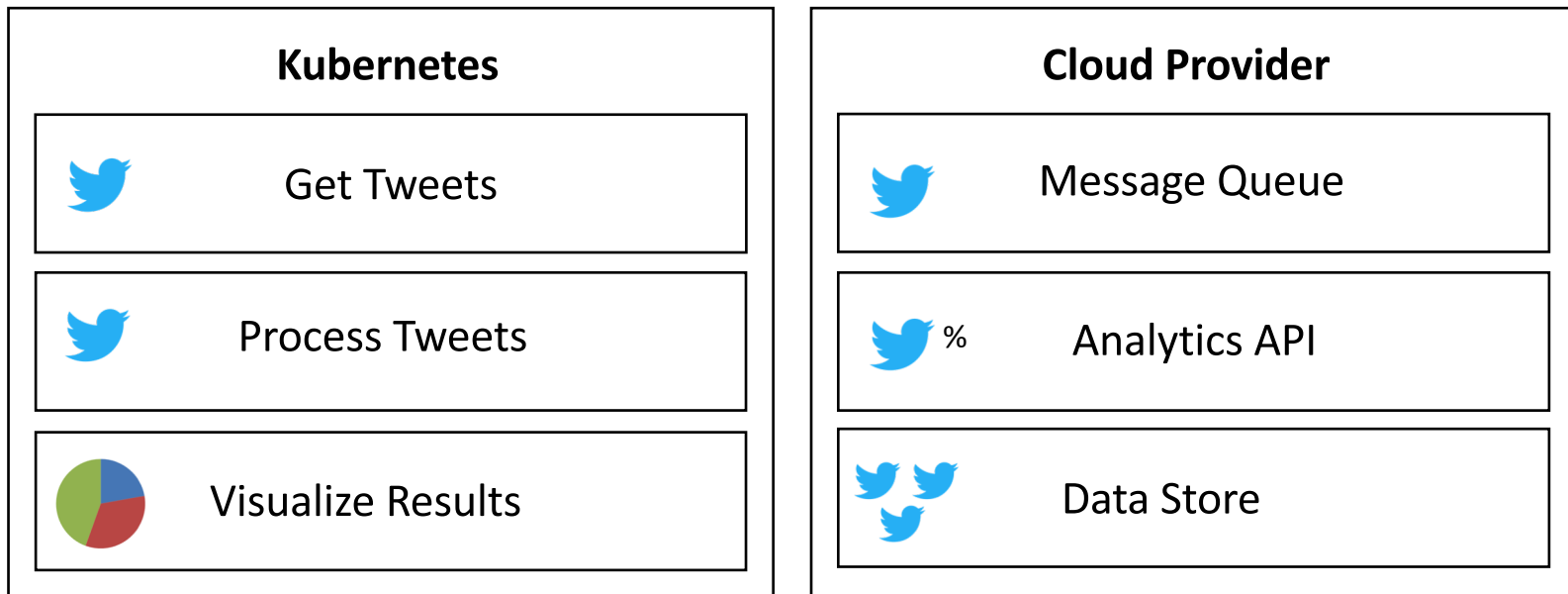# Consuming cloud services with the Kubernetes Service Catalog

Neil Peterson | @nepeters

Agenda

- Example application (problem statement)
- Kubernetes (beyond containers)
- Integrating Kubernetes with cloud providers (Service Catalog)
- Closer look at Service Catalog objects
- End to end demos

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Example application

Kubernetes	Cloud Provider
Get Tweets	Message Queue
Process Tweets	Analytics API
Visualize Results	Data Store

Application - https://github.com/Azure-Samples/helm-charts/tree/master/chart-source/twitter-sentiment

Technology spanning applications

A single application can be built / deployed across a diverse technical stack (Kubernetes, functions, hosted data store, etc.).

Deployment and management challenges
- Multiple deployment routines
- Multiple management tools
- Secrets management
- Instance management

Kubernetes

Platform on which to run applications, SaaS, and PaaS solutions ++ .

- API allows for custom integrations (CRDs, API Extension)
- Runtime for building and managing applications
- So, how can Kubernetes integrate with cloud providers?

Open Service Broker

API specification for a standard cloud provider interface.

- Framework for provisioning and accessing managed cloud services
- Specifies five operations (provision, bind, unbind, deprovision, update)

Service Brokers

Open Service Broker compliant API for specific cloud providers and others managed services.

Azure - https://github.com/Azure/open-service-broker-azure

AWS - https://github.com/awslabs/aws-servicebroker/

Google Cloud - https://cloud.google.com/kubernetes-engine/docs/concepts/google-cloud-platform-service-broker
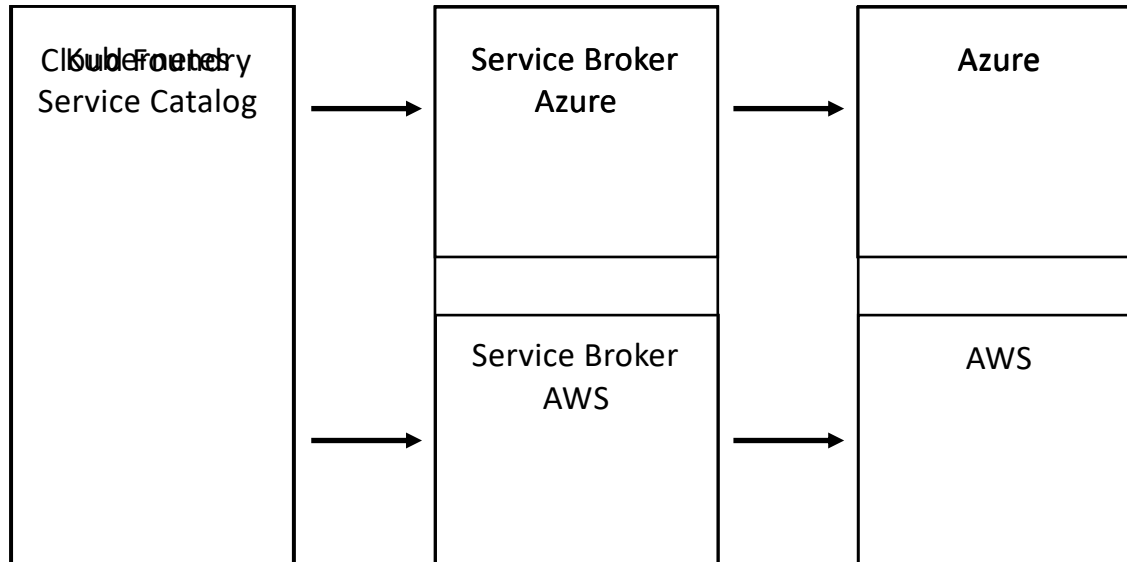
Kubernetes Service Catalog

Enlightens Kubernetes so that it "speaks" Open Service Broker.

Adds five new types to Kubernetes
- ClusterServiceBroker
- ClusterServiceClass
- ClusterServicePlan
- ServiceInstance
- ServiceBinding

How do these components line up

Broker, Class, and Plans

Catalog of cloud provider offerings.

- ClusterServiceBroker – the catalog and interface logic
- ClusterServiceClass – offering type (MySQL, storage, analytics API)
- ClusterServicePlan – Service Class tier (premium, standard, enterprise)

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ServiceInstance

Represents an instance of a managed service.

- Intent to provision cloud service
- Watched by service catalog controller
- Service is created by service broker

ServiceBinding

Request for credentials and / or connection strings for a service instance.
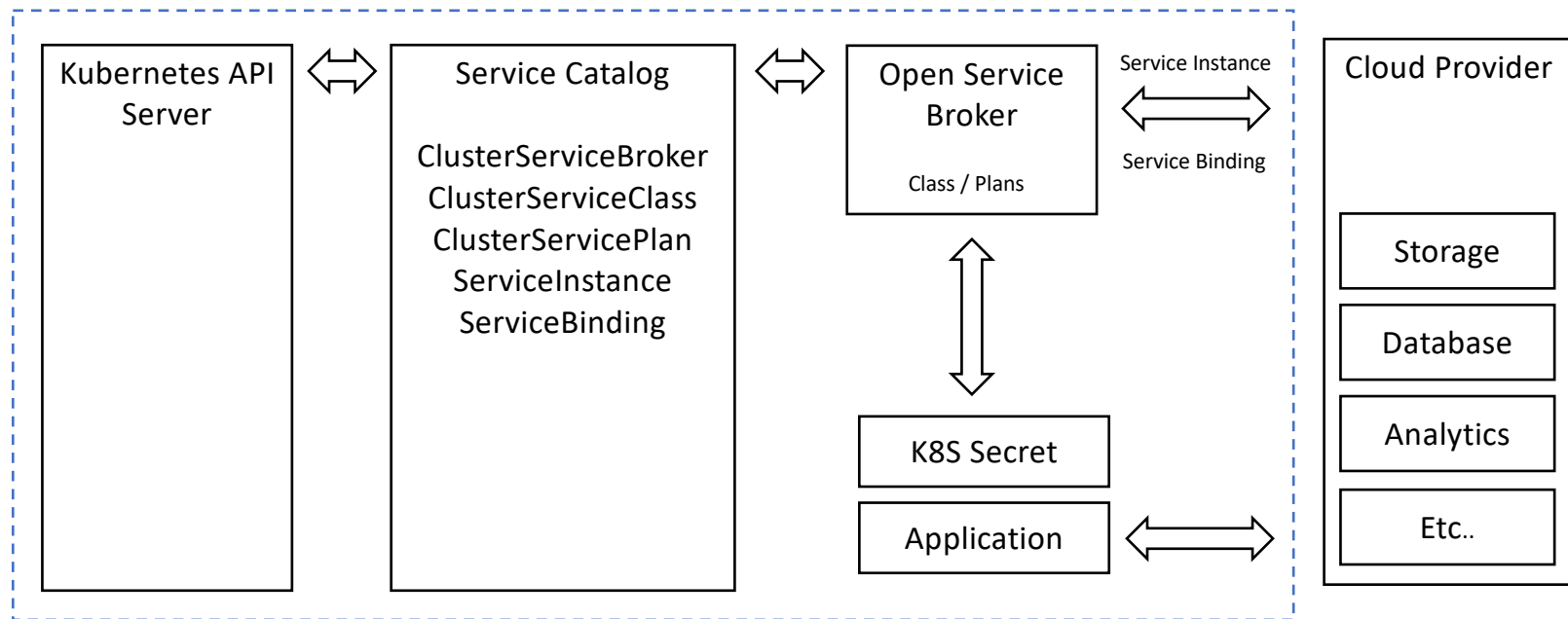
- Intent to use a cloud service
- Watched by service catalog controller
- Binding info stored in a Kubernetes secret

Application Consumption

How are service instances used?

- Define environment variables
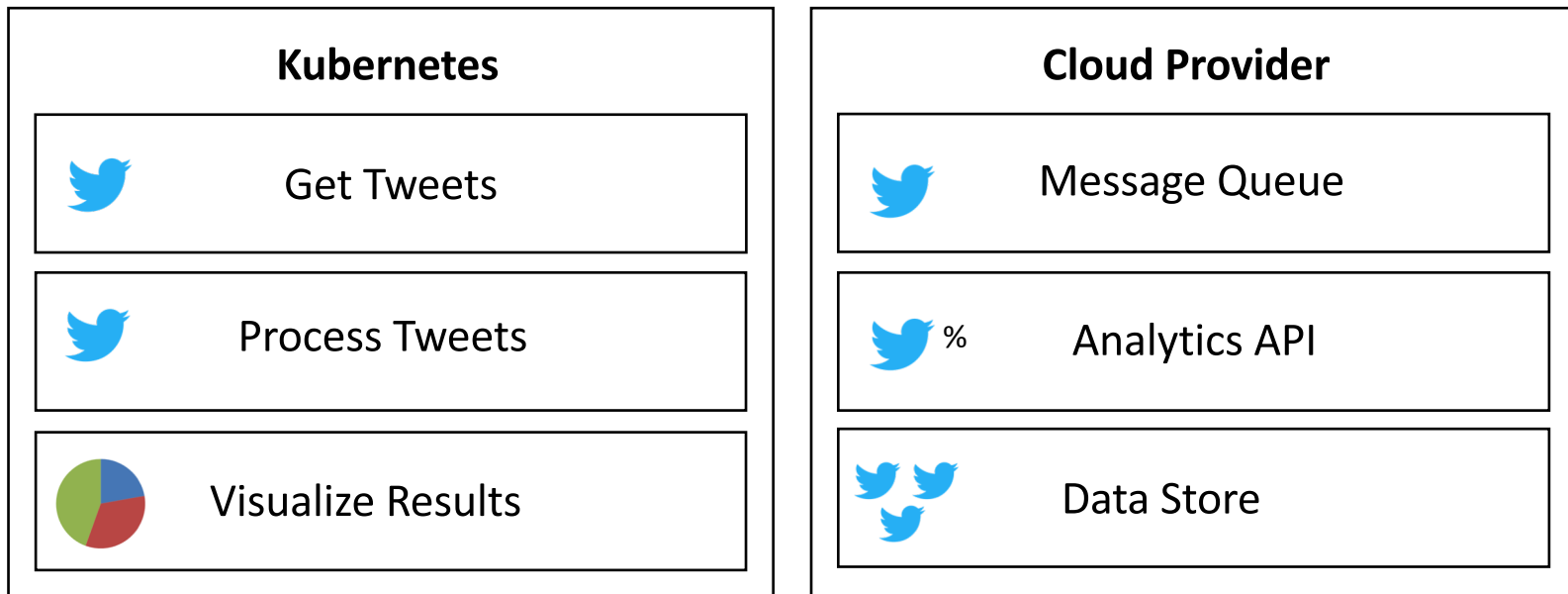- Get values from binding secret

API Diagram

Kubernetes API Server	Service Catalog	Open Service Broker	Cloud Provider

```
Kubernetes API          Service Catalog        Open Service          Cloud Provider
Server                                          Broker
                   ⇔    ClusterServiceBroker  ⇔                      Storage
                        ClusterServiceClass        Class / Plans
                        ClusterServicePlan                            Database
                        ServiceInstance                               Analytics
                        ServiceBinding                                Etc..
```

Service Instance

Service Binding

Class / Plans

K8S Secret

Application

Source - https://kubernetes.io/docs/concepts/extend-kubernetes/service-catalog/

SVCAT

Command line tool for managing service catalog objects.

- Not a requirement, simply a convenience tool
- Performs common tasks from the command line / ad hock
- Installed separately ([instructions](#))

Example application

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Additional Observations

Based on my experience.

- Some rough edges
- No current support for RBAC ([proposed spec](#))
- Potential alternatives to svc-cat
- Potential delay in cloud service parity
- Tight coupling between Helm release and cloud service

Demo

https://docs.microsoft.com/en-us/azure/aks/integrate-azure

https://github.com/neilpeterson/open-service-broker-azure-samples

https://github.com/Azure-Samples/helm-charts/tree/master/chart-source/twitter-sentiment