

NB EHR Clinical Viewer (ECV) Integration Specification

November 15, 2021

Version 1.4

Version History

Version	Type	Date	Description
1.0	Published	January 11, 2021	First release of the ECV Context Sensitive Launch Integration Specification for NB EMR Program Open Market
1.1	Published	February 3, 2021	Clarified the details related to the POST operation in the "Processing the response returned from ECV REST call" section on page 10 of the document.
1.2	Published	May 14, 2021	Updated to reflect TLS 1.2 requirement. Also updated documentation assessment to include an assertion requirement. Added a note in the Appendix A, clarifying errors generated in the EHR.
1.3	Published	September 30, 2021	Removed section 1.4 which included production ECV connection information. This information will be provided in an alternative method post conformance. Minor updates to requirements ECV.IR.03, ECV.IR.10, ECV.IR.11.
1.4		November 15, 2021	Minor updated to ECV.IR.11 to address consistent labelling in vendor audit logs.



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1 Introduction

This document describes the high-level architecture, technical requirements and conformance process for an NB Certified EMR to integrate with NB’s EHR Clinical Viewer (ECV) for access to a patient’s electronic health record in-context.

1.1 Glossary

Term	Definition
API	Application Programming Interface
Certified EMR	An Electronic Medical Record offering that has been Certified under the NB EMR Certification Process
ECV	EHR Clinical Viewer
EHR	Electronic Health Record
EMR	Electronic Medical Record and in this document refers to the NB certified EMR solution provided by the Vendor.
EMR-ID, OrgID	A unique identifier of a clinic. This ID is issued by the Department of Health Registries group and is stored in the location registry.
NB DoH	New Brunswick Department of Health
OID	OIDs, or object identifiers are an identifier mechanism standardized by the International Telecommunications Union (ITU) and ISO/IEC for naming any object, concept, or thing with a globally unambiguous persistent name.
Org ID	see EMR-ID
Org Token	A UUID that serves as a pass code to validate that the Org ID of a specific clinic is declared correctly in the ECV call.
PHN	NB Personal Health Number – a unique identifier for NB patients. The NB PHN is still under development; when final, every patient interacting with the NB healthcare system will receive a NB PHN. For now, the NB PHN is synonymous with NB Medicare Number.
REST	Representational State Transfer (REST) is a software architectural style that defines a set of constraints to be used for creating Web services. Web services that conform to the REST architectural style, called RESTful Web Services, provide interoperability between computer systems on the Internet.
SAML	Security Assertion Markup Language (SAML) is an open standard for exchanging authentication and authorization data between parties, in particular, between an identity provider and a service provider. SAML is an XML-based markup language for security assertions (statements that service providers use to make access-control decisions).
Sandbox	Sandbox is a test space for external 3rd party software developers to test their integration code before connecting to production systems.
SSO	Single Sign-On
URL	A Uniform Resource Locator (URL), colloquially termed a web address, is a reference to a web resource that specifies its location on a computer network and a mechanism for retrieving it.
UUID	A Universally Unique Identifier (UUID) is a 128-bit number used to identify information in computer systems.
Vendor	The EMR Vendor engaged in the process of connecting the EMR Software to ECV. Also referred to as EMR Vendor.
Vendor Certificate	A digital certificate issued to a 3rd Party EMR Vendor. Only one certificate is required for the Vendor, regardless of the number of installations/clinics they support.

1.2 Business Objectives & Benefits Summary

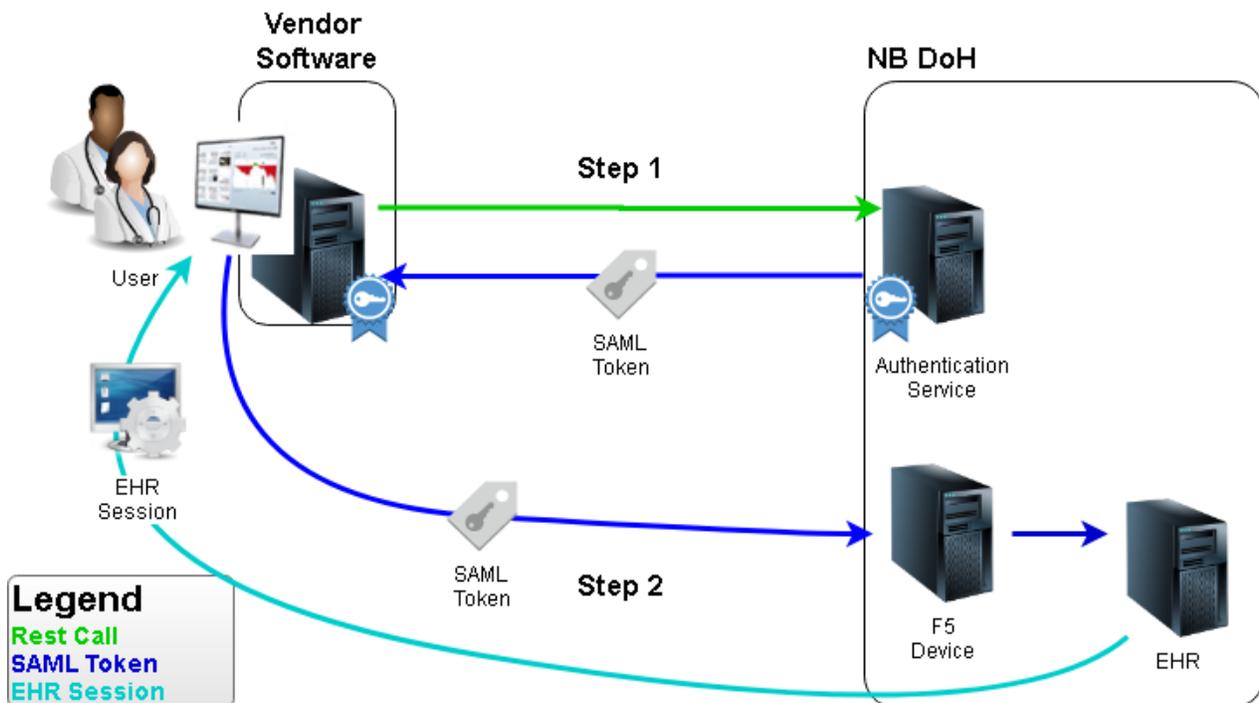
The New Brunswick Electronic Health Record (EHR) Clinical Viewer (ECV) provides context-sensitive access to New Brunswick’s Electronic Health Record from an EMR. The integration allows authorized clinical users and support staff to open the EHR from their EMR, with the patient in context, with the click of a button.

1.3 Scope

This document provides business, technical and integration specifications to assist EMR Vendors in the development, testing and implementation of SSO Integration to the ECV.

1.4 High Level Information Flow

The following diagram demonstrates how the EMR establishes a secure connection to NB DoH, to enable an authenticated EMR user to launch the ECV for the in-context patient.



Launching the ECV in context involves two steps. The first step is to authenticate the currently logged in EMR user. If the call is successful a SAML token will be generated and returned.

The second step is to use the SAML token to invoke an instance of the ECV. See Appendix A: RESTful API to EHR Clinical Viewer for processing of the SAML token. The SAML token will be used to open an instance of the ECV that will show the patient in context to the user.

Note: The ECV integration architecture leverages TLS 1.2.

2 Use Cases

The use cases in this section describe the functionality required for an EMR to integrate with the ECV.

2.1 Accessing ECV from EMR

UC1.1 Access ECV from EMR	
Goal	To access a patient's clinical information in the EHR from the EMR with the patient in context.
Description	EMR users can access the EHR from their EMR.
Trigger	The EMR User clicks the EHR Clinical Viewer button to launch the ECV.
Preconditions	EMR user is logged in to their EMR. EMR user has been configured by NB DoH with access to the EHR. Patient in context has an NB Personal Health Number (PHN). Patient in context is not a baby sharing their mother's NB PHN.
Postconditions	<p>Main Flow: The EMR user views the patient in context in the ECV.</p> <p>Alternate Flow 1: The EMR user does not have access to the EHR.</p> <p>Alternate Flow 2: The patient in context does not have an NB PHN number on their EMR record.</p> <p>Alternate Flow 3: The patient in context does not have a valid or active NB PHN number on their EMR record.</p> <p>Alternate Flow 4: The patient in context is a baby using the mother's PHN.</p>
Actor(s)	<p>EMR Primary users: Physician, Nurse Practitioner, Nurse, Allied Health Professional</p> <p>EMR Secondary users: Medical Office Assistant (MOA)</p>
Main Flow	<ol style="list-style-type: none"> EMR sends a RESTful POST request, specifying all required parameters, to the ECV authentication service. The ECV process successfully authenticates the EMR user and provides a URL and SAML token, which is then invoked by the EMR.

UC1.1 Access ECV from EMR	
	<ol style="list-style-type: none"> 3. A search is performed in the EHR for the NB PHN that was provided in the parameters and the EHR Patient Summary screen displays the matching patient's clinical record, according to their configured roles in EHR.
Alternate Flow 1	<p>The EMR user is not configured for EHR access.</p> <ol style="list-style-type: none"> 1. The EMR receives an error code from the ECV authentication service stating that the user does not exist. 2. The EMR application presents a user friendly message to the EMR user stating that they are not authorized to access the service. 3. The EMR user is asked to contact their EMR administrator.
Alternate Flow 2	<p>The patient in context does not have an NB PHN number on their EMR record.</p> <ol style="list-style-type: none"> 1. The EMR user is presented with a message stating that the ECV is not available for a patient without an NB PHN; or 2. The EHR Clinical Viewer button is disabled.
Alternate Flow 3	<p>The patient in context does not have a valid or active NB PHN number on their EMR record.</p> <ol style="list-style-type: none"> 1. EMR sends a RESTful POST request, specifying all required parameters, to the ECV authentication service. 2. The ECV process successfully authenticates the EMR user and provides a URL and SAML token, which is then invoked by the EMR. 3. A search is performed in the EHR for the NB PHN that was provided in the parameters however the EHR displays a "Patient Not Found" error.
Alternate Flow 4	<p>The patient in context is a baby and is using the mother's PHN.</p> <ol style="list-style-type: none"> 1. The EMR user is presented with a message stating that the ECV is not available for a baby using their mother's NB PHN; or 2. The EHR Clinical Viewer button is disabled.
Frequency of Use	Used frequently for most patient encounters.
Importance	High – This is the entry point for accessing the ECV
Complexity	<p>Low – the user clicks on the EHR Clinical Viewer button from their EMR and the response time to access EHR is several seconds.</p> <p>Note – the response time is higher the first time a user logs in and initiates a session. The response time may also be higher for patients with a complex medical history.</p>
Considerations	<ul style="list-style-type: none"> • N/A

3 Requirements

This section outlines the mandatory requirements for an EMR Vendor to conform to the ECV integration.

3.1 Column Definition

The requirements will be listed in the sections below in table format. The following are definitions of what each column contains:

- **ID** – This is the unique key that represents this requirement in all documentation.
- **Requirement** – A concise explanation of the requirement
- **Guidelines** – Additional instructions that make up part of the requirement
- **Status** – Indicates the state of the requirement in relation to previous specification documentation
 - New – Not included in previous specifications
 - Updated – Modified from previous specifications
 - Previous – Unchanged from previous specifications
- **Assessment** – The method of assessing the requirement. All requirements will be assessed using the following methods:
 - Documentation – Vendors will assert that a requirement is met and provide solution documentation (including diagrams) to verify how requirements are met.
 - Demonstration – Vendors will demonstrate requirements within their EMR product. Demonstrations may be conducted in person, by remote means (e.g. teleconference and Internet) or through recorded video.
 - System Integration – Vendors will perform an end-to-end test of requirements to demonstrate interoperability.

3.2 Interface Requirements

ID	Requirement	Guidelines	Status	Assessment
ECV.IR.01	API calls to the ECV must originate from a <i>certified</i> hosted solution server using TLS1.2.	The Vendor certificate cannot be installed on individual workstations, only on a hosted server.	Previous	Documentation
ECV.IR.02	All API calls are made using the POST method.		Previous	System Integration
ECV.IR.03	The ECV is accessible via a button visibly placed on the client/patient screens in the EMR. The button must be labelled “EHR Clinical Viewer” in English and “Visualiseur clinique du DSÉ” in French.		Updated	Demonstration
ECV.IR.04	The EHR Clinical Viewer button will only be	Patients must be saved within the EMR to launch	Previous	Demonstration

ID	Requirement	Guidelines	Status	Assessment
	available for existing patients in the EMR.	ECV and view their details in the EHR.		
ECV.IR.05	The EHR Clinical Viewer button is not accessible when an existing EMR patient does not have an NB PHN.	This requirement can be implemented by disabling the button for patients without an NB PHN or by providing the user a meaningful message.	Previous	Demonstration
ECV.IR.06	The EHR Clinical Viewer button is not accessible when an existing EMR patient is a baby using their mother's NB Medicare Number.	The EMR must be able to identify if the NB PHN is associated to the patient, or if it is associated with a baby linked to the mother's Medicare Number. This requirement can be implemented by disabling the button for babies using the mother's NB Medicare Number or by providing the user a meaningful message.	Previous	Demonstration
ECV.IR.07	One-click implementation.	The EMR must be able to handle the SAML response and forward to ECV with no user interaction after the 'button' click to open the ECV.	Previous	Demonstration
ECV.IR.08	EMR must be able to instantiate a browser instance using the SAML token returned from the API call.	This requirement can be implemented by either opening the EHR in the default browser, or instantiating a supported browser. See Appendix B: Supported Browsers for EHR Clinical Viewer.	Previous	Demonstration
ECV.IR.09	The SAML token must not be visible to the user. Only the EHR session URL, returned from the authentication request, will be visible.	The SAML token returned from the authentication call is not to be shown to the end user. Only the URL from the EHR after the SAML token is passed will be displayed. Visible means that it cannot be found using debug tools or other mechanisms.	Previous	Documentation and Demonstration
ECV.IR.10	EMRs must handle API errors and display only a generic user-friendly	The error code must be available for troubleshooting purposes with NB DoH and	Updated	Demonstration

ID	Requirement	Guidelines	Status	Assessment
	<p>message to the end user that states that the user is unauthorized to access the ECV. The message must include the error code returned by the API.</p> <p>The error description provided by the API must not be displayed to the user, but could be captured in the logs to aid in troubleshooting.</p>	<p>logged as part of the Request Status in ECV.IR.10.</p> <p>See examples of errors in Appendix A: RESTful API to EHR Clinical Viewer.</p>		
ECV.IR.11	<p>All calls will be audited within the EMR and at minimum contain the following fields:</p> <ul style="list-style-type: none"> • Date/time of call • Signed in user • Patient ID • Patient ID Issuer • Request Status • Error Code <p>For each field the audit log will be labeled with ECV along with the field name specified above and the associated value as follows "ECV:name:value".</p> <p>The error description provided by the API may be captured in the logs to aid in troubleshooting.</p>	<p>Request status will contain a value of "Requested" or "Resulted".</p> <p>When the "EHR Clinical Viewer" is initially clicked an audit record will be written with the "Request Status" set to "Requested".</p> <p>In the event of an error, a new audit record will be written with the "Request Status" set to "Requested" and the "Error Code" populated with the error code from the response.</p> <p>When the EHR Clinical Viewer is successfully launched a new audit record will be written with the "Request Status" set to "Resulted".</p>	Updated	Documentation and Demonstration

3.3 Parameter Requirements

<u>ID</u>	<u>Requirement</u>	<u>Guidelines</u>	<u>Status</u>	<u>Assessment</u>
ECV.PR.01	All required parameters for the API call are sent.	See Appendix A: RESTful API to EHR Clinical Viewer for the API call and parameters.	Previous	System Integration
ECV.PR.02	The userId parameter must be the logged in user.	The EMR must not use a single user account to make authentication calls to the ECV. The user that is logged in must be the one passed for authentication.	Previous	System Integration

Appendix A: RESTful API to EHR Clinical Viewer

The following section outlines the RESTful API call for the ECV integration.

Environments URLs

The following URLs will be used to call the ECV:

Environment Name	Network URL
Sandbox	To be provided
Production	To be provided

Calling the API with an HTTPS POST

The calling application will make a RESTful call to ECV as an HTTPS **POST** (POST <URL>) using the corresponding Environment URLs (as identified above) and the following headers:

Key	Value
application	The application name/mnemonic as provided by NB DoH.
orgId	The Organization Identifier for the Clinic as provided by NB DoH.
orgToken	The Organization Token for the Clinic as provided by NB DoH.
userId	The EMR user identifier of the currently signed in user. This is a unique user id within the EMR.
patientId	The provincial Personal Health Number. For the transitional phase, until the NB PHN is fully implemented, this is the same as the NB Medicare Number. The ECV will not be accessible for patients without an NB Medicare Number until a process exists for those patients to acquire a PHN. Note: if an unknown PHN is passed into the API, the ECV will still open, but it will return a patient not found error.
patientIdIssuer	The issuer of the patient ID is an OID representing the NBPHN, 2.16.840.1.113883.4.51

Note: The parameters are case sensitive. A mis-spelled parameter is a missing parameter.

Authentication and Authorization

All ECV REST calls will be authenticated using the certificate authentication model defined in MCE. This model is defined and validated externally to this process.

Processing the response returned from ECV REST call

Successful ECV REST Call

A successful call to the ECV REST API will return a SAML response like this:

Errors that can be returned from the ECV Call

Problem with the URL:

If the URL sent by the Vendor is invalid, the API will return the standard 404 error.

```

1  <html>
2
3  <head>
4  |   <meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1" />
5  |   <title>Error 404 NOT_FOUND</title>
6  </head>
7
8  <body>
9  |   <h2>HTTP ERROR: 404</h2>
10 |   <p>Problem accessing /samx1. Reason:
11 |   |   <pre>    NOT_FOUND</pre>
12 |   </p>
13 |   <hr /><i><small>Powered by Jetty://</small></i>
14 |
15 </body>
16
17 </html>

```

Problem with missing parameters:

If the required parameters are not included in the call, the API will return an error like this:

```

1  <?xml version="1.0" encoding="UTF-8"?>
2  <ERROR>
3  |   <CODE>NA-10000</CODE>
4  |   <DESCRIPTION>Please supply the following parameters: orgId, orgToken</DESCRIPTION>
5  </ERROR>

```

Problem with the values within the parameters:

If the API call is syntactically correct, but there is a problem with the values of the parameters, the API will return an ERROR XML body like what is shown in the following image. There are a series of codes that can be returned, but they will all have the same description and structure as the sample below. The description is purposefully obfuscated, as to not provide insight to potential hackers.

```

1  <?xml version="1.0" encoding="UTF-8"?>
2  <ERROR>
3  |   <CODE>NA-011</CODE>
4  |   <DESCRIPTION>You are not authorized to access this application. Please call your service desk. </DESCRIPTION>
5  </ERROR>

```

Note: Errors generated by the EHR, after the EHR has been opened, are not expected to be handled by the EMR. For example submitting an invalid PHN will open the EHR but will generate a “The specified patient cannot be found.” error in the ECV. This is an ECV error, not to be handled by the EMR.

Appendix B: Supported Browsers for EHR Clinical Viewer

The following table lists the supported browsers, as well as the supported operating system for each browser. Note that this will be updated periodically:

Browser	Version	Operating System
Microsoft Edge	Latest version	Windows 10
Internet Explorer 11 (Native mode recommended)	Latest Windows update version	Windows 7, Windows 8.1, Windows 10
Mozilla Firefox	Latest release channel version	Windows, Mac OS, Ubuntu LTS
Mozilla Firefox Extended Support Release (ESR)	Latest ESR version	Windows, Mac OS, Ubuntu LTS
Google Chrome	Latest version	Windows, Mac OS
Safari	Latest versions available for the Mac OS version	Mac OS
Safari Mobile (Standard browser mode only)	Latest versions available for the iOS version	iOS 12, iOS 13 (on iPad only)