

THALES

# CTE for Kubernetes Integrations and Solutions

FOR THIRD-PARTY PRODUCTS



# Integrating CTE for Kubernetes with Rancher Kubernetes Management Platform

Rancher is an open source software platform that enables Enterprise Kubernetes Container Management. It provides a CNCF-certified (Cloud Native Computing Foundation) Kubernetes distribution that can run on any Kubernetes cluster or distribution. It solves common Kubernetes installation complexities by removing most host dependencies, thereby presenting a stable path for deployment, upgrades & rollbacks.

This document describes installing Rancher and deploying a few workloads to a Kubernetes cluster provisioned by Rancher.

## Test Environment

- **CTE for Kubernetes Agent:** 1.2.0
- **CipherTrust Manager:** 2.12.0
- **OS:** Ubuntu 20.04
- **Rancher:** 1.5.1
- **Kubernetes cert-manager:** 1.5.1

## Prerequisite

Create a 3-node Kubernetes cluster in which all of the worker nodes and master node are in the **Ready** state.

## Policy and Policy Elements

### CTE for Kubernetes Policy

Name	Access
	all_ops with Permit, Apply Key, Audit
	all_ops with Deny, Audit
Default	No Access

# Steps to integrate Rancher with CTE for Kubernetes Cluster

You will need to use K3s for installation. K3s is a lightweight Kubernetes distribution created by Rancher Labs.

## Create a Kubernetes cluster for Rancher

- Use the default K3s installation script, type:

```
curl -sfL https://get.k3s.io INSTALL_K3S_CHANNEL="v1.21"  
K3S_KUBECONFIG_MODE="644" sh -
```

## Testing the cluster

In the previous step, K3s created a new Kubernetes cluster and installed the `kubectl` CLI which you can use to directly interact with the Kubernetes API.

- To list all the nodes in the cluster and check their status, type:

```
kubectl get nodes
```

### System Response

```
All Pods are Running
```

## Install Helm

Helm is a package manager for Kubernetes. It is used as the installation tool for Rancher when deploying Rancher onto a Kubernetes cluster.

1. Download Helm CLI, type:

```
curl https://raw.githubusercontent.com/helm/helm/master/scripts/  
get-helm-3 \ | bash
```

2. Check for the version, type:

```
helm version --client
```

3. Create a soft symlink between rancher, `/etc/rancher/k3s/k3s.yaml` and the Kubernetes config file, `~/.kube/config` so that helm can interact with your cluster, type:

```
mkdir -p ~/.kube ln -s /etc/rancher/k3s/k3s.yaml ~/.kube/config
```

4. Validate the connection, type:

```
helm ls --all-namespaces
```

## Install Kubernetes Cert-Manager

Kubernetes cert-manager is an add-on that automates the management and issuance of TLS certificates from various issuing sources.

1. Obtain the latest version of the `cert-manager`, type:

```
kubectl apply --validate=false -f https://github.com/jetstack/cert-manager/releases/download/v1.5.1/cert-manager.crds.yaml
```

2. Add the Helm repository for Jetstack:

```
helm repo add jetstack https://charts.jetstack.io
```

3. Install `cert-manager`.

```
helm install cert-manager jetstack/cert-manager --namespace cert-manager --version v1.5.1 --create-namespace
```

4. Once the Helm chart is installed, you can monitor the rollout status of `cert-manager`.

```
kubectl -n cert-manager rollout status deploy/cert-manager
```

## System Response

```
Waiting for deployment cert-manager rollout to finish: 0 of 1 updated replicas are available... deployment "cert-manager" successfully rolled out
```

5. You can also monitor the rollout status of `cert-manager-webhook`.

```
kubectl -n cert-manager rollout status deploy/cert-manager-webhook
```

# Install Rancher

Install Rancher in HA mode on your Rancher01 Kubernetes cluster.

1. Add `rancher-stable` as a Helm repository, type:

```
helm repo add rancher-stable https://releases.rancher.com/servercharts/stable
```

2. Install Rancher using the Helm install command, type:

```
helm install rancher rancher-stable/rancher \
--namespace cattle-system \
--set hostname=rancher.${vminfo:rancher01:public_ip}.sslip.io \
--set replicas=1 \
--set bootstrapPassword=RancherOnK3s \
--create-namespace \
```

3. Verify that Rancher is successfully deployed, type:

```
kubectl -n cattle-system rollout status deploy/rancher
```

4. Get container details for the `cattle-system` namespace, type:

```
kubectl get pod -n cattle-system
```

5. List all pods in all namespaces, type:

```
kubectl get pods --all-namespaces
```

6. Verify Rancher is ready to access, type:

```
curl -kv https://rancher.${vminfo:Rancher01:public_ip}.sslip.io  
2>&1 | grep -q "dynamiclistener-ca"; if [ $? != 0 ]; then echo "  
Rancher isn't ready yet"; sleep 5; continue; fi; break; done;  
echo "Rancher is Ready";
```

# Support Contacts

If you encounter a problem while installing, registering, or operating the product, please refer to the documentation before contacting support. If you cannot resolve the issue, contact your supplier or [Thales Customer Support](#).

Thales Customer Support operates 24 hours a day, 7 days a week. Your level of access to this service is governed by the support plan arrangements made between Thales and your organization. Please consult this support plan for further information about your entitlements, including the hours when telephone support is available to you.

## Customer Support Portal

The Customer Support Portal, at [Thales Customer Support](#), is where you can find solutions for most common problems. The Customer Support Portal is a comprehensive, fully searchable database of support resources, including software and firmware downloads, release notes listing known problems and workarounds, a knowledge base, FAQs, product documentation, technical notes, and more. You can also use the portal to create and manage support cases.

### Tip

You require an account to access the Customer Support Portal. To create a new account, go to the portal and click on the REGISTER link.

## Telephone Support

If you have an urgent problem, or cannot access the Customer Support Portal, you can contact Thales Customer Support by telephone at +1 410-931-7520. Additional local telephone support numbers are listed on the support portal.

## Email Support

You can also contact technical support by email at [technical.support@Thales.com](mailto:technical.support@Thales.com).