Send and Receive Exchange Use Case Test Methods

Release 1 ● Version 1.0 ● October 1, 2017

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Test Methods

Release 1

Version 1.0

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Revision History

Revision Number	Revision Date	Summary of Changes	Author
1.0	10/01/2017	Initial publication	J Donnelly

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1 Introduction

The Office of the National Coordinator for Health Information Technology (ONC) is at the forefront of HHS's health IT efforts and is a resource to the entire health system to support the adoption of health information technology and the promotion of nationwide health information exchange to improve health care.

The ConCert by HIMSS ™ program is intended to compliment the ONC's efforts in this regard via the validation of HIT products against a set of standards, services and policies, aligned with the ONC CEHRT requirements whenever applicable, that helps enable secure health information exchange over the Internet. ConCert will provide a foundation for the exchange of health information across diverse entities, within communities and across the country, helping to achieve the goals of the HITECH Act. This critical part of the national health IT agenda will enable health information to follow the consumer, be available for clinical decision making, and support appropriate use of healthcare information beyond direct patient care so as to improve population health.

1.1 Purpose of this document

The purpose of this document is to provide specific guidance and clarifications to the conformity assessment testing procedures of the ConCert by HIMSS™ program. It is must be used in conjuncture with the ConCert by HIMSS™ program document which provides the overall requirements schemes for the program and sets the context and applicability of these testing methods.

1.2 Definitions[1]

The following definitions are important to keep in mind throughout this specification document:

- **Affinity Domain** is a group of healthcare enterprises that have agreed to work together using a common set of policies and share a common infrastructure. With Direct, there is an implication of shared trust anchors.
- **Certificate Authority (CA)** is defined as an organization that issues digital certificates in a public key infrastructure environment.
- **Healthcare Provider Directory (HPD)** is an IHE profile which supports management (persistence and access) to healthcare provider's information in a directory structure. Two categories of healthcare providers are included in the directory.
    - **Individual Provider** – A person who provides healthcare services, such as a physician, nurse, or pharmacist.

[1] Individual actors are defined within each test procedure.

  - **Organizational Providers** – Organizations that provide or support healthcare services, such as hospitals, Healthcare Information Exchanges (HIEs), Integrated Delivery Networks (IDNs), and Associations.

- **Healthcare Provider Directory Plus (HPD Plus)** - An enhanced version of the IHE Healthcare Provider Directory (HPD) persistence model, harmonizing it with the S&I Framework Electronic Service Information Discovery Data Model. HPD Plus is defined by the Statewide Send and Receive Patient Record Exchange Technical Specifications v1.0, and its persistence can be implemented in LDAP or in Relational Databases.

- **Health Information Exchange (HIE)** is defined as the transfer of healthcare information electronically and securely across Health Information Organizations (HIO) within a region such as a state, community, hospital system or a physician network. HIE may also denote an HIO that provides HIE services.

- **Health Information Organization (HIO)** is an organization that oversees and governs the exchange of health-related information among organizations according to nationally recognized standards.

- **Health Information Service Provider (HISP)** is defined as an entity that is responsible for delivering health information as messages between senders and receivers over the Internet.

- **IHE Cross-Enterprise Document Media Interchange (XDM) profile** is a specification or the exchange of electronic health record documents on portable media. XDM provides an option for zipped file transfer over e-mail, which is very relevant to the Direct Project specifications.

- **IHE Cross-Enterprise Document Reliable (XDR) Interchange profile** is a specification for the interchange of electronic health record documents through reliable point-to-point network communication, based on pushing information.

- **Integrating the Healthcare Enterprise (IHE)** is a group of healthcare industry stakeholders that promotes and defines coordination of established standards to provide meaningful and effective information exchange.

- **Lightweight Directory Access Protocol (LDAP)** is an application protocol for querying and modifying data of directory services implemented in Internet Protocol (IP) networks.

- **Message Delivery Notification (MDN)** is an emailed recipient advising the sender of the successful delivery of an SMTP message.

- **Nodes** are systems with IP or URL addresses owned or used by Entities to send and receive messages.

- **Private Key and Public Key** In public key cryptography, a public and private key are created simultaneously using the same algorithm (a popular one is known as RSA) by a certificate authority (CA). The private key is given only to the requesting party and the public key is made publicly available (as part of a digital certificate) in a directory that all parties can access. The private key is never shared with anyone or sent across the Internet. You use the private key to

decrypt text that has been encrypted with your public key by someone else (who can find out what your public key is from a public directory).

- **Protocol Conversion** is defined as the translation service between various messaging protocols. In the context of this document, protocol conversion refers to the step up/step down conversion needed for Direct Protocols and IHE specifications. Specifically it includes conversion to and from S/MIME/SMTP and IHE based SOAP XML.
- **Provider Directory (PD)** refers to a persistence store with entries that pertain to end users acting as individual providers or other healthcare clinicians. Also stored are entities such as organizations or departments and the relationships between providers and entities. There are two types of provider directories, ELPD and ILPD.
    - **Entity-Level Provider Directory (ELPD)** is a directory listing provider organizations.
    - **Individual-Level Provider Directory (ILPD)** is a directory listing individual providers.
- **Secure Email Transaction** is an SMTP, POP or IMAP transaction between an email client and email server secured by VPN or TLS with user/password authentication.
- **Secure/Multipurpose Internet Mail Extensions** (**S/MIME)** is a standard for public key encryption and signing of MIME (extended email) data.
- **Secure Web Service Transaction** is a web service transaction secured by VPN connectivity or TLS with mutual authentication.
- **Security Domain** is defined as the domain, specified by Domain Name(s) taken by a HISP/HIE for the control of Direct Addresses, Certificate Common Names, Nodes, and Service Endpoints.
- **Service Endpoints** is defined as a destination address for the receipt of Web Service Request messages, usually defined by a Uniform Resource Identifier (URI). In the Direct Project a Service Endpoint can also be an email address for the receipt of S/MIME/SMTP based messages (Direct Address).
- **Service Registry (SR)** is a registry which contains the complete definition (messaging framework, protocols, payload, and clinical vocabulary) of services supported by a Node to either send or receive messages.
- **Simple Mail Transfer Protocol (SMTP)** is an Internet standard for electronic mail (e-mail) transmission across Internet Protocol (IP) networks.
- **Simple Object Access Protocol (SOAP)** is a protocol specification for exchanging structured information in the implementation of Web Services in computer networks. It relies on Extensible Markup Language (XML) for its message format, and usually relies on other Application Layer protocols, most notably Hypertext Transfer Protocol (HTTP), for message negotiation and transmission.

- **Trust Anchor** is a public key and associated information that is directly trusted by an application or system to validate digital signatures, including signatures covering other public keys that are signed by the trust anchor.

    - **Uniform Resource Identifier (URI)** is a string of characters used to identify a name or a resource on the internet. The URI syntax consists of a URI scheme name (such as "http", "ftp", "mailto" or "file") followed by a colon character, and then by a scheme-specific part.

2 System Functions

2.1 System Functions

The Send and Receive Exchange Use Case includes the system functions for the following worksteps:

Priority Definition: R = Required, O = Optional

Table 3.1-1 System Function and Priority

Workstep	Priority	Description
FR-1 Send Message to HISP from Provider using XD	O	A patient record is sent by an XD Sender to the HISP/HIE.
FR-2 Send Message to HISP from Provider using SMTP	R	The SMTP Sender will send a patient record as a Secure Email Transaction Request to the HISP/HIE.
FR-3 Provider Receive Message from HISP using XD	R	The HISP/HIE will forward the patient record to the SMTP Receiver using the Provider Direct Address.
FR-4 Provider Receive Message from HISP using SMTP	R	HISP/HIE will forward the patient record to the XD Receiver.
FR-5 Send Message to HISP from another HISP using S/MIME	R	A HISP Sender will transmit a patient record as an S/MIME request to the HISP Receiver. The HISP Receiver will handle the request and accordingly route it.
FR-6 Relay of XD Provider Message by HISP	R	A patient record is sent by an XD Sender within a HISP/HIE Security Domain to the HISP/HIE Direct XD Service. Once it is received by the HISP/HIE Direct XD Service, the patient record will be transferred accordingly to the XD Receiver.
FR-7 Relay of SMTP Provider Message by HISP	R	The SMTP Sender will send a patient record as a Secure Email Transaction Request to the HISP/HIE Direct SMTP Service. Once received the HISP/HIE Direct SMTP Service will use the Provider Direct Address and securely transfer the patient record to the SMTP Receiver.
FR-8 Relay of XD Provider Message by HISP with SMTP Conversion	R	A patient record is sent by an XD Sender within a HISP/HIE Security Domain to the HISP/HIE Direct XD Service as a ProvideAndRegister Request. Once received by the HISP/HIE Direct XD Service, the patient record will be transferred accordingly to the SMTP Receiver using the Provider Direct Address.

FR-9 Relay of SMTP Provider Message by HISP with XD Conversion	R	The SMTP Sender will send a patient record to the HISP/HIE Direct SMTP Service. The patient record will be converted by the XD* Step Up Service into a ProvideAndRegister message and sent to the HISP/HIE Direct XD* services using TLS with Bidirectional Authentication to the final endpoint of the recipient XD Receiver.
FR-10 Query Healthcare Provider Directory for Direct Address	O	The EHR will query a Healthcare Provider Directory using This either a) an individual provider lookup function based on name & demographics and retrieves the desired Direct address, or b) a provider practice lookup to obtain the Direct address of a specific provider in that practice.

(i) System Function Direct Transport Test Modules

The Statewide Send and Receive Direct Transport testing modules are designed to enable entities to clearly understand the tests required to demonstrate conformance of their required Direct Transport protocols and transactions. The table below separates tests based on a segment of a Direct transaction (between a Sender and a HISP, within a HISP, or between two HISPs). The Sections and Figures referenced in Table 2 below are extracted from the IWG's Statewide Send and Receive Technical Specification to provide clarification on technical requirements and traceability of the underlying ONC Direct transport protocol for specific testing scenarios.

Table 1: System Function and Priority

Function	Description	Expected Results	Technical Specification Reference	
			Section	Figure
FR-1: XD Sender to HISP	A patient record is sent by an XD Sender to the HISP/HIE.	The patient record must be sent securely via a ProvideAndRegister Request message from the XD Sender and securely received by the HISP/HIE.	4.3.1	2
			4.3.4.2	7
			5.1.1	10
			5.1.4	15
FR-2: SMTP Sender to HISP *(Reference Section*	The SMTP Sender will send a patient record as a Secure Email Transaction Request to the HISP/HIE.	The patient record must be sent in a Secure Email Transaction by the SMTP Sender and should be securely received by the HISP/HIE.	4.3.1	2
			4.3.4.1	6
			5.1.1	10
			5.1.4	14
FR-3: HISP to SMTP Receiver	The HISP/HIE will forward the patient	The HISP/HIE must be able to route the	4.3.4.2	7

Function	Description	Expected Results	Technical Specification Reference	
			Section	Figure
(Reference Section	record to the SMTP Receiver using the Provider Direct Address.	ProvideAndRegister Request message using the recipient's Direct address and the SMTP recipient should be to receive the patient record based on the agreed upon data.	5.1.4	15
FR-4: HISP to XD Receiver *(Reference Section*	HISP/HIE will forward the patient record to the XD Receiver.	The HISP/HIE must be able to route the message using the recipient's Direct address and the XD Recipient should be able to receive the patient record based on the agreed upon data.	4.3.4.2	8
FR-5: HISP Sender to HISP Receiver via S/MIME *(Reference Section*	A HISP Sender will transmit a patient record as an S/MIME request to the HISP Receiver. The HISP Receiver will handle the request and accordingly route it.	Original message with the patient record is sent from the HISP Sender as an S/MIME message. The HISP Receiver must be able to route the message to the Intended Recipient's receiving application (SMTP or XD) based on the agreed upon data.	4.3.4	6
FR-6: XD to XD *(Reference Section*	A patient record is sent by an XD Sender within a HISP/HIE Security Domain to the HISP/HIE Direct XD Service. Once it is received by the HISP/HIE Direct XD Service, the patient record will be transferred accordingly to the XD Receiver.	The patient record must be sent securely via a ProvideAndRegister Request message from the XD Sender and securely received by the HISP/HIE.	4.3.1	2
			4.3.3	4
		The HISP/HIE must be able to route the message using the recipient's Direct address and the XD Recipient should be able to receive the patient record based on the agreed upon data.	5.1.1	10
			5.1.3	12

Function	Description	Expected Results	Technical Specification Reference	
			Section	Figure
FR-7: SMTP to SMTP *(Reference Section*	The SMTP Sender will send a patient record as a Secure Email Transaction Request to the HISP/HIE Direct SMTP Service. Once received the HISP/HIE Direct SMTP Service will use the Provider Direct Address and securely transfer the patient record to the SMTP Receiver.	The patient record must be sent in a Secure Email Transaction by the SMTP Sender and should be securely received by the HISP/HIE. The HISP/HIE must then be able to route the message using the recipient's Direct address and finally the SMTP recipient should receive the message with the patient record based on the agreed upon data.	4.3.1	2
			4.3.3	5
			5.1.1	10
			5.1.3	13
FR-8: XD to SMTP *(Reference Section*	A patient record is sent by an XD Sender within a HISP/HIE Security Domain to the HISP/HIE Direct XD Service as a ProvideAndRegister Request. Once received by the HISP/HIE Direct XD Service, the patient record will be transferred accordingly to the SMTP Receiver using the Provider Direct Address.	The patient record is sent in a Secure Web Service Transaction as a ProvideAndRegister Request message is from the XD Sender and should be securely received by the HISP/HIE. The HISP/HIE must be then able to route the message using the recipient's Direct address and the SMTP recipient should be to receive the patient record based on the agreed upon data.	4.3.1	2
			4.3.4.2	7
			5.1.1	10
			5.1.4	15
FR-9: SMTP to XD *(Reference Section*	The SMTP Sender will send a patient record to the HISP/HIE Direct SMTP Service. The patient record will be converted by the XD* Step Up Service into a ProvideAndRegister message and sent to the HISP/HIE Direct	The patient record is sent in a Secure Email Transaction and the SMTP message is securely received by the HISP/HIE. The HISP/HIE must be able to convert the XDM package to a ProvideAndRegister message and send it to HISP/HIE Direct Service.	4.3.1	2
			4.3.4.2	8
			5.1.1	10

Function	Description	Expected Results	Technical Specification Reference	
			Section	Figure
	XD* services using TLS with Bidirectional Authentication to the final endpoint of the recipient XD Receiver.	The HISP/HIE Direct service will then must be able to route the message using the recipient's Direct address and the XD Recipient should be able to receive the patient record based on the agreed upon data.	5.1.4	14

(ii) EHR and HISP/HIE Entity Direct Transport Test Matrix

As multiple endpoints may seek conformance to the Statewide Send and Receive Patient Record Exchange Technical Specifications, a summary of the required tests for a specific type of system (e.g. XD or SMTP-based sender/receiver vs. HISP) are defined in the Test Functions Based on Entity table below. such as a HISP/HIE or EHR. For EHRs or sending/receiving edge systems, the test functions are separated into the relevant XD and SMTP protocols for that particular sending/receiving system (e.g. EHR). If that sending/receiving system conducts both XD and SMTP transactions than both the XD and SMTP Functions identified must be completed.

Table 2: Test Functions Based On Entity

Entity	Function
EHR (XD protocol) ***(Each test function applies only for EHR)***	**FR-1: XD Sender to HISP** *(Reference Section*
	FR-4: HISP to XD Receiver *(Reference Section*
EHR (SMTP protocol) ***(Each test function applies only for EHR)***	**FR-2: SMTP Sender to HISP** *(Reference Section*
	FR-3: HISP to SMTP Receiver *(Reference Section*
HISP/HIE ***(Each test function applies only for HISP/HIE)***	**FR-5: HISP Sender to HISP Receiver via S/MIME** *(Reference Section*

Entity	Function
	FR-6: XD to XD *(Reference Section*
	FR-7: SMTP to SMTP *(Reference Section*
	FR-8: XD to SMTP (protocol conversion) *(Reference Section*
	FR-9: SMTP to XD (protocol conversion) *(Reference Section*

(iii) Optional Composite End-to-End Test Scenarios

The Direct Transport Tests defined in Section 5 of this document consist of test segments of Direct transport transactions. These transaction segments consist of the transaction from a Sender to a HISP, transactions within a single HISP or between two HISPs including (protocol conversion when required) and the transaction from the HISP to the Receiver. This design provides the ability to create optional composite end-to-end test scenarios for testing Direct messages across different systems including separate Sending systems, HISPs, and Receiving systems as well as transactions that cross two HISPs and their respective domains. A summary of the composite end-to-end testing scenarios within a single HISP Domain are represented in the Single HISP Domain Composite End-to-End Test Scenarios table below.

Table 3: Single HISP Domain Composite End-to-End Test Scenarios

Test Scenario	Sender Test Module	HISP Test Module	Receiver Test Module
XD to XD within a single HISP domain	**FR-1: XD Sender to HISP** *(Reference Section*	**FR-6: XD to XD** *(Reference Section*	**FR-4: HISP to XD Receiver** *(Reference Section*
SMTP to SMTP within a single HISP domain	**FR-2: SMTP Sender to HISP** *(Reference Section*	**FR-7: SMTP to SMTP** *(Reference Section*	**FR-3: HISP to SMTP Receiver** *(Reference Section*
XD to SMTP within a single HISP domain	**FR-1: XD Sender to HISP**	**FR-8: XD to SMTP (protocol conversion)**	**FR-3: HISP to SMTP Receiver**

Test Scenario	Sender Test Module	HISP Test Module	Receiver Test Module
	(Reference Section	*(Reference Section*	*(Reference Section*
SMTP to XD within a single HISP domain	**FR-2: SMTP Sender to HISP** *(Reference Section*	**FR-9: SMTP to XD (protocol conversion)** *(Reference Section*	**FR-4: HISP to XD Receiver** *(Reference Section*

In addition to the composite end-to-end test scenarios within a single HISP domain defined above, composite end-to-end test scenarios may consist of tests that cross two HISP domains. A summary of the composite end-to-end testing scenarios across multiple HISP Domains are represented in the Multiple HISP Domain Composite End-to-End Test Scenarios table below.

Table 4: Multiple HISP Domain Composite End-to-End Test Scenarios

Test Scenario	Sender Test Module	Sending System's HISP Test Module	Receiving System's HISP Test Module	Receiver Test Module
XD to XD across multiple HISP domains	**FR-1: XD Sender to HISP** *(Reference Section*	**FR-8: XD to SMTP (protocol conversion)** *(Reference Section*	**FR-5: HISP Sender to HISP Receiver via S/MIME** *(Reference Section*	**FR-4: HISP to XD Receiver** *(Reference Section*
		FR-5: HISP Sender to HISP Receiver via S/MIME *(Reference Section*	**FR-9: SMTP to XD (protocol conversion)** *(Reference Section*	
SMTP to SMTP across multiple HISP domains	**FR-2: SMTP Sender to HISP** *(Reference Section*	**FR-7: SMTP to SMTP** *(Reference Section*	**FR-5: HISP Sender to HISP Receiver via S/MIME** *(Reference Section*	**FR-3: HISP to SMTP Receiver** *(Reference Section*
		FR-5: HISP Sender to HISP Receiver via S/MIME *(Reference Section*	**FR-7: SMTP to SMTP** *(Reference Section*	

Test Scenario	Sender Test Module	Sending System's HISP Test Module	Receiving System's HISP Test Module	Receiver Test Module
XD to SMTP across multiple HISP domains	**FR-1: XD Sender to HISP** *(Reference Section*	**FR-8: XD to SMTP (protocol conversion)** *(Reference Section*	**FR-5: HISP Sender to HISP Receiver via S/MIME** *(Reference Section*	**FR-3: HISP to SMTP Receiver** *(Reference Section*
		FR-5: HISP Sender to HISP Receiver via S/MIME *(Reference Section*	**FR-7: SMTP to SMTP** *(Reference Section*	
SMTP to XD across multiple HISP domains	**FR-2: SMTP Sender to HISP** *(Reference Section*	**FR-7: SMTP to SMTP** *(Reference Section*	**FR-5: HISP Sender to HISP Receiver via S/MIME** *(Reference Section*	**FR-4: HISP to XD Receiver** (Reference Section
		FR-5: HISP Sender to HISP Receiver via S/MIME *(Reference Section*	**FR-9: SMTP to XD (protocol conversion)** *(Reference Section*	

3 Test Methods

(i) Test Actors

The workstep tests defined in this section have specific test actors relevant to each specific test module. The universe of test actors that may be involved in a test module within this Test Specification are defined below.

- **Tester –** The individual administering the test.
- **Vendor –** The organization providing and operating the EHR or HIE under test.
- **Initiating Provider –** The provider with the Sender who is sending the patient record.
- **Receiving Provider –** The provider at the Receiver who is receiving the patient record.
- **Intended Recipient -** The provider within the HISP Receiver who is receiving the patient record.
- **HISP/HIE -** An actor that serves the backbone exchange needs of Sender and Receiver actors.
- **HISP Sender -** The Sending system which is capable of providing a patient record and supplying it to another system through an S/MIME transaction.
- **HISP Receiver -** The Receiving system which is capable of decrypting and validating a message received via S/MIME.
- **XD Receiver -** The Receiving system is capable of manipulating an XDR/SOAP message (e.g. extracting, displaying, storing) which contains the recipient's Direct address.
- **XD Sender -** The Sending system which is capable of sending a conforming XD message to HISP and the message must contain the recipient's Direct address. The XD Sender must be able to handle the response received from the HISP.
- **SMTP Sender -** The Sending system which is capable of providing a patient record and supplying it to another system with Direct address through an SMTP message.
- **SMTP Receiver -** The Receiving system which is capable of manipulating a message. (e.g. extracting, displaying, storing) received via SMTP with a Direct address from the HISP.

3.1 FR-1 Send Message to HISP from Provider using XD

3.1.1 Compliance Criteria

This compliance criterion is derived from Statewide Send and Receive Patient Record Exchange which will enable healthcare providers to exchange patient records with other providers. This document describes a detailed test specification of the NwHIN Direct Framework which can be used to provide this functionality.

Priority: Required

Description:

This test verifies the ability of the XD Sender which is sending a patient record (e.g. CCD, C32, and PDF) within a HISP/HIE Security Domain as a ProvideAndRegister Request to the HISP/HIE Direct XD Service.

Purpose:

To ensure there is a valid transportation of clinical information to the HISP.

3.1.2 Test Procedures

Derived Test Requirements

3.1.2.1 TRFR-1.1: Find Provider Electronic Service Information and Send Patient Record

- A sender may query a secure Provider Directory Service to find the intended recipient's Electronic service Information including the Direct Address and to determine the recipient's demographic, professional, service, and organization information. Reference the HPDPlus Test Specification for further information.
- The XD Sender sends a patient record within a message to the HISP/HIE in a Secure Web Service Transaction. The message contains the intended recipient's Direct Address.

Test Actors

- Tester, Vendor, XD Sender, Initiating Provider, HISP/HIE

Test Environment Prerequisites

- XD Sender should use a Secure Web Service Transaction to communicate with the HISP/HIE.

Test Step TRFR1-1

Actors: Tester, XD Sender, HISP/HIE

Procedure:

The Tester initiates a ProvideAndRegister Request message from the XD Sender containing the Receiving Provider Direct Address.

The Tester sends a message to the HISP/HIE using Secure Web Service Transaction.

Expected Result:

Message is sent in a Secure Web Service Transaction.

Verification Action:

Actor	Verification Action
XD Sender	Tester shall verify ProvideAndRegister Request message is securely and successfully sent from the system. The tester may do so by comparing messages from the sender's system to the XD XDM specification. (XDR and XDM for Direct Messaging Specification) Tester will verify that the XD Sender receives a PnR response from the HISP.
HISP/HIE	Tester shall verify ProvideAndRegister Request message is securely received by the HISP/HIE and the HISP/HIE can respond properly according to XD spec. Tester may do so by comparing response from the HISP/HIE system to the XD XDM specification (XDR and XDM for Direct Messaging Specification)

3.2 FR-2 Send Message to HISP from Provider using SMTP

3.2.1 Compliance Criteria

This compliance criterion is derived from Statewide Send and Receive Patient Record Exchange which will enable healthcare providers to exchange patient records with other providers. This document describes a detailed test specification of the NwHIN Direct Framework which can be used to provide this functionality.

Priority: Required

Description:

This test verifies the ability of the SMTP Sender which is sending a patient record (e.g. CCD, C32, and PDF) within a HISP/HIE Security Domain as a SMTP Request to the HISP/HIE Direct SMTP Service.

Purpose:

To ensure there is a valid transportation of clinical information to the HISP.

3.2.2 Test Procedures

Derived Test Requirements

3.2.2.1 TRFR-2.1: Find Provider Electronic Service Information and Send Patient Record

- A sender may query a secure Provider Directory Service to find the intended recipient's Electronic Service Information including the Direct Address and to determine the recipient's demographic, professional, service, and organization information. Reference the HPDPlus Test Specification for further information.
- The SMTP Sender sends a predetermined patient record within a message to the HISP/HIE in a Secure Email Transaction. The message contains the intended recipient's Direct Address.

Test Actors

- Tester, Vendor, SMTP Sender, Initiating Provider, HISP/HIE

Test Environment Prerequisites

- SMTP Sender should use a Secure Email Transaction to communicate with the HISP/HIE.

Test Step TRFR2-1

Actors: Tester, SMTP Sender, HISP/HIE

Procedure:

The Tester initiates a SMTP Request message from the SMTP Sender using the Receiving Provider Direct Address.

The Tester sends a message to the HISP/HIE using Secure Email Transaction.

Expected Result:

Message is sent in a Secure Email Transaction.

Verification Action:

Actor	Verification Action
SMTP Sender	Tester shall verify SMTP message is securely and successfully sent from the system.
HISP/HIE	Tester shall verify SMTP message is securely received by the HISP/HIE.

3.3 FR-3 Provider Receive Message from HISP using SMTP

3.3.1 Compliance Criteria

This compliance criterion is derived from Statewide Send and Receive Patient Record Exchange which will enable healthcare providers to exchange patient records with other providers. This document describes a detailed test specification of the NwHIN Direct Framework which can be used to provide this functionality.

Priority: Required

Description:

This test verifies the ability of the SMTP Receiver to receive the patient record by interacting with the HISP/HIE.

Purpose:

To ensure there is a valid transportation of clinical information from the HISP to the SMTP Receiver.

3.3.2 Test Procedures

Derived Test Requirements

3.3.2.1 TRFR-3.1: Forward Message from HISP to SMTP Receiver

- The HISP/HIE forwards the message in a Secure Email Transaction to the SMTP Receiver. The message contains the intended recipient's Direct Address.

Test Actors

- Tester, SMTP Receiver, Receiving Provider, HISP/HIE

Test Environment Prerequisites

- SMTP Receiver should use Secure Email Transaction to communicate with the HISP/HIE.

Test Step TRFR3-1

Actors: Tester, SMTP Receiver, HISP/HIE

Procedure:

The HISP/HIE transmits the SMTP Request message to the recipient using a Secure Email Transaction.

Expected Result:

The HISP/HIE must be able to route the message using the recipient's Direct address.

SMTP recipient receives agreed upon data.

Verification Action:

Actor	Verification Action
SMTP Receiver	Tester shall verify that the message is successfully received by the SMTP Receiver
HISP/HIE	Tester shall verify a Secure Email Transaction is used from the HISP/HIE to the recipient. Tester shall verify whether the patient record is successfully sent from the HISP/HIE to the SMTP Receiver service.

3.4 FR-4 Provider Receive Message from HISP using XD

3.4.1 Compliance Criteria

This compliance criterion is derived from Statewide Send and Receive Patient Record Exchange which will enable healthcare providers to exchange patient records with other providers. This document describes a detailed test specification of the NwHIN Direct Framework which can be used to provide this functionality.

Priority: Required

Description:

This test verifies the ability of the XD Receiver to receive a patient record (e.g. CCD, C32, PDF) from a HISP/HIE.

Purpose:

To ensure there is a valid transportation of clinical information between the HISP and the XD Receiver.

3.4.2 Test Procedures

Derived Test Requirements

3.4.2.1 TRFR-4.1: Forward Message from HISP to XD Receiver

- The HISP/HIE forwards the message in a Secure Web Service Transaction to the XD Receiver. The message contains the intended recipient's Direct Address.

Test Actors

- Tester, XD Receiver, Receiving Provider, HISP/HIE

Test Environment Prerequisites

- XD Receiver should use Secure Web Service Transaction to communicate with the HISP/HIE.

Test Step TRFR4-1

Actors: Tester, XD Receiver, HISP/HIE

Procedure:

The HISP/HIE transmits the ProvideAndRegister Request message to the recipient using a Secure Web Service transaction.

Upon delivering the message to the XD Receiver, the XD Receiver sends a ProvideAndRegister Response message to the HISP/HIE.

Expected Result:

The HISP/HIE must be able to route the message using the recipient's Direct address.

XD Recipient receives agreed upon data.

Verification Action:

Actor	Verification Action
XD Receiver	Tester shall verify that the patient record is successfully received by the XD Receiver
HISP/HIE	Tester shall verify a Secure Web Service Transaction is used from the HISP/HIE to the recipient. Tester shall verify whether the patient record is successfully sent from the HISP/HIE to the XD Receiver service, by reviewing the PnR response received in HISP/HIE XD service.

3.5 FR-5 Send Message to HISP from another HISP using S/MIME

3.5.1 Compliance Criteria

This compliance criterion is derived from Statewide Send and Receive Patient Record Exchange which will enable healthcare providers to exchange patient records with other providers. This document describes a detailed test specification of the NwHIN Direct Framework which can be used to provide this functionality.

Priority: Required

Description:

This test verifies the ability of a HISP Sender which is sending a patient record (e.g. CCD, C32, and PDF) across HISP Security Domains as an S/MIME request to the HISP Receiver. The HISP Sender message may have originated as an XD or an SMTP message. The HISP Receiver will handle the final transaction and accordingly to routing information and it may end up as an SMTP or an XD message.

Purpose:

To ensure there is a valid transportation of clinical information between two providers using the transport mechanism identified.

3.5.2 Test Procedures

Derived Test Requirements

3.5.2.1 TRFR-5.1: Send Patient Record

- If the sender is starting with an XD system the message is converted to an SMTP message via the functionality described in Section **Error! Reference source not found.**., **Error! Reference source not found.**
- The HISP Sender obtains the X.509 certificate for the intended recipient via DNS or DNS/LDAP. The HISP Sender obtains the senders private key from a local store.
- The HISP Sender encrypts the S/MIME message based on the SMTP message with the recipient's certificate and signs the message with the sender's private key, per the Direct S/MIME Specification. The S/MIME message is forwarded to the HISP Receiver based on the intended recipient's direct address and the MX record of the recipient's address domain.

Test Step TRFR5-1

Actors: Tester, HISP Sender, HISP Receiver

Procedure:

The Tester initiates an SMTP Request message per Section **Error! Reference source not found.** FR2 or an XD Request message per Section **Error! Reference source not found.** FR3 resulting in an SMTP message.

The Tester HISP Sender converts the SMTP message to an S/MIME message, using the Intended Recipients certificate and the Initiating Providers private key.

The S/MIME message is sent to the HISP Receiver.

Expected Result:

Original message is sent from the HISP Sender as an S/MIME message.

Verification Action:

Actor	Verification Action
HISP Sender	Tester shall verify S/MIME message is successfully sent from the HISP Sender.
HISP Receiver	Tester shall verify S/MIME message is successfully received by the HISP Receiver. Tester may compare the message sent from the HISP Sender with the message received by the HISP Receiver.

3.5.2.2 TRFR-5.2: Receive Patient Record

- The HISP Receiver obtains the receivers private key from a local store. X.509 certificate for the sender is retrieved via DNS or DNS/LDAP.

- The HISP Receiver decrypts the S/MIME message with the recipient's private key and authenticates the message with the sender's certificate and the certificate's trust anchors, per the Direct S/MIME Specification. The decrypted SMTP message is routed to the intended recipient.

- If the recipient is receiving with an XD system the message is converted to an XD message via the functionality described in Section **Error! Reference source not found.**, **Error! Reference source not found.**. If the Receiver is SMTP, Section **Error! Reference source not found.**, **Error! Reference source not found.** is used.

- The HISP Receiver sends a Message Delivery Notification (MDN) response to the HISP Sender using the Section **Error! Reference source not found.** FR5 process (in reverse), per the Direct S/MIME Specification.

Test Actors

- Tester, Vendor, HISP Sender, HISP Receiver, Intended Recipient, Initiating Provider

Test Environment Prerequisites

- The HISP Receiver and HISP Sender must exchange trust anchors as a basis for authentication.

Test Step TRFR5-2

Actors: Tester, HISP Sender, HISP Receiver

Procedure:

The HISP Sender sends the S/MIME message to the Intended Recipient using S/MIME.

Upon receiving the S/MIME message the HISP Receiver authenticates the message using the Initiating Providers public key and its trust anchors and decrypts the message to SMTP using the Intended Recipients locally store private key.

The decrypted SMTP message is routed to the Intended Recipient using Section **Error! Reference source not found.** FR2 if the recipient uses SMTP or Section **Error! Reference source not found.** FR4 if the recipient uses XD.

The HISP Receiver sends a Message Delivery Notification (MDN) response to the HISP Sender using the Section **Error! Reference source not found.** FR5 process (in reverse).

Upon delivering the MDN to the HISP Sender, the HISP Sender provides an MDN to the Initiating Provider for SMTP, a success message for XD.

Expected Result:

The HISP Receiver must be able to route the message to the Intended Recipients receiving application (SMTP or XD).

The Intended Recipient receives agreed upon data.

The Initiating Provider receives an MDN for an SMTP initiation. An XD based system receives a success message.

Verification Action:

Actor	Verification Action
HISP Sender	Tester shall verify whether the patient record is successfully sent from HISP Sender to the HISP Receiver by reviewing the MDN response received in HISP Sender. Tester shall verify an S/MIME Transaction is used from the HISP Sender to the HISP Receiver.
HISP Receiver	The Tester shall verify that the S/MIME message was successfully decrypted and authenticated by reviewing the patient record in the Intended Recipients ultimate HISP Receiver (SMTP or XD).

3.6 FR-6 Relay of XD Provider Message by HISP

3.6.1 Compliance Criteria

This compliance criterion is derived from Statewide Send and Receive Patient Record Exchange which will enable healthcare providers to exchange patient records with other providers. This document describes a detailed test specification of the NwHIN Direct Framework which can be used to provide this functionality.

Priority: Required

Description:

This test verifies the ability of the HISP to relay the message with the patient record (e.g. CCD, C32, and PDF) from a XD Sender to a XD Receiver.

Purpose:

To ensure there is a valid transportation of clinical information between two providers using the transport mechanism identified.

3.6.2 Test Procedures

Derived Test Requirements

The test requirements for this scenario are derived from the test requirements of the sections outlined earlier in this specification and their order is defined below:

1. Test requirement TRFR-1.1
2. Route message to XD Receiver end point, based on recipient Direct address, as per the Direct Specifications. The Statewide Send and Receive Technical Specification v1.0 document is available by request through the following link: http://interopwg.org/documents/request.html

3. Test requirement TRFR-4.1

Test Actors

- Tester, Vendor, Initiating Provider, Receiving Provider, HISP/HIE

Test Environment Prerequisites

- XD Sender is configured to use a Secure Web Service Transaction when communicating with the HISP/HIE.
- XD Receiver is configured to use Secure Web Service Transaction when communicating with the HISP/HIE.

Test Steps

The test steps which include detailed information about the Actors, Procedure, Expected Results and the Verification Action are also derived from the respective test requirements and outlined below:

- Test Step TRFR1-1 corresponds to the test requirement TRFR-1.1
- Should be able to route the input message to the XD Receiver end point, based on recipient Direct address, as per Direct specs
- Test Step TRFR4-1 corresponds to the test requirement TRFR-4.1

3.7 FR-7 Relay of SMTP Provider Message by HISP

3.7.1 Compliance Criteria

This compliance criterion is derived from Statewide Send and Receive Patient Record Exchange which will enable healthcare providers to exchange patient records with other providers. This document describes a detailed test specification of the NwHIN Direct Framework which can be used to provide this functionality.

Priority: Required

Description:

This test verifies the ability of the HISP to relay a message from a SMTP Sender which is sending a patient record (e.g. CCD, C32, and PDF) to a SMTP Receiver.

Purpose:

To ensure there is a valid transportation of clinical information between two providers using the transport mechanism identified.

3.7.2 Test Procedures

Derived Test Requirements

The test requirements for this scenario are derived from the test requirements of the sections outlined earlier in this specification and their order is defined below:

1. Test requirement TRFR-2.1
2. Route message to SMTP email account, based on recipient Direct address, as per the Direct Specifications. The Statewide Send and Receive Technical Specification v1.0 document is available by request through the following link: http://interopwg.org/documents/request.html
3. Test requirement TRFR-3.1

Test Actors

- Tester, Vendor, Initiating Provider, Receiving Provider, HISP/HIE

Test Environment Prerequisites

- SMTP Sender should use a Secure Email Transaction to communicate with the HISP/HIE.
- SMTP Receiver should use Secure Email Transaction to communicate with the HISP/HIE.

Test Steps

The test steps which include detailed information about the Actors, Procedure, Expected Result and the Verification Action are also derived from the respective test requirements and outlined below:

- Test Step TRFR2-1 corresponds to the test requirement TRFR-2.1
- Should be able to route the input message to the SMTP Receiver end point, based on recipient Direct address, as per Direct specs
- Test Step TRFR3-1 corresponds to the test requirement TRFR-3.1

3.8 FR-8 Relay of XD Provider Message by HISP with SMTP Conversion

3.8.1 Compliance Criteria

This compliance criterion is derived from Statewide Send and Receive Patient Record Exchange which will enable healthcare providers to exchange patient records with other providers. This document describes a detailed test specification of the NwHIN Direct Framework which can be used to provide this functionality.

Priority: Required

Description:

This test verifies the ability of the HISP to relay the message from a XD Sender which is sending a patient record (e.g. CCD, C32, and PDF) to a SMTP Receiver.

Purpose:

To ensure there is a valid transportation of clinical information between two providers using the transport mechanism identified.

3.8.2 Test Procedures

Derived Test Requirements

The test requirements for this scenario are derived from the test requirements of the sections outlined earlier in this specification and their order is defined below:

1. Test requirement TRFR-1.1
2. Transform the input message from the XD Sender to SMTP format as per Direct Specifications.
3. Route message to SMTP email account, based on recipient Direct address, as per the Direct Specifications. The Statewide Send and Receive Technical Specification v1.0 document is available by request through the following link: http://interopwg.org/documents/request.html
4. Test requirement TRFR-3.1

Test Actors

- Tester, Vendor, Initiating Provider, Receiving Provider, HISP/HIE

Test Environment Prerequisites

- XD Sender should use a Secure Web Service Transaction to communicate with the HISP/HIE.
- SMTP Receiver should use Secure Email Transaction to communicate with the HISP/HIE.

Test Steps

The test steps which include detailed information about the Actors, Procedure, Expected Result and the Verification Action are also derived from the respective test requirements and outlined below:

- Test Step TRFR1-1 corresponds to the test requirement TRFR-1.1
- Should be able to route the input message to the SMTP Receiver end point, based on recipient Direct address, as per Direct specs
- Test Step TRFR3-1 corresponds to the test requirement TRFR-3.1

3.9 FR-9 Relay of SMTP Provider Message by HISP with XD Conversion

3.9.1 Compliance Criteria

This compliance criterion is derived from Statewide Send and Receive Patient Record Exchange which will enable healthcare providers to exchange patient records with other providers. This document describes a detailed test specification of the NwHIN Direct Framework which can be used to provide this functionality.

Priority: Required

Description:

This test verifies the ability of the HISP to relay the message from a SMTP Sender which is sending a patient record (e.g. CCD, C32, and PDF) to the XD Receiver.

Purpose:

To ensure there is a valid transportation of clinical information between two providers using the transport mechanism identified.

3.9.2 Test Procedures

Derived Test Requirements

The test requirements for this scenario are derived from the test requirements of the sections outlined earlier in this specification and their order is defined below:

1. Test requirement TRFR-2.1
2. In the event of the CCD attached in the message from the SMTP Sender then the HISP would have to use section 5.1 of the XDR and XDM for Direct Messaging spec (Packaging conversion from RFC 5322 to XDR).
3. Route message to XD Receiver end point, based on recipient Direct address, as per the Direct Specifications. The Statewide Send and Receive Technical Specification v1.0 document is available by request through the following link: http://interopwg.org/documents/request.html.
4. Test requirement TRFR-4.1

Test Actors

- Tester, Vendor, Initiating Provider, Receiving Provider, HISP/HIE

Test Environment Prerequisites

- SMTP Sender should use a Secure Email Transaction to communicate with the HISP/HIE.

- XD Receiver should use Secure Web Service Transaction to communicate with the HISP/HIE.

Test Steps

The test steps which include detailed information about the Actors, Procedure, Expected Result and the Verification Action are also derived from the respective test requirements and outlined below:

- Test Step TRFR2-1 corresponds to the test requirement TRFR-2.1
- Should be able to transform the input message from the SMTP Sender and then route it to the XD Receiver end point, based on recipient Direct address, as per Direct specs
- Test Step TRFR4-1 corresponds to the test requirement TRFR-4.1

3.10 FR-10 Query Healthcare Provider Directory for Direct Address

While HPD Plus can support searching for Direct address certificate, the current standard for Direct Certificate Discovery is the hybrid DNS CERT and LDAP look up as specified in the Applicability Statement of Secure Health Transport, and the Certificate Discovery for Direct Project Implementation Guide. Testing of certificate discovery using HPD Plus is out of scope for this document.

While HPD Plus supports searching by attributes other than name, compliance testing will focus on name searching at this point. Compliance requirements to support searching by other attributes may be added in a future version. If an implementation does support more searching options than listed in this specification, it must do so in compliance with the HPD Plus specification as well as its underlying specifications.

Test Actors

The tests defined in this section have specific test actors relevant to each specific test module. The universe of test actors that may be involved in a test module within this Test Specification are defined below.

- Tester – The individual administering the test.
- HPDRequestor – The entity querying the directory.
- HPDResponder - The entity responding to the query.

3.10.1 HPDPlus - Provider Search

3.10.1.1 Compliance Criteria

The compliance criteria are defined to ensure the HPDRequestor and the HPDResponder can communicate appropriately. As part of this communication, a provider's Direct address is retrieved based on the provider's name look up.

Priority: Required

Description:

This test verifies the ability of the HPDRequestor to retrieve the Direct address of a provider by querying based on the provider's name and obtaining a successful response.

Purpose:

To purpose of this test is to ensure there is a valid transportation of provider information between HPDRequestor and HPDResponder.

3.10.1.2 Compliance Criteria

The compliance criteria defined is intended to ensure the HPDRequestor and the HPDResponder can communicate appropriately. The primary data as part of this communication is to ensure a provider's Direct address is retrieved based on the organization's name look up of which the provider is associated with.

Priority: Required

Description:

This test verifies the ability of the HPDRequestor to retrieve the Direct address of a provider by querying based on the organization's name of which the provider is associated with and obtaining a successful response.

Purpose:

To ensure there is a valid transportation of provider information between HPDRequestor and HPDResponder.

3.10.1.3 Test Procedures

Derived Test Requirements

TRFR-1.1: Search for Provider by querying based on first name and last name.

- An HPDRequestor searches for a provider by querying based on first name and last name.

TRFR-1.2: Find the list of organizations for a specific Provider.

- An HPDRequestor finds the list of organizations for a specific provider.

TRFR-1.3: Identify the service which is the Direct service (hpdIntegrationProfile="DirectProjectSMTP") from the service details offered by the specific organization and get the Direct address.

- An HPDRequestor finds the Direct service from the various service details offered by the specific organization and retrieves the Direct address accordingly.

Test Actors

- Tester, HPDRequestor, HPDResponder

Test Environment Prerequisites

- HPDRequestor and HPDResponder may use TLS for connectivity but do not require mutual TLS.

Test Step TRFR1-1

Actors: Tester, HPDRequestor, HPDResponder

Procedure:

The Tester initiates an HPDPlus Request to the HPDResponder to search for a provider based on first name and last name (substrings). (This is a “Find Individual” type query as defined in the S&I Framework ESI Query and Response specification.)

Sample HPDPlus Request:

<soap-env:Envelope xmlns:soap-env="http://www.w3.org/2003/05/soap-envelope">

<soap-env:Body>

<dsml:batchRequest xmlns:dsml="urn:protocol.dsml.opends.org" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

<dsml:searchRequest dn="ou=HCProfessional,dc=hpd,dc=org" scope="singleLevel" derefAliases="derefFindingBaseObj">

<dsml:filter>

<dsml:and>

<dsml:substrings name="Sn">

<dsml:initial>**Ala**</dsml:initial>

</dsml:substrings>

<dsml:and>

<dsml:substrings name="givenName">

<dsml:initial>**Wood**</dsml:initial>

</dsml:substrings>

</dsml:and>

</dsml:and>

</dsml:filter>

<dsml:attributes>

<dsml:attribute name="HcSpecialisation"/>

<dsml:attribute name="hpdProviderMailingAddress"/>

<dsml:attribute name="Cn"/>

</dsml:attributes>

</dsml:searchRequest>

</dsml:batchRequest>

</soap-env:Body>

</soap-env:Envelope>

Expected Result:

The Tester ensures a successful HPDPlus Response is obtained.

Sample HPDPlus Response for the identified HPDPlus Request

<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">

<S:Body>

<batchResponse xmlns="urn:protocol.dsml.opends.org">

<searchResponse>

<searchResultEntry dn="uid=2,ou=HCProfessional,dc=hpd,dc=org">

<attr name="hpdProviderMailingAddress">

<value>256 EAST MADISON AVENUE^^NY^NY^13445</value>

<value>1299 COOLIDGE ST^^NY^NY^13577</value>

</attr>

<attr name="uid">

<value>2</value>

</attr>

<attr name="HcSpecialisation">

<value>ORTH</value>

</attr>

<attr name="Cn">

<value>**DR ALAN WOODS**</value>

</attr>

</searchResultEntry>

<searchResultDone>

<resultCode code="0"/>

</searchResultDone>

</searchResponse>

</batchResponse>

</S:Body>

</S:Envelope>

Verification Action:

Actor	Verification Action
HPDRequestor	Tester shall verify the HPDRequestor can successfully initiate a HPDPlus Request for individual provider by name. The query request shall conform to HPD query standards, contains the right search filter and requests for the appropriate attributes conforming to the HPD Plus LDAP data model.
HPDResponder	Tester shall verify the HPDResponder can successfully process the HPDPlus Request for individual provider by name and generate an appropriate response which is to be sent to the HPDRequestor based on the request initiated. Tester shall verify that the requested provider information is present in the HPDPlus Response. Tester shall verify that the HPDPlus Response contains the Provider distinguished name in the format: dn="uid=X,ou=HCProfessional,dc=hpd,dc=org", where 'X' isthe unique id of the provider..

Test Step TRFR1-2

Actors: Tester, HPDRequestor, HPDResponder

Procedure:

The tester shall utilize the Standardized Distinguished Name (dn) for the individual provider search which is defined as dn="uid=X,ou=HCProfessional, dc=hpd,dc=org", where 'X' is the unique id for the provider in the directory.

The tester will utilize the Provider distinguished name obtained from the response of test step TRFR1-1 and then query to find the list of organizations for that specific Provider.

The tester will also include in the query a request for the serviceID information.

(This is a “Find Organizations for Unique Individual” type query as defined in the S&I Framework ESI Query and Response specification.)

Sample HPDPlus Request

<soap-env:Envelope xmlns:soap-env="http://www.w3.org/2003/05/soap-envelope">

<soap-env:Body>

<dsml:batchRequest xmlns:dsml="urn:protocol.dsml.opends.org" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

<dsml:searchRequest dn="ou=HPDMembership,dc=hpd,dc=org" scope="singleLevel" derefAliases="derefFindingBaseObj">

<dsml:filter>

<dsml:and>

<dsml:equalityMatch name="hpdHasAProvider">

<dsml:value>**2**</dsml:value>

</dsml:equalityMatch>

</dsml:and>

</dsml:filter>

<dsml:attributes>

<dsml:attribute name="hpdHasAnOrg"/>

<dsml:attribute name="hpdHasAService"/>

</dsml:attributes>

</dsml:searchRequest>

</dsml:batchRequest>

</soap-env:Body>

</soap-env:Envelope>

Expected Result:

The Tester shall verify a successful response is obtained for the HPDPlus Request initiated.

[Note: hpdMemberName was a convenience method to get organization name without having to do another query. However, just name may not be sufficient for a user to select the right organization. Therefore the additional query to get organizational details may be required.]

Sample HPDPlus Response for the HPDPlus Request initiated

<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">

<S:Body>

<batchResponse xmlns="urn:protocol.dsml.opends.org">

<searchResponse>

<searchResultEntry dn="hpdMemberId=2,ou=HPDMembership,dc=hpd,dc=org">

<attr name="hpdHasAnOrg">

<value> uid=20,ou=HcRegulatedOrganization,dc=hpd,dc=org </value>

</attr>

<attr name="hpdMemberId">

<value>**2**</value>

</attr>

<attr name="hpdHasAService">

<value>hpdServiceId=2,ou=HPDElectronicService,dc=hpd,dc=org</value>

</attr>

</searchResultEntry>

<searchResultEntry dn="hpdMemberId=3,ou=HPDMembership,dc=hpd,dc=org">

<attr name="hpdHasAnOrg">

<value> uid=30,ou=HcRegulatedOrganization,dc=hpd,dc=org </value>

</attr>

<attr name="hpdMemberId">

<value>**3**</value>

</attr>

<attr name="hpdHasAService">

<value>hpdServiceId=4,ou=HPDElectronicService,dc=hpd,dc=org</value>

<value>hpdServiceId=3,ou=HPDElectronicService,dc=hpd,dc=org</value>

</attr>

</searchResultEntry>

<searchResultDone>

<resultCode code="0"/>

</searchResultDone>

</searchResponse>

</batchResponse>

```
</S:Body>
</S:Envelope>
```

Using the organization ID returned in the response, the requestor can query for additional attributes of the organization, such as organization name, to help with user selection of the right organization. (This is a "Find Unique Organization" type query as defined in the S&I Framework ESI Query and Response specification.)

Sample HPDPlus Request for Organizational Attributes:

```
<soap-env:Envelope xmlns:soap-env="http://www.w3.org/2003/05/soap-envelope">
    <soap-env:Body>
      <dsml:batchRequest xmlns:dsml="urn:protocol.dsml.opends.org"
xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance">
                <dsml:searchRequest dn="ou=HCRegulatedOrganization,dc=hpd,dc=org"
scope="singleLevel" derefAliases="derefFindingBaseObj">
                        <dsml:filter>
                                <dsml:or>
                                        <dsml:equalityMatch name="uid">
                                                <dsml:value>20</dsml:value>
                                        </dsml:equalityMatch>
                                        <dsml:or>
                                                <dsml:equalityMatch name="uid">
                                                        <dsml:value>30</dsml:value>
                                                </dsml:equalityMatch>
                                        </dsml:or>
                                </dsml:or>
                        </dsml:filter>
                        <dsml:attributes>
                                <dsml:attribute name="HcRegisteredName"/>
                                <dsml:attribute name="hpdProviderPracticeAddress"/>
                        </dsml:attributes>
                </dsml:searchRequest>
```

```
            </dsml:batchRequest>
      </soap-env:Body>
</soap-env:Envelope>
```

Sample HPDPlus Response for the HPDPlus Request for Organizational Attributes:

```
<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
      <S:Body>
            <batchResponse xmlns="urn:protocol.dsml.opends.org">
                <searchResponse>
                <searchResultEntry dn="uid=20,ou=HcRegulatedOrganization,dc=hpd,dc=org">
                        <attr name="HcRegisteredName">
                              <value> WOODS ORTHO CARE</value>
                        </attr>
                        <attr name="hpdProviderPracticeAddress">
                              <value>123 FORTH ST^^NY^NY^123345</value>
                        </attr>
                </searchResultEntry>
                <searchResultEntry dn="uid=30,ou=HcRegulatedOrganization,dc=hpd,dc=org">
                        <attr name="HcRegisteredName">
                              <value>MAHATTAN WOODS CLINIC</value>
                        </attr>
                        <attr name="hpdProviderPracticeAddress">
                              <value>100 Main Ave^^New York^NY^12345</value>
                        </attr>
                </searchResultEntry>
                <searchResultDone>
                        <resultCode code="0"/>
                </searchResultDone>
            </searchResponse>
       </batchResponse>
    </S:Body>
```

</S:Envelope>

User can make a selection on the organization based on organizational attributes returned.

Verification Action:

Actor	Verification Action
HPDRequestor	Tester shall verify the HPDRequestor can successfully initiate HPDPlus Requests for organizations associated with a provider and relevant attributes of the organization. The query requests shall conform to HPD query standards, contain the right search filter and request for the appropriate attributes conforming to the
HPDResponder	Tester shall verify the HPDResponder can successfully process the HPDPlus Requests for organizations associated with a provider and relevant attributes of the organization, and generate appropriate responses to be sent to the HPDRequestor based on the requests initiated. Tester shall verify that the list of organizations for a specific provider is obtained in the HPDPlus Response.

Test Step TRFR1-3

Actors: Tester, HPDRequestor, HPDResponder

Procedure:

The tester shall identify a specific organization from the response of test step TRFR1-2. The requesting system shall issue the appropriate query for electronic service details for the selected provider at the selected organization to identify the Direct service and obtain the Direct address. (This can be considered part of a "Find Organizations for Unique Individual" type query as defined in the S&I Framework ESI Query and Response specification that finds services information given an individual-organization relationship.)

Sample HPDPlus Request

<soap-env:Envelope xmlns:soap-env="http://www.w3.org/2003/05/soap-envelope">

<soap-env:Body>

<dsml:batchRequest xmlns:dsml="urn:protocol.dsml.opends.org" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

<dsml:searchRequest dn="ou=HPDElectronicService,dc=hpd,dc=org" scope="singleLevel" derefAliases="neverDerefAliases" sizeLimit="100">

<dsml:filter>

<dsml:or>

<dsml:equalityMatch name="hpdServiceId">

<dsml:value>**3**</dsml:value>

</dsml:equalityMatch>

<dsml:or>

<dsml:equalityMatch name="hpdServiceId">

<dsml:value>**4**</dsml:value>

</dsml:equalityMatch>

</dsml:or>

</dsml:or>

</dsml:filter>

<dsml:attributes>

<dsml:attribute name="hpdServiceAddress"/>

<dsml:attribute name="hpdIntegrationProfile"/>

<dsml:attribute name="hpdContentProfile/>

</dsml:attributes>

</dsml:searchRequest>

</dsml:batchRequest>

</soap-env:Body>

</soap-env:Envelope>

Expected Result:

The Tester shall verify a successful response is obtained for the HPDPlus Request initiated.

Sample HPDPlus Response for the HPDPlus Request initiated

<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">

<S:Body>

<batchResponse xmlns="urn:protocol.dsml.opends.org">

<searchResponse>

<searchResultEntry dn="hpdServiceId=3,ou=HPDElectronicService,dc=hpd,dc=org">

<attr name="hpdIntegrationProfile">

<value>**DIRECTProjectSMTP** </value>

</attr>

<attr name="hpdServiceAddress">

<value>DOCTOR.ALANWOODS@NYCLINIC.HISP.COM</value>

</attr>

<attr name="hpdContentProfile">

<value>**PDF**</value>

</attr>

<attr name="hpdServiceId">

<value>**3**</value>

</attr>

</searchResultEntry>

<searchResultEntry dn="hpdServiceId=4,ou=HPDElectronicService,dc=hpd,dc=org">

<attr name="hpdIntegrationProfile">

<value>**XDS:DocumentRepository:Provide&Register** </value>

</attr>

<attr name="hpdServiceAddress">

<value>HTTP://NYCLINIC/REPOSITORY</value>

</attr>

<attr name="hpdContentProfile">

<value> **HITSP C32**</value>

</attr>

<attr name="hpdServiceId">

<value>**4**</value>

</attr>

</searchResultEntry>

<searchResultDone>

<resultCode code="0"/>

</searchResultDone>

</searchResponse>

</batchResponse>

</S:Body>

</S:Envelope>

Verification Action:

Actor	Verification Action
HPDRequestor	Tester shall verify the HPDRequestor can successfully initiate an HPDPlus Request for electronic service information based on the user's selection of provider and associated organization. The query request shall be for the right service entry based on the selected user and organization, conform to HPD query standards, contain the right search filter and request for the appropriate attributes, including service integration profile and service address, conforming to the HPD Plus LDAP data model.
HPDResponder	Tester shall verify the HPDResponder can successfully process the HPDPlus Request for electronic servie information and generate an appropriate response which is to be sent to the HPDRequestor based on the initiated request. Tester shall verify that a valid email address is returned in the HPDPlus Response for the servie where the integration profile isDirectProjectSMTP. Tester shall verify that the result code = "0" in the HPDPlus Response obtained.

3.10.2 HPDPlus - Provider Search via Organization

3.10.2.1 Test Procedures

Derived Test Requirements

TRFR-2.1: Obtain list of organizations by querying on organization name (approximate match).

- An HPDRequestor obtains a list of organizations by querying based on organization name (approximate match).

TRFR-2.2: For a specific organization, obtain a list of providers by provider name.

- An HPDRequestor obtains the list of providers for a specific organization.

TRFR-2.3: Identify the service which is the “Direct service” (hpdIntegrationProfile=”DirectProjectSMTP”) from the service details offered by the organization the specific provider is associated with and obtain the Direct address.

- An HPDRequestor finds the Direct service from the various service details offered by the organization the specific provider is associated with and retrieves the Direct address accordingly.

Test Actors

- Tester, HPDRequestor, HPDResponder

Test Environment Prerequisites

- HPDRequestor and HPDResponder may use TLS for connectivity but do not require mutual TLS.

Test Step TRFR2-1

Actors: Tester, HPDRequestor, HPDResponder

Procedure:

The Tester initiates an HPDPlus Request to the HPDResponder to obtain a list of organizations based on the organization name search query (approximate match). (This is a “Find Organizations” type query as defined in the S&I Framework ESI Query and Response specification.)

Sample HPDPlus Request:

<soap-env:Envelope xmlns:soap-env="http://www.w3.org/2003/05/soap-envelope" xmlns:a="http://www.w3.org/2005/08/addressing">

<soap-env:Header>

<a:Action soap-env:mustUnderstand="0">urn:ihe:iti:hpd:2010:ProviderInformationQueryRequest</a:Action>

<a:MessageID soap-env:mustUnderstand="0">urn:uuid:6d296e90-e5dc-43d0-b455-7c1f3eb35d83</a:MessageID>

</soap-env:Header>

<soap-env:Body>

<dsml:batchRequest xmlns:dsml="urn:oasis:names:tc:DSML:2:0:core" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

<dsml:searchRequest dn="ou=HCRequlatedOrganization,dc=hpd,dc=org" scope="singleLevel" derefAliases="derefFindingBaseObj">

<dsml:filter>

<dsml:and>

<dsml:substrings name="o">

<dsml:initial>THOMAS</dsml:initial>

</dsml:substrings>

</dsml:and>

</dsml:filter>

<dsml:attributes>

<dsml:attribute name="o"/>

</dsml:attributes>

</dsml:searchRequest>

</dsml:batchRequest>

</soap-env:Body>

</soap-env:Envelope>

Expected Result:

The Tester ensures a successful HPDPlus Response is obtained.

Sample HPDPlus Response for the identified HPDPlus Request

<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">

<S:Header>

<To xmlns="http://www.w3.org/2005/08/addressing">http://www.w3.org/2005/08/addressing/anonymous</To>

<Action xmlns="http://www.w3.org/2005/08/addressing">urn:ihe:iti:hpd:2010:ProviderInformationDirectory_PortType:ProviderInformationQueryRequestResponse</Action>

<MessageID xmlns="http://www.w3.org/2005/08/addressing">uuid:5897be8d-efb3-4069-a210-b806f0e6edaf</MessageID>

<RelatesTo xmlns="http://www.w3.org/2005/08/addressing">urn:uuid:6d296e90-e5dc-43d0-b455-7c1f3eb35d83</RelatesTo>

</S:Header>

<S:Body>

<batchResponsexmlns="urn:oasis:names:tc:DSML:2:0:core">

<searchResponse>

<searchResultEntry dn="uid=1,ou=HCRegulatedOrganization,dc=hpd,dc=org">

<attr name="uid">

<value>1</value>

</attr>

<attr name="o">

<value>THOMAS JONES PRIVATE PRACTICE</value>

</attr>

</searchResultEntry>

<searchResultDone>

<resultCode code="0"/>

</searchResultDone>

</searchResponse>

</batchResponse>

</S:Body>

</S:Envelope>

Verification Action:

Actor	Verification Action
HPDRequestor	Tester shall verify the HPDRequestor can successfully initiate a HPDPlus Request for organization by name. The query request shall conform to HPD query standards, contains the right search filter and requests for the appropriate attributes conforming to the HPD Plus LDAP data model.

HPDResponder	Tester shall verify the HPDResponder can successfully process the HPDPlus Request for organization by name and generate an appropriate response which is to be sent to the HPDRequestor based on the request initiated. Tester shall verify that the list of organizations in the HPDPlus Response is relevant to the request based on the organization name search query (approximate match). Tester shall verify that the result code = "0" in the HPDPlus Response obtained.

Test Step TRFR2-2

Actors: Tester, HPDRequestor, HPDResponder

Procedure:

The tester will select an organization from the organizations obtained from the response of test step TRFR2-1. The requesting system will use the distinguished name of the selected organization to query to find the list of providers by provider name for that specific organization. (This is a "Find Individuals for Unique Organization" type query as defined in the S&I Framework ESI Query and Response specification.)

Sample HPDPlus Request

<soap-env:Envelope xmlns:soap-env="http://www.w3.org/2003/05/soap-envelope" xmlns:a="http://www.w3.org/2005/08/addressing">

<soap-env:Header>

<a:Action soap-env:mustUnderstand="0">urn:ihe:iti:hpd:2010:ProviderInformationQueryRequest</a:Action>

<a:MessageID soap-env:mustUnderstand="0">urn:uuid:6d296e90-e5dc-43d0-b455-

7c1f3eb35d83</a:MessageID>

</soap-env:Header>

<soap-env:Body>

<dsml:batchRequest xmlns:dsml="urn:oasis:names:tc:DSML:2:0:core" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

<dsml:searchRequest dn="ou=HPDProviderMembership,dc=hpd,dc=org" scope="singleLevel" derefAliases="derefFindingBaseObj">

<dsml:filter>

<dsml:and>

<dsml:equalityMatch name="hpdHasAnOrg">

<dsml:value> uid=1,ou=HCRegulatedOrganization,dc=hpd,dc=org </dsml:value>

</dsml:equalityMatch>

</dsml:and>

</dsml:filter>

<dsml:attributes>

<dsml:attribute name="hpdHasAProvider"/><dsml:attribute name="hpdHasAService"/>

</dsml:attributes>

</dsml:searchRequest>

</dsml:batchRequest>

</soap-env:Body>

</soap-env:Envelope>

Expected Result:

The Tester shall verify a successful response is obtained for the HPDPlus Request initiated.

Sample HPDPlus Response for the HPDPlus Request initiated

<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">

<S:Header>

<To xmlns="http://www.w3.org/2005/08/addressing">http://www.w3.org/2005/08/addressing/anonymous</To>

<Action xmlns="http://www.w3.org/2005/08/addressing">urn:ihe:iti:hpd:2010:ProviderInformationDirectory_PortType:ProviderInformationQueryRequestResponse</Action>

<MessageID xmlns="http://www.w3.org/2005/08/addressing">uuid:1fa9f09a-409c-4318-9f15-8e938dab724c</MessageID>

<RelatesTo xmlns="http://www.w3.org/2005/08/addressing">urn:uuid:6d296e90-e5dc-43d0-b455-7c1f3eb35d83</RelatesTo>

</S:Header>

<S:Body>

<batchResponsexmlns="urn:oasis:names:tc:DSML:2:0:core">

<searchResponse>

<searchResultEntry dn="hpdMemberId=1,ou=HPDMembership,dc=hpd,dc=org">

<attr name="hpdMemberId">

<value>1</value>

</attr>

<attr name="hpdHasAService">

<value>hpdServiceId=1,ou=HPDElectronicService,dc=hpd,dc=org</value>

</attr>

<attr name="hpdHasAProvider">

<value>uid=2,ou=HCProfessional,dc=hpd,dc=org</value>

</attr>

</searchResultEntry>

<searchResultDone>

<resultCode code="0"/>

</searchResultDone>

</searchResponse>

</batchResponse>

</S:Body>

</S:Envelope>

The provider id obtained from the response above can be used to query for more attributes on the provider, including provider name. (This is a “Find Unique Individual” type query as defined in the S&I Framework ESI Query and Response specification.)

Sample HPDPlus Request for Provider Attributes:<soap-env:Envelope xmlns:soap-env="http://www.w3.org/2003/05/soap-envelope">

<soap-env:Body>

<dsml:batchRequest xmlns:dsml="urn:protocol.dsml.opends.org" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

<dsml:searchRequest dn="ou=HCProfessional,dc=hpd,dc=org" scope="singleLevel" derefAliases="derefFindingBaseObj">

<dsml:filter>

<dsml:equalityMatch name="uid">

<dsml:value>**2**</dsml:value>

</dsml:equalityMatch>

</dsml:filter>

<dsml:attributes>

<dsml:attribute name="HcSpecialisation"/>

<dsml:attribute name="hpdProviderMailingAddress"/>

<dsml:attribute name="Cn"/>

</dsml:attributes>

</dsml:searchRequest>

</dsml:batchRequest>

</soap-env:Body>

</soap-env:Envelope>

Sample HPDPlus Response for the Identified HPDPlus Request for Provider Attributes:

<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">

<S:Body>

<batchResponse xmlns="urn:protocol.dsml.opends.org">

<searchResponse>

<searchResultEntry dn="uid=2,ou=HCProfessional,dc=hpd,dc=org">

<attr name="hpdProviderMailingAddress">

<value>256 EAST MADISON AVENUE^^NY^NY^13445</value>

<value>1299 COOLIDGE ST^^NY^NY^13577</value>

</attr>

<attr name="uid">

<value>2</value>

</attr>

<attr name="HcSpecialisation">

<value>ORTH</value>

</attr>

<attr name="Cn">

<value>**DR ALAN WOODS**</value>

</attr>

</searchResultEntry>

<searchResultDone>

<resultCode code="0"/>

</searchResultDone>

</searchResponse>

</batchResponse>

</S:Body>

</S:Envelope>

Users can make a selection on provider based on the provider attributes returned above.

Verification Action:

Actor	Verification Action
HPDRequestor	Tester shall verify the HPDRequestor can successfully initiate the appropriate HPDPlus Requests to get the list of providers associated with the selected organization and get relevant attributes on the providers, including name. The query requests shall conform to HPD query standards, contains the right search filter and requests for the appropriate attributes conforming to the HPD Plus LDAP data model.
HPDResponder	Tester shall verify the HPDResponder can successfully process the HPDPlus Requests and generate appropriate responses to be sent to the HPDRequestor based on the requests initiated. Tester shall verify that the list of providers by provider name for that specific organization can be obtained in the HPDPlus Responses. Tester shall verify that the result code = “0” in the HPDPlus Response obtained.

Test Step TRFR2-3

Actors: Tester, HPDRequestor, HPDResponder

Procedure:

The tester shall identify a specific provider by provider name from the response of test step TRFR1-2. Accordingly, a query will be initiated to identify the Direct service from the service details offered by the organization to which the specific provider is associated with and obtain the Direct address of the specific provider.

(This can be considered part of a "Find Organizations for Unique Individual" type query as defined in the S&I Framework ESI Query and Response specification that gets service information given an individual-organization relationship.)

Sample HPDPlus Request

<soap-env:Envelope xmlns:soap-env="http://www.w3.org/2003/05/soap-envelope" xmlns:a="http://www.w3.org/2005/08/addressing">

<soap-env:Header>

<a:Action soap-env:mustUnderstand="0">urn:ihe:iti:hpd:2010:ProviderInformationQueryRequest</a:Action>

<a:MessageID soap-env:mustUnderstand="0">urn:uuid:6d296e90-e5dc-43d0-b455-7c1f3eb35d83</a:MessageID>

</soap-env:Header>

<soap-env:Body>

<dsml:batchRequest xmlns:dsml="urn:oasis:names:tc:DSML:2:0:core" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">

<dsml:searchRequest dn="ou=HPDElectronicService,dc=hpd,dc=org" scope="singleLevel" derefAliases="neverDerefAliases" sizeLimit="100">

<dsml:filter>

<dsml:or>

<dsml:equalityMatch name="hpdServiceId">

<dsml:value>1</dsml:value>

</dsml:equalityMatch>

</dsml:or>

</dsml:filter>

<dsml:attributes>

<dsml:attribute name="hpdServiceAddress"/>

<dsml:attribute name="hpdIntegrationProfile"/>

<dsml:attribute name="hpdContentProfile"/>

</dsml:attributes>

</dsml:searchRequest>

</dsml:batchRequest>

</soap-env:Body>

</soap-env:Envelope>

Expected Result:

The Tester shall verify a successful response is obtained for the HPDPlus Request initiated.

<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">

<S:Header>

<To xmlns="http://www.w3.org/2005/08/addressing">http://www.w3.org/2005/08/addressing/anonymous</To>

<Action xmlns="http://www.w3.org/2005/08/addressing">urn:ihe:iti:hpd:2010:ProviderInformationDirectory_PortType:ProviderInformationQueryRequestResponse</Action>

<MessageID xmlns="http://www.w3.org/2005/08/addressing">uuid:d57a0ced-c277-4807-9061-ea429eafd0f1</MessageID>

<RelatesTo xmlns="http://www.w3.org/2005/08/addressing">urn:uuid:6d296e90-e5dc-43d0-b455-7c1f3eb35d83</RelatesTo>

</S:Header>

<S:Body>

<batchResponsexmlns="urn:oasis:names:tc:DSML:2:0:core">

<searchResponse>

<searchResultEntry dn="hpdServiceId=1,ou=HPDElectronicService,dc=hpd,dc=org">

<attr name="hpdIntegrationProfile">

<value>DIRECTProjectSMTP</value>

</attr>

<attr name="hpdServiceAddress">

<value>DOCTORJONES@HISPA.COM</value>

```
</attr>
<attr name="hpdContentProfile">
<value>PDF</value>
</attr>
<attr name="hpdServiceId">
<value>1</value>
</attr>
</searchResultEntry>
<searchResultDone>
<resultCode code="0"/>
</searchResultDone>
</searchResponse>
</batchResponse>
</S:Body>
</S:Envelope>
```


Verification Action:

Actor	Verification Action
HPDRequestor	Tester shall verify the HPDRequestor can successfully initiate an HPDPlus Request for electronic service information for the selected provider from an organization. The query request shall be for the right service entry(ies) for the selected provider at the selected organization, conform to HPD query standards, contain the right search filter and request for the appropriate attributes conforming to the HPD Plus LDAP data model.

HPDResponder	Tester shall verify the HPDResponder can successfully process the HPDPlus Request for electronic service information and generate an appropriate response which is to be sent to the HPDRequestor based on the request initiated. Tester shall verify that a valid email address is obtained in the HPDPlus Response for the SMTP service or XD protocol used.

3.10.3 HPDPlus – Organization Search

3.10.3.1 Compliance Criteria

The compliance criteria defined is intended to ensure the HPDRequestor and the HPDResponder can communicate appropriately. The primary data as part of this communication is to ensure an organizational provider's Direct address is retrieved based on the organization's name look up.

Priority: Required

Description:

This test verifies the ability of the HPDRequestor to retrieve the Direct address of an organizational provider by querying based on the organization's name and obtaining a successful response.

Purpose:

To ensure there is a valid transportation of provider information between HPDRequestor and HPDResponder.

3.10.3.2 Test Procedures

Derived Test Requirements

TRFR-3.1: Obtain a list of organizations by querying by organization name (approximate match), along with the list of services each matching organization provides.

- An HPDRequestor obtains a list of organizations by querying based on organization name

(approximate match).

TRFR-3.2: Select an organization. Identify the service which is the “Direct service” (hpdIntegrationProfile=”DirectProjectSMTP”) from the service details offered by the organization and obtain the Direct address.

- An HPDRequestor finds the Direct service from the various service details offered by the organization and then retrieves the Direct address accordingly.

Test Actors

- Tester, HPDRequestor, HPDResponder

Test Environment Prerequisites

- HPDRequestor and HPDResponder may use TLS for connectivity but do not require mutual TLS.

Test Step TRFR3-1

Actors: Tester, HPDRequestor, HPDResponder

Procedure:

The Tester initiates an HPDPlus Request to the HPDResponder to obtain a list of organizations based on the organization name search query (approximate match). (This is a “Find Organizations” type query as defined in the S&I Framework ESI Query and Response specification.)

Sample HPDPlus Request:

<soap-env:Envelope xmlns:soap-env="http://www.w3.org/2003/05/soap-envelope" xmlns:a="http://www.w3.org/2005/08/addressing">
<soap-env:Header>
<a:Action soap-env:mustUnderstand="0">urn:ihe:iti:hpd:2010:ProviderInformationQueryRequest</a:Action>
<a:MessageID soap-env:mustUnderstand="0">urn:uuid:6d296e90-e5dc-43d0-b455-7c1f3eb35d83</a:MessageID>
</soap-env:Header>

<soap-env:Body>

<dsml:batchRequest xmlns:dsml="urn:oasis:names:tc:DSML:2:0:core" xmlns:xsd="http://www.w3.org/2001/XMLSchema" xmlns:xsi="http://www.w3.org/2001/XMLSchema- instance">

<dsml:searchRequest dn="ou=HCRequlatedOrganization,dc=hpd,dc=org" scope="singleLevel" derefAliases="derefFindingBaseObj">

<dsml:filter>

<dsml:and>

<dsml:substrings name="o">

<dsml:initial>THOMAS</dsml:initial>

</dsml:substrings>

</dsml:and>

</dsml:filter>

<dsml:attributes>

<dsml:attribute name="o"/>

</dsml:attributes>

<dsml:attributes>

<dsml:attribute name="hpdHasAService"/>

</dsml:attributes>

</dsml:searchRequest>

</dsml:batchRequest>

</soap-env:Body>

</soap-env:Envelope>

Expected Result:

The Tester ensures a successful HPDPlus Response is obtained.

Sample HPDPlus Response for the identified HPDPlus Request

<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">

<S:Header>

<To xmlns="http://www.w3.org/2005/08/addressing">http://www.w3.org/2005/08/addressing/anonymous</To >

<Action xmlns="http://www.w3.org/2005/08/addressing">urn:ihe:iti:hpd:2010:ProviderInformationDirectory_PortT y pe:ProviderInformationQueryRequestResponse</Action>

<MessageID xmlns="http://www.w3.org/2005/08/addressing">uuid:5897be8d-efb3-4069-a210-b806f0e6edaf</MessageID>
<RelatesTo xmlns="http://www.w3.org/2005/08/addressing">urn:uuid:6d296e90-e5dc-43d0-b455-7c1f3eb35d83</RelatesTo>
</S:Header>
<S:Body>
<batchResponsexmlns="urn:oasis:names:tc:DSML:2:0:core">
<searchResponse>
<searchResultEntry dn="uid=1,ou=HCRegulatedOrganization,dc=hpd,dc=org">
<attr name="uid">
<value>1</value>
</attr>
<attr name="o">
<value>THOMAS JONES PRIVATE PRACTICE</value>
</attr>
<attr name="hpdHasAService">
<value>hpdServiceId=5,ou=HPDElectronicService,dc=hpd,dc=org</value>
<value>hpdServiceId=6,ou=HPDElectronicService,dc=hpd,dc=org</value>
</attr>
</searchResultEntry>
<searchResultDone>
<resultCode code="0"/>
</searchResultDone>
</searchResponse>
</batchResponse>
</S:Body>
</S:Envelope>

Verification Action:

Actor	Verification Action
HPDRequestor	Tester shall verify the HPDRequestor can successfully initiate a HPDPlus Request for organization by name. The query request shall conform to HPD query standards, contains the right search filter and requests for the appropriate attributes conforming to the HPD Plus LDAP data model.

HPDResponder	Tester shall verify the HPDResponder can successfully process the HPDPlus Request for organization and generate an appropriate response which is to be sent to the HPDRequestor based on the request initiated. Tester shall verify that the list of organizations in the HPDPlus Response is relevant to the request based on the organization name search query (approximate match). Tester shall verify that the result code = “0” in the HPDPlus Response obtained.

Test Step TRFR3-2

Actors: Tester, HPDRequestor, HPDResponder

Procedure:

The tester shall identify a specific organization from the response of test step TRFR3-1. Accordingly, a query will be initiated to identify the Direct service from the service details offered by the organization to which the specific provider is associated with and obtain the Direct address of the specific provider.

(This can be considered part of a “Find Unique Organizations” type query as defined in the S&I Framework ESI Query and Response specification that gets the electronic service information for the organization.)

Sample HPDPlus Request

<soap-env:Envelope xmlns:soap-env="http://www.w3.org/2003/05/soap-envelope" xmlns:a="http://www.w3.org/2005/08/addressing">

<soap-env:Header>

<a:Action soap-env:mustUnderstand="0">urn:ihe:iti:hpd:2010:ProviderInformationQueryRequest</a:Action>

<a:MessageID soap-env:mustUnderstand="0">urn:uuid:6d296e90-e5dc-43d0-b455-7c1f3eb35d83</a:MessageID>

</soap-env:Header>

<soap-env:Body>

<dsml:batchRequest xmlns:dsml="urn:oasis:names:tc:DSML:2:0:core" xmlns:xsd="http://www.w3.org/2001/XMLSchema"

xmlns:xsi="http://www.w3.org/2001/XMLSchema- instance">
<dsml:searchRequest dn="ou=HPDElectronicService,dc=hpd,dc=org" scope="singleLevel" derefAliases="neverDerefAliases" sizeLimit="100">
<dsml:filter>
<dsml:or>
<dsml:equalityMatch name="hpdServiceId">
<dsml:value>5</dsml:value>
</dsml:equalityMatch>
<dsml:or>
<dsml:equalityMatch name="hpdServiceId">
<dsml:value>6</dsml:value>
</dsml:equalityMatch>
</dsml:or>
</dsml:or>
</dsml:filter>
<dsml:attributes>
<dsml:attribute name="hpdServiceAddress"/>
<dsml:attribute name="hpdIntegrationProfile"/>
<dsml:attribute name="hpdContentProfile"/>
</dsml:attributes>
</dsml:searchRequest>
</dsml:batchRequest>
</soap-env:Body>
</soap-env:Envelope>

Expected Result:

The Tester shall verify a successful response is obtained for the HPDPlus Request initiated.

<S:Envelope xmlns:S="http://www.w3.org/2003/05/soap-envelope">
<S:Header>
<To xmlns="http://www.w3.org/2005/08/addressing">http://www.w3.org/2005/08/addressing/anonymous</To>
<Action xmlns="http://www.w3.org/2005/08/addressing">urn:ihe:iti:hpd:2010:ProviderInformationDirectory_PortTy pe:ProviderInformationQueryRequestResponse</Action>
<MessageID xmlns="http://www.w3.org/2005/08/addressing">uuid:d57a0ced-c277-4807-9061-

ea429eafd0f1</MessageID>
<RelatesTo xmlns="http://www.w3.org/2005/08/addressing">urn:uuid:6d296e90-e5dc-43d0-b455-7c1f3eb35d83</RelatesTo>
</S:Header>
<S:Body>
<batchResponsexmlns="urn:oasis:names:tc:DSML:2:0:core">
<searchResponse>
<searchResultEntry dn="hpdServiceId=5,ou=HPDElectronicService,dc=hpd,dc=org">
<attr name="hpdIntegrationProfile">
<value>DIRECTProjectSMTP</value>
</attr>
<attr name="hpdServiceAddress">
<value>ThomasJonesPractice@HISPA.COM</value>
</attr>
<attr name="hpdContentProfile">
<value>PDF</value>
</attr>
<attr name="hpdServiceId">
<value>5</value>
</attr>
</searchResultEntry>
<searchResultEntry dn="hpdServiceId=6,ou=HPDElectronicService,dc=hpd,dc=org">
<attr name="hpdIntegrationProfile">
<value>**XDS:DocumentRepository:Provide&Register** </value>
</attr>
<attr name="hpdServiceAddress">
<value>HTTP://THOMASJONESPRACTICE/REPOSITORY</value>
</attr>
<attr name="hpdContentProfile">
<value> **HITSP C32**</value>
</attr>
<attr name="hpdServiceId">
<value>**6**</value>
</attr>
</searchResultEntry>
<searchResultDone>
<resultCode code="0"/>

</searchResultDone>
</searchResponse>
</batchResponse>
</S:Body>
</S:Envelope>

Verification Action:

Actor	Verification Action
HPDRequestor	Tester shall verify the HPDRequestor can successfully initiate an HPDPlus Request for electronic service information. The query request shall conform to HPD query standards, contains the right search filter and requests for the appropriate attributes conforming to the HPD Plus LDAP data model.
HPDResponder	Tester shall verify the HPDResponder can successfully process the HPDPlus Request for electronic service information and generate an appropriate response which is to be sent to the HPDRequestor based on the request initiated. Tester shall verify that a valid email address is obtained in the HPDPlus Response for the SMTP service or XD protocol used. Tester shall verify that the result code = “0” in the HPDPlus Response obtained.