

*IBM WebSphere Business Integration Collaborations
for Healthcare Version 1.0*
*IBM WebSphere Business Integration Collaborations
Version 4.5*



Solution Architecture Guide

Note!

Before using this information and the product it supports, be sure to read the general information under “Notices and Trademarks” on page 11.

Second Edition (December 2003)

This edition applies to:

Version 1 of IBM® WebSphere® Business Integration Collaborations for Healthcare (5724-H61)

Version 4, Release 5, of IBM WebSphere Business Integration Collaborations (5724-C12)

and to all subsequent releases and modifications until otherwise indicated in new editions.

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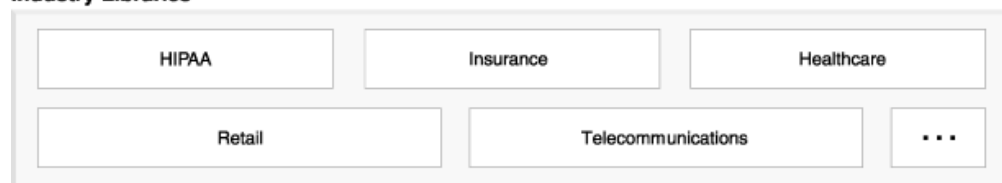
Solution architecture

The WebSphere Business Integration Collaborations for Healthcare solution architecture is derived from the WebSphere Business Integration Collaborations for Healthcare solution model (described in the WebSphere Business Integration Collaborations for Healthcare Solution Overview) The architecture also follows the WebSphere Business Integration solution architecture map for cross-industries, shown in the following diagram.

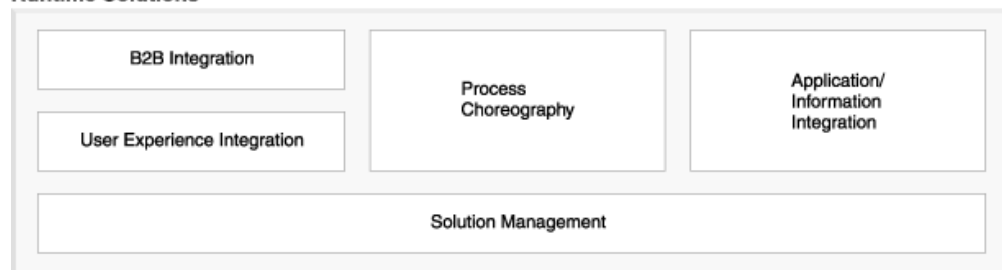
Solution Studio



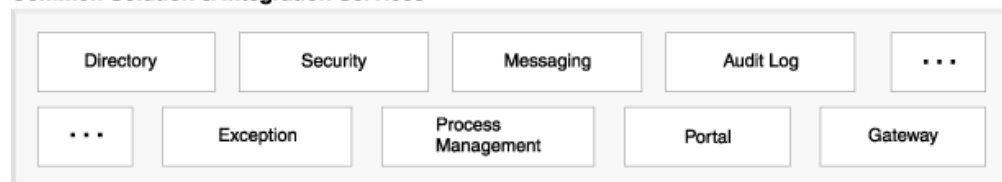
Industry Libraries



Runtime Solutions



Common Solution & Integration Services



WebSphere Platform



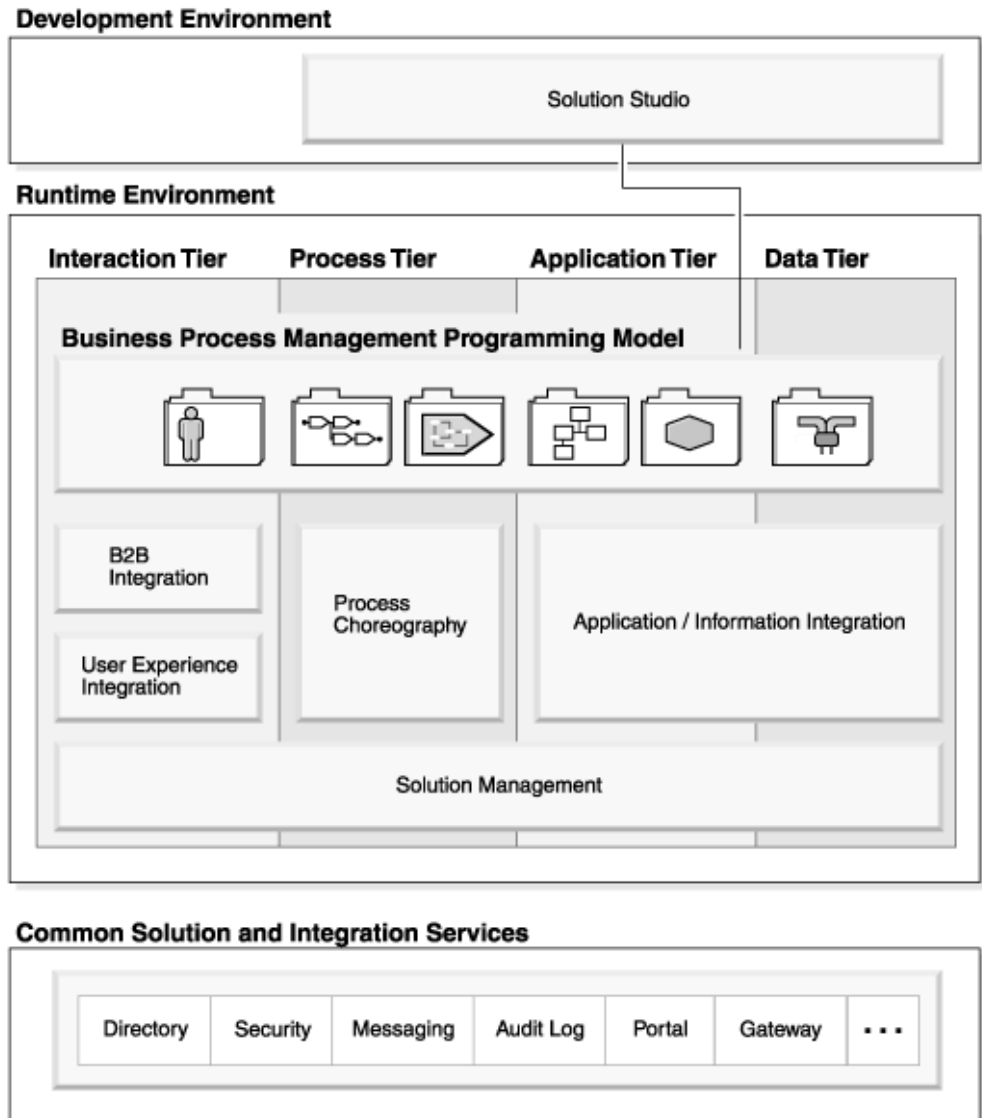
Infrastructure



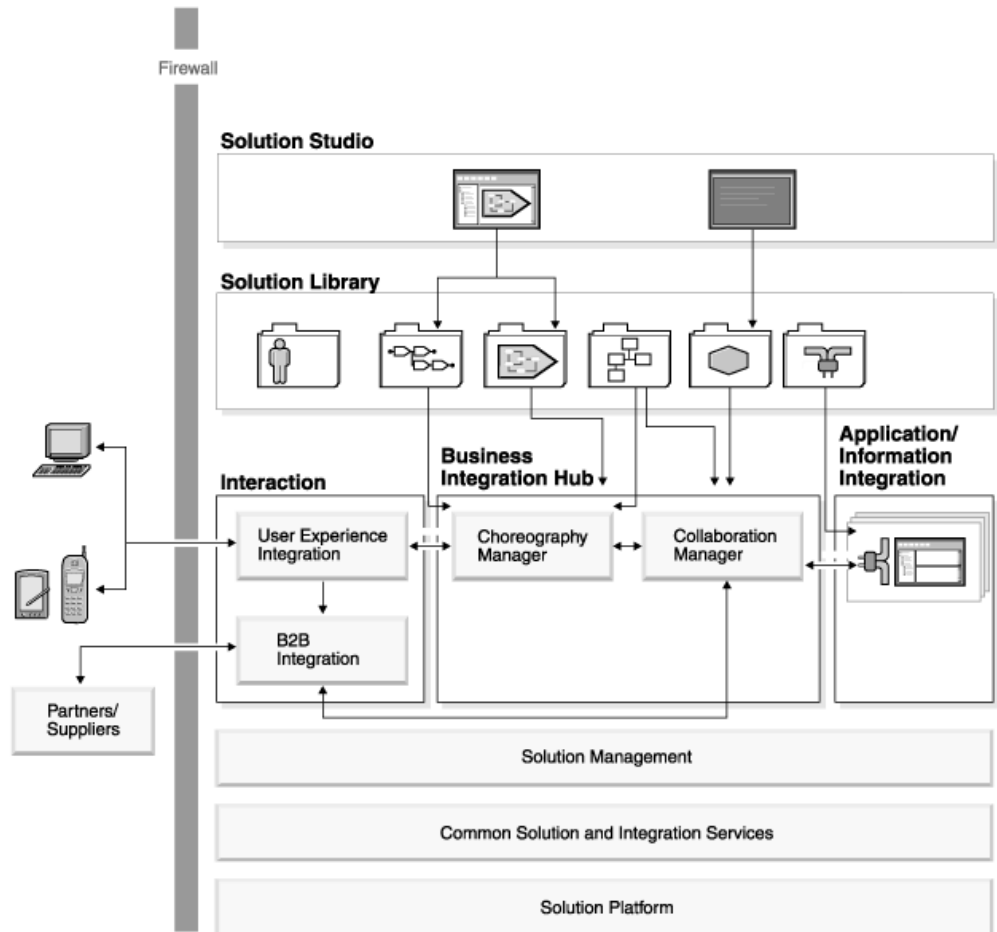
The architectural elements identified in the WebSphere Business Integration solution architecture map are as follows:

- The Solution Studio layer provides a set of development tools that you can use to utilize and customize artifacts included in the solution industry library, or to create new artifacts.
- The Industry Libraries layer provides the artifacts that define the WebSphere Business Integration Collaborations for Healthcare solution, including business process templates, collaborations, business objects and adapters.
- The Runtime Solutions layer defines the integration patterns that govern the interaction of logical components in a particular business integration solution deployment. Within this layer, the Solution Management element provides tools for managing these patterns and components in runtime.
- The Common Solution and Integration Services layer contains services that are common to all business integration solution deployments, such as directory, messaging and exception services.
- The WebSphere Platform layer consists of applications in the WebSphere software family for e-business that provide the runtime environment in which services and logical components function.
- The infrastructure layer consists of hardware and software elements infrastructures required by the WebSphere platform.

The following diagram shows the logical view of the Business Integration solution architecture. This diagram shows a categorization of the elements of the Industry Libraries and Runtime Solutions layers according to the logical tiers that they occupy.



The following diagram shows the interaction of business integration solution elements. The core of the WebSphere Business Integration Collaborations for Healthcare solution architecture is the Business Integration Hub, shown at the center of the diagram.



The following sections describe the elements of the WebSphere Business Integration Collaborations for Healthcare solution architecture in greater detail.

Business Integration Hub

The Business Integration Hub design is based on a flow composition model. In the context of a flow composition model, a business service (including a business process) is an entity that performs one or more business functions. The rules for composing a complex business service from other business services are described by a flow model. A flow model is a directed graph with nodes that represent business services, and links between nodes that represent the flow of control and information between the business services.

In the WebSphere Business Integration Collaborations for Healthcare business integration model, the Business Integration Hub is further divided into two layers. The process choreography layer consists of a set of business process models, and the application/information integration layer consists of a set of collaboration models. In a flow composition model, a business process model is defined by business process flow, and a collaboration model is defined by collaboration flow. The main difference between the two types of flows is that a business process flow models flows in the context of business operations and using business terms whereas a collaboration flow models flows in the context of application and information integration.

From a technological view, a business process flow is a coarse grained top-level flow that describes a strategic process of a business that is independent of any particular application. A business process flow follows a particular order; this ordering is defined as choreography.

Application integration often requires that logical operations be mapped to more complex interactions with external systems. For example, creating a purchase order might involve an application creating a purchase order header and adding a line item. Using collaboration flows to mediate between business process flow and applications allows business processes to be isolated from the legacy business functions provided by existing applications.

Collaboration flows also play a role as application adapters. You can use collaboration flows to aggregate business services provided by discrete applications in order to support high-level services requested by business process flows. A collaboration flow can also be treated as a subflow or microflow of a business process flow. In some applications, microflows may already be embedded within the application itself.

In WebSphere Business Integration Collaborations for Healthcare, the difference between business process flows and collaboration flows is that business process flows are targeted for business process management purposes whereas collaboration flows are used to access services provided by applications. In order to manage these two types of flows, the Business Integration Hub has two subcomponents, the Choreography Manager and the Collaboration Manager. The Choreography Manager provides the runtime environment that manages instances of business process flows, whereas the Collaboration Manager handles instances of collaboration flows.

Choreography Manager

The Choreography Manager provides the runtime environment for business process flow instances. A business process flow instance is a runtime construct representing a business process flow that can be deployed in the Choreography Manager. The Choreography Manager is responsible for interpreting and keeping track of business process flow instances, administering their execution, and logging events that result from this execution. If a business process flow contains automated business activities, the Choreography Manager performs the right activities at the right time. If a business process flow contains interactive business activities, Choreography Manager creates the work items and moves them to participant work lists.

WebSphere Business Integration Collaborations for Healthcare uses WebSphere MQ Workflow Server as its Choreography Manager. WebSphere MQ Workflow is an implementation of the flow composition model that manages macroflows. You can build business process flows for WebSphere MQ Workflow using WebSphere MQ Workflow Buildtime tools. The WebSphere MQ Workflow Server runs business process flow instances by navigating through the business process models. Applications are invoked automatically, and work items are created and distributed to the work lists of people involved.

For information about WebSphere MQ Workflow runtime, go to the WebSphere MQ Workflow Web site at www.ibm.com/software/integration/wmqwf.

Collaboration Manager

The Collaboration Manager provides the runtime environment for collaboration flow instances. A collaboration flow instance is the runtime construct representing a collaboration flow that can be deployed in the Collaboration Manager. The Collaboration Manager is responsible for interpreting the collaboration flow definitions of a collaboration flow instance. Since a collaboration model has close relationships with the business object model, the Collaboration Manager is also responsible for routing business objects to the connected applications. The Collaboration Manager is also responsible for monitoring the interactions between applications, enabling and disabling interactions to the applications and specifying the mapping for each business object that is passed between applications.

A collaboration's main responsibility is to act as an integrator of business functions. A business function may have synchronous or asynchronous responses. If an asynchronous response is required, the Collaboration Manager manages the return of responses back to the appropriate service requester.

WebSphere Business Integration Collaborations for Healthcare uses IBM WebSphere InterChange Server as its Collaboration Manager. IBM WebSphere InterChange Server is an implementation of the flow composition model that focuses on microflows. IBM WebSphere InterChange Server provides a runtime environment for collaboration flow instances. Each collaboration flow instance is called a collaboration object. A collaboration object is created from a collaboration template. A collaboration template is created using the Process Designer tool. A collaboration template contains all the information contained in the collaboration model, but it is not executable.

Solution management

The solution management layer of the architecture contains a set of tools that are used to configure and manage the architectural components such as the Choreography Manager and Collaboration Manager. In the current release, WebSphere Business Integration Collaborations for Healthcare does not provide a unified tool for this purpose. Instead, it uses the combination of the following tools provided by WebSphere MQ Workflow and IBM WebSphere InterChange Server:

- WebSphere MQ Workflow Administration Utility
- WebSphere MQ Workflow Buildtime
- IBM WebSphere Business Integration System Manager
- IBM WebSphere Business Integration System Monitor

WebSphere MQ Workflow Administration Utility

The WebSphere MQ Workflow Administration Utility is the WebSphere MQ Workflow system administration tool that interacts with the WebSphere MQ Workflow Administration Server. You can use the WebSphere MQ Workflow Administration Utility to ask the WebSphere MQ Workflow Administration Server to list operational properties of the system, to query, stop, and start system components, and to access system and error log records.

WebSphere Business Integration Toolset

WebSphere Business Integration System Manager and System Monitor are IBM WebSphere InterChange Server configuration and management tools. You can use these tools to perform the following tasks:

- Connect to multiple installations of the InterChange Server

- View, configure, and design collaborations and adapters
- Create map and relationship definitions
- Start and stop collaborations, connectors, and the InterChange Server
- Define schedules to run, stop, and pause collaborations and connectors
- View the operational state of the WebSphere Business Integration Server components
- Trace a process flow for an event that has been received by a connector, or for a call that has been received by a collaboration

Application adapters

An application adapter provides translation services when the Business Integration Hub communicates with an application. It moves data between the hub and an application. More specifically, an application adapter contains a connector that connects an application to the Collaboration Manager of the Business Integration Hub. The WebSphere Business Integration Collaborations for Healthcare application adapters can be implemented based on the IBM WebSphere Business Integration Adapter programming model.

User experience integration

User experience integration is supported by a set of architectural components that enable user interactions with the Business Integration Hub. Although WebSphere Business Integration Collaborations for Healthcare does not provide templates for user experience, WebSphere Business Integration Collaborations for Healthcare uses WebSphere Portal Web Server as the user experience architectural component. WebSphere Portal Server has a portal engine whose main responsibility is to aggregate content from different sources and to serve the assembled content to multiple devices. Additionally, the portal engine decouples the presentation details of the portal page from the characteristics of the portlets. This separation enables each portlet to be developed and maintained as a discrete component, which in turn enables faster and easier development of specialized portlets for the overall portal site.

Portlets are the visible components that users see on their portal pages. Portlets can be as simple as an e-mail inbox or as versatile as a sales forecast from an Enterprise Resource Planning application. From a technical point of view portlets are very similar to Java servlets, except that they only return a subset of the output page.

Solution studio

The WebSphere Business Integration Collaborations for Healthcare solution studio consists of a set of tools for designing, deploying and maintaining processes and process instances. The tools can be divided into the following categories:

- Process template development tools
- Adapter development tools
- Solution management tools

The current release does not provide a unified tool that connects each individual tool together. Instead, you can use the tools provided by WebSphere MQ Workflow and IBM WebSphere InterChange Server. The following sections describe a set of tools that are useful for solution development with WebSphere Business Integration Collaborations for Healthcare.

WebSphere MQ Workflow Buildtime

The WebSphere MQ Workflow Buildtime is part of a WebSphere MQ Workflow system that offers a graphical editor for creating and editing process models. In WebSphere Business Integration Collaborations for Healthcare, WebSphere MQ Workflow Buildtime is the tool that you can use to model business process flows. You can also use Buildtime to modify a predefined WebSphere Business Integration Collaborations for Healthcare business process. When defining or redefining a process, you must define or modify the properties for the three main components:

- Business process (including activities)
- Organization of people
- System resources

Process Designer

The Process Designer is a graphical editor included in the IBM WebSphere Business Integration Toolset that you can use for creating and editing collaboration templates. The WebSphere Business Integration Collaborations for Healthcare solution uses IBM WebSphere InterChange Server to manage collaboration object flows. The collaboration object flow can be designed using the Process Designer. The definition of a collaboration object flow is contained in a collaboration template.

For more information on using the Process Designer to create collaboration templates, see the WebSphere InterChange Server Collaboration Development Guide.

IBM WebSphere Business Integration Modeler

IBM WebSphere Business Integration Modeler (formerly Holosofx BPM Workbench) is an industry-independent process-modeling tool that provides the following features:

- Common workbench for business and IT units
- Powerful analysis capabilities
- Animated simulations
- Detailed graphical and tabular reporting
- User interface design
- Export capabilities into rapid application development tools
- Integration with leading workflow engines

IBM WebSphere Business Integration Modeler can integrate closely with WebSphere MQ Workflow Server. You can implement, simulate, and analyze a process flow in WebSphere Business Integration Modeler, and then export the process as a WebSphere MQ Workflow FDL file that can run on the WebSphere MQ Workflow Server.

For more detailed information on IBM WebSphere Business Integration Modeler, refer to www.ibm.com/software/integration/wbimodeler/.

Industry library

WebSphere Business Integration Collaborations for Healthcare includes a set of artifacts that are used to integrate a business integration solution for a healthcare enterprise. The set of artifacts is based on the solution models and the solution architecture. The artifacts are divided into two types: software artifacts and textual artifacts. These artifacts together comprise the industry solution library.

The WebSphere Business Integration industry solution library consists of a set of solution models. Each of the solution models is designed as a customizable template that can be used to accelerate a business integration solution. Within each WebSphere Business Integration solution industry, there is a specific subset of the industry solution library that is composed of the following templates:

- Business process templates
- Collaboration templates
- Business object templates
- Application adapters

In addition, the WebSphere Business Integration Collaborations for Healthcare solution has the following textual artifact:

- Business process use case models

The following sections describe the details of these artifacts.

Use case models

WebSphere Business Integration Collaborations for Healthcare describes business process activities in a business process use case model. Each use case model depicts the business activities that make up a business process, as well as the typical order of these activities. It is understood that enterprises that implement the business process model may want to change the order in which the business activities are executed; the solution architecture provides the capability for modification in a site engagement project.

Business process templates

The WebSphere Business Integration Collaborations for Healthcare business process templates are bundled in the WebSphere Business Integration Collaborations for Healthcare industry solution library. A business process template is a deliverable that contains a business process model. Each business process template represents a model of a business process (based on the WebSphere Business Integration Collaborations for Healthcare business process use case models). The WebSphere Business Integration Collaborations for Healthcare business process templates are delivered as FDL files. These FDL files can be deployed to the WebSphere MQ Workflow Server as business process instances.

Collaboration templates

The collaboration templates are bundled in the WebSphere Business Integration Collaborations for Healthcare industry solution library. A collaboration template is a deliverable that contains a collaboration model. A collaboration template defines the collaboration required to integrate fine-grain application functions in order to support a business process activity. Using WebSphere Business Integration System Manager, a collaboration object can be created from a collaboration template. A collaboration object is an application integration process instance that runs on the IBM WebSphere InterChange Server.

Generic business object templates

The WebSphere Business Integration Collaborations for Healthcare generic business object (GBO) templates are bundled in the WebSphere Business Integration Collaborations for Healthcare industry solution library. WebSphere Business Integration Collaborations for Healthcare includes GBOs that represent Health Level Seven Version 2.4 object models.

Related concepts

- [Solution Overview](#)
- [Solution Implementation Guide](#)

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IBM WebSphere Business Integration Adapters Version 2.4



