Pan-Canadian Patient Summary

Companion Guide to Reference Architecture

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Companion Guide: Reference Architecture

Purpose

The pan-Canadian Patient Summary - Companion Guide to Reference Architecture provides guidance on how to apply specific IHE patterns and integration profiles to address interoperability needs pertaining to the Patient Summary-CA use cases. It defines the rules of engagement and defines the interoperability landscape as well as developing a connectivity platform, linked to the virtual care implementation specification package development to allow external vendors to test solutions.

Intended Audience

The intended audience of the pan-Canadian Patient Summary - Companion Guide to Reference Architecture includes, but is not limited, to the following:

- IT departments of healthcare institutions (technical product managers, IT managers, operations staff)
- Technical staff of vendors participating in the IHE initiative
- Experts involved in standards development
- Individuals and teams responsible for implementing software solutions such as project managers, CTOs, CISOs, software engineers, technical product managers, IT managers, operations staff, and other similar roles.

Overview

This document is a Reference Architecture for the Patient Summary-CA project. It contains a list of recommended IHE candidate profiles that can meet specific needs of the PS-CA project. These sequence diagrams group together actors and transactions from multiple IHE candidate profiles to address the business requirements of the in-scope Patient Summary-CA use cases.

How to Read the pan-Canadian Patient Summary - Companion Guide to Reference Architecture

- This document lists required and optional actors and transactions from candidate IHE profiles, included in the PS-CA v1 Trial Implementation, that can enable secure exchange of health information (e.g., Patient Summary-CA) in Canada.
- The relationship between consuming and recipient actors are indicated by black lines.
- There are two swim lanes that group together the actors and transactions: Clinical systems and Jurisdictional systems. It is assumed that vendors will take on roles from the clinical systems while provinces and territories will take on roles from the jurisdictional systems.
    - Dark green actors are mandatory actors showcasing different roles within the clinical systems that are required for this release
    - Light green actors are optional actors showcasing different roles within the clinical systems that are optional for this release
    - Dark blue actors are mandatory actors showcasing different roles within the jurisdictional systems that are required for this release
    - Light blue actors are optional actors showcasing different roles within the jurisdictional that are optional for this release

- Within the Reference Architecture, two options for implementation have been highlighted, with Option 1 having two scenarios.
  - Optional 1, Scenario #1: MHD implementation, where the Document Repository is Central
  - Optional 1, Scenario #2: MHD implementation, where the Document Repository is Local
  - Option 2, Scenario #1: XDS implementation
  - A preferred option is indicated with an asterik *(e.g Optional 1, Scenario #1)
- The black lines are the interactions and standardized transactions of the actors and their association with one another as defined by the IHE methodology framework.
- A list of all the IHE profiles are included at the bottom of the Reference Architecture
- A list of Canadian National Integration Profiles are listed at the bottom of the Reference Architecture where national extensions to existing IHE profiles and net new profiles for Canada are labelled distinctly.
- A legend is found at the bottom of the Reference Architecture to help readers orient themselves to the diagram.

How to Use the pan-Canadian Patient Summary - Companion Guide to Reference Architecture

Below list summarizes how to use this document:

- **Role Identification**: Jurisdictions and vendors will need to identify their role (e.g. actors) from the Reference Architecture and sequence diagrams for each of the use cases in scope for the Patient Summary-CA project.
- **Gap Identification**: Based on the role(s) identified from the Reference Architecture and sequence diagrams, potential assessment is needed for identification of gaps for meeting the requirements of the standardized actors and transactions needed to satisfy particular PS-CA use cases.
- **Provincial Reference Architecture**: Provinces and jurisdictions may need to draft their own version of Reference Architecture specific to their needs. Current technology landscape, existing architecture and current business priorities will help in developing a version for the province.
- **Document Evolution and Feedback**: This is a living document and will evolve based on feedback and refinements to the PS-CA uses cases and business requirements, as well as from other workstreams such as the pan-Canadian Cross-Solution Secure Communications (SMX-CA) . This document is published on InfoScribe to capture comments and feedback from all key stakeholders. Additionally, multiple sessions will be conducted to discuss and update the content of this document.
- **Vendor Conformance Testing (Connectathon / Projectathon)**: This document will provide an opportunity for vendors to prepare for conformance testing of the Patient Summary-CA Standard on IHE Gazelle platform. IHE Gazelle is an open-source, web-based test platform supporting a wide portfolio of interoperability test tools suited to validate interface conformity to IHE Profiles and project-specific standards-based interoperability specifications. Vendors can validate their products and eHealth projects to procure interfaces they deploy. For additional information on Gazelle, please refer to the following link: IHE Gazelle

*Note: It's expected that the reader should have a moderate degree of familiarity with IHE profiles, esp. MHDS, PMIR, PIQm, PDQm, mCSD, ATNA, CT and IUA.

High Level View - Reference Architecture for Patient Summary-CA

This is a high-level view of relevant Integration Profiles to support the Patient Summary-CA project. The view contains a superset of profiles that offer alternatives to exchanging Patient Summaries, depending on Jurisdictional service type and availability. Mandatory and optional capability support is described in the sequence diagrams associated with each Use Case analysis.

Patient Summary-CA Release 1
Integration Profiles (Required / Optional)

Canada Health Infoway

DRAFT

Option 1: Scenario #1* — MHD Implementation (Document Repository is Central)

Option 1: Scenario #2 — MHD Implementation (Document Repository is Local)

Option 2 — XDS Implementation

Clinical Systems

Authorization Client
Document Source
Document Consumer
Document Source
Document Consumer
Document Recipient
Document Responder
Document Consumer
Document Repository
Document Source
Patient Demographics Consumer / Patient Identifier Cross-reference Consumer
Portable Media Importer
Portable Media Creator
Formatting Consumer
Formatting Responder
Time Client
Secure Node / Secure Application
Audit Repository
Terminology Consumer
Terminology Repository

Jurisdictional Systems

Authorization Server
Resource Server
Authorization Broker
Document Recipient
Document Responder
Document Registry
Document Source
Patient Identifier Registry
Formatting Responder
Time Client
Time Server
Audit Repository
Terminology Repository

IHE Profiles
IUA — Internet User Authorization
MHD — Mobile access to Health Documents
XDS — Cross Enterprise Document Sharing
PMIR — Patient Master Identity Registry
PDQm — Patient Demographics Query for Mobile
PIXm — Patient Identifier Cross-Reference for Mobile
XDM — Cross-enterprise Document Media Interchange
ATNA — Audit Trail and Node Authentication
CT — Consistent Time
SVCM — Sharing Valuesets, Codes and Maps

Canadian National Integration Profile(s)
CA:FMT — Formatting Support Service

*Preferred Option

Legend
IHE Profile | CA:Profile
Actor
[ITx] IHE Transaction
[CAx] Canadian Extension Profile

Clinical System Actors
Actor (Mandatory Actors) | Actor (Optional Actors)

Jurisdictional System Actors
Actor (Mandatory Actors) | Actor (Optional Actors)

Foundational IHE Profiles

Background

Foundational IHE Profiles are required for all of use cases and corresponding sequence diagrams.   They address critical interoperability issues such as user authorization (e.g. IUA), security node and audit records (e.g. ATNA), consistent time (e.g. CT), terminology (e.g. SVCM) and document transformation/formating (e.g. CM-FMT) that are important for sharing of Patient Summaries within and across care networks.

Assumption

It is assumed that in order to satisfy any of the use cases for the Patient Summary-CA in Release 1, vendors and jurisdictions in the ecosystem must ensure they meet the requirements of the standardized actors and transactions listed in the Cross Cutting IHE Profiles.

For more background information on the specific IHE profiles, please view this link.

IHE Profiles Included: IUA, ATNA, CT, SVCM, CA: FMT

Legend

The following diagram is the legend for the sequence diagrams to help readers orient themselves with the diagrams.
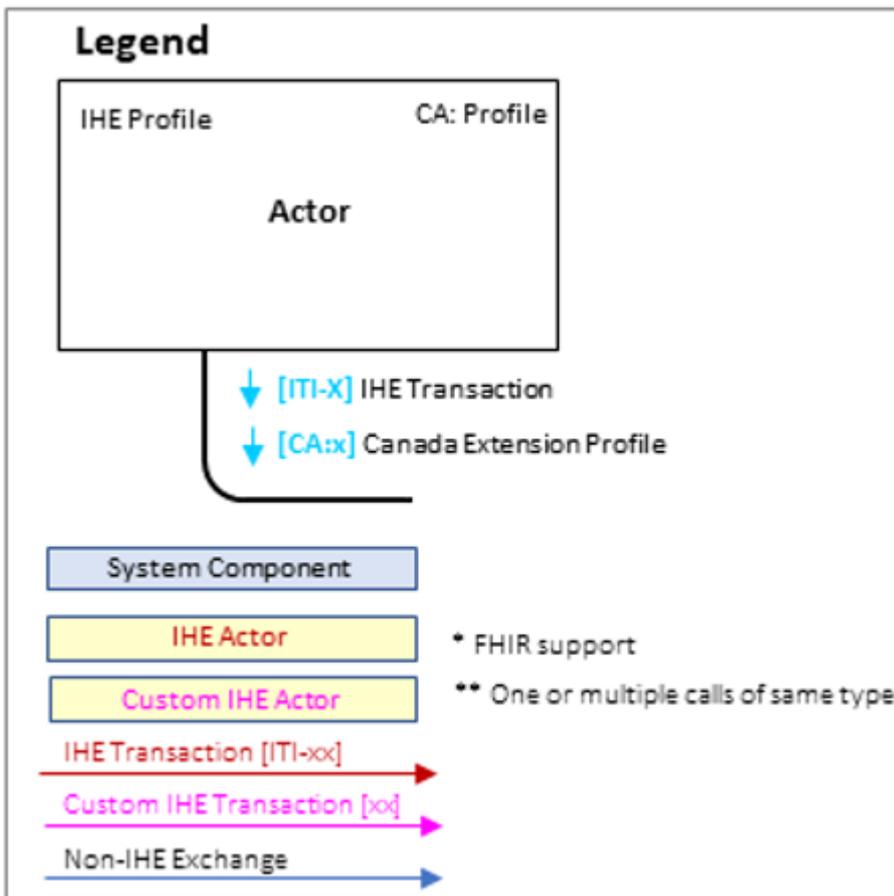
IUA*

The IUA* (Internet User Authorization) provides support for authorization to access resources when using HTTP RESTful transports, by managing authorization tokens.

The Authorization Client must have a valid token that must be presented to resource server with every request

- Get Access Token [ITI-71] – performed when Client does not yet have a token or when token is expired
- Incorporate Access Token [ITI-72] – the client must include the token with every request
- Introspect Token [ITI-102] – the resource server must introspect token at every request

Foundational IHE Profiles – used across all Use Cases – IUA*
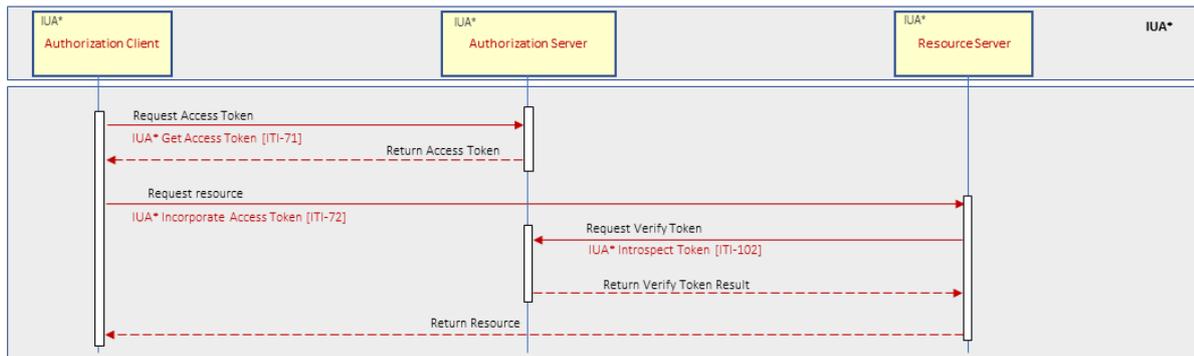
ATNA*

ATNA* (Audit Trail and Node Authentication) provides support for ensuring that that the communicating systems have a level of trust in each other through node authentication, that communications between

the different system components are encrypted (via TLS), and that system activity is audited.

- ATNA* Authenticate Node [ITI-19]

Before establishing secure communication, mutual authentication is performed between two secure nodes.

A secure pipe will be established through which secure transactions will take place.

Secure Node also authenticates the identity of the user who requests access to the node.

- ATNA* Record Audit Event [ITI-20]

The Secure Node/App sends auditable events to an Audit Record Repository. The triggers for sending audit logs can vary, the might be specified in other IHE profiles, local law or regulation, or local policy.

Foundational IHE Profiles – used across all Use Cases – ATNA*
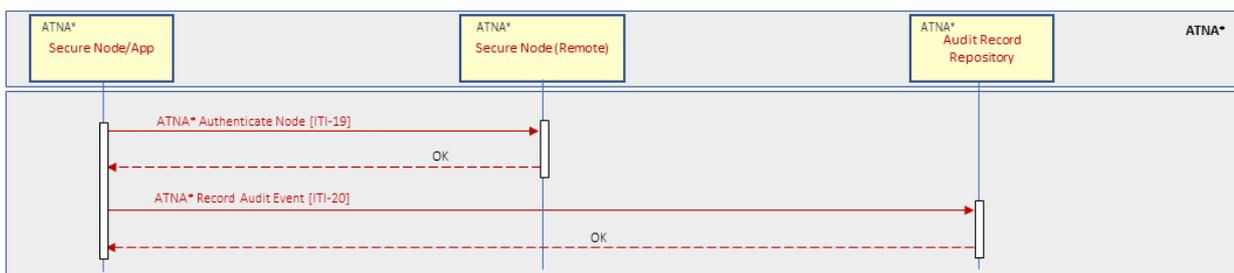
CT

CT (Consistent Time) ensures that the system clocks and time stamps of the many computers in a network are well synchronized. Synchronization with a median error less than 1 second is sufficient for most purposes.

**Foundational IHE Profiles – used across all Use Cases - CT**

SVCM*

SVCM (Sharing Valusets, Codes, and Maps) supports querying for value sets and code systems using the standard HL7 FHIR resources. It also supports looking up and validating codes as well as expanding a value set to list all the available codes.

Optionally concept maps can also be included to translate from one code system or value set to another (e.g. SNOMED CT to LOINC).

*Note: Please refer to the pan-Canadian Patient Summary – FHIR Implementation Guide for the Patient Summary-CA Valuesets

Foundational IHE Profiles – used across all Use Cases – SVCM*
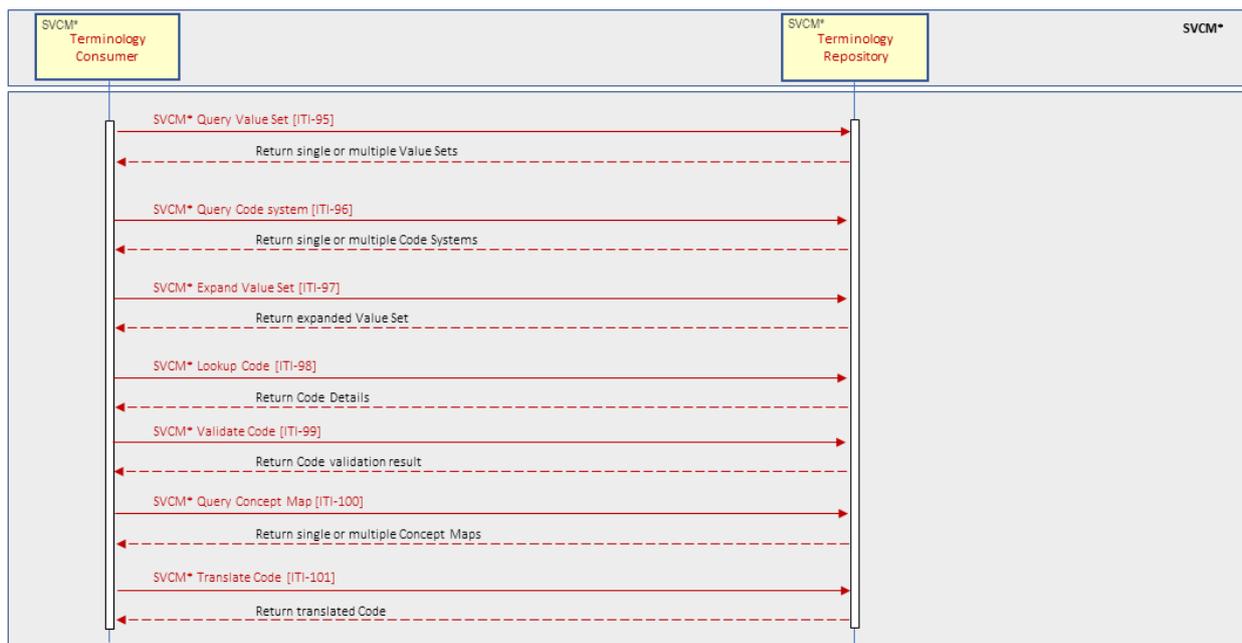
CA:FMT

*Note: Content and specifications for his Canadian Integration Profile is in development. More information on the his profile, including introduction, benefits and actor & transaction diagrams can be found below. This profile has been included in the sequence diagrams of the pan-Canadian Patient Summary – Companion Guide to Reference Architecture v1 as an option for formatting support.

Introduction

CA:FMT is a Canadian Integration Profile that provides formatting support service. It provides support for transformation of documents between different formats (e.g., from FHIR to PFD, CDA, etc.).

Benefits of CA:FMT

The following are examples of benefits for the CA:FMT profile

- Handle transformation from FHIR to PDF
- Handle transformation from FHIR to CDA

Actor & Transaction Diagram of CA:FMT
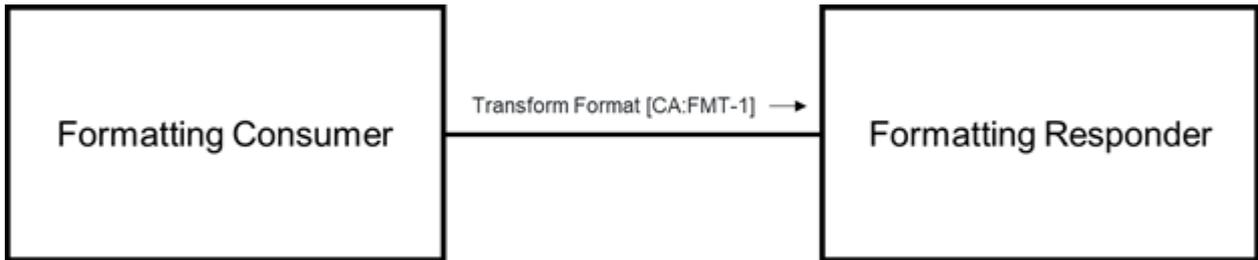
Foundational IHE Profiles – used across all Use Cases – CA:FMT
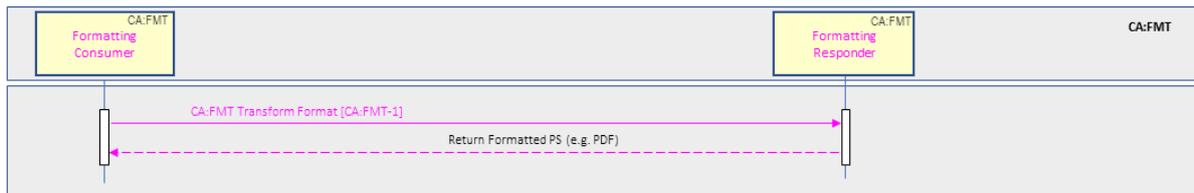
Sequence Diagrams for UC-01: HCP Creates PS

This section provides a summary of the sequence diagrams for Use Case-01:

Use Case-01: HCP Creates/Produces a PS-CA

A Health Care Provider in any care setting creates/produces a PS-CA for use at point of care, including for unscheduled/scheduled local care, which is made available to PS-Consumers.

Release 1 Implementation Options: MHD

This option is recommended and the preffered option for Release 1 as it promotes HL7 FHIR standards.

Alternative Implementation Option: XDS

This option is an alternative option but not a preferred option for Release 1 as it does not promote HL7 FHIR standards.

UC-01: Sequence Diagram 1 Implementation Option 1.1: MHD

Scenario / Assumption(s): Patient Summary is stored in Central or Local (Decentralized) Document Repository

Release 1: Clinical data (e.g. medication, lab results, immunization) is retrieved from local sources only

Release 1 Implementation Option: This sequence diagram provides the option of using the MHD IHE profile, including a Document Repository actor and supporting HL7 FHIR standards.

*Note: Please refer to the pan-Canadian Patient Summary – FHIR Implementation Guide for the Patient Summary-CA Valuesets

Sequence Diagram Overview:

Below provides guidance on how to read the sequence diagram:

- This sequence diagram illustrates how the different standardized actors of system should interact with each other to carry out specific standardized transactions, and the order in which the transactions and interactions occur when Use Case 1 of the Patient Summary-CA is executed.
- The legend on the bottom right corner describes the different system components, actors and transactions that are necessary to carry out this particular use case.
- The green swim lane is a simplified view of the actors and transactions required by the Foundational IHE Profiles, in addition to the other ones that are not explicitly illustrated on the diagram (e.g. ATNA, CT) but included as a white note. These are pre-requisite conditions for this particular use case and it is assumed that these will be satisfied.
- The blue swim lanes groups sequence of processes (along with their required actors and transactions) that are needed to occur to satisfy this particular use case. These are to be read from left to right and top to bottom.
- The red note boxes describe important call outs, information and notes that provide more context for the sequence diagram.
- More information about those details of the Foundational IHE Profiles an be found here.

UC-01: HCP Creates PS – MHD

PS is stored in Central or Local (Decentralized) Document Repository

R1 – clinical data (e.g. medication, lab results, immunization) is retrieved from local sources only
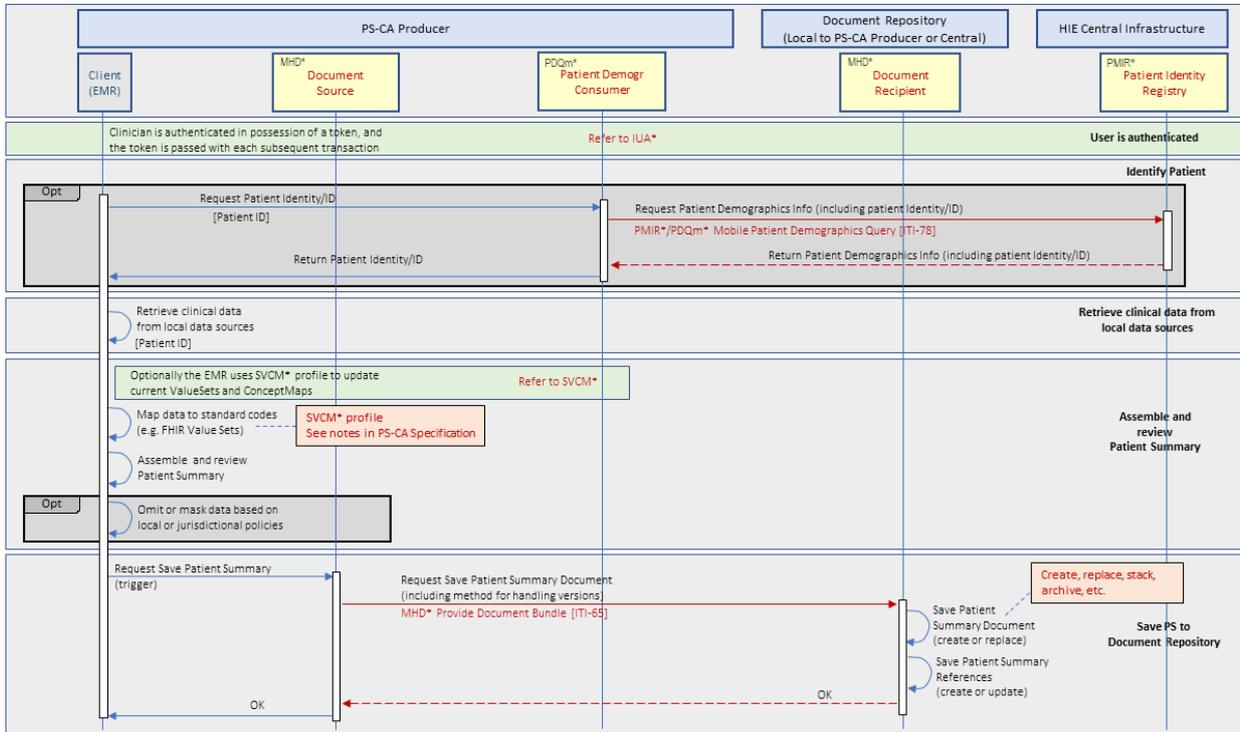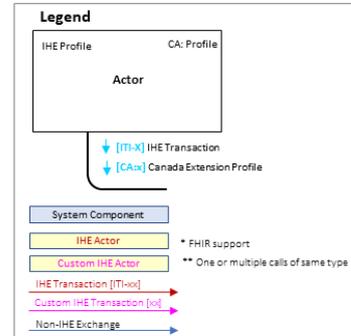
UC-01 Sequence Diagram 2 Implementation Option 1.2: XDS

Scenario / Assumption(s): Patient Summary is stored Local (Decentralized) Document Repository (XDS style repository)

Release 1: Clinical data (e.g. medication, lab results, immunization) is retrieved from local sources only

Alternative Option: This sequence diagram provides the option of using the XDS IHE profile to give jurisdictions and vendors option to leverage existing XDS-based implementations in the ecosystem.

Sequence Diagram Overview:

Below provides guidance on how to read the sequence diagram:

- This sequence diagram illustrates how the different standardized actors of system should interact with each other to carry out specific standardized transactions, and the order in which the transactions and interactions occur when Use Case 1 of the Patient Summary-CA is executed.
- The legend on the bottom right corner describes the different system components, actors and transactions that are necessary to carry out this particular use case.
- The green swim lane is a simplified view of the actors and transactions required by the Foundational IHE Profiles, in addition to the other ones that are not explicitly illustrated on the diagram (e.g. ATNA, CT) but included as a white note. These are pre-requisite conditions for this particular use case and it is assumed that these will be satisfied.
- The blue swim lanes groups sequence of processes (along with their required actors and transactions) that are needed to occur to satisfy this particular use case. These are to be read from left to right and top to bottom.
- The red note boxes describe important call outs, information and notes that provide more context for the sequence diagram.
- More information about those details of the Foundational IHE Profiles an be found here.

UC-01: HCP Creates PS – XDS

PS is stored Local (Decentralized) Document Repository (XDS style repository)

R1 – clinical data (e.g. medication, lab results, immunization) is retrieved from local sources only

Prerequisites

Client is logged into the system (IUA*)

Client obtained a valid access token from the Authorization Server that is used with each transaction (IUA*)

All communication is done through secure channels (ATNA)

System time is synchronized among all components (CT)

Legend

IHE Profile — CA: Profile

Actor

[ITI-X] IHE Transaction
[CAxx] Canada Extension Profile

System Component

IHE Actor

Custom IHE Actor

IHE Transaction [ITI-xx]

Custom IHE Transaction [xx]

Non-IHE Exchange

* FHIR support

** One or multiple calls of same type
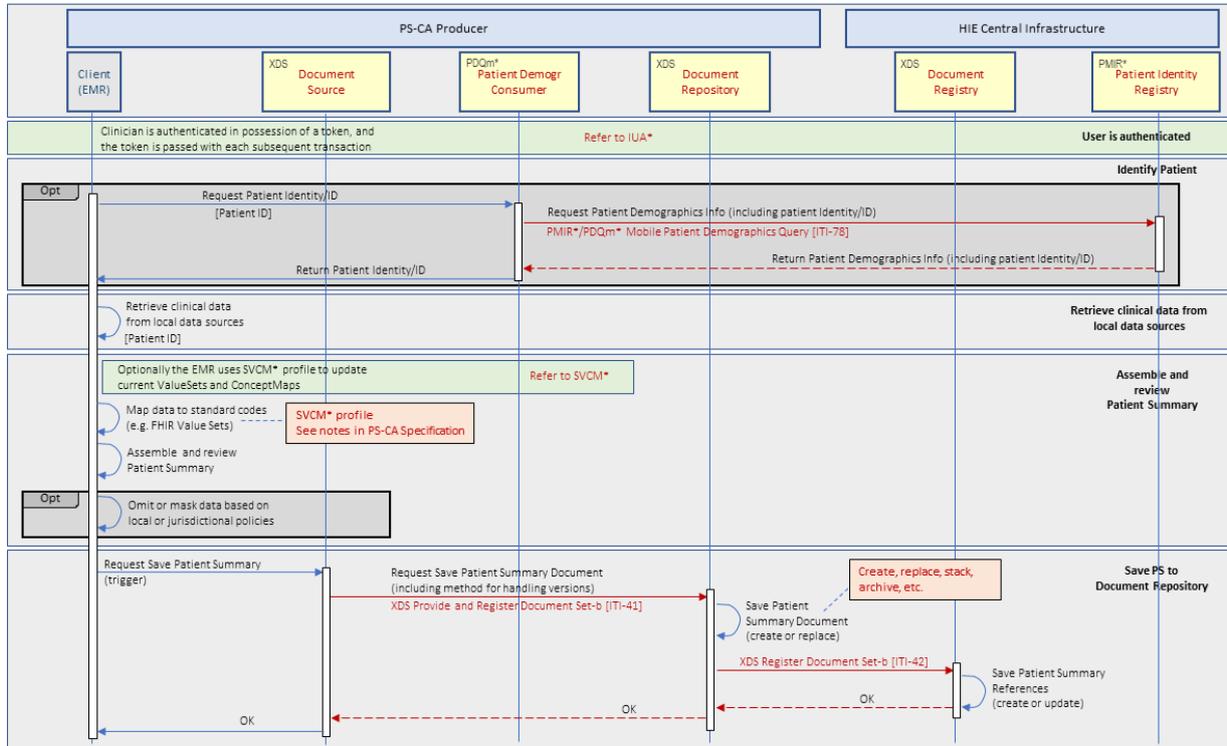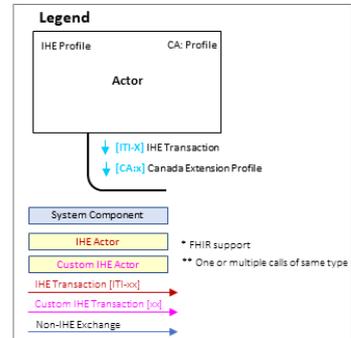
Sequence Diagrams for UC-02: HCP Views/Consumes a PS-CA

This section provides a summary of the sequence diagram for Use Case-02:

Use Case-02: HCP Views/Consumes a PS-CA

A Health Care Provider in any care setting , requests and uses a PS-CA at the point of care, including for unscheduled/scheduled local care.

Release 1 Implementation Options: MHD

This option is recommended and the preferred option for Release 1 as it promotes HL7 FHIR standards.

Alternative Implementation Option: XDS

This option is an alternative option but not a preferred option for Release 1 as it does not promote HL7 FHIR standards.

Future Scope Implementation Option: XCA-CA

This option is a future-scope implementation option and is based on jurisdictional capabilities on performing data look-up by leveraging FHIR gateways

UC-02 Sequence Diagram 3 Implementation Option 2.1: MHD

Scenario: Clinical Solution A Retrieves PS from MHD Document Registry – (MHD* IHE Profile).

Assumption: PS is stored in Central or Local (Decentralized) Document Repository

Release 1 Implementation Option: This sequence diagram provides the option of using the MHD IHE profile, including a Document Repository actor and supporting HL7 FHIR standards

Note: This sequence diagram includes a custom Canadian IHE profile (e.g. CA:FMT) that handles transformations to and from various formats (e.g. FHIR to PDF, CDA, etc). Additional details will be included in the PS-CA Interoperability Specifications.

Sequence Diagram Overview:

Below provides guidance on how to read the sequence diagram:

- This sequence diagram illustrates how the different standardized actors of system should interact with each other to carry out specific standardized transactions, and the order in which the transactions and interactions occur when Use Case 1 of the Patient Summary-CA is executed.
- The legend on the bottom right corner describes the different system components, actors and transactions that are necessary to carry out this particular use case.
- The green swim lane is a simplified view of the actors and transactions required by the Foundational IHE Profiles, in addition to the other ones that are not explicitly illustrated on the diagram (e.g. ATNA, CT) but included as a white note. These are pre-requisite conditions for this particular use case and it is assumed that these will be satisfied.
- The blue swim lanes groups sequence of processes (along with their required actors and transactions) that are needed to occur to satisfy this particular use case. These are to be read from left to right and top to bottom.
- The red note boxes describe important call outs, information and notes that provide more context for the sequence diagram.
- This sequence diagram includes a custom Canadian IHE profile (e.g. CA:FMT) that handles transformations to and from various formats (e.g. FHIR to PDF, CDA, etc.). Additional details will be included in the PS-CA Interoperability Specifications.
- More information about those details of the Foundational IHE Profiles an be found here.

**UC-02 HCP Views/Consumes PS-CA - MHD**

Clinical Solution A Retrieves PS from MHD Document Registry – (MHD* IHE Profile)

PS is stored in Central or Local (Decentralized) Document Repository

Prerequisites

Client is logged into the system (IUA*)

Client obtained a valid access token from the Authorization Server that is used with each transaction (IUA*)

All communication is done through secure channels (ATNA)

System time is synchronized among all components (CT)

Legend

IHE Profile   CA: Profile

Actor

[ITI-X] IHE Transaction

[CA-xx] Canada Extension Profile

System Component

IHE Actor   * FHIR support

Custom IHE Actor   ** One or multiple calls of same type

IHE Transaction [ITI-xx]

Custom IHE Transaction [xx]

Non-IHE Exchange
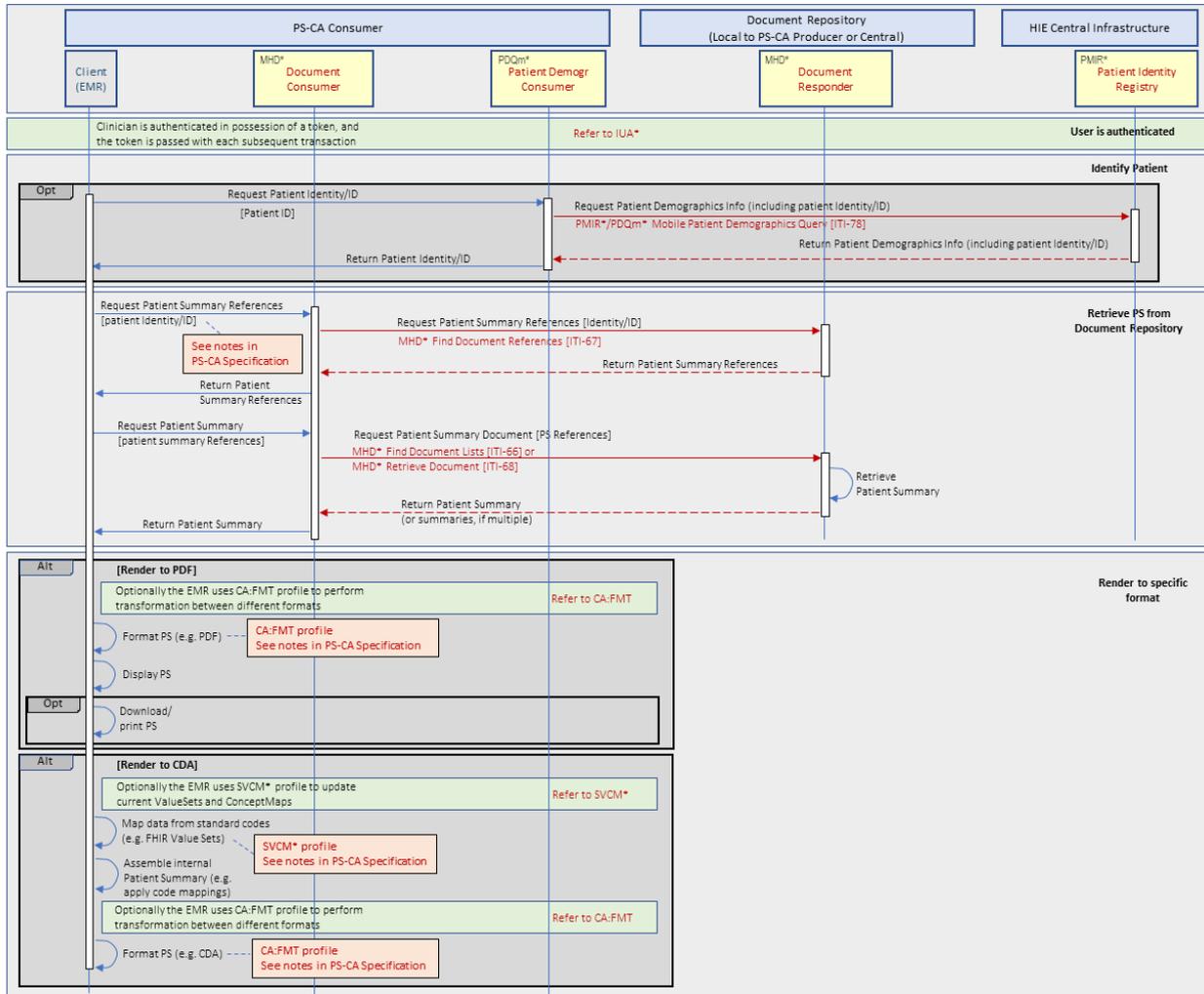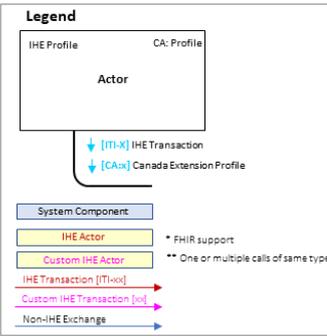
UC-02 Sequence Diagram 4 Implementation Option 2.2: XDS

Scenario: Clinical Solution A Retrieves PS from XDS Document Registry – (XDS IHE Profile)

Assumption: Patient Summary is stored in Local (Decentralized) Document Repository (XDS style repository)

Alternative Option: This sequence diagram provides the option of using the XDS IHE profile to give jurisdictions and vendors option to leverage existing XDS-based implementations in the ecosystem

Sequence Diagram Overview:

Below provides guidance on how to read the sequence diagram:

- This sequence diagram illustrates how the different standardized actors of system should interact with each other to carry out specific standardized transactions, and the order in which the transactions and interactions occur when Use Case 1 of the Patient Summary-CA is executed.
- The legend on the bottom right corner describes the different system components, actors and transactions that are necessary to carry out this particular use case.
- The green swim lane is a simplified view of the actors and transactions required by the Foundational IHE Profiles, in addition to the other ones that are not explicitly illustrated on the diagram (e.g. ATNA, CT) but included as a white note. These are pre-requisite conditions for this particular use case and it is assumed that these will be satisfied.
- The blue swim lanes groups sequence of processes (along with their required actors and transactions) that are needed to occur to satisfy this particular use case. These are to be read from left to right and top to bottom.
- The red note boxes describe important call outs, information and notes that provide more context for the sequence diagram.
- This sequence diagram includes a custom Canadian IHE profile (e.g. CA:FMT) that handles transformations to and from various formats (e.g. FHIR to PDF, CDA, etc). Additional details will be included in the PS-CA Interoperability Specifications.
- More information about those details of the Foundational IHE Profiles an be found here.

**UC-02 HCP Views/Consumes PS-CA - XDS**

Clinical Solution A Retrieves PS from XDS Document Registry – (XDS IHE Profile)

PS is stored in Local (Decentralized) Document Repository (XDS style repository)
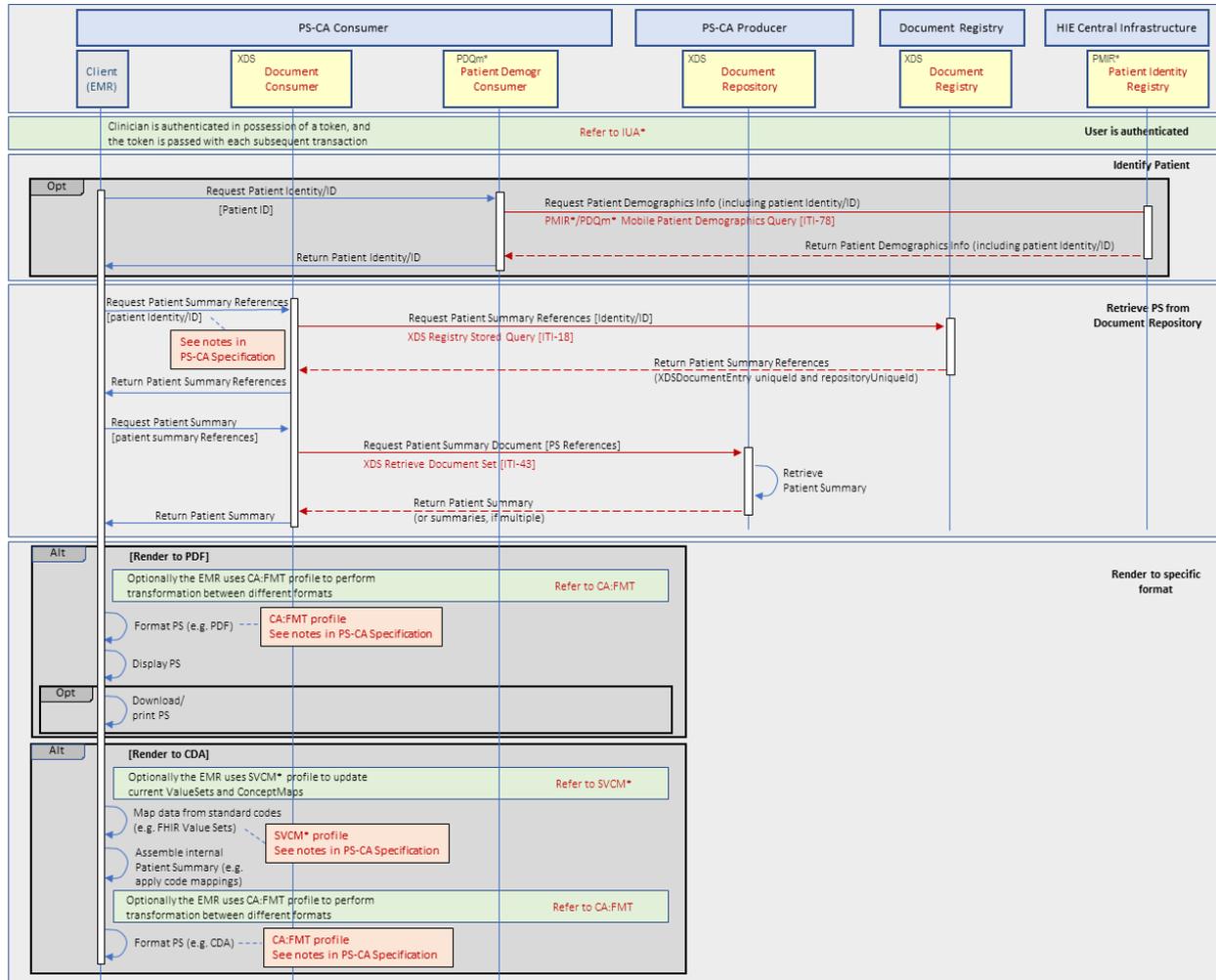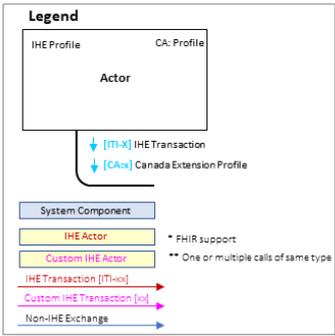
Sequence Diagrams for UC-03 Patient Views/Obtains Personal PS-CA

This section provides a summary of the sequence diagrams for Use Case-03:

Use Case-03: Patient Views/Consumes a PS-CA

A Patient or Subject of Care accesses/views and can retrieve a copy of their own PS-CA to support unscheduled/ scheduled local care, or for any other purpose.

Release 1 Implementation Options: MHD

This option is recommended and the preferred option for Release 1 as it promotes HL7 FHIR standards.

Alternative Implementation Option: XDS

This option is an alternative option but not a preferred option for Release 1 as it does not promote HL7 FHIR standards.

Future Scope Implementation Option: XCA-CA

This option is a future-scope implementation option and is based on jurisdictional capabilities on performing data look-up by leveraging FHIR gateways.

UC-03 Sequence Diagram 6 Implementation Option 3.1: MHD

Scenario: Patient Portal Retrieves PS from MHD Document Registry – (MHD* IHE Profile)

Assumption: Patient Summary is stored in Central or Local (Decentralized) Document Repository

Release 1 Implementation Option: This sequence diagram provides the option of using the MHD IHE profile, including a Document Repository actor and supporting HL7 FHIR standards.

Note: This sequence diagram includes a custom Canadian IHE profile (e.g. CA:FMT) that handles transformations to and from various formats (e.g. FHIR to PDF, CDA, etc.). Further details will be included in the PS-CA Interoperability Specifications. Additionally, the Document Repository in this scenario can be either (1) central or (2) at PS-CA Producer (the source where the document was produced). The Document Consumer actor would query the appropriate repository.

Sequence Diagram Overview:

Below provides guidance on how to read the sequence diagram:

- This sequence diagram illustrates how the different standardized actors of system should interact with each other to carry out specific standardized transactions, and the order in which the transactions and interactions occur when Use Case 1 of the Patient Summary-CA is executed.
- The legend on the bottom right corner describes the different system components, actors and transactions that are necessary to carry out this particular use case.
- The green swim lane is a simplified view of the actors and transactions required by the Foundational IHE Profiles, in addition to the other ones that are not explicitly illustrated on the diagram (e.g. ATNA, CT) but included as a white note. These are pre-requisite conditions for this particular use case and it is assumed that these will be satisfied.
- The blue swim lanes groups sequence of processes (along with their required actors and transactions) that are needed to occur to satisfy this particular use case. These are to be read from left to right and top to bottom.
- The red note boxes describe important call outs, information and notes that provide more context for the sequence diagram.
- This sequence diagram includes a custom Canadian IHE profile (e.g. CA:FMT) that handles transformations to and from various formats (e.g. FHIR to PDF, CDA, etc.). Additional details will be included in the PS-CA Interoperability Specifications.
- More information about those details of the Foundational IHE Profiles an be found here.

UC-03 Patient Views/Obtains Personal PS-CA - MHD

Patient Portal Retrieves PS from MHD Document Registry – (MHD* IHE Profile)

PS is stored in Central or Local (Decentralized) Document Repository
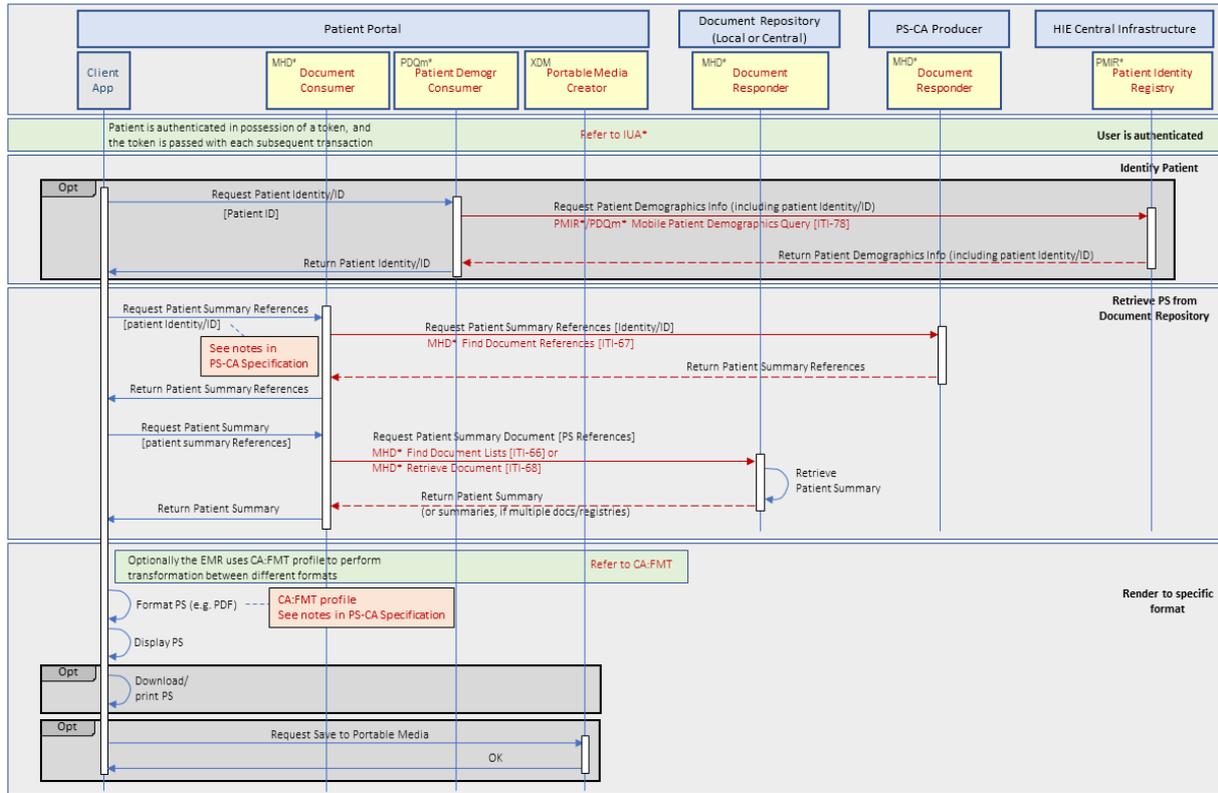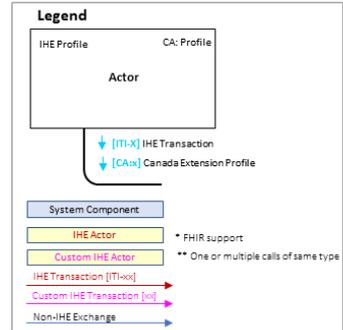
UC-03 Sequence Diagram 7 Implementation Option 3.2: XDS

Scenario: Patient Portal Retrieves PS from XDS Document Registry – (XDS IHE Profile)

Assumption: Patient Summary is stored in Local (Decentralized) Document Repository (XDS style repository)

Alternative Option: This sequence diagram provides the option of using the XDS IHE profile to give jurisdictions and vendors option to leverage existing XDS-based implementations in the ecosystem.

Note: This sequence diagram includes a custom Canadian IHE profile (e.g. CA:FMT) that handles transformations to and from various formats (e.g. FHIR to PDF, CDA, etc.). Additional details will be included in the PS-CA Interoperability Specifications.

Sequence Diagram Overview:

Below provides guidance on how to read the sequence diagram:

- This sequence diagram illustrates how the different standardized actors of system should interact with each other to carry out specific standardized transactions, and the order in which the transactions and interactions occur when Use Case 1 of the Patient Summary-CA is executed.
- The legend on the bottom right corner describes the different system components, actors and transactions that are necessary to carry out this particular use case.
- The green swim lane is a simplified view of the actors and transactions required by the Foundational IHE Profiles, in addition to the other ones that are not explicitly illustrated on the diagram (e.g. ATNA, CT) but included as a white note. These are pre-requisite conditions for this particular use case and it is assumed that these will be satisfied.
- The blue swim lanes groups sequence of processes (along with their required actors and transactions) that are needed to occur to satisfy this particular use case. These are to be read from left to right and top to bottom.
- The red note boxes describe important call outs, information and notes that provide more context for the sequence diagram.
- This sequence diagram includes a custom Canadian IHE profile (e.g. CA:FMT) that handles transformations to and from various formats (e.g. FHIR to PDF, CDA, etc.). Additional details will be included in the PS-CA Interoperability Specifications.
- More information about those details of the Foundational IHE Profiles an be found here.

UC-03 Patient Views/Obtains Personal PS-CA - XDS
Patient Portal Retrieves PS from XDS Document Registry – (XDS IHE Profile)
PS is stored in Local (Decentralized) Document Repository (XDS style repository)

Prerequisites

Client is logged into the system (IUA*)

Client obtained a valid access token from the Authorization Server that is used with each transaction (IUA*)

All communication is done through secure channels (ATNA)

System time is synchronized among all components (CT)

Legend

IHE Profile   CA: Profile

Actor

↓ [ITI-X] IHE Transaction
↓ [CA1x] Canada Extension Profile

System Component

IHE Actor   * FHIR support
Custom IHE Actor   ** One or multiple calls of same type

IHE Transaction [ITI-xx]
Custom IHE Transaction [xx]
Non-IHE Exchange