IBM Z and LinuxONE
Strategy and Future Outlook

VM Workshop 2024

Matt Whitbourne
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IBM Z and LinuxONE

IBM

State of the Business
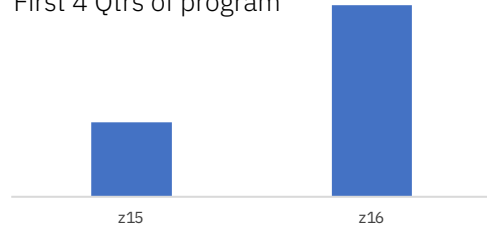
Hybrid Cloud Strategy

Simplification

State of the Business

Hybrid Cloud Strategy
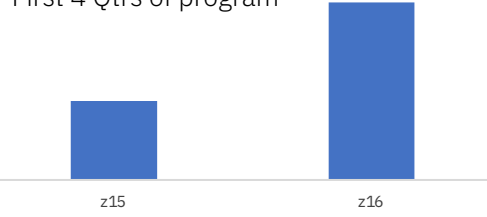
Simplification

IBM Z: Increasing momentum in the era of Hybrid Cloud

HW Revenue
First 4 Qtrs of program

z16 Revenue >100% of z15

Shipped MIPS
First 4 Qtrs of program

Record Setting z16 Shipped MIPS Capacity

Fueled by Hybrid Cloud, Linux, and Digital Transformation

IBM z16: Very strong first year

- z16 continues to be >100% of z15
- 4th quarter of double-digit growth (@CC) on strength of z16 system
- Strong growth in shipped MIPS for new Linux workloads on z16
- Software (Transaction Processing) grew mid-single digits, 6th consecutive quarter of growth

>3X growth
in installed capacity over the last decade

2012   2017   2022
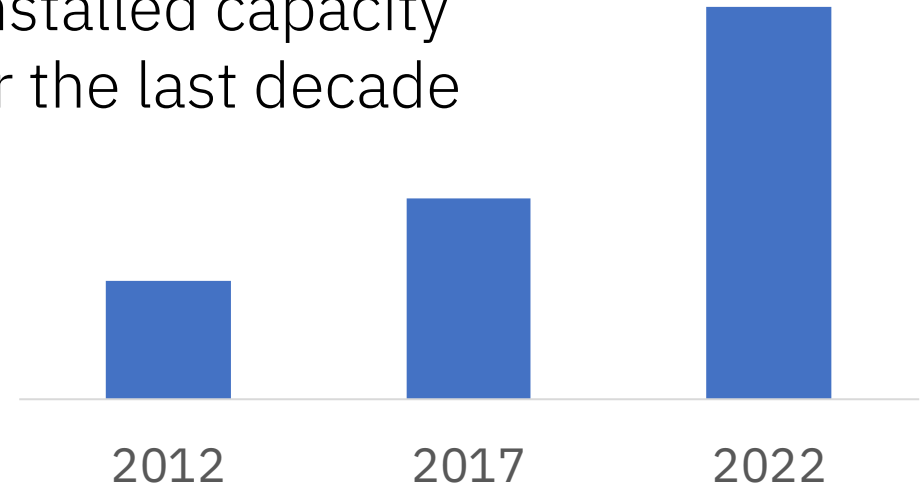
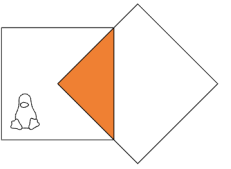Workload as measured by installed Million Instructions Per Second (MIPS)

Powering the world's economy with IBM Z

IBM Z and IBM® LinuxONE run ~70% of global transactions by value

IBM® LinuxONE product Portfolio

Building your sustainable infrastructure

IBM® LinuxONE Emperor 4

Multi frame 5.2GHz,
up 200 Linux cores

NEW: IBM® LinuxONE Rockhopper 4

Single frame, 4.6 GHz, up to 68 Linux cores

NEW: IBM® LinuxONE Rockhopper 4 Rack Mount

Parallel scalability to the Rockhopper 4

Plugs in a customer's rack, designed for colocation with other technologies

IBM Z & LinuxONE design principles

Grow LinuxONE as the premier data serving and transaction processing platform through ...

System Performance

Industry-leading resiliency

Industry-leading data privacy & protection

Dedicated workload accelerators

Optimization across the stack

Sustainability

Industry recognition

World Internet Conference 2023 – IBM Sustainable Computing Solution IBM® LinuxONE

SEAL 2023 Business Sustainable Product Award for IBM z16

SEAL 2022 Sustainable Product Award for IBM® LinuxONE

CES Innovation Award Product 2022 for IBM Telum™ Processor

Red Dot "Best of the Best" Design Award 2023: Computer and IT Category to IBM z16

DeveloperWeek DEVIES 2023: Best Innovation in DevOps: Monitoring and Observability with AI Ops on IBM Z

IF Design Award 2023 for Enterprise IT Hardware Platform to IBM z16

IF Design Award 2023 for Product User Experience for IBM z16 implementation of Dynamic Partition Manager (DPM) linking end-to-end experience

IF Design Award 2023 for AI Ops platform & for AI Ops for web/chat

MongoDB Hybrid Cloud Partner Award 2022: Building a Secure and Sustainable Enterprise with MongoDB-aaS

Finacle Partner Award 2022: Innovation Partner of the Year

DeveloperWeek DEVIES 2024: The Hyper Protect Services Offline Signing Orchestrator

German Design Award 2023, communications design and interactive user experience of Data Partition Manager (DPM) for IBM Z

Sustainability

AI acceleration on chip

Computer design

Monitoring and observability

Product user experience

Hybrid Cloud

Partner solution innovation

Dynamic Partition Manager

Hyper Protect Services
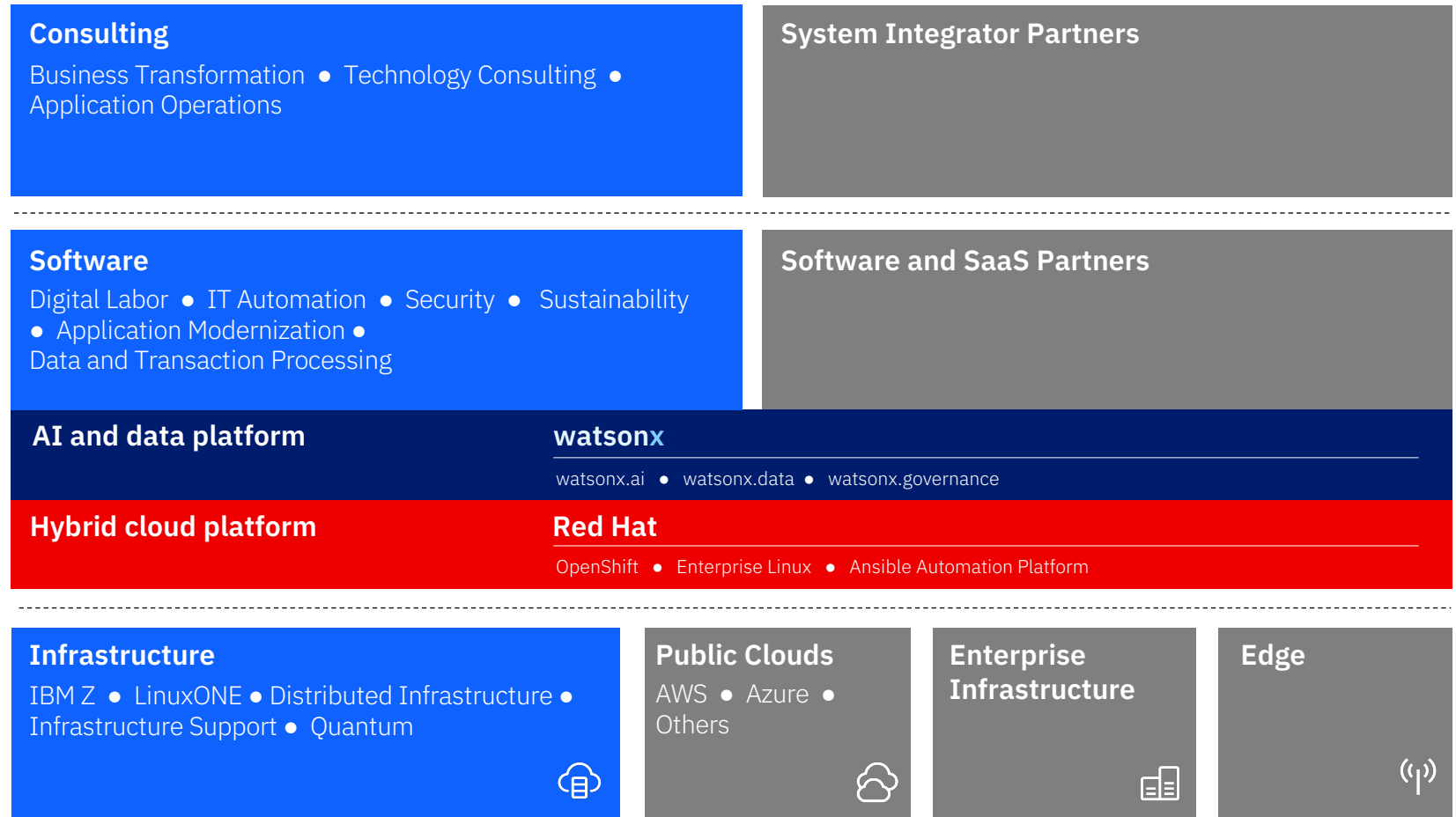
State of the Business

Hybrid Cloud Strategy

Simplification

IBM's business, built around our platforms

Our hybrid cloud and AI platforms provide the foundation for market-leading businesses

Our ecosystem enables our businesses to scale and our clients access to tailored solutions wherever they need them

Consulting

Business Transformation ● Technology Consulting ● Application Operations

System Integrator Partners

Software

Digital Labor ● IT Automation ● Security ● Sustainability ● Application Modernization ● Data and Transaction Processing

Software and SaaS Partners

AI and data platform

watsonx

watsonx.ai ● watsonx.data ● watsonx.governance

Hybrid cloud platform

Red Hat

OpenShift ● Enterprise Linux ● Ansible Automation Platform

Infrastructure

IBM Z ● LinuxONE ● Distributed Infrastructure ● Infrastructure Support ● Quantum

Public Clouds

AWS ● Azure ● Others

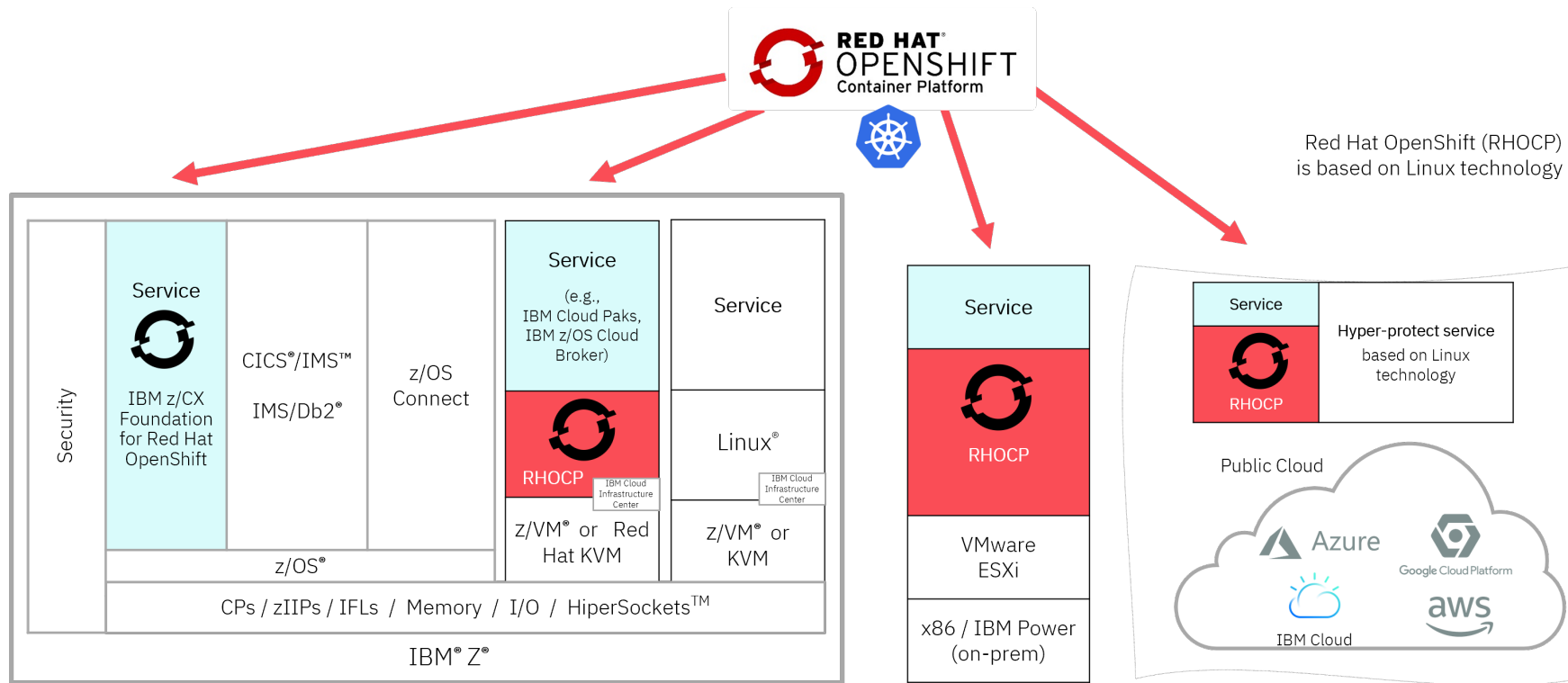## Enterprise Infrastructure

Edge

The vision of hybrid cloud and multicloud with Red Hat OpenShift

All Major OCP Add-ons available on Z

Deployment choices across IBM® LinuxONE and IBM Z

z/OS-based, LPAR, and in virtual machines based on IBM z/VM® or Red Hat KVM

Red Hat OpenShift (RHOCP) is based on Linux technology

Red Hat OpenShift

Add-ons / middleware / layer'd products

Rich ecosystem available on Red Hat OpenShift on IBM Z / IBM® LinuxONE

Modernize IBM Z operations and standardize on a single container platform across the enterprise
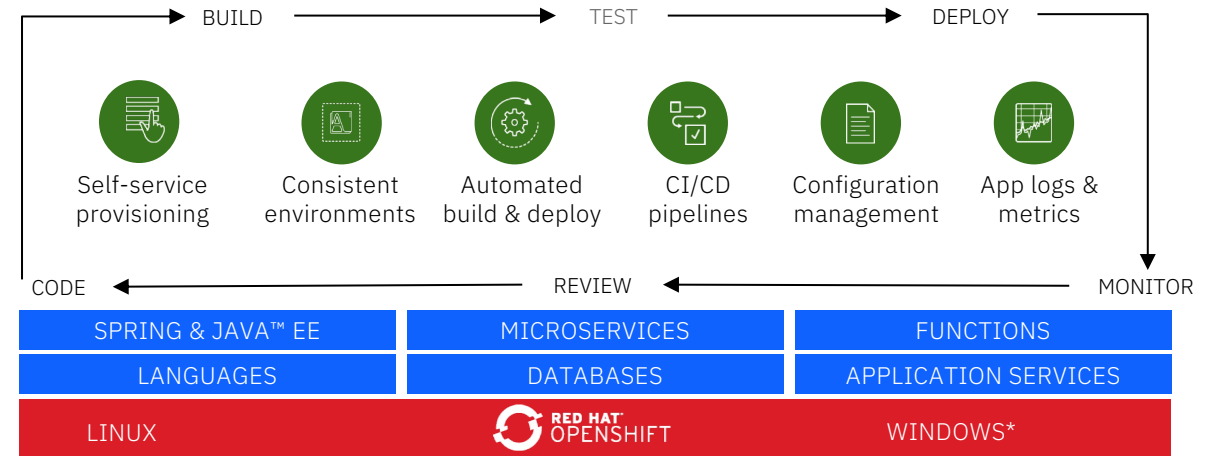- Reduces development challenges

Improve developer productivity by developing once – and deploying anywhere
- Common DevOps & CI/CD

Leverage knowledge across all platforms in the enterprise
- Enables new ways for hybrid IT projects

BUILD			TEST		DEPLOY
Self-service provisioning	Consistent environments	Automated build & deploy	CI/CD pipelines	Configuration management	App logs & metrics

CODE	REVIEW	MONITOR

SPRING & JAVA™ EE	MICROSERVICES	FUNCTIONS
LANGUAGES	DATABASES	APPLICATION SERVICES

LINUX	RED HAT OPENSHIFT	WINDOWS*

- OCP Base Add-ons/ RH Platforms
  - Red Hat odo
  - Red Hat Dev Spaces
  - Red Hat Pipelines (Tekton)
  - Red Hat Serverless
  - Red Hat Service Mesh
  - Red Hat cert-manager
- OCP Separately priced Add-ons/ RH Cloud Computing
  - Red Hat Quay
  - Red Hat Advanced Cluster Security
  - Red Hat Advanced Cluster Management
- RH Middleware/ RH Application Services:
  - Red Hat AMQ Streams
  - Red Hat Fuse
  - Red Hat 3scale API Management
  - Red Hat OpenShift GitOps

Red Hat Single Node OpenShift (SNO)

SNO reduces the prerequisites for a Red Hat OpenShift deployment, bringing the barrier to entry, down to a minimum.

- Single Node OpenShift reduces the compute footprint to only 1/3 of what is normally required for a full cluster, but with the compromise of loss of redundancy & resiliency.

- Allows to deploy application easily and using standardized enterprise way to service, automated logging and monitoring the applications

- Supported update processes and paths forward keep the environment current

- SNO offers both control and compute node capabilities in a single cluster

- SNO allows to add additional compute nodes to the cluster

- Requires 2 IFLs with SMT-2 enabled on installation time

- Supported with 'zCX Foundation for Red Hat OpenShift', Red Hat KVM, and IBM z/VM

Use case example

- Run 'IBM Z Security and Compliance Center' (zSCC) in a Single Node OpenShift environment in zCX for OpenShift

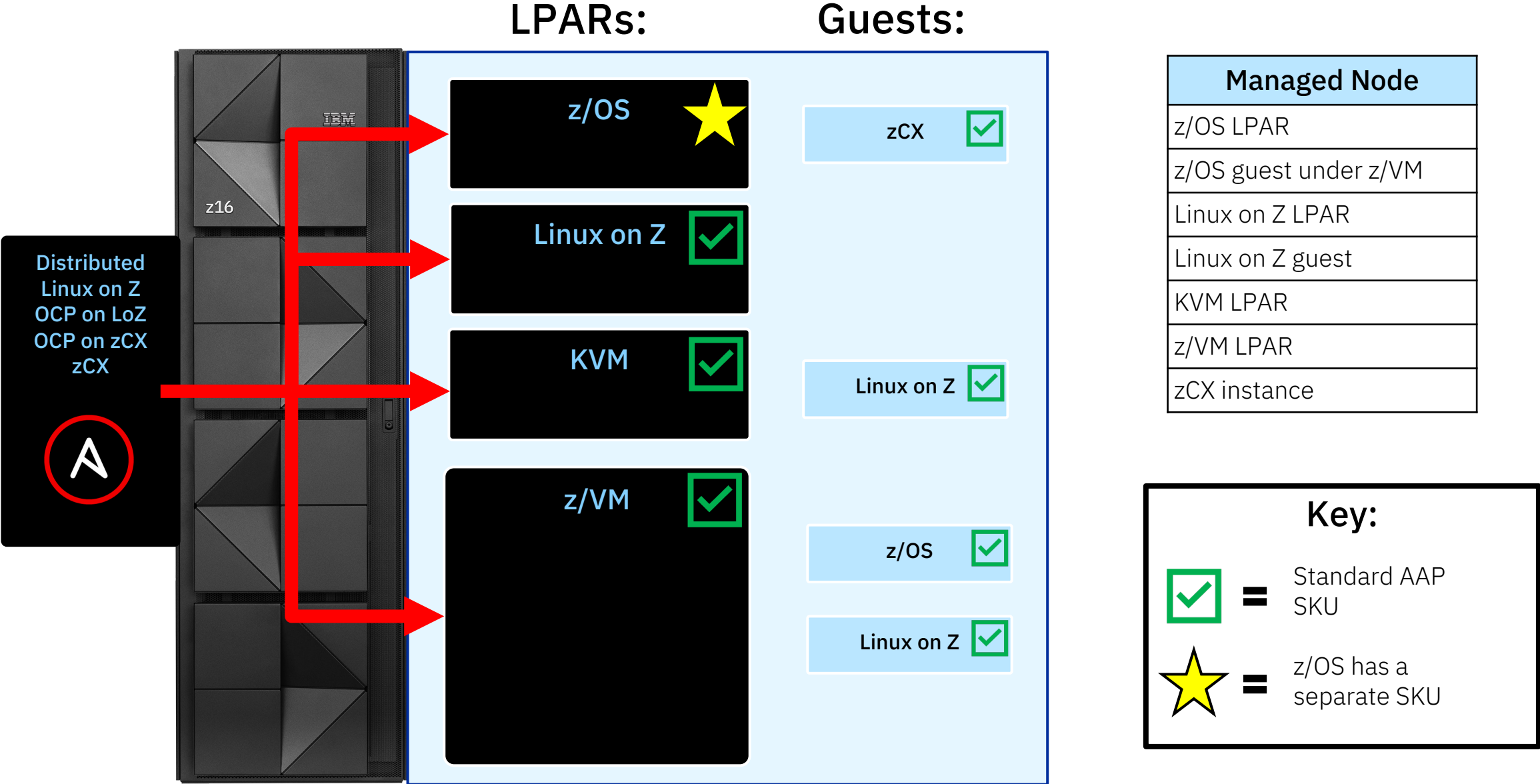# Ansible Automation Platform (AAP) support for Linux on IBM Z , IBM® LinuxONE & IBM zCX

Automation controller installation support for Linux on IBM Z and IBM® LinuxONE

- Starting in **AAP 2.4**, we are providing the full Ansible Automation Platform for Linux on IBM Z & IBM® LinuxONE.

- Organizations that have IBM Z, that require strict management separation from the infrastructure, can install the automation controller, and have the ability to automate their environments completely separately from the rest of their infrastructure.

- Provides the additional flexibility to automate whatever you need to, wherever you need to.

Event-Driven Ansible and **Automation Hub** installation support for Linux on IBM Z

- Automation Hub makes it simpler to manage automation content specifically for IBM Z. You'll also find IBM provided, certified content for this hardware that can be easily synched to your Private Automation Hub.

- Automate Day 2 operations of IBM Z infrastructure and application use cases using Event-Driven Ansible. Integrating with your existing monitoring solutions or messaging bus is simple, enabling your teams to operate quickly and effectively in these environments.

Ansible Automation Platform on Z (Manage To/From Z)

LPARs:

Guests:

Distributed
Linux on Z
OCP on LoZ
OCP on zCX
zCX

z/OS ⭐

Linux on Z ✅

KVM ✅

z/VM ✅

zCX ✅

Linux on Z ✅

z/OS ✅

Linux on Z ✅

Managed Node
z/OS LPAR
z/OS guest under z/VM
Linux on Z LPAR
Linux on Z guest
KVM LPAR
z/VM LPAR
zCX instance

Key:

✅ = Standard AAP SKU

⭐ = z/OS has a separate SKU

State of the Business

Hybrid Cloud Strategy

Simplification

# It can take 2-7 years for a new system programmer to become fully productive.

"If you're not adequately prepared [IBM Z] can feel like you're constantly drinking from a fire hose and there is no way to catch up."

– An early tenure mainframer
in a SHARE article written in April 2022

User distribution insights

Simplification and standardization are critical to ensuring business continuity.

Because many IT leaders are under increasing pressure to do more work with fewer resources, they are not always able to hire as many new hires for the mainframe as they may like resulting in a disproportionate number of new and intermediate users to expert users. This reality sometimes results in a new user taking over responsibilities for multiple retiring experts.

New   Intermediate   Expert
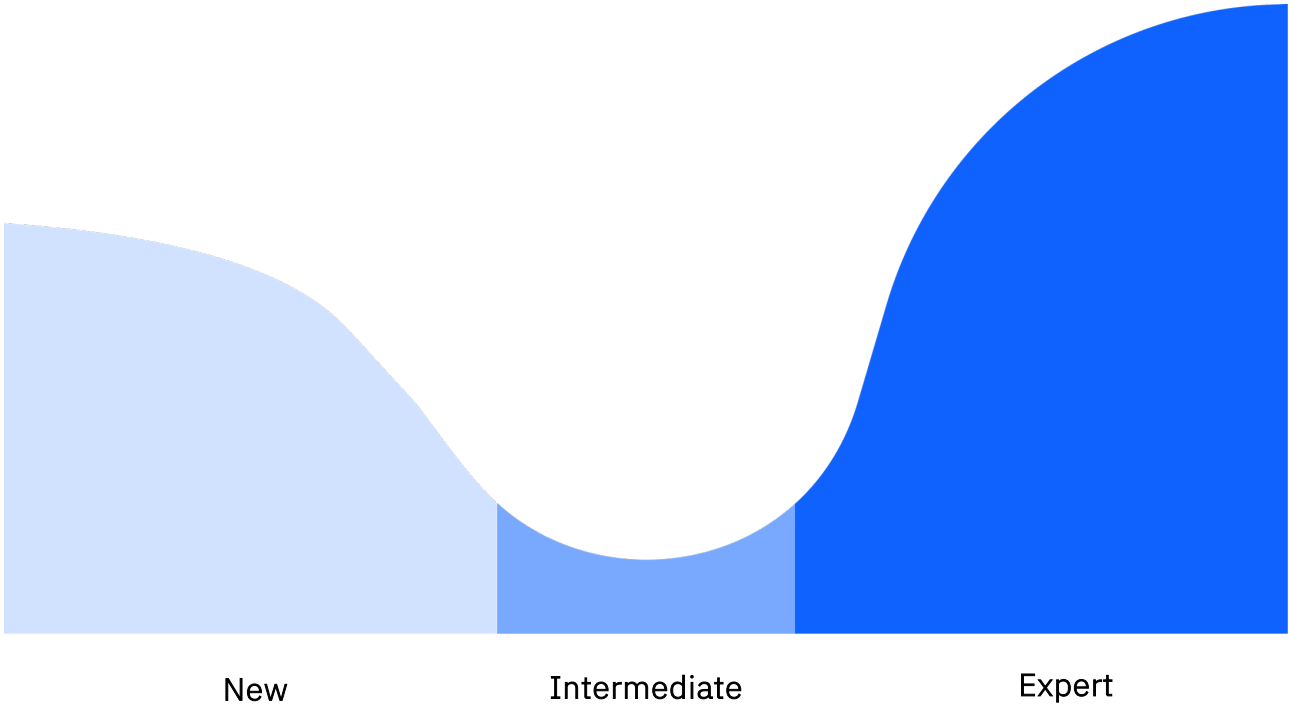
How might we reduce the IBM Z learning curve so that a new system programmer is productive in 6 months?

"We can't keep postponing the training of new people... the younger generation eventually won't have enough people to give them guidance at work."

– An early tenure mainframer
LinkedIn: *Mainframe Outreach: Talking to a New Generation*

Platform Simplification Hills ▲

▲ **Active learning**

A new to Z sysprog can explore, experiment, deploy and demonstrate value on the platform without fear.

▲ **Simplification by Design**

An IBM Z sysprog will have a consistent, intuitive experience across the platform.

▲ **Standardization**

An IT director has a clear understanding of the skills and industry standards necessary for Z allowing easier resource management and hiring.

▲ **Mainframe culture**

A new to Z sysprog will have a community of peers and feel a part of the larger mainframe culture.

IBM watsonx Assistant for Z
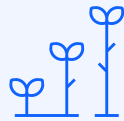## Mainframe experience, reimagined

Generative AI solution, transforming and simplifying the way system programmers, operators, and developers of all experience levels engage and interact with the mainframe to be more productive.

Benefits

Reduce learning curve
Reduce the learning curve for early tenure professionals

Increase productivity
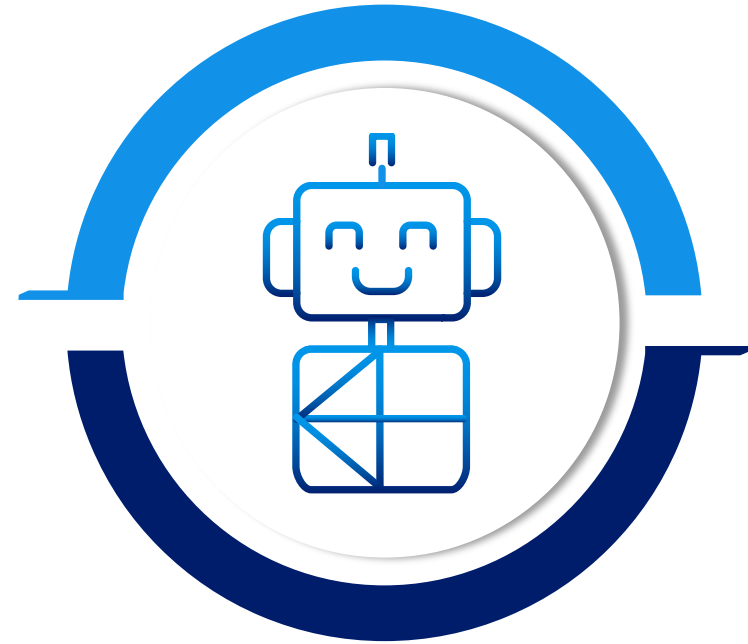Simplify and automate complex processes, save time and effort

Increase efficiency
Save hours looking for answers and completing manual tasks

Reduce errors
Increase work quality and accuracy with curated content and automation

AI assistant
Conversational AI
Automated tasks (Skills)

Builder
Build skills catalog
Create & personalize assistants

web-chat.global.assistant.watson.appdomain.cloud

IBM watsonx Assistant Preview

Using Relocation Domains - IBM Documentation

w3id

OIC

× Close

Hi! I'm a virtual assistant. How can I help you today?

IBM watsonx Assistant for Z
2024 roadmap* highlights

2H'24	
Capability	Outcome
Linux on Z support	Option to run on Linux on Z (in addition to x86)
Add customer specific knowledge	Add customer specific knowledge, best practices and documents to provide curated answers
Integration for AIOps use cases	Offer recommendations to optimize when IBM Z operational performance risks are identified.
Provide pre-built IBM Z skills	Z Skill Packs (CICS, DB2, zVM etc.)

*roadmap is subject to change.

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New Faces

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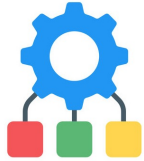## Frederik Hartmann
CPO, z/VM
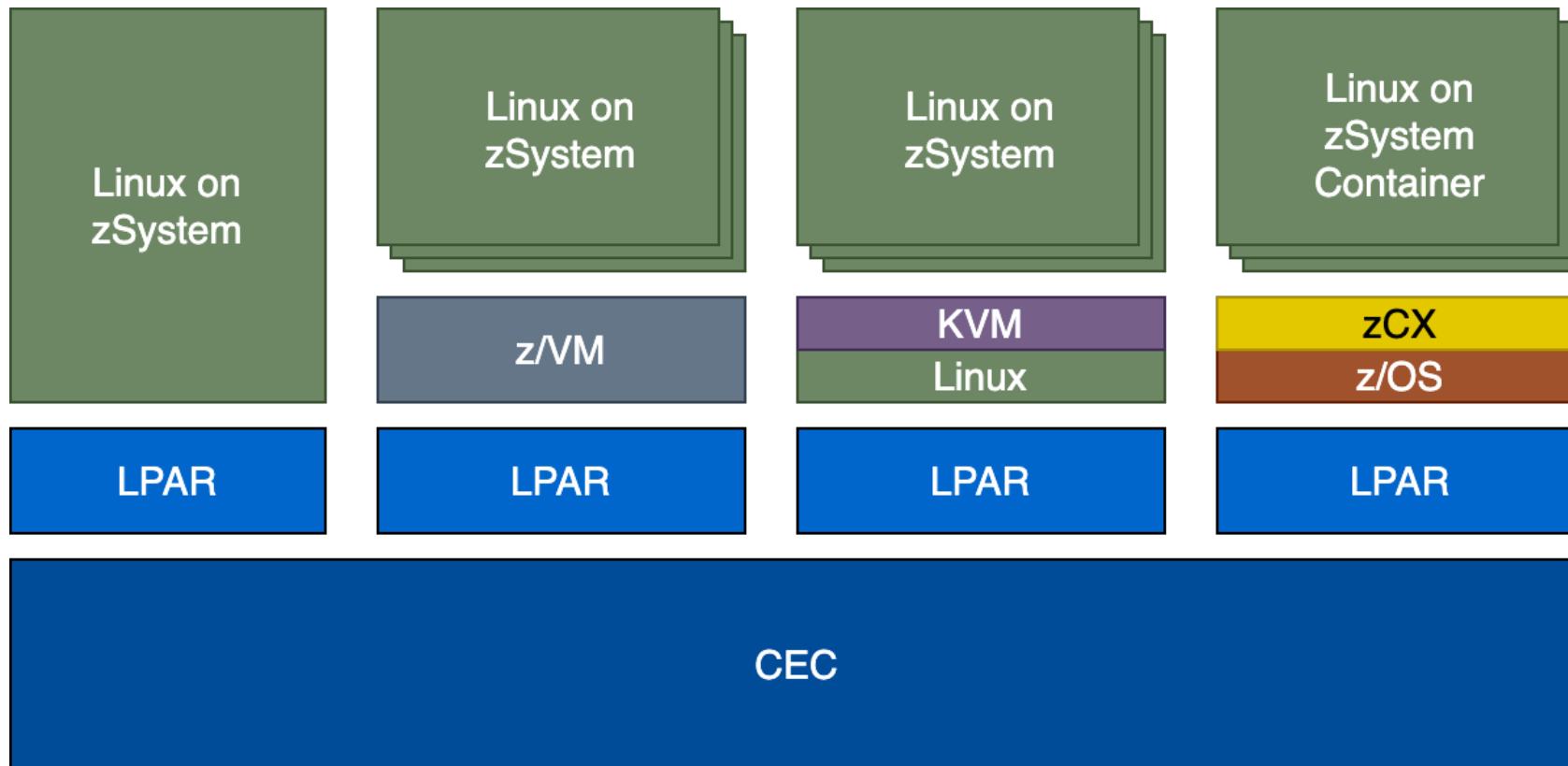frederik.hartmann@de.ibm.com

When its good, its good!

https://archive.org/details/AStrategicPointOfViewForVm
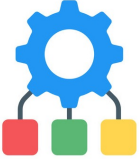
zVM Update

Hypervisors on Z
Enabling Linux workloads to exploit unique IBM Z differentiators & strengths

- IBM Z Hypervisors – essential to Linux use cases like data serving, server consolidation and z/OS co-location

z/VM – most popular hypervisor on Z

- **Most common use cases**
  - Linux on Z data serving workload like Oracle, MongoDB, PostgreSQL
  - Linux on Z in close proximity to z/OS
  - z/OS
  - z/TPF
  - VSE^n
- **Linux on Z based data-serving and data-processing workloads are the fastest growing and highest demanding workloads on the platform**
- **Significant investment is being made to improve the z/VM scalability in support of these workloads**
- **Deliver and improve exceptional service & support**

Current Development Focus
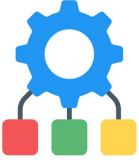
- **z/VM will have a stronger focus on scalability and data serving workloads in the future**

- **Scalability**
  - Improve memory scalability to fully exploit available physical memory
  - Currently in system level design phase
  - CPU support with SMT-2 might become next bottle neck and is under observation

- **Simplification**
  - Improved defaults for the next z/VM release to minimize configuration changes for most use cases
  - Share & entitlement management improvements

- **Resiliency**
  - IO Recovery & Stability Improvements
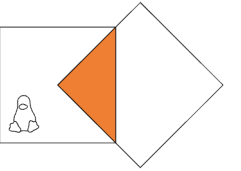
Thank you

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