Azure Architect Role (AZ-301)

A Job Task Analysis (JTA) was conducted for the Azure Solutions Architect role in May 2018. The results of that JTA identified the main tasks for an Azure Solutions Architect. These tasks are based on the definition of the Azure Solutions Architect role.

When students ask why some areas are being covered for this role and other areas are not, refer them to this role definition. Remember there are other roles, such as Azure DevOps, Azure Developer, and Azure Administrator.

> An Azure Solution Architect advises stakeholders and translates business requirements into secure, scalable, and reliable solutions.
>
> Azure Solution Architects have advanced experience and knowledge across various aspects of IT operations, including networking, virtualization, identity, security, business continuity, disaster recovery, data management, budgeting, and governance. This role requires managing how decisions in each area affects an overall solution.
>
> Azure Solution Architects must be proficient in Azure administration, Azure development, and DevOps, and have expert-level skills in at least one of those domains.

Certification Exams

Certification exams measure your ability to accomplish certain technical tasks for a job role. The study areas are based on the JTA that was conducted for the role.

Each study area has a percentage indicating the relative weight of the area on the exam. The higher the percentage, the more questions you are likely to see in that area.

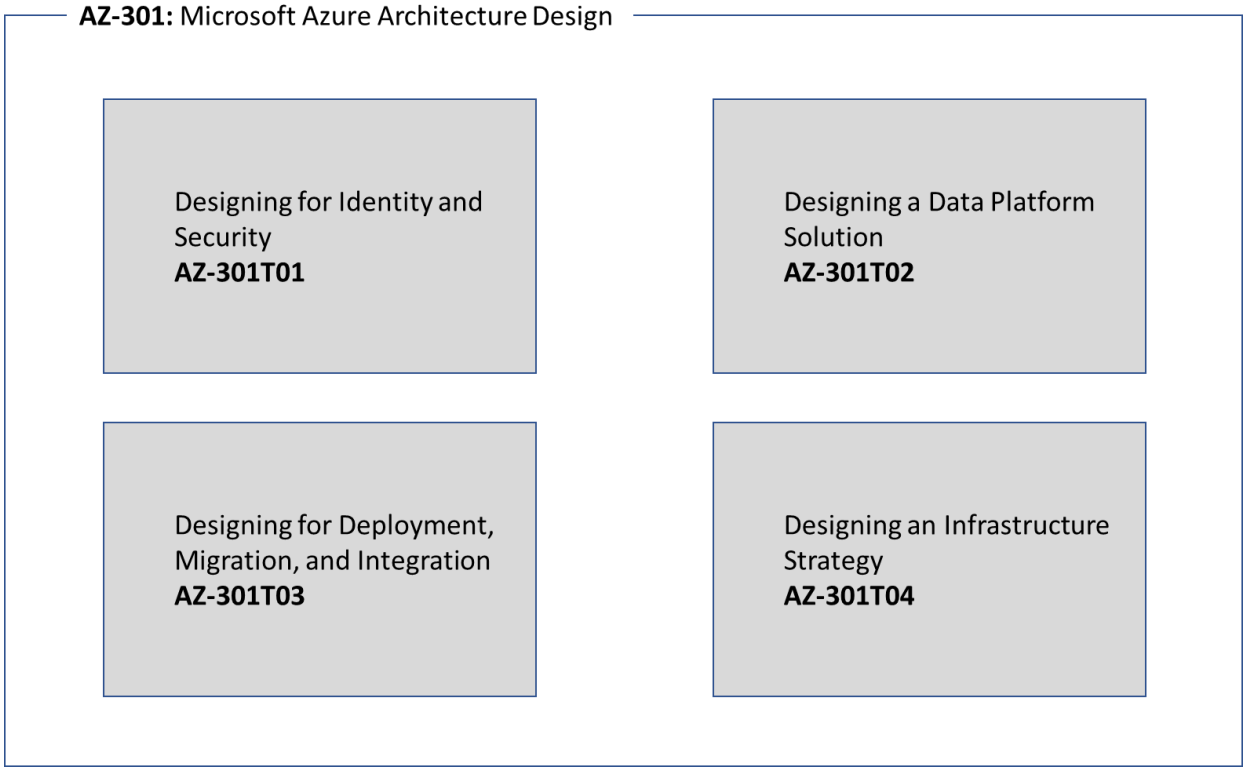
There is one certification exam with the following study areas and percentage weighting.

AZ-301: Microsoft Azure Architecture Design

Study Area	Percentage
Determine Workload Requirements	5-10%
Design for Identity and Security	15-20%
Design a Data Platform Solution	15-20%
Design a Business Continuity Strategy	5-10%
Design for Deployment, Migration, and Integration	20-25%
Design an Infrastructure Strategy	20-25%

Azure Solutions Architect Technology Courses

The four Azure Architecture Design courses are aligned to assist in preparing for the certification exam and the areas of study. For example, AZ-301 has six areas of study and there are four Azure Architect courses.



Program Offerings

The Azure Architect courses can be offered in a variety of ways.

- **Individually**. The courses can be taught standalone; however, a certain amount of foundational information about Azure is required. This information can be found in the *Subscriptions and Resources* course.
- **Certification preparation**. The courses can be bundled to support preparing for each certification exam.
- **Deep dive**. The courses can be combined to provide a more complete deep dive into an area. For example, you could combine *Configure and Manage Virtual Networks* with *Implement Advanced Virtual Networking*. Another example is combining *Manage Identities* with *Secure Identities*.

- **Custom**. The course modules can be grouped to create an entirely new course or workshop. For example, you could create a Troubleshooting course from the Azure Monitor module in *Subscription and Resources* with the troubleshooting content in the other courses.

Course Design

These courses are designed to support the certification study areas, but other content is provided to give context and job skills. For example, topics covering Internet of Things (IoT) are included even though they are not in the testing domain. This is because Azure Solutions Architects should know about these features.

Designing for Identity and Security (AZ-301T01)

This course contains the following two modules:

Module 1 - Managing Security & Identity for Azure Solutions

This module discusses both security and identity within the context of Azure. For security, this module reviews the various options for monitoring security, the options available for securing data and the options for securing application secrets. For identity, this module focuses specifically on Azure Active Directory (Azure AD) and the various features available such as Multi-Factor Authentication (MFA), Managed Service Identity, Azure AD Connect, ADFS and Azure AD B2B/B2C.

The module includes the hands-on lab entitled *Securing Secrets in Azure*.

After completing this module, students will be able to:

- Integrate their existing solutions with external identity providers using Azure AD B2B or B2C.
- Design a hybrid identity solution.
- Determine when to use advanced features of Azure AD such as Managed Service Identity, MFA and Privileged Identity Management.
- Secure application secrets using Key Vault.
- Secure application data using SQL Database and Azure Storage features.

Module 2 - Integrating SaaS Services Available on the Azure Platform

This module introduces multiple SaaS services available in Azure that are available for integration into existing Azure solutions. These services include Cognitive Services, Bot Service, Machine Learning and Media Services.

The module includes the hands-on lab entitled *Integrating SaaS Services Available on the Azure Platform*.

After completing this module, students will be able to:

- Detail the various APIs available in Cognitive Services.
- Identify when to use the Face API, Speech API or Language Understanding (LUIS) service.
- Describe the relationship to Bot Framework and Azure Bot Services.
- Create a simple bot using QnA Maker.
- Describe Azure Machine Learning.
- Describe Azure Media Services.
- Discuss Media Services workflows including live streaming, dynamic packaging and static conversion.
- Detail uses of the Computer Vision API.

Designing a Data Platform Solution (AZ-301T02)

This course contains the following three modules:

Module 1 - Backing Azure Solutions with Azure Storage

This module describes how many Azure services use the Azure Storage service as a backing store for other application solution in Azure. The module dives into critical considerations when using Azure Storage as a supplemental service for an all-up Azure solution.

After completing this module, students will be able to:

- Determine the ideal pricing option for Azure Storage based on a solution's requirements.
- Identify performance thresholds for the Azure Storage service.
- Determine the type of Storage blobs to use for specific solution components.
- Use the Azure Files service for SMB operations.
- Identify solutions that could benefit from the use of StorSimple physical or virtual devices.

Module 2 - Comparing Database Options in Azure

This module compares the various relational and non-relational data storage options available in Azure. Options are explored as groups such as relational databases (Azure SQL Database, MySQL, and PostgreSQL on Azure), non-relational (Azure Cosmos DB, Storage Tables), streaming (Stream Analytics) and storage (Data Factory, Data Warehouse, Data Lake).

This module contains the hands-on lab entitled *Deploying Database Instances in Azure*.

After completing this module, students will be able to:

- Compare and contrast various database options on Azure.
- Identify data streaming options for large-scale data ingest.
- Identify longer-term data storage options.

Module 3 - Monitoring & Automating Azure Solutions

This module covers the monitoring and automation solutions available after an Azure solution has been architected, designed and possibly deployed. The module reviews services that are used to monitor individual applications, the Azure platform, and networked components. This module also covers automation and backup options to enable business-continuity scenarios for solutions hosted in Azure.

This module contains the hands-on lab entitled *Deploying Configuration Management Solutions to Azure*.

After completing this module, students will be able to:

- Compare and contrast monitoring services for applications, the Azure platform, and networking.
- Design an alert scheme for a solution hosted in Azure.
- Select the appropriate backup option for infrastructure and data hosted in Azure.
- Automate the deployment of future resources for backup recovery or scaling purposes.
- Determine the ideal pricing option for Azure Storage based on a solution's requirements.
- Identify performance thresholds for the Azure Storage service.
- Determine the type of Storage blobs to use for specific solution components.
- Use the Azure Files service for SMB operations.

- Identify solutions that could benefit from the use of StorSimple physical or virtual devices.

- Compare and contrast monitoring services for applications, the Azure platform, and networking.
- Design an alert scheme for a solution hosted in Azure.
- Select the appropriate backup option for infrastructure and data hosted in Azure.
- Automate the deployment of future resources for backup recovery or scaling purposes.

Designing for Deployment, Migration, and Integration (AZ-301T03)

This course contains the following three modules:

Module 1 - Deploying Resources with Azure Resource Manager

This module establishes a basic understanding of Azure Resource Manager and the core concepts of deployments, resources, templates, resource groups, and tags. The module will dive deeply into the automated deployment of resources using ARM templates.

This module contains the hand-on online lab entitled *Getting Started with Azure Resource Manager Templates and Azure Building Blocks*.

After completing this module, students will be able to:

- Create a resource group.
- Add resources to a resource group.
- Deploy an ARM template to a resource group.
- Filter resources using tags.
- Author a complex deployment using the Azure Building Blocks tools.

Module 2 - Creating Managed Server Applications in Azure

This module describes how solutions can leverage serverless application hosting services in Azure to
host web applications, REST APIs, integration workflows and HPC workloads without the requirement to manage specific server resources. The module focuses on App Services-related components such as Web Apps, API Apps, Mobile Apps, Logic Apps, and

Functions.

The module includes the hand-on online lab entitled *Deploying Managed Containerized Workloads to Azure*.

After completing this module, students will be able to:

- Select between hosting application code or containers in an App Service instance.
- Describe the differences between API, Mobile, and Web Apps.
- Integrate an API or Logic App with the API Management service.
- Design an App Service Plan or multi-region deployment for high performance and scale.

Module 3 - Authoring Serverless Applications in Azure

This module describes how solutions can leverage serverless application hosting services in Azure to
host web applications, REST APIs, integration workflows and HPC workloads without the requirement to manage specific server resources. The module focuses on App Services-related components such as Web Apps, API Apps, Mobile Apps, Logic Apps, and Functions.

The module includes the hand-on online lab entitled *Deploying Serverless Workloads to Azure*.

After completing this module, students will be able to:

- Select between hosting application code or containers in an App Service instance.
- Describe the differences between API, Mobile, and Web Apps.
- Integrate an API or Logic App with the API Management service.
- Design an App Service Plan or multi-region deployment for high performance and scale.
- Create a resource group.
- Add resources to a resource group.
- Deploy an ARM template to a resource group Integrate an API or Logic App with the API Management service.
- Design an App Service Plan or multi-region deployment for high performance and scale.

- Integrate an API or Logic App with the API Management service.
- Design an App Service Plan or multi-region deployment for high performance and scale.

Designing an Infrastructure Strategy (AZ-301T04)

This course contains the following four modules:

Module 1 - Application Architecture Patterns in Azure

This module introduces, and reviews common Azure patterns and architectures as prescribed by the Microsoft Patterns & Practices team. Each pattern is grouped into performance, resiliency, and scalability categories and described in the context of similar patterns within the category.

After completing this module, students will be able to:

- Locate and reference the Cloud Design Patterns documentation.
- Locate and reference the Azure Architecture Center.
- Describe various patterns pulled from the Cloud Design Patterns.

Module 2 - Building Azure IaaS-Based Server Applications (ADSK)

This module identifies workloads that are ideally deployed using Infrastructure-as-a-Service services in Azure. The module focuses on the VM Scale Sets and Virtual Machine services in Azure and how to best deploy workloads to these services using best practices and features such as Availability Sets.

This module contains the hands-on online lab entitled *Building Azure IaaS-Based Server Applications by using Azure ARM Templates and Azure Building Blocks*.

After completing this module, students will be able to:

- Design an availability set for one or more virtual machines.
- Describe the differences between fault and update domains.
- Author a VM Scale Set ARM template.
- Join a virtualized machine to a domain either in Azure or on a hybrid network.

Module 3 - Networking Azure Application Components

This module describes the various networking and connectivity options available for solutions deployed on Azure. The module explores connectivity options ranging from ad-hoc connections to long-term hybrid connectivity scenarios. The module also discusses some of the performance and security concerns related to balancing workloads across

multiple compute instances, connecting on-premise infrastructure to the cloud and creating gateways for on-premise data.

This module contains the hands-on online lab entitled *Deploying Network Infrastructure for use in Azure Solutions*.
After completing this module, students will be able to:

- Describe DNS and IP strategies for VNETs in Azure.
- Compare connectivity options for ad-hoc and hybrid connectivity.
- Distribute network traffic across multiple loads using load balancers.
- Design a hybrid connectivity scenario between cloud and on-premise.

Module 4 - Integrating Azure Solution Components Using Messaging Services

This module describes and compares the integration and messaging services available for solutions hosted on the Azure platform. Messaging services described include Azure Storage Queues, Service Bus Queues, Service Bus Relay, IoT Hubs, Event Hubs, and Notification Hubs. Integration services include Azure Functions and Logic Apps.

This module contains the hands-on online lab entitled *Deploying Messaging Components to Facilitate Communication Between Azure Resources*.

After completing this module, students will be able to:

- Compare Storage Queues to Service Bus Queues.
- Identify when to use Azure Functions or Logic Apps for integration components in a solution.
- Describe the differences between IoT Hubs, Event Hubs and Time Series Insights.

Azure Subscriptions

To complete the practical 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.

Preparing to Teach

In the next sections we will cover the main course components and how they can used in class. This includes PowerPoint slides, module review questions, reference links, online labs, and practice exercises. There is a lot of flexibility in how you use this content to create a great learning experience for your students.

Content

The content for your courses has been chunked into small topics. Each topic/slide focuses on a single concept. For example, action groups, resource locks, and log query language. Use the topic and reference links to fully cover the concept. If you simply read the slide you will not have enough content to fill the scheduled time.

PowerPoint Slides

PowerPoint slides are provided to help you teach the course.

- Each module, within the course, has a separate file. For example, <course#>_01.pptx is for Module 01. 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.

Module Review Questions

Module review questions are provided at the end of the module. You can expect 2-4 questions. 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:

- Have the students pre-test before the course starts and then at the end to see what they have learned.
- 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 many reference links. 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.
- Reference links have been added to your PowerPoint slides/notes to make it easy for you to access more detailed information. Use these links to walk through details that are not covered in the content. For example, specific licensing and pricing options. Also, lengthy steps that have only been summarized in the content.

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?

Practice Exercises

This course has two ways for the students to practice what they are learning: The Azure documentation and Microsoft Online Labs.

- **Azure documentation.** Most of the practical exercises in these courses link to the Azure documentation tutorials and Quickstarts. The Azure documentation steps are well written and very comprehensive. Read the prerequisites closely and personally try each lab.

There are a variety of ways to use the practice exercises:

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

Also, note:

- There may be several practices to choose from in a lesson. Do them all, select the ones most appropriate to your audience, or find/write some of your own.
- The practices show all the steps to accomplish and learn something. However, in their day-to-day job architects will often use the Azure QuickStart templates. Be sure to round out your instruction with some of these templates.

Portal, Cloud Shell, PowerShell, and the CLI

The practice exercises are initially shown in the portal. The portal provides the easiest way to demonstrate most tasks. However, where available, reference links are provided to complete the tasks with Azure PowerShell or the CLI.

We recommend you use the Cloud Shell to access Azure PowerShell or the Azure CLI. The Cloud Shell automatically connects to Azure and configures the necessary components. The newer tutorials and Quickstarts start with the Cloud Shell.

If you would rather have students use PowerShell or the CLI locally, be sure to take time at the start of the class to ensure they have installed the correct components.

- Install Azure PowerShell on Windows with PowerShellGet (preferred)
- Install Azure PowerShell on Windows with MSI
- Install Azure CLI 2.0 on Windows

Other things to think about:

- Ask the students which command line tool they prefer, so you can offer the appropriate practical exercise.
- If you are helping students prepare for the certification exam they should always do the PowerShell examples. The certification exam will only have a minimal number of CLI questions.

✔ The *Subscriptions and Resource* course has an excellent overview of common Azure Architect tools. This includes the Azure portal, Azure PowerShell, Cloud Shell, Azure CLI, and ARM templates.

Group Discussions

Included throughout the content are questions designed to help students reflect on what they have learned or emphasize some important point. When you see a green checkmark, you have a chance to interact with your students and engage them in discussion. This information is included in the PowerPoint notes area. For example,

✔ Has your organization implemented MFA? Which authentication methods are they using?

Course Content Overlap

Because the courses can be taught individually there is some overlap in content. It is important to take this into account, so you can properly estimate how long it will take to teach the courses.

For example, RBAC concepts initially appear in the *Subscriptions and Resources* course. This is so a student can understand administrator accounts. However, RBAC is also discussed in the *Securing Identities* course. This is the more comprehensive coverage of the content.

Course Timing

The course content is designed to take a day to complete. This will depend on how you teach the course. For example, do the students do all the practical exercises in both the portal and PowerShell? Do you play every video during the day or are the videos supplemental to the instruction? You have flexibility in presenting the content and determining the balance of instruction and hands-on activities. Try to spend at least half your time doing practical exercises.

Designing for Identity and Security	AZ-301T01	1.0-Day
Designing a Data Platform Solution	AZ-301T02	1.0-Day
Designing for Deployment, Migration, and Integration	AZ-301T03	1.0-Day
Designing an Infrastructure Strategy	AZ-301T04	1.0-Day

Resources

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

- Azure forums. The Azure forums are very active. You can search the threads for a specific area of interest. You can also browse categories like Azure Storage, Pricing and Billing, Azure Virtual Machines, and Azure Migrate.
- Azure Architecture Center. Gain access to the Azure Application Architecture Guide, Azure Reference Architectures, and the Cloud Design Patterns.
- Microsoft Learning Community Blog. Get the latest information the certification tests and exam study groups.
- Channel 9. Channel 9 provides a wealth of informational videos, shows, and events.

- Azure Tuesdays with Corey. Corey Sanders answers your questions about Microsoft Azure - Virtual Machines, Web Sites, Mobile Services, Dev/Test etc.
- Azure Fridays. Join Scott Hanselman as he engages one-on-one with the engineers who build the services that power Microsoft Azure as they demo capabilities, answer Scott's questions, and share their insights.
- 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 MCTs. 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. should be directed to This is the official support channel for courseware.