



IBM Software Group

IBM® WebSphere® Partner Gateway V6.0 Advanced and Enterprise Editions

Architecture and Components



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The goal of this presentation is to provide you with a high level understanding of the architecture and components of WebSphere Partner Gateway V6.0.

Agenda

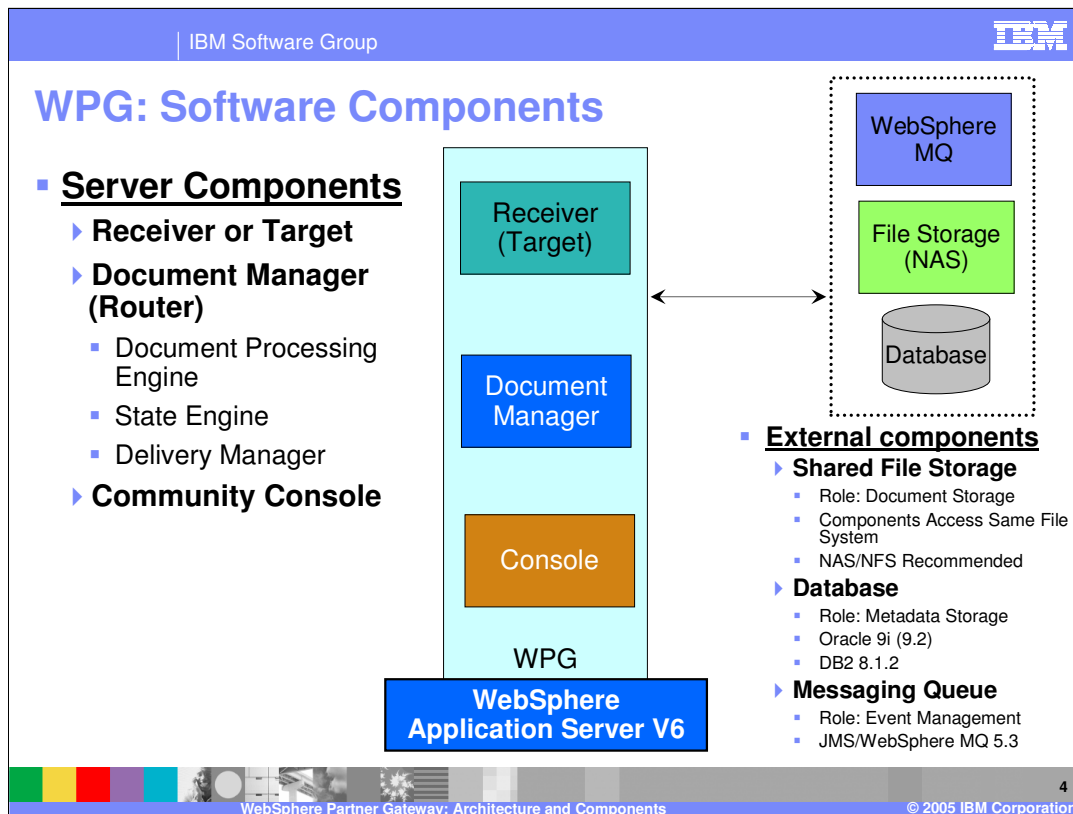
- High level overview of architecture and components
- Basic document flow
- Incoming and Outgoing EDI document flow
- Extensibility

The agenda begins with a high level overview of architecture and components, followed by some basic flows and then some Electronic Data Interchange (EDI) flows. The extensibility of the product will also be discussed.

Section

Architecture and Components

This section will provide more details on the architecture and components of the hub.



This graphic represents a high-level view of the WebSphere Partner Gateway software components.

In the centre is a box representing WebSphere Partner Gateway (WPG), our B2B gateway offering. It is made up of the following key components or servers, running on top of WebSphere Application Server V6.

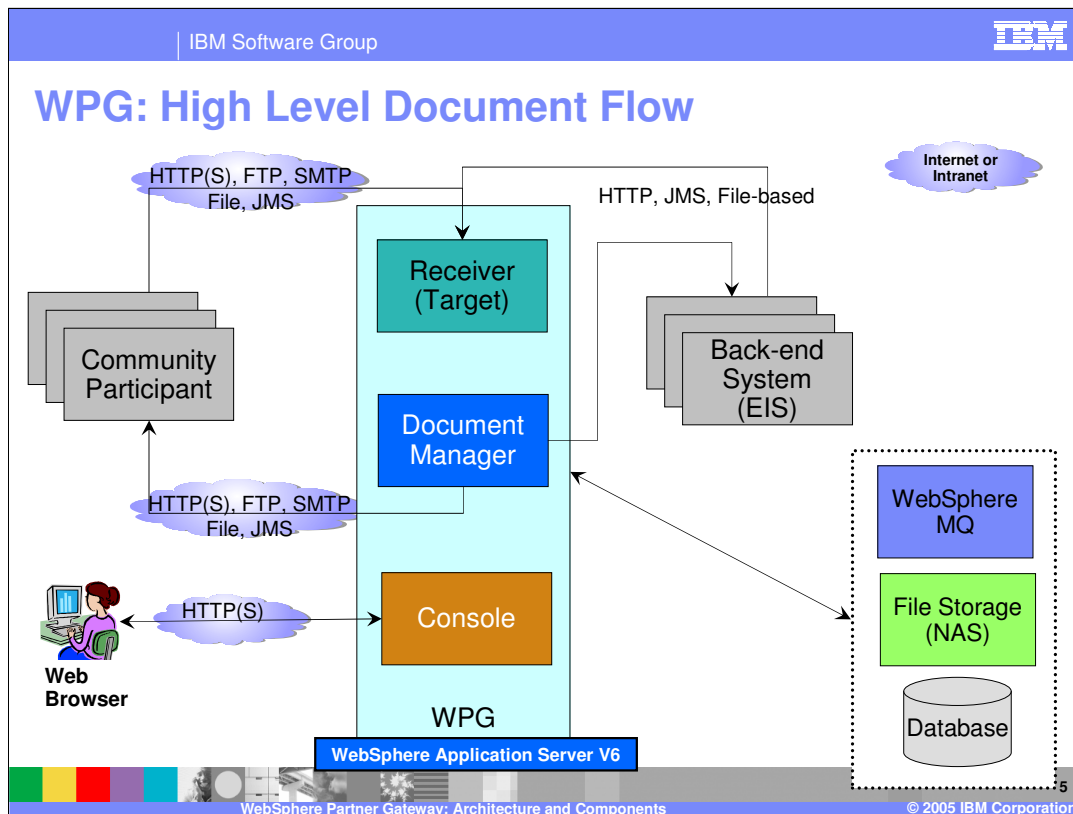
- Receiver (Target) - accepts and stores documents from partners.
- Document Manager - retrieves stored data, processes and routes it to both partners and enterprise applications. Additionally, this component performs packaging, validation, enveloping, logging and other document related functions.
- Console - provides a view of all B2B interactions as well as creation and maintenance of various partner data, including profiles, certificates and overall hub administration

Besides the servers, WebSphere Partner Gateway uses WebSphere MQ for messaging between the server components. This allows the Receiver to notify the Document manager of an incoming document.

A shared File system such as Network Area Storage (NAS) is needed for common storage of documents.

The database is also used to store hub configuration data, meta data, document status, EDI transaction store, activity logs, temporary store and other information. The console and the Document manager interacts with the database to save or retrieve information.

Although not shown on this page, WebSphere Partner Gateway also provides a graphical tool called the Data Interchange Service (DIS) client to create the data dictionary, validation maps, transformation maps for the EDI, ROD and XML documents. More information concerning the client tool will be provided in subsequent pages and other presentations.



This is a high-level view of the document flow through the WebSphere Partner Gateway components.

Documents can be sent by the trading partners or by the back end systems. Once inside the hub, the document is processed based on the configuration of the hub for that type of document. The processed documents are then sent to the trading partners or to the back end systems.

WebSphere Partner Gateway is a loosely coupled component architecture which enables very high scalability as well as high availability topologies.

For an inbound document from a partner, the target receives these documents over a supported protocol and performs three basic tasks:

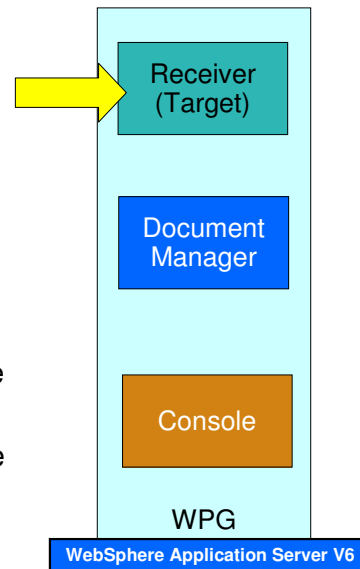
- (1) Writes the document to shared file services
- (2) Inserts a record into the database indicating message arrival
- (3) Posts a message internally to JMS to provide event notification for the Document Manager (the overall document flow is depicted on the next slide).

The Target never talks directly to the Document Manager. As a result, you can establish multiple targets to listen for document interactions and multiple document managers to handle the actual processing of these documents depending on load and performance requirements.

WebSphere Partner Gateway can be used alone to provide B2B connectivity to a partner. You might also choose to deploy it with other WebSphere Business Integration offerings to provide tighter integration with your enterprise applications. It supports JMS connectivity, HTTP/S, FTP and File-based between the gateway and the WebSphere BI server.

Receiver

- It accepts documents from community participants and from back-end systems and stores them
 - ▶ Specifically, it receives a document over a supported transport protocol
- Writes the document and metadata relating to the document to shared file services
- It records any transport-specific data (like the source IP address and certificate information about the SSL connection) to the metadata file
- It completes any transport-specific technical acknowledgment (like sending a 200 response to an HTTP POST)

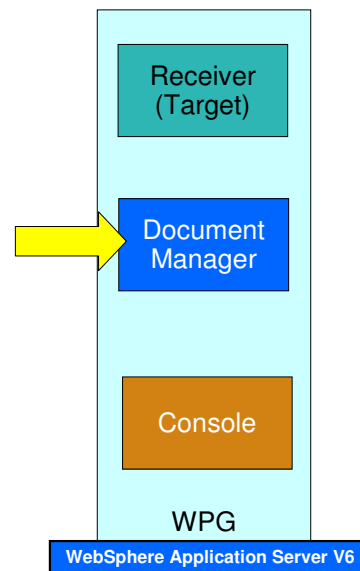


A high level view of the functions of the Receiver is shown here. As the name suggests, the job of the receiver is to receive documents and prepare them for the next stage of the document manager. It receives documents from trading partners or back end systems over many supported protocols and packages.

The received document and meta data are placed in the common shared file system and the document manager is notified of the new arrival. The receiver handles any transport level functions.

Document Manager

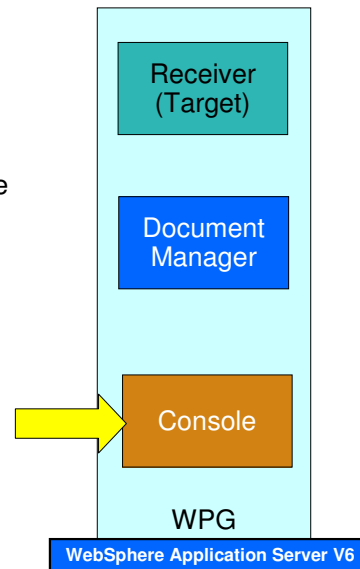
- It retrieves stored data, processes it, and routes it, both to community participants and to enterprise systems.
 - ▶ Specifically, it reads the raw document and metadata and saves the inbound document to the non-repudiation directory on shared storage
- Processes the data to the destination format (performing tasks such as validation and transformation, if specified) and saves the destination document to the non-repudiation directory on shared storage
- Delivers data to its intended target destination using JMS queue, file directory, HTTP, FTP and other supported mechanism



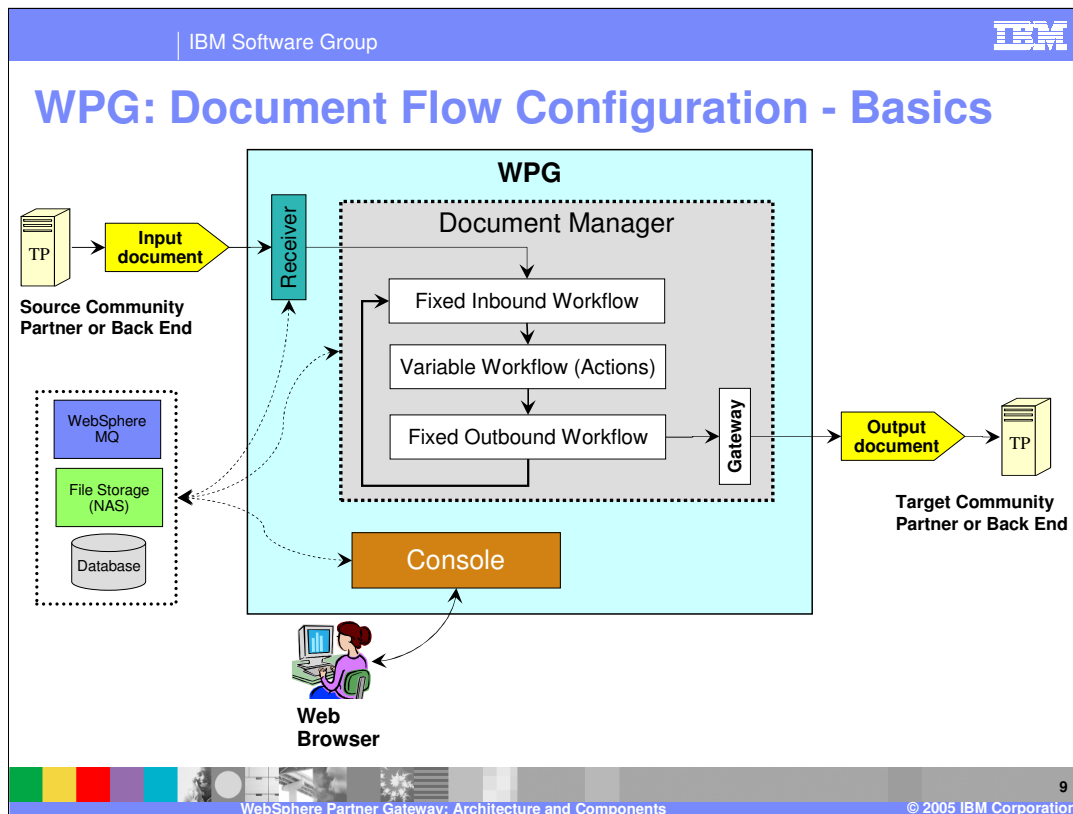
The document manager is the brain of the hub. This is where document processing occurs. When notified of a new document by the receiver, the document manager retrieves the document from the common storage, processes it and routes it to the intended target. The administrator configures the document manager to perform the appropriate actions, such as validation, transformation, or just pass through, on the document.

Console

- The Community Console is a Web-based, J2EE application for configuring, administering, and monitoring trading community activities, and responding to events
- Its users are primarily: the Community Operator, the Community Manager, and the community participant
- Console provides role-based access control to the various features and views
- Features of the console include:
 - ▶ Screens for configuring the hub community and for managing participants.
 - ▶ Tools for monitoring business-process events and exceptions
 - ▶ Detailed reports and analysis on business process, trend, and exception activity
 - ▶ Tools to troubleshoot document processing
 - ▶ The ability to drill down to events and raw documents



The Console is the user interface for the Community Operator, Manager, or the participant to configure. It is also used to administer and monitor the trading activities. Based on the type of user logged in to the console, appropriate functions are exposed based on the user's role. The console also provides an interface to a set of tools that allow you to view the documents as they flow through the hub and provides trouble shooting for failed documents.



This graphic provides more detail on the basic flow within WebSphere Partner Gateway components, especially the Document Manager.

There are 3 different potential workflows for every document passing through the document manager.

- (1) The fixed inbound workflow is used for a fixed set of work actions that apply to all incoming documents. For example, unpackaging the incoming document like an AS2 packaged document.
- (2) The Fixed outbound workflow is used for a fixed set of work actions that apply to all outgoing documents. For example, packaging the outgoing document to an AS2 packaged document.
- (3) The variable workflow is, as the term implies, variable and is based on the actions specified by the administrator on the specific incoming document. Examples are Validation and XML Translation, that applies to EDI and XML document flow.

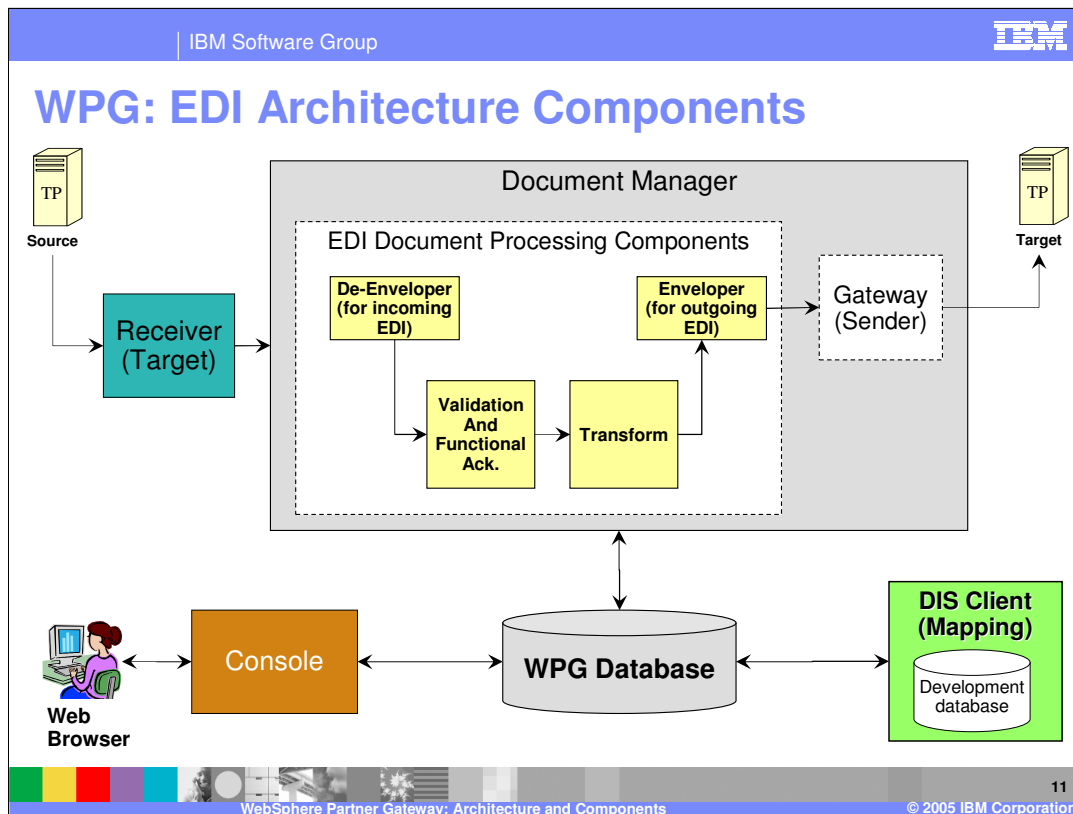
In some document flows, especially involving EDI documents, intermediate documents are created by the hub and then flowed back through the document manager for further processing. Each flow of any document through the hub represents a connection between the source and the target trading partners, including the intermediate ones.

Section

Components and architecture to support native EDI document processing



This section will provide a high level view of the architecture and components to support native EDI document processing.



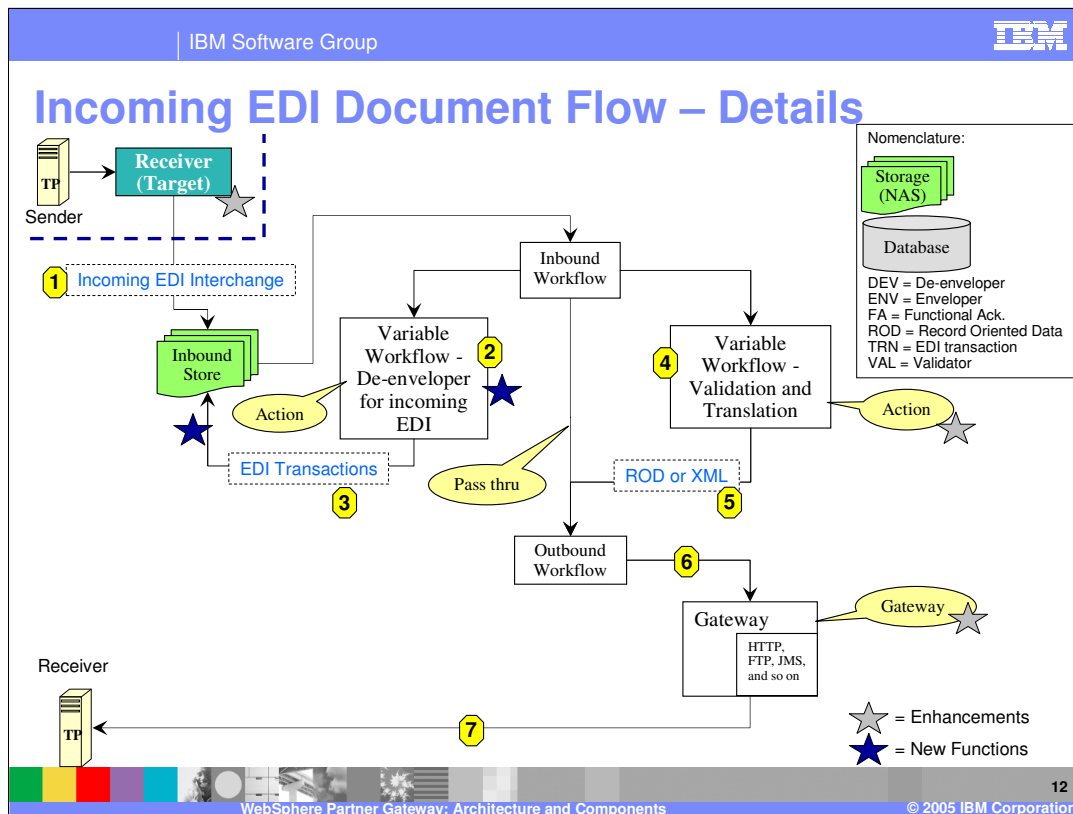
The main components involved in native processing of EDI documents within the document manager are shown here in relation to the rest of the WPG architecture and components.

The main EDI related components are as follows:

1. De-Envelope for incoming EDI Interchange to de-envelope EDI documents and extract the EDI transactions contained in them.
2. Validators to validate the EDI documents and transactions as they enter the hub or as they are generated from the maps.
3. Translator for translation to and from EDI, based on the maps.
4. Envelope for EDI output used to envelope any generated EDI transactions into an EDI interchange before sending to the target trading partner.

The DIS client tool is used to create the necessary maps to and from EDI transaction. The maps are imported in the WPG database directly from the DIS client or using the command line tool called bcgDISImport.

Other presentations will cover the details of these components and different flow use cases involving EDI documents.



New capability in WebSphere Partner Gateway provides native processing of EDI documents for validation, transformation and other EDI specific functions. This graphic shows the details of an incoming EDI that can be converted to ROD or XML.

For the Incoming EDI document, the typical steps are:

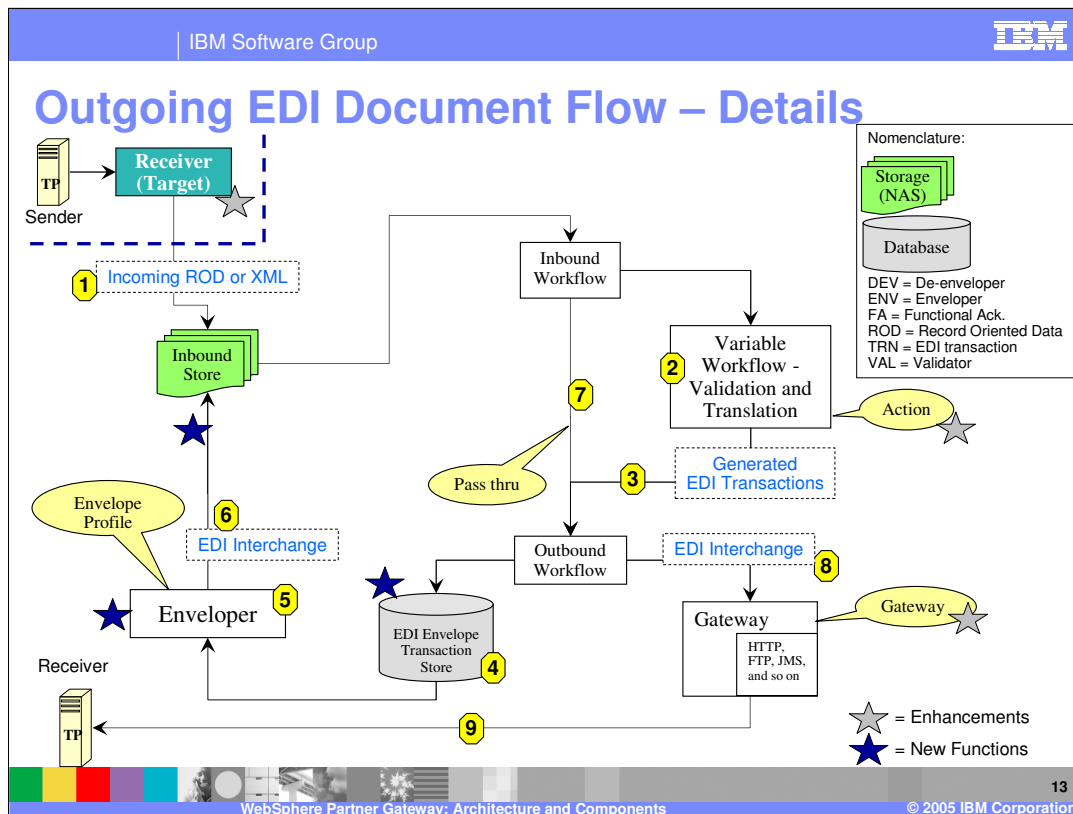
- Step 1 - The receiver receives the incoming EDI document and places it in the common storage for the document manager
- Step 2 - The EDI interchange is de-enveloped and EDI transactions extracted.
- Step 3 - The EDI transactions are fed back through the document manager.
- Step 4 - The EDI transactions are validated and transformed to the required output format, which can be XML, ROD or EDI.
- Step 5 - The generated ROD or XML is shown.
- Step 6, 7, and 8 - If the transformed data is ROD or XML, they are sent to the target trading partner gateway and then to the target trading partner.

If the EDI acknowledgements (TA1 and Functional) need to be sent, they are sent by the document manager. The flow here does not cover the EDI acknowledgements. This will be covered in detail in the flow use case presentation.

In the Fixed Inbound Workflow, the Protocol Process step EDI Handler will be used to identify an EDI Interchange.

The EDI Handler is modified for handling Interchanges and Transactions. Interchanges will either be coming from a partner or internally as output from EDI enveloper. Transactions will be coming from Interchanges that have been de-enveloped. Some of these transactions may be Functional Acknowledgments (FA) that require additional special handling.

The Variable work flow is also referred to as the action. This is where the administrator specified the action to be performed on the document, like De-enveloping, validation, or Transformation in the case of an EDI document. The De-envelope action splits the EDI Interchange into its transactions. The Transformation action then transforms the EDI transactions into the appropriate output.



This graphic shows the details of an incoming ROD or XML document converted to an EDI interchange. The usual steps generating an EDI document and sending it to the target trading partner are:

- Step 1 - The receiver receives the incoming ROD or XML document and places it in the common storage for the document manager
- Step 2 – The EDI interchange is de-enveloped and the EDI transactions extracted. ROD or XML documents are transformed into EDI transactions and validated.
- Step 3 - The EDI transactions are fed back through the document manager.
- Step 4 - The EDI transaction must be enveloped before being sent to the target trading partner. The enveloper runs from a scheduler. Between scheduled runs of the enveloper, the EDI transactions being generated are stored in the EDI Envelope transaction store, ready to be enveloped.
- Step 5 - At the scheduled time, the enveloper is invoked, enveloping the EDI transaction
- Step 6 - An EDI interchange is generated.
- Step 7 - The EDI interchange is sent back through the document manager for any packaging and other processing needed. The EDI passes through the document manager without any action.
- Step 9 - The output EDI interchange with the appropriate packaging is sent to the gateway.
- Finally, the EDI interchange is sent to the target trading partner.

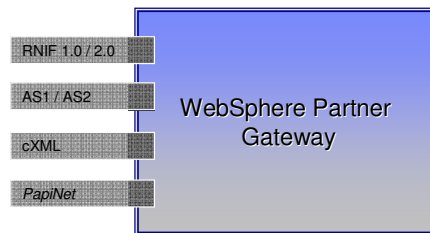
Section

Extensible Architecture

This section shows the extensibility of the architecture.

Extensible Architecture

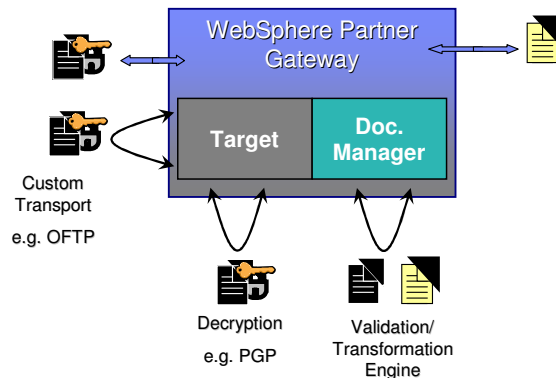
- Pluggable Protocols and Packagers
 - ▶ Provide interface to create and 'plug-in' protocols
 - ▶ Documented for Customers, Services and Partners
 - Establish Business Partner Program
 - ▶ WPG to leverage framework for supported protocols



WebSphere Partner Gateway includes support for many pre-defined packages, protocols and document types. With the pluggable extensibility of the architecture, new custom packages, protocols or document types can be added by the hub administrator.

Extensible Architecture through Exits (Handler)

- Provide interface to perform custom functions via 'exits' or "handlers"
 - Encryption/decryption, validation, transformation
- Enable addition of custom Transports, Packages and Protocols
- Documented for Customers, Services and Partners



WebSphere Partner Gateway provides a mechanism for adding custom functions called exits or handlers at different stages of document processing. This support is used to expand capabilities such as the addition of the new native EDI functionality. The functionality of the exits or handlers are carried forward from WebSphere Business Integration Connect v4.2 release. Listed below are some examples of architecture extension through the use of exits and handlers.

Encryption, Validation and Transformation

As WebSphere Partner Gateway Connect receives and processes a document, a 'call out' to any program can be easily made as part of the processing. These User Exits or handlers can be used for example for document encryption and decryption, and validation (such as a plug-in Edifact for SNIP level validation with HIPAA), or transformation, or both.

Custom Transports, Packages and Protocols

WebSphere Partner Gateway is extensible to enable custom Transports, Packages and Protocols to be added within the framework of WebSphere Partner Gateway runtime and Community Console based administration. There are a number of exit points that enable the addition of custom listeners for additional Transports, parsers for additional Packages and Protocols. In this way the rest of the infrastructure of WebSphere Partner Gateway can be used in conjunction with these new capabilities.

For example, a new Transport could deliver a document, such as EDI X12 that would be processed in the normal way through the rest of the system. Also, AS2 might be used to deliver a new Protocol as an AS2 Binary document. So the combination of standard and custom components can be used to extend and reuse all the capabilities of WebSphere Partner Gateway in a seamless manner.

Section

Summary

This section provides a summary of this presentation.

Summary

- This presentation covers the architecture and components of WebSphere Partner Gateway
- It showed the main components of the product, their roles in the document flow with specific emphasis on the new native EDI capability
- The architecture has extension points to allow support of functions, protocols that may be needed by the customer/ISV



In summary, this presentation covered the basic architecture and the components of WebSphere Partner Gateway with an emphasis on EDI capabilities.

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