



## **Nationwide Health Information Network (NHIN)**

### **HIEM Test Guide**

June 1, 2010

Version 1.0

## Reference Documents

- NHIN Onboarding Guide
- NHIN Onboarding Processes, v1.0
- NHIN Validation Plan, v2.0

## NHIN Final Production Specifications

- Authorization Framework Production Specification, v2.0;  
[http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS\\_0\\_11673\\_910545\\_0\\_0\\_18/NHIN\\_AuthorizationFrameworkProductionSpecification\\_v2.0.pdf](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910545_0_0_18/NHIN_AuthorizationFrameworkProductionSpecification_v2.0.pdf)
- Query for Documents Production Specification, v2.0;  
[http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS\\_0\\_11673\\_910546\\_0\\_0\\_18/NHIN\\_QueryforDocumentsProductionSpecification\\_v2.0.pdf](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910546_0_0_18/NHIN_QueryforDocumentsProductionSpecification_v2.0.pdf)
- Retrieve Documents Production Specification, v2.0;  
[http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS\\_0\\_11673\\_910547\\_0\\_0\\_18/NHIN\\_RetrieveDocumentsProductionSpecification\\_v2.0.pdf](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910547_0_0_18/NHIN_RetrieveDocumentsProductionSpecification_v2.0.pdf)
- Health Information Event Messaging Production Specification, v2.0;  
[http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS\\_0\\_11673\\_910522\\_0\\_0\\_18/NHIN\\_HealthInformationEventMessagingProductionSpecification\\_v2.0.pdf](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910522_0_0_18/NHIN_HealthInformationEventMessagingProductionSpecification_v2.0.pdf)
- Messaging Platform Production Specification, v2.0;  
[http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS\\_0\\_11673\\_910523\\_0\\_0\\_18/NHIN\\_MessagingPlatformProductionSpecification\\_v2.0.pdf](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910523_0_0_18/NHIN_MessagingPlatformProductionSpecification_v2.0.pdf)
- Patient Discovery Production Specification, v1.0;  
[http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS\\_0\\_11673\\_910524\\_0\\_0\\_18/NHIN\\_PatientDiscoveryProductionSpecification\\_v1.0.pdf](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910524_0_0_18/NHIN_PatientDiscoveryProductionSpecification_v1.0.pdf)
- Web Services Registry Production Specification, v2.0;  
[http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS\\_0\\_11673\\_910663\\_0\\_0\\_18/NHIN\\_WebServicesRegistryProductionSpecification\\_v2.0.pdf](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910663_0_0_18/NHIN_WebServicesRegistryProductionSpecification_v2.0.pdf)

## Document Change History

Version	Date	Items Changed Since Previous Version	Changed By
0.1	05/20/2010	Based on the C-HIEP Test Plan, created the initial draft HIEM Test Plan	Anand Perianayagam, Linda Toscano
0.2	05/21/2010	Updated production spec list, relevant specifications, and test cases sections; added Appendix A	Anand Perianayagam, Joe Lamy, Linda Toscano
0.3	5/25/2010	Updated all sections with specific HIEM technical information; changed document name	Leslie Power
1.0	06/01/2010	Updated with latest subject matter expert changes	Anand Perianayagam, Linda Toscano

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## 1 Introduction

The Nationwide Health Information Network (NHIN) validation testing focuses on two specific areas: 1) conformance testing - verifying that an organization's system conforms to the applicable NHIN specifications, and 2) interoperability testing - verifying that each organization's system can interact with the other participant systems.

Conformance does not guarantee interoperability; as a result, both elements are essential for NHIN functionality.

Conformance testing focuses on validating a particular version of a single system to a specific set of standards and specifications. Primarily, this testing confirms that a system correctly encodes the syntax and structure of a given data standard in the physical files or transactions that a system produces and receives.

Interoperability testing seeks to validate that multiple systems implementing a particular standard or set of standards can all communicate with one another.

## 2 NHIN HIEM Test Guide

The *NHIN HIEM Test Guide* provides guidance for successful testing of systems within organizations using Health Information Event Messaging (HIEM). The HIEM production specification defines the transactions which underlie NHIN's publish-and-subscribe (**pub/sub**) information exchange pattern. HIEM allows entities exchanging health information on NHIN to establish subscriptions to health content.

In addition to the Query/Retrieve and Push patterns, NHIN supports a publish-and-subscribe information exchange pattern in order to enable a wide range of transaction types. HIEM defines a generic publish and subscribe mechanism.

In order to enable any specific pub/sub transaction, organizations must utilize this generic HIEM specification, as well as the HIEM profile that describes the specific desired transaction. Organizations should think of HIEM as an information exchange pattern and the HIEM profile as an instance of use for that pattern.

While the focus of the testing effort covers Health Information Event Messaging, the testing activities described herein also validate the foundation NHIN specifications, Authorization Framework and Messaging Platform. Web Services Registry validation is optional.

### 2.1 Testing Objectives

This plan covers testing with the aim of uncovering two components of the exchange. The first testing goal ensures that organizations using the NHIN HIEM specification for the exchange of health information do so in conformance with the technical requirements described in the specification. Conformance testing is verified by visual inspection of the messages exchanged. The second testing goal ensures that organizations supporting this specification are able to interact with one another according to the specification. Organizations conduct interoperability testing by having two or more systems interact on common business scenarios.

## 2.2 Relevant Specifications and Testing Methods

This test plan encompasses the following NHIN Final Production Specifications and testing methods:

- [Authorization Framework Production Specification v2.0](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910545_0_0_18/NHIN_AuthorizationFrameworkProductionSpecification_v2.0.pdf)  
([http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS\\_0\\_11673\\_910545\\_0\\_0\\_18/NHIN\\_AuthorizationFrameworkProductionSpecification\\_v2.0.pdf](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910545_0_0_18/NHIN_AuthorizationFrameworkProductionSpecification_v2.0.pdf))  
Confirm through visual inspection of the messages provided via logs of the testing exchange.
- [Messaging Platform Production Specification v2.0](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910523_0_0_18/NHIN_MessagingPlatformProductionSpecification_v2.0.pdf)  
([http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS\\_0\\_11673\\_910523\\_0\\_0\\_18/NHIN\\_MessagingPlatformProductionSpecification\\_v2.0.pdf](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910523_0_0_18/NHIN_MessagingPlatformProductionSpecification_v2.0.pdf))  
Confirm through visual inspection of the messages provided via logs of the testing exchange.
- [Health Information Event Messaging Production Specification v2.0](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910522_0_0_18/NHIN_HealthInformationEventMessagingProductionSpecification_v2.0.pdf)  
([http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS\\_0\\_11673\\_910522\\_0\\_0\\_18/NHIN\\_HealthInformationEventMessagingProductionSpecification\\_v2.0.pdf](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910522_0_0_18/NHIN_HealthInformationEventMessagingProductionSpecification_v2.0.pdf))  
Confirm through visual inspection of the messages provided via logs of the testing exchange, through the exercise of test cases, and through the results of the exchanges.
- [Web Services Registry Production Specification v2.0](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910663_0_0_18/NHIN_WebServicesRegistryProductionSpecification_v2.0.pdf)  
([http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS\\_0\\_11673\\_910663\\_0\\_0\\_18/NHIN\\_WebServicesRegistryProductionSpecification\\_v2.0.pdf](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910663_0_0_18/NHIN_WebServicesRegistryProductionSpecification_v2.0.pdf))  
Optional for validation. It is our understanding that each organization will seek validation on this specification. NHIN requires the candidate system to find an identified end point via the NHIN Test Universal Description Discovery Interface (UDDI), and report the end point address to the NHIN team.
- [Geocoded Interoperable Population Summary Exchange \(GIPSE\) Profile Definition](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910550_0_0_18/GIPSE_ProfileDefinitionSpecification_v1.pdf)  
([http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS\\_0\\_11673\\_910550\\_0\\_0\\_18/GIPSE\\_ProfileDefinitionSpecification\\_v1.pdf](http://healthit.hhs.gov/portal/server.pt/gateway/PTARGS_0_11673_910550_0_0_18/GIPSE_ProfileDefinitionSpecification_v1.pdf))  
Confirm through visual inspection of the messages provided via logs of the testing exchange, through the exercise of test cases, and through the results of the exchanges.

## 2.3 Test Cases

Prior to commencing conformance testing, NHIN provides the following test case files to the organization:

- HIEM-documents-master-test-cases.xls
- Service-registry-master-test-cases.xls

## 2.4 Conducting Testing

This HIEM specification defines the transactions which underlie NHIN's pub/sub information exchange pattern. HIEM allows entities exchanging health information on NHIN to establish subscriptions to health content.

It is important to note that this specification does not include the information needed to request or fulfill any specific type of subscription, nor its content. NHIN Health Information Organizations (NHIOs)

utilizing HIEM for a given pub/sub transaction supported by NHIN must refer to that HIEM Profile, which describes the use of HIEM for specific transactions and user cases.

Within the exchange, one party plays the role of a document **subscriber** (a system that expresses a desire to receive information via the subscription model), and one party plays the role of a document **publisher** (a system that publishes a message by sending it to subscribers). For the initial HIEM/GIPSE pilot exchange, the Centers for Disease Control and Prevention (CDC) acts as a subscriber, and all other partners act as publishers.

Each candidate system must perform the appropriate test cases as referenced above for the validation sought. For HIEM testing, NHIN requires the following exchange:

- **Subscriber** party subscribes, **publisher** party publishes. Each side collects and submits a log for each case.

#### 2.4.1 Test Data

Before beginning testing, the parties communicate to the NHIN team what files they will be transmitting in messages. To exercise possible real-life conditions, NHIN requires a variety of file sizes.

## 2.5 Reporting Test Results

Following testing, organizations submit the following test evidence to NHIN:

1. Test logs for each candidate, each side of the exchange, as described below in the **Log Details** section
2. A test report summarizing the complete suite of test exchanges conducted
3. A sample document for schema validation

#### 2.5.1 Log Details

- Collect logs from **both** sides of the test.
- Label the logs as follows:
  - For test case HMI-1.1 (a test case in which the candidate is the **initiator** - for this case, in which the initiator sends a subscription request):
    - SDI-1.1-subscriber.log (this is the log file from the system **initiating** the request)
    - SDI-1.1-responder.log (this is the log file from the **recipient** of the message)
  - For test case HMR-5.1 (a test case in which the candidate is the **responder** - the publisher that publishes the message):
    - HMR-5.1-subscriber.log (this is the log file from the system **receiving** the message)
    - HMR-5.1-publisher.log (this is the log file from the system **sending** the message to the subscriber)
- Clear out the logs in between each test so the logs you submit contain information logged **only** for a particular test.
- Once you complete testing, provide two sets of logs for each test case – logs from the initiator and logs from the responder.
- If appropriate, **provide sample documents NHIN can use to validate schema conformance.**

## **2.6 Testing Schedule**

Refer to the testing project plan for dates.