



KubeCon EU - 19 April 2023

What Happened to the Service Catalog?



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This talk is about ...

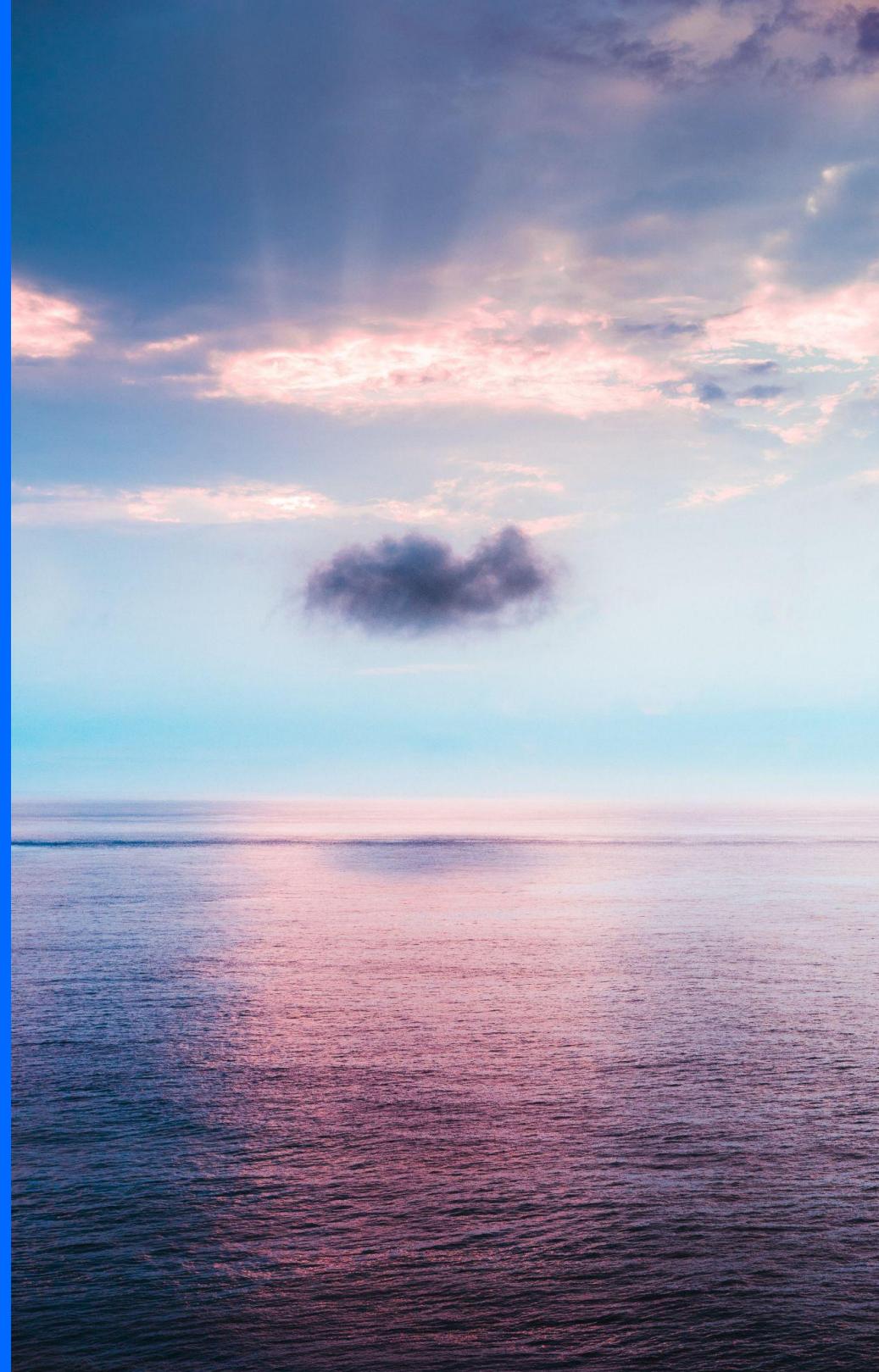
Service Catalog





This talk is (actually) about ...

Consuming external services from applications running under Kubernetes



Who's This Guy?

Engineer @ DigitalOcean

Public cloud provider: VMs, Kubernetes, Databases, all that stuff

Now: Product Strategy

Helping teams decide what to build and how to build it

Previously: Kubernetes

Tech lead for Kubernetes and Container Registry products

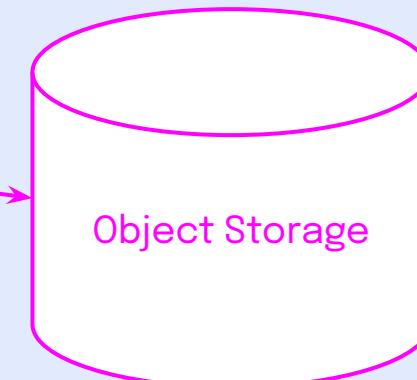
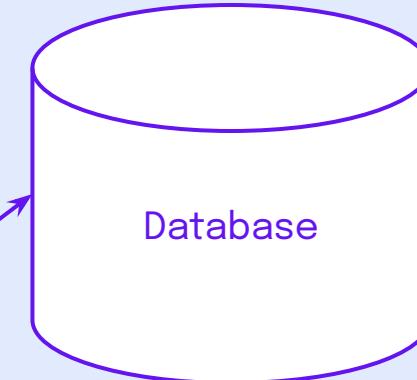


The Problem





My Cool Application



My Cool Application

Database

Message Queue

Object Storage

Email Service



Create Database Cluster

Choose a datacenter region

<input checked="" type="radio"/> Toronto • Datacenter 1 • TOR1	4 resources
<input type="radio"/> San Francisco • Datacenter 2 • SFO2	1 resource
<input type="radio"/> San Francisco • Datacenter 3 • SFO3	1 resource
<input type="radio"/> Frankfurt • Datacenter 1 • FRA1	1 resource
<input type="radio"/> Additional datacenter regions	▼

VPC network - default-tor1

All resources created in this datacenter will be members of the same [VPC network](#). They can communicate securely over their Private IP addresses.

Choose a database engine

<input type="radio"/> MongoDB	v6.0 ▾
<input type="radio"/> PostgreSQL	v15 ▾
<input checked="" type="radio"/> MySQL	v8
<input type="radio"/> Redis	v7

CONNECTION DETAILS

Public network VPC network

Connection parameters

```
username = doadmin
password = *****
show
host = my-cool-database-do-user-3762168-
0.b.db.ondigitalocean.com
port = 25060
database = defaultdb
sslmode = REQUIRED
```

User: doadmin

Copy Download CA certificate

```
emacs@gitugi
> secret.yaml > data
apiVersion: v1
kind: Secret
metadata:
  name: database-credentials
  namespace: my-cool-namespace
data:
  mysqlhost: "my-cool-database-do-user-3762168-0.b.db.ondigitalocean.com"
  ...

```

emacs@gitugi

```
terraform {
  required_providers {
    digitalocean = {
      source = "digitalocean/digitalocean"
      version = "~> 2.0"
    }
  }

  variable "do_token" {}

  provider "digitalocean" {
    token = var.do_token
  }

  resource "digitalocean_database_cluster" "my_cool_database" {
    name = "my-cool-database"
    engine = "mysql"
    version = "8"
    node_count = 1
    size = "db-s-1vcpu-1gb"
    region = "tor1"
  }
}
```



```
emacs@gitugi
> secret.yml > spec > spec > containers > 0 > env > 0 >
apiVersion: v1
kind: Secret
metadata:
  name: database-credentials
  namespace: my-cool-namespace
data:
  mysqlhost: "{{ MYSQL_HOST }}"
  ...
  ...
apiVersion: apps/v1
kind: Deployment
metadata:
  name: my-cool-application
  namespace: my-cool-namespace
  labels:
    app: my-cool-application
spec:
  selector:
    matchLabels:
      app: my-cool-application
  template:
    metadata:
      labels:
        app: my-cool-application
    spec:
      containers:
        - name: my-cool-application
          image: docker.io/adamwg/cool-application:latest
          imagePullPolicy: Always
        env:
          - name: MYSQL_HOST
            valueFrom:
              secretKeyRef:
                name: database-credentials
                key: mysqlhost

```

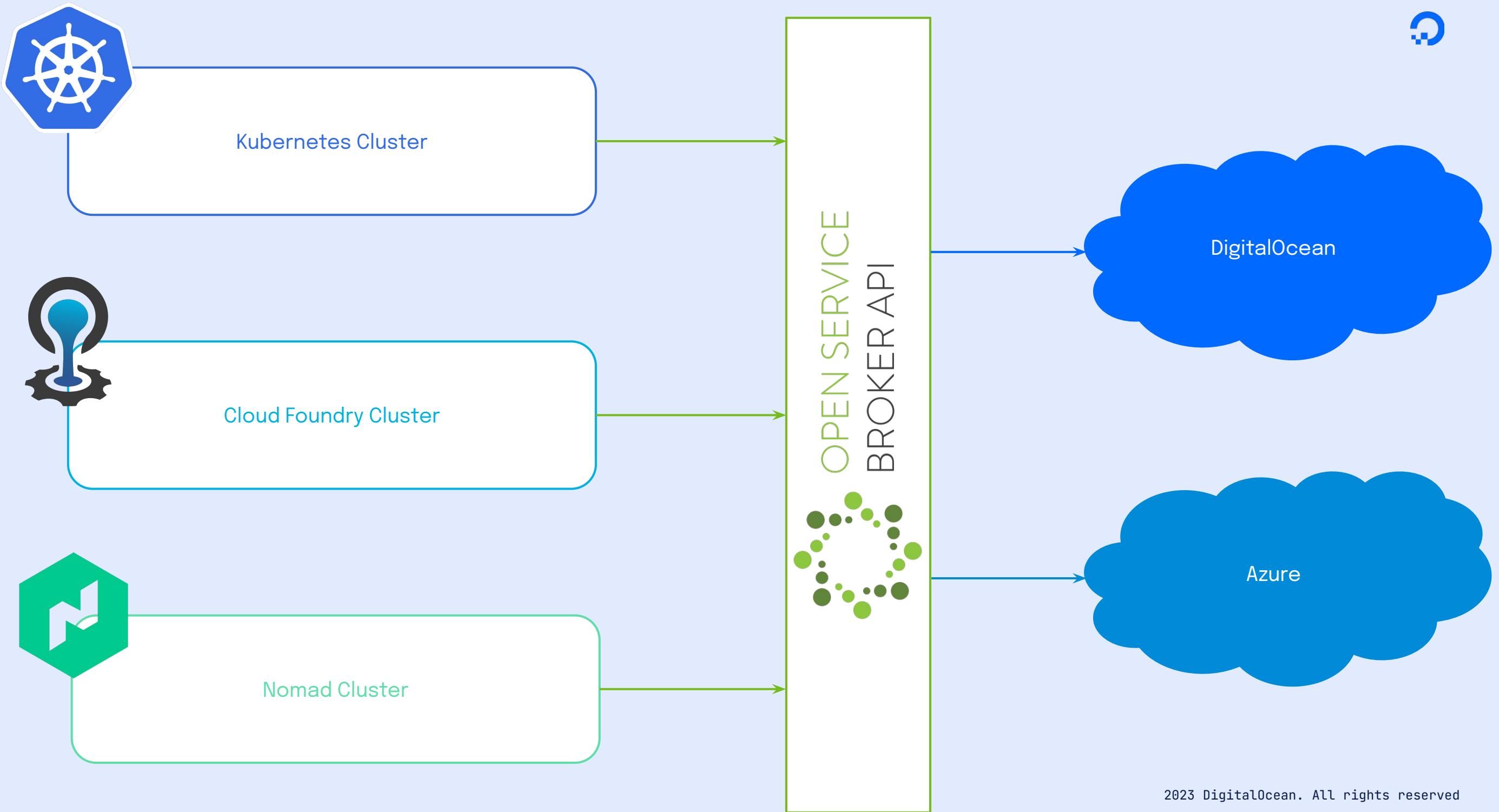


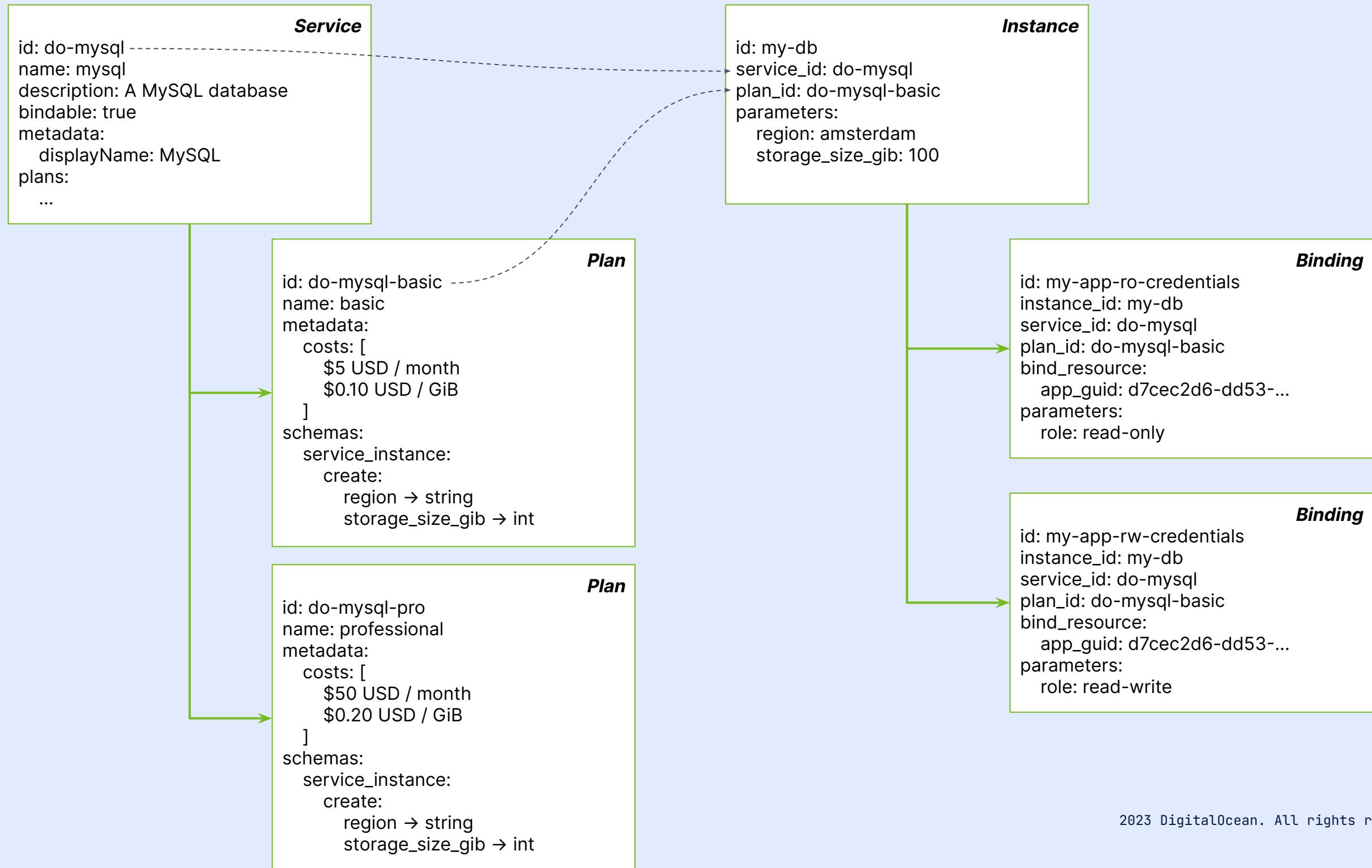


Service Catalog



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```
root@kubecon-example:~# kubectl get crd
```

NAME	CREATED AT
clusterservicebrokers.servicecatalog.k8s.io	2023-03-31T22:17:41Z
clusterserviceclasses.servicecatalog.k8s.io	2023-03-31T22:17:41Z
clusterserviceplans.servicecatalog.k8s.io	2023-03-31T22:17:41Z
servicebindings.servicecatalog.k8s.io	2023-03-31T22:17:41Z
servicebrokers.servicecatalog.k8s.io	2023-03-31T22:17:41Z
serviceclasses.servicecatalog.k8s.io	2023-03-31T22:17:41Z
serviceinstances.servicecatalog.k8s.io	2023-03-31T22:17:41Z
serviceplans.servicecatalog.k8s.io	2023-03-31T22:17:41Z

```
root@kubecon-example:~# 
```

```
root@kubecon-example:~# kubectl get clusterservicebroker
```

NAME	URL	STATUS	AGE
digitalocean	http://foo:bar@do-svc-catalog-broker.default.svc.cluster.local:9999	Ready	2m53s

```
root@kubecon-example:~# 
```



```
root@kubecon-example:~# kubectl get clusterserviceclass
NAME      EXTERNAL-NAME    BROKER          AGE
mysql     mysql            digitalocean   3m28s
root@kubecon-example:~#
```

```
root@kubecon-example:~# kubectl get clusterserviceplan
NAME      EXTERNAL-NAME    BROKER          CLASS    AGE
default   default          digitalocean   mysql    3m59s
root@kubecon-example:~#
```

```
root@kubecon-example:~# kubectl get serviceinstance
NAME      CLASS           PLAN      STATUS      AGE
my-sql    ClusterServiceClass/mysql  default  Provisioning  8s
root@kubecon-example:~# kubectl get servicebinding
NAME      SERVICE-INSTANCE    SECRET-NAME    STATUS      AGE
my-db-binding  my-sql        db-creds      ErrorInstanceNotReady  13s
root@kubecon-example:~#
```

```
root@kubecon-example:~/do-svc-catalog# kubectl get secret
NAME      TYPE      DATA  AGE
db-creds  Opaque    1     114s
All rights reserved
```



Advantages



Discoverability



Decoupling

A photograph of a wall filled with books, their spines facing outwards. The books are bound in various ways, including traditional thread stitching, leather covers, and modern plastic wraps. Some have red or blue labels. A blue horizontal bar is overlaid across the middle of the image.

Service Bindings



Downfalls

A photograph of the Leaning Tower of Pisa, showing its iconic tilt and intricate Gothic architectural details. The tower is set against a vibrant blue sky with scattered white clouds. A blue horizontal bar is overlaid across the middle of the image, containing the text.

Execution / Timing



Yet Another API



Validation



Multiple Sources of Truth



Operators



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An Operator is a Controller for a Custom Resource



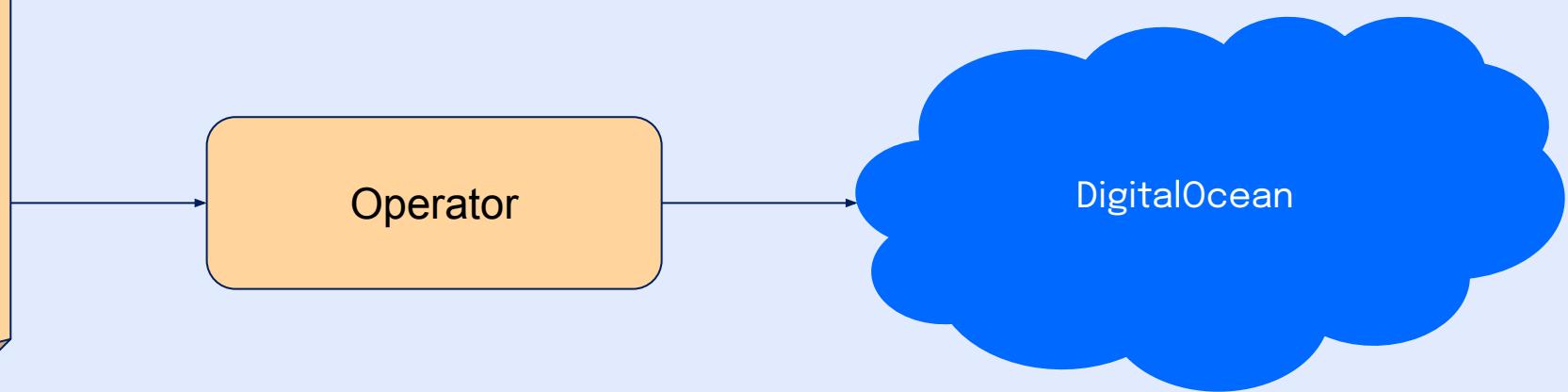
A user-defined
Kubernetes
API resource



A control loop that moves
current state closer to
desired state.



```
apiVersion: databases.digitalocean.com/v1alpha1
kind: DatabaseCluster
metadata:
  name: sample-mysql-database
spec:
  engine: mysql
  name: sample-mysql-database
  version: '8'
  numNodes: 1
  size: db-s-1vcpu-1gb
  region: tor1
```





Advantages



Full Control



No New APIs

A large, weathered wooden ship's steering wheel is the central focus, mounted on a dark metal pedestal. The wheel has a dark center hub with a small emblem and four spokes. The outer ring of the wheel is heavily stained with brown and orange rust. The background shows a bright blue sky with scattered white clouds, palm trees, and power lines. The boat's white railing and a blue railing in the distance are visible. The overall lighting is bright and sunny.

Kubernetes Native

Developer Tools

A close-up photograph of a person's hand holding a silver pen, poised to write in a checklist. The checklist is handwritten in blue ink on lined paper. It contains several items, each preceded by a small square checkbox. Some checkboxes are checked, while others are empty. The background is slightly blurred, showing more of the notebook and the pen's reflection.

Client-Side Validation



Downfalls



Coupling

(Un)Discoverability



A photograph of a wall filled with books, their spines facing outwards. The books are bound in various styles, including traditional thread-bound books and more modern stab-bound or tape-bound books. Some books have red or blue covers, while others are plain or dark-colored. The lighting creates strong shadows, emphasizing the texture of the book spines.

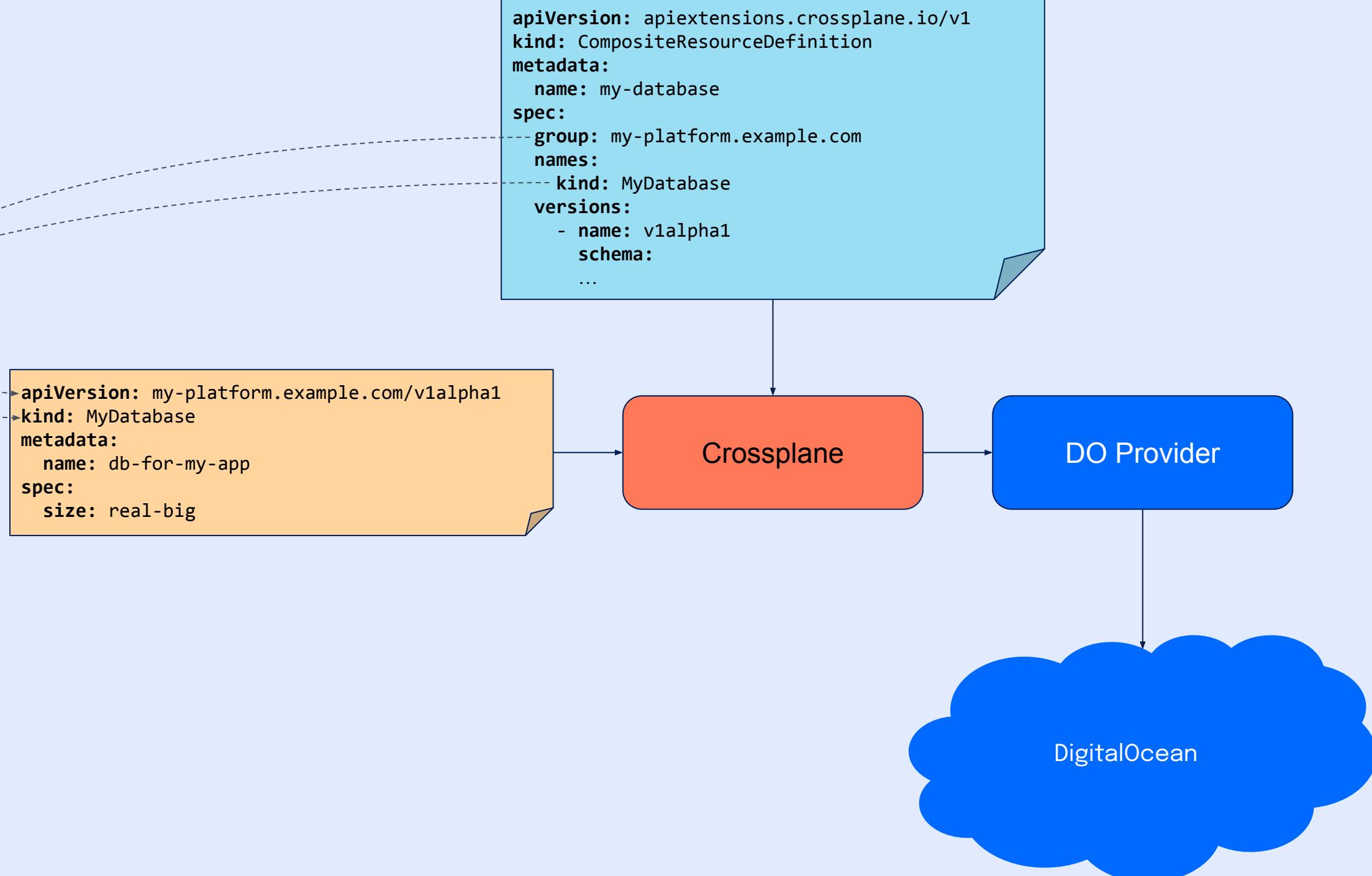
Service Bindings



Crossplane



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Advantages

Common model across
multiple providers

Good tools for building
providers

Kubernetes Native

Client-side validation
is possible

Strong momentum /
adoption

“Claims” are a lot like
service bindings

Downfalls

Complexity

(Un)Discoverability

Multiple Sources of Truth

Coupling

Generic Infrastructure Management



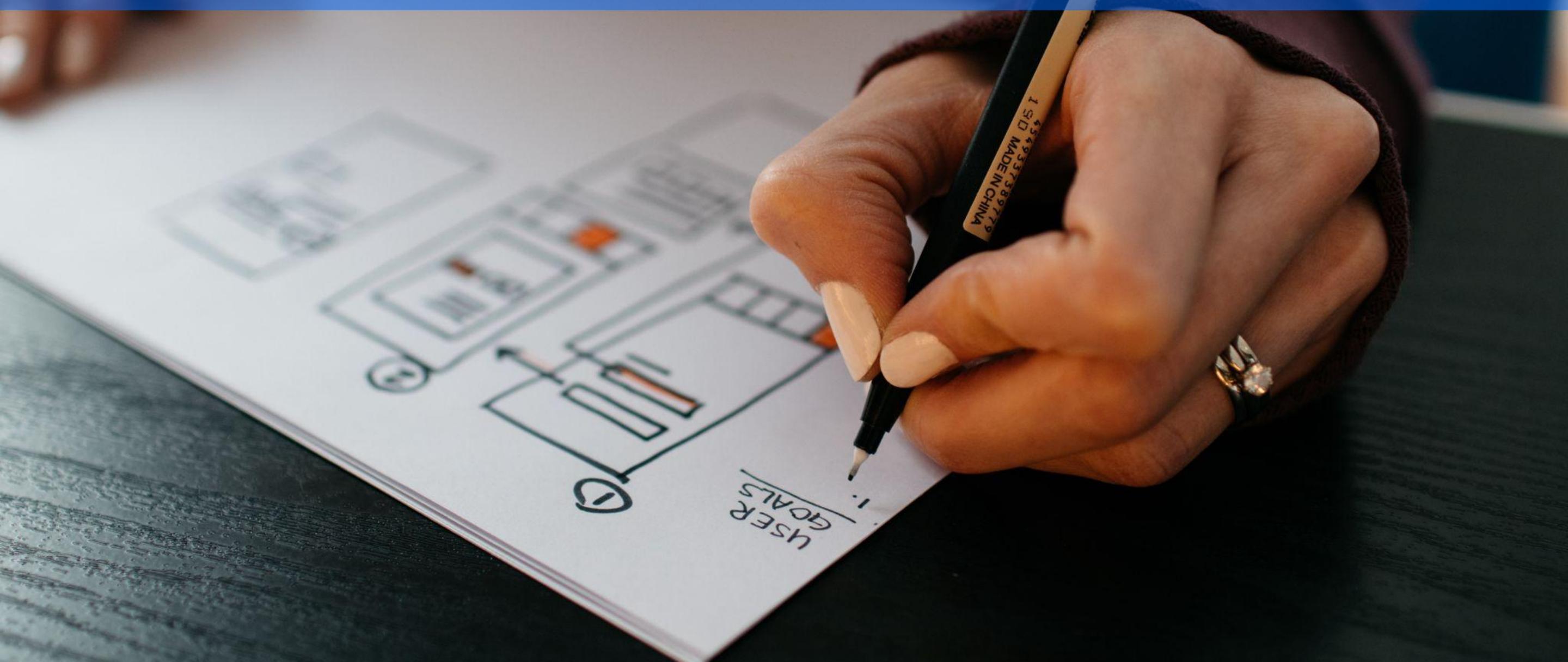
The Future



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Application Defined Infrastructure



Low Barrier to Entry



A photograph of a long, bright orange garden hose lying on a green lawn. The hose is coiled in a loose S-shape across the frame. It starts from the bottom right, goes up and to the left, then down and to the right again. A small green connector is visible near the bottom left end. The background is a flat, green grassy field.

Flexibility



Reflect on the Past



Thank You!

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