

ESG SHOWCASE

Sustainability, Circular Economy, and the Mainframe's Next Act

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ABSTRACT: The CIO has become an important part of the organization's sustainability strategy. At the same time, executives are telling the CIO to get to the cloud faster. Balancing speed and quality, CIOs must figure out what makes sense for the mainframes that they run and that play an important part in their application stack. They need places to run the cloud-native applications that are highly available and allow access to the data sets that are local to the mainframes. This paper will cover the circular economy and how Red Hat and their GSI partner help organizations to upcycle their mainframes, with a transformation from monolithic and multi-layered applications to cloud-native.

Overview

For the last 20 plus years, experts have been predicting the obsolescence of the mainframe. But is it the best idea to get rid of technology that is a great foundation with security, high availability, and a lot of power in an inefficient use of space? Red Hat provides the technology, partnering with Global System Integrators (GSIs) to help organizations jump start the sustainability aspects of their digital transformations. The CIO is an important part and, in many cases, leads the way for their organization's sustainability strategy. This paper will cover the circular economy and how it may make sense for organizations to upcycle their mainframes.

Analysis

The repeated predictions for the demise of the mainframe overlook its value as a reliable platform and an important part of an application stack. Time and again, innovations make it possible to extend its usefulness and thus cement its reputation for reliability. All organizations are using virtual servers, which have their roots in the mainframe logical partitions (LPARs) that existed before Unix or Linux. Now, cloud-native innovations are extending the life of the mainframe yet again. Ultimately, the mainframe is a large server, and that is how it is typically managed. The mainframe still has a significant role in modern cloud-like applications. According to Deloitte, 74% of organizations believe the mainframe has long-term viability as a strategic platform for their organizations.¹

Organizations may ask: Can existing monolithic applications be modernized on the mainframe? And can modern applications be built and run on the mainframe? The answer to both is a resounding yes. Many GSIs have built practices to help organizations modernize their heritage and business-critical applications while helping the microservice components of their new application next to their applications running on the mainframes.

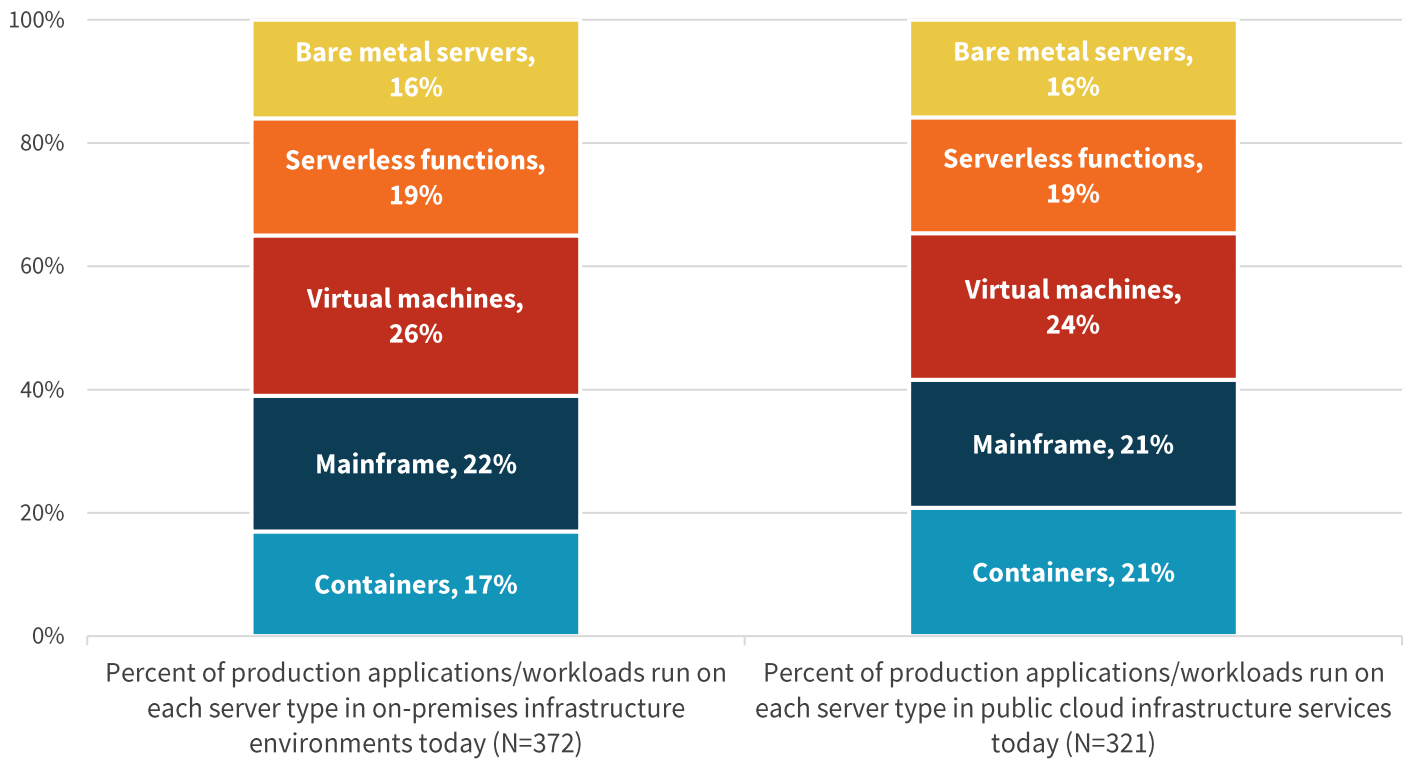
¹ Source: Deloitte, [Hello mainframe, our old friend](#), July 2020

ESG research shows that not all applications can or will move to the cloud, with 27% of organizations saying that some existing applications will remain in on-premises data centers.² At the same time, organizations are working very hard to bring a “cloud-like” experience to the on-premises data center. In the same ESG research, 50% of organizations said that improving connectivity to/interoperability with public cloud infrastructure will be part of their strategy for on-premises data centers over the next three years, and 46% said that investing in technologies that provide a cloud-like experience on-premises will be part of that strategy. Mainframes will remain a part of this strategy as a repository of secure, data-rich applications.

Let’s dig into how organizations can modernize their mainframe-resident applications while enabling the mainframe to be a participant in their cloud-native ecosystems. Organizations can bring cloud-native applications to the mainframe by leveraging Red Hat OpenShift for IBM Z/Linux One. Mainframes have been running Linux for a decade now. Red Hat OpenShift brings a mature, stable, consistent, and secure environment for building and deploying container-based applications. Red Hat OpenShift also provides methods, such as Cluster Manager and Ansible, for automation, easy control, monitoring, and migration of applications to a cloud-like environment, providing a path for applications that span data centers to be deployed on many of the public clouds that organizations are already using. A large part of what Red Hat and its GSI partners deliver is the ability to implement automation tools, such as Red Hat Ansible, to make operating a mainframe in a cloud-like manner easier.

Figure 1. Application Mix Similar Across On- and Off-premises Environments

What is the approximate percentage breakdown of the production applications/workloads running on each server type in both on-premises environments and public cloud infrastructure services today? (Mean)



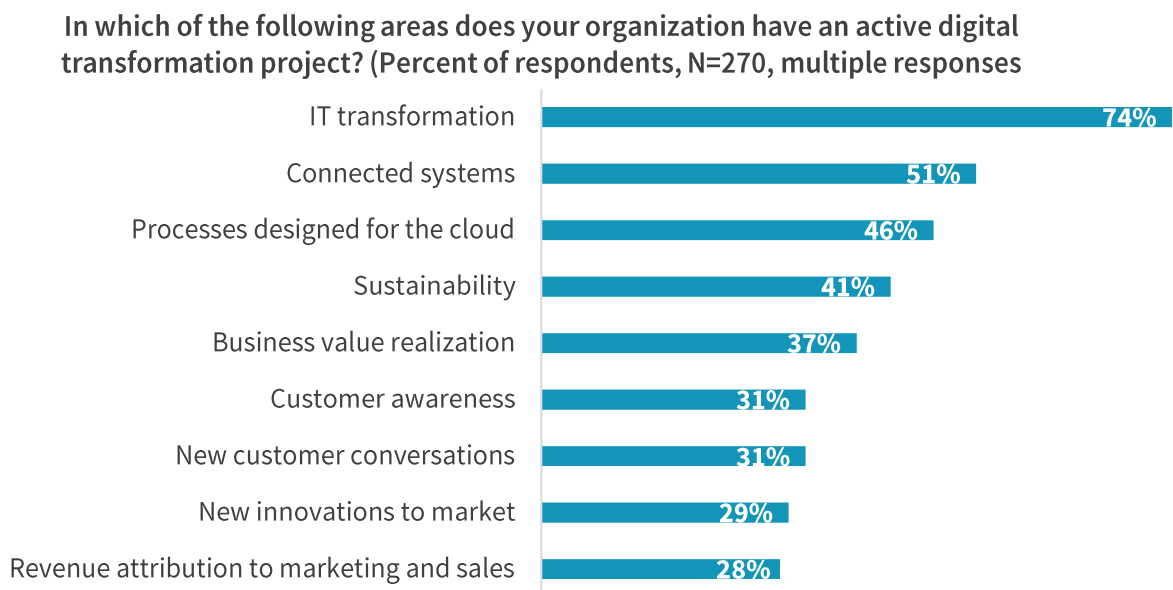
Source: ESG, a division of TechTarget, Inc.

² Source: ESG Research Report, [Application Infrastructure Modernization Trends Across Distributed Cloud Environments](#), March 2022. All ESG research references and charts in this showcase have been taken from this research report.

Mainframes continue to be used by cloud service providers and on-premises (see Figure 1). Many mainframes are still used for the security, scalability, and high availability that they afford organizations. Those organizations have been engaging with GSIs to help componentize once-monolithic applications into cloud-like microservices and virtual server-based components. A strategy many organizations are using is to front end these applications with “cloud-like” applications, using those mainframe-resident applications as data and process repositories. Organizations are seeing that it is far harder to upgrade these mainframe-based applications, with a lower return on investment. At the same time, organizations are realizing that mainframes can house many concurrent applications, including cloud-native ones, cost-effectively.

Efficiency is an important tenet for CIOs going forward. In many organizations, the CIO is leading the way on the “E” in ESG (environmental, social, and governance) activities around sustainability. Organizations are asking, “How do we meet our IT sustainability goals?” ESG research shows that 41% of organizations have active digital transformation projects in the area of sustainability (see Figure 2).

Figure 2. Areas of Active Digital Transformation Projects



Source: ESG, a division of TechTarget, Inc.

As part of sustainability efforts, CIOs are looking deeper into the “circular economy.” The European Commission defines the circular economy as an economy that “aims to maintain the value of products, materials, and resources for as long as possible by returning them into the product cycle at the end of their use while minimizing the generation of waste... This process starts at the very beginning of a product’s lifecycle: smart product design and production processes can help save resources, avoid inefficient waste management, and create new business opportunities.”³ In other words, organizations should strive to produce and consume as few new materials as possible and only what is needed to extend or continue the use of the existing systems. Mainframes are a great platform to be “upcycled” as part of the circular economy. In fact, they have been part of the circular economy for many years without it being named as such.

Many organizations that are bringing modern OSES and applications to the mainframe are already participating in the circular economy. In this way, they reduce the amount of net new servers they need to buy and extend the life of the mainframe.

³Source: European Commission, [Circular Economy - Overview](#).

Red Hat OpenShift is poised to help organizations in achieving sustainability goals through upcycling in the circular economy. Red Hat is helping organizations' data center efficiency, enhancing the locality of net new applications where the heritage applications and data reside, and enhancing mainframe capabilities by allowing modern application development and operations to be carried out on the platform. Red Hat brings full cloud-like, and importantly, cloud-native sets of capabilities that application developers are already using, such as Red Hat Ansible and Red Hat Advanced Cluster Management. This enables the building of automation on a common approach to hybrid applications and infrastructure management, such as using Ansible as the driver to automate Red Hat OpenShift and operating system-based software.

With Red Hat OpenShift, customers can build and host containerized applications on their mainframes and bring all or portions of those applications to the cloud. Red Hat has many OpenShift implementations in the cloud, such as Red Hat OpenShift on AWS (ROSA), Azure Red Hat OpenShift (ARO), and OpenShift Dedicated (OCD) on many other public cloud providers. This makes the mainframe a part of organizations' cloud journeys.

The Bigger Truth

CIOs and CTOs are faced with many challenges, including how to continue to make their infrastructure transparent, how to make it operate in a cloud-like manner, and how to lead the charge on meeting their company KPIs surrounding sustainability. Mainframes continue to be important to many organizations' digital transformation processes, but this takes thoughtful planning about modernizing their IT Infrastructure. This is a place a GSI can really help set the strategy and bring the right process, people, and tools to the table.

Many organizations will want help in answering the questions about their approach to the cloud because it is not straightforward. Is it best to take a cloud-by-cloud approach, a pure open source and build-it-yourself approach, or a platform approach? All approaches are not mutually exclusive, and organizations can deploy one approach in one location and another approach elsewhere. As part of many of these strategies, organizations can take advantage of the mainframe as a key component to being more aware of their impact on the circular economy. In an age where downtime is costly, especially if developers are idle, having a highly redundant platform, like the mainframe, is critical. At the same time, mainframes are efficient in the use of both processing power and energy per floor tile.

A sustainability goal as part of an organization's digital transformation initiatives can tie into a circular economy strategy, helping organizations to examine their supply chain and how they can truly reduce and reuse their infrastructure. With only incremental enhancements needed and no wasted parts, the mainframe can solve many of the challenging sustainability issues around the supply chain for new server acquisitions. The actions organizations need to take are focused on how they continue to bring a cloud-like experience to their on-premises data centers and include their mainframe as a part of this. The applications on the mainframe are not going away anytime soon but will need to be enabled or transformed in some ways to be part of organizations' cloud-native applications.

Mainframe platforms have a lot of qualities that are very well suited to cloud-like environments, such as high availability and performance for many parallel workloads. Mainframe technology has proven over decades that it is a mainstay for organizations based on efficiency, availability, and scalability, becoming an important component of the IT circular economy. Organizations should look for an IT infrastructure partner that can help them bring cloud-like services to their current mainframe infrastructure to meet their cloud and sustainability KPIs.



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