

# z/OS 3.2 IBM Education Assistant

Solution Name: zCX Sysplex Distributor Support for Red Hat OpenShift

Solution Element(s): zCX

July 2025



# Agenda

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- Trademarks
- Objectives
- Overview
- Usage & Invocation
- Interactions & Dependencies
- Upgrade & Coexistence Considerations
- Installation & Configuration
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# Trademarks

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- See url <http://www.ibm.com/legal/copytrade.shtml> for a list of trademarks.
- Additional Trademarks:
  - None

# Objectives

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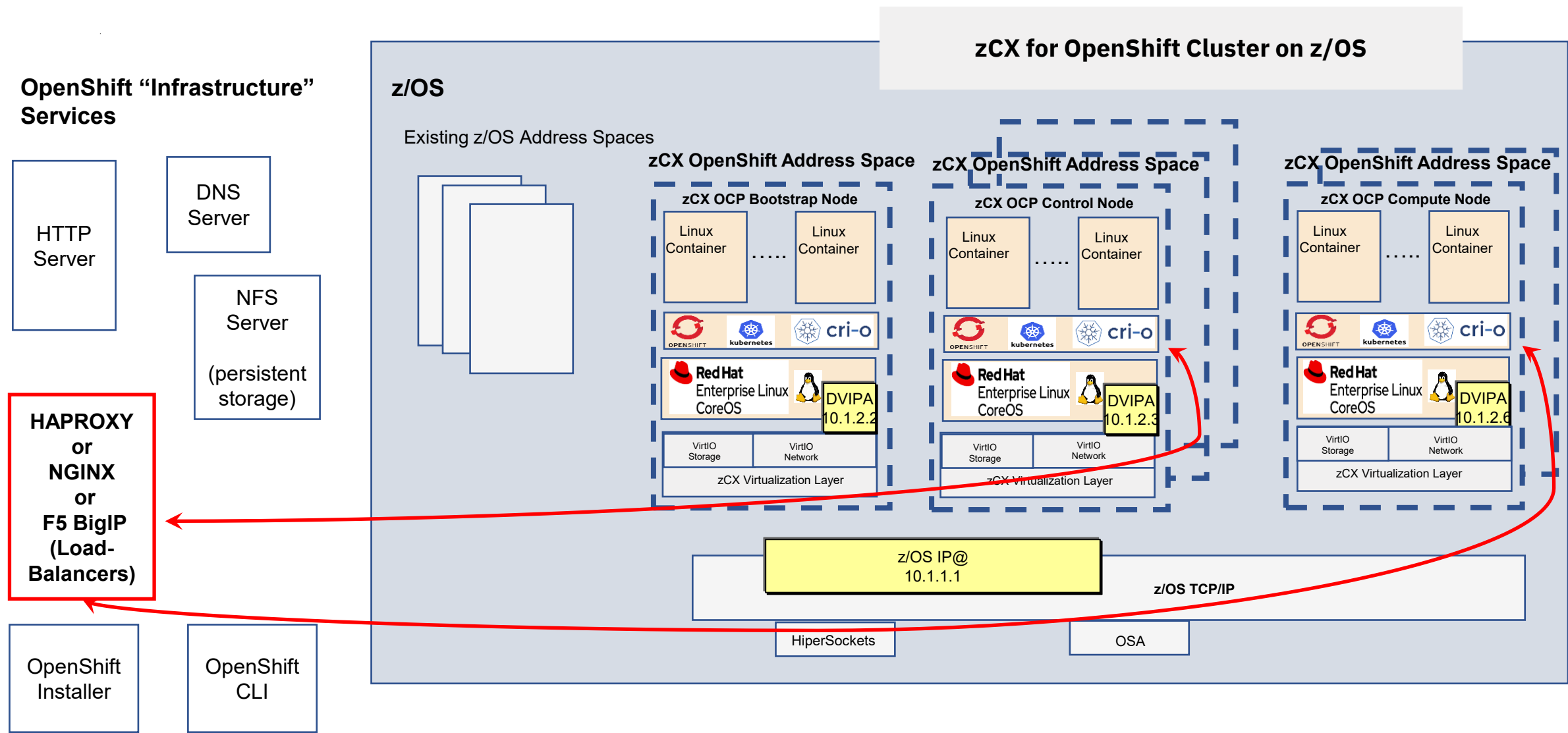
- zCX Sysplex Distributor support extends the zCX for Red Hat OpenShift dynamic VIPA network communication to allow for network load distribution among targeted zCX instances within a z/OS sysplex.
- It extends the capabilities of dynamic VIPAs to enable distribution of incoming TCP connections to ensure high availability of zCX for Red Hat OpenShift cluster's API, Machine-config, Ingress, and user-defined endpoints.

# Overview

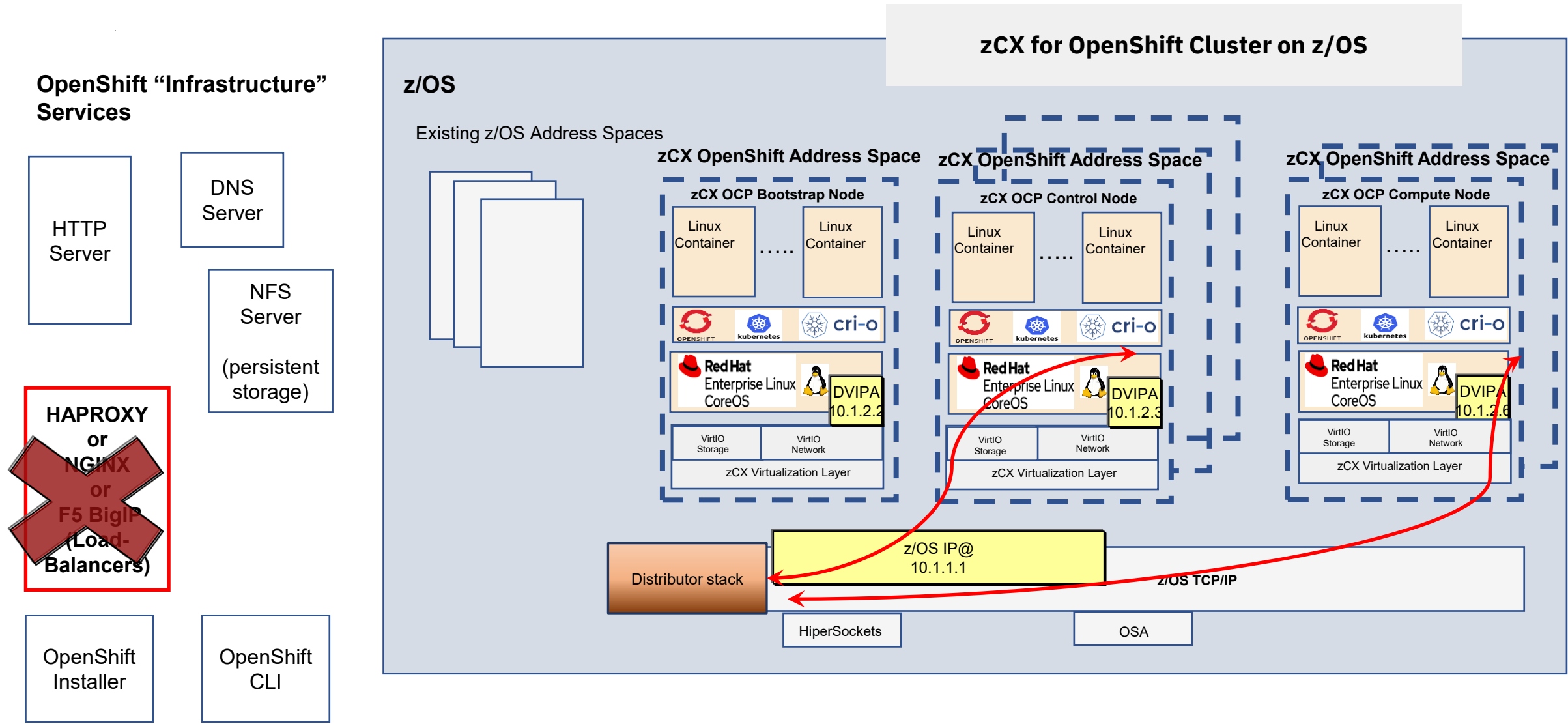
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- Who (Audience)
  - zCX for Red Hat OpenShift clients
- What (Solution)
  - Exploit CommServer Sysplex Distributor support for IBM zCX for Red Hat OpenShift
- Wow (Benefit / Value, Need Addressed)
  - Provides high availability for zCX for Red Hat OpenShift cluster's API, Machine-config, Ingress, and user-defined endpoints without the need of an external load balancer **after OpenShift installation**.
  - Minimizes the window where Red Hat OpenShift cluster's endpoints are unavailable when there is a zCX for Red Hat OpenShift address space failure, planned/unplanned maintenance (IPL, AS restart, zCX for OCP reconfigure workflow) or during an outage of the z/OS LPAR/zCX for Red Hat OpenShift instances.

# Pain Point



# Solution



# Usage & Invocation

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- Update the TCP/IP profile for Sysplex Distributor and restart the TCP/IP stack(s) to activate the updated TCP/IP profile.
- Run the new zCX for Red Hat OpenShift Sysplex Distributor enablement workflow to enable Sysplex Distributor for Red Hat OpenShift cluster's API, Machine-config, Ingress, and user-defined endpoints load-balance.
- Use the Sysplex Distributor Distributed DVIPA to communicate with the OpenShift cluster's API, Machine-config, Ingress, and user-defined endpoints.



# Interactions & Dependencies

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- Software Dependencies
  - zCX for Red Hat OpenShift (HHRH110)
  - OpenShift version 4.14 and higher
  - Container image registry to store Sysplex Distributor enablement image
  - Separate host machine or virtual server that has access to OpenShift cluster, Container image registry and z/OS
- Hardware Dependencies
  - None
- Exploiters
  - zCX for Red Hat OpenShift clients

# Upgrade & Coexistence Considerations

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- To exploit this solution, all systems in the Plex must be at the new z/OS level:
  - NO
- APAR OA66817 is needed for all z/OS 2.5 and above systems in the zCX for Red Hat OpenShift cluster.
- zCX for Red Hat OpenShift instances running on z/OS 2.4 placed into the Sysplex Distributor configuration are ignored.
- zCX for Red Hat OpenShift instance port 1702 is used to communicate with Sysplex Distributor and cannot be used by any OpenShift endpoints.
  - A zCX admin must validate that no existing OpenShift endpoints use port 1702 before enabling Sysplex Distributor support.
  - Any endpoints using port 1702 must be removed and recreated with a different port mapping

# Installation & Configuration

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- APAR for zCX for Red Hat OpenShift: OA66817
- Your TCPIP stack profile(s) must be updated to define the Sysplex Distributor Distributed DVIPA via a **VIPADefine** statement and which zCX instances are to be load balanced via a **VIPADISTRIBUTE** statement.
- An example TCP/IP profile snippet is provided on the next slide
- Restart the affected TCPIP stack(s) or use the **VARY TCPIP,,OBEYFILE** command to update TCP/IP profile configuration changes dynamically without stopping and restarting the TCP/IP address space.
- Use the **netstat VIPADCFG / -F** report to validate distributable DVIPA is configured correctly.
- Use the **netstat VDPT / -O** report to view the dynamic VIPA destination port table information and confirm target destination is available for load balancing distribution.

# Example TCP/IP Profile

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VIPADYNAMIC

; zCX Control Planes DVIPAs

VIPADefine 255.255.255.255 10.2.1.51 ZCX

VIPADefine 255.255.255.255 10.2.1.52 ZCX

VIPADefine 255.255.255.255 10.2.1.53 ZCX

;

; Sysplex Distributor Distributed DVIPA

; This is the external address used by the application

VIPADefine 255.255.255.0 192.168.1.221

;

; Sysplex Distributor routing information

; This routes traffic to the listed zCX instances

VIPADISTRIBUTE EXTTARG 192.168.1.221 DESTIP  
10.2.1.51 10.2.1.52 10.2.1.53

ENDVIPADYNAMIC

VIPADYNAMIC

; zCX Compute Planes DVIPAs

VIPADefine 255.255.255.255 10.2.1.54 ZCX

VIPADefine 255.255.255.255 10.2.1.55 ZCX

;

; Sysplex Distributor Distributed DVIPA

; This is the external address used by the application

VIPADefine 255.255.255.0 192.168.1.222

;

; Sysplex Distributor routing information

; This routes traffic to the listed zCX instances

VIPADISTRIBUTE EXTTARG 192.168.1.222 DESTIP  
10.2.1.54 10.2.1.55

ENDVIPADYNAMIC

# VIPADISTIBUTE Notes

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- ROUNDROBIN is the only supported distribution method
- DESTIP specifies VIPARANGE DVIPAs for z/OS Container Extensions (ZCX), not dynamic XCF IP addresses
- DESTIP ALL not allowed
- TIMEAFFINITY and OPTLOCAL will be ignored
- PORT statement is not allowed
- 2 unique Sysplex Distributor distributed DVIPAs are needed
  - 1 for OpenShift Control Planes (API and Machine config) endpoints
  - 1 for OpenShift Compute Planes (Ingress and user-defined) endpoints

# Enable Sysplex Distributor for OpenShift

ocp\_install\_sd.xml

- Most of the workflow steps are manual steps
- Provides guidance to generate the sysplex distributor enablement container image, OpenShift daemonset artifacts and instructions on how to transfer and apply to your zCX for OpenShift Cluster

Workflows ▶ Enable Sysplex Distributor Agent on IBM zOS Container Extensions for OpenShift Appliance - Workflow\_0

## Enable Sysplex Distributor Agent on IBM zOS Container Extensions for OpenShift Appliance - Workflow

▶ Workflow Details					
Workflow Steps					
Actions ▾					
↔ No filter applied					
<input type="checkbox"/>	State Filter	No. Filter	Title Filter	CalledWorkflow Filter	Automated Filter
<input type="checkbox"/>	➡ Ready	1	■ Retrieve IBM zCX for OpenShift appliance instance properties		No
<input type="checkbox"/>	⚠ Not Ready	2	■ Prepare Sysplex Distributor Agent Image		No
<input type="checkbox"/>	⚠ Not Ready	3	■ Transfer Sysplex Distributor Agent Image to OpenShift		No
<input type="checkbox"/>	⚠ Not Ready	4	■ Gather IBM zCX for OpenShift appliance instance properties		No
<input type="checkbox"/>	⚠ Not Ready	5	■ Apply Sysplex Distributor Agent OpenShift Artifacts Configuration		No
<input type="checkbox"/>	⚠ Not Ready	6	■ Deploy Sysplex Distributor Agent on OpenShift		No
<input type="checkbox"/>	⚠ Not Ready	7	■ Cleanup Sysplex Distributor Agent Image		No

# Enable Sysplex Distributor for OpenShift (cont)

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Provide an existing zCX for Red Hat OpenShift instance directory to hold Sysplex Distributor Enablement artifacts

No. Filter	Title Filter
1	■ Retrieve IBM zCX for OpenShift appliance instance properties

# Enable Sysplex Distributor for OpenShift (cont 1)

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Configure and prepare for the Sysplex Distributor Enablement container image for Red Hat OpenShift cluster.

2	■ <a href="#">Prepare the Sysplex Distributor enablement image for the zCX for OpenShift cluster</a>
3	■ <a href="#">Provide guidance to transfer Sysplex Distributor enablement image to the zCX for OpenShift cluster</a>



# Enable Sysplex Distributor for OpenShift (cont 2)

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Configure and prepare for the Sysplex Distributor Enablement Deployment Artifacts for Red Hat OpenShift cluster.

4	■ <a href="#">Configure the Sysplex Distributor enablement for the IBM zCX for OpenShift cluster</a>
5	■ <a href="#">Generate artifacts to enable Sysplex Distributor for the zCX for OpenShift cluster</a>
6	■ <a href="#">Provide guidance to deploy Sysplex Distributor enablement on the zCX for OpenShift cluster</a>

# Enable Sysplex Distributor for OpenShift (cont 3)

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Clean up generated artifacts in the zCX for Red Hat OpenShift instance directory.

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- Cleanup Sysplex Distributor enablement from the zCX for OpenShift instance directory

# Summary

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- Exploit CommServer Sysplex Distributor support for IBM zCX for Red Hat OpenShift as a **Day-2 operation**.

# Appendix

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- zCX User's Guide online
  - <https://www.ibm.com/docs/en/zcxrhos/1.1.0?topic=what-is-zcx-foundation-red-hat-openshift>
  - Networking section
    - <https://www.ibm.com/docs/en/zcxrhos/1.1.0?topic=openshift-network-planning>
- CommServer Sysplex Distributor Support
  - <https://www.ibm.com/support/pages/node/7152251>
  - <https://www.ibm.com/support/pages/apar/PH62487>
- License
  - <https://www.ibm.com/support/pages/node/7184863>