✓ 100 XP ▶

Describe configuring non-relational data services

8 minutes

After you've provisioned a resource, you'll often need to configure it to meet the needs of your applications and environment. For example, you might need to set up network access, or open a firewall port to enable your applications to connect to the resource.

In this unit, you'll learn how to enable network access to your resources, and how you can prevent accidental exposure of your resources to third parties. You'll see how to use authentication and access control to protect the data managed by your resources.

Configure connectivity and firewalls

The default connectivity for Azure Cosmos DB and Azure Storage is to enable access to the world at large. You can connect to these services from an on-premises network, the internet, or from within an Azure virtual network. Although this level of access sounds risky, most Azure services mitigate this risk by requiring authentication before granting access. Authentication is described later in this unit.

> ⓘ **Note**
>
> An Azure Virtual Network is a representation of your own network in the cloud. A virtual network enables you to connect virtual machines and Azure services together, in much the same way that you might use a physical network on-premises. Azure ensures that each virtual network is isolated from other virtual networks created by other users, and from the Internet. Azure enables you to specify which machines (real and virtual), and services, are allowed to access resources on the virtual network, and which ports they can use.

Configure connectivity to virtual networks and on-premises computers

To restrict connectivity, use the **Networking** page for a service. To limit connectivity, choose **Selected networks**. Three further sections will appear, labeled **Virtual Network**, **Firewall**, and

Exceptions.

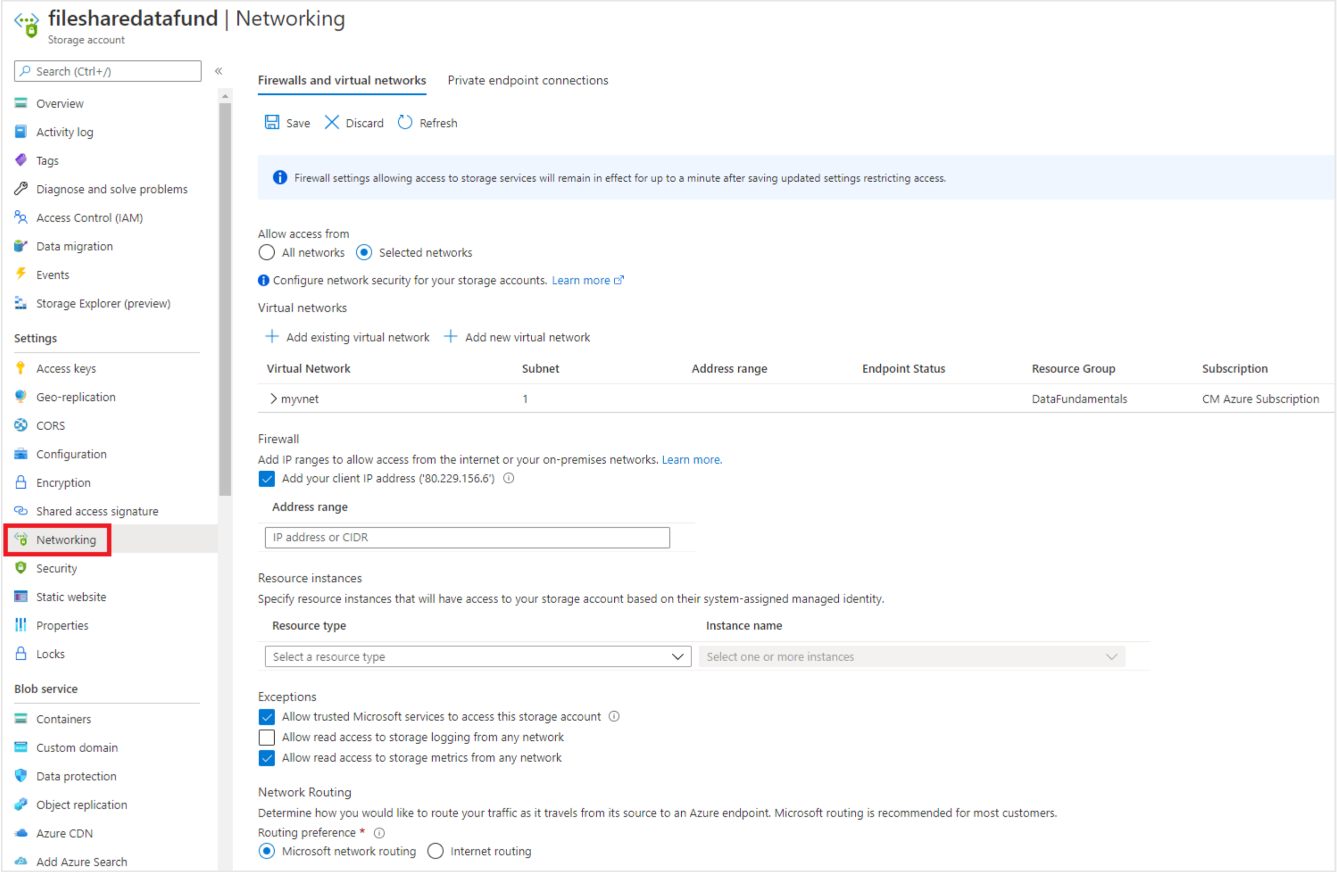
In the **Virtual networks** section, you can specify which virtual networks are allowed to route traffic to the service. When you create items such as web applications and virtual machines, you can add them to a virtual network. If these applications and virtual machines require access to your resource, add the virtual network containing these items to the list of allowed networks.

If you need to connect to the service from an on-premises computer, in the **Firewall** section, add the IP address of the computer. This setting creates a firewall rule that allows traffic from that address to reach the service.

The **Exceptions** setting allows you to enable access to any other of your services created in your Azure subscription.

For detailed information read Configure Azure Storage firewalls and virtual networks.

The image below shows the **Networking** page for an Azure Storage account. Other services have the same, or similar, page.



Firewall settings allowing access to storage services will remain in effect for up to a minute after saving updated settings restricting access.

Allow access from

○ All networks ● Selected networks

Configure network security for your storage accounts. Learn more

Virtual networks

+ Add existing virtual network + Add new virtual network

Virtual Network	Subnet	Address range	Endpoint Status	Resource Group	Subscription
> myvnet	1			DataFundamentals	CM Azure Subscription

Firewall

Add IP ranges to allow access from the internet or your on-premises networks. Learn more.

☑ Add your client IP address ('80.229.156.6')

Address range

IP address or CIDR

Resource instances

Specify resource instances that will have access to your storage account based on their system-assigned managed identity.

Resource type	Instance name
Select a resource type	Select one or more instances

Exceptions

☑ Allow trusted Microsoft services to access this storage account

☐ Allow read access to storage logging from any network

☑ Allow read access to storage metrics from any network

Network Routing

Determine how you would like to route your traffic as it travels from its source to an Azure endpoint. Microsoft routing is recommended for most customers.

Routing preference *

● Microsoft network routing ○ Internet routing

Configure connectivity from private endpoints

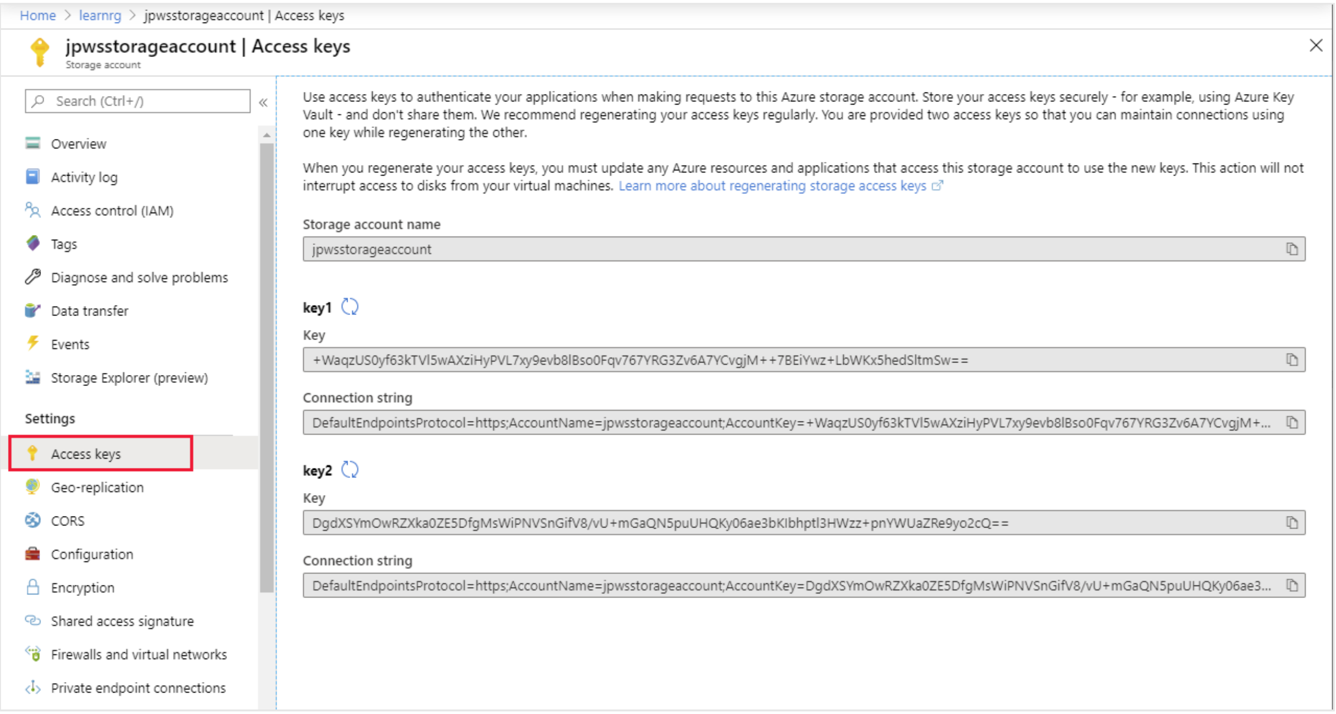
Azure Private Endpoint is a network interface that connects you privately and securely to a service powered by Azure Private Link. Private Endpoint uses a private IP address from your

VNet, effectively bringing the service into your VNet. The service could be an Azure service such as Azure Storage, Azure Cosmos DB, SQL, or your own Private Link Service. For detailed information, read What is Azure Private Endpoint?.

The **Private endpoint connections** page for a service allows you to specify which private endpoints, if any, are permitted access to your service. You can use the settings on this page, together with the **Firewalls and virtual networks** page, to completely lock down users and applications from accessing public endpoints to connect to your Cosmos DB account.

Configure authentication

Many services include an access key that you can specify when you attempt to connect to the service. If you provide an incorrect key, you'll be denied access. The image below shows how to find the access key for an Azure Storage account; you select **Access Keys** under **Settings** on the main page for the account. Many other services allow you to view the access key in the same way from the Azure portal. If your key is compromised, you can generate a new access key.


Home > learnrg > jpwsstorageaccount | Access keys
jpwsstorageaccount | Access keys
Storage account
Search (Ctrl+/)
Overview
Activity log
Access control (IAM)
Tags
Diagnose and solve problems
Data transfer
Events
Storage Explorer (preview)
Settings
Access keys
Geo-replication
CORS
Configuration
Encryption
Shared access signature
Firewalls and virtual networks
Private endpoint connections

Use access keys to authenticate your applications when making requests to this Azure storage account. Store your access keys securely - for example, using Azure Key Vault - and don't share them. We recommend regenerating your access keys regularly. You are provided two access keys so that you can maintain connections using one key while regenerating the other.

When you regenerate your access keys, you must update any Azure resources and applications that access this storage account to use the new keys. This action will not interrupt access to disks from your virtual machines. Learn more about regenerating storage access keys

Storage account name
jpwsstorageaccount

key1

Key
+WaqzUS0yf63kTVl5wAXziHyPVL7xy9evb8lBso0Fqv767YRG3Zv6A7YCvgjM++7BEiYwz+LbWKx5hedSltmSw==

Connection string
DefaultEndpointsProtocol=https;AccountName=jpwsstorageaccount;AccountKey=+WaqzUS0yf63kTVl5wAXziHyPVL7xy9evb8lBso0Fqv767YRG3Zv6A7YCvgjM+...

key2

Key
DgdXSYmOwRZXka0ZE5DfgMsWiPNVSnGifV8/vU+mGaQN5puUHQKy06ae3bKlbhptl3HWzz+pnYWUaZRe9yo2cQ==

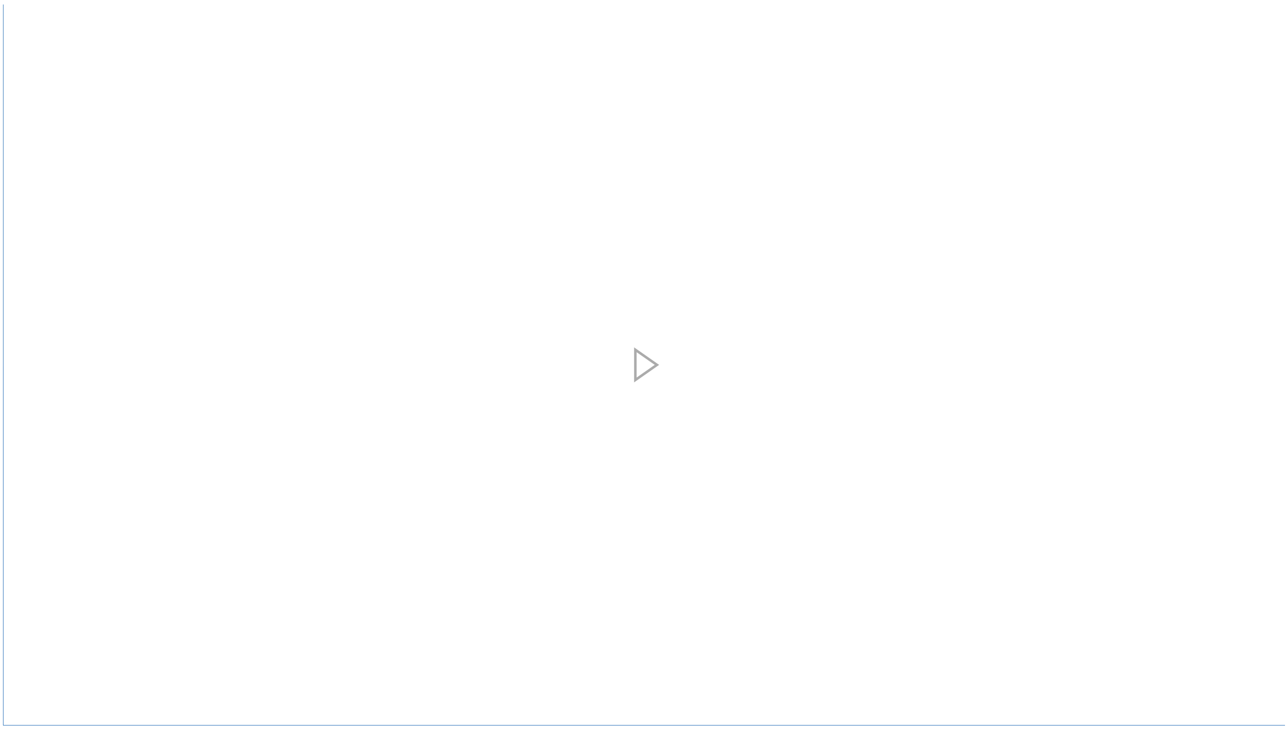
Connection string
DefaultEndpointsProtocol=https;AccountName=jpwsstorageaccount;AccountKey=DgdXSYmOwRZXka0ZE5DfgMsWiPNVSnGifV8/vU+mGaQN5puUHQKy06ae3...

> ⓘ Note
>
> Azure services actually provide two keys, labeled **key1** and **key2**. An application can use either key to connect to the service.

Any user or application that knows the access key for a resource can connect to that resource. However, access keys provide a rather coarse-grained level of authentication. Additionally, if you need to regenerate an access key (after accidental disclosure, for example), you may need to update all applications that connect using that key.

Azure Active Directory (Azure AD) provides superior security and ease of use over access key authorization. Microsoft recommends using Azure AD authorization when possible to minimize potential security vulnerabilities inherent in using access keys.

Azure AD is a separate Azure service. You add users and other security principals (such as an application) to a *security domain* managed by Azure AD. The following video describes how authentication works with Azure.



For detailed information on using Azure AD, visit the page What is Azure Active Directory? on the Microsoft website.

Configure access control

Azure AD enables you to specify who, or what, can access your resources. Access control defines what a user or application can do with your resources after they've been authenticated.

Access management for cloud resources is a critical function for any organization that is using the cloud. Azure role-based access control (Azure RBAC) helps you manage who has access to Azure resources, and what they can do with those resources. For example, using RBAC you could:

- Allow one user to manage virtual machines in a subscription and another user to manage virtual networks.
- Allow a database administrator group to manage SQL databases in a subscription.

- Allow a user to manage all resources in a resource group, such as virtual machines, websites, and subnets.
- Allow an application to access all resources in a resource group.

You control access to resources using Azure RBAC to create role assignments. A role assignment consists of three elements: a security principal, a role definition, and a scope.

- A **security principal** is an object that represents a user, group, service, or managed identity that is requesting access to Azure resources.

- A **role definition**, often abbreviated to *role*, is a collection of permissions. A role definition lists the operations that can be performed, such as read, write, and delete. Roles can be given high-level names, like owner, or specific names, like virtual machine reader. Azure includes several built-in roles that you can use, including:

  - **Owner** - Has full access to all resources including the right to delegate access to others.

  - **Contributor** - Can create and manage all types of Azure resources but can't grant access to others.

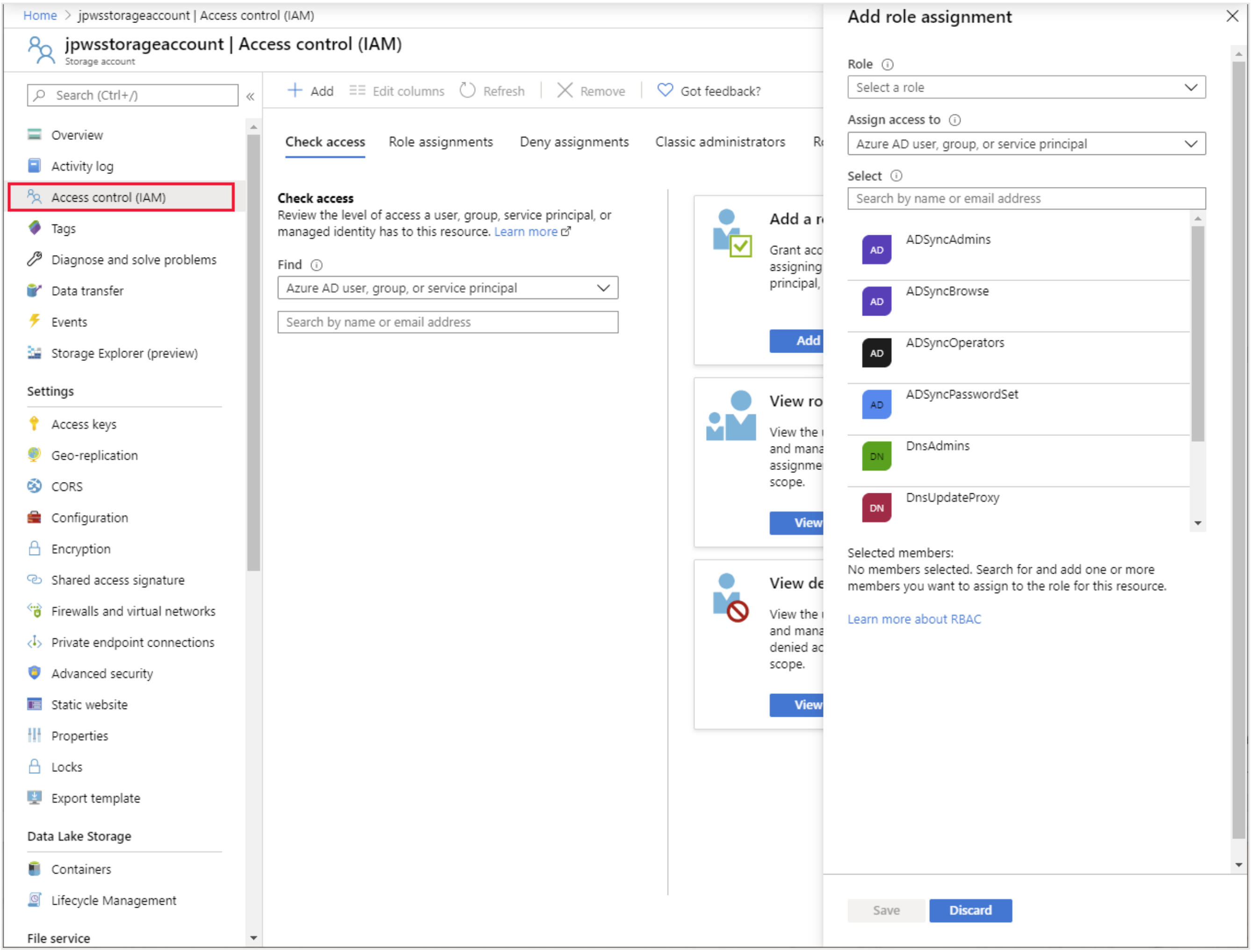
  - **Reader**- Can view existing Azure resources.

  - **User Access Administrator** - Lets you manage user access to Azure resources.

  You can also create your own custom roles. For detailed information, see Create or update Azure custom roles using the Azure portal on the Microsoft website.

- A **scope** lists the set of resources that the access applies to. When you assign a role, you can further limit the actions allowed by defining a scope. This is helpful if, for example, you want to make someone a Website Contributor, but only for one resource group.

You add role assignments to a resource in the Azure portal using the **Access control (IAM)** page. The **Role assignments** tab enables you to associate a role with a security principal, defining the level of access the role has to the resource. For further information, read Add or remove Azure role assignments using the Azure portal.



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

Find: Azure AD user, group, or service principal

Search by name or email address

Grant acc assigning principal,

View the and mana assignme scope.

View the and mana denied ac scope.

Role: Select a role

Assign access to: Azure AD user, group, or service principal

Select: Search by name or email address

- AD ADSyncAdmins
- AD ADSyncBrowse
- AD ADSyncOperators
- AD ADSyncPasswordSet
- DN DnsAdmins
- DN DnsUpdateProxy

Selected members:
No members selected. Search for and add one or more members you want to assign to the role for this resource.

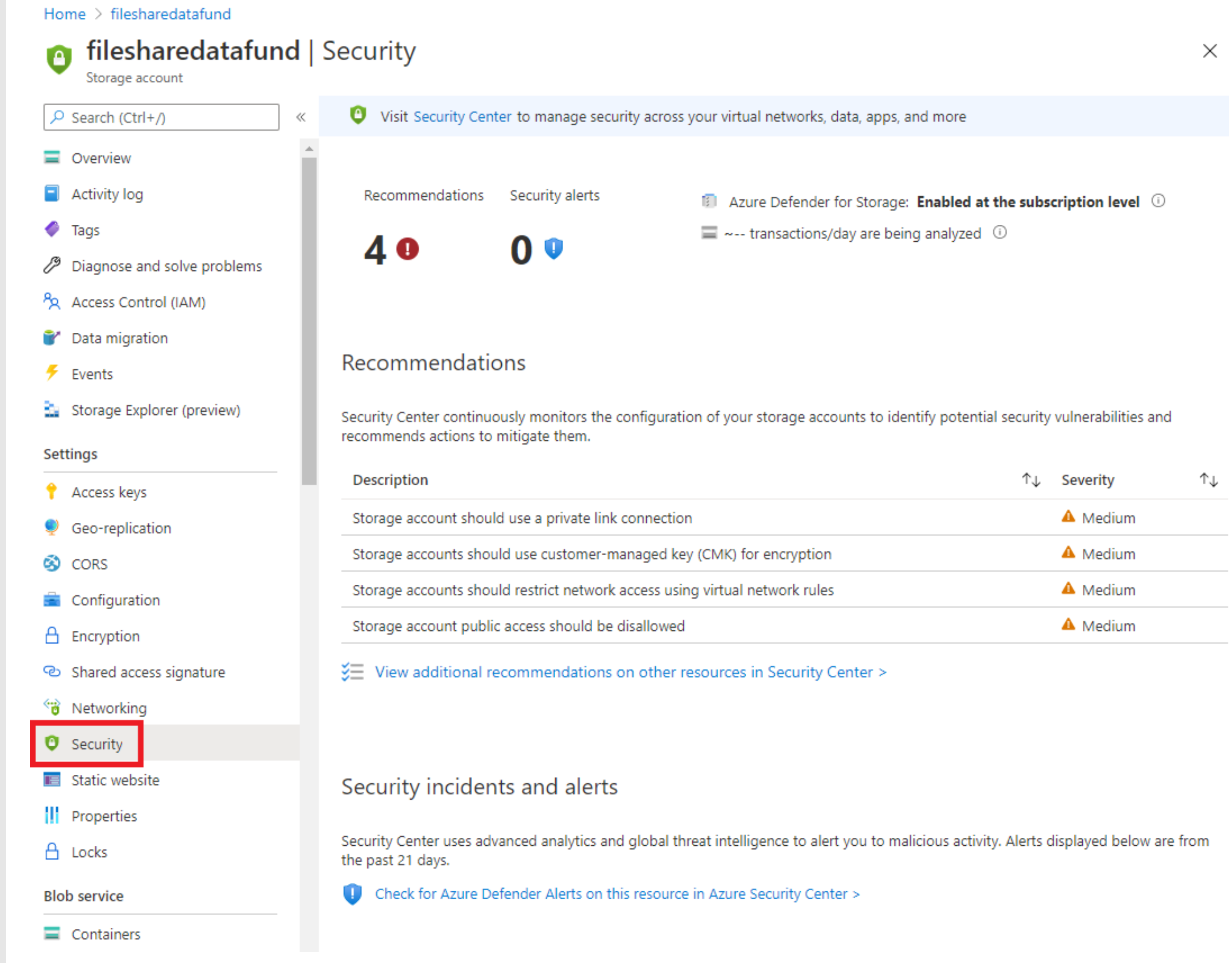
Learn more about RBAC

Configure security

Apart from authentication and authorization, many services provide additional protection through security.

Security implements threat protection and assessment. Threat protection tracks security incidents and alerts across your service. This intelligence monitors the service and detects unusual patterns of activity that could be harmful, or compromise the data managed by the service. Recommendations identifies potential security vulnerabilities and recommends actions to mitigate them.

The image below shows the **Security** page for Azure storage. The corresponding page for other non-relational services, such as Cosmos DB, is similar.



Visit Security Center to manage security across your virtual networks, data, apps, and more

Recommendations 4

Security alerts 0

Azure Defender for Storage: **Enabled at the subscription level**

~-- transactions/day are being analyzed

Recommendations

Security Center continuously monitors the configuration of your storage accounts to identify potential security vulnerabilities and recommends actions to mitigate them.

Description	Severity
Storage account should use a private link connection	Medium
Storage accounts should use customer-managed key (CMK) for encryption	Medium
Storage accounts should restrict network access using virtual network rules	Medium
Storage account public access should be disallowed	Medium

View additional recommendations on other resources in Security Center >

Security incidents and alerts

Security Center uses advanced analytics and global threat intelligence to alert you to malicious activity. Alerts displayed below are from the past 21 days.

Check for Azure Defender Alerts on this resource in Azure Security Center >

Next unit: Configure Azure Cosmos DB, and Azure Storage

Continue >