



# **Manage security with System Manager**

## **ONTAP 9**

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# Manage security with System Manager

## Security management overview with System Manager

Beginning with ONTAP 9.7, you can manage cluster security with System Manager.

With System Manager, you use ONTAP standard methods to secure client and administrator access to storage and to protect against viruses. Advanced technologies are available for encryption of data at rest and for WORM storage.

If you are using the classic System Manager (available only in ONTAP 9.7 and earlier), refer to [System Manager Classic \(ONTAP 9.0 to 9.7\)](#)

### Client authentication and authorization

ONTAP authenticates a client machine and user by verifying their identities with a trusted source. ONTAP authorizes a user to access a file or directory by comparing the user's credentials with the permissions configured on the file or directory.

### Administrator authentication and RBAC

Administrators use local or remote login accounts to authenticate themselves to the cluster and storage VM. Role-Based Access Control (RBAC) determines the commands to which an administrator has access.

### Virus scanning

You can use integrated antivirus functionality on the storage system to protect data from being compromised by viruses or other malicious code. ONTAP virus scanning, called *Vscan*, combines best-in-class third-party antivirus software with ONTAP features that give you the flexibility you need to control which files get scanned and when.

### Encryption

ONTAP offers both software- and hardware-based encryption technologies for ensuring that data at rest cannot be read if the storage medium is repurposed, returned, misplaced, or stolen.

### WORM storage

*SnapLock* is a high-performance compliance solution for organizations that use *write once, read many* (WORM) storage to retain critical files in unmodified form for regulatory and governance purposes.

## Set up multifactor authentication

Security Assertion Markup Language (SAML) authentication allows users to log in to an application by using a secure identity provider (IdP).

In System Manager, in addition to standard ONTAP authentication, SAML-based authentication is provided as an option for multifactor authentication.


Security Assertion Markup Language (SAML) is an XML-based framework for authentication and authorization between two entities: a service provider and an identity provider.

## Enable SAML authentication



To enable SAML authentication, perform the following steps:

### Steps

1. Click **Cluster > Settings**.
2. Next to **SAML Authentication**, click .
3. Ensure there is a check in the **Enable SAML Authentication** checkbox.
4. Enter the URL of the IdP URI (including "https://").
5. Modify the host system address, if needed.
6. Ensure the correct certificate is being used:
  - If your system was mapped with only one certificate with type "server", then that certificate is considered the default and it isn't displayed.
  - If your system was mapped with multiple certificates as type "server", then one of the certificates is displayed. To select a different certificate, click **Change**.
7. Click **Save**. A confirmation window displays the metadata information, which has been automatically copied to your clipboard.
8. Go to the IdP system you specified and copy the metadata from your clipboard to update the system metadata.
9. Return to the confirmation window (in System Manager) and check the checkbox **I have configured the IdP with the host URI or metadata**.
10. Click **Logout** to enable SAML-based authentication. The IdP system will display an authentication screen.
11. In the IdP system, enter your SAML-based credentials. After your credentials are verified, you will be directed to the System Manager home page.

## Disable SAML authentication

To disable SAML authentication, perform the following steps:

### Steps

1. Click **Cluster > Settings**.
2. Under **SAML Authentication**, click the **Enabled** toggle button.
3. *Optional:* You can also click  next to **SAML Authentication**, and then uncheck the **Enable SAML Authentication** checkbox.

## Control administrator access

The role assigned to an administrator determines which functions the administrator can perform with System Manager. Predefined roles for cluster administrators and storage VM administrators are provided by System Manager. You assign the role when you create the administrator's account, or you can assign a different role later.

Depending on how you have enabled account access, you might need to perform any of the following:

- Associate a public key with a local account.
- Install a CA-signed server digital certificate.
- Configure AD, LDAP, or NIS access.

You can perform these tasks before or after enabling account access.

### Assigning a role to an administrator

Assign a role to an administrator, as follows:

#### Steps

1. Click **Cluster > Settings**.
2. Click  next to **Users and Roles**.
3. Click  **Add** under **Users**.
4. Specify a user name, and select a role in the drop-down menu for **Role**.
5. Specify a login method and password for the user.

### Changing an administrator's role

Change the role for an administrator, as follows:

#### Steps

1. Click **Cluster > Settings**.
2. Select the name of user whose role you want to change, then click the  that appears next to the user name.
3. Click **Edit**.
4. Select a role in the drop-down menu for **Role**.

## Diagnose and correct file access issues

### Steps

1. In System Manager, select **Storage > Storage VMs**.
2. Select the storage VM on which you want to perform a trace.
3. Click  **More**.
4. Click **Trace File Access**.
5. Provide the user name and client IP address, then click **Start Tracing**.

The trace results are displayed in a table. The **Reasons** column provides the reason why a file could not be accessed.

6. Click  in the left column of the results table to view the file access permissions.

## Manage certificates with System Manager

Beginning with ONTAP 9.10.1, you can use System Manager to manage trusted certificate authorities, client/server certificates, and local (onboard) certificate authorities.

With System Manager, you can manage the certificates received from other applications so you can authenticate communications from those applications. You can also manage your own certificates that identify your system to other applications.

### View certificate information

With System Manager, you can view trusted certificate authorities, client/server certificates, and local certificate authorities that are stored on the cluster.

#### Steps

1. In System Manager, click **Cluster > Settings**.
2. Scroll to the **Security** area.  
In the **Certificates** section, the following details are displayed:
  - The number of stored trusted certificate authorities.
  - The number of stored client/server certificates.
  - The number of stored local certificate authorities.
3. Click any number to view details about a category of certificates, or click  to view the **Certificates** page, which contains information about all categories.  
The list displays the information for the entire cluster. If you want to display information for only a specific storage VM, perform the following steps:
  - a. Click **Storage > Storage VMs**.
  - b. Select the storage VM.
  - c. View the **Settings** tab.
  - d. Click a number shown in the **Certificate** section.

#### What to do next

- From the **Certificates** page, you can [Generate a certificate signing request](#).
- The certificate information is separated into three tabs, one for each category. You can perform the following tasks from each tab:

On this tab...	You can perform these procedures...
<b>Trusted certificate authorities</b>	<ul style="list-style-type: none"> <li>• <a href="#">Install (add) a trusted certificate authority</a></li> <li>• <a href="#">Delete a trusted certificate authority</a></li> <li>• <a href="#">Renew a trusted certificate authority</a></li> </ul>
<b>Client/server certificates</b>	<ul style="list-style-type: none"> <li>• <a href="#">Install (add) a client/server certificate</a></li> <li>• <a href="#">Generate (add) a self-signed client/server certificate</a></li> <li>• <a href="#">Delete a client/server certificate</a></li> <li>• <a href="#">Renew a client/server certificate</a></li> </ul>
<b>Local certificate authorities</b>	<ul style="list-style-type: none"> <li>• <a href="#">Create a new local certificate authority</a></li> <li>• <a href="#">Sign a certificate using a local certificate authority</a></li> <li>• <a href="#">Delete a local certificate authority</a></li> <li>• <a href="#">Renew a local certificate authority</a></li> </ul>

## Generate a certificate signing request

You can generate a certificate signing request (CSR) with System Manager from any tab of the **Certificates** page. A private key and a corresponding CSR are generated, which can be signed using a certificate authority to generate a public certificate.

### Steps

1. View the **Certificates** page. See [View certificate information](#).
2. Click **+Generate CSR**.
3. Complete the information for the subject name:
  - a. Enter a **common name**.
  - b. Select a **country**.
  - c. Enter an **organization**.
  - d. Enter an **organization unit**.
4. If you want to override defaults, select **More Options** and provide additional information.

## Install (add) a trusted certificate authority

You can install additional trusted certificate authorities in System Manager.

### Steps

1. View the **Trusted Certificate Authorities** tab. See [View certificate information](#).
2. Click  **Add**.
3. On the **Add Trusted Certificate Authority** panel, perform the following:
  - Enter a **name**.
  - For the **scope**, select a storage VM.

- Enter a **common name**.
- Select a **type**.
- Enter or import **certificate details**.

## Delete a trusted certificate authority

With System Manager, you can delete a trusted certificate authority.



You cannot delete trusted certificate authorities that were preinstalled with ONTAP.

### Steps

1. View the **Trusted Certificate Authorities** tab. See [View certificate information](#).
2. Click the name of the trusted certificate authority.
3. Click  next to the name, then click **Delete**.

## Renew a trusted certificate authority

With System Manager, you can renew a trusted certificate authority that has expired or is about to expire.

### Steps

1. View the **Trusted Certificate Authorities** tab. See [View certificate information](#).
2. Click the name of the trusted certificate authority.
3. Click  next to the name, then click **Renew**.

## Install (add) a client/server certificate

With System Manager, you can install additional client/server certificates.

### Steps

1. View the **Client/Server Certificates** tab. See [View certificate information](#).
2. Click .
3. On the **Add Client/Server Certificate** panel, perform the following:
  - Enter a **certificate name**.
  - For the **scope**, select a storage VM.
  - Enter a **common name**.
  - Select a **type**.
  - Enter or import **certificate details**.  
You can either write in or copy and paste in the certificate details from a text file or you can import the text from a certificate file by clicking **Import**.
  - Enter a the **private key**.  
You can either write in or copy and paste in the private key from a text file or you can import the text from a private key file by clicking **Import**.



## Generate (add) a self-signed client/server certificate

With System Manager, you can generate additional self-signed client/server certificates.

### Steps

1. View the **Client/Server Certificates** tab. See [View certificate information](#).
2. Click **+Generate Self-signed Certificate**.
3. On the **Generate Self-Signed Certificate** panel, perform the following:
  - Enter a **certificate name**.
  - For the **scope**, select a storage VM.
  - Enter a **common name**.
  - Select a **type**.
  - Select a **hash function**.
  - Select a **key size**.
  - Select a **storage VM**.

## Delete a client/server certificate

With System Manager, you can delete client/server certificates.

### Steps

1. View the **Client/Server Certificates** tab. See [View certificate information](#).
2. Click the name of the client/server certificate.
3. Click  next to the name, then click **Delete**.

## Renew a client/server certificate

With System Manager, you can renew a client/server certificate that has expired or is about to expire.

### Steps

1. View the **Client/Server Certificates** tab. See [View certificate information](#).
2. Click the name of the client/server certificate.
3. Click  next to the name, then click **Renew**.

## Create a new local certificate authority

With System Manager, you can create a new local certificate authority.

### Steps

1. View the **Local Certificate Authorities** tab. See [View certificate information](#).
2. Click  .
3. On the **Add Local Certificate Authority** panel, perform the following:
  - Enter a **name**.
  - For the **scope**, select a storage VM.

- Enter a **common name**.
- 4. If you want to override defaults, select **More Options** and provide additional information.

## Sign a certificate using a local certificate authority

In System Manager, you can use a local certificate authority to sign a certificate.

### Steps

1. View the **Local Certificate Authorities** tab. See [View certificate information](#).
2. Click the name of the local certificate authority.
3. Click  next to the name, then click **Sign a certificate**.
4. Complete the **Sign a Certificate Signing Request** form.
  - You can either paste in the certificate signing content or import a certificate signing request file by clicking **Import**.
  - Specify the number of days for which the certificate will be valid.

## Delete a local certificate authority

With System Manager, you can delete a local certificate authority.

### Steps

1. View the **Local Certificate Authority** tab. See [View certificate information](#).
2. Click the name of the local certificate authority.
3. Click  next to the name, then click **Delete**.

## Renew a local certificate authority

With System Manager, you can renew a local certificate authority that has expired or is about to expire.

### Steps

1. View the **Local Certificate Authority** tab. See [View certificate information](#).
2. Click the name of the local certificate authority.
3. Click  next to the name, then click **Renew**.

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