

# kontron

**Explore Kontron Transportation**

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## OpenShift Virtualization zur Modernisierung der Kommunikationsplattform im Mission- Critical Umfeld



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# Whoami

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# Agenda

- 01 Kontron Transportation
- 02 Virtual Datacenter for Railways
- 03 Questions & Answers

01

# **Kontron Transportation**

**Kontron Transportation GmbH** is a global leading supplier of dedicated end-to-end communication solutions for mission-critical networks that offers tailor made solutions to support its customers with their communication challenges.

The company's focus is to produce, transport and process voice, data and video information reliably and securely in an efficient and sustainable way.



## › LTS – Long Term Support

- › Ensure support of our network functions and systems beyond 2035+
- › Prepare for hardware and software obsolescence
- › Future-proofed virtualization platform program

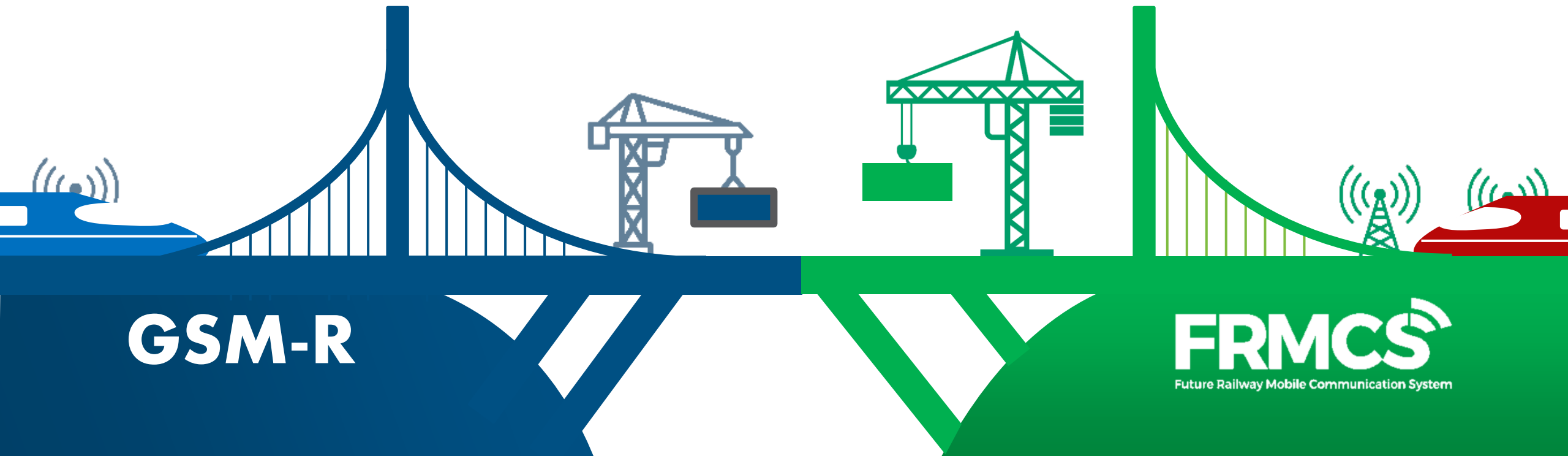
Maintaining first-class support for the existing GSM-R solution

## › FRMCS – Future Railway Mobile Communication System

- › Driving FRMCS readiness
- › Perform joint FRMCS trials / pilot
- › Introducing pre-FRMCS functions to update networks early
- › Enable smooth migrations

Continue the success of GSM-R with FRMCS

# Enabling the migration towards FRMCS

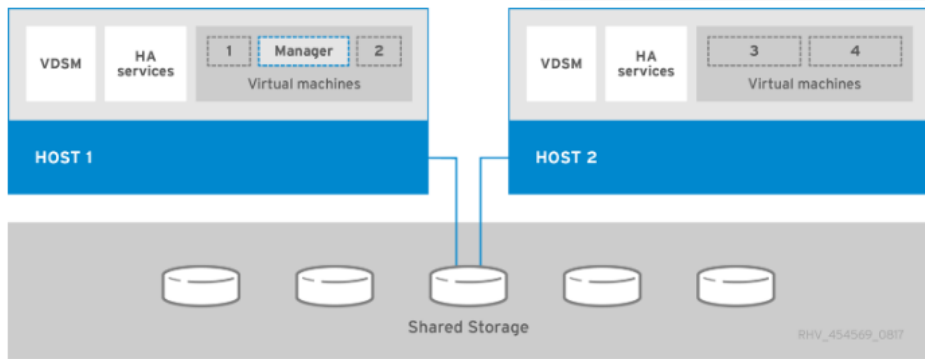


02

# **vDCR – virtual Datacenter for Railways**



# Status quo – RHV/COAM



Network Equipment



External Storage



3 Virtualization Server (Hypervisor)

## › COAM – Converged Operations and Maintenance

- › Introduction 2012
- › Private IaaS for Kontron Transportation's OAM applications only
- › LTS big challenge
  - › Hardware (2017, 2022, 2024) and Software (2026)

## Extend application scope

- › Current COAM applications
- › Kontron call critical applications (e.g. voice core)
- › Open to 3<sup>rd</sup> party applications

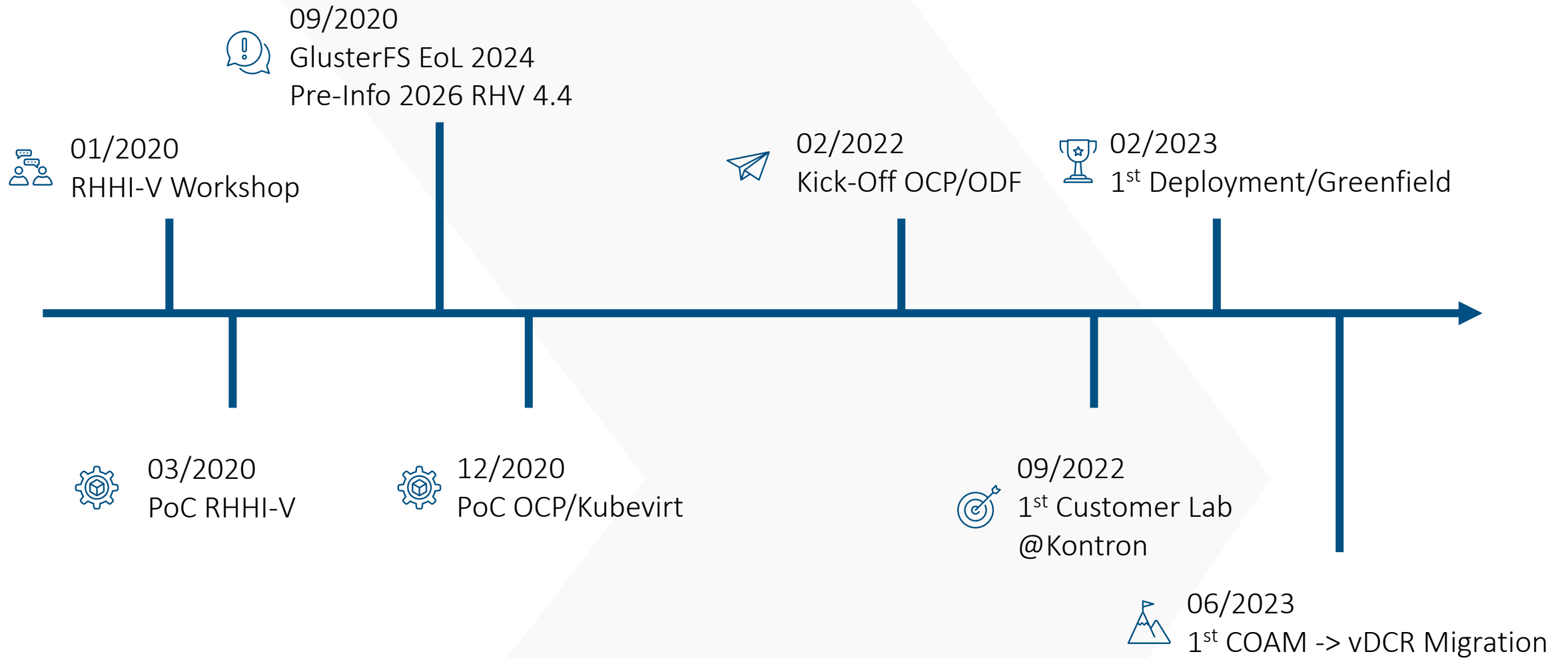
## Keep application alive

- › Leverage migration expertise acquired with COAM introduction
- › Highest resiliency including geo-redundancy solution
- › No impact on applications proven redundancy mechanisms
- › “Smooth” migration

## Platform features

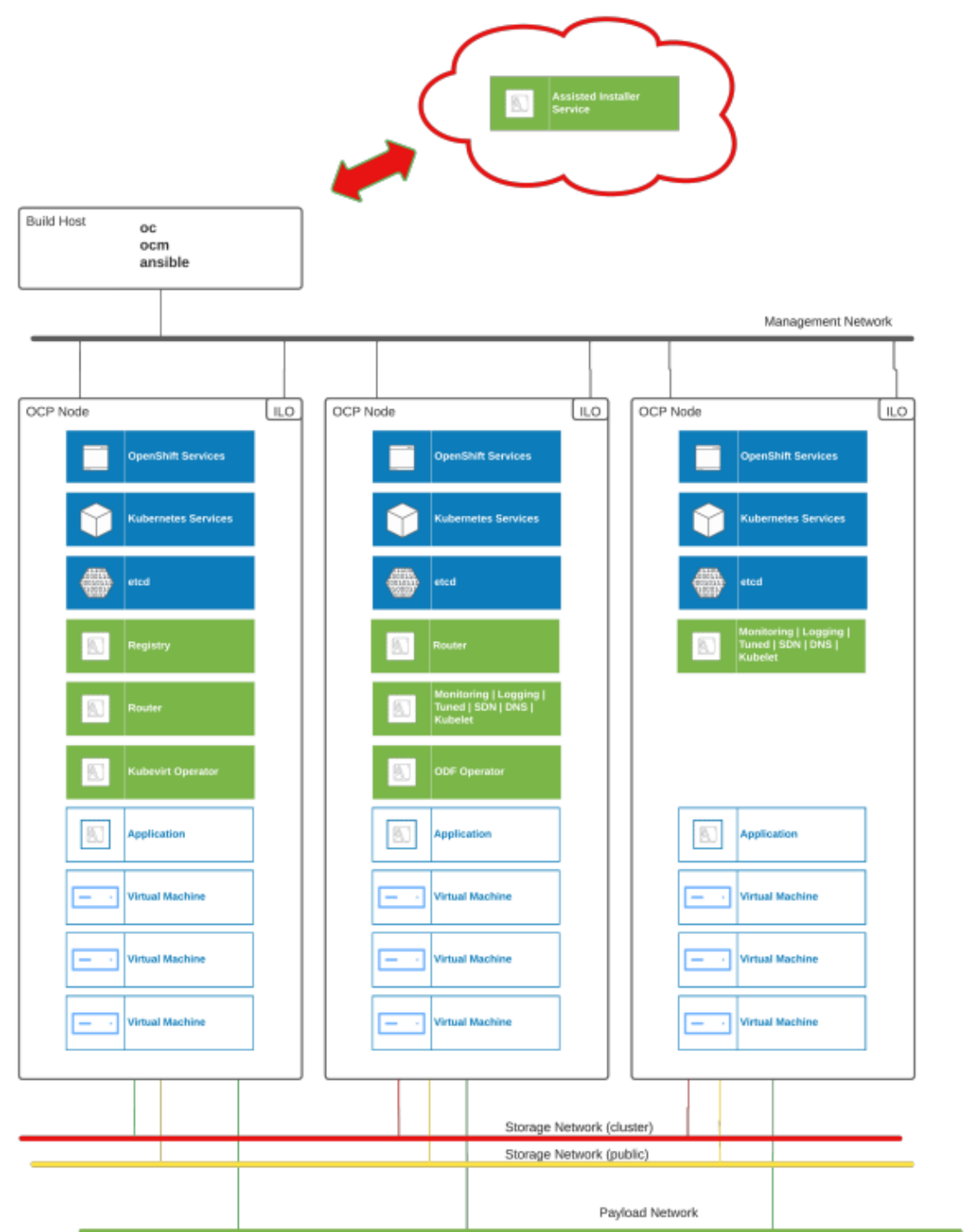
- › Air gapped
- › Small as possible with scalability as option
- › Virtualization is a must
- › Redundancy
- › Container technology introduction as plus

# Timeline



# Architecture

- › Red Hat OpenShift three node compact cluster
  - › Master, Worker and Storage hosted on each server
- › Air gapped environment
- › Red Hat Quay as offline container registry
- › Platform software (offline) upgrade during runtime
- › Scalable server based on customer requirements

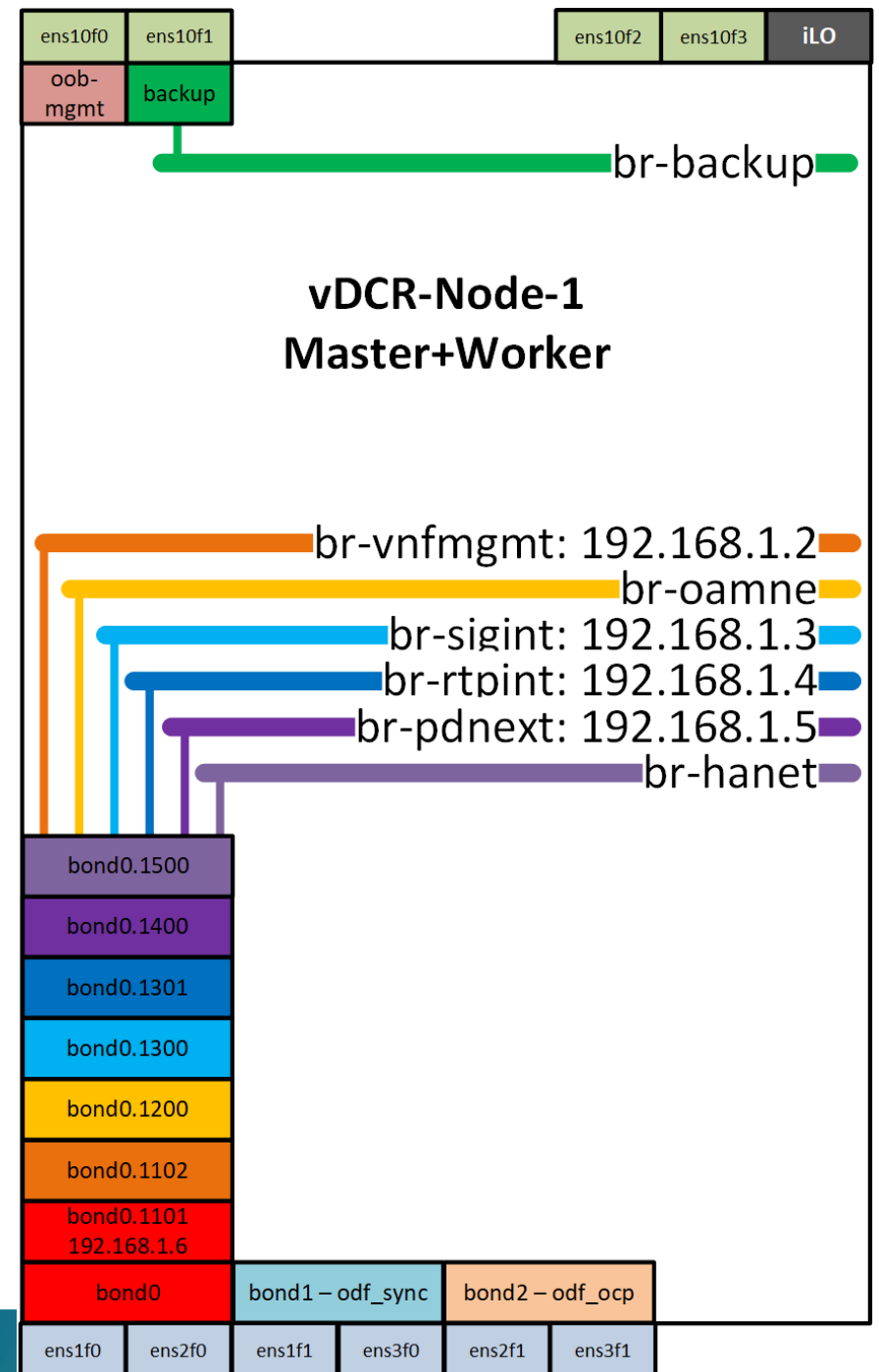


# Software stack



# Network setup

- › Network setup like other (Kontron) platform solutions
- › Complex and redundant setups are possible with Red Hat OpenShift



- › [Deploy VMs](#) with unmodified or custom images:
- › `source:`
- › `http:`
- › `url: http://172.29.29.101:8080/img/rhel-8.4-x86_64-kvm.qcow2`
  
- › Including post installation section:
- › `userData: |`
- › `runcmd:`
- › `- curl -o /root/infra-vm_post.sh http://172.29.29.101:8080/infra-vm_post.sh`
- › `- chmod +x /root/infra-vm_post.sh`
- › `- /root/infra-vm_post.sh`

› Accessing the default pod network from VMs is possible with the [masquerade](#) mode!

› [Network configuration with bridges:](#)

› `interfaces:`

```
› - bridge: {}  
›   name: nic-0  
›   model: virtio  
› - masquerade: {}  
›   name: default
```

› `networks:`

```
› - name: nic-0  
›   multus:  
›     networkName: vnfmgmt  
› - name: default  
›   pod: {}
```

› - `cloudInitNoCloud:`

› `networkData: |`

› `version: 2`

› `ethernets:`

› `eth0:`

› `addresses: [172.29.29.123/26]`

› `gateway4: 172.29.29.65`

› `eth1:`

› `dhcp4: true`

› `routes:`

› `- to: 10.103.0.0/16`

› `via: 10.0.2.1`



# Containerized applications

- › DNS for VoIP applications



- › High availability database



- › Repository server



# Lessons learned

- › Online Assisted Installer and disconnect post installation is possible, but not optimal
- › Worker scale out is possible via bare metal host, including network configuration
- › Recovering a master node is possible without service outage
- › Provision container image registry externally, if possible

# Next steps and open points

## › Organizational

- › Introduce the new platform and mindset of working
- › Update sales process -> Build awareness and show limitations
- › Supply chain catalogue

## › Technical

- › Hardware Update
- › Containerize applications
- › Scaling
- › Deployment

**Adapt the way of working**

03

# Questions & Answers

Now the stage is yours for questions!

**kontron**



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