MIGRATING TO THE SUN JAVA™ APPLICATION PLATFORM SUITE: A BUSINESS MANAGER'S GUIDE

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Chapter 1

Executive Summary

Responding to increased competitive pressure, executives today are taking a closer look at enterprise infrastructure and processes in an effort to devise innovative yet practical ways to increase revenue, reduce costs, and enhance shareholder value. As a business manager, your current strategy to carry out these requirements likely includes Web-oriented solutions to improve business process execution, enable employee productivity, work more effectively with partners, and respond more quickly to corporate and government regulations. However, information sharing alone is not enough to achieve these goals. New strategies focus on business process coordination that enables the automation and orchestration of activities between and among customers, employees, partners, and suppliers.

One example of this progression toward innovative, customizable content, applications, and services is the transition from Web sites to portals as a strategy to connect people though Web-enabled services. Web sites provide information to anyone who logs on. Some sites even update data dynamically so it is always current. However, the same information is provided to everyone, and most sites do not allow end users to interact with the information. In contrast, Web portals enable new ways of connecting people with business applications, processes, and each other.

A portal provides access to customized information and applications based on defined user roles. In addition, portals can incorporate small windows, called "portlets," that access other content, applications, and services. Portlets can be produced using pieces of several disparate applications, creating a composite application. Customized information and composite applications give individuals access to the information and processes they need to complete their tasks — a much richer and engaging user experience.

The key to implementing these innovative strategies is what Allan Alter refers to as a "frictionless infrastructure."[1] This software infrastructure supports collaboration and communication to:

- Shorten time to market
- Deliver real-time information
- Improve employee productivity
- Exploit information, instead of just managing it

However, proprietary and nonintegrated IT solutions have constrained businesses from realizing the frictionless infrastructure. The incapacity to rapidly deploy and update Web-based applications and services hinders your ability to share information and coordinate processes along the value chain. According to *CIO Insight*, IT architecture and infrastructure have never been so closely tied to corporate strategy as they are today. Yet, as a result of inflexible infrastructures, "43 percent of IT departments are regularly unable to make requested changes to systems."[2]

1. Alter, Allan B. "30 Trends for 2006: Pursuit of the Frictionless Business Platform." *CIO Insight*, 2005, p. 1.
2. Ibid, p. 2.

Many organizations see migration to open and integrated middleware platforms as the linchpin of an IT strategy for overcoming infrastructure constraints. Migrations can be accomplished at two levels: platform migrations recreate applications to run on a new platform, while application migrations modify applications to operate on an alternate platform rather than, or in addition to, the initial platform.[3] Understanding the high-level mechanics of the migration process can help you achieve flexible, Web-based applications and services that remain secure yet accessible.

In the past, new technology often meant entirely rewriting existing applications, which entailed additional costs that made adopting the technology prohibitively expensive. Sun's commitment to interoperability eases the adoption of the Sun Java™ Application Platform Suite, so your infrastructure supports your business strategy, instead of the other way around. In many cases, existing applications that conform to current standards can be migrated to the Sun™ platform with minimal modification. By integrating business process management with dynamic collaboration, the Java Application Platform Suite enables businesses to rapidly develop and deploy personalized, Web-oriented content and services through a single end-user experience.

This guide provides an overview of the concepts and processes involved in migrating to a new software infrastructure. Designed as a roadmap, it explores the reasons why you should consider migrating to the Java Application Platform Suite, and takes you through the process using a proven, six-step method. Sun has been down the migration road many times, and has developed a wide range of support resources which are described in this guide. As a result, when starting down a migration path with Sun, you can be assured of reaching your destination.

3. Migration is different than consolidation. Consolidation is the reorganization of one or more applications or platforms onto a more cohesive, cost-effective platform in order to achieve improved quality of service. While consolidation involves migration, as applications and business functionality are moved to a single machine, migration does not necessarily involve consolidation.

Chapter 2

Why Migrate to the Sun Java Application Platform Suite?

Enterprises need to be "flexible, fast, and informed".[4] To this end, business and IT executives are striving for a frictionless infrastructure, so the right information and processes get to the right people as quickly as possible. Specifically, executives are seeking more value from their middleware infrastructures in order to:

- Accelerate the development and deployment of Web-based applications and services
- Improve business productivity
- Enhance customer services through information sharing
- Collaborate with partners and reduce supply chain costs
- Control and protect enterprise information and assets
- Support their businesses in the most cost-effective manner possible

The Java Application Platform Suite responds to these challenges by enabling process-driven horizontal portals that access and aggregate information from across the enterprise, and deliver Web-oriented solutions based on an individual's role. Authorized access to applications and services is delivered through a single user experience. These role-based Web services can be developed using composite applications, allowing rapid updating and deployment. As a result, Java Application Platform Suite enables an enterprise to integrate and better manage its business processes, while supporting dynamic collaboration among customers, employees, partners, and suppliers. Ultimately this makes it possible for your enterprise to be more flexible, fast, and informed.

> *"The real key to our success when rolling out our customer loyalty programs is the efficiency of the Java Application Platform Suite, reducing development time and lowering deployment costs."*
>
> *David Yutzy, Manager, Web Intranet, CRM Systems, Retail Ventures, Inc.*

More than ever, having information and other resources available when you need them, and in a form that you can use with others, depends on the flexibility of your middleware platform. Consider the following characteristics when choosing your enterprise infrastructure:

Collaboration Framework

The Java Application Platform Suite provides integrated collaborative services, enabling teams to form online communities without requiring IT support. These communities consist of a dynamic set of users, information assets, applications, and portal pages, all accessed via a collection of Web services. Individuals can easily create communities by using templates customized to meet business needs.

Identity-based Content Delivery Framework

The unique capabilities of the Java Application Platform Suite include identity-based content delivery. This approach determines a user's interaction with enterprise data and Web services based on role definition and permissions. It also supports single sign-on (SSO) to data and information, ensuring a high level of security.

4. Alter, Allan B. "30 Trends for 2006: Pursuit of the Frictionless Business Platform." *CIO Insight*, 2005, p. 1.

Composite Application Delivery

The Java Application Platform Suite offers both a complete portal framework and support for the design and delivery of workflow and process integration. This enables your business to be more responsive by allowing access to, and interaction with, critical information and business processes in a single view.

Flexible IT: Open and Integrated

Sun supports interoperability at both the application and code level. For example, the Java Application Platform Suite:

- Supports the latest Java and Web services standards across all levels of the Java Application Platform Suite, including Web Services for Remote Portlets (WSRP), Java Specification Request (JSR) 168, and Java 2 Platform, Enterprise Edition (J2EE™) 1.4.
- Allows you to choose Sun's market-leading application server or integrate with an existing application server infrastructure, as the platform's Java System Portal Server runs on both WebSphere and WebLogic application servers.
- Runs in a wide range of environments including the Solaris™ Operating System, HP-UX, Linux, and Microsoft Windows — specifically: Solaris 10 OS (SPARC® and x86 Platform), Solaris 9 OS (SPARC and x86 Platform), Solaris 8 OS (SPARC Platform), Red Hat Enterprise Linux 2.1 and 3.1, HP-UX 11i, and Windows 2000, 2003, and XP (for developers).
- Supports global business strategies by conforming to internationalization standards. Languages supported on the aforementioned platforms include English, French, German, Korean, Japanese, Spanish, Simplified Chinese, and Traditional Chinese.

Scalability and Performance

As business grows, the infrastructure must provide optimum system performance in order to meet the demand created by increasing numbers of end users. The Java System Application Server includes transparent failover and recovery to provide continuous availability for applications and Web services. It is designed to support the most demanding operational requirements of the telecommunications and financial services markets.

Enterprise-level Quality of Service

Unplanned system outages can disrupt business and cut profits. The Java Application Platform Suite overcomes unplanned business disruptions that are a consequence of inflexible or vulnerable middleware platforms. A subset of the Java Enterprise System, all of the Suite's component products are designed and rigorously tested to ensure a level of compatibility and seamless interoperability unmatched by no other vendor. For example, the Java System Application Server delivers 99.999% availability, or less than five minutes of unplanned downtime per year. This means you can deliver consistent, reliable service to customers, employees, and partners.

Moreover, migrating to the Java Application Platform Suite is a cost-effective way to develop, deploy, and manage business integration solutions for a heterogeneous network of services, clients, and devices. It is a secure and reliable platform designed to accelerate time to service of new applications and streamline integration of legacy applications. Migration rewards are substantial: improved security, increased business agility, enhanced quality of service, and reduced costs.

For instance, migration advantages were clearly demonstrated by a major government contractor that realized significant functional and financial benefits by migrating to the Java System Portal Server, part of the Java Application Platform Suite. Initially, the contractor attempted to use BEA WebLogic to develop a portal framework. Significant issues developed while implementing e-mail, calendaring, and instant messaging applications. More problems arose when attempting to establish SSO access to these applications.

A Sun Professional Services staff member, who was on site assisting with a related project, was able to provide a better solution using Java System Portal Server portlets for e-mail, calendaring, and instant messaging. Because these portlets are fully integrated out of the box, he was able to install and demonstrate these functions in approximately four hours.

Based on the seamless integration with other products, the government contractor decided to move its existing applications from WebLogic to Java System Portal Server. Since the applications were already compatible with the Java Platform, Enterprise Edition (Java EE), the migration process was straightforward and completed in four weeks.

While functionality was the primary driver for the migration, a flexible licensing model was also a determining factor. The customer implemented a superior portal and saved $600,000 in licensing fees.

Successful migrations like this one are achieved by following a proven, structured process, as described in Section 3, *Migrating to the Sun Java Application Platform Suite*.

The Java Application Platform Suite includes:

Java System Portal Server
Increases enterprise productivity by enabling users to share, find, and manage information with others, securely and from virtually any device.

Java System Application Server Enterprise Edition
Provides a Java EE 1.4 compatible platform for developing and delivering server-side Java applications and Web services.

Java System Web Server and Java System Web Proxy Server
Delivers secure, interoperable, and highly reliable HTTP and proxy services for Web and application server environments.

Java System Message Queue
This high-performance messaging system integrates disparate applications, and is designed for large-scale enterprise deployments.

Java System Directory Server (Limited License)
Provides a secure, central repository for storing, managing, and protecting identity profiles, access privileges, and application and network resource information.

Java System Access Manager (Limited License)
Open, standards-based access control, SSO, and federation services that help control costs and minimize the security risks of conducting business more openly.

Sun Service Registry
Provides the means for registering and discovering Web services, as well as managing associated metadata and artifacts securely and reliably.

Java Studio Enterprise and Java Studio Creator
These intuitive, easy-to-use tools improve developer productivity and enable developers to rapidly implement applications and Web services across multiple platforms and environments.

Chapter 3

Migrating to the Sun Java Application Platform Suite

The key to a successful migration is developing a comprehensive plan for the process. This section provides an overview of common migration strategies, and a six-step process that has proven successful in supporting migrations.

Migration strategies generally fall into two categories: 1) Rip and replace, an all-or-nothing strategy with an associated high degree of risk; and 2) Phased transition, a lower risk strategy that first migrates components with the highest payback. In most situations, Sun recommends a phased transition. In addition to lower risk, this approach brings a quicker return on investment (ROI).

While migration projects vary widely, the process for migrating from one environment to another remains generally consistent. This process consists of six interdependent steps:

1. Migration assessment
2. Migration plan development
3. Java Application Platform Suite training
4. Migration implementation
5. Testing and deployment
6. Customer acceptance

These steps are described below.[5]

Step 1: Migration Assessment

Migration Assessment Snapshot

Objective: Establish business goals, identify what will be migrated, identify potential challenges, and determine feasibility.

Level of effort: Typically migration assessments take three to five days, depending on the complexity of the environment and the number and nature of applications involved.

Resources and tools: Application Verification Kit (AVK), Application Server Migration Tool (ASMT).

5. The information included for each step may refer to a Sun service, tool, or resource that is referenced in this section. Details of these offerings are found in Section 6, "*Migration Support*."

Migration Assessment ensures the new environment will support business objectives to enable a strategic leap forward. It also establishes scope parameters for the migration effort, which helps contain costs and supports on-time completion. As the first step in the process, the Migration Assessment answers these questions:

- What business goals will be achieved through migration?
- What server-side business applications, portal functions, or Web services will be migrated?
- What issues must be resolved to migrate these applications successfully?

The Migration Assessment typically consists of two components: business analysis and technical requirements analysis.

Business Analysis

A phased migration approach begins by deciding which infrastructure components should be migrated. This decision is typically driven by one of three considerations. The first is a strategic review of existing Web-based services, which may identify components that provide the best ROI. Second, a key component in the existing infrastructure may show signs of failure. This could be caused by an inability to scale to newly required levels, or an announcement that the vendor will no longer support a product. Third, increasing license costs for infrastructure products may make it financially beneficial to migrate a component.

Regardless of how the decision is made, the business analysis clearly states the overarching goals of migrating to a new environment. These goals should concisely reflect strategic business priorities, as in the following examples:

- Reduce Total Cost of Ownership (TCO)
- Increase application scalability
- Increase worker productivity
- Increase online sales revenues
- Consolidate resources to achieve improved quality of service

The business analysis should also address project scope and critical success factors. The scope statement briefly outlines the project's boundaries. Critical success factors are specific, measurable characteristics that define the project's success. For example, "increase online availability to 99.9 percent." Specific success factors are an important aspect of the migration planning process, because they are used later to determine if the migration is successful.[6] Other business considerations evaluated during this process include schedule and budget. Defining these areas lays a foundation for the project and enables the next step in migration planning: the technical requirements analysis.

Technical Requirements Analysis

This analysis translates information about business needs into specific technical requirements that address considerations such as performance, reliability, availability, manageability, maintainability, scalability, and security. Understanding the relationship between business and technical requirements is necessary in order to make informed decisions about possible solutions.

6. "Sun Java Enterprise System: Planning and Executing Migration Strategies." *E-Business Strategies*, 2004, p. 14.

The technical requirements analysis accounts for the degree of standards compliance of one or more migrating systems. For example, many applications employ proprietary features and functionality. Even Java EE compatible application servers, like BEA WebLogic or IBM WebSphere, may have customized extensions. It is critical to map out these features against the Java EE standard, to determine the migration's impact on the current process. Although portals use different standards, such as JSR 168 or WSRP, the same considerations apply. Portlets that adhere to standards are much easier to migrate.

As part of the technical requirements analysis, a proof of concept (POC) is frequently useful. It entails taking a representative application or application component and migrating it to the Java Application Platform Suite. This demonstrates project feasibility and identifies technical challenges and responses. As described in Section 5, *Migration Support*, Sun has the resources to deliver POCs for a variety of industries. Arrangements for developing POCs are made through Sun sales representatives.

The Migration Assessment results in a detailed description of business and technical requirements for the migration. It ensures that the resulting infrastructure supports business goals and identifies potential challenges and responses. This information is the foundation of the Migration Plan, described in Step 2.

Step 2: Migration Plan Development

Migration Plan Development Snapshot

Objective: Create a detailed plan including staffing resources, migration support services, software, and hardware.

Level of effort: Typically migration plans are developed in two to five days, depending on the complexity of the environment, and the number and nature of applications involved.

Resources and tools: Sun Reference Architecture for Portal Solutions (available through your Sun sales representative), Sun Solutions Center

The second step, Migration Plan Development involves creating a detailed plan including staffing resources, migration support services, software, and hardware. It mitigates risk by assuring that adequate resources are available to support the project. You must be involved in this step, as migration requires resources outside the IT organization to participate in functional requirements definition and testing.

The Migration Plan draws upon the detailed requirements developed previously, and moves into sizing the physical resources necessary to support those requirements. In addition to network component design, a careful plan must be established for migrating data to the new environment. This may include an approach for migrating existing data to different formats, for both transactional data and user profile information. The selection of tools and techniques to accomplish this migration is a key aspect of the Migration Plan Development process.

Both Line of Business (LOB) and IT executives have questions that need to be answered during this planning step. For example, you might ask:

1. Are there critical dates on which new functionality must be available?
2. Which employees have the expertise to help define and test new functionality?
3. How can we distribute the current workload so that staff can be allocated to support the migration effort?
4. Will employees involved with requirement definition and testing need to provide training to other internal staff on the new system?

Questions from IT managers may include:

1. What are the current application and portal servers on which the application is deployed? Is the application deployed on multiple application servers? (Typically, applications that are deployed on multiple application servers do not have proprietary components.)
2. Which proprietary features are used in WebLogic and WebSphere? Is it possible to map these features to the new application server?
3. Are the applications that are accessed via the portal JSR168-compliant?
4. The Java System Portal Server requires Java System Access Manager and Java System Directory Server. How does this fit into the customer's current directory and access control infrastructure?
5. What level of production outages are allowable for the portal during implementation?
6. What functionality would be best suited for an application server, as opposed to a Web server? The Java System Web Server features a servlet and JavaServer Pages™ (JSP™) engine for some types of applications, while the full Java EE environment is needed for more full-featured applications that leverage JavaBeans™ technology.

The last part of Migration Plan Development is creating a detailed schedule and resource plan. The time required to migrate to the Java Application Platform Suite depends on the number and size of the applications involved, current technology in use, and degree of standards compliance. For example, when migrating a server-side application, a fully Java EE compliant application may take from six to 13 weeks to migrate, depending on its size. However, an application that is not compliant with Java EE, and has proprietary features that are not mandated by the Java EE specification or supported across all application servers, will take longer to migrate because these proprietary features must be handled manually. As a result, a noncompliant application migration may take from 11 to 24 weeks, depending on size.[7]

7. "*Application Server Migration Estimates.*" Sun Microsystems, 2003, p.2.

The resource plan should describe the skills needed for a successful implementation. As mentioned earlier, nontechnical staff may be needed to help define new functionality, testing, and training. In addition, the IT manager should assign at least one lead developer to support the migration effort. This ensures more accurate estimates, since the in-house developer has explicit knowledge of the application, portal, or Web service. In addition, a lead developer can speed things up substantially if it becomes necessary to rebuild or rearrange noncompliant code.

Furthermore, as with any enterprise-class solution where downtime is unacceptable, new environments must be developed on separate, nonproduction hardware. This means the plan must include specifications for the hardware and software environments that are used for migration and testing — separate environments where development activities can take place without impacting real-world productivity.

Finally, the plan should also consider current support status. Migrations often involve technical challenges. The day you encounter a challenge that requires Sun support is not a good time to find out your support coverage has lapsed.

The Migration Plan identifies tools and human resources needed to support the migration effort. The process of formulating it is also helpful in identifying skill gaps that must be met through training.

Step 3: Sun Java Application Platform Suite Training

Sun Java Application Platform Suite Training Snapshot

Objective: Ensure staff has the skills required to accomplish the migration.

Level of effort: Varies considerably based on existing skill sets and the nature of the migration.

Resources and tools: Sun training, refer to Section 5, *Migration Support*.

Migration projects often require that technical staff acquire new knowledge and skills. This learning process may occur incrementally throughout the migration process. Several different skill sets should be considered:

- Java EE architecture and development
- Java Application Platform Suite components
  - Architecture and development
  - Installation and configuration
  - Operation and maintenance

Specific courses appropriate to the migration process are listed in Section 5, *Migration Support*.

If the migrating applications are largely standards-compliant, then it is likely that the application development staff already have the skills required to accomplish the transition. If the staff needs to increase its technical expertise, time for training must be added to the project plan.

Although technical training is usually the responsibility of an IT manager, this step is of concern to you, as well. If it is overlooked, the inevitable result is that projects take longer and cost more than anticipated. When migration is linked to business objectives, delay can have serious consequences for the organization.

Step 4: Migration Implementation

Migration Implementation Snapshot

Objective: Migrate applications and data to the new environment.

Level of effort: Varies from weeks to months.

Resources and tools: Application Server Migration Tool, Customer Success Program, Application Migration Services

Migration Implementation executes the process defined in the Migration Plan. At this point, the actual migration to the new environment is performed.

Automated tools, such as the Application Server Migration Tool (ASMT) can automate the application migration process, reducing development and porting time by as much as 95 percent. This tool is discussed further in Section 5, *Migration Support*.

Migration Implementation often includes creating prototypes in a test environment, running unit and system tests on the prototypes, as well as measuring performance and other deployment qualities. The resultant metrics are then correlated with system requirements and business goals. After successful prototype testing, careful roll out into production follows.

Stay advised of the Migration Implementation process to ensure that business goals are being fulfilled. As the system is migrated, components should be continually tested. This is a precautionary measure to ensure that individual system components are functioning properly, and system dependencies are successfully migrated. This process significantly reduces the complexity of the formal testing procedure discussed in Step 5.

Though Migration Implementation is typically under the IT manager's control, you should monitor its progress. During implementation unexpected problems can change resource requirements. For example, unanticipated testing issues might require additional functional experts to assist with problem resolution.

Step 5: Testing and Deployment

Testing and Deployment Snapshot

Objective: Perform functional, technical, and performance testing. Implement new system and remove the old system from production environment.

Level of effort: Time required for functional testing varies with the complexity of the system. Load testing typically takes a minimum of two weeks. An additional week is required to allow the production team to prepare for full deployment.

Resources and tools: Sun Solution Centers support performance testing.

Although system components are tested during implementation, they are tested only in pieces. During Testing and Deployment, the new system is tested as an integrated whole. Testing is conducted from two perspectives: functionality and performance.

Functional testing determines if expected business functions are performing on the new system. From a broader perspective, you should assess whether these functions meet the larger business goals specified during the Assessment step at the beginning of the migration effort. In many cases, users expect the new system to have the same look and feel as the old system, meaning they expect the migration to be transparent. Usually, a dedicated team of end users tests system functionality to ensure that it is transparent and all functions work properly.

Performance testing ensures that the system meets all technical specifications. This includes factors such as data manipulation, response time, and CPU utilization. Load testing is a critical part of performance testing. Applications and portals that can easily handle a small load may have problems when the load approaches real-world levels. Employ a third-party product, such as Mercury's LoadRunner, to generate simulated loads on the system. If the environment includes high availability or failover features, be sure to include these in the testing process.

Once functionality and performance have been tested, the new system is deployed. Typically, this happens in stages alongside the existing live environment, under carefully controlled circumstances. A staged deployment enables roll back to the old system should problems occur in the upgraded system during staging. Planning ensures that such upgrade milestones and the point of no return (if there is one) are well understood, and risk mitigation procedures are in place.

There are several strategies for implementing a staged deployment. For example, the system can be deployed to a limited number of random users, users of certain functions, or users in certain geographic regions.

After testing is successfully completed, the application can be fully deployed. The old system can then be taken off line, and is no longer available to users.

Step 6: Customer Acceptance

Customer Acceptance Snapshot

Objective: Determine if system meets business goals set forth in the Business Analysis.

Level of effort: One to two weeks for initial determination. Additional evaluation may take place over a longer period of time.

Resources and tools: Not applicable.

The objective of Customer Acceptance is to verify that the system meets business goals set forth in the business analysis. This step requires your participation and oversight.

Since business objectives have become drivers of IT initiatives, the new system must meet both IT and business goals.

Customer acceptance of the new system is based on how well it meets the needs identified during Migration Assessment. Typical questions asked during this step include:

- Does the application, portal, or Web service mirror original functionality?
- If appropriate, does the new application, portal, or Web service enhance original functionality as specified?
- Does the new application, portal, or Web service provide anticipated benefits to employees, partners, and customers?
- Is there anything in the new software that is of concern? For example, did testers encounter a bug in an existing version that will be fixed in the next release, causing a revision to the project's time line?

Following a structured process ensures that migration issues are identified and resolved, and that processes are successfully completed. Although a migration is a complex process, this approach provides the best assurance for success. Challenges typically encountered during a migration are discussed in Section 4, *Migration Issues*.

Chapter 4

Migration Issues

Several issues may be encountered during a migration to the Java Application Platform Suite. This section presents an overview of common issues, recommends responses, and lists available Sun resources.

Architecture

The Java EE specification allows vendors to differentiate their products by delivering various levels of service quality. For example, one vendor may minimize price, while another vendor emphasizes performance and scalability. When migrating to the Java Application Platform Suite from a product offering a lower level of performance, it is possible that the application's architecture is less than optimal, which can result in lower performance.

This is not necessarily a critical problem. The application can be migrated now and optimized during a later engagement. The Sun Solution Center Performance and Scalability offering can help evaluate and optimize system performance. This means that applications can be migrated quickly and optimal performance can be realized, while experience is gained in the production environment.

Proprietary Application Extensions

When applications are coded strictly to current standards, converting from one platform to another is relatively easy. However, as mentioned earlier, a common migration challenge is dealing with proprietary extensions in source code. These extensions are often developed to provide additional features and functionality. While home-grown applications are popular with developers and end users, these extensions may not meet current standards or run on other platforms.

The Application Verification Kit (AVK), described in Section 5, *Migration Support*, tests for specification compliance within applications, and flags proprietary features. This code must be analyzed and potentially rewritten by hand. Proprietary extensions can often be migrated, but at the cost of additional time and effort.

Sun is dedicated to the J2EE and Java EE standards, and certifies on several separate platforms (see *Multiplatform Support*), as well as MS SQL, Sybase, Oracle, Derby, and MySQL databases. This certification continues on release updates and patches.

Version Control

This process tracks changes made to software as applications are maintained, collecting information that can become vital if code fails to run properly after migration. Developers can review Version Control records of what changes were made to the source application code, in order to find the source of errors. Without clear Version Control, application migration and maintenance may become more labor-intensive.

Development Tools

Some tools, such as those from Borland, work with any application server. Others are not portable. For example, BEA WebLogic is tightly integrated with its development tool. These tools do not work in other environments. Although developers may be comfortable using the tools, they will have to learn new tools when migrating to a new infrastructure.

The Java Application Platform Suite comes with two award-winning tools to support rapid development: Java Studio Enterprise and Java Studio Creator. Training staff in the use of these tools empowers them to build new, enterprise-grade applications.

> *"Java Studio Enterprise 7 achieved the most transparent and mutually helpful integration that we had yet seen between its Unified Modeling Language (UML) diagrams and its NetBeans based Java coding tools."*
>
> *Coffee, Peter. Application Development. April 11, 2005*

Change Management

The change management aspect of the migration process is often overlooked. Migration may involve significant change to the organization, and if employees do not understand the business reasons for migration, they may not support it.

Since seeking more value from middleware infrastructure has become a critical element of company strategy to improve business productivity, you are in an excellent position to aid the IT manager by explaining the reasons supporting migration. As migration begins, work with the IT manager to schedule a meeting with the technical and functional staff likely to be involved. Help explain to them which business demands are being met by migrating. Tell them how the new infrastructure supports the company's strategic direction. Show them how their contributions will directly contribute to the company's success. Your partnership with the IT manager ensures that employees understand the new system's broad impact.

In addition to helping staff understand why the migration project is being undertaken, management must also plan for the project's human side. This means allowing time for adequate training, and adjusting regular job requirements to accommodate learning and additional responsibilities associated with the migration. Overlooking these components can jeopardize the project's success.

With a clear understanding of how migration supports the company's goals and how their roles support the migration effort, staff are more motivated to contribute. The result is a more effective and efficient migration.

Multiplatform Support

Customers may be concerned that the Java Application Platform Suite will not run in their existing environments. Sun provides a truly flexible IT architecture through open, standards-based systems, and Sun's commitment to multiplatform support accommodates your enterprise IT strategy. Specifically, the Java Application Platform Suite runs on:

- Solaris 10 OS (SPARC and x86 Platform)
- Solaris 9 OS (SPARC and x86 Platform)
- Solaris 8 OS (SPARC Platform)
- Red Hat Enterprise Linux 2.1 and 3.1
- HP-UX 11i
- Windows 2000, 2003, and XP (For developers)

Another example of Sun's commitment to multiplatform support is interoperability. The Java System Portal Server runs on these third-party application servers:

- BEA WebLogic Server (Running on Solaris)
- IBM WebSphere Application Server (Running on Solaris)

Sun’s commitment to interoperability provides a significant advantage in portal migrations, since applications can be developed and deployed on Java System Portal Server to run on an existing infrastructure. The applications can be moved over to the Java System Application Server as the migration proceeds.

Furthermore, the Java Application Platform Suite (indeed, the entire Java Enterprise System) conforms to internationalization standards. Supported languages include English, French, German, Korean, Japanese, Spanish, Simplified Chinese, and Traditional Chinese.

New Releases

Customers may wonder if there are known issues or workarounds for the versions of the software to which they are migrating. To ease these concerns, Sun publishes release notes that list:

- What is new with the release?
- Known issues and workarounds with the installer
- Known issues and workarounds with the component products

Chapter 5

Migration Support

The benefits of migrating to the Java Application Platform Suite are compelling. It enables enterprises to exploit information instead of just managing it—creating opportunities to innovate through enhanced customer services, improved employee productivity, better collaboration with partners, and increased speed to market.

Sun provides a broad range of services and tools to help you take advantage of these benefits. All of these support resources can be accessed through your Sun sales representative. This section provides an overview of services and tools, summarized in Table 1.

Table 1: Sun Migration Support Resources

Resource	Migration Step Supported	Support Services Provided
Application Migration Services	Step 1. Migration Assessment Step 3. Sun Training Step 4. Migration Implementation	• Sun Application Migration Assessment and Implementation Services • Sun Application Migration Technology Transfer Service
Application Server Migration and Upgrade Program	Step 4. Migration Implementation	• Verification and migration tools • E-mail support • Documentation
Migration Support Tools	Step 1. Migration Assessment Step 4. Migration Implementation	• Application Server migration tool • Java Application Verification Kit • Sun Deploy Tool
Sun Best Practices	Step 1. Migration Assessment Step 2. Migration Plan Development Step 4. Migration Implementation	• Sun Reference Architectures • Sun BluePrints Publications • Sun Customer Ready Systems Program
Sun Client Solutions Organization	Step 1. Migration Assessment Step 2. Migration Plan Development Step 4. Migration Implementation Step 5. Testing and Deployment	• Industry-specific vertical solutions • Access to Sun Partners • Java Enterprise System Architecture Workshop • SOA Workshops
Sun Sales Support	Step 1. Migration Assessment Step 2. Migration Plan Development	• Proof-of-concept projects • Customized migration information
Sun Software Practice	Step 1. Migration Assessment Step 2. Migration Plan Development Step 4. Migration Implementation Step 5. Testing and Deployment	• On-site professional services

Resource	Migration Step Supported	Support Services Provided
Sun Solution Centers	Step 1. Migration Assessment Step 2. Migration Plan Development Step 4. Migration Implementation Step 5. Testing and Deployment	• Detailed assessment, planning, implementation, performance, and scalability services
Sun Training	Step 3. Sun Training	• Courses covering a wide range of migration-related topics
WebSphere Interoperability Program	Step 1. Migration Assessment Step 2. Migration Plan Development Step 4. Migration Implementation	• Assistance integrating IBM WebSphere Application Server with Java Application Platform Suite products

Application Migration Services

Challenge: Customers need assistance planning, executing, and managing a migration project.

Sun Resources: Sun's service experts and partners offer technology and proven services methodology to help meet application migration needs, including:

Sun Application Migration Assessment

In-depth examination of the application code base on UNIX® or proprietary operating systems, build environment, and application interaction with other areas of the business process. Results in a migration plan and estimate of the level of effort involved.

Sun Application Migration Implementation Service

Migrates an application including code transformation, build environment transformation, and application integration.

Sun Application Migration Technology Transfer Service

Provides customized migration services that may include mentoring, coaching, training, and post-migration support.

Result: Customers can draw on Sun to supplement their own resources and complete successful migrations. For more information on the Sun Application Migration Services program, please visit www.sun.com/service/datacenter/application-migration.xml.

Application Server Migration and Upgrade Program

Challenge: Customers experience technical issues while migrating to the Java Application Server Enterprise Edition.

Sun Resources: The Java System Application Server Migration and Upgrade Program is designed to help organizations quickly and easily migrate or upgrade to the Java System Application Server Enterprise Edition. Targeting IBM, BEA, and iPlanet™ platforms, the program provides all of the resources necessary for a smooth migration, including:

- Verification tools that check Java EE applications for standards conformance and portability
- Automation tools that help migrate Java EE applications from other servers to the Java System Application Server Enterprise Edition
- Technical advice and in-depth technical documentation and guides about upgrading from other application servers to Java System Application Server Enterprise Edition
- Tools that assist in upgrading from previous versions of the Sun ONE™ Application Server and iPlanet Application Server
- Sun Client Solution Services and migration partner resources
- Real-world sample code and examples of customers using Java Enterprise System and Java System Application Server Enterprise Edition solutions

This program offers e-mail-based support to respond to customer-specific issues and challenges. Customer self-service access to migration tools, support resources, documentation, and services provided by Sun and its partners is available at www.sun.com/software/products/appsrvr/migration/index.xml.

Free tools include:

- Migration tool for Java System Application Server Enterprise Edition
- Java Application Verification Kit (AVK)

Support resources include:

- E-mail support for getting started with the Java Application Server Enterprise Edition
- Online forum for discussions of the migration tool
- E-mail support for the migration tool

Documentation:

- *Sun Java System Application Server 7 2004Q2 Migrating and Redeploying Server Applications*
- *Sun Java System Application Server Enterprise Edition 8 2004Q4 Migration Guide*
- *Migrating from IBM WebSphere Version 4.0 Resource Guide*
- *Migrating from BEA WebLogic Server 6.1 Resource Guide*
- *Migrating from BEA WebLogic Server 5.1 Resource Guide*

Result: Customers can resolve technical issues that arise while migrating to the Java Application Server Enterprise Edition.

Migration Support Tools

Challenge: Customers need tools to support the migration process.

Sun Resources: The Application Server Migration Tool, Java AVK for the Enterprise Edition, and Sun Deploy Tool are free.

Application Server Migration Tool

Automates the migration of applications based on Java EE and other application servers to Java System Application Server 7 and 8. The tool functions as a standalone Java application, or as an IDE plug-in for Java Studio and Borland JBuilder applications. It provides:

- Automatic migration of select deployment descriptors
- Auto-generation of Ant build scripts to facilitate deployment following successful migration
- Support for a select set of proprietary JSP tags as well as Java libraries and features — in particular, timer functionality — via a bundled runtime library
- Ability to handle input as source code or archive
- Detailed migration report including notation of failed files

Applications from these application servers can be migrated to Java System Application Server Enterprise Edition:

- BEA WebLogic Server 8.x, 7.x, 6.x, and 5.x
- WebSphere Application Server Version 5.x and 4.x
- JBoss 3.x
- Apache Tomcat 4.x
- Reference implementations based on J2EE 1.3 and 1.4
- Sun ONE Application Server 6.x
- Sun ONE Web Server 6.x

This tool is available at www.sun.com/download/index.jsp?tab=2.

Java Application Verification Kit (AVK) for the Enterprise Edition

The AVK tool is intended to help developers test their applications for correct use of Java EE APIs and portability across Java EE compatible application servers, while enabling developers to avoid inadvertently writing nonportable code.

This tool is available at java.sun.com/j2ee/avk/.

Sun Deploy Tool

A free tool bundled with the Java System Application Server Enterprise Edition, which is part of the Java Application Platform Suite. It generates deployment descriptors for the Java System Application Server Enterprise Edition, which is useful when migrating from a target server not currently supported by the migration tool.

This tool is available at www.sun.com/download/products.xml?id=3ec10b05.

Result: Customers are able to use free tools to reduce the time and effort required to migrate to the Java Application Platform Suite.

Sun Best Practices

Challenge: Customers frequently lack experience with migration projects and issues.

Sun Resources: Sun has extensive experience managing successful migrations. Much of this experience has been captured as best practices.

The Sun Intellectual Capital Council is charged with identifying successful approaches and best practices. Sun Best Practices brings together the results of Sun's extensive experience in deploying IT infrastructure and applications to meet customer business needs. This experience is made available through three programs:

- Sun Reference Architecture Program
- Sun BluePrints Publications
- Sun Customer Ready Systems (CRS) Program

Details on these programs can be found at www.sun.com/servicessolutions/best_practices.

Sun Reference Architecture Program

Sun works with independent software vendors and partners to design, test, tune, and document complex reference architectures that solve specific business problems. Each reference architecture comprises architecture, sizing, and implementation guides. This approach helps customers reduce the complexity, cost, and risk associated with deploying new technologies. For example, the Reference Architecture for Portal Solutions assists customers implementing portal infrastructures by providing them with pretested implementations that can be rapidly re-created in their environments.

Reference Architecture documents defining new architectures can be requested through a Sun sales representative.

Sun BluePrints Publications

The mission of the Sun BluePrints Program is to empower Sun's customers by providing the technical knowledge required to implement reliable, extensible, and secure information systems using Sun products. This program delivers a framework to identify, develop, and distribute best practices information that applies across Sun product lines.

Sun Customer Ready Systems (CRS) Program

Real-world IT system deployments rarely involve just one product. Instead, these deployments usually include complex combinations of Sun's products and partners' products. Such combinations are typically assembled and tested in the field or at the customer site. Highly skilled, highly paid IT staff spend many hours getting systems ready. Those hours could instead be spent fine-tuning applications, increasing revenue, or improving business efficiency. Sometimes, issues such as missing or wrong parts, quality issues, or delays in shipments from vendors arise. Consequently, system deployments are stalled, and business growth or improvements are delayed.

To help customers resolve these issues, Sun offers the CRS program. It speeds and simplifies deployment of new systems by preintegrating and testing custom hardware and software configurations at the Sun factory. The Sun CRS program can also assist with design validation, integration, and testing of Sun and third-party components and software. Integrated systems leave the Sun factory racked and ready to deploy. This program gives customers a choice of Sun and third-party hardware and software products, eliminating the need to source products from multiple vendors. By taking advantage of the Sun CRS program, IT personnel and operations staff can become more efficient, allowing more time to focus on core business needs and new services.

The following are typical results achieved with CRS engagements:

- Installation time reduced from 74 hours to two hours per rack
- Packing materials reduced from more than 4,000 to just 80 boxes delivered to the loading dock
- Early-life system issues reduced by up to 80 percent

Questions about the CRS program can be e-mailed to CRS@sun.com.

Result: Customers can take advantage of Sun's intellectual capital to make migration projects more efficient.

Sun Client Solutions Organization

Challenge: Over the last few decades, IT departments have been challenged with providing software infrastructures that can respond quickly to new business requirements. Today, Web services and SOAs are common strategies. Supplying an environment that is attractive and useful to business managers, as well as highly productive and available for IT staff, is very difficult.

Sun Resource: Sun delivers leading edge, scalable Web services solutions that help increase operational and application efficiency through infrastructure and application solutions. The Client Solutions Organization provides quick and easy access to Sun's wide range of industry expertise and Sun partner solutions.

Sun's approach to integrated solutions is to offer customers a portfolio of technologies and services that have been fully engineered and tested up front. This differentiates Sun from other vendors that use armies of consultants to build each solution from the ground up. Sun's solutions include structured and proven building blocks that leverage more than 20 years of experience and customer feedback. This method consumes fewer resources, costs less, and delivers results in less time, increasing ROI.

Vertical solutions address industry-specific requirements by collaborating with prominent partners that provide specific application services based on an SOA integration platform. These vertical solutions currently address:

- Financial services
- Government
- Telecommunications
- Health Care

Sun Client Solutions focus on customer needs such as identity management, Web services and data center practices. The Enterprise Web Services Practice supports customers migrating to the Java Application Platform Suite. This support frequently begins with an assessment that evaluates what the customer already has in place, clarifies business goals, and results in a recommended migration path. If necessary, Sun can provide technical staff with expertise in migrating from common platforms such as JBoss, WebSphere, and BEA. These employees can provide infrastructure architectures, migration advice, and hands-on assistance with implementation. The Enterprise Web Services Practice often uses Sun partners to provide on-site implementation support.

To help implement your migration effort, Sun Client Solutions offers these workshops:

Java Enterprise System Architecture Workshop

This two-day, on-site course covers:

- Business drivers, technology, organizational concerns, and business concepts surrounding the Java Enterprise System
- Technical review of Java Enterprise System capabilities and functionality
- Assessment and validation of your environment
- Requirements gathering session to discuss architectural considerations and identify requirements for a Java Enterprise System solution
- Logical and physical architecture
- Architectural considerations for migration to the Java Enterprise System
- Next steps for the proposed Java Enterprise System solution

SOA JumpStart Workshop

This workshop helps companies understand the benefits and challenges of adopting SOA practices to drive business strategy by presenting:

- Clear goals for the next step in your process for an SOA implementation
- Pragmatic approach to building and applying shared services at the enterprise level
- Essential characteristics of SOA and how they affect the enterprise
- SOA governance, composite applications, business process management, and SOA life cycle activities

SOA Assessment Workshop

This workshop helps companies begin to implement SOAs. Each intensive on-site, four- to six-week workshop presents:

- Overview of SOA benefits, best practices, guiding principles, methodologies, technologies, and standards
- Insight on aligning business objectives and technology by analyzing the Four Ps of SOA: people, process, practice, and platform
- Set of recommendations and a roadmap for effective SOA adoption
- Sun Repeatable Quality (RQ) methodology to identify, classify, and prioritize SOA drivers, and justify associated investments

Result: Customers can take advantage of Sun expertise to migrate successfully to the Java Application Platform Suite. For more information on the Sun Client Solutions Organization, contact your Sun sales representative.

Sun Sales Support

Challenge: Customers considering migrating to the Java Application Platform Suite have questions, including:

- Is this migration project feasible?
- How much will it cost?
- What is the most effective way to complete it?
- Will the suggested architecture work in my user environment?
- Does Sun have a partner experienced with this type of migration?

Sun Resource: A presales service, Sun Sales Support is designed to provide customized, detailed information on customer-specific migration projects. It is staffed by experts who are familiar with all the products in the Java Application Platform Suite. To answer customer questions, Sales Support teams may suggest product architectures and develop limited demonstrations of product applications.

Result: Customers can begin migrating to the Java Application Platform Suite with confidence that the migration is technically feasible, based on a solid understanding of everything involved in a successful migration. For more information on Sun Sales Support, contact your Sun sales representative.

Sun Software Practice

Challenge: Customers migrating to the Java Application Platform Suite need the support of software professionals with experience in the migration process.

Sun Resource: Sun Software Practice engages with customers and select business partners to leverage Sun intellectual capital, best practices, migration tools, programs, and support centers to plan, manage, and execute migration projects.

Working hand in hand with customers, Sun Software Practice establishes the migration's business context and goals, and determines the scope as well as business and technical risks associated with it, including larger impacts on the enterprise.

Over the last decade, Sun Software Practice has evolved the SunTone℠ Architecture Methodology, which has been employed on hundreds of migration, development, and integration projects. Derived from the standard Unified Process to manage Web services projects, this methodology assures that customer requirements are understood as the project evolves, while mitigating business and technical risks inherent in complex software projects. It is appropriate for Java EE projects in general, and is especially helpful with projects involving the Java Application Platform Suite.

Result: Customers can take advantage of experienced professionals to ensure their migration projects are successful. For more information on the Sun Software Practice, contact your Sun sales representative.

Sun Solution Centers

Challenge: Customers want access to experts to help them resolve issues with technology infrastructure, business applications, and business processes.

Sun Resource: Sun Solution Centers give customers access to expertise and technical know-how from the best people in the business. The centers offer a rich suite of services that can be tailored to meet a customer's unique requirements.

There are 23 Sun Solution Centers located around the world. Each offers customers access to state-of-the-art computing environments, as well as in-depth expertise in technologies, industries, and applications. An engagement with a Sun Solution Center can last anywhere from two to several weeks, and may include the participation of as many as 30 individuals, including customer executives, IT staff, and project leads, as well as Sun technology experts, Sun Solution Center staff, and Sun partners. Sun Solution Centers have developed solutions for these industries:

- Education
- Energy
- Financial services
- Government
- Life sciences
- Manufacturing
- Media/entertainment/publishing
- Retail
- Telecommunications
- Transportation

The Sun Solution Centers engagement process includes four levels:

1. Vision and value
2. Planning and workshop
3. Proof of concept and sizing
4. Performance and scalability

Customers may choose to engage at any of these levels, depending on their needs. For example, customers who are ready to begin developing a prototype may choose to begin at the planning and workshop level. Or, a customer who simply needs benchmarking services would start at the performance and scalability level.

1. Vision and Value

At the first engagement level, the Sun Solution Centers provide customers with an orientation to the centers' value and a vision of its capabilities. All members of a customer team, from engineers through the CIO or CTO, meet the Sun partners, Sun engineers, and technology experts who make up the engagement team.

In addition, participants receive an introduction to the facility's state-of-the-art technology and various technology and solution demonstrations. The group discusses customer goals and expectations, and outlines engagement specifics.

2. Planning and Workshop

The second level is focused on planning specific details in a session that can last from several hours to two days. Customers begin a workshop engagement with a specific topic or problem that Sun helps them understand and analyze. The group works together to discuss potential solutions, develop a solution architecture, create a project plan, review customer expectations, and set a timeline.

3. Proof-of-Concept/Sizing

The Sun Solution Center staff and Sun account teams work with customers, independent software vendor (ISV) partners, and system integration partners when needed to develop solution architectures and implement those solutions on real-world systems. Proof-of-concept and sizing engagements are driven by customers who want to see working prototypes of Sun technology-based solutions. Each engagement addresses unique customer needs and requirements.

At the engagement's conclusion, customers have complete solution details in a proof-of-concept blueprint that includes:

- Architecture design
- Hardware and software selection
- Business processes
- Load testing
- Performance and characterization
- Final recommendation for go-live implementation

4. Performance and Scalability

These engagements give customers opportunities to test system performance and solution scalability. Customers frequently engage with Sun Solution Centers to run specific benchmarks or test performance of specific systems. This service ensures customers that Sun technology-based solutions meet both current and future requirements.

Result: Customers can migrate to the Java Application Platform Suite with assistance from experienced professionals. For more information on Sun Solution Centers go to www.sun.com/solutioncenters.

Sun Training

Challenge: Customer IT staff require new skills to successfully complete a migration project.

Sun Resources: Sun Training offers both classroom and Web-based courses to provide technical staff with the concepts, knowledge, and skills they need to effectively use products in the Java Application Platform Suite. To make it easier to find appropriate classes, they are arranged by learning paths.

Learning paths for courses that support migration efforts include:

Java Enterprise System

Courses cover the Java Enterprise System, introduce shared components, and provide advanced training on installation, administration, and deployment.

- **Sun Java Enterprise System Core Concepts**
  This classroom-based course covers core services, technologies in the Java Enterprise System, as well as installing and configuring major servers.
- **Sun Java Enterprise System: Installation and Administration**
  This classroom-based course covers Java Enterprise System common architecture, system features, installer architecture, and shared component troubleshooting.

Web and Application Services

The courses in this path help students build the skills and competencies required to plan, install, customize, and manage large-scale Web applications that integrate with legacy systems.

- **Sun Java System Application Server 7: Development**
  Available in the classroom and via the Web. Covers installation, assembly, deployment, security, application troubleshooting, request flow, and database connectivity.
- **Sun Java System Application Server 7: Administration**
  Available in the classroom and via the Web. Covers installation, deployment, administration, monitoring, and security.
- **Sun Java System Application Server 7: Enterprise Edition, Deployment and Administration**
  Available in the classroom and via the Web. Covers installation, deployment, troubleshooting, high availability, failover, clustering, and performance tuning.
- **Sun Java System Application Server 8: Application Server Configuration and Deployment**
  Available in the classroom and via the Web. Covers installation, deployment, administration, logging, security, migration, tuning, and troubleshooting.
- **Sun Java System Application Server 8.1**
  Covers new 8.1 features, installation and administrative changes, Web services security, performance improvements, and developer experience.
- **Sun Java System Application Server Platform Edition 8.1: What Is New**
  Covers new features and other changes to the product since the last release of Java System Application Server PE 8. Focuses on product installation and administration changes, integrated Web service security features, performance improvements, and developer experience enhancements.
- **Sun Java System Application Server SE/EE 8.1: Administration and Deployment**
  Covers how to install, configure, and manage Java System Application Server SE and EE 8.1 in a distributed environment. Students gain experience deploying applications to the enterprise environment, and migrating applications from earlier versions of Java System Application Server and third-party application servers.
- **Sun Java System Web Server 6.1: Installation and Configuration**
  This Web-based course covers product features, functions, architecture, installation, and configuration.
- **Sun Java System Web Server 6.1: Administration and Maintenance**
  This classroom-based course covers installation, configuration, Secure Sockets Layer (SSL), and statistics monitoring.

Sun Java Enterprise System Portal Services

Two new courses for the Java System Portal Server are under development:

- **Portal Core Administration**: Scheduled for release in September 2006
- **Portal 7.1 (JES 5) Migration Techtalk**: Potentially offered in early 2007

Web Services and XML

Java and the eXtensible Markup Language (XML) are base technologies used within the Java Enterprise System. Courses in the XML learning path provide developers with skills to manage data using XML technologies.

Java EE

Focuses on providing Java EE training for architects and developers of Web components such as JSP and Java servlets, business components such as Enterprise JavaBeans™ (EJB™), and integration technology such as Java Database Connectivity (JDBC™) .

Result: Technical staff develop the skills required to successfully complete a migration project. Complete information on Sun Training can be found at www.sun.com/training.

WebSphere Interoperability Program

Challenge: The need to deploy secure Web applications is a top priority for corporate enterprises. Customers with existing investments in the IBM WebSphere application server want the lower risk, greater security, and lower TCO offered by the Java Application Platform Suite, but are not sure how to integrate the two.

Sun Resources: One of the strengths of the Java Application Platform Suite is its ability to interoperate with your existing infrastructure. The Sun sales team can employ the WebSphere Interoperability Program to enhance your infrastructure by using Java Application Platform Suite products that interoperate with WebSphere.

Result: By front-ending WebSphere Application Server with the Java System Web Server, instead of the IBM Apache-based HTTP Server, customers achieve a more secure, reliable, and scalable Web infrastructure. In addition, customers can deploy their JSP components and Java servlets on the Java System Web Server, reducing the number of required WebSphere licenses and lowering customer costs. Ask your Sun sales representative for more information about the WebSphere Interoperability Program.

Chapter 6

The Migration Process in Action: Frontier Airlines

For Frontier Airlines, a business assessment revealed familiar challenges. Like many other companies, Frontier was searching for ways to reduce costs, grow the business, and increase revenue. The foundation of its future strategy was to increase sales through the Web site by 300 percent over the next three years. In addition, the company needed back-end integration with a key partner that could support its online reservations system. Existing infrastructure could not provide the interoperability, scalability, or pricing structure required to meet these goals.

As Bob Rapp, Frontier's chief technology officer, said, "With such an uncompromising growth plan, we required an equally uncompromising infrastructure, and we didn't believe our current system could scale to meet that demand." As a result, Frontier decided to migrate to the Java Application Platform Suite. The company chose Java technology for its ability to integrate applications, and Sun as the thought leader in the Java environment.

Frontier Airlines developed a plan to migrate to the Java Application Platform Suite by creating a new environment on Sun hardware. This environment was used for development, testing, staging, and production. The plan included the Java System Application Server and Java System Web Server. Frontier also employed the Sun Travel and Hospitality Reference Architecture to provide information on configuring its new hardware and software.

Speaking about Sun products and services, Bob Rapp explained, "Sun not only provided the complete package — from industry expertise with client services, proven technologies such as the Solaris 10 OS and J2EE, to innovations like the Sun Fire™ X4100 server — but it also provided a scalable, open architecture that could meet current and future needs."

To ensure that internal staff had the technical skills needed to maintain the new environment, Frontier Airlines took advantage of Sun Training. Employees attended these courses:

- *Developing Applications for the Java 2 Platform, Enterprise Edition*
- *Web Component Development With Servlet and JSP Technology*
- *J2SE™ 5.0 for the Developer: Language Changes*
- *Developing Applications for the Java 2 Platform, Enterprise Edition*
- *Web Component Development With Servlet and JSP Technology*
- *J2SE 5.0 for the Developer: Language Changes*
- *Developing Applications for the Java 2 Platform, Enterprise Edition*
- *Java Programming Language*
- *Web Component Development With Servlet and JSP Technology*

To implement its migration plan, Frontier chose Sun Client Solutions and a Sun partner to develop the new system.

Testing and performance tuning may be done at the customer site or a Sun Solution Center. Since the environment at Frontier Airlines responds to multiple demands including development, testing, staging, and production, it would have been difficult to isolate the performance of new systems on site without potentially disrupting business. By utilizing hardware at a Sun Solution Center, the system was tested and tuned in a controlled environment. In addition, Frontier leveraged Sun's investment in hardware and its expertise in testing and performance tuning to cost-effectively accomplish this task, while also mitigating risk.

When fully deployed, customer acceptance will be based on how well the new system meets the challenges identified during the assessment process. Specifically, Frontier Airlines will evaluate how well the new system:

- Supports customers purchasing tickets over the Web
- Scales to meet growing demand for Web-based services
- Integrates with its partners

Chapter 7

Additional Resources

Sun Java Application Platform Suite	
Home page	www.sun.com/software/javaenterprisesystem/application_platform_suite/
FAQ	www.sun.com/software/javaenterprisesystem/application_platform_suite/faq.xml
Sun Java System Portal Server	
Home page	www.sun.com/software/products/portal_srvr/
Java Community Process program	www.jcp.org/en/home/index
Sun Reference Architecture for Portal Solutions	Available through your Sun sales representative.
Sun Java System Web Server	
Home page	www.sun.com/software/products/Web_srvr/home_Web_srvr.xml
Sun Java System Application Server	
Migration and Upgrade Program	www.sun.com/software/products/appsrvr/migration/index.html
Application Verification Kit	java.sun.com/j2ee/avk
Sun Java Enterprise System	
Home page	www.sun.com/software/javaenterprisesystem/index.xml
Deployment planning white paper	docs.sun.com/app/docs/doc/817-5759
Java EE Support Services	www.sun.com/service/sunjavasystem/javaenterprisesystem.html
Solutions Deployment Engineering	sde-engage@sun.com
Java Enterprise System glossary	java.sun.com/reference/glossary/index.html
Sun Training Services	
Portal Services Learning Path	www.sun.com/training/catalog/enterprise/portal.xml
Web and Application Services Learning Path	www.sun.com/training/catalog/enterprise/application.xml
Sun Solution Center	
Home page	www.sun.com/sunsolutioncenters
Service Oriented Architecture	
Service Oriented Integration	java.sun.com/integration
Sun SOA Strategy	www.sun.com/soa
Sun Java Composite Applications Suite	www.sun.com/software/javaenterprisesystem/integration_suite/index.xml
Open Enterprise Service Bus (ESB) Project	open-esb.dev.java.net

Chapter 8

Glossary

Term	Definition
Application Server	A basic application server contains the user's business logic while accessing and optimizing the performance of business applications. It deploys the operating system and provides resource utilization of external resources, such as Internet services and end-user applications.
Consolidation	The reorganization of one or more applications or platforms onto a more cohesive, cost-effective platform to achieve improved quality of service.
Deployment	The process whereby software is installed into an operational environment.
Federated Identity	Enables an individual's user information to be stored across multiple systems, allowing SSO to multiple systems. For example, if an airline and a car rental company both employ federated identity, a user could sign on to the airline's Web site to make reservations, and be taken to the rental car's Web site without signing in again.
Group	An authenticated set of users classified by common traits such as job title or customer profile. Groups are also associated with a set of roles, and every user who is a member of a group inherits all the roles assigned to that group.
Integrated Developer Environment (IDE)	A set of programs that support application development, accessed from a single user interface.
Java 2 Platform	A computing paradigm that enables anytime, anywhere information access using any device that can be networked, from smart cards to supercomputers. Although the Java 2 Platform was created by Sun, its evolution is directed through the Java Community Process program.
Java Platform, Enterprise Edition (Java EE) and Java 2 Platform, Enterprise Edition (J2EE)	According to the Java Community Process, Java EE should be used when referring to the generic Java Platform, Enterprise Edition or Java EE 5 implementation. J2EE should be used when referring to J2EE 1.3 or J2EE 1.4 implementations.
Java Specification Request (JSR) 168	Defines a set of APIs for portal computing addressing the areas of aggregation, personalization, presentation, and security.
Lightweight Directory Access Protocol (LDAP)	A set of protocols for accessing information, such as e-mail addresses, that is stored in directories.

Term	Definition
Message Queue	A storage space that holds incoming transmissions until a computer can process them. Message queues provide an asynchronous communication protocol — the sender and receiver of the message do not need to connect to the message queue at the same time.
Migration	Can be accomplished at two levels: a platform migration re-creates applications to run on a new platform, while an application migration modifies applications to operate on an alternate platform rather than, or in addition to, the initial platform.
Portal Server	An enterprise portal is a Web software infrastructure that provides access to and interaction with relevant information, applications, business processes, and human resources for targeted audiences, delivered in a highly personalized manner.[8]
Portlet	A Web-based component that processes requests and generates dynamic content.
Proxy Server	Sits between a client program, such as a Web browser, and another server to act as a relay and ensure that only allowable requests are sent to the server.
Registry	An infrastructure that enables the building, deployment, and discovery of Web services. It is a neutral third party that facilitates dynamic and loosely coupled business-to-business (B2B) interactions.
Single User Experience	Provides access to, and interaction with, critical information and business processes in a single view.
Service Oriented Architecture (SOA)	Application architecture in which software functions are defined using a description language and have invokable interfaces that are called upon to perform business processes.
Web Server	An application that provides services to access the Internet, intranet, or extranet. It hosts Web sites, provides support for HTTP and other protocols, and executes server-side programs (such as CGI scripts or servlets) that perform certain functions.
Web Services	Applications that exist in distributed environments, such as the Internet. A Web service accepts a request, performs its function based on the request, and returns a response. The request and the response can be part of the same operation or they can occur separately, in which case the consumer does not need to wait for a response. Both the request and response usually take the form of XML, a portable data interchange format.
Web Services for Remote Portlets (WSRP)	A Web services protocol for aggregating content and interactive Web applications from remote sources.

8. Phifer, Gene, “The Enterprise Portal Scenario,” Gartner Research, April 2006

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