

# White Paper



## Interfaces for the Integration of UNISERV Products

Technical background information

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### Client/Server Architecture and Interfaces

UNISERV offers a wide array of standard software for interactive address maintenance and address search for all central

functions of efficient address management. These are, for example:



Analyses, structures, and standardises addresses



For correct postal addresses and geographical information



For the search, discovery and prevention of address duplicates

These software components are excellently suited for integration into applications within 'open systems' and intelligent cli-

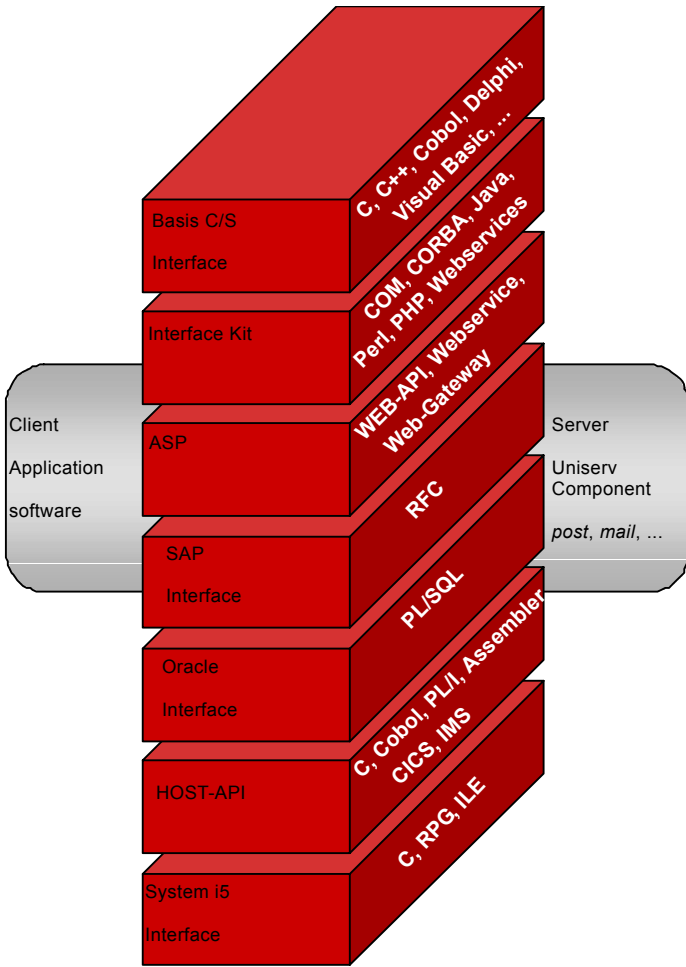


ent/server solutions. And this with comparable functionality for different operating systems such as Windows 2000/2003/XP/ Vista and Unix.

software components into your data processing environment and work sequences. Depending on the application, you choose precisely the solution which best corresponds to your specific requirements, without having to forgo performance or quality features.

Different interfaces that can be used within the scope of client/server architecture are available for the optimal integration of

**Possible interfaces**



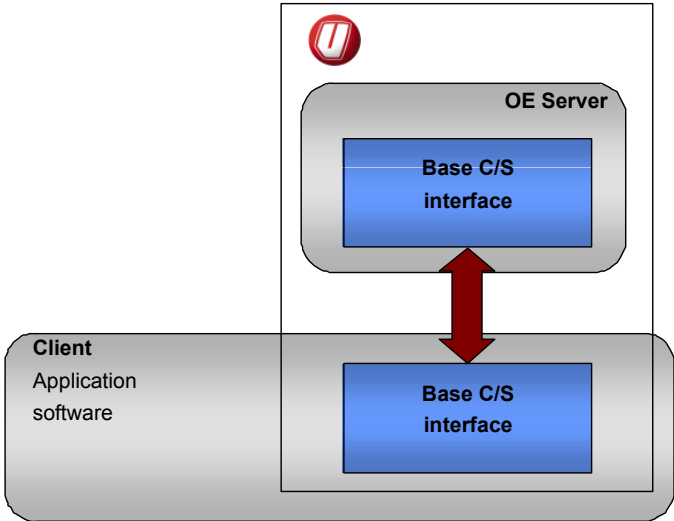
This document presents an overview of the interfaces that are currently available to facilitate your choice of the 'right' connection for your client application. Some of the interfaces are liable for costs. They are available either as supplementary

products to an OPEN.edition server (for example the Interface Kit) or as stand-alone server products (such as *post* for Oracle®).

## The Base Client/Server Interface

The basic client/server interface is based on product-neutral function calls and offers a uniform interface for all OPEN.edition products under Windows and Unix. With the aid of libraries,

which are linked to the client application, one or more OPEN.edition services can be integrated into the client environment.



Under Microsoft Windows, the base client/server interface is available as DLL, so that it can be used by all programming languages that can use functions from DLLs (C, C++, Basic, Delphi, Cobol, ...).

The client application and the UNISERV server, when using the base client/server interface, can be combined to be used as one program, or they can be used as two independent programs that communicate via a TCP/IP network.

The separation of client and server provides the greatest flexibility for the integration of UNISERV OPEN.edition products and use of the basic client/server interface. The client and server applications can run (with the exception of adjustments of the computer names) without a program change on the same computer or on different systems; several client applications can use a single server.

## The OPEN.edition Interface Kit

The UNISERV OPEN.edition Interface Kit allows to integrate all OPEN.edition components for Unix and Windows 2000/2003/XP/Vista within Internet or distributed Intranet environments.

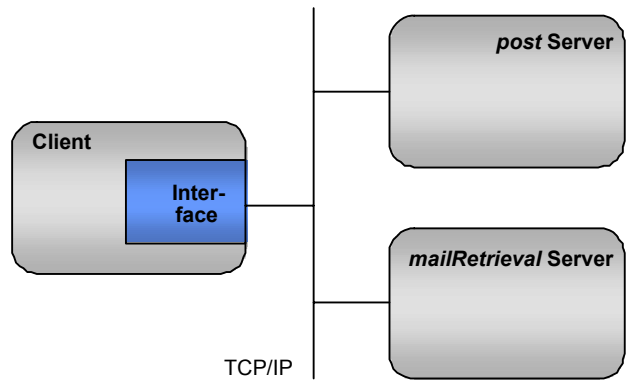
At present, the OE Interface Kit provides the following interfaces:

- Java
- Perl
- COM\*<sup>1)</sup>
- PHP
- CORBA
- Web services

### 1. Java/Perl/PHP

The development of applications with the Interface Kit can be based on the languages Perl, PHP or Java.

The Interface Kit enables a transparent communication between the user's own program (client) and one or more UNISERV systems (server). The communication between client application and UNISERV server always takes place by using a socket interface via a TCP/IP network.



The Java, Perl and PHP interfaces are generically available for all OE services. In addition, there are two product-specific Java interfaces for *post* and *mailRetrieval*. By providing optimal

user guidance, these interfaces facilitate the integration of these products, thus ensuring correct operation of the services.

\*1) Except for the COM interface, all interfaces are available for Unix and Windows 2000/2003/XP/Vista. The COM interface is available for Windows 2000/2003/XP/Vista only.



## 2. COM Interface

Besides Java, PHP and Perl, a COM interface is also available under Windows 2000/2003/XP/Vista.

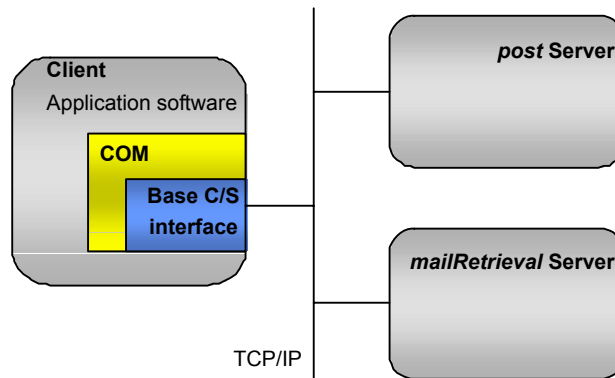
With the Component Object Model COM (and its successors DCOM and COM+), Microsoft has established a protocol regulating how components can be made accessible for other applications (or components) and how data can be exchanged between a component and a user of this component.

UNISERV provides a COM interface, which permits the use of all services of the OPEN.edition product line. Not only does it

permit access from applications that were e.g. created with Visual C++ or Visual Basic, but also the use of the services within the scope of script languages such as Visual Basic for Applications (VBA) or Visual Basic Script (VBS).

The COM interface connects to the basic client/server interface; this must likewise be installed as DLL on the computer.

The COM interface permits access to local or remote OPEN.edition servers.



The COM interface permits the integration of the OPEN.edition servers into the Microsoft® .NET™ Framework. This interface must be made available to the .NET Framework through a Runtime Callable Wrapper (RCW).

The wrapper is invoked whenever a .NET client creates an instance of the COM object. All of the instances of the COM object are used via the same RCW. Thus, from the .NET client's perspective, the UNISERV COM interface is available as a further Managed Object.

## 3. The OPEN.edition CORBA Interface

The UNISERV OPEN.edition CORBA interface is a uniform interface, with which all servers from the OPEN.edition line can be integrated into distributed CORBA-based environments.

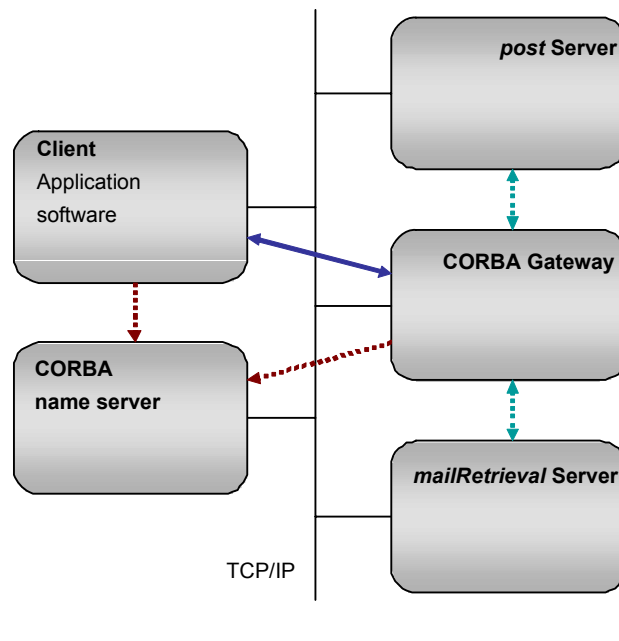
The development of applications with the CORBA interface can be based on all languages for which there is an implementation of the interface description (IDL) into the syntax and semantics of this programming language.

The CORBA interface enables a transparent communication between a user's own program (client) and one or more UNISERV systems (server). The communication between the client

application and a UNISERV server takes place via the transport mechanisms of CORBA. The CORBA gateway communicates with UNISERV servers via a TCP/IP network that uses the basic client/server interface.

To use the CORBA interface, a gateway must be additionally installed that functions as intermediary between the CORBA application and the UNISERV servers. The CORBA gateway can use one or more servers, i.e. a separate gateway need not to be installed for each UNISERV (mailRetrieval, post,...). The gateway registers itself at the CORBA naming service and is then available for all applications within the environment.

The CORBA gateway requires a Java Runtime Environment (JRE) 1.5.0 or higher. The CORBA interface itself is based on the Interface Kit Java interface.



## 4. Web Services

Uniserv Web services can be used for the integration into Java-supported web service environments.

To be used, the web service requires a J2EE-compliant application server. As an alternative, it is also possible to use another Java-based web service environment such as AXIS.

Uniserv web services are completely manufacturer-independent and can be used by clients and development environments that support JSR-181-compliant web services.

The advanced features of the application server, e.g. load balancing and fail-safety, are not fully supported by the web service. This is due to the fact that the actual functionality is not implemented in the Java component but in the server application, which runs independently of the application server. Therefore, the administration of the server application also has to be independent of the application server.

Currently, the following web services are included in the OPEN.edition Interface Kit:

- PostalValidation for postal validation and geocoding.
- Deduplication for duplicates control.



# ASP Interfaces

With the Address Service Portal (ASP), Uniserv offers various tailor-made address management solutions to small and medium enterprises, complemented by a worldwide postal

validation of addresses and a range of address-specific functions.

## The WEB API

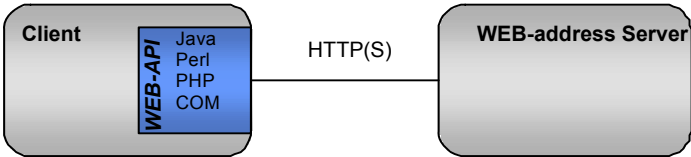
The WEB-address-server is an additional product of the OPEN.edition product line which provides services via a specifically adapted web server using the Hypertext Transfer Protocol (HTTP). The data transmission between the client and the WEB-address-server can be encrypted for increase data security (HTTPS). Currently, the WEB-address-server supports the postal validation of addresses as well as the verification of bank reference data (DE only).

The kinds and extent of services that can be used by a client are parametrizable and are safeguarded via an access control (user name and password).

With the WEB-API, UNISERV provides convenient connections to the WEB-address server which encapsulate the data transmission between the client and the WEB-address-server, completely implementing the communication between the client and the server and preparing the transmitted information in suitable form.

UNISERV presently provides the following connections to the WEB-address server:

- Java Class
- Perl Module
- PHP Module
- Microsoft COM Class



## 1. Webservice

Uniserv web services are completely manufacturer-independent and can be used by clients and development environments that support web services compatible with JSR-181.

The integration does not require any server infrastructure at the customer site; all the customer has to take care of is the integration in the client.

The type and the extent of the services that can be used by a client can be set through parameters. In addition, as for WEB

API, they are protected by an access control system (user name and password).

Currently, the following web services are available as ASP services:

- Postal validation and Geocoding.
- Telephone information (for Germany only).

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## 2. Web Gateway

In certain situations, a local installation of an OE service may not be wanted or useful for one reason or another. However, it should be possible to use the same interface, which the customer already knows from other products. This is where the Web Gateway is used. The Web Gateway provides an OE service to a client in a highly transparent way, thus allowing to use the same interface as for a local installation of the service. Any service used via the Web Gateway can be replaced with a local installation of the service, any time and without any changes to client applications.

At the customer site, the Web Gateway is started as service and then communicates with the services on the Uniserv ASP server via standard Internet protocols (HTTP, HTTPS).

The following client APIs are supported by the Web Gateway:

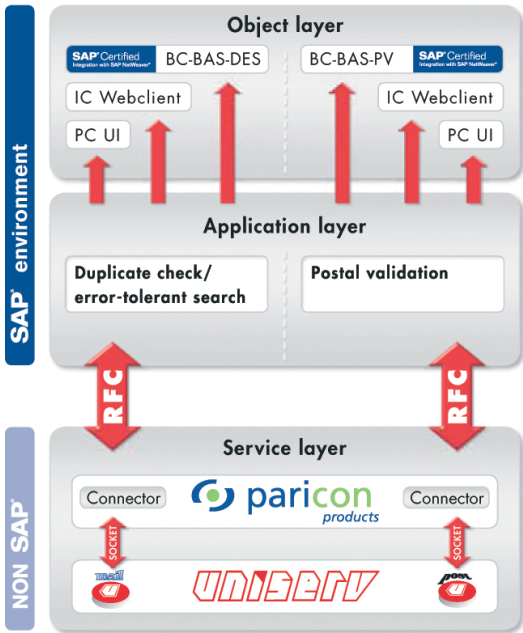
- Basic client/server interface
- Interface Kit (Java, Perl, PHP, COM, CORBA, Web service)
- SAP™ interface
- Oracle® interface
- HOST API
- System i5 interface

For information on the availability of specific OPEN.edition services via the Web Gateway please contact Uniserv.

### Integration into SAP R/3

Together with paricon, UNISERV has realized the connection between the interactive duplicate search and the postal validation to SAP R/3®, mySAP™ Business Suite and mySAP CRM.

Hence, the address retrieval postal validation/geocoding functionalities are available directly from the SAP system.



From SAP R/3 Release 4.6C and higher, the address management components can be directly linked to the central address management (ZAV) in the SAP system via the business add-ins. Thus, postal validation (*post* for mySAP™ Business Suite) and address retrieval (*mail* for mySAP™ Business Suite) are ensured without any additional integration effort. *post* for mySAP™ Business Suite and *mail* for mySAP™ Business Suite implement the interfaces specified by SAP for postal validation and duplicate check and error-tolerant search. The implementation of these interfaces documents the certification of *post* for mySAP™ Business Suite and *mail* for mySAP™ Business Suite by SAP.

To connect the OPEN.edition server to the SAP system, an additional component (Connector) is needed as intermediary.

*post* for mySAP™ Business Suite and *mail* for mySAP™ Business Suite are based on the proven predecessor solution Developer Communicator, which allows to implement proprietary developments and custom processes. Thus, the RFC connection of *post* for mySAP™ Business Suite and *mail* for mySAP™ Business Suite also allows to integrate further OPEN.edition services (e.g. *geocoding*, *phone* or *bank*) in the context of custom developments.

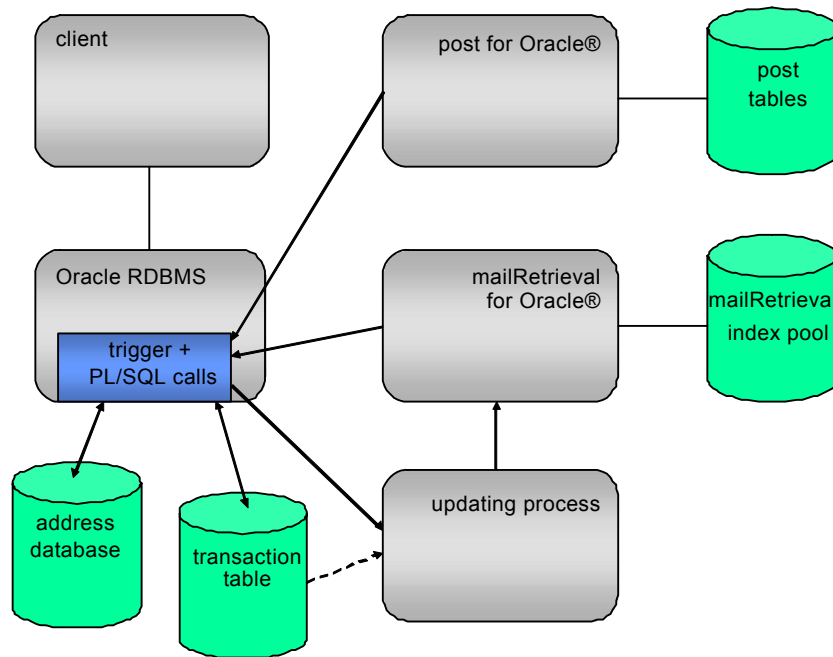
## Oracle® Integration

The OPEN.edition servers *mail* and *post* can be connected to Oracle RDBMS. Hence, the functionality of the address retrieval (*mail* for Oracle®) and the postal validation and geocoding functionality (*post* for Oracle®) are available directly from the database system.

For interactive duplicate search and postal validation, calls in PL/SQL are available. These can be used in self-developed database triggers, stored procedures, other PL/SQL packages,

Oracle Forms applications as well as all applications that have a connection to the database.

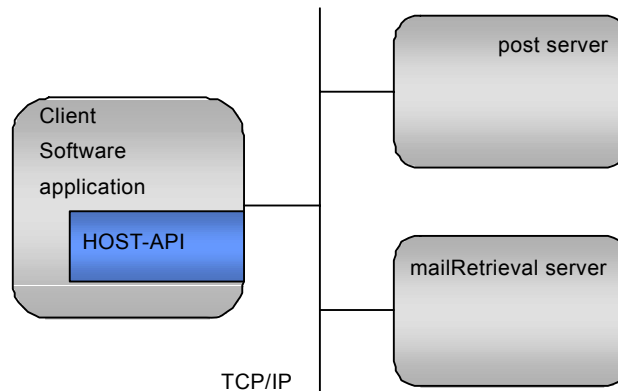
In addition, database triggers annotate the respective operation and necessary fields in a transaction table when entering as new, changing or deleting address records. A background process reads the transaction tables at regular and configurable intervals and makes changes in the *mail* system accordingly. Possible errors in the entry are annotated and can be manually corrected afterwards via an appropriate tool.



## HOST-API

Via this interface, mainframe programs (clients) can communicate on z/OS or OS/390 with all OPEN.edition products that exist as server versions under Unix or Windows 2000/2003/XP/Vista.

The data exchange takes place by means of a socket interface via a TCP/IP network.



The development of applications by using host APIs can take place with the following programming languages:

- for batch applications: COBOL, PL/I or C
- for IMS applications: COBOL, PL/I or C
- for CICS applications: COBOL, PL/I, Assembler or C

For batch applications or IMS applications, the host API is connected to the client program and accessed with CALL; for CICS applications as stand-alone program it is accessed with EXEC CICS LINK PROGRAM.

The transfer between the client program and the HOST-API takes place via a data structure, which is similar to the interface for the OE Host products.

### Installation requirements

- z/OS or OS/390 V2 R7 or higher, with Language Environment
- TCP/IP for the connection between z/OS or OS/390 and Unix/Windows 2000/2003/XP/Vista
- VSE/ESA or z/VSE 3.1 or higher
- Unix/Windows 2000/2003/XP/Vista for the installation of the product-specific OE server

## OPEN.edition Products under System i5 (iSeries, AS/400)

The function calls of the OPEN.edition servers *mail* and *post* for System i5 (iSeries, AS/400) can easily be integrated into your applications by your developers or your software partner. For that, UNISERV provides a program interface that facilitates the smooth integration into RPG programs.

To simplify integration even further, executable ILE-RPG sample programs are provided (source code) for the following functions:

- Code pool build (*mail* - Initial loading)
- Online retrieval and editing program for *mail* (*mail* client)
- Online postal validation (*post* client for diverse countries)
- Online checks with *convert-address* for France and the United Kingdom.

However, the UNISERV interface is also be smoothly integrated in other programming languages, such as Cobol, C or Java.

### Uniserv interface technical requirements

- Merely the ILE is necessary. This is available as of V3R2.
- RPG III applications are easily implemented in ILE, although this is not necessary for the complete application, but only for the parts of the program directly connected to the UNISERV interface.

- Despite the realization of the UNISERV components in C, C-Compiler or C-Runtime are not necessary, since the corresponding components for runtime control are contained as standard in i5/OS (OS/400).

### Where do the Address Management Service Processes run?

For running the service processes, there are various alternatives due to UNISERV's client/server technology and the extensive support provided by the System i5 (iSeries, AS/400) in this field:

- Directly on the i5 system.  
Requires the availability of the 'PASE' software feature.
- On an internal Windows 2000/2003 server.  
Requires the availability of the INS hardware feature (Integrated Netfinity Server - formerly IPCS). The corresponding background process is run on this internal Netfinity server under Windows 2000/2003.
- On an external Unix or Windows server.  
As external servers all generally used Unix derivatives (AIX, HP-UX, Sun Solaris, True64, Linux) and Windows 2000/2003/XP/Vista are available.

## Availability of Interfaces

The following tables display the use of the different interfaces according to various criteria.

### 1. Availability depending on purpose

	Base C/S interface	OE Interface Kit (Perl/Java/PHP)	OE Interface Kit (Webservices)	OE Interface Kit (COM)	OE Interface (CORBA)	ASP WEB-API	ASP Webservices	HOST-API	iSeries (AS/400)	SAP Business-AddIn	Oracle integration
SAP R/3 - standard processes										X	
SAP R/3 - application-specific processes										X	
Oracle application		X									X
Distributed CORBA-based environments					X			X	X		
Address validations via Internet with secure transmission and authentication (Java/Perl/COM/PHP)						X	X				
eCommerce web applications		X	X	X		X	X				
Java applications		X	X			X	X				
Perl or CGI scripts		X				X					
Active Server Pages (ASP)				X		X					
'Standard' Windows applications	X		X	X							
'Standard' Unix applications (C, C++, Cobol, X11, OSF Motif)	X										
'Standard' Host applications z/OS (prev. OS/390, MVS)								X			
'Standard' Host applications z/VSE (prev. VSE/ESA)								X			
'Standard' iSeries (AS/400) applications									X		
Data maintenance in batch mode	X							X	X		

## 2. Availability depending on platform

	Base C/S interface	OE Interface Kit (Perl/Java/PHP)	OE Interface Kit (Webservices)	OE Interface Kit (COM)	OE Interface (CORBA)	ASP WEB-API	ASP Webservices	HOST-API	iSeries (AS/400)	SAP Business-AddIn	Oracle integration
Windows 2000/2003/XP/Vista	X	X	X	X	X	X	X			X	X
Unix	X	X	X		X	X	X			X	X
iSeries (AS/400)	X								X	*1)	*1)
Host z/OS (prev. OS/390, MVS)								X		*1)	*1)
Host z/VSE (prev. VSE/ESA)								X		*1)	*1)

\*1) Supported in client application on the corresponding platform

## 3. Availability depending on programming language (Windows)

	Base C/S interface	OE Interface Kit (Perl/Java/PHP)	OE Interface Kit (Webservices)	OE Interface Kit (COM)	OE Interface (CORBA)	ASP WEB-API	ASP Webservices	HOST-API	iSeries (AS/400)	SAP Business-AddIn	Oracle integration
Microsoft Visual Basic .NET	X		X	X		X	X				X <sup>*2)</sup>
Microsoft Visual C++ .NET	X		X	X	X <sup>*1)</sup>	X	X				X <sup>*2)</sup>
Microsoft C# .NET	X		X	X		X	X				X <sup>*2)</sup>
Delphi	X			X	X <sup>*1)</sup>	X					X <sup>*2)</sup>
C++ Builder	X			X	X <sup>*1)</sup>	X					X <sup>*2)</sup>
Java		X	X		X	X	X				X <sup>*2)</sup>
Perl, PHP		X	X			X	X				
Microfocus Cobol	X										X <sup>*2)</sup>
VBA (Microsoft Office), VBS				X		X					X <sup>*2)</sup>
SQL Forms, PL/SQL											X
ABAP										X	

\*1) Requires additional middleware (ORB).

\*2) May require additional software (ODBC, JDBC, ESQ, ...)

#### 4. Availability depending on programming language (Unix)

	Base C/S interface	OE Interface Kit (Perl/Java/PHP)	OE Interface Kit (Webservices)	OE Interface Kit (COM)	OE Interface (CORBA)	ASP WEB-API	ASP Webservices	HOST-API	iSeries (AS/400)	SAP Business-AddIn	Oracle integration
C/C++	X				X <sup>*1)</sup>				X		X <sup>*2)</sup>
Microfocus Cobol	X										X <sup>*2)</sup>
Java		X	X		X	X	X				X <sup>*2)</sup>
Perl, PHP		X	X			X	X				
SQL Forms, PL/SQL											X
ABAP										X	

\*1) Requires additional middleware (ORB).

\*2) May require additional software (JDBC, ESQ, ...)

#### 5. Availability depending on programming language z/OS (OS/390, MVS)

	HOST-API Batch	HOST-API CICS	HOST-API IMS
C	X	X	X
Cobol	X	X	X
PL/1	X	X	X
ASSEMBLER		X	

## 6. Availability depending on integration means

	Base C/S interface	OE Interface Kit (Perl/Java/PHP)	OE Interface Kit (Webservices)	OE Interface Kit (COM)	OE Interface (CORBA)	ASP WEB-API	ASP Webservices	HOST-API	iSeries (AS/400)	SAP Business-AddIn	Oracle integration
Requires programming	X	X	X	X	X	X	X	X	X	X	X
Standard software (may require additional registration/licensing of functions)						X <sup>*1)</sup>	X <sup>*1)</sup>			X	

\*1) May depend on supplier of an eCommerce application

## 7. Availability depending on level

	Base C/S interface	OE Interface Kit (Perl/Java/PHP)	OE Interface Kit (Webservices)	OE Interface Kit (COM)	OE Interface (CORBA)	ASP WEB-API	ASP Webservices	HOST-API	iSeries (AS/400)	SAP Business-AddIn	Oracle integration
Basic API	X	X		X	X			X	X	X	X
High-level API			X			X	X			X	
Componentware										X	