IntegraConnect

FHIR API Guide

Table of Contents

Introduction

Summary

The document provides an overview of the steps to be followed to use FHIR APIs. This guide is written for third-party developers who are developing software applications or the patient and physician users for accessing Protected Health Information (PHI) of patients on the Integra platform. This documentation outlines the authentication details and methods to connect to the API to retrieve patient health information.

Intended Users

Patient user, clinical user, and developers.

Terms of Use

Modification or false representation of content

Integra offers many of its data in machine readable format using an Application Programming Interface (API). This service is offered only when you accept the terms and conditions (Agreement).

All documentation, content, code, and related materials available through the API and the use of API are subject to the terms and conditions.

The name Integra shall not be used to imply sponsorship, endorsement, association, approval, or authorization of any product, service, or entity i.e., not-for-profit, commercial, or otherwise.

You should not change any content available through the API in any manner which could reasonably convey the false impression that Integra is the source of such content.

Use of the API may be subject to certain limitations on access, calls, or use as set forth within the Agreement or otherwise provided by Integra. If Integra reasonably believes that you have attempted to exceed or circumvent these limits, your ability to use the API may be permanently or temporarily blocked. Integra may monitor your use of the API to improve the service or to ensure compliance with this Agreement.

Service termination

You may refrain from further use of the API to terminate this Agreement. Integra reserves the right to discontinue to provide the API or data for any reason. If your API use violates any policy, Integra may stop providing the API to you. View Integra Privacy and Legal Notices, and Website Terms and Conditions.

You must use the API as is it is and at your own risk. All provisions within this Agreement by their nature shall survive termination including, without limitation, warranty disclaimers, indemnity, and limitations of liability.

Changes

Integra reserves the right, at its sole discretion, to modify or replace this Agreement, in whole or in part. Continued use and/or access to the API after posting of any changes to the Agreement constitutes the acceptance of modified terms. Integra may, in the future, offer new services and/or features through the API. These new services and/or features shall be subject to the terms and conditions of this Agreement. Integra may change any aspect of the API or the data offered at any time for any reason.

Disclaimer of warranties

The data provided in the API is provided as it is and on an as-available-as basis. All express or conditions, warranties, and representations including without limitation the warranties of merchantability, fitness for a particular purpose, and non-infringement are hereby disclaimed. Integra makes no statement that the API data will be error-free or the access will be continuous or uninterrupted.

Limitations on liability

In no event will Integra, or its officers, employees, contractors, or agents be liable for any lost revenue, profit, or data, or for special, indirect, consequential, incidental, or punitive damages, however caused and regardless of theory of liability arising out of the use or inability to use the API or data offered through the API, even if Integra has been advised of the possibility of such damages. The limitations must apply even if the above stated warranty disclaimer fails to its purpose.

General representations

You hereby warrant that your use of API:

1. Will be in strict accordance with this agreement, Integra Privacy Policy, and applicable laws and regulations.
2. Will not infringe or misappropriate the intellectual property rights of any third party.

Indemnification

You agree to indemnify and hold harmless Integra, its employees, contractors, agents, and the like from and against any and all liabilities, claims, and expenditures, including attorney's fees, arising out of the use of the API, including but not limiting to violation of this Agreement.

Miscellaneous

This Agreement constitutes the entire Agreement between Integra and you concerning the subject matter hereof, and may be modified only by the posting of a revised version on this page by Integra.

Disputes

Any disputes in this Agreement and access to or use of the API shall be governed by Federal law.

No waiver of rights

Integra's failure to exercise or enforce any right or provision of this Agreement shall not constitute waiver of such right or provision.

Base URL

Environment

<base-url>	https://portal.minerva.integracloud.com/

Authentication and Authorization

Overview

To use Integra's APIs, a user must be registered with the Integra platform to obtain an access token, which is required to use the API. To register an account and generate the access token:
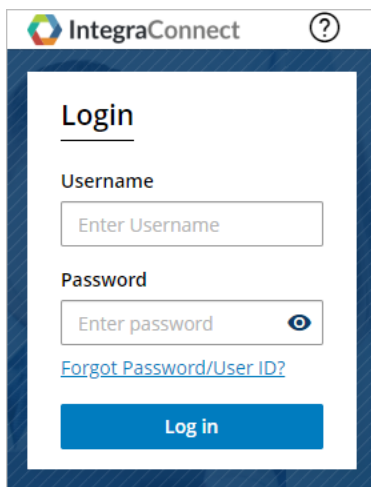
1. Provide the following details and send it to Product Support at ProductSupport@integraconnect.com.

   - First Name

   - Last Name

   - Contact Number

   - Email Address

   - Date of Birth

   - Description of requirement

2. Once the Integra team processes the request, the requestor will receive the username and password on the shared email address. You can use the username and password to log into the IDM and generate an access token to access FHIR APIs.

IDM Login URL: https://portal.minerva.integracloud.com/integra/Oauth2/oauth2Login?provider=idx

Generation of access token

Use the following procedure to generate the access token:

1. Login to Integra IDM using the credentials shared over mail.

2. After successful authentication, user is redirected to Get Access Token page.

IntegraConnect

3. Click **Generate Token** to use the authorization code to generate the access token.

    Note: The auth code is for one-time use only.

    Note: In case the auth code is already used on click of Generate Access token, application generates a new auth code which is used to generate a new access token.

    Note: You can optionally click the **Refresh Token** button to generate a new access token using the refresh token returned in response.

4. User can further access the Integra APIs through applications like Postman.

    Note: Once the token expires, you would need to generate a new access token.

URL	https://portal.minerva.integracloud.com/integra/Oauth2/oauth2Login?provider=idx
Method	POST
Headers	Content-Type: application/x-www-form-urlencoded
Response Code	200 Ok

Response Payload	{
	  "access_token": "eyJhbGciOiJSUzI1NiIsImtpZCI6InB1YmxpM",
	  "expires_in": 899,
	  "id_token": "eyJhbGciOiJSUzI1NiIsImtpZCIRgB-op15N9jOdr5sgkAtrSw",
	  "refresh_token": "nLtP_ZTEdz7QC16yVHZxfQMpWp6C-a7n4dC7Rcy__",
	  "scope": "openid offline",
	  "token_type": "bearer"
	}

Error Codes	401: Unauthorized 400: Bad Request 500: Internal Server Error

API to Fetch Patient ID

Overview

To uniquely identify a patient, a user needs to provide the patient demographic details like Gender + DOB + Mobile number to uniquely identify a patient.

The API will return a bundle of all patients (possibly zero) matching the search criteria. Only patients for which the user has been authorized access will be included in the results. Each patient returned in the search results is assigned a unique patient ID that can be found in the Patient.id element of the corresponding Patient resource. This patient ID can be included in subsequent requests to retrieve additional resources for that specific patient.

Combination of Search Parameters
Gender + DOB + Mobile
Gender + DOB + Email
Given name + Gender + DOB + Mobile
Given Name + Gender + DOB + Email

Example

To retrieve a bundle of patient resources to which the user is authorized, where the patient's last name is Steve and the patient was born on July 8, 1996, the request could be formatted as:
https://portal.minerva.integracloud.com/integra/fhir/r4/Patient?family=Steve&birthdate=1996-07-08

Name (Key)	Type	Description	Expression
birthdate	date	The patient's date of birth	Patient.birthDate
email	token	A value in an email contact	Patient.telecom.where (system='email')
gender	token	Gender of the patient	Patient.gender
phone	token	A value in a phone contact.	Patient.telecom.where (system='phone')
given	string	A portion of the given name of the patient	Patient.name.given

Configuration

URL	https://portal.minerva.integracloud.com/integra/fhir/r4/Patient?<key>=<value>				
Method	GET				
Headers	**Key**	**Value**	**Description**		**Required**
	Content-Type	application/json	The format in which the data is requested. **Default** – application/json		Optional
	Authorization	Bearer 96pkcpldem1vgejr	The Integra X-auth-token. **Format** – Bearer <integra-auth-token> Generation of access token		Required
Response Code	**200**				

Response Payload	
| | ```json
{
  "resourceType": "Patient",
  "id": "1",
  "identifier": [
    {
      "use": "usual",
      "system": "urn:oid:2.16.840.1.113883.2.4.6.3",
      "type": {
        "coding": [
          {
            "code": "MR"
          }
        ],
        "text": "MRN"
      },
      "value": "738472983"
    }
  ],
  "active": true,
  "name": [
    {
      "use": "usual",
      "family": "van de Heuvel",
      "given": [
        "Pieter"
      ],
      "suffix": [
        "MSc"
      ]
    }
  ],
  "telecom": [
    {
      "system": "phone",
      "value": "0648352638",
      "use": "mobile"
    },
    {
      "system": "email",
      "value": "p.heuvel@gmail.com",
      "use": "home"
    }
  ],
  "gender": "male",
  "birthDate": "1944-11-17",
  "deceasedBoolean": false,
  "address": [
``` |

```
    {
      "use": "home",
      "line": [
        "Van Egmondkade 23"
      ],
      "city": "Amsterdam",
      "postalCode": "1024 RJ",
      "country": "NLD"
    }
  ],
  "maritalStatus": {
    "coding": [
      {
        "system": "http://terminology.hl7.org/CodeSystem/v3-MaritalStatus",
        "code": "M",
        "display": "Married"
      }
    ],
    "text": "Getrouwd"
  },
  "multipleBirthBoolean": true,
  "contact": [
    {
      "relationship": [
        {
          "coding": [
            {
              "system": "http://terminology.hl7.org/CodeSystem/v2-0131",
              "code": "C"
            }
          ],
          "text": "Emergency Contact"
        }
      ],
      "name": {
        "use": "usual",
        "family": "Abels",
        "given": [
          "Sarah"
        ]
      },
      "telecom": [
        {
          "system": "phone",
          "value": "0690383372",
          "use": "mobile"
        }
      ]
```

```
      }
    ],
    "communication": [
      {
        "language": {
          "coding": [
            {
              "system": "urn:ietf:bcp:47",
              "code": "en-us",
              "display": "American English"
            }
          ],
          "text": "American English"
        },
        "preferred": true
      }
    ],
    "managingOrganization": {
      "reference": "Organization/1"
    }
}
```

URL	https://portal.minerva.integracloud.com/integra/fhir/r4/us-core/patient?<key>=<value>			
Method	GET			
Headers	**Key**	**Value**	**Description**	**Required**
	Content-Type	application/json	The format in which the data is requested. **Default** – application/json	Optional
	Authorization	Bearer 96pkcpldem1vgejr	The Integra X-auth-token. **Format** – Bearer <integra-auth-token> GenerateAccessToken	Required
Response Code	**200**			

| **Response Payload** | ```json
{
  "identifier": [
    {
      "system": "SSN",
      "use": "secondary",
      "type": {
        "coding": [
          {
            "code": "SB"
          }
        ],
        "text": "Social Security number"
      },
      "value": "260686207"
    },
    {
      "system": "202",
      "use": "usual",
      "type": {
        "coding": [
          {
            "code": "MR"
          }
        ],
        "text": "patientId"
      },
      "value": "354219"
    }
  ],
  "extension": [
    {
      "extension": [
        {
          "valueCoding": {
            "system": "urn:oid:2.16.840.1.113883.6.238",
            "code": "2106-3",
            "display": "White"
          },
          "url": "ombCategory"
        },
        {
          "valueCoding": {
            "system": "urn:oid:2.16.840.1.113883.6.238",
            "code": "2108-9",
            "display": "White European"
          },
          "url": "detailed"
``` |

```json
          },
          {
            "valueString": "White",
            "url": "text"
          }
        ],
        "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-race"
      },
      {
        "extension": [
          {
            "valueCoding": {
              "system": "urn:oid:2.16.840.1.113883.6.238",
              "code": "2135-2",
              "display": "Hispanic or Latino"
            },
            "url": "ombCategory"
          },
          {
            "valueCoding": {
              "system": "urn:oid:2.16.840.1.113883.6.238",
              "code": "2165-9",
              "display": "South American"
            },
            "url": "detailed"
          },
          {
            "valueString": "Hispanic or Latino",
            "url": "text"
          }
        ],
        "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-ethnicity"
      },
      {
        "valueCode": "M",
        "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-birthsex"
      }
    ],
    "address": [
      {
        "city": "STATESBORO",
        "use": "home",
        "line": [
          "6 ADRIAN COURT"
        ],
        "postalCode": "30458",
        "text": "6 ADRIAN COURT, STATESBORO, Ganja, 30458",
        "state": "GA"
```

```json
        },
        {
          "country": "IND",
          "city": "ANANTA PURA",
          "use": "old",
          "postalCode": "515002",
          "text": "ANANTA PURA  29 515002 IND",
          "state": "29"
        }
      ],
      "gender": "male",
      "active": true,
      "birthDate": "1943-06-19",
      "deceasedBoolean": false,
      "managingOrganization": {
        "reference": "Organization/29489611536",
        "display": "Organization"
      },
      "meta": {
        "lastUpdated": "2021-01-28T14:38:18.206+05:30",
        "versionId": "9",
        "profile": [
          "http://hl7.org/fhir/us/core/StructureDefinition/us-core-patient"
        ]
      },
      "contact": [
        {
          "name": {
            "given": [
              "NICHOLS"
            ],
            "use": "usual",
            "text": "NICHOLS LOIS",
            "family": "LOIS"
          },
          "telecom": [
            {
              "extension": [
                {
                  "valueString": "+1",
                  "url": "http://hl7.org/fhir/StructureDefinition/contactpoint-area"
                }
              ],
              "system": "phone",
              "use": "mobile",
              "value": "(912)294-0948"
            }
          ],
```

```
          "relationship": [
            {
              "text": "SPOUSE"
            }
          ]
        }
      ],
      "generalPractitioner": [
        {
          "reference": "Practitioner/15768103329",
          "display": "Practitioner"
        }
      ],
      "name": [
        {
          "given": [
            "GEORGE"
          ],
          "use": "usual",
          "text": "GEORGE NICHOLS",
          "family": "NICHOLS"
        },
        {
          "given": [
            "GEORGE J"
          ],
          "use": "usual",
          "text": "GEORGE J NICHOLS",
          "family": "NICHOLS"
        },
        {
          "given": [
            "John"
          ],
          "use": "old",
          "text": "John Doe",
          "family": "Doe"
        }
      ],
      "telecom": [
        {
          "extension": [
            {
              "valueString": "+1",
              "url": "http://hl7.org/fhir/StructureDefinition/contactpoint-area"
            }
          ],
          "system": "phone",
```

```
          "use": "mobile",
          "value": "(912)294-1514"
        },
        {
          "system": "other",
          "value": "(912)294-1514"
        }
      ],
      "id": "110318733539",
      "maritalStatus": {
        "text": "M"
      },
      "resourceType": "Patient"
    }
```

Response Code – 400 Bad Request example

An invalid parameter in search request will result into 400 Bad Request HTTP error code with an Operation Outcome response payload indicating the wrong parameters passed in the request.

For the list of valid search parameters, refer the Query Parameter section in the Resource documents.

URL	https://portal.minerva.integracloud.com/integra/fhir/r4/us-core/patient?pat=Integra or https://portal.minerva.integracloud.com/integra/fhir/r4/patient?pat=Integra
Method	GET
Headers	**Content-Type**: application/fhir+json **Authorization**: Bearer 96pkcpldem1vgejr
Response Code	400 Bad Request

Response Payload	```{
	  "issue": [
	    {
	      "severity": "error",
	      "diagnostics": "INVALID_SEARCH_PARAMETER : pat, ",
	      "code": "exception"
	    }
	  ],
	  "text": {
	    "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\"><h1>Operation Outcome</h1><table border=\"0\"><tr><td style=\"font-weight: bold;\">ERROR</td><td>[]</td><td><pre>INVALID_SEARCH_PARAMETER : pat, </pre></td></tr></table></div>",
	    "status": "generated"
	  },
	  "resourceType": "OperationOutcome"
	}```

Response Code – 403 Forbidden example

While performing search using the parameters that have a specified value set (such as status), if a value beyond the specified value set is used, server returns 403 Forbidden HTTP response code with Operation Outcome response payload indicating the invalid parameter used.

URL	https://portal.minerva.integracloud.com/integra/fhir/r4/Patient?gender=xyz or https://portal.minerva.integracloud.com/integra/fhir/r4/us-core/Patient?gender=xyz
Method	GET
Headers	Content-Type: application/fhir+json Authorization: Bearer 96pkcpldem1vgejr
Response Code	403 Forbidden

Response Payload	<pre>{
	  "issue": [
	    {
	      "severity": "error",
	      "diagnostics": "INVALID_SEARCH_PARAMETER: for key [gender]",
	      "code": "exception"
	    }
	  ],
	  "text": {
	    "div": "<div xmlns=\"http://www.w3.org/1999/xhtml\"><h1>Operation Outcome</h1><table border=\"0\"><tr><td style=\"font-weight: bold;\">ERROR</td><td>[]</td><td><pre>INVALID_SEARCH_PARAMETER: for key [gender]</pre></td></tr></table></div>",
	    "status": "generated"
	  },
	  "resourceType": "OperationOutcome"
	}</pre>

401	Unauthorized

API to View Patient Data in CCDA Format

Overview

The patient data can be retrieved by specifying a specific patient ID or by performing a search as mentioned in previous section "Fetching Patient ID". The resource types can be accessed for a specific patient as a Bundle of resources by performing a search by resource type or by patient compartment and specifying the patient ID in the request. For example, to retrieve a bundle of Immunization resources containing all available immunization history for Patient 123, the request could be formatted as:
https://portal.minerva.integracloud.com/Immunization?/Immunization?patient=123

Supports the following [USCDI](#) data classes:

- Allergies and Intolerances

- Assessment and Plan of Treatment

- Care Team Members

- Clinical Notes

- Goals

- Health Concerns

- Immunizations

- Laboratory

- Medications

- Patient Demographics

- Problems

- Procedures

- Provenance

- Smoking Status

- Unique Device Identifier(s) for a Patient's Implantable Device(s)

- Vital Signs

- Functional and mental status

- Family History and Social History, Vital Signs, Unique Device Identifier(s) for a Patient's Implantable Device(s),

To view the patient data in CCD format:

1. Generate an access token to get access to the API. See [Generation of access token](#).

2. Use the access token to initiate the kick-off request.

   POST https://portal.minerva.integracloud.com/integra/MoBulkExport/createBulkExportRequest

3. Using the retrieved access token, generate a nonce token.

   POST https://portal.minerva.integracloud.com/integra/moNonce/generateNonceToken

   Note: Nonce token is for one time use.

4. Use the nonce token and request ID retrieved in response of kick-off request to download the CCD file.

   GET
   https://portal.minerva.integracloud.com/integra/MoBulkDownload/bulkDownload?id=<requestId>&nonceToken=<noncetoken>

5. If you are using Postman, then click **Send and Download** in Postman to download the CCD files. For each encounter a separate file is generated.

Kick-off Request

URL	https://portal.minerva.integracloud.com/ integra/MoBulkExport/createBulkExportRequest
Method	POST
Headers	**Content-Type**: application/json **api-info**: V1|appVerson|deviceBrand|deviceModel|deviceScreenResolution|deviceOs|deviceOsVersion|deviceNetworkProvider|deviceNetworkType **x-auth-token**: <Access_Token>
Parameters	<table><tr><th>Parameter</th><th>Data Type</th><th>Required</th><th>Details</th></tr><tr><td>patientId</td><td>String</td><td>Yes</td><td>Patient identifier</td></tr><tr><td>startDate</td><td>String</td><td>Optional</td><td>Date { YYYY-MM-DDT00:00:00.000+500 }</td></tr><tr><td>endDate</td><td>String</td><td>Optional</td><td>Date { YYYY-MM-DDT00:00:00.000+500 }</td></tr><tr><td>actionName</td><td>String</td><td>Yes</td><td>ENCOUNTER_EXPORT</td></tr><tr><td>searchCriteria</td><td>JSON</td><td>Yes</td><td></td></tr><tr><td>constraints</td><td>JSON</td><td>Yes</td><td></td></tr></table>
| Request Payload | ```json
{
  "actionName": "ENCOUNTER_EXPORT",
  "searchCriteria": {
    "constraints": {
      "startDate": "2012-01-01T00:00:00.000+0500",
      "endDate": "2012-01-02T00:00:00.000+0500",
      "patientId": "12900876000"
    }
  }
}
``` |
| Response Code | **200** |

Response Payload	Response Code: 200
	
	{
	    "status": true,
	    "message": "Your request is in progress",
	    "code": "BESR01",
	    "responseStatus": 200,
	    "bulkActionRequest": "609cf685d5de49ec5014d6de"
	}

Error Codes	400, 401

Error Response Payload	When user tries to create another request and the previous request is either pending or processing (i.e. Duplicate Request) with the same user
	Response Code: 400
	
	{
	    "status": false,
	    "message": "Last request is already in process",
	    "code": "BEDR01",
	    "responseStatus": 400,
	    "bulkActionRequest": "609cff50d5de49ec5014dcdb"
	}

Error Response Payload	When user hit the API without the mandatory key "searchCriteria" in the request body
	
	Response Code: 400
	
	{
	    "status": false,
	    "message": "Bad Request",
	    "code": "400",
	    "responseStatus": 400
	}

Generate a nonce token

URL	https://portal.minerva.integracloud.com/integra/moNonce/generateNonceToken
Method	POST
Headers	**Content-Type**: application/json **api-info**: V1|appVerson|deviceBrand|deviceModel|deviceScreenResolution|deviceOs|deviceOsVersion|deviceNetworkProvider|deviceNetworkType **x-auth-token**: <Access_Token>
Parameters	
Request Payload	{}
Response Code	Response Code: 200

Response Payload	{
	    "nonceToken": "HISN262NJ66NDUH"
	}

Error Code	401

Error Response Payload	In case the authentication token is expired, missing or incorrect
	Response Status: 401
	\<html\>
	\<head\>
	       \<title\>Apache Tomcat/7.0.55 - Error report\</title\>
	       \<style\>
	          \<!--H1 {font-family:Tahoma,Arial,sans-serif;color:white;background-color:#525D76;font-size:22px;} H2 {font-family:Tahoma,Arial,sans-serif;color:white;background-color:#525D76;font-size:16px;} H3 {font-family:Tahoma,Arial,sans-serif;color:white;background-color:#525D76;font-size:14px;} BODY {font-family:Tahoma,Arial,sans-serif;color:black;background-color:white;} B {font-family:Tahoma,Arial,sans-serif;color:white;background-color:#525D76;} P {font-family:Tahoma,Arial,sans-serif;background:white;color:black;font-size:12px;}A {color : black;}A.name {color : black;}HR {color : #525D76;}
	          -->
	       \</style\>
	\</head\>
	\<body\>
	       \<h1\>HTTP Status 401 - Access Denied\</h1\>
	       \<HR size="1" noshade="noshade"\>
	       \<p\>\<b\>type\</b\> Status report\</p\>
	       \<p\>\<b\>message\</b\> \<u\>Access Denied\</u\>\</p\>
	       \<p\>\<b\>description\</b\> \<u\>This request requires HTTP authentication.\</u\>\</p\>
	       \<HR size="1" noshade="noshade"\>
	       \<h3\>Apache Tomcat/7.0.55\</h3\>
	\</body\>
	\</html\>

List of US Core FHIR Resources

Developer can access the following list of US Core FHIR APIs. The guides to access and use these mentioned APIs are given in reference link.

Resource	Link
US Core AllergyIntolerance Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-allergyintolerance.html
US Core CarePlan Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-careplan.html
US Core CareTeam Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-careteam.html
USCoreConditionCode	https://www.hl7.org/fhir/us/core/SearchParameter-us-core-condition-code.html
US Core DiagnosticReport Profile for Laboratory Results Reporting	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-diagnosticreport-lab.html
US Core DiagnosticReport Profile for Report and Note Exchange	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-diagnosticreport-note.html
US Core DocumentReference Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-documentreference.html
US Core Encounter Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-encounter.html
US Core Goal Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-goal.html
US Core Immunization Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-immunization.html
US Core Implantable Device Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-implantable-device.html
US Core Laboratory Result Observation Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-observation-lab.html
US Core Location Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-location.html
US Core Medication Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-medication.html
US Core MedicationRequest Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-medicationrequest.html
US Core Organization Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-organization.html
US Core Patient Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-patient.html
US Core Pediatric BMI for Age Observation Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-pediatric-bmi-for-age.html
US Core Pediatric Head Occipital-frontal Circumference Percentile Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-head-occipital-frontal-circumference-percentile.html
US Core Pediatric Weight for Height Observation Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-pediatric-weight-for-height.html
US Core Practitioner Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-practitioner.html

Resource	Link
US Core PractitionerRole Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-practitionerrole.html
US Core Procedure Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-procedure.html
US Core Provenance Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-provenance.html
US Core Pulse Oximetry Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-pulse-oximetry.html
US Core Smoking Status Observation Profile	https://www.hl7.org/fhir/us/core/StructureDefinition-us-core-smokingstatus.html

List of FHIR R4 APIs

Resource	Link
AllergyIntolerance	https://www.hl7.org/FHIR/R4/AllergyIntolerance.html
Account	https://www.hl7.org/FHIR/R4/account.html
Appointment	https://www.hl7.org/FHIR/R4/Appointment.html
CarePlan	https://www.hl7.org/FHIR/R4/careplan.html
CareTeam	https://www.hl7.org/FHIR/r4/careteam.html
ClinicalImpression	https://www.hl7.org/FHIR/R4/ClinicalImpression.html
Condition	https://www.hl7.org/FHIR/R4/Condition.html
Coverage	https://www.hl7.org/FHIR/R4/Coverage.html
DeviceRequest	https://www.hl7.org/FHIR/R4/DeviceRequest.html
Device	https://www.hl7.org/FHIR/R4/Device.html
DiagnosticReport	https://www.hl7.org/FHIR/R4/DiagnosticReport.html
DocumentReference	https://www.hl7.org/FHIR/R4/DocumentReference.html
Encounter	https://www.hl7.org/FHIR/R4/Encounter.html
FamilyMemberHistory	https://www.hl7.org/FHIR/R4/FamilyMemberHistory.html
Goal	https://www.hl7.org/FHIR/R4/Goal.html
Immunization	https://www.hl7.org/FHIR/R4/Immunization.html
Location	https://www.hl7.org/FHIR/R4/Location.html
Medication	https://www.hl7.org/FHIR/R4/Medication.html
MedicationRequest	https://www.hl7.org/FHIR/R4/MedicationRequest.html
Observation	https://www.hl7.org/FHIR/R4/observation.html
Organization	https://www.hl7.org/FHIR/R4/Organization.html
Patient	https://www.hl7.org/FHIR/R4/patient.html
Practitioner	https://www.hl7.org/FHIR/R4/practitioner.html
PractitionerRole	https://www.hl7.org/FHIR/R4/practitionerrole.html
Procedure	https://www.hl7.org/FHIR/R4/Procedure.html
Provenance	https://www.hl7.org/FHIR/r4/provenance.html
RelatedPerson	https://www.hl7.org/FHIR/r4/relatedperson.html
ServiceRequest	https://www.hl7.org/FHIR/R4/ServiceRequest.html
Task	https://www.hl7.org/FHIR/R4/Task.html

 IntegraConnect

Bulk Export

Overview

The Bulk Export feature allows data to be exported from the FHIR Server per the FHIR specification.

Types of Bulk Export Requests:

- **All data patient** - [FHIRbase server]/patient/$export (All patient)
- **All data on a group of patients** - [FHIRbase server]/group/groupid/$export e.g., on patient between age 5 to 35 years.
- **Getting FHIR data server** (export at a base level instead of patient-level) - Performs FHIR bulk export at system level.

When data is exported, a separate file is created for each resource type. To ensure that the exported files don't become too large. A new file is created after a single file reaches 10,000 lines of record. The result is that you may get multiple files for each resource type, which will be enumerated as (resourcename_file_1.ndjson, resourcename _file_2.ndjson).

To initiate the bulk export, user must first get the access token to access the bulk FHIR APIs.

Get access token for bulk export

Application uses SMART Backend Services Authorization to secure bulk data request. In each session, the client creates a signed token request using its private key and a client id pre-assigned by the server. The server verifies this request with the client's public key and issues a short-lived access token for use in the API requests. When the access token expires, the process is repeated.

To get the access token a user would have to reach out to Product Support at ProductSupport@integraconnect.com along with the following details:

- Application Name
- Scope
- Public Key or JWKS URL
- Use Case
- Email address

Integra team will share the Client ID, which can be further used to get the access token using API.

Access Token API: https://portal.minerva.integracloud.com/integra/fhir/oauth2/token?provider=idx

Algorithm Supported: Integra supports RS384 and ES384 algorithm only.

Request Payload

scope
client_assertion
client_assertion_type
grant_type

Query parameters

Query Parameter	Optionality	Type	Description
_outputFormat	optional	String	The format for the requested bulk data files to be generated. **Defaults to application/fhir%2Bndjson** (application/fhir+ndjson).
_since	optional	FHIR instant	Allows you to export only resources that have been modified since the time provided
_type	optional	string of comma-delimited FHIR resource types	Allows you to specify which types of resources will be included. For example, _type=Observation would return only observation resource

Supported resources

AllergyIntolerance, CarePlan, CareTeam, Condition, Device, DiagnosticReport, DocumentReference, Encounter, Goal, Immunization, Location, Medication, MedicationRequest, Observation, Organization, Patient, Practitioner, PractitionerRole, Procedure, and Provenance.

Access Bulk Export API

A user invokes $export the operation to initiate the request. This can be done using either an HTTP GET method request with export request parameters:

- https://portal.minerva.integracloud.com/integra/fhir-export/r4/bulkExport/Patient/$export

- https://portal.minerva.integracloud.com/integra/fhir-export/r4/bulkExport/Group/{id}/$export

    - Supported Group IDs:

Group IDs	Description
275131468	Age between 5 and 18 years
383681350	Age between 18 and 35 years
424548118	Age between 35 and 55 years
517483350	Age greater than 55 years
187419279	Age less than 5 years

- https://portal.minerva.integracloud.com/integra/fhir-export/r4/bulkExport/$export

Supported request header

- Authorization = Bearer {token}

- Accept=application/fhir+json

- Prefer=respond-async

In response to the API the user will receive the Content location URL using which user can further make request to get the status of the latest response of the APIs.

Content Location URL: Indicates the URL that may be used to request an update on the status of the background job.

Error codes

Status	Description
202	Server has successfully received the request and has scheduled a background job that will assemble the Bulk Export payload.
400	Invalid search parameter
500	Internal Server Error
401	Unauthorized access

Content URL

User can further hit the Content-Location URL to get the following response:

- In progress

- Error

- Complete

Note: If a same request is initiated instead of receiving a new request, you will be given the URL of the previously stored request as per the matching criteria defined as follows.

Matching Criteria: User ID, Status in Pending or Processing and, Request type (Patient level | Group level | System Export)

Request header for content status

- **Authorization**: Bearer {token}

- **Response Body**: OperationOutcome response

- **Response Headers**: Content-Type

Response header

- In case of 202 accepted it will receive Content-Location.

- Once the request has been initiated, user can further use the Content Location URL to poll for status request.

- **URL**: https://portal.minerva.integracloud.com/integra/fhir-export/r4/bulkExport/{bulkActionRequestId}

- The Status response can be:

  - InProgress

    - Status e.g., 202 Accepted

    - If status is 202 accepted; X-Progress (In-Progress)

  - Error:

Status	Description
500	Internal Server Error
401	Unauthorized access
404	URL Invalid

- Complete

  When the server has completed fetching the export files, the same content URL request will return a response as follows. The response is a list of files that were fetched by the export job.

  Note: For each resource a single unique file will be generated, for a resource if it exceeds of total 10,000 records, a new file will be generated for the same resource.

Sample response body for Complete status: Response Code 200

```
{
  "transactionTime": "2021-04-06T08:26:23.244Z",
  "request": "[base]/Patient/$export?_type=Patient,Observation",
  "requiresAccessToken": true,
  "output": [
    {
      "type": "Patient",
      "url": "
https://portal.minerva.integracloud.com/MoBulkDownload/downloadNDJSON?objectId=607d41896d70dd22f073459c&resource=Patient&fileName=patient_file_1.ndjson"
    },
    {
      "type": "Patient",
      "url": "
https://portal.minerva.integracloud.com/MoBulkDownload/downloadNDJSON?objectId=607d41896d70dd22f073459c&resource=Patient&fileName=patient_file_2.ndjson"
    },
    {
      "type": "Observation",
      "url": "
https://portal.minerva.integracloud.com/MoBulkDownload/downloadNDJSON?objectId=607d41896d70dd22f073459c&resource=Observation&fileName=observation_file_1.ndjson"
    }
  ],
  "error": [
    {
      "type": "OperationOutcome",
      "url":
"/MoBulkDownload/downloadNDJSON?objectId=607d41896d70dd22f073459c&resource=OperationOutcome&fileName=error_file_1.ndjson"
    }
  ]
}
```

Delete API

Request URL	https://portal.minerva.integracloud.com/integra/fhir-export/r4/bulkExport/{bulkActionRequestId}
Method	Delete
Request Headers	Authorization = Bearer {token}
Response Payload	**Response Code**: 202 Accepted Response Body: None

Error Codes	Status	Description
	401	Unauthorized
	500	Internal server error

Download the ndjson file

To download the ndjson files, user would need to pass the URL generated in the complete status response along with the access token.

If the access token has already expired, user would need to repeat the process to generate the Bulk Export access token.

Request URL

https://portal.minerva.integracloud.com/MoBulkDownload/downloadNDJSON?objectId=607d31896d70re22f074459c&resource=OperationOutcome&fileName=error_file_1.ndjson" + Access Token

Request header

x-auth-token

Error response

Status	Description
401	Unauthorized
500	Internal Server Error
403	ATTACHMENT_FILE_NOT_FOUND
400	Bad Request

Note: The URL received in the complete status response will expire in 48 hrs. from the time files are generated. The files will also be auto deleted post 48 hours of time period.

Note: For any URL if pipe Separator (|) is defined, it is required to encode the URL along with the + operator.

SMART on FHIR

SMART on FHIR API is an open standards-based API that allows developers to create an app that runs anywhere in the healthcare system. It represents an open, standardized, and practical means of exchanging data among EHRs, health system sites, and data sources.

Client registration for SMART application

Supported launch frameworks

- Standalone Launch

- EHR Launch Application

For Standalone or EHR launch application, developers need to submit a request to Product Support at ProductSupport@integraconnect.com.

Note: If the application supports multiple linked patients to the user, launch/scope must be passed in the application to display the patient listing. Open ID and offline access are default required to register an application.

Application supports the following authentication methods:

- client secret post (confidential client)

- client secret basic (confidential client)

- none (For Public client)

- private key jwt (Bulk export)

Post-client registration developer users need to configure the application using a shared client ID and secret (for confidential app only) along the scope.