



## TransConnect<sup>®</sup> – Business Integration Platform

➤ Universal server for data, applications  
and business processes integration

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## Overview

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TransConnect® is the central EAI platform that integrates your applications throughout the enterprise in a flexible and scalable fashion. Universal adapters are the key to an architecture that enables you to link the most different resources. TransConnect® provides the required flexibility and openness for future demands. A solid, transaction-safe server which is based on standardized XML technologies combined with certified adapters guarantee the needed data integrity.

### Typical case scenarios of usage are:

- „Enterprise Application Integration“ (EAI)  
Distribution of messages between allocated systems
- „Business Process Management“ (BPM)  
Organizing, executing, and monitoring of business processes based on a single, consistent process model
- „Service Oriented Architecture“ (SOA)  
Allocation of application functions and providing of data supply for the use by other systems

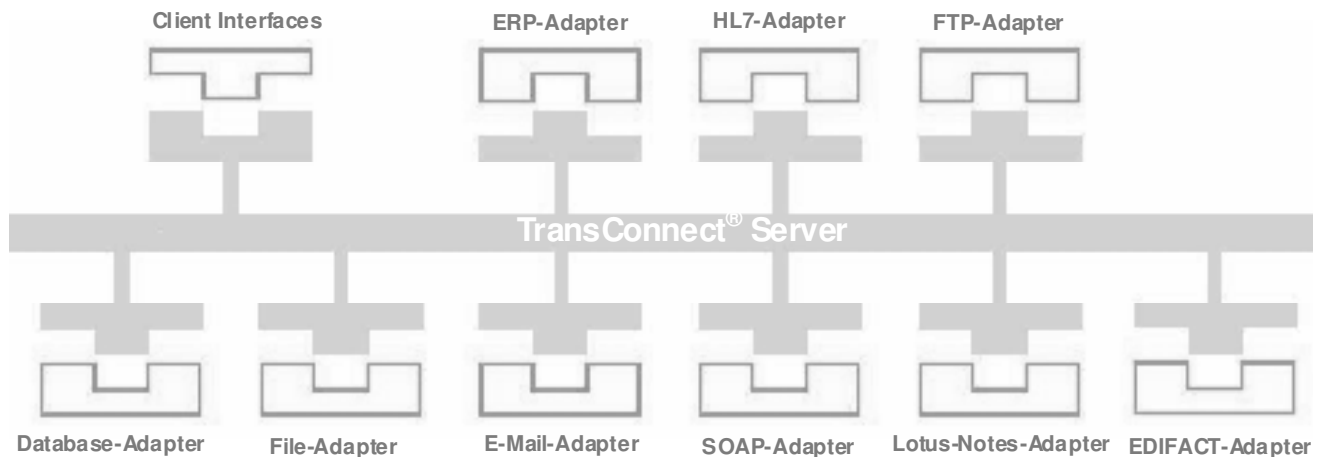
## ***Fault-tolerant integration in real-time***

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- The EAI-platform TransConnect® integrates your application systems seamlessly and in real-time using a central component.
- Recording your receipts, documents and data twice is no longer needed. Additionally, your system is **always up to date**, even during absence of your employees.
- The fast availability of information from all the involved systems enables your applications to react with flexibility to the current conditions.
- TransConnect® **guarantees** the **transfer** of the application data also in case of a system crash.
- Using an **asynchronous** operating mode, TransConnect® provides **consistency** and **fault-tolerance**.
- TransConnect® caches the exchanged data in a persistent memory so that all involved systems are able to operate **autonomously** and **independent** of the other systems' availability.
- A “true” **server integration** is implemented since all systems can actively send messages.
- **Synchronous** data access allows for integrating time-critical information.
- TransConnect® can be installed on more than one machine. Thus realizing data exchange also via a **WAN** or different network topologies.
- TransConnect® is based on technologies associated with **XML standards** like schemas and style-sheets.

## The TransConnect® architecture

The central TransConnect® server builds the foundation of TransConnect®. This server is based on a J2EE-compliant application server.



The TransConnect® server includes a transportation system for distributing the data objects. Routing systems are used for controlling the data transfer. They can be freely configured using XML.

TransConnect® contains mapping systems for adjusting the data structures of the integrated applications. They are also configured using XML and enable the necessary data transformations.

TransConnect® offers adapters for linking many different systems. The Database-Adapter opens the doors to the world of relational database systems. Web- and Email-Adapters provide access to internet systems. TransConnect's® adapter technology offers the possibility to add new applications or to replace existing ones at any time.

TransConnect® can be part of high availability environments. It provides the option of combining several installations into one software-cluster. A TransConnect® cluster offers load-balancing and resilience on different hardware platforms and operating systems.

All TransConnect® adapters are kept in active state within a component pool. Therefore calling an integrated sub-system is essentially faster. The advantage of this solution is a fast response time and a high system performance in general.

These advantages are the reason for TransConnect® being a powerful EAI-platform, which significantly helps making the enterprise's software architecture portal-ready.

The main features of TransConnect® are:

- Data Transformation
- Data Routing
- Technology and Protocol Adapters
- Time scheduling
- Workflow Managing
- Repository
- Logging/Monitoring
- Server synchronization based on high availability and reliability

## Time scheduling

TransConnect's® integrated scheduler runs system-specific or user-defined tasks at planned times or at fixed intervals. Each task can be run more than once, using a different configuration at each time. The defined tasks are able to access all components inside TransConnect®.

## Using Adapters

Integrating application systems is done using an adapter-driven concept which flexibly adapts to your needs.

There is a number of adapters that implement different communication technologies:

- the Database-Adapter integrates SQL-databases via JDBC/ODBC
- the Web-Adapter allows for calling web-services via SOAP
- the Email-Adapter communicates with mail servers using SMTP/POP3
- the SAP-Adapter enables connections via RFC, BAPI and ALE
- the HL7-Adapter opens the doors to medical systems
- the File system-Adapter supports ASCII, CSV and XML files

Each adapter is in charge of controlling the communication with the respective end-system. The adapter converts the data format of the end-system into the central format of TransConnect® (XML). Therefore the TransConnect® server is based on pure XML technologies. The specific details of a sub-system are encapsulated inside of an adapter.

Additional adapters and J2EE connectors can be integrated with TransConnect® at any time. Besides, you can develop these adapters and connectors on your own. Thus, TransConnect® is open for the growing demands of application integration in a network of systems.

TransConnect® is the open integration and application platform that integrates people, information, and processes. Its openness reflects industry standards and interoperability that enables you to implement, integrate, and maintain your infrastructure through a Web services-oriented architecture.

The following adapters are included in TransConnect®

Technology	XML	Databases	Industry-specific B2B Adapters	others
HTTP, HTTPS	XML 1.0/1.1	SYBASE	HL7 v2.x	CSV
FTP, FTSP	XSLT 1.0	MS SQL	HL7 v3	ASCII
SMTP	XPath 1.0	Oracle	DICOM	Excel
POP3	STX 1.0	IBM DB/2	HCN	Binärdateien
JMS	SAX 2.0.2	Derby	LDT	EDIFACT
SOAP	DOM Level 2/3	MySQL	GDV	SAP IDoc
JCA	JAXP 1.3	Informix	Elster Lohn	SAP RFC
MLLP		PostgreSQL		SAP BAPI
J2EE		JDBC		Lotus Notes
		ODBC		

## ***The SAP-Adapter***

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One of TransConnect®'s most powerful adapters is the certified SAP-Adapter. This adapter turns the incoming XML data, which TransConnect® receives from the involved third-party application systems, into the data structures of SAP and vice versa.

The following technologies are supported for communicating with SAP-systems:

- asynchronous data transfer using ALE
- synchronous requests using BAPI
- synchronous requests using RFC

There is no direct access to the SAP databases. Therefore, TransConnect® is independent of the current SAP soft- and hardware platform.

## ***XML-Technologies***

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All internal components of TransConnect® process application data which is XML-formatted. The adapters do the necessary conversions between the XML-format and the respective data structure of the linked systems. The XML-adapter offers direct access to the XML-formatted application data, without additional layers.

Data transformations (mappings), which are declared in the TransConnect® Implementation Guide, are defined using XML-stylesheets. The data-flow between the involved systems is also defined using technologies based on XML.

The employed XML technologies effectively support displaying hierarchically ordered information. Typical application data, e.g. orders, invoices, accounting records, delivery notes, parts lists, often consists of multiple subordinate data, building a hierarchical structure of various depths. TransConnect® easily transfers and exchanges such data without limitations in size.

## ***Graphical administration and development***

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TransConnect® comes with a tool called the "TransConnect® Manager". All tasks concerning configuration, maintenance and development can be solved by working with the TransConnect® Manager. This Explorer-like tool has been developed entirely in Java and, hence, can be run on any operating system with a Java runtime environment (version 1.2 or later) installed.

The TransConnect® Manager significantly helps in customizing TransConnect®. Individual areas can be customized specifically since the relevant parameters are given in a structured order.

Data pools that have been integrated using TransConnect® are replicated by running the Initial Load function after installation. All relevant data of the systems is exchanged in order to guarantee the consistency of the data pool. This is a one-time procedure. Further data adjustments are done automatically.

Scripts concerning the data exchange between the systems can be edited, compiled and tested using the TransConnect® Manager. There is no need to invest in additional development tools.

The TransConnect® Manager is equipped with a monitoring function for online processing. This function allows for viewing and/or modifying the transferred data. Several import and export features support the

data exchange with other TransConnect® installations. A log file, which monitors the internal workflow, is assigned to each TransConnect® component. These log files can be analyzed using the TransConnect® Manager.

The SAP-Adapter makes use of a repository in which the necessary meta-data for synchronous and asynchronous SAP data objects is loaded and managed. Java templates can be generated within this repository so that it is possible to use BAPIs.

## ***Choosing different types of communication***

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TransConnect's® concept of pluggable adapters offers the needed flexibility of exchanging application data using different communication technologies (synchronous and asynchronous).

While setting up the TransConnect® Implementation Guide, it is necessary to decide for the needed communication routes.

Optimal application integration is characterized by choosing the proper technology for exchanging data. The asynchronous technology is suitable for data exchange without the need of an immediate answer. Synchronous communication is the right choice for requests which results have to be returned immediately for further processing. Master data, for instance, is updated asynchronously. Controlling inventories, on the other hand, is realized using synchronous queries.

### ***Transaction safe, asynchronous data transfer***

This communication method works according to the *Store-And-Forward* principle. All data is sent peer-to-peer across the communication route. In case an error occurs, the message will be repeatedly sent until it reaches the next receiving point without any errors. There are no messages sent backwards. If the receiver is incapable of processing a message, there won't be the possibility of refusing this message. Instead, the receiver needs to send a new message that contains a piece of error information to the sender.

This method of communicating is most suitable for transferring data objects when no immediate answer is needed. Changes to master data, booking orders or the distribution of parts lists can be realized in that way.

A specific transaction safeguard is responsible for sending messages without errors, and it prevents messages which have been sent more than once from being processed twice. Only this technology is a warranty for true transactional integrity, similar to that of common database systems.

### ***Synchronous requests***

In some integration scenarios, it might be necessary to obtain the results of a request immediately. In that case, TransConnect® allows for processing requests synchronously. This technology, for instance, is used for displaying the result of an availability check or for inquiring the number of an order that has already been booked.

## **Queues**

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By asynchronous processing the detailed news becomes regardless of the data spring in the target systems dispatches. Around with non-availability of single receivers other data transfers not to hinder, the processing occurs through independently components running of each other. Queues serve the serialization and parallelization. All queues run independently of each other. Nevertheless, order of the news within a cue is strictly considered. The processing of the next message occurs therefore always only after ending of the actual message processing.

## **Workflow Managing**

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With TransConnect® your IT organization can make disparate applications and systems work together consistently to enable end-to-end business processes – exchanging information and executing transactions smoothly, and operating as if they were a single system.

The Integration is more than a copy and distribution of message. In several steps data put together, transformed are able outgoing from events and are passed on. On the basis of the data contents the receivers are able dynamically ascertained become. The results of the processing are able evaluated and in the broadcasting systems of the status of the transmission are maintained.

## **Monitoring**

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The functions of the supervision permit the control of the TransConnect® of server.

Are supervised are able:

- Messages
- queues and
- log

To find news in a big data bank an index can be provided, for single components of the news contents the search allows.

## **The TransConnect® Implementation Guide**

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The TransConnect® Implementation Guide guides you through the process of setting up an EAI project using TransConnect®. The Implementation Guide covers every important detail, from the analysis of the used sub-systems to the definition of the data routes. Thus reflecting the whole architecture.

The Implementation Guide results in accompanying documents, which reflect the different views on the integration scenario. For integration purposes that are more elaborate, a business process model can be used as the basis.

The Implementation Guide consists of the following milestones:

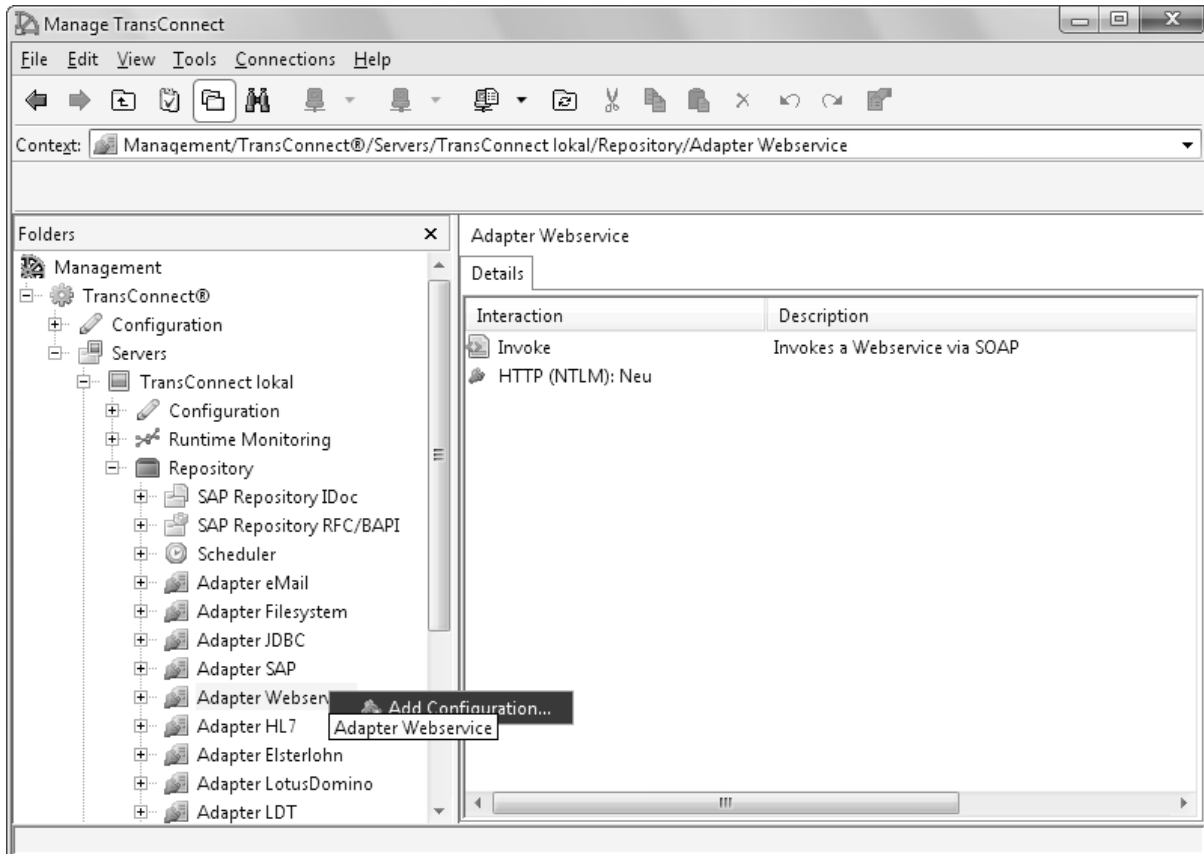
1. Defining all the participating systems
2. Determining the available interfaces of the sub-systems
3. Setting up the relevant data objects needed for the integration
4. Setting up the conditional data flows between the sub-systems
5. Setting up the needed data transformations

### 1. Defining all the participating systems

All systems which are determined to participate in the integration are analyzed and arranged.

### 2. Determining the available interfaces of the sub-systems

Depending on the system that is to be integrated, the needed adapters are chosen, configured and tested. Communication data has to be set up, depending on the type of adapter.

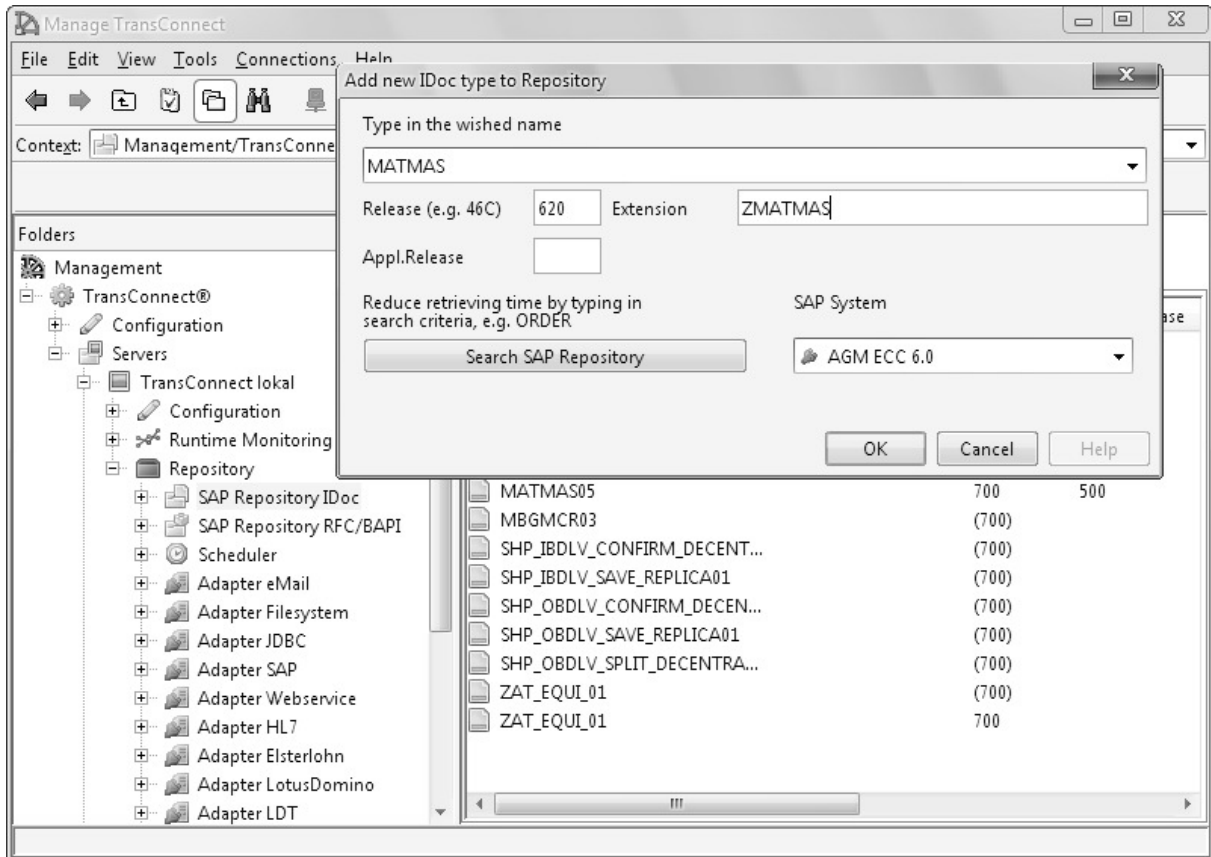


### 3. Setting up the relevant data objects needed for the integration

Each system has its own different data structure. These structures can be arranged in result sets which are logically grouped. The result sets are referred to as data objects. Data objects might be, for instance, customer master data represented as SQL-tables or CSV-data.

Later, each data object will be read, updated, created or deleted within a transaction. Therefore a description of the data object's structure is necessary.

After the relevant tables and columns have been selected, the Database-Adapter generates the structure data accordingly. The SAP-Adapter gets its data from the SAP repository. Exemplary datastructures within an SAP repository are shown in the following image.

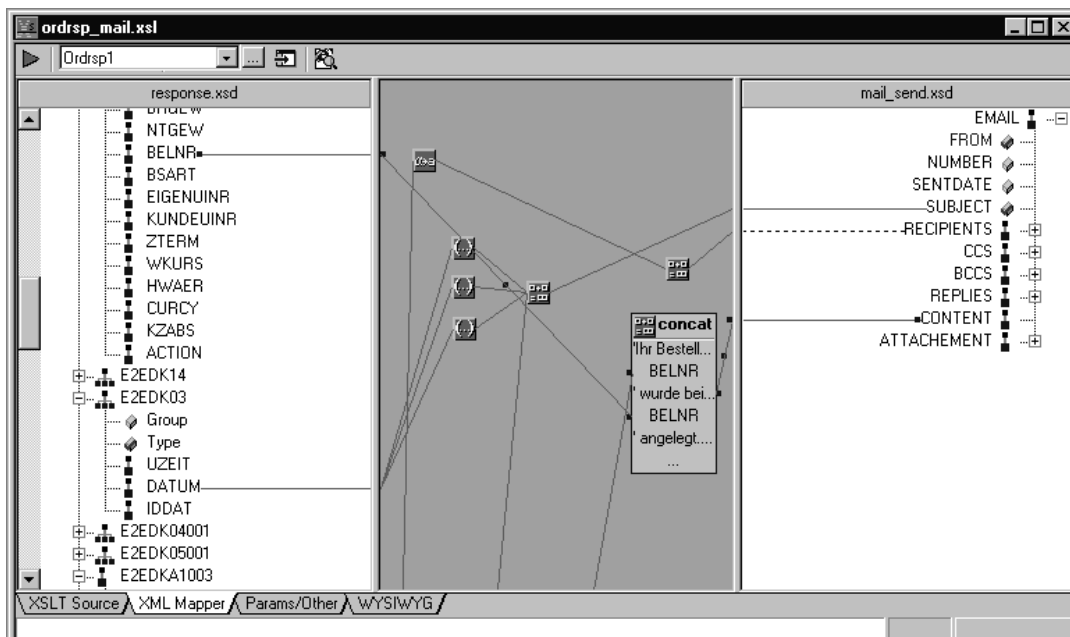


After selecting the needed data, all meta data is loaded from the SAP system, and the structure data is generated.

#### 4. Setting up the conditional data flows between the sub-systems

Within a given scenario, the route a data object goes between the systems is not a fixed one. It is rather oriented on states or the contents of data objects or systems. Therefore there is the possibility to dynamically determine the route using a distribution schema depending on the current conditions.

#### 5. Setting up the needed data transformations



Since data objects are represented in each system differently, changing the object on its transportation route is often necessary.

Transforming the data objects is done using XML stylesheets, which are stored for each system independently in the distribution schema.

The initial data pools can be replicated by executing an Initial Load, thus guaranteeing consistency of the data pools before starting the production system with an SAP integration.

## Product Overview

<b>Product name</b>	<ul style="list-style-type: none"> <li>TransConnect®</li> </ul>
<b>Product description</b>	<ul style="list-style-type: none"> <li>universal integration server for enterprise-wide on-line system integration</li> <li>message based and bi-directional communication</li> </ul>
<b>Supported J2EE-compliant application servers</b>	<ul style="list-style-type: none"> <li>TransConnect® has been tested to run on the following J2EE-compliant application servers: <ul style="list-style-type: none"> <li>Sybase Enterprise Application Server (4.2 or later)</li> <li>JBoss (3.2.1 or later)</li> <li>Borland Enterprise Server (5.1 or later)</li> <li>Oracle Application Server</li> <li>BEA WebLogic</li> <li>IBM WebSphere (5.0 or later)</li> </ul> </li> <li>The used operating system depends on the availability of the chosen application server product. <i>Windows</i> and the UNIX-platforms <i>Sun Solaris</i>, <i>Linux</i>, <i>HP-UX</i> and <i>AIX</i> are currently supported.</li> </ul>
<b>Operating system</b>	<ul style="list-style-type: none"> <li>Windows XP, 2000, 2003 and higher</li> <li>Linux</li> </ul>
<b>Hardware requirements (minimum configuration for the Windows platform)</b>	<ul style="list-style-type: none"> <li>Double-Core processor at least 2 GHz</li> <li>2 GB RAM</li> <li>100 GB HDD</li> </ul>
<b>Functionality</b>	<ul style="list-style-type: none"> <li>Building a central integration platform (Hub &amp; Spoke)</li> <li>TransConnect® Implementation Guide</li> <li>universal adapters for bi-directional linking of: <ul style="list-style-type: none"> <li>SAP R/3-systems using ALE, BAPI und RFC (certified and SAP release independent)</li> <li>SQL databases</li> <li>Email systems</li> <li>File systems</li> <li>XML systems</li> <li>Web services</li> <li>HL7 systems</li> </ul> </li> <li>asynchronous working mode allows for independent operating of the integrated application systems</li> <li>synchronous working mode for linking front-end applications</li> </ul>
<b>Data protection</b>	<ul style="list-style-type: none"> <li>Application data is saved to persistent memories to avoid loss of data in case the server, the database or the network crashes</li> <li>All information is processed transaction-safe in order to guarantee the necessary data integrity</li> </ul>
<b>Flexibility</b>	<ul style="list-style-type: none"> <li>any combination of adapters</li> <li>Description of communication routes using XML routings</li> <li>Description of data transformations using XML mappings</li> <li>Scalability by adding further adapters and individual Java components</li> </ul>

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