

Reference Implementation - Rancher



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Preface

The purpose of this documentation is to provide a reference implementation of deploying Rancher as a container management platform for organizations that deploy containers in production. Rancher makes it easy to deploy, manage, and use Kubernetes everywhere, meet IT requirements, and empower DevOps teams.

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1 Introduction

Kubernetes has become the container orchestration standard. Most cloud and virtualization vendors now offer it as standard infrastructure. Rancher users have the choice of creating Kubernetes clusters with Rancher Kubernetes Engine (RKE), lightweight edge-centric K3s, on premise or in cloud Kubernetes services, such as GKE, AKS, and EKS. Rancher users can also import and manage their existing Kubernetes clusters created using any Kubernetes distribution or installer.

1.1 Background

Even on the journey to a full [Cloud Native Landscape](https://landscape.cncf.io/) (<https://landscape.cncf.io/>)⁷, classic IT pillars are still valid considerations. General requirements include the need for a small, purpose-built operating system with a container runtime engine and a container orchestration platform to distribute workloads across a target, clustered instance. The dominant technology for container orchestration is Kubernetes. With its large community of developers and a plethora of features and capabilities, Kubernetes has become the defacto standard and is included across most container-as-a-service platforms. With all of these attributes in place, both developer and operation teams can effectively deploy, manage and deliver functionality to their end users in a resilient and agile manner.



Note

As a further reference, the National Institute of Standards and Technology's (NIST) [Definition of Microservices, Application Containers and System Virtual Machines](https://csrc.nist.gov/publications/detail/sp/800-180/draft) (<https://csrc.nist.gov/publications/detail/sp/800-180/draft>)⁷ describes the important characteristics of application containers.

1.2 Motivation

While any developer or organization may simply start with a single, Kubernetes-based deployment, it is very common for that number of cluster instances to rapidly grow. While each of these may have specific focus areas, it becomes imperative to figure out how to use, manage, maintain and replicate the all of these instances over time. This is where Rancher leads the indus-

try, being able to manage access, usage, infrastructure and applications across clusters, that are ([CNCF \(https://www.cncf.io/certification/software-conformance/\)](https://www.cncf.io/certification/software-conformance/)) compliant, anywhere from edge, core, on-premise, or cloud.

1.3 Scope

The scope of this document is to provide a quick-start, reference implementation of Rancher. This can be done in a variety of solution stack, architectural scenarios as a fundamental component of an overall Kubernetes ecosystem.

1.4 Audience

This document is intended for IT decision makers, architects, system administrators and technicians who are implementing a flexible, software-defined Kubernetes management platform. You should be familiar with the traditional IT infrastructure pillars — networking, computing and storage — along with the local use cases for sizing, scaling and limitations within each pillars' environments.

2 Business problem and business value

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2.2 Business value

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3 Requirements

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4 Architectural overview

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4.1 Solution architecture

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4.2 Networking architecture

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5 Component model

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5.1 Component overview

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5.1.1 Software component description

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5.1.2 Hardware component description

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6 Deployment

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6.3 Software deployment configuration

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7 Deployment considerations

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8 Summary

Using components and offerings from SUSE and the Rancher portfolio streamlines your ability to quickly and effectively engage in a digital transformation, taking advantage of cloud native resources and disciplines. Using such technology approaches lets you deploy and leverage transformations of your infrastructure into a durable, reliable enterprise-grade environment.

Simplify

Simplify and optimize your existing IT environments

- FixMe - Using Rancher enables you to simplify management and make significant IT savings as you scale orchestrated, microservice deployments anywhere you need to and for whatever use cases are needed in an agile and innovative way.

Modernize

Bring applications and data into modern computing

- FixMe - Using Rancher enables you to simplify management and make significant IT savings as you scale orchestrated, microservice deployments anywhere you need to and for whatever use cases are needed in an agile and innovative way.

Accelerate

Accelerate business transformation through the power of open source software

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9 References

WHITEPAPERS

- How to Build an Enterprise Kubernetes Strategy <https://info.rancher.com/how-to-build-enterprise-kubernetes-strategy>

BOOKS



- Kubernetes Management - <https://info.rancher.com/kubernetes-management-for-dummies-rancher-and-suse-0-0>

TRAINING

- Rancher - <https://rancher.com/training/>
- SUSE - <https://training.suse.com/>

WEBSITES

- Rancher Labs (<https://rancher.com/>)
 - Products
 - Rancher - <https://rancher.com/products/rancher/> (documentation (<https://rancher.com/docs/rancher/v2.x/en/>))
 - Rancher Kubernetes Engine (RKE) - <https://rancher.com/products/rke/> (documentation (<https://rancher.com/docs/rke/latest/en/>))
 - Rancher Longhorn - <https://rancher.com/products/longhorn/>
 - Rancher K3s - <https://rancher.com/products/k3s/> (documentation (<https://rancher.com/docs/k3s/latest/en/>))
 - Projects
 - Rancher Kubernetes Engine Government (RKE2) - <https://github.com/rancher/rke2> (documentation (<https://docs.rke2.io/>))
 - Harvester - <https://github.com/rancher/harvester>
- <https://www.suse.com/>
 - Products

- SUSE Linux Enterprise Micro (SLES) - FixMe (FixMe[documentation])
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A Appendix

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Role	Qty	Component	Notes
{nodeRole}	6	{vendorIHV} {node-Platform} {nodeModel}	Configuration: <ul style="list-style-type: none">• 1x {nodeCPU} {nodeCPUDesc}• 4x {nodeRAM} {nodeRAMDesc}• 2x {nodeDisk} {nodeDiskDesc}• 2x {nodeNIC} {nodeNICDesc}
{swRole}	6	{vendorISV} {sw-Product})	Configuration: <ul style="list-style-type: none">• 1x {swSKU} {swDesc}

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