

EMR Certification

eHealth_hub - Diagnostic Imaging Report Result Distribution Interface Specification

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Shared health
Soins communs
Manitoba

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1 Introduction

The purpose of this document is to provide an overview of the eHealth_hub - Diagnostic Imaging Report Result Distribution Interface (hereafter referred to as the “DI Report Result Distribution Interface”). The document will describe the high-level architecture of the data retrieval model, as well as the technical details and requirements regarding the web service and web service security.

1.1 Glossary

The following defines key business terms and acronyms used throughout this document.

Table 1: Terms and Acronyms

TERM OR ACRONYM	DEFINITION
eHealth_hub	A Shared Health business service that coordinates electronic delivery of information between systems to authorized health-care providers who are using a Manitoba Certified EMR.
EMR ID	A unique identifier assigned to each EMR instance by Shared Health.
Health Information Access Layer, or “HIAL”	Shared Health’s core integration service which provides the environment and capabilities necessary to establish interoperability between systems. For example, HIAL is a Shared Health Service that enables Business Services such as eHealth_hub.
Manitoba Certified EMR Product (EMR)	An Electronic Medical Record product that has achieved Certification in Manitoba , and is referred to throughout this document as “EMR”.
RIS	Radiology Information System
Shared EMR	An EMR instance that is used by more than one clinic. For example, in a regional shared instance, many clinics, including primary care clinics, may ‘share’ information. The user configurations can vary, but commonly client information is shared (accessed and/or updated) by users across the entire instance.
Simple Object Access Protocol (SOAP)	SOAP is a messaging protocol that allows programs that run on disparate operating systems (such as Windows and Linux) to communicate using Hypertext Transfer Protocol (HTTP) and its Extensible Markup Language (XML).

1.2 Business Objectives & Benefits Summary

The objective of the DI Report Result Distribution Interface is to provide Manitoba Certified EMR Product (EMR) users with a secure way to receive electronic diagnostic imaging (DI) results for their patients directly into their EMR, improving the quality and timeliness of patient care.

1.3 Related Documents

This document references the following companion documents:

Table 2: Related Documents

DOCUMENT
Manitoba EMR Certification - Baseline EMR Requirements Specification
eHealth_hub - Diagnostic Imaging Report Result Distribution Interface Message Specification
eHealth_hub - Diagnostic Imaging Report Result Distribution Interface Assessment Guide
eHealth_hub – Authentication Specification
eHealth_hub - Diagnostic Imaging Report Result Distribution Interface Assessment Addendum

Upon application for EMR Certification to this specification, Vendors can email EMR@sharedhealthmb.ca or contact their EMR Product Lead to request the additional assessment addendum containing additional configuration and connectivity details necessary for assessment.

2 DI Report Result Distribution Interface Overview

2.1 Scope

The scope of the DI Report Result Distribution Interface enables Certified EMR Products to receive DI result messages from the provincial Radiology Information System (RIS).

There will be no terminology translation within this version of the DI report result delivery service from what the provincial RIS source provides to a canonical standard. The provincial RIS source maintains responsibility for sending accurate code values and must clearly define what code value source is used (e.g. SNOMED), wherein the local code values will be specific for the sending RIS system.

2.2 HL7 Electronic Results Scope

2.2.1 Message Type

All messages from the provincial RIS will be sent within the HL7 v.2.3.1 ORU^R01 format. For a given imaging site, not all modalities are available to the provincial RIS system and therefore, messages pertaining to these modalities will not be available for delivery within the context of this service.

3 High-level Architecture

At a high-level, the architecture of the DI Report Result Distribution Interface will allow for registered RIS sources to submit results for distribution. Once received by the service layer, the messages will be converted to a canonical format (as described within the accompanying Message Specification document) and rules for routing will facilitate the depositing of the messages into one or more queues or “mailboxes” which represent an EMR instance. Note that a provider may be associated with one or more EMR instances.

When the EMR wishes to poll its mailbox for results, the EMR will issue a query via web service to obtain messages from the mailbox. After the EMR successfully receives the messages from the mailbox and the EMR has processed these messages, the EMR will then send an acknowledgement message to the mailbox to ensure that the mailbox will purge those “received” messages. The EMR is then responsible for polling the DI report result service on a periodic basis to ensure that results are retrieved out of that mailbox; that is, the EMR controls the frequency of the data requests. All results will be delivered to the requesting EMR on a first in – first out basis.

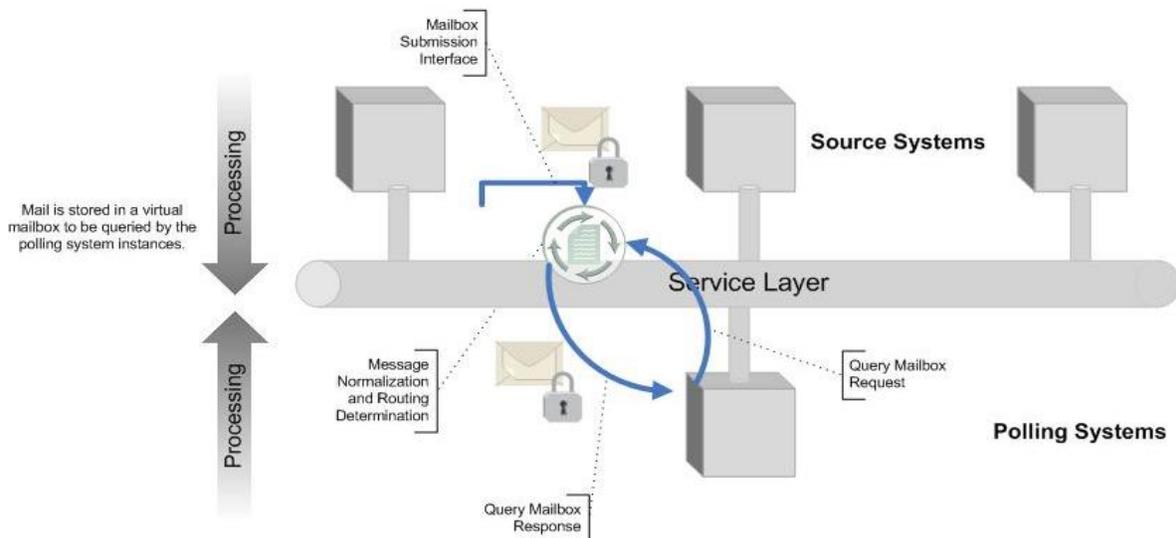


FIGURE 1: DI REPORT RESULT DISTRIBUTION INTERFACE OVERVIEW

The following sequence diagram describes the synchronous request / response mechanism to query and retrieve DI report results from the respective EMR mailbox and the subsequent acknowledgement mechanism to ensure that the EMR can establish a business-centric logical unit of work.

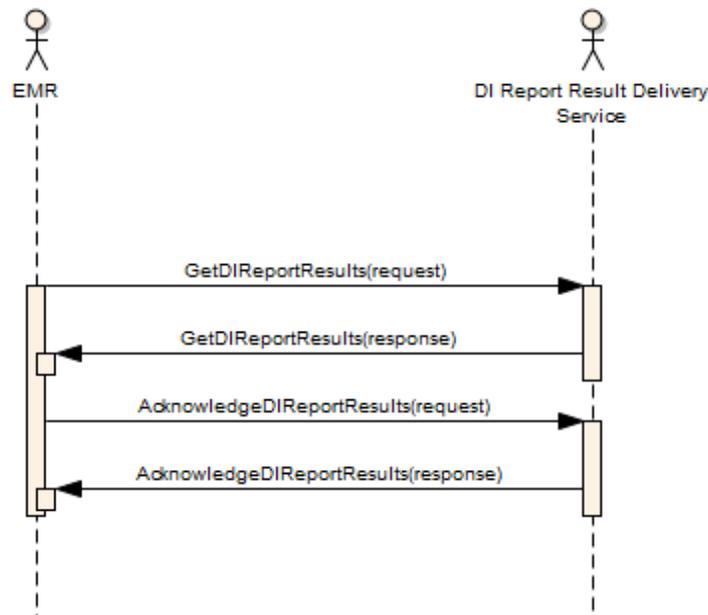


FIGURE 2: DI REPORT RESULT DISTRIBUTION INTERFACE SEQUENCE DIAGRAM

The EMR will retrieve DI report results by interfacing with a SOAP 1.1 DIReportResultService Web Service and utilize the following web methods: GetDIReportResults (request/response) and AcknowledgeDIReportResults (request/response). The EMR product shall be configured to retrieve and acknowledge results based on a regular interval (e.g. every 30 minutes). To ensure the security and privacy of DI report result data, both interfaces will require the use of a mutual certificate authentication.

Each installation of the EMR will require a unique certificate, issued by Shared Health, which will identify the authenticity of the EMR product when attempting to exchange data with the DI report result delivery service. Note that certificates, while typically issued for each EMR instance, may also be issued on a per logical instance (or per clinic basis). At this time, there is no requirement for a certificate-to-clinic association but, the solution should accommodate both associations (EMR instance or individual clinic).

3.1 DI Report Result Distribution Interface Use Cases

This section provides an overview on the use cases for communicating with the DI report results distribution service. The use cases include:

1. BC-RD-001 : Overall eHealth_hub use case
2. SC-RD-001 : Authenticate
3. SC-RD-002 : Request Results
4. SC-RD-003 : Acknowledge Results
5. SC-RD-004 : Verify Call

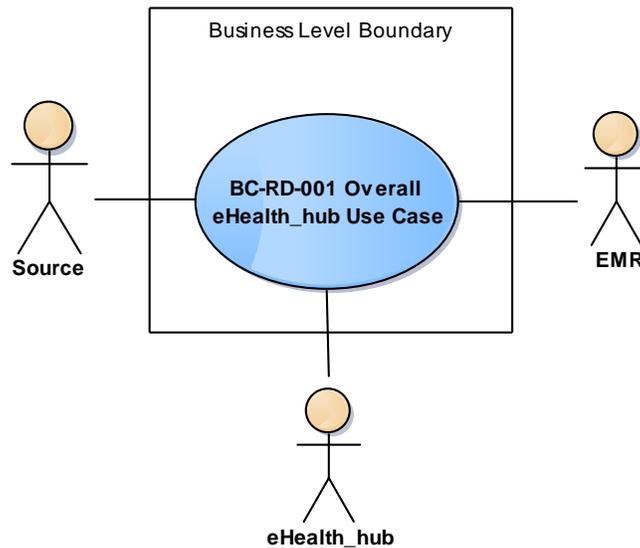


FIGURE 3: BUSINESS LEVEL USE CASES

Table 3: Use Case – BC-RD-001

Use Case ID:	BC-RD-001
Use Case Name:	Overall eHealth_hub Use Case
Actors:	EMR eHealth_hub Source
Description:	High level description of the end-to-end eHealth_hub.
Trigger:	EMR submits order to source.
Preconditions:	<ol style="list-style-type: none"> 1. EMR is registered for the results delivery solution. 2. Results for requested orders can be delivered through eHealth_hub.
Post conditions:	<ol style="list-style-type: none"> 1. EMR has received results. 2. Results are matched to provider and patient. 3. Provider has reviewed results.
Normal Flow:	<ol style="list-style-type: none"> 1. Source generates results and submits them electronically to the eHealth_hub. 2. eHealth_hub routes the results to the proper mailbox based on information in the results (i.e. ordering location, ordering provider, copied location, and copied provider). 3. EMR periodically checks its corresponding mailbox and retrieves any results from it. 4. EMR attaches the results to the proper patient's chart and assigns to a provider. 5. The provider is notified that new results are available. 6. The provider reviews the new results.

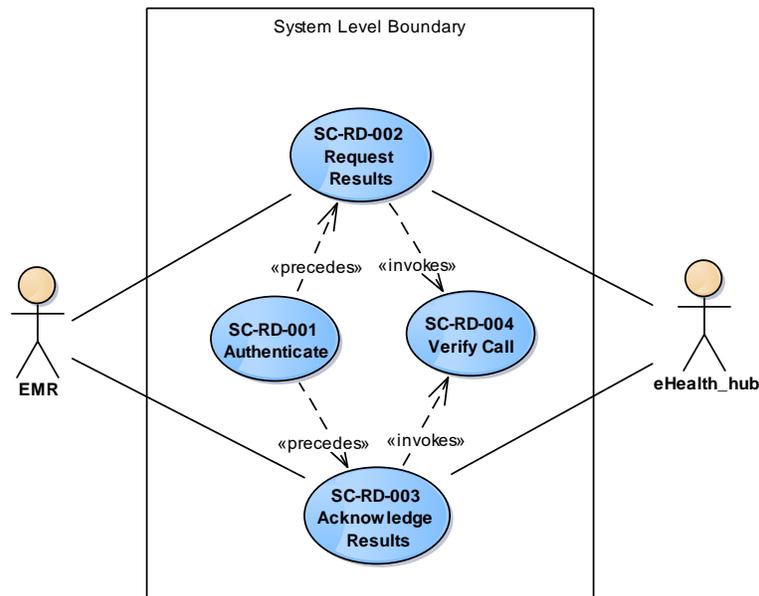


FIGURE 4: SYSTEM LEVEL USE CASES

Table 4: Use Case – SC-RD-001

Use Case ID:	SC-RD-001
Use Case Name:	Authenticate
Actors:	eHealth_hub EMR
Description:	eHealth_hub authenticates EMR to request/receive DI report results (via <i>GetDIReportResults</i> , <i>AcknowledgeDIReportResults</i>).
Trigger:	EMR attempts to establish TLS/SSL connection with eHealth_hub.
Preconditions:	<ol style="list-style-type: none"> EMR has gone through Shared Health registration process to receive results. EMR has valid security certificate.
Post conditions:	Normal Flow <ol style="list-style-type: none"> Successful authentication, established TLS/SSL connection. eHealth_hub ready to receive requests from EMR. Alternate A <ol style="list-style-type: none"> EMR authentication fails (HTTP 500 server error).
Normal Flow:	<ol style="list-style-type: none"> EMR attempts to establish secured mutual authentication with eHealth_hub using valid security certificate.
Alternate Flow:	<ol style="list-style-type: none"> EMR attempts to establish secured mutual authentication with eHealth_hub using invalid security certificate.
Frequency of Use:	High
Assumptions:	
Notes and Issues:	EMR needs to notify an EMR administrator/appropriate user of failed authentication. The certificate that Shared Health issues to the EMR will expire after two years.

Table 5: Use Case – SC-RD-002

Use Case ID:	SC-RD-002
Use Case Name:	Request Results
Actors:	eHealth_hub EMR
Description:	eHealth_hub responds to EMR's request for DI report results.
Trigger:	EMR sends request to eHealth_hub for DI report results (<i>GetDIReportResults</i>).
Preconditions:	1. EMR has gone through Shared Health registration process to receive requested results.
Post conditions:	Normal Flow 1. EMR receives response containing 0 to 25 results. Alternate A 1. EMR receives response containing error message. Alternate B 1. EMR did not acknowledge previous request for results. Alternate C: 1. EMR failed processing of messages received in previous request. Requests results again.
Normal Flow:	1. Invoke <i>SD-RD-001 Authenticate</i> . 2. EMR creates request, encrypts it, and signs it with certificate. 3. EMR sends request. 4. eHealth_hub receives request. 5. Invoke <i>SD-RD-004 Verify Call</i> . 6. eHealth_hub reads the requested number of messages from the mailbox, or the number of messages in the mailbox (whichever is less). 7. eHealth_hub creates response with same transaction ID that was sent from the EMR, encrypts it, and signs it. 8. eHealth_hub sends response. 9. EMR receives response. 10. EMR verifies signature, decrypts response, decodes and processes HL7 message.
Alternative Flows:	A – Error in the request, either: - message not signed - message not encrypted - invalid clinic ID - invalid EMR ID - invalid number of messages 1. - EMR not authorized to receive requested results: a. Invoke <i>SD-RD-001 Authenticate</i> . 2. EMR creates request, encrypts it, and signs it with certificate. 3. EMR sends request. 4. eHealth_hub receives request.

	<ol style="list-style-type: none"> 5. Invoke <i>SD-RD-004 Verify Call</i>. 6. eHealth_hub creates response with error code and message. 7. eHealth_hub sends response. 8. EMR receives response. 9. EMR notifies an EMR administrator/appropriate user of the error. <p>B – EMR has not acknowledged previous request for DI report results:</p> <ol style="list-style-type: none"> 1. Invoke <i>SD-RD-001 Authenticate</i>. 2. EMR creates request, encrypts it, and signs it with certificate. 3. EMR sends request. 4. eHealth_hub receives request. 5. Invoke <i>SD-RD-004 Verify Call</i>. 6. eHealth_hub re-reads previous set of DI report results from the mailbox, up to the number of messages being requested. 7. eHealth_hub creates response with transaction ID that was sent with the EMR’s most recent request, encrypts it and signs it. 8. eHealth_hub sends response. 9. EMR receives response. 10. EMR does not reload the messages in EMR. 11. EMR logs and notifies appropriate user of error. <p>C - EMR failed processing of messages received in previous request (<i>GetDIReportResults</i>). Requests results again (<i>GetDIReportResults</i>).</p> <ol style="list-style-type: none"> 1. EMR logs and resolves error. 2. Invoke <i>SD-RD-001 Authenticate</i>. 3. EMR creates request, encrypts it, and signs it with certificate. 4. EMR sends request. 5. eHealth_hub receives request. 6. Invoke <i>SD-RD-004 Verify Call</i>. 7. eHealth_hub re-reads previous set of results from the mailbox, up to the number of messages being requested. 8. eHealth_hub creates response with transaction ID that was sent with the EMR’s most recent request, encrypts it and signs it. 9. eHealth_hub sends response. 10. EMR receives response. 11. EMR verifies signature, decrypts response, decodes and processes HL7 messages. 12. If some of the messages received in this request were processed by EMR successfully in previous request, then EMR will discard the duplicate messages.
Frequency of Use:	High
Assumptions:	
Notes and Issues:	If the EMR receives the same results twice (i.e. because of a missed acknowledge), it will have to discard the duplicates.

Table 6: Use Case – SC-RD-003

Use Case ID:	SC-RD-003
Use Case Name:	Acknowledge Results
Actors:	eHealth_hub EMR
Description:	EMR acknowledges the successful processing of received messages.
Trigger:	EMR sends acknowledgement to eHealth_hub (<i>AcknowledgeDIRReportResults</i>).
Preconditions:	<ol style="list-style-type: none"> 1. EMR has gone through Shared Health registration process to receive results they are going to be requesting. 2. EMR has received and processed results from eHealth_hub. 3. The results are available in the EMR.
Post conditions:	<p>Normal Flow</p> <ol style="list-style-type: none"> 1. Positive Acknowledge response sent to the EMR. <p>Alternate A</p> <ol style="list-style-type: none"> 1. EMR receives response containing error message.
Normal Flow:	<ol style="list-style-type: none"> 1. Invoke <i>SD-RD-001 Authenticate</i>. 2. EMR creates acknowledgement, encrypts it, and signs it with certificate. 3. EMR sends acknowledgement. 4. eHealth_hub receives acknowledgement. 5. Invoke <i>SD-RD-004 Verify Call</i>. 6. eHealth_hub marks the results associated with that transaction ID as sent and purges the messages from mailbox. 7. eHealth_hub creates response, encrypts it, and signs it. 8. eHealth_hub sends response. 9. EMR receives response. 10. EMR verifies signature and decrypts response.
Alternative Flows:	<p>A – Error in the request, either:</p> <ul style="list-style-type: none"> - message not signed - message not encrypted - invalid clinic ID - invalid EMR ID - invalid transaction ID - EMR not authorized to receive requested results: <ol style="list-style-type: none"> 1. Invoke <i>SD-RD-001 Authenticate</i>. 2. EMR creates acknowledgement, encrypts it, and signs it with certificate. 3. EMR sends acknowledgement. 4. eHealth_hub receives acknowledgement. 5. Invoke <i>SD-RD-004 Verify Call</i>. 6. eHealth_hub creates response with error message. 7. eHealth_hub sends response. 8. EMR receives response. 9. EMR notifies EMR administrator/appropriate user of error.

Frequency of Use:	High
Assumptions:	
Notes and Issues:	

Table 7: Use Case – SC-RD-004

Use Case ID:	SC-RD-004
Use Case Name:	Verify Call
Actors:	eHealth_hub
Description:	eHealth_hub verifies an incoming message before processing the request.
Trigger:	eHealth_hub receives a new message (via <i>GetDIReportResults</i> , <i>AcknowledgeDIReportResults</i>).
Preconditions:	None
Post conditions:	Normal Flow 1. Message is successfully verified. Alternate A 1. Message is not verified.
Normal Flow:	1. eHealth_hub verifies signature and decrypts message. 2. eHealth_hub verifies the clinic ID, EMR ID and transaction ID. 3. eHealth_hub verifies the clinic/EMR are authorized for the mailbox from which they are requesting or acknowledging messages.
Alternative Flows:	A – Error in the request, either: - message not signed - message not encrypted - invalid clinic ID - invalid EMR ID - invalid transaction ID - EMR not authorized to receive requested results [After step#3 of normal flow] 4. eHealth_hub could not verify the authorization for the clinic/EMR to the mailbox from which they are requesting or acknowledging messages. 5. eHealth_hub returns appropriate error code/message.
Frequency of Use:	High
Assumptions:	
Notes and Issues:	

4 Requirements

This section includes requirements and guidelines for configuring an EMR to integrate the DI Report Result Distribution Interface and properly display the DI report results received using this interface. **All requirements listed in sections 4.2, 4.3, 4.4 and 4.5 are mandatory.**

Please note that the display requirements (provided under section 4.5) will be applicable on one or more screen presentations under the assumption that there may be a variety of screen presentations which present results. In addition, these requirements will be applicable to printed reports as well as on-screen presentations.

4.1 Requirement Column Definition

For ease of review and understanding, requirements are documented in a manner consistent with previous EMR Certification documentation. For each requirement, the following information is provided:

- **ID** – a unique identifier assigned to the requirement by Manitoba
- **Requirement** – a concise statement describing the requirement
- **Guidelines** – these additional instructions constitute part of the requirement and are relevant to implementation of the requirement in the EMR product. As such, these guidelines form part of the assessment criteria and are included in the planned product assessment.
- **Additional Notes** – relevant information or examples intended to give additional context to the requirement and to improve understanding
- **Status** – each requirement is clearly identified as:
 - New (not included in previous specifications);
 - Updated (modification to intent of the requirement from a previous version); or
 - Previous (unchanged from last issuance of core requirements).
- **Assessment** – The method of assessment is stated in the “Assessment” column for each requirement. All requirements will be assessed using the following method:
 - Assertion – Vendors will make an assertion (Yes or No) based on their self-assessment of the product’s ability to meet the requirement. Manitoba may choose to audit Vendor assertions as part of the certification process, as authorized within the Agreement.
 - Demonstration – Vendors will demonstrate key functions within their EMR product. Demonstrations may be conducted in person, by remote means (e.g. teleconference and Internet) or through recorded video.
 - System Integration Testing – this most comprehensive assessment method requires an end-to-end test of key functions such as interoperability between the EMR product and other systems (e.g. eChart Manitoba Launch or eHealth_hub)

4.2 DI Report Result Distribution Interface Requirements

Table 8: DI Report Result Distribution Interface Requirements

ID	REQUIREMENT	GUIDELINES	ADDITIONAL NOTES	STATUS	ASSESSMENT
HD.I01	Accept messages sent in HL7 v 2.3.1 ORU^R01 format.	See the Message Specifications (AD1) for the message format.		Previous	System Integration Testing
HD.I02	Interface with the <i>DIReportResultService</i> web service.	The web service uses Web Services Description Language (WSDL) version 1.1. See Appendix B: DIReportResultService.wsdl		Previous	System Integration Testing
HD.I03	Provide capability to store Clinic and EMR identifiers as configurable parameters for every EMR instance.	<i>Clinic ID</i> - a unique identifier assigned to the clinic by Shared Health. <i>EMR ID</i> - a unique identifier assigned to each EMR instance by Shared Health. A single EMR instance can have the capability to support multiple clinics. The stored parameter values must be used when invoking the web methods in the <i>DIReportResultService</i> web service.		Previous	System Integration Testing
HD.I04	Retrieve messages using the <i>GetDIReportResults</i> web method.	Required request and response parameters are listed in: Section 5.3.1 - GetDIReportResults Web Method . SOAP request and response examples are listed in: Section 5.2.1- GetDIReportResults Web Method .		Previous	System Integration Testing
HD.I05	Send an acknowledgement using the <i>AcknowledgeDIReportRe</i>	An acknowledgement must only be sent after the EMR has successfully retrieved the messages.		Previous	System Integration Testing

ID	REQUIREMENT	GUIDELINES	ADDITIONAL NOTES	STATUS	ASSESSMENT
	<p><i>sults</i> web method.</p>	<p>Retrieval will be considered successful only if the all messages within the transaction are both:</p> <ul style="list-style-type: none"> • Accepted • Verified and persisted <p>Use of the <i>AcknowledgeDIReportResults</i> web method will mean that the previously retrieved messages cannot be retrieved again.</p> <p>If acknowledgement is not successfully received by eHealth_hub, the same set of messages will be delivered again in any subsequent <i>GetDIReportResults</i> requests.</p> <p>Required request and response parameters are listed in: Section 5.3.2 - AcknowledgeDIReportResults Web Method.</p> <p>SOAP request and response examples are listed in: Section 5.2.2 - AcknowledgeDIReportResults Web Method.</p>			
HD.I06	<p>Retrieve messages which have previously failed successful retrieval.</p>	<p>In the event of any failure on a set of messages retrieved through the <i>GetDIReportResults</i> web method, an EMR must retrieve the previously failed set of messages by invoking the <i>GetDIReportResults</i> web method again after resolving any applicable issues.</p> <p>Messages that have not been successfully acknowledged or messages that have not been delivered using the</p>		Previous	Assertion

ID	REQUIREMENT	GUIDELINES	ADDITIONAL NOTES	STATUS	ASSESSMENT
		<i>GetDIReportResults</i> operation will be retrievable for up to 90 days.			
HD.I07	Poll the mailbox at a configurable periodic interval.	The recommended periodic interval for polling the mailbox is 30 minutes.		Previous	System Integration Testing
HD.I08	Attempt to retrieve all messages from the mailbox in a single polling periodic interval.	<p>The maximum messages that can be returned through the <i>GetDIReportResults</i> web method is 25.</p> <p>If the EMR receives a <i>GetDIReportResults</i> web method response stating there are remaining messages in the mailbox, the EMR must retrieve those messages prior to the next polling periodic interval.</p>		Previous	System Integration Testing
HD.I09	Create and provide a unique transaction ID for each logical unit of work.	<p>EMR must supply the same transaction ID during each <i>GetDIReportResults</i> web method request and the follow up <i>AcknowledgeDIReportResults</i> web method request.</p> <p>Use of a different transaction ID in <i>AcknowledgeDIReportResults</i> web method request will result in a failure; and a same set of messages will be returned in subsequent <i>GetDIReportResults</i> web method request.</p>		Previous	System Integration Testing
HD.I10	Provide an error logging and handling mechanism for the error scenarios encountered in the message retrieval process.	<p>There are two types of errors: Business and System.</p> <p>Error scenarios, error codes and SOAP message examples are listed in: Section 5.4 - Error Scenarios.</p> <p>Error messages must be notified / reported</p>		Previous	System Integration Testing

ID	REQUIREMENT	GUIDELINES	ADDITIONAL NOTES	STATUS	ASSESSMENT
		<p>to the EMR administrator (at either the instance or the clinic or the EMR applicant), as well as be maintained in the EMR interface log.</p> <p>The logging/notification/reporting must be able to identify the date and time of attempt, error ID, error type and error message.</p>			
HD.I11	Provide the capability to retrieve messages on demand as well as on an automatic schedule.	<p>The outcome of each attempted retrieval must be notified to the EMR user as well be maintained in the EMR interface log.</p> <p>The logging/notification/reporting must be able to identify the date and time of attempt, result and number of messages retrieved. In the event the retrieval was manually triggered the trigger user identity will be included in the log.</p>		Previous	System Integration Testing
HD.I12	Allow capability to enable or disable the interface for each clinic.	The interface must be disabled by default for each implementation.		Previous	System Integration Testing

4.3 Authentication Requirements

In addition to the specified requirements in this document the EMR must satisfy all requirements in the [eHealth hub – Authentication Specification](#).

4.4 Processing Requirements

Table 9: Processing Requirements

ID	REQUIREMENT	GUIDELINES	ADDITIONAL NOTES	STATUS	ASSESSMENT
HD.P01	<p>Processing Subsequent Messages</p> <p>Determine if the received message is subsequent.</p>	<p>A message is determined as subsequent if the following criteria of the DI report result match with a previously retrieved DI report result in the EMR:</p> <ul style="list-style-type: none"> • Sending facility (MSH-4) • Order number (ORC-2 or OBR-2) • Observation request (OBR-4.1) <p>The source radiology information system may send subsequent messages at change of observation request status.</p>		Previous	System Integration Testing
HD.P02	<p>Processing Subsequent Messages</p> <p>Process subsequent messages only if the message date/time is greater than the message that was previously processed successfully.</p>	<p>Only those subsequent messages must be processed where message date and time (MSH-7) is greater than the message date and time of the preceding message that was previously processed successfully.</p>		Previous	System Integration Testing
HD.P03	<p>Processing Subsequent Messages</p> <p>Disable the overwriting of messages once received and successfully processed.</p>	<p>A subsequent message must not overwrite the previous message that already exists in EMR. See requirement# <i>HD.D08</i> for the related display requirement on subsequent reports.</p>		Previous	System Integration Testing
HD.P04	<p>Patient Identification</p> <p>Provide an automatic-</p>	<p>An automatic-match can be made if a patient exists in the EMR with the same information as the message for below</p>		Previous	System Integration Testing

ID	REQUIREMENT	GUIDELINES	ADDITIONAL NOTES	STATUS	ASSESSMENT
	match process for the messages with their respective patients.	<p>specified attributes:</p> <ul style="list-style-type: none"> • Primary patient identifier (PID-3) • Date of birth (PID-7) • Gender (PID-8) <p>The messages may contain more than one iteration of primary patient identifier in PID-3. EMR must perform the automatic match using the patient identifier and assigning authority of each iteration.</p>			
HD.P05	<p>Patient Identification</p> <p>Provide a manual review and matching mechanism to assign the messages that do not automatically match to a patient.</p>	<p>All results received via eHealth_hub service must be matched to a patient record in the EMR.</p>		Previous	System Integration Testing
HD.P06	<p>Provider Identification</p> <p>Provide an automatic match process to assign the retrieved messages to a provider for review.</p>	<p>Provider identifiers are provided by the RIS sources.</p> <p>The EMR must store and maintain the provider identifiers at implementation of the service for a clinic.</p> <p>Assignment of messages to providers must be automatic and based on the source provider identifiers stored within the EMR.</p>		Previous	System Integration Testing
HD.P07	<p>Provider Identification</p> <p>Provide a mechanism to manually assign the messages to a provider for review.</p>	<p>A manual assignment mechanism is required for those messages which don't automatically match to a provider.</p>		Previous	System Integration Testing

ID	REQUIREMENT	GUIDELINES	ADDITIONAL NOTES	STATUS	ASSESSMENT
HD.P08	<p>Report Categorization</p> <p>Provide a mechanism to map the DI exam codes to categories.</p>	<p>The mapping list for DI exam codes to categories is provided by Shared Health.</p> <p>The exam code is available in the DI reports HL7 message at OBR-4.1.</p> <p>The applicant must populate a default mapping list for clinics in Manitoba initially.</p>		Previous	System Integration Testing
HD.P09	<p>Report Categorization</p> <p>Provide capability to update the mappings of DI exam codes to categories.</p>	<p>Shared Health will release updates to the mapping list periodically. The applicant must be able to periodically update the mappings list for clinics in Manitoba using the applicant's EMR product when Shared Health provides an updated mapping list.</p> <p>EMR support staff at a clinic must be able to update mappings.</p> <p>At a minimum, update actions must include:</p> <ul style="list-style-type: none"> • Create, remove and rename categories • Add, remove, change exam codes • Map or remap the DI exam codes to categories 		Previous	System Integration Testing

4.5 Display Requirements

Table 10: Display Requirements

ID	REQUIREMENT	GUIDELINES	ADDITIONAL NOTES	STATUS	ASSESSMENT
HD.D01	<p>New DI Report Alert</p> <p>Display an alert to EMR user indicating availability of new DI reports to review.</p>	<p>Alert must be displayed for new reports as well as subsequent reports.</p> <p>The alert must be removed once the report has been reviewed.</p>		Previous	Demonstration
HD.D02	<p>New DI Report Indication</p> <p>Display the date and time of message received and processed by EMR.</p>	<p>The message processing date and time must be displayed with the un-reviewed results alert.</p> <p>See requirement <i>HD.D03</i> for the date/time display formats.</p>		Previous	Demonstration
HD.D03	<p>Date Formats</p> <p>Display the date and time in consistent formats through the EMR. The format must not be ambiguous.</p>	<p>The preferred date formats are:</p> <ul style="list-style-type: none"> • yyyy MON dd • yyyy/MM/dd <p>The preferred date-time format is: yyyy-MM-dd HH:mm:ss (24-hour clock format).</p> <p>The preferred time format is: HH:mm:ss (24-hour clock format).</p> <p>If 24-hour clock format is not feasible, the 12-hour clock format must clearly state AM or PM.</p>		Previous	Demonstration
HD.D04	<p>Display of Patient Information</p> <p>Display minimum demographic information of the patient when displaying a DI report.</p>	<p>Following attributes must be displayed:</p> <ul style="list-style-type: none"> • Patient's Last Name • Patient's First Name • Unique Patient Identifier transmitted with the DI report result HL7 message • Secondary Patient Identifier, if transmitted with the DI report result 		Previous	Demonstration

ID	REQUIREMENT	GUIDELINES	ADDITIONAL NOTES	STATUS	ASSESSMENT
		<p>HL7 message:</p> <ul style="list-style-type: none"> ○ The unique and secondary patient identifiers must be displayed in full ○ Identifier must have no characters stripped from or added; and must include the assigning authority for the identifier ● Patient's Date of Birth: <ul style="list-style-type: none"> ○ See requirement <i>HD.D03</i> for the date/time display formats ● Patient's Gender 			
HD.D05	<p>Display of DI Reports</p> <p>Display minimum information when displaying a DI report.</p>	<p>Following attributes must be displayed:</p> <ul style="list-style-type: none"> ● Date/time result was verified and reported by the RIS (MSH-7) ● Date/time result received and processed by the EMR (EMR Received Date) <ul style="list-style-type: none"> ○ See requirement <i>HD.D03</i> for the date/time display formats. 		Previous	Demonstration
HD.D06	<p>Display of DI Reports</p> <p>Display the most recent report results based on date/time of the message.</p>	<p>The most recent report result is identified based on the message date (MSH-7).</p>		Previous	Demonstration
HD.D07	<p>Display of DI Reports</p> <p>Display an indication that historical information for a DI report is available.</p>	<p>Historical information is generated at change of status for the result.</p> <p>Indications must be available when displaying the DI reports.</p>		Previous	Demonstration
HD.D08	<p>Display of DI reports</p> <p>Display the DI reports in</p>	<p>All results must be displayed in context to the corresponding accession number, even if results are received at different</p>		Previous	Demonstration

ID	REQUIREMENT	GUIDELINES	ADDITIONAL NOTES	STATUS	ASSESSMENT
	context to the accession number.	times/on different days.			
HD.D09	Display of DI reports Display the available DI reports in respective categories.	See requirements <i>HD.P08</i> for the DI exam codes to categories mapping. All DI reports that are received through this interface (pre-existing in the EMR or new) must be displayed within the corresponding mapped categories. The DI exam code is available in the HL7 message (OBR-4.1).		Previous	Demonstration

4.6 Optional Display Requirements

This section lists some optional attributes for the above listed display requirements. These attributes provide additional information which is useful for EMR user in patient care. EMR will not be assessed for these optional display requirements.

Table 11: Optional Requirements

ID	REQUIREMENT	GUIDELINES	ADDITIONAL NOTES	STATUS	ASSESSMENT
HL.O01	Display of Patient Information.	EMR may also optionally display: <ul style="list-style-type: none"> • Patient's Middle Name or initial • Patient's Age 		Previous	Not Assessed

5 Appendix A: Web Service

5.1 WSDL

The DIReportResultService service has been exposed to the EMR community as a Web Service. The Web Service interaction is defined within an individual WSDL (Web Services Definition Language). The WSDL will be exposed on an HTTPS listener where authentication will occur based on prior certificate exchange. Once the EMR passes authentication their conformance profiles are checked based on the EMR ID contained within the message body.

Refer to [Appendix B](#) for complete description of the WSDL (entitled DIReportResultService.wsdl). The request formats for the WSDLs is defined by a DIReportResultService schema file (XSD). This schema defines the parameters that must be provided to invoke the service. The schema is referenced within the context of the WSDL. [Section 5.3](#) defines these parameters in more detail. Refer to [Appendix C](#) for complete descriptions of the XSD (entitled DIReportResultService.xsd).

5.2 SOAP Request/Response Examples

5.2.1 GetDIReportResults Web Method

5.2.1.1 SOAP Request

The following is a sample SOAP request (shown without WS-Security):

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ns1="http://www.examplewebservice.com/DIReportResultService">
  <soapenv:Header/>
  <soapenv:Body>
    <ns1:GetDIReportResultsRequest>
      <EmrID>EMR_4567</EmrID>
      <ClinicID>ClinicXYZ</ClinicID>
      <NumberOfMessages>2</NumberOfMessages>
      <TransactionID>1234</TransactionID>
    </ns1:GetDIReportResultsRequest>
  </soapenv:Body>
</soapenv:Envelope>
```

5.2.1.2 SOAP Response

The following is a sample SOAP response (shown without WS-Security):

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ns1="http://www.examplewebservice.com/DIReportResultService">
  <soapenv:Header/>
  <soapenv:Body>
    <ns1:GetDIReportResultsResponse>
      <SuccessStatus>true</SuccessStatus>
      <NumberOfMessages>2</NumberOfMessages>
      <MessagesRemaining>0</MessagesRemaining>
      <Messages>
        <ns1:Message>HL7 v.2.3.1 message placed in base 64 encoding
      </ns1:Message>
    </ns1:Message>
  </soapenv:Body>
</soapenv:Envelope>
```

```

    </Messages>
  <Messages>
    <ns1:Message>HL7 v.2.3.1 message placed in base 64 encoding
  </ns1:Message>
  </Messages>
</ns1:GetDIReportResultsResponse>
</soapenv:Body>
</soapenv:Envelope>

```

5.2.2 AcknowledgeDIReportResults Web Method

5.2.2.1 SOAP Request

The following is a sample SOAP request (shown without WS-Security):

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ns1="http://www.examplewebservice.com/DIReportResultService">
  <soapenv:Header/>
  <soapenv:Body>
    <ns1:AcknowledgeDIReportResultsRequest>
      <EmrID>EMR_4567</EmrID>
      <ClinicID>ClinicXYZ</ClinicID>
      <TransactionID>1234</TransactionID>
    </ns1:AcknowledgeDIReportResultsRequest>
  </soapenv:Body>
</soapenv:Envelope>

```

5.2.2.2 SOAP Response

The following is a sample SOAP response (shown without WS-Security):

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ns1="http://www.examplewebservice.com/DIReportResultService">
  <soapenv:Header/>
  <soapenv:Body>
    <ns1:AcknowledgeDIReportResultsResponse>
      <SuccessStatus>true</SuccessStatus>
    </ns1:AcknowledgeDIReportResultsResponse>
  </soapenv:Body>
</soapenv:Envelope>

```

5.3 Request / Response Parameters

5.3.1 GetDIReportResults Web Method

Table 12: GetDIReportResults Web Method

DIRECTION	PARAMETER	DESCRIPTION
Request	EMRID (mandatory)	The unique identifier assigned to the EMR instance by Shared Health.
	ClinicID (mandatory)	The unique identifier assigned to the clinic by Shared Health.

DIRECTION	PARAMETER	DESCRIPTION
	NumberOfMessages (optional)	EMR indicates the number of messages they want returned. The maximum that will be returned by DI report result delivery service is 25. If the EMR requests 50 messages, only 25 will be returned - the EMR would need to submit another request in this scenario. If this parameter is not supplied, the DI report result delivery service will default to returning 10 messages.
	TransactionID (mandatory)	EMR supplied reference ID. It is important that the EMR supply a unique identifier for each web service call to ensure transactional uniqueness. TransactionID is implemented as a string and so, the EMR may supply a unique numeric value or a UUID.
Response	SuccessStatus (mandatory)	A Boolean indicating success (true) or failure (false).
	NumberOfMessages (mandatory)	Number of messages contained in the response.
	MessagesRemaining (mandatory)	Number of messages remaining in current mailbox/queue.
	Messages (conditional)	The collection of base64 encoded messages. The messages returned will follow the sequence that the messages were placed on the discrete EMR queue (FIFO). The EMR must process the messages in the order received. Amount of messages provided will be equal to the number of messages provided within the NumberOfMessages attribute.

5.3.2 AcknowledgeDIReportResults Web Method

Table 13: AcknowledgeDIReportResults Web Method

DIRECTION	PARAMETER	DESCRIPTION
Request	EMRID (mandatory)	The unique identifier assigned to the EMR instance by Shared Health.
	ClinicID (mandatory)	The unique identifier assigned to the clinic by Shared Health.
	TransactionID (mandatory)	EMR supplied reference ID. It is important that the EMR supply a unique identifier for each web service call to ensure transactional uniqueness. TransactionID is implemented as a string and so, the EMR may supply a unique numeric value or a UUID. Note that this should be the same value as within the GetDIReportResults transaction to complete the logical unit of work.
Response	SuccessStatus (mandatory)	A Boolean indicating success (true) or failure (false).

5.3.3 SOAP Fault Response

The SOAP Fault response is produced in the case of an error scenario as opposed to inclusion within the business context response.

Table 14: SOAP Fault Response

DIRECTION	PARAMETER	DESCRIPTION
Response	ErrorID	The identifier corresponding to a specific error.
	ErrorType	The category code for a given error. Possible categories are CLIENT and SERVER to designate different error classification.
	ErrorMessage	Description of the given error.

5.4 Error Scenarios

There are two types of error scenarios pertaining to the DIRReportResultService transaction:

1. Business Errors – Characterized as errors encountered by EMR while communicating with the interface web services. These can be trapped by the application and translated to application-specific language to provide context to the requestor as to the nature of the error.
2. System Errors – Characterized as communication or transport-level errors. These may also include errors which address malformed messaging errors.

Note that the error messages are not encrypted.

5.4.1 Business Errors

Note that this is not a complete list of error scenarios; however, this should represent the majority of possible scenarios.

5.4.1.1 Scenario 1 – There is an XML schema validation error

In this scenario the XML format used of the client's message is invalid:

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ns1="http://www.examplewebservice.com/DIRReportResultService">
  <soapenv:Header/>
  <soapenv:Body>
    <soapenv:Fault>
      <faultcode>soapenv:Server</faultcode>
      <faultstring>Error</faultstring>
      <detail>
        <ns1:ErrorDetailResponse>
          <ErrorID>5100</ErrorID>
          <ErrorType>SERVER</ErrorType>
          <ErrorMessage>XML Schema Validation Error.</ErrorMessage>
        </ns1:ErrorDetailResponse>
      </detail>
    </soapenv:Fault>
  </soapenv:Body>
</soapenv:Envelope>
```

5.4.1.2 Scenario 2 – There is an Error Retrieving the DI Results

In this scenario an error would occur while the server is attempting to retrieve the DI results:

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ns1="http://www.examplewebservice.com/DIReportResultService">
  <soapenv:Header/>
  <soapenv:Body>
    <soapenv:Fault>
      <faultcode>soapenv:Server</faultcode>
      <faultstring>Error</faultstring>
      <detail>
        <ns1:ErrorDetailResponse>
          <ErrorID>5103</ErrorID>
          <ErrorType>SERVER</ErrorType>
          <ErrorMessage>Get DI Report Results Error.</ErrorMessage>
        </ns1:ErrorDetailResponse>
      </detail>
    </soapenv:Fault>
  </soapenv:Body>
</soapenv:Envelope>
```

5.4.1.3 Scenario 3 – A Timeout Occurs

In this scenario, the server timed out while trying to process the client's request:

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ns1="http://www.examplewebservice.com/DIReportResultService">
  <soapenv:Header/>
  <soapenv:Body>
    <soapenv:Fault>
      <faultcode>soapenv:Server</faultcode>
      <faultstring>Error</faultstring>
      <detail>
        <ns1:ErrorDetailResponse>
          <ErrorID>5200</ErrorID>
          <ErrorType>SERVER</ErrorType>
          <ErrorMessage>A timeout occurred during processing.
          </ErrorMessage>
        </ns1:ErrorDetailResponse>
      </detail>
    </soapenv:Fault>
  </soapenv:Body>
</soapenv:Envelope>
```

5.4.1.4 Scenario 4 – The Requesting Clinic is Not Authorized

In this scenario a clinic attempts to retrieve messages from a mailbox without authorization to the service:

```
<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:ns1="http://www.examplewebservice.com/DIReportResultService">
  <soapenv:Header/>
  <soapenv:Body>
```

```

<soapenv:Fault>
  <faultcode>soapenv:Server</faultcode>
  <faultstring>Error</faultstring>
  <detail>
    <ns1:ErrorDetailResponse>
      <ErrorID>5401</ErrorID>
      <ErrorType>SERVER</ErrorType>
      <ErrorMessage>The Clinic is not authorized to use this
        service.</ErrorMessage>
    </ns1:ErrorDetailResponse>
  </detail>
</soapenv:Fault>
</soapenv:Body>
</soapenv:Envelope>

```

5.4.1.5 Scenario 5 – The EMR Fails Authentication

In this scenario an EMR attempts to retrieve messages from a mailbox and fails authentication:

```

<soapenv:Envelope xmlns:soapenv="http://schemas.xmlsoap.org/soap/envelope/"
  xmlns:ns1="http://www.examplewebservice.com/DIReportResultService">
  <soapenv:Header/>
  <soapenv:Body>
    <soapenv:Fault>
      <faultcode>soapenv:Server</faultcode>
      <faultstring>Error</faultstring>
      <detail>
        <ns1:ErrorDetailResponse>
          <ErrorID>5403</ErrorID>
          <ErrorType>SERVER</ErrorType>
          <ErrorMessage>EMR Authentication Error</ErrorMessage>
        </ns1:ErrorDetailResponse>
      </detail>
    </soapenv:Fault>
  </soapenv:Body>
</soapenv:Envelope>

```

5.4.2 System Errors

5.4.2.1 Scenario 1 – EMR cannot be authenticated

In this scenario, the x.509 certificate presented by the EMR fails authentication. This fails at the transport level and the DI report result delivery service would not have access to the error message. This would provide a HTTP 500 server error.

5.4.2.2 Scenario 2 – The Client did not Sign Message

In this scenario the client has not included a digital signature in their message:

```

<env:Envelope xmlns:env="http://schemas.xmlsoap.org/soap/envelope/">
  <env:Body>
    <env:Fault>
      <faultcode>env:Client</faultcode>

```

```

    <faultstring>No signature in the WS-Security message for the configured
soap actor/role ""! (from client)</faultstring>
  </env:Fault>
</env:Body>
</env:Envelope>

```

5.4.2.3 Scenario 3 – The Client Experienced an Internal Error

In this scenario, an unknown error has occurred while processing the client's request, such as message that does not conform to WSDL or SOAP specification:

```

<env:Envelope xmlns:env="http://schemas.xmlsoap.org/soap/envelope/">
  <env:Body>
    <env:Fault>
      <faultcode>env:Client</faultcode>
      <faultstring>Internal Error (from client)</faultstring>
    </env:Fault>
  </env:Body>
</env:Envelope>

```

5.4.2.4 Scenario 4 – Certificate mismatch

In this scenario the client certificate used for SSL authentication does not match certificate used for request signing:

```

<env:Envelope xmlns:env="http://schemas.xmlsoap.org/soap/envelope/">
  <env:Body>
    <env:Fault>
      <faultcode>env:Client</faultcode>
      <faultstring>Certificate mismatch. SSL and signing certificates must
match. (from client)</faultstring>
    </env:Fault>
  </env:Body>
</env:Envelope>

```

5.4.2.5 Scenario 5 – There is a Breach of Policy

In this scenario the client has not encrypted their message:

```

<env:Envelope xmlns:env="http://schemas.xmlsoap.org/soap/envelope/">
  <env:Body>
    <env:Fault>
      <faultcode>env:Client</faultcode>
      <faultstring>Rejected by policy. (from client)</faultstring>
    </env:Fault>
  </env:Body>
</env:Envelope>

```

5.4.3 Error Codes

The following table contains examples of errors that the EMR might receive when attempting to access eHealth_hub. Note that these are only some of the errors that may be received:

Table 15: Error Codes

ERROR CODE	ERROR MESSAGE	DESCRIPTION
5000	No signature in message! (from client)	This error is returned when the message is not signed ("client" is EMR).
5001	Internal Error	Generic error indicating something went wrong within the connection between client EMR and eHealth_hub interface service.
5002	Rejected By Policy (from client)	This error is returned when the message is not encrypted.
5100	XML Schema Validation Error	An error was found in the XML of the request.
5101	Get DI Report results error. - <DATABASE error message>	There was an error when eHealth_hub was processing a GetDIReportResults request.
5102	Acknowledge DI Report Results Error	There was an error when eHealth_hub was processing the AcknowledgeDIReportResults request.
5200	A timeout occurred during processing	A timeout occurred during processing.
5401	The EMR is not authorized to use this service	EMR / Clinic does not have the correct authorization for the requested service.
5403	EMR Authentication Error	This error is generated if the passed in EMR ID and/or Clinic ID do not match what is configured within eHealth_hub.

6 Appendix B: DIReportResultService.wsdl

```
<?xml version="1.0" encoding="UTF-8"?>
<wsdl:definitions name="DIReportResultService"
targetNamespace="http://www.examplewebservice.com/DIReportResultService"
  xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/"
  xmlns:tns="http://www.examplewebservice.com/DIReportResultService"
  xmlns:wSDL="http://schemas.xmlsoap.org/wsdl/"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema" >

  <wsdl:types>
    <xsd:schema targetNamespace="http://www.examplewebservice.com/DIReportResultService"
      xmlns:mrm="http://www.examplewebservice.com/DIReportResultService">
      <xsd:include schemaLocation="examplewebservice.com/DIReportResultService.xsd"/>
    </xsd:schema>
  </wsdl:types>

  <wsdl:message name="GetDIReportResultsOperation_in">
    <wsdl:part element="tns:GetDIReportResultsRequest" name="GetDIReportResultsRequest"/>
  </wsdl:message>
  <wsdl:message name="GetDIReportResultsOperation_out">
    <wsdl:part element="tns:GetDIReportResultsResponse" name="GetDIReportResultsResponse"/>
  </wsdl:message>
  <wsdl:message name="AcknowledgeDIReportResultsOperation_in">
    <wsdl:part element="tns:AcknowledgeDIReportResultsRequest"
name="AcknowledgeDIReportResultsRequest"/>
  </wsdl:message>
  <wsdl:message name="AcknowledgeDIReportResultsOperation_out">
    <wsdl:part element="tns:AcknowledgeDIReportResultsResponse"
name="AcknowledgeDIReportResultsResponse"/>
  </wsdl:message>
  <wsdl:message name="ErrorDetailResponse">
    <wsdl:part element="tns:ErrorDetailResponse" name="ErrorDetailResponse" />
  </wsdl:message>

  <wsdl:portType name="DIReportResultsPortType">
    <wsdl:operation name="GetDIReportResultsOperation">
      <wsdl:input message="tns:GetDIReportResultsOperation_in"
name="GetDIReportResultsOperation_Input"/>
      <wsdl:output message="tns:GetDIReportResultsOperation_out"
name="GetDIReportResultsOperation_Output"/>
      <wsdl:fault message="tns:ErrorDetailResponse" name="ErrorDetailResponse" />
    </wsdl:operation>
    <wsdl:operation name="AcknowledgeDIReportResultsOperation">
      <wsdl:input message="tns:AcknowledgeDIReportResultsOperation_in"
name="AcknowledgeDIReportResultsOperation_Input"/>
      <wsdl:output message="tns:AcknowledgeDIReportResultsOperation_out"
name="AcknowledgeDIReportResultsOperation_Output"/>
      <wsdl:fault message="tns:ErrorDetailResponse" name="ErrorDetailResponse" />
    </wsdl:operation>
  </wsdl:portType>

  <wsdl:binding name="DIReportResultsBinding" type="tns:DIReportResultsPortType">
    <soap:binding style="document" transport="http://schemas.xmlsoap.org/soap/http"/>
    <wsdl:operation name="GetDIReportResultsOperation">
      <soap:operation soapAction="" />
      <wsdl:input name="GetDIReportResultsOperation_Input">
        <soap:body parts="GetDIReportResultsRequest" use="literal"/>
      </wsdl:input>
      <wsdl:output name="GetDIReportResultsOperation_Output">
        <soap:body parts="GetDIReportResultsResponse" use="literal"/>
      </wsdl:output>
      <wsdl:fault name="ErrorDetailResponse" >
        <soap:fault name="ErrorDetailResponse" use="literal"/>
      </wsdl:fault>
    </wsdl:operation>
    <wsdl:operation name="AcknowledgeDIReportResultsOperation">

```

```
<soap:operation soapAction=""/>
<wsdl:input name="AcknowledgeDIReportResultsOperation_Input">
  <soap:body parts="AcknowledgeDIReportResultsRequest" use="literal"/>
</wsdl:input>
<wsdl:output name="AcknowledgeDIReportResultsOperation_Output">
  <soap:body parts="AcknowledgeDIReportResultsResponse" use="literal"/>
</wsdl:output>
<wsdl:fault name="ErrorDetailResponse" >
  <soap:fault name="ErrorDetailResponse" use="literal"/>
</wsdl:fault>
</wsdl:operation>
</wsdl:binding>

<wsdl:service name="DIReportResultsService">
  <wsdl:port binding="tns:DIReportResultsBinding" name="DIReportResultsPort">
    <soap:address
location="https://www.examplewebservice.com/DIReportResultsService"/>
  </wsdl:port>
</wsdl:service>
</wsdl:definitions>
```

7 Appendix C: DIReportResultsService.xsd

```

<?xml version="1.0" encoding="UTF-8"?>
<xsd:schema
  xmlns:tns="http://www.examplewebservice.com/DIReportResultService"
  xmlns:xsd="http://www.w3.org/2001/XMLSchema">
  <xsd:complexType name="RequestType">
    <xsd:sequence>
      <xsd:element name="EmrID" type="xsd:string" minOccurs="1" maxOccurs="1" />
      <xsd:element name="ClinicID" type="xsd:string" minOccurs="1" maxOccurs="1" />
      <xsd:element name="NumberOfMessages" type="xsd:int" minOccurs="0" maxOccurs="1" />
      <xsd:element name="TransactionID" type="xsd:string" minOccurs="1" maxOccurs="1" />
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="ResponseType">
    <xsd:sequence>
      <xsd:element name="SuccessStatus" type="xsd:boolean" minOccurs="1" maxOccurs="1" />
      <xsd:element name="NumberOfMessages" type="xsd:int" minOccurs="1" maxOccurs="1" />
      <xsd:element name="MessagesRemaining" type="xsd:int" minOccurs="1" maxOccurs="1" />
      <xsd:element name="Messages" type="MessagesType" minOccurs="0" maxOccurs="25" />
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="MessagesType">
    <xsd:sequence>
      <xsd:element name="Message" type="xsd:base64Binary" minOccurs="0" maxOccurs="1"
form="qualified" />
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="ErrorDetailType">
    <xsd:sequence>
      <xsd:element name="ErrorID" type="xsd:int" minOccurs="1" maxOccurs="1" />
      <xsd:element name="ErrorCodeErrorType" type="xsd:string" minOccurs="1" maxOccurs="1" />
      <xsd:element name="ErrorMessage" type="xsd:string" minOccurs="1" maxOccurs="1" />
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="AcknowledgeRequestType">
    <xsd:sequence>
      <xsd:element name="EmrID" type="xsd:string" minOccurs="1" maxOccurs="1" />
      <xsd:element name="ClinicID" type="xsd:string" minOccurs="1" maxOccurs="1" />
      <xsd:element name="TransactionID" type="xsd:string" minOccurs="1" maxOccurs="1" />
    </xsd:sequence>
  </xsd:complexType>
  <xsd:complexType name="AcknowledgeResponseType">
    <xsd:sequence>
      <xsd:element name="SuccessStatus" type="xsd:boolean" minOccurs="1" maxOccurs="1" />
    </xsd:sequence>
  </xsd:complexType>
  <xsd:element name="GetDIReportResultsRequest" type="RequestType"/>
  <xsd:element name="GetDIReportResultsResponse" type="ResponseType"/>
  <xsd:element name="AcknowledgeDIReportResultsRequest" type="AcknowledgeRequestType"/>
  <xsd:element name="AcknowledgeDIReportResultsResponse" type="AcknowledgeResponseType"/>
  <xsd:element name="ErrorDetailResponse" type="ErrorDetailType"/>
</xsd:schema>

```

8 Appendix D: Release Notes

Version 1.0 December 1, 2015

- Updated name of service from earlier “DDS” or “CID” or “Health_Hub” to “eHealth_hub”
- Added use-cases under section 3.2 from the Assessment Guide
- Added requirements in tabular format; under new section 4
- Removed redundant sections and repeated information (erstwhile sections 2.3, 2.4, 6, and sequence diagram flow in section 3)
- Updated requirements:
 - Updated requirement# HL.I05: The “AcknowledgeDIReportResults” must be invoked only after successful processing of messages. Also added clarification that processing is identified as successful only if all messages are accepted, verified and persisted.
 - Updated requirement# HL.S02 and section 6.2.2 Algorithms: The preferred message digest hash is updated to SHA-256 and key size to 2048 bit
 - Updated requirement# HL.P04: Added clarification that message may have more than iterations of PID-3. Patient identifier + assigning authority of each iteration must be used for patient matching.
 - Added new requirements # HD.P08, HD.P09 and HD.D09: Mapping DI exam codes to predefined categories; and display DI reports grouped by the mapped categories
 - Added requirement # HD.D07: EMR must display an indicator if historical reports are available in the same accession; when displaying the DI reports
 - Other minor updates to various requirements:
 - Added HL7 message segments for display requirements for more clarification, where applicable
- Converted Web Service and Web Service Security details to appendix. Updated the appendix numbers for remaining sections with no change to their content; and updated their references in the document.
- Section 5:
 - Corrected the sample XSDs
 - Added error codes and descriptions from eHealth_hub DI Report Results Distribution Assessment Guide

Version 1.2 February 15, 2016

- Changed requirements with an assessment status of verification to demonstration
- Corrected statement in section 4 so that display requirements are explicitly mentioned under the multiple presentation assumption

Version 1.3 September 29, 2016

- Added clarification on interface requirements: HL.I05 and HL.I06
- Updated message segment for order number in processing requirement HL.P01
- Added clarification on processing requirement: HL.P03

Version 1.4 March 31, 2020

- Updated document theme to new organizational visual identity
- Updated Manitoba eHealth to Shared Health to align with new organizational structure, including changes to the EMR Certification contact email address
- Added Glossary
- Updated References (now known as Related Documents):
 - Removed Document IDs throughout document
 - Added Manitoba EMR Certification - Baseline EMR Requirements Specification
- Updated all requirements with a status of previous
- Removed statement “These requirements are assessed as defined in the eHealth_hub DI Report Result Distribution Interface Assessment Guide” from the introduction
- Added table references to all tables
- Updated references from “provincial Agfa RIS” to “provincial RIS”
- Updated Use Cases to remove enrolment references
- Created a dependency to the eHealth_hub – Authentication Specification
 - The eHealth_hub – Authentication Specification contains the previous security requirements and appendices
 - Deleted previous security requirements and appendices
 - Renamed Security Requirements to Authentication Requirements