

# **Intro To Azure**

Sending data from an iot device to azure IoT hub  
and services

# Step 1-Creating an azure account

- Go to <https://azure.microsoft.com/en-in/>
- Click on start free to create your free account
- Sign up using your Microsoft account or else create a new Microsoft account
- Enter the necessary details(NOTE- Azure allows the use of credit cards only)
- Now you are good to go
- Go to <https://portal.azure.com/#home>

# This is how Azure Home page looks like

The screenshot shows the Microsoft Azure portal home page. The browser address bar displays `portal.azure.com/#home`. The page header includes the Microsoft Azure logo and a search bar. The main content area is divided into several sections: 'Azure services' with icons for creating resources, viewing all resources, cost management, resource groups, virtual machines, app services, storage accounts, SQL databases, and Azure Database for PostgreSQL; 'Recent resources' with a table listing recent activities; 'Navigate' with icons for subscriptions, resource groups, all resources, and the dashboard; and 'Tools' with links to Microsoft Learn, Azure Monitor, Security Center, and Cost Management. The Windows taskbar is visible at the bottom.

portal.azure.com/#home

Microsoft Azure

Search resources, services, and docs (G+)

### Azure services

- Create a resource
- All resources
- Cost Management...
- Resource groups
- Virtual machines
- App Services
- Storage accounts
- SQL databases
- Azure Database for PostgreSQL...
- More services

### Recent resources

Name	Type	Last Viewed
fgstream	Stream Analytics job	a day ago
fgstrageacc	Storage account	a day ago
energymeterhub	IoT Hub	a day ago
(Disabled) Free Trial	Subscription	2 weeks ago

### Navigate

- Subscriptions
- Resource groups
- All resources
- Dashboard

### Tools

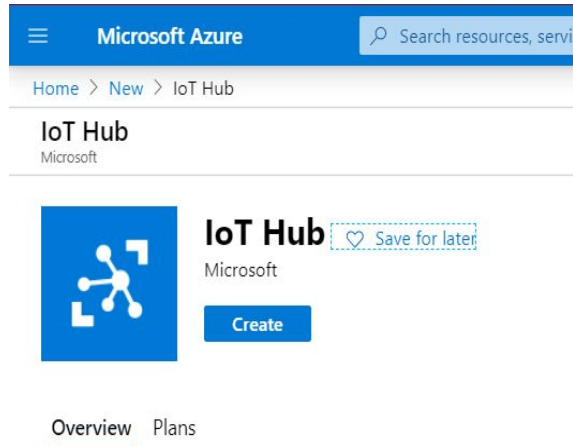
- Microsoft Learn
- Azure Monitor
- Security Center
- Cost Management

# Step 2-Creating Azure IoT Hub

-On the home page>> click on create a resource

-Type IoT Hub and press enter

-Click on create



## IoT hub

Microsoft

### Basics

[Size and scale](#)

[Tags](#)

[Review + create](#)

Create an IoT hub to help you connect, monitor, and manage billions of your IoT assets. [Learn more](#)

### Project details

Choose the subscription you'll use to manage deployments and costs. Use resource groups like folders to help you organize and manage resources.

Subscription \* ⓘ

Azure for Students



Resource group \* ⓘ

[Create new](#)

Region \* ⓘ

(US) East US

IoT hub name \* ⓘ

Enter a name for your hub

-Choose your subscription

-Since we have not created any resource group click on create new

-Enter the name of your choice

Resource group \* ⓘ

Create new

A resource group is a container that holds related resources for an Azure solution.

Name \*

OK Cancel

-Next select region as (Asia Pacific) Central India

-Enter the name of your hub

-Click on Size and scale

Review + create

< Previous

Next: Size and scale >

## Scale tier and units

Pricing and scale tier \* ⓘ

Number of F1 IoT hub units ⓘ

## Azure Security Center

Turn on Azure Security Center for IoT a

F1: Free tier

S1: Standard tier

S2: Standard tier

S3: Standard tier

B1: Basic tier

B2: Basic tier

B3: Basic tier

F1: Free tier

-In the Pricing and scale tier choose F1:Free tier

-Below click on Review+create

-Then click on create

-You should see a message Deployment is in process

-Wait for 2-3 min for it to get deployed

# Step 3-Creating a Storage Account

- Go to Home
- Click on Create a resource
- Type Storage Account and press enter
- Click on create
- Choose your subscription
- Choose the Resource group you have created by  
Clicking on the downward arrow



**Storage account - blob, file,  
table, queue**

Microsoft

Use Blobs, Tables, Queues, and Files  
for reliable, economical cloud  
storage.





- Enter a name for your account
  - Location choose Central India
  - Performance-Standard
  - Account kind choose -Storage(General Purpose v1)
- Replication choose-Locally redundant storage
- Click on Review+create
  - Wait until it gets deployed



## Create storage account

### Project details

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

Subscription \*

Azure for Students



Resource group \*

Energymeterfg



[Create new](#)

### Instance details

The default deployment model is Resource Manager, which supports the latest Azure features. You may choose to deploy using the classic deployment model instead. [Choose classic deployment model](#)

Storage account name \* ⓘ

demoacctt



Location \*

(Asia Pacific) Central India



Performance ⓘ



Standard



Premium

Account kind ⓘ

Storage (general purpose v1)



Replication ⓘ

Locally-redundant storage (LRS)



[Review + create](#)

[< Previous](#)

[Next : Networking >](#)

# Step 4- Create Stream Analytics Job

- Go to Home
- Click on Create a resource
- Type Stream analytics job and press enter
- Click on create
- Enter job name
- Choose subscription
- Choose existing resource group
- Choose Central India as location



## Stream Analytics job

Microsoft


Unlock real-time insights from  
streaming data

-Click on create


-Wait till it gets deployed

Home > New > Marketplace > Stream Analytics job > New Stream Analytics job


## New Stream Analytics job

 This will create a new Stream Analytics job. You will be charged according to Azure Stream


**Job name \***

demostream 

**Subscription \***


Azure for Students 


**Resource group \***

Energymeterfg 


[Create new](#)


**Location \***

(Asia Pacific) Central India 

**Hosting environment** 

**Cloud** Edge

**Streaming units (1 to 192)** 

 3

**Create**

# Step 5- Setting up Stream Analytics Job

-Go to All resources in Home

-Click on your stream analytics job name and the below page should appear

The screenshot displays the Azure Stream Analytics job configuration page for a job named 'fgstream'. The interface includes a left-hand navigation pane with sections for Overview, Settings, Job topology, and Configure. The main content area shows job details, a query editor, and input/output counts.

**fgstream**  
Stream Analytics job

Search (Ctrl+/) <<

Start Stop Delete

To start your job, you need to add an input. →

**Resource group** (change)  
Energymeterfg

**Status**  
Created

**Location**  
Central India

**Subscription** (change)  
Azure for Students

**Subscription ID**  
d993f892-1169-4b57-a63f-de3bd07041ac

Send feedback  
UserVoice

Created  
Monday, April 13, 2020, 1:46:02 PM

Started  
-

Output watermark  
-

Hosting environment  
Cloud

**Inputs**  
0

**Outputs**  
0

**Query** [Edit query](#)

```
1 SELECT
2 *
3 INTO
4 [YourOutputAlias]
5 FROM
6 [YourInputAlias]
```

**Settings**

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

**Job topology**

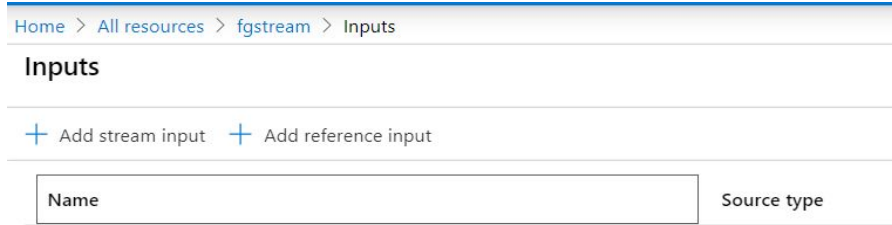
- Inputs
- Functions
- Query
- Outputs

**Configure**

- Storage account settings
- Scale

-Click on Inputs

-Click on Add stream input



Home > All resources > fgstream > Inputs

### Inputs

+ Add stream input + Add reference input

Name	Source type
------	-------------

-Choose IoT Hub

**-Give an input alias name(Eg- input 1)**

-Choose the option Select IoT Hub from your subscriptions

Click on save

## Inputs

 Add stream input  Add reference input

Name	Source type	Source
in1	Stream	IoT Hub

- You can see that a new input has been created
- Go back to stream analytics homepage which is shown in slide 13
- Click on output
- Click on add
- Choose Table storage from the drop down menu

-Enter an output alias name(Eg-Output 1)

-Click on create new

-Enter table name

-Enter xyz for partition and row key

## Outputs

+ Add

Event Hub

SQL Database

Blob storage/Data Lake Storage

Table storage

Service Bus topic

Service Bus queue

Cosmos DB

Power BI



-Batch size choose 10

-Click on save

-Go back to Stream

analytics page

as show in slide 13

## Table storage

New output

☒ Select table storage from your subscriptions

Subscription

Azure for Students

Storage account ⓘ

No accounts available

Storage account key

.....

Table name \* ⓘ

☒ Create new ☐ Use existing

table1

Partition key \* ⓘ

xyz

Row key \* ⓘ

xyz

Batch size ⓘ



10

-Click on edit query






-In Input Alias enter your input alias name given in slide 14

-In Output Alias enter your output alias name given in slide 16

**-Enter the details as shown below(exactly as shown in the picture below)**

-Click on save query

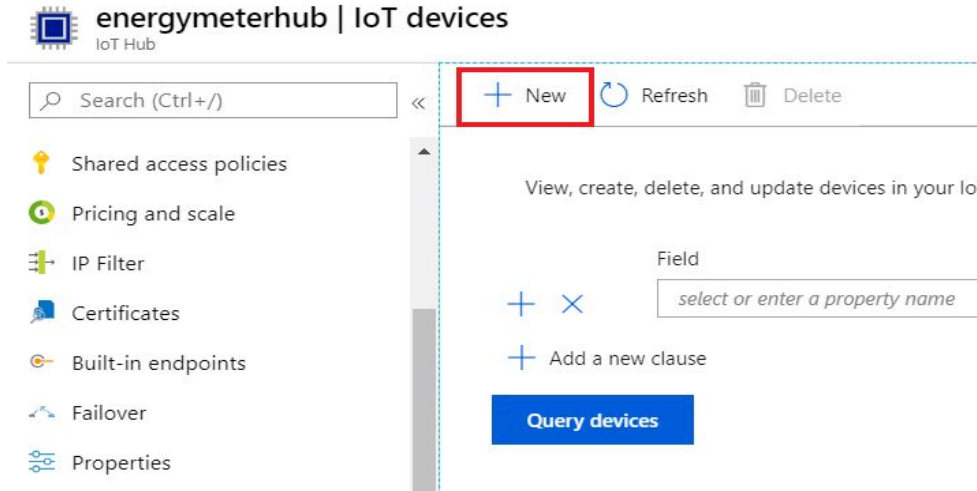
 Test query  Save query  Discard changes

```
1  SELECT
2  |    * , system.timestamp xyz|
3  INTO
4  |    output1
5  FROM
6  |    input1
```

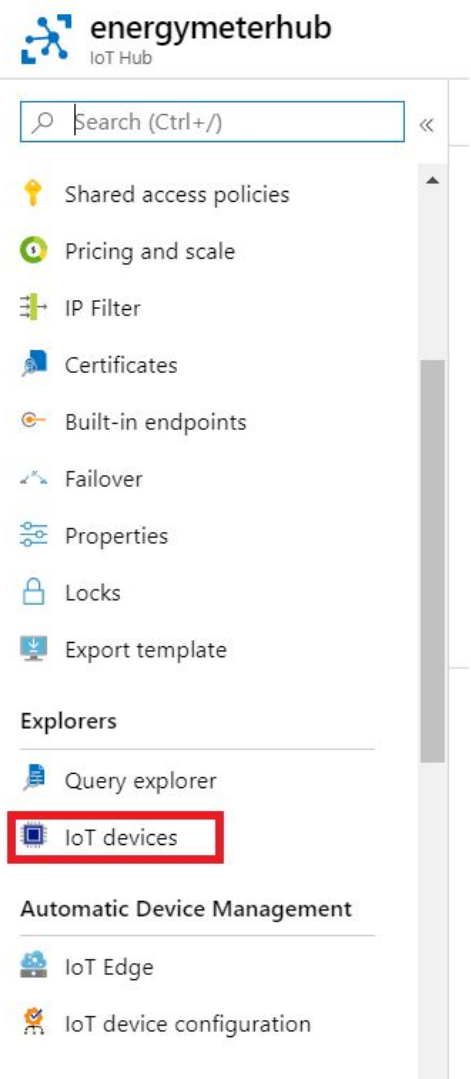
-Go back to stream analytics page and click on start

# Step 6- To copy the connection string

- Go to All resources on your Azure Home page
- Click on your IoT Hub name
- Click on IoT devices



The screenshot shows the 'energymeterhub | IoT devices' page in the Azure portal. The left sidebar contains a search bar and a list of resource types: Shared access policies, Pricing and scale, IP Filter, Certificates, Built-in endpoints, Failover, and Properties. The main content area has a header with a search bar and three buttons: '+ New' (highlighted with a red box), 'Refresh', and 'Delete'. Below the header, there is a section titled 'View, create, delete, and update devices in your IoT Hub'. This section contains a table with a 'Field' header and a text input field with the placeholder 'select or enter a property name'. Below the table, there is a '+ Add a new clause' button and a blue 'Query devices' button.



The screenshot shows the 'energymeterhub IoT Hub' page in the Azure portal. The left sidebar contains a search bar and a list of resource types: Shared access policies, Pricing and scale, IP Filter, Certificates, Built-in endpoints, Failover, Properties, Locks, and Export template. The main content area has a section titled 'Explorers' with a list of links: Query explorer and IoT devices (highlighted with a red box). Below the Explorers section, there is a section titled 'Automatic Device Management' with a list of links: IoT Edge and IoT device configuration.

-Click on new

-Enter the name of the device and click on save

-Go back to IoT devices and click on the device id you have created

The screenshot shows the 'energymeterhub | IoT devices' interface. On the left is a sidebar with navigation links: Shared access policies, Pricing and scale, IP Filter, Certificates, Built-in endpoints, Failover, Properties, Locks, Export template, Explorers, Query explorer, and IoT devices (highlighted). The main area has a top bar with '+ New', 'Refresh', and 'Delete' icons. Below this is a query builder section with the text 'View, create, delete, and update devices in your IoT Hub.' It contains a clause editor with 'Field' (select or enter a property name), 'Operator' (=), and 'Value' (specify constraint value) dropdowns. A '+ Add a new clause' button is also present. A blue 'Query devices' button is on the left, and a '</> Switch to query editor' link is on the right. Below the query builder is a table with the following data:

DEVICE ID	STATUS	LAST STATUS UPDATE (UTC)	AUTHENTICATION TYPE	CLOUD TO DEVICE MESSA...
deviceic	Enabled	--	Sas	0

Device ID ⓘ

deviceic

Primary Key ⓘ

.....

Secondary Key ⓘ

.....

Primary Connection String ⓘ

.....

Secondary Connection String ⓘ

.....

-Copy the Primary Connection String

## Step 7- Running python code

-Open command prompt and navigate to the folder where the python file(which you need to download) is stored(Eg- if you have stored the python file in documents use the command **cd "space"** C:\Users\Name\Documents)

- Next copy the following command and paste it on the terminal

```
pip install azure-iot-device
```

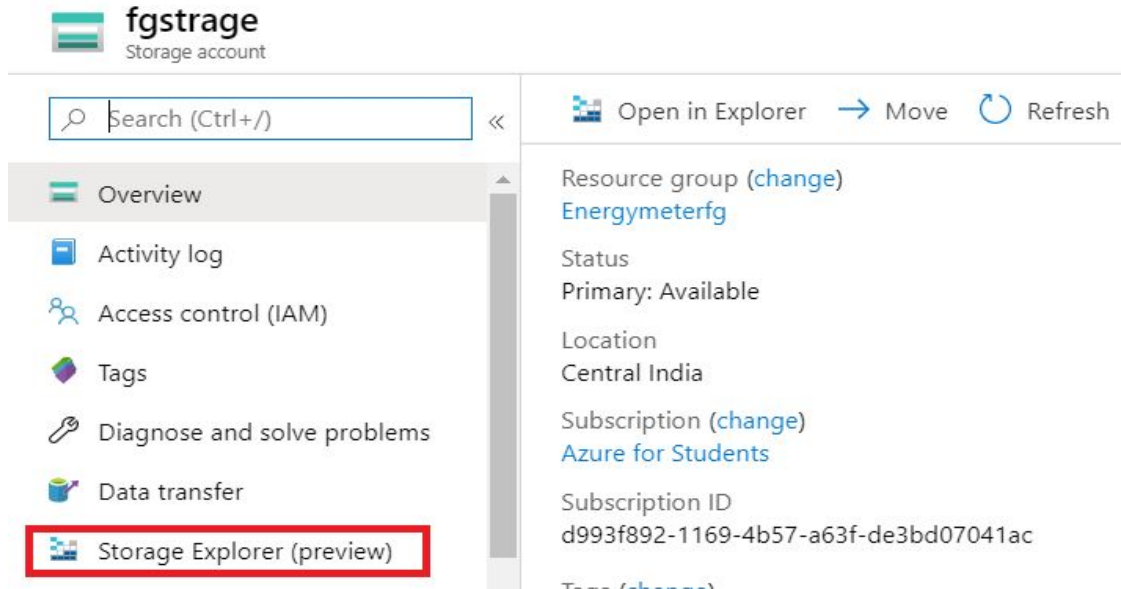
-After installation open the python code which you have downloaded and enter your IoT Hub **device** connection string

-Run the python file and you should be able to see data being sent to IoT Hub(Please refer the video for reference)

# Step 8- Viewing the stored data

-Go to your azure Storage Account


-Click on Storage Explorer(preview)





-Click on TABLES

-Click on your table name and you should see your data being stored

 **fgstrage** | Storage Explorer (preview)  
Storage account

Search (Ctrl+/,)

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Data transfer

Storage Explorer (preview)

Settings

Access keys

Geo-replication

CORS

Configuration

Encryption

Search

BLOB CONTAINERS

FILE SHARES

QUEUES

TABLES

table

QueryAddEditSelect AllColumn OptionsMore

NQUEUEDUTCTIME	EVENTPROCESSEDUTCTIME	IOTHUB	PARTITIONID	ENERGY	XYZ
4-16T17:58:15.574Z	2020-04-16T17:58:15.6843661Z	Record	0	25	2020-04-16T17:58:15.574Z
4-16T17:58:16.651Z	2020-04-16T17:58:16.7655899Z	Record	0	25	2020-04-16T17:58:16.651Z
4-16T17:58:17.776Z	2020-04-16T17:58:17.8764887Z	Record	0	25	2020-04-16T17:58:17.776Z
4-16T17:58:18.885Z	2020-04-16T17:58:18.9725787Z	Record	0	25	2020-04-16T17:58:18.885Z
4-16T17:58:20.014Z	2020-04-16T17:58:20.0659061Z	Record	0	25	2020-04-16T17:58:20.014Z
4-16T17:58:21.139Z	2020-04-16T17:58:21.2250138Z	Record	0	25	2020-04-16T17:58:21.139Z
4-16T17:58:22.362Z	2020-04-16T17:58:22.4312786Z	Record	0	25	2020-04-16T17:58:22.362Z
4-16T17:58:23.508Z	2020-04-16T17:58:23.6356051Z	Record	0	25	2020-04-16T17:58:23.508Z
4-16T17:58:24.636Z	2020-04-16T17:58:24.7316577Z	Record	0	25	2020-04-16T17:58:24.636Z
4-16T17:58:25.747Z	2020-04-16T17:58:25.8266335Z	Record	0	25	2020-04-16T17:58:25.747Z
4-16T17:58:26.872Z	2020-04-16T17:58:26.9234273Z	Record	0	25	2020-04-16T17:58:26.872Z
4-16T17:58:27.998Z	2020-04-16T17:58:28.1240294Z	Record	0	25	2020-04-16T17:58:27.998Z
4-16T17:58:29.123Z	2020-04-16T17:58:29.2206097Z	Record	0	25	2020-04-16T17:58:29.123Z
4-16T17:58:30.256Z	2020-04-16T17:58:30.3159455Z	Record	0	25	2020-04-16T17:58:30.256Z

THANK YOU

