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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

E-health multimedia services and applications –
Interoperability compliance testing of personal health
systems (HRN, PAN, LAN, TAN and WAN)

**Conformance of ITU-T H.810 personal health
system: Services interface Part 2: Web services
interoperability: Health & Fitness Service
receiver**

Recommendation ITU-T H.830.2



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Recommendation ITU-T H.830.2

Conformance of ITU-T H.810 personal health system: Services interface Part 2: Web services interoperability: Health & Fitness Service receiver

Summary

Recommendation ITU-T H.830.2 provides a test suite structure (TSS) and the test purposes (TP) for Web services interoperability for messages through the Health & Fitness Service (HFS) receiver in the Services interface, based on the requirements defined in the Recommendations of the ITU-T H.810 sub-series, of which Recommendation ITU-T H.810 (2016) is the base Recommendation. The objective of this test specification is to provide a high probability of interoperability at this interface.

Recommendation ITU-T H.830.2 is a transposition of Continua Test Tool DG2016, Test Suite Structure & Test Purposes, Services Interface; Part 2: Web Services Interoperability. HFS Receiver (Version 1.5, 2017-03-14), that was developed by the Personal Connected Health Alliance. A number of versions of this specification existed before transposition.

This Recommendation includes an electronic attachment with the protocol implementation conformance statements (PICS) and the protocol implementation extra information for testing (PIXIT) required for the implementation of Annex A.

History

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Conformance testing, Continua Design Guidelines, e-health, Health & Fitness Service receiver, ITU-T H.810, personal connected health devices, Services Interface, Web services interoperability.

* To access the Recommendation, type the URL <http://handle.itu.int/> in the address field of your web browser, followed by the Recommendation's unique ID. For example, <http://handle.itu.int/11.1002/1000/11830-en>.

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Electronic attachment: This Recommendation includes an electronic attachment with the protocol implementation conformance statements (PICS) and the protocol implementation extra information for testing (PIXIT) required for the implementation of Annex A.

Introduction

This Recommendation is a transposition of Continua Test Tool DG2016, Test Suite Structure & Test Purposes, Services Interface; Part 2: Web Services Interoperability. HFS Receiver (Version 1.5, 2017-03-14), that was developed by the Personal Connected Health Alliance. The table below shows the revision history of this test specification; it may contain versions that existed before transposition.

Version	Date	Revision history
1.1	2012-10-05	Initial release for Test Tool DG2011. It is the same version as "TSS&TP_1.5_WAN_PART_2_(REC WS-I)_v1.1.doc" because new features included in [b-CDG 2011] do not affect the test procedures specified in this document.
1.1	2013-05-24	Initial release for Test Tool DG2012. It is the same version as "TSS&TP_DG2011_WAN_PART_2_(REC WS-I)_v1.1.doc" because new features included in [b-CDG 2012] do not affect the test procedures specified in this document.
1.1	2014-01-24	Initial release for Test Tool DG2013. It is the same version as "TSS&TP_DG2012_WAN_PART_2_(REC WS-I)_v1.1.doc" because new features included in CDG 2013 [b-ITU-T H.810 (2013)]/[b-CDG 2013] do not affect the test procedures specified in this document.
1.2	2014-04-24	TM Lite & Doc Enhancements (Test Tool v4.0 Maintenance Release 1). It uses "TSS&TP_DG2013_WAN_PART_2_(REC WS-I)_v1.1.doc" as baseline and it adds new features included in Documentation Enhancements: <ul style="list-style-type: none">• "Other PICS" row has been added
1.3	2015-07-01	Initial release for Test Tool DG2015: <ul style="list-style-type: none">• Test suite structure modified• Applicability modified due to the inclusion of hData OU
1.4	2016-09-20	Initial release for Test Tool DG2016. It implements changes according to [ITU-T H.810 (2016)]/[b-CDG 2016] (Iris + Errata) refreshments.
1.5	2017-03-14	Editorial: added insulin pump and continuous glucose monitor specializations to the TSS list in clause 6.

Recommendation ITU-T H.830.2

Conformance of ITU-T H.810 personal health system: Services interface Part 2: Web services interoperability: Health & Fitness Service receiver

1 Scope

The scope of this Recommendation¹ is to provide a test suite structure (TSS) and the test purposes (TP) for the Services interface based on the requirements defined in the Continua Design Guidelines (CDG) [ITU-T H.810 (2016)]. The objective of this test specification is to provide a high probability of interoperability at this interface.

The TSS and TP for the Services interface have been divided into the parts specified below. This Recommendation covers Part 2.

- Part 1: Web services interoperability Health & Fitness Service sender
- **Part 2: Web services interoperability Health & Fitness Service receiver**
- Part 3: SOAP/ATNA. Health & Fitness Service sender
- Part 4: SOAP/ATNA. Health & Fitness Service receiver
- Part 5: PCD-01 HL7 messages. Health & Fitness Service sender
- Part 6: PCD-01 HL7 messages. Health & Fitness Service receiver
- Part 7: Consent Management. Health & Fitness Service sender
- Part 8: Consent Management. Health & Fitness Service receiver
- Part 9: hData Observation Upload. Health & Fitness Service sender
- Part 10: hData Observation Upload. Health & Fitness Service receiver
- Part 11: Questionnaires. Health & Fitness Service sender
- Part 12: Questionnaires. Health & Fitness Service receiver

2 References

The following ITU-T Recommendations and other references contain provisions which, through reference in this text, constitute provisions of this Recommendation. At the time of publication, the editions indicated were valid. All Recommendations and other references are subject to revision; users of this Recommendation are therefore encouraged to investigate the possibility of applying the most recent edition of the Recommendations and other references listed below. A list of the currently valid ITU-T Recommendations is regularly published. The reference to a document within this Recommendation does not give it, as a stand-alone document, the status of a Recommendation.

[ITU-T H.810 (2016)] Recommendation ITU-T H.810 (2016), *Interoperability design guidelines for personal health systems*.

[ITU-T H.812] Recommendation ITU-T H.812 (2016), *Interoperability design guidelines for personal health systems: Services interface: Common certified capability class*.

¹ This Recommendation includes an electronic attachment with the protocol implementation conformance statements (PICS) and the protocol implementation extra information for testing (PIXIT) required for the implementation of Annex A.

- [ITU-T H.812.1] Recommendation ITU-T H.812.1 (2016), *Interoperability design guidelines for personal health systems: Services interface: Observation upload certified capability class*.
- [ITU-T H.812.2] Recommendation ITU-T H.812.2 (2016), *Interoperability design guidelines for personal health systems: Services interface: Questionnaires certified capability class*.
- [ITU-T H.812.3] Recommendation ITU-T H.812.3 (2016), *Interoperability design guidelines for personal health systems: Services interface: Capability exchange certified capability class*.
- [ITU-T H.812.4] Recommendation ITU-T H.812.4 (2016), *Interoperability design guidelines for personal health systems: Services interface: Authenticated persistent session certified capability class*.
- [OASIS/WS-I BP] OASIS/WS-I (2006), *Basic Profile Version 1.1*.
<http://www.ws-i.org/Profiles/BasicProfile-1.1.html>
- [OASIS/WS-I BSP] OASIS/WS-I (2007), *Basic Security Profile Version 1.0*.
<http://www.ws-i.org/Profiles/BasicSecurityProfile-1.0.html>
- [OASIS WS-I RM] OASIS (2007), *Web Services Reliable Messaging (WS-Reliable Messaging) Version 1.1*.
<http://docs.oasis-open.org/ws-rx/wsrn/200702/wsrn-1.1-spec-cs-01.pdf>

3 Definitions

3.1 Terms defined elsewhere

None.

3.2 Terms defined in this Recommendation

None.

4 Abbreviations and acronyms

This Recommendation uses the following abbreviations and acronyms:

AHD	Application Hosting Device
ATNA	Audit Trail and Node Authentication
ATS	Abstract Test Suite
CDG	Continua Design Guidelines
CGM	Continuous Glucose Monitor
DUT	Device Under Test
GUI	Graphical User Interface
HFS	Health & Fitness Service
HFSS	Health & Fitness Service Sender
HFSR	Health & Fitness Service Receiver
HL7	Health Level 7
HTTP	Hypertext Transfer Protocol
HTTPS	Hypertext Transfer Protocol Secure

INR	International Normalized Ratio
IP	Insulin Pump
IUT	Implementation Under Test
MDS	Medical Device System
NFC	Near Field Communication
PCO	Point of Control and Observation
PCT	Protocol Conformance Testing
PHD	Personal Health Device
PHDC	Personal Healthcare Device Class
PHG	Personal Health Gateway
PICS	Protocol Implementation Conformance Statement
PIXIT	Protocol Implementation extra Information for Testing
SABTE	Sleep Apnoea Breathing Therapy Equipment
SCR	Static Conformance Review
SDP	Service Discovery Protocol
SOAP	Simple Object Access Protocol
TCRL	Test Case Reference List
TCWG	Test and Certification Working Group
TP	Test Purpose
TSS	Test Suite Structure
URI	Uniform Resource Identifier
USB	Universal Serial Bus
WAN	Wide Area Network
WDM	Windows Driver Model
WS	Web Service
WSDL	Web Service Description Language
XML	extensible Markup Language

5 Conventions

The key words "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "MAY", "MAY NOT" in this Recommendation are to be interpreted as in [b-ETSI SR 001 262].

- SHALL is equivalent to 'must' or 'it is required to'.
- SHALL NOT is equivalent to 'must not' or 'it is not allowed'.
- SHOULD is equivalent to 'it is recommended to'.
- SHOULD NOT is equivalent to 'it is not recommended to'.
- MAY is equivalent to 'is permitted'.
- MAY NOT is equivalent to 'it is not required that'.

NOTE – The above-mentioned key words are capitalized for illustrative purposes only and they do not appear capitalized within this Recommendation.

Reference is made in the ITU-T H.800-series of Recommendations to different versions of the Continua Design Guidelines (CDG) by a specific designation. The list of terms that may be used in this Recommendation is provided in Table 1.

Table 1 – List of designations associated with the various versions of the CDG

CDG release	Transposed as	Version	Description	Designation
2016 plus errata	[ITU-T H.810 (2016)]	6.1	Release 2016 plus errata noting all ratified bugs [b-CDG 2016].	–
2016	–	6.0	Release 2016 of the CDG including maintenance updates of the CDG 2015 and additional guidelines that cover new functionalities.	Iris
2015 plus errata	[b-ITU-T H.810 (2015)]	5.1	Release 2015 plus errata noting all ratified bugs [b-CDG 2015]. The 2013 edition of H.810 is split into eight parts in the H.810-series.	–
2015	–	5.0	Release 2015 of the CDG including maintenance updates of the CDG 2013 and additional guidelines that cover new functionalities.	Genome
2013 plus errata	[b-ITU-T H.810 (2013)]	4.1	Release 2013 plus errata noting all ratified bugs [b-CDG 2013].	–
2013	–	4.0	Release 2013 of the CDG including maintenance updates of the CDG 2012 and additional guidelines that cover new functionalities.	Endorphin
2012 plus errata	–	3.1	Release 2012 plus errata noting all ratified bugs [b-CDG 2012].	–
2012	–	3.0	Release 2012 of the CDG including maintenance updates of the CDG 2011 and additional guidelines that cover new functionalities.	Catalyst
2011 plus errata	–	2.1	CDG 2011 integrated with identified errata.	–
2011	–	2.0	Release 2011 of the CDG including maintenance updates of the CDG 2010 and additional guidelines that cover new functionalities [b-CDG 2011].	Adrenaline
2010 plus errata	–	1.6	CDG 2010 integrated with identified errata	–
2010	–	1.5	Release 2010 of the CDG with maintenance updates of the CDG Version 1 and additional guidelines that cover new functionalities [b-CDG 2010].	1.5
1.0	–	1.0	First released version of the CDG [b-CDG 1.0].	–

6 Test suite structure (TSS)

The test purposes (TPs) for the Services interface have been divided into the main subgroups specified below. Annex A describes the TPs for subgroups 2.1.1 to 2.1.3 (shown in bold).

- Group 1: HFS sender (HFSS)
 - Group 1.1: Web services interoperability (WSI)
 - Subgroup 1.1.1: Basic profile (BP)
 - Subgroup 1.1.2: Basic security profile (BSP)
 - Subgroup 1.1.3: Reliable messaging (RM)
 - Group 1.2: Simple object access protocol (SOAP)
 - Subgroup 1.2.1: SOAP headers (HEAD)
 - Group 1.3: Audit trail and node authentication (ATNA)
 - Subgroup 1.3.1: General (GEN)
 - Subgroup 1.3.2: PCD-01 (PCD-01)
 - Subgroup 1.3.3: Consent Management (CM)
 - Group 1.4: PCD-01 HL7 messages (PCD-01-DATA)
 - Subgroup 1.4.1: General (GEN)
 - Subgroup 1.4.2: Design guidelines (DG)
 - Subgroup 1.4.3: Pulse oximeter (PO)
 - Subgroup 1.4.4: Blood pressure monitor (BPM)
 - Subgroup 1.4.5: Thermometer (TH)
 - Subgroup 1.4.6: Weighing scales (WEG)
 - Subgroup 1.4.7: Glucose meter (GL)
 - Subgroup 1.4.8: Cardiovascular fitness and activity monitor (CV)
 - Subgroup 1.4.9: Strength fitness equipment (ST)
 - Subgroup 1.4.10: Independent living activity hub (HUB)
 - Subgroup 1.4.11: Adherence monitor (AM)
 - Subgroup 1.4.12: Peak expiratory flow monitor (PF)
 - Subgroup 1.4.13: Body composition analyser (BCA)
 - Subgroup 1.4.14: Basic electrocardiograph (ECG)
 - Subgroup 1.4.15: International normalized ratio (INR)
 - Subgroup 1.4.16: Sleep apnoea breathing therapy equipment (SABTE)
 - Subgroup 1.4.17: Insulin pump (IP)
 - Subgroup 1.4.18: Continuous glucose monitor (CGM)
 - Group 1.5: Consent Management (CM)
 - Subgroup 1.5.1: HFS XDR transaction (TRANS)
 - Subgroup 1.5.2: HFS metadata validation (META)
 - Subgroup 1.5.3: HFS consent directive validation (CDV)
 - Group 1.6: hData Observation Upload (HDATA)
 - Subgroup 1.6.1: General (GEN)
 - Group 1.7: Questionnaires (QUE)
 - Subgroup 1.7.1: General (GEN)

- Subgroup 1.7.2: CDA validation (CDA)
- Group 2: HFS receiver (HFSR)
 - **Group 2.1: Web service interoperability (WSI)**
 - **Subgroup 2.1.1: Basic profile (BP)**
 - **Subgroup 2.1.2: Basic security profile (BSP)**
 - **Subgroup 2.1.3: Reliable messaging (RM)**
 - Group 2.2: SOAP (SOAP)
 - Subgroup 2.2.1: SOAP headers (HEAD)
 - Group 2.3: Audit (ATNA)
 - Subgroup 2.3.1: General (GEN)
 - Subgroup 2.3.2: PCD-01 (PCD-01)
 - Subgroup 2.3.3: Consent Management (CM)
 - Group 2.4: PCD-01 HL7 messages (PCD-01-DATA)
 - Subgroup 2.4.1: General (GEN)
 - Subgroup 2.4.2: Design guidelines (DG)
 - Subgroup 2.4.3: Pulse oximeter (PO)
 - Subgroup 2.4.4: Blood pressure monitor (BPM)
 - Subgroup 2.4.5: Thermometer (TH)
 - Subgroup 2.4.6: Weighing scales (WEG)
 - Subgroup 2.4.7: Glucose meter (GL)
 - Subgroup 2.4.8: Cardiovascular fitness and activity monitor (CV)
 - Subgroup 2.4.9: Strength fitness equipment (ST)
 - Subgroup 2.4.10: Independent living activity hub (HUB)
 - Subgroup 2.4.11: Adherence monitor (AM)
 - Subgroup 2.4.12: Peak expiratory flow monitor (PF)
 - Subgroup 2.4.13: Body composition analyser (BCA)
 - Subgroup 2.4.14: Basic electrocardiograph (ECG)
 - Subgroup 2.4.15: International normalized ratio (INR)
 - Subgroup 2.4.16: Sleep apnoea breathing therapy equipment (SABTE)
 - Subgroup 2.4.17: Insulin pump (IP)
 - Subgroup 2.4.18: Continuous glucose monitor (CGM)
 - Group 2.5: Consent Management (CM)
 - Subgroup 2.5.1: HFS XDR transaction (TRANS)
 - Subgroup 2.5.2: HFS service validation (SER)
 - Group 2.6: hData Observation Upload (HDATA)
 - Subgroup 2.6.1: General (GEN)
 - Subgroup 2.6.2: hData record format (HRF)
 - Group 2.7: Questionnaires (QUE)
 - Subgroup 2.7.1: General (GEN)
 - Subgroup 2.7.2: CDA validation (CDA)
 - Subgroup 2.7.3: hData record format (HRF)

7 Electronic attachment

The protocol implementation conformance statements (PICS) and the protocol implementation extra information for testing (PIXIT) required for the implementation of Annex A can be downloaded from <http://handle.itu.int/11.1002/2000/12067>.

In the electronic attachment, letters "C" and "I" in the column labelled "Mandatory" are used to distinguish between "PICS" and "PIXIT" respectively during testing. If the cell is empty, the corresponding PICS is "independent". If the field contains a "C", the corresponding PICS is dependent on other PICS, and the logical expression is detailed in the "SCR_Expression" field. The static conformance review (SCR) is used in the test tool to assert whether the PICS selection is consistent.

Annex A

Test purposes

(This annex forms an integral part of this Recommendation.)

A.1 TP definition conventions

The test purposes (TPs) are defined according to the following rules:

- **TP Id:** This is a unique identifier (TP/<TT>/<DUT>/<GR>/<SGR>/<XX> – <NNN>). It is specified according to the naming convention defined below:
 - Each test purpose identifier is introduced by the prefix "TP"
 - <TT>: This is the test tool that will be used in the test case.
 - HFS: Health & Fitness Services Interface
 - <DUT>: This is the device under test.
 - SEN: HFS sender
 - REC: HFS receiver
 - <GR>: This identifies a group of test cases.
 - <SGR>: This identifies a subgroup of test cases.
 - <XX>: This identifies the type of testing.
 - BV: Valid behaviour test
 - BI: Invalid behaviour test
 - <NNN>: This is a sequential number that identifies the test purpose (TP).
- **TP label:** This is the title of the TP.
- **Coverage:** This contains the specification reference and clause to be checked by the TP.
 - Spec: This indicates the earliest version of the specification from which the testable items to be checked by the TP are included.
 - Testable item: This contains testable items to be checked by the TP.
- **Test purpose:** This is a description of the requirements to be tested.
- **Applicability:** This contains the PICS items that define if the test case is applicable or not for a specific device. When a TP contains an "ALL" in this field it means that it applies to the device under test within that scope of the test (specialization, transport used, etc.).
- **Other PICS:** This contains additional PICS items (apart from the PICS specified in the Applicability row) which are used within the test case implementation and can modify the final verdict. When this row is empty, it means that only the PICS specified in the Applicability row are used within the test case implementation.
- **Initial condition:** This indicates the state to which the DUT needs to be moved at the beginning of TC execution.
- **Test procedure:** This describes the steps to be followed in order to execute the test case.
- **Pass/Fail criteria:** This provides criteria to decide whether the DUT passes or fails the test case.

A.2 Subgroup 2.1.1 – Basic profile (BP)

TP Id		TP/HFS/REC/WSI/BP/BI-000		
TP label		SOAP Envelope Namespace		
Coverage	Spec	[OASIS/WS-I BP]		
	Testable items	BP-R1015; M		
Test purpose		<p>Check that:</p> <p>An HFS receiver must generate a fault if they encounter an envelope whose document element is not soap:Envelope</p>		
Applicability		C_REC_000 AND C_REC_GEN_003		
Other PICS				
Initial condition		The HFS receiver under test has a WebService enabled and the simulated HFS sender has a SOAP message [b-SOAP 1.2] whose document element is not a soap:Envelope, ready to be sent		
Test procedure		<ol style="list-style-type: none"> 1. The simulated HFS sender sends the SOAP message. 2. The HFS receiver generates a fault. 		
Pass/Fail criteria		Check that the HFS receiver generates a fault and does not discard the message.		
Notes				

TP Id		TP/HFS/REC/WSI/BP/BV-000		
TP label		SOAP Envelopes Structure		
Coverage	Spec	[OASIS/WS-I BP]		
	Testable items	BP-R9980; M	BP-R9981; M	BP-R1014; M
		BP-R1008; M	BP-R1009; M	BP-R1033; R
		BP-R1017; M	BP-R1032; M	
Test purpose		<p>Check that:</p> <p>An Envelope must conform to the structure specified in SOAP1.2 Section 5.1, "SOAP Envelope"</p> <p>[AND]</p> <p>an Envelope must have exactly zero or one child elements of the soap:Body element</p> <p>[AND]</p> <p>the children of the soap:body element in an Envelope must be namespace qualified</p> <p>[AND]</p> <p>an Envelope must not contain a Document Type Declaration (DTD) nor Processing Instructions</p> <p>[AND]</p> <p>an Envelope should not contain the namespace declaration xmlns:xml="http://www.w3.org/XML/1998/namespace"</p> <p>[AND]</p> <p>An HFS receiver must not mandate the use of the xsi:type attribute in envelopes except as required in order to indicate a derived type</p> <p>[AND]</p> <p>the soap:envelope, soap:header and soap:body elements in an Envelope must not have attributes in the namespace "http://schemas.xmlsoap.org/soap/envelope/"</p>		
Applicability		C_REC_000 AND C_REC_GEN_003		
Other PICS				

Initial condition	The HFS receiver under test has a WebService enabled and the simulated HFS sender has a SOAP message ready to be sent.
Test procedure	<ol style="list-style-type: none"> The simulated HFS sender sends a SOAP message to the HFS receiver under test. The HFS receiver responds with another SOAP message. Check that the captured message has the following structure <pre> <soap:Envelope 'namespace'> <soap:Header> ... </soap:Header> <soap:Body> <i>The children of the soap:envelope are here</i> </soap:Body> </soap:Envelope> </pre> where soap:Header is optional and it is recommended that the namespace is not "http://www.w3.org/XML/1998/namespace".
Pass/Fail criteria	<p>Check that:</p> <ul style="list-style-type: none"> the message contains, in this order, an envelope, an optional header and a body. each namespace that appears in the soap message is qualified. the soap:envelope, soap:header and soap:body do not have attributes in the namespace "http://schemas.xmlsoap.org/soap/envelope/". there is no DTD or processing instructions in the envelope. an xsi:type is used only if a derived type is indicated (see [b-XML Schema Part 1], clause 2.6.1) the namespace is "http://www.w3.org/2003/05/soap-envelope" to support SOAP 1.2.
Notes	<p>BP-R2201 and BP-R2210 imply that there may be at most one child element of the soap:Body.</p> <p>The referenced errata, NE05, would not be allowed by Continua (as it is not compliant with the WS-I Basic Profile).</p>

TP Id	TP/HFS/REC/WSI/BP/BV-001		
TP label	SOAP encodingStyle Attribute		
Coverage	Spec	[OASIS/WS-I BP]	
	Testable Items	BP-R1005; M	BP-R1006; M
Test purpose	<p>Check that:</p> <p>An Envelope must not contain soap:encodingStyle attributes on any of the elements whose namespace name is "http://schemas.xmlsoap.org/soap/envelope/"</p> <p>[AND]</p> <p>An Envelope must not contain soap:encodingStyle attributes on any element that is a child of soap:body.</p> <p>[AND]</p> <p>an Envelope described in an rpc-literal binding must not contain soap:encodingStyle attribute on any element that is a grandchild of soap:Body</p>		
Applicability	C_REC_000 AND C_REC_GEN_003		
Other PICS	C_REC_WSI_003		
Initial condition	The HFS receiver under test has a WebService enabled and the simulated HFS sender has a SOAP message, with a correct soap:encodingStyle attribute in one of the elements, ready to be sent.		

Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends the SOAP message. 2. The HFS receiver responds with another SOAP message: <ol style="list-style-type: none"> a. If a soap:encodingStyle attribute is present in any element: <ul style="list-style-type: none"> <input type="checkbox"/> Namespace is not "http://schemas.xmlsoap.org/soap/envelope/" <input type="checkbox"/> The element is not a child of soap:Body <input type="checkbox"/> If PICS C_REC_WSI_003 is declared, the element is not a grandchild of soap:body
Pass/Fail criteria	In step 2, if the soap:encodingStyle attribute is present, it is as specified.
Notes	

TP Id	TP/HFS/REC/WSI/BP/BV-002		
TP label	Use of SOAP in HTTP		
Coverage	Spec	[OASIS/WS-I BP]	
	Testable items	BP-R1127; M	BP-R1140; M
Test purpose	Check that: An HFS receiver must not rely on the value of the SOAPAction HTTP header to correctly process the message. [AND] A Message shall be sent using HTTP/1.1		
Applicability	C_REC_000 AND C_REC_GEN_003		
Other PICS			
Initial condition	The HFS receiver under test has a WebService enabled and the simulated HFS sender has a SOAP message ready to be sent that contains a SOAPAction field not quoted in its HTTP header.		
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a message using HTTP/1.1 with a SOAPAction HTTP Header field not quoted without using security. 2. The HFS receiver processes the message (it responds with the fault wsse:InvalidSecurity). 		
Pass/Fail criteria	Check that in step 2 the message has been processed.		
Notes			

TP Id	TP/HFS/REC/WSI/BP/BV-003			
TP label	HTTP Status Codes			
Coverage	Spec	[OASIS/WS-I BP]		
	Testable items	BP-R1124; M	BP-R1111; R	BP-R1112; R
		BP-R1125; M	BP-R1113; R	BP-R1114; R
		BP-R1115; R		
Test purpose	Check that: An instance must use a 2xx HTTP status code on a response message that indicates the successful outcome of a HTTP request [AND] An instance should use a "200 OK" HTTP status code on a response message that contains an envelope that is not a fault [AND] An Instance should use either a "200 OK" or "202 Accepted" HTTP status code for a response message that does not contain a SOAP envelope but indicates the successful			

	<p>outcome of a HTTP request</p> <p>[AND]</p> <p>An instance must use a 4xx HTTP status code for a response that indicates a problem with the format of a request</p> <p>[AND]</p> <p>An instance should use a "400 Bad Request" HTTP status code, if a HTTP request message is malformed</p> <p>[AND]</p> <p>An instance should use a "405 Method not Allowed" HTTP status code if a HTTP request message's method is not "POST".</p> <p>[AND]</p> <p>An instance should use a "415 Unsupported Media Type" HTTP status code if a HTTP request message's Content-Type header field-value is not permitted by its WSDL description</p>
Applicability	C_REC_000 AND C_REC_GEN_003
Other PICS	
Initial condition	The HFS receiver under test has a WebService enabled and the simulated HFS sender is ready to send a HTTP request with an envelope permitted by the SUT
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a HTTP request to the HFS receiver under test with an envelope permitted by the SUT. 2. The HFS receiver responds with "2xx" as status code, which is recommended to be: "200 OK" if the response contains an envelope that is not a fault; and "200 OK" or "202 Accepted" if the response does not contain a SOAP envelope but indicates the successful outcome of the HTTP Request. 3. The simulated HFS sender sends a HTTP request with a malformed message. 4. The HFS receiver responds with "4xx" as status code. It is recommended to be "400 Bad Request". 5. The simulated HFS sender sends a HTTP request with a method that is not "POST" 6. The HFS receiver responds with "4xx" as status code. It is recommended to be "405 Method not Allowed". 7. The simulated HFS sender sends a HTTP request with a Content-Type header field not permitted by the HFS receiver's WSDL description. 8. The HFS receiver responds with "4xx" as status code. It is recommended to be "415 Unsupported Media Type".
Pass/Fail criteria	Check that status codes are as specified.
Notes	

TP Id	TP/HFS/REC/WSI/BP/BV-004		
TP label	Messages using WSDL descriptions		
Coverage	Spec	[OASIS/WS-I BP]	
	Testable items	BP-R2211; M	BP-R2212; M
		BP-R2214; M	
Test purpose	<p>Check that:</p> <p>An Envelope described with an rpc-literal binding must not have the xsi:nil attribute with a value of "1" or "true" on the part accessors</p> <p>[AND]</p> <p>an Envelope must contain exactly one part accessor element for each of the wsdl:parts in the same wsdl:message that are referred to by its soapbind:body element(s)</p> <p>[AND]</p> <p>in a doc-literal description where the value of the parts attribute of soapbind:body is an empty string, the corresponding envelope must have no element content in the soap:Body element</p>		

	[AND] in a rpc-literal description where the value of the parts attribute of soapbind:body is an empty string, the corresponding envelope must have no part accessor elements.
Applicability	C_REC_000 AND (C_REC_WSI_003 OR C_REC_WSI_004) AND C_REC_GEN_003
Other PICS	
Initial condition	The HFS receiver under test has a WebService enabled and the simulated HFS sender is ready to send any SOAP message.
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a SOAP message. 2. The HFS receiver under test responds with another SOAP message. 3. Look into the WSDL of the service and check in the captured message that: If C_REC_WSI_003: <ol style="list-style-type: none"> a. If the value of the parts attribute of the soapbind:body element of the description is an empty string, there is no part accessor element. b. If the value of the parts attribute of the soapbind:body element of the description is not empty, check that the part accessor of the envelope is present and that the value of the xsi:nil attribute, if it is present, is not "1" or "true". If C_REC_WSI_004: <ol style="list-style-type: none"> a. If the value of the parts attribute of the soapbind:body is an empty string, the envelope does not have element content in the soap:Body element.
Pass/Fail criteria	Check that the envelope is as specified in step 3.
Notes	

TP Id	TP/HFS/REC/WSI/BP/BV-005		
TP label	Port Types		
Coverage	Spec	[OASIS/WS-I BP]	
	Testable items	BP-R2301; M	
Test purpose	Check that: The order of the elements in the soap:Body of an envelope must be the same as that of the wsdl:parts in the wsdl:message that describes it for each of the wsdl:part elements bound to the envelope's corresponding soapbind:body element		
Applicability	C_REC_000 AND C_REC_GEN_003		
Other PICS			
Initial condition	The HFS receiver under test has a WebService enabled and the simulated HFS Sender is ready to send any SOAP message.		
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS Sender sends a SOAP message to the HFS receiver under test. 2. The HFS receiver under test responds with a SOAP message. 3. Check the wsdl:parts elements in the wsdl:message of the WSDL of the HFS receiver under test. 4. Compare them with the soap:Body elements. 		
Pass/Fail criteria	In step 4, check that the order of the wsdl:parts are the same as the order of the elements in the soap:Body		
Notes			

TP Id	TP/HFS/REC/WSI/BP/BV-006		
TP label	SOAP Binding		
Coverage	Spec	[OASIS/WS-I BP]	
	Testable	BP-R2742; O	BP-R2743; O

	items			
Test purpose	<p>Check that:</p> <p>An envelope may contain fault with a detail element that is not described by a soapbind:fault element in the corresponding WSDL description</p> <p>[AND]</p> <p>An envelope may contain the details of a header processing related fault in a SOAP header block that is not described by a soapbind:headerfault element in the corresponding WSDL description</p>			
Applicability	C_REC_000 AND C_REC_GEN_003			
Other PICS				
Initial condition	The HFS receiver under test has a WebService enabled and the simulated HFS sender is ready to send a SOAP message that causes a fault in the HFS receiver response.			
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a SOAP message that causes a fault at the HFS receiver. 2. The HFS receiver under test responds with a fault message. 3. Check the detail element and the SOAP header block. 			
Pass/Fail criteria	<p>Look into the WSDL description of the web service and check that:</p> <ul style="list-style-type: none"> • in step 2, it is optional that the detail element is not described by the soapbind:fault element of the description and that the header block is not described by a soapbind:headerfault element. 			
Notes	<p>A simulated HFS sender can cause a fault at the HFS receiver in many different ways:</p> <ul style="list-style-type: none"> • If the HFS receiver uses security, the HFS sender sends a SOAP envelope without the security header. • If the HFS sender sends something that is not a SOAP envelope. • If the HFS receiver uses WSRM, the HFS sender sends something incorrect about the WSRM, such as an unknown sequence, or something like that. 			

TP Id	TP/HFS/REC/WSI/BP/BV-006_B			
TP label	SOAP Binding 2			
Coverage	Spec	[OASIS/WS-I BP]		
	Testable items	BP-R2712; M	BP-R2729; M	BP-R2735; M
		BP-R2755; M	BP-R2737; M	BP-R2738; M
	BP-R2739; O	BP-R2752; O	BP-R2753; O	
Test purpose	<p>Check that:</p> <p>A document-literal binding must be serialized as an envelope with a soap:Body whose child element is an instance of the global element declaration referenced by the corresponding wsdl:message part</p> <p>[AND]</p> <p>An envelope described with an rpc-literal binding that is a response must have a wrapper element whose name is the corresponding wsdl:operation name suffixed with the string "Response".</p> <p>[AND]</p> <p>An envelope described with an rpc-literal binding must place the part accessor elements for parameters and return value in no namespace</p> <p>[AND]</p> <p>The part accessor elements in a message described with an rpc-literal binding must have a local name of the same value as the name attribute of the corresponding wsdl:part element</p> <p>[AND]</p> <p>An envelope described with an rpc-literal binding must namespace qualify the descendants of part accessor elements for the parameters and the return value, as defined by the schema in</p>			

	<p>which the part accessor types are defined</p> <p>[AND]</p> <p>An envelope must include all soapbind:headers specified on a wsdl:input or wsdl:output of a wsdl:operation of a wsdl:binding that describes it</p> <p>[AND]</p> <p>An envelope containing SOAP header blocks that are not described in the appropriate wsdl:binding may have the mustUnderstand attribute on such SOAP header blocks set to '1'.</p> <p>[AND]</p> <p>An Envelope may contain SOAP header blocks that are not described in the wsdl:binding that describes it</p> <p>[AND]</p> <p>An envelope may contain more than one instance of each SOAP header block for each soapbind:header element in the appropriate child of soapbind:binding in the corresponding description</p>
Applicability	C_REC_000 AND (C_REC_WSI_003 OR C_REC_WSI_004) AND C_REC_GEN_003
Other PICS	
Initial condition	The HFS receiver under test has a WebService enabled and the simulated HFS sender is ready to send any SOAP message.
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a SOAP message to the HFS receiver under test. 2. The HFS receiver responds with a SOAP message. 3. Check the captured message.
Pass/Fail criteria	<p>Look into the WSDL description of the web service and check:</p> <ul style="list-style-type: none"> • In step 2, <ul style="list-style-type: none"> ○ If the SOAP header block is not described in wsdl:binding, it can be present and it is optional that the mustUnderstand attribute is present and equal to "1" and that the envelope has more than one instance for each header block. ○ All soapbind:headers specified in wsdl:input or wsdl:output of a wsdl:operation of a wsdl:binding are included in the envelope. ○ If C_REC_WSI_003, the part accessor of the envelope has a local name equal to the name of the attribute of the wsdl:part element, it is placed in no namespace and its descendants have a namespace qualified by the schema in which the part accessor types are defined. In addition the envelope has a wrapper element whose name is the corresponding wsdl:operation name suffixed with the string "Response". ○ If C_REC_WSI_004, the child element of the soap:Body is an instance of the global element declaration referenced by the corresponding wsdl:message part.
Notes	

TP Id	TP/HFS/REC/WSI/BP/BV-007		
TP label	Use of HTTPS		
Coverage	Spec	[OASIS/WS-I BP]	
	Testable items	BP-R5000; O	BP-R5001; M
Test purpose	<p>Check that:</p> <p>An Instance may require the use of HTTPS</p> <p>[AND]</p> <p>if an instance requires the use of HTTPS, the location attribute of the soapbind:address element in its wsdl:port description must be a URI whose scheme is "https"; otherwise it must be a URI whose scheme is "http"</p> <p>[AND]</p> <p>an instance may require the use of HTTPS with mutual authentication</p>		

Applicability	C_REC_000 AND C_REC_GEN_003
Other PICS	
Initial condition	The HFS receiver under test has a WebService enabled and the simulated HFS sender is ready to send any HTTP request.
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a HTTP request. 2. Wait until the HFS receiver under test responds using a HTTP instance. 3. Check the value of the location attribute of the soapbind:address element in its wsdl:port description.
Pass/Fail criteria	In step 2, if this value is "https", the instance requires HTTPS, otherwise, if it is "http", the instance requires HTTP.
Notes	Applicability is ALL because although TI says that HTTPS is optional, the CDG states that HTTPS with TLS must be used.

TP Id	TP/HFS/REC/WSI/BP/BV-008		
TP label	SOAP Processing Model		
Coverage	Spec	[OASIS/WS-I BP]	
	Testable items	BP-R1025; M	BP-R1028; R
		BP-R1030; R	BP-R1027; M
Test purpose	<p>Check that:</p> <p>An HFS receiver must handle envelopes in such a way that it appears that all checking of mandatory header blocks is performed before any actual processing [AND]</p> <p>When a fault is generated by an HFS receiver, further processing should not be performed on the SOAP envelope aside from that which is necessary to rollback, or compensate for, any effects of processing the envelope prior to the generation of the fault. [AND]</p> <p>Where the normal outcome of processing a SOAP envelope would have resulted in the transmission of a SOAP response, but rather a fault is generated instead, an HFS receiver must transmit a fault in place of the response. [AND]</p> <p>An HFS receiver that generates a fault should notify the end user that a fault has been generated when practical, by whatever means is deemed appropriate to the circumstance. [AND]</p> <p>An HFS receiver must generate a "soap:MustUnderstand" fault when an envelope contains a mandatory header block (i.e., one that has a soap:mustUnderstand attribute with the value "1") targeted at the HFS receiver (via soap:actor) that the HFS receiver does not understand.</p>		
Applicability	C_REC_000 AND C_REC_GEN_003		
Other PICS			
Initial condition	The HFS receiver under test has a WebService enabled and the simulated HFS sender is ready to send a SOAP message with a header block with soap:MustUnderstand='1' 'true' that the HFS receiver does not understand.		
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends the SOAP message. 2. The HFS receiver under test generates a soap:MustUnderstand fault. 3. The HFS receiver responds with that fault. 4. Check that, when HFS receiver generates the fault, the simulated HFS sender is notified of the fault by the HFS receiver. 		
Pass/Fail criteria	In step 3, the HFS receiver responds with a soap:MustUnderstand fault and no other messages.		
Notes	If the HFS receiver does not send another message besides a soap:MustUnderstand fault, then it is considered that further processing is not performed prior to the generation of the fault.		

TP Id		TP/HFS/REC/WSI/BP/BV-009		
TP label		SOAP Faults		
Coverage	Spec	[OASIS/WS-I BP]		
	Testable items	BP-R1107; M	BP-R1002; M	
Test purpose		<p>Check that:</p> <p>An HFS receiver must interpret a SOAP message as a Fault when the soap:Body of the message has a single soap:Fault child</p> <p>[AND]</p> <p>An HFS receiver must accept faults that have any number of elements, including zero, appearing as children of the detail element. Such children can be qualified or unqualified</p>		
Applicability		C_REC_000 AND C_REC_GEN_003		
Other PICS				
Initial condition		The HFS receiver under test has a WebService enabled and the simulated HFS sender is ready to send a SOAP message with a soap:Fault in the soap:Body.		
Test procedure		<ol style="list-style-type: none"> 1. The simulated HFS sender sends an envelope with a single soap:Fault child in the soap:Body. 2. Wait for any response from the HFS receiver under test. 3. The simulated HFS sender sends a soap:Fault message with zero elements as child of the detail element. 4. Wait for any response of HFS receiver. 5. The simulated HFS sender sends a soap:Fault with zero attributes in the detail element. 6. Wait for any response from the HFS receiver. 		
Pass/Fail criteria		In steps 2, 4 and 6, the HFS receiver must not report any error because all the messages are accepted.		
Notes				

TP Id		TP/HFS/REC/WSI/BP/BV-010		
TP label		WSDL Description		
Coverage	Spec	[OASIS/WS-I BP]		
	Testable items	BP-R1034; R	BP-R2028; M	BP-R2029; M
		BP-R4004; M	BP-R4005; R	BP-R4002; R
		BP-R4003; M	BP-R2030; O	BP-R2026; R
		BP-R2101; M	BP-R2102; M	BP-R2105; M
		BP-R2110; M	BP-R2111; M	BP-R2112; R
		BP-R2114; R	BP-R2302; O	BP-R2303; M
		BP-R2304; M	BP-R2305; M	BP-R2709; O
		BP-R2711; R		
Test purpose		<p>Check that:</p> <p>A Description should not contain the namespace declaration xmlns:xml="http://www.w3.org/XML/1998/namespace"</p> <p>[AND]</p> <p>A Description using the WSDL namespace must be valid according to the XML Schema found at "http://ws-i.org/profiles/basic/1.1/wSDL11.xsd".</p> <p>[AND]</p> <p>A Description using the WSDL SOAP binding namespace must be valid according to the XML</p>		

	<p>Schema found at "http://ws-i.org/profiles/basic/1.1/wsdlsoap2004-08-24.xsd"</p> <p>[AND]</p> <p>A Description must use version 1.0 of the eXtensible Markup Language W3C Recommendation</p> <p>[AND]</p> <p>A Description may include the Unicode Byte Order Mark (BOM)</p> <p>[AND]</p> <p>A Description must use either UTF-8 or UTF-16 encoding</p> <p>[AND]</p> <p>In a Description the wsdl:documentation element may be present as the first child element of wsdl:import, wsdl:part and wsdl:definitions in addition to the elements cited in the WSDL1.1 specification</p> <p>[AND]</p> <p>A Description should not include extension elements with a wsdl:required attribute value of "true" on any WSDL construct (wsdl:binding, wsdl:portType, wsdl:message, wsdl:types or wsdl:import) that claims conformance to the Profile</p> <p>[AND]</p> <p>A Description must not use QName references to WSDL components in namespaces that have been neither imported, nor defined in the referring WSDL document</p> <p>[AND]</p> <p>A QName reference to a Schema component in a Description must use the namespace defined in the targetNamespace attribute on the xsd:schema element, or to a namespace defined in the namespace attribute on an xsd:import element within the xsd:schema element</p> <p>[AND]</p> <p>All xsd:schema elements contained in a wsdl:types element of a Description must have a targetNamespace attribute with a valid and non-null value, unless the xsd:schema element has xsd:import and/or xsd:annotation as its only child element(s).</p> <p>[AND]</p> <p>In a Description, declarations must not extend or restrict the soapenc:Array type</p> <p>[AND]</p> <p>In a Description, declarations must not use wsdl:arrayType attribute in the type declaration</p> <p>[AND]</p> <p>In a Description, elements should not be named using the convention ArrayOfXXX</p> <p>[AND]</p> <p>The target namespace for WSDL definitions and the target namespace for schema definitions in a Description may be the same</p> <p>[AND]</p> <p>A Description may use the parameterOrder attribute of an wsdl:operation element to indicate the return value and method signatures as a hint to code generators</p> <p>[AND]</p> <p>A Description must not use Solicit-Response and Notification type operations in a wsdl:portType definition</p> <p>[AND]</p> <p>A wsdl:portType in a Description must have operations with distinct values for their name attributes</p> <p>[AND]</p> <p>A wsdl:operation element child of a wsdl:portType element in a Description must be constructed so that the parameterOrder attribute, if present, omits at most 1 wsdl:part from the output message</p> <p>[AND]</p>
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	<p>A wsdl:portType in a Description may have zero or more wsdl:bindings that refer to it, defined in the same or other WSDL documents</p> <p>[AND]</p> <p>A Description should not have more than one wsdl:port with the same value for the location attribute of the soapbind:address element</p>
Applicability	C_REC_000 AND C_REC_GEN_003
Other PICS	
Initial condition	The HFS receiver has published its WSDL description.
Test procedure	<ol style="list-style-type: none"> 1. Look up the WSDL description using the corresponding URL given by the HFS receiver under test. Check that: <ol style="list-style-type: none"> a. xmlns:xml≠ "http://www.w3.org/XML/1998/namespace" b. XML version = "1.0" c. UTF-8 or UTF-16 encoding are used and the unicode byte order mark (BOM) is optional. d. if wsdl:documentation is present, check that it is the first child element of wsdl:import, wsdl:part or wsdl:definitions. e. the targetNamespace attribute of an xsd:schema contained in wsdl:types element, has a valid non-null value, unless the xsd:schema has xsd:import and/or xsd:annotation as its only child element(s) <pre> <types> <xsd:schema targetNamespace="http://example.org/foo/" ... > </pre> f. the wsdl:portType definition does not use Solicit-Response or Notification Type operations and has operations with distinct values for their name attributes: <pre> <portType name="BarPortType"> <operation name="BarOperation"> <input message="bar:BarMsg"/> </operation> </portType> </pre> g. if present, the parameterOrder attribute of the wsdl:operation (that is a child of wsdl:portType) omits at most one wsdl:part from the output message. h. the wsdl:ArrayType is not present on type declaration. i. the soapenc:ArrayType is not extended or restricted. j. the description does not contain any extension elements with a wsdl:required attribute value of "true" on any WSDL construct (wsdl:binding, wsdl:portType, wsdl:message, wsdl:types or wsdl:import) as is recommended. k. The namespace of a QName reference to a schema component is defined in the targetNamespace attribute on the xsd:schema element or is the namespace of the xsd:import element. l. a QName reference to WSDL components in namespaces that have been neither imported nor defined on the referring WSDL Document, is not used. m. wsdl:bindings are optional n. that more than one wsdl:port with the same value for the location attribute of the soapbind:address element are not used as is recommended.
Pass/Fail criteria	<p>Check that:</p> <ul style="list-style-type: none"> • in step 1, the HFS sender can access the WSDL description. • all elements and attributes are as specified. • the description using the wsdl namespace is valid according to the XML schema found at http://ws-i.org/profiles/basic/1.1/wsdl11.xsd. • the description using the WSDL SOAP Bind namespace is valid according to the XML

	schema found at http://ws-i.org/profiles/basic/1.1/wsdlsoap-2004-08-24.xsd .
Notes	BP-R4005 is the same that BP-R1034

TP Id	TP/HFS/REC/WSI/BP/BV-011			
TP label	WSDL Description: wsdl:binding			
Coverage	Spec	[OASIS/WS-I BP]		
	Testable items	BP-R2209; R	BP-R2202; O	BP-R2208; O
		BP-R2205; M	BP-R2701; M	BP-R2702; M
		BP-R2705; M	BP-R2706; M	BP-R2710; M
		BP-R2716; M	BP-R2717; M	BP-R2726; M
		BP-R2718; M	BP-R2719; O	BP-R2740; R
		BP-R2741; R	BP-R2720; M	BP-R2749; M
		BP-R2721; M	BP-R2754; M	BP-R2722; O
		BP-R2723; M	BP-R2707; M	BP-R2751; M
Test purpose	<p>Check that:</p> <p>A wsdl:binding in a Description should bind every wsdl:part of a wsdl:message in the wsdl:portType to which it refers with a binding extension element.</p> <p>[AND]</p> <p>A wsdl:binding in a Description may contain soapbind:body element(s) that specify that zero parts form the soap:Body</p> <p>[AND]</p> <p>A binding in a Description may contain soapbind:header element(s) that refer to wsdl:parts in the same wsdl:message that are referred to by its soapbind:body element(s).</p> <p>[AND]</p> <p>A wsdl:binding in a Description must refer, in each of its soapbind:header, soapbind:headerfault and soapbind:fault elements, only to wsdl:part element(s) that have been defined using the element attribute</p> <p>[AND]</p> <p>The wsdl:binding element in a Description must be constructed so that its soapbind:binding child element specifies the transport attribute.</p> <p>[AND]</p> <p>A wsdl:binding element in a Description must specify the HTTP transport protocol with SOAP binding. Specifically, the transport attribute of its soapbind:binding child must have the value "http://schemas.xmlsoap.org/soap/http".</p> <p>[AND]</p> <p>A wsdl:binding in a Description must either be a rpc-literal binding or a document-literal binding.</p> <p>[AND]</p> <p>The operations in a wsdl:binding in a Description must result in operation signatures that are different from one another</p> <p>[AND]</p> <p>A wsdl:binding in a Description must use the value of "literal" for the use attribute in all soapbind:body, soapbind:fault, soapbind:header and soapbind:headerfault elements</p> <p>[AND]</p> <p>A document-literal binding in a Description must not have the namespace attribute specified on contained soapbind:body, soapbind:header, soapbind:headerfault and soapbind:fault elements</p> <p>[AND]</p> <p>An rpc-literal binding in a Description must have the namespace attribute specified, the value</p>			

	<p>of which must be an absolute URI, on contained soapbind:body elements</p> <p>[AND]</p> <p>An rpc-literal binding in a Description must not have the namespace attribute specified on contained soapbind:header, soapbind:headerfault and soapbind:fault elements</p> <p>[AND]</p> <p>A wsdl:binding in a Description must have the same set of wsdl:operations as the wsdl:portType to which it refers</p> <p>[AND]</p> <p>A wsdl:binding in a Description may contain no soapbind:headerfault elements if there are no known header faults</p> <p>[AND]</p> <p>A wsdl:binding in a Description should contain a soapbind:fault describing each known fault</p> <p>[AND]</p> <p>A wsdl:binding in a Description should contain a soapbind:headerfault describing each known header fault</p> <p>[AND]</p> <p>A wsdl:binding in a Description must use the part attribute with a schema type of "NMTOKEN" on all contained soapbind:header and soapbind:headerfault elements</p> <p>[AND]</p> <p>A wsdl:binding in a Description must not use the parts attribute on contained soapbind:header and soapbind:headerfault elements</p> <p>[AND]</p> <p>A wsdl:binding in a Description must have the name attribute specified on all contained soapbind:fault elements</p> <p>[AND]</p> <p>In a Description, the value of the name attribute on a soapbind:fault element must match the value of the name attribute on its parent wsdl:fault element</p> <p>[AND]</p> <p>A wsdl:binding in a Description may specify the use attribute on contained soapbind:fault elements</p> <p>[AND]</p> <p>If in a wsdl:binding in a Description the use attribute on a contained soapbind:fault element is present, its value must be "literal".</p> <p>[AND]</p> <p>A wsdl:binding in a Description that contains one or more soapbind:body, soapbind:fault, soapbind:header or soapbind:headerfault elements that do not specify the use attribute must be interpreted as though the value "literal" had been specified in each case</p> <p>[AND]</p> <p>The order of soapbind:header elements in soapbind:binding sections of a Description must be considered independent of the order of SOAP header blocks in the envelope</p>
Applicability	C_REC_000 AND (C_REC_WSI_003 OR C_REC_WSI_004) AND C_REC_GEN_003
Other PICS	
Initial condition	The HFS receiver has published its WSDL description.
Test procedure	<ol style="list-style-type: none"> 1. Look up the WSDL description using the corresponding URL given by the HFS receiver under test. If wsdl:binding is present, check that: <ol style="list-style-type: none"> a. the Soapbind:binding child element specifies the transport attribute and transport="http://schemas.xmlsoap.org/soap/http". b. the soapbind:header and soapbind:body elements are optional. c. the wsdl:binding refers in soapbind:headerfault, soapbind:header, soapbind:fault elements only to wsdl:parts that has been defined using the element attribute.

	<ul style="list-style-type: none"> d. the operations resulted in operation signatures that are different from one another. e. the "use" attribute in soapbind:header, soapbind:body, soapbind:headerfault and soapbind:fault, if they are present, is "literal". f. the wsdl:binding has the same wsdl:operations as wsdl:portType. g. the part attribute of soapbind:header and soapbind:headerfault elements, if they are present, have the schema type of "NMOKEN". h. the soapbind:headerfault elements are optional if there are no known header faults. i. all soapbind:fault elements have the name attribute specified and its value matches the value of the name attribute on its parent wsdl:fault element. The "use" attribute is optional. j. the order of the soapbind:header element, if it is present, is independent of the order of SOAP header blocks. k. if C_REC_WSI_003, the namespace attribute is specified only on a contained soapbind:body and its value is an absolute URI. if C_REC_WSI_004, the namespace attribute is not specified.
Pass/Fail criteria	The HFS sender can access the WSDL description and if wsdl:binding is present, elements and attributes are as specified above.
Notes	<p>The profile defines the "operation signature" to be the fully qualified name of the child element of SOAP body of the SOAP input message described by an operation in a WSDL binding.</p> <p>In the case of rpc-literal binding, the operation name is used as a wrapper for the part accessors. In the document-literal case, since a wrapper with the operation name is not present, the message signatures must be correctly designed.</p>

TP Id	TP/HFS/REC/WSI/BP/BV-012			
TP label	WSDL Description. Imported Descriptions			
Coverage	Spec	[OASIS/WS-I BP]		
	Testable items	BP-R2001; M	BP-R2803; M	BP-R2002; M
		BP-R2003; M	BP-R2004; M	BP-R2009; O
		BP-R2010; M	BP-R2011; M	BP-R2007; M
		BP-R2022; M	BP-R2023; M	BP-R2005; M
Test purpose	<p>Check that:</p> <p>A Description must only use the WSDL "import" statement to import another WSDL description</p> <p>[AND]</p> <p>In a Description, the namespace attribute of the wsdl:import must not be a relative URI</p> <p>[AND]</p> <p>To import XML Schema Definitions, a Description must use the XML Schema "import" statement</p> <p>[AND]</p> <p>A Description must use the XML Schema "import" statement only within the xsd:schema element of the types section</p> <p>[AND]</p> <p>In a Description the schemaLocation attribute of an xsd:import element must not resolve to any document whose root element is not "schema" from the namespace "http://www.w3.org/2001/XMLSchema"</p> <p>[AND]</p> <p>An XML Schema directly or indirectly imported by a Description may include the Unicode Byte Order Mark (BOM).</p> <p>[AND]</p> <p>An XML Schema directly or indirectly imported by a Description must use either UTF-8 or</p>			

	<p>UTF-16 encoding</p> <p>[AND]</p> <p>An XML Schema directly or indirectly imported by a Description must use version 1.0 of the eXtensible Markup Language W3C Recommendation</p> <p>[AND]</p> <p>A Description must specify a non-empty location attribute on the wsdl:import element</p> <p>[AND]</p> <p>When they appear in a Description, wsdl:import elements must precede all other elements from the WSDL namespace except wsdl:documentation</p> <p>[AND]</p> <p>When they appear in a Description, wsdl:types elements must precede all other elements from the WSDL namespace except wsdl:documentation and wsdl:import</p> <p>[AND]</p> <p>The targetNamespace attribute on the wsdl:definitions element of a description that is being imported must have same the value as the namespace attribute on the wsdl:import element in the importing Description</p>
Applicability	C_REC_000 AND C_REC_WSI_002 AND C_REC_GEN_003
Other PICS	
Initial condition	The HFS receiver has published its WSDL description.
Test procedure	<ol style="list-style-type: none"> 1. Look up the WSDL description using the corresponding URL given by the HFS receiver under test. If the wsdl:import element is present, check that: <ol style="list-style-type: none"> a. the wsdl:import is only used to import another wsdl description. b. the namespace of the wsdl:import is not a relative URI. c. the XML schema "import" statement is used to import the XML schema definitions within the xsd:schema element. d. an imported XML schema definitions is version 1.0. e. the schemaLocation attribute of the xsd:import element is resolved to a document whose root element is a schema from the namespace "http://www.w3.org/2001/XMLSchema" f. UTF-8 or UTF-16 encoding is used and it is optional that it includes the unicode byte order mark (BOM). g. the location attribute of the wsdl:import element is not empty. h. the wsdl:import precedes all other elements from the WSDL, except wsdl:documentation. i. wsdl:types precedes all other elements from the WSDL, except wsdl:documentation and wsdl:import. j. the targetNamespace attribute of the description being imported is the same as the namespace attribute on the wsdl:import element in the importing description.
Pass/Fail criteria	The HFS sender can access the WSDL description and elements and attributes of wsdl:import that are specified above.
Notes	

TP Id	TP/HFS/REC/WSI/BP/BV-013		
TP label	WSDL Description: wsdl:parts element		
Coverage	Spec	[OASIS/WS-I BP]	
	Testable items	BP-R2201; C	BP-R2210; C
		BP-R2207; O	BP-R2204; C
	BP-R2306; M		BP-R2203; C
Test purpose	Check that:		

	<p>A document-literal binding in a Description must, in each of its soapbind:body element(s), have at most one part listed in the parts attribute, if the parts attribute is specified</p> <p>[AND]</p> <p>If a document-literal binding in a Description does not specify the parts attribute on a soapbind:body element, the corresponding abstract wsdl:message must define zero or one wsdl:parts</p> <p>[AND]</p> <p>If a rpc-literal binding in a Description must refer, in its soapbind:body element(s), only to wsdl:part element(s) that have been defined using the type attribute</p> <p>[AND]</p> <p>A wsdl:message in a Description may contain wsdl:parts that use the elements attribute provided those wsdl:parts are not referred to by a soapbind:body in an rpc-literal binding</p> <p>[AND]</p> <p>A document-literal binding in a Description must refer, in each of its soapbind:body element(s), only to wsdl:part element(s) that have been defined using the element attribute</p> <p>[AND]</p> <p>A wsdl:message in a Description containing a wsdl:part that uses the element attribute must refer, in that attribute, to a global element declaration</p> <p>[AND]</p> <p>A wsdl:message in a Description must not specify both type and element attributes on the same wsdl:part</p>
Applicability	C_REC_000 AND (C_REC_WSI_003 OR C_REC_WSI_004) AND C_REC_GEN_003
Other PICS	
Initial condition	The HFS receiver has published its WSDL description.
Test procedure	<p>1. Look up the WSDL description using the corresponding URL given by the HFS receiver under test.</p> <p>An example of a part element in a description is shown below:</p> <pre><message name="GetTradePricelInput"> <part name="body" element="tns:SubscribeToQuotes"/> </message></pre>
Pass/Fail criteria	<p>Check that:</p> <ul style="list-style-type: none"> • if C_REC_WSI_004 is supported and the HFS receiver does not specify the parts attribute on a soapbind:body element, the wsdl:message defines zero or one wsdl:parts. <ul style="list-style-type: none"> ○ If the HFS receiver does specify the doc-literal binding, it has at most one part listed in the parts attribute and it is defined using the element attribute, that refers to a global element declaration. • if C_REC_WSI_003 is supported, the HFS receiver refers in its soapbind:body element(s) only to a wsdl:part element(s) defined using the type attribute. wsdl:parts that uses the elements attribute and this provided those wsdl:parts are not referred to by a soapbind:body are optional. • in either case above, the wsdl:message does not specify both type and element attributes on the same wsdl:part.
Notes	

A.3 Subgroup 2.1.2 – Basic security profile (BSP)

TP Id	TP/HFS/REC/WSI/BSP/BV-000		
TP Label	TLS and SSL		
Coverage	Spec	[OASIS/WS-I BSP]	
	Testable items	BSP-322; R	BSP-323; R
	Spec	[ITU-T H.812]	
	Testable items	SecGuidelines2; M	
Test purpose	<p>Check that:</p> <p>As the AES encryption algorithm is intended to supersede the 3DES algorithm, it is recommended that TLS-capable implementations implement TLS_RSA_WITH_AES_128_CBC_SHA or the FIPS equivalent</p> <p>[AND]</p> <p>The ciphersuites defined in the TLS specifications that use anonymous Diffie-Hellman (i.e. those that have DH_anon in their symbolic name) are vulnerable to man-in-the-middle attacks. It is also recommended that ciphersuites that include MD5 (i.e. those that have MD5 in their symbolic name) be avoided, due to known security weaknesses of the MD5 algorithm. It is recommended that such ciphersuites be avoided.</p> <p>The Profile recommends against the use of the following ciphersuites due to their lack of confidentiality services:</p> <ul style="list-style-type: none"> - TLS_RSA_WITH_NULL_SHA - TLS_RSA_WITH_NULL_MD5 <p>It is also recommended that ciphersuites that use 40 or 56 bit keys be avoided, due to their relative ease of compromise through brute-force attack.</p> <p>[AND]</p> <p>Continua HFS client and service components shall support AES cipher as specified in RFC 3268.</p>		
Applicability	C_REC_000 AND C_REC_GEN_003		
Other PICS	C_REC_WSI_005, C_REC_WSI_029, C_REC_WSI_030, C_REC_WSI_031, C_REC_WSI_032		
Initial condition	The simulated HFS sender and the HFS receiver under test have never been partners in a message exchange.		
Test procedure	<ol style="list-style-type: none"> 1. If instance is FIPS compliant (C_REC_WSI_005=true): <ol style="list-style-type: none"> a. Load the simulated HFS sender supporting TLS_RSA_FIPS_WITH_AES_128_CBC_SHA b. Make the HFS receiver under test establish a TLS connection. c. Check in TLS handshake that the HFS receiver under test SHOULD not support: <ul style="list-style-type: none"> <input type="checkbox"/> Any cipher-suites with an DH_anon in their symbolic name <input type="checkbox"/> Any cipher-suites with a MD5 in their symbolic name <input type="checkbox"/> Any of the following cipher-suites: <ul style="list-style-type: none"> • TLS_RSA_WITH_NULL_SHA • TLS_RSA_WITH_NULL_MD5 <input type="checkbox"/> Any cipher-suites that use 40 or 56 bit keys d. Check that the HFS receiver under test supports TLS_RSA_FIPS_WITH_AES_128_CBC_SHA e. Close the connection. 2. If an instance is not FIPS compliant (C_REC_WSI_005=false): 		

	<p>a. Load the simulated HFS sender supporting TLS_RSA_WITH_AES_128_CBC_SHA.</p> <p>b. Make the HFS receiver under test establish a TLS connection.</p> <p>c. Check in the TLS handshake that the HFS receiver under test SHOULD not support:</p> <ul style="list-style-type: none"> <input type="checkbox"/> any cipher-suites with a DH_anon in their symbolic name. <input type="checkbox"/> any cipher-suites with a MD5 in their symbolic name. <input type="checkbox"/> any of the following cipher-suites: <ul style="list-style-type: none"> • TLS_RSA_WITH_NULL_SHA • TLS_RSA_WITH_NULL_MD5 <input type="checkbox"/> any cipher-suites that use 40 or 56 bit keys. <p>d. Check that the HFS receiver under test MUST support TLS_RSA_WITH_AES_128_CBC_SHA.</p> <p>e. Close the connection.</p>
Pass/Fail criteria	<ul style="list-style-type: none"> • If C_REC_WSI_005, the HFS receiver under test must support TLS_RSA_FIPS_WITH_AES_128_CBC_SHA. • If not C_REC_WSI_005, the HFS receiver under test must support TLS_RSA_WITH_AES_128_CBC_SHA. • The cipher-suites supported must match with these PICS: C_REC_WSI_029, C_REC_WSI_030, C_REC_WSI_031, C_REC_WSI_032.
Notes	

TP Id	TP/HFS/REC/WSI/BSP/BV-003			
TP label	Basic Profile Clarification			
Coverage	Spec	[OASIS/WS-I BSP]		
	Testable items	BSP-R5814; O	BSP-R5801; M	BSP-R5803; M
		BSP-R5805; M	BSP-R5807; M	BSP-R5809; M
		BSP-R5811; M	BSP-R5813; M	
Test purpose	<p>Check that:</p> <p>Where the normal outcome of processing a SECURE_ENVELOPE would have resulted in the transmission of a SOAP Response, but rather a fault is generated instead, an HFS receiver may transmit a fault or silently discard the message</p> <p>[AND]</p> <p>bp11:R2301 must be true after any SOAP Message Security has been reversed for the Envelope</p> <p>[AND]</p> <p>bp11:R2710 must be true after SOAP Message Security processing has been reversed for the Envelope</p> <p>[AND]</p> <p>bp11:R2712 must be true after any SOAP Message Security has been reversed for the Envelope</p> <p>[AND]</p> <p>For bp11:R2724 "Inconsistent" must be taken to mean "Inconsistent after SOAP Message security has been reversed", for the Envelope</p> <p>[AND]</p> <p>With respect to bp11:R2725 the Instance must check for consistency of the Envelope per BP 1.1 after reversing SOAP Message Security</p> <p>[AND]</p> <p>With respect to bp11:R2729 the verification of the wrapper element name of the Envelope must be performed after reversing SOAP Message Security.</p>			

	<p>[AND]</p> <p>With respect to bp11:R2738 verification of an Envelope must occur after SOAP Message Security has been reversed</p>
Applicability	C_REC_000 AND C_REC_WSI_006 AND C_REC_GEN_003
Other PICS	C_REC_WSI_003, C_REC_WSI_004
Initial condition	The HFS receiver under test has a WebService enabled and the simulated HFS sender is ready to send a SOAP message using the same security policy as the HFS receiver.
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a message using SOAP message security. 2. The HFS receiver under test responds using SOAP message security. 3. The simulated HFS sender takes the WSDL description and after reversing the SOAP message security of the response, check that: <ol style="list-style-type: none"> a. the order of the elements in the soap:body is the same as that of the wsdl:parts in the wsdl:message. b. operations in wsdl:binding result in operations signatures that are different from one another. c. the envelope includes all the soapbind:headers specified on a wsdl:input or wsdl:output of a wsdl:operation of a wsdl:binding. d. if C_REC_WSI_003, the envelope has a wrapper element whose name is the corresponding wsdl:operation name suffixed with the string "Response". e. if C_REC_WSI_004, the binding is serialized as an envelope with a soap:Body whose child element is an instance of the global element declaration referenced by the corresponding wsdl:message part. 4. The simulated HFS sender sends an envelope with an incorrect namespace. 5. The HFS receiver generates a soap:Fault with a faultcode= "VersionMismatch". 6. The simulated HFS sender sends an envelope with an incorrect namespace and a soap:MustUnderstand attribute value of "1". 7. The HFS receiver generates a soap:Fault with a faultcode= "VersionMismatch". 8. The simulated HFS sender sends an envelope with a correct namespace and soap:MustUnderstand attribute value of "1" using security that the HFS receiver is not going to understand. 9. The HFS receiver generates a soap:Fault with a faultcode="MustUnderstand". 10. The simulated HFS sender sends an envelope with a correct namespace, soap:MustUnderstand attribute value of "0" and that is inconsistent with its WSDL description. 11. The HFS receiver generates a soap:Fault with a faultcode="Sender".
Pass/Fail criteria	All steps are as specified. When the HFS receiver generates a soap:Fault, it can transmit it or discard the message.
Notes	<p>"Reverse" means to remove impacts of applying SOAP message security that has been applied to an envelope created according to BP 1.1</p> <ul style="list-style-type: none"> • bp11:R1029 states "Where the normal outcome of processing a SOAP Envelope would have resulted in the transmission of a SOAP response, but rather a fault is generated instead, an HFS receiver MUST transmit a fault place of the response" • bp11:R2301 states "The order of the elements in the soap:body of an ENVELOPE MUST be the same as that of the wsdl:parts in the wsdl:message that describes it." • bp11:R2710 states "The operations in a wsdl:binding in a DESCRIPTION MUST result in operation signatures that are different from one another." • bp11:R2712 states "A document-literal binding MUST be serialized as an ENVELOPE with a soap:Body whose child element is an instance of the global element declaration referenced by the corresponding wsdl:message part." • bp11:R2724 states "If an INSTANCE receives an envelope that is inconsistent with its WSDL description, it SHOULD generate a soap:Fault with a faultcode of 'Client', unless a 'MustUnderstand' or 'VersionMismatch' fault is generated." • bp11:R2725 states "If an INSTANCE receives an envelope that is inconsistent with its

	<p>WSDL description, it MUST check for "VersionMismatch", "MustUnderstand" and "Client" fault conditions in that order."</p> <ul style="list-style-type: none"> • bp11:R2729 states "An ENVELOPE described with an rpc-literal binding that is a response MUST have a wrapper element whose name is the corresponding wsdl:operation name suffixed with the string 'Response'." • bp11:R2738 states "An ENVELOPE MUST include all soapbind:headers specified on a wsdl:input or wsdl:output of a wsdl:operation of a wsdl:binding that describes it."
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TP Id		TP/HFS/REC/WSI/BSP/BV-004		
TP label		Timestamp element		
Coverage	Spec	[OASIS/WS-I BSP]		
	Testable items	BSP-R3227; M	BSP-R3203; M	BSP-R3224; R
		BSP-R3221; M	BSP-R3222; M	BSP-R3220; R
		BSP-R3229; R	BSP-R3213; M	BSP-R3215; M
		BSP-R3225; M	BSP-R3226; M	BSP-R3217; M
		BSP-R3223; M		
Test purpose		<p>Check that:</p> <p>A SECURITY_HEADER must not contain more than one Timestamp [AND]</p> <p>A Timestamp must contain exactly one Created [AND]</p> <p>Any Timestamp must not contain more than one Expires [AND]</p> <p>Any Timestamp containing an Expires must contain a Created that precedes its sibling Expires [AND]</p> <p>Any Timestamp must not contain anything other than Created or Expires elements [AND]</p> <p>Any Created should not contain a seconds value with more than three digits to the right of the decimal (milliseconds). [AND]</p> <p>Any Expires should not contain a seconds value with more than three digits to the right of the decimal (milliseconds). [AND]</p> <p>Any Created containing second values must specify seconds values less than 60 [AND]</p> <p>Any Expires containing second values must specify seconds values less than 60 [AND]</p> <p>Any Created must not include a ValueType attribute [AND]</p> <p>Any Expires must not include a ValueType attribute [AND]</p> <p>Any Created must contain time values in UTC format as specified by the XML Schema type (dateTime). [AND]</p> <p>Any Expired must contain time values in UTC format as specified by the XML Schema type (dateTime).</p>		

Applicability	C_REC_000 AND C_REC_WSI_007 AND C_REC_GEN_003
Other PICS	
Initial condition	The HFS receiver under test has a WebService enabled and the simulated HFS sender is ready to send a SOAP message with a Timestamp
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends the message using a Timestamp element. 2. The HFS receiver under test responds to the message. 3. Check in the response message that: <ol style="list-style-type: none"> a. the Timestamp is present and there is only one. For example: <pre><wsu:Timestamp wsu:Id="timestamp"> <wsu:Created>2001-09-13T08:42:00Z</wsu:Created> <wsu:Expires>2001-10-13T09:00:00Z</wsu:Expires> </wsu:Timestamp></pre> b. only one created element is present and inside it: <ul style="list-style-type: none"> <input type="checkbox"/> ValueType attribute is not included <input type="checkbox"/> UTC format is used in time values <input type="checkbox"/> seconds values are less than 60 and its decimal values are recommended to be less than 3 digits to the right c. if an Expires element is present, there is only one and it comes after the created element and: <ul style="list-style-type: none"> <input type="checkbox"/> ValueType attribute is not included <input type="checkbox"/> UTC format is used in time values <input type="checkbox"/> the seconds values are less than 60 and its decimal values are recommended to be less than 3 digits to the right
Pass/Fail criteria	The elements in step 3 are as specified.
Notes	

TP Id	TP/HFS/REC/WSI/BSP/BV-005			
TP label	Security Token References - Direct References			
Coverage	Spec	[OASIS/WS-I BSP]		
	Testable items	BSP-R3061; M	BSP-R3057; M	BSP-R3064; M
		BSP-R3059; M	BSP-R3058; M	BSP-R3062; M
	BSP-R3027; M	BSP-R3211; M		
Test purpose	<p>Check that:</p> <p>A SECURITY_TOKEN_REFERENCE must provide exactly one token reference [AND]</p> <p>Any STR_REFERENCE must not reference a SECURITY_TOKEN_REFERENCE [AND]</p> <p>Any STR_REFERENCE must not reference an STR_EMBEDDED [AND]</p> <p>Any STR_REFERENCE must specify a ValueType attribute [AND]</p> <p>Any STR_REFERENCE ValueType attribute must contain a value for the referenced SECURITY_TOKEN specified by the corresponding security token profile. [AND]</p> <p>Any STR_REFERENCE must specify a URI attribute</p>			

	[AND] Any SECURITY_TOKEN_REFERENCE must not contain an STR_KEY_NAME [AND] Any SECURITY_TOKEN_REFERENCE must not reference a ds:KeyInfo element
Applicability	C_REC_000 AND C_REC_WSI_019 AND C_REC_GEN_003
Other PICS	
Initial condition	The HFS receiver under test has a WebService enabled and the simulated HFS sender is ready to send a SOAP message with the same security policy as the HFS receiver.
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a message using a security token reference (STR) with an STR reference. 2. The HFS receiver under test responds with a message including a SecurityTokenReference with a direct reference: <pre><wsse:SecurityTokenReference wsu:Id="..."> <wsse:Reference URI="..." ValueType="..." /> </wsse:SecurityTokenReference></pre> 3. Check in the captured message that: <ol style="list-style-type: none"> a. there is only one STR_Reference to the SECURITY_TOKEN_REFERENCE b. the STR_Reference does not reference another STR or an STR_Embedded. c. a URI Attribute is present. d. a ValueType attribute is present and it contains a value for the referenced security token specified by the corresponding security token profile (e.g., an X.509 certificate token). e. the STR does not contain an STR_KEY_NAME and does not reference a ds:KeyInfo element.
Pass/Fail criteria	Check that the STR is as specified in steps 2 and 3.
Notes	

TP Id	TP/HFS/REC/WSI/BSP/BV-006		
TP label	Security Token References - Key Identifier References		
Coverage	Spec	[OASIS/WS-I BSP]	
	Testable items	BSP-R3054; M	BSP-R3063; M
		BSP-R3071; M	BSP-R3070; M
Test purpose	Check that: Any STR_KEY_IDENTIFIER must specify a ValueType attribute [AND] Any STR_KEY_IDENTIFIER ValueType attribute must contain a value specified within the security token profile associated with the referenced SECURITY_TOKEN [AND] Any STR_KEY_IDENTIFIER that refers to a SECURITY_TOKEN other than a SAML_TOKEN must specify an EncodingType attribute [AND] Any STR_KEY_IDENTIFIER EncodingType attribute must have a value of "http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-soap-message-security-1.0#Base64Binary".		
Applicability	C_REC_000 AND C_REC_WSI_020 AND C_REC_GEN_003		
Other PICS			
Initial condition	The HFS receiver under test has a WebService enabled and the simulated HFS sender is ready to send a SOAP message with the same security policy as the HFS receiver.		

Test procedure	<ol style="list-style-type: none"> The simulated HFS sender sends a message using a security token reference (STR) with a key identifier reference. The HFS receiver under test responds with a message including a SecurityTokenReference with a key identifier reference: <pre> <wsse:SecurityTokenReference> <wsse:KeyIdentifier wsu:Id="..." ValueType="..." EncodingType="..."> ... </wsse:KeyIdentifier> </wsse:SecurityTokenReference> </pre> Check in the captured message that: <ol style="list-style-type: none"> ValueType is present and contains a value specified within the security token profile associated with the referenced security token. if SAML Token is referenced, an encodingType attribute is not present. If SAML Token is not referenced, encodingType="http://docs.oasis-open.org/wss/2004/01/oasis-200401-wss-soap-message-security-1.0#Base64Binary".
Pass/Fail criteria	In step 3, the attributes are as specified.
Notes	

TP Id	TP/HFS/REC/WSI/BSP/BV-024		
TP label	SoapAction Header		
Coverage	Spec	[OASIS/WS-I BSP]	
	Testable items	BSP-C2010; R	
Test purpose	Check that: In a Description, the soapAction attribute of a soapbind:operation element should be either omitted, or have as its value an empty string		
Applicability	C_REC_000 AND C_REC_GEN_003		
Other PICS			
Initial condition	The HFS receiver under test has a WebService enabled and its WSDL description is available.		
Test procedure	<ol style="list-style-type: none"> Take the wsdl description using the URL provided by the HFS receiver under test (I_REC_WSI_001). Check that in soapbind:operation element, the soapAction attribute is omitted or its value is an empty string. 		
Pass/Fail criteria	In step 2, it is recommended that the soapAction attribute is omitted or that its value is an empty string, if it is present and includes any value, a warning is issued.		
Notes	This test case verifies a recommended behaviour and therefore it will never result in a fail.		

A.4 Subgroup 2.1.3 – Reliable messaging (RM)

TP Id		TP/HFS/REC/WSI/RM/BV-000_A	
TP label		Protocol Preconditions	
Coverage	Spec	[OASIS WS-I RM]	
	Testable items	Namespace; M	
Test purpose		<p>Check that:</p> <p>The XML namespace URI that MUST be used by implementations of this specification is: http://docs.oasis-open.org/ws-rx/wsrn/200702</p>	
Applicability		C_REC_000 AND C_REC_GEN_003	
Other PICS			
Initial condition		The simulated HFS sender and the HFS receiver under test are in the "None" sequence state.	
Test procedure		<ol style="list-style-type: none"> 1. The simulated HFS sender sends a CreateSequence with an offer element to the HFS receiver. 2. The HFS receiver under test responds with a CreateSequenceResponse accepting the offer. 3. The simulated HFS sender sends a sequence. 4. The HFS receiver under test responds with its sequence and a SequenceAcknowledgement element. 5. The simulated HFS sender sends a SequenceAcknowledgement element. 	
Pass/Fail criteria		Check that in every wsrn element its XML namespace is: xmlns:wsrn="http://docs.oasis-open.org/ws-rx/wsrn/200702"	
Notes			

TP Id		TP/HFS/REC/WSI/RM/BV-000_B	
TP label		Delivery Assurances	
Coverage	Spec	[OASIS WS-I RM]	
	Testable items	DelivAssurance 4; C	DelivAssurance 7; C
	Spec	[ITU-T H.812]	
	Testable items	CommonReq 2; O	CommonReq 3; R
Test purpose		<p>Check that:</p> <p>AtMostOnce assertion sets that each message is to be delivered at most once. The RM Source MAY retry transmission of unacknowledged messages, but is NOT REQUIRED to do so.</p> <p>[AND]</p> <p>The requirement on an RM Source using ExactlyOnce assertion is that it SHOULD retry transmission of every message sent by the Application Source until it receives an acknowledgement from the RM Destination</p> <p>[AND]</p> <p>Continua HFS client and service components may transmit messages from the Continua better QoS bin using a WS-ReliableMessaging sequence configured to use 'AtMostOnce' message delivery.</p> <p>[AND]</p> <p>Continua HFS client and service components should transmit messages from the Continua best QoS bin using a WS-ReliableMessaging sequence configured to use 'ExactlyOnce'</p>	

	message delivery.
Applicability	C_REC_000 AND (C_REC_WSI_025 OR C_REC_WSI_026) AND C_REC_GEN_003
Other PICS	
Initial condition	The simulated HFS sender and the HFS receiver under test are in the "None" sequence state.
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a CreateSequence message with an offer element. 2. The HFS receiver under test responds with CreateSequenceResponse. 3. The HFS sender sends a sequence message indicating that it is the last message. Note that when the HFS receiver acknowledges that sequence, the HFS sender and HFS receiver switch WSRM roles: the HFS sender becomes an RM destination and the HFS receiver becomes an RM source. 4. The HFS receiver responds with the SequenceAcknowledgement and a sequence message indicating that it is the last message. 5. The HFS sender does not send the SequenceAcknowledgement. 6. If C_REC_WSI_025, the HFS receiver may retry transmission. 7. If C_REC_WSI_026, the HFS receiver should retry transmission.
Pass/Fail criteria	All steps are as indicated.
Notes	

TP Id	TP/HFS/REC/WSI/RM/BV-001		
TP label	Considerations on the Use of Extensibility Points		
Coverage	Spec	[OASIS WS-I RM]	
	Testable items	ExtensPoints 2; R	
Test purpose	<p>Check that:</p> <p>If an HFS receiver does not recognize an extension, the HFS receiver SHOULD ignore the extension</p>		
Applicability	C_REC_000 AND C_REC_GEN_003		
Other PICS			
Initial condition	The simulated HFS sender and the HFS receiver under test are in the "None" sequence state.		
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a CreateSequence message using an extensibility point that the HFS receiver does not recognize, such as <myExtensibilityPoint/>. 2. The HFS receiver under test should respond, ignoring the extensibility point, with CreateSequenceResponse. 		
Pass/Fail criteria	All step are as indicated.		
Notes	An attribute extensibility point is referred to using @{any} in place of the attribute name. This indicates that any attribute name can be used, from any namespace other than the wsrn: namespace.		

TP Id	TP/HFS/REC/WSI/RM/BV-002		
TP label	Consideration on the Use of "Piggy-Backing"		
Coverage	Spec	[OASIS WS-I RM]	
	Testable items	PiggyBack 1; O	PiggyBack 2; M
Test purpose	<p>Check that:</p> <p>Some RM Protocol Header Blocks MAY be added to messages that are targeted to the same Endpoint to which those headers are to be sent (a concept often referred to as "piggy-backing"), thus saving the overhead of an additional message exchange.</p>		

	<p>[AND]</p> <p>Reference parameters MUST be considered when determining whether two endpoint references (EPRs) are targeted to the same Endpoint</p> <p>[AND]</p> <p>In order to ensure optimal and successful processing of RM Sequences, endpoints that receive RM-related messages SHOULD be prepared to process RM Protocol Header Blocks that are included in any message it receives.</p>
Applicability	C_REC_000 AND C_REC_GEN_003
Other PICS	
Initial condition	The simulated HFS sender and the HFS receiver under test are in the "None" sequence state.
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a CreateSequence with an offer element. 2. The HFS receiver under test responds with CreateSequenceResponse. 3. The HFS sender sends a sequence message. 4. The HFS receiver responds including a SequenceAcknowledgement header block. <ul style="list-style-type: none"> ❑ If the SOAP message also contains a sequence header block (piggy-backing), all the header blocks have the same EPR. ❑ If not, any other header block is sent in the same SOAP message, the HFS receiver under test sends a message for every other RM-element (not piggy-backing). 5. The HFS sender responds using a SequenceAcknowledgement header block.
Pass/Fail criteria	In step 4, if the HFS receiver sends only one message with more than one header block (piggy-backing), the EPR is the same for every header block.
Notes	<p>See the sections of the WS-RM that define each RM Protocol header block for indications on which ones may be considered for piggy-backing.</p> <p>An endpoint reference is made using a "wsa:To" element. The way to test that every header block is targeted to the same endpoint is to check that there is only one "wsa:To" element in the soap:header.</p>

TP Id	TP/HFS/REC/WSI/RM/BV-003			
TP label	Sequence Creation			
Coverage	Spec	[OASIS WS-I RM]		
	Testable items	WSAddress 1; C	SeqCreation 1; M	SeqCreation 3; M
		SeqCreation 6; M	SeqCreation 13; M	SeqCreation 16; M
		SeqCreation 17; M	SeqCreation 18; C	SeqCreation 19; M
		SeqCreation 20; O	SeqCreation 21; O	SeqCreation 23; M
SeqRefused 1; M		Faults 3; M		
Test purpose	<p>Check that:</p> <p>When an Endpoint generates a message that carries an RM protocol element in the body of a SOAP envelope that Endpoint MUST include in that envelope a wsa:Action SOAP header block whose value is an IRI that is a concatenation of the WS-RM namespace URI, followed by a "/", followed by the value of the local name of the child element of the SOAP body.</p> <p>[AND]</p> <p>The RM Source MUST request creation of an outbound Sequence by sending a CreateSequence element in the body of a message to the RM Destination which in turn responds either with a message containing CreateSequenceResponse or a CreateSequenceRefused fault</p> <p>[AND]</p> <p>An offer is either accepted or rejected by the RM Destination in the CreateSequenceResponse message.</p> <p>[AND]</p>			

	<p>The RM Destination MUST respond either with a CreateSequenceResponse response message or a CreateSequenceRefused fault</p> <p>[AND]</p> <p>An RM Destination MUST NOT accept (via the /wsrm:CreateSequenceResponse/wsrm:Accept element) an offer that contains the "http://www.w3.org/2005/08/addressing/anonymous" IRI as its address</p> <p>[AND]</p> <p>The RM Destination MUST NOT send wsrm:CreateSequenceResponse element as a header block. This element is sent in the body of the response message in response to a CreateSequence request message</p> <p>[AND]</p> <p>The RM Destination MUST include wsrm:Identifier element within any CreateSequenceResponse message it sends. The RM Destination MUST set the value of this element to the absolute URI (conformant with RFC3986) that uniquely identifies the Sequence that has been created by the RM Destination</p> <p>[AND]</p> <p>wsrm:Expires element, if present, of type xs:duration accepts or refines the RM Source's requested duration for the Sequence. It specifies the amount of time after which any resources associated with the Sequence SHOULD be reclaimed thus causing the Sequence to be silently terminated</p> <p>[AND]</p> <p>The RM Destination MUST set the value of wsrm:Expires element to be equal to or less than the value requested by the RM Source in the corresponding CreateSequence message.</p> <p>[AND]</p> <p>wsrm:IncompleteSequenceBehaviour element, if present in wsrm:CreateSequenceResponse element, specifies the behavior that the destination will exhibit upon the closure or termination of an incomplete Sequence. For the purposes of defining the values used, the term "discard" refers to behavior equivalent to the Application Destination never processing a particular message.</p> <p>A value of "DiscardEntireSequence" indicates that the entire Sequence MUST be discarded if the Sequence is closed, or terminated, when there are one or more gaps in the final SequenceAcknowledgement.</p> <p>A value of "DiscardFollowingFirstGap" indicates that messages in the Sequence beyond the first gap MUST be discarded when there are one or more gaps in the final SequenceAcknowledgement.</p> <p>The default value of "NoDiscard" indicates that no acknowledged messages in the Sequence will be discarded.</p> <p>[AND]</p> <p>wsrm:Accept element, if present, enables an RM Destination to accept the offer if a corresponding Sequence for the reliable exchange of messages Transmitted from RM Destination to RM Source</p> <p>[AND]</p> <p>The RM Destination MUST include wsrm:AcksTo element within wsrm:Accept.</p> <p>[AND]</p> <p>CreateSequenceRefused properties:</p> <p>[Code] HFS Sender or HFS Receiver</p> <p>[Subcode] wsrm:CreateSequenceRefused</p> <p>[Reason] The Create Sequence request has been refused by the RM Destination.</p> <p>[Detail] xs:any</p> <p>[AND]</p> <p>Entities that generate WS-ReliableMessaging faults MUST include as the [action] property the default fault action IRI: http://docs.oasis-open.org/ws-rx/wsrm/200702/fault.</p>
Applicability	C_REC_000 AND C_REC_GEN_003

Other PICS	
Initial condition	The simulated HFS Sender and the HFS receiver under test are in the "None" sequence state.
Test procedure	<p>1. The simulated HFS Sender sends a CreateSequence, with an offer element message to the HFS receiver under test.</p> <p>2. The HFS receiver responds with a CreateSequenceResponse or a CreateSequenceRefused fault message.</p> <p>If the response is CreateSequenceResponse:</p> <p>3. The received message has the following properties:</p> <p>a. In the header block:</p> <ul style="list-style-type: none"> <input type="checkbox"/> wsa:Action = http://docs.oasis-open.org/ws-rx/wsrn/200702/CreateSequenceResponse. <input type="checkbox"/> wsrn:CreateSequenceResponse is not present. <p>b. In the body of the message:</p> <ul style="list-style-type: none"> <input type="checkbox"/> the wsrn:Identifier value is an absolute URI that uniquely identifies the sequence created by the RM destination <input type="checkbox"/> the wsrn:Expires element, if present: <ul style="list-style-type: none"> • its type is xs:duration • is value is equal or less than the value requested by the RM source in the corresponding CreateSequence message • it is recommended that any resources associated with the sequence are reclaimed before this time. Otherwise, the sequence will be silently terminated after this time. <input type="checkbox"/> the wsrn:IncompleteSequenceBehaviour element may be present. Possible values are: "discard", "DiscardEntireSequence", "DiscardFollowingFirstGap" and "NoDiscard" <input type="checkbox"/> if the offer element contains the "http://www.w3.org/2005/08/addressing/anonymous" IRI as its address, the HFS receiver does not accept this offer. <input type="checkbox"/> if wsrn:Accept is present, wsrn:AcksTo is present within the Accept element, and the HFS receiver is able to send sequences messages <input type="checkbox"/> if wsrn:Accept is not present, the HFS receiver is NOT able to send sequences messages. <p>If the response is a CreateSequenceRefused fault:</p> <p>4. the received message has the following properties:</p> <ul style="list-style-type: none"> <input type="checkbox"/> wsa:Action = http://docs.oasis-open.org/ws-rx/wsrn/200702/fault <input type="checkbox"/> Code = HFS Sender or HFS Receiver <input type="checkbox"/> Subcode = wsrn:CreateSequenceRefused <input type="checkbox"/> Reason = "The create sequence request has been refused by the RM destination". <input type="checkbox"/> Detail = xs:any.
Pass/Fail criteria	All the elements are as specified and only if the offer is accepted by the HFS receiver, can it send sequence messages.
Notes	

TP Id	TP/HFS/REC/WSI/RM/BV-004		
TP label	Closing a Sequence		
Coverage	Spec	[OASIS WS-I RM]	
	Testable items	WSAddress 1; C	SeqClosing 1; O
SeqClosing 3; M		SeqClosing 4; R	SeqClosing 5; O

		SeqClosing 6; M	SeqClosing 8; O	SeqClosing 9; M
		SeqClosing 10; R	SeqClosing 11; M	SeqClosing 12; M
		SeqClosing 7; R		
Test purpose	<p>Check that:</p> <p>When an Endpoint generates a message that carries an RM protocol element in the body of a SOAP envelope that Endpoint MUST include in that envelope a wsa:Action SOAP header block whose value is an IRI that is a concatenation of the WS-RM namespace URI, followed by a "/", followed by the value of the local name of the child element of the SOAP body.</p> <p>[AND]</p> <p>To ensure that the Sequence ends with a known final state either the RM Source or RM Destination MAY choose to close the Sequence before terminating it.</p> <p>[AND]</p> <p>If the RM Source wishes to close the Sequence, then it sends a CloseSequence element, in the body of a message, to the RM Destination. This message indicates that the RM Destination MUST NOT accept any new messages for the specified Sequence, other than those already accepted at the time the CloseSequence element is interpreted by the RM Destination</p> <p>[AND]</p> <p>Upon receipt of CloseSequence message, or subsequent to the RM Destination closing the Sequence of its own volition, the RM Destination MUST include a final SequenceAcknowledgement (within which the RM Destination MUST include the Final element) header block on any messages associated with the Sequence destined to the RM Source, including the CloseSequenceResponse message or on any Sequence fault Transmitted to the RM Source</p> <p>[AND]</p> <p>To allow the RM Destination to determine if it has received all of the messages in a Sequence, the RM Source SHOULD include the LastMsgNumber element in any CloseSequence messages it sends. The value of the LastMsgNumber element MUST be the same in all the CloseSequence messages for the closing Sequence</p> <p>[AND]</p> <p>If the RM Destination decides to close a Sequence of its own volition, it MAY inform the RM Source of this event by sending a CloseSequence element, in the body of a message, to the AcksTo EPR of that Sequence. The RM Destination MUST include a final SequenceAcknowledgement (within which the RM Destination MUST include the Final element) header block in this message and any subsequent messages associated with the Sequence destined to the RM Source</p> <p>[AND]</p> <p>While the RM Destination MUST NOT accept any new messages for the specified Sequence it MUST still process Sequence Lifecycle Messages and Acknowledgement Requests</p> <p>[AND]</p> <p>/wsrm:CloseSequence. This element MAY be sent by an RM Source to indicate that the RM Destination MUST NOT accept any new messages for this Sequence This element MAY also be sent by an RM Destination to indicate that it will not accept any new messages for this Sequence</p> <p>[AND]</p> <p>The RM Source or RM Destination MUST include wsrm:Identifier element in any CloseSequence messages it sends. The RM Source or RM Destination MUST set the value of this element to the absolute URI (conformant with RFC3986) of the closing Sequence</p> <p>[AND]</p> <p>The RM Source SHOULD include wsrm:LastMessageNumber element in any CloseSequence message it sends.</p> <p>[AND]</p> <p>A wsrm:CloseSequenceResponse element is sent in the body of a message in response to receipt of a CloseSequence request message. It indicates that the responder has closed the Sequence</p>			

	<p>[AND]</p> <p>The responder (RM Source or RM Destination) MUST include wsrn:Identifier element in any CloseSequenceResponse messages it sends. The responder MUST set the value of this element to the absolute URI (conformant with RFC3986) of the closing Sequence.</p> <p>[AND]</p> <p>In the case where the RM Destination wishes to discontinue use of a Sequence it is RECOMMENDED that it close the Sequence. Whenever possible the SequenceClosed fault SHOULD be used in place of the SequenceTerminated fault to allow the RM Source to still Receive Acknowledgements.</p>
Applicability	C_REC_000 AND C_REC_GEN_003
Other PICS	C_REC_WSI_033
Initial condition	The simulated HFS sender has created a sequence with an offer element. The simulated HFS sender and the HFS receiver under test are in the "Created" sequence state.
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a sequence message including an AckRequested element in its header block or indicating that it is the last one. 2. The HFS receiver under test responds using a SequenceAcknowledgement header block. 3. If C_REC_WSI_033 = TRUE, the HFS receiver under test sends a CloseSequence element in the body of the message before the simulated HFS sender does, check that the received message includes: <ol style="list-style-type: none"> a. In the header block: <ul style="list-style-type: none"> <input type="checkbox"/> a SequenceAcknowledgement element and a wsrn:Final element within it are present. <input type="checkbox"/> wsa:Action = http://docs.oasis-open.org/ws-rx/wsrn/200702/CloseSequence. b. In the body of the message, within the CloseSequence element: <ul style="list-style-type: none"> <input type="checkbox"/> the wsrn:Identifier value is an absolute URI of the closing sequence <input type="checkbox"/> it is recommended that a LastMsgNumber element is present and that in this case, it specifies the highest assigned message number of all the sequence traffic messages for the closing sequence. 4. If the HFS receiver under test sends the CloseSequence element in the body of the message before the simulated HFS sender, the simulated HFS sender responds with a CloseSequenceResponse message, including its Identifier element as an absolute URI, then goes to step 7 below. 5. If C_REC_WSI_033 = FALSE, the simulated HFS sender sends a CloseSequence element in the body of the message including a correct LastMsgNumber. 6. The HFS receiver responds with a message including: <ol style="list-style-type: none"> a. In the header block: <ul style="list-style-type: none"> <input type="checkbox"/> A SequenceAcknowledgement header block including a Final element is present. <input type="checkbox"/> wsa:Action = http://docs.oasis-open.org/ws-rx/wsrn/200702/CloseSequenceResponse. b. In the body of the message: <ul style="list-style-type: none"> <input type="checkbox"/> A CloseSequenceResponse element with a wsrn:Identifier element that is an absolute URI of the closing sequence. 7. Once the sequence is closed, the HFS sender sends a new sequence message referencing that closed sequence. 8. The HFS receiver under test does not accept that message. It is recommended that HFS receiver responds with a SequenceClosed fault.
Pass/Fail criteria	All fields are as specified.
Notes	

TP Id		TP/HFS/REC/WSI/RM/BV-005		
TP label		Sequence Termination		
Coverage	Spec	[OASIS WS-I RM]		
	Testable items	WSAddress 1; C	SeqTermination 1; R	SeqTermination 2; M
		SeqTermination 3; O	SeqTermination 4; O	SeqTermination 5; M
		SeqTermination 7; M	SeqTermination 8; O	SeqTermination 9; M
		SeqTermination 10; M	SeqTermination 11; M	SeqTermination 12; R
		SeqTermination 13; M	SeqTermination 14; M	SeqTermination 15; M
Test purpose		<p>Check that:</p> <p>When an Endpoint generates a message that carries an RM protocol element in the body of a SOAP envelope that Endpoint MUST include in that envelope a <code>wsa:Action</code> SOAP header block whose value is an IRI that is a concatenation of the WS-RM namespace URI, followed by a "/", followed by the value of the local name of the child element of the SOAP body.</p> <p>[AND]</p> <p>To allow the RM Destination to determine if it has received all of the messages in a Sequence, the RM Source SHOULD include the <code>LastMsgNumber</code> element in any <code>TerminateSequence</code> messages it sends</p> <p>[AND]</p> <p>The value of the <code>LastMsgNumber</code> element in the <code>TerminateSequence</code> message MUST be equal to the value of the <code>LastMsgNumber</code> element in any <code>CloseSequence</code> message(s) sent by the RM Source for the same Sequence</p> <p>[AND]</p> <p>If the RM Destination decides to terminate a Sequence of its own volition, it MAY inform the RM Source of this event by sending a <code>TerminateSequence</code> element, in the body of a message, to the <code>AcksTo</code> EPR for that Sequence. The RM Destination MUST include a final <code>SequenceAcknowledgement</code> (within which the RM Destination MUST include the <code>Final</code> element) header block in this message</p> <p>[AND]</p> <p>A <code>wsm:TerminateSequence</code> element MAY be sent by an RM Source to indicate it has completed its use of the Sequence</p> <p>[AND]</p> <p>The RM Source MUST NOT send <code>wsm:TerminateSequence</code> element as a header block</p> <p>[AND]</p> <p>Once <code>wsm:TerminateSequence</code> element is sent, other than this element, the RM Source MUST NOT send any additional message to the RM Destination referencing this Sequence</p> <p>[AND]</p> <p>A <code>wsm:TerminateSequence</code> element MAY also be sent by the RM Destination to indicate that it has unilaterally terminated the Sequence</p> <p>[AND]</p> <p>Upon sending <code>wsm:TerminateSequence</code> message the RM Destination MUST NOT accept any additional messages (with the exception of the corresponding <code>TerminateSequenceResponse</code>) for this Sequence</p> <p>[AND]</p> <p>Upon receipt of a <code>TerminateSequence</code> the RM Source MUST NOT send any additional messages (with the exception of the corresponding <code>TerminateSequenceResponse</code>) for this Sequence</p> <p>[AND]</p> <p>The RM Source or RM Destination MUST include <code>wsm:Identifier</code> element in any <code>TerminateSequence</code> message it sends. The RM Source or RM Destination MUST set the value of this element to the absolute URI (conformant with RFC3986) of the terminating Sequence</p> <p>[AND]</p>		

	<p>/wsrm:TerminateSequence/wsrm:LastMsgNumber. The RM Source SHOULD include this element in any TerminateSequence message it sends. The LastMsgNumber element specifies the highest assigned message number of all the Sequence Traffic Messages for the terminating Sequence.</p> <p>[AND]</p> <p>TerminateSequenceResponse element is sent in the body of a message in response to receipt of a TerminateSequence request message. It indicates that the responder has terminated the Sequence. The responder MUST NOT send this element as a header block</p> <p>[AND]</p> <p>The responder (RM Source or RM Destination) MUST include wsrm:Identifier element in any TerminateSequenceResponse message it sends. The responder MUST set the value of this element to the absolute URI (conformant with RFC3986) of the terminating Sequence.</p> <p>[AND]</p> <p>On receipt of a TerminateSequence message the HFS receiver (RM Source or RM Destination) MUST respond with a corresponding TerminateSequenceResponse message or generate a fault UnknownSequenceFault if the Sequence is not known.</p>
Applicability	C_REC_000 AND C_REC_GEN_003
Other PICS	C_REC_WSI_035
Initial condition	The simulated HFS sender has created a sequence with an offer element. The simulated HFS sender and the HFS receiver under test are in the "Created" sequence state.
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a sequence message including an AckRequested element in its header block or indicating that it is the last one. 2. The HFS receiver under test responds using a SequenceAcknowledgement header block. 3. If C_REC_WSI_035 = TRUE, the HFS receiver under test sends a TerminateSequence element in the body of the message before the simulated HFS sender does so. The received message includes: <ol style="list-style-type: none"> a. In the header block: <ul style="list-style-type: none"> <input type="checkbox"/> A SequenceAcknowledgement element containing a wsrm:Final element. <input type="checkbox"/> wsa:Action = http://docs.oasis-open.org/ws-rx/wsrm/200702/TerminateSequence. <input type="checkbox"/> The wsrm: TerminateSequence is not present. b. In the body of the message, within the TerminateSequence element: <ul style="list-style-type: none"> <input type="checkbox"/> The wsrm:Identifier value is an absolute URI of the terminating sequence. <input type="checkbox"/> It is recommended that LastMsgNumber is present, and in that case, its value must be equal to the value of the LastMsgNumber element in any CloseSequence message(s) sent for the same sequence. 4. If the HFS receiver sends a TerminateSequence, the simulated HFS sender responds with a TerminateSequenceResponse message, including its Identifier element as an absolute URI. 5. If C_REC_WSI_035 = FALSE, the simulated HFS sender sends a TerminateSequence element in the body of the message and it is recommended that the TerminateSequence element includes a correct LastMsgNumber. 6. If the simulated HFS sender has sent a TerminateSequence, the HFS receiver generates an UnknownSequence fault or responds with a message including: <ol style="list-style-type: none"> a. In the header block: <ul style="list-style-type: none"> <input type="checkbox"/> A SequenceAcknowledgement header block. <input type="checkbox"/> wsa:Action = http://docs.oasis-open.org/ws-rx/wsrm/200702/TerminateSequenceResponse. b. In the body of the message within the TerminateSequenceResponse element: <ul style="list-style-type: none"> <input type="checkbox"/> wsrm:Identifier value = an absolute URI of the terminating sequence. 7. Once the sequence is terminated, the simulated HFS sender sends a sequence message referencing the terminated sequence.

	8. The HFS receiver under test does not accept that message.
Pass/Fail criteria	All fields and messages exchanged are as specified.
Notes	

TP Id		TP/HFS/REC/WSI/RM/BV-006		
TP label		Sequences		
Coverage	Spec	[OASIS WS-I RM]		
	Testable items	ProtocolInv 1; M	Sequences 1; M	Sequences 2; M
		Sequences 3; M	Sequences 4; M	Sequences 5; M
		Sequences 6; M	Sequences 7; M	Sequences 8; M
Test purpose		<p>Check that:</p> <p>The RM Source MUST assign each message within a Sequence a message number beginning at 1 and increasing by exactly 1 for each subsequent message. These numbers MUST be assigned in the same order in which messages are sent by the Application Source.</p> <p>[AND]</p> <p>The RM Source MUST include a Sequence header block in all messages for which reliable transfer is REQUIRED</p> <p>[AND]</p> <p>The RM Source MUST identify Sequences with unique Identifier elements and the RM Source MUST assign each message within a Sequence a MessageNumber element that increments by 1 from an initial value of 1</p> <p>[AND]</p> <p>The RM Source MUST NOT include more than one Sequence header block in any message</p> <p>[AND]</p> <p>The RM Destination MUST understand the Sequence header block</p> <p>[AND]</p> <p>The RM Source MUST assign a mustUnderstand attribute with a value 1/true (from the namespace corresponding to the version of SOAP to which the Sequence SOAP header block is bound) to the Sequence header block element.</p> <p>[AND]</p> <p>An RM Source that includes a Sequence header block in a SOAP envelope MUST include wsrn:Identifier element in that header block</p> <p>[AND]</p> <p>The RM Source MUST set the value of wsrn:Identifier element to the absolute URI (conformant with RFC3986) that uniquely identifies the Sequence</p> <p>[AND]</p> <p>The RM Source MUST include wsrn:MessageNumber element within any Sequence headers it creates. This element is of type MessageNumberType.</p>		
Applicability		C_REC_000 AND C_REC_GEN_003		
Other PICS				
Initial condition		The simulated HFS sender has created a sequence with an offer element. The simulated HFS sender and the HFS receiver under test are in the "Created" sequence state.		
Test procedure		<ol style="list-style-type: none"> 1. The simulated HFS sender sends a sequence message including an AckRequested element in its header block or indicates that it is the last one. 2. The HFS receiver under test responds using a SequenceAcknowledgement header block. 3. If an offer element was sent in the CreateSequence and the HFS receiver accepts that offer: <ul style="list-style-type: none"> <input type="checkbox"/> Wait until the HFS receiver starts to send sequence messages. 		

	<ul style="list-style-type: none"> ❑ In the received messages, check that: <ul style="list-style-type: none"> • The wsrn:MessageNumber element is of type MessageNumberType and starts at 1 and increments by 1 for every sequential message. • There is only one sequence header block in each message. • The wsrn:Identifier element must be present in the header block and must be an absolute URI that uniquely identifies the sequence. • The mustUnderstand attribute = "1" or "true".
Pass/Fail criteria	All elements in step 3 are as specified.
Notes	

TP Id	TP/HFS/REC/WSI/RM/BV-007		
TP label	Request Acknowledgement		
Coverage	Spec	[OASIS WS-I RM]	
	Testable items	ProtocolInv 6; R	WSAddress 3; C
		ReqAck 2; O	ReqAck 7; M
		SeqAck 3; R	SeqAck 4; M
		SeqAck 23; R	
Test purpose	<p>Check that:</p> <p>While the Sequence is not closed or terminated, the RM Source SHOULD retransmit unacknowledged messages.</p> <p>[AND]</p> <p>When an Endpoint generates an Acknowledgement Request that has no element content in the SOAP body, then the value of the wsa:Action IRI MUST be: http://docs.oasis-open.org/ws-rx/wsrn/200702/AckRequested.</p> <p>[AND]</p> <p>The RM Source MAY request an Acknowledgement Message from the RM Destination at any time by independently transmitting an AckRequested header block</p> <p>[AND]</p> <p>Alternatively the RM Source MAY include an AckRequested header block in any message targeted to the RM Destination</p> <p>[AND]</p> <p>An RM Source that includes an AckRequested header block in a SOAP envelope MUST include wsrn:Identifier element in that header block</p> <p>[AND]</p> <p>The RM Source MUST set the value of wsrn:Identifier element to the absolute URI, (conformant with RFC3986), that uniquely identifies the Sequence to which the request applies.</p> <p>[AND]</p> <p>The RM Source SHOULD process SequenceAcknowledgement header blocks that are included in any message it receives.</p> <p>[AND]</p> <p>If a non-mustUnderstand fault occurs when processing a SequenceAcknowledgement header that was piggy-backed, a fault MUST be generated, but the processing of the original message MUST NOT be affected</p> <p>[AND]</p> <p>Upon the receipt of a Nack, an RM Source SHOULD retransmit the message identified by the Nack.</p> <p>[AND]</p> <p>The RM Source SHOULD ignore a SequenceAcknowledgement containing a Nack for a</p>		

	message that has previously been acknowledged within an AcknowledgementRange.
Applicability	C_REC_000 AND C_REC_WSI_036 AND C_REC_GEN_003
Other PICS	
Initial condition	The simulated HFS sender and the HFS receiver under test are in the "None" sequence state.
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a CreateSequence message with an offer element. If the HFS receiver accepts the offer: 2. The HFS receiver responds with a CreateSequenceResponse including an accept element. 3. The simulated HFS sender sends a sequence message indicating that it is the last one. 4. The HFS receiver under test sends a SequenceAcknowledgement and starts to send sequence messages and sends its first AckRequested element in the header block of one message. 5. In the header block of that received message, check that: <ul style="list-style-type: none"> <input type="checkbox"/> wsa:Action = http://docs.oasis-open.org/ws-rx/wsrn/200702/AckRequested (if soap body is empty). <input type="checkbox"/> wsrn:Identifier = absolute URI that uniquely identifies the sequence. 6. The simulated HFS sender does not validate any message with a SequenceAcknowledgement header block with a None element. 7. The HFS receiver should retransmit the messages. 8. If the HFS receiver retransmits the messages, the simulated HFS sender does not validate any message using a Nack element within a SequenceAcknowledgement header block. 9. The HFS receiver should retransmit the messages. 10. If the HFS receiver retransmits the messages, the simulated HFS sender validates the messages using a SequenceAcknowledgement header block. 11. The simulated HFS sender sends a Nack element with the MessageNumber of one of the previous messages received. 12. The HFS receiver should ignore the Nack element.
Pass/Fail criteria	<p>All elements are as specified.</p> <p>If a non-mustUnderstand fault occurs when processing a SequenceAcknowledgement header that was piggy-backed, a fault is generated, but the processing of the original message is not affected.</p>
Notes	

TP Id	TP/HFS/REC/WSI/RM/BV-008			
TP label	Sequence Acknowledgement			
Coverage	Spec	[OASIS WS-I RM]		
	Testable items	Protocollnv 2; M	Protocollnv 3; M	Protocollnv 4; M
		Protocollnv 5; O	WSAddress 2; C	ReqAck 3; R
		ReqAck 4; M	ReqAck 5; M	SeqAck 1; O
		SeqAck 2; O	SeqAck 5; O	SeqAck 6; M
		SeqAck 7; R	SeqAck 8; M	SeqAck 9; M
		SeqAck 10; M	SeqAck 11; O	SeqAck 12; M
		SeqAck 13; M	SeqAck 14; M	SeqAck 15; M
		SeqAck 16; M	SeqAck 17; M	SeqAck 18; O
SeqAck 19; M	SeqAck 20; O	SeqAck 22; M		
Test purpose	Check that:			

Within every Acknowledgement Message it issues, the RM Destination MUST include one or more AcknowledgementRange child elements that contain, in their collective ranges, the message number of every message accepted by the RM Destination.

[AND]

The RM Destination MUST exclude, in the AcknowledgementRange elements, the message numbers of any messages it has not accepted.

[AND]

If no messages have been received the RM Destination MUST return None instead of an AcknowledgementRange(s).

[AND]

The RM Destination MAY transmit a Nack for a specific message or messages instead of an AcknowledgementRange(s).

[AND]

When an Endpoint generates an Acknowledgement Message that has no element content in the SOAP body, then the value of the wsa:Action IRI MUST be: <http://docs.oasis-open.org/ws-rx/wsrn/200702/SequenceAcknowledgement>

[AND]

The RM Destination SHOULD process AckRequested header blocks that are included in any message it receives

[AND]

If a non-mustUnderstand fault occurs when processing an AckRequested header block that was piggy-backed, a fault MUST be generated, but the processing of the original message MUST NOT be affected.

[AND]

An RM Destination that Receives a message that contains an AckRequested header block MUST send a message containing a SequenceAcknowledgement header block to the AcksTo endpoint reference for a known Sequence or else generate an UnknownSequence fault

[AND]

The RM Destination MAY Transmit the SequenceAcknowledgement header block independently (i.e. as a header of a SOAP envelope with an empty body)

[AND]

Alternatively, an RM Destination MAY include a SequenceAcknowledgement header block on any SOAP envelope targeted to the endpoint referenced by the AcksTo EPR

[AND]

During creation of a Sequence the RM Source MAY specify the WS-Addressing anonymous IRI as the address of the AcksTo EPR for that Sequence

[AND]

When the RM Source specifies the WS-Addressing anonymous IRI as the address of the AcksTo EPR, the RM Destination MUST Transmit any SequenceAcknowledgement headers for the created Sequence in a SOAP envelope to be Transmitted on the protocol binding-specific back-channel

[AND]

When the RM Destination receives an AckRequested header, and the AckTo EPR for that sequence is the WS-Addressing anonymous IRI, the RM Destination SHOULD respond on the protocol binding-specific back-channel provided by the Received message containing the AckRequested header block

[AND]

An RM Destination that includes a SequenceAcknowledgement header block in a SOAP envelope MUST include wsrn:Identifier element in that header block

[AND]

The RM Destination MUST set the value of wsrn:Identifier element to the absolute URI (conformant with RFC3986) that uniquely identifies the Sequence

	<p>[AND]</p> <p>The RM Destination MUST NOT include multiple SequenceAcknowledgement header blocks that share the same value for Identifier within the same SOAP envelope</p> <p>[AND]</p> <p>The RM Destination MAY include one or more instances of wsrn:AcknowledgementRange element within a SequenceAcknowledgement header block</p> <p>[AND]</p> <p>The ranges in wsrn:AcknowledgementRange MUST NOT overlap.</p> <p>[AND]</p> <p>The RM Destination MUST NOT include wsrn:AcknowledgementRange element if a sibling Nack or None element is also present as a child of SequenceAcknowledgement</p> <p>[AND]</p> <p>The RM Destination MUST set the value of upper attribute (in wsrn:AcknowledgementRange) equal to the message number of the highest contiguous message in a Sequence range accepted by the RM Destination</p> <p>[AND]</p> <p>The RM Destination MUST set the value of Lower attribute (in wsrn:AcknowledgementRange) equal to the message number of the lowest contiguous message in a Sequence range accepted by the RM Destination</p> <p>[AND]</p> <p>The RM Destination MUST include wsrn:None element within a SequenceAcknowledgement header block if the RM Destination has not accepted any messages for the specified Sequence</p> <p>[AND]</p> <p>The RM Destination MUST NOT include wsrn:None element if a sibling AcknowledgementRange or Nack element is also present as a child of the SequenceAcknowledgement</p> <p>[AND]</p> <p>The RM Destination MAY include wsrn:Final element within a SequenceAcknowledgement header block. This element indicates that the RM Destination is not receiving new messages for the specified Sequence</p> <p>[AND]</p> <p>The RM Destination MUST include wsrn:Final element when the Sequence is closed. The RM Destination MUST NOT include this element when sending a Nack; it can only be used when sending AcknowledgementRange elements or a None</p> <p>[AND]</p> <p>The RM Destination MAY include wsrn:Nack element within a SequenceAcknowledgement header block. If used, the RM Destination MUST set the value of this element to a MessageNumberType representing the MessageNumber of an unreceived message in a Sequence. The RM Destination MUST NOT include a Nack element if a sibling AcknowledgementRange or None element is also present as a child of SequenceAcknowledgement</p> <p>[AND]</p> <p>The RM Destination MUST NOT issue a SequenceAcknowledgement containing a Nack for a message that it has previously acknowledged within an AcknowledgementRange</p>
Applicability	C_REC_000 AND C_REC_GEN_003
Other PICS	
Initial condition	The simulated HFS sender has created a sequence with an offer. The simulated HFS sender and the HFS receiver under test are in the "Created" sequence state.
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender transmits 3 messages with its respective sequence header block and in the last one it includes an AckRequest. 2. The HFS receiver under test responds including a SequenceAcknowledgement header block or an UnknownSequence fault.

	<p>3. If the response has a SequenceAcknowledgement header block:</p> <ul style="list-style-type: none"> ❑ If AcksTo field of any message to be acknowledged is an anonymous IRI, the HFS receiver must transmit the SequenceAcknowledgement on the channel provided by the context of the received message containing a SOAP envelope that contains a sequence header block and/or an AckRequested header block for that same sequence identifier. ❑ If the soap body of the message is empty, the wsa:Action = http://docs.oasis-open.org/ws-rx/wsrn/200702/SequenceAcknowledgement ❑ The wsrm:Identifier = absolute URI. It cannot be used in another SequenceAcknowledgement in the same message. ❑ Only one of these elements is present: one or more AcknowledgementRange, a None or a Nack. ❑ The final element is present when the sequence is closed, but it is not included when a Nack is sent. ❑ If an AcknowledgementRange element is present: <ul style="list-style-type: none"> • the lower attribute is equal to or less than the upper attribute, • the lower attribute is equal to the message number of the lowest contiguous message in a sequence range accepted by the HFS receiver, • the upper attribute is equal to the message number of the highest contiguous message in a sequence range accepted by the HFS receiver. ❑ If a None element is present then no messages have been accepted or received. ❑ If a Nack element is present a specific message has not been received and it cannot be included in a SequenceAcknowledgement header block for a message that it had previously acknowledged within an AcknowledgementRange.
Pass/Fail criteria	<p>All elements are as specified.</p> <p>If a non-mustUnderstand fault occurs when processing an AckRequested header block that was piggy-backed, a fault is generated, but the processing of the original message is not affected.</p>
Notes	

TP Id	TP/HFS/REC/WSI/RM/BV-009		
TP label	Sequence Terminated Fault		
Coverage	Spec	[OASIS WS-I RM]	
	Testable items	SeqTerminatedFault 2; M	SeqTerminatedFault 3; M
		Faults 1; R	Faults 2; M
Test purpose	<p>Check that:</p> <p>SequenceTerminated has the following properties:</p> <p>[Code] HFS Sender or HFS Receiver</p> <p>[Subcode] wsrm:SequenceTerminated</p> <p>[Reason] The Sequence has been terminated due to an unrecoverable error.</p> <p>[Detail] <wsrm:Identifier ...> xs:anyURI </wsrm:Identifier></p> <p>[AND]</p> <p>An Endpoint MUST generate a SequenceTerminated fault when encountering an unrecoverable condition or detection of violation of the protocol</p> <p>[AND]</p> <p>An Endpoint that receives a SequenceTerminte fault MUST terminate the Sequence if not otherwise terminated</p> <p>[AND]</p> <p>Destinations that generate faults related to known sequences SHOULD transmit those faults.</p>		

	<p>[AND]</p> <p>If transmitted, faults MUST be transmitted to the same [destination] as Acknowledgement messages</p> <p>[AND]</p> <p>Entities that generate WS-ReliableMessaging faults MUST include as the [action] property the default fault action IRI: http://docs.oasis-open.org/ws-rx/wsrn/200702/fault.</p>
Applicability	C_REC_000 AND C_REC_GEN_003
Other PICS	C_REC_WSI_035
Initial condition	The simulated HFS sender and the HFS receiver under test are in the "None" sequence state. The simulated HFS sender is able to send a sequence message when the sequence has been terminated.
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a CreateSequence message with an offer element. 2. The HFS receiver under test responds with a CreateSequenceResponse message accepting the offer. 3. The simulated HFS sender sends a sequence indicating that it is the last message. 4. The HFS receiver responds with a SequenceAcknowledgement with the element AcknowledgementRange Lower=1 and Upper=1. 5. IF C_REC_WSI_035=TRUE, wait until the HFS receiver under test sends a TerminateSequence or force it to terminate the sequence and the simulated HFS sender responds with TerminateSequenceResponse. ELSE, the simulated HFS sender sends a TerminateSequence message and the HFS receiver under test responds with TerminateSequenceResponse. 6. The simulated HFS sender transmits a sequence with the message number within the range, for example, Message Number=2. 7. The HFS receiver generates a SequenceTerminated fault. It is recommended that the fault is transmitted to the HFS sender. 8. If the fault is transmitted by the HFS receiver under test, the message includes the following properties: <ul style="list-style-type: none"> <input type="checkbox"/> wsa:Action = http://docs.oasis-open.org/ws-rx/wsrn/200702/fault. <input type="checkbox"/> Code = HFS Sender <input type="checkbox"/> Subcode = SequenceTerminated <input type="checkbox"/> Reason = The Sequence has been terminated due to an unrecoverable error. <input type="checkbox"/> Detail = <wsrm:Identifier ...> xs:anyURI </wsrm:Identifier> 9. The simulated HFS sender terminates the sequence and passes to the "None" sequence state.
Pass/Fail criteria	All elements are as specified in step 8
Notes	

TP Id	TP/HFS/REC/WSI/RM/BV-010		
TP label	Unknown Sequence Fault		
Coverage	Spec	[OASIS WS-I RM]	
	Testable items	UnknownSeq 1; M	UnknownSeq 2; M
Faults 1; R		Faults 2; M	Faults 3; M
Test purpose	<p>Check that:</p> <p>UnknownSequence has the following properties:</p> <p>[Code] HFS Sender</p> <p>[Subcode] wsrm:UnknownSequence</p> <p>[Reason] The value of wsrm:Identifier is not a known Sequence identifier</p> <p>[Detail] <wsrm:Identifier ...> xs:anyURI </wsrm:Identifier></p>		

	<p>[AND]</p> <p>An Endpoint MUST generate an UnknownSequence fault in response to a message containing an unknown or terminated Sequence identifier</p> <p>[AND]</p> <p>An Endpoint that receives an UnknownSequence fault MUST terminate the Sequence if not otherwise terminated</p> <p>[AND]</p> <p>Destinations that generate faults related to known sequences SHOULD transmit those faults.</p> <p>[AND]</p> <p>If transmitted, faults MUST be transmitted to the same [destination] as Acknowledgement messages</p> <p>[AND]</p> <p>Entities that generate WS-ReliableMessaging faults MUST include as the [action] property the default fault action IRI: http://docs.oasis-open.org/ws-rx/wsrn/200702/fault.</p>
Applicability	C_REC_000 AND C_REC_GEN_003
Other PICS	
Initial condition	The simulated HFS sender and the HFS receiver under test are in the "None" sequence state. The simulated HFS sender is able to send a sequence message when it is in the "None" sequence state.
Test procedure	<ol style="list-style-type: none"> The simulated HFS sender transmits a sequence message to the HFS receiver under test. The HFS receiver generates an UnknownSequence fault. It is recommended that the fault is transmitted to the HFS sender. If the fault is transmitted by the HFS receiver under test, that message includes the following properties: <ul style="list-style-type: none"> <input type="checkbox"/> wsa:Action = http://docs.oasis-open.org/ws-rx/wsrn/200702/fault. <input type="checkbox"/> Code = HFS Sender <input type="checkbox"/> Subcode = UnknownSequence <input type="checkbox"/> Reason = The value of wsrn:Identifier is not a known sequence identifier <input type="checkbox"/> Detail = <wsrn:Identifier ...> xs:anyURI </wsrn:Identifier> Wait until the HFS receiver terminates the sequence.
Pass/Fail criteria	All elements are as specified in step 3
Notes	

TP Id	TP/HFS/REC/WSI/RM/BV-011		
TP label	Invalid Acknowledgement Fault		
Coverage	Spec	[OASIS WS-I RM]	
	Testable items	InvalidAck 1; M	InvalidAck 2; M
		Faults 2; M	Faults 3; M
Test purpose	<p>Check that:</p> <p>InvalidAcknowledgement fault has the following properties:</p> <p>[Code] HFS Sender</p> <p>[Subcode] wsrn:InvalidAcknowledgement</p> <p>[Reason] The SequenceAcknowledgement violates the cumulative Acknowledgement invariant.</p> <p>[Detail] <wsrn:SequenceAcknowledgement ...> ... </wsrn:SequenceAcknowledgement></p> <p>[AND]</p>		

	<p>RM Source MUST generate an InvalidAcknowledgement in response to a SequenceAcknowledgement that violate the invariants stated in 2.3 or any of the requirements in 3.9 about valid combinations of AckRange, Nack and None in a single SequenceAcknowledgement element or with respect to already Received such elements.</p> <p>[AND]</p> <p>Destinations that generate faults related to known sequences SHOULD transmit those faults.</p> <p>[AND]</p> <p>If transmitted, faults MUST be transmitted to the same [destination] as Acknowledgement messages</p> <p>[AND]</p> <p>Entities that generate WS-ReliableMessaging faults MUST include as the [action] property the default fault action IRI: http://docs.oasis-open.org/ws-rx/wsrn/200702/fault.</p>
Applicability	C_REC_000 AND C_REC_GEN_003
Other PICS	
Initial condition	The simulated HFS sender and the HFS receiver under test are in the "None" sequence state. Simulated HFS sender is able to include a wrong AckRange and None and Nack elements in a SequenceAcknowledgement message.
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender creates a sequence with an offer. 2. The HFS receiver under test responds using a CreateSequenceResponse message accepting the offer. 3. After the simulated HFS sender has sent its sequences and the HFS receiver acknowledges them, the HFS receiver under test sends a sequence message with its respective message number. 4. If the last sequence message is not labelled as the last one, wait until the HFS receiver sends an AckRequested. Otherwise, go to next step. 5. The simulated HFS sender responds with a SequenceAcknowledgement with the wrong AckRange element and None and Nack elements. 6. The HFS receiver generates an InvalidAcknowledgement fault. It is recommended that the fault is transmitted to the HFS sender. 7. If the fault is transmitted by the HFS receiver under test, that message includes the following properties: <ul style="list-style-type: none"> <input type="checkbox"/> wsa:Action = http://docs.oasis-open.org/ws-rx/wsrn/200702/fault. <input type="checkbox"/> Code = HFS Sender <input type="checkbox"/> Subcode = InvalidAcknowledgement <input type="checkbox"/> Reason = <any> <input type="checkbox"/> Detail = <any related to the message that produces the fault>
Pass/Fail criteria	All elements are as specified in step 7.
Notes	

TP Id	TP/HFS/REC/WSI/RM/BV-012		
TP label	Message Number Rollover		
Coverage	Spec	[OASIS WS-I RM]	
	Testable items	MessageNumrRoll 4; R	
Test purpose	<p>Check that:</p> <p>RM Source SHOULD continue to retransmit undelivered messages until the Sequence is closed or terminated.</p>		
Applicability	C_REC_000 AND C_REC_GEN_003		
Other PICS			

Initial condition	The simulated HFS sender has created a sequence with an offer element. The simulated HFS sender and the HFS receiver under test are in the "Created" sequence state. The simulated HFS sender is able to send a message number rollover fault instead of a SequenceAcknowledgement message.
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender under test transmits a sequence message indicating that it is the last one. 2. The HFS receiver under test sends its sequence and the SequenceAcknowledgement. 3. The simulated HFS sender generates a message number rollover fault and this is transmitted to the HFS receiver. 4. The HFS receiver should retransmit undelivered messages until the HFS sender closes or terminates the sequence. 5. The simulated HFS sender closes the sequence.
Pass/Fail criteria	Step 4 must be as indicated.
Notes	

TP Id	TP/HFS/REC/WSI/RM/BV-012_B		
TP label	Message Number Rollover2		
Coverage	Spec	[OASIS WS-I RM]	
	Testable items	MessageNumrRoll 1; M Faults 1; R	MessageNumrRoll 2; M Faults 2; M
Test purpose	<p>Check that:</p> <p>Message Number Rollover fault has the following properties:</p> <p>[Code] HFS Sender</p> <p>[Subcode] wsrn:MessageNumberRollover</p> <p>[Reason] The maximum value for wsrn:MessageNumber has been exceeded.</p> <p>[Detail] <wsrm:Identifier ...> xs:anyURI </wsrm:Identifier></p> <p><wsrm:MaxMessageNumber> wsrn:MessageNumberType </wsrm:MaxMessageNumber></p> <p>[AND]</p> <p>RM Destination MUST generate a MessageNumberRollover fault when Message number in /wsrm:Sequence/wsrn:MessageNumber of a Received message exceeds the internal limitations of an RM Destination or reaches the maximum value of 9,223,372,036,854,775,807</p> <p>[AND]</p> <p>RM Destination SHOULD continue to accept undelivered messages until the Sequence is closed or terminated</p> <p>[AND]</p> <p>Destinations that generate faults related to known sequences SHOULD transmit those faults.</p> <p>[AND]</p> <p>If transmitted, faults MUST be transmitted to the same [destination] as Acknowledgement messages</p> <p>[AND]</p> <p>Entities that generate WS-ReliableMessaging faults MUST include as the [action] property the default fault action IRI: http://docs.oasis-open.org/ws-rx/wsrn/200702/fault.</p>		
Applicability	C_REC_000 AND C_REC_GEN_003		
Other PICS			
Initial condition	The simulated HFS sender has created a sequence with an offer element. The simulated HFS sender and the HFS receiver under test are in the "Created" sequence state. The simulated HFS sender is able to change the message number of its sequence message.		
Test procedure	1. The simulated HFS sender sends a sequence message with a MessageNumber=1		

	<ol style="list-style-type: none"> 2. The HFS receiver under test responds with its sequence message and may include a SequenceAcknowledge header block. 3. The simulated HFS sender transmits a sequence message with a message number outside the range (bigger than 9,223,372,036,854,775,807 or its internal limitation). 4. The HFS receiver generates a message number rollover fault. It is recommended that the fault is transmitted to the HFS sender. 5. If the fault is transmitted by the HFS receiver under test, that message includes the following properties: <ul style="list-style-type: none"> <input type="checkbox"/> wsa:Action = http://docs.oasis-open.org/ws-rx/wsrn/200702/fault. <input type="checkbox"/> Code = HFS Sender <input type="checkbox"/> Subcode = MessageNumberRollover <input type="checkbox"/> Reason = The maximum value for wsrn:MessageNumber has been exceeded <input type="checkbox"/> Detail = <wsrn:Identifier ...> xs:anyURI </wsrn:Identifier> <wsrn:MaxMessageNumber> wsrn:MessageNumberType </wsrn:MaxMessageNumber> 6. The simulated HFS sender retransmits its undelivered messages. 7. The HFS receiver should accept undelivered messages until the sequence is closed or terminated. 8. The simulated HFS sender closes the sequence.
Pass/Fail criteria	All elements are as specified in step 5 and steps 2, 4 and 7 must be as indicated.
Notes	

TP Id		TP/HFS/REC/WSI/RM/BV-013		
TP label		Sequence Closed Fault		
Coverage	Spec	[OASIS WS-I RM]		
	Testable items	SeqClosedFault 1; M	SeqClosedFault 2; M	Faults 1; R
		Faults 2; M	Faults 3; M	
Test purpose		<p>Check that:</p> <p>SequenceClosed fault MUST be generated by an RM Destination when it is asked to accept a message for a Sequence that is closed</p> <p>[AND]</p> <p>SequenceClosed properties:</p> <p>[Code] HFS Sender</p> <p>[Subcode] wsrn:SequenceClosed</p> <p>[Reason] The Sequence is closed and cannot accept new messages.</p> <p>[Detail] <wsrn:Identifier...> xs:anyURI </wsrn:Identifier></p> <p>[AND]</p> <p>Destinations that generate faults related to known sequences SHOULD transmit those faults.</p> <p>[AND]</p> <p>If transmitted, faults MUST be transmitted to the same [destination] as Acknowledgement messages</p> <p>[AND]</p> <p>Entities that generate WS-ReliableMessaging faults MUST include as the [action] property the default fault action IRI: http://docs.oasis-open.org/ws-rx/wsrn/200702/fault.</p>		
Applicability		C_REC_000 AND C_REC_GEN_003		
Other PICS				
Initial condition		The simulated HFS sender has created a sequence with an offer element. The simulated HFS sender and HFS receiver under test are in the "Created" sequence state. The simulated		

	HFS sender is able to send a sequence message as long as the sequence has not yet been closed.
Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender sends a sequence to the HFS receiver under test with MessageNumber=1 and indicating that it is the last one. 2. The HFS receiver responds with a SequenceAcknowledgement with an AcknowledgementRange Lower=1 Upper=1, and a sequence message 3. The simulated HFS sender sends a CloseSequence. 4. The HFS receiver responds with CloseSequenceResponse. 5. The simulated HFS sender transmits a sequence with a message number within the range, for example, MessageNumber=2. 6. The HFS receiver generates a SequenceClosed fault. It is recommended that the fault is transmitted to the HFS sender. 7. If the fault is transmitted by the HFS receiver under test, that message includes the following properties: <ul style="list-style-type: none"> <input type="checkbox"/> wsa:Action = http://docs.oasis-open.org/ws-rx/wsrn/200702/fault. <input type="checkbox"/> Code = HFS Sender <input type="checkbox"/> Subcode = SequenceClosed <input type="checkbox"/> Reason = The Sequence is closed and cannot accept new messages <input type="checkbox"/> Detail = <wsrm:Identifier ...> xs:anyURI </wsrm:Identifier>
Pass/Fail criteria	All elements are as specified in step 7.
Notes	

TP Id	TP/HFS/REC/WSI/RM/BV-014		
TP label	WSRM Required Fault		
Coverage	Spec	[OASIS WS-I RM]	
	Testable items	WSRMReq 1; C Faults 2; M	WSRMReq 2; M Faults 3; M
Test purpose	<p>Check that:</p> <p>If an RM Destination requires the use of WS-RM, WSRMRequired fault is generated when it Receives an incoming message that did not use this protocol.</p> <p>[AND]</p> <p>WSRM Required properties:</p> <p>[Code] HFS Sender</p> <p>[Subcode] wsrm:WSRMRequired</p> <p>[Reason] The RM Destination requires the use of WSRM</p> <p>[Detail] xs:any</p> <p>[AND]</p> <p>Destinations that generate faults related to known sequences SHOULD transmit those faults.</p> <p>[AND]</p> <p>If transmitted, faults MUST be transmitted to the same [destination] as Acknowledgement messages</p> <p>[AND]</p> <p>Entities that generate WS-ReliableMessaging faults MUST include as the [action] property the default fault action IRI: http://docs.oasis-open.org/ws-rx/wsrn/200702/fault.</p>		
Applicability	C_REC_000 AND C_REC_WSI_034 AND C_REC_GEN_003		
Other PICS			
Initial condition	The simulated HFS sender and the HFS receiver under test are in the "None" sequence state. The simulated HFS sender is able to send a message without using WSRM protocol.		

Test procedure	<ol style="list-style-type: none"> 1. The simulated HFS sender transmits a SOAP message without using any element of the WSRM protocol. 2. The HFS receiver generates a WSRMRequired fault. It is recommended that the fault is transmitted to the HFS sender. 3. If the fault is transmitted by the HFS receiver under test, that message includes the following properties: <ul style="list-style-type: none"> <input type="checkbox"/> wsa:Action = http://docs.oasis-open.org/ws-rx/wsrn/200702/fault. <input type="checkbox"/> Code = HFS Sender <input type="checkbox"/> Subcode = WSRMRequired <input type="checkbox"/> Reason = The RM Destination requires the use of WSRM <input type="checkbox"/> Detail = xs:any
Pass/Fail criteria	All elements are as specified in step 3.
Notes	

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