



Digital Health Interoperability

pan-Canadian Projectathon

March 20 - 23, 2023

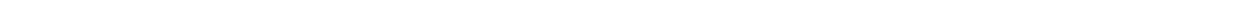
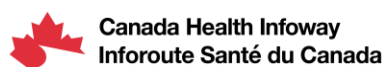




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Definitions

Actors: IHE Actors are responsible for producing, managing and/or acting on information in the context of an IHE Profile. An Actor is defined in terms of its primary responsibility. Each IHE Profile assigns specific requirements to specific actors. The same Actor might be referenced in multiple Profiles.¹ For example, in the context of the Patient Summary, a health records system (e.g., EMR, HIS, PHR, etc.) may be an actor that creates a Patient Summary.

Canadian FHIR Exchange (CA:FeX): CA:FeX seeks to promote FHIR RESTful exchange patterns developed by leading FHIR standards that can be applied on top of existing non-FHIR infrastructure as well as FHIR servers.

International Patient Summary (IPS): The IPS is a minimal, non-exhaustive set of data elements defined by ISO/EN 17269 and realized by HL7 in both CDA and FHIR. The IPS is a snapshot clinical document that can be used for planned or unplanned care of a person locally or across national/jurisdictional borders. It emphasizes the data required and the necessary conformance of the use cases for an international patient summary.²

No-Peer Testing: Tests between a system and a supporting tool (e.g., CA:FeX Client Simulator.)

Peer-to-Peer Testing: Testing between two or more vendor systems.

PS-CA: The pan-Canadian Patient Summary. Aligned as closely as possible to the IPS profiles, the PS-CA will allow care solutions to contribute pertinent patient health information into clinical repositories (e.g., provincial/regional electronic health records, clinical data repositories, personal health records, etc.) to improve health outcomes and reduce administrative burden for clinicians.

Transactions: Transactions are exchanges of information between actors using messages based on established standards (e.g., HL7).

¹ Integrating the Healthcare Enterprise (IHE): <https://wiki.ihe.net/index.php/Actors#:~:text=IHE%20Actors%20are%20responsible%20for,be%20referenced%20in%20multiple%20Profiles>.

² IHE International Patient Summary. [https://wiki.ihe.net/index.php/International_Patient_Summary_\(IPS\)](https://wiki.ihe.net/index.php/International_Patient_Summary_(IPS))



Executive Summary

In collaboration with the provinces and territories, Canada Health Infoway (Infoway) invited vendors to participate in the March 2023 Projectathon. Projectathons are an important step and best practice approach in testing and validation of a specification package, wherein implementers demonstrate live interoperability of solutions (actors) in conformance with pan-Canadian specifications.

The March 2023 Projectathon was dedicated to supporting Patient Summary implementation projects across Canada. The expansion of patient summary adoption is a key initiative within the Shared Pan-Canadian Interoperability Roadmap; the March 2023 Projectathon convened vendors to test and collaborate on the specific use cases within the pan-Canadian Patient Summary Specification (PS-CA). Among other objectives, the event sought to:

- Enable vendors to demonstrate the ability to implement the IPS-aligned PS-CA and pan-Canadian FHIR Exchange (CA:FeX) specifications for the secure exchange of well-formed patient summaries
- Communicate next steps and future planning for the Shared Pan-Canadian Interoperability Roadmap, especially regarding PS-CA and CA:FeX specifications

The Projectathon was held from March 20-23, 2023. The first three days focused on No-Peer (tests between a system and a supporting tool) and Peer-to-Peer (tests between two or more vendor systems) testing, while the final day was dedicated to a “Symposia Day,” comprised of a series of information-sharing and interactive sessions. Over the course of the three testing days, nine vendors executed 203 tests, with 57 of those being Peer-to-Peer test cases, demonstrating a high level of collaboration between vendors.

While vendors expressed that additional preparation time prior to the event would have been beneficial, their capability and readiness to meet PS-CA expectations were higher than anticipated. The primary challenges experienced by vendors were in meeting IPS standards, underscoring that IPS adoption is a journey that will need to allow for national considerations. Learnings suggest that both the PS-CA and IPS will require refinements based on implementation realities.

Overall, the 2023 Projectathon doubled many of its achievements from the first event in 2022. Projectathon learnings will be aligned with Infoway’s vendor mobilization strategy, complementary to the Shared Pan-Canadian Interoperability Roadmap, and Infoway will continue to work toward progressing pan-Canadian interoperability initiatives.



Projectathons are connectivity test marathons. Much like athletic marathons, they require planning, dedication, preparation, and perseverance to succeed. Each event is a shared learning experience from which improvements can be applied for future success. We are thankful for the ongoing collaboration and support of our many partners, and for the commitment and hard work of the participating vendors.



As the Canadian health ecosystem collectively works to advance its interoperability maturity, Infoway recognizes the importance of stakeholder input and will continue our collaboration with all our stakeholders.



Context

In collaboration with the provinces and territories, Canada Health Infoway (Infoway) invited vendors to participate in the March 2023 Projectathon. This event sought to build upon the successes of the first pan-Canadian Projectathon event held in March 2022. Projectathons are an important step and best practice approach in testing and validation of a specification package, wherein implementers demonstrate live interoperability of solutions (actors) in conformance with pan-Canadian specifications. Additional information about Projectathons is available [here](#).

The March 2022 Projectathon was conceived to test and improve the quality of the pan-Canadian Patient Summary Interoperability Specifications (“PS-CA”) to ensure they were implementable, testable and meet expectations. Details about this event are available in the [pan-Canadian Projectathon Final Report](#).

The March 2023 Projectathon was dedicated to supporting Patient Summary implementation projects across Canada. The Projectathon was organized and sponsored by Infoway, with support from IHE Catalyst. This no-fee event was designed to continue a testing methodology that introduces increasingly more complex scenarios to the market; and to work with vendors and stakeholders to identify, test and solve typical data exchange (transactions) and workflow challenges that hinder current integration efforts.

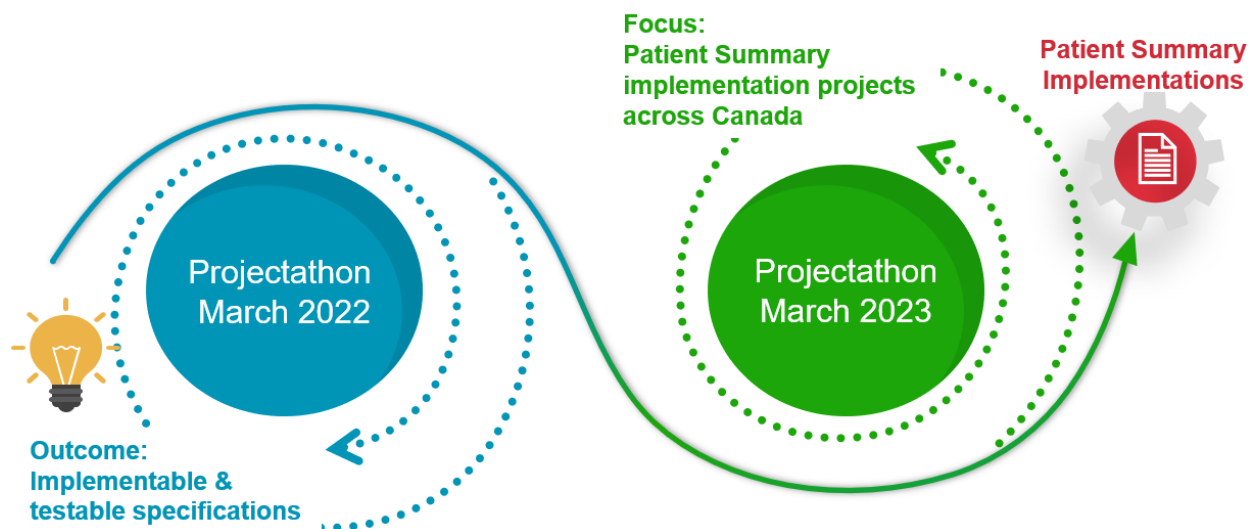


Figure 1 Progression of the Projectathon



Projectathon Objectives

The second pan-Canadian Projectathon sought to build the successes of its predecessor, while expanding the scope of capabilities defined within the PS-CA and pan-Canadian FHIR Exchange (“CA:FeX”) specifications. It convened vendors to test and collaborate on the specific use cases within the PS-CA, with the intent to accelerate product development, bring developers and implementers together to help identify and mitigate difficult conditions in specification development that have the potential of becoming insurmountable, such as threats to clinical and business workflows. The ultimate objective of this event was to evaluate the appropriateness and ease of adoption of a specification, typically achieved through the following activities:

- Preparations focused on implementing the specification
- Trialing exchange patterns using the testing platform through simulation
- Learning about the logistics of live testing, providing feedback on the specification through targeted discussion sessions

This Projectathon continued to offer Canadian implementers exposure to the type of interoperability testing occurring on an international-scale, one that helps strengthen implementation guidelines and standards in the health sector. Projectathons require a series of steps in preparation, execution and follow-ups that lead to successful implementations, as represented in Figure 2.

The Journey: Development – Projectathon Testing - Implementation

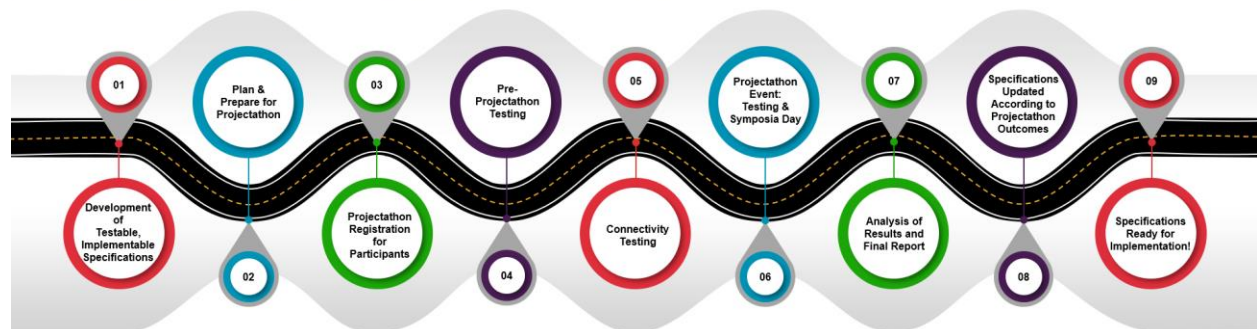


Figure 2 The Journey: Development – Projectathon – Implementation

Key objectives of the Projectathon were to:

- Enable vendors to demonstrate the ability to implement the PS-CA and CA:FeX specifications for the secure exchange of well-formed patient summaries
- Further improve the pan-Canadian testing and conformance capabilities of this event through continuous improvement processes and feedback from participating stakeholders
- Test the readiness and completeness of the IPS-aligned PS-CA v1.0.0 Trial Implementation (TI) specification, with added focus on the new features and capabilities introduced since 2022



- Test the ability to configure systems to meet the Ontario implementation guidance
- Test the foundational security profiles CA:Aud, CA:Sec and IUA to establish a baseline to begin stakeholder collaboration
- Continue to promote:
 - The use of integration profiles as established patterns in solving typical integration problems
 - International testing tools to the Canadian market, to raise vendors' awareness of and familiarity with them, and to better align Canada with international trends
- Deepen vendor understanding of the PS-CA specifications and advance vendor preparations for upcoming jurisdictional patient summary pilot implementations via practical testing means, specifically by evaluating participating vendor system capabilities to securely exchange well-formed Patient Summary information
- Provide value to the provinces and territories implementing the PS-CA and the CA:FeX specifications
- Communicate next steps and future planning for the Shared Pan-Canadian Interoperability Roadmap, especially regarding PS-CA and CA:FeX specifications

Projectathon Preparation and Event

The pan-Canadian Projectathon included four distinct phases (Figure 3):

1. **Registration:** Participating vendors registered their organizations and systems and identified the profiles their systems can support.
2. **Pre-Projectathon Testing:** Participating vendors performed pre-event testing to ensure interoperability of their systems with the platform simulators.
3. **Connectivity Testing:** Participating vendors performed connectivity tests to verify that nodes and machines from different test participants could detect and identify each other and access ports.
4. **Projectathon Execution:** Vendors tested against other live systems during the event, simulating actual implementation environments.

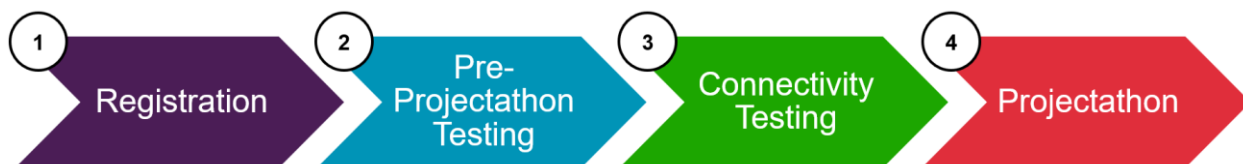


Figure 3 pan-Canadian Projectathon Phases



Projectathon Event Schedule

The Projectathon was held over four days, as illustrated in Table 1:

Table 1 Projectathon Event Schedule

	Date	Objective
Days 1-3	March 20-22, 2022	No-Peer & Peer-to-Peer Testing
Day 4	March 23, 2022	Symposia Day

Days 1-3 of the Projectathon focused on No-Peer testing and Peer-to-Peer testing, exploring the interoperability aspects of the specification. Tests offered coverage for six profiles represented in the PS-CA (described [here](#)).

Day 4 was a designated “Symposia Day,” including a series of sessions covering the Shared Pan-Canadian Interoperability Roadmap and the next iteration of the Canadian FHIR Exchange; a session with open discussion with clinicians and vendors about opportunities for achieving pan-Canadian interoperability; and presentations from national and international interoperability implementers.

Participants

Nine vendors, including Akinox, Enovacom, Microquest Inc., Oracle, Smile Digital Health, TELUS Health, VeroSource Solutions, Verto Health and WELL Health registered and participated in the Projectathon testing.

The Symposia Day saw extended participation and collaboration from additional stakeholders. Figure 4 includes a complete list of the participating organizations.




Figure 4 Projectathon Testing & Symposia Day Participants



Projectathon Package Specifications

The Interoperability specifications under test at the Projectathon included the PS-CA v1.0.0 TI, the CA:FeX v1.0.0 TI and the supporting Reference Architecture v0.1.1 Draft.

 A complete list of the specifications package, including links to each specification, can be found [here](#).

Projectathon Testing Tools

A combination of the Gazelle testing platform and other tools (e.g., FHIR Validator, Client & Server Simulators, etc.) were used to complete the pre-Projectathon and Projectathon event testing. For more information, please see Appendix A.

Use Cases

Two use cases, as represented in Figure 5, were tested during the Projectathon:

- UC-01: A Health Care Provider in any care setting creates a Patient Summary for use at the point of care, which is made available to Patient Summary consumers.
- UC-02: A Health Care Provider in any care setting, views and uses a Patient Summary at the point of care.

 A complete description of the use cases can be found [here](#).

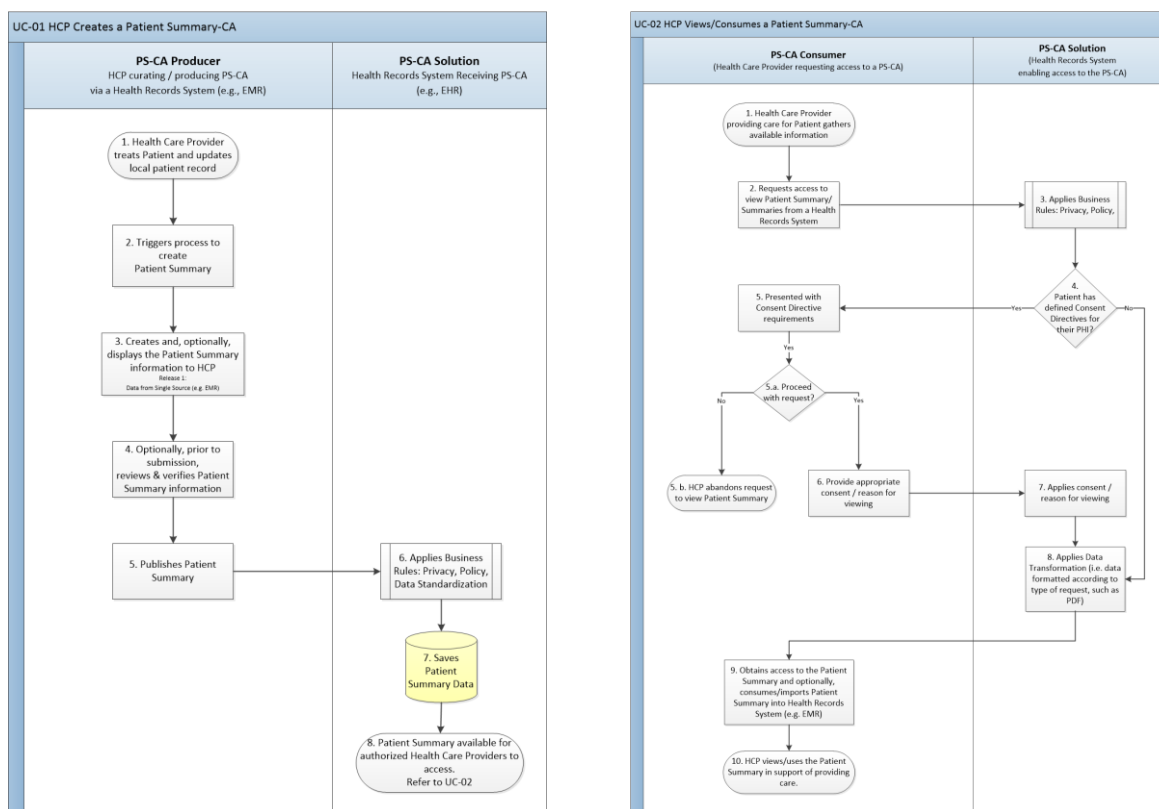



Figure 5 Use Case Flow Diagrams

FHIR Content Data Model

The PS-CA specifications v1.0.0 TI content data model is communicated in the form of FHIR profiles that are compiled together in the PS-CA FHIR Implementation Guide (IG) v1.0.0 TI. These profiles describe the minimal expectations for expressing information in each patient summary domain (e.g., Medication Summary, Problem List, Immunization, etc.). A complete list of data that were defined as FHIR profiles in this release can be found in Figure 6. There are several changes to the data model tested at the 2023 Projectathon, notably, the addition of the Family Member History and Observation Social History Data Domains and closer alignment between the [IPS-UV](#) and PS-CA.

 The PS-CA FHIR IG, including more information about the changes noted above, is available [here](#).

For a detailed list of updates to the PS-CA FHIR IG since the last Projectathon, readers are encouraged to review the release notes associated with each release after the PS-CA v0.2. Draft up to the PS-CA v1.0.0 TI, available [here](#).



Patient Summary-CA: Data Domains of Interest by Canadian Jurisdiction and Release

IPS-UV		PS- CA		AB	BC	MB	NL	ON	SK	v1.0.0 TI	Future
Header	Subject	Header	Subject								+
	Author		Author								+
	Attester		Attester								+
	Custodian		Custodian								+
Required	Medication Summary	Recommended	Medication Summary								+
	Allergies and Intolerances		Allergies and Intolerances								+
	Problem List		Problem List								+
Recommended	Immunizations	Recommended	Immunizations								+
	History of Procedures		History of Procedures								+
	Medical Devices		Medical Devices								
	Diagnostic Results		Diagnostic Results								
Optional	Vital Signs	Optional	Vital Signs								+
	Past history of Illness		Past History of Illness								+
	Social History		Social History								+
	Advance Directives		Advance Directives								
	Pregnancy		Pregnancy								
	Functional Status		Functional Status								
	Plan of Care		Plan of Care								
		EXT	Extension(s)								
			Family History								+

Figure 6 PS-CA FHIR Content Data Model and Domains of Interest by Canadian Jurisdictions

Test Cases and Test Data

The 2023 Projectathon was dedicated to supporting Patient Summary implementation projects across Canada. Testing focused on validating that the vendor systems have the capabilities needed to securely exchange well-formed Patient Summary information with other systems. Vendors had an opportunity to test and demonstrate capabilities in two distinct areas of the PS-CA specification: 1) PS-CA document and content and 2) PS-CA secure exchange transactions.

- 1) PS-CA Document format and content:** Ensuring that the Patient Summary document is structured in the expected format and contains the required information, using the correct data types and value sets, where specific value sets are defined as required in the PS-CA v1.0.0 TI.

In support of testing the PS-CA document format and content, vendors were provided with a set of test cases and supporting data sets.

A **new feature** at this year’s Projectathon included the ability to validate the national (PS-CA) and harmonized provincial Patient Summary specifications from Ontario (PS-ON).



1. In addition to testing the PS-CA, test cases validated the PS-ON specifications, which are very closely aligned to the PS-CA and supported by minimal configuration of capability in the vendor systems. The configuration details were provided in the Data Configuration Guide available [here](#).


Note: Alberta has been working closely with Infoway throughout the Patient Summary project development and continues to actively work on their implementation guide and updating their profiles to the latest findings for their data dictionary. For the purposes of this Projectathon, vendors were asked to focus their efforts on configuring their systems to the PS-CA. At such time that the PS-AB becomes available, only minimal configurations are expected.

2. The test cases highlighted where configuration is needed, and tested that the configuration was applied properly, based on claimed vendor conformance.
3. The Projectathon offered an assessment of the Patient Summary document against the ON implementation guidance as represented in the PS-ON specifications, in addition to the PS-CA.

2) PS-CA Secure, exchange transactions: Ensuring that the system(s) can securely exchange Patient Summary information using the recommended secure exchange methods of the FHIR summary document, as presented in the RA v0.1.1 DFT, referenced by the PS-CA and CA:FeX specifications.

Two categories of integration profiles were tested:

1. Core integration profiles (Transport of a Patient Summary):
 - Pan-Canadian FHIR Exchange (CA:FeX)
 - Mobile Access to Health Documents (MHD)
2. Supporting integration profiles (Security and Authorization):
 - Audit Trail and Node Authentication (ATNA)
 - Canadian Network Security (CA:Sec) Implementation Guidance
 - Canadian Audit Trail (CA:Aud) Implementation Guidance
 - Internet User Authorization Profile (IUA)
 - Consistent Time (CT)

 Profile descriptions and educational materials for each profile are available [here](#), in section *What will be Tested (Implementation Guides & IHE Profiles)*.

Implementation patterns of these integration profiles may differ from jurisdiction to jurisdiction and information exchange channels may vary in terms of their security footprint. Therefore, the Projectathon test cases were organized into two categories:

- **Category 1:** Test cases that test **individual actor capabilities in isolation**, e.g., how a system can handle encrypted transactions, how a system can handle a CA:FeX transaction, how a system can handle an OAuth 2 token exchange, etc.



- **Category 2:** Complex test cases that **group individual actor capabilities with other relevant actor capabilities to simulate real world scenarios**, e.g., how a patient summary creator system can submit the document to a repository by using an OAuth 2 integration, etc.

Systems and Exchange Interfaces

During testing, participating vendors exchanged Patient Summaries using one (or both) of the recommended data exchange patterns, as represented in Figure 7 and outlined in the PS-CA specifications:

- Option 1: Document Repository using MHD
- Option 2: FHIR HIE using CA:FeX

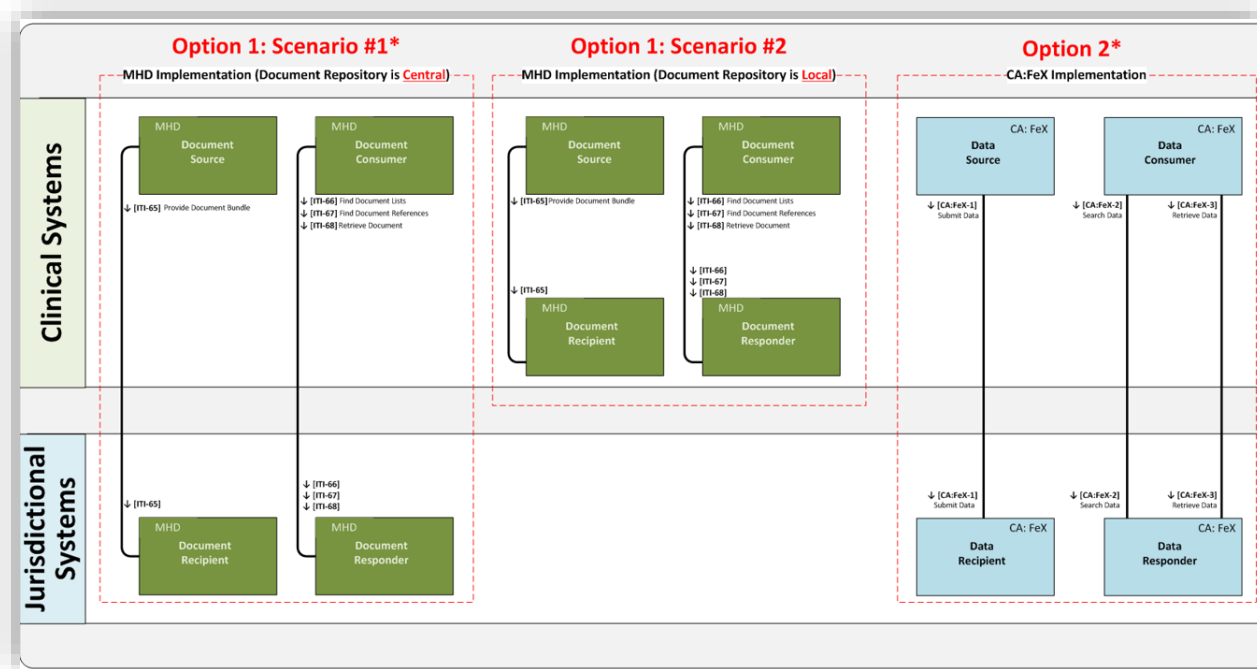


Figure 7 Data Exchange Patterns

Based on the chosen option, participating vendors selected a PS-CA actor to test their ability to play the roles of the required supporting profile. To successfully exchange a Patient Summary (PS-CA), participating vendors had to meet the requirements of the actor roles (Table 2) and associated transactions (Table 4) as outlined in the PS-CA specifications.



Table 2 Summary of PS-CA Actors

PS-CA Actor	Required Supporting Profiles (Actors)
Option 1: MHD Implementation (Document Repository)	
PS-CA Producer	MHD Document Source
Document Repository	MHD Document Recipient & Document Responder
PS-CA Consumer	MHD Document Consumer
Option 2: CA:FeX Implementation	
PS-CA Producer	CA:FeX (Data Source)
Document Repository	CA:FeX (Data Recipient, Data Responder)
PS-CA Consumer	CA:FeX (Data Consumer)

Table 3 lists the profiles and corresponding transactions that the vendors were able to test.

Table 3 Summary of List of the Profiles and Transactions

Profiles and Transactions
<p>MHD (Document Repository) Transactions</p> <ul style="list-style-type: none"> • Capability Statement • Save PS-CA to Document Repository <ul style="list-style-type: none"> ○ ITI-65 Provide Document Bundle • Retrieve PS-CA from Document Repository <ul style="list-style-type: none"> ○ ITI-66 Find Document Lists ○ ITI-67 Find Document References ○ ITI-68 Retrieve Document
<p>CA:FeX Transactions</p> <ul style="list-style-type: none"> • Capability Statement • Save PS-CA to Document Repository <ul style="list-style-type: none"> ○ CA:FeX-1 Submit Data • Retrieve PS-CA from Document Repository <ul style="list-style-type: none"> ○ CA:FeX-2A Search Data ○ CA:FeX-3A Retrieve Data
<p>IUA Transactions</p> <ul style="list-style-type: none"> • ITI-103 Get Authorization Server Metadata



Profiles and Transactions

- ITI-71 Get Access Token (Authorization Code Grant)
- ITI-71 Get Access Token (Client Credentials Grant)
- ITI-72 Incorporate Access Token

CT Transactions

- ITI-1 Maintain Time

CA:Sec Transactions

- ITI-19 Authenticate Node

CA:Aud Transactions

- ITI-20 Record Audit Event



Vendor Test Results (Projectathon Days 1-3)

The Projectathon provides vendors an opportunity to test the interoperability of their products in a structured, rigorous and neutral environment with simulators and peer vendors. It also enables the Infoway standards to be tested in the form of trial implementation/deployment settings using clinical scenarios to mimic real-world workflow.

The Projectathon is also used to help validate and mature the emerging specifications to ensure that the specification is both achievable by vendors and provides the necessary supports for clinicians and their patients. It is important to interpret test results in light of these points.

Through their Projectathon participation, vendors are helping to test the standards as much as the Projectathon aids them in testing and adjusting their systems to better support pan-Canadian interoperability. The Projectathon events also provide important confirmation whether the profiles developed by Infoway are sufficiently clear and can be implemented consistently.

Vendor collaboration

Vendors collaborated with the Monitors and provided evidence that the work they submitted for grading was soundly based; leading practice among vendors is to ensure that their logs remain ready to run, replay, and replay again if necessary. The Monitors focus on collaboration with vendors to resolve issues with tests that cannot be validated, cognizant of the fact that challenges experienced by one vendor may arise for tomorrow. This approach also encourages vendors, large and small, to work closely together to resolve issues.

How the tests were conducted and validated

During the Projectathon, testing is performed using the Gazelle Test Bed, an established international tool. Among other features, the Gazelle testing suite is comprised of a test management tool, simulators, and validators. The test management tool is used to configure the vendors systems (i.e., systems under test), the users, the Monitors, and the orchestration of these for conducting test cases. The system enables participants to identify suitable partner systems for Peer-to-Peer testing, log evidence of the tests performed and run the tests at their own pace, marking them as ready for validation by the Monitors when complete.

The messages exchanged during an interoperability test can be recorded using Gazelle's proxy to be validated using the available validation services.

In addition to the software systems available to vendors taking part at the Projectathon, Infoway provides simulators (such as IUA Simulator, CA:FeX Simulator, etc.) that mimic the functionality of specified actors to test interfaces. These tools are of particular interest between Projectathons and enable vendors to prepare their systems' interfaces for Peer-to-Peer tests at Projectathons.



Monitors, who are subject-matter experts, verify each test. Approximately 10 Monitors were recruited for observing and evaluating the tests under the oversight of Infoway test management. While the Monitors provide assistance, they remain independent and objective throughout the testing process.

Overall Vendor Test Results

In total, nine participating vendor systems executed 203 tests during the Projectathon. This report will focus on test instances in Gazelle that were passed and partially passed. (Refer to Figure 12 for definitions of test result statuses).

Table 4 represents the overall number of tests that were conducted.

Table 4 Overall Projectathon Test Results Summary

Summary	Total
Total Tests Conducted	203
Pass	182
Partial Pass	13
Other Statuses	8

**Note: Other Statuses is inclusive of test instances that were failed, paused, running and/or aborted. This dashboard contains latest data from 3:30 PM on 23/03/2023 from the Gazelle Testing Platform*

Table 5 provides further breakdown of the overall results by profile and separated by No-Peer and Peer-to-Peer test results.

Table 5 Projectathon No-Peer and Peer-to-Peer Test Summary

Profiles	No-Peer Tests			Peer-to-Peer Tests		
	Total	Pass	Partial Pass	Total	Pass	Partial Pass
CT	6	6	N/A	N/A	N/A	N/A
CA:Aud	3	3	N/A	N/A	N/A	N/A
CA:Sec	10	9	1	N/A	N/A	N/A
IUA (OAuth2)	27	26	1	10	10	N/A



CA:FeX	69	65	4	47	46	1
MHD	19	15	4	N/A	N/A	N/A
PS-CA	3	2	1	N/A	N/A	N/A
PS-ON	1	N/A	1	N/A	N/A	N/A
Total	138	126	12	57	56	1

**Note 1 (IUA/OAuth2): The majority of vendors showed IUA (OAuth2) support for CA:FeX and MHD transactions. The CA:FeX and MHD tests were performed with and without IUA (OAuth2). Capability Statements (CA:FeX and MHD) do not require IUA (OAuth2) authorization.*

**Note 2 (No-Peer vs Peer-to-Peer): Some tests are No-Peer only: CT, CA:Sec, CA:Aud, Patient Summary Validation (PS-CA, PS-ON).*

Individual Vendor Test Results

This section includes individual vendor test results and describes the profiles, actors and options tested, results interpretation, and observations about the process and outcomes where vendors were able to show full or partial capability of the test case.

Interpreting individual vendor test results

Participating vendors tested their implementation of the pan-Canadian specifications with implementations of other vendors using real-world clinical scenarios. All participants gained considerable experience in this domain.

In some cases, vendors were attempting new functionality in their systems and were unable to show full or partial capability as required by the test case. This was a learning opportunity that will allow vendors to continue with their implementation work and re-test functionality at future events. As this Projectathon was primarily a tool for learning and discovery and not a certification event, Infoway will not disclose areas where tests were not successfully completed.

The test results are assigned to three categories, as outlined in Figure 8.

- Pass: full capability was demonstrated.
- Partial Pass: partial capability was demonstrated, e.g.,
 - The vendor could not/did not conclusively demonstrate complete coverage of the transactions and/or content required as defined in the test case. However, the results showed advanced progress toward full capability.
 - For some transactions, the specifications are a work in progress with a dependency on the pan-Canadian Roadmap. Vendors completed the test case as best as possible and,



in some cases, raised areas for consideration in the Roadmap or items that will require consideration of refinements to the PS-CA or IPS based on implementation realities.

- Not Applicable: the capability was not demonstrated, e.g.,
 - It is important to note that not all test cases are relevant to all types of solutions. For example, the actor type defined in the test case may not be relevant to the vendor solution.
 - There wasn't enough time for the vendor to demonstrate the capability or there were insufficient vendor-partners to demonstrate it.

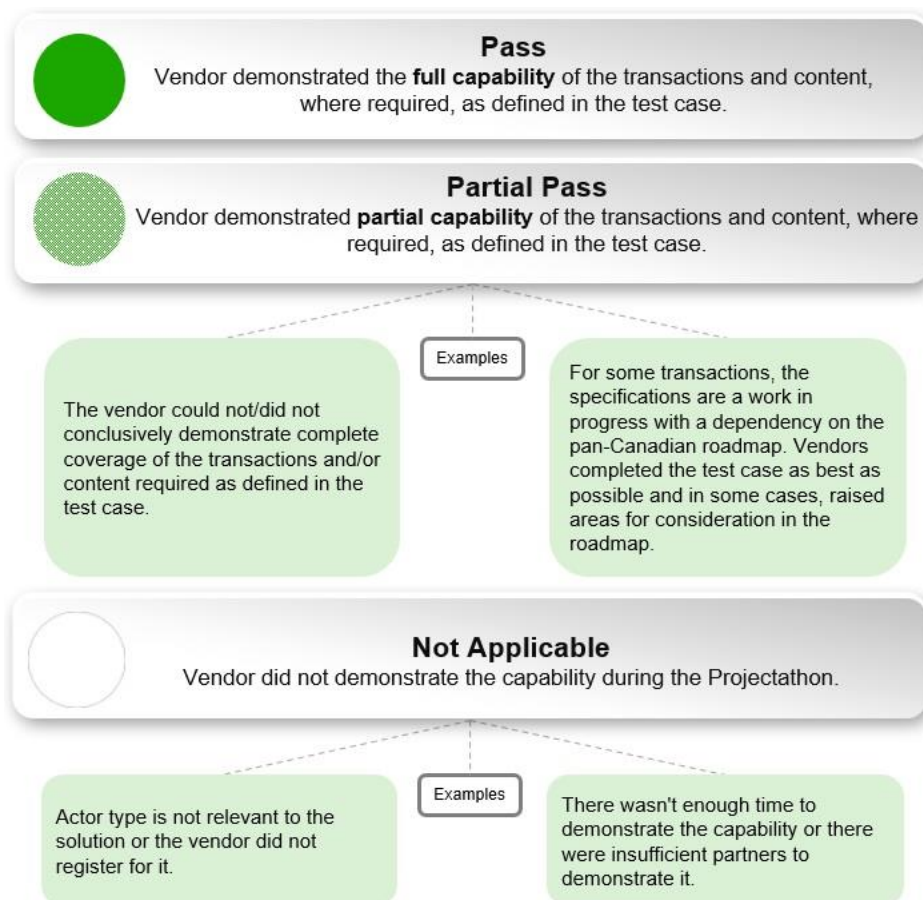


Figure 7 Test Result Statuses

Test results for the PS-CA and PS-ON Patient Summary documents

This section presents the results of a set of test cases that focused on ensuring that the Patient Summary document is structured in the expected format and that it contains the required information using the correct data types and value sets, where specific value sets are defined as required in the PS-CA and PS-ON.



The tests were conducted by subject matter experts using the validation tools. As an outcome of this testing, possible improvements with respect to tooling were discovered. The PS-CA FHIR Content Data model tests were tested using a combination of test data and validation tooling. Verification was two-fold. Vendors uploaded the following into the Gazelle test instance:

- Evidence of the validation results produced by Infoway FHIR Validator after validating against the jurisdictional specification package (e.g., ca.on.oh.patient-summary version 0.10.0-alpha-11)
- The test example for manual verification for demonstration of MustSupport elements and other aspects that cannot be automatically assessed through FHIR Validators

The Projectathon team worked with vendors over the Rocket.Chat messaging tool to identify missed expectations and request corrections on submitted instances.

Vendors were required to meet all mandatory (elements and terminology) and MustSupport expectations to be considered fully passed. The Partial Pass status identified vendors who met some, but not all, of the test expectations.

The PS-ON specifications are aligned to the PS-CA and were expected to be supported by minimal configuration of capability in the vendor systems. It became apparent that the majority of corrections centered around expressing expectations that are in the International Patient Summary (IPS) specification, rather than in the minimal configurations put forward in PS-CA and PS-ON. It was found:

- All Patient Summary test instances required corrections to the submitted test instance to demonstrate the full set of expectations, particularly around optional MustSupport elements. Examples include demonstration of codeableConcept.text, Absent or Unknown codes, Data Absent Reason extension, and Composition elements.
- Codings and terminology expectations did not represent a challenge area for most vendors. Submissions largely met international (HL7, SNOMED CT value sets) and national (CCDD, CVC) terminology expectations.

At least one vendor used \$summary to generate the submitted instance, expressing challenges closing gaps during the event to demonstrate composition elements (e.g., identifier, attester, custodian). To learn more about the \$summary operation, refer to the pan-Canadian FHIR Exchange (CA:FeX) iGuide v2.0.0 DFT, available [here](#).

Figure 9 represents the vendor results for Patient Summary Validation.



Patient Summary Document Validation		
	PS-CA CA:FeX Data Source	PS-ON CA:FeX Data Source
Akinox		
Microquest		
TELUS Health		

Figure 9 Patient Summary Documentation Validation Results

Test results for CA:FeX and CA:FeX with IUA

This section presents the results of CA:FeX and CA:FeX paired with IUA for both No-Peer tests and Peer-to-Peer tests.

The purpose of testing CA:FeX is to ensure systems have the ability to create, search and retrieve FHIR documents (e.g., Patient Summary) over the internet in a secure manner.

About CA:FeX

The pan-Canadian FHIR Exchange (CA:FeX) is an implementable, testable interoperability specification based on HL7 FHIR Implementation Guides that defines building blocks to enable creating, consuming and sharing clinical data via FHIR RESTful exchange patterns.

Overview of CA:FeX test results

The Infoway-built CA:FeX client and server simulators were instrumental for vendors in their preparation for the Projectathon to validate their client or server and/or to trigger some of the test cases during the pre-Projectathon phase, as well as during the event.

The CA:FeX profile was thoroughly tested, including six tests for CA:FeX with IUA in the No-Peer category and 3 in the Peer-to-Peer category.

The CA:FeX with IUA Peer-to-Peer tests are among the most complex, requiring, in some cases, collaboration between three different systems to simulate real-world workflow. These profiles were largely embraced by the vendors as a promising exchange mechanism for the Canadian



ecosystem, encompassing built-in security mechanisms. The tests targeted all actors (data source, data recipient, data consumer and data responder) as well as all transactions (submit data, search data and retrieve data) of the CA:FeX profile.

Figures 10 and 11 represent the vendor results for CA:FeX and CA:FeX paired with IUA. Testing the following transactions, the vendors demonstrated the ability to create, search and retrieve FHIR documents (e.g., Patient Summary) over the internet in a secure manner:

- Capability Statement
- CA:FeX-1 Submit Data
- CA:FeX-1 Submit Data + IUA
- CA:FeX-2A Search Data
- CA:FeX-2A Search Data + IUA
- CA:FeX-3A Retrieve Data
- CA:FeX-3A Retrieve Data + IUA



No-Peer: CA:FeX and CA:FeX with IUA Testing

	Capability Statement		CA:FeX-1 Submit Data			
	Client Data Source / Consumer	Server Data Recipient / Responder	Data Source (Client)	Data Source (Client) + IUA	Data Recipient (Server)	Data Recipient (Server) + IUA
Akinox	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enovacom	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Microquest	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oracle	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Smile Digital Health	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
TELUS Health	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Verto	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
VeroSource	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
WELL Health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

Figure 10 CA:FeX No-Peer Results (Part 1)



	CA:FeX 2A Search Data				CA:FeX-3A Retrieve Data			
	Data Consumer (Client)	Data Consumer (Client) + IUA	Data Responder (Server)	Data Responder (Server) + IUA	Data Consumer (Client)	Data Consumer (Client) + IUA	Data Responder (Server)	Data Responder (Server) + IUA
Akinox	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Enovacom	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Microquest	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Oracle	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Smile Digital Health	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
TELUS Health	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Verto	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
VeroSource	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
WELL Health	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Figure 11 CA:FeX No-Peer Results (Part 2)

Peer-to-Peer: Partner pairings for CA:FeX and CA:FeX with IUA

The Peer-to-Peer testing saw ample vendor registration, with participation of five server-side participants and five vendors supporting client transactions. We were able to validate interoperability with a large number of vendors, therefore validating that the specifications are clear and interoperable. These tests provided an opportunity for vendors to test and collaborate with a wide variety of systems. The test matrix below illustrates the Peer-to-Peer test cases that were executed between vendor systems and demonstrates how the value of the Projectathon testing process increases as additional vendors participate. Having more vendors allows for a broader scope of testing, and as a result, provides more comprehensive understanding.

Table 6 represents the vendors who partnered for CA:FeX in the roles of a Client and Server. All tests passed, except for one partial pass.



Table 6 CA:FeX Peer-to-Peer Test Pairings

Vendor Partners		Client				
		Akinox	Microquest	Oracle	TELUS Health	Verto
Server	Smile Digital Health	CA:FeX-1	CA:FeX-1 CA:FeX-1 + IUA CA:FeX-2A CA:FeX-2A + IUA CA:FeX-3A CA:FeX-3A + IUA	CA:FeX-1 CA:FeX-3A	CA:FeX-1	CA:FeX-1 CA:FeX-1 + IUA CA:FeX-2A CA:FeX-2A + IUA CA:FeX-3A CA:FeX-3A + IUA
	TELUS Health	CA:FeX-1 CA:FeX-1 + IUA	CA:FeX-1 CA:FeX-2A CA:FeX-2A + IUA CA:FeX-3A CA:FeX-3A + IUA			
	Verto	CA:FeX-1 CA:FeX-1 + IUA	CA:FeX-2A CA:FeX-2A + IUA CA:FeX-3A CA:FeX-3A + IUA			
	VeroSource		CA:FeX-1 + IUA CA:FeX-2A + IUA CA:FeX-3A + IUA	CA:FeX-1 + IUA CA:FeX-2A + IUA CA:FeX-3A + IUA		CA:FeX-2A + IUA CA:FeX-3A + IUA
	WELL Health	CA:FeX-1		CA:FeX-2A CA:FeX-2A+IUA CA:FeX-3A CA:FeX-3A + IUA		CA:FeX-1 CA:FeX-1 + IUA CA:FeX-2A CA:FeX-3A

Legend	
CA:FeX-1	Submit Data
CA:FeX-1 + IUA	Submit Data paired with IUA
CA:FeX-2A	Search Data
CA:FeX-2A + IUA	Search Data paired with IUA
CA:FeX-3A	Retrieve Data
CA:FeX-3A + IUA	Retrieve Data paired with IUA



Test Results for MHD and MHD with IUA

This section presents the results of MHD and MHD paired with IUA for No-Peer tests.

The purpose of testing MHD is to ensure systems have the ability to publish and access (i.e., query/retrieve) FHIR documents (e.g., Patient Summary) over the internet in a secure manner.

About MHD

The Mobile Access to Health Documents (MHD) Profile defines one standardized interface to health document sharing. This profile is applicable to systems where needs are simple, such as pulling the latest summary for display.

Overview of MHD test results

Two vendors registered for the MHD and MHD with IUA testing. MHD is a well-known and common profile with over 65 international vendors supporting the MHD actors in various international testing events, whereas CA:FeX is an alternative and newer specification to MHD. It is therefore surmised that the vendors that registered for the Projectathon in large majority opted for testing the newer CA:FeX specification. The vendors that registered for MHD testing did not have enough testing partners available to conduct tests with two other vendors each required for the Peer-to-Peer testing. Nevertheless, some No-Peer testing occurred and successfully demonstrated the potential capability to transport the PS-CA documents via the MHD profile.

Figure 12 represents the vendor results for MHD and MHD with IUA IHE IT Infrastructure Technical Framework transactions. Testing the following transactions, the vendors demonstrated the ability to publish and access (i.e., query/retrieve) FHIR documents (e.g., Patient Summary) over the internet in a secure manner:

- Capability Statement
- ITI-65 Provide Document Bundle
- ITI-65 Provide Document Bundle + IUA
- ITI-66 Find Document Lists
- ITI-66 Find Document Lists + IUA
- ITI-67 Find Document References
- ITI-67 Find Document References + IUA
- ITI-68 Retrieve Document
- ITI-68 Retrieve Document + IUA



	Capability Statement		ITI-65 Provide Document Bundle			
	Document Recipient (Server)	Document Responder (Server)	Document Source (Client)	Document Source (Client) + IUA	Document Recipient (Server)	Document Recipient (Server) + IUA
Oracle	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Smile Digital Health	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

	ITI-66 Find Document Lists			ITI-67 Find Document References			ITI-68 Retrieve Document		
	Document Consumer (Client)	Document Responder (Server)	Document Responder (Server) + IUA	Document Consumer (Client)	Document Responder (Server)	Document Responder (Server) + IUA	Document Consumer (Client)	Document Responder (Server)	Document Responder (Server) + IUA
Oracle	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Smile Digital Health	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>

Figure 12 MHD No-Peer Results

Note: there were no MHD Peer-to-Peer tests.

Test Results for Foundational Profiles: CT, CA:Aud, CA:Sec

This section presents the results of three foundational profiles: CT, CA:Aud and CA:Sec.

About CT, CA:Aud and CA:Sec

CT: The Consistent Time Integration Profile (CT) provides a means to ensure that the system clocks and time stamps of the many computers in a network are well synchronized.

The purpose of testing CT in these use cases is to ensure the systems exchanging FHIR documents (e.g., Patient Summary) are synchronized with a median error of less than 1 second. This provides systems with the ability to properly manage the information and provides clarity for users as to when the information was recorded.

CA:Sec: The CA:Sec (Canadian Network Security) Implementation Guidance specifies the foundational elements needed to securely execute transactions between two systems. It is based on the IHE ATNA profile and aims to bring improvements via loose coupling, and high cohesion, with focus on secure communication.

The purpose of testing CA:Sec in these test cases is to ensure that the systems exchanging FHIR documents are able to meet the requirements of secure exchange between systems.

CA:Aud: The CA:Aud (Canadian Audit Trail) Implementation Guidance specifies the foundational elements needed to perform event logging for auditing purposes. It is based on the IHE ATNA (Audit Trail and Node Authentication) profile and aims to bring improvements via loose coupling and high cohesion, with a focus on auditing using modern formats and technologies. CA:Aud



defines capabilities to record, store and retrieve audit messages in FHIR format using RESTful operations and other (IHE or non-IHE) methods.

The purpose of testing CA:Aud in these test cases is to ensure that the systems exchanging FHIR documents (e.g., Patient Summary) are able to meet the requirements of recording, storing and retrieving audit messages.

Overview of the CT, CA:Aud and CA:Sec test results

The foundational profiles CT, CA:Aud and CA:Sec were introduced this year; the objectives as they relate to this Projectathon were limited to awareness and standards readiness assessment.

From the summary results chart, we can conclude that all the vendors have some level of the foundational security profiles already implemented, but none have all the profiles. We are pleased to see the vendors' appetite to adopt and implement these foundational profiles. As the specifications themselves were new, this testing also provided valuable feedback on the readiness of these profiles. This feedback will be leveraged to refine and improve these foundational profiles. Inconsistencies in implementations were noted, and possible improvements (primarily in the CA:Aud profile) are to be considered as part of the Shared pan-Canadian Interoperability Roadmap implementation.

Figure 13 represents the vendor results for CT, CA:Aud and CA:Sec IHE IT Infrastructure Technical Framework transactions:

- ITI-1 Maintain Time - ensure the systems exchanging FHIR documents (e.g., Patient Summary) are synchronized with a median error of less than 1 second.
- ITI-19 Authenticate Node - ensure that the systems exchanging FHIR documents are able to meet the requirements of secure exchange between systems.
- ITI-20 Record Audit Event - ensure that the systems exchanging FHIR documents (e.g., Patient Summary) are able to meet the requirements of recording, storing and retrieving audit messages



	CT	CA:Aud	CA:Sec	
	ITI-1 Maintain Time	ITI-20 Record Audit Event	ITI-19 Authenticate Node Client	Secure Application Server
Akinox	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Enovacom	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Microquest	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Oracle	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Smile Digital Health	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
TELUS Health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Verto	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
VeroSource	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
WELL Health	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Figure 13 CT, CA:Aud, CA:Sec No-Peer Results

Test Results for Foundational Profile: IUA

This section presents the results of the Internet User Authorization (IUA) profile.

The purpose of testing IUA in these test cases is to ensure that the person (e.g., patient, provider, etc.) and application requesting access to the FHIR document (e.g., Patient Summary) are authorized to have access.

About IUA

IUA is an interoperability profile that provides an authorization profile for the HTTP RESTful transactions.

Being authorized means that the user, patient or provider has legitimate access to this HTTP RESTful service. The authorization includes identifying the user and the application that is making



the request to the HTTP RESTful server, so that the server can make further access control decisions.

Overview of IUA test results

The IUA tests included eight No-Peer tests as well as two Peer-to-Peer tests. Since this is a well-established international profile, many of the more complicated test cases validating rejections as well as normal trajectory were present.

These tests successfully demonstrated the IUA basic OAuth2 capabilities for the Authorization Server actor. Note that fully implementing the IUA profile requires IUA extension to be included in the JWT token. These assertions will have to be examined during development activities associated with the implementation of the Shared Pan-Canadian Interoperability Roadmap; precise market guidance will follow. The results show that the vendor understands and complies with basic OAuth2 flows, and as the Projectathon is not a certification event, the test will receive a pass with attached comments.

Figure 14 represents the vendor results for IUA IHE IT Infrastructure Technical Framework transactions. Testing the following transactions, the vendors demonstrated the ability to ensure that the person (e.g., patient, provider, etc.) and application requesting access to the FHIR document (e.g., Patient Summary) are authorized to have access:

- ITI-103 Get Authorization Server Metadata
- ITI-71 Get Access Token (Authorization Code Grant)
- ITI-71 Get Access Token (Client Credentials Grant)
- ITI-72 Incorporate Access Token



No-Peer test results for IUA

	ITI-103 Get Auth Server Metadata		ITI-71 Get Access Token (Auth Code Grant)		ITI-71 Get Access Token (Client Cred Grant)		ITI-72 Incorporate Access Token	
	Authorization Client	Authorization Server	Authorization Client	Authorization Server	Authorization Client	Authorization Server	Authorization Client	Resource Server
Akinox	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Enovacom	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Microquest	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Oracle	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Smile Digital Health	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
TELUS Health	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Verto	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
VeroSource	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
WELL Health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>

Figure 14 IUA No-Peer Results



Peer-to-Peer partner pairings for IUA

Table 7 represents the vendors who partnered for IUA in the roles of an Authorization Client, Authorization Server and Resource Server. All tests passed.

Table 7 IUA Peer-to-Peer Test Pairings


Transaction	Actor	Partners				
ITI-71 Get Access Token (Authorization Code Grant)	AUTH_CLIENT	Akinox	Verto	Akinox	Akinox	Akinox
	AUTH_SERVER	TELUS Health	Smile Digital Health	TELUS Health	Smile Digital Health	Verto
	RESOURCE_SERVER	TELUS Health	VeroSource	Verosource	Smile Digital Health	Verto
ITI-71 Get Access Token (Client Credentials Grant)	AUTH_CLIENT	Oracle	Microquest	Oracle	Microquest	Verto
	AUTH_SERVER	Smile Digital Health	Smile Digital Health	TELUS Health	Verto	Smile Digital Health
	RESOURCE_SERVER	VeroSource	VeroSource	VeroSource	TELUS Health	VeroSource



Symposia (Projectathon Day 4)

A Symposia Day was held on the final day of the Projectathon. The Symposia was opened by Infoway's President and CEO, Michael Green, who spoke about the challenges and opportunities in interoperability and Infoway's commitment to active collaboration with all stakeholders to deliver on the shared Roadmap outcomes. The day was comprised of four sessions which provided opportunities for all stakeholders to engage, learn and offer insights into the future of interoperability.

1. **Welcome and Keynote: International Interoperability Experience: Switzerland.** Participants learned about eHealth Suisse's interoperability experience, key takeaways and next steps. This was an interactive session with questions and answers throughout, hosted by Martin Smock.
2. **Primer to the pan-Canadian Interoperability Strategy & Shared Roadmap.** Participants learned about the pan-Canadian strategy to achieving connected care and associated key initiatives. This session was hosted by Abhi Kalra and Attila Farkas.
3. **Canadian FHIR Exchange (CA:FeX) v2.0.0 Draft.** Participants learned about the next iteration of CA:FeX and how it can help drive modernization of Health Information Exchanges. The session also provided an early look at how the evolution of the standard can support vendors with easier ways to create patient summaries. This session was hosted by Attila Farkas and Sheridan Cook.
4. **Clinical Session: Achieving pan-Canadian alignment on Data Elements.** Participants joined an open, interactive discussion about the opportunities for achieving pan-Canadian interoperability. During this session, clinicians shared their thoughts and recommendations on several topics, including: the importance of focusing on efficient clinical workflow in addition to the technology changes, involving clinicians in a co-design model for the specifications development and building in formal change management to ensure the success of national interoperability initiatives.

 The presentation materials and session recordings are available [here](#).



Lessons Learned

The following themes were identified as lessons learned. For additional feedback and suggestions for future improvement, please see Appendix B.

Technical Tooling and Infrastructure

- **JSON Library:** A potential challenge was raised involving receivers relying on the order of certain properties in JSON. The FHIR Base specification [expands on this challenge](#), expressing that some implementers that make assumptions about the order of properties (including those using the Json.Net framework) may experience challenges receiving FHIR resources that do not fix the resourceType as the first property. The FHIR Base Specification does not require that JSON elements be enforced in a particular order and indicates that implementers may choose to fix the property order if they are able. This effectively bypasses the challenge. Infoway will continue to investigate whether this is expected to be expressed in the Canadian FHIR ecosystem.
- **IUA Implementation:** The focus for this Projectathon was to demonstrate the IUA basic OAuth 2 capabilities for systems that are implementing the IUA profile. Infoway ensured that the test gradings are aligned with this approach and provided comments where clarification was needed. Note that a fully implemented IUA profile requires IUA extensions to be included in the JWT token. These assertions will have to be examined during the activities associated with the implementation of the Shared Pan-Canadian Interoperability Roadmap and precise market guidance will follow. It is recommended that the IUA Simulator to be updated according to this future guidance. Greater clarity in the Projectathon materials will be included next year.
- **SNI Certificates for Proxy:** Infoway will consider being more explicit on the requirements for the SNI Certificates for the Proxy to streamline communications between vendor systems and tools.

Vendor Engagement

- **Incentive:** It was suggested that there is a need to identify incentives to encourage vendors to continue to participate in the Projectathon and position their participation as a proud achievement worthy of industry spotlighting.

Collaboration

- **Diverse Ecosystem:** A total of nine vendors participated in the Projectathon, which resulted in a diverse ecosystem of testing partners and greater collaboration among key players in the Canadian market. Testing hours were extended on Day 4 to allow additional time to vendors who experienced issues completing their No-Peer or Peer-to-Peer tests. Vendors leveraged Rocket.Chat to ensure a transactional partner was available to



complete Peer-to-Peer tests.

- **Rocket.Chat:** Vendors effectively leveraged Rocket.Chat to connect with Monitors, exchange information, receive real-time technical support or connect with other vendors to complete Peer-to-Peer tests. Vendors noted that a more robust collaboration tool would better support collaboration among test teams.

Integration Profiles:

There were a few challenges around test instances for the integration profiles such as IUA, CA:Sec, CA:Aud etc. Some tests were complicated, with some vendors requiring additional guidance. Additionally, mandatory grouping of profiles made testing fairly complex:

- **CA-Sec / CA-Aud:** In order to streamline grading of the CA:Sec and CA:Aud test instances and reduce room for interpretation by vendors and Monitors, it is recommended to have a clear position on the “none” option for next year.
- **Content Data Model:** It was suggested that vendors should communicate the data type that will be incorporated into the PS-CA to Monitors ahead of time to reduce time and effort spent on troubleshooting.
- **PS-CA / PS-ON:** Some vendors did not have time to revise their PS-CA or PS-ON documents for validation as they had other test instances requiring attention. This resulted in a partially verified grading. Others exchanged patient summaries as part of their peer-to-peer tests but did not submit a test instance for PS-CA or PS-ON Validation. Vendors are encouraged to dedicate more focused time to the no-peer tests to ensure they are successfully validating against the full set of expectations for the specifications. Completing the full set of no-peer tests also assists vendors in catching errors that impact peer testing

Live Technical Support:

- Infoway incorporated feedback to ensure there is increased team capacity for responding to technical support and troubleshooting requests from vendors by dedicating several full-time resources for monitoring during the Projectathon and also assigning a Monitor as a “case manager” per vendor. As a result, several vendors had a positive experience with the quality, responsiveness, and timeliness of technical support during the Projectathon. Many Monitors provided real-time technical support to vendors, especially for test instances that were graded as Partially Verified (i.e., partial pass), requiring improvements or additional evidence to allow to be marked as fully Verified (i.e., passed).



The Future of Industry-Wide Conformity Assessment Infrastructure (e.g., Projectathons)

In support of the provinces and territories, Infoway is facilitating a national collaborative effort to advance interoperability which includes a national approach to industry-wide testing, compliance and conformance (e.g., Projectathons), as part of the pan-Canadian Interoperability Strategy and Shared Roadmap.

The Roadmap includes a set of strategic goals in which initiatives/programs (e.g., Patient Summaries, eReferral and eConsult) will be identified over time based on jurisdictional priorities across the country. As these initiatives/programs progress, they will naturally require various interoperability building blocks (e.g., reference architectures, data standards, trusted exchange frameworks, digital identity, patient/provider access, etc.) that will be designed and developed to enable successful implementation of the initiatives. This approach will enable the creation of core capabilities and drive the maturation of each building block over time.

The Roadmap includes two key building blocks that will support the national approach to conformity assessment (e.g., Projectathons and Connectathons).

Interoperability Roadmap Building Blocks

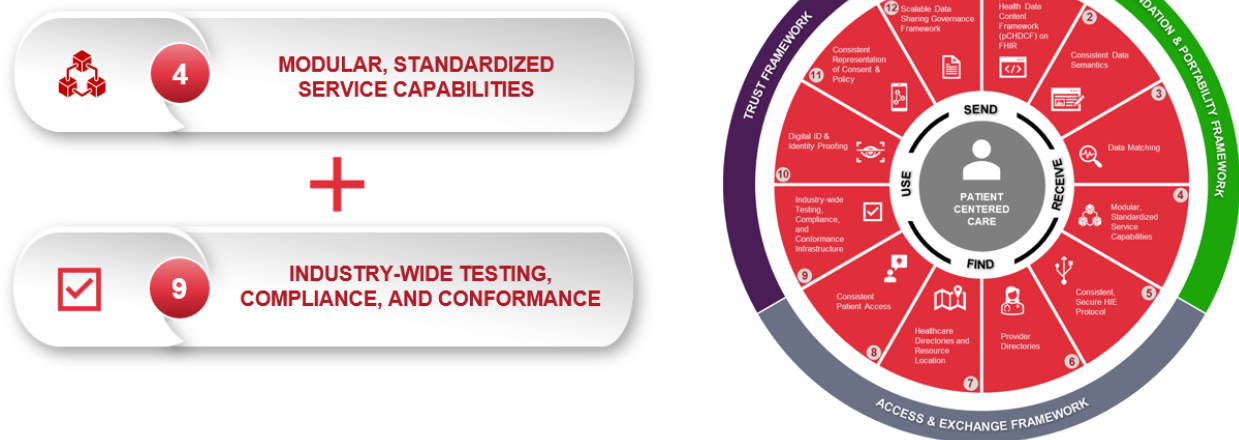


Figure 15 Interoperability Roadmap Building Blocks

Modular, Standardized Service Capabilities, one of the core building blocks, will work toward a pan-Canadian, service-oriented Reference Architecture that accomplishes the following:

- Definition of an ecosystem-wide, standardized common services set (e.g., service and provider directories, digital identity assertion services, health data access services, electronic booking or request services)
- Alignment with and leverage of successful international integrations patterns and services
- Drive towards a convergent method of large-scale service integrations




Industry-wide testing, compliance and conformance infrastructure, another core building block, will focus on the establishment of a first-class conformity assessment program. Conforming a number of core services at the pan-Canadian level will result in the opportunity for predictable growth, while allowing for different deployment architectures across jurisdictions.

Key components of this item include:

- Development of a pan-Canadian Conformity Assessment program tied to the Reference Architecture (Building Block #4) that enables vendor solution capability assessment against core ecosystem expectations.
- Deployment of a first-class conformity assessment platform (e.g., Gazelle) that provides the infrastructure for jurisdictions and vendors to leverage core testing capabilities for the standardized components referenced above.

To complement and build on the Projectathon approach being used for the initial pan-Canadian specifications (PS-CA and CA:FeX), Infoway is exploring the establishment of a pan-Canadian vendor conformance testing service to help support vendor implementation of software solutions that meet pan-Canadian interoperability standards. We are engaging both jurisdictional and industry partners to develop an initial conformance testing framework and expect to begin engaging with the broader vendor community on a potential approach in the coming months.

 The Shared Pan-Canadian Interoperability Roadmap will be published soon on Infoway's corporate website.



Next Steps

Infoway will continue to work toward progressing pan-Canadian interoperability initiatives, such as advancement of the PS-CA, interoperable data standards, eReferral, patient access to their health information, etc. We recognize the importance of stakeholder input and will continue our collaboration with all of partners across the health ecosystem.

Looking to the 2023-24 fiscal year, some key next steps include:

- Publish the pan-Canadian Interoperability Strategy & Shared Roadmap and approved action plan by Q1-Q2
- Align the learnings from the 2023 Projectathon with Infoway's vendor mobilization strategy, complementary to the Roadmap and action plan, to establish an ongoing conformance service in support of jurisdictions and the private sector
- Exploring the potential of adding a formal Connectathon event to support formal conformance and certification for priorities identified in the Shared Pan-Canadian Interoperability Roadmap.



Conclusion

Projectathon 2023 was the second pan-Canadian interoperability event hosted by Canada Health Infoway. It doubled many of its achievements from the first event in 2022. A total of nine vendors participated, with two returning and seven new.

Events like these are a tremendous learning opportunity for everyone designing, developing and implementing interoperable solutions in this instance, the Patient Summary. While the core objective was to test participating vendor capabilities in alignment with PS-CA and the Ontario configuration guidance (PS-ON), along with CA:FeX, participating vendors, jurisdictions and Infoway were pleased to uncover additional insights that will both increase the value of such events going forward and ensure the specifications continue to move through the development life cycle into practical application.

Collaboration and Innovation

The event was an invaluable opportunity for vendors to collaborate with each other and interoperability SMEs in a trusted environment, using a neutral platform to create innovative solutions to interoperability design issues that could be tested almost immediately.

IPS Adoption will Require Time

Vendor capability and readiness to meet PS-CA expectations were higher than anticipated, however adoption of more rigid International Patient Summary elements could not be achieved due to a variety of factors. The IPS is in its infancy and like PS-CA, will experience refinements based on implementation realities. Results from the Projectathon will be assessed and discussed with jurisdictions to identify potential areas for advocating for relaxation of the IPS, where warranted.

Contributing to the Shared Pan-Canadian Interoperability Roadmap:

Testing concepts early, like the newly developed Canadian Security Profile (CA:Sec), the Canadian Audit Profile (CA:Aud) and the Identity User Authentication (IUA) profile can help drive the direction of these critical components of the Shared Pan-Canadian Interoperability Roadmap. The learnings from these and other tests can refine how specifications are developed collaboratively with vendors and jurisdictions to work for all stakeholders.

Jurisdictional Value

Aside from being an opportunity for exploration and discovery, the Projectathon tests vendor readiness to implement specific jurisdictional guidance for the pan-Canadian specification. The results from the testing can also be used to identify realistic and specific requirements to be used in jurisdictional procurements, reducing some of the jurisdictional teams' burden. Infoway is currently in the process of consulting with our partner vendors, agencies and provincial partners to refine the future of the Interoperability program, including the evolution of the PS-CA specifications. As part of this process, feedback from the Projectathon tests and Symposia



sessions will be reflected in the Roadmap for both PS-CA and CA:FeX specifications as a functional step towards Trial Implementation maturity.

The lessons learned from both the successful 2022 and 2023 Projectathons, along with other requirements and needs from our PTs stakeholders and vendors, will also be incorporated into a broader vendor activation plan that will be shared with our stakeholders shortly.

In summary, participating vendors successfully proved their capabilities in contributing to support pan-Canadian interoperability and to implementing PS-CA in their solutions. We look forward to continued collaboration in all planning and development activities necessary to evolve the specifications and the Roadmap to ensure that the international standards actively meet Canadian needs.



Appendix A – Projectathon Tool Sets

A combination of the Gazelle testing platform and other tools were used to complete the pre-Projectathon and Projectathon event testing, along with tools to provide testing support and communications.


Overview of Testing Tools

Gazelle offers participants a suite of test cases supporting the various testing roles (e.g., Data Source, Data Consumer, Data Recipient and Data Responder) as outlined in the Projectathon specifications package.

During the pre-Projectathon phase, a set of No-Peer test cases were executed by the vendors, in isolation, allowing them the ability to ensure they were fully prepared for the Projectathon event. No-Peer test results were not validated during the pre-Projectathon phase.

During the Projectathon event, vendors began with the No-Peer tests, which were validated by the Monitors (i.e., evaluators), and followed by collaborative testing with other industry participants. for Peer-to-Peer testing.

A combination of the Gazelle testing platform and other tools in the tool set were used to complete the pre-Projectathon and Projectathon event testing. Figures 16 – 19 provide the list of testing tools and visual examples of several of the tools.

 The Test Tools, including training materials, are available [here](#).

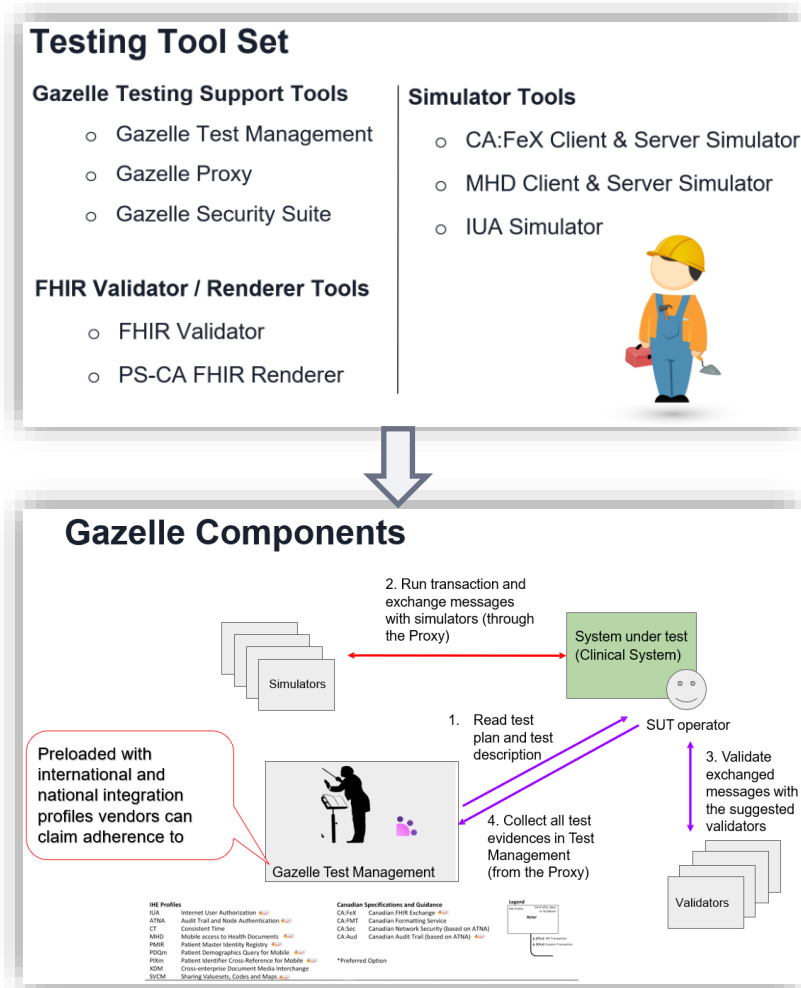


Figure 16 Gazelle Components & Supporting Tools



Gazelle - PAN-Canadian Projectathon 2023

TF Tests List Configurations Connection Administration Search Submit CAT Messages

List of Pre-Connectathon tests for OTHER_INFOWAY_QA

Search Criteria

Integration Profiles: Please Select... Actors: Please Select...
Option: Please Select... Status: Please Select...

Back to systems' list

Test	Integration Profile	Actor	Int Prof. option	Option	Status	Action
00_IUA_Client_Registration[CA]	IUA	AUTH_CLIENT	NONE	R		Return log file
CA_Aud_Log_Creation[CA]	CA_AUD	AUDIT_CREATOR	NONE	R		Return log file
CA_FeX-1_DataRecipient_IUA[CA]	IUA	AUTH_CLIENT	NONE	R	Running	View log file(s)
CA_FeX-1_DataSource_IUA[CA]	IUA	AUTH_CLIENT	NONE	R		Return log file
CA_FeX-2A_DataConsumer_IUA[CA]	IUA	AUTH_CLIENT	NONE	R		Return log file
CA_FeX-2A_DataResponder_IUA[CA]	IUA	AUTH_CLIENT	NONE	R		Return log file
CA_FeX-3A_DataConsumer_IUA[CA]	IUA	AUTH_CLIENT	NONE	R		Return log file
CA_FeX-3A_DataResponder_IUA[CA]	IUA	AUTH_CLIENT	NONE	R		Return log file
IUA_ITI-103_AuthClient[CA]	IUA	AUTH_CLIENT	NONE	R		Return log file
IUA_ITI-103_AuthServer[CA]	IUA	AUTH_CLIENT	NONE	R		Return log file
IUA_ITI-71_Client_AuthCode[CA]	IUA	AUTH_CLIENT	NONE	R		Return log file
IUA_ITI-71_Client_ClientCode[CA]	IUA	AUTH_CLIENT	NONE	R		Return log file
IUA_ITI-71_Server_AuthCode[CA]	IUA	AUTH_CLIENT	NONE	R		Return log file
IUA_ITI-71_Server_ClientCode[CA]	IUA	AUTH_CLIENT	NONE	R		Return log file
IUA_ITI-72_AuthClient[CA]	IUA	AUTH_CLIENT	NONE	R		Return log file

Figure 17 Gazelle Pre-Projectathon Test List Example

Canada Health Infoway Inforoute Santé du Canada Swagger UI PS-CA (CA:FeX)

Patient Summary API (CA:FeX) 0.2 OAS3

RESTful APIs used to save and retrieve Patient Summary documents.

Based on [CA:FeX profile](#)

Note

- Where applicable, FHIR search interactions are required to support both GET and POST methods. In the POST variant, parameters may appear in both the URL and the body. See [FHIR search](#) for more details.
- This page is intended to be used as dynamic documentation for the PS-CA CA:FeX APIs. Please do not include any PII/PHI in the documents exchanged via this page.
- The data served by this page is ephemeral and should not be considered as persistent in the long term.
- When executing transactions combined with authorization (utilizing [IHF IUA profile](#)), a valid access token is required that is provided by the authorization server. The token must include the respective scopes for each CA:FeX transaction (CAFEX-1, CAFEX-2 and CAFEX-3). Use the Authorize button to provide the access token.

Servers

Capability Statement

FHIR Capability Statement for this service

GET /metadata Retrieves the FHIR Capability Statement for this service

Data Recipient

APIs for saving Patient Summary documents

POST /Bundle Saves a new Patient Summary to the document repository [CA:FeX-1]

Data Responder

APIs for retrieving Patient Summary documents

GET /Bundle Retrieves a list of document Bundles matching the search criteria [CA:FeX-2A]

Figure 18 CA:FeX Simulator



Canada Health Infoway
Inforoute Santé du Canada

PS-CA FHIR Renderer

Patient Summary Data
Paste the Patient Summary JSON or XML here, or [Load from a file](#)
Please do not include any PI/PHI into the documents. View PS-CA

```
1- {
2-   "resourceType": "Bundle",
3-   "id": "Bundle-PSCA-Minimal",
4-   "meta": {
5-     "profile": [
6-       "http://fhir.infoway-inforoute.ca/lo/psca/StructureDefinition/bundle-ca-ps
7-     ]
8-   },
9-   "identifier": {
10-    "system": "http://fictional-identifier-system-uri.com",
11-    "value": "PSCA-Minimal"
12-  },
13-   "type": "document",
14-   "timestamp": "2023-04-17T17:21:21-06:00",
15-   "entry": [
16-     {
17-       "fullurl": "Composition/c5aa5a1c-7e76-4ea2-a489-226059c84be3",
18-       "resource": {
19-         "resourceType": "Composition",
20-         "id": "Composition-PSCA-Minimal",
21-         "meta": {
22-           "profile": [
23-             "http://fhir.infoway-inforoute.ca/lo/psca/StructureDefinition/compos
24-           ]
25-         },
26-         "text": {
27-           "status": "additional",
28-           "div": "<div xmlns=\\"http://www.w3.org/1999/xhtml\">Primary Problem: R
29-         },
30-         "status": "final",
31-         "type": {
32-           "coding": [
33-             {
34-               "system": "http://loinc.org",
35-               "code": "60591-5",
36-               "display": "Patient summary Document"
37-             }
38-           ]
39-         },
40-         "subject": {
41-           "reference": "Patient/d520ecd1-76a0-4894-b895-b8a5a971954e"
42-         },
43-         "date": "2023-04-17T17:21:21-06:00",
44-         "author": [
45-           {
46-             "reference": "PractitionerRole/b5cf9ac3-c323-490e-87e4-88fbf65b9888"
47-           }
48-         ],
49-         "title": "Patient Summary PS-CA",
50-         "attester": [
51-           {
52-             "reference": "PractitionerRole/b5cf9ac3-c323-490e-87e4-88fbf65b9888"
53-           }
54-         ]
55-       }
56-     ]
57-   }
58- }
```

Patient Summary View

Composition | Patient | Practitioner | Organization | Condition | Medication | Allergies

General Information

Title: Patient Summary PS-CA
Date: 2023-04-17T17:21:21-06:00
Status: final
Patient: Robert, Gray
Attester: Allan, Allan
Custodian: Fictional Custodian Organization

Medications

Title: Medications

Medication Statements:

Medication	Status	Period Start	Period End
perindopril	active	2022-01-05T04:03:22-06:00	
	completed		

Medication Requests:

Medication	Status
indomethacin 50 mg oral capsule	active
	unknown

Allergies and Intolerances

Title: Allergies and Intolerances

Category	Display	Criticality
----------	---------	-------------

Active Problems

Title: Active Problems

Condition	Status	Severity
	active	

Figure 19 PS-CA FHIR Renderer



Table 8 provides the available vendor-to-vendor pairings for Peer-to-Peer testing and vendor-to-Infoway tools for No-Peer testing by transactions.

Table 8 Available Testing Partner Pairings

		Client					
		Infoway	CERNER (ORACLE)	Akinox	Microquest	Verto	
S e r v e r	Infoway	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72) MHD	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72) MHD	CAFeX-1 IUA (ITI-71)	CAFeX-1 CAFeX-2 IUA (ITI-71)	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72)	CAFeX-1
	Telus Health	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72)	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72)	CAFeX-1 IUA (ITI-71)	CAFeX-1 CAFeX-2 IUA (ITI-71)	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72)	CAFeX-1
	Enovacom	CAFeX-1 CAFeX-2	CAFeX-1 CAFeX-2	CAFeX-1	CAFeX-1 CAFeX-2	CAFeX-1 CAFeX-2	CAFeX-1
	WELL Oscar	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72)	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72)	CAFeX-1	CAFeX-1 CAFeX-2 IUA (ITI-71)	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72)	CAFeX-1
	VeroSource	CAFeX-1 CAFeX-2 IUA (ITI-72)	CAFeX-1 CAFeX-2 IUA (ITI-72)	CAFeX-1	CAFeX-1 CAFeX-2	CAFeX-1 CAFeX-2 IUA (ITI-72)	CAFeX-1
	CERNER (ORACLE)	CAFeX-1 CAFeX-2 IUA (ITI-72) MHD	CAFeX-1 CAFeX-2 IUA (ITI-72) MHD	CAFeX-1	CAFeX-1 CAFeX-2	CAFeX-1 CAFeX-2 IUA (ITI-72)	CAFeX-1
	Verto	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72)	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72)	CAFeX-1 IUA (ITI-71)	CAFeX-1 CAFeX-2 IUA (ITI-71)	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72)	CAFeX-1
	Smile Digital Health	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72) MHD	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72) MHD	CAFeX-1 IUA (ITI-71)	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72)	CAFeX-1 CAFeX-2 IUA (ITI-71) IUA (ITI-72)	CAFeX-1



Test Support and Communications

During the Projectathon, the following tools were leveraged to provide testing support and communications:

- Zoom for establishing a command center during the Projectathon and offer live support throughout the testing days.
- Rocket.Chat instant messaging platform integrated with the Gazelle testing platform that allowed vendors to interact with each other, Projectathon Monitors, and Test Managers.
- Gazelle offered vendors, who were partnered for specific tests, the ability to add comments for their partner to view/respond to, within a test instance (e.g., the following Patient IDs are available within our system).



Appendix B – Issues, Feedback & Suggestions for Future Improvement

The following section outlines feedback received from participants across multiple themes (Figure 20), along with suggestions for improvements. Some future-facing items and insights have been noted for consideration in the Roadmap.



Figure 8 Key Themes Across Participant Feedback

Projectathon Testing & Tooling

- **Evidence for Tests:** A few vendors experienced issues in providing evidence for completed tests in Gazelle, whether as issues in uploading a permanent link from the proxy as evidence or neglecting to attach evidence. However, these issues were quickly resolved through technical support via the Monitor team.
- **Proxy:** Some vendors experienced issues looking at proxy messages in Gazelle and/or experiencing proxy connectivity issues
 - Issues looking at proxy messages:
 - Infoway provided training through documentation, videos and webinars so that vendors could gain more experience using the tools by practicing and performing pre-Projectathon testing. During the Projectathon, vendors were able to reach out to Monitors if they encountered any issues finding their messages in the proxy and providing evidence of their test execution
 - Experiencing proxy connectivity issues:
 - The communication via the proxy requires collaboration and potential work on both sides: the proxy, as well as the system that connects to it. While the proxy is subject for improvements on an ongoing basis, collaboration between the Monitors and vendors is important to ensure configurations are completed accordingly before the event begins in order to focus on test cases during the Projectathon (e.g., provide certificates, update firewall rules, reverse proxy configs, etc.).
 - Vendors are encouraged to perform the connectivity testing early, to allow time for troubleshooting.
- **System under Test (SUT):** Some vendors used the Infoway Simulator or Postman instead of their own client application to perform testing (e.g., obtain a token). Infoway sent reminders to client-side systems that the goal is to test their own application, not the simulators.
- **Security:** Some vendors experienced issues looking for specific TLS requirements such as TLS version, ciphers, recommended certificate authorities and more in the Infoway



specifications and InfoScribe documentation.

- **IUA Simulator:** Some vendors suggested improvements to the simulators for No-Peer testing. One suggestion was for CORS support to display a warning in case the right headers are not present. This can be applied to a common use case when a web app does login [IUA] and performs FHIR transactions [CA:FeX]. Infoway will consider this suggestion, appreciating ideas that help improve its systems and tools.

Interoperability Certification

- **Certification:** Some vendors have suggested the concept of a 'multi-party certification' for the Projectathon event. Infoway always appreciates suggestions for improvements for the testing process. The concept of certification will be placed as an item for discussion as part of the Shared Pan-Canadian Interoperability Roadmap.

PS-CA / PS-ON

- **Capability Statements:** As the PS-CA specifications do not have conformity for pre-requisite steps (e.g., Capability Statements); there is a need to complete pre-requisite requirements to ensure vendors are able to successfully complete tests.
- **Invalid PS-CA Bundles:** Monitors have observed invalid PS-CA bundles in some of the CA:FeX test instances. Infoway recommends that when performing the exchange of PS-CA bundles, vendors should perform the validation of the PS-CA bundle first. Optionally, for the exchange transaction test, vendors may use the prepared PS-CA bundle available with the Projectathon content to ensure the exchange does not fail on the validation of the PS-CA bundle.
- **Search Parameters:** As current specification only has optional search parameters, there is a need to consider where more constraints can be applied on testing expectations and the specification. There is consideration on identifying the different types of combinations for parameters for a query. For example, when a token is issued for the scope, it is suggested to ask for 'who?', 'why?' as the parameters, where the relevant policy should enforce the right for search. Infoway expects jurisdictions to post localized clarifications on how PS-CA be used.
- **\$summary Operation and MustSupport Elements:** While not a formally accepted method of creating Patient Summaries in CA:FeX v1.0.0 TI, some vendors were using the HAPI implementation of the \$summary operation as their method of producing Patient Summary documents that they wanted to validate. While much of the Patient Summary content meets mandatory and MustSupport requirements, the Composition was missing elements that are MustSupport and require demonstration to pass. As such, Infoway will consider whether to allow for partial verification with identification of which Patient Summary domains the vendor has been verified against and continue advocacy with vendors that use the \$summary operation to ensure all MustSupport elements are supported in default builds.
- **Content Validation:** Based on discussion, there is a possibility to consider evidence



from other tests for content validation test cases (e.g., PS-CA Validation). However, the challenge with this approach is it is difficult to determine if an exchanged message was generated by the vendor or submitted by an external source, which makes it difficult to determine what would be appropriate supportive evidence. For future events, Infoway is encouraged to provide more clarity in scope of the content validation test cases to cover vendors creating that content (e.g., not exchanging the content). Additionally, Infoway will consider an alternative way to ensure vendors provide Patient Summaries that include originating vendor identifiers to aid in investigation in future events.

Projectathon Time and Preparation:

- **Additional Preparation Time:** Vendors suggested it would be beneficial to have additional time to on-ramp, familiarize themselves and their teams with the Projectathon process and tooling, prepare for the event and ensure adequate resourcing. While vendors demonstrated their capabilities well, taking advantage of the full lead time prior to the event (approximately 6 months) would position them for even greater success. And, having access to the tools all year-round would allow vendors to become more familiar with the tools and test on an ad hoc basis during their development cycles.
- **Additional Testing Time:** Some of the participating vendors expressed the need for additional testing time on Day 4, as some had experienced issues with their systems or connections at the beginning of the Projectathon or ran out of time to complete their No-Peer or Peer-to-Peer tests. Based on this feedback, Infoway extended the testing time on the Gazelle platform on Day 4 to allow vendors to complete their No-Peer and Peer-to-Peer tests. In the future, Infoway will make the system available much earlier in advance as some delays resulted from pre-Projectathon activities not being clearly defined at the start of the event.

Communications

- **Rocket.chat:** Vendors suggested that it would be more useful to have group channels per vendor on Rocket.chat, instead of relying on 1:1 direct messages. In response, the Infoway team created channels specific to each vendor. Vendors were able to access the channels by navigating to the Directory menu and finding the relevant vendor partner.



Appendix C – Post-Projectathon Survey Results



Two brief surveys were shared at the end of the Projectathon through Survey Monkey to help Infoway better structure future testing events for vendors and participants.

Summary of Survey 1: Focused feedback related to the overall Projectathon event:

Top Factors that Influenced Decision to Participate in the Pan-Canadian Projectathon 2023:

The majority of vendors indicated that the top reason was to prepare for imminent jurisdictional implementations of the Patient Summary and to promote visibility of their organization in the interoperability space. The ability to provide input into the Interoperability Roadmap was also identified as a reason for participation.

Projectathon Event Compared to Expectations: Most vendors indicated that the event met their expectations, stating that it was *‘Excellent’* or *‘Good.’*

Experience with Gazelle Tool 51 or Testing: Most vendors indicated their experience with Gazelle for Testing was *‘Very Good’* or *‘Good.’*

Interest in Interoperability Tools: Most vendors indicated they are *‘Very Interested’* in having tools like Gazelle (e.g., other test tools or a modernized version of Gazelle) accessible on an ongoing basis to test interoperability against vendor partners or simulators.

Satisfaction with Tech Support: Most vendors agreed that they were *‘Very Satisfied’* with the support they received from the team when they experienced issues with tooling and testing.

User Experience with Rocket.Chat: Most vendors indicated they were *‘Very Satisfied’* or *‘Satisfied’* with their user experience of Rocket.Chat during the Projectathon event.

Overall Rating of the 2023 Pan-Canadian Projectathon: Most vendors said they were *‘Very Satisfied’* or *‘Satisfied’* with the training and communications and value gained from participating in the Projectathon.

Participation in Future Conformance Testing Events: Most vendors said they would be interested in participating *‘In-Person’* or *‘Virtually’* if Infoway was to host additional conformance testing events in the future.



Summary of Survey 2: Focused on stakeholder feedback related to the Symposia Day sessions:

Stakeholder Group / Demographics: Most participants in the Symposia Day belonged to the “Vendor” and “Provincial/Territorial Jurisdiction or Agency” groups.

Top Factors Influenced Decision to Participate in Day 4 Symposia: Most participants indicated that they wanted to promote visibility of their organization, as well as pursuing an interest in the future of Pan-Canadian Interoperability.

Expectations of the Symposia: Most participants indicated that the Symposia met their expectations, rating it “Excellent” and “Good.” A specific piece of feedback stated, *“Great work and excellent presenters. Thanks for including us.”*

Most Useful Sessions of Day 4 Symposia: Out of the four Symptosia sessions, **Session 1: Keynote International Interoperability Experience – Switzerland** and **Session 2: Primer to the pan-Canadian Interoperability Strategy and Shared Roadmap** received the highest scores for being “Very Useful.”

Value-Add Gained: Most of the participants reported that they were “Very Satisfied” with the value-add gained from sessions they added as part of the Symposia.

Participation in Future Conformance Testing Events: Most participants claimed they would be very interested to participate “Virtually” if Infoway hosted additional conformance testing events in the future.

Future Interoperability Topics: Participants were asked to describe which interoperability related topics they would like Infoway to further explore. Some commented that they were interested in seeing other international experiences and vendor experiences; others wanted to learn more about Gazelle and other Infoway tools; and others wanted exploration of inter-jurisdictional information sharing, including privacy, legal and regulatory considerations.