

Exam AZ-220: Microsoft Azure IoT Developer

Introduction

Microsoft Azure IoT Developer (Exam AZ-220) certification examination is ideal for individuals who want to gain subject matter expertise developing cloud and edge components of an Azure IoT solution. The AZ-220 exam successfully measures the student's ability to implement the IoT solution infrastructure; provision and manage devices; implement solutions on Azure IoT Edge devices; process and manage data; monitor, troubleshoot, and optimize IoT solutions; and implement security. With Certbazar's exclusive training course, candidates will also get a deep understanding of deploying Azure IoT Edge components and configuring device networking on the edge.

Course Outline

MODULE 1: 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

MODULE 2: 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

MODULE 3: 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 the environment for IoT Edge development; debug Edge modules in a 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)

MODULE 4: 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

MODULE 5: 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

MODULE 6: 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

MODULE 7: 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

Prerequisites

- Candidates who wish to take up the Microsoft Azure IoT Developer AZ-220 certification exam should have a basic awareness of cloud solutions in the form of IaaS, PaaS, SaaS.
- Participants should have fundamental software development experience.
- One should also have experience in data processing, which includes data storage.

Target Audience

The Azure IoT Developer implements the configuration and performs coding tasks required to create and maintain the cloud and edge portions of an IoT solution. In addition to configuring and maintaining the devices by using cloud services, the IoT Developer also sets up the physical devices. The IoT Developer is responsible for maintaining and troubleshooting the configuration of the devices throughout the life cycle.

The IoT Developer implements design specifications for IoT solutions, including device topology, connectivity, diagnostics and monitoring, and security. The IoT Developer develops and deploys modules and configures device networking for the IoT Edge portion of the solution. The IoT Developer implements designs for solutions to manage data pipelines, including monitoring and data transformation as it relates to IoT. The IoT Developer works with the Azure IoT Architect, data engineers, and other stakeholders to ensure successful business integration.

IoT Developers should have a general understanding of device types and Azure services, including data storage options, data analysis, data processing, AI, and other Platform-as-a service options. IoT Developers must be able to program in at least one Azure IoT SDKsupported language.

Duration

32 Hours