

文章

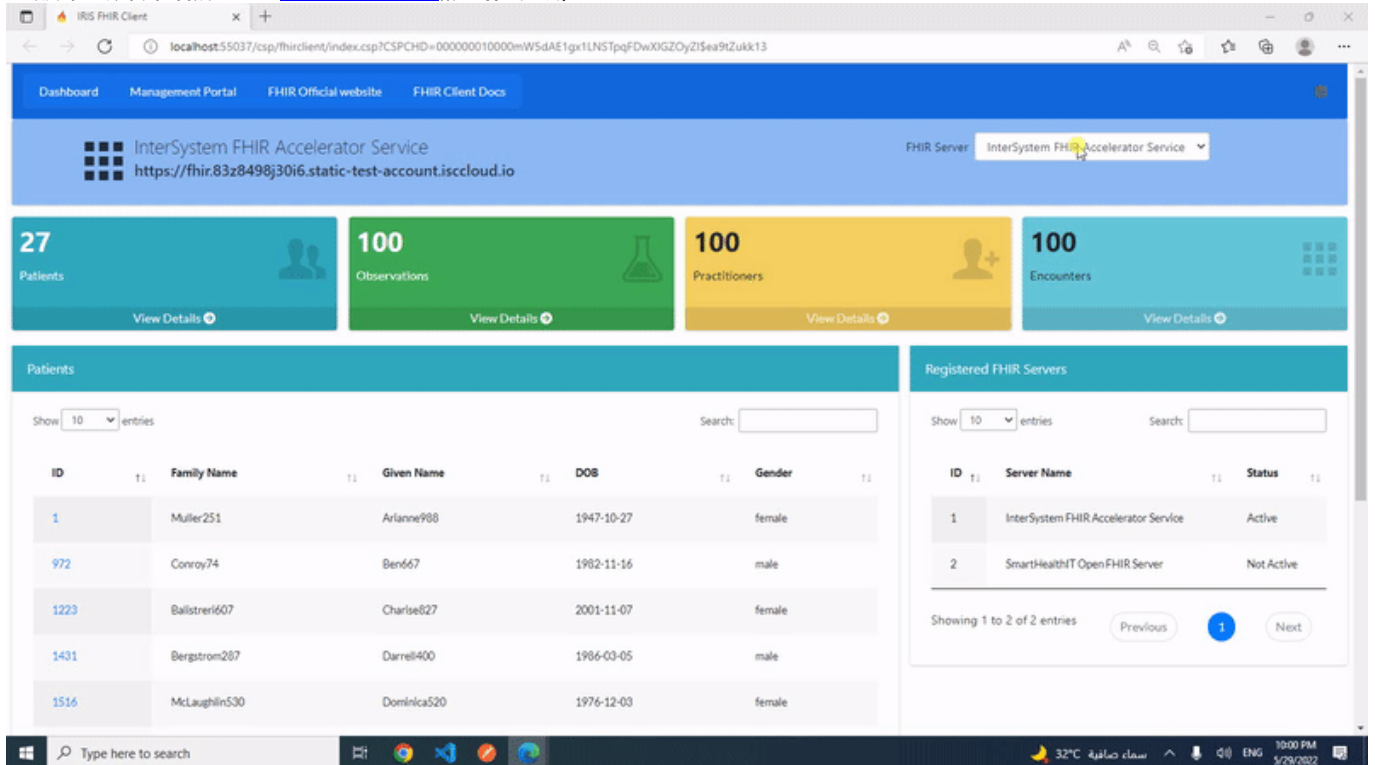
[Muhammad Waseem](#) · 八月 11 阅读大约需分钟

[Open Exchange](#)

FHIR 客户端使用嵌入式 python 连接任何打开的 FHIR 服务器

嗨社区,

这篇文章公开介绍 [iris-fhir-client](#) 客户端 应用。



[iris-fhir-client](#) 可以借助嵌入式 python 连接到任何开放的 FHIR 服务器 [fhirpy](#) 图书馆。

通过终端和使用 CSP Web 应用程序获取资源信息。

查询和激活 注册服务器

连接到 IRIS 终端

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

应用程序将默认注册 InterSystems FHIR Accelerator Service 和 SmartHealthIT Open FHIR Server, 两者都可以使用。

使用以下命令列出已注册的服务器

```
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.iscloud.io
ApiKey
EPOAuth2
ISActive    Active
-----
ID          2
Name        SmartHealthIT Open FHIR Server
EndPoint    https://r4.smarthealthit.org
ApiKey
EPOAuth2
ISActive    Not Active
-----

```

InterSystems 的 FHIR 服务器处于激活状态。为了选择 SmartHealthIT 打开 FHIR 服务器,通过传递服务器 ID 使用 dc.FhirClient 类的 SetFhirServer 函数

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

注册的 FHIR 服务器

要注册新服务器,请使用 dc.FhirClient 类的 RegisterServer() 函数

```
class(dc.FhirClient).RegisterServer("Server Name","Endpoint","ApiKey"[optional],"EndpointOAuth"[optional])
```

```
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
-----

```

从 FHIR 服务器获取资源

要检索当前服务器的所有资源, 请使用 dc.FhirClient 类的 ListResources() 方法

```
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 PatientResource Subscription
```

上面的命令将从激活的 FHIR 服务器获取患者资源计数器

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

要检索所有创建的资源及其计数, 只需 1 传递给 ListResource() 函数

```
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
```

要获取资源的详细信息，请通过传递 `dc.FhirClient` 类的 `Resource` 使用 `GetResource()` 命令。下面的命令将从激活的 FHIR 服务器中检索所有患者。

```
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
```

下面的命令将从激活的 FHIR 服务器中检索所有观察结果

```
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

从 FHIR 服务器获取特定患者的资源

下面的命令将从激活的 FHIR 服务器中检索针对 Patient ID 1 的观察详细信息

```
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
    
```

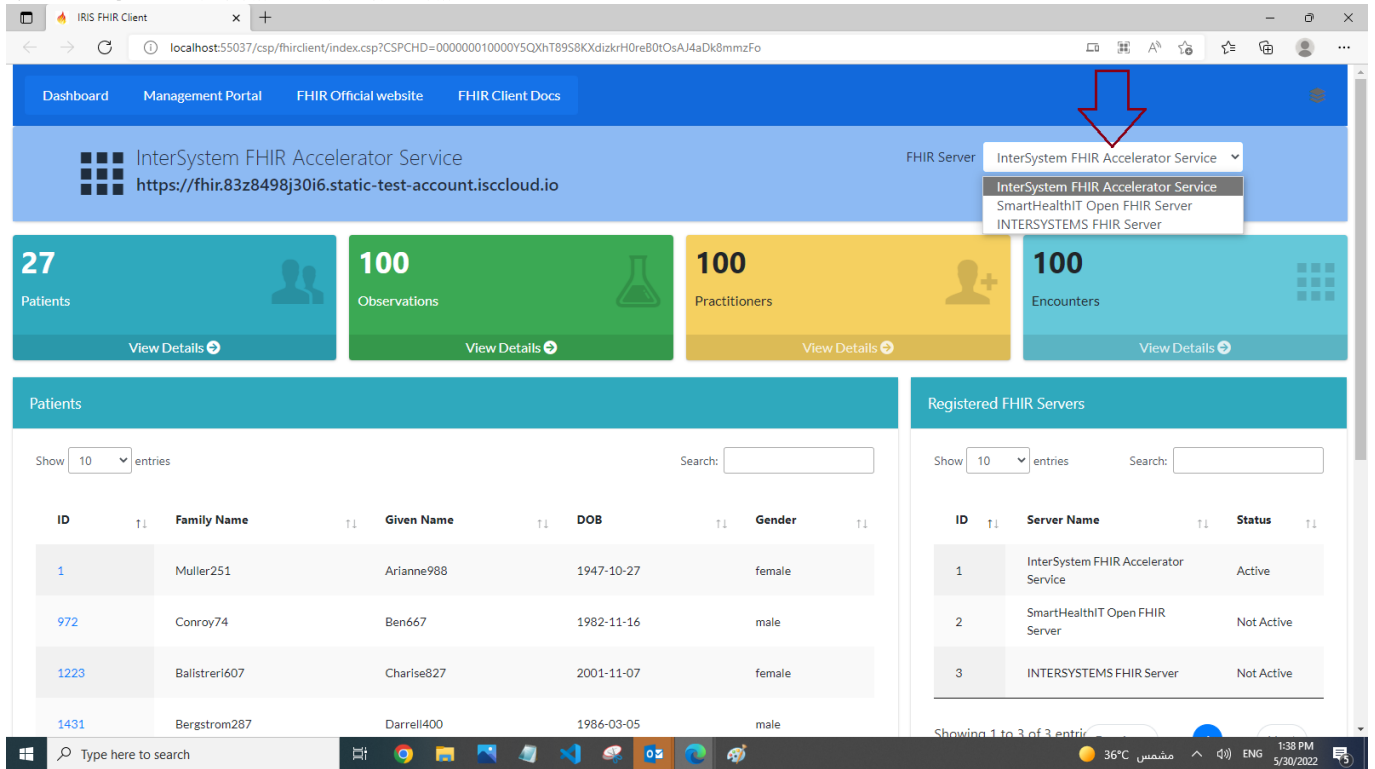
从 CSP Web 应用程序查看 FHIR 服务器信息

导航 <http://localhost:55037/csp/fhirclient/index.csp>

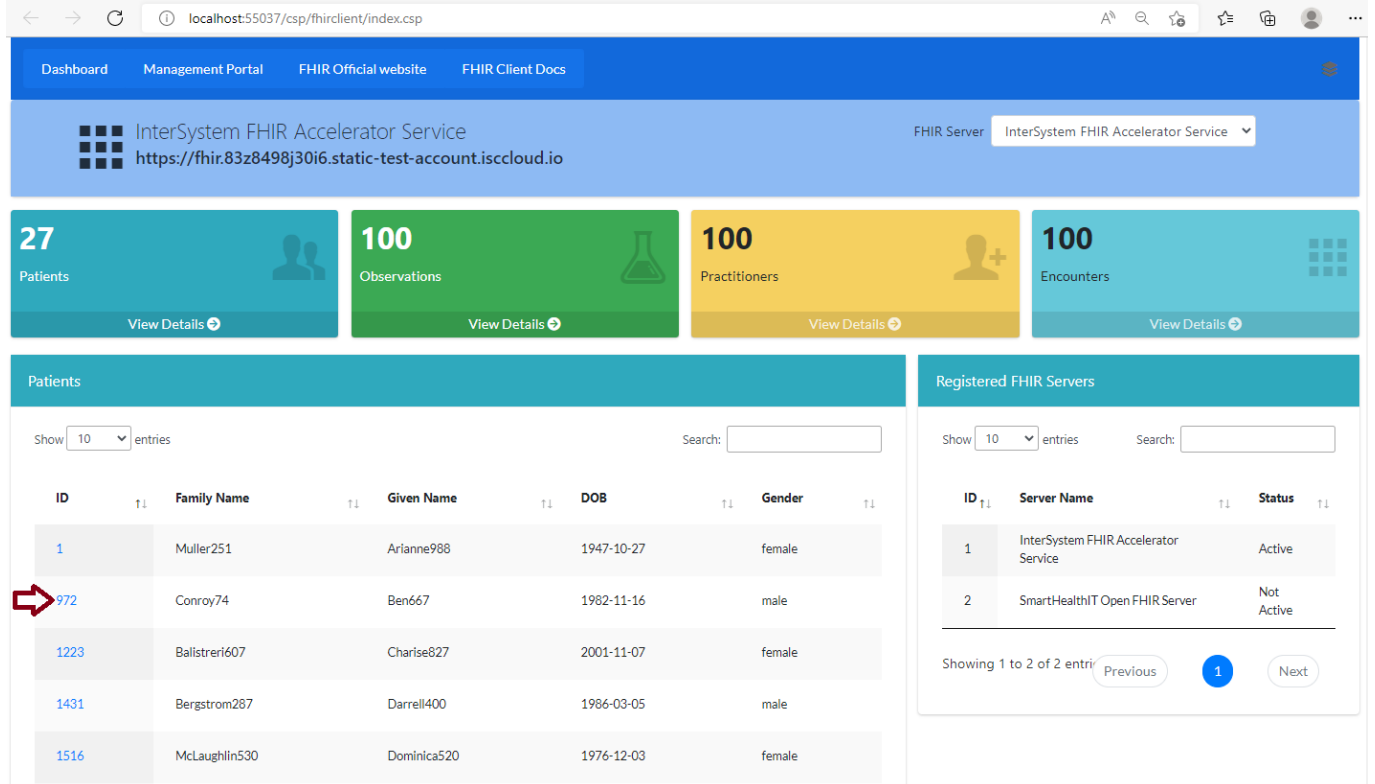
索引页面将显示激活服务器中患者、观察、从业者和就诊次数以及患者和注册服务器的详细信息

The screenshot displays the InterSystem FHIR Accelerator Service web application. At the top, there's a navigation bar with 'Dashboard', 'Management Portal', 'FHIR Official website', and 'FHIR Client Docs'. Below this, the main header shows 'InterSystem FHIR Accelerator Service' and the URL 'https://fhir.83z8498j30i6.static-test-account.iscloud.io'. The dashboard features four large colored boxes representing key metrics: 27 Patients (teal), 100 Observations (green), 100 Practitioners (yellow), and 100 Encounters (light blue). Each box has 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 two servers: 'InterSystem FHIR Accelerator Service' (Active) and 'SmartHealthIT Open FHIR Server' (Not Active). Navigation controls like 'Previous' and 'Next' are visible at the bottom of the server table.

索引页面将显示 FHIR 服务器列表，其中选择了激活的服务器。
从列表中选择其他服务器以查看所选服务器的详细信息



将鼠标悬停到患者 ID 并选择以获取患者资源的详细信息



此页面将显示一些患者资源的数量以及患者观察的详细信息

Dashboard
Management Portal
FHIR Official website
FHIR Client Docs

Conroy74 Ben667
ID = 972

Patient Resources

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

Patient Observations

Copy Excel CSV PDF
Search:

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

谢谢

[##嵌入式 Python #CSP #FHIR #ObjectScript #ObjectScript Package Manager \(ZPM\) #REST API #仪表盘 #竞赛 #InterSystems IRIS for Health #Open Exchange 在 InterSystems Open Exchange 上检查相关应用程序](#)

源

URL:

<https://cn.community.intersystems.com/post/fhir-%E5%AE%A2%E6%88%B7%E7%AB%AF%E4%BD%BF%E7%94%A8%E5%B5%8C%E5%85%A5%E5%BC%8F-python-%E8%BF%9E%E6%8E%A5%E4%BB%BB%E4%BD%95%E6%89%93%E5%BC%80%E7%9A%84-fhir-%E6%9C%8D%E5%8A%A1%E5%99%A8>