

Internet Open Trading Protocol (IOTP) HTTP Supplement

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Status of This Document

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Abstract

Internet Open Trading Protocol (IOTP) messages will be carried as XML documents. As such, the goal of mapping to the transport layer is to ensure that the underlying XML documents are carried successfully between the various parties.

This documents describes that mapping for the Hyper Text Transport Protocol (HTTP), Versions 1.0 and 1.1.

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1. Introduction

Internet Open Trading Protocol (IOTP) messages will be carried as XML documents. As such, the goal of mapping to the transport layer is to ensure that the underlying XML documents are carried successfully between the various parties.

This documents describes that mapping for the Hyper Text Transport Protocol (HTTP), Versions 1.0 and 1.1 [RFCs 1945, 2068].

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC2119](#)].

2. HTTP Servers and Clients

The structure of IOTP maps on to the structure of HTTP in the following way:

The merchant, payment handler, deliverer, merchant customer care, and payment customer care roles are all represented by HTTP servers. Each may be represented by a separate server, or they may be combined in any combination.

The consumer role is represented by an HTTP client.

Note: A Merchant, may act in the role of a consumer, for example to deposit electronic cash. In this case the Merchant, as an organisation rather than as a role, would need to be supported by an HTTP client.

3. HTTP Net Locations

The Net Locations contained within the IOTP specification are all URLs [[RFC 1738](#)]. If a secure connection is required or desired any secure channel that both the HTTP Server and Client support may be used, for example SSL version 3 or TLS [[RFC 2246](#)].

4. Consumer Clients

In most environments, the consumer agent will initially be an HTML browser. However, this does not provide the needed capability to act as an agent for the consumer for an IOTP transaction. This leads to

two requirements:

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a method of starting and passing control to the IOTP client, and

a method of closing down the IOTP client cleanly and passing control back to the HTML browser once the IOTP Transaction has finished.

4.1 Starting the IOTP Client and the Merchant IOTP Server

At some point, the HTTP client at the consumer will send a HTTP request that is interpreted as an "IOTP Startup Request" by the Merchant HTTP server. This might, for example, be the result of clicking on a "pay" button. This message is a stand-in for a request message of some form and the Merchant Server will respond with the first IOTP Message in the form of an XML document.

The MIME type for all IOTP messages is: "application/iotp"; however "application/x-iotp" has been in use for experimentation and development and SHOULD also be recognized. Because HTTP is binary clean, no content-transfer-encoding is required. (See [[RFC 2376](#)] re the application/xml type which has some similar considerations.)

This HTTP response will be interpreted by the HTML browser as a request to start the application associated with MIME type "application/iotp", and to pass the content of this message to that application.

At this point, the IOTP client will be started and have the first message.

IOTP messages are short-lived. Therefore, the HTTP server should avoid having its responses cached. In HTTP V1.0, the "nocache" pragma can be used. This can be neglected on SSL/TLS secured connections which are not cached and on POST HTTP request in HTTP v1.1 as in v1.1 POST responses are not cached.

4.2 Ongoing IOTP Messages

Data from earlier IOTP Messages in a transaction must be retained by the IOTP Client so that it may (1) be copied to make up part of later IOTP Messages, (2) used in calculations to verify signatures in later IOTP message, (3) be resent in some cases where it is a request that times out, (4) used as input to the Customer Care role in later versions of IOTP, etc. The way in which the data is copied depends on the IOTP Transaction.

The IOTP Messages contain Net Locations (e.g. the PayReqNetLocn)

which for HTTP will contain the URLs to which the IOTP client must

ship IOTP Messages.

Subsequent IOTP Messages (XML documents) will be sent using the POST function of HTTP. The HTTP client has to perform full HTTP POST requests.

The XML documents will be sent in a manner compatible with the external encodings allowed by the XML specification.

4.3 Stopping an IOTP Transaction

An IOTP Transaction is complete

- when an IOTP Message is received by the IOTP client with a status of "LastMsg",
- the IOTP client decides to fail the IOTP Transaction for some reason either by canceling the transaction or as a result of discovering an error in an IOTP message received, or
- a "time out" occurs or a connection fails, e.g. a response to an IOTP Message, has not been received after some user-defined period of Time (including retransmissions).

An IOTP Client which processes an IOTP Transaction which:

- completes successfully i.e. it has not received any Fail Trading Block, must direct the browser to the Net Location specified in SuccessNetLocn in the Protocol Options Component, i.e., cause it to do a GET with that URL.
- does not complete successfully, because it has received some Fail Trading Block must display the information in the Fail Message, stop the transaction, then pass control to the browser so that it will do a GET on the Error Net Location specified for the role from which the error was received. See [draft-ietf-trade-iopt-v1.0-protocol-*.txt](#).
- is cancelled for some reason, sends an IOTP Message containing an Error Trading Block to the CancelNetLocn contained in the Protocol Options Component, stops the IOTP Transaction, and hands control to the browser so that it will do a GET on the Cancel Net Locations specified for the role the customer was in communications with when the cancel occurred. See [draft-ietf-trade-iopt-v1.0-protocol-*.txt](#)
- is in error because an IOTP Message does not conform to this

specification, sends an IOTP Message containing a Fail Trading

Block to role from which the bad message was received and the ErrorNetLogLoc specified for that role, stops the IOTP Transaction, and hands control to the browser so that it will do a GET from the Error Net Location specified for the role from which the bad message was received. See [draft-ietf-trade-iotp-v1.0-protocol-*.txt](#)

- has a "time out", must display a message describing the time out. May give the user the option of cancelling or retrying and/or may automatically retry. On failure due to time out, treat as an error above.

Each implementation of an IOTP client may decide whether or not to terminate the IOTP Client application immediately upon completing an IOTP Transaction or whether to wait until it is closed down as a result of, for example, user shut down or browser shut down.

5. Starting the Payment handler and Deliverer IOTP Servers

Payment Handler and Deliverer IOTP Servers are started by receiving an IOTP Message which contains:

- for a Payment handler, a Payment Request Block, and
- for a Deliverer, a Delivery Request Block

6. Security Considerations

Security of Internet Open Trade Protocol messages is primarily dependent on signatures within IOTP as described in [[draft-ietf-trade-iotp-v1.0-protocol-*.txt](#)] and [[draft-ietf-trade-iotp-v1.0-dsig-*.txt](#)].

Note that the security of payment protocols transported by IOTP is the responsibility of those payment protocols, NOT of IOTP.

7. IANA Considerations

This specification defines the application/iotp mime type which is thereby reserved.

References

[RFC 1738](#) - "Uniform Resource Locators (URL)", T. Berners-Lee, L. Masinter & M. McCahill. December 1994.

[RFC 1945](#) - "Hypertext Transfer Protocol -- HTTP/1.0", T. Berners-Lee, R. Fielding & H. Frystyk. May 1996.

[RFC 2068](#) - "Hypertext Transfer Protocol -- HTTP/1.1", R. Fielding, J. Gettys, J. Mogul, H. Frystyk, T. Berners-Lee. January 1997.

[RFC 2119](#) - S. Bradner, "Key words for use in RFCs to Indicate Requirement Levels", March 1997.

[RFC 2246](#) - "The TLS Protocol Version 1.0", T. Dierks, C. Allen. January 1999.

[RFC 2376](#) - "XML Media Types", E. Whitehead, M. Murata. July 1998.

[draft-ietf-trade-iotp-v1.0-protocol-*.txt](#) - David Burdett

[draft-ietf-trade-iotp-v1.0-dsig-*.txt](#) - Kent Davidson

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