

**SAP White Paper**  
**SAP NetWeaver**



# **INTEROPERABILITY OF** **SAP NetWeaver™ AND** **IBM WebSphere**

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# INTRODUCTION

## THE NEED FOR INTEROPERABILITY

After at least a decade of large-scale expenditures on best-of-breed application software and technology infrastructure products, companies are finding themselves with ample investment in a considerable number of differing and often incompatible technologies. Furthermore, decisions with regard to software infrastructure are being made on departmental rather than an enterprise level, further escalating system incompatibility.

This situation is, of course, reflective of an IT strategy that follows three principal criteria: protecting existing investments, mastering system heterogeneity, and lowering total cost of ownership (TCO). Along the way, companies have increased the pressure on their IT organizations to reduce cost, enable growth, and, most of all, demonstrate their value.

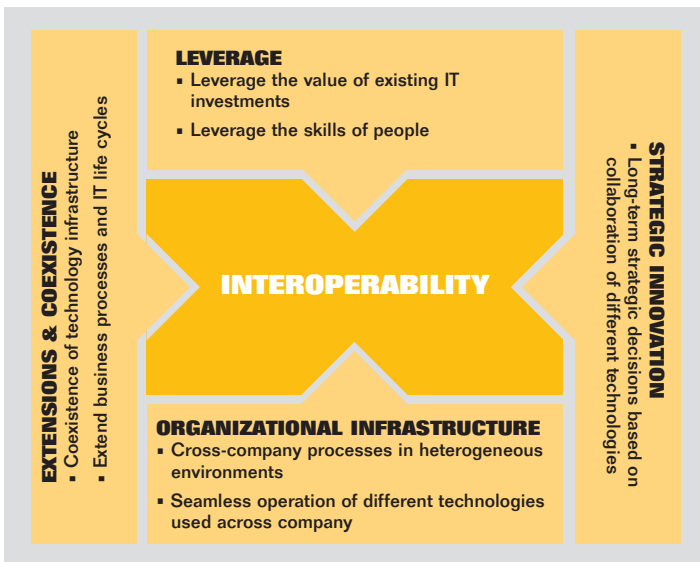


Figure 1: Need for Interoperability

For all of these reasons, a growing number of SAP customers are focusing their software assets and choosing IBM and Microsoft, among other vendors, to supply them with most of their general business applications and technology infrastructure.

A critical element in the overall IT landscape for these companies becomes how well these solutions work together. In this new milieu, SAP has made a commitment to ensure interoperability with IBM and Microsoft solutions on a technology infrastructure level and to cooperate with these companies in development strategies, field engagements, and competency and collaboration technology support centers.

## SAP'S PHILOSOPHY

As a trusted IT innovator, SAP recognizes the high level of heterogeneity necessary for robust IT landscapes and the need to protect existing investments. At the same time, SAP supports adaptive business processes – ones through which IT promotes the growth of your enterprise. SAP always endorses the paradigm that business drives technology, not the other way around. SAP understands that environments exist in which technology products from a variety of vendors have different roles and that no one vendor can deliver everything within a single IT structure. A key aim, therefore, is full interoperability with existing infrastructures.

SAP's business solutions are powered by SAP NetWeaver™, an open application and integration platform that is fully interoperable with IBM WebSphere and Microsoft .NET environments. SAP NetWeaver unifies and aligns people, information, and business processes across technologies and organizations. SAP NetWeaver also enables Enterprise Services Architecture, a blueprint for a complete, services-based business solution that combines the power of enterprise applications with the flexibility of Web services and open technologies.

All of this rests, of course, on a foundation of open standards supported by a broad industrywide – or even marketwide – initiative. Openness is a prerequisite for achieving a high degree of heterogeneity. To this end, SAP, IBM, and Microsoft have committed themselves to close cooperation in major standardization councils (W3C, WS-I, OASIS, UDDI.org, and others).

## **A NEW ERA OF COLLABORATION**

Over the last three decades, IBM and SAP have developed an incomparable partnership that is manifestly benefiting the more than 8,000 customers the two companies have in common. Furthermore, IBM is one of the top customers of SAP and vice versa, indicating that both organizations have built a broad knowledge base and a firm understanding of their respective products. This is an excellent base from which to further serve customers and deliver even greater value.

Based on the technology and service area partnership that is now firmly in place, the interoperability story is focusing to the software side. A rapidly growing number of customers are selecting SAP and IBM from among the few dominant vendors that supply business applications and technology infrastructure. Now it's not about selecting a reliable and scalable database such as DB2 for an SAP® application as much as it is about finding a long-term, focused landscape in which technology infrastructures can mesh together to provide best-in-class solutions.

The announced interoperability between SAP NetWeaver and IBM WebSphere at all levels created significant excitement in the marketplace. The result has been an increase in customer expectation levels and anticipation of a high degree of heterogeneity within their IT environments. By introducing this new kind of collaboration and cooperation, IBM and SAP will deliver novel ways for customers to lower their TCO, protect their investment, and leverage their existing skills – as well as see a greater overall return on their investment. By combining technical expertise with unmatched industry-specific know-how, IBM and SAP will provide customers not just with technology solutions but with real long-term business value as well.

# TECHNICAL OVERVIEW

## SAP NETWEAVER: BRIEF TECHNICAL OVERVIEW

SAP NetWeaver is the foundation for all SAP solutions – including SAP xApps™ composite applications, mySAP™ Business Suite solutions, and selected partner solutions. SAP NetWeaver enables complete business integration on all relevant levels. It integrates people by bringing the right functionality and the right information to the right places. It integrates information by making both structured and unstructured information available in a consistent and accessible manner. And process integration enables open technology-based communication that supports process-centric collaboration among SAP and non-SAP components, within the boundaries of an enterprise and beyond.

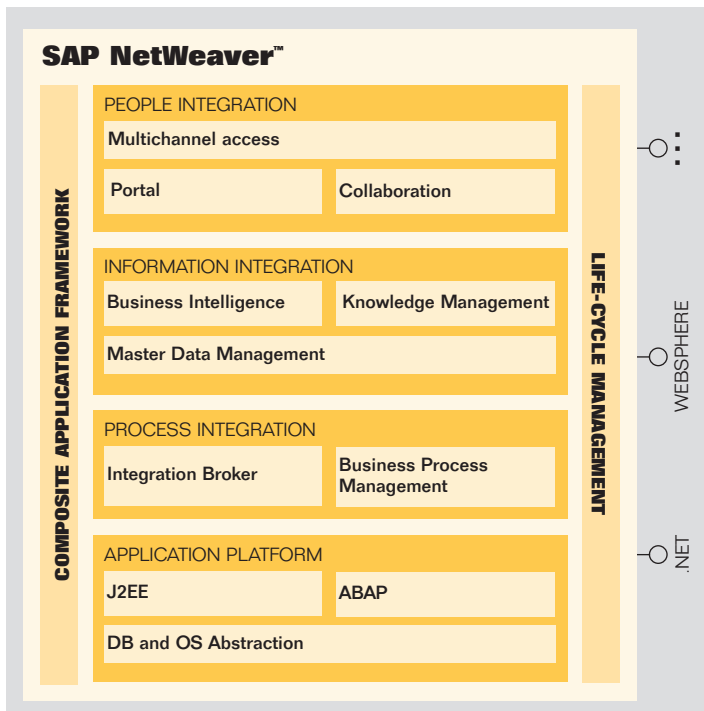


Figure 2: Overview – SAP NetWeaver

The key capabilities listed in the following table – all based on open technology and standards – are what make SAP NetWeaver a powerful integration and application platform.

<b>People Integration</b>	<b>Portal Infrastructure</b>	Gives workers unified, personalized, role-based access to heterogeneous IT environments.
	<b>Collaboration</b>	Promotes dynamic and cost-effective communication among teams and communities. Includes virtual and real-time collaboration tools such as news, chat, team calendars, application sharing, and document stores.
	<b>Multichannel Access</b>	Permits access to enterprise systems using mobile devices and voice systems, allowing the extension of business processes any place business is conducted.
<b>Information Integration</b>	<b>Knowledge Management</b>	Manages and makes accessible unstructured information such as text files, slide shows, or audio files.
	<b>Business Intelligence</b>	Enables organizations to integrate, analyze, and disseminate business-critical information. Includes a robust suite of tools for creating and publishing customized, interactive reports and applications that support decision making at every level.
	<b>Master Data Management</b>	Promotes information integrity across the business network in heterogeneous IT environments. Provides services to consolidate, harmonize, and centrally manage master data, including business partner information, product masters and structures, and technical-asset information.
<b>Process Integration</b>	<b>Integration Broker</b>	Enables eXtensible Markup Language (XML) and Simple Object Access Protocol (SOAP) communications among application components from heterogeneous sources.
	<b>Business Process Management</b>	Allows the modeling and driving of business processes in a dynamic IT environment. Permits underlying applications to be combined into adaptive, end-to-end processes spanning the entire value chain.
<b>Application Platform</b>	<b>J2EE, ABAP, DB, and OS Abstraction</b>	Supports J2EE and the ABAP™ programming language in a single environment. Provides independence from existing databases and operating systems, full support for platform-independent Web services and business applications, and an open, standards-based development environment.
<b>Life-Cycle Management</b>		Provides comprehensive technology for managing all stages of the software life cycle – from design, development, deployment, implementation, versioning, and testing through ongoing operations such as administration and change management.
<b>Composite Application Framework</b>		Provides the development environment for building SAP® xApps™ composite applications. Contains the tools, methodology, rules, and patterns that allow SAP and its partners to develop SAP xApps composite applications efficiently, while taking advantage of all integration layers. In 2004 it will also be available for customers to build their own custom apps.

### IBM WEBSHERE: BRIEF TECHNICAL OVERVIEW

WebSphere is infrastructure software designed for dynamic e-business. Delivering a proven, secure, and reliable software portfolio while at the same time providing comprehensive e-business leadership, WebSphere evolves to meet the demands of companies faced with challenging business environments such as the need for increasing operational efficiencies, strengthening customer loyalty, and integrating disparate systems.

WebSphere helps customers in their quest for truly dynamic e-business. WebSphere includes: Foundation & Tools, Business Portals, Business Integration, and Transaction Servers & Tools. Together, those facets of the WebSphere software platform close the gap between business strategy and information technology.

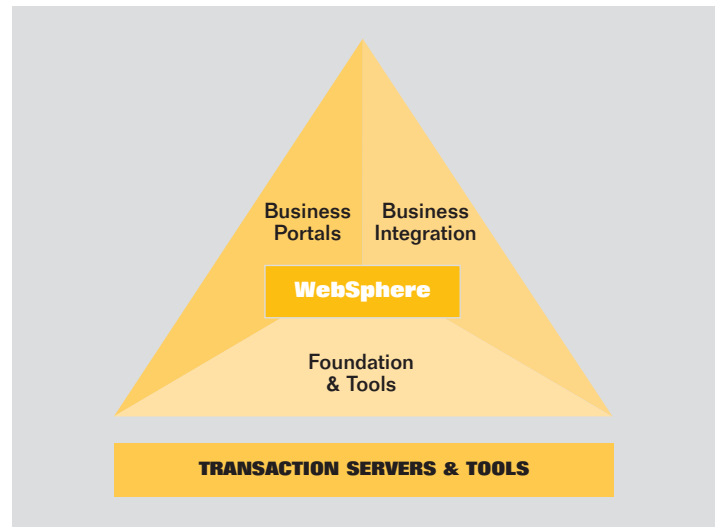


Figure 3: Overview – IBM WebSphere

<b>Foundation and Tools</b>	<b>Open Services Infrastructure</b>	WebSphere Application Server lets you deploy a core operating environment for a reliable foundation capable of high volume, secure transactions, and Web services.
	<b>Application Development</b>	WebSphere Studio lets you deliver a rapid and efficient response to business needs through new e-business applications.
	<b>Enterprise Modernization</b>	WebSphere Host Integration and WebSphere Studio let you leverage existing business assets and skills to satisfy new e-business requirements.
<b>Business Portals</b>	<b>Interactive User Experience</b>	WebSphere Portal helps people interact in a personalized way with diverse business resources.
	<b>Access On Demand</b>	WebSphere Everyplace and WebSphere Voice let you easily access information and take action anywhere, anytime, using any choice of devices.
	<b>Selling and Channel Management</b>	WebSphere Commerce helps you optimize marketing, business relationships, and channel management to maximize e-commerce revenue.
<b>Business Integration</b>		Business Integration lets you realize the benefits of end-to-end integration through five core capabilities: modeling, integration, connecting, monitoring, and management.
<b>Transaction Server &amp; Tools</b>		Transaction Server & Tools provide the products and offerings needed to integrate traditional core assets into a new technology infrastructure. They update existing systems and leverage applications by transforming them into e-business components that can result in a new integrated e-business solution.

## INTEROPERABILITY AT DIFFERENT LEVELS

The interoperability offered by SAP NetWeaver provides companies and IT organizations with a lot of flexibility. There is no need to decide on just one technology while rejecting all others. Using SAP NetWeaver, they can weave their environments into one single, smooth fabric. Interoperability options can be found at all levels of SAP NetWeaver: at the people, information, and process levels as well as in the application platform, including development tools, system management, and support of open technology standards. The following discussion provides a look at the interoperability options at each integration level of SAP NetWeaver.

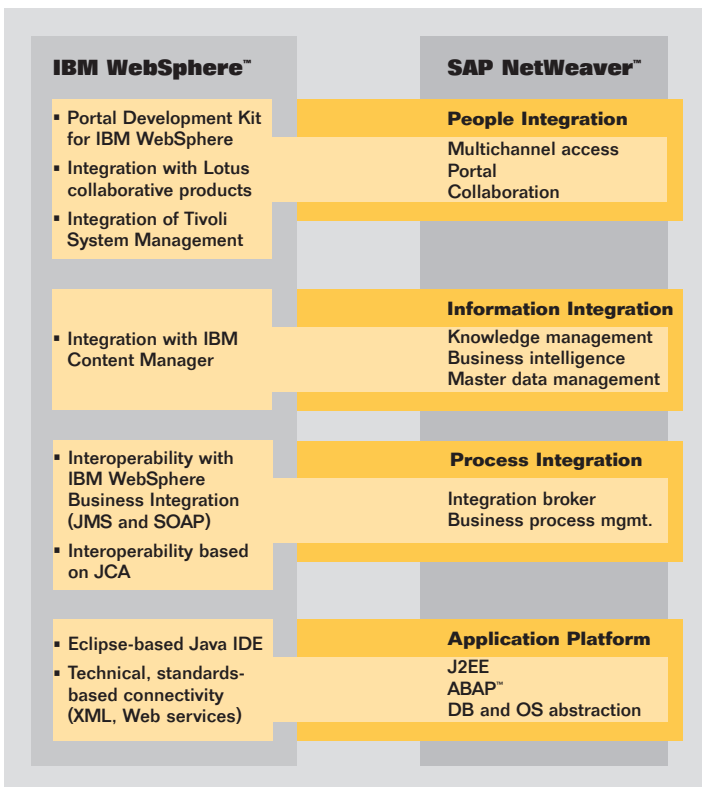


Figure 4: Overview – IBM WebSphere

### INTEROPERABILITY AT THE PEOPLE INTEGRATION LEVEL

#### Portals

Representing user interfaces that enable employees to access IT-based information, applications, and services, each portal is unique, but also different from one company to another. Part of this difference may depend simply upon where in the company their rollout began. And portals often have differing aims, depending upon the type of vendor making the offering: pure play vendor, technology platform vendor, application vendor, niche player, and so on. Also, individual units and departments use portals from a variety of vendors to ensure an effective environment in their own special contexts.

So from a strategic point of view, what does all this mean for a company?

Companies evaluate their portals again and again and hopefully try to find precisely the right one to deliver just what they want – right out of the box. As a result, evaluation has become a strategic and difficult task; being able to reach an either-or decision when it comes to choosing a portal has become almost impossible. While no doubt overlap exists between the offerings of IBM and SAP, it is sometimes absolutely necessary to offer customers flexibility and synergies when combining IBM and SAP offerings on the portal level.

#### Development Environment for Portal Content

To deliver on the promise of a portal that aggregates content from numerous sources – regardless of their origin – into a consistent, role-based user interface, an efficient and productive development environment is required. So it is essential for content developers to work within an environment and a tool set with which they are familiar. IBM and SAP offerings will support the emerging WSRP standard and will be JSR 168-compliant. This will allow the portal to transparently consume WebSphere portlets and SAP iViews developed in other development environments, and vice versa.



Furthermore, with its portal development kits (PDKs), SAP offers content developers an Eclipse-based approach to developing SAP iViews. The PDK for Java, for instance, provides wizards for an Eclipse-based IDE-like WSAD to develop, run, and test SAP iViews locally and deploy them into SAP Enterprise Portal, using the IBM WebSphere development environment. And the PDK for WebSphere goes one step further, enabling content developers – using their preferred IDE – to integrate existing WebSphere applications and services into SAP Enterprise Portal. Thus the PDK for WebSphere also allows access to all WebSphere components and services as well as giving users the ability to leverage services of SAP Enterprise Portal (user management and personalization, for example) and display them through SAP Enterprise Portal.

### Infrastructure Integration

When deploying a portal, enterprises look for an intelligent way to integrate with existing infrastructure landscapes. For instance, portal users might be administered and maintained in directories that are already in place. And security that includes single sign-on needs to integrate according to a given landscape. Since many SAP customers are already using IBM products, it is important that SAP Enterprise Portal can be seamlessly integrated. Following are some examples of interoperability between SAP and IBM in the infrastructure area:

- **Security and User Management with Tivoli Access Manager**  
SAP Enterprise Portal supports IBM's Tivoli Access Manager as an external authentication tool. Tivoli Access Manager allows access to the SAP Enterprise Portal user; the portal server then logs the user onto the portal. Since configuration is all that's required, this interoperability option provides seamless integration. Furthermore, it allows SAP Enterprise Portal to be easily plugged into existing access management concepts.

- **User Management Integration with Existing Directories Based on LDAP**

To store user data persistently, SAP Enterprise Portal also supports IBM SecureWay Directory. This LDAP directory server allows users, groups, and role assignment to be leveraged within the portal environment.

- **Integration into Existing System Management**

With Tivoli Business System Manager, IBM is offering a single point of control for business systems management. SAP Enterprise Portal can be integrated into this environment through SAP Computing Center Management System.

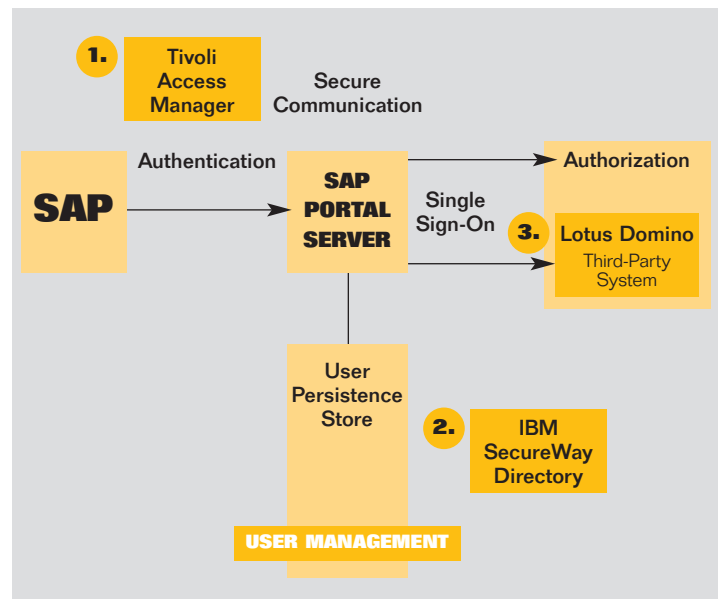


Figure 5: Landscape with IBM and SAP EP

### Interoperability Scenarios with More than One Portal in Place

In addition to the situations described above, from a development and infrastructure point of view, scenarios do exist in which both IBM and SAP Portal products must be implemented and leveraged. Take an example in which a customer has chosen IBM WebSphere portal as the external access point and SAP Enterprise Portal as the internal one (or vice versa). This means that at some joint customer sites there would not be a pure SAP or pure non-SAP landscape. Portals really depend on the kind of application with which they are associated; both portal products should be able to interoperate with each other.

Interoperability here could be either a portal-hub scenario or a portal-in-a-portal approach. Portal hubs build application-specific islands – such as in a network structure – and are able to cross-link and interact with one another. The portal-in-a-portal concept assigns a leading role to one of the portals, which

means that it acts as a front end for the user. At the same time, the other portal must be in place to offer the functionality to provide the necessary data and information. This approach also offers migration options and synergies. IBM and SAP are jointly investigating and evaluating these interoperability scenarios.

### Collaboration

Collaboration simply means working together. In the context of the modern organization, however, collaboration is likely to be anything but simple. To collaborate, people depend on a multitude of technologies, ranging from the telephone and e-mail to sophisticated project management tools. Collaboration may also require the sharing of news items or internal documents, retrieving data from deep within an organization’s transactional systems, or interacting on someone else’s screen. What’s more, the people involved may be in offices across the country or halfway around the world – or they may not be in an office at all.

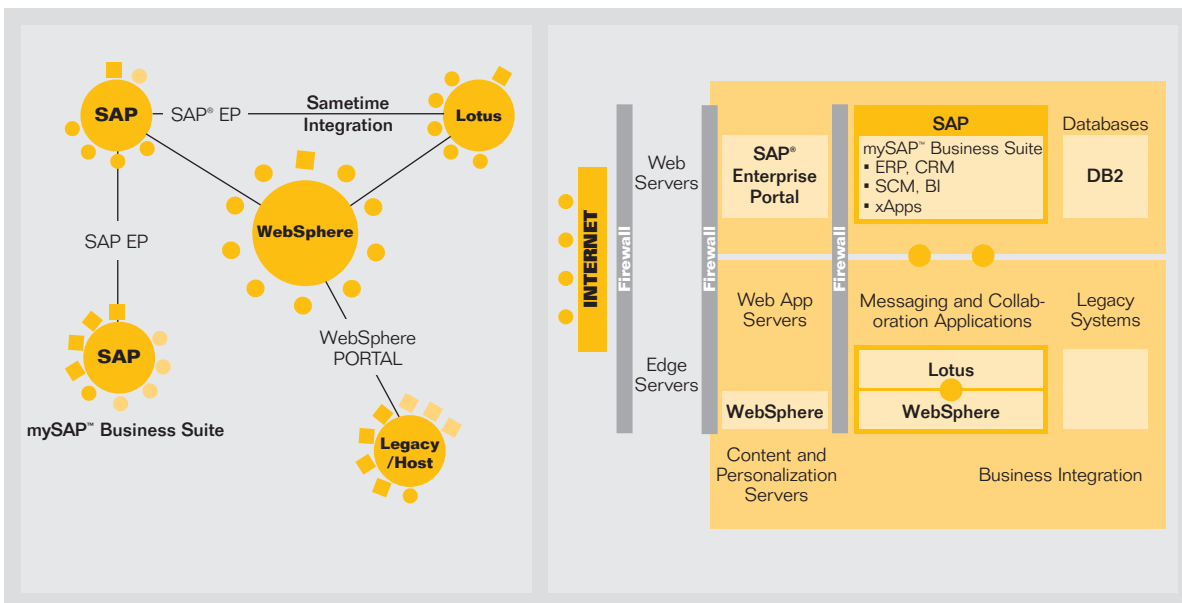


Figure 6a: Portal Hub (Application-Specific Island)

Figure 6b: Portal-in-Portal Approach (Migration, Creating Synergies)

IBM provides, through Lotus Software, a comprehensive environment for information and collaboration management with such applications as Lotus Domino/Notes, Lotus Sametime, and Lotus Team Workplace (formerly Quickplace). Proactive integration of these applications and joint engagements provide opportunities to deliver customers integrated solutions and leverage existing investment in Lotus product offerings.

Although it offers best-in-class collaboration capabilities, SAP NetWeaver is designed to be used with groupware and collaboration products from other vendors – like Lotus Software. Groupware interoperability exists on two levels: back-end and front-end connectivity. Back-end connectivity means that SAP Enterprise Portal modules have read-and-write access to Lotus back-end systems. Connectivity authentication is achieved with single sign-on, using SAP logon tickets. On the front end, there must be integration of Web Mail/iNotes from the Lotus system into SAP Enterprise Portal. Collaboration tasks such as mail, calendar, contacts, availability, and single sign-on need to be addressed in order to have a collaborative portal.

SAP is also working with IBM jointly to develop built-in integration of Lotus Sametime, IBM's instant messaging and Web conferencing solution. This will allow SAP Enterprise Portal users to take full advantage of Lotus Sametime capabilities without switching back and forth and without having to learn two different environments.

SAP and IBM are working to provide Lotus Sametime Web conferencing functionality within the synchronous collaboration framework of SAP Enterprise Portal, which for one thing allows direct start of a Lotus Sametime session. Furthermore, the instant messaging capabilities of Lotus Sametime (chat and awareness) will be integrated into SAP Enterprise Portal.

Lotus Team Workplace provides work spaces for sharing and organizing ideas, documents, tasks, and calendar entries similar to the collaboration room concept of SAP Enterprise Portal. Integrating Lotus Team Workplace into SAP Enterprise Portal means showing the Team Workplace user an interface that includes a personalized Team Workplace list. Another way to make Team Workplace interoperable has to do with back-end integration. It should be possible to take documents out of SAP Enterprise Portal and store them in Team Workplace, and also to exchange calendar data within Team Workplace. In addition, single sign-on needs to be available to allow users access to Team Workplace without being asked for additional login information.

#### **INFORMATION INTEGRATION**

Knowledge management (KM) is SAP NetWeaver's capability to manage unstructured information – that is, documents of all kinds, regardless of their physical location. The KM capability of SAP Enterprise Portal turns unstructured information into organizational knowledge. By placing taxonomies and a set of services on top of heterogeneous repositories of unstructured information, KM provides a view of that information; unstructured information is presented to the user via a common look and feel.

This KM platform provides an opportunity within your organization to “connect those who know with those who need to know.” The KM functionality helps companies manage all facets of unstructured information – from collaborative authoring and publishing to advanced search and navigation. The platform supports industry standards for accessing, interacting with, and delivering unstructured information stored in a heterogeneous repository landscape. The repository framework of KM makes it possible for open application programming interfaces (APIs) to connect to virtually any repository – either via specific connectors or via standard protocols, including Web-based distributed authoring and versioning (WebDAV), HTTP, and information and content exchange (ICE).

Although information is typically universal, accessing and aggregating it consistently while ensuring its integrity requires a high level of openness and interoperability. SAP's framework does not actually centralize all the various information sources and storage sites an organization might have; it instead provides an open architecture that allows connections to any and all potential information repositories. If you look at realistic scenarios, it is impossible to centralize all documents in precisely one repository; that is, no one would store Web sites in an SAP R/3® System, for instance, or their scanned contracts on a Web server.

To integrate repositories, SAP offers several options, depending on the depth and completeness of the front- or back-end system.

- **Via URL**

The user interface of the repository is directly integrated via URL into a portal iView. To be able to do that, the repository needs to provide a Web-based interface that can be called up via URL.

- **Via specific iViews**

This is a specific method of integrating repositories. iViews must be programmed from scratch to address the particular functions and features of each repository.

- **Via repository manager**

The most generic method of integration into the portal is via a repository manager (RM); once the RM is programmed, all the KM platform services are usable without any extra coding. One RM is programmed for each repository type and reveals to the portal the typical functions of a document repository – displaying a document, searching in a document, and so forth. Based on this functionality, IBM and SAP are exploring integration scenarios between KM repository frameworks and data management tools such as IBM Content Manager and Lotus Domino/Notes.

### **Integration of Lotus Notes via a Repository Manager**

Through the KM architecture, it is possible to use SAP Enterprise Portal as a common interface for accessing unstructured documents stored in Lotus Notes.

### **Integration into the Retrieval and Classification Engine of the SAP Enterprise Portal**

TREX (Retrieval and Classification) is the search and text-mining engine for information retrieval and classification that is integrated in and delivered with SAP Enterprise Portal. In SAP Enterprise Portal, TREX leverages the KM platform's connectivity to all kinds of document repositories to index. TREX provides intelligent search and text-mining functions as well as automatic classification.

Based on the RM for Lotus Notes, TREX allows content (that is, documents) within Lotus Notes to be searched and classified; the comprehensive retrieval and classification services of TREX on Lotus Notes can be leveraged while still respecting existing authorization parameters.

### **Integration of IBM Content Manager**

IBM Content Manager has its own enterprise content management framework – a centrally managed repository for all types of content produced anywhere in a company. IBM and SAP are looking into a number of different integration options as a means of combining their product offerings. To integrate Content Manager via the repository framework – apart from the already existing option of displaying it within SAP Enterprise Portal – it might be conceivable to develop specific iViews for IBM Content Manager to be part of a work set of users similar to the Lotus Notes approach.

### **PROCESS INTEGRATION**

SAP's process integration offering includes an open, standards-based integration broker as well as comprehensive business process management. IBM's offering here includes a variety of different products combined under the brand name WebSphere Business Integration. Since at many customer sites both product families are intensively implemented and leveraged, it is essential to provide reliable and easy-to-configure connections between these two landscapes. Since SAP NetWeaver is going to have a significant footprint within mySAP Business Suite, coexistence with existing IBM WebSphere Business Integration landscapes is key.

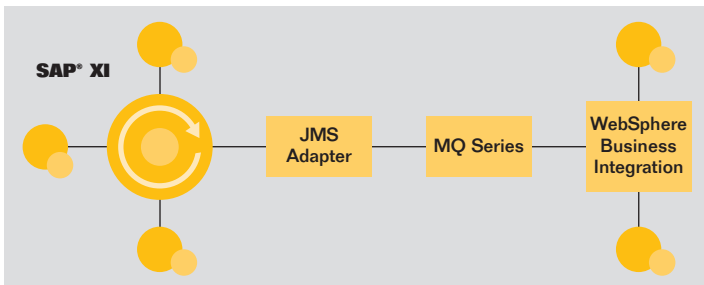


Figure 7: SAP XI and WebSphere Business Integration

### Integration Broker

SAP Exchange Infrastructure (SAP XI) delivers much of its openness through technical adapters that facilitate interoperability with other enterprise application integration infrastructures. The JMS adapter and the Single Object Access Protocol (SOAP) adapter are suitable for IBM WebSphere Business Integration, providing off-the-shelf technical interoperability with the runtime environment of two integration solutions at the message level.

#### JMS-BASED INTEROPERABILITY

The SAP XI JMS adapter allows interoperability with JMS-enabled messaging systems such as IBM WebSphere MQ. By applying JMS and using WebSphere MQ, a business application that runs on SAP NetWeaver can be integrated with one that runs on IBM WebSphere. That means companies can interweave and manage an IT landscape in which IBM WebSphere MQ and SAP Exchange Infrastructure coexist and exchange information. The JMS adapter supports next-to message parsing and serialization, which means a message will be delivered only once, and in a queue arranged according to when it was created. JMS provides for asynchronous, bidirectional delivery of messages between SAP Exchange Infrastructure and WebSphere MQ.

#### SOAP-BASED INTEROPERABILITY

To be able to interoperate with WebSphere Interchange Server (formerly Crossworlds), SAP XI offers an adapter that allows connectivity via the SOAP protocol. SOAP mainly provides a synchronous way to interact between the two integration

infrastructures. Like the JMS adapter, SOAP allows bidirectional messaging. Best-of-delivery and guaranteed-exactly-once delivery options are available when asynchronous usage occurs.

The benefits of interoperability in both cases include a minimum number of point-to-point connections, centralized integration knowledge, allowance for ease of change, and the orchestration of processes that span many technologies.

#### JCA-BASED INTEROPERABILITY

IBM and SAP agree that in the future Java Connector Architecture (JCA) will be an important part of application integration. SAP Exchange Infrastructure will offer an adapter framework based on JCA that will allow third-party providers, major software vendors, and others to develop resource adapters that plug into it. IBM WebSphere Business Integration offers a number of JCA adapters for connectivity to non-SAP back-end systems. The IBM WebSphere adapters, for instance, can easily and seamlessly accept the SAP adapter framework. IBM and SAP will jointly evolve this technology and architecture to ensure open, standards-based connectivity not only between SAP XI and WebSphere Business Integration but also to other SAP and non-SAP applications.

#### Business Process Management

Business process management (BPM) includes the orchestration, design, execution, and monitoring of business processes that span multiple systems or applications. The challenge for software vendors is to come up with business processes that include applications built by other vendors. As various BPM tools adapt to the standards, business process design that involves applications from multiple vendors becomes possible. SAP will support the “winning” standards as they emerge. BPEL4WS is one example that will be available with SAP Exchange Infrastructure. It will give BPM tools the capability they need to import and export descriptions of business process sequences to and from other BPM tools and facilitate interoperability between SAP NetWeaver and IBM WebSphere.

## **APPLICATION PLATFORM**

SAP Web Application Server (SAP Web AS), representing the application platform, is a key building block of SAP NetWeaver. SAP Web AS is scalable, reliable, and is based on Java 2 Platform, Enterprise Edition (J2EE) and ABAP™. SAP Web AS embraces native Web technologies while at the same time providing all the benefits of what was previously known as SAP Basis.

Thanks to its open, standards-based architecture, SAP Web AS offers broad connectivity and interoperability options within IBM WebSphere offerings, including WebSphere Application Server, WebSphere Business Integration, and WebSphere Portal Server. Web services will be a key technology for publishing, discovering, and accessing business functions across an entire network using open standards; all major technology standards are supported off-the-shelf by SAP Web AS (for example, XML, SOAP, WSDL, UDDI). Both IBM WebSphere Application Server and SAP Web Application Server are compliant with Web Service Interoperability (WS-I) Basic Profile, thus ensuring development and deployment of interoperable Web services on both platforms.

Besides Web services interoperability, SAP Web AS provides connectivity on the pure technology level. To integrate third-party products, tools, and applications within the Java environment, SAP Web Application Server supports the J2EE Connector Architecture. This enables WebSphere developers to access SAP business functionality within a WebSphere environment.

## **DEVELOPMENT TOOLING (ECLIPSE)**

SAP made a strategic decision to standardize its development environment on the Eclipse open source framework; SAP's Java-integrated development environment is therefore Eclipse-based. SAP NetWeaver Developer Studio offers a tool environment with the look and feel of IBM WebSphere Studio Application Developer, allowing application developers to feel at home within both environments. This also ensures high interoperability, because the technical aspects follow the design

principles and architecture of Eclipse. The Eclipse architecture allows easy plug-in capability and integration of extensions to the framework, giving both IBM and SAP the opportunity to integrate and personalize their development environments with specific plug-ins wherever possible.

For example, SAP Enterprise Connector is a plug-in for SAP NetWeaver Developer Studio, allowing the generation of Java classes for accessing SAP business functionality (BAPI®, RFC). Integration of this Eclipse plug-in into WebSphere Studio Application Developer could offer an easy-to-use call interface to SAP for Java programmers.

Eclipse is only a framework and everything is a plug-in, so it provides broad flexibility for building an easy-to-use Java development environment. From an interoperability standpoint, this provides a common basis for development environments within the SAP NetWeaver and IBM WebSphere infrastructures and guarantees that developers can reuse their skill sets across the platform.

## **SYSTEM MANAGEMENT**

IBM provides a wealth of tools and solutions for centrally managing, monitoring, and securing applications and systems – most notably Tivoli. While SAP continues to provide infrastructure management tools within SAP NetWeaver (for instance, SAP Solution Manager) that guarantee business reliability of mySAP Business Suite, the services of Tivoli are complementary. Tivoli provides a comprehensive solution for the management of mySAP Business Suite and all interconnected IT systems suitable for a heterogeneous environment.

Tivoli can provide the necessary instruments to organize and cover all relevant parts of an IT operation: business systems management, service level management, configuration and deployment management, security management, capacity management, availability and performance management, and disaster recovery/business continuity planning/storage

management. The Tivoli solution for mySAP Business Suite can help SAP customers optimize their IT processes and the operation of both SAP and non-SAP environments, providing the highest level of service to SAP's lines of business or external customers. This helps improve IT operations, eliminates redundancies, and frees up time for other tasks and responsibilities.

In this way, a comprehensive monitoring environment for SAP and non-SAP solutions can be offered that provides true capability for heterogeneous environment management – proactive monitoring of resources, detection of potential issues, and quick recovery from problems – while allowing the close management of bottom-line business aspects as well.

### OPEN STANDARDS

SAP and IBM are channeling their collaboration activities through leading industry standards councils. The two companies have committed themselves to close cooperation with these organizations to help promote and steer the evolution of open standards.

Orgs	SAP NetWeaver™	Standards Supported (Selection)
W3C	XML ENCR. & SIG., DSIG, SAML ...	<b>People Integration</b> Multichannel access Portal Collaboration JAAS, WSRP, PERSONAL JAVA
OASIS		<b>Information Integration</b> Knowledge management Business intelligence Master data management ICE, WEBDAV, XML/A, JMI, XMI, CWM, ODBO
JCP		<b>Process Integration</b> Integration broker Business process mgmt. BPEL, CIDX, ROSETTANET, CPPA
WS-I		<b>Application Platform</b> J2EE ABAP DB and OS abstraction HTTP, XML, SMTP, J2EE, WSDL, SOAP, UDDI, XSLT
ECLIPSE .ORG		
mySQL		
OMG		
...		

Figure 8: Open-Standards Support by SAP NetWeaver

### World Wide Web Consortium (W3C)

IBM and SAP are working together within W3C in a number of different groups. For instance, both companies have been involved in driving the SOAP specification, the Web Services Description Language, and the Web Services Architecture Working Group.

### OASIS

IBM and SAP both have committees that jointly deal with the technical aspects of interoperability issues like Web Services Business Execution Language (WSBPEL); Web Services for Remote Portlets (WSRP); Web Service Security (WSS); and Universal Description, Discovery and Integration (UDDI). In conjunction with JSR 168 – a specification request that was set up to provide interoperability between portlets and portals – WSRP aggregates content produced by portlets running on remote machines that use different programming environments. IBM and SAP carefully align the basic concepts underlying both JSR 168 and WSRP. In addition to the standardization work, lab technicians in both companies are hard at work on the latest drafts and specifications to make them available as soon as possible.

### Web Services Interoperability Organization (WS-I)

WS-I is dedicated to accelerating the adoption of Web services by assisting in the selection and interpretation of Web services specifications and in the development of mutual best practices for use in developing, deploying, and integrating business applications. IBM and SAP are both founding members of WS-I and are represented on the board of directors of the organization. IBM is heading WS-I's basic profile working group, whereas SAP is heading the sample applications working group.

### **Java Community Process (JCP)**

As an open, inclusive organization made up of active members and nonmembers (who provide public input), the JCP primarily guides the development and approval of Java technical specifications. SAP as an executive member and IBM are among the leading companies involved with the JCP.

### **Web Services Policy (WS-Policy)**

WS-Policy is an initiative undertaken by a number of industry leaders – including IBM and SAP – with the goal of addressing interoperability issues surrounding the description and communication of Web services policies. By using the XML, SOAP, and WSDL extensibility models, WS-Policy provides not only a general purpose model but also a corresponding syntax to describe and communicate the policies of a Web service.

### **Vertical Industry Standards**

SAP provides application-level industry solutions for various vertical industries – the high-tech and chemical fields, among others. As a complement of this effort, SAP will provide solution kits for industry standards such as RosettaNet, Chem eStandards (CIDX), and Petroleum Industry Data Exchange (PIDX).

## **CUSTOMER BENEFITS**

After that brief look at the technical aspects of interoperability, we will now focus on how customers can benefit from SAP/IBM joint partnership efforts. Simply put: Customers benefit because they do not have to make an either-or decision when it comes to their infrastructure platform.

### **COEXISTENCE**

IBM and SAP's sophisticated collaboration approach makes broad synergies possible. While leveraging the functionality and advantages of each organization's products, customers can operate these products in what they see as the most advantageous ways possible. Best-in-class solutions can easily be combined, resulting in significant synergistic opportunities.

If a company was forced to make a decision to replace its entire technology infrastructure, it would mean replacing not only a lot of costly software assets but also of many valuable skills – driving companies to follow an IT blueprint that would be revolutionary, not evolutionary. To avoid this, IBM and SAP intend to combine and leverage their existing investments and skills. Customers can be absolutely assured that their investment will be safe. From now on, SAP NetWeaver and IBM WebSphere, Tivoli, Lotus, and more will seamlessly and jointly operate together.

### **VALUE PROPOSITION**

This approach gives customers a matchless value proposition; organizations will achieve a lower TCO on their entire software and IT landscape. At the same time, they will benefit from being able to take advantage of the most up-to-date technologies and developments. The smooth interoperability achieved by open standards means no more nightmarish scenarios when crossing technology or product boundaries. And, once again, by leveraging the strengths of each portfolio, a combined and interoperable solution enables customers to reduce implementation time. Nothing has to be reinvented on a different platform, and cost reduction is guaranteed.



### **TRUSTED ADVICE AND INNOVATION**

IBM and SAP are doing more than just sharing this vision; we are acting on it. A Collaboration Technology Support Center, jointly staffed by both companies, acts as trusted adviser and innovator. The center – supported from the executive level of both organizations – offers everything needed to make a collaboration work: from proof-of-concept to solution guidance to implementation guidelines.

The outstanding partnership IBM and SAP has built up over the last three decades is now being extended into an area that heretofore was viewed by the marketplace as purely competitive. SAP NetWeaver provides an extendable and interoperable integration and application platform for SAP business applications; IBM WebSphere is one of these extension and interoperability options. The two companies jointly offer collaboratively developed knowledge that is tightly focused on customer requests and strategy.

### **FLEXIBILITY**

That flexibility is demanded by coexistence may seem obvious, but it's worth mentioning because it is so essential. Complementary product offerings that enrich a specific solution are one aspect of flexibility. In addition, interoperability gives customers and partners the flexibility they need in order to develop solutions on their own preferred platform – or to select an environment they feel performs in the best and most suitable way for them. In the end flexibility contributes to the bottom line by enabling cost savings and protecting investments. Flexibility is also part of the “ease-of-change” paradigm. A flexible landscape is by its nature one that is not simply “stuck” with one infrastructure. In the end, it should be possible to orchestrate infrastructure, software, and business processes that span many technologies, all based on open standards but independent of the specific product offerings involved.

### **LONG-TERM STRATEGY**

IBM and SAP are conjointly offering help and guidance for the long-term strategies of their customers. Landscapes that were created over the last years with best-of-breed approaches in mind are simply no longer feasible; consolidation and harmonization are now necessities. Based on the strong alliance that has been built by the two companies, IBM and SAP customers can rethink their strategies with the assurance that their major providers and software vendors are working together and aligning their solution offerings in the most helpful ways possible.

Talks and discussions with representatives of both companies about IT architectures now involve focusing clearly on long-term results, not simply looking at temporary fixes.

## CONCLUSION

IBM and SAP consider themselves trusted partners and innovators that help IT organizations reduce their total cost of ownership, enable growth, and deliver added value to their enterprises. Sharing this vision and a willingness to respond to customer demands creates an adaptive business environment in which IT promotes growth for the entire enterprise.

IBM and SAP are committed to maintaining open standards and remaining in the same technology camp. Continuing to investigate ways of building cooperation will help enterprises meet the toughening real-world requirements they face today.

SAP delivers an integration and application platform designed to be fully interoperable with IBM WebSphere. This interoperability clearly stresses coexistence – not competition – of both companies' product offerings.

The advice and guidance the two companies offer through the Collaboration Technology Support Center, which the two companies mutually support, creates further value and added synergies at all customer sites.



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