

HEALTH IT
STANDARDS TESTING INFRASTRUCTURE

NIST Medical Device Communication Testing

Semantic interoperability of Medical Devices

Test Tool Update

HL7 Healthcare Devices WG / IEEE x73 Upper Layers

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22 January, 2015 – San Antonio, Texas

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NIST MDC Testing Staff

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- Nicolas Crouzier(GR)
 - RTMMS,
 - HL7 V2 Tools
- Michael Faughn (Contractor - *Prometheus Computing, LLC* w/ Art Griesser)
 - DIM Modeling + “DIM Editor” + “MyDevice” (next gen ICSGenerator plus)

Key Discussion Topics

- Work Area & Status Updates
- DIM Editor work updates and tool review
- HL7 Tooling Status & Updates

Work Areas & Status Updates

- *HL7 V2 (2.6) IHE-PCD Validation Tools*
 - Enhancements to Pre-Connectathon, Connectathon Tools to support IHE-PCD Cycle 9
 - “Pre-Connectathon 2014-15 (Cycle 9)” results in Pre-Con Tool
 - Cycle 9 - CP updates coded for 2014-15;
 - Fall/Winter Pre-Connectathon + Virtual Testing,
 - January/February 2015 Connectathon
 - IHE-PCD Pre-Connectathon, “Isolated Environment”
 - IHE-PCD Connectathon, “Instance Environment”
- Rosetta Terminology Mapping Management System (*RTMMS*)
Overview + Update
 - RTMMS Deployment Update and service status
 - -10101a +
 - IEEE Agreement to make available the “Works” – ‘Common Term’ added
 - Latest numbers...

Work Areas & Status Updates, Continued

- IGAMT – Implementation Guide Authoring Management Tool
 - *Continue to develop PCD-01 (ORU^R01)...*
 - *Initial Goal: Develop first version of IG for PCD-01 (TF Vol. II)*
 - *Focus on IHE-PCD TF Vol. II/III*
- ISO/IEEE 11073 ‘Domain Information Model Editor’ -> “DIM Editor”
 - Progress/Update/Status (Michael Faughn)
 - UML Defined x73 DIM (-10201) basis for tooling
 - DIM Editor / ‘MyDevice’ pilot tool demo
 - Auto producing ISO/IEEE documentation (to meet SDO’s templates)
 - No major hurdles – from IEEE and w/ document generation
 - Michael provided a sample – Kathryn B. circulated w/in IEEE
 - Continue weekly TCons (Thursdays @ 11 am & 2 pm Eastern)

Work Areas, continued

- IHE North American Connectathon Under Way next week...
 - NIST Connectathon Tool being used for static validation
- John G., Nicolas C., and Sandra Martinez serving as test monitors
- John G. participating (“Staff”) in IHE’s education series (“Connectathon 101”) – presenting session on how PCD tests...

Royalty Free Agreement – Addendum (Sept. 2014)

- IEEE / NIST Royalty Free Agreement – December 2012

Definition of the “Works”

The following data items within the approved standards, existing and future versions, currently designated as:

1 – IEEE 11073-10xxx

2 – IEEE 11073-20xxx

Limited to the following data items within, currently designated as:

1 – Ref ID

2 – Code

3 – Description

4 – Systematic Name

Shall heretofore be designated as the “Works”

- September 2014

Add to the Definition of the “Works”

Data item

5 – Common Term

HEALTH IT
STANDARDS TESTING INFRASTRUCTURE

HL7 V2.6 Validation Tooling IHE-PCD Pre-Connectathon Cycle 9

Semantic interoperability of Medical Devices

Test Tool Update

Joint HL7/IEEE 11073 Healthcare Devices Working Group

National Institute of Standards and Technology

22 January, 2015 – San Antonio, Texas

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Testing Environments

- Instance Testing
 - Conformance (e.g., against HL7 2.x or CDA)
 - Test object conforms to specification on which it is based
 - IHE Model: ~*Virtual and Pre-Connectathon*
 - NIST IHE-PCD v2 Message Validation Test Tool
- Isolated System Testing
 - Includes *Instance Testing* Activities
 - Protocol Conformance
 - Functional Behavior Conformance
 - Features and operational behavior correspond to specifications
 - IHE Model: ~*Virtual and Pre-Connectathon*
 - NIST IHE-PCD v2 Test Tool
- Peer-to-Peer System Testing
 - Includes *Isolated System Testing* Activities
 - Interoperability Testing
 - Testing complete application environment
 - May include interacting with Database, using Network Communications, or interacting with other hardware, applications, or systems if appropriate
 - IHE Model: ~*Connectathon*

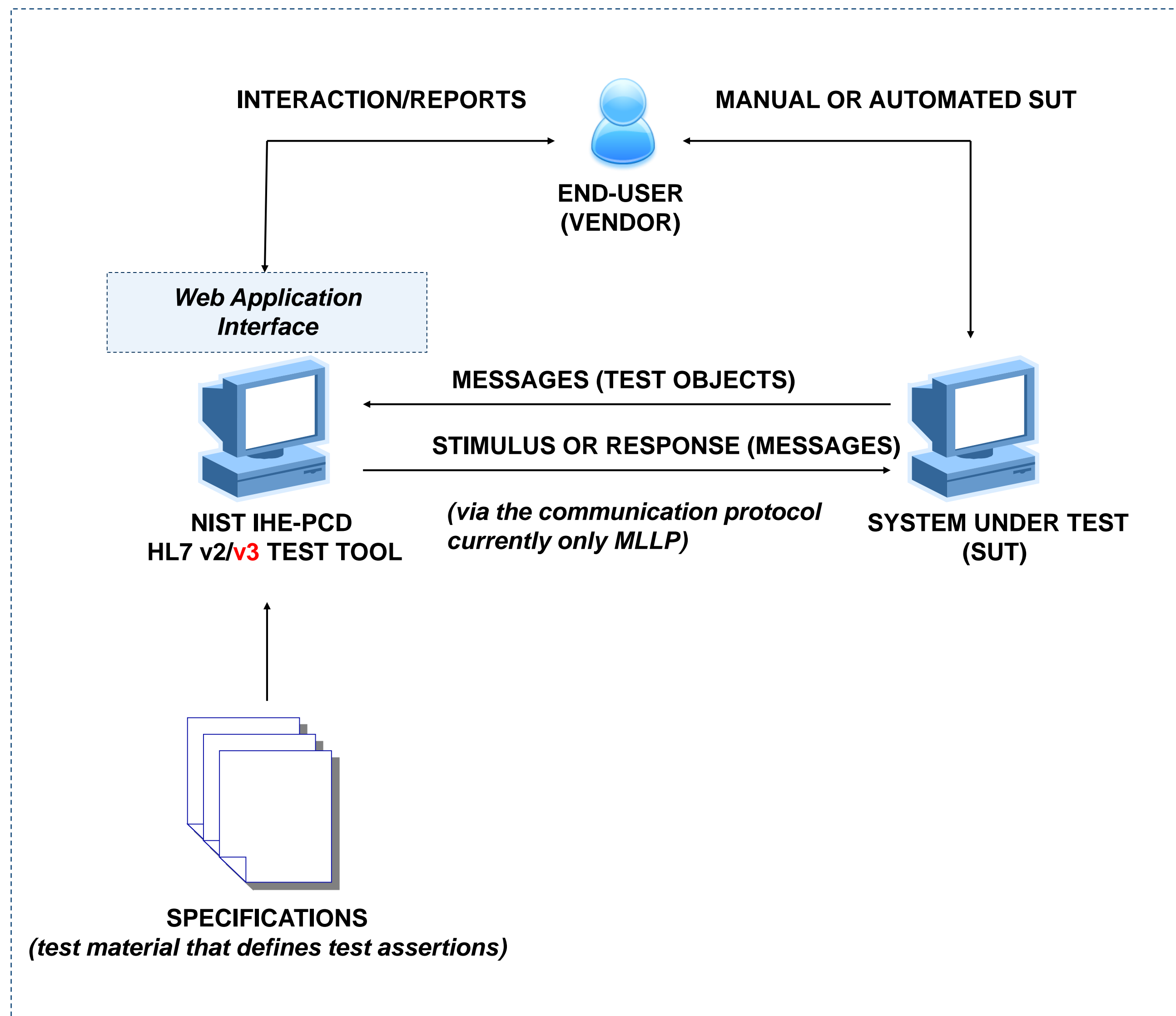
IHE-PCD 2014/15 Pre-Connectathon + Connectathon

NIST Testing Support

The NIST V2 (2.6) Tools perform the following validation:

- Syntax and Semantic Content Validation
 - Against HL7 conformance profile
 - Against IHE-PCD Technical Frameworks/Supplements constraints (e.g., PCD-01: ORU^R01, Communicate Device Data)
 - Against HL7 and/or user [local] provided tables
 - Example of user provided table is RTM for Ref_IDs, Units, body sites, etc.
 - Against ‘validation context’, including specific values
 - Defined in XML (e.g., specific test case values)

NIST V2 HL7 IHE-PCD Test Tool: Operational Process



V3 – Future Work

2014-15 IHE-PCD

Pre-Connectathon + Connectathon Status

- Cycle 9 - Test Cases/demographics reviewed – used as basis for tooling at 2015 NA Connectathon
- IHE-PCD Fall F2F
 - Oct 20-24, 2014 @ Philips in Boca Raton, FL.
- IHE-PCD Cycle 9 Pre-Connectathon
 - Dec. 2014 – Jan. 2015 via on-line tool (ihe-pcd-precon.nist.gov)
- CPs documented and submitted (see PCD wiki)
 - Note: Agreement on two CPs* (prior to “official” ballot to accommodate cycle 9 testing)
 - 11 CPs received and processed: http://wiki.ihe.net/index.php?title=PCD_CP_grid
- Roadmap of activities updated... see PCD wiki
http://wiki.ihe.net/index.php?title=Patient_Care_Devices

* To accommodate recent Alert terminology (to be included in 10101a release), e.g., “196616^MDC_EVT_ALARM^MDC “

2014-15 IHE-PCD Pre-Connectathon Tool: Cycle 9 Status, Continued

- IHE-PCD: NIST “Isolated Environment” Test Tools required
 - HL7 V2.6
 - Supports 8 Integration Profiles (number of test cases, some duplicated amongst actors)
 - DEC – Device Enterprise Communication (10)
 - SPD – Filter (4)
 - POI – Pulse Ox (3)
 - PIV – Patient Infusion Verification (9)
 - IPEC – Infusion Pump Event Communication (6)
 - IDCO – Implantable Device Cardiac Observation (4)
 - ACM – Alarm Communication Management (2)
 - RDQ – Retrospective Data Query (1)
 - MEMDMC – Device Management Communication (1)
 - MEMLS – Location Services (1)
 - *OMS, RTLS/CMS, Security white papers/WGs*
 - 30+ Unique Test Cases (across ‘Actors’)

2014-15 IHE-PCD Pre-Connectathon Tool: **Cycle 9 Status, continued**

- 60+ existing User Accounts
 - Contributing Orgs, SDO (leads/Co-chairs), Reviewers
 - In total since tool made publically available (2011)
- 17 Users – cycle 9
- 106 Test Cases –executed in Cycle 9
 - Recorded or stored by NIST tool registered user
- Cycle 8: 22 Users, 115 Tests Executed/Stored
- Cycle 1-7: 42 Users, 99 Tests Executed/Stored*
 - *Cycles 1-7 not all test were stored in tool – 99 tests are primarily from cycle 7

HL7 V2 Tool Updates – New/In Progress

- ✓ Various test cases corrections (messages examples, validation contexts...) – Update to reflect updated TF
- ✓ IPEC containment tree validation tested; now integrated into tooling for Cycle 9 (as of summer 2014)
- ✓ Pre-Connectathon tool, fixed test case scenarios and validation files for DOC-DOR-DOF test cases.
- ✓ Completed implementing PCD CPs (97-108 from http://wiki.ihe.net/index.php?title=PCD_CP_grid)
- ✓ Limit of 999 for HD-2 length error on MSH-3
 - Should be 199 with total length of 277 for combined length of components
 - Updated TF-2 table (page 140, table C.6-1, second component (999) to 199)
- ✓ Updated tool to fix error on OB X-3 validation
69986^MDC_DEV_PUMP_INFUS_VMD^MDC

HL7 V2 Tool Updates, New for Cycle 9, continued

PRE and Connectathon tools:

- ✓ [PRE & CON] Moved to faster server, new addresses:
<http://ihe-pcd-precon.nist.gov/> and <http://ihe-pcd-con.nist.gov>
- ✓ [PRE] Re-engineered overall the way tests are represented and processed in the system. This makes testing more stable and faster, allows the potential for dynamic testing (i.e. testing against values vendors enter at launch of test).
- ✓ [PRE] Every validation artifact is now stored in a database thus allowing faster updates.
- ✓ [PRE] 'Admin' User type can create test case "live", in future similar functionality could be added (fully or partially) for all users.
- ✓ [PRE] Accept 'Ack' now generated and sent as appropriate (Previously, some 'Acks' were not sent at all when certain errors occurred in the inbound message)

HL7 V2 Tool Updates, New for Cycle 9, continued

- ✓ Better and faster profile viewer
- ✓ Added MEMLS and MEMDMC profiles and basic test recently for Cycle 9 (1 test case each)
- ✓ Nomenclature update for ACM
- ✓ Updated POI tests and profiles
- ✓ Updated DOC-DOF tests
- ✓ Better log system for admin to help with user issues
- ✓ Some fixes in user interface for browser compatibility and logging issues

HL7 V2 Tool Updates, RTMMS – New for Cycle 9

- ✓ Moved to secure server, new address: <https://rtmms.nist.gov>
- ✓ Added timestamp to terms for latest update
- ✓ Added term standard table field (i.e., table in x73 Standard) and populated values for available terms
- ✓ Added API for 'My Device'
- ✓ Updated some terms and corresponding co-constraints that were missing
- ✓ Fixes in UI and a small performance tweak

HL7 V2 Tool Updates, continued – To Do

- Cycle 10: Looking into capability to upload libraries + demographics
 - incorporated [automatically] into validation context files used by tooling

RTMMS by the numbers (as of 21 January 2015) – (since September 2014)

- 1619 (0) Rosetta terms
- 667 (- 4) hRTM terms
- 224 (0) Groups
- 8 (0) Unit Groups
 - 445 (0) Units (MDC)
 - 444 (+14) Units (UCUM)
- 28 (0) Enumeration Groups
 - 273 (0) Enumerations
- 57 (+8) Contributing Organizations now Registered!

Contributing Organization		
<input type="button" value="Edit contributing organization"/> <input type="button" value="Add contributing organization"/> <input type="button" value="Delete contributing organization"/> <input type="button" value="Merge two contributing"/>		
CO ID	Suffix	CO Name
DocBox-Inc	DOCBOX	DocBox Inc
Draeger		Draeger-Siemens
Editorial-pss		Editorial additions (Paul Schluter)
Editorial-RTMV		
Elbrys-Networks	ELBRYN	Elbrys Networks
EPIC	EPIC	EPIC
Eversolve	EVERSOLVE	Eversolve
Fresenius	FRE	Fresenius
GE_Aware	GE	GE (Aware Gateway)
HL7-Hellas	HL7HELLAS	HL7 Hellas
Hospira	HSP	Hospira
IEEE	IEEE	ISO/IEEE 11073-10101 and its extensions
IHE PCD Infusion Pump Work ...	IHEPCDINF	IHE PCD Infusion Pump Work Group
LiveData		LiveData
Mindray	MR	Mindray
Nuvon		Nuvon
OSD_MIL	OSDMIL	OSD MIL
Philips		Philips Healthcare
Shoulders_Corporation	SCO	Shoulders Corporation
Siemens	SI	Siemens
Smiths Medical	SM	Smiths Medical
Spacelabs		Spacelabs Healthcare
STYK		
True Process Inc	TPI	True Process Inc.
VA	VA	Veterans Affairs
VIASYS		Cardinal VIASYS
WelchAllyn		Welch Allyn
West_Health	WH	West Health Institute

Term Approval, Proposed cont.

As of January 21, 2015 (Since September 2014)

Terms being vetted (by the numbers)

- “Proposed Terms”: 192 rows (0)
- “Ready Terms Table”: 282 rows (-4)
- “Mapped Terms”: 33 rows (+6)
- “Proposed Units”: 101 rows (0)
- “Proposed Enumerations”: 133 rows (0)

Tool Updates: Test Event Selection



- Top Right Corner – Cycle 9 Event - to enable separation (historical) of test event results (for/by participants, current being Cycle 9 (Fall – Winter 2014-15))
- Simply choose other Event (from pull-down) to see past results stored for (by user account/Log-in)

Tool updates – Profile Viewer – updated to reflect CPs

IHE-PCD Pre-Connectathon Test Tool
NIST HL7 V2 Tools

Welcome, Guest | Register | Log in
Current testing event: Pre-Connectathon 2013

Overview Execute Test **Profile Viewer** Test Case Viewer Contact us About

G Group
 S Segment
 F Field
 C Component
 S Subcomponent

Select Profile: PCD-01 (ORU^R01^ORU_R01)

Filter by usage: R,RE,C ☐ All usage ☒

Location	Usage	Cardinality	Data Type	Length	Table	Report
▶ S MSH	R	[1,1]				
▶ S SFT	X	[0,*]				
▶ S UAC	X	[0,1]				
▼ G PATIENT_RESULT	R	[1,*]				
▼ G PATIENT	O	[0,1]				
▶ S PID	R	[1,1]				
▶ S PD1	X	[0,1]				
▼ S NTE	X	[0,*]				
F NTE.1 : Set ID - NTE	R	[0,1]	SI	4		
F NTE.2 : Source of Comment	X	[0,1]	ID	8	0105	
F NTE.3 : Comment	RE	[0,*]	FT	65536		
▼ F NTE.4 : Comment Type	X	[0,1]	CWE	250	0364	
C NTE.4.1 : Identifier	RE		ST	40		
C NTE.4.2 : Text	R		ST	199		
C NTE.4.3 : Name of Coding System	RE		ID	20	0396	
C NTE.4.4 : Alternate Identifier	RE		ST	20		
C NTE.4.5 : Alternate Text	RE		ST	199		
C NTE.4.6 : Name of Alternate Coding System	RE		ID	20	0396	
C NTE.4.7 : Coding System Version ID	C		ST	10		
C NTE.4.8 : Alternate Coding System Version ID	O		ST	10		
C NTE.4.9 : Original Text	O		ST	199		
▶ F NTE.5 : Entered By	X	[0,1]	XCN	3220		

HL7 V2 Tool Updates

- Current Version / Release Notes – new text entry feature (only for 'Admin' user role)
 - 'About' Tab (yellow ribbon)

The screenshot displays the 'IHE-PCD Pre-Connectathon Test Tool' interface. The top navigation bar is yellow and contains the following tabs: Overview, Execute Test, User Account, Profile Viewer, Test Case Manager, Resources Management, Documentation, Contact us, and About (which is highlighted). The main content area is white and contains the following elements:

- Header:** 'IHE-PCD Pre-Connectathon Test Tool' and 'NIST HL7 V2 Tools' on the left; 'Welcome, Admin | Log out' and 'Current testing event: Pre-Connectathon 2014-2015 (Cycle 9)' on the right.
- Current testing Event:** Pre-Connectathon 2014-2015 (Cycle 9)
- Current Version:** 1.4.5
- Last Update Date:** November 21, 2014
- Message logging status:** [View logs](#)
- On/Off toggle:** ☒ On ☐ Off
- version:**
- message:** A large text area with a rich text editor toolbar (B, I, S, etc.) and a 'Save' button.
- Change log:** A table listing previous versions and their release dates.

Version	Date
Version: 1.4.5	Date: November 21, 2014 3:00 PM
Fix bug with MSH 6.3 making the tool usable. Thanks to Glen Cook from Hospira.	
Version: 1.4.4	Date: November 13, 2014 10:58 AM
Fixed registration process.	
Version: 1.4.3	Date: November 4, 2014 4:20 PM

HL7 V2 Tool Updates

- Admin view of log entries (i.e., messages by SUT)

Number of log entries: 200

<input type="checkbox"/> Id	<input type="checkbox"/> Date	<input type="checkbox"/> Sender	<input type="checkbox"/> Receiver	<input type="checkbox"/> Message Type	Message
321...	2014-12-30 10:02:37.0	CareFusion 00D07500001 EUI-64 / CareFusion	DEC_DOC_schawla / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
321...	2014-12-30 10:01:38.0	CareFusion 00D07500001 EUI-64 / CareFusion	DEC_DOC_schawla / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
321...	2014-12-30 10:00:37.0	CareFusion 00D07500001 EUI-64 / CareFusion	DEC_DOC_schawla / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
321...	2014-12-30 09:59:38.0	CareFusion 00D07500001 EUI-64 / CareFusion	DEC_DOC_schawla / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
321...	2014-12-30 09:58:37.0	CareFusion 00D07500001 EUI-64 / CareFusion	DEC_DOC_schawla / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
321...	2014-12-30 09:57:37.0	CareFusion 00D07500001 EUI-64 / CareFusion	DEC_DOC_schawla / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
321...	2014-12-30 09:57:33.0	NantHealth / NantHealth	DEC_DOC_19 / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
321...	2014-12-30 09:57:02.0	PAT_DEVICE_RAULAND rauland_registered_eui-64_value EUI-64 / RB...	ACM_AM_89 / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
321...	2014-12-30 09:56:37.0	CareFusion 00D07500001 EUI-64 / CareFusion	DEC_DOC_schawla / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
321...	2014-12-30 09:55:37.0	CareFusion 00D07500001 EUI-64 / CareFusion	DEC_DOC_schawla / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
321...	2014-12-30 09:54:37.0	CareFusion 00D07500001 EUI-64 / CareFusion	DEC_DOC_schawla / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
321...	2014-12-30 09:53:38.0	CareFusion 00D07500001 EUI-64 / CareFusion	DEC_DOC_schawla / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
321...	2014-12-30 09:52:52.0	PAT_DEVICE_IVENIX 0012211839000001 EUI-64 / IVENIX	IPEC_DOC_ibaldwin / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
321...	2014-12-30 09:52:37.0	CareFusion 00D07500001 EUI-64 / CareFusion	DEC_DOC_schawla / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
321...	2014-12-30 09:52:32.0	NantHealth / NantHealth	DEC_DOC_19 / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
320...	2014-12-30 09:52:02.0	PAT_DEVICE_RAULAND rauland_registered_eui-64_value EUI-64 / RB...	ACM_AM_89 / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
320...	2014-12-30 09:51:37.0	CareFusion 00D07500001 EUI-64 / CareFusion	DEC_DOC_schawla / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
320...	2014-12-30 09:50:37.0	CareFusion 00D07500001 EUI-64 / CareFusion	DEC_DOC_schawla / NIST	INCOMING_MESSAGE_TEST_FRAMEWORK	View
320...	2014-12-30 09:50:27.0	IPEC DOC ibaldwin / NIST	PAT_DEVICE_IVENIX 0012211839000001 EUI-64 / IVENIX	OUTGOING_MESSAGE_TEST_FRAMEWORK	View

HL7 V2 Tool Updates

- Admin view of exchanged HL7 V2 message (being validated) after selection prior slide's "View" button

Message info for CareFusion 00D07500001 EUI-64 / CareFusion to DEC_DOC_schawla / NIST on the 2014-12-30 10:02:37.0

```
MSH|^~\&|CareFusion^00D07500001^EUI-64|CareFusion|DEC_DOC_schawla|NIST|20141230070238-0800||ORU^R01^ORU_R01|1412300702385349|P|2.6|||AL|NE||||IHE_PCD_ORU_  
PID|||HO2009002^HL7^PI||^U|||||||  
OBR|1|Unknown^HL7^00D075FFFFF^EUI-64|Unknown^Alaris^00D075FFFFF^EUI-64|999999^Medication Unknown|||20141230070233-0800|||||||  
OBX|1||69985^MDC_DEV_PUMP_INFUS_MDS^MDC|1.0.0.0||||X|||20141230070233-0800|||M8015S12460079^Alaris^00D075BA9DDD8F2F^EUI-64|20141230070233-0800  
OBX|2||70050^MDC_DEV_PUMP_INFUS_LVP_VMD^MDC|1.1.0.0||||X|||20141230070233-0800|||M8100S12656404^Alaris^00D075BC98844314^EUI-64|20141230070233-0800  
OBX|3||70067^MDC_DEV_PUMP_INFUS_CHAN_DELIVERY^MDC|1.1.1.0||||X|||20141230070233-0800|||20141230070233-0800  
OBX|4|CWE|184512^MDC_PUMP_MODE_CURRENT^MDC|1.1.1.50||||R|||20141230070233-0800|||2^AMEAS||20141230070233-0800  
OBX|5|CWE|184508^MDC_PUMP_STAT^MDC|1.1.1.51|^pump-status-not-infusing^MDC||||R|||20141230070233-0800|||2^AMEAS||20141230070233-0800  
OBX|6|CWE|184513^MDC_PUMP_NOT_INFUSING_REASON^MDC|1.1.1.55|^pump-stopped-standby^MDC||||R|||20141230070233-0800|||2^AMEAS||20141230070233-0800
```

OK

HL7 V2 Tool Updates

- Updated Documentation Tab for Cycle 9 testing
 - Conformance Profiles, Demographics, Drug Library

The screenshot displays the IHE-PCD Pre-Connectathon Test Tool interface. The header includes the tool name, NIST HL7 V2 Tools, and user information (Welcome, Admin | Log out). The current testing event is Pre-Connectathon 2014-2015 (Cycle 9). The navigation bar contains links for Overview, Execute Test, User Account, Profile Viewer, Test Case Manager, Resources Management, Documentation, Contact us, and About. The Documentation tab is active, showing sub-tabs for Conformance profiles, Patient Demographics, IDCO Patient Demographic, and PIV Drugs. The Conformance profiles sub-tab is selected, displaying a message: "The following table contains NIST documentation for the PCD Validation Tool". Below this message is a table with two columns: Resource and Link. The table lists the IHE PCD Technical framework and HL7. Below this is a section titled "PCD v2 Conformance profiles" with a list of profiles: PCD01 ORU R01 / PCD01 ACK R01, PCD02 QSB Z02 / PCD02 ACK Z02, PCD03 RGV O15 / PCD03 ACK O15, PCD03 RRG O16 / PCD03 ACK O16, PCD04 ORU R40 / PCD04 ACK R40, PCD09 ORU R01 / PCD01 ACK R01, PCD10 ORU R42 / PCD10 ACK R42, and PCD12 QBP Q11 / PCD12 ACK Q11.

IHE-PCD Pre-Connectathon Test Tool
NIST HL7 V2 Tools

Welcome, Admin | Log out
Current testing event: Pre-Connectathon 2014-2015 (Cycle 9) ▼

Overview Execute Test User Account Profile Viewer Test Case Manager Resources Management Documentation Contact us About

Conformance profiles Patient Demographics IDCO Patient Demographic PIV Drugs

The following table contains NIST documentation for the PCD Validation Tool

Resource	Link
IHE PCD Technical framework	http://www.ihe.net/Technical_Framework/index.cfm#pcd
HL7	http://www.hl7.org

PCD v2 Conformance profiles

- [PCD01 ORU R01 / PCD01 ACK R01](#)
- [PCD02 QSB Z02 / PCD02 ACK Z02](#)
- [PCD03 RGV O15 / PCD03 ACK O15](#)
- [PCD03 RRG O16 / PCD03 ACK O16](#)
- [PCD04 ORU R40 / PCD04 ACK R40](#)
- [PCD09 ORU R01 / PCD01 ACK R01](#)
- [PCD10 ORU R42 / PCD10 ACK R42](#)
- [PCD12 QBP Q11 / PCD12 ACK Q11](#)

HEALTH IT
STANDARDS TESTING INFRASTRUCTURE

Rosetta Terminology Mapping Management System - RTMMS

Semantic interoperability of Medical Devices

Test Tool Update

Joint HL7/IEEE 11073 Healthcare Devices Working Group

National Institute of Standards and Technology

21 January, 2014 – San Antonio, TX

Contact: john.garguilo@nist.gov, 301-975-5248

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RTMMS Overview

- A web application* that allows vendors and reviewers access, retrieval, and reporting of Rosetta Tables over the internet in conformance to IHE-PCD RTM Profile
- An electronic resource/tool providing the capability of saving data in xml format (as defined by RTM Profile)
- Aids the harmonization process by:
 - Identifying missing terms
 - Automatic generation of the “Harmonized Rosetta Table”
 - Providing latest up-to-date view of hRTM table
- Facilitates the proposal of New Terms to IEEE 11073 Nomenclature standard
- Facilitates Conformance Tooling
 - Message verification and conformance (syntax and semantics)
 - Leading to interoperability...
 - *developed by and currently hosted at NIST
 - Integrated with ICSGenerator Tool (hRTM also imported into DIM Editor)

Rosetta Terminology Mapping Data Base

- Rosetta Table
 - Maps vendor supported observations, units and enumerations to ISO/IEEE x73 nomenclature
- Units Table
 - Defines allowed units-of-measure
 - Defines groups of related units-of-measure
- Enumerations Table
 - Defines groups of enumerated values
- hRTM Table
 - Generated from the original Rosetta

X73 Nomenclature DB

- Linked to RTMMS

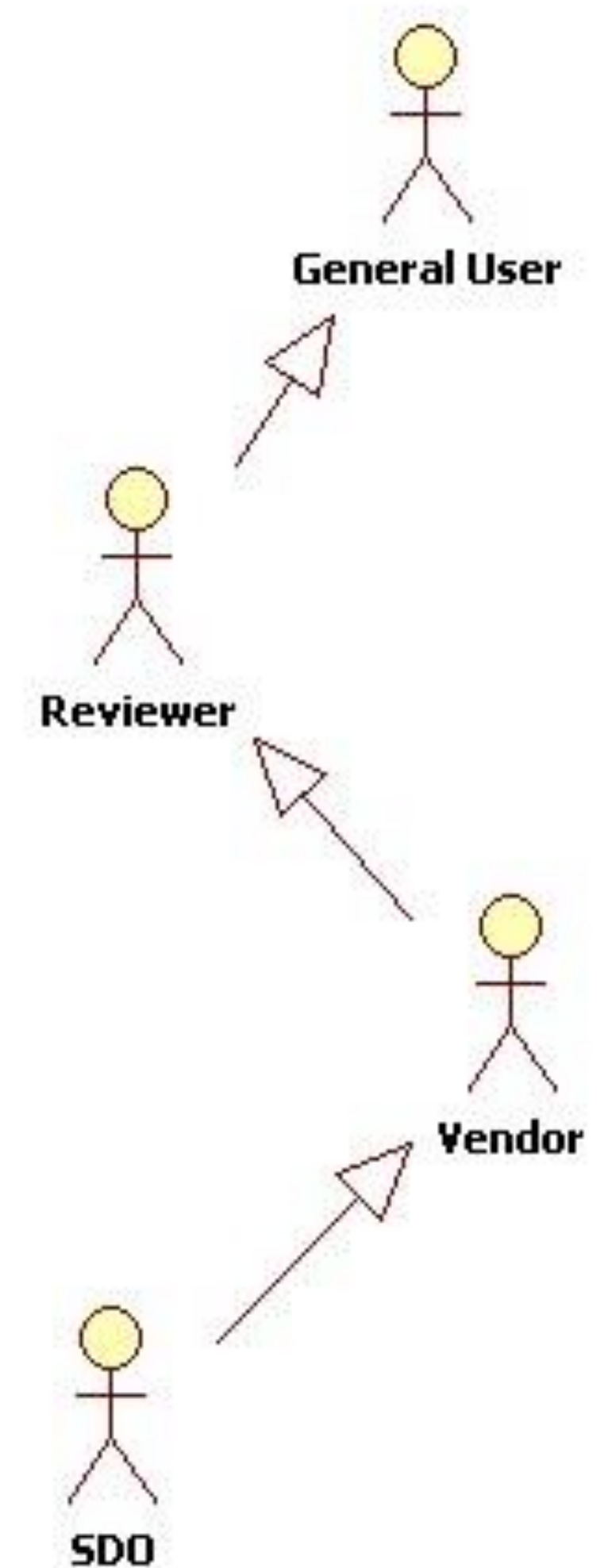
Security DB - Stores users information

RTMMS Key Features

- Access to NIST IEEE 11073 Nomenclature database
 - Appendix A terms (from ISO/IEEE 11073 10101: Nomenclature)
 - Appendix B terms (from ISO/IEEE 11073 10101: Nomenclature)
 - IDCO terms (ISO/IEEE 11073-10301 – implantable device cardiac)
 - aECG (annotated Electrocardiography)
 - PHD terms (personal health domain)
- Access to RTM database
- Ability to propose terms in Rosetta
- hRTM, units, and enumeration download-able in XML format
- User registration
 - Email confirmation, approval process... controlled through 'admin'
- Filtering based on regular expressions
- Rosetta validation against hRTM
- Management capabilities for SDO users
- ❖ *Integrated w/ ICSGenerator / exported to 'DIM Editor'*

RTMMS Users

- General user
 - Views Rosetta Tables
- Reviewer
 - Participates in discussions
- Contributing Organizations
 - Vendor/Contributer 'sandbox'
 - Modifies Vendor Rosetta Table
 - Suggests new terms
 - Modifies Units and Enumerations Table
- SDO (Standard Development Organization)
 - Modifies Units and Enumerations Table
 - Register new terms
- Admin
 - Manages User Accounts



RTMMS by the numbers (as of 21 September 2014) – (since September 2014)

- 1619 (0) Rosetta terms
- 667 (- 4) hRTM terms
- 224 (0) Groups
- 8 (0) Unit Groups
 - 445 (0) Units (MDC)
 - 444 (+14) Units (UCUM)
- 28 (0) Enumeration Group
 - 273 (0) Enumerations
- 57 (+8) Contributing Organizations now Registered!

Contributing Organization		
<input type="button" value="Edit contributing organization"/> <input type="button" value="Add contributing organization"/> <input type="button" value="Delete contributing organization"/> <input type="button" value="Merge two contributing"/>		
CO ID	Suffix	CO Name
DocBox-Inc	DOCBOX	DocBox Inc
Draeger		Draeger-Siemens
Editorial-pss		Editorial additions (Paul Schluter)
Editorial-RTMV		
Elbrys-Networks	ELBRYN	Elbrys Networks
EPIC	EPIC	EPIC
Eversolve	EVERSOLVE	Eversolve
Fresenius	FRE	Fresenius
GE_Aware	GE	GE (Aware Gateway)
HL7-Hellas	HL7HELLAS	HL7 Hellas
Hospira	HSP	Hospira
IEEE	IEEE	ISO/IEEE 11073-10101 and its extensions
IHE PCD Infusion Pump Work ...	IHEPCDINF	IHE PCD Infusion Pump Work Group
LiveData		LiveData
Mindray	MR	Mindray
Nuvon		Nuvon
OSD_MIL	OSDMIL	OSD MIL
Philips		Philips Healthcare
Shoulders_Corporation	SCO	Shoulders Corporation
Siemens	SI	Siemens
Smiths Medical	SM	Smiths Medical
Spacelabs		Spacelabs Healthcare
STYK		
True Process Inc	TPI	True Process Inc.
VA	VA	Veterans Affairs
VIASYS		Cardinal VIASYS
WelchAllyn		Welch Allyn
West_Health	WH	West Health Institute

RTMMS Terminology Access and Views

- ✓ Agreement finalized between IEEE and NIST (Dec 2012, Sep. 2014)
 - Allows users free and public access of terminology attributes that were formally ‘pay-for’ via the NIST tool
 - The “Works”

Definition of the “Works” [from IEEE/NIST Agreement]

The following data items within the approved standards , existing and future versions, currently designated as:

1 – IEEE 11073-10xxx

2 – IEEE 11073-20xxx

Limited to the following data items within, currently designated as:

1 – Ref ID

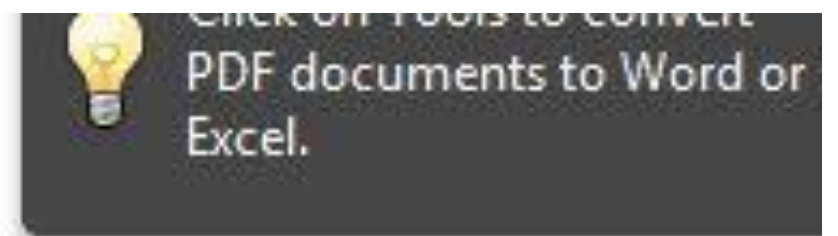
2 – Code

3 – Description

4 – Systematic Name

5 – Common Term – added to agreement in Sept. 2014 (worked w/ Kathryn Bennett/IEEE to amend)

RTMMS Primary Updates – Signed Agreement 12/20/12



For IEEE:

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WHEREFOR, the signatories below, having signed this License Agreement, attest as to having the authority to enter into this Agreement and, agree to comply with all of the terms and conditions, covenants and obligations contained herein.

Licensors


Signature

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Name

Managing Director, IEEE-SA
Title

20 Dec 2012
Date

Licensee


Signature

Ram D. Sriram
Name

Division Chief
Title

12-20-12
Date

- Project Web site: www.nist.gov/medicaldevices
- *NIST HL7 V2 Test Tooling Web sites:*
 - IHE-PCD Pre-Connectathon:
<http://ihe-pcd-precon.nist.gov/>
 - IHE-PCD Connectathon:
<http://ihe-pcd-con.nist.gov/>
- NIST Medical Device Terminology Service:
 - Rosetta Terminology Mapping Management System (*RTMMS*):
<http://rtmms.nist.gov/>
- NIST Implementation Conformance Statement Generator (*ICSGenerator*): **(no longer supported)**
 - http://hit-testing.nist.gov/medicaldevices/ICSGenerator/ics_download.html
- DIM Work
 - http://mdcx73-working.wikispaces.com/_NIST-ArtG

Domain Information Model UML / DIM Editor, Progress Update

Semantic interoperability of Medical Devices

Test Tool Update – Michael Faughn

Prometheus Computing

Joint HL7/IEEE 11073 Healthcare Devices Working Group

National Institute of Standards and Technology

22 January 2015 – San Antonio, Texas