Outbound Firewall Rules - Configuration

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Contents

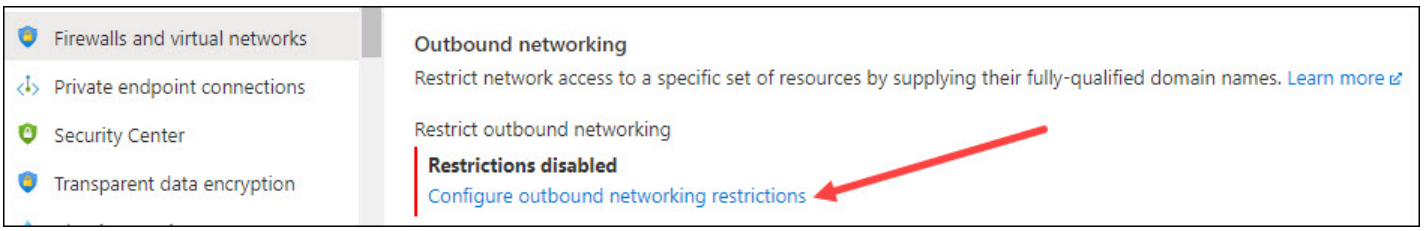
- Introduction
- Configuring OFR in the Azure Portal
- Configuring using PowerShell
- Configuring OFR using Azure CLI
- Troubleshooting
  - Checking enforcement of Outbound Firewall Rules
  - Auditing
  - Vulnerability Assessment
  - I/E Service
  - Kusto Query
- Common Errors and Cause

Introduction

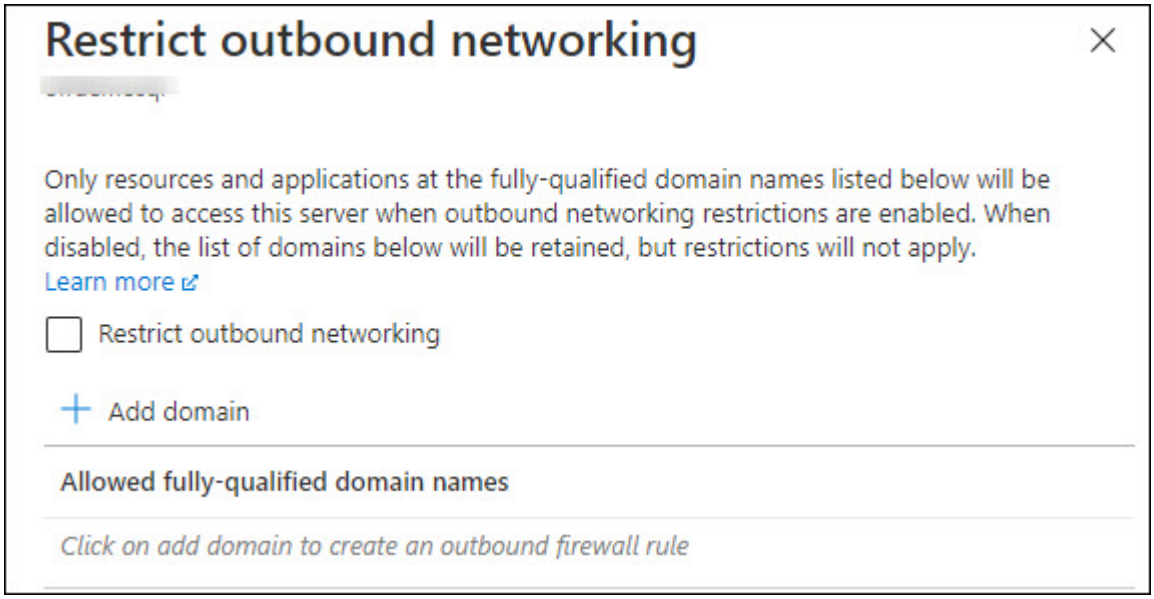
Outbound Firewall Rules limits network traffic from Azure SQL to a customer defined list of Storage accounts and any attempt to access Storage accounts that are not in this list is denied. The following Azure SQL DB features support this feature Auditing, Vulnerability Assessment, I/E Service, OpenRowset, Elastic Query and Bulk Insert.

Configuring OFR in the Azure Portal

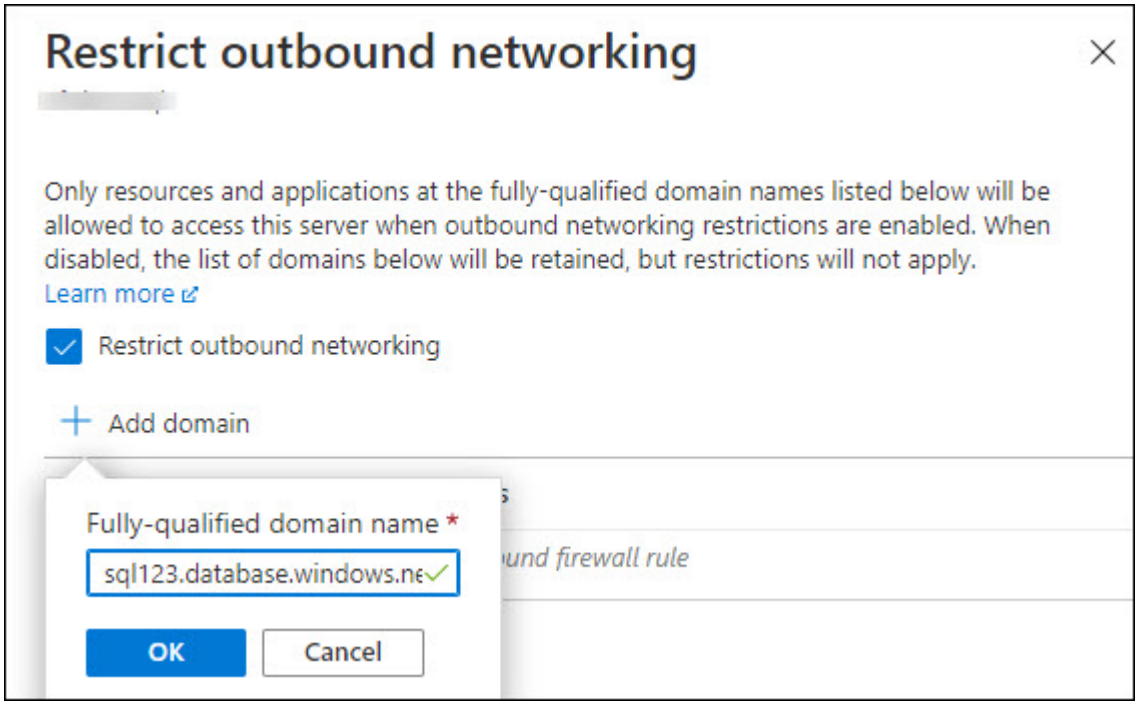
- Browse to the Outbound networking section in the Firewalls and virtual networks blade for your Azure SQL Database and select Configure outbound networking restrictions.



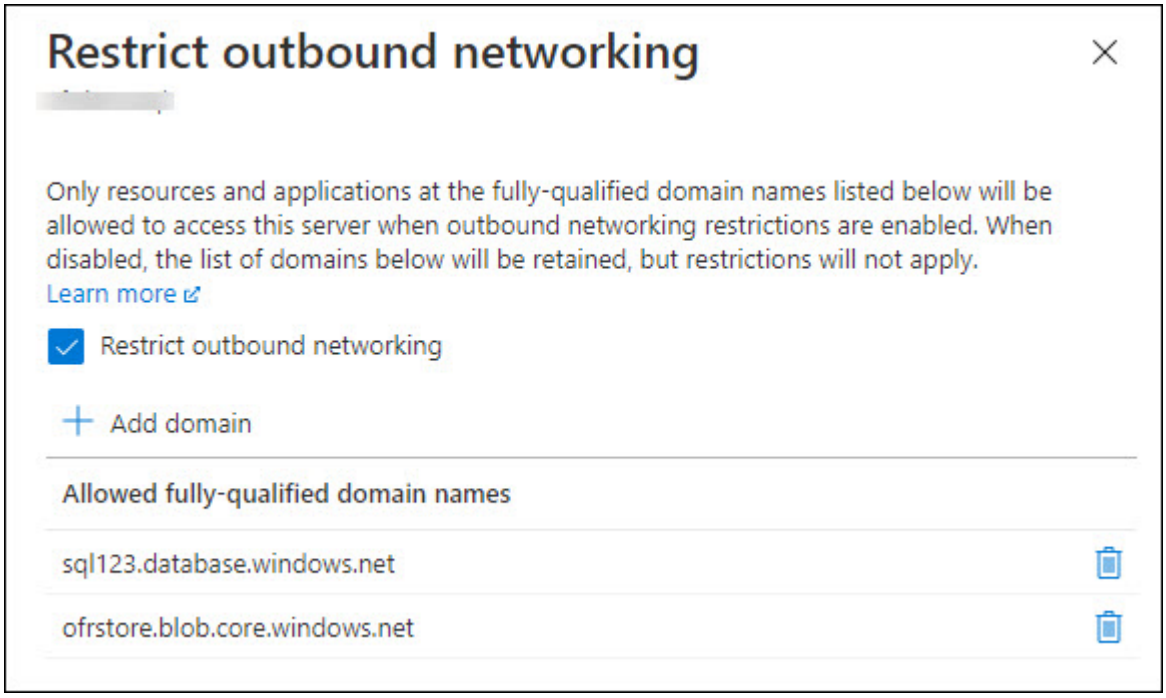
This will open up the following blade on the right-hand side:



- Select the check box titled Restrict outbound networking and then add the FQDN for the Storage accounts (or SQL Databases) using the Add domain button.



- After you're done, you should see a screen similar to the one below. Select OK to apply these settings



Configuring using PowerShell

Azure SQL Database still supports the PowerShell Azure Resource Manager module, but all future development is for the Az.Sql module. For these cmdlets, see AzureRM.Sql. The arguments for the commands in the Az module and in the AzureRm modules are substantially identical. The following script requires the Azure PowerShell module.

The following PowerShell script shows how to change the outbound networking setting (using the RestrictOutboundNetworkAccess property):

```
# Get current settings for Outbound Networking
(Get-AzSqlServer -ServerName <SqlServerName> -ResourceGroupName <ResourceGroupName>).RestrictOutboundNetworkAc

# Update setting for Outbound Networking
$SecureString = ConvertTo-SecureString "<ServerAdminPassword>" -AsPlainText -Force

Set-AzSqlServer -ServerName <SqlServerName> -ResourceGroupName <ResourceGroupName> -SqlAdministratorPassword $
```

Use these PowerShell cmdlets to configure outbound firewall rules

```
# List all Outbound Firewall Rules
Get-AzSqlServerOutboundFirewallRule -ServerName <SqlServerName> -ResourceGroupName <ResourceGroupName>

# Add an Outbound Firewall Rule
New-AzSqlServerOutboundFirewallRule -ServerName <SqlServerName> -ResourceGroupName <ResourceGroupName> -Allowe

# List a specific Outbound Firewall Rule
Get-AzSqlServerOutboundFirewallRule -ServerName <SqlServerName> -ResourceGroupName <ResourceGroupName> -Allowe

#Delete an Outbound Firewall Rule
Remove-AzSqlServerOutboundFirewallRule -ServerName <SqlServerName> -ResourceGroupName <ResourceGroupName> -All
```

Configuring OFR using Azure CLI

The following CLI script shows how to change the outbound networking setting (using the RestrictOutboundNetworkAccess property) in a bash shell:

```
# Get current setting for Outbound Networking
az sql server show -n sql-server-name -g sql-server-group --query "RestrictOutboundNetworkAccess"

# Update setting for Outbound Networking
az sql server update -n sql-server-name -g sql-server-group --set RestrictOutboundNetworkAccess="Enabled"
```

Use these CLI commands to configure outbound firewall rules

```
# List a server's outbound firewall rules.
az sql server outbound-firewall-rule list -g sql-server-group -s sql-server-name

# Create a new outbound firewall rule
az sql server outbound-firewall-rule create -g sql-server-group -s sql-server-name --outbound-rule-fqdn allowe

# Show the details for an outbound firewall rule.
az sql server outbound-firewall-rule show -g sql-server-group -s sql-server-name --outbound-rule-fqdn allowedF

# Delete the outbound firewall rule.
az sql server outbound-firewall-rule delete -g sql-server-group -s sql-server-name --outbound-rule-fqdn allowe
```

Troubleshooting

Checking enforcement of Outbound Firewall Rules

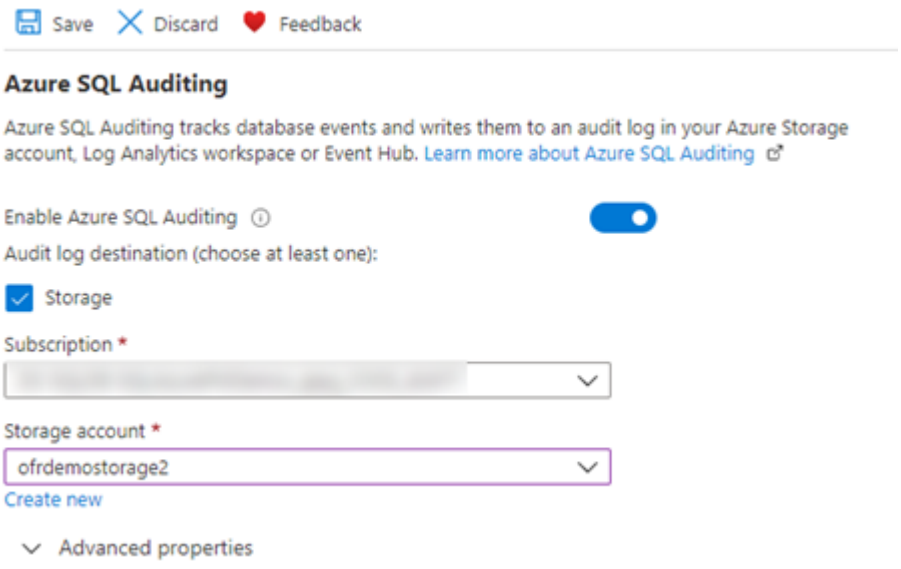
The following section demonstrates how to check enforcement of Outbound Firewall Rules on the SQL DB specific features. As a pre-requisite for this you need to have done the following

1. Set flag on the logical Sql Server instance to enable Outbound Firewall Rules
    - Refer to PUT RestrictOutboundNetworkAccess to Yes
2. Create an Outbound Firewall Rule for a specific storage account
    - Refer to PUT an Outbound Firewall Rule

For purposes of illustration I have setup and OFR allowing traffic from ofrdemosql to ofrdemostorage1. I have another storage account ofrdemostorage2 that is in the same resource group and not covered by any OFR – hence will be blocked for any network traffic from ofrdemosql

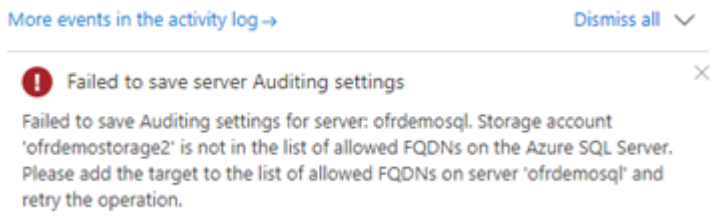
Auditing

When you attempt to setup Auditing to a storage account that is not covered by OFR (e.g. ofrdemostorage2) the following error will be raised as follows

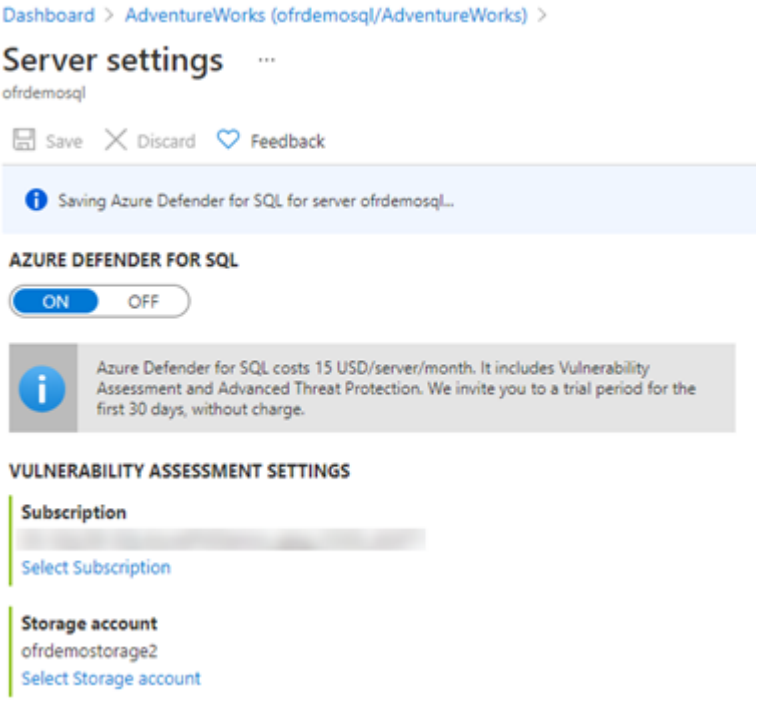


Error configuring Auditing for OFR

Failed to save server Auditing settings Failed to save Auditing settings for server: ofrdemosql. Storage account 'ofrdemostorage2' is not in the list of allowed FQDNs on the Azure SQL Server. Please add the target to the list of allowed FQDNs on server 'ofrdemosql' and retry the operation.

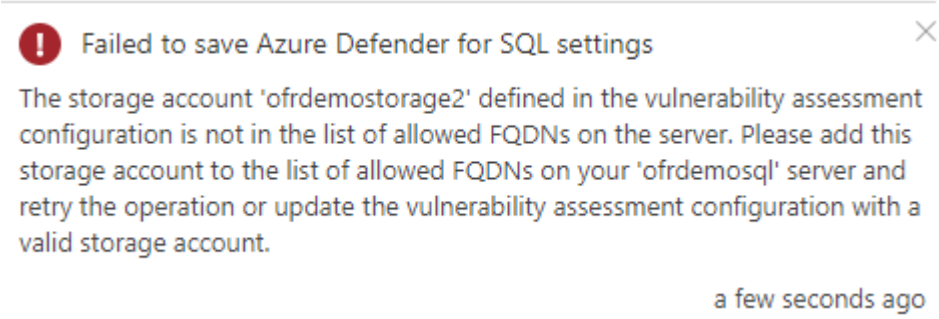


Vulnerability Assessment

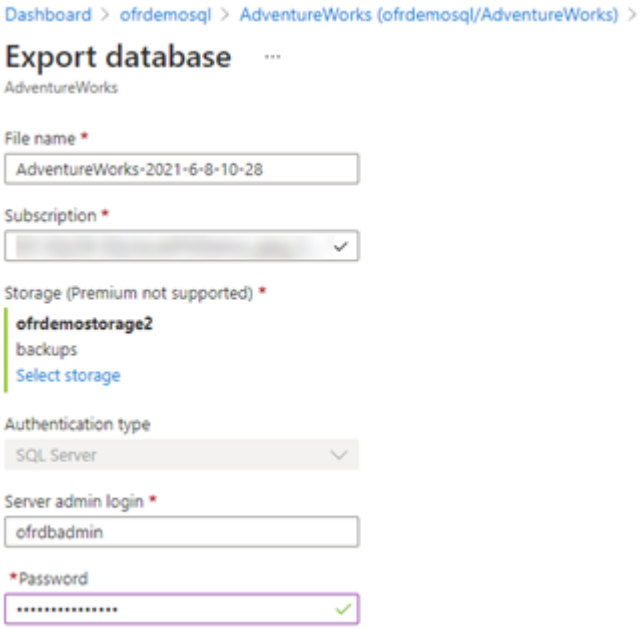


Error Configuring

Failed to save Azure Defender for SQL settings The storage account 'ofrdemostorage2' defined in the vulnerability assessment configuration is not in the list of allowed FQDNs on the server. Please add this storage account to the list of allowed FQDNs on your 'ofrdemosql' server and retry the operation or update the vulnerability assessment configuration with a valid storage account.

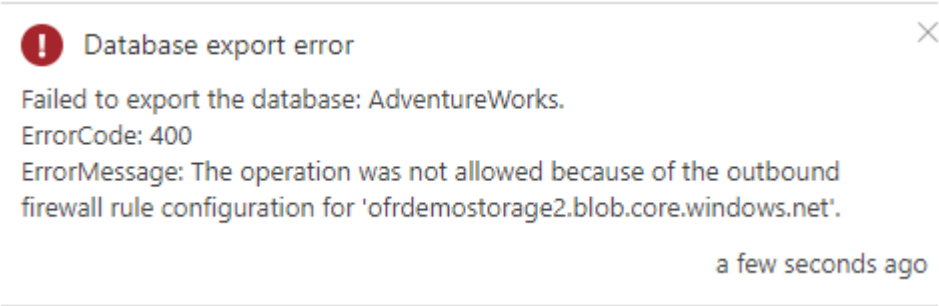


I/E Service



Database export error

Failed to export the database: AdventureWorks. ErrorCode: 400 ErrorMessage: The operation was not allowed because of the outbound firewall rule configuration for 'ofrdemostorage2.blob.core.windows.net'.



Kusto Query

1. Find operation in MonManagementResourceProvider

```
Execute: [Web] [Desktop] [Web (Lens)] [Desktop (SAW)] https://sqlazureeus22.kustomfa.windows.net/sqlazure1
        MonManagementResourceProvider
        | where controller_name == 'OutboundFirewallRules'
        | where request_url contains "<serverName>" and request_url contains "<outboundFqdn>"
        | project originalEventTimestamp, request_id, http_verb, response_code, request_url
```

2. Use timestamps and request_id from (1) to find full traces in MonManagement

```
Execute: [Web] [Desktop] [Web (Lens)] [Desktop (SAW)] https://sqlazureeus22.kustomfa.windows.net/sqlazure1
        MonManagement
        | where originalEventTimestamp >= datetime(<beginTime>)
        | where originalEventTimestamp <= datetime(<endTime>)
        | where request_id =~ "<requestId>"
```

3. At this point, the only error we are aware of is due to reaching the max limit of OFRs (200). For other cases, you will need to employ generic MonManagement debugging abilities. Please escalate to Connectivity queue if unable to determine the problem or if you believe there is a bug.

Common Errors and Cause

Error	Severity	Owner	Description	Cause
46842	EX_USER	<USERACCT>	Logical server %ls defined in the elastic query configuration is not in the list of Outbound Firewall Rules on the server. Please add this logical server name to the list of Outbound Firewall Rules on your %ls server and retry the operation.	Data exfiltration prevention is enabled, but the target server not in the allowed FQDN list.
16539	EX_USER	USERACCT	Operation failed since the external data source '%ls' has underlying storage account that is not in the list of Outbound Firewall Rules on the server. Please add this storage account to the list of Outbound Firewall Rules on your server and retry the operation	Data exfiltration is blocked and the destination is not in allowed list. ErrorCorrectiveAction: Add destination to allowed list for data exfiltration.
45530	EX_USER	USERACCT	The operation was not allowed because of the outbound firewall rule configuration for '%ls'.	The outbound firewall rules blocked the request.

How good have you found this content?