Artículo
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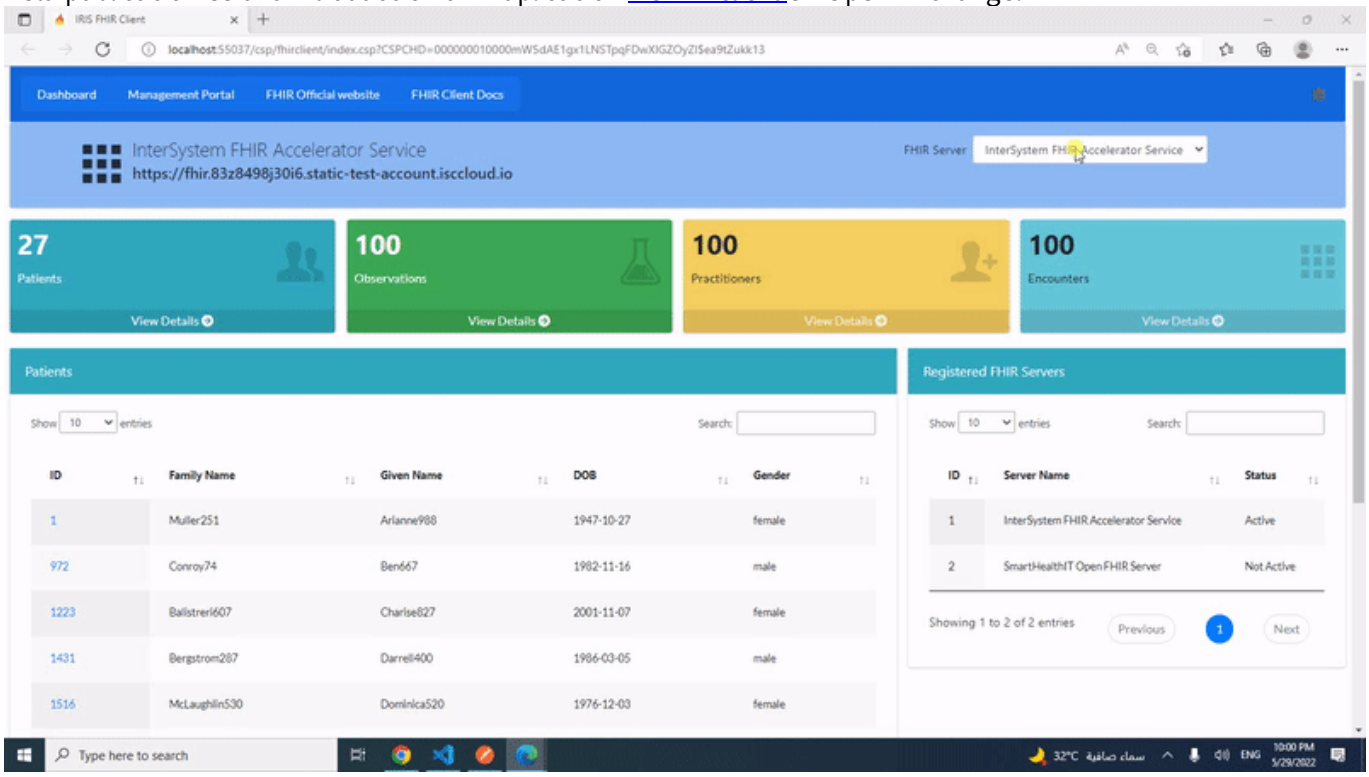
Open Exchange

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).RegsterServer("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.isccloud.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
ActivityDefinition          DetectedIssue                 ImplementationGuide             Organization
AdverseEvent                Device                        InsurancePlan                   OrganizationAffiliation
AllergyIntolerance          DeviceDefinition              Invoice                         Patient
Appointment                 DeviceMetric                  Library                         PaymentNotice
AppointmentResponse         DeviceRequest                 Linkage                         PaymentReconciliation
AuditEvent                  DeviceUseStatement            List                            Person
Basic                       DiagnosticReport              Location                        PlanDefinition
Binary                      DocumentManifest              Measure                         Practitioner
BodyStructure               DocumentReference             MeasureReport                   PractitionerRole
Bundle                      EffectEvidenceSynthesis       Media                           Procedure
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
```

Substance
SubstanceSpecification
SupplyDelivery
SupplyRequest
Task
TerminologyCapabilities
TestReport
TestScript
ValueSet
VerificationResult
VisionPrescription

Para mostrar la cantidad de registros 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      RubÃ©n780      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

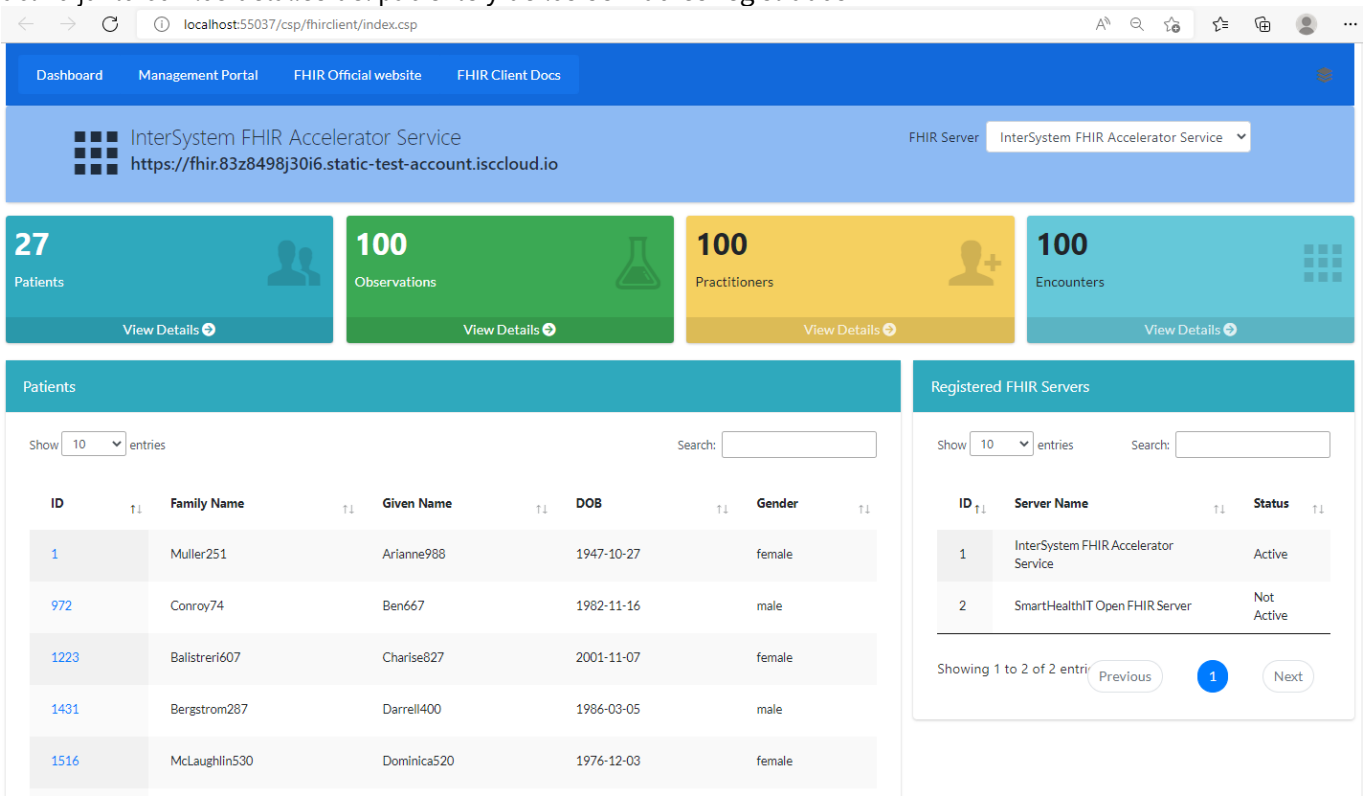
El siguiente comando recuperará los detalles de las Observaciones contra Patinet ID 1 del servidor FHIR activo

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

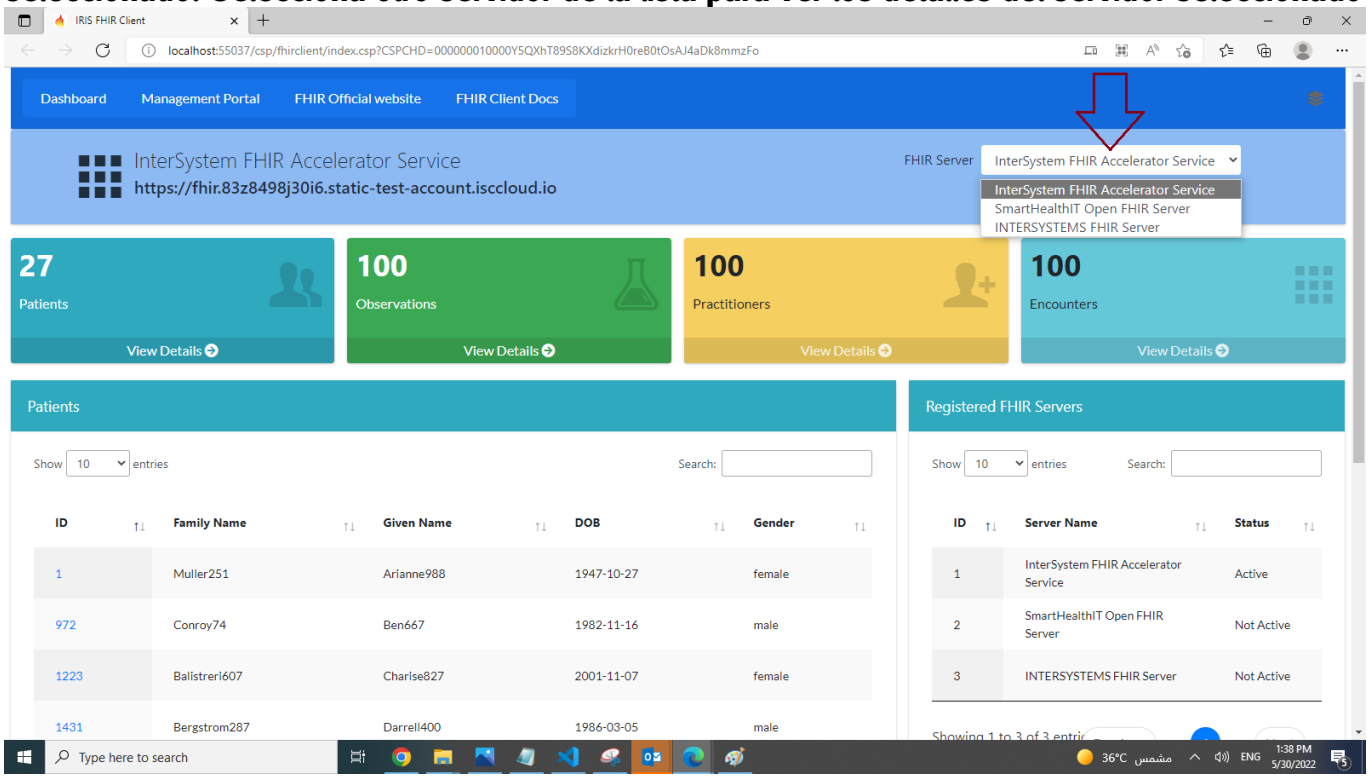
```
USER>do ##class(dc.FhirClient).GetPatientResources("Observation","1")
  ID  Category     Code         Value  UOM      Date                       Patient
----  -----------  -------  ---------  -------  -------------------------  ---------
 408  vital-signs  8302-2   174.1      cm       2010-08-30T11:59:49+00:00  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

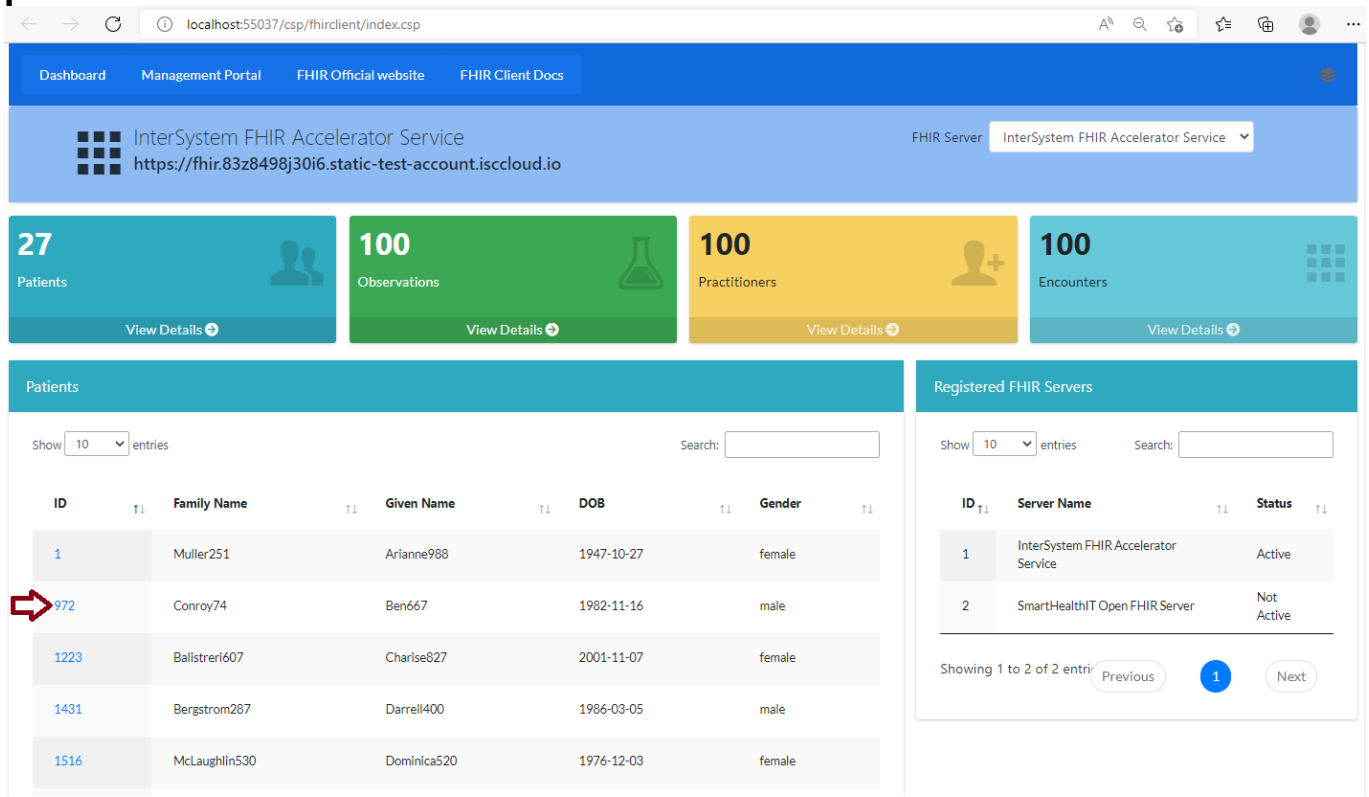
Ir a http://localhost:55037/csp/fhirclient/index.csp
La página Index (Índice) mostrará el recuento de pacientes, observaciones, médicos y encuentros del servidor activo junto con los detalles del paciente y de los servidores registrados



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

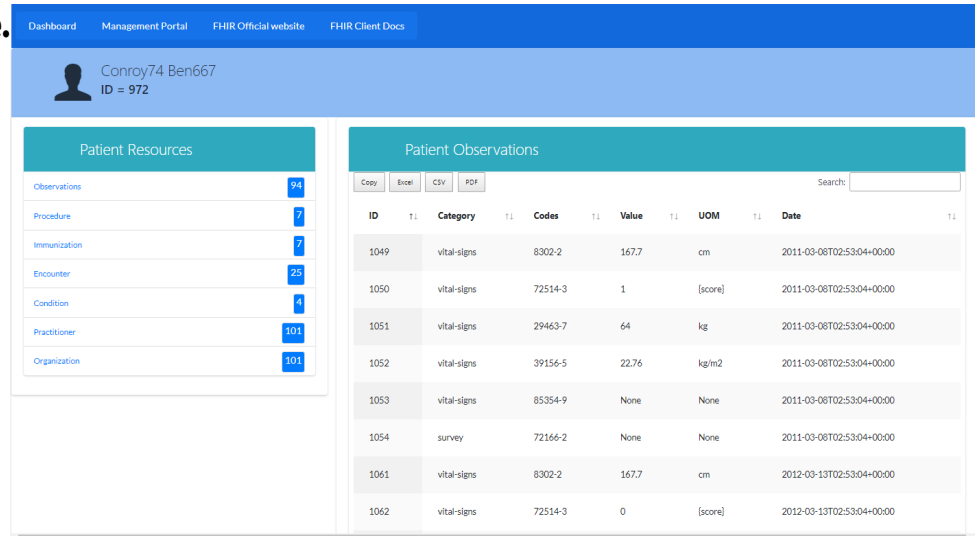


Desplázate hasta el ID del paciente y selecciónalo para obtener detalles de los Recursos del paciente



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

observaciones del paciente.



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-embebido-cualquier-servidor-fhir-abierto