Gateway or Process Integration – which is the Right Tool for the Job?

Applies to:

SAP NetWeaver Process Orchestration 7.3x, SAP NetWeaver Process Integration 7.1x, PI 7.3x, SAP NetWeaver Gateway 2.0
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Summary

Both SAP NetWeaver Gateway and SAP NetWeaver Process Integration can provision RESTful services to SAP backend applications. What does this mean? Should a company consider one or both? How does a company determine which is the most suitable? How does a company evaluate the products?

In order to answer these questions, we should at least understand what each product does, and the differences and purposes of each product.

This article has been written to provide some of that information to help a company in making the business decision during the evaluation process.

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Created on: March 12, 2012

Author Bio

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Abstract

The objective of this document is to outline the different solutions provided by SAP that provision SAP backend applications as services for easy consumption by client applications or for integrating between SAP and non-SAP systems, focusing on the strengths of each solution and the recommendations for their usage.

A summarization of the findings is available at the end of the document.

SAP Solutions

Through SAP's history, SAP has provided numerous methods for accessing SAP backend data by external consumer applications. With applications increasingly moving toward a web- or mobile-based environment, this paper will focus specifically on product solutions that enable easy consumption of SAP backend data by web and mobile applications. This paper will discuss the intended use cases so that SAP customers can determine which product will suit their environment best.

This section of the document concentrates on outlining the existing solutions and what use cases they support.

Currently, there are two main products that can provision SAP backend applications for consumption by web- or mobile-based application, SAP NetWeaver Gateway and SAP NetWeaver Process Integration.

SAP NetWeaver Gateway

SAP NetWeaver Gateway is a technology that provides a simple way to connect devices and applications to SAP software based on market standards (REST and OData). The framework enables development of people-centric solutions by exposing SAP business software data to new experiences such as social and collaboration environments, mobile and tablet devices and rich internet applications. It simplifies connectivity to SAP applications by allowing any programming language or model to be used without the need for SAP knowledge by leveraging REST services and OData/ATOM protocols.

In order to make the OData consumption process even easier, SAP delivers several versions of the Gateway Consumption Tool. This tool can be used in popular integrated development environments (IDE) including Eclipse, Visual Studio 2010 or XCode to generate OData proxy objects and provide other productivity help for software developers. In addition to further ease development, the Gateway Consumption Tool can generate a basic application that wraps the generated proxy object.

The SAP NetWeaver Gateway interface has been designed to conform completely to the six architectural constraints that define a RESTful software system (for details, reference http://en.wikipedia.org/wiki/Representational_state_transfer#Constraints). This makes the business data content of your SAP systems accessible as RESTful resources through a uniform, stateless interface to any software system that can communicate using HTTP(S) and the OData protocol.

A key capability of SAP NetWeaver Gateway is the REST enablement of SAP business data and functionality, thereby making it easy for non-SAP applications to consume. These could be:

- Any external business application. E.G. Microsoft Office applications via a .Net (or even VBA) interface
- Desktop machines using Web-based applications running PHP, Java, Ruby or any other popular web-development language.
- Native applications on mobile devices e.g., iPad/iPhone, Android device, or Blackberry.
- Embedded devices such as manufacturing robots or route planning software in Satellite Navigation systems.
- Any other business scenario involving a programmable device that can speak HTTP(S).

In providing this capability, it hides the complexities that exist within your system landscape by making use of:

Protocol Adaptation

OData becomes the only communication protocol needed for you to supply or consume SAP Business Data to or from your SAP systems.

Service Adaptation

Different types and versions of SAP systems now appear as a single, integrated repository of business information.

Does SAP NetWeaver Gateway Replace any Existing SAP Software? In a word—No. SAP NetWeaver Gateway is not designed to be a channel for transactional applications, nor is it designed to replace existing middleware like SAP NetWeaver PI. In addition, applications built on SAP NetWeaver Gateway are not designed to target integration scenarios.

Instead, SAP NetWeaver Gateway provides for mass consumption of SAP business data and functionality in your existing SAP Business Suite systems. The target audience for SAP NetWeaver Gateway applications is a group known as Occasional Platform Users (OPU). These are people who need ad hoc access to SAP data and functionality in an easy-to-consume manner. They may be employees in a company or consumers of its products.

To enable you to define and provide exactly the right OData services for mobile and web applications without coding, the SAP NetWeaver Gateway ABAP-Add-On provides Designtime Tools, which can generate OData services from existing business objects inside the SAP system (such as RFCs, BAPIs or ABAP Dynpro screens). Alternatively you may develop more advanced services using the ***OData Channel*** *programming model*. This is a set of ABAP classes and interfaces that can be used to develop specific OData Services within your backend SAP system. For server-notification of change events to the client, Gateway provides a server-API using the Push Channel to update the client, e.g. Gateway can send an asynchronous event message to the client application of shipping information when an order is fulfilled.

For more information about SAP NetWeaver Gateway please see: http://www.sdn.sap.com/irj/sdn/gateway

Process Integration capabilities of SAP NetWeaver Process Orchestration

Integration across heterogeneous IT landscapes is critical for all companies. The trend to heterogeneity is further driven by mergers and acquisitions as well as software-as-a-service or on-demand offerings. Process Integration is SAP's Enterprise Service Bus (ESB) solution for all kinds of integration needs including SAP and non-SAP systems either through message exchange or via web service calls. Whether application-to-application (A2A) or business-to-business (B2B) integration is needed, Process Integration helps customers connect systems in a secure, standards-based, reliable, and scalable way. Process Integration especially provides best-in-class connectivity to SAP systems and delivers SOA foundation capabilities to SAP customers. Using Process Integration, customers can leverage enterprise services delivered by SAP and also benefit from existing investments in third-party and legacy applications by integrating and service-enabling these applications.

Process Integration provides a set of technical and partner adapters for application and B2B integration. The following is a sample set of adapters provided by SAP and partners: File/FTP, JMS, JDBC, SOAP, HTTP, RFC, IDoc, AS2, CICS, IMS, PeopleSoft, Oracle Applications, etc. For a full set of adapters, please examine the following links:

Partner Adapters:
http://www.sap.com/partners/directories/ProductSearchResults.epx?context=21B87D61C0F646A22B2A6DB254A010CA8C9C141B7529F02972463D54EC8217D707ADFB1B61328B27A6200891D1824987C4A2286C415FA5583A680E633FB258D6F702338D4AE86843C5ADEB30E7160581899BB4603C9793EC%7c6F12B862C581661DDC24764F9C7927F5419DC328C62BA22B835E8506997D10B55A354B13B4227E92D6D369658167CE044A394E1123E665900CBD8ACCA30E1EC9D7F14ED7E2299D541D7BFBB8130BD4A3802CB838F8F43980E803085B912820024E1B92198E403D6183CDAC5A5C969468

SAP Technical Adapters:
http://help.sap.com/saphelp_nw73ehp1/helpdata/en/48/ce24473a8e5430e10000000a42189b/frameset.htm

SAP NetWeaver PI includes:
- Enterprise Service Repository (ES Repository) to build, model, and manage (Web-) services, e.g. publish to the Service Registry.
- High-volume enterprise services bus that supports distributed integration
- Principal propagation for trusted communication helping ensure compliance
- Application-to-application (A2A) and business-to-business (B2B) integration capabilities

- • Predefined integration scenarios to jump-start integration projects

Process Integration provides access to an extensive set of mapping and transformation programs such as XSLT and Java mappings. Process Integration also has its own easy-to-use graphical mapping/transformation tool with extensive function support for flexibility and extensibility. One of Process Integration's strengths is the ease of integration to SAP backend systems. Process Integration provides a multitude of connectivity options using adapters for access to BAPIs, RFC-enabled function modules, and IDocs or by using ABAP/Java proxies, which can be automatically generated based on the service information available in the ESR. With configurations, those accesses can be exposed as HTTP or SOAP web services.

Process Integration is intended as an enterprise integration broker. It enables multiple consumption and integration patterns, whether they be system-to-system interaction, business to business interaction, or simple consumption of backend systems via various interaction channels. This is accomplished via Process Integration's strength in integrating backend systems, regardless of if they are SAP, non-SAP, or external customer and business partners.

The interactions between the consumer and provider applications can either be synchronous or asynchronous. With asynchronous communication, Process Integration guarantees delivery of the information where the consumer applications will not need to resend the information in case of system or network failures.

For consumer application development, SAP NetWeaver Developer Studio (SAP NWDS) provides a plug-in to access Process Integration's ES Repository and is able to generate proxies from the service interfaces that have been designed and stored in the repository. In addition, without requiring ES Repository, any SOAP web services can be used by the NWDS plug-in to generate the proxies needed to ease and jump-start the consumer application development.

Finally, Process Integration supports the orchestration of message exchanges and service calls via a BPMN-based process engine. (For more information on BPMN, please reference http://en.wikipedia.org/wiki/BPMN.) It allows the stateful handling of integration-centric processes, based on standard integration patterns to support more sophisticated integration scenarios such as collecting and aggregating messages or bringing messages in the right order.

Comparative Summary

This section is intended to provide a summarized perspective on the topics discussed in this document.

	SAP NetWeaver Gateway	SAP NetWeaver Process Orchestration
Platform	ABAP	ABAP+Java or Java only
Access to SAP ERP		
BAPI/RFC	Y	Y
ABAP Transaction	Y	N
IDoc	N	Y
ABAP Proxy	Y	Y
Access to non-SAP	N	Y [1]
Providing Services	Y	Y

Consuming Services	N[5]	Y
REST	Y	Y [2]
OData	Y	N[2]
JSON	Y[6]	Y[2]
SOAP	N	Y
Synchronous Service	Y	Y
Asynchronous Service	N [3]	Y
Eclipse Plug-In	Y [4]	Y
Visual Studio 2010 Plug-In	Y [4]	N
XCode Plug-In	Y [4]	N
Stateful orchestration of message exchanges and service calls	N	Y

[1] Access to non-SAP via adapters: File/FTP, JDBC, JMS, SOAP, HTTP, WS, plus various other 3rd party adapters.

[2] Using NetWeaver certified PI REST adapter, which can be licensed from Advantco. The REST adapter supports JSON. OData support will be available in the future. MuleSoft is also planning on providing a REST adapter for PI in the near future.

[3] Only for notification in workflow or business events by using the Push Channel, which provides an asynchronous event message to be sent to the client from Gateway.

[4] The plug-ins can provide application specifically targeted for mobile devices, e.g. Blackberry and iPhone. This eases the developer's tasks significantly.

[5] Technically possible, but there is no use-case.

[6] Will be available in SP4 May 2012.

Product Decision Factors

Gateway is recommended for user-centric applications. Use Gateway when there is a need for synchronous access to business objects of an SAP Business Suite system (like BAPI/RFCs or transactions) via light-weight REST services. Access using mobile devices is especially easier due to the available developer tool plug-ins which can target those specific devices.

Use Process Integration when general purpose integration is needed, involving disparate systems and applications requiring asynchronous and synchronous services involving SAP and non-SAP applications and systems. Process Integration is especially useful for service enabling of SAP and non-SAP applications in establishing standards based on SOA. Finally if you need stateful handling of message and/or service call orchestrations, SAP NetWeaver Process Orchestration is the right choice.

For new customers without either SAP NetWeaver Gateway or SAP NetWeaver Process Orchestration, customers should evaluate their selections based on the following considerations:

1. Application development: Gateway can provide simple, flat interfaces by using a simple mapping tool and "wizard-like" add-on in ABAP to generate the services. Gateway also provides plug-ins in Eclipse and Visual Studio to jumpstart the client application development. In addition, Gateway can also access ABAP transactions (i.e. screen-scraping) as services, which Process Integration does not support. Development in Process Integration of the same interface requires a higher learning curve due to the number of components, e.g. ESR, ID, SLD. Since Process Integration requires Java knowledge and Gateway is based on ABAP, those customers without Java expertise will be able to benefit from Gateway quicker without additional training.
2. Systems support: When developing REST services, Gateway uses the ABAP server, which is already supported in the customer's environment. Supporting Gateway should fit into the existing SAP support infrastructure easily with minimum interruption. Since Process Integration requires Java server, and if such expertise is not present with the customer, additional training will be required.
3. Requirement to access non-SAP applications: Process Integration provides access to both SAP and non-SAP applications and systems, whereas Gateway provides access to only SAP applications. By using the SOAP or REST adapters in Process Integration, both SAP and non-SAP applications can be consumed by client applications.
4. Requirement for A2A or B2B integrations: Gateway does not support A2A or B2B integrations, where consumption and provisioning of both synchronous and asynchronous services are required. Process Integration provides both synchronous and asynchronous interfaces to client applications. Asynchronous interfaces are primarily used in A2A and B2B integrations. Process Integration can consume and provision services, whereas Gateway can only provision services. .
5. Requirement for stateful message/service call handling: SAP NetWeaver Process Orchestration supports the stateful coordination of message exchanges and/or service calls via a standards-based BPMN-engine. A dedicated graphical modeler as part of the SAP NetWeaver Developer Studio allows the efficient development of sophisticated integration scenarios. SAP NetWeaver Gateway doesn't provide a comparable feature.

In a brief context, Gateway provides REST services based on HTTP/OData to SAP backend applications for simple consumption by light weight applications and devices. Process Integration provides A2A and B2B integrations between applications and systems using adapters.

During the evaluation, the customer should consider whether there is or will be a need for capabilities provided by an enterprise service bus (e.g. A2A, B2B integration) such as SAP NetWeaver Process Orchestration. If not, then SAP NetWeaver Gateway is likely the preferred solution. If so, then a more detailed evaluation should be conducted to determine whether the REST or SOAP adapter in Process Integration can meet the requirement to access SAP backend applications.

FAQ

Q: Who is the target audience for SAP NetWeaver Gateway?

A: SAP customers who want to provide user access to SAP backend applications using mobile devices or web applications using REST web services. The applications are synchronous and involving user-interaction.

Q: Who is the target audience for SAP NetWeaver Process Orchestration?

A: SAP and non-SAP customers who want to provide integrations of services/message exchanges between SAP and non-SAP systems, applications, and partners.

Q: If I have Process Integration, do I need SAP NetWeaver Gateway?

A: It depends, since both Gateway and Process Orchestration can provide REST services to SAP backend application. However, Gateway has to be considered if the SAP backend application is transaction-base, where screen-scraping must be used. With the availability of REST adapter(s) from SAP's partner(s), a detailed evaluation of requirements and business case for each should be performed.

Q: If I have SAP NetWeaver Gateway, do I need SAP NetWeaver Process Orchestration?

A: Yes, if there is a need for heterogeneous integrations between SAP and non-SAP systems involving A2A and B2B, for both synchronous and asynchronous scenarios.

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