

What's Your Legacy?

You Can Use What You've Got to Get to Where You Want

IT Modernization: Preserving Business Value

The total cost of ownership of mainframe environments is high and continuing to increase. Therefore, it's no surprise that surveys show that cost control ranks with the desire for greater agility as the two top business drivers for modernization. That means that IT executives are setting a high bar—they want to achieve improved flexibility and adaptability so

Businesses today are at the point where it is critical to modernize their infrastructure and re-host or re-architect their applications so they can survive and thrive in a world of economic challenges.

they can meet their tactical and strategic goals for greater agility. At the same time, they are motivated to deal with the bottom-line issue of reducing costs.

Fortunately, these goals are not mutually exclusive. But to achieve them, it is critical that the business content of legacy systems be preserved—and that can be accomplished through either re-hosting or re-architecting.

Simply put, re-hosting aims to move an entire application system from a mainframe environment to an alternate, non-mainframe environment without altering the code of the application. Key drivers for a re-host modernization effort include:

- Need to avoid costly mainframe upgrades

- and software maintenance increases
- Need to save costs on applications with limited lifetimes that are too costly to re-architect

EXECUTIVE SUMMARY

Constrained by the inflexibility of older technology with its high maintenance costs, businesses today need an alternative that provides lower cost and an increased ability to react to business change. While many organizations have reached a “comfort zone” with their existing platforms, almost half of those surveyed in a recent CIO/Computerworld Nextgen IT survey, “Data Center Consolidation,” said they plan to eliminate their mainframes within three years. Given the high cost of rewriting an application, organizations have to retain the business content of current applications while replacing their mainframes with new technology. This is what application modernization is all about.

Of course, application modernization is no small task. It means implementing a process by which legacy elements are superseded and applications are replaced, migrated or transformed to newer platforms and more adaptable architectures. The first step is looking clearly at your existing applications and infrastructure and asking three important questions:

- Are our current applications and infrastructure adapting and reacting quickly enough to support change in our business?
- Do our current applications and infrastructure deliver value for money spent?
- Will our current applications and infrastructure satisfy our future requirements?

Read this paper to learn more about answering these questions, and then take the steps to create a next-generation IT organization through modernization.

BUSINESS WHITEPAPER SPONSORED BY



EDS is a leading technology services company delivering business solutions to help clients become more productive, innovate and grow.



The world leader in silicon innovation is designing its market-leading platforms to deliver next-generation capabilities to benefit both IT and end users alike.



Providing the mission-critical PRIMEQUEST server, which exceeds mainframe performance, with improved reliability and dramatically reduced cost.



Provides software that helps companies drive mission-critical applications and seamlessly enhance their web presence and mobility.

- Desire to facilitate future modernization by having legacy applications in the same environment as next-generation technology
- Need to migrate remaining “attached” legacy code when the bulk of a legacy application has been replaced with a commercial off-the-shelf (COTS) application that executes in the new environment

There is no single budget-cycle “quick fix,” yet when it comes to modernization, benefits often start immediately.

potential value of a new architecture going forward. It starts with an effort to understand and document the existing application (i.e., what it does and how it does it from a business perspective). Then, using the best available modern technology, the functionality is recreated to be more portable, agile and scalable. Key drivers for a re-architect modernization effort include:

- Need to improve business process efficiency and effectiveness
- Need to lower cost of maintenance by maximizing the use of next-generation technology such as portals, process orchestration engines and business rules engines
- Need to eliminate reliance on legacy skill sets
- Need for a more agile environment that can react more effectively to business change
- Need to increase reusability of application components
- Need for additional business functionality that requires non-trivial application change

Businesses today are at a point where it is critical to modernize their infrastructure and re-host or re-architect their applications so

they can survive and thrive in a world of economic challenges.

Delivering Your IT Modernization Initiative

IT modernization makes companies more competitive by ensuring that their application architectures can meet business needs in the 21st century. Modernization is best accomplished in a step-wise fashion, over a period of time, through a series of transformation activities. The resulting optimized, modern applications and infrastructure allow IT to better support business growth and accelerate revenue generation goals.

To produce consistently excellent results, it is important to apply best practices that build on tested, repeatable processes. EDS, working with Fujitsu, Intel and Oracle [see sidebar], can ensure the benefits from modernization are optimized. EDS draws on its modernization experience and the next-generation software and hardware of its partners to deliver a complete application modernization solution that helps you attain your goals: greater agility and lower costs.

What does IT modernization look like? EDS-provided elements can include:

- Business process analysis and process re-engineering
- Current application and infrastructure landscape assessment
- Support for modern target platforms and architectures, including J2EE*, .NET, UNIX* and Linux
- Use of industry best practices through the EDS applications modernization framework
- A comprehensive approach to modernizing all solution components, including organization, process, applications and technology
- Support for various modernization approaches, including re-hosting and re-architecting
- Demonstrating the value of a more flexible, modern infrastructure

Working with Fujitsu, Intel and Oracle, EDS

provides a powerful combination of reliable software and hardware, along with proven processes that can optimize your applications infrastructure while preserving the value of your existing applications.

EDS professionals use their industry and domain expertise, applications knowledge and strategic planning capabilities to quickly and efficiently transform legacy applications to modern platforms based on Oracle Fusion Middleware, Oracle Database 10g and Intel-based Fujitsu servers that provide increased functionality and flexibility and are also more economical. EDS professionals can ensure that your modernized applications portfolio and infrastructure will align to your business, operations and budget needs, making IT a major component of your business growth strategy.

Preserving What's Best

The most likely legacy applications to be modernized are systems that have a high degree of critical business value and are not at the end of their life cycle, but operate at relatively old technology levels and/or high costs of ownership. Determining where applications reside along this spectrum and along their life cycle is a critical first step in addressing legacy issues.

EDS uses seven strategies to modernize your organization's application infrastructure from today's rigid environment to a streamlined and modern operation. EDS offers centers of expertise that specialize in transforming specific computer languages, carrying out data migration, introducing process management and more. These professionals also provide a framework for ongoing management that ensures you get optimum performance from your applications portfolio.

The EDS process for modernizing a legacy application to a new platform, language or architecture generally follows a typical set of steps designed to fit the process to the business need. A particular project will perform some of these steps and omit others, depending on the goal of the project.

EDS conducts a thorough analysis of an

LEARN MORE ABOUT IT MODERNIZATION

Your Legacy of Change

There is no single budget-cycle "quick fix," yet when it comes to modernization, benefits often start immediately. You don't have to wait until the end of the transformation to begin seeing these bottom-line results.

So, if you want to better control costs and enhance ROI—with reduced total cost of ownership—consider modernization now. You can continue to justify the long-term investments that have given your legacy assets their business value while minimizing long-term business risk by moving away from costly and unmanageable legacy environments. And, of course, you can improve your competitiveness through enhanced business capabilities based on more modern technology. Best of all, EDS and its collaborators provide the means and methods to make the journey to business agility financially and operationally successful. Additional information on EDS, Fujitsu, Intel and Oracle "next-generation" offerings and on taking the next steps to achieve IT modernization is available at: www.nextgenerationinsights.com.

application portfolio, based on in-depth interviews and analysis of business strategy, estimations of the business value of systems, and quantitative technical analysis of the programs. This approach, called rationalization, presents an actionable plan for your application portfolio. Based on this effort, you can determine which applications should be re-hosted or re-architected as part of the modernization effort.

Delving even deeper, EDS can assess the underlying construct of programs selected for modernization, using automated software tools to examine the source code and related documents that define a legacy software system. Related documents include such things as database schemas and job control files. Design documents, if they exist in a suitable format, may also be analyzed. These automated tools can produce a great deal of useful information about the legacy application, including:

- Statistics such as size, lines of code and frequency of certain characteristics
- Standard metrics defining complexity

- Diagrams of the logical structure of the application
- Databases describing the legacy application that can be interactively queried
- Inventories of programs, inputs, outputs, job control steps and their inter-relationships
- High-level descriptions of functions for use as requirements for re-architecting
- Application models or other standard representations

Information produced by these tools is vital in further defining transformations of a legacy system and determining how to optimize performance in the new target environment. Then it is a matter of selecting the tactics to be used to transform any given application based on the particular need. These tactics can include:

- Changing source code to replace legacy database and file system access to use relational databases such as Oracle Database 10g

- Re-hosting an application by migrating the application to a similar environment on another platform such as Linux
- Translation of application code to other languages without changes to functionality or architecture (such as translation of legacy fourth-generation languages to C or Java)
- Re-architecting applications by reverse-engineering and then forward-engineering application functionality to new service-oriented architectures while retaining business content

Given the investment that organizations have in their legacy applications, taking advantage of the modernization approach, which preserves application business content while adopting new technology, is something every organization looking to reduce cost and increase agility needs to examine. EDS, working with the best in modernization platforms provided by Fujitsu, Intel and Oracle, can help you get there.

A CONSORTIUM OF CAPABILITIES

EDS, Fujitsu, Intel and Oracle are taking a consortium approach to modernization—a strategy that offers both a starting point for understanding your organization's challenges and the answers you need to shape your own avenue to modernization.

EDS, for its part, has immense knowledge of IT processes and practices—from the network to the desktop—based on its four decades of experience as an outsourcer. Its clients span every kind of industry in every part of the world. And the company provides a full portfolio of information technology and business process services, including all the necessary elements for tran-

sitioning from legacy systems to more modern, adaptable and affordable architectures. To best deliver on its vision of modernization, EDS has joined with three other widely respected corporations—Fujitsu, Intel and Oracle—combining EDS modernization experience with the next-generation infrastructure provided by the complete Oracle 10g technology stack and Intel-based Fujitsu servers to create complete application modernization solutions.

THE RIGHT SOFTWARE FOR THE MODERNIZED APPLICATION

Oracle, the world's largest enterprise software company, provides a mature and sophisticated set of

products that combine to form a complete destination platform for modernization projects. Oracle Fusion Middleware and Oracle Database 10g, coupled with Linux/Unix operating systems and hardware platforms such as the Intel-based Fujitsu PRIME-QUEST™, form the complete platform for modernized applications.

Oracle recognizes that modernized applications need to take advantage of today's new unified workplace. Oracle Fusion Middleware provides a complete set of products for implementing the many access mechanisms needed by today's organization.

In contrast to legacy applications, modernized applications

make use of new architectural concepts such as SOA and business process orchestration. Through core products such as Oracle Web Services Manager and Oracle BPEL Process Manager, the Oracle SOA Suite provides the complete solution for composition and process orchestration, allowing SOA services to be defined, managed and orchestrated into complete business processes.

Modernized applications also require a core infrastructure that provides a mainframe-like quality of service. Oracle Grid Computing products such as Oracle Application Server 10g and Oracle Database 10g provide the necessary reliability, availability and serviceability (RAS) characteristics for both database and J2EE applications to support the modernization of mission-critical applications.

Oracle also provides a number of products, such as Oracle Business Rules, Oracle B2B, Oracle Enterprise Service Bus (ESB) and Oracle XML Publisher, that are key to modernization in that they replace functionality that is typically hard-coded in legacy applications, thus helping to decrease the number of lines of code, and as a result the ongoing maintenance cost, in the modernized application.

Fujitsu, a global provider of industry-standard servers with a long history of providing mission-critical data center solutions, has built its RAS technology on the solid, underlying power of Intel® Itanium® 2 processors. PRIMEQUEST™ servers, for example, are specifically tailored

to meet the highest demands for reliability and availability in the data center.

With a long history of designing industry-leading data centers, the newest Fujitsu offering—the PRIMEQUEST™ server line—is a superlative choice for cost-effective modernization. The disciplines of the data center environment, both design and execution, have been partnered with the performance and economics of the Intel Itanium 2 Processor to produce a highly available mission-critical open systems server.

The PRIMEQUEST™ line of servers is capable of taking your applications into the next level of scalable performance, reliability and flexibility for open systems supporting Microsoft Windows* Server, Red Hat and Novell SUSE Linux.

ARCHITECTURAL OVERVIEW

Like other scalable symmetrical multi-processor (SMP) designs, PRIMEQUEST™ systems are constructed from modular building blocks. System boards contain processors and memory. PRIMEQUEST™ system boards contain four processor chips and 32 DIMM slots for memory. I/O units provide PCI slots, Gigabit Ethernet connections, and SCSI connections. A crossbar switch enables the system interconnect among the processor/memory boards and I/O units. Fujitsu-designed system management boards monitor for failures and help configure the system into partitions.

From such a basic description, the PRIMEQUEST™ architecture sounds similar to those of

other modularly scalable SMP systems. However, there are some important differences. For example, the system interconnect (crossbar) is a key determinant of overall performance. Fujitsu has used its supercomputing experience to design a crossbar switch that delivers higher bandwidth at lower latencies than competitive systems. Specifically, the PRIMEQUEST™ 580 offers 137 GB/sec. aggregate peak bandwidth. As such, PRIMEQUEST™ can deliver higher system performance than other implementations that may use the same processor chips.

Not only does the Fujitsu system interconnect deliver high performance, but it can also be configured redundantly, with each crossbar transporting a duplicate copy of the same data. Should a failure occur in one set of hardware, PRIMEQUEST™ systems can continue operating without service disruption. Redundant mirroring of the system interconnect is only one of the mirroring choices that enable PRIMEQUEST™ to serve in mission-critical environments.

PRIMEQUEST™ flexible partitioning provides the ability to configure up to 16 isolated partitions, each running its own operating system instance and software stack. Unique to the Fujitsu implementation is the flexible I/O capability, which permits system boards and I/O units to be independently assigned to partitions, enabling partitions to be defined with the blend of processing power and I/O connectivity most appropriate for the application set.

Another item to note is that PRIMEQUEST™ system boards and I/O units can be independently assigned to different partitions. Other designs typically tie I/O capability to associated system boards, requiring that system boards and I/O always be configured together. Fujitsu does not predefine which I/O units are associated with particular system boards and permits partitions to flexibly contain different numbers of I/O units.

Integrating the robust performance of the Itanium 2 processor together with a Fujitsu-designed memory and I/O subsystem have produced the best platform for running your mission-critical applications. The scalability, flexible growth and solid foundation of SMP memory performance designed into PRIMEQUEST servers delivers the agility, efficiency and continuity that are required to meet your needs now and well into the future.

Other features and benefits include:

- Enterprise-class integrated server designs
- Flexible partitioning for multiple operating systems
- Support for Red Hat Enterprise Linux and Novell SUSE Linux Enterprise Server
- Support for Microsoft Windows Server Enterprise Edition and Datacenter Edition
- Fault immunity using System Mirror Mode for class-leading availability
- Flexible I/O capability supports balanced configurations

- Full support for the extensive catalog of Intel Itanium 2 processor-based applications
- A host of integrated facilities to reduce administrative complexity
- Redundant management networks hosting Secure Sockets Layer (SSL) protocols
- Integrated gigabit switching and hub connections
- Integrated SCSI hard drives
- Integrated KVM/USB for simplified partition management

THE RIGHT FOUNDATION FOR MODERNIZATION

Many of the world's largest and most successful organizations are deploying Intel Itanium® 2 processor-based solutions to cut costs and improve agility for some of their most demanding, business-critical applications. Adopters include more than 70 of the world's 100 largest companies, including 9 of the top 10 automotive companies, 8 of the top 10 banking companies, 14 of the top 15 energy companies, and 4 of the top 5 healthcare companies. More than 109,000 Intel Itanium® 2 processor-based systems have already been deployed around the world,¹ in configurations ranging from small two-way servers to massive systems with up to 512 processors.² Customers are reporting a high level of satisfaction³ and systems based on the new Dual-Core Intel® Itanium® 2 processor can be expected to provide another major boost in adoption rates. In fact, these servers deliver twice the perfor-

mance of previous systems while consuming up to 20 percent less energy and providing expanded enterprise capabilities that help businesses achieve even higher levels of performance, flexibility and availability.

While it has taken time for application support to reach critical mass for Itanium-based systems, that time has clearly arrived. Software availability has more than doubled to more than 8,000 optimized applications and tools. In addition, new binary translation technologies will soon enable Sun Solaris-based applications, and many others, to run without change and with near-native performance on Intel Itanium processor-based systems. This breakthrough capability will greatly reduce the cost and complexity of migration, enabling more businesses to take advantage of the flexibility and value of Itanium-based solutions. Businesses around the world are finding that Intel Itanium 2 processor-based servers enable them to substantially reduce their total costs, while offering the flexibility to choose from 10 operating systems, dozens of hardware vendors, thousands of applications, and a large community of independent solution providers.

For organizations that are tired of the high cost and limitations of proprietary architectures, Intel Itanium 2 processor-based solutions offer a new model for business-critical computing—one that is rapidly gaining traction in the worldwide marketplace.

¹ Based on data from IDC Server Tracker Q1, 2006.

² A notable example is NASA's Columbia supercomputer, which includes 20 Itanium 2-based systems, each with 512 processors: www.intel.com/technology/computing/hw10041.htm

³ "Satisfaction among current Itanium customers is high, with two-thirds applying the highest satisfaction ratings for their Itanium servers." Source: IDC, "Customer Perceptions of the Future of Itanium," Michelle Bailey, Crawford Del Prete, Vernon Turner, Matthew Eastwood, and Stephen L. Josselyn, Doc #34842, February 2006, available for purchase at: www.idc.com/getdoc.jsp?containerId=34842