Microsoft Certified: Azure IoT Developer Specialty – Skills Measured

This document contains the skills measured on the exams associated with this certification. It does not include any upcoming or recent changes that have been made to those skills. For more information about upcoming or recent changes, see the associated exam details page(s).

NOTE: The bullets that follow each of the skills measured are intended to illustrate how we are assessing that skill. This list is NOT definitive or exhaustive.

NOTE: Most questions cover features that are general availability (GA). The exam may contain questions on Preview features if those features are commonly used.

Exam AZ-220: Microsoft Azure IoT Developer

Set up the IoT Solution Infrastructure (10-15%)

Create and configure an Azure 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
- optimize message size and scaling
- connect to IoT Hub using TLS server certificates

Configure physical IoT devices

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

Provision and Manage Devices (15-20%)

Set up Device Provisioning Service (DPS)
• create a Device Provisioning Service
• create a new enrollment in DPS
• 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
• configure a set of devices by using IoT Hub Automatic Device Management
• trigger an action on a set of devices by using IoT Hub Jobs and Direct Methods
• implement a device firmware update process by using device management primitives
• configure module identities

**Manage IoT devices by using Azure IoT Central**

• create a custom device template by using Azure IoT Central
• configure rules and actions in Azure IoT Central
• customize the operator view
• add and manage devices from IoT Central
• troubleshoot device connections and data mapping
• create an application based on an app template for an industry vertical
• export a custom application template
• create and manage a new application based on a custom application template
• upgrade and version a device template
• run IoT Central jobs
• interact with IoT Central devices using the REST APIs

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

**Set up an IoT Edge device**

• create a device identity in IoT Hub
• set up an IoT device for IoT Edge
• select and install container runtime on IoT devices
• implement module access to the host system
• update IoT Edge runtime
• provision IoT Edge devices by using DPS
Deploy an IoT Edge device

- create and implement a deployment manifest
- create a deployment for a single IoT Edge device
- create a deployment to target multiple devices
- create a continuous deployment by using Azure DevOps

Develop IoT Edge modules

- create and customize an Edge module
- deploy a custom IoT Edge module to an Edge device
- deploy an IoT Edge module from the Azure Marketplace to an Edge device
- publish an IoT Edge module to an Azure Container Registry
- define module configuration
- configure IoT Edge module routing
- configure environment for IoT Edge development; debug Edge modules in development environment

Configure an IoT Edge device

- select an appropriate gateway pattern
- deploy an IoT gateway by using IoT Hub and IoT Edge
- configure IoT Edge certificates
- implement and configure offline support (including local storage)
- create a layered hierarchy of IoT Edge devices

Implement Business Integration (5-10%)

Integrate with upstream and downstream systems

- set up input and output connections
- set up IoT Hub routing for triggering workflows
- test data interface integration
- integrate third-party solutions
- configure workflows, including rules and alerts

Develop Azure Digital Twins (ADT) solutions

- create ADT models and digital twins
- map IoT device data to ADT models and relationships
- ingest IoT device messages and translate messages to ADT
- configure routes and endpoints to trigger business logic and data processing
- query the ADT graph
• update properties on ADT entities in the graph
• monitor and troubleshoot ADT

**Process and Manage Data (15-20%)**

**Configure message routing in Azure IoT Hub**

• implement message enrichment in IoT Hub
• implement routing of IoT device messages to endpoints
• define and test routing queries
• configure IoT Hub as an Event Grid source
• reconfigure the default EventHub endpoint when there are multiple endpoints

**Configure stream processing of IoT data**

• create ASA for data and stream processing of IoT data
• process and filter IoT data by using Azure Functions
• write user-defined functions and aggregations in ASA
• consume Azure Machine Learning functions in ASA
• configure Stream Analytics outputs

**Create ASA queries**

• write an ASA query that runs in the IoT Edge
• write an ASA query that runs in the cloud

**Process real-time data by using Time Series Insights (TSI)**

• create a TSI environment
• connect the IoT Hub and the TSI environment
• create a reference data set for a TSI environment by using the Azure portal
• implement Time Series model hierarchies, types, and instance fields
• consume data by using Time Series Expression syntax

**Monitor, Troubleshoot, and Optimize IoT Solutions (15-20%)**

**Configure health monitoring**

• configure metrics in IoT Hub
• set up diagnostics logs for Azure IoT Hub
• configure IoT Hub scaling (SKUunit) programmatically
• query and visualize tracing by using Azure Monitor
• apply Azure Policy definitions for IoT Hub
• gather IoT Edge metrics
• retrieve diagnostics from Azure IoT Edge

Troubleshoot device communication

• establish maintenance communication by using RDP or SSH
• establish maintenance communication by using Device Streams
• verify device telemetry is received by IoT Hub
• validate device twin properties, tags and direct methods
• troubleshoot device disconnects and connects
• troubleshoot IoT Edge devices

Ensure performance and availability

• identify and resolve bottlenecks
• calculate capacity requirements for each service
• create a simulated fleet of devices for performance and stress testing
• troubleshoot message loss
• test manual failover

Implement Security (10-15%)

Implement security for IoT devices and services

• implement device and gateway security
• ensure secure connections

Implement Azure Defender for IoT

• configure an Azure Defender for IoT agent-based solution
• implement Defender-IoT-micro-agents (security agents)
• configure built-in and custom alerts for IoT Hub