

WHITEPAPER

# The Rockstar in Your Data Center: The IBM Z Mainframe



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# Why read this?

Some CIOs may think it's time to retire their IBM Z<sup>®</sup> mainframe. They may think the technology has become outdated, they may not understand the full benefits they provide, or both. The mainframe has design strengths that, today, make it invaluable to IT organizations for hosting their most important, mission-critical applications. These applications typically include customer order processing, financial transactions, production and inventory control, payroll, as well as many other types of computationally intensive and high-volume tasks. This whitepaper demonstrates why IBM Z mainframes are the best choice to be the bedrock for critical, "can't fail" processing tasks, and why, over the long term, they deliver among the best value in the IT ecosystem.





# Key takeaways

Don't automatically dismiss IBM Z when making strategic decisions about your current and future IT environment. It continues to have significant market and competitive strength, and IBM makes sure it works with the latest technologies, including cloud computing and open-source tools. It's a key innovation player that drives better ROI on core infrastructure while supporting the latest advancements in technology and user experience.

The at-risk platform in large organization data centers is not the mainframe. It's distributed x86 servers that are the real cost and maintenance sinkholes. The modern mainframe of today is an engineering wonder that can handle all of a business's biggest tasks simultaneously—without straining—and pays for itself many times over in unmatched performance, reliability, security, and resource efficiency.

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## Who should read this report?

This report is for anyone responsible for the operation and success of IBM Z mainframes, particularly those who are struggling to convince leadership of the value the mainframe brings to the business. It's also for those considering migrating to distributed systems or re-evaluating a strategy that includes IBM mainframes.





# Executive summary

After five decades, IBM mainframes are still going strong as the backbone of on-premises data centers. Analysts expect the mainframe market to produce a compound annual growth rate of 4.3 percent by 2025<sup>[1]</sup>, increasing from \$2,094 million in 2017 to a predicted \$2,906 million in 2025.

## *A leader since day one*

With systematic updates ever since its inception by IBM, the IBM Z platform was always light years ahead of its time. Originally in high demand because of their unique ability to run any application, legacy or new, without modification, they remain prized for their unprecedented utilization rates, long-term cost advantages, security, scalability, and resiliency. And today, IBM Z works with open-source languages; databases and development tools; runs in the cloud; and can be accessed from Windows, web, mobile, IoT, and web service interfaces.

The mainframe has adapted and reinvented itself, staking and defending its claim as the most powerful business computer in the world. One mainframe can process 2.5 billion transactions in a single day<sup>[2]</sup>, which is the equivalent of handling 100 Cyber Mondays—and over \$790 billion—on one system.

50 years ago, few experts recognized that the mainframe would continue to deliver higher utilization, lower overheads, and low total cost-per-user. Nor did they foresee that mainframes would become far more than tireless transaction processors. Today's business world is a transaction-heavy environment. Everything from the Internet of Things (IoT) and the Industrial Internet of Things (IIoT), to telemetry capture and high-frequency trading creates enormous amounts of transactional data. This information needs to be processed and used at neck-breaking speed to keep production lines running and end-user applications responding. With the IBM mainframe, decades of hardware and software innovations have made the modern mainframe the world's best mixed-workload server on the planet, capable of handling transactions, as well as big data analytics, AI, and almost any other type of task.

[1] *Mainframe Market by Type and Industry Vertical: Global Opportunity Analysis and Industry Forecast, 2018–2025*

[2] *DevOps.com, Mainframes: The Cloud Before the Cloud, Bob Reselman*



Today, the IBM z15™ is cloud native<sup>[3]</sup> thanks to Red Hat® OpenShift® and IBM Cloud Paks®. The IBM mainframe also offers the elasticity, distributed computing, storage, and shared infrastructure needed to reliably move IT environments towards a hybrid cloud strategy, leveraging the exhaustive list of mainframe capabilities for business-critical workloads, and moving less critical workloads to the cloud.

### *Avoiding the pit of the unknown*

Unfortunately, too many businesses make decisions about their IT ecosystems based on acquisition costs and misconceptions in the market. There is no understanding of the long-term value, multi-purpose uses, exceptional security, data integrity, resilience, and innovation potential of a centralized IT infrastructure with an IBM mainframe at its heart.

Many businesses have made the mistake of attempting to duplicate what the mainframe already is—and has been—for decades. They spent millions of dollars and years of resources migrating to distributed servers with higher deployment and maintenance costs. And, they had to rewrite software applications that have been customized over decades to closely align to the company's unique way of doing business. The difference with a mainframe is you get the core technology needed to run a secure and reliable system that's far less complex than managing multiple disparate servers, without having to spend the energy to rewrite complicated, custom applications to a new environment.

### *Not going away anytime soon*

The mainframe continues to power the world's most demanding enterprise computing needs. It's used today in <sup>[4]</sup>:

**67** of the Fortune 100

**8** of the top 10 Insurers

**4** of the top 5 Airlines

**44** of the top 50 Banks

**7** of the top 10 Retailers

<sup>[3]</sup> IBM.com Cloud native development

<sup>[4]</sup> IBM Community "Happy Birthday Mainframe", Hans Joachim Picht



If you look closely, it's easy to see why. The IBM Z mainframe has more than stood the test of time. It can:

- 1** Power critical employee- and customer-facing business processes

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- 2** Carry more and more business-critical workloads simultaneously

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- 3** Run reliably with little hands-on management, low overhead, and low TCO

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- 4** Protect against data loss and cyber-attacks through its legendary resiliency and built-in security

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- 5** Support the latest computing technologies like machine learning and big data analytics

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- 6** Keep up with future demands due to IBM's ongoing development

IBM Z and z/OS are more than ready to be a part of your digital transformation and other IT strategies. Now you just have to convince your CIO.





# The IBM Z platform does what?

## 10 facts for your CIO

Consider the words that come to mind when someone says “mainframe.” Outdated? Rigid? Incompatible? Too expensive? Then reconsider.

While it’s true mainframes have been around for more than 50 years, they are far from computing dinosaurs. They empower businesses to use the latest technologies, tools, and processes to reimagine business and drive innovation, all without having to rewrite existing applications onto distributed systems.

We’ve all heard the story so many times, we could tell it in our sleep. An eager new CIO joins a company and their first order of business is to get rid of the mainframes. They often spend millions of dollars and years trying to move to x86 servers, only to realize it wasn’t possible, nor did it make sense. But the IT leaders with experience using mainframes love them. They realize the value of the mainframe to the business, often increasing the usage of the mainframe over time because only a mainframe can provide a single, unified, efficient solution to a host of different challenges. The proof: IBM has grown usage, as measured by million instructions per second (MIPS), by 350% over the past ten years. In a 2020 Deloitte survey <sup>[5]</sup>, 74% of respondents said the mainframe has a long-term viability as a strategic platform for their organizations.

So, let’s look closer to better understand why the mainframe isn’t going anywhere anytime soon.

<sup>[5]</sup> Deloitte, 2020 Mainframe Market Pulse Survey





## Fact 1:

### IBM Z leaves no code behind

IBM Z mainframes enable business data-processing operations to grow without the enormous expense of rewriting vital programs. With IBM Z, you can run applications written in COBOL and legacy applications like ERP software without touching a line of code. In addition to that, IBM Z supports popular open-source tools and modern technologies. Developers and programmers can use their favorite open-source languages (such as Node.js, Java, Python and JavaScript); development tools (such as Git, GitHub, Jenkins and Ansible); and just about any open-source technology that can run on Linux/UNIX and Windows.

You no longer have to develop and work with proprietary tools. z/OS has been brought completely into the world of modern application development with development teams able to take full advantage of modern processes (Agile development and DevOps), including open-source managers such as YUM to keep open-source components up to date. Open source is enhancing and extending IBM Z's capabilities into areas such as hybrid cloud, artificial intelligence (AI), blockchain, machine learning (ML), analytics, and the IoT. You have the freedom to choose where to take your IBM Z applications next and decide what new business challenges you want to address.

Then there's Zowe, an integrated and extensible open-source framework for z/OS, developed in a partnership between Rocket® Software, IBM, and Broadcom. Zowe, like Mac OS or Windows, comes with a set of APIs and OS capabilities that applications build on and includes some applications out of the box.

Zowe offers modern interfaces to interact with z/OS and allows you to work with z/OS in a way similar to what you experience on cloud platforms today. You can use these interfaces as delivered, or through plugins and extensions that are created by clients or third-party vendors.

Because it can run anything, IBM Z is the ideal platform to future-proof your business. Software frameworks and operating systems come and go. Any applications created for the mainframe using older frameworks or new programming languages still run on IBM Z.



## Fact 2:

**IBM Z is legendary for virtually limitless processing power and data integrity**

The IBM Z architecture is built for organizations that need to process thousands of transactions per second with infallible security and reliability. But IBM Z goes beyond pure transaction processing. Its robust, reliable, and rapid power handles all major computing functions, all in one place.

In banking, for example, people can check their balances, make purchases and transfers, and deposit their checks online using their mobile devices and cloud technology. The transactions are uploaded remotely via mobile to the cloud to be processed and filed away by a mainframe. And the mainframe handles those important financial transactions in a way that ensures data integrity and proper transaction management through protocols like IBM Customer Information Control Systems (CICS) Transaction Server. At the same time, the mainframe has the muscle to monitor for signs of fraud, perform analytics in real time, and more. In other words, banks can not only be confident in the integrity of their customers' transactions, but they can also gain actionable insights while transactions are taking place. No other platform can claim that level of transaction certainty and data integrity.

Other types of industries benefit, too, from this virtually limitless machine with robust processing protocols and security. The mainframe can run mission-critical applications and anything else they want to throw its way at the same time.



### Fact 3:

#### IBM Z is endlessly resilient

If your CIO can't sleep at night for fear of downtime, mention 99.99999% availability in your next conversation with him or her. That's less than five minutes of downtime per year, and no planned outages. The anxiety of not achieving the highest service levels, not supporting your most critical workloads, or not recovering applications and data without data loss, dissolves. It's more than just a good night's sleep: it's a business differentiator.

IBM Z is synonymous with resiliency, meaning that your business is able to meet the highest service levels, recover applications and data quickly, deliver continuous service, and reduce the impact of disruption. While it's handling your critical workloads, it can also store hundreds of immutable copies of data for forensic analysis and to restore production systems.

And let's not forget, these critical workloads are not obscure unknown processes happening in the back room somewhere. When we say business-critical, we mean it. They're all the processes that form the backbone of modern society: your ATM withdrawal, patient records, claims processing, manufacturing inventories, unemployment claims, air traffic control, and more.

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### Fact 4:

#### IBM Z and z/OS scale infinitely

The old days of the data center, when things were simpler and you knew who your users were, are over. Now your users are people (or IoT sensors, or machines, or any number of smart devices) from everywhere in the world. You don't know how many there are or what they plan to do within your IT ecosystem. So how do you deal with this uncertainty?

IBM Z and z/OS give you near-infinite vertical scalability. When you need more capacity to meet peaks in demand, you can turn it on and pay as you go. They offer full virtualization, without any fuss. It's completely transparent to your applications and users. There is no need to take the time to buy and deploy another server and integrate it into the network—not to mention adding to the expense of maintaining a sprawling server farm.

If you don't want to expand capacity on-premises, you can extend into private, public, and hybrid clouds with utmost security. For example, you can isolate and protect large numbers of workloads from internal and external threats across a hybrid-cloud environment.





## Fact 5:

### IBM Z and z/ OS give you IT flexibility

IBM Z and z/OS provide a rock-solid hardware and operating system as a foundation. From there, you have the flexibility to tailor the environment to your unique business needs. Choose your own database and storage, your preferred transaction manager, even run Red Hat Linux on IBM Z.

With IBM Z, you get a proven bedrock on which to build that preserves all the previous IT investments you want to keep, with the ability to modernize and adopt newer, more advanced technologies such as open-source operating systems and applications. All of this provides you the freedom to choose where to take your IT infrastructure, depending on your next big business venture.

Balancing the needs of a business is critical as well. Using workload management capabilities, you can assign priorities to different business applications. For example, during a retail sales spike, preference may be given to enable a larger volume of retail transactions while ERP and HR processing may be slowed down. X86 servers, on the other hand, typically dedicate a processor or cluster of processors to a specific task to avoid spikes. As a result, analytics and transaction processing may occur on totally separate infrastructure. On IBM Z, resources and data can be federated, without fear of system resources being compromised. A business can add fraud analytics together with transaction processing to prevent an activity from occurring. Other systems handling the two processes separately will likely detect issues after the fact. The business then has to attempt to recover from that loss. This makes the mainframe a game-changer in the overall costs of doing business.





## Fact 6:

### The mainframe can be an essential part of your hybrid cloud strategy

One of the main reasons why mainframes are thriving is that they are well-suited to be a trusted, efficient architecture for enterprise organizations delivering intense hybrid workloads from booking travel, to reducing fraud in online banking. The mainframe offers the elasticity, distributed computing, storage, and shared infrastructure needed to reliably move workloads into hybrid cloud environments.

Many business and technology leaders are relying on both the cloud and mainframe to lead digital transformation efforts to achieve peace of mind, with speed, security, versatility, elasticity, and scale on demand in a hybrid environment. IBM's open hybrid cloud approach delivers greater velocity and value from transformation strategies, on average, 2.5 times more than siloed approaches.

Today, IT leaders are looking to their cloud, mainframe, and open-source investments to improve organizational ROI and adapt to change. By combining the market-leading open platform from Red Hat with IBM industry expertise and cloud capabilities, enterprises can better accommodate changing business and regulatory needs. IBM's fully managed Red Hat OpenShift service provides the enterprise scale and security of IBM Cloud to automate updates, scaling, and provisioning. It also offers the resiliency to accommodate unexpected surges in demand.

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## Fact 7:

### IBM Z reduces risk

Moving applications to a new platform often calls for abandoning your core application investments. It can also add enormous costs and risks to your business with complex migration projects, large upfront licenses, new hardware, and change management. There are countless stories of multimillion-dollar failures in which companies attempted to completely switch over to other platforms.

IBM Z can do about anything any other platform can—probably faster, and more reliably and securely—with no replatforming or replacement of systems, and no software rewrites. Actively supported by ongoing development by IBM, IBM Z will run your core applications for a long time coming and will be ready for anything new your business needs.



## Fact 8:

### IBM Z offers unmatched security

You rarely hear about hackers going after mainframes. That's because it hardly ever happens.

IBM Z mainframes are designed from the ground up to ensure isolation of workloads at scale, protect against insider and outsider attacks, deliver continuous service, and mitigate downtime. Security is built into the IBM Z hardware and z/OS by design. For those instances in which an attack on your mainframe does happen, it likely will be through a weakness in user authentication, namely password policy. In addition to integrated security, you can run multi-factor authentication for the mainframe itself, and or its applications, for an added level of defense against breaches.

Considering a move to the cloud? The obvious reasons why are flexibility, responsiveness, and perceived cost savings—but security risks are a major concern. As the most securable system, where the system rather than applications is responsible for security, IBM Z mainframes protect your critical applications and sensitive data across hybrid clouds, with the industry's most innovative encryption, data privacy, and cyber resiliency capabilities. Businesses can actually write less code because the majority of authentication, access control, and audit functions are performed by the system. The ideal platform for sensitive data and critical applications in the cloud, IBM Z can protect your data and manage privacy by policy across your ecosystem.

Any business considering “offloading” applications from the mainframe must reconsider all of the built-in security functions inherent to the mainframe. The memory protection available within the mainframe to inhibit things like Trojan horses and viruses doesn't exist on other hardware architectures.





## Fact 9:

### **IBM Z has the lowest total cost of ownership (TCO) and operating costs**

The elegant simplicity of the IBM Z mainframe's centralized architecture—combined with the collective effort of generations of mainframe professionals to perfect mainframe operations over multiple decades—has resulted in platform TCO that is incredibly efficient.

With IBM Z, IBM does the heavy lifting, starting with the industry's best hardware and operating system and updating it every year based on industry trends and customer requirements. That translates to far less work for CIOs and IT teams, and far lower cost of ownership.

With updates handled by IBM, the next consideration is operating costs, and the main question is, why would anyone want to manage a giant server farm on-premises and pay for all the IT personnel costs and software required? The up-front cost of a single box might be more attractive, but what then? A sprawling client-server farm snowballs into a distributed and costly update-configure-manage-monitor-recover nightmare.

The software and labor costs for servers grow linearly. The more servers you add, the more software licenses and system administrators you need. And yet, the mainframe delivers higher utilization, lower overheads, and the lowest cost-per-user of any platform. IBM Z and z/OS also reduce costs by sharing resources across different applications running at the same time.

Training costs, too, are also minimized with the IBM Z mainframe family. IBM Z supports the latest modern user interfaces to promote employee productivity and skills portability.

When it comes to TCO, the last computing platform standing in enterprise data centers will be the IBM mainframe. Not the old-school mainframe, but today's inventive wonder that supports Linux, Java, C++, Hadoop, Spark, and so on, while still optimally executing all your investments in software, unchanged, from years ago.





## Fact 10:

### IBM Z transforms user experiences

Put that IBM-Z-means-100-green-screens picture in your CIO's rearview mirror.

Having moved far beyond just patching on a new UI, developers now easily re-engineer critical business processes using the latest UI and interface languages (such as HTML5, Node.js, Angular and React) and tools, including open-source software for native z/OS application development. They can deliver full-bodied modern user experiences that can automate or streamline processes for customers, business partners and employees all while reducing the need for training or additional support. You can attract and engage today's most innovative programmers to deliver the modern, intuitive experiences that people expect and business demands.

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## Now, go challenge your CIO

Using the IBM Z, you have an all-in-one processing powerhouse that not only handles your critical transactions, but also, simultaneously, anything else the business needs, from big data analytics to AI. The IBM Z becomes the most secure, worry-free part of your IT ecosystem, and you never have to worry again about the risks of re-platforming or the expense of rewriting legacy code.

With IBM Z, IBM makes constant updates, meaning CIOs have far less to worry about, and lower TCO. Although the acquisition cost may seem high, the investment is more than worth it in the long run.





# Next steps and additional resources

You can read more about IBM's strategy and roadmap for the IBM Z and z/OS [here](#).

Want help, moral support, and/or more ammunition for your CIO conversation? Contact [Rocket Software](#).

We're a trusted, strategic IBM partner, with a relationship that began over 25 years ago. Our partnership spans multiple IBM brands, solutions, and platforms, including IBM Z and z/OS. Our ranks include 21 IBM Champions for 2021, and our ecosystem includes Rocket.Build, an event that pulls together hundreds of talented IBM Z, i and OSS developers—all of whom love a good hack and get together annually to solve a world-changing problem (or two). Come join us.

And remember: Legacy Powers Legendary™

# Rocket Software

Rocket Software has decades of experience helping organizations bolster their legacy infrastructure and bring about legendary results. Rocket helps customers implement low-risk, effective modernization strategies and solutions so they can take advantage of all the latest technologies. Contact us today to get ahead of your competition and stay there for the next decade.

## Rocket modernization portfolio for IBM Z includes solutions for:

- **User experience:** Easily create rich, modern experiences through browser-enabled user interfaces for IBM Z applications
- **API and automation creation and management:** Access host-based business and screen logic via APIs to drive productivity, without COBOL coding expertise
- **DevOps:** Agile software development and deployment tools leveraging open-source technology
- **Mobile Terminal emulation:** Anywhere, anytime host access at a fraction of the cost



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