International Telecommunication Union

ITU-T

TELECOMMUNICATION
STANDARDIZATION SECTOR
OF ITU

H.830.9

(11/2015)

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 devices: WAN interface Part 9: hData observation upload: Sender

Recommendation ITU-T H.830.9

ITU International Telecommunication Union

ITU-T H-SERIES RECOMMENDATIONS

AUDIOVISUAL AND MULTIMEDIA SYSTEMS

CHARACTERISTICS OF VISUAL TELEPHONE SYSTEMS	H.100–H.199
INFRASTRUCTURE OF AUDIOVISUAL SERVICES	
General	H.200–H.219
Transmission multiplexing and synchronization	H.220–H.229
Systems aspects	H.230–H.239
Communication procedures	H.240–H.259
Coding of moving video	H.260–H.279
Related systems aspects	H.280–H.299
Systems and terminal equipment for audiovisual services	H.300–H.349
Directory services architecture for audiovisual and multimedia services	H.350–H.359
Quality of service architecture for audiovisual and multimedia services	H.360–H.369
Telepresence	H.420–H.429
Supplementary services for multimedia	H.450–H.499
MOBILITY AND COLLABORATION PROCEDURES	
Overview of Mobility and Collaboration, definitions, protocols and procedures	H.500–H.509
Mobility for H-Series multimedia systems and services	H.510–H.519
Mobile multimedia collaboration applications and services	H.520–H.529
Security for mobile multimedia systems and services	H.530–H.539
Security for mobile multimedia collaboration applications and services	H.540–H.549
Mobility interworking procedures	H.550–H.559
Mobile multimedia collaboration inter-working procedures	H.560–H.569
BROADBAND, TRIPLE-PLAY AND ADVANCED MULTIMEDIA SERVICES	
Broadband multimedia services over VDSL	H.610–H.619
Advanced multimedia services and applications	H.620–H.629
Ubiquitous sensor network applications and Internet of Things	H.640–H.649
IPTV MULTIMEDIA SERVICES AND APPLICATIONS FOR IPTV	
General aspects	H.700–H.719
IPTV terminal devices	H.720–H.729
IPTV middleware	H.730–H.739
IPTV application event handling	H.740–H.749
IPTV metadata	H.750–H.759
IPTV multimedia application frameworks	H.760–H.769
IPTV service discovery up to consumption	H.770–H.779
Digital Signage	H.780–H.789
E-HEALTH MULTIMEDIA SERVICES AND APPLICATIONS	
Personal health systems	H.810–H.819
Interoperability compliance testing of personal health systems (HRN, PAN, LAN, TAN and WAN)	**H.820–H.859**
Multimedia e-health data exchange services	H.860–H.869

For further details, please refer to the list of ITU-T Recommendations.

Recommendation ITU-T H.830.9

Conformance of ITU-T H.810 personal health devices: WAN interface Part 9: hData observation upload: Sender

Summary

Recommendation ITU-T H.830.9 provides a test suite structure (TSS) and the test purposes (TPs) for the WAN interface (consent management; sender) based on the requirements defined in Recommendation ITU-T H.810 (2015). The objective of this test specification is to provide a high probability of air interface interoperability between different devices.

This Recommendation is a transposition of Continua Test Tool DG2015, Test Suite Structure (TSS) & Test Procedures, WAN Interface; Part 9: hData observation upload: Sender (Version 1.0, 2015-07-01).

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T H.830.9	2015-11-29	16	11.1002/1000/12660

* 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.

FOREWORD

The International Telecommunication Union (ITU) is the United Nations specialized agency in the field of telecommunications, information and communication technologies (ICTs). The ITU Telecommunication Standardization Sector (ITU-T) is a permanent organ of ITU. ITU-T is responsible for studying technical, operating and tariff questions and issuing Recommendations on them with a view to standardizing telecommunications on a worldwide basis.

The World Telecommunication Standardization Assembly (WTSA), which meets every four years, establishes the topics for study by the ITU-T study groups which, in turn, produce Recommendations on these topics.

The approval of ITU-T Recommendations is covered by the procedure laid down in WTSA Resolution 1.

In some areas of information technology which fall within ITU-T's purview, the necessary standards are prepared on a collaborative basis with ISO and IEC.

NOTE

In this Recommendation, the expression "Administration" is used for conciseness to indicate both a telecommunication administration and a recognized operating agency.

Compliance with this Recommendation is voluntary. However, the Recommendation may contain certain mandatory provisions (to ensure, e.g., interoperability or applicability) and compliance with the Recommendation is achieved when all of these mandatory provisions are met. The words "shall" or some other obligatory language such as "must" and the negative equivalents are used to express requirements. The use of such words does not suggest that compliance with the Recommendation is required of any party.

INTELLECTUAL PROPERTY RIGHTS

ITU draws attention to the possibility that the practice or implementation of this Recommendation may involve the use of a claimed Intellectual Property Right. ITU takes no position concerning the evidence, validity or applicability of claimed Intellectual Property Rights, whether asserted by ITU members or others outside of the Recommendation development process.

As of the date of approval of this Recommendation, had not received notice of intellectual property, protected by patents, which may be required to implement this Recommendation. However, implementers are cautioned that this may not represent the latest information and are therefore strongly urged to consult the TSB patent database at http://www.itu.int/ITU-T/ipr/.

Table of Contents

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 DG2015, Test Suite Structure (TSS) & Test Procedures, WAN interface; Part 9: hData observation upload: Sender (Version 1.0, 2015-07-01), that was developed by the Personal Connected Health Alliance. A version of this specification that existed before transposition is indicated in the table below.

Version	Date	Revision history
1.0	2015-07-01	Initial release for Test Tool DG2015

Recommendation ITU-T H.830.9

Conformance of ITU-T H.810 personal health devices: WAN interface Part 9: hData observation upload: sender

1 Scope

The scope of this Recommendation[1] is to provide test suite structure (TSS) and the test procedures for WAN interface based on the requirements defined in the Continua Guidelines. The objective of this test specification is to provide a high probability of air interface interoperability between different devices.

TSS & TP for the WAN interface document have been divided into the 12 parts specified below.This Recommendation covers Part 9.

– **Part 1:** Web Services Interoperability. Sender
– **Part 2:** Web Services Interoperability. Receiver
– **Part 3:** SOAP/ATNA. Sender
– **Part 4:** SOAP/ATNA. Receiver
– **Part 5:** PCD-01 HL7 messages. Sender
– **Part 6:** PCD-01 HL7 messages. Receiver
– **Part 8:** Consent Management. Receiver
– **Part 9:** hData Observation Upload. Sender
– **Part 10:** hData Observation Upload. Receiver
– **Part 11:** Questionnaires. Sender
– **Part 12:** Questionnaires. 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 (2015)] Recommendation ITU-T H.810 (2015), *Interoperability design guidelines for personal health systems.*

[ITU-T H.811] Recommendation ITU-T H.811 (2015), *Interoperability design guidelines for personal health systems: PAN/LAN/TAN interface.*

[ITU-T H.812] Recommendation ITU-T H.812 (2015), *Interoperability design guidelines for personal health systems: WAN interface: Common certified device 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 (2015), *Interoperability design guidelines for personal health systems: WAN interface: Observation upload certified device class.*

[ITU-T H.812.2] Recommendation ITU-T H.812.2 (2015), *Interoperability design guidelines for personal health systems: WAN interface: Questionnaires.*

[ITU-T H.812.3] Recommendation ITU-T H.812.3 (2015), *Interoperability design guidelines for personal health systems: WAN interface: Capability exchange device class.*

[ITU-T H.812.4] Recommendation ITU-T H.812.4 (2015), I*nteroperability design guidelines for personal health systems: WAN interface: Authenticated persistent session device class.*

[ITU-T H.813] Recommendation ITU-T H.813 (2015), *Interoperability design guidelines for personal health systems: Health record network (HRN) interface.*

[IETF RFC 6749] IETF RFC 6749 (2012), *The OAuth 2.0 Authorization Framework.*

[IETF RFC 6750] IETF RFC 6750 (2012), *The OAuth 2.0 Authorization Framework: Bearer Token Usage.*

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:

ATNA Audit Trail and Node Authentication

CDA Clinical Document Architecture

CDG Continua Design Guidelines

DUT Device Under Test

INR International Normalized Ratio

PCHA Personal Connected Health Alliance

PCD Patient Care Device

PICS Protocol Implementation Conformance Statement

SABTE Sleep Apnoea Breathing Therapy Equipment

SOAP Simple Object Access Protocol

TP Test Purpose

TSS Test Suite Structure

WAN Wide Area Network

WS Web Service

WSI Web Service Interoperability

XDR Cross-Enterprise Document Reliable Interchange

5 Conventions

The key words "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "MAY", "MAY NOT" in this document 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 name	Transposed as	Version	Description	Designation
2015 plus errata	ITU-T H.810	5.1	Release 2015 plus errata noting all ratified bugs [ITU-T H.810 (2015)].	-
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	ITU-T H.810	4.1	Release 2013 plus errata noting all ratified bugs. [b-ITU-T H.810 (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.	-

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

CDG name	Transposed as	Version	Description	Designation
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 WAN interface have been divided into the main subgroups specified below. Annex A describes the TPs for subgroup 1.6.1 (shown in bold):

– Group 1: Sender (SEN)
  - 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)
  - Group 1.5: Consent management (CM)

        - Subgroup 1.5.1: WAN XDR transaction (TRANS)
        - Subgroup 1.5.2: WAN metadata validation (META)
        - Subgroup 1.5.3: WAN 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: Receiver (REC)
    - 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 ration (INR)
        - Subgroup 2.4.16: Sleep apnoea breathing therapy equipment (SABTE)
    - Group 2.5: Consent management (CM)
        - Subgroup 2.5.1: WAN XDR transaction (TRANS)
        - Subgroup 2.5.2: WAN 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 (TPs)

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

A.1 TP definition conventions

The test purposes are defined according to the following rules:

- **TP Id:** This is a unique identifier (TP/<TT>/<DUT>/<GR>/<SGR>/<XX> – <NNN>). 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.
    - WAN: Wide area network
  - <DUT>: This is the device under test.
    - SEN: WAN observation sender
    - REC: WAN observation 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 Test Purpose
- **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 were 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 protocol implementation conformance statement (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.).
- **Initial condition:** This indicates the state .to which the device under test (DUT) needs to be moved at the beginning of TC execution.
- **Test procedure:** This escribes 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 1.5.1: General (GEN)

TP Id		TP/WAN/SEN/HDATA/GEN/BV-000		
TP label		hData Observation Upload. AHD Sender Application		
Coverage	**Spec**	[ITU-T H.812]		
	Testable items	RESTSec 3	RESTSec 4	RESTSec 5
		CommonReq 5		
	Spec	[ITU-T H.812.1]		
	Testable items	hData 2	hData 4	
Applicability		C_SEN_000 AND C_SEN_GEN_004		
Other PICS		C_SEN_GEN_005		
Initial condition		Simulated WAN receiver has an hData WebService that requires TLS 1.1 and Oauth v2.0 authorization token enabled and ready to receive a PCD-01 message. Simulated WAN Receiver also provides an Oauth v2.0 token for authorization using resource owner password credentials grant type that requires TLS 1.1.		
Test procedure		1. AHD application under test using hData observation upload has a PCD-01 message ready to be sent. 2. AHD application uses provided client_id, client_secret, username and password parameters to obtain an Oauth v2.0 bearer token from the test tool using resource owner password credentials grant type and TLS 1.1 security. 3. AHD application uses the authorization request header field method as defined in Section 2.1 of RFC6750 [IETF RFC 6749] to send the obtained bearer token with the PCD-01 message to the test tool according to RFC6750 and using TLS 1.1 security.		
Pass/fail criteria		• AHD application under test supports capability exchange as specified in [ITU-T H.812.3]. • Observation upload enabled AHD application uses HTTP POST with the provided URL for uploading the PCD-01 payload. • AHD application under test uses the provided “bearer” token according to RFC6750 to request access to upload an observation to the Simulated WAN Device [IETF RFC 6750]. • AHD application uses TLS 1.1 and Oauth v2.0 bearer token using authorization request header field method to send a PCD-01 message to the test tool.		
Notes				

Bibliography

[b-ITU-T H.810 (2013)] Recommendation ITU-T H.810 (2013), *Interoperability design guidelines for personal health systems*.

[b-CDG 1.0] Continua Health Alliance, Continua Design Guidelines v1.0 (2008), *Continua Design Guidelines*.

[b-CDG 2010] Continua Health Alliance, Continua Design Guidelines v1.5 (2010), *Continua Design Guidelines*.

[b-CDG 2011] Continua Health Alliance, Continua Design Guidelines (2011), "Adrenaline", *Continua Design Guidelines*.

[b-CDG 2012] Continua Health Alliance CDG, Continua Design Guidelines (2012), "Catalyst", *Continua Design Guidelines*.

[b-CDG 2013] Continua Design Guidelines (2013), "Endorphin", *Continua Design Guidelines.*

[b-CDG 2015] Personal Connected Health Alliance CDG, Continua Design Guidelines (2015), "Genome", *Continua Design Guidelines*.

[b-ETSI SR 001 262] ETSI SR 001 262 v1.8.1 (2003), *ETSI drafting rules.*

SERIES OF ITU-T RECOMMENDATIONS

Series A	Organization of the work of ITU-T
Series D	General tariff principles
Series E	Overall network operation, telephone service, service operation and human factors
Series F	Non-telephone telecommunication services
Series G	Transmission systems and media, digital systems and networks
Series H	**Audiovisual and multimedia systems**
Series I	Integrated services digital network
Series J	Cable networks and transmission of television, sound programme and other multimedia signals
Series K	Protection against interference
Series L	Environment and ICTs, climate change, e-waste, energy efficiency; construction, installation and protection of cables and other elements of outside plant
Series M	Telecommunication management, including TMN and network maintenance
Series N	Maintenance: international sound programme and television transmission circuits
Series O	Specifications of measuring equipment
Series P	Terminals and subjective and objective assessment methods
Series Q	Switching and signalling
Series R	Telegraph transmission
Series S	Telegraph services terminal equipment
Series T	Terminals for telematic services
Series U	Telegraph switching
Series V	Data communication over the telephone network
Series X	Data networks, open system communications and security
Series Y	Global information infrastructure, Internet protocol aspects, next-generation networks, Internet of Things and smart cities
Series Z	Languages and general software aspects for telecommunication systems

Printed in Switzerland
Geneva, 2016