

SAP Integration and Certification Center

Integration Guide

SAP-endorsed Integration Technologies for Integration Certification of Third-party Software Applications with SAP Solutions

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SAP® Certified
SAP Business One Integration

SAP® Certified
Integration with SAP Applications

SAP® Certified
Integration with SAP BusinessObjects

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1 Introduction

This guide describes the SAP-endorsed integration technologies that Independent Software Vendors (ISVs), SAP Software Partners, or System Integrators (SIs) are required to use to develop interface software eligible for SAP Integration Certification by the SAP Integration and Certification Center (SAP ICC). Using these technologies to integrate the interface software of a third-party product with SAP solutions, and submitting the integration to the SAP ICC for integration testing, can make integration projects more successful for SAP customers and ISVs alike. Certified integrations are generally more release-stable, have a reduced implementation time and will in most cases also ensure smoother release upgrades for SAP customers.

As a starting point, the [ICC Homepage](#) on the **SAP Community Network** (SCN) contains a well-rounded description of the complete SAP integration and certification program and integration options.

The SAP Integration and Certification Center can be contacted via email at icc@sap.com

2 SAP HANA® Platform-based Integration

SAP HANA is an in-memory data platform that is deployable as an appliance or in the cloud. At its core, it is an innovative in-memory relational database management system that makes full use of the capabilities of current hardware to increase application performance, to reduce cost of ownership, and to enable new scenarios and applications that were not possible before.

With SAP HANA, partners and ISVs have the opportunity to build applications that integrate the business control logic and the database layer with unprecedented performance.

2.1 Third Party HANA-based Applications Deployment

Partners and ISVs can now take advantage of the power of the SAP HANA Platform to develop new applications with advanced reporting analysis, and planning in a real time. SAP HANA-based applications can be distinguished into these two broad categories:

- Traditional client-based scenarios, where an external application accesses the SAP HANA data model (tables, analytic views, etc.) via client interfaces such as ODBC and JDBC, and only uses SQL and native SQLScript procedures.
- Web-based application that take full advantage of the SAP HANA Extended Application Services. In this scenario, clients access SAP HANA data using standard OData or XML for Analysis (XMLA) interfaces, or directly use a Web-based GUI that was developed using SAP UI5 toolkit, and that uses custom-developed server-side JavaScript, as well as native SQLScript procedures.

SAP offers certification for such applications running on HANA; details can be found [here](#).

2.2 Backint SDK for SAP HANA

Using the interface Backint for HANA, third party backup tools can create backups for the data and redo logs of SAP HANA system. The certification is a mandatory pre-requisite for installing a third party backup tool on the SAP HANA appliance. See [SAP Note 1730932](#) for more details.

When a third party backup tool has been installed and configured for SAP HANA, backups are transferred via pipe from the SAP HANA database to the third party backup agent. The backup agent runs on the SAP HANA database server and communicates with the remote third party backup server.

The Backint for SAP HANA interface supports “backup”, “recovery”, “inquiry”, and “delete” functions.

Third party backup tools are fully integrated with SAP HANA:

- Execution of backups and recoveries from SAP HANA studio and via SAP HANA SQL commands
- Configuration of tool-specific parameters via SAP HANA studio

You can find more information on Backint for SAP HANA certification [here](#).

2.3 SAP HANA Cloud Portal Content

SAP HANA Cloud Portal is a cloud-based solution for fast and easy portal site creation. SAP HANA Cloud Portal allows users to build, brand, and publish external and internal web sites. Portal sites created using Cloud Portal can be consumed both on the desktop and mobile devices. Partner application sites built and published on SAP HANA Cloud portal to consume on desktop or mobile devices can be certified. All the details of the certification can be found [here](#).

Interested companies can sign up via the [SAP HANA Cloud Applications Partner Center](#) for a complete enablement package, including certification of their portal application.

For technical information for Cloud Portal development, including API documentation and configuration guides, you can refer [SAP HANA Cloud Portal – Developer Guide](#)

3 SAP NetWeaver® Technology Platform-based Integration

SAP NetWeaver is a web-based, open integration and application platform that serves as the foundation for Service-Oriented Architecture (SOA). It delivers a complete, open, and flexible infrastructure that allows third party software vendors to run SAP and non-SAP applications on one central platform.

3.1 Packaged Composite Applications

SAP NetWeaver helps you compose, develop, and run composite applications. Composite applications reuse, integrate, and orchestrate functionalities from existing application assets in the context of service-oriented architecture, with only selective development of new functionality where needed to fill gaps.

Composite application is a key concept of the SOA approach. A Packaged Composite Application (PCA) is a composite application that is developed by an ISV or SI as packaged software with the potential of repeatable deliveries to multiple customers. Promoting SOA and delivering software technologies that enable SOA, SAP offers certification for PCAs based on the criteria set forth in the PCA Certification Guide. All the details and guidelines for PCA certification can be found [here](#).

3.2 SAP NetWeaver Runtime/ Deployment

3.2.1 ABAP Development and ABAP Add-On Deployment Certification

For the integration certification of non-SAP products, a software vendor is generally not encouraged to submit code programmed in ABAP, SAP's proprietary programming language, as the integration via open APIs and SAP-endorsed integration technologies as listed in this guide generally makes for easier integration into customer landscapes. Extending to the original ABAP code of a customer system requires a different certification approach. Therefore SAP offers a separate [ABAP Add-On Deployment certification](#) with different technical requirements geared towards testing the third-party product's ABAP code and its proper co-existence with other ABAP codes as well as its smooth installation in the SAP NetWeaver ABAP component.

With SAP HANA, in addition to optimize and improve the performance, there are several changes in the NetWeaver ABAP stack. Therefore ABAP Add-On solutions must be certified for "SAP Business Suite Powered by SAP HANA" separately.

3.2.2 Certification of J2EE/ EE 5 applications' Installation/Deployment and SAP HANA Cloud Java

The SAP NetWeaver technology platform provides complete support for Java technology, including Java Platform Enterprise Edition, Enterprise JavaBeans (EJB), Java Server Faces (JSF), Java Persistence API, Java Connector Architecture (JCA), Java Database Connectivity (JDBC), and many more. SAP NetWeaver also supports fast deployment for high development productivity, and advanced clustering for high availability and reliability.

Many SAP customers are not only running SAP solutions, but also third-party and/or custom developed Java EE applications on SAP NetWeaver to achieve a streamlined infrastructure and lower TCO.

To further improve the customer's experience of running third-party Java EE applications on SAP NetWeaver, SAP offers a certification program that tests the installation and deployment of third-party Java EE applications on SAP NetWeaver Application Server Java (SAP NetWeaver AS Java).

The test ensures that the Java EE application, compliant to J2EE (1.3, 1.4) /EE 5 (Java 5) specification, can be deployed and runs on the SAP NetWeaver AS Java. ISVs might have to migrate an existing J2EE/EE 5

application over to the SAP NetWeaver AS Java. If it is the case, SAP provides a [J2EE migration kit](#) for SAP NetWeaver 7.0 and a Migration Plug-in for SAP NetWeaver Composition Environment 7.1, 7.2 and 7.3. To help you decide which SAP Java release and certification integration scenario to choose to deploy your Java application, please refer to the [Table Matrix here](#). Furthermore, once the ISV Java EE application (J2EE/EE 5 EAR file wrapped into SAP SCA file) is certified, it also achieves the SAP Solution Manager Ready qualification.

There is an interesting blog "[Freedom for Java](#)" written by SAP's Chief Technology Officer Vishal Sikka to explain SAP's commitment to Java standards.

SAP HANA Cloud enables SAP partners, third-party software vendors and customers to develop / deploy and use [Java applications](#) in a cloud environment. SAP HANA Cloud is an open-standards, Eclipse-based, module software development kit. It is certified at the latest industry cloud standards and operated by SAP. You can find more information on SAP HANA Cloud Java application certification [here](#).

3.3 SAP NetWeaver Integration

3.3.1 SAP NetWeaver Gateway

SAP NetWeaver Gateway facilitates easier provisioning and consumption of business logic and content of SAP backend systems for mobile and Web applications. It aims to reduce the complexity and the skill set required to access SAP data, thereby removing deployment barriers. Simple interfaces also help to shorten development times.

SAP NetWeaver Gateway enables people-centric applications to consume SAP Business Suite data through popular platforms and devices (such as the iPad and Blackberry) in an easy and standards-based manner. It is a framework that connects business users to SAP systems using consumer technologies, groupware, and mobile devices and is based on open standards (such as the Atom Publishing Protocol and OData) that offer simple services based on the REST principle.

Depending on your development requirements and where you want to develop SAP NetWeaver Gateway content, you can install SAP NetWeaver in either an SAP Business Suite backend system (embedded deployment) or in an SAP NetWeaver Gateway hub system (central hub deployment).

SAP NetWeaver Gateway uses OData protocol. OData is based on industry standards and offers database-like access to business data using REST-based architecture. For its consumption outside of SAP, no knowledge of SAP structures is required and it supports object navigation. Dynamic binding takes place at runtime. OData can be easily consumed by various platforms and it offers flexibility (filtering, query options). OData for SAP comprises OData plus SAP annotations.

In SAP NetWeaver Gateway, entities are defined and connected in data models. These data models can be exposed as OData services during runtime. Runtime processing is handled by data provider classes (DPC) that are assigned to the object models.

The *OData Channel (ODC)* for SAP NetWeaver Gateway allows you to develop content by defining object models and registering a corresponding runtime data provider class. There are two ODC application components, the business data provider and the metadata provider. An ODC data provider implements a single interface that is very close to the OData protocol. OData Channel applications obtain access to common framework services, for example, logging or transaction handling using a set of agents called "Common Service Exposure". These agents wrap existing framework services in a way that OData Channel applications can easily consume.

To be eligible for a SAP NetWeaver Gateway certification, the developed Gateway contents have to be based on the OData Channel (ODC) programming paradigm.

3.3.2 Certification for Packaged Portal Content

SAP NetWeaver enables user productivity with its market-leading enterprise portal solution. SAP NetWeaver Portal provides a single web portal which includes unified information from enterprise applications, data warehouses, unstructured document collections, and the Internet. Users can easily access, share, analyze, and act on relevant information from any data source - dramatically accelerating event resolution and increasing business insight.

Portlets (iViews, and other packaged portal content such as Business Packages) allow the integration of information and functions from a wide range of sources within the SAP NetWeaver Portal. For example, an iView can present information from a Web site, integrate functions from business software, or provide search functions. iViews are typically lightweight and can be developed quickly. iViews can be implemented on both the .NET and the Java platforms. For more information about developing iViews, and to download the Portal Development Kit (PDK), please visit [SAP Community Network](#).

ISVs can design iViews and Business Packages to expose the information and functionality of their product to the SAP NetWeaver Portal. SAP offers certification for these third-party iViews and Business Packages as part of the EP-BP certification scenario. Details can be found [here](#).

3.3.3 SAP NetWeaver Process Integration

SAP NetWeaver also represents a platform for process integration based on the exchange of XML messages. It enables you to connect systems from different providers (non-SAP and SAP), different versions, and different programming languages (Java, ABAP, etc.). SAP NetWeaver Process Integration (SAP NetWeaver PI) is based on an open architecture, primarily uses open standards (in particular those from the XML and Java environments), and offers those services that are essential in a heterogeneous and complex system landscape:

- Modeling and design of messages, transformations, and cross-component integration processes
- Configuration options for managing collaborative processes and message flow
- Runtime for message and process management
- Adapter Engine for integrating heterogeneous system components
- Central monitoring for monitoring message flow and processes

With SAP NetWeaver PI component, SAP offers a complete EAI solution that integrates SAP business applications and third-party solutions (A2A). SAP offers two SAP NetWeaver PI-based certifications to ensure a standardized and aligned development process:

- NW-XI-AF to certify adapters running in SAP PI
- NW-XI-CNT to certify process integration content for SAP PI

All the details can be found on the [SAP PI certification in SCN](#).

4 Service-Oriented Architecture (SOA)

Service-oriented architecture (SOA) is an adaptable, flexible, and open IT architecture, where functionality is grouped around business processes and packaged as interoperable services. SAP makes it easy to adopt service-oriented architecture (SOA) by delivering SOA-enabled business applications, enterprise services, and SAP NetWeaver as the enabling technical foundation for SOA. All enterprise services communicate using Web services standards, can be described in a central repository, and are created and managed by tools provided by SAP NetWeaver.

Please see below [chapter 5.1](#) on how integration via enterprise services qualifies for integration certification.

5 SAP-Endorsed Integration Technologies Linking to Functionality of SAP Solutions

In addition to the certification opportunities for third-party products offered around the SAP NetWeaver technology platform, ISVs are able to choose from various SAP-endorsed integration technologies to tie into the functionality of SAP solutions, including components of SAP NetWeaver (e.g. SAP NetWeaver Business Intelligence) and the SAP Business Suite.

SAP-endorsed integration technologies include:

- Enterprise Services
- SAP BAPIs (Business Application Programming Interfaces)
- Remote callable function modules (RFMs) that have been released for customer/external use
- IDocs (Intermediate Documents) provided by SAP, that are sent or received by SAP Business Suite components
- Data Transfer Programs provided by SAP
- SAP Integration Tools

In addition to the above listed SAP-endorsed integration technologies, SAP reserves the right to evaluate and approve other integration technologies not included in this document, as long as a thorough check and subsequent test determine that this is in the best interest of all involved parties, and that those tested third-party solutions do not affect the integrity of similar SAP systems.

5.1 Enterprise Services

SOA revolutionizes the design of business applications, enabling the rapid composition of business solutions. With enterprise services, you can encapsulate business logic and expose it as enterprise services -- smaller functionality components that can be reassembled quickly to form new innovative business solutions that meet changing business requirements.

Enterprise services are highly-integrated web services combined with business logic and semantics that can be accessed and used repeatedly to support a particular business process. SAP publishes all enterprise services that support SAP Business Suite functionality at the [Enterprise Services Workplace](#). You can find more information on how to access and test the Enterprise Services [here](#).

[SAP Enterprise Services \(ES\) Wiki](#) is a collaborative environment based on Wiki technology. It publishes ES bundles catalog that you can view enterprise services supporting business processes for SAP Business Suite solutions.

The following characteristics differentiate enterprise services from regular web services:

- **Business semantics:** Enterprise services are structured according to a harmonized enterprise model based on business objects, process components, and global data types (GDTs). They are defined using an outside-in approach: common business rules and know-how, rather than SAP-specific implementations, are the guideline for defining the business content of SAP applications.
- **Quality and stability:** Enterprise services safeguard a stable interface for future versions (backward compatibility). Their behaviors, prerequisites, dependencies of usage and configuration possibilities are well documented.
- **Standards:** Enterprise services are based on open standards. The interfaces are described according to WSDL. They are created by using global data types which are based on UN/CEFACT CCTS (Core Component Technical Specification). B2B enterprise services are defined in compliance with e-business standards, where applicable.

SAP has developed an advanced metamodel and governance process to define and model enterprise services. Key concept is the business object model. Each enterprise service is assigned to a business object, representing a well-defined business entity or document. Each business object is assigned to a process component. Process components are pieces of software covering a well-defined set of business tasks which belong logically together and are usually executed in the same department.

Logically, an enterprise service is a service operation, derived from a standardized interface pattern, which contains operation names such as create, update, or cancel, and incorporates communicational patterns. It is described as a WSDL or an XML scheme in the ESR. The consuming application and the back-end systems communicate through messages that manage the input and output of the service operation data fields. In this document, service operations are often used as synonyms for particular enterprise services.

For example, the ERP process component Sales Order Processing provides the enterprise service interface Manage Sales Order In, among others. From this interface, you can access the enterprise service operation Create Sales Order.

For asynchronous enterprise services, the consumption is implemented via SAP PI.

5.2 Business Application Programming Interfaces

Business Application Programming Interfaces (BAPIs) are standard SAP interfaces that enable software vendors to integrate their software with SAP solutions. BAPIs are technically implemented using RFC (Remote Function Call) enabled function modules inside SAP systems.

BAPIs are defined in the Business Object Repository (BOR) as methods for SAP business objects that perform specific business tasks. They allow integration at business level, not technical level. This makes it much easier to find suitable BAPIs compared to non-BAPI based function modules.

Once SAP has released a BAPI, its interface definitions and parameters will usually remain stable in the long term, which means third-party application programs may not be affected by changes to the underlying SAP software or data. If upward-compatible enhancements are made to the BAPIs, the integration of the existing applications is not affected. If incompatible changes to the BAPI become necessary, SAP will create a new BAPI and mark the old BAPI as "obsolete". Obsolete BAPIs are guaranteed to work at least in two subsequent functional releases, starting with the one in which they are declared obsolete. This gives developers approximately two years, depending on SAP's then current release cycle, to change their existing integration from using the obsolete BAPI to the usage of the new BAPI.

The BAPI Explorer is available as of SAP Basis Release 4.6A and can be used to get an overview of BAPIs in the BOR. To call the BAPI Explorer in the SAP system, choose *Tools* → *Business Framework* → *BAPI Explorer* (transaction **BAPI**).

5.3 Remote Function Call

The SAP development environment supports several ways of structuring software. ABAP function modules are equivalent to what most programming languages call "functions". The SAP system contains thousands of function modules - for example more than 110,000 in SAP R/3 Release 4.6C.

Only a subset of those can be called from external systems using a protocol called Remote Function Call (RFC). RFC allows for remote calls between two SAP systems (for example SAP R/3 and SAP Business Warehouse) or between an SAP system and a non-SAP system. These remotely callable functions are called RFC-enabled function modules or RFMs in short. SAP R/3 Release 4.6 C for example contains more than 10,000 RFMs. They can have import and export parameters to send and receive data between systems.

Only RFMs with a 'released for customer/released for external use' status will remain stable in long term. Only these should be used for third-party integration projects and are eligible for integration certification. As the special set of RFMs that are linked as methods of the business objects in the SAP systems, BAPIs are explicitly released for customer usage.

Software vendors can search the Function Builder for existing released RFC-enabled function modules. To call the function builder in the SAP system, choose *Tools* → *ABAP Workbench* → *Development* → *Function Builder* (transaction **SE37**).

5.4 Intermediate Documents

Intermediate documents (IDocs) were originally invented by SAP to support Electronic Data Interchange (EDI) in a generic fashion. Later, IDocs were also used in the SAP Application Link Enabling (ALE) technology as data containers, which allow exchange of business information between an SAP system and other SAP or non-SAP systems.

IDocs are based on a hierarchical, tree-like segment structure. The syntax for each IDoc type is defined in the SAP system (transactions **WE30/WE31**).

IDocs can be used in the following business scenarios:

- Application Link Enabling (ALE): Communication between logical systems (intra-company relations). Logical systems can be either SAP systems or non-SAP systems. ALE distribution models are based on message types and BAPIs that indicate the appropriate IDoc types.
- Electronic Data Interchange (EDI): Communication between SAP systems and the third-party EDI subsystem which is typically connected to an EDI VAN (inter-company relation).

IDocs are created when message types and (object) methods are distributed. The message type is the semantic information which identifies the usage of business data. The IDoc type defines the syntactical format in which the data for a specific business process is transferred.

To gain an overview of all message types defined in an SAP system, choose *Tools → Business Communication → IDoc-Basis → Development → Message types* (transaction **WE81**).

To see the IDoc types related to a message type, choose *Tools → Business Communication → IDoc-Basis → Development → IDoc type / message* (transaction **WE82**).

To display the documentation for a particular IDoc type, choose *Tools → Business Communication → IDoc-Basis → Documentation → IDoc types* (transaction **WE60**).

5.5 Business Configuration Sets (BC Sets)

Customized settings can be collected by processes into Business Configuration Sets (BC Sets). BC Sets make customizing more transparent by documenting and analyzing the customizing settings. BC Sets allow to capture customizing settings, and to store them in a container, separate from the actual customizing tables.

Software vendors can create own BC Sets for specific industries and applications, and pre-package these as templates. Any BC Set's name must contain a registered namespace of the software vendor to ensure that it will not be overwritten by BC Sets delivered by SAP.

- To maintain BC Sets, choose *Tools → Customizing → Business Configuration Sets → Display and Maintain BC Sets* (transaction **SCPR3**)
- To activate BC Sets, choose *Tools → Customizing → Business Configuration Sets → Activation of BC Sets* (transaction **SCPR20**)
- To see BC Set activation logs, choose *Tools → Customizing → Business Configuration Sets → BC Set activation logs* (transaction **SCPR20PR**)

5.6 Data Transfer Programs

Some SAP applications provide data transfer programs that can be used to transfer data into or out of SAP systems. The Data Transfer Workbench is a tool that supports the transfer of data into the SAP system with these data transfer programs. The Data Transfer Workbench is particularly useful for business objects with large data volumes. It guarantees that data is transferred efficiently and ensures that data in the SAP system remains consistent. The data transfer is performed in a batch-like fashion. The Data Transfer Workbench was

designed for the initial transfer of data. If you want to transfer data repeatedly at regular intervals, SAP recommends using tools such as ALE (through the IDoc interface) or SAP NetWeaver Process Integration (SAP NetWeaver PI).

To call the data transfer workbench choose *Tools* → *Data Transfer Workbench* (transaction **SXDA**). Information of the data transfer programs and the transactions are listed in the relevant, application specific parts of the [SAP Library](#).

5.7 SAP Integration Tools

The SAP ICCs offer software vendors remote access to various pre-configured SAP systems for integration testing as well as the latest SAP integration tools/Software Development Kits (SDKs). This system access and corresponding tools are offered via the **SAP Remote Access and Connectivity Service** (SAP RAC Service) and are available at an annual fee.

The SDKs include SAP GUI Presentation CD, SAP Online Documentation CD, SAP Gateway, RFC-SDK, SAP Java Connector, SAP .NET Connector and more.

Recommended SAP Integration Tools for ISVs are:

- SAP Java Connector (JCo), which enables Java programs to access SAP BAPIs, IDocs, and released RFMs.
- SAP Connector for Microsoft .NET, which enables .NET applications to access SAP BAPIs, IDocs, and released RFMs.
- SAP NetWeaver RFC Library, which enables C/C++ programs to access SAP BAPIs, IDocs, and released RFMs.
- SAP SOAP Processor released within SAP NetWeaver AS 6.20, which enables external programs use WSDL/SOAP-based approach to access SAP BAPIs and released RFMs.
- SAP Web Services Framework starting with SAP NetWeaver 6.40, which enables external programs to create and use Web services that are based on SAP BAPIs, released RFMs, and XI messages
- Flat file-based data transfer as used by SAP data transfer programs and SAP delivered standard ABAP reports

SAP ICC also highly recommends supporting the **Load Balancing** mechanism when connecting with SAP via RFC protocol. There is an SCN blog available that explains the easy configuration steps to "[Enable Load Balancing for RFC Clients](#)"

Additional information about SAP connectors can be found on the SAP Service Marketplace under <http://service.sap.com/connectors>. Read access to these SAP Service Marketplace Web pages requires a SAPNet user, which is provided to software vendors as part of the DPA.

Upon request SAP ICC offers workshops on these SAP integration technologies and tools specially tailored to software vendors.

5.8 SAP Java Connector

The SAP Java Connector (JCo) is a toolkit that allows Java applications to communicate with SAP systems. JCo is a high-performance encapsulation of the RFC Library that supports all features of RFC. It combines an easy to use API with unprecedented flexibility and performance. The package supports both Java to SAP system as well as SAP system to Java calls. It can be used to implement BAPI/RFM/IDoc based integrations.

As part of the SAP RAC Service, the SAP Java Connector can be downloaded by subscribers at <http://service.sap.com/connectors>.

5.9 SAP Connector for Microsoft .NET

SAP offers the SAP Connector for Microsoft .NET, which provides developers the possibility to expose BAPIs and RFMs to any .NET application. At design-time the Proxy Wizard for Visual Studio .NET will interactively generate proxy classes in C# or VB.NET and add them to a .NET project. Developers can then access all properties, methods and even table structures from a .NET application independently of the preferred .NET language (C#, VB.NET or any other supported language). At run-time the SAP Connector for Microsoft .NET will perform and manage all necessary communication between the .NET application and the SAP server. The Connector also provides classes which can be used by .NET applications to post the IDocs to the target SAP system, as well as receive the IDocs from the SAP system.

Please see [SAP Note 856863](#) for more details on supported platforms.

As part of the SAP RAC Service, the SAP Connector for Microsoft .NET can be downloaded by subscribers at <http://service.sap.com/connectors>.

5.10 SAP NetWeaver RFC Library

The SAP NetWeaver (SAP NW) RFC Library provides a set of C-language routines that enables the ISVs to develop C/C++ programs accessing SAP BAPIs, IDocs and released RFMs from release R/3 4.0B up to today's NetWeaver systems. It is a low level API, but provides some additional functionality, performance, and flexibility.

The SAP NW RFC Library, suiting for non-Unicode and Unicode applications, is available on all SAP-supported platforms including Windows, different types of UNIX, etc. For each supported platform, the C header files and some sample RFC programs are provided.

As part of the SAP RAC Service, the SAP NW RFC Library can be downloaded by subscribers at <http://service.sap.com/connectors>

Important Note: The "classic" RFC libraries for non-Unicode and Unicode will be replaced by the SAP NW RFC library. The SAP NW RFC library is not compatible to the classic RFC library. All existing applications using classic RFC library need to be adjusted and should convert to SAP NW RFC library before the maintenance end of SAP Release 7.10 (planned for 2016). Please see [SAP Note 825494](#) for updates on the classic RFC library.

5.11 Note on SAP Business Connector

The SAP Business Connector (SAP BC) is a middleware component. It allows integration with SAP solutions via open and non-proprietary technology. SAP BC uses the Internet protocols like HTTP/HTTPS for communication, and XML as the data format. Thus, it seamlessly integrates different IT architectures with SAP components.

Important Note: Because the functionalities offered by SAP Business Connector are provided by SAP NetWeaver components (web services functionality by SAP NetWeaver AS, IDOC conversion to an XML

message by SAP Process Integration, etc.) we do **not** recommend using SAP Business Connector anymore in new projects.

ISVs are encouraged to start all new development using SAP NetWeaver. Please see [SAP Note 571530](#) for updates on SAP Business Connector.

5.12 SAP SOAP Processor

The SAP SOAP Processor within SAP NetWeaver Application Server (SAP NetWeaver AS) 6.20 contains the following components, among others:

- Web Service Browser
Browser for searching and generating WSDL 1.1 compatible descriptions for RFC-enabled function modules in the system.
- SOAP Server for RFMs
Support synchronous calls that conform to SOAP 1.1, of the RFC-enabled function modules.

When integrating with SAP NetWeaver AS 6.20-based SAP Business Suite components (e.g. SAP R/3 Enterprise 4.7), third party software vendors can use the industry-standard WSDL/SOAP-based approach to invoke the RFC-enabled function modules in the SAP system, without using additional SAP connector software. Since BAPIs are special RFMs that are linked as methods of the business objects, BAPIs can also be invoked through the SAP SOAP Processor.

Important Note: Starting with SAP NetWeaver 2004, SAP has completely redesigned the SOAP runtime and offers a new Web Service Framework. The SOAP Processor is obsolete as of SAP NetWeaver 2004. For more information on the Web Services Framework, see SAP Library [SOAP Framework](#) and [Web Service Toolset](#).

5.13 Flat File-Based Integration

In some cases SAP applications can also use flat files to import and export data. For example the SAP EDI integration is mostly based on a file interface that exchanges IDocs and status records via operating system files with the third-party EDI subsystems. Separately, with Data Transfer Programs provided by SAP, flat files are also used to transfer data into the SAP system. The files need to be created in specific formats and delivered to the file system of the SAP servers. Also standard ABAP reports provided by SAP can sometimes be used to generate flat files containing data extracted from the SAP system.

In general, SAP encourages third party vendors to use BAPIs, released-RFMs, and IDocs whenever possible. Flat file-based approach should only be considered when these other means are not available. In such cases, the flat file-based approach must be used with the SAP-delivered standard programs. Custom developed ABAP programs may not be used (see ABAP Add-on certification chapter above).

5.14 Obsolete RFC-based Middleware Products

SAP strives to make SAP solutions as open as possible. However, some of the middleware components released in the past have been set to End-of-Maintenance and should no longer be used. [SAP Note 423522](#) lists all these obsolete middleware components and the suggested replacements. Third-party integration projects must no longer use these obsolete middleware components, if they want to earn integration certification by SAP.

6 Duet Enterprise

Duet Enterprise provides an industry standard foundation that enables technical interoperability between SAP applications and Microsoft SharePoint.

This built-in functionality is provided by add-on modules to Microsoft SharePoint and the SAP NetWeaver® technology platform. The add-on for Microsoft SharePoint enables connectivity to SAP applications, as well as the integrated security, authorization, and data models that allow Duet Enterprise to consume SAP enterprise services within Microsoft SharePoint. The service consumption layer, which is an add-on module to SAP NetWeaver, allows streamlined access to SAP data models.

Duet Enterprise includes tools and business content that let your team accelerate the development of composite applications for Microsoft SharePoint and SAP software. You can use SAP tools to adapt and combine services, develop custom business logic, and modify existing fields or add new ones. You can use Microsoft SharePoint Designer to create external lists and document libraries and design views and forms. You can also use Microsoft Visual Studio to modify Microsoft SharePoint Designer solutions and create custom user experiences and data integrations.

Duet Enterprise offers preconfigured business content, including SAP enterprise services and Microsoft SharePoint external lists and templates, and it provides a set of Microsoft SharePoint user interface templates. The business content helps harmonize the user experience, enabling quick solution composition by allowing users to reuse existing content rather than starting development from scratch.

New content developed for Duet Enterprise can be certified by SAP.

Note: Starting with Duet Enterprise 2.0, the certification is defined by NW-GW-INT 2.0 test requirements.

7 Mobile Applications using Sybase Unwired Platform

Sybase Unwired Platform is a mobile enterprise application platform that enables you to simply and quickly develop mobile applications that give business users secure access to diverse business data on a broad range of mobile devices. Sybase Unwired Platform is a flexible, open infrastructure allows customers to strategically respond as the device types and data sources in the enterprise evolve.

With Sybase Unwired Platform you can:

- Accelerate mobile application development – A powerful 4GL tooling environment enables you to speed application development. Compatibility with common integrated development environments (IDEs), such as Eclipse, enables developers to leverage existing tools and expertise.
- Support diverse mobile device types – The platform provides the ability to design once and deploy to a range of mobile devices and operating systems, including Windows Mobile, Windows 32 (laptops/tablets), iPhone, and RIM BlackBerry devices.
- Extend back-end data to mobile devices – Sybase Unwired Platform integrates with a variety of enterprise applications, including any application that leverages databases or service oriented architecture (SOA)/Web services.
- Enforce enterprise-class security and mobility management – Full integration with the Afaria device management and security solution provides a single administrative console from which you can centrally manage, secure, and deploy mobile data, applications, and devices.

Certification of third party mobile applications on Sybase Unwired Platform will verify the following aspects:

- Deployment of the Mobile Application on the device
- Definition and Deployment of the Content in SUP
- SAP Backend Connectivity – If applicable

For more information, please visit [here](#).

8 SAP BusinessObjects Business Intelligence Platform

SAP BusinessObjects Business Intelligence (BI) platform provides enterprise-level analysis and reporting tools. The platform allows you to analyze data from a variety of database systems (both SAP and non-SAP data sources) and publish ad-hoc reporting and analysis, dashboards and visualizations.

ISVs can provide prebuilt analytic content packages to enable users to analyze their applications data and to gain additional insights about their businesses. An analytic content package can be built to support industry-specific or LOB-specific solutions.

To ensure a standardized and harmonized development process for the implementation of analytic content packages, [SAP BusinessObjects Analytic Content \(BO-CNT\) certification](#) is available for VARs, ISVs and SIs.

9 SAP Business One Add-Ons

Solutions for small businesses include the SAP Business One application, which is developed by SAP and delivered by SAP channel partners who provide local services and support. Third-party solutions that conform to SAP Business One integration standards and conventions are eligible for SAP Business One Interface Certification. Channel partners of SAP can develop SAP Business One add-on programs under a special SAP Business One SDK development license and certify their add-ons (B1-SDK certification).

More information on SAP Business One Interface Certification is available [here](#).

10 Performance Considerations for SAP NetWeaver

Performance is a major consideration in all phases of the software lifecycle. It is the responsibility of the software vendors to ensure that their application delivers both the correct business functionality and the satisfactory level of performance and scalability. Performance is not merely a characteristic of a particular program but rather of a business process put into practice with the help of programs. The smooth running of a business process in a scenario reflecting a real world, i.e., computers with varying and unpredictable load as well as varying and unpredictable data volumes, can only be ensured when the programs show good linearity and scalability starting from a reasonable runtime for basic test cases.

Performance Programs

Writing performance programs implies programs which:

- Can complete a business process in a reasonable amount of time (as measure in straight forward performance analysis)
- Show linear runtimes (with logarithmic correlation at most) with increasing amount of data being processed (this would require measurement with varying amounts of data)
- Show no dependency (or logarithmic dependency at most) on data already having been processed or stored in the database.
- Are scalable when run in a multiprocessor and/or multi-computer environment (this would require tests in comparable environments)
- Can run with minimum resource available.

Data

- Loading and formatting data consumes CPU time and time on the application server and database server. Therefore, it is better to load detail data at a later stage if required rather than causing long delays in the initial display.
- Data processing time can be reduced if a suitable filter was selected in an appropriate order. Use filter criteria whenever possible to avoid superfluous data.
- Data should be read once only and shared in the business process.
- Read data when it is requested and do not prepare too much data.

Analyzing Tools

SAP solutions provide various tools for performance analysis, such as:

- ST05 - Trace Request (RFC Trace)
- SM50 - Process Overview
- SMGW - Gateway Monitor
- SM51 - SAP Servers

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Original Document

The original version of this document is stored as ICC_INTEGRATION_GUIDE_4.0.doc in ICC Server

Purpose of this Document

This document should help software vendors with their decisions on choosing the proper technology for their software integration with SAP NetWeaver, SAP Business Suite, and SAP Business One. It documents which SAP integration technologies are eligible for integration certification. The integration certification contract will explicitly refer to this document which is currently available online at [ICC Homepage](#)

Author

SAP ICC

History

Version 0.9	.... Preliminary	03/29/01	
Version 0.91	..... Feedback	04/06/01	
Version 1.00	..... Additional technology	06/21/01	
Version 2.0	..... Adjustments – Validation/Certification	01/23/02	
Version 2.1	..... Add Performance section	03/07/02	
Version 2.2	.... Additional technologies: .NET Connector, SOAP Processor, etc. New template		01/30/03
Version 3.0	..... Re-structure	05/16/06	
Version 3.1	..... Add Enterprise Services	08/16/07	
Version 3.2	..... Add BC Sets, SAP ES Explorer, NW RFC library, Java EE, OV, etc.		01/22/10
Version 3.5	..... Add Gateway, Duet Enterprise, SUP, BOBJ BI	10/24/11	
Version 4.0	Add SAP HANA, SAP HANA Cloud, Update links	05/25/13	
Version 4.01	Add Load Balancing for RFC protocol	10/28/13	

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