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SERIES H: AUDIOVISUAL AND MULTIMEDIA SYSTEMS

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Conformance of ITU-T H.810 personal health system: Services interface Part 16: FHIR Observation Upload: Health & Fitness Service receiver

Recommendation ITU-T H.830.16

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Recommendation ITU-T H.830.16

Conformance of ITU-T H.810 personal health system: Services interface Part 16: FHIR Observation Upload: Health & Fitness Service receiver

Summary

Recommendation ITU-T H.830.16 provides a test suite structure (TSS) and the test purposes (TPs) for fast healthcare interoperability resource (FHIR) Observation Upload 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 (2017) 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.830.16 includes an electronic attachment with the protocol implementation conformance statements (PICSs) and the protocol implementation extra information for testing (PIXIT) required for the implementation of Annex A.

History

Edition	Recommendation	Approval	Study Group	Unique ID*
1.0	ITU-T H.830.16	2018-08-29	16	11.1002/1000/13677

Keywords

Conformance testing, Continua Design Guidelines, e-health, Health & Fitness Service, ITU-T H.810, personal connected health devices, Services interface, Capability Exchange, FHIR Observation Upload.

* 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

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

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NOTE

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As of the date of approval of this Recommendation, ITU 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/.

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

Introduction

The table below shows the revision history of this test specification.

Version	Date	Revision history
1.0	2018-02-27	Initial release for the inclusion of FHIR Observation Upload for Health & Fitness Service receivers.

Recommendation ITU-T H.830.16

Conformance of ITU-T H.810 personal health system: Services interface Part 16: FHIR Observation Upload: Health & Fitness Service receiver

1 Scope

The scope of this Recommendation[1] is to provide a test suite structure (TSS) and the test purposes (TPs) for the Services interface based on the requirements defined in Continua Design Guidelines (CDG) [ITU-T H.810 (2017)]. The objective of this test specification is to provide a high probability of interoperability at this interface.

The TSS and TPs for the Services interface have been divided into the parts specified below. This Recommendation covers Part 16.

– 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
– Part 13: Capability Exchange. Health & Fitness Service sender
– Part 14: Capability Exchange. Health & Fitness Service receiver
– Part 15: FHIR Observation Upload. Health & Fitness Service sender
– **Part 16: FHIR Observation Upload. 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 (2017)] Recommendation ITU-T H.810 (2017), *Interoperability design guidelines for personal connected health systems: Introduction*.

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[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] Recommendation ITU-T H.812 (2017), *Interoperability design guidelines for personal connected health systems: Services interface.*

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
CDG Continua Design Guidelines
CGM Continuous Glucose Monitor
DUT Device Under Test
FHIR Fast Healthcare Interoperability Resource
HFS Health & Fitness Service
HFSS Health & Fitness Service Sender
HFSR Health & Fitness Service Receiver
HL7 Health Level 7
HTTP Hypertext Transfer Protocol
INR International Normalized Ratio
IP Insulin Pump
JSON JavaScript Object Notation
PCD Patient Care Device
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
SOAP Simple Object Access Protocol
TLS Transport Level Security
TP Test Purpose
TSS Test Suite Structure
WSI Web Services Interoperability
XDR cross-enterprise Document Reliable interchange
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
2017	-	7.0	Release 2017 of the CDG including maintenance updates of the CDG 2016 and additional guidelines that cover new functionalities.	-
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 [ITU-T H.810] is split into eight parts in the ITU-T 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

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

CDG release	Transposed as	Version	Description	Designation
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

The test purposes (TPs) for the Services interface have been divided into the main subgroups specified below. Annex A describes the TPs for subgroups 2.7.1, 2.7.2 and 2.7.3 (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 1.8: Capability Exchange (CE)
    - Subgroup 1.8.1: General (GEN)
    - Subgroup 1.8.2: hData record format (HRF)
- Group 1.9: FHIR Observation Upload (FHIR)
    - Subgroup 1.9.1: General (GEN)
    - Subgroup 1.9.2: FHIR Encoding Guidelines (ENC)

– 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)
- Group 2.8: Capability Exchange (CE)
    - Subgroup 2.8.1: General (GEN)
    - Subgroup 2.8.2: hData record format (HRF)
- **Group 2.9: FHIR Observation Upload (FHIR)**
    - **Subgroup 2.9.1: General (GEN)**

7 Electronic attachment

The protocol implementation conformance statements (PICSs) 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. See [b-HFSR PICS & PIXIT] and [b-HFSS PICS & PIXIT].

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 PICSs, 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 procedures

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

A.1 Test purpose definition conventions

The 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 TP 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 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 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 PICS items that define if a 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 DUT within that scope of the test (specialization, transport used, etc.).
- **Other PICSs**: 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 2.9.1: General (GEN)

TP Id		TP/HFS/REC/FHIR/GEN/BV-000		
TP label		FHIR Observation Server support		
Coverage	**Spec**	[ITU-T H.812]		
	Testable items	RESTSec 7;M	RESTSec 8;M	CommonReq 5;M
	Spec	[ITU-T H.812.5]		
	Testable items	FOSReq 1; M	FOSReq 2; M	HFSCommon 6; M
		HFSCommon 5; M	HFSCommon 6; M	HFSCommon 7; M
		HFSCommon 8; M	HFSCommon 9; M	HFSCommon 10; M
		HFSCommon 11; M	HFSCommon 12; M	HFSCommon 13; M
		HFSCommon 14; M	HFSCommon 15; M	HFSCommon 16; M
		HFSCommon 17; O	HFSCommon 18; M	HFSCommon 19; M
		HFSCommon 20; O		
Test purpose		Check that: The root.xml file for the H&FS under test contains all required elements for the support of the FHIR Observation Server Continua Certified Capability Class, the H&FS is able to provide the OAuthDescriptor in JSON or XML format and it contains the required elements.		
Applicability		C_REC_000 AND C_REC_GEN_007		
Other PICSs				
Initial condition		The simulated PHG supporting FHIR Observation Client and Capability Exchange Continua Certified Capability Classes is ready to request the root file of the H&FS under test using TLS 1.1.		
Test procedure		1. The simulated PHG performs an HTTP GET of root.xml using TLS v.1.1. 2. The simulated PHG obtains the root.xml file of the H&FS under test and checks that: a) There is a <profile> element in which: • <id> element has a value of "FHIR-Observation-Server-4C". • <reference> elements points to the latest revision of the hData Content Profile document that the implementation supports b) There is a <resourceType> element in which: • <resourceTypeID> element has a value of "OAuthDescriptor". • <reference> elements points to the latest revision of the reference document that the implementation supports • <representation> element has a <mediaType> element which value is "application/json" or "application/xml". c) There is a <section> element in which: • <profileID> has a value of "FHIR-Observation-Server-4C". • <resourceTypeID> has a value of "OAuthDescriptor". • <resourcePrefix> has a value of "true". • <path> element contains an atom feed to get the OAuthDescriptor. 3. The simulated PHG retrieves the atom feed returned by the H&FS and checks that:		

	a) There is (at least) one OAuthDescriptor listed. 4. The simulated PHG retrieves the OAuthDescriptor (in XML or JSON format) using the link element of the atom feed and checks that: a) There is a resourceServerURL element which value is an URL (the endpoint where the H&FS expects to receive measurements). b) There is a tokenEndpointURL element which value is an URL (the endpoint for obtaining the bearer OAuth token). c) There is a grantTypes element and it contains one or more of the following strings: • "clientCredential" • "resourceOwnerCredential" • "implicit" • "authorizationCode" d) Additionally, the grantTypes element may contain: • "rfc7523" e) There may be an authorizationEndpointURL element which value is an URL (the OAuth endpoint the H&FS expects the PHG to use for OAuth authorization).
Pass/Fail criteria	• The root file contains all the elements and values described in step 2. • The provided atom feed contains at least one OAuthDescriptor listed. • The OAuthDescriptor can be retrieved using the link element in the atom feed. • The OAuthDescriptor is compliant to the description given in step 4. • If the <mediaType> element of the <resourceType>with a <resourceTypeID> value of "OAuthDescriptor" is set to application/xml the OAuthDescriptor will be retrieved in XML format. • If the <mediaType> element of the <resourceType>with a <resourceTypeID> value of "OAuthDescriptor" is set to application/json the OAuthDescriptor will be retrieved in JSON format.
Notes	

TP Id		TP/HFS/REC/FHIR/GEN/BV-001		
TP label		FHIR Observation Reporting Server support		
Coverage	**Spec**	[ITU-T H.812]		
	Testable items	RESTSec 7;M	RESTSec 8;M	CommonReq 5;M
	Spec	[ITU-T H.812.5]		
	Testable items	FORSReq 1; M	FORSReq 2; M	HFSCommon 6; M
		HFSCommon 5; M	HFSCommon 6; M	HFSCommon 7; M
		HFSCommon 8; M	HFSCommon 9; M	HFSCommon 10; M
		HFSCommon 11; M	HFSCommon 12; M	HFSCommon 13; M
		HFSCommon 14; M	HFSCommon 15; M	HFSCommon 16; M
		HFSCommon 17; O	HFSCommon 18; M	HFSCommon 19; M
		HFSCommon 20; O		

Test purpose	Check that: The root.xml file for the H&FS under test contains all required elements for the support of the FHIR Observation Reporting Server Continua Certified Capability Class, the H&FS is able to provide the OAuthDescriptor in JSON or XML format and it contains the required elements.
Applicability	C_REC_000 AND C_REC_GEN_008
Other PICSs	
Initial condition	The simulated PHG supporting FHIR Observation Reporting Client Continua Certified Capability Class is ready to request the root file of the H&FS under test using TLS 1.1.
Test procedure	1. The simulated PHG performs an HTTP GET of root.xml using TLS v.1.1. 2. The simulated PHG obtains the root.xml file of the H&FS under test and checks that: a) There is a <profile> element in which: • <id> element has a value of "FHIR-Observation-Reporting-Server-4C". • <reference> elements points to the latest revision of the hData Content Profile document that the implementation supports b) There is a <resourceType> element in which: • <resourceTypeID> element has a value of "OAuthDescriptor". • <reference> elements points to the latest revision of the reference document that the implementation supports. • <representation> element has a <mediaType> element which value is "application/json" or "application/xml". c) There is a <section> element in which: • <profileID> has a value of "FHIR-Observation-Reporting-Server-4C". • <resourceTypeID> has a value of "OAuthDescriptor". • <resourcePrefix> has a value of "true". • <path> element contains an atom feed to get the OAuthDescriptor- 3. The simulated PHG retrieves the atom feed returned by the H&FS and checks that: a) There is (at least) one OAuthDescriptor listed. 4. The simulated PHG retrieves the OAuthDescriptor (in XML or JSON format) using the link element of the atom feed and checks that: a) There is a resourceServerURL element which value is an URL (the endpoint where the H&FS expects to receive measurements). b) There is a tokenEndpointURL element which value is an URL (the endpoint for obtaining the bearer OAuth token). c) There is a grantTypes element and it contains one or more of the following strings: • "clientCredential" • "resourceOwnerCredential" • "implicit" • "authorizationCode" d) Additionally, the grantTypes element may contain: • "rfc7523" e) There may be an authorizationEndpointURL element which value is an URL (the OAuth endpoint the H&FS expects the PHG to use for OAuth authorization).
Pass/Fail criteria	• The root file contains all the elements and values described in step 2. • The provided atom feed contains at least one OAuthDescriptor listed. • The OAuthDescriptor can be retrieved using the link element in the atom feed.

	• The OAuthDescriptor is compliant to the description given in 4. • If the <mediaType> element of the <resourceType>with a <resourceTypeID> value of "OAuthDescriptor" is set to application/xml the OAuthDescriptor will be retrieved in XML format. • If the <mediaType> element of the <resourceType>with a <resourceTypeID> value of "OAuthDescriptor" is set to application/json the OAuthDescriptor will be retrieved in JSON format.
Notes	

TP Id		TP/HFS/REC/FHIR/GEN/BV-002		
TP label		OAuth support		
Coverage	**Spec**	[ITU-T H.812]		
	Testable items	RESTSec 7;M	RESTSec 8;M	CommonReq 5;M
	Spec	[ITU-T H.812.5]		
	Testable items	HFSCommon 1; M	HFSCommon 2; M	HFSCommon 3; C
		HFSCommon 22; M	HFSCommon 23; M	HFSCommon 24; M
Test purpose		Check that: The H&FS under accepts the upload of a FHIR measurement (as a complete transaction bundle) using the supported OAuth authorization grant types.		
Applicability		C_REC_000 AND (C_REC_GEN_007 OR C_REC_GEN_008)		
Other PICSs		C_REC_FHIR_001		
Initial condition		The simulated PHG supporting FHIR Observation Reporting Client Continua Certified Capability Class is ready to perform a conditional create operation to upload a complete FHIR bundle (with no external references) to the H&FS under test. PHG has previously retrieved both the root file and the OAuthDescriptor from the H&FS under test.		
Test procedure		1. The simulated PHG performs a create operation (HTTP POST) to upload a complete FHIR bundle (in XML format) containing a new measurement using TLS 1.1 and an OAuth 2.0 bearer token obtained using the client credentials grant type. 2. The H&FS accepts the request and returns <HTTP 201> (Created). 3. The simulated PHG performs a create operation (HTTP POST) to upload a complete FHIR bundle (in JSON format) containing a new measurement using TLS 1.1 and an OAuth 2.0 bearer token obtained using the resource owner credentials grant type. 4. The H&FS accepts the request and returns <HTTP 201> (Created). IF C_REC_FHIR_001=TRUE continue with step 5, ELSE the test case ends. 5. The simulated PHG performs a create operation (HTTP POST) to upload a complete FHIR bundle (in XML format) containing a new measurement using TLS 1.1 and an OAuth 2.0 bearer token obtained using the authorization code grant type. 6. The H&FS accepts the request and returns <HTTP 201> (Created). 7. The simulated PHG performs a create operation (HTTP POST) to upload a complete FHIR bundle (in JSON format) containing a new measurement using TLS 1.1 and an OAuth 2.0 bearer token obtained using the implicit grant type. 8. The H&FS accepts the request and returns <HTTP 201> (Created).		

Pass/Fail criteria	• The H&FS under test accepts the requests as described in steps 2 and 4, and, if C_REC_FHIR_001=TRUE, it also accepts the requests as described in steps 6 and 8.
Notes	

TP Id		TP/HFS/REC/FHIR/GEN/BV-003		
TP label		JSON Web Token support		
Coverage	**Spec**	[ITU-T H.812]		
	Testable items	RESTSec 7;M	RESTSec 8;M	CommonReq 5;M
	Spec	[ITU-T H.812.5]		
	Testable items	HFSCommon 20; C	HFSCommon 21; M	
Test purpose		Check that: If the H&FS contains the "rfc7523" string in the grantTypes element of its OAuthDescriptor, it shall accept a valid JWT as an authorization grant. [AND] If an invalid JWT is provided, the H&FS shall provide information regarding the error in the response.		
Applicability		C_REC_000 AND (C_REC_GEN_007 OR C_REC_GEN_008)		
Other PICSs		C_REC_FHIR_002		
Initial condition		The simulated PHG supporting FHIR Observation Reporting Client Continua Certified Capability Class is ready to retrieve the OAuthDescriptor of the H&FS and to perform a conditional create operation to upload a complete FHIR bundle (with no external references). PHG has previously retrieved the root file from the H&FS under test.		
Test procedure		1. The simulated PHG retrieves the OAuthDescriptor (in XML or JSON format) using the link element of the atom feed provided by the root file of the H&FS under test. 2. The simulated PHG checks that the grantTypes element of the OAuthDescriptor contains the string "rfc7523". 3. The simulated PHG performs a create operation (HTTP POST) to upload a complete FHIR bundle containing a new measurement using TLS 1.1 and a single valid JSON Web Token. 4. The H&FS accepts the request and returns <HTTP 201> (Created). 5. The simulated PHG performs a create operation (HTTP POST) to upload a complete FHIR bundle containing a new measurement using TLS 1.1 and an invalid JSON Web Token. 6. The H&FS does not accept the request and returns an error (i.e. an <HTTP 400> (Bad Request)) with additional information using the "error_description" or "error_uri" parameters.		
Pass/Fail criteria		• The OAuthDescriptor contains the "rfc7523" string in step 2. • The H&FS accepts the operation as described in step 4. • The H&FS rejects the operation and provides information about the error as described in step 6.		
Notes				

TP Id		TP/HFS/REC/FHIR/GEN/BV-004		
TP label		FHIR API Support for FHIR Operation Server		
Coverage	**Spec**	[ITU-T H.812]		
	Testable items	RESTSec 7;M	RESTSec 8;M	CommonReq 5;M
	Spec	[ITU-T H.812.5]		
	Testable items	HFSCommon 2; M	FOSReq 3; M	
Test purpose		Check that: A FHIR Observation Server shall support a minimum set of FHIR operations as defined by [RESTful FHIR]:		
Applicability		C_REC_000 AND C_REC_GEN_007		
Other PICSs				
Initial condition		The simulated PHG supporting FHIR Observation Reporting Client Continua Certified Capability Class is ready to perform a conditional create operation to upload a complete FHIR bundle with an Observation resource (with no external references) to the H&FS under test. PHG has previously retrieved both the root file and the OAuthDescriptor from the H&FS under test. The H&FS under test have no previously stored resources.		
Test procedure		1. The simulated PHG performs a create operation (HTTP POST) to upload a complete FHIR bundle containing an Observation resource (using TLS 1.1 and an OAuth 2.0 bearer token obtained using the client credentials grant type). 2. The H&FS accepts the request and returns <HTTP 201> (Created) and a Location header, which contains the new Logical Id and Version Id of the created resources. 3. The simulated PHG performs a conditional create operation (HTTP POST) using the HL7 defined extension header "If-None-Exist" to upload a FHIR Observation resource (which references can be resolved within the H&FS) using TLS 1.1 and an OAuth 2.0 bearer token obtained using the client credentials grant type. The simulated PHG uses a non-existent Logical Id (other than the ones returned in step 2) as the search parameter in the "If-None-Exist" header. 4. The H&FS accepts the request and returns <HTTP 201> (Created) and a Location header, which contains the new Logical Id and Version Id of the created resource version. 5. The simulated PHG performs a conditional create operation (HTTP POST) using the HL7 defined extension header "If-None-Exist" to upload the same FHIR Observation Resource as in step 3 (using TLS 1.1 and an OAuth 2.0 bearer token obtained using the client credentials grant type). The simulated PHG uses Logical Id obtained in step 4 as the search parameter in the "If-None-Exist" header. 6. The H&FS ignores the operation as it finds a match and returns <HTTP 200> (OK). 7. The simulated PHG performs an update operation (HTTP PUT) to update the FHIR Observation resource uploaded in step 3 (using TLS 1.1 and an OAuth 2.0 bearer token obtained using the client credentials grant type). This operation uses a non-existent id (not the one obtained in step 4) 8. The H&FS creates the resource (as no resource already exists for the given id) and returns <HTTP 201> (Created) and a Location header, which contains the new Logical Id and Version Id of the created resource version 9. The simulated PHG performs an update operation (HTTP PUT) to update the FHIR Observation resource uploaded in step 3 (using TLS 1.1 and an OAuth 2.0 bearer token obtained using the client credentials grant type). This operation uses the id obtained in step 4.		

	10. The H&FS accepts the request, updates the resource, and returns an <HTTP 200> (OK) status code. 11. The simulated PHG performs a capabilities operation (HTTP GET) to retrieve the server's Capability Statement that defines how it supports resources (using TLS 1.1 and an OAuth 2.0 bearer token obtained using the client credentials grant type). 12. The H&FS returns a Capability Statement that specifies which resource types and interactions are supported for the GET command. 13. The simulated PHG performs a transaction operation (HTTP PUT) to update the resource uploaded in 3 and to upload (create) a new measurement resource with known references (using TLS 1.1 and an OAuth 2.0 bearer token obtained using the client credentials grant type). 14. The H&FS accepts the transaction operation and returns a successful response as both operations succeeded.
Pass/Fail criteria	• The H&FS accepts the operations and responds as described in step 2, 4, 6, 8, 10, 12 and 14.
Notes	

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