

Mainframe Modernization: When the Platform Is the Solution

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Organizations that have a significant investment in IBM mainframes can undertake modernization efforts while remaining on this platform. IBM has made significant investment and innovation in the platform, and clients have a variety of choices to continue their modernization efforts.

Key Findings

- Modernization efforts on IBM mainframes can leverage the IBM specialty engines for their new workload in order to manage CPU costs.
- A commitment to Java is required for customers modernizing on this platform.
- Linux for System z provides a cost-effective solution to consolidate distributed platforms under a single environment where the number of systems exceeds approximately 40.
- Service-oriented architecture (SOA) solutions are available from IBM, as well as a number of dedicated mainframe independent software vendors (ISVs).

Recommendations

- Modernize existing mainframe applications, initially by reusing current systems with SOA wrapping products from DataDirect Technologies, GT Software, Hostbridge, IBM or SOA Software.
- Build a strong competency in WebSphere on the mainframe, utilizing System z Application Assist Processor (zAAP) engines.
- Consider Linux for System z for consolidation of utility workloads, such as file serving, print serving, Web serving or e-mail applications.
- Invest in creating a new generation of IT employees with strong enterprise system skills in both z/OS and Linux for System z.

ANALYSIS

IBM mainframes house some of the most strategic, high-volume, complex applications on the planet. They represent decades of investment in hardware and software for many companies and are not easily replaced with newer computing architectures. Long the workhorse of computing around the world, IBM has invested billions of dollars in evolving these platforms to meet the demands of modern workloads. Arguably, no IT vendor in existence today has invested as much in a computing platform as IBM. The company has refined its hardware and software solutions over decades of computer usage and thousands of the largest, most-sophisticated customers in the world. The installed base of mainframes, while shrinking over the years in total systems, continues to grow in installed million instructions per second (MIPS), now at approximately 14 million MIPS globally.

Despite these investments and unparalleled heritage, many customers do choose to move to Windows, Unix or Linux environments. However, for those organizations needing thousands or tens of thousands of MIPS installed, the IBM mainframe can be utilized well into the next decade. IBM has always taken its relationship with enterprise customers seriously, and we believe the company will continue to invest in and enhance this platform.

Modernizing the Platform

IBM has invested significantly in providing a modern hardware environment that can support a mixed workload environment, or, increasingly, a Java workload. IBM has created a strong, market-leading Java application server environment that runs on the mainframe. As strong as the IBM mainframe platform is, most legacy applications are often based on what are seen as declining languages and technologies. While IBM is attempting to address some aspects of the decline in skills on the mainframe through the IBM Academic Initiative, the company is not doing anything to address the many ISV products that have been used over the decades on this platform. Consequently, IBM has invested significantly in establishing the Java language, runtime and related ISV solutions as viable on this strong platform. The alternative is to risk the "baby being thrown out with the bath water" (i.e., the mainframe being eliminated because clients no longer want to depend on legacy languages or technologies).

The company offers application development technology under the WebSphere and Rational brands. IBM continues to extend its strong Customer Information Control System (CICS) and Information Management System (IMS) platforms to better enable integration with new Java and SOA development. The company has further enhanced its WebSphere application server, providing a multiaddress space solution for Java workload. The WebSphere Extended Deployment Compute Grid enables companies to create a multiaddress space solution for running transactional and batch workloads in Java. It acquired technology (JZOS) that better enables the use of Java for batch applications that need to access traditional legacy file structures and resources. IBM also defined a batch framework for Java that is similar to the Spring Batch framework from SpringSource (now a division of VMware).

IBM has also provided hardware enhancements to support the demands of more-modern workloads. It introduced the ability to run new Java or Linux workloads on the mainframe over five years ago and continues to strengthen this option. The introduction of specialty engines was designed to attract new workloads to the mainframe at a much lower cost and now represents approximately 20% of the 14 million installed MIPS in the marketplace. These engines are not really "special" in design and are the same as any other general-purpose engine, but they are "dedicated" to specific types of processing. Workloads are directed to specific processors via the operating systems dispatch function for Java (zAAPs) and DB2 (System z Integrated Information Processors [zIIPs]) specialty engines and via logical partitions in the case of Linux (Integrated

Facility for Linux [IFL]) workloads. The MIPS associated with these engines are independent of those used by traditional z/OS workloads. The engines not only cost less, but also reduce software costs by keeping these MIPS away from the software cost calculations based on total MIPS (see "Specialty Engines Are Key Factors in IBM Mainframe Viability"). The zAAP, zIIP and IFL specialty engines are offered by IBM to attract new workloads to this platform.

Linux and the Mainframe

IBM's Linux for System z is becoming somewhat of a growth opportunity for IBM. Initially, many of the workloads for this environment came from distributed servers that handled utility workloads, such as file serving, print serving, Web serving or e-mail applications. More recently, we have seen an increase in the use of Linux for System z for Oracle, SAP applications and WebSphere. Typically, most computing-intensive Linux applications are not run on System z. The challenge for IBM is to grow Linux for System z workloads without impacting traditional z/OS software revenue. Revenue from CICS and IMS is significant, and IBM is not really interested in risking these revenue streams. However, if customers are driven to modernize to newer application environments or languages, IBM would certainly prefer them to be WebSphere and Java on Linux for System z, rather than another vendor's hardware platform. Gartner has seen IBM have greater success with Linux for System z in its largest mainframe customers. We have found less interest or commitment to Linux for System z in the lower end of the System z installed base (fewer than 1,500 MIPS).

ISVs and the Modern Mainframe

Over the last five years, IBM has become very aggressive, competing with the ISVs that have fed at the mainframe software trough for many decades. IBM clients have complained about increasing software costs from these vendors, and IBM began to offer lower-cost solutions, displacing the very vendors it spent decades supporting. As a result, many traditional ISVs no longer showed great innovation on this platform, and seemed content to manage their maintenance revenue streams, doing "just enough" development to ensure that the products would operate in the new IBM mainframe environments, but not showing any dramatic innovation.

In the last year, we saw vendors modifying their products to take advantage of IBM System z specialty engines. In particular, DataDirect and GT Software announced enhancements to their mainframe SOA solutions that take advantage of IBM zIIPs and zAAPs. GT Software also offers a version of its Ivory Service Architect product that will run in the Linux for System z environment. CA announced support in fall 2009 for zIIP specialty engines in its IDMS database product. It also leverages these engines in some products in its Unicenter product line.

Other ISVs support the conversion of legacy languages and databases to COBOL, Java and/or DB2 on the mainframe. Ateras, MigrationWare, Tiburon and Trinity Millennium Group all can transform many IBM or third-party languages and databases to the more ubiquitous COBOL/DB2. These solutions eliminate many of the license costs associated with these third-party languages and databases, and yield a more streamlined and technologically consistent portfolio. This approach makes subsequent modernization efforts, such as migration to Java or Linux, easier to perform. COBOL applications will remain viable for quite some time. Java can be used to begin to encircle these applications, providing more-modern or multichannel interfaces. A gradual evolution to Java as the technology continues to improve on the mainframe enables migration to occur at a manageable pace.

SOA and the Mainframe

Organizations can expose existing mainframe applications as services. While developing the skills necessary to create services by orchestrating screen-based or callable transactions, as well

as inputting data into a unified business service, organizations should evaluate the impact of this approach on the organization structure, development approach, application infrastructure and operational environment. Also, do not underestimate the compromises that may need to take place to make these initial efforts successful. Introducing SOA into a company has a technology component, but, more importantly, it involves a change in organizational thinking. Use the early efforts to deliver tactical benefits, while beginning to change the organizational view of applications. Evaluate tools that provide good microflow orchestration. The creation of useful services from existing mainframe transactions will require the composition of potentially multiple transactions or data sources. Navigation among these transactions is referred to as "microflows." When existing screen-based transactions are combined with other screen-based or callable transactions, the navigation among these various transactions can handle the traditional menu flows of screens and extract data from one transaction to use in another. The result of extracting data from several sources is then used to respond to the service request. Services can be built on top of a single transaction, but this is not ideal, unless the granularity of the single transaction has a direct relationship to the defined service. Tools from IBM, GT Software, DataDirect, SOA Software, HostBridge Technology and Seagull Software, a division of Rocket Software, provide microflow navigation and marshaling/unmarshaling of data into XML for the service response.

Rational to the Rescue

The IBM Rational brand has become the cornerstone of IBM's enterprise modernization strategy. Rational is focusing its efforts on people/skills, applications and teams. Its strategy is a go-to-market overlay on top of the full Rational product portfolio. Its focus is on all IBM platforms, not just on System z and System i. The foundation of its strategy for the mainframe remains Rational Developer for System z (RD4z). This product is focused on people who deliver applications and is designed to achieve greater productivity, leveraging existing domain knowledge. Rational is also offering, through its own service channel, the ability to migrate off many legacy languages. These Rational Migration Extensions offer partner-led solutions to migrate off COBOL, RPG and Synon on System i and COBOL, Natural, Datacom, COOL:gen and CA-Ideal on System z. All these partner solutions transform the source code to Enterprise Generation Language (EGL). Customers can then choose to run these applications by generating COBOL for CICS or Java for WebSphere.

CICS Is Not To Be Left Out

CICS, the basis for much of the online transaction processing running on IBM mainframes, is not to be left out. There is a significant youth movement in the labs in Hursley, U.K., and IBM is showing great interest in turning the CICS environment into a modern application platform. IBM has added support for CICS events, Atom feeds and a significant new CICS Explorer feature. CICS Explorer is designed to serve as the integration platform for all CICS management, whether from IBM or ISVs. It can be downloaded for free from the Web and currently supports three IBM products — CICS Configuration Manager, Performance Analyzer, and Interdependency Manager. Furthermore, IBM continues to increase the integration points between CICS and WebSphere. CICS Events can be consumed by the WebSphere Business Monitor product. Web Services can be consumed by WebSphere Application Server (WAS). CICS has also introduced improved cross-memory connections with WAS on the mainframe.

Modernization on the Mainframe

Clients wishing to evolve their legacy application portfolios into more-modern technologies and architectures can do so on the IBM mainframe. Gartner believes that these clients must accept a strategic commitment to Linux for System z, Java, WebSphere and DB2 during the next decade. The evolution of a large-scale legacy portfolio fundamentally based on the languages, runtimes

and design principles of decades past is not inconsequential. Transition of mainframe workloads to other distributed platforms is not simple either. Gartner believes the sub-3,000 MIP segment of the IBM mainframe installed base is more likely to consider migration than IBM's largest enterprise customers. These customers should accept that their dependence on IBM will continue to grow if they make this commitment.

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