



FUSE Product Family

Glossary

Making Software Work Together™

Glossary

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Preface

The FUSE Product Family Library

The FUSE Product Family documentation library consists of the following libraries:

- [FUSE ESB Documentation](http://open.iona.com/documentation/fuse-esb-documentation)
[http://open.iona.com/documentation/fuse-esb-documentation]
- [FUSE Mediation Router Documentation](http://open.iona.com/documentation/fuse-mediation-router-documentation)
[http://open.iona.com/documentation/fuse-mediation-router-documentation]
- [FUSE Message Broker Documentation](http://open.iona.com/documentation/fuse-message-broker-documentation)
[http://open.iona.com/documentation/fuse-message-broker-documentation]
- [FUSE Services Framework Documentation](http://open.iona.com/documentation/fuse-service-framework-documentation)
[http://open.iona.com/documentation/fuse-service-framework-documentation]
- [FUSE HQ Documentation](http://open.iona.com/documentation/fuse-hq-documentation)
[http://open.iona.com/documentation/fuse-hq-documentation]

In addition to the above books, you may also want to read the documentation for each of the projects that FUSE Product Family uses. This documentation is available from the projects responsible for developing the component.

Open Source Project Resources

Web site: <http://cxf.apache.org/>

User's list: <users@cxf.apache.org>

Web site: <http://tomcat.apache.org/>

User's list: <users@tomcat.apache.org>

Web site: <http://activemq.apache.org/>

User's list: <users@activemq.apache.org>

Web site:

<http://activemq.apache.org/camel/enterprise-integration-patterns.html>

User's list: <camel-user@activemq.apache.org>

Web site: <http://servicemix.apache.org>

User's list: <users@servicemix.apache.org>

Document Conventions

This book uses the following typographical conventions:






<code>fixed width</code>	<p>Fixed width (Courier font) in normal text represents portions of code and literal names of items such as classes, functions, variables, and data structures. For example, text might refer to the <code>javax.xml.ws.Endpoint</code> class.</p> <p>Constant width paragraphs represent code examples or information a system displays on the screen. For example:</p> <pre>import java.util.logging.Logger;</pre>
<i>Fixed width italic</i>	<p>Fixed width italic words or characters in code and commands represent variable values you must supply, such as arguments to commands or path names for your particular system. For example:</p> <pre>% cd /users/YourUserName</pre>
<i>Italic</i>	<p>Italic words in normal text represent <i>emphasis</i> and introduce <i>new terms</i>.</p>
Bold	<p>Bold words in normal text represent graphical user interface components such as menu commands and dialog boxes. For example: the User Preferences dialog.</p>

This book uses the following keying conventions:

No prompt	When a command's format is the same for multiple platforms, the command prompt is not shown.
%	A percent sign represents the UNIX command shell prompt for a command that does not require root privileges.
#	A number sign represents the UNIX command shell prompt for a command that requires root privileges.
>	The notation > represents the MS-DOS or Windows command prompt.
...	Horizontal or vertical ellipses in format and syntax descriptions indicate that material has been eliminated to simplify a discussion.
[]	Brackets enclose optional items in format and syntax descriptions.
{ }	Braces enclose a list from which you must choose an item in format and syntax descriptions.

	In format and syntax descriptions, a vertical bar separates items in a list of choices enclosed in { } (braces).
--	--

This book uses the following conventions for admonitions:

	Notes display information that may be useful, but not critical.
	Tips provide hints about completing a task or using a tool. They may also provide information about workarounds to possible problems.
	Important notes display information that is critical to the task at hand.
	Cautions display information about likely errors that can be encountered. These errors are unlikely to cause damage to your data or your systems.
	Warnings display information about errors that may cause damage to your systems. Possible damage from these errors include system failures and loss of data.

A

abstract contract	See logical contract.
abstract head element	An XML Schema element that cannot appear in an instance document. When a substitution group's head element is declared as abstract with <code>abstract="true"</code> , a member of that element's substitution group must be used instead.
anyType	The root type for all XML Schema type definitions hierarchies. All primitive types are derivatives of this type, as are all user-defined complex types.
application server	A software platform that provides the services and infrastructure required to develop and deploy middle-tier applications. Middle-tier applications implement the business logic necessary to provide web clients with access to enterprise information systems. In a multi-tier architecture, an application server sits beside a web server or between a web server and enterprise information systems. Application servers provide the middleware for enterprise systems. JBoss, WebLogic and WebSphere are J2EE application servers.

B

binding	A description of the message format and protocol details for a set of operations and messages. Bindings are created based on the information specified in a WSDL <code>binding</code> element.
binding component	A JBI component that provides connectivity to services external to the JBI environment.
<code>binding</code> element	The element in a WSDL contract that maps the messages defined for a specific <code>portType</code> element to a payload format that will be sent over the wire. For example, a WSDL contract might bind <code>HelloWorldPortType</code> to the SOAP payload format.
bundle	In OSGi, a bundle is the primary deployment format. They are either ZIP or JAR files that contain resources and classes for providing a set of functionality to other bundles or to the end user.. Bundles differ from standard JAR files in that they must contain an OSGi manifest describing the bundle and its dependencies.
Business Process Execution Language (BPEL)	An XML-based language for specifying interaction and process flow between Web services to implement a set of business rules.
business rule	In general, an enterprise-specific statement that defines or constrains some aspect of business operation. Business rules are unique to each enterprise or organization.

C

choice complex type	An XML Schema construct defined using the <code>choice</code> element to constrain the possible elements in a complex data type. When using a choice complex type, only one of the elements defined in the complex type can be present at a time.
client	An application or process that requests services from other applications known as servers. The server processes may be running on the same or a different machine. In the context of a SOA network, a client process is called a consumer or service consumer.
concrete contract	See physical contract.
consumer	The end user of a service, also called a client for that service. The more exact term in the context of a service-oriented network is service consumer.
contract	<p>A description of the messages and formats accepted and generated by a service. A service's contract is specified in a WSDL document that defines the interface and all connection-related information for that interface. A WSDL contract contains two sets of components: logical (or abstract) and physical (or concrete).</p> <p>The logical components of the contract are those that describe the data types, message formats, operations, and interfaces for the services defined in the contract. Logical components are specified with the WSDL elements <code>types</code>, <code>message</code>, <code>portType</code>, and <code>operation</code>.</p>

D

dead letter channel

A dead letter channel is an EIP component that handles messages that cannot be delivered to the intended recipient.

E

endpoint	The point of contact that a service provides for its consumers.
endpoint reference (EPR)	A self-contained object that describes the network contact and policy information for an endpoint, as defined in the WS-Addressing standard.
Enterprise Application Integration (EAI)	Enterprise Application Integration (EAI), the use of software and architectural principles to integrate disparate enterprise applications.
Enterprise Integration Patterns	A collection of patterns describing common EAI problems. For more information see http://www.enterpriseintegrationpatterns.com/ .
Enterprise Management System (EMS)	Enterprise Management System(EMS), a set of integrated tools that enable system administrators to manage large-scale production environments.
Enterprise Service Bus (ESB)	The infrastructure that allows service providers and service consumers to interact in a distributed environment. The bus handles the delivery of messages between different middleware systems, and provides management, monitoring, and mediation services such as routing, service discovery, or transaction processing.

F

facet	A rule in an XML Schema definition used in the derivation of user-defined simple types. Common facets include length, pattern, totalDigits, and fractionDigits.
<code>fault</code> element	The element in a WSDL document that defines a fault message for an operation.
fault message	A message containing error or exception information passed between a service and its consumers. Fault messages are defined using the <code>fault</code> element in a WSDL document. See also request-response operation on page 39 and solicit-response operation.



i18n	An abbreviation for internationalization, used in the context of preparing products, especially software and documentation, for use in more than one national locale and language.
input element	The element in a WSDL contract that defines an input message for an operation.
input message	A message passed from a service consumer to a service. When mapped into Java, the parts of an input message are mapped into a method's parameter list. Input messages are defined using the <code>input</code> element in a WSDL document. See also request-response operation on page 39 , solicit-response operation, and one-way operation on page 33 .
interface	<p>The external touch point between applications to collaborate or share functional behavior. Interfaces are completely described by the combination of logical and physical portions of a WSDL document.</p> <p>Once defined in a contract, an interface is the abstract boundary that a service exposes. A service's interface is the set of message types and message exchange patterns through which service consumers can interact with that service. In a WSDL 1.0 document, interfaces are defined using the <code>portType</code> element.</p>
intermediary	A service whose main role is to process all received messages in a value-added way, such as converting them from one data format to another, or routing them to another service. An intermediary has characteristics of both a service provider and a service consumer. Most intermediaries have an intermediary contract, which is similar in form to a service contract, except that it includes rules for processing messages.

J

Java API for RESTful Services (JAX-RS)	A programming model based on a specification from Sun Microsystems. JAX-RS defines a set of APIs and annotations designed to simplify the creation of RESTful services.
Java API for XML Processing (JAXP)	An API for processing XML documents. JAXP supports the SAX, DOM, and XSLT standards.
Java API for XML Registries (JAXR)	An API for accessing an XML registry.
Java API for XML Web Services (JAX-WS)	A programming model based on a specification from Sun Microsystems. JAX-WS is a newly rearchitected API for Web services, and is designed to take the place of JAX-RPC in Web services and Web applications.
Java API for XML-Based RPC (JAX-RPC)	A programming model based on a specification from Sun Microsystems. The JAX-RPC specification defines APIs and conventions for supporting XML-based remote procedure calls in the Java platform. For further information, see http://java.sun.com/xml/jaxrpc/overview.html .
Java Architecture for XML Binding (JAXB)	An API that provides a way to bind an XML Schema to a representation in Java code. JAXB is part of Sun Microsystems' Java Web Services Developer Pack.
Java Business Integration (JBI)	A specification for a standards-based, vendor-neutral architecture, based on SOA principles, for the integration of disparate applications, service providers, and service consumers. JBI-compliant components are expected to plug in and interoperate with other JBI-compliant components. This frees vendors to concentrate on supplying components that implement their particular area of expertise without worrying about implementing the other necessary portions of a complete solution. JBI also frees end-users to pick and choose among many JBI-compliant components to assemble a SOA network sized to their needs, without locking in to one vendor's approach. The JBI specification was developed by the Java Community Process. Compare with SCA.
Java Database Connectivity (JDBC)	An API specified in Java technology that provides Java applications with access to databases and other data sources.
Java Management eXtensions (JMX)	A Java technology that supplies tools for managing and monitoring applications, system objects, devices, and service-oriented networks.
Java Message Service (JMS)	A Java API implementing a Sun Microsystems messaging standard that allows application components based on J2EE to create, send, receive, and read

messages. It enables distributed communication that is loosely coupled, reliable, and asynchronous.

Java Naming and Directory Interface (JNDI)

A set of APIs specified in Java technology that assists Java applications with interfacing to multiple naming and directory services.

Java Platform, Enterprise Edition 5 (JEE)

A specification and toolkit from Sun Microsystems for the development and deployment of enterprise applications. JEE is the Java 5 version of J2EE.

L

l10n	An abbreviation for localization, used in the context of preparing products, especially software and documentation, for use in more than one national locale and language. Localization is the process of translating the elements of a product for a particular locale and language.
list type	A data type defined in an XML Schema definition as a space-separated list of primitive type elements, defined using the <code>xsd:list</code> element.
logical contract	<p>The abstract portion of a WSDL document that defines the data types, message types, and the interfaces for the services defined in the contract. The logical contract answers questions such as:</p> <ul style="list-style-type: none">• What kinds of data will this service work with?• What kinds of data are grouped together for processing?• What operations are related and what are their interfaces? <p>WSDL elements used in the logical contract include: <code>portType</code> element, <code>operation</code> element, <code>message</code> element, and <code>types</code> element. Compare with physical contract.</p>

M

marshalling	The process in data communications of packing one or more items of data into a message buffer prior to transmitting that message buffer over a communication channel. Data packing is performed according to the rules of the <code>binding</code> element, and the communication channel is defined by the <code>port</code> element.
message	Any data passed between a service provider and a service consumer, or between two endpoints. Messages are defined in using the WSDL <code>message</code> element. See also fault message on page 21 , input message on page 23 , and output message on page 33 .
message element	The element in a WSDL document that defines the abstract structure for a particular type of message. For example, a message might consist of a text string that can be tokenized into the parameter arguments for an operation. Another message type might contain an invoice, an account history, or a query string.
middleware	A software communications layer that manages the interaction of disparate applications across heterogeneous hardware and network environments.

N

nilable	In an XML Schema definition, an attribute of an element that specifies that the element is optional within a complex type.
normalized message router (NMR)	Part of the JBI architecture responsible for receiving message exchanges from JBI components and routing them to the appropriate component for processing.
notification operation	One type of WSDL-defined abstract operation, in which the service endpoint sends a message, but does not expect a return message.

O

OASIS	An international consortium that drives the development, convergence, and adoption of Web services standards. See www.oasis-open.org .
one-way operation	One type of WSDL-defined abstract operation, in which the service endpoint receives a message, but does not provide a return message. One-way operations specify only input message types.
operation	<p>A message interaction between a service and a service consumer. The WSDL specification provides for four types of operations:</p> <ul style="list-style-type: none">• one-way operation on page 33• request-response operation on page 39• solicit-response operation on page 41• notification operation on page 31
operation element	The element in a WSDL contract that provides an abstract definition of a specific interaction between a service and a service consumer. A WSDL <code>operation</code> element is defined in terms of input messages on page 23 , output messages on page 33 , and fault messages on page 21 .
OSGi	<p>OSGi is set of open specifications aimed at making it easier to build and deploy complex software applications. The key piece of OSGi technology is the OSGi Framework. It defines standardized mechanism for packaging and managing application bundles. It can dynamical resolve dependencies between bundles and can handle having multiple versions of a bundle deployed simultaneously.</p> <p>The OSGi specifications are maintained by the OSGi Alliance. See http://www.osgi.org.</p>
output element	The element in a WSDL contract that defines an output message for an operation.
output message	A message passed from a service provider to a service consumer. When mapped into Java, the parts of an output message are mapped to a method's output parameter list, including any return value. Output messages are defined using the <code>output</code> element in a WSDL contract. See also request-response

[operation on page 39](#), solicit-response operation, and [notification operation on page 31](#).

P

participant	A member of a SOA network, whether service provider, service consumer, or intermediary.
payload format	The on-the-wire structure of messages over a given transport. The payload format is specified using a WSDL <code>binding</code> element.
physical contract	<p>The concrete portion of a WSDL contract that defines the bindings and transport details used by the services defined by that contract. The physical contract answers questions such as:</p> <ul style="list-style-type: none">• How is message traffic formatted on the wire?• How and where does message traffic travel?• Is there more than one option for transmitting a request? <p>WSDL elements used in the physical contract include: <code>binding</code> element, <code>service</code> element, <code>operation</code> element, and <code>port</code> element.</p>
port	The physical mechanism used to access a service. Ports are created based on the information specified in a WSDL <code>port</code> element.
<code>port</code> element	The element in a WSDL document that specifies the details needed to contact the services defined in the contract. The contact details might include location information and policy details. For example, a <code>port</code> element for an HTTP endpoint might specify a URL and its MIME encoding types and timeout policies.
<code>portType</code> element	The element in a WSDL document that represents the logical interface for the service defined in the contract. A <code>portType</code> element is a collection of abstract operations supported by one or more endpoints. The defined interface is mapped to one or more transports using one or more bindings.

Q

QName

Industry-standard abbreviation for qualified name, as defined in the XML namespace specification. A QName is resource name that incorporates the namespace of the specification where that resource is defined.

QNames are composed of:

- A URI representing the namespace of the resource's definition.
- The name of the resource, usually called the *localPart*.
- Some QName formats also include an alias for the namespace called the *prefix*.

QNames can be found in several formats. The canonical format for QNames in FUSE is the one specified in `javax.xml.namespace.QName`, which is the namespace URI enclosed in braces, followed immediately (with no punctuation) by the *localPart*. For, example: `{http://open.iona.com/demo}SOAPHTTPService`.

Another format is used in a self-contained document such as a WSDL contract, where a qualified name is in the form *prefix:localPart*. The *prefix* is declared in an `xmlns` element in an XML namespace declaration in the same document. For example, `Is:SOAPHTTPService` is a qualified name, where the *prefix* `Is` is defined in the statement `xmlns:Is="http://www.iona.com/FixedBinding"` earlier in the same document, and `SOAPHTTPService` is a resource defined in the specification at that location.

R

reply	A message returned by a service to a service consumer in response to a request from that consumer. See also output message on page 33 .
Representational State Transfer (REST)	A model for Web services based solely on HTTP. REST takes the view that the Web already has everything necessary for Web services, without having to add extra specifications such as SOAP and UDDI. The theory holds that any object can be represented and made available at a URI, and, subject to the necessary permissions, can be fully manipulated using one of the four simple HTTP verbs: GET, PUT, POST, and DELETE.
request	A message sent from a service consumer to a service provider asking for the service to perform an action. See also input message on page 23 .
request-response operation	One type of WSDL-defined abstract operation, in which the service endpoint receives a message and returns a correlated message. Request-response operations specify input message on page 23 , output message on page 33 , and fault message on page 21 types.
response	See reply.

S

service	A collection of operations that perform a useful set of functions in a network, access to which is implemented as an endpoint. In a service-oriented network, services are defined by a service contract. The more exact term in the context of a service-oriented network is service provider.
service assembly	A collection of service units .
Service Component Architecture (SCA)	A set of specifications that describe a model for building applications and systems using a Service-Oriented Architecture. SCA extends and complements prior approaches to implementing services, and SCA builds on open standards such as Web services. SCA is developed by a consortium of companies. Compare with JBI.
service consumer	See consumer.
<code>service</code> element	An enclosing element in a WSDL document that contains one or more <code>port</code> elements. Each <code>port</code> element maps a binding to the transport details necessary to contact the service.
service engine	A JBI component that provides business logic and transformation services and also consumes such services.
service unit	Artifacts deployed to a JBI component. A service unit configures the component to provide a piece of functionality such as expose an endpoint or route messages.
Service-Oriented Architecture (SOA)	A loosely-coupled distributed architecture in which service providers make resources available to service consumers in a standardized way. SOA is language and protocol independent.
solicit-response operation	One type of WSDL-defined abstract operation, in which the service endpoint sends a message and receives a correlated message.
substitution group	A feature of XML Schema that allows you to define groups of elements that may be used interchangeably in instance documents. For example, a <code>vehicle</code> head element might be defined with <code>automobile</code> , <code>boat</code> , and <code>airplane</code> substitution elements, any of which could be used wherever the <code>vehicle</code> element might be used. A substitution group is defined using the

substitutionGroup attribute of the XML Schema element. See also [abstract head element on page 11](#).

T

transport

A standards-based network protocol, such as HTTP or IIOP, that defines how objects communicate over a network. The transport details for an endpoint are specified inside the WSDL `port` element.

`types` element

The enclosing element in a WSDL document that contains data type definitions using a type system such as XSD.

U

Universal Description, Discovery, and Integration (UDDI)

An industry initiative to create a platform-independent, open framework and registry for describing services, discovering businesses, and integrating business services using the Internet. UDDI specifies a mechanism for Web service providers to advertise the existence of their Web services and for Web service consumers to locate Web services of interest. For further information, see <http://www.uddi.org>.

W

Web Services Addressing (WS-A, WS-Addressing)	A specification that provides transport-neutral mechanisms to address Web services and messages. See the WS-Addressing specification [http://www.w3.org/Submission/ws-addressing/].
Web Services Description Language (WSDL)	An XML grammar for describing network services as a set of endpoints operating on messages containing either document-oriented or procedure-oriented information. WSDL is the language used to express service contracts. For further information see the WSDL specification [http://www.w3.org/TR/wsdl].
Web Services Reliable Messaging (WS-RM)	A specification that describes a protocol that allows messages to be delivered reliably between distributed applications in the presence of software component, system, or network failures.
Web Services Security (WSS)	An OASIS specification that describes enhancements to SOAP messaging to provide a means for applying security to Web services. For further details, see the WSS specification [http://www.oasis-open.org/committees/tc_home.php?wg_abbrev=wss].
wiretap pattern	The wiretap pattern is an EIP in which an additional message channel off of the primary message channel. Messages are directed to both the primary channel and the secondary channel.
World Wide Web Consortium (W3C)	An international consortium where member organizations, a full-time staff, and the public work together to develop Web standards.

X

XML Schema

A language specification by the W3C that defines an XML vocabulary for defining the contents and structure of XML documents. XML Schema is a successor to XML Document Type Declarations (DTDs), but is more expressive and better designed for expressing a type system.

XSD

XML Schema Definition (XSD), an instance of an XML schema written in the XML Schema language. An XSD defines a type of XML document in terms of constraints upon what elements and attributes may appear, their relationship to each other, and what types of data may be in them.

