



MIGRATING .NET APPLICATIONS TO JAVA EE AND SOLARIS PLATFORMS

Leveraging Sun-Mainsoft Porting Strategies

White Paper

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Chapter 1

Introduction

This white paper describes in detail how ISVs and developers can leverage Microsoft .NET applications, tools, and skills to achieve a predictable, managed multi-platform deployment strategy with Sun™ Java™ Enterprise Edition (Java EE) and Solaris™ OS. For enterprise customers seeking interoperability between systems and applications, greater manageability, and enhanced security in their data centers, the Sun Java EE and Solaris platforms provide a proven, cost-effective alternative to Windows, .NET, and open source options. ISVs and developers who recognize the potential for new opportunities by offering multi-platform deployments of their existing applications can use the Mainsoft family of products to achieve complete ports on predictable schedules and budgets while lowering application lifecycle costs.

A Valuable Partnership Working for Developers & ISVs

Sun Microsystems and Mainsoft Corporation have partnered for over a decade to offer platform interoperability and porting solutions. ISVs and developers can efficiently expand their offerings to encompass the Solaris and Java EE platforms in addition to Windows and .NET that has many advantages over other porting methods. These benefits include:

- Single code base approach to multi-platform deployments
- Faster, more predictable, and more cost-effective strategy compared to manual porting
- Development teams remain free to focus on enhancements and new functionality rather than multi-platform support and maintenance
- Enables ISVs to offer greater interoperability to customers
- Java EE and Solaris both provide enterprise-wide management tools for customers with mixed platform environments

Challenges Facing Developers & ISVs

ISVs need to assure global competitiveness, maximize profitability, and increase their offerings within new and existing customers in order to remain successful. Sun and Mainsoft can help ISVs achieve these important goals by allowing them to offer their applications to enterprise customers who operate mixed or UNIX® environments.

Revenue opportunities in mixed or UNIX environments can be realized by porting Windows and .NET applications to Solaris and Java EE faster and more efficiently by adopting Mainsoft's cross-platform toolsets as compared with other approaches.

Reduce Porting & Lifecycle Costs

Costs and timelines associated with multi-platform code development need to be predictable, and kept within predictable margins. ISVs who struggle with how to offer their applications on the Java EE and Solaris operating platforms in addition to Windows and .NET platforms can use Mainsoft tools to implement a complete porting strategy.

By leveraging existing code, as well as, the same tools and skill sets used to develop Windows and .NET applications, Mainsoft tools enable ISVs to avoid hiring new, expensive development teams or re-writing and maintaining separate code bases. In addition to faster and more reliable deployment schedules, lifecycle management of Windows and .NET applications for the Solaris and Java EE operating platforms is greatly simplified and costs are minimized and more predictable.

Serve Customers Better

ISVs' customers seeking better security, reliability, scalability, and manageability in their data centers can benefit greatly by adopting the Solaris and Java EE operating platforms. By offering customers a choice of platforms, and by extension interoperability within mixed environments, ISVs can serve customers better, retain them more easily, and become competitive on all platforms.

Chapter 2

Sun Platforms Offerings Can Generate New Opportunities

How Solaris Helps IT Meet Real-World Challenges

According to IDC Research, IT organizations are increasingly looking to ISVs and systems vendors to take a more active role in solving some of their greatest challenges. ISVs and developers can assist customers by offering solutions that are more flexible and interoperable, simplify data center management, and increase security. Using Mainsoft for UNIX, C++ applications developed for Windows can be redeployed on Solaris OS rapidly and reliably, enabling customers to take advantage of Solaris' proven security, management, and scalability advantages. These are a few of the ways that offering applications on the Solaris platform can enable ISVs and developers to serve their customers and effectively address key challenges:

Enterprise Databases

Supporting enterprise databases is a worldwide, around-the-clock proposition. Access to these enterprise databases is required for everything from customers purchasing a product online to international divisions working together across time zones. Solaris leads the industry as the database platform of choice for enterprise customers running every type of database, from Oracle to MySQL.

Dynamic Monitoring

DTrace is a comprehensive dynamic tracing framework for the Solaris Operating Environment, with powerful, low-overhead monitoring and reporting capabilities not included on the Windows platform. DTrace provides a powerful infrastructure to permit administrators, developers, and service personnel to concisely answer questions about the behavior of the operating system and user programs without adding overhead that taxes server performance.

Open Source Applications

ISV customers looking to run open source applications turn to Solaris, not only because it is an open source operating system, but also because Solaris 10 includes 188 of the leading open source packages. In many cases, these applications are supported by Sun.

Grid Computing

ISV enterprise customers looking to reclaim underutilized resources on their networks or manage complex calculations over a broad range of systems can leverage grid computing immediately using the Solaris 10 platform. Extensive platform optimization offers more computing cycles, and allows data to be processed with both high performance levels and security.

Regulatory Compliance

Business customers subject to government security regulations can leverage the Solaris 10 platform to meet those requirements. Solaris 10 offers the highest levels of security available in any commercial operating system on the market today.

Web Services

As an optimized Web services platform, the Solaris 10 operating system delivers reliability, an enhanced TCP/IP stack, and extensive security features. For enterprise customers, it's an ideal operating platform to introduce and iteratively expand

availability of Web services driven by ISV applications. Since Solaris 10 comes with open source Apache and Tomcat software that's fully supported by Sun, ISV customers can deploy Web services immediately.

Solaris' extensive out-of-the-box functionality provides enterprise customers with the infrastructure technology, flexibility, and versatility they need to run their businesses more efficiently. ISVs who support these customers by offering Solaris versions of their applications can attract new business and build loyalty by supporting their customer's success in innovating their infrastructure for improved ROI.

Greater Enterprise Penetration

ISVs offering applications on Sun's Solaris 10 for SPARC® and x64 platforms can leverage and capitalize on Sun's history and strength of working with enterprise level customers. These platforms are aimed at helping enterprise customers meet their most important IT challenges. Solaris has continually been recognized as the industry leading operating platform for enterprise customers.

According to IDC, over 70% of IDC's top software vendors offer products on Solaris. There are currently over 1,600 applications from ISVs like Oracle, Sybase, IBM, BMC, TIBCO, BEA, and many others available on Solaris 10 for x64/x86, and tens of thousands more on previous versions of Solaris.

Lower TCO

According to a study conducted by the Crimson Consulting Group, Solaris for x86 offers a lower total cost of ownership as compared with Windows or Red Hat Linux. The report, entitled, "Adoption of Solaris 10 on x86/x64 by Independent Software Vendors Cost Analysis and Discussion" concludes that for ISVs weighing their options for porting applications to UNIX, Solaris for x86 offers the most attractive licensing, cost, security, and management functionality profile over the long term.

How Java EE Helps IT Customers Meet Real-World Challenges

In general, the market has consolidated into two major families of technology for developing multi-tiered applications: the Microsoft .NET family and Java EE. According to the authors of [Java EE and .NET Interoperability: Integration Strategies, Patterns and Best Practices](#), published in 2006, Java EE is considered by many to be superior to .NET because of its security, scalability, and manageability.

Gartner reports that Java EE represents 44% of the overall market for Web-based enterprise application platforms, and that it dominates market share in certain industries such as insurance. The reliability, availability, and massive scalability of Java EE applications is well known and widely documented. The reality is that most organizations operate both .NET and Java EE applications. The key is interoperability.

Security

Java EE provides a full complement of standards-based security services for interoperation with .NET including authentication, authorization, secure sockets, cryptography, certification, and more. In addition, it's possible to ensure secure interoperability with .NET applications on every tier of the multi-tier applications: the web tier, business tier, and resources tier. At the same time, Mainsoft for Java EE recompiles .NET code into Java byte code, which runs securely on Java platforms. It also enables Java components to be directly called from within .NET applications, without compromising security.

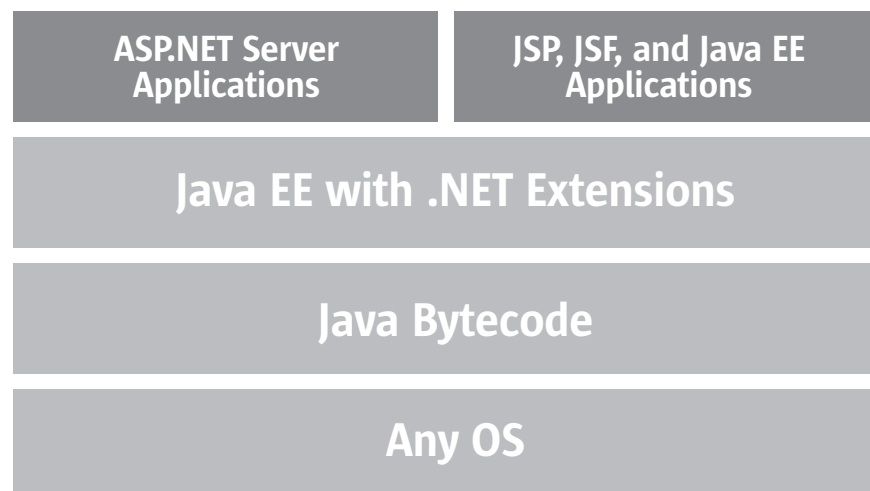
Flexibility

Java EE applications are platform-agnostic and therefore more flexible. Java EE applications work on most hardware and operating system configurations, and since they're based on Java, they work on any system that supports the Java Virtual Machine. This flexibility is critical for enterprise customers seeking interoperability in mixed environments.

Simplified, Powerful Management

Gaining insight into application operations to prevent failure and optimize performance in Java EE can be done using advanced, managed bean components to monitor services and resources within an application. .NET applications, by contrast, utilize a different, incompatible approach, making it difficult to gain an apples-to-apples view of entire applications across both technologies. However, by re-hosting .NET applications in the Java EE environment using Mainsoft products, the problem of dual management strategies becomes moot, simplifying and unifying management across both .NET and Java EE components. Here are a few of the management benefits that can be achieved using Mainsoft software to host .NET components within Java EE:

- **Fault Management**—By consolidating on Java EE, developers gain end-to-end debugging and fault analysis for all components, including for .NET components
- **Configuration Management**—System management and application management through a JAVA EE administration console can be done across the entire platform, including the .NET components
- **Accounting Management**—Use a single accounting management system running on Java EE across different accounting systems on heterogeneous platforms.
- **Performance Management**—Avoid the problematic overhead of protocol conversions, such as bridging or SOAP to HTTP Web services, while collecting statistics using Java EE metering facilities
- **Security Management**—The Java EE security model enables management of users and authorizations in a single domain, simplifying management by consolidating authorizations across multiple domains into a single one



Compile-time translation layer that converts MSIL into Java byte code

Built-in High Availability Components

Microsoft Visual Studio tools empower developers to quickly produce quality software, but enterprise applications require functionality such as object pooling to scale well, scale securely, and remain inherently manageable. Java EE application servers deliver this functionality for a fraction of the cost it takes to develop these features independently.

Enhanced Web Services

Java EE includes simplified Web services support and enhanced Web services APIs, making it an ideal implementation platform for Service-Oriented Architectures (SOA). Even though many organizations may not adopt SOA fully, Web services still provide a flexible means of delivering data and integrating applications. Constructing Web applications is made easier with JavaServer™ Faces (JSF) technology and the JavaServer Pages™ Standard Tag Library (JSTL). Java EE supports rich thin-client technologies such as AJAX (Asynchronous Java and XML), technologies that are crucial for building Web 2.0 applications.

Chapter 3

How Can ISVs Perform Sustainable Ports?

Porting Applications to Solaris and Java EE

Traditionally, undertaking multi-platform development was prohibitively expensive, slow, and difficult to manage. Maintaining parallel application development teams, procedures, and functionality over the lifecycle of the application simply wasn't realistic for all but the largest software vendors. Mainsoft for UNIX and Mainsoft for Java EE change the economics and timelines associated with supporting multi-platform product offerings.

Mainsoft Tools Lower Costs and Speed Porting

Tools from Mainsoft Corporation lower the total cost of ownership associated with porting and maintaining multiple deployments, both by accelerating the porting process significantly and by enabling developers to maintain multiple deployments using a single code base. This holds true for C++ applications running on Windows and Solaris, and for C# and Visual Basic .NET server and Web applications running on .NET and Java EE.

Overview of Mainsoft for UNIX

Mainsoft for UNIX is an enterprise-class application-porting platform that enables software developers to develop C++ applications on Windows using the Visual Studio development environment and deploys them on Solaris and other UNIX operating systems.

The product recompiles Windows source code with UNIX compilers to create native UNIX applications. It also features a Java EE Integration Package and industry-leading XML support. It supports Solaris 8, 9, and 10 for SPARC, and Solaris 10 for the x64/x86 platforms in both 32 and 64-bit versions. Together, these features create the most high-performance, scalable, robust application-porting platform available. Mainsoft for UNIX delivers several strategic advantages for ISVs considering porting their applications:

- Establishes a single code base for Windows and Solaris versions, avoiding the complexity and resource drain associated with maintaining multiple code bases and separate application evolutionary tracks
- Enables trained developers to continue working in the Microsoft Visual Studio development environment, where they are most comfortable and productive
- Keeps existing development teams, processes, and productivity methods intact while avoiding the need to hire new, specialized talent
- Focuses developers on writing better applications, not performing housekeeping duties associated with maintaining several versions of the same application

Overview of Mainsoft for Java EE

Mainsoft for Java EE is a single-source code development solution for the .NET and Java EE platforms which enables software vendors to rapidly port Microsoft .NET Web and server applications to the Java EE platform, without having to hire more engineers or rewrite well-functioning, tested, and valuable .NET components.

.NET to Java EE Porting Strategies

For ISVs making the decision to port .NET applications written in VB.NET or C#, the most time and resource-intensive processes are to re-write the code, or manually port the code.

To estimate the time it takes to re-write code, note that developers normally write 50-300 lines of code per day, depending on complexity. For a typical enterprise application consisting of 500,000 lines of code, the process can take 40 man-years or longer.

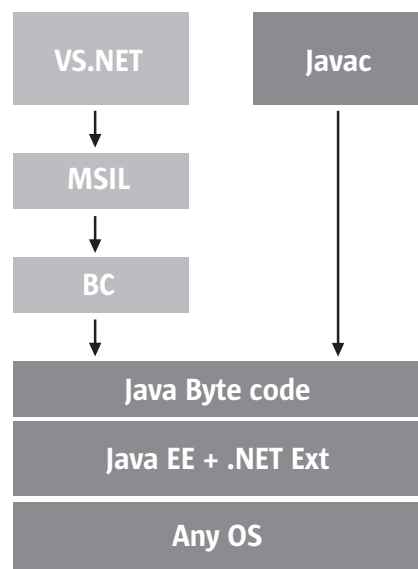
Manual porting creates binaries for Solaris out of those from Windows. At first glance, a manual port may seem straightforward for an application written in a higher-level language such as C# or VB.NET.

Unfortunately, however, the underlying class libraries differ greatly, and, in the case of a C# or VB.NET application, there are also numerous semantics gaps that need to be fixed. The only method for making those changes is to go line by line, a time-consuming task.

According to Mainssoft studies and customer accounts, re-writing code or performing manual ports can double R&D costs over the lifecycle of applications.

Establish and Maintain a Single Code Base for Multiple Platforms

Using Mainssoft's specialized tools to automate and streamline the process, ISVs can deliver native performance in the new operating environments while establishing a single code base supporting Windows and Solaris or .NET and Java EE. Developers continue to work in their familiar and productive development environment, most often Microsoft Visual Studio, while gaining consistency and reliability for multi-platform delivery over the lifecycle of the product.



Mainssoft for Java EE provides a plug-in for Visual Studio.NET that enables developers to use C# or VB.NET

Seibel Systems, Telelogic, Pacific Edge Software, and Comtec are among a growing number of ISVs extending their Windows applications to multiple platforms, while dramatically reducing development costs and time-to-market.

Equivalent Performance, Scalability in Java EE as Native .NET Application

Applications ported from .NET to Java EE with Mainssoft software and services perform just as well, if not better, than the original .NET application. Mainssoft used its software to port a popular business integration software platform from .NET to Java EE as a pure Java EE application. The original .NET version and the Java EE version running under Linux were tested using three different user scenarios.

- The first test measured the throughput of the two versions on identical machines, measuring the number of requests per second handled by each version under constant optimal user load. The WebSphere version of the application handled slightly more requests per second across all user loads.
- The second test measured the ability of the two versions to scale and increase their throughput with the addition of CPUs. Performance between the two versions was comparable.
- The third test observed how the response time of the two versions is influenced as the user load grows. The ported version of the application delivered approximately eight percent better response times compared to the original .NET version.

For complete results and the testing methodology, refer to the whitepaper, “Mainssoft ports a composite application platform to Java EE while maintaining original .NET performance.”

Chapter 4

Scenarios and Real-World Results

Many ISVs are using Mainsoft products to respond to customer requirements and meet demand for Solaris and Java EE versions of their successful Windows products. In fact, the ISVs described below reported to Mainsoft that their porting process was five to ten times faster than rewriting the applications from scratch. In addition, these vendors have been able to successfully maintain these applications for both Windows and open systems, in most cases delivering both versions either simultaneously or nearly so.

Siebel Systems

Siebel Systems provides the industry's most comprehensive family of multi-channel applications and services. Siebel applications allow organizations to create a single source of customer information that makes it easier to sell to, market to, and service customers across multiple channels. These include the Web, call centers, field, resellers, retail, and dealer networks.

Written in C++ and built on a proven, component-based architecture, Siebel eBusiness Applications are designed from the ground up to be completely Web-based. They deliver support for multiple computing platforms, while providing automatic upgrades and software distribution that significantly reduce the total cost of ownership.

“We needed to complete two native-quality ports quickly and Mainsoft proved to be the right choice. It took us less than six months to port the core of the Siebel eBusiness Applications to both Solaris and AIX.”

—Skip Bacon, Director of Architecture at Siebel Systems

Pacific Edge Software

Pacific Edge Software is working with Mainsoft to extend the reach of “Mariner” to Java EE. “Mariner” provides portfolio, project, resource, and financial management capabilities to organizations managing thousands of projects and resources. It is a sophisticated enterprise application that implements the latest Web technologies like AJAX (Asynchronous Java and XML) and Web Services.

“Using Mainsoft for Java EE, Pacific Edge is able to simultaneously develop and target Microsoft .NET and Java EE server platforms. In the past, this would have required costly and time consuming software porting projects.”

—John Scumnotales, Vice President of Products for Pacific Edge Software

Comtec

Comtec, a leading information technology services and solutions provider for insurers, contracted Mainsoft to extend its Total Insurance System (TIS), an extensive integrated system designed for insurance companies that process personal and commercial lines of business to Java EE platform. To extend its market reach to customers that prefer the scalability and performance of enterprise Java EE servers, the company made the strategic decision to offer Java EE deployments of the presentation layer of TIS. According to Forrester Research, 56% of server deployments in the insurance industry are on Java EE.

“Because Mainsoft is a compile-time solution, we are able to continue to maintain a single source code base. This lowers our TCO significantly, and allows us to have a multi-platform solution. The costs of having multiple source code bases, multiple R&D teams and multiple deployment types would have been prohibitive. We would likely not have been able to cost-effectively provide a multi-platform offering without it.”

—David Ghetler, CEO

Chapter 5

Conclusion

Together, Sun and Mainsoft technologies offer a comprehensive platform and porting solution that can assist ISVs in positioning their products for new, growing markets and develop strengthened long-term competitiveness. By offering applications for Solaris and Java EE in addition to Windows and .NET, ISVs can assist their enterprise IT customers to consolidate infrastructure, simplify licensing, and gain the unique management, scalability, and reliability features available only in Solaris and Java EE. This proven approach enables ISVs to offer these alternatives in a sustainable way without having to re-write code from scratch, maintain multiple code bases, or hire new teams of engineers. According to their own analysis, many ISVs have successfully transitioned from offering a Windows or .NET application to a multi-platform application encompassing the Solaris and Java EE in less time and for less cost than any other available method. For ISVs considering a port to enter new markets and improve global competitiveness, the Sun and Mainsoft solution provides the most powerful and cost-effective approach available on the market today.

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