Microsoft Azure IoT Developer

This course provides students with the skills and knowledge required to successfully create and maintain the cloud and edge portions of an Azure IoT solution. The course includes full coverage of the core Azure IoT services such as IoT Hub, Device Provisioning Services, Azure Stream Analytics, Time Series Insights, and more. In addition to the focus on Azure PaaS services, the course includes sections on IoT Edge, device management, monitoring and troubleshooting, security concerns, Azure Digital Twins, and Azure IoT Central.

Duration: 4 days

Audience

The Azure IoT Developer is responsible for the implementation and the coding required to create and maintain the cloud and edge portion of an IoT solution. In addition to configuring and maintaining devices by using Azure IoT services and other Microsoft tools, the IoT Developer also sets up the physical devices and is responsible for maintaining the devices throughout the life cycle. The IoT Developer implements designs for IoT solutions, including device topology, connectivity, debugging and security. For Edge device scenarios, the IoT Developer also deploys compute/containers and configures device networking, which could include various edge gateway implementations. 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 data engineers and other stakeholders to ensure successful business integration. IoT Developers should have a good understanding of Azure services, including data

storage options, data analysis, data processing, and the Azure IoT PaaS versus SaaS options. IoT Developers should have basic programming skills in at least one Azure-supported language, including C#, Node.js, C, Python, or Java.

Prerequisites

To be successful in this course, learners should have the following:

- Cloud Solution Awareness: Students should have experience using the Azure Portal and a basic understanding of PaaS, SaaS, and IaaS implementations.
- Software Development Experience: Software development experience is a prerequisite for this course, but no specific software language is required, and the experience does not need to be at a professional level.
- Data Processing Experience: General understanding of data storage and data processing is a recommended but not required.
- Free online: Azure Fundamentals (https://docs.microsoft.com/en-us/learn/paths/azure-fundamentals/)
- Instructor-led course: AZ-900: Azure Fundamentals

Objetives

- Create, configure, and manage an Azure IoT hub.
- Provision devices by using IoT Hub and DPS, including provisioning at scale.
- Establish secure 2-way communication between devices and IoT Hub.
- Implement message processing by using IoT Hub routing and Azure Stream Analytics.
- Configure the connection to Time Series Insights and support business integration requirements.
- Implement IoT Edge scenarios using marketplace modules and various edge gateway patterns.
- Implement IoT Edge scenarios that require developing and deploying custom modules and containers.
- Implement device management using device twins and direct methods.
- Implement solution monitoring, logging, and diagnostics testing.

- Recognize and address security concerns and implement Azure Security Center for IoT.
- Build an Azure Digital Twins solution that integrates upstream and downstream services.
- Build an IoT Solution by using Azure IoT Central and recognize SaaS opportunities for IoT.

Topics

Module 1: Introduction to IoT and Azure IoT Services

- Business Opportunities for IoT
- Introduction to IoT Solution Architecture
- IoT Hardware and Cloud Services
- Lab Scenarios for this Course

Module 2: Devices and Device Communication

- IoT Hub and Devices
- IoT Developer Tools
- Device Configuration and Communication

Module 3: Device Provisioning at Scale

- Device Provisioning Service Terms and Concepts
- Configure and Manage the Device Provisioning Service
- Device Provisioning Tasks

Module 4: Message Processing and Analytics

- Messages and Message Processing
- Data Storage Options
- Azure Stream Analytics

Module 5: Insights and Business Integration

- Business Integration for IoT Solutions
- Data Visualization with Time Series Insights
- Data Visualization with Power BI

Module 6: Azure IoT Edge Deployment Process

- Introduction to Azure IoT Edge
- Edge Deployment Process
- Edge Gateway Devices

Module 7: Azure IoT Edge Modules and Containers

- Develop Custom Edge Modules
- Offline and Local Storage

Module 8: Device Management

- Introduction to IoT Device Management
- Manage IoT and IoT Edge Devices
- Device Management at Scale

Module 9: Solution Testing, Diagnostics, and Logging

- Monitoring and Logging
- Troubleshooting

Module 10: Azure Security Center and IoT Security Considerations

- Security Fundamentals for IoT Solutions
- Introduction to Azure Security Center for IoT
- Enhance Protection with Azure Security Center for IoT Agents

Module 11: ADT

- Introduction to Azure Digital Twins
- Introduction to ADT solution development
- Monitor and troubleshoot ADT

Module 12: Build an IoT Solution with IoT Central

- Introduction to IoT Central
- Create and Manage Device Templates
- Manage Devices in Azure IoT Central