Mainframes in a public cloud era

Mainframes are a significant investment and mainstay for key business verticals, but new demands are driving the need to integrate this legacy technology with the cloud.

IT journalist Stewart Alsop will forever be known for predicting the end of mainframe. His crystal ball gazing led him to predict that the last mainframe would be unplugged on March 15, 1996. Over two decades from this prediction the mainframe is still very much alive and kicking, now more than 50 years old. With Big Data, analytics, and ever increasing transaction volumes across the globe, the mainframe is not going away. Indeed, IBM recently announced that it will bring machine learning to traditional mainframe customers and 90 percent of large enterprises' core systems still run on the mainframe.

Global spending on mainframes was $3.57 billion in 2017, and it expects the market will still command $2.8 billion in spending annually by 2022.[1]

The mainframe has remained the backbone of enterprise computing this long for good reason. Mainframe computing is about size, scale and significant reliability. Mainframes have provided these three factors more consistently than any other enterprise technology platform to date. This is why the mainframe has endured such a long tenure as an active computing platform. According to analyst IDC, global spending on mainframes was $3.57 billion in 2017, and it expects the market will still command $2.8 billion in spending annually by 2022,[1] highlighting the longevity of the technology.

A significant investment for any organization, a mainframe is an IT mainstay for many key business verticals including financial services, retail, transport, pharmaceuticals and manufacturing. Able to handle significant volumes and perform complex computing tasks involving large data sets, the mainframe has a solid role to play in data-rich and high-transaction environments, justifying its high initial cost and the long-term investment to maintain it.

However, changing times are finally catching up with the mainframe and its users, with the cloud transforming it from cutting edge to legacy technology.

Why the cloud and the mainframe must meet

We live and work in a world today that is dominated by mobile devices, with lightweight applications running on them and web-based applications and services. The traditional desktop software and hardware estate has been largely supplanted by these. Yet, most of these apps and web services still rely on mainframes on the back end to power them. Mainframes were created in the pre-mobile world, yet their importance to it means steps must be taken to maintain their functionality for the longer term, while also narrowing the gap between external and mobile applications, and the mainframes that drive them.

This shift in user expectation and the devices they use, combined with new and rapidly evolving business requirements and faster time-to-market requirements, demands that platforms be more flexible, agile and distributed. This often means asking more of a traditional on-premises mainframe than it can do in its original form. For many organizations, it requires a transition to and integration of the cloud into the IT framework, including transferring mainframe functionality into the cloud. Platforms such as Amazon Web Services (AWS) and Microsoft Azure are at the forefront of this push, providing organizations with unprecedented levels of scalability, storage and processing power that can be metered on demand. This computing power can be switched on and turned up exactly when it is needed, and throttled down when it isn't for cost effectiveness.

THE ADVANTAGES OF HYBRID IT

The rise of cloud services does not necessarily mean replacing the mainframe outright and writing off years of financial and developer investment. Rather, it is often about creating a hybrid of the two, where mainframe applications and data are lifted off the physical mainframe and moved into the cloud via a virtual mainframe container. There, mainframe applications and functions can operate using emulation just as they would on dedicated hardware. Within the cloud, mainframe applications and their users benefit from far greater and on-demand processing and storage capabilities, outsourced management and support, as well as exposing mainframe services to modern languages and application programming interfaces (APIs) for new software development and service integration.

Adopting a modern, cloud-based application architecture is a significant driver for business growth. Organizations that implement modern application architectures—such as new APIs, cloud frameworks and virtual services—along with modern development approaches including DevOps and Agile are far more able to respond to user needs and business opportunities quickly. Modernization will improve operations, widen access to information, expand device support to a wider range of client devices and applications, as well as reduce development and deployment times. This, in turn, will ultimately benefit the organization's bottom line. Savings in the region of 50–60 percent[2] can be achieved over the long term by migrating key mainframe services to cloud platforms and leveraging the updated technology and skills on offer.

MAINFRAME DEMAND

$3B
industry

Demand for mainframes is strong—it is projected to remain upwards of a $3 billion industry for each of the next five years.

Source: IDC.

[2] Ensono estimate.

DECIDING WHAT TO MOVE AND WHAT TO KEEP

It is arguable that all mainframe users are looking at a cloud strategy in some form today. However, that rarely involves a complete decommissioning of the on-premises mainframe in favor of cloud hosting. Discovery is the first stage of any migration process.

Breaking down and identifying the existing mainframe into its component parts— applications, data, code, languages, relationships with other internal and external systems, what is being used and how it is being used. Only then can it be determined what can and should be migrated to the cloud, and whether the skills and the code base are present to achieve that internally, along with confirming what external support is needed from an expert cloud services provider.

Ensono, much like the mainframe sector itself, has upwards of 50 years of expert knowledge to draw on, alongside over a decade of cloud expertise. It has established and close relationships with key vendors in the cloud mainframe space, from platform operators such as AWS and Microsoft to the core emulation and developer tools providers that enable mainframe applications to function in the cloud. Together, with Astadia and its quarter-decade mainframe migration expertise, Ensono represents a trusted expert partnership— one that understands the technology being used today, the technology being migrating to, as well as how the two can best co-exist to create and deliver a successful hybrid solution.

The goal here is not to move 100 percent of the mainframe to the cloud, but the most used and most suitable applications and data.

MIGRATION SUITABILITY

60–70%

On average, Ensono sees that 60–70 percent of mainframe applications are suitable for cloud migration.*

* Ensono estimate.

Building a mainframe presence in the cloud

Migrating mainframe capabilities to the cloud is not just about unlocking a technology advantage. It is also about unlocking and maintaining skilled support capabilities to manage and nurture a mainframe for the longer term.

The skills gap is particularly hard felt in the mainframe world. Put simply, the age of many mainframe systems mean that in-house and available skills are in decline. A mature workforce dominated by Baby Boomers is leaving the sector, taking its knowledge with it. Millennial mainframe experts are a rarity. Where mainframes have been the backbone of the IT estate for a prolonged period of time, we have to accept that the skills of the original people responsible for developing those applications and other pieces of code have likely gone away. It is also a reason why we should consider how we support and maintain mainframe applications with external shared expertise going into the future.

This is where working with a partner such as Ensono is essential. A trusted, expert partner unlocks expertise, as well as providing economies of scale for support, development and implementation. This is something that a partner can offer with a hosted mainframe over any one organization's IT operation.

An experienced partner will help incorporate the mainframe into the organization's cloud journey. It will do this with informed advice, support and implementation, using the right mainframe migration tools. It can provide guidance on the best relational database management systems (RDBMS) to migrate a mainframe hierarchical and flat files to.

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A skilled partner will help developers and admins with the deployment and use of the tools from Astadia to analyze legacy code, determining its suitability and requirements for migration. When building a cloud mainframe instance, the design needs to take into account several important elements, including:

• The type of cloud instance that is needed to host the virtual mainframe.

• Existing mainframe transaction volumes should be measured so that the cloud instance is suitably provisioned from day one to handle the transfer of data traffic seamlessly.

• As previously mentioned, other systems and applications not on the mainframe will inevitably be reliant on it for data as well as processing. This also applies to batch processes. The design needs to consider whether these interdependencies or processes are needed, how these links can be recreated between the cloud and these system with new code, and how the migration can be completed without disrupting the business.

• Future expectations, while hard to predict, need to inform part of the process. Public cloud by its nature provides scope for additional storage, performance and other capacity growth. Thinking about potential future integration and interdependency needs and wants now will make these easier to accomplish later, if needed.

A MATTER OF EMULATION

Moving applications, services and data from on premises to the cloud does involve a significant amount of new code, if migrating to a completely new software platform. Be that entirely new applications, connectors to link cloud resources with on-premises ones, or code to convert file formats and data sets to fit new technologies application requirements. However, moving existing mainframe applications into the cloud as a virtual mainframe instance should not.

Rewriting a mainframe application from scratch makes little sense, economically and logistically. With a cloud mainframe migration, we are looking to run the original applications as-is in a virtual mainframe space on a scalable cloud instance. This maintains continuity of operation and data output.

The mainframe cloud framework makes use of a set of emulators, mimicking and translating the calls and actions of the mainframe and allowing recompiled original code to be used without redevelopment. Core to this is Astadia's Message Control System (OpenMCS), which Ensono uses as part of the cloud virtual mainframe environment to deliver mainframe emulation with minimal overhead. OpenMCS emulates mainframe aspects such as transaction monitors, allowing existing COBOL mainframe applications to be migrated into the virtual space with minimal or no changes to the code. The emulated functions and translation of calls ensure that the applications function and behave as they should, even when interfaced with more modern and faster hardware, storage, networking and other elements of the cloud technology stack.

EMULATION SUCCESS

85–90%

By parallel testing cloud-migrated mainframe applications alongside their original on-premises versions, Ensono sees a 85–90 percent success rate on average for application migration to emulation.

Source: Jason Woodrum, Director of Client Experience, Hyperscale Cloud, Ensono.

MOVING A MAINFRAME APPLICATION TO THE CLOUD

With design, mapping and the build of the cloud mainframe environment in place, it's time to move applications. On average, Ensono sees that 60–70 percent[3] of mainframe applications are suitable for cloud migration. This, of course, is reliant on the availability of original source code for recompiling and minor tweaks. Astadia's Code Transformation Engine is used to do this, and the process is simple. If the code recompiles successfully, it's ready for testing in the migrated cloud environment. Where errors persist, these will usually illustrate where minor code revisions will be needed to complete the recompile. This will not be a major rewrite of the code. Often, compiling errors are common across applications, making fixes simple and repeatable.

Testing is paramount in the migration process. Even with meticulous planning, this is necessary to ensure everything works as expected and documented, as well as ensuring that nothing is broken by the physical shift in location of the mainframe application and its data being recompiled and transplanted to the cloud. Testing of the cloud migrated code should be done in parallel with the existing mainframe to compare and reaffirm the reliability of the migrated assets. Ensono sees a 85–90 percent success rate on average with application migration to emulation with this testing approach.

Once everything has been tested, interdependencies are confirmed as functioning and data sets are successfully imported into cloud database repositories, the process of live deployment and switchover can commence.

JUSTIFYING THE MOVE TO THE CLOUD

Moving mainframe applications from a functional hardware installation to the cloud is no small undertaking, given the criticality of the platform and the data being moved. Therefore, justification for the investment needs to be clearly established. A cloud mainframe, like a physical one, is a long play. The more that is migrated, the greater the incremental savings that can be achieved from economies of scale and reduced support costs.

Moreover, it provides the organization with a degree of skills and technology assurance. In effect, it hedges the organization against further loss of in-house mainframe knowledge and skills, as well mitigating the risk of the mainframe failing, being rendered obsolete, or simply becoming too complex to alter in the event that unavoidable application changes have to be made to comply with new regulations or service new business needs. The cloud provides an economical, reliable and infinitely scalable alternative path where new development, using the latest tools and developer skills, can supplement the legacy without forcing a wholesale replacement.

Visit ensono.com/hybrid-cloud/managed-aws or contact us at 866.880.8611 or info@ensono.com for more information.

OPERATIONAL SAVINGS

50–60%

Operational savings of 50–60 percent can be achieved over the long term when moving mainframe services and data to the cloud.

* Ensono estimate.

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