

Why Application Requirements Should Drive the Choice of Your Infrastructure

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Enterprises of all sizes may be tempted to reduce IT spend by choosing a single standard server to be deployed throughout their entire infrastructure. Not only can it be expensive and time consuming to migrate applications to a single standard server, it can inadvertently introduce issues caused by different applications requiring unique architecture attributes. Even within the same enterprise, application requirements can vary, resulting in the need for careful analysis of infrastructure attributes.

IT infrastructure will have a profound financial impact, thus analysis of an application's total cost of ownership (TCO) is essential for an informed decision. While most IBM Z® experts understand why the platform is ideal after considering application requirements, emphasizing the financial benefits of IBM Z can be helpful for management stakeholders. Typically, commodity servers are perceived as a low-cost and effective infrastructure yet TCO analysis tends to illustrate the opposite. When all application requirements and data center costs are summed, commodity scale-out servers can actually drive up the total cost of IT spend and fail to deliver a ROI.

Evolving Application Development Methodologies

IT applications represent the real assets of modern organizations, as business processes are implemented within them. This is why many organizations are still running applications that were originally deployed more than half a century ago.

But application development methodologies have largely changed over the years, and organizations have often adopted new trends while maintaining the already-deployed applications. This has created different layers of technologies, and application integration has become a crucial challenge for every organization.

The development of an application, as well as every aspect of the application's maintenance, requires significant resources. In just a few years the total cost of an application becomes much larger than the cost of the infrastructure on which it runs. When an application represents a critical business area of a company, the application tends to be kept in place as is while being integrated with other application modules adopting the latest technologies and approaches. If the application is originally deployed on a platform that lacks the ability to adapt to changing business requirements or proves to be expensive in its upkeep, the overall cost of the application can be a significant burden to an organization's total IT budget.

Lower TCO and Higher ROI

IBM Z usually emerges as a superior infrastructure option for many applications when all application requirements are considered. For most enterprises security, business continuity, scalability, performance, and ease of management are essential attributes for the efficacy of their infrastructure and business success. All these attributes are inherent in the design of IBM Z and have made it the platform of preference amongst enterprises for decades.

We often hear rumors of the demise of the mainframe and that IBM Z is obsolete. To the contrary, years of development have enabled IBM Z to deliver the latest technological advancements while still running applications first written decades ago. IBM Z incorporates new application lifecycle management approaches, methodologies and techniques so that both traditional and new workloads can perform and deliver business results from the same platform.

Another misperception is that IBM Z is expensive and that the same types of workloads can run on other platforms at a lower total cost of ownership. However, data from IBM IT Economics TCO offload assessments for clients find that most companies that continue to run their applications on IBM Z benefit from a lower TCO and higher ROI than moving to a decentralized server environment.¹

Because of the complexity of offloading IBM Z applications, most re-platforming projects run beyond their planned completion date and budget, and fall short of the project's planned scope. Even in cases considered technically successful, IT Economics analysis found that the project either faced a long ROI breakeven point of 20 or more years, or none whatsoever. The risk of project duration and cost tend to be why many companies avoid application migration and ultimately keep their applications running on IBM Z. Alternatively, they find cost savings through optimization of their IBM Z environment or by exploring new service provisioning models like shared data centers or IBM Z cloud offerings.

IBM IT Economics TCO offload assessments requested by clients that involved a rewrite of up to 10 million lines of application code had on average a 3.2x lower annual TCO when keeping their applications on IBM Z versus moving to an x86-based infrastructure.² This was mainly due to the fact that the application migration costs, the parallel environment maintenance period costs and the sizing of the equivalent x86 infrastructure once fully deployed were overlooked and/or underestimated.

Another factor that has contributed to the direction to remain on IBM Z has been an increased acceleration in the availability of new offerings and products that modernize IBM Z environments. This, combined with investments made in IBM Z applications running in thousands of enterprises worldwide, has convinced many IBM Z clients to further enhance and expand their mainframe environments. Instead of re-platforming their applications to another hardware architecture, clients are deploying new applications and modules on IBM Z that extend the capabilities of their original applications.

IBM z15™ performance enables enterprises to efficiently deliver business-critical solutions with high availability, security (pervasive encryption and access control), privacy (Data Privacy Passports) and scalability (up to 190 cores per system and often with many systems clustered in Sysplex environments). These characteristics enable solutions to meet the

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1. IBM customers across different industries and geographies requested TCO analysis of their IBM Z workload offload projects. Mainframe operations ranged in size from 88 to 12,500 MIPS and required some application rewrite effort, varying from 750,000 to 10,000,000 lines of code, to move to an x86 environment. Client workloads were comprised of IBM monthly license charges (MLC) and International Program License Agreement (IPLA) licensing and independent software vendor (ISV) licensing. Hardware was comprised of IBM Z servers running z/OS and specialty engines such as IBM z Integrated Information Processors (zIIPs). Each client engaged the IT Economics team to evaluate the workloads, their existing mainframe environment and proposed distributed environment for the offload. One third of clients had already initiated IT offload activities while another third had completed the effort, although reported the project as a failure. The remaining third was considering offload and was still in the planning phase of their project. For all the TCO assessments, IT Economics consultants met on-site with the client to discuss offload planning and execution, analyzed forecasted project costs, and examined actual cost to date for those in execution mode. IT Economics analysis observed activity omissions and underestimated sizings in the offload projects and quantified offload costs for the clients. The clients concurred that their plans had underestimated the effort, cost and risk of their offload project plans. The average five-year x86 TCO for all clients was 3.2x higher than the IBM Z TCO, with a range of 2.1x to 3.7x.
 2. 17 IT Economics assessments involving analysis of Java x86 workloads for consolidation onto zIIPs or IFLs on IBM Z, or LinuxONE were selected from diverse industries (35% financial, 25% government, 12% healthcare, 6% retail, 6% telecommunications, 6% utilities) and geographies. The assessments included were performed for clients with business-critical workloads running in production and non-production environments. The workloads targeted for consolidation from x86 and distributed servers were IBM Java application server middleware running on different types of x86 and distributed servers. TCO costs included hardware, software, networking, energy, floor space and people costs. TCO savings with zIIPs, IFLs or LinuxONE ranged from 20% to 85% over five years with an on average savings of 54%. Each client engaged the IT Economics team to evaluate the distributed workloads and the proposed IFL or LinuxONE environment for the consolidation. For each assessment, IT Economics consultants met with the client to discuss consolidation planning and execution, analyzed the client's current total cost of ownership, and provided a projected total cost of ownership with workload consolidation based on estimated core consolidation ratios for the client's workloads. For additional information on x86 workload analysis contact the IBM IT Economics team, it.economics@us.ibm.com.

most challenging business requirements while minimizing IT costs. IBM Z provides a cost-effective TCO case for:

- Java® applications through the exploitation of IBM Z specialty engines. Workloads can leverage IBM Z Integrated Information Processors (zIIPs) and the integration of JVM with IBM z/OS® to minimize general processor compute charges and software license charges by offloading the work to zIIPs. Workloads can also leverage Integrated Facility for Linux® (IFLs) on IBM Z. Because Java workloads can be densely consolidated onto IBM Z requiring fewer processor cores than on x86 servers, middleware software costs for both the z/OS and Linux on IBM Z environments can be significantly reduced. Workload consolidation analysis from 17 IBM IT Economics assessments found that the same Java workloads on IBM LinuxONE or IBM Z provided on average a 54% lower TCO over five years than on compared x86 servers.²
- Competitive database solutions due to the reduction in the number of software licenses by as much as 78%. Sizing analysis from IBM IT Economics assessments of clients with business-critical loads show most x86 Linux workloads have a core consolidation ratio ranging from 10 to 32.5 distributed cores to one IFL with an average of 17x fewer cores.³
- Data warehouse and transactional business intelligence solutions, particularly if the master copy of the data already resides on the IBM Z system in IBM z/OS and in Linux on Z partitions for both structured data and big data repositories. These applications are already co-located with the data, eliminating the need to support off-platform environments.

While individual TCO benefits vary depending on each client's requirements and workloads, consolidation of workloads onto a centralized single platform can bring notable infrastructure savings and efficiencies with reduced latency.

The Benefits of IBM Z

IBM Z enables legacy and open environments to coexist on the same hardware platform so that businesses can streamline operations and optimize costs. IBM Z can provide a lower TCO compared to alternative scale-out solutions while enabling applications to exploit the latest development and delivery approaches on an enterprise proven infrastructure.

About the Authors

Alfredo Micarelli

IBM Executive Team Leader for Europe and the Middle East

alfredo.micarelli@it.ibm.com

Susan Proietti Conti

IBM Executive Project Manager, PMP®

sconti@us.ibm.com

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Armonk, NY 10504
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