

Purpose

This document is for Microsoft Certified Trainers teaching the AZ-220 Microsoft Azure IoT Developer course.

Microsoft Azure IoT Developer Role (Specialty)

A Job Task Analysis (JTA) was conducted for the Azure IoT Developer role in June 2019. The results of that JTA identified the main tasks for an Azure IoT Developer. Those tasks formed the basis for the AZ-220: Microsoft Azure IoT Developer exam and the topics covered in the AZ-220 course.

AZ-220 certification exam

This exam measures your ability to accomplish the technical tasks listed below. The percentages indicate the relative weight of each major topic area on the exam. The higher the percentage, the more questions you are likely to see on that content area on the exam.

AZ-220 Study Areas	Percentage
Implement the IoT Solution Infrastructure	15-20%
Provision and Manage Devices	20-25%
Implement Edge	15-20%
Process and Manage Data	15-20%
Monitor, Troubleshoot, and Optimize IoT Solutions	15-20%
Implement Security	15-20%

Azure IoT Developer Course

The technical scope of the Azure IoT Developer course is aligned with the scope defined by certification exam (the published objective domain) and the areas of study.

Program Offerings

The Azure IoT Developer course is intended as a 4-day course.

- **Individually.** The course is designed to be taught standalone.

- **Certification preparation.** The courses can be bundled to support preparing for the certification exam.
- **Custom.** The course modules can be grouped to create an entirely new course or workshop.

Course Design

The course is designed to support the certification study areas, but other content is occasionally included to provide context and job skills.

Preparing to Teach

In the next sections we will cover the main course components and how they can be used in class. This includes PowerPoint slides, videos (if/when any are included), module review questions, reference links, and practice exercises. There is a lot of flexibility in how you use this content to create the best learning experience for your students.

It's important as a trainer to understand that this course is targeting the **Azure IoT Developer** role, not a general IoT Developer role. This means that there are topics such as the mechanics of flash updates that are not in scope as per the JTA. Similarly, this means that although the course touches on architecture topics, because a developer needs to be able to work with an architect and be able to contribute to the architecture of a solution, this is not an architecture course.

Ultimately, it's expected that course attendance will include not only developers, but also architects, low-level/embedded device programmers, and data analysts, although this course is not focused on those roles. As a trainer, you may need to manage expectations around what is and is not in the course due to this reality, and should be prepared to cater your presentation to all of these roles and recognize those roles as you proceed.

PowerPoint Slides

PowerPoint slides are provided to help you teach the course. But if you simply read the slide you will not have enough content to fill the scheduled time. Be sure to go through the materials in the main content for the course to ensure you're covering things fully.

- There is a Module 00 PowerPoint file. This includes an agenda, listing modules and lessons for the course. We recommend you customize this file for your

specific situation. For example, you could modify the introduction slides and overview of the classroom facilities.

- Additionally, each module within the course has a separate PowerPoint file. These slides were designed to supplement the student materials. You should review how the topics are presented to the student versus how the slides are organized. You can customize the slides to make your presentation more interesting.
- The PowerPoint files may include slides that are designated as potential demonstration opportunities or include instructor notes that identify when a supporting demo is available in GitHub. When reviewing the slides look for opportunities to provide demonstrations for your class. It is worth noting that this course includes a good deal of hands-on guidance, combined with additional technical information, to create a richer learning experience for the student. This information should be leveraged during your presentation.
- The goal is to have every slide be directly traceable back to the corresponding SkillPipe in relative order, with many slides deliberately not going into detail but instead referring the student to the SkillPipe where appropriate. Early releases will meet this goal more loosely as we continue to revise the presentation order and make updates to corresponding SkillPipe topics.

Videos

We do not have videos in the courses.

Module Review Questions

Module review questions are provided at the end of the module. Note these questions are not at the level of the certification exam. You may wish to supplement with questions of your own choosing.

You can use these review questions in several ways:

- As a group, go through the questions before moving on to another section.
- Sprinkle the questions into the content as you cover the appropriate material.

Reference Links

The course content includes links to reference materials. The main reason for this is the Azure documentation is constantly being updated.

- Before you teach the course, use the reference links to validate the content is still current. Pay attention to capabilities and limits. For example, preview features and virtual machine sizes.
- Let students know they can use the reference links after the course to review and confirm what they learned.

You will need to decide how to use the documentation and the reference links. Teaching from the documentation is a new concept in this series of courses. When you leave the slide deck, how will you get students focused back on the course?

Azure Subscriptions

To complete the labs and any additional practice exercises in this course, students need an Azure Subscription. The recommended way to give students access to Azure is by requesting Microsoft Learning Azure Passes.

You can [request Microsoft Learning Azure Passes](#) for yourself and your students. Ensure that you request these passes at least two weeks before the class starts. After receiving the passes each student will need to activate their pass.

✓ It is very important you ensure students activate their passes before class. You don't want to lose time configuring the passes.

✓ It is also important you ensure the Azure pass can be used for the practice exercises. The pass effectively functions in the same way as the [publicly available Microsoft Azure Trial Subscription](#). This means there are limitations on what you can do with the pass.

Labs

There are labs provided for each module of the course. The lab instructions are available in the [Microsoft Learning GitHub](#) repository. In addition to the lab instructions, any supplemental files, like scripts and templates, are also provided. In GitHub there is a single repository (<https://github.com/MicrosoftLearning/AZ-220-Microsoft-Azure-IoT-Developer> and <https://aka.ms/az220labs>) that supports all lab and demo materials.

To complete the labs, you will need an internet connection to the Azure portal. If you prefer a hosted environment, any PC capable of running the latest version of Windows 10 should work.

You can choose to have students do the labs at the end of the modules, closer to the corresponding lecture, or wherever you determine it makes the most sense for a particular group of students.

Labs are designed to be generally independent, meaning that a student can pick and choose which labs to complete. Each lab also has a script available to create the necessary prerequisite resources; this is because the students create an IoT Hub and DPS instance early in the labs, and those same instances are used throughout. The starter script will create those for them. The lab steps refer to this as the first exercise of each lab.

Note that currently, there is no Lab 18. This is a deliberate decision as a lab is being created that belongs there in the flow. When it's ready, it will be in the GitHub repository listed above.

Students that are not developers may find the labs a bit more difficult to complete. Time management in the labs will be a critical part of being successful for this course, which means that you may need to adjust expectations around lab completion for some students.

You should consider having a completed set of all lab outputs available – all Azure resources and completed code – because as you present materials, you may find the lab implementations useful for demoing concepts, especially early in the course life while scripted demos are being created. This will also help students connect the presentation to the labs.

Portal, Cloud Shell, VS Code, and the CLI

Throughout the course there are many examples and instructions that rely on using the Portal, Cloud Shell, VS Code and the Azure CLI. If you're having your students follow along with any of the demonstrations, you can have your students access those tools through the course VM.

Other things to think about:

- Ask the students which tools they prefer, so you can offer to demo activities using that method.
- You may want to ensure that your instructor machine has the tools installed locally, which is likely to be faster than using the VM. This way you can use them to quickly view any scripts and show students how to construct the commands.

Additional Practice Exercises

This course will include numerous potential practice exercises in the form of instructor demos. As mentioned in the PowerPoint section above, demo steps are not listed in the SkillPipe content, but they will be available in GitHub. Read the prerequisites closely and personally try each demo to evaluate how you might want to use them. Here are a few suggested ways to use that content:

- You could walk through the steps as a class demonstration.
- You could schedule time for the students to complete the steps as practices.
- You could invite students to demonstrate different parts of the practice and go through as a group.

Course Content Overlap

Some terms and concepts are introduced earlier in the course and then drilled down into later. This results in some intentional overlap.

Course Timing

The course content is designed to take approximately four days to complete. This will depend on how you teach the course. For example, if you have the students follow along during the demo activities, it could be a five-day course.

Resources

There are a lot of resources to help you and the student learn about Azure IoT services. We recommend you bookmark these pages and offer the list to your students.

- Azure IoT Fundamentals - <https://docs.microsoft.com/en-us/azure/iot-fundamentals/> . The Azure IoT documentation page provides links to lots of resources.

- Azure IoT Products - <https://azure.microsoft.com/en-us/product-categories/iot/> . The Azure IoT Products page provides links to product pages.
- Azure IoT Reference Architecture - <https://docs.microsoft.com/en-us/azure/architecture/reference-architectures/iot/> . This reference architecture shows a recommended architecture for IoT applications on Azure using PaaS (platform-as-a-service) components.
- Building IoT solutions with Azure: a developer's guide - <https://discover.microsoft.com/azure-iot-building-solutions-dev-guide/>. This guide provides an overview of Azure services that address key IoT solution requirements, as well as a step-by-step progression you can use to build proficiency and move toward a fully functioning solution quickly and easily.
- [Channel 9](#). Channel 9 provides a wealth of informational videos, shows, and events.
- [Microsoft Azure Blog](#). Keep current on what's happening in Azure, including what's now in preview, generally available, news & updates, and more.
- [Azure Newsletter](#). Stay informed on the latest Azure features, events, and community activities. Browse through past newsletters or subscribe and get the latest Azure news delivered to your inbox.

Connect with others

[MCT Central](#) – Your one stop for all things MCT. Stay up to date with the latest MCT news, learn about upcoming events, find job opportunities, or connect with other MCTs around the world. You can also ask questions and discuss a variety of topics including courseware and certification with Microsoft and other MCTs through the MCT Central Forums.

[MOC Courseware Support](#) – If there are problems with a course or you need to log a support ticket, contact the Official Support channel for MOC courses. This channel is monitored by support agents and is the quickest way to log your course support issue.

Feedback

These courses are different from the traditional MOC courses that have been provided in the past. We have provided a framework for you to work with. Take time to prepare

and think about the value that only an instructor can bring to training. We hope to partner with you to provide an exceptional student experience and we welcome your feedback.

Happy learning!