SAP AG

SAP Certification Guide

SAP NetWeaver Composites, PCA and process templates

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NW-XI-CTB

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1. Introduction

Composite applications (composites) are an approach and architecture of software that focuses on reuse, integration, and orchestration of functionalities from existing application assets in the context of an enterprise services architecture, with only selective development of new functionality where needed to fill gaps. A composite application provides new application functionality beyond simple integration, allowing business users to analyze information from multiple systems and take action in business-task specific user screens, and then syndicate the results of back to one or more backend systems in support of a business process. This is to distinguish from software that provides consolidation of read-only views.

Properly done, application orchestration utilize Service Oriented Architecture (SOA), leveraging Enterprise Services from SAP applications, web services from other components, and where necessary, applying SOA on top of legacy integration interfaces. Composite applications can also be built according to a "BPM Approach", providing task-specific user interfaces and automated actions that bridge multiple applications and even organizations in support of end-to-end business processes. The BPM "method" also prescribes a strong linkage between business goals, process measurement, and agile implementation.

For more information about building composite applications, please check the Composition-Homepage on SAP SDN.

Composite applications can be built by customers, by system integrators (SIs), by 3rd party Independent Software Vendors, and by SAP.

A Packaged Composite Application (PCA) is a composite application that is developed by an independent software vendor or SI (hereinafter "Vendor") as packaged software with the potential of repeatable deliveries to multiple customers. It is a requirement that the PCA is generally available, supported and maintained by Vendor or its affiliate(s). Furthermore, the PCA should follow a schedule for new release cycles and needs to be configurable and deployable at customers' environments without code-level change.

A semi-packaged or packaged process "template" (herein referred to as "process template") is a composite application that is developed by a Vendor that provides a standardized working proof of concept and repeatable implementation starting point for business process automation supporting an end-to-end business process. A process template must be generally available, supported and maintained by Vendor or its affiliate(s). A process template must be version controlled, and must be configurable and deployable at customer environments or customer-specific sandbox instance without code-level changes in the initial delivery. It is understood that changes in processes, user interfaces, and service implementations as well as additional development are likely after initial deployment, and therefore they are not part of the initial certification. A process template should include documentation of typical dimensions of modification and flex points the template is designed to address, and specific prerequisites that must be in place (for example, specific Enterprise Services requiring a minimum enhancement pack level etc.).

The diagram in Figure 1 illustrates a typical architecture of a composite application, either as a PCA or process template, based on SAP NetWeaver BPM:

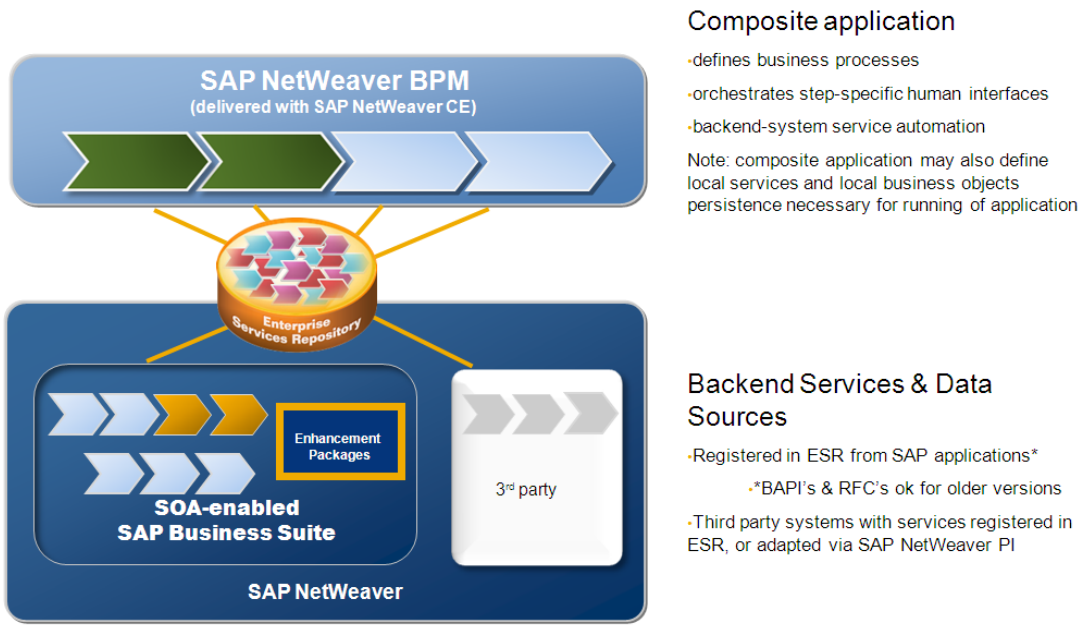


Figure 1. PCA Conceptual Diagram

The PCA and Process template certifications exist so that partners can demonstrate to their customers that their applications meet SAP's architectural guidelines for SOA-based composite applications by applying to the criteria set forth in this certification guide.

SAP currently offers the following options for composite application certification:

- **SAP NetWeaver Composite – Composition Tools Based (NW-CA-CTB)**

  This certification option is for composites built with SAP's latest composition tool, such as SAP NetWeaver Composition Environment (CE) 7.2. Using SAP's composition tools to build composites not only increases Vendors' development productivity, but also to some extent automatically enforces the composite architecture.
  Usage of at least one designated SAP composition tool, such as SAP NetWeaver BPM, is required to qualify for NW-CA-CTB.

  A valid license agreement for such SAP tools is required prior to certification. This license is not part of the certification agreements or process. The then current terms and conditions for such licenses will apply. Please contact local SAP sales office for details.

- **SAP NetWeaver Composite – Manufacturing (NW-CA-MFG)**

  This certification option is for manufacturing composites which were built using SAP's Manufacturing Integration and Intelligence (MII). Details of this NW-CA-MFG certification can be found in the separate NW-CA-MFG Certification Guide document.

The purpose of this document is to outline the PCA certification requirements and the certification process for the **NW-CA-CTB PCA certification**.

The target audience of this document is executives, architects and developers of Vendors who intend to develop or have developed PCAs which may be submitted to SAP for certification.

2. Development of PCA

SAP NetWeaver, as SAP's application and composition platform, provides the infrastructure for enterprise applications to provide enterprise services. The platform also includes the Enterprise Service Repository (ESR) where all enterprise services are registered and can be identified by SAP customers. In addition, the SAP NetWeaver platform includes Composition Tools that facilitate the development of composite applications. The number and functionality of composition tools are gradually being expanded by SAP.

As of NetWeaver Composition Environment (CE) 7.2, the most important composition tools include SAP Java WebDynpro. Starting with SAP NetWeaver 7.1, enhancement pack 1, the guided procedures component was placed into maintenance, and process based composite applications should now utilize the **SAP NetWeaver Business Process Management (BPM)** component that orchestrates steps in end to end business processes by enabling modeling of process execution, association of implementing business services and user screens, deployment, and maintenance of composite business processes.

It's strongly recommended to use a business process modeling component like BPM to develop the composite application.

More information about BPM and other composition tools can be found at SAP Developer Network (http://sdn.sap.com) and SAP Library (http://help.sap.com), especially:

- SAP NetWeaver Business Process Management (BPM) on SDN
- SAP NetWeaver Business Process Management (BPM) on help.sap.com
- SAP ASAP methodology for BPM at Service Marketplace (s-user required)
- Best Built Applications on SDN.
- Composite Development Architecture Guidelines
- SAP NetWeaver CE 7.2

To qualify for NW-CA-CTB certification, it is required that a Vendor develops its packaged composite using SAP NetWeaver Composition Environment. Usage of BPM is strongly recommended.

3. Overview of the Composite Application Certification Process

Upon a Vendor's inquiry of composite application certification, SAP provides this certification guide to the Vendor. The Vendor's development should follow the SAP guideline described in the Best Built Apps document, and the requirements specified in this document.

Once the Vendor has finished the development of the composite application and is ready for certification, they should contact SAP Integration and Certification Center (ICC) [icc@sap.com] to formally register and sign the integration certification agreement for composite applications. The vendor will then also receive the name of a technical contact person from SAP ICC. Once the certification agreement is signed, the ICC contact will provide further details (*PCA submission kit*) to the Vendor.

The Vendor must submit the following information using the templates provided in the kit:

- Company profile
- Product profile
- Detailed description and diagram of the business processes supported by the composite application including sequence of system calls and user experience screens
- Composite application architecture diagram
- Test cases proposal that covers all the business processes supported by the PCA
- *For Process Templates:* Documentation that outlines typical modifications of the packaged template and examples of typical scope additions to implementation projects based on the template.

Upon receiving the Vendor's submission and after review, the assigned SAP contact will discuss next steps with the Vendor. SAP reserves the right to either accept or reject the submission in case of concerns or missing data. SAP may request more information regarding the composite application and the submission kit data.

The Vendor should address the request by re-architecting/re-developing the PCA and/or revising the related documents, and then resubmit all the relevant information to SAP for another review. A Vendor has up to three chances to resubmit the kit per PCA certification.

Once the Vendor submission kit is accepted, the details of the certification test procedure are discussed. SAP will review the Vendor-submitted business process test case proposals and set-up a test plan that is derived from Vendor's proposals. Vendor may then schedule test days with SAP ICC to run the tests according to the test plan. Usually this test is done remotely on the Vendor's test system landscape, where the composite and all connected backend application systems are available.

Besides the business processes test cases defined by SAP and the vendor during the review process, SAP ICC test steps will include the following, according to the composite application certification requirements detailed in Section 4 "Composite Application Certification Requirements" of this document:

- Installation and configuration procedure
- Composite criteria checks
- Composite business process tests

Once all tests have been completed successfully and all terms of the composite application certification requirements are met by Vendor, SAP will grant Vendor the appropriate certificate and logo.

4. Composite Application Certification Requirements

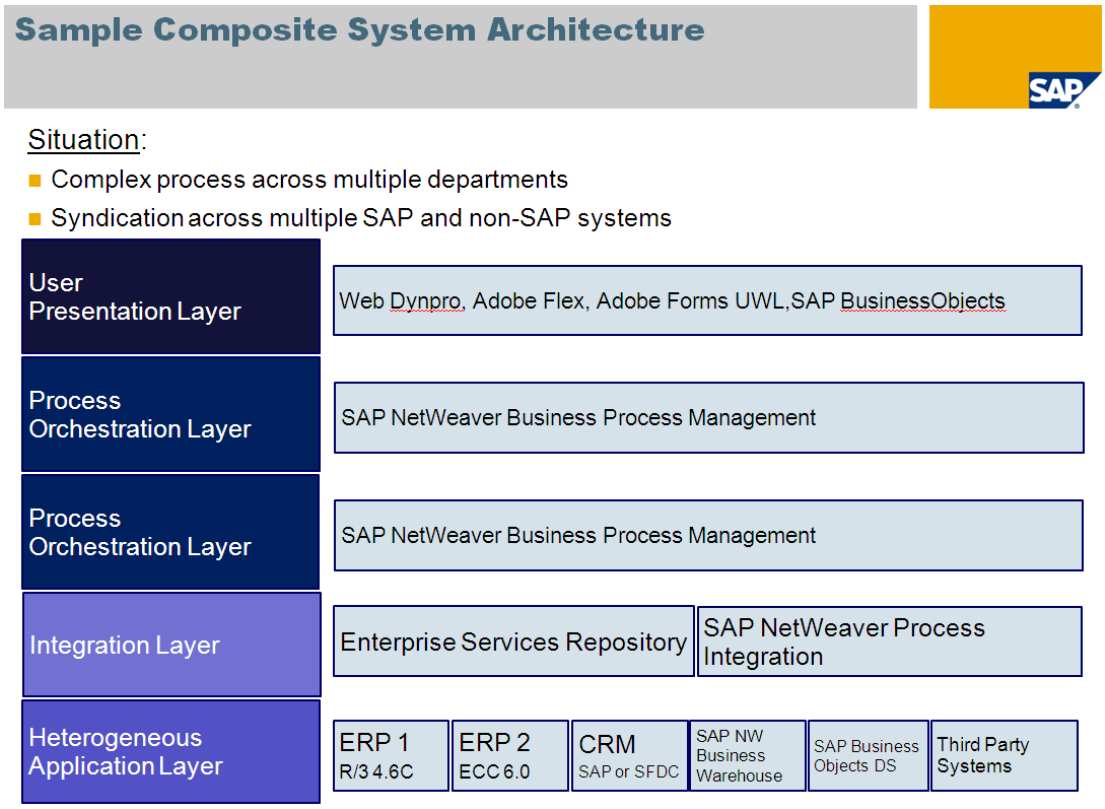
The composite subject to certification must meet the standard certification requirements set by SAP in the following areas, besides the business process test cases described in Section 3:

- Differentiation with Traditional Applications
- Separation between Composite and Components
- Composite Service Consumption
- Composite Business Processes
- Composite User Interface
- Composite Packaging
- Backend Component Consideration

The next sections discuss each of the requirements in details.

4.1. Differentiation with Traditional Applications

Unlike a traditional application which is self-contained or integrates with other systems to exchange data, the composite not only reads but operates on data from one or multiple systems, resulting in changes that are propagated back to those systems or to other systems in a business process. This data consolidation, operation via user interaction, and syndication happens in a defined business process. Implicitly that means, that the composite cannot function in a meaningful way without the underlying component systems being accessible.



The execution of a supported business process must in the end result in changes to business data. Since for a composite the majority of the business data should exist in the backend components accessed by the composite, the composite application subject to certification must successfully demonstrate that:

- Execution of a supported business process in the end results in changes to the business data residing in the backend components accessed by the composite.

In the description of the business processes supported by the composite application, the Vendor must clearly indicate as the result of the execution of a business process what business data is changed and where and when the changes occur – within the composite itself how the changes are syndicated to backend components. If the business data change occurs at the composite only, the Vendor must submit clear evidence establishing that no pertaining business data reside in any of the backend components accessed by the composite.

In the business process test case proposal, the Vendor must provide steps to execute the supported business processes, check its functional correctness, and examine the changes to business data.

The composite application certificate issued by SAP will briefly document the business processes which had been documented by the Vendor during the integration assessment and successfully tested during the certification process. In the case of a process template, it will specifically state which flexibility options were tested and which were beyond scope of the testing scenarios.

4.2. Separation between Composite and Components

The composite subject to certification must be clearly decoupled from the backend components it accesses.

The composite may have its own persistence. The composite's own persistence can be used to store business process metadata and business process instance data. The composite can also manages the persistence of some new own business data that do not reside in any backend components it accesses. The composite's own persistence is part of the composite and is not considered a backend component.

The composite accesses data and orchestrates functionalities and processes from enterprise-system-level backend components by using their services. The backend components must not be in the same deployable unit as the composite.

It must be possible to install the composite independently of the installation of the components. However, since the composite will need the components to function, it must be possible to configure the composite to connect to the components it accesses, after the successful installation of the composite. Some kind of connectivity test similar to the PING-functionality should be provided to verify the component connectivity configuration.

4.3. Composite Service Consumption

SAP applications provide *Enterprise Services* as key building blocks for composite applications, in applications such as SAP Business Suite. Enterprise services are a standards-based way of encapsulating enterprise application functionality and exposing it as a reusable web services that can be combined with other services to implement automation in support of business processes. More information about available SAP Enterprise Services can be found at SAP Developer Network Enterprise Services Workplace (ES Workplace) area.

If the composite uses data / functionally from one or more backend SAP application components, then by default such interactions must be done through consuming Enterprise Services provided by these SAP components. Any dependencies with regard to SAP Enhancement Packages must be stated in documentation.

Only in exceptional cases, when no equivalent SAP Enterprise Service is available in a backend SAP component, the composite may invoke RFMs/BAPIs in the backend SAP component directly. Such direct RFM/BAPI invocation must be carried out using the then-current release of the SAP Java Connector or the RFC-facility of the used SAP composition tool.
All RFMs/BAPIs accessed must either be SAP-developed RFMs/BAPIs with status "released", or in case of 3rd party RFMs be certified by SAP as an ABAP add-on.
Important: Please contact SAP ICC soon if your composition solution contains own ABAP development that needs to be imported into some SAP backend system!

In the scope of the composite application certification, the composite may neither use middleware from a third-party ("non-SAP") to communicate to the components, nor directly access databases (through JDBC, ODBC, Stored Procedure etc.) from the composite to any backend component.

If the composite uses data / functionally from one or more non-SAP backend components, then such interactions must be done through consuming web services provided by the non-SAP backend components.

The composite may also use SAP NetWeaver Process Integration (PI) to communicate with the backend components. All PI-based communication options are allowed, including IDoc exchange with the backend components. In case SAP PI is used, the Vendor must provide deliverable PI Content along with the associated documentation of this content. Please contact SAP ICC early to clarify the requirements for such content.

4.4. Composite Business Processes

The composite must enable execution of clearly defined business process(es) from start to finish. In other words, the composite must provide new application functionalities other than mere integration.

The composite must also allow analysis followed by action, i.e., read-only information aggregation is not enough. The application must draw data from one or more backend sources, provide task-specific actions that trigger changes to business data, and these actions must be syndicated back to prior backend systems or downstream business systems. The process, systems involved, and user screens in sequence must be diagramed as part of the submission kit.

The composite must also be configurable. Business rules maintained in the SAP NetWeaver BRM or BRF Plus components must be explicitly documented. The composite's configuration interface

must be provided, and the configuration procedure documented. Code change should not be necessary to adapt the composite to a customer's deployment environment in the case of a PCA.

In the case of process templates, the expected range of variation of a template must be explicitly documented. Multiple permutations of a process template can be included in the test, provided the modification of the BPM process is documented, and implementing services and user interface artifacts can be provided. This will be explicitly agreed upon with the Vendor and documented in the tested scenario.

4.5. Composite User Interface

Composite applications must feature task specific user interfaces, specific to each step in a business process. While it is beyond the scope of the certification to evaluate quality of user experience, the documentation must explicitly state the screens and user experience mediums provided for each process step. Acceptable user interfaces include Web Dynpro for Java and Visual Composer screens built within SAP NetWeaver CE.

Other UIs could also be accepted, e.g. Web Dynpro screens called from SAP Business Suite applications, SAP Business Objects reports and dashboards, Adobe Flex, Adobe Forms, Universal Work List (UWL), emails, SMS, mobile device screens …
Just let us know early so that we can clarify the usage.

4.6. Composite Packaging

The composite subject to certification must be packaged software. In other words, the composite must not be a custom composite developed for only one customer. It must clearly demonstrate the potential for repeatable delivery to multiple customers. The composite must be generally available, supported and maintained by Vendor or its affiliate(s). Furthermore, the composite should follow a schedule for new release cycles and needs to be configurable and deployable at customers' environments without code-level change.

In the case of a process template, the implementation starting point must be a standardized packaged deliverable with a version controlled release cycle. A range of standard supported options for changes to the process model, business rules, implementation services, and user interface screens must be documented. A subset of these changes will be tested as part of the certification. The testing will be explicitly documented.

4.7. Backend Component Consideration

A backend component in the context of composite application:

- is a installable software unit which is separate from the composite, and
- has its own independent maintenance cycle, and
- provides data and/or functionality through clearly defined services, and
- can serve multiple composites.

A database is not considered a backend component.

Backend components accessed by the composite are generally not in the scope of the composite application certification. However, if the components are developed and owned by the same Vendor of the composite, then the following pre-requisites must be met:

- If the component is a J2EE component, the Vendor is highly encouraged to port the component to SAP NetWeaver AS Java and pursue the SAP Java EE Deployment certification test, if it has not already done so.
- If the component is an ABAP component, it *still* must have passed the SAP ABAP certification test.

5. Additional Comments on the Certification

5.1. Quality Measures

Only the architectural and functional aspects discussed above are considered in the PCA certification process. The quality measures (security, performance, scalability, etc.) of the composite are neither measured nor considered in this PCA certification.

5.2. Future Changes

SAP defined the composite application certification in a way that future evolution of SAP technologies should not make necessary a complete re-architect of 3rd party Vendor PCAs.

However, SAP is free to revise the SAP technologies and composite application certification requirements at its sole discretion and to terminate formerly issued PCA certificates.

5.3. Disclaimer

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