

Microsoft

Exam Questions AZ-220

Microsoft Azure IoT Developer



NEW QUESTION 1

- (Exam Topic 1)

You need to enable telemetry message tracing through the entire IoT solution. What should you do?

- A. Monitor device lifecycle events.
- B. Upload IoT device logs by using the File upload feature.
- C. Enable the DeviceTelemetry diagnostic log and stream the log data to an Azure event hub.
- D. Implement distributed tracing.

Answer: D

Explanation:

IoT Hub is one of the first Azure services to support distributed tracing. As more Azure services support distributed tracing, you'll be able trace IoT messages throughout the Azure services involved in your solution.

Note:

Enabling distributed tracing for IoT Hub gives you the ability to:

Precisely monitor the flow of each message through IoT Hub using trace context. This trace context includes correlation IDs that allow you to correlate events from one component with events from another component. It can be applied for a subset or all IoT device messages using device twin.

Automatically log the trace context to Azure Monitor diagnostic logs.

Measure and understand message flow and latency from devices to IoT Hub and routing endpoints. Start considering how you want to implement distributed tracing for the non-Azure services in your IoT solution.

Reference:

<https://docs.microsoft.com/en-us/azure/iot-hub/iot-hub-distributed-tracing>

NEW QUESTION 2

- (Exam Topic 1)

How should you complete the GROUP BY clause to meet the Streaming Analytics requirements?

- A. GROUP BY HoppingWindow(Second, 60, 30)
- B. GROUP BY TumblingWindow(Second, 30)
- C. GROUP BY SlidingWindow(Second, 30)
- D. GROUP BY SessionWindow(Second, 30, 60)

Answer: B

Explanation:

Scenario: You plan to use a 30-second period to calculate the average temperature reading of the sensors. Tumbling window functions are used to segment a data stream into distinct time segments and perform a function against them, such as the example below. The key differentiators of a Tumbling window are that they repeat, do not overlap, and an event cannot belong to more than one tumbling window.

InAnswers:

A: Hopping window functions hop forward in time by a fixed period. It may be easy to think of them as Tumbling windows that can overlap, so events can belong to more than one Hopping window result set.

Reference:

<https://docs.microsoft.com/en-us/azure/stream-analytics/stream-analytics-window-functions>

NEW QUESTION 3

- (Exam Topic 1)

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.

Answer: D

Explanation:

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:

*1.Sign in to the Azure portal.

*2.Browse to your IoT hub.

*3.Select Diagnostics settings.

*4.Select Turn on diagnostics.

*5. Enable Connections logs to be collected.

*6. 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>

NEW QUESTION 4

- (Exam Topic 3)

You have an Azure IoT Central application that has a custom device template. You need to configure the device template to support the following activities:

- Return the reported power consumption.

- > Configure the desired fan speed.
- > Run the device reset routine.
- > Read the fan serial number.

Which option should you use for each activity? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

Return the reported power consumption:

Configure the desired fan speed:

Read the fan serial number:

Run the device reset routine:

- A. Mastered
- B. Not Mastered

Answer: A

Explanation:

Box 1: Measurement

Telemetry/measurement is a stream of values sent from the device, typically from a sensor. For example, a sensor might report the ambient temperature.

Box 2: Property

The template can provide a writeable fan speed property

Properties represent point-in-time values. For example, a device can use a property to report the target temperature it's trying to reach. You can set writeable properties from IoT Central.

Box 3: Settings

Box 4: Command

You can call device commands from IoT Central. Commands optionally pass parameters to the device and receive a response from the device. For example, you can call a command to reboot a device in 10 seconds.

Reference:

<https://docs.microsoft.com/en-us/azure/iot-central/core/howto-set-up-template>

NEW QUESTION 5

- (Exam Topic 3)

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

- A. Mastered
- B. Not Mastered

Answer: A

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

NEW QUESTION 6

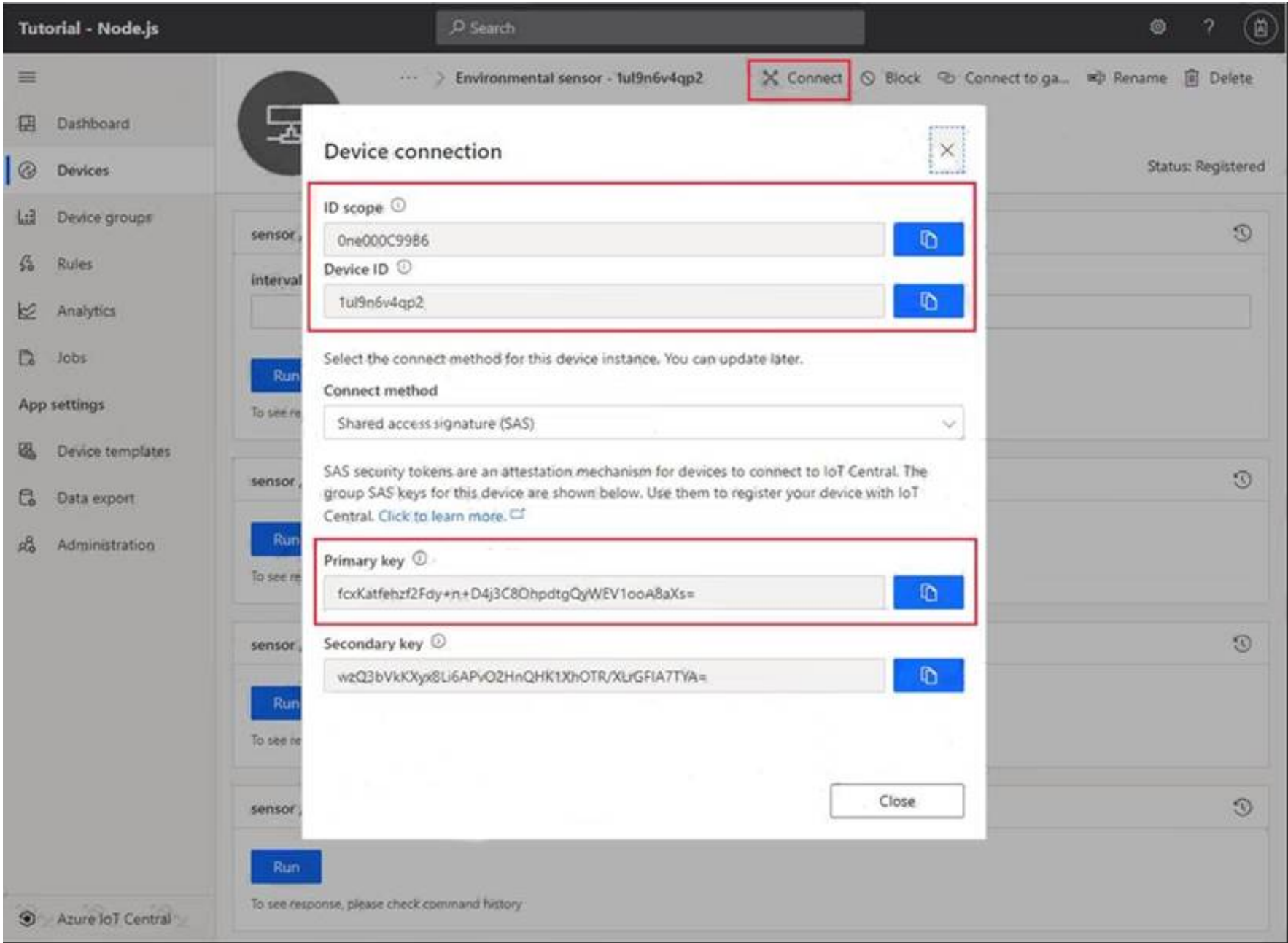
- (Exam Topic 3)
You have an Azure IoT Central application.
You need to connect an IoT device to the application.
Which two settings do you require in IoT Central to configure the device? Each correct answer presents part of the solution.
NOTE: Each correct selection is worth one point.

- A. Group SAS Primary Key
- B. the IoT hub name
- C. Scope ID
- D. Application Name
- E. Device ID

Answer: CE

Explanation:

In your Azure IoT Central application, add a real device to the device template
*1. On the Devices page, select the Environmental sensor device template.
*2. Select + New.
*3. Make sure that Simulated is Off. Then select Create.
Click on the device name, and then select Connect. Make a note of the device connection information on the Device Connection page - ID scope, Device ID, and Primary key. You need these values when you create your device code:




Reference:
<https://docs.microsoft.com/bs-cyrl-ba/azure/iot-central/core/tutorial-connect-device-python>




NEW QUESTION 7

- (Exam Topic 3)


From the Device Provisioning Service, you create an enrollment as shown in the exhibit. (Click the Exhibit tab.)



enrollment1
 Enrollment Group Details



 Save
  Refresh
  Regenerate keys

Settings
Registration Records



 You can view and update attestation information, set how you want to assign devices to hubs, define the re-provisioning policy and set the initial twin state of provisioning devices.


Attestation Type
 Symmetric Key

Primary Key

Secondary Key


 



IoT Edge device 


True

False


Select how you want to assign devices to hubs


Evenly weighted distribution
 


Select the IoT hubs this group can be assigned to: 

iothub-contoso.azure-devices.net
 

Link a new IoT hub

Select how you want device data to be handled on re-provisioning * 

Re-provision and migrate data
 

Enable entry 

Enable

Disable

You need to deploy a new IoT device.

What should you use as the device identity during attestation?

- A. a self-signed X.509 certificate
- B. the random string of alphanumeric characters
- C. the HMACSHA256 hash of the device's registration ID
- D. the endorsement key of the device's Trusted Platform Module (TPM)

Answer: C

Explanation:

Each device uses its derived device key with your unique registration ID to perform symmetric key attestation with the enrollment during provisioning. To generate the device key, use the key you copied from your DPS

enrollment to compute an HMAC-SHA256 of the unique registration ID for the device and convert the result into Base64 format.

Reference:

<https://docs.microsoft.com/en-us/azure/iot-edge/how-to-auto-provision-symmetric-keys>

NEW QUESTION 8

- (Exam Topic 3)

You have an Azure IoT hub that is being taken from prototype to production.

You plan to connect IoT devices to the IoT hub. The devices have hardware security modules (HSMs). You need to use the most secure authentication method between the devices and the IoT hub. Company policy prohibits the use of internally generated certificates. Which authentication method should you use?

- A. an X.509 self-signed certificate
- B. a certificate thumbprint
- C. a symmetric key
- D. An X.509 certificate signed by a root certification authority (CA).

Answer: D

Explanation:

Purchase X.509 certificates from a root certificate authority (CA). This method is recommended for production environments.

The hardware security module, or HSM, is used for secure, hardware-based storage of device secrets, and is the most secure form of secret storage. Both X.509 certificates and SAS tokens can be stored in the HSM

Reference:
<https://docs.microsoft.com/en-us/azure/iot-dps/concepts-security>

NEW QUESTION 9

- (Exam Topic 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.

Answer: D

Explanation:

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/>

NEW QUESTION 10

- (Exam Topic 3)
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.

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 iotedge
```

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

```
sudo systemctl restart iotedge
```

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.



- A. Mastered
- B. Not Mastered

Answer: A

Explanation:

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>

NEW QUESTION 10

- (Exam Topic 3)

You have an Azure IoT solution that includes a standard tier Azure IoT hub and an IoT device. The device sends one 100-KB device-to-cloud message every hour. You need to calculate the total daily message consumption of the device. What is the total daily message consumption of the device?

- A. 24
- B. 600
- C. 2,400
- D. 4,800

Answer: B

Explanation:

100 KB * 24 is around 2,400 bytes.

The 100 KB message is divided into 4 KB blocks, and it is billed for 25 messages. 25 times 24 is 600

Note: The maximum message size for messages sent from a device to the cloud is 256 KB. These messages are metered in 4 KB blocks for the paid tiers so for instance if the device sends a 16 KB message via the paid tiers it will be billed as 4 messages.

Reference:

<https://azure.microsoft.com/en-us/pricing/details/iot-hub/>

NEW QUESTION 12

- (Exam Topic 3)

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 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>

NEW QUESTION 14

- (Exam Topic 3)

You have an Azure IoT hub that uses a Device Provisioning Service instance to automate the deployment of Azure IoT Edge devices.

The IoT Edge devices have a Trusted Platform Module (TPM) 2.0 chip.

From the Azure portal, you plan to add an individual enrollment to the Device Provisioning Service that will use the TPM of the IoT Edge devices as the attestation mechanism.

Which detail should you obtain before you can create the enrollment.

- A. the scope ID and the Device Provisioning Service endpoint
- B. the primary key of the Device Provisioning Service shared access policy and the global device endpoint
- C. the X.509 device certificate and the certificate chain
- D. the endorsement key and the registration ID

Answer: D

Explanation:

The TPM simulator's Registration ID and the Endorsement key, are used when you create an individual enrollment for your device.

Reference:

<https://docs.microsoft.com/en-us/azure/iot-edge/how-to-auto-provision-simulated-device-linux>

NEW QUESTION 18

- (Exam Topic 3)

You develop a custom Azure IoT Edge module named temperature-module.

You publish temperature-module to a private container registry named mycr.azurecr.io

You need to build a deployment manifest for the IoT Edge device that will run temperature-module. Which three container images should you define in the manifest? Each correct answer presents part of the solution.

NOTE: Each correct selection is worth one point.

- A. mcr.microsoft.com/azureiotedge-simulated-temperature-sensor:1.0
- B. mcr.microsoft.com/azureiotedge-agent:1.0
- C. mcr.microsoft.com/iotedge-dev:2.0
- D. mycr.azurecr.io/temperature-module:latest
- E. mcr.microsoft.com/azureiotedge-hub:1.0

Answer: BDE

Explanation:

Each IoT Edge device runs at least two modules: \$edgeAgent and \$edgeHub, which are part of the IoT Edge runtime. IoT Edge device can run multiple additional modules for any number of processes. Use a deployment manifest to tell your device which modules to install and how to configure them to work together.

Reference:

<https://docs.microsoft.com/en-us/azure/iot-edge/module-composition>

NEW QUESTION 23

- (Exam Topic 3)

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 devices that connect to an Azure IoT hub. Each device has a fixed GPS location that includes latitude and longitude.

You discover that a device entry in the identity registry of the IoT hub is missing the GPS location.

You need to configure the GPS location for the device entry. The solution must prevent the changes from being propagated to the physical device.

Solution: You add the desired properties to the device twin. Does the solution meet the goal?

- A. Yes
- B. No

Answer: A

Explanation:

Device Twins are used to synchronize state between an IoT solution's cloud service and its devices. Each device's twin exposes a set of desired properties and reported properties. The cloud service populates the desired properties with values it wishes to send to the device. When a device connects it requests and/or subscribes for its desired properties and acts on them.

Reference:

<https://azure.microsoft.com/sv-se/blog/deep-dive-into-azure-iot-hub-notifications-and-device-twin/>

NEW QUESTION 27

- (Exam Topic 3)

You have an Azure IoT hub that uses a Device Provisioning Service instance.

You create a new individual device enrollment that uses symmetric key attestation.

Which detail from the enrollment is required to auto provision the device by using the Device Provisioning Service?

- A. the registration ID of the enrollment
- B. the primary key of the enrollment
- C. the device identity of the IoT hub
- D. the hostname of the IoT hub

Answer: C

Explanation:

An enrollment is the record of devices or groups of devices that may register through auto-provisioning. The enrollment record contains information about the device or group of devices, including:

the attestation mechanism used by the device

the optional initial desired configuration desired IoT hub the desired device ID

Note: Azure IoT auto-provisioning can be broken into three phases:

*1. Service configuration - a one-time configuration of the Azure IoT Hub and IoT Hub Device Provisioning Service instances, establishing them and creating linkage between them.

*2. Device enrollment - the process of making the Device Provisioning Service instance aware of the devices that will attempt to register in the future. Enrollment is accomplished by configuring device identity information in the provisioning service, as either an "individual enrollment" for a single device, or a "group enrollment"

for multiple devices.

*3. Device registration and configuration Reference:

<https://docs.microsoft.com/en-us/azure/iot-dps/concepts-service#enrollment>

NEW QUESTION 28

- (Exam Topic 3)

You have an Azure IoT Edge device.

You need to modify the credentials used to access the container registry. What should you modify?

- A. the @edgeHub module twin
- B. the IoT Edge module
- C. the \$edgeAgent module twin
- D. the Azure IoT Hub device twin

Answer: C

Explanation:

The module twin for the IoT Edge agent is called \$edgeAgent and coordinates the communications between the IoT Edge agent running on a device and IoT Hub. The desired properties are set when applying a deployment manifest on a specific device as part of a single-device or at-scale deployment.

These properties include: runtime.settings.registryCredentials.{registryId}.username runtime.settings.registryCredentials.{registryId}.password

Reference:

<https://docs.microsoft.com/en-us/azure/iot-edge/module-edgeagent-edgehub>

NEW QUESTION 31

- (Exam Topic 3)

You have an Azure IoT solution that includes an Azure IoT Hub named Hub1 and an Azure IoT Edge device named Edge1. Edge1 connects to Hub1.

You need to deploy a temperature module to Edge1. What should you do?

- A. From the Azure portal, navigate to Hub1 and select IoT Edg
- B. Select Edge1, and then select Manage Child Device
- C. From a Bash prompt, run the following command:az iot edge set-modules -device-id Edge1 -hub-name Hub1 -content C:\deploymentMan1.json
- D. Create an IoT Edge deployment manifest that specifies the temperature module and the route to\$upstrea
- E. From a Bush prompt, run the following command: az iot hub monitor-events-device-id Edge1 -hub-name Hub1
- F. From the Azure portal, navigate to Hub1 and select IoT Edg
- G. Select Edge1, select Device Twin, and then set the deployment manifest as a desired propert
- H. From a Bash prompt, run the following commandaz iot hub monitor-events-device-id Edge1 -hub-name Hub1
- I. Create an IoT Edge deployment manifest that specifies the temperature module and the route to\$upstrea
- J. From a Bush prompt, run the following command:az iot edge set-modules -device-id Edge1 -hub-name Hub1 -content C:\deploymentMan1.json

Answer: D

Explanation:

You deploy modules to your device by applying the deployment manifest that you configured with the module information.

Change directories into the folder where your deployment manifest is saved. If you used one of the VS Code IoT Edge templates, use the deployment.json file in the config folder of your solution directory and not the deployment.template.json file.

Use the following command to apply the configuration to an IoT Edge device:

az iot edge set-modules --device-id [device id] --hub-name [hub name] --content [file path] Reference: <https://docs.microsoft.com/en-us/azure/iot-edge/how-to-deploy-modules-cli>

NEW QUESTION 36

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