Red Hat OpenShift Container Platform on IBM Z and IBM LinuxONE

Best Use Cases

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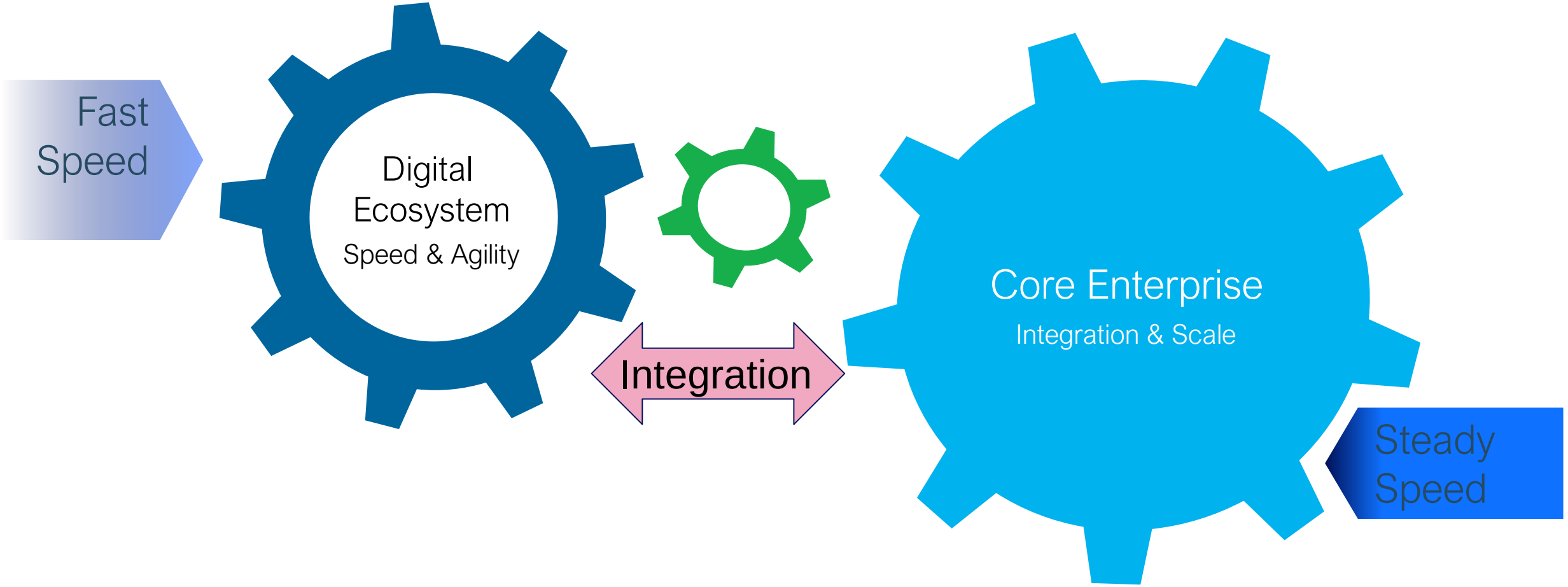
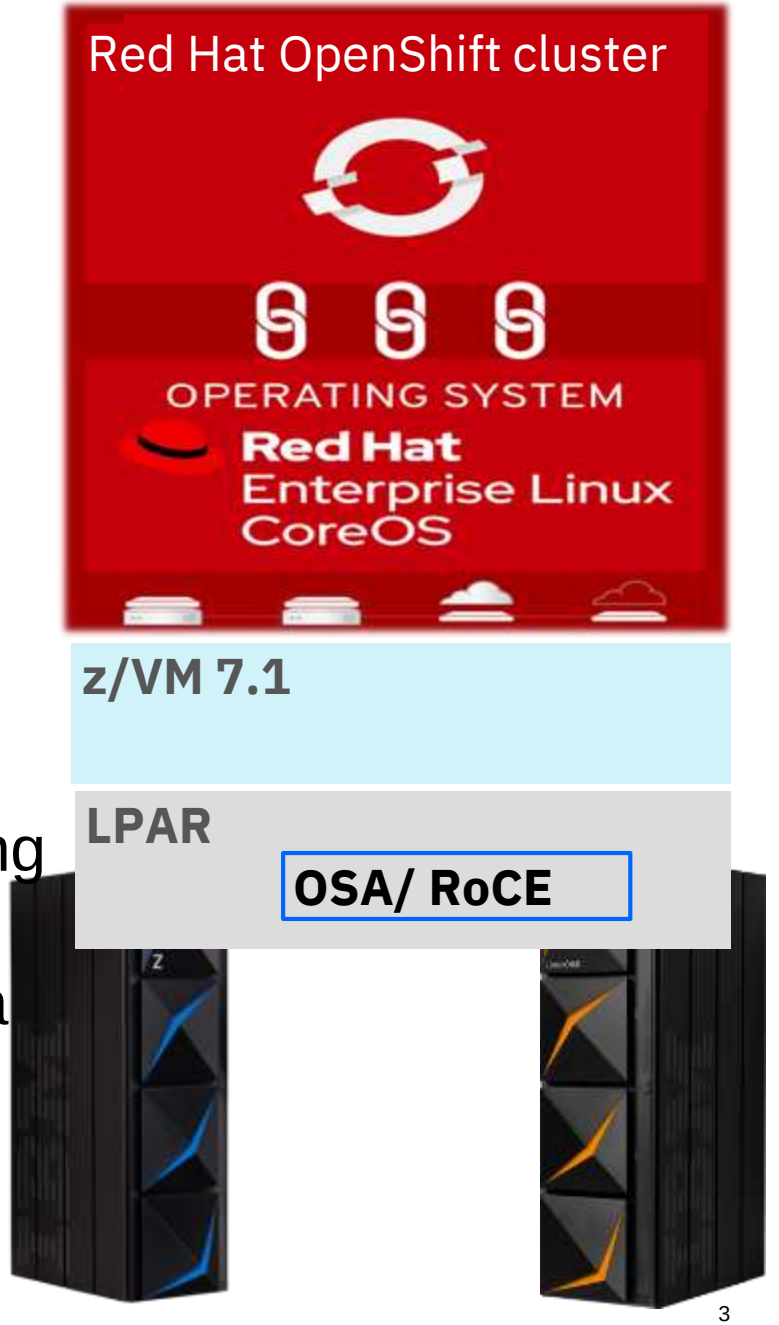
IT environments today - a multi-speed IT



Red Hat OpenShift Container Platform (RHOCP) V4 is available on IBM Z and LinuxONE

- takes advantage of the underlying enterprise capabilities
  - grow to **thousands of Linux guests**
  - and **millions of containers**
- non-disruptively grow, vertical and horizontal scalability
  - including advanced security
  - **confidential Cloud Computing,**
    including **FIPS 140-2 Level 4** certification

These capabilities were highlighted with the recent announcement of the IBM z15 and IBM LinuxONE III. Running Red Hat OpenShift on IBM Z and LinuxONE also enables cloud native applications to easily integrate with existing data and applications on these platforms, reducing latency by avoiding network delays.

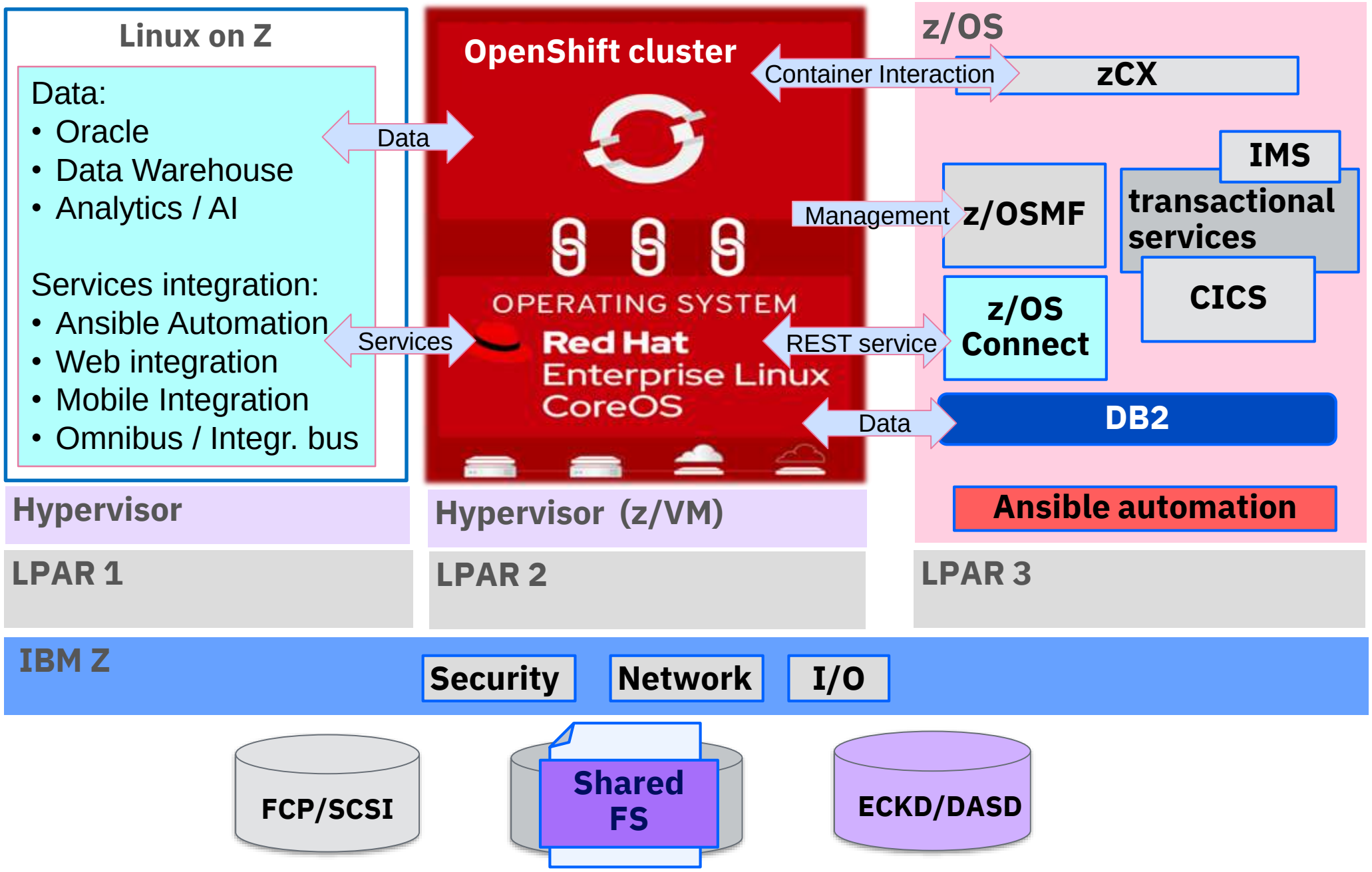


https://www.ibm.com/blogs/systems/get-ready-for-red-hat-openshift-on-ibm-z-and-linuxone/

Clients business reasons for RHOCP on IBM Z and IBM LinuxONE

- ✓ **It solves the business problem**
  - ✓ Faster time to market, perfect for dynamic workloads
- ✓ **It solves the development challenges**
  - ✓ Develop once deploy multiple (CI/CD & DevSecOps)
- ✓ **It enables new ways for hybrid IT projects**
  - ✓ Best fit placement for applications
- ✓ **It helps in the Digitalization journey**
  - ✓ Global integration with standards and openness
- ✓ **Confidential computing is closer than ever**
  - ✓ Secure workloads and Digital Asset Management
- ✓ **Business Continuity is empowered**
  - ✓ Inherit availability and stability form IBM Z

Use case Overview: Red Hat OpenShift Container Platform on IBM Z



Ideal Use Cases for RHOCP on IBM Z and IBM LinuxONE

1. Data gravity on IBM Z
2. Application Development Consistency
3. Consolidation and TCO Reduction
4. Blockchain and Digital Asset Management
5. Business Continuity

Best Use Cases for RHOCP on IBM Z and IBM LinuxONE

(1) Data gravity on IBM Z and IBM LinuxONE

Take advantage of the IBM Z and IBM LinuxONE platform in a co-location implementation of containerized applications with traditional workloads, like Data lakes, Enterprise databases, transactional services, or other traditional workloads running in Linux on IBM Z or z/OS.

The operational advantages of co-located applications and data will optimize:

- latency
- response time
- deployment
- end-2-end security from input request, secure execution, secure data processing, encrypted data in flight and on rest
- coordinated service and cost

Functional advantages:

- enable cloud-native applications close to Systems of Record and enterprise databases
- RHOCP integration with REST services and data in z/OS, bidirectional with z/OS Connect EE
- High scalability of RHOCP applications integrate with core enterprise databases on Linux on IBM Z and IBM LinuxONE (for example PostgreSQL, MongoDB, DB2, Oracle)
- Extend existing core systems with Open Source software and cloud services
- Automation of Core Backend (Cloud Broker)

Best Use Cases for RHOCP on IBM Z and IBM LinuxONE

(2) Application Development Consistency

With RHOCP on IBM Z and IBM LinuxONE you can develop once and take advantage of:

- cross architecture portability
- DevSecOps to deploy on the most securable platform
- enabling / disabling and shifting compute capacity

Functional advantages:

- develop with the tools of your choice
- build the application containers for all platforms using cross architecture build pipelines
- CI/CD and automation cross architectures
- deploy on the platform of choice using defined criteria or conditions
- dynamic workload distribution based on SLA rules

Best Use Cases for RHOCP on IBM Z and IBM LinuxONE

(3) Consolidation and TCO Reduction

Consolidating a RHOCP environment to IBM Z and IBM LinuxONE, has economic and operational advantages. The 3-dimension scalability, vertical, horizontal and combined results in a high flexibility without new hardware footprint for dynamic workloads and unpredicted growth.

In summary these key benefits can be achieved:

- Economic advantages due to reduced number of subscriptions needed
- Fewer physical resources needed
- Less operational endpoints to manage
- Less security endpoints to control
- Handling of dynamic workloads with unpredicted growth
- Enabling and disabling hardware capacity and components on demand
- Disaster Recovery (DR) with Capacity Backup Upgrade (CBU) for reduced license costs

Best Use Cases for RHOCP on IBM Z and IBM LinuxONE

(4) Blockchain and Digital Asset Management

Blockchain Platform V2.1.3 includes:

- RHOCP on LinuxONE and Linux on IBM Z as part of a Multicloud network management
  - Deploy Blockchain components: peer, orderer, and certificate authority
- Integrated hardware security module (HSM) support using PKCS 11
- Improved multiorganization resilience with the Raft consensus protocol
- Ansible support for simplified network configuration and management
- Blockchain Platform extension for Visual Studio Code for development
- Full support for Java smart contracts via JavaScript, TypeScript, and Golang smart contract support
- Integration of Blockchain with MQ Bridge
- Support for Hyperledger Fabric V1.4.6
- Serviceability enhancements for identity enrollment and certificate authorization
- Synergy with specific IBM Cloud Paks

https://www.ibm.com/blockchain/use-cases/success-stories/

Best Use Cases for RHOCP on IBM Z and IBM LinuxONE

(5) Business Continuity

The IBM Z and IBM LinuxONE hardware has built-in components for HA from the design point of view.

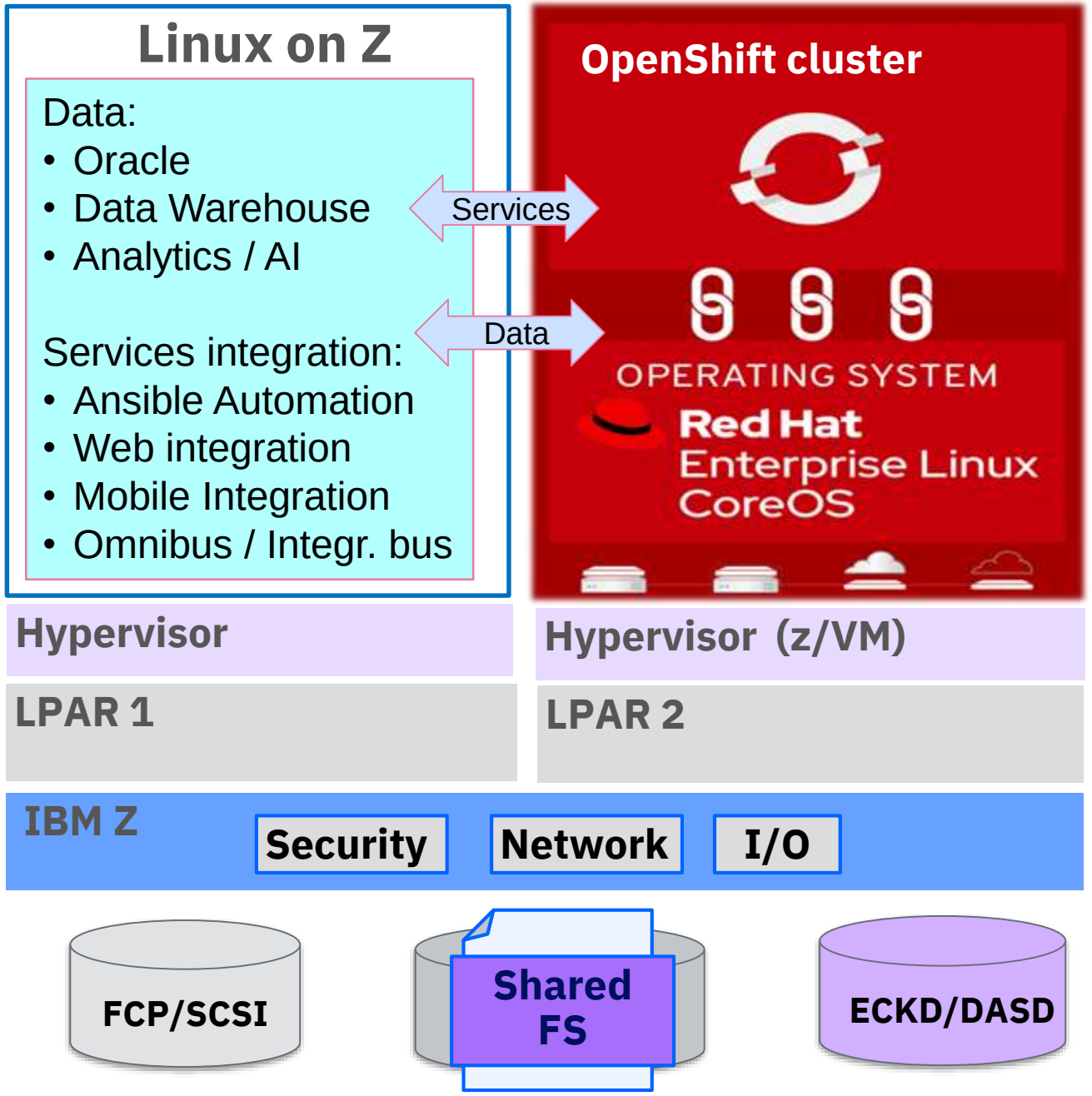
- up to 100% capacity utilization without performance impact
- availability 99,99999 (avg 3,16 sec outage per year) /w GDPS Virtual appliance
- RAIM memory - no memory errors anymore
- Spare cores - for dynamic change of cores
- dedicated cores for I/O
- concurrent upgrade and maintenance
- Meantime Before Failure (MTBF) of 50 years

Functional advantages:

- internal networks deliver high scalability, speed and reliability
- highest predictability vs. on distributed servers
- Latency between LPARs is much more predictable vs many servers in a network
- z/VM SSI / LGR for planned service windows
- allocation of resources on demand
- dynamically changing of resources - flexibility and shift of resources based on priority and availability
- dynamic workload distribution based on SLA rules

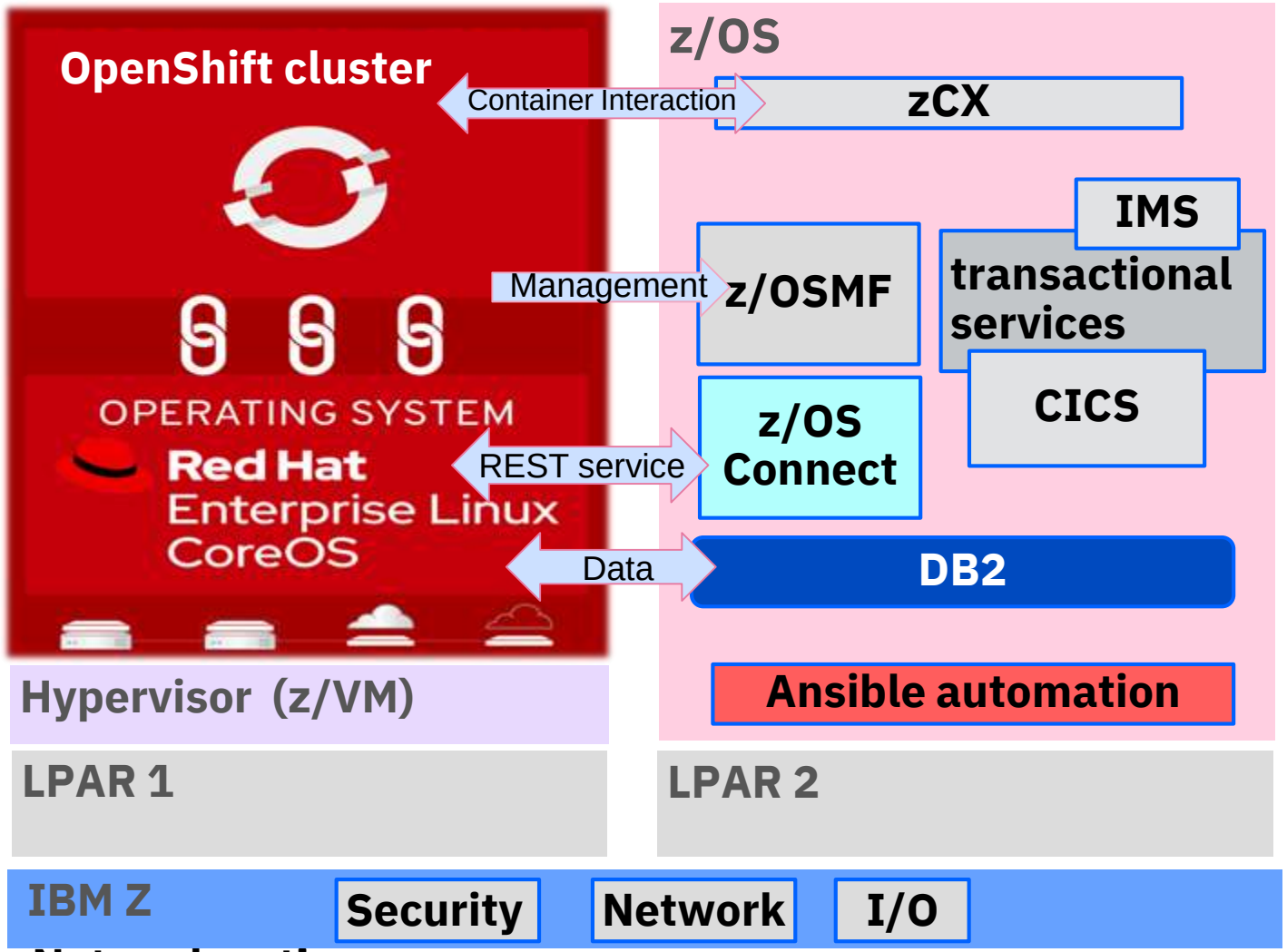
Red Hat OpenShift Container Platform collocated with Linux on IBM Z

- RHOCP environment with Linux on Z transactional integration, bidirectional capabilities (e.g. Temenos for banking)
- RHOCP workload interacts with Oracle or Db2 Warehouse
- RHOCP representing the Front end for Web or Mobile applications, with high dynamic workload, scalability and reliability
- RHOCP extends Linux on Z Systems of Record with Open Source technologies



Use Cases for Red Hat OpenShift in colocation with z/OS

- RHOCP environment with z/OS transactional integration using z/OS Connect, bidirectional capabilities
- RHOCP workload interacts with DB2 z/OS
- RHOCP uses z/OS Cloud Broker and Ansible to automate z/OS deployments and resource management using z/OSMF
- RHOCP integration with workload in z/OS Container Extension (zCX) Address space
- RHOCP with Open Source technologies extends z/OS



Network options:

- Shared OSA
- Hipersockets (HS) with VSWITCH Bridge (VB) to OSA (OSA Uplink Bridge to Hipersockets)

Best Practices to build RHOCP on IBM Z and IBM LinuxONE

1. **Address the pain points for the business**
   - goal is to position IT as tool for the business not a cost center

2. **Define a representative workload for RHOCP**
   - Can be small, but representative not a playground
   - Decide to start the project in a production like environment
   - Consider Best practices (vs. a PoC as limited environment)

3. **Consider the characteristics of the workload**
   - High number of Requests to the RHOCP environment
   - High dynamics inside the RHOCP cluster between pods
   - A colocation with z/OS or Oracle in Linux on Z

4. **Define the SLAs including HA / DR requirements**
   - Number of physical sites and IBM Z machines per site

IBM Z and IBM LinuxONE can be the core of your secure hybrid cloud

- Unparalleled trust and security for mission critical workloads and data
- Delivers single-point secure management and integration across environments and cloud platforms
- Agility in operations and development across the cloud ecosystem
- Remove skills barriers with open technology and tooling
- Support mobility of workloads, services and data across the hybrid cloud ecosystem

Benefits of running OpenShift workloads on IBM Z

https://www.ibm.com/downloads/cas/2RZP23XG

Performance Experiences in the Linux on IBM Z & IBM LinuxONE Knowledge center

https://www.ibm.com/support/knowledgecenter/de/linuxonibm/liaaf/lnz_r_perf_latest.html

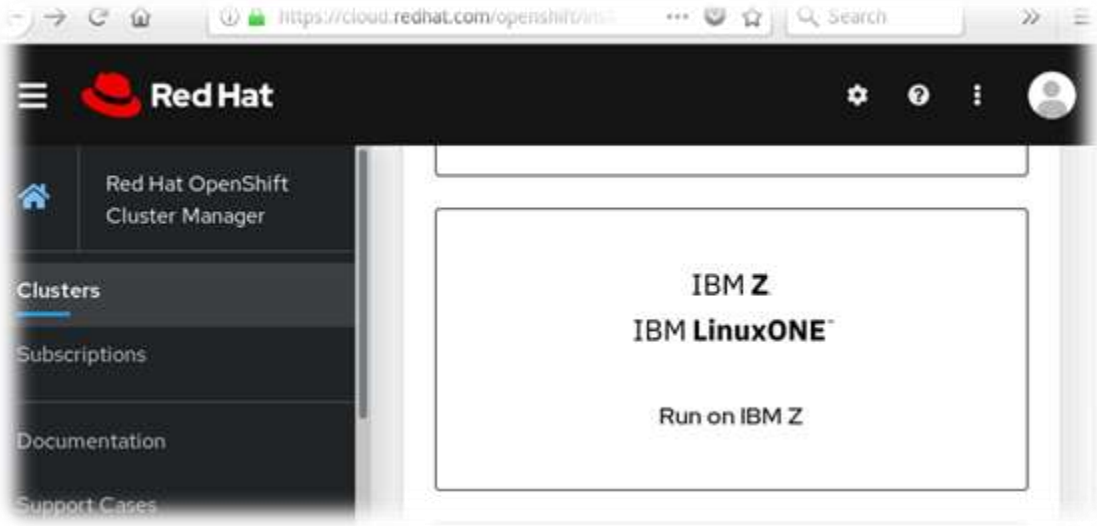
Red Hat OpenShift on IBM Z - Performance Experiences, Hints and Tips

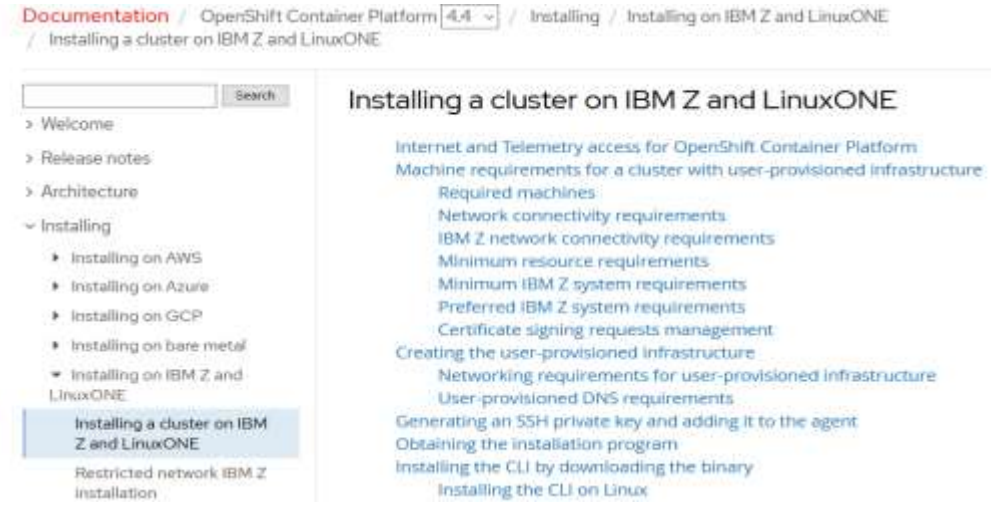
- Performance measurement and tuning approach
- Observations and recommendations
  - CPU-intensive workloads
  - Network-intensive workloads
- General tips for cloud-native applications

http://public.dhe.ibm.com/software/dw/linux390/perf/OpenShift_on_IBM_Z_-_Performance_Experiences_V11.pdf

Where can you download RHOCP?

try.openshift.com
cloud.redhat.com





OCP 4.6 on Z was released on 27/10/20
OCP 4.5 on Z was released on 7/30/20
OCP 4.4 on Z was released on 6/22/20
OCP 4.3 on Z was released on 4/30/20
OCP 4.2 on Z was released on 2/11/20

https://docs.openshift.com/container-platform/4.6/installing/installing_ibm_z/installing-ibm-z.html
https://docs.openshift.com/container-platform/4.6/release_notes/ocp-4-6-release-notes.html

Fast Start Guides for the LinuxONE Community Cloud

Guides, tutorials, and labs to start your learning path

Search | Search items | Type | All types | Clear filters

Showing 9 of 9 items.

Virtual Server Deployment Guide

Guide

This guide will take you through the steps to get access to the LinuxONE community cloud, deploy a virtual virtual and start using it in your project or in one of the Fast Start Guides.

Use the Red Hat OpenShift Container Platform on the IBM LinuxONE Community Cloud to launch a web server

Tutorial

Launch a simple NGINX web server container from a Dockerfile using the OpenShift Container Platform on the LinuxONE Community Cloud

https://www.ibm.com/community/z/linuxone-cc/faststart/

YOUR Community for Linux on IBM Z and IBM LinuxONE

Commpass L !

http://bit.do/compass-L

Technology
Interchange
Community

Introducing: Compass L!

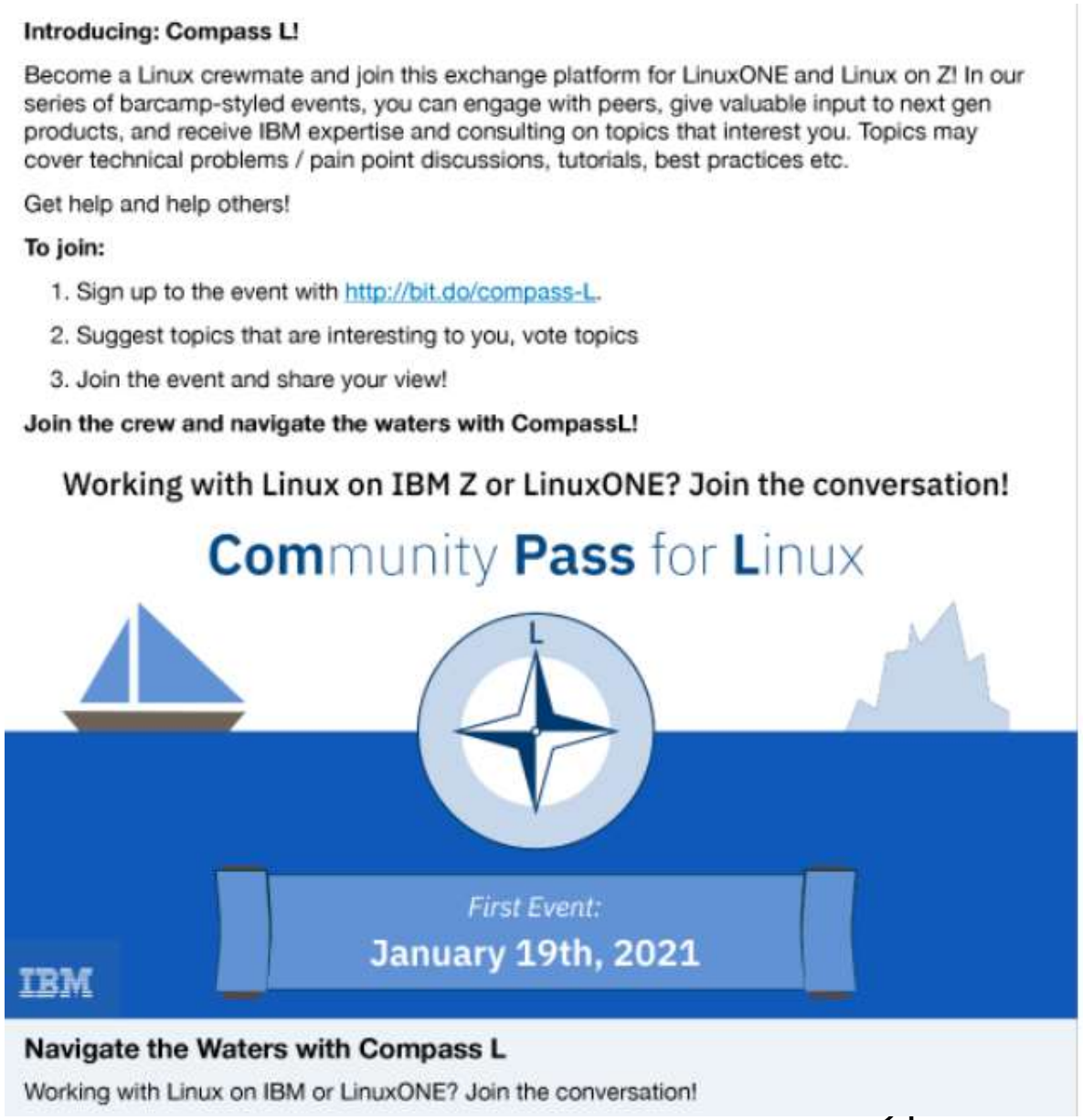
Become a Linux crewmate and join this exchange platform for LinuxONE and Linux on Z! In our series of barcamp-styled events, you can engage with peers, give valuable input to next gen products, and receive IBM expertise and consulting on topics that interest you. Topics may cover technical problems / pain point discussions, tutorials, best practices etc.

Get help and help others!

To join:

1. Sign up to the event with http://bit.do/compass-L.
2. Suggest topics that are interesting to you, vote topics
3. Join the event and share your view!

Join the crew and navigate the waters with CompassL!



More information about RHOCP

Red Hat RHOCP portal

cloud.redhat.com

Install OCP on IBM Z

https://docs.openshift.com/container-platform/4.5/installing/installing_ibm_z/installing-ibm-z.html

Step by step sample installations and environment setup

https://www.openshift.com/blog/installing-ocp-in-a-mainframe-z-series
https://www.openshift.com/blog/red-hat-openshift-installation-process-experiences-on-ibm-z-linuxone

IBM Systems Magazine Article

https://ibmsystemsmag.com/01/2020/cutting-edge-ibm-z-innovations

IDC Whitepaper

https://www.ibm.com/it-infrastructure/linuxone/capabilities/linux-containers

Useful links for Linux on IBM Z & LinuxONE

- **Technical Linux on Z and LinuxONE customer webinar series from the development Labs**
  - **http://ibm.biz/LinuxonZandLinuxONEwebcasts**

- **IBM Knowledge Center for Linux on Z and LinuxONE**
  - Blog: Linux and Mainframe
  - News and tips for running Linux on IBM Z and LinuxONE

- **Red Hat OpenShift**
  - **Red Hat OpenShift blog**
  - OpenShift on IBM Z

- **Virtualization on IBM Z & LinuxONE**
  - z/VM resources
  - KVM on Z blog

- **Containers on IBM Z**
  - IBM Z container blog: Linux on Z and Containers

Questions?

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