Purpose

This document is for Microsoft Certified Trainers preparing to teach the AZ-304 Microsoft Azure Architect Design course. This course is designed for students who are planning to take the associated certification exam, or students who are performing Azure Architect tasks in their day-to-day job.

Azure Architect Role Definition

Both the certification exam and the courseware are based on the Azure Architect role. When students ask why some areas are being covered and other areas are not, refer them to this role definition. Remember there are other roles, such as DevOps and Administrator .

- Solutions Architects translate business requirements into secure and reliable recommendations for infrastructure, governance, high availability, cost optimization, and data integration.
- Skills include recommending solutions for logging, multi-factor authentication, SSO, hybrid identity, backup and recovery, containers, microservices, monitoring, automation, networking, and application infrastructure.

Audience

This course is for IT Professionals with expertise in designing and implementing solutions running on Microsoft Azure. They should have broad knowledge of IT operations, including networking, virtualization, identity, security, business continuity, disaster recovery, data platform, budgeting, and governance. Azure Solution Architects use the Azure Portal and as they become more adept they use the Command Line Interface.

Candidates must have intermediate-level skills in Azure administration and have experience with Azure development processes and DevOps processes.

Prerequisites

Successful Azure Solution Architects start this role with experience on operating systems, virtualization, cloud infrastructure, storage structures, governance, and networking.

- Understanding of on-premises virtualization technologies, including: VMs, virtual networking, and virtual hard disks.

- Understanding of network configuration, including TCP/IP, Domain Name System (DNS), virtual private networks (VPNs), firewalls, and encryption technologies.
- Understanding of Active Directory concepts, including domains, forests, domain controllers, replication, and Kerberos protocol.
- Understanding of resilience and disaster recovery, including backup and restore operations.

Certification Exam

Certification exams measure your ability to accomplish certain technical tasks for a job role. The study areas are based on the Job Task Analysis that was conducted for the role in December 2019.

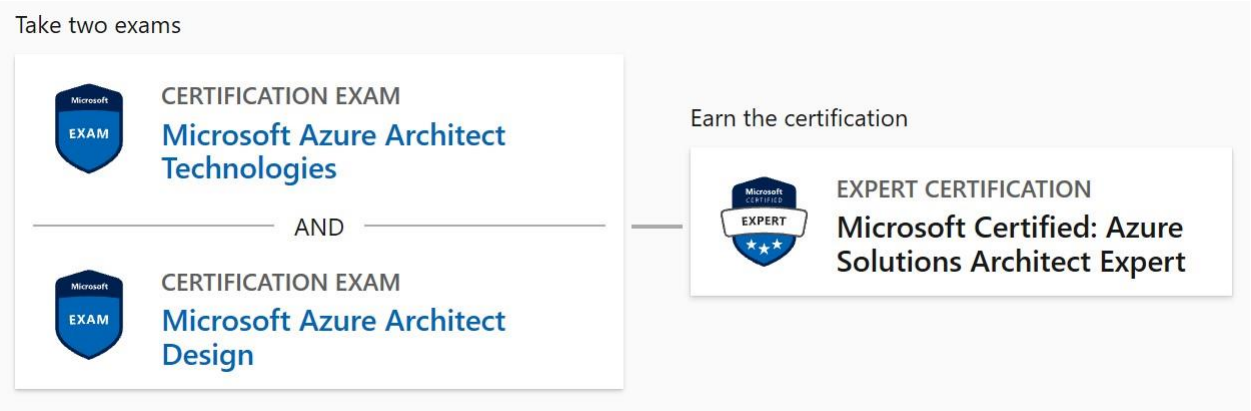
Each study area has a percentage indicating the relative weight of the area on the exam. The higher the percentage, the more questions you are likely to see in that area.

AZ-304 Study Areas	Weights
Design monitoring	10-15%
Design identity and security	25-30%
Design data storage	15-20%
Design business continuity	10-15%
Design infrastructure	25-30%

Candidates should have a minimum of 12 months of hands-on experience with Azure. Candidates should have a strong understanding of core Azure services, Azure workloads, security, monitoring, and governance. Candidates for this exam should have experience in using PowerShell, the Command Line Interface, Azure Portal, and ARM templates.

For more information on the skills measured in the exam, please visit AZ-304: Microsoft Azure Architect Design certification page.

The AZ-304 Microsoft Azure Architect Design certification combined with the AZ-303 Microsoft Azure Architect Technologies certification result in the Microsoft Certified: Azure Solutions Architect Expert certification.



For more information, see the AZ-303 Microsoft Azure Architect Technologies page.

Preparing to Teach

In the next sections we will cover the main course components and how they can used in class. There is a lot of flexibility in how you use this content to create the best learning experience for your students.

Feedback from students indicates that instructor demonstrations, hands-on labs, and Q&A sessions help to enliven the classroom experience, whether live or online.

Content

The content for your course is organized into Modules, Lessons, and Topics. There are 14 modules.

- Module 1: Design a Compute Solution
- Module 2: Design a Network Solution
- Module 3: Design for Migration
- Module 4: Design Authentication and Authorization
- Module 5: Design Governance
- Module 6: Design a Solution for Databases
- Module 7: Select an Appropriate Storage Account
- Module 8: Design Data Integration
- Module 9: Design a Solution for Logging and Monitoring
- Module 10: Design a Solution for Backup and Recovery
- Module 11: Design for High Availability
- Module 12: Design for Cost Optimization
- Module 13: Design an Application Architecture

- Module 14: Design Security for Applications

This is a suggested order and aligns with the learning objectives describe on the AZ-304: Microsoft Azure Architect Design certification page. To teach all of the objectives for this course is challenging, so ensure you are covering the content most applicable to your audience. This is an expert level course and students are expected to already have experience in many of the topic areas.

PowerPoint Slides

Each module has a PowerPoint deck. Each course topic has a PowerPoint slide. Module overview and lesson overview slides are included so you can introduce the content to your students.

The Module 00 PowerPoint provides a course overview.

Azure Subscriptions

To complete the labs and any additional demonstration exercises in this course, students will need an Azure Subscription. The current 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.

The Azure 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.

Online Labs

Labs are provided for each module. The lab instructions are in the AZ-304 Microsoft Learning GitHub repository. Supplemental files, like scripts and templates, are also provided.

Module 1 Lab

- Lab Title: Implementing Containers on Azure
- GitHub filename: Module_1_Lab.md

Module 3 Lab

- Lab Title: Migrating Hyper-V VMs to Azure by using Azure Migrate
- GitHub filename: Module_3_Lab.md

Module 4 Lab

- Lab Title: Managing Azure AD Authentication and Authorization
- GitHub filename: Module_4_Lab.md

Module 6 Lab

- Lab Title: Implementing Azure SQL Database-Based Applications
- GitHub filename: Module_6_Lab.md

Module 13 Lab

- Lab Title: Implement Azure Logic Apps Integration with Azure Event Grid
- GitHub filename: Module_13_Lab_a.md

To complete the labs, you will need:

- An internet connection to the Azure portal.
- An Azure subscription.

Hosted machines may be available for an additional charge.

If you have lab feedback, create an Issue on the lab GitHub repository.

Portal, Cloud Shell, PowerShell, and the CLI

The lab instructions are written to use the Cloud Shell. The Cloud Shell automatically connects to Azure and provides access to PowerShell and the CLI.

If you would rather have students use PowerShell or the CLI locally, you can use these links.

- Install Azure PowerShell on Windows with PowerShellGet
- Install Azure CLI on Windows

Demonstrations

This course has numerous demonstrations. Take the time to work through each one and decide which to use. Some of the demonstrations are simple show and tell walk-throughs of the Azure portal; others require some scripting skills. Consider having the students do the demonstrations themselves, or walk-through as a group. You might also consider using the demonstration instead of the slides. Lastly, consider the overlap with the formal labs and make the best use of your time.

Module Review Questions

Module review questions are provided at the end of each module. These are multiple choice and multiple answer questions. You can use these review questions in several ways:

- Have the student's 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.

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

Microsoft Learn - Additional Study Resources

Microsoft Learn provides self-paced skills training on a variety of topics. You can also search for additional content that might be helpful.

Identity

- Create Azure users and groups in Azure Active Directory
- Manage users and groups in Azure Active Directory
- Secure your Azure resources with role-based access control
- Secure Azure Active Directory users with Multi-Factor Authentication
- Allow users to reset their password with Azure Active Directory self-service password reset
- Secure your application by using OpenID Connect and Azure AD

Governance and Compliance

- Analyze costs and create budgets with Azure Cost Management
- Predict costs and optimize spending for Azure
- Control and organize Azure resources with Azure Resource Manager
- Apply and monitor infrastructure standards with Azure Policy
- Create custom roles for Azure resources with role-based access control
- Manage access to an Azure subscription by using Azure role-based access control
- Secure your Azure resources with role-based access control

Azure Administration

- Core Cloud Services - Manage services with the Azure portal
- Control and organize Azure resources with Azure Resource Manager
- Build Azure Resource Manager templates
- Automate Azure tasks using scripts with PowerShell
- Manage virtual machines with the Azure CLI **Virtual Networking**

- Networking Fundamentals - Principals
- Design an IP addressing schema for your Azure deployment
- Secure and isolate access to Azure resources by using network security groups and service endpoints **Intersite Connectivity**
- Distribute your services across Azure virtual networks and integrate them by using virtual network peering
- Connect your on-premises network to Azure with VPN Gateway
- Connect your on-premises network to the Microsoft global network by using ExpressRoute

Network Traffic Management

- Manage and control traffic flow in your Azure deployment with routes
- Improve application scalability and resiliency by using Azure Load Balancer
- Load balance your web service traffic with Application Gateway
- Enhance your service availability and data locality by using Azure Traffic Manager

Azure Storage

- Create an Azure Storage account
- Secure your Azure Storage
- Optimize storage performance and costs using Blob storage tiers
- Make your application storage highly available with read-access geo-redundant storage
- Copy and move blobs from one container or storage account to another from the command line and in code
- Move large amounts of data to the cloud by using Azure Data Box family
- Monitor, diagnose, and troubleshoot your Azure storage

Azure Virtual Machines

- Build a scalable application with virtual machine scale sets
- Deploy Azure virtual machines from VHD templates
- Choose the right disk storage for your virtual machine workload
- Add and size disks in Azure virtual machines
- Protect your virtual machine settings with Azure Automation State Configuration **Serverless Computing**
- Host a web application with Azure App service
- Stage a web app deployment for testing and rollback by using App Service deployment slots
- Scale an App Service web app to efficiently meet demand with App Service scale up and scale out
- Dynamically meet changing web app performance requirements with autoscale rules
- Capture and view page load times in your Azure web app with Application Insights

- Run Docker containers with Azure Container Instances
- Introduction to the Azure Kubernetes Service

Data Protection

- Protect your virtual machines by using Azure Backup
- Back up and restore your Azure SQL database
- Protect your Azure infrastructure with Azure Site Recovery
- Protect your on-premises infrastructure from disasters with Azure Site Recovery

Monitoring

- Analyze your Azure infrastructure by using Azure Monitor logs
- Improve incident response with alerting on Azure
- Monitor the health of your Azure virtual machine by collecting and analyzing diagnostic data
- Monitor, diagnose, and troubleshoot your Azure storage

References

There are a lot of resources to help you and the student learn about Azure. We recommend you bookmark these pages. The list is included in the Welcome section of the student materials.

- 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.
- Microsoft Learning Community Blog . Get the latest information about 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 Documentation . Stay informed on the latest products, tools, and features. Get information on pricing, partners, support, and solutions.
- Azure Architecture Center . The Azure Architecture Center provides best practices for running your workloads on Azure.
- Azure Reference Architectures . Architecture diagrams, reference architectures, example scenarios, and solutions for common workloads on Azure.

- Cloud Design Patterns . Cloud design patterns for building reliable, scalable, secure applications in the cloud.
- Tailwind Traders . A three-tier legacy app re-written for modern cloud app ARM Solution]
- IoT Scenario Reference Architecture . Recommendations for architecture for IoT applications on Azure using PaaS (platform-as-a-service) components.
- Bot Framework Reference Architecture . An architecture that describes how to build an enterprise-grade conversational bot (chatbot) using the Azure Bot Framework.
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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

In this course 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!
Azure Architecture Courseware Development Team