

Artículo

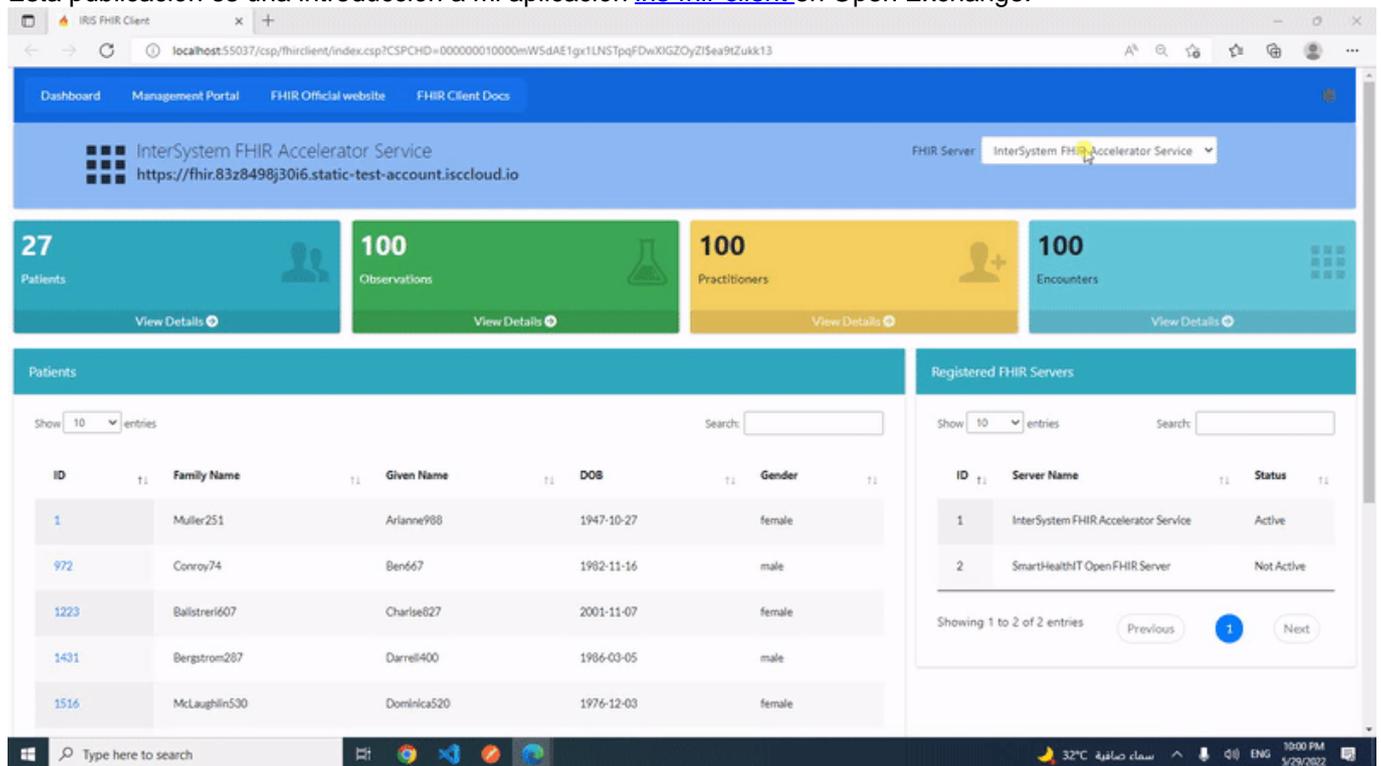
[Muhammad Waseem](#) · 1 jun, 2022 Lectura de 3 min

[Open Exchange](#)

Cliente FHIR para conectar, mediante Python Embebido, cualquier servidor FHIR abierto

¡Hola comunidad!

Esta publicación es una introducción a mi aplicación [iris-fhir-client](#) en Open Exchange.



Usando Python embebido y con la ayuda de la librería [fhirpy](#), [iris-fhir-client](#) puede conectarse a cualquier servidor FHIR abierto.

Obten información de recursos por terminal y mediante el uso de la aplicación web CSP.

Ver y activar servidores registrados

Conéctate a la terminal IRIS

```
docker-compose exec iris iris session iris
```

La aplicación registrará InterSystems FHIR Accelerator Service y SmartHealthIT Open FHIR Server de manera predeterminada y ambos estarán listos para ser usados.

Usa el siguiente comando para enumerar los servidores registrados

```
do ##class(dc.FhirClient).ServerList()
```

```
USER>do ##class(dc.FhirClient).ServerList()
-----
Registered FHIR Servers
-----
ID          1
Name        InterSystem FHIR Accelerator Service
EndPoint    https://fhir.83z8498j30i6.static-test-account.isccloud.io
ApiKey
EPOAuth2
ISActive    Active
-----
ID          2
Name        SmartHealthIT Open FHIR Server
EndPoint    https://r4.smarthealthit.org
ApiKey
EPOAuth2
ISActive    Not Active
-----
```

InterSystems FHIR Accelerator Service está activo. Para seleccionar SmartHealthIT Open FHIR Server, usa la función SetFhirServer de la clase dc.FhirClient pasando la ID del servidor

```
do ##class(dc.FhirClient).SetFhirServer(2)
```

Servidores FHIR registrados

Para registrar un nuevo servidor, utiliza la función RegisterServer() de la clase dc.FhirClient
`class(dc.FhirClient).RegisterServer("Server Name","Endpoint","ApiKey"[opcional],"EndpointOAuth"[opcional])`

```
do ##class(dc.FhirClient).RegisterServer("INTERSYSTEMS FHIR Server","http://localhost:52773/csp/healthshare/samples/fhir/r4/","", "")
```

```
USER>do ##class(dc.FhirClient).RegisterServer("INTERSYSTEMS FHIR Server","http://localhost:52773/csp/healthshare/samples/fhir/r4/","","")
FHIR Server registered successfully
USER>do ##class(dc.FhirClient).ServerList()
-----
Registered FHIR Servers
-----
ID          1
Name        InterSystem FHIR Accelerator Service
EndPoint    https://fhir.83z8498j30i6.static-test-account.iscloud.io
ApiKey
EPOAuth2
ISActive    Active
-----
ID          2
Name        SmartHealthIT Open FHIR Server
EndPoint    https://r4.smarthealthit.org
ApiKey
EPOAuth2
ISActive    Not Active
-----
ID          3
Name        INTERSYSTEMS FHIR Server
EndPoint    http://localhost:52773/csp/healthshare/samples/fhir/r4/
ApiKey
EPOAuth2
ISActive    Not Active
-----
```

Obtener recursos de los servidores FHIR

Para recuperar todos los recursos para el servidor actual, utiliza el método ListResources() de la clase dc.FhirClient

```
do ##class(dc.FhirClient).ListResources()
```

```
USER>do ##class(dc.FhirClient).ListResources()
Account CoverageEligibilityResponse ImmunizationRecommendation OperationDefinition Substance
ActivityDefinition DetectedIssue ImplementationGuide Organization SubstanceSpecification
AdverseEvent Device InsurancePlan OrganizationAffiliation SupplyDelivery
AllergyIntolerance DeviceDefinition Invoice Patient SupplyRequest
Appointment DeviceMetric Library PaymentNotice Task
AppointmentResponse DeviceRequest Linkage PaymentReconciliation TerminologyCapabilities
AuditEvent DeviceUseStatement List Person TestReport
Basic DiagnosticReport Location PlanDefinition TestScript
Binary DocumentManifest Measure Practitioner ValueSet
BodyStructure DocumentReference MeasurementReport PractitionerRole VerificationResult
Bundle EffectEvidenceSynthesis Media Procedure VisionPrescription
CapabilityStatement Encounter Medication Provenance
CarePlan Endpoint MedicationAdministration Questionnaire
CareTeam EnrollmentRequest MedicationDispense QuestionnaireResponse
ChargeItem EnrollmentResponse MedicationKnowledge RelatedPerson
ChargeItemDefinition EpisodeOfCare MedicationRequest RequestGroup
Claim EventDefinition MedicationStatement ResearchDefinition
ClaimResponse Evidence MedicinalProduct ResearchElementDefinition
ClinicalImpression EvidenceVariable MedicinalProductAuthorization ResearchStudy
CodeSystem ExampleScenario MedicinalProductContraindication ResearchSubject
Communication ExplanationOfBenefit MedicinalProductIndication RiskAssessment
CommunicationRequest FamilyMemberHistory MedicinalProductInteraction RiskEvidenceSynthesis
CompartmentDefinition Flag MedicinalProductPackaged Schedule
Composition Goal MedicinalProductPharmaceutical SearchParameter
ConceptMap GraphDefinition MedicinalProductUndesirableEffect ServiceRequest
Condition Group MessageDefinition Slot
Consent GuidanceResponse MessageHeader Specimen
Contract HealthcareService MolecularSequence SpecimenDefinition
Coverage ImagingStudy NamingSystem StructureDefinition
CoverageEligibilityRequest Immunization NutritionOrder StructureMap
CoverageEligibilityResponse ImmunizationEvaluation Observation Subscription
```

Para obtener el contador de recursos de cualquier recurso, usa el método CountResource() pasando Resource de

dc.FhirClient.

El siguiente comando obtendrá el contador de recursos del paciente contra el servidor FHIR activo

```
set count = ##class(dc.FhirClient).CountResource("Patient")
write count
```

Para recuperar todos los recursos creados junto con su recuento, simplemente pasa 1 a la función ListResource()

```
do ##class(dc.FhirClient).ListResources(1)
```

```
USER>do ##class(dc.FhirClient).ListResources(1)
AllergyIntolerance:9
CarePlan:59
CareTeam:59
Claim:100
Condition:100
DiagnosticReport:100
Encounter:100
ExplanationOfBenefit:100
Goal:49
ImagingStudy:6
Immunization:100
Location:1
MedicationRequest:100
Observation:100
Organization:100
Patient:27
Practitioner:100
Procedure:100
```

Para obtener detalles del recurso, usa `GetResource()` pasando `Resource` de la clase `dc.FhirClient`
El siguiente comando recuperará todos los pacientes del servidor FHIR activo

```
do ##class(dc.FhirClient).GetResource("Patient")
```

```
USER>do ##class(dc.FhirClient).GetResource("Patient")
  ID  Family Name      Given Name      DOB            Gender
----  -
  1   Muller251          Arianne988     1947-10-27    female
 972  Conroy74           Ben667          1982-11-16    male
1223  Balistreri607     Charise827     2001-11-07    female
1431  Bergstrom287     Darrell400     1986-03-05    male
1516  McLaughlin530    Dominica520    1976-12-03    female
1970  Kozey370          Donnell534     2009-09-17    male
2177  Almonte426        Elisa944        2001-01-27    female
2395  Waelchi213        Enrique929     1970-09-30    male
2592  Bednar518         Kenneth671     1958-06-24    male
2871  Steuber698        Kiera822       2019-03-06    female
3021  Schinner682       Lennie123      1947-03-04    female
3294  Durgan499         Lindsay928     1979-02-04    male
3432  Haley279          Logan497        1979-03-21    male
3558  Mueller846        Magaly973      1974-10-06    female
3963  Ratke343          Marcela739     2016-10-28    female
4122  Dibbert990        Mario764       1986-02-07    male
4379  FernÃ¡ndez399    Marisol435     1964-10-23    female
4908  Mayer370          Maryland870    2013-08-02    female
5166  Schumm995         Moises22       1962-10-17    male
5341  Schmidt332        Numbers230     1959-03-03    male
5637  Sanches349        RubÃ³n780      1946-06-28    male
6201  Franecki195       Sade71         1970-07-28    female
6591  Kuhlman484        Stevie682      2004-01-26    male
6805  Fisher429         Takako793      1977-02-14    female
7123  Peres371          Teodoro374     1946-06-28    male
7786  Upton904          Winnifred2     1987-03-09    female
8109  Donald            Duck           male
```

El siguiente comando recuperará todas las Observaciones del servidor FHIR activo

```
do ##class(dc.FhirClient).GetResource("Observation")
```

```
USER>do ##class(dc.FhirClient).GetResource("Observation")
```

ID	Category	Code	Value	UOM	Date	Patient
408	vital-signs	8302-2	174.1	cm	2010-08-30T11:59:49+00:00	Patient/1
409	vital-signs	72514-3	3	{score}	2010-08-30T11:59:49+00:00	Patient/1
410	vital-signs	29463-7	84.3	kg	2010-08-30T11:59:49+00:00	Patient/1
411	vital-signs	39156-5	27.81	kg/m2	2010-08-30T11:59:49+00:00	Patient/1
412	vital-signs	85354-9			2010-08-30T11:59:49+00:00	Patient/1
413	laboratory	2339-0	68.33	mg/dL	2010-08-30T11:59:49+00:00	Patient/1
414	laboratory	6299-2	17.31	mg/dL	2010-08-30T11:59:49+00:00	Patient/1
415	laboratory	38483-4	1.15	mg/dL	2010-08-30T11:59:49+00:00	Patient/1
416	laboratory	49765-1	8.89	mg/dL	2010-08-30T11:59:49+00:00	Patient/1
417	laboratory	2947-0	136.02	mmol/L	2010-08-30T11:59:49+00:00	Patient/1
418	laboratory	6298-4	4.99	mmol/L	2010-08-30T11:59:49+00:00	Patient/1
419	laboratory	2069-3	109.94	mmol/L	2010-08-30T11:59:49+00:00	Patient/1
420	laboratory	20565-8	21.06	mmol/L	2010-08-30T11:59:49+00:00	Patient/1
421	survey	72166-2			2010-08-30T11:59:49+00:00	Patient/1
422	laboratory	4548-4	6.23	%	2010-08-30T11:59:49+00:00	Patient/1
435	laboratory	2339-0	90.71	mg/dL	2011-05-11T11:59:49+00:00	Patient/1
436	laboratory	6299-2	13.99	mg/dL	2011-05-11T11:59:49+00:00	Patient/1
437	laboratory	38483-4	3.1234	mg/dL	2011-05-11T11:59:49+00:00	Patient/1
438	laboratory	49765-1	9.69	mg/dL	2011-05-11T11:59:49+00:00	Patient/1
439	laboratory	2947-0	141.28	mmol/L	2011-05-11T11:59:49+00:00	Patient/1
440	laboratory	6298-4	4.82	mmol/L	2011-05-11T11:59:49+00:00	Patient/1
441	laboratory	2069-3	105.23	mmol/L	2011-05-11T11:59:49+00:00	Patient/1
442	laboratory	20565-8	25.29	mmol/L	2011-05-11T11:59:49+00:00	Patient/1
443	laboratory	33914-3	68.715	mL/min	2011-05-11T11:59:49+00:00	Patient/1
444	laboratory	2885-2	79.415	g/dL	2011-05-11T11:59:49+00:00	Patient/1
445	laboratory	1751-7	5.0093	g/dL	2011-05-11T11:59:49+00:00	Patient/1
446	laboratory	10834-0	2.8258	g/L	2011-05-11T11:59:49+00:00	Patient/1
447	laboratory	1975-2	0.16126	mg/dL	2011-05-11T11:59:49+00:00	Patient/1

Obtener recursos de los servidores FHIR para un paciente en particular

El siguiente comando recuperará los detalles de las Observaciones contra Patient ID 1 del servidor FHIR activo

```
do ##class(dc.FhirClient).GetPatientResources("Observation", "1")
```

```

USER>do ##class(dc.FhirClient).GetPatientResources("Observation","1")
    ID  Category      Code      Value  UOM      Date      Patient
-----
408  vital-signs  8302-2    174.1  cm       2010-08-30T11:59:49+00:00  Patient/1
409  vital-signs  72514-3    3      {score}  2010-08-30T11:59:49+00:00  Patient/1
410  vital-signs  29463-7    84.3   kg       2010-08-30T11:59:49+00:00  Patient/1
411  vital-signs  39156-5    27.81  kg/m2    2010-08-30T11:59:49+00:00  Patient/1
412  vital-signs  85354-9                    2010-08-30T11:59:49+00:00  Patient/1
413  laboratory  2339-0     68.33  mg/dL    2010-08-30T11:59:49+00:00  Patient/1
414  laboratory  6299-2     17.31  mg/dL    2010-08-30T11:59:49+00:00  Patient/1
415  laboratory  38483-4    1.15   mg/dL    2010-08-30T11:59:49+00:00  Patient/1
416  laboratory  49765-1    8.89   mg/dL    2010-08-30T11:59:49+00:00  Patient/1
417  laboratory  2947-0    136.02  mmol/L   2010-08-30T11:59:49+00:00  Patient/1
418  laboratory  6298-4     4.99   mmol/L   2010-08-30T11:59:49+00:00  Patient/1
419  laboratory  2069-3    109.94  mmol/L   2010-08-30T11:59:49+00:00  Patient/1
420  laboratory  20565-8    21.06  mmol/L   2010-08-30T11:59:49+00:00  Patient/1
421  survey      72166-2                    2010-08-30T11:59:49+00:00  Patient/1
422  laboratory  4548-4     6.23   %        2010-08-30T11:59:49+00:00  Patient/1
435  laboratory  2339-0     90.71  mg/dL    2011-05-11T11:59:49+00:00  Patient/1
436  laboratory  6299-2    13.99   mg/dL    2011-05-11T11:59:49+00:00  Patient/1
437  laboratory  38483-4    3.1234 mg/dL    2011-05-11T11:59:49+00:00  Patient/1
438  laboratory  49765-1    9.69   mg/dL    2011-05-11T11:59:49+00:00  Patient/1
439  laboratory  2947-0    141.28  mmol/L   2011-05-11T11:59:49+00:00  Patient/1
440  laboratory  6298-4     4.82   mmol/L   2011-05-11T11:59:49+00:00  Patient/1
441  laboratory  2069-3    105.23  mmol/L   2011-05-11T11:59:49+00:00  Patient/1
442  laboratory  20565-8    25.29  mmol/L   2011-05-11T11:59:49+00:00  Patient/1
443  laboratory  33914-3    68.715 mL/min   2011-05-11T11:59:49+00:00  Patient/1
444  laboratory  2885-2     79.415 g/dL    2011-05-11T11:59:49+00:00  Patient/1
    
```

Ver información del servidor FHIR desde la aplicación web CSP

Ir a <http://localhost:55037/csp/fhirclient/index.csp>

La página Index (Índice) mostrará el recuento de pacientes, observaciones, médicos y encuentros del servidor activo junto con los detalles del paciente y de los servidores registrados

The screenshot shows the InterSystem FHIR Accelerator Service web application. At the top, there is a navigation bar with links for Dashboard, Management Portal, FHIR Official website, and FHIR Client Docs. Below this is a header area with the service name and a dropdown menu for the FHIR Server. The main content area features four summary cards: Patients (27), Observations (100), Practitioners (100), and Encounters (100). Below these cards, there are two main sections: 'Patients' and 'Registered FHIR Servers'. The 'Patients' section displays a table with columns for ID, Family Name, Given Name, DOB, and Gender. The 'Registered FHIR Servers' section displays a table with columns for ID, Server Name, and Status.

ID	Family Name	Given Name	DOB	Gender
1	Muller251	Ariane988	1947-10-27	female
972	Conroy74	Ben667	1982-11-16	male
1223	Balistreri607	Charise827	2001-11-07	female
1431	Bergstrom287	Darrell400	1986-03-05	male
1516	McLaughlin530	Dominica520	1976-12-03	female

ID	Server Name	Status
1	InterSystem FHIR Accelerator Service	Active
2	SmartHealthIT Open FHIR Server	Not Active

La página Index (Índice) mostrará la lista de servidores FHIR con el servidor activo seleccionado. Selecciona otro servidor de la lista para ver los detalles del servidor seleccionado

Dashboard Management Portal FHIR Official website FHIR Client Docs

InterSystem FHIR Accelerator Service
<https://fhir.83z8498j30i6.static-test-account.iscloud.io>

FHIR Server InterSystem FHIR Accelerator Service

27 Patients View Details

100 Observations View Details

100 Practitioners View Details

100 Encounters View Details

Patients

ID	Family Name	Given Name	DOB	Gender
1	Muller251	Ariane988	1947-10-27	female
972	Conroy74	Ben667	1982-11-16	male
1223	Ballistreri607	Charise827	2001-11-07	female
1431	Bergstrom287	Darrell400	1986-03-05	male

Registered FHIR Servers

ID	Server Name	Status
1	InterSystem FHIR Accelerator Service	Active
2	SmartHealthIT Open FHIR Server	Not Active
3	INTERSYSTEMS FHIR Server	Not Active

Desplázate hasta el ID del paciente y selecciónalo para obtener detalles de los Recursos del paciente

Dashboard Management Portal FHIR Official website FHIR Client Docs

InterSystem FHIR Accelerator Service
<https://fhir.83z8498j30i6.static-test-account.iscloud.io>

FHIR Server InterSystem FHIR Accelerator Service

27 Patients View Details

100 Observations View Details

100 Practitioners View Details

100 Encounters View Details

Patients

ID	Family Name	Given Name	DOB	Gender
1	Muller251	Ariane988	1947-10-27	female
972	Conroy74	Ben667	1982-11-16	male
1223	Ballistreri607	Charise827	2001-11-07	female
1431	Bergstrom287	Darrell400	1986-03-05	male
1516	McLaughlin530	Dominica520	1976-12-03	female

Registered FHIR Servers

ID	Server Name	Status
1	InterSystem FHIR Accelerator Service	Active
2	SmartHealthIT Open FHIR Server	Not Active

Esta página mostrará el recuento de algunos recursos del paciente junto con los detalles de las

observaciones del paciente.

The screenshot shows a web interface for a patient named Conroy74 Ben667 (ID = 972). The interface is divided into two main sections: Patient Resources and Patient Observations.

Patient Resources:

Resource	Count
Observations	94
Procedure	7
Immunization	7
Encounter	25
Condition	4
Practitioner	101
Organization	101

Patient Observations:

ID	Category	Codes	Value	UOM	Date
1049	vital-signs	8302-2	167.7	cm	2011-03-08T02:53:04+00:00
1050	vital-signs	72514-3	1	[score]	2011-03-08T02:53:04+00:00
1051	vital-signs	29463-7	64	kg	2011-03-08T02:53:04+00:00
1052	vital-signs	39156-5	22.76	kg/m2	2011-03-08T02:53:04+00:00
1053	vital-signs	85354-9	None	None	2011-03-08T02:53:04+00:00
1054	survey	72166-2	None	None	2011-03-08T02:53:04+00:00
1061	vital-signs	8302-2	167.7	cm	2012-03-13T02:53:04+00:00
1062	vital-signs	72514-3	0	[score]	2012-03-13T02:53:04+00:00

Si encuentra útil esta aplicación, considere votar por mi aplicación

¡Gracias!

[#API REST](#) [#Concurso](#) [#CSP](#) [#Embedded Python](#) [#FHIR](#) [#ObjectScript](#) [#InterSystems Package Manager \(IPM\)](#)
[#Paneles de control](#) [#InterSystems IRIS for Health](#) [#Open Exchange](#)
[Ir a la aplicación en InterSystems Open Exchange](#)

URL de
fuente: <https://es.community.intersystems.com/post/cliente-fhir-para-conectar-mediante-python-embellido-cualquier-servidor-fhir-abierto>