SAP NetWeaver

Troubleshooting Guide

SAP® Exchange Infrastructure

Release 3.0 and 2.0

Document Version 2.00 – October, 2005

SAP

THE BEST-RUN E-BUSINESSES RUN SAP

SAP®

Documentation in the SAP Service Marketplace
You can find this documentation at the following address:
http://service.sap.com/instguidesnw04

Typographic Conventions

Type Style	Represents
Example Text	Words or characters that appear on the screen. These include field names, screen titles, pushbuttons as well as menu names, paths and options.
	Cross-references to other documentation
Example text	Emphasized words or phrases in body text, titles of graphics and tables
EXAMPLE TEXT	Names of elements in the system. These include report names, program names, transaction codes, table names, and individual key words of a programming language, when surrounded by body text, for example, SELECT and INCLUDE.
Example text	Screen output. This includes file and directory names and their paths, messages, names of variables and parameters, source code as well as names of installation, upgrade and database tools.
Example text	Exact user entry. These are words or characters that you enter in the system exactly as they appear in the documentation.
<Example text>	Variable user entry. Pointed brackets indicate that you replace these words and characters with appropriate entries.
EXAMPLE TEXT	Keys on the keyboard, for example, function keys (such as F2) or the ENTER key.

Icons

Icon	Meaning
	Caution
	Example
	Note
	Recommendation
	Syntax

1 Introduction

This guide helps you when analyzing problems associated with the SAP Exchange Infrastructure (XI). It describes where to find information in error situations and how to trace problems.

Refer to SAP Note 806546 for the latest version of this guide because it will be regularly extended with new features and solutions.

2 Installation and Patching

2.1 Installation Problem Analysis

Problem

You need information about how to analyze and solve problems during the installation of SAP XI or SAP Partner Connectivity Kit (PCK).

Validity

XI 2.0, XI 3.0

Analysis

XI 2.0

The installation procedure is described in the Installation Guide SAP Exchange Infrastructure Release 2.0 SR1.

The central SAP Note for the XI 2.0 Installation is 620103. It contains information about errors in the guide and problems during and after migration.

XI 3.0

The installation procedure is described in the Installation Guide for SAP Exchange Infrastructure Release 3.0 (SP0) and in the Installation Guide for SAP Exchange Infrastructure Release 3.0 SR1.

The main SAP Notes for the installation of XI 3.0 are 664107 (SP0) and 782801 (SR1). They contain information about any errors in the guides and problems that can occur during and after migration.

Checking the Installation

After installation, carry out the tests described in SAP Note 817920.

Some test scenarios are created to test the XI functions in XI 3.0. All the objects that are necessary for configuration are delivered by SAP with **SP13**. Use the Simple Use Cases to test if your XI system is running properly.

PCK (XI 3.0 Component)

The installation procedure is described in the installation guide for the SAP Partner Connectivity Kit for SAP Exchange Infrastructure 3.0 (SP0) and in the installation guide for the SAP Partner Connectivity Kit for SAP Exchange Infrastructure 3.0 SR1.

The main SAP Notes for the installation of the PCK XI 3.0 are 670362 (SP0) and 792456 (SR1). They contain information about any errors in the guides and problems that can occur during and after migration.

2.2 Patching Information

Problem

You need information about patching your XI or PCK installation.

Validity

XI 2.0, XI 3.0

Analysis

XI 2.0

The patch procedure is described in SAP Note 588568. It contains information about how to patch the different components of SAP XI.

All changes in XI 2.0 and J2EE 6.20 patches are enclosed in SAP Note 855845.

XI 3.0/PCK

The patch procedure is described in the Support Package Stack Guide on SAP Service Marketplace at `service.sap.com/sp-stacks` → *SAP NetWeaver'04* →

Documentation, and in the SAP Notes <u>670388</u> (<SP4) and <u>750511</u> (>=SP4). The SAP Notes contain information about how to patch the different components of the SAP Exchange Infrastructure and they also describe known problems after patching and their solutions.

If the PCK is patched from a patch level <= SP3 to SP4 or higher you also need to implement SAP Note <u>746328</u>.

All changes in XI 3.0 and J2EE 6.40 patches are described in SAP Note <u>855679</u>.

After patching, carry out the tests described in SAP Note <u>817920</u>.

2.3 Problems and Solutions

2.3.1.1 Service Users Are Not Created

Problem

XI service users such as **XIAPPLUSER, XIDIRUSER, XILDUSER, XIREPUSER, XIRWBUSER** are not created during installation.

Validity

XI 2.0

Solution

The cause of the problem is not yet known. You can create the users manually and continue the installation. Assign the users with the roles as described in the <u>SAP XI 2.0 - Configuration Guide</u>. The user type should be **service user** and the password **XIPASS**.

2.3.1.2 Query String Not Allowed

Problem

If you try to save a HTTP destination in transaction **SM59** with a prefix containing **'?'** you get an error message: 'Query string not allowed'.

Validity

XI 2.0

Solution

This is a warning only; you can ignore the message. Press *Enter* and choose *Save*.

3   Migration

3.1 Analysis of Migration Problems

Problem

You need information about how to analyze and solve problems during the XI 2.0 to XI 3.0 migration process.

Validity

XI 2.0 → XI 3.0

Analysis

The migration procedure is described in the Component Upgrade Guide for SAP Exchange Infrastructure.

The central SAP Note for XI 2.0 to XI 3.0 migration is 711752. It contains information about any errors in the guide and problems that can occur during and after migration.

For information about where to find log files, error information, and how to increase the trace level, refer to SAP Note 742694. This note also describes some typical error situations and how to solve them.

4   Design- and Configuration Time (Repository & Directory)

4.1 Problem Analysis for the Integration Builder - Directory & Repository

Problem

You need information about how to analyze and solve problems associated with the XI tools (Integration Builder for the Integration Repository and Integration Directory).

Validity

XI 2.0, XI 3.0

Analysis

Starting the Tools (Java Web Start)

To start the XI tools, *Java Web Start* must be installed on the client PC. In case of problems, refer to the following notes:

- **XI 2.0:** SAP Note 580351
- **XI 3.0:** SAP Note 801868

Memory Log

If problems occur in the XI tools, you can use the XI memory log for further problem analysis. If you are able to reproduce the problem, use the memory log because the log in the browser is overwritten after 1000 lines.

XI 2.0

To increase the trace level, use the following URL:

Integration Directory: http://server:port/dir/support

Integration Repository: http://server:port/rep/support

→ To Private Tools

→ Edit Logging Configuration

→ Reset to `DEBUG`

→ *Save*

To refresh the logging configuration, use the following URL:

http://server:port/dir/support

→ To Private Tools

→ Refresh Logging Configuration (all applications)

To check the log, use the following URL:

Integration Directory: http://server:port/dir/support

Integration Repository: http://server:port/rep/support

→ View Log

→ Show this filter

The log is also written to the output.log of the J2EE engine and can be found under `..j2ee\cluster\server\managers\console_logs`

Reset the log level to **DEFAULT** after your analysis. Save and refresh the logging configuration to avoid performance problems.

XI 3.0:

To increase the trace level, use the following URL:

Integration Directory: http://server:port/dir/support/private

Integration Repository: http://server:port/rep/support/private

→ Edit Memory Log Configuration

→ Reset to **DEBUG**

→ *Save*

To check the log, use the following URL:

Integration Directory: http://server:port/dir/support/private

Integration Repository: http://server:port/rep/support/private

→ View Memory Log

→ Show this filter

Reset the log level to **DEFAULT** after your analysis and save to avoid performance problems.

J2EE Logs

All XI applications that run in the J2EE engine write their logs to the J2EE engine logs.

XI 2.0

output.log and error.log

All messages originating from J2EE applications are written to the file `<date>output.log`. The file can be found in the file system under `..j2ee\cluster\server\managers\console_logs`.

All error messages originating from J2EE applications are written to the file
`<date>error.log`. The file can be found in the file system under
`..j2ee\cluster\server\managers\console_logs`.

XI 3.0

xi.log and applications.log

All messages originating from XI applications in the J2EE engine are written to the
file `xi.<number>.log`. The file can be found in the file system under
`..j2ee\cluster\server<number>\log\applications\com.sap.xi`.

All error messages from J2EE applications are written to the file
`applications.<number>.log`. The file can be found in the file system under
`..j2ee\cluster\server<number>\log`.

To analyze the logs, use the *LogViewer* Service in the *Visual Administrator* or the
stand-alone *Logviewer*.

XI 3.0

J2EE defaultTrace.trc

To trace applications in the J2EE Engine, you can increase the trace level for a
specific XI application.

To increase the trace level, call the *Visual Administrator.*

→ Server

→ Service *Log Configurator*

→ *Locations*

→ Select the location `XIDIR` (Integration Directory) or `XIREP` (Integration
Repository)

→ Change the severity to **DEBUG**

→ Choose *Copy Severity to Subtree*

→ *Save* the entry

The trace is written to the file `defaultTrace.<number>.trc`. The file can be
found in the file system under `..j2ee\cluster\server<number>\log`.

To analyze the log, use the *LogViewer* Service in the *Visual Administrator* or the
stand-alone *Logviewer*.

Reset the trace level to **ERROR** after your analysis, copy the setting to the subtree, and finally save the entry to avoid performance problems.

4.2 Repository

4.2.1 Problems and Solutions

4.2.1.1 Import of IDoc or RFC- No Connection to Source System

Problem

You want to import an IDoc/RFC from a target SAP system to the Integration Builder. The connection step does not work.

Validity

XI 2.0, XI 3.0

Solution

1. Unsure that the logon group entry is correct. If using **SPACE**, check whether it is written in capital letters.
2. Check that the hostname and client are correct.
3. Implement section 5 of SAP Note [593058](#).
4. The message server must be known in the `etc/services` file on the Integration Builder host. Navigate to the target system. In `/etc/services` or on NT `C:\WINNT\system32\drivers\etc\services`, find the entry for the message server, for example sapmsE14 3614/tcp. Enter this in the services file of the XI server (or the services file of the Integration Builder if distributed installation has been used).

4.2.1.2 Import of IDoc Type Fails

Problem

The import of some IDoc types fails in the Integration Directory despite the logon and selection steps being successful. You get an error message stating that the IDoc type is not correct or that no message exists; the import hangs.

Validity

XI 2.0, XI 3.0

Solution

The cause of the problem can most probably be found in the system from where you are trying to import the IDocs.

1. Check the IDoc type in transaction **WE60** (try to create a parser). If prompted, check the segment definition of any erroneous segments in transaction **WE31**.
2. Check whether the RFC function module `DD_DOMA_GET` is remote-enabled. Refer to SAP Note [718320](#).
3. Check whether any short dumps or errors are written in the source system.

5 Proxy

5.1 ABAP Proxy

5.1.1 ABAP Proxy Troubleshooting

You have the option of using proxies to connect an application to SAP XI.

Problem

You have problems using the ABAP proxy framework and you need more information about how to trace, debug, and analyze these issues.

Validity

XI 2.0, XI 3.0

Analysis

XI 2.0

In XI 2.0, you can only use the ABAP Proxy Framework to communicate with XI once you have installed the XI Add-On in the 6.20 business system as described in the [Installation Guide for SAP Exchange Infrastructure Release 2.0 SR1](#).

The configuration of the business system is described in *Connecting Business Systems with an Integration Engine to the Central Integration Server* in the [Configuration Guide for SAP Exchange Infrastructure 2.0](#).

If you have problems, use the following tools/transactions for further analysis:

- Transaction **SLDCHECK**

    Since the applications communicate with the SLD to get their own business system and Integration Server information, the connection to the SLD needs

to be running from all business systems. Use the transaction `SLDCHECK` to check whether this is the case.

- Transaction **SPROXY**

  The interfaces are taken from the Integration Repository of the connected XI system. To make sure that this connection is running correctly, use the test reports provided in transaction **SPROXY** → *Goto* → *Connection Test*:

  o Report `SPROX_CHECK_IFR_ADDRESS` checks if the connection to the Exchange Profile is running and if the parameters are set.
  o Report `SPROX_CHECK_HTTP_COMMUNICATION` checks if the HTTP communication of the system is running.
  o Report `SPROX_CHECK_IFR_RESPONSE` checks it the connection to the Integration Builder is running correctly.
  o Report `SPROX_CHECK_IFR_CONNECTION` checks if the data coming from the Integration Builder can be correctly interpreted.

Proxy Debugging and Tracing

If you have problems in the proxy runtime, you can use the debugging and trace tools described in the How-To Guide How -To Debug XI Applications.

XI 3.0:

In XI 3.0, you can connect 6.20 business systems once you have installed the XI add-on in the business systems as described in the Installation Guide for SAP Exchange Infrastructure Release 2.0 SR1. If you are using a 6.40 business system to connect to an XI 3.0 Integration Server, you do not need to install any add-ons.

How to configure the business system to be connected to an XI system is described in *Connecting Business Systems with an Integration Engine to the Central Integration Server* in the SAP NetWeaver '04 Configuration Guide for SAP Exchange Infrastructure Release 3.0.

If you have problems you can use the following tools/transactions for further analysis:

- Transaction **SLDCHECK**

  Since the applications communicate with the SLD to get the their own business system and Integration Server information the connection to the SLD needs to be running from all business systems. Use the transaction `SLDCHECK` to check whether this is the case.

- Transaction **SPROXY**

  The interfaces are taken from the Integration Repository of the connected XI system. To make sure this connection is running correctly, use the test reports provided in transaction **SPROXY** → *Goto* → *Connection Test*:

  o Report `SPROX_CHECK_IFR_ADDRESS` checks whether the connection to the Exchange Profile is running and whether the parameters are set.

o Report `SPROX_CHECK_HTTP_COMMUNICATION` checks whether the HTTP communication of the system is running.
o Report `SPROX_CHECK_IFR_RESPONSE` checks whether the connection to the Integration Builder is running correctly.
o Report `SPROX_CHECK_IFR_CONNECTION` checks whether the data coming from the Integration Builder can be correctly interpreted.

Proxy Debugging and Tracing

If you have problems in the proxy runtime, you can use the debugging and trace tools described in the How-To Guide How -To Debug XI Applications.

5.1.2 Problems and Solutions

5.1.2.1 SPRX 081 - No connection to Integration Builder (only local data visible)

Problem

The error message SPRX 081: `No connection to Integration Builder (only local data visible)` is displayed when you call transaction **SPROXY.**

Validity

XI 2.0

Solution

1. Check SAP Note 689847.
2. For more information about the cause of the problem, call transaction **SPROXY** and choose *Goto → Connection test*.

5.1.2.2 SPRX 097 - Integration Builder data not understood

Problem

The error message SPRX 097: `Integration Builder data not understood` is displayed when performing the connection test in transaction **SPROXY**.

Validity

XI 2.0, XI 3.0

Solution

Make sure your business system is set up as follows:

1. Transaction **SXMB_ADM** (refer to the Configuration Guide, chapter 5)
   - Role of System: `Application System`
   - Corresponding Integration Server:
     `dest://<your_sm59_http_destination>`
2. Ensure that the RFC destinations `LCRSAPRFC` and `SAPSLDAPI` are maintained and working (refer to the Configuration Guide, chapter 5.3)
3. Run **SLDCHECK** to verify that the connection to the System Landscape Directory works.
4. Check that the Integration Repository is running and data is maintained there.

5.2 Java Proxy Runtime (JPR)

5.2.1 JPR (Java Proxy Runtime) Troubleshooting

In XI, you can use proxies to connect an application to an XI system.

Problem

You have problems using the Java Proxy Runtime and need more information about configuration and use of the JPR.

Validity

XI 2.0, XI 3.0

Analysis

XI 2.0:

How to configure the business system is described in chapter *Java Proxy Runtime (JPR)* in the Configuration Guide for SAP Exchange Infrastructure 2.0.

XI 3.0:

How to configure the connection of the java proxy runtime to an XI system is described in chapter *Java Proxy Runtime (JPR)* in the SAP NetWeaver '04 Configuration Guide for SAP Exchange Infrastructure Release 3.0.

6 Adapters

6.1 Error Tracking in the Plain J2SE Adapter Engine

(Problem) Introduction

This chapter provides an overview of the stand-alone Adapter Engine with regard to tracing, logging, configuration and other support-relevant information. It does not cover specific errors, but describes the means of analysis within the J2SE Adapter Engine. The following information helps you to localize errors and/or provide the support with all relevant information.

> The J2SE Adapter Engine differs from the J2EE Adapter Engine. It is a stand-alone tool that runs on its own Java Virtual Machine. It can be installed on any business system and is delivered with XI 2.0 (as the only Adapter Engine), as well as with XI 3.0 (in addition to the J2EE Adapter Engine and the PCK). The handling and the functionality in XI 3.0 is - apart from a few exceptions – exactly the same.

Validity

XI 2.0, XI 3.0

Folder Structure

The following file structure is created during the installation of the Adapter Engine:

Tech_adapter (contains run_adapter and logging.properties)

- Administration
- Base Configuration
- Configuration (contains configuration files)
- Data
- LogFiles (contains logs and traces)
- PersistLayer

These folders contain all relevant information for supporting the Adapter Engine and are referred to in the following chapters. Parts of the files can be displayed using the browser interface of the Adapter Engine; this is explained in the relevant file description.

Logs and Traces

In general, the Adapter Engine writes two types of logs: one contains overall information about processes in the Adapter Engine, the other contains adapter-specific information.

The **Adapter Engine Log** is written in the `Adapter_<number>.log`. These files are located in the file system in the *LogFiles* folder and can be viewed either by opening the respective file on operating system level or by starting the browser interface of the Adapter Engine (http://<host>:8200) and navigating to *Traces*. Their quantity and size is configured by using the file tech_adapter -> *logging.properties*. The standard values are 5 files (Adapter_0.log to Adapter_4.log) with a size of 2 MB each. Once 5 files of 2MB each exist, the files are overwritten. If an error occurs, it is recommended to save the Log Files **immediately**.

The **adapter-specific Log** is written into the `<Name_of_adapter>.log`. These files can be found in the folder *Log Files*. Unlike the `Adapter_<number>.logs` this type of log is not meant to be read at operating system level, but by using the browser interface of the Adapter Engine and clicking on the name of the specific adapter. There is only one file per adapter that is overwritten as soon as the respective adapter is restarted. If an error occurs, save the Log File **immediately**; do not restart the adapter until you have done so. The size of the file can be restricted by parameters that are described in the documentation of the Adapter Engine (minimum version XI 2.0 SP5, the parameters are called `maxViewSize`, `maxFileSize`, `archviveFiles`) – it is, however, not affected by settings in the file logging.properties.

Special information for the **RFC adapter**: In addition to the adapter-specific information that is contained in the file `rfc_adpater.log`, the RFC Adapter writes a trace file called `Adapter_rfc.log`. This is the default name that must not be changed. It is set via the parameter `RFCAdapter.traceFile` and contains the most valuable information about errors in the RFC adapter.

Trace Level

To track errors it might become necessary to increase the trace level of the respective logs and to reproduce the error to receive more and detailed information about the error. This is achieved as follows:

For the **Adapter Engine Logs** use the file `logging.properties` to set the respective location to a sufficient trace level. For example: in one of the `Adapter_<number>.log` the following error is reported:

"Sep 22, 2004 11:36:43...
...i.messaging.adapter.File2XMBProcessor [fileprocessor]
Error: Unexpected exception running file2xmbprocessor

java.lang.NullPointerException".

To increase the trace level, edit the `logging.properties` by adding the following line:

"com.sap.aii.messaging.adapter.File2XMBProcessor.severity=DEBUG".

Restart the Adapter Engine to apply the new settings.

The degree of information in the **adapter-specific Logs** cannot be changed.

To increase the trace level for the **RFC adapter**, set the parameter `RFCAdapter.trace` in the RFC adapter configuration. The level is follows:

0 = none, 1 = error, 2 = standard, 3 = request, 4 = payload, 5 = binary payload outbound.

> Note that at trace level 5, the JCo trace is activated as well. The output of this JCo Trace can be found in folder *tech_adapter* and has the name `JCO<number>.trc`.

Configuration Files

The parameters for each adapter are set using the *Configuration* button in the web interface of the Adapter Engine. The information is saved at operating system level in the folder *Configuration*. The name of the configuration file corresponds to `<adapter_name>.properties`. In case of an error, copy this information to the message for your support organization or SAP.

Additional Information

The following additional information may be useful when analyzing a problem in the Adapter Engine and you must therefore make it available to support organizations.

- Version of the Adapter Engine. To determine the version, open the Web interface and navigate to *About Adapter Engine*. Choose *General Information* to display the version as the parameter name `Adapter Engine` (e. g. 2.0.1412).
- Version of the JDK. Navigate as above to the parameter `java.runtime.version` in the *General System Information*.
- Class path and VM parameters used by the Adapter Engine. This information can be found in the file `run_adapter.<OS_specific_type>`, e. g. `run_adapter.bat` for Windows.

SDN: Web Logs

Some **F**requently **a**sked **q**uestions (FAQs) about J2SE adapters can be found on the [**S**AP **D**eveloper **N**etwork (SDN)](#).

6.2 Error Tracking in the J2EE Adapter Engine

Problem

You need information about how to increase the trace level and find the error messages and more information about the errors in the J2EE-based adapters (File, JDBC, JMS, RFC, BC, SOAP, Mail, RNIF, CIDX).

Validity

XI 3.0

Analysis

Version of Adapter Engine

See SAP Note <u>784471</u> for a description of how to find your Adapter Engine version.

Adapter Monitoring

For an initial check of your configured channels and to check whether they could be started without errors, use adapter monitoring:

- SP8 and lower

  Goto http://server:j2ee-port/AdapterFramework

  o   Select the *adapter type* `(file, JDBC, ..)` you want to check

- SP9 and higher
  o   In the Runtime Workbench <u>http://server:port/rwb</u> choose *Component Monitoring* and select *Components with Status* `all`
  o   Choose *Display*
  o   Select the appropriate Adapter Engine
  o   Click on the *Adapter Monitoring* button.
  o   Select the *Adapter Type* `(file, JDBC, ..)` you want to check

The channel information is available in the monitor after the service and the channel have successfully been activated. However, in the case of the SOAP adapter, the adapter status is not available until the first request is sent to the adapter.

Audit Log

If you have problems during message processing in the messaging system, first check the audit log of the respective message. You can find this log in the Runtime Workbench monitoring:

<u>http://server:port/rwb</u>

- Choose *Message Monitoring*

- Select the appropriate Adapter Engine
- Choose *Display*
- Select your message using the correct selection parameter
- Choose *Details*

For more information about the audit log refer to SAP Note 751915.

Log File

For more information about errors, check the following log file:

```
/usr/sap/[SID]/[Instanz]/j2ee/cluster/server[N]/log/applicatio
ns.[n].log
```

Use the *Log Viewer* to analyze this file.

For more information about the log file refer to SAP Note 751915.

Increasing the Trace Level

If you need more information about the error or problem, you can increase the trace level of your adapter and check the relevant trace file. This is described in SAP Note 761921.

For more information about the trace file in general refer to SAP Note 751915.

JCO Trace in XI 3.0 RFC Adapter

How to get a JCO trace for the RFC adapter is described in SAP Note 793434.

For more information about troubleshooting problems in the Adapter Engine, refer to the How-To Guide How To Monitor and Analyze Errors in the SAP J2EE Adapter Engine.

For problems during message transfer to J2EE adapters in XI 3.0, refer to the PAS (problem analysis scenario) in the SAP Help Portal: Message Failed on the Adapter Engine.

SDN: Web Logs

Some **F**requently **a**sked **q**uestions (FAQs) about adapters and the Adapter Framework runtime can be found on the **S**AP **D**eveloper **N**etwork (SDN**)**.

6.3 FAQs about Adapters

XI 3.0 has an Adapter Engine that runs on the J2EE Engine of the SAP NetWeaver Application Server. It contains several adapters:

JMS, File, JDBC, RFC, SOAP, Marketplace, Mail, BC, RNIF, CIDX, XI.

These adapters run as services in the J2EE Engine and are configured in the Integration Directory by using sender and receiver channels.

Problem

You want to know more about the J2EE-based Adapter Engine and the adapters it contains.

Validity

XI 3.0

Solution

You can find more information about the messaging system and the different adapters in the Adapter Engine in the following notes:

821268 XI 3.0 Adapter Framework: Overview of available FAQ notes

816022 FAQ XI 3.0 J2EE Adapter Engine / Messaging System

813993 FAQ: Message status in the adapter framework

774854 FAQ XI 3.0 BC Adapter

730870 FAQ XI 3.0 RFC-Adapter

821267 FAQ XI 3.0 File Adapter

831162 FAQ XI 3.0 JDBC Adapter

856346 FAQ: J2EE JMS Adapter

856597 FAQ: XI 3.0 SOAP Adapter

856599 FAQ: XI 3.0 Mail Adapter

For a description of how to install external drivers for the JDBC and JMS adapters, see the How-To Guide How To Install and Configure External Drivers for JDBC & JMS.

If you want to use other providers apart from Microsoft SQL server, Oracle or IBM MQ Series, you have to use the driver jars from these providers. Here are some more examples:

SAP DB: sapdbc.jar

DB2/DB6: db2jcc.jar; db2jcc_license_cu.jar, db2jcc_license_cisuz.jar

DB4:   jt400.jar

Important XI adapter service properties (Service `SAP XI Adapter: XI`) are described in SAP Note 791379.

The properties of the messaging system service `SAP XI AF Messaging` are described in SAP Note 791655.

The properties of most of the XI services are described in the Configuration Guide for SAP XI 3.0 -> *Appendix -> J2EE Service Properties*.

FAQs about the deployment of the adapter framework are described in SAP Note 830039.

6.4 Problems and Solutions

6.4.1.1 Acknowledgment Message with tech_adapter

Problem

According to the XI documentation, it is possible to send an acknowledgment to the sender system if required by the sender. Is it possible to use acknowledgments with the tech_adapter?

Validity

XI 2.0

Solution

XI 2.0 only supports acknowledgments in the scenarios where both the sender and the receiver are IDoc adapters, in other words, acknowledgements are not possible with the tech_adapter.

6.5 IDoc Adapter

6.5.1 FAQs About the IDoc Adapter

The XI IDoc adapter converts IDocs to XI messages and XI messages to IDocs to enable communication between XI and systems that can only send and receive IDoc messages.

The IDoc adapter runs in the ABAP part of the XI system and is called by using the RFC protocol. The outbound IDoc sends the IDoc to the receiving system using the tRFC protocol.

Problem

You want to know more about the IDoc adapter, how it must be configured and how to analyze errors.

Validity

XI 2.0, XI 3.0

Analysis

Configuration

How to configure IDoc exchange in the business and XI system is described in the configuration guides under *Integration of Business Systems Using the IDoc Adapter*.

XI 2.0: Configuration Guide for SAP Exchange Infrastructure 2.0

XI 3.0: SAP NetWeaver '04 Configuration Guide for SAP Exchange Infrastructure Release 3.0

For **XI 3.0** the guide How To Sample IDoc-XI Scenarios gives some examples of how to configure different IDoc-XI-IDoc scenarios using alternative identifiers and header mappings.

For a description of how to work with acknowledgements in **XI 3.0** IDoc scenarios, see the guide How To handle Acknowledgments for IDoc. SAP Note 777175 describes how to determine whether the IDoc adapter requests an acknowledgement or not.

The procedure for converting IDoc partners to XI partners in **XI 3.0** is described in SAP Note 792333.

How XI 3.0 handles the IDoc control record is described in SAP Note 728792.

Runtime

If you have problems sending an IDoc through XI, use the PAS (problem analysis scenario) in the Online Help: Sending an IDoc through XI failed.

6.5.2 Problems and Solutions

6.5.2.1 IDoc Control Record Overwritten

Problem

The IDoc adapter does not pass the fields of the IDoc control record filled in the payload of the XML message to the target system. The fields are overwritten by the contents taken from IDoc adapter configuration.

Validity

XI 2.0, XI 3.0

Solution

XI 2.0:

The problem can be solved by a customer modification. Contact the RIG (`service.sap.com/xi` -> *Contacts*).

XI 3.0:

You can control the functionality by selecting the *Apply control record values from payload* flag in the corresponding communication channel in the Integration Directory. See also the SAP Notes 789895 and 728792.

6.5.2.2 Changes Not Reflected

Problem

You have changed the structure of an IDoc in the source or target system. Nevertheless the IDoc adapter still uses the old structure for IDoc <-> XML conversion.

Validity

XI 2.0, XI 3.0

Solution

Delete the metadata for the IDoc in transaction **IDX2** and reload them.

6.5.2.3 IDOC_ADAPTER 601 - No business system for system &1, client &2 in SLD

Problem

Error message IDOC_ADAPTER 601: `No business system for system &1, client &2 in SLD` occurs.

Validity

XI 2.0

Solution

1) Call transaction **SLDCHECK**. If it reports any errors follow the instructions from the document for **SLDCHECK**.

2) If **SLDCHECK** does not report any errors, execute the function. SAI_LOGICAL_SYSTEM_GET in test mode in **SE37** using the business system name as the first parameter and leaving the second parameter blank. Depending on the error reported there ('Message = '):

   - 'Exception in SLD client: AbapSLDRequestHandler…'

     The model and SLD content are probably not completely loaded. Reload them as described in SAP Note 609364.

6.5.2.4 IDOC_ADAPTER.METADATA - Segment &, segmentnumber & not correct in structure &

Problem

Error message IDOC_ADAPTER.METADATA – `Segment &, segmentnumber & not correct in structure &` can be found in the XML message when trying to send the message to the outbound/receiver IDoc adapter.

Validity

XI 2.0, XI 3.0

Solution

The structure of the message does not correspond to the IDoc structure. Compare the payload of the XI message with the IDoc structure shown in transaction **WE60** in the target SAP System.

6.5.2.5 IDOC_ADAPTER.SENDER_BSI_INCORRECT - no_ale_system_found

Problem

Error message IDOC_ADAPTER.SENDER_BSI_INCORRECT: `no_ale_system_found` occurs in the XML message when it is sent to the IDoc adapter.

Validity

XI 2.0

Solution

Check the business system cache in transaction **SXI_CACHE** by choosing *Goto →
Business Systems*. The sending business system must have an entry with the logical
ALE name here.

Assign the ALE name defined in the SLD to the business system in the error
message (this is usually the sender system: The receiver of the IDoc needs to know
which system is the sender to determine the corresponding partner profile for
inbound processing of the IDoc). Delete the cache content in transaction
SXI_CACHE by choosing *Goto → Business Systems*. The data will be read from the
SLD when the next message is sent.

6.6 File Adapter

6.6.1 Problems and Solutions

6.6.1.1 (4076) - ERROR Finished sending to Integration Engine with error &

Problem

The inbound/sender file adapter cannot send a file to the Integration Engine. You get
the following error message (4076): 'ERROR\: Finished sending to
Integration Engine with error "{0}".' in the protocol of the adapter.

Validity

XI 2.0, XI 3.0

Solution

Depending on the error that is passed in the parameter {0} you can do the following:

1. `HTTP 404 File not found`

   Check the sender/inbound file-adapter configuration. In particular, the
   parameter `XMB.TargetURL` often references the J2EE Port (usually 50000)
   instead of the SAP NetWeaver AS port. You have to use the port that can be
   found in transaction **SMICM** by choosing *Goto → Services*.

2. `java.net.ConnectException: Connection refused`

   Check if the HTTP service is active (use transaction **SMICM**) and if the
   correct client/user/password is used. Try to log on to the system by using this
   user.

6.6.1.2 Files Without Extension

Problem

The outbound file adapter cannot create files without an extension.

Validity

XI 2.0

Solution

Workaround: Use the file name like '`<name>.`' instead of '`<name>`'.

6.6.1.3 FTPS Protocol

Problem

Are there any adapters that support the FTPS protocol.

Validity

XI 2.0, XI 3.0

Solution

This protocol is not supported in XI 2.0.

FTPS can be used in XI 3.0 in the J2EE-based Adapter Engine with SP13 and higher.

6.6.1.4 Parameter 'file.NameA.optional' Does Not Work

Problem

The configuration parameter `file.NameA.optional` for the file adapter has no effect.

Validity

XI 2.0

Solution

SP6 and lower: use parameter `XMB.NameA.optional` instead.

SP7 and higher: use parameter `file.NameA.optional` as well.

6.7 JDBC Adapter

6.7.1 Problems and Solution

6.7.1.1 (4221) - ERROR Finished sending query result to Integration Engine with error &

Problem

Error message (4221): `ERROR\: Finished sending query result to Integration Engine with error "{0}"` occurs in the inbound JDBC adapter.

Validity

XI 2.0

Solution

Depending on the error that is passed in parameter {0} you can do the following:

1. `HTTP 401 Unauthorized`

   Check the settings for sap/xi/engine service in transaction **SICF** (the service itself should be active of course). If there is a user assigned, check the logon data.

   If no user is assigned in transaction **SICF**, check if the parameters `XMB.User`, `XMB.Password` and `XMB.Client` are correct in the adapter configuration.

2. `HTTP 404 File not found`

   Check the inbound jdbc adapter configuration. In particular, the parameter `XMB.TargetURL` often references the J2EE port (usually 50000) instead of the SAP NetWeaver AS port. You have to use the port set in transaction **SMICM**; by choose *Goto → Services*.

6.7.1.2 Regional Settings

Problem

The inbound JDBC adapter uses the wrong regional settings. For example '.' (4.35) is used instead of ',' (4,35) in the message sent by the adapter.

Validity

XI 2.0

Solution

The JDBC adapter does not allow settings to convert the format. The method `toString` is used for all SQL types. The settings should be performed in the database configuration.

If this is not possible, the conversion has to be done in mapping.

6.8 RFC Adapter

6.8.1 Problems and Solutions

6.8.1.1 (6030) - Attempt to start RFC adapter failed

Problem

The RFC adapter cannot be started. Error message (6030): `Attempt to start RFC adapter failed\: {0}` is displayed in protocol of the adapter.

Validity

XI 2.0

Solution

General solution:

1. Check if the environment variable `CLASSPATH` contains paths to sapjco.jar and servlet.jar.
2. If the adapter engine started as a *Windows* service:
   - Start `regedit`
   - Search for JVMOptions as a key
   - Check if the path to sapjco.jar is contained there.
     - If not:
       - In the directory `tech_adapter` uninstall the Adapter Engine service using `uninstall_service.bat`.
       - In the file `install_service.bat` add the path to sapjco.jar to the parameter `jvmoption2`.
       - Install the service again using `install_service.bat`.

6.8.1.2 Changes in Function Structure Not Applied

Problem

You applied changes to the structure of a function module in the SAP system, but the RFC adapter still uses the old definition.

Validity

XI 2.0, XI 3.0

Solution

XI 2.0:

Restart the RFC adapter to update the metadata for the function.

XI 3.0:

Refer to SAP Note 730870 (section 5).

6.8.1.3 RFC Adapter with Non-SAP Systems

Problem

Can the RFC adapter be used to communicate with external non-SAP systems?

Validity

XI 2.0, XI 3.0

Solution

XI 2.0

No, it is not possible.

XI 3.0

Yes, but you have to use an SAP system as the source for the metadata. This has to be configured in the Integration Directory in the RFC adapter.

6.8.1.4 SM59 - no unicode option for registering RFC adapter

Problem

You want to define a TCP/IP connection in transaction **SM59** to the RFC adapter. You want to set the `Unicode` option in the destination. But the option is missing on the *Special options* tab.

Validity

XI 2.0

Solution

This setting is only possible if the system is a Unicode system. You do not need this option for non-Unicode systems. Then register the RFC adapter as a non-unicode program, set `RfcAdapter.sourceBackend.unicode`=`0` in the RFC adapter configuration.

6.8.1.5 Incomplete connect information missing field null

Problem

You get the error message `incomplete connect information missing field: null` when you call the RFC adapter.

Validity

XI 2.0

Solution

Check if the parameter `RfcAdapter.fromXmb.unicode` is set to `1` in the RFC adapter configuration and the *Unicode* flag is set in transaction **SM59** in the RFC destination `AI_RFCADAPTER_JCOSERVER`.

6.8.1.6 RFC Adapter Cuts Blanks

Problem

The RFC adapter cuts blanks at the end of fields.

Validity

XI 2.0

Solution

It is a property of the RFC protocol and not an error.

6.9 Plain HTTP Adapter

6.9.1 FAQs About the Plain HTTP Adapter

XI provides an HTTP adapter to convert plain HTTP requests to XI messages and XI messages to plain HTTP requests to enable communication between XI and systems that can only send and receive HTTP calls.

The HTTP adapter runs in the ABAP part of the XI system and communicates with the sending and receiving systems using the HTTP protocol by using the Internet Communication Manager (ICM).

Problem

You want to know more about the Plain HTTP-adapter, how it has to be configured and how to analyze errors.

Validity

XI 2.0, XI 3.0

Analysis

Configuration

How to configure HTTP exchange in the business and XI system is described in the XI online help:

XI 2.0: Plain HTTP Adapter

XI 3.0: Plain HTTP Adapter

For further information about the HTTP adapter refer to SAP Note 839803 *Plain HTTP Adapter: Calling the HTTP service*.

Runtime

If you have problems sending requests to or receiving calls from the HTTP adapter you can use the ICM Trace to get more information about the problem. See SAP Note 634006 question 9.

7 Runtime

7.1 Demo Examples

Problem

You want to test your XI system after installation or you want to know more about the configuration of scenarios in XI.

Validity

XI 3.0

Solution

Within XI 3.0, some test scenarios are created to test the XI functions and to learn more about XI and how to configure scenarios within your XI system. All objects necessary for the configuration are delivered by SAP.

You should start with the Simple Use Cases. The objects necessary for configuration are delivered with **SP13**.

For more advanced scenarios, see the XI Demo Examples.

7.2 Timeouts in XI

Problem

In XI there are different places where timeouts can occur: when calling the Integration Builder, during cache refresh, in the runtime, when (re)starting the J2EE engine, when calling the Adapter Framework and so on. This chapter gives an overview of several known timeout issues and the parameters to adapt timeout settings.

Validity

XI 3.0

Solution

Timeout During Cache Refresh

- RFC Destination `INTEGRATION_DIRECTORY_HMI`
- Tab page *Special options → timeout*
- After the XI post-installation steps, set the default to 900 msec

Timeout Calling the Mapping During Runtime

- Timeout for establishing RFC connection (only if all mapping threads are busy)
  occurs rarely
  gw/reg_timeout = 60

  Default: 60 secs

- Number of mapping threads in J2EE engine
  Number of processes for RFC destination AI_RUNTIME_<SID>in the J2EE service JCo RFC Provider

  Default after XI post installation steps: 10

Timeout Processing XI Messages

- Workprocess processing timeout
  rdisp/max_wprun_time = 900

  Default: 600 secs

Timeout Calling the Adapter Framework or Calling an External Partner Using the HTTP Protocol

- ICM timeout for http client calls (IS -> AF): ICM_HTTP_TIMEOUT
  Value for all ports: icm/keep_alive_timeout (Default: 60 seconds)

  Value for specific ports: icm/server_port_0 =
  PROT=HTTP,PORT=<icmhttpport>, TIMEOUT=30, PROCTIMEOUT=900

  PROCTIMEOUT not set → TIMEOUT is used → TIMEOUT not set →
  icm/keep_alive_timeout is used

  Default: TIMEOUT and PROCTIMEOUT not set –>icm/keep_alive_timeout is used.

  For more details see SAP Note 824554.

- XI Parameter in transaction **SXMB_ADM** → Integration Engine Configuration: Category RUNTIME, Parameter HTTP_TIMEOUT
  This timeout overwrites the ICM Timeout setting in icm/keep_alive_timeout and icm/server_port_0 for outgoing HTTP calls.

  Default: 0 - not set

- Timeout setting up the connection to the external partner: HTTP 404
  icm/conn_timeout=5000

Default: 5000 ms

HTTP 401 Calling the Adapter Framework

- Calling the AF may end with HTTP 401 during high load, this is caused by too few connections to the ABAP user management or a timeout waiting for a new connection.

  The connection pool for the user verification calls to the ABAP-side is controlled with J2EE properties in the J2EE service 'UME Provider':

  ume.r3.connection.master.poolmaxsize

  ume.r3.connection.master.poolmaxwait

  The property poolmaxsize controls the maximum number of connections that can be used in parallel. If all connections are in use and a new one is needed, the property poolmaxwait specifies the time to wait for a free connection (in milliseconds). After this time the attempt is treated as an error.

  Default for poolmaxsize: 10

  Default for poolmaxwait: empty → internal timeout: 30 seconds

  Increase parameters until problem disappears: e.g. poolmaxsize=50, poolmaxwait=60000

  For more details see SAP Notes 816022 and 821026.

Timeout Calling the Integration Server from the Adapter Framework

- ICM timeout for incoming http calls (AF -> IS): ICM_HTTP_TIMEOUT

  Value for all ports: icm/keep_alive_timeout (default: 60 seconds)

  Value for specific ports: icm/server_port_0 = PROT=HTTP,PORT=<icmhttpport>, TIMEOUT=30, PROCTIMEOUT=900

  PROCTIMEOUT not set –> TIMEOUT is used → if TIMEOUT is also not set → icm/keep_alive_timeout is used

  Default: PROCTIMEOUT and TIMEOUTnot set –>icm/keep_alive_timeout is used.

  For more details see SAP Note 824554.

- Timeout because of insufficient available dialog work processes in Integration Server.

  rdisp/wp_no_dia

  Default: 2

Timeouts in the Adapter Framework

- Cluster communication timeout in adapter framework core
  Property of Service " SAP XI AF Core" within J2EE Visual Administrator

  clusterCommunicationTimeoutMsec.

  It specifies the timeout value for the cluster communication in the SAP J2EE Engine. Even though the default value of 15 seconds should be sufficient for the adapter monitoring functionality, this value may be increased in cases where you are experiencing cluster timeout exceptions of the cluster communication mechanism of the J2EE Engine.

  Default: 15000 [ms]

  See Configuration Guide SAP XI 3.0 → Appendix → J2EE Service Properties

- Cluster timeout in adapter framework messaging system
  Property of Service " SAP XI AF Messaging " within J2EE Visual Administrator messaging.cluster.timeout

  The "messaging.cluster.timeout" property specifies the timeout value for the internal cluster communication of the SAP J2EE Engine. The default value of 60 seconds is very generous. If cluster timeout errors still occur, you must increase this value.

  Default: 60000 [ms]

  For more details see SAP Note 791655.

- Sync message processing XI Adapter
  This "timeout" property is only relevant for synchronous messages. The time specifies how long the messaging system waits for a response during synchronous communication. If this time elapses, a "MessageExpired" exception is triggered.

  Property of Service "SAP XI Adapter: XI" within J2EE Visual Administrator

  xiadapter.inbound.timeout.default

  Default: 180000 [ms]

  For more details see SAP Note 791379.

Timeouts in Different J2EE-Based Adapters

- **FTP adapter** setting within the channel
  ftp.timeout=timeoutSecs

  For more details see SAP Note 849089.

- Synchronous message delivery timeout in the SAP Business Connector adapter (**BC adapter)**

  syncMessageDeliveryTimeoutMsec

  This property controls the timeout while sending synchronous messages from the SAP Business Connector Adapter to the Adapter Framework and the other way round. It is also used to set the *valid until* field of a synchronous response message which is sent from the adapter to the SAP Business Connector.

  Default: 300000 [ms]

  See Configuration Guide SAP XI 3.0 -> Appendix -> J2EE Service Properties

- Synchronous message delivery timeout in the **RFC adapter**

  syncMessageDeliveryTimeoutMsec

  When an RFC server sends an sRFC call as a synchronous XI message to the Adapter Framework, it uses the module processor. The last module in the chain must be the RFC adapter module (localejbs/RfcAFBean). Within this module, the XI message is sent to Adapter Framework messaging. This property sets the timeout, which is used to send the message and wait for a response. If the given time has elapsed, an exception is thrown by the Adapter Framework and sent back to the sender.

  Default: 300000 [ms]

  See Configuration Guide SAP XI 3.0 -> Appendix -> J2EE Service Properties

- Synchronous message delivery timeout in the **SOAP adapter**

  XI.Timeout in SOAP sender channel

  This is the timeout for synchronous message delivery to the adapter framework. In **SP13** and higher you can change this value by setting parameter XI.Timeout in the module configuration table. The value must be set in milliseconds (e.g., 300000 for 5 minutes).

  Default: 5 minutes

  For more details see SAP Note 856597.

Timeout Calling the Integration Builder Tools

- HTTP client read timeout

  ServletInputStreamTimeout (default: 10000ms)

  ServletsLongDataTranferTimeout

  For more details see SAP Note 807000.

Timeout starting J2EE services (HTTP 503)

- Load Timeout for J2EE Services

  J2EE Visual Adminstrator: Server → Kernel → Service Manager → parameter LoadTimeout

  Default after setting from XI installation:

  > IBM iSeries: 20

  > Other platforms: 5

- Connect timeout to listener bean of Adapter Framework

  Property of Service "SAP XI AF Messaging" in the *Visual Administrator*

  messaging.connections (name=AFW, .., pollInterval=60000 [ms], pollAttempts=10, ..)

  The "pollIntervall" and "pollAttempts" properties define how often and in what interval the messaging system tries to access the Listener Beans

  during startup (using JNDI Lookup). In the default system, this is a maximum of 10 attempts every 60 seconds. This is necessary because the Messaging System (MS) is implemented as a J2EE service, whereas EJBs are part of a J2EE application. During server startup, applications are always in a second phase after the services; therefore they are unavailable during the MS initialization. If your system starts very slowly (if it takes more than 10 minutes), you may therefore need to increase "pollIntervall" and "pollAttempts".

  Default: pollInterval=60000 [ms], pollAttempts=10

  For more details see SAP Note 791655.

Timeouts in the J2EE Engine

- Cluster manager

  =>emergency shutdown cluster node during GarbageCollection

  ms.keepalive, default: 300000 [ms]

  ms.notification.timeout, default: 180000 [ms]

  ms.reconnect.timeout, default: 180000 [ms]

- SCS Instance

  Timeout for cluster

  ms/keepalive, default: 300 [s]

- HTTP Session timeout

  In case of too many open http sessions

J2EE Visual Adminstrator:

Server → Service → Web Container

sap.com/com.sap.xi.repository → rep   Click on push button *View*

sap.com/com.sap.xi.directory → dir   Click on push button *View*

sap.com/com.sap.xi.services → run   Click on push button *View*

Parameter: Session Timeout

Default: Session Timeout = 86400

7.3 Known Restrictions of EOIO

Problem

You have problems with the EOIO (Exactly Once In Order) handling and you are unsure about the current EOIO support for the different adapter types, ccBPM, and so on.

Validity

XI 2.0, XI 3.0

Solution

In the following sections you find known restrictions of message handling with the *Quality of Service* Exactly Once in Order (EOIO).

RFC Adapter

- The XI 2.0 RFC adapter does not support EOIO.
- The XI 3.0 RFC adapter does support EOIO starting with XI 3.0 SP11. For Details refer to SAP Note 730870 *FAQ XI 3.0 RFC Adapter* and see *Which flavors of RFC are supported?*.

IDoc Adapter

The EOIO function of the IDoc adapter functions for a backend system of SAP NetWeaver AS Release 6.40 and higher. For older SAP releases the standard ALE transfer function of tRFC (Exactly Once) is used.
For more details, refer to the SAP Help Portal:
http://help.sap.com/saphelp_nw04/helpdata/en/96/d8fa40badbf56fe10000000a1550b0/frameset.htm

JMS Adapter:

When using EOIO in the sender channel, you have to specify the Queue ID and exactly one J2EE Cluster Server (using the Cluster ID). This specification prevents

queue jumping in the JMS queue and guarantees that only one server node is used to process messages with EOIO.
The restriction of this setup is that there is no automatic fail-over for this sender channel if the server node fails.

For more details, see the SAP Help Portal:
http://help.sap.com/saphelp_nw04/helpdata/en/f4/2d6189f0e27a4894ad517961762db7/frameset.htm (XI Settings - Parameters: Quality of Service).

SAP Business Connector Adapter (BC Adapter)

The XI 3.0 BC Adapter does not support EOIO.

For details see SAP Note 774854 "FAQ XI 3.0 BC Adapter" – Question "Q: Which quality of service (QoS) is supported?".

ccBPM:

The Business Process Engine does not automatically support EOIO from inbound to outbound.
For more details see SAP Note 833740 "EOIO messages via BPE become EO messages".

Interface Split:

Prior to XI 3.0 SP11, the interface split is set up in the Integration Directory (several interfaces are assigned to one receiver) and the processing quality of service automatically changed to EOIO. This leads to problems in scenarios where you access outbound/receiver adapters that do not support in-order processing and therefore react with a system error.
For more details see SAP Note 781356 "XI3.0 SP10: Processing sequence of interfaces".

7.4 Runtime

7.4.1 Runtime Troubleshooting

The XI messages are sent from sender systems to the XI pipeline in the Integration Server. In XI there are several steps to be executed that can cause problems (receiver determination, mapping, technical routing, and so on).

Problem

You have a problem during XI message processing in the XI runtime and want to get more information about the error and how to analyze and solve it.

Validity

XI 2.0, XI 3.0

Analysis

XI 2.0

Trace in the XI Message

To get more information about the error in the XI message, you have to increase the trace level from 1 (default) to 3. Then the trace in the XI message in transaction **SXMB_MONI** is written with trace level 3.

- To set the trace level in the XI system call transaction **SXMB_ADM**
- Choose *Pipeline Settings*
- Select *Pipeline ID* SAP_CENTRAL and choose *Enter*
- Switch to the *Change* mode and change the *Trace Level* to 3
- *Save* the setting.

Logging Different Pipeline Steps

To get more information about the different pipeline steps in the XI message processing, you have to change the logging setting from 0 (default) to 1. Then, all pipeline steps the messages run through are logged in the XI message and you can view them using transaction **SXMB_MONI**. This can be very helpful if you want to see the message payload before and after the mapping step.

- To set the logging in the system call transaction **SXMB_ADM**
- Choose *Pipeline Settings*
- Select *Pipeline ID* SAP_CENTRAL and choose *Enter*
- Switch to the *Change* mode and change the *Logging* to 1
- *Save* the setting.

Error Analysis Settings

To analyze special messages or special connections, use the error analysis settings in the XI system.

- Call transaction **SXMB_ADM**
- Choose *Error Analysis Settings*
- Create a new entry.

You can create an entry for the sending user (user ID), the queue ID, quality of service or for a message ID. On the *Action* tab page select TRACELEVEL if you want to increase the trace level or select LOGGING if you want to activate the logging. After saving the settings are active and you can send a new message.

ICM Trace

If you want to trace the complete data transfer by using HTTP you can use the ICM Trace as described in SAP Note 634006. The trace can be used for all incoming and

outgoing requests that use the HTTP protocol. It does not work for IDoc and RFC calls since these adapters use the RFC protocol.

XI Debugging Guide

Debugging the XI pipeline is described in the guide How To Debug XI Message Processing.

XI 3.0

Trace in the XI Message

To get more information about an error in the XI message, increase the trace level from 1 (default) to 3. The trace in the XI message in transaction **SXMB_MONI** is then written with trace level 3.

- To set the trace level in the system, call transaction **SXMB_ADM**
- Choose *Integration Engine Configuration*
- Choose *Specific Configuration*.
- Set the parameter TRACE_LEVEL of *category* RUNTIME to value **3** (if the parameter does not exist, create it using the *New entries* button)
- *Save* the setting

If you want to analyze one special message that caused an error you can increase the trace level during restart of the message.
- For this select the message in transaction **SXMB_MONI**
- Select *Restart*.
  A popup will ask you if you want to increase the trace level
- Select *Increase*.
  The trace will be written with level 3 for the steps after restart.

This only works for messages that can be restarted from transaction **SXMB_MONI**. It does not work for synchronous messages or for messages that are already processed successfully.

Logging of Different Pipeline Steps

To get more information about the different pipeline steps in XI message processing, you have to increase the logging setting from 0 (default) to 1. All pipeline steps the messages then run through are logged in the XI message and you can view them using transaction **SXMB_MONI**. This can be very helpful if you want to view the message payload before and after the mapping step.

- To set logging in the system, call transaction **SXMB_ADM**
- Choose *Integration Engine Configuration*
- Choose *Specific Configuration*.
- Set the parameter LOGGING of *category* RUNTIME to value **1** (if the parameter does not exist, create it using the *New entries* button.)

- *Save* the setting

- For the logging of synchronous messages set the parameter `LOGGING_SYNC` of *category* `RUNTIME` to `1`.

Error Analysis Settings

To analyze special messages or special connections you can use the error analysis settings in the system.

- Call transaction **SXMB_ADM.**
- Choose *Error Analysis Settings.*
- Create new entry.

You can create an entry for the sending user (user ID), the queue ID, quality of service or for a message ID. On the *Action* tab page select `TRACELEVEL` if you want to increase the trace level or select `LOGGING` if you want to activate the logging. After saving the settings they are active and you can send a new message.

ICM Trace

If you want to trace the complete data transfer by using HTTP, you can use the ICM Trace described in SAP Note 634006. This can be used for all incoming and outgoing requests that use the HTTP protocol. It does not work for IDoc and RFC calls. These adapters use the RFC protocol.

SDN: Web Logs

Frequently **a**sked **q**uestions (FAQs) about the Integration Engine can be found on **S**AP **D**eveloper **N**etwork (SDN**)**.

7.4.2 How to Troubleshoot and Solve Queuing Problems on the Integration Server

Problem

The Integration Server uses pipelines to carry out the required tasks. Each pipeline is a set of pipeline services that are ABAP object classes which perform a step on a message.

These steps are: Receiver Identification, Interface Determination, Message Branch According to Receiver List, Request Message Mapping, Technical Routing, Call Adapter.

Technically, these steps are carried out using qRFC. The standard queues for message with the QoS (Quality of Service) Exactly Once (EO) are called `XBTI*` (inbound queues) and `XBTO*` (outbound queues). Apart from that there are queues for QoS EOIO (Exactly Once In Order), for message with low/high priority, for large message and for acknowledgment messages. In this chapter, `XBTI*` and `XBTO*` queues are used to explain the principles. The troubleshooting, however, is the same for all queues.

Depending on the value of the parameter `EO_INBOUND_TO_OUTBOUND` (*category* `TUNING` of the specific configuration of the Integration Server) the pipeline services are carried out in the inbound queues (value 0) or in the inbound and the outbound queues (value 1). The underlying qRFC technique results in a subsequent handling of the incoming messages: only the message that occupies the first slot in the qRFC queue will be handled. Once this message has been successfully processed, the next message in the queue is handled. Should the first message produce a system error, e. g. the receiving system cannot receive the message, then the status of the queue will change to error and it will not process any message. This situation is often referred to as "the queue is blocked".

In the daily operation of an XI system, blocked queues are found in different ways, though the first way is the most popular:

1) The CCMS (transaction **RZ20**) issues an alert that a queue is blocked
2) The end user in the receiving system complains about missing messages
3) The performance of the system (messages per hour) drops

Validity

XI 2.0, XI 3.0

Analysis

SAP basis functionality provides a qRFC monitor for inbound and outbound queues. Although the queues in XI are called inbound and outbound queues, they are technically both inbound queues. Consequently, only the monitor for inbound queues can be used to monitor the queues used by XI. The qRFC monitor for inbound queues is accessed from transaction **SMQ2** and shows an overview over all active queues. To check if a queue is blocked, either set *Waiting Queues only* to **x** in the selection screen or refresh the overview page several times and follow the number of entries.

Apart from directly accessing transaction **SMQ2**, it is possible to navigate there either from a given alert in CCMS (transaction RZ20) or from a message in transaction **SXMB_MONI** by clicking on the queue name in *Queue ID* column. Messages in transaction **SXMB_MONI** with a green flag (which stands for "Message scheduled") are a good starting point to look for possibly blocked queues.

In transaction **SMQ2**, navigate forward until you receive the list of queue entries (or LUW, Logical Unit of Work). From there, navigate forward to the respective blocking message by double-clicking on the entry in the *TID* column in the first line. Analyze which problem occurred with this message, for example in the SOAP Header -> Error.

Solution

First of all, try to solve the problem that led to the blocking of the queue in the first place. It could for example be a receiver that could not be reached. Once the problem is solved, restart the message out of transaction **SXMB_MONI**. Generally, it is possible to restart messages from transaction **SMQ2** as well, but it is not recommended and requires the change a parameter in the Integration Engine configuration to be changed (*category* MONITOR and parameter QRFC_RESTART_ALLOWED). After the message has been successfully processed, the queue is no longer blocked and starts processing the next messages.

It can, of course, happen that the problem cannot be solved or cannot be solved in a reasonable amount of time. In this case, you have two options:

1) The message can be manually cancelled in transaction **SXMB_MONI** and will subsequently be archived and deleted. Once cancelled, the queue should start processing the next message.

    Note that canceling a message that is part of an EO or an EOIO (Exactly Once in Order) queue could have severe impacts on the application logic of the receiver, because this message will not be sent again by XI.

2) The queue entry (LUW) can be temporarily saved and restarted at a later point in time from transaction **SMQ2**. To save the LUW, mark the entry and choose *Edit -> Save LUW*. To restart it later, call transaction **SMQ3**, mark the entry and use *Edit -> Restore LUW*.

    You should **never delete LUWs**, because this leads to inconsistencies (missing queue entry).

    Note that temporarily saving a LUW out of an EOIO queue could have severe impacts on the application logic of the receiver. Make sure that *not* sending this specific message is justifiable!

There are also known bugs in previous support packages that can lead to queuing problems. Refer to the section *Relevant Notes and Information*.

How to Avoid Blocked Queues / Improve Performance of Queues

The blocking of queues must be avoided because it can prevent important messages behind the blocking message being sent to the receiving system. Leave the parameter EO_INBOUND_TO_OUTBOUND at its default value of 1 so that a message is processed by XBTI* and XBTO* queues. At runtime this means that the message changes the queue after the branch / before the message mapping step. Since blocked queues almost always occur in one of the steps that are handled by the outbound queues, this will keep the inbound queues (XBTI*) running smoothly. Also, there is another, even more important reason to use XBTI* and XBTO* queues: it enables you to use the parameter EO_OUTBOUND_PARALLEL of *category* TUNING. This parameter allows you to create separate outbound (XBTO*) queues per receiver, with different numbers of parallel queues if the receiver is specified as the sub parameter. Consequently, even if a queue is blocked for a specific receiver, maybe for a good reason, a message for other receivers will still be processed.

Relevant SAP Notes and Information

688147 (for XI 2.0): Check whether messages are scheduled in a queue.
In XI 3.0 the report RSXMB_CHECK_MSG_QUEUE is available for checking inconsistencies between XI messages and queue entries.

827872 (for XI 2.0 and XI 3.0): Work process waits for registered RFC server

795221 (for XI 3.0): RFC queue remains in RUNNING status after mapping

Information about configuration parameters can be found in your system. Start transaction **SXMB_ADM**. Choose *Integration Engine Configuration -> Specific Configuration*. Choose a *category* and choose *Information*.

7.4.3 How to Debug Applications in XI

Problem

Your self-developed integration scenarios or ABAP proxies are causing problems.

You would like to evaluate what is going on with your message forwarded to the Integration Engine because you encounter unknown and irresolvable error situations.

You want to debug the pipeline services of your Integration Engine for incoming messages from the HTTP service.

Validity

XI 2.0, XI 3.0

Solution

A detailed description about the possible debugging and tracing functions is available in the relevant How-To Guides.

The guide for debugging XI 2.0 message processing can be found on SAP Service Marketplace:

http://service.sap.com/xi

Choose *Implementation* → *Implementation – Tips & Tricks* → *Runtime* and select How-To Debug XI Message Processing

The guide for debugging proxies for XI 2.0 and XI 3.0 can be found on SAP Service Marketplace: http://service.sap.com/nw-howtoguides

Select *Exchange Infrastructure* and open How-To debug XI Applications

7.4.4 Problems and Solutions

7.4.4.1 001 **- Message scheduled (commit follows)**

Problem

XML message stopped in status 001: `Message scheduled (commit follows)` and does not reach the recipient.

Validity

XI 2.0, XI 3.0

Solution

1. Synchronous messages

   For synchronous messages this status means that message processing is not yet complete (neither successfully nor with an error). That probably means that an error occurred at the receiver side without reporting the status back to XI (for example, short dump in function being called by RFC adapter). To find the cause of the problem, have a look in the system log (transaction **SM21**) and short dumps (transaction **ST22**). Otherwise analyze the problem in the target system.

2. Asynchronous messages

   Check the status of the corresponding RFC queue. If it has the status `RUNNING`, you can restart the queue by resetting the status of the first LUW: place the cursor on `SXMS_ASYNC_EXEC` and press *Shift+F5*.

If you want to delete these messages refer to SAP Note 712628.

7.4.4.2 012 - Scheduled for Outbound Processing

Problem

An XML message stopped in status 012: `Scheduled for Outbound Processing` and does not reach the recipient.

Validity

XI 2.0, XI 3.0

Solution

Most probably the message is waiting in the qRFC queue. See transaction **SMQ2** or navigate to the queue from the XML messages monitor (transaction **SXMB_MONI**). Usually, you find the first LUW in the queue that led to an error during processing. More details of the error are documented in the XML message corresponding to the LUW. To find this message, double-click the `TID` of the LUW. Then you will either see a screen from where you can get the message ID or (depending on the release) you are forwarded to the XML message directly.

7.4.4.3 6.4.4.3. CONFIG.LCR_ERROR - No own business system

Problem

The error message CONFIG.LCR_ERROR: `No own business system` appears in the XI message.

Validity

XI 2.0

Solution

Run transaction **SLDCHECK**. Check the errors and follow the instructions in the document for SLDCHECK.

7.4.4.4 503 Service unavailable Application stopped

Problem

The error message `503 Service unavailable Application stopped!` is displayed.

Validity

XI 3.0

Solution

The problem is that not all J2EE services can be started by the J2EE. Start the *Visual Administrator* and select *Server* → *Services* → *Deploy* in the tree on the left. On the right-hand side, choose the *Runtime* tab page. You see a tree in the right window with all applications if you select the *APPLICATION* radio button. Check if they are running, otherwise choose *Start*. Usually the J2EE engine starts all services automatically.

7.5 Adapter Framework Runtime

7.5.1 Error Tracking in the Adapter Engine

Problem

You need information about how to increase the trace level and find the error messages and more information about the errors in the J2EE-based adapters (File, JDBC, JMS, RFC, BC, SOAP, Mail, RNIF, CIDX).

Validity

XI 3.0

Analysis

Version of the Adapter Engine

How to find your adapter engine version is described in SAP Note 784471.

Adapter Monitoring

For a first check of your configured channels and if they could be started without errors you may check the adapter monitor:

SP8 and lower:

- Enter `http://server:j2ee-port/AdapterFramework`
- Select the *adapter type* `(file, JDBC, ..)` you want to check

SP9 and higher:

In the Runtime Workbench http://server:port/rwb

- Choose *Component Monitoring* and select components with *status* `all`
- Choose *Display*
- Select the appropriate Adapter Engine
- Click on the button *Adapter Monitoring*

- Select the *adapter type* (`file, JDBC, ..`) you want to check

Usually the channel information is available in the monitor after the service and the channel are activated successfully. For the SOAP adapter, the status of the channel is not available until the first request is sent to the adapter.

Audit Log

If you have problems during message processing in the messaging system, first check the audit log of the respective message. You can find this log in Runtime Workbench monitoring:

In the Runtime Workbench http://server:port/rwb

- Select *Message Monitoring*
- Select the appropriate Adapter Engine
- Choose **Display**
- Select your message using the correct selection parameter.
- Choose *Details*.

Find more information about the audit log in SAP Note 751915.

Log File

To get more information about errors, check the log file:

```
/usr/sap/[SID]/[Instanz]/j2ee/cluster/server[N]/log/applicatio
ns.[n].log
```

Use the *Log Viewer* to analyze this file.

For more information about the log file refer to SAP Note 751915.

Increasing the Trace Level

If you need more information about the error or problem, increase the trace level of your adapter and check the relevant trace file. This is described in SAP Note 761921.

More information about the trace file in general can be found in SAP Note 751915.

JCO Trace in XI30 RFC adapter

How to get a JCO Trace for the RFC adapter is described in SAP Note 793434.

More information about troubleshooting problems in the adapter engine can be found in the guide How-To Monitor and Analyze Errors in the SAP J2EE Adapter Engine.

For problems during message transfer to J2EE adapters in XI 3.0, see the PAS (problem analysis scenario) on the Help Portal: Message Failed on the Adapter Engine.

SDN: Web Logs

Some **F**requently **a**sked **q**uestions (FAQs) about adapters and the Adapter Framework runtime can be found on the **SAP Developer Network (SDN)**.

7.5.2 Communication error when sending XI messages from messaging system to XI or from XI to messaging system

Problem

1. The messaging system is trying to send a message to XI but fails with a communication error, for example:

```
Transmitting the message to endpoint
https://server:https-port/sap/xi/engine?type=entry using
connection AFW failed, due to:
com.sap.aii.af.ms.api.RecoverableException:
java.lang.RuntimeException:Error while silently
connecting: org.w3.www.protocol.http.HttpException:
java.net.ConnectException: Connection refused: connect
```

The error message is different if the port cannot be reached at all.

2. XI is trying to send a message to the messaging system but fails with a communication error, for example:

```
<SAP:P1>400</SAP:P1>
<SAP:P2>ICM_HTTP_CONNECTION_FAILED</SAP:P2>
```

The error message is different if the port is blocked or returns an error.

Validity

XI 3.0

Analysis

1. Check the following:
   - Check the audit log of the message in the messaging system according to chapter *Error Tracking in the Adapter Engine*.
   - Check the URL that is used to send the message to XI, for example https://server:ICM-port/sap/xi/engine?type=entry
   - Try to execute the URL in the browser using the user XIAFUSER.
   - Check the error you get:
     - Page cannot be displayed, cannot find server → server:port not accessible
     - HTTP 401 → unauthorized
     - HTTP 403 → forbidden
     - HTTP 404 → Not found

2. Check the following:
   - Check the outbound binding of the message in transaction **SXMB_MONI**
   - Find the Adapter Engine the message is sent to in the tag `SAP:AdapterEngineName` → `af.<sid>.<host>`
   - Open transaction **SXI_CACHE** and choose *Goto → AE Cache*
   - Check the URL for the Adapter Engine, for example
     https://server:J2EE-port/MessagingSystem/receive/AFW/XI
   - Try to execute the URL in the browser using the user `XIISUSER`.
   - → Check the error you get:
     - Page cannot be displayed, cannot find server → server:port not accessible
     - HTTP 401 → unauthorized
     - HTTP 403 → forbidden
     - HTTP 500 → internal Server Error
     - HTTP 503 → service not active

Solution

1. There are different solutions:
   a. Page cannot be displayed, cannot find server

      If https is used but you would like to use http, SSL is probably activated by mistake.

      To deactivate the SSL for XI messaging do the following:
      - Open the exchange Profile:
        http://server:port/exchangeProfile
      - Delete the value **messaging** in the parameter `com.sap.aii.connect.secure_connections` in section *connections*
      - *Save* it.
      - Restart the J2EE server to activate the change.
      - Restart the message

   b. Page cannot be displayed, cannot find server

      If https is used and you really would like to use https:
      - Check and correct the SSL configuration for the ABAP and J2EE sides of the system

      For more information about security in XI see the XI Security Guide.

   c. HTTP 401
      - User `XIAFUSER` uses a wrong password
      - Check the Exchange Profile and transaction **SU01**, try to reset the password
      - Restart the J2EE Engine to activate changes in the Exchange Profile
   d. HTTP 403
      - Path `sap/xi/engine` not active
      - Activate the service engine in transaction **SICF** as described in the XI Installation Guide

     e. HTTP 404
- o Using the server:port the specified path cannot be found
- o Check that the port really is the ICM HTTP Port (transaction **SMICM**) and not the J2EE port
- o If the port is wrong, change the pipeline URL in the SLD in the business system of the Integration Server
- o Restart the J2EE Engine to reset the SLD buffer of the Adapter Engine

2. There may be different solutions:

    a. Page cannot be displayed, cannot find server

      If https is used but you would like to use http SSL is probably activated by mistake.

      To deactivate the SSL for XI messaging do the following:
- o Open the exchange Profile: http://server:port/exchangeProfile
- o Delete the value **messaging** in the parameter `com.sap.aii.connect.secure_connections` in the section *connections*
- o *Save* it.
- o Restart the J2EE server to activate the change.
- o Delete the Adapter Engine cache in transaction **SXI_CACHE** *Goto → Cache*
- o Restart the message.

    b. Page cannot be displayed, cannot find server

      If https is used and you really want to use https
- o Check and correct the SSL configuration for the ABAP and the J2EE side of the system

    c. HTTP 401
- o User `XIISUSER` uses a wrong password
- o Check ExchangeProfile and transaction **SU01**, reset the password.
- o Restart the J2EE Engine to activate changes in the exchangeProfile.
- o Delete the Adapter Engine cache in transaction **SXI_CACHE** *Goto → Cache*
- o Restart the message.

    d. HTTP 403
- o User `XIISUSER` has no authorization to send messages to the messaging system
- o This is caused by a deployment error of the J2EE Engine.
- o Undeploy the component `com.sap.aii.af.ms.app` and redeploy `SAPXIAF*.sca`.
- o Restart the message.

    e. HTTP 500
- o Internal error in J2EE
- o Check SAP Note 807000

    f. HTTP 503

      J2EE application com.sap.aii.af.ms.app not active

o Try to (re)start the application using the Visual Administrator
Choose *Server* → *Services* → *Deploy* → *View on Application*
or restart the J2EE engine

7.6 Business Process Engine (BPE) Runtime

7.6.1 BPE: First Checks

Problem

You have problems in the runtime of your BPE scenario and you want to check the settings for the BPE in your XI system.

Validity

XI 3.0

Analysis

Before starting to analyze your processes in detail you should check the global settings for BPE in your XI system.

Check SAP Note 807640 for more information.

Information about how to monitor ccBPM processes is described in the How-To-Guide How To Monitor Integration Processes (ccBPM).

SDN: Web Logs

Some **F**requently **a**sked **q**uestions (FAQs) about the BPE runtime can be found on the **S**AP **D**eveloper **N**etwork (SDN**)** under *Integration Engine*.

7.6.2 BPE: Inactive Process Definition

Problem

At deployment ("Activate Change List" in Repository / Directory) of the integration process an equivalent workflow definition ("compilation") is generated in the Integration Server. This workflow definition, however, has not been activated and appears with Return Code 99 in transaction **SXI_CACHE**.

Validity

XI 3.0

Analysis

Activate it manually from transaction **SXI_CACHE**. You get more detailed information about the problem here.

Display the workflow definition in the R/3 Process Builder (**SWDD, SWF_XI_PBUILDER**) and analyze with respect to the error message given above.

Also review the process definition in the Process Builder in the Integration Repository.

Finally investigate the XML file containing the process definition. This is the exchange format between Java and R/3. If the error already occurs in this XML file, the issue is on the Java side and thus for BC-XI-IBD-BPM.

7.6.3 BPE: Message Is Not Received by Business Process

Problem

A message routed to a business process has not been received by this process. In transaction **SXMB_MONI** you can find a message with a red flag. By clicking on PE you get the message There are no workflows that have already worked with this object (Message SWL 013).

Validity

XI 3.0

Analysis

First exclude modeling errors (wrong specification) in the Integration Directory in terms that the receiver interface does not match the process signature.

Then verify that the workflow customizing is complete (transaction **SWU3, SWF_XI_CUSTOMIZING)**, especially that the RFC destination WORKFLOW_LOCAL_<Client> has been configured. In addition check the qRFC queue by clicking on the column QUEUE ID in transaction **SXMB_MONI**. Have a look at the tRFC queue (transaction **SM58**).

In general we have to distinguish between a **triggering receive** (process start) and a **receive step with correlation**. In case of a triggering receive, any message of a

given interface is received (**type coupling**) and creates a workflow instance. In case of a receive step with correlation in addition to the type match, a special condition (dependent on the payload) needs to be fulfilled (**instance coupling**) in order to continue an already created and waiting workflow instance, if any.

The crucial thing is to determine the receiver information (service / interface / namespace / correlation) from a workflow point of view in the Integration Server, i.e.:

Workflow Definition   `WS90100008`

Version   `0017`

Step   `000004`

XML Object type   `Z_PROXY_<Interface>_<0001>`

Correlation   `Z_<Correlation>_<0001>`

Navigation between Java and R/3 is not supported in ccBPM, this is by far not an easy thing. Here is the recommended procedure:

- Start with the WS number. This can be retrieved from the column `QUEUE ID` in transaction **SXMB_MONI**, e.g. you find there `XBQO$PE_WS90100008`.
- Then go to transaction **SXI_CACHE** and find the business process (workflow definition) in question. Suppose this workflow has `return code 0`, otherwise there is an issue already at deployment time described in a separate document.
- Your next step is to retrieve the appropriate version. If the process has not been changed in the meantime, the related version is always the current one, i.e. the one with the highest number. Otherwise, however, the appropriate version has to be determined based on the timestamps in the Workflow Builder (transaction **SWDD**, **PFWS** or **SWF_XI_PBUILDER**).
- Now display the graph of the process and find out the appropriate receive step. Usually there is only one receive step, the triggering one. If so, you have also found the corresponding XML object type as the data reference for the container element hosting the message. If there are more than one receiving steps, you have to distinguish based on the XML object type. This requires knowledge of the XML object type in advance. You can retrieve this XML object type in question using the F4 help in transaction **SWF_XMP1**. Thereby one exploits the fact that the description of this XML object type has been generated as `<Interface name> / <Namespace>`. Now determine the container element(s) -- ideally only one --, which refers to this XML object type. Using the *where-used-list* (right mouse click) for container elements you obtain the receive step(s), you have been looking for. In such a receive step the used correlation is also specified.
- You can test the correlation using transaction **SWF_CRL1**. Again there is a separate document dealing with this.

Alternatively ask the customer. They will know which they have defined. In case of a triggering receive they should tell you about the WS number to be started, otherwise

they should tell you the WI_ID of the waiting step to be completed. Once there is a WI_ID, all the information required can be seen directly from the workflow log and the container instance.

Now we can simulate (and debug) the incoming (from a process point of view) message:

Raise the event

Object Category = `XML Object type`

Object Type   = `ZXI_PROXY_<Interface>_<0001>`

Event   = `RECEIVED`

with

Object Key   = `Message GUID`

(taken from transaction **SXMB_MONI**)

by using transaction **SWUE**.

7.6.4 BPE: Process Instance in Status ERROR

Problem

An integration process has been triggered but it has the status `ERROR`.

Validity

XI 3.0

Analysis

Ask the customer to provide the `WI_ID` (work item ID) of the process instance in question.

Call transaction **SWI1 (**enter the WI_ID) to review the technical workflow log.

The further procedure depends on the step type, where the error has occurred:

Mapping step   → `BC-XI-IBD-MAP`

Send step   → `BC-XI-IS-IEN`

In both cases all the information required (Mapping ID, Message ID …) for the XI colleagues to take over can be retrieved form the work item container. The container can be accessed from the technical workflow log.

Any other type of error needs to be analyzed with standard workflow techniques; in that case forward the message to `BC-BMT-WFM`.

The same applies to hanging processes with the status `STARTED`. In this case you should also have a look at the sys log (transaction **SM21**) and the **ABAP dumps** (transaction **SM22**)

7.6.5 BPE: Display Mapping Trace

Problem

You have maintained a mapping in your transformation step and want to check the trace for it.

Validity

XI 3.0

Analysis

In transaction **SXMB_MONI**, select the message that is sent to the integration process.

- Navigate to the workflow log and display the view with technical details.
- From here you can display the container of the transformation step. This container has the entry "trace".

If you cannot display the trace check SAP Note 791352.

7.6.6 BPE: Correlations and XPath Evaluation

Background

XPath denotes a **sequence of XML tags** pointing to a specific `field` in the payload of an XML message. XPaths are the "access plan" in order to determine the value of that field at runtime, for example `/BookingOrders/Order/BookingCode`. So they are always related to a specific message/interface type.

At deployment time, XPaths are converted to workflow expressions such as
`&ZXI_PROXY_<Interface>_0001.PAYLOAD.BOOKINGCODE&`

XPaths are used in BPE, for example, in container operations, conditions and especially in correlations. Typically, a correlation consists of two message interfaces plus an XPath expression for each of them. At runtime two messages of different types are correlated when the XPath evaluation according to the correlation leads to the same value.

Problem

The customer claims that the XPath evaluation does not work (wrong or no value) and/or that correlations are misinterpreted at runtime.

Validity

XI 3.0

Analysis

Once you know the XML Object type `ZXI_PROXY_<Interface>_0001` and the `Message GUID,` you can simulate the XPath evaluation in transaction **SWF_XMP1**.

Once you have the R/3 name `Z_<correlation>_0001` of the correlation and both `Message GUIDs,` you can test the correlation stand alone using transaction **SWF_CRL1**.

Always ask the customer first about these technical details. However, since customers usually only know the repository point of view, we can try to retrieve the corresponding R/3 backend information following the approach outlined in a previous trouble shooting document.

7.6.7 BPE: Prerequisites for Troubleshooting

Remote Connection

R/3 connection to the Integration Server

Front end connection to Integration Builder

Details see SAP Note 769478.

Technical Information

According to SAP Note 792971 we need to know:

At Build Time

In the Integration Repository
- Software component (SWC)
- Software component version (SWCV)
- Namespace
- Business Process
  - Step   (if necessary)
  - Correlation(if necessary)
- Message Interface(s)

In the Integration Server

- Workflow Definition   *SWDD:*   **WS<999><00001>**
- Version of the Process   (NUMC4)
- Node ID   (NUMC6)
- XML Object type *SE24*: **ZXI_PROXY_<Interface>_<0001>**
- Correlation: *SWF_CRL1:* **Z<Correlation>_<0001>**

At Runtime

- **Message GUID**   *SXMB_MONI* GUID32
- **WI_ID** (Work item ID) *SWI1*   NUMC12

8 Caches

8.1 Analysis of Cache Problems

In XI 3.0 there are several caches established to make the communication between XI components as fast as possible. The most important caches are the XI runtime cache (transaction **SXI_CACHE**) for the ABAP runtime and the CPACache for the Adapter Engine runtime.

Problem

You need information about how to analyze and solve problems associated with the XI caches.

Validity

XI 3.0

Analysis

For an overview of cache refresh errors in the Integration Repository or Integration Directory you can check SAP Note 780747.

For troubleshooting information about problems in the CPACache refresh, see SAP Note 741214.

For information about the XI3.0 caching infrastructure and about where to find information about possible errors and how to solve them, see the How-To Guide for XI 3.0 Caching.

This guide can be found on SAP Service Marketplace:

http://service.sap.com/nw-howtoguides

- Choose *Exchange Infrastructure*
- Open *How to handle XI3.0 Caches*

8.2 Problems and Solutions

8.2.1.1 No SLD Elements of type SAP_XIAdapterFramework found

Problem

When performing post-installation activities for XI 3.0 (Initial Adapter Cache Refresh) you get the error `No SLD Elements of type SAP_XIAdapterFramework found.`

Validity

XI 3.0

Solution

Your Adapter Framework is probably not registered in the SLD. You may force the registration if you perform the action as follows:

1. In the J2EE *administrator tool* in *cluster - server - services - deploy (application view)*, stop the J2EE applications:
   a. `sap.com/com.sap.aii.af.service.cpa.monitor`
   b. `sap.com/com.sap.aii.af.`
2. Restart the `sap.com/com.sap.aii.af` application.

Refer also to SAP Note 670388 (chapter 1, point I).

8.3 SXI_CACHE

8.3.1 Problems and Solutions

8.3.1.1 AUTHORITY_NOT_AVAILABLE

Problem

The error message `cl_http_client RFC_READ_HTTP_DESTINATION AUTHORITY_NOT_AVAILABLE` is displayed in transaction **SXI_CACHE**.

Validity

XI 3.0

Solution

1. Check if the user `XIISUSER` with password is maintained in transaction **SM59** for the destination `INTEGRATION_DIRECTORY_HMI` and that this user is not locked (transaction **SU01**).
2. Check if the user `XIDIRUSER` has a profile for the role `SAP_XI_ID_SERV_USER`. If not, generate the profile and execute the user comparison.

9 Mapping

9.1 Error Analysis of Mapping Problems

In XI you can create and assign mappings to execute them during message processing in the runtime. If there are problems in the mapping there are different options for analysis.

Problem

You have problems with your mappings and want to analyze them.

Validity

XI 2.0, XI 3.0

Analysis

There are different places where to find more information about the mapping problem and how to increase the trace level.

For **XI 2.0** the troubleshooting for XI mappings is described in SAP Note 802126.

For **XI 3.0** the troubleshooting for XI mappings is described in SAP Note 801951.

For problems during mapping in XI 3.0 there is also a PAS (Problem Analysis Scenario) in the SAP Help Portal: Mapping Fails for a Certain Message Type.

Value Mapping

For **XI 2.0** the troubleshooting for value mappings is described in SAP Note 858767.

For **XI 3.0** the troubleshooting for value mappings is described in SAP Note 858766.

9.2 Problems and Solutions

9.2.1.1 CANNOT_PRODUCE_ELEMENT in XI mapping

Problem

You have the error CANNOT_PRODUCE_ELEMENT in the mapping step in the runtime or during the test of a mapping in the Integration Repository.

Validity

XI 3.0

Analysis

Check SAP Note 799657 for possible root causes and how to analyze it.

10 Runtime Workbench & Monitoring

10.1 Runtime Workbench Overview

XI offers a central entry point for monitoring purposes: the Runtime Workbench (RWB).

Problem

You are running XI 3.0 and would like to know about the features of the Runtime Workbench (RWB). In addition you want to know how to troubleshoot problems that occur while working in the RWB.

Validity

XI 3.0

Solution

For a general overview and further description of the available features refer to the SAP Help Portal: RWB.

For troubleshooting the Runtime Workbench refer to SAP Note 768456.

RWB and CCMS Monitoring Infrastructure (Transaction RZ20)

In general, the How-To guide 'XI Monitoring via CCMS' describes the monitoring via CCMS in XI 3.0.

This guide can be found on SAP Service Marketplace:

http://service.sap.com/nw-howtoguides

- Choose *Exchange Infrastructure*
- Open *XI Monitoring via CCMS*

As the alerts of the alert framework can be propagated into the RWB, the collaboration between RWB and CCMS is also briefly described. Further details are also available in the SAP Help Portal, topic RWB.

To display alerts from the RWB in the CCMS see SAP Note 824039.

SAP Note 634771 describes how to use the GRMG customizing file for XI to display heartbeat monitoring in the CCMS.

If you want to implement Single Sign-On for the Runtime Workbench refer to SAP Note 757373.

11 PCK

11.1 Configuration

11.1.1 Problem Analysis for the PCK Configuration Tool

Problem

You need information about how to analyze and solve problems associated with the PCK Configuration Tool.

Validity

XI 3.0

Analysis

Problems Starting the Tools (Java Web Start)

To start the PCK configuration tool, Java Web Start needs to be installed on the client PC. In case of problems check SAP Note 801868.

Memory Log

If problems occur in the PCK configuration tool you can use the PCK memory log for further problem analysis. The memory log should be used if the problem is reproducible because the log in the browser is overwritten after 1000 lines.

- To increase the trace level, call the following URL: http://server:port/pck/support/admin
- Edit *Memory Log Configuration*
- Reset to `DEBUG`
- Choose *Save*

- To check the log, use the following URL: http://server:port/pck/support/admin
- View Memory Log
- Show this file

Reset the log level to `DEFAULT` after your analysis and save it to avoid unnecessary performance problems.

J2EE Logs

All XI applications that run in the J2EE Engine write their logs to the J2EE engine logs.

xi.log and applications.log

All messages from XI applications in the J2EE Engine are written into the file `xi.<number>.log`. The file can be found in the file system under `..j2ee\cluster\server<number>\log\applications\com.sap.xi.`

All error messages from J2EE applications are written to the file `applications.<number>.log`. The file can be found in the file system under `..j2ee\cluster\server<number>\log.`

To analyze the logs, use the *LogViewer* Service in the *Visual Administrator* or in the standalone *Logviewer*.

J2EE defaultTrace.trc

To trace the applications in the J2EE Engine you can increase the trace level for the specific PCK application.

- To increase the trace level, call the *Visual Administrator* of the J2EE Engine.
- Choose *Server*
- Choose the Service `Log Configurator`
- Choose *To advanced mode*
- Choose *Locations*
- Create the new location `com.sap.xi.pck` using the button *New*
- Change the *severity* to `DEBUG.`
- *Save* the entry

The trace is written to the file `defaultTrace.<number>.trc`. The file can be found in the file system under `..j2ee\cluster\server<number>\log.`

To analyze the log, use the LogViewer Service in the *Visual Administrator* or the standalone *Logviewer*.

After your analysis, reset the trace level to `ERROR`, *copy* the setting to the subtree and *save* the entry to avoid unnecessary performance problems.

In case of authorization problems check if the roles described in SAP Note 746328 are correctly assigned.

11.2 Runtime

11.2.1   Error Tracking in the PCK Adapter Engine

Problem

You need information about how to increase the trace level and find the error messages and more information about errors in the PCK adapters (File, JDBC, JMS, RFC, BC, SOAP, Mail, XI).

Validity

XI 3.0

Analysis

Version of the Adapter Engine

How to find your adapter engine version is described in SAP Note 784471 ("Determining installed Adapter Framework Version").

Adapter Monitoring

For a first check of your configured channels and to check if they are started without errors you can check the Adapter Monitor using: http://server:port/pck/start

- Call the *Adapter Monitor*
- Select the *adapter type* `file, JDBC, ..` you want to check

Usually, the channel information is available in the monitor after the service and the channel are activated successfully. For the SOAP adapter the status of the channel is not available until the first request is sent to the adapter.

Audit Log

If you have problems during message processing in the messaging system you should first check the audit log of the respective message. You can find this log in the message monitoring: http://server:port/pck/start

- Choose the *Message Monitor*
- Select your message using the correct selection parameter
- Press the *Details* button**.**

More information about the audit log can be found in SAP Note 751915 ("Differences between trace, log and audit log").

Log File

To get more information about errors you can check the log file:
`/usr/sap/[SID]/[Instance]/j2ee/cluster/server[N]/log/applicati
ons.[n].log`

Use the *Log Viewer* to analyze this file.

More information about the log file can be found in SAP Note 751915 ("Differences between trace, log and audit log").

Increase the Trace Level

If you need more information about the error or problem, you can increase the trace level of your adapter and check the relevant trace file. This is described in SAP Note 761921 ("Creating an XI adapter framework trace file").

More information about the trace file in general can be found in SAP Note 751915 ("Differences between trace, log and audit log").

Information about the Adapter Framework can also be found in the chapter Adapters.

12 Network

12.1 Network Aspects with XI

The SAP Exchange Infrastructure features a message-based engine that combines heterogeneous systems into cross-functional, end-to-end business processes. As an Integration Broker, XI holds a central position in your systems' network from a communication perspective.

Problem

You are running an XI system and need more information regarding network-related issues, configuration as well as additional background information.

Validity

XI 2.0, XI 3.0

Solution

To get a general idea about networking in an SAP environment, refer to the SAP Network Integration Guide. You can find the document on SAP Service Marketplace on the main network integration page .This information will be very helpful for planning and configuring your network infrastructure according to SAP requirements.

You will also find further information as to which service uses which port in TCP/IP Ports used by SAP Applications or an overall picture of the general architecture in a SAP system landscape in Network Integration of SAP Servers.

The documentation mentioned also includes security aspects. If you need more information about this refer to the alias Security on SAP Service Marketplace.

To find out about basic architecture aspects regarding:

- General architecture, refer to SAP Service Marketplace, alias XI, Presentations, SAP XI 3.0 - Architecture & Operational Aspects
- System Landscape Directory (SLD), refer to the SAP Service Marketplace, alias SLD, go to Exchange Infrastructure, Planning Guide - System Landscape Directory.

Additional information is also available via the Technical Infrastructure Guide alias 'Instguides' on the SAP Service Marketplace.

The Java stack components of XI are using an SAP proprietary protocol called P4, that is, the *Visual Administrator* to connect to the J2EE Engine. Problems are handled by the Java support team who provide several notes related to the protocol and networking problems that can arise.
Typical problems encountered in the XI environments are:

- Connection problems with `SAPROUTER`. Refer to SAP Note 842810 for further information.
- Connections to XI might fail if you are using different network domains between client and server applications. See SAP Note 864268 for details.
- If the XI server hardware has more than one physical network card, you might encounter the problem as described and solved in SAP Note 609603.
- Necessary ports for P4, ABAP ICM communications are not opened in customer firewalls. For the list of used ports by SAP applications see the above mentioned documentation "TCP/IP Ports used by SAP Applications".

When working in a complex and integrated system landscape you might want to control the access from the "outside" world to your intranet. As a general access point the *SAP Web Dispatcher* is designed for this. Find detailed information on the SAP Help Portal help.sap.com → *Documentation* → *SAP NetWeaver* → *German/English* → *SAP Library* → *SAP Netweaver* → *Solution Life Cycle Management* → *System Management* → *SAP WebDispatcher* and additional information in SAP Note 538405. For Troubleshooting the *SAP WebDispatcher* refer to SAP Note 634262.

Besides using the *SAP WebDispatcher* for load balancing, the same can also be achieved by using the HTTP Port of the Messages Server instead of the direct ABAP or J2EE Port in the configuration. For more details see SAP Note 751873.

Using SSL and HTTPS for Communication:

When configuring HTTPS for your message exchange, you must handle the ABAP and Java parts differently. For detailed information refer to the alias Security in the SAP Service Marketplace: XI security guide, chapter *Network and Communication Security* → *HTTP and SSL*.

13 Transport

13.1 Software Logistics in XI

Problem

You are looking for strategies how to set up the software logistics for your XI environment. You do not know how to transport objects in XI.

Validity

XI 2.0, XI 3.0

Solution

The transport of Integration Repository objects should be done in a three-system landscape from development to quality assurance, followed by testing in quality assurance. After successfully testing, the same transport request should be used for transportation to the productive system.

The transport of Integration Directory objects on the other side requires a transport from development to quality assurance, followed by a new export from quality assurance and the transport of this newly generated export to the productive system.

See SAP Note 834507 for known restrictions about cross-release transports.

See SAP Note 832142 for known restrictions about transporting objects between different XI 3.0 support packages.

For troubleshooting the Integration Repository and Integration Directory refer to

Problem Analysis for the Integration Builder - Directory & *Repository*.

The transport of XI objects can be carried out by using file transfer in XI 2.0 and XI 3.0. The usage of CMS (Change Management Service) is possible from XI 3.0 SP9 on.

For CMS reference also check the chapter Problems with setting up CMS within XI 3.0

If you are developing a solution combining ABAP objects (e.g. RFC, IDocs, ABAP proxies) and XI objects, no central transport tool is available at the moment. When you are developing software component versions with parts in backend systems and XI, the combined transport process to release depending parts at the same moment in time has to be set up by organizational means.

XI 2.0

How-To Guide "[Development and Modifications in Customer Projects](#)"
This guide can be found on SAP Service Marketplace: http://service.sap.com/xi

Goto *Media Libary* → *Guides* → [SAP XI 2.0 How-to Guides](#)

Refer to the SAP Help Portal for information on Software Logistics:
http://help.sap.com/saphelp_xi20sr1/helpdata/en/94/c461bd75be534c89b5646b6ddc0aff/frameset.htm

XI 3.0

Refer to the SAP Help Portal for information on Software Logistics for XI Objects:

http://help.sap.com/saphelp_nw04/helpdata/en/94/c461bd75be534c89b5646b6ddc0aff/frameset.htm

13.2 Problems with Setting up CMS in XI 3.0

General

The Change Management Service (CMS) is a tool which can be used in XI as an alternative to the file system transport for Integration Repository and Integration Directory objects. Both, directory and repository objects can be exported, approved and imported in a two or three system landscape from one single surface, without accessing the file system level.

Problem

During the design, installation and configuration of CMS with XI there might be some issues which need XI- or CMS-specific knowledge.

Validity

XI 3.0 as of SP9

Analysis

During setup the CMS reports some errors or the initial tests of XI transports are not working correctly.

Errors should be displayed either during the export (or in the message windows) on the Integration Builder or on the CMS surface. If there is no or only generic information available, have a look at the following places:

- Memory log (directory or repository) of a sending XI system

  → You find the memory log in the following location(s) under *View Memory log*:

  Integration Repository: http://<server>:<port>/rep/support/private/index.html

  Integration Directory: http://<server>:<port>/rep/support/private/index.html

- Memory log (directory or repository) of a receiving XI system (see above)
- Engine log of the CMS System

  → Open the *Visual Admininistrator* and go to the Service *Log Viewer* and open the `defaultTrace.trc`

- Engine logs of sending and receiving XI systems. Open the `defaultTrace.trc` as described above.
- Engine log of the SLD system (if a separate SLD is used)

If you are opening an OSS message use the component BC-XI for errors in the logs of XI systems and the BC-CTS-CMS component for errors in the logs on the CMS system.

You can find some solutions for errors in the following SAP Note: 780297

Solution

For conceptual settings and general problems use the SAP XI 3.0 - Using CMS for SAP XI 3.0 guide. This guide is kept up-to-date and covers current problems, possible workarounds and future changes in the conception.

This guide can be found on SAP Service Marketplace:

http://service.sap.com/nw-howtoguides

Select *Exchange Infrastructure* and open SAP XI 3.0 - Using CMS for SAP XI 3.0.

For installation options and instructions refer to the corresponding chapter in the XI configuration guide.

Some issues and error messages are explained in SAP Note 780297. This note is continuously updated.

14 Archiving

14.1 Troubleshooting Archiving

General

To avoid the XI database from growing too fast, SAP has implemented data management functions. These functions can be used in the following components:

- Adapter Framework
- Integration Server
- XI ccBPM

The data management requires different procedures in each of the components.

Problem

You are not sure if the customer is archiving or following the correct procedure. We shall address the basic steps in setting up the deletion and archiving in XI 3.0 and where to check the procedures.

Validity

XI 3.0

For general troubleshooting of archiving and deletion in XI 3.0 refer to SAP Note 872388.

For XI 2.0 refer to SAP Note 861846.

Analysis

The **Adapter Framework** automatically deletes correctly processed XML messages.

Asynchronous messages are persisted in the database and are automatically deleted from it after their storage time has expired.

For monitoring purposes, synchronous messages are made persistent in the message store (MS) for a certain time. Since these messages are held in the memory, you should not set this value too high because if there is a high load of synchronous messages, this can result in `OutOfMemoryError` errors.

The default periods for this are:
- *Correctly* processed *synchronous messages* are deleted after 5 minutes *by default*.
- *Correctly* processed *asynchronous messages* are deleted after 30 days *by default*.

These time values are defined in milliseconds [ms], where 300000 [ms] equals 5 [min], and 2592000000 [ms] equals 30 days. The relevant SAP Note is 791379.

How to set the storage period:

For the processed asynchronous messages this is done with the
Visual Admininistrator → Server → Services → SAP Adapter: XI →
`*.persistDuration.default` property of the XI Adapter Service.

For synchronous messages you specify this period (in minutes) with the
Visual Administrator → Server → Services → SAP XI AF Messaging →
`syncMessageRemover.checkInterval` .

The deletion job is started with the message store and triggered periodically. It is
triggered once a day (1440 minutes) by default and this is set in the *Visual
Administrator* under the value `persistMessageRemover.checkInterval`
(under: *Visual Administrator → Server → Services → SAP XI AF Messaging*) and is
set in minutes.

The relevant SAP Note is [791655](791655) *Documentation of the XI Messaging System
Service Properties*.

> Note that the deletion job is not visible from the operating system; it is a
> thread within the Java Virtual Machine.

The archiving procedures are configured in the *Runtime Workbench*,

- Open the *Runtime Workbench*, select *Component Monitoring* and choose an
  Adapter Engine.
- In the lower window choose *Message Archiving* and *Security Archiving*.

There are two kinds of messages that you can archive in the Adapter Framework,
"normal" and signed messages.

Signed messages contain additional information (the signatures from the parties);
otherwise signed and unsigned messages are the same. Signed messages may
need to be archived for legal reasons. Both types of messages are stored locally on
a database for the Adapter Framework and therefore need a separate archiving
process, in addition the signed and non-signed messages are archived in different
ways.

If you would like to save some messages you need to specify which messages you
wish to keep; all others are automatically deleted.

To check if the archiving is performed:

- Go to the *Runtime Workbench* and select *Component Monitoring*

- Choose `All` and click on the *Adapter Engine*

From this point on you can either choose *Security Archiving* or *Message Archiving*. Both will then display an interface to implement and monitor your archiving process. In both cases you need to choose the timeframe and the periodic interval of the archiving (JAVA) process. It is also possible to check the status of archiving.

If you want to look at the archive, you have to go to the *Message Monitoring* in the *Runtime Workbench*.

In the two dropdown lists you choose the specific *Adapter Engine* you want to view archives from and choose *Archives* when you want to see messages that are in the archive, making sure that you also enter selection values, otherwise no archived messages will be displayed.

You can now display messages which were archived.

Refer to the following SAP Notes:

791379 XI Adapter service properties documentation

791655 Documentation of the XI Messaging System Service Properties

The **Integration Server** provides a different procedure. Depending on your needs you either define a deletion or an archiving & deletion procedure.

You have to specify for how long XML messages are retained in the database before they are deleted or archived, and how long historical entries for deleted XML messages are retained in the database.

The thresholds for the archiving and deletion times are defined in transaction **SXMB_ADM**

- Choose *Configuration* → *Define Interfaces for Archiving and Retention Periods*
- Select the *Retention Period* button.

The database size and the need to keep it at a manageable size is important hence a high-volume XI system will have much shorter retention times. Another aspect to be considered when setting retention times is that you might have specific reasons to retain information.

The history of a XML message is a separate object and needs an additional procedure for archiving /deletion.

Archiving Processed XML Messages

For processed messages you can either archive and then delete them or delete them immediately.

It is recommended that you configure the archiving (& deletion) jobs by using transaction **SXMB_ADM**.

Choose *Administration → Schedule Archiving Job* and define what kind of interface to archive using transaction **SXMB_ADM** → *Define Interfaces for Archiving and Retention Periods.*

The reoccurrence depends on the volume of messages you wish to archive in the system, if at all. The background job created is called `SAP_BC_XMB_ARCHIVE<client>`, it in turn calls the program `RSXMB_ARCHIVE_PLAN` and the object `BC_XMB` is archived. In the system the `RSXMB_ARCHIVE_PLAN` starts the program `RSXMB_ARCHIVE_MESSAGES` automatically. Then `RSXMB_DELETE_MESSAGES` is started afterwards.

They are in turn responsible for archiving and then deleting the messages.

There are currently two points to keep in mind:

- Archiving and deletion jobs are client-dependent!
- All of these jobs are scheduled as priority `C` batch jobs. So it is quite possible that the jobs are not started when they are thought to be scheduled. This can lead to unexpected issues with database growth.

You can check if the jobs for the deletion and archiving are running correctly (in their respective clients) by calling transaction **SXMB_MONI** and choosing *Job Overview*. It is also possible to display the archives in transaction **SXMB_MONI** by choosing *Archived XML Messages*.

Deletion of processed XML messages

The deletion of the messages can be achieved in two ways. The "simple deletion" and the "switch" method.

- The simple method is a straight forward deletion of the messages that are to be deleted.
- The switch method sets a "to be deleted" flag for the message that is to be deleted (the delete flags are set if the defined retention time for the message has been exceeded). The size of the table `SXMSPMAST` is monitored and when it reaches a specified fill level, the entries in the table are copied. Those entries that are marked are not copied to the new table. After this the "old" table is dropped and recreated.

With parameter `DROP_MAX_TABLE_LOAD` you control at what fill level the switch is triggered. The parameter is set in transaction **SXMB_ADM**.

- Choose *Configuration → Integration Engine Configuration.*
- Select *Category* `DELETION` and choose *Specific Configuration*.

The default setting is 90% (filled: meaning 900.000 messages). Currently we suggest 50% and in specific cases even lower values might be appropriate, depending, for example, on the size of messages in XI.

It is important to note here that you can have problems with disk space for the database because the switch table procedure creates a copy of the tables. Experience has shown that here values as low as 10% have been used by customers (due to experimentation on their part).

The table switch also has a performance issue. Since you really cannot control when the switch is triggered most customers tend to configure a low percentage to avoid a large table being copied.

To help you calculate if you need a smaller value for the parameter `DROP_MAX_TABLE_LOAD`:

- Look up the table `SXMSPMAST` in transaction **SE11**.
- Choose *Technical Setting*.
  This shows the maximum size that the table may have and how big the copies can become in the worst case. This is an indicator for the resulting growth and shrinkage of the database.

For the Processed XML Message History

The history entries for a message also need to be deleted to avoid database performance issues.

- Go to transaction **SXMB_ADM**.
- Choose *Configuration → Define Interfaces for Archiving and Retention Periods* and choose *Retention Period.*
  The default setting is set to 30 days retention, but can be reduced to a smaller value, if needed.

Refer to the following SAP Notes:

768415 - Program termination in database analysis or table switch

810282 - Potential loss of data through the deletion of messages (solved with SP11)

824374 - XI messages are not archived or deleted

811086 - Potential loss of data - check report

ccBPM Archiving

If you use the cross-component Business Process Management (ccBPM), you need to implement an archiving procedure. This follows the standard recommendations for workflow items.

Archiving in ccBPM should also be implemented. The work item tables can grow quickly (tables included are `SWWWIHEAD, SWW*`). A work item is created for each

workflow execution and each step in a workflow; once a work item is completed, it is usually not needed anymore.

As the Business Process Engine (BPE) operates with work items, you must use transaction **SARA** to archive work items. The SARA archiving object is the `WORKITEM`. For further details refer to the SAP Help Portal about Work Items.

You also have the choice to "manually" archive items. You can do this by using report `RSWWWIDE_TOPLEVEL` and selecting work item type **F** with status `COMPLETED` and the workflow task you wish to archive. If you are not certain which task you require, you can look it up in transaction **SXI_CACHE**. Archive *Integration Processes* whose names start with `WS`.

To delete all work items from the BPE you can also use the reports `RSWWWIDE` and `RSWWHIDE`. `RSWWWIDE` deletes the work item as such (including its attachments and all dependent work items), `RSWWHIDE` deletes the work item history. `RSWWWIDE` can also delete work items which are not in final status or that are part of a higher-level workflow. After executing the reports, there is no possibility to reconstruct the deleted work items.

Refer to the following SAP Notes:

49545   - Deleting unnecessary work items

836092 – Archiving/Deleting work items in the XI

14.2 Problems and Solutions

14.2.1.1   Adapter Framework: Messages Disappear

Problem

Unsent messages (that are in status retry) disappear from the message store in the Adapter Framework.

Validity

XI 3.0 SP 10 (and below)

The problem should be fixed by SP 12.

Analysis

The customer probably has modified the retention periods in the Adapter Framework to reduce the volume of data in the Adapter Framework.

Solution

The default periods for this are as follows:
- Synchronous messages are deleted after 5 minutes.
- Asynchronous messages are deleted after 30 days.

The preset time values are defined in milliseconds [ms], where 300000 [ms] equals 5 [min], and 2592000000 [ms] equals 30 days. The relevant SAP Note is 791379.

How to set the storage period:
- For asynchronous messages this is done using the *Visual Administrator → Server → Services → SAP Adapter: XI →* `*.persistDuration.default` property of the XI Adapter Service.
- For synchronous messages you specify the period (in minutes) using the *Visual Administrator →* Server → Services → SAP XI AF Messaging→ `syncMessageRemover.checkInterval` .

The deletion job is started with the message store and triggered periodically. It is triggered by default once a day (1440 minutes) and this is set in the *Visual Administrator* under the value `persistMessageRemover.checkInterval` (This can be found under: *Server → Services → SAP XI AF Messaging*) and is set in minutes. The relevant SAP Note is 791655.

A Rule of Thumb:

The `persistDuration` specifies how long the message should be stored in the messaging system database. This time must be greater than the product of the number of retries (default is 3) and the retry interval (default is 5 min). If this is not the case then it is possible that the Adapter Framework will delete the messages.

This issue is taken care of with SP 12

To solve this adjust the times to fit the needs of the customer so that the above rule applies.

Refer to the following SAP Notes:

791379 - XI Adapter service properties documentation

791655 - Documentation of the XI Messaging System Service Properties

15 System Landscape Directory (SLD)

15.1 Troubleshooting the System Landscape Directory

Problem

This chapter provides basic information about how to check if the connection to the SLD works correctly and how to troubleshoot in case of a problem. The connection to the SLD is a vital part of XI during development as well as during runtime. Among others, a working connection to the SLD is needed to:

- import Software Component Versions into the Integration Repository
- assign Business Systems in the Integration Directory
- provide input help for interfaces in the Integration Directory
- send messages from the Adapter Framework to the Integration Server
- carry out a cache refresh either from the Integration Directory or the ABAP runtime cache (transaction **SXI_CACHE**).

Validity

XI 3.0

Analysis

The ABAP runtime provides the transaction SLDCHECK as a very useful tool for the analysis of SLD access problems. Log on to the client of the Integration Server and start this transaction.

The transaction consists of three parts:

1) Logging in to the SLD using a browser
2) Testing the SLD access itself (the result is displayed in the SAP GUI),
3) Testing the Exchange Profile (the result is displayed in the SAP GUI). A successful check will mark all tests green in the SAP GUI. To display screen shots, refer to SAP Note 817920 (XI Readiness Check).

Solution

A detailed Problem Analysis Scenario (PAS) has been delivered in the SAP Help Portal for SAP NetWeaver. Refer to SAP Note 768452 (Troubleshooting SLDCHECK) to locate the relevant web site.

Related SAP Notes that help to solve problems beyond the mere accessibility are:

720198: Integration Repository cannot access SLD

720717: Reduce the number of System Landscape Directories

764176: Error in XI due to inconsistent SLD contents

SDN: Web Logs

Frequently **a**sked **q**uestions (FAQs) about the SLD can be found in the **S**AP **D**eveloper **N**etwork SDN.

15.1.1 Problems and Solutions

15.1.1.1 Changes in SLD are not passed to runtime

Problem

You have changed the ALE name for the business system in the SLD. Nevertheless changes are not reflected at runtime.

Validity

XI 2.0, XI 3.0

Solution

XI 2.0

Run transaction **SXI_CACHE** and choose *Goto → Business system*. Choose *Compare data*.

XI 3.0

In the Integration Directory reload the data into the service and perform a cache refresh in transaction **SXI_CACHE**.

15.1.1.2 How to Change the SLD Object Server

The SLD object server and the server used in transaction **SLDAPICUST** must be maintained in agreement, see SAP Note 608322. If you change it in the transaction **SLDAPICUST** you also have to adjust the SLD object server.

Problem

How do you change the SLD object server (displayed in the lower-right corner in the section *Administration* of the SLD)?

Validity

XI 2.0

Solution

Since it is a deployment parameter, you have to redeploy the SLD. In order to be able to choose a new value you should choose the option SDM Deployment (Deployment Configuration: *Use new deployment parameter' & 'Redeploy'*).

15.1.1.3   No *Administration* Button Visible in SLD

Problem

No *Administration* button appears in the SLD.

Validity

XI3.0

Solution

It is an authorization problem. With the J2EE administration tool select the SLD service and press the button to *Assign application roles to user groups*. Afterwards open a new browser window. The Administration button should now be available.

16 J2EE

16.1 How to Determine the J2EE Version and SP

Problem

How do you determine the J2EE version and SP?

Validity

XI 2.0, XI 3.0

Solution

XI 2.0

You find the version in `<J2EE-Home>\<Instance>\j2ee\cluster\<ClusterElement>\managers\version.txt`. For the SP number see the SAP Note 635453.

XI 3.0

You find the version in `<J2EE-Home>\<Instance>\j2ee\cluster\<ClusterElement>\version.txt` or check the link `http://<j2ee-host>:<j2ee-port>/sap/monitoring/SystemInfo` if the J2EE engine is running.

If the SP number is not contained there use the SAP Note 701385 to determine it.

16.2 How to Determine the HTTP Port of the J2EE

Problem

How do you determine the HTTP port of the J2EE?

Validity

XI 2.0, XI 3.0

Solution

XI 2.0

You may find it in the properties file following the path:
`<installdir>/j2ee/cluster/dispatcher/services/http`.

XI 3.0

Start transaction **SMICM** and choose *Goto -> HTTP Server -> Display Data*.

16.3 J2EE Central Notes

Some of the XI applications run in the J2EE engine. Often it is necessary to tune or adapt the parameter settings of the J2EE engine to improve performance or to avoid `OutOfMemory` or `OutOfThread` errors.

Problem

You need more information about parameters and settings for the J2EE engine.

Validity

XI 2.0, XI 3.0

Analysis

XI 2.0:

The necessary settings for SAP Exchange Infrastructure 2.0 are outlined in the Installation Guide SAP Exchange Infrastructure Release 2.0 SR1 chapter *Installation Preparation*.

Contrary to the Installation Guide, `Xmx` and `Xms` should be set to the same value. If the values are set too high that may lead to problems on certain platforms, e.g. the J2EE Engine does not start. Setting `Xms` to a lower value only defers the problem

until the Heap grows. Additionally a lower value of `Xms` forces the VM to resize the heap from time to time.

The XI Tuning Guide 2.0 also contains some J2EE- and java-specific recommendations for XI message processing.

Initial checks for problems with the J2EE engine 6.20 are described in SAP Note 604564.

Where to find logs and traces in the J2EE engine is described in chapter Problem Analysis for XI Integration Builder - Directory & Repository.

The Java VM settings for XI 2.0 can be found in SAP Note 722787. This note refers to the central SAP Note 696410 and contains XI-specific information. SAP Note 729178 contains some operating-system-specific settings in J2EE 6.20.

The central note for memory issues in 6.20 J2EE engines is SAP Note 634689.

This is also the right note in case of `OutOfMemory` errors if the Java memory parameters are already set to our recommendations.

Changing the JDK for a J2EE 6.20 is described in SAP Note 575774.

XI 3.0:

The necessary settings for SAP Exchange Infrastructure 3.0 are outlined in the Installation Guide - SAP Exchange Infrastructure 3.0 and Installation Guide - SAP Exchange Infrastructure 3.0 SR1.

The XI Tuning Guide 3.0 (available under http://service.sap.com/instguidesnw04 -> *Operations -> SAP XI*) also contains some J2EE and Java-specific recommendations for XI message processing.

The central note for problems with the 6.40 J2EE engine is SAP Note 724452. It contains links to all other important notes for the J2EE engine 6.40.

For Java VM setting information for XI 3.0 (J2EE 6.30) refer to SAP Note 723909.

Changing the JDK for a J2EE 6.40 is described in SAP Note 718901.

Troubleshooting information on J2EE engine 6.40 is contained in SAP Note 764417.

Where to find logs and traces in the J2EE engine is described in chapter Problem Analysis for XI Integration Builder - Directory & Repository.

If there are `OutOfMemory` errors and the java memory parameters are already set to our recommendations you can find helpful information in SAP Note 634689.

This note was written for the J2EE Engine 6.20 but does also apply for 6.40, with the difference that the console output is written to
`\usr\sap\<SID>\...\work\std_<server_name>.out`

16.4 XI Services in J2EE

XI applications are separated by either running as a service in the J2EE engine or in the ABAP stack of the Integration Engine.

Problem

You need more information about the following:

- Which XI applications are running as a service in the J2EE engine?
- How can I find out the services that are currently running/active?
- What XI applications are maintained via J2EE deployment?
- How can I see the deployed version?
- What is the content of the deployed SCAs?

Validity

XI 3.0

Analysis

Which XI applications are running as a service in the J2EE engine?

XI uses the ABAP stack as well as the Java stack for its applications.

On the java side there are:
- Central Adapter Engine
  - Adapter Framework
  - Resource Adapters
    - RFC Adapter
    - JDBC Adapter
    - File/FTP Adapter
    - JMS Adapter
    - SOAP Adapter

- ▪ Marketplace Adapter
- ▪ Mail
- ▪ SAP BC
- ▪ RosettaNet (RNIF 2.0) Adapter
- ▪ CDIX Adapter
  - o Messaging System
  - o CPACache
- Integration Builder
  - o Integration Repository
  - o Integration Directory
- Runtime Workbench
- Mapping Runtime
- System Landscape Directory

  running in the Java stack, but technically XI is a client application to it.

As a prerequisite for analysis, check whether the SAP J2EE engine is running:

In the ABAP stack call transaction **SMICM** , choose *GOTO -> HTTP-Server –> Display data.* The setting has to be: `J2EE Server operational = true`

In the Java stack open an internet explorer – http://<J2EE-host>:<J2EE-port>;

This should open the administration page of the J2EE Engine.

<u>How can I find out the services that are currently running/active?</u>

To check for the relevant settings use the *Visual Administrator* -> connect to the J2EE

On the *Cluster* tab follow *instance -> server –> services*. On the left hand side you find all deployed services.

The XI services are:

- `SAP XI Adapter <type>` – enlisting all the available adapters as an XI service:

  BC

  File

  JDBC

  JMS

  Mail

  Marketplace

  RFC

  XI

- `SAP XI AF` … – enlisting the services for the XI Adapter Framework

    Core

    CPA Cache

    Messaging

Check the icon placed in front of the service name to find out whether the services are running or down:
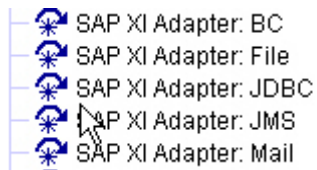
Services running
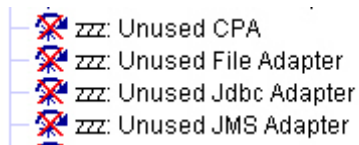
Services down

How can I see the deployed version?

To get the current version of a running service you can mark the service on the left hand side and then choose the *Additional Info* tab page on the right hand side.
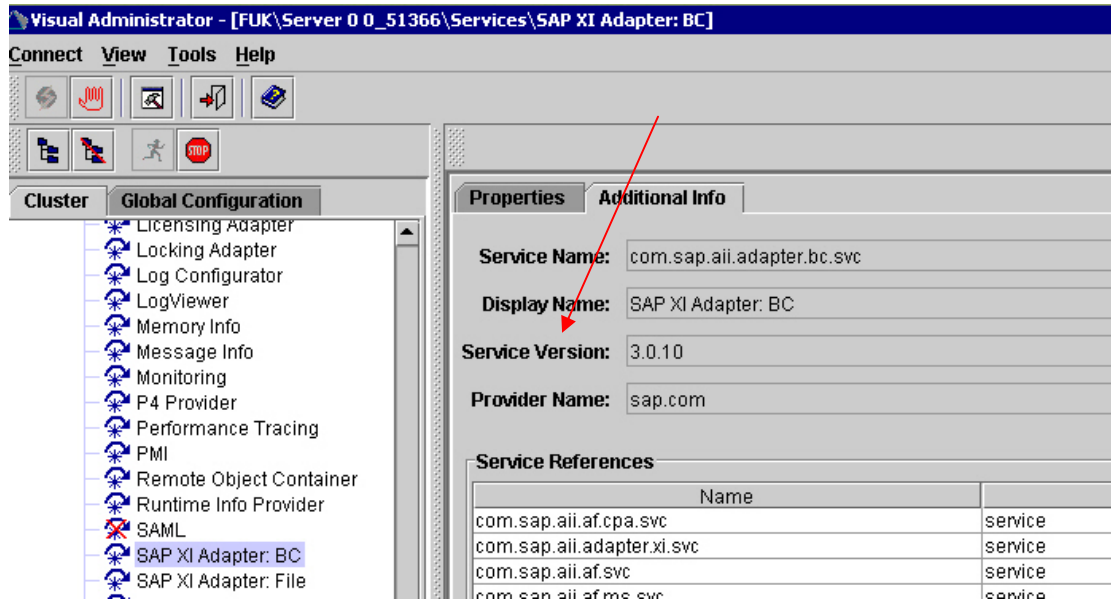
Another possibility is:

Open the J2EE start page in an internet browser: http://<J2EE-host>:<J2EE-port>
- Choose *System information*,
- Follow the link to *all components*.
- Here you find the SP release for each of the software components, i.e.

sap.com   SAP-XIAFC   3.0 SP10 for (1000.3.0.10.0.20050529222533)

For a single development components, i.e.:

sap.com com.sap.aii.af.service.file 3.0 (3.0.10 20050525081916.0000) --> XI30 SP10

What XI applications are maintained by using a J2EE deployment?

All XI applications running as a Java service are maintained via Java deployment (SCA packages). You use the SDM (Software Deployment Manager) to do so.

The following XI services are deployed with the corresponding SDA:

Package　　　　　　　　　　**Technical name, i.e. for current patch**

XI ADAPTER FRAMEWORK 3.0   SAPXIAF<SP>_<Patch>(SAPXIAF10_2)

XI ADAPTER FRAMEWORK CORE 3.0 SAPXIAFC<SP>_<Patch>

XI TOOLS 3.0   SAPXITOOL<SP>_<Patch>

XI CONNECTIVITY SE 3.0   SAPXICONS<SP>_<Patch>

XI PCK 3.0   SAPXIPCK<SP>_<Patch>

The XI content is not deployed with SDM. This package is imported within the repository (refer to SAP Note 705541).

XI CONTENT SAP_BASIS 6.40   SAP_BASIS<SP>_<Patch>

What is the content of the deployed SCAs?

To find out the detailed content of each package double-click on the SCA file. This opens a WinZip window showing Java SDA archives together with the manifest files related to the package. To get further details you might want to open these archives again with WinZip showing you the single files.

Further information:

SAP Note 784471 Determining installed Adapter Framework Version

SAP Note 771785 SAP Exchange Infrastructure patch information

SAP Note 656711 Deploying Java Support Packages with SDM

SAP Note 724452 Central Note for SAP J2EE Engine 6.30/6.40

16.5 Using Full Thread Dump to Analyze the J2EE Problem

Problem

The J2EE Engine started but stopped after a certain amount of time with high CPU consumption or the application stopped but the J2EE Engine is still running, sometimes with an Out of Memory error.

Validity

XI 3.0

Analysis

First read SAP Note 764417, *Information for troubleshooting of the SAP J2EE Engine 6.40*.

It is very useful to have a full thread dump if the J2EE engine is running with high CPU consumption, or an `Out of Memory` error. Refer to SAP Note 710154, *How to create a thread dump for J2EE Engine 6.30*. It is recommended that you create the thread dump once the J2EE Engine is running properly and once when an error happens.

After creating the full thread dump, you will find the string `full thread dump` as the header in the file `STD_SERVERx.out`.

You can use *ThreadDumpScan* to analyze the result of full thread dump. *ThreadDumpScan* is a simple Java J2SE application that scans the Java VM console

output and generates summary tables for `verbose:gc` output and full thread dumps found in the console log. Refer to SAP Note <u>751791</u> for details.

Solution

1. Try to find the explicit deadlocks in the dump file. Java will detect the simple deadlocks automatically.

2. If the errors are something like "`OutofMemoryError: unable to create new native thread…`", or after analyzing the dump file, you found almost all the threads are in use, then go to the ConfigTool, choose *cluster data -> server -> cfg -> kernel -> propertysheet -> Application Thread Manager*, double click on the property sheet, and change the value of `MaxThreadCount` to **150** or **200**.

3. When you operate XI3.0 on Suse Linux 8 and get errors like "`unable to create new native thread`", upgrade your system to Suse Linux 9 and configure the Stack size to 256KB per Java Thread as follows. For details, refer to SAP Note <u>834878</u>.

4. When using HP-UX together with XI, if J2EE server cannot start or hangs after being started, try to change the Kernel Unix parameter `NKTHREAD` to **3000** or **6000**, `MAX_THREAD_PROC` to **10000** or **20000**. For details refer to SAP Note <u>534867</u>.

5. For any other problem, analyze the dump file and try to find the place where the error occurs.

16.6 How to Read the Garbage Collection Output

Problem

You want to analyze the output of the parameters `–verbose:gc`,

`-XX+PrintGCDetails` (XI 3.0 only; not for IBM AIX VM),

`-XX:+PrintGCTimeStamps` (XI 3.0 only; not for IBM AIX VM)

Validity

XI 2.0, XI 3.0

Analysis

XI 2.0:

You can find the output in

`\usr\sap\<SID>\DVEBMGS<sysnr>\j2ee\cluster\dispatcher`

`\services\r3startup\work\<ClusterElementID>_output`

XI 3.0:

You can find the output in
`\usr\sap\<SID>\DVEBMGS<sysnr>\work\std_<servername>.out`

Solution

XI 2.0:

Pattern:

[type before->after(total), duration]

Example:

[GC 200000K->100000K(500000K), 0.1247834 secs]

This output shows how much memory was allocated before and after the garbage collection. So if you calculate (before - after) you get the amount of memory the garbage collector was able to free.

You also see the total available memory. That is how much memory the JVM allocated from the operating system.

The duration shows how much time the garbage collection took.

Abbreviation	Explanation	Example
Type	Type of the garbage collection	Either GC for minor garbage collection or Full GC for full garbage collection
Before	Used bytes of the heap before garbage collection	200000K
After	Used bytes of the heap after the garbage collection	100000K
Total	Total bytes of the heap	500000K
Duration	Duration of the whole garbage collection cycle	0,1247834 secs

XI 3.0:

Pattern:

start:

[type

newStart: [newType: newBefore->newAfter(newTotal), newDuration]

[Tenured: tenuredBefore->tenuredAfter(tenuredTotal), tenuredDuration]

before->after(total),

[Perm permBefore->permAfter(permTotal)],

duration]

Example:

0.000: [GC 0.000: [ParNew: 120000K->60000K(200000K), 0.0435896 secs] 570000K->285000K(700000K), 0.1894676 secs]

This output shows you more details about what happened inside the VM.

The –XX:+PrintGCTimeStamps adds the start and newStart timestamps.

The –XX:+PrintGCDetails adds information about what happened in the different generations of the heap.

All the new information is indented in the above pattern.

In case of a minor garbage collection there will be information about the new generation. If the minor collection could not finish successfully, information about the old (tenured) generation will be added. (Because a full garbage collection is triggered)

In case of a full garbage collection there will be information about the old (tenured) generation and possibly the permanent generation.

Abbreviation	Explanation	Example
Start	Timestamp. Start of the garbage collection cycle	0.000
Type	Type of the garbage collection	Either GC for minor garbage collection or Full GC for full garbage collection
newStart	Timestamp: Start of the new generation part of the garbage collection cycle	0.000
newType	Type of the minor garbage collection	DefNew for the default type, ParNew for parallel garbage collection

Abbreviation	Explanation	Example
newBefore	Used bytes of the new generation before garbage collection	120000K
newAfter	Used bytes of the new generation after the garbage collection	60000K
newTotal	Total bytes of the new generation	200000K
newDuration	Duration of the new generation part of the garbage collection cycle	0.0435896 secs
tenuredBefore	Used bytes of the old generation before garbage collection	450000K
tenuredAfter	Used bytes of the old generation after the garbage collection	225000K
tenuredTotal	Total bytes of the old generation	500000K
tenuredDuration	Duration of the old generation part of the garbage collection cycle	0.145878 secs
Before	Used bytes of the heap before garbage collection	570000K
After	Used bytes of the heap after the garbage collection	285000K
Total	Total bytes of the heap	700000K
duration	Duration of the whole garbage collection cycle	0.1894676 secs

GC Analysis with Solution Manager Diagnostics:

Solution Manager Diagnostics can be used to visualize the GC output of any java component running on JVM 1.4.2, i.e. any XI3.0 java component.

Either the SMD reads the latest `std_<servername>.out` file form any J2EE server connected to the SMD, or it reads any external output file form the SMD user's front end.

SMD:

1. Select the appropriate combination of "Solution", "Landscape", "Product" and "Host".

---

2. Choose *Monitoring*
3. Then select *Thread Dump Analysis* in the detailed navigation area.
4. Either select the check box at the server node, or upload the external file in the section *Upload File*.
5. Select card *Garbage Collection*

The graphic displays the used portion of the java heap size after each minor or major garbage collection (red) and the duration of each garbage collection (black dots) as a function of the timestamp.

With SUN's JDK the GC graph from a healthy server shows as more or less regular saw tooth pattern with larger portions of heap usage reduced at each full GC.

AIX (IBM JDK):

On AIX only one type of GC exists. Thus a different pattern will be displayed.

17 HA (High Availability)

17.1 HA (High Availability) Troubleshooting

Problem

You have problems setting up XI in an HA environment and need more information concerning this issue.

Validity

XI 2.0, XI 3.0

Analysis

XI 2.0

The use of the SAP Exchange Infrastructure 2.0 in a high-availability environment is described in the Guide <u>SAP Exchange Infrastructure in High Availability Environments XI Release 2.0</u>.

The central SAP Note for XI 2.0 in an HA environment is <u>781463</u>.

XI 3.0

The use of the SAP Exchange Infrastructure 3.0 in a high-availability environment is described in the Guide <u>SAP Exchange Infrastructure in High Availability Environments SAP XI Release 3.0</u>.

The central SAP Notes for XI 3.0 in an HA environment are <u>786224</u> (<SR1 – using Microsoft Cluster Server) and <u>774116</u> (SR1).

In a high availability environment there may be problems applying Java support packages. There are two ways to solve this:
- Wait for SAP J2EE Engine SP10
- Use the workaround to switch off HA settings before applying the patch and change the settings back afterwards. For more information see SAP Notes <u>697535</u>, chapter I and <u>757692</u>.

18 Security & User Management

18.1 Security Troubleshooting

Problem

You have problems or questions concerning security in an XI landscape.

Validity

XI 2.0, XI 3.0

Analysis

XI 2.0

The XI 2.0 security features are described in the SAP Exchange Infrastructure Security Guide. It explains the options for data protection for each XI component and contains a description of how to set up secure communication for the different XI components. It also contains information about all XI service users used for communication between the XI components.

Changing passwords for the XI service users in an XI 2.0 environment is described in SAP Note 721772.

XI 3.0

The XI 3.0 security features are described in the SAP NetWeaver '04 SAP Security Guide XI. It explains the options for data protection for each XI component and contains a description of how to set up secure communication for the different XI components. It also contains information about all XI service users used for communication between the XI components.

Changing passwords for the XI service users in an XI 3.0 environment is described in SAP Note 721548.

19 XI Performance

19.1 How to Analyze Performance Issues on Your XI System

Problem

You have performance problems in your XI system. The message processing in your XI system takes a long time and does not fulfill your requested message throughout.

Validity

XI 2.0, XI 3.0

Analysis

Check if the XI System Performance is generally poor, or if just the times for processing specific messages are longer.

For message specific performance problems:

Analyze the PerformanceHeader of the messages in transaction **SXMB_MONI** and identify the pipeline service that causes a high processing time by evaluating the time difference in the *begin* and *end* timestamps. Depending on which pipeline service is responsible for the long processing time, further investigations have to take place:

- `DB_ENTRY_QUEUING / /DB_SPLITTER_QUEUING`:
  Check that all XI queues are registered in transaction `SMQR`. Check that enough dialog work processes on the Web Application Server are available for tRFC Processing. Transaction `SARFC` provides you with a momentary status of available dialog resource.
- `PLSRV_MAPPING_REQUEST`:
  Check and analyze the used mapping in more detail.
  (A link to TOM Performance Problem Analyzing Scenario will be added when available.)
- `PLSRV_CALL_ADAPTER`:
  Check the performance of the Adapter Engine/Adapter Framework.
  For the XI 3.0 Adapter Framework you can use JARM data as described in SAP Note 746971 to retrieve more analysis data.

For general XI System Performance problems:

1) Check the ABAP stack including OS/DB of the XI System by using transactions as listed in SAP Note 15374.
For interpretation of the results displayed in the transactions you need to be familiar with the SAP System Performance Analysis. The following gives you an idea of where to look for more details.

- Detection of high CPU times:
  Check which processes are causing high CPU usage.
- Detection of high DB request times:
  Check for CPU/memory bottleneck on database server.
  Check for network problems.
  Check for expensive SQL statements.
  Check for database locks.
  Check for missing indexes.
  Check for missing optimizer statistics.
  Check for small database buffers.
- Detection of higher processing times than CPU time:
  Check for CPU bottleneck.
  Check for network problems / communication problems.
- Detection of high load times:
  Check for program/CUA/screen buffer.

2) Check the JAVA Stack of the XI system by applying SAP Note 766598: "Persist and analyze java monitoring data with J2EE Engine 640".

For each operation system a dedicated SAP Note is available to analyze high CPU usage by the J2EE Engine:

743207:   Analyzing High CPU usage by the J2EE Engine: Windows

743206:   Analyzing High CPU usage by the J2EE Engine: Solaris

743204:   Analyzing High CPU usage by the J2EE Engine: HP-UX

743192:   Analyzing High CPU usage by the J2EE Engine: Linux

743191:   Analyzing High CPU usage by the J2EE Engine: AIX

3) Are you using ccBPM scenarios causing heavy system load? Refer to the Solution ccBMP: below

4) Are you using IDoc scenarios causing heavy system load? Refer to the Solution IDoc below.

Solution

Tuning of XI Systems:
Recommendations about how to tune your XI systems are available for XI 2.0 under:

http://service.sap.com/xi

-> *Installation -> Implementation - Tips & Tricks -> Configuration   -> SAP XI 2.0 - Tuning Guide (Link)*

Recommendations about how to tune your XI systems are available for XI 3.0 under:

http://service.sap.com/instguidesNW04 -> *Operations -> SAP XI ->* Tuning Guide - SAP XI 3.0

ccBMP:
If you are encountering performance issues with scenarios running ccBPM processes, check for design advice for use cases of ccBMP in the document:

http://service.sap.com/bpms > *Media Library*
Documents: (English) Checklist: Making Correct Use of an Integration Process

IDoc:

If you are encountering performance issues with IDoc scenarios, check if SAP Note 814393 could be of assistance to redesign a much faster solution for your scenario.

Others:

If you still experience performance issues and you cannot solve them by the guidelines and information provided in this paragraph you might want to involve SAP specialists by opening an SAP Message under component XX-SER-TCC-XI.

SAP also offers for your XI Systems GoingLive Services which are evaluating the overall system settings and configuration. Refer to the SAP Service Marketplace for general description of GoingLive service and SAP Note 617604 for detailed setup of your XI system for the remote service.
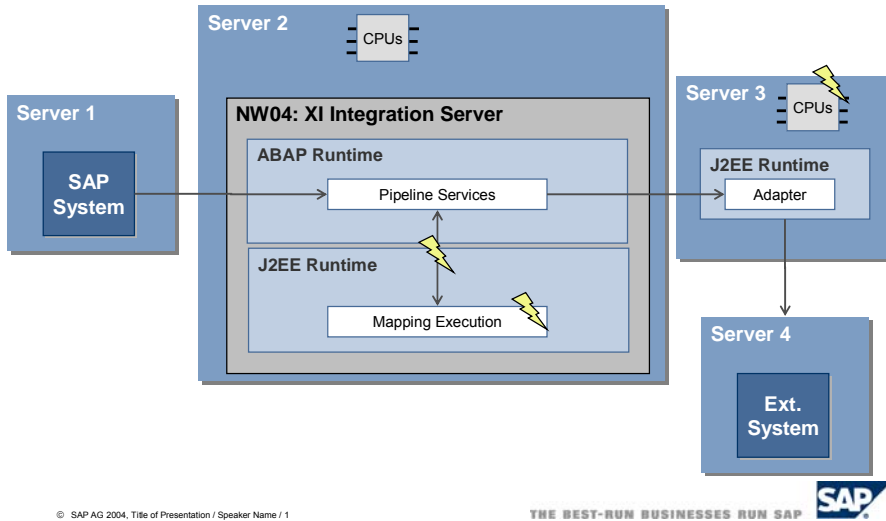
19.2 Problem Analysis Scenario: XI 3.0 Performance

This chapter describes three typical performance problems and their analysis. The cases are selected to cover as many analysis tools and functions as possible, as well as many different XI software components. The focus is set on the analysis of problems regarding the Java coding and runtime, since this is still challenging.

1. **Expensive Application Mapping:** A specific performance problem caused by a complicated message mapping.
    a. Involved software components: Integration Server, XI Mapping Runtime,
    b. Involved tools: Runtime Workbench, Message Monitoring: Performance Header, DSR: JARM statistics of Mapping Runtime, Sherlok
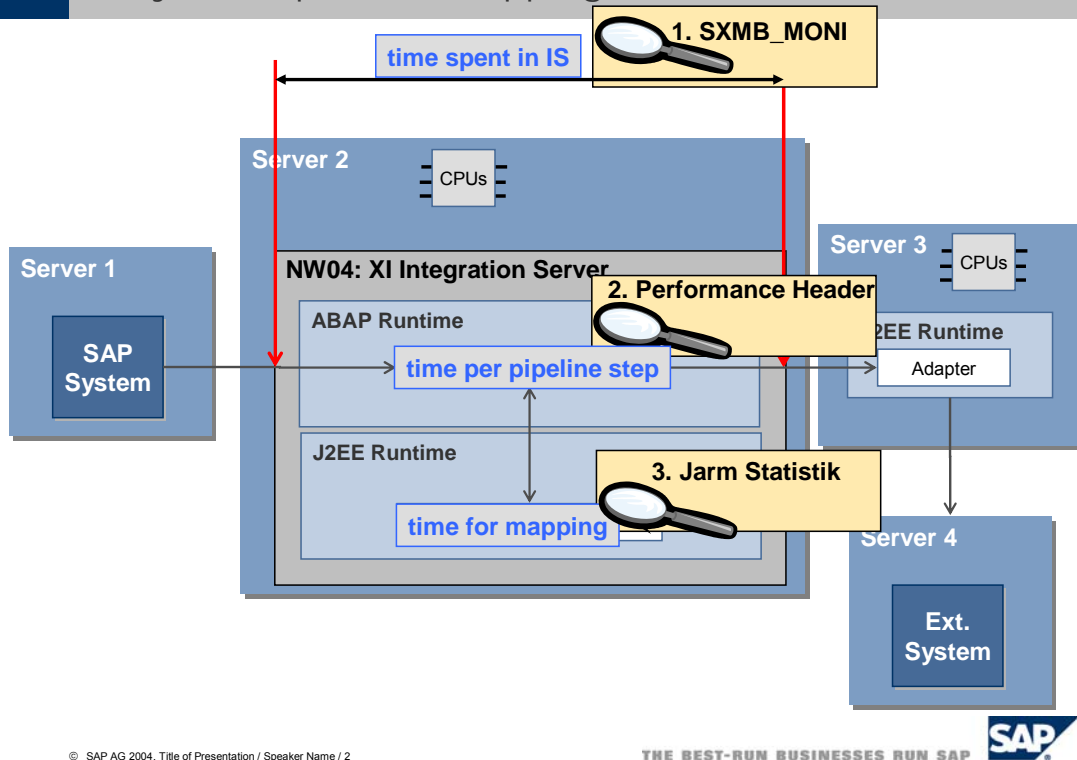
2. **Bottleneck in ABAP->Java Communication**: A general performance problem on the Integration Server during parallel mappings caused by non-optimal configuration
    a. Involved software components: Integration Server, XI Mapping Runtime
    b. Involved tools: Runtime Workbench, Message Monitoring: Performance Header, DSR: JARM statistics of Mapping Runtime

3. **CPU overload due to Java garbage collection:** A general performance problem on the Adapter Engine server caused by high load from VM garbage collection
    a. Involved software components: Integration Server, Adapter Engine,
    b. Involved tools: Runtime Workbench, Message Monitoring: Performance Header, J2EE Visual Administrator, Remote saposcol, Sherlock

XI 3.0 Example Landscape

© SAP AG 2004, Title of Presentation / Speaker Name / 1

Analysis: Expensive Mapping

© SAP AG 2004, Title of Presentation / Speaker Name / 2

1. Expensive Application Mapping:

Performance Analysis with Single Messages in a Ramp up Project

Symptoms

The processing of an XI message takes a long time in specific a pipeline step.

Example Scenario

During a GoingLive Optimization Session for an SRM scenario, an invoice is sent from an SUS System to a MM backend via XI as a pre-production test. A standard SAP scenario `SUS2MM` is used for the interface. The total response time of the business process is more than 2,3 sec, which is not acceptable for the customer, since the business process is time-critical and has a high volume.

Scope

Component: XI 3.0

Validity: ≥ XI 3.0, SP1

Used Tools: transaction **SXMB_MONI**, Performance Header Display, Visual Administrator, Jarm Statistics

Verification of Symptoms

Start transaction **SXMB_MONI**, select the particular XI message and go to the performance header. Pipeline step `PLSRV_MAPPING_REQUEST` is the longest pipeline service.

Potential Problem Causes

Bad mapping algorithms

Analysis

In a pre-production system a single message of a specific type can be tested by sending it separately and looking at the response time in XI.

Message Monitoring (transaction SXMB_MONI)

Log on to the Integration Server and call transaction SXMB_MONI: Monitor for processed XML messages.

A selection for the messages in status `Processed Successfully` during the last hour is done.
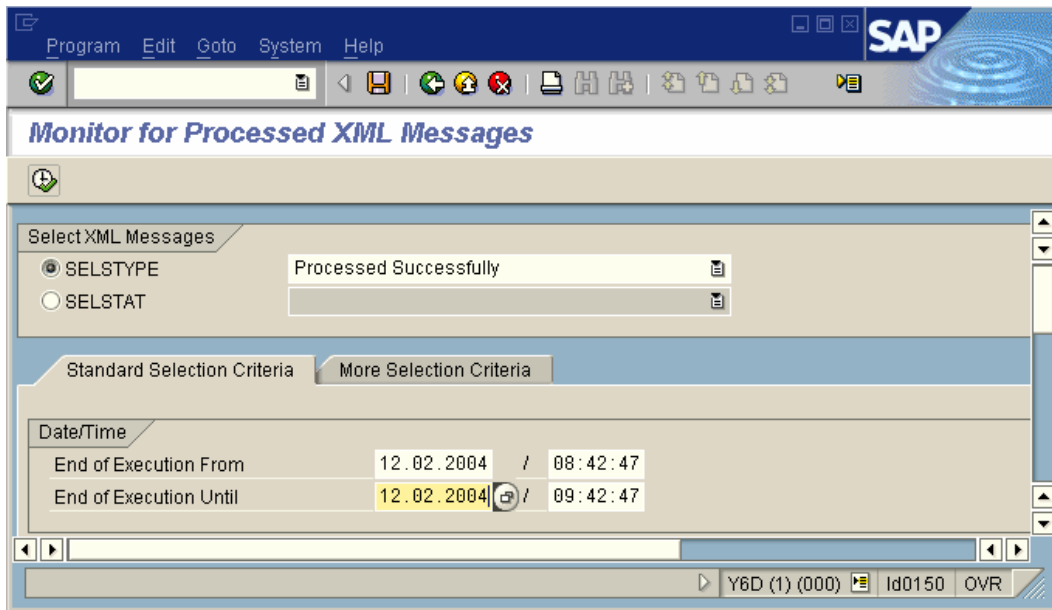
In the list of displayed messages, you can identify your message e.g. by the sender, receiver or time stamp. Select it by double-clicking and you can take a look at the message content. Choose the latest `Performance Header` from the tree on the left-hand side and take a look at the soap header in the upper window on the other side.
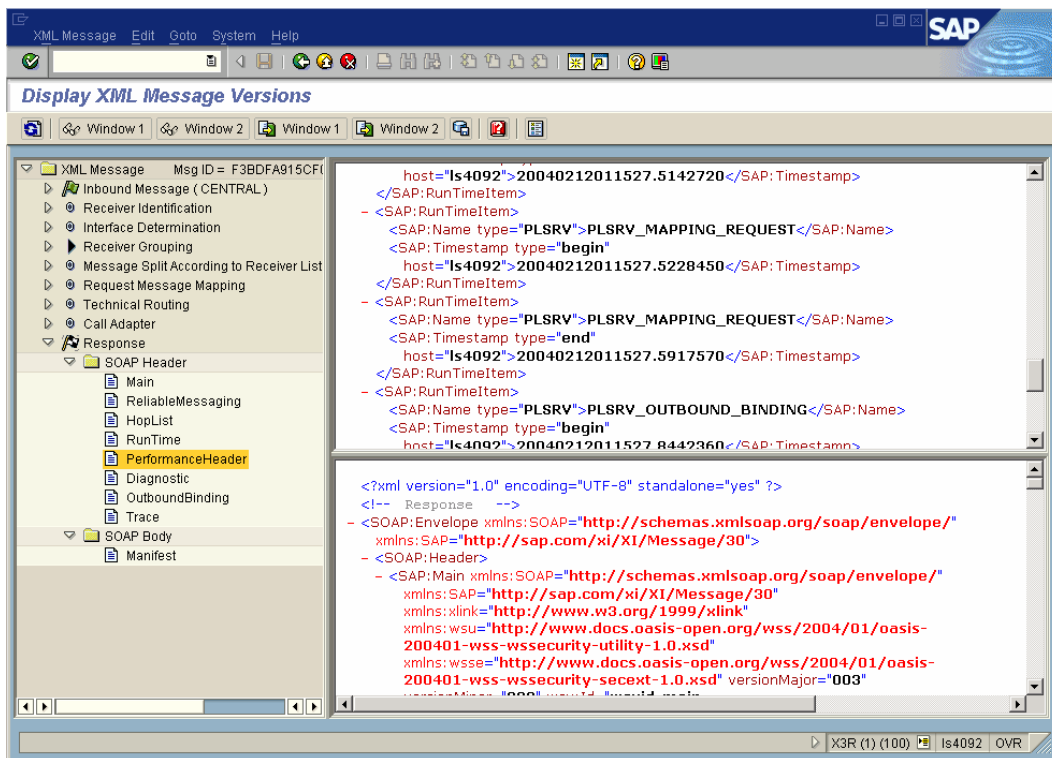
By comparing the time stamps given in the format `<YYYYMMDDHHMMSS.msec>` for all pipeline steps, one can find the step with the longest processing time.

```
- <SAP:RunTimeItem>
    <SAP:Name type="PLSRV">PLSRV_MAPPING_REQUEST</SAP:Name>
    <SAP:Timestamp type="begin"
      host="ls4092">20040212011527.5228450</SAP:Timestamp>
  </SAP:RunTimeItem>
- <SAP:RunTimeItem>
    <SAP:Name type="PLSRV">PLSRV_MAPPING_REQUEST</SAP:Name>
    <SAP:Timestamp type="end"
      host="ls4092">20040212011527.5917570</SAP:Timestamp>
  </SAP:RunTimeItem>
```

In this example the mapping step takes the most time.

You have to know the overall XI architecture to find the next analysis step. The mapping request is the only step that is processed in the Java part of the SAP NetWeaver AS. Therefore any further analysis has to be done with the Java monitoring tool.

Performance monitoring in the J2EE Engine

Launch the *Visual Administrator* by executing the `go.bat` in path <…>. You will see the cluster configuration in the tree on the left-hand side.
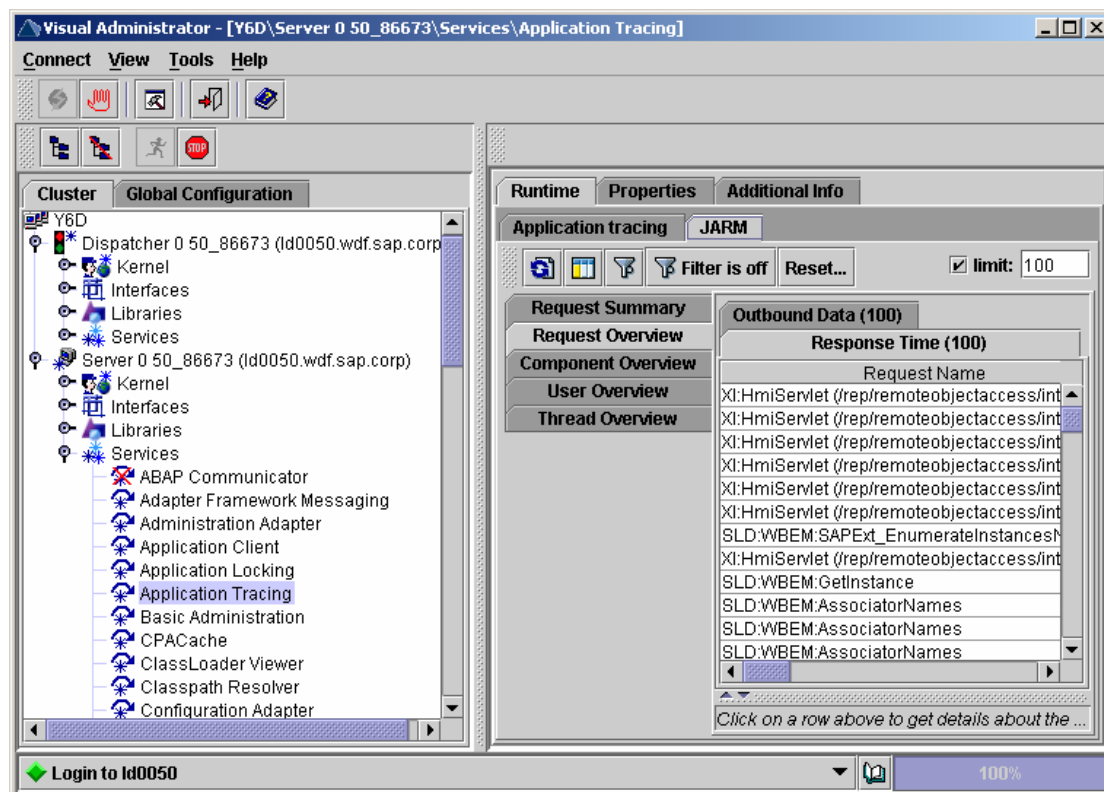
Choose the relevant server node. Then expand *Services* and choose *Application tracing* and the tab *JARM*. To display any data, you always have to click on the *Refresh* icon.

2. Bottleneck in ABAP->Java Communication: Mr. Schulz: Scenario Interference

Description

Mr. Schulz is a senior adviser of the XI regional support team. He is 53, married to a friendly wife and has two children, who already started studying at the university.

A customer has an obviously difficult problem with his mapping on the Integration Server. All was well until the start of a new scenario yesterday. It consists of small IDocs sent from an SAP system to the Integration Engine (including mapping), which directs them to a file adapter on a different server at a maximal rate of approximately 3-4 per second from 8 to 9 o'clock. Although the CPU load of the Integration Server drops to only 40%, the qRFC-queues become longer and longer.

Analysis

As expected, the performance monitoring of the Runtime Workbench shows increasing queuing times for the respective messages. A selection from the PMI (Process Monitoring Infrastructure) source shows no noticeable problems on the Java side for the file adapter.

Mr. Schulz looks at the statistical records, selected for the special RFC-destination for this Adapter Engine and sees that the connection times increase much over time. Hence, Mr. Schulz supposes a problem on the Adapter Engine side concerning the RFC connections. He starts the *Visual Administrator* and looks for the number of RFC-connections under *Services->JCo RFC Provider ->(right frame)Runtime tab strip -> Number of Processes* and increases them from 5 to 20.

5 connections was obviously an insufficient number to handle the massive requests for mapping at peak times. Too few registered mapping threads means that the outbound queues become blocked with every message waiting for a free mapping request.

3. CPU overload due to Java garbage collection:

Mrs. Chang: performance analysis under load conditions

Description

Mrs. Chang is an experienced member of the XI regional support team. She is 35, single and likes to go hiking and skiing in the mountains.

A customer experiences the following problem: He sends approximately 40.000 messages from a business system via the Integration Server to a file adapter between 10 and 11 o'clock in the morning. These messages have to be delivered within one hour, in other words, by 12 o'clock at the latest. However, at noon half of the messages are still missing in the file system.

Execution

By looking at the aggregated throughput of the performance monitoring of the Runtime Workbench, Mrs. Chang finds increasing latencies for the processed messages.

Performance Daten						
Anzeige auffrischen	Anzeigeoptionen					
Intervallanfang	Intervallende	Anzahl	Größe [Byte]	Verarbeitungszeit [s]	Rate [msg./h]	Komponente
12.02.04 08:42:47	12.02.04 08:52:47	2	280	3.116	12.0	XIIntegrationServer/is.50.ld0050/B
12.02.04 08:52:47	12.02.04 09:02:47	3	17.180	1380.599	18.0	XIIntegrationServer/is.50.ld0050/B
12.02.04 09:12:47	12.02.04 09:22:47	2	280	3.417	12.0	XIIntegrationServer/is.50.ld0050/B
12.02.04 09:22:47	12.02.04 09:32:47	3	115	4.403	18.0	XIIntegrationServer/is.50.ld0050/B
12.02.04 09:32:47	12.02.04 09:42:47	1	115	25.469	6.0	XIIntegrationServer/is.50.ld0050/B
						Seite 1 / 1

A further analysis with the aggregated detail data shows that the sending step requires more and more time.

Check

Analysis

Her first advice is to increase the number of qRFC- queues from 5 to 20. However, this makes the performance even worse.

Her second thought concerns the Adapter Engine and so she initiates an output of the garbage collector of this Adapter Engine (requires a restart for the new settings to take effect).

Under load conditions, the garbage collector becomes highly active, consuming a large amount of processing resources. The solution is to adjust the JVM parameters `MaxHeapSize`, which was fairly low with only 512 MB to 2GB.
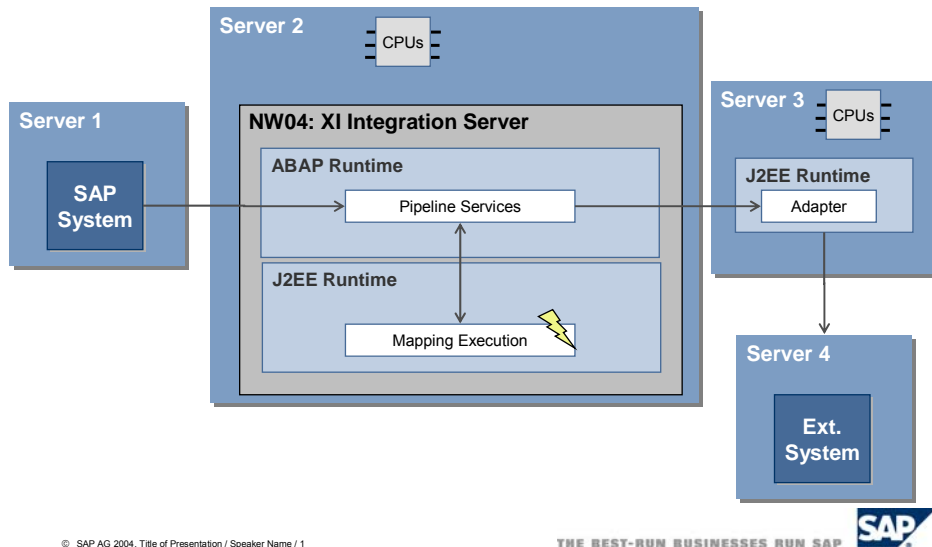
19.3 Performance Analysis with Single Message

Symptoms

Processing of an XI message takes a long time in a specific pipeline step.

Example Scenario

XI 3.0 Example Landscape

During a GoingLive Optimization Session for an SRM scenario, an invoice is sent from an SUS System to an MM backend system via XI as a pre-production test. A standard SAP scenario SUS2MM is used for the interface. The total response time of the business process is more than 2,3 sec, which is not acceptable for the customer, since the business process is time-critical and has a high volume.

Scope

Component: XI 3.0, Validity: ≥ XI 3.0, SP1

Tools Used: Transaction **SXMB_MONI**, Performance Header Display, Visual Administrator, Jarm Statistics

Verification of Symptoms

Call transaction **SXMB_MONI**, select the particular XI message and go to the performance header. The pipeline step PLSRV_MAPPING_REQUEST is the pipeline service that takes the longest.

Potential Problem Causes

Bad mapping algorithms

Analysis Overview

Analysis: Expensive Mapping

© SAP AG 2004, Title of Presentation / Speaker Name / 2

THE BEST-RUN BUSINESSES RUN SAP
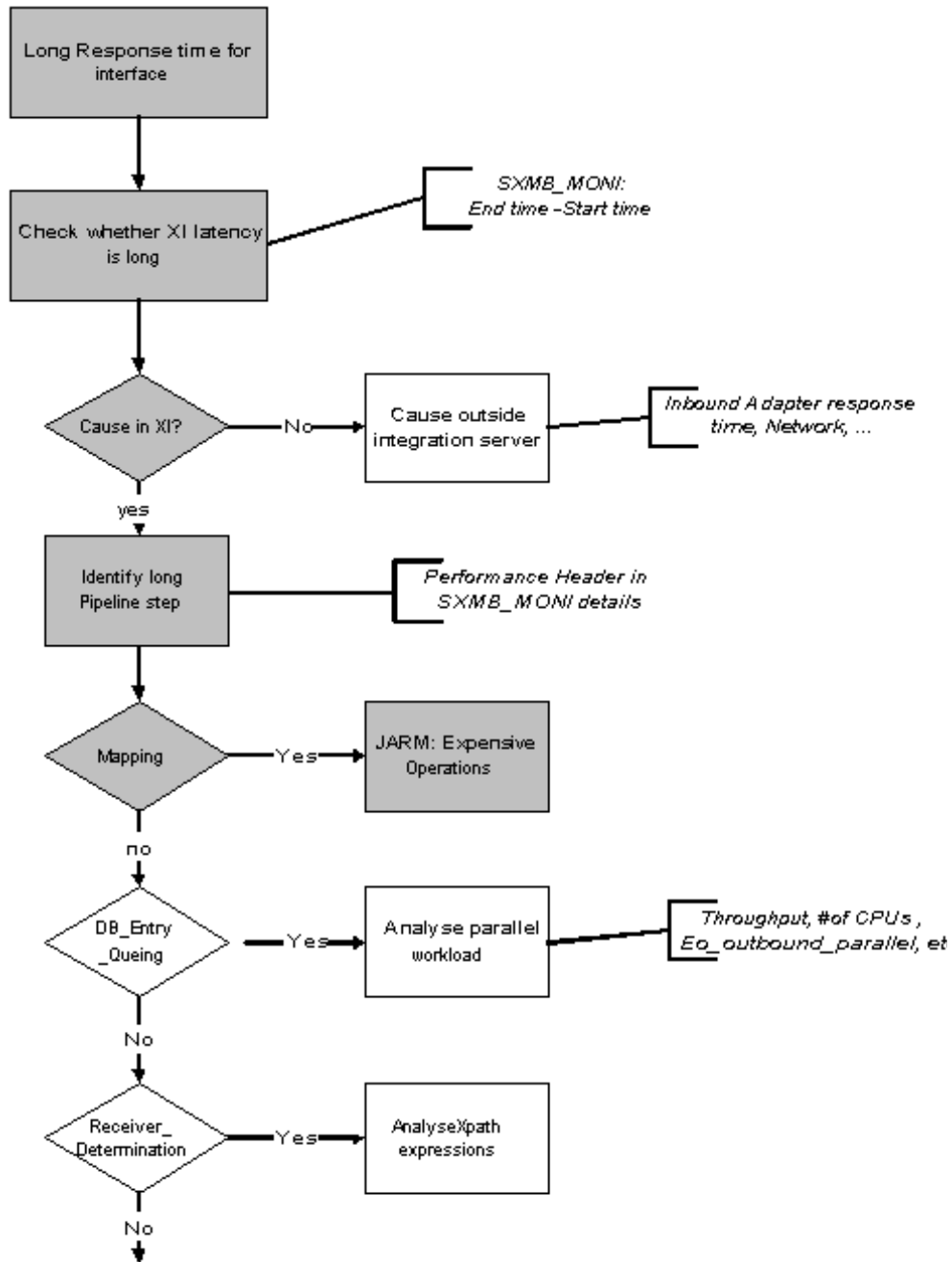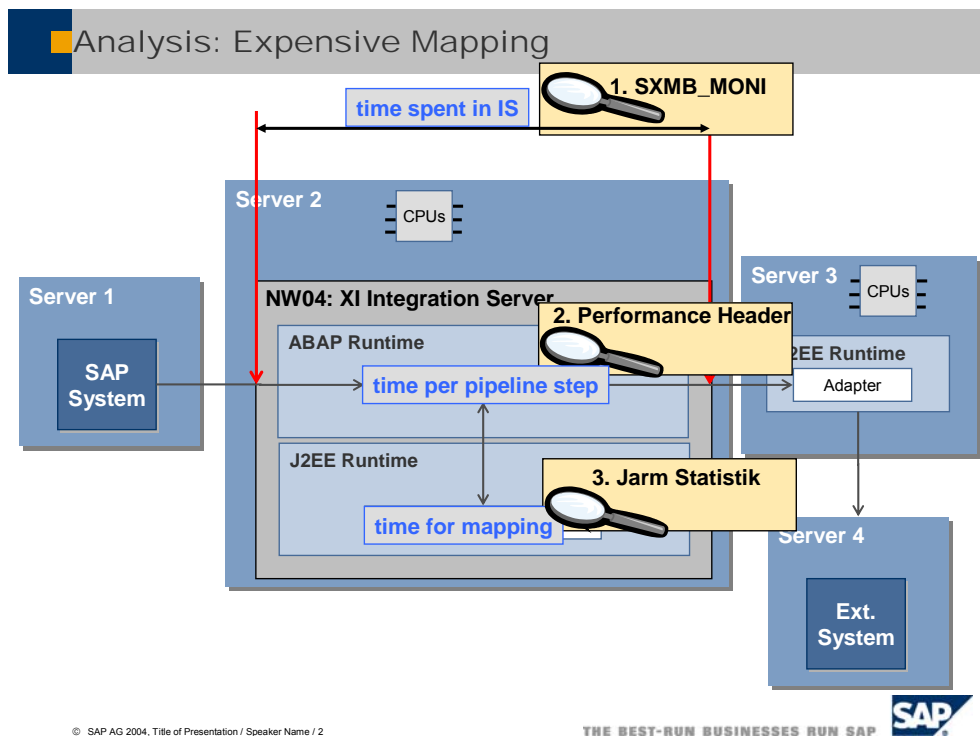
Analysis Details

In a pre-production system a single message of a specific type can be tested by sending it separately and looking at the response time within XI.

Message Monitoring (Transaction SXMB_MONI)

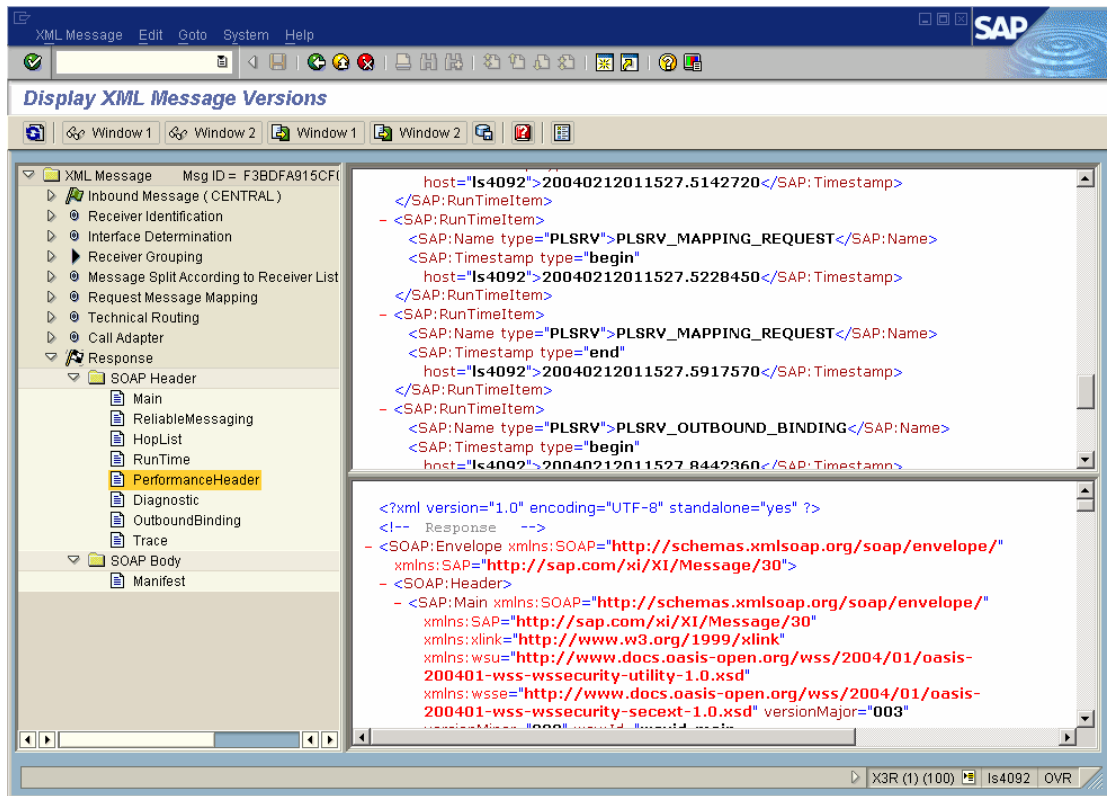Log on to the Integration Server and call the *Monitor for processed XML messages* (transaction **SXMB_MONI**).

A selection for the messages in status `Processed Successfully` during the last hour is done.
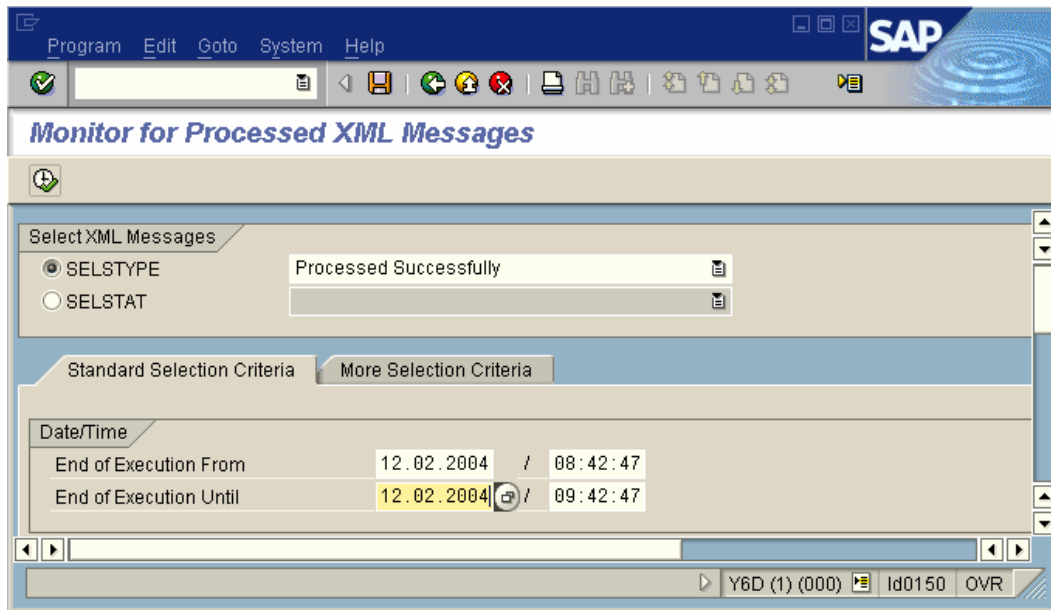
In the list of displayed messages, you can identify your message, for example, by using the sender, receiver or a time stamp. Select it by double-clicking and you can take a look at the message content.

Performance Header

Select the latest *Performance Header* from the tree on the left-hand side and look at the soap header in the upper window on the other side.

By comparing the time stamps given in the format `<YYYYMMDDHHMMSS.msec>` for all pipeline steps, you can find the step that takes the longest time.


In the example, it is the mapping step that takes the most time.

You have to know the overall XI architecture to find the next analysis step. The Mapping Request is the only step that is processed within the Java part of the Web Application Server. Therefore any further analysis has to be carried out using the Java monitoring tool.

Performance Monitoring in the J2EE Engine

Launch the *Visual Administrator* by executing the **go.bat** in path **<…>**. The cluster configuration is displayed in the tree on the left-hand side.
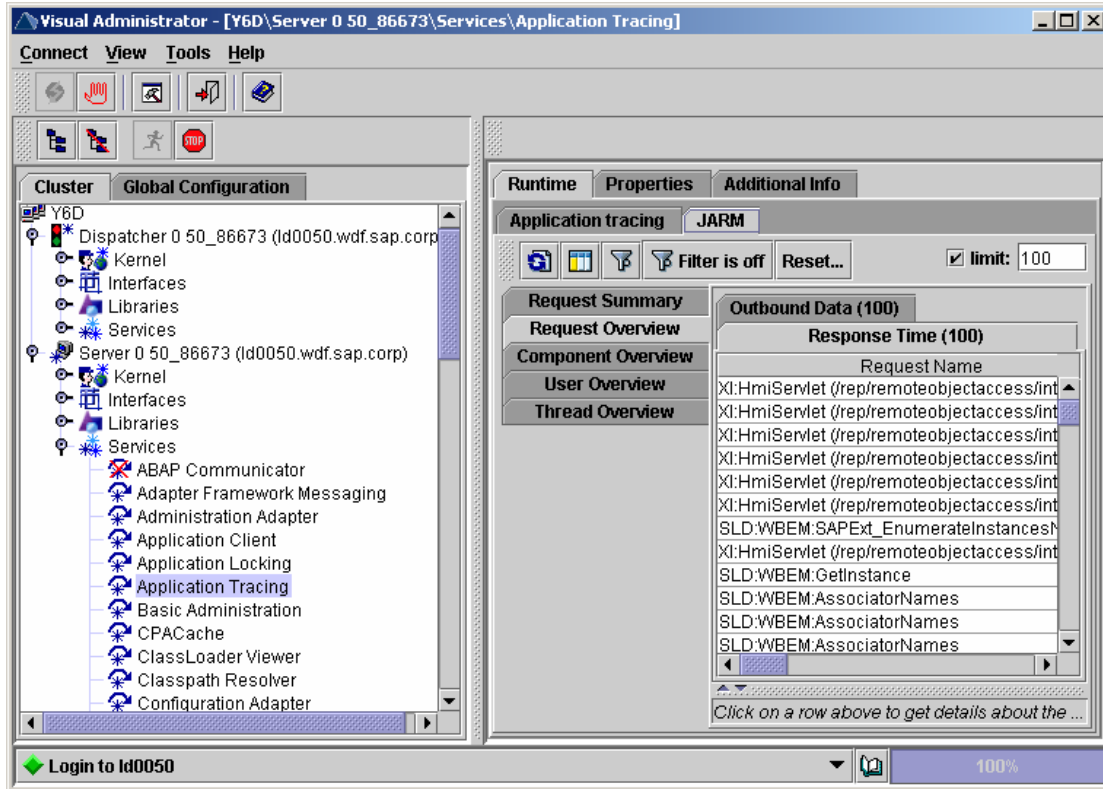
- Choose the relevant server node.
- Expand *Services* and choose *Application Tracing* and the *JARM* tab.
- To display any data, choose *Refresh*.