

SAP NetWeaver Process Integration 7.1
New Capability – XML Validation



SAP NetWeaver Regional Implementation Group
SAP NetWeaver Product Management
December 2007

THE BEST-RUN BUSINESSES RUN SAP™



After reading this document, you will be able to:

- Understand the architecture of the XML payload validation within SAP NetWeaver Process Integration
- Configure XML payload validation for synchronous and asynchronous messages in inbound and outbound message processing
- Understand the key benefits that SAP NetWeaver Process Integration provides for XML payload validation

Agenda



1. **Overview**
2. **Syntax Validation**
3. **Configuration**
4. **Error Handling**
5. **Excercise**
6. **Summary**

Agenda



1. **Overview**
2. **Syntax Validation**
3. **Configuration**
4. **Error Handling**
5. **Excercise**
6. **Summary**



- **XML Validation allows you to check the structure of a PI message payload**
- **Required by Industry Standards (RosettaNet, CIDX, ...)**
- **Demanded by Customers**
- **Completion of PI functionality**
- **Used for ...**
 - **internal integration (A2A)**
 - **external integration (B2B)**
- **Validate incoming messages against their XML schemata**
- **Validate outgoing messages against their XML schemata**

- XML Validation allows you to check the structure of a PI message payload. The structure check is performed using saved data types.
- Many external standards such as Rosettanet and CIDX Industry Standards, explicitly specify the requirement for validating XML messages at the various stages of the message processing.
- This feature is demanded by the customers.
- XML Validation is used for the internal A2A integration and for the external B2B integration.
- Syntax validation of the incoming message payload is done at the Advanced Adapter Engine and at the Integration Engine against their XML Schema stored in the File System.
- Syntax validation of outgoing message payload is done at the Integration Engine against their XML Schema stored in the File System.



XML Payload Validation

- XML Validation is one of the major new capabilities of SAP Netweaver PI 7.1
- Validate incoming/outgoing messages against XML schema
- Forward/Backward error handling

Edit Sender Agreement Status: Being Processed en

Sender

Partner: AFU_Bank

Service: Fileadapter_AFU

Interface: DE_MT940_INTERFACE_ABSTRACT

Namensraum: http://sap.com/xi/AP/Globalization

Receiver

Partner:

Service: AEL_100

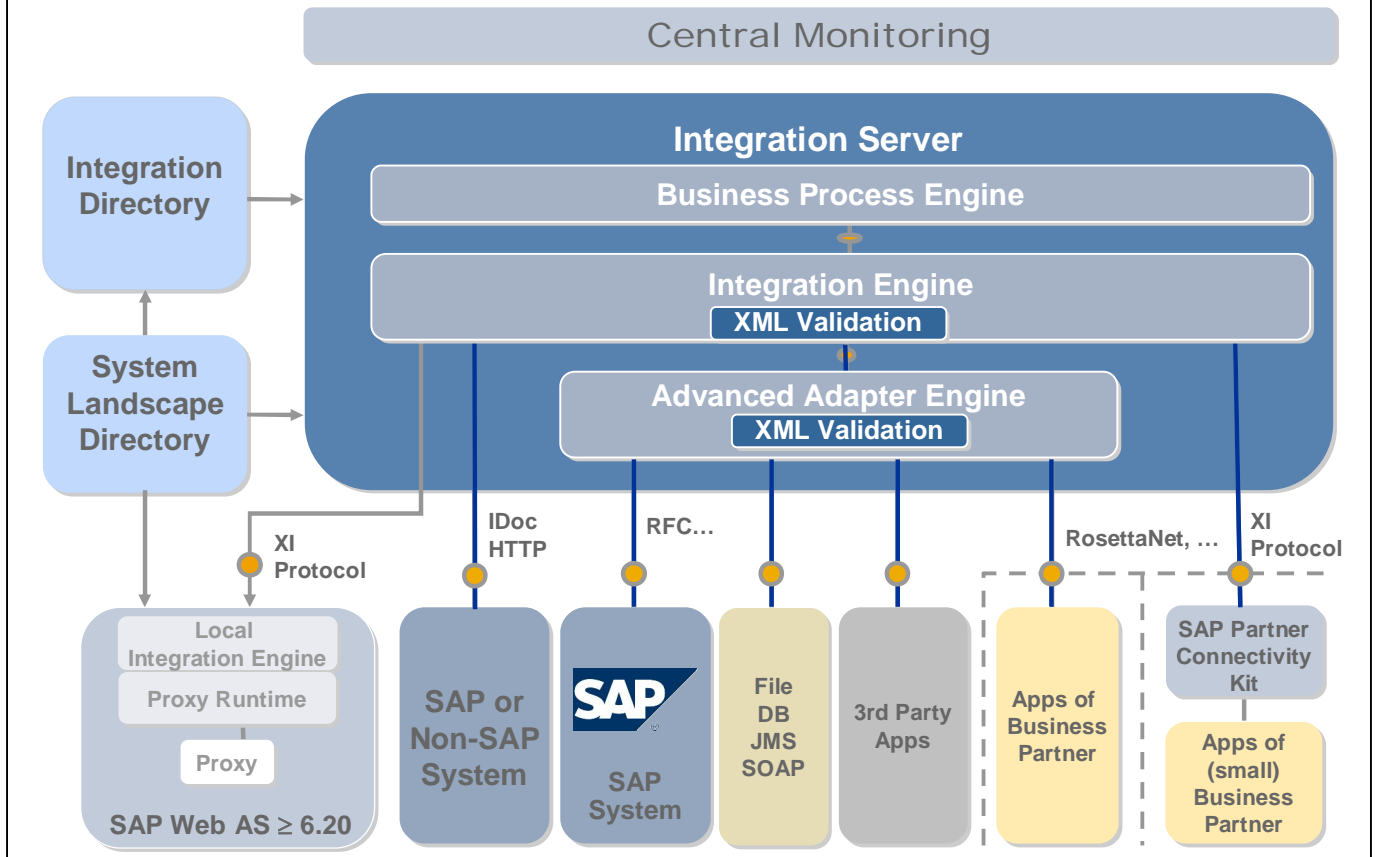
Description:

Parameters Assigned Users

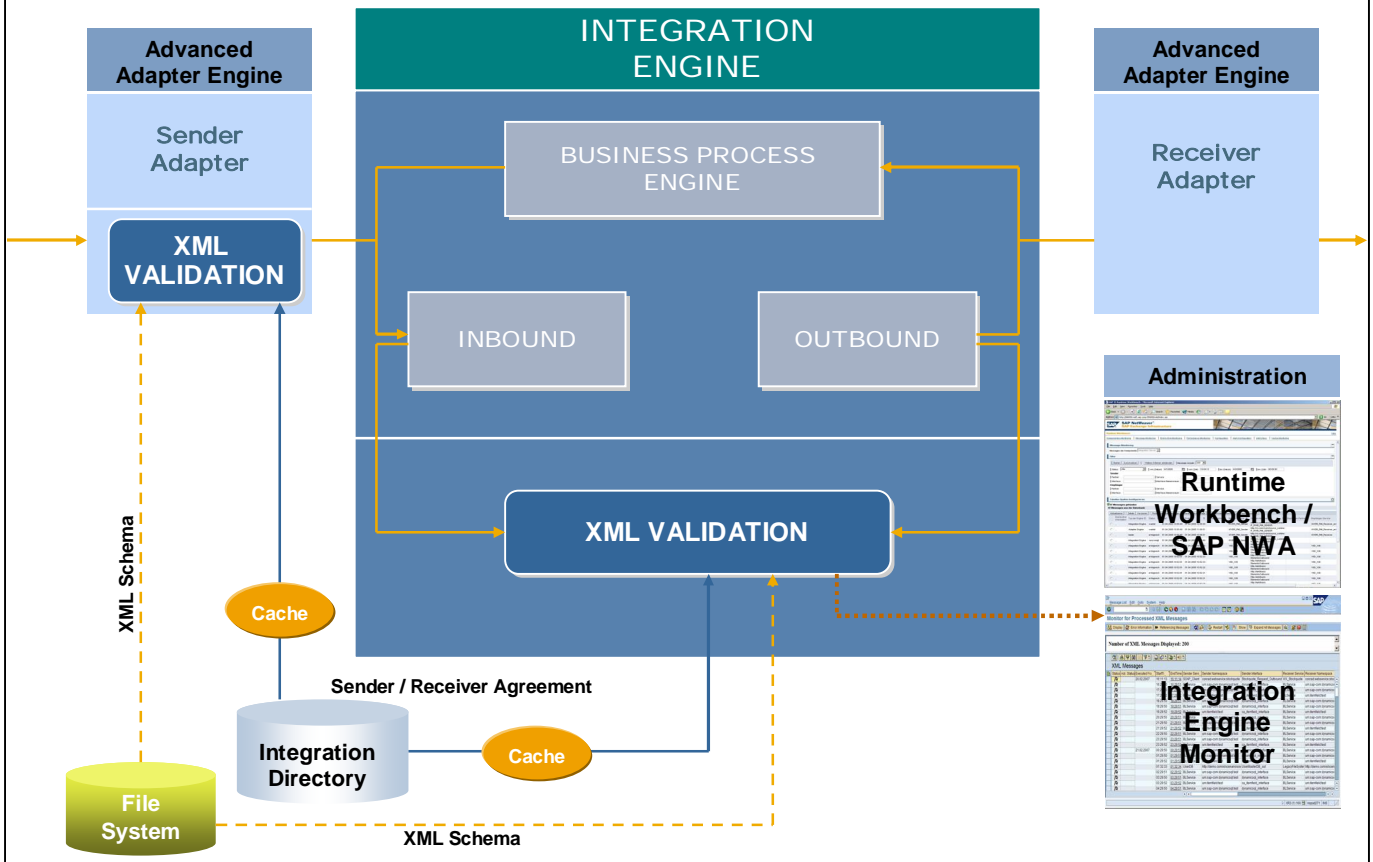
Sender Communication Channel * MT940_DE_IN_CHANNEL

Software Component Version: SAP_GLOBALIZATION_7.10

Validation Mode: No Validation Validation by Adapter Validation by Integration Engine



- XML Validation can be performed at three different points in the PI message processing.
- In the Inbound processing message is validated at the Advanced Adapter Engine or at the Integration Engine.
- Validation at the Advanced Adapter Engine: When the inbound message enters the adapter (AAE & IS), the adapter converts the adapter specific wire format into an XI message. The payload of this message can be validated against the configured schema.
- Validation in the Integration Engine: In the inbound processing the message is validated in the IE as a new step in the pipeline. The syntax validator checks the payload against the configured schema.
- In outbound processing the message is validated in the IE as a new step in the pipeline. The syntax validator checks the payload against the configured schema.



- The data types that are used for validation come from the Enterprise Services Repository. The schemas for validation are exported from the Enterprise Services Repository and are saved in the file system in the PI root folder.
- Validation in the sender adapter

If the sender adapter has created the PI message, you can then perform the validation of the PI payload. If the structure of the payload differs from the definition of the data type provided for comparison, message processing is stopped. The adapter sends a synchronous response to the sender of the message, informing it about the structure error. The industry-specific adapters inform the sender asynchronously, as required by the RNIF protocol and the CIDX protocol.

All sender adapters (including non-SAP adapters) can perform this validation.
- Validation in the Integration Engine

In inbound and outbound processing, validation of the PI message payload takes place as a pipeline step of the Integration Engine. If the structure of the message payload does not match the saved definition of the data type, an error description is generated. The error description contains status information and a list of all structure errors. Message processing is stopped. The message is set to error status and an error report is saved.

Agenda



1. Overview
2. **Syntax Validation**
3. Configuration
4. Error Handling
5. Excercise
6. Summary



Asynchronous messages

- **Outbound Validation (Sender)**
 - **Validation in the Advanced Adapter Engine**
 - **Validation in the Integration Engine**

- **Inbound Validation (Receiver)**
 - **Validation in the Integration Engine**

Synchronous messages

- **Both request and response payloads can be validated against syntax**
- **Validation is done in the Advanced Adapter Engine for Outbound (Sender)**
- **Validation is done in the Integration Engine for Inbound (Receiver)**

- In case of asynchronous messages the inbound validation of the PI message payload is done at the Advanced Adapter Engine or at the Integration Engine
- The outbound validation of asynchronous messages is done in the Integration Engine.
- Synchronous messages consist of a request and a response payload, which are processed in a synchronous call. Both payloads can only be validated together



Prerequisite:

- RFC destination for AI_VALIDATION_JCOSERVER on AS ABAP and AS Java must be created

For Validation on the Integration Server

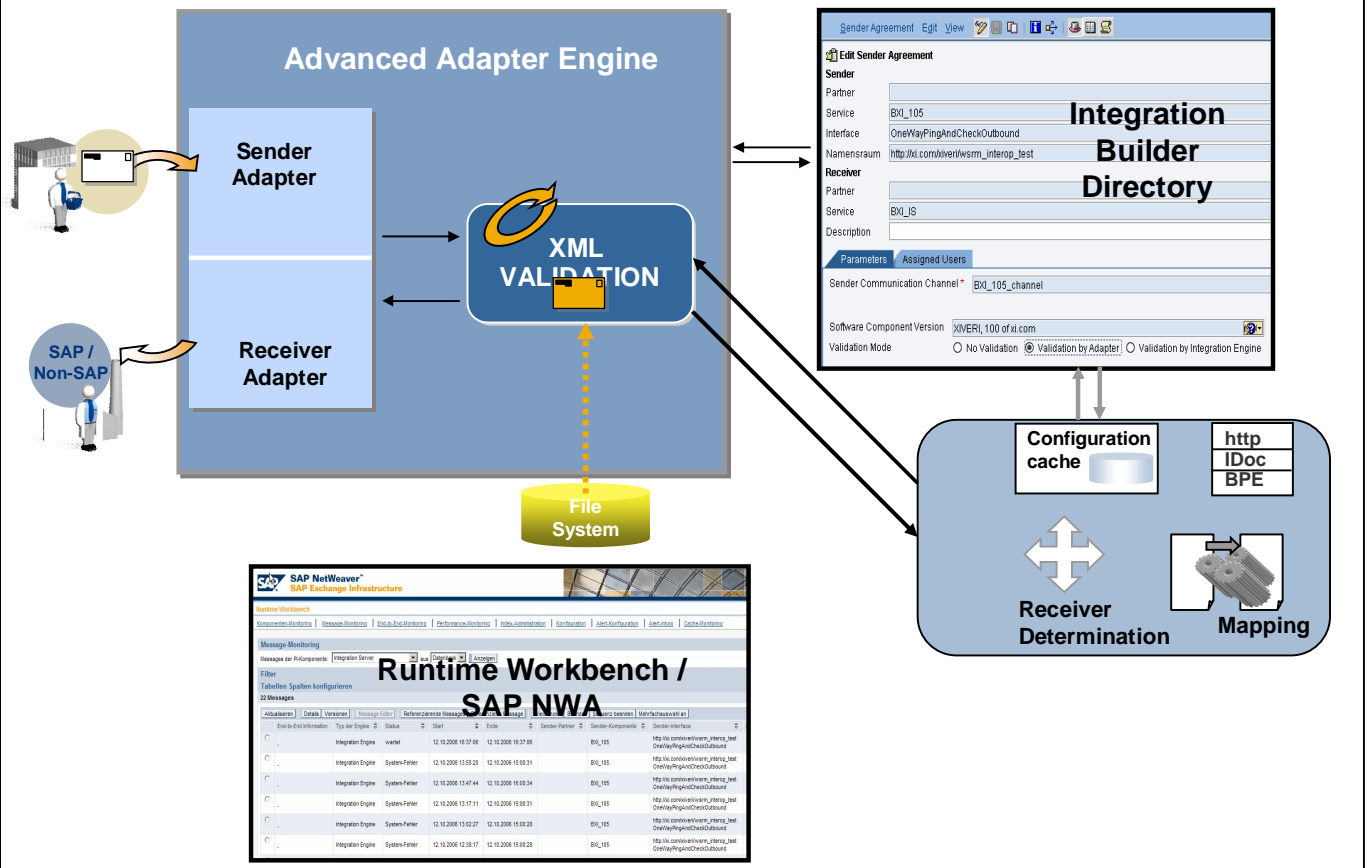
- **The Schemas from the ES Repository must be saved under**
/validation/schema/<GUID of software component version to which Service Interface is assigned>/<Repository Namespace of Service Interface>
under the directory <sysdir>/xi/runtime_server

For Validation on the Central AAE or Non-central AAE

- **The Schemas from the ES Repository must be saved under**
/validation/schema/<GUID of software component version to which Service Interface is assigned>/<Repository Namespace of Service Interface>
under the directory <sap installation directory>/<system id>/<instance number>/j2ee/cluster/server0 for a non clustered installation of JEE Engine

- For XML validation, you must save the required schemas from the Enterprise Services Repository in the file system by creating the following directory structure:
- For validation on the Integration Server, create the directory **/validation/schema/<GUID of software component version to which Service Interface is assigned>/<Repository Namespace of Service Interface>** under the directory <sysdir>/xi/runtime_server.
- For validation on the central and non-central Advanced Adapter Engine, create the directory **/validation/schema/<GUID of software component version to which Service Interface is assigned>/<Repository Namespace of Service Interface>** under the directory <sap installation directory>/<system id>/<instance number>/j2ee/cluster/server0 for a non clustered installation of JEE Engine

Syntax Validation: Advanced Adapter Engine



Validation at the Adapter

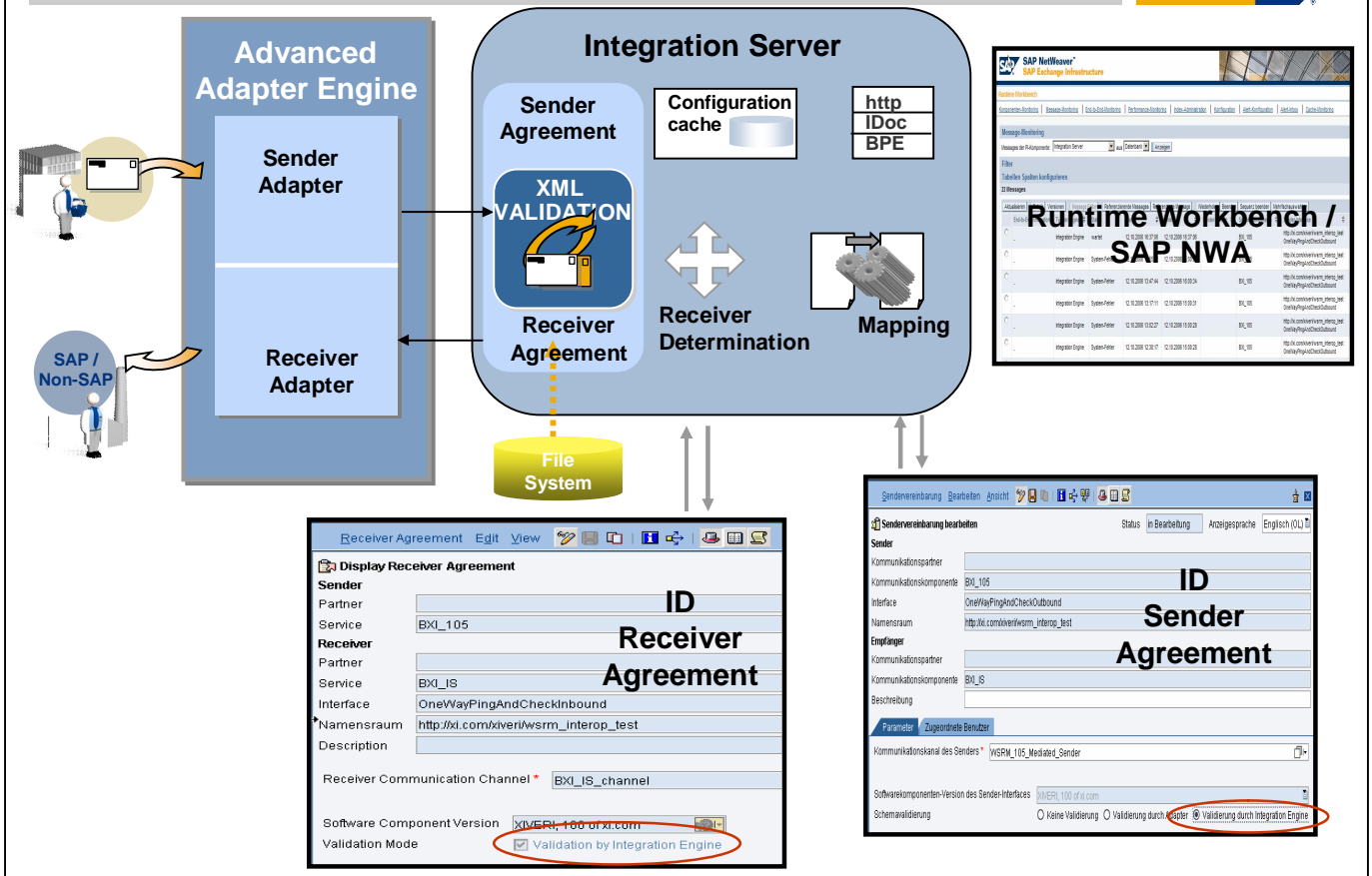
The data types that are used for validation come from the Enterprise Services Repository.

When the inbound message enters the adapter (AAE & IS), the adapter converts the adapter specific wire format into an XI message. The payload of this message can be validated against the configured schema.

If syntax validation is configured at the agreement, The AAE and the IS will call at a single central place a syntax validation component, which calls an XML schema validator.

In case of errors an exception is raised and the adapter stops processing and informs the sender via a synchronous response informing about the syntax errors. The industry-specific adapters inform the sender asynchronously, as required by the RNIF protocol and the CIDX protocol.

Syntax Validation: Integration Engine



■ Validation at Integration Engine

The data types that are used for validation come from the Enterprise Services Repository..

In inbound and outbound processing, validation of the PI message payload takes place as a pipeline step of the Integration Engine. If the structure of the message payload does not match the saved definition of the data type, an error description is generated.

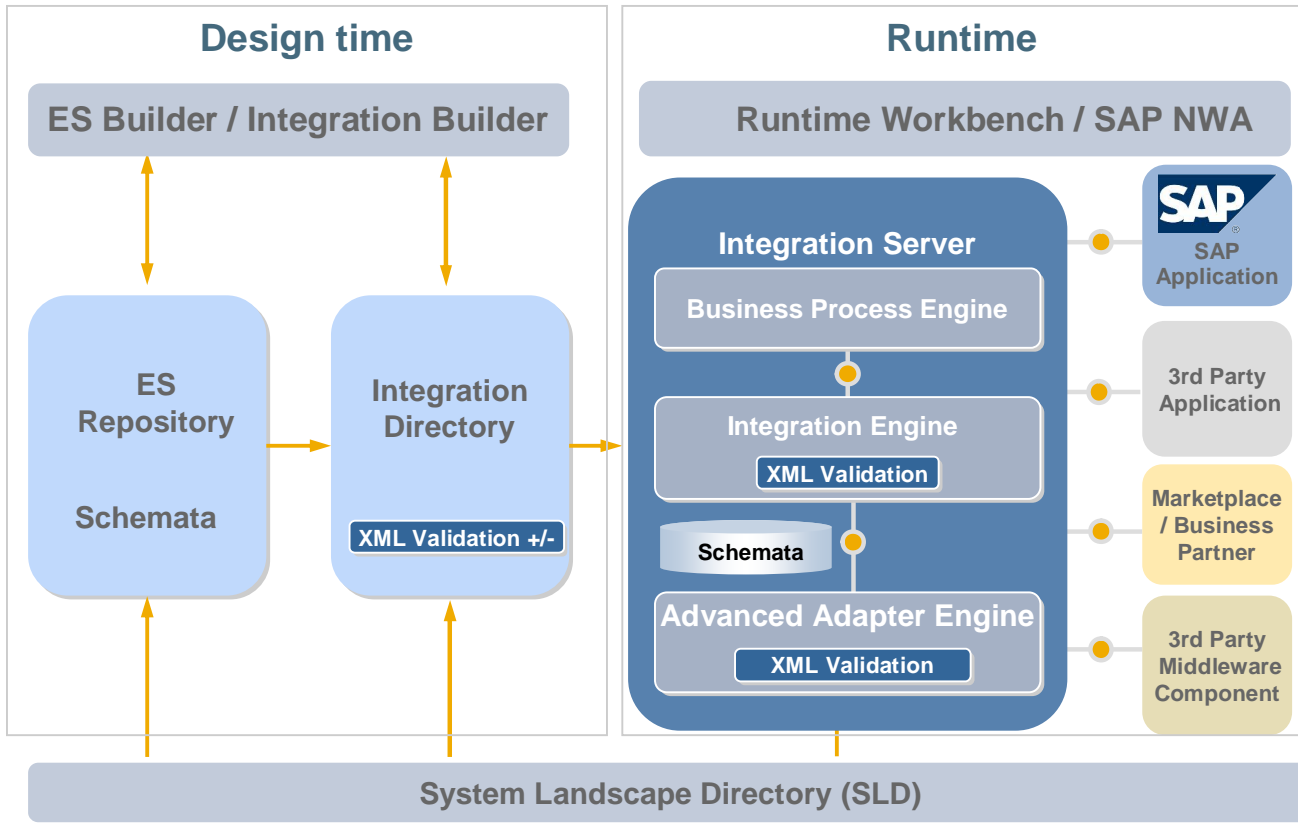
The error description contains status information and a list of all structure errors. Message processing is stopped. The message is set to error status and an error report is saved.

If validation takes place in the Integration Engine, the sender of the message is not automatically informed of the structure error. The message is set to error status and an administrator can process the message further using the Runtime Workbench.

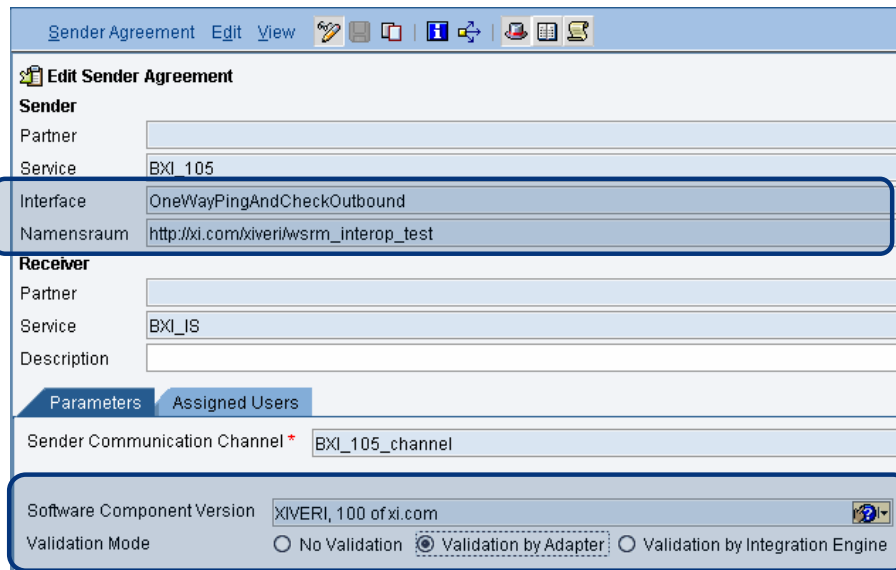
Agenda



1. Overview
2. Syntax Validation
3. **Configuration**
4. Error Handling
5. Excercise
6. Summary



- The configuration of the PI message validation takes place in the respective collaboration agreement.
- In a sender agreement, you can choose between validation in the sender adapter or validation in the Integration Engine.
- If validation takes place in the adapter, a synchronous response is sent to the sender when an error occurs.
- If validation takes place in the Integration Server, the message is set to error status and can be processed by the administrator in the Runtime Workbench in the case of an error.
- In the receiver agreement, you can configure the validation in the Integration Engine.



Sender Agreement Edit View

Edit Sender Agreement

Sender

Partner

Service BXL_105

Interface OneWayPingAndCheckOutbound

Namensraum http://xi.com/xiveri/wsrm_interop_test

Receiver

Partner

Service BXL_IS

Description

Parameters Assigned Users

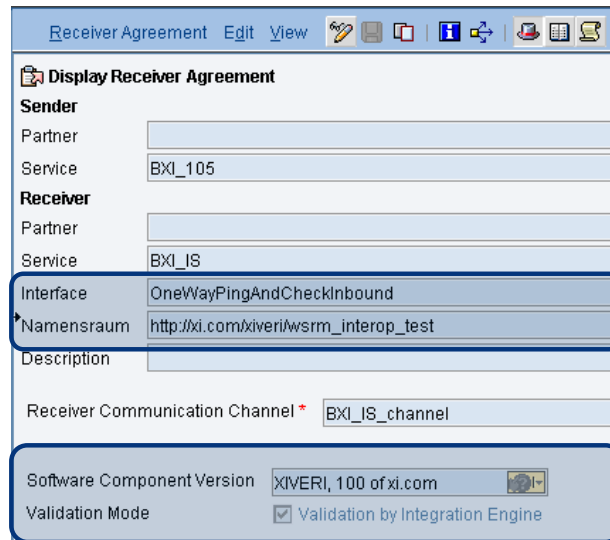
Sender Communication Channel * BXL_105_channel

Software Component Version XIVERI, 100 of xi.com

Validation Mode No Validation Validation by Adapter Validation by Integration Engine

- Define (Software Component Version, Interface & Namespace)
- XML Validation at ...
 - ... Adapter with Backward-Error handling
 - ... IE-Pipeline with Forward-Error handling

- The schema located in the Enterprise Services Repository can be uniquely identified with the interface, namespace, and Software Component Version.
- The Sender Agreement will contain a selection to switch XML Validation either on or off.
- You can select to perform the XML Validation either in the Advanced Adapter Engine with Backward-Error handling or in the Integration Engine with the forward-error handling.
- The Sender Agreement in the Integration Directory contains the information about Interface, Namespace and if the Validation mode is switched on, it also contains the information about SWCV.



The screenshot shows the 'Display Receiver Agreement' window in SAP. The window title is 'Receiver Agreement Edit View'. The main content area is titled 'Display Receiver Agreement' and contains the following fields:

Sender	
Partner	
Service	BXI_105
Receiver	
Partner	
Service	BXI_IS
Interface	OneWayPingAndCheckInbound
Namensraum	http://xi.com/xiveri/wsrm_interop_test
Description	
Receiver Communication Channel *	BXI_IS_channel
Software Component Version	XIVERI, 100 of xi.com
Validation Mode	<input checked="" type="checkbox"/> Validation by Integration Engine

- Define (Software Component Version, Interface & Namespace)
- XML Validation at IE-Pipeline with **Forward-Error** handling

- The schema located in the Enterprise Services Repository can be uniquely identified with the interface, namespace, and Software Component Version.
- The Receiver Agreement will contain a selection to switch XML Validation either on or off.
- The syntax validation is performed at the IS and the error handling method is forward error handling only.
- The Receiver Agreement in the Integration Directory contains the information about Interface, Namespace and if the Validation mode is switched on, it also contains the information about SWCV.

Agenda



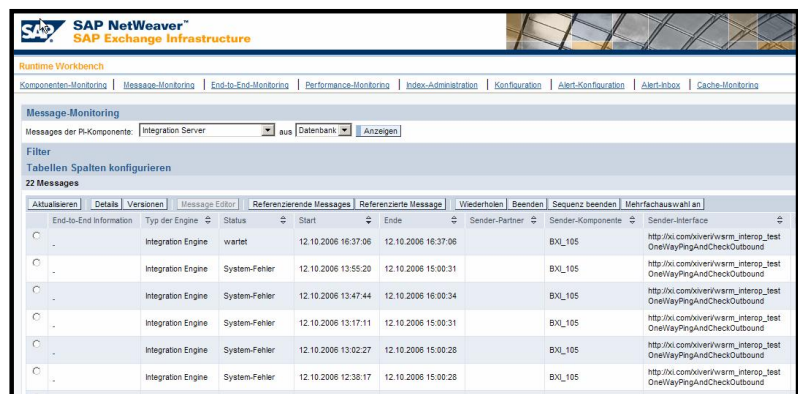
1. Overview
2. Syntax Validation
3. Configuration
4. **Error Handling**
5. Exercise
6. Summary

Backward-Error handling

- The sender is directly informed (adapter dependent)
- The message is not persisted
- An alert can be raised

Forward-Error handling (at the Integration Server Pipeline)

- The message is set into an error-state
- The sender is not directly informed
- The message is persisted
- The message can be re-started
- An alert can be raised



End-to-End Information	Typ der Engine	Status	Start	Ende	Sender-Partner	Sender-Komponente	Sender-Interface
-	Integration Engine	wartet	12.10.2006 16:37:06	12.10.2006 16:37:06		BXL_105	http://xi.com/xiver/vwarm_interop_testOneWayPingAndCheckOutbound
-	Integration Engine	System-Fehler	12.10.2006 13:55:20	12.10.2006 15:00:31		BXL_105	http://xi.com/xiver/vwarm_interop_testOneWayPingAndCheckOutbound
-	Integration Engine	System-Fehler	12.10.2006 13:47:44	12.10.2006 16:00:34		BXL_105	http://xi.com/xiver/vwarm_interop_testOneWayPingAndCheckOutbound
-	Integration Engine	System-Fehler	12.10.2006 13:17:11	12.10.2006 15:00:31		BXL_105	http://xi.com/xiver/vwarm_interop_testOneWayPingAndCheckOutbound
-	Integration Engine	System-Fehler	12.10.2006 13:02:27	12.10.2006 15:00:28		BXL_105	http://xi.com/xiver/vwarm_interop_testOneWayPingAndCheckOutbound
-	Integration Engine	System-Fehler	12.10.2006 12:38:17	12.10.2006 15:00:28		BXL_105	http://xi.com/xiver/vwarm_interop_testOneWayPingAndCheckOutbound

Two different ways of xml syntax validation error handling strategies are supported.

Backward-Error handling

- The backward error handling is performed at the adapter (AAE & IS) only. The adapter will be enabled to synchronously report back the cause of errors in case of XML syntax errors. An http based adapter the response code of "400 Bad Request" is sent back to the sender in case of syntax error at the adapter level.
- In case of the Industry speak adapters an asynchronous response is created. Processing of the message is stopped/completed and the sender has to re-send a new and corrected version of the message.

Forward-Error handling

- In the forward error handling the sender is not informed about the syntax error, but the message is placed into the error state and the administrator with help of the RWB will further process this message. The administrator can resend messages and skip the validation step.



Message Monitoring can be done in

- **Runtime Workbench / SAP NWA**
- **SXMB_MONI**

Messages that have error status

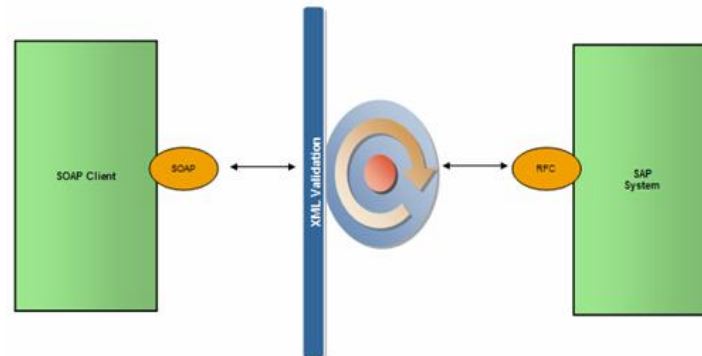
- **Can be processed further by an Administrator in the RWB**
- **Messages can be resent skipping the validation step**

- Monitoring and administration takes place in message monitoring of the Runtime Workbench / SAP NetWeaver Administrator and in the Integration Engine.
- Messages that have error status following validation can be processed further by an administrator in the Runtime Workbench. The administrator can resend messages and skip the validation step.

Agenda



1. Overview
2. Syntax Validation
3. Configuration
4. Error Handling
5. **Excercise**
6. Summary



Asynchronous scenario

- **Outbound Validation (Sender)**
 - Validation in the Advanced Adapter Engine
 - Validation in the Integration Engine

Synchronous scenario

- **Validation in the Advanced Adapter Engine for Outbound (Sender)**

- The schema located in the Enterprise Services Repository can be uniquely identified with the interface, namespace, and Software Component Version.
- The Sender Agreement will contain a selection to switch XML Validation either on or off.
- You can select to perform the XML Validation either in the Advanced Adapter Engine with Backward-Error handling or in the Integration Engine with the forward-error handling.
- The Sender Agreement in the Integration Directory contains the information about Interface, Namespace and if the Validation mode is switched on, it also contains the information about SWCV.



Configuration

- In Integration Directory via Model Configurator wizard

Monitoring

- Monitoring within Integration Engine and Runtime Workbench
- Simulation of validation failures
- Example: Validation rules for asynchronous scenario:

Name	Type	Occurrence	Details
Vendor			
VendorNumber	xsd:string	1	minLength="1"
LastName	xsd:string	1	minLength="1"
SearchTerm	xsd:string	1	minLength="1"
Currency	xsd:string		enumeration="USD, EUR, INR"
Address			
Street	xsd:string	1	
City	xsd:string	1	
Zip	xsd:string	1	minLength="1"; maxLength="6"
Country	xsd:string	1	minLength="1"; maxLength="3"

- The schema located in the Enterprise Services Repository can be uniquely identified with the interface, namespace, and Software Component Version.
- The Sender Agreement will contain a selection to switch XML Validation either on or off.
- You can select to perform the XML Validation either in the Advanced Adapter Engine with Backward-Error handling or in the Integration Engine with the forward-error handling.
- The Sender Agreement in the Integration Directory contains the information about Interface, Namespace and if the Validation mode is switched on, it also contains the information about SWCV.

Agenda



1. Overview
2. Syntax Validation
3. Configuration
4. Error Handling
5. Excercise
6. Summary



- **XML Validation allows you to check the structure of a PI message payload**
- **XML Validation is required by many Industry Standards**
- **Validation can be done on XSDs and DTDs**
- **It can be used for A2A and B2B Integration**
- **Validation can be done on Integration Engine or Advanced Adapter Engine**
- **Monitoring and administration takes place in message monitoring of the Runtime Workbench / SAP NetWeaver Administrator and in the Integration Engine**



No part of this publication may be reproduced or transmitted in any form or for any purpose without the express permission of SAP AG. The information contained herein may be changed without prior notice.

Some software products marketed by SAP AG and its distributors contain proprietary software components of other software vendors.

Microsoft, Windows, Excel, Outlook, and PowerPoint are registered trademarks of Microsoft Corporation.

IBM, DB2, DB2 Universal Database, OS/2, Parallel Sysplex, MVS/ESA, AIX, S/390, AS/400, OS/390, OS/400, iSeries, pSeries, xSeries, zSeries, System i, System i5, System p, System p5, System x, System z, System z9, z/OS, AFP, Intelligent Miner, WebSphere, Netfinity, Tivoli, Informix, i5/OS, POWER, POWER5, POWER5+, OpenPower and PowerPC are trademarks or registered trademarks of IBM Corporation.

Adobe, the Adobe logo, Acrobat, PostScript, and Reader are either trademarks or registered trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Oracle is a registered trademark of Oracle Corporation.

UNIX, X/Open, OSF/1, and Motif are registered trademarks of the Open Group.

Citrix, ICA, Program Neighborhood, MetaFrame, WinFrame, VideoFrame, and MultiWin are trademarks or registered trademarks of Citrix Systems, Inc.

HTML, XML, XHTML and W3C are trademarks or registered trademarks of W3C®, World Wide Web Consortium, Massachusetts Institute of Technology.

Java is a registered trademark of Sun Microsystems, Inc.

JavaScript is a registered trademark of Sun Microsystems, Inc., used under license for technology invented and implemented by Netscape.

MaxDB is a trademark of MySQL AB, Sweden.

SAP, R/3, mySAP, mySAP.com, xApps, xApp, SAP NetWeaver, and other SAP products and services mentioned herein as well as their respective logos are trademarks or registered trademarks of SAP AG in Germany and in several other countries all over the world. All other product and service names mentioned are the trademarks of their respective companies. Data contained in this document serves informational purposes only. National product specifications may vary.

The information in this document is proprietary to SAP. No part of this document may be reproduced, copied, or transmitted in any form or for any purpose without the express prior written permission of SAP AG.

This document is a preliminary version and not subject to your license agreement or any other agreement with SAP. This document contains only intended strategies, developments, and functionalities of the SAP® product and is not intended to be binding upon SAP to any particular course of business, product strategy, and/or development. Please note that this document is subject to change and may be changed by SAP at any time without notice.

SAP assumes no responsibility for errors or omissions in this document. SAP does not warrant the accuracy or completeness of the information, text, graphics, links, or other items contained within this material. This document is provided without a warranty of any kind, either express or implied, including but not limited to the implied warranties of merchantability, fitness for a particular purpose, or non-infringement.

SAP shall have no liability for damages of any kind including without limitation direct, special, indirect, or consequential damages that may result from the use of these materials. This limitation shall not apply in cases of intent or gross negligence.

The statutory liability for personal injury and defective products is not affected. SAP has no control over the information that you may access through the use of hot links contained in these materials and does not endorse your use of third-party Web pages nor provide any warranty whatsoever relating to third-party Web pages.