



Recommendations for DIRECT and eHealth Exchange ESI

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Introduction

This document is intended as a guidance document for implementers working with Electronic Service Information (ESI) on any health care directory platform for Federal Partners including but not limited to the IHE HPD. It provides recommendations on agency agreed upon ESI profiles.

In addition to recommending internal and external trust relationships for utilization of Exchange Electronic Service Information (ESI), this supporting deliverable provides recommendations for DIRECT and eHealth Exchange ESI profiles. Future deliverables plan to integrate FHIR ESI interoperability as well as other relative applications that agencies may need to publish. Those particular applications will be analyzed as they are discovered.

CONNECT is an open source product that has implemented the Nationwide Health Information Network (NwHIN) standards and services used in the eHealth Exchange. The HcDir WG has provided guidance for the implementation of CONNECT and eHealth Exchange as it directly relates to healthcare directories. The intent is to solely provide recommendations for integrating ESI related data fields from DIRECT and eHealth Exchange as part of the “Integrating the Healthcare Enterprise” (IHE) Healthcare Provider Directory (HPD) initiative. The task of writing an implementation guide remains the charge of the Standards Development Organizations (SDOs).

Information exchange requires detailed specifications that must be established and agreed upon. Organizations need consensus on pertinent required and optional data fields in order to interoperate unambiguously. The recommendations submitted by the HcDir WG for user configurable IHE HPD data fields provides specificity for electronic service profiles that can be used to accurately share healthcare provider information.

Background

Organizations seeking to engage in health information exchange will need accurate provider data that can be easily discovered, verified, and retrieved. Today, many organizations are attempting to create and share provider directories. In support of this work, the HcDir WG conducted a gap analysis to further create a defined list of ESI profiles for DIRECT and eHealth Exchange.

Initial evaluation of agency requirements, existing standards, and the need to schedule the appropriate agency subject matter experts (SMEs) in small concentrated efforts led to the formation of three focus groups within the HcDir WG:

1. Shared Services
2. Security
3. Standards Alignment

Performed by the Standards Alignment Focus Group, the gap analysis revealed that the IHE HPD contains data fields pertaining to ESI are defined to be “user configurable” with indeterminate value sets.



Recommendations for DIRECT and eHealth Exchange ESI profiles are the first work product of the Standards Alignment Focus Group.

The IHE HPD Implementation Guide is referenced in this recommendation because of its importance within the healthcare industry. The IHE HPD was referenced in the 2015 Edition of the Health Information Technology (Health IT) Certification Criteria, Base Electronic Health Record (EHR) Definition, and the Office of the National Coordinator for Health IT (ONC) Health IT Certification Program Modifications Proposed Rule. The “federated” option of the IHE HPD was showcased in the Connect-a-thon during the HIMSS 2015 conference.

Gap Analysis

The Gap Analysis revealed that the IHE HPD contains fields pertaining to electronic service information designated as ‘user configurable’ with user definable values. Tables 1 and 2 provide the results from the gap analysis performed by the Standards Alignment Focus Group:

Table 1. Relevant Field Description (from IHE HPD specification)

| Field Name | Description |
|---------------------------------------|---|
| hpdServiceId | An identifier assigned by the provider directory to uniquely identify a unique Electronic Service Object. |
| hpdServiceAddress | The electronic service address, possibly in URI or email address form. |
| hpdIntegrationProfile | A string describing the integration profile. Values are defined through local configuration. |
| hpdContentProfile | A string describing the content profile preferred in situations when content is being pushed to the service. Content not conforming to one of the specified content profiles may result in unpredictable results. Values are defined through local configuration. |
| hpdCertificate | Public digital certificate for the service |
| hpdMedicalRecordsDeliveryEmailAddress | An optional attribute in the IHE HPD Table, IHE HPDProvider Optional Attributes. |

Table 2. Gap Analysis

| Field Name | Table | Gap | Transition Path to the Desired State |
|---------------------------------------|------------------|-----|--|
| hpdServiceId | 3.58.4.1.2.2.1-6 | Y | Recommend user universally unique identifier (UUID) value. |
| hpdServiceAddress | 3.58.4.1.2.2.1-6 | Y | Recommend hpdServiceAddress electronic end point to be a DIRECT address or fully formed URI |
| hpdIntegrationProfile | 3.58.4.1.2.2.1-7 | Y | Recommendations are contained in this document |
| hpdContentProfile | 3.58.4.1.2.2.1-7 | Y | Recommendations are contained in this document |
| hpdCertificate | 3.58.4.1.2.2.1-7 | N | Use field as defined in IHE HPD. |
| hpdMedicalRecordsDeliveryEmailAddress | 3.58.4.1.2.2.1-1 | Y | Recommend DIRECT email addresses <u>not</u> be stored in hpdMedicalRecordsDeliveryEmailAddress., Recommend DIRECT email addresses <u>only</u> be stored in hpdServiceAddress. |



In addition to Table 1 defining the relevant fields and Table 2 defining a summary of the gap analysis, the following is a summary of the focus group’s findings:

- The hpdServiceID is expected to contain a unique identifier for which the HcDir WG decided a universally unique identifier (UUID) would be appropriate.
- The hpdServiceAddress is the electronic service address which can be a DIRECT address or uniform resource identifier (URI). It is recommended that when the hpdServiceAddress is a URI that is a complete URI and not a partial URI that only specifies the domain.
- The hpdIntegrationProfile and hpdContentProfile were intentionally allocated in the IHE HPD for local configuration and this document provides recommendations to remove ambiguity in agency implementations. The hpdIntegrationProfile recommendations define a consistent manner of publishing services and sub-services corresponding to the published hpdServiceAddress.
- The hpdContentProfile recommendations define specific profiles that providers can use to publish the types of data they are prepared to receive at the corresponding hpdServiceAddress.
- The hpdCertificate is allocated by the IHE HPD for publishing a public digital certificate for the service corresponding to the hpdServiceAddress and requires no recommendations.
- The hpdMedicalRecordsDeliveryEmailAddress is an IHE HPD field that can cause confusion because it can be used to store a DIRECT address. A DIRECT address is a form of ESI and can also be appropriately stored in hpdServiceAddress along with other ESI. To remove ambiguity in agency implementations, this document recommends DIRECT addresses only be stored in the hpdServiceAddress so that ESI Consumers can benefit from the corresponding supporting hpdContentProfile and hpdCertificate fields.

Electronic Service Information Recommendations

Table 3. Electronic Service Information Recommendations

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| General Recommendations Regarding ESI | <p>ESI information will only be stored in the HPDElectronicService Mandatory and Optional Attributes tables. For example:</p> <ul style="list-style-type: none"> • DIRECT addresses will be stored in hpdServiceAddress as defined in Table 3.58.4.1.2.2.1-6: HPDElectronicService Mandatory and Optional Attributes tables • DIRECT addresses will not be stored in hpdMedicalRecordsDeliveryEmailAddress • When the hpdServiceAddress is to contain a URI and not a DIRECT address, only complete URI are permissible. • It is recommended that agency agreed upon content and integration profiles (as recommended in this document) are published in a central location and additions are submitted to the profile’ stewards for approval and inclusion. |
|--|--|



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| <p>hpdIntegrationProfile Syntax and Rules</p> | <p><i>Delimiters</i></p> <ul style="list-style-type: none"> • Element delimiters are the ‘ ’ symbol, following Health Level 7 (HL7) version 2 (v2) convention • Field delimiters are the ‘^’ symbol, following HL7v2 convention <p><i>Syntax</i></p> <ul style="list-style-type: none"> • service^subservice versionNo additionalRequirements <p><i>Fields</i></p> <ul style="list-style-type: none"> • Service - specifies service, 'DIRECT' or 'eHealthExchange' • Subservice – when the service that provides a subservice specifies that specific subservice, e.g., NwHIN’s QueryForDocument as used in eHealthExchange <p><i>Rules</i></p> <ul style="list-style-type: none"> • The hpdIntegrationProfile entry is mandatory when hpdServiceAddress contains an electronic service address • If someone supports a profile, they support the "whole" profile (all elements of a profile) • Elements may be empty, but not blanks (e.g. ^ but not ^) • Definition of additionalRequirements is specific to an integration profile and, if defined, the support is not optional. • Third delimiter is optional unless additionalRequirements is used, in which case it is mandatory <p><i>Examples of Syntactically Acceptable hpdIntegrationProfile Strings</i></p> <ul style="list-style-type: none"> • DIRECT 1.1 • DIRECT 1 • eHealthExchange^PatientDiscoveryDeferredReq 2.0 • eHealthExchange^QueryForDocuments 2.0 |
| <p>Current Recommendations for service^subservice profile String Values</p> | <ul style="list-style-type: none"> • eHealthExchange^PatientDiscovery • eHealthExchange^PatientDiscoveryDeferredReq • eHealthExchange^PatientDiscoveryDeferredResp • eHealthExchange^PatientDiscoveryAsyncReq • eHealthExchange^PatientDiscoveryAsyncResp • eHealthExchange^QueryForDocuments • eHealthExchange^QueryForDocument • eHealthExchange^RetrieveDocuments • eHealthExchange^RetrieveDocument • eHealthExchange^HIEM • eHealthExchange^notificationproducer • eHealthExchange^DocSubmission • eHealthExchange^DocSubmissionDeferredReq • eHealthExchange^DocSubmissionDeferredResp • eHealthExchange^AdminDistribution • eHealthExchange^CORE_X12DSRealTime • eHealthExchange^CORE_X12DSGenericBatchRequest • eHealthExchange^CORE_X12DSGenericBatchResponse |



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|--|---|
| <p>hpdContentProfile Syntax and Rules</p> | <ul style="list-style-type: none"> • An empty hpdContentProfile indicates the hpdServiceAddress recipient advertises no content constraints when receiving transactions at this ESI address (only applicable for a content neutral hpdIntegrationProfile) • An explicit hpdContentProfile indicates the content types it supports. Negative lists are not allowed (i.e., it will never be used to specific a type it will not accept) • An explicit hpdContentProfile indicates only what its corresponding hpdServiceAddress recipient will accept and does not imply the owner of the ESI can generate that content type • For the hpdContentProfile, only the outer wrapper of a file with multiple wrapped content is expressed; for example, the recipient of a C62 that contains a PDF within a Clinical Care Document (CCD) is expected to read the structured header of the outer wrapper to identify and process the C62 message. The remaining content (i.e., the CCD, the PDF, and other MIME types) is not expressed in the outer wrapper. • HL7 version 3 (v3) messages are not currently defined due to minimal adoption in the US. However, Clinical Document Architecture (CDA) types across content neutral transports are widely accepted. |
|--|---|

Table 4. hpdContentProfile Recommended Values for Supported HL7 and ASTM Content (see table HL7 v2 Table for supported messages)

| Value | Description |
|-----------|---|
| c32 | HITSP C32 Patient Summary (HITSP - Healthcare Information Technology Standards). |
| c62 | Unstructured Document Component |
| ccd | HL7 Continuity of Care Document |
| ccr | ASTM Continuity of Care Record (ASTM – American Society for Testing and Materials). |
| cdaR2 | HL7 CDA Release 2 |
| c-cdaR1.1 | HL7 Consolidated CDA Release 1.1 |
| c-cdaR1.2 | HL7 Consolidated CDA Release 1.2 |
| fhir | HL7 Fast Healthcare Interoperability Resources |
| qrda | HL7 Quality Reporting Document Architecture |

Table 5. hpdContentProfile Recommended Values for Supported HL7 v2.x Messages

| Most Common Admission Discharge Transfer (ADT) messages) | |
|--|---------------------------------|
| Value | Description |
| ADT^A01 | Admit/visit notification |
| ADT^A02 | Transfer a patient |
| ADT^A03 | Discharge/end visit |
| ADT^A04 | Register a patient |
| ADT^A05 | Pre-admit a patient |
| ADT^A08 | Update patient information |
| ADT^A11 | Cancel admit/visit notification |
| ADT^A12 | Cancel transfer |
| ADT^A13 | Cancel discharge/end visit |



Table 6. Medical Document Management (MDM) Messages (not to be confused with DIRECT Mail Delivery messages)

| Value | Description |
|---------|---|
| MDM^T01 | Original document notification |
| MDM^T02 | Original document notification and content |
| MDM^T03 | Document status change notification |
| MDM^T04 | Document status change notification and content |
| MDM^T05 | Document addendum notification |
| MDM^T06 | Document addendum notification and content |
| MDM^T07 | Document edit notification |
| MDM^T08 | Document edit notification and content |
| MDM^T09 | Document replacement notification |
| MDM^T10 | Document replacement notification and content |
| MDM^T11 | Document cancel notification |

Table 7. Master Files Notification (MFN) Messages

| Value | Description |
|---------|---|
| MFN^M01 | Master file not otherwise specified (for backward compatibility only) |
| MFN^M02 | Master file - Staff Practitioner |
| MFN^M03 | Master file - Test/Observation (for backward compatibility only) |
| MFN^M04 | Master files charge description |
| MFN^M05 | Patient location master file |
| MFN^M06 | Clinical study with phases and schedules master file |
| MFN^M07 | Clinical study without phases but with schedules master file |
| MFN^M08 | Test/observation (Numeric) master file |
| MFN^M09 | Test/Observation (Categorical) master file |
| MFN^M10 | Test/observation batteries master file |
| MFN^M11 | Test/calculated observations master file |
| MFN^M12 | Master file notification message |
| MFN^M13 | Master file notification - general |
| MFN^M14 | Master file notification - site defined |
| MFN^M15 | Inventory item master file notification |
| MFN^M16 | Master file Notification Inventory Item Enhanced |

Table 8. Laboratory Order Message (OML) Messages

| Value | Description |
|---------|--|
| OML^O21 | Laboratory order |
| ORL^O22 | General laboratory order response message to any OML |



Table 9. Observation Result Unsolicited (ORU) Messages

| Value | Description |
|---------|---|
| ORU^W01 | Waveform result, unsolicited transmission of requested information |
| ORU^R01 | Unsolicited transmission of an observation message |
| ORU^R30 | Unsolicited Point-Of-Care Observation Message Without Existing Order - Place An Order |
| ORU^R31 | Unsolicited New Point-Of-Care Observation Message - Search For An Order |
| ORU^R32 | Unsolicited Pre-Ordered Point-Of-Care Observation |

Table 10. Query by Parameter (QBP) Messages and Request Immunization History Response (RSP)

| Value | Description |
|---------|---|
| QBP^Q11 | Query by parameter requesting an RSP segment pattern response |
| QBP^Q13 | Query by parameter requesting an RTB - tabular response |
| QBP^Q15 | Query by parameter requesting an RDY display response |
| QBP^Q21 | Get person demographics |
| QBP^Q22 | Find candidates |
| QBP^Q23 | Get corresponding identifiers |
| QBP^Q24 | Allocate identifiers |
| QBP^Q25 | Personnel Information by Segment Query |
| QBP^Q31 | Query Dispense history |
| RSP^K11 | Request Immunization History Response |

Table 11. Query for Vaccination Record (VXQ) Messages

| Value | Description |
|---------|------------------------------|
| VXQ^V01 | Query for vaccination record |

Table 12. Unsolicited Vaccination Record Update (QBP) Messages

| Value | Description |
|---------|---|
| VXU^V04 | VXU - Unsolicited vaccination record update |

Table 13. hpdContentProfile Values for Supported MIME Types

| Value | Description |
|--------------------|-------------|
| video/avi | .avi |
| application/msword | .doc |
| image/gif | .gif |
| text/html | .html |
| image/jpeg | .jpg |
| application/base64 | .mme |
| video/quicktime | .mov |



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|-------------------|-------|
| audio/mpeg3 | .mp3 |
| video/mpeg | .mpeg |
| audio/mpeg | .mpg |
| application/pdf | .pdf |
| image/png | .png |
| text/rtf | .rtf |
| image/tiff | .tiff |
| text/plain | .txt |
| text/uri-list | .uri |
| audio/wav | .wav |
| application/excel | .xls |
| text/xml | .xml |
| application/xml | .xml |
| application/zip | .zip |

Table 14. hpdContentProfile Values for Supported X12 EDI Messages

| Value | Description |
|---------|--|
| X12_148 | Report of Injury, Illness or Incident Illness or Incident |
| X12_252 | Insurance Producer Administration |
| X12_269 | Health Care Benefit Coordination Verification |
| X12_270 | Eligibility Coverage or Benefit Inquiry |
| X12_271 | Eligibility Coverage or Benefit Information |
| X12_274 | Health Care Provider Information |
| X12_275 | Patient Information |
| X12_276 | Health Care Claim Status Request |
| X12_277 | Health Care Claim Status Notification |
| X12_278 | Health Care Services Review Information |
| X12_500 | Medical Event Reporting |
| X12_820 | Premium Payments |
| X12_824 | Application Advice (a Financial Services related X12 code) |
| X12_834 | Benefit Enrollment and Maintenance |
| X12_835 | Health Care Claim Payment/Advice |
| X12_837 | Health Care Claim |
| X12_997 | Functional Acknowledgement |
| X12_999 | Implementation Acknowledgement |
| X12_TA1 | Interchange Acknowledgment |



References

1. HL7 v2.6 Implementation Guide
http://www.hl7.org/implement/standards/product_brief.cfm?product_id=145
2. IHE HPD Implementation Guide
http://wiki.ihe.net/index.php?title=Healthcare_Provider_Directory