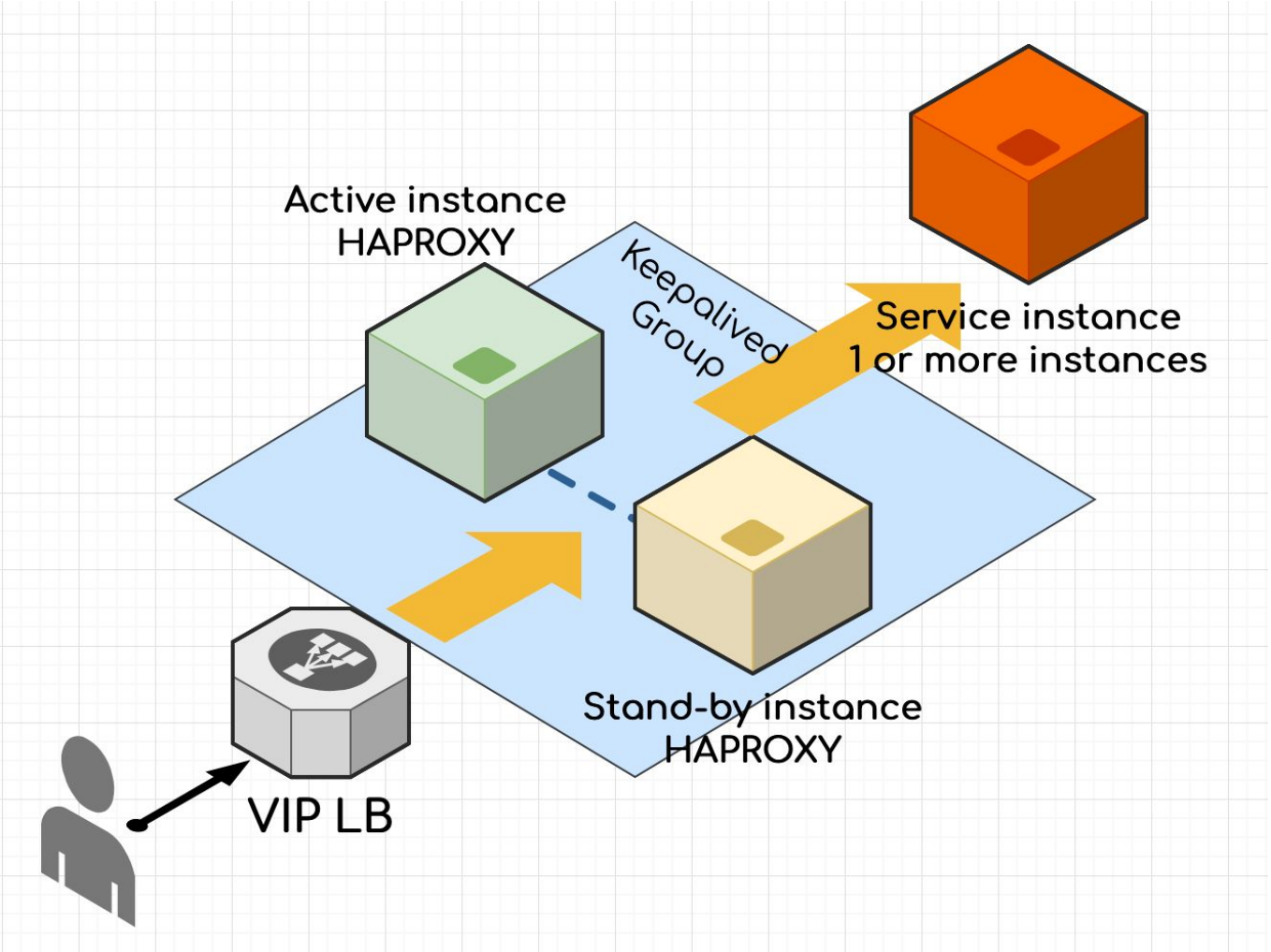
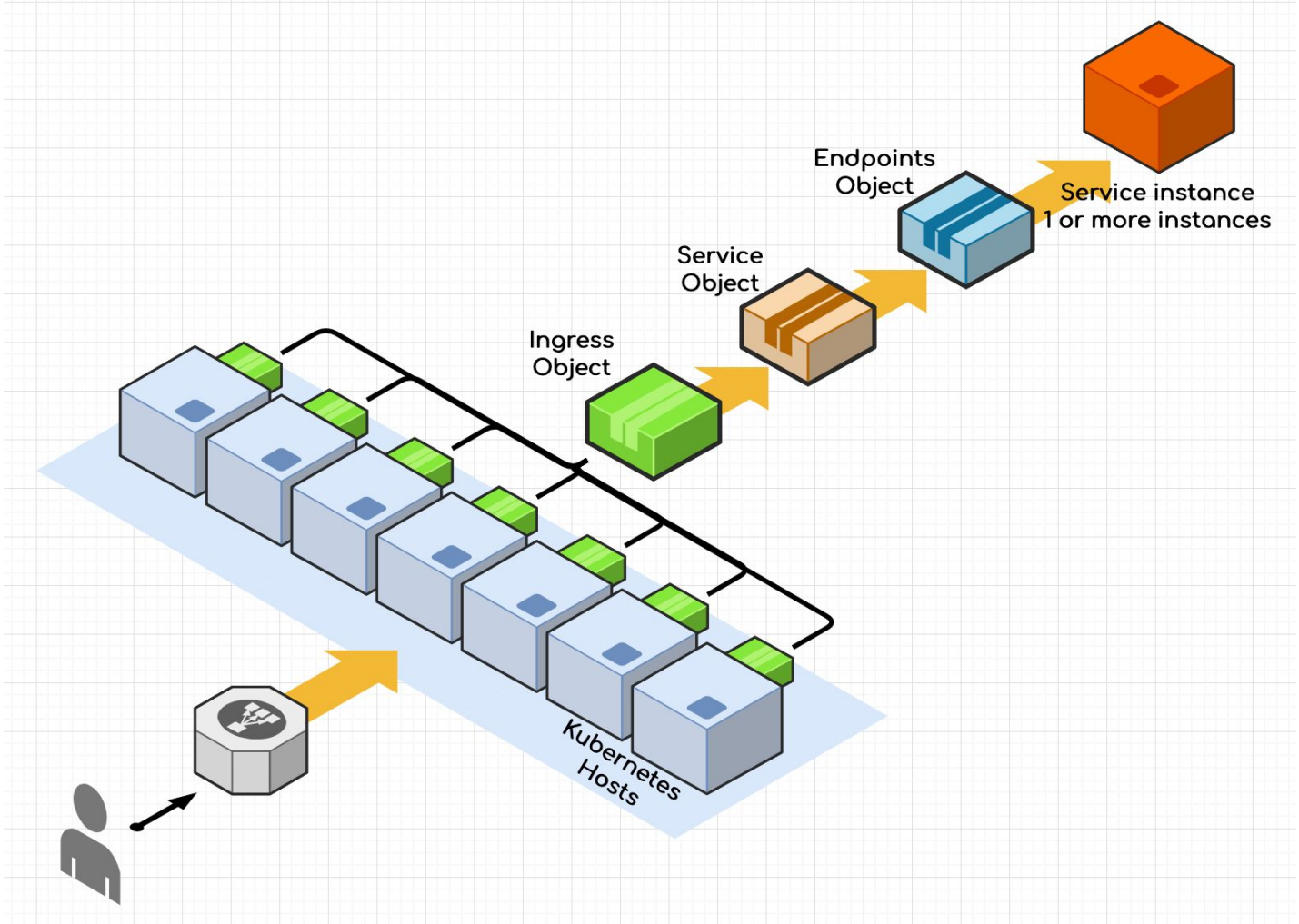
Desejo a ser atendido:

Remover instâncias de HAProxy do ambiente de Flow para aplicações que não estão no Kubernetes.


Active instance
HAPROXY
Keepalived
Group
Service instance
1 or more instances
Stand-by instance
HAPROXY
VIP LB



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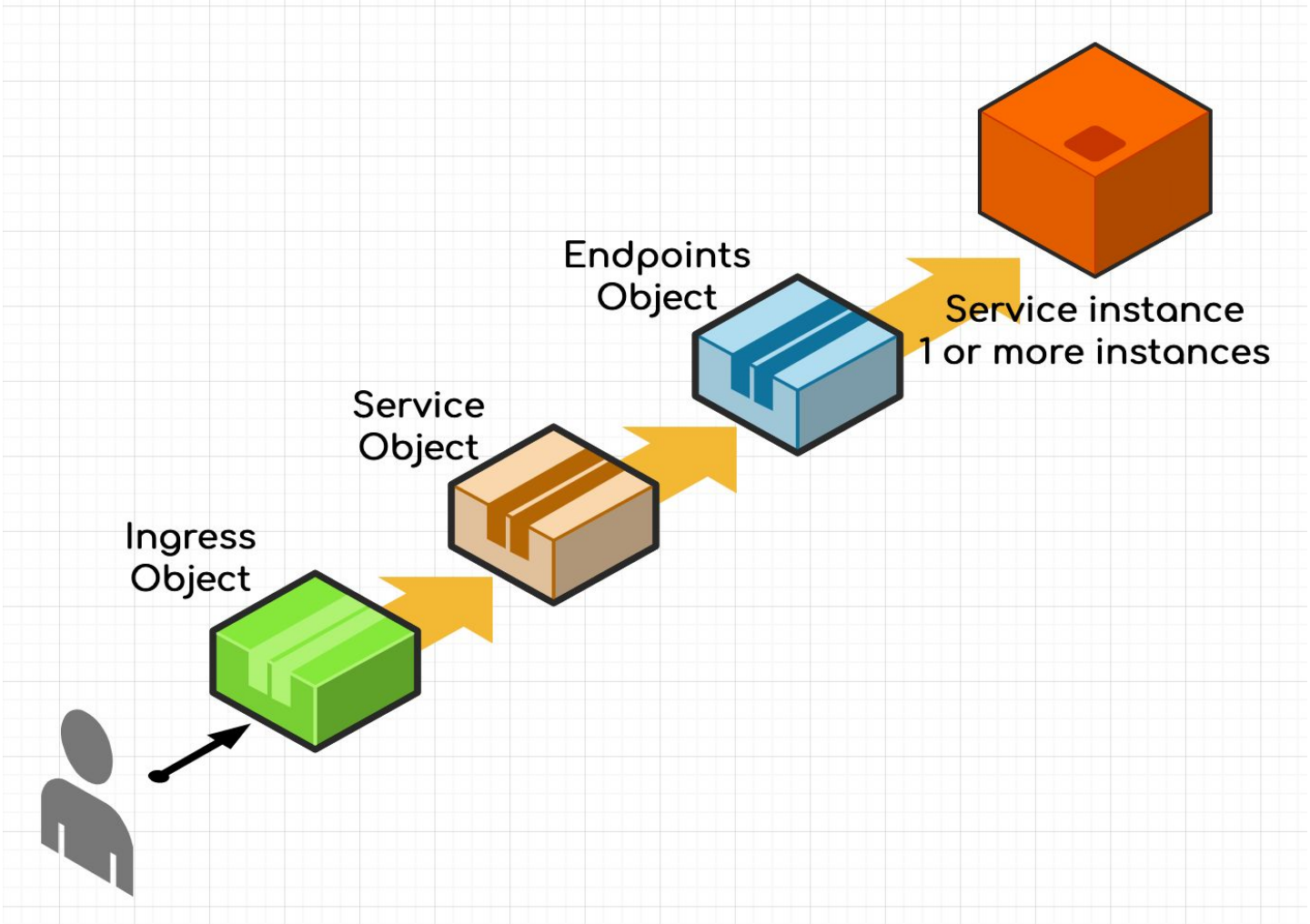
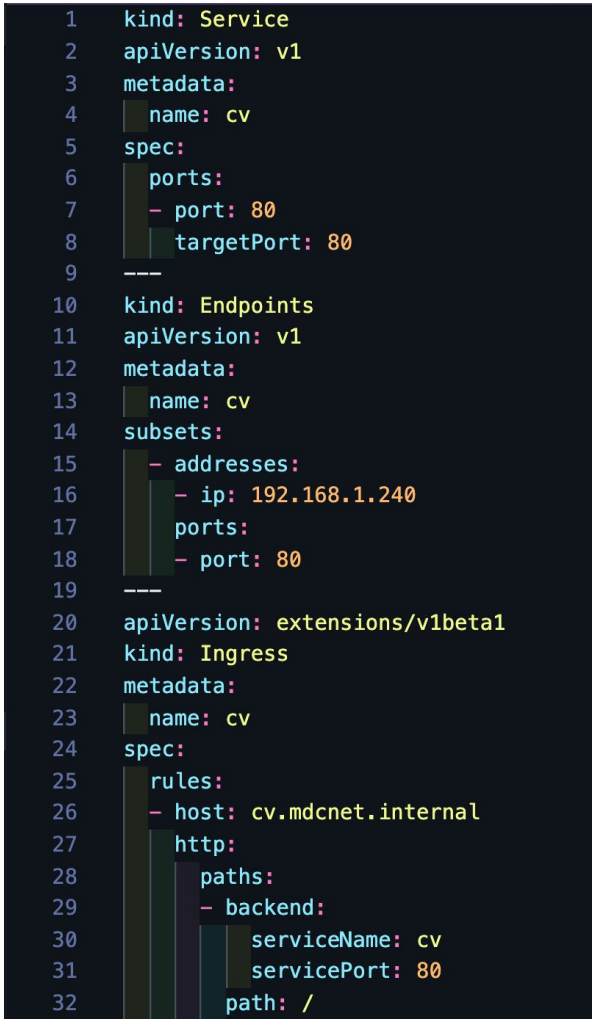

Ingress Object
Service Object
Endpoints Object
Service instance
1 or more instances



```yaml
kind: Service
apiVersion: v1
metadata:
  name: cv
spec:
  ports:
  - port: 80
    targetPort: 80
---
kind: Endpoints
apiVersion: v1
metadata:
  name: cv
subsets:
  - addresses:
    - ip: 192.168.1.240
    ports:
    - port: 80
---
apiVersion: extensions/v1beta1
kind: Ingress
metadata:
  name: cv
spec:
  rules:
  - host: cv.mdcnet.internal
    http:
      paths:
      - backend:
          serviceName: cv
          servicePort: 80
        path: /
```

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Remover instâncias de HAProxy do ambiente de Flow para aplicações que não estão no Kubernetes.

ATENDIDO!

Novos problemas introduzidos:

1 - Cada serviço necessita de 3 objetos para serem configurados: ingress, service e endpoints

2 - Endpoints são configurações fixas e não removem endpoints com falha

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Desejos novos a serem atendidos:

1 - Configurar um único objeto no Kubernetes

2 - Atualizar os endpoints de forma dinâmica de acordo com a saúde do serviço

Controllers	Operators
Atua sobre os recursos core tais como deployments, services, endpoints. São tipicamente parte do Kubernetes controller-manager no control plane ou podem observar e manipular recursos customizados criados pelo usuário	São controllers que codificam algum conhecimento operacional, por exemplo, o ciclo de vida de uma aplicação em conjunto com recursos definidos pelo usuário

Endpoints Operator

1 - Configurar um único objeto no Kubernetes

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Custom Resource Definition

Custom Resource

ETCD

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apiVersion: v1
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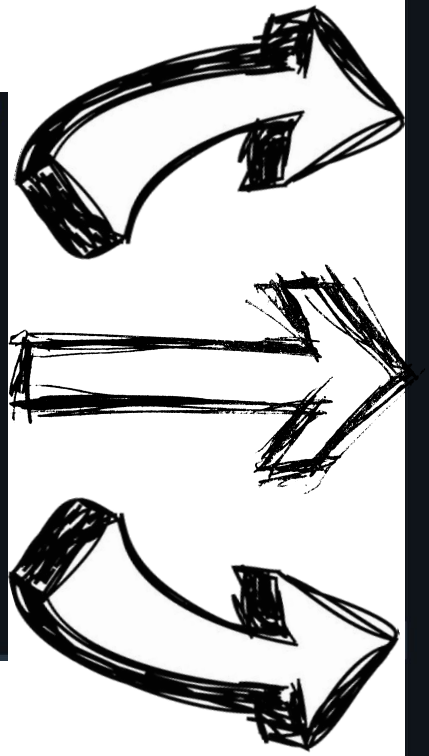
apiVersion: extensions/v1beta1
kind: Ingress
metadata:
  name: cv
spec:
  rules:
  - host: cv.mdcnet.internal
    http:
      paths:
      - backend:
          serviceName: cv
          servicePort: 80
        path: /
```

```yaml
apiVersion: endpoints.mdcnet.ninja/v1alpha1
kind: EndpointService
metadata:
  name: cv
spec:
  url: cv.mdcnet.internal
  targetPort: 8000
  port: 80
  path: "/"
  scheme: "http"
  endpoints:
    - "192.168.1.240"
  healthcheck:
    protocol: "HTTP"
    path: "/"
```

```yaml
apiVersion: endpoints.mdcnet.ninja/v1alpha1
kind: EndpointService
metadata:
  name: cv
spec:
  url: cv.mdcnet.internal
  targetPort: 8000
  port: 80
  path: "/"
  scheme: "http"
  endpoints:
    - "192.168.1.240"
  healthcheck:
    protocol: "HTTP"
    path: "/"
```



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```

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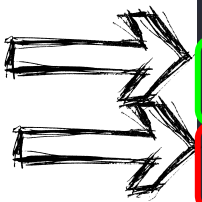
2 - Atualizar os endpoints de forma dinâmica de acordo com a saúde do serviço



```
apiVersion: v1
kind: Endpoints
metadata:
  creationTimestamp: "2019-11-18T23:53:13Z"
  labels:
    endpointservice: cv
  name: cv
  namespace: default
  ownerReferences:
  - apiVersion: endpoints.mdcnet.ninja/v1alpha1
    blockOwnerDeletion: true
    controller: true
    kind: EndpointService
    name: cv
    uid: ba2817d1-621a-489c-9b0f-13477d5ad14f
  resourceVersion: "289025"
  selfLink: /api/v1/namespaces/default/endpoints/cv
  uid: 70442d00-b083-4733-8c76-b88d478819f0
subsets:
- addresses:
  - ip: 192.168.1.188
  notReadyAddresses:
  - ip: 192.168.50.82
  ports:
  - port: 8000
    protocol: TCP
```

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ATENDIDOS!

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Melhorias e funcionalidades próximas versões:

- Suporte TLS (ingress e endpoints);
- Paralelização dos testes dos endpoints;
- Múltiplos subsets para definir mais de uma porta no service;
- Gerar dinamicamente o ingress e o service em caso de update do EndpointService.


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