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AZ-220

Microsoft Azure IoT Developer

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Question: 167

Question Set 2

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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

You have an Azure IoT solution that includes an Azure IoT hub, a Device Provisioning Service instance, and 1,000 connected IoT devices.

All the IoT devices are provisioned automatically by using one enrollment group.

You need to temporarily disable the IoT devices from the connecting to the IoT hub.

Solution: From the Device Provisioning Service, you disable the enrollment group, and you disable device entries in the identity registry of the IoT hub to which the IoT devices are provisioned.

Does the solution meet the goal?
A. Yes
B. No

Answer: A

Explanation:

You may find it necessary to deprovision devices that were previously auto-provisioned through the Device Provisioning Service.

In general, deprovisioning a device involves two steps:

Question: 168

Testlet 1

Case Study

This is a case study. Case studies are not timed separately. You can use as much exam time as you would like to complete each case . However, there may be additional case studies and sections on this exam. You must manage your time to ensure that you are able to complete all questions included on this exam in the time provided.

To answer the questions included in a case study, you will need to reference information that is provided in the case

study. Case studies might contain exhibits and other resources that provide more information about the scenario that is described in the case study. Each question is independent of the other question on this case study.

At the end of this case study, a review screen will appear. This screen allows you to review your answers and to make changes before you move to the next sections of the exam. After you begin a new section, you cannot return to this section.

To start the case study

To display the first question on this case study, click the Next button. Use the buttons in the left pane to explore the content of the case study before you answer the questions. Clicking these buttons displays information such as business requirements, existing environment, and problem statements. If the case study has an All Information tab, note that the information displayed is identical to the information displayed on the subsequent tabs. When you are ready to answer a question, click the Question button to return to the question.

Existing Environment. Current State of Development

Contoso produces a set of Bluetooth sensors that read the temperature and humidity. The sensors connect to IoT gateway devices that relay the data.

All the IoT gateway devices connect to an Azure IoT hub named iothub1.

Existing Environment. Device Twin

You plan to implement device twins by using the following JSON sample.

```json
{
    "deviceId": "device_n",
    "etag": "AAAAAAAAAAQ=",
    "deviceEtag": "NDcwMTU4Mzk=",
    "status": "enabled",
    "statusUpdateTime": "0001-01-01T00:00:00Z",
    "connectionState": "Disconnected",
    "lastActivityTime": "0001-01-01T00:00:00Z",
    "cloudToDeviceMessageCount": 0,
    "authenticationType": "sas",
    "x509Thumbprint": {
        "primaryThumbprint": null,
        "secondaryThumbprint": null
    },
    "version": 11,
    "properties": {
        "desired": {
            "fanSpeed": 70,
            "$metadata": {
                "$lastUpdated": "2019-10-16T09:43:42.2944169Z",
                "$lastUpdatedVersion": 4,
                "fanSpeed": {
                    "$lastUpdated": "2019-10-16T09:43:42.2944169Z",
                    "$lastUpdatedVersion": 4
                }
            },
            "$version": 4
        },
        "reported": {
            "fanSpeed": 80,
            "metadata": {
                "$lastUpdated": "2019-10-16T09:43:42.4035171Z",
                "fanSpeed": {
                    "$lastUpdated": "2019-10-16T09:43:42.4035171Z"
                }
            },
            "$version": 7
        }
    },
    "capabilities": {
        "lotEdge": false
    }
}
```

Existing Environment. Azure Stream Analytics

Each room will have between three to five sensors that will generate readings that are sent to a single IoT gateway device. The IoT gateway device will forward all the readings to iothub1 at intervals of between 10 and 60 seconds.

You plan to use a gateway pattern so that each IoT gateway device will have its own IoT Hub device identity.

You draft the following query, which is missing the GROUP BY clause.

SELECT

AVG(temperature),

System.TimeStamp() AS AsaTime

FROM

Iothub

You plan to use a 30-second period to calculate the average temperature reading of the sensors.

You plan to minimize latency between the condition reported by the sensors and the corresponding alert issued by the Stream Analytics job.

Existing Environment. Device Messages

The IoT gateway devices will send messages that contain the following JSON data whenever the temperature exceeds a specified threshold.

```
{
  "event": {
    "payload":"Temperature = 26.23 Humidity = 78.70597746416186 Button = 0",
    "properties": {
      "application": {
        "level": "critical"
      }
    }
  }
}
```

The level property will be used to route the messages to an Azure Service Bus queue endpoint named criticalep.

Existing Environment. Issues

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

Requirements. Planning Changes

Contoso plans to make the following changes:

– Use Stream Analytics to process and view data.

– Use Azure Time Series Insights to visualize data.

– Implement a system to sync device statuses and required settings.

– Add extra information to messages by using message enrichment.

– Create a notification system to send an alert if a condition exceeds a specified threshold.

– Implement a system to identify what causes the intermittent connection issues and lost messages.

Requirements. Technical Requirements

Contoso must meet the following requirements:

– Use the built-in functions of IoT Hub whenever possible.

– Minimize hardware and software costs whenever possible.

– Minimize administrative effort to provision devices at scale.

– Implement a system to trace message flow to and from iothub1.

– Minimize the amount of custom coding required to implement the planned changes.

– Prevent read operations from being negatively affected when you implement additional services.
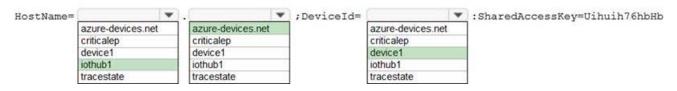
HOTSPOT

You create a new IoT device named device1 on iothub1. Device1 has a primary key of Uihuih76hbHb.

How should you complete the device connection string? To answer, select the appropriate options in the answer area.
NOTE: Each correct selection is worth one point.

Answer Area

HostName=[▼] . [▼] ;DeviceId=[▼] :SharedAccessKey=Uihuih76hbHb

azure-devices.net	azure-devices.net	azure-devices.net
criticalep	criticalep	criticalep
device1	device1	device1
iothub1	iothub1	iothub1
tracestate	tracestate	tracestate

Answer:
Answer Area

HostName=[▼] . [▼] ;DeviceId=[▼] :SharedAccessKey=Uihuih76hbHb

azure-devices.net	**azure-devices.net**	azure-devices.net
criticalep	criticalep	criticalep
device1	device1	**device1**
iothub1	iothub1	iothub1
tracestate	tracestate	tracestate

Explanation:

Box 1: iothub1

The Azure IoT hub is named iothub1.

Box 2: azure-devices.net

The format of the device connection string looks like:

HostName={YourIoTHubName}.azure-
devices.net;DeviceId=MyNodeDevice;SharedAccessKey={YourSharedAccessKey}

Box 1: device1

Device1 has a primary key of Uihuih76hbHb.

Reference:

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

Question: 169

You plan to deploy a standard tier Azure IoT hub.

You need to perform an over-the-air (OTA) update on devices that will connect to the IoT hub by using scheduled jobs.

What should you use?
A. a device-to-cloud message
B. the device twin reported properties
C. a cloud-to-device message
D. a direct method

Answer: D

Explanation:

Releases via the REST API. All of the operations that can be performed from the Console can also be automated using the REST API. You might do this to automate your build and release process, for example.

You can build firmware using the Particle CLI or directly using the compile source code API.

Note: Over-the-air (OTA) firmware updates are a vital component of any IoT system. Over-the-air firmware updates refers to the practice of remotely updating the code on an embedded device.

Reference:

https://docs.particle.io/tutorials/device-cloud/ota-updates/

Question: 170

You have an IoT device that gathers data in a CSV file named Sensors.csv. You deploy an Azure IoT hub that is accessible at ContosoHub.azure-devices.net. You need to ensure that Sensors.csv is uploaded to the IoT hub.

Which two actions should you perform? Each correct answer presents part of the solution. NOTE: Each correct selection is worth one point.
A. Upload Sensors.csv by using the IoT Hub REST AP
C. From the Azure subscription, select the IoT hub, select Message routing, and then configure a route to storage.
D. From the Azure subscription, select the IoT hub, select File upload, and then configure a storage container.
E. Configure the device to use a GET request to ContosoHub.azure-devices.net/devices/ContosoDevice1/files/notifications.

Answer: AC

Explanation:

C: To use the file upload functionality in IoT Hub, you must first associate an Azure Storage account with your hub. Select File upload to display a list of file upload properties for the IoT hub that is being modified.

For Storage container: Use the Azure portal to select a blob container in an Azure Storage account in your current Azure subscription to associate with your IoT Hub. If necessary, you can create an Azure Storage account on the Storage accounts blade and blob container on the Containers

A: IoT Hub has an endpoint specifically for devices to request a SAS URI for storage to upload a file. To start the file upload process, the device sends a POST request to {iot hub}.azure-devices.net/devices/{deviceId}/files with the following JSON body:

{

"blobName": "{name of the file for which a SAS URI will be generated}"

}

Incorrect Answers:

D: Deprecated: initialize a file upload with a GET. Use the POST method instead.

Reference:

https://github.com/MicrosoftDocs/azure-docs/blob/master/articles/iot-hub/iot-hub-configure-file-upload.md

Question: 171

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

You have an Azure IoT solution that includes an Azure IoT hub, a Device Provisioning Service instance, and 1,000 connected IoT devices. All the IoT devices are provisioned automatically by using one enrollment group. You need to temporarily disable the IoT devices from the connecting to the IoT hub.

Solution: From the IoT hub, you change the credentials for the shared access policy of the IoT devices.

Does the solution meet the goal?
A. Yes
B. No

Answer: B

Explanation:

Reference:

https://docs.microsoft.com/bs-latn-ba/azure/iot-dps/how-to-unprovision-devices

Question: 172

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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

You have an Azure IoT solution that includes an Azure IoT hub, a Device Provisioning Service instance, and 1,000 connected IoT devices.

All the IoT devices are provisioned automatically by using one enrollment group.

You need to temporarily disable the IoT devices from the connecting to the IoT hub.

Solution: You delete the enrollment group from the Device Provisioning Service.

Does the solution meet the goal?
A. Yes
B. No

Answer: B

Explanation:

Instead, from the Device Provisioning Service, you disable the enrollment group, and you disable device entries in the identity registry of the IoT hub to which the IoT devices are provisioned.

Reference:

https://docs.microsoft.com/bs-latn-ba/azure/iot-dps/how-to-unprovision-devices

Question: 173

HOTSPOT

You have an Azure IoT hub.

You plan to deploy 1,000 IoT devices by using automatic device management.
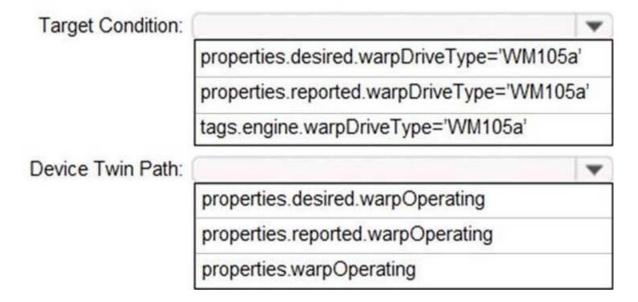
The device twin is shown below.

```json
{
  "deviceId": "ContosoHyperDriveEngine1",
  "etag": "AAAAAAAAAAw=",
  "deviceEtag": "MTYyNDk20kw",
  "status": "enabled",
  "statusUpdateTime": "0001-01-01t00:00:00Z",
  "connectionTime": "Disconnected",
  "lastActivityTime": "0001-01-01T00:00:00Z",
  "cloudToDeviceMessageCount": 0,
  "authenticationType": "sas",
  "x509Thumbprint": {
    "primaryThumbprint": null,
    "secondaryThumbprint": null
  },
  "version": 13,
  "tags": {
    "engine": {
      "warpCorVersion": "1.2.65b",
      "warpDriveType": "WM105a"
    }
  },
  "properties": {
    "desired": {
      "$metadata": {
        "$lastUpdated": "2019-10-17T18:43:33.7599556Z"
      },
      "$version": 1
    },
    "reported": {
      "$metadata": {
        "$lastUpdated": "2019-10-17T18:43:33.7599556Z"
      },
      "$version": 1
    }
  }
}
```

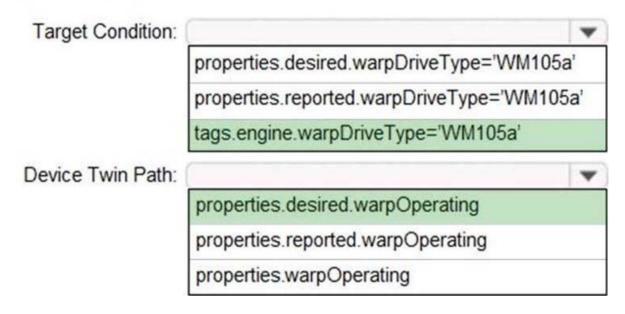You need to configure automatic device management for the deployment.

Which target Condition and Device Twin Path should you use? To answer, select the appropriate options in the answer area. NOTE: Each correct selection is worth one point.

Answer Area

Target Condition: [dropdown ▼]

properties.desired.warpDriveType='WM105a'
properties.reported.warpDriveType='WM105a'
tags.engine.warpDriveType='WM105a'

Device Twin Path: [dropdown ▼]

properties.desired.warpOperating
properties.reported.warpOperating
properties.warpOperating

Answer:

Answer Area

Target Condition: [dropdown ▼]

properties.desired.warpDriveType='WM105a'
properties.reported.warpDriveType='WM105a'
tags.engine.warpDriveType='WM105a'

Device Twin Path: [dropdown ▼]

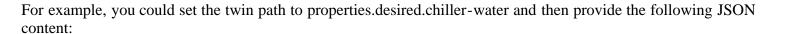| |
|---|
| **properties.desired.warpOperating** |
| properties.reported.warpOperating |
| properties.warpOperating |

Explanation:

Box 1: tags.engine.warpDriveType='VM105a'

Use tags to target twins. Before you create a configuration, you must specify which devices or modules you want to affect. Azure IoT Hub identifies devices and using tags in the device twin, and identifies modules using tags in the module twin.

Box 2: properties.desired.warpOperating

The twin path, which is the path to the JSON section within the twin desired properties that will be set.

For example, you could set the twin path to properties.desired.chiller-water and then provide the following JSON content:

{

"temperature": 66,

"pressure": 28

}

Reference:

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

Question: 174

Question Set 2

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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All the IoT devices are provisioned automatically by using one enrollment group.

You need to temporarily disable the IoT devices from the connecting to the IoT hub.

Solution: From the Device Provisioning Service, you disable the enrollment group, and you disable device entries in the identity registry of the IoT hub to which the IoT devices are provisioned.

Does the solution meet the goal?
A. Yes
B. No

Answer: A

Explanation:

You may find it necessary to deprovision devices that were previously auto-provisioned through the Device Provisioning Service.

In general, deprovisioning a device involves two steps:

Question: 175

You plan to deploy an Azure IoT hub.

The IoT hub must support the following:

– Three Azure IoT Edge devices

– 2,500 IoT devices

Each IoT device will spend a 6 KB message every five seconds.

You need to size the IoT hub to support the devices. The solution must minimize costs.

What should you choose?
A. one unit of the S1 tier
B. one unit of the B2 tier
C. one unit of the B1 tier
D. one unit of the S3 tier

Answer: D

Explanation:

2500* 6 KB * 12 = 180,000 KB/minute = 180 MB/Minute.

B3, S3 can handle up to 814 MB/minute per unit.

Incorrect Answers: A, C: B1, S1 can only handle up to 1111 KB/minute per unit

B: B2, S2 can only handle up to 16 MB/minute per unit.

Reference:

https://docs.microsoft.com/en-us/azure/iot-hub/iot-hub-scaling

Question: 176

DRAG DROP

You deploy an Azure IoT hub. You need to demonstrate that the IoT hub can receive messages from a 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.

Actions

Get a service primary key for the IoT hub.

Configure the Device Provisioning Service on the IoT hub.

Configure the device connection string on a device client.

Register a device in IoT Hub.

Trigger a new send event from a device client.

Answer Area

Answer:

Actions

Get a service primary key for the IoT hub.

Configure the Device Provisioning Service on the IoT hub.

Configure the device connection string on a device client.

Register a device in IoT Hub.

Trigger a new send event from a device client.

Answer Area

Register a device in IoT Hub.

Configure the device connection string on a device client.

Trigger a new send event from a device client.

Explanation:

Step 1: Register a device in IoT Hub

Before you can use your IoT devices with Azure IoT Edge, you must register them with your IoT hub. Once a device is registered, you can retrieve a connection string to set up your device for IoT Edge workloads.

Step 2: Configure the device connection string on a device client.

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.

Step 3: Trigger a new send event from a device client.

Reference:

https://docs.microsoft.com/en-us/azure/iot-edge/how-to-register-device

Question: 177

Question Set 2

Note: This question is part of a series of questions that present the same scenario. Each question in the series contains a unique solution that might meet the stated goals. Some question sets might have more than one correct solution, while others might not have a correct solution.

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All the IoT devices are provisioned automatically by using one enrollment group.

You need to temporarily disable the IoT devices from the connecting to the IoT hub.

Solution: From the Device Provisioning Service, you disable the enrollment group, and you disable device entries in the identity registry of the IoT hub to which the IoT devices are provisioned.

Does the solution meet the goal?
A. Yes
B. No

Answer: A

Explanation:

You may find it necessary to deprovision devices that were previously auto-provisioned through the Device Provisioning Service.

In general, deprovisioning a device involves two steps:

Question: 178

DRAG DROP

You have an Azure IoT hub.

You plan to attach three types of IoT devices as shown in the following table.

Name	Specification	Note
Transparent Field Gateway Device	High-power device with a fast processor and 4 GB of RAM	Will connect to multiple devices, each with its own credentials, by using the same TLS connection.
Low Resource Device	Low resource specifications, battery-operated, and 512 KB of RAM	Will connect directly to an IoT hub and will **NOT** connect to any other devices. Will use cloud-to-device messages.
Limited Sensor Device	Extremely low-power device with a limited microcontroller (MCU) and 256 KB of RAM	Will **NOT** support the Azure SDK. Messages must be as small as possible.

You need to select the appropriate communication protocol for each device.

What should you select? To answer, drag the appropriate protocols to the correct devices. Each protocol may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content. NOTE: Each correct selection is worth one point.

Protocols

AMQP

HTTPS

MQTT

Answer Area

Device	Protocol
Transparent Field Gateway Device:	Protocol
Low Resource Device:	Protocol
Limited Sensor Device:	Protocol

Answer:

Protocols

AMQP

HTTPS

MQTT

Answer Area

Device	Protocol
Transparent Field Gateway Device:	AMQP
Low Resource Device:	MQTT
Limited Sensor Device:	HTTPS

Explanation:

Box 1: AMQP

Use AMQP on field and cloud gateways to take advantage of connection multiplexing across devices.

Box 2: MQTT

MQTT is used on all devices that do not require to connect multiple devices (each with its own per-device credentials) over the same TLS connection.

Box 3: HTTPS

Use HTTPS for devices that cannot support other protocols.

Reference:

https://docs.microsoft.com/en-us/azure/iot-hub/iot-hub-devguide-protocols

SAMPLE QUESTIONS

*These questions are for demo purpose only. **Full version** is up to date and contains actual questions and answers.*

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