Adding IoT Device to Azure IOT Hub

Use Case:

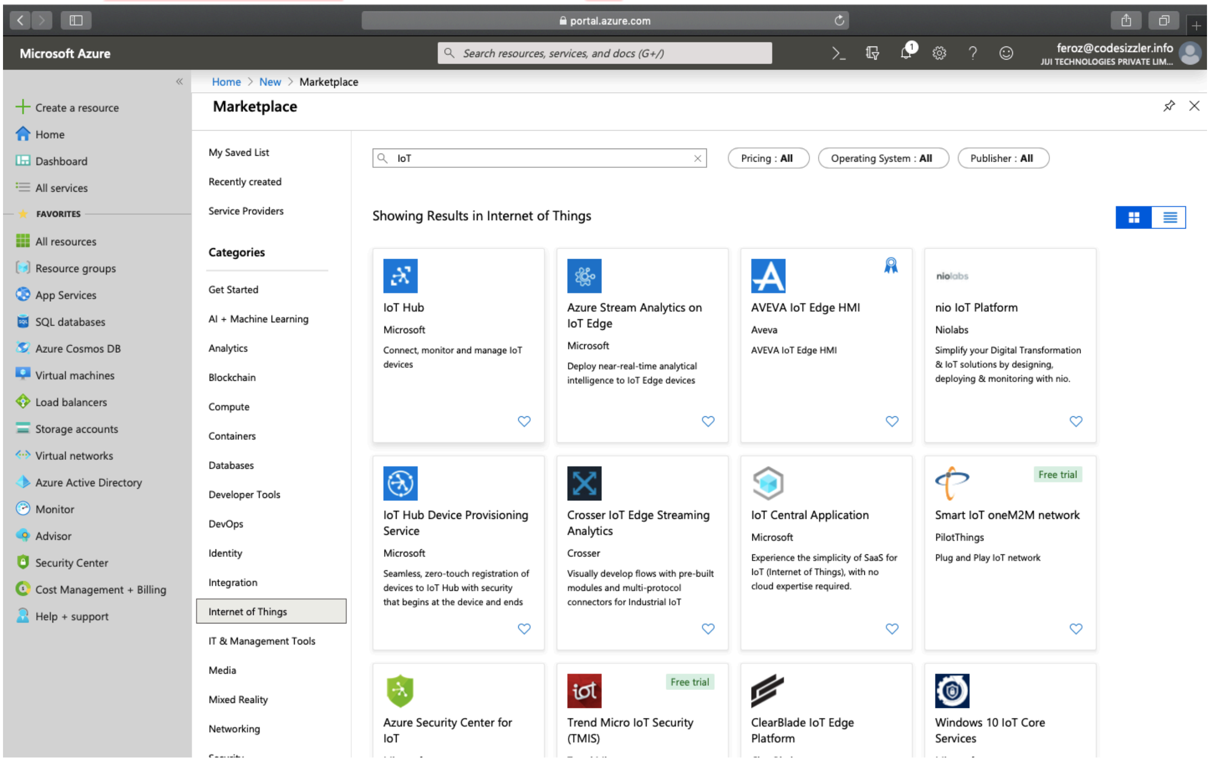
In this walkthrough you will set up a new Azure IoT Hub in Azure Portal, and configure the hub to authenticate a connection to an IoT device using the online Raspberry Pi device simulator. Sensor data and messages are passed from the Raspberry Pi simulator to your Azure IoT Hub, and you view metrics for the messaging activity in Azure Portal.

Prerequisites:

An active Azure subscription is required. If you do not have an Azure subscription, create a free Azure account before you begin.

Steps:

1. To create a new Azure IoT Hub, select the Deploy to Azure button to go to the url https://portal.azure.com/#create/microsoft.iothub and sign into Azure Portal, when prompted.



IoT

Showing Results in Internet of Things

IoT Hub
Microsoft
Connect, monitor and manage IoT devices

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

AVEVA IoT Edge HMI
Aveva
AVEVA IoT Edge HMI

nio IoT Platform
Niolabs
Simplify your Digital Transformation & IoT solutions by designing, deploying & monitoring with nio.

IoT Hub Device Provisioning Service
Microsoft
Seamless, zero-touch registration of devices to IoT Hub with security that begins at the device and ends

Crosser IoT Edge Streaming Analytics
Crosser
Visually develop flows with pre-built modules and multi-protocol connectors for Industrial IoT

IoT Central Application
Microsoft
Experience the simplicity of SaaS for IoT (Internet of Things), with no cloud expertise required.

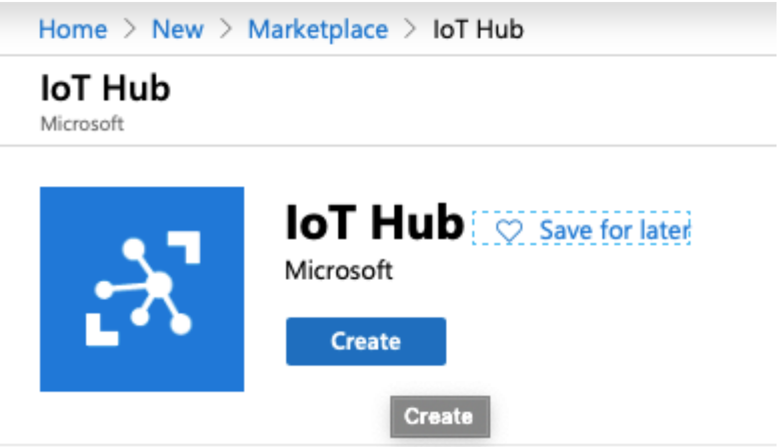
Smart IoT oneM2M network
PilotThings
Plug and Play IoT network

Azure Security Center for IoT

Trend Micro IoT Security (TMIS)

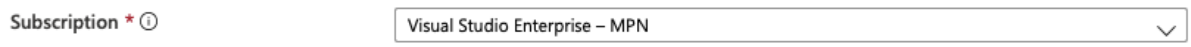
ClearBlade IoT Edge Platform

Windows 10 IoT Core Services

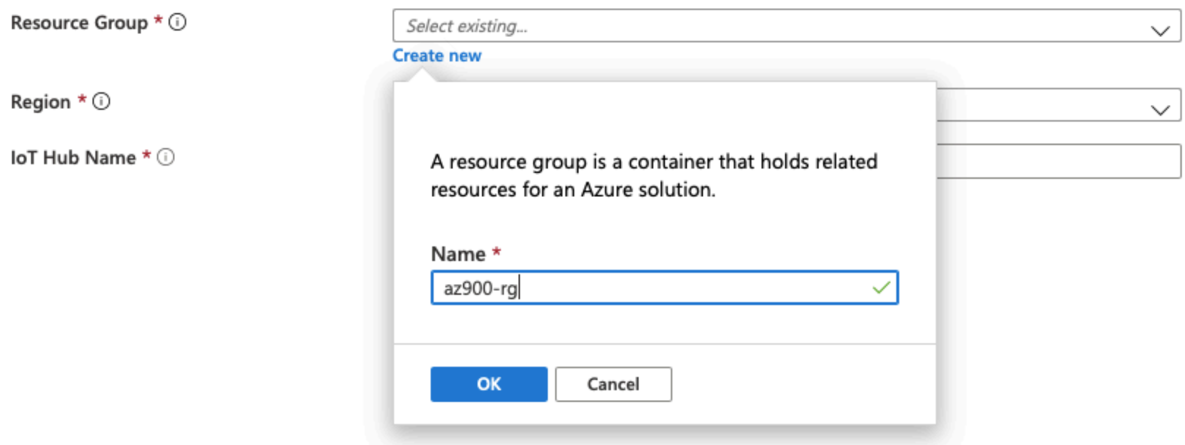


2. Fill in the fields with the following details.

•**Subscription**: Select the subscription to use for your new Azure IoT Hub.


Subscription * ⓘ Visual Studio Enterprise – MPN

•**Resource Group**: Choose **Create new** and provide a name for the resource group.(az-900-rg)


Resource Group * ⓘ *Select existing...*

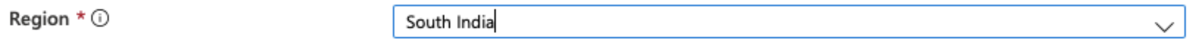
Region * ⓘ

IoT Hub Name * ⓘ

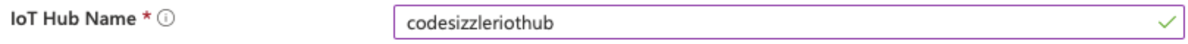
A resource group is a container that holds related resources for an Azure solution.

Name * az900-rg

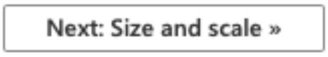
•**Region**: Select the Azure region that is closest to your location from the dropdown list.


Region * ⓘ South India

•**IoT Hub Name**: Put in a name for your Azure IoT Hub. This name must be unique to your chosen region. If the name you enter is available, a green check mark appears. (codesizzleriothub)

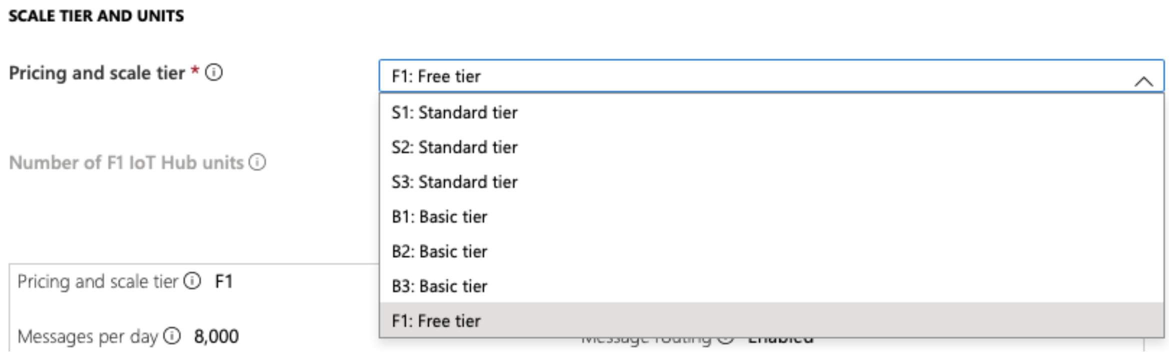

IoT Hub Name * ⓘ codesizzleriothub ✓

•Select the **Next: Size and scale** button to continue.



2. On the **Size and scale** tab, use the dropdown list to set the **Pricing and scale tier** to F1 - Free tier.

•Leave all other options set to their defaults.



SCALE TIER AND UNITS

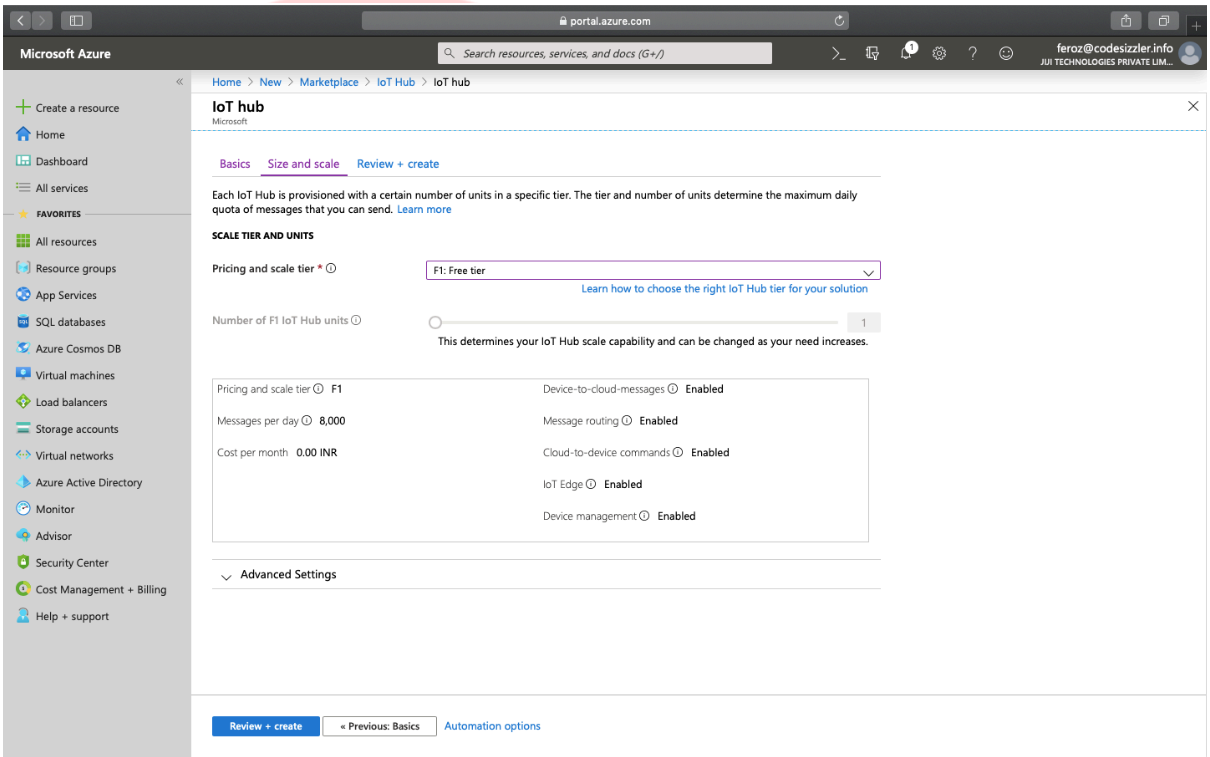
Pricing and scale tier * F1: Free tier

Number of F1 IoT Hub units

Pricing and scale tier F1

Messages per day 8,000

•Select the **Review + create** button at the bottom.



Home > New > Marketplace > IoT Hub > IoT hub

IoT hub

Microsoft

Each IoT Hub is provisioned with a certain number of units in a specific tier. The tier and number of units determine the maximum daily quota of messages that you can send. Learn more

SCALE TIER AND UNITS

Pricing and scale tier * F1: Free tier

Learn how to choose the right IoT Hub tier for your solution

Number of F1 IoT Hub units 1

This determines your IoT Hub scale capability and can be changed as your need increases.

Pricing and scale tier F1

Messages per day 8,000

Cost per month 0.00 INR

Device-to-cloud-messages Enabled

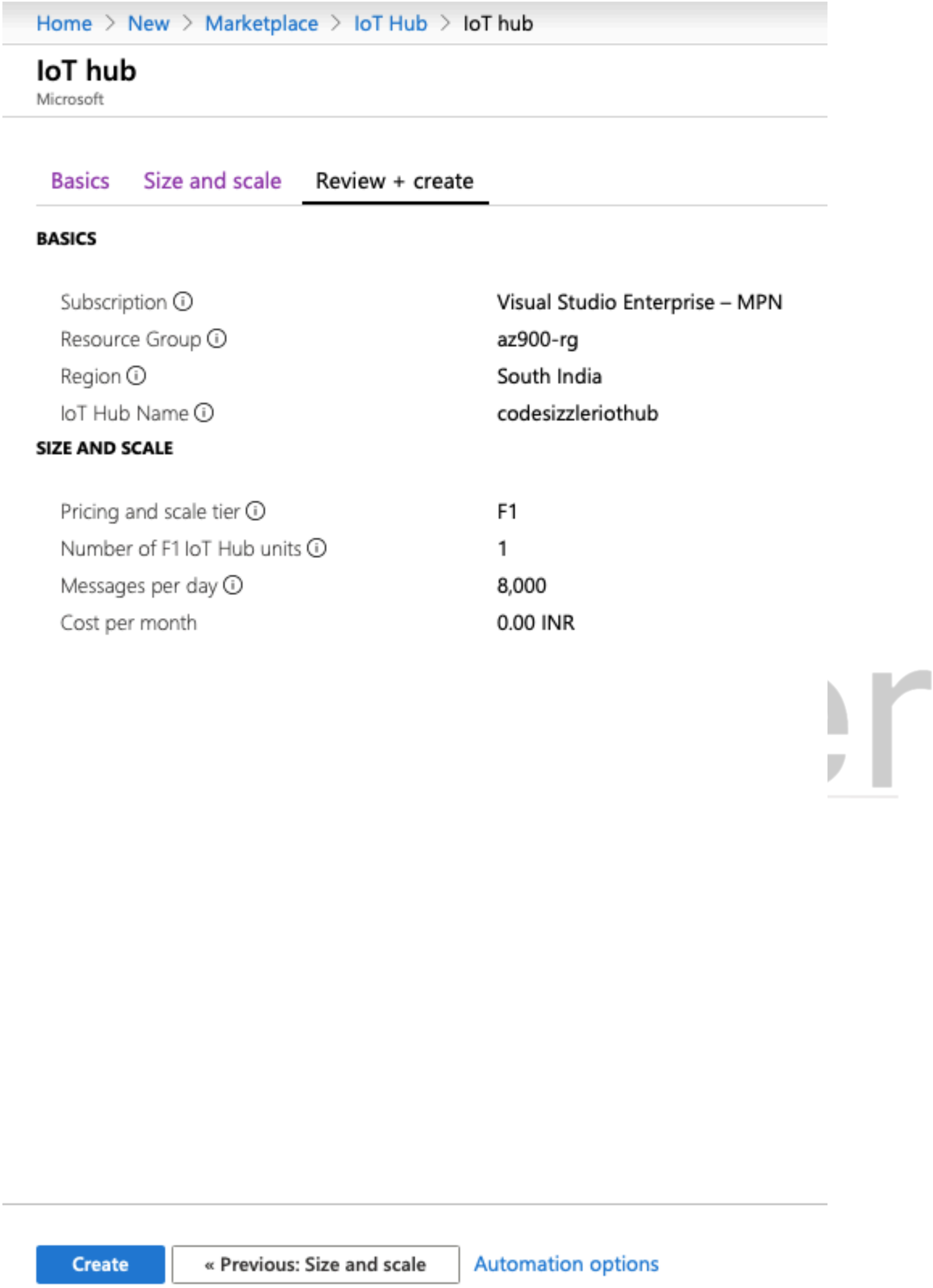
Message routing Enabled

Cloud-to-device commands Enabled

IoT Edge Enabled

Device management Enabled

4. Review your choices on the **Review + create** tab, then select the **Create** button to begin creating your new Azure IoT Hub.


Home > New > Marketplace > IoT Hub > IoT hub

IoT hub

Microsoft

Basics
Size and scale
Review + create

BASICS

Subscription ⓘ	Visual Studio Enterprise – MPN
Resource Group ⓘ	az900-rg
Region ⓘ	South India
IoT Hub Name ⓘ	codesizzleriothub

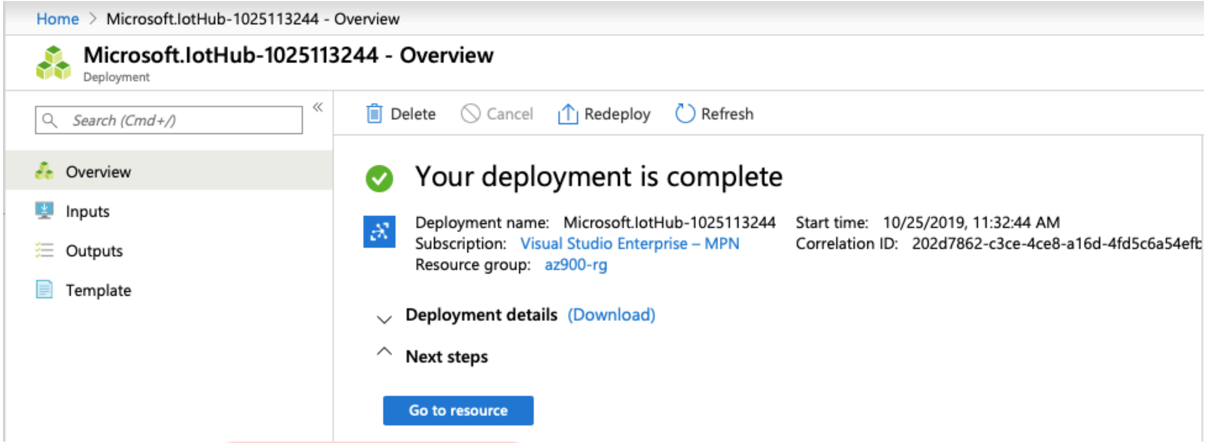
SIZE AND SCALE

Pricing and scale tier ⓘ	F1
Number of F1 IoT Hub units ⓘ	1
Messages per day ⓘ	8,000
Cost per month	0.00 INR

Create
« Previous: Size and scale
Automation options

Note: When the deployment starts, a notification appears in Azure Portal indicating the deployment is in progress. Another notification is displayed when the deployment has completed successfully.

5. When the deployment has completed, choose **Go to resource** from the notification area to open the Azure IoT Hub **Overview** blade. You can also select **All resources** from the main menu, then choose your Azure IoT Hub from the list of resources.



Home > Microsoft.IotHub-1025113244 - Overview

Microsoft.IotHub-1025113244 - Overview

Deployment

Your deployment is complete

Deployment name: Microsoft.IotHub-1025113244

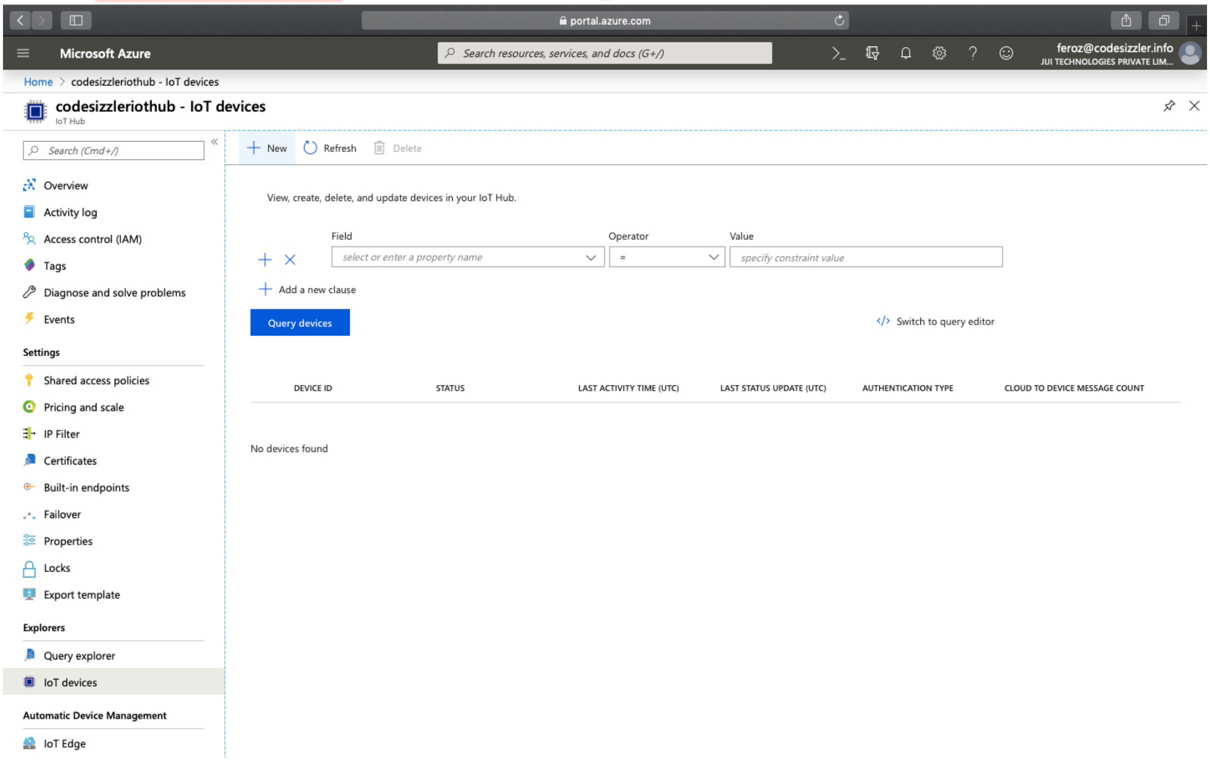
Subscription: Visual Studio Enterprise – MPN

Resource group: az900-rg

Start time: 10/25/2019, 11:32:44 AM

Correlation ID: 202d7862-c3ce-4ce8-a16d-4fd5c6a54efb

6. To add a new IoT device, select **Explorers** > **IoT Devices** from the **IoT Hub navigation** blade. Then, choose the **+ Add** button.



Home > codesizzleriothub - IoT devices

codesizzleriothub - IoT devices

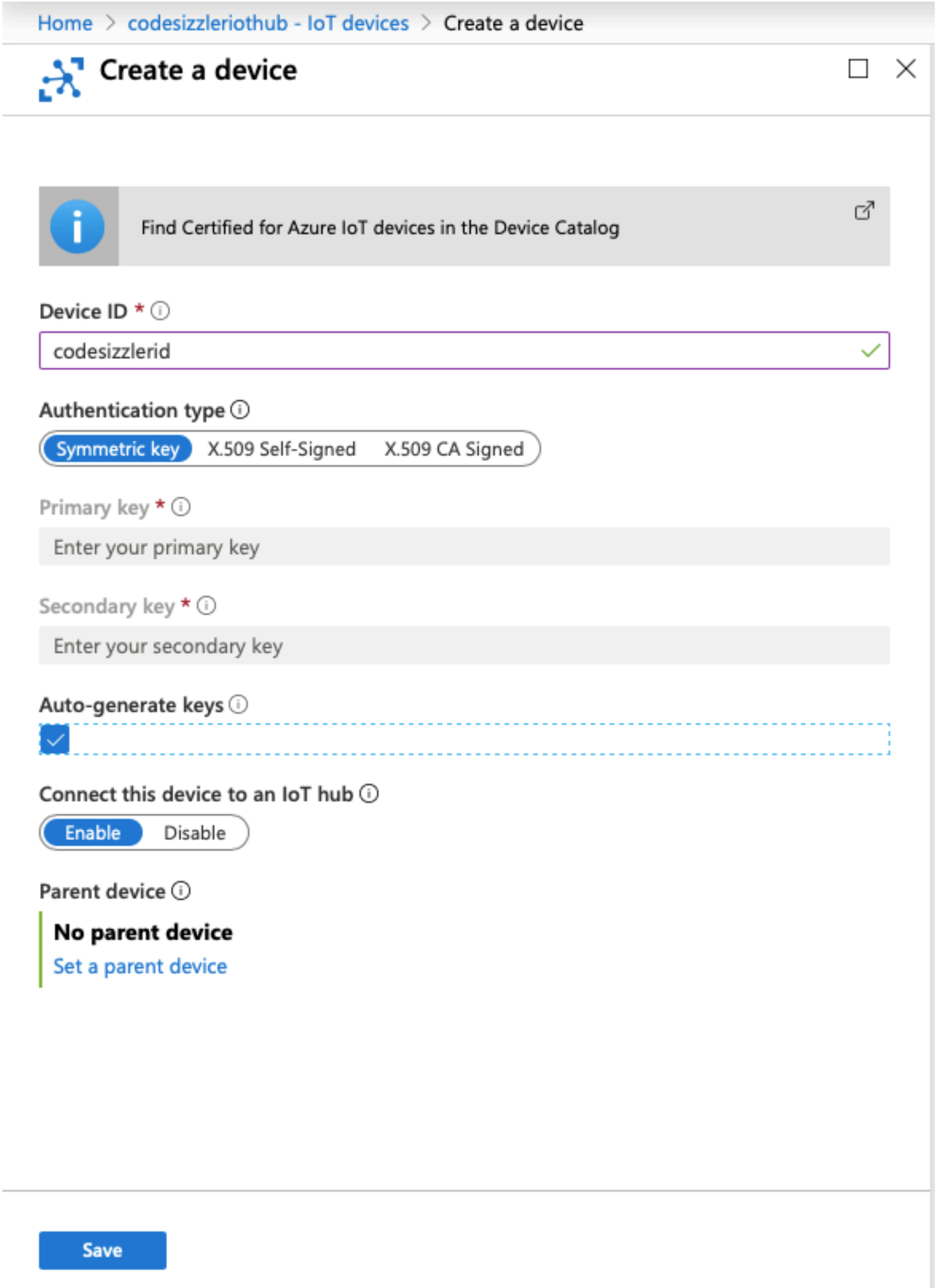
IoT Hub

View, create, delete, and update devices in your IoT Hub.

DEVICE ID	STATUS	LAST ACTIVITY TIME (UTC)	LAST STATUS UPDATE (UTC)	AUTHENTICATION TYPE	CLOUD TO DEVICE MESSAGE COUNT

No devices found

7. Provide a name for your new IoT device, for example codesizzlerid, and select the **Save** button. This will create a new IoT device identity in your Azure IoT Hub.



Home > codesizzleriothub - IoT devices > Create a device

Create a device

Find Certified for Azure IoT devices in the Device Catalog

Device ID * ⓘ

codesizzlerid ✓

Authentication type ⓘ

[✓ Symmetric key] X.509 Self-Signed X.509 CA Signed

Primary key * ⓘ

Enter your primary key

Secondary key * ⓘ

Enter your secondary key

Auto-generate keys ⓘ

☑

Connect this device to an IoT hub ⓘ

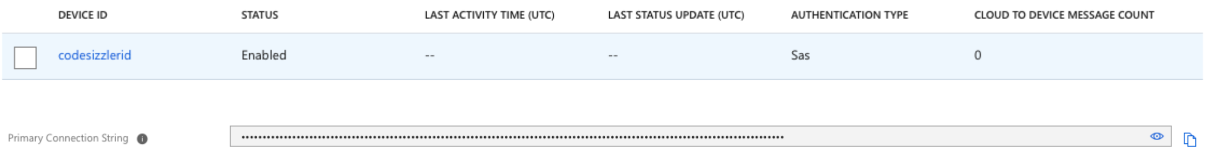
[✓ Enable] Disable

Parent device ⓘ

No parent device

Set a parent device

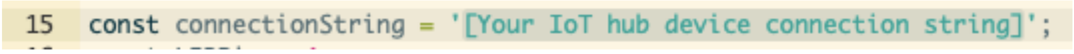
8. After the new device is created, select the new device from the list of IoT devices in the **IoT devices** pane. Copy the **Connection string—primary key** value. You will use this key in Step 10 to authenticate a connection to a Raspberry Pi device.



	DEVICE ID	STATUS	LAST ACTIVITY TIME (UTC)	LAST STATUS UPDATE (UTC)	AUTHENTICATION TYPE	CLOUD TO DEVICE MESSAGE COUNT
□	codesizzlerid	Enabled	--	--	Sas	0

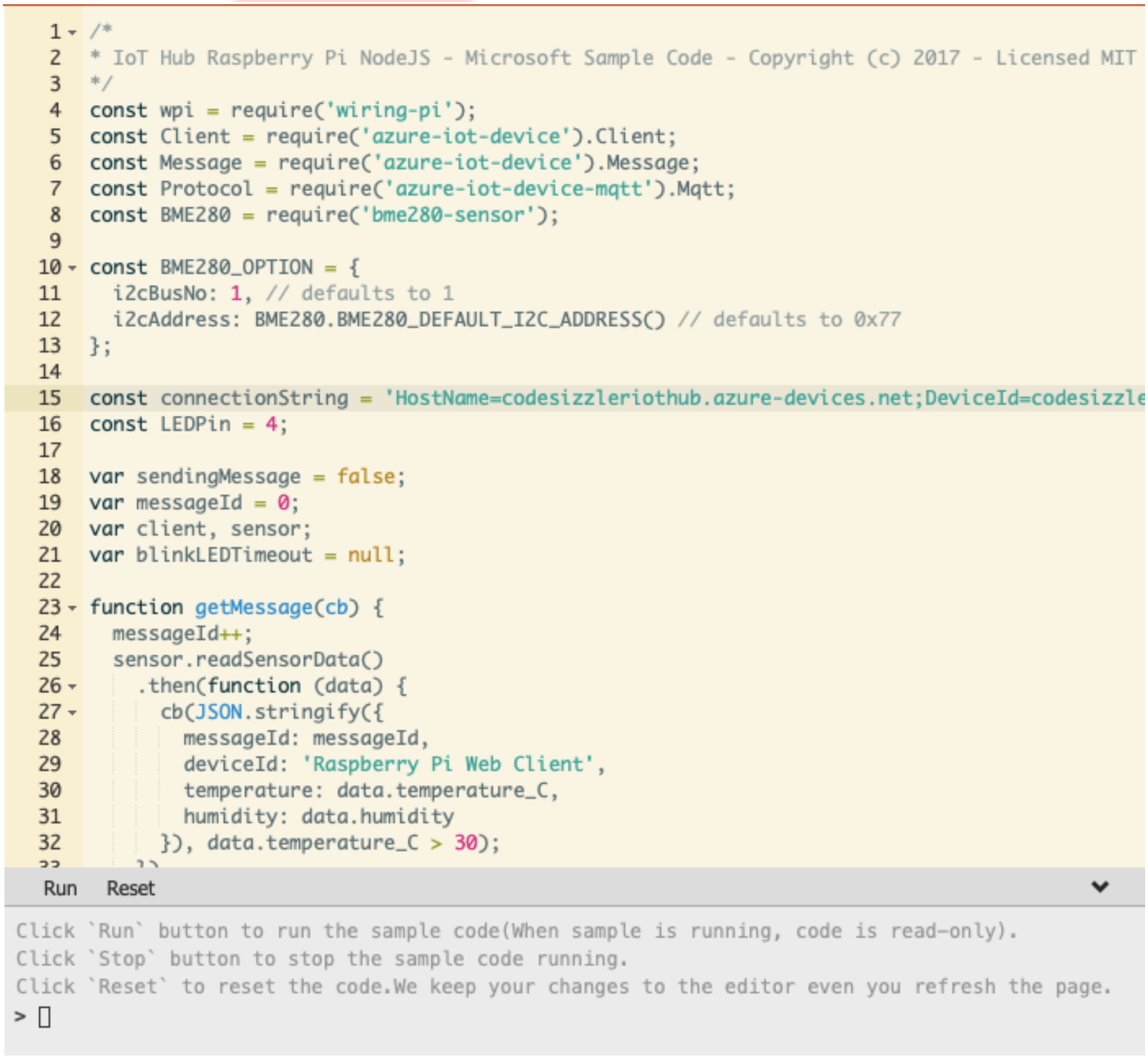
Primary Connection String ••

9. In a web browser, open the online Raspberry Pi simulator at https://azure-samples.github.io/raspberry-pi-web-simulator/#Getstarted . Select “**X**” to close the **Overview of Raspberry Pi Simulator** window or choose **Next** to step through the guide.



```
15  const connectionString = '[Your IoT hub device connection string]';
```

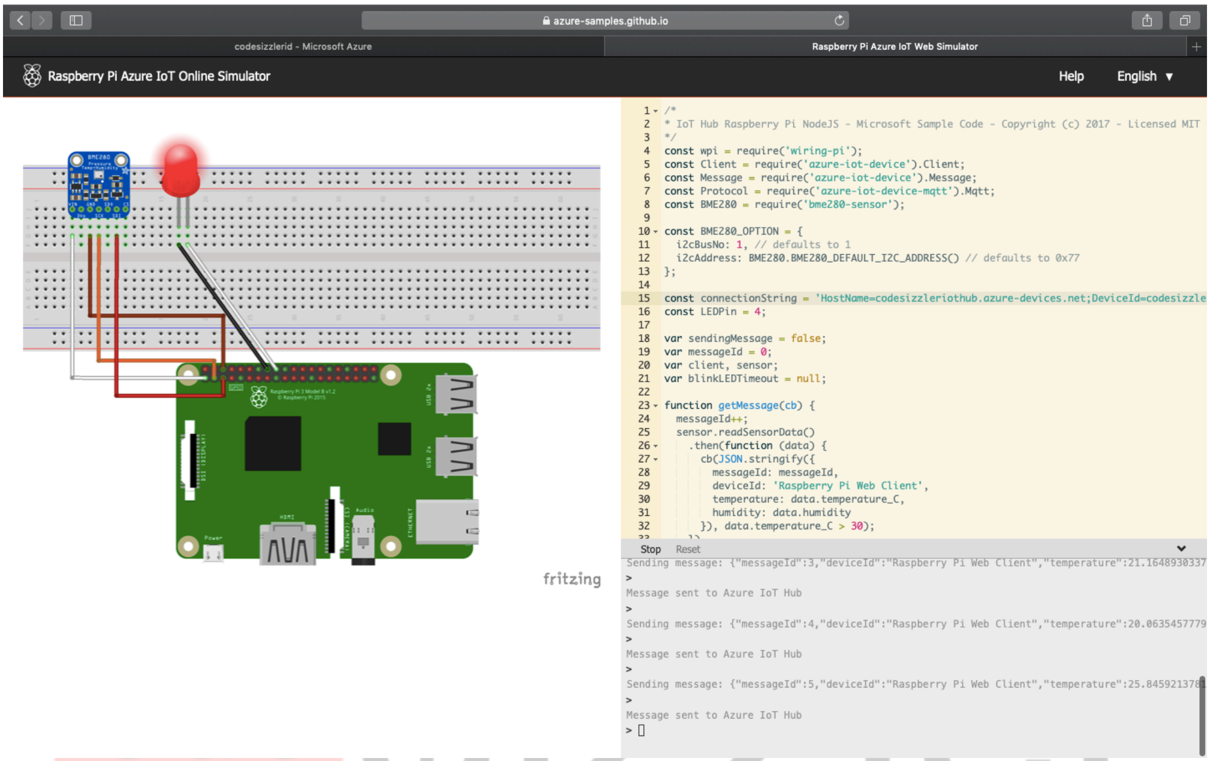
10. In the coding area, make sure that you are working on the default, Microsoft sample code. Replace the placeholder code on Line 15 with the Azure IoT Hub connection string value that you copied from Step 8. Copy over the text that is present, including the brackets.



```
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=codesizzleriothub.azure-devices.net;DeviceId=codesizzle
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    messageId++;
25    sensor.readSensorData()
26      .then(function (data) {
27        cb(JSON.stringify({
28          messageId: messageId,
29          deviceId: 'Raspberry Pi Web Client',
30          temperature: data.temperature_C,
31          humidity: data.humidity
32        }), data.temperature_C > 30);
```

```
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.
>
```

11. Select **Run** or type npm start to run the application. The console output should show the sensor data and messages that are sent from the Raspberry Pi simulator to your Azure IoT Hub. Data and messages are sent each time the Raspberry Pi simulator LED flashes. Select **Stop** to stop sending data.


azure-samples.github.io
codesizzlerid - Microsoft Azure
Raspberry Pi Azure IoT Web Simulator
Raspberry Pi Azure IoT Online Simulator
Help
English ▼
fritzing
Stop
Reset

```
/*
* IoT Hub Raspberry Pi NodeJS - Microsoft Sample Code - Copyright (c) 2017 - Licensed MIT
*/
const wpi = require('wiring-pi');
const Client = require('azure-iot-device').Client;
const Message = require('azure-iot-device').Message;
const Protocol = require('azure-iot-device-mqtt').Mqtt;
const BME280 = require('bme280-sensor');

const BME280_OPTION = {
  i2cBusNo: 1, // defaults to 1
  i2cAddress: BME280.BME280_DEFAULT_I2C_ADDRESS() // defaults to 0x77
};

const connectionString = 'HostName=codesizzleriothub.azure-devices.net;DeviceId=codesizzle
const LEDPin = 4;

var sendingMessage = false;
var messageId = 0;
var client, sensor;
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function getMessage(cb) {
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  sensor.readSensorData()
    .then(function (data) {
      cb(JSON.stringify({
        messageId: messageId,
        deviceId: 'Raspberry Pi Web Client',
        temperature: data.temperature_C,
        humidity: data.humidity
      }), data.temperature_C > 30);
```
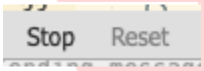
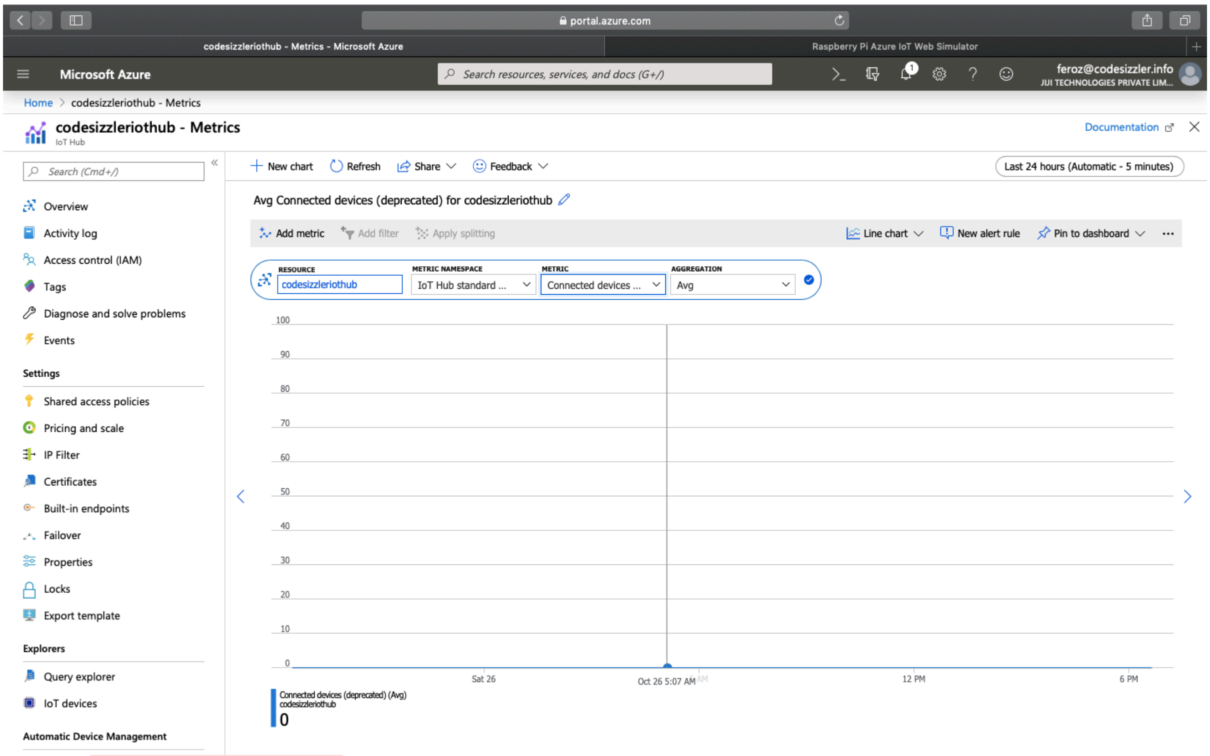

```
Sending message: {"messageId":3,"deviceId":"Raspberry Pi Web Client","temperature":21.1648930337
>
Message sent to Azure IoT Hub
>
Sending message: {"messageId":4,"deviceId":"Raspberry Pi Web Client","temperature":20.0635457779
>
Message sent to Azure IoT Hub
>
Sending message: {"messageId":5,"deviceId":"Raspberry Pi Web Client","temperature":25.845921378
>
Message sent to Azure IoT Hub
> ▯
```



12. To view metrics for the messaging activity in Azure Portal, select **All resources** from the main menu. Choose your Azure IoT Hub from the list of resources. Scroll down to the **IoT Hub Usage** pane of the **IoT Hub Overview** blade. To access these metrics from the **IoT Hub navigation** blade, select **Metrics** from the **Monitoring** section.



Avg Connected devices (deprecated) for codesizzleriothub

RESOURCE	METRIC NAMESPACE	METRIC	AGGREGATION
codesizzleriothub	IoT Hub standard ...	Connected devices ...	Avg

Connected devices (deprecated) (Avg)
codesizzleriothub
0