

SAP Solution in Detail
SAP NetWeaver



SAP NetWeaver™ AND Microsoft .NET INTEROPERABILITY

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EXECUTIVE SUMMARY

SAP understands how important it is for you to have reliable and flexible interoperability between SAP® solutions and solutions from other providers. Interoperability is essential to ensure you can extract the greatest possible value from your IT investments.

Almost every SAP customer relies on Microsoft platforms and applications in some way, which is why SAP has a long-term commitment to ensuring interoperability with Microsoft technologies. This interoperability stems from a decade-long relationship between SAP and Microsoft and a stated commitment by both companies to promote interoperability on an ongoing basis through a range of technical and nontechnical initiatives.

These initiatives include integration between the SAP NetWeaver™ and Microsoft .NET platforms; tools and technical support for SAP and Microsoft developers; a dedicated SAP-Microsoft technology support center; collaboration on the development of open standards; and collaboration on the development of advanced Web services standards that form the basis of emerging service-oriented architectures, such as the Enterprise Services Architecture blueprint.

The SAP-Microsoft relationship enables you to:

- Maximize the value of existing investments in SAP and Microsoft technology
- Leverage existing expertise to build innovative new applications and business processes based on SAP and Microsoft solutions
- Reduce total cost of ownership (TCO) by enabling seamless integration across diverse IT platforms
- Facilitate the development of integrated SAP and Microsoft solutions with dedicated tools, support, and expertise

SAP AND Microsoft: A LONG-TERM RELATIONSHIP

SAP and Microsoft established a formal relationship in 1994 with the integration of the SAP® R/3® platform into the newly developed Windows NT operating system. Since then, SAP solutions have enjoyed immense success on Microsoft platforms. More than 58% of existing SAP installations and more than 62% of new SAP installations run on Microsoft Windows, from the high-end Datacenter Edition to the sleek, portable Windows Mobile.

Microsoft Windows is the only platform to support the entire SAP solution portfolio. SAP and Microsoft have worked together consistently to investigate and exploit opportunities to integrate products and solutions for the benefit of our mutual customers.

This long-term commitment was strengthened in 2004 when Microsoft and SAP announced their intention to deepen the relationship with a joint commitment to Web services as the foundation of the next generation of enterprise software. The announcement included a detailed road map for a range of technical and nontechnical initiatives that ensure the core SAP and Microsoft platform technologies – SAP NetWeaver™ and Microsoft .NET – will continue to add value to our customers over the next decade.

About SAP NetWeaver

SAP NetWeaver is a comprehensive platform that facilitates the integration and alignment of people, information, and business processes across organizational and technological boundaries. It is a next-generation integration and application platform, so interoperability is inherent in the design of SAP NetWeaver. The SAP NetWeaver platform includes development tools, system management tools, full support for a wide range of open standards, and full support for platform-independent Web services to facilitate interoperability with Microsoft and with other non-SAP products and solutions.

SAP NetWeaver is the technical foundation of mySAP™ Business Suite solutions, the SAP xApps™ portfolio of packaged composite applications, partner solutions, and custom-built applications. It also enables Enterprise Services Architecture – the SAP blueprint for service-oriented business solutions.

About Microsoft .NET

Microsoft .NET is the Microsoft Web services framework and strategy to connect information, people, systems, and devices through software. Integrated across the Microsoft platform, .NET technology provides the ability to quickly build, deploy, manage, and use connected, security-enhanced solutions with Web services. .NET-connected solutions enable you to integrate your systems more rapidly and in a more agile manner, as well as helping you realize the promise of information anytime, anywhere, and on any device.

Microsoft .NET enables you to create and use XML-based applications, processes, and Web sites that combine and share information and functionality on any platform or smart device. .NET is also the basis for a growing number of Microsoft products built according to industry and Internet standards, which enhance every aspect of developing, managing, and using Web services.

INTEROPERABILITY OVERVIEW

SAP has a holistic strategy for interoperability with Microsoft. This strategy includes direct integration between SAP NetWeaver and Microsoft .NET technologies, joint development and customer support through a dedicated center of expertise, and collaboration on the development of Web services and other open industry standards.

Over a decade of collaborative work with Microsoft has enabled SAP to establish multiple process and data touch points between SAP NetWeaver and Microsoft .NET. You can access and control these using a range of development tools, industry-standard Web services protocols, and dedicated integration links between various SAP and Microsoft products. The result is multilayered interoperability that covers all of the key integration layers enabled by SAP NetWeaver: people, information, and business processes.

SAP NetWeaver and Microsoft .NET integrate people:

- Microsoft products and Microsoft-based applications can be integrated seamlessly into the unified user interface of SAP Enterprise Portal, a key SAP NetWeaver component.
- SAP continues to link its products and solutions with Microsoft Office and is also developing support for the next generation of Microsoft user interfaces by utilizing new tools that enable Microsoft smart clients to access SAP NetWeaver.
- Integration between SAP NetWeaver, mySAP Business Suite, and the Microsoft Active Directory service simplifies user management in combined SAP-Microsoft environments.

SAP NetWeaver and Microsoft .NET integrate information:

- SAP and Microsoft are enhancing joint knowledge management capabilities by integrating SAP Enterprise Portal with Microsoft Windows SharePoint Services.
- SAP and Microsoft support enhanced content management by enabling Microsoft-managed content to be integrated at any level of SAP Enterprise Portal.

SAP NetWeaver and Microsoft .NET integrate business processes:

- SAP NetWeaver and Microsoft .NET support advanced Web services protocols, providing a solid basis for flexible integration of processes across SAP and Microsoft environments.
- SAP and Microsoft provide products that enable you to transition to a service-oriented architecture, such as Enterprise Services Architecture.
- SAP provides application-level integration with Microsoft .NET so Microsoft-based applications can access the in-depth process optimization and integration capabilities of SAP solutions.

The SAP and Microsoft relationship extends to numerous activities outside the sphere of joint technical integration effort. For example, SAP and Microsoft collaborate on development and customer support. SAP and Microsoft jointly operate the Collaboration Technology Support Center (CTSC) for SAP and Microsoft customers, offering development services and advice to support your integration projects.

Support is also available for the .NET development community to maximize the potential of solutions created for joint SAP and Microsoft environments, including Powered by SAP NetWeaver certification. More information can be obtained from SAP's integration and certification centers.

SAP and Microsoft also collaborate on industry standards.

SAP and Microsoft are involved in a wide range of industry bodies and initiatives, collaborating on the development of open standards and, in particular, on the development of advanced Web services, which form the foundation of the SAP NetWeaver and Microsoft .NET platforms.

INTEROPERABILITY IN DETAIL: INTEGRATING PEOPLE

Enterprise Portals: The SAP Portal Development Kit for Microsoft .NET

Many SAP customers have invested in Microsoft products and built applications based on Microsoft technology. SAP provides tools and technology that help you leverage these investments by enabling access to Microsoft-based applications in SAP Enterprise Portal and develop new portal components so you don't need to change your preferred development landscape.

With the SAP portal development kit (PDK) for Microsoft .NET, you can create SAP Enterprise Portal components in the familiar development environment of Microsoft Visual Studio. This integration goes far beyond a simple portal-based visualization of Microsoft user interfaces; it is a full integration with the SAP Enterprise Portal infrastructure, including landscape, branding, authorizations, roles, and communication with iView software.

The PDK for .NET integrates seamlessly with Microsoft Visual Studio .NET to minimize the learning curve for .NET developers working in the C# or Visual Basic .NET languages. Developers create portal components using a dedicated portal add-in for Microsoft Visual Studio 2003, and they access SAP Enterprise Portal infrastructure and services using .NET objects. The PDK for .NET includes a variety of SAP NetWeaver-based .NET controls so that the created portal components share the same look and feel as other portal views in SAP Enterprise Portal, as well as sharing the same awareness of user roles and contexts. Completed portal views can be deployed directly from Visual Studio to SAP Enterprise Portal.

Desktop Applications: SAP NetWeaver and Microsoft Smart Client Technology

Microsoft smart clients are easily deployed and managed client applications that provide an adaptive, responsive, and rich interactive experience by leveraging local resources and by intelligently connecting to distributed data sources. The Microsoft Office suite plays a central role in the Microsoft smart client initiative, and tight interoperability and integration between Microsoft Office, SAP NetWeaver, and SAP business applications enhance the value of smart client technology for SAP and Microsoft customers.

SAP has a long history of enabling customers to link SAP solutions with Microsoft Office. Continuing this tradition, SAP has announced the delivery of sample applications and a software development kit (SDK) based on Visual Studio 2005 that will enable access to SAP NetWeaver from the Microsoft Office suite.

SAP is also working toward an implementation of our Web Dynpro development environment for the next generation of Microsoft Windows user interface technology. Web Dynpro is an integral part of SAP Web Application Server, a key component of SAP NetWeaver. It enables you to build enterprise-strength Web applications quickly and cost-effectively. SAP and Microsoft are working on future versions of Web Dynpro and Microsoft Windows that will provide the foundation for a new generation of reliable, attractive, responsive, and secure user interfaces.

User Management: SAP NetWeaver and Microsoft Active Directory

SAP has integrated SAP NetWeaver with Microsoft Active Directory to simplify user sign-on in combined SAP-Microsoft environments. SAP has developed a new bridging mechanism from SAP's ticket-based single sign-on (SSO) mechanism to Kerberos. The bridge enables users to sign on to Microsoft-based back-end applications using SAP logon tickets. SAP logon tickets are the central authentication token used in SAP environments for single sign-on to all SAP and various non-SAP back-end systems.

This means users only have to remember one password (their Windows password) instead of several user names and passwords for each back-end system. Also, alternative authentication mechanisms like those based on smart cards or biometric information can be used this way. That increases usability and productivity, and it decreases calls to the help desk about forgotten passwords. This mechanism is based on features available with the Microsoft Kerberos implementation in Windows Server 2003 and Active Directory 2003.

SAP NetWeaver and Microsoft Active Directory can also be integrated to simplify user management. SAP has developed an interface that allows you to create and modify user records in Microsoft Active Directory automatically based on employee data stored in mySAP ERP Human Capital Management (mySAP ERP HCM). At the same time, you can leverage data in Microsoft Active Directory to manage all mySAP Business Suite users. SAP users can be created automatically using the standard Lightweight Directory Access Protocol (LDAP), and SAP Enterprise Portal can use Microsoft Active Directory directly as its user database.

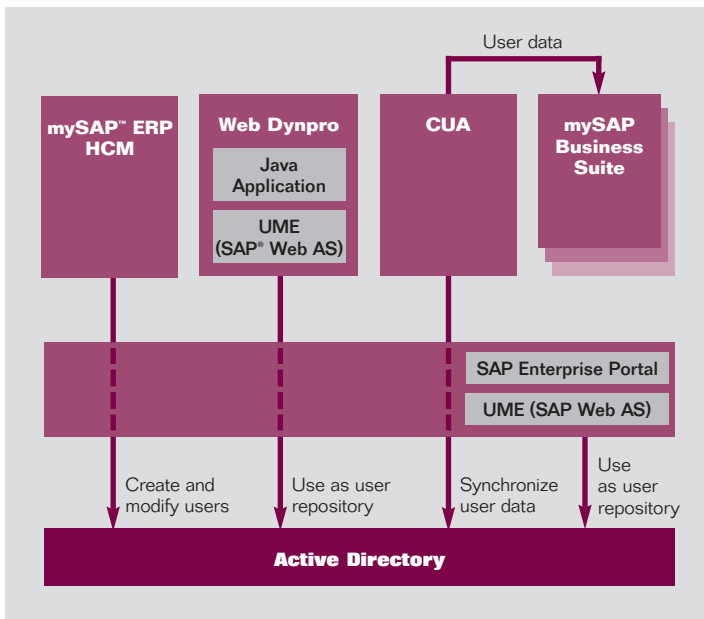


Figure 1: User Management in SAP® Systems

INTEROPERABILITY IN DETAIL: INTEGRATING INFORMATION

Knowledge Management: SAP Enterprise Portal and Microsoft SharePoint Services

SAP Enterprise Portal provides a comprehensive, open knowledge management platform by enabling you to find, organize, and access unstructured enterprise information efficiently and effectively. Microsoft Windows SharePoint Portal Server through Windows SharePoint Services offers document management capabilities, document collaboration, and tight integration with Microsoft Office and Microsoft Windows Server.

SAP Enterprise Portal integrates with third-party applications through a repository manager framework. Microsoft has committed to build on this framework to integrate its SharePoint solutions with SAP Enterprise Portal. This will give you access to documents stored in SharePoint Services. A second repository manager will be built to integrate SAP Enterprise Portal with public folders held on Microsoft Exchange Server.

Content Management: SAP Enterprise Portal and Microsoft Content Management Server

Microsoft Content Management Server is an enterprise Web content management system that spans content authoring and delivery for Internet and extranet scenarios. You can present content managed by Content Management Server in SAP Enterprise Portal using a certified integration solution that has two main components. The navigation component calculates and displays the Content Management Server navigation structure as a tree, while the content component establishes the link between the SAP Enterprise Portal context and the Content Management Server content. This makes it possible to integrate through content in Content Management Server at any level of the SAP Enterprise Portal navigation structure, and it provides a contextual link between the two solutions to facilitate content management.

INTEROPERABILITY IN DETAIL: INTEGRATING PROCESSES

Commitment to Advanced Web Services

SAP NetWeaver and Microsoft .NET support advanced Web services protocols, and this support is the basis of technical interoperability between the two architectures. The principal focus of interoperability is on SAP Exchange Infrastructure (SAP XI), a key component of SAP NetWeaver, and on Microsoft BizTalk Server. Both products offer interoperability based on existing or upcoming open standards like Web Services Reliable Messaging (WS-RM), Simple Object Access Protocol (SOAP), or Business Process Execution Language for Web Services (BPEL4WS).

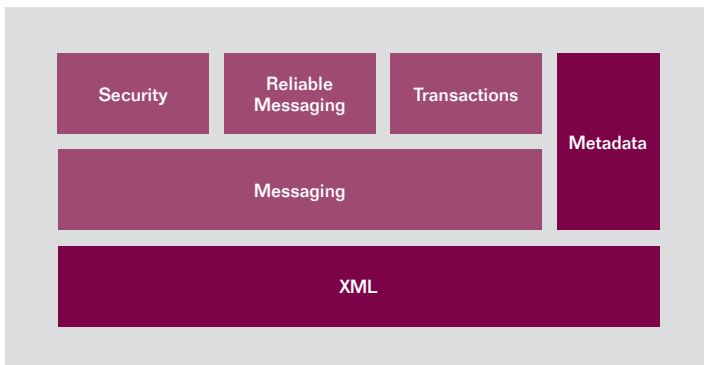


Figure 2: Reliable Messaging and Metadata in the Context of Advanced Web Services

Enterprise Services Architecture: SAP NetWeaver and Microsoft BizTalk Server

Enterprise Services Architecture is the SAP blueprint for service-based, enterprise-scale business solutions that offer the increased levels of adaptability, flexibility, and openness required to improve business performance. SAP and Microsoft are ready to provide customers with products that enable this service-oriented IT environment, using Web services to simplify the management and operation of diverse, distributed business applications and processes.

This advanced Web services support makes it possible to integrate both SAP Exchange Infrastructure and Microsoft BizTalk Server in Enterprise Services Architecture without having specific SAP Exchange Infrastructure or Microsoft BizTalk Server adapters in place. An adapter framework, based on the adapter for Java 2 Platform, Enterprise Edition (J2EE) in SAP Exchange Infrastructure and on .NET in Microsoft BizTalk Server, extends the value of both products to a variety of industry-specific solutions, such as Chemical Industry Data Exchange (CIDX), as well as to horizontal solutions like Electronic Data Interchange for Administration, Commerce, and Trade (EDIFACT).

Examples of scenarios and solutions combining SAP NetWeaver and Microsoft .NET frameworks might include:

- SAP xApps composite applications using the Microsoft Message Queuing (MSMQ) transactional support
- Accessing the SAP enterprise service repository through Microsoft .NET-based applications using open standards
- Bridging existing SAP and Microsoft applications
- Having two larger application clusters where one is managed by SAP and the other is managed by Microsoft

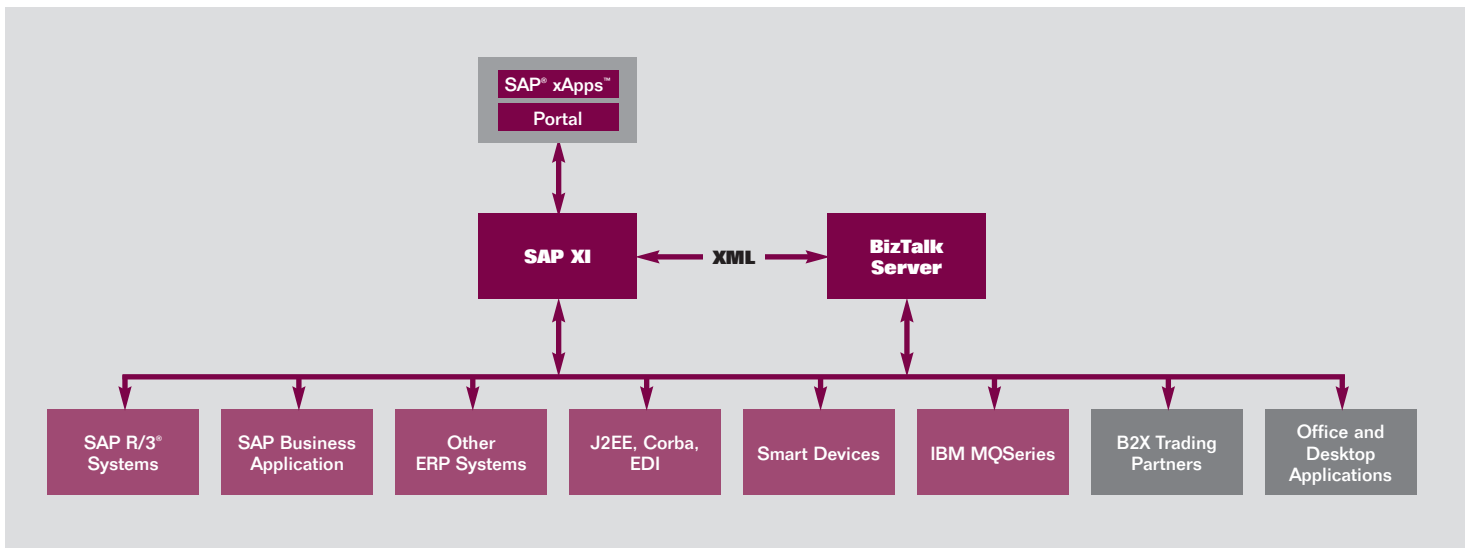


Figure 3: SAP Exchange Infrastructure and Microsoft BizTalk Server in Enterprise Services Architecture

Whether a solution should be based on SAP Exchange Infrastructure, Microsoft BizTalk Server, or both, should be analyzed by certified partners from SAP or Microsoft. Contact your account representatives to discuss the best option for your business.

Application Integration: The SAP .NET Connector

The latest release of the SAP .NET connector provides interoperability between SAP NetWeaver and Microsoft .NET on the application platform level. It enables developers to write .NET applications (Windows and Web forms) that access the business functionality of SAP applications.

The SAP .NET connector is the newest addition to the SAP portfolio of development support tools for Microsoft, and it is designed to pave the way for transition to Enterprise Services Architecture.

The SAP .NET connector simplifies the task of creating integrating systems and provides fast, secure, and reliable communication between .NET and SAP applications. Developers can build .NET applications that access SAP business solutions through BAPI® technology. The runtime environment handles communication between the Microsoft .NET platform and SAP applications quickly, reliably, and securely using open Internet standards (including HTTP, SOAP, and XML) or the SAP remote function call (RFC) protocol.

INTEROPERABILITY IN DETAIL: NONTECHNICAL INITIATIVES

Collaboration Technology Support Center

The Collaboration Technology Support Center (CTSC) is a joint SAP-Microsoft effort that exists to drive ongoing interoperability between SAP NetWeaver and Microsoft .NET. CTSC forms part of the existing SAP-Microsoft Competence Center and is staffed by experts from Microsoft and SAP.

Each member of the joint team possesses exceptional knowledge of technology from both companies, and the center leverages this expertise to support integration scenarios for joint SAP and Microsoft customers. This gives SAP and Microsoft customers an in-depth resource for integration of current SAP and Microsoft solutions, as well as a way to explore and drive development of interoperability of upcoming SAP and Microsoft releases.

CTSC publishes collaboration briefs for integration scenarios using existing technology. These documents explain the concepts behind each integration and the steps required to implement them. Collaboration briefs are published in the .NET Interoperability area of SAP Developer Network (<http://sdn.sap.com>).

When an integration scenario arises because of upcoming products or as the result of a specific requirement from SAP and Microsoft customers, CTSC will coordinate the information, people, and resources required to design a solution. If additional development is required to support an integration scenario, CTSC can help create the specifications for that development.

Contact the Collaboration Technology Support Center by sending e-mail to ctsc@sap.com.

Collaborative Standards Development

Microsoft and SAP participate in the ongoing development of advanced Web services and open standards at industry standards bodies, including the following:

- **World Wide Web Consortium (W3C)**
Microsoft and SAP work with W3C on projects, including SOAP and its extensions, Web Services Description Language (WSDL), and Web Services Addressing (WS-Addressing).
- **Organization for the Advancement of Structured Information Standards (OASIS)**
As participants in OASIS committees, Microsoft and SAP collaborate on the technical aspects of interoperability issues, such as Web Services Business Process Execution Language (WSBPEL), Web Services for Remote Portlets (WSRP), Web Services Security (WSS), and Universal Description, Discovery, and Integration (UDDI).
- **Web Services Interoperability Organization (WS-I)**
Microsoft and SAP are founding members of WS-I and are represented on the organization's board of directors. WS-I promotes the use of Web services by helping companies select and interpret Web services specifications and develop best practices. These specifications and best practices are used to develop, deploy, and integrate interoperable business applications.

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

WS-Policy is an initiative undertaken by Microsoft, SAP, and other industry leaders to address interoperability issues for the description 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.

- **Web Services Metadata Exchange (WS-MetadataExchange)**

Microsoft, SAP, and other industry leaders collaborate on the WS-MetadataExchange initiative, which addresses interoperability issues for the exchange of Web services metadata. By using the XML, SOAP, and WSDL extensibility models, WS-MetadataExchange provides a general-purpose metadata exchange model and bindings to the most prominent Web service description formats: XML Schema, WSDL, and WS-Policy.

- **Vertical industry standards**

SAP provides application-level industry standards for a number of sectors, such as the high-tech and chemical industries. To enhance this effort, SAP offers solution kits for industry standards, such as RosettaNet, Chem eStandards (a CIDX standard), and Petroleum Industry Data Exchange (PIDX).

CONCLUSION

With SAP NetWeaver, SAP has delivered a unique integration and application platform that is designed to be fully interoperable with Microsoft .NET. This interoperability embraces all three integration layers – people, information, and business processes – using an extensible application platform that is based on open standards and advanced Web services.

As a result, the SAP and Microsoft developer communities can integrate solutions using the power of SAP NetWeaver at both a business process level and a technical level. Using common connectivity methodologies and integration scenarios, the Microsoft .NET developer community can integrate solutions easily and reliably with SAP applications to provide a seamless end-user experience. At the same time, you can extend your solutions to take advantage of investments in Microsoft technology, with complete transparency for end users.

SAP is committed to continuing its collaboration with Microsoft to help you achieve a high level of interoperability, reduce total cost of ownership, and provide the flexibility to use IT to solve business challenges today and tomorrow. This close relationship gives our joint customers a secure, stable road map for the future of more open, service-oriented enterprise business applications.

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