
**Information technology — Advanced
Message Queuing Protocol (AMQP) v1.0
specification**

*Technologies de l'information — Spécification du protocole avancé de
mise en file d'attente de messages (AMPQ) v1.0*

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Additional artifacts:

This specification consists of the following documents:

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<http://docs.oasis-open.org/amqp/core/v1.0/os/amqp-core-overview-v1.0-os.html>
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<http://docs.oasis-open.org/amqp/core/v1.0/os/amqp-core-types-v1.0-os.html>
- Part 2: Transport - AMQP transport layer
<http://docs.oasis-open.org/amqp/core/v1.0/os/amqp-core-transport-v1.0-os.xml> (Authoritative)
<http://docs.oasis-open.org/amqp/core/v1.0/os/amqp-core-transport-v1.0-os.html>
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<http://docs.oasis-open.org/amqp/core/v1.0/os/amqp-core-messaging-v1.0-os.xml> (Authoritative)
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- Part 4: Transactions - AMQP Transactions Layer
<http://docs.oasis-open.org/amqp/core/v1.0/os/amqp-core-transactions-v1.0-os.xml> (Authoritative)
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<http://docs.oasis-open.org/amqp/core/v1.0/os/amqp-core-security-v1.0-os.html>
- XML Document Type Definition (DTD)
<http://docs.oasis-open.org/amqp/core/v1.0/os/amqp.dtd> (Authoritative)

Related work:

This specification replaces or supersedes:

- AMQP v1.0 Final, 07 October 2011. <http://www.amqp.org/specification/1.0/amqp-org-download>

Abstract:

The Advanced Message Queuing Protocol (AMQP) is an open internet protocol for business messaging. It defines a binary wire-level protocol that allows for the reliable exchange of business messages between two parties. AMQP has a layered architecture and the specification is organized as a set of parts that reflects that architecture. Part 1 defines the AMQP type system and encoding. Part 2 defines the AMQP transport layer, an efficient, binary, peer-to-peer transport layer, transporting messages between two processes over a network. Part 3 defines the AMQP message format, with a concrete encoding. Part 4 defines how interactions can be grouped within atomic transactions. Part 5 defines the AMQP security layers.

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Part 0: Overview

0.1 Introduction

The Advanced Message Queuing Protocol is an open internet protocol for business messaging.

AMQP is comprised of several layers. The lowest level defines an efficient, binary, peer-to-peer protocol for transporting messages between two processes over a network. Above this, the messaging layer defines an abstract message format, with concrete standard encoding. Every compliant AMQP process **MUST** be able to send and receive messages in this standard encoding.

0.1.1 Terminology

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this specification are to be interpreted as described in IETF RFC 2119 [RFC2119].

The authoritative form of the AMQP specification consists of a set of XML source documents. These documents are transformed into PDF and HTML representations for readability. The machine readable version of the AMQP DTD describes the XML used for the authoritative source documents. This DTD includes the definition of the syntax used in the excerpts of XML presented in the PDF and HTML representations.

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AMQP Capabilities Registry: Delivery Annotations

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[AMQPDISTMODE]

AMQP Capabilities Registry: Distribution Modes

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[AMQPFILTERS]

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[AMQPFooter]

AMQP Capabilities Registry: Footer

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[AMQPLINKCAP]

AMQP Capabilities Registry: Link Capabilities

<http://www.amqp.org/specification/1.0/link-capabilities>

[AMQPLINKPROP]

AMQP Capabilities Registry: Link Properties

<http://www.amqp.org/specification/1.0/link-properties>

[AMQPLINKSTATEPROP]

AMQP Capabilities Registry: Link State Properties

<http://www.amqp.org/specification/1.0/link-state-properties>

[AMQPMESSANN]

AMQP Capabilities Registry: Message Annotations

<http://www.amqp.org/specification/1.0/message-annotations>

[AMQPNODEPROP]

AMQP Capabilities Registry: Node Properties

<http://www.amqp.org/specification/1.0/node-properties>

[AMQPSESSCAP]

AMQP Capabilities Registry: Session Capabilities

<http://www.amqp.org/specification/1.0/session-capabilities>

[AMQPSESSPROP]

AMQP Capabilities Registry: Session Properties

<http://www.amqp.org/specification/1.0/session-properties>

[AMQPSOURCECAP]

AMQP Capabilities Registry: Source Capabilities

<http://www.amqp.org/specification/1.0/source-capabilities>

[AMQPTARGETCAP]

AMQP Capabilities Registry: Target Capabilities

<http://www.amqp.org/specification/1.0/target-capabilities>

0.2 Conformance

AMQP defines a wire level protocol for business messaging. The definition allows for all common business messaging behaviors. AMQP does not define a wire-level distinction between “clients” and “brokers”, the protocol is symmetric. It is expected and encouraged that implementations of AMQP will have different capabilities. Expectations of the capabilities of a “client library” are different from expectations of a “broker” which are themselves different from the capabilities of a “router”. As relevant profiles emerge (where appropriate and applicable) these will be formalised.

A conformant implementation **MUST** perform protocol negotiation (see Part 2: section 2.2), and then parse, process, and produce frames in accordance with the format and semantics defined in parts 1 through 5 of this specification.

Conformant implementations **MUST NOT** require the use of any extensions defined outside this document in order to interoperate with any other conformant implementation.

Part 1 of this document defines the type system and type encodings that every conformant implementation **MUST** implement.

Part 2 defines the peer-to-peer transport protocol which operates over TCP. Every conformant implementation of AMQP over TCP **MUST** implement Part 2. Future standards mapping AMQP to protocols other than TCP **MAY** modify or replace Part 2 when AMQP is being used over that protocol. A conformant implementation **MUST** implement Part 2 or a mapping of AMQP to some non-TCP protocol.

Part 2 admits behaviors that might not be appropriate for every implementation. For example a “client library” might not allow for its communication partner to spontaneously attempt to initiate a connection and request messages. Where an implementation does not allow for a behavior the implementation **MUST** respond according to the rules defined within Part 2 of the specification.

Part 3 of this document defines the AMQP Messaging Layer. Every conformant implementation which processes messages **MUST** implement this part of the specification.

Some implementations might not process messages (for example, an implementation acting as a “router” which looks only at the routing information carried by the AMQP Transport layer). Such implementations do not actively implement Part 3, but **MUST NOT** act in ways which violate the rules of this part of the specification.

The Messaging layer admits behaviors that might not be appropriate for all implementations (and within an implementation all behaviors might not be available for all configurations). Where a behavior is not admitted, the implementation **MUST** respond according to the rules defined within this specification.

Part 4 defines the requirements for transactional messaging. Transactional messaging defines two roles, that of the *transactional resource* and that of the *transaction controller*. A conformant implementation **SHOULD** be capable of operating in one of these roles but **MAY** be unable to operate in either (for instance a simplistic client library might have no ability to act as a transaction controller and would not be expected to act as a transactional resource).

It is **RECOMMENDED** that implementations designed to act as messaging intermediaries support the ability to act as a transactional resource. It is **RECOMMENDED** that implementations or re-usable libraries provide Application Programming Interfaces to enable them to act as transactional controllers.

Where a behavior is not admitted, the rules defined in part 4 regarding responses to non-admitted behaviors **MUST** be followed.

Part 5 defines Security Layers to provide an authenticated and/or encrypted transport. Implementations **SHOULD** allow the configuration of appropriate levels of security for the domain in which they are to be deployed.

Conformant implementations acting in the TCP server role are strongly **RECOMMENDED** to implement Part 5: section 5.2 (or Part 5: 5.2.1 Alternative Establishment). Implementations acting in the TCP server role are strongly **RECOMMENDED** to implement Part 5: section 5.3 and to support commonly used SASL mechanisms. In particular such implementations **SHOULD** support the PLAIN [RFC4616] and SCRAM-SHA1 [RFC5802] mechanisms.