SUSE

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SUSE Rancher on IBM Z and LinuxONE

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Agenda

1. Why Rancher for IBM Z and LinuxONE
2. The Rancher for s390x products
3. Brief Product Overview
   - Rancher Multi-Cluster Manager
   - Longhorn
   - Rancher Kubernetes Engine
4. Deploying your first Rancher environment on s390x
5. What's next

Why SUSE Rancher for IBM Z and LinuxONE

- SLES for Z and LinuxONE customers are asking for a SUSE container strategy
- SUSE strategy is to innovate everywhere - on-prem, public cloud and server architectures
- Important that SUSE provides a choice for customers
- We knew that Kubernetes technically works on s390x
  - Most of the work was to QA / productize Rancher
- In early 2021, SUSE executives approved business plan to bring RKE2, Rancher Manager and Longhorn to s390x
  - The goal is that these products will run on all IBM supported Linux distros on Z

The Rancher for s390x products

SUSE Rancher

Industry's only platform to manage all Kubernetes distributions

Rancher Overview

Innovate Everywhere

Multi-cluster Management

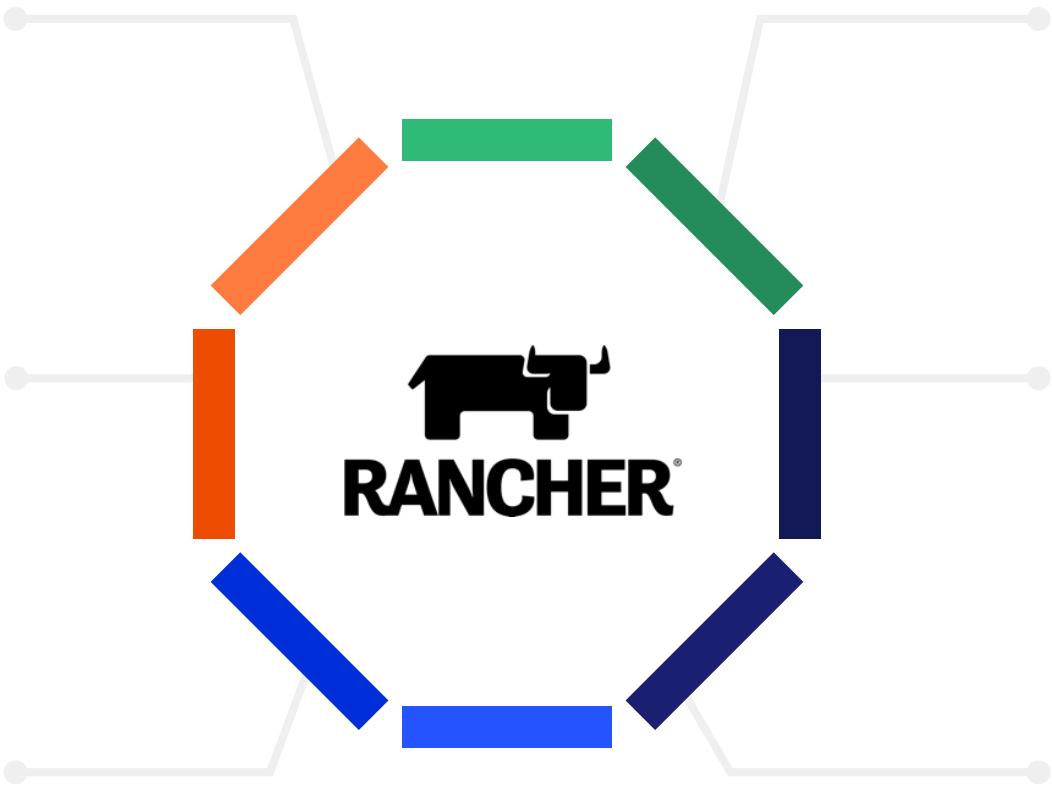
Rancher Multi-cluster Manager unifies clusters to ensure consistent operations, workload management, and enterprise-grade security

Edge

Leveraging the agility and software delivery from the Datacenter is making its way to branch offices, cell towers and satellites.

Single Cluster

Rancher provides a consistent experience for Kubernetes clusters on the desktop, edge , or datacenter.



One Dashboard

Rancher provides a consistent interface for managing and interacting with the cluster. Providing a gateway to Kubernetes native apps through the catalog.

Installs Everywhere

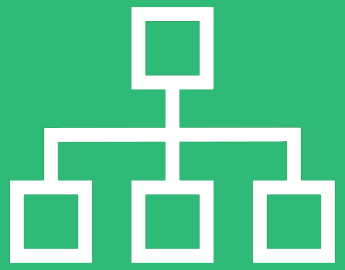
Rancher can be installed on any CNCF certified cluster.

Scaled Management

Rancher provides a graphical interface for managing smaller environments. The built in GitOps engine allows deployments to scale up to thousands of clusters.

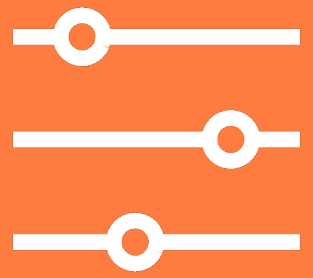
Available Vision

Our Unique Approach



It's a multi-cluster world

Treat all Kubernetes distributions as first class citizens



Value is in Kubernetes management

'Open' approach to open source

Rancher Manager

Unifies Kubernetes management everywhere to ensure consistent operations, workload management and enterprise-grade security.

- s390x support added in v2.6.4
  - Tech preview release
  - Custom and imported downstream cluster are supported
- Validated features in v2.6.4

Server	Agent	Fleet	Catalog
Backup/restore operator (preview)			

- Images for these features are not built in v2.6.4 are being planned for validation in future releases

Monitoring	Logging	Alerting	CIS Scans
Istio	OPA Gatekeeper		

- Supported on z/VM, KVM and LPAR
- Installation is the same as other architectures

Longhorn

Cloud native distributed block storage for Kubernetes

Longhorn

Enable Persistent Workloads

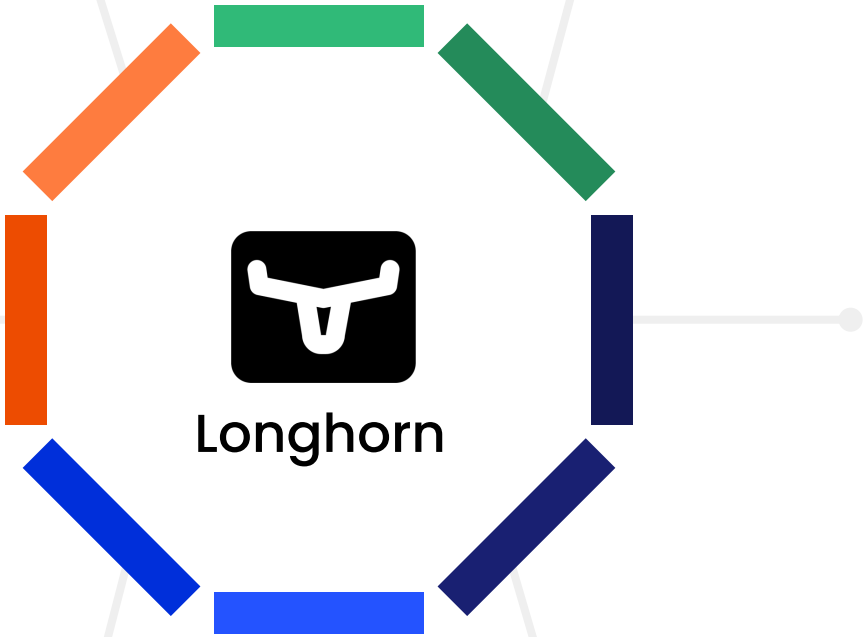
Support databases, analytics tools, AI/ML workloads that require persistent storage

Manage complexity

Free-up time spent on managing complex storage solutions

Deploy Anywhere

Support cloud, on prem and edge with ARM64 support and low resource support



Ease of use

"Everything should be made as simple as possible..."

Security

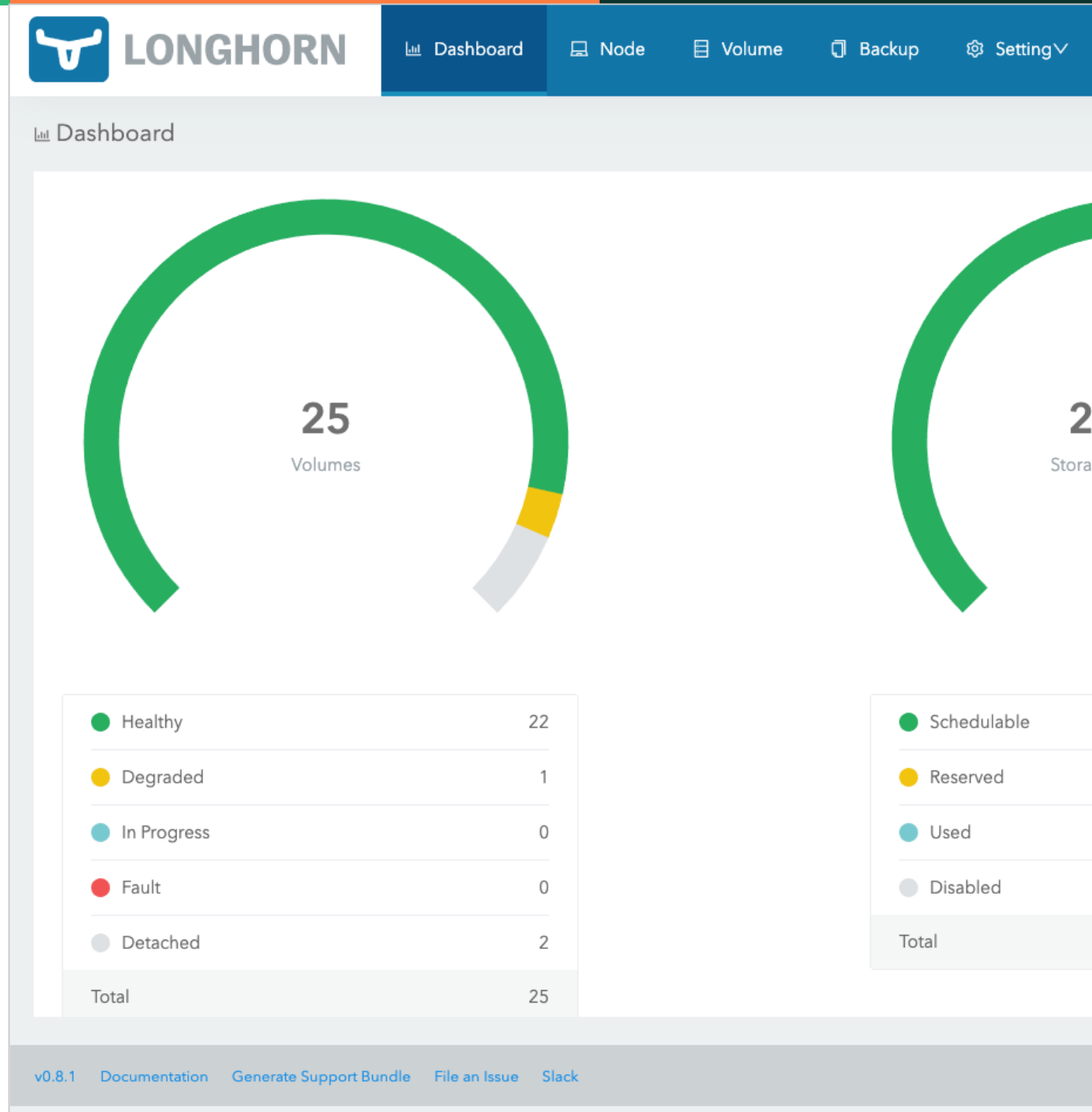
Longhorn is built with security in mind

Open Source

Longhorn is 100% open source and owned by a non profit foundation (CNCF)

Key Features

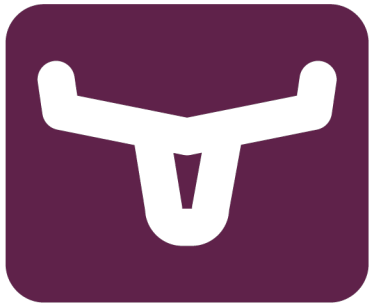
- 100% open source, enterprise-grade, distributed block storage
- '1-click' deployment from within Rancher app catalog
- Simple to use and operate with free, intuitive GUI dashboard
- Keep your data secure with snapshots and backups
- Fast recovery with definable RPO & RTO
- Support option available through Rancher
- SUSE Rancher subscription keep costs to a minimum with node-based pricing
- Active CNCF Sandbox Project



Longhorn

Cloud-native distributed persistent storage

- Longhorn internal build testing based on v1.2.2
- Tested with DASD and FCP storage
- Support initially planned for SLES
  - Goal is that the installation will be the same as other architectures
- Support for s390x will be in v1.3.0



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Rancher Kubernetes Distributions

Why choose Rancher Kubernetes Engine?

Automate Your Kubernetes Operations with RKE2 and K3s.

CNCF-certified

Simplified deployment, supports air gapped environments

Automated operation

Vendor-neutral

Safe, atomic upgrades. FIPS-enabled option

24x7x365 enterprise support

What's the difference between RKE2 & K3S?

Kubernetes distribution that uses containerd as its container runtime. Rancher Kubernetes Engine 2 (RKE2) is CNCF-certified and that focuses on security and compliance

To meet these goals, RKE2 does the following:

- Provides defaults and configuration options that allow clusters to pass the CIS Kubernetes Benchmark v1.5 or v1.6 with minimal operator intervention
- Enables FIPS 140-2 compliance
- Regularly scans components for CVEs using trivy in our build pipeline

K3s is also a fully certified Kubernetes distribution released by Rancher that is newer than RKE. It is a lightweight distribution of Kubernetes that has been designed for production workloads in unattended, resource-constrained, remote locations or inside IoT appliances.

K3s is packaged as a single <50MB binary that reduces the dependencies and steps needed to install, run and auto-update a production Kubernetes cluster.

RKE2

Rancher Kubernetes Engine v2

- Support for s390x was introduced in v1.21.8
- As of May 5, 2022, s390x support is available on v1.21.12, v1.22.9 and v1.23.6
- Supported CNI – Canal
- Supported Ingress Controller - NGINX
- Supported on SLES and tested on RHEL and Ubuntu
- Installation is the same as other architectures

RKE 2

K3s

Lightweight certified Kubernetes

- Was not part of the original scope but an interesting use case after working with early adopters
  - The use case will be shown in early adopter section
- Support for s390x added in v1.22.9 and v.1.23.6
- Supported CNI - Flannel
- Supported Ingress Controller – Traefik
- Support on SLES; testing on RHEL and Ubuntu in progress
- Installation is the same as other architectures

Deploying your first Rancher environment on s390x

Deploying your first Rancher environment on s390x

- Review published YouTube videos for online and air-gapped installations on s390x
  - Videos show installations on z/VM guest and KVM virtual machines
  - **RKE2** and **Rancher Manager** installation videos available
  - **K3s** and **Longhorn** installation videos will be coming
- Use the official Rancher documentation
  - Rancher Manager 2.6
  - RKE2
  - K3s
  - Longhorn
- Build and deploy a simple container using a SLE Base Container Image
- Learn the Basics includes Online Meetups, Rodeos, Master Classes and Tutorials
- Join the SUSE & Rancher Community and chat via Slack

Cheat Sheets:
Deploying RKE2 and Rancher

Cheat Sheet Assumptions

The following sections are based on the following assuptions:

- SLES15SP3 is the base operating system
- Using Rancher for issuing SSL certificates
- Access to the internet from test devices (ports 80 and 443). Having a proxy is OK.
- Followed recommended VM sizing for both RKE2 and Rancher MCM

The steps are just a consolidation of the following Install Instractio guides:

- RKE2: https://docs.rke2.io/install/quickstart/
- Rancher MCM: https://rancher.com/docs/rancher/v2.6/en/installation/install-rancher-on-k8s/

Also, these instructions are strictly for a test/learning environment, not for a PoC, Pilot or Production.

Cheat Sheet Part 1 – Deploying RKE2

Install RancherKubernetesEngine2:

- *Check hostnamectl - make sure its the name your what*
- *Check DNS resolution - must be able to resolve its name via nslookup*
- Download the install script: curl -sfL https://get.rke2.io | INSTALL_RKE2_CHANNEL=stable sh -
- Start RKE2: systemctl enable rke2-server.service --now
- *On another terminal, run* journalctl -u rke2-server –f *and watch it pull the required packages. You will see transient errors as packages are downloaded and installed.*
- *Add rke2 path and kubeconfig:*
  - export KUBECONFIG=/etc/rancher/rke2/rke2.yaml
    PATH=$PATH:/var/lib/rancher/rke2/bin

Cheat Sheet Part 2a – Deploying Rancher

Rancher MultiClusterManager:

- *Install helm if required from SLES15 Package Hub*
- helm repo add rancher-stable https://releases.rancher.com/server-charts/stable
- kubectl create namespace cattle-system
- kubectl apply -f https://github.com/jetstack/cert-manager/releases/download/v1.7.1/cert-manager.crds.yaml
- helm repo add jetstack https://charts.jetstack.io
- helm repo update
- helm install cert-manager jetstack/cert-manager --namespace cert-manager --create-namespace --version v1.7.1

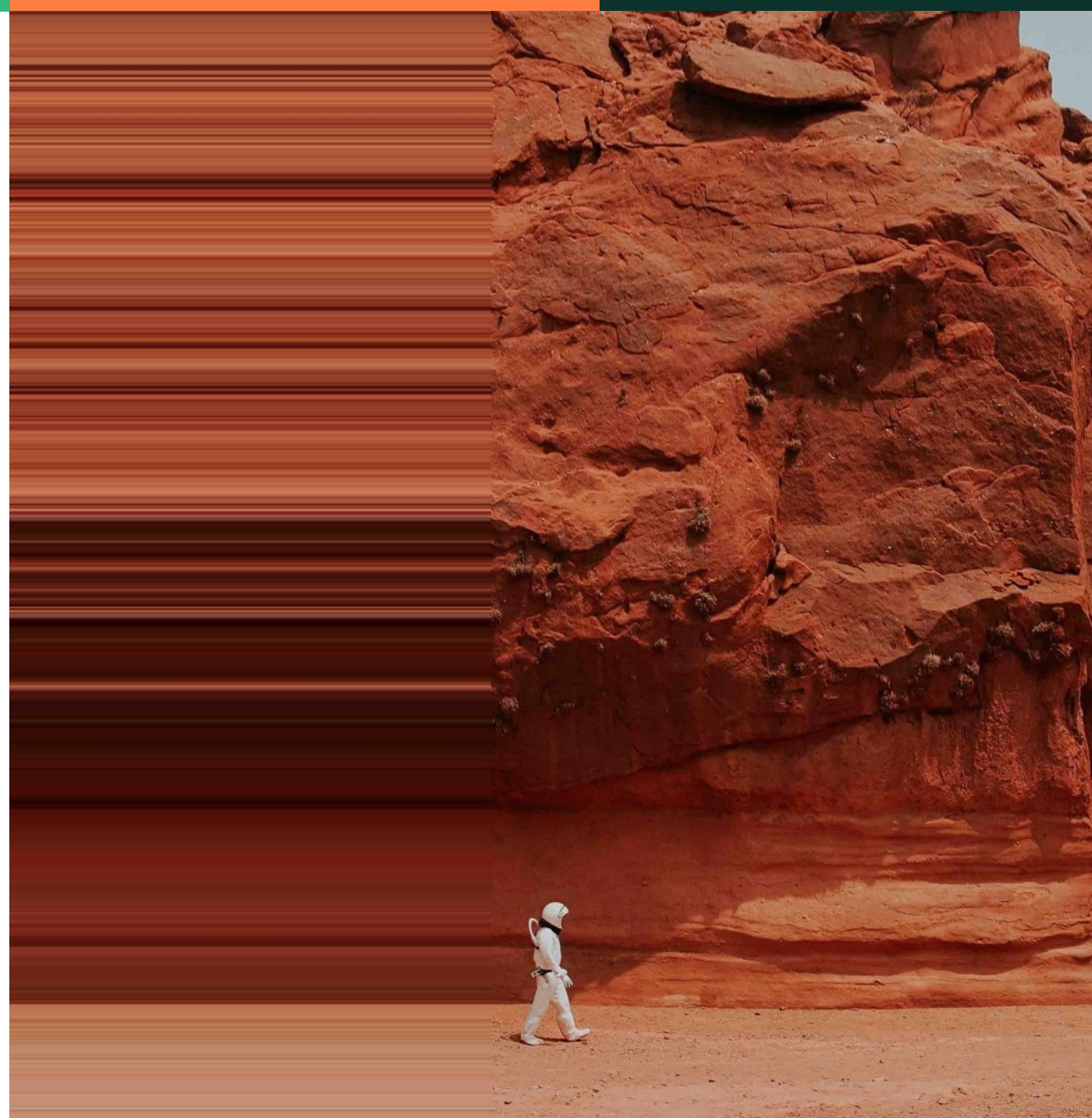
Cheat Sheet Part 2b – Deploying Rancher

Rancher MultiClusterManager:

- kubectl get pods --namespace cert-manager
- helm install rancher rancher-stable/rancher --namespace cattle-system --set hostname=<FQDN of server> --set bootstrapPassword=admin
- kubectl -n cattle-system rollout status deploy/rancher
- *Open preferred browser and point to the FQDN of the Rancher Server*

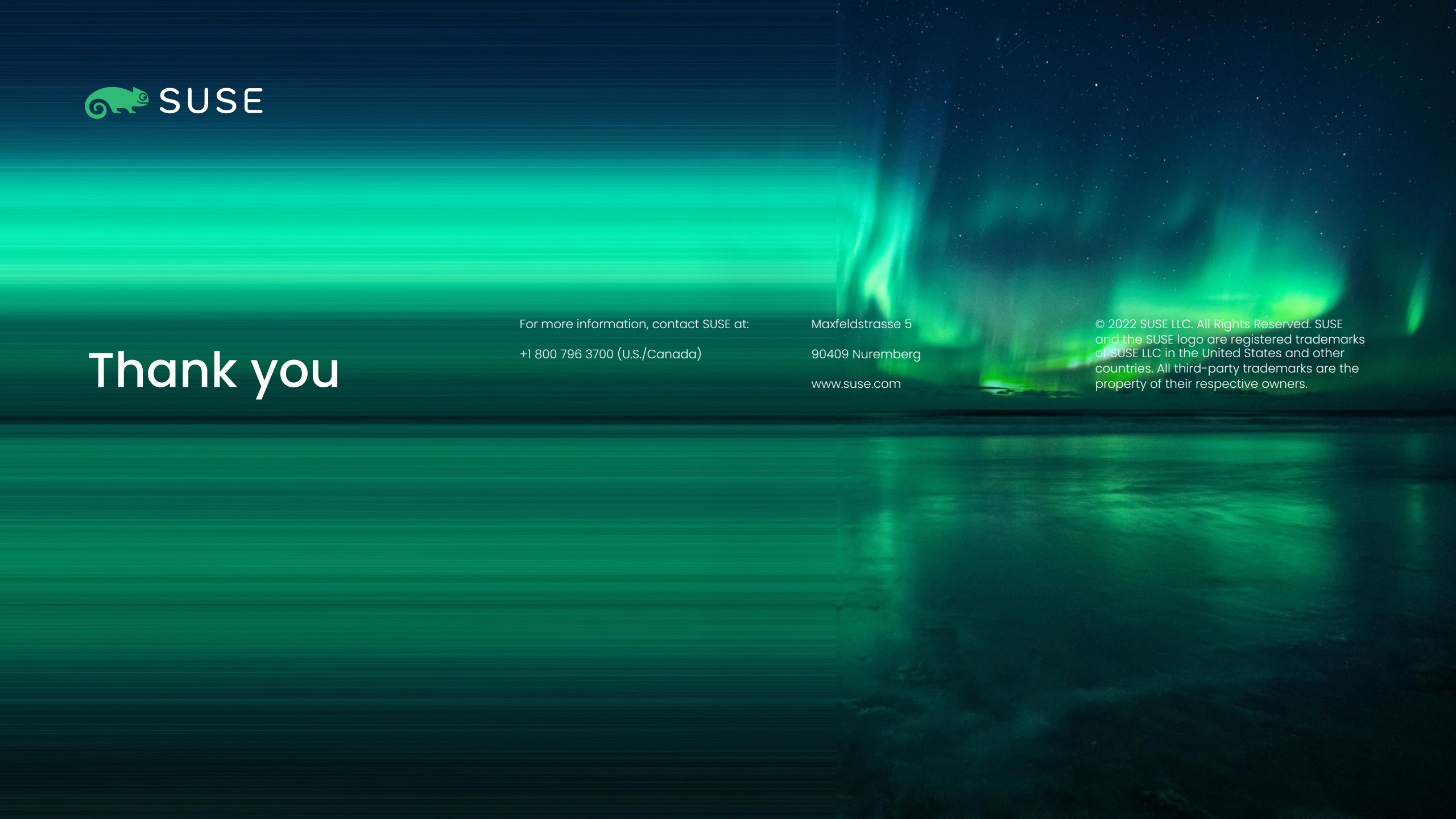
What’s next

What can you expect in the near future...



What's next

- This Rancher for IBM Z and LinuxONE release is a foundational release
- This builds the foundation for SUSE to do more
  - Continue enabling and validating the capabilities that were not done in this release
    - The Cluster Tools in Rancher Manager like Monitoring, Backups and CIS Benchmarks are important
    - If you need CNIs for RKE2 or K3s for s390x, come talk with us
  - Work with ISVs to enable their containerized applications for Rancher on s390x
  - Continue hybrid cloud work to add Rancher as an option
  - Create integrated solution stacks combining the strengths of IBM Z and LinuxONE with SUSE Rancher
- Work with customers and partners
  - Support their journey to application containerization and micro-services with Rancher



Thank you

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