IBM

**WebSphere**® software

# IBM WebSphere Transformation Extender, Version 8.2

*Delivering business agility from IT agility, transforming vital business information and helping ensure content quality across and beyond your organization.*

## Contents

**Introduction**

If you are considering introducing new data-transformation services or upgrading your existing transformation capability, IBM WebSphere® Transformation Extender provides a comprehensive and universal solution.

WebSphere Transformation Extender is a universal data transformation and validation engine that delivers flexibility for your IT systems, resulting in business agility. Through a codeless, graphical approach to development, it handles high volumes of large, multipart documents with complex formatting — helping to address the challenge of integrating your enterprise business systems.

WebSphere Transformation Extender will help you deliver new business services to market quickly and reduce development cycles for business-driven enhancements. It enables you to minimize the impact that integration imposes on an application. Developers no longer need to modify an application's interfaces to deal with new message structures and file formats. They do not need to write and test new preprocessing and postprocessing programs to validate the syntax and semantics of content exchanged between applications.

Business is better served when electronic documents that are exchanged between organizations can be validated before they are sent or received, eliminating costly errors and corrective actions to resend. Validation checking is also important for businesses that must comply with regulatory and industry requirements for business-to-business (B2B) transactions.

This white paper provides an overview of the WebSphere Transformation Extender product family, illustrating the breadth and depth of its capabilities as a universal data-transformation engine for the WebSphere platform. It also describes new features introduced with Version 8.2, announced in December 2007.

**Why WebSphere Transformation Extender?**

WebSphere Transformation Extender excels at processing old and new formats that contain complex and detailed business information, including XML, non-XML and mixed formats. Without a dedicated solution for transformation, developers would need to have significant programming skills to transform complex formats — such as a Health Insurance Portability and Accountability Act (HIPAA)-electronic data interchange (EDI) document or an SAP IDoc — to other formats. They would need to write specialized, format-specific programs to perform the preprocessing and postprocessing tasks of checking content quality. The tasks associated with manually transforming formats would all need to be administered and maintained over time, incurring development and maintenance costs. Under these circumstances, it would be difficult for a business to implement new services. Multiple applications would need to be maintained and retested.

Blue-chip institutions worldwide have successfully deployed WebSphere Transformation Extender to solve their IT pains. WebSphere Transformation Extender is capable of maintaining each transformation mapping, including content validation and format variations, in a portable form — regardless of sources, target applications, platforms or adapter requirements, and without the need to write a line of code.

*Service oriented architecture*

WebSphere Transformation Extender is an enabler for new business services in a service oriented architecture (SOA). It has editions that extend the Extensible Stylesheet Language Transformation (XSLT) mediation capabilities of both enterprise service bus (ESB) and business process management (BPM) solutions from IBM WebSphere, as well as enhance B2B trading hubs.

In addition to taking advantage of Web services support from its companion products, WebSphere Transformation Extender also provides stand-alone support for importing Web Services Description Language (WSDL), and can send and receive SOAP messages using the SOAP and HTTP adapters provided.

*Mainframe scalability*

Mainframes continue to play a key role in many enterprises, both in traditional and SOA architectures. A single mainframe can perform the work of several servers, reducing administration overhead and the green footprint from an energy-conserving perspective. In some cases, the volume of data is simply too large to be moved off the mainframe (for example, the data in a very large database). In other cases, a system does not provide an upgrade path. Data affinity is a common justification for transforming data on the mainframe itself, where the critical business applications reside. Also, mainframes can simply be the most-reliable and scalable platforms upon which to run corporate data for day-to-day business functions. Many enterprises have made strategic commitments to deploy data-integration applications on mainframes. These enterprises want to continue taking advantage of the scale, security and expertise they have on the mainframe.

WebSphere Transformation Extender is available on IBM AIX®, Microsoft® Windows®, Linux® and UNIX® operating systems. More significantly, the WebSphere Transformation Extender engine is available on the IBM System z™ platform for embedding in COBOL applications, batch processing and integrating with IBM DB2® software, as well as participating in IBM CICS® or IBM IMS™ transactions. WebSphere Transformation Extender, Version 8.2 also supports Linux for System z technology.

*Ease of design*

Integration developers and data architects use the WebSphere Transformation Extender Design Studio to visualize both simple and complex data types. The design studio enables them to map between simple and complex data types using the tool's robust data-processing and manipulation capabilities – a coding-free activity.

A comprehensive, yet extensible library of prebuilt functions can be assembled graphically into macro-based rules that are familiar to spreadsheet users. Rules can be assembled for text manipulation, mathematical calculations (including technical math), date and time handling, and accessing the host environment where the engine resides. Macros are also provided for iterating through records and line items. For example, a developer can iterate sales orders, with the ability to compute or validate subtotals. With the Version 8.2 release of WebSphere Transformation Extender, the two primary tools – Type Designer and Map Designer – are now available for both stand-alone use and as pluggable components to an existing Eclipse standard workbench. This provides a single look and feel and user experience when WebSphere Transformation Extender is used as an extension to complementary products in the WebSphere portfolio. Figure 1 shows the updated Eclipse-based interface for the Map Designer tool.
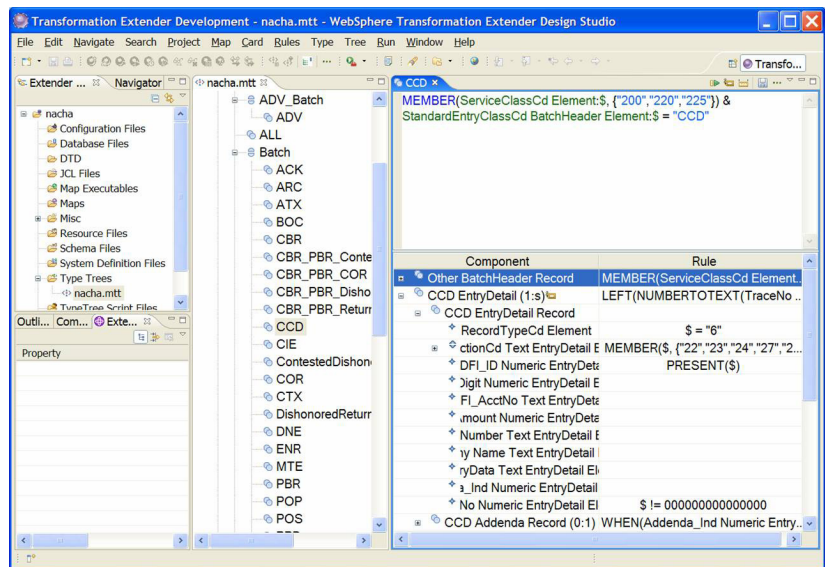


*Figure 1. New Eclipse look and feel for map designer*

*Industry solution acceleration*

Optional industry-specific WebSphere Transformation Extender Packs help accelerate the time to value of developing and maintaining solutions based on industry-standard, information-exchange formats that require transformation to internal business-application formats. They can also accelerate the process of unbatching into individual transactions with an internal business application. Packs might include predefined format templates, conversion maps and validation support for important industry standards, often where quality of service is mandated by external industry organizations or government regulatory bodies. WebSphere Transformation Extender has packs available for standards in financial services, insurance, health care and EDI for retail and distribution sectors:

- *IBM WebSphere Transformation Extender Packs for Health Care*
  - HIPAA EDI, Health Level Seven (HL7), National Council for Prescription Drug Programs (NCPDP)
- *IBM WebSphere Transformation Extender Packs for Financial Services*
  - National Automated Clearing House Association (NACHA), Single Euro Payments Area (SEPA), SWIFTNet FIN, SWIFTNet Funds
- *IBM WebSphere Transformation Extender Packs for Insurance*
  - ACORD
- *IBM WebSphere Transformation Extender Packs for EDI*
  - Electronic Data Interchange For Administration, Commerce and Transport (EDIFACT) , X12, EANCOM, Trading Data Communications Standard (TRADACOMS), Odette

As standards evolve and are updated each year, IBM provides timely updates to the pack contents, helping to protect existing investments year after year. The pack contents are imported into the Design Studio tools, and they help to ensure that your business can quickly assimilate new industry-led requirements. For your internal application formats or specialized industry formats, the tools can quickly build the data dictionary-like format for record structures, or import and run against any XML Schema.

*Extended connectivity*

WebSphere Transformation Extender provides a range of technology connectors and adapters delivered as a single package. It also provides optional enterprise application Packs with template formats and connectivity examples for leading enterprise-information suites, including PeopleSoft, SAP, SAP XI and Siebel. The SAP Exchange Infrastructure (SAP XI) Pack is unique in supporting the WebSphere Transformation Extender engine as an embedded component of the SAP Web Server itself. It provides SAP users with all their transformation and validation needs when integrating applications other than SAP into an environment that is essentially SAP.

*Database on-ramp*

WebSphereTransformation Extender supports file-based exchange as standard, and it is widely applicable as an *on-ramp* for database and integration in an extract, transform, and load (ETL) capacity. It can handle multiple input sources and route to multiple targets — all as part of a single transformation process. On System z, it is widely used with IBM DB2 and IBM IMS applications.

On all platforms, WebSphere Transformation Extender makes an ideal on-ramp for use by DB2 in converting older formats to XML for storage and retrieval as XML. This new database technology enables firms to manage their XML data efficiently and without manually *shredding* or mapping it into individual columns of various tables.

**Universal deployment**

WebSphere Transformation Extender is packaged in different editions to suit the deployment mode that best fits your requirement:

- *As an embedded engine inside any COBOL, C or Java™ application*
- *As a batch-file processing engine called from a command script or System z job control language (JCL)*
- *As an event-driven server, either stand-alone or as an ESB or BPM extender*

The Design Studio and complementary Software Development Kit (SDK) are available separately from the deployment editions. Transformations and validations can be fully developed, analyzed and tested on a developer's Windows-based workstation or laptop, before generating a platform-specific compiled format. As a file-based solution, there is no additional database repository required to manage the transformation artifacts, and any preferred source-code management solution can be used to manage the assets between development teams.

*IBM WebSphere Transformation Extender for Application Programming*

Use this edition to deploy transformations in custom programming environments. C, Java, Enterprise JavaBeans (EJB), COBOL and .Net application programming interfaces (APIs) are available to engage the transformation engine to process a prebuilt transformation. This edition is also suited for embedding within original equipment manufacturer (OEM) offerings and is the edition recommended for enhancing IBM WebSphere Application Server applications. This is available for all System z environments.

**IBM WebSphere Transformation Extender with Command Server**

Use this edition to run transformations from a command line, shell script, JCL on System z, or timer. This edition is often used to extend an existing application and infrastructure with minimal intrusion and for fixed-window batch processing. The WebSphere Transformation Extender with Command Server for System z is recommended for CICS, IMS and DB2 environments.

**IBM WebSphere Transformation Extender with Launcher**

This edition provides a stand-alone event server to host the WebSphere Transformation Extender engine. It includes the command line and script execution capabilities found in IBM WebSphere Transformation Extender with Command Server. With similar but less extensive capabilities than IBM WebSphere Message Broker, the Launcher (event server) activates transformations when triggered by an event, which might be a file creation, a message arriving on an IBM WebSphere MQ queue, a database trigger or a scheduler. It is capable of complex event handling, supporting time- and availability-based event synchronization on combinations of triggers on multiple input sources. WebSphere Message Broker, extended with WebSphere Transformation Extender is recommended for new users for strategic deployment across an organization, with its more-extensive capabilities as an ESB. WebSphere Transformation Extender Trading Manager is an application of WebSphere Transformation Extender with Launcher deployed with EDI industry Packs (EDIFACT and HIPAA EDI) as a business-to-business hub. It includes two components: Partner Manager (a graphical client for administering partner and trade-link information) and Message Manager (a runtime system that manages integration of inbound and outbound partner messages). Users can audit, control and monitor an entire B2B integration environment across the extended enterprise. Trading Manager complements IBM WebSphere Partner Gateway, which provides AS1 and AS2 channel support for EDI users transitioning from value added networks (VANs) to Internet EDI.

**IBM WebSphere Transformation Extender for Integration Servers**

This is a new edition in Version 8.2 to provide installation and integration support when combining WebSphere Transformation Extender with additional IBM products. Version 8.2 sees its introduction with extenders for IBM WebSphere Enterprise Service Bus, Version 6.1 and IBM WebSphere Process Server, Version 6.1. In turn, the Version 6.1 WebSphere products have introduced default WebSphere Transformation Extender bindings that are ready to deploy WebSphere Transformation Extender in mediation flows and business processes.

Before the 8.2 release of WebSphere Transformation Extender, bindings were custom-coded with the aid of the WebSphere Transformation Extender SDK or with software assets provided by IBM service teams. Now these interfaces can be generated from within IBM WebSphere Integration Developer, the development studio for WebSphere Process Server and WebSphere Enterprise Service Bus. And the latest Eclipse-based Type Designer and Map Designer simply plug into the Eclipse workbench to provide a single tool experience for the developer. The WebSphere Transformation Extender transformation engine is a powerful, purpose-built enhancement to complement the native Java mediation and business-rule capabilities of these products, and it enables the handling of larger documents and messages with more complex formats that are not based on XML.

WebSphere Transformation Extender for Integration Services can also enhance solutions built with the IBM WebSphere Business Services Fabric offering, which includes WebSphere Process Server and WebSphere Integration Developer products. All of these products are available on System z, under the UNIX System Services shell and zLinux. WebSphere Transformation Extender Design Studio is a separately orderable item, required for developing the transformation maps themselves.

**WebSphere Transformation Extender for Message Broker now included in the WebSphere Transformation Extender for Integration Servers edition**

To simplify the choice of editions that complement ESB and BPM solutions from IBM, WebSphere Transformation Extender for Message Broker is included as the third extender packaged as WebSphere Transformation Extender for Integration Servers. This extender complements the extended Structured Query Language (ESQL) and Java scripting capabilities of the compute node with the ability to process WebSphere Transformation Extender transformation maps from within a message flow running in a WebSphere Message Broker run time. The combination of universal ESB and WebSphere Transformation Extender extension provides the broadest capabilities for simple and complex routing and mediation. WebSphere Transformation Extender makes the Industry Packs available to WebSphere Message Broker users, accelerating time to value for EDI and complex document-processing solutions. WebSphere Message Broker provides WebSphere Transformation Extender users with a broad range of transports and routing capability, including secure publish-and-subscribe routing, IBM WebSphere MQ, Java Message Service (JMS), Web services and much more. WebSphere Message Broker, Version 6.1 has introduced additional enhancements to improve its support for WebSphere Transformation Extender integration by providing simplified parsing and multiple input capabilities equivalent to those found in the launcher edition.

**New in this release**

WebSphere Transformation Extender, Version 8.2 includes new features that are designed to support compliance, and enhance integration and ease of use. The features are summarized in the following sections.

*IBM WebSphere Transformation Extender Industry Pack for ACORD*

This new Pack accelerates delivery of data transformation solutions for the American insurance-industry standard managed and maintained by the ACORD organization. ACORD standards are in use with insurance and reinsurance companies, agents and brokers, and financial services organizations. The ACORD XML Schema is available to members and must be downloaded from the ACORD Web site (www.acord.org) as a prerequisite to using this Pack. The Pack contains prebuilt templates for Life Version 2 and Property & Casualty/Surety (PCS)-Version1 message formats. An AL3 template and sample transformation map to PCS is included. AL3 is a non-XML format still widely used in the industry. ACORD Forms is not supported in this release. Interested readers might also look at the IBM Workplace Forms™ support for ACORD at **ibm.com**/software/workplace/forms.

*IBM WebSphere Transformation Extender Industry Pack for NACHA*

This new Pack targets message formats of the NACHA and improves governance by transforming and validating compliance of credit transfers, direct debits and electronic check processing using Automated Clearing House (ACH) transactions. NACHA maintains formal relationships with the Federal Reserve System and the U.S. Department of the Treasury. Federal and state governments rely on NACHA to create, regulate and enforce rules that protect both consumers and merchants in an electronic check transaction. The ACH Network supports online and batch-processing environments, and it transacts value-dated recurring and spontaneous e-payments. Nearly 14 billion ACH payments were made in 2005. It is used by more than 15 000 participating financial institutions and over 750 000 corporations. The Pack contains

a comprehensive template for all ACH application types, and transformation maps for two types of corporate payments: Cash Concentration or Disbursement (CCD) and Corporate Trade Exchange (CTX). Prearranged Payment and Deposit Entry (PPD) payments are very similar and can be quickly customized. The CCD format is a single transaction format. The CTX format supports multiple EDI X12 820 Addendum records, and the pack includes an X12 820 message-format template and example map. Figures 1 and 2 show the updated Eclipse-based interface using the NACHA ACH template.
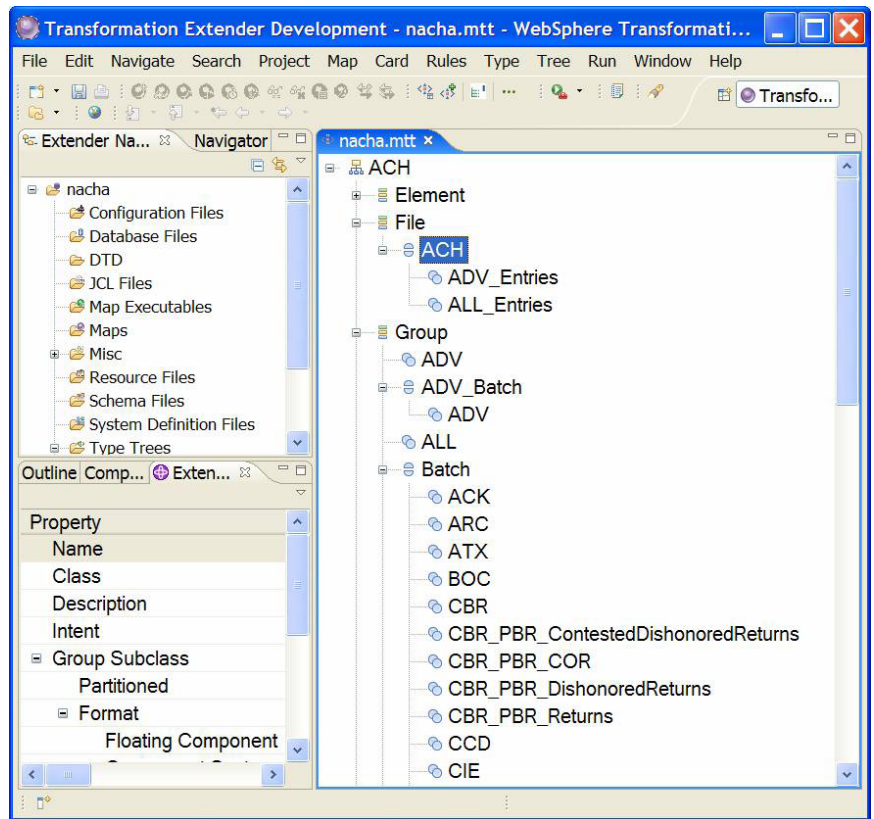


*Figure 2. New Eclipse look and feel Type Designer using NACHA ACH template*

*IBM WebSphere Transformation Extender Industry Pack for SEPA*
Introduced in June 2007, this Pack helps banks and financial services institutions meet their compliance obligations to the European Union initiative to have a pan-European electronic payments infrastructure. It includes templates for SEPA credit transfers and direct debits, mapping between SEPA and Society for Worldwide Interbank Financial Telecommunication (SWIFT) message type103, as well as validation for the European Payment Council's SEPA implementation guidelines. New with Version 8.2 are additional converter examples for mapping MT101, 102, 102+ and 103+ SWIFT message types to their SEPA equivalent messages. The Pack includes validation updates implemented from the European Payment Council updated guidelines of June 2007 and in addition, Euro Banking Association (EBA) STEP2 support has been added to the bundle/unbundled example in the SEPA Pack. STEP2 is the implementation of the SWIFT network (SWIFTNet) FileAct and SWIFT Standards XML for Automated Clearing Houses used by the EBA pan-European retail-payment clearing house.

*IBM WebSphere Transformation Extender Industry Pack for HL7*
HL7 is an American National Standards Institute (ANSI)-accredited standards organization operating in the U.S. health-care arena. HL7 produces standards for the exchange, management and integration of clinical data, intended to promote interoperability between health-care information systems. HL7, Version 2.4 support has been added to Version 8.2 of this Pack to complete coverage of Version 2.1 through 2.5. HL7, Version 3 XML Schema can be easily downloaded into the Design Studio for transforming between Version 2 and Version 3.

*IBM WebSphere Transformation Extender for Integration Servers*

This edition (described earlier in the paper) brings together extenders for WebSphere Process Server, WebSphere Enterprise Service Bus and WebSphere Message Broker. The user can choose which to deploy. This edition includes the following enhancements:

- *Support for WebSphere Transformation Extender data bindings for JMS, WebSphere MQ, HTTP, enterprise information system (EIS) import and EIS export (WebSphere Process Server and WebSphere Enterprise Service Bus)*
- *Maps to convert between external formats and business objects (WebSphere Process Server and WebSphere Enterprise Service Bus)*
- *An Eclipse-based wizard to simplify map design that runs in WebSphere Integration Developer*

*IBM WebSphere Transformation Extender for Application Programming*

This is the edition previously named WebSphere Transformation Extender. It has been renamed to clarify its use as an embedded engine called by its programming interface.

*IBM WebSphere Transformation Extender Design Studio*

Version 8.2 of WebSphere Transformation Extender introduced the new Eclipse standard look and feel for the Type Designer and Message Designer tools. These continue to run as stand-alone tools, but are now also available as plug-ins to WebSphere Integration Developer and WebSphere Message Broker developer environments, both based on Eclipse. The design of the new tools is similar to the existing tools. The integration flow designer and other tools from the previous release have not been converted to Eclipse in Version 8.2. Importer utilities become Eclipse importers, and additional importers are included to support adapter connectivity with enterprise applications. Native support is now available with the new tools for XML Schema. These no longer need to be converted to type trees unless content validation rules are to be added. XML Schemas now appear as type trees in the Map Designer tool. Customized type trees and maps will continue to work with the new tools.

*Enterprise application Packs*

Enterprise application Packs include capabilities to accelerate the connectivity and integration of WebSphere Transformation Extender with key, independent software vendor (ISV) business applications. Each Pack supports one or more interfaces provided by the vendor to communicate and exchange business information with third-party vendor applications and business services, with WebSphere Transformation Extender acting as the mediation engine.

Enterprise application Packs include:

- *IBM WebSphere Transformation Extender Pack for PeopleSoft Enterprise*
- *IBM WebSphere Transformation Extender Pack for SAP R/3*
- *IBM WebSphere Transformation Extender Pack for SAP XI*
- *IBM WebSphere Transformation Extender Pack for Siebel*

WebSphere Transformation Extender, Version 8.2 has additional IBM WebSphere Adapters, Version 6.1 components for the SAP, PeopleSoft and Siebel Packs. These adapters come with importers that support the Enterprise Metadata Discovery specification implemented in WebSphere Adapters that enable the applications' functions and database records to be browsed.

*IBM WebSphere Transformation Extender SNMP Collection*

The Simple Network Management Protocol (SNMP) Collection includes the SNMP Agent, which enables monitoring and management by an SNMP manager, and an SNMP Adapter, which enables the sending of alerts to SNMP manager products from WebSphere Transformation Extender maps.

*Integrated support for WSDL and SOAP*

Support for IBM WebSphere Transformation Extender Pack for Web Services has been withdrawn in WebSphere Transformation Extender, Version 8.2. Instead, all editions now include the WSDL and SOAP functionality from the Pack.

*Platform support*

Support is now available for Linux on the System z platform. WebSphere Transformation Extender also supports 64-bit tolerance mode on platforms with 64-bit operating system support.

*Feature enhancements*

There have been many technical enhancements to tooling, parser and runtime functionality, including the additional enhancements required for complementary WebSphere products. These features are summarized as follows:

*General*

- *Java 1.5 support*
- *Internet Protocol, version 6 (IPv6) support for all adapter components*
- *JExit function to call out to Java applications that will create or reuse a Java virtual machine (JVM)*
- *Text sizes specified for both bytes and characters*

*XML*

- *Support for XML Schema Definition (XSD) Union type*
- *Support for xsi:type*
- *Restart and reject logic available for XML type trees*
- *XML Schema validation that is switchable on and off on a per-card basis*
- *Location of XML Schema specified by a card setting in the form of a Web address or file path*

*Globalization*
- *Support for bidirectional code locales*
- *Substitution characters allowed (If a character does not exist in a target code page, the target code page's default character is used.)*

*Connectivity*
- *WebSphere adapters for e-mail and FTP added to base editions*
- *E-mail adapter support for multiple headers and attachments*
- *FTP adapter that allows remote files to be renamed after being read*
- *WebSphere adapters for SAP, PeopleSoft and Siebel added to packs*
- *Additional support for the Query Interface for SAP Software (QISS) and an inbound RFC server provided by an SAP adapter*
- *PeopleSoft adapter with added listener interface for PeopleSoft Component Interfaces*
- *New importer functionality for Enterprise Metadata Discovery for Adapters*
- *E-mail, FTP and SAP adapters available on System z*

**Summary**

WebSphere Transformation Extender is the universal transformation engine for data and message architects, application-integration specialists and programmers who need to integrate diverse and complex data sets, documents and messages across their enterprises. Its powerful write-once, deploy-anywhere portable technology enables you to grow your infrastructure with your business. Furthermore, the WebSphere Transformation Extender family of products enables you to accelerate your time to market, with the confidence that your data complies with the latest industry formats and regulations.

### For more information

To learn more about the IBM WebSphere Transformation Extender family of products, contact your IBM representative or IBM Business Partner, or visit:

**ibm.com**/software/integration/wtx

To join the Global WebSphere Community, visit:

http://www.websphere.org/

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