

Introducing the z/OS Container Platform

SHARE 2026 Winter Technical Conference
Session 42772 – February 25, 2026

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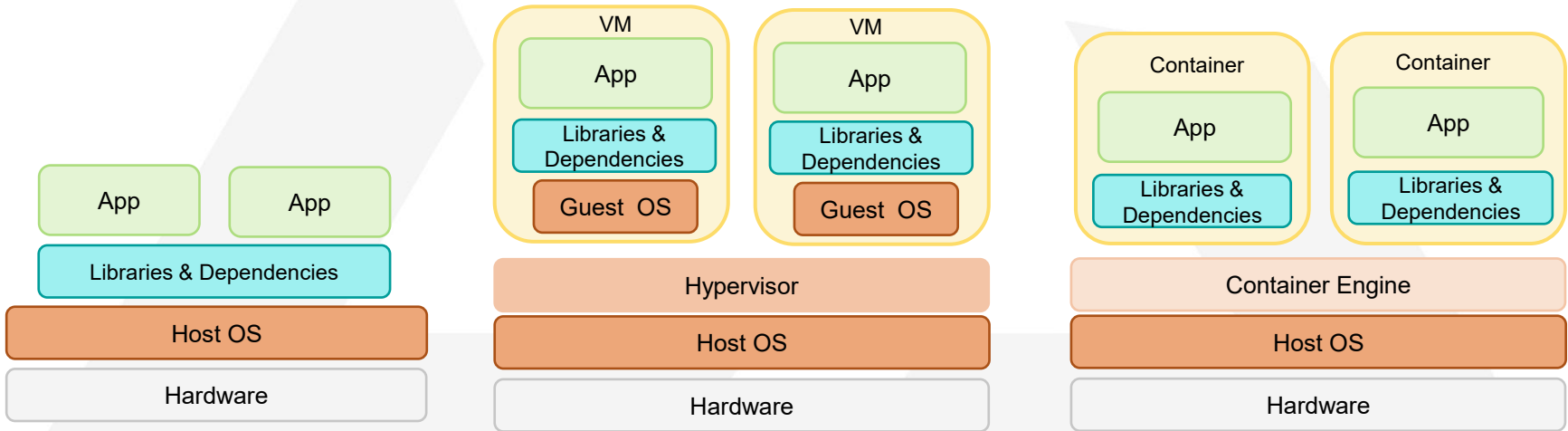
Agenda

- Overview of Containers and Kubernetes
- What is z/OS Container Platform (zOSCP)
- Podman Overview and Demo
- zOSCP/Kubernetes Overview and Demo
- Dashboard
- Upgrading your zOSCP Cluster

Overview of containers and Kubernetes

Evolution of Application Deployment

Personal Computer / Bare Metal	Virtual Machines	Containers
		
Dedicated hardware	Hardware virtualization	OS virtualization
Performance	Hardware utilization, different guest OSs Persistent, resource heavy apps, databases	Fast deployment, scalability, portability Microservices, cloud native dev, DevOps



Containers overview

- Are standard units of software that package up application code and all required dependencies
- Containers are operating system and HW-architecture specific
- Utilize facilities provided by the underlying operating system to run applications in isolated environments
- Make moving, stacking, unstacking of compliant software easier – provides for application portability and isolation

Kubernetes overview

Open-source container orchestration framework

Helps manage containerized applications

- The trend for application development is to break monolithic applications into many microservices
 - Containers provide the perfect environment for running microservices
- Orchestration becomes important when there are many application instances (microservices) across many systems/environments spanning physical machines, VMs, cloud

Features

- Framework for deploying microservices
- Automatic rollouts and rollbacks
- Service discovery and load balancing
- Horizontal scaling
- Self-healing
- Secret and configuration management

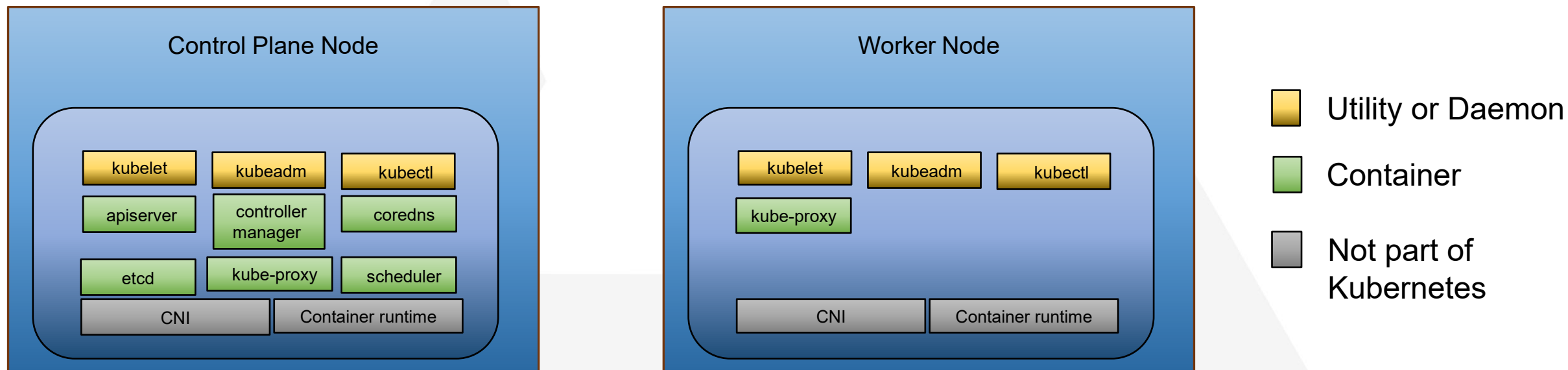
Kubernetes architecture

Control Plane Nodes

- Manage and provide the infrastructure for the Kubernetes cluster

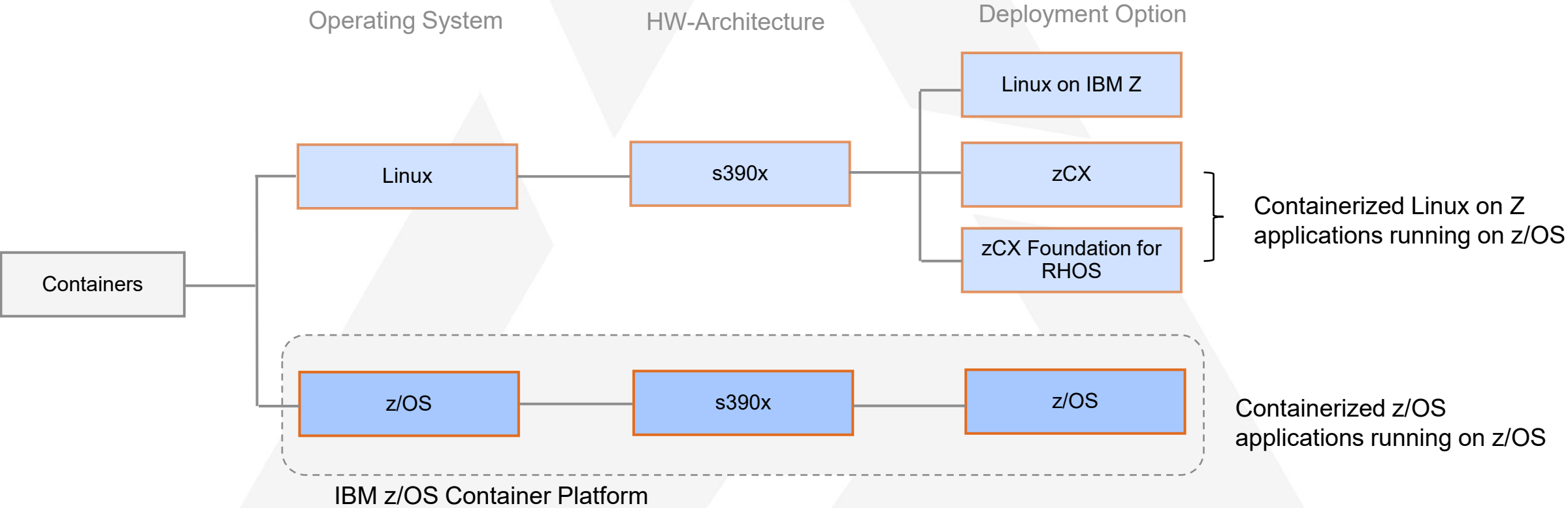
Worker Nodes

- Host the container applications (microservices)



What is z/OS Container Platform (zOSCP)?

IBM Z container portfolio

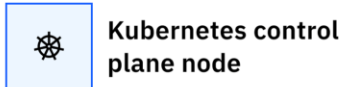


zOSCP components

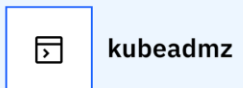
z/OS Containers product components

Kubernetes

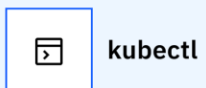
z/OS control plane appliance



Kubernetes control plane node



kubeadmz



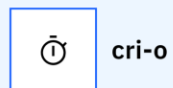
kubectl



kubelet



crictl



cri-o

Utilities



Skopeo



Podman

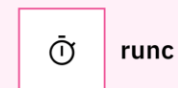
Container runtime



Container network interface (CNI)



common



runc

Tools Kubernetes Containers

IBM z/OS Container Platform sessions

Configuring Networking for z/OS Container Platform

Wednesday, February 25, 2026: 2:30 PM - 3:30 PM

Salon 16

Speakers: Mary Julian, Ben Hicks

Podman

Podman Background

- Podman is a daemonless open-source tool designed to manage the container lifecycle
 - Allows to create, run, and maintain OCI images in a production environment
 - Allows for building and running pods without root access
 - Provides a highly customizable environment
- Podman was ported to z/OS
 - Similar look and feel as Linux

Setting up Podman

- /usr/lpp/IBM/zoscp/workflows/zoscp_general.xml
 - Should be performed on each system
 - Expectation is the workflow is run by uid 0 or access to BPX.SUPERUSER
- Security setup to authorize specific users
 - Sample in SYS1.SBCZSMPL(BCZSECS1)
- Rootless Podman is recommended
 - Podman runs pods under the user ID of the submitter, which can give containers root privileges
 - Reduces required permissions for users, and containers run with less access
- zOSCP work can be classified by WLM
 - Default is SYSOTHER unless SYSCNTNR service class is created
 - Default assignment can be overridden
 - Alternatively, Container Qualifiers can be used

Networking Setup

- CINET environments must set `_BPXK_SETIBMOPT_TRANSPORT` environment variable to set stack affinity.
- CNI
 - Specification that defines and handles network interfaces for containers
 - Plugins are invoked by Podman or cri-o
 - Defaults to IPv4
 - Creates `/etc/cni/net.d/10-zoscni.conflist`
- Must have ZCONTAINER VIPARANGE

```
VIPADYNAMIC  
VIPARANGE 255.255.255.248 10.10.21.0 ZCONTAINER  
ENDVIPADYNAMIC
```

Initial Verification Program

- Builds and runs “Hello World” container image
 - Built from scratch

```
The /proc directory was found.  
The /proc filesystem is mounted.  
The UFS filesystem is started.  
The TFS filesystem is started.  
The /usr/lpp/IBM/zoscp/bin directory was found.  
STEP 1/3: FROM scratch  
STEP 2/3: COPY hello.rexx /  
--> e6835f77ea3f  
STEP 3/3: CMD ["/hello.rexx"]  
COMMIT 0-hello-world-64  
--> 48c2f62c6591  
Successfully tagged localhost/0-hello-world-64:latest  
48c2f62c65916f79059c7be2f33c0d1fd42674169b29723be789d4235c805666  
hello world  
Untagged: localhost/0-hello-world-64:latest
```

Workflows ▶ Performs the base setup for running zOSCP - Workflow_1 ▶ 11. Validate container setup

Properties for Workflow Step 11. Validate container setup

General Details Dependencies Notes **Perform** Status Input Variables Feedback

- ✓ Input Variables
- ✓ General
- ➡ Review Instructions
 - Create JOB statement
 - Review JCL
 - Submit and Save JCL

Review Instructions

Instructions:

This will create and run a simple "hello world" containerfile using podman.

This step should be run from a user that has a UID of 0 or has access to the SAF resource BPX.SUPERUSER in the FACILITY class.

IBM Cloud Container Registry

- Container Images are shipped only to ICR
 - Entitled to images with z/OS license
 - Use skopeo to copy from ICR
 - Growing list of container images
 - z/OS Container Platform uses zos for s390x images
 - IBM z/OS base, IBM Open Enterprise SDK for Go, IBM SDK Java Technology Edition for z/OS (Java 8)
 - Some images require APF authorization
- Policy.json must be updated
 - podman image trust set -t accept icr.io
- Private Container Registry
 - Build custom images that others within your org can access
 - Blog on how to configure your private registry within zCX
 - <https://community.ibm.com/community/user/ibmz-and-linuxone/blogs/michael-fitzpatrick/2024/11/26/configuring-your-private-registry-for-ibm-zos-cont>

```
{
  "default": [
    {
      "type": "reject"
    }
  ],
  "transports": {
    "containers-storage": {
      "": [
        {
          "type": "insecureAcceptAnything"
        }
      ]
    },
    "docker": {
      "icr.io": [
        {
          "type": "insecureAcceptAnything"
        }
      ]
    },
    "docker-archive": {
      "": [
        {
          "type": "insecureAcceptAnything"
        }
      ]
    }
  }
}
```

Podman Demo

1. Pulling and building an image from a registry
2. Running a container

1. Pulling and Building an Image

```
>> podman images
REPOSITORY                TAG      IMAGE ID      CREATED      SIZE
localrepo.ibm.com/zoscp/zos  latest   89123cdd6d1c  6 weeks ago  228 MB

>> podman build . -t demo:1.0
STEP 1/5: FROM localrepo.ibm.com/zoscp/zos:latest
STEP 2/5: WORKDIR /
--> 8cc6fdc20f0
STEP 3/5: COPY demo ./
--> a2b6b7f874d
STEP 4/5: RUN chmod 555 demo
--> d2e32c9f213
STEP 5/5: CMD ["/demo"]
COMMIT demo:1.0
--> 7c42fe9cecb
Successfully tagged localhost/demo:1.0
7c42fe9cecb7e5c76a2726666da2a08be5a9e27ff34d7298d4e98377807bf01c

>> podman images
REPOSITORY                TAG      IMAGE ID      CREATED      SIZE
localhost/demo            1.0      7c42fe9cecb7  13 minutes ago  245 MB
localrepo.ibm.com/zoscp/zos  latest   89123cdd6d1c  6 weeks ago  228 MB

>> podman tag localhost/demo:1.0 localrepo.ibm.com/demo:1.0

>> podman push localrepo.ibm.com/demo:1.0
Getting image source signatures
Copying blob 39c1a25583ad done
:
Copying config 7c42fe9cec done
Writing manifest to image destination
Storing signatures
```

2. Running a Container

```
>> podman images
REPOSITORY          TAG      IMAGE ID      CREATED        SIZE
localhost/demo      1.0      7c42fe9cecb7  17 minutes ago 245 MB
localrepo.ibm.com/demo 1.0      7c42fe9cecb7  17 minutes ago 245 MB
localrepo.ibm.com/zoscp/zos latest 89123cdd6d1c  6 weeks ago   228 MB

>> podman run -d -name demo localrepo.ibm.com/demo:1.0
9061c781139fbb124e57d8306747f8a41dad30309431d0a6f56e3fb80c2ed83f

>> podman ps
CONTAINER ID  IMAGE                        COMMAND      CREATED        STATUS        PORTS      NAMES
9061c781139f  localrep.ibm.com/demo:1.0  ./demo      11 seconds ago Up 9 seconds ago          demo

>> podman inspect -f '{{.NetworkSettings.IPAddress}}' demo
10.10.21.1

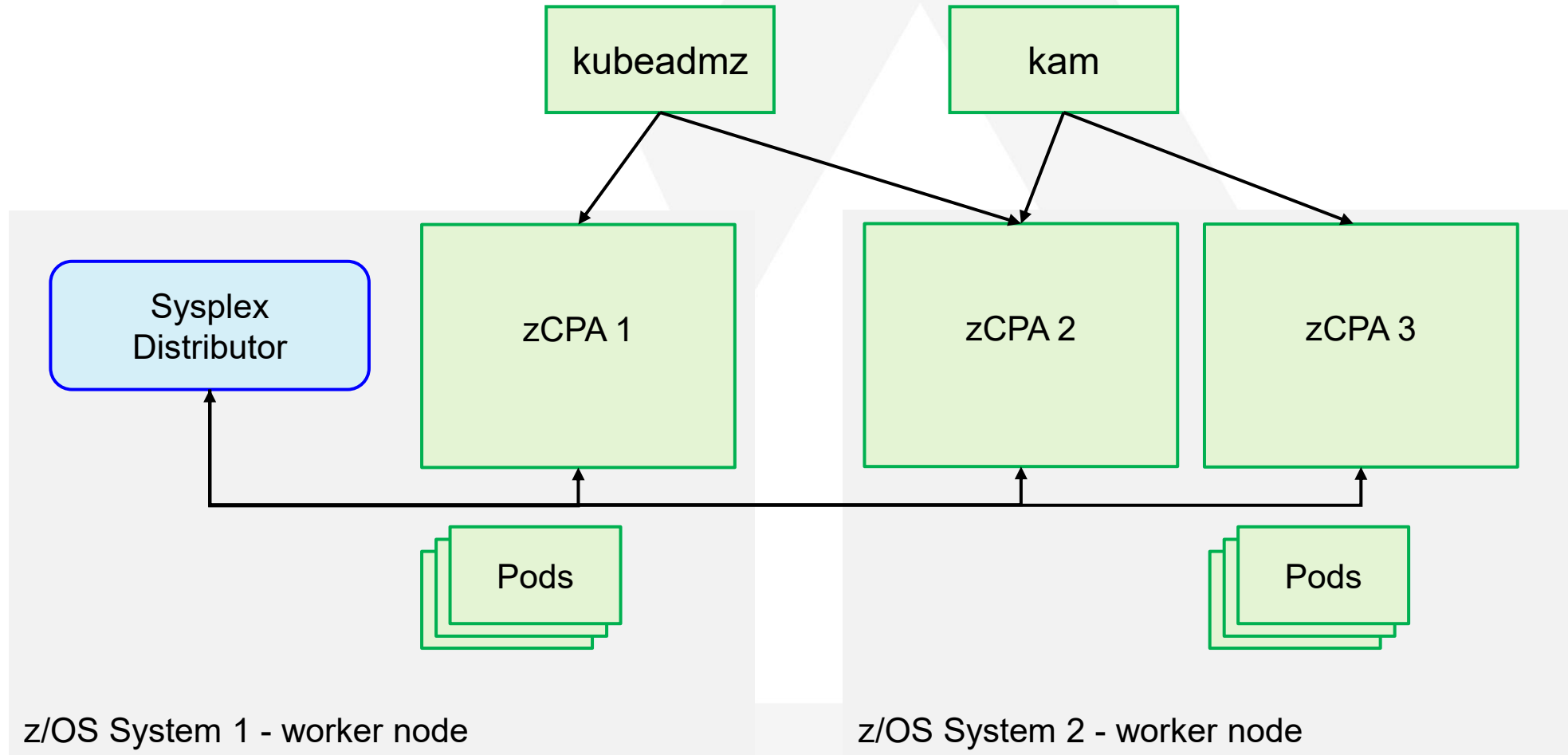
>> curl http://10.10.21.1:8080

-> Hello from Pod 9061c781139f

>> netstat -c
User Id  Conn      State
-----  ----      -
BCZ-CNTR 00000146 Listen
  Local Socket: 10.10.21.1..8800
  Foreign Socket: 0.0.0.0..0
```

Kubernetes Cluster

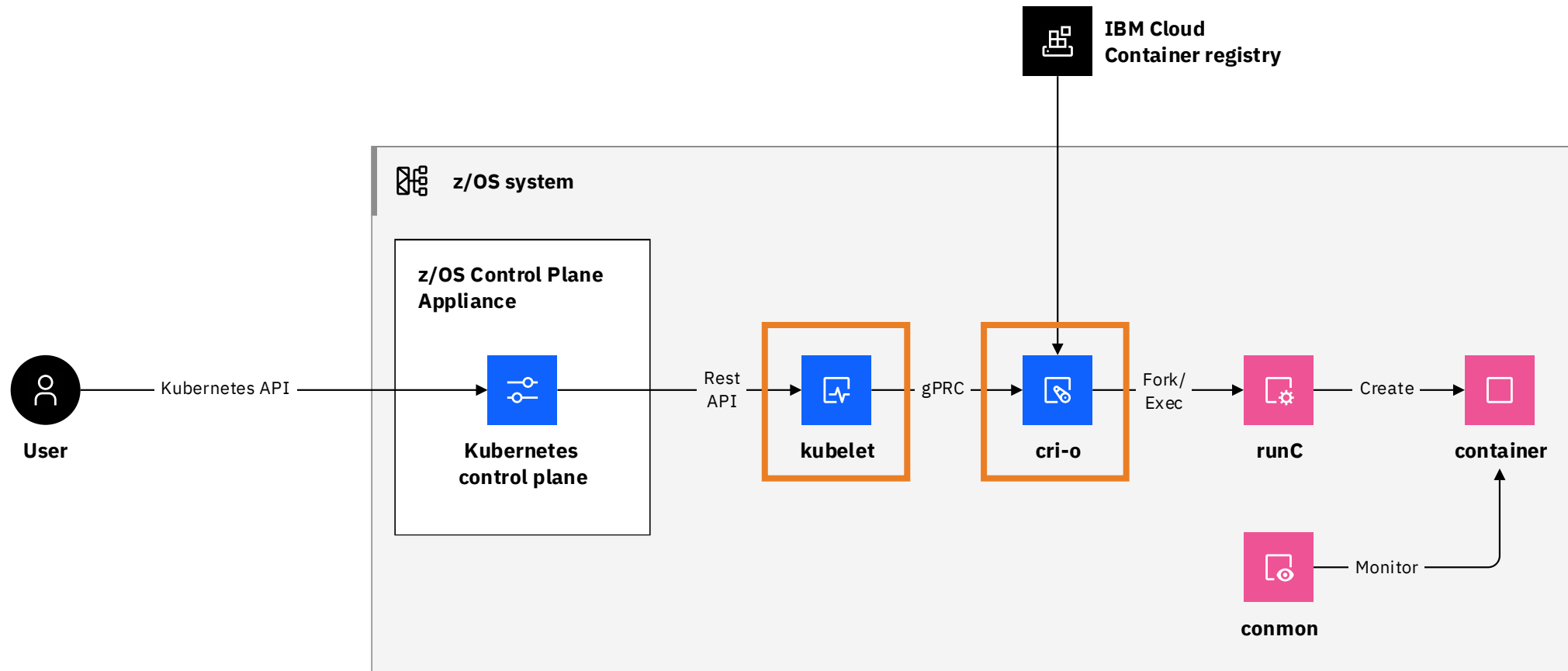
Kubernetes on z/OSCP Overview



Kubernetes on z/OSCP Overview

- Stores images in different directory from Podman
 - Can use a private registry to get images built with Podman
- Pods may or may not run under identity of the user
 - User specified in deployment yaml
 - Recommended to have generic user
 - Prevents other users from deploying container under another user's identity
- Run workflow to setup worker nodes

Kubernetes on z/OSCP Overview



■ Kubernetes ■ Container runtime

Setup for Kubernetes – zCPA

- /usr/lpp/IBM/zoscp/workflows/zcpa_provision.xml
 - Allocates a single zCPA (zFS instance directory, VSAM datasets)
 - Run once for each zCPA
- Add zFS instance mount to BPXPRMxx member
- Security setup to authorize kubeadmz and kam CLI tools
 - Sample in SYS1.SBCZSMPL(BCZSECS2)
- For a high availability environment, configure the Sysplex Distributor
 - Will discuss this in more detail in the afternoon session

Setup for Kubernetes – Worker Nodes

- /usr/lpp/IBM/zoscp/workflows/zoscp_worker_node.xml
 - Once for each system that should be a worker node
 - Must have UID 0 or BPX.SUPERUSER access
- Setup the started procedures CRIO and KUBELET
 - They get started/stopped automatically when joining or leaving the cluster
- Define SYMDEF, point to current Kubernetes version

```
SYMDEF(&K8SVER='1.34')
```

```
/usr/lpp/IBM/zoscp/$(/bin/sysvar K8SVER)/bin
```

- Security setup: Containers user OCIUSER, CRIO and Kubelet users
 - Sample SYS1.SBCZSMPL(BCZSECS3)

Kubernetes Demo

1. Starting the zCPAs
2. Initializing the control plane nodes
3. Joining the worker nodes
4. Creating pods

1. Starting the zCPAs

```
S ZCPA,JOBNAME=ZCPA1,CONF='/global/zcpa/instances/ZCPA1/start.json'
```

```
GLZB025I zCX instance ZCPA1: Initialization has started. Code date 02/21/25.
```

```
EZD1204I DYNAMIC VIPA 10.10.10.1 WAS CREATED USING IOCTL BY ZCPA1 ON TCPIP
```

```
:
```

```
Workflows Performed:
```

```
Provision:          1.0.1      HCZ1110      2026/02/21 12:52
```

```
Reconfigure:        N/A       N/A         N/A
```

```
Upgrade :           N/A       N/A         N/A
```

```
Add Data Disks: :   N/A       N/A         N/A
```

```
GLZB027I zCX instance ZCPA1: Starting virtual CPUs.
```

```
GLZB027I zCX instance ZCPA1: IPLing guest.
```

```
GLZM012I zCX services for instance ZCPA1 are available.
```

2. Initializing the Control Plane Nodes

```
>> kubeadm init --control-plane-appliance-address 10.10.10.1 --control-plane-endpoint 10.10.20.1
--upload-certs
```

```
.....
BCZ2001I kubeadm initialized the Kubernetes control plane on zCPA 10.10.10.1
```

```
>> kubeadm join 10.10.20.1 --control-plane-appliance-address 10.10.10.2 --control-plane
```

```
.....
BCZ2001I kubeadm joined the Kubernetes control plane on zCPA 10.10.10.2
```

```
>> kubeadm join 10.10.20.1 --control-plane-appliance-address 10.10.10.3 --control-plane
```

```
.....
BCZ2001I kubeadm joined the Kubernetes control plane on zCPA 10.10.10.3
```

```
>> kubeadm getConfig --control-plane-appliance-address 10.10.10.1
```

```
BCZ2002I kubeadm wrote zCPA Kubernetes config file /u/user2/.kube/config
```

```
>> kubectl get nodes
```

NAME	STATUS	ROLES	AGE	VERSION
zcpa1	Ready	control-plane	13m	v1.34.1
zcpa2	Ready	control-plane	11m	v1.34.1
zcpa3	Ready	control-plane	8m	v1.34.1

3. Joining Worker Nodes

```
>> kubeadmz join 10.10.10.1
```

```
.....  
BCZ2218I kubeadmz initialized the z/OS worker node to the Kubernetes cluster
```

```
>> kubectl get nodes
```

NAME	STATUS	ROLES	AGE	VERSION
node1	Ready	<none>	72s	v1.34.2-zos.v1.1.0
node2	Ready	<none>	11m	v1.34.2-zos.v1.1.0
zcpa1	Ready	control-plane	38m	v1.34.1
zcpa2	Ready	control-plane	11m	v1.34.1
zcpa3	Ready	control-plane	8m	v1.34.1

4. Creating Pods

```
>> kubectl apply -f service.yaml
service/demo created
```

```
>> kubectl get pods -o wide
```

NAME	READY	STATUS	RESTARTS	AGE	IP
demo-67f5bddd46-gr1cw	1/1	Running	0	47s	10.10.21.1 node1
demo-67f5bddd46-nvvzv	1/1	Running	0	47s	10.10.22.1 node2

```
>> curl http://10.10.21.1:8080
```

```
-> Hello from Pod demo-67f5bddd46-nvvzv
```

```
>> curl http://10.10.22.1:8080
```

```
-> Hello from Pod demo-67f5bddd46-gr1cw
```

```
>> curl http://10.10.20.1:30089
```

```
-> Hello from Pod demo-67f5bddd46-nvvzv
```

```
>> curl http://10.10.20.1:30089
```

```
-> Hello from Pod demo-67f5bddd46-gr1cw
```

- 10.10.20.1 is the Sysplex Distributor address

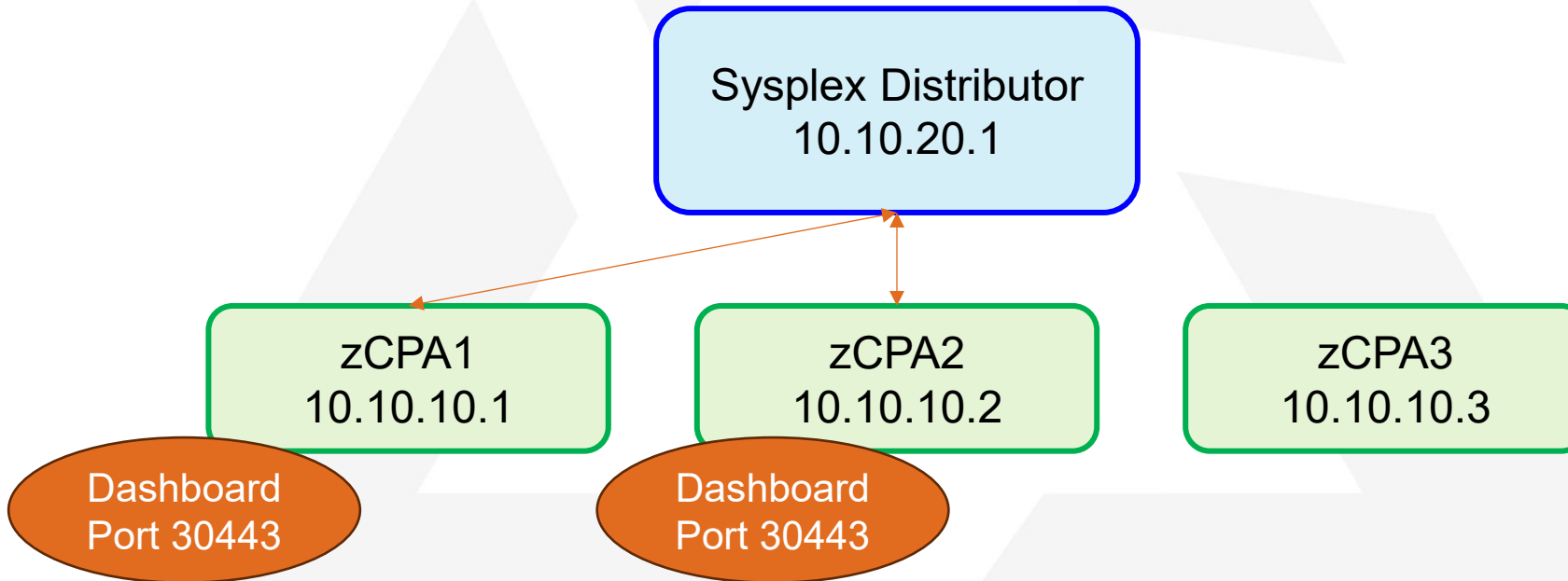
Connecting to pods directly

Connecting to pods through the Sysplex Distributor (round robin)

Dashboard

Dashboard

- zOSCP provides the Kubernetes Dashboard as an alternative to using kubectl commands
- Start/stop the dashboard using kubeadmz
- Creates a NodePort service, can connect to the dashboard directly through the zCPA IP address or the Sysplex Distributor IP address

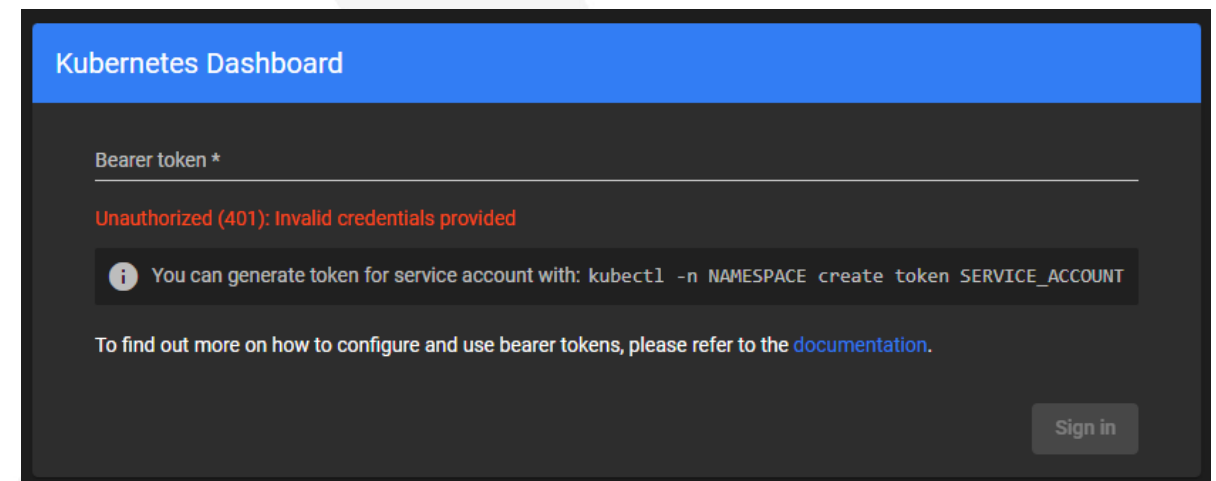


Starting Dashboard

- 2 user tokens are returned when starting the dashboard:
 - Admin user – read/write access to dashboard namespace and resources
 - Monitor user – read access to dashboard resources

```
>> kubeadmz dashboard start --control-plane-appliance-address 10.10.10.1
. . . . .
BCZ2002I kubeadmz wrote zCPA Kubernetes dashboard file
/u/user1/.kube/.dashboard
BCZ2440I started the Kubernetes dashboard on zCPA 10.10.10.1
```

```
{"tokens": {
  "admin-user": "eyJhbGciOiJSUzI1NiIsImt...c3T7yI8Yg",
  "monitor-user": "AZOKw9hHhTxV4By7AgLI...bvAOzQ"
}}
```



Get Pods View

 **kubernetes**

Workloads > Pods

Workloads

Cron Jobs

Daemon Sets

Deployments

Jobs

Pods

Replica Sets

Replication Controllers

Stateful Sets

Service

Ingresses

Ingress Classes

Services

kube-system

kubernetes-dashboard

zosc-zcpa

zosc-zos-pod-admission-controller

zosc-zos-security-admission-cont...

	Namespaces	Labels	Node
		app.kubernetes.io/component: api	
		app.kubernetes.io/instance: vault	
		app.kubernetes.io/managed-by: Helm	
		Show all	
		app.kubernetes.io/component: metrics-scraper	
		app.kubernetes.io/instance: vault	
		app.kubernetes.io/managed-by: Helm	
		Show all	
		app: vault-kong	

Select a namespace

View list of pods

Viewing a Pod

coredns-668d6bf9bc-fj8q4

Metadata

Name	Namespace	Created	Age	UID
coredns-668d6bf9bc-fj8q4	kube-system	Apr 23, 2025	2 hours ago	0cbb4627-fce2-47
Owner				
replicaset/coredns-668d6bf9bc				
Labels				
k8s-app: kube-dns pod-template-hash: 668d6bf9bc				

Resource information

Node	Status	IP	QoS Class	Restarts	Service Account
zcpa1	Running	192.168.1.11	Burstable	0	coredns

Conditions

Type	Status	Last probe time	Last transition time	Reason
Initialized	True	-	2 hours ago	-

Metrics Server

- The metrics server pod scrapes the host appliance for CPU and memory usage
- Gives insight to the node and pod resource usage
- Fits existing management solutions
- Only for control plane nodes

Nodes										
Name	Labels	Ready	CPU requests (cores)	CPU limits (cores)	CPU capacity (cores)	Memory requests (bytes)	Memory limits (bytes)	Memory capacity (bytes)	Pods	Created ↑
zcpa1	beta.kubernetes.io/arch: s390x	True	1.65 (82.50%)	2.10 (105.00%)	2.00	1.26Gi (61.14%)	1.89Gi (91.94%)	2.06Gi	16 (14.55%)	30 minutes ago
	beta.kubernetes.io/os: linux									
	kubernetes.io/arch: s390x									

Connecting via REST APIs

`https://<dashboard>/api/v1/resource/namespace`

```
>> curl https://10.168.217.14:32001/api/v1/pod/kubernetes-dashboard --header "Authorization: Bearer $TOKEN"
{
  "listMeta": {
    "totalItems": 5
  },
  "cumulativeMetrics": [],
  "status": {
    "running": 5,
    "pending": 0,
    "failed": 0,
    "succeeded": 0,
    "terminating": 0
  },
  "pods": [
    {
      "objectMeta": {
        "name": "vault-kong-7df5fb9c85-rnwq2",
        "namespace": "kubernetes-dashboard",
        "creationTimestamp": "2025-04-23T16:55:28Z",
        ...
      }
    }
  ]
}
```

Upgrade Process

Upgrade Overview

- There is a new Kubernetes version every quarter, zOSCP follows the same release cycle
- Each upgrade goes to the next patch level or minor version
 - Control plane nodes can be no more than one minor version apart
 - If there is more than a single minor version increase to upgrade to, these steps will have to be performed multiple times
- Steps to upgrade a cluster:
 1. Run the z/OSMF zCPA upgrade workflow against each zCPA in the cluster, then rejoin the zCPA
 2. Run kubeadmz upgrade against each zCPA
 3. Run the z/OSMF worker node upgrade workflow against each worker node, then rejoin the zCPA
- Alternatively, run kam upgrade against each zCPA in place of steps 1 and 2

Kam Upgrade

```
>> kubectl get nodes
NAME      STATUS    ROLES          AGE   VERSION
node1     Ready     <none>         72s   v1.33.2-zos.v1.1.0
node2     Ready     <none>         11m   v1.33.2-zos.v1.1.0
zcpa1     Ready     control-plane  38m   v1.33.1
zcpa2     Ready     control-plane  11m   v1.33.1
zcpa3     Ready     control-plane   8m   v1.33.1

>> kam upgrade 10.10.10.1 --zosmf-system MVSSYS --zcpa-filesystem /global/instances/ZCPA1
User USER1 z/OSMF password:

Preparing zCPA at 10.10.10.1 for an upgrade . . . . .
Upgrading zCPA at 10.10.10.1 . . .
Resuming zCPA at 10.10.10.1 after upgrade . . .
BCZ2435I node 10.10.10.1 upgraded.

>> kam upgrade 10.10.10.2 --zosmf-system MVSSYS --zcpa-filesystem /global/instances/ZCPA2
User USER1 z/OSMF password:

Preparing zCPA at 10.10.10.2 for an upgrade . . . . .
Upgrading zCPA at 10.10.10.2 . . .
Resuming zCPA at 10.10.10.2 after upgrade . . .
BCZ2435I node 10.10.10.2 upgraded.
```

Kam Upgrade...

```
>> kam upgrade 10.10.10.3 --zosmf-system MVSSYS --zcpa-filesystem /global/instances/ZCPA3
```

```
User USER1 z/OSMF password:
```

```
Preparing zCPA at 10.10.10.3 for an upgrade . . . . .
```

```
Upgrading zCPA at 10.10.10.3 . . .
```

```
Resuming zCPA at 10.10.10.3 after upgrade . . .
```

```
Upgrading control plane node for zCPA at 10.10.10.3 . . .
```

```
Upgrading control plane node for zCPA at 10.10.10.1 . . .
```

```
Upgrading control plane node for zCPA at 10.10.10.2 . . .
```

```
BCZ2435I node 10.10.10.3 upgraded.
```

```
>> kubectl get nodes
```

```
NAME STATUS ROLES AGE VERSION
```

```
node1 Ready <none> 72s v1.33.2-zos.v1.1.0
```

```
node2 Ready <none> 11m v1.33.2-zos.v1.1.0
```

```
zcpa1 Ready control-plane 1m v1.34.1
```

```
zcpa2 Ready control-plane 4m v1.34.1
```

```
zcpa3 Ready control-plane 7m v1.34.1
```

Version Health Check

- Sends a message when an upgrade is available on the system for the zCPA or worker node
- Add the check to the HZSPRMxx member

```
GLZB027I zCX instance ZCTEST: Loading guest image.
GLZB022I zCX instance ZCTEST version information 321
Bootloader:           HZDC7C0           oa67075
                      3.7.3             2.5.0
Current Appliance:    HCZ1110           0A67369
                      4.4.3             1.33.1
                      20250217T200029Z
Available Appliance:  HCZ1110           0A67369
                      4.4.3             1.34.1
                      20250127T205848Z
Virtualization Layer: HBB77D0   UJ96016   09/30/24
                      Started on 2026/02/20 16:54:22

Workflows Performed:
Provision:            1.0.2           HCZ1110   2026/02/20 15:19
Reconfigure:          N/A            N/A      N/A
Upgrade:              N/A            N/A      N/A
Add Data Disks:       N/A            N/A      N/A
Add Local Stg Disks:  N/A            N/A      N/A
GLZB027I zCX instance ZCTEST: Starting virtual CPUs.
GLZB001I zCX instance ZCTEST initialization is complete.
Code date
09/30/24.
GLZB027I zCX instance ZCTEST: IPLing guest.
```

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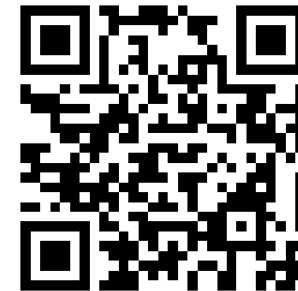
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Reference Material

Filesystem Layout and PDSE locations

`/usr/lpp/IBM/zoscp/`

1.32/
1.33/
1.34/
bin/
lib/
samples/
smpefiles/
workflows/

PDS: **SYS1.BCZSAMP**

PDSE: **SYS1.SBCZCPA1**
 SYS1.SBCZCPA2
 SYS1.SBCZCPA3
 SYS1.SBCZCPA4

Setup BPXPRMxx and Path for zOSCP

- Union file system
 - Provides a merged view of two or more directories
- Temporary file system
 - In memory physical file system not written to DASD
- Proc file system
 - Pseudo-filesystem representing the current state of the system and processes
- Update PATH environment variable
 - Access to Podman, CNI and others
 - Recommended to update /etc/profile

Workflows ▶ Performs the base setup for running zOSCP - Workflow_1 ▶ 1. Validate your BPXPRMxx parmlib is setup for zOSCP

Properties for Workflow Step 1. Validate your BPXPRMxx parmlib is setup for zOSCP

GeneralDetailsDependenciesNotesPerformStatusInput VariablesFeedback

Review Instructions

Instructions:

zOSCP requires the UFS, TFS and PROC filesystems.

To activate the union filesystem, add the following to your BPXPRMxx PARMLIB member:

```
FILESYSTYPE TYPE(UFS) ENTRYPPOINT(BPXUNINT)
```

To activate the temporary filesystem, add the following to your BPXPRMxx PARMLIB member:

```
FILESYSTYPE TYPE(TFS) ENTRYPPOINT(BPXTFS)
```

To activate the PROC filesystem, add the following to your BPXPRMxx PARMLIB member:

```
FILESYSTYPE TYPE(PROC) ENTRYPPOINT(BPXUPINT)
```

```
MOUNT MOUNTPOINT('/proc') FILESYSTEM('PROC') TYPE(PROC) MODE(RDWR)
```

The /proc directory is required. Check to see that this directory exists. If it does not, you will have to create this directory.

Workflows ▶ Performs the base setup for running zOSCP - Workflow_1 ▶ 2. Add the zOSCP product directory to PATH= environment variable in /etc/profile

Properties for Workflow Step 2. Add the zOSCP product directory to PATH= environment variable in /etc/profile

GeneralDetailsDependenciesNotesPerformStatusInput VariablesFeedback

Review Instructions

Instructions:

Add /usr/lpp/IBM/zoscp/bin to your PATH environment variable in /etc/profile as like the example below:

```
# Add zoscp executables to PATH  
PATH=$PATH:/usr/lpp/IBM/zoscp/bin
```

Podman Security Setup

- Manual step performed by z/OS Security administrator
- Sample job in
SYS1.SBCZSMPL(BCZSECS1)
- Creates PODMAN group
 - Access to CONTAINERS in UNIXPRIV class
- Connect command to add Users

```
//STEP1 EXEC PGM=IKJEFT01
//SYSPRINT DD SYSOUT=*
//SYSTSPRT DD SYSOUT=*
//SYSTSIN DD *

/* SETROPTS CLASSACT(UNIXPRIV) */
/* SETROPTS RACLIST(UNIXPRIV) */

/* Create group that will be given access to run podman */
/* ADDGROUP PODMAN OMVS(AUTOGID) */
/* RDEFINE UNIXPRIV CONTAINERS UACC(NONE) */
/* PERMIT CONTAINERS ID(PODMAN) ACCESS(READ) CLASS(UNIXPRIV) */
/* SETROPTS RACLIST(UNIXPRIV) REFRESH */

/* To connect a user ID to the PODMAN group, run: */
/* CONNECT <userid> GROUP(PODMAN) */
/* Where the <userid> is the user ID you want to connect to the */
/* PODMAN group. */
```

File System Setup

- Permanent filesystem setup
 - Persistent storage for container images and other artifacts
 - Mounted on /var/lib/podman
 - Creates /var/lib/podman/storage
- Sharing of Podman filesystem
 - Allows for unprivileged users to use Podman file system
 - /var/share/containers/storage
- Setup temporary filesystems
 - /var/run/containers
 - Container metadata
 - /var/run/runc
 - runc metadata
 - /var/run/user
 - Stores user specific meta data

Workflows > Performs the base setup for running zOSCP - Workflow_0 > 4. Setup permanent filesystem used by podman

Properties for Workflow Step 4. Setup permanent filesystem used by podman

General	Details	Dependencies	Notes	Perform	Status	Input Variables	Feedback
✓ Input Variables 🔧 General Review Instructions Create JOB statement Review JCL Submit and Save JCL							
Input Variables - General Enter the variable values for this input category. * Podman lib filesystem: ⓘ - Name of the filesystem to create for the podman lib filesystem: BCZ.PODLIB Podman lib volser: ⓘ - Volume used to allocate filesystem for container images and artifacts: * Podman lib filesystem primary size: ⓘ - Primary size of the podman lib filesystem in MB: 4096 * Podman lib filesystem secondary size: ⓘ - Secondary size of the podman lib filesystem in MB: 2048 SMS STORCLAS: ⓘ - STORCLAS for the podman lib VSAM data sets and zFS filesystem: SMS MGMTCLAS: ⓘ - MGMTCLAS for the podman lib VSAM data sets and zFS filesystem: SMS DATACLAS: ⓘ - DATACLAS for the podman lib VSAM data sets and zFS filesystem:							

Configuration Files

- containers.conf
 - Default configuration options for podman
- mounts.conf
 - Default mounts for podman
- storage.conf
 - Specifies container storage options
- registry.conf
 - Configures default image registries
- policy.json
 - Determines whether an image should be accepted

```
[storage]
```

```
# Default Storage Driver, Must be set for proper  
operation.
```

```
driver = "ufs"
```

```
# Temporary storage location
```

```
runroot = "/var/run/containers/storage"
```

```
# Primary Read/Write location of container storage  
graphroot = "/var/lib/podman/storage"
```

```
# Storage path for rootless users
```

```
rootless_storage_path =
```

```
"$HOME/.local/$SYSNAME/containers/storage"
```

WLM Setup

- zOSCP work can be classified by WLM
 - Default is SYSOTHER unless SYSCNTNR service class is created
 - Default assignment can be overridden
- Alternatively, Container Qualifiers can be used
 - Can be configured at the pod level
 - annotations = ["zoscp.ibm.com/wlm-qualifier=myqual"]
 - Can be configured at the container level
 - annotations = ["zoscp.ibm.com/wlm-qualifier.'container_name'=myqual"]
 - Can be passed directly on run command
 - Podman run --annotation zoscp.ibm.com/wlm-qualifier=myqual

Provisioning a zCPA - Networking

Properties for Workflow Step 1.2. Gather z/OS Control Plane Appliance instance properties

General Details Dependencies Notes **Perform** Status Input Variables Feedback

Input Variables - z/OS Control Plane Appliance Network Configuration

Enter the variable values for this input category.

* IPv4 Address: ⓘ - IPv4 address for the zCPA instance (as defined by a VIPARANGE ZCPA TCP/IP profile statement):

Sysplex Distributor IPv4 Address: ⓘ - IPv4 address of the Sysplex Distributor DVIPA for the zCPA instance:

TCP/IP Stack Name: ⓘ - z/OS TCP/IP stack name:

* MTU Size: ⓘ - The MTU to use for network communication with the zCPA instance:

1492

IPv4 address assigned in VIPARANGE ZCPA statement in the TCP/IP profile

Optionally, IPv4 address assigned as distributable dynamic VIPA in VIPADISTRIBUTE EXTARG statement in the TCP/IP profile

zCPA Security Setup

- Sample job
SYS1.SBCZSMPL(BCZSECS2)
- kubeadmz
 - Create group K8SADMIN with access to the SAF resource BCZE.KUBEADMZ.*
- kam
 - Create SAF resource BCZE.KAM.* and add users
- Permit the kam users and K8SADMIN group to the required ICSF SAF profiles
- Create public/private key pair in a certificate
- Define OPERCMDS to start/stop CRIO and KUBELET

```
/******  
/* This job step permits a user or group to the SAF resource  
/* which  
/* allows the user to run the kubeadmz or kam utility.  
K8SADMIN is  
/* a SAF group name representing Kubernetes administrators.  
This SAF  
/* group name is also used by other programs meant for use by  
/* Kubernetes administrators.  
/*  
//ZCPASAF EXEC PGM=IKJEFT01  
//SYSTSPRT DD SYSOUT=*  
//SYSTSIN DD *,SYMBOLS=JCLONLY  
/* SETROPTS CLASSACT(SERVAUTH)  
/* SETROPTS RACLIST (SERVAUTH)  
/* RDEFINE SERVAUTH BCZE.KUBEADMZ.&SYS. UACC(NONE)  
/* ADDGROUP K8SADMIN OMVS(AUTOGID)  
/* PERMIT BCZE.KUBEADMZ.&SYS. CLASS(SERVAUTH) ACC(READ)  
ID(K8SADMIN)  
/* RDEFINE SERVAUTH BCZE.KAM.&SYS. UACC(NONE)  
/* PERMIT BCZE.KAM.&SYS. CLASS(SERVAUTH) ACCESS(READ)  
ID(&USERKAM)  
/* SETROPTS RACLIST(SERVAUTH) REFRESH
```

Security Setup

- Sample job SYS1.SBCZSMPL(BCZSECS3)
- Recommended to create a default containers user (OCIUSER)
 - Run containers with minimal privileges
 - CRIO read access to SURROGAT BPX.SRV.OCIUSER
 - A different user ID can be selected

Instructions:

```
kubectrl set env daemonset zoscp-zos-security-admission-controller -n zoscp-zos-security-admission-controller DEFAULT-PERMITTED-USERID=${YOUR_DEFAULT_USERID}"
```

Note: A change in the default user ID for containers has implications for any running workload and a decision to perform such a change should be carefully managed. For example, you might do this when the cluster is instantiated and before any workload is assigned.

For more information, please see the 'Default user ID for containers on z/OS' and 'Authorizing the CRIO user ID for surrogate access' sections of the IBM z/OS Container Platform documentation.

For information on annotating namespaces to override the default container userid, please see the 'Adding user ID annotations to namespaces' section of the IBM z/OS Container Platform documentation.

Security Setup ...

- Create custom user ID for KUBELET
 - UID 0
- Create custom user ID for CRIO
 - UID 0
 - Read access to FACILITY BPX.FILEATTR.*:
 - APF, PROGCTL, SHARELIB
 - Read access to UNIXPRIV CONTAINERS so container related functions can be performed
 - Recommended to define BPX.DAEMON so runc and only swap to permitted IDs
 - Give CRIO read access to SURROGAT BPX.SRV.<userID>
 - SURROGAT BPX.SRV.OCIUSER

Permanent and Temporary File Systems

- Permanent
 - /var/lib/containers, /var/log/crio, /var/lib/kubelet, /var/log/kubelet, /etc/kubernetes, /var/log/pods
- Temporary
 - /var/run/crio
- Recommended to add the filesystems to the BPXPRMxx PARMLIB member, so they are automatically mounted following an IPL

* zOSCP lib filesystem: ⓘ - Name of the filesystem to create for the zOSCP lib filesystem:

zOSCP lib volser: ⓘ - Volume used to allocate filesystem for container images and artifacts:

* zOSCP lib filesystem primary size: ⓘ - Primary size of the zOSCP lib filesystem in MB:

* zOSCP lib filesystem secondary size: ⓘ - Secondary size of the zOSCP lib filesystem in MB:

* CRIO userid: ⓘ - Userid that will run the crio daemon:

* Kubernetes admin group: ⓘ - Group under which the crio and kubelet daemons will run.:

SMS STORCLAS: ⓘ - STORCLAS for the Container lib VSAM data sets and zFS filesystem:

SMS MGMTCLAS: ⓘ - MGMTCLAS for the Container lib VSAM data sets and zFS filesystem:

SMS DATACLAS: ⓘ - DATACLAS for the zOSCP lib VSAM data sets and zFS filesystem:

Configuration Files

- /etc/crio/crio.conf
 - CRIO configuration file
- /etc/kubernetes/patches/kubeletconfiguration.yaml
 - KUBELET configuration file
- /etc/kubernetes/kubelet.env
 - KUBELET environment variables

* Kubelet port: ⓘ - Port for the Kubelet to serve on the worker node:

* Kubelet ip: ⓘ - IP address of the worker node the Kubelet will serve:

* Kubelet userid: ⓘ - Userid that will run the kubelet daemon:

* Kubernetes admin group: ⓘ - Group under which the crio and kubelet daemons will run.:

* Kubernetes version: ⓘ - System symbol that represents the version of Kubernetes:

Kubelet job name: ⓘ - Job name of the Kubelet started task:

cri-o job name: ⓘ - Job name of the cri-o started task:

* Kubelet userid: ⓘ - Userid that will run the kubelet daemon:

* Kubernetes admin group: ⓘ - Group under which the crio and kubelet daemons will run.:

Syslogd

- Update the syslogd configuration to store the CRIO and KUBELET log files
 - /var/log/crio/crio.syslog and /var/log/kubelet/kubelet.syslog

Properties for Workflow Step 15. Setup syslogd

General Details Dependencies Notes **Perform** Status Input Variables Feedback

Review Instructions

Instructions:

When the syslogd daemon (syslogd) is running, the crio and kubelet daemons will use syslogd as the primary logging facility. If syslogd is not active, the crio and kubelet daemons will send all messages to the log file specified in the procedure. It is recommended to add new rules to the syslogd configuration file to indicate where logs will be written. For example, the following lines can be added to a syslogd configuration file:

```
*.CRIO*.*.* /var/log/crio/crio.syslog
*.KUBELET*.*.* /var/log/kubelet/kubelet.syslog
```

It is also recommended to give the Kubernetes administrator group read access to these files. To do this, issue the following z/OS UNIX commands, replacing {syslogd_user} with the the userid that syslogd runs under and {kubernetes_admin_group} with the Kubernetes administrator group name:

```
touch /var/log/crio/crio.syslog
chown {syslogd_user}:{kubernetes_admin_group} /var/log/crio/crio.syslog
chmod 640 /var/log/crio/crio.syslog
touch /var/log/kubelet/kubelet.syslog
chown {syslogd_user}:{kubernetes_admin_group} /var/log/kubelet/kubelet.syslog
chmod 640 /var/log/kubelet/kubelet.syslog
```

If syslogd is currently running, the configuration file will need to be reread in order to pick up the changes. This can be done by either issuing a "MODIFY procname,RESTART" or sending a "SIGHUP" signal to the syslogd process.

Refer to **Configuring the syslog daemon** section in the z/OS Communications Server: IP Configuration Guide for information about setting syslogd log file permissions.

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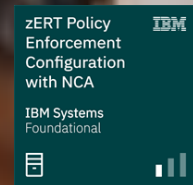


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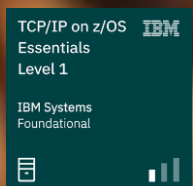


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