



**Canada Health Infoway**

# **Projectathon Tooling**

CA:FeX Client & Server Simulators

# What are the CA:FeX Client & Server Simulators?



- ❖ **CA:FeX Client Simulator:** A web application, based on the Swagger UI, used to simulate CA:FeX conformant clients, with or without IUA authorization.
- ❖ **CA:FeX Server Simulator:** A FHIR server with RESTful APIs used to simulate CA:FeX conformant servers, with or without IUA authorization.

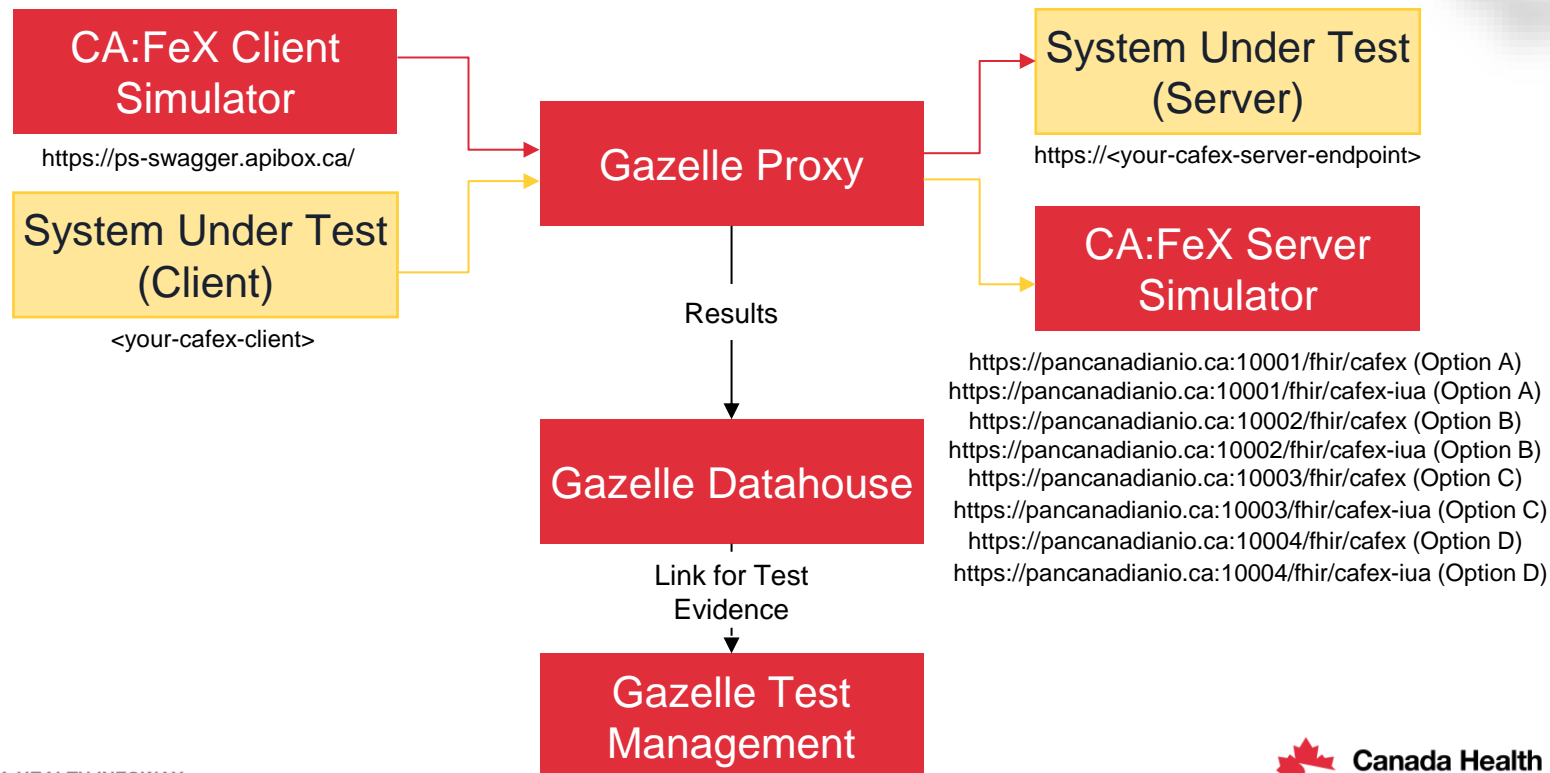
# Training Objectives



This training aims to meet the following objectives:

- ✓ Provide an understanding of the **CA:FeX Client Simulator**, **when** to use it, **how** to use it, and **where** to access it
- ✓ Provide an understanding of the **CA:FeX Server Simulator**, **when** to use it, **how** to use it, the options for using this tool with authorization and without authorization, and **where** to access it

# CA:FeX Simulators Architectural Overview



# What are the CA:FeX Simulators' Capabilities?



CA:FeX has three types of transactions: CA:FeX-1 (Submit), CA:FeX-2 (Search), CA:FeX-3 (Retrieve), each with various options (A, B, C, D) for how they can be performed based on the FHIR resources used.

The **Client Simulator** and **Server Simulator** are configured to execute all transactions and options:

- ❖ Submit, Search, & Retrieve FHIR Document Bundles (Option A)
- ❖ Fetch (Create and/or Retrieve) DocumentReferences and surrounding content (Option B)
- ❖ Submit, Search, & Retrieve Individual Patient Resources (Option C)
- ❖ Retrieve the most recent Patient Summary Document using \$summary operation (Option D)

Each transaction can be simulated with or without authorization tokens (using the IHE IUA profile).

# When to use the CA:FeX Client Simulator



The **CA:FeX Client Simulator** is used in Pre-Projectathon and No Peer testing when a participant wants to test that their FHIR Server (System Under Test) can receive FHIR Resources and respond to requests according to the CA:FeX transactions

- ❖ The Client Simulator UI is organized into pages by Option (A, B, C, D), each page has a visual documentation and buttons to execute various APIs. Participants can test some or all of the CA:FeX transactions using this tool
- ❖ The user designates the server endpoint that the Client Simulator will interact with, typically entering the proxied endpoint that allows traffic to be logged for test evidence
- ❖ The UI is pre-loaded with examples and configurable parameters that allow the tester to customize what is sent to their System Under Test
- ❖ Responses to API calls are viewable in the UI and stored in the Gazelle Datahouse-Proxy to use for test evidence

# When to use the CA:FeX Server Simulator



The **CA:FeX Server Simulator** is used in Pre-Projectathon and No Peer testing when a participant wants to test that their FHIR Client (System Under Test) can request FHIR Resources according to the CA:FeX transactions

- ❖ The Server Simulator has no UI but is configured to support the required endpoints and parameters for all transactions and options in CA:FeX. Participants can test some or all of the CA:FeX transactions using this tool
- ❖ The Server Simulator has open and IUA-authorized endpoints that are proxied to allow traffic to be logged for test evidence
- ❖ Responses to API calls are returned to the Client and stored in the Gazelle Datahouse-Proxy to use for test evidence

# Tool Demonstration – Client Simulator UI



1 Navigate to the page directly or select from the dropdown menu

2 Enter your server's proxied endpoint information

See instructions for setting up proxy: <https://pancanadianio.ca/gazelle-documentation/Proxy/user.html>

*Optional:*

3 If testing with IUA Authorization Token, click “Authorize” button

3.1 In pop-up, enter Bearer Token and click “Authorize”

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Swagger UI

PS-CA\_(CA-FeX\_Bundle\_Option\_A)

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## Patient Summary API (CA:FeX): Bundle Option (A) 0.2 OAS 3.0

RESTful APIs used to save and retrieve Patient Summary documents. This page contains Bundle Option (A) transactions

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 [IHE 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

incanadianio.ca:your-proxied-server-endpoint? 2

3 Authorize

3.1

Available authorizations

Bearer Authorization (http, Bearer)

This API uses Bearer Authorization that requires a valid access token provided by the authorization server.

Value:

Authorize Close



# Tool Demonstration – Client Simulator UI



4 Click to expand the API that you would like to execute

5 Customize the content of the call to your server's Endpoint, examples include:

- Use loaded patient examples or paste in your own
- Use presets or provide values for parameters that the client will use in the call to your server

6 Click "Execute"

The screenshot shows the Swagger UI Client Simulator interface. On the left, the 'Data Recipient' and 'Data Responder' sections are visible. The 'Data Responder' section is expanded to show the 'GET /Bundle' endpoint. The 'Parameters' table is shown below:

Name	Description
<code>_pretty</code>	Specifies whether response should be pretty printed
boolean (query)	type: string false
<code>_format</code>	Specifies alternative response formats by their MIME-types (when a client is unable access accept: header)
string (query)	type: string application/fhir+json
timestamp	Specifies the timestamp when the PS-CA was created
string (query)	type: string timestamp
composition.patient.identifier	Specifies the identifier of the patient that is subject of the composition
string (query)	type: string composition.patient.identifier
composition.type	Specifies the composition type of the PS-CA document
string (query)	type: string 00501-0
composition.status	Specifies the status of the composition.
string (query)	type: string composition.status

On the right, the 'POST /Bundle' endpoint is selected. The 'Parameters' section is expanded, showing the same configuration as the left panel. The 'Request body' is set to 'application/fhir+json'. The 'Protte' section shows a JSON response for a patient named 'Roberta Gray'.

```
Protte
Roberta Gray (PS-CA 2.0.0) - 370191

{
  "resourceType": "Bundle",
  "id": "Bundle-PS-CA-2.0.0-AllProfList",
  "meta": {
    "profile": "http://fhir.infoway-infouroute.ca/iso/pca/structuredefinition/bundle-ca-ps"
  },
  "type": "searchset",
  "timestamp": "2021-12-13T14:30:00-05:00",
  "entry": [
    {
      "fullUrl": "urn:uuid:c1a5a5c1-7676-4ea2-a489-22689e84be61",
      "resource": {
        "resourceType": "Composition",
        "id": "c1a5a5c1-7676-4ea2-a489-22689e84be61",
        "meta": {
          "profile": "http://fhir.infoway-infouroute.ca/iso/pca/structuredefinition/composition-ca-ps"
        },
        "text": {
          "status": "additional",
          "div": "observedAt=http://www.w3.org/1999/xhtml/primaryProblem: Roberta is a normally well-controlled type 2 diabetic with well-managed hypertension. She experiences occasional hypoglycemia."
        },
        "status": "final",
        "timestamp": "2021-12-13T14:30:00-05:00"
      }
    }
  ]
}
```



# Tool Demonstration – Client Simulator UI

- 7 After execution, scroll down to view the Curl request sent to your proxied endpoint and the Server Response details
- 8 After successfully executing the request against your proxied endpoint, navigate to the Gazelle Datahouse to select the "Access detail" you would like to use for evidence
- 9 Copy the permanent link for pasting into Gazelle Test Instance

The screenshot displays the Swagger UI for the Canada Health Infoway API and the Gazelle Datahouse Proxy interface. The Swagger UI shows a curl command and a JSON response. The Gazelle Datahouse Proxy interface shows a table of messages and a detailed view of a message.

**Swagger UI:**

```
curl -X POST \
  https://pancanadian.ca:10001/#!/cafes/bundle1_gretty-falsek_forest-application2F#!/rj2joom \
  -H 'accept: application/#!/rjoom' \
  -H 'Content-Type: application/#!/rjoom' \
  -d '{
    "resourceType": "Bundle",
    "id": "bundle-PSCA-2.0.0-AllProfiles",
    "meta": {
      "profile": "http://hl7.org/fhir/r4/psca/StructureDefinition/bundle-ca-ps"
    },
    "identifier": {
      "system": "http://ca-ps-identifier-system.org",
      "value": "urn:oid:1.3.6.1.4.1.30441.2.10001"
    },
    "type": "Document",
    "timestamp": "2022-12-11T14:30:00-0800"
  }'
```

**Gazelle Datahouse - Proxy:**

Standard	Sender hostname	Sender ip address	Proxy port	Receiver hostname	Receiver ip address	Message type	Action
HTTP [TLS]		Nov 22, 2024 12:17:40:189 PM - AST	dev-ps-swagger-api.apibox.ca	11001	130.93.133.5	200	Access details
HTTP [TLS]		Nov 22, 2024 12:17:39:619 PM - AST	130.93.133.5	11001	dev-ps-swagger-api.apibox.ca	POST	Access details
HTTP [TLS]		Nov 22, 2024 12:15:40:864 PM -					Access
HTTP [TLS]		Nov 22, 2024 12:15:40:277 PM -					

**Gazelle Datahouse - Proxy (Message Detail):**

Connection detail	Initiator	Responder
Type: HTTP [TLS] Connection id: 6740a34ef8c2a02c70b885 Permanent link: <a href="#">copy URL</a>	Hostname: 130.93.133.5 IP address: 130.93.133.5 Port: 7801 Proxy port: 11001 Certificate subject: CN=pancanadian.ca-the catalyst.net	Hostname: dev-ps-swagger-api.apibox.ca IP address: 15.197.226.2 Port: 443 TLS version: TLSv1.3 Cipher suite: TLS_AES_256_GCM_SHA384 Certificate subject: CN=*apibox.ca, CN=Amazon RSA 2048 M02, O=Amazon, CI=US, CN=Amazon Root CA 1, O=Amazon, CI=US

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# Where to Access the CA:FeX Simulators



Simulator	URL
CA:FeX Client Simulator (Direct Links for Option A, B, C, D)	<ul style="list-style-type: none"><li>❖ <a href="https://ps-swagger.apibox.ca/index.html?spec=PS-CA">https://ps-swagger.apibox.ca/index.html?spec=PS-CA</a> (CA-FeX Bundle Option A)</li><li>❖ <a href="https://ps-swagger.apibox.ca/index.html?spec=PS-CA">https://ps-swagger.apibox.ca/index.html?spec=PS-CA</a> (CA-FeX Metadata Option B)</li><li>❖ <a href="https://ps-swagger.apibox.ca/index.html?spec=CA-FeX">https://ps-swagger.apibox.ca/index.html?spec=CA-FeX</a> (Single Resource Option C)</li><li>❖ <a href="https://ps-swagger.apibox.ca/index.html?spec=PS-CA">https://ps-swagger.apibox.ca/index.html?spec=PS-CA</a> (CA-FeX Summary Option D)</li></ul>
CA:FeX Server Simulator (without authorization)	<a href="https://pancanadianio.ca:10001/fhir/cafex">https://pancanadianio.ca:10001/fhir/cafex</a> (Option A) <a href="https://pancanadianio.ca:10002/fhir/cafex">https://pancanadianio.ca:10002/fhir/cafex</a> (Option B) <a href="https://pancanadianio.ca:10003/fhir/cafex">https://pancanadianio.ca:10003/fhir/cafex</a> (Option C) <a href="https://pancanadianio.ca:10004/fhir/cafex">https://pancanadianio.ca:10004/fhir/cafex</a> (Option D)
CA:FeX Server Simulator (with authorization)	<a href="https://pancanadianio.ca:10001/fhir/cafex-iaa">https://pancanadianio.ca:10001/fhir/cafex-iaa</a> (Option A) <a href="https://pancanadianio.ca:10002/fhir/cafex-iaa">https://pancanadianio.ca:10002/fhir/cafex-iaa</a> (Option B) <a href="https://pancanadianio.ca:10003/fhir/cafex-iaa">https://pancanadianio.ca:10003/fhir/cafex-iaa</a> (Option C) <a href="https://pancanadianio.ca:10004/fhir/cafex-iaa">https://pancanadianio.ca:10004/fhir/cafex-iaa</a> (Option D)
CA:FeX Specification	<a href="https://infoscribe.infoway-inforoute.ca/display/PCI/CA%3AFeX+Release+Information">https://infoscribe.infoway-inforoute.ca/display/PCI/CA%3AFeX+Release+Information</a>



**Canada Health Infoway**

# Thank you!

**To learn more about the Projectathon 2025, visit:**

<https://infoscribe.infoway-inforoute.ca/display/PCI/Scope%3A+Projectathon+2025>

## **Contact Information:**

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