

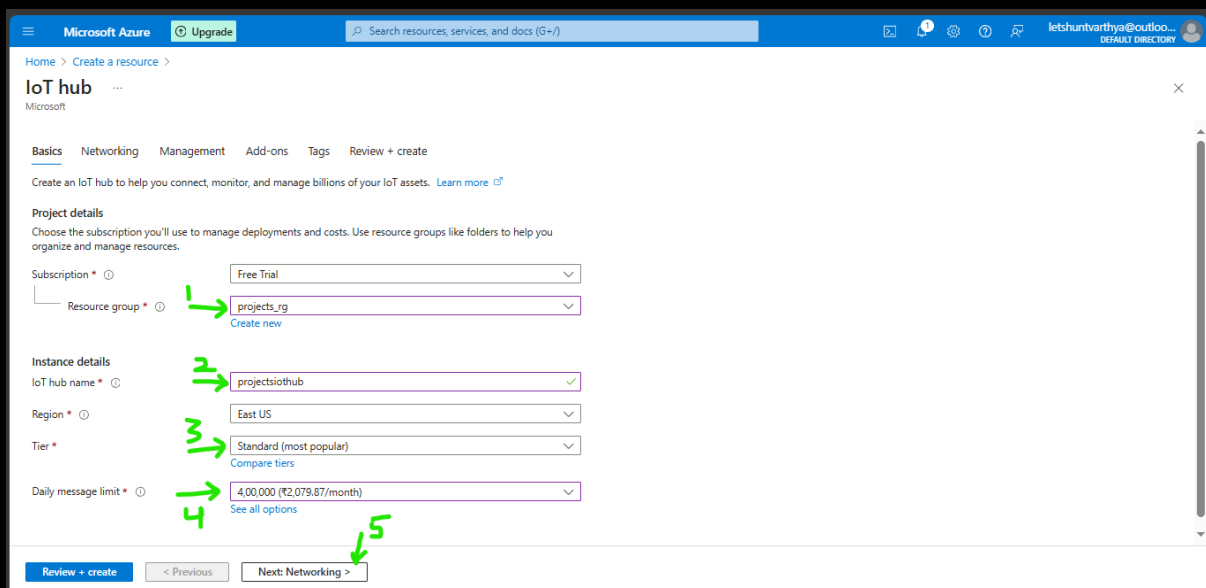
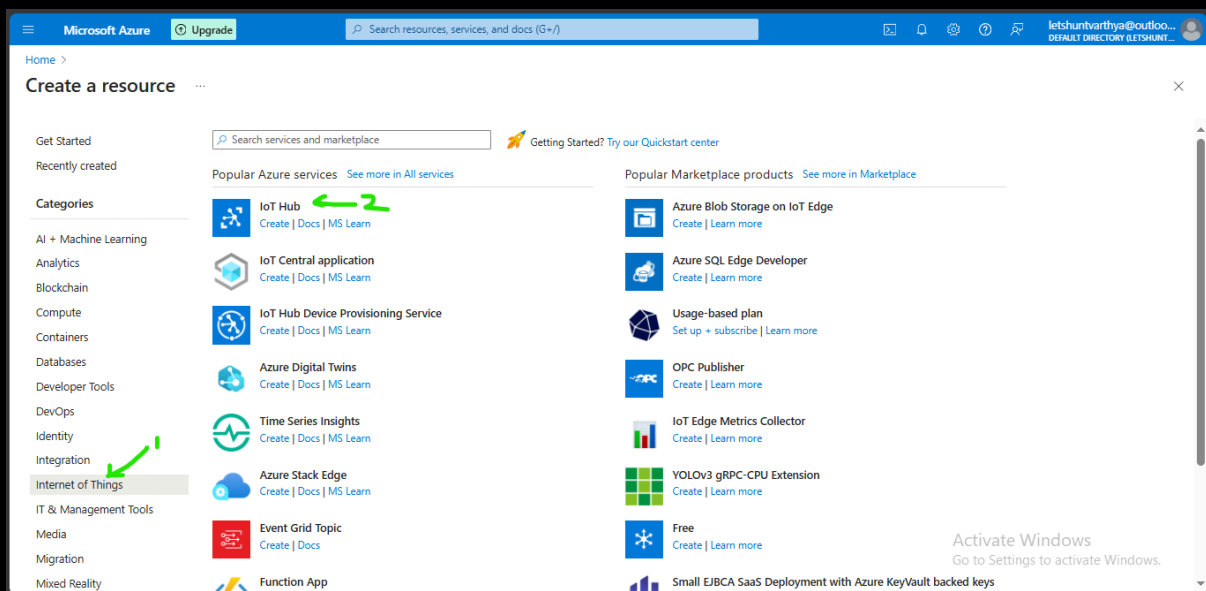
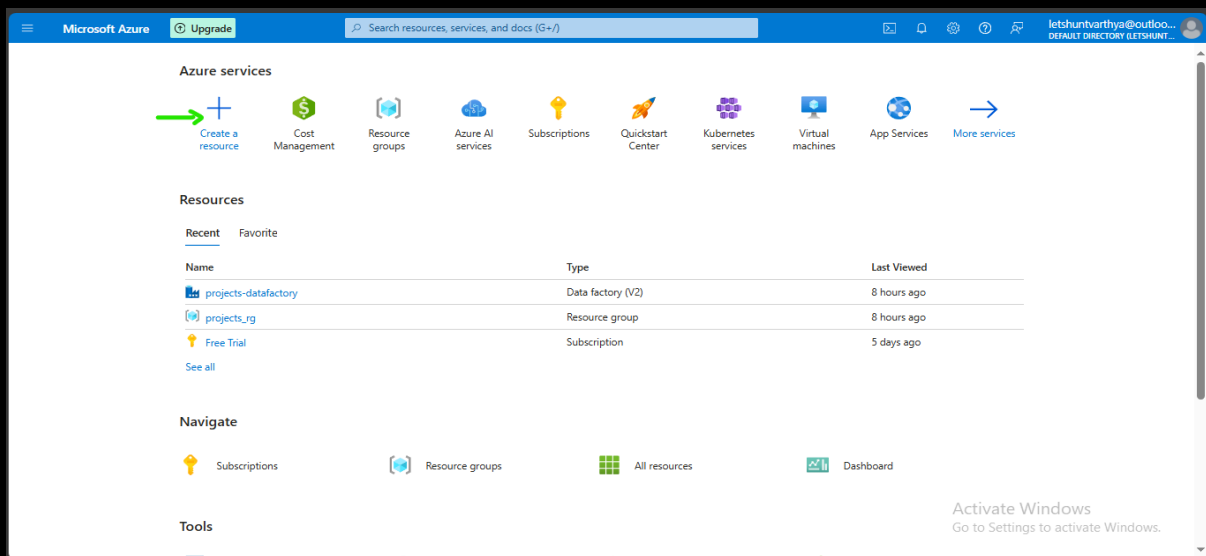
- Storage which support Azure streaming analytics
  - Event Hub
  - IOT Hub
  - Adls

IOT Hub to data lake using azure streaming analytics :

Streaming pipeline steps :

1. Create IOT Hub service (captures input data )
2. Device IOT Data (data from device)
3. Live data ( keep on getting data every 15 secs )
4. Processing streaming data ( Azure Streaming Analytics )
5. Analyse the output

## Create a IOT HUB Service :



Microsoft Azure

Upgrade

Search resources, services, and docs (G+/)

letshuntvarthya@outloo...  
DEFAULT DIRECTORY

Home > Create a resource >

IoT hub

Microsoft

Basics Networking Management Add-ons Tags Review + create

You can connect to your IoT hub either publicly via its public hostname or privately using a private endpoint.  
[Learn more](#)

Connectivity configuration \*

☒ Public access

☐ Private access (Recommended)

! You can change this or configure another connectivity method after this resource has been created.

[Learn more](#)

Minimum TLS Version ⓘ

☒ 1.0

☐ 1.2

Review + create

< Previous: Basics

Next: Management >

Microsoft Azure

Upgrade

Search resources, services, and docs (G+/)

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Home > Create a resource >

IoT hub

Microsoft

Basics Networking Management Add-ons Tags Review + create

The following features are optional and billed separately. Microsoft recommends enabling them to ensure the most robust protections and capabilities to secure and update your fleet of devices are available. [Learn more](#)

Device Update for IoT Hub

Device Update for IoT Hub is an additional service that enables you to deploy over-the-air updates for your IoT devices. You will be charged separately for this service. See [Azure pricing](#) for more details.

Enable Device Update for IoT Hub ☐

Defender for IoT

Microsoft Defender for IoT is a separate service which adds an extra layer of threat protection for Azure IoT Hub, IoT Edge, and your devices. You will be charged separately for this service. Defender for IoT may process and store your data within a different geographic location than your IoT Hub. [Learn more](#)

Enable Defender for IoT ☐ ₹0.083 per device per month

Review + create

< Previous: Management

Next: Tags >

Microsoft Azure

Upgrade

Search resources, services, and docs (G+/)

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DEFAULT DIRECTORY

Home > Create a resource >

IoT hub

Microsoft

Basics Networking Management Add-ons Tags Review + create

Tags are name/value pairs. To categorize resources and consolidate billing, apply the same tag to multiple resources and resource groups. Your tags will update automatically if you change your resources. [Learn more](#)

Name ⓘ	Value ⓘ	Resource
<input type="text"/>	<input type="text"/>	IoT Hub

Review + create

< Previous: Add-ons

Next: Review + create >

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

Home > Create a resource >

## IoT hub

Microsoft

Basics Networking Management Add-ons Tags **Review + create**

**Pricing**

IoT hub ₹2,079.87 INR per month [Change basics](#)

Add-ons total ₹0.083 INR per device per month [Change add-ons](#)

**Basics**

Subscription	Free Trial
Resource group	projects_rg
IoT hub name	projectsiothub
Region	East US
Disaster recovery enabled	Yes
Tier	Standard
Daily message limit	4,00,000 (₹2,079.87/month)

**Networking**

[Create](#) < Previous: Tags Next > [Automation options](#)

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

Home >

## projectsiothub-529133121 | Overview

Deployment

Search < Delete Cancel Redeploy Download Refresh

**Overview** Inputs Outputs Template

**Your deployment is complete**

Deployment name: projectsiothub-529133121 Start time: 5/29/2024, 1:31:33 PM  
Subscription: Free Trial Correlation ID: 8d1e86e8-9744-46e9-9b14-b5df7e6de2f5  
Resource group: projects\_rg

**Deployment details**

**Next steps**

[Add and configure IoT Devices](#) Recommended  
[Configure routing rules for device messaging](#) Recommended

[Go to resource](#)

**Give feedback**  
Tell us about your experience with deployment

**Cost Management**  
Get notified to stay within your budget and prevent unexpected charges on your bill. [Set up cost alerts >](#)

**Microsoft Defender for Cloud**  
Secure your apps and infrastructure  
[Go to Microsoft Defender for Cloud >](#)

**Free Microsoft tutorials**  
[Use IoT Hub message routing to send device-to-cloud messages to different endpoints](#)  
[Understanding the device identity registry](#)  
[Understanding IoT Hub quotas and throttling](#)

**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.

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

**Azure services**

[Create a resource](#) Cost Management Resource groups Azure AI services Subscriptions Quickstart Center Kubernetes services Virtual machines App Services [More services](#)

**Resources**

Recent Favorite

Name	Type	Last Viewed
<a href="#">projectsiothub</a>	IoT Hub	4 minutes ago
<a href="#">projects_rg</a>	Resource group	4 minutes ago
<a href="#">projects-datafactory</a>	Data factory (V2)	9 hours ago
<a href="#">Free Trial</a>	Subscription	5 days ago

[See all](#)

**Navigate**

[Subscriptions](#) [Resource groups](#) [All resources](#) [Dashboard](#)

<https://portal.azure.com/#home> Tools

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

Home > Create a resource > Marketplace

New! Get AI-generated suggestions for your search. Ask AI to suggest products, articles, and solutions for what you need. View suggestions

azure stream analytics Pricing: All Operating System: All Publisher Type: All Product Type: All Publisher name: All

☐ Azure services only

Showing 1 to 20 of 85 results for 'azure stream analytics'. Clear search

Tile view

**Azure Stream Analytics on IoT Edge**  
Microsoft  
Azure Service  
Deploy near-real-time analytical intelligence to IoT Edge devices  
Create

**Stream Analytics job**  
Microsoft  
Azure Service  
Unlock real-time insights from streaming data  
Create

**Stream Analytics cluster**  
Microsoft  
Azure Service  
Unlock real-time insights from streaming data with guaranteed capacity and sub-second latency  
Create

**Azure Stream Analytics solution for Sentinel**  
Microsoft Sentinel, Microsoft Co...  
Azure Application  
Azure Stream Analytics  
Price varies  
Create

**SAS Event Stream Processing**  
SAS Institute Inc.  
Azure Application  
Analyze streaming data and make real-time, intelligent decisions  
Price varies  
Create

Is Marketplace helpful?

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

Home > Create a resource > Marketplace > Stream Analytics job

Microsoft

**Stream Analytics job** Add to Favorites  
Microsoft | Azure Service  
★ 4.0 (189 ratings)

Plan  
Stream Analytics job Create

Overview Plans Usage Information + Support Ratings + Reviews

Home > Create a resource > Marketplace > Stream Analytics job > New Stream Analytics job

Basics Storage Tags Managed Identity Review + create

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

Subscription \* Free Trial  
Resource group \* projects\_rg Create new

Instance details  
Name \* streamanalytics  
Region \* (US) East US  
Hosting environment \* Cloud

Streaming unit details  
Streaming units (SUs) represents the computing resources that are allocated to execute a Stream Analytics job. The higher

Previous Next Review + create

https://portal.azure.com/#

Give feedback

Home > Create a resource > Marketplace > Stream Analytics job >

## New Stream Analytics job

Basics Storage Tags Managed Identity Review + create

This storage account is used for storing content related to your Stream Analytics job, such as SQL reference data snapshots.

Add storage account ☐

Previous Next **Review + create** Give feedback

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

letshuntvarthya@outloo... DEFAULT DIRECTORY

Home > Create a resource > Marketplace > Stream Analytics job >

## New Stream Analytics job

Basics Storage Tags Managed Identity **Review + create**

[View automation template](#)

**Basics**

Subscription	Free Trial
Resource group	projects_rg
Name	streamanalytics
Location	East US
Hosting environment	Cloud
Streaming units	1

Previous Next **Create** Give feedback

Home >

## StreamAnalyticsJob | Overview

Deployment

Search Delete Cancel Redeploy Download Refresh

Overview Inputs Outputs Template

**Your deployment is complete**

Deployment name : StreamAnalyticsJob  
Subscription : Free Trial  
Resource group : projects\_rg

Start time : 5/29/2024, 2:24:18 PM  
Correlation ID : 9330f89c-4c93-4f9e-bf05-3c30f4d396ce

Deployment details

Next steps

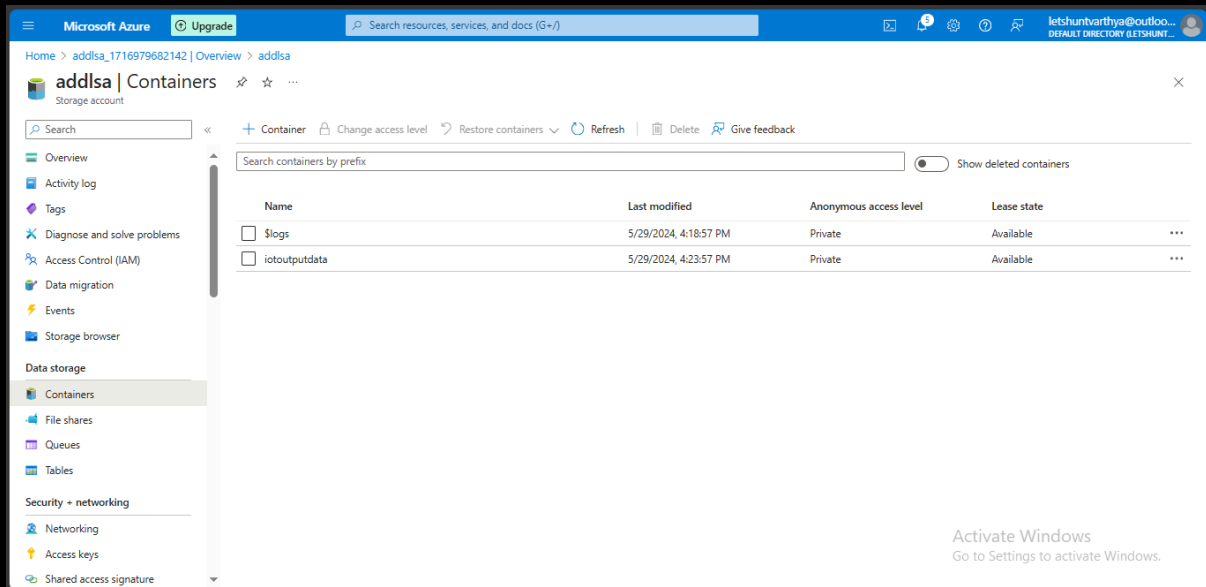
**Go to resource**

**Cost management**  
Get notified to stay within your budget and prevent unexpected charges on your bill.  
[Set up cost alerts >](#)

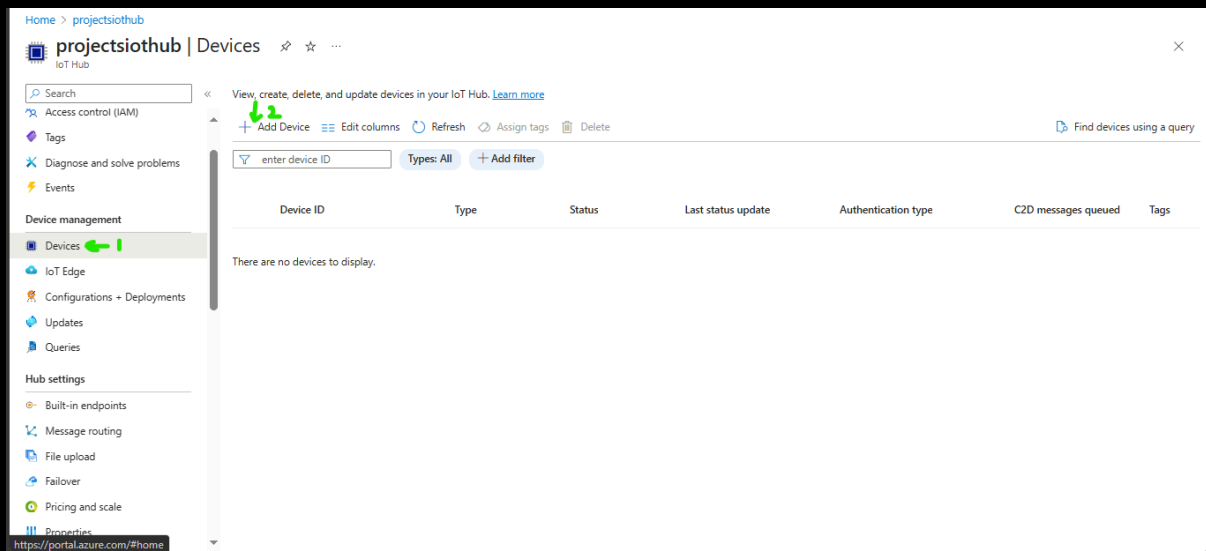
**Microsoft Defender for Cloud**  
Secure your apps and infrastructure

## Azure data lake storage creation :

- How to create azure data lake storage is shown in the document below.
- [https://docs.google.com/document/d/1Gyz7yN9HDF7d\\_i6wM\\_i9ph0Z0PNi\\_KP\\_FLgPfRJshs\\_A/edit?usp=shoring](https://docs.google.com/document/d/1Gyz7yN9HDF7d_i6wM_i9ph0Z0PNi_KP_FLgPfRJshs_A/edit?usp=shoring)
- Create a container in azure data lake storage ( name : iotoutputdata )



In projectsiothub →



Home > projectsiothub | Devices >

## Create a device

Find Certified for Azure IoT devices in the Device Catalog

Device ID \*  ✓

☐ IoT Edge Device

Authentication type ☒ Symmetric key ☐ X.509 Self-Signed ☐ X.509 CA Signed

Auto-generate keys ☒

Connect this device to an IoT hub ☒ Enable ☐ Disable

Parent device ☐ No parent device  
[Set a parent device](#)

Home > projectsiothub

## projectsiothub | Devices

IoT Hub

Search

Access control (IAM)

Tags

Diagnose and solve problems

Events

Device management

- Devices
- IoT Edge
- Configurations + Deployments
- Updates

View, create, delete, and update devices in your IoT Hub. [Learn more](#)

+ Add Device Edit columns Refresh Assign tags Delete

Find devices using a query

enter device ID Types: All + Add filter

Device ID	Type	Status	Last status update	Authentication type	C2D messages queued	Tags
raspberrypi	IoT Device	Enabled	--	Shared Access Signature	0	

Home > projectsiothub | Devices >

## raspberrypi

projectsiothub

Save Message to Device Direct method + Add Module Identity Device twin Refresh

Device ID

Primary key

Secondary key

Primary connection string

Secondary connection string

Tags (edit) No tags

Enable connection to IoT Hub ☒ Enable ☐ Disable

Parent device ☐ No parent device

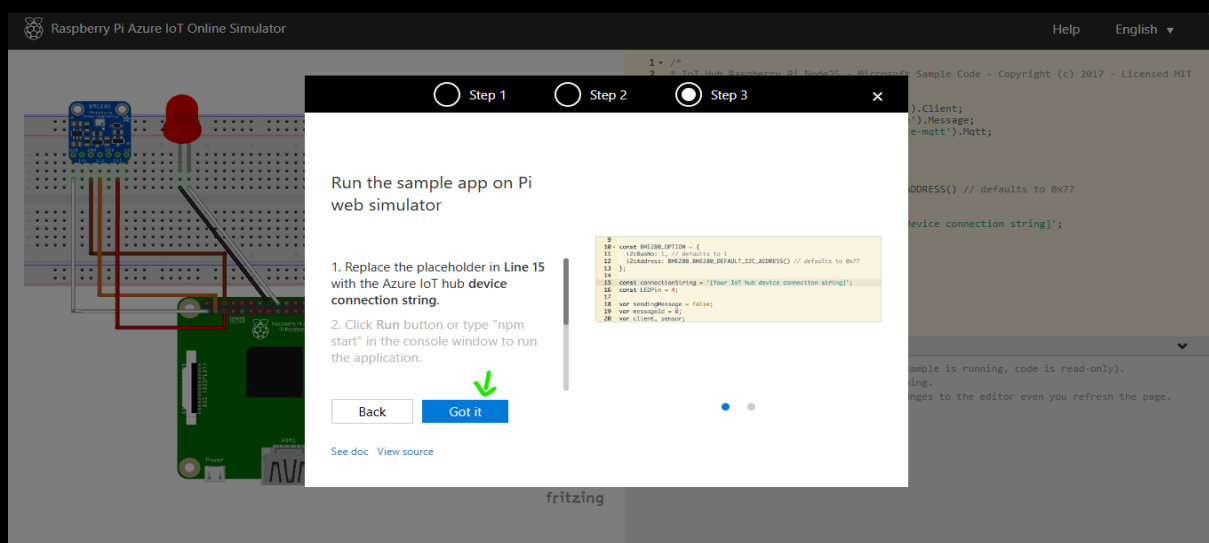
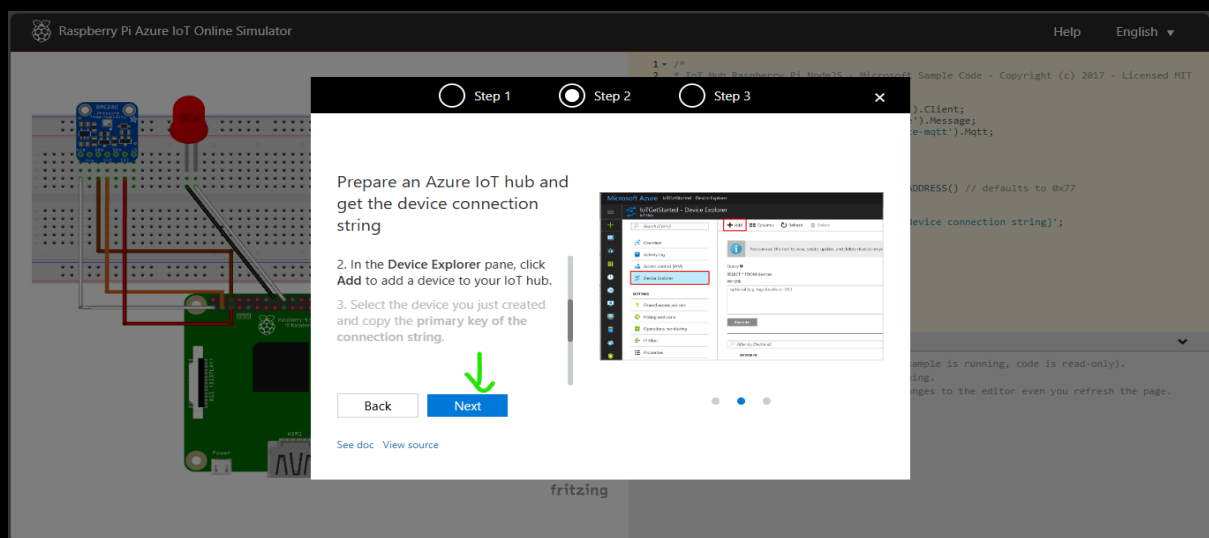
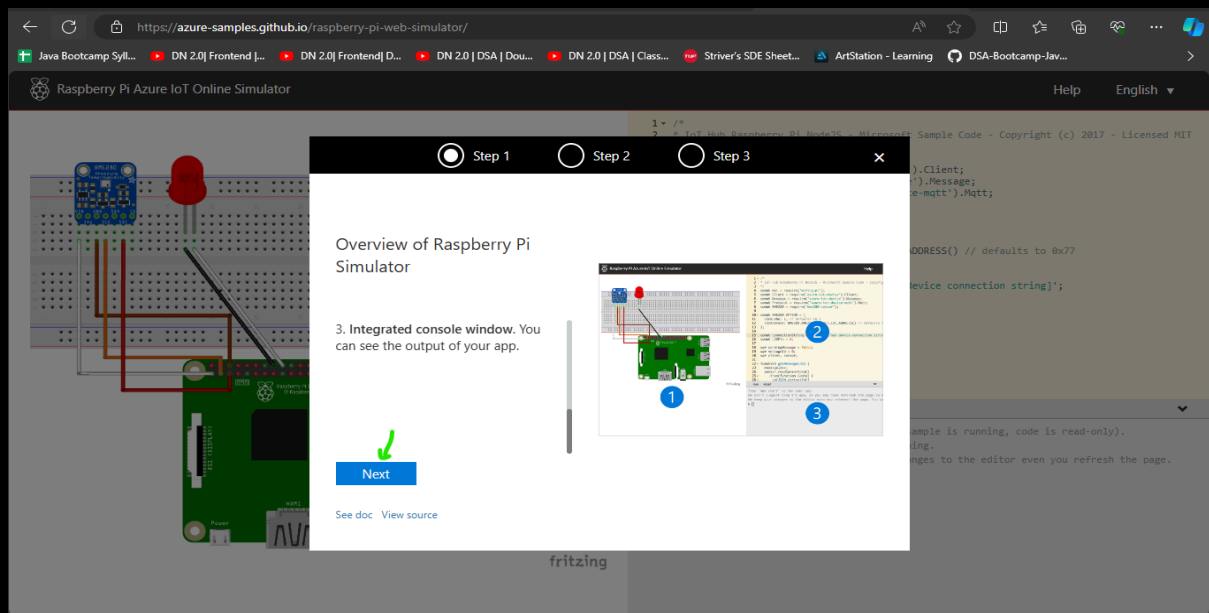
Module Identities [Configurations](#)

Module ID	Connection State	Connection State Last Updated ...	Last Activity Time (UTC)
There are no module identities for this device.			



Open Azure IoT Online simulator in new tab

Link : <https://azure-samples.github.io/raspberry-pi-web-simulator/>



Raspberry Pi Azure IoT Online Simulator
Help English

```

1 /*
2  * IoT Hub Raspberry Pi NodeJS - Microsoft Sample Code - Copyright (c) 2017 - Licensed MIT
3  */
4 const wpi = require('wiring-pi');
5 const Client = require('azure-iot-device').Client;
6 const Message = require('azure-iot-device').Message;
7 const Protocol = require('azure-iot-device-mqtt').Mqtt;
8 const BME280 = require('bme280-sensor');
9
10 const BME280_OPTION = {
11   i2cBusNo: 1, // defaults to 1
12   i2cAddress: BME280.BME280_DEFAULT_I2C_ADDRESS() // defaults to 0x77
13 };
14
15 const connectionString = '[Your IoT hub device connection string]';
16 const LEDPin = 4;
17
18 var sendingMessage = false;
19 var messageId = 0;
20 var client, sensor;
21 var blinkLEDTIMEOUT = null;
22
23 function getMessage(cb) {
24

```

Run Reset

Click 'Run' button to run the sample code(when sample is running, code is read-only).  
Click 'Stop' button to stop the sample code running.  
Click 'Reset' to reset the code, we keep your changes to the editor even you refresh the page.

Home > projectsiothub | Devices >

raspberrypi
projectsiothub

Save Message to Device Direct method Add Module Identity Device twin Refresh

Device ID raspberrypi
Primary key \*\*\*\*\*
Secondary key \*\*\*\*\*
Primary connection string \*\*\*\*\*
Secondary connection string \*\*\*\*\*
Tags No tags
Enable connection to IoT Hub ☒ Enable ☐ Disable
Parent device No parent device

Module Identities Configurations

Module ID	Connection State	Connection State Last Updated ...	Last Activity Time (UTC)
There are no module identities for this device.			

Raspberry Pi Azure IoT Online Simulator
Help English

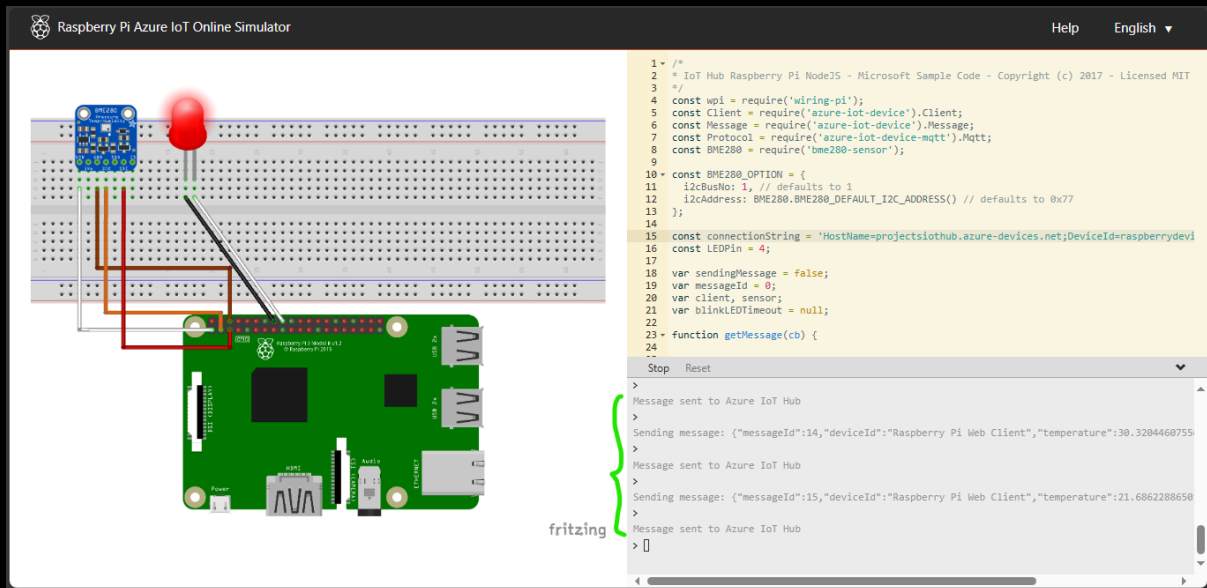
```

1 /*
2  * IoT Hub Raspberry Pi NodeJS - Microsoft Sample Code - Copyright (c) 2017 - Licensed MIT
3  */
4 const wpi = require('wiring-pi');
5 const Client = require('azure-iot-device').Client;
6 const Message = require('azure-iot-device').Message;
7 const Protocol = require('azure-iot-device-mqtt').Mqtt;
8 const BME280 = require('bme280-sensor');
9
10 const BME280_OPTION = {
11   i2cBusNo: 1, // defaults to 1
12   i2cAddress: BME280.BME280_DEFAULT_I2C_ADDRESS() // defaults to 0x77
13 };
14
15 const connectionString = 'HostName=projectsiothub.azure-devices.net;DeviceId=raspberrypi';
16 const LEDPin = 4;
17
18 var sendingMessage = false;
19 var messageId = 0;
20 var client, sensor;
21 var blinkLEDTIMEOUT = null;
22
23 function getMessage(cb) {
24

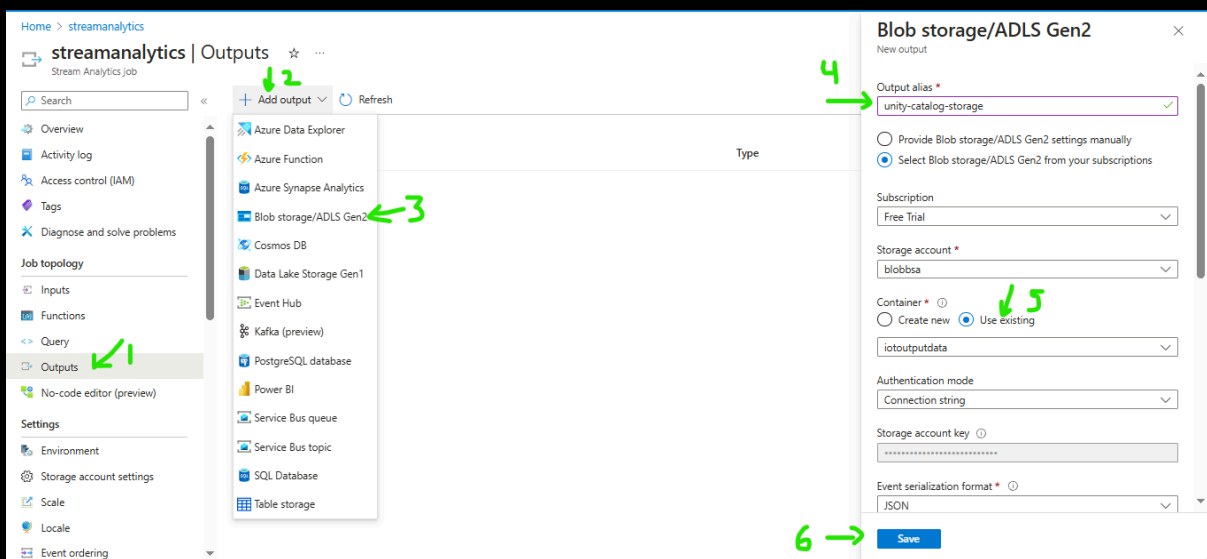
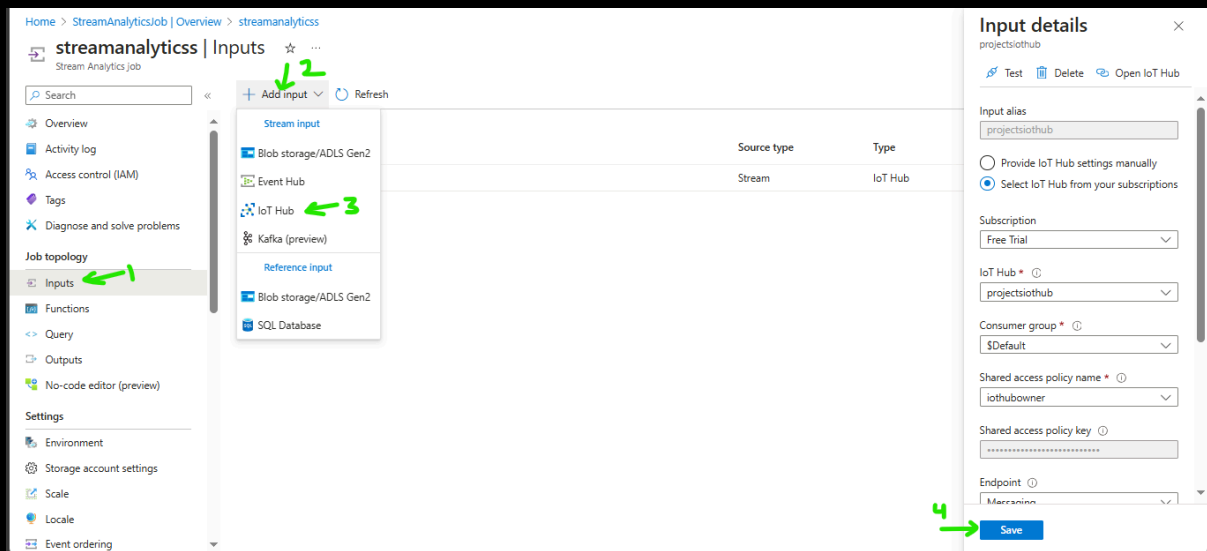
```

Run Reset

Click 'Run' button to run the sample code(when sample is running, code is read-only).  
Click 'Stop' button to stop the sample code running.  
Click 'Reset' to reset the code, we keep your changes to the editor even you refresh the page.



## Open stream analytics



Home > StreamAnalyticsJob | Overview > streamanalytics

### streamanalytics | Query

Stream Analytics job

Search

Start job Open in VS Code Diagnostic settings Refresh Query language docs Share feedback Tutorial Job ready to start

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Job topology

Inputs

Functions

Query

Outputs

No-code editor (preview)

Settings

Environment

Storage account settings

Scale

Locale

Test query Save query Discard changes

```
1 /*
2 Here are links to help you get started with Stream Analytics Query Language:
3 Common query patterns - https://go.microsoft.com/fwlink/?LinkID=619153
4 Query language - https://docs.microsoft.com/stream-analytics-query/query-language-elements-azure-stream-analytics
5 */
6 SELECT
7 *
8 INTO
9 [iotoutputdata]
10 FROM
11 [projectsiothub]
```

Input preview Test results Job simulation (preview)

Showing sample events from 'projectsiothub'.

Table Raw Refresh Select time range Upload sample input Download sample data

messageid	deviceid	temperature	humidity	EventProcessedUtcTime	Partitionid
bigint	string	float	float	datetime	bigint
1	"Raspberry Pi Web Cli...	20.579169020317302	79.63068836549873	"2024-05-29T10:14:01....	1
2	"Raspberry Pi Web Cli...	28.329597714856575	68.29014603706618	"2024-05-29T10:14:01....	1

While sampling data, no data was received from '3' partitions. Ln 1, Col 1

Start job -> start

Home > StreamAnalyticsJob | Overview > streamanalytics

### streamanalytics | Query

Stream Analytics job

Search

Start job Open in VS Code Diagnostic settings Refresh Query language docs Share feedback Tutorial Job ready to start

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Job topology

Inputs

Functions

Query

Outputs

No-code editor (preview)

Settings

Environment

Storage account settings

Scale

Locale

Test query Save query Discard changes

```
1 /*
2 Here are links to help you get started with Stream Analytics Query Language:
3 Common query patterns - https://go.microsoft.com/fwlink/?LinkID=619153
4 Query language - https://docs.microsoft.com/stream-analytics-query/query-language-elements-azure-stream-analytics
5 */
6 SELECT
7 temperature, humidity, EventProcessedUtcTime
8 INTO
9 [iotoutputdata]
10 FROM
11 [projectsiothub]
```

Input preview Test results Job simulation (preview)

Download results

temperature	humidity	EventProcessedUtcTime
float	float	datetime
20.579169020317302	79.63068836549873	"2024-05-29T10:14:01.7641625Z"
28.329597714856575	68.29014603706618	"2024-05-29T10:14:01.7641625Z"
23.09824976559484	61.966583461990446	"2024-05-29T10:14:01.7641625Z"

Showing 50 rows from 'iotoutputdata'. Ln 7, Col 47

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

Home > StreamAnalyticsJob | Overview > streamanalytics

### streamanalytics | Query

Stream Analytics job

Search

Start job Open in VS Code Diagnostic settings Refresh Query language docs

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Job topology

Inputs

Functions

Query

Outputs

No-code editor (preview)

Settings

Environment

Storage account settings

Scale

Locale

Event ordering

Test query Save query Discard changes

```
1 /*
2 Here are links to help you get started with Stream Analytics Query Language:
3 Common query patterns - https://go.microsoft.com/fwlink/?LinkID=619153
4 Query language - https://docs.microsoft.com/stream-analytics-query/query-language-elements-azure-stream-analytics
5 */
6 SELECT
7 temperature, humidity, EventProcessedUtcTime
8 INTO
9 [iotoutputdata]
10 FROM
11 [projectsiothub]
```

Input preview Test results Job simulation (preview)

Showing sample events from 'projectsiothub'.

Table Raw Refresh Select time range

messageid	deviceid	tem
bigint	string	float
1	"Raspberry Pi Web Cli...	20.5
2	"Raspberry Pi Web Cli...	28.3

While sampling data, no data was received from '3' partitions.

Start job

streamanalytics

You have not configured the diagnostic settings for this job yet. Add diagnostic settings in the diagnostic settings pane.

Streaming units

1

Environment

Standard

Job output start time

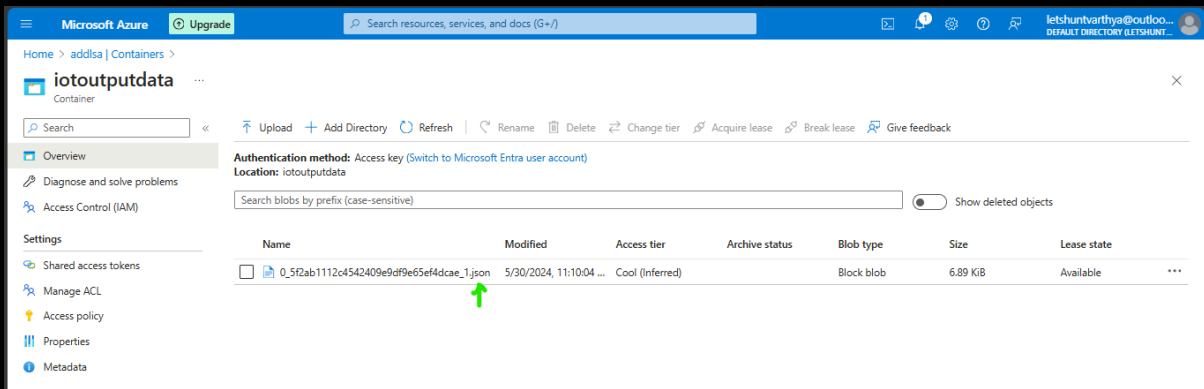
Now

Custom

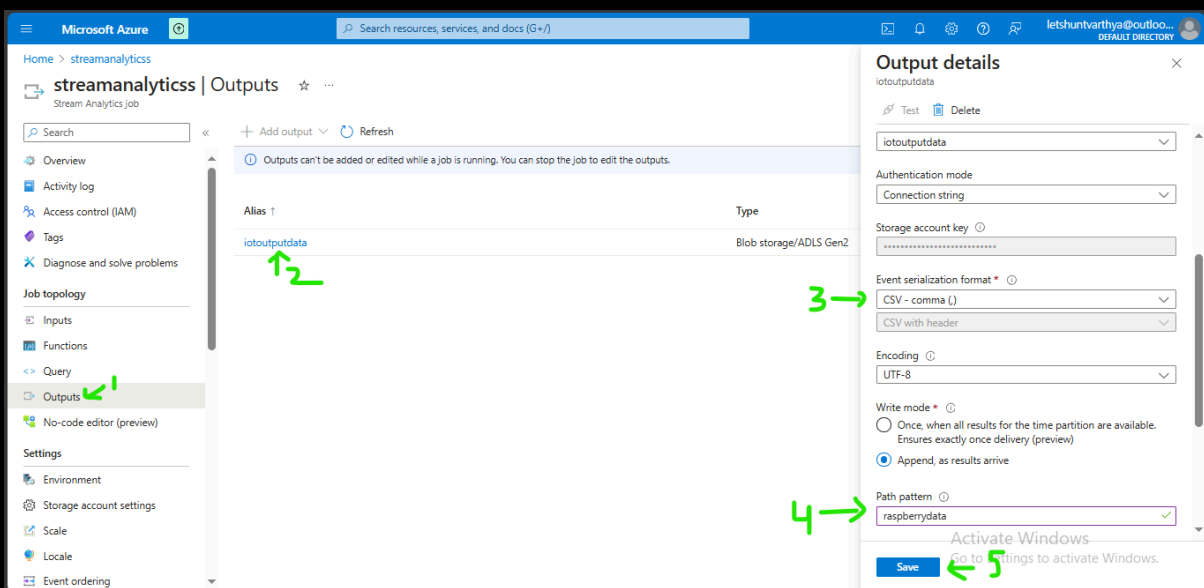
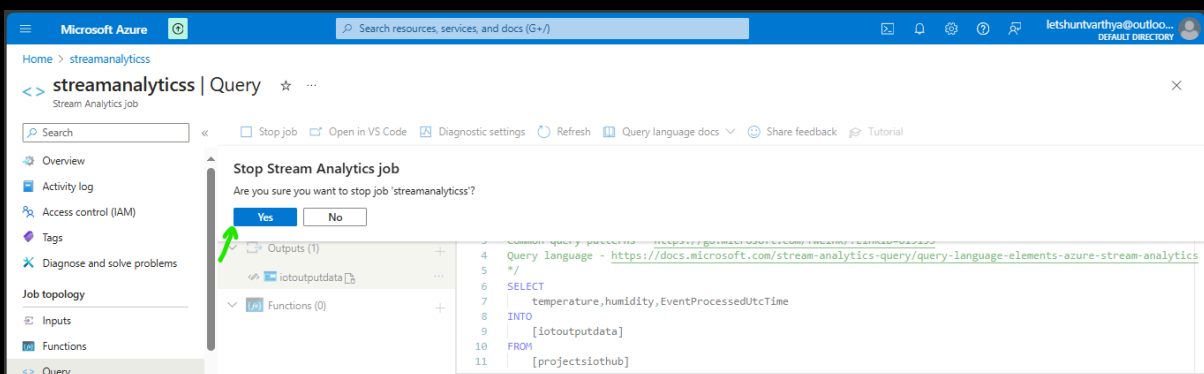
When last stopped

Activate Windows Go to Settings to activate Windows.

Start



We can see that output is in json format. Let's change it to csv.  
To edit iotouptput details in outputs we need to stop the job.



Delete the files in iotoutputdata container which is in azure data lake storage.  
Start the job.

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

Home > StreamAnalyticsJob | Overview > streamanalyticss

streamanalyticss | Query

Stream Analytics job

Start job

Test query

```
1 /*
2 Here are links to help you get started
3 Common query patterns - https://go.mic
4 Query language - https://docs.microsof
5 */
6 SELECT
7     temperature, humidity, EventProcesso
8 INTO
9     [iotoutputdata]
10 FROM
11     [projectsiothub]
```

Input preview

Showing sample events from 'projectsiothub'.

messageid	deviceid	tem
bigint	string	float
1	"Raspberry Pi Web Cli...	20.5
2	"Raspberry Pi Web Cli...	28.3

Start

Activate Windows  
Go to Settings to activate Windows.

Here, we can see the output is in csv format.

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

Home > addlisa | Containers >

iotoutputdata

Container

Authentication method: Access key (Switch to Microsoft Entra user account)

Location: iotoutputdata / raspberrydata

Search blobs by prefix (case-sensitive)

Show deleted objects

Name	Modified	Access tier	Archive status	Blob type	Size	Lease state
[.]						...
994811650_90a5f5dfe99b4c35a8f534aa1e690afd_1.csv	5/30/2024, 11:29:38 AM	Cool (Inferred)		Block blob	910 B	Available