



GAINSystems SAP Integrator Overview

by GAINSystems, Inc.

W h i t e P a p e r

Overview

GAINSystems SAP Integrator (GSI) facilitates communication between SAP and GAINS using IDocs (Intermediate Document), a standard data structure for electronic data interchange between SAP and external applications. Inbound (SAP-to-GAINS) message traffic is managed through IDoc interfaces, where the SAP integration engine uses a mapping schema to convert IDoc messages to GAINS-specific XML (Extensible Markup Language) messages. To process outbound (GAINS-to-SAP) messages, the SAP integration engine identifies appropriate IDoc interfaces based on the received message type from GAINS' Web Services and makes an XSLT (Extensible Style sheet Language Transformation) data transformation to handle the message execution in SAP.

GSI is built on SAP NetWeaver Process Integration platform that enables Service-Oriented Architecture (SOA) foundation capabilities for SAP customers. Using GSI, customers can leverage enterprise services delivered by SAP, enable GAINS to seamlessly integrate into SAP, and also service-enable the functions in GAINS. The GSI framework is comparable to features available in other enterprise architecture integration packages such as IBM Web Sphere Business Integration, Microsoft BizTalk and others.

To the right is a diagram describing the summary-level data flow between GAINS and SAP. Most exchanges are handled using standard IDoc interfaces (as described in the following paragraphs).

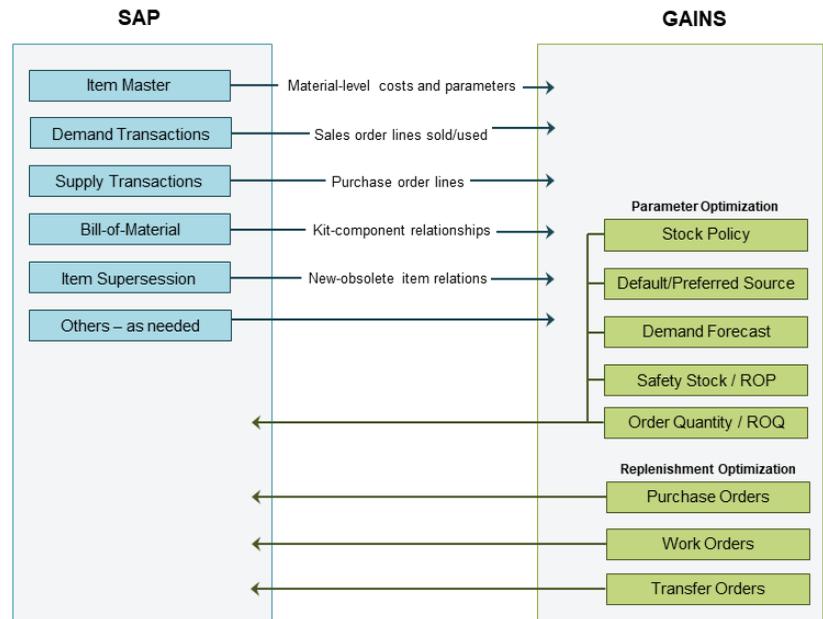


Figure 1: Common information exchanges between SAP and GAINS

Technical Overview

The "Hub-and-spoke" architecture of the SAP NetWeaver Process Integration (or PI) allows coupling between PI and GAINS and the integration of various sender/receiver systems without further development effort on GAINS end of the exchange. To connect the two systems, only a custom mapping program needs to be implemented in the middleware layer.

SAP-to-GAINS Message Processing

When an IDoc is created in SAP, the ALE (Application Link En-abling) processing layer will convert the IDoc and ensure delivery to the SAP PI system. In the PI system, the IDoc is consumed by the IDoc Adapter and forwarded to the Integration Engine, which determines the appropriate interface for the message as described in the Integration Directory metadata. The IDoc XML created in this step is then converted to GAINS-specific XML. This is achieved via XSLT transformations; depending on the input data requirements, most XSLT-based mapping schemas are either directly available from GAINS' schemas repository, or available with minor modifications. Once the mapping is completed, the Integration Engine will forward the XML-based message via a SOAP (Simple Object Access Protocol) adapter to a Web Service hosted on the GAINS server where the message is processed internally.

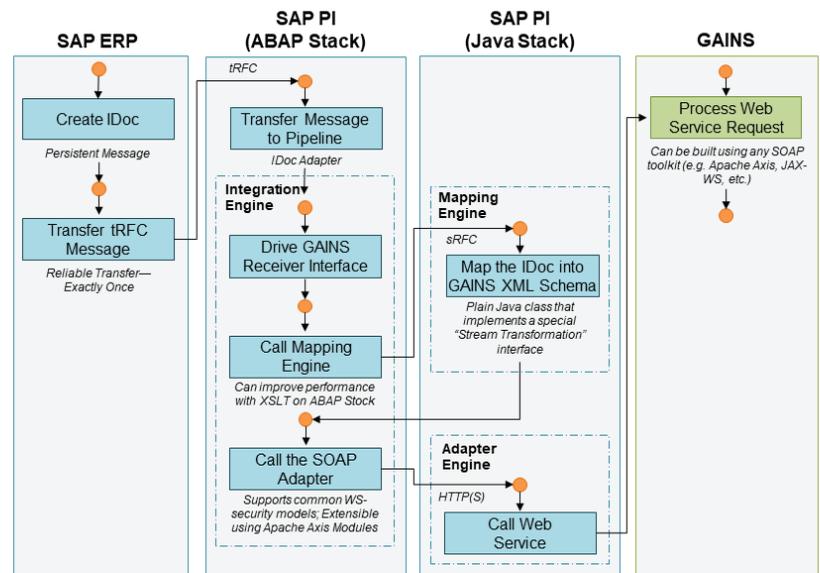


Figure 2: SAP-to-GAINS message flow

GAINS-to-SAP Message Processing

To initiate message transmission to SAP, GAINS initiates a SOAP-based service call on the PI system via a Web Service hosted on the GAINS server. Before PI can process the message internally, a SOAP call will be converted to proprietary SAP XI-SOAP protocol. Once converted, the message will be sent to the Integration Engine, which will determine the receiver interface using configuration objects from the Integration Directory. Based on selected interface, the Mapping Engine will use an XSLT schema to convert the message to the appropriate IDoc XML. Finally, the IDoc will be delivered to SAP using the IDoc adapter and then processed using the IDoc handler modules.

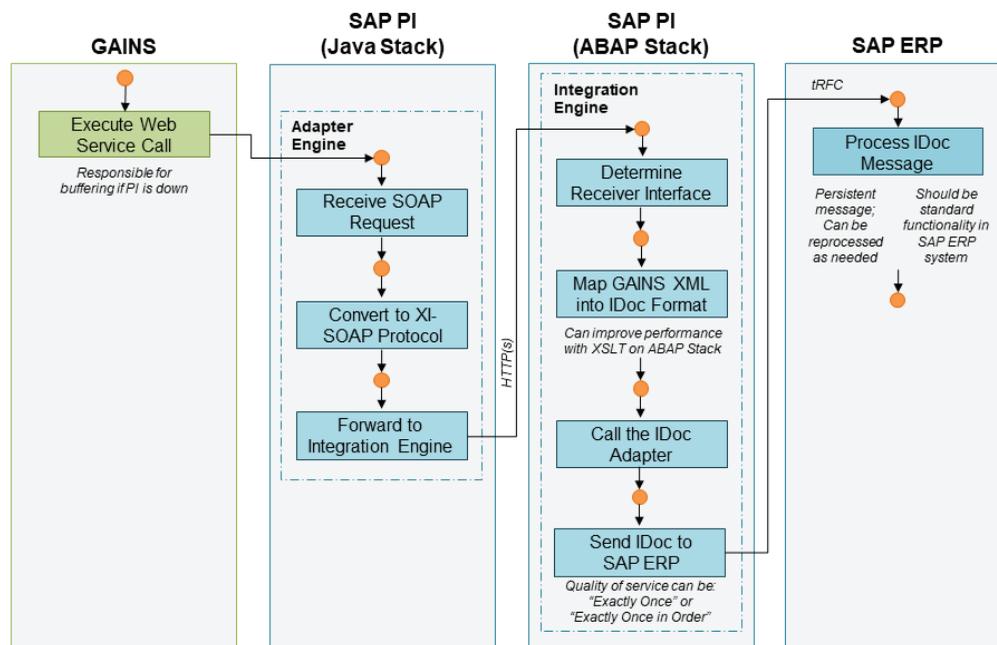


Figure 3: GAINS-SAP message flow

Creating the data translation layer between SAP and GAINS comprises a significant part of the GSI integration efforts. To maximize efficiency and ensure a robust solution, the GAINS implementation team typically applies standard SAP ERP transactions (e.g., WE20, BD64, WE02, SMQ1/SMQ2), and SAP PI transactions (e.g., SE11, SXMB_ADM, IDX1/IDX2/IDX5).

Appendix 1: Samples of some of the most-commonly exchanged messages:

| Interface | Data Exchange Direction | Description | SAP IDoc Interface Name |
|-----------------------|-------------------------|--|--|
| Item Master | SAP-to-GAINS | Part by location attributes (e.g., cost, description) | IDoc Type MATMAS05 |
| On-Hand Data | SAP-to-GAINS | Available on-hand inventory | IDoc Type LOISTD01 |
| Bill-of-Materials | SAP-to-GAINS | Extract of bill-of-material relationships between raw materials, in-process and finished goods | IDoc Type BOMMAT04 |
| Min/ROP, Max/ROQ | GAINS-to-SAP | Inventory policy parameters | IDoc Type MATMAS05; Process Code MATM |
| Purchase Requisitions | GAINS-to-SAP | Purchase replenishment details (e.g., date, quantity, supplier) | IDoc Type PREQCR01; Process Code BAPI |
| Transfer Orders | GAINS-to-SAP | Transfer replenishment details (e.g., date, quantity, source) | IDoc Type WMTOID02; Process Code WMT1 |



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