

Exam Questions AZ-220

Microsoft Azure IoT Developer

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NEW QUESTION 1

- (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 2

- (Exam Topic 1)

You plan to deploy Azure Time Series Insights.

What should you create on `iothub1` before you deploy Time Series Insights?

- A. a new message route
B. a new consumer group
C. a new shared access policy
D. an IP filter rule

Answer: B

Explanation:

Create a dedicated consumer group in the IoT hub for the Time Series Insights environment to consume from. Each Time Series Insights event source must have its own dedicated consumer group that isn't shared with any other consumer. If multiple readers consume events from the same consumer group, all readers are likely to exhibit failures.

Reference:

<https://docs.microsoft.com/en-us/azure/time-series-insights/time-series-insights-how-to-add-an-event-source- iotHub>

NEW QUESTION 3

- (Exam Topic 1)

You need to use message enrichment to add additional device information to messages sent from the IoT gateway devices when the reported temperature exceeds a critical threshold.

How should you configure the enrich message values? To answer, select the appropriate options in the answer area.

NOTE: Each correct selection is worth one point.

Answer Area

| | |
|------------------|----------------------|
| Stiothubname | desired.pressure |
| Stwin | fanSpeed.reported |
| Stwin.properties | reported.fanSpeed |
| Stwin.results | temperature |
| Stwin.tags | temperature.reported |

- A. Mastered
B. Not Mastered

Answer: A

Explanation:

Reference:

<https://docs.microsoft.com/bs-cyrl-ba/azure/iot-hub/iot-hub-message-enrichments-overview>

NEW QUESTION 4

- (Exam Topic 1)

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.

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 |

- A. Mastered
- B. Not Mastered

Answer: A

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={YourShared Box 1: device1

Device1 has a primary key of Uihuih76hbHb. Reference:

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

NEW QUESTION 5

- (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:

| |
|-------------|
| Command |
| Measurement |
| Properties |
| Settings |

Configure the desired fan speed:

| |
|-------------|
| Command |
| Measurement |
| Properties |
| Settings |

Read the fan serial number:

| |
|-------------|
| Command |
| Measurement |
| Properties |
| Settings |

Run the device reset routine:

| |
|-------------|
| Command |
| Measurement |
| Properties |
| Settings |

- 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 6

- (Exam Topic 3)

You have an Azure IoT solution that includes several Azure IoT hubs.

A new alerting feature was recently added to the IoT devices. The feature uses a new device twin reported property named alertCondition.

You need to send alerts to an Azure Service Bus queue named MessageAlerts. The alerts must include alertCondition and the name of the IoT hub.

Which two actions should you perform? Each Answer presents part of the solution. NOTE: Each correct selection is worth one point.

- A. Configure File upload for each IoT hu
- B. Configure the device to send a file to an Azure Storage container that contains the device name and status message.
- C. Add the following message enrichments: Name = iotHubNameValue = \$twin.tag.location Endpoint = MessageAlert
- D. Create an IoT Hub routing rule that has a data source of Device Twin Change Events and select the endpoint for MessageAlerts.
- E. Add the following message enrichments: Name = iotHubName Value = \$iothubnameEndpoint = MessageAlert
- F. Create an IoT Hub routing rule that has a data source of Device Telemetry Messages and select the endpoint for MessageAlerts.

Answer: BD

Explanation:

B: Message enrichments is the ability of the IoT Hub to stamp messages with additional information before the messages are sent to the designated endpoint. One reason to use message enrichments is to include data that can be used to simplify downstream processing. For example, enriching device telemetry messages with

a device twin tag can reduce load on customers to make device twin API calls for this information. D: Applying enrichments

The messages can come from any data source supported by IoT Hub message routing, including the following examples:

-->device twin change notifications -- changes in the device twin device telemetry, such as temperature or pressure

device life-cycle events, such as when the device is created or deleted Reference:

<https://docs.microsoft.com/en-us/azure/iot-hub/iot-hub-message-enrichments-overview>

NEW QUESTION 7

- (Exam Topic 3)

You have an existing Azure IoT hub.

You need to connect physical IoT devices to the IoT hub.

You are connecting the devices through a firewall that allows only port 443 and port 80.

Which three communication protocols can you use? Each correct answer presents a complete solution. NOTE: Each correct selection is worth one point.

- A. MQTT over WebSocket
- B. AMQP
- C. AMQP over WebSocket
- D. MQTT
- E. HTTPS

Answer: ACE

Explanation:

MQTT over WebSockets, AMQP over WebSocket, and HTTPS use port 443. Reference:

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

NEW QUESTION 8

- (Exam Topic 3)

You have 10 IoT devices that connect to an Azure IoT hub named Hub1.

From Azure Cloud Shell, you run `az iot hub monitor-events --hub-name Hub1` and receive the following error message: "az iot hub: 'monitor-events' is not in the 'az iot hub' command group. See 'az iot hub

--help'."

You need to ensure that you can run the command successfully. What should you run first?

- A. `az iot hub monitor-feedback --hub-name Hub1`
- B. `az iot hub generate-sas-token --hub-name Hub1`
- C. `az iot hub configuration list --hub-name Hub1`
- D. `az extension add -name azure-cli-iot-ext`

Answer: D

Explanation:

Execute `az extension add --name azure-cli-iot-ext` once and try again.

In order to read the telemetry from your hub by CLI, you have to enable IoT Extension with the following commands:


Add: `az extension add --name azure-cli-iot-ext` Reference:




<https://github.com/MicrosoftDocs/azure-docs/issues/20843>

NEW QUESTION 9


- (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 10

- (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 tags to the device twin. Does the solution meet the goal?

- A. Yes
- B. No

Answer: B

Explanation:

Instead add the desired properties to the device twin.

Note: 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 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

- 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.

Answer Area



- 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/iotedgedge/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 iotedgedge`

Reference:

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

NEW QUESTION 13

- (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 16

- (Exam Topic 3)

You have 1,000 devices that connect to a standard tier Azure IoT hub.

All the devices are commissioned and send telemetry events to the built-in IoT Hub endpoint. You configure message enrichment on the events endpoint and set the enrichment value to \$twin.tags.ipV4.

When you inspect messages on the events endpoint, you discover that all the messages are stamped with a string of "\$twin.tags.ipV4".

What are two possible causes of the issue? Each Answer presents a complete solution. NOTE: Each correct selection is worth one point.

- A. The ipV4 tag is a restricted twin property that is unavailable for message enrichment.
- B. A standard tier IoT hub does not support device twin properties in message enrichments.
- C. The device sending the message has no device twin.
- D. Message enrichment cannot be added to messages going to a built-in endpoint.
- E. The device twin path used for the value of the enrichment does not exist.
- F. The device twin property value used for message enrichment is set to "\$twin.tags.ipV4".

Answer: CE

Explanation:

In some cases, if you are applying an enrichment with a value set to a tag or property in the device twin, the value will be stamped as a string value. For example, if an enrichment value is set to \$twin.tags.field, the messages will be stamped with the string "\$twin.tags.field" rather than the value of that field from the twin.

This happens in the following cases:

(C) Your IoT Hub is in the standard tier, but the device sending the message has no device twin.

(E) Your IoT Hub is in the standard tier, but the device twin path used for the value of the enrichment does not exist. For example, if the enrichment value is set to \$twin.tags.location, and the device twin does not have a location property under tags, the message is stamped with the string "\$twin.tags.location".

Your IoT Hub is in the basic tier. Basic tier IoT hubs do not support device twins. Reference:

<https://docs.microsoft.com/en-us/azure/iot-hub/iot-hub-message-enrichments-overview>

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/iotedgedev: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.

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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 24

- (Exam Topic 3)

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.

A. Upload Sensors.csv by using the IoT Hub REST API.

B. From the Azure subscription, select the IoT hub, select Message routing, and then configure a route to storage.

C. From the Azure subscription, select the IoT hub, select File upload, and then configure a storage container.

D. 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}"
}
```

Reference:

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

NEW QUESTION 29

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