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Mainframes in the modern world

IESS workshop
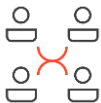
7. 2. 2024

Ales Maly, Mainframe Architect

Kyndryl's Mainframe Services

We bring our expertise to enable the best Hybrid Infrastructure environment

Mainframe services is in the **heart** of what we do to help our customers succeed

80+ years of experience across **22K+ subsystems, 6.2M MIPS,** and **100+ million batch jobs** per day

Managing **6.2M** MIPS and **61%** of the IBM Z MIPS in the service provider market

Nearly 8,000 global, highly diverse, mainframe experts keeping a currency of **expertise through our deep bench of mainframe practitioners** - onboarding several hundred new practitioners/year

Successful mainframe transformation is built on **a holistic, end-to-end strategy**

Kyndryl's mission is to help customers **manage and optimize their mission-critical workloads** seamlessly by modernizing mainframes to handle high-volume, always-on computing

Kyndryl is committed to utilizing our expertise across your entire IT infrastructure landscape to help customers place the **Right Workload on the Right Platform**

Three (3) main **patterns for mainframe transformation** and application modernization

Modernize On Platform

Integrate With Cloud

Move Off Platform

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Kyndryl's Mainframe Approach – Supporting the Right Workloads on the Right Platform

Mainframe Modernization

"Modernize On"

Transform applications on the mainframe by implementing and exploiting the most modern features available of the platform.

- Implementation of improvements to automation
- Upgrades to the mainframe hardware and software infrastructure.

"Integrate With"

Modernize applications to integrate them with re-platformed or existing applications hosted on public clouds.

- Opening of the mainframe to cloud applications through APIs
- Platform-to-platform integration using container technology

"Move Off"

Rehost entire applications and/or data and host them on the public cloud.

- Implementation of DevOps or DevSecOps
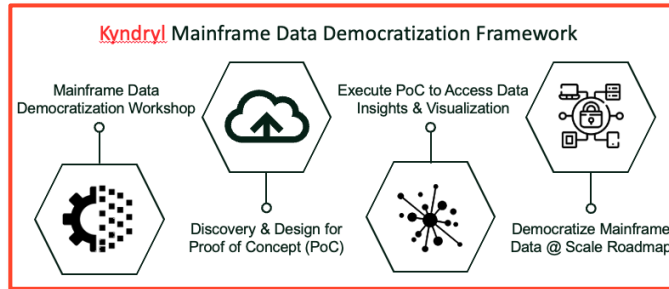- Changes to applications to use different run-time environments including different O/S and middleware

Modernize On

Mainframe Transformation Levers

Event Management & Automation	Automated IPL	zOS Health Checker	Procedural Automation
Automated Incident Management	Batch Standardization & Automation	Automated Security Health Check	Performance & Capacity Management
System Operations Task Automation	Automated Software Delivery	Z Modernization	

Integrate With

Kyndryl and Microsoft Announce Initiative to Deliver Cloud-based Insights and Innovation for Mainframe Customers

Kyndryl Mainframe Data Democratization Framework

- Mainframe Data Democratization Workshop
- Execute PoC to Access Data Insights & Visualization
- Discovery & Design for Proof of Concept (PoC)
- Democratize Mainframe Data @ Scale Roadmap

Move Off

Our approach, skilled resources and ability to deliver on the promise of Moving off is resonating with our mainframe customers

"BT Group Moves from Mainframes to the Cloud with Kyndryl, Targets £17M Annual Savings"

Click here

THOUGHT LEADERSHIP   **OPERATIONAL EFFICIENCY**   **PARTNERSHIP MODEL**   **RISK MITIGATION**   **INNOVATION**

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Most enterprises are only exploiting a fraction of what a modern mainframe can do

Traditional use

Cobol, Db2, IMS, CICS, batch

Application and data modernization
- Java
- Containerization

Infrastructure optimization
- Software currency and cost optimization
- Configuration and tuning

Improved automation
- Artificial intelligence driven
- Management and maintenance

Full capabilities of the platform

Consolidation
- Reduce footprint
- Linux to Z

Modern tools
- Common with other platforms
- Program and manage

Agile processes
- DevSecOps

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Top 3 Kyndryl focused automation focus areas

01

Fix Before Break

Utilize AIOps to proactively identify potential issues and opportunities for improvement in their end-to-end business application environments

02

Auto-resolve With No Human Intervention

Utilize AIOps to quickly solve issues that are occurring with no human intervention and limited to no impact.

03

Policy Based Guardrails and Orchestration

Implement policy-based automation and orchestration to implement guardrails and standards across entire business application environment.

Kyndryl Bridge with Advanced Delivery and Intelligent Automation is designed to help clients meet these goals

Now think.... When have you used a mainframe?

DAILY

30 billion transactions

400 million retail transactions

1 million hotel nights

ANNUALLY

29 billion ATM transactions

87% of all credit card transactions

90% of all airline reservations

World's leading businesses run on the mainframe

92 of the top 100 worldwide banks

10 out of 10 of the world's largest insurers

23 of the top 25 US retailers

23 out of 25 of the world's largest airlines

Mainframes process **30 billion** business transactions per day

Mainframes enable **$6 trillion** in card payments annually

80 percent of the world's corporate data resides or originates on mainframes

91 percent of CIOs said new customer-facing apps are accessing the mainframe

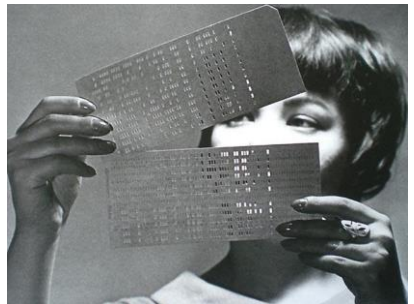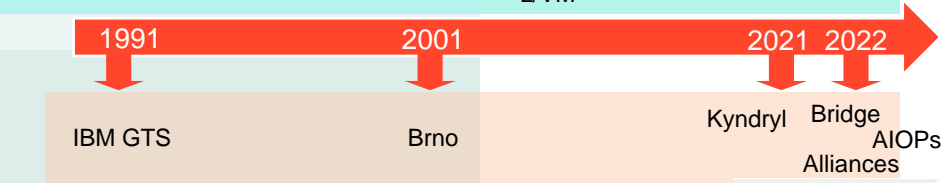# How can I access? …. many ways!

Traditional 3270

Zowe
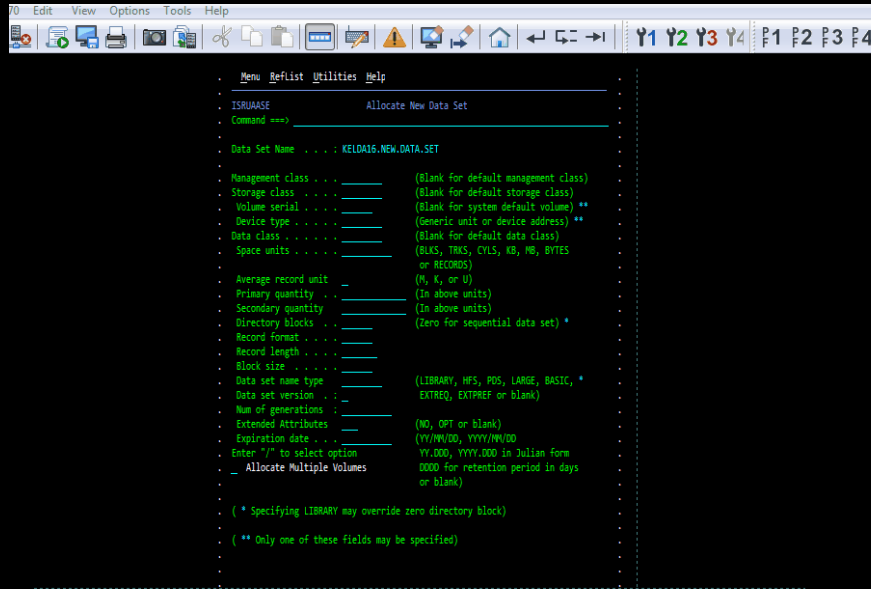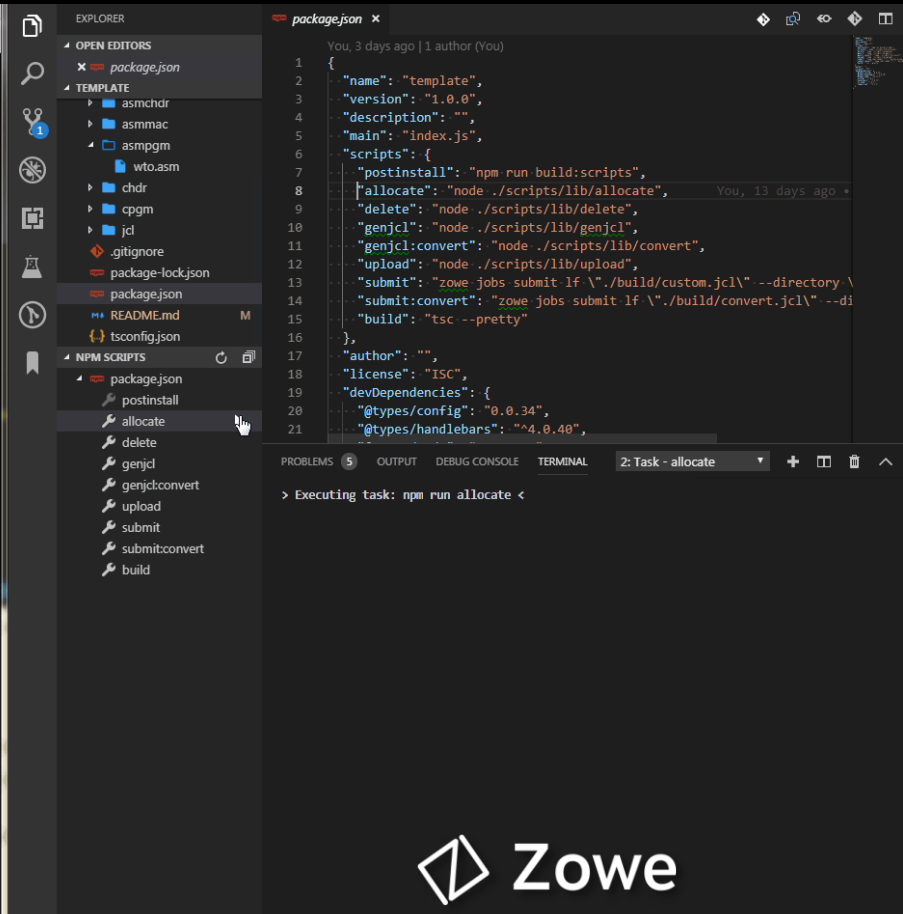
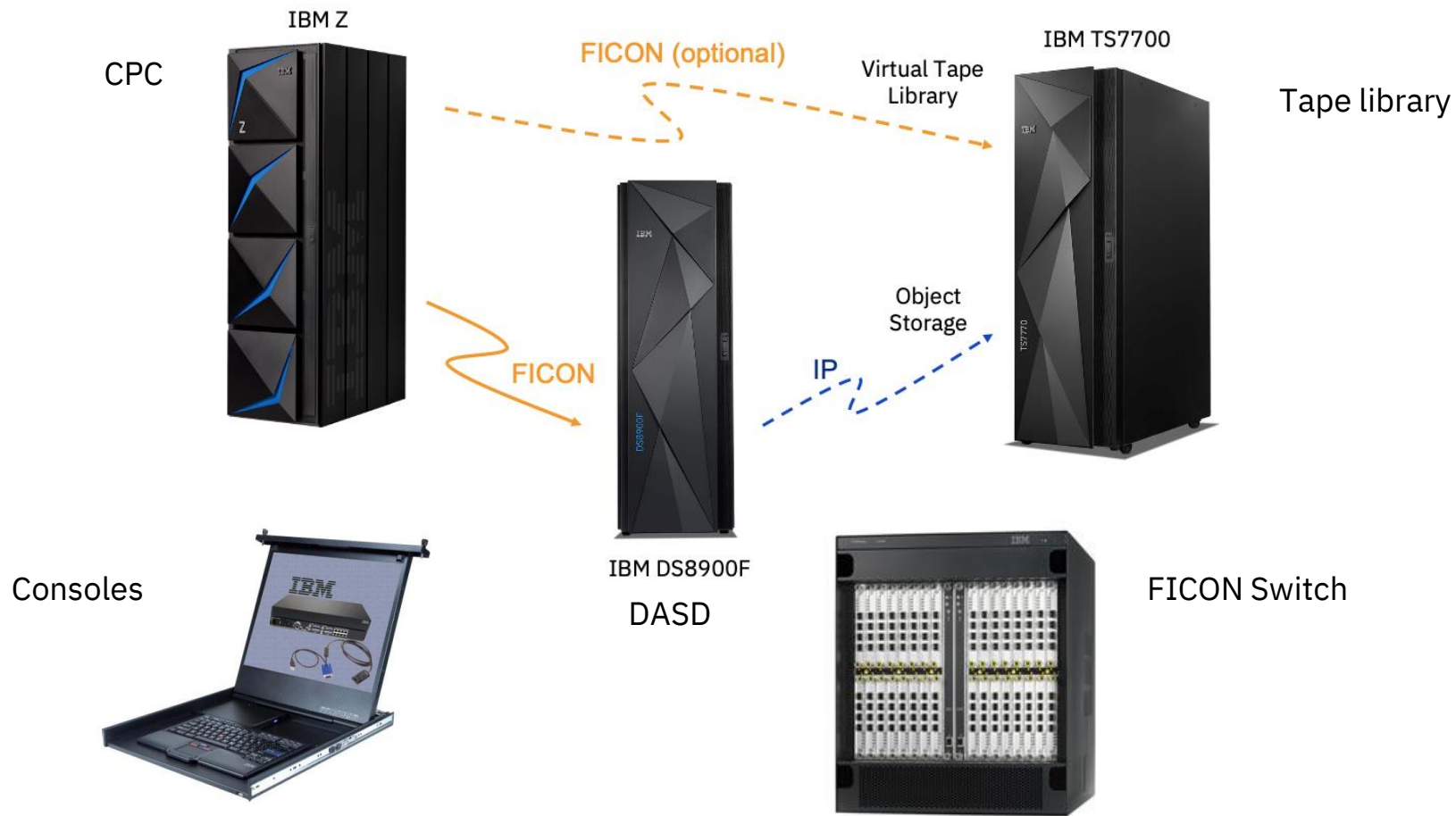# Speaking of Change : A Shift has Happened

A "legacy" platform?
Not anymore...

What is your perception of the industry wide future of the mainframe?

- grow and attract new workloads
- viable long term as a legacy platform

	2016	2017	2018	2019	2020	2021	2022
grow and attract new workloads	46%	46%	50%	52%	51%	56%	60%
viable long term as a legacy platform	43%	45%	42%	41%	38%	36%	35%
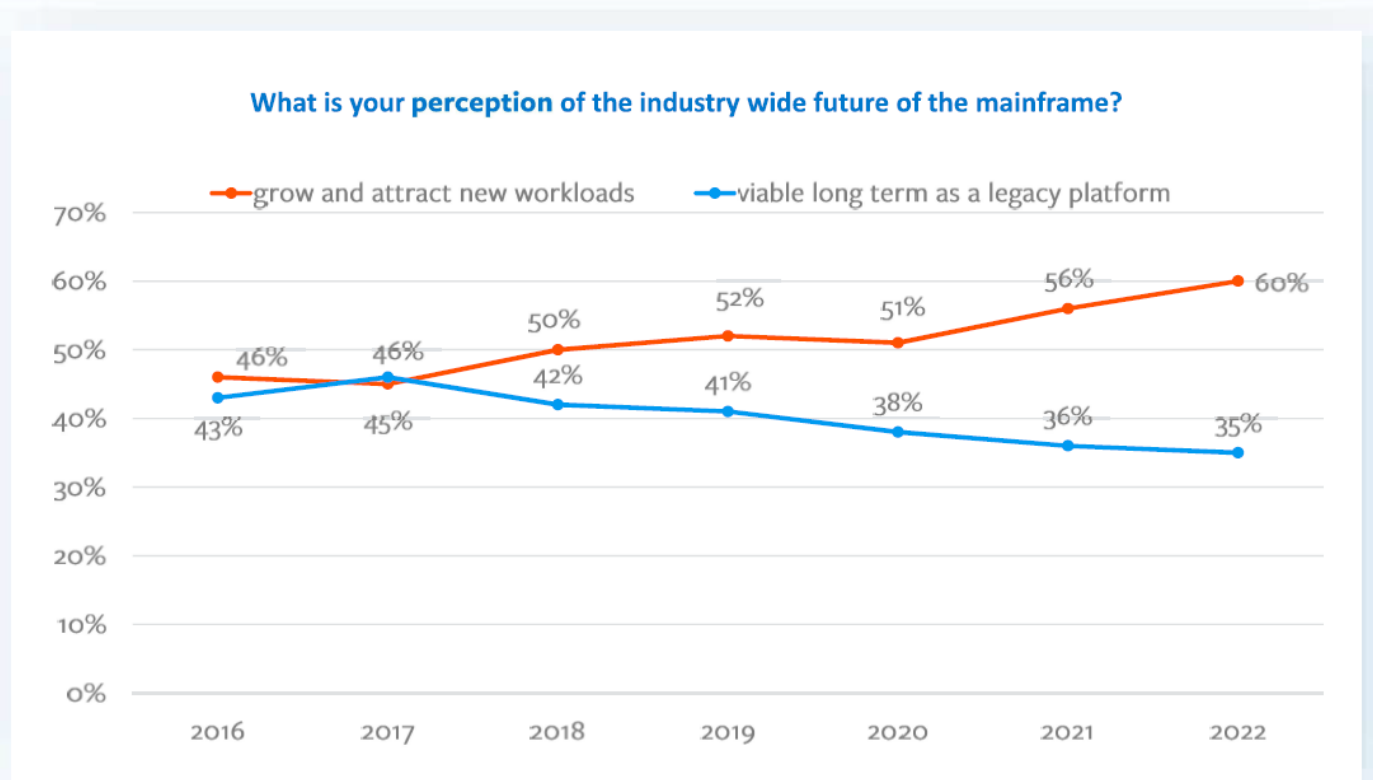
What is inside a mainframe?

IBM Z® Architecture

IBM Z

CPC

FICON (optional)

Virtual Tape Library

IBM TS7700

Tape library

FICON

IBM DS8900F

Object Storage

IP

Consoles

DASD

FICON Switch
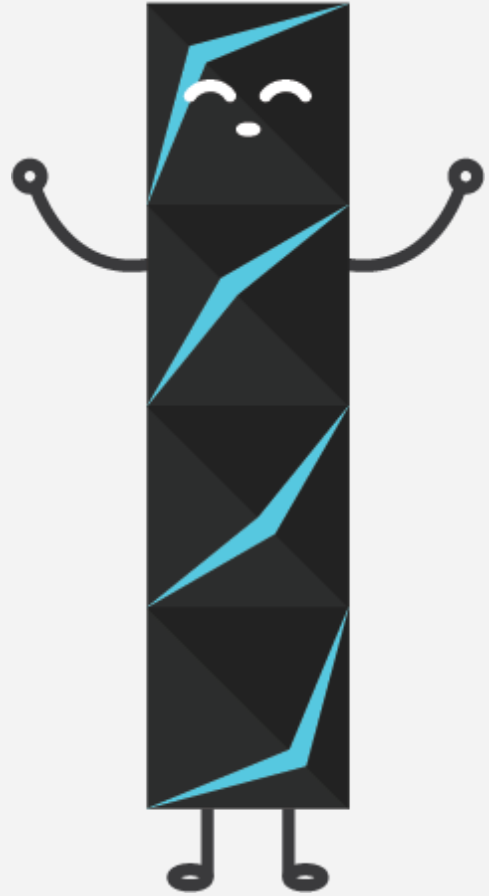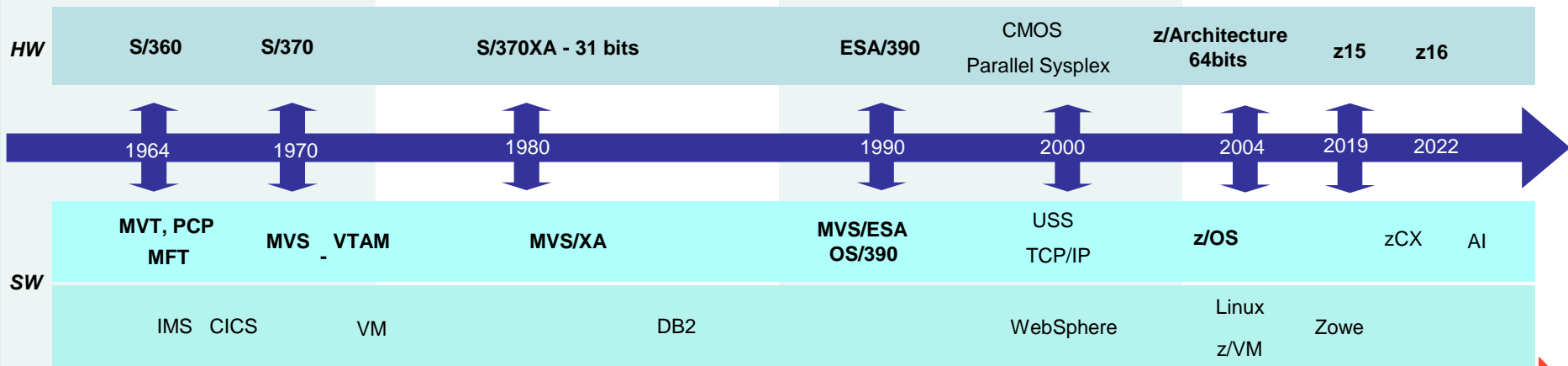
IBM Z – Reliable, Scalable, Secure and Virtualized

An integrated, highly scalable computer system that allows many different pieces of work to be handled at the same time, sharing the same information as needed with protection, handling very large amounts of information for many users with security, without users experiencing any failures in service
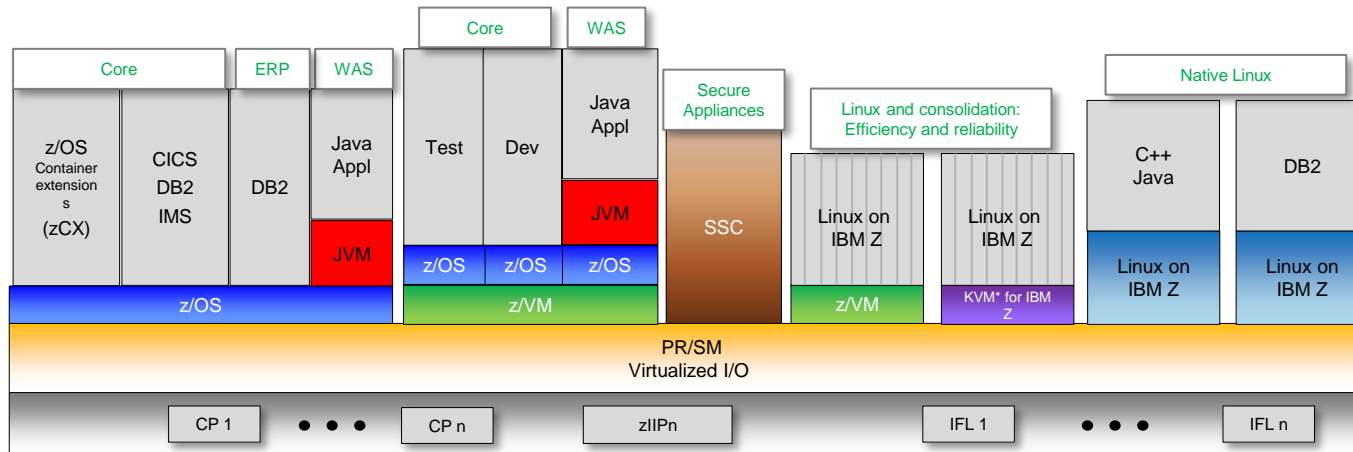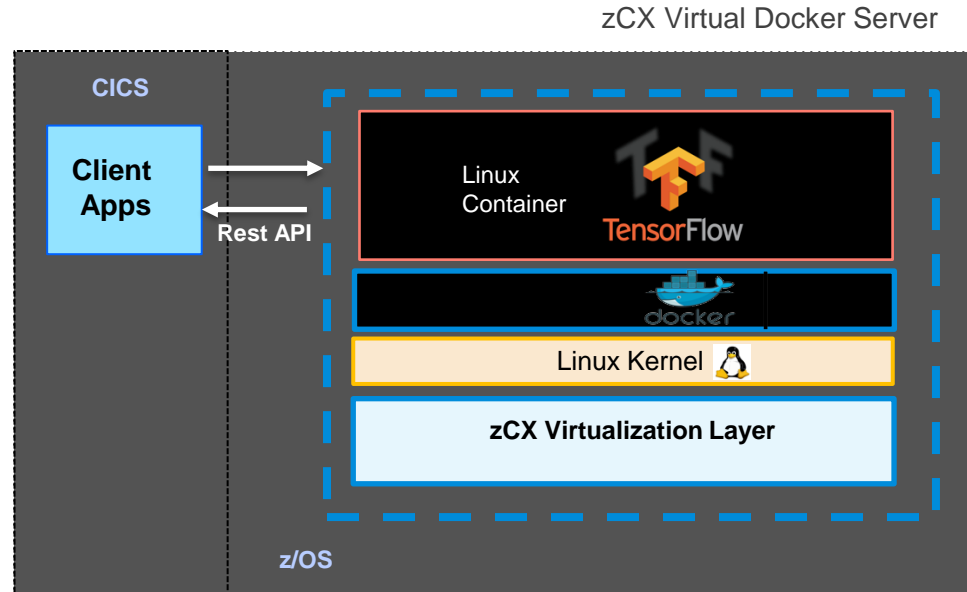

- Large scale, security, robust consolidation platform
- Built-in Virtualization
- 100s to 1000s of virtual servers on z/VM
- Intelligent and autonomic management of diverse workloads and system resources
- z/OS Container Extensions (zCX) enables integration of Linux on IBM Z applications with z/OS
- * Note: The KVM hypervisor is delivered with Linux for IBM Z Distributions (see Software – Linux section)

DevOps
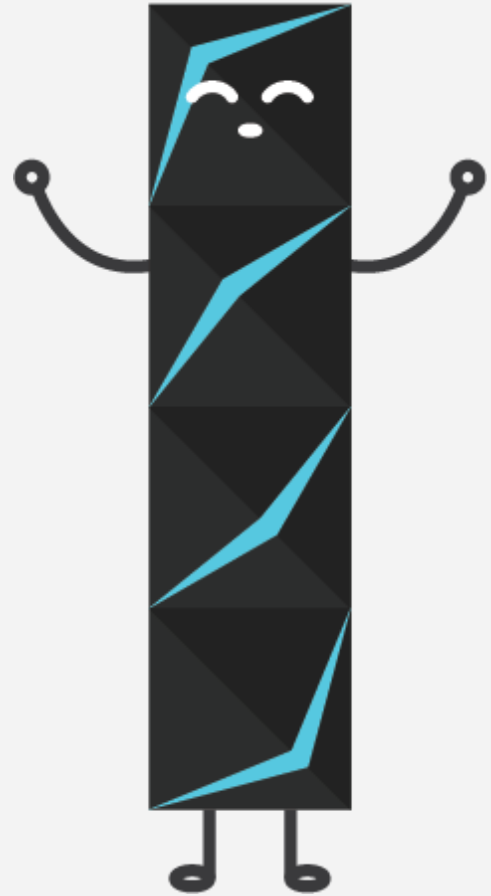
Simplify deployment using z/OS Container Extensions

- IBM z/OS Container Extensions (zCX) helps integrate Linux on IBM Z applications with z/OS

- zCX Provides:
  - Predictable performance and service
    - Fast performance on IBM Z
    - High speed virtual network

  - Support for high availability and DR
    - zCX containers are automatically managed

  - zCX CPU consumption is zIIP eligible

zCX Virtual Docker Server

CICS

Client Apps

Rest API

Linux Container

TensorFlow

docker

Linux Kernel

zCX Virtualization Layer

z/OS

Run TensorFlow in a container on Linux on IBM Z or on a z/OS Container Extension (zCX)

Zowe™

The first open source project based on z/OS.
ZOWE provides solutions that allow development and operations teams to securely, manage, control, script & develop on the Mainframe like any other cloud platform.

Attract new people
- ✓ Demystify the Z platform
- ✓ Enhance integration and consumability
- ✓ Promote Open community of practice
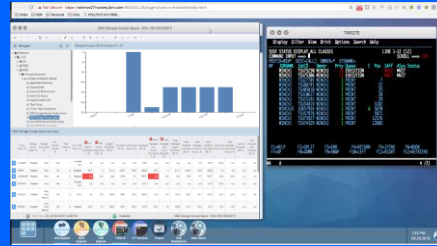
Reduce learning curve
- ✓ Improve productivity
- ✓ Modern, platform-neutral interfaces
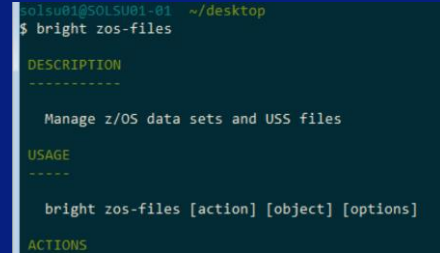- ✓ Cloud-like experience

Simplify architecture
- ✓ Reduce operational overhead
- ✓ Improve co-existence
- ✓ Enable rich ecosystem of free and commercial solutions
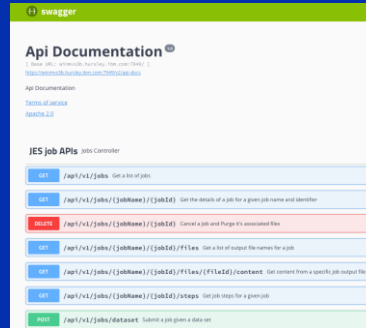
https://www.openmainframeproject.org
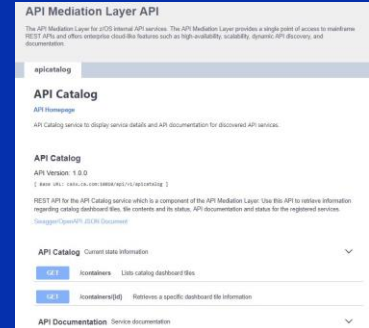
Browser-based web desktop

Node.js based Command line

z/OS REST API & API mediation layer

Swagger-defined

API mediation layer
(Gateway, Discovery Service, Catalog)

Integrated Pipeline Example

End to End DevOps
The IBM Way
Open and Flexible

Code
- IBM Developer for Z
- Z Open Developmen
- eclipse
- appium
- JUnit

Build
- IBM Dependency Based Build (Git)
- Z Open Unit Test
- uBuild
- Gradle
- sonarqube
- Maven

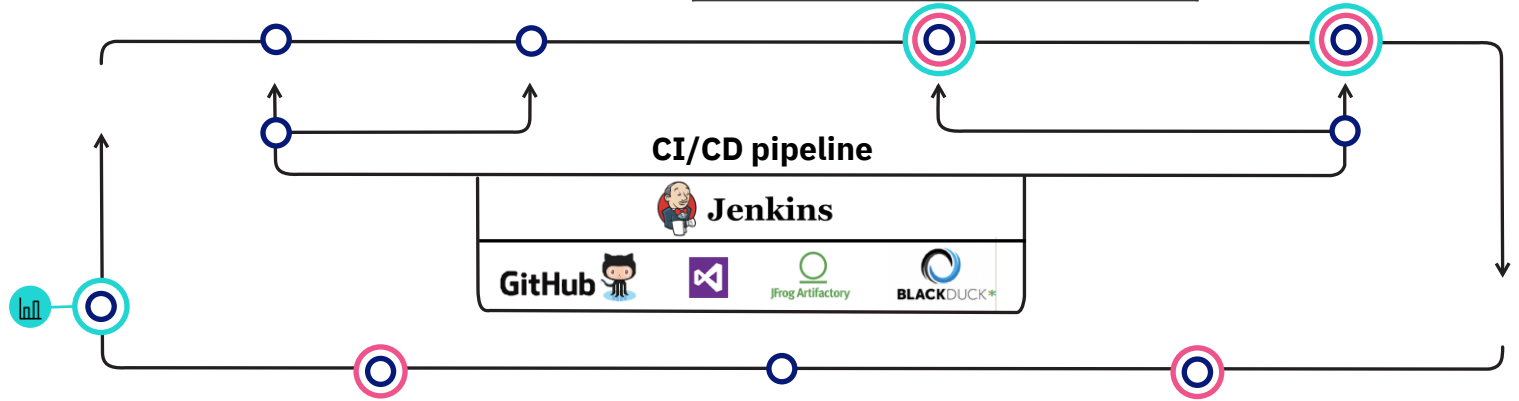## Provision & Deploy
- IBM ZD&T
- urban{code}
- Jenkins

Test
- IBM Z Development and Test Environment
- coverity
- FORTIFY
- RTW

IBM Application Discovery and Delivery Intelligence

splunk>

Analyze

CI/CD pipeline

Jenkins

GitHub · JFrog Artifactory · BLACKDUCK

Plan
- IBM Rational Team Concert
- JIRA · Confluence

Monitor
- IBM Z APM Connect
- OMEGAMON Operational Insights
- APPDYNAMICS

Release
- urban{code}
- cloudbees

LEGEND
- Analyze
- Feedback, approvals