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IBM'S ENTERPRISE PLATFORMS FOR DIGITAL TRANSFORMATION
THE CLOUD, CYBERSECURITY, AND THE MAINFRAME

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WHY MAINFRAME EVOLUTION MATTERS

The financial services industry is evolving with a new competitive landscape driving changes in firms' IT and technology needs. But there are still IT platforms that provide the infrastructure to process the mission-critical workloads and transactions for most of the largest institutions globally. As institutions are increasingly deploying selected workloads into a cloud environment, including traditional on-premise, private cloud, and public cloud, they struggle with how this mission critical infrastructure fits into these new environments. Although there are advantages cloud can offer, many applications have not been deployed in the cloud for reasons like vendor lock-in and security concerns, among other things.

Figure 1: IBM Z Footprint in Financial Services

87% of all credit card transactions	**400 million** retail transactions	**29 billion** – more than half of the world's ATM transactions

Source: IBM, 2019

Many institutions are looking at how to best leverage mainframe applications and data to advance long-term strategic planning. The mainframe will continue to be an asset within large tier 1 institutions, no matter the transformation strategy. In this environment, it is crucial to optimize all existing infrastructure.

The release of the IBM z15 is positioned as the company's answer to the age of cloud computing, evolving to meet the needs of hybrid cloud deployments, leveraging investment in data and applications, and adding features and functionality to complement this strategy. IBM sees z15 as having tools and capabilities needed to modernize towards the cloud and protect enterprise applications and data.

Context
On September 12th, 2019 IBM released its update to IBM Z, the IBM z15, (called "z15" hereafter for simplicity). In preparation for the release, Celent received two briefings by relevant subject matter experts and product heads involved in the update.
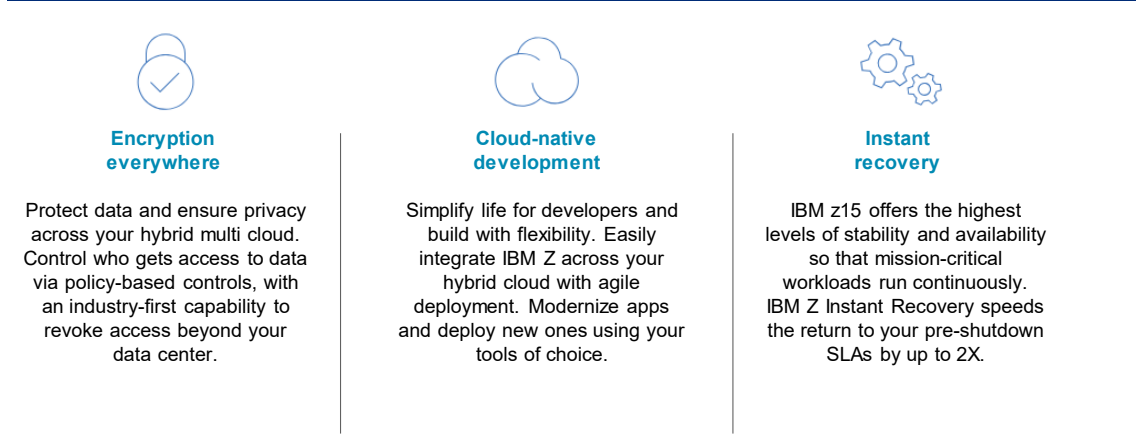
KEY BRIEFING TAKEAWAYS

IBM z15 and the Role of the Mainframe in Cloud Adoption
- In addition to its traditional role as a platform for very large transaction and data-intense missions, IBM z15 is positioned to be a critical component within a broader cloud adoption strategy and hybrid cloud deployment model.
- IBM points to z15's enhanced capabilities for "encryption everywhere" – protecting data and privacy in transit or at rest, inside or outside of your datacenter, with the ability to manage and revoke access to data anywhere in an institution's hybrid multicloud environment.
- IBM states z15 offers increased resiliency in terms of what it calls an "instant recovery" capability from either planned or unplanned downtime lessening the impact of maintenance windows and the rare unplanned outage.
- IBM intends to port the OpenShift capabilities Red Hat to z15 and LinuxONE, recognizing the move towards cloud-native development.
- Its announcement also highlighted the ability to run containerized Linux applications on z/OS and access z/OS services from cloud-native apps running elsewhere. There are more

than 2 million developers using OpenShift, bringing cloud-native application development, modernization, and deployment much closer to IBM Z.

- The z15 will also support IBM's digital transformation initiative, a joint offering of IBM's consulting and hardware businesses.

Figure 2: IBM z15 Key Upgrades

Encryption everywhere	**Cloud-native development**	**Instant recovery**
Protect data and ensure privacy across your hybrid multi cloud. Control who gets access to data via policy-based controls, with an industry-first capability to revoke access beyond your data center.	Simplify life for developers and build with flexibility. Easily integrate IBM Z across your hybrid cloud with agile deployment. Modernize apps and deploy new ones using your tools of choice.	IBM z15 offers the highest levels of stability and availability so that mission-critical workloads run continuously. IBM Z Instant Recovery speeds the return to your pre-shutdown SLAs by up to 2X.

Source: IBM

Encryption Everywhere

- IBM introduces pervasive encryption to data traveling beyond the borders of the data center
  - It extends that protection to data on platforms other than IBM Z as well
- The keys to on-chip accelerated compression include:
  - Reduced data size and improved workload execution times
  - 6x compression ratio for storage, 42x faster with on-chip acceleration than industry-standard software compression
- IBM Data Privacy Passports protects data as it moves through the enterprise
  - IBM introduces the concept of "passport" meaning that the protection, privacy and access controls travel with the data wherever it is – not just on the originating platform
  - Ensure data protection and privacy with IBM Data Privacy Passports throughout the hybrid cloud
  - It allows for extended managing of roles and restrictions (admins can see who has viewed and affected data stores; Personas are given individual access and parameters) and simplifies compliance reporting
    - Protection, privacy, and proof are the foundations of the data privacy passports
  - Extend pervasive encryption throughout the enterprise with no application changes and no impact to SLAs—100% data encryption at rest
  - Protecting data and privacy on the platform and managing access and revocation throughout the enterprise

Advantages of the Hybrid Cloud Environment

- The z15 is designed to work seamlessly in a hybrid cloud and multicloud environment.
- A hybrid cloud infrastructure is one that supports the use and mixed deployment between on-premise, private cloud, or public cloud including multiple public clouds.
- Hybrid cloud becomes vastly more important as firms try to optimize the operations and development across their on-premises infrastructure, private clouds, and public clouds.
- Workloads deploying in a hybrid cloud will require institutions to have a well-developed cloud services strategy (interoperating with all cloud platforms).

- We have seen financial service firms running in all these environments. A key to driving efficiencies is effectively managing all aspects of creating and managing applications in a mixed infrastructure.
- Private cloud is often preferred for highly secure transactions which institutions aren't comfortable (or are prohibited via regulation from) placing in a public cloud environment.
- IBM z15 is a secure and resilient enterprise platform that is designed to integrate into cloud environments and enable deployment of mission-critical applications and data safely and with confidence across all of these different deployment environments.
- For mission-critical hybrid cloud container workloads, IBM Cloud Pak for multi-cloud management integrated with Red Hat OpenShift centralizes management and orchestration across hybrid clouds from a single point of control.

Instant Recovery
- z15's recovery protocols aim to diminish the impact of any one event with zero increase in IBM software licensing costs
- Much routine maintenance today takes down capacity; instant recovery is intended to mitigate this returning partitions or systems back to production in ½ the time previously possible
- The delivery and recovery of those workloads should be faster than before as the instant recovery capability uses all available capacity for a period of time during recovery to "catch up" on the backlog of work

Like past versions, IBM ships each z15 with fully populated drawers of cores. Users have the ability to unlock them to provide extra capacity as needed, without having to install new hardware. Also, new capacity can be added for fixed periods on an LPAR (Logical Partition) by-LPAR basis.

Opportunities and Advantages
Through much of its history, IBM has been defined by its mainframe technology and strategy. It has been a workhorse for the financial services industry, processing workloads reliably and at scale for some of the largest institutions globally.

For years the role of the mainframe platform in enterprise computing has been challenged first by large deployments of distributed servers, and most recently by the emergence of large cloud providers: AWS, Microsoft Azure, Google, and IBM itself.

The value propositions of the public cloud service providers include large and flexible computing power and data storage capacity. Additional value propositions include security, rapid provisioning of development environments (especially suitable for DevOps and the use of containers), and access to highly sophisticated AI and machine learning tools.

As a result, global, national, and large regional banks, capital market firms, and insurers have increased the use of public cloud – sometimes selectively (for example creating data lakes) and sometimes aggressively (migrating core operating systems to the cloud). However, for a variety of reasons (e.g. security, vendor lock-in, integration efforts), rapid shifts to the cloud are not feasible. Rather there is a clear movement towards mixing and matching:

- On premises enterprise platforms (mainframes) as is (traditional, non-cloud environments)
- On premises enterprise platforms (mainframes) or servers configured as private clouds
- On premises enterprise platforms (mainframes) configured as private clouds and integrated with public cloud(s)
- Single public cloud or multiple public clouds

These developments have not escaped IBM's notice. The features, functions, and capabilities of the z15 listed above can be read as a fundamental repositioning of the IBM Z beyond the traditional data center image, and towards a new role as a highly compatible and valuable element in a hybrid multi-cloud infrastructure.

The good news for IBM is that Z's long-standing role as the computing platform for many FIs' highest volume, resource-intensive core processing jobs gives it a position that cannot be easily transferred. However, that role alone will not be enough to maintain its position and achieve growth in an environment where software and applications are continually being ported to the cloud. While most acknowledge that the mainframe platform is a back-office workhorse with a long history and pedigree, many still question how it might complement a deep cloud strategy:

- The z15 is IBM's answer to that challenge. It is positioned to provide a compelling price-to-value rationale for long term success as the mission-critical application and data platform in today's hybrid multi-cloud environment.
- Many accept the image of mainframe as legacy piece of hardware at face value despite investments into modernization. Perceptions tend to linger, as this is a challenge for any product/ company looking to evolve its value proposition.
- All technology needs people who understand it. IBM appears to be making a meaningful push to train a new generation of mainframe platform technologists. This longer-term effort will take time to bear fruit.

Financial institutions need to make the most of existing assets, even during large-scale digital transformation. The capabilities built by IBM for z15 show an effort to align with where the market is heading and provide a value piece for a hybrid cloud and digital transformation strategy. It may be a valuable incentive to upgrade.

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