

Nationwide Health Information Network

Adapter Version 5.0



Interface Control Document Version 5.7

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**Department of Veterans Affairs
Office of Information and Technology
Product Development**

Revision History

Date	Version	Description	Author
10/11/2011	4.5	VLER PMO Review: Three misspellings corrected. TWR2 508-compliance sweep & removed watermark. This version has been VLER PMO approved: Changed VW PjM to R. Muse. FINAL.	
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1. INTRODUCTION

The Nationwide Health Information Network (NwHIN) is being developed to provide a secure, nationwide, interoperable health information infrastructure that will connect providers, consumers, and others involved in supporting health and health care. This critical part of the national health IT agenda will enable health information to follow the consumer, be available for clinical decision making, and support appropriate use of health care information beyond direct patient care so as to improve health.

This document describes the interaction between the Veterans Affairs (VA) Nationwide Health Information Network (NwHIN) Adapter and other VA systems. It is intended as a definition of what functionality the NwHIN provides, where data comes from, and the impact on other VA systems.

1.1. Purpose

This Interface Control Document (ICD) presents the software interface requirements between the VA Adapter and other VA systems.

It describes the concept of operations for the interface, defines the message structure and protocols which govern the interchange of data, and identifies the communication paths along which the data is expected to flow.

1.2. Scope

This document describes external interfaces exposed by NwHIN Adapter version 5.0. The following interfaces are covered:

- Retrieve patient data from the NwHIN
- Announce/discover patients to the NwHIN
- Respond to requests from NwHIN for patient data
- Retrieve audit data

1.3. System Identification

The NwHIN project provides a NwHIN Gateway that is connected to other participants in the NwHIN. The VA Adapter facilitates exchanges of information between VA systems and external partners via the NwHIN Gateway. The NwHIN Gateway and Adapter interfaces are based on web services standards.

1.3.1. NwHIN Adapter 5.0

The NwHIN Adapter is the system responsible for servicing and facilitating requests for information that originate both inside and outside the VA.

Table 1: Adapter 5.0 System Information

System	Details
Identification number	S4
Title	Adapter
Abbreviation	N/A
Version number	5.0
Release number	5

System	Details
Point of Contact	
Vendor [optional]	

1.3.2. NwHIN Gateway

The NwHIN Gateway System is responsible for securely exchanging and orchestrating health information between external NwHIN partners and the VA.

Table 2: VA Gateway System Information

System	Details
Identification number	S3
Title	Gateway
Abbreviation	N/A
Version number	CONNECT 3.2.2.1
Release number	3.2.2.1
Point of Contact	
Vendor [optional]	

1.3.3. Vista Web

VistaWeb is a web-based system that provides the clinical user interface used to request and display Veteran health care information.

Table 3: Vista Web System Information

System	Details
Identification number	S5
Title	VistaWeb
Abbreviation	N/A
Version number	16
Release number	N/A
Point of Contact	
Vendor [optional]	

1.3.4. NwHIN VAP

The Veterans Authorization and Preferences (VAP) subsystem enables Veterans to manage, integrate, and enforce their opt-in/opt-out preferences electronically. VAP enables Veterans to update and change those preferences through the use of the eBenefits application.

VAP is a consumer of the Adapter Audit interface. Adapter is a consumer of VAP to retrieve the Veterans authorization preference for release of information to the NwHIN. The VAP consumes audit information from the Adapter.

Table 4: VAP System Information

System	Details
Identification number	S9
Title	Veteran Authorizations and Preferences
Abbreviation	VAP
Version number	1.0
Release number	1
Point of Contact	
Vendor [optional]	

1.4. Operational Agreement

When the VA and a Health Information Exchange (HIE) partner agree to participate in the NwHIN, they develop or acquire systems that are able to communicate using Web services (messaging platform). For the VA, this might be an instance of CONNECT that is interfaced to its existing health care systems. Both organizations sign Data Use and Reciprocal Support Agreements (DURSAs) with the governing body for the NwHIN and are accredited as conforming to the NwHIN standards. As a result, they receive digital certificates that attest to their identity and their right to participate in the NwHIN (messaging platform). These certificates serve as the technical basis of trust between NwHIN participants, since they were issued by a certification authority that all participants trust. Later on, these certificates will be used to sign and encrypt all communications between the VA and the HIE, now an NHIE (Nationwide Health Information Network Exchange).

Note: The NwHIN Adapter Project Manager shall take responsibility for communicating any potential or planned changes to the interfaces defined herein, once these changes are known, in order to minimize adverse impacts on the systems involved and team schedules.

1.5. Reference Documentation

The following documents are referenced to facilitate a greater understanding of the changes developed for the NwHIN Adapter 5.0 release. Many of the documents in the table below can be accessed from TSPR.

Table 5: Adapter 5.0 Reference Documents on TSPR

Document Title	Notebook Section/Other Location	Post Date
NwHIN Enhancements Request #20100102 Business Requirements Document	ProPath Home Page – Business Requirements Document	July 2011
NwHIN Adapter 5.0 Requirements Specification Document	Project Planning – Requirements Specification Document	January 2012
NwHIN Adapter 5.0 Epic Stories	Requirements Elaboration – Use Case Specifications	January 2012
Virtual Lifetime Electronic Records (VLER) Concept of Operations (CONOPS) 2.0	Project Planning - CONOPS	April 2011

The following documents from the U.S. Department of Health & Human Services (HHS) and the Veterans Health Administration (VHA) web sites are referenced for more detailed information regarding interface compliance specifications for the Adapter.

Table 6: Adapter 5.0 External References

Document Title/Website Name	Website Section
HHS Federal Health Architecture (FHA) NwHIN Resources	HHS FHA NwHIN Resources website
2010 NwHIN Final Production Specifications	Latest Resources – April 2010 > 2010 NwHIN Final Production Specifications
NwHIN Query for Documents - Web Service Interface Specification	Latest Resources – August 2011 > Revised Specifications Adopted for Exchange
NwHIN Retrieve Documents - Web Service Interface Specification	Latest Resources – August 2011 > Revised Specifications Adopted for Exchange
NwHIN Patient Discovery - Web Service Interface Specification	Latest Resources – August 2011 > Revised Specifications Adopted for Exchange
VHA Section 508 Office (19F) Health Data & Informatics (HDI) Section 508 Checklist for Web-based Internet Information and Applications	_____ _____

2. INTERFACE DEFINITION

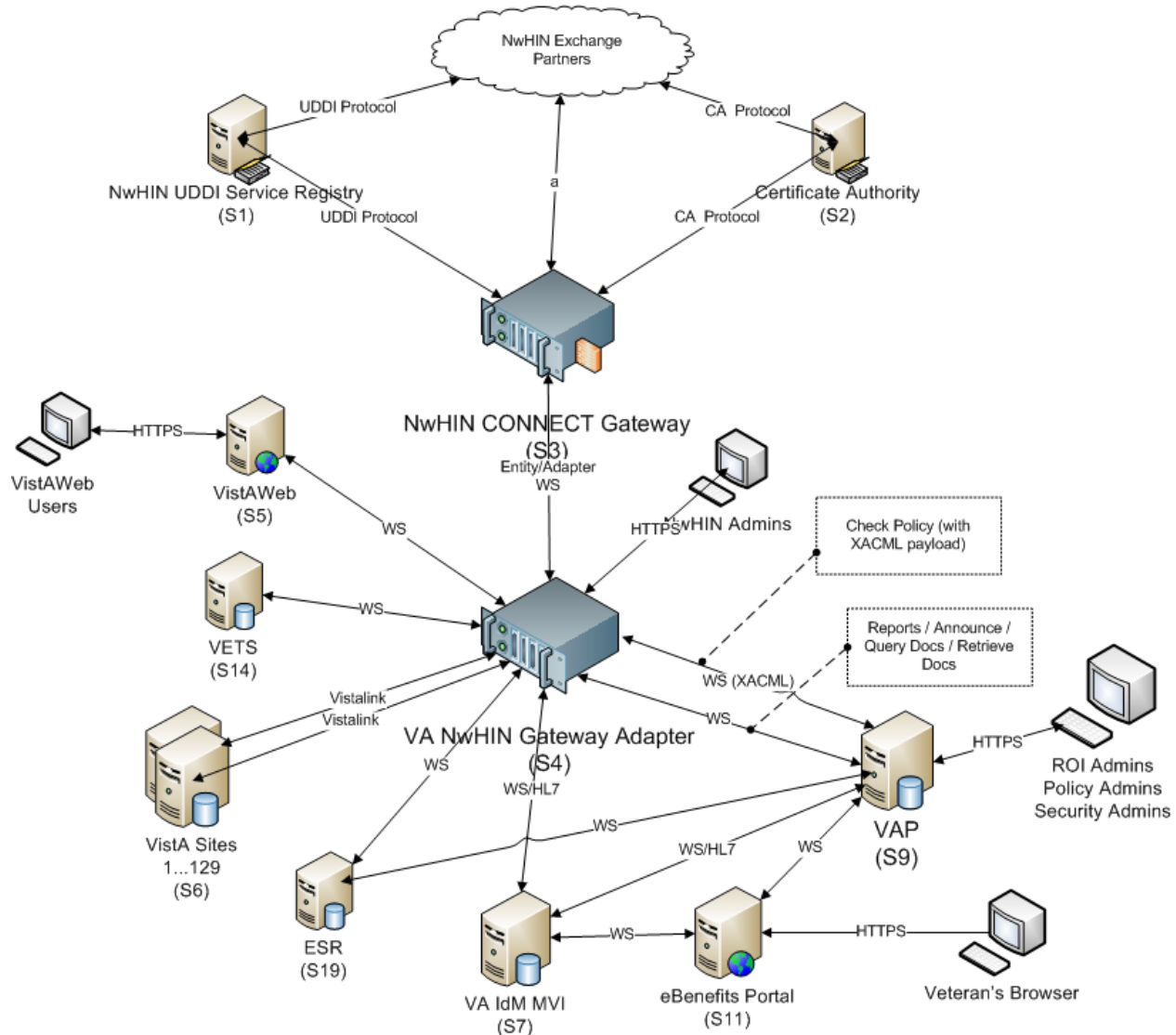
The VA Adapter is the component that allows the NwHIN CONNECT reference implementation (also referred as Gateway) to adapt to various NwHIN partner systems and essentially bridging the local electronic health record (EHR) to the NwHIN. It implements a standard reference interface in order to support this NwHIN Connect Gateway service orchestration.

Besides supporting the NwHIN Connect Gateway, Adapter also exposes interfaces that allow authorized internal applications/users to query and retrieve patient data from NwHIN partners.

2.1. System Overview

The following diagram summarizes each system involved in interfacing activities.

Figure 1: NwHIN Adapter 5.0 System Overview



2.2. Interface Overview

The table below provides a description of the various system interfaces that appear in the system overview graphic.

Table 7: NwHIN Adapter 5.0 Interface Overview

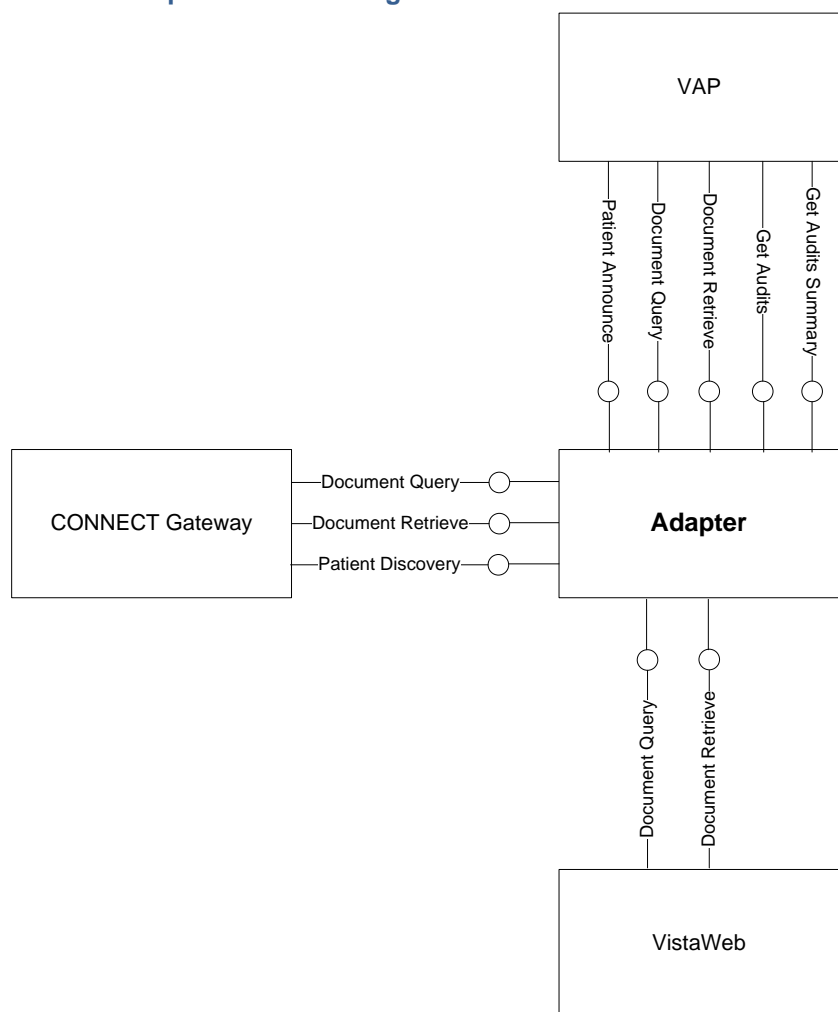
System	Type	Description
NwHIN Adapter (S1)	Web Service	<p>The Adapter represents the software used by an organization to communicate bi-directionally with the CONNECT Gateway by wrapping an organization's existing system. It must implement a specific set of interfaces defined by CONNECT.</p> <p>The Adapter system connects all the subsystems together in order to provide the VA clinicians with data from external NwHIN partners.</p> <p>Similarly to the Connect Gateway entity services, Adapter exposes a set of interfaces that are invoked by the Connect Gateway to service NwHIN partner requests.</p>
NwHIN CONNECT Gateway (S2)	Web Service	<p>This is the subsystem that provides the NwHIN Adapter with the capability to connect to the Gateway. The NwHIN-C Gateway allows the Adapter to receive information from providers who are participants in the NwHIN.</p> <p>The Connect Gateway exposes a set of standard NwHIN services that are accessed by partners in the NwHIN. The Connect Gateway is also responsible for sending (and receiving) data to the NwHIN on behalf of the Adapter.</p> <p>The Connect Gateway exposes services (Entity Services) to Adapter for requesting data from NwHIN partners.</p>
VistaWeb (S3)	Web Service	<p>VistaWeb provides the clinician facing user interface. VistaWeb is the primary consumer of NwHIN data that is hosted by the Adapter.</p>
VAP (S4)	Web Service	<p>This is the subsystem that provides the NwHIN Adapter with the capability to verify a VA patient's preference to opt in or opt out. This subsystem will verify if the patient's preference is either "Opt In" or "Opt Out" and allow the patient to update and change their preference.</p> <p>VAP is also a consumer of the Adapter audit log data.</p>

System	Type	Description
VA MVI	Web Service	<p>Access to the Master Patient Index (MPI) at the VA. This is the subsystem that provides the NwHIN Adapter with patient demographics and the patient's ICN (Integration Control Number).</p> <p>The MPI is the authoritative source for the ICN and the following five identity fields: Name (all components), SSN, Date of Birth, Gender, Mother's Maiden Name, and the correlated domains (treating facilities/systems of interest) that are known by that ICN.</p>
VETS	Web Service	VHA Enterprise Terminology Services (VETS) translates terminology between different applications. For example, VETS is used by the NwHIN Adapter when assembling a C32 or a C62 document for trusted, external healthcare partners.
ESR	Web Service	Enrollment System Redesign (ESR) is an enrollment system that tracks information pertaining to a Veteran. The ESR exposes a Web Service interface that Adapter will use to access and retrieve the 'Preferred Facility' that will be stored in the Audit table and provided to VAP when Audit Summary and Detail Reports are requested from Adapter.
Vista	VistaLink	The Vista instance(s) is the EHR system that provides the data to NwHIN partners.

2.3. Operations

The following interface diagram depicts the operations exposed by the Adapter along with the respective consumers.

Table 8: Adapter Interface Diagram



2.3.1.NwHIN Standard Operations

The NwHIN specification includes a set of operations that every partner is required to implement. These are described in the following sub-sections.

The NwHIN standard operations and related interfaces exist in two forms; CONNECT Gateway and the Adapter. The Adapter form is used internally to request data from NwHIN partners and is referred to as an Entity interface. This Entity interface is equivalent to the CONNECT Gateway interface that faces the NwHIN with a slight modification – it does not support Security Assertion Mark-up Language (SAML). Instead it takes the SAML-related assertion information in the form of an assertion object. This object is then used by the Message Proxy Components to construct a valid SAML message.

Pass Through Mode

Adapter version 5.0 bypasses the Gateway orchestration by using the pass through interfaces of the gateway (called proxy [msg_Proxy] interfaces). Pass through occurs for all relevant NwHIN services, namely Patient Discovery, Document Query and Document Retrieve services. The gateway is still responsible for communications to and from NwHIN including SAML processing.

This mode enables the Adapter to improve performance of in/outbound NwHIN transactions by eliminating the Gateway orchestration overhead; in addition, the impact to Adapter of future Gateway releases is reduced.

Note: For detailed information on messages used by these standard NwHIN operations, refer to [2.6 Data Exchanges](#).

The Query/Retrieve information exchange pattern is a three-step process through which the Adapter identifies the patient for whom documents are being requested, verifies that the documents requested are available, and retrieves the documents for exchange with the trusted HIE partner.

1. Patient Discovery (Arbitrate patient identity)
2. Document Query (Query for list of available documents)
3. Document Retrieve (Retrieve documents)

2.3.2. Patient Discovery

Patient Discovery is the first in the three-step process which defines the Query/Retrieve information exchange pattern in the NwHIN. In order to share patient data within the NwHIN connected partner organizations, it is necessary to have mechanisms to match patient identities in the absence of a single national identifier.

The receiving partner searches its patient index for matches, using the demographic information sent to it and its own matching algorithms, criteria, and policy. If a match is found, and sharing that patient ID over the NwHIN with the other partner is allowed by policy and patient preferences, the receiving partner sends its patient ID and the demographic information as it is known to that partner back to the querying partner. Finally, the querying partner compares the demographic information returned to it, using its matching algorithms, criteria, and policy, to determine whether it agrees with the match. Fundamental to the Patient Discovery service is that both NwHIN partners must agree on a match for an exchange to proceed. Authorization assertion(s) are included in the query message as specified by the Authorization Framework specification.

The Patient Discovery operation is typically invoked when a Veteran requests to opt-in (or opt-out) to the NwHIN. The Patient Discovery operation is also referred to as a Patient Announce. The VAP system will use this operation to batch announce Veterans to the NwHIN.

Although the specification (IHE XCPD - Cross Gateway Patient Discovery Transaction) supports asynchronous operations, the current VA implementation only supports synchronous operations using Simple Object Access Protocol (SOAP) profile over HTTP/S.

2.3.3. Document Query

Query for documents is the second in the three-step process which defines the Query/Retrieve information exchange pattern in the NwHIN. Currently, Document Query is a synchronous operation, supporting SOAP messages over HTTP/S transport.

2.3.4. Document Retrieve

Document Retrieve is the third in the three-step process which defines the Query/Retrieve information exchange pattern in the NwHIN. Document Retrieve is used to retrieve a specific document by unique doc ID. It is assumed (and a pre-condition) that the invoking application has previously obtained the Document ID and any associated metadata needed to retrieve a document; typically through a prior Query for Documents transaction. Currently, Document Retrieve is a synchronous operation, supporting SOAP messages over HTTP/S transport.

2.3.5. Audit Manager Operations

Audit Manager operations allow external applications (such as VAP reporting) to retrieve audit records captured by Adapter during various events such as patient discovery and disclosure of documents.

Note: For detailed information on messages used by these operations, refer to section [2.6 Data Exchanges](#).

2.3.6. Get Audits

The Get Audits operation provides the ability to retrieve audit information from the Adapter. This operation returns detail audit records. Depending on the query parameters the response may be quite large and so the operation features pagination parameters to limit the number of records returned by each invocation. This operation may be invoked several times to return a complete result set. This pagination feature is crucial for on-line reporting applications such as VAP disclosure reports. Currently, Get Audits is a synchronous operation, supporting SOAP messages over HTTP/S transport.

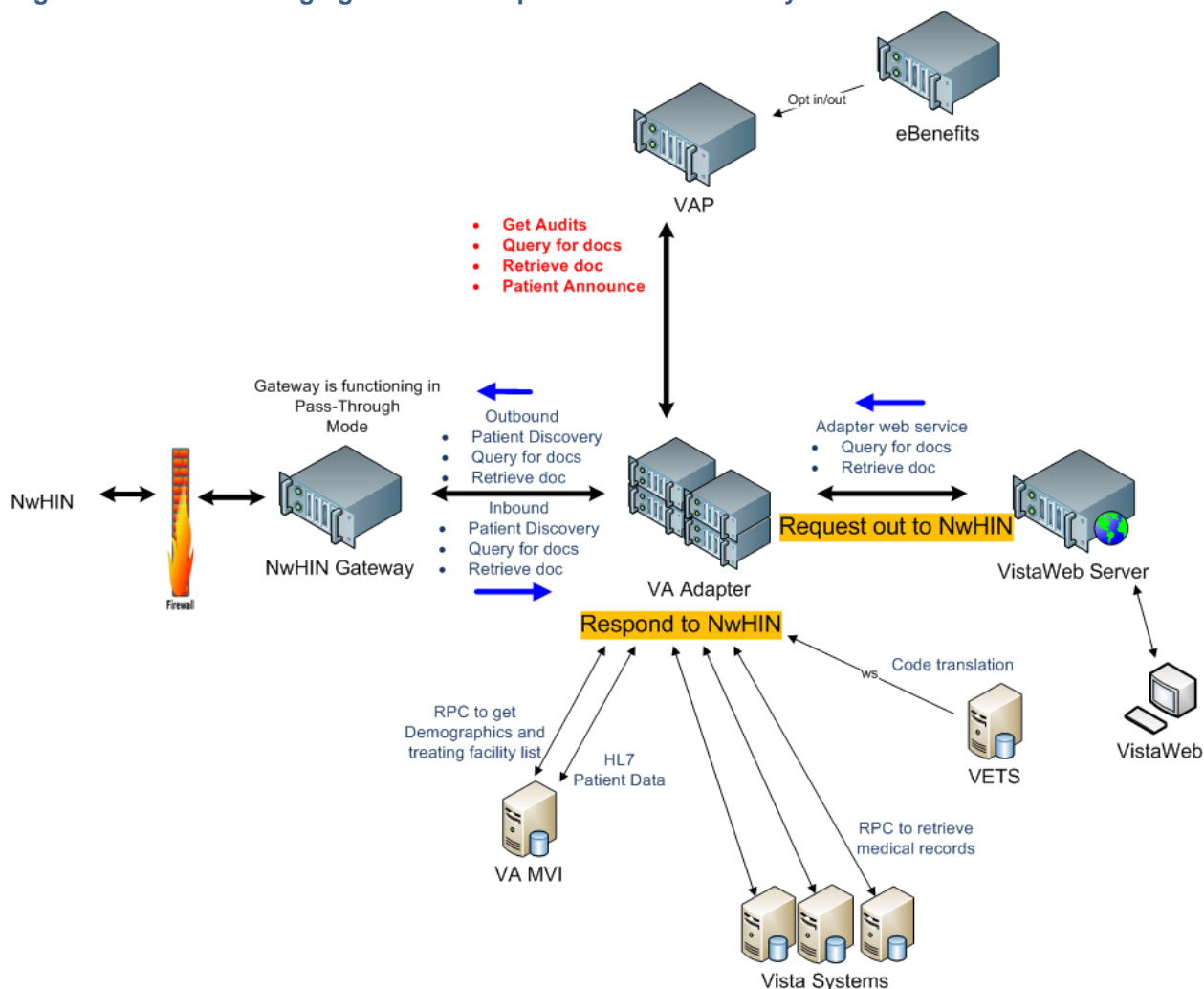
2.3.7. Get Audits Summary

The Get Audits Summary operation allows an external system such as VAP to retrieve aggregated audit information from the Adapter. This operation returns summary audit records. Each record is comprised of the aggregate attribute (group by column) and a count. Currently, Get Audits Summary is a synchronous operation, supporting SOAP messages over HTTP/S transport.

2.4. Data Transfer

The following diagram illustrates how messaging works between the Adapter and related systems.

Figure 2: Flow of Messaging between Adapter 5.0 and Related Systems



All data transfer between systems and interfaces described in this document will be performed across secure network connections.

- If the interface being exposed by the system is a Web Service interface, then the data will be packaged as a Simple Object Access Protocol (SOAP) payload for data transfer.
- If the interface being exposed is a HL7 messaging based interface, then the HL7 data will be ER7 encoded and packaged using the Minimum Lower Level Protocol (MLLP) for data transfer.

2.5. Transaction Types

All NwHIN Adapter transactions are atomic and serialized to ensure isolation and consistency. All Adapter services are synchronous. It is the responsibility of external systems to add any asynchronous and batching functions.

2.6. Data Exchanges

The VA NwHIN Gateway Adapter is deployed as a single, national instance from the Austin Information Technology Center (AITC). Payloads are standards-based Clinical Document Architecture (CDA) XML

documents. VistA data is retrieved through the use of VistALink-mediated Remote Process Calls (RPC) calls; HIE data retrieved (web services) by the NwHIN Adapter is displayed by VistAWeb.

The following sub-sections describe the interface messages that are exchanged between the VA Adapter and other related internal systems.

2.6.1.Document Query

Document Query is used to retrieve a list of documents for a specific patient's integration control number (ICN) for subsequent retrieval. The Web Services Description Language (WSDL) used by an internal application to access this interface is "AdapterGatewayDocQuery.wsdl" (refer to Appendix).

The input message consists of the following sections:

- Query data – Sequence of RIM slot entries (see table below)
- Security Assertion object – see Assertion object below
- Target Communities – This is an optional section containing a sequence of Target partners, when left out, the Adapter will issue requests to all partners where patient is known (based on MVI correlations).

The tables below depict the most commonly used elements in the Query and Assertion objects. For a list of all possible elements, please refer to the NhinCommonAdapter and NhinCommon schemas.

Table 9 - Input Query Data Slot Elements

Name	Type	R/O	Comments
\$XDSDocumentEntryFormat Code	XDS Coding System	O	Use format code of "urn:ihe:pcc:xphr:2007" for "Exchange of Personal Health Records (XPHR)" format
\$XDSDocumentEntryPatientId	String	R	VA ICN
\$XDSDocumentEntryClassCode	String/Code	R	LOINC codes for document class codes request. Example entry to request only C32 (LOINC Code 34133-9): '34133-9^^2.16.840.1.113883.6.1'
\$XDSDocumentEntryServiceStartTimeFrom	Lower value of XDSDocumentEntry.serviceStartTime	O	Doc selection start time (used for C62)
\$XDSDocumentEntryServiceStopTimeTo	Lower value of XDSDocumentEntry.serviceStopTime	O	Doc selection end time (used for C62)

Table 10 - Assertion object (common elements)

Name	Type	R/O	Comments
HomeCommunity	HomeCommunityType	R	Comprised of Home Community ID and optionally a description and/or name.
UserInfo	UserInfoType	R	Name of individual requesting information along with subject Organization information

Name	Type	R/O	Comments
RoleCoded	RoleCodedType	R	Role of individual requesting information. Contains code system, code value and Display name.
purposeOfDisclosureCoded	purposeOfDisclosureCodedType	R	Purpose of request. Contains code system, code value and Display name.

The response data includes a list of document unique identifiers matching the query.

For detailed interface data information, refer to the *NwHIN Query for Documents - Web Service Interface Specification* (see [Reference Documentation](#)). In addition, [Appendix A: Data Elements](#) provides the WSDL and a sample Document Query messages.

Table 11: Document Query Error Conditions

Error Code	Description
XDSRegistryError	Error from the registry in processing the query (e.g. invalid query criteria)
XDSRegistryBusy	Too much activity
XDSRegistryOutOfResources	Resources are low.
XDSTooManyResults	Too many results
XDSUnknownStoredQuery	The Query ID provided in the request is not recognized.
XDSStoredQueryMissingParam	A required parameter to a stored query is missing.
XDSStoredQueryParamNumber	A parameter which only accepts a single value is coded with multiple values
XDSUnknownPatientId	The Patient ID specified is no longer valid. If the Patient ID is not known, has never been valid, and the HIE is not able to distinguish this from previously valid Patient ID's, then this error should also be returned. Otherwise a Patient ID that has never been valid should result in an empty list.
XDSUnknownCommunity	A value for the homeCommunityId is not recognized
XDSMissingHomeCommunityId	A value for the homeCommunityId

2.6.2. Document Retrieve

Document Retrieve is used to retrieve a specific document by unique doc ID. It is assumed (and a pre-condition) that the invoking application has previously obtained the Document ID and any associated metadata needed to retrieve a document; typically through a prior Query for Documents transaction. The WSDL used in this part of the process is EntityDocumentRetrieve.wsdl. Input data elements consist of:

- Home Community ID
- Repository Unique ID
- Doc Unique ID

The response data includes:

- Document Unique ID
- Repository Unique ID
- The retrieved document in base64binary encoded format
- The MIME type of the retrieved document
- Errors or warnings in case document could not be retrieved

For detailed interface data information, refer to the *NwHIN Retrieve Documents - Web Service Interface Specification* (see [Reference Documentation](#)). In addition, [Appendix A: Data Elements](#) provides the WSDL.

Table 12: Document Retrieve Error Conditions

Error Code	Description
XDSRepositoryError	Internal Repository Error.
XDSRepositoryBusy	Too much activity
XDSRepositoryOutOfResources	Resources are low.
XDSUnknownRepositoryId	The repositoryUniqueId value could not be resolved to a valid document repository or the value does not match the repositoryUniqueId of the Document Repository
XSDocumentUniqueIdError	The document associated with the DocumentUniqueId is not available. This could be because the document is not available to the Document Repository, the requestor is not authorized to access that document or the document is no longer available
XDSUnknownCommunity	A value for the homeCommunityId is not recognized
XDSMissingHomeCommunityId	A value for the homeCommunityId is required and has not been specified

2.6.3. Patient Discovery (Patient Announce)

Patient Announce was developed by the VA as a simpler alternative to the NwHIN Patient Discovery interface. It is used to establish patient correlation with VA NwHIN partners. The WSDLs used in this part of the process are EntityPatientDiscovery.wsdl and AnnouncePatient.wsdl. Input message consists of:

- Requestor's Home Community ID
- Patient ID (Assigning Authority OID + Patient ID)
- List of target Facilities (VA Trusted Partners filtered from UDDI Registry)
- Requesting user
- Purpose of Use (TREATMENT or BENEFITS VERIFICATION)
- User Role (MEDICAL DOCTOR)

The response data includes a result code and possible list of patient identifiers matching the identity traits.

When queried for a match, a partner can return one of three responses. It can return a match with a patient ID and demographics. It can return a message that there was an ambiguous match and request additional information that might result in a single matching patient. Or it can return no match, which might correspond to a failure to identify any matches or an ambiguous match to multiple patients when a more

exact match cannot be expected. A partner can only return multiple matches if they represent exact matches to multiple institutions within the partner that are believed to represent a single patient.

The following outbound demographic traits are used by the VA for the patient correlation process to NwHIN Partners:

- SSN
- First name
- Last name
- Middle initial
- Address
- Date of birth
- Gender
- VA identifier (ICN)

The following inbound demographic traits are used by NwHIN partners for the patient correlation process to the VA:

- SSN
- First name
- Last name
- Middle initial
- Address
- Date of birth
- Gender
- External identifier

Inbound Patient Discovery response (for successful patient discoveries) from each partner is stored in MVI. The SOAP envelope contains the XCPD message.

Table 13: Patient Discovery Error Conditions

Error Code	Description
LivingSubjectAdministrativeGenderRequested	Requests the LivingSubjectAdministrativeGender attribute be specified
PatientAddressRequested	Requests the PatientAddress attribute be specified
PatientTelecomRequested	Requests the PatientTelecom attribute be specified
LivingSubjectBirthPlaceNameRequested	Requests the LivingSubjectBirthPlaceName attribute be specified
LivingSubjectBirthPlaceAddressRequested	Requests the LivingSubjectBirthPlaceAddress attribute be specified
MothersMaidenNameRequested	Requests the MothersMaidenName attribute be specified
SSNRequested	Requests the Social Security Number be provided
ResponderBusy	The responder was not able to process the request because it is currently overloaded.
AnswerNotAvailable	The answer is not available. Human intervention may be needed.

The following are additional notes regarding the Patient Discovery process.

- Adapter calls MVI (QBP) to find a match in the MVI
- The Adapter ONLY responds if there is a single match
- The Adapter will store the external identifier and external traits in the MVI
- The announce response will contain the VA traits along with the ICN
- Adapter sends out the XCPD in SOAP envelope as a PD response

For detailed interface data information, refer to the *NwHIN Patient Discovery - Web Service Interface Specification* (see [Reference Documentation](#)). In addition, [Appendix A: Data Elements](#) provides sample Patient Discovery messages.

2.6.4. Get Audits

Get Audits is used to retrieve detail audit records which may be used for reporting purposes. This interface is geared to support reporting applications. The WSDLs used in this part of the process is AuditManager.wsdl. The tables below describe the input and output message for this service operation.

Table 14: GetAudits Input Message

Element	Type	Required/Optional	Comments
fromDate	dateTime	O	Start Date and Time. Evaluated against Audit Record Creation Date/Time.
toDate	dateTime	O	End Date and Time Evaluated against Audit Record Creation Date/Time.
patientIds	StringValuesType	O	The VA ICN. Note: The VAP Application uses the specified Veteran SSN, Last Name and First Name from the VAP User Interface to retrieve the VA ICN from the Master Veteran Index (MVI)
patientSSNs	StringValuesType	O	
patientLastNames	StringValuesType	O	
patientGivenNames	StringValuesType	O	
patientFacilityNumbers	StringValuesType	O	Veteran preferred facility number(s) Evaluated against Audit Record's Veteran Preferred Facility Nbr (For Acctg of Disclosure - Retrieve Document)
userIds	StringValuesType	O	
userNames	StringValuesType	O	
userFacilityNumbers	StringValuesType	O	Valid Values: List of 0, 1, or More User Facility Nbr. Evaluated against Audit Record's User Organization Nbr
organizationIds	StringValuesType	O	

Element	Type	Required/Optional	Comments
remoteOrganizationIds	StringValuesType	O	Valid Values: List of 0, 1, or More Individual NwHIN Partner Facility Nbr (e.g.: 200DoD) Evaluated against Audit Record's NwHIN Partner Facility Nbr.
actions	ActionValuesType	O	One or more actions causing the creation of the audit record All permitted values are listed in table 11. For Acctg of Disclosure: - Retrieve Document For Received NwHIN Docs: - RetrieveDocumentOut For Patient Discovery Audit - Announce - Check Policy - Add Patient Correlation - MPI Find Match
details	String	O	
sortFields	SortFieldsType	O	One or more sort field descriptors. Each descriptor consists of 2 attributes - Field name (refer to Fields table below) and sort direction (ASC or DESC).
pageInfo pageNumber pageSize	PageInfoType Int Int	O	Valid Values: pageNumber: 0..* pageSize: Blank (all), 10, 25, 50, 100

Table 15: GetAudits Output Message

Element	Type	Occurs	Description
Sequence		1..1	
Audits	AuditsType Record	0..1	Refer to AuditsType Detail record (refer to table 7 below)
pageInfo	PageInfoType Int Int	1..1	Valid Values: pageNumber: 0..* pageSize: Blank (all), 10, 25, 50, 100

The following table describes the actual Detail audit record that is returned to the caller.

Table 16: AuditsType Detail Record

Component	Type	Occurs
Sequence		1..1
auditId	xsd:long	1..1
auditTime	xsd:dateTime	1..1
Action	ActionType	1..1
userId	xsd:string	1..1
userName	xsd:string	1..1

Component	Type	Occurs
userFacilityNumber	xsd:string	1..1
userFacilityName	xsd:string	1..1
organizationId	xsd:string	1..1
organizationName	xsd:string	1..1
patientId	xsd:string	1..1
patientSSN	xsd:string	1..1
patientLastName	xsd:string	1..1
patientGivenName	xsd:string	1..1
patientFacilityNumber	xsd:string	1..1
patientFacilityName	xsd:string	1..1
purposeForUse	xsd:string	1..1
documentId	xsd:string	1..1
documentTitle	xsd:string	1..1
remoteOrganizationId	xsd:string	1..1
remoteOrganizationName	xsd:string	1..1
remoteDocumentRepositoryId	xsd:string	1..1
remoteDocumentId	xsd:string	1..1
sourcePatientId	xsd:string	1..1
sourceAssigningAuthority	xsd:string	1..1
optOutReason	xsd:string	1..1
Details	xsd:string	1..1

An error condition returns a generic FAULT error. An empty result set (or empty message) indicates that no records were found that met the query criteria.

The NwHIN Adapter returns all Audit Data that satisfies the request parameters sorted by the specified Sort Field (if provided) and ordered by the specified Sort Direction (if provided).

The example below shows the results of a query for: All SSNs, All Dates 1 Facility Name, ALL NwHIN Partner Org. Names

Table 17: Example 2.6.4.A

Veteran SSN	Last Name, First Name	Date/Time	Facility Name	Partner Name
111111111	AAAAAAA, AAAAA	06/1/2011	VAMC San Diego	Kaiser Permanente
333223333	SSSSSSS, SSSSS	4/4/2011	VAMC San Diego	MedVirginia
444115555	PPPPPPP, PPPPP	8/8/2010	VAMC San Diego	Indiana Health
222222222	DDDDDDD, DDDDD	4/14/2010	VAMC San Diego	Kaiser Permanente
000002424	GGGGGGG, GGGGG	5/7/2009	VAMC San Diego	Department of Defense
000000000	JJJJJJ, JJJJJ	3/3/2009	VAMC San Diego	Kaiser Permanente

2.6.5. Get Audits Summary

The Get Audits Summary operation allows an external system such as VAP to retrieve aggregated audit information from the VA Adapter. This operation returns a count or total of the Audit Data that satisfies the request parameters grouped by the specified Group By parameter, if provided (e.g.: 1st by Facility and 2nd by NwHIN Partner Organization). The WSDLs used in this part of the process is AuditManager.wsdl. The tables below describe the input and output message for this service operation.

Table 18: GetAuditsSummary Input Message

Element	Type	Required/Optional	Description
fromDate	xsd:dateTime	O	Start Date and Time. Evaluated against Audit Record Creation Date/Time.
toDate	xsd:dateTime	O	End Date and Time Evaluated against Audit Record Creation Date/Time.
patientIds	StringValuesType	O	The VA ICN. NOTE: The VAP Application uses the specified Veteran SSN, Last Name and First Name from the VAP User Interface to retrieve the VA ICN from the Master Veteran Index (MVI)
patientSSNs	StringValuesType	O	
patientLastNames	StringValuesType	O	
patientGivenNames	StringValuesType	O	
patientFacilityNumbers	StringValuesType	O	Veteran preferred facility number(s) Evaluated against Audit Record's Veteran Preferred Facility Nbr (For Acctg of Disclosure - Retrieve Document)
userIds	StringValuesType	O	
userNames	StringValuesType	O	
userFacilityNumbers	StringValuesType	O	
organizationIds	StringValuesType	O	
remoteOrganizationIds	StringValuesType	O	
actions	ActionValuesType	O	One or more actions to be included. Permitted values are listed in Actions table below.
details	xsd:string	O	
groupByFields	GroupByFieldsType	O	One or more fields to group data by. Permitted values are listed in Fields table below.
pageInfo	PageInfoType	O	

Table 19: GetAuditsSummary Output Message

Element	Type	Occurs	Description
Sequence		1..1	
tns:groupByFields	tns:GroupByFieldsType	0..1	See Fields table below
tns:auditSummaries	tns:AuditSummariesType	0..1	Sequence of summary results (see Table below)
tns:pageInfo	tns:PageInfoType	1..1	Paging information

Table 20: Summary Results Output Message Sequence

Component	Type	Occurs	Description
Sequence		1..1	
summaryFields	String	0..1	Name of summary field
count	xsd:long	1..1	Summary count

The following are the custom enumeration data types used in these messages.

- auditTime
- action
- userId
- username
- userFacilityNumber
- organizationId
- organizationName
- patientId
- patientSSN
- patientLastName
- patientGivenName
- patientFacilityNumber
- patientFacilityName
- purposeForUse
- remoteOrganizationId
- remoteOrganizationName
- optOutReason
- documented
- documentTitle

The following are the custom action data types used in these messages.

- RetrieveDocument
- RetrieveDocumentOut
- AddPatientCorrelation
- CPP OptOut
- CPP Announce
- Announce
- CheckPolicy
- MPI findMatch
- CPP OptIn
- CPP Login
- CPP Revoke

Any error conditions return a generic FAULT error. However, an empty result set (empty message) does not necessarily indicate an error condition. For example, when a count of the Audit Data is zero, the Adapter omits the Audit Data from the response to the requesting application.

Table 21: Example 2.6.5.A: Summary Count=0 for 1 NwHIN Partner

Adapter Summary Audit Data	Summary Audit Data Returned to Partner
Facility Name=VAMC San Diego Partner Name=Department of Defense Count/Total=68	Facility Name=VAMC San Diego Partner Name=Department of Defense Count/Total=68
Facility Name=VAMC San Diego Partner Name=Kaiser Permanente Count/Total=30	Facility Name=VAMC San Diego Partner Name=Kaiser Permanente Count/Total=30
Facility Name=VAMC San Diego Partner Name=MedVirginia Count/Total=0	

Note: In this example, since the summary count for MedVirginia was found to be 0 in the Audit Data, Adapter omits all information from its response to the requesting partner.

2.7. Precedence and Criticality

The Adapter relies on several systems to successfully service requests from internal and external (via Gateway) systems. An outage in one dependent system could cause the VA Adapter to be offline and unable to service requests.

- The NwHIN Gateway is a critical component that must be operational in order for the VA Adapter to successfully service requests from internal VA systems (i.e., VistaWeb) and external partner requests.
- The VA MPI/MVI system is necessary in order for the Adapter application to perform many of its functions, including patient correlation and patient identity retrieval.
- The Vista Systems are required to retrieve the actual patient health records
- The ESR system is required in order to retrieve the Veteran preferred facility to populate the audit record.
- The VETS system is required to perform code translations

2.8. Communications Methods

The following table describes the communication protocols used within the Hardware Architecture to facilitate communication between Adapter module components and external systems.

Table 22: NwHIN Adapter Hardware Communication Protocols

Communications Protocol	Component(s) / Module	Description
HTTPS	Web Services / Processing	NwHIN CONNECT Gateway
HTTPS	Web Services / Processing	VistAWeb
HTTP	Data Layer / Data Adapters	VAP
HTTP / MLLP	Data Layer / Data Adapters	MVI
HTTP	Data Layer / Data Adapters	VETS
HTTP	Data Layer / Data Adapters	ESR
TCP / RPC	Data Layer / Data Adapters	VistA Sites
Oracle Java thin driver	Data Layer / Data Access Objects	Oracle database communication

2.9. Performance Requirements

The following metrics were gathered from the VLER Concept of Operations (see [Reference Documentation](#)).

2.9.1. Routine Transactions

The industry standard for a response to the clinician's query is expected to be no more than seven (7) seconds. NwHIN is dependent upon external participants for its data needs and cannot control the amount of time it takes for an external participant to respond to a query. Furthermore, in the NwHIN specifications, the Office of the National Coordinator for Health Information Technology (ONCHIT) imposes no restrictions or service level agreements (SLAs) for response times. As such, it is assumed that the timings are relevant from the point a response message enters the VA network (NwHIN CONNECT Gateway) for processing and display.

2.9.2. Non-routine Transactions

Response time for non-routine transactions, such as retrieval of files larger than a kilobyte from sources outside the local area network (LAN), retrieval of archived data, and retrieval of graphics data, will be at the industry standard (30 seconds).

2.9.3. Get an Updated Message

(For example, new prescription or allergy) Response time from one agency to another should occur within twelve (12) seconds ninety percent (90%) of the time. Request for a clinical history will take two seconds to get to the other agency, and the exchange of the complete clinical history will take two minutes ninety percent (90%) of the time.

2.10. Security

The VA Adapter will use secure web services for all interfaces as follows:

- All SOAP web service based messaging between systems (even system located on the same networks) shall be over a secure socket layer (SSL) HTTP connection.
- All SOAP web service based messaging between systems shall use an authentication infrastructure for authenticating requests.
- All operational data stores shall be password protected in compliance with VA directives on password strength requirements.
- All communication between services shall be across secure communication lines.
- All communication between SOAP web services shall be signed by the sender and verified by the receiver to ensure data integrity during transmission.
- All critical system functions shall be audited for an accurate accountability of actions taken by interfacing systems.

In addition to the above, external NwHIN partners/participants must comply with the following:

- NwHIN DURSA
- Health Insurance Portability and Accountability Act (HIPAA)
- Mission Assurance Category (MAC) II controls and Confidentiality Level Sensitivity Controls defined in DoD Instruction 8500.2 and VA equivalent
- NwHIN security documentation development in accordance with the Department of Defense Information Technology Security Certification and Accreditation Process (and VA equivalent), to document the secure exchange of patient identifiable information

3. INTERFACE REQUIREMENTS

This section describes the requirements for the NwHIN Adapter 5.0 exposed interfaces.

3.1. NwHIN Adapter Interface Requirements

The following sections describe the requirements for the NwHIN Adapter 5.0 interface.

3.1.1. Interface Processing Time Requirements

The following metrics were gathered from the VLER Concept of Operations (see [Reference Documentation](#)).

Routine Transactions

The industry standard for a response to the clinician's query is expected to be no more than seven (7) seconds. NwHIN is dependent upon external participants for its data needs and cannot control the amount of time it takes for an external participant to respond to a query. Furthermore, in the NwHIN specifications, ONCHIT imposes no restrictions or SLAs for response times. As such, it is assumed that the timings are relevant from the point a response message enters the VA network (NwHIN CONNECT Gateway) for processing and display.

Non-routine Transactions

Response time for non-routine transactions, such as retrieval of files larger than a kilobyte from sources outside the local area network (LAN), retrieval of archived data, and retrieval of graphics data, will be at the industry standard (30 seconds).

Get an updated message

(For example, new prescription or allergy) Response time from one agency to another should occur within twelve (12) seconds ninety percent (90%) of the time. Request for a clinical history will take two seconds to get to the other agency, and the exchange of the complete clinical history will take two minutes ninety percent (90%) of the time.

3.1.2. Message/File Requirements

The WSDL files for each service describe the message requirements and are essentially the message payload agreement between the adapter and consuming application. Refer to section 2.6 for details.

3.1.3. Communication Methods

All consuming applications will use standard web services calls over HTTPS. The WSDL files describe each service and are the agreement between the adapter and consuming application.

Interface Initiation

Interface communication may be initiated and orchestrated by the NwHIN Connect gateway as the result of an NwHIN request or by the VistaWeb application requiring NwHIN data.

Note: The scope of the ICD does not cover availability requirements outside of the control of the interfacing systems, for example, network availability.

Flow Control

Flow control is provided by the HTTPS protocol and Web Services Interoperability (WS-I) Profiles WS-I Basic v 2.0 and WS-I Security v 1.1.

3.1.4. Security Requirements

The NwHIN Adapter shall comply with the following VA equivalents.

- Public Law 104-191, "Health Insurance Portability and Accountability Act (HIPAA) of 1996," August 21, 1996.
- FIPS 140-2, "Security Requirements for Cryptographic Modules," May 25, 2001.
- CJCSI 6510.01D, "Information Assurance and Computer Network Defense (CND)," June 15, 2004.
- Military Health System (MHS) IA Policy Guidance Manual, March 5, 2004.

Note: If the interface relies solely on network and firewalls through which the systems are connected, then highlight this point.

3.1.5. Physical Requirements

The interface described in this section is based only on software and does not have any Physical requirements.

3.1.6. Structural Requirements

The interface described in this section is based only on software and does not have any Structural requirements.

3.1.7. Mechanical Requirements

The interface described in this section is based only on software and does not have any Mechanical requirements.

3.1.8. Electrical Requirements

The interface described in this section is based only on software and does not have any Electrical requirements.

3.1.9. Thermal Requirements

The interface described in this section is based only on software and does not have any Thermal requirements.

3.1.10. Special Fluid Requirements

The interface described in this section is based only on software and does not have any Fluid requirements.

3.1.11. Signal Requirements

The interface described in this section is based only on software and does not have any Signal requirements.

3.2. Audit Manager Interface Requirements

The following sections describe the requirements for the Audit Manager interface.

3.2.1. Interface Processing Time Requirements

The following metrics were gathered from the VLER Concept of Operations (see [Reference Documentation](#)). The Audit Manager is a non-routine transaction providing data for reporting applications.

Non-routine Transactions

Response time for non-routine transactions, such as retrieval of files larger than a kilobyte from sources outside the LAN, retrieval of archived data, and retrieval of graphics data, will be at the industry standard (30 seconds).

3.2.2.Message/File Requirements

The WSDL files for each service describe the message requirements and are essentially the message payload agreement between the adapter and consuming application. Refer to section 2.6 for details.

3.2.3.Communication Methods

All consuming applications will use standard web services calls over HTTPS. The WSDL files describe each service and are the agreement between the adapter and consuming application.

Interface Initiation

Interface communication may be initiated and orchestrated by the NwHIN Connect gateway as the result of an NwHIN request or by the VistaWeb application requiring NwHIN data.

Note: The scope of the ICD does not cover availability requirements outside of the control of the interfacing systems, for example, network availability.

Flow Control

Flow control is provided by the HTTPS protocol and WS-I Profiles WS-I Basic 2.0 and WS-I Security 1.1.

3.2.4.Security Requirements

The NwHIN Adapter shall comply with the following VA equivalents.

- Public Law 104-191, "Health Insurance Portability and Accountability Act (HIPAA) of 1996," August 21, 1996.
- FIPS 140-2, "Security Requirements for Cryptographic Modules," May 25, 2001.
- CJCSI 6510.01D, "Information Assurance and Computer Network Defense (CND)," June 15, 2004.
- MHS IA Policy Guidance Manual, March 5, 2004.

Note: If the interface relies solely on network and firewalls through which the systems are connected, then highlight this point.

3.2.5.Physical Requirements

The interface described in this section is based only on software and does not have any Physical requirements.

3.2.6.Structural Requirements

The interface described in this section is based only on software and does not have any Structural requirements.

3.2.7.Mechanical Requirements

The interface described in this section is based only on software and does not have any Mechanical requirements.

3.2.8. Electrical Requirements

The interface described in this section is based only on software and does not have any Electrical requirements.

3.2.9. Thermal Requirements

The interface described in this section is based only on software and does not have any Thermal requirements.

3.2.10. Special Fluid Requirements

The interface described in this section is based only on software and does not have any Fluid requirements.

3.2.11. Signal Requirements

The interface described in this section is based only on software and does not have any Signal requirements.

4. INTERFACE VERIFICATION

All interfaces defined within this interface control document shall be verified using the following mechanisms:

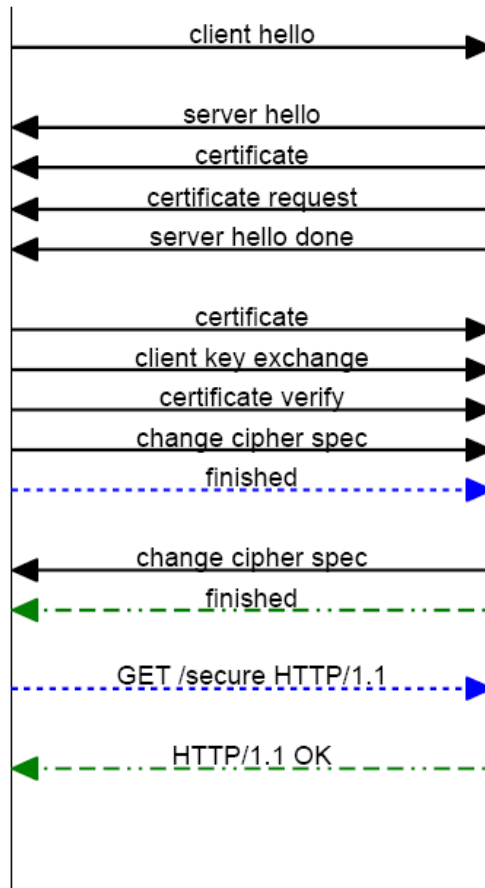
- Interface development unit and integration testing that demonstrate both success and failure scenarios of the interfaces.
- Interface functional testing that demonstrate success, failure and all boundary scenarios related to the interface.
- Interface load testing that demonstrates the capabilities of the interface under stress and in concurrent scenarios.

5. INTERFACE CONTROL

NwHIN Connect Gateway

The following diagram depicts the secure interface control provided in NwHIN Connect Gateway using HTTPS protocol. The VA Gateway or NwHIN could take the role of client or server (depending on use case).

Figure 3: Interface Control - HTTPS



5.1. Electrical Interface









Not Applicable

6. APPENDIX A: DATA ELEMENTS

6.1. Data Structure

The following WSDL files describe the interfaces and data structures of the services exposed by Adapter.

Table 23: WSDL Files of Interfaces and Data Structure Exposed by the Adapter

Interface Name	WSDL
Patient Discovery and Announce	  EntityPatientDiscovery.wSDL AnnouncePatient.wSDL
Document Query	   AdapterGatewayDocQuery.wSDL exampleAdapterGatewayDoc exampleAdapterGatewayDoc
Document Retrieve	 EntityDocRetrieve.wSDL
Audit Manager	  AuditManager.wSDL AuditManager.xsd

6.2. Data Elements

Data Elements are described in section [2.6 Data Exchanges](#).

7. APPENDIX B: ACRONYMS AND GLOSSARY TERMS

This section provides listings of commonly used acronyms and terms.

7.1. Acronyms

Table 24: Acronyms

Acronym	Definition
AHIC	American Health Information Community
AITC	Austin Information Technology Center
CCD	Continuity of Care Document
CDA	Clinical Document Architecture
CCR	Continuity of Care Record
CND	Computer Network Defense
DoD	Department of Defense
DURSA	Data Use and Reciprocal Support Agreements
EHR	Electronic Health Record
ESR	Enrollment System Redesign
HHS	Department of Health and Human Services
HIE	Health Information Exchange
HIPAA	Health Insurance Portability and Accountability Act
HITSP	Health Information Technology Standard Panel
HL7	Health Level 7
ICD	Interface Control Document
ICN	Integration Control Number
KP	Kaiser Permanente
LAN	Local Area Network
MAC	Mission Assurance Category
MHS	Military Health System
MLLP	Minimum Lower Level Protocol
MVI	Master Veteran Index

Acronym	Definition
NHIE	Nationwide Health Information Exchange
NwHIN	Nationwide Health Information Network
NwHINC	Nationwide Health Information Network Connector
OASIS	Organization for the Advancement of Structured Information Standards
ONCHIT	Office of the National Coordinator for Health Information Technology
RPC	Remote Procedure Call
SAML	Security Assertion Markup Language
SLA	Service Level Agreement
SOAP	Simple Object Access Protocol
SSA	Social Security Administration
SSL	Secure Socket Layer
SSN	Social Security Number
TES	Terminology Editing System
UDDI	Universal Discovery and Description Interface (UDDI) v3.0.2
VA	Department of Veterans Affairs
VETS	VHA Enterprise Terminology Services
VHA	Veterans Health Administration
VLER	Virtual Lifetime Electronic Record
WS	Web Services
WS-I	Web Services Interoperability
WSDL	Web Services Description Language
XACML	Extensible Access Control Markup Language
XML	eXtensible Markup Language

7.2. Glossary Terms

Table 25: Glossary Terms

Terms	Definitions
Clinician	May be an individual, an organization, or “system.” When appropriate the clinician perspective is further specified as an ‘ordering clinician’ (responsible for ordering the lab test) or a ‘provider of care’ (providing care to the patient, but not the ordering clinician).
Gateway	The interface that provides access to medical records across the medical services providers.
Health Providers	Clinical users of the health systems. They may be providers or health administrators, such as a Patient Admission Clerk.
Master Patient Index (MPI)	Assigns and maintains unique patient identifiers, known as internal control numbers (ICN) that link patients to their records across the VHA systems.
Member	Any person to whom the VA provides medical services.
NIST CDA Validation Tool	A tool used for self-testing to determine if an XML instance document is correct with respect to the specifications identified within certain HITSP constructs (C37, C32, and C28).
OID	A globally unique string representing an ISO (International Standards Organization) identifier in a form that consists only of numbers and dots (e.g., "2.16.840.1.113883.3.1").
Patient	The subject of an electronic health record and does not imply any legal constructs such as Patient-Provider legal relationship or other semantics.
Providers	Clinical users of the health systems. They may be providers or health administrators such as Patient Admission Clerk.
Remote Procedure Call	Remote Procedure Call is a protocol that one program can use to request a service from a program located on another computer network. Essentially M code may take optional parameters to do some work and then return either a single value or an array back to the client application.
UDDI	The use of UDDI is fully described in the “NwHIN Web Services Registry” specification.
VistAWeb	Web interface for displaying remote clinical data.
XPath	XPath is a language that describes a way to locate and process items in Extensible Markup Language (XML) documents by using an addressing syntax based on a path through the document's logical structure or hierarchy.
WSDL	An XML document that describes Web services and is also used to locate Web services.