

# **Microsoft Certified: Azure IoT Developer Specialty – Skills Measured**

## **Implement the IoT solution infrastructure (15-20%)**

### **Create and configure an IoT Hub**

- create an IoT Hub
- register a device
- configure a device twin
- configure IoT Hub tier and scaling

### **Build device messaging and communication**

- build messaging solutions by using SDKs (device and service)
- implement device-to-cloud communication
- implement cloud-to-device communication
- configure file upload for devices

### **Configure physical IoT devices**

- recommend an appropriate protocol based on device specifications
- configure device networking, topology, and connectivity

## **Provision and manage devices (20-25%)**

### **Implement the Device Provisioning Service (DPS)**

- create a Device Provisioning Service
- create a new enrollment in DPS
- manage allocation policies by using Azure Functions
- link an IoT Hub to the DPS

### **Manage the device lifecycle**

- provision a device by using DPS
- deprovision an autoenrollment
- decommission (disenroll) a device

### **Manage IoT devices by using IoT Hub**

- manage devices list in the IoT Hub device registry
- modify device twin tags and properties
- trigger an action on a set of devices by using IoT Hub Jobs and Direct Methods
- set up Automatic Device Management of IoT devices at scale

### **Build a solution by using IoT Central**

- define a device type in Azure IoT Central
- configure rules and actions in Azure IoT Central
- define the operator view
- add and manage devices from IoT Central
- monitor devices

## **Implement Edge (15-20%)**

### **Set up and deploy an IoT Edge device**

- create a device identity in IoT Hub
- deploy a single IoT device to IoT Edge
- create a deployment for IoT Edge devices
- install container runtime on IoT devices
- define and implement deployment manifest
- update security daemon and runtime

### **Develop modules**

- create and configure an Edge module
- deploy a module to an Edge device
- publish an IoT Edge module to an Azure Container Registry

### **Configure an IoT Edge device**

- select and deploy an appropriate gateway pattern
- implement module-to-module communication
- implement and configure offline support

## **Process and manage data (15-20%)**

### **Configure routing in Azure IoT Hub**

- implement message enrichment in IoT Hub
- configure routing of IoT Device messages to endpoints
- define and test routing queries
- integrate with Event Grid

### **Configure stream processing**

- create ASA for data and stream processing of IoT data
- process and filter IoT data by using Azure Functions
- configure Stream Analytics outputs

### **Configure an IoT solution for Time Series Insights (TSI)**

- implement solutions to handle telemetry and time-stamped data
- create an Azure Time Series Insights (TSI) environment
- connect the IoT Hub and the Time Series Insights (TSI)

## **Monitor, troubleshoot, and optimize IoT solutions (15-20%)**

### **Configure health monitoring**

- configure metrics in IoT Hub
- set up diagnostics logs for Azure IoT Hub
- query and visualize tracing by using Azure monitor

### **Troubleshoot device communication**

- establish maintenance communication
- verify device telemetry is received by IoT Hub
- validate device twin properties, tags and direct methods
- troubleshoot device disconnects and connects

### **Perform end-to-end solution testing and diagnostics**

- estimate the capacity required for each service in the solution
- conduct performance and stress testing
- set up device D2C message tracing by using Azure Distributed Tracing

## **Implement security (15-20%)**

### **Implement device authentication in the IoT Hub**

- choose an appropriate form of authentication
- manage the X.509 certificates for a device
- manage the symmetric keys for a device

### **Implement device security by using DPS**

- configure different attestation mechanisms with DPS

- generate and manage x.509 certificates for IoT Devices
- configure enrollment with x.509 certificates
- generate a TPM endorsements key for a device
- configure enrollment with symmetric keys

### **Implement Azure Security Center (ASC) for IoT**

- enable ASC for IoT in Azure IoT Hub
- create security modules
- configure custom alerts