Rancher Introduction

Christian Frank
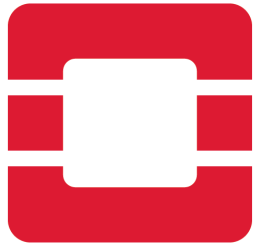February 18th
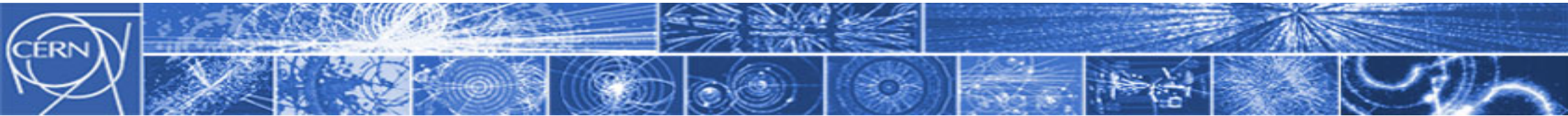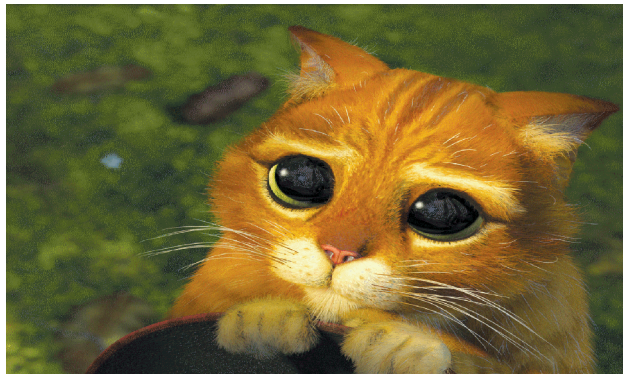teuto.net - Bielefeld (Smartsquare GmbH)

Experience

Experience

Service Model

cloudscaling

- Pets are given names like pussinboots.cern.ch
- They are unique, lovingly hand raised and cared for
- When they get ill, you nurse them back to health

- Cattle are given numbers like vm0042.cern.ch
- They are almost identical to other cattle
- When they get ill, you get another one

Future application architectures should use Cattle but Pets with strong configuration management are viable and still needed

Gavin McCance, CERN

Rancher Concepts

Enterprise Container Management Platform

RANCHER 2.0

COMPLETE
CONTAINER
MANAGEMENT
PLATFORM

Workload Management
User Interface • App Catalog • CI/CD • Monitoring • Logging

Unified Cluster Management
Provisioning • Authentication • RBAC • Policy • Security • Capacity • Cost

Rancher Kubernetes Engine (RKE)
vSphere • Bare metal

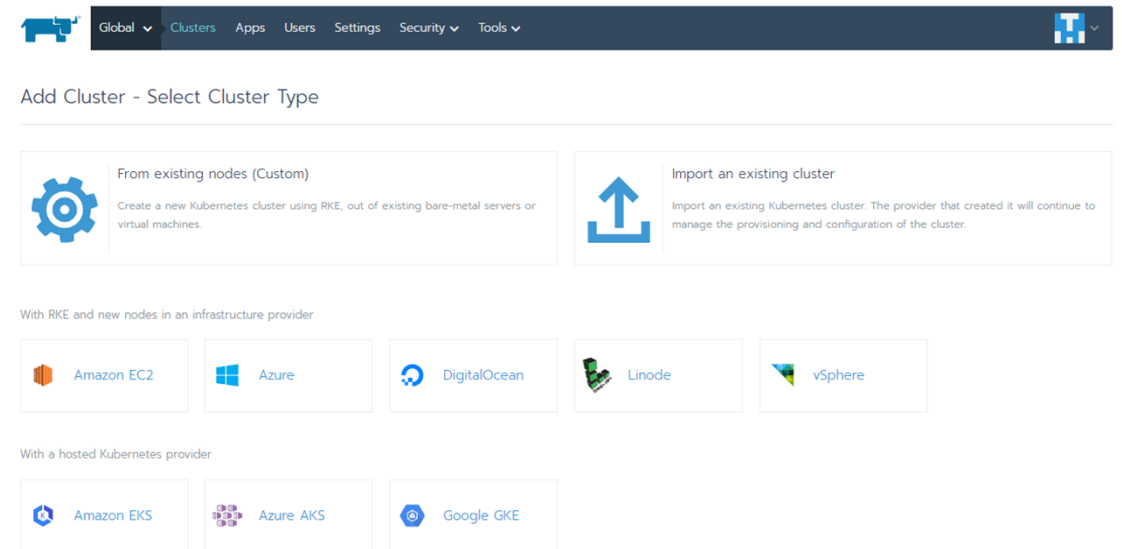| aws	Google Cloud Platform	Microsoft Azure	kubernetes
EKS	**GKE**	**AKS**	**Import**

Lighthouse
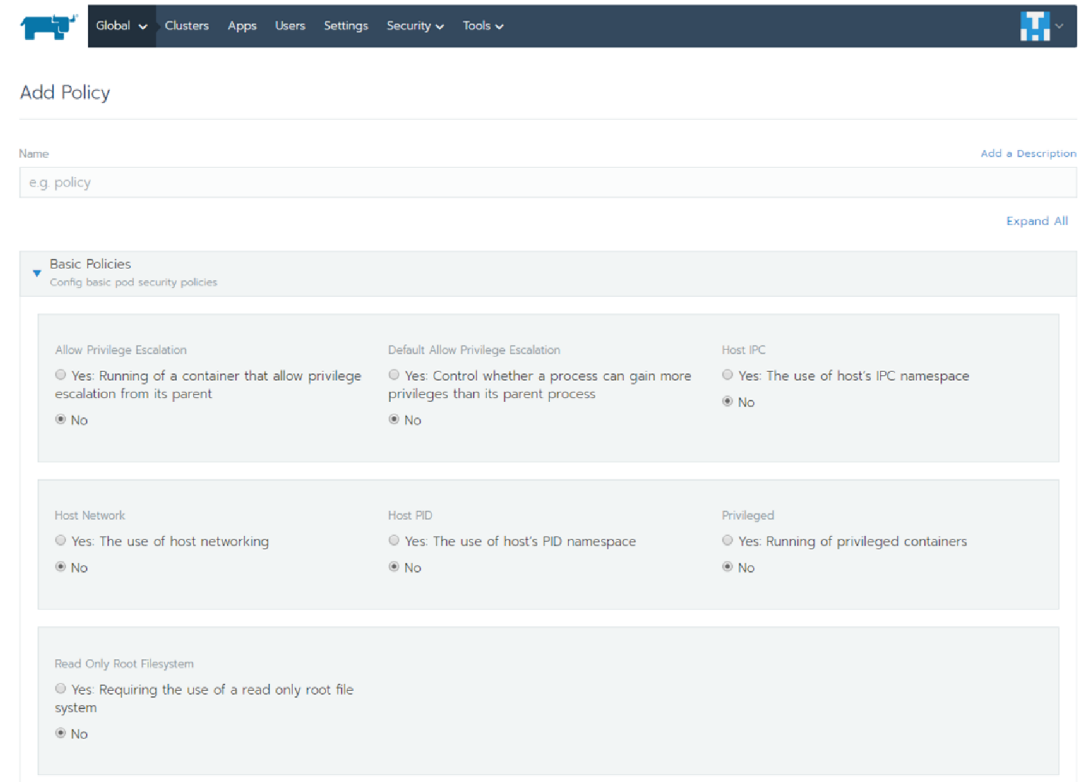
Multi-Cluster Kubernetes Management

1. Manage Kubernetes everywhere
    1. Cloud Hosted (GKE, EKS, AKS)
    2. Datacenter (BareMetal, OpenStack, VMware)
2. Importing existing clusters
3. Supports infrastructure as code
4. Upgrade, Backup and Restore clusters

Centralize Operations and Policy Management

Centrally define and apply policies
to any Kubernetes cluster
1. Pod security policies
2. Network security policies
3. RBAC policies

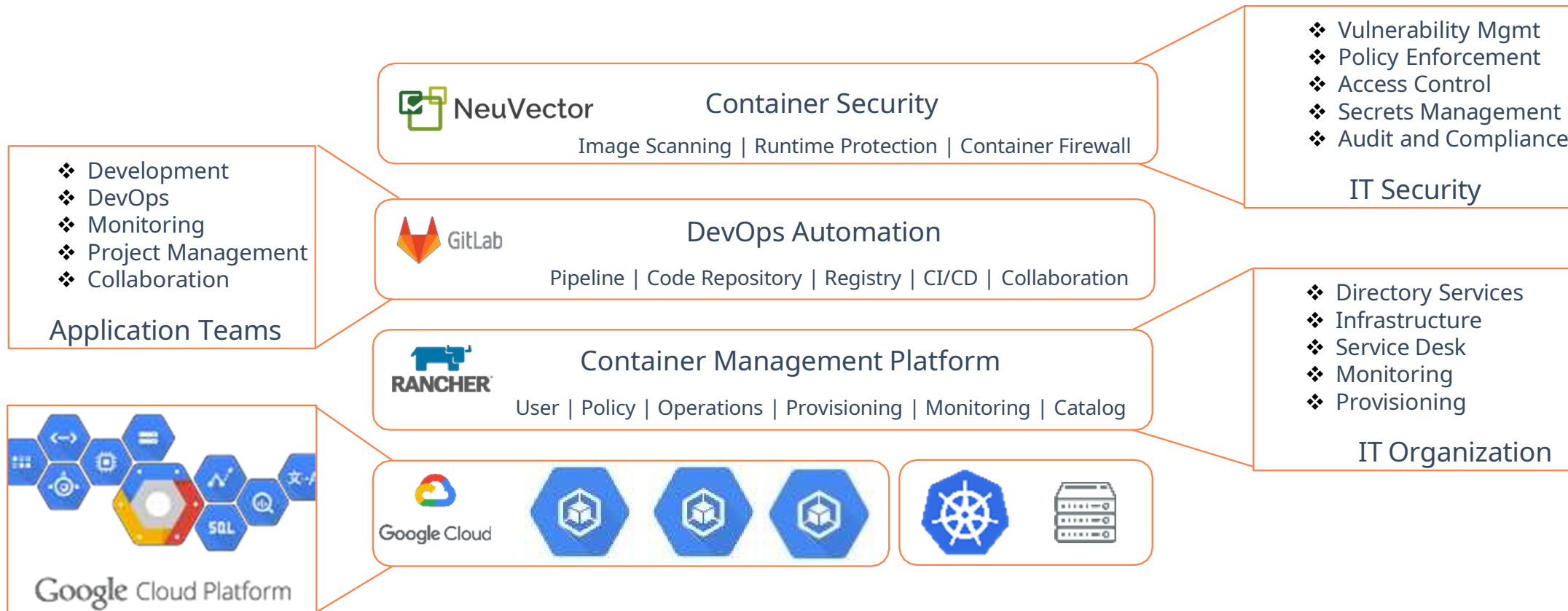Lighthouse

Simplify container administration

1. Powerful User Interface
2. CLI/API access for GitOps
3. Centralize access to shared and private Helm catalogs
4. Integrated monitoring and alerting
5. Automated logging

Building an Enterprise Container Service

NeuVector — Container Security

Image Scanning | Runtime Protection | Container Firewall

- ❖ Vulnerability Mgmt
- ❖ Policy Enforcement
- ❖ Access Control
- ❖ Secrets Management
- ❖ Audit and Compliance

IT Security

- ❖ Development
- ❖ DevOps
- ❖ Monitoring
- ❖ Project Management
- ❖ Collaboration

Application Teams

GitLab — DevOps Automation

Pipeline | Code Repository | Registry | CI/CD | Collaboration

- ❖ Directory Services
- ❖ Infrastructure
- ❖ Service Desk
- ❖ Monitoring
- ❖ Provisioning

IT Organization

RANCHER — Container Management Platform

User | Policy | Operations | Provisioning | Monitoring | Catalog

Google Cloud

Google Cloud Platform

Lighthouse

- Founded in 2014

- 130 Employees, 250+ Customers

- We build software that makes it easy for organizations to adopt containers.

- Rancher has been adopted by more than 20,000 teams running Docker and Kubernetes around the world

User Interface

Demo

Rancher CLI


```
(2313)minecraft:/home/cfrank>rancher help
Rancher CLI, managing containers one UTF-8 character at a time

Usage: rancher [OPTIONS] COMMAND [arg...]

Version: v2.0.4

Options:
  --debug       Debug logging
  --help, -h    show help
  --version, -v  print the version

Commands:
  apps, [app]               Operations with apps
  catalog                   Operations with catalogs
  clusters, [cluster]       Operations on clusters
  context                   Operations for the context
  inspect                   View details of resources
  kubectl                   Run kubectl commands
  login, [l]                Login to a Rancher server
  namespaces, [namespace]   Operations on namespaces
  nodes, [node]             Operations on nodes
  projects, [project]       Operations on projects
  ps                        Show workloads in a project
  settings, [setting]       Show settings for the current server
  ssh                       SSH into a node
  up                        apply compose config
  help, [h]                 Shows a list of commands or help for one command

Run 'rancher COMMAND --help' for more information on a command.
(2313)minecraft:/home/cfrank>
```

https://rancher.com/docs/rancher/v2.x/en/cli/

Rancher Catalog

Catalog Overview

- The Catalog is a collection of application templates that make it easy to deploy complex stacks
- Includes Helm Charts as of Rancher 2.0
- Decouples stack deployment from Docker knowledge
- Enables non-technical users to deploy stacks
- Allows site admins to maintain control over Docker image versions in deployment
- Global and cluster-level catalog repositories
- Enable applications per-cluster or per-client

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Multi-Cluster Applications

- Reliable, repeatable deployments
- Reduce operational workload
- Reduce cross-AZ spend on data transfer
- Improve application availability
- Atomic installations and upgrades

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Global DNS Integration

- Connect applications and their DNS records
- Works with multi-cluster apps
- Automatically updates on cluster change
- Does away with manual DNS updates when apps change

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Catalog - Library

- Rancher Server infrastructure stacks
- Provided by Rancher and vendors
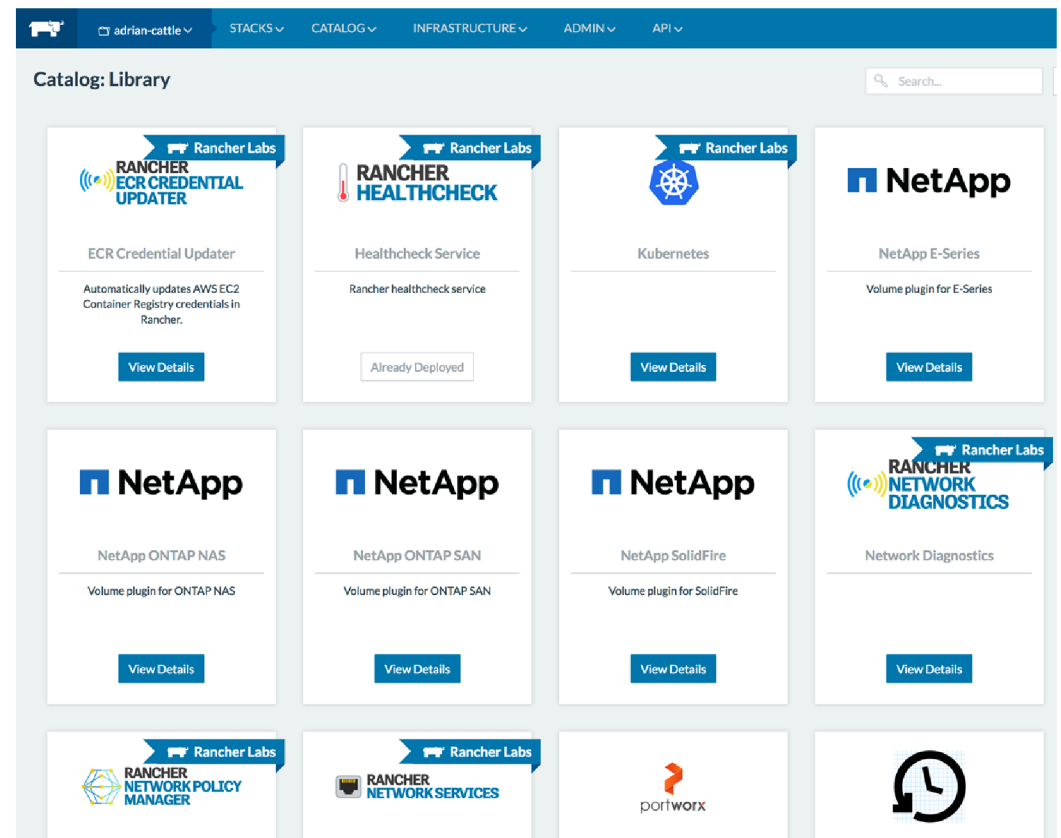
Catalog - Community

- User stacks

- Provided by Rancher, vendors, and community members

- Basic vetting by Rancher staff

- No support unless Rancher certified
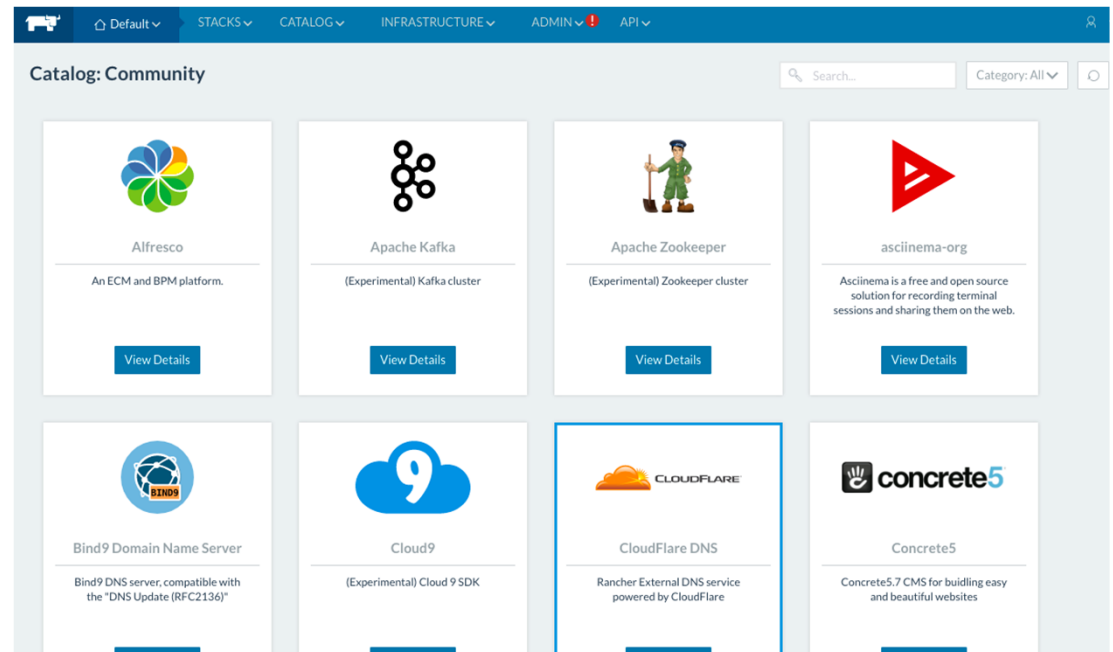
Catalog Structure

- Git repository
- Consists of Helm Charts
- Refreshed every few minutes
- Follows a specific structure
- Allows you to create your own private catalogs
- See https://github.com/rancher/charts for details and structure
- See https://rancher.com/docs/rancher/v2.x/en/catalog/ for documentation
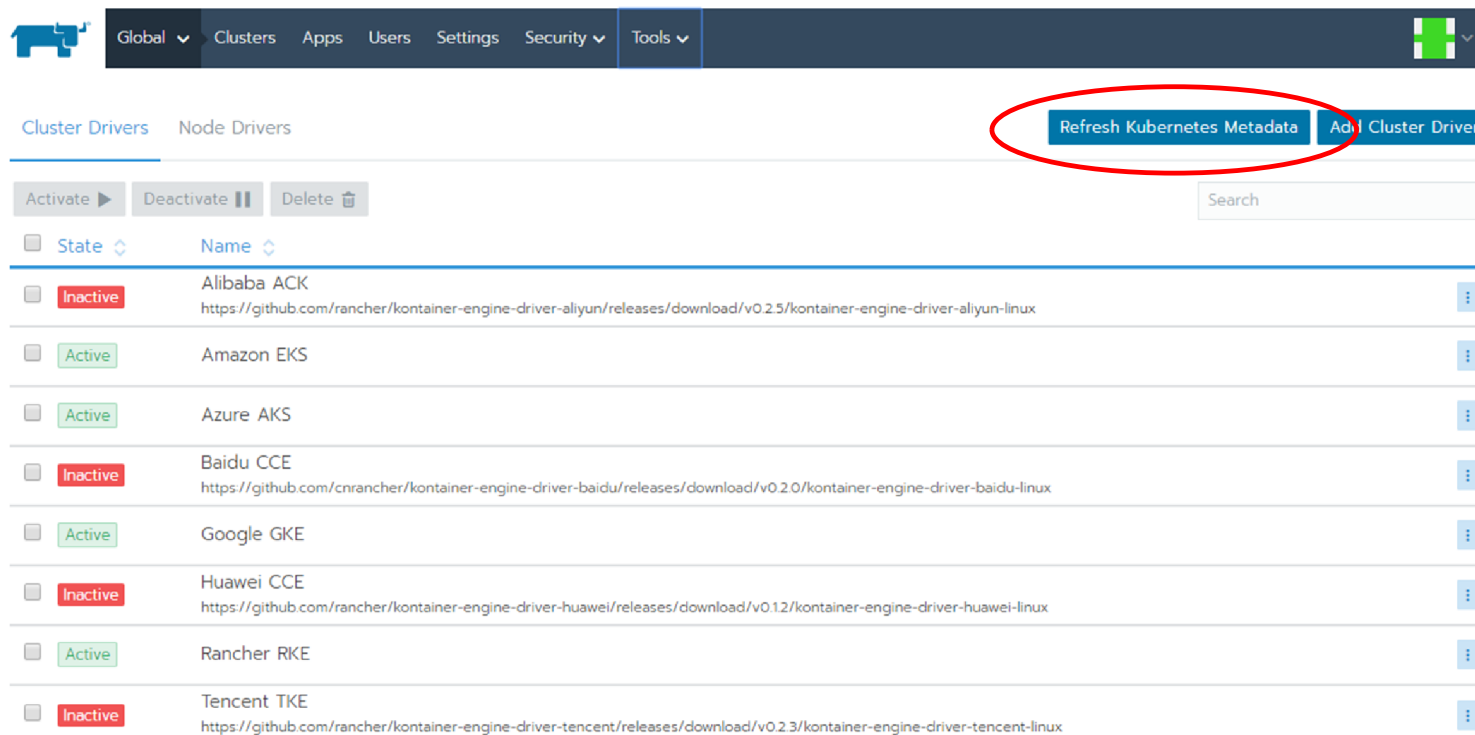
RANCHER

Demo

Cluster Creation

Demo

Cluster Update (1/2)

Cluster Update (2/2)

Infrastructure as Code

Integrate infrastructure creation into your CI/CD pipelines.

Advantages:

- Automation!
- Get fresh infrastructure with every deployment
- Treat your infrastructure as cattle, not as pets
- When using IaaS, there's no more need for patching

Cluster Creation (Terraform)

https://www.terraform.io/docs/providers/rancher2/r/cluster.html

Cluster Creation (main.tf)

```
provider "google" {
  project     = "xxxxxxx-xxxxxx-xxxxxx"
  credentials = "${file("account.json")}"
  region      = "us-central1"
  zone        = "us-central1-c"
}

provider "rancher2" {
  api_url = "https://rancher.chfrank.net/v3"
  token_key = "token-xxxxx:xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx"
  insecure = true
}

resource "rancher2_cluster" "cluster_gcp" {
  name        = "gcp-1"
  description = "Terraform"

  rke_config {
    kubernetes_version = "v1.14.8-rancher1-1"
    ignore_docker_version = false
    network {
      plugin = "flannel"
    }
  }
}

output "gcp-1-token" {
  value = "${rancher2_cluster.cluster_gcp.cluster_registration_token}"
}

resource "google_compute_instance" "vm_gcp_1" {
  name         = "gcp-rke-1"
  machine_type = "n1-standard-2"

  boot_disk {
    initialize_params {
      image = "ubuntu-os-cloud/ubuntu-minimal-1804-lts"
    }
  }

  metadata = {
    ssh-keys = "rancher:${file("~/.ssh/id_rsa.pub")}"
```

main.tf [+]   1,1   Top

Rancher Resources

Resources – Documentations

https://rancher.com/docs/rancher/v2.x/en/quick-start-guide/

Resources – GitHub

http://github.com/rancher

Resources – Rancher Slack and Forums

https://slack.rancher.io/

http://forums.rancher.com

Thank you

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