

Containers Come to z/OS

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IBM z/OS Development, Poughkeepsie, NY (the Home of the Mainframe !)

November 2019

Session **BF**

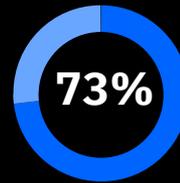


Cloud integration is fundamental to digital transformation

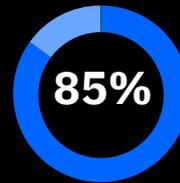
Businesses with IBM Z are becoming more agile, and integrating across platforms

To succeed, enterprises must

- Modernize without undermining current functionality
- Build applications that are digital native/cloud native



Maintain a hybrid or other cloud ecosystem
Use APIs for the mainframe



Report that hybrid cloud is accelerating digital transformation in their organization

IBM Z brings z/OS into the enterprise hybrid multicloud ecosystem



Client Need

Modernize infrastructure, applications, and data to drive hybrid cloud integration for mission critical workloads



IBM Goal

Extend z/OS software ecosystem by driving agility and flexibility into the operations of IBM Z while delivering IBM Z service and QoS.

Delivering capabilities for mission critical enterprise workloads

Hybrid Cloud

Availability

Agility

Control

Openness

Reliability

Self-service

Security

Skills

Plus a single consistent approach to:

Integration

Management

Orchestration

Automation

Consistent Management and Orchestration

**Industry Leading
Cloud Management**

Consistent management
and orchestration across
your hybrid cloud with **Red
Hat OpenShift**

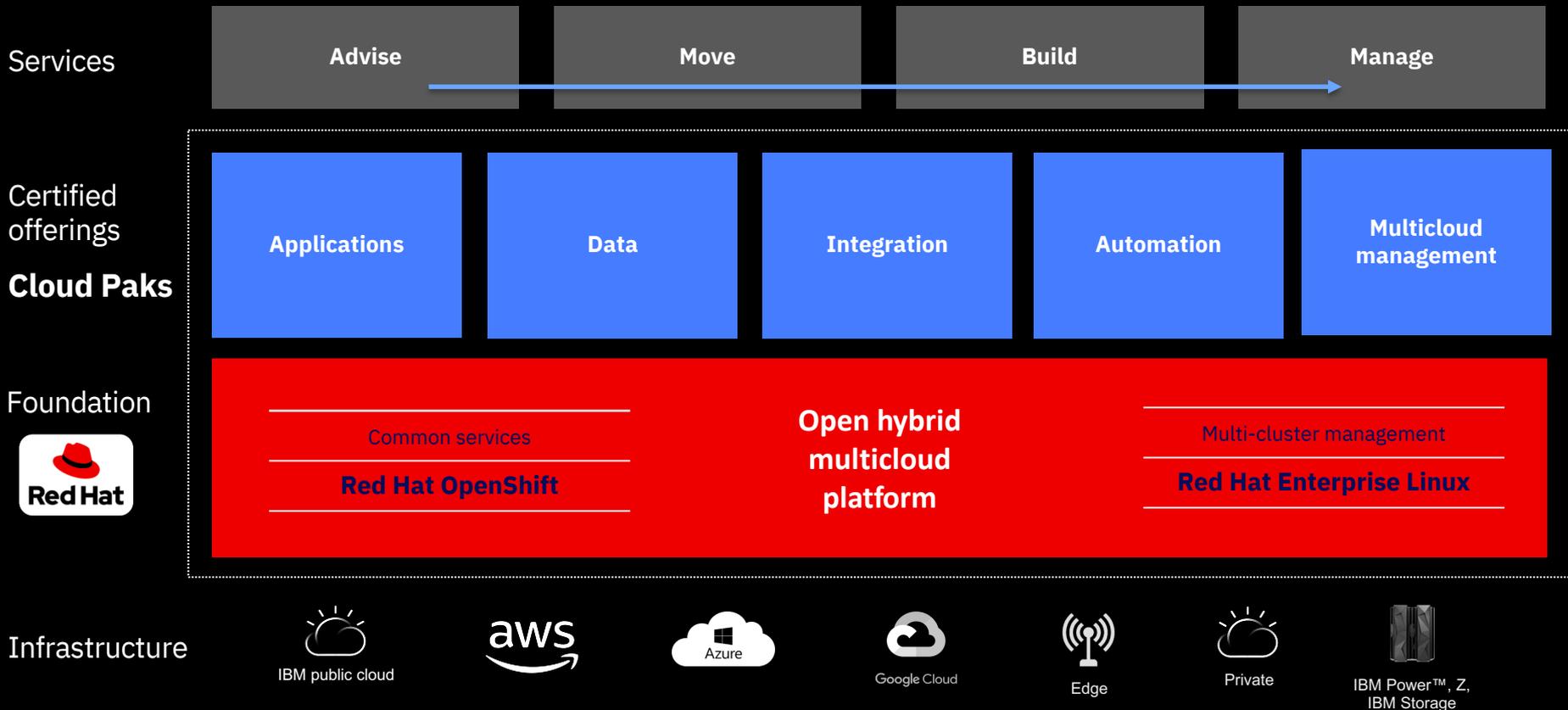
**Optimized deployment
for Critical workloads**

Delivering IBM Z services
and QoS as part
of an end-to end **cloud
native experience**

**Containers across the
Enterprise**

Extreme Agility with
lightweight and **portable
containers** for all
applications

Next-generation hybrid multicloud platform – Journey Stages



Cloud Paks – Enterprise-ready cloud software

A faster, more secure way to move your core business applications to any cloud through enterprise-ready containerized software solutions

IBM containerized software

Packaged with Open Source components, pre-integrated with the common operational services, and secure by design



Container platform and operational services

Logging, monitoring, security, identity access management



Complete yet simple: Unified UX and consumption based pay for what you use and use the capabilities you want

IBM certified: Certified, up-to-date software that secures the entire stack, from hardware to applications

Run anywhere: Portable, running on-premises, on public clouds, or in a pre-integrated system



Google Cloud



Edge



Private



Systems

5 IBM Cloud Paks – Pre-integrated for cloud use cases

IBM intends to deliver IBM Cloud Pak offerings to IBM Z and LinuxONE. These enterprise platforms bring industry-leading security and resiliency to help accelerate the rich IBM software ecosystem that is necessary for enterprise clients to adopt hybrid multicloud for their mission-critical workloads.

Cloud Pak for Applications	Cloud Pak for Data	Cloud Pak for Integration	Cloud Pak for Automation	Cloud Pak for Multicloud Management		
 Developer & DevOps Tools  Modernization Toolkit  Frameworks and Runtimes	 Organize  Analyze  Collect	 API Lifecycle  Messaging and Events  App and Data Integration	 Content  Operational Intelligence  Workflow and Decisions	 Multicloud  App and Infrastructure  Security and Compliance Management		
Container platform and operational services 	Container platform and operational services 	Container platform and operational services 	Container platform and operational services 	Container platform and operational services 		
IBM public cloud 	Amazon Web Services 	Microsoft Azure 	Google Cloud 	Edge 	Private 	IBM Z IBM LinuxONE IBM Power Systems™

IBM z/OS Container Extensions (zCX)

Integrate Linux® application into z/OS

z/OS Container Extensions is new capability of z/OS 2.4. It enables z/OS to integrate into the hybrid multcloud with its capability to enable deployment of Linux on Z software components as Linux Containers in a z/OS system in direct support of z/OS workloads. A separately provisioned Linux server isn't required, and overall solution operational control is maintained within z/OS with z/OS Qualities of Service.



Modernize z/OS workloads by providing flexibility for development and operations on Z.

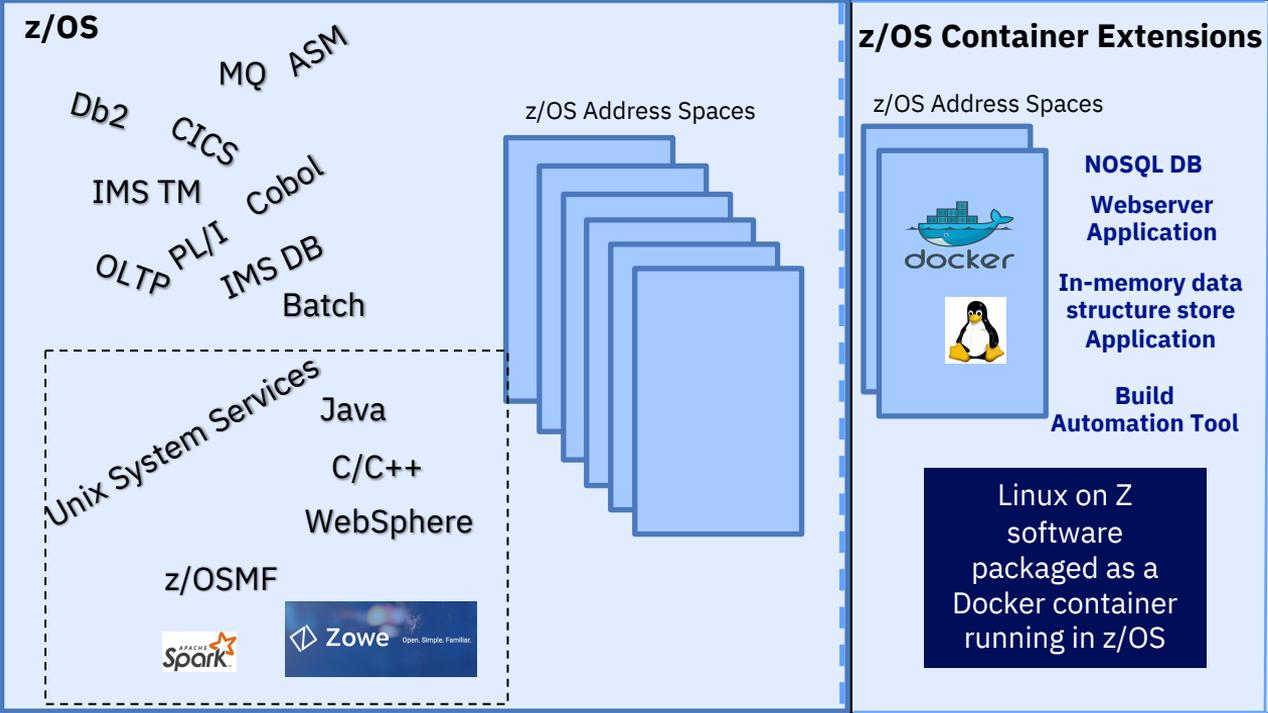


Maintain operational control and extend z/OS Qualities of Service to Linux software.



Make use of existing IT investments by enabling optimal utilization of z/OS skills

Expanding the z/OS Software Ecosystem



**Traditional
z/OS**



**Unix
Systems
Services**



**z/OS
Container
Extensions**

Benefits of IBM Z Container Extensions

Workload Modernization

- Enable existing or new z/OS applications to use services that are not currently available under z/OS.
- Access a large ecosystem of open source and Linux on Z workloads, co-located on the z/OS platform with no porting required.
- Open Mainframe Project – Ambitus – Collaboration on innovative workload deployment across enterprise

IBM Z QoS

Co-location offers advantages and enables operational control and exploitation of z/OS platform benefits and z/OS QoS:

- Scalability
- Availability
- Integrated disaster recovery with GDPS
- Work Load Manager
- Integration with z/OS Pervasive Encryption

Operational Efficiency

- Improved time to value with less effort versus native porting
- Get more out of existing hardware investments by enabling optimal utilization.
- Overcome cross platform cultural and operational challenges to enable resource efficiency.

Primary zCX Use Cases

z/OS Software Ecosystem Expansion

Integrated z/OS operational model,
transparently inherit QoS

Co-locate Non-SQL databases, latest
microservices, and analytics frameworks
within native z/OS without compromising on
performance and security.

Systems Management

Less burden on Operations and
Dependency Management

Centralized database and UI portals for
management products (example: IBM
Systems Management Unite – Image
availability 4Q19)

DevOps

Attract and exploit new talent and
improve time to market

Application developers access to open
source applications and Linux based
development tools within z/OS environment

Future Support: Kubernetes Orchestration - SOD Issued in Hybrid Cloud Announcement (May 2019)



kubernetes

Determining if zCX is a good fit



Business Case

- 1. Is the modernization of z/OS applications by allowing access to an ecosystem of open source and Linux on Z workloads, that can now be co-located on the z/OS platform with no porting requirements, of value to you?
- 2. Do you have existing open source or Linux on Z software that can benefit from being co-located and managed inside a z/OS environment; leveraging z/OS QoS for optimized business continuity?
- 3. Can your software be integrated with and/or can help complement existing z/OS workloads and environment?

✓	✗
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Technical Case

- 4. Is your software available as a Docker image or can it be packaged as a Docker image for Linux on Z?
- 5. Can your software communicate with z/OS and external components using TCP/IP?

<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

If you answered YES to all the questions above, z/OS Container Extensions is a good fit



zCX presents many opportunities, but it is not a replacement for...

Linux on Z Environments

- Native Linux on Z LPARs
- Linux under z/VM
- Linux under KVM on Z
- LinuxONE offerings
- IBM Secure Services Container

Native z/OS Environments & Software

- z/OS UNIX System Services
- Java on z/OS
- Running software natively on z/OS

“

Suppose your z/OS-resident application wants to access a microservice that runs on Linux? Do you want the request to go off platform, across interfaces you don't necessarily trust, into systems whose performance characteristics you don't necessarily understand, and whose maintenance schedules and downtime philosophies might not align with yours?

Or would you prefer bullet-proof, secure, z/OS performance and infrastructure behind that microservice so you know it will be there when you need it -- guaranteed? I know what my answer is...

”

Ed Jaffe, Phoenix Software International



OPEN **MAINFRAME** PROJECT

Ambitus

A project to enable open source
software deployment on z/OS*

<https://github.com/ambitus/linux-containers>

Help Linux architects and developers
understand z/OS

Enable system programmers to provision
resources for open source deployments

Both personas operate in the environments
they understand

**Ambitus is Latin for "compass"*

Samples for building common
Docker images

How-to information to help with
container deployment



Grafana



Development



Portainer

IBM zCX Requirements

- IBM z/OS® Container Extensions is delivered with z/OS® V2R4 – available Sept 30th, 2019
- IBM z/OS® Container Extensions workloads will be zIIP eligible.
- IBM z/OS® Container Extensions will run on IBM z15 or z14 servers (SSC pre-req)

z/OS Version 2 Release 4 – Key Capabilities

Agility	Optimization	Resiliency
<p>Cloud integration</p> <ul style="list-style-type: none">• z/OS Container Extensions - integration of Linux containers in z/OS• z/OS Cloud Provisioning & Management for z/OS Cloud Broker – Leverage z/OS resources through a single management plane. <p>Simplification and automation</p> <ul style="list-style-type: none">• z/OSMF - RESTful interface to support automation and scripting of resource provisioning.	<p>Analytics</p> <ul style="list-style-type: none">• Open Data Analytics on z/OS – enable and infuse machine learning into your IBM Z application with the latest open source tooling <p>Pricing transparency</p> <ul style="list-style-type: none">• Tailored Fit Pricing – unmatched simplicity, transparency, and predictability of pricing. Delivers economies of scale for all z/OS workloads.	<p>Encryption Everywhere</p> <ul style="list-style-type: none">• Pervasive Encryption – industry leading security for your most sensitive and valuable data and workloads.• z/OS Encryption Readiness Tool – Rapidly determine the security of your platform connectivity

24 Early-support Clients validating z/OS 2.4

16 Clients in production with z/OS 2.4

10 Clients in mission critical production using z/OS 2.4

“IBM z/OS V2R4 demonstrates that in addition to maintaining compatibility with older z/OS versions, it also stays current with new market technologies. IBM Tailored Fit Pricing for IBM Z, IBM z/OS Container Extensions and IBM Open Data Analytics on z/OS are examples for new and good technologies.” – Banco Do Brasil

“z/OS V2.4 brought us many benefits – improved system management, improved availability and security – through a set of new functions, to our mission critical environments. The ease of installation and migration helped us to run smoothly the new z/OS release and deliver the service our users depend on.”

Marc Theis - Head of Mainframe and Production at CTIE

Shameless plug for Jerry's session...

Date: Wednesday 6th November

Title: **z/OS 2.4: Introduction to z/OS Container Extensions: Running Linux on Z Docker Containers Inside of z/OS**

Time: 10:15-11:15

Session: EG

Location: Stowe

zCX Contacts

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Please submit your session feedback!

Do it online at <http://conferences.gse.org.uk/2019/feedback/BF>

This session is **BF**



1. What is your conference registration number?

✦ This is the three digit number on the bottom of your delegate badge

2. Was the length of this presentation correct?

✦ 1 to 4 = "Too Short" 5 = "OK" 6-9 = "Too Long"

1 2 3 4 5 6 7 8 9

3. Did this presentation meet your requirements?

✦ 1 to 4 = "No" 5 = "OK" 6-9 = "Yes"

1 2 3 4 5 6 7 8 9

4. Was the session content what you expected?

✦ 1 to 4 = "No" 5 = "OK" 6-9 = "Yes"

1 2 3 4 5 6 7 8 9