



Use single sign-on (SSO)

StorageGRID

NetApp
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Table of Contents

- Use single sign-on (SSO) 1
 - Configure single sign-on 1
 - Requirements for using single sign-on 3
 - Confirm federated users can sign in 5
 - Use sandbox mode 6
- Create relying party trusts in AD FS 15
- Create enterprise applications in Azure AD 19
- Create service provider (SP) connections in PingFederate 21
- Disable single sign-on 25
- Temporarily disable and reenable single sign-on for one Admin Node 26

The image shows the StorageGRID Sign in page. On the left is the NetApp logo. The main heading is "StorageGRID® Sign in". Below the heading, there is a "Recent" dropdown menu with "S3 tenant" selected. Below that is an "Account ID" text input field containing "27469746059057031822". A note below the field says "For Grid Manager, leave this field blank." At the bottom right is a "Sign in" button.

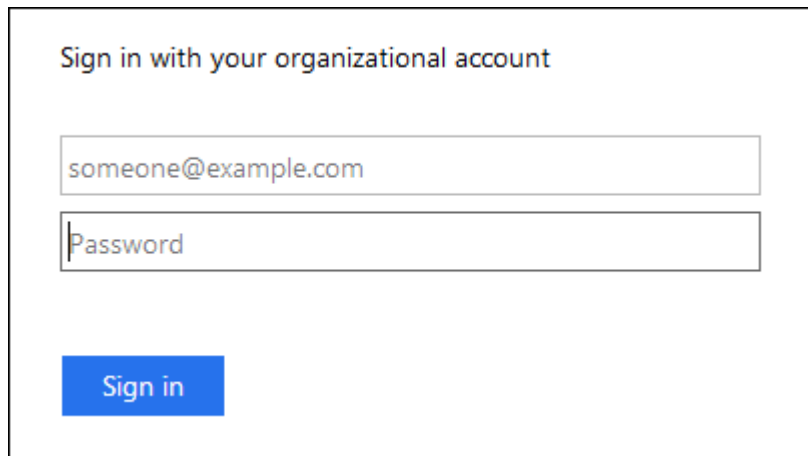
The StorageGRID Sign in page is not shown when you enter the complete URL for a tenant account (that is, a fully qualified domain name or IP address followed by `/?accountId=20-digit-account-id`). Instead, you are immediately redirected to your organization's SSO sign-in page, where you can [sign in with your SSO credentials](#).

2. Indicate whether you want to access the Grid Manager or the Tenant Manager:

- To access the Grid Manager, leave the **Account ID** field blank, enter **0** as the account ID, or select **Grid Manager** if it appears in the list of recent accounts.
- To access the Tenant Manager, enter the 20-digit tenant account ID or select a tenant by name if it appears in the list of recent accounts.

3. Select **Sign in**

StorageGRID redirects you to your organization's SSO sign-in page. For example:

The image shows an example of an SSO sign-in page. The heading is "Sign in with your organizational account". Below the heading are two text input fields: the first contains "someone@example.com" and the second contains "Password". At the bottom left is a blue "Sign in" button.

4. Sign in with your SSO credentials.

If your SSO credentials are correct:

- a. The identity provider (IdP) provides an authentication response to StorageGRID.
- b. StorageGRID validates the authentication response.
- c. If the response is valid and you belong to a federated group with StorageGRID access permissions, you are signed in to the Grid Manager or the Tenant Manager, depending on which account you selected.



If the service account is inaccessible, you can still sign in, as long as you are an existing user that belongs to a federated group with StorageGRID access permissions.

- Optionally, access other Admin Nodes, or access the Grid Manager or the Tenant Manager, if you have adequate permissions.

You do not need to reenter your SSO credentials.

Sign out when SSO is enabled

When SSO is enabled for StorageGRID, what happens when you sign out depends on what you are signed in to and where you are signing out from.

Steps

- Locate the **Sign Out** link in the top-right corner of the user interface.
- Select **Sign Out**.

The StorageGRID Sign in page appears. The **Recent Accounts** drop-down is updated to include **Grid Manager** or the name of the tenant, so you can access these user interfaces more quickly in the future.

If you are signed in to...	And you sign out from...	You are signed out of...
Grid Manager on one or more Admin Nodes	Grid Manager on any Admin Node	Grid Manager on all Admin Nodes Note: If you use Azure for SSO, it might take a few minutes to be signed out of all Admin Nodes.
Tenant Manager on one or more Admin Nodes	Tenant Manager on any Admin Node	Tenant Manager on all Admin Nodes
Both Grid Manager and Tenant Manager	Grid Manager	The Grid Manager only. You must also sign out of the Tenant Manager to sign out of SSO.
	Tenant Manager	The Tenant Manager only. You must also sign out of the Grid Manager to sign out of SSO.



The table summarizes what happens when you sign out if you are using a single browser session. If you are signed in to StorageGRID across multiple browser sessions, you must sign out of all browser sessions separately.

Requirements for using single sign-on

Before enabling single sign-on (SSO) for a StorageGRID system, review the requirements in this section.

Identity provider requirements

StorageGRID supports the following SSO identity providers (IdP):

- Active Directory Federation Service (AD FS)
- Azure Active Directory (Azure AD)
- PingFederate

You must configure identity federation for your StorageGRID system before you can configure an SSO identity provider. The type of LDAP service you use for identity federation controls which type of SSO you can implement.

Configured LDAP service type	Options for SSO identity provider
Active Directory	<ul style="list-style-type: none">• Active Directory• Azure• PingFederate
Azure	Azure

AD FS requirements

You can use any of the following versions of AD FS:

- Windows Server 2022 AD FS
- Windows Server 2019 AD FS
- Windows Server 2016 AD FS



Windows Server 2016 should be using the [KB3201845 update](#), or higher.

- AD FS 3.0, included with Windows Server 2012 R2 update, or higher.

Additional requirements

- Transport Layer Security (TLS) 1.2 or 1.3
- Microsoft .NET Framework, version 3.5.1 or higher

Server certificate requirements

By default, StorageGRID uses a management interface certificate on each Admin Node to secure access to the Grid Manager, the Tenant Manager, the Grid Management API, and the Tenant Management API. When you configure relying party trusts (AD FS), enterprise applications (Azure), or service provider connections (PingFederate) for StorageGRID, you use the server certificate as the signature certificate for StorageGRID requests.

If you have not already [configured a custom certificate for the management interface](#), you should do so now. When you install a custom server certificate, it is used for all Admin Nodes, and you can use it in all StorageGRID relying party trusts, enterprise applications, or SP connections.



Using an Admin Node's default server certificate in a relying party trust, enterprise application, or SP connection is not recommended. If the node fails and you recover it, a new default server certificate is generated. Before you can sign in to the recovered node, you must update the relying party trust, enterprise application, or SP connection with the new certificate.

You can access an Admin Node's server certificate by logging in to the command shell of the node and going to the `/var/local/mgmt-api` directory. A custom server certificate is named `custom-server.crt`. The node's default server certificate is named `server.crt`.

Port requirements

Single sign-on (SSO) is not available on the restricted Grid Manager or Tenant Manager ports. You must use the default HTTPS port (443) if you want users to authenticate with single sign-on. See [Control access through firewalls](#).

Confirm federated users can sign in

Before you enable single sign-on (SSO), you must confirm that at least one federated user can sign in to the Grid Manager and in to the Tenant Manager for any existing tenant accounts.

What you'll need

- You are signed in to the Grid Manager using a [supported web browser](#).
- You have specific access permissions.
- You have already configured identity federation.

Steps

1. If there are existing tenant accounts, confirm that none of the tenants is using its own identity source.

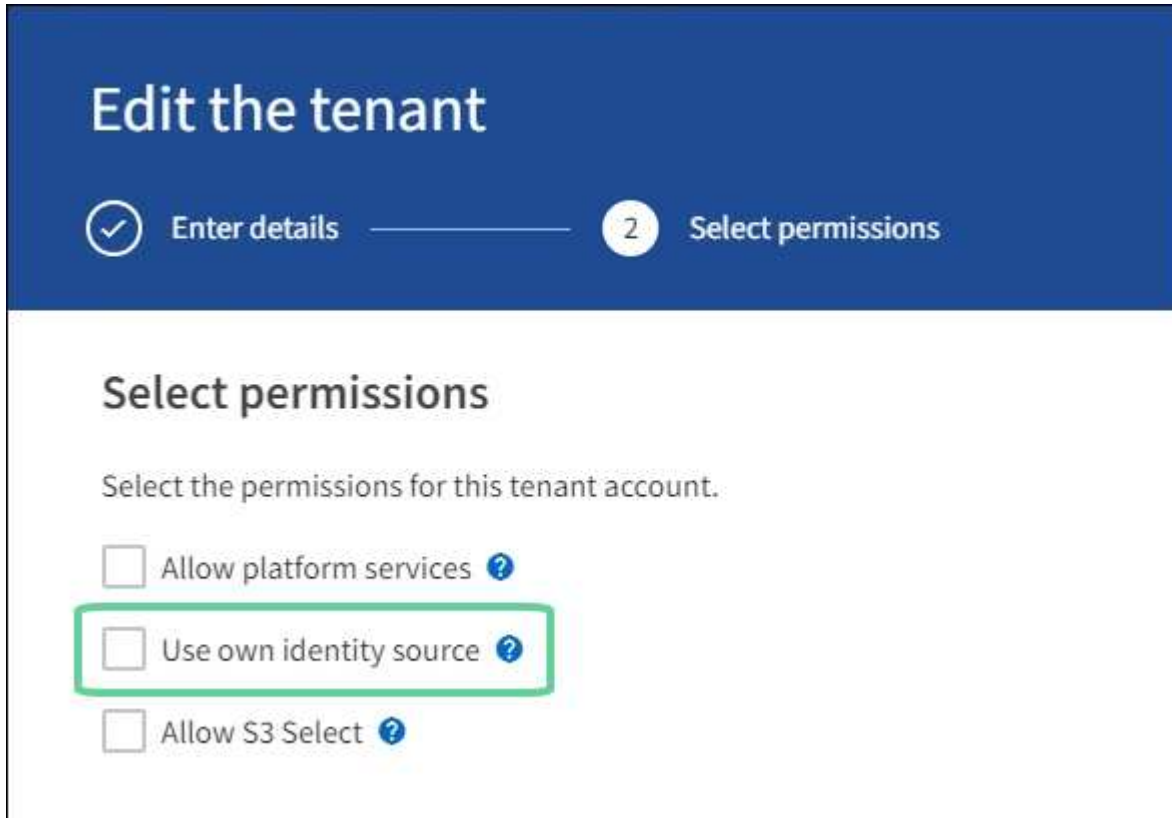


When you enable SSO, an identity source configured in the Tenant Manager is overridden by the identity source configured in the Grid Manager. Users belonging to the tenant's identity source will no longer be able to sign in unless they have an account with the Grid Manager identity source.

- a. Sign in to the Tenant Manager for each tenant account.
 - b. Select **ACCESS MANAGEMENT > Identity federation**.
 - c. Confirm that the **Enable identity federation** check box is not selected.
 - d. If it is, confirm that any federated groups that might be in use for this tenant account are no longer required, unselect the check box, and select **Save**.
2. Confirm that a federated user can access the Grid Manager:
 - a. From Grid Manager, select **CONFIGURATION > Access control > Admin groups**.
 - b. Ensure that at least one federated group has been imported from the Active Directory identity source and that it has been assigned the Root access permission.
 - c. Sign out.
 - d. Confirm you can sign back in to the Grid Manager as a user in the federated group.
 3. If there are existing tenant accounts, confirm that a federated user who has Root access permission can

sign in:

- a. From the Grid Manager, select **TENANTS**.
- b. Select the tenant account, and select **Actions > Edit**.
- c. On the Enter details tab, select **Continue**.
- d. If the **Use own identity source** check box is selected, uncheck the box and select **Save**.



The Tenant page appears.

- e. Select the tenant account, select **Sign in**, and sign in to the tenant account as the local root user.
- f. From the Tenant Manager, select **ACCESS MANAGEMENT > Groups**.
- g. Ensure that at least one federated group from the Grid Manager has been assigned the Root access permission for this tenant.
- h. Sign out.
- i. Confirm you can sign back in to the tenant as a user in the federated group.

Related information

- [Requirements for using single sign-on](#)
- [Manage admin groups](#)
- [Use a tenant account](#)

Use sandbox mode

You can use sandbox mode to configure and test single sign-on (SSO) before enabling it for all StorageGRID users. After SSO has been enabled, you can return to sandbox mode

whenever you need to change or retest the configuration.

What you'll need

- You are signed in to the Grid Manager using a [supported web browser](#).
- You have the Root access permission.
- You have configured identity federation for your StorageGRID system.
- For the identity federation **LDAP service type**, you selected either Active Directory or Azure, based on the SSO identity provider you plan to use.

Configured LDAP service type	Options for SSO identity provider
Active Directory	<ul style="list-style-type: none">• Active Directory• Azure• PingFederate
Azure	Azure

About this task

When SSO is enabled and a user attempts to sign in to an Admin Node, StorageGRID sends an authentication request to the SSO identity provider. In turn, the SSO identity provider sends an authentication response back to StorageGRID, indicating whether the authentication request was successful. For successful requests:

- The response from Active Directory or PingFederate includes a universally unique identifier (UUID) for the user.
- The response from Azure includes a User Principal Name (UPN).

To allow StorageGRID (the service provider) and the SSO identity provider to communicate securely about user authentication requests, you must configure certain settings in StorageGRID. Next, you must use the SSO identity provider's software to create a relying party trust (AD FS), Enterprise Application (Azure) or Service Provider (PingFederate) for each Admin Node. Finally, you must return to StorageGRID to enable SSO.

Sandbox mode makes it easy to perform this back-and-forth configuration and to test all of your settings before you enable SSO. When you are using sandbox mode, users cannot sign in using SSO.

Access sandbox mode

1. Select **CONFIGURATION > Access control > Single sign-on**.

The Single Sign-on page appears, with the **Disabled** option selected.

Single Sign-on

You can enable single sign-on (SSO) if you want an external identity provider (IdP) to authorize all user access to StorageGRID. To start, enable [identity federation](#) and confirm that at least one federated user has Root Access permission to the Grid Manager and to the Tenant Manager for any existing tenant accounts. Next, select Sandbox Mode to configure, save, and then test your SSO settings. After verifying the connections, select Enabled and click Save to start using SSO.

SSO status  Disabled Sandbox Mode Enabled

Save



If the SSO Status options do not appear, confirm you have configured the identity provider as the federated identity source. See [Requirements for using single sign-on](#).

2. Select **Sandbox Mode**.

The Identity Provider section appears.

Enter identity provider details

1. Select the **SSO type** from the drop-down list.
2. Complete the fields in the Identity Provider section based on the SSO type you selected.

Active Directory

- a. Enter the **Federation service name** for the identity provider, exactly as it appears in Active Directory Federation Service (AD FS).



To locate the federation service name, go to Windows Server Manager. Select **Tools > AD FS Management**. From the Action menu, select **Edit Federation Service Properties**. The Federation Service Name is shown in the second field.

- b. Specify which TLS certificate will be used to secure the connection when the identity provider sends SSO configuration information in response to StorageGRID requests.

- **Use operating system CA certificate:** Use the default CA certificate installed on the operating system to secure the connection.
- **Use custom CA certificate:** Use a custom CA certificate to secure the connection.

If you select this setting, copy the text of the custom certificate and paste it in the **CA Certificate** text box.

- **Do not use TLS:** Do not use a TLS certificate to secure the connection.

- c. In the Relying Party section, specify the **Relying party identifier** for StorageGRID. This value controls the name you use for each relying party trust in AD FS.

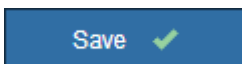
- For example, if your grid has only one Admin Node and you do not anticipate adding more Admin Nodes in the future, enter `SG` or `StorageGRID`.
- If your grid includes more than one Admin Node, include the string `[HOSTNAME]` in the identifier. For example, `SG-[HOSTNAME]`. This generates a table that shows the relying party identifier for each Admin Node in your system, based on the node's hostname.



You must create a relying party trust for each Admin Node in your StorageGRID system. Having a relying party trust for each Admin Node ensures that users can securely sign in to and out of any Admin Node.

- d. Select **Save**.

A green check mark appears on the **Save** button for a few seconds.



Azure

- a. Specify which TLS certificate will be used to secure the connection when the identity provider sends SSO configuration information in response to StorageGRID requests.

- **Use operating system CA certificate:** Use the default CA certificate installed on the operating system to secure the connection.
- **Use custom CA certificate:** Use a custom CA certificate to secure the connection.

If you select this setting, copy the text of the custom certificate and paste it in the **CA Certificate** text box.

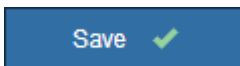
- **Do not use TLS:** Do not use a TLS certificate to secure the connection.
- b. In the Enterprise Application section, specify the **Enterprise application name** for StorageGRID. This value controls the name you use for each enterprise application in Azure AD.
- For example, if your grid has only one Admin Node and you do not anticipate adding more Admin Nodes in the future, enter `SG` or `StorageGRID`.
 - If your grid includes more than one Admin Node, include the string `[HOSTNAME]` in the identifier. For example, `SG-[HOSTNAME]`. This generates a table that shows an enterprise application name for each Admin Node in your system, based on the node's hostname.



You must create an enterprise application for each Admin Node in your StorageGRID system. Having an enterprise application for each Admin Node ensures that users can securely sign in to and out of any Admin Node.

- c. Follow the steps in [Create enterprise applications in Azure AD](#) to create an enterprise application for each Admin Node listed in the table.
- d. From Azure AD, copy the federation metadata URL for each enterprise application. Then, paste this URL into the corresponding **Federation metadata URL** field in StorageGRID.
- e. After you have copied and pasted a federation metadata URL for all Admin Nodes, select **Save**.

A green check mark appears on the **Save** button for a few seconds.



PingFederate

- a. Specify which TLS certificate will be used to secure the connection when the identity provider sends SSO configuration information in response to StorageGRID requests.
- **Use operating system CA certificate:** Use the default CA certificate installed on the operating system to secure the connection.
 - **Use custom CA certificate:** Use a custom CA certificate to secure the connection.

If you select this setting, copy the text of the custom certificate and paste it in the **CA Certificate** text box.

- **Do not use TLS:** Do not use a TLS certificate to secure the connection.
- b. In the Service Provider (SP) section, specify the **SP connection ID** for StorageGRID. This value controls the name you use for each SP connection in PingFederate.
- For example, if your grid has only one Admin Node and you do not anticipate adding more Admin Nodes in the future, enter `SG` or `StorageGRID`.
 - If your grid includes more than one Admin Node, include the string `[HOSTNAME]` in the identifier. For example, `SG-[HOSTNAME]`. This generates a table that shows the SP connection ID for each Admin Node in your system, based on the node's hostname.



You must create an SP connection for each Admin Node in your StorageGRID system. Having an SP connection for each Admin Node ensures that users can securely sign in to and out of any Admin Node.

c. Specify the federation metadata URL for each Admin Node in the **Federation metadata URL** field.

Use the following format:

```
https://<Federation Service  
Name>:<port>/pf/federation_metadata.ping?PartnerSpId=<SP Connection  
ID>
```

d. Select **Save**.

A green check mark appears on the **Save** button for a few seconds.



Configure relying party trusts, enterprise applications, or SP connections

When the configuration is saved, the Sandbox mode confirmation notice appears. This notice confirms that sandbox mode is now enabled and provides overview instructions.

StorageGRID can remain in sandbox mode as long as required. However, when **Sandbox Mode** is selected on the Single Sign-on page, SSO is disabled for all StorageGRID users. Only local users can sign in.

Follow these steps to configure relying party trusts (Active Directory), complete enterprise applications (Azure), or configure SP connections (PingFederate).

Active Directory

1. Go to Active Directory Federation Services (AD FS).
2. Create one or more relying party trusts for StorageGRID, using each relying party identifier shown in the table on the StorageGRID Single Sign-on page.

You must create one trust for each Admin Node shown in the table.

For instructions, go to [Create relying party trusts in AD FS](#).

Azure

1. From the Single sign-on page for the Admin Node you are currently signed in to, select the button to download and save the SAML metadata.
2. Then, for any other Admin Nodes in your grid, repeat these steps:
 - a. Sign in to the node.
 - b. Select **CONFIGURATION > Access control > Single sign-on**.
 - c. Download and save the SAML metadata for that node.
3. Go to the Azure Portal.
4. Follow the steps in [Create enterprise applications in Azure AD](#) to upload the SAML metadata file for each Admin Node into its corresponding Azure enterprise application.

PingFederate

1. From the Single sign-on page for the Admin Node you are currently signed in to, select the button to download and save the SAML metadata.
2. Then, for any other Admin Nodes in your grid, repeat these steps:
 - a. Sign in to the node.
 - b. Select **CONFIGURATION > Access control > Single sign-on**.
 - c. Download and save the SAML metadata for that node.
3. Go to PingFederate.
4. [Create one or more service provider \(SP\) connections for StorageGRID](#). Use the SP connection ID for each Admin Node (shown in the table on the StorageGRID Single Sign-on page) and the SAML metadata you downloaded for that Admin Node.

You must create one SP connection for each Admin Node shown in the table.

Test SSO connections

Before you enforce the use of single sign-on for your entire StorageGRID system, you should confirm that single sign-on and single logout are correctly configured for each Admin Node.

Active Directory

1. From the StorageGRID Single Sign-on page, locate the link in the Sandbox mode message.

The URL is derived from the value you entered in the **Federation service name** field.

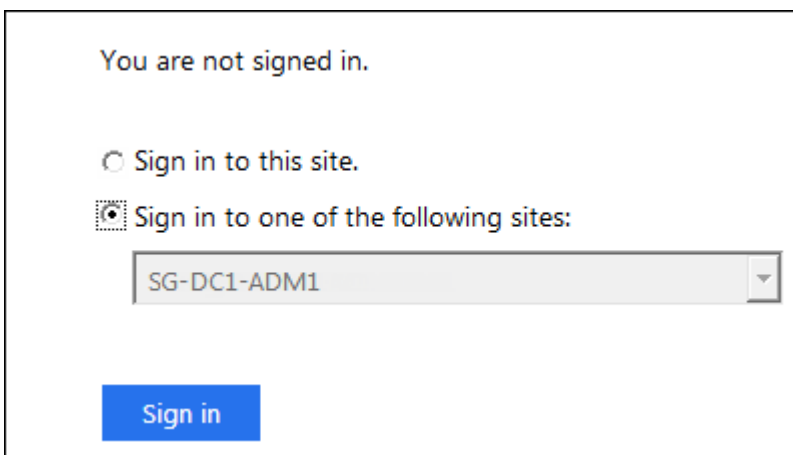
Sandbox mode

Sandbox mode is currently enabled. Use this mode to configure relying party trusts and to confirm that single sign-on (SSO) and single logout (SLO) are correctly configured for the StorageGRID system.

1. Use Active Directory Federation Services (AD FS) to create relying party trusts for StorageGRID. Create one trust for each Admin Node, using the relying party identifier(s) shown below.
2. Go to your identity provider's sign-on page: <https://ad2016.saml.sgws/adfs/ls/idpinitiatedsignon.htm>
3. From this page, sign in to each StorageGRID relying party trust. If the SSO operation is successful, StorageGRID displays a page with a success message. Otherwise, an error message is displayed.

When you have confirmed SSO for each of the relying party trusts and you are ready to enforce the use of SSO for StorageGRID, change the SSO Status to Enabled, and click Save.

2. Select the link, or copy and paste the URL into a browser, to access your identity provider's sign-on page.
3. To confirm you can use SSO to sign in to StorageGRID, select **Sign in to one of the following sites**, select the relying party identifier for your primary Admin Node, and select **Sign in**.



You are not signed in.

Sign in to this site.

Sign in to one of the following sites:

SG-DC1-ADM1

Sign in

4. Enter your federated username and password.
 - If the SSO sign-in and logout operations are successful, a success message appears.

✓ Single sign-on authentication and logout test completed successfully.

- If the SSO operation is unsuccessful, an error message appears. Fix the issue, clear the browser's cookies, and try again.
5. Repeat these steps to verify the SSO connection for each Admin Node in your grid.

Azure

1. Go to the Single sign-on page in the Azure portal.

2. Select **Test this application**.
3. Enter the credentials of a federated user.
 - If the SSO sign-in and logout operations are successful, a success message appears.

✔ Single sign-on authentication and logout test completed successfully.

- If the SSO operation is unsuccessful, an error message appears. Fix the issue, clear the browser's cookies, and try again.
4. Repeat these steps to verify the SSO connection for each Admin Node in your grid.

PingFederate

1. From the StorageGRID Single Sign-on page, select the first link in the Sandbox mode message.

Select and test one link at a time.

2. Enter the credentials of a federated user.
 - If the SSO sign-in and logout operations are successful, a success message appears.

✔ Single sign-on authentication and logout test completed successfully.

- If the SSO operation is unsuccessful, an error message appears. Fix the issue, clear the browser's cookies, and try again.
3. Select the next link to verify the SSO connection for each Admin Node in your grid.

If you see a Page Expired message, select the **Back** button in your browser and resubmit your credentials.

Enable single sign-on

When you have confirmed you can use SSO to sign in to each Admin Node, you can enable SSO for your entire StorageGRID system.



When SSO is enabled, all users must use SSO to access the Grid Manager, the Tenant Manager, the Grid Management API, and the Tenant Management API. Local users can no longer access StorageGRID.

1. Select **CONFIGURATION > Access control > Single sign-on**.
2. Change the SSO Status to **Enabled**.
3. Select **Save**.
4. Review the warning message, and select **OK**.

Single sign-on is now enabled.



If you are using the Azure Portal and you access StorageGRID from the same computer you use to access Azure, ensure that the Azure Portal user is also an authorized StorageGRID user (a user in a federated group that has been imported into StorageGRID) or log out of the Azure Portal before attempting to sign in to StorageGRID.

Create relying party trusts in AD FS

You must use Active Directory Federation Services (AD FS) to create a relying party trust for each Admin Node in your system. You can create relying party trusts using PowerShell commands, by importing SAML metadata from StorageGRID, or by entering the data manually.

What you'll need

- You have configured single sign-on for StorageGRID and you selected **AD FS** as the SSO type.
- **Sandbox mode** is selected on the Single sign-on page in Grid Manager. See [Use sandbox mode](#).
- You know the fully qualified domain name (or the IP address) and the relying party identifier for each Admin Node in your system. You can find these values in the Admin Nodes detail table on the StorageGRID Single Sign-on page.



You must create a relying party trust for each Admin Node in your StorageGRID system. Having a relying party trust for each Admin Node ensures that users can securely sign in to and out of any Admin Node.

- You have experience creating relying party trusts in AD FS, or you have access to the Microsoft AD FS documentation.
- You are using the AD FS Management snap-in, and you belong to the Administrators group.
- If you are creating the relying party trust manually, you have the custom certificate that was uploaded for the StorageGRID management interface, or you know how to log in to an Admin Node from the command shell.

About this task

These instructions apply to Windows Server 2016 AD FS. If you are using a different version of AD FS, you will notice slight differences in the procedure. See the Microsoft AD FS documentation if you have questions.

Create a relying party trust using Windows PowerShell

You can use Windows PowerShell to quickly create one or more relying party trusts.

Steps

1. From the Windows start menu, right-select the PowerShell icon, and select **Run as Administrator**.
2. At the PowerShell command prompt, enter the following command:

```
Add-AdfsRelyingPartyTrust -Name "Admin_Node_Identifier" -MetadataURL  
"https://Admin_Node_FQDN/api/saml-metadata"
```

- For *Admin_Node_Identifier*, enter the Relying Party Identifier for the Admin Node, exactly as it appears on the Single Sign-on page. For example, SG-DC1-ADM1.
- For *Admin_Node_FQDN*, enter the fully qualified domain name for the same Admin Node. (If

necessary, you can use the node's IP address instead. However, if you enter an IP address here, be aware that you must update or recreate this relying party trust if that IP address ever changes.)

3. From Windows Server Manager, select **Tools > AD FS Management**.

The AD FS management tool appears.

4. Select **AD FS > Relying Party Trusts**.

The list of relying party trusts appears.

5. Add an Access Control Policy to the newly created relying party trust:

- a. Locate the relying party trust you just created.
- b. Right-click the trust, and select **Edit Access Control Policy**.
- c. Select an Access Control Policy.
- d. Select **Apply**, and select **OK**

6. Add a Claim Issuance Policy to the newly created Relying Party Trust:

- a. Locate the relying party trust you just created.
- b. Right-click the trust, and select **Edit claim issuance policy**.
- c. Select **Add rule**.
- d. On the Select Rule Template page, select **Send LDAP Attributes as Claims** from the list, and select **Next**.
- e. On the Configure Rule page, enter a display name for this rule.

For example, **ObjectGUID to Name ID**.

- f. For the Attribute Store, select **Active Directory**.
- g. In the LDAP Attribute column of the Mapping table, type **objectGUID**.
- h. In the Outgoing Claim Type column of the Mapping table, select **Name ID** from the drop-down list.
- i. Select **Finish**, and select **OK**.

7. Confirm that the metadata was imported successfully.

- a. Right-click the relying party trust to open its properties.
- b. Confirm that the fields on the **Endpoints**, **Identifiers**, and **Signature** tabs are populated.

If the metadata is missing, confirm that the Federation metadata address is correct, or simply enter the values manually.

8. Repeat these steps to configure a relying party trust for all of the Admin Nodes in your StorageGRID system.

9. When you are done, return to StorageGRID and test all relying party trusts to confirm they are configured correctly. See [Use Sandbox mode](#) for instructions.

Create a relying party trust by importing federation metadata

You can import the values for each relying party trust by accessing the SAML metadata for each Admin Node.

Steps

1. In Windows Server Manager, select **Tools**, and then select **AD FS Management**.
2. Under Actions, select **Add Relying Party Trust**.
3. On the Welcome page, choose **Claims aware**, and select **Start**.
4. Select **Import data about the relying party published online or on a local network**.
5. In **Federation metadata address (host name or URL)**, type the location of the SAML metadata for this Admin Node:

```
https://Admin_Node_FQDN/api/saml-metadata
```

For *Admin_Node_FQDN*, enter the fully qualified domain name for the same Admin Node. (If necessary, you can use the node's IP address instead. However, if you enter an IP address here, be aware that you must update or recreate this relying party trust if that IP address ever changes.)

6. Complete the Relying Party Trust wizard, save the relying party trust, and close the wizard.



When entering the display name, use the Relying Party Identifier for the Admin Node, exactly as it appears on the Single Sign-on page in the Grid Manager. For example, SG-DC1-ADM1.

7. Add a claim rule:
 - a. Right-click the trust, and select **Edit claim issuance policy**.
 - b. Select **Add rule**:
 - c. On the Select Rule Template page, select **Send LDAP Attributes as Claims** from the list, and select **Next**.
 - d. On the Configure Rule page, enter a display name for this rule.

For example, **ObjectGUID to Name ID**.
 - e. For the Attribute Store, select **Active Directory**.
 - f. In the LDAP Attribute column of the Mapping table, type **objectGUID**.
 - g. In the Outgoing Claim Type column of the Mapping table, select **Name ID** from the drop-down list.
 - h. Select **Finish**, and select **OK**.
8. Confirm that the metadata was imported successfully.
 - a. Right-click the relying party trust to open its properties.
 - b. Confirm that the fields on the **Endpoints**, **Identifiers**, and **Signature** tabs are populated.

If the metadata is missing, confirm that the Federation metadata address is correct, or simply enter the values manually.
9. Repeat these steps to configure a relying party trust for all of the Admin Nodes in your StorageGRID system.
10. When you are done, return to StorageGRID and test all relying party trusts to confirm they are configured correctly. See [Use Sandbox mode](#) for instructions.

Create a relying party trust manually

If you choose not to import the data for the relying party trusts, you can enter the values manually.

Steps

1. In Windows Server Manager, select **Tools**, and then select **AD FS Management**.
2. Under Actions, select **Add Relying Party Trust**.
3. On the Welcome page, choose **Claims aware**, and select **Start**.
4. Select **Enter data about the relying party manually**, and select **Next**.
5. Complete the Relying Party Trust wizard:

- a. Enter a display name for this Admin Node.

For consistency, use the Relying Party Identifier for the Admin Node, exactly as it appears on the Single Sign-on page in the Grid Manager. For example, `SG-DC1-ADM1`.

- b. Skip the step to configure an optional token encryption certificate.
- c. On the Configure URL page, select the **Enable support for the SAML 2.0 WebSSO protocol** check box.
- d. Type the SAML service endpoint URL for the Admin Node:

```
https://Admin_Node_FQDN/api/saml-response
```

For `Admin_Node_FQDN`, enter the fully qualified domain name for the Admin Node. (If necessary, you can use the node's IP address instead. However, if you enter an IP address here, be aware that you must update or recreate this relying party trust if that IP address ever changes.)

- e. On the Configure Identifiers page, specify the Relying Party Identifier for the same Admin Node:

```
Admin_Node_Identifier
```

For `Admin_Node_Identifier`, enter the Relying Party Identifier for the Admin Node, exactly as it appears on the Single Sign-on page. For example, `SG-DC1-ADM1`.

- f. Review the settings, save the relying party trust, and close the wizard.

The Edit Claim Issuance Policy dialog box appears.



If the dialog box does not appear, right-click the trust, and select **Edit claim issuance policy**.

6. To start the Claim Rule wizard, select **Add rule**:
 - a. On the Select Rule Template page, select **Send LDAP Attributes as Claims** from the list, and select **Next**.
 - b. On the Configure Rule page, enter a display name for this rule.

For example, **ObjectGUID to Name ID**.
 - c. For the Attribute Store, select **Active Directory**.
 - d. In the LDAP Attribute column of the Mapping table, type **objectGUID**.

- e. In the Outgoing Claim Type column of the Mapping table, select **Name ID** from the drop-down list.
 - f. Select **Finish**, and select **OK**.
7. Right-click the relying party trust to open its properties.
 8. On the **Endpoints** tab, configure the endpoint for single logout (SLO):
 - a. Select **Add SAML**.
 - b. Select **Endpoint Type > SAML Logout**.
 - c. Select **Binding > Redirect**.
 - d. In the **Trusted URL** field, enter the URL used for single logout (SLO) from this Admin Node:

```
https://Admin_Node_FQDN/api/saml-logout
```

For *Admin_Node_FQDN*, enter the Admin Node's fully qualified domain name. (If necessary, you can use the node's IP address instead. However, if you enter an IP address here, be aware that you must update or recreate this relying party trust if that IP address ever changes.)

- e. Select **OK**.
9. On the **Signature** tab, specify the signature certificate for this relying party trust:
 - a. Add the custom certificate:
 - If you have the custom management certificate you uploaded to StorageGRID, select that certificate.
 - If you do not have the custom certificate, log in to the Admin Node, go the `/var/local/mgmt-api` directory of the Admin Node, and add the `custom-server.crt` certificate file.
 - Note:** Using the Admin Node's default certificate (`server.crt`) is not recommended. If the Admin Node fails, the default certificate will be regenerated when you recover the node, and you will need to update the relying party trust.
 - b. Select **Apply**, and select **OK**.

The Relying Party properties are saved and closed.

10. Repeat these steps to configure a relying party trust for all of the Admin Nodes in your StorageGRID system.
11. When you are done, return to StorageGRID and test all relying party trusts to confirm they are configured correctly. See [Use sandbox mode](#) for instructions.

Create enterprise applications in Azure AD

You use Azure AD to create an enterprise application for each Admin Node in your system.

What you'll need

- You have started configuring single sign-on for StorageGRID and you selected **Azure** as the SSO type.
- **Sandbox mode** is selected on the Single sign-on page in Grid Manager. See [Use sandbox mode](#).
- You have the **Enterprise application name** for each Admin Node in your system. You can copy these values from the Admin Node details table on the StorageGRID Single Sign-on page.



You must create an enterprise application for each Admin Node in your StorageGRID system. Having an enterprise application for each Admin Node ensures that users can securely sign in to and out of any Admin Node.

- You have experience creating enterprise applications in Azure Active Directory.
- You have an Azure account with an active subscription.
- You have one of the following roles in the Azure account: Global Administrator, Cloud Application Administrator, Application Administrator, or owner of the service principal.

Access Azure AD

1. Login to the [Azure Portal](#).
2. Navigate to [Azure Active Directory](#).
3. Select [Enterprise applications](#).

Create enterprise applications and save StorageGRID SSO configuration

In order to save the SSO configuration for Azure in StorageGRID, you must use Azure to create an enterprise application for each Admin Node. You will copy the federation metadata URLs from Azure and paste them into the corresponding **Federation metadata URL** fields on the StorageGRID Single Sign-on page.

1. Repeat the following steps for each Admin Node.
 - a. In the Azure Enterprise applications pane, select **New application**.
 - b. Select **Create your own application**.
 - c. For the name, enter the **Enterprise application name** you copied from the Admin Node details table on the StorageGRID Single Sign-on page.
 - d. Leave the **Integrate any other application you don't find in the gallery (Non-gallery)** radio button selected.
 - e. Select **Create**.
 - f. Select the **Get started** link in the **2. Set up single sign on** box, or select the **Single sign-on** link in the left margin.
 - g. Select the **SAML** box.
 - h. Copy the **App Federation Metadata Url**, which you can find under **Step 3 SAML Signing Certificate**.
 - i. Go to the StorageGRID Single Sign-on page, and paste the URL in the **Federation metadata URL** field that corresponds to the **Enterprise application name** you used.
2. After you have pasted a federation metadata URL for each Admin Node and made all other needed changes to the SSO configuration, select **Save** on the StorageGRID Single Sign-on page.

Download SAML metadata for every Admin Node

After the SSO configuration is saved, you can download a SAML metadata file for each Admin Node in your StorageGRID system.

Repeat these steps for each Admin Node:

1. Sign in to StorageGRID from the Admin Node.

2. Select **CONFIGURATION > Access control > Single sign-on**.
3. Select the button to download the SAML metadata for that Admin Node.
4. Save the file, which you will upload into Azure AD.

Upload SAML metadata to each enterprise application

After downloading a SAML metadata file for each StorageGRID Admin Node, perform the following steps in Azure AD:

1. Return to the Azure Portal.
2. Repeat these steps for each enterprise application:



You might need to refresh the Enterprise applications page to see applications you previously added in the list.

- a. Go to the Properties page for the enterprise application.
 - b. Set **Assignment required** to **No** (unless you want to separately configure assignments).
 - c. Go to the Single sign-on page.
 - d. Complete the SAML configuration.
 - e. Select the **Upload metadata file** button and select the SAML metadata file you downloaded for the corresponding Admin Node.
 - f. After the file loads, select **Save** and then select **X** to close the pane. You are returned to the Set up Single Sign-On with SAML page.
3. Follow the steps in [Use sandbox mode](#) to test each application.

Create service provider (SP) connections in PingFederate

You use PingFederate to create a service provider (SP) connection for each Admin Node in your system. To speed up the process, you will import the SAML metadata from StorageGRID.

What you'll need

- You have configured single sign-on for StorageGRID and you selected **Ping Federate** as the SSO type.
- **Sandbox mode** is selected on the Single sign-on page in Grid Manager. See [Use sandbox mode](#).
- You have the **SP connection ID** for each Admin Node in your system. You can find these values in the Admin Nodes detail table on the StorageGRID Single Sign-on page.
- You have downloaded the **SAML metadata** for each Admin Node in your system.
- You have experience creating SP connections in PingFederate Server.
- You have the [Administrator's Reference Guide](#) for PingFederate Server. The PingFederate documentation provides detailed step-by-step instructions and explanations.
- You have the Admin permission for PingFederate Server.

About this task

These instructions summarize how to configure PingFederate Server version 10.3 as an SSO provider for StorageGRID. If you are using another version of PingFederate, you might need to adapt these instructions.

Refer to the PingFederate Server documentation for detailed instructions for your release.

Complete prerequisites in PingFederate

Before you can create the SP connections you will use for StorageGRID, you must complete prerequisite tasks in PingFederate. You will use information from these prerequisites when you configure the SP connections.

Create data store

If you haven't already, create a data store to connect PingFederate to the AD FS LDAP server. Use the values you used when [configuring identity federation](#) in StorageGRID.

- **Type:** Directory (LDAP)
- **LDAP Type:** Active Directory
- **Binary Attribute Name:** Enter **objectGUID** on the LDAP Binary Attributes tab exactly as shown.

Create password credential validator

If you haven't already, create a password credential validator.

- **Type:** LDAP Username Password Credential Validator
- **Data store:** Select the data store you created.
- **Search base:** Enter information from LDAP (for example, DC=saml,DC=sgws).
- **Search filter:** sAMAccountName=\${username}
- **Scope:** Subtree

Create IdP adapter instance

If you haven't already, create an IdP adapter instance.

1. Go to **Authentication > Integration > IdP Adapters**.
2. Select **Create New Instance**.
3. On the Type tab, select **HTML Form IdP Adapter**.
4. On the IdP Adapter tab, select **Add a new row to 'Credential Validators'**.
5. Select the [password credential validator](#) you created.
6. On the Adapter Attributes tab, select the **username** attribute for **Pseudonym**.
7. Select **Save**.

Create or import signing certificate

If you haven't already, create or import the signing certificate.

1. Go to **Security > Signing & Decryption Keys & Certificates**.
2. Create or import the signing certificate.

Create an SP connection in PingFederate

When you create an SP connection in PingFederate, you import the SAML metadata you downloaded from

StorageGRID for the Admin Node. The metadata file contains many of the specific values you need.



You must create an SP connection for each Admin Node in your StorageGRID system, so that users can securely sign in to and out of any node. Use these instructions to create the first SP connection. Then, go to [Create additional SP connections](#) to create any additional connections you need.

Choose SP connection type

1. Go to **Applications > Integration > SP Connections**.
2. Select **Create Connection**.
3. Select **Do not use a template for this connection**.
4. Select **Browser SSO Profiles** and **SAML 2.0** as the protocol.

Import SP metadata

1. On the Import Metadata tab, select **File**.
2. Choose the SAML metadata file you downloaded from the StorageGRID Single sign-on page for the Admin Node.
3. Review the Metadata Summary and the information on the General Info tab.

The Partner's Entity ID and the Connection Name are set to the StorageGRID SP connection ID. (for example, 10.96.105.200-DC1-ADM1-105-200). The Base URL is the IP of the StorageGRID Admin Node.

4. Select **Next**.

Configure IdP Browser SSO

1. From the Browser SSO tab, select **Configure Browser SSO**.
2. On the SAML profiles tab, select the **SP-initiated SSO**, **SP-initial SLO**, **IdP-initiated SSO**, and **IdP-initiated SLO** options.
3. Select **Next**.
4. On the Assertion Lifetime tab, make no changes.
5. On the Assertion Creation tab, select **Configure Assertion Creation**.
 - a. On the Identity Mapping tab, select **Standard**.
 - b. On the Attribute Contract tab, use the **SAML_SUBJECT** as the Attribute Contract and the unspecified name format that was imported.
6. For Extend the Contract, select **Delete** to remove the `urn:oid`, which is not used.

Map adapter instance

1. On the Authentication Source Mapping tab, select **Map New Adapter Instance**.
2. On the Adapter instance tab, select the [adapter instance](#) you created.
3. On the Mapping Method tab, select **Retrieve Additional Attributes From a Data Store**.
4. On the Attribute Source & User Lookup tab, select **Add Attribute Source**.
5. On the Data Store tab, provide a description and select the [data store](#) you added.

6. On the LDAP Directory Search tab:
 - Enter the **Base DN**, which should exactly match the value you entered in StorageGRID for the LDAP server.
 - For the Search Scope, select **Subtree**.
 - For the Root Object Class, search for the **objectGUID** attribute and add it.
7. On the LDAP Binary Attribute Encoding Types tab, select **Base64** for the **objectGUID** attribute.
8. On the LDAP Filter tab, enter **sAMAccountName=\${username}**.
9. On the Attribute Contract Fulfillment tab, select **LDAP (attribute)** from the Source drop-down and select **objectGUID** from the Value drop-down.
10. Review and then save the attribute source.
11. On the Failsave Attribute Source tab, select **Abort the SSO Transaction**.
12. Review the summary and select **Done**.
13. Select **Done**.

Configure protocol settings

1. On the **SP Connection > Browser SSO > Protocol Settings** tab, select **Configure Protocol Settings**.
2. On the Assertion Consumer Service URL tab, accept the default values, which were imported from the StorageGRID SAML metadata (**POST** for Binding and `/api/saml-response` for Endpoint URL).
3. On the SLO Service URLs tab, accept the default values, which were imported from the StorageGRID SAML metadata (**REDIRECT** for Binding and `/api/saml-logout` for Endpoint URL).
4. On the Allowable SAML Bindings tab, unselect **ARTIFACT** and **SOAP**. Only **POST** and **REDIRECT** are required.
5. On the Signature Policy tab, leave the **Require Authn Requests to be Signed** and **Always Sign Assertion** check boxes selected.
6. On the Encryption Policy tab, select **None**.
7. Review the summary and select **Done** to save the protocol settings.
8. Review the summary and select **Done** to save the Browser SSO settings.

Configure credentials

1. From the SP Connection tab, select **Credentials**.
2. From the Credentials tab, select **Configure Credentials**.
3. Select the [signing certificate](#) you created or imported.
4. Select **Next** to go to **Manage Signature Verification Settings**.
 - a. On the Trust Model tab, select **Unanchored**.
 - b. On the Signature Verification Certificate tab, review the signing certificate information, which was imported from the StorageGRID SAML metadata.
5. Review the summary screens and select **Save** to save the SP connection.

Create additional SP connections

You can copy the first SP connection to create the SP connections you need for each Admin Node in your grid.

You upload new metadata for each copy.



The SP connections for different Admin Nodes use identical settings, with the exception of the Partner's Entity ID, Base URL, Connection ID, Connection Name, Signature Verification, and SLO Response URL.

1. Select **Action > Copy** to create a copy of the initial SP connection for each additional Admin Node.
2. Enter the Connection ID and Connection Name for the copy, and select **Save**.
3. Choose the metadata file corresponding to the Admin Node:
 - a. Select **Action > Update with Metadata**.
 - b. Select **Choose File** and upload the metadata.
 - c. Select **Next**.
 - d. Select **Save**.
4. Resolve the error due to the unused attribute:
 - a. Select the new connection.
 - b. Select **Configure Browser SSO > Configure Assertion Creation > Attribute Contract**.
 - c. Delete the entry for **urn:oid**.
 - d. Select **Save**.

Disable single sign-on

You can disable single sign-on (SSO) if you no longer want to use this functionality. You must disable single sign-on before you can disable identity federation.

What you'll need

- You are signed in to the Grid Manager using a [supported web browser](#).
- You have specific access permissions.

Steps

1. Select **CONFIGURATION > Access control > Single sign-on**.

The Single Sign-on page appears.

2. Select the **Disabled** option.
3. Select **Save**.

A warning message appears indicating that local users will now be able to sign in.

Warning

Disable single sign-on

After you disable SSO or switch to sandbox mode, local users will be able to sign in. Are you sure you want to proceed?

Cancel

OK

4. Select **OK**.

The next time you sign in to StorageGRID, the StorageGRID Sign in page appears and you must enter the username and password for a local or federated StorageGRID user.

Temporarily disable and reenable single sign-on for one Admin Node

You might not be able to sign in to the Grid Manager if the single sign-on (SSO) system goes down. In this case, you can temporarily disable and reenable SSO for one Admin Node. To disable and then reenable SSO, you must access the node's command shell.

What you'll need

- You have specific access permissions.
- You have the `Passwords.txt` file.
- You know the password for the local root user.

About this task

After you disable SSO for one Admin Node, you can sign in to the Grid Manager as the local root user. To secure your StorageGRID system, you must use the node's command shell to reenable SSO on the Admin Node as soon as you sign out.



Disabling SSO for one Admin Node does not affect the SSO settings for any other Admin Nodes in the grid. The **Enable SSO** check box on the Single Sign-on page in the Grid Manager remains selected, and all existing SSO settings are maintained unless you update them.

Steps

1. Log in to an Admin Node:
 - a. Enter the following command: `ssh admin@Admin_Node_IP`
 - b. Enter the password listed in the `Passwords.txt` file.
 - c. Enter the following command to switch to root: `su -`
 - d. Enter the password listed in the `Passwords.txt` file.

When you are logged in as root, the prompt changes from `$` to `#`.

2. Run the following command:`disable-saml`

A message indicates that the command applies to this Admin Node only.

3. Confirm that you want to disable SSO.

A message indicates that single sign-on is disabled on the node.

4. From a web browser, access the Grid Manager on the same Admin Node.

The Grid Manager sign-in page is now displayed because SSO has been disabled.

5. Sign in with the username `root` and the local root user's password.

6. If you disabled SSO temporarily because you needed to correct the SSO configuration:

- a. Select **CONFIGURATION > Access control > Single sign-on**.
- b. Change the incorrect or out-of-date SSO settings.
- c. Select **Save**.

Selecting **Save** from the Single Sign-on page automatically reenables SSO for the entire grid.

7. If you disabled SSO temporarily because you needed to access the Grid Manager for some other reason:

- a. Perform whatever task or tasks you need to perform.
- b. Select **Sign Out**, and close the Grid Manager.
- c. Reenable SSO on the Admin Node. You can perform either of the following steps:

- Run the following command: `enable-saml`

A message indicates that the command applies to this Admin Node only.

Confirm that you want to enable SSO.

A message indicates that single sign-on is enabled on the node.

- Reboot the grid node: `reboot`

8. From a web browser, access the Grid Manager from the same Admin Node.

9. Confirm that the StorageGRID Sign in page appears and that you must enter your SSO credentials to access the Grid Manager.

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