

# What's new with IBM Z16 and LinuxONE Emperor 4

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Jan Tits ([jancarmen@be.ibm.com](mailto:jancarmen@be.ibm.com))  
IBM zSystems Client Technical Specialist



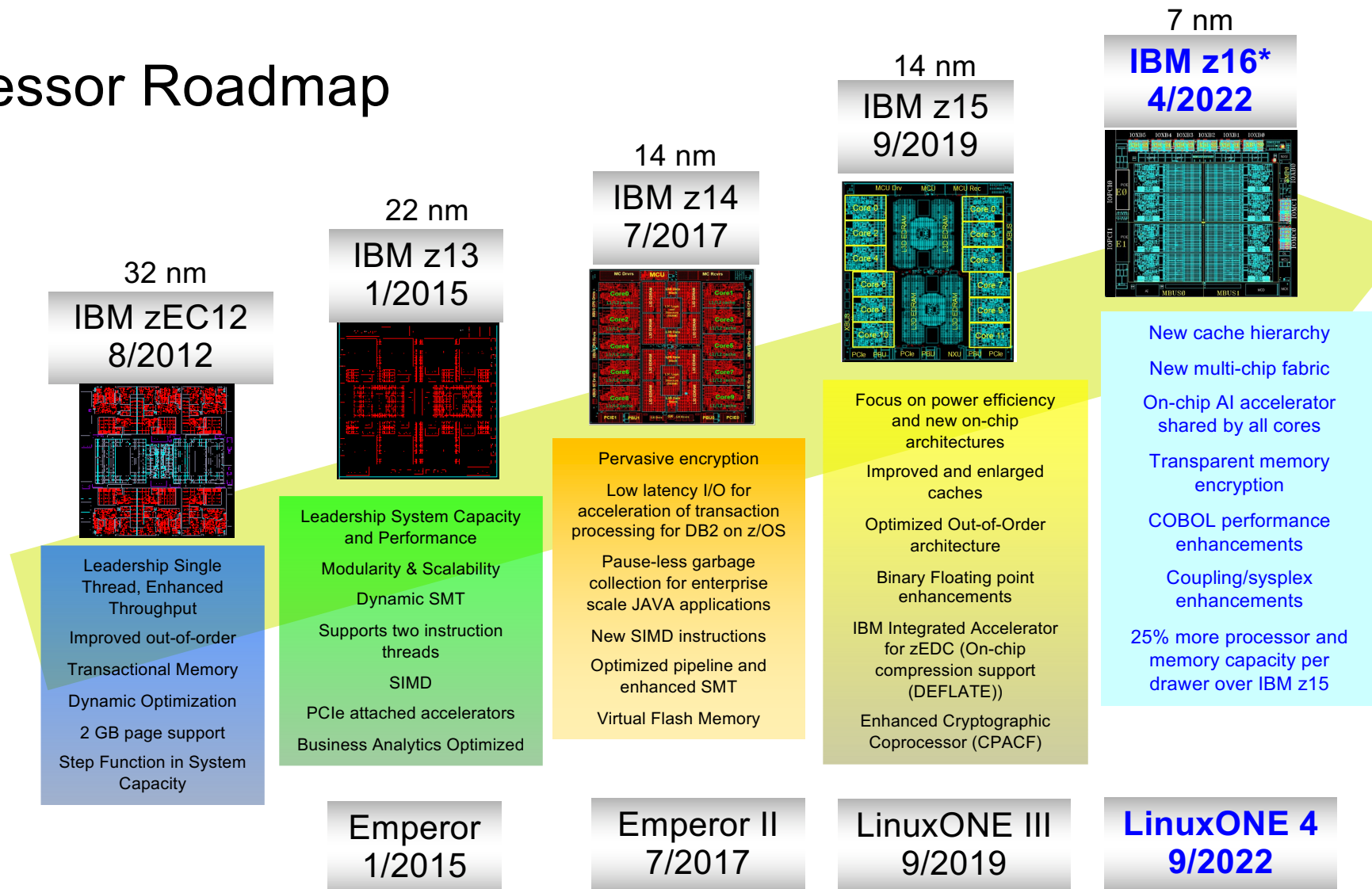
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# Processor Roadmap



At the heart of IBM z16 / LinuxONE 4:

## IBM Telum Processor

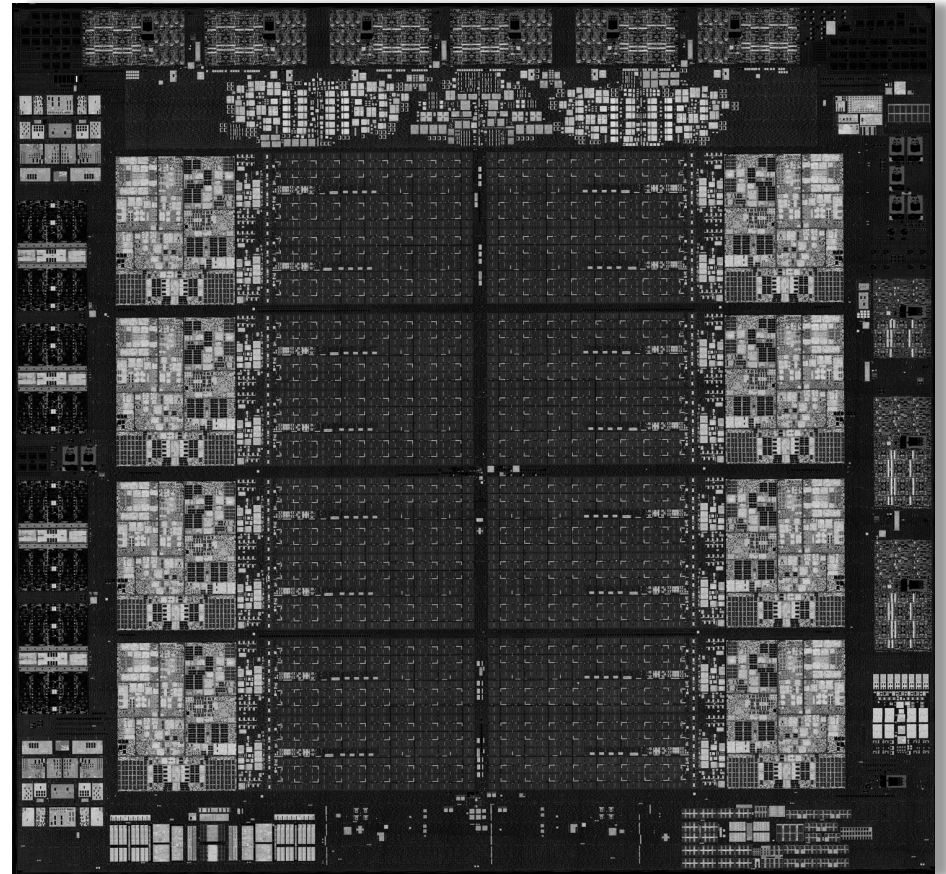
Optimized for enterprise workloads with embedded real-time AI insights

Performance and Scale

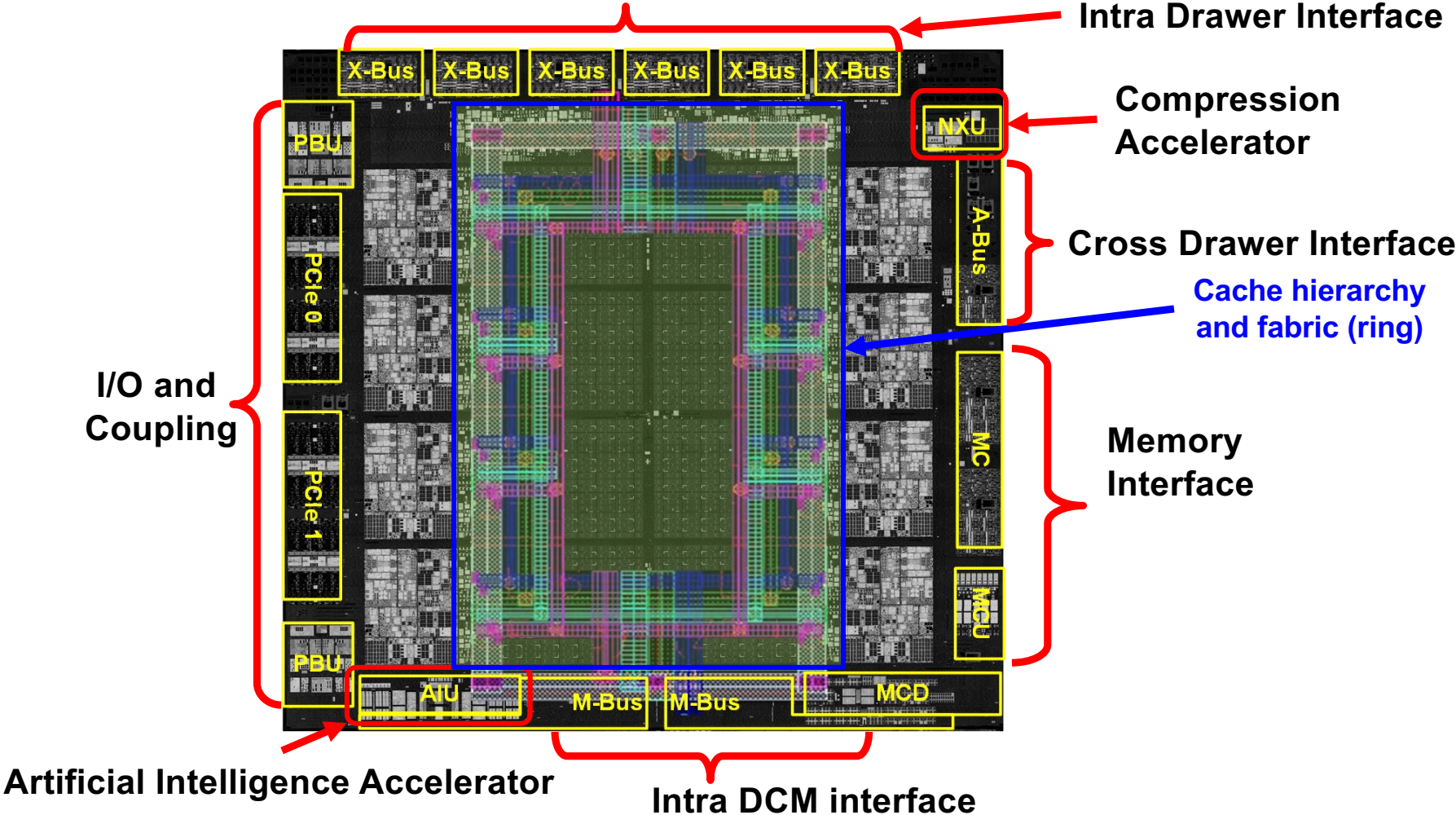
On-Chip Integrated Accelerator for AI

1.5x Cache growth

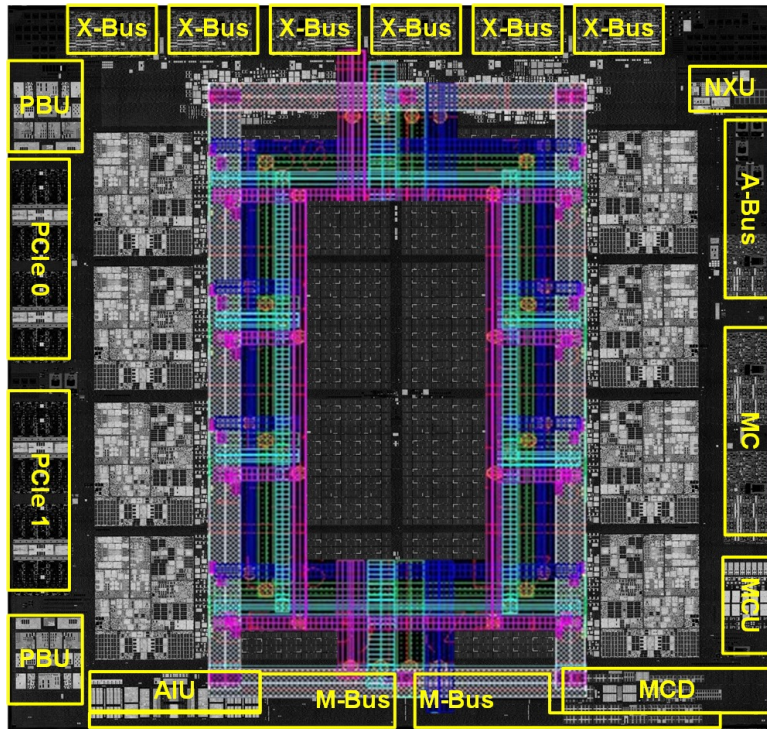
7nm, 5.2GHz



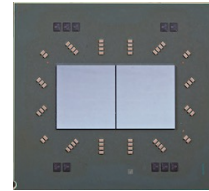
# IBM Telum core fabric and Nest interfaces



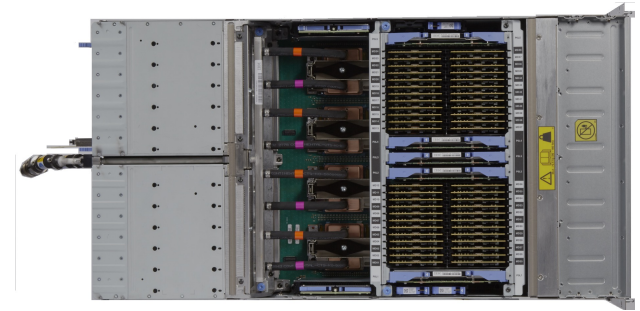
# The big picture



x2



x4



CCM



x4

# IBM z16 is built to build



## Predict and Automate for Increased Decision Velocity

*Apply insights at speed and scale to create new value in every client interaction*

*Increase productivity and lower operational costs with automation and AIOps*



## Secure with a Cyber Resilient System

*Secure data and systems now and in the future with quantum-safe protection*

*Address ever-increasing regulations with automation for compliance*

*Plan and mitigate risk of potential future outages*



## Modernize with Hybrid Cloud

*Empower developers with agility to accelerate modernization of existing workloads*

*Enable integration of IBM z16 workloads with new digital services across the hybrid cloud*

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# IBM z16: Predict and automate for increased decision velocity



Prevent fraud before it happens by scoring up to 100% of transactions in real-time without impacting SLA's

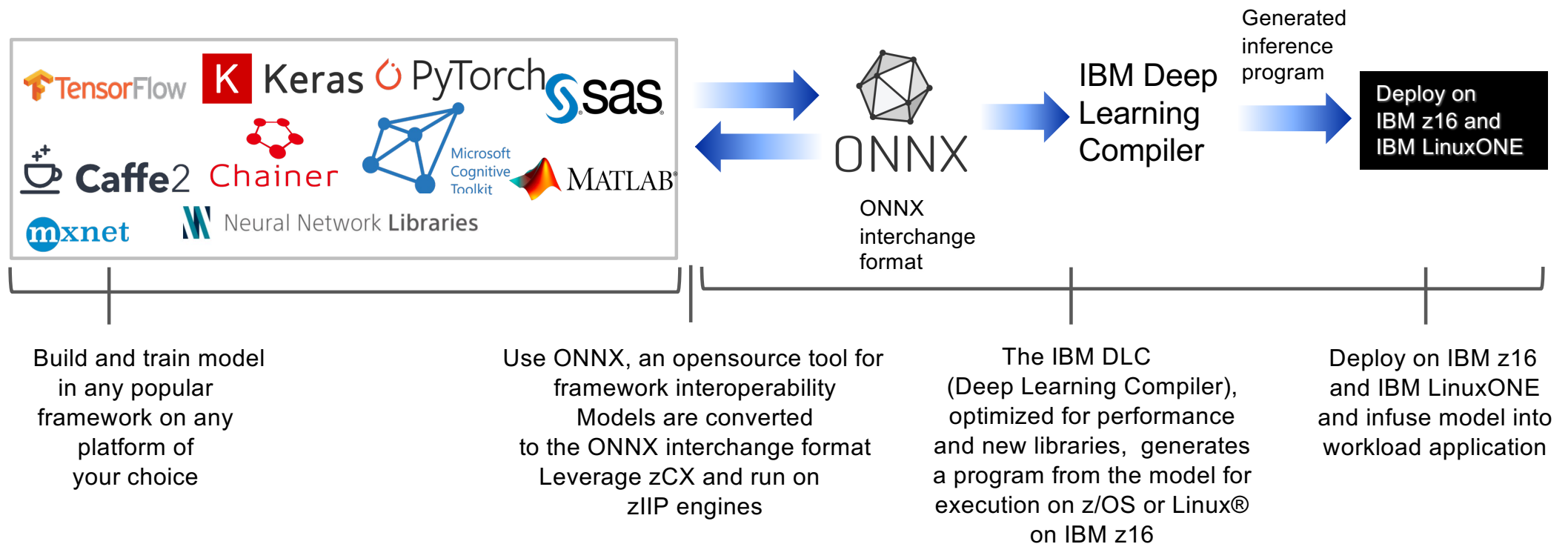
Insights at unprecedented speed and scale means every customer interaction can now be a personalized experience

Leveraging AI, in operational processes can proactively identify and stop outages before they occur

# Seamlessly leverage AI accelerator on IBM z16 with optimized model build, train and deploy capabilities



- Bring machine learning & deep learning models to IBM z16 with ONNX/DLC
- Exploit IBM Integrated Accelerator for AI for best inference performance.
- Repeatable practice for different vendors to leverage IBM z16 and Integrated Accelerator for AI



# AI on IBM Z Strategy: Designed for Business Insights and Intelligent Infrastructure



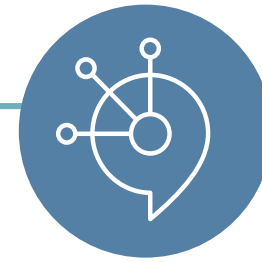
## REAL TIME BUSINESS INSIGHTS

Infuse AI in real time into every business transaction

- High throughput, low latency AI, in-transaction decision making
- Detect Fraud and Mitigate risk
- Meet even the most stringent SLAs



**Db2 SQL Insight**  
Semantic query for discover new insights



## Intelligent Infrastructure

Improve Security, Data Privacy, IT Operations with AI



**Watson AIOps (IZOA)**  
Deploy advanced, explainable AI across the ITOps toolchain



**DB2 AI for z/OS**  
Optimize database performance with Machine Learning



**Data Privacy for Diagnostics**  
Leverage Machine Learning to detect and redact PII from diagnostic dumps

Enable leading AI portfolio & ecosystem



XGBoost



Keras

PYTORCH



Watson Machine Learning for z/OS



Cloud Pak for Data

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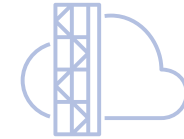


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# We are entering a new cryptographic era



There will be a time when the power of quantum may crack public key cryptographic security protection ...

Your data and security is already at risk for quantum-attacks



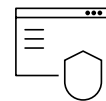
## Harvest now, decrypt later

schemes are underway to collect data now for decryption when quantum computers are powerful enough



## Replacing most of the public-key systems

currently in use will take 5 to 15 years



## Lifetime of data

means that sensitive data generated today that is not protected with quantum-safe algorithms is at risk now

# IBM z16 industry-first quantum-safe system



Quantum-safe technology and key management services were developed to help protect data and keys against a potential future quantum attack like harvest now, decrypt later

## Quantum-safe System

Industry first quantum-safe system protected by quantum-safe technologies through multiple layers of firmware

Helps protect IBM z16 firmware from quantum attacks through a built-in dual signature scheme with no changes required

## Protect Sensitive Data

New Crypto Express card with quantum-safe APIs to modernize existing and build new applications leveraging quantum-safe cryptography along with classical cryptography

## Create Crypto Inventory

Discover where and what crypto is used in applications to aid in developing a crypto inventory for migration and modernization planning

New crypto discovery features in IBM Application Discovery and Delivery Intelligence (ADDI) to analyze source code and discover crypto usage in applications.

# Business continuity is a key aspect of cyber resiliency



## Proactive Outage Avoidance

With extreme weather events becoming more and more frequent, a proactive approach to delivering continuous service is needed.

You need to be able to migrate your critical workloads to an alternate site before your business gets impacted.

## Disaster Recovery and DR Testing

In the event of an unplanned outage, including cyber attacks, the ability to rapidly restore operations and service is paramount.

The ability to test that production workloads can be shifted and run at full capacity is critical for ensuring continuous availability during unplanned outages is key.

## Business Continuity Compliance

Regulation around business continuity and disaster recovery policies are increasing and becoming more stringent.

These regulations mandate that businesses be able to switch over full production loads to a secondary data center and operate there for extended periods of time.

## Site Facility Maintenance

Site facility and building maintenance is an ongoing activity for businesses. Upgrading for environmental, health, and safety purposes or other improvements sometimes requires closures.

The ability to continue to provide 24x7 service to your customers is more important than ever.

# IBM Flexible Capacity for Cyber Resiliency



Designed to help organizations proactively reduce the impact of downtime by dynamically shifting their critical workloads to an alternate site for business continuity

➔ Greater Flexibility	➔ Complete Client Control	➔ Simplified Compliance
<p>Dynamically shift production capacity between z16 systems at different sites within seconds</p> <p>Can be used for proactive outage avoidance, business continuity compliance, disaster recovery and DR test scenarios.</p> <p>Be confident that production workloads can be seamlessly shifted to an alternate site and still meet production SLAs.</p>	<p>Remotely transfer capacity – no on-site personnel required after initial set up.</p> <p>Flexibility over duration of capacity transfer, production can remain at the alternate site for up to one year.</p> <p>Fully automatable using solutions such as GDPS.</p> <p>Integrates with System Recovery Boost for faster system and workload startup</p>	<p>Simplify business continuity compliance and improve audit readiness by using the same procedures for both for DR testing and real unplanned disasters.</p> <p>Automate and test recovery procedures for unplanned outages to provide near-continuous availability and disaster recovery.</p>



# IBM Z Security and Compliance Center



A modern application specifically designed for progressing towards a state of continuous compliance readiness with over 300 pre-built goal validations and customizability.

➔ Optimize Resources	➔ Assess Compliance Posture	➔ Identify Compliance Drift
Automates the collection and validation of facts against goals to help increase visibility into potential compliance oversights and reduce manual errors.	Interactive dashboard provides a view of current compliance posture for PCI-DSS and NIST SP800-53 regulations to help simplify audit preparations and improve continuous compliance operations.	Track compliance drift over time with dashboard style visualizations which display historical compliance scores, to help clients better understand their compliance posture

Reduce number of skilled resources needed for audit preparation functions by over 40%<sup>1</sup>

Reduce audit preparation time from one month to one week<sup>2</sup>

<sup>1,2</sup> See claims in notes  
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# IBM Z Security and Compliance Center dashboard



IBM Z Security and Compliance Center You are logged in as Admin [Log out](#)

Z Security and Complian... / Scans /

## PCI Review

PCI\_DSS\_SCOPE | PCI\_DSS 3.2.1 | Validation [Details](#)

Mar 16, 2022 1:10 PM March 16, 2022 1:10 PM

35 Pass 11 Fail 1 Unable to perf... 0 Not applicable [Download report](#)

### Controls

47 Total controls

Legend: Pass (Green), Fail (Red), Unable to perf... (Yellow), Not applicable (Grey)

### Failures

Legend: Critical (Dark Red), High (Red), Medium (Orange), Low (Yellow)

### Drift over time

1 month

Legend: Fail (Red), Pass (Green), Unable to perf... (Yellow), Not applicable (Grey)

**Control view** | Resource view

Status Filter... Severity Filter... Search

Status	ID	Control	Severity	Resource details
Fail	1.1	Ensure the Appropriate Version/Patches for Oracle Software Is Installed	Critical	0 Pass 1 Fail 0 Unable to perf... 0 Not applicable
Fail	2.1.1	Ensure 'extproc' Is Not Present in listener config	Medium	0 Pass 1 Fail 0 Unable to perf... 0 Not applicable
Unable to perform	2.1.2	Ensure 'ADMIN_RESTRICTIONS' is set to 'ON'	-	0 Pass 0 Fail 1 Unable to perf... 0 Not applicable
Pass	2.2.1	Ensure 'AUDIT_SYS_OPERATIONS' Is Set to 'TRUE'	-	1 Pass 0 Fail 0 Unable to perf... 0 Not applicable
Pass	2.2.2	Ensure 'AUDIT_TRAIL' Is Set to 'OS', 'DB', 'XML', 'DB,EXTENDED', or 'XML,EXTENDED'	-	1 Pass 0 Fail 0 Unable to perf... 0 Not applicable
Fail	2.2.3	Ensure 'GLOBAL_NAMES' Is Set to 'TRUE'	Medium	0 Pass 1 Fail 0 Unable to perf... 0 Not applicable

# IBM System Recovery Boost



Over **95%** of IBM z15 customers with System Recovery Boost eligible systems, are using System Recovery Boost to unleash additional processing capacity.<sup>1</sup>

## Introduced with IBM z15

### Faster shutdown and startup

Accelerate the shutdown, restart and recovery of images, middleware environments and client workloads to accelerate return to pre-shutdown SLAs.<sup>2</sup>

### Faster sysplex recovery

Accelerate Parallel Sysplex recovery processes to minimize disruption and expedite return to steady-state operations.

### Faster GDPS automation

Drive faster and more efficient GDPS automation actions to rapidly reconfigure and recover your environment.

### Faster elimination of backlog

Utilize additional capacity for a fixed period during recovery, so you can process backlog faster after planned or unplanned downtime.

## ➔ New with IBM z16

### Faster middleware restart

Accelerate the restart and recycle of client-specified middleware environments to rapidly return to steady-state operations up to 35% faster.<sup>3</sup>

### Faster SVC dump processing

Accelerate the SVC dump capture process so you can gather the diagnostics and return to normal operations up to 30% faster.<sup>4</sup>

### Faster Hyperswap Config Load

Accelerate the process of loading hyperswap configuration and policy information and to reduce the system impact while the load is in progress.

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# IBM Z and Cloud Modernization Stack

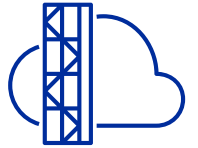


Accelerate application modernization and IT automation: connect, provision, and manage z/OS systems from OpenShift anywhere it runs

➔ Simple Access to Applications and Data	➔ Agile Enterprise DevOps	➔ Standardized IT Automation
<p>Empower agile development teams to build APIs as part of their DevOps pipelines with rich new capabilities in support of current API standards and containerized deployment.</p> <p>API-first functional mapping with a no-code approach to create APIs.</p>	<p>Increase speed and agility for greater productivity through a radically simplified cloud native development, deployment and configuration.</p> <p>Analyze source code to identify application dependencies.</p> <p>Modify and debug code in IDE of choice then automatically build, test, qualify and deploy the code.</p>	<p>Reduce need for specialized skills and empower developers with on-demand z/OS services and environments.</p> <p>Direct access by Red Hat OpenShift users driven by Ansible and orchestrated with Kubernetes.</p> <p>Containerized, personal sandbox running on Red Hat OpenShift.</p>

# IBM Wazi as a Service

## IBM Virtual Dev and Test for z/OS



Empower developers to modernize and integrate z/OS apps with services across the hybrid cloud

➔ Increase Agility and Speed to Market	➔ Improve developer productivity and software quality	➔ Accelerate and Scale DevOps
<p>Spin up an on-demand z/OS system running on IBM Cloud as a Service or on Linux on IBM z16 on-prem.</p> <p>Create a z/OS development and test environment in less than 6 minutes and compile up to 15x faster than comparable x86 solutions<sup>1,2</sup></p>	<p>Deploy custom images of your application on Cloud with Wazi Image builder, eliminate wait times and accelerate shift left testing.</p> <p>With self-service environments running on IBM z16 hardware and real-time code testing, developers can increase productivity and fix potential code issues much earlier than before.</p>	<p>Optimize your resources and costs, pay only for what you use with a flexible consumption model.</p> <p>Flexible consumption models enable you to transform IT into a cost-effective, as-a-service platform that removes barriers to scale DevOps practices.</p>

<sup>1,2</sup> see notes for claims

# IBM LinuxONE™ Emperor 4

## Building a sustainable infrastructure

Reduce your carbon footprint while improving your efficiency and performance

Deliver consistent service with a massively scalable system

Build privacy and protection with a cyber resilient system

# IBM LinuxONE Emperor 4 – Build a sustainable infrastructure

## Reduce your energy consumption and costs with a highly efficient system

- **Designed for sustainability**, without compromising security, performance and scale
- **Optimized architecture** to meet the needs of a modern responsible digital business.
- Designed to run at the **highest level of utilization** for maximum efficiency

Consolidate x86 server workloads onto  
IBM LinuxONE Emperor 4™ and reduce energy  
consumption by 75%, and datacenter floor space by 50%<sup>1</sup>

<sup>1</sup> Consolidating Linux workloads on 5 IBM LinuxONE Emperor 4 systems instead of running them on compared x86 servers under similar conditions can reduce energy consumption by 75%, space by 50%, and the CO2e footprint by over 850 metric tons annually.

IBM LinuxONE Emperor 4 Overview / © 2022 IBM Corporation



<sup>1</sup>see disclaimer chart for full claims



