



Rancher Introduction

Christian Frank

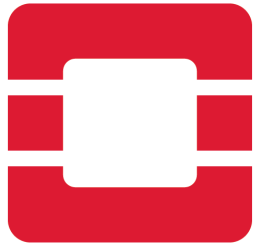
February 18th

teuto.net - Bielefeld (Smartsquare GmbH)

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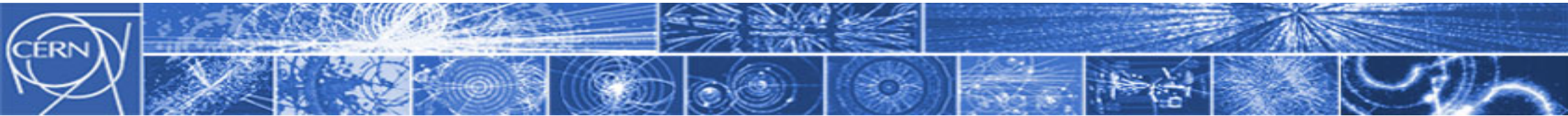


Experience



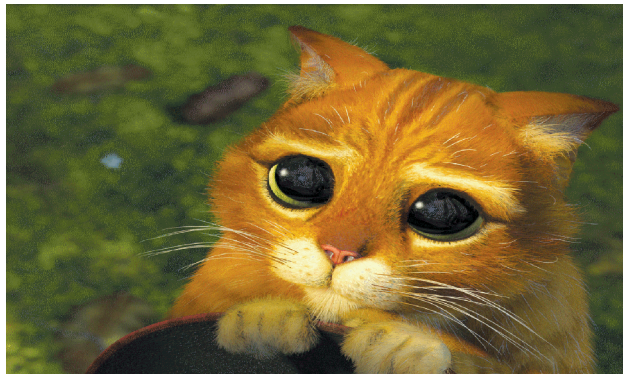
Experience





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

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Enterprise 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



EKS



Google
Cloud Platform

GKE



Microsoft
Azure

AKS

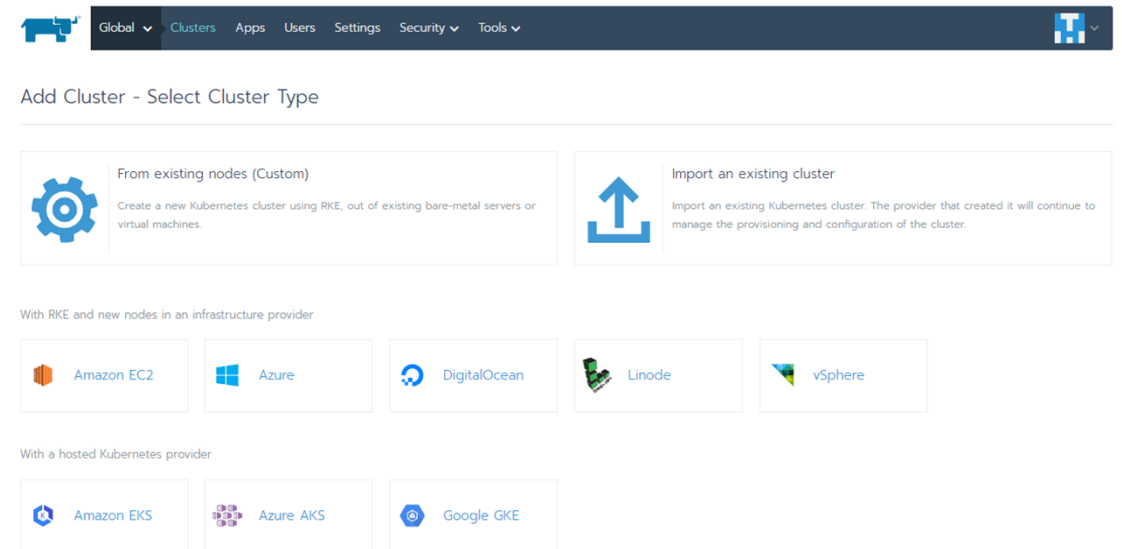


Import



Multi-Cluster Kubernetes Management

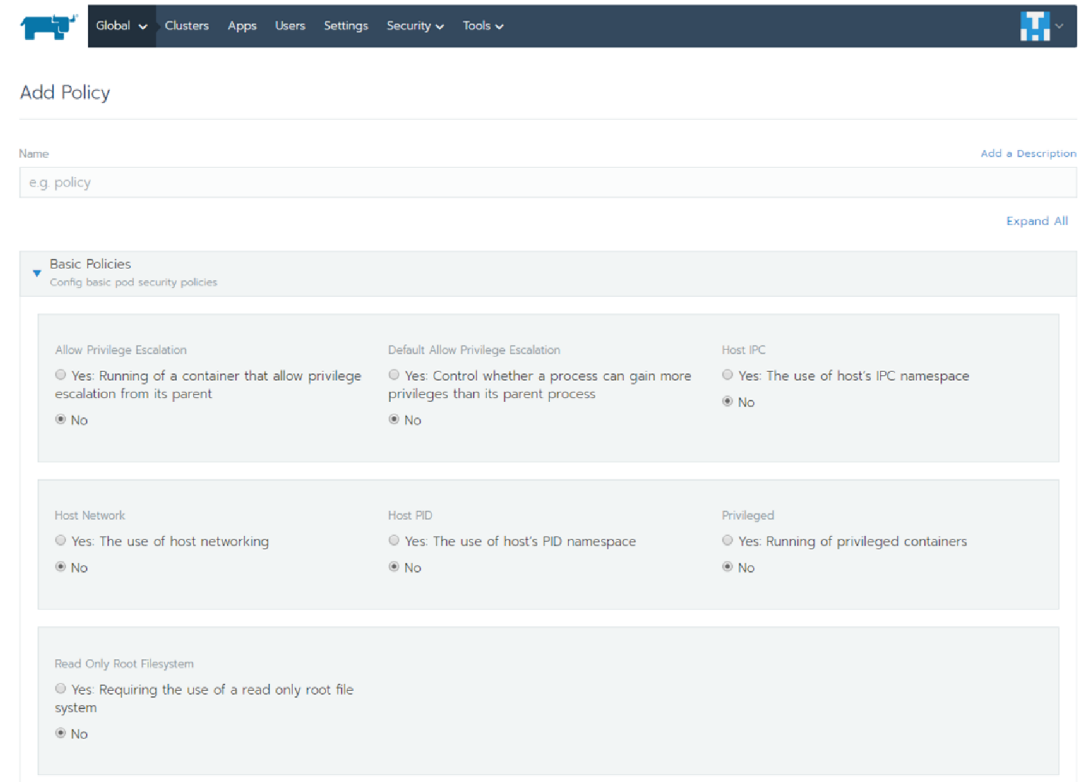
1. Manage Kubernetes everywhere
 1. Cloud Hosted (GKE, EKS, AKS)
 2. Datacenter (BareMetal, OpenStack, VMware)
2. Importing existing clusters
3. Supports infrastructure as code
4. Upgrade, Backup and Restore clusters



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



The screenshot shows the 'Add Policy' interface in the Lighthouse application. At the top is a navigation bar with a lighthouse icon, a dropdown menu (Global), and links for Clusters, Apps, Users, Settings, Security, and Tools. Below the navigation bar is the 'Add Policy' section. It features a 'Name' input field with the placeholder text 'e.g. policy' and a link to 'Add a Description'. To the right of the input field is an 'Expand All' link. Below the input field is a section titled 'Basic Policies' with a sub-header 'Config basic pod security policies'. This section contains several policy configuration options, each with a radio button for 'Yes' and 'No'. The options are: 'Allow Privilege Escalation' (Yes: Running of a container that allow privilege escalation from its parent, No), 'Default Allow Privilege Escalation' (Yes: Control whether a process can gain more privileges than its parent process, No), 'Host IPC' (Yes: The use of host's IPC namespace, No), 'Host Network' (Yes: The use of host networking, No), 'Host PID' (Yes: The use of host's PID namespace, No), 'Privileged' (Yes: Running of privileged containers, No), and 'Read Only Root Filesystem' (Yes: Requiring the use of a read only root file system, No).

Global Clusters Apps Users Settings Security Tools

Add Policy

Name [Add a Description](#)

e.g. policy [Expand All](#)

Basic Policies
Config basic pod security policies

Allow Privilege Escalation
☐ Yes: Running of a container that allow privilege escalation from its parent
☒ No

Default Allow Privilege Escalation
☐ Yes: Control whether a process can gain more privileges than its parent process
☒ No

Host IPC
☐ Yes: The use of host's IPC namespace
☒ No

Host Network
☐ Yes: The use of host networking
☒ No

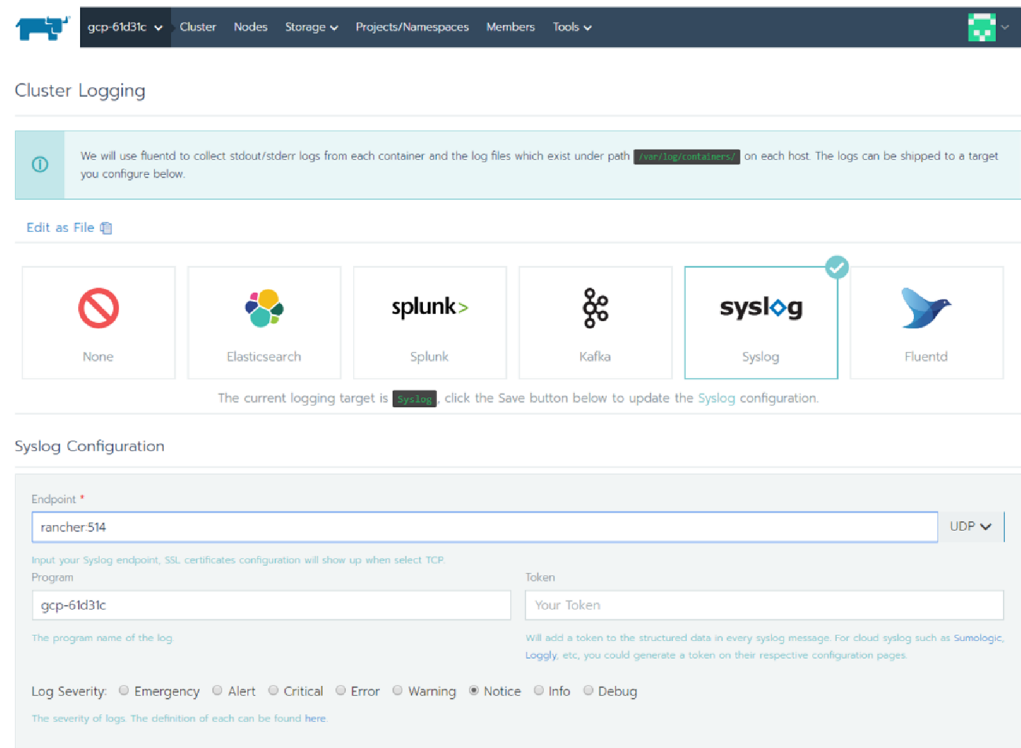
Host PID
☐ Yes: The use of host's PID namespace
☒ No

Privileged
☐ Yes: Running of privileged containers
☒ No

Read Only Root Filesystem
☐ Yes: Requiring the use of a read only root file system
☒ No

Simplify container administration

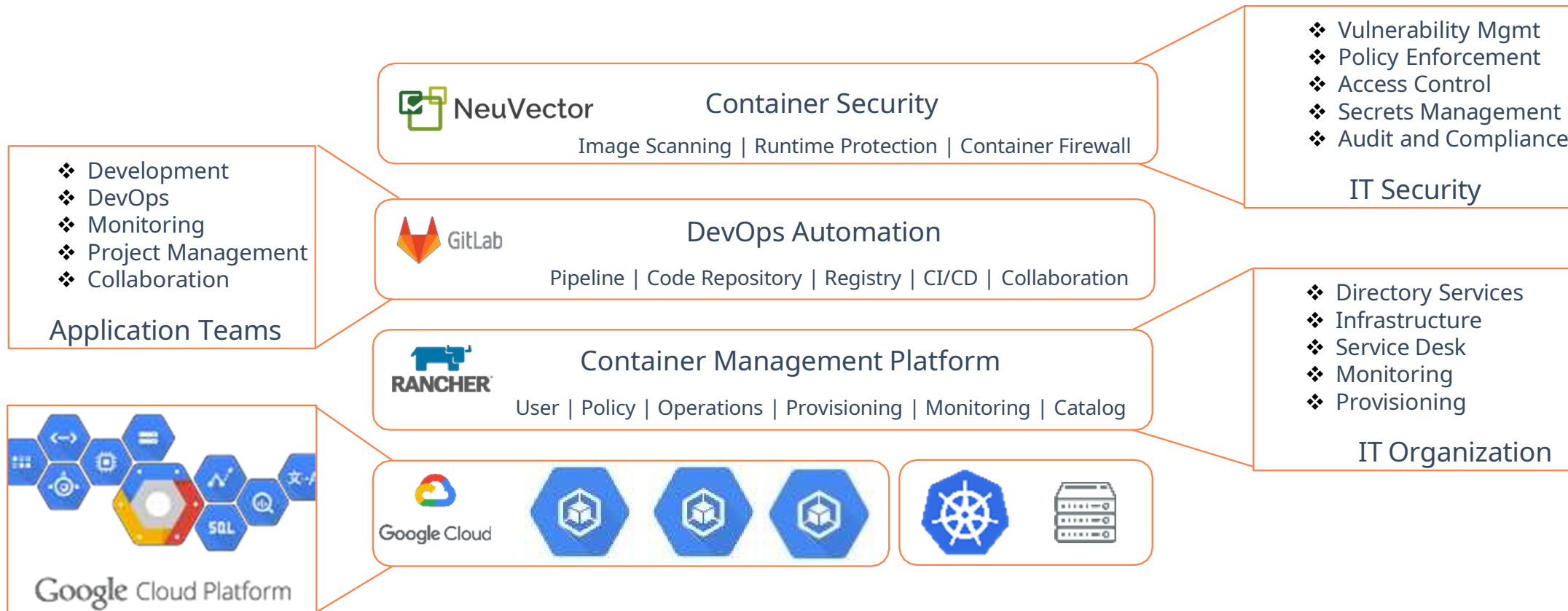
1. Powerful User Interface
2. CLI/API access for GitOps
3. Centralize access to shared and private Helm catalogs
4. Integrated monitoring and alerting
5. Automated logging



The screenshot shows the Rancher UI for configuring cluster logging. The top navigation bar includes a blue cow icon, a dropdown menu for 'gcp-6ld3lc', and links for 'Cluster', 'Nodes', 'Storage', 'Projects/Namespaces', 'Members', and 'Tools'. The main heading is 'Cluster Logging'. A light blue box contains an information icon and text: 'We will use fluentd to collect stdout/stderr logs from each container and the log files which exist under path `/var/log/containers` on each host. The logs can be shipped to a target you configure below.' Below this is an 'Edit as File' link. A row of six logging targets is shown: 'None' (with a red prohibition sign), 'Elasticsearch' (with its logo), 'Splunk' (with its logo), 'Kafka' (with its logo), 'syslog' (with its logo and a green checkmark), and 'Fluentd' (with its logo). Below the targets, a message states: 'The current logging target is `syslog`, click the Save button below to update the Syslog configuration.' The 'Syslog Configuration' section has a light gray background and contains the following fields: 'Endpoint' (with a red asterisk) set to 'rancher514' and a 'UDP' dropdown; 'Program' set to 'gcp-6ld3lc'; and 'Token' set to 'Your Token'. Below these fields are two lines of explanatory text: 'The program name of the log' and 'Will add a token to the structured data in every syslog message. For cloud syslog such as Sumologic, Loggly, etc, you could generate a token on their respective configuration pages.' At the bottom, there is a 'Log Severity' section with radio buttons for 'Emergency', 'Alert', 'Critical', 'Error', 'Warning', 'Notice' (which is selected), 'Info', and 'Debug'. A link 'The severity of logs. The definition of each can be found here.' is provided.



Building an Enterprise Container Service





- 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

```
minecraft (2313)
(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

Multi-Cluster Applications

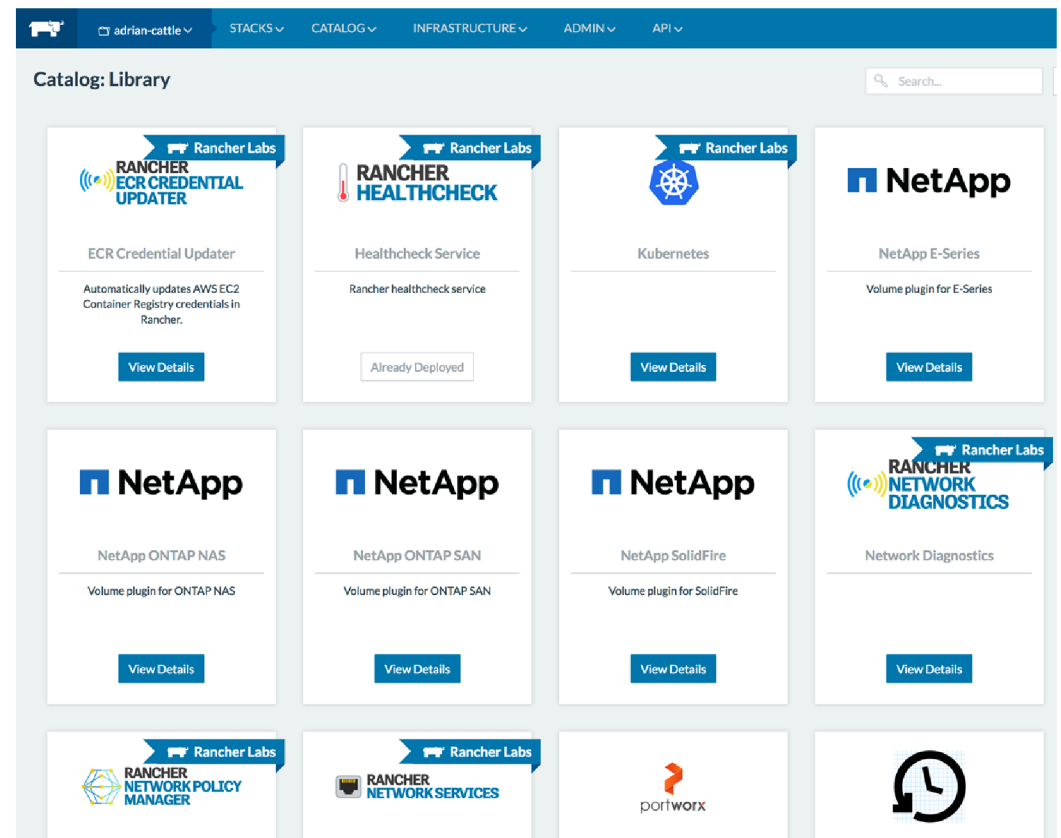
- Reliable, repeatable deployments
- Reduce operational workload
- Reduce cross-AZ spend on data transfer
- Improve application availability
- Atomic installations and upgrades

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

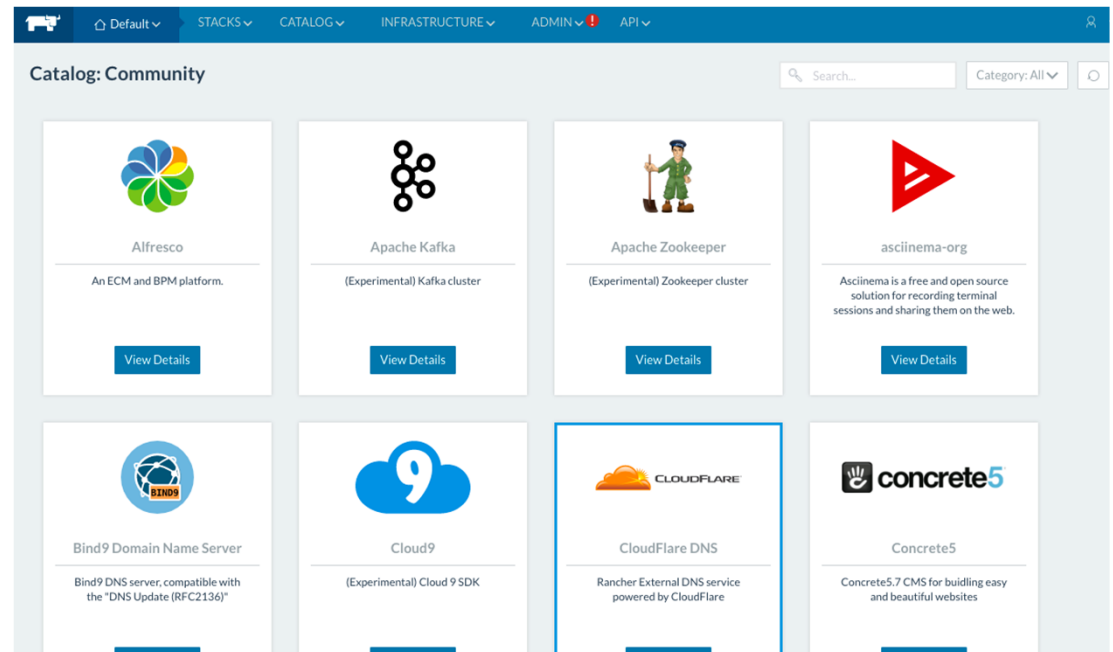
Catalog - Library

- 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

Demo





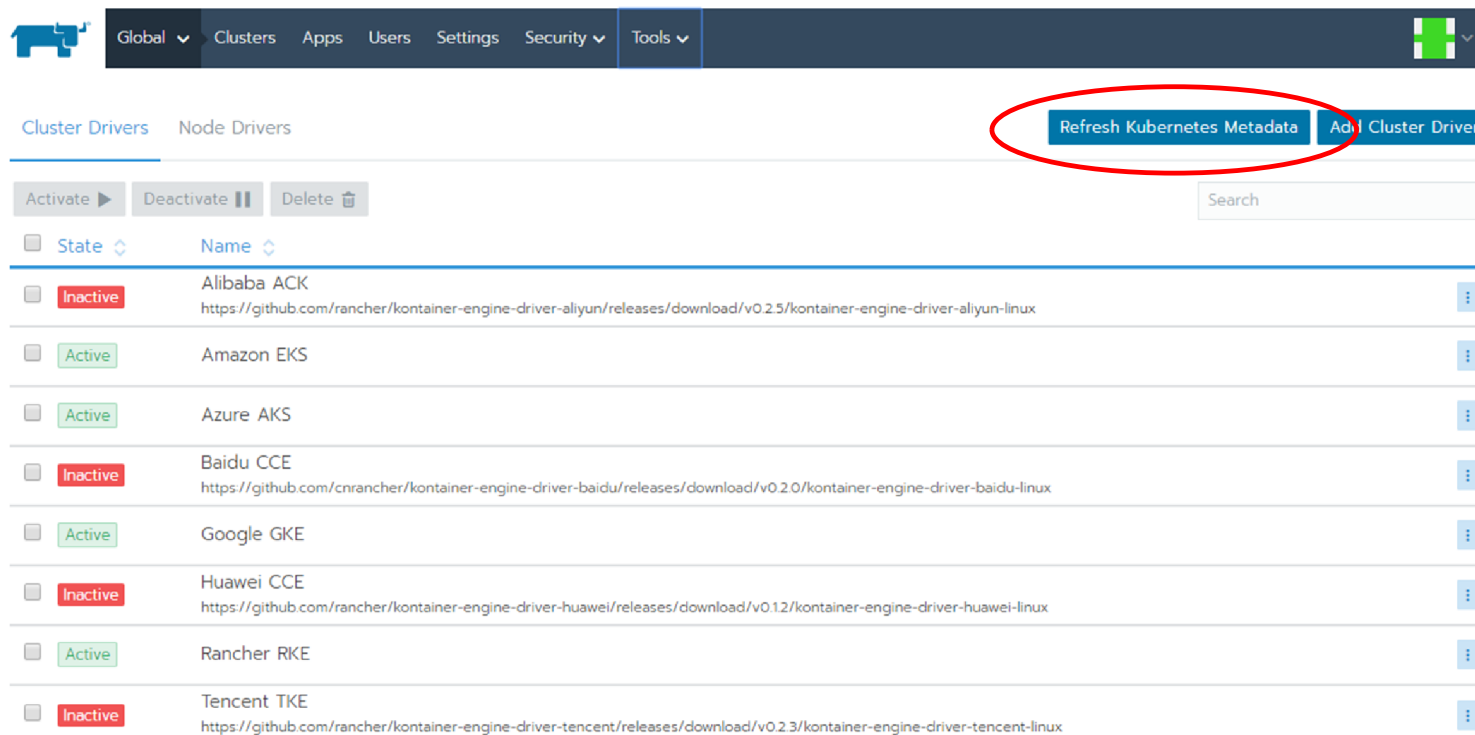
Cluster Creation



Demo



Cluster Update (1/2)



The screenshot shows the Rancher management interface. At the top, a dark navigation bar contains the Rancher logo and a menu with items: Global, Clusters, Apps, Users, Settings, Security, and Tools. Below this, a secondary bar shows 'Cluster Drivers' and 'Node Drivers' tabs. In the 'Cluster Drivers' tab, there are buttons for 'Activate', 'Deactivate', and 'Delete', along with a search bar. A table lists various cluster drivers with columns for 'State' and 'Name'. The 'Refresh Kubernetes Metadata' button is circled in red. The 'Add Cluster Driver' button is partially visible.

State	Name
Inactive	Alibaba ACK https://github.com/rancher/kontainer-engine-driver-aliyun/releases/download/v0.2.5/kontainer-engine-driver-aliyun-linux
Active	Amazon EKS
Active	Azure AKS
Inactive	Baidu CCE https://github.com/cnrancher/kontainer-engine-driver-baidu/releases/download/v0.2.0/kontainer-engine-driver-baidu-linux
Active	Google GKE
Inactive	Huawei CCE https://github.com/rancher/kontainer-engine-driver-huawei/releases/download/v0.12/kontainer-engine-driver-huawei-linux
Active	Rancher RKE
Inactive	Tencent TKE https://github.com/rancher/kontainer-engine-driver-tencent/releases/download/v0.2.3/kontainer-engine-driver-tencent-linux



Cluster Update (2/2)

Cluster Options

[Edit as YAML](#)[Expand All](#)

Kubernetes Options

Customize the kubernetes cluster options

Kubernetes Version

v1.15.5-rancher1-2

v1.16.2-rancher1-1 (experimental)

v1.15.5-rancher1-2

v1.14.8-rancher1-1

v1.13.12-rancher1-1

Project Network Isolation

☐ Enabled

☒ Disabled

Cloud Provider

☒ None

☐ Azure

☐ External

Private Registry



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)

 Terraform

IntroLearnDocsCommunityEnterpriseDownloadGitHub

- All Providers
- Rancher2 Provider
- Data Sources
 - rancher2_setting
- Resources
 - rancher2_auth_config_activedirectory
 - rancher2_auth_config_adfs
 - rancher2_auth_config_azuread
 - rancher2_auth_config_freeipa
 - rancher2_auth_config_github
 - rancher2_auth_config_opendap
 - rancher2_auth_config_ping
 - rancher2_bootstrap
 - rancher2_catalog
 - rancher2_cloud_credential
 - rancher2_cluster**
 - rancher2_cluster_driver
 - rancher2_cluster_logging
 - rancher2_cluster_role_template_binding
 - rancher2_etcd_backup
 - rancher2_namespace
 - rancher2_node_driver
 - rancher2_node_pool
 - rancher2_node_template
 - rancher2_orolect

Page Quick Nav

rancher2_cluster

Provides a Rancher v2 Cluster resource. This can be used to create Clusters for rancher v2 environments and retrieve their information.

Example Usage

Creating Rancher v2 imported cluster

```
# Create a new rancher2 imported Cluster
resource "rancher2_cluster" "foo-imported" {
  name = "foo-imported"
  description = "Foo rancher2 imported cluster"
}
```

Creating Rancher v2 rke cluster

```
# Create a new rancher2 rke Cluster
resource "rancher2_cluster" "foo-custom" {
  name = "foo-custom"
  description = "Foo rancher2 custom cluster"
  rke_config {
    network {
      plugin = "canal"
    }
  }
}
```

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



Cluster Creation (main.tf)

[illegible]




Rancher Resources



Resources – Documentations

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

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Rancher 2.0 ▾

Overview

Quick Start Guides

- Deploying Rancher Server
- Deploying Workloads

Installation

Upgrades and Rollbacks

Backups and Disaster Recovery

Admin Settings

Provisioning Kubernetes Clusters

Kubernetes in Rancher

Catalogs and Charts

Rancher Tools

Quick Start Guides


Note:

The intent of these guides is to quickly launch a sandbox that you can use to evaluate Rancher. These guides are not intended for production environments. For comprehensive setup instructions, see [Installation](#).

Howdy buckaroos! Use this section of the docs to jump start your deployment and testing of Rancher 2.0! It contains instructions for a simple Rancher setup and some common use cases. We plan on adding more content to this section in the future.

We have Quick Start Guides for:

- [Deploying Rancher Server](#): Get started running Rancher using the method most convenient for you.
- [Deploying Workloads](#): Deploy a simple workload and expose it, letting you access it from outside the cluster.

Edit this page 

Resources – GitHub

<http://github.com/rancher>

The screenshot shows the GitHub repository page for `rancher/rancher`. At the top, the repository name is displayed with icons for Watch (616), Unstar (10,581), and Fork (1,113). Below this is a navigation bar with links for Code, Issues (1,157), Pull requests (50), Projects (0), Wiki, and Insights. A description of the repository as a "Complete container management platform" is followed by a link to `http://rancher.com` and a set of tags: `rancher`, `docker`, `kubernetes`, `orchestration`, `cattle`, and `containers`. A statistics bar shows 2,141 commits, 25 branches, 940 releases, 1 environment, 49 contributors, and Apache-2.0 license. Below the statistics are buttons for "Branch: master", "New pull request", "Create new file", "Upload files", "Find file", and "Clone or download". The commit history table lists recent changes:

Commit	Author	Description	Time
prachidamle and alena1108 Handle not found error incase multiclusterapp is deleted Latest commit 01e8404 2 days ago			
<code>.github</code>		Update ISSUE_TEMPLATE.md	4 days ago
<code>app</code>		Giving users the ability to view container drivers	4 days ago
<code>chart</code>		add server chart to build	21 days ago
<code>cleanup</code>		Remove specifying kubeconfig for kubectl calls	5 months ago
<code>package</code>		helm v2.10.0-rancher8	4 days ago
<code>pkg</code>		Handle not found error incase multiclusterapp is deleted	2 days ago
<code>rke-templates</code>		Update 3-node-certificate.yml	4 months ago
<code>scripts</code>		Set `ui-index` setting to local if rancher version is formal	14 days ago
<code>server</code>		cloudcredential creation and management	11 days ago


Resources – Rancher Slack and Forums


<https://slack.rancher.io/>


#general
☆ | 👤 8,276 | 🗨️ 3 | Rancher Users | [#one-point-x](#) for non 2.0 discussions 👍 | Rancher staff = 🤖


Today


[View newer replies](#)


 **John Farrar** 7:39 AM
joined #general along with 2 others.


 **dlynch** 8:12 AM
One of the features of Rancher 1.x was the ability to run a Rancher Node on you use labels to make sure certain containers only ran on the internal node. I used t to talk to an internal SQL server so that I didn't have to open sql related ports or Is this still possible in Rancher 2.x? If so how would it be achieved?


 **drpebcak** 8:21 AM
It works pretty much the same in rancher 2.x. K8s has 'taints' which prevent any them from running on the node (edited)

 **dlynch** 8:32 AM
do I need to do anything special for the K8s node on the internal network? Can i and will Rancher look after deploying K8s etc.
For the external nodes they will be running on Azure

 **drpebcak** 8:47 AM
Yep, that's all you need. Nothing special really


 **Cam Farmer** 9:13 AM
joined #general along with nickadam.

 **bjornmagnusson** 9:39 AM
any chance to get support for 1.13.x in 2.1 line? For rke clusters.

 **louis** 9:42 AM
Is it possible to cycle the keys used by a custom cluster configuration after it's be

+ Message #general

<http://forums.rancher.com>

 **RANCHER**

all categories ▾ **Categories** Latest Top

Category	Topics
Announcements Category for announcing new releases or updates to Rancher, RancherOS and Rancher Labs in general.	4 / month
General Topics that don't need a category, or don't fit into any other existing category.	7 / month
Rancher 2.x This is a discussion area for Rancher 2.x .	59 / month
Rancher 1.x This is a discussion area for Rancher 1.x .	16 / month
RancherOS This is a discussion area for RancherOS .	10 / month
Longhorn Longhorn is an open source project for microservices-based distributed block storage. It is built from containers, for	4 / month





Thank you

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