Configure and apply audit policies to NTFS files and folders using the CLI

ONTAP 9

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Configure and apply audit policies to NTFS files and folders using the CLI overview

There are several steps you must perform to apply audit policies to NTFS files and folders when using the ONTAP CLI. First, you create an NTFS security descriptor and add SACLs to the security descriptor. Next you create a security policy and add policy tasks. You then apply the security policy to a storage virtual machine (SVM).

About this task

After applying the security policy, you can monitor the security policy job and then verify the settings for the applied audit policy.

When an audit policy and associated SACLs are applied, any existing DACLs are overwritten. You should review existing security policies before creating and applying new ones.

Related information

Securing file access by using Storage-Level Access Guard

Limits when using the CLI to set file and folder security

How security descriptors are used to apply file and folder security

SMB and NFS auditing and security tracing

Configure and apply file security on NTFS files and folders using the CLI

Create an NTFS security descriptor

Creating an NTFS security descriptor audit policy is the first step in configuring and applying NTFS access control lists (ACLs) to files and folders residing within SVMs. You will associate the security descriptor to the file or folder path in a policy task.

About this task

You can create NTFS security descriptors for files and folders residing within NTFS security-style volumes, or for files and folders residing on mixed security-style volumes.

By default, when a security descriptor is created, four discretionary access control list (DACL) access control entries (ACEs) are added to that security descriptor. The four default ACEs are as follows:

Object	Access type	Access rights	Where to apply the permissions
BUILTIN\Administrators	Allow	Full Control	this-folder, sub-folders, files
BUILTIN\Users	Allow	Full Control	this-folder, sub-folders, files

Object	Access type	Access rights	Where to apply the permissions
CREATOR OWNER	Allow	Full Control	this-folder, sub-folders, files
NT AUTHORITY\SYSTEM	Allow	Full Control	this-folder, sub-folders, files

You can customize the security descriptor configuration by using the following optional parameters:

- Owner of the security descriptor
- Primary group of the owner
- Raw control flags

The value for any optional parameter is ignored for Storage-Level Access Guard. See the man pages for more information.

Steps

1. If you want to use the advanced parameters, set the privilege level to advanced: `set -privilege advanced`
2. Create a security descriptor: `vserver security file-directory ntfs create -vserver vserver_name -ntfs-sd SD_nameoptional_parameters`

   ```
   vserver security file-directory ntfs create -ntfs-sd sd1 -vserver vs1 -owner DOMAIN\joe
   ```

3. Verify that the security descriptor configuration is correct: `vserver security file-directory ntfs show -vserver vserver_name -ntfs-sd SD_name`

   ```
   vserver security file-directory ntfs show -vserver vs1 -ntfs-sd sd1
   ```

   ```
                                   Vserver: vs1
                          Security Descriptor Name: sd1
                    Owner of the Security Descriptor: DOMAIN\joe
   ```

4. If you are in the advanced privilege level, return to the admin privilege level: `set -privilege admin`

Add NTFS SACL access control entries to the NTFS security descriptor

Adding SACL (system access control list) access control entries (ACEs) to the NTFS security descriptor is the second step in creating NTFS audit policies for files or folders in SVMs. Each entry identifies the user or group that you want to audit. The SACL entry defines whether you want to audit successful or failed access attempts.

About this task

You can add one or more ACEs to the security descriptor's SACL.

If the security descriptor contains a SACL that has existing ACEs, the command adds the new ACE to the SACL. If the security descriptor does not contain a SACL, the command creates the SACL and adds the new ACE to it.

You can configure SACL entries by specifying what rights you want to audit for success or failure events for the account specified in the `-account` parameter. There are three mutually exclusive methods for specifying rights:

- Rights
- Advanced rights
- Raw rights (advanced-privilege)

If you do not specify rights for the SACL entry, the default setting is `Full Control`.

You can optionally customize SACL entries by specifying how to apply inheritance with the `apply to` parameter. If you do not specify this parameter, the default is to apply this SACL entry to this folder, subfolders, and files.

Steps

1. Add a SACL entry to a security descriptor: `vserver security file-directory ntfs sacl add -vserver vserver_name -ntfs-sd SD_name -access-type {failure|success} -account name_or_SIDoptional_parameters`

   ```
   vserver security file-directory ntfs sacl add -ntfs-sd sd1 -access-type
   failure -account domain\joe -rights full-control -apply-to this-folder
   -vserver vs1
   ```

2. Verify that the SACL entry is correct: `vserver security file-directory ntfs sacl show -vserver vserver_name -ntfs-sd SD_name -access-type {failure|success} -account name_or_SID`

   ```
   vserver security file-directory ntfs sacl show -vserver vs1 -ntfs-sd sd1
   -access-type deny -account domain\joe
   ```

   ```
                                Vserver: vs1
                   Security Descriptor Name: sd1
         Access type for Specified Access Rights: failure
                       Account Name or SID: DOMAIN\joe
                             Access Rights: full-control
                    Advanced Access Rights: -
                                  Apply To: this-folder
                             Access Rights: full-control
   ```

Create security policies

Creating an audit policy for storage virtual machines (SVMs) is the third step in configuring and applying ACLs to a file or folder. A policy acts as a container for various tasks, where each task is a single entry that can be applied to files or folders. You can add tasks to the security policy later.

About this task

The tasks that you add to a security policy contain associations between the NTFS security descriptor and the file or folder paths. Therefore, you should associate the security policy with each storage virtual machine (SVM) (containing NTFS security-style volumes or mixed security-style volumes).

Steps

1. Create a security policy: `vserver security file-directory policy create -vserver vserver_name -policy-name policy_name`

   `vserver security file-directory policy create -policy-name policy1 -vserver vs1`

2. Verify the security policy: `vserver security file-directory policy show`

```
vserver security file-directory policy show
   Vserver           Policy Name
 ------------      --------------
     vs1               policy1
```

Add a task to the security policy

Creating and adding a policy task to a security policy is the fourth step in configuring and applying ACLs to files or folders in SVMs. When you create the policy task, you associate the task with a security policy. You can add one or more task entries to a security policy.

About this task

The security policy is a container for a task. A task refers to a single operation that can be done by a security policy to files or folders with NTFS or mixed security (or to a volume object if configuring Storage-Level Access Guard).

There are two types of tasks:

- File and directory tasks

  Used to specify tasks that apply security descriptors to specified files and folders. ACLs applied through file and directory tasks can be managed with SMB clients or the ONTAP CLI.

- Storage-Level Access Guard tasks

  Used to specify tasks that apply Storage-Level Access Guard security descriptors to a specified volume. ACLs applied through Storage-Level Access Guard tasks can be managed only through the ONTAP CLI.

A task contains definitions for the security configuration of a file (or folder) or set of files (or folders). Every task in a policy is uniquely identified by the path. There can be only one task per path within a single policy. A policy cannot have duplicate task entries.

Guidelines for adding a task to a policy:

- There can be a maximum of 10,000 tasks entries per policy.
- A policy can contain one or more tasks.

  Even though a policy can contain more than one task, you cannot configure a policy to contain both file-directory and Storage-Level Access Guard tasks. A policy must contain either all Storage-Level Access Guard tasks or all file-directory tasks.

- Storage-Level Access Guard is used to restrict permissions.

  It will never give extra access permissions.

You can customize the security descriptor configuration by using the following optional parameters:

- Security type
- Propagation mode
- Index position
- Access control type

The value for any optional parameter is ignored for Storage-Level Access Guard. See the man pages for more information.

Steps

1. Add a task with an associated security descriptor to the security policy: `vserver security file-directory policy task add -vserver vserver_name -policy-name policy_name -path path -ntfs-sd SD_nameoptional_parameters`

   `file-directory` is the default value for the `-access-control` parameter. Specifying the access control type when configuring file and directory access tasks is optional.

   ```
   vserver security file-directory policy task add -vserver vs1 -policy-name policy1 -path /home/dir1 -security-type ntfs -ntfs-mode propagate -ntfs-sd sd2 -index-num 1 -access-control file-directory
   ```

2. Verify the policy task configuration: `vserver security file-directory policy task show -vserver vserver_name -policy-name policy_name -path path`

   ```
   vserver security file-directory policy task show
   ```

```
Vserver: vs1
Policy: policy1

Index    File/Folder    Access           Security   NTFS       NTFS
Security
         Path           Control          Type       Mode
Descriptor Name
-----    --------       -----------      --------   ------
----------------
1        /home/dir1     file-directory   ntfs       propagate  sd2
```

Apply security policies

Applying an audit policy to SVMsis the last step in creating and applying NTFS ACLs to files or folders.

About this task

You can apply security settings defined in the security policy to NTFS files and folders residing within FlexVol volumes (NTFS or mixed security style).

Step

1. Apply a security policy: `vserver security file-directory apply -vserver vserver_name -policy-name policy_name`

   ```
   vserver security file-directory apply -vserver vs1 -policy-name policy1
   ```

   The policy apply job is scheduled and the Job ID is returned.

   ```
   [Job 53322]Job is queued: Fsecurity Apply. Use the "Job show 53322 -id
   53322" command to view the status of the operation
   ```

Monitor the security policy job

When applying the security policy to storage virtual machines (SVMs), you can monitor the progress of the task by monitoring the security policy job. This is helpful if you want to ascertain that the application of the security policy succeeded. This is also helpful if you have a long-running job where you are applying bulk security to a large number of files and folders.

About this task

To display detailed information about a security policy job, you should use the `-instance` parameter.

Step

1. Monitor the security policy job: `vserver security file-directory job show -vserver`

`vserver_name`

```
vserver security file-directory job show -vserver vs1
```

```
Job ID Name                 Vserver    Node           State
------ -------------------- ---------- -------------- ----------
53322  Fsecurity Apply      vs1        node1          Success
       Description: File Directory Security Apply Job
```

Verify the applied audit policy

You can verify the audit policy to confirm that the files or folders on the storage virtual machine (SVM) to which you applied the security policy have the desired audit security settings.

About this task

You use the `vserver security file-directory show` command to display audit policy information. You must supply the name of the SVM that contains the data and the path to the data whose file or folder audit policy information you want to display.

Step

1. Display audit policy settings: `vserver security file-directory show -vserver` *`vserver_name`* `-path` *`path`*

Example

The following command displays the audit policy information applied to the path “/corp” in SVM vs1. The path has both a SUCCESS and a SUCCESS/FAIL SACL entry applied to it:

```
cluster::> vserver security file-directory show -vserver vs1 -path /corp

                Vserver: vs1
              File Path: /corp
         Security Style: ntfs
        Effective Style: ntfs
         DOS Attributes: 10
 DOS Attributes in Text: ----D---
Expanded Dos Attributes: -
           Unix User Id: 0
          Unix Group Id: 0
         Unix Mode Bits: 777
 Unix Mode Bits in Text: rwxrwxrwx
                   ACLs: NTFS Security Descriptor
                         Control:0x8014
                         Owner:DOMAIN\Administrator
                         Group:BUILTIN\Administrators
                         SACL - ACEs
                           ALL-DOMAIN\Administrator-0x100081-OI|CI|SA|FA
                           SUCCESSFUL-DOMAIN\user1-0x100116-OI|CI|SA
                         DACL - ACEs
                           ALLOW-BUILTIN\Administrators-0x1f01ff-OI|CI
                           ALLOW-BUILTIN\Users-0x1f01ff-OI|CI
                           ALLOW-CREATOR OWNER-0x1f01ff-OI|CI
                           ALLOW-NT AUTHORITY\SYSTEM-0x1f01ff-OI|CI
```

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