

# Multicloud CI/CD with OpenStack and Kubernetes

OpenStack Summit Berlin 2018

# Hi, I'm Maxime

Cloud Consultant

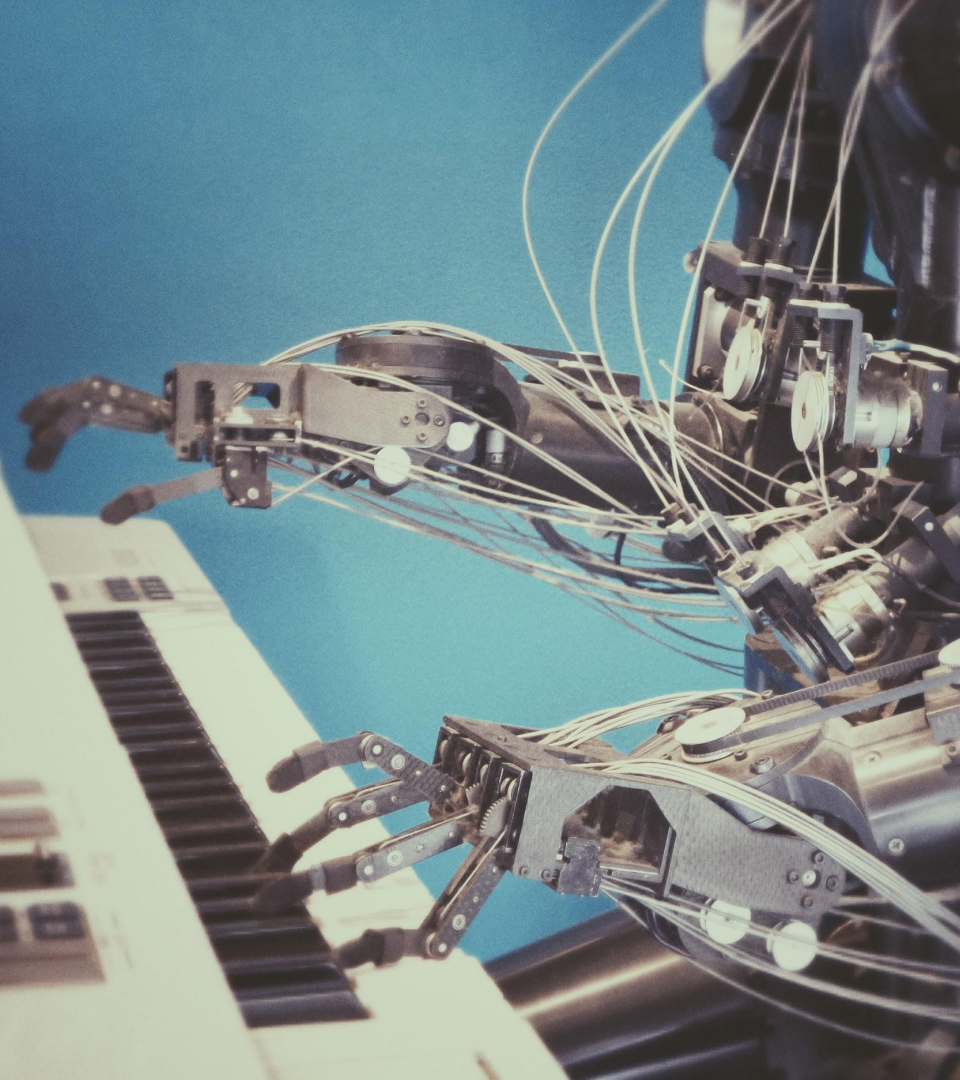
- Public & Private
- OpenStack
- Kubernetes
- Ceph
- CI/CD

# Introduction

# Multicloud

- Several providers
- Resiliency
- Vendor lock-in
- Cost & Hybrid
- Features
- Locations & Edge





# CI/CD

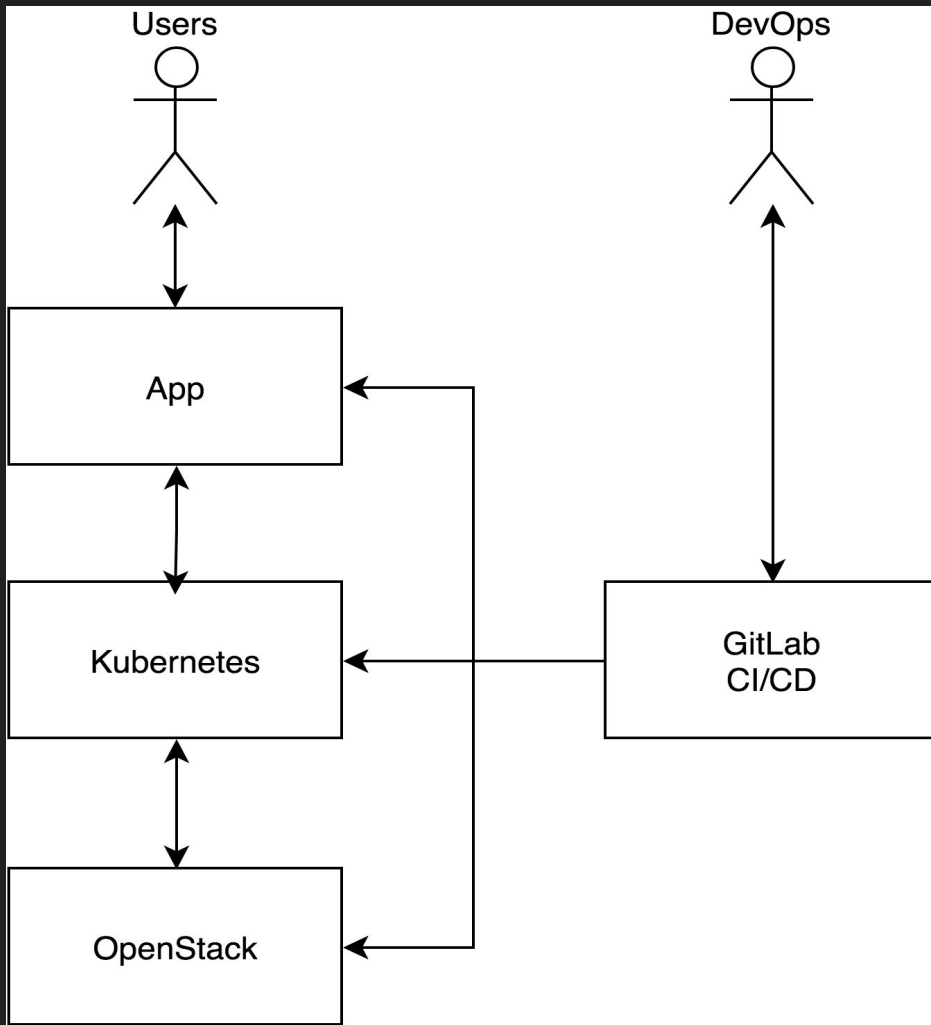
- Fail fast
- Automation
- Consistency



# OpenStack & Kubernetes

- OpenStack
  - API driven
  - Open Infrastructure
  - 60 Public cloud AZs
- Kubernetes
  - Container ecosystem
  - Developer centric
  - Reproducible
  - Portable





# Overview

## App

Business logic

## Kubernetes

Container platform

## OpenStack

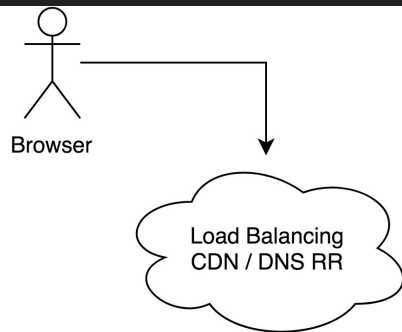
Infrastructure as a Service

# Multicloud architecture



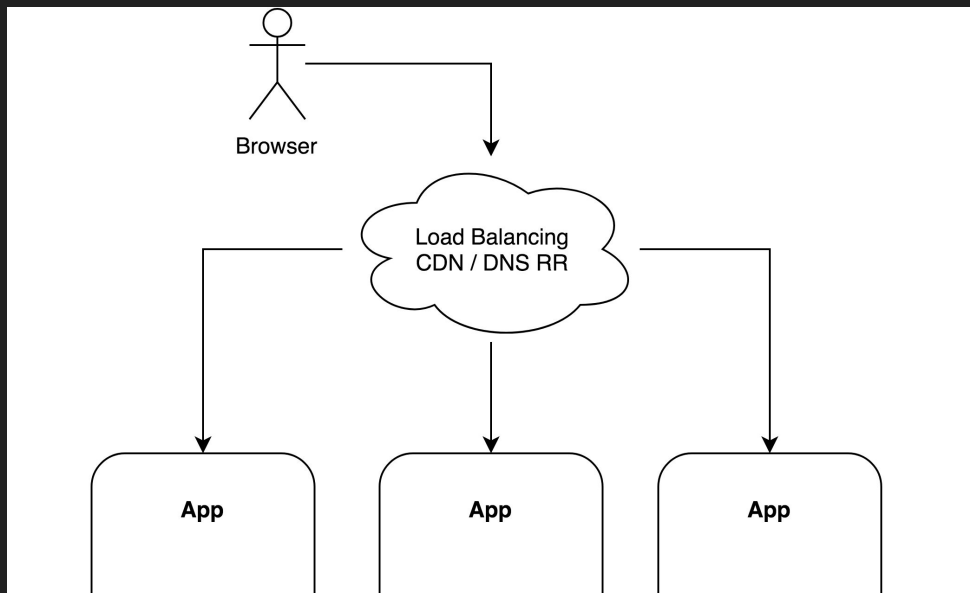
# The edge

- DNS name
- Global load balancing
  - CDN
  - DNS
    - Geo routing (Route53, Dyn)
    - DIY Dynamic DNS
    - Round Robin



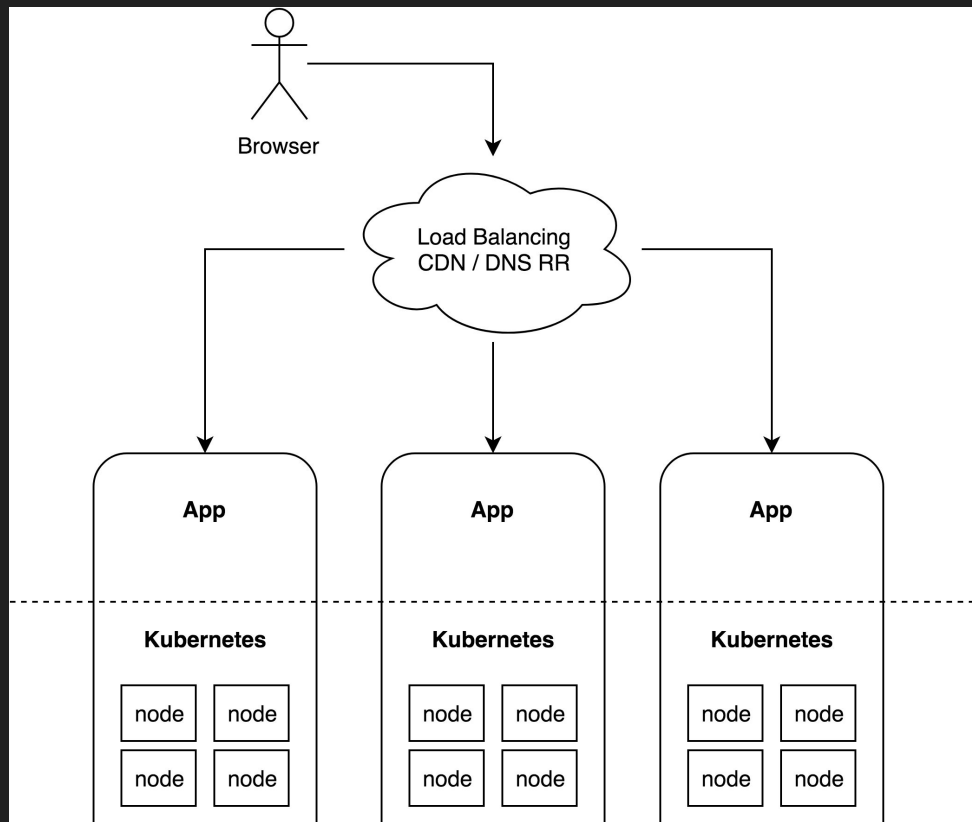
# The app

- 12 factor
- Dockerized
- HTTP based
- Distributed



# Kubernetes

- Cloud abstraction
- 1 cluster per location
- Ingress
- Federation...



# Kubernetes federation

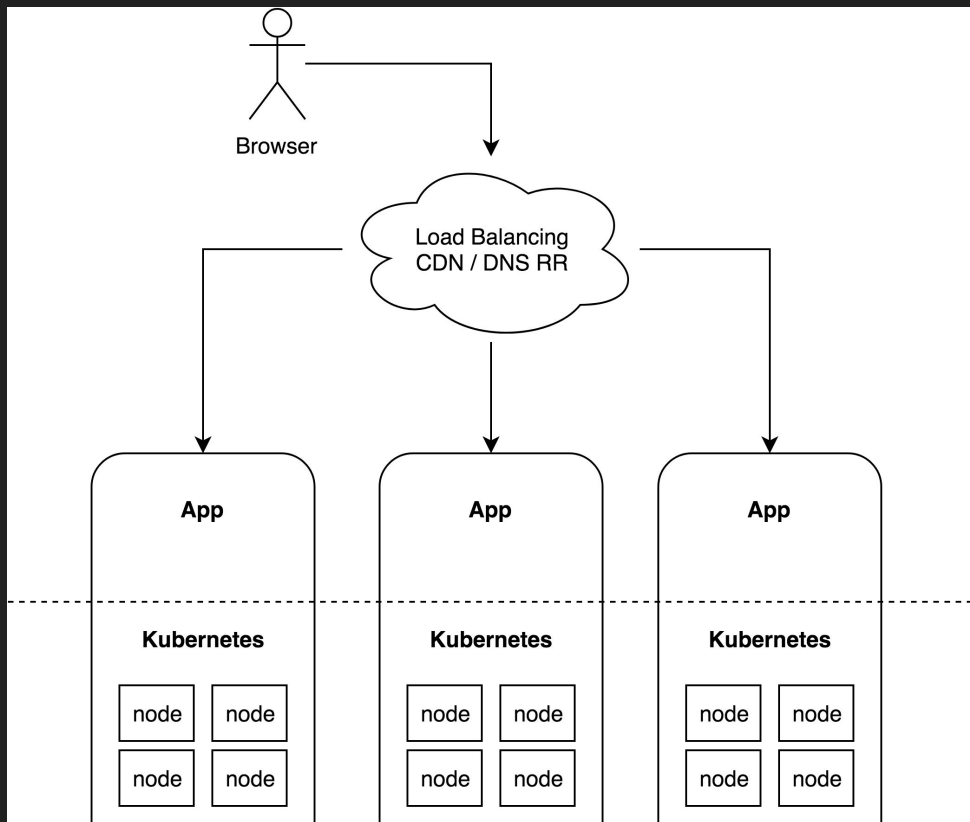
- Authentication federation

- OpenID or Webhook
- `--oidc-issuer-url`
- `--oidc-client-id`
- `kubectl --auth-provider=oidc`
  - or Kuberos

- Kubefed

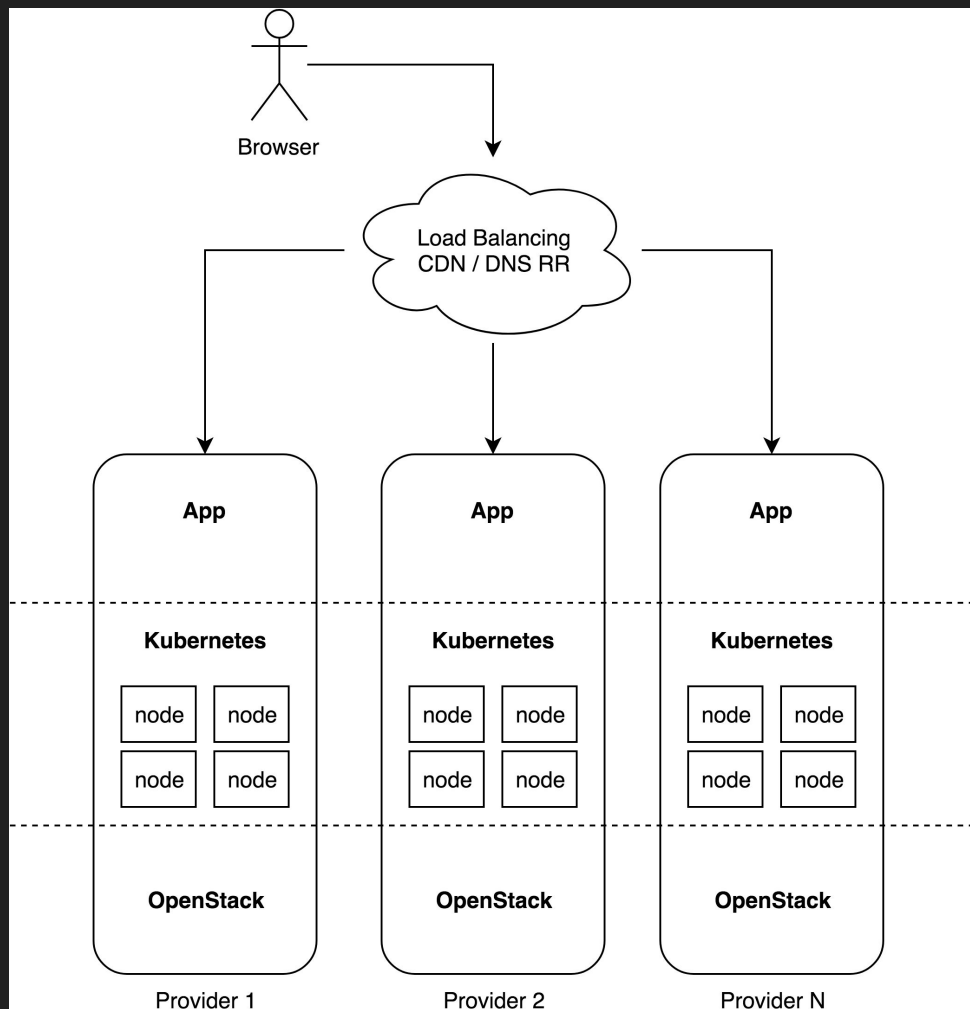
- One API to rule them all
- V1 discontinued
- V2 in development
  - Kube v1.11+
  - Beta Q4?

- DIY - GitLab



# OpenStack

- Nova
  - Servers / Instances
  - Security Groups
  - Key pairs
  - Server Groups (optional)
- Neutron
  - Network & Subnet
  - Router
  - Floating IPs



Cloud agnostic tools

# Infra tools

- Heat
  - OpenStack native
  - How about non-openstack clouds?
  - Smaller ecosystem
- Ansible
  - Cloud modules `os_server`, `os_floating_ip`, ...
  - Lots of clouds: AWS, GCP, VMware
- Terraform
  - Infra as a code
  - Execution plan
  - Even more cloud platforms





# Kubernetes install tools

- Magnum
  - OpenStack only
  - Smaller ecosystem
- Kops
  - No OpenStack support, AWS only
- Rancher
  - No OpenStack support
- Kubespray
  - Support: OpenStack, AWS, Azure, baremetal, VMware, ...
  - Ansible playbook
  - Terraform plans



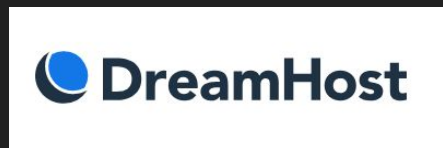
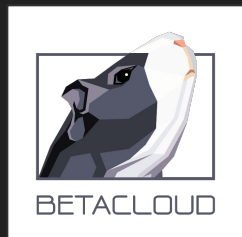
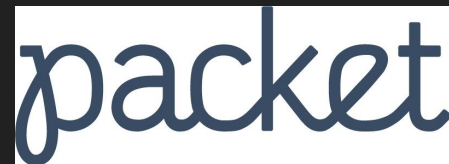
# Demo

Source: [gitlab.com/multicloud-openstack-k8s](https://gitlab.com/multicloud-openstack-k8s)

# Demo setup

- DNS RR
- Kubespray
- Terraform
- GitLab CI w/ Auto DevOps
  - docker build && helm install
- 35 regions
- Havana to Rocky

Source: [gitlab.com/multicloud-openstack-k8s](https://gitlab.com/multicloud-openstack-k8s)



Demo

Wrap Up

# Wrap Up

- Kubefed v2 is coming
- OpenStack interop is hard
  - Neutron routers
  - Floating IPs
  - Glance images
- Common denominator vs Exceptions



# Thank you!



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