SUSE traefiklabs

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Build a Lightweight Private Cloud with Harvester, K3s, and Traefik

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Introducing the speakers

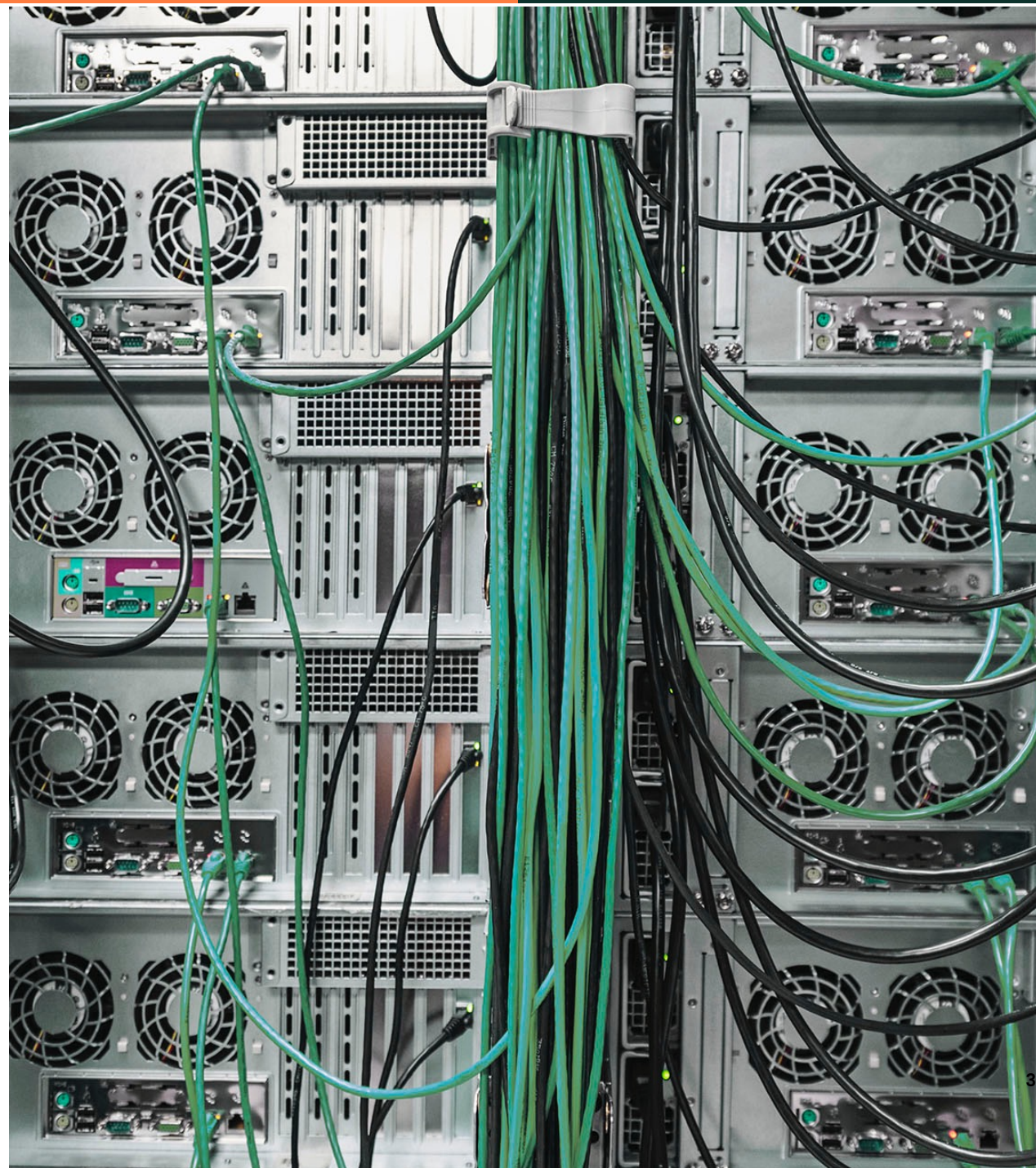
Andrés Valero

```
apiVersion: users.suse.io/v1
group: Technical Marketing Manager
Kind: User
metadata:
    name: Andrés Valero
    email: andres.valero@suse.com
    background:
      - Solution Architect
      - Consultant
      - Salesman
    social:
     - twitter.com/anvarui
     - linkedin.com/in/avaleror
```

State of Play

The infrastructure landscape is rapidly changing.

- **Containers** uptake continues to grow exponentially
    - *By the end of 2022 – 60% of enterprises will be leveraging containers on the cloud (Forrester, 2021)*
- **Virtualized workloads** are now mature but continue to experience steady growth in on-prem environments and cloud
- **HCI market** is predicted to experience double-digit growth in the next 5 years



Harvester combines key cloud-native technologies into a single API

Orchestration	 kubernetes
Virtualization Platform	
VM Management	 KubeVirt
Persistent Storage	 LONGHORN
Meta CNI	 MULTUS
Virtual IP	 Kube-vip

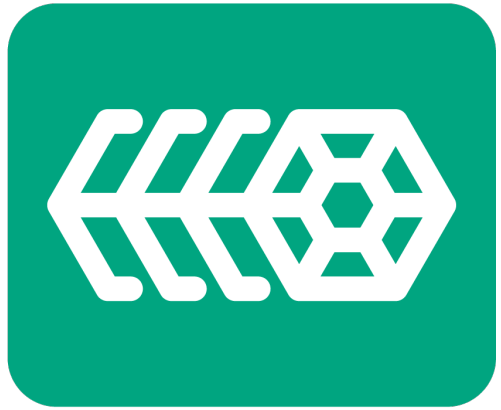
What is hyperconverged infrastructure (HCI)?

- HCI is software-defined IT infrastructure
- Virtualizes all the elements of conventional "hardware-defined" systems.
- It generally incorporates:
  - A hypervisor (VMs)
  - Software-defined Storage
  - Software-defined Networking
- Reliance on off-the-shelf hardware solutions to deploy

- ✓ Simplified operations of VMs
  - ✓ Including deployment, lifecycle management & upgrades
- ✓ Scalable solution with HCI clusters and nodes architecture
- ✓ Reliable system that provides high availability across VM environments
- ✓ Improved operator agility capable of handling diverse workloads
- ✓ Software-defined enables automation,
- ✓ Cloud Integration

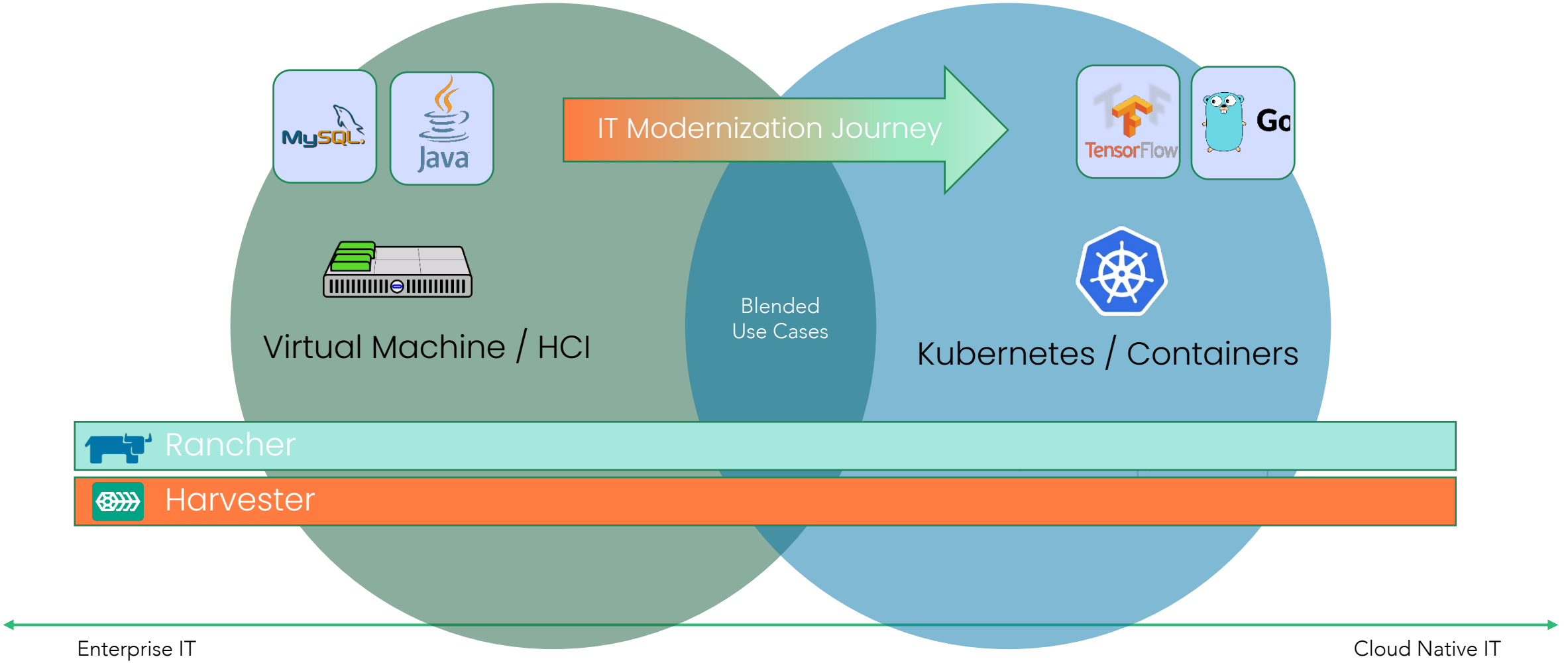
What is Harvester?

- ‘Open, Interoperable Hyperconverged Infrastructure Solution’
  - 100% Open-Source
  - No Licensing & Hardware Fees
- Modern solution built on cloud-native technology
  - Linux, Kubernetes (RKE2), Longhorn, KubeVirt, Multus
- Production-ready, turn-key conventional HCI experience
- Implements HCI on bare metal
- Lightweight, software-driven
  - Doesn’t require any additional hardware, external SANs
  - Reliable at the Edge
- Native Integration with Rancher for containerized workloads

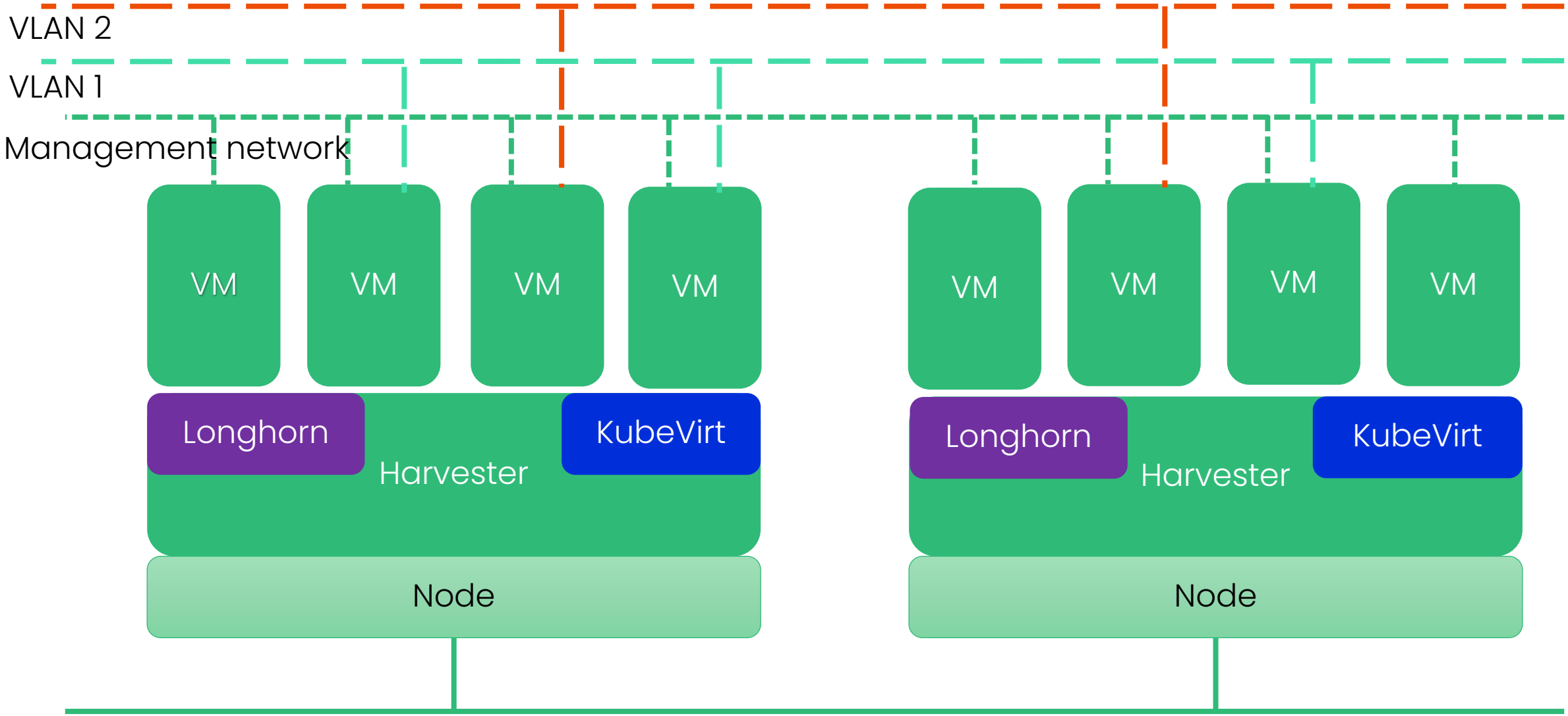


HARVESTER

Harvester bridges the classic and cloud-native infrastructure use cases together



Harvester Architecture



Hardware requirements

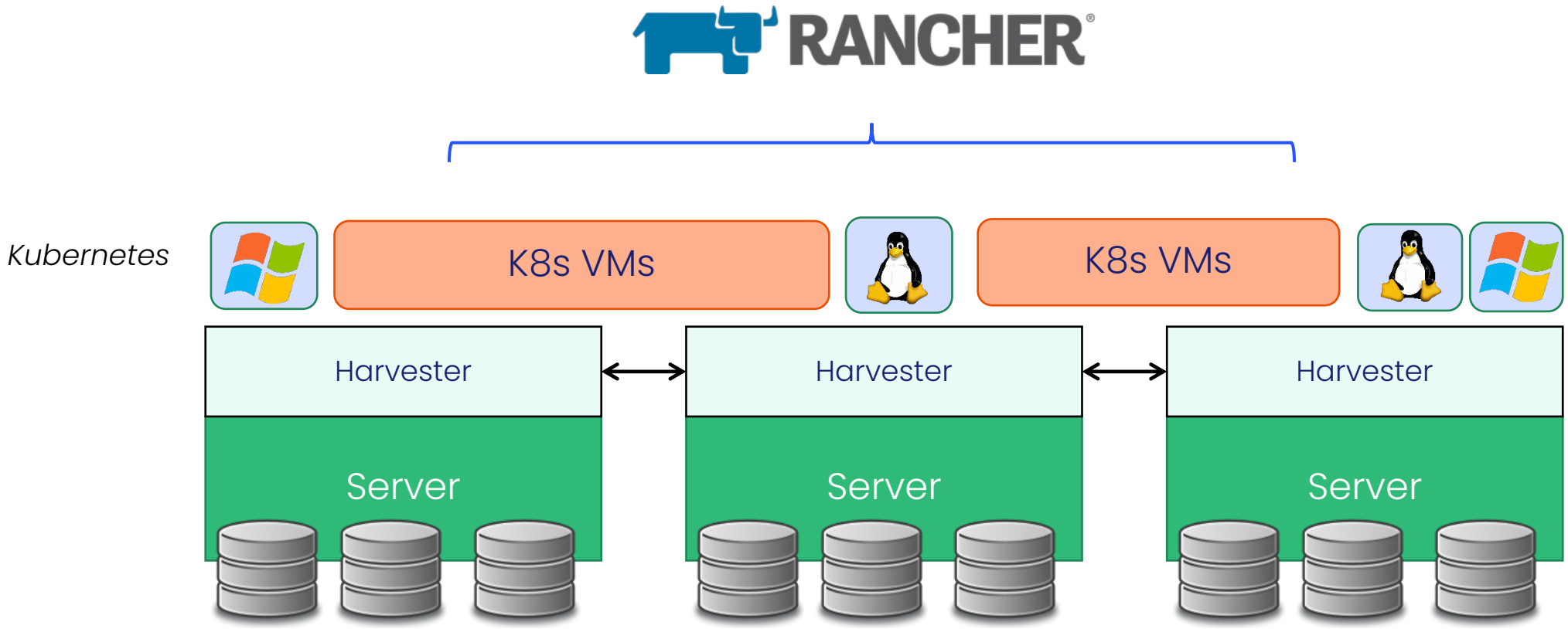
- Bare metal x86_64 machines
- CPU: 16 core or more
- Memory: 32GB or more
- Disk space: SSD/NVMe with 120GB or more
- Network: 10Gbps or more
  - Bonded NIC is supported

Deployment

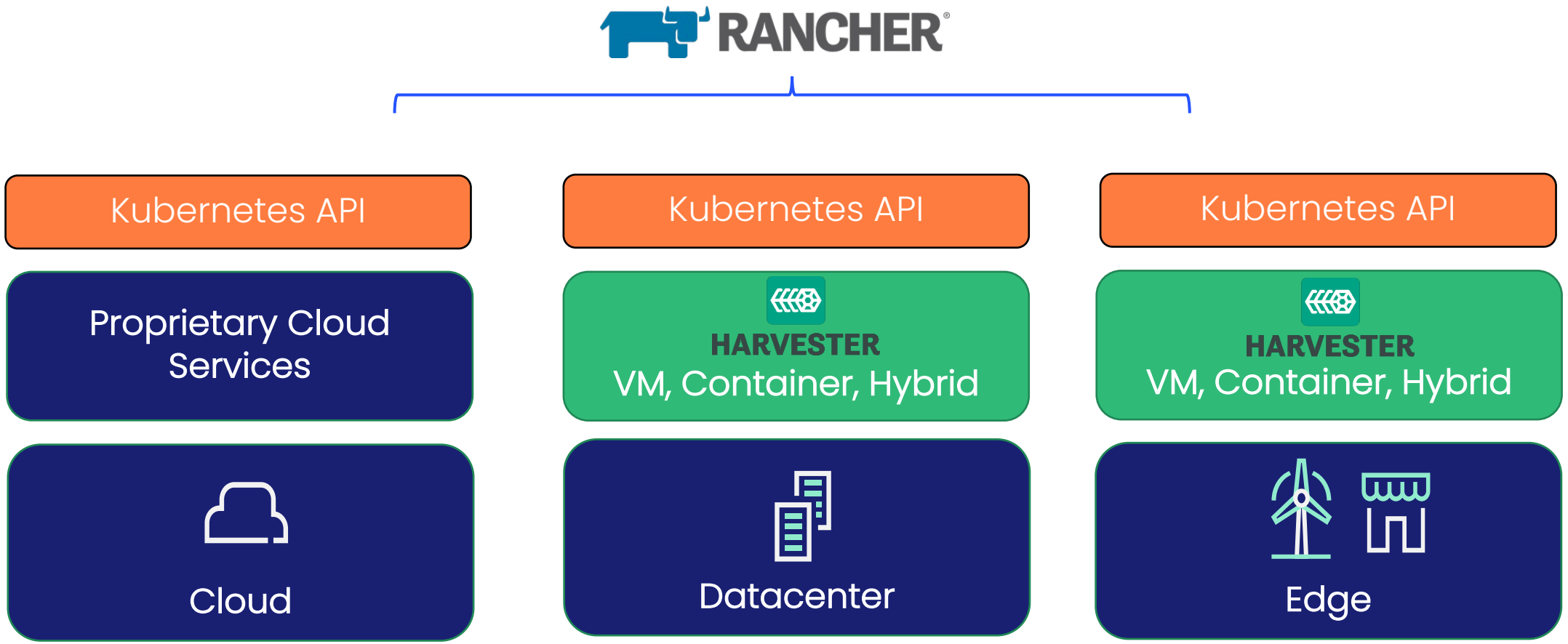
ISO images and PXE boot for installing direct to bare-metal

Hybrid: Modernize HCI

Virtual Machines and Containers managed from a single pane of glass



Helping organizations build a truly hybrid-IT strategy



Major Features

- Installation via ISO or PXE
  - Air gap environment support
  - Proxy support
- VM lifecycle management
  - Cloud Config
  - SSH key injection
  - Graphic console to VNC and serial port
  - Template
  - Live migration
  - Export images from existing VMs
  - Terraform support
- Built-in monitoring dashboard
- Storage
  - High performance and efficient block storage
  - Built-in highly-available image repository
  - VM backup/restore to NFS/S3
  - Hot plug disk
- Network
  - Virtual IP for the cluster
  - Multi-network support
  - VLAN support
  - Custom SSL certificate

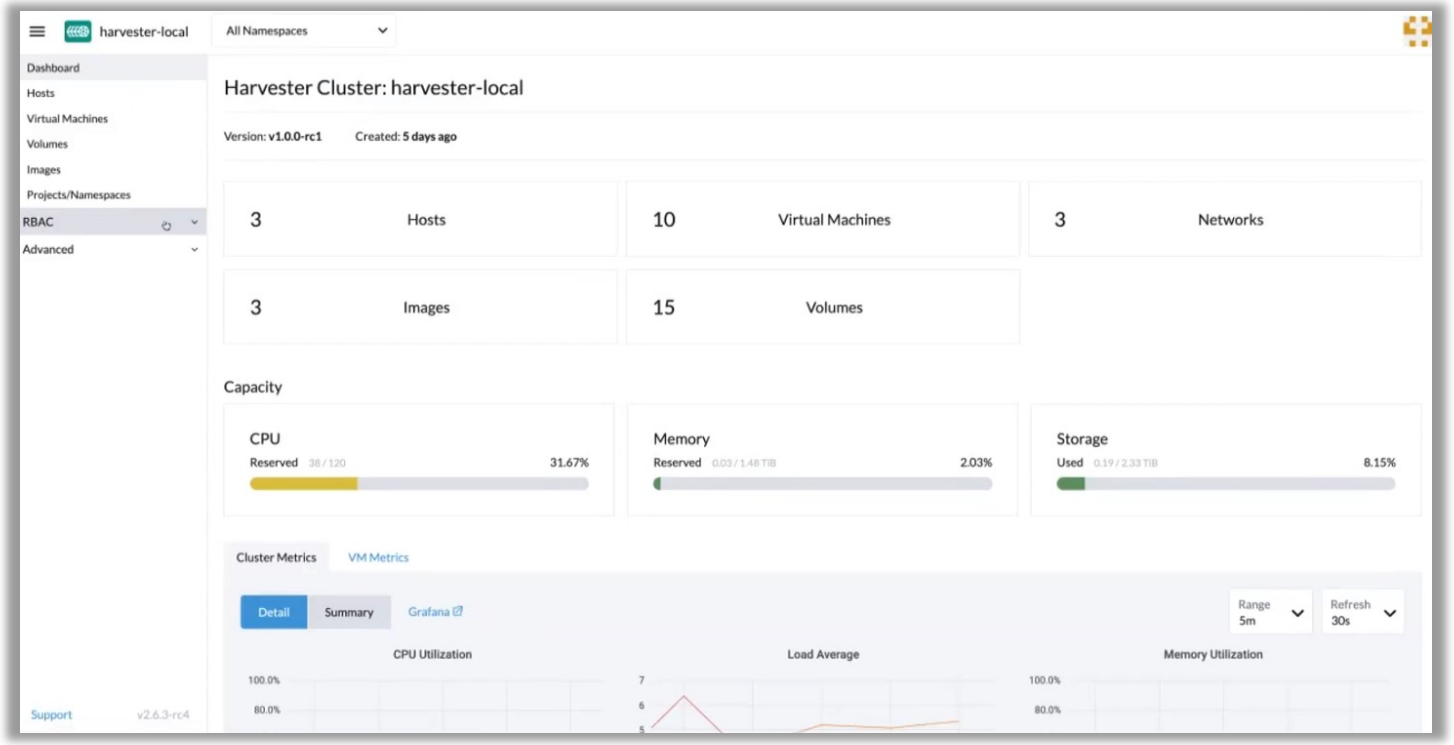
Rancher

- Enterprise Container Management tool
  - Runs on any CNCF compliant distribution
  - Shipped as a Helm Chart
  - Compatible with multiple Operating Systems
  - Low resource consumption
  - Open Source and flexible

- Offers all what you need to manage clusters and containers at scale.
  - Single pane of glass for managing clusters
  - Standardized monitor and logging tools
  - Application Market based on Helm
  - Full lifecycle management for AKS, EKS and GKE
  - Cluster management at scale with GitOps and Fleet
  - Harvester clusters management
  - Supports as providers AWS, Azure, GCP, VMware, OpenStack, **Harvester**, Digital Ocean and more out of the box.

Multi-Cluster Management using Rancher

Use Rancher to Manage Hyper Converged Infrastructure

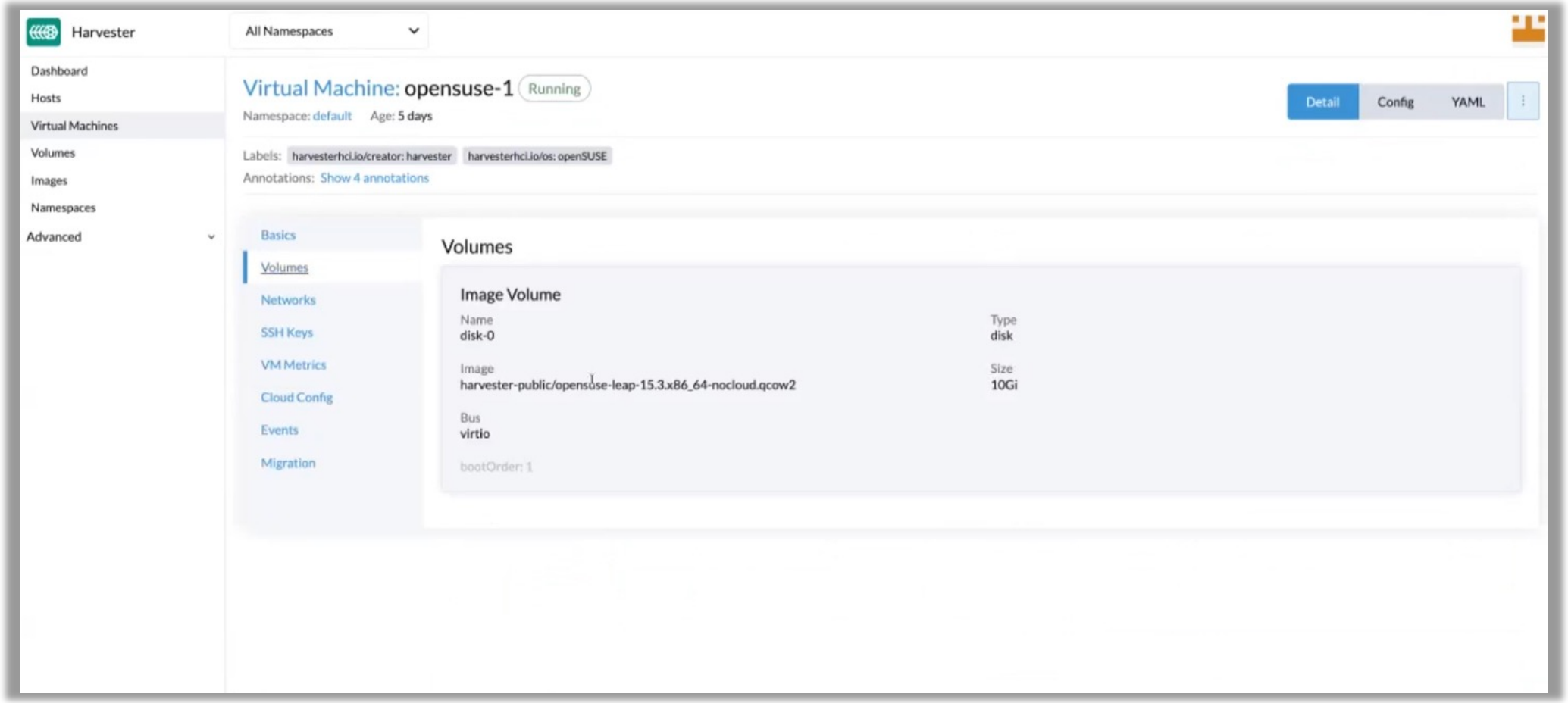


SUSE Rancher can

- Import Harvester clusters
- Provide full RBAC control
- Manage the entire infrastructure
- Drive policy and push consistent updates

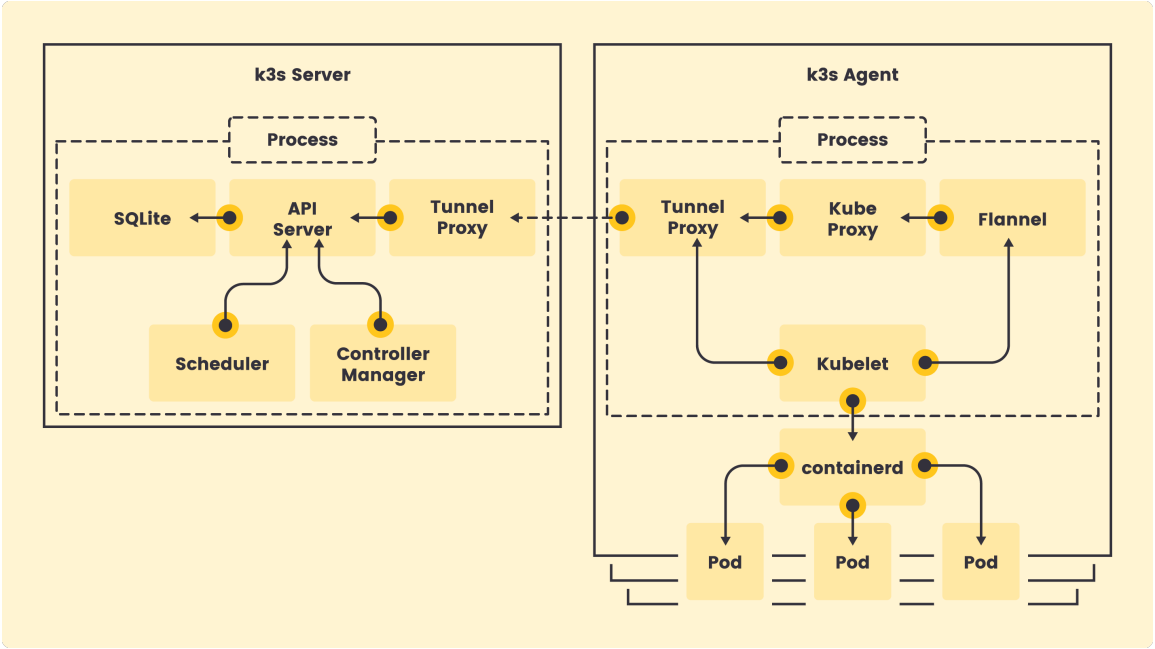
Easy to use and familiar UI for VM operators

Uses concepts such as VMs, VLANS and Disk Volumes



What is K3s?

- Everything you need to run Kubernetes in a single binary
  - Traefik Ingress Controller
  - Embedded SQLite Database
  - Container run time (containerd)
  - CNI Plugin for networking (Flannel)
  - DNS (coredns)
  - Host utilities (iptables, socat, etc)
  - Local storage provider
  - Service load balance
  - Helm controller
- All components are swappable
- Also available in HA

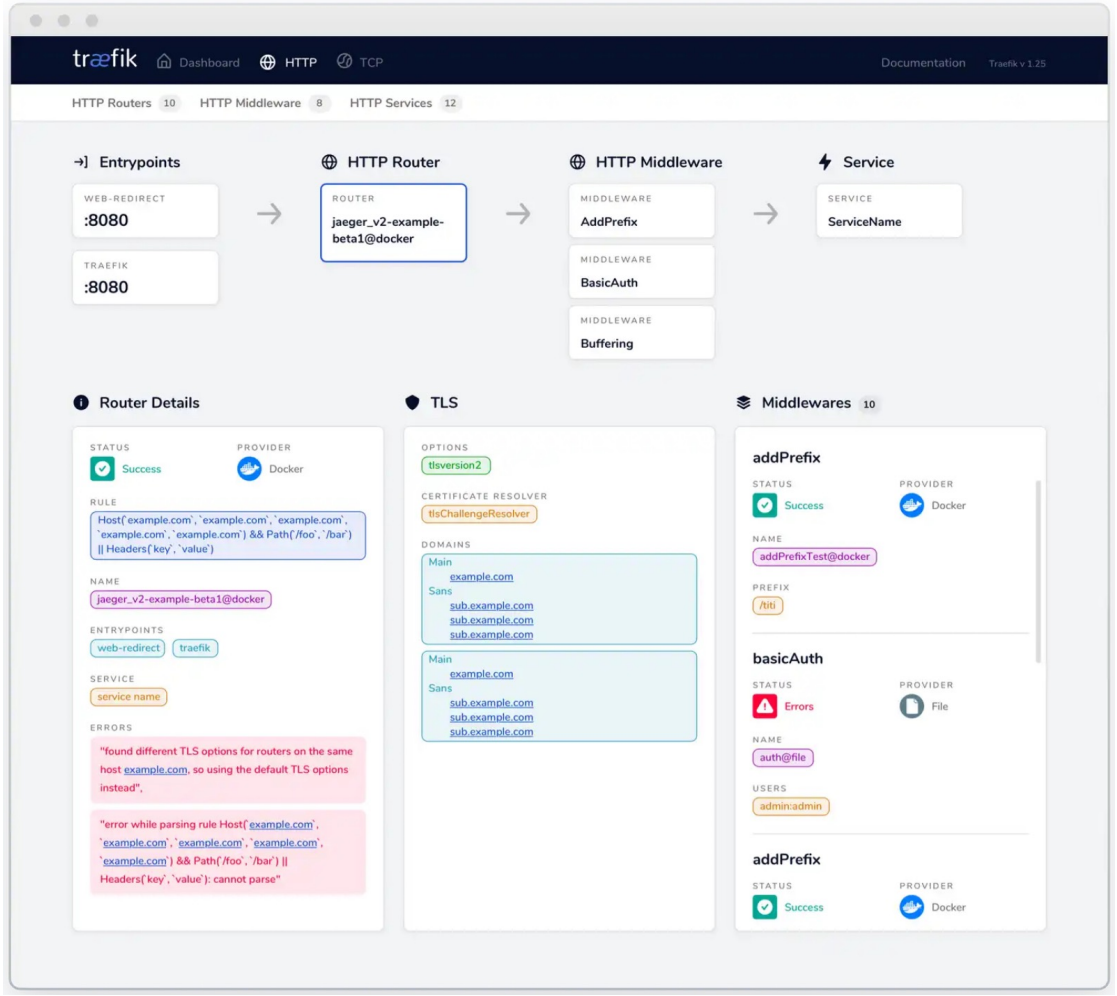


Why K3s?

- Perfect for Edge
  - K3s is a highly available, certified Kubernetes distribution designed for production workloads in unattended, resource-constrained, remote locations or inside IoT appliances.
- Simplified & Secure
  - 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.
- Multi Platform
  - Runs in most of Linux platforms, supporting x86_64, armhf, arm64 and s390x.

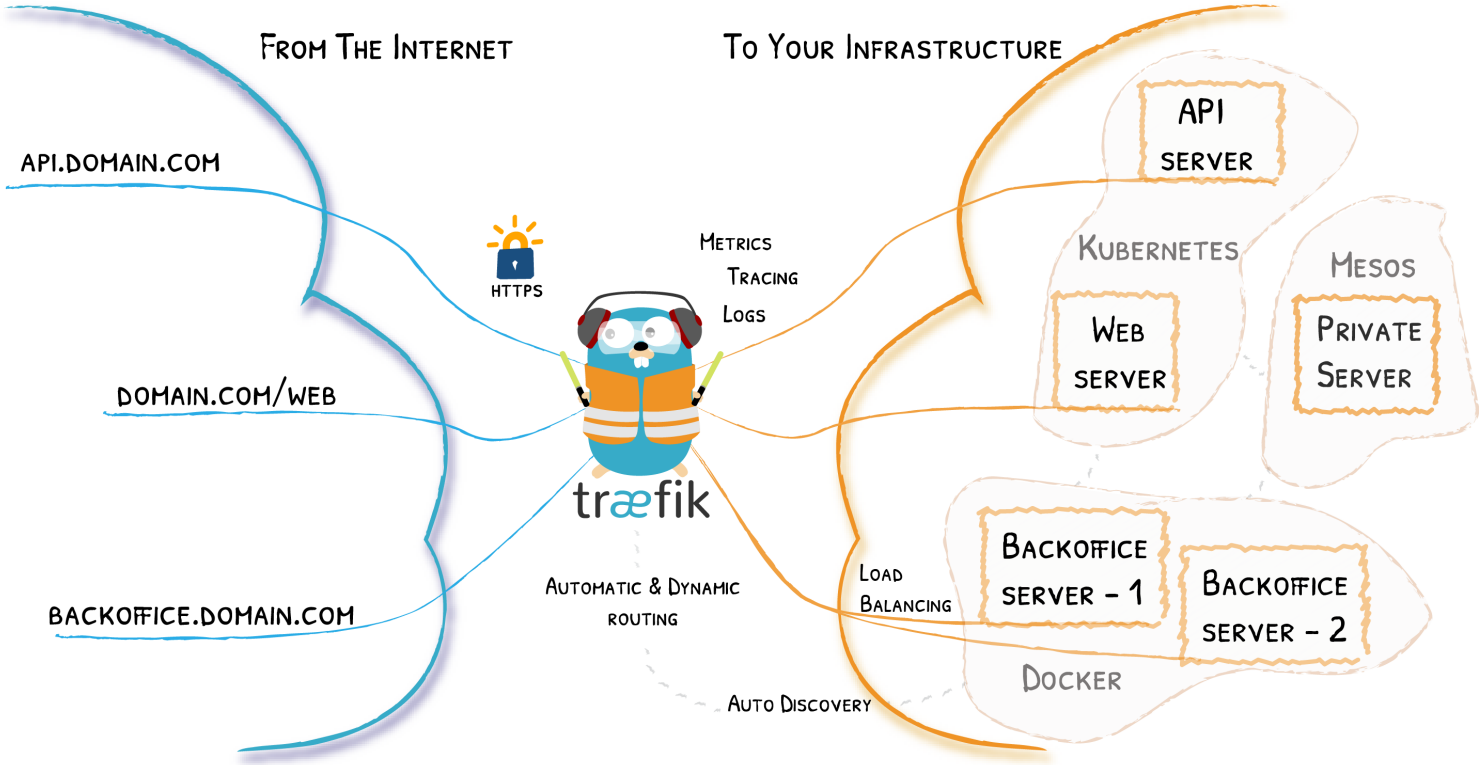
What is Traefik?

- Traefik is a leading modern reverse proxy and load balancer that makes deploying microservices easy. Traefik integrates with your existing infrastructure components and configures itself automatically and dynamically.
- Traefik comes with a powerful set of middlewares that enhance its capabilities to include load balancing, API gateway, orchestrator ingress, as well as east-west service communication and more



Traefik Architecture

- Traefik intercepts and routes every incoming request to the corresponding backend services.
- Unlike a traditional, statically configured reverse proxy, Traefik uses service discovery to configure itself dynamically from the services themselves. All major protocols are supported and can be flexibly managed with a rich set of configurable middlewares for load balancing, rate-limiting, circuit-breakers, mirroring, authentication, and more.



Thank you

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