



Gestão de clusters K8s com Rancher

Mateus Valgueiro

Quem sou eu?

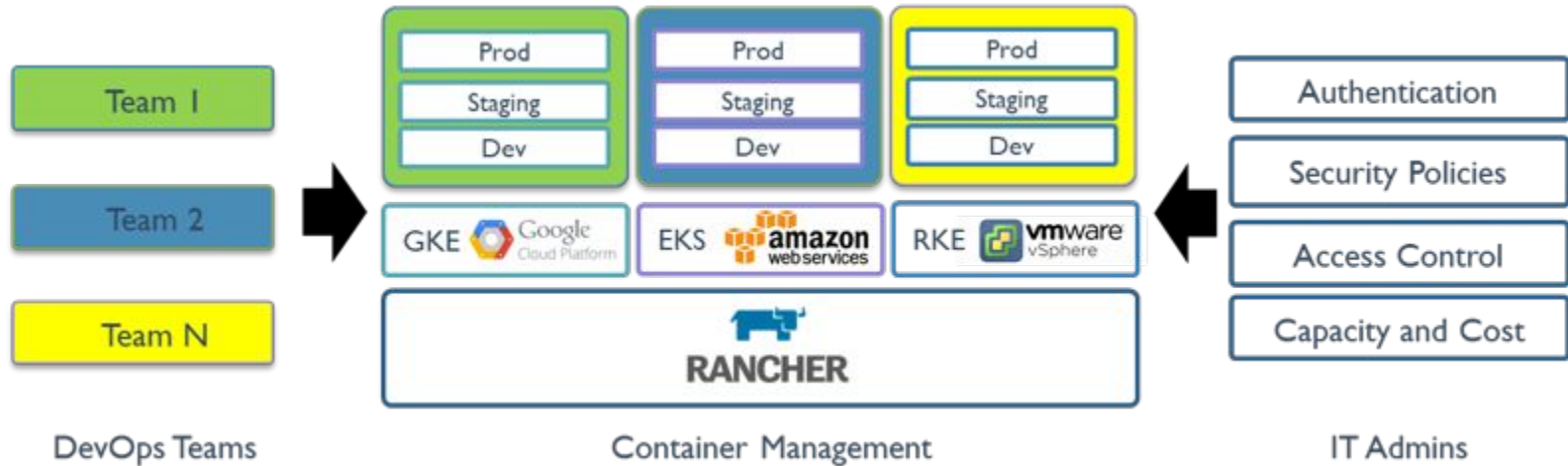
- Mateus Valgueiro
- Gosto de cozinhar e Jogos Online
- Gosto de aprender coisas novas
- Site Reliability Engineer na Komatsu



O que é Rancher?

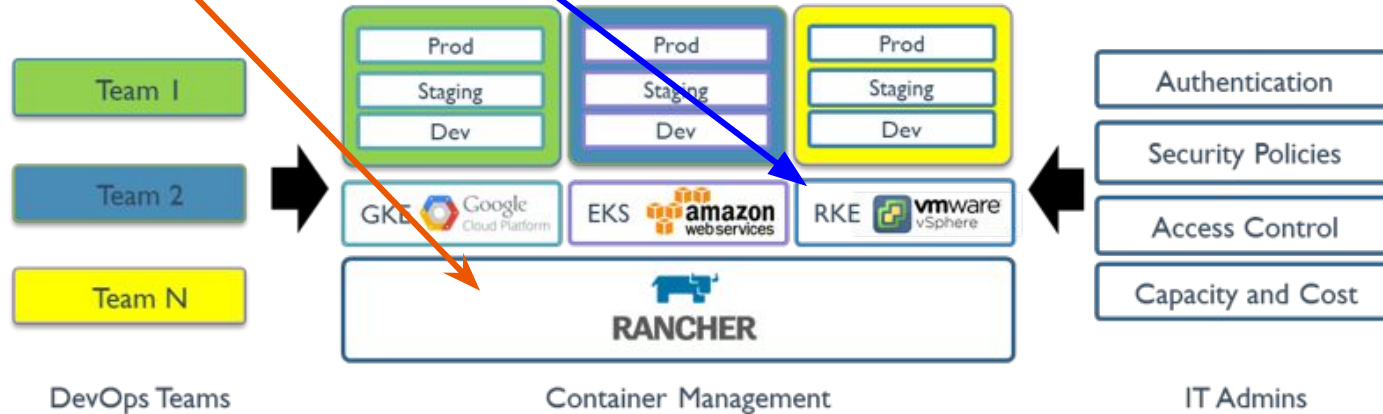
Rancher é uma **plataforma de gerenciamento de contêineres** criada para organizações que implantam contêineres em produção. O Rancher **facilita a execução de Kubernetes** em qualquer lugar, **atende aos requisitos de TI** e **capacita equipes de DevOps**.

Rancher Manager



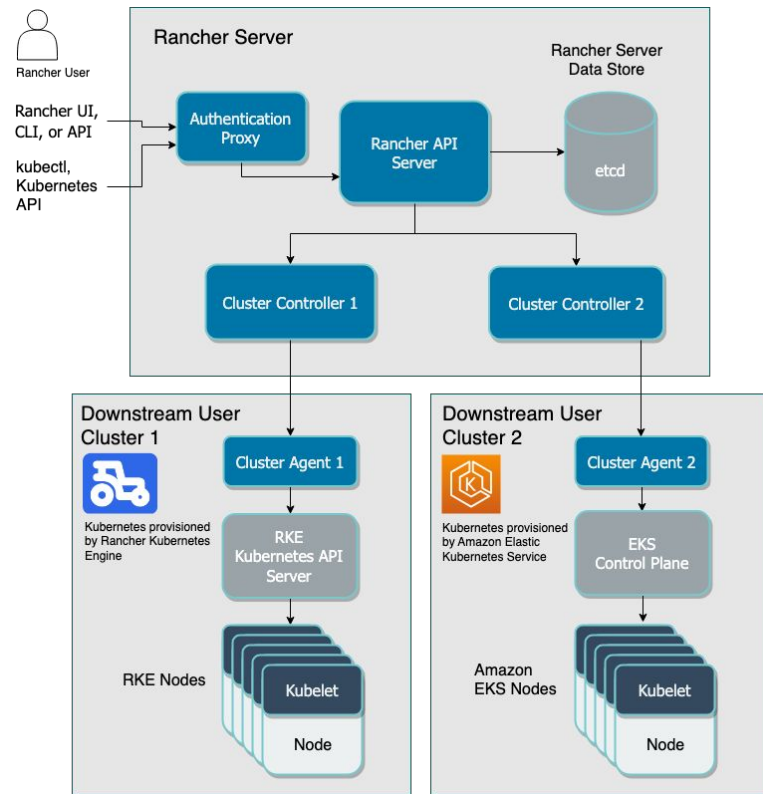
Para não confundir:

- **Rancher Kubernetes Engine (RKE)**: Engine que tem como principal foco a praticidade de manutenção
- **Rancher Manager**: Serviço que ajuda no gerenciamento de clusters kubernetes



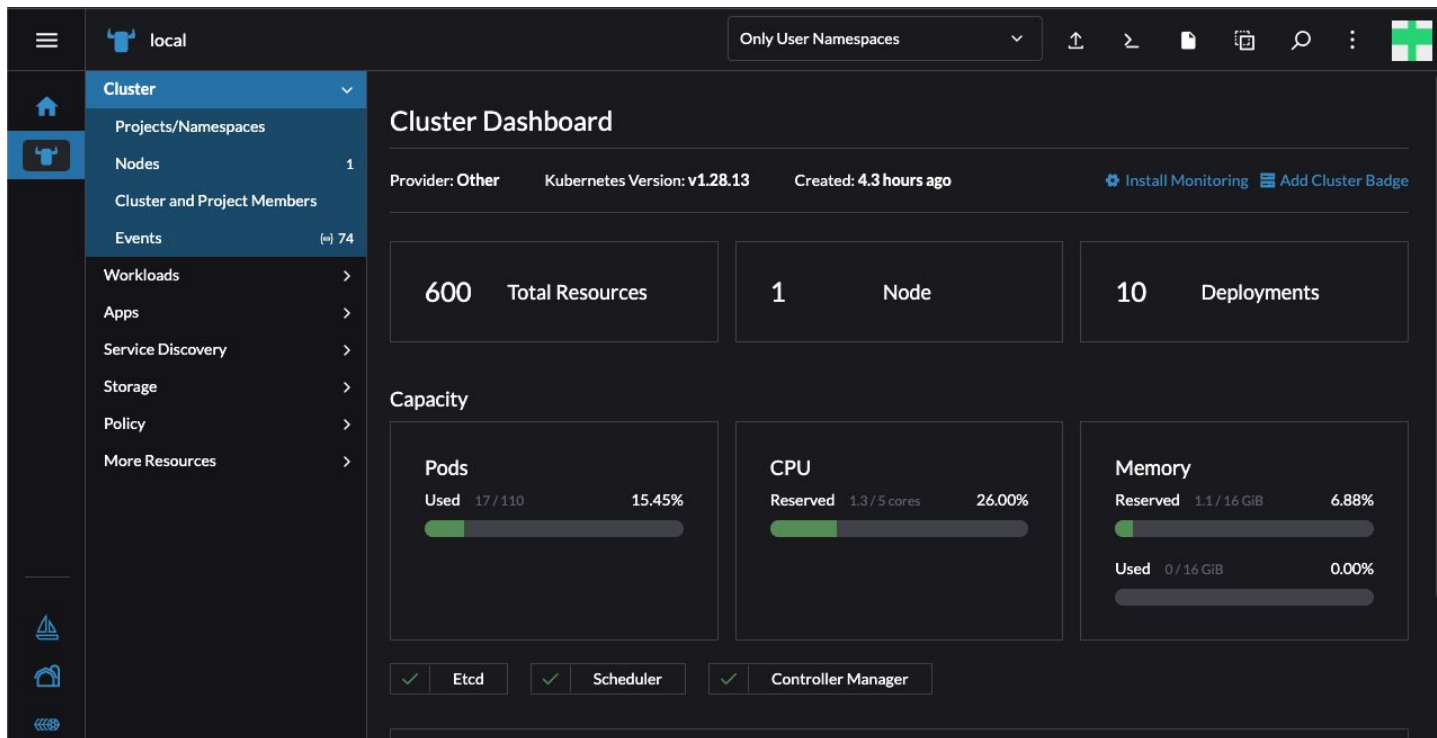
Arquitetura

- Roda em um cluster Kubernetes
- Utiliza CRD's no cluster como banco de dados
- Se comunica através dos agents



Funcionalidades

UI no browser



Workloads

csforum

1.2.0

All Namespaces

Starred

Cluster

Workloads

CronJobs

0

DaemonSets

12

Deployments

64

Jobs

6

StatefulSets

4

Pods

114

Apps

Service Discovery

Storage

Policy

Monitoring

Legacy

OPA Gatekeeper

Cluster Tools

v2.7.9

Workloads

Redeploy

Download YAML

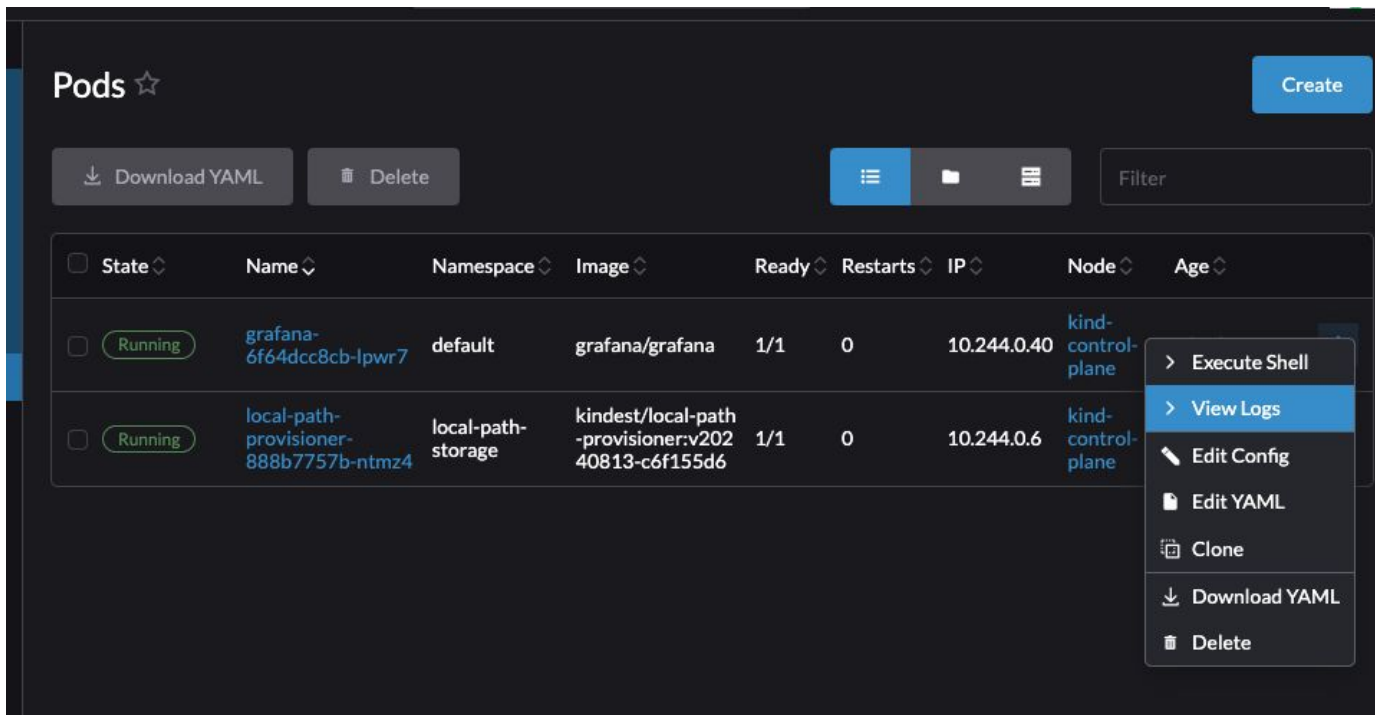
Delete

Create

Filter

State	Name	Namespace	Type	Image	Restarts	Age	Health
Active	alertmanager-rancher-monitoring-alertmanager	cattle-monitoring-system	StatefulSet	synergymts.azurecr.io/rancher/mirrored-prometheus-alertmanager:v0.24.0 + 1 more	1	25 days	
Active	app-config	kmnts-classic	Deployment	synergymts.azurecr.io/dspx/core:0.0.1.36	0	1.7 days	
Active	app-sessions	kmnts-classic	Deployment	synergymts.azurecr.io/dspx/core:0.0.1.36	0	1.7 days	
Active	bbroker	kmnts-classic	Deployment	synergymts.azurecr.io/dspx/bbroker:0.0.1.36	0	1.7 days	
Active	calico-kube-controllers	kube-system	Deployment	synergymts.azurecr.io/rancher/mirrored-calico-kube-controllers:v3.25.0	4	62 days	
Active	canal	kube-system	DaemonSet	synergymts.azurecr.io/rancher/mirrored-calico-node:v3.25.0 + 1 more	18	62 days	
Active	cattle-cluster-agent	cattle-system	Deployment	synergymts.azurecr.io/rancher/rancher-agent:v2.7.9	11	62 days	

Logs & Shell



The screenshot shows the Kubernetes Dashboard interface. At the top, there's a 'Pods' header with a star icon and a 'Create' button. Below the header, there are buttons for 'Download YAML' and 'Delete', along with icons for list, folder, and menu, and a 'Filter' input field. The main area displays a table of pods. Two pods are listed: 'grafana-6f64dcc8cb-lpwr7' and 'local-path-provisioner-888b7757b-ntmz4'. The 'local-path-provisioner' pod is selected, and a context menu is open over it, showing options: 'Execute Shell', 'View Logs' (highlighted), 'Edit Config', 'Edit YAML', 'Clone', 'Download YAML', and 'Delete'.

<input type="checkbox"/>	State	Name	Namespace	Image	Ready	Restarts	IP	Node	Age
<input type="checkbox"/>	Running	grafana-6f64dcc8cb-lpwr7	default	grafana/grafana	1/1	0	10.244.0.40	kind-control-plane	
<input type="checkbox"/>	Running	local-path-provisioner-888b7757b-ntmz4	local-path-storage	kindest/local-path-provisioner:v20240813-c6f155d6	1/1	0	10.244.0.6	kind-control-plane	

- > Execute Shell
- > View Logs
- Edit Config
- Edit YAML
- Clone
- Download YAML
- Delete

Edição com UI

Pod: grafana-6f64dcc8cb-2w7xn Running

Namespace: [default](#) Age: 1.8 mins

Namespace *

default

Name *

grafana-6f64dcc8cb-2w7xn

Description

Any text you want that better describes this resource

Pod

[grafana](#)

+ Add Container

General

Health Check

Resources

Security Context

Storage

General

Container Name

grafana

☐ Init Container

☒ Standard Container

Image

Container Image

grafana/grafana:latest

Pull Policy

IfNotPresent

Pull Secrets

Networking

Define a Service to expose the container, or define a non-functional, named port so that humans will know where the app within the container is expected to run.

If ClusterIP, LoadBalancer, or NodePort is selected, a Service is automatically created that will select the Pods in this workload using labels.

Service Type

Do not create a servi...

Name

http-grafana

Private Container Port

3000

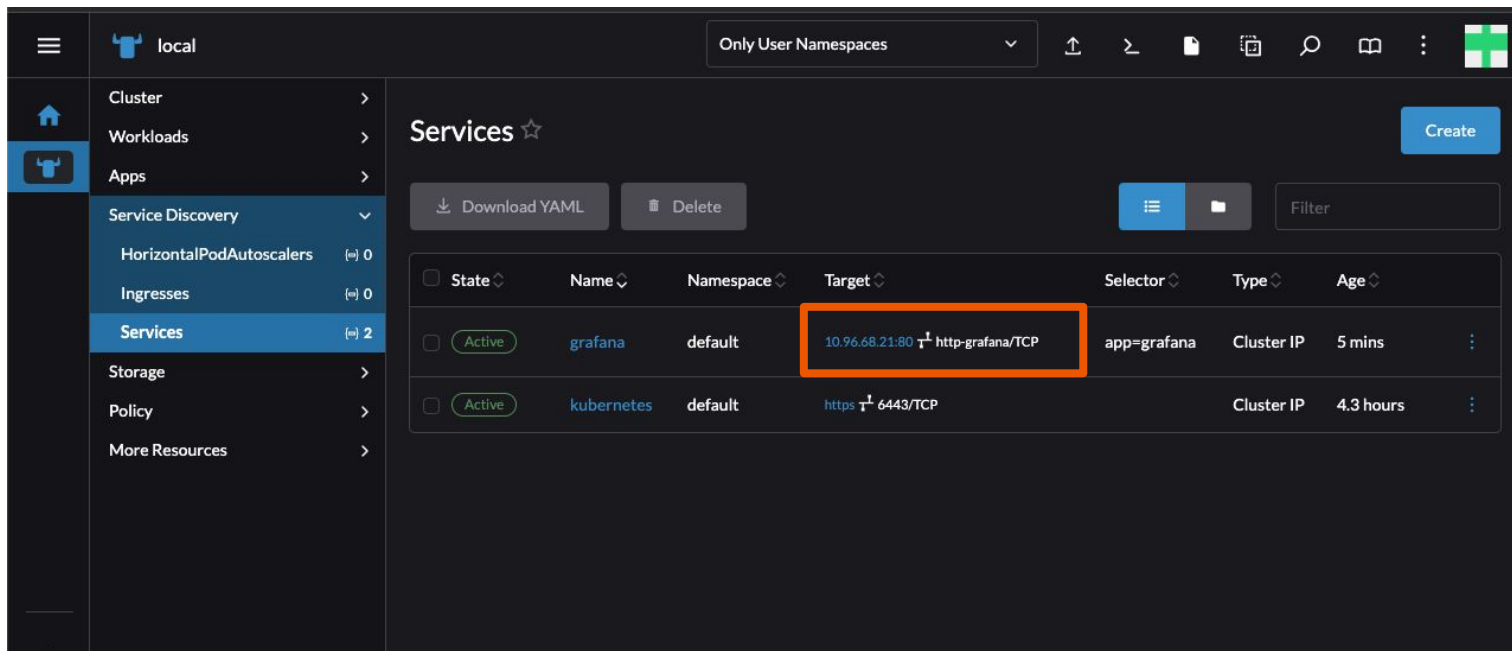
Protocol

TCP

Add Host

Remo

Port forward no click de um botão



The screenshot shows the Kubernetes Dashboard interface. The left sidebar contains a navigation menu with the following items: Cluster, Workloads, Apps, Service Discovery (expanded), HorizontalPodAutoscalers (0), Ingresses (0), Services (2), Storage, Policy, and More Resources. The 'Services' item is selected. The main panel displays the 'Services' page with a 'Create' button in the top right. Below the 'Create' button are 'Download YAML' and 'Delete' buttons. A table lists the services:

State	Name	Namespace	Target	Selector	Type	Age
Active	grafana	default	10.96.68.21:80 http-grafana/TCP	app=grafana	Cluster IP	5 mins
Active	kubernetes	default	https 6443/TCP		Cluster IP	4.3 hours

The 'grafana' service row is highlighted with an orange box around the 'Target' column, which shows the IP address and port (10.96.68.21:80) and the target (http-grafana/TCP).

Utilidades

The screenshot shows the Rancher UI Cluster Dashboard for a cluster named 'csforum' (version 1.20). The dashboard provides an overview of the cluster's health and resources. A dropdown menu is open, showing options to filter resources by namespace or project.

Cluster Dashboard Overview:

- Provider:** RKE1
- Kubernetes Version:** v1.26.8
- Created:** 57 days ago
- Total Resources:** 301
- Nodes:** 4
- Capacity:**
 - Pods:** Used 83 / 320 (25.76%)
 - CPU:** Reserved 14.87 / 18
 - Used:** 1.14 / 20 cores
- Control Plane:** Etcd, Scheduler, and Controller Manager are all running successfully.

Namespace Filter Menu:

- All Namespaces** (Selected)
- Only User Namespaces
- Only System Namespaces
- Only Namespaced Resources
- Only Cluster Resources
- Project: Default**
 - default
 - pigs-team
- Project: System**
 - cattle-fleet-system
 - cattle-impersonation-system
 - cattle-system
 - ingress-nginx
 - kube-node-lease
 - kube-public
 - kube-system
- Not in a Project

Events Table:

Reason	Object	Message
ReconciliationSucceeded	Kustomization apps	(combined from similar events): Reconciliation finished in 144.675961ms, next run in 1m0s
ArtifactUpToDate	HelmChart monitoring-fluent-bit	artifact up-to-date with remote revision: '0.10.0'
ReconciliationSucceeded	Kustomization rancher-monitoring-patch	(combined from similar events): Reconciliation finished in 144.675961ms, next run in 1m0s
ReconciliationSucceeded	Kustomization k8scontainerhaslimits-template	(combined from similar events): Reconciliation finished in 144.675961ms, next run in 1m0s

Footer: v2.7.9 | k8scontainerhaslimits-template.17b6a538ee846979 | Fri, Mar 8 2024 9:30:00 am

Utilidades

Cluster Dashboard

Provider: RKE1 | Kubernetes Version: 1.20

301 Total Pods

Capacity

Resource	Used	Reserved	Percentage
Pods	83 / 330		25.76%
CPU	1.18 / 20 cores	14.87 / 30.5 cores	5.82% / 80.38%
Memory	24 / 79 GiB	23 / 87 GiB	30.77% / 37.31%

✓ Etcd | ✓ Scheduler | ✓ Controller Manager

Events | Alerts

Reason	Object	Message	Name	Date
ReconciliationSucceeded	Kustomization apps	(combined from similar events): Reconciliation finished in 81.556514ms, next run in 1m0s	apps.17b6a5447bc2731f	Fri, Mar 8 2024 9:30:04 am
ArtifactUpToDate	HelmChart monitoring-fluent-bit	artifact up-to-date with remote revision: '0.6.2'	monitoring-fluent-bit.17b6a4c03a8cece	Fri, Mar 8 2024 9:30:04 am
ReconciliationSucceeded	Kustomization rancher-monitoring-patch	(combined from similar events): Reconciliation finished in 172.053036ms, next run in 1m0s	rancher-monitoring-patch.17b6a54cdbc7ed2c	Fri, Mar 8 2024 9:30:03 am
ReconciliationSucceeded	Kustomization k8scontainerhaslimits-template	(combined from similar events): Reconciliation finished in 144.675961ms, next run in 1m0s	k8scontainerhaslimits-template.17b6a538ee846979	Fri, Mar 8 2024 9:30:00 am

Full events list

Cluster Tools

v2.7.9

Utilidades

The screenshot displays the Rancher UI Cluster Dashboard for a cluster named 'csforum' (version 1.2.0). The interface includes a left-hand navigation menu with options like 'Starred', 'Cluster', 'Projects/Namespace', 'Nodes', 'Cluster and Project Members', 'Events', 'Workloads', 'Apps', 'Service Discovery', 'Storage', 'Policy', 'Monitoring', 'Legacy', 'OPA Gatekeeper', and 'More Resources'. The main dashboard area shows the 'Cluster Dashboard' for 'Provider: RKE1' and 'Kubernetes Ver: 1.20.10'. A 'Only User Namespaces' dropdown is visible at the top. A tooltip 'Copy KubeConfig to Clipboard' is active, showing 'Detail' and 'Config' buttons. The 'Capacity' section displays three metrics: Pods (Used: 83 / 330, 25.76%), CPU (Reserved: 14.87 / 18.5 cores, 80.38%; Used: 1.16 / 20 cores, 5.82%), and Memory (Reserved: 25 / 67 GiB, 37.31%; Used: 24 / 78 GiB, 30.77%). Below the capacity section, there are status indicators for 'Etcd', 'Scheduler', and 'Controller Manager', all marked as 'OK'. The 'Events' tab is selected, showing a table of recent events.

Reason	Object	Message	Name	Date
ReconciliationSucceeded	Kustomization apps	(combined from similar events): Reconciliation finished in 81.556514ms, next run in 1m0s	apps.17b6a5447bc2731f	Fri, Mar 8 2024 9:30:04 am
ArtifactUpToDate	HelmChart monitoring-fluent-bit	artifact up-to-date with remote revision: '0.6.2'	monitoring-fluent-bit.17b6a4c03a8cece	Fri, Mar 8 2024 9:30:04 am
ReconciliationSucceeded	Kustomization rancher-monitoring-patch	(combined from similar events): Reconciliation finished in 172.053036ms, next run in 1m0s	rancher-monitoring-patch.17b6a54cd8c7ed2c	Fri, Mar 8 2024 9:30:03 am
ReconciliationSucceeded	Kustomization k8scontainerhaslimits-template	(combined from similar events): Reconciliation finished in 144.675961ms, next run in 1m0s	k8scontainerhaslimits-template.17b6a538ee846979	Fri, Mar 8 2024 9:30:00 am

Kubeconfig

```
1  apiVersion: v1
2  kind: Config
3  clusters:
4  - name: "csforum"
5    cluster:
6      server: "https://rancher.modularminingcloud.com/k8s/clusters/c-lr55z"
7
8  users:
9  - name: "csforum"
10    user:
11      token: << Redacted >>
12
13
14  contexts:
15  - name: "csforum"
16    context:
17      user: "csforum"
18      cluster: "csforum"
19
20  current-context: "csforum"
```


Apps

The screenshot displays the Rancher UI interface for managing applications. The left sidebar contains navigation links: Home, Clusters, Workloads, Apps (selected), Charts, Installed Apps (0), Repositories (3), Recent Operations (0), Service Discovery, Storage, Policy, and More Resources. The 'Apps' section is active, showing a list of installed apps and a 'Cluster Tools' button. The main content area is titled 'Charts' and 'Featured Charts'. It features a search bar, filters, and a grid of chart cards. The top card is 'Hashicorp Vault' (Official HashiCorp Vault Chart). Below it are 'Alerting Drivers', 'CIS Benchmark', 'Elemental', 'Harvester Cloud Provider', 'Harvester CSI Driver', and 'Istio'. A notification banner at the bottom states: 'All charts have at least one version that is installable on clusters with Linux and Windows nodes unless otherwise indicated.'

local Only User Namespaces

Starred > Cluster > Workloads > Apps > Charts > Installed Apps (0) Repositories 3 Recent Operations (0) Service Discovery > Storage > Policy > More Resources >

Charts

Featured Charts

monitor your cloud

Hashicorp Vault Official HashiCorp Vault Chart

Alerting Drivers The manager for third-party webhook receivers used in Prometheus Alertmanager

CIS Benchmark The cis-operator enables running CIS benchmark security scans on a...

Elemental Elemental provides Cloud Native OS Management for Cluster Nodes. Linux only

Harvester Cloud Provider A Helm chart for Harvester Cloud Provider

Harvester CSI Driver A Helm chart for Harvester CSI driver








Istio A basic Istio setup that installs with the istioctl. Refer to...

Cluster Tools

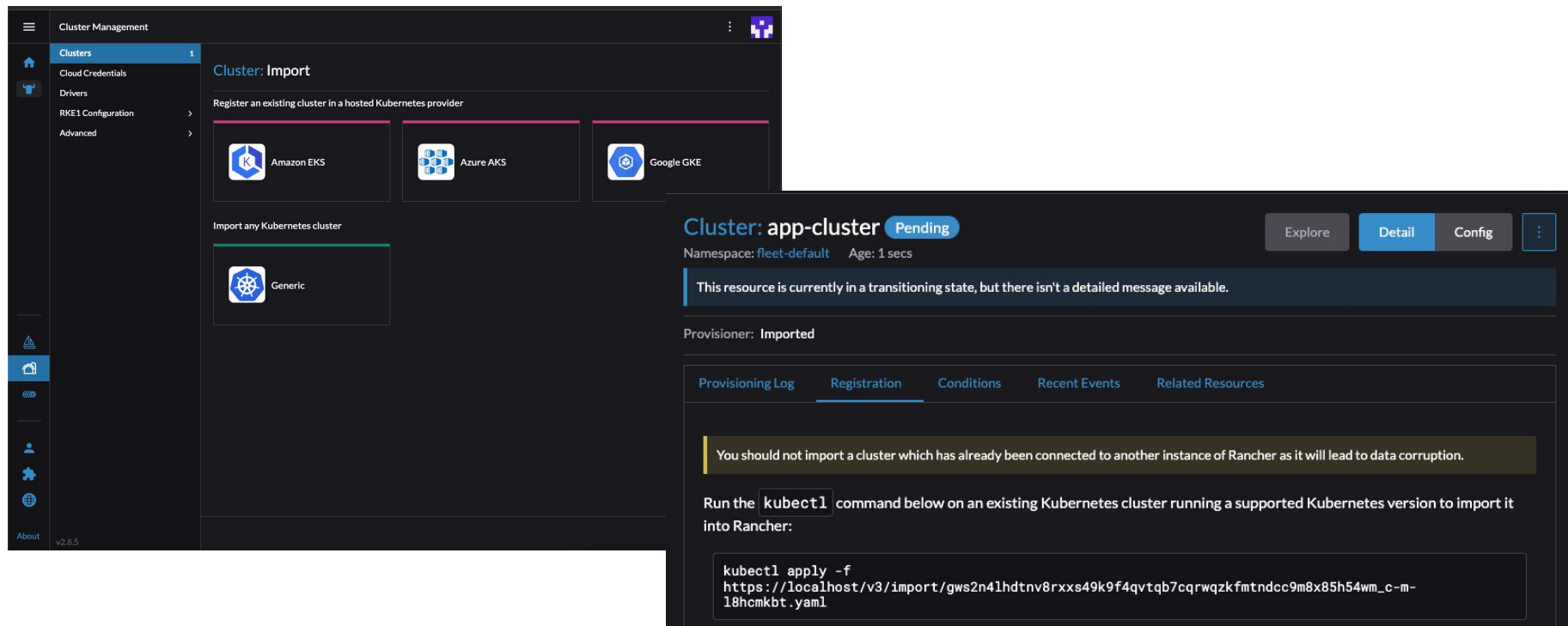
About v2.8.5

Starred CRDs



	 local
	Starred 
	Catalogs 3
	ClusterRoleBindings 83
	ReplicaSets  2
	Cluster 

Tá, mas e como eu adiciono um novo cluster?



Cluster Management

Clusters 1

Cloud Credentials

Drivers

RKE1 Configuration >

Advanced >

Cluster: Import

Register an existing cluster in a hosted Kubernetes provider

Amazon EKS

Azure AKS

Google GKE

Import any Kubernetes cluster

Generic

Cluster: app-cluster Pending

Namespace: fleet-default Age: 1 secs

Explore Detail Config

This resource is currently in a transitioning state, but there isn't a detailed message available.

Provisioner: Imported

Provisioning Log Registration Conditions Recent Events Related Resources

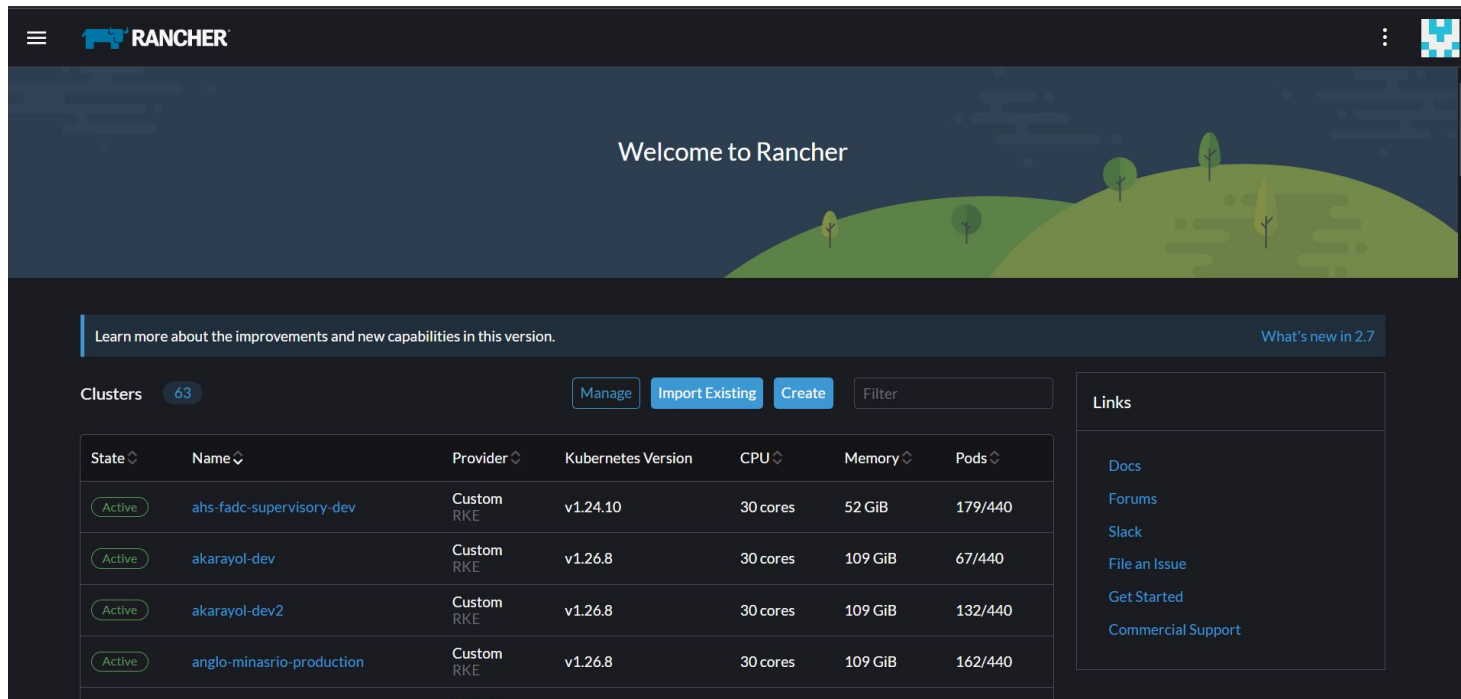
You should not import a cluster which has already been connected to another instance of Rancher as it will lead to data corruption.

Run the `kubectl` command below on an existing Kubernetes cluster running a supported Kubernetes version to import it into Rancher:

```
kubectl apply -f
https://localhost/v3/import/gws2n4lhtnv8rxs49k9f4qvtqb7cqrwqzkfntndcc9m8x85h54wm_c-m-18hcmkbt.yaml
```

Funcionalidades para multicluster

Mover entre clusters no click de um botão



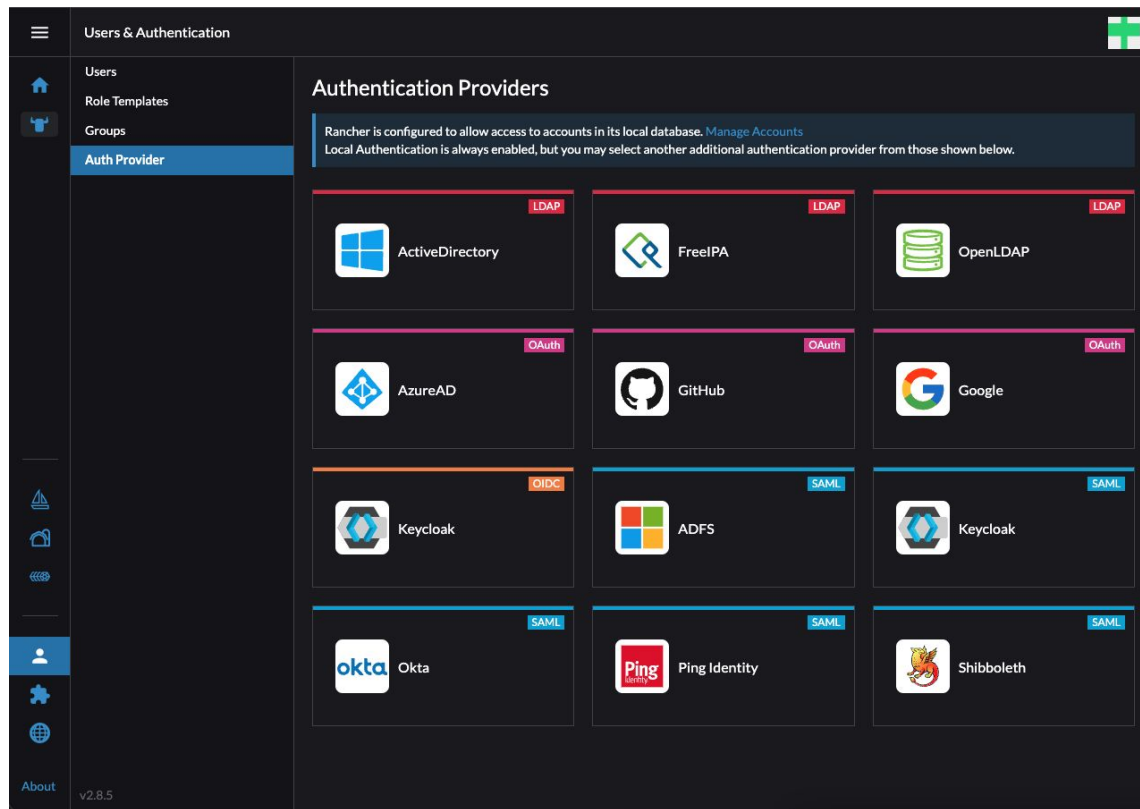
The screenshot shows the Rancher web interface. At the top, there's a navigation bar with the Rancher logo and a hamburger menu. Below the navigation bar is a large banner with the text "Welcome to Rancher" and a stylized landscape illustration. A horizontal bar below the banner contains a link to "Learn more about the improvements and new capabilities in this version." and a button for "What's new in 2.7".

The main content area displays a list of clusters. Above the list, there are buttons for "Manage", "Import Existing", and "Create", along with a "Filter" input field. The cluster list table has columns for State, Name, Provider, Kubernetes Version, CPU, Memory, and Pods. Four clusters are visible, all in an "Active" state.

On the right side of the interface, there is a "Links" section with a list of links: Docs, Forums, Slack, File an Issue, Get Started, and Commercial Support.

State	Name	Provider	Kubernetes Version	CPU	Memory	Pods
Active	ahs-fadc-supervisory-dev	Custom RKE	v1.24.10	30 cores	52 GiB	179/440
Active	akarayol-dev	Custom RKE	v1.26.8	30 cores	109 GiB	67/440
Active	akarayol-dev2	Custom RKE	v1.26.8	30 cores	109 GiB	132/440
Active	anglo-minasrio-production	Custom RKE	v1.26.8	30 cores	109 GiB	162/440

RBAC integrado com provedores



The screenshot shows the 'Users & Authentication' section of the Rancher UI, specifically the 'Auth Provider' configuration page. The left sidebar contains navigation links for Users, Role Templates, Groups, and Auth Provider (which is currently selected). The main content area is titled 'Authentication Providers' and includes a notice about local database access. Below the notice, a grid of authentication providers is displayed, each with its logo, name, and protocol type.

Authentication Providers

Rancher is configured to allow access to accounts in its local database. [Manage Accounts](#)
Local Authentication is always enabled, but you may select another additional authentication provider from those shown below.

Protocol	Provider Name	Icon
LDAP	ActiveDirectory	Windows logo
LDAP	FreeIPA	FreeIPA logo
LDAP	OpenLDAP	OpenLDAP logo
OAuth	AzureAD	AzureAD logo
OAuth	GitHub	GitHub logo
OAuth	Google	Google logo
OIDC	Keycloak	Keycloak logo
SAML	ADFS	ADFS logo
SAML	Keycloak	Keycloak logo
SAML	Okta	Okta logo
SAML	Ping Identity	Ping Identity logo
SAML	Shibboleth	Shibboleth logo

At the bottom left, the 'About' section shows the version 'v2.8.5'.

Casos de uso e Melhores Práticas

Algumas dicas



- Usa muito mais memória do que o advertido!
- Garbage collector não muito bom
- Diversas outras features não foram faladas aqui!
- Muito bom quando usado em conjunto com o RKE (Rancher Kubernetes Engine)

Step 2

Registration Command

Run this command on each of the existing Linux machines you want to register.

```
curl -fL https://localhost/system-agent-install.sh | sudo sh -s - --server https://localhost -  
-label 'cattle.io/os=linux' --token 298vhghftw89znjv4d78vvnph9n6rh9nwggblf4b6hvch9c9kf5bbd --  
etcd --controlplane --worker
```

☐ Insecure: Select this to skip TLS verification if your server has a self-signed certificate.

Cenário da Komatsu

- Mais de 70 clusters entre Cloud e On-Premise
- Clientes com restrições de rede severas
- Gerenciados atualmente por um time de 6 pessoas
- Vários times de desenvolvimento
- Acesso facilitado a serviços rodando no cluster




Alguns Concorrentes

Context: minikube
Cluster: minikube
User: minikube
K9s Rev: dev
K8s Rev: v1.17.3
CPU: 5%
MEM: 17%

<0> all
<1> kube-system
<2> default

<a> Attach
<ctrl-d> Delete
<d> Describe
<e> Edit
<ctrl-k> Kill
<l> Logs

<ctrl-j> Logs (jq)
<ctrl-l> Logs <Stern>
<shift-l> Logs Previous
<shift-f> Port-Forward
<s> Shell
<y> YAML



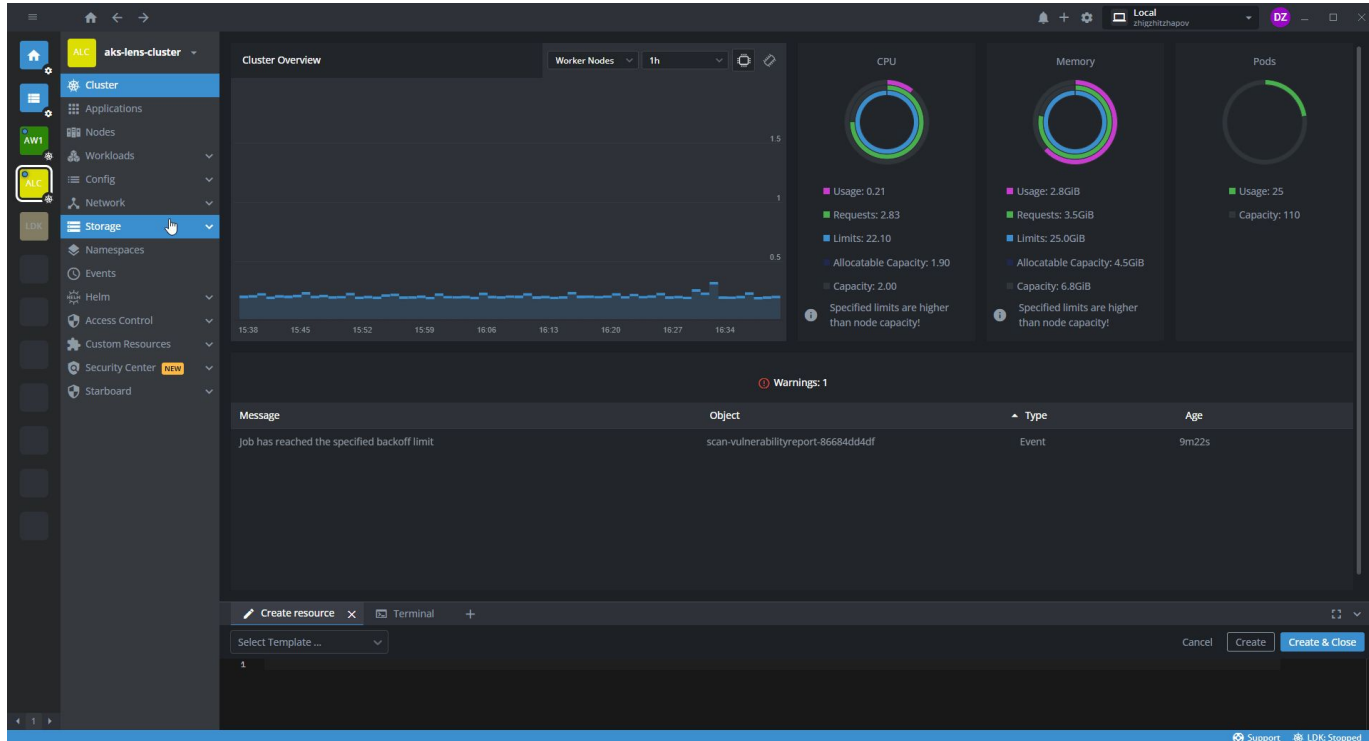
Pods(all)[23]

NAMESPACE↑	NAME	READY	RESTART	STATUS	CPU	MEM	%CPU/R	%MEM/R	%CPU/L	%MEM/L	IP	NODE
default	hello-1582785780-lsrtd	0/1	0	Completed	n/a	n/a	n/a	n/a	n/a	n/a	172.17.0.12	minikube
default	hello-1582785840-rq8h5	0/1	0	Completed	n/a	n/a	n/a	n/a	n/a	n/a	172.17.0.12	minikube
default	hello-1582785900-4zbf	0/1	0	Completed	n/a	n/a	n/a	n/a	n/a	n/a	172.17.0.12	minikube
default	jaeger-5bbc8c887-cmjj7	1/1	1	Running	0	7	0	3	0	0	172.17.0.11	minikube
default	nginx	1/1	1	Running	0	4	0	0	0	0	172.17.0.10	minikube
default	nginx-6fbbddc48c-5kv5p	1/1	0	Running	0	2	0	28	0	0	172.17.0.15	minikube
default	nginx-6fbbddc48c-7xn7j	1/1	0	Running	n/a	n/a	n/a	n/a	n/a	n/a	172.17.0.7	minikube
default	nginx-6fbbddc48c-bmqj	1/1	0	Running	n/a	n/a	n/a	n/a	n/a	n/a	172.17.0.13	minikube
default	nginx-6fbbddc48c-jf944	1/1	0	Running	n/a	n/a	n/a	n/a	n/a	n/a	172.17.0.12	minikube
default	nginx-6fbbddc48c-xwjnb	1/1	0	Running	0	3	0	39	0	0	172.17.0.14	minikube
kube-system	coredns-6955765f44-2pkvx	1/1	1	Running	3	7	3	10	0	0	172.17.0.2	minikube
kube-system	coredns-6955765f44-wr88k	1/1	1	Running	3	7	3	10	0	0	172.17.0.3	minikube
kube-system	etcd-minikube	1/1	1	Running	20	29	0	0	0	0	192.168.64.15	minikube
kube-system	fluentd-elasticsearch-vnt25	1/1	1	Running	1	51	1	25	0	0	172.17.0.5	minikube
kube-system	kube-apiserver-minikube	1/1	1	Running	47	227	18	0	0	0	192.168.64.15	minikube
kube-system	kube-controller-manager-minikube	1/1	2	Running	20	35	10	0	0	0	192.168.64.15	minikube
kube-system	kube-proxy-sqs9s	1/1	1	Running	0	14	0	0	0	0	192.168.64.15	minikube
kube-system	kube-scheduler-minikube	1/1	2	Running	4	12	4	0	0	0	192.168.64.15	minikube
kube-system	metrics-server-6754dbc9df-t8x2n	1/1	1	Running	0	13	0	0	0	0	172.17.0.8	minikube
kube-system	metrics-server-6754dbc9df-tz7kh	1/1	1	Running	0	10	0	0	0	0	172.17.0.6	minikube
kube-system	storage-provisioner	1/1	2	Running	0	14	0	0	0	0	192.168.64.15	minikube
kubernetes-dashboard	dashboard-metrics-scraper-7b64584c5c-5tjsh	1/1	1	Running	0	5	0	0	0	0	172.17.0.4	minikube
kubernetes-dashboard	kubernetes-dashboard-79d9cd965-wb2vv	1/1	1	Running	0	11	0	0	0	0	172.17.0.9	minikube

<pulses>

<pod>

Alguns Concorrentes



Dúvidas?
Obrigado!

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