



Estácio

Universidade Estácio de Sá

- DESENVOLVIMENTO FULL STACK-
 - Disciplina: RPG0027 - Vamos interligar as coisas com a nuvem
 - Semestre Letivo: 2024.1
 - Repositorio Git: <https://github.com/Gregdev22/Missao-5-Mundo-4>
-

- [EMERSON GREGORIO ALVES](#) - MATRICULA: 2022.0908.4986
-

Missão Prática | Nível 5 | Mundo 4

Vamos interligar as coisas com a nuvem

Microatividade 1: Como Criar um Hub IoT do Azure

Microatividade 2: Como registrar um novo dispositivo no Hub IoT

Microatividade 3: Conectar o simulador online Raspberry Pi ao Hub IoT do Azure

Microatividade 4: Adicionando extensão Hub IoT do Azure para Visual Studio Code

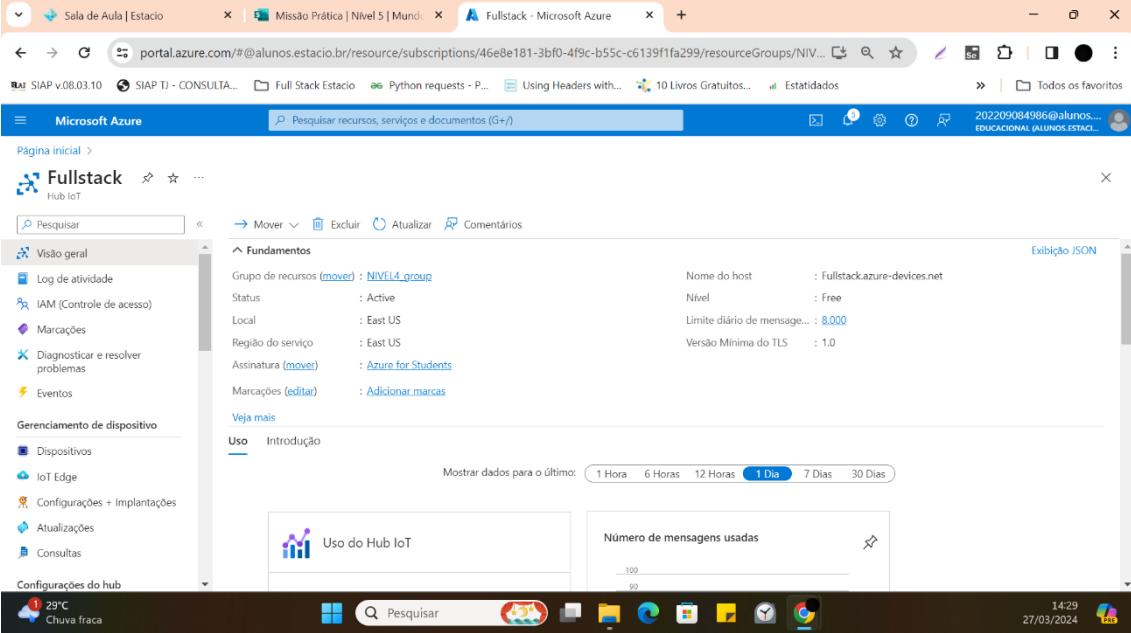
Microatividade 5: Gerenciando e interagindo com o Hub IoT

Objetivos da Prática

- Como criar um Hub IoT do Azure;
- Como registrar um novo dispositivo no Hub IoT;
- Adicionando extensão Hub IoT do Azure para Visual Studio Code;
- Gerenciando e interagindo com o Hub IoT .

Resultados:

► Microatividade 1:



The screenshot shows the Microsoft Azure portal interface for managing an IoT Hub. The main page displays the 'Fundamentos' (Basics) section for the hub 'Fullstack'. Key details include:

- Nome do host: Fullstack.azure-devices.net
- Nível: Free
- Límite diário de mensagens: 8,000
- Versão Mínima do TLS: 1.0

The portal also shows usage statistics for the hub, such as 'Uso do Hub IoT' (IoT Hub usage) and 'Número de mensagens usadas' (Number of messages used).

► Microatividade 2:

Screenshot of the Microsoft Azure IoT Hub Device Explorer. The page shows a table with one row of data:

ID do Dispositivo	Tipo	Status	Última atualização do status	Tipo de autenticação	Mensage...	Marcas
Fullstack_dispositivo	Dispositivo IoT	Habilitado	--	Assinatura de Acesso Compartilh...	0	

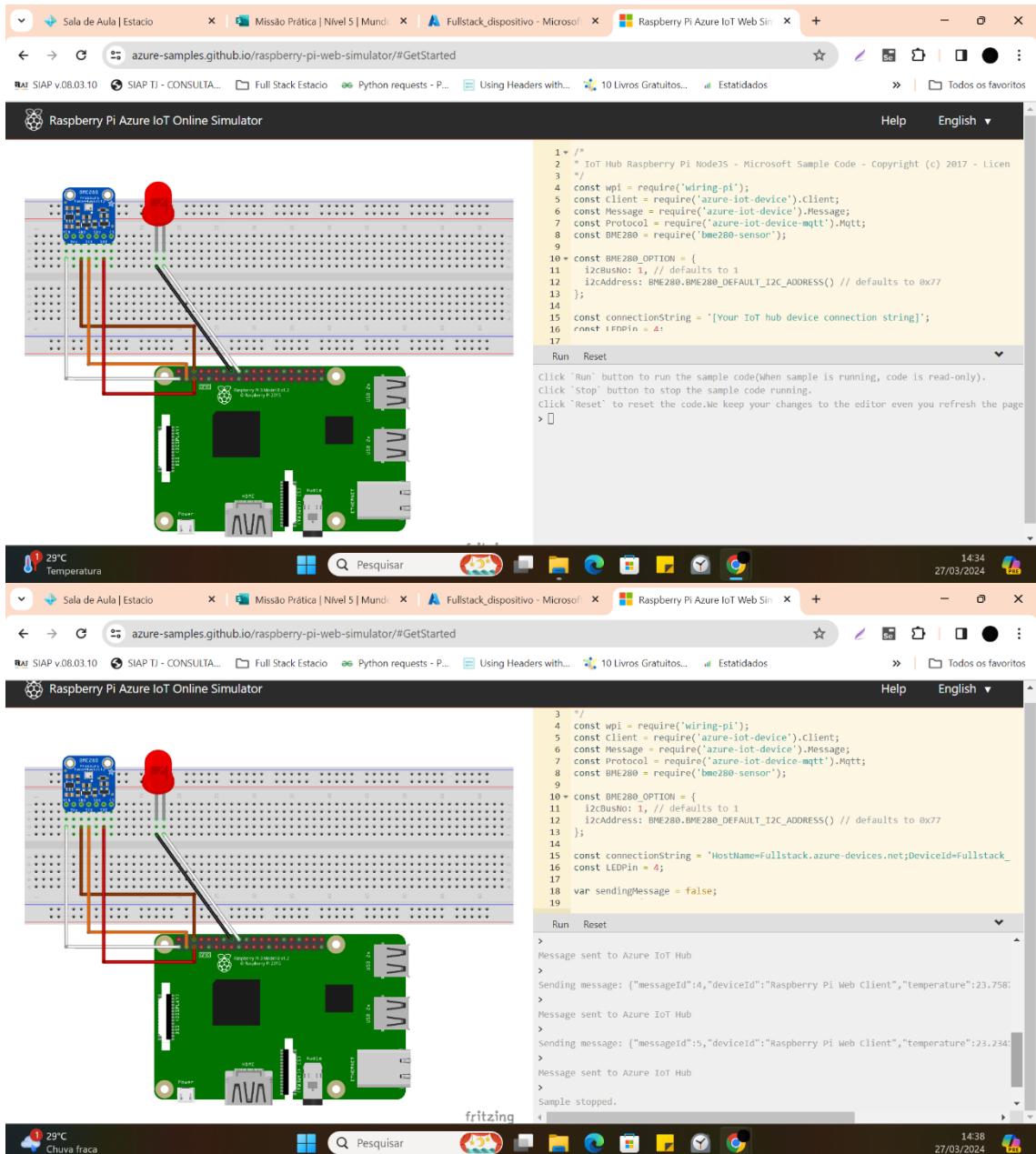
A success message is displayed in the top right corner: "Criar um dispositivo" and "Dispositivo Fullstack_dispositivo criado com êxito."

Screenshot of the Microsoft Azure IoT Hub Device blade for the device "Fullstack_dispositivo". The page displays the following configuration details:

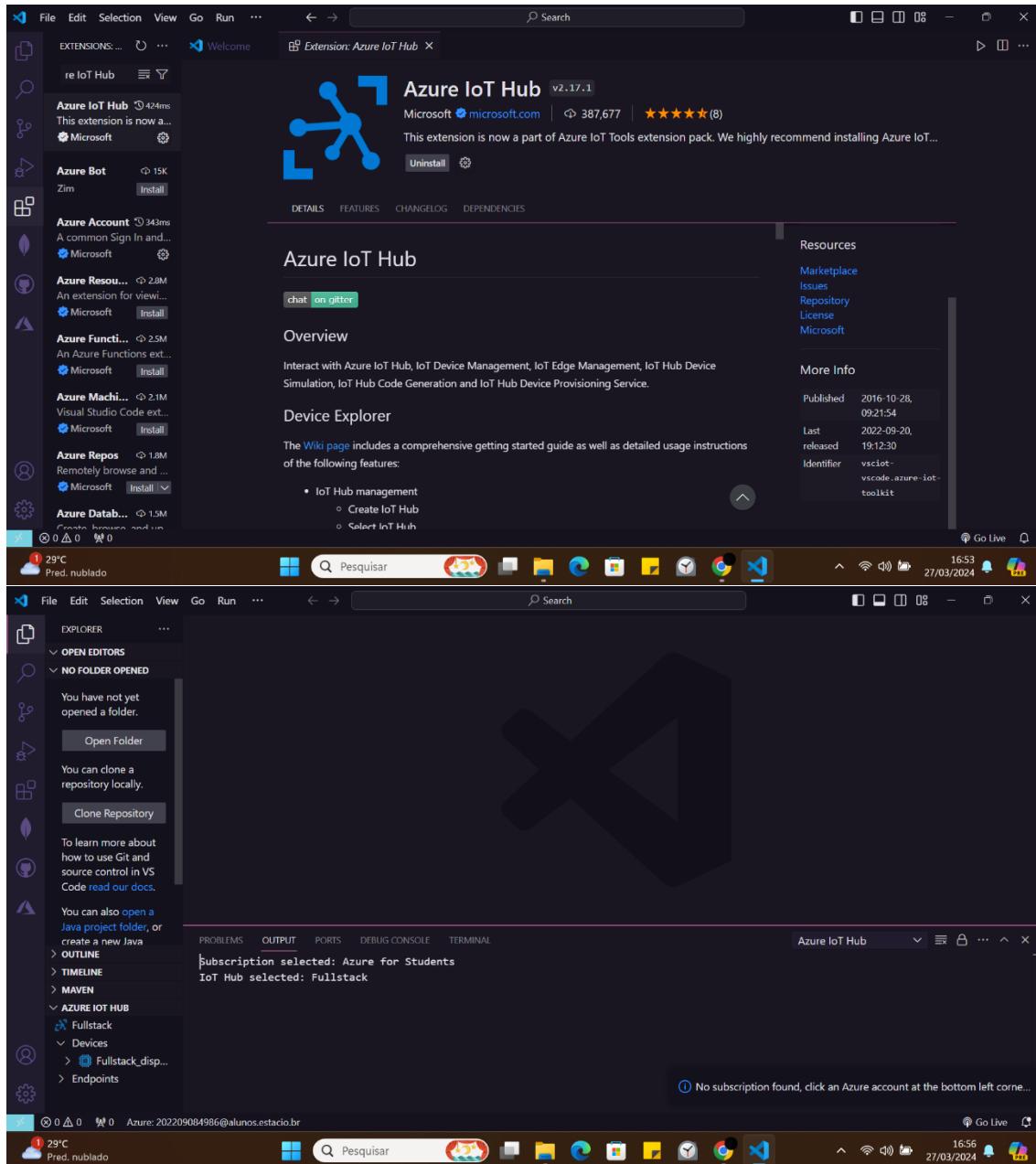
- ID do dispositivo: Fullstack_dispositivo
- Chave primária: (redacted)
- Chave secundária: (redacted)
- Cadeia de conexão primária: (redacted)
- Cadeia de conexão secundária: (redacted)
- Marcas: Sem marcas
- Habilitar a conexão com o Hub IoT: Habilitar (radio button selected)
- Dispositivo pai: Nenhum dispositivo pai

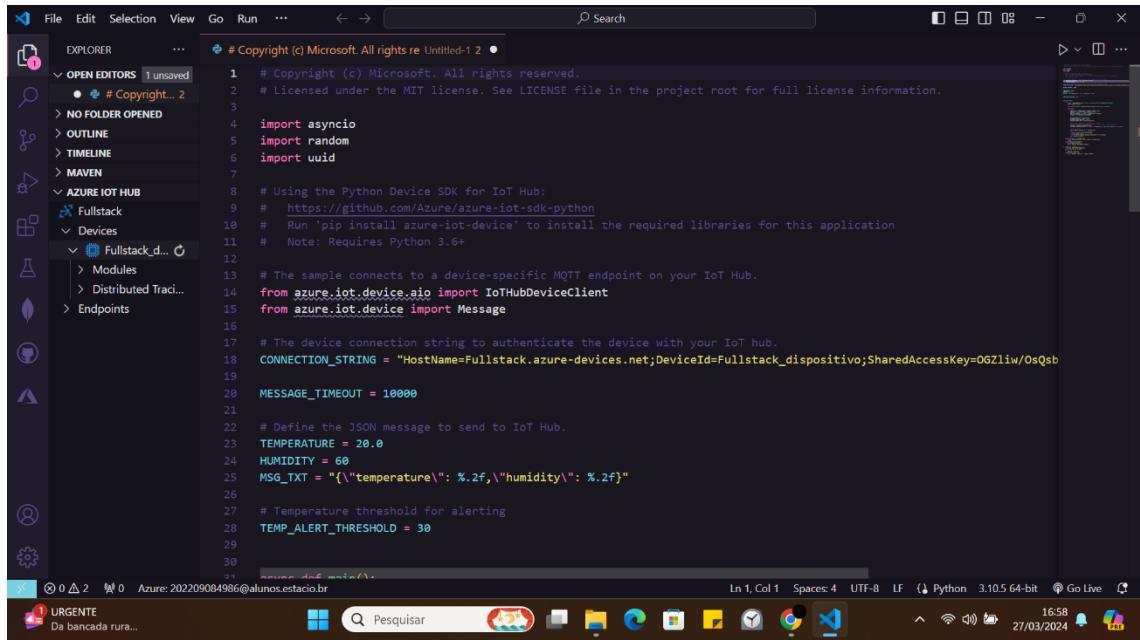
The "Identidades do Módulo" tab is selected. Below the table, there is a table with columns: ID do Módulo, Estado da Conexão, Última Atualização do Estado d..., and Hora da Última Atividade (UTC).

► Microatividade 3:



► Microatividade 4:





```
# Copyright (c) Microsoft. All rights reserved.
# Licensed under the MIT license. See LICENSE file in the project root for full license information.

import asyncio
import random
import uuid

# Using the Python Device SDK for IoT Hub:
# https://github.com/Azure/azure-iot-sdk-python
# Run 'pip install azure-iot-device' to install the required libraries for this application
# Note: Requires Python 3.6+
# The sample connects to a device-specific MQTT endpoint on your IoT hub.
from azure.iot.device.aio import IoTHubDeviceClient
from azure.iot.device import Message

# The device connection string to authenticate the device with your IoT hub.
CONNECTION_STRING = "HostName=Fullstack.azure-devices.net;DeviceId=Fullstack_dispositivo;SharedAccessKey=OGZliw/OsQsb

MESSAGE_TIMEOUT = 10000

# Define the JSON message to send to IoT Hub.
TEMPERATURE = 20.0
HUMIDITY = 50
MSG_TXT = "{\"temperature\": %2f, \"humidity\": %2f}"

# Temperature threshold for alerting
TEMP_ALERT_THRESHOLD = 30
```

► Misão Prática

Screenshot of a Windows desktop environment showing multiple windows related to Azure IoT Hub development.

VS Code (Top Window):

- File Explorer:** Shows the project structure for "web-apps-node-iot-hub-data-visualization-master".
- Open Editors:** Displays "Welcome" and "vscode".
- Start:** Includes links for "New File...", "Open File...", "Open Folder...", "Clone Git Repository...", and "Connect to...".
- Recent:** Lists recent files like "explore_mundo2", "node_selenium", "my_app", "explore_mundo", and "Mundo 4".
- Walkthroughs:** Offers introductory guides for VS Code, Python Development, Jupyter Notebooks, and Java Development.
- System Tray:** Shows icons for battery, signal, and date/time (17:35, 27/03/2024).

Microsoft Edge Browser:

- Address bar: portal.azure.com/#@alunos.estacio.br/resource/subscriptions/46e8e181-3bf0-4f9c-b55c-c6139f1fa299/resourceGroups/NIVEL4_group/providers/Microsoft.Devices/IotHubs/FullStack/eventHubEndpoints/events/ConsumerGroups/Consumidor-FullStack
- Tab: Missão Prática | Nível 5 | Mundo
- Icons: SIAP v0.03.10, SIAP TJ - CONSULTA..., Full Stack Estacio, Python requests - P..., Using Headers with..., 10 Livros Gratuitos..., Estatídios.
- Bottom bar: Todos os favoritos, Microsoft Azure icon.

Microsoft Azure Cloud Shell (Top Terminal):

```

PowerShell
Requesting a Cloud Shell.Succeeded.
Connecting terminal...

MOTD: SqlServer has been updated to Version 22!
VERBOSE: Authenticating to Azure ...
VERBOSE: Building your Azure drive ...
PS /home/emerson> az iot hub consumer-group create --hub-name FullStack --name Consumidor-FullStack
{
  "etag": null,
  "id": "/subscriptions/46e8e181-3bf0-4f9c-b55c-c6139f1fa299/resourceGroups/NIVEL4_group/providers/Microsoft.Devices/IotHubs/FullStack/eventHubEndpoints/events/ConsumerGroups/Consumidor-FullStack",
  "name": "Consumidor-FullStack",
  "properties": {
    "created": "Wed, 27 Mar 2024 20:42:18 GMT",
    "properties": {
      "name": "Consumidor-FullStack"
    }
  },
  "resourceGroup": "NIVEL4_group",
  "type": "Microsoft.Devices/IotHubs/EventHubEndpoints/ConsumerGroups"
}
PS /home/emerson>

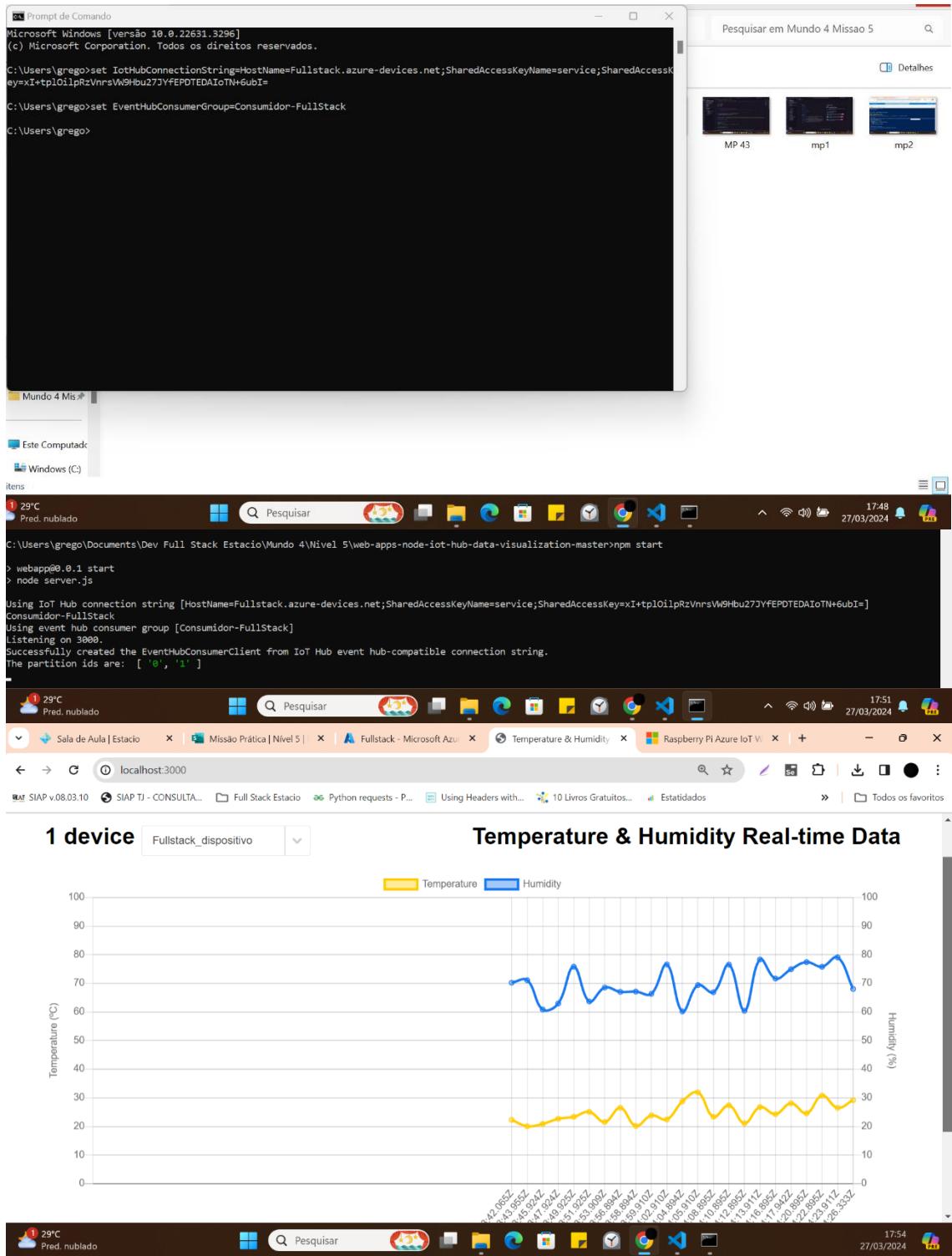
```

Microsoft Azure Cloud Shell (Bottom Terminal):

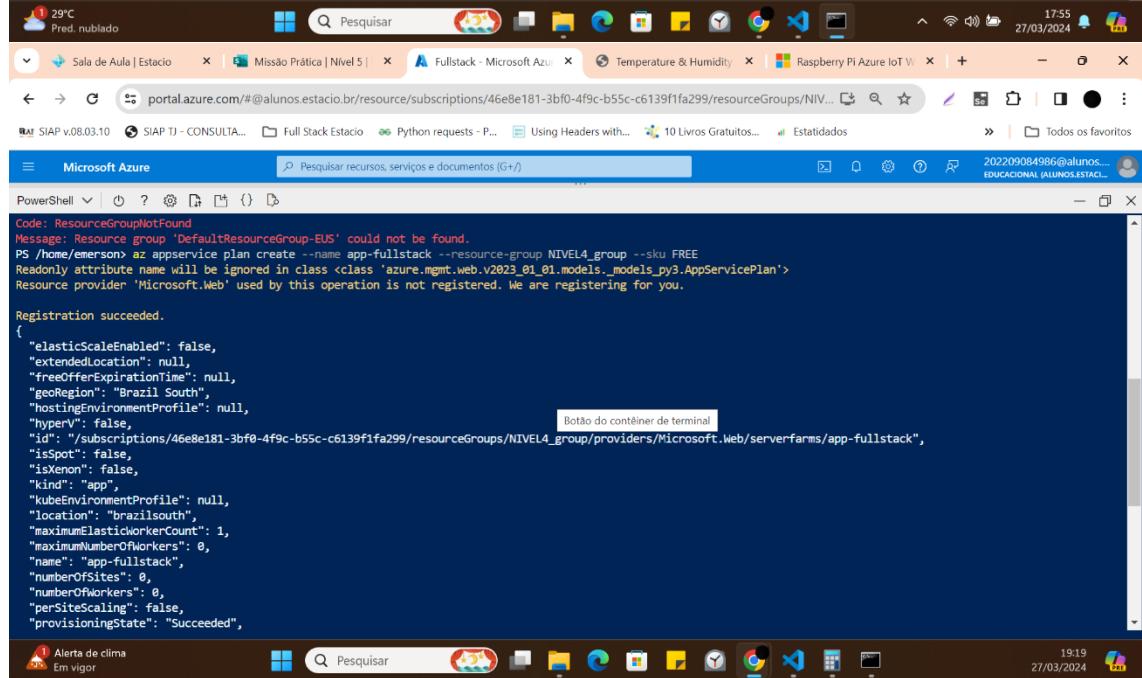
```

PowerShell
VERBOSE: Authenticating to Azure ...
VERBOSE: Building your Azure drive ...
PS /home/emerson> az iot hub consumer-group create --hub-name FullStack --name Consumidor-FullStack
{
  "etag": null,
  "id": "/subscriptions/46e8e181-3bf0-4f9c-b55c-c6139f1fa299/resourceGroups/NIVEL4_group/providers/Microsoft.Devices/IotHubs/FullStack/eventHubEndpoints/events/ConsumerGroups/Consumidor-FullStack",
  "name": "Consumidor-FullStack",
  "properties": {
    "created": "Wed, 27 Mar 2024 20:42:18 GMT",
    "properties": {
      "name": "Consumidor-FullStack"
    }
  },
  "resourceGroup": "NIVEL4_group",
  "type": "Microsoft.Devices/IotHubs/EventHubEndpoints/ConsumerGroups"
}
PS /home/emerson> az iot hub show-connection-string --hub-name FullStack --policy-name service
This command has been deprecated and will be removed in a future release. Use 'IoT Extension (azure-iot) connection-string command (az iot hub connection-string show)' instead.
[Warning] This output may compromise security by showing the following secrets: connectionString. Learn more at: https://go.microsoft.com/fwlink/?LinkId=2258669
{
  "connectionString": "HostName=Fullstack.azure-devices.net;SharedAccessKeyName=service;SharedAccessKey=xI+tpG1pRz/nrsW9hb27JYfEPDTEDAToTN+6ubI="
}
PS /home/emerson>

```



```
npm start
Consumidor-FullStack
Using event hub consumer group [Consumidor-FullStack]
listening on 3000.
Successfully created the EventHubConsumerClient from IoT Hub event hub-compatible connection string.
The partition ids are: [ '0', '1' ]
Broadcasting data {'IoTData':{"messageId":1,"deviceId":"Raspberry Pi Web Client","temperature":22.283947336144447,"humidity":70.20815113053204}, "MessageDate": "2024-03-27T20:53:42.065Z", "DeviceId": "Fullstack_dispositivo0" }
Broadcasting data {'IoTData': {"messageId": 2, "deviceId": "Raspberry Pi Web Client", "temperature": 20.03872202929, "humidity": 71.08079588450252}, "MessageDate": "2024-03-27T20:53:49.955Z", "DeviceId": "Fullstack_dispositivo1" }
Broadcasting data {'IoTData': {"messageId": 3, "deviceId": "Raspberry Pi Web Client", "temperature": 20.870070828268744, "humidity": 60.842878973833365}, "MessageDate": "2024-03-27T20:53:45.924Z", "DeviceId": "Fullstack_dispositivo2" }
Broadcasting data {'IoTData': {"messageId": 4, "deviceId": "Raspberry Pi Web Client", "temperature": 22.6467652423601977, "humidity": 62.95397555806769}, "MessageDate": "2024-03-27T20:53:47.924Z", "DeviceId": "Fullstack_dispositivo3" }
Broadcasting data {'IoTData': {"messageId": 5, "deviceId": "Raspberry Pi Web Client", "temperature": 23.345897297626898, "humidity": 75.81099587628457}, "MessageDate": "2024-03-27T20:53:49.925Z", "DeviceId": "Fullstack_dispositivo4" }
Broadcasting data {'IoTData': {"messageId": 6, "deviceId": "Raspberry Pi Web Client", "temperature": 25.076937268202187, "humidity": 63.661876967750366}, "MessageDate": "2024-03-27T20:53:51.925Z", "DeviceId": "Fullstack_dispositivo5" }
Broadcasting data {'IoTData': {"messageId": 7, "deviceId": "Raspberry Pi Web Client", "temperature": 21.533940072947274, "humidity": 68.53016994264529}, "MessageDate": "2024-03-27T20:53:53.909Z", "DeviceId": "Fullstack_dispositivo6" }
Broadcasting data {'IoTData': {"messageId": 8, "deviceId": "Raspberry Pi Web Client", "temperature": 26.493667218075106, "humidity": 67.02035020529825}, "MessageDate": "2024-03-27T20:53:56.894Z", "DeviceId": "Fullstack_dispositivo7" }
Broadcasting data {'IoTData': {"messageId": 9, "deviceId": "Raspberry Pi Web Client", "temperature": 20.147042083276645, "humidity": 67.10796603363117}, "MessageDate": "2024-03-27T20:53:58.894Z", "DeviceId": "Fullstack_dispositivo8" }
Broadcasting data {'IoTData': {"messageId": 10, "deviceId": "Raspberry Pi Web Client", "temperature": 23.841946770382513, "humidity": 66.32496231654052}, "MessageDate": "2024-03-27T20:53:59.910Z", "DeviceId": "Fullstack_dispositivo9" }
Broadcasting data {'IoTData': {"messageId": 11, "deviceId": "Raspberry Pi Web Client", "temperature": 22.450284971490355, "humidity": 76.60167891246275}, "MessageDate": "2024-03-27T20:54:02.910Z", "DeviceId": "Fullstack_dispositivo10" }
Broadcasting data {'IoTData': {"messageId": 12, "deviceId": "Raspberry Pi Web Client", "temperature": 28.73361923100792, "humidity": 60.19389046772803}, "MessageDate": "2024-03-27T20:54:04.894Z", "DeviceId": "Fullstack_dispositivo11" }
Broadcasting data {'IoTData': {"messageId": 13, "deviceId": "Raspberry Pi Web Client", "temperature": 31.87549129890644, "humidity": 69.384935855052}, "MessageDate": "2024-03-27T20:54:05.910Z", "DeviceId": "Fullstack_dispositivo12" }
Broadcasting data {'IoTData': {"messageId": 14, "deviceId": "Raspberry Pi Web Client", "temperature": 23.34193590637717, "humidity": 66.86774889236472}, "MessageDate": "2024-03-27T20:54:08.895Z", "DeviceId": "Fullstack_dispositivo13" }
Broadcasting data {'IoTData': {"messageId": 15, "deviceId": "Raspberry Pi Web Client", "temperature": 27.3688644845235, "humidity": 76.5421840258123}, "MessageDate": "2024-03-27T20:54:10.895Z", "DeviceId": "Fullstack_dispositivo14" }
Broadcasting data {'IoTData': {"messageId": 16, "deviceId": "Raspberry Pi Web Client", "temperature": 21.088871789251467, "humidity": 60.402589684943855}, "MessageDate": "2024-03-27T20:54:12.895Z", "DeviceId": "Fullstack_dispositivo15" }
Broadcasting data {'IoTData': {"messageId": 17, "deviceId": "Raspberry Pi Web Client", "temperature": 26.7373802027374945, "humidity": 78.33697459518476}, "MessageDate": "2024-03-27T20:54:13.911Z", "DeviceId": "Fullstack_dispositivo16" }
Broadcasting data {'IoTData': {"messageId": 18, "deviceId": "Raspberry Pi Web Client", "temperature": 24.27196200370467, "humidity": 71.67353537986494}, "MessageDate": "2024-03-27T20:54:15.927Z", "DeviceId": "Fullstack_dispositivo17" }
```



A screenshot of a Windows desktop environment. At the top, there's a taskbar with several pinned icons including a weather app showing '29°C Pred. nublado', a search bar, and system status indicators like battery level and signal strength. Below the taskbar, there are four browser tabs open: 'Sala de Aula | Estacio', 'Missão Prática | Nível 5 |', 'Fullstack - Microsoft Azure |', and 'Temperature & Humidity |'. In the center, a PowerShell window is running a command to create an app service plan in Azure:

```
Code: ResourceGroupNotFound
Message: Resource group 'DefaultResourceGroup-EUS' could not be found.
PS /home/emerson> az appservice plan create --name app-fullstack --resource-group NIVEL4_group --sku FREE
Readonly attribute name will be ignored in class <class 'azure.mgmt.web.v2023_01_01.models._models_py3.AppServicePlan'>
Resource provider 'Microsoft.Web' used by this operation is not registered. We are registering for you.

Registration succeeded.
{
  "elasticScaleEnabled": false,
  "extendedLocation": null,
  "freeOfferExpirationTime": null,
  "geoRegion": "Brazil South",
  "hostingEnvironmentProfile": null,
  "hyperV": false,
  "id": "/subscriptions/46e8e181-3bf0-4f9c-b55c-c6139f1fa299/resourceGroups/NIVEL4_group/providers/Microsoft.Web/serverfarms/app-fullstack",
  "isSpot": false,
  "isXenon": false,
  "kind": "app",
  "kubeEnvironmentProfile": null,
  "location": "brazilsouth",
  "maximumElasticWorkerCount": 1,
  "maximumNumberOfWorkers": 0,
  "name": "app-fullstack",
  "numberOfSites": 0,
  "numberOfWorkers": 0,
  "perSiteScaling": false,
  "provisioningState": "Succeeded",
```

The PowerShell window has a small button labeled 'Botão do container de terminal' at the bottom right. The bottom of the screen shows another taskbar with various application icons.

```
PS /home/emerson> az webapp create -n app-IoT2 -g NIVEL4_group -p app-fullstack --runtime "NODE:16 LTS" --deployment-source-url https://github.com/Azure-Samples/web-apps-node-iot-hub-data-visualization  
Linking to git repository 'https://github.com/Azure-Samples/web-apps-node-iot-hub-data-visualization'  
location is not a known attribute of class <class 'azure.mgmt.web.v2023_01_01.models._models_py3.SiteSourceControl'> and will be ignored  
{  
    "availabilityState": "Normal",  
    "clientAffinityEnabled": true,  
    "clientCertEnabled": false,  
    "clientCertExclusionPaths": null,  
    "clientCertMode": "Required",  
    "cloningInfo": null,  
    "containerSize": 0,  
    "customDomainInQuotaId": "837ED9F6528F2FC8AA035749608B5445693AE80646F1FEF49638CABC89A16073",  
    "dailyMemoryTimeQuota": 0,  
    "daprConfig": null,  
    "defaultHostName": "app-iot2.azurewebsites.net",  
    "enabled": true,  
    "enabledHostNames": [  
        "app-iot2.azurewebsites.net",  
        "app-iot2.scm.azurewebsites.net"  
    ],  
    "extendedLocation": null,  
    "ftpPublishingUrl": "https://waws-prod-cq1-031.ftp.azurewebsites.windows.net/site/wwwroot",  
    "hostNameSslStates": [  
        {  
            "certificateResourceId": null,  
            "hostType": "Standard",  
            "ipBasedSslResult": null,  
            "ipBasedSslState": "NotConfigured",  
            "name": "app-iot2.azurewebsites.net",  
            "sslState": "Disabled",  
            "thumbprint": null,  
            "toUpdate": null,  
            "toUpdateIpBasedSsl": null,  
            "virtualIPv6": null,  
            "virtualIP": null  
        },  
        {  
            "certificateResourceId": null,  
            "hostType": "Repository",  
            "ipBasedSslResult": null,  
            "ipBasedSslState": "NotConfigured",  
            "name": "app-iot2.scm.azurewebsites.net",  
            "sslState": "Disabled",  
            "thumbprint": null,  
            "toUpdate": null,  
            "toUpdateIpBasedSsl": null,  
            "virtualIPv6": null,  
            "virtualIP": null  
        }  
    ]  
}  
Botão do contêiner de terminal
```

```
"ftpPublishingUrl": "https://waws-prod-cq1-031.ftp.azurewebsites.windows.net/site/wwwroot",  
"hostNameSslStates": [  
    {  
        "certificateResourceId": null,  
        "hostType": "Standard",  
        "ipBasedSslResult": null,  
        "ipBasedSslState": "NotConfigured",  
        "name": "app-iot2.azurewebsites.net",  
        "sslState": "Disabled",  
        "thumbprint": null,  
        "toUpdate": null,  
        "toUpdateIpBasedSsl": null,  
        "virtualIPv6": null,  
        "virtualIP": null  
    },  
    {  
        "certificateResourceId": null,  
        "hostType": "Repository",  
        "ipBasedSslResult": null,  
        "ipBasedSslState": "NotConfigured",  
        "name": "app-iot2.scm.azurewebsites.net",  
        "sslState": "Disabled",  
        "thumbprint": null,  
        "toUpdate": null,  
        "toUpdateIpBasedSsl": null,  
        "virtualIPv6": null,  
        "virtualIP": null  
    }  
]  
Botão do contêiner de terminal
```

Sala de Aula | Estacio | Missão Prática | Nível 5 | Fullstack - Microsoft Azure | Temperature & Humidity | Raspberry Pi Azure IoT W | +

SIAP v0.08.03.10 SIAP TJ - CONSULTA... Full Stack Estacio Python requests - P... Using Headers with... 10 Livros Gratuitos... Estaduais » Todos os favoritos

Microsoft Azure Pesquisar recursos, serviços e documentos (G+)

PowerShell

```

"hostNames": [
    "app-iot2.azurewebsites.net"
],
"hostNamesDisabled": false,
"hostingEnvironmentProfile": null,
"httpsOnly": false,
"hyperV": false,
"id": "/subscriptions/46e8e181-3bf0-4f9c-b55c-c6139f1fa299/resourceGroups/NIVEL4_group/providers/Microsoft.Web/sites/app-IoT2",
"identity": null,
"inProgressOperationId": null,
"isDefaultContainer": null,
"isNewton": false,
"keyVaultReferenceIdentity": "SystemAssigned",
"kind": "app",
"lastModifiedTimeUtc": "2024-03-27T22:30:13.930000",
"location": "Brazil South",
"managedEnvironmentId": null,
"maxNumberOfWorkers": null,
"name": "app-IoT2",
"outboundIpAddresses": "20.201.6.121,191.237.206.157,20.201.24.113,20.201.24.164,20.201.24.188,20.201.24.187,191.235.228.36",
"possibleOutboundIpAddresses": "20.201.6.121,191.237.206.157,20.201.24.113,20.201.24.164,20.201.24.188,20.201.24.189,20.201.24.208,20.201.24.239,20.201.24.252,20.201.25.48,20.201.25.55,20.201.25.82,20.201.25.83,20.201.25.84,191.237.206.210,20.201.25.85,20.201.25.94,20.201.25.95,20.201.25.102,20.201.25.103,20.201.25.232,20.201.26.54,20.201.26.55,20.201.7.33,20.201.7.34,20.201.7.35,20.201.24.117,191.235.228.36",
"publicNetworkAccess": null,
"redundancyCode": "None",
"repositorySiteName": "app-IoT2",
"reserved": false,
```

28°C Pred. nublado 19:37 27/03/2024

Sala de Aula | Estacio | Missão Prática | Nível 5 | Fullstack - dispositivo - M | Temperature & Humidity | Raspberry Pi Azure IoT W | +

SIAP v0.08.03.10 SIAP TJ - CONSULTA... Full Stack Estacio Python requests - P... Using Headers with... 10 Livros Gratuitos... Estaduais » Todos os favoritos

Microsoft Azure Pesquisar recursos, serviços e documentos (G+)

PowerShell

```

"virtualNetworkSubnetId": null,
"vnetContentShareEnabled": false,
"vnetImagePullEnabled": false,
"vnetRouteAllEnabled": false,
"workloadProfileName": null
}
PS /home/emerson> az webapp config appsettings set -n app-IoT2 -g NIVEL4_group --settings EventHubConsumerGroup=Consumidor-FullStack IoTHubConnectionString="HostName=fullstack.azure-devices.net;DeviceId=fullstack_dispositivo;SharedAccessKey=0GzliwOsQsbkd4G8LYh7/FZYBsqipYIoTFCShig"
App settings have been redacted. Use `az webapp/logicapp/functionapp config appsettings list` to view.
[ {
    "name": "WEBSITE_NODE_DEFAULT_VERSION",
    "slotSetting": false,
    "value": null
},
{
    "name": "EventHubConsumerGroup",
    "slotSetting": false,
    "value": null
},
{
    "name": "IoTHubConnectionString",
    "slotSetting": false,
    "value": null
}
]
PS /home/emerson>
```

28°C Pred. nublado 19:43 27/03/2024

```
PS /home/emerson> az webapp show -n app-IoT2 -g NIVEL4_group --query state  
"Running"  
PS /home/emerson>
```

