

IBM.

WebSphere Software

Out-of-the-box integration of industry standard data formats with your Enterprise Infrastructure.

- IBM WebSphere Transformation Extender
Teleconference July 18 2007



SOA on your terms and our expertise

ON DEMAND BUSINESS

© 2007 IBM Corporation

Title Page

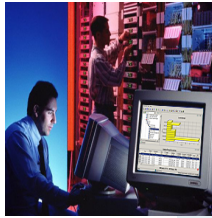
Agenda

- 1 **Intro - Data transformation as a service**
- 2 **Designing with WebSphere Transformation Extender**
- 3 **Deploying WebSphere Transformation Extender**

The agenda for today's teleconference is in three parts, an introductory discussion of the needs driving data transformation and validation as a service, followed by a high level walk through of the design studio tooling, Then I'll talk to the deployment scenarios for System z users.

Business Challenge of Data Transformation

- Need a system that can deliver information to other departments or applications
- Limited skills in house and need a solution that is easier to learn, quicker and simpler to get up and running.
- Increasingly diverse and incompatible range of apps, partners, and platforms.
- Redeploying EDI apps to the Internet .



- Have a batch environment, looking for a non invasive way to validate documents.
- Building a gateway for exchanging HIPPA EDI messages
- Use WebSphere Transformation Extender to integrate my existing business systems to SWIFT - need the same for SEPA.
- Need to validate and transform documents at their source as well as in the middle tiers.

As your infrastructure grows, the need to provide a transformation service for complex data may arise, especially as SOA encourages more applications to be connected to the ESB.

New services may need to utilize information from a wider variety of sources where it is stored and exchanged in a wide variety of formats.

To Reuse mature business applications in an SOA, or perform business transactions that conform to industry standard exchange formats will involve

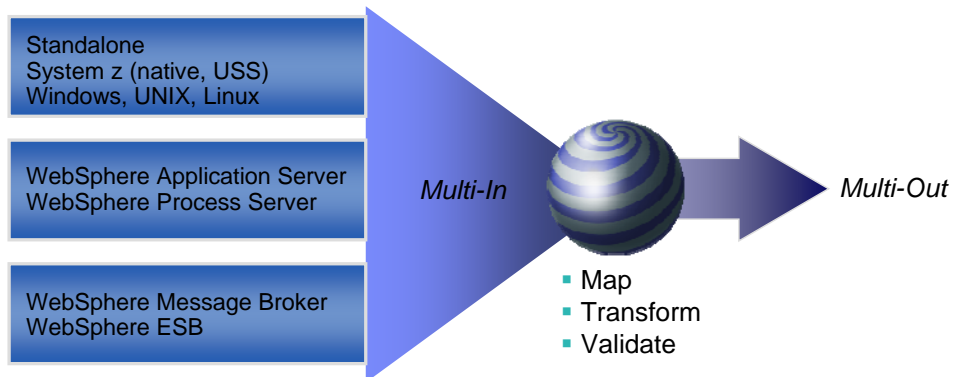
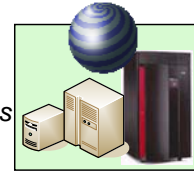
- manipulating complex structured data that is not XML data;
- processing data structures where the format is variable and not fixed and predictable in advance
- Processing documents that batch together many individual transactions
- Responding to changes in exchange standards as the formats evolve.
- Checking the content complies to the standards to ensure first time successful transmission.

Writing this logic into the applications or custom adapters inhibits flexibility. Writing pre and post processor checking applications just adds to the complexity, the development costs, and adds to the management overhead.

There is also the challenges of where in the SOA is the most efficient place to manipulate the data. Closer to the source application on the mainframe ? Or as documents are received at a B2B or EDI gateway ? These are architectural decisions guided by performance and throughput considerations, together with the processing power of the hardware platforms. The challenge comes through different products in your infrastructure having varying levels of transformation capability. ESBs, Portals, and Process Servers are all able to perform basic transformations and mediations and generate business rules, but as the complexity of the information to be transformed grows, the number of lines of script or code to write becomes significant. This may mean inheriting a maintenance burden that grows over time, as business requirements change, and the number of different transformation artifacts held by different products within your SOA grows.

IBM WebSphere Transformation Extender

- Transform, validate, and enrich document files and messages, containing complex and variable data structures
- Deliver trustworthy information for critical business initiatives
- Help Meet regulatory compliance requirements



IBM WebSphere Transformation Extender product family provides a universal transformation engine that can describe and transform most any data. It is equally suited to SOA and non SOA environments. It successfully plays a role in many healthcare insurance companies as a component of B2B gateways capable of validating compliance to the HIPAA EDI standards for out bound transactions, and converting inbound transactions into formats more consumable by internal business systems. In banking and finance it performs a similar role for electronic payments and securities, and is a core component of IBM solutions for Banking.

WebSphere Transformation Extender stands on its own as data transformation offering both for Information Management tasks –data cleansing and -Extract, Transform, Load operations and for Application Integration with its ability to handle more complex processing tasks, less reliance on coding and scripting, and validating information before it reaches its target destination.

It provides an excellent companion to ESBs and Integration Servers to provide transformation as a service, and enable reuse of existing business systems.

Universal Transformation spans Multiple Styles and Demands for Integration

Styles

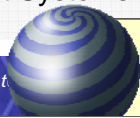
- ❖ Data Processing
- ❖ Application Integration
- ❖ Systems Integration
- ❖ Data Integration
- ❖ Business Integration (B2B, E2E)
- ❖ Portal Integration
- ❖ Process / Workflow Integration
- ❖ Management Systems Integration

Demands

- ❖ Synchronous Communication
- ❖ Batch Processing
- ❖ Asynchronous Communication
- ❖ Multi-Channel Handling
- ❖ Complex Data Handling
- ❖ Interdependent Data Sets
- ❖ Data and Business Rule Validation
- ❖ Multiple Environment / Use Scenarios

5

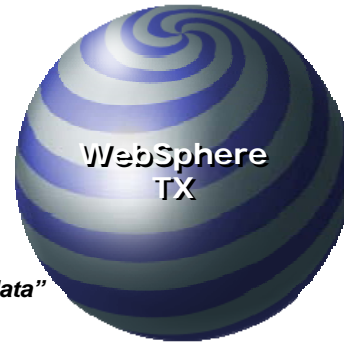
SOA on your t



WebSphere Transformation Extender provides capabilities in all of these use cases

Multiple styles and demands for Integration need a universal transformation capability.

Chief Value Differentiators

Powerful Transform capabilities with No Coding***Lowers cost to implement, maintain and re-use******High-Throughput, Complex Transformations******Cost per transaction very low******Natively Handles Any Data Type******Never resort to “flattening” or “re-structuring data”******Data integrity and meaning are never lost******In Process Data Validation******Greatly reduces development efforts and implementation costs******Solve Really Hard problems, in less time, with one common design method***

What differentiates WebSphere Transformation Extender ?

Power without coding – one common design method

Lower cost to implement and maintain over time than the applications being integrated

Native handling of any structured data type

And in process validation.

Powerful Capabilities

- **Code-Free Design and Deployment**

- ✓ There is no "language" to TX, the transforms and data process are all maintained within the spreadsheet-like GUI, and you never need to drop down to writing code to handle complex transforms. You create portable "transformation objects".

- **Self-describing Data Model**

- ✓ WebSphere TX uses data in its native format, and has a unique mechanism for describing data in its native form. WebSphere TX is able to handle complex and mixed data types using one design environment

- **Data Validation as part of the transformation process**

- ✓ data is validated to content rules and context usages as part of the transformation process. You do not need to write separate logic or have separate executions in order to provide extremely rich data validation

- **High-Throughput of Complex Transforms and Enhancements**

- ✓ WebSphere TX has a unique many-to-many model of transforming and processing data, which allows it to execute all transforms, lookups and data enrichments with only one pass at the data, making it one of the most performing transformation engines on the market

- **One Engine – Multiple Deployment Options including Z**

- ✓ Using the same design environment, you can deploy transformation to a number of runtime environments including ,embedded, standalone batch and event driven scenarios across a number of OS platforms.

- **Industry Packs – Solution accelerators**

- ✓ Cut development times and maintenance costs even further with pre built templates, conversion maps and validation assets for widely used industry format standards and services.

Key to its success are :

Code-Free Design and Deployment

WebSphere Transformation Extender users benefit from a single design studio running under Windows for designing, debugging and testing all transformation maps, without resorting to scripting or coding, independent of where they need to be deployed. An extensive library of predefined functions are available to both transform and validate. Iterations can be applied to handle multiple items in a purchase order, or to compute values and check totals in a sales order. This way big transformation tasks can be handled within one easily managed map file and without resorting to code.

Self-describing Data Model

WebSphere TX uses data in its native format, and has a unique mechanism for describing data in its native form. WebSphere TX is able to handle complex and mixed data types using one design environment. Mapping between application specific format to a general purpose Canonical format and back again is not a requirement. Self describing XML schema can be easily imported and automatically converted for processing XML content with non XML formats including COBOL Copybook, and older versions of industry standard exchange formats for example HealthCare Level 7 (HL7) v2 to v3 which has an XML schema.

In-Process Data Validation

Validate the business content on input or output with WebSphere Transformation Extender. Apply rules and functions, sum multi part inventories or purchase orders and compare with totals. Compare coded values against lookup tables held as files, or database entries. The time to value benefit here is that you can reduce or even eliminate the need for extensive checking to be written into application interfaces, adapters or additional pre and post processing applications. Instead many content checks can be applied from within the transformation engine before output. In fact maps can be created with the same input and outputs, solely for the purpose of using the function library to check the content meets a quality standard. And exchanges of data with regulated services like SWIFT can be checked for completeness to ensure First time success and reduce rejects.

High Throughput Execution of Complex Transformations

Transformation maps which can be deployed and used across a wide range of platforms including Windows, AIX, Solaris, HP and the IBM zSeries platform. Here it can be deployed with CICS, IMS, and DB2, or drive batch processes under MVS. For SOA deployments WebSphere Transformation Extender can be deployed with WebSphere ESB, Message Broker, or Process Server.


One Engine, Multiple Deployment Options including ZSeries

WebSphere Transformation Extender delivers one transformation engine with one set of tools, requiring one set of skills that focus on the business content of data, not on coding. The transformation engine is packaged for different deployment scenarios creating a family of offerings

Solution Accelerator Packs

WebSphere Transformation Extender users can cut development times and maintenance costs even further with WebSphere Transformation Extender industry Packs. These accelerate time to value by providing IBM maintains these assets, and provides updates when the standards body or regulatory authority release new versions or extensions. Many Banks and financial institutions in capital markets are using WebSphere Transformation Extender with a SWIFTNet FIN industry Pack to integrate and at the same time insulate their business applications from the complexity of protocols and logic needed to conduct business over SWIFTNet. We are introducing an industry pack for SEPA [speaker advice- pronounced SAY PAH] to do a similar job in reducing the time to integrate and convert to a new electronic payments specification for the Single Euro Payment Area initiative underway in Europe.

WebSphere Transformation Extender Enterprise Packs provide similar templates for leading Enterprise Applications including SAP, SAP XI, Siebel, PeopleSoft. With most of the hard work accomplished, users can focus on customisations they require, and get to production faster.

WebSphere 

Healthcare organizations rely on WebSphere Transformation Extender


- Increasing pressure to control costs
- Improving productivity and processes
- Focus on improving quality of care


Healthcare standards

- HIPAA EDI
- Healthcare Level 7 (HL7)
- NCPDP

- Virtualization of IT in healthcare
- Electronic Medical Records
- Clinical Collaboration

Over 75% of all Blue Cross/Blue Shields have IBM Software and over 40% use it for HIPAA compliance



8 SOA on your terms and our expertise 

It's during our implementations we identified the most pressing Healthcare business issues beyond Industry regulatory pressures. We helped many Blues organizations to minimize resources needed to respond to claims and status requests, eliminate labor and paper-intensive processes, give patients and other key constituents online access to appropriate data, and manage patient care cases in real time. With the help from IBM BCS and other System Integrators, we bring to our customer sites PS architectural assessment, quick installation procedures, technology training and "know-how" tips and techniques.

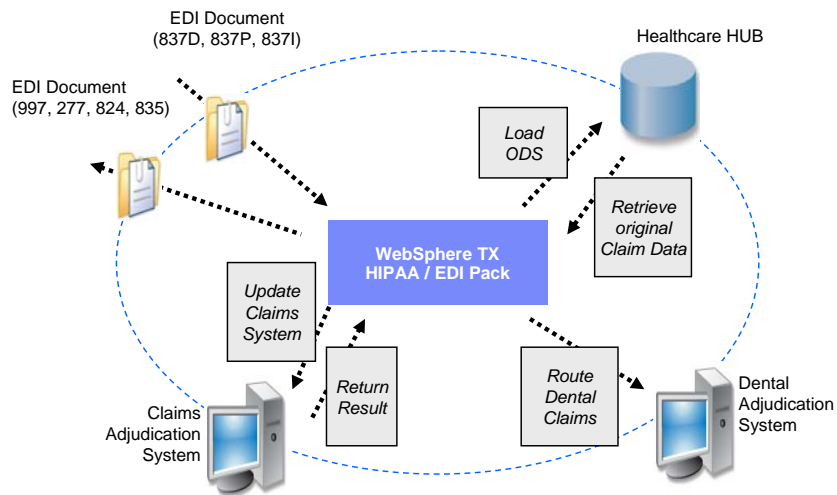
HIPAA EDI addresses the administrative simplification aspects of HIPAA legislation - the standardization of electronic patient health, administrative, and financial data. HIPAA regulations affect payers, health plans, clearinghouses, and those providers who conduct financial and administrative transactions electronically.

Health Level Seven is an ANSI-accredited standards organization operating in the healthcare arena. HL7's domain is clinical data. The HL7 produces standards for the exchange, management, and integration of data, intended to promote interoperability between healthcare information systems.

National Council of Prescription Drug Providers (NCPDP)

- Submission of Pharmaceutical Claims - Specific to U.S.
- Also Mandated By U.S. Government – Part of HIPAA
- Retail Pharmacy

Claims processing requires robust EDI Gateway

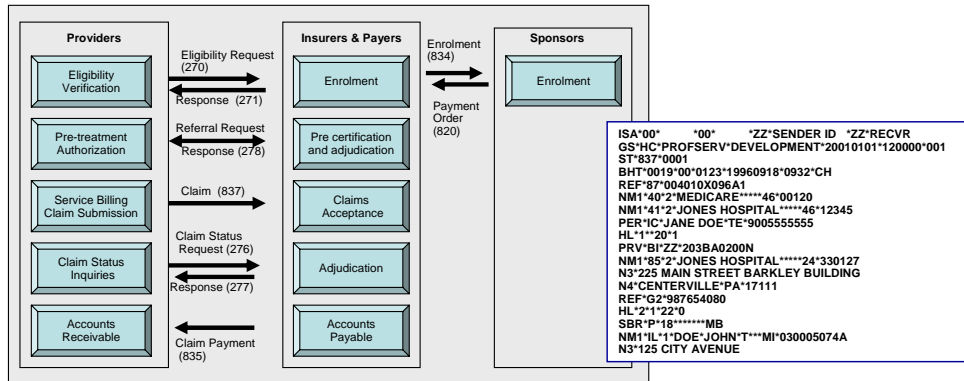


A simple benefits inquiry might take 20 minutes on the phone. Using electronic data interchange (EDI), this type of request can be processed almost immediately without the need for a call to the insurer's customer service center. Healthcare insurance service providers, such as Blue Cross & Blue Shield or Medicare, routinely interact with a variety of entities (hospitals, medical clinics, billing agencies, and so on) to determine what patient services have been provided and who needs to be paid. Each year, in the United States, healthcare insurers process over 5 billion claims for payment.

Then consider transaction complexity. A single insurance transaction may contain information for multiple healthcare services or for multiple patients; conversely, the insurer may have separate systems for adjudication based on which healthcare provider or coverage plan submits the claim.

HIPAA EDI

- Unique to U.S. Market ; Mandated by U.S. Government since October 2002
- WTX supports the HIPAA healthcare embedded XML claims attachment standard.
- perform all WEDI/SNIP validations on the EDI and XML validation of the claim attachment
- New HIPAA 5010 format requirement for 2007/8



WebSphere Transformation Extender can support the HIPAA healthcare claims attachment standard. You can use the 275 and 277 transactions with embedded XML and perform all WEDI/SNIP validations on the EDI and XML validation of the claim attachment

Healthcare Level 7 (HL7)

- Exchange of Information Related To Patient Care
 - Patient Administration (Admissions, Discharges, etc.)
 - Clinical Orders (Requests for Testing)
 - Scheduling (Appointments)
 - Observation Reporting (Care Notes)
 - Laboratory Results (Test Data)
- ✓ International Scope
- ✓ Designed to be Extended
- Two Categories of Messages
 - ✓ EDI style HL7v2 – Pack available.
 - ✓ XML HL7v3 - download and Import

```
MSH|^~\&|CDR|hubh1|WBI|WBID.MCIT.MED.UMICH.EDU|20051
EVN|A08|20050922135029|20050922135029|ALLC|CWEBDEV
PID|01|555555555|555555555^M||FAT^LAD^L||2000|M|POT|
NK1|0001|||E|||||
NK1|0002|||N|||||
NK1|0003||510 E COLUMBIA AVE^BATTLE CREEK^MI^49999^US
PV1|||4WEM^4145^01^D|E||^010853^RAY^LISA|595942^SENOR^RAJA
PV2||Y|HYPERTENSION EDC 020905|||||20050131
AL1|01||^98||
AL1|02|Drug|C0009214^codeine^UMLS^d00012^codeine^MMSL|SV|Anaphylax
is
AL1|01||^98||
AL1|01|Drug|C0009214^codeine^UMLS^d00012^codeine^MMSL|^Dizziness
DG1|02|I9||
DG1|02|I9||
DG1|02|I9||
DG1|02|I9||
```

The Health Care Level 7 (HL7) standard is used internationally for the exchange of information relating to patient care. Version 2 supports EDI style formats whilst version 3 supports XML style formats. HL7's domain is clinical data. The HL7 produces standards for the exchange, management, and integration of data, intended to promote interoperability between healthcare information systems.

- Data definition type trees are included for:
 - Patient Administration (includes Admissions, Discharges)
 - Clinical Orders (Requests for Testing)
 - Scheduling (Appointments)
 - Observation Reporting (Care Notes)
 - Laboratory Results (Test Data)

The WebSphere Transformation Extender Pack for HL7 includes HL7 versions 2.1, 2.2, 2.3, and 2.5 type trees.

HL7 version 3 XML formats can be easily imported into the Design Studio Type Designer using the XML Importer built into the tool.

Importance of Validation

“After you receive the electronic remittance advice from the primary payers, send the other payers' claim information to xxxxx using the 837 version 4010 format. For MSP claims, place the primary payer paid amounts, in loop 2300, qualifier HIXX-1 = BE. Place the value codes in HIXX-2 and the (value code) monetary amounts in HIXX-5. NOTE: In regard to Value Code 44, Obligated to Accept as Payment in Full (OTAF) amount, indicate a value of "Y" in loop 2320, segment OI03. This will inform xxxxx that an OTAF amount is present on the claim and the amount can be found in the 2300 loop HI segment.”

- Room for human error coding this.
- Flexibility for users in standard formats can equate to complexity for maintenance.
- WebSphere Transformation Extender is a solution that can quickly adapt to changing requirements and minimize the impact and cost of change on your business applications.

When there are documented implementation guidance for using industry de-facto business services like SWIFT in finance, or mandatory government requirements such as HIPAA in Healthcare, there is the time and effort to translate these requirements into code or business rules and apply them. HIPAA, SWIFT and SEPA industry Packs include validation.

Validation maps or valid applications that can accelerate solution delivery and maintenance. These can ensure transactions with external business services are not rejected through invalid content as well as ill formed structure. And ensure high quality service levels with business partners. The example above is guidance from a specific healthcare organization.

Even standards contain flexibility for the users that can equate to complexity for maintenance.

• Industry Packs

- Provide prebuilt templates – which many clients customize for internal use.
- Accelerate delivery, and provide mappings between latest and earlier versions.
- May provide validation maps and applications based on
 - Standards organization implementation guidance
 - Regulatory body requirements
- Ensure Quality of Content to reduce transmission failures by messaging services.

WebSphere **IBM**

Global Financial Institutions Rely on WebSphere TX Software

Fortune 1000 Coverage

- Commercial Banks
- Diversified Financials
- Life and Health Insurance Companies
- Property and Casualty Insurance

Financial Standards

- SWIFT
- SEPA
- FIX
- NACHA
- ACORD

Significant In Capital Markets:

- **\$Billions** of SWIFT traffic goes through WebSphere daily
- **40% of London** securities transactions are powered by WebSphere TX

13 SOA on your terms and our expertise **ON DEMAND BUSINESS**

WebSphere has an extensive customer base in leading financial services firms spanning capital markets, banking and insurance. In these accounts, WebSphere delivers integration solutions across all business latencies, from warehouse-oriented batch processes, connectivity to enterprise crm and general ledger applications to real-time transaction oriented processing of SWIFT messages.

Fortune 1000 Coverage

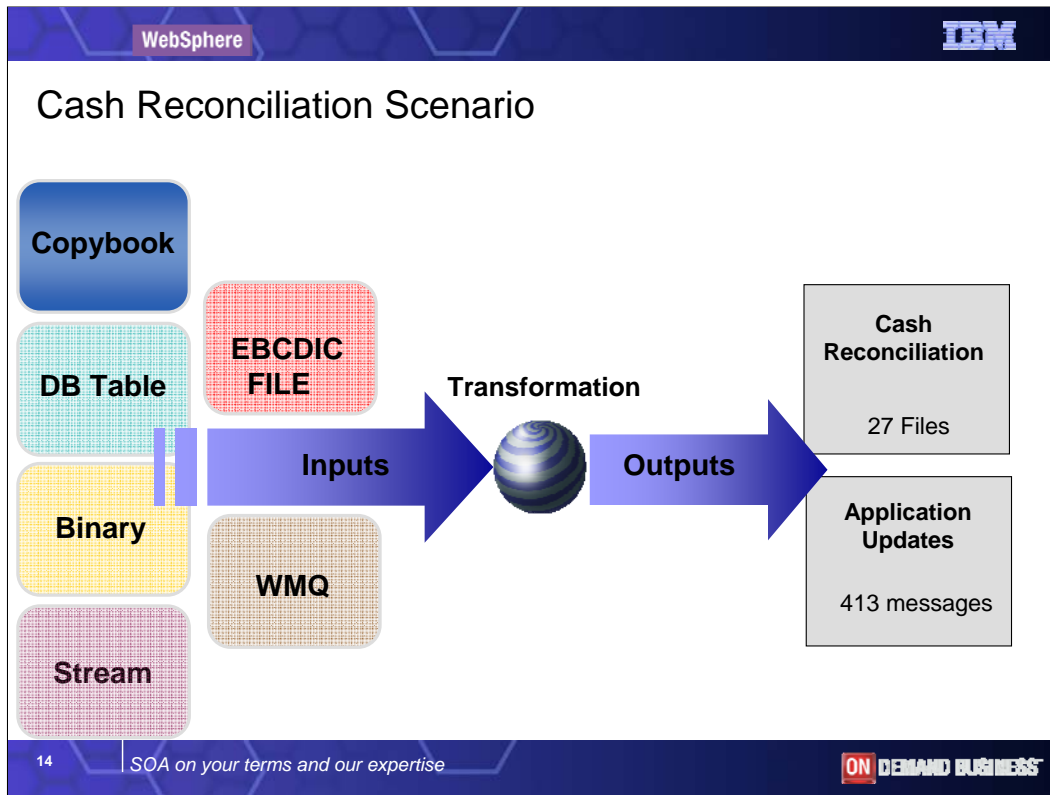
- 9 of Top 10** Commercial Banks
- 6 of Top 15** Diversified Financials
- 4 of Top 12** Life and Health Insurance Companies
- 8 of Top 14** Property and Casualty Insurance

Significant Impact on Capital Markets:

- \$500 billion plus** of SWIFT traffic goes through WebSphere daily
- 40% of London** securities transactions are powered by WebSphere TX

WebSphere TX for STP:

- 100 international banks
- 70 investment managers
- 40 broker dealers
- 10 global custodians



On this slide we have 6 inputs from a variety of system types in order to process a CASH RECONCILIATION Report for a Bank. Each of the 6 inputs have different forms, data types, input methods, and usage rules. The results of this transform utilize some heavy interdependencies across the many inputs.

We have 1) Binary Data, 2) a database table, 3) a COBOL application, 4) a cash management application stream from a socket connection, 5) a risk analysis application connected via WebSphere MQ, and 6) and EBCDIC data set from a mainframe file .

Before transformation can commence, each of these input sources has to be synchronized. Processing one source without the others would fail. And in order to produce the outputs, it is not just the form and structure that needs to be changed, but the input source contents compared, processed together, in one step to create meaningful outputs. Here 2 TYPES of Outputs are created following the transformation – a cash reconciliation report and application update but actually 27 new files and 413 messages corresponding to payers, payees, and checking accounts affected, have been created.

WebSphere Transformation Extender met the challenge by handling all the data semantics, the usage rules, and the constraints of the outputs. It also handled the transforming from different data types (binary and EBCDIC into ASCII). It even produces an audit trail for the whole transformation down to a transaction level using native abilities of the transformation engine.

Integration Challenges exemplified with SEPA

- *Transition from existing systems to SEPA schemes will require significant investment.*
 - ✓ *SEPA's data set (ISO 20022, a.k.a. UNIFI) is large, complex, and requires more than basic XML schema handling*
 - ✓ *SEPA's rulebooks require not only format level compliance, but message content validation and implementation rule logic*
 - ✓ *Anticipated changes and updates to the SEPA Schema and Implementation Guidelines introduce risk to bespoke solutions*
- *The breadth and overhead of the ISO 20022 schema, and the need to integrate with existing systems presents processing cost challenges and infrastructure architecture concerns for banks.*

SEPA was not originally welcomed with open arms by the Banking industry faced with the uncertainty, risk, and investment cost of implementing new IT systems. Some have taken a more tactical approach to leveraging their existing applications and infrastructure. For some it has been the trigger to an overhaul of aging payment systems, and a more strategic investment programs being put in place.

SEPA V2.2 released by the EPC in December 2006

Specifies a Rulebook (RB) and Implementation Guide (IG) for both Direct Debit and Credit Transfer schemes

Rulebook defines the rules and obligations of the scheme

Implementation Guideline defines the core mandatory subset of the UNIFI ISO 20022 messages and message elements to be used by the SEPA schemes

Split into 2 areas

Bank-to-Bank messages – rules are mandatory

Customer-to-Bank messages – rules are recommendations

Still evolving

WebSphere Transformation Extender Pack for SEPA

*For IBM Clients needing to develop their
Single Euro Payments Area solution with
IBM WebSphere Transformation Extender.*

SEPA Credit Transfer

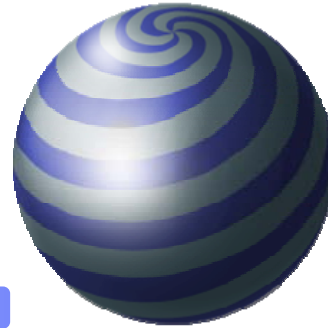
SEPA Direct Debit

SEPA UNIFI Message and Content Validation

EPC Implementation Rules Validation

SEPA to SWIFT MT 103

Sample SEPA-Domestic converters



EPC European Payments Council – the regulating authority of the European Community
SEPA Single Euro Payments Area
UNIF the short name given to the subset of ISO20022 standard messages for SEPA.

The SEPA initiative poses significant challenges to the Banking community with respect to the IT infrastructure changes needed both in the short and longer term to meet the requirements of the regulating body the European Payments Council to deliver the SEPA messaging system for credit transfers, direct debits, and credit card payments. IBM provides premier support for all SEPA projects small or large, with products and service offerings, expertise and best practices.

The pack delivers those items shown on the chart in the initial release. MT 103 Single Credit Transfer map was prioritised by our customers. SWIFT MT101,102 may follow in a later release.

The domestic format converters are designated samples – to indicate we are not guaranteeing they will be maintained and enhanced. Most users have a need to customize for in house use.

In future releases of the pack. Many clients also customize domestic formats for internal use. BACS,DTAUS,MINOS are examples of country domestic formats.

The pack does not cover credit card payments in this first release. Credit Card payments are also covered in the SEPA directive. This Pack includes a z/OS example with sample JCL to create an interbank message from customer-bank messages. Type trees and schemas for all of the messages in the previous slide.

Validation framework to perform compliance checking for all of these messages

- Basic UNIFI compliance
- EPC-mandated usage rules for CT and DD

Example converter maps for domestic CT and DD formats

- Francs (MINOS, CFONB))
- Germany (DTAUS)
- UK (BACS)
- SWIFT (MT103)

z/OS example with sample JCL

Example to create interbank message from customer-bank messages.

The Pack for Sepa is supplied with reference data templates:

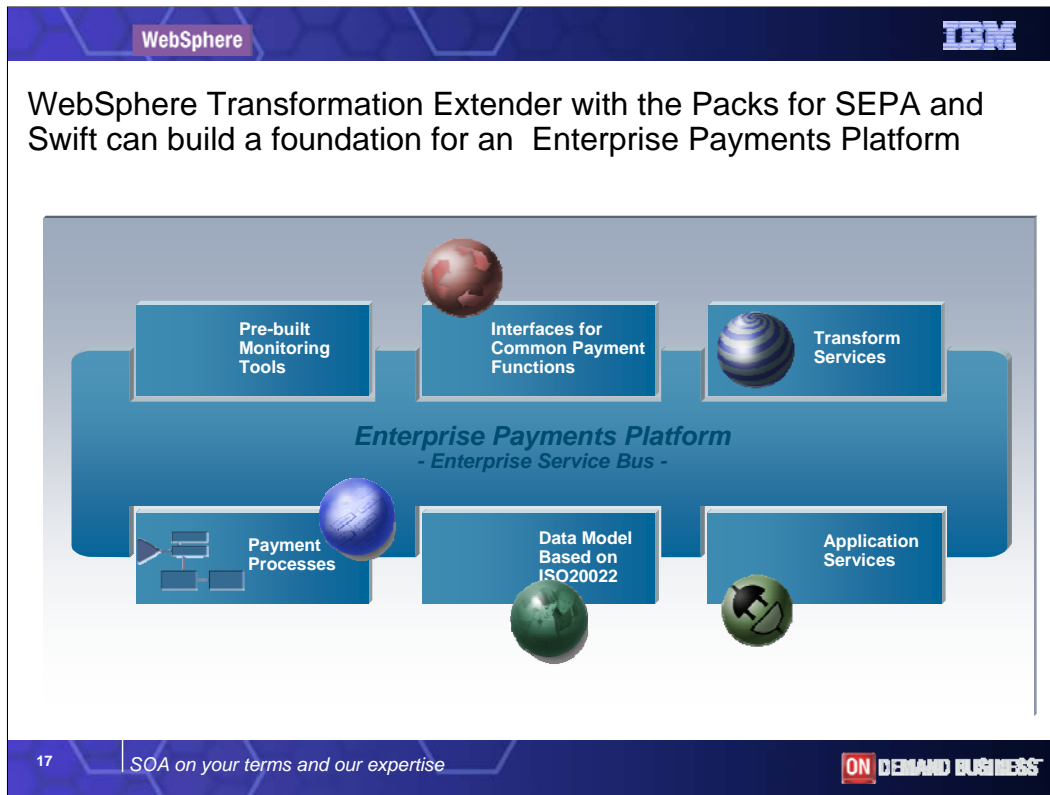
- bic.xml
- Currencycode decimals.xml

These files are used by the validation maps in the Pack to validate

- BIC
- Currency Code
- Country Code
- Allowed decimal places for currency amounts

The Pack contains maps to populate these XML lookup files from the SWIFT-provided BIC and Currency data files.

These files can be downloaded from the Swift website (www.swift.com) by registered users. Some implementations may have this information in databases, and its easy to replace or override. The file adapter for a database or application adapter.



WebSphere Transformation Extender is a key component in building the foundation for an Enterprise Payments Platform, Tailored to fit the clients needs with best of breed solution.

Add Business Process models for SEPA and ayments processing and execute in WebSphere Process Server, the lynchpin of IBMs Business Process Management / Automation solutions.

EPP Applies SOA to Payments

IBM WebSphere middleware provides the basis for building out the SOA. Of course, these products can be applied to any industry. When applied in the context of an SOA to be used for processing payments there are additional assets and services available which are be pre-built and pre-integrated on top of the SOA foundation. This assets and services are what the IBM enterprise payments platform (EPP) offers.

The EPP is designed to support open standards and business-oriented services based on SOA. By using open architectures and documented models, EPP supports a common definition of data and services thus allowing for phased and component based development and encouraging re-use and consistency across the enterprise.

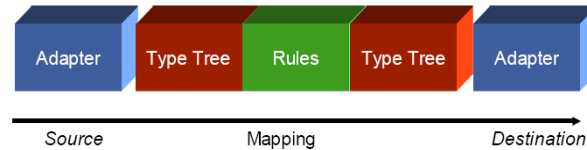
This solution platform provides a mechanism for financial institutions to renovate payment rules and process fl ows in a progressive manner to SOA. In addition, this platform provides by which IBM products, Independent Software Vendor (ISV) products and banks own services relate to each other for the purpose of payments renovation. For example, incorporated into the data model are the emerging standards which can be mapped in/out of in-house formats and country networks. This platform can also be extended with edge services gateways to provide the management necessary to maintain the many connections to corporate clients.

Agenda

- 1 Intro - Data transformation as a service
- 2 **Designing with WebSphere Transformation Extender**
- 3 Deploying WebSphere Transformation Extender

The agenda for today's teleconference is in three parts, an introductory discussion of the needs driving data transformation and validation as a service, followed by a high level walk through of the design studio tooling, Then I'll talk to the deployment scenarios for System z users.

Components of WebSphere Transformation Map



- A Type Tree is a graphical representation of input and output meta-data
- Rules define how a Source structure is transformed to a Destination structure
- An Adapter is a technical connector which can be “plugged” into a source or destination. The “File Adapter is built into the engine itself.
- Together these components form a “Map”

Lets look at the core components that go to make up a WebSphere TX transformation.

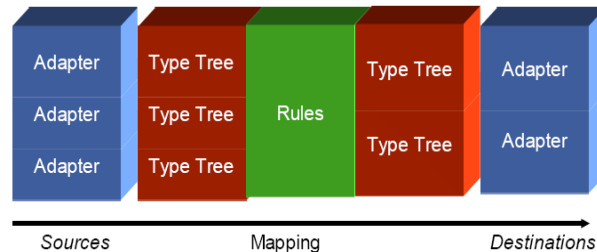
First there is the need to define the structure and syntax of the inputs and outputs. As the capabilities we need are rarely limited to self describing data like XML, we need to describe the formats of the inputs and outputs to the engine. These we call type trees. Later we will see the graphical designer with its import [and export] capabilities.

Functions and rules define the transformation itself. As we map from one type tree to another, these are saved as map source files, and we describe them as WebSphere TX maps.

For each input and output an “adapter” is defined. By default the engine supports a filesystem adapter which you can simply configure with the location directory and filetype. Adapters are associated with the maps but the map is not dependent on the adapter.

The source map is a file. It can be managed in any Source Code Management system. All the WTX artifacts are file based. There is no dependency on a repository database.

Many-to-Many Mappings



Conversion Maps - transform source to target formats

Functional Maps - called within maps for repeatable tasks

Validation Maps - check content on input or output

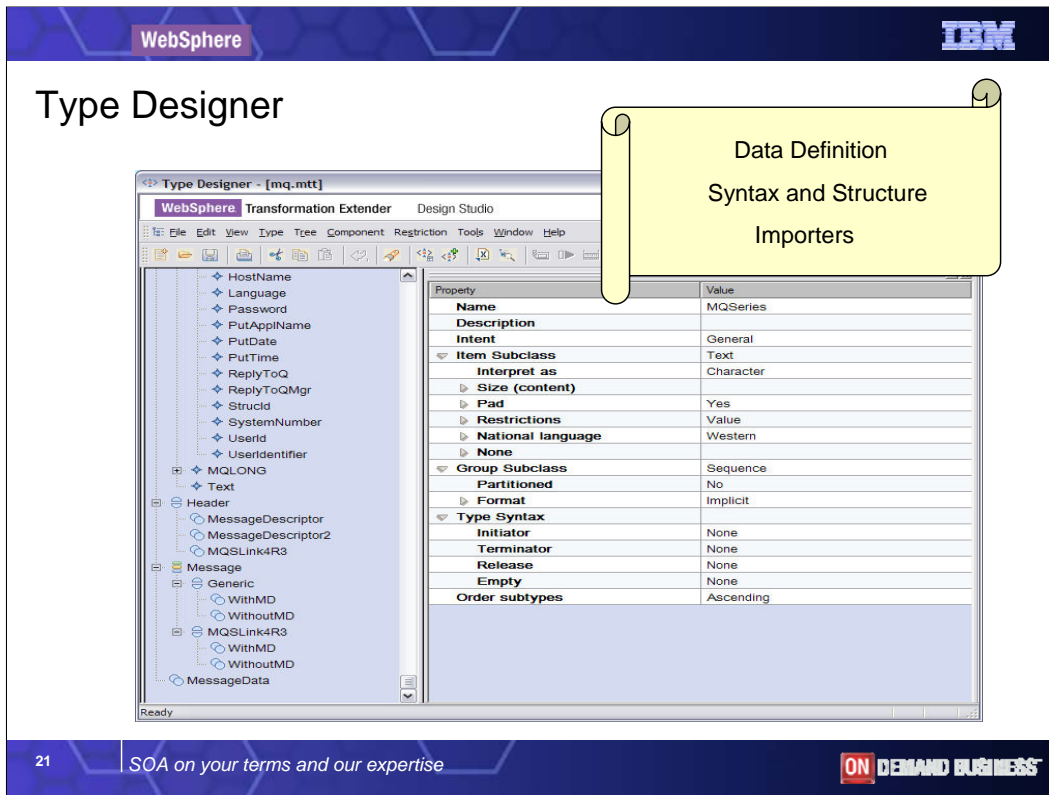
WebSphere TX is able to handle up to a 100 inputs and outputs, and each one needs to be associated with a type tree definition, and an adapter.

We describe the maps in various ways by usage. A transformation map is sometimes described as an application map or conversion map.

Functional maps have an equivalent role to subroutines in a program, they can be called by other maps to perform a repetitive set of common tasks. The function library contains a "RunMap" function to execute a function map from within another. For complex document processing this facility is essential for dividing up the transformation task into easily understood sub tasks.

And from version 8.1, the debugger provided can traverse these runmaps dropping into the functional maps and then back to the calling map.

Validation maps are regular maps with one-to-one mappings with input and output type trees the same and with validation rules assigned to check the content of the outputs. Some of Industry Packs also include validation applications.



The next few slides provide a quick tour through the basic design process for transformations using screenshots of the two main tools provided with the WebSphere TX Design Studio: Type Designer and Map Designer. All of the design work, analysing and functional testing of the transformation can be performed on the MS Windows desktop before deployment to a server.

First step in the design process is the data definition for your inputs and outputs. We use the Type Designer to define, modify, and view type trees.

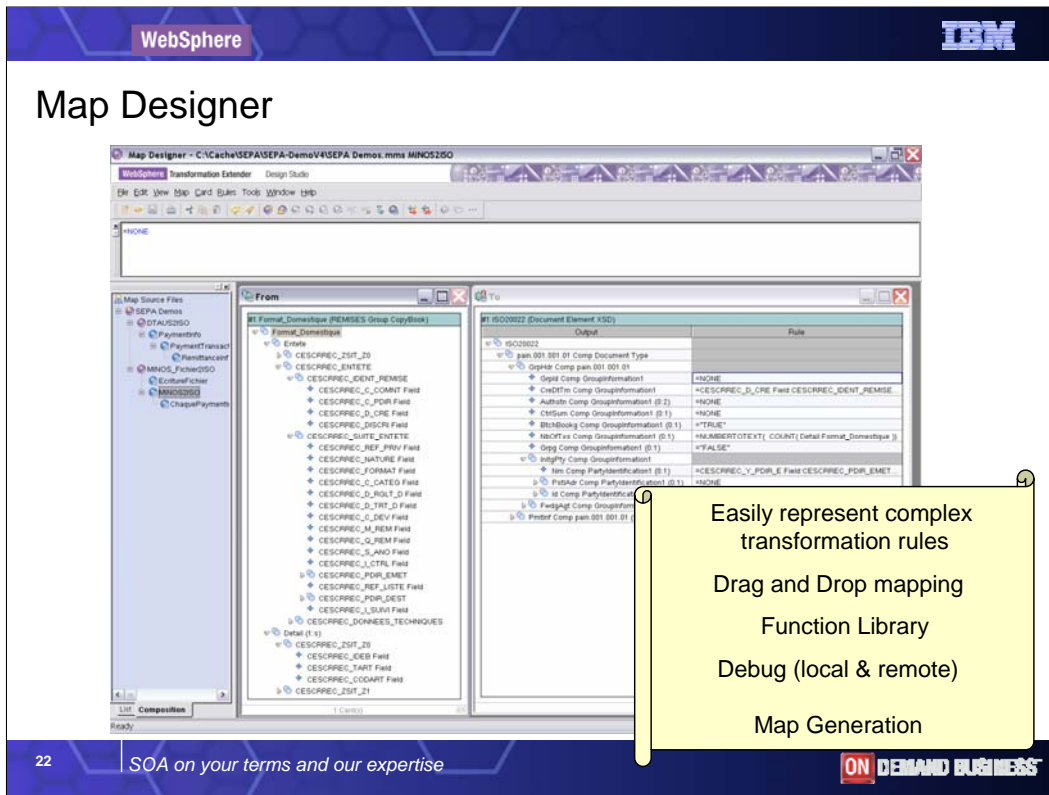
A type tree describes the syntax, structure, and semantics of your data.

The syntax of data refers to its format including tags, delimiters, terminators, and other characters that separate or identify sections of data.

The structure of data refers to its composition including repeating substructures and nested groupings.

The semantics of data refer to the meaning of the data including rules for data values, relationships among parts of a large data object, and error detection and recovery.

The Type Designer like other tools comes with command line utility commands to perform equivalent tasks.



The second tool used in the design process is the Map Designer. The Map Designer is a client component of the Design Studio that you use to develop maps that define input and output specifications and mapping rules for data transformation.

The Map Designer uses the definitions of data stored in type trees to specify the transformation logic in the form of map rules.

Map rules operate on input data objects and build output data objects.

The screenshot happens to show an example conversion between a COBOL copybook input and an XML output. The output is a new

Finance and Banking Industry standard exchange format for credit transfer payments across Europe, mandated within the EEC and the SEPA or Single Euro Payments Area directive. We have recently announced a WebSphere TX Pack for SEPA for use in Europe by banking institutions in France.

The “From” window shows the input and the “To” window shows the output format with a map rule field. Each field has a map rule specified to generate the output. Assigning rules is similar in some ways to how you specify macros and functions in a spreadsheet.

Simple mappings from input to output fields are performed with drag and drop. Fields can also be computed by selecting functions from the out of the box function library provided. In passing its worth noting that custom functions can be added to the WTX library if needed, although the range of functions is pretty broad including technical math, as well as functions that quiz the environment.

If you look at the From window .. You will see an example of how a function is defined to display as text, a count of the number of “detail” records contained in the input document ..and store the count as text string “nbofTXs” in the output record.

WebSphere **IBM**

Map Designer - Creating Transformation Rules

Predefined functions

Text Edit

Drag & Drop

Map Designer - C:\demo\General\Legacy\Error Handling.mms F_MakeNewOrderRecord

WebSphere Transformation Extender Design Studio

File Edit View Map Card Rules Tools Window Help

#F(WantDate Field LegacyRecord < ADDDAYS(CURRENTDATE(), 5),
OrderDate Field LegacyRecord,
WantDate Field LegacyRecord)

From

#2 XrefFile (XrefFile Data)

#1 LegacyRecord (LegacyRecord Data)

- OrderNumber Field
- CustomerID Field
- ShipToCode Field
- ContactName Field (0:1)
- OrderDate Field
- WantDate Field (0:1)
- CatalogNumber Field
- QtyOrdered Field
- UOM Field
- UnitPrice Field
- Message Field (0:2)

Insert Function

Category: All Categories

Functions:

- GETLOCALS
- GETPARTITIONNAME
- GETRESOURCECLASS
- GETRESOURCENAME
- GETTEXTALLDIRECTORY
- HANDLERIN
- HEXTEXTOSTREAM
- IF
- INDEX
- INDEXABS
- INT
- ISALPHA
- ISERROR
- ISLOWER

Evaluates a conditional expression, returning one value if true, another if false.

Syntax

```
IF ( single-condition-expression , single-general-expression [ , single-general-expression ] )
```

Meaning

```
IF ( test_this , result_if_true [ , result_if_false ] )
```

Returns (a single-item or single-group)

Output

Output	Rule
NewOrderRecord	
CustomerID Field	=LOOKUP(NewCustomerID Field_XrefFile, O...
ShipToCode Field	=TEXTTONUMBER(ShipToCode Field Legac...
OrderDate Field	=OrderDate Field LegacyRecord
WantDate Field	=F(WantDate Field LegacyRecord < ADDDA...
CatalogNumber Field	=CatalogNumber Field LegacyRecord
QtyOrdered Field	=QtyOrdered Field LegacyRecord
UOM Field	=UOM Field LegacyRecord
UnitPrice Field	=UnitPrice Field LegacyRecord
ExtendedPrice Field	=FOUND(QtyOrdered Field LegacyRecord * U...
ReceivedDate Field	=CURRENTDATE()
RoutingInfo Field	=NONE

23 SOA on your terms and our expertise **ON DEMAND BUSINESS**

Here's an example of a customer order transformation illustrating how you select predefined functions and use drag and drop to compose the rule. The complete rule is built up and viewed in a text editor. Notice the context sensitive help for the function library to help explain how each function is used.

Notice too there are two inputs and one output in this example. Input #2 has been titled Xreffile which suggests it contains lookup data, perhaps to complete an enumeration or convert a numeric code into a text description.

Here the quantity ordered and the unit price fields are drag and dropped to map to the output fields.

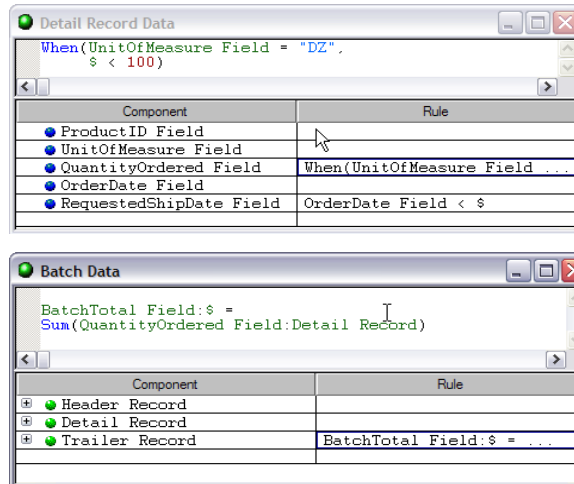
The wantDate field though is set to the order date if less than 5 days from the current date.

Map Designer - Built in validations

Component Rules allow cross-field validation

- Incorporates semantic validation directly into the parsing process

- Supports aggregate functions and computations



Here are some examples of the basic built in functions to create rules for cross validating fields. Semantic validation is the checking of the business sense of the data being transformed., eliminating the Need to write application code to perform this.

We should mention here that if you need to perform simple database or file look ups to conditionally insert content or validate the content, you can do so directly. For more complex lookups you can put such requests into a function Map especially if the same processing is going to be reused elsewhere.

Map Designer - Built in validations

Field Items have extensive validation options

- Enumerations
- Exclusions (with substitution)
- Patterns
- Ranges

Include	Description
EA	Each
BX	Box
CS	Case
DZ	Dozen
FT	Foot

Exclude	Reference Str
'	"
"	'

Include First	Include After
<DIGIT>	<DIGIT>-

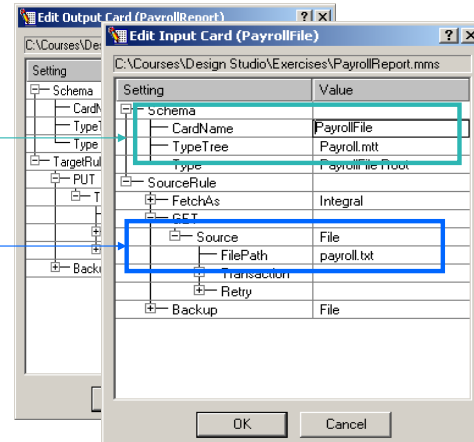
Include Min...	Include Ma...	Description
0	100	

There are some built in validations to check enumerations, exclude and include valid content, and check ranges.

Map Designer - Input and Output Cards define data sources and destinations

Identify type tree and type tree components that define data target

Identify adapter type of data and location of data



In the previous screenshots you see the From and To windows that correspond to input and output “cards”.

Cards are a WebSphere TX term for defining sources and targets. Having completed the transformation aspects the next step in the design process is to associate the source and target adapter sources to be used. Here you can see The “edit Input card” dialog .

The content of an input card is defined with the **CardName**, **TypeTree** and **Type** settings. These settings define what the data is, but you can also specify how to retrieve the data. For example you can be set to retrieve all data from a source or to receive it in user defined bursts where supported by the specific adapter.

The content of an input can be a *data object* such as a table of patient records in a relational database, a message that contains a mortgage application, or a file of item master update records that is transferred from another location using the FTP adapter.


There is support for resource aliases for filepaths, and command line override of paths specified in the paths.

There is a resource manager tool to graphically set up resource aliases.. Helpful to redeploy the same maps to Different environments such as development, test, staging and production you may have in your development process.

WebSphere IBM

Out of the box connectivity

- Archive (Tar)
- Archive (Zip)
- Base64
- Batch File and Shell Script
- BEA MessageQ
- BEA Tuxedo
- CICS (3270 bridge)
- COM Automation
- CORBA
- DB2
- E-mail (IBM Lotus Notes)
- E-Mail (SNMP)
- File
- FS Manager
- FTP
- GZIP/ZLIB
- HTTP
- IBM WebSphere MQ
- IBM WebSphere Quality Stage
- Informix
- J2EE Connector Architecture Gateway (JCA)
- Java Class
- Java Message Service (JMS)
- JNDI
- Microsoft SQL Server
- MIME
- MSMQ
- ODBC
- OLE DB
- Oracle
- Oracle AQ
- Quoted-Printable
- Shell Script
- Sink
- SOAP
- Socket
- Sybase SQL Server
- TIBCO Rendezvous
- VAN



Native z/OS support for File (Sequential file and VSAM), DB2, WebSphere MQ and FTP

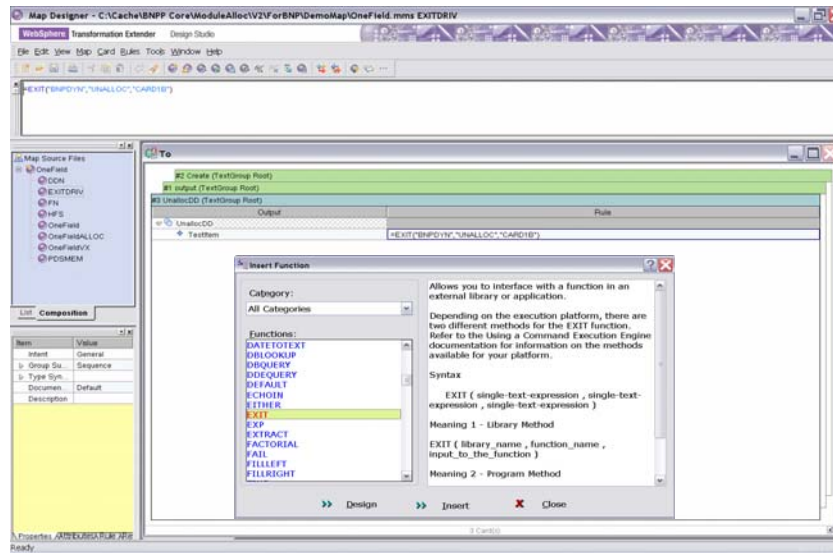
27 SOA on your terms and our expertise **ON DEMAND BUSINESS**

Here's a summary of technical adapters and connectivity solutions available, most are out of the box. There is also a secure adapters optional Pack. Some Adapters are used together such as SOAP and HTTP.

We have not yet covered the different run time editions of WebSphere TX but when used with the native z/OS a subset of the adapters most commonly used are File, DB2, WebSphere MQ, and FTP.

The CICS adapter allows you to retrieve CICS screen data using a 3270 bridge transaction over TCP/IP. Using the CICS adapter with type trees generated from CICS BMS maps you can send data to and retrieve data from CICS transactions. This CICS adapter is not required for WTX to participate in CICS transactions though. More of this later in the presentation.

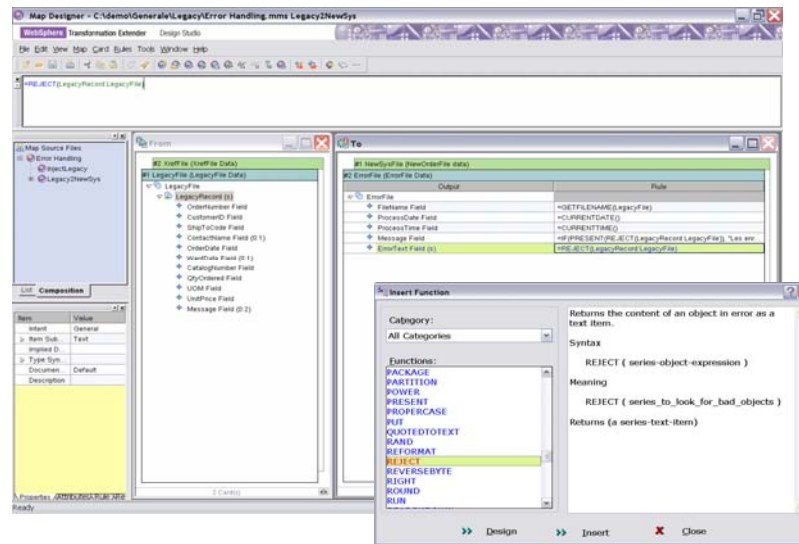
Call External programs from Maps



An important feature to note the function library is divided into categories for easy selection. Here you can see - external applications or functions in libraries can be called using an EXIT function. This extensibility also adds to its claim of being universally applicable.

Handling Input Errors

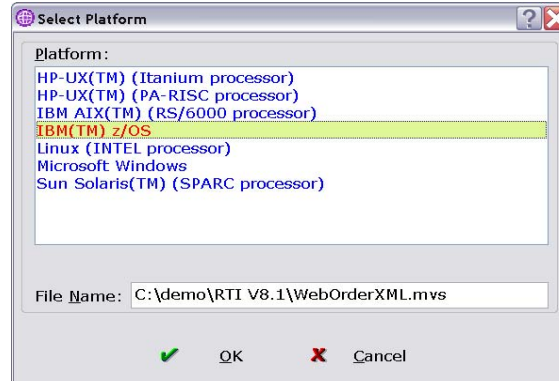
- *Stop on error or continue processing*
- *Generate reports as outputs*
- *Audit Log capability*



You also have built in capabilities for logging, and levels of tracing which can be turned on or off, as you would expect. The power of maps means you can easily generate custom reports. Here the REJECT is one of half a dozen general purpose error handling functions.

Build Map

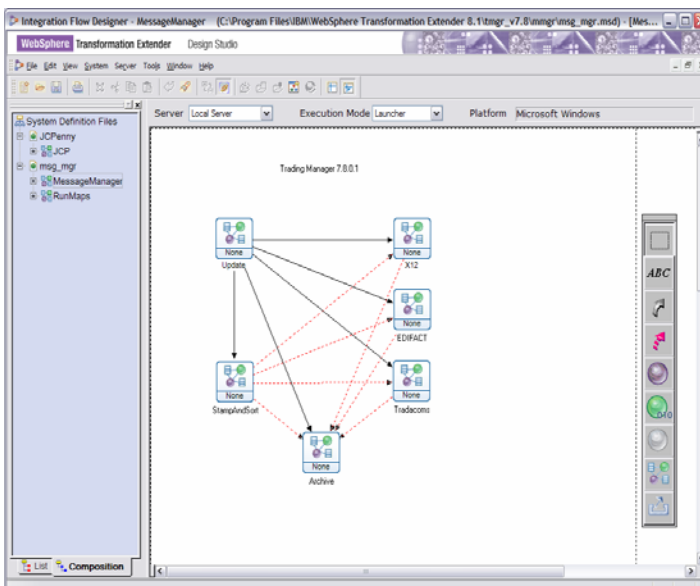
- Analyzes logical interfaces within map rule
 - Build errors prevent map from being compiled
 - Build warnings alert of condition that might be problematic
- Creates compiled map file
 - For current platform
 - For selected platform, which accounts for byte-order and character set differences on that platform



from the Map Designer you can analyse and build the map and test it with your sample data files for inputs and outputs before compiling for the target server platform.

Integration Flow Designer

- combine collections of maps and run them as a single unit ("system")
- Primarily used with Launcher Edition
- Similar function to Message Broker Flow Designer
- Can generate command files for Command Servers
- Systems saved as .msd files.



31

SOA on your terms and our expertise

ON DEMAND BUSINESS

The Integration Flow designer is similar to those of you who are familiar with the WebSphere Message Broker Flow designer... here you can design

Graphically the sequence of calls to related map files. It combines the collection of maps and saves to a system file. Its main purpose is as a

Client interface to the Launcher edition of WebSphere Transformation Extender which is the event driven transformation service.

It can also help generate command execution files for the Command Server edition, but is not a pre-requisite, like for the Launcher.

Users of WebSphere Message Broker would use the Message Broker Flow Designer.

Similarly, when you combine WebSphere Transformation Extender with the WebSphere ESB or WebSphere Process Server, WebSphere TX maps

Can be executed from the process execution engine they provide, each top-level map acts as a business process activity.

Agenda

- 1 Intro - Data transformation as a service
- 2 Designing with WebSphere Transformation Extender
- 3 **Deploying WebSphere Transformation Extender**

The agenda for today's teleconference is in three parts , an introductory discussion of the needs driving data transformation and validation as a service, followed by a high level walk through of the design studio tooling, Then ill talk to the deployment scenarios for System z users.

WebSphere Transformation for z/OS

- ✓ Increased productivity
- ✓ Simplified maintenance of transformations
- ✓ Compilation and graphical debugging managed within the WTX Design Studio
- ✓ Native execution options on z systems

The image displays two screenshots from the WebSphere Transformation Studio (WTS) interface. The left screenshot shows the 'Map Designer' window with a transformation editor. The top pane shows the source data fields, and the bottom pane shows the target data fields. The right screenshot shows the 'TEST ANALYZER' window, which displays a table of test results. The table has columns for 'Display', 'Status', 'View', 'Error', 'Options', and 'Help'. The test results show a successful execution with a status of 'PASS' and a message of 'COMPILED SUCCESSFULLY'.

Compared to

33

SOA on your terms and our expertise

Moving into the realm of z/OS, the design studio we have just covered runs on a Windows desktop, the transformations can be analysed, debugged, and functionally tested

Before they need to be deployed to the runtime system. No design takes place on the mainframe itself. A system administrator for the Z System will prove useful for

Configuring the particular z environment in terms of memory allocation and file space. The next set of charts walk through the various deployment scenarios.

WebSphere TX for Z/OS -Batch

- WebSphere TX engine is executed using JCL

```
// SET WTXLIB=L333703.WTX.REL8.XPL.LOAD <= WTX LOAD LIB
// DSTX EXEC PGM=DSTX,REGION=0M,
// PARM='SEPA2APP /IF1 INPTSEPA'
// STEPLIB DD DISP=SHR,DSN=&WTXLIB
```

- Supports the following Adapters

- ✓ Files (QSAM, VSAM)
- ✓ WebSphere MQ
- ✓ DB2
- ✓ FTP

- EXIT function allows existing COBOL and C programs to be called from a WebSphereTX Map

- installation

- ✓ Transfer the WebSphere TX Load Lib to z/OS
- ✓ Issue the TSO RECEIVE command
i.e. RECEIVE INDA('WTX.LOAD.LIB')



Content in chart.

WebSphere TX for Z/OS -Batch continued

- Administration is through standard z tools (ISPF, etc.)

- ✓ No need to learn a new monitoring tool

- No permanent active processes

- ✓ WTX is only active when called by the JCL

- ✓ When the map transformation ends WTX is no longer active

- Integrate seamlessly into existing production procedures

- ✓ Does not require changes to customer job and system administration processes

The image shows two screenshots of a z/OS console window. The top screenshot displays the 'SDSF STATUS DISPLAY ALL CLASSES' command output, showing a table of job classes with columns for Job ID, Owner, Priority, Queue, Class, Position, Start Time, and Step Status. The bottom screenshot displays the 'SDSF JOB DATA SET DISPLAY - JOB KORQUOT1 (JOB00260)' command output, showing a table of job data sets with columns for Job ID, Step Name, Proc Step, OSID, Owner, Class, Destination, and Record Count.

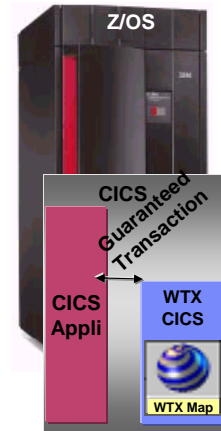
Job ID	Owner	Priority	Queue	Class	Position	Start Time	Step Status
KORQUOT1 JOB00260	KORQUOT	8	EXECUTION	A		ZT01	
KORQUOT1 TSU00264	KORQUOT	15	EXECUTION	A		ZT01	
KORQUOT1 TSU00266	KORQUOT	1	PRINT	A		216	
KORQUOT1 JOB00265	KORQUOT	1	PRINT	A		509	

Job ID	Step Name	Proc Step	OSID	Owner	Class	Destination	Record Count	Page
JESMSJLG	JES2	2	KORQUOT	A		4		
JESJCL	JES2	3	KORQUOT	A		178		
JESYMSG	JES2	4	KORQUOT	A		0		
DSTALOG	DSTX	101	KORQUOT	A		0		
DSTFIND	DSTX	102	KORQUOT	A		0		
SVSOUT	DSTX	105	KORQUOT	A		0		

WebSphere TX and CICS

- Runs native in CICS – inline and batch modes
- Transactional execution with CICS transaction
- Supports natively
 - ✓ VSAM Files
 - key-sequenced
 - entry-sequenced
 - relative-record data sets
 - ✓ DB2
 - ✓ WebSphere MQ
 - ✓ Transient data queues
 - ✓ Temporary storage queues
 - ✓ Storage buffers (COMMAREA)

- EXIT function allows existing COBOL and C programs to be called from a WTX Map



Content in chart

Installation

Transfer the WTX CICS Load Lib to z/OS

Issue the TSO RECEIVE command, i.e. RECEIVE INDA('WTXCICS.LOADLIB')

Transfer WTX RDO definitions (DSTXCICS.tbl) to z/OS in order to update the CICS CSD definitions

Transfer DSTXCICS.tbl to z/OS in order to define through IDCAMS the VSAM key-sequenced data set (KSDS) where WTX CICS maps will be stored for use in the z/OS CICS region

More details in release notes.

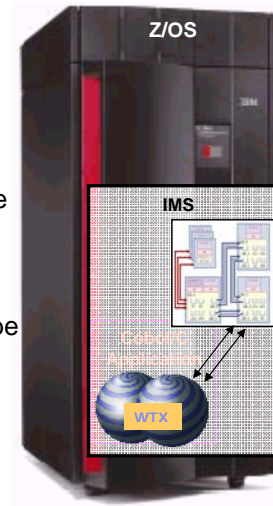
WebSphere TX and CICS continued

- WebSphere TX z/OS CICS can be invoked:
 - ✓ From a clear terminal by using the **DSTX** transaction
 - i.e. DSTX MYMAP -IF1 INPUTF
 - ✓ From a user program by starting the **DSTX** transaction in the **EXEC CICS START** command
 - ✓ From a trigger transient data queue by initiating the **DSTX** transaction
 - ✓ By calling the **DSTXCICS** program through an **EXEC CICS LINK**
- Administration is through standard z tools (CEBR, etc.)
- Integrates seamlessly into existing production procedures

Content in chart

WebSphere TX for Z/OS – IMS TM & IMS/DC

- Allows WTX Maps to be programmatically executed through IMS
- Relies on WTX Platform APIs and high-level language programs
- C/C++ and COBOL programs can invoke WTX through the IMS execution option
- WTX Maps participate in the IMS transaction
- EXIT function allows existing COBOL and C programs to be called from a WTX Map



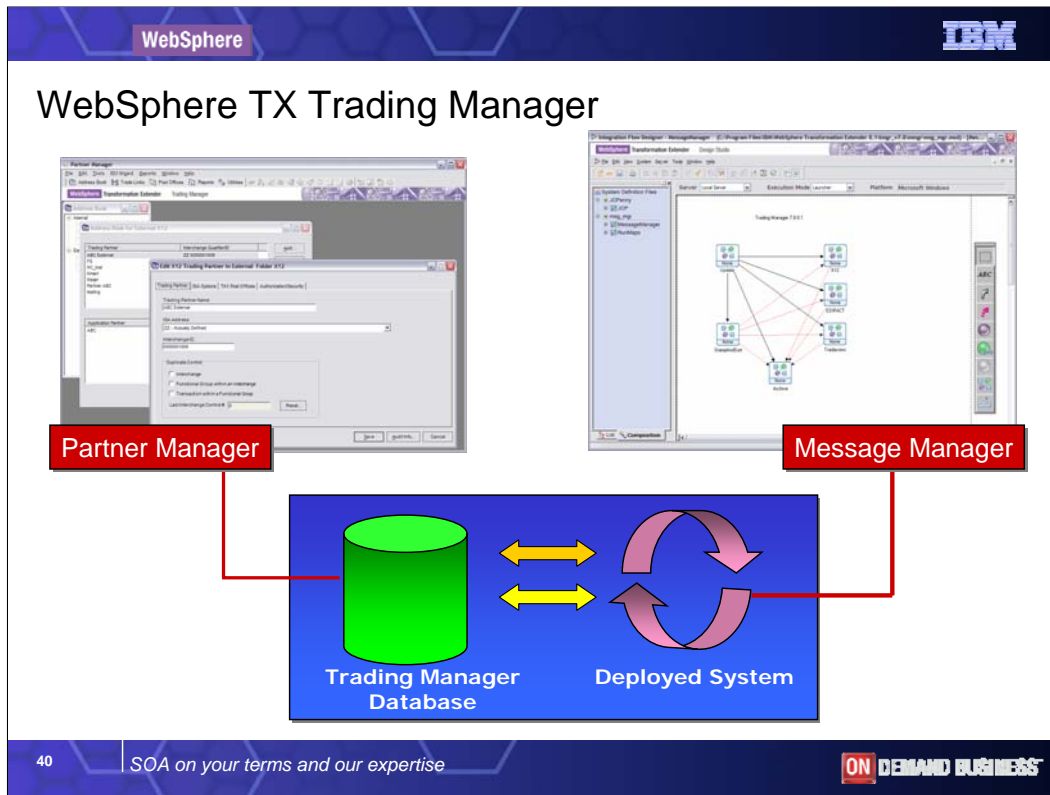
Content in chart

WebSphere TX with Launcher (USS)

- Event-driven server
- WTX Launcher process is always active waiting for events to occur
- Supported Event-based Triggering
 - ✓ Time events – Single instance or Recurring
 - ✓ Source events – Files, WebSphere MQ, Oracle
 - ✓ Compound Events
 - Multiple sources
 - Source and time
- Supports the following adapters on z/OS
 - ✓ Files (hierarchical and native file systems)
 - ✓ DB2 (MVS & CLI)
 - ✓ FTP
 - ✓ WebSphere MQ
 - ✓ CICS (3270 Bridge Adapter)
 - ✓ EMAIL



Content in chart



WebSphere Transformation Extender Trading Manager is an EDI Hub application of WTX with Launcher, for EDI with support for HIPAA EDI Pack.

The Message Manager system has several basic functions for processing e-commerce data;

Validate: Utilizing EDI version specific type trees, the Message Manager systems of maps will validate inbound and outbound data against these trees such as X12Mail.mt

Archive: All inbound and outbound data will archived to a *.zip file in a Windows environment and to a *.tar file in a UNIX environment. **Note:** Archived data can be restored for reprocessing if necessary.

Route Data: Message Manager will route both inbound and outbound data according to the Post Offices defined in the Partner Manager Database.

Error Handling: Message Manager will reject and produce reports for any inbound or outbound data that does not match either the Trading Partner information in the Partner Manager data base or if the data fails the validation process.

Auditing: As Message Manager processes e-commerce data audit information will be captured and written to the Partner Manager Database.

Features:

Use Database of Choice

MS SQL Server, DB2, Oracle, Sybase, Access

Works hand-in-hand with WebSphere TX with Launcher

Multiple Post Offices

File, e-mail, FTP, VAN, HTTP, Messaging

User Security

Document Level Routing per Trading Partner

Partner XML Auto Load Utility

Ability to Edit/Resend Data

Automatic 997/CONTRL Creation and Reconciliation

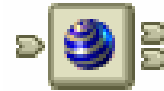
Control Segment Validation

Validates number of segments

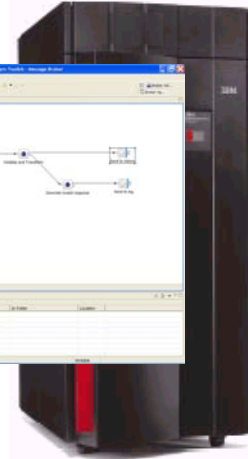
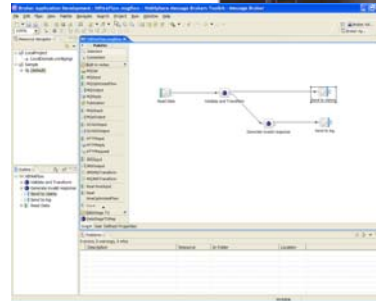
Validates control number

duplicate interchange control number checking

WTX for Message Broker for zOS (USS)



- Parser
 - ✓ Transforms bit streams to Message Trees (MQInput) and Message Trees to bit streams (MQOutput)
 - ✓ Transforms Message Trees to Message Trees (RCD)
- Mapping node
 - ✓ Easy configuration
 - ✓ Icon installs into Message Flow palette
 - ✓ Each TX Node in a Message flow executes a TX Map
 - ✓ Use Message Brokers universal connectivity options
- WebSphere TX Design Studio
 - ✓ creates the maps for Message Flow Designer



WebSphere TX V8.1 deployment editions

Scenario/ Offering	Execution Method
Application programming and embedding WebSphere Transformation Extender	<ul style="list-style-type: none"> •API: COBOL, C, C++, Java, RMI, COM •As EJB in J2EE environments) •Native z/Series support
Scheduled / batch processing WebSphere Transformation Extender with Command Server	<ul style="list-style-type: none"> •JCL, UNIX scripts •CICS , IMS •Native z/Series support.
Near realtime event-driven transformation service WebSphere Transformation Extender with Launcher	<ul style="list-style-type: none"> •Event-driven server •Self contained server •Includes Command Server •USS z/Series
Extended ESB WebSphere Transformation Extender for Message Broker	<ul style="list-style-type: none"> •Message/ Event driven •Requires WS Message Broker •USS z/Series

Microsoft Windows ,AIX, Red Hat & SUSE Enterprise Linux Solaris ,HP-UX (PA-RISC, ITANIUM), z/OS

Deployment scenario summary- Content in chart

Why is WebSphere Transformation Extender the right solution?

With WebSphere TX you eliminate the need of custom programming for integrating and transforming data regardless of complexity

You leverage powerful graphical facilities.

You have flexible deployment – from Windows to UNIX to Mainframe; Deploy where needed in a Service Oriented Architecture

You have product-based maintenance updates to WebSphere Industry Packs

You have the capability to respond quickly and with flexibility to rapidly evolving, strategic business requirement

You have the ability to leverage the value of your data, applications and enterprise systems to their fullest potential

In conclusion, let's briefly summarize our discussion of WebSphere TX:

You leverage powerful graphical facilities.

You have the capability to respond quickly and with flexibility to rapidly evolving, strategic business requirement

You deploy your data integration where you need it in an open architecture.

You can support high-performance, scalable and secure operation across both centralized and decentralized environments

Finally All of these value propositions enable you to leverage the value of your data, applications and enterprise systems to their fullest potential.

Business Benefits Summary

- Industry compliance solutions that leverage a standards-based approach to enterprise data integration provide:
 - ✓ The **Fastest Time** to market and **Highest Value** impact
 - ✓ The **Easiest** to maintain and most **Responsive** to changes
 - ✓ The **Highest ROI** in terms of technology, hardware and personnel
 - ✓ **Extremely Scalable** and **Reliable** solutions adaptable to existing IT infrastructures
 - ✓ Support for the **Complexity** of integration paradigms

LOWER COST OF OVERALL OWNERSHIP
LOWEST-RISK INTEGRATION APPROACH
GREATEST OPPORTUNITY FOR SUCCESS

www.ibm.com/software/integration/wtx/

From a business perspective, WebSphere Transformation Extender exhibits a high return on investment for many customers

both for initial deployment, then year on year maintenance. In many cases it provides a non intrusive, non disruptive integration solution.

Should you change hardware platforms, investment in transformation logic is protected as it is easily transferable. Maps created on

Earlier versions of the product are easily migrated to new versions. It does not need a dedicated server or database for its own use.

WebSphere 



- IBM WebSphere Transformation Extender
 - ✓ www.ibm.com/software/integration/wtx/

Thank
YOU



45 *SOA on your terms and our expertise* **ON DEMAND BUSINESS**

Thank you. I hope that has been of interest

Our website address is www.ibm.com/software/integration/wtx/

Please contact your IBM Sales representative to discuss how WebSphere Transformation can transform your organization