IBM WebSphere Partner Gateway Enterprise and
Advanced Editions

IBM

Product Overview

Version 6.0

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> **Note:**
> Before using this information and the product it supports, read the information in "Notices" on page 31.

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This edition of this document applies to IBM WebSphere Partner Gateway Enterprise Edition (5724-L69) and Advanced Edition (5724-L68), version 6.0, and to all subsequent releases and modifications until otherwise indicated in new editions.

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Preface

About this book

This document provides an overview of the IBM^(R) WebSphere^(R) Partner Gateway product family and, in more detail, the WebSphere Partner Gateway Enterprise and Advanced Editions.

Audience

This book is intended for the reader who wants an overview of the WebSphere Partner Gateway product. Chapter 4, "Fast paths," on page 25 identifies the documents that provide more detailed information on installing, administering, and using Partner Gateway.

Typographic conventions

This document uses the following conventions.

Convention	Description
`Monospace font`	Text in this font indicates text that you type, values for arguements or command options, examples and code examples, or information that the system prints on the screen (message text or prompts).
Bold	Boldface text indicates graphical user interface controls (for example, online button names, menu names, or menu options) and column headings in tables and text.
Italics	Text in italics indicates emphasis, book titles, new terms and terms that are defined in the text, variable names, or letters of the alphabet used as letters.
`Italic monospace font`	Text in italic monospace font indicates variable names within monospace-font text.
ProductDir	*ProductDir* represents the directory where the product is installed. For the IBM WebSphere InterChange Server environment, the defalt product directory is IBM\WebSphereICS For the IBM WebSphere Business Integration Adapters environment, the default product directory is WebSphere Adapters. All WebSphere Business Integration Adapters product path names are relative to the directory where the product is installed on your system.
%text% and $text	Text within percent signs (%) indicates the value of the Windows text system variable or user variable. The equivalent notation in a UNIX environment is $text, indicating the value of the text UNIX environment variable.

Convention	Description
Underlined colored text	Underlined colored text indicates a cross-reference. Click the text to go to the object of the reference.
Text in a blue outline	(In PDF files only) An outline around text indicates a cross-reference. Click the outlined text to go to the object of the reference. This convention is the equivalent for PDF files of the "Underlined colored text" convention included in this table.
" " (quotation marks)	(In PDF files only) Quotation marks surround cross-references to other sections of the document.
{ }	In a syntax line, curly braces surround a set of options from which you must choose one and only one.
[ ]	In a syntax line, square brackets surround optional parameters.
. . .	In a syntax line, ellipses indicate a repetition of the previous parameter. For example, option [, . . .] means that you can enter multiple, comma-separated options.
< >	Angle brackets surround variable elements of a name to distinguish them from one another. For example, <server_name><connector_name>tmp.log.
\ /	Backslashes (\) are used as separators in directory paths in Windows installations. For UNIX installations, substitute slashes (/) for backslashes.

Related documents

The complete set of documentation available with this product includes comprehensive information about installing, configuring, administering, and using WebSphere Partner Gateway Enterprise and Advanced Editions.

You can download this documentation or read it directly online at the following site:
http://www.ibm.com/software/integration/wspartnergateway/library/infocenter

Note: Important information about this product may be available in Technical Support Technotes and Flashes issued after this document was published. These can be found on the WebSphere Business Integration Support Web site, http://www.ibm.com/software/integration/websphere/support/. Select the component area of interest and browse the Technotes and Flashes sections.

New in this release

New in release 6.0

This section highlights the changes to Partner Gateway for version 6.0:

- WebSphere Business Integration Connect has been renamed WebSphere Partner Gateway.
- Enhanced EDI document processing capabilities, provided by the Data Interchange Services feature, expand on the passthrough processing offered in previous releases. New support includes:
  - Enveloping, de-enveloping and splitting provide the ability to handle or generate EDI interchanges with multiple heterogeneous documents as well as input files with multiple heterogeneous interchanges.
  - Extensive validation and functional acknowledgments support.
  - Robust, any-to-any mapping capability for EDI, XML, and record oriented data (both fixed length fields and comma-separated values) using the Data Interchange Services client. This graphical user interface includes a drag-and-drop mapper with extensive on-line help, a library of built in functions for string handling, date manipulation, arithmetic operations, and the ability to combine maps.
  - Enhancements to the Community Console for:
    - Configuring Partner Gateway to receive, process, and send EDI documents.
    - Importing transformation and validation maps from the Data Interchange Services client graphical user interface.
    - Viewing EDI document content and transaction details.
    - Trading-partner-level control: all aspects of transformation, validation and acknowledgment can now be controlled at the individual trading partner level.
- Extended transport and business protocol support:
  - Added FTP Scripting transport support for the Receiver and Gateway.
  - Additional Receiver transport handlers added for splitting files containing multiple EDI Interchanges, SML and Record Oriented Data (ROD) documents.
  - Support for additional RosettaNet PIPs.
- Enhancements for reliability, availability, and serviceability:
  - Ability to copy a document to the file system.
  - Full message repository support including the ability to view status and images of interchanges sent or received and drill down to the individual documents within the interchanges to see their functional acknowledgment status.
  - Added ability to re-send documents that have been sent successfully or unsuccessfully.
  - New support for handling multiple leaf or root certificates prevents outages when certificates expire or are revoked.
- Changes to software supported or required:
  - Support for management of Partner Gateway by IBM Tivoli License Manager (ITLM).

New in release 4.2.2

This section highlights the changes to Business Integration Connect for version 4.2.2:

- Changes to software supported or required:
  - Business Integration Connect can be integrated with WebSphere Business Integration Message Broker, in addition to WebSphere InterChange Server.
  - WebSphere Business Integration Adapter for HTTP (for sending documents with or without attachments) is supported for use with InterChange Server.
  - WebSphere MQ version 5.3 or higher is now a pre-requisite for installing Business Integration Connect.
- Enhanced document-processing customization options
  User exits let you customize WebSphere Business Integration Connect to support new protocols, document-handling processes, and workflows, significantly enhancing WebSphere Business Integration Connect's ability to meet diverse customer requirements.
- A new Launch Pad improves the usability of the WebSphere Business Integration Connect installation process and includes a link to the InfoCenter.
- Improvements to administrative functions
  - An XML-document-based HTTP interface to WebSphere Business Integration Connect lets you perform basic administrative tasks, such as importing or exporting partner profiles, without using the Community Console. This new interface also facilitates the migration of participant data between test and production environments.
  - Support is now provided for deleting WebSphere Business Integration Connect participants.
  - A system administration screen has been added to the Community Console to allow the hub administrator to configure and review event processing information, as well as perform other administrative tasks.
  - An event publishing feature lets customers monitor and respond to Business Integration Connect events using their own system management programs.
  - A utility is available for archiving the non-repudiation data store.
- Extended transport protocol support
  The Community Manager and participants can exchange documents using Secure File Transfer Protocol (FTP), WebSphere MQ's implementation of JMS, or file directory.
- Additional RosettaNet Partner Interface Processes (PIPs) are supported. See "Supported PIPs" on page 27 for more information.
- Accessibility enhancements
  New features have been added to the Community Console to support screen readers.
- WebSphere Business Integration Connect meets the requirements for RosettaNet and Drummond certification.

Chapter 1. Product introduction

WebSphere Partner Gateway enables the establishment and maintenance of a business-to-business (B2B) trading community for secure, automated, cost-effective exchange of business documents between companies and their suppliers.

Partner Gateway is fully scalable and designed to support the diverse protocol, document-processing, and security requirements of large and small companies alike. Using back-end systems such as WebSphere InterChange Server or WebSphere Business Integration Message Broker, companies can seamlessly integrate the information received from trading partners with their business-critical applications . A Web-based graphical user interface makes it easy to enable and manage trading partner interactions, and to administer the trading community.

Overview of a trading community

A trading community typically revolves around a hub—an enterprise that acts as the Community Manager. Businesses of various sizes, known as community participants, connect to the hub through the Internet. In addition, participants themselves can act as a hub. Figure 1 on page 2 illustrates a trading community consisting of a Community Manager and a set of participants.
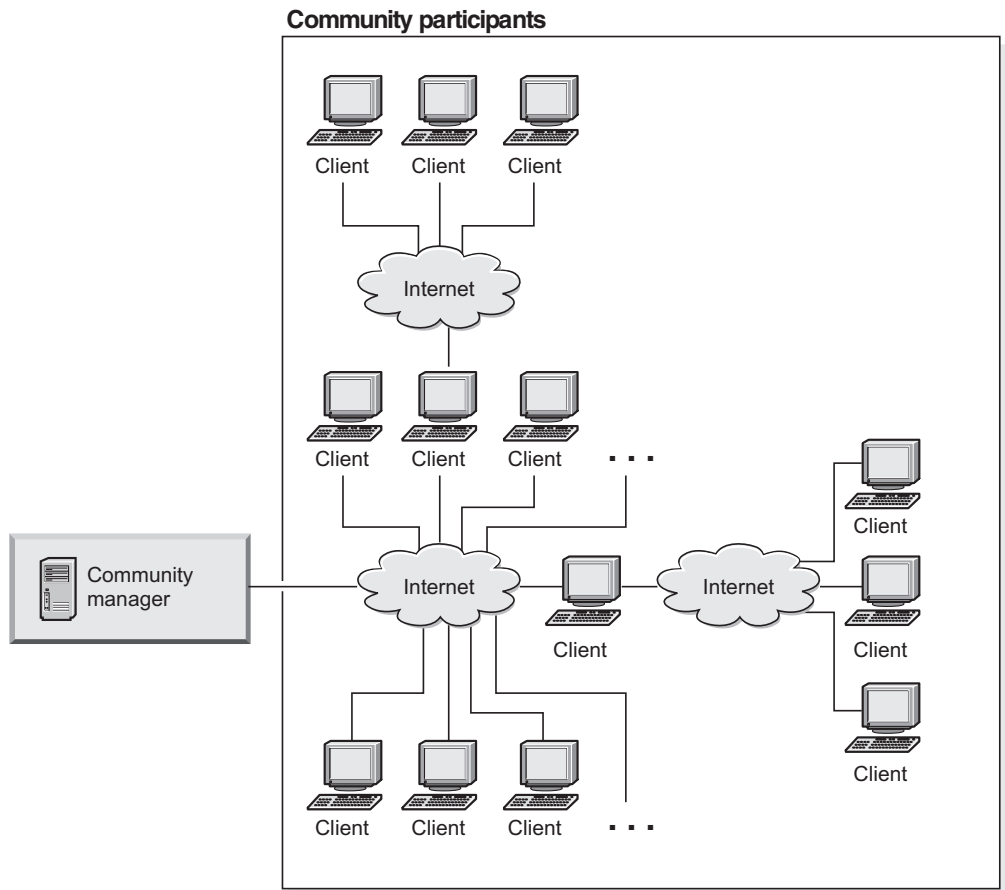
Community participants

Figure 1. A trading community consisting of a Community Manager and community participants.

Partner Gateway provides a solution for each type of participant in the trading community.

- WebSphere Partner Gateway Enterprise Edition is ideal for the larger enterprise that wants to connect to an unlimited number of trading partners using a variety of transports and message formats. This enterprise acts as the Community Manager, establishing the community, getting partners on board, and monitoring the activity of all participants in the community.
- WebSphere Partner Gateway Advanced Edition is suited to the customer who wants the flexibility of transport and message formats but has a more limited number of trading partners. This type of enterprise can act as a Community Manager (of its own smaller community) as well as a community participant in a larger community. The right side of the previous illustration shows an example of a client who is both a community participant (to the Community Manager) as well as a hub to its own community.
- WebSphere Partner Gateway - Express is designed for small to medium-sized businesses that want to integrate with a very small number of partners using a limited protocol support as quickly, simply and affordably as possible. Typically, the Express customer connects to a trading community operated by a large and important trading partner at that partner's request.

The remainder of this document focuses on Partner Gateway Enterprise and Advanced Editions. For information on Partner Gateway - Express, refer to the InfoCenter for WebSphere Partner Gateway - Express.

Benefits of a trading community

The benefits of participating in a trading community and exchanging business documents electronically include the reduction in cost associated with a traditional, paper-based exchange as well as a reduction in the number of errors inherent in such an exchange. After all, critical transactions involving purchase orders, invoices, shipping notices, and other documents drive your business. The ability to participate in a trading community to exchange this information efficiently and securely is essential to success.

Partner Gateway provides benefits to all types of participants in a trading community. For the Community Manager, it provides real-time visibility into the entire supply chain, which helps improve data accuracy and decrease cycle times. Community participants who use Partner Gateway - Express can join the trading community with minimal cost and effort.

Additional benefits of a Partner Gateway trading community include scalability, ease of use, and flexibility.

Scalability

Partner Gateway is scalable. For example, an enterprise acting as the Community Manager can easily add additional servers to accommodate growth in the size of the trading community. See "System configuration options" on page 23 for additional details.

The Partner Gateway - Express customer can upgrade to Enterprise or Advanced Edition should the enterprise require more sophisticated functionality or enterprise-level trading volume. For example, customers who must support additional document formats or who want to connect to additional community participants can install the Advanced Edition.

Ease of use

Ease of use is essential to the successful deployment and maintenance of a trading community. The tasks involved in planning, setting up, and running a trading community can be performed either by the enterprise itself or by an IBM Community Integration Services team. See your IBM representative for information about these services.

Joining a trading community is easy. The community participant provides some basic information (such as the types of protocols it can support) to the Community Manager. The Community Manager uses this information to define a connection between the hub and the participant. After these steps are completed, the participant is ready to send test documents.

Once defined to the community, participants can administer their own profiles and monitor the flow of their own documents, subject to the level of authorization defined by the Community Manager.

For community participants using Partner Gateway - Express or another connectivity tool, joining a trading community is equally simple.

Flexibility

Another key requirement for a trading community is the ability to handle diverse transports, protocols, and document formats. Partner Gateway supports a wide

range of industry-standard transport and business protocols, while also providing superior customization options for tailoring document-handling and workflow to the specific needs of your enterprise.

For example, you might exchange purchase orders with a subset of your trading partners through RosettaNet PIPs. With other trading partners, you might have an agreement to exchange EDI-formatted documents. You can accommodate both types of participants in your trading community.

Similarly, you can use Partner Gateway to make a Web service available to your community participants. You can also access the Web services of your community participants. Partner Gateway acts as a SOAP proxy.

You can exchange a wide variety of documents with community participants, using industry-standard business protocols such as RosettaNet, AS1, AS2, SOAP, cXML, XML, EDI, and binary over a variety of transports:

- The HTTP or HTTPS transport protocols can be used by all types of documents (except for binary documents with no associated packaging sent from a community participant).
- The FTP or secure FTP transport protocol can be used for EDI, XML, and binary documents that do not have packaging associated with them.
- An FTP-script-based transport protocal can be used to send and receive EDI documents over multiple types of value-added (VAN) and non-value-added networks, such as General Electric Information Services (**GEIS**).
- The SMTP transport protocol can be used for EDI, XML, and binary documents that conform to the AS1 protocol
- The JMS transport protocol can be used for XML, EDI or binary documents.
- File directory can be used for XML or EDI documents.

Depending on the transport protocol, Partner Gateway supports either synchronous or asynchronous business document exchange, or both. The HTTP and HTTPS transport portocols both support synchronous and asynchronous document exchanges. For AS2, cXML, RNIF, or SOAP documents that will be used in synchronous exchanges, you must specify the associated SyncCheck handler on the HTTP or HTTPS target. Asynchronous document transfer is supported in other transport protocols such as File System, FTP, SMTP, etcetera.

You have a variety of choices for how the documents are processed--everything from passthrough routing to translation into custom XML.

If the transports, business protocols, and processing options offered by Partner Gateway do not meet your requirements, you can customize document-handling and workflow with user exits. User exits are breaks in the natural process flow designed to permit developers to insert customized processing. Through the use of user exits, you can send and receive documents using customized protocols and seamlessly invoke customized packing, unpacking, validation, translation, and transformation routines. User exits can be used to extend or modify an existing document-handling function or to create entirely new ones.

For comunication with your back-end systems, you can exchange RosettaNet Service Content (RNSC), SOAP, cXML, XML, EDI, and binary documents over a variety of transport protocols:

- The HTTP or HTTPS transport protocols can be used by all types of documents (except for binary documents with no associated packaging send from the back-end system). Note that SOAP and cMXL documents can use synchronous communication.
- The JMS transport protocol can be used for RNSC, XML, EDI, and binary documents.
- File-based transfer can be used for XML or EDI documents that have no packaging associated with them.

Partner Gateway supports multiple security standards including third-party certificate authorities from VeriSign and Thawte, SSL support, and Non-Repudiation as required for full AS2 compliance.

See "Summary of supported business and transport protocols," on page 29 for additional information.

Partner Gateway components

The three major runtime components of Partner Gateway are the Receiver, Document Manager, and Community Console. A brief overview of these components is provided in the following sections. For more detailed information and for a description of prerequisite and related software, see Chapter 3, "Key concepts and technical overview," on page 13.

Receiver

Documents sent by community participants enter the system through the Receiver. The Receiver stores the documents in a file system for the Document Manager to process.

In Figure 2, a document intended for processing by a back-end system, such as InterChange Server (ICS) or WebSphere Business Integration Message Broker, is sent from a community participant to the Receiver.
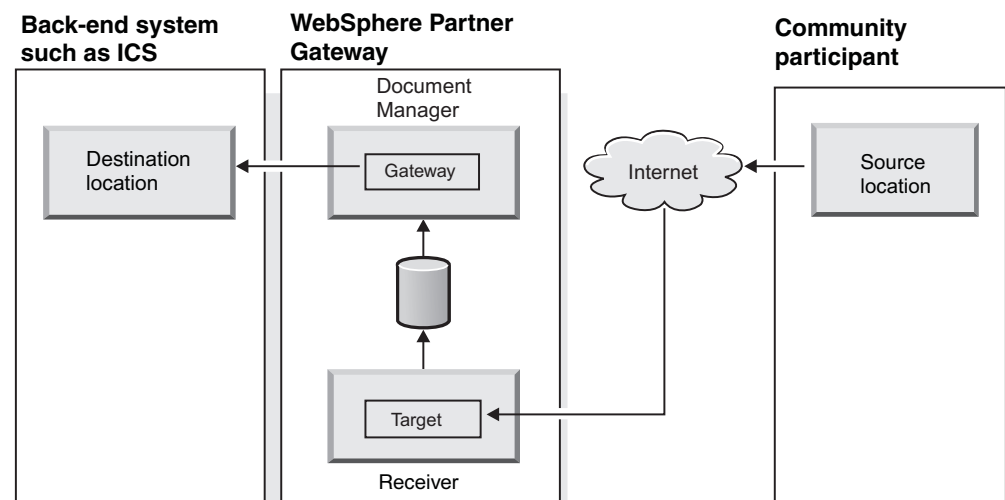

Figure 2. A document from a participant flows to InterChange Server through the Receiver and Document Manager

Documents sent from the Community Manager to community participants reverse the process. The back-end system sends the outgoing document to a directory or

through the HTTP, HTTPS, or JMS transport protocol to a Receiver set up for the directory or protocol type. The Document Manager detects the document and routes it to the community participant. In Figure 3, a document from a back-end system such as Interchange Server is received by the participant.
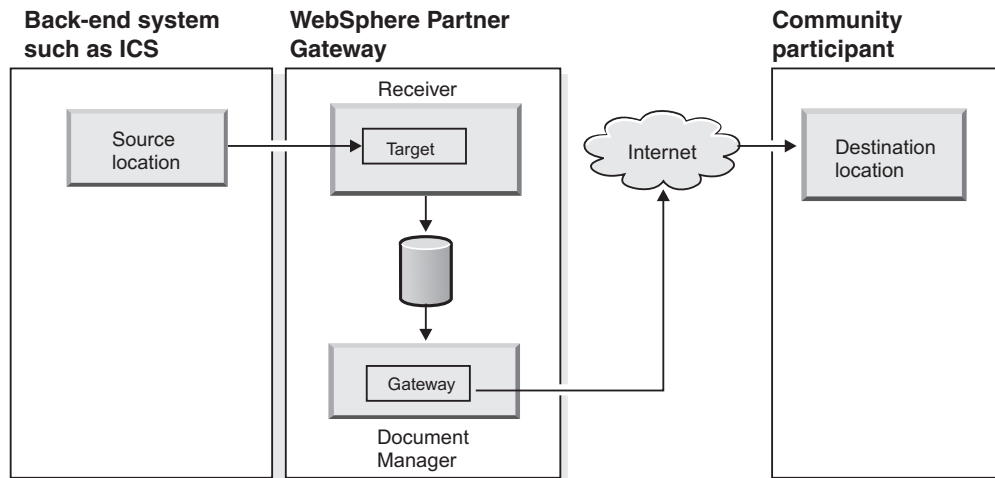

Figure 3. A document from InterChange Server flows to a participant through the Receiver and Document Manager

Document Manager

The Document Manager polls the file system for documents, performs any user-configured processing, and then delivers the document to its final destination as shown in Figure 3.

Subsystems of the Document Manager also decrypt the document (if required), perform digital signature verification (if required), perform XML, EDI, ROD (record oriented data) transformation and validation (if required), and log entries about the processing of the document in the database repository.

Community Console

The Community Console provides a Web-based graphical user interface for configuring and administering the trading community, and for monitoring the flow of documents and processes within the community. With the Community Console, you can manage and troubleshoot current or past event, document, and process activity.

For example, if you find that documents are repeatedly failing for the same reason or from the same source, you can use the Community Console to quickly identify and resolve the problem. The Community Console gives you access to detailed reports and analysis on business processes, trends, and exception activity.

The Community Console is available to both the enterprise running Partner Gateway as well as to all the participants in the trading community. The Community Manager has visibility to the entire community on a 24 x 7 basis. Participants can access the Community Console through a Web browser to get a real-time view of the documents, processes, and events that relate to their trading activities.

Hardware and software requirements

Partner Gateway Enterprise and Advanced Editions require the hardware and software listed below. For a complete list, see the *Installation Guide*.

Hardware requirements

Business Integration Connect Enterprise and Advanced Editions have the following hardware requirements. Actual requirements for your system may be different, depending on the complexity of your specific environment, the throughput you require, and data object size used.

- Disk space
  - Minimum: 300 MB available disk space for application, additional disk space for document storage
  - Recommended: 30 GB
- Minimum and recommended memory: 2 GB RAM
- Minimum and recommended processor
  - Linux or Windows: 2 GHz Intel Xeon processor
  - AIX: 600 MHz processor
  - Solaris: SPARC III, 750 MHz processor
- Additional requirements
  - Additional servers for added capacity and redundancy
  - Multi-server installations require network attached shared storage.

Software requirements

Partner Gateway Enterprise and Advanced Editions have the following software requirements.

Operating systems

WebSphere Partner Gateway supports the following operating systems:

- Sun Solaris, Version 9.
- RedHat Linux Enterprise Server, Version AS 3.0 with Update 3.
- SUSE Linux Enterprise Server, Version 8 with SP3 or Version 9.
- IBM AIX 5L, Version 5.2 with Recommended Maintenence package 5200-03.
- IBM AIX 5L, Version 5.3.
- Microsoft Windows 2000 with SP4.
- Microsoft Windows 2000 Advanced with SP4.
- Microsoft Windows 2003 Standard and Enterprise.

The Data Interchange Services Client supports the following operating systems:

- Microsoft Windows 2000 Professional, with service packs 3 and 4.
- Microsoft Windows XP Professional.
- Microsoft Windows 2003 Professional.

Databases

WebSphere Partner Gateway supports the following databases for use as a data repository:

- IBM DB2[R] Enterprise Server Edition, Version 8.2.
- Oracle Enterprise Edition 9i Release 2, Version 9.2.0.4 or Oracle Enterprise Edition 10g, Release 1, version 10.1.0.3.

Back-end WebSphere systems

WebSphere Partner Gateway can be integrated with the following back-end WebSphere systems:

- For integration with WebSphere InterChange Server:
  - WebSphere InterChange Server, Version 4.2.2 or 4.3
  - WebSphere Business Integration Adapter for HTTP, Version 1.2.1
  - WebSphere Business Integration Adapter for JMS, Version 2.7.0
  - WebSphere Business Integration Adapter for Web Services, Version 3.4.0.
- WebSphere Data Interchange Server, Version 3.2 with CSD 7 or higher.

See the *Installation Guide* for the list of supported platforms.

Additional software requirements

WebSphere Partner Gateway has the following additional software requirements:

- WebSphere MQ, Version 5.3 with Fix Pack CSD 08 or later with SupportPac MA0C: MQSeries—Publish/Subscribe SupportPac.
- To view the Community Console:
  - Microsoft Internet Explorer, Version 6.x with SP1 or higher
  - Mozilla, Version 1.4 or 1.7
- If you are planning to use File Transfer Protocol (FTP) or secure FTP, you must have an FTP server installed.
- If you are planning to use the Simple Mail Transport Protocol (SMTP) transport protocol, an SMTP -based e-mail relay server for e-mail alert delivery and SMTP message delivery.
- Dedicated servers are recommended for your database and for WebSphere MQ.

  Components of Partner Gateway Enterprise and Advanced Editions and prerequisite products can be installed on one server or can be split among multiple servers. However, the use of multiple servers is recommended for production to prevent resource constraints. For more information about Partner Gateway configurations, see "System configuration options" on page 23.

Chapter 2. WebSphere product family overview

This chapter describes how WebSphere Partner Gateway fits into the WebSphere product family.

About WebSphere

IBM WebSphere is the leading software platform for e-business. It includes more than 150 Internet infrastructure software or middleware products designed to help businesses become on demand e-businesses. The WebSphere product family features broad support for open standards. Its products include application servers, messaging software, business integration tools, portal creation tools, and integrated development environments for creating Web-based business applications.

The WebSphere platform can help you to:
* Accelerate the delivery of products and services.
* Respond quickly to market changes and customer demand.
* Integrate and automate business processes.
* Create portals to simplify access to information and applications.
* Reuse and leverage existing and legacy assets.

The WebSphere product family

The WebSphere family of products falls into the following categories, providing a complete middleware infrastructure for dynamic e-business:
* Business Portals
* Business Integration
* Foundation & Tools.

IBM WebSphere software platform

WebSphere Portal

WebSphere Commerce

WebSphere Everyplace

WebSphere Edge Server

WebSphere Voice

WebSphere Business Integration

WebSphere MQ

Business portals   Business integration

WebSphere

Foundation and tools

WebSphere Host Integration

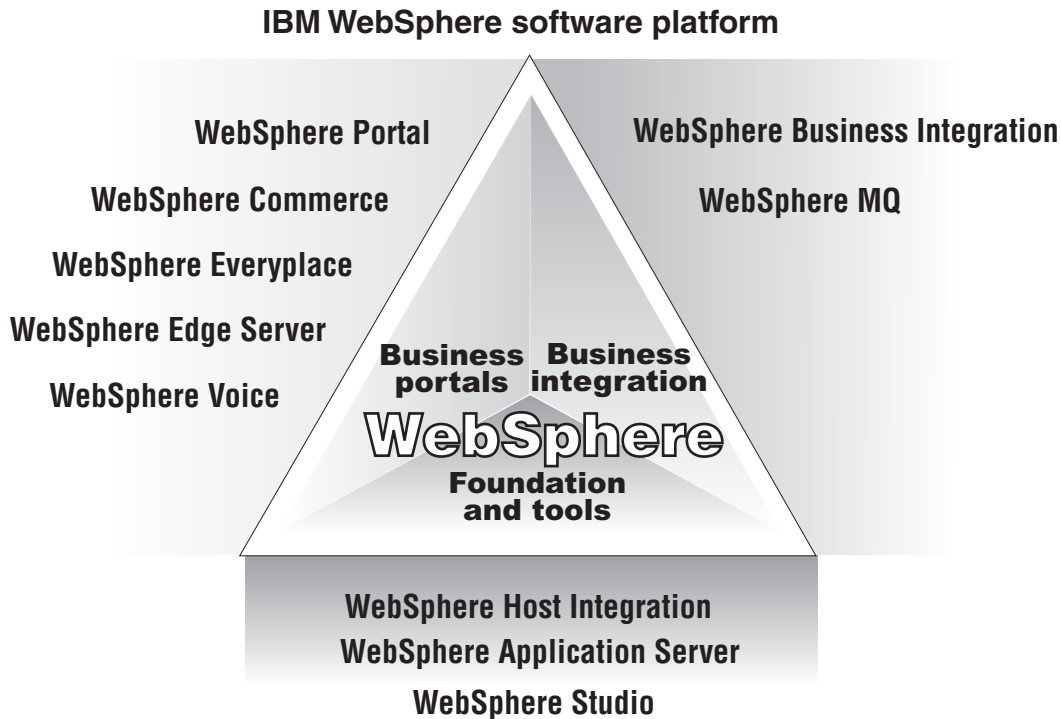WebSphere Application Server

WebSphere Studio

Figure 4. The three categories of software that comprise the WebSphere software platform.

The WebSphere platform consists of middleware software for three major e-business needs: portals, integration, and foundation and tools.

As shown in Figure 3, the WebSphere platform provides:

- Tools to create and deploy Web-enabled applications for e-business, such as WebSphere Studio tools, WebSphere Application Server, and WebSphere Host Integration.
- Tools to integrate business applications and enable them to communicate with each other and over the Web, such as WebSphere Business Integration and WebSphere MQ.
- Tools to extend business applications and access to portals and mobile devices, such as WebSphere Portal, WebSphere Commerce, WebSphere Everyplace, WebSphere Edge Server, and WebSphere Voice.

WebSphere Business Integration

WebSphere Business Integration, one of the three types of WebSphere solutions and products, allows businesses to connect their applications and exchange information quickly, efficiently, and cost-effectively, with minimal human intervention. Business Integration enables companies to realize the benefits of end-to-end integration through five core capabilities:

- **Model:** Map and simulate business processes.
- **Integrate:** Link people, processes, systems, and information.
- **Connect:** Expand your processes to include partners and clients.
- **Monitor:** Track the progress of business processes as they are implemented.
- **Manage:** Review and analyze the performance of your processes.

Partner Gateway helps fulfill the **Connect** capability. Not only does it allow you to communicate with the members of your trading community, it extends the business integration within your enterprise to trading partners and customers.

Figure 5 shows Partner Gateway's place in WebSphere's Business Integration product line.
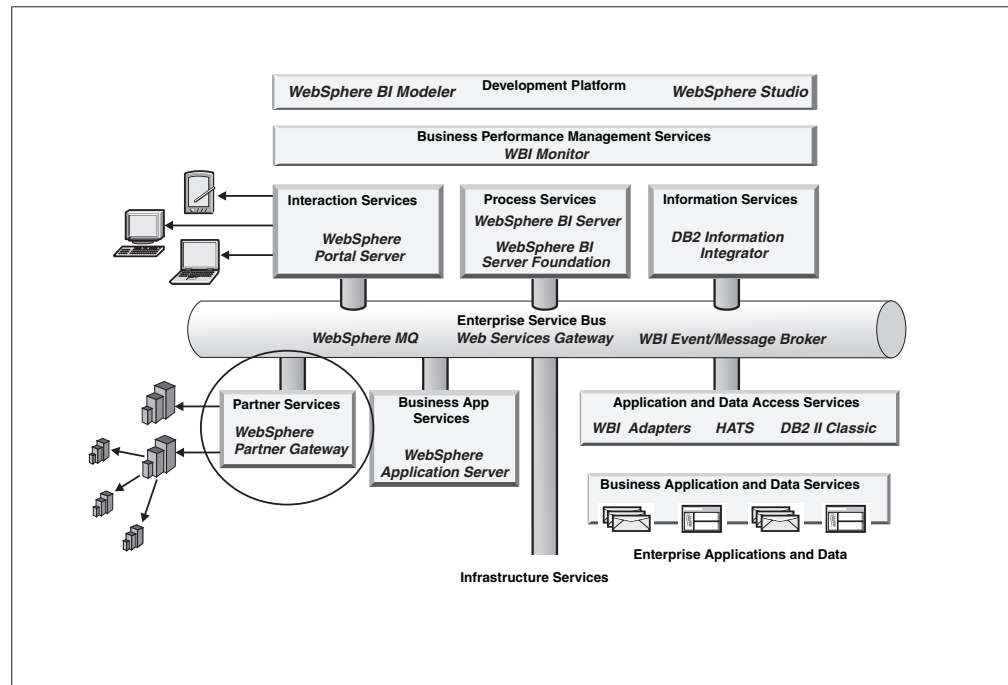
Figure 5. Partner Gateway's role in WebSphere Business Integration's product line.

WebSphere Partner Gateway is layered with other WebSphere products to build comprehensive, flexible business integration solutions. Partner Gateway's role is to enable enterprises and their trading partners to exchange business documents. Through the use of back-end systems such as WebSphere Business Integration Message Broker or WebSphere InterChange Server, business information contained in the exchanged documents is easily integrated with the business-critical applications on which companies depend.

Chapter 3. Key concepts and technical overview

This chapter provides a brief technical overview of Partner Gateway, its main components, and its architecture.

It consists of the following topics:

- "WebSphere Partner Gateway architecture" gives an overview of the architecture of Partner Gateway and its major run-time components.
- "Summary of supported protocols" on page 18 lists the transport, messaging, and business protocols supported by Partner Gateway. Other protocols can be supported through customization.
- "Configuration requirements" on page 19 provides an overview of the Partner Gateway components you need to configure when you establish a trading community.
- "Integration with enterprise systems" on page 21 discusses the different options for integrating Partner Gateway with a back-end system.
- "Sample message flow" on page 22 describes the sequence of steps involved in a sample exchange of documents between a community participant and the Community Manager.
- "System configuration options" on page 23 discusses the different ways to configure Business Integration Connect for scalability, performance, and fail-over support.

WebSphere Partner Gateway architecture

The runtime environment of Partner Gateway consists of the following components:

- The Receiver to handle secure and reliable receipt of documents over the supported transport protocols.
- The Community Console, a standard J2EE component that provides Community Console access to the Community Manager and to community participants. The Community Manager can view the entire community. Participants have a more limited view, which allows them to modify their profiles and monitor the flow of their documents.
- The Document Manager, consisting of one or more routing and processing servers, which implement the reliable routing, validation, and translation services within Partner Gateway. When validation is required, it is performed through the use of XML schemas. When translation is required, it can be performed through the use of transformation maps. If you are sending or receiving EDI interchanges (that will be de-enveloped into individual transactions) or XML or record-oriented data (ROD) documents, you will probably receive a transformation map from the Data Interchange Services client mapping specialist. The transformation map describes how to translate a document from one format to another format. Transformations can be performed among any combination of EDI transactions, XML documents, and ROD documents. For example, suppose you receive an EDI interchange that contains one transaction. After the interchange is de-enveloped, the transaction is transformed into an XML document before being delivered. The Hub Configuration Guide describes all possible document flows associated with EDI

interchanges and XML and ROD documents. Note that translation can also be performed through the use of XSLT-based transformations, optimized for performance.

- The queue manager and publish/subscribe broker, which routes messages and events to other components within the system and to external applications.
- A database to store trading partner profile information and state information about ongoing processes in Partner Gateway.
- Common storage, typically consisting of a large stand-alone storage device, where documents are stored during and after processing by Partner Gateway.

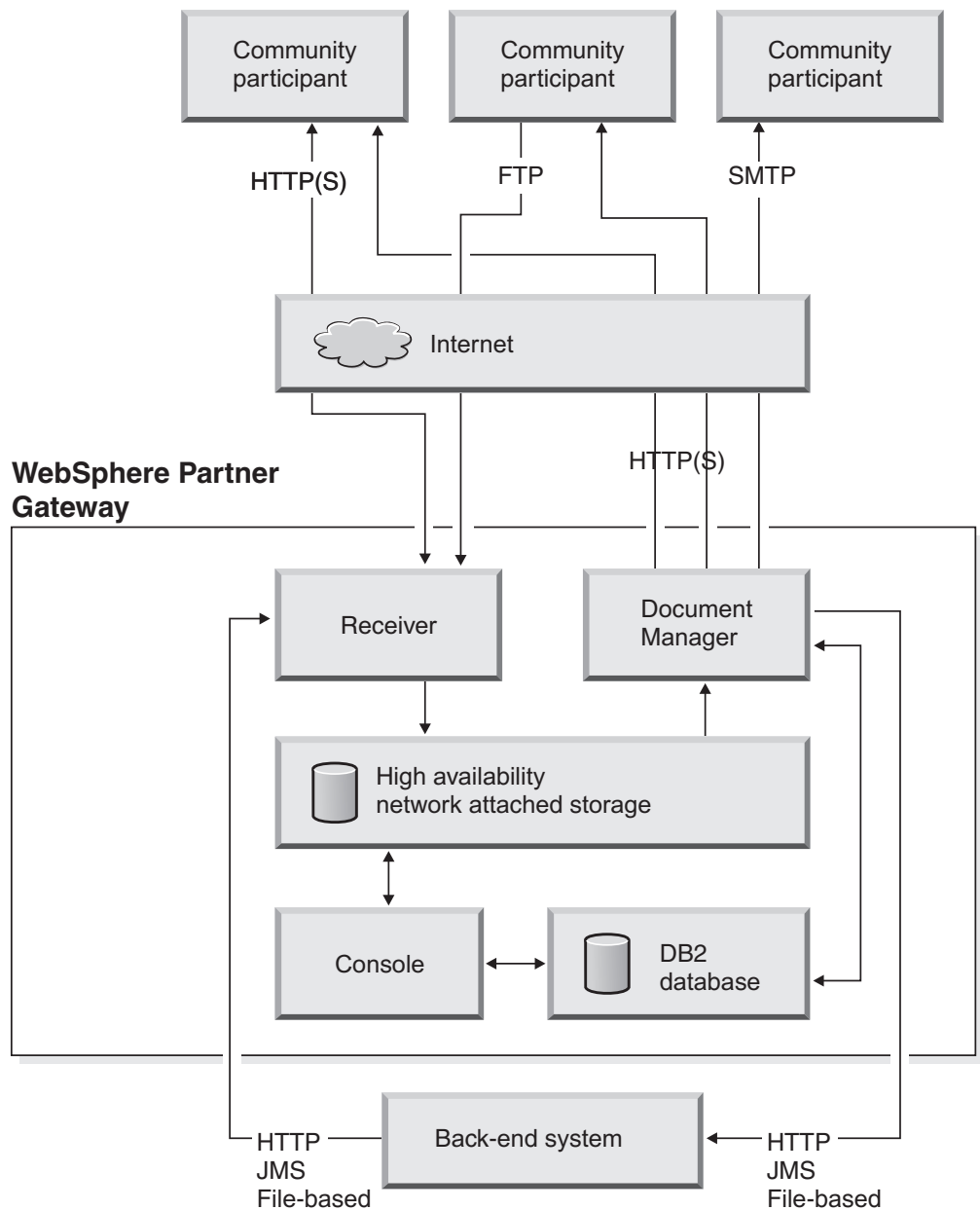Figure 6 shows how the components work together:

Figure 6. WebSphere Partner Gateway runtime components

The sections that follow describe in more detail the runtime components as well as other key elements of WebSphere Partner Gateway.

Receiver

The Receiver component 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.

Receivers are responsible for accepting the inbound document from a particular transport. The Receiver records any transport-specific data (for example, the source IP address and certificate information about the SSL connection) to the metadata file and completes any transport-specific technical acknowledgment (for example, sending a 200 response to an HTTP POST).

Document Manager

The Document Manager retrieves stored data, processes it, and routes it, both to community participants and to enterprise systems. Specifically, it:

1. Reads the raw document and metadata and saves the inbound document to the non-repudiation directory on shared storage
2. 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
3. Delivers data to its intended destination, which could be a JMS queue, a directory, or a URL.

The following sections describe how the subcomponents of the Document Manager perform the tasks presented in the previous list.

Document Processing Engine

The Document Processing Engine performs all of the processing of documents. The Document Processing Engine is responsible for:

- Unpacking documents
- Ensuring that the source of the document is authorized
- Filtering out duplicate documents
- Validating the structure and content of the document
- Translating the document into the format required by the destination
- Packaging the document for the destination, including digitally signing and encrypting the document, if needed
- Storing both the original inbound document and the final outbound document in the non-repudiation repository
- Passing the packaged document to the outbound transport engine

State Engine

The State Engine encapsulates the business rules on a per-protocol basis and executes instructions based on those rules (for example, initiating a retry when no acknowledgment has been received in the defined interval).

Alert Engine

The Alert Engine monitors activity and generates e-mail notifications. You can configure the Alert Engine to specify which alerts are generated, to whom the alerts are sent, and when the alerts are delivered.

Delivery Manager

The Delivery Manager component is responsible for transporting documents to specific destinations, maintaining a separate queue of documents for each destination. A dedicated transport mechanism exists for each destination, so problems delivering to one destination should not affect transport to other destinations.

Community 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. The console provides role-based access control to the various features and views. The 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.

Profile

Partner profile information, which is largely read-only once the system is configured. Changes occur only when profiles are added or deleted, or when an existing profile is updated. See "Profile" on page 20 for more information.

Gateway

A gateway specifies the destination information needed for the Document Manager to send a document to the Community Manager or to another participant. See "Gateway" on page 20 for more information.

Participant connection

Connections define valid interactions between community participants, one of which is the Community Manager. They include information about the document protocol, document type, sending participant, receiving participant, connection type, and source and destination gateways. The Document Manager uses the information in the connection to determine if translation is required and to determine the destination gateway information. See "Participant connection" on page 21 for more information.

Database

A prerequisite DB2 Universal Database Enterprise or Oracle database is used as the data repository. It is used to store data that can be classified in two broad categories: profile information and state management information. The database stores partner profile information and event logs. A single document exchange results in the logging of many events to capture the state transitions of the document.

All information configured through the Community Console is stored in the database.

The data repository is also where guidelines and maps (for validation and translation) are stored, where the state of various processes is recorded, and where trading activity is tracked.

The information stored in the data repository is used by Partner Gateway to provide the administrator with visibility into the entire trading community.

The information stored in the data repository is used by Partner Gateway to provide the administrator with visibility into the entire trading community.

Note that some information (for example, the raw message data in the non-repudiation and message stores) is kept on the shared file system, as described in "File System" on page 18.

The database is used to store the following types of information.

Certificates and IP addresses

The following security information is stored:

- Certificate information used to certify the sending community participant based on the client certificate used during the SSL connection
- Certificates used for encryption and digital signature validation
- IP addresses used to confirm that the source IP address is correct and that documents can be posted from that address.

Alerts configuration

Alerts are defined at a participant level and consist of a variety of attributes to describe event-based alerts or volume alerts.

You can define event-based alerts so that they will be triggered each time the event occurs or so that they will batched, based on an interval. You can also configure the alert with a contact list for notification based on a defined schedule.

Document activity

Partner Gateway logs information to describe documents as they are routed. Details are logged about the document as it was received and as it was transmitted. The following types of information are logged:

- The format of the document, including the source participant, target participant, source protocol, target protocol, source document type, and target document type
- The format of the document, including the source participant, destination participant, source protocol, destination protocol, source document type, and destination document type
- Metrics that describe the size of the document and the time it was received and transmitted
- The state that is logged against a document, describing whether it was transmitted to the participant.

Document events

Partner Gateway uses events to track activities and logs the events in a central event log. The events, which are classified as Informational, Warning, or Critical Errors, can be generated by different components in Partner Gateway.

Events can be tied back to document activity when they are in relation to a document that was routed by Partner Gateway. The events can also track non-document related activities, such as logging into the system.

Summary data

Partner Gateway summarizes key metrics, which can be displayed in the console. The information that is summarized includes:

- The number of documents received, sent, and failed. These counts are summarized by certain attributes by hour.
- The number of events that were generated. These counts are summarized by certain detail attributes by hour.

These counts are rolled up by hour and can be correlated back to the document activity logs.

File System

The following information is stored in the shared file system:

Non-Repudiation data repository

Documents are stored on a disk that has shared access from all components of Partner Gateway (Receiver, Console, and Document Manager). Both the original document (as it was received) and the final document (as it was sent) are stored.

Message data repository

Documents are stored in an unencrypted form for displaying to the console. This disk also has shared access from all components of Partner Gateway (Receiver, Console, and Document Manager).

Communication using JMS

Communication between some components is done using JMS. JMS queues with reliable storage allow the flexibility of locating components on different machines while still maintaining a standard inter-component communication method.

Summary of supported protocols

Partner Gateway includes built-in support for the following transport, messaging, and business protocols. However, with customization, Partner Gateway can support virtually any customer-required protocol.

- Transport protocols: documents can be exchanged with participants over any of the following transports:
  - HTTP or HTTPS
  - FTP or FTPS
  - FTP scripting
  - JMS
  - SMTP
  - File-directory-based
- Business protocols:
  - AS1 and AS2
  - RosettaNet 1.1 and 2.0
  - SOAP (Web services)
  - cXML
- Data types:
  - EDI X12 and EDIFACT
  - XML

- Custom XML.
- Flat files.

The following illustration shows the numerous supported transports for integrating trading participants with Partner Gateway, and Partner Gateway with a back-end system such as ICS.
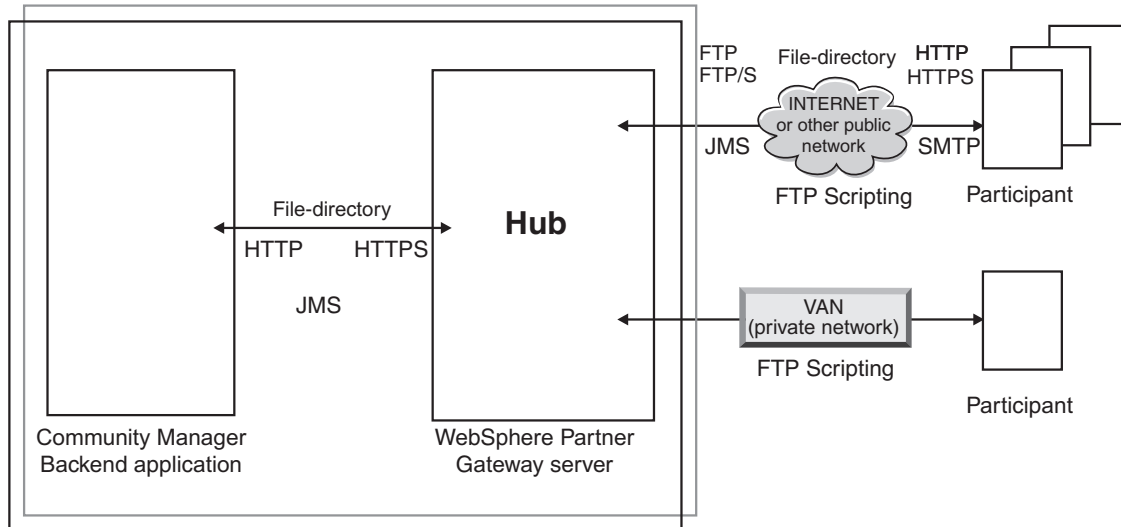

Figure 7. Supported transports for integrating trading participants with Partner Gateway, and Partner Gateway with a back-end system such as ICS.

Configuration requirements

The configuration process define the particular transports, messaging protocols, and business protocols the trading community will support. It also defines the trading community participants, as well as the specific types of documents and protocols valid for each participant to send and receive. To make configuration easier, Partner Gateway comes with predefined configuration elements for all of the industry-standard protocols and formats it supports.

The following elements need to be configured. For detailed configuration information, see the *Hub Configuration Guide.*

Target

A target is an entry point into Partner Gateway. It is an instance of a receiver configured for a particular deployment. You may have multiple targets configured from one receiver. For example, you may configure multiple JMS targets using the JMS receiver. Each JMS target can be configured to poll for inbound documents on separate inbound queues. Each target's configuration specifies which inbound queue the target polls.

A target listens or polls for new documents to be processed by Partner Gateway. For example, it can poll a folder on the file system, a JMS queue, or listen on an HTTP URL for incoming documents from business partners or from a back-end system. A target is used for both inbound and outbound flows. Inbound are coming into Parterner Gateway and outbound are leaving Partner Gateway.

Gateway

A gateway is an exit point out of Partner Gateway. It is used by Partner Gateway to deliver documents to a back-end system or a trading partner. For example, when sending a document to a partner, your WebSphere Partner Gateway server needs a gateway that points to a URL configured on your partner's server. In this case, the gateway points to a remote target on the partner's server. However, a gateway can also point to a resource in an internal network, such as a JMS queue configured as the input queue for WebSphere Business Integration Message Broker.

A gateway is defined by a *gateway definition*, which includes a destination URI, optional login information, and transport-level settings for the gateway.

Profile

A profile is required for each trading community participant. The profile holds participant data, routing information, and console-access authorizations. The participant profile consists of partner information, configuration data for document routing, and console access authorizations. The profile includes information such as:

- Partner data
- Users
- Contacts.

The participant data includes participant names and business identifiers such as DUNS numbers. A single partner can have one or more business identifiers.

Users are accounts that have access to the Partner Gateway console. A user account gets its permissions to interact with the console based on group membership.

Contacts are similar to users; however, they cannot interact with the console, and they can only be configured to receive notifications from the alert system.

Document flow definition

A document flow definition must be defined for each type of document to be processed by Partner Gateway. The document flow definition gives information to the hub about how to process the document:

- The packaging that surrounds the document
- The business protocol that defines the document
- The type of document flow.

There are several parts to a document flow definition. A package defines how a document is to be packaged per a specification for the transport, such as AS2. A protocol describes the general standard that a document adheres to, such as EDI-X12. A document flow details what needs to be done with the contents of a flow. All of these parts have attributes that may apply, providing the runtime the information required to help process the document.

Interaction

An interaction specifies how the document gets processed through Partner Gateway, independent of any participants.

The interaction defines for a received document (package, protocol, and document flow):

- The document to send (package, protocol, document flow)
- The actions to be performed on a document and, optionally, the Transformation map to use.

B2B capabilities

B2B capabilities identify to Partner Gateway the specific document types each trading community participant is authorized to send and receive. Depending on the document type, some characteristics can be set on how the Community manager wants to send or receive the document (as pertains to the participant). A participant's B2B capabilities are defined as:

- The valid document flow definitions for documents to be sent by the participant
- The valid document flow definitions for documents to be received by the participant.
- Any document attributes specific to the participant.

   Note: Attribute values set in the B2B capabilities take precedence over the Document Flow Definition attribute values.

You need to specify the B2B capabilities for each participant by selecting the applicable document flow definitions from the pool that has been defined for the trading community.

Participant connection

A participant connection specifies a valid type of document exchange between a specific participant and the Community Manager. The participant connection is an Interaction that has been associated with specific sending and receiving partners. A participant connection also specifies the gateways and other routing information necessary for that exchange.

Partner Gateway derives a list of valid participant connections for document exchange between the participant and the Community manager using the defined Interactions and partner B2B capabilities.

From the list of valid connections, you need to activate those connections that are actually needed by the participant to send or receive its business documents.

Integration with enterprise systems

Each edition of Partner Gateway provides the ability to connect to back-end integration systems. Partner Gateway - Express provides file-based integration, while Partner Gateway Enterprise and Advanced Editions provide both file-based integration and integration over HTTP, HTTPS, and JMS transports.

Partner Gateway is the entry point for documents coming into the enterprise. It validates, transforms, and otherwise processes the documents, based on their type, and passes them on to a back-end system that integrates the information with other applications. The back-end system can be an integration broker such as WebSphere InterChange Server or WebSphere Business Integration Message Broker, or it can be a customer-developed system.
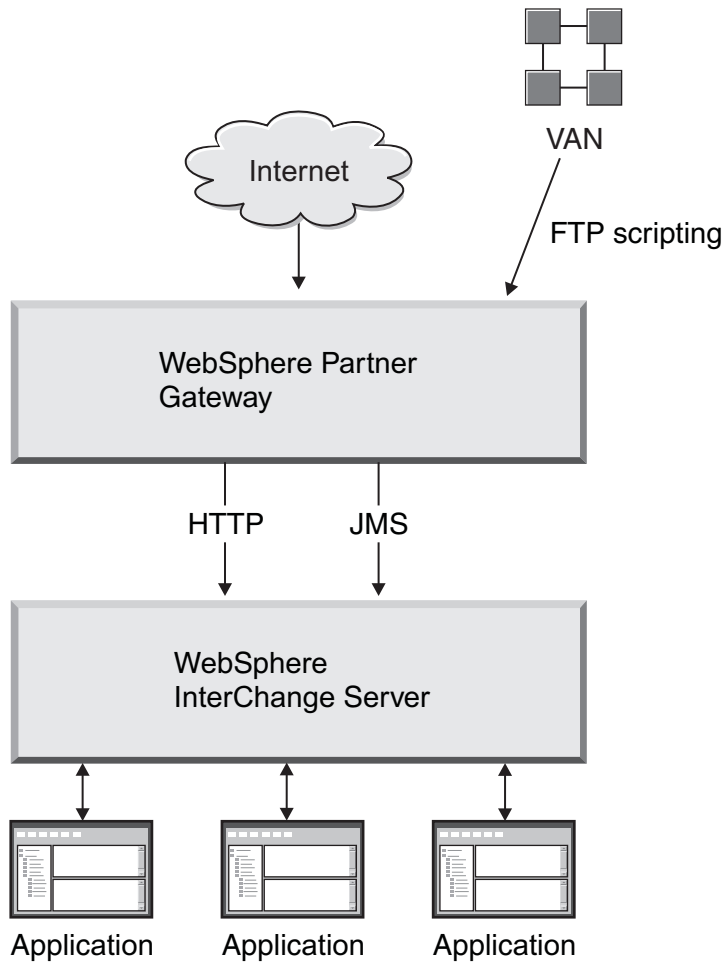
Figure 8. Document flow over the internet or a VAN through Partner Gateway to InterChange Server

A document intended for WebSphere InterChange Server (ICS) can be sent to Partner Gateway by a community participant in a variety of formats such as XML, EDI, RosettaNet, or binary. Partner Gateway can send the document (after transformation, if necessary) to ICS through the HTTP or JMS transport protocol.

Integration with back-end systems is described in more detail in the *Enterprise Integration Guide*.

Sample message flow

The scenario below describes the sequence of events in a Partner Gateway document exchange scenario.

In this scenario, a partner sends an AS2 packaged XML document payload over HTTP. Partner Gateway unpackages the document extracting the XML payload, validates the payload and sends the payload to the back-end using JMS transport. The Partner Gateway also sends back an MDN receipt to the partner.

1. The AS2 request with the XML document enters the Receiver component of Partner Gateway.
2. The Receiver saves the document to persistent shared storage.
3. The Receiver returns an HTTP 200 response to the community participant.

4. The Document Manager picks up the document for processing by the Document Processing Engine and saves the original document to the non-repudiation database. The Document Processing Engine processes the document, which includes:

   a. Performing decryption and verification

   b. Performing authentication and duplicate checks

   c. Determines the sending and receiving of participants based on the business IDs

   d. Determines the payload document type

   e. Based on the sending and receiving partners, AS2 packaging and the XML document type for the participant connection is looked up.

   f. From the participant connection, the Action, Transformation Map (if specified), the document type to send, document attribute values, and gateways are determined.

   g. Performs structural validation per the Action that was specified.

   h. Adds packaging information such as Back-end Integration per the document type to be sent.

   i. Saving the final packaged document to the non-repudiation database.

5. The Delivery Manager sends the document (in this case, using the JMS transport) to the back-end system

6. A message disposition notification (MDN) is sent to the community participant.

7. The community participant acknowledges the receipt of the MDN by sending an HTTP 200.

System configuration options

The component-based structure of Partner Gateway means that it can be configured in a variety of ways—from a single-server configuration to a redundant configuration for high performance or failover support—to meet the needs of your business.

For example, you can install the Partner Gateway components on one server and the prerequisite programs on another, with a firewall in front of each server. Or, you can divide the components and programs among three servers.

To achieve scalability and high performance, you might divide the components and programs among six servers. The following illustration shows such a configuration. Two servers contain instances of the Receiver and the Console, two servers contain the Document Manager, one server contains WebSphere MQ, and one server contains the DB2 database. Firewalls are set up between servers as illustrated. Note that network-attached storage, while recommended, is not required.
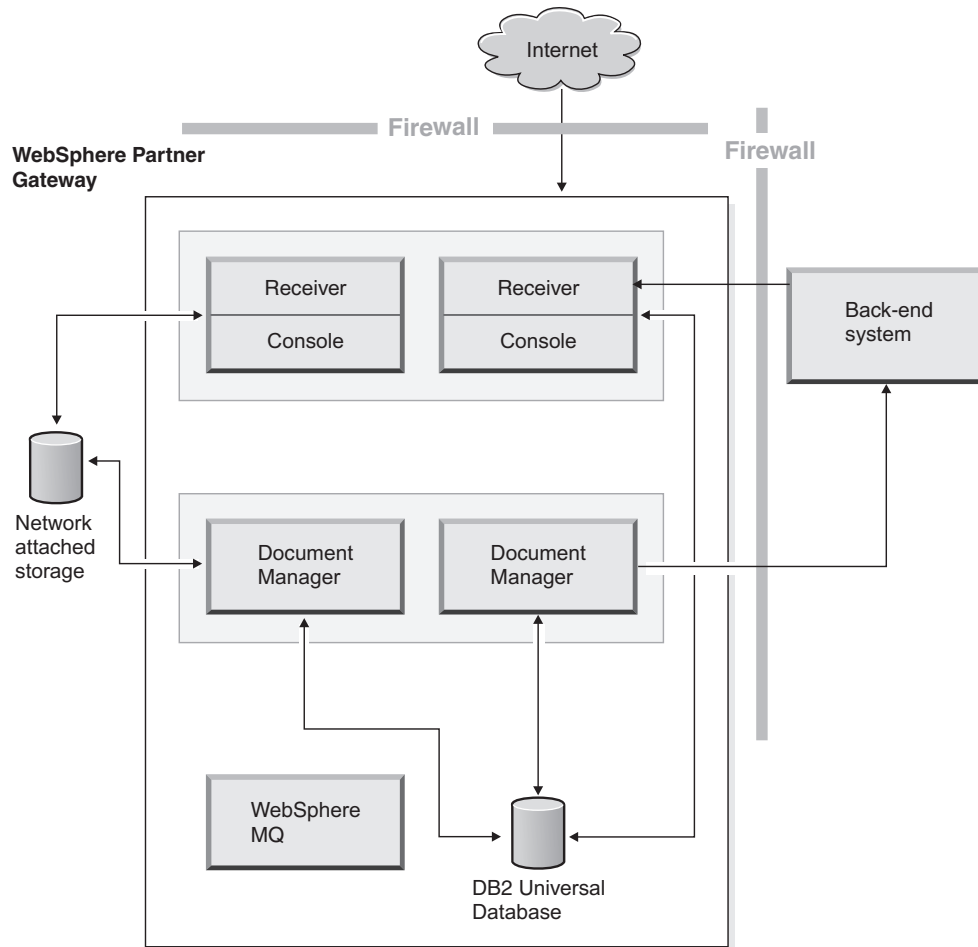
Figure 9. A sample WebSphere Partner Gateway configuration.

All of the components in Partner Gateway are designed to scale both horizontally and vertically, where horizontal scaling is characterized as running multiple instances across multiple servers, and vertical scaling is characterized as adding processing power to a single server.

Having the ability to run any of the components on any server allows for greater flexibility with regard to scaling the system. I/O or compute-intensive components can be deployed on servers optimized for their needs. Also, the shared work queue mechanism allows each component to scale independently of other components.

Chapter 4. Fast paths

This section describes, at a high-level, the tasks involved in setting up and running a Partner Gateway trading community. It also includes pointers to documentation, code samples, and PIP information, you might need to help you get started.

The major steps required to establish a Partner Gateway trading community are the following:

1. Analyze the needs of your enterprise and trading partners:
   - Identify the types of documents that will be sent and received.
   - Examine the content of the documents that will be exchanged and determine how this data needs to be processed.
   - For each document exchange scenario between a participant and the Community Manager, identify the every action that needs to be performed on the document and its contents on its path from the sender, to Partner Gateway, to the back-end system, and finally to the business application.
   - Identify any documents that will require customized processing and determine the customizations you need to make to support those documents. Explore customization options and decide whether you will need to customize any document-handling or workflow.
   - If necessary, work with trading partners to modify the formats or protocols of their business documents to enable their participation in the trading community.
   - Use the Data Interchange Services client to create validation and transformation maps for document content that requires them.
2. Plan the trading community:
   - Estimate the volume of documents that will be exchanged
   - Determine the number of WebSphere Partner Gateway instances you need to deploy.
   - Determine your security requirements. Assess whether your installation requires a reverse proxy server.
   - Determine how you will integrate Partner Gateway with your back-end system.
   - Define the process you will follow for connecting businesses to the trading community.
   - Consider how you will adjust the community to respond to changing business needs.
3. Install Partner Gateway.
4. Configure the hub and define community participants.
5. Perform administrative tasks as needed to maintain the trading community.

The documentation available to help you perform these tasks is listed below.

Partner Gateway documentation

The InfoCenter for WebSphere Partner Gateway Enterprise and Advanced Editions includes the following documents:

Table 1. Documentation set for WebSphere Partner Gateway Enterprise and Advanced Editions

Book	Description and purpose
Information Roadmap	Presents an overview of the documentation set
Product Overview	Presents an overview of Partner Gateway Enterprise and Advanced Editions, and how they fit into the broader WebSphere family of products.
Installation Guide	Leads you through the process of planning for and installing Partner Gateway.
Hub Configuration Guide	Provides step-by-step instructions for configuring the trading community hub and defining community participants. Once you have installed Partner Gateway, proceed to this book.
Administrator Guide	Explains how to perform the administrative tasks needed to maintain the trading community.
Enterprise Integration Guide	Describes how to integrate Partner Gateway with a back-end system such as WebSphere InterChange Server or WebSphere Business Integration Message Broker.
Programmer Guide	Explains how to create user exits to customize document-handling and workflow processing in Partner Gateway.
Mapping Guide	Provides guidance and task-level information about using the Data Interchange Services client to create validation and transformation maps.
Participant Guide	Covers all the information a community participant needs to participate in a Partner Gateway trading community.
PIP Sample	The PIP Sample demonstrates how to set up Partner Gateway and WebSphere InterChange Server to exchange messages when you implement WebSphere InterChange Server as the back-end system. Supported PIPs are included on the product CD. See "Supported PIPs" on page 27 for more information.
Glossary	Presents definitions of terms used in the documentation.

Code samples

To help you configure and customize Partner Gateway to meet the requirements of your enterprise, the code samples listed in Table 2 are provided on the product CD.

Table 2. Description and location of code samples included with Partner Gateway.

Description of sample	Location on product CD
Back-end integration with ICS: HTTP Adapter with RNIF.	Integration/WBI/WICS/samples/RosettaNet/HTTP
Back-end integration with ICS: JMS Adapter with RNIF.	Integration/WBI/WICS/samples/RosettaNet/JMS
Back-end integration with ICS: JMS integration with ICS.	Integration/WBI/WICS/samples/JMS

Table 2. Description and location of code samples included with Partner Gateway. (continued)

Description of sample	Location on product CD
Back-end integration with ICS 4.2.2 using the Adapter for HTTP.	Integration/WBI/WICS/samples/HTTP
Back-end integration with WebSphere Business Integration Message Broker.	Integration/WBI/WBIMB/samples
Use of administrative APIs for trading partner management and systems administration.	DevelopmentKits/AdministrativeAPI/samples
Use of user exits to customize workflow and document-handling.	DevelopmentKits/UserExits/samples

Supported PIPs

Supported PIPs are located in the directory, `B2BIntegrate\rosettanet`, on the product CD. They are also listed in the *Hub Configuration Guide*. The PIP Sample document provides an example of how to set up Partner Gateway and WebSphere InterChange Server to exchange messages when WebSphere InterChange Server is used as the back-end system.

Appendix. Summary of supported business and transport protocols

This appendix summarizes the supported transport and business protocols included with Partner Gateway. Through the use of user exits, the product can also be customized to support additional protocols. See the *Programmer Guide* for more information about customization options.

Table 3. Summary of support for XML and Binary protocols provided by Partner Gateway.

	XML	Binary
Supported version	N/A	N/A
Synchronous transactions?	No	No
Support for passthrough only or support for protocol and document translation?	Both business protocol and document translation supported for XML (XSLT).	No
Attachments supported?	No	No
Specific transactions supported?	N/A	N/A
Security	FTP/S and HTTP/S (HTTP header authentication is supported for outbound).	No
Communication between hub and participants	• JMS • HTTP/S • FTP/S • File directory	• JMS • HTTP/S • FTP/S • File directory
Back-end integration options	• JMS • HTTP/S • File directory	• JMS • HTTP/S • File directory
Samples provided?	Yes. See "Code samples" on page 26.	No

Table 4. Summary of support for AS1, AS2, RosettaNet, SOAP, and cXML protocols provided by Partner Gateway.

	AS1	AS2	RosettaNet	SOAP	cXML
Supported version	N/A	N/A	RNIF 1.1 and 2.0	• SOAP version 1.1 • WSDL version 1.1	Version 1.2.009 is preloaded.
Synchronous transactions?	No	Message Disposition Notification (MDN) only.	Yes	Both request only and request-response operations are supported.	Both cXML asynchronous and request-response (synchronous) are supported.

Table 4. Summary of support for AS1, AS2, RosettaNet, SOAP, and cXML protocols provided by Partner Gateway. (continued)

	AS1	AS2	RosettaNet	SOAP	cXML
Support for passthrough only or support for protocol and document translation?	Both business protocol and document translation supported for XML (XSLT)	Both business protocol and document translation supported for XML (XSLT).	Both business protocol and document translation supported for RNIF to RNSC and vice versa.	Passthrough only.	Passthrough support is primary usage; however, document translation is possible, but will change the behavior for synchronous cXML.
Attachments supported?	No	No	Yes	No	Yes
Specific transactions supported?	N/A	N/A	See "Supported PIPs" on page 27.	Support for RPC and document styles.	Passthrough-support only is available for Punctuate messages.
Security	Business encryption with triple DES. Digital signature hashing with SHA-1 or MD5.	SSL Connection with Server and Client Authentication Business encryption with triple DES. Digital signature hashing with SHA-1 or MD5.	SSL Connection with Server and Client Authentication Business encryption with triple DES and RC2-40 Digital signature hashing with SHA-1 or MD5.	SSL Connection with Server and Client Authentication	SSL Connection with Server and Client Authentication
Communication between hub and participants	SMTP	HTTP/S	HTTP/S	HTTP/S	HTTP/S
Back-end integration options	Payload only using: • JMS • HTTP/S • File directory	• JMS • HTTP/S • File directory	• JMS (when using RNSC) • HTTP/S	HTTP/S	HTTP/S
Samples provided?	No	No	Yes. See "Code samples" on page 26 .		

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