Configuration Standard RedHat OpenShift Cluster for Container platform and virtualization				
Number:	Local Document		Status:	Draft
Owner:	Naga Krishna Sai Baruri		Effective:	13. Jan 2026
Doc.- type:	Design		Revision	1.0
Comments:				
[Authorized by: (Optional, delete if not required)]	[Name] [Department]	[Name] [Department]	[Name] [Department]	IT-MIO-INFRASTRUCTURE ENGINEERING

Table of Contents

1 Purpose

The purpose of this document is to define the mandatory configuration standard for OpenShift clusters running containerized workloads.

This document establishes:

- Required configuration state for Openshif platform
- Baseline configuration for container workloads
- Consistency security and operational requirements

2 Scope

The scope of this document is limited to the IT-MIO-INFRASTRUCTURE ENGINEERING.
This Configuration standard applies to :

- OpenShift cluster hosting container based workload
- All environments

The standard applies to:

- Platform configuration
- Container workeload configuration
- Networking, storage, security and availability requirements related to container

3 Summary

This document provides a definition of an IT Infrastructure Service. It is intended for IT infrastructure teams responsible for designing, configuring, and delivering services. Each block includes a clear purpose, detailed description, and proposal implementation requirements. This ensures consistency, security, compliance, and operational excellence across all infrastructure services.

4 Technology Standard

4.1 Architecture overview

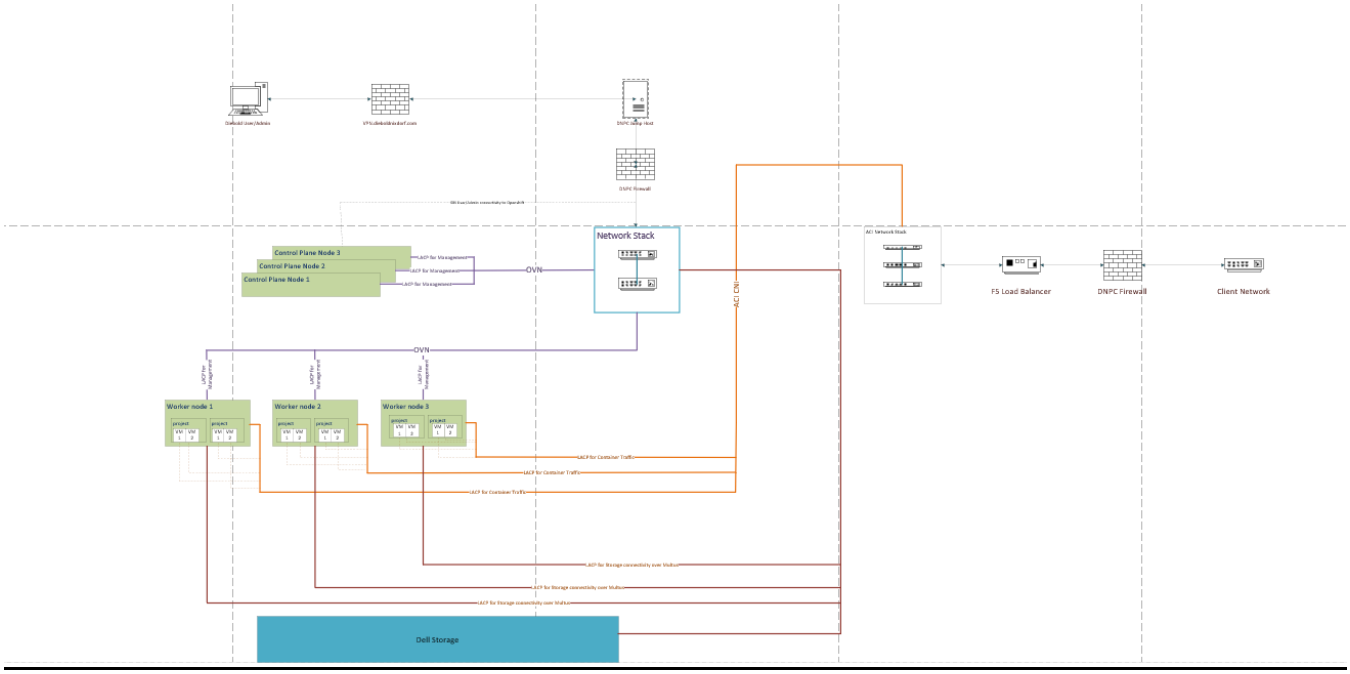
OpenShift Container platform provides a Kubernetes based container orchestration platform deplyoing, managin and scaling containerized workloads.

The platform consists of

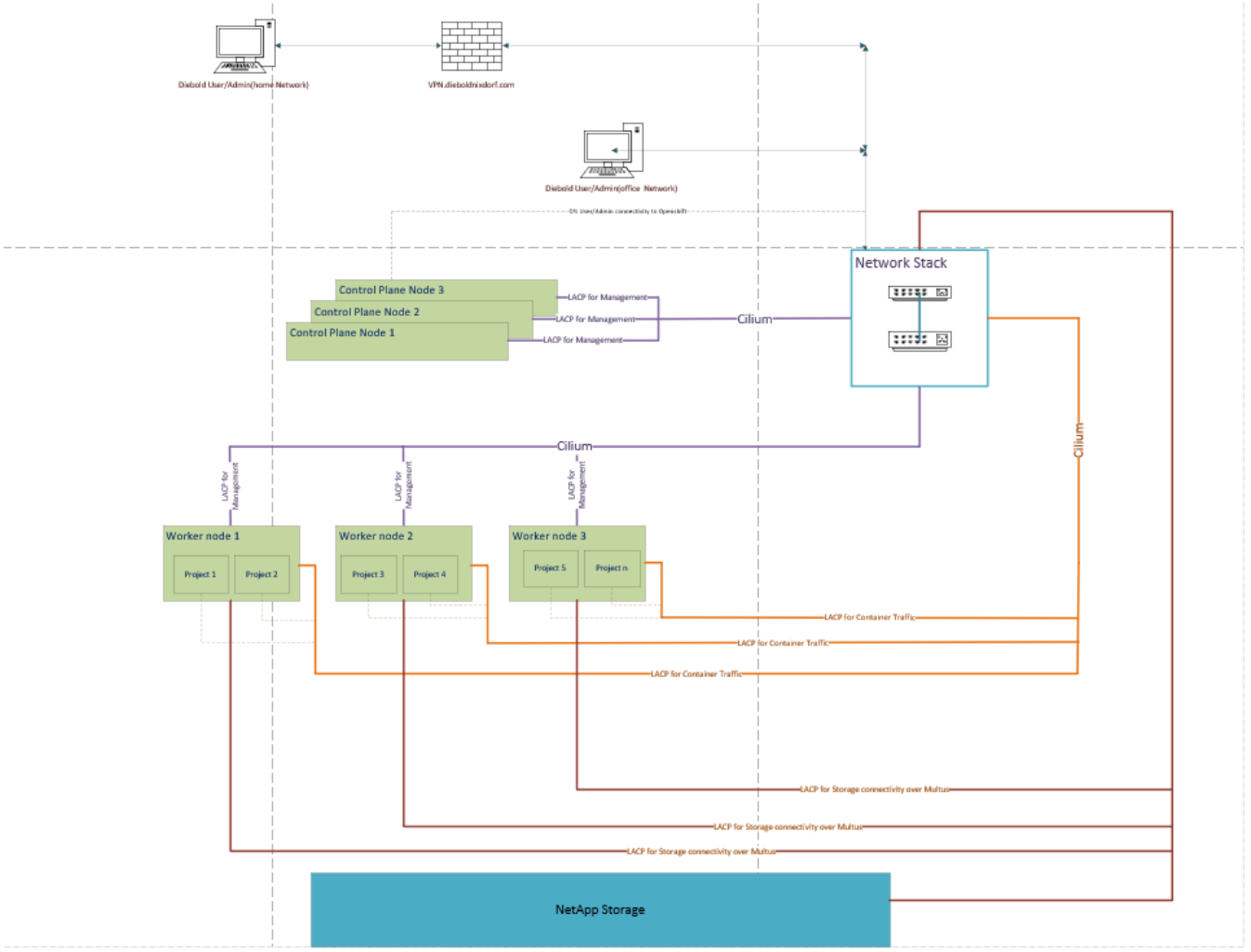
- Highly available control plane responsible for cluster management
- Worker nodes hosting application workloads
- Integrated networking storage, security and observability components

Container workloads are executed as Kubernetes Pods and managed using native OpenShift APIs and controllers.

For DNPC:



For Others:



4.2 Supported version

OpenShift container platform version must align with RedHat support lifecycle.

The Latest version of OpenShift Container Platfrom (OCP)

- OCP Allowed version: n

4.3 Cluster Specification

HA-capable Minimal Cluster 6x

- 3x Control plane (master) node
- 3x Worker (Compute) node

Count	Purpose	Server Type	Details
3x	Control plane (master)	Physical	
3+	Worker (Compute)	Physical	2*64 Core processors; 1TB RAM

4.4 Hardware Standards

The platform is based on the enterprise grade server hardware.

Server Models	RedHatVersion
Dell PowerEdge R670	4.16+

Product Name	Product Quantity	Module Name	Option Name	Quantity
PowerEdge R670 - Datacenter Large	1			
		Basis	PowerEdge R670 Server	1
		Chassis Configuration	Without hard drive, without backplane	1
		Processor	Intel® Xeon® 6 Efficient 6710E 2.4 GHz, 64 Cores/64 Threads, 24 GT/s, 96 MB Cache, Turbo, (205 W) DDR5-5600	1
		Additional Processor	Intel® Xeon® 6 Efficient 6710E 2.4 GHz, 64 Cores/64 Threads, 24 GT/s, 96 MB Cache, Turbo, (205 W) DDR5-5600	1
		Processor Cooling Configuration	Kühlkörper für Konfiguration mit 2 CPUs (CPU mindestens 185 W und weniger als 270 W)	1
		Memory Configuration Type	Performance Optimization	1
		DIMM Type and Speed	6.400 MT/s, RDIMMs	1
		Memory Capacity	64 GB, RDIMM, 6.400 MT/s, Dual-Rank	16
		RAID Configuration	D1 – Diskless Configuration (kein RAID, kein Controller)	1
		RAID/Internal Storage Controller	No Controller	1
		Hard Drive	Ohne Festplatte	1
		BIOS and Advanced System Settings	BIOS setting: 'Energy Safe'	1
		Advanced System Configurations	UEFI BIOS boot mode with GPT partition	1
		Fans	PowerEdge, 1 HE, Silver-Lüfter mit hoher Performance	1
		Integrated System Management	iDRAC10 Datacenter 17G mit OpenManage Enterprise Advanced Plus	1
		Integrated System Management	Dell Connectivity Client – Deaktiviert 17G	1
		Power Supply	Dual, vollständig redundant (1 + 1), Hot-Plug-MHS-Netzteil, 1.100 W MM (100–240 V Wechselstrom), Titanium	1

		Power Cable	Rack-Netzkabel, 2 m (C13/C14, 10A)	2
		PCIe Riser	Riser-Konfiguration 6, 2 x16 LP-Steckplätze (Gen5) hinten, 1 x16 OCP, 1 x8/x16 OCP, Warmgang	1
		Motherboard	PowerEdge R670, Hauptplatine, ROW	1
		OCP 3.0 Network Adapter	Broadcom 57414, 2 Anschlüsse, 25 GbE, SFP28-Adapter, OCP 3.0 NIC +Sec	2
		Additional Network Cards	Broadcom 57414, 25 GbE, SFP28, Adapter mit 2 Anschlüssen, PCIe, flaches Profil, +Sec	1
		OCP 3.0 Accessories	2 OCP – ohne Kabel	1
		Password	iDRAC, Legacy-Kennwort für OCP-Karten	1
		Bezel	PowerEdge, 1 HE, Standardblende für E3-Gehäuse für x16, x20 oder ohne Rückwandplatine	1
		Cables	Kein DPUs-Kabel erforderlich, kein DPU	1
		Boot Optimized Storage Cards	BOSS-N1-Controller-Karte + mit 2 x M.2, 960 GB (RAID 1) (22x80), hinten	1
		Optics & Cables for Network Cards	Dell Networking – Transceiver, 25 GbE, SFP28, SR, ohne FEC, MMF, Duplex-LC	6
		Operating System	Kein Betriebssystem	1
		OS Media Kits	No media required	1
		Rack Rails	ReadyRails sliding rails without cable management arm	1
		Quick Sync	Empty module, left rack angle module	1
		Shipping	PowerEdge R670, Versand EMEA1 (Englisch/Französisch/Deutsch/Spanisch/Russisch/Hebräisch)	1
		Packaging Material	PowerEdge, 1 HE, Versandmaterial	1
		Regulatory Compliance	PowerEdge with CCC and CE marking	1
		ECCN	Auswahl ablehnen	1
		Standard Service	Standardservice am nächsten Arbeitstag, 36 Monate, 36 Monat(e)	1
		Extended Service	ProSupport Plus und Mission Critical Service innerhalb von 4 Stunden, 60 Monat(e)	1
		Keep Your Hard Drive for Enterprise	Keep Your Hard Drive for Enterprise, 60 Monat(e)	1
		Theft Protection and Asset Tagging	Bestandskennzeichnung - ProSupport (Webseite, Barcode, integrierte MAC-Adresse)	1
		Shipping Box Labels - Standard	Versandetikett – Bestellkonfiguration (Versanddatum, Modell, Prozessorgeschwindigkeit, Festplattenlaufwerkgröße, RAM)	1

4.5 Storage and performance classes

For Dell:

Storage Array(s)	Model	Protocol	Product Version (s)	Red Hat OpenShift Version (s)	Infrastructure features
PowerFlex	Rack or Appliance	TCP-IP proprietary protocol, NVMe/TCP	5.8	4.19+	CSI, OpenShift Virtualization

For NetApp:

Storage Array(s)	Protocol	Product Version (s)	Red Hat OpenShift Version (s)	Infrastructure features
AFF A-Series	TFC[tech preview], NVMe over TCP, iSCSI, NFS, SMB	A50 C60	4.19+	CSI, OpenShift Virtualization, VDI
FAS	FC[tech preview], NVMe over TCP, iSCSI, NFS, SMB	8200	4.19+	CSI, OpenShift Virtualization, VDI
A300	FC[tech preview], NVMe over TCP, iSCSI, NFS, SMB	A300	4.19+	CSI, OpenShift Virtualization, VDI

Storage Class:-

Class Name	IOPs	Expected Service Tier to be Opted
Bronze	300	Bronze,Bronze+,Silver
Silver	1500	Silver+,Gold
Gold	3000	Gold+,Platinum

4.6 Networking

TBD

4.7 Monitoring Defined

CheckMk + Grafana
TBD

4.8 ITSM Integration

TBD

4.9 Etcd

TBD

4.10 Backup

TBD

5 Configuration Standard

5.1 Cluster deployment

Installation Method	Infrastructure Provisioning	Network Environment Suitability	Description
Assisted Installer	Partially automated	Connected (web-based UI)	Uses a web console to guide the installation, validate prerequisites, and generate a discovery ISO to boot cluster machines. Simplifies the process significantly.

5.1.1 Installation Method

Here we have choose to go with User Provisioned Infrastructure way of installing as we can use this way to both Intranet and DMZ in manual way with needed customization.

5.1.2 Prerequisites

Physical Server

- All physical servers must be racked and powered on.
- Each server must have iDrac connectivity configured with:
- Assigned IP address
- DNS registration
- All required network interfaces must be physically connected

Reference values :

	Type	Space for OS	NIC Count	Connectivity Type1	Connectivity Type2	Connectivity Type3	Quantity
Physical	Worker nodes	100 GB	6 NICs	Management Bond	Container NW Bond	SAN Network Bond	3
Physical	Master nodes	100 GB	6 NICs	Management Bond	NA	NA	3
Virtual	Jump/Bastion	100 GB	2 nics	Management Bond	NA	NA	1

Need a Jump or not???

Network connectivity:

- Required VLANs and subnets must be available prior to installation
- Required Network segments:
- Management VLAN
- Container NW VLAN(Multus)

- SAN NW VLANs
- IDRAC VLAN
- IP allocation:
- The following IP addresss allocation must be defined and reserved prior OpenShift cluster installation:
- Management VLAN: 6 IPs for master and worker nodes
- IDRAC VLAN: 6 IPs for Master and Worker nodes

Load Balancer

- An Enterprise load balancer must be available for OpenShift cluster communication

Reference Values:

- Load Balancer Type: F5
- API will be connected over keepalived IP which configured on master nodes
- Ingress controller will be via F5 VIPs

URL Users will use to access the service	Protocol/Port for users	Front END IP	Member Server IP address	Protocol /Port Server listens on	SSL Offloading (If yes please attach certificate)	Monitoring (Default TCP port status)	Load Balancing Method (Default Round Robin)	Remarks
api.dnpcpoc.test-dnpcloud.dieboldnixdorf.com api-int.dnpcpoc.test-dnpcloud.dieboldnixdorf.com	6443, 22623			6443, 22623	N/A	Default	Round Robin	Passthrough(layer 4 routing)
*.apps.dnpcpoc.test-dnpcloud.dieboldnixdorf.com	443			443	N/A	Default	Round Robin	SSL

DNS Configuration:

- DNS must be externally managed
- All required DNS records must exist prior to installation

Required DNS records:

- api.<clustername>.<dns-zone> (Naming convention TBD)
- *.apps.<clustername>.<dns-zone> (Naming convention TBD)
- Node hostname for controlplane and workers (Naming convention TBD)

Cluster	Reqired for	Node/LB	Record (Reversed)	Record Type	IP
Clustername	Load Balancer	api.clutsername.dieboldnixdorf.com	api.clutsername.dieboldnixdorf.com	A + PTR	

		api-int.clustername.dieboldnixdorf.com	api-int.clustername.dieboldnixdorf.com	A + PTR	
		*.apps.clustername.dieboldnixdorf.com	*.apps.clustername.dieboldnixdorf.com	A	
	Nodes	bootstrap fqdn	bootstrap.dieboldnixdorf.com	A + PTR	
		Jump/Bastion/Helper	jump.dieboldnixdorf.com	A + PTR	
		Node hostname	Masternode1.dieboldnixdorf.com	A + PTR	
		Node hostname	Masternode2.dieboldnixdorf.com	A + PTR	
		Node hostname	Masternode3.dieboldnixdorf.com	A + PTR	
		Node hostname	Workernode1.dieboldnixdorf.com	A + PTR	
		Node hostname	Workernode2.dieboldnixdorf.com	A + PTR	
		Node hostname	Workernode3.dieboldnixdorf.com	A + PTR	

HW Management	Nodes	IP for IDRAC for master node 1	masternode1_drac.dieboldnixdorf.com	A + PTR
		IP for IDRAC for master node 2	masternode2_drac.dieboldnixdorf.com	A + PTR
		IP for IDRAC for master node 2	masternode3_drac.dieboldnixdorf.com	A + PTR
		IP for IDRAC for master node 1	workernode1_drac.dieboldnixdorf.com	A + PTR
		IP for IDRAC for master node 2	workernode2_drac.dieboldnixdorf.com	A + PTR
		IP for IDRAC for master node 2	workernode3_drac.dieboldnixdorf.com	A + PTR

Note:- Incase of Intranet, Firewall rules are not needed.

Bastion host

- Bastion host must be available for OpenShift cluster depployment
- Bastion host must be deployed outside the OpenShift cluster
- Bastion host must have network connectivity to:
- Control plane nodes
- Worker nodes
- Enterprise DNS
- Enterprise Load Balancer
- Bastion host must be accesed controled and restricted to authorized administrators.

Reference values:

Bastian Node:
Jump.dieboldnixdorf.com-jump node IP <Naming convention TBD>
Master Nodes:
Masternode1.dieboldnixdorf.com-masternode1 IP <Naming convention TBD>
Masternode2.dieboldnixdorf.com-masternode2 IP <Naming convention TBD>
Masternode3.dieboldnixdorf.com-masternode3 IP <Naming convention TBD>

Worker Nodes:
Workernode1.dieboldnixdorf.com-worker node1 ip
Workernode2.dieboldnixdorf.com-worker node2 ip
Workernode3.dieboldnixdorf.com-worker node3 ip

5.1.3 Installation Working Instructions

This section defines the mandatory configuration requirements for OpenShift worker nodes. It doesn not describe provisioning or installation steps.

Objective
Deploy a functional OpenShift cluster to validate platform capabilities including container orchestration, , and integration with enterprise infrastructure.

Installation Overview

- **Platform**: Red Hat OpenShift Container Platform 4.20
- **Hardware:** Dell Physical Hardware for both master and worker nodes
- **Deployment Type**: UPI (User-Provisioned Infrastructure)
- **Environment**: Firewall-restricted zone with proxy access / Intranet
- **Cluster Size**: 3 control plane nodes, 3 worker nodes
- **Virtualization**: OpenShift Virtualization Enabled
- **Migration Toolkit for Virtualization (MTV)**: Installed for VMware VM migration

Infrastructure Overview

Component	Quantity	Purpose
Master Nodes	3	Control plane for cluster management
Worker Nodes	3	Application workloads and services
Bastion Host	1	Secure access point for cluster management
F5 Load Balancer	1	External load balancing for API and ingress

Cluster installation configuration

The following YAML represents the normative baseline template for OpenShift cluster installation configuration. No secrets material is included. All secrets must be provided securely during installation.

Control Plane and worker node provisioning

- Control plane must be provisioned using ignition configuration generated from the approved cluster configuration
- Worker nodes must be provisioned using ignition configuration generated from the approved cluster configuration
- Control plane must successfully form an etcd quorum
- Worker nodes must successfully join cluster before workloads are scheduled

OCP Console:

https://console-OpenShift-console.apps.ocp4test.ad.diebold.com

User: kubeadmin
Pass: use kubeadmin-password file

5.1.4 Enable Identity providers

5.1.4.1 LDAP

Global standard authentification TBD

5.1.4.2 OIDC

- We need to give console URL to OpenID administrators.
- Login to OpenShift Console
- Navigate to Administration tab
- Select cluster setting and goto configuration tab
- Once we scroll down we will see oAuth and select the Identity provide as OpenID.
- We will see a form opened. We need to key in below details
    1) Client ID(will be given by OpenID Team)
    2) Clientr Secret(will be given by OpenID Team)
    3) Issuer URL(will be given by OpenID Team)
    4) Leave other as is.
    5) Under Extra scopes please add email and profile
- Once all the details are filled click add.
- The OpenID administrators should add redirect_uri for authentication purpose.
- Reload the page, we should see openID as one of the indetitiy providers added OpenShift Console.

6 Contacts

[Insert statement regarding whom to contact if any issues or questions surrounding the subject matter of the document.]

7 Definition / Terms and Abbreviations

Term	Definition
[Document Control System]	[IT System to manage documents]
[DN]	[Diebold Nixdorf]

8 Employee Roles and Responsibilities

Role	Responsibility
[Quality Management]	[Controls and reviews the level of quality.]

9 Related Documents / References

Title	Number

10 History

Revision	Date	Comment	By

[0.1]	22.10.2025	[First draft version]	Stuart Evans