

Practical Task 7: Implementing Security Best Practices with Azure RBAC and Managed Identities

Securely manage access to Azure resources and integrate services using Managed Identities.

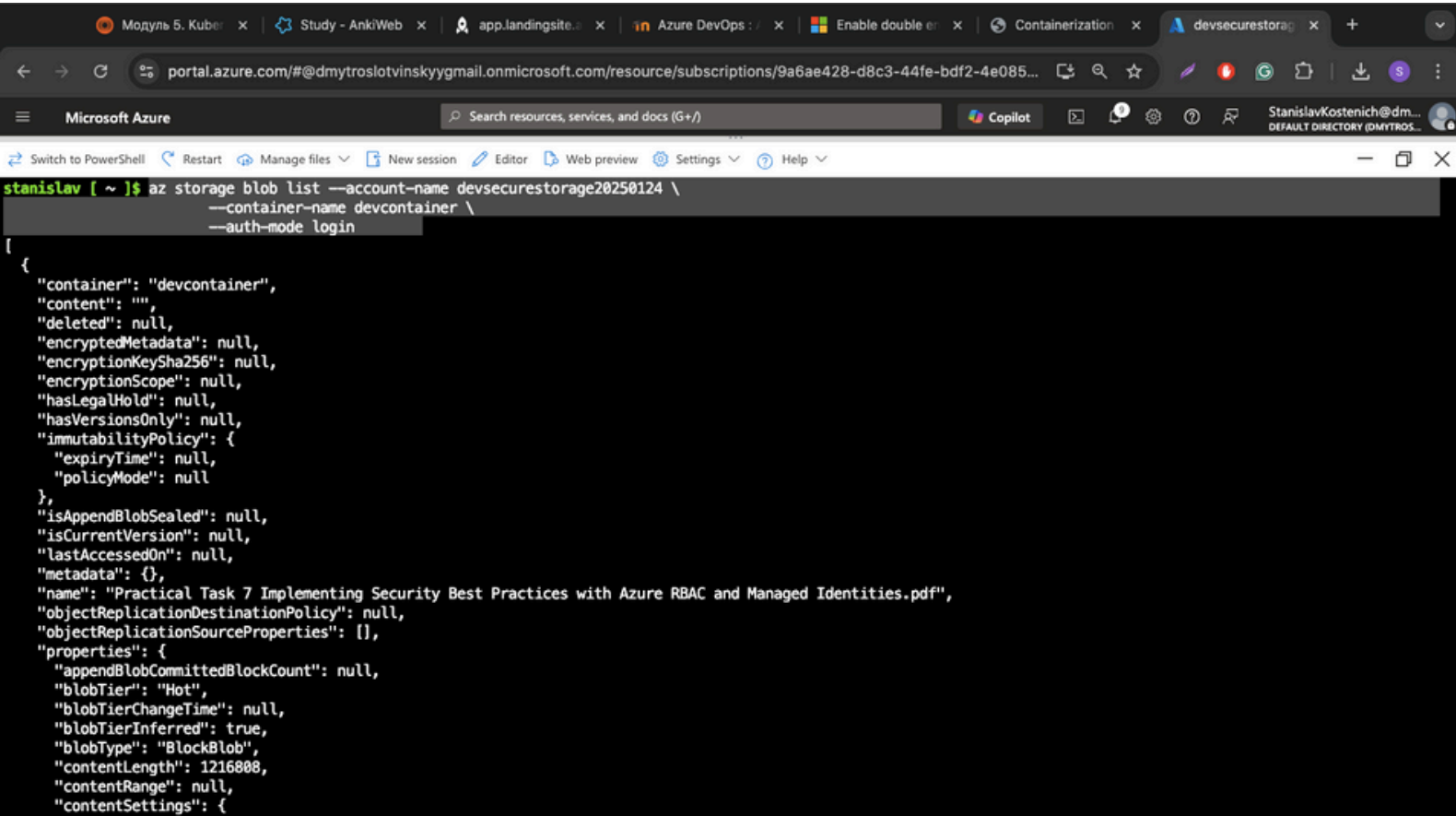
Requirements:

1. Configure Azure RBAC for a Storage Account:

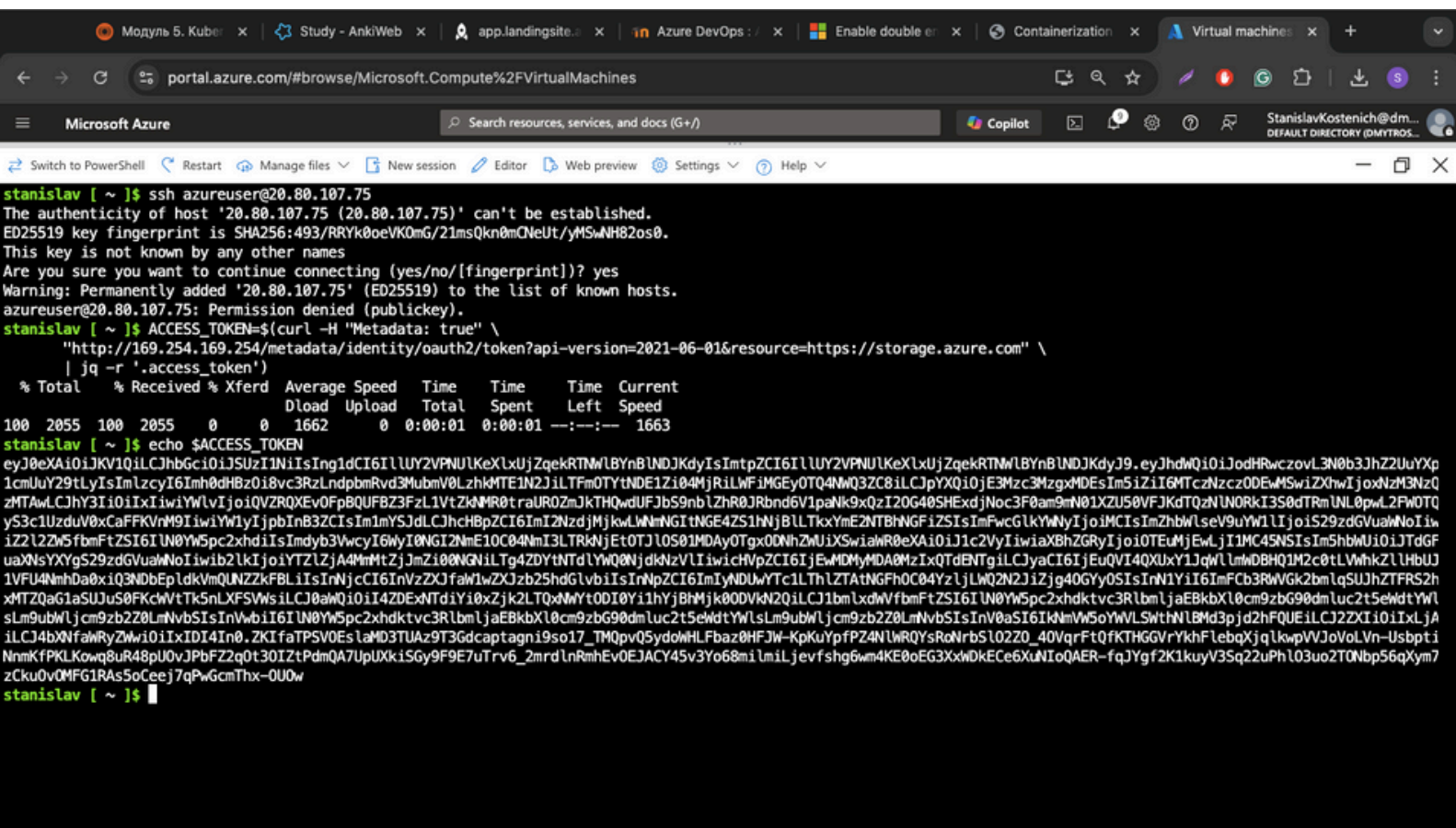
- Create a storage account named "secure-storage".
- Add a user or service principal with **Storage Blob Data Contributor** role.
- Verify that the user or service principal can upload and download blobs to the account.
- Attempt access with an unauthorized user and verify access is denied.

2. Set Up a Managed Identity for an Azure Virtual Machine:

- Create an Azure Virtual Machine (VM) with a system-assigned Managed Identity enabled.
- Assign the **Storage Blob Data Reader** role to the Managed Identity for "secure-storage".
- Connect to the VM and verify that the Managed Identity can access blob data using Azure CLI or a pre-installed script.



```
stanislav [ ~ ]$ az storage blob list --account-name devsecurestorage20250124 \
--container-name devcontainer \
--auth-mode login
{
  "container": "devcontainer",
  "content": "",
  "deleted": null,
  "encryptedMetadata": null,
  "encryptionKeySha256": null,
  "encryptionScope": null,
  "hasLegalHold": null,
  "hasVersionsOnly": null,
  "immutabilityPolicy": {
    "expiryTime": null,
    "policyMode": null
  },
  "isAppendBlobSealed": null,
  "isCurrentVersion": null,
  "lastAccessedOn": null,
  "metadata": {},
  "name": "Practical Task 7 Implementing Security Best Practices with Azure RBAC and Managed Identities.pdf",
  "objectReplicationDestinationPolicy": null,
  "objectReplicationSourceProperties": [],
  "properties": {
    "appendBlobCommittedBlockCount": null,
    "blobTier": "Hot",
    "blobTierChangeTime": null,
    "blobTierInferred": true,
    "blobType": "BlockBlob",
    "contentLength": 1216888,
    "contentRange": null,
    "contentSettings": {
```



54
55
56 **### **Step 3: Verify Access from the VM****

57 **1. **Connect to the VM:****

58 ```sh

59 ssh azureuser@20.80.107.75

60 ```

61 - Replace `**<VM_PUBLIC_IP>**` with your VM's public IP.

62
63 **2. **Acquire an Access Token using Managed Identity:****

64 ```sh

65 ACCESS_TOKEN=\$(curl -H "Metadata: true" \
66 "http://169.254.169.254/metadata/identity/
67 oauth2/token?api-version=2021-06-01&resource=https://storage.azure.com" \
68 | jq -r '.access_token')
69 ```

70 **3. **List Blob Containers to Verify Access:****

71 ```sh

72 az storage blob list --account-name secure-storage \
73 --container-name mycontainer \
74 --auth-mode login
75 ```

76
77 **4. **Alternatively, Use cURL to Test Access:****

78 ```sh

79 curl -H "Authorization: Bearer \$ACCESS_TOKEN" \
80 "https://secure-storage.blob.core.windows.net/mycontainer?restype=container&comp=list"
81 ```

```
portal.azure.com/#@dmytroslovinskygmail.onmicrosoft.com/resource/subscriptions/9a6ae428-d8c3-44fe-bdf2-4e085...
Microsoft Azure
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DEFAULT DIRECTORY (DMYTROS...)

Switch to PowerShell Restart Manage files New session Editor Web preview Settings Help

stanislav [ ~ ]$ az vm show --resource-group dev-LinuxVM-1_group --name dev-LinuxVM-1 --query identity.principalId --output tsv
a7210ec4-9763-4853-b2e0-e28b34b8bbec
stanislav [ ~ ]$
stanislav [ ~ ]$ az storage account show --name devsecurestorage20250124 --query id --output tsv
/subscriptions/9a6ae428-d8c3-44fe-bdf2-4e08593901a0/resourceGroups/StaniavKostenich/providers/Microsoft.Storage/storageAccounts/devsecurestorage20250124
stanislav [ ~ ]$
stanislav [ ~ ]$ az role assignment create --assignee a7210ec4-9763-4853-b2e0-e28b34b8bbec \
--role "Storage Blob Data Reader" \
--scope /subscriptions/9a6ae428-d8c3-44fe-bdf2-4e08593901a0/resourceGroups/StaniavKostenich/providers/Microsoft.Storage/storageAccounts/d
evsecurestorage20250124
{
  "condition": null,
  "conditionVersion": null,
  "createdBy": null,
  "createdOn": "2025-01-24T17:02:50.488365+00:00",
  "delegatedManagedIdentityResourceId": null,
  "description": null,
  "id": "/subscriptions/9a6ae428-d8c3-44fe-bdf2-4e08593901a0/resourceGroups/StaniavKostenich/providers/Microsoft.Storage/storageAccounts/devsecurestorage20250124/prov
iders/Microsoft.Authorization/roleAssignments/77104b70-04b6-4097-a812-f4e39c2557a2",
  "name": "77104b70-04b6-4097-a812-f4e39c2557a2",
  "principalId": "a7210ec4-9763-4853-b2e0-e28b34b8bbec",
  "principalType": "ServicePrincipal",
  "resourceGroup": "StaniavKostenich",
  "roleDefinitionId": "/subscriptions/9a6ae428-d8c3-44fe-bdf2-4e08593901a0/providers/Microsoft.Authorization/roleDefinitions/2a2b9908-6ea1-4ae2-8e65-a410df84e7d1",
  "scope": "/subscriptions/9a6ae428-d8c3-44fe-bdf2-4e08593901a0/resourceGroups/StaniavKostenich/providers/Microsoft.Storage/storageAccounts/devsecurestorage20250124",
  "type": "Microsoft.Authorization/roleAssignments",
  "updatedBy": "a6ef082c-f2ff-44cb-88d6-57ead467d75e",
  "updatedOn": "2025-01-24T17:02:51.105376+00:00"
}
stanislav [ ~ ]$
```

28
29 2. ****Get the Managed Identity's Object ID:****

30 ```sh

31 az vm show --resource-group StanislavKostenich --name dev-LinuxVM-1 --query identity.
principalId --output tsv

32 ```
33 - Copy the output (`PRINCIPAL_ID`) for later steps.

34
35 ----
36
37 ### ****Step 2: Assign the Storage Blob Data Reader Role****

38 1. ****Find the Storage Account Resource ID:****

39 ```sh

40 az storage account show --name secure-storage --query id --output tsv

41 ```
42 - Copy the ****Storage Account Resource ID****.

43
44 2. ****Assign the Role:****

45 ```sh

46 az role assignment create --assignee 599066be-31a3-48ff-8861-efca43ed2297 \
47 --role "Storage Blob Data Reader" \
48 --scope /subscriptions/9a6ae428-d8c3-44fe-bdf2-4e08593901a0/
resourceGroups/StaniSlavKostenich/providers/Microsoft.Storage/
storageAccounts/devaccount20250119

49 ```
50 - Replace `` with the output from ****Step 1****.

51 - Replace `` with the output from ****Step 2.1****.

52
53 ----

portal.azure.com/#view/HubsExtension/DeploymentDetailsBlade/~/overview/id/%2Fsubscriptions%2F9a6ae428-d8c3-44f...

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Home >

CreateVm-canonical.ubuntu-24_04-lts-server-20250124184913 | Overview

Deployment

Search

Delete Cancel Redeploy Download Refresh

Overview

Inputs

Outputs

Template

Deployment is in progress

Deployment name: CreateVm-canonical.ubuntu-24_04-lts-server-2... Start time: 1/24/2025, 6:55:51 PM
Subscription: Azure subscription 1 Correlation ID: 9b0033df-20d4-4b4d-9a4f-1906441b2d8f
Resource group: dev-LinuxVM-1-group

Deployment details

Resource	Type	Status	Operation details
dev-LinuxVM-1	Microsoft.Compute/virtualMachines	Created	Operation details
dev-linuxvm-126_x1	Microsoft.Network/networkInterfaces	Created	Operation details
dev-LinuxVM-1-vnet	Microsoft.Network/virtualNetworks	OK	Operation details
dev-LinuxVM-1-ip	Microsoft.Network/publicIpAddresses	OK	Operation details
dev-LinuxVM-1-nsg	Microsoft.Network/networkSecurityGroups	OK	Operation details

Give feedback

Tell us about your experience with deployment

Download private key and create resource

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portal.azure.com/#create/Microsoft.VirtualMachine-ARM

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Home > Virtual machines >

Create a virtual machine

Help me create a low cost VMHelp me create a VM optimized for high availabilityHelp me choose the right VM size for my workload

BasicsDisksNetworkingManagementMonitoringAdvancedTagsReview + create

Configure management options for your VM.

Microsoft Defender for Cloud

Microsoft Defender for Cloud provides unified security management and advanced threat protection across hybrid cloud workloads. [Learn more](#)

✔ Your subscription is protected by Foundational Cloud Security Posture Management Free Plan.

Identity

Enable system assigned managed identity ☒

Microsoft Entra ID

Login with Microsoft Entra ID ☐

RBAC role assignment of Virtual Machine Administrator Login or Virtual Machine User Login is required when using Microsoft Entra ID login. [Learn more](#)

Microsoft Entra ID login now uses SSH certificate-based authentication. You will need to use an SSH client that supports OpenSSH certificates. You can use Azure CLI or Cloud Shell from the Azure Portal. [Learn more](#)

Auto-shutdown

Enable auto-shutdown ☐

Backup

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Home > Virtual machines >

Create a virtual machine

Help me create a low cost VMHelp me create a VM optimized for high availabilityHelp me choose the right VM size for my workload

Subscription ⓘ

Azure subscription 1

Resource group ⓘ

(New) dev-LinuxVM-1_group

Create new

Instance details

Virtual machine name ⓘ

dev-LinuxVM-1

Region ⓘ

(US) Central US

Availability options ⓘ

Availability zone

Zone options ⓘ

☒ Self-selected zone

Choose up to 3 availability zones, one VM per zone

☐ Azure-selected zone (Preview)

Let Azure assign the best zone for your needs

Availability zone ⓘ

Zone 1

☒ You can now select multiple zones. Selecting multiple zones will create one VM per zone. [Learn more](#)

Security type ⓘ

Trusted launch virtual machines

[Configure security features](#)

Image ⓘ

Ubuntu Server 24.04 LTS - x64 Gen2

[See all images](#) | [Configure VM generation](#)

VM architecture ⓘ

☐ Arm64

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Review + create

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portal.azure.com/#view/Microsoft_Azure_Storage/ContainerMenuBlade/~/_/overview/storageAccountId/%2Fsubscriptions%2F9a6...

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Home > devsecurestorage20250124_1737736749774 | Overview > devsecurestorage20250124 | Containers >

devcontainer
Container

Search

UploadChange access levelRefreshDeleteChange tierAcquire leaseBreak leaseView snapshotsCreate snapshotGive feedback

Overview

Diagnose and solve problems

Access Control (IAM)

Settings

Shared access tokens

Access policy

Properties

Metadata

Authentication method: Microsoft Entra user account (Switch to Access key)

Location: devcontainer

Search blobs by prefix (case-sensitive)

Show deleted blobs

Add filter

Name	Modified	Access tier	Archive status	Blob type	Size	Lease state	
<input type="checkbox"/> Practical Task 7 Implementing Security Best Practices with Azure RBA...	1/24/2025, 6:44:17 PM	Hot (Inferred)		Block blob	1.16 MiB	Available	...

Successfully uploaded blob(s)
Successfully uploaded 1 blob(s).

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portal.azure.com/#view/Microsoft_Azure_Storage/ContainerMenuBlade/~/_/overview/storageAccountId/%2Fsubscriptions%2F9a6...

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devcontainerContainer

Search

OverviewDiagnose and solve problemsAccess Control (IAM)SettingsShared access tokensAccess policyPropertiesMetadata

Authentication method: Microsoft Entra user account (Switch to Access key)Location: devcontainerSearch blobs by prefix (case-sensitive)Add filter

Name	Modified	Access tier	Archive s
No results			

Upload blob

1 file(s) selected: Practical Task 7 Implementing Security Best Practices ...
Drag and drop files here or [Browse for files](#)

☐ Overwrite if files already exist

Advanced

Upload

Give feedback

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portal.azure.com/#@dmytroslotvinskygmail.onmicrosoft.com/resource/subscriptions/9a6ae428-d8c3-44fe-bdf2-4e0859390...

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Home > devsecurestorage20250124_1737736749774 | Overview > devsecurestorage20250124

devsecurestorage20250124 | Access Control (IAM)

Storage account

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Diagnose and solve problems

Access Control (IAM)

Data migration

Events

Storage browser

Storage Mover

Partner solutions

Data storage

Containers

File shares

Queues

Tables

Security + networking

Data management

Settings

Monitoring

Monitoring (classic)

Check access

Role assignments

Roles

Deny assignments

Classic administrator

My access

View my level of access to this resource.

View my access

Check access

Review the level of access a user, group, service principal, or managed identity has to this resource.

Check access

Grant access to this resource

Grant access to resources by assigning a role.
[Learn more](#)

Add role assignment

View access to this resource

View the role assignments that grant access to this and other resources.
[Learn more](#)

View

Stanislav Kostenich assignments - devsecurestorage20250124

Current role assignments

Eligible assignments

Assignments for the selected user, group, service principal, or managed identity at this scope or inherited to this scope.

Search by assignment name or description

Role assignments (3)

Role	Description	Scope	Group assignment	Condition
Contributor	Grants full access to manage all r...	Subscription (Inherited)	Capgemini Azure Course 2025	None
Role Based Access Contr	Manage access to Azure resourc...	Subscription (Inherited)	Capgemini Azure Course 2025	View
Storage Blob Data Cont	Allows for read, write and delete ...	This resource	--	Add

Deny assignments (0)

Storage Blob Data Contributor

Classic administrators (0)

Role	Description
User is not a classic administrator.	

https://portal.azure.com/#

Модуль 5. Kuber xStudy - AnkiWeb xapp.landingsite.xAzure DevOps : / xEnable double er xContainerization xSelect members x

portal.azure.com/#view/Microsoft_Azure_AD/AddRoleAssignmentsLandingBlade/scope/%2Fsubscriptions%2F9a6ae428-d8c3-...x

Microsoft AzureSearch resources, services, and docs (G+/)CopilotStanislavKostenich@dm...DEFAULT DIRECTORY (DMYTROS...

Home > devsecurestorage20250124_1737736749774 | Overview > devsecurestorage20250124 | Access Control (IAM) >

Add role assignment

RoleMembersConditionsReview + assign

Showing a filtered list of roles because your permissions include a condition. [Learn more](#)
[View my access](#)

Selected roleStorage Blob Data Contributor

Assign access to☒ User, group, or service principal
☐ Managed identity

Members+ Select members

Name	Object ID	Type
No members selected		

DescriptionOptional

Review + assignPreviousNext

Select members

sta

SKStanislav KostenichStanislavKostenich@dmytroslovinskyygmail.onmicrosoft.com

Selected members:

SKStanislav KostenichStanislavKostenich@dmytroslovinskyygmail.onmicrosoft.com

SelectClose

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Home > devsecurestorage20250124_1737736749774 | Overview > devsecurestorage20250124 | Access Control (IAM) >

Add role assignment

RoleMembersConditionsReview + assign

A role definition is a collection of permissions. You can use the built-in roles or you can create your own custom roles. [Learn more](#) >

Job function rolesPrivileged administrator roles

Grant access to Azure resources based on job function, such as the ability to create virtual machines.

blob

Type : AllCategory : All

Name ↑↓	Description ↑↓	Type ↑↓	Category ↑↓	Details
Defender CSPM Storage Data Scanner	Grants access to read blobs and files. This role is used by the data scanner of Dfender CSPM.	BuiltInRole	None	View
Defender for Storage Data Scanner	Grants access to read blobs and update index tags. This role is used by the data scanner of Defender for Storage.	BuiltInRole	None	View
Storage Blob Data Contributor	Allows for read, write and delete access to Azure Storage blob containers and data	BuiltInRole	Storage	View
Storage Blob Data Owner	Allows for full access to Azure Storage blob containers and data, including assigning POSIX access control.	BuiltInRole	Storage	View
Storage Blob Data Reader	Allows for read access to Azure Storage blob containers and data	BuiltInRole	Storage	View
Storage Blob Delegator	Allows for generation of a user delegation key which can be used to sign SAS tokens	BuiltInRole	Storage	View

Showing 1 - 6 of 6 results.

Review + assign

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Home > devsecurestorage20250124_1737736749774 | Overview > devsecurestorage20250124

devsecurestorage20250124 | Access Control (IAM)

Storage account

Search

OverviewActivity logTagsDiagnose and solve problemsAccess Control (IAM)Data migrationEventsStorage browserStorage MoverPartner solutionsData storageContainersFile sharesQueuesTablesSecurity + networkingData managementSettingsMonitoringMonitoring (classic)Automation

Check accessRole assignmentsRolesDeny assignmentsClassic administrator

My access

View my level of access to this resource.

View my access

Check access

Review the level of access a user, group, service principal, or managed identity has to this resource.

Check access

Grant access to this resource

Grant access to resources by assigning a role.
[Learn more](#)

Add role assignment

View access to this resource

View the role assignments that grant access to this and other resources.
[Learn more](#)

View

Stanislav Kostenich assignments - devsecurestorage20250124

Current role assignmentsEligible assignments

Assignments for the selected user, group, service principal, or managed identity at this scope or inherited to this scope.

Search by assignment name or description

Role assignments (2)

Role	Description	Scope	Group assignment	Condition
Contributor	Grants full access to manage all r...	Subscription (Inherited)	Capgemini Azure Course 2025	None
Role Based Access Contr	Manage access to Azure resourc...	Subscription (Inherited)	Capgemini Azure Course 2025	View

Deny assignments (0)

Classic administrators (0)

Role	Description
User is not a classic administrator.	

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portal.azure.com/#create/Microsoft.StorageAccount-ARM

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Home > Storage accounts >

Create a storage account

Configure security settings that impact your storage account.

Require secure transfer for REST API operations ⓘ

Allow enabling anonymous access on individual containers ⓘ

Enable storage account key access ⓘ

Default to Microsoft Entra authorization in the Azure portal ⓘ

Minimum TLS version ⓘ

Permitted scope for copy operations (preview) ⓘ

☒

☐

☒

☒

Version 1.2

From any storage account

Hierarchical Namespace

Hierarchical namespace, complemented by Data Lake Storage Gen2 endpoint, enables file and directory semantics, accelerates big data analytics workloads, and enables access control lists (ACLs). [Learn more](#) ⓘ

Enable hierarchical namespace ⓘ

☐

Access protocols

Blob and Data Lake Gen2 endpoints are provisioned by default. [Learn more](#) ⓘ

Enable SFTP ⓘ

☐

ⓘ SFTP can only be enabled for hierarchical namespace accounts

Enable network file system v3 ⓘ

☐

ⓘ To enable NFS v3 'hierarchical namespace' must be enabled. [Learn more about NFS v3](#) ⓘ

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portal.azure.com/#create/Microsoft.StorageAccount-ARM

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Home > Storage accounts >

Create a storage account

Azure Storage is a Microsoft-managed service providing cloud storage that is highly available, secure, durable, scalable, and redundant. Azure Storage includes Azure Blobs (objects), Azure Data Lake Storage Gen2, Azure Files, Azure Queues, and Azure Tables. The cost of your storage account depends on the usage and the options you choose below. [Learn more about Azure storage accounts](#)

Project details

Select the subscription in which to create the new storage account. Choose a new or existing resource group to organize and manage your storage account together with other resources.

Subscription *

Azure subscription 1

Resource group *

StanislavKostenich

Create new

Instance details

Storage account name * ⓘ

devsecurestorage20250124

Region * ⓘ

(US) Central US

Deploy to an Azure Extended Zone

Primary service ⓘ

Select a primary service

Performance * ⓘ

☒ Standard: Recommended for most scenarios (general-purpose v2 account)

☐ Premium: Recommended for scenarios that require low latency.

Redundancy * ⓘ

Geo-redundant storage (GRS)

☒ Make read access to data available in the event of regional unavailability.

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