



# AZ-220<sup>Q&As</sup>

Microsoft Azure IoT Developer

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### QUESTION 1

#### DRAG DROP

Your company is creating a new camera security system that will use Azure IoT Hub.

You plan to use an Azure IoT Edge device that will run Ubuntu Server 18.04.

You need to configure the IoT Edge device.

Which three actions should you perform in sequence? To answer, move the appropriate actions from the list of actions to the answer area and arrange them in the correct order.

Select and Place:

#### Actions

#### Answer Area

- Create an individual device enrollment by using the Device Provisioning Service.
- Run the following commands.  

```
sudo apt-get install moby-engine  
sudo apt-get install moby-cli  
sudo apt-get install iotedged
```
- Add the connection string to the /etc/iotedged/config.yaml file, and then run the following command.  

```
sudo systemctl restart iotedged
```
- Install the IoT edge repository for Ubuntu Server 18.04 on the physical device. From IoT Hub, create a new IoT Edge device.
- From IoT Hub, create an IoT Edge device registry entry.



Correct Answer:



**Actions**

Create an individual device enrollment by using the Device Provisioning Service.

Install the IoT edge repository for Ubuntu Server 18.04 on the physical device. From IoT Hub, create a new IoT Edge device.

**Answer Area**

Run the following commands.

```
sudo apt-get install moby-engine
sudo apt-get install moby-cli
sudo apt-get install iotedge
```

From IoT Hub, create an IoT Edge device registry entry.

Add the connection string to the /etc/iotedge/config.yaml file, and then run the following command.

```
sudo systemctl restart iotedge
```

Step 1: Run the following commands

Install the container runtime.

Azure IoT Edge relies on an OCI-compatible container runtime. For production scenarios, we recommended that you use the Moby-based engine provided below. The Moby engine is the only container engine officially supported with Azure

IoT Edge. Docker CE/EE container images are compatible with the Moby runtime.

Install the Moby engine.

```
sudo apt-get install moby-engine
```

Install the Moby command-line interface (CLI). The CLI is useful for development but optional for production deployments.

```
sudo apt-get install moby-cli
```

Install the security daemon. The package is installed at /etc/iotedge/.

```
sudo apt-get install iotedge
```

Step 2: From IoT Hub, create an IoT Edge device registry entry.

Note: In your IoT Hub in the Azure portal, IoT Edge devices are created and managed separately from IoT devices that are not edge enabled.



Sign in to the Azure portal and navigate to your IoT hub.

In the left pane, select IoT Edge from the menu.

Select Add an IoT Edge device.

Provide a descriptive device ID. Use the default settings to auto-generate authentication keys and connect the new device to your hub.

Select Save.

Retrieve the connection string in the Azure portal

1.

When you're ready to set up your device, you need the connection string that links your physical device with its identity in the IoT hub.

2.

From the IoT Edge page in the portal, click on the device ID from the list of IoT Edge devices.

3.

Copy the value of either Primary Connection String or Secondary Connection String.

Step 3: Add the connection string to..

To manually provision a device, you need to provide it with a device connection string that you can create by registering a new device in your IoT hub.

Open the configuration file.

```
sudo nano /etc/iotedge/config.yaml
```

Find the provisioning configurations of the file and uncomment the Manual provisioning configuration section. Update the value of `device_connection_string` with the connection string from your IoT Edge device.

Save and close the file.

After entering the provisioning information in the configuration file, restart the daemon:

```
sudo systemctl restart iotedge
```

Reference: <https://docs.microsoft.com/en-us/azure/iot-edge/how-to-install-iot-edge-linux>

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## QUESTION 2

You have IoT devices that connect to an Azure IoT hub.

From IoT Hub, you create an Event subscription to be notified when devices are registered to IoT Hub. You select webhook endpoint as a handler for the Event subscription.

Which two types of Event Grid messages will be received by the webhook? Each correct answer presents a complete solution.



NOTE: Each correct selection is worth one point.

- A. Microsoft.Devices.DeviceCreated
- B. Microsoft.Resources.ResourceWriteSuccess
- C. Microsoft.EventGrid.SubscriptionValidationEvent
- D. Microsoft.Devices.DeviceConnected

Correct Answer: AC

Microsoft.Devices.DeviceCreated: Published when a device is registered to an IoT hub.

The first thing you want to do is handle Microsoft.EventGrid.SubscriptionValidationEvent events. Every time someone subscribes to an event, Event Grid sends a validation event to the endpoint with a validationCode in the data payload.

Reference: <https://docs.microsoft.com/en-us/azure/iot-hub/iot-hub-event-grid> <https://docs.microsoft.com/en-us/azure/event-grid/receive-events>

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### QUESTION 3

You have three Azure IoT hubs named Hub1, Hub2, and Hub3, a Device Provisioning Service instance, and an IoT device named Device1.

Each IoT hub is deployed to a separate Azure region.

Device enrollment uses the Lowest latency allocation policy.

The Device Provisioning Service uses the Lowest latency allocation policy.

Device1 is auto-provisioned to Hub1 by using the Device Provisioning Service.

Device1 regularly moves between regions.

You need to ensure that Device1 always connects to the IoT hub that has the lowest latency.

What should you do?

- A. Configure device attestation that uses X.509 certificates.
- B. Implement device certificate rolling.
- C. Disenroll and reenroll Device1.
- D. Configure the re-provisioning policy.

Correct Answer: D

Automated re-provisioning support.

Microsoft added first-class support for device re-provisioning which allows devices to be reassigned to a different IoT solution sometime after the initial solution assignment. Re-provisioning support is available in two options:

Factory reset, in which the device twin data for the new IoT hub is populated from the enrollment list instead of the old



IoT hub. This is common for factory reset scenarios as well as leased device scenarios.

Migration, in which device twin data is moved from the old IoT hub to the new IoT hub. This is common for scenarios in which a device is moving between geographies.

Reference:

<https://azure.microsoft.com/en-us/blog/new-year-newly-available-iot-hub-device-provisioning-service-features/>

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#### QUESTION 4

What should you do to identify the cause of the connectivity issues?

- A. Send cloud-to-device messages to the IoT devices.
- B. Use the heartbeat pattern to send messages from the IoT devices to iothub1.
- C. Monitor the connection status of the device twin by using an Azure function.
- D. Enable the collection of the Connections diagnostics logs and set up alerts for the connected devices count metric.

Correct Answer: D

Scenario: You discover connectivity issues between the IoT gateway devices and iothub1, which cause IoT devices to lose connectivity and messages.

To log device connection events and errors, turn on diagnostics for IoT Hub. We recommend turning on these logs as early as possible, because if diagnostic logs aren't enabled, when device disconnects occur, you won't have any information to troubleshoot the problem with.

Step 1:

Sign in to the Azure portal.

Browse to your IoT hub.

Select Diagnostics settings.

Select Turn on diagnostics.

Enable Connections logs to be collected.

For easier analysis, turn on Send to Log Analytics (see pricing).

Step 2:

Set up alerts for device disconnect at scale

To get alerts when devices disconnect, configure alerts on the Connected devices (preview) metric.

Reference:

<https://docs.microsoft.com/bs-cyrl-ba/azure/iot-hub/iot-hub-troubleshoot-connectivity>

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## QUESTION 5

After you answer a question in this section, you will NOT be able to return to it. As a result, these questions will not appear in the review screen.

You have 20 IoT devices deployed across two floors of a building. The devices on the first floor must be set to 60 degrees. The devices on the second floor must be set to 80 degrees.

The device twins are configured to use a tag that identifies the floor on which the twins are located.

You create the following automatic configuration for the devices on the first floor.

```
{
  "id": "first_floor_devices",
  "schemaVersion": null,
  "labels": {
    "Version": "1"
  },
  "content": {
    "deviceContent": {
      "properties.desired.ac": {
        "temperature": 60
      }
    }
  },
  "targetCondition": "tags.floor-'first'",
  "createdTimeUtc": "2020-12-08T04:06:56.651Z",
  "lastUpdatedTimeUtc": "2020-12-08T04:06:56.651Z",
  "priority": 1,
  ...
}
```

You create the following automatic configuration for the devices on the second floor.



```
{
  "id": "second_floor_devices",
  "schemaVersion": null,
  "labels": {
    "Version": "1"
  },
  "content": {
    "deviceContent": {
      "properties.desired.ac": {
        "temperature": 80
      }
    }
  },
  "targetCondition": "*",
  "createdTimeUtc": "2020-12-08T04:11:08.561Z",
  "lastUpdatedTimeUtc": "2020-12-09T18:50:55.070Z",
  "priority": 10,
  ...
}
```

The IoT devices on the first floor report that the temperature is set to 80 degrees.

You need to ensure that the first-floor devices are set to the correct temperature.

Solution: In the automatic configuration for the second-floor devices, you set Version to 2.

Does this meet the goal?

A. Yes

B. No

Correct Answer: B

Reference: <https://docs.microsoft.com/en-us/azure/iot-edge/module-deployment-monitoring?view=iotedge-2020-11>

<https://docs.microsoft.com/en-us/azure/iot-hub/iot-hub-automatic-device-management-cli>

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