



Canada Health Infoway

Projectathon Tooling

CA:eReC Client & Server Simulators

What are the CA:eReC Client & Server Simulators?



- ❖ **CA:eReC Client Simulator:** A web application, with user interface, used to simulate CA:eReC conformant clients (supports Requester and Performer Client transactions).
- ❖ **CA:eReC Server Simulator:** A FHIR server with RESTful APIs used to simulate CA:eReC conformant servers. Currently supports an open (non-IUA) endpoint.

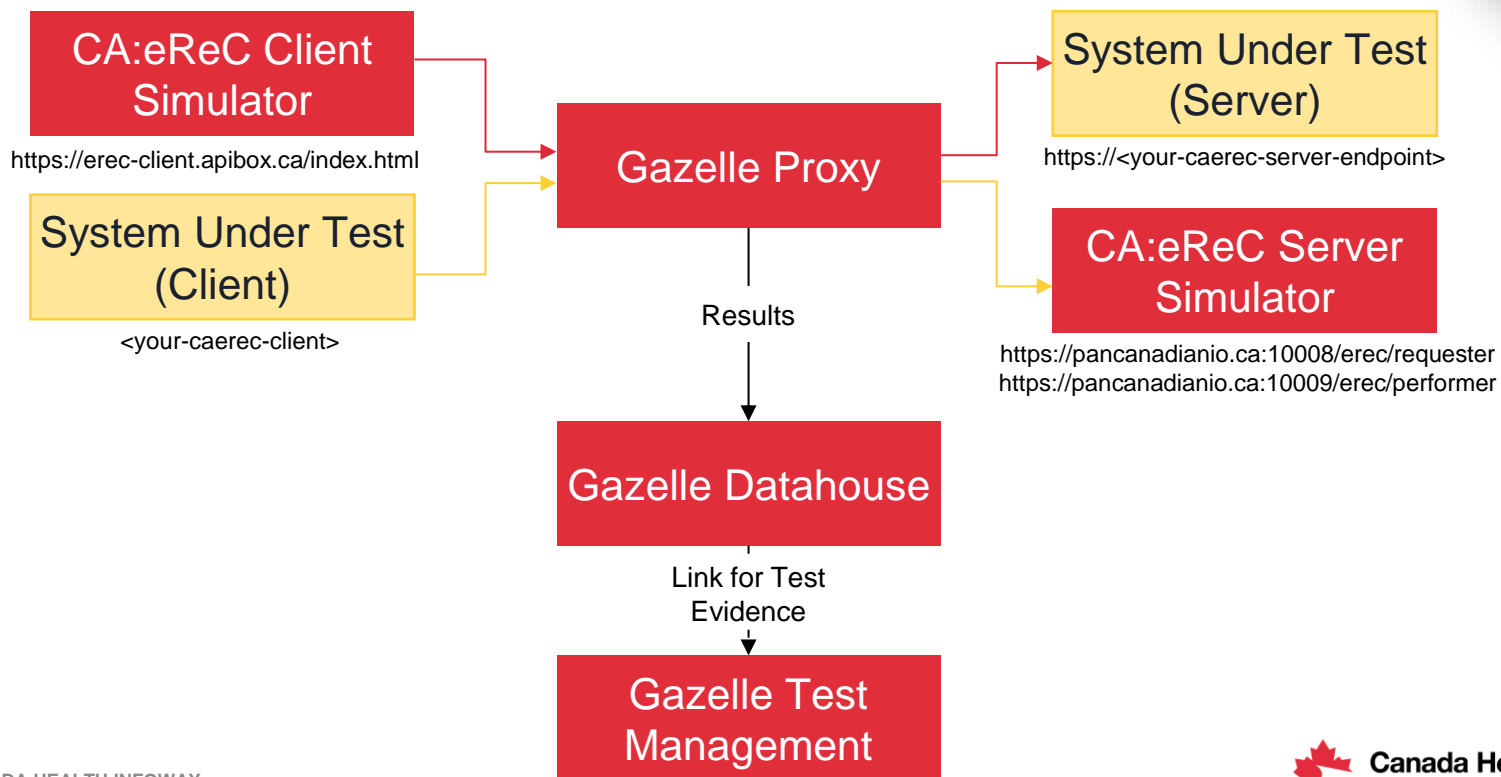
Training Objectives



This training aims to meet the following objectives:

- ✓ Provide an understanding of the **CA:eReC Client Simulator**, **when** to use it, **how** to use it, and **where** to access it
- ✓ Provide an understanding of the **CA:eReC Server Simulator**, **when** to use it, **how** to use it, and **where** to access it

CA:eReC Simulators Architectural Overview



What are the CA:eReC Simulators' Capabilities?



CA:eReC has multiple transactions performed by various actors (eReC Requester, eReC Performer, eReC Informer). Systems participating in eReferral and eConsult may have different levels of maturity / capability to support the full span of transactions.

The **Client Simulator** and **Server Simulator** are configured to execute and receive the following transactions for Level 1, Level 2, and Level 3 systems:

- ❖ Send new service request [eReCm-1]
- ❖ Notify update service request [eReCm-3]*
- ❖ Notify data correction [eReCm-4]*
- ❖ Revoke service request [eReCm-5]
- ❖ Notify new request processing [eReCm-6]*
- ❖ Notify update request processing [eReCm-7]*
- ❖ Notify new appointment [eReCm-8]**
- ❖ Send communication from requester [eReCm-9]**
- ❖ Send communication from performer [eReCm-10]**

*Not required for Level 1 testing

** Not required for Level 2 testing

When to use the CA:eReC Client Simulator



The **CA:eReC 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:eReC transactions

- ❖ The Client Simulator UI is organized into a Requester Screen and a Performer Screen, each screen has a visual documentation and buttons to submit CA:eReC FHIR messages in XML/JSON to a server endpoint. Participants can test some or all of the supported 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 in addition to an editor that allows the tester to customize what is sent to their System Under Test
- ❖ Responses to API calls (in the form of response messages) are viewable in the UI and stored in the Gazelle Datahouse-Proxy to use for test evidence

When to use the CA:eReC Server Simulator



The **CA:eReC 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 receive FHIR Resources and respond to requests according to the CA:eReC transactions

- ❖ The Server Simulator has no UI but is configured to support the required transactions for CA:eReC Level 1, 2, & 3 systems. Participants can test some or all of the CA:eReC transactions using this tool
- ❖ The Server Simulator has an open endpoint to emulate the Requester Server ([https://pancanadianio.ca:10008/erec/requester/\\$process-message](https://pancanadianio.ca:10008/erec/requester/$process-message)) and an open endpoint to simulate the Performer Server ([https://pancanadianio.ca:10009/erec/performer/\\$process-message](https://pancanadianio.ca:10009/erec/performer/$process-message)). These are proxied to allow traffic to be logged for test evidence
- ❖ Responses to API calls (in the form of response messages) are returned to the Client and stored in the Gazelle Datahouse-Proxy to use for test evidence

Tool Demonstration – Client Simulator UI



1 Select the desired screen based on the role you would like the Client Simulator to play (i.e., Requester, Performer)

2 Populate the eReC Server URL with your server's proxied endpoint information

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



Tool Demonstration – Client Simulator UI

- 3 Click “Load static eReCm templates”, select the desired message from the dropdown menu of loaded eReC example messages

You can also edit the message from within the interface if desired

Note: Ensure you modify the source and destination endpoints in the JSON/XML to reflect your desired target

- 4 Click “Submit eReC Message to RMS Server”

The screenshot shows the Client Simulator UI with two main sections: 'REQUESTER' and 'PERFORMER'. The 'REQUESTER' section contains a text area for editing JSON/XML messages, with a red box highlighting the 'destination' field and a red circle with the number '3' next to it. The 'PERFORMER' section contains a dropdown menu for selecting eReCm templates, with a red box highlighting the 'eReCm-1 (e-referral request for ligament injury)' option and a red circle with the number '3' next to it. Below the dropdown is a text input field for the 'eReC System Partner' URL, with a red box highlighting the 'SUBMIT EREC MESSAGE TO RMS SERVER' button and a red circle with the number '4' next to it. The 'Operational Outcome' section shows a JSON response with details like 'resourceType', 'id', 'type', 'timestamp', and 'entry'.

Submit eReCm JSON/XML

```
30 "destination": [
31   {
32     "name": "RMS Target",
33     "endpoint": "https://pancanadianio.ca:10009/erec/performer/$process-message"
34   },
35 ],
36 "author": {
37   "reference": "urn:uuid:4db13666-e169-4c36-a7d4-f6b351077219",
38   "identifier": {
39     "system": "http://first-provider-system-uri.ca",
40     "value": "practitioner-role-id"
41   }
42 },
43 "source": {
44   "endpoint": "https://pancanadianio.ca:10008/erec/requester/$process-message"
45 }
```

Operational Outcome

```
1 {
2   "resourceType": "Bundle",
3   "id": "ac0fa90e-eadc-41fc-a02d-89595e039127",
4   "type": "message",
5   "timestamp": "2024-12-05T14:13:38.820+00:00",
6   "entry": [
7     {
8       "fullUrl": "urn:uuid:2675c8f4-e3d3-4f09-a020-35f99517bb79",
9       "resource": {
10        "resourceType": "MessageHeader",
11        "id": "2675c8f4-e3d3-4f09-a020-35f99517bb79",
12        "meta": {
13          "profile": [
14            "http://fhir.infoway-inforoute.ca/ig/CA-eReC/StructureDefinition/CA-eReC-Messa
15          ]
16        }
17      }
18    }
19  ]
20 }
```

Usage Instructions

- Enter FHIR Server Uri
- Provide CA:eReC FHIR message(s) in (XML/JSON) format
- HIT Submit eRec message and view the Operational Outcome
- Select bundle type to load (Outgoing/Incoming) and hit Load bundles from server
- Bundles list populated and onClick of bundle will populate the View Message Bundle

Requester can send these message:

- eReCm-1 (add-service-requested)
- eReCm-3 (notify-update-service-request)
- eReCm-5 (revoke-service-request)
- eReCm-9 (send-communication-from-requester)

Load static eReCm templates (for testing)

3 eReCm-1 (e-referral request for ligament injury)

eReC System Partner

4 SUBMIT EREC MESSAGE TO RMS SERVER

Tool Demonstration – Client Simulator UI



- 5 The Client Simulator will display any details that are sent in response to the message, this may be in the form of:
 - FHIR Message sent in response (e.g., an eReCm-6 in response to an eReCm-1 message)
 - OperationOutcome in the case of an error

- 6 You can look up previously exchanged bundles (e.g., to find business identifiers) by loading lastN selection from the dropdown menu and selecting the bundle you would like to load into the viewer

The screenshot displays the Client Simulator UI with several key components:

- Operational Outcome:** A JSON response showing a Bundle resource with a MessageHeader entry. A red circle with the number 5 highlights the top of this section.
- View Message Bundles:** A JSON response showing a Bundle resource with meta, identifier, and message details. A red circle with the number 6 highlights the top of this section.
- Configuration:** A dropdown menu for "Load static eReCm templates" is set to "eReCm-1 (e-referral request for ligament injury)".
- System Partner:** A text input field contains "https://pancanadianio.ca:10009/er/ /\$process-message".
- Buttons:** A "SUBMIT EREC MESSAGE TO RMS SERVER" button is visible.
- Past Bundles:** Radio buttons for "Sent Bundles" (selected) and "Received Bundles". A "LOAD BUNDLES FROM SERVER" button and a "Number of bundles to load" dropdown (set to "Last 10") are highlighted with a red circle 6.
- Bundle List:** A list of bundles is shown, with the top entry "2024-12-05 10:25 add-service-request" highlighted by a red circle 6.

Tool Demonstration – Client Simulator UI



7 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

8 In Message View, Review your Message Content and Click "Validate" button

The screenshot shows the Gazelle Datahouse interface. At the top, there are search filters for Standard, Sender hostname, Sender ip address, Proxy port, and Receiver hostname. Below these are filters for Receiver ip address, Message type, and Secured message. A date range selector is also present. A table lists messages with columns for Standard, Timestamp, Sender, Proxy, Receiver, Message type, and Action. A red circle with the number 7 highlights the 'Access details' link in the Action column of the first message. Below the table, a detailed view of the selected message is shown, with a red circle and the number 8 highlighting the 'Validate' button. The detailed view includes sections for Connection detail, Initiator, and Responder, each with various technical details like Hostname, IP address, Port, TLS version, and Cipher suite.

Tool Demonstration – Remote Message Validation



- 9 In the pop-up window, Select “Body only” and select the FHIR profile you would like to validate the message against
- 10 Click “Validate” button
- 11 A summary of validation results will appear in the validation box.
Tip: Click the EVS Validation Report for detailed view of validation findings
- 12 Once passed, Copy permanent link for pasting into Gazelle Test Instance

The screenshot shows the 'Validate' tool interface. A pop-up window titled 'Validate' is open, showing a dropdown menu with 'Body only' selected and another dropdown menu with 'Select or search by typing validation profile'. A 'Validate' button is visible in the bottom right of the pop-up. The main interface displays validation results for a connection. The results are organized into sections: Connection details (Type: HTTP, Connection id: 67377732e8c2a02c35a81cf, Permanent link: c20bLVJBL, Proxy port: 11001, Certificate subject: CN=pancanadianio/the-catalyst.net), Hostname details (Hostname: 66.23.63.12, IP address: 66.23.63.19, Port: 64733, TLS version: TLSv1.3, Cipher suite: TLS_AES_256_GCM_SHA384), and Responder details (Hostname: dev-ps-swagger-api.apibox.ca, IP address: 15.157.226.2, Port: 443, TLS version: TLSv1.3, Cipher suite: TLS_AES_128_GCM_SHA256, Certificate subject: CN=*apibox.ca, CN=Amazon RSA 2048 M02, O=Amazon, C=US, CN=Amazon Root CA 1, O=Amazon, C=US). A 'Validation' section at the bottom right shows a 'PASSED' status with a 'View EVS validation report' link and a timestamp of 11:31:27:709 AM - Nov 21, 2024. A 'Go back' button is visible in the top right of the main interface.

Where to Access the CA:eReC Simulators



Simulator	URL
CA:eReC Client Simulator	https://erec-client.apibox.ca/index.html
CA:eReC Server Simulator (without authorization)	https://pancanadianio.ca:10008/erec/requester https://pancanadianio.ca:10009/erec/performer
CA:eReC Specification	https://simplifier.net/CA-eReC



Canada Health Infoway

Thank you!

To learn more about the Projectathon 2025, visit:

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

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