

ONE ACCESS CONSUMER GATEWAY

Client Integration Guide

Patient Identity Solution

Version 1.0.0

Ontario Health

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1.0 Introduction

1.1 About This Document

The primary audience for this integration guide includes Clients of Ontario Health (Digital Services) with an interest in ONE Access Consumer Gateway / Patient Identity Solution integration. The document assumes the reader has technical knowledge of the ONE Access Gateway, Application Programming Interfaces (APIs) and API Management Solutions. The document provides technical instructions for adopters (API Consumers (Client Applications)) to follow to consume APIs exposed by the ONE Access Consumer Gateway after completing the required technical and project prerequisites to expedite the integration process and minimize potential impediments.

Client Applications wishing to integrate with the ONE Access Consumer Gateway will be required to comply with legal, privacy, security and project requirements, which will be provided at project initiation.

2.0 Overview

The ONE Access Consumer Gateway exposes a set of RESTful FHIR APIs protected by OAuth2/Open ID Connect authorization and authentication protocols.

After completing the required project prerequisites, the following tasks should be completed by the Client Application before interacting with the gateway:

- Obtain an access token from the Authorization Server
- Register the Client Application.
- Invoke the APIs exposed by gateway and receive response.

Each of the steps above are described in detail in this document.

3.0 Obtain Access Token

Details available in OIDC Guide for Ontario Patient Identity Solution:

Details available in My Ontario Account for Health OpenID connect Specification; see references in 10. Relevant Links.

4.0 ONE Access Consumer Gateway Client Application Registration

Every Client Application must be registered to interact with the ONE Access Consumer Gateway as outlined below.

4.1. Registration Activities

The following registration activities must be performed for each environment in which a connection is made, including the Partner Self-Test Environment and Production environments:

- **Create Client organization:** The registration is performed by Ontario Health (Digital Services) on behalf of the Client Application organization.
- **Create Client Application:** This step is performed by Ontario Health (Digital Services) on behalf of the Client Application organization. At the end of successful Application registration, the following information is returned to the Client Application organization:
  - Gateway Client ID
- **Subscribe to product:** The Client Application must be subscribed to an API product before it can be used. Ontario Health (Digital Services), on behalf of the Client Application organization, subscribes the Client Application to the appropriate API product. Once subscribed, the Client Application is ready to invoke the APIs through the ONE Access Consumer Gateway. The following information is available after a successful subscription:
  - API product name and version information.
  - API gateway endpoint for the selected product.

Note:

The information above describes the current state Client Application registration process, where the API Client registration workflow is not necessarily integrated with the OAuth2 Client registration process, as described in 3.0 Obtain Access Token.

The above activities will be conducted by Ontario Health (Digital Services) staff members through manual and semi-automated processes.

5.0 Invoke API

The access token obtained is used as a bearer token to invoke the selected RESTful API. The bearer token is placed within the authorization header of the http request as defined in (Tools.ietf.org, 2019)

- http request header
- Authorization: Bearer <access token>

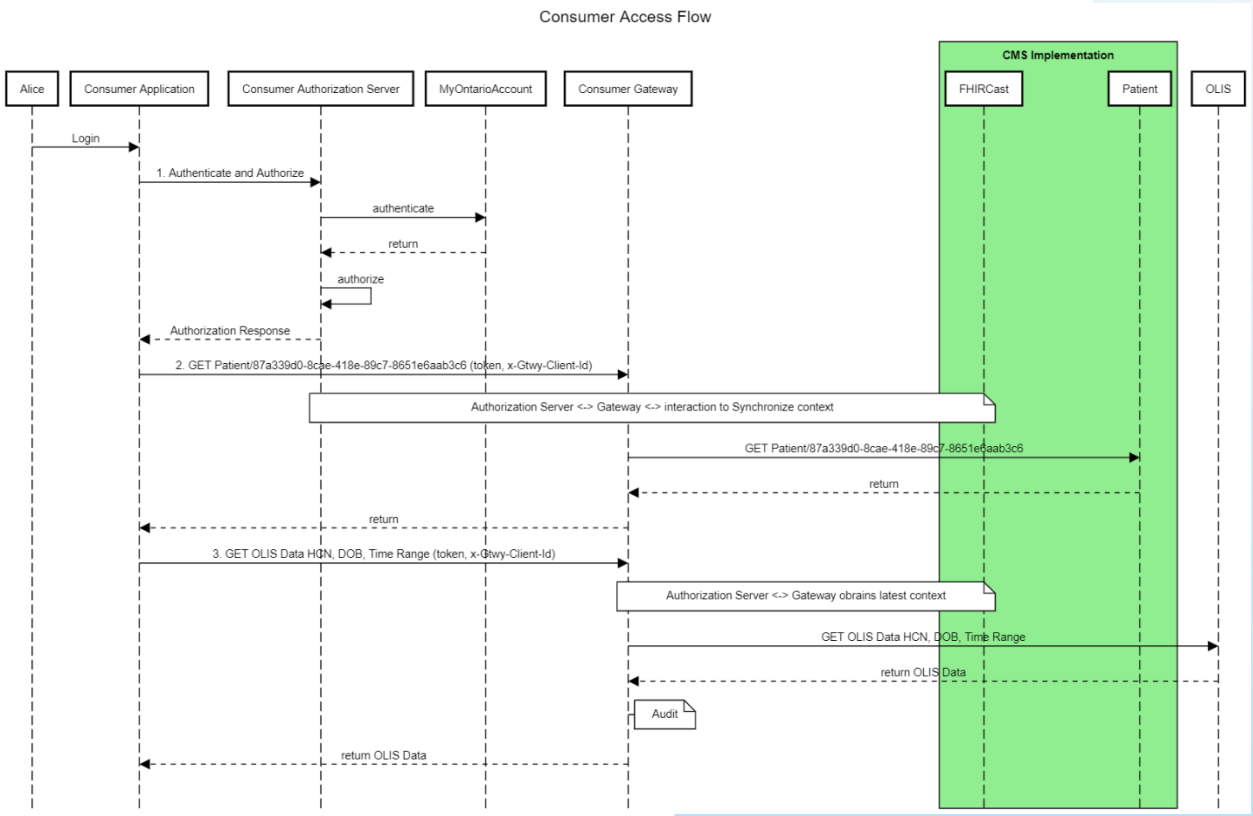


Figure 1 - Consumer Access Flow

Accessible Description – Consumer Access Flow

A user authenticates using MyOntarioAccount and the Consumer Authorization Server. After successful authentication and authorization, the client application receives an access token. The client application sends requests containing the access token and client identifier to ONE Access Consumer Gateway. The gateway validates authorization information and forwards requests to downstream systems, including OLIS. Responses are returned through the gateway to the client application. Audit information is generated as part of the transaction flow.

To reduce the chance of TLS-related connection issues, Clients should keep their technology stack up to date and use currently supported TLS versions and cipher suites.

5.1 Gateway Response Codes

The table below lists http response codes returned by the ONE Access Consumer Gateway. Please note that the API may return status codes in addition to the ones listed below as part of business processing. Client Application developers will be provided, and are required to review, API-specific documentation (such as the FHIR Standards, as applicable to integration project) to understand all possible HTTP codes returned as part of API interaction.

HTTP Code	Description
200/201	No system errors from the ONE Access Consumer Gateway point of view; however, there could be business errors, warnings or information messages. In case of business errors or warnings, FHIR OperationOutcome is populated with appropriate information.
400	• Bad request • Token not present • Required parameter not present • Back-end token validation failed
401	Unauthorized • Invalid Client ID • Required scope not available • Token expired • Issued in future • Not destined for gateway • Not issued by Authorization Server • Required claims for gateway processing are not present • Back-end fine grained authorization failed
404	Resource not supported by ONE Access Consumer Gateway
405	Method not allowed as per business rules.
500	Internal Error • Back-end error • Default timeout for backend connectivity exceeded • JWT cannot be validated, signature issues

5.2 HTTP Headers

The table below outlines the number of http headers that are used within the ONE Access Consumer Gateway. Some are required to be filled in by the Client Application placing the API request, while others are populated by the ONE Access Consumer Gateway, as described below.

Header name	External Request	Gateway to LOB request	LOB to gateway response	External response
X-Gtwy-Client-Id	Identifies the Client identifier	Not present	Not present	Not present

5.3 Request Tracking

There is a need to track end-to-end requests and responses within the ONE Access Consumer Gateway. The early version of the gateway used its own http headers (GtwyTxId, LOB.transactionid) to track transactions through the system.

However, HL7 FHIR R4 has provided recommendations on this area as described here. This approach is preferred to be adopted in order to be more aligned with the standard.

In addition to the headers mentioned in the standard, two custom headers are proposed to achieve the end-to-end transaction tracking capability as shown in the table below.

The ONE Access Consumer Gateway always propagates any header present in the Client Application request to the API backend. Inbound request headers are marked as optional in order to avoid any request rejection if a header is not present.

Header name	**External Request**	**Gateway to Backend request**	**Backend to gateway response**	**External response**
X-Request-Id	Identifies the Client transaction ID. Optional.	Identifies the Client transaction ID. Optional.	Not present	Identifies the gateway transaction ID. Mandatory.
X-Correlation-Id	Not present	Not present	Not present	Identifies the original X-Request-Id in the Client request.
X-Forwarded-Host	Not present	Identifies the original requested host	Not present	Not present
X-Intermediary	Not present	Identifies the Gateway. Optional.	Not present	Not present
X-GtwyTxId	Not present	Identifies the gateway global transaction ID.	Not present	Not present
X-LobTxId	Not present	Not present	Identifies the line of business transaction ID.	Identifies the line of business transaction ID.

6.0 Versions

6.1 Version Syntax

API Products contain one or more APIs. These APIs and API Products follow a four-part version schema, i.e., <Major>.<minor>.<revision>.<build> all represented in digits, starting with 1.0.0.0 Revisions are generally defect fixes and minor feature enhancements with backward compatibility. Minor digits signify a business feature support (which may or may not be backward compatible), while major digits represent major business changes, and are usually not backward compatible.

6.2 Version Changes

Any change to an API version results in a corresponding change to a section of the API product. For this reason, only API product version changes are discussed in this document, not API version changes.

Once Clients subscribe to a specific API product version, they will continue to consume the subscribed API product version without any impact from subsequent version changes of the API product, subject to the following:

- API product owners (Ontario Health (Digital Services)) will automatically migrate the Client to a later version of the API product after determining the new API product version is backward compatible with the subscribed API product version. This migration will have no impact on the Client side, and no action is necessary from the Client Application.
- When the new API product is not backward compatible with the subscribed version, client application owners can subscribe to the new product version once necessary development and testing has been completed against the new product version. Subscription upgrades may be carried out at the product owners' discretion or requested by Ontario Health (Digital Services).
- Ontario Health (Digital Services) may request consumers to upgrade to a newer version when old versions are no longer supported.

Application owners can go back to an older version of the API product if it is still available for subscription.

6.3 Multiple Subscribed Versions

If Clients want to subscribe to and consume two different versions of the same API product, two different API keys should be used. Otherwise, all Client requests will be forwarded to one of the two subscribed versions of the API product.

7.0 API Product Life Cycle

The following diagram illustrates the API Product Life Cycle from the point of view of the consumer Application. The two key states are "Published" and "Deprecated". Clients can only subscribe to published API products; clients of deprecated API products can continue to function, but no new subscriptions are allowed.

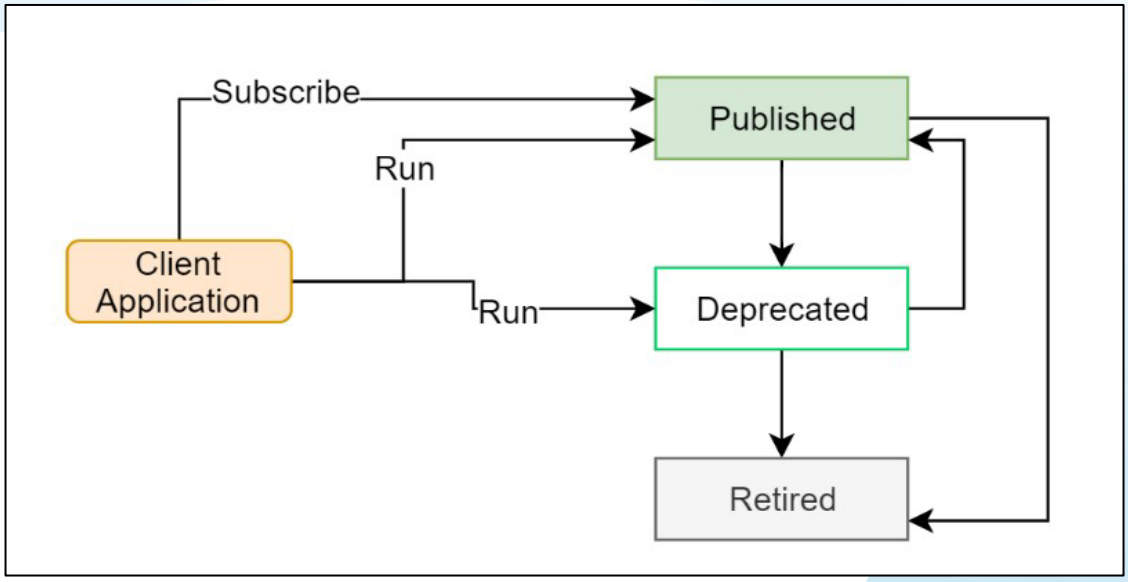


Figure 2 - Product Lifecycle Diagram

Accessible Description – API Product Life Cycle

API products progress through the lifecycle states Published, Deprecated and Retired. Client applications may subscribe to Published products. Existing consumers of Deprecated products may continue to use them, but new subscriptions are not permitted. Deprecated products may eventually move to the Retired state, at which point they are no longer available.

8.0 Environments

External Client applications wishing to integrate with the ONE Access Consumer Gateway are required to comply with legal, privacy, security and project requirements which will be provided at project initiation. Once the appropriate prerequisites are met, Client Applications are connected to two environments:

- **Partner Self Test (PST)** for partner development, self-testing and conformance testing, using fabricated data.
- **Production (Prod)** for live use of real data in production.

Ontario Health (Digital Services) will not offer performance testing environments to external clients.

Name	Base Gateway Endpoint	Description
Partner Self Test (PST)	https://consumer.pst.ontariohealth.ca	• Environment for partner development, self testing and conformance testing • Fabricated data.
Production (Prod)	https://consumer.ontariohealth.ca	• Production environment • Real data.

9.0 Glossary

- **Access Token** - The access token verifies that your Application is authorized to access the requested resource. Use the Client ID to exchange an access token at the token endpoint.
- **API Product** - API products are bundled APIs (resources and service plan), that are made available to app developers for consumption.
- **Application Program Interface (API)** - A set of standard software interrupts, calls, functions, and data formats that can be used by an Application program to access network services, devices, Applications, or operating systems.
- **Authentication** - In computer security, verification of the identity of a user or process and the construction of a data structure that contains the privileges that were granted to the user or process.
- **FHIR** - Defines a set of resources for health. These resources represent granular clinical concepts that can be exchanged to quickly and effectively solve problems in healthcare and related processes. The resources cover the basic elements of healthcare - patients, admissions, diagnostic reports, medications, and problem lists, with their typical participants, and support a range of richer and more complex clinical models. The simple direct definitions of the resources are based on thorough requirements gathering, formal analysis and extensive cross mapping to other relevant standards.
- **OAuth** - An HTTP-based authorization protocol that gives Applications scoped access to a protected resource on behalf of the resource owner, by creating an approval interaction between the resource owner, Client, and resource server.
- **Open IDConnect (OIDC)** - An identity protocol and open standard that is built on top of the OAuth 2.0 protocol. It enables Client Applications to rely on authentication that is performed by an OpenID Connect provider to verify the identity of a user.
- **RESTful API** - FHIR is described as a 'RESTful' specification based on common industry level use of the term REST. In this RESTful framework, transactions are performed directly on the server resource using an HTTP request/response. The API does not directly address authentication, authorization, and audit collection.

10. Relevant Links

This section lists and hyperlinks all the documents that are external to the guide.

- (2006). Himss dictionary of healthcare information technology terms, acronyms, and organizations. Chicago, IL: HIMSS.
- Canadian FHIR Registry. Retrieved from https://simplifier.net/organization/CanadianFHIRRegistry/~projects
- Resource OperationOutcome - Content. (n.d.). Retrieved from https://www.hl7.org/fhir/operationoutcome.html
- The OAuth 2.0 Authorization Framework: Bearer Token Usage. [online] Available at: https://tools.ietf.org/html/rfc6750 [Accessed 10 Sep. 2019].
- My Ontario Account for Health OpenID connect Specification available on the same page as this document.

Need this information in an accessible format? 1-877-280-8538, TTY 1-800-855-0511, info@ontariohealth.ca.
Document disponible en français en contactant info@ontariohealth.ca