

Send telemetry from an IoT Plug and Play device to Azure IoT Hub:-

Objective : Basic Azure IoT application development workflow. We use the Azure CLI and IoT Explorer to create an Azure IoT hub and a device. Then we use an Azure IoT device SDK sample to run a simulated data connect it securely to the hub, and send telemetry.

Tasks:

1. Use Azure Website/CLI to create an IoT hub and a resource group
2. Register a device : We create a new device instance and register it with the IoT hub you created.
3. Run a simulated device : Need to install Azure IoT C device SDK and run a sample program by using IOTHUB_DEVICE_CONNECTION_STRING which we get from our IoT Hub we created earlier.
4. Run the code : After running the code successfully, the sample securely connects to your IoT hub as the device we registered and begins sending telemetry messages. The sample output appears in your console.

References :

<https://docs.microsoft.com/en-us/azure/iot-develop/quickstart-send-telemetry-iot-hub>

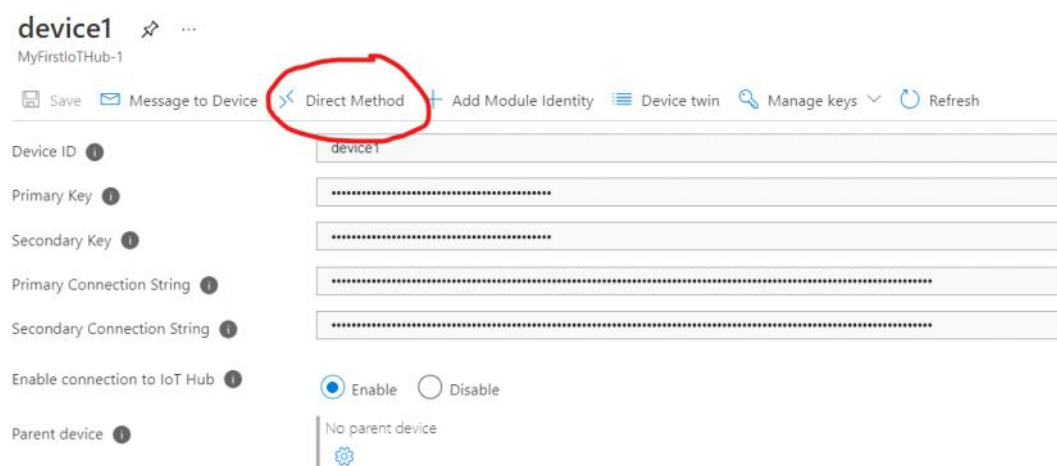
Control a device connected to an IoT hub:-


Objective : We use a direct method to control a simulated device connected to your IoT hub.

Tasks:

1. Create an IoT hub
2. Register a device
3. Listen for direct method calls : The simulated device application connects to a device-specific endpoint on your IoT hub, sends simulated telemetry, and listens for direct method calls from your hub. We can find a sample to run it in `iot-hub\Quickstarts\simulated-device-2` folder of SDK.
4. Call the direct method : The back-end application connects to a service-side endpoint on your IoT Hub. The application makes direct method calls to a device through your IoT hub and listens for acknowledgments. We can find a sample to run it in `iot-hub\Quickstarts\back-end-application`


We can call the direct method directly from Azure Website using Direct Method dialog, need to pass method name and Payload, mentioned the back-end application is already running.



 Invoke Method



You can use this tool to send direct methods to a device. Direct methods have a name, payload, and configurable connection and method timeouts.


Device Id 

device1

Method Name 

Payload 

Connection Timeout 

Method Timeout 

References :

<https://docs.microsoft.com/en-us/azure/iot-hub/quickstart-control-device>

<https://docs.microsoft.com/en-us/azure/iot-hub/iot-hub-devguide-direct-methods>

Device Update for Azure IoT Hub tutorial using the Raspberry Pi 4 B+ Reference Image

Objective : complete an end-to-end image-based update using Device Update for IoT Hub on a Raspberry Pi 4 board.

Steps:

- 1) Install Raspbian OS in Pi
- 2) Add a tag to your IoT device
- 3) Import an update
- 4) Create a device group
- 5) Deploy an image update
- 6) Monitor the update deployment

Details:

- 1) First we need to install Raspbian OS on our Raspberry Pi 4.
- 2) After installing OS, we need to clone iot-hub-device-update. (<https://github.com/Azure/iot-hub-device-update>)
- 3) Need to Build the Device Update Agent (<https://github.com/Azure/iot-hub-device-update/blob/main/docs/agent-reference/how-to-build-agent-code.md>)
- 4) No we have installed the Azure device update agent, we can run it. (<https://github.com/Azure/iot-hub-device-update/blob/main/docs/agent-reference/how-to-run-agent.md>)
- 5) Before running we require to create a file named adu-conf.txt in /etc/adu. This file is used to fetch our connection string of Azure device.

```
echo "connection_string=<device connection string>" > /adu/adu-conf.txt
echo "aduc_manufacturer=ADUTeam" >> /adu/adu-conf.txt
echo "aduc_model=RefDevice" >> /adu/adu-conf.txt
```

- 6) We need to Add device to Azure IoT Hub and also require to copy the connection string of the device which is require to run Azure IoT Agent.
- 7) We can get the connection string of the device from azure site -> Explorers -> IoT Devices -> Select our Device -> Copy Primary Connection String.
- 8) Add a tag to our device

```
"tags": {
  "ADUGroup": "<CustomTagValue>"
}
```

- 9) Before updating first we require to import the update on Azure. We require 2 things manifest and image update. (Can be downloaded from link mentioned below)
- 10) After importing the update we create a update group using the tag we have created earlier.
- 11) After that we can directly deploy the update.

View compliance information for devices connected to Device Update for IoT Hub.



Create device groups to deploy updates to many devices at the same time.

+ Add Refresh Delete

Group name	Creation date (UTC)	Device count	Available updates
testTag	Oct 4, 2021 9:46 AM	1	tutorial-duiothubteam tutorial-rpi 0.6.5073.1 (0 device(s))

References :

<https://docs.microsoft.com/en-us/azure/iot-hub-device-update/device-update-raspberry-pi>

Device Update for Azure IoT Hub tutorial using the Ubuntu (18.04 x64) Simulator Reference Agent

Objective : an end-to-end image-based update using Device Update for IoT Hub.

Steps :

1. Download and install image
2. Add a tag to your IoT device
3. Import an update
4. Create a device group
5. Deploy an image update
6. Monitor the update deployment

Details :-

- 1) We can install ubuntu on virtual box or download WSL (Windows Subsystem for Linux) on our Windows device.
- 2) After that we need to Install Device Update Agent simulator and we can download from repository mention below.
- 3) We need to Add device to Azure IoT Hub and also require to copy the connection string of the device which is require to run Azure IoT Agent.
- 4) Add a tag to our device

```
'tags': {
  "ADUGroup": "<CustomTagValue>"
}
```

- 5) Before updating first we require to import the update on Azure. We require 2 things manifest and image update.
- 6) After importing the update we create a update group using the tag we have created earlier.
- 7) After that we can directly deploy the update.

References:

<https://docs.microsoft.com/en-us/azure/iot-hub-device-update/device-update-simulator>

References :-

Quickstart: Send telemetry from an IoT Plug and Play device to Azure IoT Hub

<https://docs.microsoft.com/en-us/azure/iot-develop/quickstart-send-telemetry-iot-hub>

Quickstart: Control a device connected to an IoT hub

<https://docs.microsoft.com/en-us/azure/iot-hub/quickstart-control-device>

Understand and invoke direct methods from IoT Hub

<https://docs.microsoft.com/en-us/azure/iot-hub/iot-hub-devguide-direct-methods>

Device Update for IoT Hub Resource Management

<https://docs.microsoft.com/en-us/azure/iot-hub-device-update/create-device-update-account>

Device Update for Azure IoT Hub tutorial using the Raspberry Pi 3 B+ Reference Image

<https://docs.microsoft.com/en-us/azure/iot-hub-device-update/device-update-raspberry-pi>

How To Build the Device Update Agent

<https://github.com/Azure/iot-hub-device-update/blob/main/docs/agent-reference/how-to-build-agent-code.md>

```
sudo AduclotAgent ""
```

```
sudo ./AduclotAgentSim-microsoft-swupdate ""
```

```
grep -rnw '/path/to/somewhere/' -e 'pattern'
```

```
grep -rnwe 'pattern'
```

https://emn178.github.io/online-tools/sha256_checksum.html

<https://base64.guru/converter/encode/hex>