

WebSphere® Business Integrator



Concepts and Planning

Version 2.1

WebSphere® Business Integrator



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Version 2.1

Note

Before using this information and the products it supports, read the information in “Notices” on page 81

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This edition applies to Version 2.1 of the IBM® WebSphere® Business Integrator (program number 5724-A78) and to all subsequent release and modifications until otherwise indicated in new editions.

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About this book

This book is an introduction to IBM® WebSphere Business Integrator (Business Integrator). It provides a detailed description of the system, defines the capabilities of the system, and describes its value to e-businesses.

Who should read this book

This book is for anyone who needs an overview of the concepts and planning considerations of Business Integrator, including:

- Architects responsible for defining and refining business processes.
- Solution developers responsible for creating solutions.
- System administrators responsible for managing the runtime system and solutions, and for performing problem determination.
- Personnel assigned to installing Business Integrator.

The book will also be useful for decision-makers assessing the value of Business Integrator to their business and processes.

The book provides the planning information to allow you to choose the appropriate configuration of IBM WebSphere Business Integrator for your business needs and order the appropriate licenses.

In the case of installation personnel, it is essential to read this book *before* installing Business Integrator. You must understand the concepts of Business Integrator, perform the necessary planning work, and choose a topology before starting the installation.

Before you implement WebSphere Business Integrator

WebSphere Business Integrator uses multiple underlying products and technologies to support the solutions that you create and run. In general, before you implement Business Integrator, you will need to understand the underlying products and technologies that support your solution.

Before you implement Business Integrator, you or other members of your organization will need to be generally skilled in the activities listed below for similar solutions, products and underlying products and technologies. If you and other members of your organization do not possess these skills, you will need to obtain assistance, from qualified services staff, either from IBM or from third parties, to implement Business Integrator. You must be prepared to

use the documentation of the underlying products and technologies. (This documentation is provided with Business Integrator or otherwise from IBM.)

When you plan, install, and configure Business Integrator, you will need to understand how to install and configure some of the underlying products and technologies that you use in your installation. Business Integrator provides the installation of most of the underlying products and technologies into its run time environment. However, you might need to install and configure certain underlying products separately into either the build time or run time environment. You might also need to diagnose and correct installation problems with underlying products and technologies.

Before you design, develop and publish solutions, you will need to be:

- Generally familiar with system integration techniques in a business environment.
- Prepared to use the tools of the underlying products and technologies that your solution requires.
- Familiar with the run time behavior of the underlying products and technologies that your solution requires.
- Familiar with modeling concepts and techniques such as Unified Modeling Language, and related tools, with state machine concepts, and with visual flow composition-modeling concepts and techniques.
- Familiar with Internet and Electronic Data Interchange (EDI) concepts and technologies, if required by your solution.
- Prepared to research the existing applications, systems, and networks that you integrate with Business Integrator.
 - Inside your enterprise, they can be known as legacy systems, back-end systems, enterprise applications, or endpoint applications.
 - Outside your enterprise, they can be known as trading networks, private EDI networks, or similar networks that your solution requires.

Before you deploy, run, manage, diagnose, and tune Business Integrator, you will need to be prepared to use the management, trace, audit, exception handling, diagnostic and related tools of the underlying products and technologies that support your solution. You will need to be prepared to understand the solution itself to the degree needed for these tasks.

Conventions and terminology used in this book

The “Glossary of Terms and Abbreviations” on page 85 introduces the terminology relevant to Business Integrator.

Other useful glossaries

The Web Site at <http://www.ibm.com/ibm/terminology> consolidates several of the main glossaries created for IBM products in one convenient location, including:

- Glossary of Computing Terms
- DB2[®] Glossary
- Tivoli[®] Glossary.

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Chapter 1. Introduction to IBM WebSphere® Business Integrator

IBM WebSphere Business Integrator belongs to a category of business software called an *e-business™ process integration (e-BPI) system*.

An e-BPI system enables companies to create, execute, and manage processes that span diverse applications, enterprises, and people, and to manage those processes—as well as the components that support those processes—as a unified, extensive, flexible solution. An e-BPI system can reduce the time, complexity, and cost of implementing enterprise business process solutions. After solutions have been implemented, companies are able to rapidly change their applications and processes to meet new business needs.

Business Integrator is IBM's offering to meet the need for end-to-end business process integration and management.

Business Integrator enables companies and systems integrators to efficiently architect and implement end-to-end business process-based solutions. It exploits the capabilities of the IBM middleware products that are used in business integration. Using its process choreography capability, it works with these underlying IBM products to choreograph the business process lifecycle. The process choreography capability is key to understanding how Business Integrator adds value beyond the value of the individual underlying products and technologies that are part of Business Integrator. This capability delivers content to individuals based on their roles and on the state of the overall business process.

Business process management

Traditional business processes are owned by the employees of the organization. The organization's employees mediate between the organization's information technology and its customers, suppliers and business partners.

e-business process management is becoming more important to organizations.

Now, e-business processes are being put directly into information technology itself. Information technology systems of the organization can interact with the information technology systems of its customers, of its suppliers and of its business partners.

Introduction

The e-business community has created the need for integrated business processes: *e-business process integration*.

Approaches to e-business process integration

In e-business, a business process is not limited to one application. A single business process can span beyond the boundaries of one enterprise, for example:

- Customer relationship management
- Enterprise resource management
- Trading partner management

In this environment, things can change quickly:

- The organization and its customers, suppliers and business partners can be geographically dispersed.
- Demand can be volatile.
- Availability of material and capacity can change.
- The organization and its customers, suppliers and business partners typically have different information technology systems. These systems can change.

In this environment, information must be constantly updated across different types of information systems, in real time.

One of two broad approaches to e-business process integration can generally be taken:

- Enterprise application suites
- Integration of multiple best-of-breed applications

Each has its own strength and weaknesses.

enterprise application suites

Strengths:

- A single data store, in theory
- A consistent architecture, in theory

Weaknesses:

- It is seldom best-of-breed in its entirety.
- Introduction of an enterprise application suite has a significant impact throughout the organization.
- It can be monolithic and inflexible.
- An enterprise application suite does not fundamentally address e-business process integration. You still have to integrate

applications because many business processes are outside your control. They can span beyond the boundaries of one enterprise.

Integration of multiple best-of-breed applications

Strengths:

- You have a wider selection of functionality from which you can choose.
- It enables you to keep what works. The change can be incremental.

Weaknesses:

- The data store is fragmented.
- Inconsistent architecture: Applications have different security, content, formats, and management.
- Software releases are not synchronized
- It produces a shortage of skills to deal with all the variations.
- Integration of multiple best-of-breed applications does not fundamentally address e-business process integration. e-business process integration requires more than integration.

The Business Integrator approach

It provides the best of both approaches: enterprise application suites and of integration of best-of-breed applications:

- A single consistent framework for integrating all types of applications:
 - Enterprise application suites
 - Best-of-breed applications
 - Legacy applications
- Consistent security, content, formats, management and tooling.
- Process management for both inside and between enterprises.
- Rapid deployment to support rapid change.
- One set of skills to handle a range of applications.
- Industry-leading integration technology from IBM.

To better understand Business Integrator, first, let's look at the key requirements of e-business process integration.

Key requirements of e-business process integration

There are six key requirements of e-business process integration:

- *Connectivity*: Bridging the underlying connection differences that exist between participants, applications, and enterprises.
- *Content*: Mediation of the different ways in which content is represented on different systems throughout the business process.

Introduction

- *Community*: Identification of the participants in the process and the resources and services that they can access.
- *Collaboration*: Enablement of participants to work jointly with other participants on the content used in the business process as well as on the processes themselves.
- *Control*: Management of processes across all the systems and management of the infrastructure.
- *Composition*: Provision of the environment for building and deploying cross-application, cross-enterprise business processes.

Integration of best-of-breed applications can meet the requirements for connectivity and content. However, all requirements must be met in order to make e-business process integration possible.

Connectivity

This requirement addresses how participants in the business process connect. There are several considerations.

Within the enterprise, that is, between applications:

- Semantic differences
- Security model differences
- Platform differences

Between enterprises:

- Firewalls
- Gateways to handle multiple transports and business protocols
- Identification of different enterprises
- Authorization to use resources
- State and session management

Both the transport characteristics, such as HTTPS, the secure Internet protocol, as well as the business interaction protocols, such as RosettaNet, must be addressed.

Content

This requirement addresses the need for a single view of an entity when each application represents the content with different semantics and syntactics.

The content created and used in a multi-application, multi-vendor business process comes from sources that are quite disparate. Content might need to persist over an extended period, and to be used in a number of steps in the business process. A mechanism for normalizing semantic differences is required as well as a capability to maintain data over the process' entire life. Furthermore, the content required in the process will vary based:

- On the user role (that is, each person should only see the information pertaining to him or her), and
- On the stage of the process.

Community

A business process involves a community of participants (persons, organizations or applications) that reside in one or many enterprises and that need access to a number of resources or services through a variety of mechanisms. For security reasons, not everyone or every application should be allowed to have access to all resources or services. A capability to determine the credentials, permissions, and authorizations of each participant is essential.

Because each application and infrastructure component will likely have its own authentication and authorization policy, some sort of central authentication and distributed authorization will be required. Credentials must be propagated both to the applications and to the infrastructure components. Internet security problems must be addressed.

Collaboration

Collaboration in a business process can mean two things:

- To work jointly with other participants on content.
- To work jointly with other participants on the process itself.

Collaborating on content is important because the content itself can vary based on the role of the participant. For instance, in a collaborative forecasting scenario, multiple participants will participate in the same overall business process, but for security reasons, each participant should be able to see only the information that is pertinent to him or her. This requires a mechanism that can coordinate all of the content and that can distinguish which content should be made available to whom.

Collaborating on content becomes particularly important in multi-vendor environments. This environment creates the need to distinguish between:

- Public processes—those that are shared by all the participants.
- Private processes—those that pertain to particular enterprises.

Participants must be able to work on the public processes and still be able to carry out their own processes in private.

Control

Control in a business process can mean two things:

- To control the business process itself.
- To control the e-business process integration system.

Introduction

To control the business process means, for example:

- To start, restart, recover and manage a process.
- To adapt, improve, or rectify a process.

This requires having a full record of what has happened. Therefore, there must be support for business transaction logs that can render information meaningfully to the system administrator.

To meet this requirement is not simple.

A typical business process is made of several process steps which act either in serial or in parallel upon a business entity. A business entity can include a lot of information. For instance, a purchase order can be thought of as a business entity that is acted on by several process steps. Each process step will run independently of each other with its own unique data store that represents information about the business entity. The result is that information about the business entity (the purchase order) is highly fragmented. If something changes in one data store, the information in the other data stores is not necessarily changed at the same time. In fact, a change to the state of information in one data store might be so significant that it warrants a change in how another process step should execute. This complexity has several results:

- Process steps can quickly become unsynchronized.
- Ad hoc situations are difficult to deal with.
- Going back on a process becomes complex.
- Managing exceptions can become quite complex.

To control the business process requires:

- A way to aggregate and reference the information that makes up the business entity (for example, the purchase order) that is stored in multiple data stores, in other words, an entity state mechanism.
- A way to trigger appropriate process steps based on changes of state of the business entity (for example, the purchase order), in other words, a process broker.

To control the e-business process integration system means:

- To control the infrastructure components that facilitate the process.
- In case of failure, to identify the cause of the problem.
- To manage all of these disparate infrastructure components as one system.

Composition

Composition means the capability to build (through modeling) and deploy, and then to modify and deploy, all the elements that enable the e-business

process integration system to be executed and managed. This capability is required to support building and deployment through several perspectives of the business process, for example:

- Business model (flows)
- Information model (data)
- Client model (interactions)
- Application model (adapters)
- System model (directory)

Components of Business Integrator

Each of the underlying products and technologies of Business Integrator provides general functional capabilities. Business Integrator builds on these capabilities. It provides an architectural framework and additional function. In this way, it enables all the components (Business Integrator managers and gateways and underlying products and technology) to be harnessed for a specific purpose: e-business process integration.

You can focus on your business—not on the infrastructure. You can build end-to-end e-business process integration solutions faster.

How Business Integrator works

First, we will discuss the *process choreography capability*, important in understanding how Business Integrator works.

Then we will list the Business Integrator managers and gateways, the key functional components of this product during run time.

Finally, we will discuss the tool for creation of the elements that enable the e-business process integration system, the solution itself. The tool is WebSphere Studio Business Integrator Extensions, running within WebSphere Studio.

Process choreography capability

The process choreography capability is the capability in *Business Integrator* that:

- Aggregates business content that is managed by a variety of underlying processes (also known as *tasks*). One underlying process might be performed by *MQSeries Workflow*. Another underlying process might be performed by an *Endpoint application*. Processes can be performed by different organizations.
- Provides the output of an underlying process to one or more other underlying processes that might need it as an input.

Introduction

- Based on the states of the underlying processes, assigns one state to the overall business process.
- Assigns security privileges to each of the participants across the set of processes.
- Dynamically delivers different views of the business content, based on the point in the business process at which the business content is accessed and on the role of the participant who accesses it.
- Manages the life cycle of the business process.

In summary, the process choreography capability coordinates the set of underlying processes that make up a business process, in order to align the business process with changing business conditions. Many things can happen at any time that can affect what the business process should do next. To align the business process with changing business conditions, the process choreography capability synchronizes information across multiple underlying processes. It maintains the state of the business process apart from the main process.

The process choreography capability is key to understanding how Business Integrator adds value *beyond* the value of the individual underlying products and technologies that are part of Business Integrator.

The *adaptive document* is part of how the process choreography capability is implemented.

How the process choreography capability works

Here is a very simplified description of how the process choreography capability works:

1. You define a common business entity which participates in multiple underlying processes throughout its life.
2. You define the common business entity to have multiple potential states. Each state corresponds with a particular set of processes.
3. You put representations of diverse business content (that reside in the underlying products and technologies) into a common format.
4. You programmatically watch for changes to the business content in the underlying products and technologies. For example, you could establish a trading partner agreement and specify that you want to be alerted of changes to certain types of information.
5. You define a central point of user authentication and assign user rights to the business content.
6. New business processes can be redirected and triggered based on changes of overall state.

7. Business content is dynamically rendered, appropriate for a given participant, based on the point in the business process at which the business content is accessed and on the role of the participant who accesses it.

Examples of the process choreography capability

Several examples show various facets of the process choreography capability.

The state of the overall business process changes based on changes in business content in each underlying process. One underlying process can provide input to other underlying processes.

Consider a travel reservation business process. It consists of a travel agency process, an airline process, a hotel process and an automobile rental process. It uses a business entity called “travel itinerary”. The travel agency process executes first to prepare the travel itinerary. Its output is reflected in the business entity “travel itinerary”. Its output is used as an input to the other processes. The state of the overall travel reservation business process is based on the states of each of the underlying processes. After the travel agency process is complete but before the other processes have started, the state of the overall business process is *ready*. The other processes cannot start until the state of the overall business process is ready.

The view of business content changes based on the role of the user who accesses it and the process context in which it is brought into focus.

Consider a forecasting business process that is used in a retail environment by product buyers and customer demand planners. As the forecasting process is executed, information changes both in scope and detail based on who is viewing it and when. For instance, a buyer and a demand planner have different information needs. This ability to ensure that each individual sees only the information that is pertinent to him or her is critical—particularly in e-business process integration:

- A buyer might be required to forecast data and have the capability to import and export data.
- A demand planner might need to be able to view data and use a range of analysis tools.

The business content that they view might be different. The business content is rendered only at the point of presentation to the individual, to take into account that they might be using different presentation devices.

Business Integrator managers, gateways and tooling

Business Integrator *managers* and *gateways* are functional components of the overall run-time system—not separate products. They work with the underlying products and technology components to orchestrate the overall e-business process integration solution.

There are several Business Integrator managers and gateways:

- “Business Flow Manager” on page 11
- “Trust and Access Manager” on page 12
- “Information Delivery Manager” on page 14
- “Interaction Manager” on page 14
- “Solution Manager” on page 17
- Gateways, a type of component of Business Integrator that performs messaging between the trusted zone and the Internet or an EDI network:
 - “Partner Agreement Manager” on page 17, for the Internet
 - “DataInterchange” on page 18, for EDI

Business Integrator’s tooling is WebSphere Studio Business Integrator Extensions, commonly called *Solution Studio*. It supports a set of tools that allow the creation of the solution, in the form of a *solution template*.

Multiple configurations to meet different business needs

There are several configurations of Business Integrator that meet different business needs. See “Chapter 6. Planning” on page 63 for which configuration of Business Integrator contains each manager and gateway component, as well as each underlying product and technology component.

Chapter 2. Business Integrator run time

This chapter discusses Business Integrator at run time.

Overview

Business Integrator run time functions are provided by several managers and gateways that are described in the following sections.

Endpoints

In order to discuss Business Integrator managers and gateways, we need to define one term, Endpoint.

An Endpoint application is any business application that resides on an Endpoint machine together with an application adapter. Endpoint applications are typically called legacy applications or enterprise applications. Examples of such applications are SAP, Siebel, i2 or Ariba applications. An Endpoint is a machine within the trusted zone that contains one or more Endpoint applications. A Business Integrator system can contain one or more Endpoint machines. Java™ connection enabled Endpoints are also supported as shown in Figure 2 on page 21.

A significant portion of the Business Integrator run time functionality, called an Endpoint facility, is installed on each Endpoint. The Endpoint facility consists of a portion of Information Delivery Manager (MQSeries™, MQSeries Adapter Kernel and application adapters). An Endpoint facility provides access via one or more application adapters to Endpoint applications to enable messaging within Business Integrator.

Business Flow Manager

Business Flow Manager is the center of the run time functionality. It combines the strengths of:

- MQSeries Workflow, the flow control engine, and
- WebSphere Application Server, the business object manager.

It supports the process choreography capability. See “Process choreography capability” on page 7. In so doing, Business Flow Manager separates the flow management (that is, the definition and execution of control and data flows, assignment of tasks to people and applications, and the maintenance of the long-running state) from the application logic that resides in Endpoint applications.

Business Integrator run time

The Business Flow Manager manages the state of adaptive documents. An adaptive document is the primary mechanism for delivering role—sensitive and process-sensitive dynamic business content.

Business Flow Manager helps enable:

- Transactional integrity and intelligent process management over each Endpoint application in the business process, that is, over diverse applications and across enterprise boundaries.
- Greater business control and flexibility, such as the ability to go back in a business process or to handle ad hoc situations.
- Examination of the process to enable refinement.

Business Flow Manager also supports the JMS Listener and associated worker message beans as well as access to MQSeries Workflow by means of WebSphere Workflow, WebSphere Workflow Services and workflow collaboration support.

Trust and Access Manager

Trust and Access Manager uses a central security engine, Tivoli® Policy Director, for centralized authentication. It then correlates and propagates security credentials as digital certificates to Endpoint applications such as SAP, Siebel, i2 or Ariba applications and to the underlying infrastructure products and technology components such as MQSeries Integrator, MQSeries Workflow and Partner Agreement Manager for authorization. Endpoint applications then authorize separately.

Trust and Access Manager helps support global signon, in which an end user can sign on once and thus be authorized to use multiple Endpoint applications.

Security

Solutions to business problems must consider security comprehensively to include enterprise-wide security policies, standards, and processes. Their development and deployment must ensure that the overall network is secure and appropriate mechanisms are in place to mitigate anticipated security risks.

For security, the Business Integrator run time environment is divided into three zones: the trusted zone, demilitarized zone (DMZ), and outside world. The trusted zone is a protected environment that ensures the integrity of data and allows processing of sensitive and classified information. This is where the business processing occurs. A DMZ lies between two firewalls and prevents direct access to the run time trusted zone. The outside world is a non-trusted zone. All clients enter the Business Integrator run time trusted zone from the outside world through the web.

Within the DMZ and between firewalls, SecureWay® Policy Director WebSEAL, a secure web proxy server, provides the only exposed entry point for requests for services from web clients. WebSEAL provides a junction point for authentication and authorization.

The managers (but not the gateways) in the run time environment use the Trust and Access Manager for security. Trust and Access Manager uses a mix of directory and security services to handle authentication, authorization and policy administration. It is also responsible for name resolution and directory access.

Trust and Access Manager, in turn, uses two software products to fulfill its security functions:

IBM SecureWay Directory

Uses the Lightweight Directory Access Protocol (LDAP) and serves as the central repository that stores and makes accessible to administrators the authentication information, such as user IDs and passwords, and group memberships.

IBM SecureWay Policy Director

This serves as the way to manage authentication and authorization.

In addition, WebSphere security is enabled to provide security for WebSphere resources. WebSphere Application Server performs authentication and authorization to ensure that only authorized users can access enterprise beans.

Authentication: Authentication is a method for verifying that a user requesting services is who he claims to be. Business Integrator provides for authentication in two ways. For the Entry configuration, authentication is provided by Lightweight Third Party Authentication (LTPA), a WebSphere protocol. For Enterprise configuration, authentication is provided by WebSphere, WebSEAL, and IBM SecureWay Policy Director.

Authorization: Authorization is a method of determining what services and Business Integrator resources the authenticated user has privileges to use.

Audit: Business Integrator provides audit logging for security related activities. Audit capabilities are provided by:

- WebSEAL/Policy Director
- WebSphere Application Server
- DataInterchange

Non-repudiation: Non-repudiation prevents the sender of information from claiming that information was never sent.

Business Integrator run time

Non-repudiation logging is provided by Partner Agreement Manager for the receipt of trading partner messages.

Delegation/propagation: Delegation and propagation is supported within a WebSphere domain by passing an LTPA token as a cookie.

Privacy/integrity: This service allows the recipient of information to verify that it has not been modified in transit. Any attempt to modify data or to substitute a false message for a legitimate one can be detected.

Information Delivery Manager

Information Delivery Manager acts as a distributed infrastructure for data interchange, a *message bus*, within Business Integrator. It sends messages:

- Between the gateways and the Business Flow Manager.
- Between the Business Flow Manager and Endpoints.
- Between the gateways and Endpoints.

The messages are typically in a common canonical format, that is, in an application-neutral format such as a Business Object Document in Extensible Markup Language (XML).

The Information Delivery Manager can perform assured delivery of messages, transformation of data elements and related functionalities, routing of messages, and message brokering. This functionality is performed by MQSeries Adapter Kernel using adapters that you build with MQSeries Adapter Builder, along with MQSeries for assured delivery, and optionally MQSeries Integrator for message brokering services such as complex routing, data transformation, and data mediation.

Information Delivery Manager also passes security credentials to Endpoint applications and provides an audit record of exchanges across boundaries.

Interaction Manager

Interaction Manager renders a view of a business entity that is appropriate to the role of the end user based on:

- The end user's authorization, and
- The point in the business process.

Interaction Manager provides:

- JSPs to provide the user interface to a Business Integrator solution.
- Servlets to handle logon, workflow, and access to Business Flow Manager.
- An inbox to notify users of new work items.
- A navigation framework to render role-specific, tree-structured links to access services that are hosted by the solution.

- Rules based filtering and rendering of content based on the user role in a solution.
- View support for creating and rendering adaptive documents that are accessed through the Business Flow Manager.
- An AServlet API with tooling support that is used to organize controller servlets and classes in a Model View Controller architecture.

Note: Interaction Manager provides device specific logon views. When a solution is developed, the solution must handle the rendering of information on different devices that are supported. (Not all devices are supported.) For example, presentation on a personal computer is different than the presentation on a personal digital assistant.

Interaction Manager presents a *role-based desktop* to the end user, typically in a web browser. It consists of:

- A title bar.
- A left-hand pane containing all the services that the user's role is allowed to perform.
- A right-hand pane containing the work area.
- And (depending on the Business Integrator configuration) an associated inbox window that contains work items that the end user can pick to work on.

Figure 1 on page 16 shows a sample desktop as it could be rendered on a user's desktop utilizing the type of default view provided by Interaction Manager.

Business Integrator run time

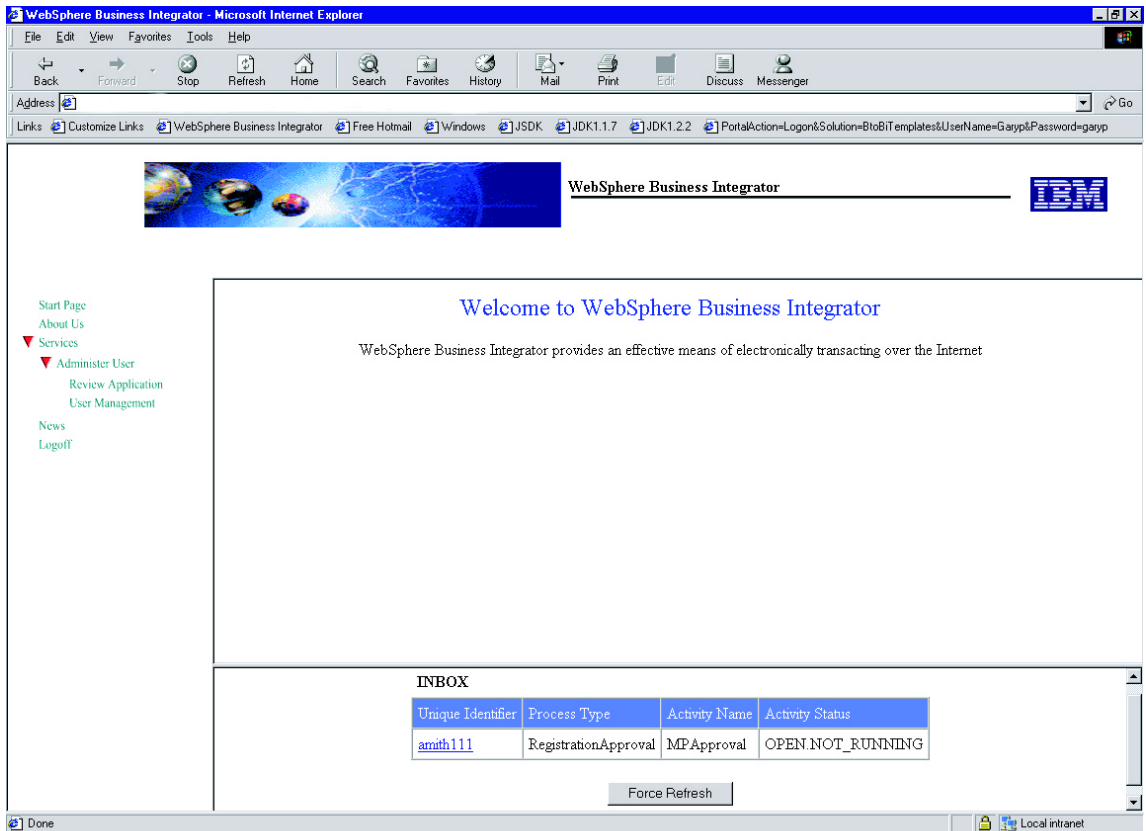


Figure 1. Sample Interaction Manager User Desktop (default view)

In response to the end user's request, Interaction Manager gets the content of the view that it will render from the Business Flow Manager, as the result of the Business Flow Manager's process choreography capability.

The Interaction Manager renders the content of the view in a form that is compatible with the end user's browser. Device specific rendering for devices such as personal digital assistants must be handled by the solution. (Not all devices are supported.) How the content is rendered depends on the target device that the end user is using to view the content. For example, presentation on a web browser might be different from the presentation on a personal digital assistant.

Interaction Manager runs within the WebSphere Personalization Server. Interaction Manager is not involved when the content of the view is delivered by one of the gateways.

Solution Manager

Provides the infrastructure for monitoring and managing the Business Integrator system as well as audit logging, exception logging and tracing. Solution Manager provides these consoles and services:

Platform Console

Is used to deploy solutions, start and stop underlying products, and view the status of machines, facilities and solutions. See “Platform Console” on page 29.

Product Console Launchpad

Is used to monitor the Business Integrator run time and launch the management consoles of the underlying products of Business Integrator. See “Product Console Launchpad” on page 32.

Solution Console

Is a web-enabled interface that provides access to log data that is persisted by the Audit Log server, the Exception Management server, and the Trace server. See “Solution Console” on page 35.

Solution services provided are:

- Logging of trace, audit, and exception data.
- Event services
- Console functions to manage the run-time services and to view and manage the content of logs.

Gateways

Partner Agreement Manager

The Partner Agreement Manager gateway provides the capability for exchanges with trading partners over the Internet, using a variety of business protocols (channels) between the partners. Partner Agreement Manager therefore facilitates the integration of inter-enterprise business processes, as opposed to the intra-enterprise business processes that are integrated with the rest of the Business Integrator product suite.

The Partner Agreement Manager gateway is provided by these products:

- **Partner Agreement Manager**, which provides gateway connectivity, through the definition of public processes that are shared between partners, and the use of integration adapters and tooling. Tools that allow the creation of solution artifacts specific to the Partner Agreement Manager gateway can be launched from within Solution Studio.
- **Partner Agreement Connect**, which can be used as a limited-function alternative to Partner Agreement Manager in the Entry configuration. Partner Agreement Connect does not allow the definition of new public processes, and supports a limited number of trading partners. Partner

Business Integrator run time

Agreement Connect would be used as the spoke of a trading hub, where the hub owner wishes to control the public process definitions of its participating partners.

- **Partner Agreement View**, which enables the connection of Web applications to Partner Agreement Manager, to allow users to interact with public processes and business objects through the Internet.

Access control on inbound messages from trading partners to Business Integrator and on outbound messages from Business Integrator to trading partners is performed by the PAM Proxy Server, which resides in the DMZ.

The Business Process Integration Adapter provided by Business Integrator enables Partner Agreement Manager to work with the rest of Business Integrator. The Business Process Integration Adapter packages XML message payloads from a public process into message formats that can be transported by Information Delivery Manager to Endpoints or to the Business Flow Manager. It packages messages from Endpoints or the Business Flow Manager into message formats that can be sent through a public process. The Business Process Integration Adapter manages the correlation information that is necessary to bind public processes in Partner Agreement Manager with business processes in the Business Flow Manager. For information about Business Process Integration Adapter, refer to the *WebSphere Partner Agreement Manager Business Process Integration Adapter Guide*.

The Partner Agreement Manager gateway can be managed from the Business Integrator Solution Manager, for example, to allow the configuration of trading partners at run time.

DataInterchange

DataInterchange provides an EDI channel for message transformation and transport to and from EDI connected partners.

Three DataInterchange transports are:

- MQ EDI Services
- IBM IE
- IBM Base MQSeries

DataInterchange includes the following features:

- Flexible setup and administration
 - Online customization of standards, maps, and trading partner relationships.
 - Mapping designed to support:
 - Literals/constants.
 - Accumulators, arithmetic and logical operations.
 - Qualified loop and element mapping.
 - Hierarchical loop mapping.

- Envelope field mapping.
- User exits at the field level.
- User-defined translation and validation tables.
- Boolean logic.
- Maps can be used by one or more trading partners.
- Export/import available to move user data between test and production systems.
- Superior translation capability
 - Syntax checking.
 - Test and production support.
 - Ability to translate and envelope separately.
 - Flexible command language interface.
 - Interactive, batch, event-driven, and real-time processing.
 - Automatic generation of functional acknowledgments.
- Versatile communications
 - Support for networks and direct connections to trading partners.
 - Ability to resend individual transactions or entire envelopes.
 - Support for MQSeries queues as a means of exchanging data between trading partners.
- Extensive reporting and auditing
 - Reporting of trading partner relationships, including the transaction set being used, and the last communication with a trading partner, and others.
 - Reporting of envelope and transaction status for both online and batch processing.
 - Exception reporting.
 - Setting acceptable error levels for the trading partner/map combination.
 - Reporting of SAP status for online and batch processing.
 - Optional audit log with archive recovery capability.
- Standards support:
 - Multiple versions and releases of standards.
 - Electronic standards distribution to speed delivery of new standards.
 - Ability to migrate a map from one version/release of a standard to another, or from one transaction to another.
 - Online creation and customization of standards.
 - Full standards compliance checking (user option).

For more information about DataInterchange, see *WebSphere Business Integrator DataInterchange for Windows NT User's Guide*.

Putting run time concepts together

Now that we have discussed the components, that is, Endpoints, each of the managers and the gateways, let's look at a simplified diagram of the run time environment. Figure 2 on page 21 shows the Enterprise configuration, along with Partner Agreement Connect (from the Entry configuration) on the far left. Partner Agreement Connect can be provided to trading partners to act as a spoke, to enable them to connect to the hub. You can get a general sense of the flow of information through the trading partner environment and within the enterprise.

This is a general, logical view of functionality, not a view of the layout of all physical machines for planning or licensing purposes. The boxes, circles and icons show major components and major units of functionality. Other components are not shown.

The arrows show the general flow of business information during run time under normal conditions. Each arrow can represent one or more messages or invocations.

Business Integrator run time

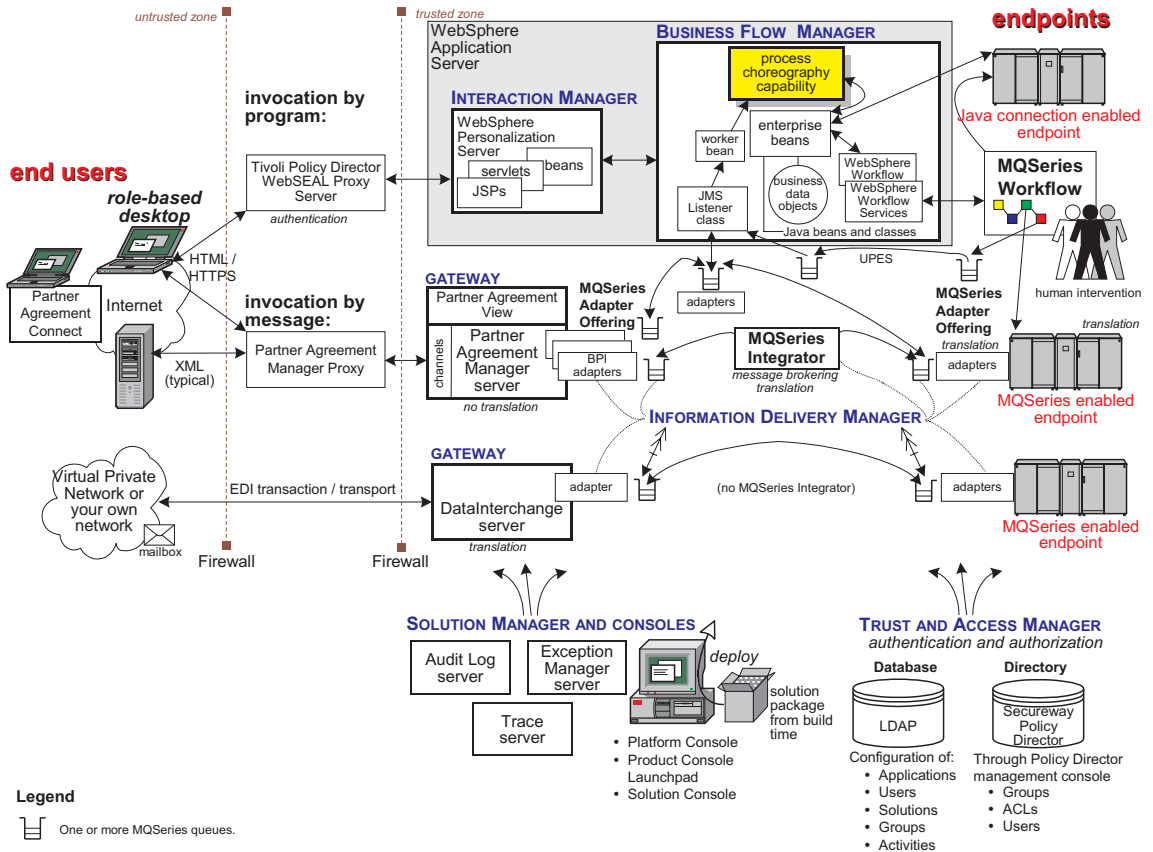


Figure 2. Run time environment (logical view)

The end users are on the left. They can access Business Integrator via the Internet or via EDI. Notice the *role-based desktop* in the top left corner.

The Endpoints are on the right. They can be legacy applications or back ends or enterprise applications. MQSeries Workflow is on the right also. It can support interaction with people as well as with Endpoints.

At the bottom of the figure are Solution Manager logs and consoles and Trust and Access Manager. They interact with many other components of Business Integrator. The diagram does not show the interactions of these two managers with the rest of Business Integrator. Parts of Solution Manager reside on the other managers, but this is not shown. Some Trust and Access Manager components are not shown here.

Business Integrator can be invoked in several ways, as shown. Proxies help handle authentication.

Business Integrator run time

The Interaction Manager handles interaction with end users' browsers. The gateways, Partner Agreement Manager and DataInterchange, interact via messaging. They work via adapters provided with Business Integrator.

The Interaction Manager invokes the Business Flow Manager, where the process choreography capability and a wide variety of other functionality can reside, depending on your solution design. The Business Flow Manager invokes MQSeries Workflow, which in turn can reply to it.

The Business Flow Manager can also be invoked via a message by one of the gateways, either Partner Agreement Manager or DataInterchange. It also can be invoked via a message by an Endpoint.

Messaging within WebSphere Business Integrator is handled by the Information Delivery Manager, consisting of MQSeries, MQSeries Adapter Kernel and optionally MQSeries Integrator (acting as a message broker).

Administration, authentication, authorization, and logging of exceptions, trace and audit are not shown.

Chapter 3. Creating a solution

The tooling for Business Integrator is WebSphere Studio Business Integrator Extensions, commonly called *Solution Studio*. You create solutions using Solution Studio during the solution development life cycle.

For detailed information about creating solutions, see the *WebSphere Studio Business Integrator Extensions Developer's Guide*.

Solution development life cycle

The development life cycle has three major phases:

Design

During this phase, existing business processes are examined to identify ways they can be improved or streamlined. Parts of the design phase can be performed using tools. The business problem is clearly defined in the following terms:

business process

Defines the improved process flow

tasks Identifies the tasks of the process

information

Identifies the data exchanged during the flow of the process

organization

Defines the role players who perform the tasks

This phase results in a design for a solution that can be developed during the next phase.

Development

During the development phase, the artifacts of the solution are created according to the specifications produced in the design phase. Then a solution package is published that can later be deployed.

Deployment

During the deployment phase, the solution package is moved to the run-time environment, where it is installed, configured, and activated.

Some of the files that can result from the design phase can be imported into Solution Studio for use in the development phase. The development phase takes place in the build-time environment under Solution Studio. The deployment phase takes place in the run-time environment.

Business Integrator tooling: WebSphere Studio Business Integrator Extensions

Solution Studio supports a set of tools that allow the creation of the solution, in the form of a *solution template*.

The solution template is a representation, at build time, of the business process that the solution is intended to carry out later at run time. In a business domain, such as supply chain management for example, the solution template contains the following:

- A business process model that defines the business process, for example, in the areas of enterprise integration, planning, forecasting, replenishment, scheduling, order management, and transportation. A typical business process is called “purchase order”.
- A system registry that defines the run-time repository. The repository contains system configuration and solution-specific information such as users, roles, and trading partner profiles.
- Business objects, which define the distributed objects necessary to support the business process.
- Adapters, which define the connection between gateways, the Business Flow Manager and *Endpoints*.
- Business flow, which provides a detailed view of the business process.

Solution templates typically can be reusable assets, and are key to Business Integrator’s added value.

All deployable files that make up a solution are called *artifacts*. Artifacts can be any of the following, which is not an exhaustive list:

- Executables, such as enterprise beans, Java beans, Java Server Pages, servlets, MQSeries Adapter Offering adapters, and various class files.
- Configuration files, such as MQSeries configuration files that control queues, LDIF (LDAP configuration) files, MQSeries Integrator MRP files, Policy Director map files, and files that control personalization.
- Other content, such as HTML files.

You create artifacts by means of Solution Studio and its associated tools such as VisualAge for Java, MQSeries, MQSeries Integrator, MQSeries Adapter Offering, WebSphere Application Server, Partner Agreement Manager and others.

Artifacts for one solution may be used for other solutions. You can modify a solution that you had created as a solution template for another purpose, thus enabling re-use.

By creating artifacts through Solution Studio, you create the solution template. You publish the solution template as a solution in a *solution package*. Then you deploy the solution into the run-time environment.

Developers can use existing projects as solution templates.

User interface

Solution Studio uses WebSphere Studio and its graphical user workbench as the integrated tool launchpad that you can use to create solutions. A group of wizards extends the capabilities of WebSphere Studio by:

- Launching other products' tools for creating and configuring artifacts.
- Performing tasks such as registering tools and managing solutions in the build-time environment.
- Publishing the solution package through the Publishing Wizard, in the form of a zip file that later can be deployed.

A complete list and explanation of the wizards appears in the *WebSphere Studio Business Integrator Extensions Developer's Guide*.

See Table 1 for examples of some tools that are launched.

Table 1. Some Solution Studio tools

Tool	Artifact type
VisualAge for Java	Server and client side enterprise beans (these can be entity, session or enterprise beans) and servlets
MQSeries Adapter Builder	Application adapters and microflows
MQSeries	Message queues
MQSeries Integrator	Message mapping and translation
MQSeries WorkFlow	Workflows
WebSphere Studio Page Designer	HTML and Java Server Pages
Partner Agreement Manager Public Process Editor	Public Processes

Other tools can be registered for use and launched.

Refer to the Solution Studio online help for detailed information about Solution Studio wizards and instructions for creating artifacts and publishing solution packages.

Build time repository

Solution Studio provides a repository for storing the artifacts and elements of a solution during build time: the Rational® ClearCase® LT repository. Solution

Creating a solution

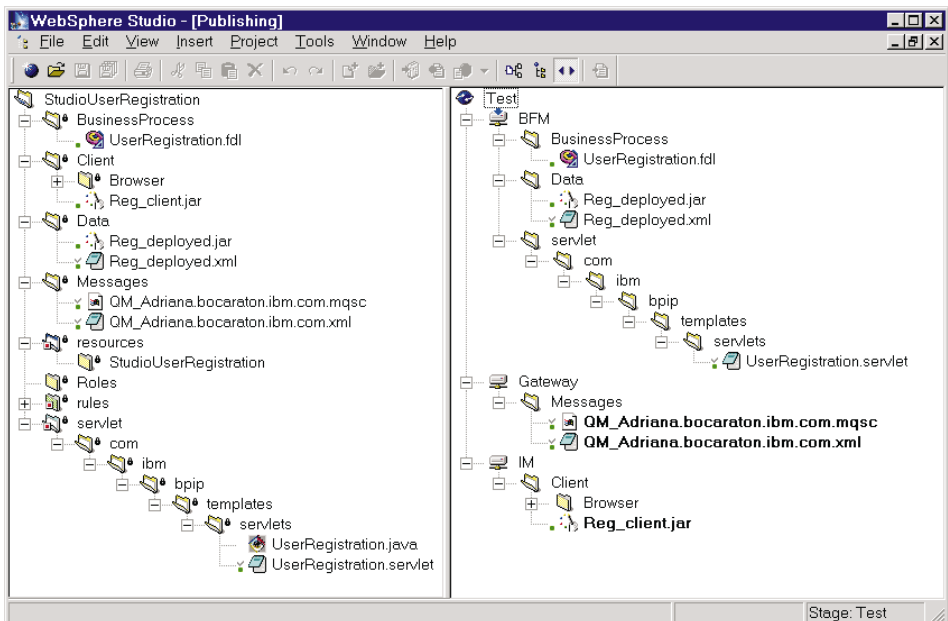
developers can keep a solution organized from the design phase through the creation of a deployable solution package. File checkin to and checkout from the repository is implicit through WebSphere Studio.

The artifact files for a solution under development are imported from the tool that was used to create them to a WebSphere Studio project folder. The “project” uses the familiar tree directory structure with folders and subfolders. The files are implicitly stored in the versioned object base of the repository. The repository is located on a server and is accessed by ClearCase LT client software running on the machines used by developers of solutions. This client-server model allows individuals or groups to work in parallel to develop one or more solutions or several elements of a solution at the same time. The repository stores the work in progress, performs change management, and performs version control.

Developers can use existing projects as solution templates, thus enabling re-use.

Example of a solution template

Standard solution templates can be installed into Solution Studio. You can modify these templates to fit the needs of your particular solution. These templates appear as folders in a directory tree structure in the project view of WebSphere Studio. The following figure is an example of a solution template.



Deploying a solution

The deployable solution package contains all solution artifacts and the associated configuration scripts logically grouped and targeted for a particular manager in the run-time environment. One solution package may contain artifacts for multiple managers, but they are grouped within the package such that each group of artifacts is targeted for a single logical manager. It also includes any instructions for manual configuration of products in the run-time environment that are not automatically configured via programmatic changes.

Deploying a solution is a two-step process:

- You publish the solution package in the build-time under Solution Studio.
- You deploy the solution through a wizard, the Solution Deployment Wizard, in the run-time environment. It distributes the solution elements to the correct machines, and installs, configures, and activates them. For details on deployment, refer to the *WebSphere Business Integrator Run Time* book.

Creating a solution

Chapter 4. Managing the run time

This chapter provides an overview of the tools provided for the management of the Business Integrator run-time system. These tools are provided within the Business Integrator Solution Manager:

- The Platform Console, which you use to monitor and manage the resources and applications of Business Integrator, and to deploy solutions to the run-time system. See “Platform Console”.
- The Product Console Launchpad, which you use to monitor and manage the base products of Business Integrator and their components. See “Product Console Launchpad” on page 32.
- The administration consoles of Partner Agreement Manager, DataInterchange, and MQSeries Integrator, which are installed on the same machine as the Product Console Launchpad.
- The Solution Console, which you use to monitor and manage a solution, and which provides access to audit, exception, and trace data. See “Solution Console” on page 35.

Platform Console

The Platform Console allows you to manage resources and applications in the Business Integrator system from a single point. The resources and applications that you can manage are those that have an associated Managed Bean (MBean). MBeans are part of the Java Management Extensions (JMX) architecture.

The Platform Console (see Figure 3 on page 30) is based on a *topology* explorer GUI framework. Therefore, when you run the Platform Console, a tree view of the topology is displayed in the left-hand pane. The status icons in the console provide an overview picture of the system status. You can navigate through the tree structure and select individual *nodes* representing containers (for example, WebSphere Application Server) and their artifacts (for example, enterprise beans). For more information about topology, see Chapter 5.

For those nodes that have an associated MBean, you can start a management dialog either by right-clicking on the node, or from the main menu. The management dialog depends on how the MBean has been implemented, but by default it displays:

- A table of the properties available via the MBean together with their current values (a combination of read-only and read-write fields)

Managing the run time

- A list of the management operations available, with a means of entering arguments

The management operations that you can perform are typically:

- Start the object or service that the MBean represents
- Stop the object or service that the MBean represents

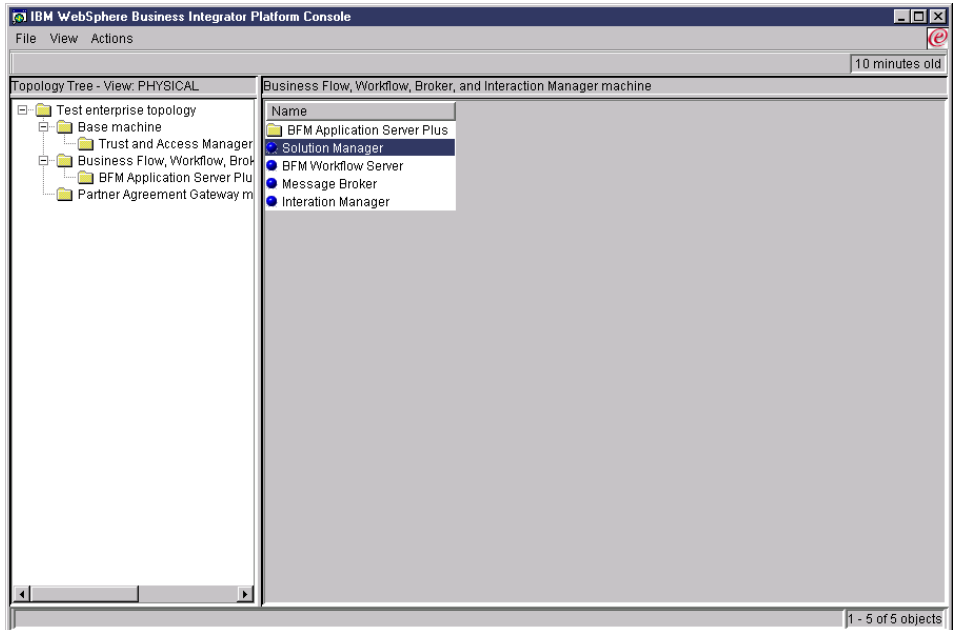


Figure 3. Platform Console

For more information about using the Platform Console, refer to the *WebSphere Business Integrator Run Time* book, and the online help information.

The Solution Deployment Wizard

The Platform Console provides a wizard for deploying solution packages onto the run-time system.

As mentioned in “Deploying a solution” on page 27, solution packages are created using the Publishing Wizard in Solution Studio. This involves identifying the artifacts of the solution to be deployed, grouping them into solution elements destined for a single target machine, and *logically mapping* those elements to run-time Business Integrator components. For example, a solution element containing a group of enterprise beans would be mapped to Business Flow Manager and its subcomponent WebSphere Application Server.

A solution package contains the elements of the solution, and for each element, associated metadata used in deploying the solution. Within the package there are scripts for each solution element that drive the automatic installation and activation of the solution element on the target machine in the run-time system. When automatic installation or activation of a solution element is not possible, there is instead a text file containing instructions for the manual installation and activation required.

To perform the deployment, the Solution Deployment Wizard calls a deployment application that runs on top of a deployment framework that is installed with Business Integrator. The deployment application invokes the deployment scripts through the deployment framework, which contains various plug-ins on remote machines that perform the actual deployment processing.

You start the Solution Deployment Wizard from the **File** menu of the Platform Console. The deployment processing is then as follows:

1. You enter the pathname of the solution package.
2. Data about the solution and its elements is stored in the *Topology Repository*, which contains data about the machines in the topology and the software installed on them. (For a discussion of topology, see “Chapter 5. Topology” on page 39).
3. For each solution element in the package, the metadata of the solution element is used to identify from the Topology Repository the *facility* to which the solution element applies. The facility is then used to identify the physical target machine for the solution element. This is known as *physical mapping*.
4. Each solution element is downloaded to a temporary directory on its target machine, ready for installation.
5. The installation process is started, and scripts are run to install the elements on the target machine.

Some solution elements cannot be installed automatically, and in this case a dialog box containing installation instructions is displayed. These instructions must be carried out before the deployment process can continue.

6. Scripts are run to activate the elements on the target machine. Again, where automatic activation is not possible, manual instructions are displayed. When all the elements are activated, the solution is then activated.

If deployment fails, or is interrupted, the Solution Deployment Wizard allows you to carry on where you left off after you fix any problems, and restart deployment.

Managing the run time

For more information about using the Solution Deployment Wizard, refer to the *WebSphere Business Integrator Run Time* book, and the online help information.

Undeploying solutions

You cannot automatically undeploy solutions in Business Integrator. However you can use the Platform Console to unzip a solution package and generate a list of undeployment instructions for the solution package. Using these instructions, together with supporting documentation, you can manually undeploy the solution.

For more information about undeploying solutions, refer to the *WebSphere Business Integrator Run Time* book, and the online help information.

Product Console Launchpad

The Product Console Launchpad allows you to launch the administration consoles for the base products of Business Integrator from a single machine, allowing you to remotely manage the components of the base products. Using the Product Console Launchpad you can:

- View all of the machines in the topology, and see which base products are installed on those machines.
- Remotely administer the base products, by launching the appropriate administration console and directing it at the correct machine.
- Automatically log on to the appropriate administration console. Where this is not directly possible, the Product Console Launchpad provides you with any information needed for you to log on.
- Register a new administration console for a specified base product.

The Product Console Launchpad (see Figure 4 on page 33) is based on a topology explorer GUI framework. Therefore, when you run the Product Console Launchpad, a tree view of the topology is displayed in the left-hand pane. This shows the machines in the topology and the base products installed on those machines. For example, the topology explorer might show an instance of WebSphere Application Server installed on the Business Flow Manager node. You can select this instance and directly invoke the WebSphere administration console.

When you launch a console for a base product, you are prompted for any information required to connect to the remote system. A right-hand pane then appears, and this displays the elements of the selected base product. In the case of WebSphere Application Server, enterprise beans might be shown in the right-hand pane, but the type of node, and the actions you can perform on the node depend on the base product.

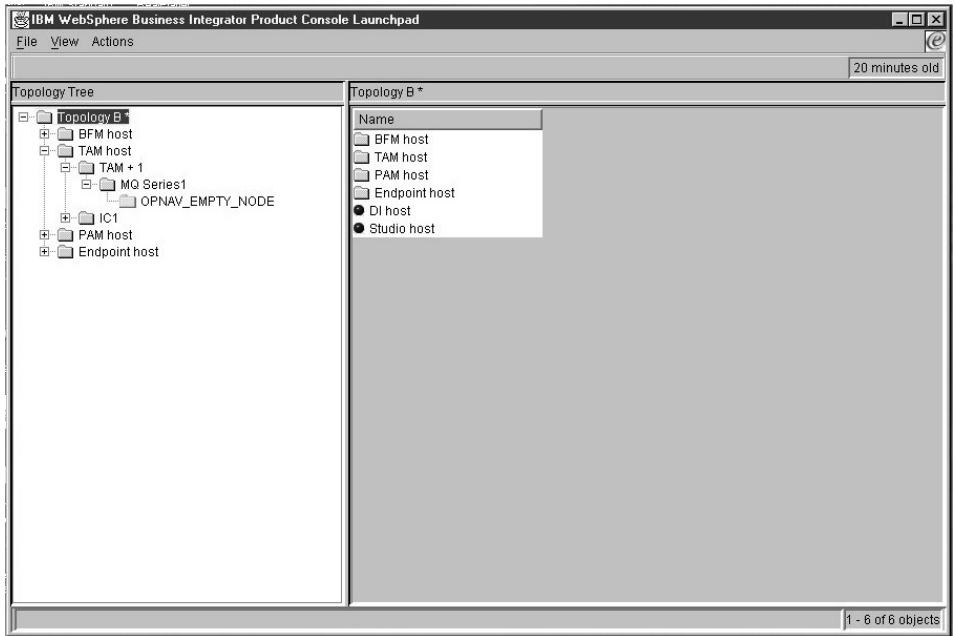


Figure 4. Product Console Launchpad

You can view the properties for a node, that is, information from the *Topology Repository*, by right-clicking on the node, and selecting **Properties**. The properties that are displayed depend on the type of node.

An XML document is used to store data about each product console supported, including information about how the console is launched, and information that is displayed when it is launched. The XML document is preconfigured for each of the base-product consoles that ship with Business Integrator. However, you can use the new console wizard to add new consoles, and update the XML document, see “The new console wizard” on page 34.

The Product Console Launchpad generates error messages in pop-up dialog boxes, and these are also written to a log file. In addition, the Product Console Launchpad provides trace output whenever a user attempts to start an administration console.

For more information about using the Product Console Launchpad, refer to the *WebSphere Business Integrator Run Time* book, and the online help information.

Managing the run time

Base product consoles

You can launch the following administration consoles from Product Console Launchpad:

- WebSphere Administrative Console
- DB2 Control Center
- DB2 Client Configuration Assistant
- HTTP Administration Client
- MQSeries Explorer
- MQSeries Services
- SecureWay Directory Management Tool
- LDAP Web Administration

All of the above are standalone management consoles, apart from HTTP Administration Client, which has administration tools that run within a Web browser.

Business Integrator also allows you to use the consoles of some other products from the machine containing the Product Console Launchpad, see “Administration consoles of other products” on page 35.

For information about how to use the product consoles, refer to the relevant product documentation.

The new console wizard

The Product Console Launchpad contains a new console wizard that allows you to add a new product console to the Product Console Launchpad. You may want to do this to use a new console for an existing product, or to add a console for a new product that has just been installed on a remote machine in the topology.

The new console wizard prompts you for information about the console, (for example, the executable to be run when users launch the console, and any command-line arguments that are needed), and automatically updates the XML document. When you add a new console, you can start it via the Product Console Launchpad immediately—you do not have to restart the Product Console Launchpad for the change to take effect.

If you need to delete a console, you must delete the console definition from the XML file using a text editor. To change a console definition you can either edit the appropriate section in the XML file, or delete the definition and re-register the console using the wizard.

For more information about using the new console wizard, refer to the *WebSphere Business Integrator Run Time* book, and the online help information.

Administration consoles of other products

The consoles of some base products are not included in the Product Console Launchpad, but are optionally installed on the same machine as the Product Console Launchpad. These are:

- Message Broker Console.

The Control Center for MQSeries Integrator that is installed with the Message Broker facility, which is optional in some topologies and required in others.

- PAM Console.

The console for Partner Agreement Manager, which is optional in some topologies and required in others.

- EDI Console.

The console for DataInterchange, which is an option in some topologies.

For more information about what is installed with each topology, see “Chapter 5. Topology” on page 39.

Refer to the documentation for MQSeries Integrator, Partner Agreement Manager, and DataInterchange for information on using the consoles.

Solution Console

The main purpose of the run-time environment is to execute the solution created in build time. To assist in managing the running solution, Business Integrator provides the Solution Console. The Solution Manager enables administrators to monitor the state of business-process instances by collecting and storing data about the solution to logs and then viewing the data through the Solution Console

The Solution Console is an extensible application providing a unified view of selected aspects of a solution and Solution Services at the application level. Solution Console is a web-enabled interface that provides access to data that is persisted in the Audit Log server, the Exception Management server, and Trace server databases.

The information available to the Solution Manager is dependent on the application. The configuration for a particular solution is accomplished as part of creating the solution, so solutions should be created with managing them in mind. Once the solution is executing in the run-time environment, you can use the Solution Console to view the following logs:

Audit Log

The Audit Log service collects solution-specific messages sent between applications through the Business Integrator infrastructure and stores

Managing the run time

them in a database, providing a centralized logging facility. Such messages are stored in the order in which they are received.

Exception Log

The Exception service logs both system and solution exceptions to the exception database. System exceptions are those exceptions caught by the solution components (managers). Solution exceptions are solution-specific. For instance, a response on a user registration request has timed out.

Trace The Tracing service records error and debug messages that can be used to determine problems.

Using the Solution Console

Through the Solution Console, multiple users with administrative authority can view the data in a variety of ways that enable them to manage the solutions. An example of a Solution Console is shown in Figure 5 on page 36.

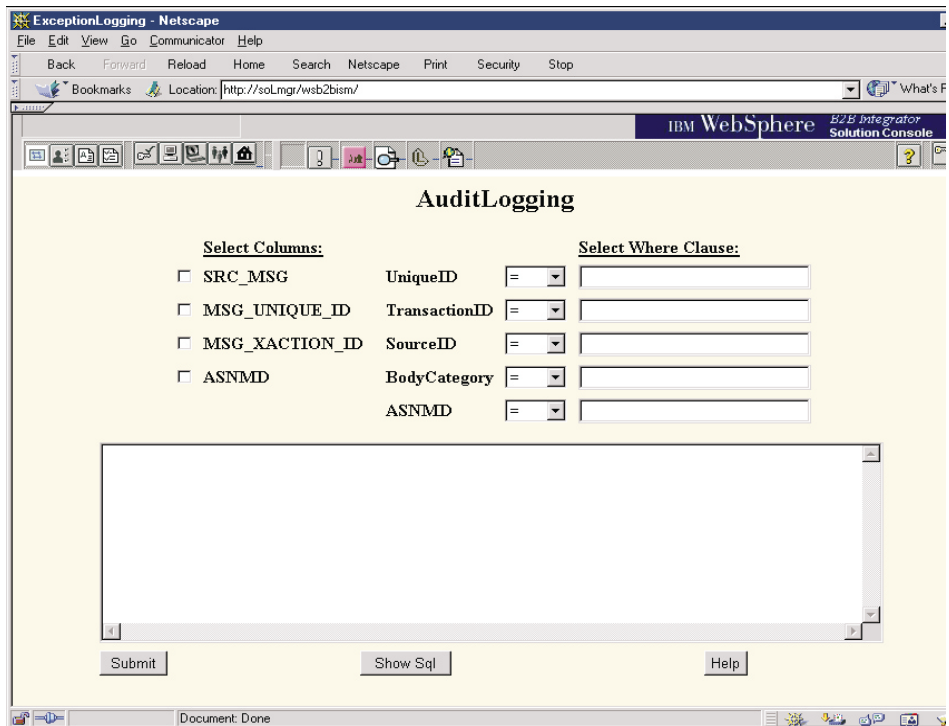


Figure 5. Solution Console Audit Logging

The Solution Console in Figure 5 shows a console view of the Audit Logging database. The console is available from within a web browser, and displays

features unique to Solution Console in the content area of the page. Across the top, is a navigation frame containing a row of buttons. Selecting one of the buttons changes the content in the frame beneath. The lower frame in this example contains selectable categories to search on that correspond to the database columns. The user can select to submit a search, show the SQL, or access Solution Manager online help.

From the Solution Console, multiple users with administrative authority can view any process of interest and, with the correct level of authority, execute management tasks. All data in the logs is retrieved through the Solution Console using SQL queries. These queries can either be prepackaged in templates or can be performed by the user by executing searches or packaged commands. Users can:

- Submit canned queries to target databases
- Filter queries when viewing the exception databases
- Submit custom queries when viewing the Audit Log database
- View the content of trace files
- View and change the QoS entries in LDAP Directories.

Solution Services

Business Integrator Solution Services are resource managers available to the Business Integrator managers to log information and gather that information in a flexible and extendible way. Solution Services also offers ways to automatically send messages as a result of certain types of logged exceptions.

Chapter 5. Topology

This chapter explains the concept of topology in IBM WebSphere Business Integrator. It will help you understand:

- What a topology is, and why Business Integrator uses this concept
- How you select a topology
- How topology data is stored in Business Integrator
- The ways in which Business Integrator uses the topology data
- The predefined topologies that you can select, and what they offer

What is a topology?

Business Integrator is a large product consisting of many base products and software components. There are many interdependencies between products, and products could be installed in many permutations across a variety of machine configurations. This makes installation and configuration difficult. However, to make the processes of planning, installation, and system administration easier, and to help in choosing the correct software for your business purposes, Business Integrator uses the concept of topology.

A **topology** is a definition of the arrangement of physical machines, together with the software products and components installed on these machines, that make up a Business Integrator runtime environment. A topology contains:

- **Machines**—the computers on which Business Integrator is installed.
- For each machine, one or more **facilities**—a grouping of products and supporting technologies. For more information, see “Facilities” on page 42.
- **Products**—the base products and supporting technologies that make up the facilities.

The details of which machines, facilities and products make up the topology, together with other data, are stored in a **Topology Repository**. By providing this central repository of topology data that is accessed by Business Integrator runtime components, the processes of installation, solution management, and deployment are made easier.

Business Integrator ships with several predefined topologies that represent tested system configurations. The predefined topologies define standard ways of combining products, allowing for different runtime environments that meet different complexities of solution and varieties of business need. The

Topology

predefined topologies that you can select are discussed in The predefined topologies, but first let's discuss how a topology is selected and then used by Business Integrator.

Selecting a predefined topology

When you install Business Integrator, you run the Select Topology Tool from the Initial Setup Installer CD. This tool allows you to select the predefined topology that best suits your needs, together with any optional facilities that you require. You can choose from:

1. Test topology
2. Minimum production topology
3. Standard production topology
4. Test enterprise topology
5. Standard enterprise production topology
6. Large-scale enterprise production topology

The Topology Repository is then created with data about your chosen topology. The base machine in your topology contains the **Topology Server**, which contains the software required to create the Topology Repository, and controls access to the Topology Repository.

After you select a topology, you can then run the Install Launchpad to install the software on each machine in the topology in turn. This updates the Topology Repository with data about the machines in your topology.

For a more detailed overview of installation, see “Overview of the installation process” on page 72, and for full information about the installation process, refer to the *WebSphere Business Integrator Installation Guide* book.

How topology data is stored

Information about your topology is stored in the Topology Repository, which is simply an XMI file that is held on the machine containing the Topology Server. The Topology Server provides remote access to the Topology Repository, as described in the next section.

The Topology Repository stores the topology data according to a topology information model—a definition of the data that can be stored and accessed.

The Topology Repository stores information for a collection of objects. Each topology object has a type that identifies the type of object. For example, computer system, facility and product component are all topology types, as are queue manager and enterprise bean. Each topology type has an associated name and description.

Each topology type can have zero, one or more properties. A property is an attribute that topology objects of a given topology type can have. Properties have names, descriptions, and values associated with them. When you display a topology tree view using the Product Console Launchpad or Platform Console, you can display the properties (if any) for each node.

The Topology Server

The Topology Server uses HTTP Server so that HTTP can be used to communicate between the Topology Clients (the machines in the topology) and the Topology Server. The Topology Server includes Web Distributed Authoring and Versioning (WebDAV) a standard designed to allow co-operative updates of files across the Web. This provides locking and concurrent access to the Topology Repository from Topology Clients.

HTTP Server requires that a user ID and password are supplied to access the Topology Repository. The same user ID and password are used by all Topology Clients, and these are supplied at installation time.

How topology data is used

The data held in the Topology Repository is accessed by other components of Business Integrator including:

- The installation software, which uses topology data during the installation process.
- Solution Manager components that need to know where software products and other logical components of the system are located so that management tasks can be directed at the correct points in the system. This includes the Product Console Launchpad and the Platform Console.
- Solution Studio and the deployment application—after a solution has been developed in Solution Studio, the artifacts created must be packaged and then deployed on the correct products in the system. This is achieved by reference to the stored topology.

As the Topology Repository is based on a topology information model, Business Integrator can display the data in different ways. Therefore, you can display three views of a topology from both the Product Console Launchpad and the Platform Console.

A logical view

Shows the facilities in the topology and their base products.

A physical view

Shows the machines in the topology and the facilities installed on those machines, and their base products.

A solution view

Shows the elements and artifacts that make up a solution instance.

Figure 6 shows an expanded physical view of a topology illustrating the hierarchy of machine, facilities, and base products.

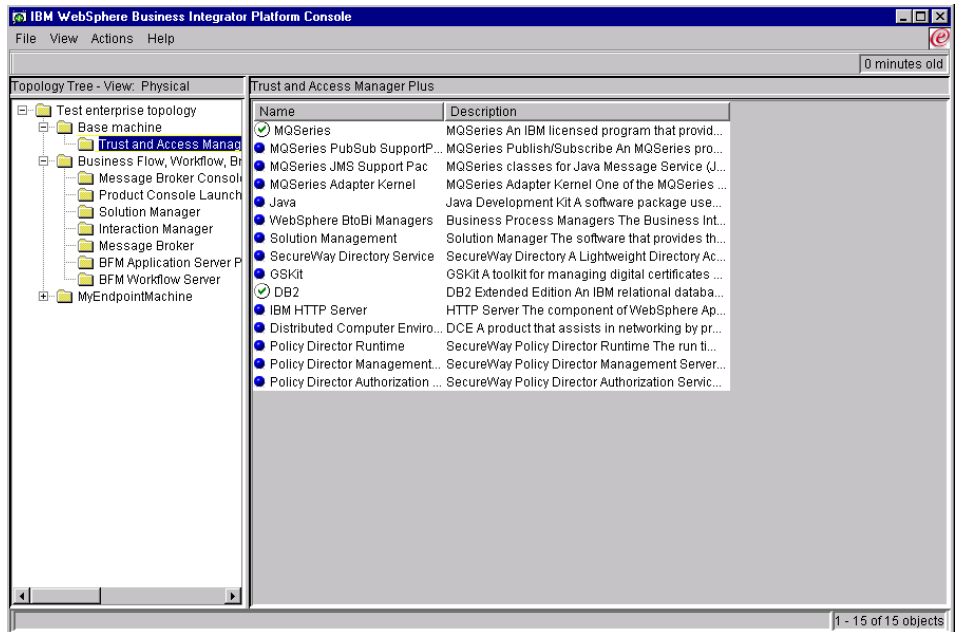


Figure 6. Physical view of a topology

For more information about solution management and deployment, refer to the *WebSphere Business Integrator Run Time* book.

The predefined topologies

This section describes the predefined topologies that are shipped with Business Integrator. It will give you an understanding of the purpose of each topology and its contents. However, first of all you need to understand some more about facilities, the subject of the next section.

Facilities

A **facility** is a logical grouping of software components that perform a particular task. A facility is an indivisible unit of installation that must be completely installed on one machine. A machine contains one or more facilities. Several facilities installed on a single machine may contain a number

of common software products and components, in which case those base components are shared among the facilities and **not** multiply installed.

Some facilities are for Entry configuration only, some for Enterprise configuration only, and some can be installed in both configurations.

Within a topology, some facilities are required and others are optional—you choose these when you run the Select Topology Tool.

Note: Solution Studio can be installed on any machine in your topology, although it is usually installed on machines outside the topology. Solution Studio data is not stored in the Topology Repository.

Pre-defined Entry configuration topologies

You can choose from the following topologies for the Entry configuration:

- Test topology (see Figure 7 on page 46)
- Minimum production topology (see Figure 8 on page 47)
- Standard production topology (see Figure 9 on page 48)

The Entry configuration topologies are comprised of the following facilities. For information on which base products and supporting technologies are contained in each facility, see the tables in “Facilities and base products” on page 55.

Entry configuration— required facilities

Trust and Access Manager

Controls security by providing authorization and authentication services for Business Integrator. Trust and Access Manager also provides the Topology Server which contains the Topology Repository. See Table 11 on page 57.

BFM Application Server

Provides basic management of business-process flow. See Table 12 on page 57.

Solution Manager

Provides the software that supports the deployment, monitoring, and management of solutions. See Table 3 on page 55.

Product Console Launchpad

Provides a launchpad for the administration consoles of base products of Business Integrator. This allows the monitoring and management of Business Integrator and its components from a single machine. See Table 13 on page 58.

One or more Endpoint facilities

Provides access to endpoint machines via application adapters, which allow the integration of customer applications within Business Integrator. See Table 4 on page 56.

Entry configuration—optional facilities

Partner Agreement Manager

Facilitates exchanges between business partners and management of the public and private processes. See Table 5 on page 56.

PAM Console

Provides the administration console of Partner Agreement Manager. See Table 7 on page 56.

Partner Agreement View

Provides an interface that allows the seamless integration of Partner Agreement Manager with Web applications. See Table 6 on page 56.

Message Broker

Works with existing messaging transports by adding both routing intelligence and the ability to convert data from one protocol to another. Message Broker analyzes a message to determine the application to receive it and then converts the data into the structure that the receiving application requires. This functionality is provided by MQSeries Integrator. See Table 9 on page 57.

Message Broker Console

Provides the administration console of Message Broker. See Table 10 on page 57.

PAM Proxy Server

Provides software that resides in the DMZ between an internal and external firewall. PAM Proxy Server passes outbound messages from Business Integrator to external business partners, and passes inbound messages from business partners to Business Integrator. Access control is provided for both inbound and outbound messages. See Table 8 on page 56.

The optional PAM Proxy Server cannot be part of the topology-driven installation, because such an installation would require a hole in the firewall during installation. No solution artifacts are deployed to the PAM Proxy Server, so it is not necessary for the Topology Repository to know about it.

The Partner Agreement Manager facility may consist of Partner Agreement Connect, the limited licence version of Partner Agreement Manager. For more information, see “Which Business Integrator configuration?” on page 64.

How Entry configuration facilities relate to the business process managers

The following shows to which business process manager or gateway each of the facilities belongs:

Manager	Facilities
Business Flow Manager	BFM Application Server
Trust and Access Manager	Trust and Access Manager
Solution Manager	<ul style="list-style-type: none"> • Solution Manager • Product Console Launchpad • Message Broker Console • PAM Console
Information Delivery Manager	<ul style="list-style-type: none"> • Message Broker • Endpoint
Partner Agreement Manager	<ul style="list-style-type: none"> • Partner Agreement Manager • Partner Agreement View • PAM Proxy Server

For more information about the business process managers and gateways, refer to Chapter 2.

Topology

Test topology

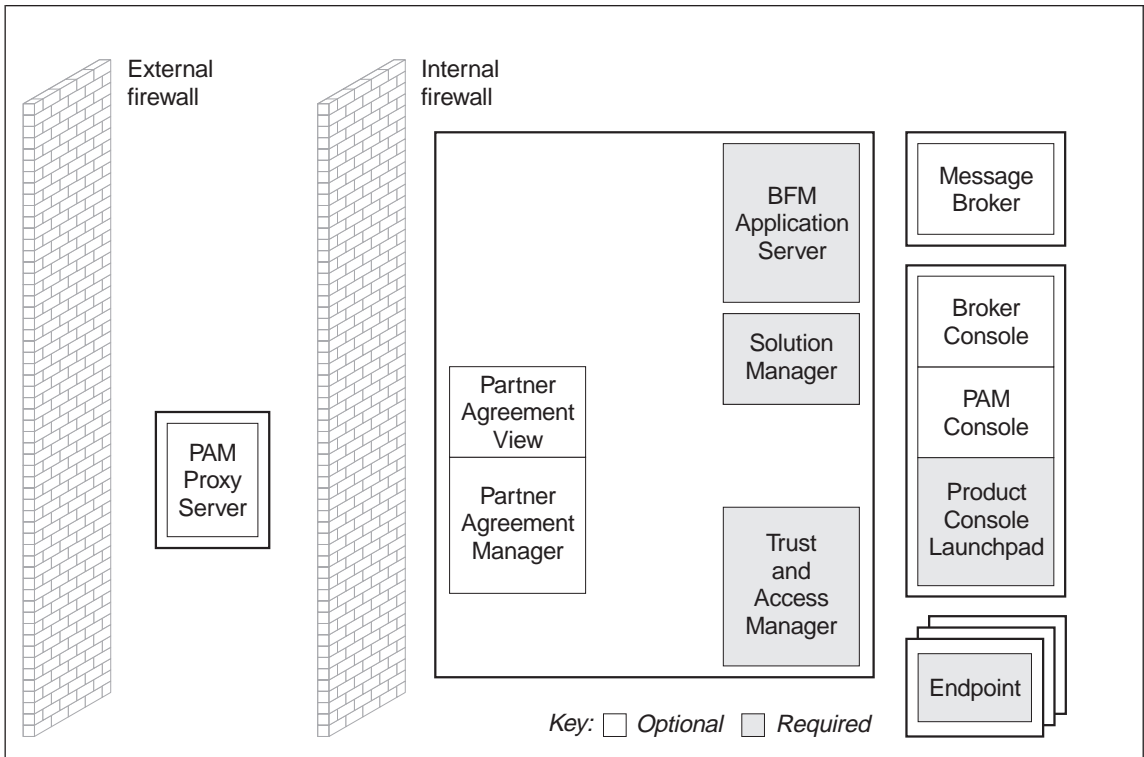


Figure 7. Test topology

Description A topology to be used for test purposes, most of which can be installed on a single machine. This topology may optionally include Partner Agreement Manager to allow communication with business partners and management of the public and private processes.

Number of machines

Two machines, plus one machine each for the optional PAM Proxy Server, and Message Broker, and one machine for each endpoint.

Minimum production topology

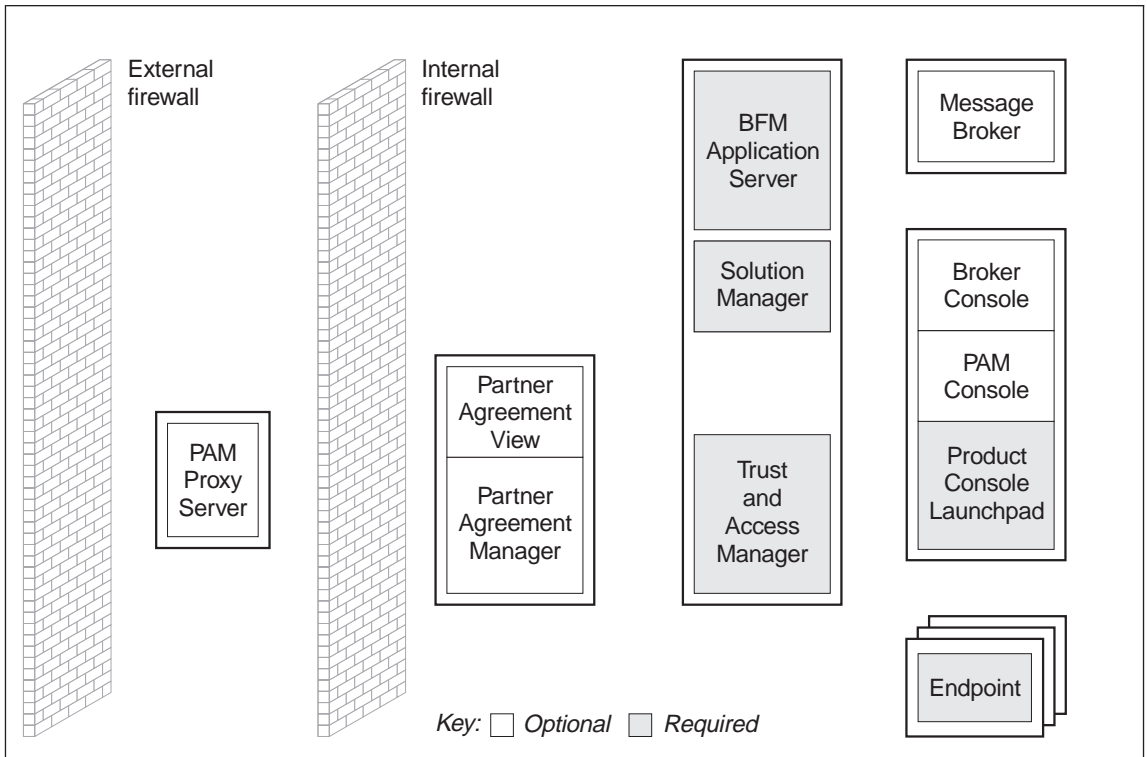


Figure 8. Minimum production topology

Description A topology that provides the minimum production capability for a Business Integrator runtime system. This topology may optionally include Partner Agreement Manager to allow communication with business partners and management of the public and private processes.

Number of machines Two machines, plus one machine each for the optional Partner Agreement Manager, PAM Proxy Server, and Message Broker, and one machine for each endpoint.

Topology

Standard production topology

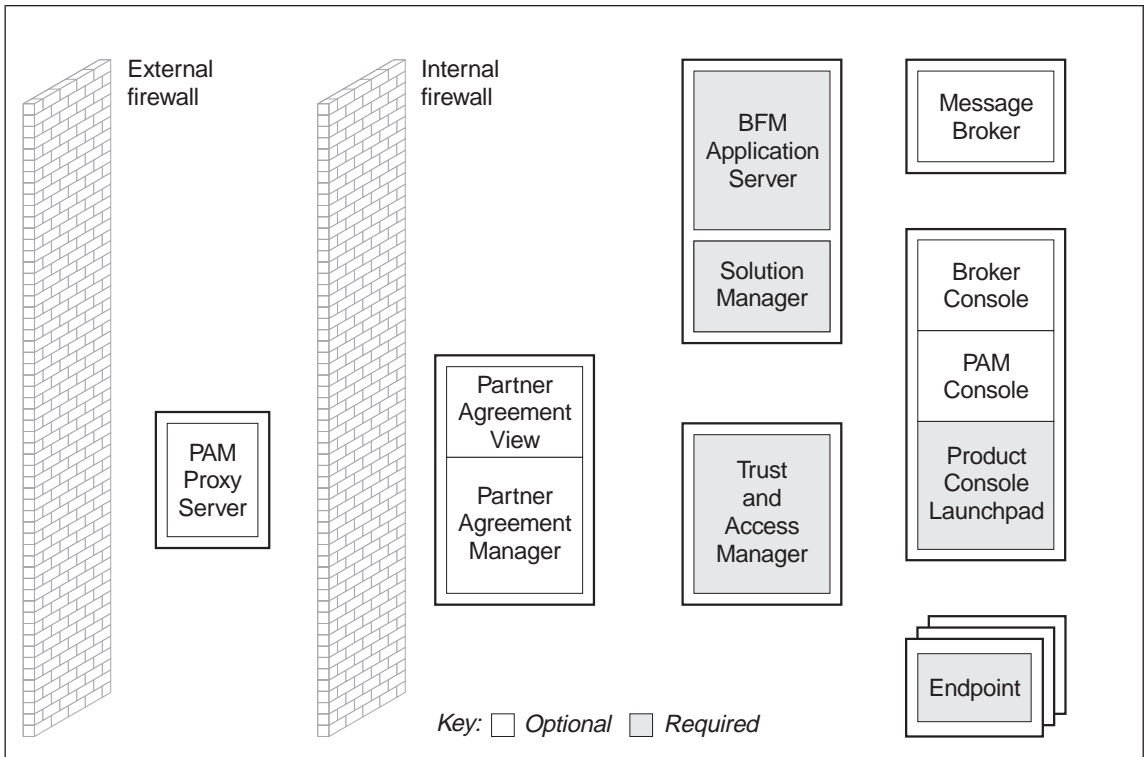


Figure 9. Standard production topology

Description A topology that provides production capability for a Business Integrator runtime system with enhanced performance over the Minimum production topology. This topology may optionally include Partner Agreement Manager to allow communication with business partners and management of the public and private processes.

Number of machines

Three machines, plus one machine each for the optional Partner Agreement Manager, PAM Proxy Server, and Message Broker, and one machine for each endpoint.

Pre-defined Enterprise configuration topologies

You can choose from the following topologies for the Enterprise configuration:

- Test enterprise topology (see Figure 10 on page 52)
- Standard enterprise production topology (see Figure 11 on page 53)
- Large-scale enterprise production topology (see Figure 12 on page 54)

The Enterprise configuration topologies are comprised of the following facilities. For information on which base products and supporting technologies are contained in each facility, see the tables in “Facilities and base products” on page 55.

Enterprise configuration— required facilities

Trust and Access Manager Plus

Controls security by providing enhanced authorization, authentication and user group management services for Business Integrator. Trust and Access Manager also provides the Topology Server which contains the Topology Repository. See Table 14 on page 58.

BFM Application Server Plus

Provides enhanced management of business-process flow. See Table 15 on page 58.

Solution Manager

Provides the software that supports the deployment, monitoring, and management of solutions. See Table 3 on page 55.

Product Console Launchpad Plus

Provides a launchpad for the administration consoles of base products of Business Integrator. This allows the monitoring and management of Business Integrator and its components from a single machine. See Table 18 on page 60.

Interaction Manager

Provides personalized access to content and activities required by the business processes and applications, based on the role of the user through exploitation of WebSphere Personalization. See Table 17 on page 59.

BFM Workflow Server

Provides workflow management functionality. This functionality is provided by MQSeries Workflow. See Table 16 on page 59.

Message Broker

Works with existing messaging transports by adding both routing intelligence and the ability to convert data from one protocol to another. Message Broker analyzes a message to determine the application to receive it and then converts the data into the structure

that the receiving application requires. This functionality is provided by MQSeries Integrator. See Table 9 on page 57.

Message Broker Console

Provides the administration console of Message Broker. See Table 10 on page 57.

One or more Endpoint facilities

Provides access to endpoint machines via application adapters, which allow the integration of customer applications within Business Integrator. See Table 4 on page 56.

Note that the Product Console Launchpad Plus facility includes the additional consoles added by the extra products supported in the Enterprise configuration.

Enterprise configuration—optional facilities

Partner Agreement Manager

Facilitates exchanges between business partners and management of the public and private processes. See Table 5 on page 56.

Partner Agreement View

Provides an interface that allows the seamless integration of Partner Agreement Manager with Web applications. See Table 6 on page 56.

EDI Gateway

Provides an EDI channel for message transformation and transport to and from EDI-connected business partners. See Table 20 on page 60.

EDI Console

Provides the administration console of DataInterchange. See Table 19 on page 60.

PAM Console

Provides the administration console of Partner Agreement Manager. See Table 7 on page 56.

PAM Proxy Server

Provides software that resides in the DMZ between an internal and external firewall. PAM Proxy Server passes outbound messages from Business Integrator to external business partners, and passes inbound messages from business partners to Business Integrator. Access control is provided for both inbound and outbound messages. See Table 8 on page 56.

Web Proxy Server

Provides software that resides in the DMZ and which performs access control on inbound messages from Web clients to Business Integrator. See Table 21 on page 61.

The optional PAM Proxy Server and Web Proxy Server cannot be part of the topology-driven installation, because such an installation would require a hole in the firewall during installation. No solution artifacts are deployed to the PAM Proxy Server or Web Proxy Server, so it is not necessary for the Topology Repository to know about them.

Note that the Partner Agreement Manager facility in Enterprise configuration must be Partner Agreement Manager and not Partner Agreement Connect.

How Enterprise configuration facilities relate to the business process managers

The following shows to which business process manager or gateway each of the facilities belongs:

Manager	Facilities
Business Flow Manager	<ul style="list-style-type: none"> • BFM Application Server Plus • BFM Workflow Server
Trust and Access Manager	Trust and Access Manager Plus
Solution Manager	<ul style="list-style-type: none"> • Solution Manager • Product Console Launchpad Plus • Message Broker Console • PAM Console • EDI Console
Interaction Manager	Interaction Manager
Information Delivery Manager	<ul style="list-style-type: none"> • Message Broker • Endpoint
Partner Agreement Manager	<ul style="list-style-type: none"> • Partner Agreement Manager • Partner Agreement View • PAM Proxy Server • Web Proxy Server
EDI Gateway	EDI Gateway

For more information about the business process managers and gateways, refer to Chapter 2.

Topology

Test enterprise topology

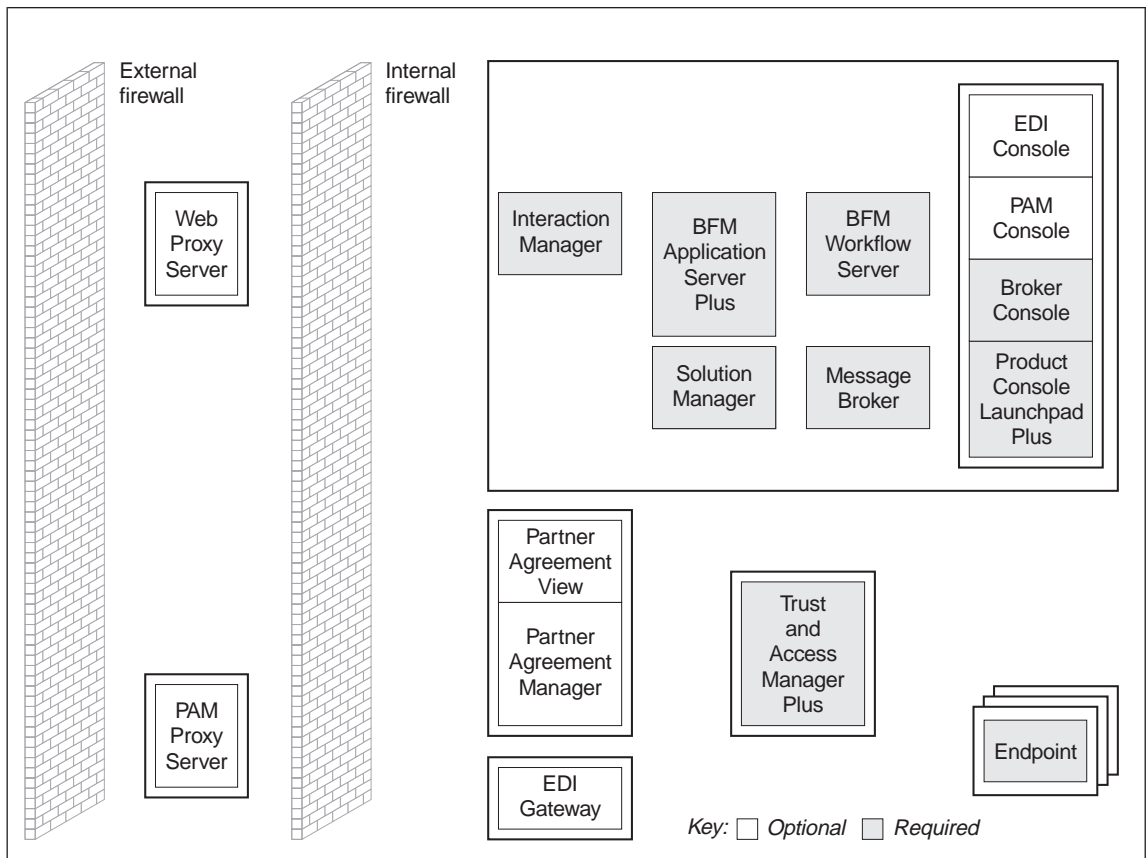


Figure 10. Test enterprise topology

Description

A topology that represents the minimum installation for Enterprise configuration, and which is likely to be used for test purposes only. Partner Agreement Manager provides easy communication with business partners and management of the public and private processes. This topology may optionally include EDI Gateway to allow EDI exchanges with business partners.

Number of machines

Two machines, plus one machine each for the optional Partner Agreement Manager, EDI Gateway, PAM Proxy Server and Web Proxy Server, and one machine for each endpoint.

Standard enterprise production topology

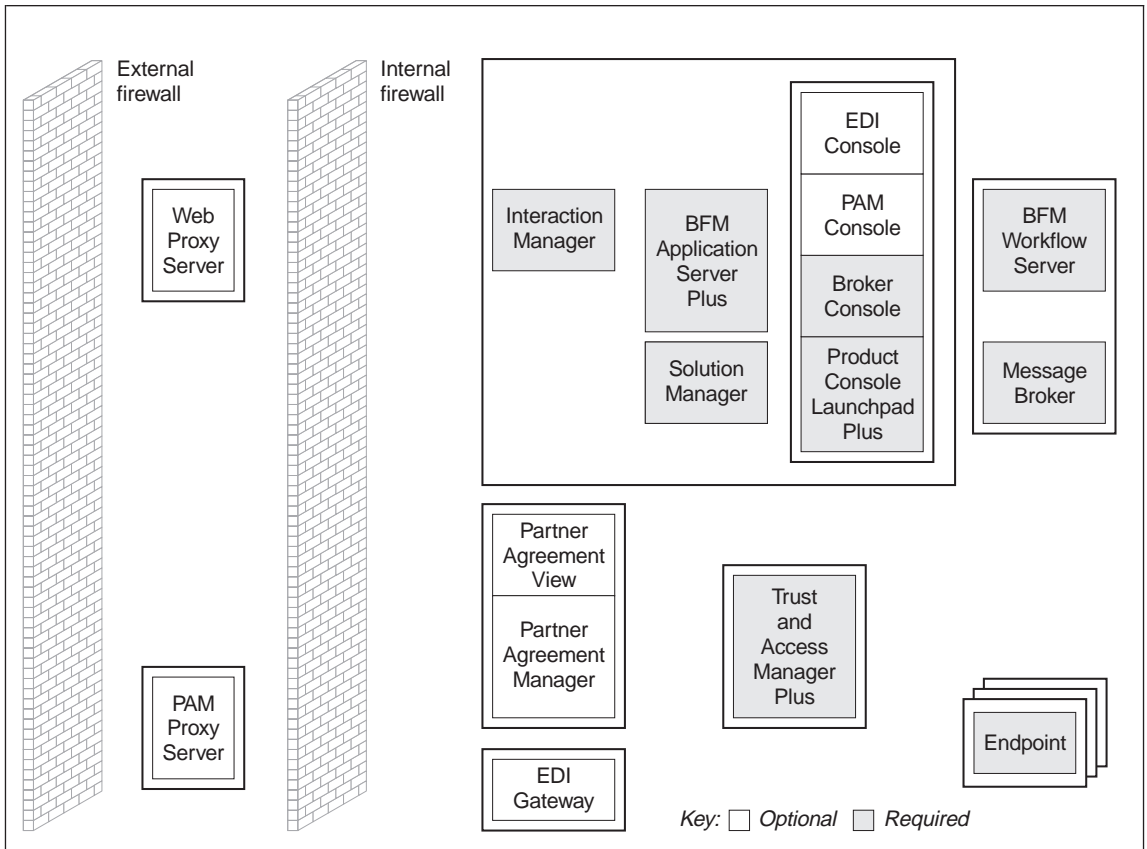


Figure 11. Standard enterprise production topology

Description A topology that provides production capability for a Business Integrator Enterprise configuration runtime system. Partner Agreement Manager provides easy communication with business partners and management of the public and private processes. This topology may optionally include EDI Gateway to allow EDI exchanges with business partners.

Number of machines Three machines, plus one machine each for the optional Partner Agreement Manager, EDI Gateway, PAM Proxy Server and Web Proxy Server, and one machine for each endpoint.

Topology

Large-scale enterprise production topology

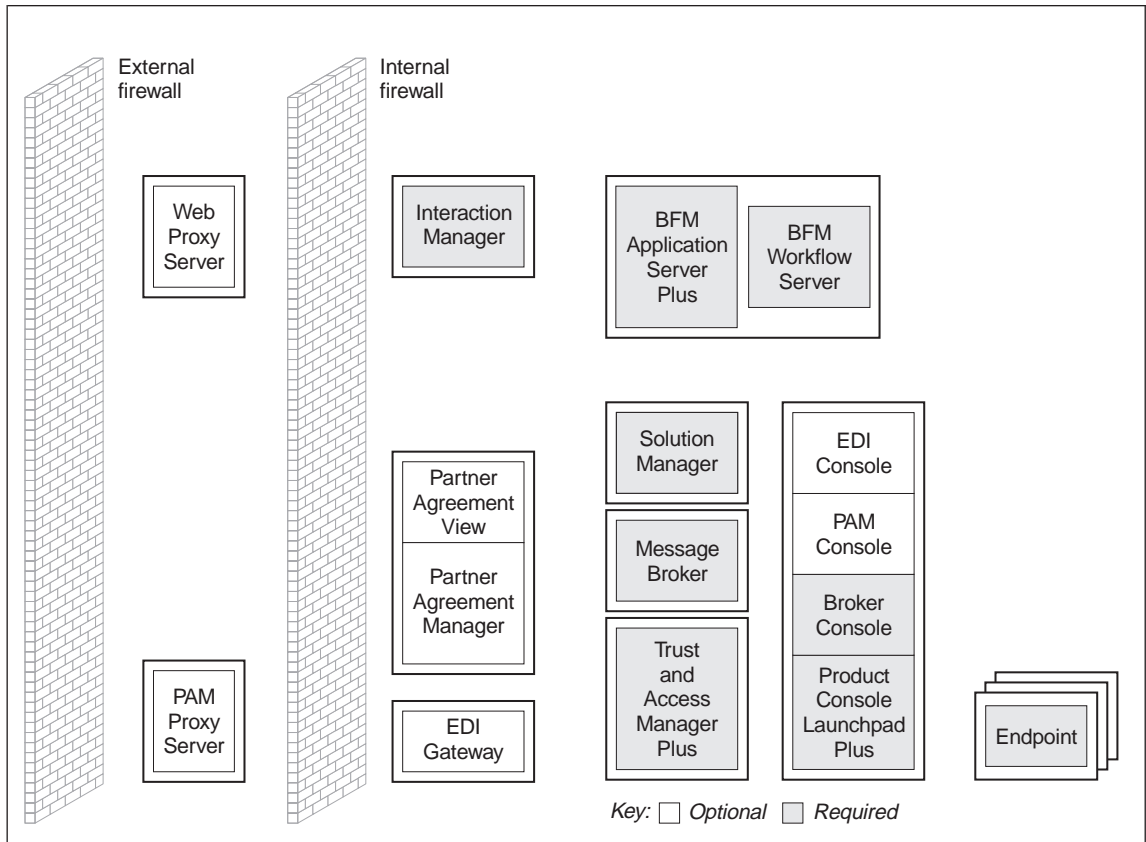


Figure 12. Large-scale enterprise production topology

Description A topology that provides production capability for a Business Integrator runtime system with enhanced performance over the Standard enterprise production topology. This topology is suitable for the largest of enterprises. Partner Agreement Manager provides easy communication with business partners and management of the public and private processes. This topology may optionally include EDI Gateway to allow EDI exchanges with business partners.

Number of machines

Six machines, plus one machine each for the optional Partner Agreement Manager, EDI Gateway, PAM Proxy Server and Web Proxy Server, and one machine for each endpoint.

Facilities and base products

The tables in the following sections show the base products and supporting technologies comprising each facility. Unless stated otherwise in the **Notes** column, products are installed silently.

Refer to “Glossary of Terms and Abbreviations” on page 85 for descriptions of the software products.

Common products and supporting technologies

The following products form part of many of the facilities. They are shown as **COMMON** in the tables in the following sections.

Table 2. Common products and supporting technologies

Product/supporting technology	Notes
MQSeries Version 5.2	
MQSeries Publish/Subscribe Version 5.2	
MQSeries classes for Java Message Service (JMS)	
MQSeries Adapter Kernel Version 1.1.1	
Solution Manager Client	
Business Integrator Log Client	
Java Runtime Environment Version 1.2.2	Service release 11 required
SecureWay Directory Version 3.1.1.5 Client	
Global Secure Toolkit	Part of SecureWay Directory
JMX	

Common Entry configuration and Enterprise configuration facilities

The following tables list the base products and supporting technologies in the facilities that are common to both Entry configuration and Enterprise configuration.

Table 3. Solution Manager base products

Product/supporting technology	Notes
COMMON, see Table 2	
DB2 Runtime Client Version 7.1.3	This has a restricted license
HTTP Server Version 1.3.12	
WebSphere Application Server Version 3.5.3	Advanced edition
WebSphere Application Server FixPak 3b	
Platform Console	

Table 3. Solution Manager base products (continued)

Product/supporting technology	Notes
Solution Console	

Table 4. Endpoint base products

Product/supporting technology	Notes
COMMON, see Table 2 on page 55	

Table 5. Partner Agreement Manager base products

Product/supporting technology	Notes
COMMON, see Table 2 on page 55	
DB2 Runtime Client Version 7.1.3	This has a restricted license
HTTP Server Version 1.3.12	
WebSphere Application Server Version 3.5.3	Advanced edition
WebSphere Application Server FixPak 3b	
Partner Agreement Manager Version 2.1	Manual install from Partner Agreement Manager CD; may be Partner Agreement Connect in the Entry configuration
Business Process Integration Adapter	Manual install from Partner Agreement Manager CD

Table 6. Partner Agreement View base products

Product/supporting technology	Notes
Partner Agreement View Version 2.1	Manual install from Partner Agreement View CD

Table 7. PAM Console base products

Product/supporting technology	Notes
Partner Agreement Manager Client	Manual install from Partner Agreement Manager CD

Table 8. PAM Proxy Server base products

Product/supporting technology	Notes
PAM Proxy Server	Manual install from Partner Agreement Manager CD

Table 9. Message Broker base products

Product/supporting technology	Notes
COMMON, see Table 2 on page 55	
MQSeries Integrator Broker Version 2.0.1	In Entry configuration, MQSeries Integrator must be separately purchased
MQSeries Integrator User Name Server Version 2.0.1	
MQSeries Integrator Configuration Manager Version 2.0.1	

Table 10. Message Broker Console base products

Product/supporting technology	Notes
Message Broker Console	

Unique Entry configuration facilities

The following tables list the base products and supporting technologies in the facilities that are unique to Entry configuration.

Table 11. Trust and Access Manager base products

Product/supporting technology	Notes
COMMON, see Table 2 on page 55	
DB2 [®] Universal Database [™] Extended Edition Version 7.1.3	This has a restricted license
HTTP Server Version 1.3.12	
SecureWay Directory Version 3.1.1.5 Server	
Business Integrator Log Server	

Table 12. BFM Application Server base products

Product/supporting technology	Notes
COMMON, see Table 2 on page 55	
DB2 Runtime Client Version 7.1.3	This has a restricted license
HTTP Server Version 1.3.12	
WebSphere Application Server Version 3.5.3	
WebSphere Application Server FixPak 3b	
Solution Console	

Table 12. BFM Application Server base products (continued)

Product/supporting technology	Notes
business process managers	Software supporting the Business Flow Manager functionality, including the JMS Listener

Table 13. Product Console Launchpad base products

Product/supporting technology	Notes
Business Integrator Log Client	
Java Runtime Environment Version 1.2.2	
Product Console Launchpad	
DB2 Control Center	
WebSphere Administrative Console	
MQSeries Explorer	
SecureWay Directory Version 3.1.1.5 Client	
Global Secure Toolkit	

Unique Enterprise configuration facilities

The following tables list the base products and supporting technologies in the facilities that are unique to Enterprise configuration.

Table 14. Trust and Access Manager Plus base products

Product/supporting technology	Notes
COMMON, see Table 2 on page 55	
DB2 [®] Universal Database [™] Extended Edition Version 7.1.3	This has a restricted license
HTTP Server Version 1.3.12	
SecureWay Directory Version 3.1.1.5	
DCE Version 2.2.3	Manual install from SecureWay Policy Director CD
SecureWay Policy Director Version 3.7.1	Manual install from SecureWay Policy Director CD. Includes NetSEAT, Runtime, Management Server, Authorization ADK, and Authorization Services components.

Table 15. BFM Application Server Plus base products

Product/supporting technology	Notes
COMMON, see Table 2 on page 55	

Table 15. BFM Application Server Plus base products (continued)

Product/supporting technology	Notes
DB2 Runtime Client Version 7.1.3	This has a restricted license
HTTP Server Version 1.3.12	
WebSphere Application Server Version 3.5.3	
WebSphere Application Server FixPak 3b	
MQSeries Workflow Java CORBA Agent Version 3.3	
SecureWay Policy Director Runtime Version 3.7.1	Manual install from SecureWay Policy Director CD
SecureWay Policy Director Authorization Services Version 3.7.1	Manual install from SecureWay Policy Director CD
business process managers	Software supporting the Business Flow Manager functionality, including the JMS Listener and worker beans

Table 16. BFM Workflow Server base products

Product/supporting technology	Notes
COMMON, see Table 2 on page 55	
DB2 Runtime Client Version 7.1.3	This has a restricted license
MQSeries Workflow Version 3.3	
business process managers	Software supporting the Business Flow Manager functionality

Table 17. Interaction Manager base products

Product/supporting technology	Notes
COMMON, see Table 2 on page 55	
DB2 Runtime Client Version 7.1.3	This has a restricted license
HTTP Server Version 1.3.12	
WebSphere Application Server Version 3.5.3	
WebSphere Application Server FixPak 3b	
WebSphere Personalization Server Version 3.5.2	Manual install from WebSphere Personalization Server CD
SecureWay Policy Director Authorization Services Version 3.7.1	Manual install from SecureWay Policy Director CD

Table 17. Interaction Manager base products (continued)

Product/supporting technology	Notes
business process managers	Software supporting the Interaction Manager functionality

Table 18. Product Console Launchpad Plus base products

Product/supporting technology	Notes
Business Integrator Log Client	
JMS	
Java Runtime Environment Version 1.2.2	
Product Console Launchpad	
DB2 Control Center	
WebSphere Administrative Console	
Partner Agreement Manager Client	
MQSeries Explorer	
SecureWay Directory Management Tool	
MQSeries Workflow Client	
SecureWay Policy Director Runtime Version 3.7.1	
SecureWay Policy Director Console	Manual install from SecureWay Policy Director CD
MQSeries Publish/Subscribe Version 5.2	
MQSeries Adapter Kernel Version 1.1.1	
Global Secure Toolkit	

Table 19. EDI Console base products

Product/supporting technology	Notes
EDI Console	Manual install from DataInterchange CD

Table 20. EDI Gateway base products

Product/supporting technology	Notes
COMMON, see Table 2 on page 55	
DataInterchange Server	Manual install from DataInterchange CD
DataInterchange Adapter	Manual install from DataInterchange CD

Table 21. Web Proxy Server base products

Product/supporting technology	Notes
SecureWay Policy Director NetSEAT Version 3.7.1	Manual install from SecureWay Policy Director CD
SecureWay Policy Director Runtime Version 3.7.1	Manual install from SecureWay Policy Director CD
SecureWay Policy Director WebSEAL Version 3.7.1	Manual install from SecureWay Policy Director CD

Changing your topology

If you need to change your topology, you must uninstall the existing topology before you install the new topology. The overall procedure is as follows:

1. Back up your data.
2. Undeploy any solutions that have been deployed, as described in the *WebSphere Business Integrator Run Time* book.
3. Uninstall Business Integrator as described in the *WebSphere Business Integrator Installation Guide*. You run the uninstall program on each machine in the topology, before completing the uninstallation on the base machine.
4. Install the new topology.
5. Deploy your solutions.
6. Restore your data.

Topology

Chapter 6. Planning

This chapter provides the information you need to plan the installation of your Business Integrator system. It will help you to:

- Understand the packaging of Business Integrator
- Decide which Business Integrator configuration you require
- Decide which topology to select
- Plan for installation by listing the hardware and software requirements for Business Integrator, and giving an overview of the installation process.
- Plan for implementing security in the Business Integrator system.
- Decide how many software licenses you need to purchase for your Business Integrator system

IBM WebSphere Business Integrator packaging

You can order the following IBM WebSphere Business Integrator media packs:

- WebSphere Business Integrator Entry Version 2.1
- WebSphere Business Integrator Enterprise Version 2.1
- Partner Agreement Manager Version 2.1
- Partner Agreement Connect Version 2.1
- Partner Agreement View Version 2.1

A copy of WebSphere Studio Business Integrator Extensions Version 2.1 (Solution Studio) is included in the WebSphere Business Integrator Entry and WebSphere Business Integrator Enterprise media packs.

For an **Entry configuration**, you require the WebSphere Business Integrator Entry media pack with the Partner Agreement Manager or Partner Agreement Connect media pack, and optionally the Partner Agreement View media pack. If you are going to install the optional Message Broker facility, you must purchase MQSeries Integrator separately, as this is not supplied with Entry configuration.

For an **Enterprise configuration**, you require the WebSphere Business Integrator Enterprise media pack with the Partner Agreement Manager media pack, and optionally the Partner Agreement View media pack.

To help you decide which configuration you require, refer to “Which Business Integrator configuration?” on page 64.

Planning

For a list of CDs contained in the various media packs, refer to the *WebSphere Business Integrator Installation Guide*.

IBM WebSphere Business Integrator Version 2.1 manuals are included on CD-ROM in the product media packs. These manuals are in PDF format and you can view them using Adobe Acrobat Reader, which is also supplied on the CD. For each of the product media packs, separate documentation packs containing hardcopy *Installation* books are also available.

Which Business Integrator configuration?

This section will help you decide which configuration of Business Integrator you require, and also whether you require Partner Agreement Connect or Partner Agreement View.

The **Entry configuration** encompasses the Test topology, Minimum production topology, and Standard production topology, see “Chapter 5. Topology” on page 39.

The Entry configuration is designed for business-to-business (B2B) hub environments where internal integration is comparatively straightforward but where there is a need for complex external partner integration and collaboration. It is designed for small, medium, and large organizations whose primary focus is B2B commerce with one or more partners. These companies may include smaller-scale independent e-marketplace exchanges, as well as B2B trading hubs.

The Entry configuration is therefore an ideal solution for smaller companies or divisions of larger organizations that have only one or two internal applications to integrate, but who nevertheless need to perform process collaboration with several external partners. It can also be used for smaller-scale e-market exchanges.

The **Enterprise configuration** encompasses the Test enterprise topology, Standard enterprise production topology, and Large-scale enterprise production topology, see “Chapter 5. Topology” on page 39.

The Enterprise configuration is designed for large companies that have a broad range of internal and B2B integration challenges. Such companies would typically include complex application-integration hubs, trading partner hubs, large-scale private and public exchanges, as well as Application Service Providers (ASP) and Internet Service Providers (ISP). In comparison with the Entry configuration, it provides a more comprehensive solution to e-BPI. It enables companies to manage both diverse external relationships as well as more complex application integration and process management scenarios.

Unlike the Entry configuration, the Enterprise configuration includes MQSeries Integrator, MQSeries Workflow, WebSphere Personalization, Tivoli SecureWay Policy Director, and WebSphere Business Integrator DataInterchange. Therefore, this configuration provides more sophisticated business process management, security, and role-based rendering.

The Enterprise configuration is therefore an ideal solution for large companies, with multiple divisions and many applications, that need to coordinate and collaborate with multiple external partners. It is especially useful for companies merging with other organizations who need to get the combined operation up and running quickly. The Enterprise configuration is also an essential infrastructure for complex private and public e-marketplaces where several applications (for example, i2, Ariba, and WebSphere Commerce Suite) must be brought together.

In both Entry configuration and Enterprise configuration, **Partner Agreement Manager** provides the capability for exchanges with trading partners over a variety of channels, and implements the public process and trading partner agreements. In the Entry configuration, **Partner Agreement Connect** can be used instead of Partner Agreement Manager. Partner Agreement Connect is a restricted-use configuration of Partner Agreement Manager that allows trading partners of the hub operator to participate in the defined public processes via a direct program-to-program connection. However, as a user of Partner Agreement Connect, you cannot build your own public processes, or operate your own trading hub.

Partner Agreement View enables a licensee of Partner Agreement Manager to build a Web browser application that provides a simple, manually operated connection to the trading hub for partners who do not require sophisticated program-to-program integration capabilities. This allows trading partners to see the details of transactions that involve them and take appropriate action to process them. Partner Agreement View can be used with both the Entry configuration and the Enterprise configuration.

Which topology?

Before you order Business Integrator, you must choose the topology that best fits your business needs. From reading “Which Business Integrator configuration?” on page 64, you will understand roughly whether you require an Entry configuration, or an Enterprise configuration. Your choice is likely to be influenced by the functionality you require in your Business Integrator system. Table 22 on page 66 will help you in this decision, as will reading “Chapter 5. Topology” on page 39, which summarizes what the various predefined topologies offer, and lists the products and supporting technologies they contain.

Table 22. Choosing a topology for the functionality you require

Functionality	Software you require	Topology you require
Message brokering or complex data transformations	MQSeries Integrator as provided in Message Broker facility	Any Enterprise topology, or any Entry topology with MQSeries Integrator separately purchased
Development, implementation, and management of business-process flow	MQSeries Workflow and associated software as provided in the BFM Application Server Plus and BFM Workflow Server facilities	Any Enterprise topology
Web-based interaction personalized according to user role	Interaction Manager	Any Enterprise topology
Exchanges with trading partners over the Internet	Partner Agreement Manager or Partner Agreement Connect	Any Entry or Enterprise topology, but Entry topologies only, if Partner Agreement Connect is used
Exchanges with trading partners via EDI	WebSphere Business Integrator DataInterchange as provided in the EDI Gateway facility	Any Enterprise topology
Enhanced security functions	SecureWay Policy Director as provided in the Trust and Access Manager Plus, BFM Application Server Plus and Interaction Manager facilities	Any Enterprise topology

Having decided on either an Entry configuration or Enterprise configuration, you then need to decide on one of the three topologies encompassed by the chosen configuration, and this is likely to be determined by performance considerations.

There is probably a performance advantage in installing Business Integrator over a greater number of machines. In particular, there is a performance advantage in having the DB2 server on machines separate from other facilities. This is however countered by the increased cost of additional licenses (see “Licensing requirements” on page 77) and machines, and system administration overhead. You should also remember that the performance will depend on the solution that is deployed.

Hardware and software requirements

This section lists the hardware and software requirements for your topology as well as for Solution Studio.

Operating system

Business Integrator runs under Microsoft Windows NT Version 4.0, or later, with Service pack 6a, or later. Note that Service pack 6 is not supported by MQSeries, or MQSeries Integrator.

Machine requirements

For all of the machines in your topology, you will require:

- An IBM or compatible PC with at least one Pentium III 600 MHz (or faster) processor
- At least 512 MB of memory
- At least 2 GB hard disk space
- A TCP/IP network adapter

Machines must use English (United States) regional settings.

Important

You must install Business Integrator on “clean” machines, that is, machines on which you have not already installed or partly installed Business Integrator or its base products or supporting technologies. The machines may however contain the software mentioned in “Prerequisite software products”.

If you try to install Business Integrator on a machine that is not clean, the installation might fail because of wrong levels of products. The Windows NT Registry might be in an indeterminate state, and the resulting configuration might be incorrect.

You are recommended to install on a machine on which Windows NT has been freshly installed.

Network considerations

Each machine in your TCP/IP network must have a fixed IP address—Dynamic Host Configuration Protocol (DHCP) cannot be used. If you want to use host names, you must ensure that all host names are defined to your name server.

Prerequisite software products

There are number of prerequisite products for Business Integrator:

- Windows NT Service Pack 6a

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- Microsoft Internet Explorer Version 5.5, (IE)
- Active Directory Service Interfacer Version 2.0, (ADSI)
- Microsoft Management Console Version 1.1, (MMC)
- HTML Help Upgrade Version 1.2.2, (HTMLHelp)
- Microsoft Windows Installer

At installation time, as you install the facilities for each machine in your topology, you are informed of any prerequisites missing from that machine. You can then install the missing prerequisites from CD, from the Internet, or from a network drive.

Note that ADSI, MMC, HTMLHelp, and Microsoft Windows Installer are supplied on Facilities CD 1.

It is better to install Windows NT Service Pack 6a and Microsoft Internet Explorer *before* you install Business Integrator, as these require restarting the machine.

Note: It is strongly recommended that you install Microsoft Data Access Components Version 2.5 for use with DB2. If you do not follow this recommendation, you might encounter unpredictable results. Be aware that the Business Integrator installation program does not check for this prerequisite. You can download Microsoft Data Access Components Version 2.5 from:

http://www.microsoft.com/data/download_25SP1.htm

Requirements for Solution Studio

You install Solution Studio on machines outside your topology, and Solution Studio data is not included in the Topology Repository. The following sections show the hardware and software requirements of Solution Studio. For full information about installing and configuring Solution Studio, refer to the *WebSphere Studio Business Integrator Extensions Installation Guide*.

Minimum hardware requirements

Solution Studio runs on one or more Intel[®]-based machines in a local area network. The number and configuration of these machines depend on how you choose to create the artifacts that make up a solution. A minimum of two machines is recommended: one running the ClearCase server, and one running WebSphere Studio and the ClearCase client. Assuming that the project involves a team of tool specialists who are using a variety of tools to create the various artifacts, many client machines are possible. The following table lists the minimum requirements for server and client machines.

Table 23. Minimum hardware requirements

	Server machine	Client machine
Processor	Intel Pentium® III 550-MHz	Intel Pentium III 550-MHz
Memory	512 MB	512 MB
Storage	40 GB free disk space	10 GB free disk space

The storage requirements for client machines vary depending on your specific installation. As a general rule, 5 GB of free disk space are required for each software product you plan to install on the machine. For instance, if you plan for one client machine to be used for MQSeries Workflow development, that machine must have a total of 25 GB free disk space. MQSeries Workflow requires that MQSeries and DB2® are installed. The calculation is as follows:

Table 24. Calculating free disk space requirements for client machines (example)

Product	Amount (GB)
Solution Studio (minimum)	10
MQSeries	5
MQSeries Workflow	5
DB2	5
Total	25

See “Additional software” on page 70 for additional information about software used with Solution Studio to create artifacts.

Solution Studio software requirements

The following sections list prerequisite software, Solution Studio software, and other software you use to create the artifacts for your solution.

Software prerequisites: The following table lists the required software for a minimum Solution Studio installation.

Table 25. Software prerequisites

Software product	Version	Server	Client
Windows NT server	4.0 with SP6a or higher	X	
Windows NT workstation	4.0 with SP6a or higher		X
Rational ClearCase LT	4.1	X	X
WebSphere Studio Advanced Edition	3.5.2		X
Solution Studio	2.1	X	X

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It is assumed that the operating system is installed on all machines before you install ClearCase LT, WebSphere Studio, Solution Studio, and any additional software products you intend to use to create solution artifacts.

Note: Microsoft Internet Explorer 4.0 or higher is corequisite software. It is not required to install Solution Studio; however, it is required to run parts of Solution Studio such as the help system.

Additional software: Additional software is used to develop solution artifacts with Solution Studio. This software can include the following:

- DB2 (client and server) version 7.2 (not required directly by Solution Studio, but required by other products)
- MQSeries (client and server) version 5.2
- MQSeries Adapter Builder version 1.0.1
- MQSeries Adapter Kernel version 1.1.1
- MQSeries Integrator version 2.0.1
- MQSeries Workflow version 3.3
- Partner Agreement Manager (PAM) Public Process Editor version 2.1
- VisualAge for Java version 3.5.3

Additionally, DataInterchange client version 2.1 can be used to develop DataInterchange artifacts, although the DataInterchange client does not interact directly with Solution Studio.

Many of these products have patches that must be installed for them to work correctly with Solution Studio and Business Integrator. See the Solution Studio release notes for a listing of the current supported levels.

Some additional software products have prerequisites that must be installed for them to work. Additionally, some products listed here are build-time products only and require run-time products when the artifacts are tested and deployed; for instance, adapters created in MQSeries Adapter Builder require MQSeries Adapter Kernel to run, and FDL files created in MQSeries Workflow Buildtime require MQSeries Workflow Runtime to run. Refer to the product documentation for more information. Some software requires DB2, which must be installed before you install the dependent product.

The additional products that are installed on a given machine depend on the type of development to be done on that machine. For example, if a client machine is to be used to develop only Web applications, then VisualAge for Java is the only product other than Solution Studio that needs to be installed

on the machine. However, if a machine is to be used to develop both Web applications and MQSeries Integrator artifacts, then the following products need to be installed on the client:

- DB2 client (prerequisite for MQSeries Integrator)
- MQSeries (prerequisite for MQSeries Integrator)
- MQSeries Integrator
- VisualAge for Java

Additionally, the server machine in this case must run DB2 server to support the DB2 client.

It is recommended that additional software products be installed, configured, and verified before Solution Studio is installed, and that each product be installed, configured, and verified as a unit (for instance, if you are installing both DB2 and MQSeries, first install, configure, and verify DB2, then install MQSeries). It is recommended that additional software products be installed in the following order:

1. DB2
2. MQSeries
3. MQSeries Integrator
4. MQSeries Workflow
5. Partner Agreement Manager
6. MQSeries Adapter Kernel
7. MQSeries Adapter Builder
8. VisualAge for Java
9. Solution Studio

For example, if you install software to support MQSeries Workflow development, install the software in the following order:

Table 26. Example of recommended installation order for software products

Client	Server
1. DB2 client	1. DB2 server
2. MQSeries	2. Solution Studio server
3. MQSeries Workflow	
4. Solution Studio client	

Overview of the installation process

The overall installation process is as follows (this does not include Solution Studio):

1. Choose a machine to be the base machine.
2. At the designated machine, insert the Initial Setup Installer CD, and run the Select Topology Tool to choose a topology. This stores the topology in the Topology Repository.
3. At the same machine, insert the Facilities CD 1 and run Install Launchpad to assign this machine as part of the topology and install the appropriate facilities.
4. For every other machine you require to be in the topology, insert the appropriate Facilities CD and run the Install Launchpad to assign the machine and install the software. You must complete the configuration work for each machine before you move on to the next machine.

Important

You must install the software on one machine at a time. You cannot install the software on multiple machines simultaneously, because only one machine can access the Topology Repository at one time.

The Select Topology Tool allows you to:

1. Select one of the predefined topologies. The machines required for each topology are shown, and for each machine the facilities, base products, and software prerequisites are shown.
2. Select any optional facilities allowed for this topology.
3. Select Endpoints for this topology.
4. Confirm the selection of topology.

The Select Topology Tool silently installs HTTP Server on the base machine, and the chosen topology is stored in the Topology Repository.

The Install Launchpad allows you to:

1. Locate the Topology Repository. You enter the URL of the Topology Server machine and supply a user ID and password.
2. Identify the machine on which you are working, and display a view of the topology showing the facilities that can be installed on this machine.
3. Assign this machine to the chosen topology.
4. Install any missing prerequisites (for example, MMC, ADSI).
5. Silently install as many products as possible.

The Install Launchpad updates the Topology Repository accordingly. The silent installation includes setting up user IDs as necessary, and installing configuration scripts.

After completing the silent installation, you must install those base products that need to be installed manually. Note that some of these products must be manually installed at stages within the silent installation process. “Facilities and base products” on page 55 indicates the products that require manual installation.

Remember

It is essential to perform the installation of Business Integrator in the correct order as described in the *WebSphere Business Integrator Installation Guide*.

Running the configuration scripts

When you install Business Integrator, configuration scripts are installed for each of the facilities in your topology. A configuration script is installed even for those products that you must install manually. After installing the facilities on a machine in your topology, you must run the configuration script before you move on to the next machine. In some cases you will be prompted for user IDs and passwords when you run the scripts.

Some base products require configuration in addition to that performed by the configuration scripts. For information on running the configuration scripts and on the other configuration work you must do, refer to the *WebSphere Business Integrator Installation Guide*.

Planning for implementing security

This section describes the security considerations of Business Integrator.

User IDs for base products

Some of the base products of Business Integrator require user IDs. If these do not already exist, you are prompted at installation time and they are created.

You should be aware of the following defaults and permissions required for user IDs.

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Table 27. User IDs during installation

Product	Default user ID	Permissions
DB2	db2admin	Created by DB2 installation. Has a restriction of user ID length of 8 characters or less.
HTTP Server	http	<ul style="list-style-type: none">• Member of the local "Users" group• Log on as a Service user right
WebSphere	was	<ul style="list-style-type: none">• Member of the local "Users" group• Member of the local "Administrators" group• Act as part of the operating system user right• Log on as a Service user right

In addition, when installing WebSphere Application Server, you must provide an existing valid DB2 user ID and password if you already have DB2 installed.

Note: If the WebSphere or HTTP Server user ID creation fails, it may be because the machine has additional account policy settings or domain level security enabled, thus preventing the user ID from being created locally. In this case, you would have to exit the installation program and create a local user ID manually using the Windows User Manager Administrative Tool before restarting the installation.

Installing and configuring a firewall

If you choose a topology that includes Partner Agreement Manager or DataInterchange, you must install internal and external firewalls.

To install a firewall, you require Tivoli SecureWay Firewall Version 4.1. You may use other products, but SecureWay Firewall is the only product that has been tested with Business Integrator. SecureWay Firewall must be purchased separately.

For information on installing and configuring firewalls, see the *WebSphere Business Integrator Installation Guide*.

Installing and configuring PAM Proxy Server and Web Proxy Server

In the Entry configuration and Enterprise configuration, you have the option of installing the Partner Agreement Manager and the associated PAM Proxy Server facility.

In addition, in the Enterprise configuration you have the option of installing the Web Proxy Server facility.

The configuration procedures for the base products of PAM Proxy Server and Web Proxy Server depend on enabling Secure Sockets Layer (SSL) security, and you need a digital certificate to do this, “Obtaining a digital certificate”.

For information on installing and configuring PAM Proxy Server and Web Proxy Server, see the *WebSphere Business Integrator Installation Guide*.

Obtaining a digital certificate

To use SSL, you should obtain a certificate from a Trusted Certification Authority (CA), such as Verisign. You should be aware that this can take several weeks.

If you do not have a certificate from a Trusted CA when you install Business Integrator, you can create a self-signed certificate, for use until you receive the certificate from the Trusted CA. This is described in the *WebSphere Business Integrator Installation Guide*.

Key security considerations

Business Integrator provides a security-related Application Programming Interface, the Access Manager Enterprise Beans. This API provides access to security functions that should only be accessible to a limited set of users. Generally System Administrators would be the typical users that should be authorized to access these security functions. As initially installed the Business Integrator security functions can be accessed by any user that has a valid WebSphere Application Server login and RMI/IIOP access to the WebSphere Application Server. IBM therefore strongly recommends that the following precautions are implemented:

- RMI/IIOP access is not allowed for users that access the system through firewalls.
- Either all users inside the firewalls in the trusted zone are trusted to be authorized for administrator access, or additional measures are taken in the deployed solution to deny access to the Access Manager Enterprise beans for users that are not authorized as administrators.

The Access Manager Enterprise Beans also provide Global Sign on capability, that enables password retrieval for use with GSO. This function can also be accessed by any user that has a valid WebSphere Application Server login and

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RMI/IOP access to the server. In a typical solution it is desirable that the Global Sign on capability is provided for all authorized users, however, if Global Sign on is enabled for users within the firewall inside the trusted zone, those users must be trusted to be authorized for administrator access. For users that can not be authorized for administrative access, the Global Sign on capability must not be enabled.

Business Integrator security design assumes that all software that is installed on the application servers is trusted software. System Administrators must ensure that all deployed solutions are properly assessed for their security implications. To protect the application servers from the possible deployment of software that has not been assessed, ensure that access to Solution Manager consoles and applications is restricted to administrative users. See the *WebSphere Business Integrator Installation Guide* for details.

For any questions or concerns relating to security requirements, contact the Security Consultant for your enterprise or contact your IBM Representative.

MQSeries planning considerations

During Business Integrator installation you must enter a MQSeries Cluster Name to be used for all MQSeries servers installed as part of the topology. You should make sure that you have a unique cluster name and that it is consistent with any existing MQSeries naming standards. The cluster name will be added to the host name to create queue manager names. Queue manager names must not be longer than sixteen characters.

For your MQSeries configuration, you must ensure that each machine is enabled as part of a Windows NT domain environment. If you want to use multiple NT domains, ensure that there are appropriate trust relationships between all of the machines in the topology. Without these relationships, MQSeries cannot perform authentication across the cluster. For more information about MQSeries security requirements, see the *MQSeries Planning Guide*, GC33-1349.

Licensing requirements

For each of the IBM WebSphere Business Integrator offerings:

- WebSphere Business Integrator Entry
- WebSphere Business Integrator Enterprise
- Partner Agreement Manager
- Partner Agreement Connect
- Partner Agreement View

two license options are available:

1. Production license.

As a licensee you may install and use all the program products and components included in the program media package only as part of an IBM WebSphere Business Integrator solution.

2. Development and Test license.

As a licensee you may install and use all the program products and components included in the program media package only for the purposes of development and test of an IBM WebSphere Business Integrator solution.

Licenses are also known as proofs of entitlement (POE).

You must carefully study the different topologies and options that are available with Business Integrator, and be clear about your intended usage of the software before ordering the required number and type of licenses to support your installation.

For WebSphere Business Integrator and Partner Agreement Manager, the number of licenses (POEs) you require is calculated from the number of *capacity units* needed, as described in the following sections. Each capacity unit requires one POE. For Partner Agreement Connect and Partner Agreement View, the number of licenses you require depends on the number of machines on which these products are installed.

WebSphere Business Integrator licensing structure

For WebSphere Business Integrator, you calculate the number of capacity units as follows:

1. Decide on a topology, if you have not already done so.
2. Calculate the number of machines in your topology, **not** including proxy machines, or machines containing Partner Agreement Manager or Partner Agreement Connect, but including machines containing Endpoint facilities. You can find this information by referring to Figure 7 on page 46 through Figure 12 on page 54 and the accompanying text.

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3. Add to your total the number of machines required for Solution Studio. (For these machines, you should order development licenses rather than production licenses).
4. Determine the number of Symmetrical Multiprocessors (SMP) for each machine. You may need to contact your system administrator for this information.
5. Using the number of SMPs, determine the tier to which each machine belongs and consequently the number of capacity units needed. See Table 28.
6. Total the number of capacity units for the machines in your topology, to find the number of licenses (POEs) required (see Figure 7 on page 46 through Figure 12 on page 54.)

Table 28. Calculator table for number of capacity units (WebSphere Business Integrator)

Tier	1	2	3	4	5
SMPs	1	2	3–8	9–23	24 plus
Capacity Units	2	4	8	16	30

For example, for a topology being installed on a total of 8 machines, with:

4 machines containing 4 SMPs
4 machines containing 2 SMPs

you would require a total of (4×8) plus $(4 \times 4) = 48$ capacity units.

Note: The version of DB2 packaged with Business Integrator has a restricted license. For details refer to:

<http://www-3.ibm.com/software/sla/sladb.nsf>.

Partner Agreement Manager licensing structure

For Partner Agreement Manager, you calculate the number of capacity units as follows:

1. Determine the number of Symmetrical Multiprocessors (SMP) for the machine on which Partner Agreement Manager is installed.
2. Using the number of SMPs, determine the tier to which the machine belongs and consequently the number of capacity units needed. See Table 29 on page 79.

A license for machines containing the PAM Console or PAM Proxy Server is not required.

Table 29. Calculator table for number of capacity units (Partner Agreement Manager)

Tier	1	2	3	4	5
SMPs	1	2	3-8	9-23	24 plus
Capacity Units	4	4	8	16	30

For example, for a system installed on a machine containing 4 SMPs, you would require a total of 8 capacity units.

Partner Agreement View requires one production or development license for every machine on which it is installed.

Partner Agreement Connect requires one production or development license for every machine on which it is installed. A license for machines containing the PAM Console or PAM Proxy Server is not required.

A license for the client or proxy components is not required.

Other planning considerations

This section discusses some restrictions and other considerations that apply to Business Integrator.

IBM Java Runtime Environment Version 1.2.2, Service Release 11, is installed as part of the Business Integrator wrapper installation. If this version of JRE is already present on any machine in the topology but is not the System JVM, you should uninstall it and allow it to be reinstalled. Unless it is the System JVM, there will be compatibility problems with other Business Integrator components.

During installation, you must enter a Remote Method Invocation (RMI) port number that will be used for all machines in the topology. You must therefore use a port number that is free on all machines. This will be the port at which JMX agents will create their RMI listener Daemon.

During installation, you specify the machines in your topology that contain Endpoints. For each endpoint; you enter a machine name and a publishing name. The publishing name is the name for the Endpoint, used in Solution Studio when publishing a solution. You must ensure that the publishing names you enter at installation time match those used in Solution Studio. For more information, refer to *WebSphere Studio Business Integrator Extensions Developer's Guide*.

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On machines on which SecureWay Policy Director NetSEAT and HTTP Server are both installed, you must not configure HTTP Server to use SSL. This is the case for machines containing the Trust and Access Manager Plus facility.

Checklist—what you must know before installing

In summary, before you install Business Integrator, you will need to know the following:

- Which pre-defined topology you require, and which optional facilities you require. Remember that if you choose an Entry configuration configuration, and you require the functionality of MQSeries Integrator, you must purchase it separately.
- The additional software that you require for your Solution Studio work.
- The licensing requirements for your chosen system, that is, the number of capacity units, and the type of licenses you require.
- Which software product you will use for firewalls, if required. SecureWay Firewall is the only product that has been tested with Business Integrator.
- The name of machines containing Endpoints, and their publishing name.
- The MQSeries Cluster Name.
- The port number to be used as RMI port number.
- The HTTP Server User Name and Password.

Where relevant, it is a good idea to make a note of these in the checklist provided in the *WebSphere Business Integrator Installation Guide* book before you start the installation.

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Glossary of Terms and Abbreviations

This glossary defines terms and abbreviations used in Business Integrator. If you do not find the term you are looking for, see the *IBM Dictionary of Computing*, New York: McGraw-Hill, 1994, or refer to the Web Site at

<http://www.ibm.com/ibm/terminology>, which consolidates several of the main glossaries created for IBM products in one convenient location, including:

- Glossary of Computing Terms
- DB2 Glossary
- Tivoli Glossary

The following cross-references are used in this glossary:

Contrast with This refers you to a term that has an opposed or substantively different meaning.

See This refers you to (a) a related term, (b) a term that is the expanded form of an abbreviation or acronym, or (c) a synonym or more preferred term.

A

Active Directory Service Interfacer (ADSI). A means for client applications to use a common set of interfaces to communicate with and control any server that implements them. This allows a single client application to configure a number of different servers because it is shielded from API details specific to each server.

adapter. An element of a solution that provides semantic adaptations based on specific interchange schema specified by the message set

and that allows legacy applications to communicate with the Business Integrator system.

During run time, the adapter with MQSeries Adapter Kernel and MQSeries act as the *Information Delivery Manager*.

The adapter is output from MQSeries Adapter Builder under Solution Studio. See the MQSeries Adapter Builder documentation for a full definition of adapter.

Contrast with *Business Process Integration Adapter*.

adaptive document. Part of how *Process Choreography* is implemented on Business Flow Manager. The adaptive document includes state machine functionality and persistent data. It can be realized through several approaches.

Different views of the business content are rendered to the end user by the *Interaction Manager*.

application adapter. See *adapter*.

Application Service Provider (ASP). A company that offers subscription services for applications and related services on a pay-per-use basis. ASPs host, manage and maintain applications at their own site and make them available via the Web. This enables smaller companies or those with limited budgets to take full advantage of the latest information technology.

artifacts. The name for the set of all deployable files that make up a solution. Artifacts can be:

- Executables, for example, enterprise beans, Java beans, Java Server Pages, servlets, MQSeries Adapter Offering adapters, and various class files
- Configuration files, for example, MQSeries configuration files that control queues, LDIF (LDAP configuration) files, MQSeries Integrator MRP files, Policy Director map files, and files that control personalization

ASP • Business Process Integration Adapter

- Other content, for example, HTML files

You create artifacts by means of Solution Studio and its associated tools such as VisualAge for Java, MQSeries, MQSeries Integrator, MQSeries Adapter Offering, WebSphere Application Server, Partner Agreement Manager, DataInterchange and others. See *solution package*.

ASP. See *Application Service Provider*

Audit Log. The log of messages that are sent between applications and adapters.

Audit Log server. The Business Integrator component that allows the storage and retrieval of audit log information in a DB2 database.

B

B2B. See *business-to-business*.

B2C. See *business-to-customer*.

base machine. The machine that contains the *Topology Repository*, and the Trust and Access Manager facility. Depending on the topology selected, the base machine may also contain other facilities.

BO. See *business object*.

BOD. See *Business Object Document*.

broker. See *message broker*.

business flow. The business processes, at the task level, that drive the business.

Business Flow Manager. The Business Integrator component that controls the flow of business processes. It can be invoked programmatically by Interaction Manager, or via a message from a gateway or an Endpoint. It can invoke Endpoints.

Business Flow Manager provides a platform for:

- *Microflows*
- Data objects
- Workflow enterprise beans that invoke and communicate with MQSeries Workflow

- *JMS Listener*

- *Worker beans*

Business Integrator. The short name for IBM WebSphere Business Integrator.

Business Integrator Log Client. Software that is installed with most of the facilities of Business Integrator, and which allows logging at those facilities.

business object. Data and application objects that persist data for business entities or tasks that are used to populate messages exchanged with other components during run time. Business objects are reusable Enterprise Java Beans (EJB) that typically implement a business entity or task. A business object has both data and function. For example, a request for quotation (RFQ) is a business object that might have a unique identifier, a vendor, and one or more parts.

Business objects are also known as business data objects.

Business Object Document (BOD). A representation of a standard business process that flows within an organization or between organizations. Examples are: add purchase order, show product availability, and add sales order. BODs are defined by the *Open Applications Group* using XML.

business process. The step-by-step flow of information and actions within one organization or between two or more trading partners. A business process can be as simple or complex as needed to meet the business needs of the organization or trading partners. See *task*. There are several types of business processes. See *private process* and *public process*.

Business Process Integration Adapter. Software that enables Partner Agreement Manager to work with the rest of Business Integrator. It packages XML message payloads from a public process into message formats that can be transported by Information Delivery Manager to Endpoints or to the Business Flow Manager. It packages messages from Endpoints or the Business Flow Manager into message formats that can be sent

through a public process. The Business Process Integration Adapter manages the correlation information that is necessary to bind public processes in Partner Agreement Manager with business processes in the Business Flow Manager.

business process managers. The Business Integrator components that control Business Integrator. The business process managers are *Trust and Access Manager, Business Flow Manager, Interaction Manager, Information Delivery Manager, and Solution Manager.*

business-to-business (B2B). Electronic commerce where a buyer organization buys goods or services from a merchant organization.

business-to-customer (B2C). Electronic commerce where a consumer buys goods or services from a merchant.

C

capacity unit. A measure of the number of Symmetrical Multiprocessors (SMP) in a machine. This is used to calculate the license requirements when you purchase Business Integrator.

Certificate Authority (CA). A trusted third-party organization or company that issues digital certificates used to create digital signatures and public-private key pairs. The role of the CA is to authenticate the entities (individuals or organizations) involved in electronic transactions. CAs are a critical component in data security and electronic commerce because they guarantee that the two parties exchanging information are really who they claim to be.

channel. In Partner Agreement Manager, an encapsulation of all the processing information needed to send messages to a trading partner's system, and to translate data from a trading partner into Partner Agreement Manager messages. All Partner Agreement Manager installations have the *PAM-to-PAM channel* installed. Available non-Partner Agreement Manager channels include the *RosettaNet* and *XML channel.*

ClearCase repository. In Solution Studio, the storage place for the *solution artifacts*. Rational ClearCase manages version control for all of the artifact files created for each solution.

common systems administration (CSA). Tools and technology used to implement the Product Console Launchpad and solution management framework in Business Integrator. The use of CSA provides a consistent look and feel within the system management consoles of Business Integrator and other IBM products.

correlation identifier. A field in a message that provides a means of identifying related messages. Correlation identifiers are used, for example, to match request messages with their corresponding reply message.

CRM. See *Customer Relationship Management.*

CSA. See *common systems administration.*

Customer Relationship Management (CRM). The systems and infrastructure required to analyze, capture, and share all parts of the customer's relationship with the enterprise. From a strategy perspective, CRM represents a process for measuring and allocating organizational resources to those activities that have the greatest return and impact on profitable customer relationships.

D

DataInterchange. A component of the Business Integrator that performs messaging between the trusted zone and an EDI network or virtual private network. DataInterchange reformats data for transmission via one or more channels, transforms data, supports registration of trading partners, performs auditing and reporting, supports extensive customization, and provides APIs for administrative, logging and command procedures.

DataInterchange can accept messages from the untrusted zone, perform appropriate processing and send the message to Endpoints or to the Business Flow Manager.

DataInterchange adapter • EJB

Endpoints or the Business Flow Manager can send messages to DataInterchange which cause DataInterchange to execute one or more command procedures to perform one or more actions, for example, to log on to a mailbox, and then to check for messages.

DataInterchange adapter. Software that enables DataInterchange to work with the rest of Business Integrator.

data object. In the Business Integrator programming model, a special type of command that encapsulates access to a data store.

Data Universal Numbering System (DUNS). A system in which internationally recognized nine-digit numbers are assigned and maintained by Dun & Bradstreet to uniquely identify worldwide businesses.

DB2. An IBM relational database management system that is available as a licensed program. Programmers and users of DB2 can create, access, modify, and delete data in relational tables using a variety of interfaces.

DB2 XML Extender. An extension to DB2 that provides data types that let you store XML documents in DB2 databases and functions that assist you in working with these structured documents. Entire XML documents can be stored in DB2 databases as character data or stored as external files but still managed by DB2. Retrieval functions allow you to retrieve either the entire XML document or individual elements or attributes.

DCE. See *distributed computing environment*.

Demilitarized Zone (DMZ). In network security, a network that is isolated from, and serves as a neutral zone between, a trusted network (for example, a private intranet) and an untrusted network (for example, the Internet). One or more secure gateways usually control access to the DMZ from the trusted or the untrusted network.

deployment. The process of making all the elements of a solution available to the run-time system. Compare with *publishing*.

deployment application. Part of the run time that unzips the solution package into the constituent artifacts and that moves the artifacts to the correct location on each machine in the run time environment according to the topology. The deployment application is invoked by the *Solution Deployment Wizard*. See *artifact* and *solution package*.

Digital Certificate. A form of electronic ID. The digital certificate facilitates unique identification of the entity that holds it. It is issued by a Certificate Authority (CA).

distributed computing environment (DCE). A product that assists in networking by providing such functions as authentication, directory service (DS), and remote procedure call (RPC).

DMZ. See *Demilitarized Zone*.

Document Type Definition (DTD). A file associated with XML documents that defines how the markup tags should be interpreted by the application using the document.

DUNS. See *Data Universal Numbering System*.

Dynamic MBean. An MBean that implements the DynamicMBean interface, so called because certain elements of its instrumentation can be controlled at runtime. See *Managed Bean* and contrast with *Standard MBean*.

E

EAI. See *enterprise application integration*.

e-business process integration (e-BPI). A system that enables companies to create, execute, and manage processes that span diverse applications, enterprises, and people, and to manage those processes—as well as the components that support those processes—as a unified, extensive, flexible solution.

Business Integrator is an e-business process integration system.

EDI. See *Electronic Data Interchange*.

EJB. See *Enterprise Java Bean*.

Electronic Data Interchange (EDI). A method of transmitting business information over a network, between trading partners who agree to follow approved national or industry standards in translating and exchanging information.

e-market. Where business-to-business buyers and sellers meet to trade in a virtual market.

Endpoint. A machine within the trusted zone that contains one or more *Endpoint applications*, each with an *application adapter* that allows communication with the Business Integrator system. A Business Integrator system can contain one or more Endpoint machines. Each Endpoint machine contains a single *Endpoint facility*.

Endpoint application. A business application that resides on an Endpoint machine together with an *application adapter*. Endpoint applications are typically called legacy applications or enterprise applications. Examples of such applications are SAP applications.

Endpoint facility. A significant portion of Business Integrator's run time functionality that is installed on each Endpoint machine. An Endpoint facility provides access via one or more adapters to Endpoint applications, and enable messaging within Business Integrator. The Endpoint facility also helps support deployment and management of the solution.

Endpoint machine. Synonymous with *Endpoint*.

element. See *solution element*.

enterprise application integration (EAI). The integration of disparate systems and applications across an enterprise, and the interoperability of complementary systems and applications between enterprises.

Enterprise configuration. The version of Business Integrator used by large enterprises. Enterprise configuration provides capabilities for more complex interactions with trading partners including EDI capability and generalized access to a Web Application server. Compare with *Entry configuration*.

Enterprise Java Bean (EJB). A Java API that defines a component architecture for multi-tier client/server systems. EJB systems allow developers to concentrate on the business architecture of a model, instead of programming the connections between components. EJB systems are platform-independent and object-oriented, and can be implemented into existing systems with minimal recompiling and configuring.

entity bean. A reusable Java component that is built using the Java Beans technology. Entity beans model business concepts that can be expressed as nouns. Entity beans represent data, so a change to an entity bean results in a change on a database. Entity beans are persistent; if the container in which an entity bean is hosted crashes, the entity bean and any remote references survive the crash. Contrast with *session bean*.

Entry configuration. The version of Business Integrator used by small companies and departments of large enterprises. Entry configuration enables trading partners to participate in e-markets with a limited initial investment and relatively low level of complexity. It allows peer-to-peer or spoke-to-hub participation in electronic markets. Compare with *Enterprise configuration*.

EPAC. See *Extended Privilege Attribute Certificate*.

event. In the context of Partner Agreement Manager, a piece of information that comes into Partner Agreement Manager as a message from another source (an enterprise system or business application, for example) and which triggers a *public process*.

Exception Management server. The Business Integrator component that allows the storage and retrieval of exception information in a DB2 database.

Extended Privilege Attribute Certificate (EPAC). A certificate that contains authorization information specific to the user, for example, details of groups to which the user belongs. EPACs are used to authorize users; that is, to

Extensible Markup Language (XML) • Information Delivery Manager

help a server decide whether users should be granted access to resources that the server manages.

Extensible Markup Language (XML). A standard metalanguage for defining markup languages that was derived from and is a subset of Standard Generalized Markup Language (SGML). XML omits the more complex and less-used parts of SGML and makes it much easier to (a) write applications to handle document types, (b) author and manage structured information, and (c) transmit and share structured information across diverse computing systems. The use of XML does not require the robust applications and processing that is necessary for SGML.

extension action. A private process action that communicates, via an adapter, with an external application that is registered with Partner Agreement Manager. You can use an extension action, for example, to get information from an enterprise system or listen for an event in the enterprise system. See also *adapter*, *private process*.

F

facility. In Business Integrator, an indivisible unit of installation that must be completely installed on one machine. A machine contains one or more facilities. Several facilities installed on a single machine may contain a number of common components, in which case those base components are shared amongst the facilities and not multiply installed.

FDL. See *MQSeries Workflow Definition Language*.

firewall. A functional unit that protects and controls the connection of one network to other networks. The firewall (a) prevents unwanted or unauthorized communication traffic from entering the protected network and (b) allows only selected communication traffic to leave the protected network.

G

gateway. A type of component of the Business Integrator that performs messaging between the trusted zone and the Internet or an EDI network.

There are two gateways:

- Partner Agreement Manager, for the Internet
- DataInterchange, for EDI

Global Secure Toolkit (GSK). A toolkit for managing digital certificates used in implementing Secure Sockets Layer (SSL) security.

H

HTTP. See *Hypertext Transfer Protocol*.

HTTP Server. The component of WebSphere Application Server that provides secure Web Server functionality.

Hypertext Transfer Protocol (HTTP). The protocol used by the Internet to transfer HTML and other information from servers to browsers and other servers.

I

Information Delivery Manager. The Business Integrator component that sends messages:

- Between the gateways and the Business Flow Manager
- Between the Business Flow Manager and Endpoints
- Between the gateways and Endpoints

The messages are typically in a common canonical format, that is, in an application-neutral format such as a *Business Object Document* in XML.

The Information Delivery Manager can perform assured delivery of messages, transformation of data elements and related functionalities, routing of messages, and message brokering. This functionality is performed by MQSeries Adapter Kernel with adapters that you build with

MQSeries Adapter Builder, along with MQSeries for assured delivery, and optionally MQSeries Integrator for message brokering services such as complex routing, data transformation, and data mediation.

instrument. In application or system software, to use monitoring functions to provide performance and other information to a management system.

instrumentation. In application or system software, either (a) monitoring functions that provide performance and other information to a management system or (b) the use of monitoring functions to provide performance and other information to a management system.

Interaction Manager. The Business Integrator component that helps to render a view of a business entity that is appropriate to the role of the end user based on their authorization and the point in the business process. Interaction Manager gets the content of the view that it will render from the Business Flow Manager, as the result of the Business Flow Manager's processing.

How the content is rendered depends on the target device used to view the content. For example, presentation on a Web browser might be different from the presentation on a personal digital assistant.

Interaction Manager is not involved when the content of the view is delivered by one of the gateways.

Internet Inter-ORB Protocol (IIOP). A protocol used for communication between CORBA object request brokers.

J

J2EE Connector Architecture. An architecture for the integration of J2EE products with enterprise information systems. The architecture has two parts: a resource adapter provided by an enterprise information system vendor, and the J2EE product that allows this resource adapter to plug in.

Java 2 Platform, Enterprise Edition (J2EE platform). An environment for developing and deploying enterprise applications. The J2EE platform consists of a set of services, APIs, and protocols that provide functionality for developing multi-tiered, Web-based applications.

Java Authentication and Authorization Service (JAAS). A Java package that enables services to authenticate users and enforce access controls upon them.

Java Cryptography Extension (JCE). A framework and implementations for encryption, key generation and key agreement, and Message Authentication Code (MAC) algorithms. JCE is used by Partner Agreement Manager for certificate-based authentication

Java Database Connectivity (JDBC). An industry standard for database-independent connectivity between the Java platform and a wide range of databases. JDBC provides a call-level API for SQL-based database access.

Java Development Kit (JDK). A software package used to write, compile, debug, and run Java applets and applications.

Java Management Extensions (JMX). A means of doing management of and through Java technology. JMX was developed through the Java Community ProcessSM program, by Sun Microsystems, Inc. and some leading companies in the management field. JMX is a universal, open extension of the Java programming language for management that can be deployed across all industries, wherever management is needed.

Java Message Service (JMS). An API for using enterprise messaging systems such as IBM MQSeries.

Java Runtime Environment (JRE). A subset of the Java Development Kit (JDK) comprising the Java Virtual Machine (JVM), the Java core classes, and supporting files.

Java Secure Socket Extension (JSSE). A Java package that enables secure Internet communications. It implements a Java version of

Java Server Pages (JSP) • MBean Server

the Secure Sockets Layer (SSL) and Transport Layer Security (TLS) protocols and supports data encryption, server authentication, message integrity, and optionally client authentication. JSSE is used by Partner Agreement Manager for certificate-based authentication

Java Server Pages (JSP). An extensible Web technology that uses template data, custom elements, scripting languages, and server-side Java objects to return dynamic content to a client. The template data is typically HTML or XML elements, and the client is often a Web browser.

Java Virtual Machine (JVM). A software implementation of a central processing unit (CPU) that runs compiled Java code (applets and applications).

JCE. See *Java Cryptography Extension*

JCX. A deprecated abbreviation for *J2EE Connector Architecture*.

JDBC. See *Java Database Connectivity*.

JDK. See *Java Development Kit*.

JMS. See *Java Message Service*.

JMS Listener. Part of the Business Flow Manager that is started as a WebSphere service. The JMS Listener, in concert with a *worker bean*, decides which enterprise bean in the Business Flow Manager to invoke. The JMS Listener monitors a JMS queue that is associated with a worker bean. It receives the message from the queue and passes it to the worker bean, which then determines the enterprise bean to invoke based on the content of the message.

The JMS Listener is configured through its own XML file, and in WebSphere's Class of Service Naming service.

JMX. See *Java Management Extensions*.

JRE. See *Java Runtime Environment*.

JSP. See *Java Server Pages*.

JSSE. See *Java Secure Socket Extension*.

JVM. See *Java Virtual Machine*.

L

LDAP. See *Lightweight Directory Access Protocol*.

Lightweight Directory Access Protocol (LDAP). An open protocol that (a) uses TCP/IP to provide access to directories that support an X.500 model and (b) does not incur the resource requirements of the more complex X.500 Directory Access Protocol (DAP). Applications that use LDAP (known as directory-enabled applications) can use the directory as a common data store for retrieving information about people or services, such as e-mail addresses, public keys, or service-specific configuration parameters.

Lightweight Third Party Authentication (LTPA). An authentication framework that allows single sign-on across a set of Web servers that fall within an Internet domain.

logical topology view. A view of a topology that shows a tree structure in terms of the facilities of Business Integrator and their base products. See *topology* and *facility*.

M

Managed Bean (MBean). According to the Java Management Extensions (JMX) specification, the Java objects that implement resources and their *instrumentation* are called Managed Beans, or MBeans for short. MBeans must follow the design patterns and interfaces defined in the instrumentation level of the JMX specification. This ensures that all MBeans provide the instrumentation of managed resources in a standardized way. MBeans are manageable by any JMX agent, but they may also be managed by non-compliant agents that support the MBean concept. See also *Java Management Extensions*, *Standard MBean*, and *Dynamic MBean*.

MBean Server. A set of services for handling *MBeans*.

message broker. (1) A set of executing processes hosting one or more message flows. MQSeries Integrator is an example of a message broker. (2) The Business Integrator facility that works with existing messaging transports by adding both routing intelligence and the ability to convert data from one protocol to another. It analyzes a message to determine the application to receive it (rules engine). It then converts the data into the structure that the receiving application requires.

microflow. Part of a *solution*, that is modeled as a Java Service Adapter in MQSeries Adapter Builder. A microflow is deployed as stateless session beans, Java beans, and Java classes, which at run time are part of the Business Flow Manager, running under WebSphere Application Server. A microflow can also can invoke Endpoints, MQSeries Integrator and MQSeries Workflow.

Microsoft Management Console (MMC). An extensible user interface that provides an environment for running management applications structured as components called snap-ins.

middleware. The software that provides the links between applications.

MMC. See *Microsoft Management Console*.

MQSeries. An IBM licensed program that provides reliable message queuing and associated services across a range of platforms.

MQSeries Adapter Builder (MQAB). One of the MQAO set of products, MQAB uses a visual interface to help build an adapter for virtually any application and to build *microflows*.

MQSeries Adapter Kernel (MQAK). One of the MQSeries Adapter Offering set of products that provides common runtime services. In the Business Integrator run time, MQAK, together with MQSeries, and optionally MQSeries Integrator, acts as the Information Delivery Manager.

MQSeries Adapter Offering (MQAO). A set of application integration products that work with MQSeries messaging to reduce the risk,

complexity and cost of managing point-to-point application integration. MQAO allows you to create adapters that use a standard interface that remains stable even though the application changes. The interface is typically based on Business Object Documents (BOD), message format standards defined by the Open Applications Group Inc (OAG).

The MQAO is a set of products that includes MQSeries Adapter Builder (MQAB) and MQSeries Adapter Kernel (MQAK).

MQSeries classes for Java Message Service (JMS) (MQ JMS). A set of Java classes, that implement Sun's Java Message Service (JMS) interfaces to enable JMS programs to access MQSeries systems.

MQSeries Integrator (MQSI). A product that works with MQSeries messaging, extending its basic connectivity and transport capabilities to provide a powerful message broker solution driven by business rules.

MQSeries Integrator User Name Server. A component of MQSI that can be used to provide authentication of users and groups performing publish/subscribe operations. At least one of these may be used for each domain, to manage the access paths to resources.

MQSeries Publish/Subscribe. An MQSeries product that allows you to decouple the provider of information from the consumers of the information. An application can send information to a destination managed by MQSeries Publish/Subscribe, which deals with the distribution of the information.

MQSeries Workflow. An MQSeries product that manages *workflow*. MQSeries Workflow is used to design, refine, document, and control business processes.

MQSeries Workflow Definition Language (FDL). The language used to exchange MQSeries Workflow information between MQSeries Workflow systems.

node • process choreography capability

N

node. In Business Integrator one of the points in a *topology view*. Depending on the type of view, a node might correspond to a machine, *facility*, base product, *solution element*, or *solution artifact*.

non-repudiation. In business-to-business communication the ability of the recipient to prove who sent a message based on the contents of the message. This can derive from the use of a digital signature on the message, which links the sender to the message.

O

Object Management Group (OMG). A group of vendors formed for the purpose of creating a standard architecture for distributed objects in networks. The architecture that resulted is the Common Object Request Broker Architecture (Common Object Request Broker Architecture). See also *XML Metadata Interchange*.

Open Applications Group (OAG). A non-profit industry consortium comprised of many prominent stakeholders in the business software component interoperability arena. The OAG defines *Business Object Documents (BOD)*.

P

PAM Proxy Server. Software that resides in the DMZ and which performs access control on inbound messages from business partners to Business Integrator and on outbound messages from Business Integrator to business partners.

PAM-to-PAM channel. A *channel* that is ready-installed in Partner Agreement Manager.

Partner Agreement Connect. A limited licence version of Partner Agreement Manager that allows a customer to participate in a public process defined by a trading partner, but does not allow the authoring of new public processes.

Partner Agreement Manager.

The Business Integrator component that implements the *public process* and *trading partner agreements*.

Partner Agreement Manager is a separately purchased, optional component, of both the Entry configuration and Enterprise configuration of Business Integrator.

Partner Agreement View. (1) A product that provides an interface that allows the seamless integration of Partner Agreement Manager with Web applications. (2) The Business Integrator facility that encapsulates Partner Agreement View.

physical topology view. A view of a topology that shows a tree structure in terms of the machines in the topology, the facilities installed on those machines, and their base products. See *topology* and *facility*.

Platform Console. The Business Integrator console used to monitor and manage the business process managers and components of Business Integrator and, through the Solution Deployment Wizard to deploy solution packages onto the runtime system.

point-to-point messaging. Data transmission between two locations without the use of any intermediate display station or computer.

predefined topology. A topology, corresponding to a tested configuration, that can be selected at installation time. A number of predefined topologies are shipped with Business Integrator to allow for different business needs and complexity of solution.

private process. A trading partner's internal sequence of actions for its steps in the *public process*. Although all trading partners in a public process see and agree to its flow, the trading partner that develops a private process is the only one that can ever see it.

process choreography capability. The name of the capability in *Business Integrator* that:

- Aggregates business content that is managed by a variety of underlying processes (also known as *tasks*). One underlying process might

be performed by *MQSeries Workflow*, another might be performed by an *Endpoint application*. Processes can be performed by different organizations.

- Provides the output of an underlying process to one or more other underlying processes that might need it as an input.
- Based on the states of the underlying processes, assigns one state to the overall business process.
- Assigns security privileges to each of the participants across the set of processes.
- Dynamically delivers different views of the business content, based on the point in the business process at which the business content is accessed and on the role of the participant who accesses it.
- Manages the life cycle of the business process.

In summary, the process choreography capability coordinates the set of underlying processes that make up a business process, to align the business process with changing business conditions. Many things can happen at any time that can affect what the business process should do next. To align the business process with changing business conditions, the process choreography capability synchronizes information across multiple underlying processes. It maintains the state of the business process apart from the main process.

The process choreography capability is key to understanding how Business Integrator adds value *beyond* the value of the individual underlying products and technologies that are part of Business Integrator.

The *adaptive document* is part of how the process choreography capability is implemented.

process state. The current state of a business process.

Product Console Launchpad. The graphical user interface used to monitor the runtime system of Business Integrator and launch the management consoles of base products of Business Integrator. The Product Console

Launchpad provides a wizard to facilitate the addition of new product consoles to the launchpad.

program client. A Business Integrator client that provides for the automated interchange of business documents with trading partners by responding to program requests and maintaining a relationship with requesting programs.

project. In the build time of Business Integrator, the project organizes and contains all *artifacts* of a single solution. The project and its artifacts are stored in the Clear Case server and in the WebSphere Studio Project, on a mapped network drive that can be shared by a team creating a solution together. You employ the project to organize the work-in-progress files during creation of a solution and the artifacts that result when creation is complete. Project is a WebSphere Studio term.

public process. The step-by-step flow of information and actions between two or more trading partners. One trading partner develops the public process, and all trading partners involved review and accept the process before it is implemented. The trading partner that designs a process is its owner. See *private process*.

publishing. The process of preparing a *solution package* using Solution Studio. The solution package is deployed to the runtime system by the *deployment application*. See also *deployment*.

Publishing Wizard. The wizard within Solution Studio that is used to prepare a *solution package*. Contrast with *Solution Deployment Wizard*.

publish/subscribe. See *MQSeries Publish/Subscribe*.

Q

QoS. Quality of service.

queue manager. (1) A program that provides queuing services to applications. It provides an application programming interface to enable programs to access messages on the queues that

Rational ClearCase • solution

the queue manager owns. (2) An object that defines the attributes of a particular queue manager.

R

Rational ClearCase. A product used by Solution Studio to enforce version control, provide change management, and as a repository for solution templates, elements, and artifacts. ClearCase is jointly developed between IBM and Rational.

receiver channel. A channel that moves messages from the target to the source machine.

Remote Method Invocation (RMI). A distributed object model for Java program to Java program, in which the methods of remote objects written in the Java programming language can be invoked from other Java virtual machines, possibly on different hosts.

repudiation. Backing out of, or denying taking part in, an e-business transaction.

RMI. See *Remote Method Invocation*.

role-based desktop. A view rendered in a user's browser that provides access to the services the user is authorized to access when they log on to a solution. For example, a user with a defined role of buyer typically has authorization to create and view purchase orders, or a user with a role of administrator typically has authorization to add users and change passwords. In Business Integrator access to the specific services for each user is rendered in the user's browser.

RosettaNet. A non-profit organization that seeks to implement standards for supply chain management transactions on the Internet. The group includes companies such as Microsoft, Netscape, and IBM, and is working to standardize labels for elements such as product descriptions, part numbers, pricing data, and inventory status. The group aims to implement many of its goals through XML.

RosettaNet channel. A type of *channel* in Partner Agreement Manager.

S

SCM. See *Supply Chain Management*

SecureWay Directory. A Lightweight Directory Access Protocol (LDAP) cross-platform, highly scalable, robust directory server for security and e-business solutions.

SecureWay Policy Director. A Tivoli product that provides highly available, centralized, authentication, authorization, and user management.

SecureWay Policy Director WebSEAL. The authentication component of SecureWay Policy Director, the product that provides highly available, centralized, authentication, authorization, and user management.

sender channel. A channel that moves messages from the source to the target machine.

service. In the Business Integrator programming model, a set of command operations that is exposed within a public process or a private process.

servlet. An application program, written in the Java programming language, that is executed on a Web server. A reference to a servlet appears in the markup for a Web page, in same way that a reference to a graphics file appears. The Web server executes the servlet and sends the results of the execution (if there are any) to the Web browser.

session bean. An enterprise bean that is created by a client, that usually exists only for the duration of a single client/server session, and which is responsible for managing processes and tasks. A session bean may be transactional, but it is not recoverable if a system crash occurs. Session bean objects can be either stateless or they can maintain conversational state across methods and transactions. Contrast with *entity bean*.

solution. The realization of a business process. The solution is an instance of a solution template. At build time, you build a solution

template and employ the project to organize and contain its artifacts. Before deployment the solution is published to create a solution package, and at run time, solutions are deployed, sometimes customized for the run time environment, and then run. When it is running in production, the solution is key to Business Integrators added value.

See *business process, solution template, artifacts, solution package and deployment application.*

solution artifact. See *artifact.*

Solution Console. An extensible application providing a unified view of selected aspects of a solution and solution services at the application level. Solution Console is a web-enabled interface that provides access to data that is persisted in the *Audit Log server*, the *Exception Management server*, and *Trace server* databases.

Solution Deployment Wizard. A wizard called from the Platform Console that invokes the *deployment application* to deploy a *solution package* onto the runtime system. The wizard also allows the redeployment of solution packages that have already been deployed, or partly deployed.

solution elements. The component parts of a solution. An element is a group of artifacts that is installed on one machine. Typical elements of solutions include: Business Processes Model, System Registry, Business Objects, application adapters, Business Flow, Web Clients, and Program Clients.

Solution Manager. The software that provides the infrastructure for monitoring and managing the Business Integrator system. This includes the *Platform Console*, *Product Console Launchpad* and *Solution Console*, which are used to manage the Business Integrator system and solution.

Solution Manager Client. Software that is installed with most of the facilities of Business Integrator, and which provides the solution management and deployment frameworks. These frameworks consist of *Java Management Extensions (JMX)* and *Managed Beans (MBeans)* to support the management of solutions and deployment of *artifacts.*

solution package. A zip file comprising solution elements, metadata, and scripts created by the publishing process of Solution Studio. The metadata contains information that determines how solution elements will map to machines and facilities in the runtime system. The scripts are used by the *deployment application* in the deployment of the solution to the runtime system.

Solution Services. Services provided by Solution Manager that include audit logging, tracing, events, and exception management.

Solution Studio. The Business Integrator component that is used to define the business processes and assemble the solution.

Solution Studio wizards. Wizards provided by Solution Studio for use in developing solutions. The wizards perform a variety of tasks. For example, many of the tools (products such as MQSeries Adapter Builder) that you use to create the solution *artifacts* are launched by using Solution Studio wizards. These wizards are also used to store the created artifacts in the project folders in the *ClearCase repository*. Solution Studio provides online help for using the wizards.

solution template. In build time, a representation of the business process that the solution is intended to carry out later at run time. In a business domain, such as supply chain management, the solution template defines the following:

- A business process model that defines the business process, for example, in the areas of enterprise integration, planning, forecasting, replenishment, scheduling, order management, and transportation. A typical business process is “purchase order”.
- A system registry that defines the run-time repository that contains system configuration and solution-specific information such as users, roles, and trading partner profiles.
- Business objects, which define the distributed objects necessary to support the business process.

solution topology view • transition

- Adapters, which define the connection between gateways, the Business Flow Manager and Endpoints.
- Business flow, which provides a detailed view of the business process.

You model and create the solution template through Solution Studio, and publish the solution template as a solution in a solution package.

Solution templates typically can be reusable assets, and are key to Business Integrator's added value.

solution topology view. A view of a topology that shows a tree structure in terms of the elements and artifacts that make up a solution instance. See *topology*, *facility* and *solution*.

Standard Bean. A class that implements its own MBean interface, See *Managed Bean* and contrast with *Dynamic MBean*.

stateful session bean. A *session bean* that has a conversational state.

state machine. Software that defines one or more states with multiple transitions. Each transition contains a to-state, transition event, conditions, and a set of actions (or commands). For the transition to go to the next state (the to-state), it must successfully execute all the actions defined for the current state. In Business Integrator, a state machine can be realized in a *microflow*.

stateless session bean. A *session bean* that has no conversational state. All instances of a stateless session bean are identical.

Supply Chain Management (SCM). The management of resources, functions, and sequence of processes used by organizations involved in the supply of raw materials and products, and their delivery to manufacturers, wholesalers, retailers, and finally consumers. Business Integrator provides SCM in terms of integrated design, development, and deployment

tools for creating solutions that manage the supply of goods and services between supplier and consumer.

T

task. A step in the business process.

topology. A definition of the arrangement of physical machines, together with the software products and components installed on these machines, that make up a Business Integrator runtime environment. A number of *predefined topologies* are shipped with Business Integrator, and one of these is selected at installation time.

Topology Repository. An XML file that stores the details of the machines, facilities and products that make up the topology. The Topology Repository is accessed by Business Integrator runtime components and used to display topology views.

Topology Server. The software that creates, and controls access, to the Topology Repository.

topology type. The identification of an object in the topology repository, for example, computer systems, facilities and products are topology types. Each topology type can have zero, one, or more properties, which can be displayed using the Platform Console or Product Console Launchpad.

topology view. A view of the topology in terms of either the logical, physical, or solution-related elements of the topology. You can use both the Product Console Launchpad and the Platform Console to display a *logical topology view*, *physical topology view*, or a *solution topology view*.

Trace server. The Business Integrator component that allows the storage and retrieval of trace information in a DB2 database.

trading partner agreement (TPA). The formal agreement between trading partners.

transition. A change in state when certain conditions are met.

transmission queue. A queue that stores the messages that are to be sent across a channel.

Trust and Access Manager. The Business Integrator software components that control access to the system and its associated business applications. The Trust and Access Manager provides authorization, authentication, and directory services for Business Integrator. Trust and Access Manager grants users and other business applications access, based on their authorized solutions and roles. The audit and logging capabilities of Trust and Access Manager allow administrators to monitor the system for security breaches.

TPA. See *trading partner agreement*.

U

UML. Unified Modeling Language. A general-purpose notational language for specifying and visualizing complex software, especially object-oriented projects. UML builds on previous notational methods such as Booch, OMT, and OOSE.

UNS. Short for User Name Server. See *MQSeries Integrator User Name Server*.

utilities. In the context of Solution Studio, executable software and associated documentation that can prove useful in building and running solutions. Utility software can be found in the utilities directory in Solution Studio.

W

WebDAV. An abbreviation for Web Distributed Authoring and Version. It is a set of extensions to the HTTP protocol that allows users to collaboratively edit and manage files on remote web servers.

Web Proxy Server. Software that resides in the DMZ and which performs access control on inbound messages from Web clients to Business Integrator

WebSeal. See *SecureWay Policy Director WebSEAL*.

WebSphere. A family of IBM software products that provides a development and deployment environment for basic Web publishing and for transaction-intensive, enterprise-scale e-business applications.

WebSphere Application Server. An e-business application deployment environment built on open standards-based technology. The Advanced Edition is a high-performance EJB server for implementing EJB components that incorporate business logic.

worker bean. An enterprise bean that, in concert with a JMS Listener, decides which enterprise bean in the Business Flow Manager to invoke. See *JMS Listener* for information about how they work together.

Worker beans are configured through the LDAP directory.

worker message bean. Synonymous with *worker bean*.

workflow. The sequence of activities performed in accordance with the business processes of an enterprise. For a full definition, refer to the *MQSeries Workflow* documentation.

X

X.500. The directory services standard of ITU, ISO, and IEC.

XML. See *Extensible Markup Language*.

XML channel. A type of *channel* in Partner Agreement Manager.

XML Metadata Interchange (XMI). A proposal from the *Object Management Group* that uses the *Extensible Markup Language (XML)* to provide a standard way for programmers and other users to exchange information about metadata (essentially, information about what a set of data consists of and how it is organized). XMI is intended to help programmers with different languages and development tools to exchange their data models with each other. XMI can also be used to exchange information about data warehouses.

The XMI format standardizes the way in which any set of metadata is described and requires users across many industries and operating environments to see data the same way.

Bibliography

This bibliography lists the books in the IBM WebSphere Business Integrator and associated libraries.

IBM WebSphere Business Integrator library

The Business Integrator library consists of the following books:

- *WebSphere Business Integrator Concepts and Planning, GC34-5960*

This book introduces the Business Integrator system, providing a high-level system overview, defining the system capabilities, and describing its value to e-businesses. This book also provides the information that you need to plan the installation of Business Integrator.
- *WebSphere Business Integrator Installation Guide, GC34-5961*

This book is a guide to installing and configuring Business Integrator, It contains information about:

 - Selecting your required topology
 - Installing and configuring the base products and software components of Business Integrator on each machine in the topology
 - Installing and configuring firewalls and proxies
- *WebSphere Studio Business Integrator Extensions Installation Guide, SC34-5962*

This book is a guide to installing and configuring Solution Studio, It also contains information about setting up clients and servers, and creating projects.
- *WebSphere Business Integrator Run Time*

This book is a comprehensive guide to the Business Integrator runtime system, providing the following information:

 - Detailed conceptual information about the runtime components of Business Integrator.
 - Deployment of solutions to the runtime system
 - System administration, such as starting and stopping software components and base products, defining users, and using the Exception Console.
 - General problem determination information, including how to trace and debug, and information on obtaining help from technical support

- *WebSphere Business Integrator Messages*
This book lists the error messages that are produced by Business Integrator and provides references to the documentation for the messages of base products.
- *WebSphere Studio Business Integrator Extensions Developer's Guide*
This book describes how to create a Business Integrator solution, beginning with the solution design phase, to the solution implementation phase, and finally the solution deployment phase using a sample business problem. This book also provides procedures for assembling a Business Integrator solution in the run-time environment and a description of how to use the Solution Studio for solution design and implementation.
- *WebSphere Business Integrator DataInterchange for Windows NT User's Guide, SC34-5963*
This book is a guide to installing and using DataInterchange, in the Business Integrator environment.

You can find the latest versions of the books at the following Web site:

<http://www-4.ibm.com/software/webservers/btobintegrator/>

This site contains links to the Web sites of the underlying products of IBM WebSphere Business Integrator.

Related documentation

The *utilities* subdirectory on the Documentation CD contains documentation about utilities that can prove useful in building and running solutions. This documentation is not available on the IBM WebSphere Business Integrator Web site.

WebSphere Business Integrator also provides a number of external application programming interfaces (API). HTML documentation that is generated using the Javadoc tool is provided for these APIs. For a list of the APIs, refer to the *WebSphere Business Integrator Run Time* book.

WebSphere Partner Agreement Manager library

The Partner Agreement Manager Version 2 Release 1 library consists of:

- *Partner Agreement Manager Installation Guide*, GC34-5964
- *Partner Agreement Manager Administrator's Guide*
- *Partner Agreement Manager User's Guide*
- *Partner Agreement Manager Adapter Developer's Guide*
- *Partner Agreement Manager Script Developer's Guide*
- *Partner Agreement Manager API Guide*
- *Partner Agreement Manager Adapters for MQSeries User's Guide*
- *Partner Agreement View User's Guide*, GC34-5965
- *WebSphere Partner Agreement Manager Business Process Integration Adapter Guide*.

DataInterchange library

The DataInterchange Version 3 Release 1 library consists of:

- *DataInterchange Client User's Guide*, SB34-2010
- *DataInterchange Administrator's Guide*, SB34-2002
- *DataInterchange Installation Guide*, GB09-8070
- *DataInterchange Messages and Codes*, SB34-2000
- *DataInterchange Programmer's Reference*, SB34-2001

Other Libraries

You can find important information in the libraries of the following products:

- DB2[®] UDB
 - *IBM DB2 Universal Database Quick Beginnings Version 6.1* , S10J-8149
- MQSeries[®]
 - *MQSeries for Windows NT Quick Beginnings*, GC34-5389
 - *MQSeries System Administration*, SC33-1873
 - *MQSeries Using Java*, SC34-5456
 - *MQSeries MQSC Command Reference*, SC33-1369
 - *MQSeries Queue Manager Clusters*, SC34-5349
 - *MQSeries Integrator Introduction and Planning*, GC24-5599
 - *MQSeries Workflow Getting Started with Buildtime*, SH12-6286
 - *MQSeries Workflow Getting Started with Runtime*, SH12-6287
 - *MQSeries Adapter Kernel for Multiplatforms: Quick Beginnings*, GC34-5855
 - *MQSeries Adapter Kernel for Multiplatforms: Problem Determination Guide*, GC34-5897

- *MQSeries Adapter Builder for Windows NT: Using the Control Center, GC34-5882*
- **SecureWay[®]**
 - *SecureWay Policy Director Up and Running, SCT6-3KNA*
 - *SecureWay Policy Director Base Administration Guide*
 - *SecureWay Firewall User's Guide, CG31-8658*
- **VisualAge[®]**
 - *VisualAge Java, Enterprise Edition Getting Started*
 - *VisualAge C++ Professional for Windows NT Getting Started*
- **WebSphere[™] Application Server**
 - *Introduction to WebSphere Application Server, SC09-4430*

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