

SOAP-over-UDP

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SOAP-over-UDP

- User Datagram Protocol (UDP)
- SOAP-over-UDP binding
- One-way and request-response examples
- Message encoding and retransmissions
- URI scheme
- Security considerations
- Some suggested changes

UDP

- Unreliable transport
- Supports unicast message transmission
 - Best effort delivery
- Supports multicast message transmission
 - Uses IP multicast group address.
Example: 239.255.255.250
 - Multicast range limited by TTL (IPv4) or hop limit (IPv6) setting
- UDP packet size limitation (64k)

UDP packet

+	Bits 0-15	Bits 16-31
0 – 31	Source Port	Destination Port
32 – 63	Length	Checksum
64 - 65635(max)	Data	

SOAP-over-UDP binding

- Describes how to transmit a SOAP message inside a UDP packet.
- Supports both SOAP 1.1 and SOAP 1.2
- Supports the following MEPs
 - Unicast one-way
 - Multicast one-way
 - Unicast request-response
 - Multicast request, unicast response

One-way message

- <!-- SOAP-over-UDP message sent unicast from 192.168.0.200:65938 to 192.168.0.300:65939 -->
-
- <?xml version="1.0" encoding="utf-8"?>
- <s:Envelope
- xmlns:s="http://www.w3.org/2003/05/soap-envelope"
- xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
- <s:Header>
- <a:MessageID>urn:uuid:xy8923ee-6813-498c-8c1b-6272a22353f7</a:MessageID>
- <a:Action>http://fabrikam.com/Hello</a:Action>
- <a:To><http://fabrikam.com/Server></a:To>
- </s:Header>
- <s:Body>.
-
- </s:Body>
- </s:Envelope>

Request message

- <!-- SOAP-over-UDP message sent unicast from 192.168.0.200:65938 to 192.168.0.300:65939 -->
- <?xml version="1.0" encoding="utf-8"?>
- <s:Envelope
- xmlns:s="http://www.w3.org/2003/05/soap-envelope"
- xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
- <s:Header>
- <a:MessageID>urn:uuid:xy8923ee-6813-498c-8c1b-6272a22353f7</a:MessageID>
- <a:Action><http://fabrikam.com/Hello></a:Action>
- <a:To><http://fabrikam.com/Server></a:To>
- <a:ReplyTo>
- <http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous>
- </a:ReplyTo>
- <a:To><http://fabrikam.com/Server></a:To>
- </s:Header>
- <s:Body>.
-
- </s:Body>
- </s:Envelope>

Response message

- <!-- SOAP-over-UDP message sent unicast from 192.168.0.300:65939 to 192.168.0.200:65938 -->
- <?xml version="1.0" encoding="utf-8"?>
- <s:Envelope
- xmlns:s="http://www.w3.org/2003/05/soap-envelope"
- xmlns:a="http://schemas.xmlsoap.org/ws/2004/08/addressing"
- <s:Header>
- <a:MessageID>urn:uuid:xy8923ee-6813-498c-8c1b-6272a22353f7</a:MessageID>
- <a:Action>http://fabrikam.com/HelloResponse</a:Action>
- <a:To>
- http://schemas.xmlsoap.org/ws/2004/08/addressing/role/anonymous
- </a:To>
- </s:Header>
- <s:Body>.
-
- </s:Body>
- </s:Envelope>

Message encoding

- Use of algorithm defined XML 1.0 (Appendix F) to detect if message is encoded as XML.
- XML 1.0 specification describes
 - how to auto detect encoding of XML messages when no external encoding information is present.
 - How to use external encoding information, if present.
 - Use of UTF-8, UTF-16, UCS-4 and other encoding styles along with byte order information.

Message retransmissions

- Retransmitted messages
 - MUST use [message id]
 - MUST contain the same [message id]
- To avoid packet collisions
 - Implementations should use exponential back-off techniques

URI scheme

- soap.udp: // <host> [: <port>] [/ <rel_path>] [? <query>]
- The syntax and semantics of <host>, <port>, <rel_path> and <query> are as defined in RFC 2396.

Security considerations

- Use of WS-Security recommended for message integrity, confidentiality, authenticity and establishing trust.
- Due to UDP packet size limitation
 - Pass security tokens by reference using Key Identifier mechanisms described in WS-Security is recommended.

Some suggested changes

- Use of default port
 - UDP is a transport level protocol and hence must NOT be limited to a specific port.
- False duplicates
 - Messages transmitted by two different sources containing the same content and NO [message id] may be interpreted as duplicates.
 - Specification should discuss this case.
- Add message examples that show use of addressable URI in the [reply endpoint] addressing property.

Some suggested changes

- Add message examples that show use of soap.udp URI scheme in the [destination endpoint] and [reply endpoint] addressing properties.
- Change the occurrence of 'messageld' to 'messageID'.
- Use urn:uuid scheme for messageID values (per RFC 4122).

Q & A