

Artículo

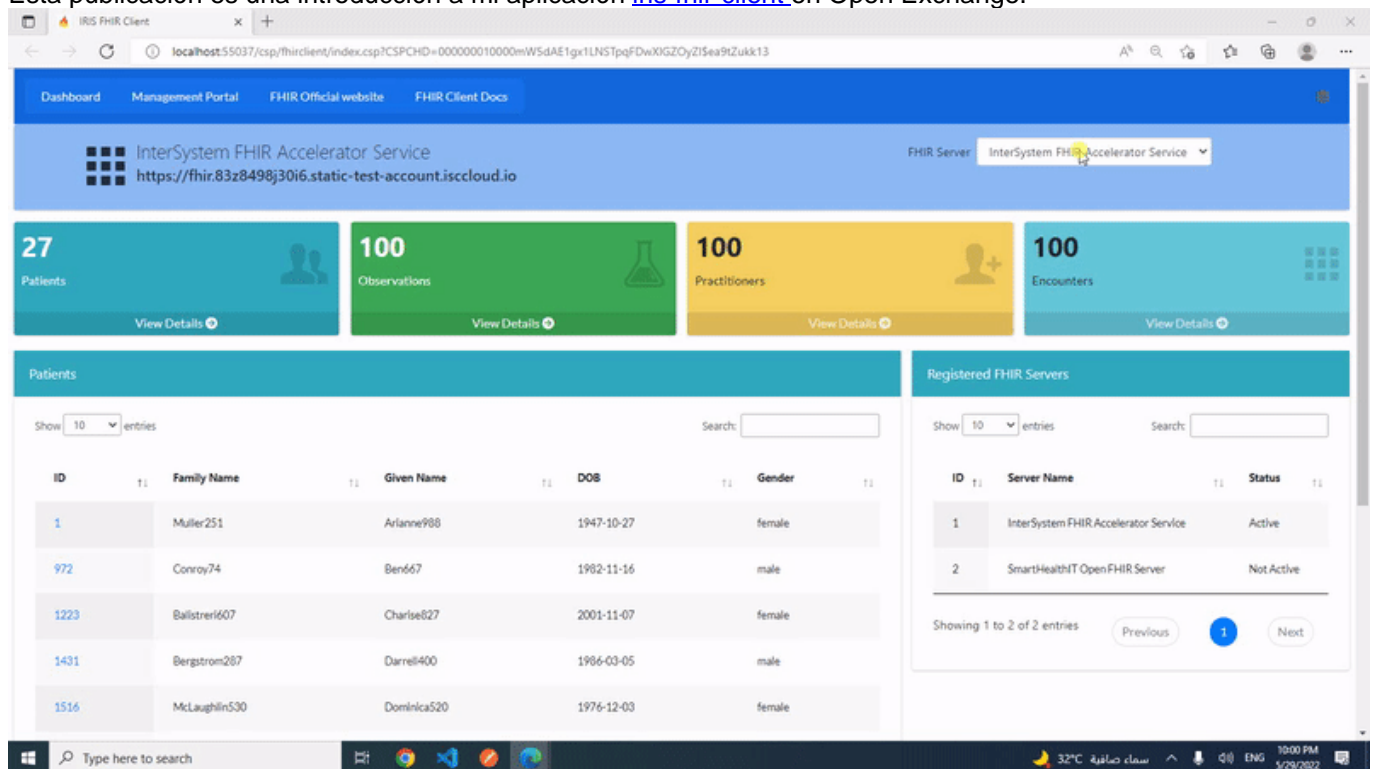
[Muhammad Waseem](#) · Jun 1 Lectura de 3 min

[Open Exchange](#)

Ciente 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                   Questionnaire
CarePlan               Endpoint                    MedicationAdministration    QuestionnaireResponse
CareTeam               EnrollmentRequest           MedicationDispense           RelatedPerson                RequestGroup
ChargeItem             EnrollmentResponse          MedicationKnowledge          ResearchDefinition           ResearchElementDefinition
ChargeItemDefinition   EpisodeOfCare                MedicationRequest            ResearchStudy                 ResearchSubject
Claim                  EventDefinition             MedicinalProduct              RiskAssessment
ClaimResponse          Evidence                      MedicinalProductAuthorization  RiskEvidenceSynthesis
ClinicalImpression     EvidenceVariable            MedicinalProductContraindication  Schedule
CodeSystem             ExampleScenario              MedicinalProductIndication     SearchParameter
Communication           ExplanationOfBenefit         MedicinalProductInteraction    ServiceRequest
CommunicationRequest   FamilyMemberHistory         MedicinalProductPackaged       Slot
CompartmentDefinition  Flag                         MedicinalProductPharmaceutical  Specimen
Composition            Goal                          MedicinalProductUndesirableEffect  SpecimenDefinition
ConceptMap             GraphDefinition              MessageDefinition              StructureDefinition
Condition              Group                         MessageHeader                  StructureMap
Consent                GuidanceResponse            MolecularSequence              Subscription
Contract               HealthcareService           NamingSystem                    Observation
Coverage               ImagingStudy                 NutritionOrder                  Observation
CoverageEligibilityRequest  Immunization                 Observation                     Observation
CoverageEligibilityResponse  ImmunizationEvaluation       Observation                     Observation

```

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
    
```

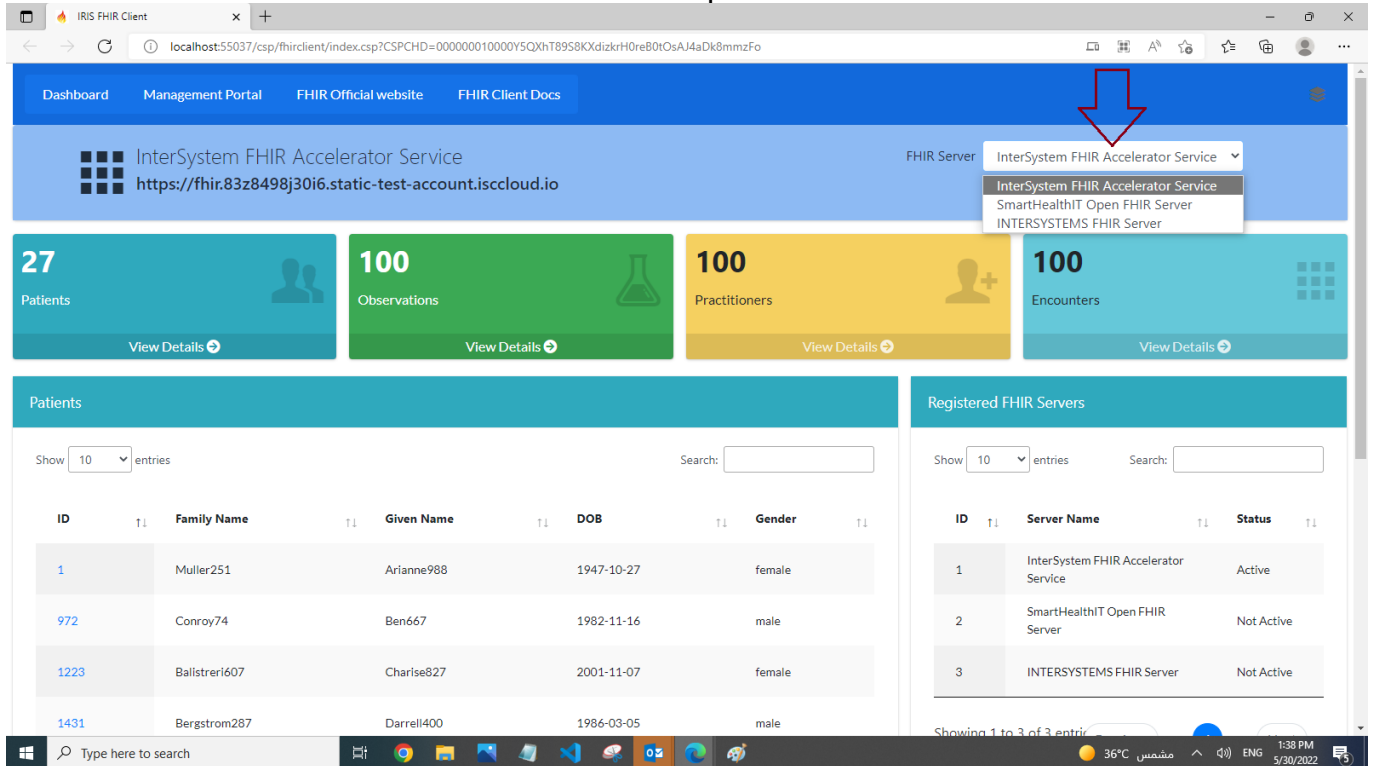
Ver información del servidor FHIR desde la aplicación web CSP

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

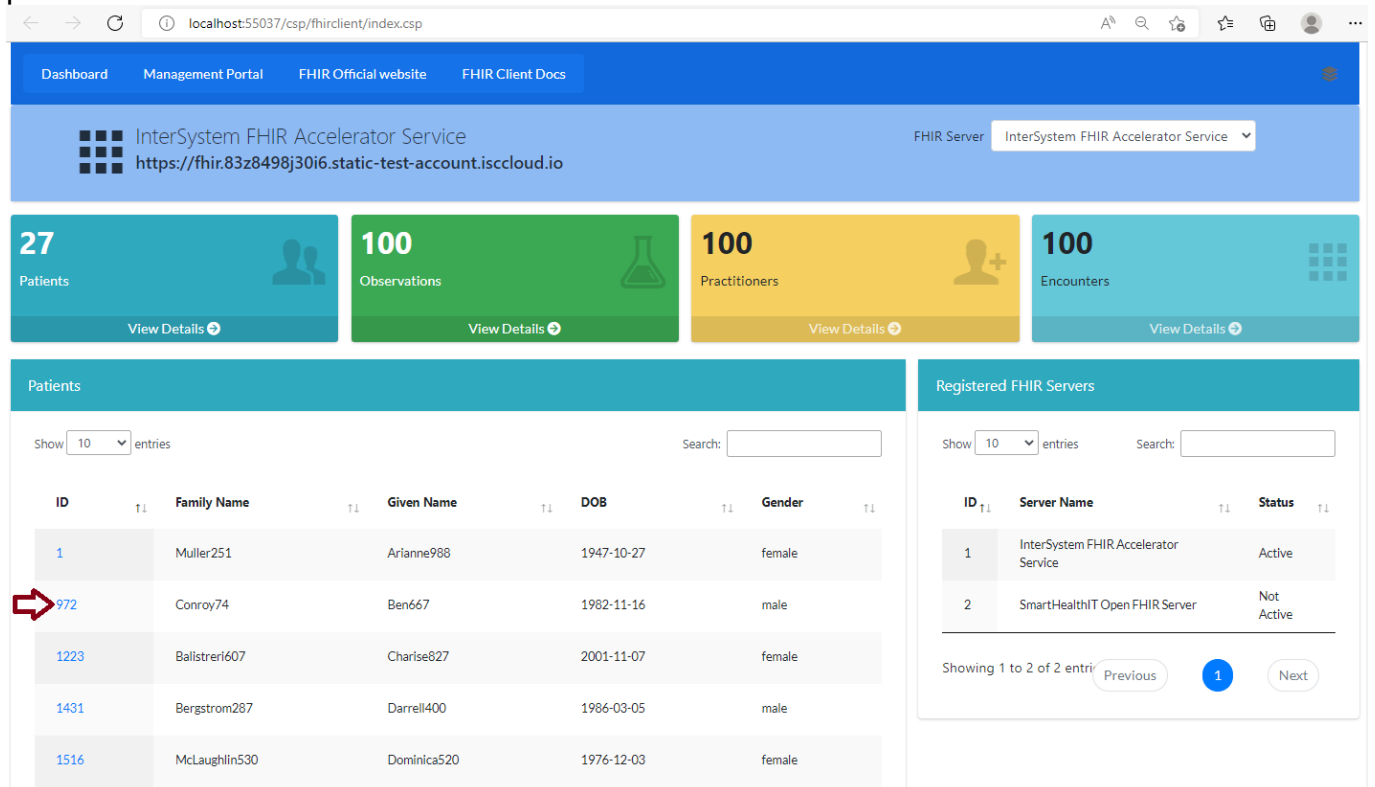
La página Index (Índice) mostrará el recuento de pacientes, observaciones, médicos y encuentros del servidor activo junto con los detalles del paciente y de los servidores registrados

The screenshot displays the InterSystems 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, the service name and URL are shown, along with a dropdown menu for the FHIR Server. The main dashboard features four large colored tiles representing key metrics: 27 Patients (blue), 100 Observations (green), 100 Practitioners (yellow), and 100 Encounters (teal). Each tile includes a 'View Details' link. Below the dashboard, there are two data tables. The 'Patients' table shows a list of patients with columns for ID, Family Name, Given Name, DOB, and Gender. The 'Registered FHIR Servers' table shows a list of servers with columns for ID, Server Name, and Status. The interface is clean and modern, with a light blue and white color scheme.

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



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



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

observaciones del paciente.

The screenshot displays a web interface for a patient's medical data. At the top, there are navigation links: Dashboard, Management Portal, FHIR Official website, and FHIR Client Docs. Below this, the patient's name 'Conroy74 Ben667' and ID 'ID = 972' are shown. The main content is divided into two panels: '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!

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[#Paneles de control](#) [#InterSystems IRIS for Health](#) [#Open Exchange](#)
[Compruebe la aplicación relacionada en InterSystems Open Exchange](#)

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