

# Microsoft Azure API for FHIR

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Principal Program Manager, Microsoft Health Cloud and Data

## **1. Microsoft Azure API for FHIR: Applications and Data Ingest**

Jun 17, 2020 - 03:30PM - 04:10PM

## **2. FHIR Analytics with Power BI**

Jun 18, 2020 - 03:30PM - 04:10PM

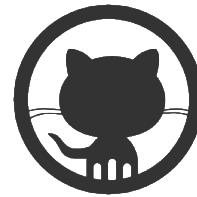
<https://aka.ms/michael-devdays>

# Two offerings to meet your needs

## Open source, full control

Built managed and maintained by the Microsoft Healthcare engineering team.

Designed to enable you to operate and manage compliance.



FHIR Server for Azure

## Fully managed Azure offering

Distribution of the open source project, offered as a Platform-as-a-Service in Azure.

Meets regulatory compliance requirements for Protected Healthcare Information (PHI).



Azure API for FHIR

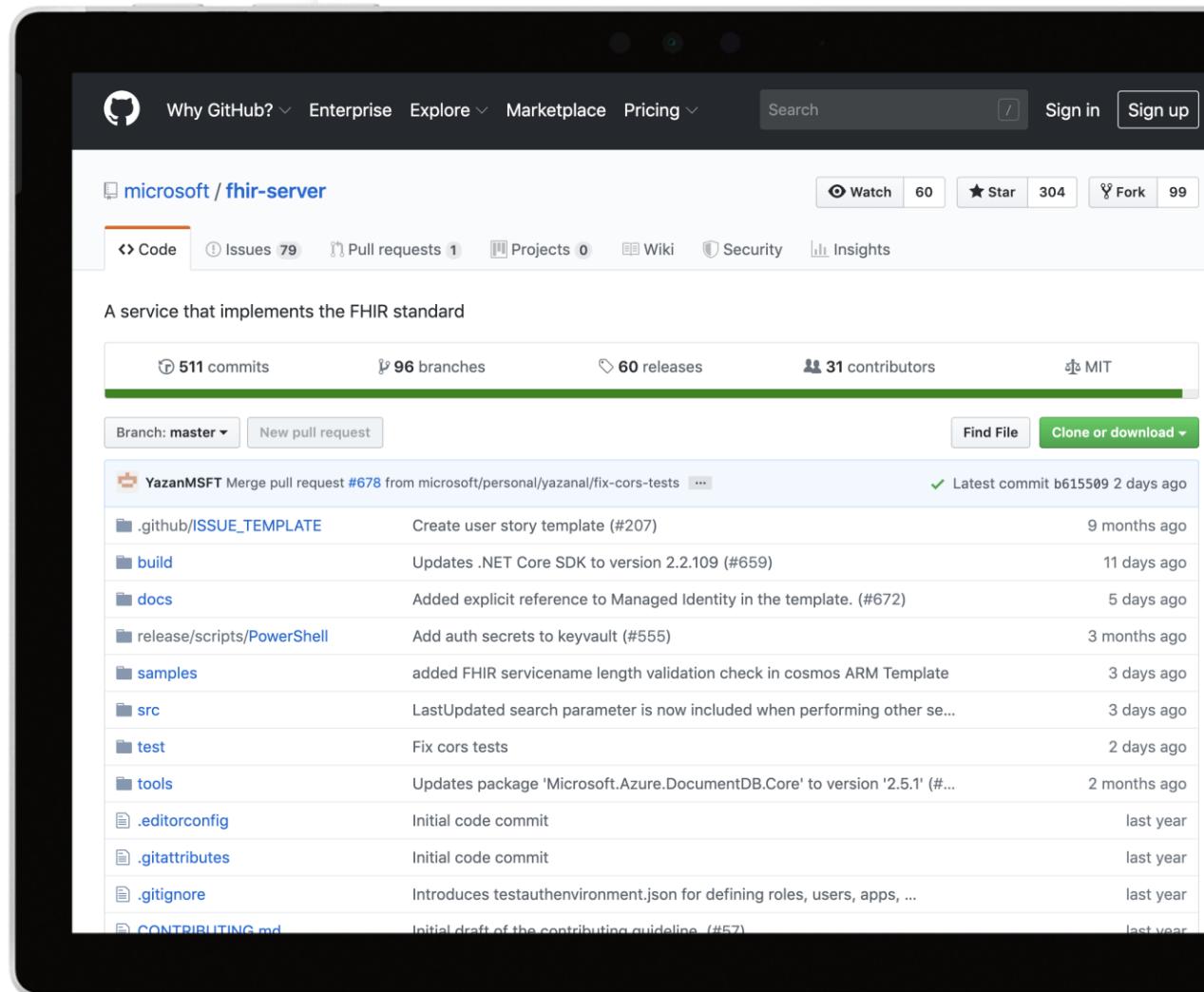
# FHIR Server for Azure

Open source implementation of the industry HL7 Fast Healthcare Interoperability Resources (FHIR) specification.

Supports FHIR STU3, [FHIR R4](#), draft R5 versions.

Easily deployable into your Azure subscription

An extensible persistence provider model enables multiple options for how data is stored, including Azure Cosmos DB and Azure SQL.



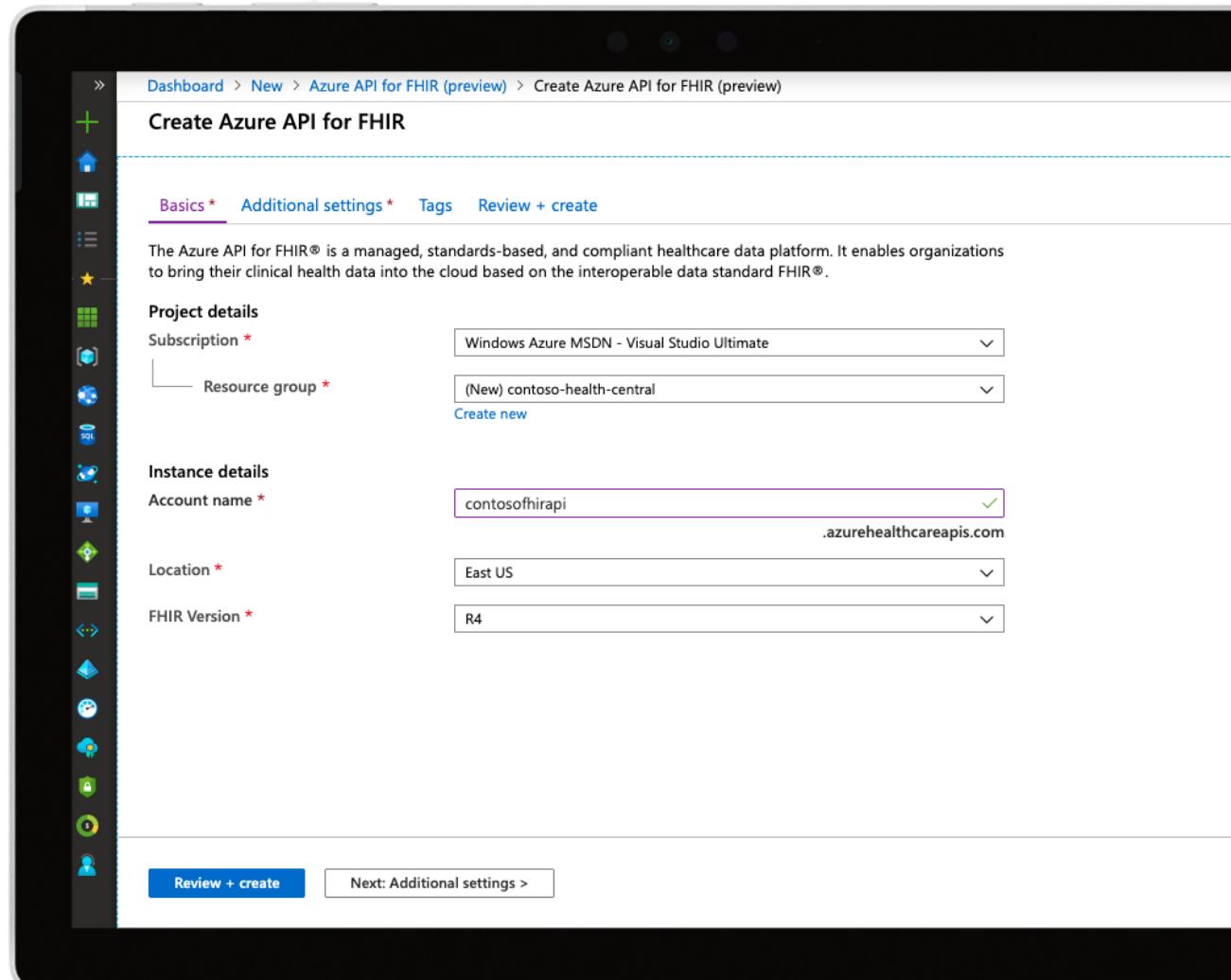
# Azure API for FHIR

Fully managed, enterprise-grade FHIR service.  
Provisioned in the cloud in less than 5 minutes

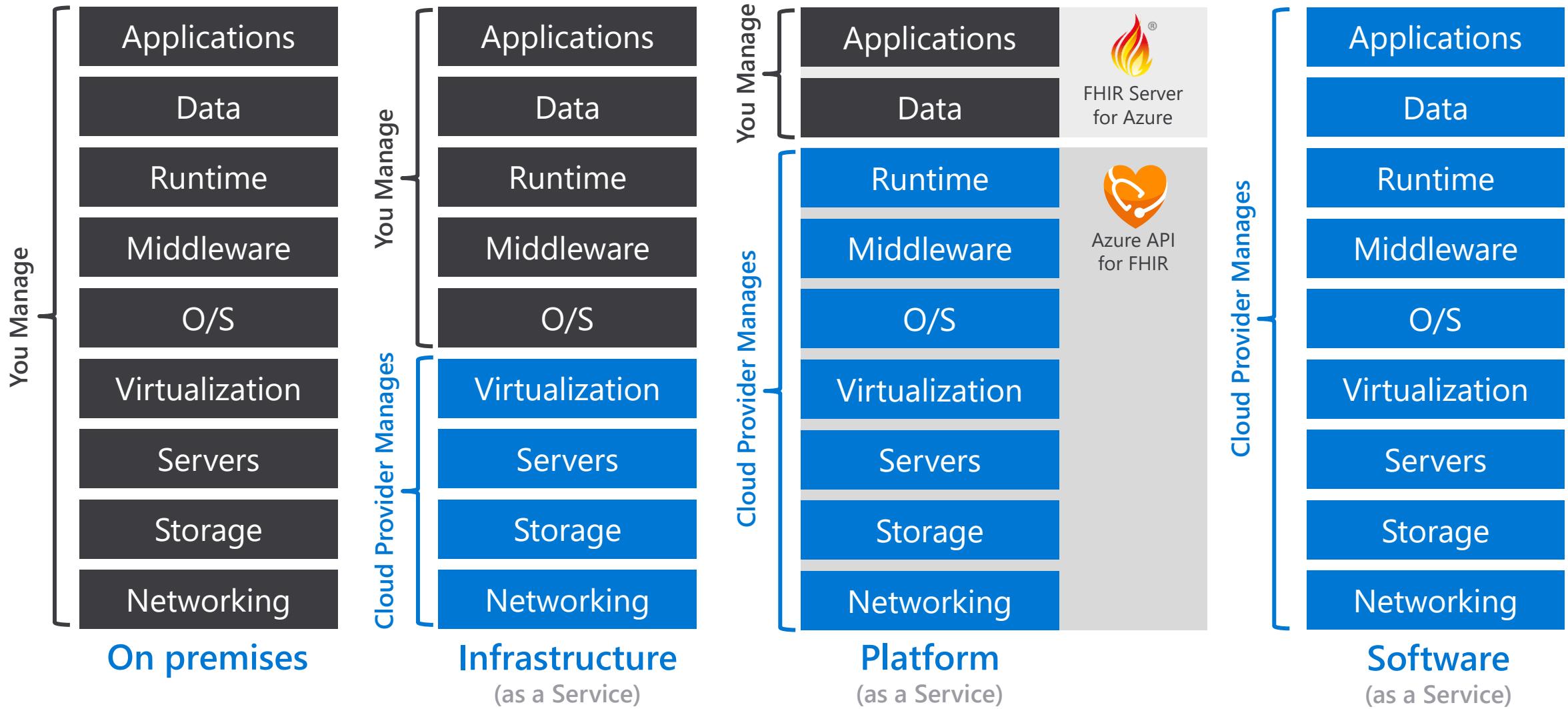
Enables bringing together health data from  
disparate systems using industry standard HL7  
FHIR (Fast Healthcare Interoperability  
Resources).

Supports FHIR STU3 and FHIR R4 versions.

Data is isolated and protected with layered, in-depth defense and advanced threat protection according to the most stringent industry compliance standards.



# Cloud Models



**54** regions  
worldwide

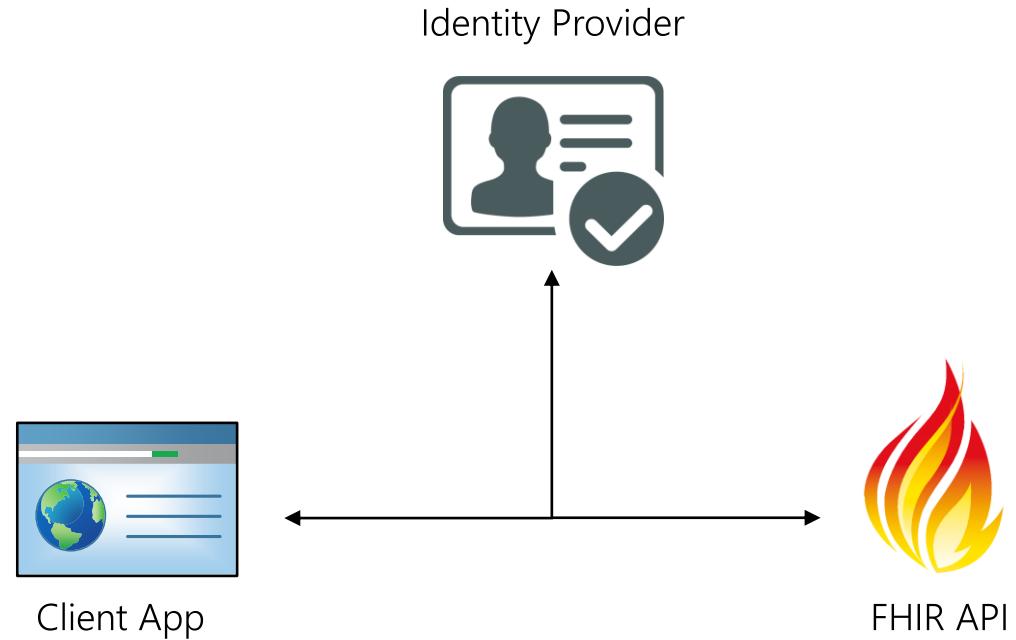
**140** available in  
140 countries

# Azure API for FHIR

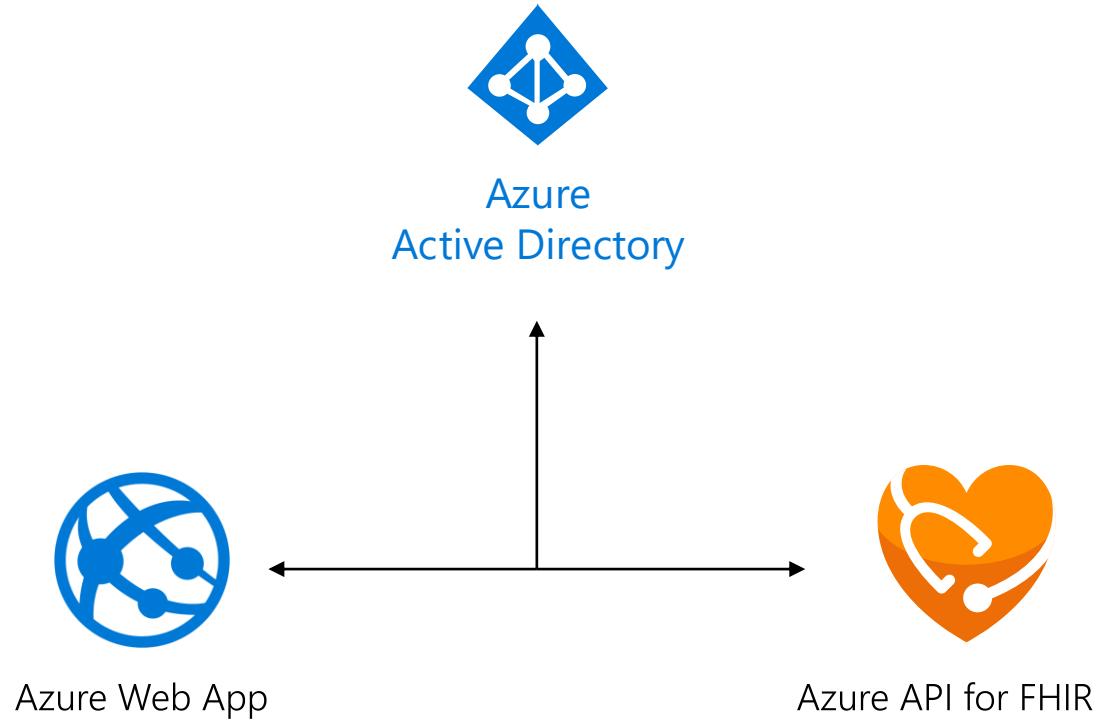
## Available in 11 Regions, expanding to >20



# A SIMPLE FHIR SANDBOX

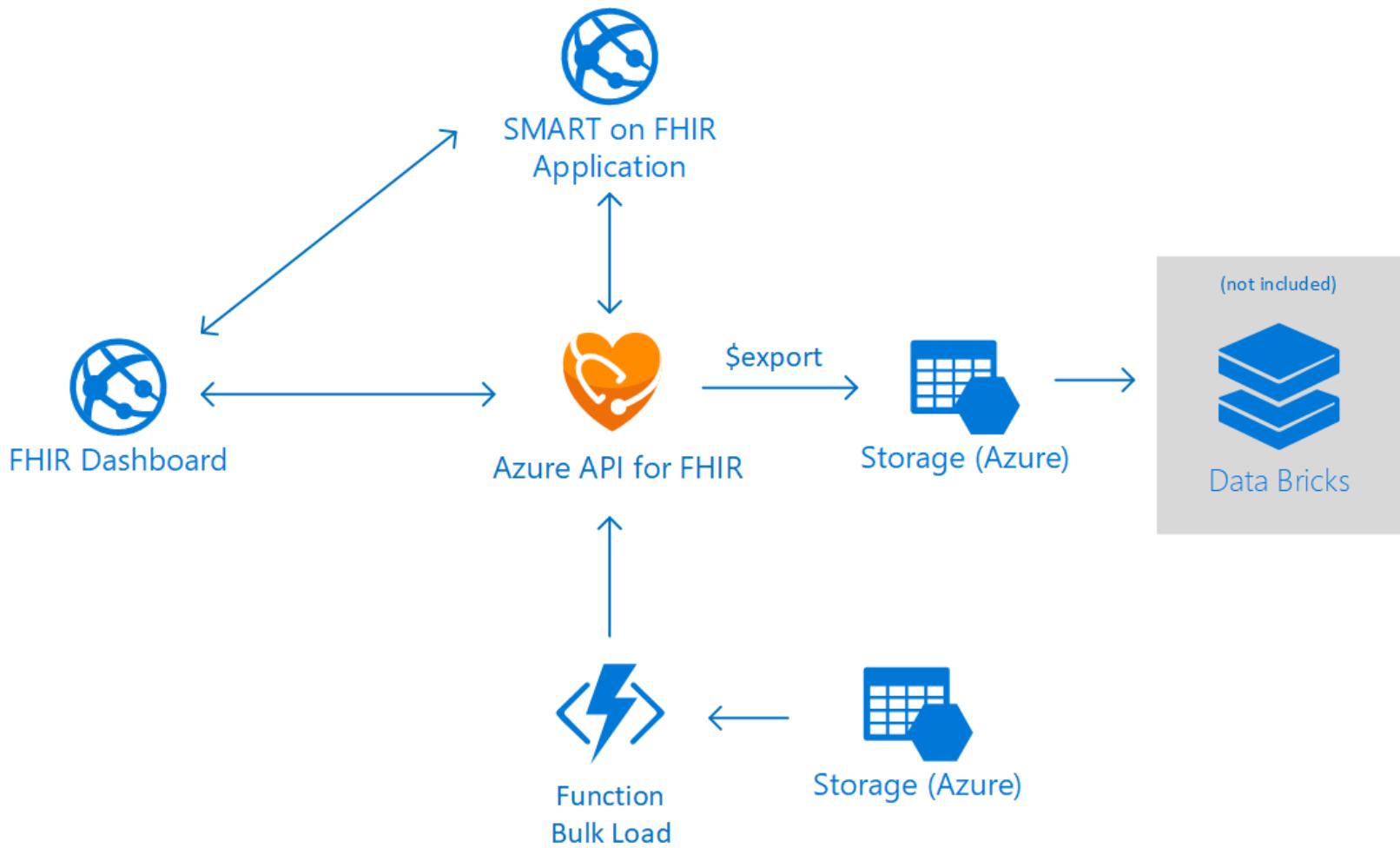


# TINY SANDBOX

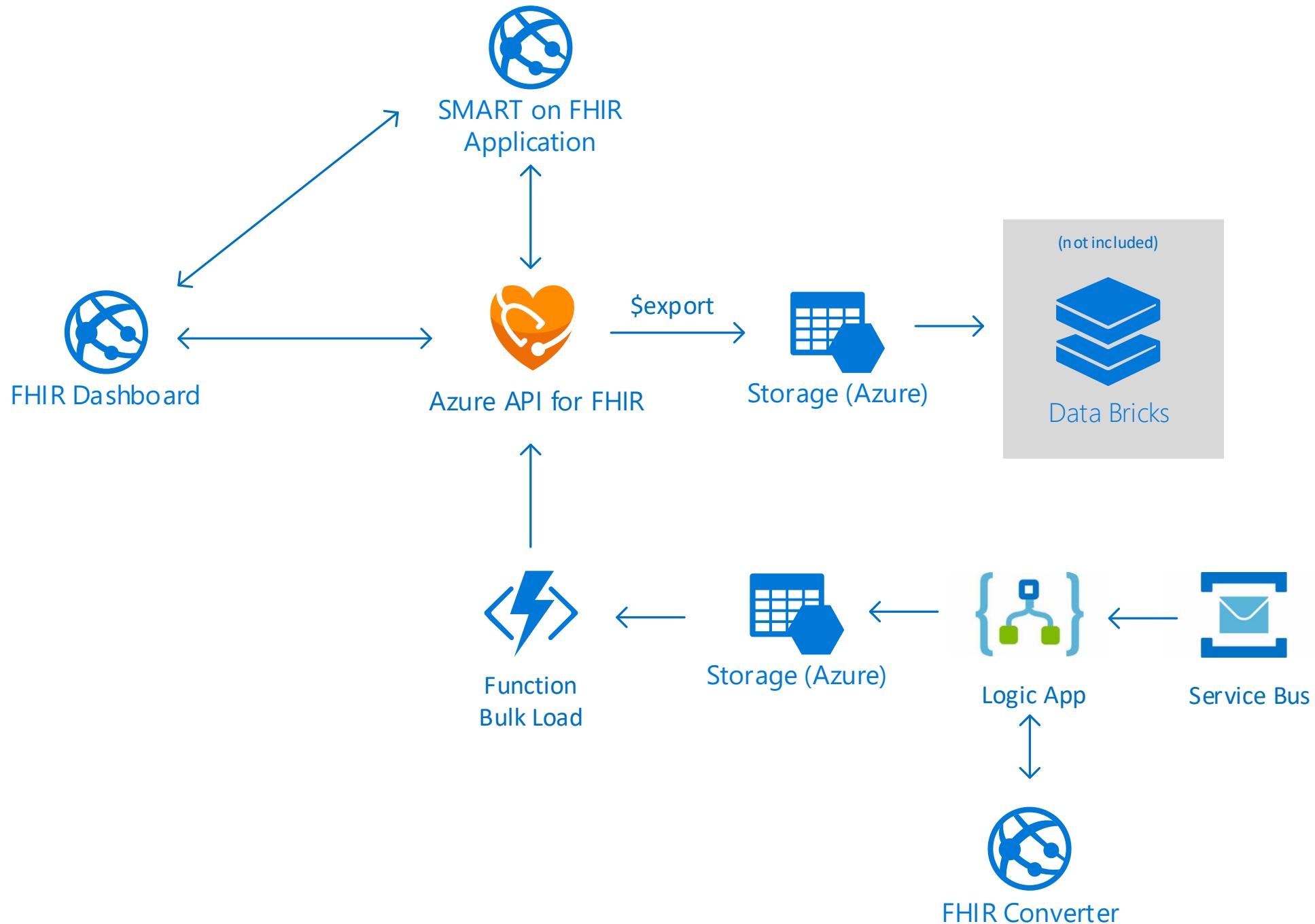


<https://aka.ms/michael-devdays>

# LARGE SANDBOX

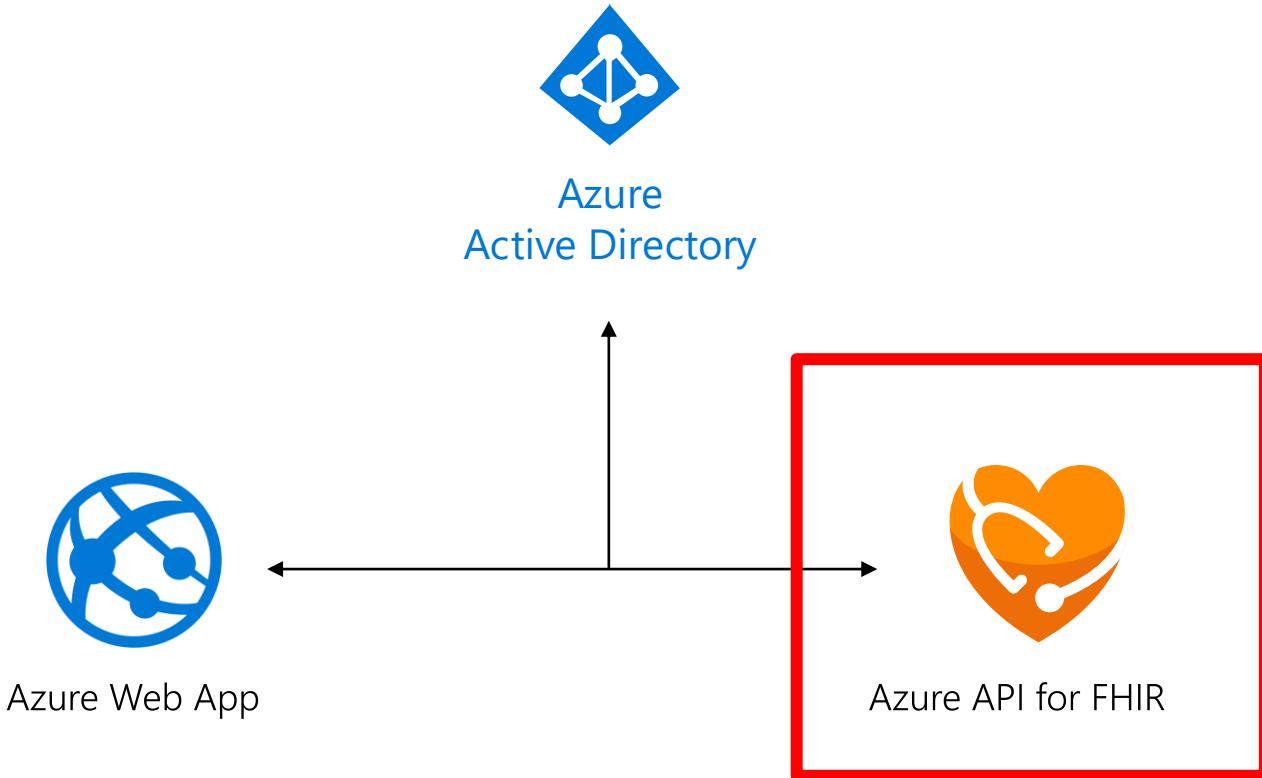


<https://github.com/Microsoft/fhir-server-samples>



# FHIR API

# TINY SANDBOX



<https://github.com/hansenms/FHIRDevDays-Virtual2020>

Web Application

FHIR DevDays 2020 - Microsoft

https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/dashboard/private/770ceb55-e66f-4d96-b6cc-96b36388e030

Create a resource

Home

Dashboard

All services

FAVORITES

- All resources
- Resource groups
- App Services
- SQL databases
- Azure Cosmos DB
- Virtual machines
- Load balancers
- Storage accounts
- Virtual networks
- Azure Active Directory
- Monitor
- Advisor
- Security Center
- Help + support
- Cost Management + Billing

Search resources, services, and docs (G+)

New dashboard Upload Download Edit Share Full screen Clone Delete Refresh

Last updated: a few seconds ago

mihansen@microsoft.co... MICROSOFT

New - Microsoft Azure

https://portal.azure.com/?feature.customportal=false#create/hub

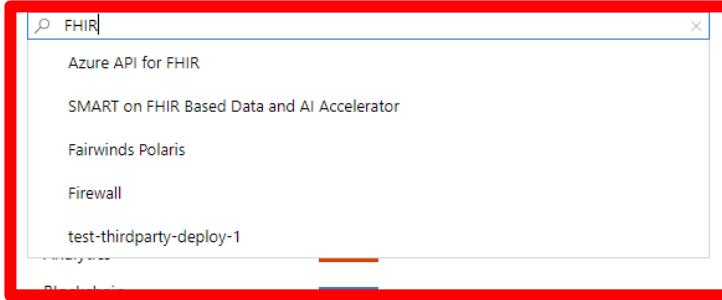
Microsoft Azure

Search resources, services, and docs (G+)

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Dashboard > New

New



	Web App	
Compute		<a href="#">Quickstarts + tutorials</a>
Containers		<a href="#">SQL Database</a> <a href="#">Quickstarts + tutorials</a>
Databases		<a href="#">Function App</a> <a href="#">Quickstarts + tutorials</a>
Developer Tools		<a href="#">Azure Cosmos DB</a> <a href="#">Quickstarts + tutorials</a>
DevOps		<a href="#">Kubernetes Service</a> <a href="#">Quickstarts + tutorials</a>
Identity		<a href="#">DevOps Project</a> <a href="#">Quickstarts + tutorials</a>
Integration		<a href="#">Storage account - blob, file, table, queue</a> <a href="#">Quickstarts + tutorials</a>
Internet of Things		
Media		
Mixed Reality		
IT & Management Tools		
Networking		
Software as a Service (SaaS)		
Security		
Storage		
Web		<a href="#">Show recently created items</a>

Azure API for FHIR - Microsoft A: https://portal.azure.com/?feature.customportal=false#create/hub

Microsoft Azure Search resources, services, and docs (G+) mihansen@microsoft.co... MICROSOFT

Dashboard > New > Azure API for FHIR

## Azure API for FHIR

Microsoft

 Azure API for FHIR [Save for later](#)

[Create](#)

[Overview](#) [Plans](#)

The Azure API for FHIR® is a managed, standards-based, and healthcare data platform. It enables organizations to bring their clinical health data into the cloud based on the interoperable data standard FHIR®.

FHIR helps unlock the value of data and respond to changing business dynamics more easily.

Organizations are able to bring together clinical data from multiple systems of records, normalize the data using common models and specifications, and use that data in AI workloads to derive insight and power new systems of engagement, including clinician and patient dashboards, diagnostic assistants, population health insights, and connected healthcare scenarios, such as Remote Patient Monitoring.

The Azure API for FHIR is capable of powering Internet of Medical Things (IoMT) scenarios, population health research projects, AI-powered diagnostic solutions and much more.

Security and privacy features are embedded into the service. Customers own and control patient data, knowing how it is stored and accessed.

Useful Links

- [HL7 FHIR Specification](#)
- [FHIR Server for Azure](#)
- [Documentation](#)

Create Azure API for FHIR - Microsoft Edge

https://portal.azure.com/?feature.customportal=false#create/Microsoft.HealthcareAPIs

Microsoft Azure

Search resources, services, and docs (G+)

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Dashboard > New > Azure API for FHIR > Create Azure API for FHIR

## Create Azure API for FHIR

Basics \* Additional settings \* Tags Review + create

The Azure API for FHIR® is a managed, standards-based, and compliant healthcare data platform. It enables organizations to bring their clinical health data into the cloud based on the interoperable data standard FHIR®.

**Project details**

Subscription \*

Resource group \*

(New) mihansen-devdays-2020

Create new

**Instance details**

Account name \*

mihansendevdays2020 .azurehealthcareapis.com

Location \*

(US) West US 2

FHIR Version \*

R4

**Review + create**

Next: Additional settings >

A red box highlights the 'Subscription' dropdown containing 'mihansen internal subscription' and the 'Resource group' dropdown containing '(New) mihansen-devdays-2020'. Another red box highlights the 'Account name' field containing 'mihansendevdays2020' and the 'Location' field containing '(US) West US 2'. At the bottom left, the 'Review + create' button is also highlighted with a red box.

Microsoft.HealthcareAPIs-20200520150457 x +

https://portal.azure.com/?feature.customportal=false#blade/HubsExtension/DeploymentDetailsBlade/overview/id/%2Fsubscriptions%2F8d0d324c-b1a1-4c71-8b9b-12320b418911%2Fresour... ☆ 6 1 ? mihansen@microsoft.co... MICROSOFT

Microsoft Azure

Search resources, services, and docs (G+)

Dashboard > Microsoft.HealthcareAPIs-20200520150457 | Overview

Microsoft.HealthcareAPIs-20200520150457 | Overview

Deployment

Search (Ctrl+ /) Delete Cancel Redeploy Refresh

Overview

Inputs

Outputs

Template

Your deployment is complete

Deployment name: Microsoft.HealthcareAPIs-20200520150457  
Subscription: mihansen internal subscription  
Resource group: mihansen-devdays-2020

Start time: 5/20/2020, 3:04:58 PM  
Correlation ID: 66c4e81e-a1f4-4643-8911-5f674ed02be2

Deployment details (Download)

Next steps

Go to resource

Security Center

Secure your apps and infrastructure

Go to Azure security center >

Free Microsoft tutorials

Start learning today >

Work with an expert

Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support.

Find an Azure expert >

mihansen devdays2020 - Microsoft +

https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/resource/subscriptions/8d0d324c-b1a1-4c71-8b9b-12320b418911/resourcegroups/mihansen-devdays-2... ☆ 6 1 ? ☺ mihansen@microsoft.co... MICROSOFT

Microsoft Azure

Search resources, services, and docs (G+)

Dashboard > Microsoft.HealthcareAPIs-20200520150457 | Overview > mihansen devdays2020

**mihansen devdays2020** Azure API for FHIR

Search (Ctrl+ /) Refresh Move Delete

Resource group (change) : mihansen-devdays-2020

Status : Online

Location : West US 2

Subscription (change) : mihansen internal subscription

Subscription ID : 8d0d324c-b1a1-4c71-8b9b-12320b418911

Tags (change) : Click here to add tags

FHIR metadata endpoint : <https://mihansen devdays2020.azurehealthcareapis.com/metadata>

Provisioned throughput ... : 400

FHIR Version : R4

Links

**Getting started with your FHIR service.**  
Learn how to access your FHIR service.  
[How to obtain your OAuth access token](#)  
[How to access your service using Postman](#)

Overview

Activity log

Access control (IAM)

Tags

Settings

Authentication

CORS

Database

Integration

Identity

Locks

Export template

Monitoring

Metrics

Diagnostic settings

Logs

Support + troubleshooting

New support request

Add role assignment - Microsoft

https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/resource/subscriptions/8d0d324c-b1a1-4c71-8b9b-12320b418911/resourcegroups/mihansen-devdays-2...

Microsoft Azure

Search resources, services, and docs (G+)

mihansen@micr... MICROSOFT

Dashboard > Microsoft.HealthcareAPIs-20200520150457 | Overview > mihansen-devdays2020 | Access control (IAM)

mihansen-devdays2020 | Access control (IAM)

Azure API for FHIR

Search (Ctrl+ /) Add Edit columns Refresh Remove Got feedback?

Overview Role assignments Deny assignments Classic administrators Roles

Check access Role assignments Deny assignments Classic administrators Roles

Manage access to Azure resources for users, groups, service principals and managed identities at this scope by creating role assignments. [Learn more](#)

Number of role assignments for this subscription 17 2000

Name Type Role Scope Group by

xxxxx All 3 selected All scopes Role

Showing a filtered set of results. Total number of role assignments: 19

0 items

Name Type Role

No user assignments exist

Selected members:  
No members selected. Search for and add one or more members you want to assign to the role for this resource.

Add role assignment

Role FHIR Data Contributor

Assign access to Azure AD user, group, or service principal

Select mihansen@microsoft.com

Michael Hansen mihansen@microsoft.com

Save Discard

mihansen devdays2020 | Access c +

https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/resource/subscriptions/8d0d324c-b1a1-4c71-8b9b-12320b418911/resourcegroups/mihansen-devdays-2... ☆ 6 2 ? ☺ mihansen@microsoft.co... MICROSOFT

Microsoft Azure Search resources, services, and docs (G+)

Dashboard > Microsoft.HealthcareAPIs-20200520150457 | Overview > mihansen devdays2020 | Access control (IAM)

mihansen devdays2020 | Access control (IAM) Azure API for FHIR

Search (Ctrl+ /) Add Edit columns Refresh Remove Got feedback?

Overview Activity log Access control (IAM) Tags

Check access Role assignments Deny assignments Classic administrators Roles

Manage access to Azure resources for users, groups, service principals and managed identities at this scope by creating role assignments. [Learn more](#)

Number of role assignments for this subscription 18 2000

Name Type Role Scope Group by

mihansen@microsoft.com All 4 selected All scopes Role

Showing a filtered set of results. Total number of role assignments: 20

2 items (2 Users)

<input type="checkbox"/> Name	Type	Role	Scope
<input type="checkbox"/> Michael Hansen mihansen@microsoft.com	User	FHIR Data Contributor	This resource
<input type="checkbox"/> Michael Hansen mihansen@microsoft.com	User	User Access Administrator	Subscription (Inherited)

FHIR Data Contributor

Michael Hansen  
mihansen@microsoft.com

User

FHIR Data Contributor

This resource

User Access Administrator

Subscription (Inherited)

Support + troubleshooting

New support request

mihansen devdays2020 | CORS - +

https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/resource/subscriptions/8d0d324c-b1a1-4c71-8b9b-12320b418911/resourcegroups/mihansen-devdays-2... ☆ 6 3 ? mihansen@microsoft.co... MICROSOFT

Microsoft Azure

Search resources, services, and docs (G+)

Dashboard > Microsoft.HealthcareAPIs-20200520150457 | Overview > mihansen devdays2020 | CORS

## mihansen devdays2020 | CORS

Azure API for FHIR

Save Discard Refresh

Cross-origin resource sharing (CORS) is a security mechanism that allows a web page from one domain or origin to access a resource with a different domain (a cross-domain request). Without features like CORS, websites are restricted to accessing resources from the same origin through what is known as same-origin policy. Please refer to <https://docs.microsoft.com/azure/healthcare-apis/configure-cross-origin-resource-sharing> for details on how to configure CORS.

Origins ⓘ

Headers ⓘ

Methods ⓘ

Max age ⓘ

Allow credentials ⓘ

Search (Ctrl+ /) <<

Overview

Activity log

Access control (IAM)

Tags

Settings

CORS

Database

Integration

Identity

Locks

Export template

Monitoring

Metrics

Diagnostic settings

Logs

Support + troubleshooting

New support request

Log Analytics Workspace - Micro + – X

https://portal.azure.com/?feature.customportal=false#create/hub

Microsoft Azure Search resources, services, and docs (G+) Dashboard New Log Analytics Workspace

Log Analytics Workspace Microsoft Save for later

 **Log Analytics Workspace** Microsoft Create

[Overview](#) [Plans](#)

**About Azure Monitor Log Analytics**  
With Azure Monitor Log Analytics you can easily store, retain and query data collected from your monitored resources in Azure and other environments for valuable insights.  
A Log Analytics workspace is the logical storage unit where your log data is collected and stored.  
A Log Analytics workspace is the basic management unit of Log Analytics.

**Create a new workspace**  
A Log Analytics Workspace is an Azure resource and a container where data is collected, aggregated, and serves as an administrative boundary.  
Creating an Azure Monitor Log Analytics workspace has some specific considerations you need to account for before choosing to create a new workspace.  
Please refer to the following documentation to learn more about the consideration you need to take before creating a new Log Analytics workspace.

Click on the 'Create' button to create an Azure Log Analytics workspace.

Useful Links  
[Watch Video](#)  
[Learn More](#)  
[Documentation](#)

Create Log Analytics workspace - + https://portal.azure.com/?feature.customportal=false#create/Microsoft.LogAnalyticsOMS Microsoft Azure Search resources, services, and docs (G+) mihansen@microsoft.co... MICROSOFT

Dashboard > New > Log Analytics Workspace > Create Log Analytics workspace

## Create Log Analytics workspace

Basics Pricing tier Tags Review + Create

A Log Analytics workspace is the basic management unit of Azure Monitor Logs. There are specific considerations you should take when creating a new Log Analytics workspace. [Learn more](#)

With Azure Monitor Logs you can easily store, retain, and query data collected from your monitored resources in Azure and other environments for valuable insights. A Log Analytics workspace is the logical storage unit where your log data is collected and stored.

**Project details**

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription \* ⓘ mihansen internal subscription

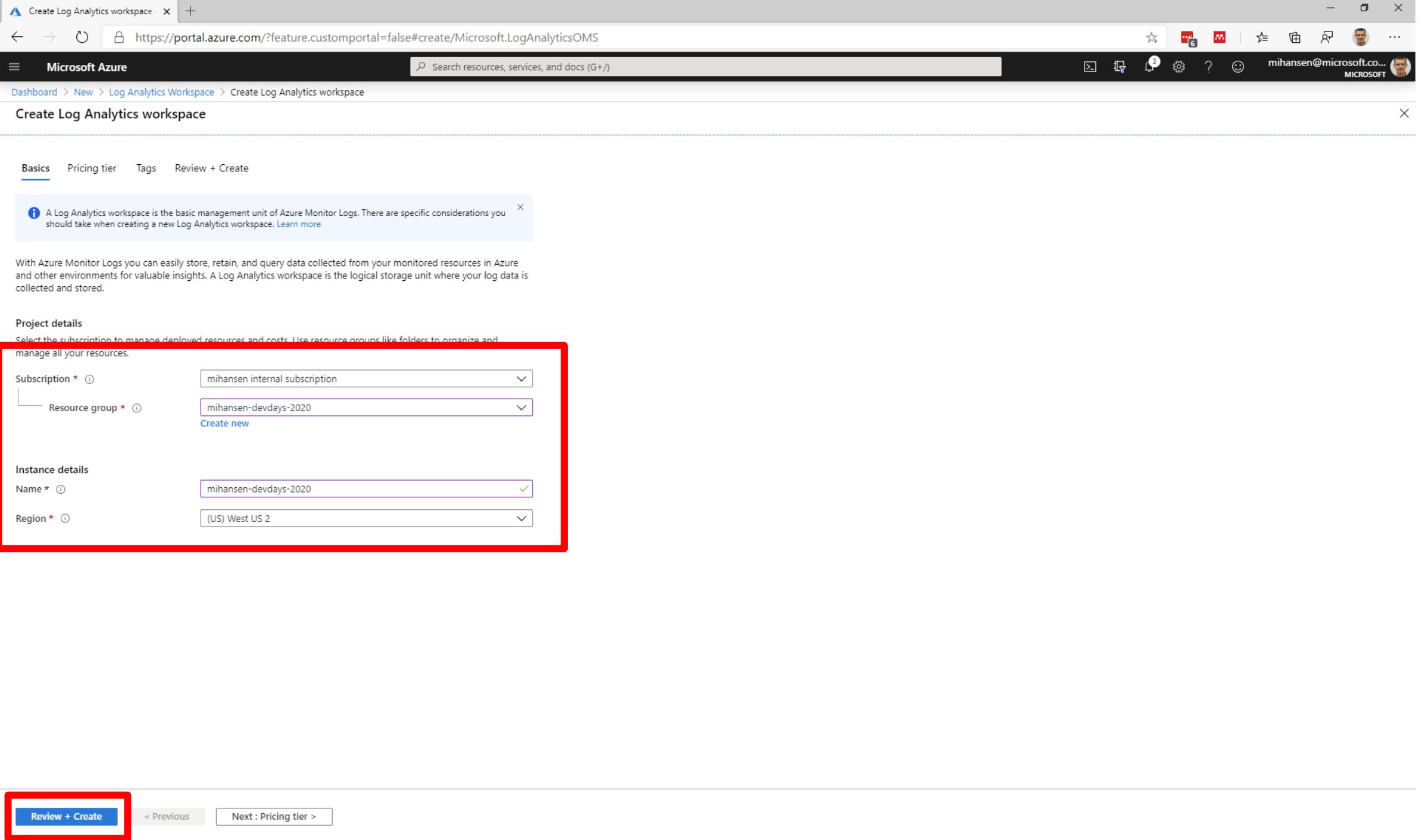
Resource group \* ⓘ mihansen-devdays-2020 [Create new](#)

**Instance details**

Name \* ⓘ mihansen-devdays-2020

Region \* ⓘ (US) West US 2

**Review + Create** [« Previous](#) [Next : Pricing tier >](#)



mihansen devdays2020 | Diagnos x + - ×

https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/resource/subscriptions/8d0d324c-b1a1-4c71-8b9b-12320b418911/resourcegroups/mihansen-devdays-2... ☆ 6 5 ? ⓘ mihansen@microsoft.co... MICROSOFT

Microsoft Azure

Search resources, services, and docs (G+)

Dashboard > mihansen devdays2020 | Diagnostic settings

mihansen devdays2020 | Diagnostic settings

Azure API for FHIR

Search (Ctrl+ /) Refresh Provide feedback

Overview Activity log Access control (IAM) Tags

Settings

- Authentication
- CORS
- Database
- Integration
- Identity
- Locks
- Export template

Monitoring

- Metrics
- Diagnostic settings
- Logs

Support + troubleshooting

New support request

Diagnostic settings are used to configure streaming export of platform logs and metrics for a resource to the destination of your choice. You may create up to five different diagnostic settings to send different logs and metrics to independent destinations. [Learn more about diagnostics settings](#)

Diagnostics settings

Name	Storage account	Event hub	Log Analytics workspace	Edit setting
No diagnostic settings defined				

+ Add diagnostic setting

Click 'Add Diagnostic setting' above to configure the collection of the following data:

- AuditLogs
- Errors
- Traffic
- Availability
- Saturation

Diagnostics settings - Microsoft

https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/resource/subscriptions/8d0d324c-b1a1-4c71-8b9b-12320b418911/resourcegroups/mihansen-devdays-2...

Microsoft Azure

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Dashboard > mihansen-devdays2020 | Diagnostic settings > Diagnostics settings

Diagnostics settings

Save Discard Delete Provide feedback

A diagnostic setting specifies a list of categories of platform logs and/or metrics that you want to collect from a resource, and one or more destinations that you would stream them to. Normal usage charges for the destination will occur. [Learn more about the different log categories and contents of those logs](#)

Diagnostic settings name \* SendToLogAnalytics

Category details

log

- AuditLogs

metric

- Errors
- Traffic
- Availability
- Saturation

Destination details

Send to Log Analytics

Subscription mihansen internal subscription

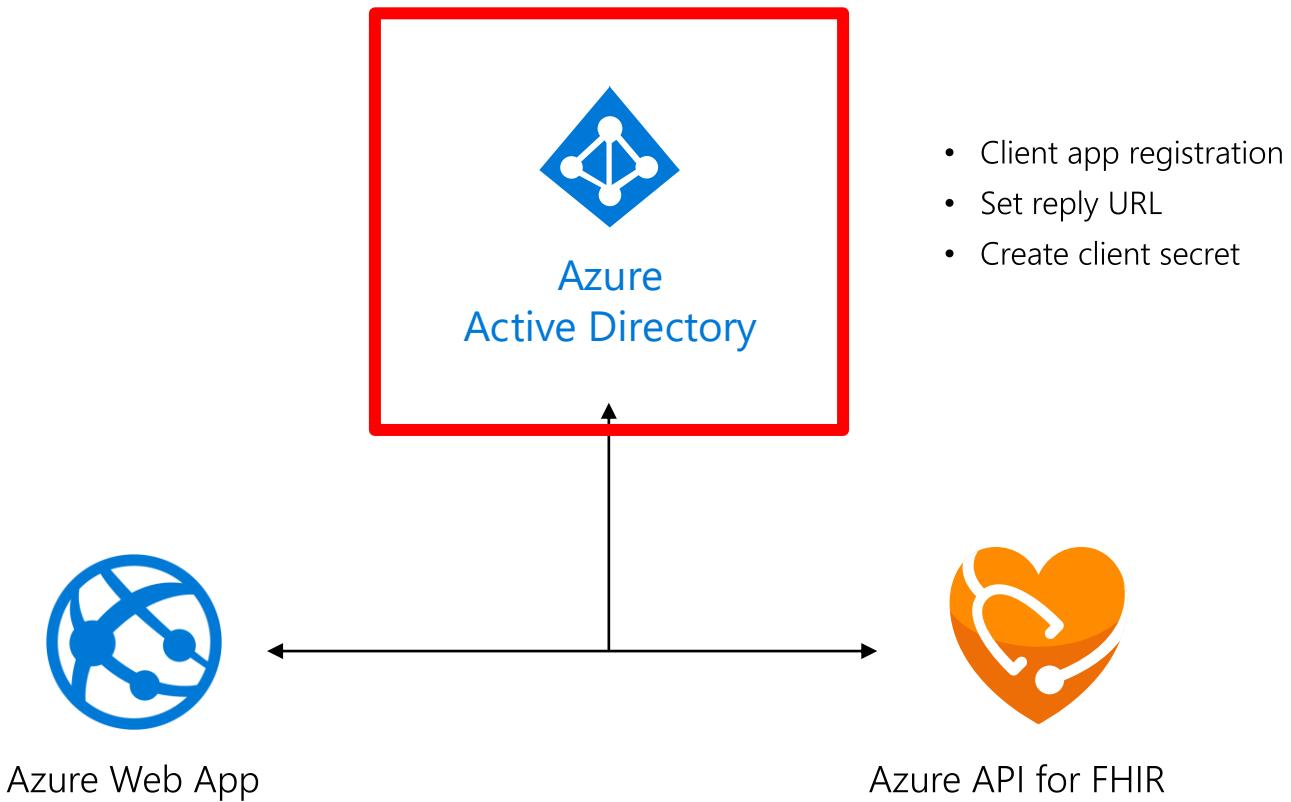
Log Analytics workspace mihansen-devdays-2020 ( westus2 )

Archive to a storage account

Stream to an event hub

# Identity Provider Client Application Registration

# TINY SANDBOX



<https://github.com/hansenms/FHIRDevDays-Amsterdam2019>

Microsoft | App registrations - M + Microsoft Azure https://portal.azure.com/?feature.customportal=false#blade/Microsoft\_AAD\_IAM/ActiveDirectoryMenuBlade/RegisteredApps

Microsoft Azure Search resources, services, and docs (G+) mihansen@microsoft.co... MICROSOFT

Dashboard > Microsoft | App registrations

Microsoft | App registrations Azure Active Directory

Search (Ctrl+ /) New registration Endpoints Troubleshooting Got feedback?

Overview Getting started Diagnose and solve problems

Welcome to the new and improved App registrations (now Generally Available). See what's new and learn more on how it's changed. →

⚠ If you are building an application for external users that will be distributed by Microsoft, you must register as a first party application to meet all security, privacy, and compliance policies. Read our decision guide ↗

All applications Owned applications

Display name Application (client) ID Created on Certificates & secrets

Display name	Application (client) ID	Created on	Certificates & secrets
AZ azureapiforfhircient	79f92a91-b6d3-4d40-b29d-adb42b3608a4	2/4/2019	✓ Current

azureapi

Manage

- Users
- Groups
- External Identities
- Roles and administrators
- Administrative units (Preview)
- Enterprise applications
- Devices
- App registrations**
- Identity Governance
- Application proxy
- Licenses
- Azure AD Connect
- Custom domain names
- Mobility (MDM and MAM)
- Password reset
- Company branding
- User settings
- Properties
- Security

Monitoring

- Sign-ins
- Audit logs
- Provisioning logs (Preview)
- Logs

azureapiforhclient | Authentication

https://portal.azure.com/?feature.customportal=false#blade/Microsoft\_AAD\_RegisteredApps/ApplicationMenuBlade/Authentication/appId/79f92a91-b6d3-4d40-b29d-adb42b3608a4/isMSA...

Microsoft Azure

Search resources, services, and docs (G+)

mihansen@microsoft.co... MICROSOFT

Dashboard > Microsoft | App registrations > azureapiforhclient | Authentication

## azureapiforhclient | Authentication

Save Discard Got feedback?

Got a second to give us some feedback? →

### Platform configurations

Depending on the platform or device this application is targeting, additional configuration may be required such as redirect URIs, specific authentication settings, or fields specific to the platform.

+ Add a platform

#### Mobile and desktop applications

Quickstart Docs

Redirect URIs

The URIs we will accept as destinations when returning authentication responses (tokens) after successfully authenticating users. Also referred as reply URLs. [Learn more about redirect URLs and the restrictions](#)

https://login.microsoftonline.com/common/oauth2/nativeclient

https://login.live.com/oauth2\_desktop.srf (LiveSDK)

msal79f92a91-b6d3-4d40-b29d-adb42b3608a4://auth (MSAL only)

https://mihansendevdays2020.azurewebsites.net

http://localhost:9090/index.html

https://www.getpostman.com/oauth2/callback

Add URI

**NOTE:** You have implicit grant and/or logout URI settings set without any Web or SPA redirect URIs registered. You should remove these settings or register the appropriate redirect URL.

#### Logout URL

This is where we send a request to have the application clear the user's session data. This is required for single sign-out to work correctly.

e.g. https://myapp.com/logout

#### Implicit grant

Allows an application to request a token directly from the authorization endpoint. Checking Access Token and ID Token only recommended if the application has a single-page architecture (SPA), has no back end components and does not use the latest version of MSAL.js with Auth Code Flow, or invokes a Web API via JavaScript. ID Token is needed for ASP.NET Core Web Apps. [Learn more about the implicit grant flow](#)

azureapiforhclient | API permis x + - ×

https://portal.azure.com/?feature.customportal=false#blade/Microsoft\_AAD\_RegisteredApps/ApplicationMenuBlade/CallAnAPI/appId/79f92a91-b6d3-4d40-b29d-adb42b3608a4/isMSAApp/ ⌂ 6 8 ? ⓘ mhansen@microsoft.co... MICROSOFT

Microsoft Azure

Search resources, services, and docs (G+)

Dashboard > Microsoft | App registrations > azureapiforhclient | API permissions

## azureapiforhclient | API permissions

Search (Ctrl+ /) Refresh

Configured permissions

Applications are authorized to call APIs when they are granted permissions by users/admins as part of the consent process. The list of configured permissions should include all the permissions the application needs. [Learn more about permissions and consent](#)

+ Add a permission Grant admin consent for Microsoft

API / Permissions name	Type	Description	Admin consent req...	Status	...	
✓ Azure Healthcare APIs (1)					...	
user_impersonation	Delegated	Access Azure Healthcare APIs	-	✓ Granted for Microsoft	...	
✓ Microsoft Graph (1)					...	
	User.Read	Delegated	Sign in and read user profile	-	✓ Granted for Microsoft	...

Overview Quickstart Integration assistant (preview) Manage Branding Authentication Certificates & secrets Token configuration API permissions Expose an API Owners Roles and administrators (Previous) Manifest Support + Troubleshooting Troubleshooting New support request

# Testing FHIR API



Postman

File Edit View Help

[New](#) [Import](#) [Runner](#) [+](#)My Workspace [Invite](#)[Upgrade](#)[Logout](#) [Help](#) [Feedback](#) [Support](#) [APIs](#) [Collections](#) [Tests](#) [Code](#) [Comments](#) [Examples](#)

Filter

History

Collections

APIs

[+ New Collection](#)

Trash

FHIR DevDays 2020

3 requests

[GET](#) {{fhirserverurl}}/metadata[GET](#) {{fhirserverurl}}/Patient[POST](#) {{fhirserverurl}}/Patient

FHIR Training

30 requests

FHIR Training Example Q...

30 requests

rbac-demo

2 requests

GET {{fhirserverurl}}/metadata

Params Authorization Headers (8) Body Pre-request Script Tests Settings

Query Params

KEY	VALUE	DESCRIPTION
Key	Value	Description

Body Cookies Headers (8) Test Results Status: 200 OK Time: 423 ms Size: 901 KB Save Response

Pretty Raw Preview Visualize JSON

```
1
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41
42
{
  "resourceType": "CapabilityStatement",
  "url": "/metadata",
  "version": "1.0.0.0",
  "name": "Microsoft FHIR Server",
  "status": "draft",
  "experimental": true,
  "publisher": "Microsoft",
  "contact": [
    {
      "telecom": [
        {
          "system": "url",
          "value": "https://www.microsoft.com"
        }
      ]
    }
  ],
  "kind": "capability",
  "software": {
    "name": "Microsoft FHIR Server",
    "version": "1.0.0.0"
  },
  "fhirVersion": "4.0.1",
  "format": [
    "application/fhir+json"
  ],
  "rest": [
    {
      "mode": "server",
      "security": {
        "extension": [
          {
            "extension": [
              {
                "url": "token",
                "valueUri": "https://login.microsoftonline.com/72f988bf-86f1-41af-91ab-2d7cd011db47/oauth2/token"
              },
              {
                "url": "authorize",
                "valueUri": "https://login.microsoftonline.com/72f988bf-86f1-41af-91ab-2d7cd011db47/oauth2/authorize"
              }
            ]
          }
        ]
      }
    }
  ]
}
```



Bootcamp

Build

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FHIR DevDays 2020

4 requests

[GET {{fhirserverurl}}/metadata](#)[GET {{fhirserverurl}}/Patient](#)[POST {{fhirserverurl}}/Patient](#)[DEL {{fhirserverurl}}/Patient](#)

FHIR Training

30 requests

FHIR Training Example Q...

30 requests

rbac-demo

2 requests

GET {{fhirserverurl}}/metadata

GET {{fhirserverurl}}/Patient

DEL {{fhirserverurl}}/Patient

POST {{fhirserverurl}}/Patient

FHIR DevDays 2020

GET {{fhirserverurl}}/Patient

Params

Authorization

Headers (11)

Body

Pre-request Script

Tests

Settings

Send

Save

Cookies

Code

TYPE

Inherit auth from parent

This request is using an authorization helper from collection FHIR DevDays 2020.

The authorization header will be automatically generated when you send the request. [Learn more about authorization](#)

Status: 401 Unauthorized Time: 53 ms Size: 781 B

Save Response

Body Cookies Headers (9) Test Results

Q

Pretty

Raw

Preview

Visualize

JSON



```
1 {
2   "resourceType": "OperationOutcome",
3   "id": "34ba926938a8a34fa06706ee50127ba5",
4   "issue": [
5     {
6       "severity": "error",
7       "code": "login",
8       "diagnostics": "Authentication failed."
9     }
10   ]
11 }
```



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GET {{fhirserverurl}}/metadata

GET {{fhirserverurl}}/Patient

POST {{fhirserverurl}}/Patient

DEL {{fhirserverurl}}/Patient

FHIR Training  
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30 requestsrbac-demo  
2 requests

GET {{fhirserverurl}}/metadata

GET {{fhirserverurl}}/Patient

DEL {{fhirserverurl}}/Patient

POST {{fhirserverurl}}/Patient

EDIT COLLECTION

Name

FHIR DevDays 2020

Description Authorization Headers Scripts Tools Variables

TYPE

Inherit auth from parent

The authorization header will be automatically generated by the request. [Learn more about authorization](#)

Body Cookies Headers (10) Test Results

Pretty Raw Preview Visualize

```
1 {
2   "resourceType": "Bundle",
3   "id": "27fcf55256d1d84da75f4a01
4   "meta": {
5     "lastUpdated": "2020-05-20
6   },
7   "type": "searchset",
8   "link": [
9     {
10       "relation": "self",
11       "url": "https://mihansen
12     }
13   ]
14 }
```

GET NEW ACCESS TOKEN

Token Name

mihansen-devdays

Grant Type

Authorization Code

Callback URL ⓘ

https://www.getpostman.com/oauth2/callback

 Authorize using browser

Auth URL ⓘ

https://login.microsoftonline.com/{{aadTenant}}/oauth2/v2.0/authorize

Access Token URL ⓘ

https://login.microsoftonline.com/{{aadTenant}}/oauth2/v2.0/token

Client ID ⓘ

{{clientId}}

Client Secret ⓘ

Client Secret

Scope ⓘ

{{fhirserverurl}}/user\_impersonation

State ⓘ

State

Client Authentication

Send client credentials in body

Cancel

Request Token

Cancel

Update

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?



Postman

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FHIR DevDays 2020  
4 requests

GET {{fhirserverurl}}/metadata

GET {{fhirserverurl}}/Patient

POST {{fhirserverurl}}/Patient

DEL {{fhirserverurl}}/Patient

FHIR Training  
30 requestsFHIR Training Example Q...  
30 requestsrbac-demo:  
2 requests

GET {{fhirserverurl}}/metadata

GET {{fhirserverurl}}/Patient

GET {{fhirserverurl}}/Patient

+ + +

FHIR DevDays 2020

Comments 0

Examples 0

Send

Save

Cookies Code

collection FHIR DevDays 2020

Status: 401 Unauthorized Time: 53 ms Size: 781 B Save Response

Body Cookies Headers (9) Test Results

Pretty Raw Preview Visualize

```
1: {
2:   "resourceType": "OperationOutcome",
3:   "id": "34ba926938a8a34fa0670c",
4:   "issue": [
5:     {
6:       "severity": "error",
7:       "code": "login",
8:       "diagnostics": "Authenticat"
9:     }
10:   ]
11: }
```

EDIT COLLECTION

Name: FHIR DevDays 2020

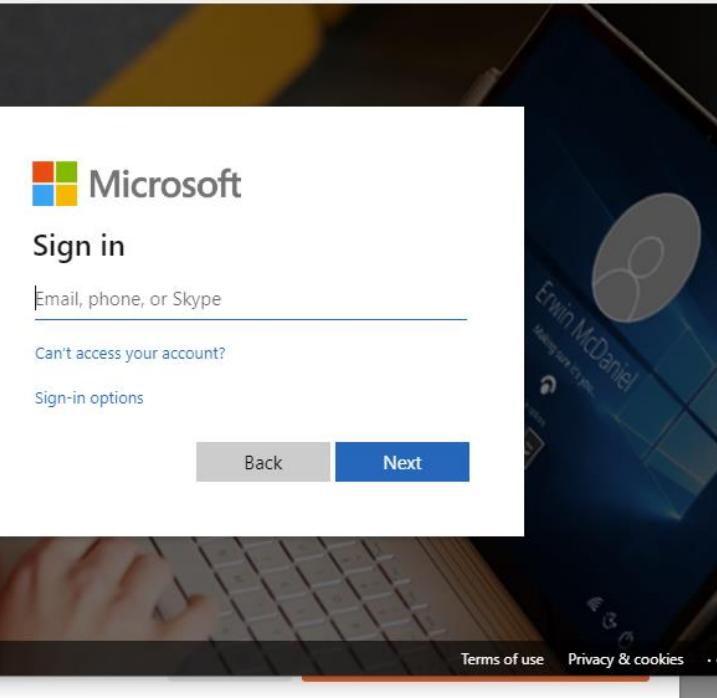
Description: Authorization

Params Authorization Headers (11)

GET NEW ACCESS TOKEN

Sign in to your account

File Edit View Help



Cancel

Update



Postman

File Edit View Help

New Import Runner

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GET {{fhirserverurl}}/metadata

GET {{fhirserverurl}}/Patient

POST {{fhirserverurl}}/Patient

DEL {{fhirserverurl}}/Patient

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30 requestsFHIR Training Example Q...  
30 requestsrbac-demo  
2 requests

GET {{fhirserverurl}}/metadata

GET {{fhirserverurl}}/Patient

DEL {{fhirserverurl}}/Patient

POST {{fhirserverurl}}/Patient

EDIT COLLECTION

Name

FHIR DevDays 2020

GET

{{fhirserverurl}}/Patient

Params

Authorization

Headers (11)

Send

Save

Cookies

Code

## MANAGE ACCESS TOKENS

TYPE

Inherit auth from parent

ALL TOKENS

https://fhirtraining-loc...

https://fhirtraining-azu...

https://fhirtraining-azu...

https://fhirtraining-loc...

https://fhirtraining-azu...

https://fhirtraining-loc...

https://fhirtraining-azu...

https://fhirtraining-azu...

https://fhirtraining-azu...

https://fhirsampdev.az...

## Token Details

Use Token

Token Name

mihansen-devdays

Access Token

```
eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiIsIng1dCI6IkN0VHV0TUptRDVN  
N0RMZHpeMnYyeDNRS1NSWSIlsImtpZCI6IkN0VHV0TUptRDVN  
MZHpEMnYyeDNRS1NSWSj9eyJhdWQIOiJodHRwczovL21paGFuc2V  
uZGV2ZGFc澤MjAuYXp1cmVoZWfsdGhjYXjYXBpcy5jb20iCJpc3Mi  
OjodHRwczovL3N0cy53aW5kb3dzLm5ldC83MmY5ODhiZl04NmYxL  
TQxyWYtOTFHYi0yZDdjZDAxMWRiNDcvliwiWF0ljoxNTkwMDE3NDA  
3LCJuYmYjOjE1OTAwMTc0MDcsImV4cCl6MTU5MDAyMTMwNywiYW  
NyljoiMSIsImFpbly6IkFWUUFxLzhQQUFBUjsRddKTy9jWVRXaTNW  
MC9nTG80Umd6OWhRRjNPNk9vUIZ3amjiaEqT2tFb3Q2WXIsdjVSZ  
mRUcEVBNkZY53MwcXNkUzxcnhQa0jkYnhTznR2OS9DSjlleWdxR1J  
LMXF1UEENXTWNROudNPSIsImFcil6Wyl3aWEiLCJtZmEiXSwiYBwa  
WQiOj3OWY5MmE5MS1iNmQzLTRkNDAjYj5ZC1hZGI0MmlzNjA4YT  
QiLCJhcHBpZGFjcl6ljAiLCjmYW1pbHfbmFtZSj6ikhbnNlbisImdpd  
mVuX25hbWUiOjNaWNoYWVsliwiw5Fy29ycC6lnRydWUiLCJpcGFk  
ZHliOilyNC4xOC440C4xOSlsIm5hbWUiOjNaWNoYWVsliEhhbnNlbis
```

Cancel

Update



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Examples 0

Send

Save

Cookies

Code

GET [{{fhirserverurl}}/Patient](#)

Params

Authorization

Headers (10)

Body

Pre-request Script

Tests

Settings

TYPE

Inherit auth from parent

The authorization header will be automatically generated when you send the request. [Learn more about authorization](#)

This request is using an authorization helper from collection FHIR DevDays 2020.

Status: 200 OK

Time: 272 ms

Size: 663 B

Save Response

Body Cookies Headers (10) Test Results

Pretty

Raw

Preview

Visualize

JSON



```
1  {
2      "resourceType": "Bundle",
3      "id": "027aa772b4906a4ab4a514607bc90bc2",
4      "meta": {
5          "lastUpdated": "2020-05-20T23:35:41.9297872+00:00"
6      },
7      "type": "searchset",
8      "link": [
9          {
10             "relation": "self",
11             "url": "https://mihansendevdays2020.azurehealthcareapis.com/Patient"
12         }
13     ]
14 }
```



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No Environment

Comments (0)

Untitled Request

POST https://amsterdam1.azurehealthcareapis.com/Patient

Send

Save

Params Authorization [Headers \(9\)](#) [Body](#) [Pre-request Script](#) [Tests](#) [Settings](#)

Cookies Code

 none  form-data  x-www-form-urlencoded  raw  binary  GraphQL [BETA](#) [JSON](#)

Beautify

```
1 [ {  
2   "resourceType": "Patient",  
3   "active": true,  
4   "name": [  
5     {  
6       "use": "official",  
7       "family": "Kirk",  
8       "given": [  
9         "James",  
10        "Tiberious"  
11      ],  
12    },  
13    {  
14      "use": "usual",  
15      "given": [  
16        "Jim"  
17      ]  
18    }  
19  ],  
20  "gender": "male",  
21  "birthDate": "1960-12-25"  
22 }]
```

Body Cookies Headers (10) Test Results

Status: 200 OK Time: 1308ms Size: 653 B

Save Response

Pretty Raw Preview Visualize [BETA](#) JSON [-](#)

F Q

```
1 [ {  
2   "resourceType": "Bundle",  
3   "id": "b6b9fb967d23d8499f6fbc6e559b3b31",  
4   "meta": {  
5     "lastUpdated": "2019-11-06T23:28:50.338885+00:00"  
6   },  
7   "type": "searchset",  
8   "link": [  
9     {  
10       "relation": "self",  
11       "url": "https://amsterdam1.azurehealthcareapis.com/Patient"  
12     }  
13   ]  
14 }]
```



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Filter

History Collections APIs

[+ New Collection](#) TrashFHIR DevDays 2020  
4 requests

GET {{fhirserverurl}}/metadata

GET {{fhirserverurl}}/Patient

POST {{fhirserverurl}}/Patient

DEL {{fhirserverurl}}/Patient

FHIR Training  
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30 requestsrbac-demo  
2 requestsGET {{fhirserverurl}}/metadata GET {{fhirserverurl}}/Patient DEL {{fhirserverurl}}/Patient POST {{fhirserverurl}}/Patient [+](#) [...](#)

FHIR DevDays 2020

Comments 0 Examples 0

Send

Save

Cookies Code

Beautify

POST {{fhirserverurl}}/Patient

Params Authorization Headers (13) Body Pre-request Script Tests Settings

none form-data x-www-form-urlencoded raw binary GraphQL JSON

```
1 {
2   "resourceType": "Patient",
3   "active": true,
4   "name": [
5     {
6       "use": "official",
7       "family": "Kirk",
8       "given": [
9         "James",
10        "Tiberious"
11      ]
12    },
13    {
14      "use": "usual",
15      "given": [
16        "Jim"
17      ]
18    }
19  ],
20  "gender": "male",
21  "birthDate": "1960-12-25"
22 }
```

Body Cookies Headers (13) Test Results

Status: 201 Created Time: 832 ms Size: 910 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {
2   "resourceType": "Patient",
3   "id": "1f350893-6158-476b-97e0-a46e706bad94",
4   "meta": {
5     "versionId": "1",
6     "lastUpdated": "2020-05-20T23:37:01.118+00:00"
7   },
8   "active": true,
9   "name": [
10     {
11       "use": "official",
12       "family": "Kirk",
13       "given": [
14         "James",
15         "Tiberious"
16       ]
17     },
18     {
19       "use": "usual",
20       "given": [
21         "Jim"
22       ]
23     }
24   ],
25 }
```



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GET {{fhirserverurl}}/Patient

DEL {{fhirserverurl}}/Patient

POST {{fhirserverurl}}/Patient

FHIR DevDays 2020

Comments 0

Examples 0

Send

Save

Cookies

Code

GET {{fhirserverurl}}/Patient

Params Authorization Headers (9) Body Pre-request Script Tests Settings

none form-data x-www-form-urlencoded raw binary GraphQL

This request does not have a body

Status: 200 OK

Time: 52 ms

Size: 1.1 KB

Save Response

Body Cookies Headers (10) Test Results

Pretty Raw Preview Visualize JSON

1

```
1
2   "resourceType": "Bundle",
3   "id": "1cc1c07e9f2eff4f9e25c4acc1290d33",
4   "meta": {
5     "lastUpdated": "2020-05-20T23:37:47.2018143+00:00"
6   },
7   "type": "searchset",
8   "link": [
9     {
10       "relation": "self",
11       "url": "https://mihansendevdays2020.azurehealthcareapis.com/Patient"
12     }
13   ],
14   "entry": [
15     {
16       "fullUrl": "https://mihansendevdays2020.azurehealthcareapis.com/Patient/1f350893-6158-476b-97e0-a46e706bad94",
17       "resource": {
18         "resourceType": "Patient",
19         "id": "1f350893-6158-476b-97e0-a46e706bad94",
20         "meta": {
21           "versionId": "1",
22           "lastUpdated": "2020-05-20T23:37:01.118+00:00"
23         },
24         "active": true,
25         "name": [
26           {
27             "use": "official",
28             "family": "Kirk",
29             "given": [
30               "James",
31               "Tiberious"
32             ]
33           },
34           {
35             "use": "usual",
36             "given": [
37               "Jim"
38             ]
39           }
40         ],
41         "gender": "male",
42         "birthDate": "1960-12-25"
43       }
44     }
45   ]
46 }
```

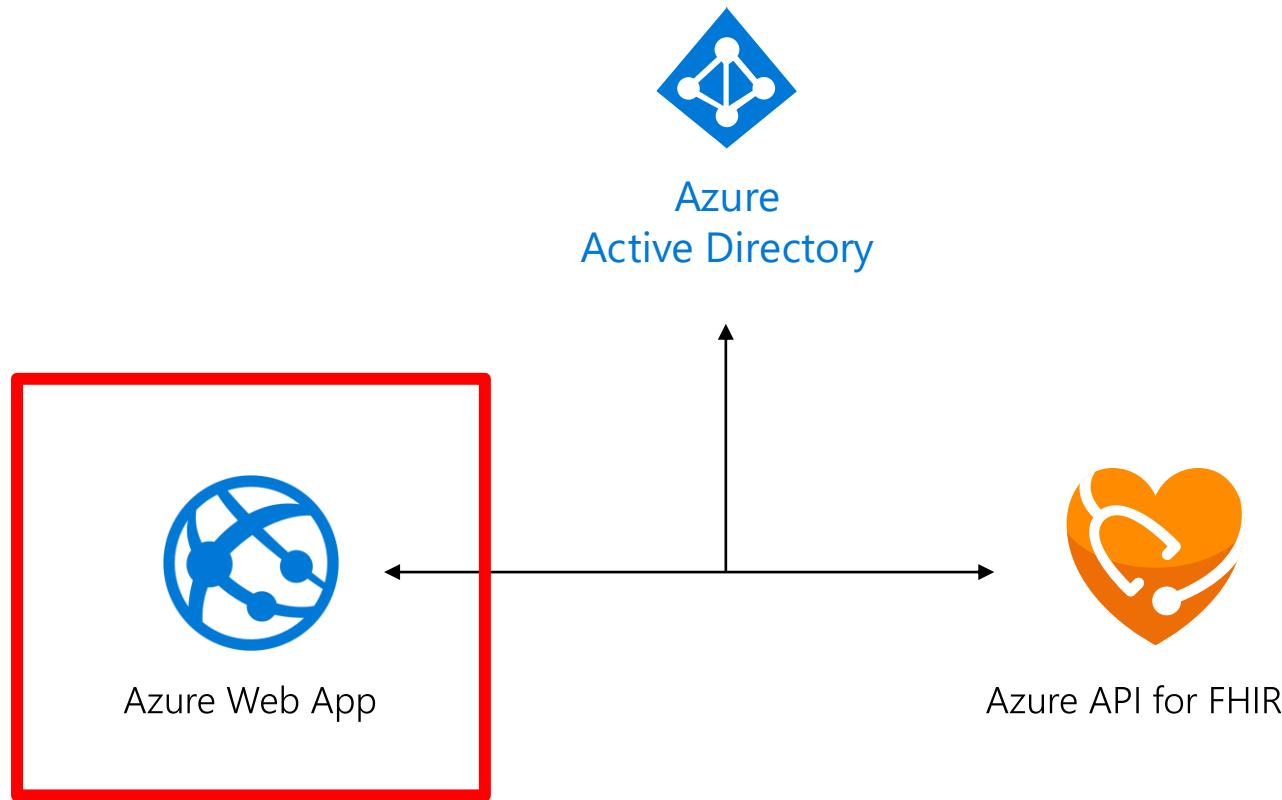


Browse



# Web Application

# TINY SANDBOX



Larger Sandbox

<https://github.com/Microsoft/fhir-server-samples>

New - Microsoft Azure

https://portal.azure.com/?feature.customportal=false#create/hub

Microsoft Azure

Search resources, services, and docs (G+)

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Storage account - blob, file, table, queue Quickstarts + tutorials

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Web App - Microsoft Azure

https://portal.azure.com/?feature.customportal=false#create/Microsoft.WebSite

Microsoft Azure

Search resources, services, and docs (G+)

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Dashboard > New > Web App

## Web App

Basics Monitoring Tags Review + create

App Service Web Apps lets you quickly build, deploy, and scale enterprise-grade web, mobile, and API apps running on any platform. Meet rigorous performance, scalability, security and compliance requirements while using a fully managed platform to perform infrastructure maintenance. [Learn more](#)

**Project Details**

Select a subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage

Subscription \* mihansen internal subscription

Resource Group \* mihansen-devdays-2020

Create new

**Instance Details**

Name \* mihansendevdays2020 .azurewebsites.net

Publish \* [Code](#) Docker Container

Runtime stack \* .NET Core 3.1 (LTS)

Operating System \* Linux Windows

Region \* West US 2 Not finding your App Service Plan? Try a different region.

**App Service Plan**

App Service plan pricing tier determines the location, features, cost and compute resources associated with your app. [Learn more](#)

Windows Plan (West US 2) \* (New) ASP-mihansendevdays2020-981f

Create new

Sku and size \* Standard S1  
100 total ACU, 1.75 GB memory

Change size

Review + create < Previous Next : Monitoring >

The screenshot shows the Microsoft Azure portal's 'Create a new Web App' wizard. The 'Project Details' and 'Instance Details' sections are highlighted with a red box. The 'Project Details' section includes fields for Subscription (mihansen internal subscription) and Resource Group (mihansen-devdays-2020). The 'Instance Details' section includes fields for Name (mihansendevdays2020), Publish method (Code), Runtime stack (.NET Core 3.1 (LTS)), Operating System (Windows), and Region (West US 2). The 'App Service Plan' section shows the Windows Plan (ASP-mihansendevdays2020-981f) and sku (Standard S1).

mihansen devdays2020 | App Ser +

https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/resource/subscriptions/8d0d324c-b1a1-4c71-8b9b-12320b418911/resourcegroups/mihansen-devdays-2... ☆ 6 9 ? ☺ mihansen@microsoft.co... MICROSOFT

Microsoft Azure

Search resources, services, and docs (G+)

Dashboard > Microsoft.Web-WebApp-Portal-58f51b4e-b8aa | Overview > mihansen devdays2020 | App Service Editor (Preview)

mihansen devdays2020 | App Service Editor (Preview) X

Search (Ctrl+ /) <>

Properties  
Locks  
Export template  
App Service plan  
App Service plan  
Quotas  
Change App Service plan  
Development Tools  
Clone App  
Console  
Advanced Tools  
**App Service Editor (Preview)** Go →

App Service Editor provides an in-browser editing experience for your App code. [Learn more](#)

Resource explorer  
Extensions  
API  
API Management  
API definition  
CORS  
Monitoring  
Alerts  
Metrics  
Logs  
Diagnostic settings (preview)  
App Service logs  
Log stream  
Process explorer  
Support + troubleshooting

mihansendevdays2020 - Microsoft Edge index.html - wwwroot - App Service Editor

https://mihansendevdays2020.scm.azurewebsites.net/dev/wwwroot/index.html

App Service Editor | mihansendevdays2020 | Michael Hansen | SAVED

EXPLORE WORKING FILES index.html WWWROOT index.html

```
index.html
1 <!DOCTYPE html>
2 <html>
3
4 <head>
5   <title>FHIR Patient browser sample app</title>
6   <script src="https://secure.aadcdn.microsoftonline-p.com/lib/1.0.0/js/msal.js"></script>
7 </head>
8
9 <body>
10   <div class="leftContainer">
11     <p id="WelcomeMessage">Welcome to the FHIR Patient browsing sample Application</p>
12     <button id="SignIn" onclick="signIn()>Sign In</button>
13   </div>
14
15   <div id="patientTable">
16   </div>
17
18 <script>
19   var msalConfig = {
20     auth: {
21       clientId: '<client-id>',
22       authority: "https://login.microsoftonline.com/<tenant-id>"
23     },
24     cache: {
25       cacheLocation: "localStorage",
26       storeAuthStateInCookie: true
27     }
28   }
29
30   var FHIRConfig = {
31     FHIREndpoint: "https://<fhir-service-name>.azurehealthcareapis.com"
32   }
33   var requestObj = {
34     scopes: ["https://<fhir-service-name>.azurehealthcareapis.com/user_impersonation"]
35   }
36
37   function authRedirectCallBack(error, response) {
38     if (error) {
39       console.log(error)
40     } else {
41       if (response.tokenType === "access_token") {
42         callFHIRServer(FHIRConfig.FHIREndpoint + '/Patient', 'GET', null, response.accessToken, FHIRCallback);
43       }
44     }
45   }
46
47   var myMSALObj = new Msal.UserAgentApplication(msalConfig);
48   myMSALObj.handleRedirectCallback(authRedirectCallBack);
49
50   function signIn() {
51     myMSALObj.loginPopup(requestObj).then(function (loginResponse) {
52       showWelcomeMessage();
53       acquireTokenPopupAndCallFHIRServer();
54     }).catch(function (error) {

```

Welcome to the FHIR Patient browsing sample Application

Sign In

Welcome to the Patient Browser FHIR Patient Browser App

Sign Out

1. Kirk, James Tiberious (1f350893-6158-476b-97e0-a46e706bad94)

# Audit logging

mihansen-devdays-2020 | Logs - index.html - wwwroot - App Serv | + https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/resource/subscriptions/8d0d324c-b1a1-4c71-8b9b-12320b418911/resourceGroups/mihansen-devdays-2... 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 50 items per page 1 - 4 of 4 items

Microsoft Azure Search resources, services, and docs (G+) mihansen@microsoft.co... MICROSOFT

Dashboard > mihansen-devdays-2020 | Logs

mihansen-devdays-2020 | Logs Log Analytics workspace

Search (Ctrl+ /) New Query 1+ Run Time range : Last 24 hours Save Copy link + New alert rule Export Pin to dashboard Prettify query

Overview Activity log Access control (IAM) Tags Diagnose and solve problems

Tables Filter MicrosoftHealthcareApisAuditLogs | limit 100

Group by: Solution Filters: not selected

Favorites You can add favorites by clicking on the star icon

LogManagement

- Operation
- Usage
- ReservedCommonFields
- Alert
- ComputerGroup
- AppCenterError
- AzureActivity
- AzureMetrics
- MicrosoftHealthcareApisA...

Results Chart Columns Display time (UTC+00:00) Group columns

Completed. Showing results from the last 24 hours. 00:00:01.293 4 records

TimeGenerated [UTC]	OperationName	CorrelationId	RequestUri	FhirResourceType	StatusCodes
5/22/2020, 6:35:01.000 PM	Microsoft.HealthcareApis/services/fhir-R4/search-type	0dc389e78d35fd4788b01fc6c82933fd	https://mihansen-devdays2020.azurehealthcareapis.com:443/Patient	Patient	0
5/22/2020, 6:35:01.000 PM	Microsoft.HealthcareApis/services/fhir-R4/search-type	0dc389e78d35fd4788b01fc6c82933fd	https://mihansen-devdays2020.azurehealthcareapis.com:443/Patient	Patient	200
5/22/2020, 6:58:51.000 PM	Microsoft.HealthcareApis/services/fhir-R4/search-type	02016a3d4f305749be7339467ca9f46b	https://mihansen-devdays2020.azurehealthcareapis.com:443/Patient	Patient	0
5/22/2020, 6:58:51.000 PM	Microsoft.HealthcareApis/services/fhir-R4/search-type	02016a3d4f305749be7339467ca9f46b	https://mihansen-devdays2020.azurehealthcareapis.com:443/Patient	Patient	200

Logs Solutions

Saved searches Pricing tier Usage and estimated costs Properties Service Map

Virtual machines Storage accounts logs Azure Activity log Scope Configurations (Preview)

Automation Account

# Larger Sandbox

<https://github.com/Microsoft/fhir-server-samples>

Importing HL7 v2 data

microsoft/fhir-server-samples: S + https://github.com/Microsoft/fhir-server-samples

Search or jump to... Pull requests Issues Marketplace Explore

**microsoft / fhir-server-samples**

Unwatch 19 Unstar 97 Fork 59

Code Issues 4 Pull requests 0 Actions Projects 0 Wiki Security 0 Insights Settings

Samples for Microsoft FHIR Server for Azure Edit

Manage topics

-o 60 commits 12 branches 0 packages 0 releases 7 contributors MIT

Branch: master New pull request Create new file Upload files Find file Clone or download

File / Commit	Description	Date
hansenms Updated Azure Functions SDK (#82)	✓ Latest commit 56148a7 28 days ago	
analytics Adf option2 (#41)	13 months ago	
deploy Corrected problem when deploying without export (#81)	2 months ago	
images Removed ADF (#78)	2 months ago	
src Updated Azure Functions SDK (#82)	28 days ago	
test/FhirDashboard.Tests.E2E Refactor r4 (#59)	9 months ago	
.editorconfig Style cop corrections (#10)	17 months ago	
.gitignore Initial deployment templates	17 months ago	
CustomAnalysisRules.Test.ruleset Style cop corrections (#10)	17 months ago	
CustomAnalysisRules.ruleset Style cop corrections (#10)	17 months ago	
GeoPol.xml GeoPolitical Update: Fix for ExcludedFilesRemoved into master branch (#...	9 months ago	
LICENSE Initial commit	2 years ago	
README.md Removed ADF (#78)	2 months ago	
azure-pipelines.yml Removed ADF (#78)	2 months ago	
fhir-server-samples.sln Refactor r4 (#59)	9 months ago	
stylecop.json Style cop corrections (#10)	17 months ago	

README.md

FHIR Server Samples

microsoft/fhir-server-samples: S x +

← → 🔍 https://github.com/Microsoft/fhir-server-samples

Before deploying the samples scenario make sure that you have `Az` and `AzureAd` powershell modules installed:

```
Install-Module Az  
Install-Module AzureAd
```

## Deployment

To deploy the sample scenario, first clone this git repo and find the deployment scripts folder:

```
git clone https://github.com/Microsoft/fhir-server-samples  
cd fhir-server-samples/deploy/scripts
```

Log into your Azure subscription:

```
Login-AzAccount
```

Connect to Azure AD with:

```
Connect-AzureAd -TenantDomain <AAD TenantDomain>
```

NOTE The connection to Azure AD can be made using a different tenant domain than the one tied to your Azure subscription. If you don't have privileges to create app registrations, users, etc. in your Azure AD tenant, you can [create a new one](#), which will just be used for demo identities, etc.

Then deploy the scenario with the Open Source FHIR Server for Azure:

```
.\Create-FhirServerSamplesEnvironment.ps1 -EnvironmentName <ENVIRONMENTNAME> -UsePaaS $false
```

or the managed Azure API for FHIR:

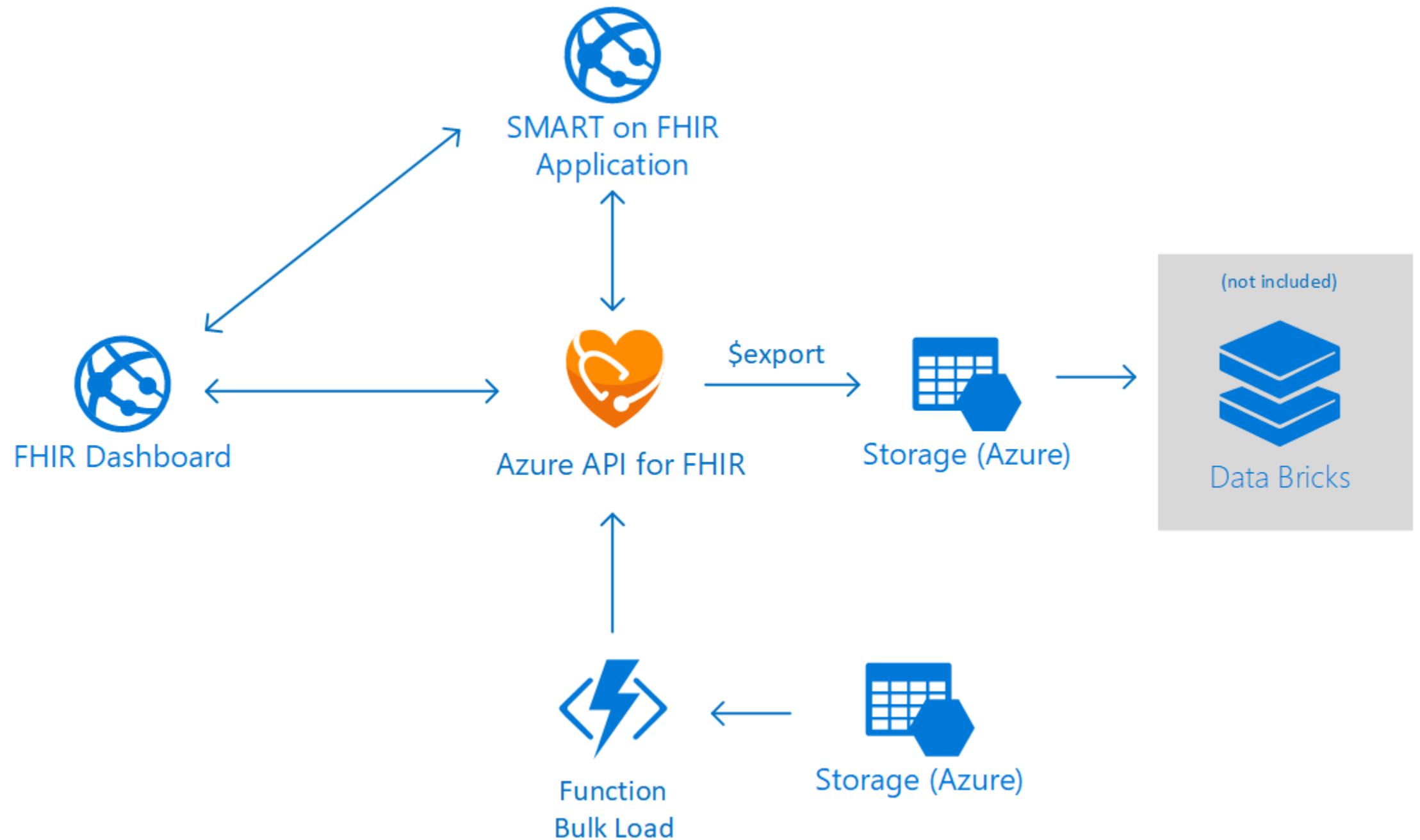
```
.\Create-FhirServerSamplesEnvironment.ps1 -EnvironmentName <ENVIRONMENTNAME> -UsePaaS $true
```

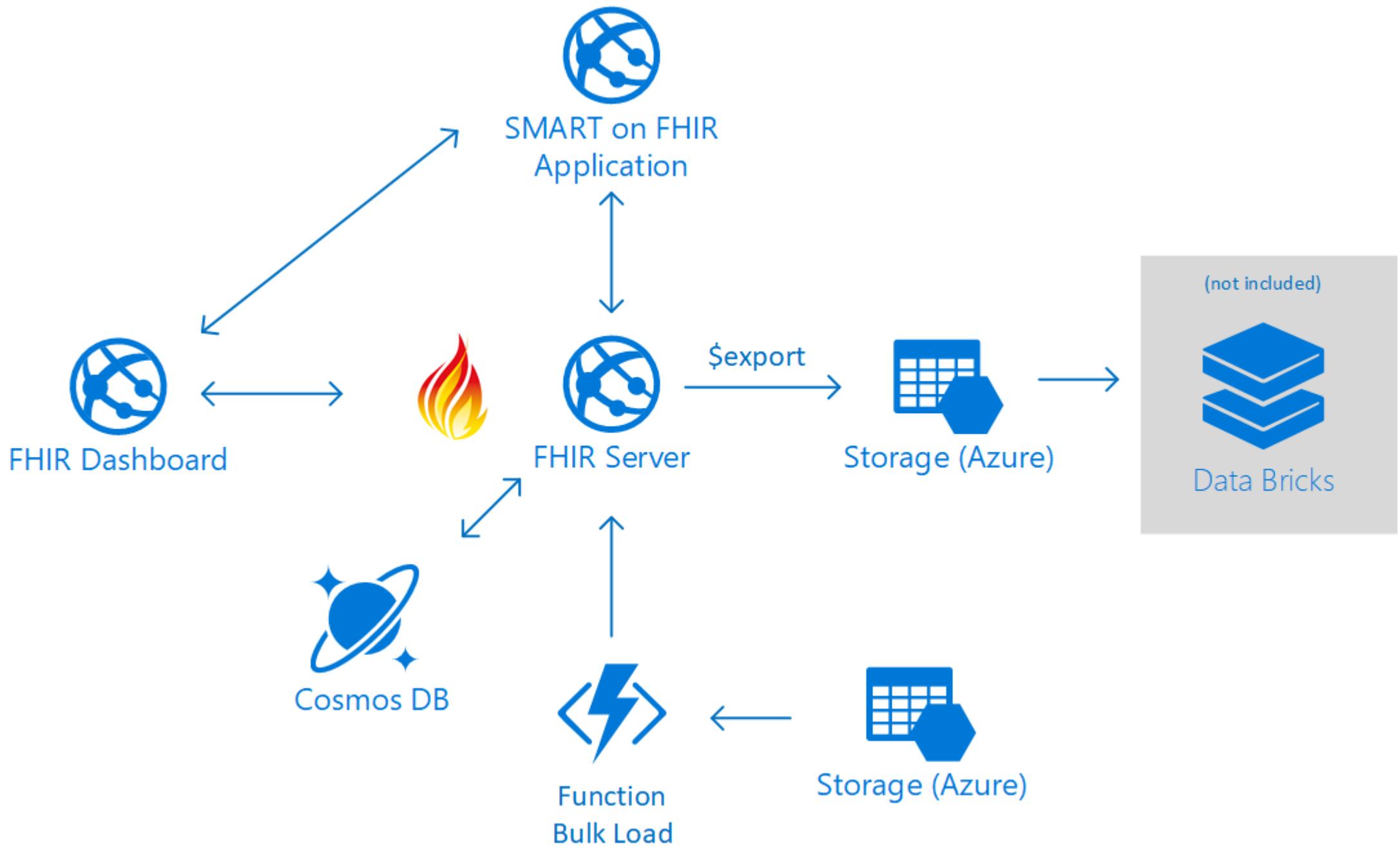
and to enable `$export`:

```
.\Create-FhirServerSamplesEnvironment.ps1 -EnvironmentName <ENVIRONMENTNAME> -UsePaaS $true -EnableExport $true
```

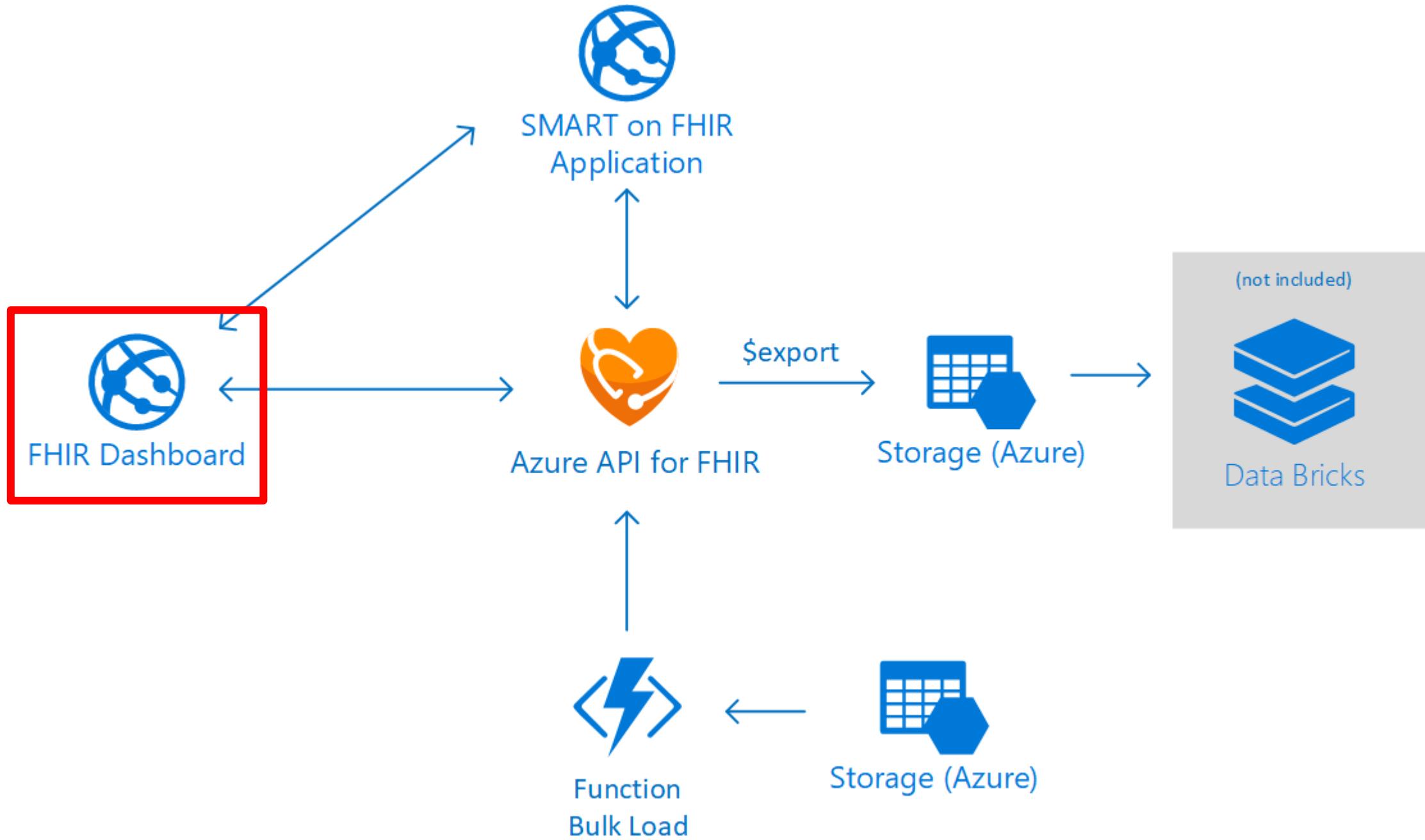
To delete the scenario:

```
.\Delete-FhirServerSamplesEnvironment.ps1 -EnvironmentName <ENVIRONMENTNAME>
```





# FHIR Dashboard



FHIR DevDays 2020 - Microsoft

https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/dashboard/private/770ceb55-e66f-4d96-b6cc-96b36388e030

Microsoft Azure

Search resources, services, and docs (G+)

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FHIR DevDays 2020

+ New dashboard

Upload

Download

Edit

Share

Full screen

Clone

Delete

Refresh

Last updated: 17 hours ago

Auto refresh : Off

Resources

mihansen-devdays-2020

Refresh

mihsansen-devdays-2020	Log Analytics workspace	West US 2
mihsansen-devdays2020	App Service	West US 2
mihsansen-devdays2020	Azure API for FHIR	West US 2
ASP-mihansen-devdays2020-981f	App Service plan	West US 2
mihsansen-devdays2020	Application Insights	West US 2

Resources

mihandd2020

Refresh

mihandd2020impsa	Storage account	West US
mihandd2020imp	App Service	West US
mihandd2020export	Storage account	West US
mihandd2020	Azure Databricks Service	West US 2
mihandd2020	Azure API for FHIR	West US 2
mihandd2020-asp	App Service plan	West US
mihandd2020dash	App Service	West US
mihandd2020imp	Application Insights	East US
mihandd2020imp	App Service plan	West US
mihandd2020-ts	Key vault	West US

Resources

mihandd2020-sof

Refresh

mihandd2020growth	App Service	West US
mihandd2020growth-plan	App Service plan	West US
mihandd2020meds	App Service	West US
mihandd2020meds-plan	App Service plan	West US

Resources

mihandd-converter

Refresh

azureblob	API Connection	West US 2
converter-app	Logic app	West US 2
hl7v2input	Service Bus Namespace	West US 2
mihandd2020converter	App Service	East US
mihandd2020converter-appinsight	Application Insights	East US
mihandd2020converter-plan	App Service plan	East US
servicebus	API Connection	West US 2

Microsoft

microsoft.onmicrosoft.com

Microsoft

Azure AD Premium P2

About me Patients

< >

	Family Name	Given Name	Age		
1	Gallegos952	Anita473	62		
2	Kohler843	Alexis664	15		
3	Arriaga291	Anita473	63		
4	Fajardo595	Alfredo17	40		
5	Saucedo620	Anita473	66		
6	Hilll811	Bao544	78		
7	Lynch190	Azalee124	57		
8	Amador986	Antonia30	54		
9	Romaguera67	Basil991	16		
10	Waelchi213	Billy698	2		

About me Patients

## Information about the signed in user

UPN: mihandd2020-admin@fhirserver.samples.onmicrosoft.com

FHIR Server URL: https://mihandd2020.azurehealthcareapis.com

Access token:

```
eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiIsIng1dCI6IkN0VHVoTUptRDVNN0RMZHpEMnYyeDNRS1NSWSIslmtpZCI6IkN0VHVoTUptRDVNN0RMZHpEMnYyeDNRS1NSWSJ9eyJhdWQiOiJodHRwczovL21paGFuZGQyMDIwLmF6dXJlaGVhbHRoY2FyZWFWaXMuY29tliwiaXNzIjoiaHR0cHM6Ly9zdHMud2luZG93cy5uZXQvYWJmZGU3YjtZGYwZi00N2U2LWFhYmYtMjQ2MmlwNzUwOGRjLyIsImlhcdCI6MTU5MDc2OTcxNiwbmJmljoxNTkwNzY5NzE2LCIleHAIoJE1OTA3NzM2MTYsImFjci6jEiLCIhaW8iOiI0MmRnWU5DUGxYaGMvWTEzODZ5VWx3MkhGK2pkcmIxb0rMW4reIN5ZTFKc1Y5NnNXY2NBliwiYW1yIjpblnB3ZCJdLCJhcHBpZCI6IjY4MzQ1N2ZhLTU0ZJltNDc4Yy05NGU0LTlyY2U1ZWM0ZWE2OSIsImFwcGIkYWNyIjoiMSIsImlwYWRkcil6jI0LjI4LiiaIjF5liwbmEtZSl6lm1naGEuZGOvMDIwlWFkbWluiwib2IklioiNWViMTk5ZTAtMzaxNC00YzdhlWF
```

[About me](#) [Patients](#)[<](#)[>](#)

	Family Name	Given Name	Age	
1	Quiñónez764	Antonio44	29	<a href="#"><span style="color: #0070C0;">i</span></a> <a href="#"><span style="color: #E67E22;">fire</span></a>
2	Runolfsson901	Ernestina649	17	<a href="#"><span style="color: #0070C0;">i</span></a> <a href="#"><span style="color: #E67E22;">fire</span></a>
3	Emard19	Antonia30	57	<a href="#"><span style="color: #0070C0;">i</span></a> <a href="#"><span style="color: #E67E22;">fire</span></a>
4	Krajcik437	Granville802	1	<a href="#"><span style="color: #0070C0;">i</span></a> <a href="#"><span style="color: #E67E22;">fire</span></a>
5	Griego535	Caridad510	39	<a href="#"><span style="color: #0070C0;">i</span></a> <a href="#"><span style="color: #E67E22;">fire</span></a>
6	Gutkowski940	Darwin703	41	<a href="#"><span style="color: #0070C0;">i</span></a> <a href="#"><span style="color: #E67E22;">fire</span></a>
7	Heaney114	Mauro926	45	<a href="#"><span style="color: #0070C0;">i</span></a> <a href="#"><span style="color: #E67E22;">fire</span></a>
8	Heathcote539	Lester513	2	<a href="#"><span style="color: #0070C0;">i</span></a> <a href="#"><span style="color: #E67E22; border: 2px solid red;">fire</span></a>
9	Mohr916	Gregorio366	87	<a href="#"><span style="color: #0070C0;">i</span></a> <a href="#"><span style="color: #E67E22;">fire</span></a>
10	Hegmann834	Rodrigo242	87	<a href="#"><span style="color: #0070C0;">i</span></a> <a href="#"><span style="color: #E67E22;">fire</span></a>

About me Patients

< >

Fa

x/Patient/a34858e3-c86d-4866-b731-e23c0a14c89b

```
{  
    "resourceType": "Patient",  
    "id": "a34858e3-c86d-4866-b731-e23c0a14c89b",  
    "meta": {  
        "versionId": "8",  
        "lastUpdated": "2019-04-07T03:15:34.4579377+00:00"  
    },  
    "text": {  
        "status": "generated",  
        "div": "  
Generated by Synthea. Version identifier: v2.2.0-56-g113d8a2d\n. Person seed: 269190012548182190  
"  
    },  
    "extension": [  
        {  
            "extension": [  
                {  
                    "url": "ombCategory",  
                    "valueCoding": {  
                        "system": "urn:oid:2.16.840.1.113883.6.238",  
                        "code": "2106-3",  
                        "display": "White"  
                    }  
                },  
                {  
                    "url": "text",  
                    "valueString": "White"  
                }  
            ],  
            "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-race"  
        },  
        {  
            "extension": [  
                {  
                    "url": "ombCategory",  
                    "valueCoding": {  
                        "system": "urn:oid:2.16.840.1.113883.6.238",  
                        "code": "2107-4",  
                        "display": "Asian"  
                    }  
                },  
                {  
                    "url": "text",  
                    "valueString": "Asian"  
                }  
            ],  
            "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-race"  
        }  
    ]  
}
```

About me Patients

&lt; &gt;

	Family Name	Given Name	Age		
1	Quiñónez764	Antonio44	29	<span>info</span>	<span>fire</span>
2	Runolfsson901	Ernestina649	17	<span>info</span>	<span>fire</span>
3	Emard19	Antonia30	57	<span>info</span>	<span>fire</span>
4	Krajcik437	Granville802	1	<span>info</span>	<span>fire</span>
5	Griego535	Caridad510	39	<span>info</span>	<span>fire</span>
6	Gutkowski940	Darwin703	41	<span>info</span>	<span>fire</span>
7	Heaney114	Mauro926	45	<span>info</span>	<span>fire</span>
8	Heathcote539	Lester513	2	<span>info</span>	<span>fire</span>
9	Mohr916	Gregorio366	87	<span>info</span>	<span>fire</span>
10	Hegmann834	Rodrigo242	87	<span>info</span>	<span>fire</span>

About me Patients

# Heathcote539, Lester513

**DOB:** 2016-08-17

**Gender:** male

SMART on FHIR Apps

Growth Chart

Medications

## Conditions 5

Onset	Description	Status	
2016-08-25T03:46:47+00:00	Atopic dermatitis	active	
2017-06-14T03:46:47+00:00	Acute allergic reaction	resolved	
2017-09-12T03:46:47+00:00	Sprain of ankle	resolved	
2017-11-11T03:46:47+00:00	Otitis media	resolved	
2018-03-26T03:46:47+00:00	Otitis media	resolved	

## Encounters 16

## Observations 71

FHIR Dashboard (JS Edition) x +

https://fhirsampdevjs.azurewebsites.net/#

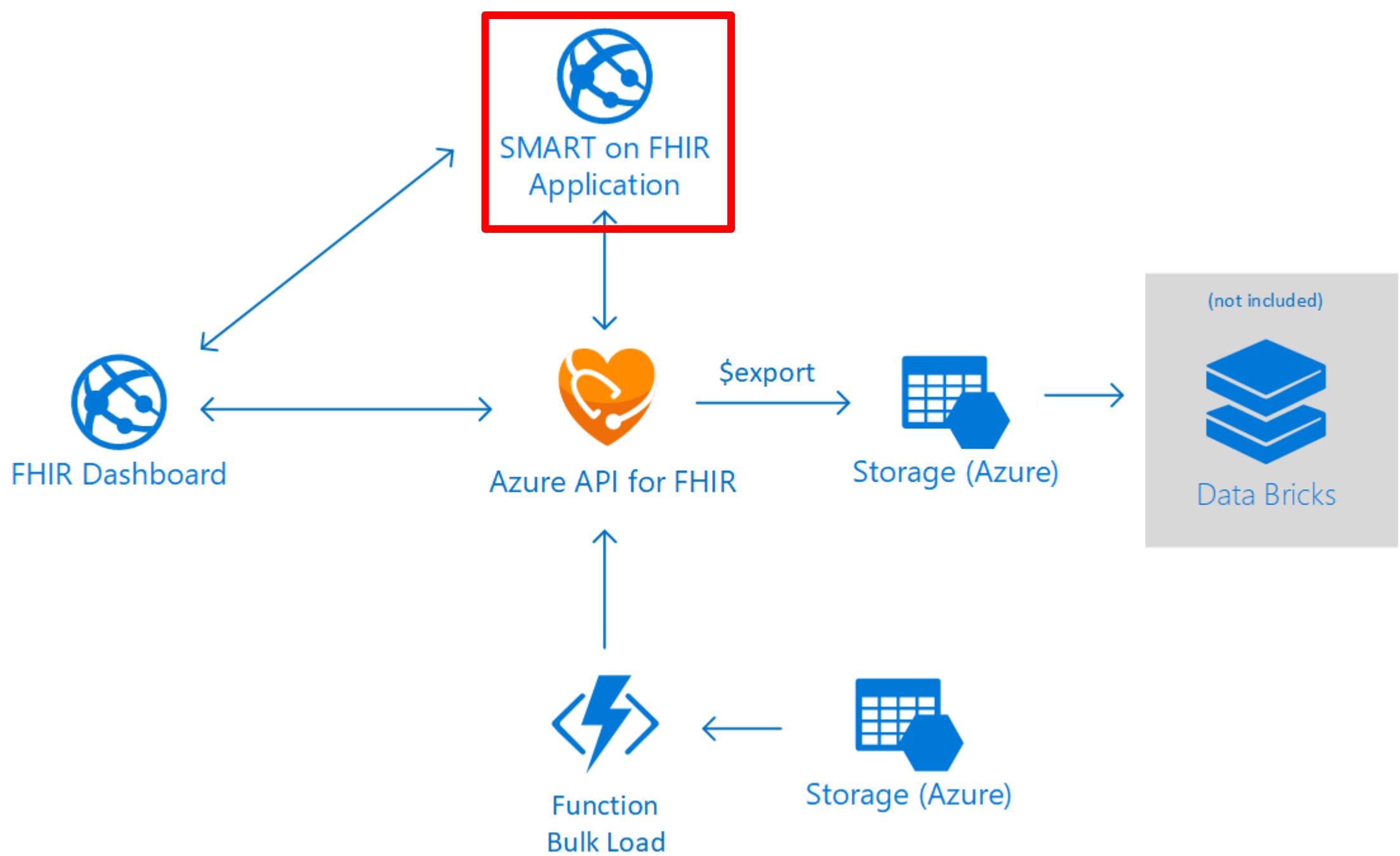
About me Patients Healthcare Observations Encounters SMART on FHIR API Growth Chart Conditions 5 Onset 2016-08-25T03 2017-06-14T03 2017-09-12T03 2017-11-11T03 2018-03-26T03 Encounters 16 Observations 71

x /Condition/e350bd0b-fb83-4990-83cb-b0595dd55bd6

```
{ "resourceType": "Condition", "id": "e350bd0b-fb83-4990-83cb-b0595dd55bd6", "meta": { "versionId": "9", "lastUpdated": "2019-04-07T03:15:32.4019127+00:00" }, "clinicalStatus": "active", "verificationStatus": "confirmed", "code": { "coding": [ { "system": "http://snomed.info/sct", "code": "24079001", "display": "Atopic dermatitis" } ], "text": "Atopic dermatitis" }, "subject": { "reference": "Patient/a34858e3-c86d-4866-b731-e23c0a14c89b" }, "context": { "reference": "Encounter/e0f85812-7c71-491f-afaa-cd6e27d85387" }, "onsetDateTime": "2016-08-25T03:46:47+00:00", "assertedDate": "2016-08-25T03:46:47+00:00" }
```

Close

# SMART on FHIR Apps



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https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/dashboard/private/770ceb55-e66f-4d96-b6cc-96b36388e030

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+ New dashboard

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Full screen

Clone

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Refresh

Last updated: 17 hours ago

Auto refresh : Off

Resources

mihansen-devdays-2020

Refresh

mihansen-devdays-2020	Log Analytics workspace	West US 2
mihansendevdays2020	App Service	West US 2
mihansendevdays2020	Azure API for FHIR	West US 2
ASP-mihansendevdays2020-981f	App Service plan	West US 2
mihansendevdays2020	Application Insights	West US 2

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Azure AD Premium P2

Resources

mihandd2020

Refresh

mihandd2020impsa	Storage account	West US
mihandd2020imp	App Service	West US
mihandd2020export	Storage account	West US
mihandd2020	Azure Databricks Service	West US 2
mihandd2020	Azure API for FHIR	West US 2
mihandd2020-asp	App Service plan	West US
mihandd2020dash	App Service	West US
mihandd2020imp	Application Insights	East US
mihandd2020imp	App Service plan	West US
mihandd2020-ts	Key vault	West US

Resources

mihandd2020-sof

Refresh

mihandd2020growth	App Service	West US
mihandd2020growth-plan	App Service plan	West US
mihandd2020meds	App Service	West US
mihandd2020meds-plan	App Service plan	West US

Resources

mihandd-converter

Refresh

azureblob	API Connection	West US 2
converter-app	Logic app	West US 2
hl7v2input	Service Bus Namespace	West US 2
mihandd2020converter	App Service	East US
mihandd2020converter-appinsight	Application Insights	East US
mihandd2020converter-plan	App Service plan	East US
servicebus	API Connection	West US 2

About me Patients

# Heathcote539, Lester513

**DOB:** 2016-08-17

**Gender:** male

SMART on FHIR Apps

Growth Chart

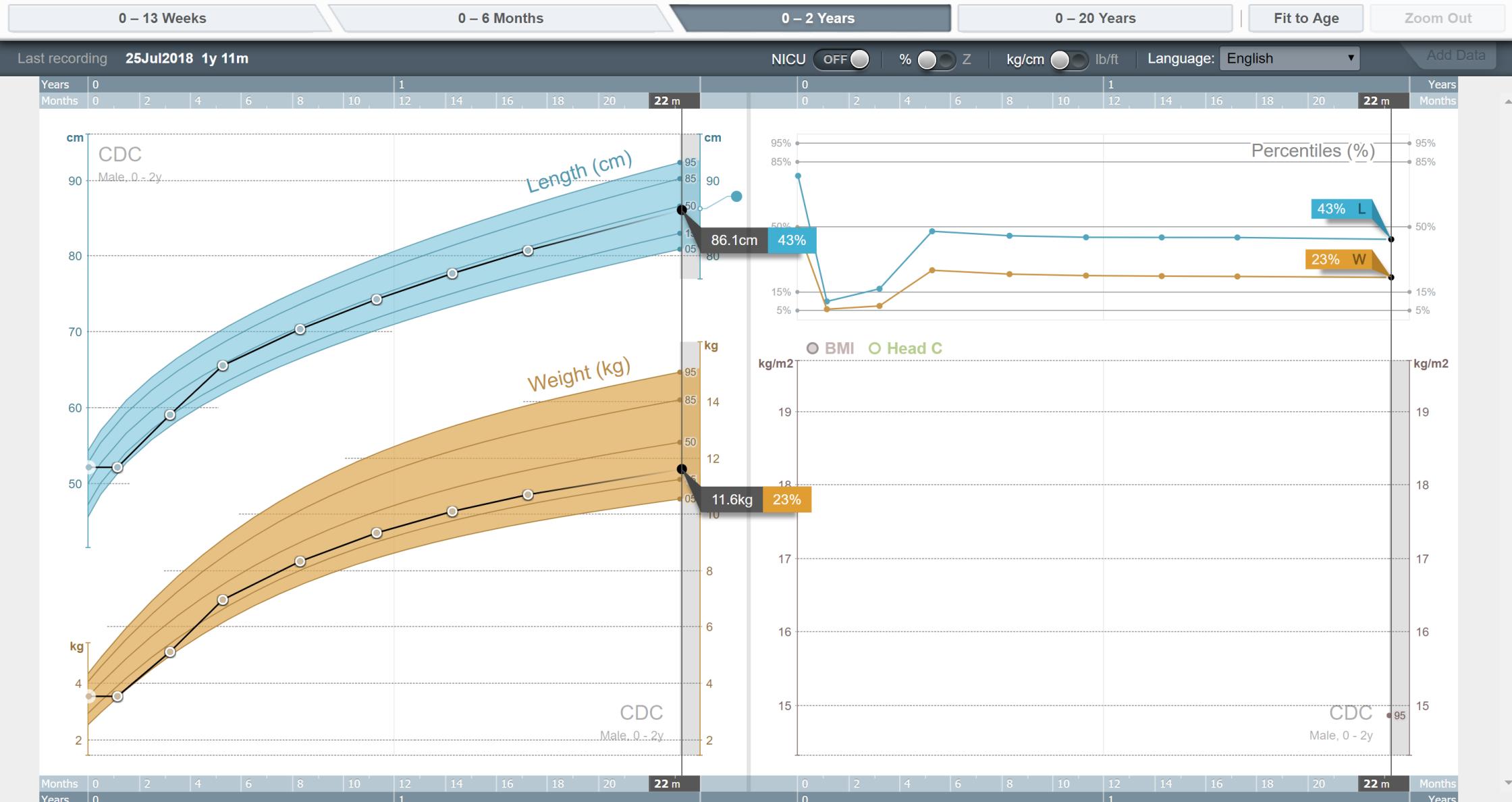
Medications

## Conditions 5

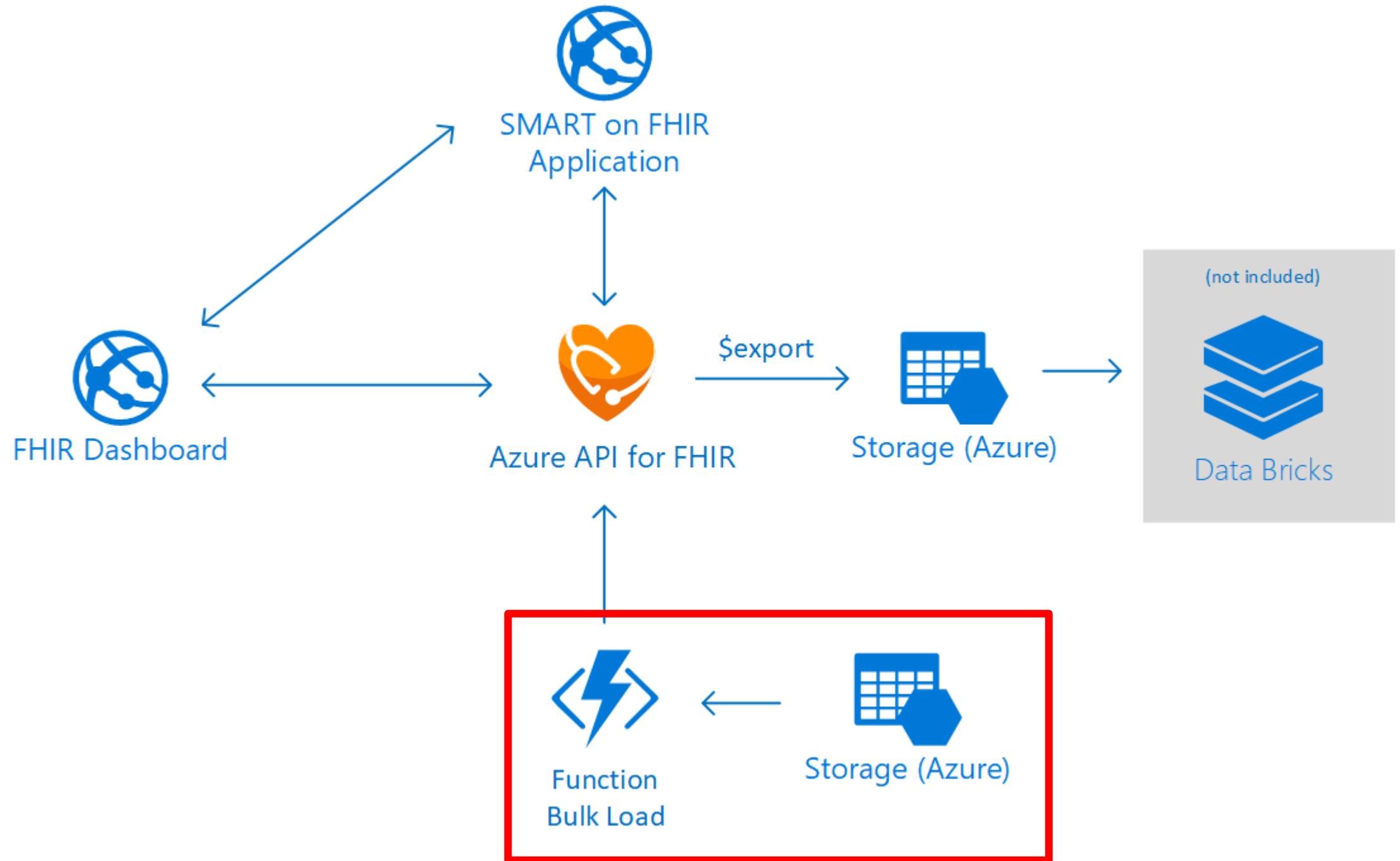
Onset	Description	Status	
2016-08-25T03:46:47+00:00	Atopic dermatitis	active	🔥
2017-06-14T03:46:47+00:00	Acute allergic reaction	resolved	🔥
2017-09-12T03:46:47+00:00	Sprain of ankle	resolved	🔥
2017-11-11T03:46:47+00:00	Otitis media	resolved	🔥
2018-03-26T03:46:47+00:00	Otitis media	resolved	🔥

## Encounters 16

## Observations 71



# Importing Synthea Data



About me Patients

< >

	Family Name	Given Name	Age		
41	Raynor401	Lacy523	4	 	 
42	Greenholt190	Dong972	70	 	 
43	Wiegand701	Osvaldo336	0	 	 

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https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/dashboard/private/770ceb55-e66f-4d96-b6cc-96b36388e030

Microsoft Azure

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+ New dashboard    Upload    Download    Edit    Share    Full screen    Clone    Delete    Refresh

Last updated: 17 hours ago

Auto refresh : Off

Resources

mihansen-devdays-2020

Refresh

mihansen-devdays-2020	Log Analytics workspace	West US 2
mihansendevdays2020	App Service	West US 2
mihansendevdays2020	Azure API for FHIR	West US 2
ASP-mihansendevdays2020-981f	App Service plan	West US 2
mihansendevdays2020	Application Insights	West US 2

Microsoft

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Azure AD Premium P2

Resources

mihandd2020

Refresh

mihandd2020impsa	Storage account	West US
mihandd2020imp	App Service	West US
mihandd2020export	Storage account	West US
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mihandd2020	Azure API for FHIR	West US 2
mihandd2020-asp	App Service plan	West US
mihandd2020dash	App Service	West US
mihandd2020imp	Application Insights	East US
mihandd2020imp	App Service plan	West US
mihandd2020-ts	Key vault	West US

Resources

mihandd2020-sof

Refresh

mihandd2020growth	App Service	West US
mihandd2020growth-plan	App Service plan	West US
mihandd2020meds	App Service	West US
mihandd2020meds-plan	App Service plan	West US

Resources

mihandd-converter

Refresh

azureblob	API Connection	West US 2
converter-app	Logic app	West US 2
hl7v2input	Service Bus Namespace	West US 2
mihandd2020converter	App Service	East US
mihandd2020converter-appinsight	Application Insights	East US
mihandd2020converter-plan	App Service plan	East US
servicebus	API Connection	West US 2

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Create a resource Home Dashboard All services FAVORITES All resources Resource groups App Services SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Azure Active Directory Monitor Advisor Security Center Cost Management + Bill... Help + support Subscriptions Resource Explorer Azure AD B2C Key vaults App Service Environmen... Log Analytics workspaces

Home > Resource groups > fhirsampdev > fhirsampdevimpsa

**fhirsampdevimpsa** Storage account

Search (Ctrl+)

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Data transfer Storage Explorer (preview)

Resource group (change) : fhirsampdev Status : Primary: Available Location : West US 2 Subscription (change) : Resolute Open Source Subscription ID : a1766500-6fd5-4f5c-8515-607798271014 Tags (change) : Click here to add tags

Performance : Standard Replication : Locally-redundant storage (LRS) Account kind : Storage (general purpose v1)

Services

**Blobs** REST-based object storage for unstructured data Learn more

**Files** File shares that use the standard SMB 3.0 protocol Learn more

**Tables** Tabular data storage Learn more

**Queues** Effectively scale apps according to traffic Learn more

Monitoring

Show data for last: 1 hour 6 hours 12 hours 1 day 7 days Show data for: Account

Total egress 43.95KiB 39.06KiB 24.10KiB

Total ingress 117.19KiB 67.40KiB 32.10KiB

Microsoft Azure

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Create a resource Home Dashboard All services FAVORITES All resources Resource groups App Services SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Azure Active Directory Monitor Advisor Security Center Cost Management + Bill... Help + support Subscriptions Resource Explorer Azure AD B2C Key vaults App Service Environments Log Analytics workspaces

Home > Resource groups > fhirsampdev > fhirsampdevimpsa - Blobs

## fhirsampdevimpsa - Blobs

Storage account: fhirsampdevimpsa

Container Refresh Delete Change access level

Search containers by prefix

NAME	LAST MODIFIED	PUBLIC ACCESS L...	LEASE STATE
azure-webjobs-hosts	4/6/2019, 6:47:48 PM	Private	Available
<b>fhirimport</b>	5/3/2019, 12:51:18 PM	Private	Available
fhirrejected	5/3/2019, 12:51:18 PM	Private	Available

Preview Microsoft Azure Report a bug Search resources, services, and docs

Home > Resource groups > fhirsampdev > fhirsampdevimpsa - Blobs > fhirimport

**fhirimport**  
Container

Search (Ctrl+ /) Upload Refresh Change access level Delete Acquire lease Break lease View snapshots Create snapshot

**Authentication method:** Access key ([Switch to Azure AD User Account](#))  
**Location:** fhirimport

Search blobs by prefix (case-sensitive)  Show deleted blobs

NAME	MODIFIED	ACCESS TIER	BLOB TYPE	SIZE	LEASE STATE
No blobs found.					

Create a resource Home Dashboard All services FAVORITES All resources Resource groups App Services SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Azure Active Directory Monitor Advisor Security Center Cost Management + Bill... Help + support Subscriptions Resource Explorer Azure AD B2C Key vaults App Service Environmen... Log Analytics workspaces

Microsoft Azure

Preview Report a bug Search resources, services, and docs

Home > Resource groups > fhirsampdev > fhirsampdevimpsa - Blobs > fhirimport

**fhirimport** Container

Search (Ctrl+ /)

Overview Access Control (IAM) Settings

Access policy Properties Metadata Editor (preview)

Upload Refresh Change access level Delete Acquire lease Break lease

**Authentication method:** Access key ([Switch to Azure AD User Account](#))  
**Location:** fhirimport

Search blobs by prefix (case-sensitive)

NAME	MODIFIED	ACC
No blobs found.		

**Upload blob**  
fhirimport/

Files "Vivien121\_Borer986\_5a23db0c-c452-425b-8ef0-001a37..."

Overwrite if files already exist

Advanced

**Upload**

Preview Microsoft Azure Report a bug Search resources, services, and docs

Home > Resource groups > fhirsampdev > fhirsampdevimpsa - Blobs > fhirimport

**fhirimport**  
Container

Search (Ctrl+ /) Upload Refresh Change access level Delete Acquire lease Break lease View snapshots Create snapshot

Overview Access Control (IAM)

Authentication method: Access key (Switch to Azure AD User Account)  
Location: fhirimport

Search blobs by prefix (case-sensitive) Show deleted blobs

NAME	MODIFIED	ACCESS TIER	BLOB TYPE	SIZE	LEASE STATE
Vivien121_Borer986_5a23db0c-c452-425b-8ef0-...	5/30/2019, 5:33:26 PM		Block blob	2.45 MiB	Available

Create a resource Home Dashboard All services FAVORITES All resources Resource groups App Services SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Azure Active Directory Monitor Advisor Security Center Cost Management + Bill... Help + support Subscriptions Resource Explorer Azure AD B2C Key vaults App Service Environmen... Log Analytics workspaces

Microsoft Azure

Preview Report a bug Search resources, services, and docs

Home > Resource groups > fhirsampdev > fhirsampdevimpsa - Blobs > fhirimport

**fhirimport**  
Container

Upload Refresh Change access level Delete Acquire lease Break lease View snapshots Create snapshot

Authentication method: Access key (Switch to Azure AD User Account)  
Location: fhirimport

Search blobs by prefix (case-sensitive)  Show deleted blobs

NAME	MODIFIED	ACCESS TIER	BLOB TYPE	SIZE	LEASE STATE
No blobs found.					

Create a resource

Home Dashboard All services FAVORITES All resources Resource groups App Services SQL databases Azure Cosmos DB Virtual machines Load balancers Storage accounts Virtual networks Azure Active Directory Monitor Advisor Security Center Cost Management + Bill... Help + support Subscriptions Resource Explorer Azure AD B2C Key vaults App Service Environmen... Log Analytics workspaces

About me Patients

< >

	Family Name	Given Name	Age		
41	Raynor401	Lacy523	4		
42	Greenholt190	Dong972	70		
43	Wiegand701	Osvaldo336	0		
44	Borer986	Vivien121	35		

About me Patient...

< >

x /Patient/15aac6e1-3e1f-4bda-abc3-dc6d14ed58a5

Family

41

Race

```
{
  "resourceType": "Patient",
  "id": "15aac6e1-3e1f-4bda-abc3-dc6d14ed58a5",
```

42

Group

```
,
  "meta": {
    "versionId": "1",
    "lastUpdated": "2019-05-31T00:33:36.3422591+00:00"
  },
  "text": {
```

43

With

```

    "status": "generated",
    "div": "
```

Generated by [Synthea](#).Version identifier: v2.2.0-56-g113d8a2d\n . Person seed: -5698744194936560646

44

Body

```

  },
  "extension": [
    {
      "extension": [
        {
          "url": "ombCategory",
          "valueCoding": {
            "system": "urn:oid:2.16.840.1.113883.6.238",
            "code": "2106-3",
            "display": "White"
          }
        },
        {
          "url": "text",
          "valueString": "White"
        }
      ],
      "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-race"
    },
    {
      "extension": [
        {
          "url": "ombCategory",
          "valueCoding": {
            "system": "urn:oid:2.16.840.1.113883.6.238",
            "code": "2106-3",
            "display": "White"
          }
        }
      ],
      "url": "http://hl7.org/fhir/us/core/StructureDefinition/us-core-race"
    }
  ]
}
```

# Importing HL7 v2 data



microsoft/FHIR-Converter: Conv... + https://github.com/microsoft/FHIR-Converter

Search or jump to... Pull requests Issues Marketplace Explore

**microsoft / FHIR-Converter**

Watch 17 Star 33 Fork 10

Code Issues 0 Pull requests 2 Actions Projects 0 Wiki Security 0 Insights Settings

Conversion utility to translate legacy data formats into FHIR

Edit

hl7v2 fhir converter fhir-converter Manage topics

-o 104 commits 9 branches 0 packages 0 releases 8 contributors MIT

Branch: master New pull request Create new file Upload files Find file Clone or download

moiradillon12 Update using-helpers-concept.md (#24) ✓ Latest commit 1f9c0b7 on Apr 13

File / Commit Message	Time
.github Update issue templates	3 months ago
deploy add app insights in deployment template (#13)	3 months ago
docs Update using-helpers-concept.md (#24)	2 months ago
src ignore mkdir EEXIST error (#25)	2 months ago
test/perf initial code commit	3 months ago
.dockerignore initial code commit	3 months ago
.gitignore upgraded npm packages; separated out messages (sample) and test data	3 months ago
.npmrc initial code commit	3 months ago
CODE_OF_CONDUCT.md Initial commit	10 months ago
CONTRIBUTING.md Create CONTRIBUTING.md (#16)	3 months ago
Dockerfile container startup script	3 months ago
GeoPol.xml initial code commit	3 months ago
LICENSE Initial commit	10 months ago
Pull-Request-Template.md Create Pull-Request-Template.md	3 months ago
README.md Update README.md	2 months ago
SECURITY.md Created documentation	3 months ago
mocha.config.json initial code commit	3 months ago
package-lock.json update packages for comp gov warnings (#26)	2 months ago
package.json update packages for comp gov warnings (#26)	2 months ago

microsoft/FHIR-Converter: Conv... +

← → 🔍 https://github.com/microsoft/FHIR-Converter

2. A set of sample messages to accompany the released templates.  
3. A collection of APIs to convert messages real time and assist in the template management and creation.  
4. A Web UI editor to modify and create templates and test single message conversion to FHIR bundles.

FHIR® is the registered trademark of HL7 and is used with the permission of HL7. Use of the FHIR trademark does not constitute endorsement of this product by HL7

## Deploy the FHIR Converter

The source code is available to be deployed in any manner you would like. The FHIR Converter can be run on-prem or in the cloud. To deploy the FHIR Converter, there are two key pieces of functionality. One is a web server (node.js) and the other is a persistence layer for the templates. To assist with easy deployment we have included two options below, one through Azure and one which will deploy locally. If you choose to deploy from another mechanism then the two options below, you will need to setup the storage for the templates.

### Deploy to Azure

To deploy in Azure, you will need to have a subscription in Azure. If you do not have an Azure subscription, you can start [here](#).

Once you have your subscription, click the link below:

 Deploy to Azure

Note that the Service Name will be included in the URL you will use to access the application. In addition, the API Key is automatically generated when you deploy the App Service but you can change this to another value if you want.

Once deployment is complete, you can go to the newly created App Service to see the details. Here you will get the URL to access your FHIR Converter (<https://<SERVICE NAME>.azurewebsites.net>).

If you need to find your API Key again or change the value take the following steps:

1. Navigate to your App Service
2. Under Settings, select Configuration
3. You will see CONVERSION\_API\_KEYS listed here. You can view the key and edit from this location.

### Deploy locally

Follow these steps to deploy a local copy of the FHIR Converter

Make sure that you have Node.js >=10.10.0 < 11.0 installed

```
git clone https://github.com/microsoft/FHIR-Converter/
cd FHIR-Converter
npm install
npm start
```

Once this completes, you can access Web UI locally at <http://localhost:2019/>

FHIR Converter API - X

<https://mihandd2020converter.azurewebsites.net/#>

FHIR Converter API Settings Load message Load template ADT\_A01.hbs Save Git Refresh

```

1 MSH|^~\&|AccMgr|1||20050110045504|ADT^A01|599102|P|2,3|||..
2 EVN|A01|20050110045502|||||.
3 PID|1||10006579^MR^1||DUCK^DONALD^D||19241010|M||1|111 DUCK ST^^FOWL^CA^999990000^M|1|8885551212|8885551212|1|2||40007716^^AccMgr^VN^1|123121234||||||NO
4 NK1|1|DUCK^HUEY|SO|3583 DUCK RD^^FOWL^CA^99999000|8885552222|Y|||||||
5 PV1|1|I|PREOP^101^1^1^^S|3|||37^DISNEY^WALT^^^^AccMgr^^^CI|||01|||1||37^DISNEY^WALT^^^^AccMgr^^^CI|2|40007716^^AccMgr^VN|4|||||||1|G||20050110045253|||||
6 GT1|1|8291|DUCK^DONALD^D||111^DUCK ST^^FOWL^CA^99999000|8885551212||19241010|M||1|123121234|||#Cartoon Ducks Inc|111^DUCK ST^^FOWL^CA^99999000|8885551212||PT||.
7 DG1|1|I9|71596^OSTEOARTHROS NOS-L/LEG ^I9^OSTEOARTHROS NOS-L/LEG ||A|
8 IN1|1|MEDICARE|3|MEDICARE|||||Cartoon Ducks Inc|19891|01|||4|DUCK^DONALD^D|1|19241010|111^DUCK ST^^FOWL^CA^99999000||||||123121234A|||||PT|M|111 DUCK ST^^FOWL^CA^99999000|||8291.
9 IN2|1||123121234|Cartoon Ducks Inc|||123121234A||||||8885551212.
10 IN1|2|NON-PRIMARY|9|MEDICAL MUTUAL CALIF.|PO BOX 94776^HOLLYWOOD^CA^441414776|8003621279|PUBSUMB|||Cartoon Ducks Inc|||7|DUCK^DONALD^D|1|19241010|111 DUCK ST^^FOWL^CA^99999000|||||||056269770|||||PT|M|111^DUCK ST^^FOWL^CA^99999000|||8291.

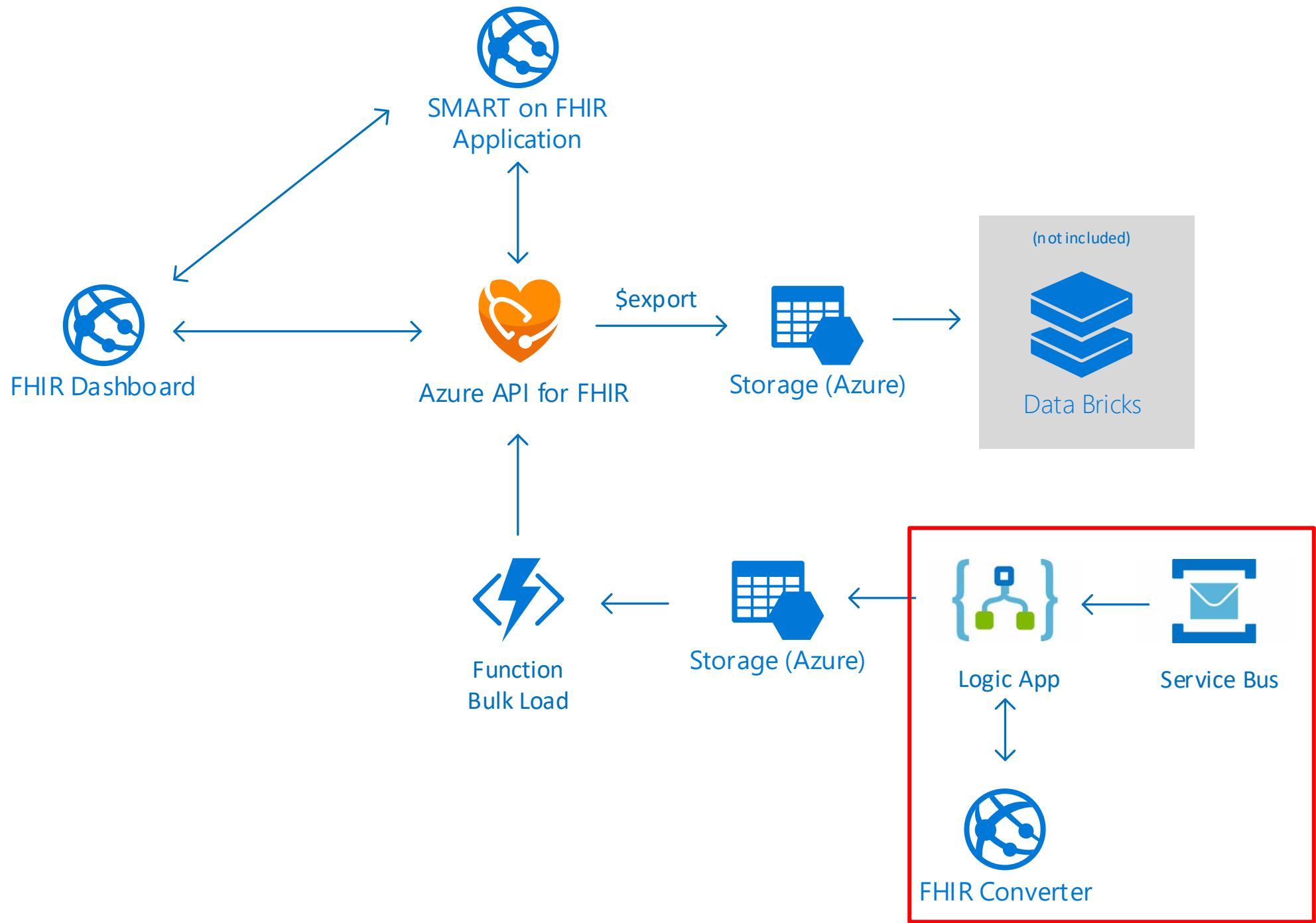
```

**ADT\_A01.hbs**

```

1 {
2   "resourceType": "Bundle",
3   "type": "transaction",
4   "entry": [
5     {
6       "fullUrl": "urn:uuid:64bac34e-e611-3549-848b-89416176aa0b",
7       "resource": {
8         "resourceType": "Patient",
9         "id": "64bac34e-e611-3549-848b-89416176aa0b",
10        "identifier": [
11          {
12            "value": "10006579",
13            "type": {
14              "coding": [
15                {
16                  "code": "MR"
17                }
18              ]
19            }
20          },
21          {
22            "value": "123121234"
23          }
24        ],
25        "name": [
26          {
27            "family": "DUCK",
28            "given": [
29              "DONALD",
30              "D"
31            ]
32          }
33        ],
34        "birthDate": "1924-10-10",
35        "gender": "male",
36        "address": [
37          {
38            "line": [
39              "111 DUCK ST"
40            ],
41            "city": "FOWL"
42          }
43        ]
44      }
45    }
46  ]
47}

```



FHIR DevDays 2020 - Microsoft

https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/dashboard/private/770ceb55-e66f-4d96-b6cc-96b36388e030

Microsoft Azure

Search resources, services, and docs (G+)

mihansen@microsoft.co... MICROSOFT

FHIR DevDays 2020

+ New dashboard

Upload

Download

Edit

Share

Full screen

Clone

Delete

Refresh

Last updated: 17 hours ago

Auto refresh : Off

Resources

mihansen-devdays-2020

Refresh

mihsansen-devdays-2020	Log Analytics workspace	West US 2
mihsansen-devdays2020	App Service	West US 2
mihsansen-devdays2020	Azure API for FHIR	West US 2
ASP-mihansen-devdays2020-981f	App Service plan	West US 2
mihsansen-devdays2020	Application Insights	West US 2

Microsoft

microsoft.onmicrosoft.com

Microsoft

Azure AD Premium P2

Resources

mihandd2020

Refresh

mihandd2020impsa	Storage account	West US
mihandd2020imp	App Service	West US
mihandd2020export	Storage account	West US
mihandd2020	Azure Databricks Service	West US 2
mihandd2020	Azure API for FHIR	West US 2
mihandd2020-asp	App Service plan	West US
mihandd2020dash	App Service	West US
mihandd2020imp	Application Insights	East US
mihandd2020imp	App Service plan	West US
mihandd2020-ts	Key vault	West US

Resources

mihandd2020-sof

Refresh

mihandd2020growth	App Service	West US
mihandd2020growth-plan	App Service plan	West US
mihandd2020meds	App Service	West US
mihandd2020meds-plan	App Service plan	West US

Resources

mihandd-converter

Refresh

mihandd-converter	API Connection	West US 2
converter-app	Logic app	West US 2
h1/v2input	Service Bus Namespace	West US 2
mihandd2020converter	App Service	East US
mihandd2020converter-appinsight	Application Insights	East US
mihandd2020converter-plan	App Service plan	East US
servicebus	API Connection	West US 2

converter-app | Logic app design x +

https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/resource/subscriptions/8d0d324c-b1a1-4c71-8b9b-12320b418911/resourceGroups/mihandd-converter/p... ☆ 6 1 ? ☺ mihansen@microsoft.co... MICROSOFT

Microsoft Azure

Search resources, services, and docs (G+)

Dashboard >

## converter-app | Logic app designer

Logic app

Search (Ctrl+/) Save Discard Run Designer Code view Parameters Templates Connectors Help

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Development Tools Logic app designer Logic app code view Versions API connections Quick start guides Release notes Settings Workflow settings Authorization Access keys Identity Properties Locks Export template Monitoring Alerts Metrics Diagnostic settings Logs Diagnostics Support + troubleshooting New support request

When a message is received in a queue (auto-complete)

Queue name: v2q  
Queue type: Main  
How often do you want to check for items? 15 Second  
Add new parameter  
Connected to ServiceBusConnection. Change connection.

HTTP

Method: POST  
URI: https://mihandd2020converter.azurewebsites.net/api/convert/hl7/ADT\_A01.hbs  
Headers: X-MS-CONVERSION-API-KEY: 123456  
Queries: Enter key Enter value  
Body: Content  
Cookie: Enter HTTP cookie  
Add new parameter

Create block blob

Specify folder path to upload: /fhirimport  
Specify name of the blob to create: concat(...)  
Blob content: Body  
Add new parameter  
Connected to storageconnection. Change connection.



Postman

File Edit View Help

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History Collections APIs

[+ New Collection](#) TrashFHIR DevDays 2020  
5 requestsFHIR Training  
30 requestsFHIR Training Example Q...  
30 requestsrbac-demo  
2 requests

Untitled Request

GET https://mihandd2020.azurehealthcareapis.com/Patient?name=duck

Params Authorization Headers (8) Body Pre-request Script Tests Settings

TYPE Bearer Token

The authorization header will be automatically generated when you send the request. [Learn more about authorization](#)

Token eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiIsInq1dCI6IkN0VHVoTUpRDVNN0RMZHpEMnYyeDNRS1NSWSlsImtpZC16IkN0VHVoTUpRDVNN0f...

Status: 200 OK Time: 36 ms Size: 668 B Save Response

Pretty Raw Preview Visualize JSON

```
1 {
2   "resourceType": "Bundle",
3   "id": "016172926da6c743a48c16a34d7417d8",
4   "meta": {
5     "lastUpdated": "2020-05-29T19:03:27.9009479+00:00"
6   },
7   "type": "searchset",
8   "link": [
9     {
10       "relation": "self",
11       "url": "https://mihandd2020.azurehealthcareapis.com/Patient?name=duck"
12     }
13   ]
14 }
```

v2q (hl7v2input/v2q) | Service Bu x +

https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/resource/subscriptions/8d0d324c-b1a1-4c71-8b9b-12320b418911/resourceGroups/mihandd-converter/p... ☆ 6 1 ? mihansen@microsoft.co... MICROSOFT

Microsoft Azure

Search resources, services, and docs (G+)

Dashboard > hl7v2input | Queues >

## v2q (hl7v2input/v2q) | Service Bus Explorer (preview)

Service Bus Queue

Search (Ctrl+ /) Refresh

Overview Access control (IAM) Diagnose and solve problems Settings Shared access policies Metrics (preview) Service Bus Explorer (preview)

Active 0 MESSAGES Dead-Lettered 0 MESSAGES Scheduled 0 MESSAGES

Send Receive Peek

Send Message to Queue v2q

Content Type \*

Text/Plain

MSH|^~\&|AccMgr|1||20050110045504|ADT^A01|599102|P|2.3|||  
EVN|A01|20050110045504|2|||||  
PID|1||10006579^~~~1^MR^1||DUCK^DONALD^D||192|1010|M||1|111 DUCK ST^~FOWL^CA^999990000^~M||1|8885551212|8885551212|1|2||40007716^~~~AccMgr^VN^1|123121234||||  
NK1|1|DUCK^HUEY|SO|3533 DUCK RD^~FOWL^CA^999990000|8885552222||Y|||||||||||  
PV1|1|I|PREOP^101^1^~~~S|3|||37^DISNEY^WALT^~~~AccMgr^~~~CI|||01||||1|||37^DISNEY^WALT^~~~AccMgr^~~~CI|2|40007716^~~~AccMgr^VN|4|||||||||||||1|||  
GT1|1|8291|DUCK^DONALD^D||111^DUCK ST^~FOWL^CA^999990000|8885551212||19241010|M||1|123121234|||#Cartoon Ducks Inc|111^DUCK ST^~FOWL^CA^999990000|88855512  
DG1|1|I9|71596^OSTEOARTHROS NOS-L/LEG ^I9|OSTEOARTHROS NOS-L/LEG ||A|

Expand Advanced Properties

Custom Properties

Name	Value

Send



Postman

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5 requestsFHIR Training  
30 requestsFHIR Training Example Q...  
30 requestsrbac-demo  
2 requests[GET {{fhirserver...}}](#) [GET {{fhirserver...}}](#) [DEL {{ffhirserver...}}](#) [POST {{ffhirserve...}}](#) [GET http://52.25...](#) [GET https://miha...](#) [GET https://miha...](#) [GET http://test.fh...](#) [GET Untitled Req...](#) [GET https://miha...](#) [+](#) [...](#) FHIR DevDays 2020 [...](#) [...](#) [...](#) [...](#) [...](#)

Untitled Request

Comments 0

GET https://mihandd2020.azurehealthcareapis.com/Patient?name=duck

Send

Save

Params [Authorization](#) Headers (8) Body Pre-request Script Tests Settings

Cookies Code

TYPE

Bearer Token

The authorization header will be automatically generated when you send the request. [Learn more about authorization](#)! Heads up! These parameters hold sensitive data. To keep this data secure while working in a collaborative environment, we recommend using variables. [Learn more about variables](#)

Token

eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiIsInq1dCI6IkN0VHVoTUptRDVNN0RMZHpeEMnYyeDNRS1NSWSlsImtpZC16IkN0VHVoTUptRDVNN0...

Body Cookies Headers (10) Test Results

Status: 200 OK Time: 229 ms Size: 1.35 KB Save Response

Pretty Raw Preview Visualize JSON

```
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        "identifier": [
          {
            "type": {
              "coding": [
                {
                  "code": "MR"
                }
              ]
            },
            "value": "10006579"
          },
          {
            "value": "123121234"
          }
        ],
        "name": [
          {
            "family": "DUCK",
            "given": [
              "DONALD",
              "D"
            ]
          }
        ],
        "telecom": [
          {
            "value": "8885551212",
            "use": "home"
          },
          {
            "value": "8885551212",
            "use": "work"
          }
        ],
        "gender": "male",
        "birthDate": "1924-10-10",
        "address": [
          {
            "city": "BIRMINGHAM",
            "country": "GBR",
            "line": [
              "100 BIRDMONT DR",
              "SUITE 100"
            ],
            "postOfficeBox": null,
            "state": "AL"
          }
        ]
      }
```



Bootcamp

Build

Browse



v2q (hl7v2input/v2q) | Service Bu x +

https://portal.azure.com/?feature.customportal=false#@microsoft.onmicrosoft.com/resource/subscriptions/8d0d324c-b1a1-4c71-8b9b-12320b418911/resourceGroups/mihandd-converter/p... ☆ 6 2 ? mihansen@microsoft.co... MICROSOFT

Microsoft Azure

Search resources, services, and docs (G+)

Dashboard > hl7v2input | Queues >

## v2q (hl7v2input/v2q) | Service Bus Explorer (preview)

Service Bus Queue

Search (Ctrl+ /) Refresh

Overview Access control (IAM) Diagnose and solve problems Settings Shared access policies Metrics (preview) Service Bus Explorer (preview)

Active 0 MESSAGES Dead-Lettered 0 MESSAGES Scheduled 0 MESSAGES

Send Receive Peek

Send Message to Queue v2q

Content Type \*

Text/Plain

MSH|^~\&|AccMgr|1|||20050110045504|ADT\_A01|599102|P|2.3|||  
EVN|A01|20050110045502|||||  
PID|1||10006579^~~~1^MR|||1|DUCK^DONAAAAAAAALD^D||19241010|M||1|111 DUCK ST^~FOWL^CA^999990000^~M||1|8885551212|8885551212|1|2||40007716^~~~AccMgr^VN^1|123121  
NK1|1|DUCK^HUEY|SO|3583|DUCK RD^~FOWL^CA^999990000|8885552222||Y|||||||||||  
PV1|1|I|PREOP^101^1^~~~5|3|||37^DISNEY^WALT^~~~AccMgr^~~~CI|||01||||1|||37^DISNEY^WALT^~~~AccMgr^~~~CI|2|40007716^~~~AccMgr^VN|4|||||||||||||||1||  
GT1|1|8291|DUCK^DONALD^D||111^DUCK ST^~FOWL^CA^999990000|8885551212||19241010|M||1|123121234|||#Cartoon Ducks Inc|111^DUCK ST^~FOWL^CA^999990000|88855512  
DG1|1|I9|71596^OSTEOARTHROS NOS-L/LEG ^I9|OSTEOARTHROS NOS-L/LEG ||A|

Expand Advanced Properties

Custom Properties

Name	Value

Send



Postman

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History Collections APIs

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5 requestsFHIR Training  
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2 requests

Untitled Request

GET https://mihandd2020.azurehealthcareapis.com/Patient?name=duck

Params Authorization Headers (8) Body Pre-request Script Tests Settings

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Token eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiIsInq1dCI6IkN0VHVoTUpRDVNN0RMZHpeMnYyeDNRS1NSWSlsImtpZC16IkN0VHVoTUpRDVNN0f...

Status: 200 OK Time: 226 ms Size: 1.36 KB Save Response

Pretty Raw Preview Visualize JSON

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```

IDENTIFIER : [

], "name": [

], "telecom": [

], "gender": "male", "birthDate": "1924-10-10", "address": [

]

], "value": "10006579", "type": { "coding": [ { "code": "MR" } ] }, "value": "123121234"

], "family": "DUCK", "given": [ "DONAAAAAAAALD", "D" ] }

], "value": "8885551212", "use": "home" }, { "value": "8885551212", "use": "work" }

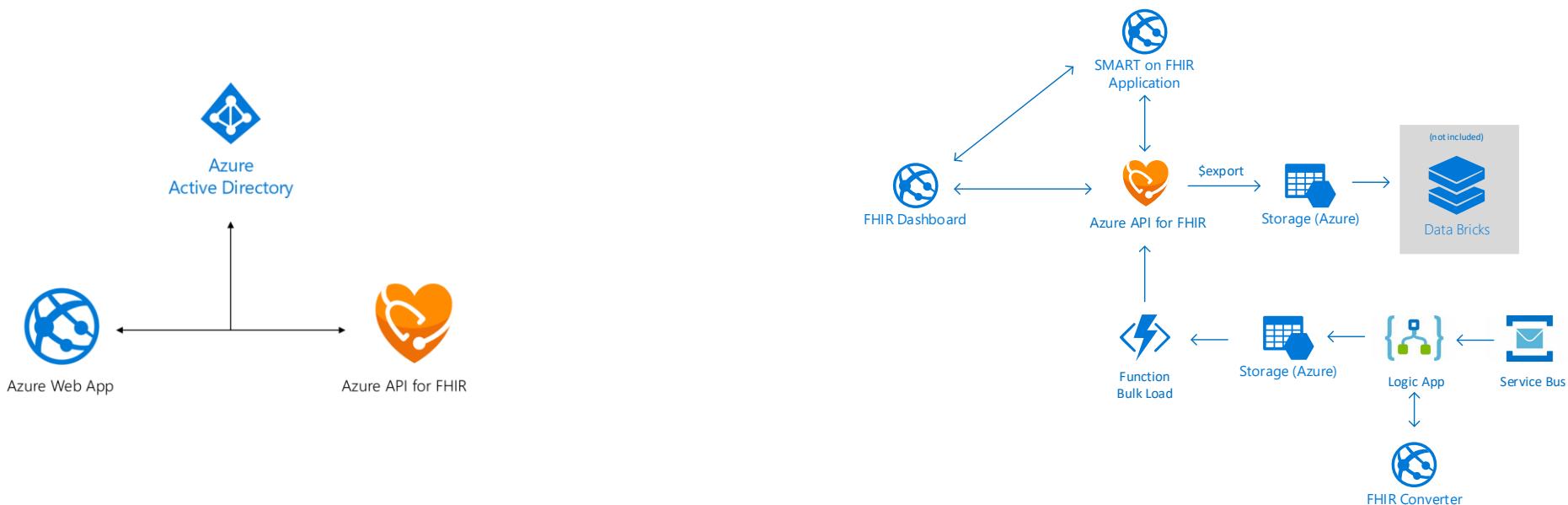
Bootcamp Build Browse

# SUMMARY

You are likely to need a FHIR sandbox to test your FHIR App

Good sandboxes are easy to deploy, maintain, and dispose of

We looked at a couple of options for sandboxes based on managed cloud services



<https://aka.ms/michael-devdays>

<https://github.com/Microsoft/fhir-server-samples>

<https://azure.microsoft.com/free/>

mihansen@microsoft.com