Software

Product

Description

Product Name: Digital Message Wrapper for R/3, Version 1.1 SPD 64.86.01

DESCRIPTION

Digital's Message Wrapper for R/3 is a set of software components designed to interface SAP's R/3 application with external systems using a message-oriented middleware ("MOM"). These components provide application level connectivity without custom ABAP/4 coding and only require minimal configuration to provide message-oriented middleware connectivity to R/3 application interfaces. Because of the complex and configurable structure of R/3, some additional analysis work is required for each message interface to R/3. Digital's Message Wrapper for R/3 is an SAP Complementary Software Partner product with SAP Certification in Process.

The Message Wrapper for R/3 allows access to R/3 functions, transactions, or data, as well as the ability to call other applications integrated with the messaging bus from within R/3. The intent of the Wrapper is to minimize the amount of work required to access R/3 from a message-oriented middleware, and remove entirely the need for coding at either the system or R/3 application level.

The Message wrapper for R/3 consists of a set of software components to transport data in and out of R/3, and to execute external server code from within R/3. *Figure 1* shows the four major components of the R/3 Wrapper, and the data flows between them. These are briefly described in the next section.

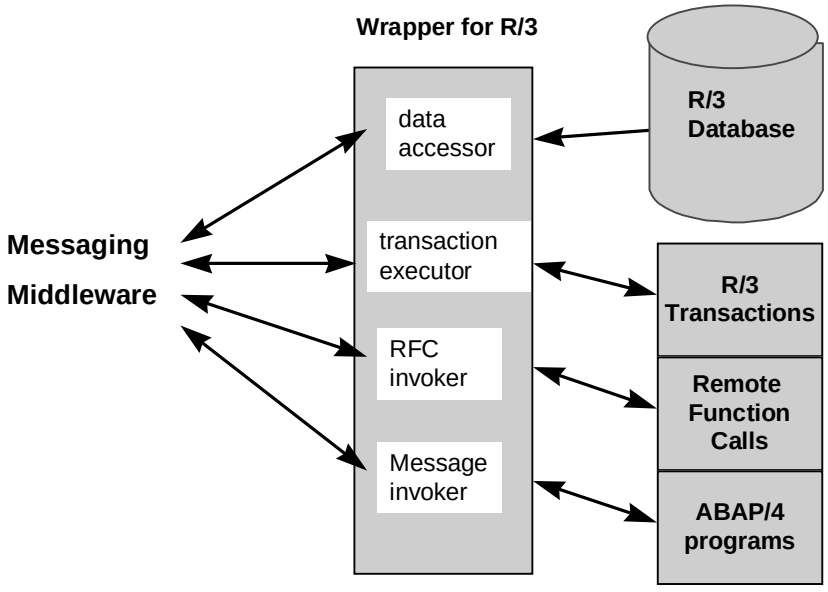

Figure 1: Overview diagram of the R/3 Wrapper

Currently, the R/3 Wrapper consists of 4 components, each serving a specific interfacing purpose. All four interface to the messaging transport layer, three as servers, one as a client.

Name	Type	Description
R/3 Data Accessor	Server	Accesses data in the R/3 database using the standard ABAP/4 SQL statements. Provides the resulting data in the self-describing name-value format.
R/3 Transaction Executor	Server	Invokes standard R/3 transactions through the use of the R/3 CALL TRANSACTION facility, using the R/3 BDC internal data structure. The data received from the MESSAGING client may be pre-formatted to match the R/3 BDC requirements, or be translated externally to R/3 inside the Transaction Executor
R/3 RFC Invoker	Server	Invokes any Remote Function Call on R/3. Returns the results in the self-describing name-value format.
Messaging Invoker	Client	Provides the client functionality in R/3 to call services available on the messaging bus.

Component Definitions

Data Accessor

The Data Accessor provides read-only direct access to the R/3 database tables. Because it works through R/3 (and does not access the underlying database, e.g., Oracle, directly), it is capable of reading all tables in the R/3 dictionary (given security restrictions). This includes master data, transaction data, pool tables, etc. The client is required to formulate a set of R/3 SQL statements to select the required data, and the data is returned as a standard set of name-value pairs.

The Data Accessor consists of an external program and a Remote Function Call in R/3. The external program interfaces to the messaging middleware as a server on the messaging bus. This program accesses an Remote Function Call in R/3, which performs the data lookup and delivers the results to the external program, which prepares the response message.

Features of the Data Accessor:

Read Any Database Tables within R/3 As long as the client knows how to access the data, (the table name and fields required), it can be retrieved as a self describing message.

Maintains System and Database Integrity via Database Server and SAP SQL Because the server uses R/3's SLQ interface, as opposed to the underlying databases' (Oracle, e.g.), there are no interference or database integrity issues. Also for some data R/3 uses the underlying database tables in specific ways which make access via that databases interface complex or impossible (ex. POOL and CLUSTER tables).

Server Syntax based SAP SQL The server syntax is based on the SAP SQL subset of SQL, but implements only the read access. The SQL supports column and row access to R/3 database tables.

Full on-line capabilities for Testing and Debugging of SAP SQL logic From within the R/3 interface, the Data Accessor testing program can execute SAP SQL statements before trying to invoke them through the server. This test ABAP/4 program, ZTESTDB, is provided as part of the R/3 Wrapper kit.

Transaction Executor

The Transaction Executor consists of an external program and an ABAP/4 program which must be installed in R/3. The external program accesses R/3 through the CPI-C communication protocol, sending transaction data to the internal ABAP/4 program. The internal program parses the transaction data and executes the transaction using the standard R/3 CALL TRANSACTION functionality. The status result of the transaction is passed back to the external program, which returns it to the calling client.

The external program also translates the data received from the messaging middleware by mapping the received data into a description of the transaction to be performed. This description, called a "map", describes the screens and fields of the transaction in terms of the BDC ("Batch Data Control") structure. The translated data is combined with BDC instructions before being passed into R/3 over the CPI-C connection. This translation functionality allows the messaging client to access R/3 transactions without knowing the structure of the R/3 transaction, but instead passing a message with business-defined data.

Features of the Transaction Executor:

Executes Any BDC Transaction within R/3 After analyzing a transaction, screens, programs and fields, the client can invoke it remotely using a self described message.

Maintains System and Database Integrity via R/3's own transaction semantics.

Uses ABAP/4 CALL TRANSACTION with Synchronous Transaction Processing. Transactions are processed synchronously in order to return a status to the client system. Completion of transactions is assured because the R/3 system manages the update of the database and returns a completion status to the calling client, through the messaging middleware.

Communicates with R/3 via CPI-C. This component, like all components of the Message Wrapper for R/3, communicates with the R/3 application through the most simple and generic method available.

Built-in BDC Converter for map-based BDC Generation. Definition of Batch Data Control transactions is implemented as a simple text file "map", which describes the structure of the R/3 BDC transaction, and allows a simple self-describing data stream to be translated into a complex R/3 transaction with no additional coding in R/3, and no programming on the application platform.

Map selection through messaging. Maps are grouped in directories, and can be loaded (or reloaded) by a single message. The directory may be selected in the message, or the default map directory will be loaded.

Full on-line capabilities for Testing and Debugging of BDC logic From within the R/3 interface, a transaction can be executed prior to invoking it through the server using the ABAP/4 program ZWTRANEX which is provided as part of the Message Wrapper kit. In addition, tools are provided for direct testing of translation maps using simple text files.

RFC Invoker

The RFC Invoker provides a generic method of creating a message which can call any R/3 Remote Function Call. It consists of a single external program. This program receives the message and formats the inbound data into the structure required to communicate with R/3 RFCs. It then calls the RFC specified in the message, and receives the results, which it packages into the messaging response to send back to the client. All calls to R/3 RFCs are synchronous. This functionality provides access to both discrete data elements and fields within tables, since tables may be passed into and out of R/3 as either complete table records or as parsed fields.

Features of the RFC Invoker:

Invokes Any ABAP/4 Remote Function Call available in R/3 Any R/3 RFC can be invoked remotely by a client using a self describing message.

Maintains System and Database Integrity by using SAP supplied routines Validates the names and values of the RFC import, export, and table elements before invoking the RFC, preventing unpredictable results. Tables are parsed and data conversions performed for both discrete and table elements by examining the R/3 data dictionary directly, ensuring data formats match R/3 requirements

Server Syntax matches ABAP/4 CALL FUNCTION

SAP_RFC_INQUIRE service provides Interface Definition. The R/3 Remote Function Call can be examined by the accessing client through the messaging middleware to ensure accuracy of the call.

Full on-line capabilities for Testing and Debugging Since the RFC Executor is executing existing R/3 functions, they can be tested on-line in R/3 by using the testing facilities of the Function Module Maintenance Transaction (SE37).

Messaging Invoker

The Messaging Invoker is the client message bus caller for R/3. This module provides a method for R/3 to call the message bus, sending messages containing self-describing data. It consists of a Remote Function Call which is used for all client calls from R/3. To provide this generic messaging functionality, the function call passes all input and output parameters in a single R/3 internal array. After making the call, it returns the response message and the message status to the calling ABAP program through the same internal array.

The external program receives the RFC calls formats the messages, sends the messages, then reformats and returns the responses to R/3.

Features of the Messaging Invoker:

Invoke any message service or server from within R/3 Adding a simple remote function call to an ABAP/4 program allows you to send and receive a self describing message, integrating with any external application that has been wrapped, or any message server and service on the messaging bus, distributed across the network on multiple platforms. The application does not have to reside on the same machine as the R/3 implementation, tying up resources devoted to running R/3.

Single Remote Function Call (RFC)

Self-describing Input / Output Table Structure A single internal table is passed to the RFC, carrying the name-value pairs of the request to be serviced. The same table is returned with the response name-value pairs.

Significantly reduces code development and maintenance Because there is only one RFC, the number of processes and function calls for access to external data is reduced to just one. The contents of the I/O table, and not the code in the RFC, determines the external service to be called and the data passed to and from the service.

Full on-line capabilities for Testing and Debugging From within the R/3 interface, any messaging service can be tested before coding directly in ABAP/4, by executing the supplied ABAP/4 test program.

INSTALLATION

Because the Message Wrapper for R/3 is one component of several required to implement a complete message-oriented middleware solution with R/3, and because R/3 requires significant configuration, it is strongly recommended that the Message Wrapper for R/3 be installed by Digital.

Digital provides training in the usage of the Message Wrapper for R/3, combined with training in the message-oriented middleware, as part of the delivery of the Message Wrapper. This training is costed separately, as part of the delivery of a complete business solution, but is strongly recommended for all customers except those

already using and experienced with the message-oriented middleware and with messaging wrappers and the R/3 product.

HARDWARE REQUIREMENTS

The Message Wrapper for R/3 has minimal hardware requirements, and may function in several different configurations with the R/3 application, depending on the platform and R/3 installation.

Required hardware capacity (in addition to co-resident messaging and R/3 software)

Disk space (root file node)	20 MBytes
Disk space (all other nodes)	20 MBytes
Memory	500 Kbytes/process

These disk volumes refer to the disk space required on the system disk. The sizes are approximate; actual sizes may vary depending on the user's system environment, configuration, and software options.

Memory usage is determined on a per-process basis. Generally, each running instance of a wrapper component occupies one process, this does NOT include processes supporting the middleware. The three server processes, (Transaction Executor, Data Accessor, and RFC Invoker) may be run in multiple instances for parallel performance and reliability, so this must be taken into account in memory sizing. The client process (Message Invoker) occupies memory only during call outs from R/3, but occupies about 500Kbytes during that time.

Processors supported:

All processors which run the required layered operating system(s) and messaging software, and have TCP/IP LAN connectivity to R/3 are supported.

SOFTWARE REQUIREMENTS

The Message Wrapper for R/3 is supported as one component of a complete Message-Oriented Middleware solution. To solve the business problem of connecting applications to R/3 using MOM technology, the messaging middleware components are required, along with connectivity development to other applications. The connectivity software is usually referred to as “wrappers”.

For version 1.1A of the Message Wrapper for R/3, the supported middleware is DECmessageQ. In addition to DECmessageQ, layered software and installation services provided by Digital’s NSIS organization is required. The NSIS layered software which provides the messaging protocol API, is MSG+.

The following versions are supported:

Product	**Version(s) supported**
DECmessageQ	3.20
MSG+	1.3.2A

R/3 versions for which connection is supported are: (Quarterly updates will be available to support enhancements and changes to SAP R/3)

2.2
3.0

The following operating system platforms are supported: (Windows NT support is in development)

Platform	Version(s) supported
Digital UNIX	3.x, 4.0

OPTIONAL SOFTWARE

Additional software components of the messaging solution which are not mandatory for the Message Wrapper for R/3 to operate are as follows:

Software	Version(s) supported
MSG+ Request Interpreter	all

GROWTH CONSIDERATIONS

The minimum hardware/software requirements for any future version of this product may be different from the requirements for the current version.

DISTRIBUTION MEDIA

The distribution kit for Digital's Message Wrapper for R/3 is supplied on the following media:

DAT 8mm tape
CD-ROM

ORDERING INFORMATION

There is no run-time only version of the Message Wrapper for R/3. Development and run-time software components are the same.

Currently, the Message Wrapper for R/3 has no country-specific components.

The following are part numbers for the deliverable components of the Message Wrapper for R/3.

Component	Order Number
Traditional Work Group License - Message Wrapper for R/3	QL-5SXAE-AA
Traditional Departmental License - Message Wrapper for R/3	QL-5SXAG-AA
Traditional Enterprise License - Message Wrapper for R/3	QL-5SXAQ-AA
30 Day Loan License	QL-5SXA9-LB

60 Day Loan License	QL-5SXA9-LD
Installation services includes software kit with documentation - required	QS-BB1A9-5Z
Training services - introductory - very highly recommended	QS-BB2A9-CZ
Training services - comprehensive - highly recommended	QS-BB3A9-CZ
Consulting services	QS-BB1A9-CZ

For additional information on available licenses, services, and media, refer to the appropriate price book.

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