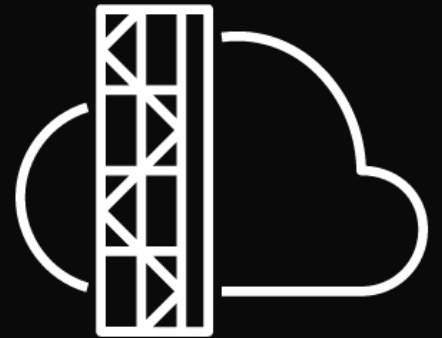


Not your grandad's mainframe!

An Introduction to
Enterprise Computing

Marcus Davage
CEng CITP MBCS
Lead Product Developer
BMC Software Ltd

@spufidoo



What happens in one second?



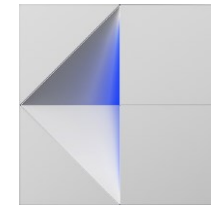
270
TikToks



1.6 million
WhatsApp
messages



98000 uploads
(8.3 hours)



1.2 million
IBM zSystems
transactions



1200 posts

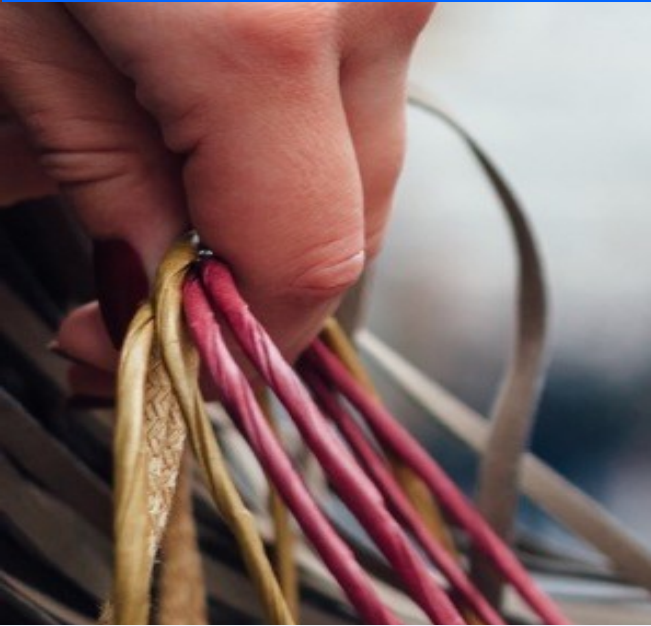


10000
posts



160,000
searches

The backbone of the world's leading businesses



23

**of the top 25
US retailers**



92

**of the top 100
worldwide banks**



23

**out of 25
of the world's
largest airlines**



10 out of 10
**of the world's
largest insurers**



<hello, world!>



System/360

Announced April 7, 1964 and withdrawn March 15, 1977



System/370

Announced June 30, 1970



S/390 CMOS Mainframes

Announced Sep 13, 1994



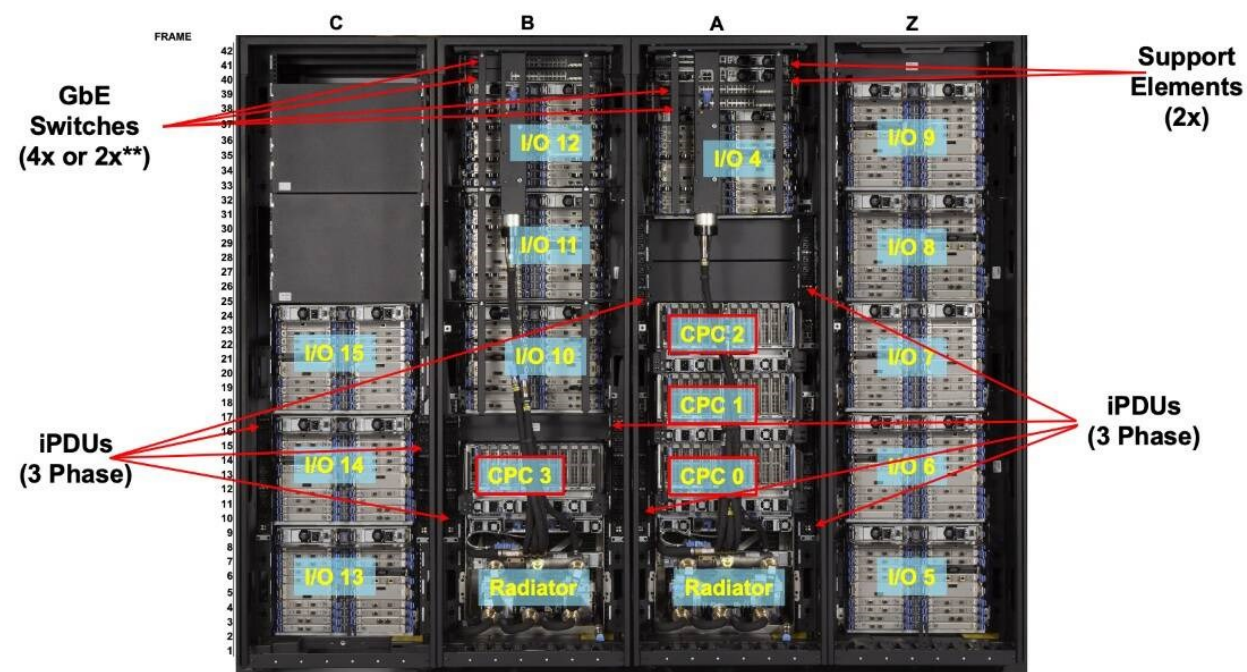
zSeries with z/Architecture

Announced October 3, 2000 (z900)



Z16

Announced April 5, 2022



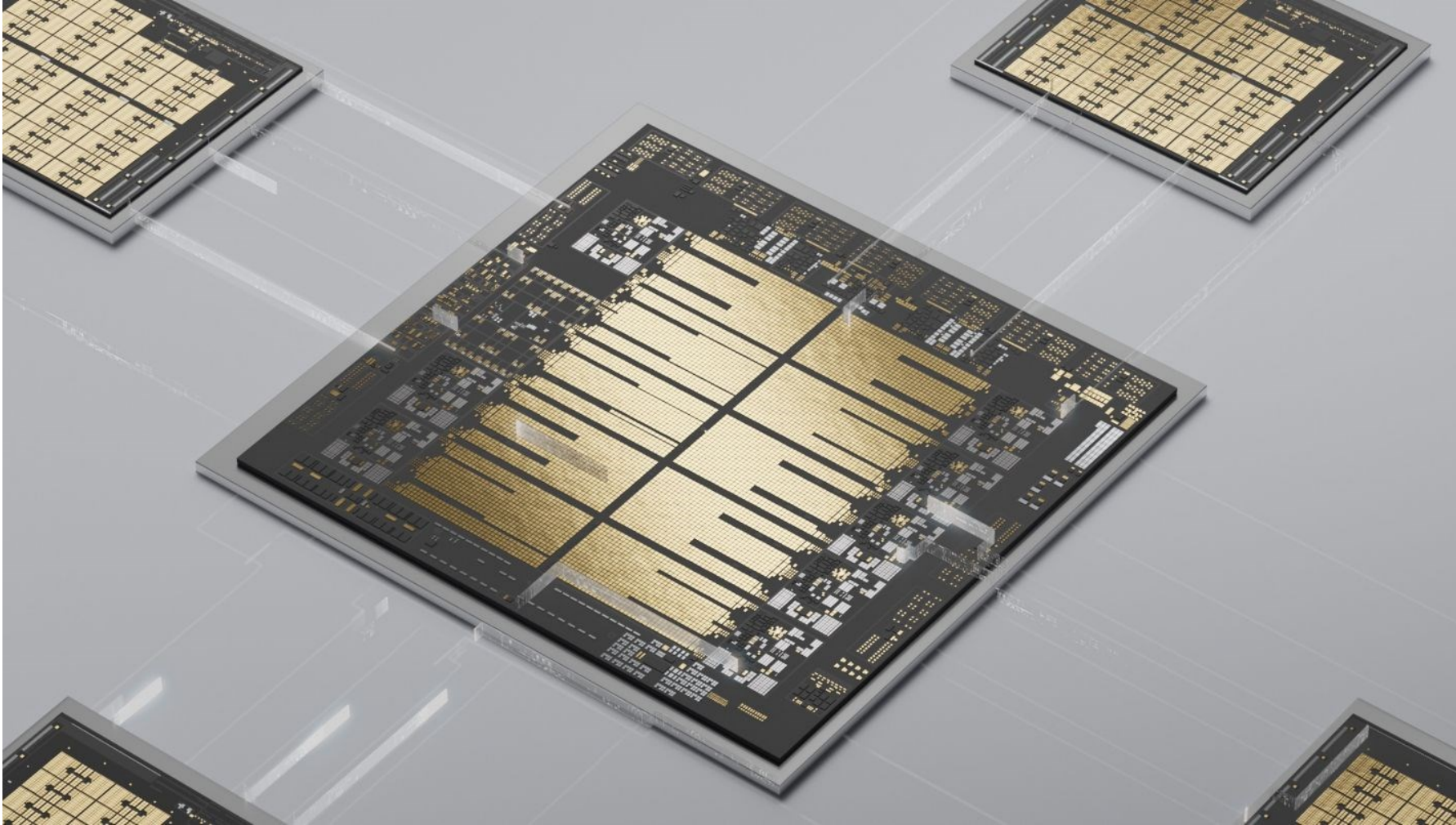
Z17

Announced April 8, 2025



Z17

Announced April 8, 2025



IBM Telum II processor

5nm

8 cores

5.5 GHz

36MB L2 cache

370MB L3 cache

2.88GB L4 cache

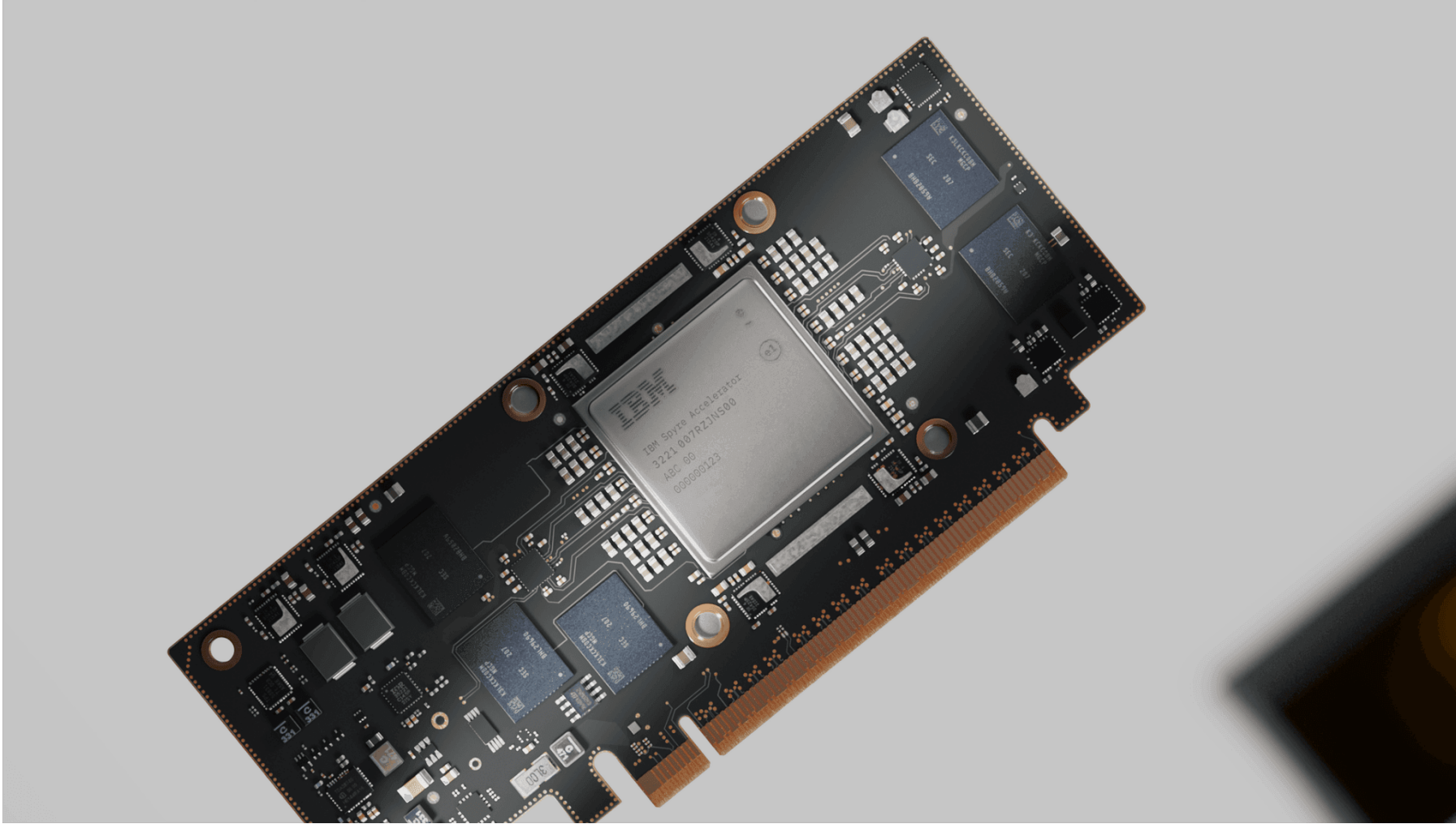
2nd gen AI Accelerator

24 TFLOPs

**64TB over 4 drawers with
208 processors**

Z17

Announced April 8, 2025



IBM Spyre AI Accelerator

- Non-GPU compute**
- Fraction of cost and power**
- 32 cores**
- 128GB memory**
- 26 Billion Transistors**
- 14 miles of wire**
- 5nm technology**
- Max 48 cards**
- Runs LLMs natively on Z17**



System/360
1964



Porsche 911
1964



IBM Z16
2022



Porsche 911 Carrera 4 GTS
2024

Comparing the S/360 with the Z16/Z17

Mainframe	1964 S/360	2022 Z16	2025 Z17
Instructions/s	34,500	300,000	c. 375,000
Memory	8 Kb	40 Tb	64 Tb
Clock Speed	1 MHz	5.2 GHz	5.5 GHz

Comparing

1964 Porsche 911 with the 2024 Porsche 911

Porsche 911	1964	2024
Top Speed	130mph	192mph
0 – 60 mph	8.5s	3.1
BHP	130	473

Comparing Porsche 911 to Mainframes

Porsche 911	1964	2024	Conjecture
Top Speed	130mph	192mph	10,000mph
0 – 60 mph	8.5s	3.1s	0.01s
BHP	130	473	$\times 10^6$

The Reality

92 of the top 100 banks

90% of all Credit Cards

€70,000 Avg Salary

70% of Worlds Data

All of the Top 10 Insurers worldwide

Average Age of a Mainframer is 55-60

63% Increased workload since 2016

30 Billion Transaction a day

71% of Fortune 500

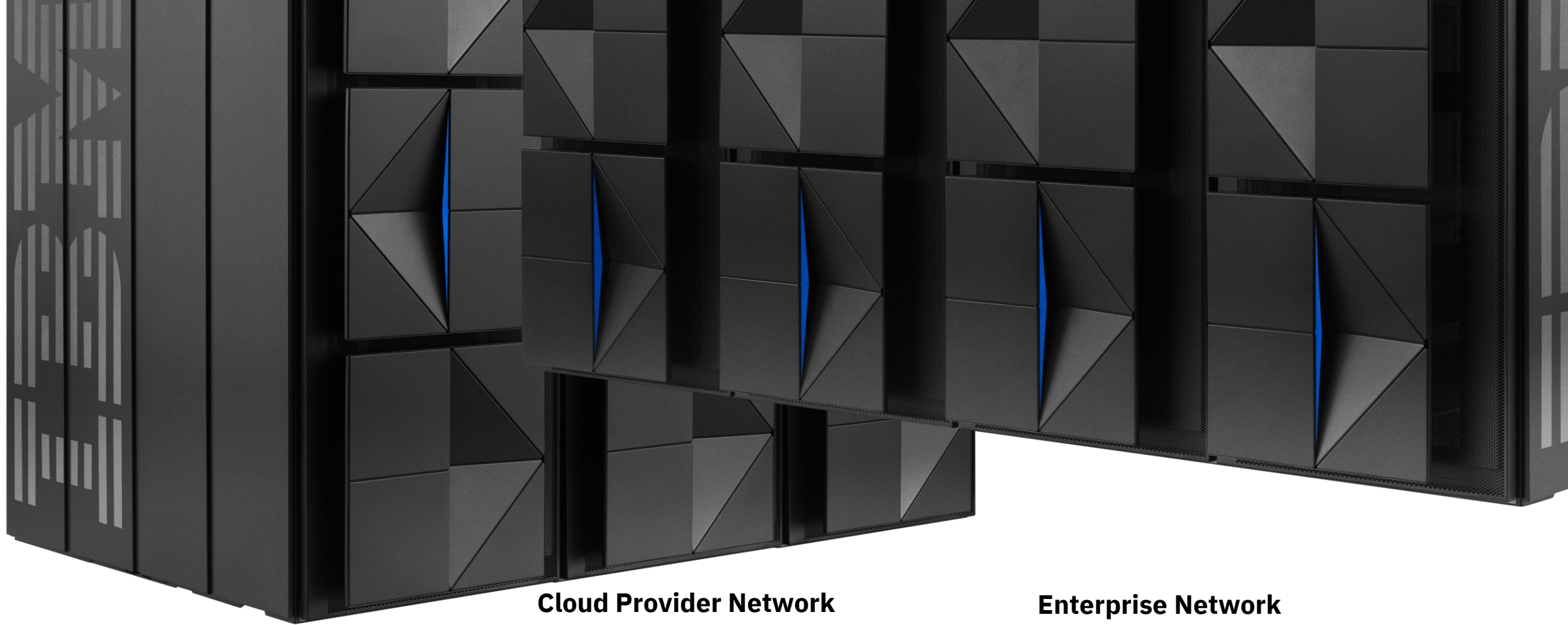
68% Production Workload for 6% cost

Earthquake proof at 8.0 Magnitude Richter scale

What is a mainframe?

IT's Best Kept Secret!

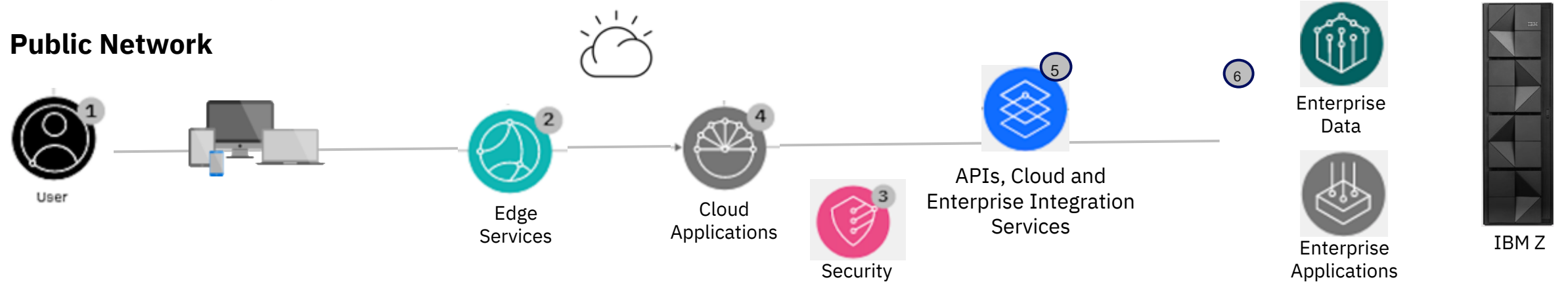




Cloud Provider Network

Enterprise Network

Public Network



Enterprise Computing enables you to work in a wide variety of areas....

Hybrid Cloud



Public clouds like AWS, Azure and IBM Cloud partner perfectly with more secure private cloud options like IBM Z.

Analytics



Insurers are expected to spend approximately \$8.3B, or 8% of their overall spending, with big data and analytics vendors in 2019, growing to \$11.5B in 2022

Blockchain



Insurance Blockchain market is expected to grow to \$1.4B by 2023, at a CAGR of 85%

FinTech



VC investments almost doubled in last two years, 1.7B in 2016 to \$3B in 2018

Artificial Intelligence



AI spending jumped from \$1.1B in 2019 to \$2.6B in 2022 to \$154B in 2023

Internet of Things



The global insurance industry is spent \$27.5B on IoT in 2022, growing to \$168B in 2028.

COBOL

- 2024 is COBOL's 65th anniversary year
- It was originally devised by 3 brilliant women
- There are 250 or 800 Billion Lines of COBOL Code in Production
- 92% core applications are strategic to their organization
- Runs on 90%+ of all Z mainframes
- 85% of all COBOL is on the mainframe
- 58% say COBOL runs on at least two enterprise platforms
- COBOL is supported on over 500 platforms
- 55% expect their systems to last at least 10 years
- 72% think Modernization is their best option
- 43% say Cloud is the main driver for change
- 1 day – training course to learn COBOL
- 16 weeks internal corporate training course
- 140 COBOL courses available online

Growing IBM Z & LinuxONE Open-Source Software Ecosystem

Linux Distributions & Virtualization



Linux Community Versions



Networking & Monitoring



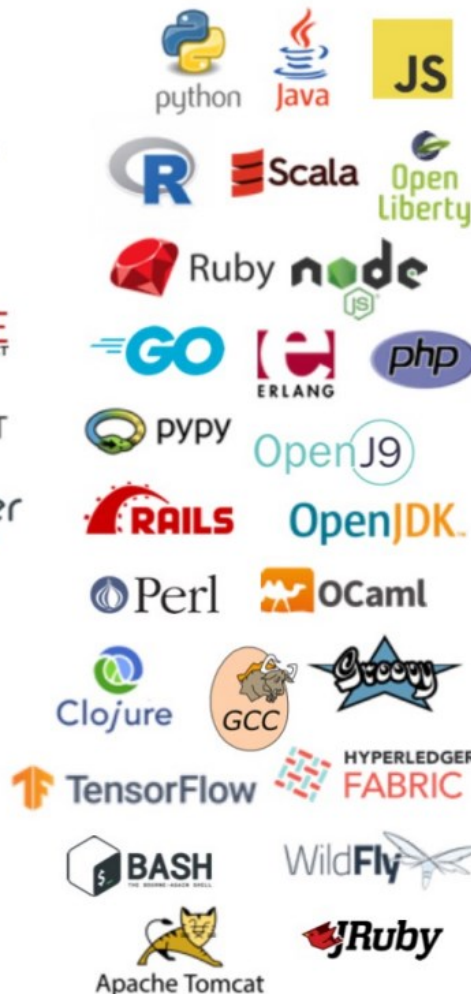
More: hub.docker.com

Cloud & Container Services

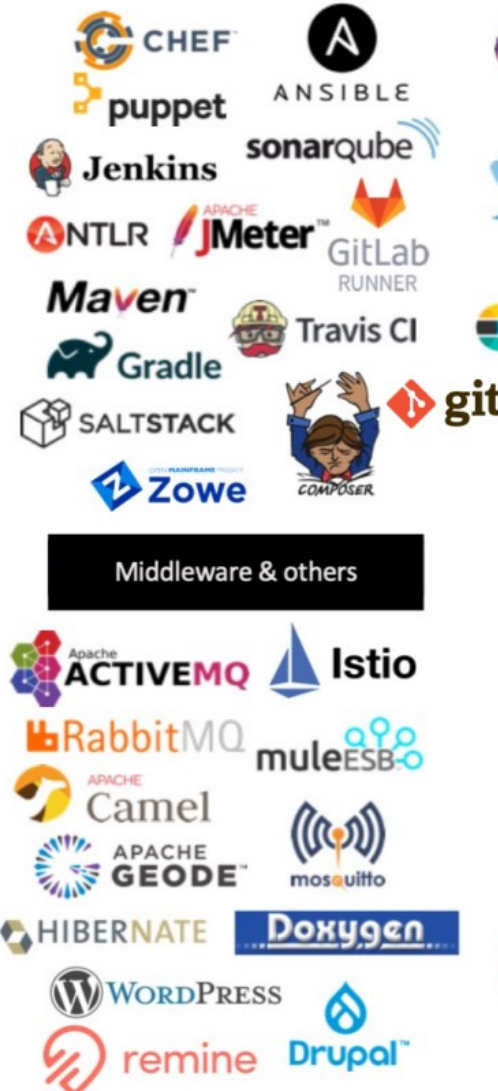


www.ibm.com/community/z/open-source-software/

Languages & Runtimes



DevOps/Automation



Big Data, Observability, Analytics



Databases & Storage



Students pursuing careers in technology are focused on five primary things in a potential career.

Enterprise Computing outperforms other IT roles

Base: US online adults, 18+; 414 IT professionals involved in software development, IT support, enterprise architecture, enterprise computing systems administration/development, data science, etc.
Source: A commissioned study conducted by Forrester Consulting on behalf of IBM, September 2019

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Good salary

● Enterprise computing role ● Other computing role

Average reported starting salary for enterprise computing is **\$70,100** versus \$62,950 of other mixed IT roles.



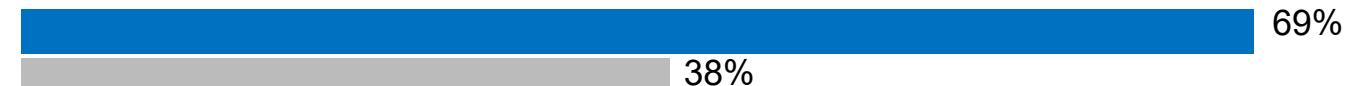
Good work-life balance

A good work-life balance (*% rating 8, 9, or 10 out of 10*)



Ability to make a social impact

Social impact, for example, the ability to contribute to open source, social, or community groups, with your technical skills



Working on something that aligns with primary interests in technology

Opportunity to work with leading-edgetech



Job security/role versatility

Nearly **90%** of professionals in enterprise computing careers agree the job market for their skill set is growing, and **75%** believe there is a shortage (i.e., high demand) for their skill.

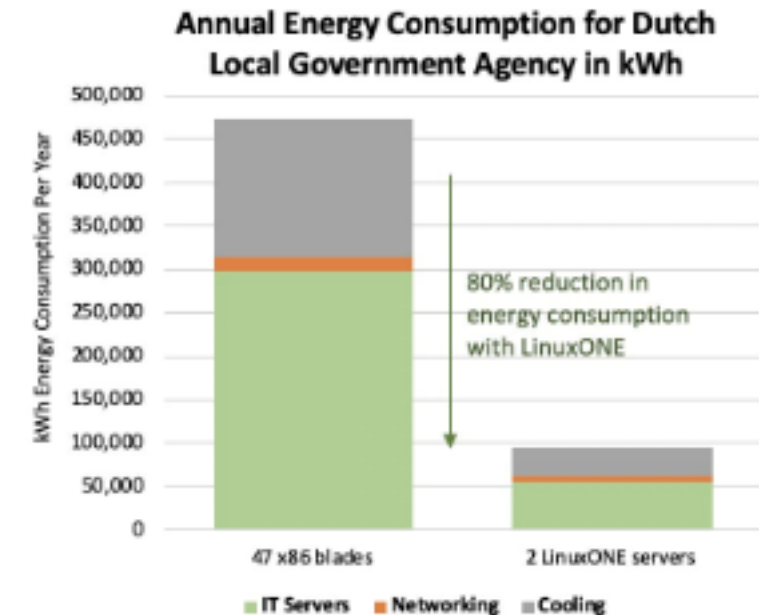
Responsible Computing



“IBM Europe is changing how **European clients** work by leading them on the journey to **hybrid cloud** and becoming a **responsible, cognitive enterprise.**”

Rashik Parmar

IBM Fellow & Vice President Technology



Responsible use of natural resources

Reduce environmental impact of data centers

Responsible Infrastructure

Reduce energy/ computing unit
Reduce precious/ rare metal usage
Recycling of tech

Responsible Code

Efficient coding
Open
Secure

Responsible Data Insights

Privacy
Transparency
Authorized data acquisition
Consent for use

Responsible Systems

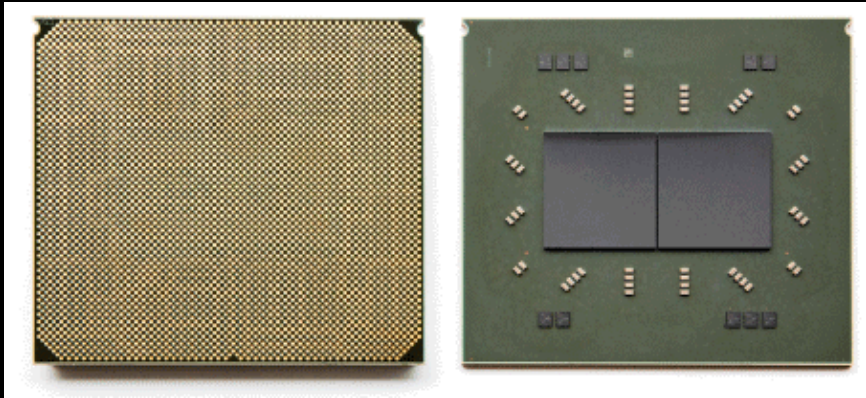
Ethical systems
Unbiased
Explainable AI

Responsible Impact

Tech for good
Address societal issues
Social mobility

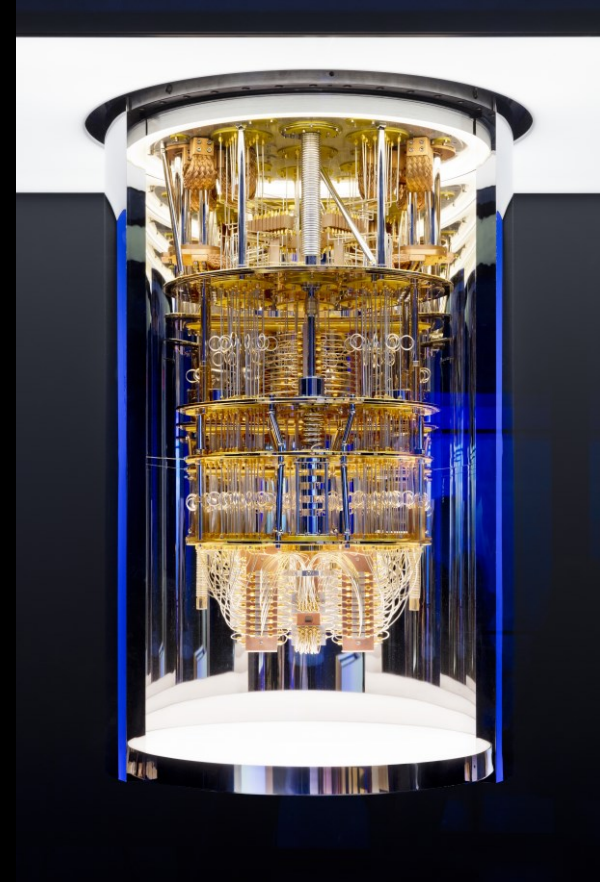
The Future of AI and Cybersecurity is Here

AI in Real Time



Brand new double chip Telum Processor allows for on chip AI acceleration

Future Proof Encryption



Quantum Cryptography pre-empts cybersecurity challenges created by quantum computing

AI is delivering value in every industry

Banking

Examples

- Compliance Testing: account ID take over and identity theft
- Gaming the system – reward cards and account openings
- Interest rate forecasting
- Loan processing & approval

Finance

Examples

- Enable point-of-sale payment processing with fraud detection
- Financial crimes detection, anti-money laundering (AML)
- Wealth management with predictive models

Trading

Examples

- High frequency trading analytics
- Algorithmic trading
- Clearing & Settlements

Insurance

Examples

- Real-time fraud detection for claims and images
- Claims adjudication
- Pricing & actuarial analysis for better risk assessment

Other

Examples

- Supply Chain
- Payroll processing
- Manufacturing
- Scientific research
- Computer design
- Biosecurity
- Mining
- Healthcare
- Airlines

Home / Innovation / Computing

The first IBM mainframe for AI arrives

The next-generation IBM z16 comes with an IBM Telum processor for real-time AI insights.



NEWS

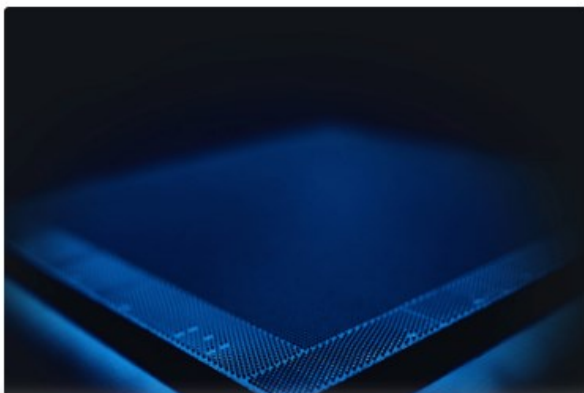
IBM z16 tackles financial fraud and quantum hacks

New addition to Z series mainframe family uses IBM Telum processor to accelerate AI for real-time credit card fraud detection

TOMORROW RUNS

IBM's Upcoming Z Series Chip Gains On-Chip AI Acceleration and New Name: Telum

August 22, 2021 by Todd R. Weiss



In a major refresh of its Z Series chips, IBM is adding on-chip AI acceleration capabilities to allow enterprise customers to perform deep learning inferencing while transactions are taking place to capture business insights and fight fraud in real-time.

IBM is set to unveil the latest Z chip Aug. 23 (Monday) at the

RTI RTInsights

IBM Delivers Real-Time AI for Transaction Processing at Scale

The new IBM z16 offers AI inferencing (delivered via the integrated on-chip AI accelerator IBM Telum Processor) and is designed to analyze...

Apr 7, 2022

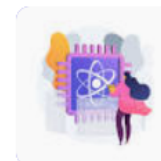


PaymentsJournal

Can Quantum Security & Embedded AI Breathe New Life into Mainframes?

Building on IBM technologies like Pervasive Encryption and Confidential Computing, IBM z16 takes cyber resiliency a leap further by protecting...

Apr 12, 2022



CW Computer Weekly

IBM z16 tackles financial fraud and quantum hacks

New addition to Z series mainframe family uses IBM Telum processor to accelerate AI for real-time credit card fraud detection.

Apr 5, 2022



|T| Tech Wire Asia

IBM z16: Here's why the cloud won't replace the mainframe

The first IBM mainframe for AI arrived not too long ago and it integrates its Telum processor to analyze real-time transactions for...

May 4, 2022

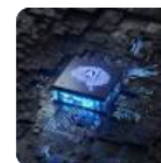


F Forbes

IBM And MLCommons Show How Pervasive Machine Learning Has Become

With its latest Z-Series mainframe computer, the z16, IBM has added ... include classic computing, AI processing, and quantum computing.

Apr 7, 2022



Client Use Cases In Finance & Banking

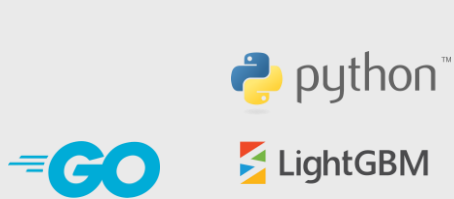
FRAUD DETECTION



Business Challenge
A large US bank was unable to score all transactions in real-time with an off-platform scoring engine. Causing 80% of transactions to go unscored

Business Impact
100% real-time scoring, saving > \$20M in exposure risk per year

Capabilities Leveraged



CLEARING & SETTLEMENT



Business Challenge
A card processor needed to determine which trades and/or transactions have a high-risk exposure before settlement

Business Impact
Enhancement of rules-based approach with no impact to SLAs

Capabilities Leveraged



LOAN APPROVAL



Business Challenge
A large lender needed to speed up their consumer loan approval process, in order to maintain client satisfaction

Business Impact
Reduction in latency of over 1000X, with corresponding decrease in lender risk and exposure

Capabilities Leveraged



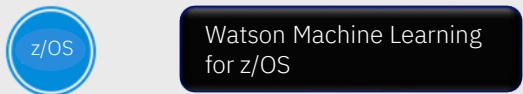
CLAIMS FRAUD



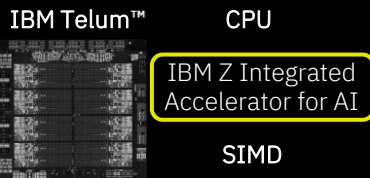
Business Challenge
A state government in the US realized that their process to determine fraudulent claims was manual & intensive and could not scale, taking up to 40 hours per case

Business Impact
Now able to process claims and detect fraud in under 1 minute per case and allocate resources to higher value tasks

Capabilities Leveraged



IBM z16
Platform
AI Stack



Client Use Cases In Other Industries

MEDICAL IMAGES



Business Challenge

A Health Insurer needs to analyze large volumes of medical records, including training computer vision models, while optimizing for energy efficiency

Business Impact

Replace x86 server environments with LinuxONE to reduce energy consumption by x%

Capabilities Leveraged



IBM LinuxONE

Integrated Accelerator for AI

IBM Deep Learning Compiler



ONNX



PyTorch

GEOSPATIAL ANALYSIS & NLP



Business Challenge

A European land registry needs to determine which buildings have been added to, modified, or demolished for land surveys and tax purposes. Also embedding NLP into chat services.

Business Impact

Deploy on IBM z16 to ensure security of data, and optimization of IT and operational costs

Capabilities Leveraged



z/OS

Watson Machine Learning for z/OS



zCX



ONNX

FEDERATED LEARNING



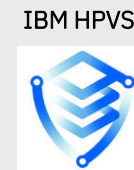
Business Challenge

Organized Retail Crime costs over \$3.5B per year to US retailers, who lack the ability to fully model for the risk as they only have the data for their own business.

Business Impact

Federated learning enables sharing of models, without exposing sensitive data, to catch the bad actors

Capabilities Leveraged



IBM HPVS

Watson Federated Learning



IBM Cloud Pak for Data

DATA REDACTION



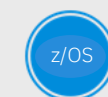
Business Challenge

Due to banking secrecy laws and slow post-processing performance, a European bank was unable to send diagnostic data to vendors to effectively maintain operational stability for their production environment.

Business Impact

Automatic redaction of PI & SPI, resulted in a 47x performance improvement in post-processing speeds

Capabilities Leveraged



z/OS

Data Privacy for Diagnostics

IBM z16 Platform AI Stack

IBM Telum CPU

IBM Z Integrated Accelerator for AI

SIMD



z/OS



zCX



Red Hat



SUSE ubuntu



OPBL



ENAS



python



GO

IBM Deep Learning Compiler



ONNX



TensorFlow



K Keras



ANACONDA



APACHE SPARK



IBM Cloud Pak for Data

Watson Machine Learning for z/OS

Demand for IBM zSystems and Skills

92%

Platform for
Growth and
long-term
applications

72%

X-Large
shops have
majority of
Data on
mainframe

58%

See
availability of
new
technologies
as a key
strength of
the platform

80%

Yield value
from DevOps
adoption in 1
year or less

61%

Rate Security
as top
priority

Demand for IBM Z and Skills

60%

Mainframe
Technology
Specialists
over the age
of 50

71%

IT Leaders
say their
mainframe
team is
understaffed

93%

Say it's
moderately
or extremely
challenging
to find
mainframe
skills

67%

Executives
recognize the
mainframe's
ability to grow
and attract
new workloads

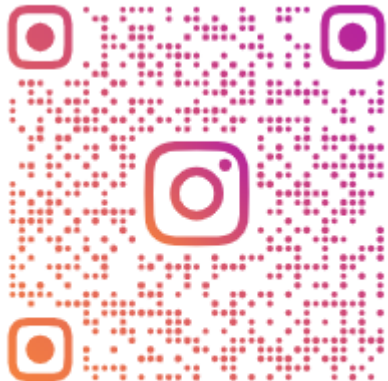
91%

Expanding
their
mainframe
footprints as a
moderate or
critical priority

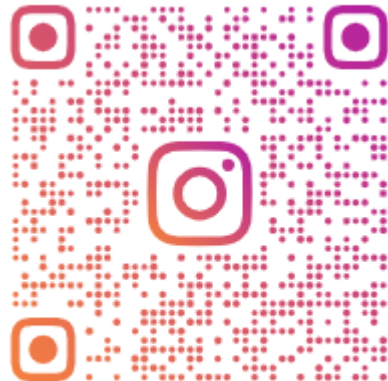
Start a Mainframe Society

Accelerate your mainframe journey and become a tech leader on your campus

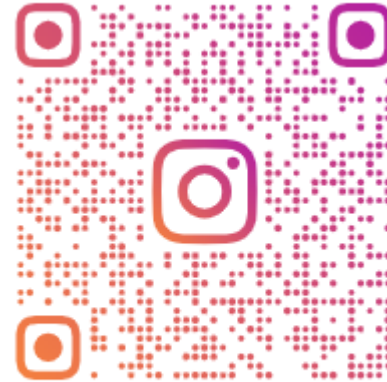
- Run zXplore events
- Develop skills
- Networking opportunities
- Enhance your CV
- Professional Mentorship
- Plenty of help available
- Free attendance at GS UK Conference!



IBMZ.BHAM



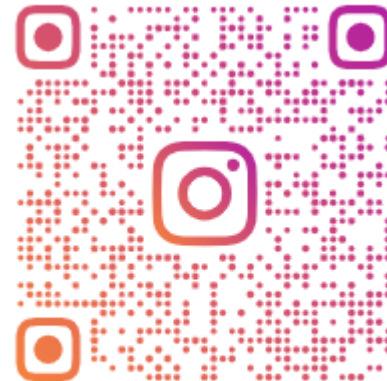
UHIBMZ



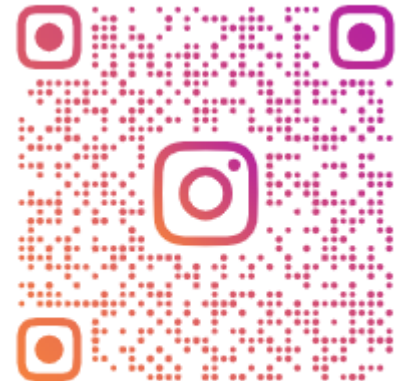
IBMZ.UOM



WOLVESMASS



IBMZ_IMPERIAL



IBM.KCL

Become an IBM Z Ambassador

Accelerate your mainframe journey and become a tech leader on your campus

- Earn technical certification in mainframe technology
- Network with industry professionals and peers
- Gain valuable leadership skills
- Connect with companies who hire for IBM Z skills
- Represent all things IBM Z on your campus
- Represent your University nationally and globally



Apply now!

ibm.biz/z-ambassadors



IBM Z Xplore

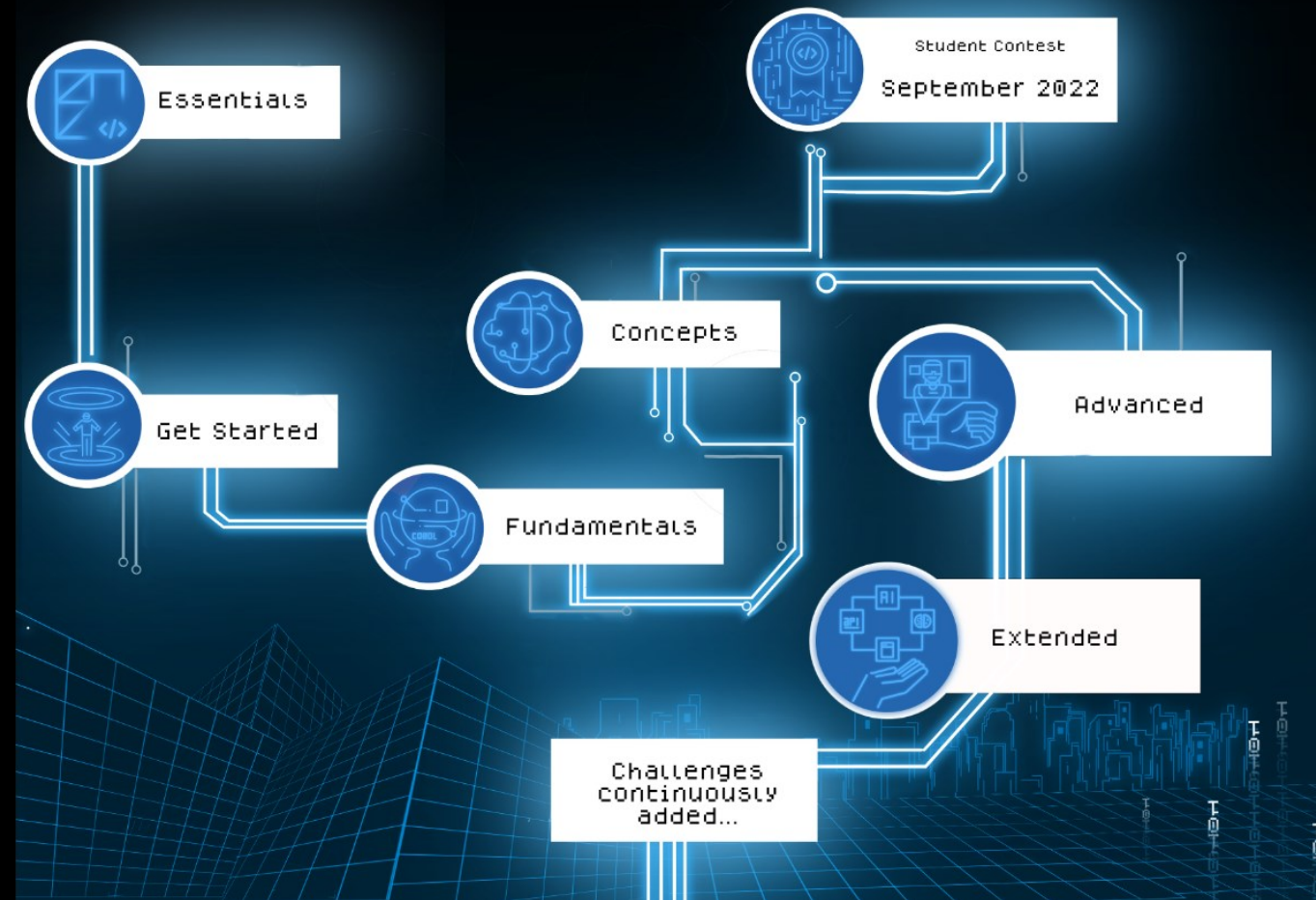
A new learning experience

The new learning platform is a year-round interactive learning platform available for anyone to get hands-on experience across a variety of technologies, to develop valuable skills, and to earn industry recognized digital badges – with **no prior knowledge required!**

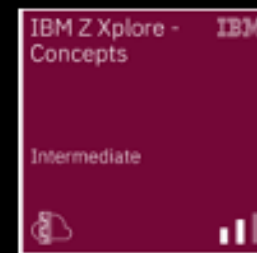
You will find:

- Hands-on Challenges
- Progressive learning paths
- Direct access to zSystem environments
- User community and leaderboard
- Digital badging

Register today: ibm.biz/ibmz-xplore



Concepts
Badge



Advanced
Badge



Upskill, reskill and new skill

IBM Z Xplore is a year-round interactive learning platform available for any learner to get hands-on experience across a variety of technologies, to develop valuable skills, and to earn industry recognized badges – with no prior knowledge required!

You will find:

- Hands-on challenges
- Digital badging
- Direct access to IBM Z environments
- Progressive learning paths
- User community discussion boards

Fundamentals + Concepts:

Fundamentals: Learn about data sets and how to use VS Code. Introduction to coding languages such as JCL, Python, USS, and REXX.

Concepts: Increased knowledge on security, uptime and enterprise scalability. Take a deeper look into enterprise systems and RACF.

Advanced: Further your hands-on learning around REXX, COBOL, Linux, SQL1, Partitioned Data Sets, and more.

Extended: Develop skills surrounding TSO/ISPF, Node.js, MQ, VM, Machine Learning, Ansible, and more.



Concepts Badge



All Star Badge



Advanced Badge

Register today: ibm.biz/ibmz-xplore

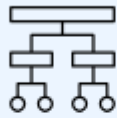


//* IBM Z Day

//* open | on | secure



250+
Speakers



6 Technical
Tracks



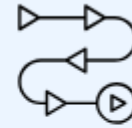
Free Online
Conference



4 Industry-Recognized
Skills Badges



Live
Demos



4 Experiential
Journeys

12 November 2025 | 8AM - 4:30PM ET

IBM Z Day is a free 1-day enterprise computing virtual conference for anyone and everyone! Hear the latest about IBM Z and LinuxONE, and join our lineup of global thought leaders who will highlight industry trends and innovation spanning AI, Hybrid Cloud, Quantum-Safe Security, and more!

