A comprehensive study guide that will provide you with great preparation tools for the AZ-104: Microsoft Azure Administrator exam

AZ-104 Official Course Study Guide

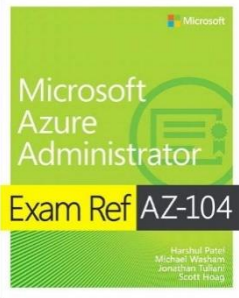Jordi Koenderink   1/8/2021

Introduction

Welcome to the AZ-104 Study Guide. This guide will go over each topic of the skills outline, provided by Microsoft for the AZ-104: Microsoft Azure Administrator exam.

For this exam, Microsoft suggests having a minimum of six months of hands-on experience administering Azure. You also should have a strong understanding of core Azure services, Azure workloads, security, and governance (check out AZ-900). Candidates for this exam should have experience in using PowerShell, the Command Line Interface, Azure Portal, and ARM templates.

About the exam:

- Taking the exam will cost you $165 US dollars.
- Microsoft certification exams are scored out of 1000 points. You need 700 points or higher to pass the AZ-104 exam and gain your Azure Administrator Badge.
- The AZ-104 exam will need to be renewed every year. Microsoft will from time to time retire certifications, however, and you may also find exam numbers evolve (this is what happened with the previous exam AZ-103) when Microsoft changes the curriculum substantially for the certification.
- The exam will have around 65 questions for which you have 3h to answer.
- As of this moment of writing, there're no labs.

Book/e-book:

Exam Ref AZ-104 Microsoft Azure Administrator
Prepare for Microsoft Exam AZ-104–and help demonstrate your real-world mastery of implementing and deploying Microsoft Azure Infrastructure as a Service (IaaS). Designed for experienced cloud professionals ready to advance their status, Exam Ref focuses on the critical thinking and decision-making acumen needed for success at the Microsoft Certified Associate level.

- Amazon.com: https://amzn.to/39EGcM8
- Amazon Canada: https://amzn.to/2Xdslar
- Amazon UK: https://amzn.to/316jyrV
- Amazon FR: https://amzn.to/3hY2pYB
- Amazon DE: https://amzn.to/2PcKS2d

Video training:

Udemy	This course goes through all of the skills needed to take and pass the AZ-104 exam: Microsoft Azure Administrator. This course teaches all of the requirements for the exam, one by one. Each of the things that Microsoft tests will be covered in this course. https://www.udemy.com/course/70533-azure/
PLURALSIGHT	This path is structured to mimic the organization of the exam so you can more easily follow along during your study preparation. https://app.pluralsight.com/paths/certificate/microsoft-azure-administrator-az-104
w	Whizlabs' Microsoft Azure Exam AZ-104 Online Course helps Professionals to prepare themselves for the actual certification exam. https://www.whizlabs.com/microsoft-azure-certification-az-104/online-course/

Microsoft Learn:

Those tutorial/paths have been combined by Microsoft and published for free. They contain a collection of text, videos, and exercises for the exam.

	AZ-104: Prerequisites for Azure administrators If you're an IT Administrator that's new to Azure and need to prepare for Exam AZ-104: Microsoft Azure Administrator, this path is the place to start. Learn the basic Azure concepts you'll need to know as an Azure administrator. • https://docs.microsoft.com/en-us/learn/paths/az-104-administrator-prerequisites/
	AZ-104: Manage identities and governance in Azure Learn how to manage Azure Active Directory objects, role-based access control (RBAC), subscriptions, and governance in Azure. This learning path helps prepare you for Exam AZ-104: Microsoft Azure Administrator. • https://docs.microsoft.com/en-us/learn/paths/az-104-manage-identities-governance/

	AZ-104: Implement and manage storage in Azure Learn how to manage storage accounts, data in Azure Storage, and Azure File and Blob storage. This learning path helps prepare you for Exam AZ-104: Microsoft Azure Administrator. • https://docs.microsoft.com/en-us/learn/paths/az-104-manage-storage/
	AZ-104: Deploy and manage Azure compute resources Learn how to deploy and configure virtual machines, containers, and Web Apps in Azure. This learning path helps prepare you for Exam AZ-104: Microsoft Azure Administrator. • https://docs.microsoft.com/en-us/learn/paths/az-104-manage-compute-resources/
	AZ-104: Configure and manage virtual networks for Azure administrators Learn how to configure and manage Azure network capabilities like connectivity services, application protection, application delivery, and network monitoring services. This learning path helps prepare you for Exam AZ-104: Microsoft Azure Administrator. • https://docs.microsoft.com/en-us/learn/paths/az-104-manage-virtual-networks/
	AZ-104: Monitor and back up Azure resources Learn how to monitor resources by using Azure Monitor and implement back up and recovery in Azure. This learning path helps prepare you for Exam AZ-104: Microsoft Azure Administrator. • https://docs.microsoft.com/en-us/learn/paths/az-104-monitor-backup-resources/

Practice exams

Those are practice exams and not dumps. I do not encourage dumps as they ruin the certification value for everyone.

	Whizlabs – Microsoft Azure Exam AZ-104 Practice Tests Exam AZ-104 Microsoft Azure Administrator certification is to validate the skills of implementing, managing, monitoring the identity, compute, storage, virtual networks, and governance in Azure cloud. What's inside: • 4 Full-Length Mock Exams (235 Unique Questions) • Objective-Based Practice Tests • Exhaustive explanation with every question • Reports to assess strengths and weaknesses https://www.whizlabs.com/microsoft-azure-certification-az-104/practice-tests/

This guide is divided up into the following sections and is also part of the exam:

- Manage Azure identities and governance (15-20%)
- Implement and manage storage (10-15%)
- Deploy and manage Azure compute resources (25-30%)
- Configure and manage virtual networking (30-35%)
- Monitor and back up Azure resources (10-15%)

Feel free to join our Facebook Azure Study Group, or check out the Azure courses on Udemy. Errors and suggestions can also be reported in the Azure Group on Facebook.

Thank you,

Software Architect Team
Jordi Koenderink

Contents

1. Manage Azure identities and governance (15-20%)

1.1   Manage Azure AD objects

Every user who needs access to Azure resources needs an Azure user account. A user account contains all the information needed to authenticate the user during the sign-on process. Once authenticated, Azure AD builds an access token to authorize the user and determine what resources they can access and what they can do with those resources.

1.1.2   Create users and groups
- [Add or delete users - Azure Active Directory | Microsoft Docs](#)
- [Create a basic group and add members - Azure Active Directory | Microsoft Docs](#)
- [Create a new user | Microsoft Docs](#)
- [New-AzureADUser (AzureAD) | Microsoft Docs](#)
- [New-AzureADGroup (AzureAD) | Microsoft Docs](#)
- [New-AzureADMSGroup (AzureAD) | Microsoft Docs](#)

1.1.3   Manage user and group properties
- [Edit your group information - Azure Active Directory | Microsoft Docs](#)
- [Add or update user profile information - Azure AD | Microsoft Docs](#)
- [Bulk create users in the Azure Active Directory portal | Microsoft Docs](#)
- [Set-AzureADUser (AzureAD) | Microsoft Docs](#)
- [Set-AzureADGroup (AzureAD) | Microsoft Docs](#)
- [Set-AzureADMSGroup (AzureAD) | Microsoft Docs](#)

1.1.4   Manage device settings
- [How to manage devices using the Azure portal | Microsoft Docs](#)

1.1.5   Perform bulk user updates
- [Import data into my directory | Microsoft Docs](#)
- [Bulk upload to add or create members of a group - Azure Active Directory | Microsoft Docs](#)

1.1.6   Manage guest accounts
- [What is B2B collaboration in Azure Active Directory? | Microsoft Docs](#)
- [Add B2B collaboration users in the Azure portal - Azure AD | Microsoft Docs](#)
- [Manage guest access with access reviews - Azure AD | Microsoft Docs](#)
- [Quickstart: Add guest users in the Azure portal - Azure AD | Microsoft Docs](#)

1.1.7   Configure Azure AD Join
- [How to plan your Azure Active Directory join implementation | Microsoft Docs](#)
- [Plan hybrid Azure Active Directory join - Azure Active Directory | Microsoft Docs](#)
- [Configure hybrid Azure Active Directory join for managed domains | Microsoft Docs](#)

1.1.8   Configure self-service password reset
- [Deployment considerations for Azure Active Directory self-service password reset | Microsoft Docs](#)
- [Self-service password reset deep-dive - Azure Active Directory | Microsoft Docs](#)
- [Customize self-service password reset - Azure Active Directory | Microsoft Docs](#)

NOT: Azure AD Connect; PIM

1.2 Manage role-based access control (RBAC)

Securing your Azure resources, such as virtual machines, websites, networks, and storage, is a critical function for any organization using the cloud. You want to ensure that your data and assets are protected, but still, grant your employees and partners the access they need to perform their jobs. Role-based access control (RBAC) is an authorization system in Azure that helps you manage who has access to Azure resources, what they can do with those resources, and where they have access.

1.2.1 Create a custom role

- [Azure custom roles - Azure RBAC | Microsoft Docs](#)
- [Tutorial: Create an Azure custom role with Azure PowerShell - Azure RBAC | Microsoft Docs](#)
- [Tutorial: Create an Azure custom role with Azure CLI - Azure RBAC | Microsoft Docs](#)
- [Create or update Azure custom roles using Azure PowerShell - Azure RBAC | Microsoft Docs](#)
- [AZ-104 Study Guide: Microsoft Azure Administrator (vladtalkstech.com)](#)

1.2.2 Provide access to Azure resources by assigning roles

- Subscriptions
  - o [Add or remove Azure role assignments using the Azure portal - Azure RBAC | Microsoft Docs](#)
  - o [Add or change Azure subscription administrators | Microsoft Docs](#)
  - o [Classic subscription administrator roles, Azure roles, and Azure AD roles | Microsoft Docs](#)
  - o [Elevate access to manage all Azure subscriptions and management groups | Microsoft Docs](#)

- Resource groups
  - o [Tutorial: Grant group access to Azure resources using Azure PowerShell - Azure RBAC | Microsoft Docs](#)
- Resources (VM, disk, etc.)
  - o [What is Azure role-based access control (Azure RBAC)? | Microsoft Docs](#)
  - o [Azure built-in roles - Azure RBAC | Microsoft Docs](#)

1.2.3 Interpret access assignments

- [List Azure role assignments using the Azure portal - Azure RBAC | Microsoft Docs](#)
- [Understand Azure deny assignments - Azure RBAC | Microsoft Docs](#)

1.2.4 Manage multiple directories

- [Characteristics of multiple tenant interaction - Azure AD | Microsoft Docs](#)

1.3 Manage subscriptions and governance

Managing resources across single or several subscriptions is a challenge. In this section, you'll learn to manage your Azure subscriptions with the services provided.

1.3.1 Configure Azure policies

- [Overview of Azure Policy - Azure Policy | Microsoft Docs](#)
- [Azure Subscription Governance – Controlling resources with Tags, Policies, and Locks | Microsoft Docs](#)

- [Tutorial: Build policies to enforce compliance - Azure Policy | Microsoft Docs](#)
- [Quickstart: New policy assignment with the portal - Azure Policy | Microsoft Docs](#)
- [Quickstart: New policy assignment with PowerShell - Azure Policy | Microsoft Docs](#)
- [Quickstart: New policy assignment with Azure CLI - Azure Policy | Microsoft Docs](#)

1.3.2 Configure resource locks
- [Lock resources to prevent changes - Azure Resource Manager | Microsoft Docs](#)

1.3.3 Apply tags
- [Tag resources, resource groups, and subscriptions for a logical organization - Azure Resource Manager | Microsoft Docs](#)
- [Tutorial: Manage tag governance - Azure Policy | Microsoft Docs](#)

1.3.4 Create and manage resource groups
- [Manage resource groups - Azure portal - Azure Resource Manager | Microsoft Docs](#)
- [Manage resources - Azure PowerShell - Azure Resource Manager | Microsoft Docs](#)
- [Manage resources - Azure CLI - Azure Resource Manager | Microsoft Docs](#)

1.3.5 Move resources
- [Move resources to a new subscription or resource group - Azure Resource Manager | Microsoft Docs](#)
- [Move a Windows VM resource in Azure - Azure Virtual Machines | Microsoft Docs](#)

1.3.6 Remove RG's
- [Delete resource group and resources - Azure Resource Manager | Microsoft Docs](#)

1.3.7 Manage subscriptions
- [Add or change Azure subscription administrators | Microsoft Docs](#)
- [Create an additional Azure subscription | Microsoft Docs](#)
- [Export your Azure subscription top-level information | Microsoft Docs](#)

1.3.8 Configure Cost Management
- [Overview of Azure Cost Management + Billing | Microsoft Docs](#)
- [Optimize your cloud investment with Azure Cost Management | Microsoft Docs](#)
- [Quickstart - Explore Azure costs with cost analysis | Microsoft Docs](#)

1.3.9 Configure management groups
- [Organize your resources with management groups - Azure Governance - Azure governance | Microsoft Docs](#)
- [Quickstart: Create a management group with the portal - Azure governance | Microsoft Docs](#)

2. Implement and manage storage (10-15%)

2.1 Manage storage accounts

An Azure storage account contains all of your Azure Storage data objects: blobs, files, queues, tables, and disks. The storage account provides a unique namespace for your Azure Storage data that is accessible from anywhere in the world over HTTP or HTTPS. Data in your Azure storage account is durable and highly available, secure, and massively scalable.

2.1.1 Configure network access to storage accounts
- Manage account access keys - Azure Storage | Microsoft Docs
- Configure Azure Storage firewalls and virtual networks | Microsoft Docs

2.1.2 Create and configure storage accounts
- Storage account overview - Azure Storage | Microsoft Docs
- Create a storage account - Azure Storage | Microsoft Docs

2.1.3 Generate shared access signature
- Getting Started with Shared Access Signatures (SAS) - Code Samples | Microsoft Docs
- Delegate access with a shared access signature - Azure Storage | Microsoft Docs
- Grant limited access to data with shared access signatures (SAS) - Azure Storage | Microsoft Docs

2.1.4 Manage access keys
- Manage account access keys - Azure Storage | Microsoft Docs
- Manage storage account keys with Azure Key Vault and the Azure CLI | Microsoft Docs

2.1.5 Implement Azure storage replication
- Data redundancy - Azure Storage | Microsoft Docs
- Change how a storage account is replicated - Azure Storage | Microsoft Docs

2.1.6 Configure Azure AD Authentication for a storage account
- Authorize access to blobs and queues using Active Directory - Azure Storage | Microsoft Docs

2.2 Manage data in Azure Storage

Most organizations have diverse requirements for their cloud-hosted data. For example, storing data in a specific region, or needing separate billing for different data categories. Azure storage accounts let you formalize these types of policies and apply them to your Azure data.

2.2.1 Export from Azure job
- Using Azure Import/Export to transfer data to and from Azure Storage | Microsoft Docs
- Create an export Job for Azure Import/Export | Microsoft Docs

2.2.2 Import into Azure job
- Create an Import Job for Azure Import/Export | Microsoft Docs

2.2.3 Install and use Azure Storage Explorer
- Introduction to Microsoft Azure Storage Explorer
- Get started with Storage Explorer | Microsoft Docs
- Quickstart - Create a blob with Azure Storage Explorer - Azure Storage | Microsoft Docs

2.2.4 Copy data by using AZCopy

- [Transfer data to or from Azure Files by using AzCopy v10 | Microsoft Docs](#)
- [Copy or move data to Azure Storage by using AzCopy v10 | Microsoft Docs](#)

2.3 Configure Azure files and Azure blob storage

Azure Files offers fully managed file shares in the cloud that are accessible via the industry standard Server Message Block (SMB) protocol or Network File System (NFS) protocol. Azure file shares can be mounted concurrently by cloud or on-premises deployments. Azure Files SMB file shares are accessible from Windows, Linux, and macOS clients. Azure Files NFS file shares are accessible from Linux or macOS clients. Additionally, Azure Files SMB file shares can be cached on Windows Servers with Azure File Sync for fast access near where the data is being used.

Azure Blob storage is Microsoft's object storage solution for the cloud. Blob storage is optimized for storing massive amounts of unstructured data. Unstructured data is data that doesn't adhere to a particular data model or definition, such as text or binary data.

2.3.1 Create an Azure file share

- [Create an Azure file share - Azure Files | Microsoft Docs](#)
- [Managing Azure file shares using Azure Storage Explorer | Microsoft Docs](#)
- [Create and use an Azure Files share on Windows VMs | Microsoft Docs](#)
- [Quickstart for managing Azure file shares with Azure portal | Microsoft Docs](#)
- [Quickstart for managing Azure file shares with Azure PowerShell | Microsoft Docs](#)
- [Quickstart for managing Azure file shares using the Azure CLI | Microsoft Docs](#)

2.3.2 Create and configure Azure File Sync service

- [Deploy Azure File Sync | Microsoft Docs](#)
- [Planning for an Azure File Sync deployment | Microsoft Docs](#)
- [Tutorial - Extend Windows file servers with Azure File Sync | Microsoft Docs](#)

2.3.3 Configure Azure blob storage

- [Introduction to Blob (object) storage - Azure Storage | Microsoft Docs](#)
- [Quickstart - Create a blob with the Azure portal - Azure Storage | Microsoft Docs](#)
- [Manage Azure Blob Storage resources with Storage Explorer | Microsoft Docs](#)

2.3.4 Configure storage tiers for Azure blobs

- [Access tiers for Azure Blob Storage - hot, cool, and archive | Microsoft Docs](#)

2.3.4 Configure blob lifecycle management

- [Optimize costs by automating Azure Blob Storage access tiers | Microsoft Docs](#)

2.3.5 Configure blob object replication

- [Configure object replication - Azure Storage | Microsoft Docs](#)
- [Object replication overview - Azure Storage | Microsoft Docs](#)

3. Deploy and manage Azure compute resources (25-30%)

3.1 Configure VMs for high availability and scalability

Availability of cloud resources is critical along with the ability to adjust workloads to meet demand. This section will teach you how to deploy highly available and scalable virtual machines

3.1.2 Configure VMs for high availability and scalability

- [Availability options - Azure Virtual Machines | Microsoft Docs](#)
- [Manage the availability of VMs - Azure Virtual Machines | Microsoft Docs](#)
- [Manage the availability of VMs - Azure Virtual Machines | Microsoft Docs](#)
- [Tutorial - High availability for Linux VMs in Azure - Azure Virtual Machines | Microsoft Docs](#)
- [Azure virtual machine scale sets overview - Azure Virtual Machine Scale Sets | Microsoft Docs](#)
- [Quickstart - Create a virtual machine scale set in the Azure portal - Azure Virtual Machine Scale Sets | Microsoft Docs](#)
- [Quickstart - Create a Windows virtual machine scale set with an Azure template - Azure Virtual Machine Scale Sets | Microsoft Docs](#)
- [Tutorial: Create a Windows virtual machine scale set - Azure Virtual Machines | Microsoft Docs](#)

3.2 Automate deployment and configuration of VMs

To create and manage Azure virtual machines (VMs) in a consistent manner at scale, some form of automation is typically desired. There are many tools and solutions that allow you to automate the complete Azure infrastructure deployment and management lifecycle.

3.2.1 Modify Azure Resource Manager (ARM) template

- [Deploy resources with Azure portal - Azure Resource Manager | Microsoft Docs](#)
- [Update a resource in an Azure Resource Manager template - Azure Architecture Center | Microsoft Docs](#)
- [Template structure and syntax - Azure Resource Manager | Microsoft Docs](#)
- [Deploy template - Azure portal - Azure Resource Manager | Microsoft Docs](#)

3.2.2 Configure VHD template

- [Create a Windows VM from a specialized VHD in the Azure portal - Azure Virtual Machines | Microsoft Docs](#)

3.2.3 Deploy from template

- [Create a Windows VM from a template in Azure - Azure Virtual Machines | Microsoft Docs](#)
- [Deploy template - Azure portal - Azure Resource Manager | Microsoft Docs](#)
- [Deploy a Windows Virtual Machine with Azure Resource Manager Templates and PowerShell (microsoft.com)](#)

3.2.4 Save a deployment as an ARM template

- [Download the template for an Azure VM - Azure Virtual Machines | Microsoft Docs](#)

3.2.5 Automate configuration management by using custom script extensions

- [Azure Custom Script Extension for Windows - Azure Virtual Machines | Microsoft Docs](#)
- [Run Custom Script Extension on Linux VMs in Azure - Azure Virtual Machines | Microsoft Docs](#)

3.3   Create and configure VMs

Azure virtual machines (VMs) can be created and configured through the Azure portal. This method provides a browser-based user interface to create VMs and their associated resources.

3.3.1   Configure Azure Disk Encryption

- Enable Azure Disk Encryption for Linux VMs - Azure Virtual Machines | Microsoft Docs
- Enable Azure Disk Encryption for Windows VMs - Azure Virtual Machines | Microsoft Docs

3.3.2   Move VMs from one resource group to another

- Move resources to a new subscription or resource group - Azure Resource Manager | Microsoft Docs
- Move a Windows VM resource in Azure - Azure Virtual Machines | Microsoft Docs
- Resize virtual machines | Blog y actualizaciones de Azure | Microsoft Azure

3.3.3   Manage VM sizes

- Resize a Windows VM in Azure - Azure Virtual Machines | Microsoft Docs
- VM sizes - Azure Virtual Machines | Microsoft Docs

3.3.4   Add data discs

- Attach a data disk to a Windows VM in Azure by using PowerShell - Azure Virtual Machines | Microsoft Docs
- Add a data disk to Linux VM using the Azure CLI - Azure Virtual Machines | Microsoft Docs
- Attach a data disk to a Linux VM - Azure Virtual Machines | Microsoft Docs
- Attach a managed data disk to a Windows VM - Azure - Azure Virtual Machines | Microsoft Docs

3.3.5   Configure networking

- Create a virtual network - quickstart - Azure portal - Azure Virtual Network | Microsoft Docs
- Open ports to a VM using the Azure portal - Azure Virtual Machines | Microsoft Docs

3.3.6   Redeploy VMs

- Redeploy Windows virtual machines in Azure - Azure Virtual Machines | Microsoft Docs
- Redeploy Linux Virtual Machines in Azure - Azure Virtual Machines | Microsoft Docs
- Redeploy a VM in a lab in Azure DevTest Labs - Azure DevTest Labs | Microsoft Docs

3.4   Create and configure containers

Azure Container Instances is a solution for any scenario that can operate in isolated containers, without orchestration. Run event-driven applications, quickly deploy from your container development pipelines, and run data processing and build jobs.

3.4.1   Create and configure Azure Kubernetes Service (AKS)

- Kubernetes on Azure tutorial - Deploy a cluster - Azure Kubernetes Service | Microsoft Docs
- Quickstart: Deploy an AKS cluster by using Azure CLI - Azure Kubernetes Service | Microsoft Docs

3.4.2   Create and configure Azure Container Instances (ACI)

- Quickstart - Deploy Docker container to container instance - Portal - Azure Container Instances | Microsoft Docs

3.5 Create and configure Web Apps

Azure App Service is an HTTP-based service for hosting web applications, REST APIs, and mobile back ends. You can develop in your favorite language, be it .NET, .NET Core, Java, Ruby, Node.js, PHP, or Python. Applications run and scale with ease on both Windows and Linux-based environments.

3.5.1 Create and configure App Service

- [Configure apps in the portal - Azure App Service | Microsoft Docs](#)

3.5.2 Create and configure App Service Plans

- [Manage App Service plan - Azure App Service | Microsoft Docs](#)
- [App Service plans - Azure App Service | Microsoft Docs](#)

4. Configure and manage virtual networking (30-35%)

4.1 Implement and manage virtual networking

Azure virtual networks enable Azure resources, such as virtual machines, web apps, and databases, to communicate with: each other, users on the Internet, and on-premises client computers. You can think of an Azure network as a set of resources that links other Azure resources.

4.1.1 Create and configure VNET peering

- Azure Virtual Network peering | Microsoft Docs
- Create, change, or delete an Azure virtual network peering | Microsoft Docs
- Connect virtual networks with VNet peering - tutorial - Azure portal | Microsoft Docs

4.1.2 Configure private and public IP addresses, network routes, network interface, subnets, and virtual network

- Azure Virtual Network | Microsoft Docs
- Create, change, or delete an Azure virtual network | Microsoft Docs
- Azure virtual network traffic routing | Microsoft Docs
- Route network traffic - tutorial - Azure portal | Microsoft Docs
- Public IP addresses in Azure | Microsoft Docs
- Manage public IP addresses - Azure Virtual Network | Microsoft Docs
- Configure IP addresses for an Azure network interface | Microsoft Docs
- Configure private IP addresses for VMs - Azure portal | Microsoft Docs
- Add, change, or delete an Azure virtual network subnet | Microsoft Docs

4.2 Configure name resolution

Depending on how you use Azure to host IaaS, PaaS, and hybrid solutions, you might need to allow the virtual machines (VMs), and other resources deployed in a virtual network to communicate with each other. Although you can enable communication by using IP addresses, it is much simpler to use names that can be easily remembered, and do not change.

4.2.1 Configure Azure DNS

- Azure DNS documentation | Microsoft Docs
- Quickstart: Create a DNS zone and record - Azure portal - Azure DNS | Microsoft Docs
- Quickstart: Create an Azure DNS zone and record - Azure PowerShell - Azure DNS | Microsoft Docs
- Quickstart: Create an Azure DNS zone and record - Azure CLI - Azure DNS | Microsoft Docs

4.2.2 Configure custom DNS settings

- Integrate Azure DNS with your Azure resources - Azure DNS | Microsoft Docs
- Tutorial: Map existing custom DNS name - Azure App Service | Microsoft Docs

4.2.3 Configure a private or public DNS zone

- Quickstart - Create an Azure private DNS zone using Azure PowerShell | Microsoft Docs
- What is Azure Private DNS? | Microsoft Docs
- Tutorial: Host your domain and subdomain - Azure DNS | Microsoft Docs

4.3 Secure access to virtual networks

4.3.1 Create security rules
- [Azure network security groups overview | Microsoft Docs](#)
- [Create, change, or delete an Azure network security group | Microsoft Docs](#)

4.3.2 Associate an NSG to a subnet or network interface
- [Create, change, or delete an Azure network security group | Microsoft Docs](#)

4.3.3 Evaluate effective security rules
- [Microsoft Azure Network Security Group effective security rules evaluation - Daniel's Tech Blog](#)
- [Create, change, or delete an Azure network security group | Microsoft Docs](#)

4.3.4 Deploy and configure Azure Firewall
- [Tutorial: Deploy & configure Azure Firewall using the Azure portal | Microsoft Docs](#)
- [Tutorial: Deploy and configure Azure Firewall in a hybrid network using the Azure portal | Microsoft Docs](#)
- [Deploy and configure Azure Firewall using Azure PowerShell | Microsoft Docs](#)
- [Deploy & configure Azure Firewall in hybrid network using PowerShell | Microsoft Docs](#)

4.3.5 Deploy and configure Azure Bastion Service
- [Tutorial: Create an Azure Bastion host: Windows VM: portal | Microsoft Docs](#)
- [Create a Bastion host using Azure PowerShell | Microsoft Docs](#)

4.4 Configure load balancing
Load balancing provides a higher level of availability and scale by spreading incoming requests across multiple virtual machines.

4.4.1 Configure Application Gateway
- [Azure Application Gateway configuration overview | Microsoft Docs](#)
- [Frequently asked questions about Azure Application Gateway | Microsoft Docs](#)
- [Quickstart: Direct web traffic using the portal - Azure Application Gateway | Microsoft Docs](#)
- [Configure an internal load balancer (ILB) endpoint - Azure Application Gateway | Microsoft Docs](#)
- [Tutorial: Create using portal - Web Application Firewall | Microsoft Docs](#)

4.4.2 Configure an internal load balancer
- [Internal Load Balancing | Azure blog and updates | Microsoft Azure](#)
- [Quickstart: Create an internal load balancer - Azure portal - Azure Load Balancer | Microsoft Docs](#)
- [Quickstart: Create an internal load balancer - Azure PowerShell - Azure Load Balancer | Microsoft Docs](#)
- [Quickstart: Create an internal load balancer - Azure CLI - Azure Load Balancer | Microsoft Docs](#)
- [Quickstart: Create an internal load balancer by using a template | Microsoft Docs](#)

4.4.3 Configure load balancing rules
- [Quickstart: Create a public load balancer - Azure portal - Azure Load Balancer | Microsoft Docs](#)

- [Quickstart: Create a public load balancer - Azure CLI - Azure Load Balancer | Microsoft Docs](#)
- [Quickstart: Create a public load balancer - Azure PowerShell - Azure Load Balancer | Microsoft Docs](#)

4.4.4 Configure a public load balancer

- [Quickstart: Create a public load balancer - Azure template - Azure Load Balancer | Microsoft Docs](#)

4.4.5 Troubleshoot load balancing

- [Troubleshoot Azure Load Balancer | Microsoft Docs](#)
- [Diagnostics with metrics, alerts, and resource health - Azure Standard Load Balancer | Microsoft Docs](#)

4.5 Monitor and troubleshoot virtual networking

You can create complex and flexible setups in Azure that connect many virtual machines (VMs) to meet your needs. Just like in an on-premises network, configuration errors can result in problems that are challenging to troubleshoot. When you have to diagnose network problems in Azure, use Azure Network Watcher.

4.5.1 Monitor on-premises connectivity

- [Diagnose On-Premises connectivity via VPN gateway - Azure Network Watcher | Microsoft Docs](#)
- [Connect an on-premises network to Azure - Azure Architecture Center | Microsoft Docs](#)

4.5.2 Use Network Performance Monitor

- [Network Performance Monitor solution in Azure - Azure Monitor | Microsoft Docs](#)
- [Performance Monitor in Network Performance Monitor - Azure Monitor | Microsoft Docs](#)

4.5.3 Use Network Watcher

- [Azure Network Watcher | Microsoft Docs](#)
- [Introduction to resource troubleshooting - Azure Network Watcher | Microsoft Docs](#)
- [Troubleshoot VNET Gateway and Connections - Azure REST API - Azure Network Watcher | Microsoft Docs](#)

4.5.4 Troubleshoot external networking

- [Troubleshoot Azure VNet gateway and connections - Azure PowerShell - Azure Network Watcher | Microsoft Docs](#)

4.5.5 Troubleshoot virtual network connectivity

- [Troubleshoot virtual network peering issues | Microsoft Docs](#)
- [Troubleshooting connectivity problems between Azure VMs | Microsoft Docs](#)
- [Troubleshoot VNET Gateway and Connections - Azure REST API - Azure Network Watcher | Microsoft Docs](#)

4.6 Integrate an on-premises network with an Azure virtual network

A cross-premises Azure virtual network is connected to your on-premises network, extending your network to include subnets and virtual machines hosted in Azure infrastructure services. This connection lets computers on your on-premises network to directly access virtual machines in Azure and vice versa.

4.6.1. Create and configure Azure VPN Gateway

- [Tutorial - Create and manage a VPN Gateway: Azure portal | Microsoft Docs](#)
- [Azure VPN Gateway: configuration settings | Microsoft Docs](#)
- [Tutorial - Create and manage a VPN Gateway: Azure portal | Microsoft Docs](#)
- [Create a route-based Azure VPN Gateway: CLI | Microsoft Docs](#)
- [Azure VPN Gateway: Create route-based gateway: PowerShell | Microsoft Docs](#)

4.6.2 Create and configure VPNs

- [Tutorial - Connect on-premises network to virtual network: Azure portal - Azure VPN Gateway | Microsoft Docs](#)
- [Connect on-premises networks to a virtual network: Site-to-Site VPN: CLI - Azure VPN Gateway | Microsoft Docs](#)
- [Azure ExpressRoute: Configure S2S VPN over Microsoft peering | Microsoft Docs](#)

4.6.3 Configure ExpressRoute

- [Extend an on-premises network using ExpressRoute - Azure Architecture Center | Microsoft Docs](#)

4.6.4 Configure Azure Virtual WAN

- [Azure Virtual WAN Overview | Microsoft Docs](#)
- [Tutorial: Use Azure Virtual WAN to Create Site-to-Site connections | Microsoft Docs](#)

5. Monitor and back up Azure resources (10-15%)

5.1   Monitor resources by using Azure Monitor

Azure Monitor helps you maximize the availability and performance of your applications and services. It delivers a comprehensive solution for collecting, analyzing, and acting on telemetry from your cloud and on-premises environments. This information helps you understand how your applications are performing and proactively identify issues affecting them and the resources they depend on.

5.1.1   Configure and interpret metrics

- [Getting started with Azure metrics explorer - Azure Monitor | Microsoft Docs](#)
- [Metrics in Azure Monitor - Azure Monitor | Microsoft Docs](#)
- [Custom metrics in Azure Monitor (Preview) - Azure Monitor | Microsoft Docs](#)
- [Azure Monitor data platform - Azure Monitor | Microsoft Docs](#)
- [Advanced features of Azure Metrics Explorer - Azure Monitor | Microsoft Docs](#)

5.1.2   Configure Log Analytics

- [Create a Log Analytics workspace in the Azure portal - Azure Monitor | Microsoft Docs](#)
- [Azure Activity log - Azure Monitor | Microsoft Docs](#)
- [Manage Log Analytics workspaces in Azure Monitor - Azure Monitor | Microsoft Docs](#)
- [Azure Activity log - Azure Monitor | Microsoft Docs](#)
- [Resource Manager template samples for diagnostic settings - Azure Monitor | Microsoft Docs](#)

5.1.3   Query and analyze logs

- [Log queries in Azure Monitor - Azure Monitor | Microsoft Docs](#)
- [Get started with log queries in Azure Monitor - Azure Monitor | Microsoft Docs](#)
- [Azure Monitor log query examples - Azure Monitor | Microsoft Docs](#)
- [Log Analytics tutorial - Azure Monitor | Microsoft Docs](#)

5.1.4   Set up alerts and actions

- [Overview of alerting and notification monitoring in Azure - Azure Monitor | Microsoft Docs](#)
- [Create, view, and manage activity log alerts in Azure Monitor - Azure Monitor | Microsoft Docs](#)
- [Create, view, and manage log alerts Using Azure Monitor - Azure Monitor | Microsoft Docs](#)
- [Activity log alerts in Azure Monitor - Azure Monitor | Microsoft Docs](#)
- [Log alerts in Azure Monitor - Azure Monitor | Microsoft Docs](#)
- [Create and manage action groups in the Azure portal - Azure Monitor | Microsoft Docs](#)
- [Create, view, and manage activity log alerts in Azure Monitor - Azure Monitor | Microsoft Docs](#)
- [Create, view, and manage log alerts Using Azure Monitor - Azure Monitor | Microsoft Docs](#)
- [Azure Monitor alerting just got better! | Azure Blog and Updates | Microsoft Azure](#)

5.1.5   Configure Application Insights

- [What is Azure Application Insights? - Azure Monitor | Microsoft Docs](#)
- [Application Insights for Azure cloud services - Azure Monitor | Microsoft Docs](#)

5.2 Implement backup and recovery

The Azure Backup service provides simple, secure, and cost-effective solutions to back up your data and recover it from the Microsoft Azure cloud.

5.2.1 Configure and review backup reports

- Configure Azure Backup reports - Azure Backup | Microsoft Docs
- Microsoft Azure : Azure Backup Report with Recovery Services Vault & Power BI - TechNet Articles - United States (English) - TechNet Wiki

5.2.2 Perform backup and restore operations by using Azure Backup

- Azure Backup Documentation - Azure Backup | Microsoft Docs
- Quickstart - Back up a VM with the Azure portal - Azure Backup | Microsoft Docs
- Quickstart - Back up a VM with PowerShell - Azure Backup | Microsoft Docs
- Quickstart - Back up a VM with Azure CLI - Azure Backup | Microsoft Docs
- Tutorial - Back up multiple Azure virtual machines - Azure Backup | Microsoft Docs
- Introducing backup for Azure file shares | Azure Blog and Updates | Microsoft Azure
- Recover files and folders from Azure VM backup - Azure Backup | Microsoft Docs
- Restore VMs by using the Azure portal - Azure Backup | Microsoft Docs

5.2.3 Create a Recovery Services Vault

- Overview of Recovery Services vaults - Azure Backup | Microsoft Docs
- Manage Azure Recovery Services vaults and servers - Azure Backup | Microsoft Docs
- Back up Azure VMs in a Recovery Services vault - Azure Backup | Microsoft Docs
- Soft delete for virtual machines in Azure Backup | Azure updates | Microsoft Azure
- Soft delete for Azure Backup - Azure Backup | Microsoft Docs
- Soft delete for virtual machines - Azure Backup | Microsoft Docs

5.2.4 Create and configure backup policy

- Manage and monitor Azure VM backups - Azure Backup | Microsoft Docs

5.2.5 Perform site-to-site recovery by using Azure Site Recovery

- About Azure Site Recovery - Azure Site Recovery | Microsoft Docs
- Set up Azure VM disaster recovery to a secondary region with Azure Site Recovery - Azure Site Recovery | Microsoft Docs
- Tutorial to set up Azure VM disaster recovery with Azure Site Recovery - Azure Site Recovery | Microsoft Docs
- Monitor Azure Site Recovery - Azure Site Recovery | Microsoft Docs
- Monitor Azure Site Recovery with Azure Monitor Logs - Azure Site Recovery | Microsoft Docs