



West Virginia Health Information Network (WVHIN)

Interoperability Services Guide
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Table of Contents

Introduction	6
Objective	6
Intended Audience.....	6
Background	6
Guiding Principles	8
WVHIN Standards Overview	9
A Foundation Based on Standards.....	9
IHE	9
NwHIN	9
HITSP	9
Technology Overview.....	10
A Brief Overview of NwHIN Standards and IHE	12
Standards for Connectivity.....	12
Integrating the Healthcare Enterprise (IHE)	12
Content Standards	13
Clinical Document Architecture	13
Continuity of Care Document	13
HITSP C32	14
HITSP CDA Content Modules (C83).....	14
IHE Patient Care Coordination Profiles	14
What it means to “Connect to WVHIN”	15
Resources Provided by the WVHIN to Participants	15
WVHIN PIX Management Service	15
WVHIN XDS.b Document Registry	16
WVHIN XDS.b Document Repository	16
Audit Services.....	17
A Step-by-Step Overview of WVHIN Data Flow	17
Step 1 – Provide Patient Information	17
Step 2 – Provide Documents.....	18
Step 3 – Retrieve Documents.....	18

WVHIN IHE Participation: Architecture.....	19
WVHIN Connectivity - Levels of Participation:.....	19
1 st Level – “Basic Connectivity” Overview: Connecting to WVHIN	20
Minimum required transactions to be implemented by the Participant	20
Data Flow Summary by Exchange Function in the 1 st Level:.....	21
2 nd Level: CDA Content certified	22
WVHIN IHE Participation: Sending Compliant Content	22
Content Validation and Testing Process	22
3 rd Level – “BPPC/Record Patient Consent” Workflow	23
Implement the BPPC Profile.....	23
BPPC Content Validation and Testing Process	23
4 th Level: Immunization Reporting Workflow	24
Provide Coded Immunization Content.....	24
Immunization Content Validation and Testing Process	24
5 th Level: Public Health Lab Reporting Workflow	25
6 th Level: NwHIN/VLER Workflow	25
NwHIN Connectivity Enablement Overview	25
Relevant Exchange Functionality and Services enabling this flow:	25
Requirements to be implemented by the Participant to leverage WVHIN connectivity to the NwHIN	25
Getting Connected - Process Flow	26
Step 1: Preparation and Readiness	26
• Complete Readiness Survey.....	26
• Review Interoperability Service Guide.....	26
• Complete the Subscription and Order Form.....	26
Step 2: Technical Connectivity Testing and Participation Agreement.....	26
• Receive information from WVHIN	26
• Interface Functional Validation.....	26
• Complete Participation Agreement Form.....	26
Step 3: Complete Verification and Validation, Begin Patient Notice Process	27
• Initiate Patient Notice Process.....	27

• Receive Technical Test Package from WVHIN	27
• Complete tests that are part of the Verification and Validation document.....	27
Step 4: Production Readiness	27
• Receive Production Package	27
• Upgrade production environment.....	27
• Test production connectivity	27
Technical Preparation Checklist.....	27
1st Level – “Basic Connectivity” Overview: Connecting to WVHIN	28
Test 1 – Provide Patient Information.....	28
Test 2 – Obtain WVHIN Affinity Domain Patient Identifier.....	28
Test 3a – Register Document with Registry	28
Test 3b – Provide and Register Document with the WVHIN hosted XDS.b Repository.....	29
Test 4 – Query Registry by Patient Identifier	29
Test 5 – Retrieve document from Repository (as Repository actor)	30
Test 6 – Query Registry for On-demand documents associated with patient.....	30
2nd Level: CDA Content certified.....	31
Test 1 – Validate Content Samples	31
3rd Level – “BPPC/Record Patient Consent” Workflow.....	31
Test 1 – Validate BPPC Content Document.....	31
Test 2 – Register Opt-out BPPC Document with Registry.....	32
Test 3 – Query Registry by Patient Identifier	33
Test 4 – Register Opt-back in BPPC Document with Registry	33
Test 5 – Query Registry by Patient Identifier	34
4 th Level: Immunization Reporting Workflow	34
Test 1 – Validate Immunization Content or HITSP C32 Document.....	34
Test 2 – Immunization Workflow testing.....	34
5th Level: Public Health Lab Reporting Workflow	36
6th Level: NwHIN/VLER Workflow.....	36
Test 1 – Provide Patient Information.....	36
Test 2 – Obtain WVHIN Affinity Domain Patient Identifier.....	37
Test 3– Query Registry by Patient Identifier	37

Test 4 – Retrieve document (as Document Consumer).....	38
Test 5 – Validate HITSP C32 Content Document.....	38
Additional Resources and References	38
PIX and XDS.b and BPPC Profiles.....	38
IHE Patient Care Coordination (PCC) Profiles or Content profiles	38
HITSP C32	38
Wiki Pages	39
Annotated XDS.b Examples.....	39
Glossary of Terms.....	40

Introduction

Objective

This document provides a technical overview of the West Virginia Health Information Network (WVHIN) and the standards-based specifications regarding connectivity to WVHIN. First, this guide intended to serve as an introduction to the technical services, implementation methodology and national standards employed to develop WVHIN into a highly secure and standards-based platform that will serve as the backbone for health information exchange in the state of West Virginia. Second, this guide will detail the national standards and technical requirements that are a requirement for WVHIN Participants (Participant). The systematic “on boarding” process that will enable an organization to connect to WVHIN and to become a Participant in the WVHIN is discussed in detail.

Intended Audience

This document is intended for prospective WVHIN Participants who are seeking an introduction to the technical services provided by WVHIN and an outline of the work process required to take part in the Exchange¹. It is intended for technical users familiar with health care information technology standards such as those promulgated by integrating the Healthcare Enterprise (IHE), Healthcare Information Technology Standards Panel (HITSP) and the Office of the National Coordinator (ONC).

Background

The charter of the WVHIN was to build a secure electronic health information system for the exchange of patient data among physicians, hospitals, diagnostic laboratories, care providers, and other stakeholders.

The WVHIN’s vision is “High quality, patient-centered care facilitated by health information technology.” The WVHIN’s efforts to achieve this vision are guided by its mission:

The West Virginia Health Information Network provides the health care community with a trusted, integrated and seamless electronic structure enabling medical data exchange necessary for high-quality, patient-centered care.

Currently, critically important patient data is often fragmented and residing in silos that do not communicate with each other. The WVHIN’s Health Information Exchange (HIE) will connect providers and others electronically to enable clinical information and administrative data to be shared between Participants. The WVHIN will provide the interoperability necessary to enable secure exchange of information and will oversee access to health care data to transform health care in West Virginia through improved quality and value.

¹ In the document the terms WVHIN and “the Exchange” are used interchangeably. Both refer to the West Virginia Health Information Network.

From a technology perspective, the WVHIN provides core HIE network services such as a statewide master patient index (MPI), a statewide record locator service (RLS), authentication services, and audit services that providers, healthcare organizations, emerging regional health information exchanges across West Virginia could use. **Figures 1 and 2** illustrate the goals and the vision of the West Virginia Health Information Network.

THE ULTIMATE GOAL: QUALITY ... REQUIRES INTEROPERABLE DATA



Figure 1 – Drivers behind the WV Health Information Network

WVHIN – FEDERATED SOA ESB FOR EXCHANGE

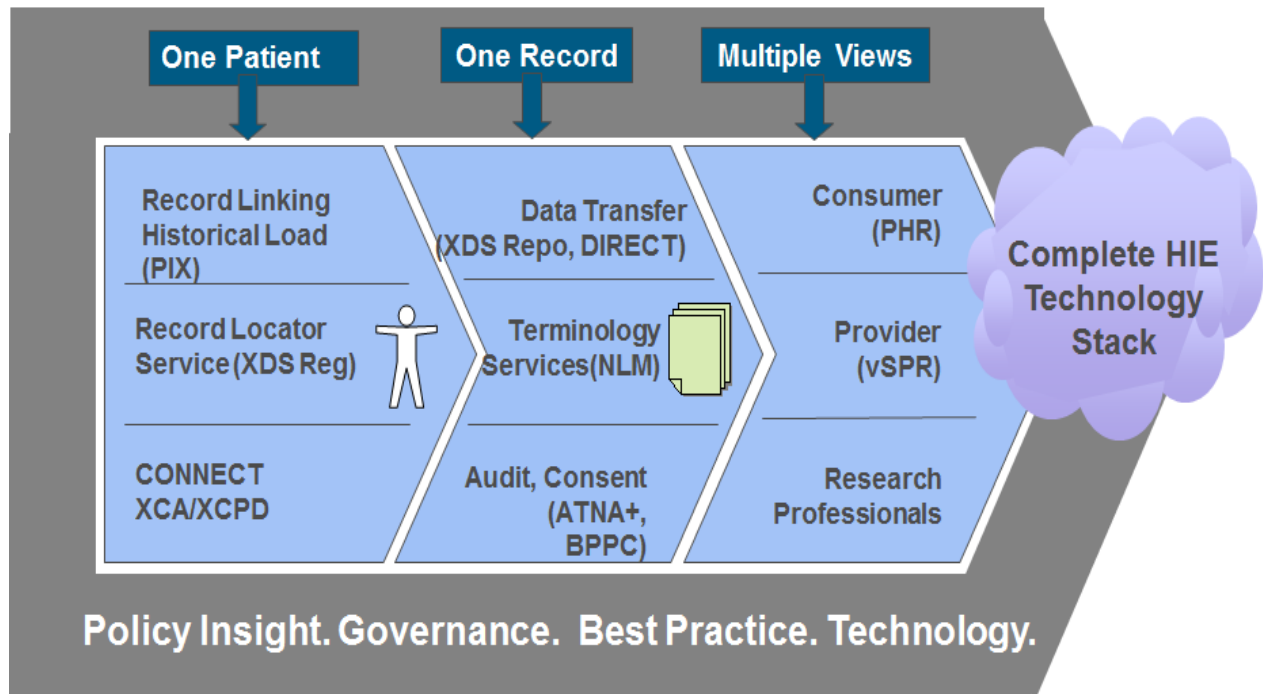


Figure 2 - WVHIN Overview

Guiding Principles

- WVHIN is built on open technology standards for health information exchange and interoperability.** To be part of the Exchange, Participants are free to choose any healthcare vendor that has the ability to provide standards based interoperability services as required by the WVHIN.
- WVHIN is highly secure and committed to patient privacy.** Every aspect of the health information exchange process is secured in order to protect private patient health information. WVHIN Participants are required to implement a PKI certificate-based encryption scheme that protects sensitive information in transport and authenticates Exchange Participants. All centrally located demographic information is secured using an industry leading crypto-hash persistence mechanism that guarantees sensitive demographic information cannot be revealed through the network.

- **WVHIN is designed as a hybrid architecture.** WVHIN minimizes the amount of information managed centrally. Clinical data is persisted in Participant managed repositories and will be available to other WVHIN Participants only when a verifiable clinical relationship with the relevant patient.
- **WVHIN focuses on delivering highly valuable health data to providers.** The WVHIN includes interfaces to existing health data assets such as Medicaid claims information so that for a large set of their patients new Participants will have access to clinical data available to the Exchange. WVHIN provides a “Clinical Viewer” web application. It is specifically designed to provide visualization and data monitoring tools tailored to the wealth of data available to the Exchange in order to enhance provider productivity, streamline communications between providers and improve patient care outcomes.

WVHIN Standards Overview

A Foundation Based on Standards

WVHIN is built using open technology standards that fully comply with the specifications established by the Integrating the Healthcare Enterprise (IHE), the Nationwide Health Information Network (NwHIN) and the Healthcare Information Technology Standards Panel (HITSP).

IHE

IHE is an initiative by healthcare professionals and industry to improve the way computer systems in healthcare share information. IHE promotes the coordinated use of established standards such as DICOM and HL7 to address specific clinical need in support of optimal patient care. Systems developed in accordance with IHE communicate with one another better, are easier to implement, and enable care providers to use information more effectively.

NwHIN

NwHIN is a set of standards, services, and policies that enable secure health information exchange over the Internet. The NwHIN will provide a foundation for the exchange of health IT across diverse entities, within communities, and across the country.

HITSP

HITSP is a cooperative partnership between the public and private sectors. The Panel was formed for the purpose of harmonizing and integrating standards that will meet clinical and business needs for sharing information among organizations and systems.

More information on all of the above standards is available in the [“A Brief Overview of NwHIN Standards and IHE”](#) section below.

Technology Overview

WVHIN is built on a commercial off-the-shelf software (COTS) technology stack that uses a hybrid, service-oriented architecture (SOA) to deliver a standards-compliant enterprise service infrastructure to deploy and operate a statewide HIE.

Key items of note in this architecture are its flexibility and compliance with NwHIN and ARRA/HITECH Meaningful Use Final Rule standards:

- WVHIN is designed as a hybrid model where the patient clinical records can be stored in repositories that are physically located adjacent to the source or could be stored in a WVHIN hosted repository that's offered as an option to Participants.
- WVHIN provides a statewide Master Patient Index (MPI) service.
- WVHIN also implements a Record Locator Service (RLS), which serve as a “white pages” for the state providing pointers to clinical information about a given patient.
- WVHIN provides the Service Access Layer, which provides a trusted uniform transport and security infrastructure based on web services following IHE standards. These standards (i.e. IHE ATNA) describe the security environment (user identification, authentication, authorization, and access control), audit requirements, and transport-level security (TLS) requirements to ensure each network node complies with the guiding principles of WVHIN for security and privacy.

Figure 3 shows WVHIN Services and the standards used for interoperability for healthcare providers to connect. It demonstrates compliance with national interoperability standards to facilitate connecting to the NwHIN and other states. Similarly, the HITSP and IHE standards for content that are based on the Clinical Document Architecture (CDA), the IHE standards for connectivity like Patient Identifier Cross Reference (PIX), Cross Enterprise Document Sharing (XDS.b), and Audit Trail and Node Authentication (ATNA), allow providers from disparate and diverse healthcare settings within the state to connect to WVHIN to effectively and securely exchange patient information. The power and flexibility of the WVHIN is demonstrated by the fact that, irrespective of the type of organization that is connecting, for e.g. a clinic, a regional health information exchange with existing MPI, or a large IDN, the same connectivity principles apply and the on boarding process is the same.

WVHIN - STANDARDS BASED EXCHANGE

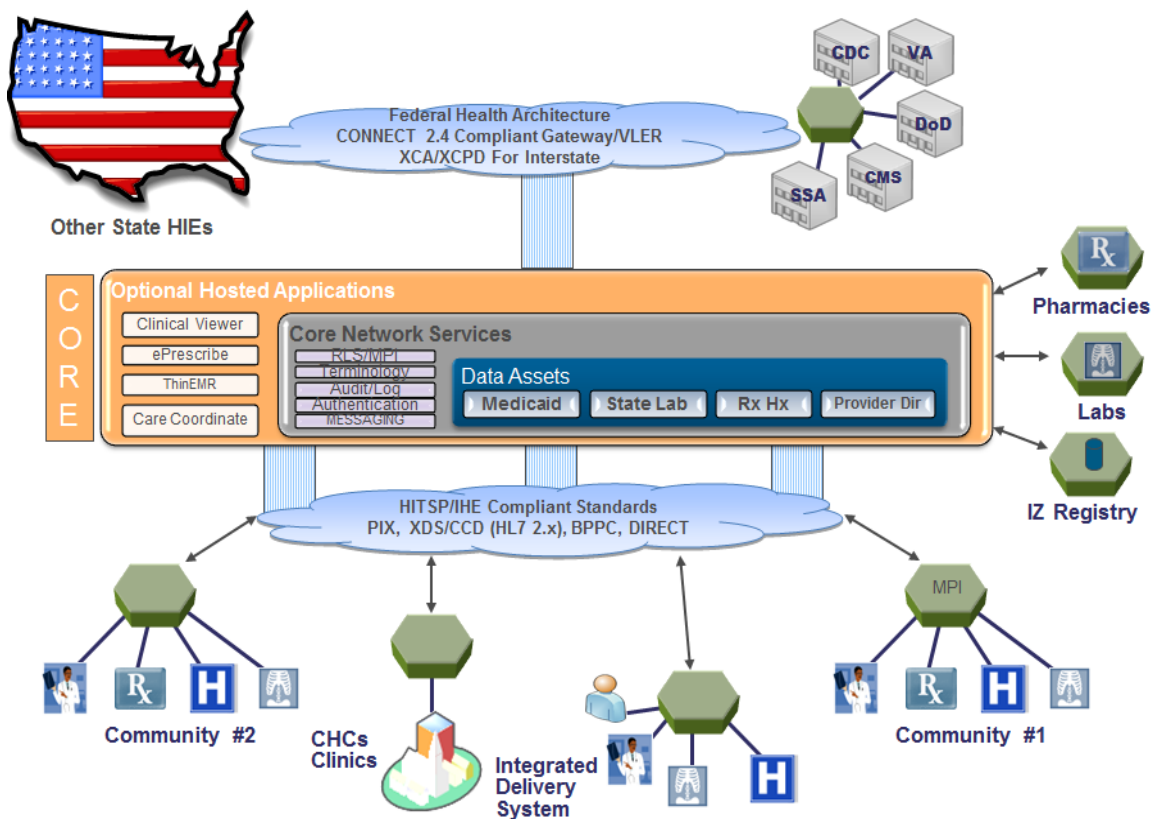


Figure 3: WVHIN Services and Standards-based Interoperability

Figure 3 illustrates the high-level architecture of the WVHIN. There are core services, data assets and other applications that are available to the Participants in the Exchange. The HITSP/IHE promoted standards apply to intra-state Participants of any kind where PIX, XDS.b, CDA/CCD play a major role. Participants in the WVHIN can leverage the connectivity to Public Health as shown on the right. Bi-directional flow with the Immunization Registry and Electronic Submission of Labs to Public Health are some of the services that can be available based on the level of participation in the Exchange.

The segment of Figure 3 that points to the federal entities like Department of Defense, Veteran’s Administration, etc. and to the other states shows the ability of WVHIN to participate in inter-state exchange though the use of standards. A Cross-Community Patient Discovery (XCPD) gateway that allows for patient discovery and a Cross-Community Access (XCA) gateway that manages exchange of patient clinical information with other states or federal entities will be available to be leveraged by those Participants that wish to participate at an inter-state level.

A Brief Overview of NwHIN Standards and IHE

Standards for Connectivity

It is required of all WVHIN Participants to have a basic understanding of the standards, services and policies (some mandated and some indirectly driven by the NwHIN) that form the basis for the technical requirements specified in this document. An introduction to the core standards and specifications is provided in this section. Detailed documents describing these standards and specifications are available here:

Integrating the Healthcare Enterprise: Technical Framework

Of specific relevance to WVHIN are the IHE *IT-Infrastructure (ITI)* and *Patient Care Coordination (PCC)* profiles that are described here:

- http://www.ihe.net/Technical_Framework/

NwHIN History and Background

- http://healthit.hhs.gov/portal/server.pt/community/healthit_hhs_gov_NHIN_historical_background_information/1409

The WVHIN implements the specifications prescribed by the NwHIN and provides the necessary Gateway Services to be a node on the NwHIN.

HITSP Harmonization Framework

- <http://www.hitsp.org/harmonization.aspx#Components>
- <http://www.hitsp.org/default.aspx#c>

Integrating the Healthcare Enterprise (IHE)

IHE is an industry-leading initiative that seeks to facilitate the exchange of information among healthcare systems by creating detailed specifications for specific use cases that optimize established standards.

IHE has published a set of “Integration Profiles” (an amalgamation of existing standards and supplemental usage constraints designed for a specific use case) that define the core interoperability services implemented by WVHIN. Specifically, the following integration profiles must be understood and implemented by Participants:

1. **PIX:** Patient Identifier Cross Reference
 - PIX does matching based on demographics to map patient identifiers from across independent sources for the same patient
2. **XDS.b:** Cross Enterprise Document Sharing
 - XDS.b refers to two major components: an XDS.b Document Registry and an XDS.b Document Repository

- XDS.b Registry is like a card catalog in a library and maintains metadata about each document that is made known to the registry. It does not store the actual document but contains a link to the actual document in the repository in which it is stored
 - XDS.b Repository is analogous to the stacks in a library where the books are actually stored. The XDS.b Repository is where the actual clinical documents are stored. The WVHIN supports a hybrid model of document repositories. The repository is responsible for registering its documents with the XDS.b Registry
3. **ATNA:** Audit Trail and Node Authentication
 - ATNA is the IHE profile that supports the authentication of various Participants in a network and defines rules to ensure that communication is secure
 4. **CT:** Consistent Time
 - CT provides consistent definition of date/time enabling time synchronization across multiple systems
 5. **BPPC:** Basic Patient Privacy and Consent
 - BPPC provides a mechanism to record patient opt preferences
 6. Subset of Content Profiles like the HITSP C32, XPHR, MS, IC, etc.

IHE also tests and verifies compliance with these integration profiles at carefully planned and supervised events called “Connect-a-thons”. The WVHIN core network service technologies have been verified for compliance with regards to the relevant integration profiles. Participants can inquire whether vendors supplying interoperability services to their organizations have also been at a recent Connect-a-thon in order to assess the vendor capabilities.

Content Standards

While the majority of this document focuses on the transport, handshake, and mechanism of exchange, the actual “content” of what health information may be exchanged from a technology standpoint is governed by the following industry standards:

Clinical Document Architecture

Clinical Document Architecture (CDA) is an HL7 document markup standard that specifies the structure and semantics of "clinical documents" for the purpose of exchange. CDA documents derive their machine-processable meaning from the HL7 Reference Information Model (RIM) and use the HL7 Version 3 Data Types. CDA is flexible XML-based clinical document architecture. CDA itself is not a specific document, but can be used to express many types of documents.

A CDA document can contain many data sections, all of which contain narrative text, and some of which contain structured data elements, some of which are coded. There are many types of CDA documents, including CCD, XPHR, HITSP C32, MS Discharge Summary (HITSP C48), History and Physical (HITSP C84), Lab Report (HITSP C37), etc. Some of the more common ones are described below.

Continuity of Care Document

Continuity of Care Document (CCD) describes constraints on the HL7 Clinical Document Architecture, Release 2 (CDA) specification. It specifies a core data set of the most relevant administrative,

demographic, and clinical information facts about a patient's healthcare, covering one or more healthcare encounters. It provides a means for one healthcare practitioner, system, or setting to aggregate all of the pertinent data about a patient and forward it to another practitioner, system, or setting to support the continuity of care.

CCD is just one type of CDA document. Other types of CDA documents can contain some of the same CCD sections, but different sections as well.

HITSP C32

The HITSP Summary Document using the HL7 Continuity of Care Document (CCD) Component, HITSP C32, describes the document content summarizing a patient's medical status for the purpose of information exchange. HITSP C32 is based on a CCD but further constrains the CCD specification.

The content may include administrative (e.g., registration, demographics, insurance, etc.) and clinical (e.g., problem list, medication list, allergies, test results, etc.) information. Any specific use of this component by another HITSP specification may constrain the content further based upon the requirements and context of the document exchange. This specification defines content in order to promote interoperability between participating systems. Any given system creating or consuming the document may contain much more information than conveyed by this specification. Such systems may include Personal Health Records (PHRs), EHRs (Electronic Health Records), Practice Management Applications, and other persons and systems as identified and permitted.

HITSP CDA Content Modules (C83)

HITSP CDA Content Modules (C83) specification is a library of the HITSP defined data elements utilized for mapping to data elements from selected standards that HITSP is based on. It is used by other HITSP components to establish the set of harmonized constraints that HITSP applies across the selected standards.

Note that the HISTP C32 has a dependency on the HISTP C83 as far as the constraints on each content module's data elements.

IHE Patient Care Coordination Profiles

IHE PCC domain was established in July 2005 to deal with integration issues that cross providers, patient problems or time. It deals with general clinical care aspects such as document exchange, order processing, and coordination with other specialty domains. PCC also addresses workflows that are common to multiple specialty areas and the integration needs of specialty areas that do not have a separate domain within IHE.

IHE Patient Care Coordination (PCC) does not refer to a single CDA based document but a series of various medical summary document types. Some of the more common IHE PCC Profiles include document types like Medical Summary (MS), Emergency Department Referral (EDR), Exchange of Personal Health Record Content (XPHR), and Immunization Content (IC). These form some of the initial set of documents accepted by the WVHIN registry.

What it means to “Connect to WVHIN”

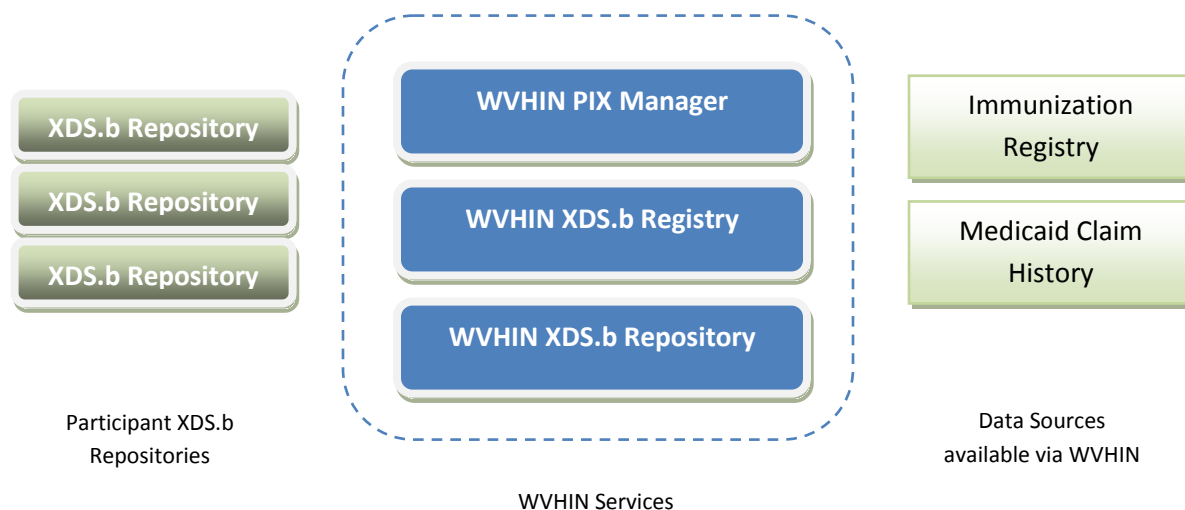
Connecting to the WVHIN means that the Participant will be able to send and receive health information amongst other WVHIN Participants that have been “on ramped” to WVHIN by leveraging the MPI, RLS, and core network services offered by the WVHIN.

Participants must agree to abide by all policies and procedures that govern the operation of WVHIN (see www.wvhin.org for detailed policy documents).

In order to connect to WVHIN, the Participant’s health information systems will need to implement the technical services and interfaces described in the “[Step-by-Step Overview of WVHIN Data Flow](#)” section below. In addition, Participants will need to follow the process steps outlined in “[Getting Connected-Process Flow](#)” in order to demonstrate standards-based exchange capabilities and obtain production credentials and connectivity information.

Resources Provided by the WVHIN to Participants

WVHIN implements a set of IHE profiles and NwHIN standards compliant services to facilitate the flow of clinical data between Participants. These network-level services are intended to support the management of clinical data by providing secure patient identity management and record location for all patients in the state of West Virginia.



WVHIN PIX Management Service

WVHIN provides statewide PIX Management service that provides identity management services to WVHIN Participants. Participants will send demographic information for the patients that they manage to the WVHIN PIX Manager which implements a robust record-linking algorithm to link together patient records across the state.

The WVHIN PIX Management Service implements the PIX (Patient Identifier Cross-Referencing) IHE integration profile.

WVHIN XDS.b Document Registry

WVHIN provides a statewide XDS.b Document Registry that provides record location services (RLS) for all clinical data available through WVHIN. Participants will register metadata describing the clinical documents that they are making available through their XDS.b Repositories so that other Participants can easily obtain a catalog of all clinical data and its managing repository for a particular patient.

The WVHIN Document Registry implements the XDS.b (Cross Enterprise Document Sharing-b) IHE integration profile.

As part of the WVHIN connectivity testing, Participants will be provided guidance on certain required metadata values like the PIX namespace to use, Repository ID (to avoid conflicts across Participants), Source ID root OID², Document ID root OID etc. The required OIDs will be based on the WVHIN Root OID,1.3.6.1.4.1.38674 and each Participant will be provided child OIDs for their organization by the WVHIN when the on boarding process is initiated.

Each Participant must ensure that each facility, within their organization, that is connecting to WVHIN is assigned a different source ID based on the Source ID root OID that is provided. Similarly, the document IDs being submitted by each Participant should be based on the Document ID root OID.

WVHIN XDS.b Document Repository

As part of the WVHIN interoperability, Participants are required to implement XDS.b repository functionality. Participants can choose to leverage XDS.b repository functionality that might already be available to them through some internal system, implement their own, or delegate this responsibility to the WVHIN.

WVHIN provides an optional XDS.b Document Repository to Participants who would like to leverage a hosted XDS.b repository. If Participants choose to leverage this option, it would imply that the WVHIN XDS.b Repository would host the clinical documents on the Participants behalf. Participants will have to provide the clinical document to the WVHIN repository along with some metadata information. The repository then handles registering of the document with the WVHIN XDS.b Document Registry as well as subsequent requests for document retrieval. Note that this option can only be leveraged if the Participant is publishing a stable clinical document. If a Participant chooses to only publish on-demand documents that are created at the time of document request, the registration as well as retrieval requests for those documents is expected to be handled directly by the end Participant.

² Many standards define certain objects for which unambiguous identification is required. This is achieved by registration. Registration is the assignment of an object identifier (OID) to an object in a way which makes the assignment available to interested parties. Different types of “objects” can be identified by an OID, including but not limited to a country, a company, a project, and ISO standards. OIDs are in use widely in the HL7 standard to specify concepts like identifier namespaces, terminology identification, value sets, conformance profiles, v3 templates.

Each Participant that chooses to leverage this option will be allowed 100 GB of free storage on the WVHIN XDS.b Document Repository. Space requirements beyond 100 GB will require a separate contractual agreement.

Audit Services

WVHIN captures audit data for identity management and its core clinical data services. WVHIN does not provide a centralized store of audit information for clinical data that is managed in locally implemented XDS.b repositories unless, as could be the case in certain circumstances, Participants route their requests for clinical documents to other Participant repositories via the WVHIN gateway. Participants that are managing these locally implemented repositories are required to implement appropriate audit services as described by the IHE ATNA Secure Node Integration Profile.

A Step-by-Step Overview of WVHIN Data Flow

The following section describes the basic data flow in the WVHIN and applies to all Participants.

Patient demographic information and clinical data flow through WVHIN and utilize its standards-compliant services in the following manner:

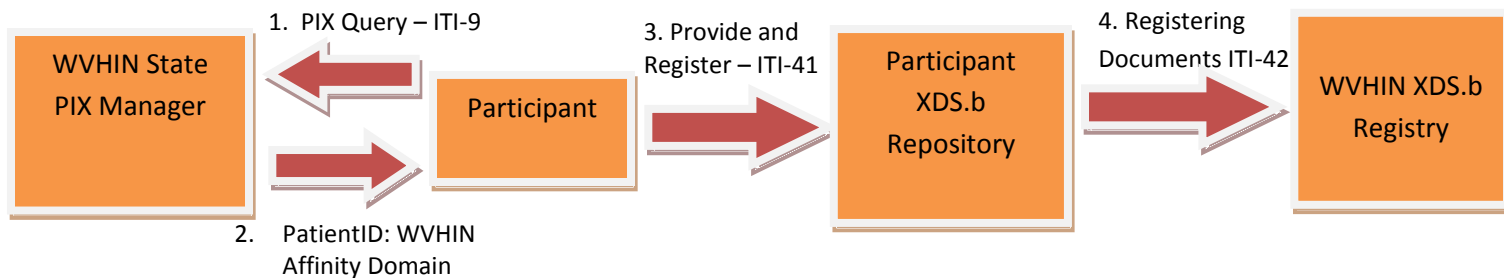
Step 1 – Provide Patient Information



The Participant, the Patient Identity Source, sends a Patient Identify Feed (ITI-8) transaction to add/update a patient in the domain specified in the transaction. WVHIN PIX Manager then handles the cross-referencing of patients across multiple domains and ensures that any documents in the Registry will be associated with this patient.

Patient information must be provided to and processed by the WVHIN PIX Manager before documents can be submitted or retrieved for that patient.

Step 2 – Provide Documents

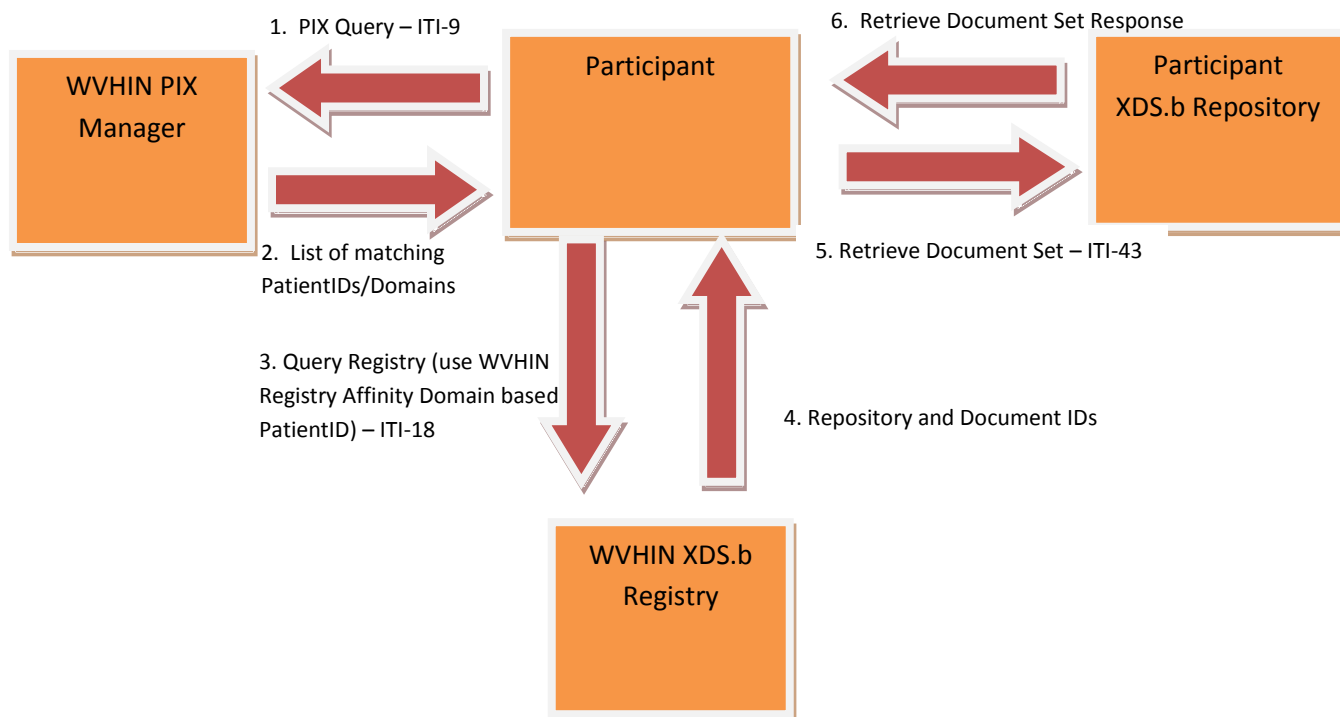


Now that a patient is in the system, the Participant can begin adding documents associated with that patient. The Participant (the Document Source) will send a Provide and Register Document Set-b (ITI-41) transaction to an XDS.b Repository. If the XDS.b repository in this flow is the WVHIN hosted XDS.b repository, then the Register Document transaction (ITI-42) is handled by this XDS.b repository and there is no further action required by the Participant.

The results of this transaction are:

- The document(s) in the transaction are then stored in an XDS.b Repository and available for retrieval
- The provided documents are registered with the WVHIN XDS.b Registry

Step 3 – Retrieve Documents



After patient information is provided to the WVHIN PIX Manager and there are documents associated with the patient, the general flow required to retrieve available documents for a patient is as follows:

- Participant sends a PIX Query (ITI-9) transaction. The WVHIN PIX Manager responds with a list of cross-referenced matching PatientIDs/domains. The PatientID associated with the “WVHIN” Registry Affinity Domain should be the ID used for registry transactions
- Participant queries the WVHIN XDS.b Registry via a Registry Stored Query (ITI-18) transaction using the cross-referenced WVHIN Registry Affinity Domain based identifier that was received from the PIX Manager. The WVHIN XDS.b Registry returns a response containing document information.
- Using the information contained in the response, Participant queries the appropriate repositories using the Retrieve Document Set (ITI-43) transaction. The queried repositories return a document set.

The result of these transactions will be a clinical document set that may contain demographics, problems, procedures, medications, allergies, etc. (depending on the information available on the patient in question). This document set will contain the clinical information from other WVHIN Participants about the patient in question.

WVHIN IHE Participation: Architecture

WVHIN Connectivity - Levels of Participation:

Each Participant that is connecting to the WVHIN has to decide what their goals are for connecting to the WVHIN. It is required that every Participant satisfies the requirements of the 1st Level: “Basic Connectivity” in order to participate in the WVHIN. Based their own specific goals, Participants can additionally choose to participate in one or more of the other levels. The requirements for connectivity for each level are different.

The 1st level and its requirements must be satisfied by all Participants in order to participate in the Exchange. The other levels have no dependencies and Participants can choose to participate in one or more of the levels 2, 3, 4, 5 and 6 if they are able to fulfill the requirements of the 1st Level plus the additional requirements of the specific level(s) of interest to them.

Connectivity Levels:

- **1st Level: Basic Connectivity** (required of ALL participants): This level allows Participants to register documents of various formats with the WVHIN and query the WVHIN for information on a patient.
- **2nd Level: CDA Content certified** (highly recommended): This level requires Participants to register only CDA based documents with the WVHIN. This is the level that most Participants should choose. Meaningful Use, NwHIN efforts are already driving HITSP content standards that

are based on the CDA. An organization pursuing Meaningful Use should not have difficulty participating at this level.

- **3rd Level: BPPC/Record Patient Consent Workflow certified:** This level enables Participants to communicate electronically Patient Opt status to the WVHIN. The other option is to manage manually the Patient Opt status via a web portal but that requires administrative resources and is not an efficient mechanism.
- **4th Level: Immunization Reporting Workflow Certified:** Participating at this level enables the Participant to send Immunization administration messages to the Immunization Registry as well as query the Immunization Registry for Immunization History on a patient. Complying with this level also helps satisfy the Meaningful use criteria for electronic submission of data to Immunization Registry. This will imply that the Participant does not have to have to build and maintain a separate interface to the Immunization Registry or perform duplicate data entry into a separate system. The WVHIN takes care of the end connectivity to the Immunization Registry.
- **5th Level: Public Health Lab Reporting Workflow Certified:** This level allows a Participant of the WVHIN to send automatically Lab results to Public Health. This level helps satisfy the Meaningful use criteria for electronic submission of lab results to Public Health. This will imply that the Participant does not have to have to build and maintain a separate interface to Public Health to transmit Lab results. The WVHIN takes care of the end connectivity to Public Health.
- **6th Rung: NwHIN/VLER Workflow Certified:** By participating in this level, each Participant does not independently have to go through the NwHIN onboarding process but will leverage WVHIN’s participation in the NwHIN. (The NwHIN onboarding is a planned activity for the WVHIN.) This level allows Participants to bi-directionally exchange information with other NwHIN nodes.

1st Level – “Basic Connectivity” Overview: Connecting to WVHIN

Participants connect to the Exchange using IHE standards. The Participant will utilize the WVHIN PIX Manager Service and XDS.b Registry Service for Master Patient Index and Record Location functionality. The actual clinical content and its storage are the responsibility of the Participant.

- The Participant will register the document with the WVHIN XDS.b Registry. As part of WVHIN participation, Participants are also required to have XDS.b Repository capabilities. For XDS.b Repository functionality, Participants can choose to implement their own (e.g., their native EMR or some other internal standards based interoperability engine offers this functionality) or they can choose to leverage the XDS.b Repository offered by the WVHIN. The Participant chosen XDS.b repository is responsible for responding to document retrieval requests from other Participants in the Exchange for documents registered by that specific repository.

Minimum required transactions to be implemented by the Participant

Integration Profile	Description of Required Functionality
ITI-8: Patient Identity Feed (as Patient Identity Source)	The Participant will send patient demographics to the WVHIN PIX Management Service.
ITI-9: PIX Query (as Consumer)	The Participant will query the WVHIN PIX Manager to receive a record location list.

WVHIN Interoperability Services Guide v1.0

<p>ITI-18: Query Registry (as Consumer)</p>	<p>The Participant must query the WVHIN XDS.b Registry for data from other WVHIN Participants. Note that it is required that Participant be able to query for both “stable” as well as “on-demand” documents since either could be registered by any given document source/repository</p>
<p>ITI-41: Provide and Register Document Set-b (as Source)</p>	<p>This is required of Participants choosing to leverage the WVHIN hosted XDS.b Repository.</p> <p>The Participant must populate the WVHIN hosted XDS.b Repository with clinical data for its patients.</p>
<p>ITI-42: Register Document Set-b (as Repository or Integrated Document Source/Repository)</p>	<p>This is required of Participants choosing to implement their own XDS.b Repository. In this case, sending the “Provide and Register” transaction to the right repository is the responsibility of the Participant and that repository must send a Register Document Set-b transaction to the WVHIN XDS.b Registry</p> <p>The Participant must populate the WVHIN XDS.b Registry with meta data for its patients’ clinical documents.</p>
<p>ITI-43: Retrieve Document Set (Repository or Integrated Document Source/Repository)</p>	<p>This is required of participants choosing to implement their own XDS.b Repository.</p> <p>The Participant must respond to queries to its XDS.b Repository from other WVHIN Participants.</p>
<p>ITI-43: Retrieve Document Set (as Consumer)</p>	<p>The Participant must be capable of issuing a Retrieve Document Set transaction in order to retrieve clinical documents from other participant repositories</p>

Data Flow Summary by Exchange Function in the 1st Level:

Exchange Function	Data Flow Summary
<p>Record Location</p>	<ol style="list-style-type: none"> 1. Local PIX Consumer sends patient demographic information to the WVHIN PIX Manager. 2. The PIX Manager responds with record location information (patient and domain identifiers) for matching patient records available in WVHIN.
<p>Sending Clinical Data</p>	<ol style="list-style-type: none"> 3. The Participant sends clinical data to its XDS.b Repository, which must in turn register the documents with the WVHIN Registry. 4. XDS.b Consumers (other participants) on WVHIN will query the WVHIN XDS.b Registry. 5. The Participant will then query the XDS.b Repository for clinical documents.
<p>Receiving Clinical Data</p>	<ol style="list-style-type: none"> 6. The Participant’s XDS.b Consumer service queries the WVHIN Registry for available clinical documents.

- | | |
|--|---|
| | 7. The Participant will then query the XDS.b Repository for clinical documents. |
|--|---|

2nd Level: CDA Content certified

As part of this rung, a Participant is choosing to only create and publish “CDA” compliant documents to the Exchange. It is highly recommended that all Participants choose this level as this will create a common language for clinical information communication within the WVHIN.

WVHIN IHE Participation: Sending Compliant Content

WVHIN supports a number of industry standard content formats that can be registered in the WVHIN XDS.b Document Registry. All acceptable document formats are specific implementations of the CDA specification. Document standard content formats that will pass validation and can be registered with WVHIN include but are not limited to:

1. HISTP/C32 v2.x Summary Documents
2. IHE XDS-MS Referral Summary (HITSP/C48)- 2009 (or later)
3. IHE XDS-MS Discharge Summary (HITSP/C48)- 2009 (or later)
4. IHE EDR Emergency Department Referral (HITSP/C84)- 2009 (or later)
5. IHE XPHR Personal Health Record Abstract- 2009 (or later)
6. IHE IC Immunization Content- 2009 (or later)
7. IHE BPPC Basic Patient Privacy Consents- 2009 (or later)
8. IHE XDS-SD Cross Enterprise Sharing of Scanned Documents – 2009 (or later)
9. IHE Laboratory Report- 2008 (or later)
10. IHE Laboratory Report (HITSP/C37)- 2007 (or later)

Additional formats not shown on the above list may be validated and accepted by WVHIN. Please contact a WVHIN technical resource by sending an email to info@wvhin.org if there is a need for additional content specifications and the supporting use cases driving the need.

Content Validation and Testing Process

WVHIN requires that Participants choosing this Level have successfully completed the NwHIN approved NIST testing process to ensure that compliant CCD/C32 and other document content profiles can be created by the sending system.

This process is managed and provided by the National Institutes of Standards and Technology and can be found here:

<http://xreg2.nist.gov/cda-validation/validation.html>

This validation tool will enable the Participant to test compliance with NwHIN standards prior to approaching WVHIN about a connection. The following diagram shows the NIST CDA Validation tool that should be used.

CDA Guideline Validation FAQs Contact

Home Validation Tool Downloads Web Service Meaningful Use

Note: NIST cannot guarantee 24/7 access to this on-line service. If you have mission-critical work dependent on access to this service, please consider using the available downloadable version as a service local to you. Thank you.

- Upload the file for validation: No file chosen
- Please select the level of detail:
 - Everything (Errors, Warnings, Notes)
 - Errors and Warnings only
 - Errors Only
- What would you like this file to validate to?

Name	Description	Dependencies (if applicable)
<input checked="" type="radio"/> CDA R2	HL7 CDA R2 (with no extensions)	
<input type="radio"/> CCD	Continuity of Care Document	• CDA R2
<input type="radio"/> CRS Level 1 & 2	HL7 Care Record Summary	• CDA R2
<input type="radio"/> CDA4CDT (header only)	HL7 CDA For Common Document Types (CDA4CDT) -- header only	• CDA R2
<input type="radio"/> HITSP/C32 v2.5 -- HITSP/C83 v2.0	HITSP/C32 v2.5 Summary Documents Using HL7 CCD	• CDA R2 (With HITSP Extensions) • CDA4CDT (header only and with IHE modifications) • CCD
<input type="radio"/> HITSP/C32 v2.5 -- HITSP/C83 v1.1	HITSP/C32 v2.5 Summary Documents Using HL7 CCD (using HITSP/C83 v1.1)	• CDA R2 (With HITSP Extensions) • CDA4CDT (header only and with IHE modifications) • CCD
<input type="radio"/> HITSP/C32 v2.4	HITSP/C32 v2.4 Summary Documents Using HL7 CCD (using	• CDA R2 (With HITSP

Detailed Documentation regarding the Schematron rules for relevant documents is located here:

<http://xreg2.nist.gov/cda-validation/downloads.html>

3rd Level – “BPPC/Record Patient Consent” Workflow

Implement the BPPC Profile

A Participant choosing this level will have to implement the IHE Basic Patient Privacy Consent (BPPC) profile. IHE BPPC profile used to record and communicate patient “opt out” and “cancel opt out” preferences. *Opt-out* and *cancel opt-out* preferences are global, triggering a system wide implementation of the patient’s desired status. Participants can choose to produce the BPPC document with or without a scanned document part.

It is required that the BPPC document registered be registered as a stable document.

BPPC Content Validation and Testing Process

WVHIN requires that Participants choosing this level have successfully completed the NwHIN approved NIST testing process to ensure that a BPPC compliant document is able to be produced by the Participant.

Use the CDA content validation link in order to test for content compliance:

<http://xreg2.nist.gov/cda-validation/validation.html>

This validation tool will enable the Participant to test compliance with NwHIN standards prior to approaching WVHIN about participating in this level.

Choose the IHE BPPC radio button to validate this document. Choose the radio button “Errors only” under level of detail.

4th Level: Immunization Reporting Workflow

Provide Coded Immunization Content

Implement IHE PCC IC or HITSP C32 with Immunizations Section

If a Participant is interested in having immunization administration information from them flow through to the WV Immunization Registry with the WVHIN acting as a gateway, this level applies. This service provides a Participant with the option of leveraging the connectivity to the WVHIN to satisfy the needs to reporting to the Immunization registry. This precludes the need for a separate interface directly from the Participant’s systems to the Immunization Registry.

In order for dataflow to be functional, the Participant will need to create and register a NIST compliant Immunization Content document (IHE PCC) or a NIST compliant stable HITSP C32 with the Immunization section populated with CVX or CPT coded immunization records. The document containing the coded immunizations is required to be a stable document.

Note that connecting to WVHIN also allows the Participant to retrieve the Immunization history on a patient. The history is available as an on-demand Immunization Content document registered with the WVHIN XDS.b registry, if a patient match can be made within the WV Immunization Registry.

Immunization Content Validation and Testing Process

WVHIN requires that Participants choosing this level have successfully completed the NwHIN approved NIST testing process to ensure that compliant HITSP C32 containing an Immunization Section or IHE IC document content profiles can be created by the sending system.

Use the CDA content validation link in order to test for content compliance:

<http://xreg2.nist.gov/cda-validation/validation.html>

This validation tool will enable the Participant to test compliance with NwHIN standards prior to approaching WVHIN about participating in this level.

If the Participant is using HITSP C32 they will have to select the radio button, “HITSP/C32 v2.5 -- HITSP/C83 v2.0” for content validation and if using the Immunization Content profile, they will have to select the radio button “IHE IC” for content validation. Choose the radio button “Errors only” under level of detail.

5th Level: Public Health Lab Reporting Workflow

The WVHIN is working with the WV Bureau of Public Health (BPH) to understand the Electronic Lab Reporting options and establish a connection from WVHIN to the public health to report labs electronically. The WVHIN is also working on defining the Participant requirements for lab reporting such that connectivity to the WVHIN enables flow of lab information from the Participant to BPH.

6th Level: NwHIN/VLER Workflow

NwHIN Connectivity Enablement Overview

The 6th level is required by Participants who wish to leverage WVHIN as a gateway to the NwHIN through which they will be able to connect to Federal entities like the Department of Defense, VA and to other states that are nodes on the NwHIN. (See Figure 3 for WVHIN architecture).

For a Participant to become direct node on the NwHIN and talk to NwHIN nodes there is an exhaustive NwHIN on boarding process that includes sponsorship from a federal agency, seeking approval for participation in the NwHIN as well as a comprehensive technical testing process followed by production on boarding.

On boarding to the WVHIN, however, makes the NwHIN connectivity process more efficient and transparent for a WVHIN Participant. The WVHIN will be responsible for the process of becoming a node on the NwHIN and abiding by the technical and policy requirements of the NwHIN. A Participant in the WVHIN needs to indicate their interest in this level and satisfy the requirements of this level in order to have bi-directional data flow enabled with *specific* nodes on the NwHIN.

Please note that the WVHIN is not yet a node on the NwHIN but will be pursuing the effort of onboarding in order to become a node. Once this process is complete, WVHIN participants will have the ability to exchange patient information with other nodes on the NwHIN, bi-directionally.

Relevant Exchange Functionality and Services enabling this flow:

In support of inter-state communication, the WVHIN will implement XCPD Initiating and Responding gateways and XCA Initiating and Responding gateways following the NwHIN specifications. This implementation of the XCPD, XCA profiles will enable the WVHIN to be a node on the NwHIN and share patient and clinical information with other nodes on the NwHIN as appropriate.

Requirements to be implemented by the Participant to leverage WVHIN connectivity to the NwHIN

Integration Profile	Description of Required Functionality
ITI-43: Retrieve Document Set (as Consumer)	The Participant must be capable of issuing a Retrieve Document Set transaction <i>to the WVHIN XCA Initiating Gateway</i> , providing it with three required parameters : HomeCommunityId, DocumentId, and RepositoryId. (Note that prior to this, the Participant, in the role of a document

	consumer should have issued a Registry Stored Query by PatientID and would have received all three parameters in the response. It is required that the Participant have the capability of retaining and sending the HomeCommunityId, the DocumentID and the RepositoryID if they wish to retrieve the document content)
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Note that the NwHIN also requires HITSP C32 as the standard for clinical content. Participants should be able to comply with this requirement in order to share information on their patients with other nodes on the NwHIN.

Getting Connected - Process Flow

The WVHIN has established the following step-by-step procedure for Participants to establish and validate a standards-compliant interface to WVHIN.

Step 1: Preparation and Readiness

- **Complete Readiness Survey:** As part of this step, the Participant is required to complete a survey to help understand WVHIN connectivity goals, baseline system capability to connect to the WVHIN and to gather general information about the participating organization.
- **Review Interoperability Service Guide:** This is to help ensure that there is an understanding of what is involved in the WVHIN onboarding process and helps the Participant make informed decisions about level of participation
- **Complete the Subscription and Order Form:** This form enables the Participant to formalize decisions regarding connectivity to the WVHIN like whether to use own XDS.b Repository or to leverage the WVHIN hosted option. It also requires Participants to state what levels of connectivity they expect to achieve. This drives the testing requirements in the process.

Send an email to info@wvhin.org when Step 1 is complete. Return completed forms as part of the email.

Step 2: Technical Connectivity Testing and Participation Agreement

- **Receive information from WVHIN:** Receive required metadata information (various OIDs) from WVHIN in order to start testing
- **Interface Functional Validation:** Complete "[Technical Preparation Checklist](#)" steps outlined in the WVHIN Interoperability Services Guide. Note that the Technical Preparation Checklist has a section for each level of participation and Participants are required to complete the requirements for all the levels that have been selected by them as part of the Subscription and Order Form. This testing is conducted in the WVHIN Sandbox environment. In this step, the Participant is strictly required to use only mock patient data. No PHI should be transmitted as part of the testing process.
- **Complete Participation Agreement Form**

Send an email to info@wvhin.org when Step 2 is complete. Return the completed Participation Agreement Form as part of the email.

Step 3: Complete Verification and Validation, Begin Patient Notice Process

- **Initiate Patient Notice Process:** As part of connecting to the WVHIN, Participants should follow their organizational policy guidelines. If it is required to notify patients of upcoming WVHIN participation, this is the time to initiate patient notice process
- **Receive Technical Test Package from WVHIN:** This includes:
 - Verification and Validation document with detailed test cases for each level that have been selected by Participant as part of the Subscription and Order Form
 - Technical connectivity information for Test environment: URLs (this is different from the Sandbox environment of Step 2 testing)
 - Test Certificates (This step involves mutual-TLS testing to test secure information exchange. Certificates are hence required to be exchanged)
 - Additional document meta-data specification (accepted types, classes, etc.)
- **Complete tests that are part of the Verification and Validation document:** In this step, the Participant is strictly required to use only mock patient data. No PHI should be transmitted as part of the testing process.

Send an email to info@wvhin.org when Step3 is complete.

Step 4: Production Readiness

- **Receive Production Package:** This includes:
 - Technical connectivity for Production: URLs, production metadata etc.
 - Production Certificate
- **Upgrade production environment:** Participant needs to ensure that the production environment has the required software components, configuration and certificates required to connect to the WVHIN.
- **Test production connectivity:** Test the connectivity with the WVHIN production environment.

Send an email to info@wvhin.org when Step4 is complete.

Technical Preparation Checklist

This part of the on boarding process is aimed at basic connectivity testing between Participant systems and WVHIN. It serves to weed out connectivity and interface compliance issues, if any, early in the process.

1st Level – “Basic Connectivity” Overview: Connecting to WVHIN

Provide a listing of the types of CDA documents that the Participant will be publishing to the WVHIN - e.g. pdf, text, jpeg, gif etc.

Test 1 – Provide Patient Information

The Participant will add a patient to their assigned test domain on the sandbox server with the identifier abc123. The patient will have the following information:

First name: Helen
 Last name: Demoski
 Middle name: Bleh
 DOB: 08/24/87
 SSN: 123-45-6789

Transaction

Transaction	ITI-8
Actor	Patient Identity Source
Parameters	Identifiers: abc123 Domain: (Namespace ID that was provided by WVHIN) Demographics: See above
Sandbox Configuration	IP: TBD Port: TBD

Test 2 – Obtain WVHIN Affinity Domain Patient Identifier

The Participant now queries the PIX Manager Service to obtain patient identifiers for this patient across multiple domains including the WVHIN Registry Affinity Domain. The Registry Affinity Domain Namespace ID is WVHIN, and Universal ID & Universal ID Type is <1.3.6.1.4.1.38674>&ISO. Retrieve the PatientID, for the patient “abc123” registered, under the WVHIN Registry Affinity Domain.

Transaction

Transaction	ITI-9 – PIX Query
Actor	Patient Identifier Cross-reference Consumer
Parameters	Identifiers: abc123 Domain: (Namespace ID that was provided by WVHIN)
Return	Patient identifiers that match the provided patient
Sandbox Configuration	IP: TBD Port: TBD

Test 3a – Register Document with Registry

This is required of Participants choosing to implement their own XDS.b Repository.

The Participant now registers a sample CCD document with WVHIN Services Registry. The PatientID should be the ID for the patient from the Registry Affinity Domain that was retrieved in step 2, followed by ‘^^^&<1.3.6.1.4.1.38674>&ISO’

Transaction

Transaction	ITI-42 – Register Document Set-b
Actor	Document Repository (Participants document repository)
Parameters	<ul style="list-style-type: none"> • PatientID from the Registry Affinity Domain and Registry Affinity Domain ID, provided as patientID, • PatientID from Participant’s local domain namespace and Participant’s local namespace ID, provided as sourcePatientID; • Document ID, unique within consumer’s repository • Repository ID <p>All other parameters required by ITI-42 are also required</p>
Sandbox Configuration	Registry URI: TBD

Test 3b – Provide and Register Document with the WVHIN hosted XDS.b Repository

This is required of Participants choosing to leverage the WVHIN hosted XDS.b Repository.

The Participant now provides a sample CCD document to WVHIN hosted XDS.b Repository. The PatientID should be the ID for the patient from the Registry Affinity Domain that was retrieved in step 2, followed by ‘^^^&1.3.6.1.4.1.38674&ISO’

Transaction

Transaction	ITI-41 – Provide and Register Document Set-b
Actor	Document Source (Participant’s source of clinical data)
Parameters	<ul style="list-style-type: none"> • PatientID from the Registry Affinity Domain and Registry Affinity Domain ID, provided as patientID, • PatientID from Participant’s local domain namespace and Participant’s local namespace ID, provided as sourcePatientID; • Document ID • Submission Set SourceID • Document hash • Document size <p>All other parameters required by ITI-41 are also required</p>
Sandbox Configuration	Repository URI: TBD

Test 4 – Query Registry by Patient Identifier

The consuming site Participant now queries the WVHIN Registry to obtain document IDs for that patient and the repository ID where that document is stored. The Participant can then retrieve those documents from the repositories.

When a query to the registry is made, the PatientID should be the ID for the patient from the Registry Affinity Domain that was retrieved in step 2, followed by '^<1.3.6.1.4.1.38674>&ISO'. Expect the return set for this query to include the document registered in step3 and at least one additional document.

Transaction

Transaction	ITI-18 – Registry Stored Query
Actor	Document Consumer
Parameters	Patient identifier filter, provided as \$XDSDocumentEntryPatientId Status filter, provided as \$XDSDocumentEntryStatus
Return	A list of document IDs or document metadata
Sandbox Configuration	Registry URI: TBD

Test 5 – Retrieve document from Repository (as Repository actor)

This will be a basic connectivity test to ensure that the WVHIN testing harness will be able to retrieve the document registered as part of Test 3 from the Participant repository. Please contact a WVHIN technical resource at info@wvhin.org indicating that Test 3 is complete.

Transaction

Transaction	ITI-43 – Retrieve Document Set
Actor	Document Repository
Parameters	Repository Id, Document Id
Return	A CDA document
Configuration	RepositoryId and EndPoint to be provided by the Participant

Test 6 – Query Registry for On-demand documents associated with patient

The Participant queries the WVHIN Registry to obtain document IDs for that patient and the repository ID where that document is stored. The Participant can then retrieve those documents from the repositories.

When a query to the registry is made, the PatientID should be the ID for the patient from the Registry Affinity Domain that was retrieved in step 2, followed by '^<1.3.6.1.4.1.38674>&ISO'. Expect the return set for this query to include the document registered in step3 and at least one additional document.

Transaction

Transaction	ITI-18 – Registry Stored Query
Actor	Document Consumer
Parameters	Patient identifier filter, provided as \$XDSDocumentEntryPatientId Status filter, provided as \$XDSDocumentEntryStatus, Document Type filter provided as \$XDSDocumentEntryType filter

	For this test, \$XDSDocumentEntryType should contain the values that represent both: Stable: urn:uuid:7edca82f-054d-47f2-a032-9b2a5b5186c1, as well as On-Demand: urn:uuid:34268e47-fdf5-41a6-ba33-82133c465248
Return	A list of stable and on-demand document IDs or document metadata; note that the return set should contain at least one document entry whose object type is urn:uuid:34268e47-fdf5-41a6-ba33-82133c465248
Sandbox Configuration	Registry URI: TBD

2nd Level: CDA Content certified

Test 1 – Validate Content Samples

Provide a listing of the types of CDA documents that the Participant will be publishing to the WVHIN. E.g., HITSP C32 Patient Summary, HITSP C32 Encounter Summary, XPHR, XDS-MS Discharge Summary, the sections that will be part of each document and the formatCode that will be used (See Table 1). Also, provide 3 *samples* of each type of document. Ensure that not all samples provided contain any PHI that can be associated with a real patient.

Document Type	formatCode	Sections
HITSP C32	urn:ihe:pcc:xphr:2007	<ul style="list-style-type: none"> • Medications • Labs • Allergies

Table 1 – Sample Listing

WVHIN will conduct content validation tests using the NIST validator and provide feedback. It is expected that the samples provided in this step will be a good representation of the kind of content that will be created in production. Rigor in this step will ensure that the production on boarding will be smooth.

3rd Level – “BPPC/Record Patient Consent” Workflow

Test 1 – Validate BPPC Content Document

Produce two BPPC Content documents following the requirements listed below and submit to a WVHIN technical resource, by sending an email to info@wvhin.org, for validation via the NIST validator.

Relevant OIDs:

Access Policy	OID
Opt Out	1.3.6.1.4.1.38674.2.1
Opt back in/Cancel Opt out	1.3.6.1.4.1.38674.2.1

Details of BPPC and content requirements are currently addressed by ITI-TF [Volume 1](#) and [Volume 3](#). As of April 2011, there is a change proposal that addresses the issue of where to indicate the privacy policy being acknowledged by the patient.

Requirement1:

The code element of the Patient Privacy Acknowledgement Service Event should be present and the expected code attribute values are “opt-out” or “cancel opt-out” OIDs listed above.

Requirement2:

In the code element, the codeSystem attribute should be set to “<1.3.6.1.4.1.38674>” and the codeSystemName should be “WVHIN”

Requirement3:

The documentationOf/serviceEvent/effectiveTime element’s low value is taken into consideration when patient opt status changes are being effected on the WVHIN network. The effectiveTime/low values have to be before the time the document is published to the repository. The effectiveTime/high element is ignored. If the patient chooses to reverse opt decision after a certain point in time, then a separate BPPC with the right opt status is required to be registered.

Test 2 – Register Opt-out BPPC Document with Registry

Register the sample opt-out BPPC document with WVHIN XDS.b Registry. The PatientID should be the ID for the patient from the Registry Affinity Domain that was retrieved in test 2 of the 1st Level testing, followed by ‘^^^&<1.3.6.1.4.1.38674>&ISO’. It is required that this document be registered as a stable document.

Transaction

Transaction	ITI-42 – Register Document Set-b
Actor	Document Repository (Participant’s document repository)
Parameters	<ul style="list-style-type: none"> • PatientID from the Registry Affinity Domain and Registry Affinity Domain ID, provided as patientID, • PatientID from Participant’s local domain namespace and Participant’s local namespace ID, provided as sourcePatientID; • Document ID, unique within consumer’s repository • Repository ID • formatCode: urn:ihe:iti:bppc:2007 <p>All other parameters required by ITI-42 are also required</p>
Sandbox Configuration	Registry URI: TBD

Test 3 – Query Registry by Patient Identifier

Query the WVHIN Registry to obtain document IDs for that patient and the repository ID where that document is stored.

When querying the registry, the PatientID should be the ID for the patient from the Registry Affinity Domain that was retrieved in test 2 of the 1st Level testing, followed by ‘^^^&<1.3.6.1.4.1.38674>&ISO’. Expect the return set for this query to exclude any documents even though Test 4 of the 1st Level testing had yielded some documents. This is because there has been a submission of an opt-out BPPC document on this patient to the registry and hence no documents should be expected back.

Transaction

Transaction	ITI-18 – Registry Stored Query
Actor	Document Consumer
Parameters	Patient identifier filter, provided as \$XDSDocumentEntryPatientId Status filter, provided as \$XDSDocumentEntryStatus
Return	Empty response – no documents should be returned
Sandbox Configuration	Registry URI: TBD

Test 4 – Register Opt-back in BPPC Document with Registry

Register the sample opt-back in BPPC document with WVHIN XDS.b Registry. The PatientID should be the ID for the patient from the Registry Affinity Domain that was retrieved in test 2 of the 1st Level testing, followed by ‘^^^&<1.3.6.1.4.1.38674>&ISO’. It is required that this document be registered as a stable document.

Transaction

Transaction	ITI-42 – Register Document Set-b
Actor	Document Repository (Participant’s document repository)
Parameters	<ul style="list-style-type: none"> • PatientID from the Registry Affinity Domain and Registry Affinity Domain ID, provided as patientID, • PatientID from Participant’s local domain namespace and Participant’s local namespace ID, provided as sourcePatientID; • Document ID, unique within consumer’s repository • Repository ID • formatCode: urn:ihe:iti:bppc:2007 <p>All other parameters required by ITI-42 are also required</p>
Sandbox Configuration	Registry URI: TBD

Test 5 – Query Registry by Patient Identifier

Query the WVHIN Registry to obtain document IDs for that patient and the repository ID where that document is stored.

When querying the registry, the PatientID should be the ID for the patient from the Registry Affinity Domain that was retrieved in test 2 of the 1st Level testing, followed by ‘^^^&<1.3.6.1.4.1.38674>&ISO’. Expect the return set for this query not to include at least one document. This is because there has been a submission of an opt-back in BPPC document on this patient to the registry and hence some documents are now expected back.

Transaction

Transaction	ITI-18 – Registry Stored Query
Actor	Document Consumer
Required Parameters	Patient identifier filter, provided as \$XDSDocumentEntryPatientId Status filter, provided as \$XDSDocumentEntryStatus
Return	At least one document
Sandbox Configuration	Registry URI: TBD

4th Level: Immunization Reporting Workflow

Test 1 – Validate Immunization Content or HITSP C32 Document

Produce either an IHE IC or a HITSP/C32 v2.5 -- HITSP/C83 v2.0 document following the requirements listed below and submit to a WVHIN technical resource, by sending an email to info@wvhin.org, for validation via the NIST validator.

Requirement1:

Shall contain immunizations coded as either CVX or CPT codes. CDC standard codes are expected and references to those are found here:

CPT Code: <http://www2a.cdc.gov/nip/IIS/IISStandards/vaccines.asp?rpt=cpt>

CVX Code: <http://www2a.cdc.gov/nip/IIS/IISStandards/vaccines.asp?rpt=cvx>

MXV Code: <http://www2a.cdc.gov/nip/IIS/IISStandards/vaccines.asp?rpt=mxv>

Test 2 – Immunization Workflow testing

Test Configuration

URLs:

Registry: TBD

Repository: TBD (WVHIN XDS.b repo link)

Repository: TBD

Immunization Test Patient: *(Use a patient known to the IZ registry)*

Last Name: TBD

Fist Name: TBD

DOB: TBD

SSN: TBD

Metadata values:

Document Format Code:

Use *urn:ihe:pcc:xphr:2007* if Participant is sending Immunizations section as part of a HITSP C32 document

Use *urn:ihe:pcc:ic:2009* if Participant is sending immunizations section as part of an IHE PCC IC document

Ensure that the submission set *sourceId* is the value that is assigned by WVHIN.

Repository Unique ID: Returned as part of the registry stored query

Test Plan for testing bi-directional Immunization data flow with the Immunization Registry

Step 1: Using the WVHIN assigned PIX namespace send a PIX Patient Identity feed for the Immunization Test Patient identified in the Testing Configuration section above.

Step 2: Send a PIX Query to retrieve the WVHIN Affinity Domain PatientID for the Immunization Test Patient.

Step 3: Send a Registry Stored Query by PatientID and include the option to retrieve both stable and on-demand documents. Expect to receive on On-demand document back.

Step 4: Send a Retrieve Document Set-b for the On-demand document entry retrieved as part of Step3. Ensure that the returned document contains some immunizations for the Immunization Test Patient. Save this document locally for purposes of comparison later.

Step 5: For the Immunization Test Patient send a Register Document Set-b with a stable document (HITSP C32 or PCC IC) that contains Immunizations. Note that Participant can use the Affinity Domain Patient Identifier retrieved as part of Step2 in the Register Document Set-b transaction.

Step 6: Send a Registry Stored Query by PatientID and include the option to retrieve both stable and on-demand documents. Expect to receive on On-demand document and one stable document (that was submitted in step 5 above).

Step 7: Send a Retrieve Document Set-b for the On-demand document entry retrieved as part of Step6. Compare this document with the document retrieved as part of Step4. The difference should be in the Immunization section and the new immunizations that are seen in the latest documents should correspond to the immunizations submitted by Participant for the Immunization Test Patient as part of the stable document submission in Step5.

5th Level: Public Health Lab Reporting Workflow

The tests for Electronic Lab Reporting are under development and will be available later.

6th Level: NwHIN/VLER Workflow

Test 1 – Provide Patient Information

The Participant will add a patient to their assigned test domain on the sandbox server with the identifier **TBD**. The patient will have the following information:

First name: TBD

Last name: TBD

Middle name: TBD

DOB: TBD

SSN: TBD

Transaction

Transaction	ITI-8
Actor	Patient Identity Source
Parameters	Identifiers: abc123 Domain: (Namespace ID that was provided by WVHIN) Demographics: See above
Sandbox Configuration	IP: TBD Port: TBD

Test 2 – Obtain WVHIN Affinity Domain Patient Identifier

The Participant now queries the PIX Manager Service to obtain patient identifiers for this patient across multiple domains including the WVHIN Registry Affinity Domain. The Registry Affinity Domain Namespace ID is *WVHIN*, and Universal ID & Universal ID Type is *<1.3.6.1.4.1.38674>&ISO*. Retrieve the PatientID, for the patient registered in Test 1, under the WVHIN Registry Affinity Domain.

Transaction

Transaction	ITI-9 – PIX Query
Actor	Patient Identifier Cross-reference Consumer
Parameters	Identifiers: abc123 Domain: (Namespace ID that was provided by WVHIN)
Return	Patient identifiers that match the provided patient
Sandbox Configuration	IP: TBD Port: TBD

Test 3– Query Registry by Patient Identifier

The Participant now queries the WVHIN Registry to obtain documents for that patient.

When a query to the registry is made, the PatientID should be the ID for the patient from the Registry Affinity Domain that was retrieved in step 2, followed by ‘^^^&<1.3.6.1.4.1.38674>&ISO’. Expect the return set for this query to include at least one document back whose homeCommunityId does not match that of the WVHIN.

Transaction

Transaction	ITI-18 – Registry Stored Query
Actor	Document Consumer
Required Parameters	Patient identifier filter, provided as \$XDSDocumentEntryPatientId Status filter, provided as \$XDSDocumentEntryStatus
Return	A list of document IDs or document metadata with homeCommunityId, documentId, repositoryId
Sandbox Configuration	Registry URI: TBD

Test 4 – Retrieve document (as Document Consumer)

The Participant now communicates with the WVHIN XCA Initiating Gateway to obtain the clinical document.

Transaction

Transaction	ITI-43 – Retrieve Document Set
Actor	Document Consumer
Required Parameters	Repository Id, Document Id, homeCommunityId
Return	A CDA document
Configuration	WVHIN XCA Initiating Gateway: TBD

Test 5 – Validate HITSP C32 Content Document

Produce two HITSP C32 Content documents and submit to a WVHIN technical resource, by sending an email to info@wvhin.org, for validation via the NIST validator.

Additional Resources and References

PIX and XDS.b and BPPC Profiles

http://www.ihe.net/Technical_Framework/upload/IHE_ITI_TF_Rev8-0_Vol1_FT_2011-08-19.pdf

http://www.ihe.net/Technical_Framework/upload/IHE_ITI_TF_Rev8-0_Vol2a_FT_2011-08-19.pdf

http://www.ihe.net/Technical_Framework/upload/IHE_ITI_TF_Rev8-0_Vol2b_FT_2011-08-19.pdf

http://www.ihe.net/Technical_Framework/upload/IHE_ITI_TF_Rev8-0_Vol3_FT_2011-08-19.pdf

http://www.ihe.net/Technical_Framework/upload/IHE_ITI_Suppl_On_Demand_Documents_Rev1-2_TI_2011-08-19.pdf (On-demand documents)

http://www.ihe.net/Technical_Framework/ (Link to latest IHE Technical Profiles)

IHE Patient Care Coordination (PCC) Profiles or Content profiles

http://www.ihe.net/Technical_Framework/upload/IHE_PCC_TF_Rev7-0_Vol_1_2011-09-09.pdf

http://www.ihe.net/Technical_Framework/upload/IHE_PCC_TF_Rev7-0_Vol_2_2011-09-09.pdf

http://www.ihe.net/Technical_Framework/upload/IHE_PCC_Suppl_Immunization_Content_Rev2-2_TI_2011-09-09.pdf

HITSP C32

http://www.hitsp.org/ConstructSet_Details.aspx?&PrefixAlpha=4&PrefixNumeric=32

Wiki Pages

http://wiki.ihe.net/index.php?title=Patient_Identifier_Cross_Referencing

http://wiki.ihe.net/index.php?title=Cross_Enterprise_Document_Sharing

Annotated XDS.b Examples

http://wiki.ihe.net/index.php?title=Annotated_StoredQuery_Transaction

http://wiki.ihe.net/index.php?title=Annotated_ProvideAndRegister.b_Transaction

http://wiki.ihe.net/index.php?title=XDS.b#Example_Retrieve_Document_Set_transaction

Glossary of Terms

Acronym	Term
ARRA	American Recovery and Reinvestment Act (of 2009)
ATNA	Audit Trail and Node Authentication
BPPC	Basic Patient Privacy Consents
CCD	Continuity of Care Document
CDA	Clinical Document Architecture
COTS	Commercial Off The Shelf
CT	Consistent Time
CVX	Refers to “Vaccines administered”
C32	Refers to HITSP C32
EDR	Emergency Department Referral
EHR	Electronic Health Record
HIE	Health Information Exchange
HITECH	Health Information Technology for Economic and Clinical Health
HITSP	Healthcare Information Technology Standards Panel
HL7	Health Level 7
IC	Immunization Content
IDN	Integrated Delivery Network
IHE	Integrating the Healthcare Enterprise
ITI	IT Infrastructure (IHE Profile set)
MPI	Master Patient Index
NIST	National Institute of Standards and Technology
NwHIN	Nationwide Health Information Network
OID	Object Identifier
ONC	Office of National Coordinator
PCC	Patient Care Coordination (IHE Profile set for content standards)
PHR	Personal Health Record
PIX	Patient Identifier Cross Referencing
RIM	Reference Information Model
RLS	Record Locator Service
SOA	Service Oriented Architecture
TLS	Transport Layer Security
URI	Uniform Resource Identifier
VLER	Virtual Lifetime Electronic Record
WVHIN	West Virginia Health Information Network
XCA	Cross Community Access
XCPD	Cross Community Patient Discovery
XDS.b	Cross Enterprise Document Sharing
XDS-MS	Cross Enterprise Document Sharing – Medical Summaries
XPHR	Exchange of Personal health record
XML	Extensible Markup Language