

### Tarea 3: Azure IoT Hub con SAS token

El objetivo de esta tarea es conocer con detalle el servicio Azure IoT Hub y las opciones que tiene para conectar dispositivos IoT mediante el uso de SAS tokens.

#### Ejercicio #1: Conexión de dispositivo a mediante SAS token

Para este ejercicio debéis crear una cuenta en Azure y registrar vuestra dispositivo mediante clave privada simétrica y publicar en el broker


**Resultado:** capturas detalladas que permitan ver la realización de la práctica como por ejemplo: creación del IoT Hub y dispositivo. Publicación en el device Twin, consulta del device Twin en la web de Azure y a través de MQTT.

Creación del IoT hub:

The first screenshot shows the 'hub-iot-iker-116192258 | Overview' page in the Azure portal. The left sidebar contains links for Overview, Inputs, Outputs, and Template. The main content area shows a 'Deployment' status of 'Deployment is in progress'. It includes a feedback message, deployment details (name: hub-iot-iker-116192258, subscription: Azure subscription 1, resource group: mcs-iot), and a table for deployment details which currently shows 'No results'.

The second screenshot shows the 'hub-iot-iker | IoT Hub' overview page. The left sidebar lists various management options like Activity log, Access control (IAM), Tags, Diagnose and solve problems, Events, Pricing and scale, and Device management. The main content area displays 'Essentials' information: Resource group (Move) : mcs-iot, Status : Active, Current location : West Europe, Subscription (Move) : Azure subscription 1, Subscription ID : 130bb66b-2870-4ae1-b40c-9211dcd67bc9, and Tags (Edit) : Click here to add tags. Below this, there are tabs for Usage and Get started.

Creamos el dispositivo:

Device ID	Status
 <a href="#">UCAM_001</a>	Enabled

### UCAM\_001

hub-iot-iker

Save Message to Device Direct Method Add Module Identity Device twin Manage keys Refresh

Device ID	UCAM_001
Primary Key	*****
Secondary Key	*****
Primary Connection String	*****
Secondary Connection String	*****
Enable connection to IoT Hub	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Parent device	No parent device

Generando SaS Token con el script pasado mas las claves generadas al generar el dispositivo:

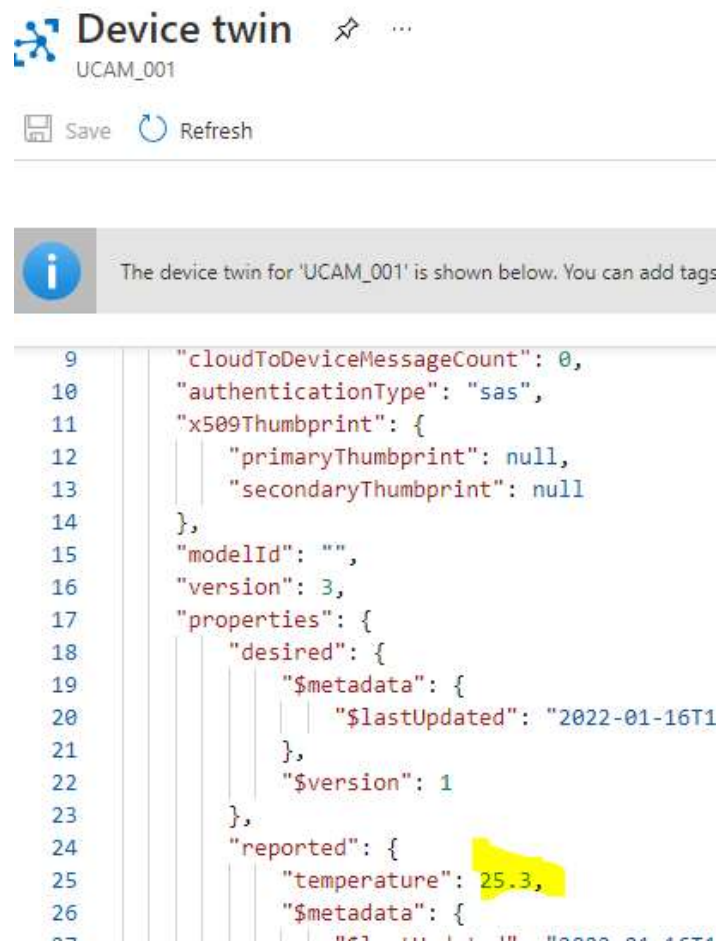
SharedAccessSignature sr=hub-iot-iker.azure-devices.net%2Fdevices%2FUCAM\_001&sig=0ZzqzL9%2BSp5Bej1H%2FIBW2hcct8cNiEMIMAAaFWr34sw%3D&se=1642365457

Conectando al dispositivo:

```
PS C:\Users\Admin\Documents\Tech\EMIT\Ciberseguridad\09_Seguridad_IoT\03_Tarea> mosquito_pub -h hub-iot-iker.azure-devices.net -p 8883 -t '$iothub/twin/PATCH/properties/reported/?rid=231253' -i UCAM_001 -u "hub-iot-iker.azure-devices.net/UCAM_001/?api-version=2020-06-30" -P "SharedAccessSignature sr=hub-iot-iker.azure-devices.net%2Fdevices%2FUCAM_001&sig=0ZzqzL9%2BSp5Bej1H%2FIBW2hcct8cNiEMIMAAaFWr34sw%3D&se=1642365457" -m "{temperature: 25.3}" --cafile ./BaltimoreCyberTrustRoot.crt.pem -d
Client UCAM_001 sending CONNECT
Client UCAM_001 received CONNACK (0)
Client UCAM_001 sending PUBLISH (d0, q0, r0, m1, '$iothub/twin/PATCH/properties/reported/?rid=231253', ... (19 bytes))
Client UCAM_001 sending DISCONNECT
PS C:\Users\Admin\Documents\Tech\EMIT\Ciberseguridad\09_Seguridad_IoT\03_Tarea>

Client UCAM_001 sending CONNECT
Client UCAM_001 received CONNACK (0)
Client UCAM_001 sending PUBLISH (d0, q0, r0, m1, '$iothub/twin/PATCH/properties/reported/?rid=231253', ... (19 bytes))
Client UCAM_001 sending DISCONNECT
```

Vemos el resultado en el Device twin:



```
9      "cloudToDeviceMessageCount": 0,
10     "authenticationType": "sas",
11     "x509Thumbprint": {
12       "primaryThumbprint": null,
13       "secondaryThumbprint": null
14     },
15     "modelId": "",
16     "version": 3,
17     "properties": {
18       "desired": {
19         "$metadata": {
20           "$lastUpdated": "2022-01-16T1
21         },
22         "$version": 1
23       },
24       "reported": {
25         "temperature": 25.3,
26         "$metadata": {
```

Nos subscribimos al mismo:

```
PS C:\Users\Admin\Documents\Tech\ENIIT\Ciberseguridad\09_Seguridad_IoT\03_Tarea> mosquito_sub -h hub-iot-iker.azure-devices.net -p 8883 -t '$iothub/twin/PATCH/properties/desired/#' -i UCAM_001 -u "hub-iot-iker.azure-devices.net/UCAM_001/?api-version=2018-06-30"
Client UCAM_001 sending CONNECT hub-iot-iker.azure-devices.net%2Fdevices%2FUCAM_001&sig=0ZzqzL9%2BSp5Bej1H%2FIBW2hctt8cNiEMIMAAaFW
Client UCAM_001 received CONNACK (0)altimoreCyberTrustRoot.crt.pem -0
Client UCAM_001 sending SUBSCRIBE (Mid: 1, Topic: $iothub/twin/PATCH/properties/desired/#, QoS: 0, Options: 0x00)
Client UCAM_001 received SUBACK
Subscribed (mid: 1): 0
Client UCAM_001 sending PINGREQ
Client UCAM_001 received PINGRESP
```

Y modificando un valor, lo vemos en la consola desde donde nos hemos suscrito:

```
"desired": {
  "temperature": 32.5,
  "$metadata": {
    "$lastUpdated": "20
```

Y aquí tenemos la actualización:

```
Client UCAM_001 received PUBLISH (d0, q0, r0, u0)
{"temperature":32.5,"$version":2}
```