

## WHITE PAPER

# Sun Portal Solutions with Integrated Identity Management: Unifying and Simplifying the Computing Environment for Lower Costs and Greater Productivity

Sponsored by: Sun Microsystems, Inc.

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## INTRODUCTION

As companies focus on their ability to reduce costs, increase employee productivity, and enhance customer and partner retention and satisfaction in their organizations, enterprise portals are an increasingly important part of realizing these business objectives. Portals are a powerful part of an organization's operations that help enable it to function on a day-to-day basis. Sun Microsystems, Inc. has combined its technology, products, relationships with third-party systems integrators and technology vendors, and service offerings to form a complete portal solution offering.

### BUSINESS DRIVERS

Current business drivers for portal solutions are practical goals, such as the following, focused on improving business and can be directly linked to specific business uses:

- ☒ **Improve productivity, reduce costs.** Improving the bottom line requires that companies and organizations find innovative ways to reduce costs and enhance worker productivity. Enterprises and organizations are seeking ways to enable and empower employees to accomplish more with less. Easy access to the right information at the right time can increase the quality of work performed by and efficiency of employees.
- ☒ **Enhance customer service.** In an effort to grow the top line, enterprises are striving to retain and grow their client base and strengthen partner relationships by improving customer service. In addition, both private and public sector entities are seeking to bolster these relationships by giving employees, customers, and partners access to relevant knowledge, data, and services.
- ☒ **Reduce costs throughout the supply chain.** As a part of an enterprise's drive to meet the changing needs of clients, performance management of the supply chain has come under increasing scrutiny. Identifying and reducing hidden costs are essential parts of this process.
- ☒ **Proliferation of information.** The Internet and other technology advances have exacerbated expectations regarding the availability and rapid dissemination of information. To harness the power that this information can bring an organization, both private and public sector entities need to focus on the most relevant information and develop a way to successfully broadcast communications. If an organization lacks the power and capacity to consolidate, process, and utilize this content and intelligence, then growth and progress could be impeded.

### Worldwide Enterprise Portal Services Market to Grow

Enterprise portals are being rapidly adopted to address the information and application access requirements of knowledge workers within the enterprise. Despite a slowdown in the economy and IT spending, the U.S. and worldwide enterprise portal services market shows robust growth.

IDC forecasts that discrete worldwide enterprise portal services spending will increase to more than \$1.1 billion by 2003, representing a 23.7% growth over 2002. Worldwide enterprise portal services spending is projected to reach \$2.3 billion in 2007, which translates to a global compound annual growth rate (CAGR) of 19.1%.

Source: Abstracted from IDC's *Worldwide and U.S. Enterprise Portal Services Forecast and Analysis, 2003–2007*, IDC #28971, March 2003

## MACROECONOMIC TRENDS

Today we live in an increasingly interdependent and connected world. Boundaries — both virtual and physical — are dissolving. This development can stimulate the sharing of resources and intellectual property, but it also gives rise to new challenges, including:

- ☒ **Globalization of organizations.** A key driver of portal solutions is the globalization of many businesses. As organizations strive to serve the increasing global needs of their customers and partners, they also must develop a worldwide presence and extensive capabilities. Globalization often exacerbates the necessity for greater integration and collaboration, with exigencies encompassing people, languages, nations, cultures, economies, and technologies.
- ☒ **Global, dispersed workforce.** Geographically dispersed workforces and workplaces are the byproducts of the globalization of businesses and organizations. Expanding into overseas markets typically means extending personnel and physical offices to new territories.
- ☒ **Inefficient communication.** Poor communication can quickly translate into wasted employee time, squandered dollars on wages, and decreased productivity levels. Effective communication is a challenge on its own; globalization of businesses and organizations simply intensifies the problem.

## TECHNOLOGICAL CHALLENGES

In addition to the aforementioned business drivers, a host of technological issues today aggravate the need for a unifying solution. IDC examines some of the challenges that have paved the way for portal solutions, including:

- ☒ **Integration with legacy back-end systems.** Companies have invested much time and money in legacy systems. Today's heterogeneous computing environment is an ongoing challenge for organizations as they strive to increase communication — both between systems and with their workforce, partners, suppliers, and customers. Although there is an ongoing movement toward more open standards and technologies, much work needs to be done to achieve complete interoperability. As organizations strive to reap the most from their existing systems while continuing to invest in the future, integration with back-end legacy systems is a necessity. With cost-cutting pressures increasing, some organizations are seeking more affordable answers than traditional systems integration projects.
- ☒ **Integration with third-party products.** The number of systems, operating platforms, software, hardware, applications, and vendors involved in an organization's technology infrastructure has increased dramatically over the past decade. Heterogeneous computing environments often increase total cost of ownership (TCO) and diminish system performance through greater complexity and reduced flexibility. Organizations, in order to facilitate communications between their silo-based IT environments, have embarked on costly and time-consuming integration projects that often lead to greater technology complexity, which IDC has termed "the complexity crisis" (see sidebar "Portal Solutions Address Complexity Crisis"). Portal solutions are emerging as an important phase in the evolution that will allow enterprises to mitigate or altogether avoid onerous integration initiatives. These solutions are an important step in the development of Web Services projects, which enable full interoperability and integration between various internal and external systems.

## Portal Solutions Address Complexity Crisis

Enterprise portal solutions make up a rapidly growing market opportunity because they assist enterprises in overcoming the barriers of what IDC has characterized as today's "complexity crisis."

This complexity crisis, which can be likened to Hades' feared guardian Cerberus, has numerous heads within any single enterprise. This complexity, which manifests itself through the continuous surge of disparate and not always necessary information sources and investments in disparate and not necessarily integrated productivity tools, threatens knowledge worker productivity and efficiency.

Enterprises attempt the Herculean feat of tackling their own knowledge management complexities and are rapidly adopting enterprise portals as a staging point to address the unique information and application access and administration requirements of their workers, customers, suppliers, and buyers. Although enterprise portals software is still at a relatively early stage of development, its vision, promise, and need is what makes this market such an exciting opportunity for both end users and providers of services and software.

Source: Abstracted from *Worldwide and U.S. Enterprise Portal Services Forecast and Analysis, 2003–2007*, IDC #28971, March 2003

- ☒ **Disparate applications.** Historically, organizations implemented applications and services in a silo-based fashion. However, business processes do not reside and operate in isolation from each other. Rather, today's business environment is dynamic and interconnected. Many applications and services are based on technologies that inhibit or even prevent integration with other applications and services. The drive to improve customer service and employee productivity and the need to cut costs are driving organizations to consolidate these disparate applications and services, making their management as well as end-user access available from a single interface with a holistic enterprisewide view.
  
- ☒ **Secure authentication and authorization.** There is a clear movement toward sharing intellectual property and resources by leveraging technology, but managing and securing access to such are primary concerns and challenges; organizations expose potential risks if they fail to have appropriate security controls in place. In addition, data stores for applications and services no longer reside within the firewall of one organization but rather across various systems and organizations. Accordingly, IDC believes that it is increasingly critical for organizations to aggregate and personalize in a secure-rich environment by allowing access based on specific user roles and protocols.
  
- ☒ **Scalable, highly available infrastructure.** Although enhanced functionality is becoming increasingly important for organizations, quality-of-service requirements such as scalability, availability, and reliability remain integral. Designing architectures — both application services and the underlying server and storage platforms — that meet mission- and business-critical requirements is something that few organizations are able to achieve with their existing internal resources.
  
- ☒ **Flexible integration of new services and applications.** Business requirements for private and public sector organizations will continue to evolve because of competitive pressures and increasing demands for more cost-effective and citizen- and business-focused services. Thus, organizations will continue to invest in new applications and services. The ability to deploy these quickly and easily — seamlessly, if possible — is a requirement that is possible only through a portal-driven application environment (see Figure 1).

**Trend Points Toward Enterprises  
Optimizing Existing IT Assets**

A recent IDC survey of CIOs and high-level IT managers affirms the trend toward optimizing existing IT assets. When asked about their IT spending priorities, CIOs indicated that they want to:

Optimize recent investments in enterprise software (67%)

Redesign and optimize business processes (54%)

Install/implement new enterprise software (50%)

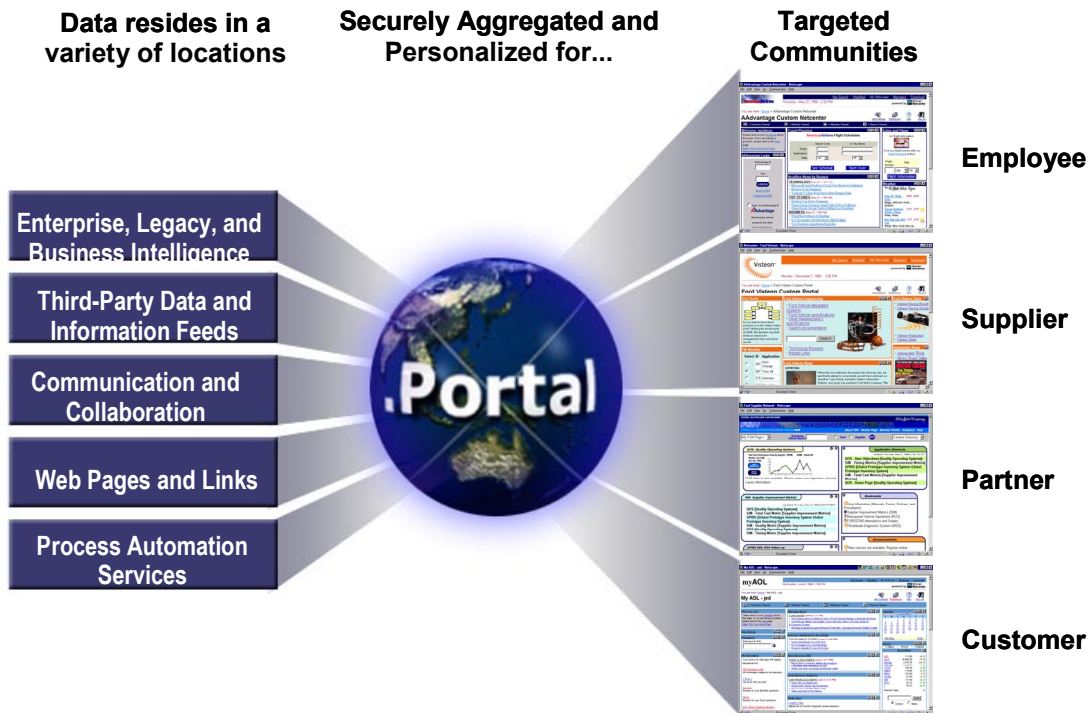
Upgrade underlying network environment (42%)

IDC believes that end users will deploy portals as a means to increase the accessibility and use of their software investments.

Source: IDC's *Solutions Services Demand Survey*, January 2003

**FIGURE 1**

PORTAL COMPUTING AGGREGATES AND PERSONALIZES DATA FOR TARGETED COMMUNITIES



Source: Sun and IDC, 2003

## THE PORTAL ADVANTAGE

Organizations are looking increasingly at portal solutions because of the aforementioned business drivers and technological challenges. However, a wide variety of portal types exist, as many enterprises are pursuing enterprise portal initiatives seeking a range of operational efficiencies. IDC has identified several types of portal initiatives, including:

- ☒ **Business-to-business (B2B) portals.** B2B or supply chain management portals are used for exchanging information between customers, suppliers, and business partners. These portals may also be used for product life-cycle management.
- ☒ **Business-to-employee (B2E) portals.** B2E portals are designed to enhance employee intranet Web sites with features and functionality designed around employee self-service.
- ☒ **Consumer portals.** Consumer portals such as Yahoo.com are aimed at consumer audiences and typically offer free email, personal home pages, sports scores, stock tickers, instant messengers, auctions, chat, and games.
- ☒ **Enterprise portals.** Enterprise or corporate portals are similar to consumer portals, but they are offered only to corporations or similar organizations.

### Integration Time for Average Portal Engagement Continues to Decline

In a recent survey of leading integrators in the enterprise portal space, IDC found that the average portal engagement time appears to be on the decline.

Our survey showed that average implementation time frames would decline from 6.7 months in 2001 to approximately 5.7 months in 2003. This drop can be partly attributed to the desire among end users for shorter, more modular implementations with proven and measurable returns on investment (ROI).

Source: Abstracted from *Worldwide and U.S. Enterprise Portal Services Forecast and Analysis, 2003–2007*, IDC #28971, March 2003

In addition, many enterprises develop functional portals based on the specific features or benefits the portals offer. Such functional portals include knowledge-based portals (for sharing information or knowledge), customer relationship management (CRM)-based portals (for customer relationship purposes), and sales force automation portals (for personalized account automation functionality). In addition, the creation of an employee or customer self-service portal, focused on reducing expensive internal/external call center operations and overhead, is becoming more common in many enterprises.

#### **PORTAL ADVANTAGES**

Going forward, IDC believes initiatives such as the consolidation of multiple independent intranets or Web sites into a single portal will engender cost savings through reduced IT infrastructure and lower maintenance expenses. Customers pursuing first-time portal initiatives are reporting immediate and measurable ROI from such deployments and are using the cost savings created to fund other similar initiatives throughout the enterprise.

IDC believes there are a number of potential benefits to implementing a portal solution, from obvious advantages such as reducing costs and enhancing productivity and communications to those that are less discernible such as improved service and greater agility and flexibility. Other advantages include:

- ☒ **Common interface.** Though the Internet and the increased pervasiveness of IT networks have enabled enterprises around the globe to communicate and collaborate, in practice a common interface can be quite challenging to implement. Portals are one way in which enterprises are bridging this divide, allowing disparate parties to interact through a common interface, a mechanism for sharing information and conducting transactions — anytime, anywhere. As a result, organizations can improve throughput and velocity while lowering costs and improving productivity.
- ☒ **Faster time to market and measurable ROI.** In a recent survey of leading integrators in the enterprise portal space, IDC observed that the average portal engagement time appears to be on the decline. Our survey showed that average implementation time frames declined from 6.7 months in 2001 to approximately 5.7 months in 2003. This drop can be partly attributed to the desire among end users for shorter, more modular implementations with proven and measurable ROI.
- ☒ **Provisioning of pertinent information and tools.** The Internet provides individuals and organizations with access to information and services that are transforming the economic and societal composition, but it also brings inundation and overload; individuals and organizations do not have the time required to sift through the plethora of internal and external information and services that are now available. The inability to quickly and easily locate required information and services and collaborate with other employees, customers, and partners in real time results in productivity declines, something few enterprises can afford in today's highly demanding economic climate.
- ☒ **Additional channel for new revenue opportunities and efficiencies.** Various end-user entities such as customers, partners, and even employees are no longer dependent on one Internet channel. However, a successful portal solution can help streamline efficiencies and expand revenue opportunities by transforming business processes that extend across an enterprise — both internally and externally — connecting employees, various third-party partners, and customers. Better integration between these disparate entities and easier, faster access to information and services have a tangible impact on bottom-line results, ranging from lower costs, to enhanced productivity, to new revenue opportunities, to better customer service.

#### **Worldwide Enterprise Portal Software Market to Grow 21%**

In addition to the impressive growth rates predicted for portal services, despite a slowdown in the economy and IT spending, the U.S. and worldwide enterprise portal software market also shows robust growth. IDC forecasts that discrete worldwide enterprise portal software spending will increase to more than \$804 million in 2003, representing 21.8% growth over 2002, and worldwide enterprise portal software spending is projected to reach \$1.7 billion in 2007, which translates to a global compound annual growth rate (CAGR) of 21.0%.

As enterprise portals are being rapidly adopted to address the information and application access requirements of knowledge workers within the enterprise, IDC cites several key growth drivers that will contribute to this impressive growth, including:

Demand for portals will increase as more companies begin to understand the IT and business benefits associated with enterprise information portal (EIP) deployments.

Broader adoption and deployment of EIP software across the enterprise will spur increased sales among companies that originally deployed EIP to address the needs of a single department or employee role.

More direct and measurable business benefits will be marketable as EIP software is deployed to improve specific business processes.

Source: Abstracted from *Enterprise Portal Software Market Forecast, 2003–2007*, IDC #29076, March 2003

## CREATING AN EFFECTIVE PORTAL SOLUTION

When embarking on any new IT initiative, organizations face the decision of whether to design, implement, and manage the project on their own or to engage an outside vendor or set of vendors. Although it makes sense for companies to leverage internal resources for some projects, IDC believes the sophisticated nature of portal solutions requires IT organizations to seriously consider bringing in outside expertise. "Getting it right the first time" is not simply an objective but a requisite. Organizations cannot afford — in terms of both time and cost — to rework solutions. As a result, many organizations recognize that an external provider can address a number of key challenges, including:

- ☒ **Time to market.** Increasing competitive pressures, which have become more and more intense with the economic downturn of the past couple years, necessitate rapid time to market. Delays of weeks or months in the deployment of a portal solution can quickly translate into lost revenue, cost overruns, and continued inefficiencies.
- ☒ **High availability and reliability.** The application services architecture as well as the platform architecture must be designed with no single point of failure and with horizontal and vertical scalability. The effectiveness of a portal solution quickly dissolves with downtime, resulting in lost revenue and diminished productivity. Successful design and implementation are not assurances of ultimate success, however, as an IT organization or its hosting provider needs to have operational processes in place to deliver on service-level objectives or agreements.
- ☒ **Security and network identity.** Typically, portal solutions exponentially increase the number of users and the number of services and applications available to individuals and organizations, thereby intensifying security concerns. Organizations offering portal solutions as well as their employees, customers, and partners demand a secure-rich environment from both architectural and operational standpoints. The environment also must be safe from external threats and internal breaches and oversights. Intelligent network identity, with the proliferation in roles and protocols, becomes an integral concern.
- ☒ **Robust functionality.** A portal is of little value unless it delivers functionality, ranging from single sign-on access, to interoperability between disparate software components, to integration with legacy back-end resources. All of these functions are requisite in order for a portal to deliver rich collaboration, which is at the center of most business objectives behind portal development. None of these are easy to accomplish, and often each requires assistance from one or more third-party technology vendors with expertise in these areas.
- ☒ **Future proof.** Today's portals are not seen as short-term solutions. Portals must allow for the seamless integration of new services and applications — which many times means new technologies — without costly and time-consuming changes to the portal architecture. Accordingly, the architecture design of a portal solution must be based on open standards and account for potential unforeseen business requirements and emerging technologies. IT organizations also require development and operational methodologies based on best practices. Initial guidance in establishing these methodologies and then ongoing support through training and even supplemental support is often needed.

IDC believes that the impact of Web Services on the portal market will be substantial over the next 12 to 24 months. Web Services will be adopted as customers seek portal solutions that are based on flexible nonproprietary architectures and will require greater reuse of their existing software investments. Enterprise portals will essentially act as the channels through which Web Services will be accessed. IDC believes that Web Services are likely to speed up implementation time frames considerably by essentially eliminating the need to create custom connectors to access different applications.

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Fortunately, options are available to organizations looking for outside assistance in executing a portal strategy. Sun is one of these options, offering an end-to-end portal solution that addresses both business drivers and technology challenges.

## **SUN PORTAL SOLUTIONS WITH INTEGRATED IDENTITY MANAGEMENT: DESIGNED WITH THE FUTURE IN MIND**

Based in Santa Clara, California, and a leading provider of hardware, software, and services, Sun has more than 35,000 employees worldwide, operations in 170 countries, and \$11.4 billion in revenue in 2003. Its portal strategy combines (1) its best-in-class technologies — both software and hardware; (2) a wide-ranging set of iForce partners, including systems integrators and independent software vendors (ISVs); (3) consulting, training, and sustaining services from Sun Services; and (4) the availability of iForce Centers and Sun Benchmark Center Facilities for proof-of-concept development and solution testing.

### ***SUN JAVA SYSTEM PLATFORM AND ARCHITECTURE***

Sun's portal solution is based on Sun Java System platform and architecture and includes open standards-based Java Web Services. Sun is one of a few technology vendors that can offer an end-to-end portal solution deployed on a comprehensive infrastructure platform; its offering includes its Sun Fire and Sun StorEdge technologies — both software and hardware — coupled with Sun Cluster software, Sun Management Center, and Sun N1 Provisioning server.

At the heart of the portal offering from Sun is Sun ONE Portal Server and integrated identity management using Sun ONE Identity Server. Sun ONE Portal Server provides enterprises and service providers with robust, secure-rich capabilities for building portal solutions. Key features and highlights include:

- ☒ Industry's first fully integrated identity management and portal platform
- ☒ Flexible deployment with multiplatform and multiapplication server support and a readily extensible, high-throughput aggregation and presentation layer
- ☒ Unique VPN-on-demand capabilities with Secure Remote Access
- ☒ Fully integrated Mobile Access development and delivery, which provides a device-aware, device-independent rendering layer that offers broad multichannel capabilities, including VoiceXML and Java 2 Platform, Micro Edition (J2ME) technology support
- ☒ Extensible developer-friendly platform, including Web Services
- ☒ Proven scalability, high availability, reliability, and performance
- ☒ Mature solution with more than 500 customers

Sun ONE Portal Server leverages a common infrastructure solution that includes Sun ONE Identity Server, Sun ONE Directory Server, Sun ONE Web Server, and Sun ONE Application Server. This integrated solution helps enable enterprises and service providers to increase productivity, lower development and deployment cycles, and decrease costs through the use of shared components. For example, the integration of portal and identity management makes possible a sophisticated user, preference, role, and policy data model that can be centrally administered and enables the creation and management of communities.

Sun's portal strategy combines (1) its best-in-class technologies — both software and hardware; (2) a wide-ranging set of iForce partners, including systems integrators and independent software vendors; (3) consulting, training, and sustaining services from Sun Services; and (4) the availability of iForce Centers and Sun Benchmark Center Facilities for proof-of-concept development and solution testing.

Sun is able to offer enterprises and service providers a readily extensible solution through the Sun Java Enterprise System platform and architecture (see Figure 2). Application services — which can be deployed out-of-the-box — include email, calendaring, and collaboration services powered by Sun ONE Messaging Server, Sun ONE Calendar Server, and Sun ONE Instant Messaging. Business logic and integration functions are enabled through the Sun ONE Application Server, Sun ONE Integration Server, and Sun ONE Message Queue. Application development tools are contained within the Sun ONE Studio, and integrated desktop applications are available through the Sun Java Desktop System.

Notwithstanding, while Sun is able to offer an end-to-end technology solution for portal deployments, its standards-based technology architecture allows enterprises and service providers to substitute alternative software components based on existing infrastructures and functionality and quality-of-service requirements. For example, in addition to Sun ONE Application Server, the Sun ONE Portal Server supports multiple application servers, including IBM WebSphere Application Server and BEA WebLogic Server. In all, services offered from more than 40 Sun iForce ISV partners are integrated with the Sun ONE Portal Server, providing enterprises and service providers with multiple deployment options for content management, collaboration, productivity applications, enterprise applications, content syndication, business intelligence, personalization, development tools, Web-enabled application delivery, and security.

Key attributes and functions of Sun's integrated portal solution include:

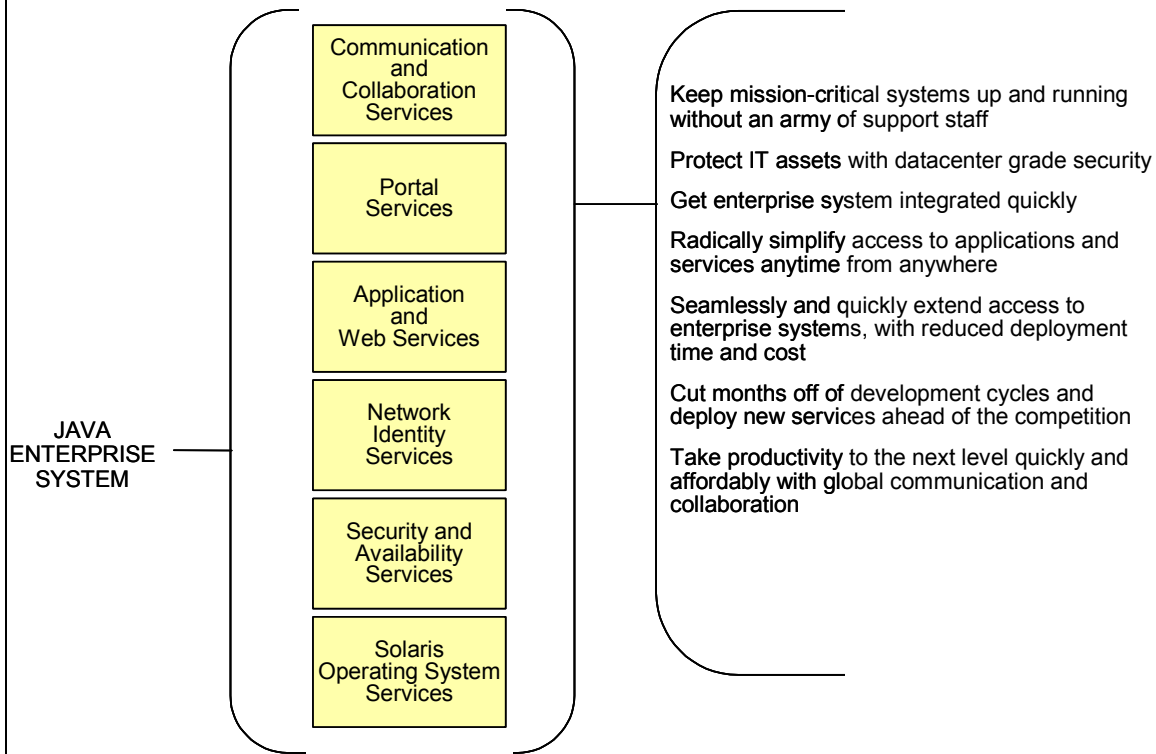
- ☒ **Identity management.** Tight integration of the Sun ONE Portal Server with Sun ONE Identity Server allows Sun to offer an identity management solution that includes policy and profile management, single sign-on, common directory, delegated administration, centralized access and control, and multirole and group management. For example, this functionality allows administrators to create portals for each line of business with different policy and permission access rights for each user within that line of business.
- ☒ **Personalization.** End users are able to customize their portals by creating portal tabs containing the content relevant to their role and interests. Through advanced identity management capabilities, administrators have the capability to control customization down to the content and application level by setting fine-grained policy and permission rights.
- ☒ **Secure-rich model.** The policy and access control system has the ability to use many different types of authentication, with simplified security administration that encompasses UNIX, LDAP, RADIUS, and Smart Cards. All traffic through Sun ONE Portal Server is encrypted regardless of whether the traffic is encrypted at the source. Fine-grained policy control is also possible such that users may only access documents, applications, and data as defined by the administrator, providing a high level of information control within the organization. Finally, single sign-on allows users to seamlessly access multiple applications without the need to reenter their name and password.
- ☒ **Aggregation and presentation.** Customizable portlets enable the delivery of integrated content, applications, and services to end users. Sun ONE Portal Server delivers other aggregation and presentation features such as identity management, security, and personalization.
- ☒ **Flexible user experience.** One of the benefits of advanced identity management using Sun ONE Identity Server is the ability to create multiple groups, roles, and privileges within the portal. This allows line-of-business managers to dynamically "push" or provision content and services to end users based on their roles in the organization. A finance manager, for example, would have access to the latest

ROI calculator, while an HR manager would have access to employee salary information. End users can also "pull" or select information in which they are most interested.

- ☒ **Collaboration and communications.** Integrated collaborative services help enable secure communication and collaboration across the extended enterprise. Prebuilt portlets are available for the Sun ONE Communication platform, including Sun ONE Messaging Server, Sun ONE Calendar Server, and Sun ONE Instant Messaging. Real-time collaboration is particularly valuable to portal users and is enabled through Sun ONE Instant Messaging, which also enables real-time polling, persistent chat rooms, and bulletin board capabilities. Other leading communication applications can also be readily integrated into the Sun Java System portal solution, including Microsoft Exchange and Lotus Notes.
- ☒ **Knowledge management and search.** The solution incorporates advanced robot-based search technology from Sun that is administered as a portal service, supports major document and file types, and offers full search capabilities, including specific passage retrieval and document-level secure searches. One of the benefits of having search and browse functions preintegrated with the portal service is that it shares the same administration console with Sun ONE Portal Server and Sun ONE Identity Server, thus making it easier to manage. Other benefits include cost savings, because there are no additional software license or integration costs; ease of use, because it presents an integrated user interface for end users and administrators out-of-the-box; and security, because it is able to leverage portal authentication and authorization services. Taxonomy capabilities extend the knowledge management offering and allow categorization of documents and the creation of browser-accessible document directories.
- ☒ **Mobile access.** Sun ONE Portal Server Mobile Access includes a dynamic rendering engine that allows enterprises to write applications once and render on any device. Content can be displayed correctly regardless of markup language (e.g., WML, cHTML, HDML) or device (e.g., Palm, iPAQ, RIM, WAP phones, i-mode phones). It also extends mobile access to voice-enabled applications by providing a voice portal framework that includes voice authentication and voice navigation capabilities. Wireless connectivity is available for leading collaboration services, including Sun ONE Calendar Server and Sun ONE Messaging Server, Microsoft Exchange, and Lotus Notes/Domino. Enterprises and service providers can customize the look and feel of the portal design to meet their user needs as well as integrate other content to create a complete mobile portal.
- ☒ **Service integration and Web Services development.** Integration of legacy applications and new Web Services is critical to making portals effective and a valuable investment. Sun ONE Portal Server includes a plug-in to Sun ONE Studio to help facilitate development and integration. Extensive APIs and wizards guide developers through the process of building portlets for their portal environment. Tools for Sun ONE Portal Server Mobile Access allow for the development of wireless applications, including J2ME technology devices. Sun ONE Portal Server embraces industry standards such as JSR 168, which defines a common interface for integrating applications and services into a portal. Portlets based on JSR 168 can run across multiple portal vendor deployments.
- ☒ **Administration.** Sun ONE Portal Server includes a common console that allows administrators to manage various identity and portal services, including domain names, user roles, and access rights for a single portal, or multiple portals from one integrated interface. Delegated administration features allow administrators to streamline tasks such as user registration and password maintenance, thereby improving quality and speed of service delivery.

**FIGURE 2**

THE JAVA ENTERPRISE SYSTEM



Source: Sun and IDC, 2003

**SUN SERVICES: INTELLECTUAL CAPITAL AND PORTAL SOLUTIONS**

Sun's portal solution engages its iForce partner community for the development of business strategy and processes. Once the business strategy is in place, Sun Services and/or iForce systems integrator and ISV partners work with the customer to help transform the business strategy into a technology solution.

Sun Services uses the SunTone Architecture Methodology, which encompasses architecture design, project management, and the development approach, as the basis for designing and implementing portal solutions. Architecture design is based on a services-driven network architecture, whereby different services are broken into separate tiers. Use cases and iterative, sequential development cycles form the core of the development approach espoused by Sun Services. Sun Services frequently serves as the general contractor for medium- and large-scale portal deployments, providing overarching project management that adheres to industry standards embedded within IT Information Library (ITIL) and Prince2 methodologies as well as methodologies from the Project Management Institute. The services-driven network architecture and development approach helps reduce development risks while speeding time to market by allowing developers to work concurrently on separate services (e.g., presentation logic, network identity services, and business and integration logic).

The service offerings from Sun Services cover three basic areas: architecture, implementation, and management.

Sun Services uses the SunTone Architecture Methodology, which encompasses architecture design, project management, and the development approach, as the basis for designing and implementing portal solutions.

## ARCHITECT

Sun Services can help organizations translate business strategy and processes into technology-based solutions. Architecture design services, depending on the stage of transformation at which an IT organization finds itself, encompass the following areas:

- ☒ **Architecture Workshop.** Architecture Workshops help customers identify a customized, end-to-end solution that fully addresses their business issues and provides direction needed to make the solution a reality. Workshop participants typically include those with business owners' responsibility for developing the technology architecture as well as management and other key stakeholders, including business unit representatives, architects, enterprise infrastructure groups, and others. This service is designed to provide either a general discussion of technical architecture and business needs or specific business initiatives such as network identity, security, integration.
- ☒ **Architecture Assessment.** The Architecture Assessment Service for portal solutions analyzes the state of a customer's current infrastructure compared with its desired architecture design. During this process, Sun consultants examine the customer's internal technology skills, organizational structure, and processes for using and managing its architecture. They also work with customers to identify business services and required functionality and to articulate service-level requirements. At this juncture, as part of the assessment phase, a customer may opt to engage Sun for an Enterprise Security Assessment or Learning Strategy Services.
- ☒ **Architecture Roadmap.** The Architecture Roadmap service from Sun focuses on creating a high-level architecture, including an implementation plan.

Sun Services can help organizations translate business strategy and processes into technology-based solutions.

## IMPLEMENT

Once an architecture design for the portal solution is solidified, Sun Services, working with the customer and iForce partners, can help sort through the various interdependencies of implementing the Architecture Roadmap. This process can occur in several different manners, depending on the requirements of the customer:

- ☒ **Quick Start Services.** Sun Services can provide installation and implementation services surrounding the Sun ONE software platform that can help IT organizations quickly achieve a production-ready environment. These engagements are typically fixed price and last approximately two weeks.
- ☒ **Sun ONE and Java Technology Services.** Sun Services can provide valuable assistance through the use of its extensive intellectual capital in the areas of building architecture frameworks and functionality around Sun ONE software products and Java technology. For the installation, testing, and deployment of the server and storage platform infrastructure, Sun consultants can provide valuable assistance through an Application Readiness Service.
- ☒ **Flexible Training.** Sun Services can help IT organizations with training for Sun ONE products and Java technology as well as best practices related to integration and network security. Sun can customize skill assessments, training, and certification to best meet customer requirements.

## MANAGE

Whether an IT organization plans to manage the portal solution itself or to outsource its management to a SunTone Certified iForce partner, Sun Services has service programs in place to help the customer achieve optimal availability, reliability, security, and scalability.

- ☒ **Support Programs.** Through SunSpectrum support agreements, which can be customized to meet customer requirements, Sun can deliver proactive multivendor support to assist either the SunTone Certified iForce partner hosting the solution or the customer itself to sustain optimal service levels.
- ☒ **Managed Services.** Through its Managed Services offerings, Sun Services can help enterprises, service providers (e.g., hosting providers, ASPs, and ISPs), and outsourcers to manage their service level agreements (SLAs) or manage the SLAs on behalf of the customer for portal deployments.
- ☒ **Online and Developer Support Programs.** Support used to be a time-consuming and costly process. However, customers have access to online self-service support through the Sun.com portal for patch downloads and software and hardware updates. This resource provides self-service online support to both developers and IT staff.
- ☒ **Certification and Learning Management.** To help IT organizations sustain efficient datacenter operations, achieve high availability and reliability, and prepare for new integration and application services initiatives, Sun Services offers ongoing skill assessments, training, and certification.

### **SUN IFORCE PARTNERS AND PORTAL SOLUTIONS**

Sun recognizes that both private and public sector entities want to buy and implement portal solutions that address their unique business drivers. In addition, while Sun has a breadth of products and technologies that it can offer in the portal solution space, it acknowledges that many organizations have significant investments in their existing technology infrastructures and moreover that other software components are needed to meet the business requirements of customers. Because the Sun ONE architecture is based on open standards, Sun is committed to working with iForce ISV partners with offerings that add functionality and performance to its portal solution. Some of the iForce ISV partners with which Sun works include Art Technology Group Inc., BEA Systems Inc., Bowstreet Inc., Documentum Inc., Epicentric Inc., Fatwire Corporation, Interwoven Inc., Oracle Corporation, Siebel Systems Inc., and Vignette Corporation.

For business strategy consulting, application development, and outsourcing services, Sun has relationships with a number of systems integrators that form part of the iForce partner community. Some of the iForce partners with which Sun works in these areas include Accenture, Atos, BearingPoint, Cap Gemini Ernst & Young, Deloitte & Touche, and EDS.

### **SUN IFORCE CENTERS AND BENCHMARK CENTERS**

The global network of iForce Centers includes three types: Sun led, partner led, and software product focused. Sun's network of centers allows customers to make informed investment decisions by testing architectural configurations and concepts through proof of concepts before purchasing and implementing the final solution components. Each iForce Center comprises intellectual capital that helps customers minimize risks and costs associated with the architecture design of their portal solutions.

Whether an IT organization plans to manage the portal solution itself or to outsource its management to a SunTone Certified iForce partner, Sun Services has service programs in place to help the customer achieve optimal availability, reliability, security, and scalability.

Because the Sun ONE architecture is based on open standards, Sun is committed to working with iForce ISV partners with offerings that add functionality and performance to its portal solution.

Sun portal solutions include best-in-class software and hardware technologies combined with a wide-ranging set of iForce partners, including systems integrators and ISVs, that allow an organization to focus on its core business issues.

## ***DIFFERENTIATION, ADVANTAGES, AND CHALLENGES***

Sun portal solutions include best-in-class software and hardware technologies combined with a wide-ranging set of iForce partners, including systems integrators and ISVs, that allow an organization to focus on its core business issues. By leveraging expertise surrounding consulting, training, and sustaining services from Sun Services as well as the availability of iForce Centers and Sun Benchmark Center Facilities, enterprises are positioned to quickly achieve business objectives through Sun's portal technologies and services.

As a leading technology and services vendor, Sun is building upon its history in traditional technology environments through its portal solutions. Having an established track record plays an integral part of its "We Make the Net Work" vision. Integration and intelligent provisioning of services between different individuals and entities will move Web Services more and more to the center of the technology solution for portal services. Sun's focus on placing Web Services at the core of its next generation of Sun ONE software products is a strategic decision that will coincide with these emerging technology requirements. Sun ONE Portal Server, Sun ONE Directory Server, Sun ONE Meta-Directory Server, and Sun ONE Identity Server provide public and private sector enterprises with a robust, functionally rich platform that will flexibly adapt to changing business and technology requirements.

In addition, Sun's ability to offer a virtual end-to-end product portfolio in the portal solution space, combined with its intellectual capital in the realm of Java and XML technologies and, in particular, its leadership role in the development of Web Services, provides the company with a strategic advantage.

To corroborate the breadth of how Sun portal solutions are helping organizations to transform the ways in which they conduct business, IDC highlights how three global enterprise organizations — Sabre Airline Solutions, People's Insurance Company of China, and the Federated European Tourism Information Systems Harmonisation (FETISH) network — have deployed portal solutions on Sun technology with the assistance of Sun.

## CUSTOMER CASE STUDIES: SUN PORTAL SOLUTIONS IN PRACTICE

### SABRE AIRLINE SOLUTIONS: EMERGO SOLUTIONS

Sabre Airline Solutions, a Sabre Holdings Company, is one of the world's largest providers of software products, reservation and departure control systems, and consulting services to airlines worldwide. More than 200 airlines use Sabre Airline Solutions' broad portfolio of technology solutions for decision-support tools to increase revenues and improve operations, and more than 70 airlines worldwide rely on Sabre Airline Solutions for their reservation and departure control systems, with 16 new carriers and 8 renewals signed in 2002. In addition, more than 100 clients worldwide have turned to Sabre Airline Solutions' consulting group for strategic, commercial, and operational consulting, with more than 300 contracts signed in 2002.

#### **THE CHALLENGE: AN ASP PORTAL**

Sabre Airline Solutions embarked on a search in 2000 to standardize its offerings for airlines. The goal was to lower the TCO and enhance the services delivered to its customers by moving away from individual customized solutions. Sabre eMergo Web-enabled and dedicated network solutions were launched in February 2001 as an application service provider (ASP) model to deliver Sabre Airline Solutions applications. Sabre eMergo is a cost-effective alternative to installed onsite systems for airlines. eMergo's ASP portal delivery helps airlines to realize savings in hardware and software, system implementation, support personnel, data storage, and ongoing maintenance while allowing airlines to focus on running their core businesses. In addition to lowering the TCO, the eMergo suite of simplified and standard applications produces faster implementations, improves time to market, and provides greater integration with Sabre's other software products. Today eMergo delivers more than 20 applications to more than 35 different airline carriers through a common portal interface.

In early 2002, Sabre Airline Solutions looked to enhance the functionality and performance of its ASP portal offering, eMergo. Although the company considered other technology solutions, it turned to Sun for assistance in designing a next-generation architecture for its portal. Some of the key business drivers for eMergo included continuing to lower TCO for airline carriers; enhancing customer service through consolidated access to applications and services; and improving communications with customers, for functions such as conferences and system notifications, through the use of a portal. Key technology challenges that Sabre faced when designing the ASP portal included consolidation of disparate applications and services — including Citrix applications running on a mainframe environment — into a common environment; consolidation of user identities into a common identity management console; a robust, secure medium for content delivery; and the ability to leverage technology for ASP-ready solutions.

#### **THE SOLUTION: EMERGO**

Starting in January 2003, Sun Services, coordinating with iForce partner EDS, provided architectural assistance in the design and implementation of a portal solution powered by the Sun ONE software platform, including Sun ONE Portal Server 6.0, Sun ONE Identity Server, Sun ONE Directory Server, Sun ONE Web Server, Sun ONE Meta-Directory Server, and J2EE and XML technologies. The portal environment also includes BEA WebLogic Server and Oracle8i database and integrates numerous disparate systems. It further facilitates integration with business partner portals such as that of eLSG.SkyChefs. The underlying platform infrastructure is powered by Sun Fire V880 servers. A secure-rich computing environment is backed by Cisco Firewall software.

**Challenge:** Enhance customer service while tapping new revenue opportunities through deployment of ASP portal

**Solution:** Sabre eMergo IT team, with assistance from Sun Services, designed and implemented eMergo ASP portal that is powered by Java Web Services and the Sun ONE platform and architecture residing on Sun Fire V880 servers; hosting provided by iForce partner EDS

**Results:** Portal helping to support projected 300% revenue growth in 2003; 30% to 50% lower TCO for customers (versus traditional, proprietary-based solutions); 100% faster implementation cycles via open standards-based architecture and Extreme Programming; Sun ONE Meta-Directory Server helping to save significant person-hours per application deployed

The portal will provide eMergo with the following functionality:

- ☒ Consolidated user identities
- ☒ Delegated administration of user accounts
- ☒ A secure and robust mechanism for launching applications
- ☒ Single sign-on for most applications
- ☒ Individually customized portal pages for customers
- ☒ Integration with business partners
- ☒ Technology for migrating applications to a services-oriented architecture that includes Web Services

The functionality of the portal, however, goes beyond the above. The portal will be used as a marketing tool to direct specific content to users. Not only will users be able to access data on their specific applications, but information on other eMergo applications will also be readily available to help drive multiple sales to customers. The portal will also serve as a central repository for industry news and links to which users will have virtual real-time access. Finally, operational content will include service-level reports, scheduled downtimes, and links to the product support help desk. The portal will provide significant value for users as the one-stop shop for carriers' needs.

#### **BUSINESS RESULTS**

eMergo is delivering measurable results to customers, including a 30% to 50% reduction in TCO (versus traditional, proprietary-based solutions). With the assistance of EDS and Sun, Sabre Airline Solutions has been able to rapidly scale, supporting projected revenue growth of 300% in 2003.

The open-standards architecture and Extreme Programming are helping the eMergo IT team to speed time to market for new applications by as much as 100%. In addition, the network identity management component of eMergo, which includes Sun ONE Meta-Directory Server, enables seamless integration with existing applications using Microsoft Active Directory, thereby translating into significant productivity improvements and cost savings. Finally, backed by a hosting solution from EDS, which includes a SunSpectrum Platinum agreement, Sabre eMergo Solutions has exceeded all customer SLAs.

"We were looking for a mechanism to deliver all of our airline applications in a more secure way. Sun ONE Portal Server and Sun ONE Identity Server, with their built-in components for security, were key in our selection of Sun."  
– Stephanie Bundick, eMergo Product Marketing, Sabre Airline Solutions

"The open standards-based Sun ONE platform and architecture allows us to make various back-end systems available to our customers in a virtual seamless manner."  
– Manish Mehrotra, eMergo Enterprise Architect, Sabre Airline Solutions

"Sun ONE Portal Server and Sun Identity Server allow us to have a single entry-point into our various applications and services, which provides a secure-rich environment while giving us the ability to track exactly what applications and services are being used by each user."  
– Manish Mehrotra, eMergo Enterprise Architect, Sabre Airline Solutions

## PEOPLE'S INSURANCE COMPANY OF CHINA

The People's Insurance Company of China (PICC) is one of the largest insurance companies in the Asia/Pacific region, with more than 70,000 employees and headquarters in Beijing, China. PICC offerings include automobile, home, business, and personal insurance.

### **THE CHALLENGE: ENHANCE REVENUE, LOWER COSTS**

Traditionally, PICC sold insurance products through its network of branch offices, insurance agents, or call centers. However, businesses and consumers were increasingly using the Internet to conduct transactions and purchase products and services, including financial services. With the online insurance market expected to grow rapidly during the next several years, PICC saw an opportunity to leverage the Internet to sell its insurance products and reduce operational and internal communication costs by moving manual processes to Internet-based transactions.

Once the business case had been established, PICC identified technology requirements, ranging from an open standards-based architecture, to integration with call center and legacy systems, to scalability and high availability, to security, to flexibility and adaptability.

### **THE SOLUTION: EBUSINESS PORTAL POWERED BY SUN ONE PLATFORM AND ARCHITECTURE**

PICC needed assistance to move forward quickly in designing and implementing the eBusiness portal. It looked for a technology vendor that could coordinate more than 10 best-of-breed ISVs and systems integrators and help ensure that the project met an aggressive deployment schedule. Though PICC considered other technology vendors, it ultimately determined that Sun was the best choice to serve as its primary technology provider.

Sun Services and iForce partners Tom.com, which provided systems integration assistance, and eBao, which provided software development support, initiated work with PICC in February 2002 to design the architecture for the eBusiness portal and then implement the application services infrastructure and platform infrastructure in April 2002. A production-ready solution was ready for deployment by June 2002.

The application services architecture includes Sun ONE components such as Sun ONE Portal Server, Sun ONE Directory Server, Sun ONE Web Server, and J2EE and XML technologies. The various services, per the SunTone Architecture Methodology, are broken into different services tiers. The platform infrastructure is powered by Sun Fire midframe servers running the Solaris 8 Operating Environment connected to Sun StorEdge T3 disk arrays for backup and restore. Portions of the platform infrastructure are clustered using Sun Cluster 3.0 for reliability and availability. PICC engages Sun Services for ongoing skill assessments and training in Sun technologies and has a SunSpectrum Gold agreement for high availability and reliability.

### **BUSINESS RESULTS**

The eBusiness portal is currently serving customers, employees, and third-party agents in Beijing, assisting more than 100,000 users while sustaining in excess of 99.9% availability. During the next year, PICC will roll out the portal functionality to its branch offices across the People's Republic of China (PRC), with the user base exceeding 2 million. In addition, Sun and its iForce partners were able to help PICC shave an estimated 3 months from time to market. The costs of transactions conducted online are significantly lower than those of transactions conducted via traditional processing channels (IDC research shows online transaction processing approximately 40% lower than traditional channels.)

**Challenge:** Tap Internet as a new channel to enable individual and business customers, employees, and third-party agents to conduct business online, with business objectives that include reduced cost, improved productivity, and enhanced customer service

**Solution:** eBusiness portal – powered by Sun ONE platform residing on Sun Fire servers connected to Sun StorEdge disk arrays – provides end-user functionality that includes claim submittal, data processing, information access, and much more

**Results:** Currently serves more than 100,000 users and is expected to reach more than 2 million within the first year; currently sustaining in excess of 99.9% availability; transactions now conducted online at significantly lower cost than that of traditional processing channels; 3 months shaved from time to market with help of Sun and its iForce partners

"We felt that the primary technology vendor would be tasked in the coordination of the various third parties and the aggressive timeline. We were confident Sun could meet these challenges."  
– Mr. Su Yao Hui,  
General Manager of  
E-Business Center,  
PICC

## THE FEDERATED EUROPEAN TOURISM INFORMATION SERVICE HARMONISATION NETWORK PORTAL

The European Commission is funding the Federated European Tourism Information Service Harmonisation (FETISH) project in an attempt to bring together services from small and medium-sized tourism businesses. The FETISH Network portal, located at [www.fetishproject.com](http://www.fetishproject.com), unites a scattered collection of more than 100 disparate tourism enterprises and services.

### **THE CHALLENGE: DISPARATE IT SYSTEMS AND DATA**

IT consultancy and research firm T6 was chartered by the European Commission with the creation and deployment of the FETISH Network portal. Family-owned businesses in the European tourism industry play a major role in the sector, yet they do not always have the resources or skills to connect to electronic distribution channels that can help them flourish. The FETISH Network aimed to allow small and medium-sized tourism businesses to share services, resources, and information over a distributed network without modifying the structure of their very disparate IT systems.

### **THE SOLUTION: DISTRIBUTED NETWORK PORTAL**

When T6 began looking for a technology solution, it saw Sun Java and Jini network technologies as the answers. It subsequently built upon this foundation by adding Java Web Services and components of the Sun ONE software platform and architecture. "Java Web Services with Jini technology was idea for providing small and medium-sized businesses with the ability to access integrated applications from disparate providers, thereby providing customers with value-added travel offerings," notes T6 CEO and FETISH Project Coordinator Andrea Nicolai.

As T6 began to develop an industry-first solution using emerging technologies, it sought a technology consulting partner with the expertise required to design and implement the complex infrastructure. The FETISH Network determined that Sun Services was the right choice, initially engaging Sun consultants for a Java Architecture Assessment Service and subsequently for ongoing architectural direction and implementation assistance as well as mentoring and training in Java technology and Sun ONE software. Nicolai comments, "With Sun's assistance, we've launched one of the largest and first such implementations of Jini technology in the world. And our network has only gotten better now that it has evolved into a Web Services environment."

The business logic for the FETISH Network portal is powered by Java and XML technologies and Sun ONE Application Server. The underlying engine for presentation logic is made up of Sun ONE Web Server, Sun ONE Web Proxy Server, and Java technology. Java Web Services, which consist of dynamic Universal Discovery Descriptive Interface (UDDI) protocol, provide a static view of the dynamic network that is being served. Jini technology delivers the central lookup and discovery mechanism. The platform infrastructure consists of three Sun Enterprise 420R servers running the Solaris 8 Operating Environment. "Our Java Web Services framework has made it easy to add or drop services from our network," explains Nicolai. "Services are interchangeable, so travelers might use a particular application on the network to book a flight one week and another to do the same thing a month later. The functionality is all the same, and what happens beneath the surface is transparent to end users."

**Challenge:** Provide small and medium-sized tourism businesses with the ability to access integrated applications and services from disparate providers, thereby providing tourists value-added travel offerings

**Solution:** T6 and Sun Services collaborated to design and implement distributed network portal powered by Java Web Services, the Sun ONE software platform and architecture, and Jini, Java, and XML technologies residing on Sun Enterprise servers

**Results:** 20% to 30% increase in revenue opportunities for small and medium-size businesses; 500% reduction in development cycles through virtual plug-and-play toolkit; projected 100% reduction in TCO for members; 60% to 70% increase in revenue opportunities for national tourism providers; wireless capability decreases overhead for customers by 100%

"The nature of our network is such that we don't have to worry about scalability. Because it is based on Sun ONE solutions, we also aren't burdened by availability issues."  
– Andrea Nicolai, CEO, T6, and Project Coordinator, FETISH project

## **BUSINESS RESULTS**

The FETISH Network portal offers an array of different services, including a Reservation Engine, Agent Search Engine, User Profile Engine, Mobile Application Gateway, Itinerary Generator, and more. Though recently deployed, T6 projects a 20% to 30% increase in revenue opportunities for small and medium-sized businesses and a 60% to 70% increase in revenue opportunity for national tourism providers. And in the case of small and medium-sized businesses, the distributed network portal is expected to help reduce TCO by a projected 100%.

The Java Web Services toolkit will allow service providers to deploy new services to the network portal as much as 500% faster. As the portal allows multichannel access, small businesses will be able to shave approximately 100% of IT overhead by tapping wireless connections instead of more costly wireline solutions.

"Java Web Services with Jini technology was ideal for providing small and medium-sized businesses with the ability to access integrated applications from disparate providers, thereby providing customers value-added travel offerings."

— Andrea Nicolai, CEO, T6, and Project Coordinator, FETISH project

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