Tutorial: Azure AD SSO integration with FortiGate SSL VPN

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In this article

In this tutorial, you'll learn how to integrate FortiGate SSL VPN with Azure Active Directory (Azure AD). When you integrate FortiGate SSL VPN with Azure AD, you can:

- Use Azure AD to control who can access FortiGate SSL VPN.
- Enable your users to be automatically signed in to FortiGate SSL VPN with their Azure AD accounts.
- Manage your accounts in one central location: the Azure portal.

Prerequisites

To get started, you need the following items:

- An Azure AD subscription. If you don't have a subscription, you can get a free account.
- A FortiGate SSL VPN with single sign-on (SSO) enabled.

Tutorial description

In this tutorial, you'll configure and test Azure AD SSO in a test environment.

FortiGate SSL VPN supports SP-initiated SSO.

Add FortiGate SSL VPN from the gallery

To configure the integration of FortiGate SSL VPN into Azure AD, you need to add FortiGate SSL VPN from the gallery to your list of managed SaaS apps:

1. Sign in to the Azure portal with a work or school account or with a personal Microsoft account.
2. In the left pane, select **Azure Active Directory**.
3. Go to **Enterprise applications** and then select **All Applications**.
4. To add an application, select **New application**.
5. In the **Add from the gallery** section, enter **FortiGate SSL VPN** in the search box.
6. Select **FortiGate SSL VPN** in the results panel and then add the app. Wait a few seconds while the app is added to your tenant.

Alternatively, you can also use the Enterprise App Configuration Wizard. In this wizard, you can add an application to your tenant, add users/groups to the app, assign roles, as well as walk through the SSO configuration as well. Learn more about Microsoft 365 wizards.

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Configure and test Azure AD SSO for FortiGate SSL VPN

You'll configure and test Azure AD SSO with FortiGate SSL VPN by using a test user named B.Simon. For SSO to work, you need to establish a link relationship between an Azure AD user and the corresponding SAML SSO user group in FortiGate SSL VPN.

To configure and test Azure AD SSO with FortiGate SSL VPN, you'll complete these high-level steps:

1. Configure Azure AD SSO to enable the feature for your users.
   a. Create an Azure AD test user to test Azure AD single sign-on.
   b. Grant access to the test user to enable Azure AD single sign-on for that user.
2. Configure FortiGate SSL VPN SSO on the application side.
   a. **Create a FortiGate SAML SSO user group** as a counterpart to the Azure AD representation of the user.
3. Test SSO to verify that the configuration works.

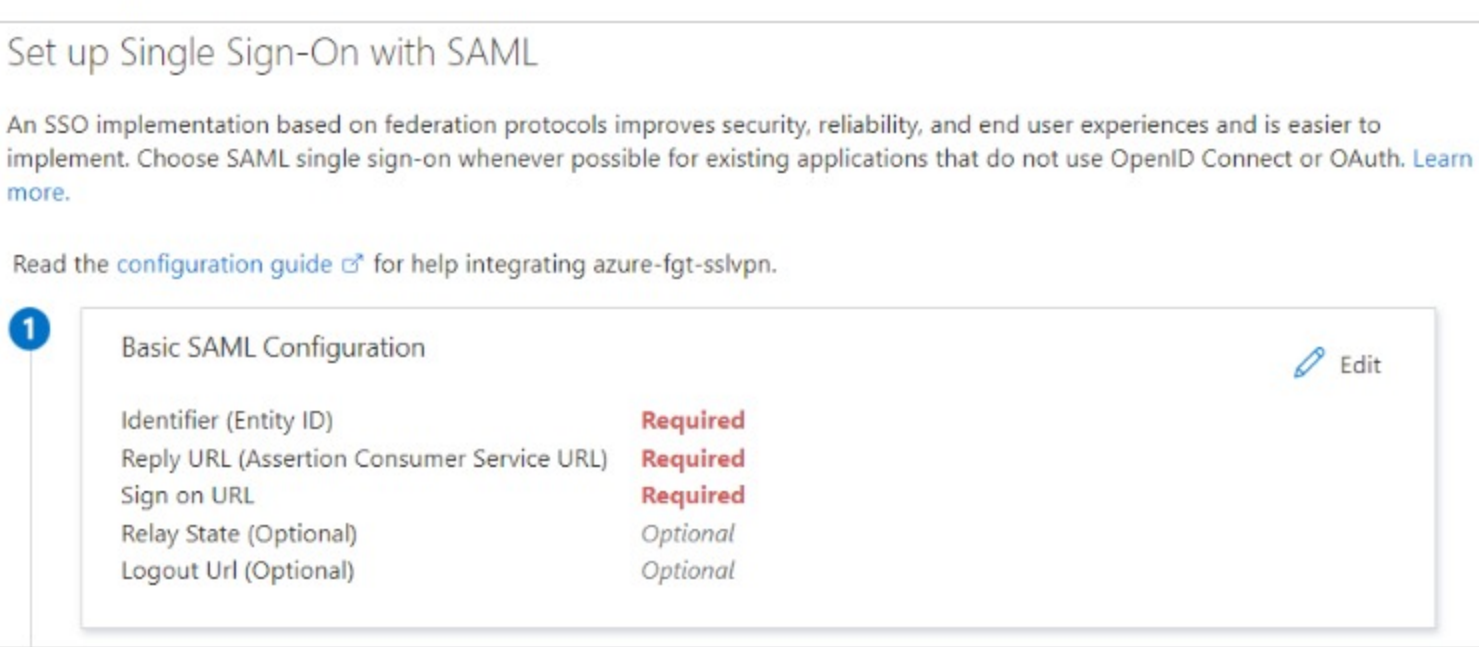
Configure Azure AD SSO

Follow these steps to enable Azure AD SSO in the Azure portal:

1. In the Azure portal, on the **FortiGate SSL VPN** application integration page, in the **Manage** section, select **single sign-on**.

2. On the **Select a single sign-on method** page, select **SAML**.

3. On the **Set up Single Sign-On with SAML** page, select the **Edit** button for **Basic SAML Configuration** to edit the settings:



4. On the **Set up Single Sign-On with SAML** page, enter the following values:

   a. In the **Identifier** box, enter a URL in the pattern `https://<FortiGate IP or FQDN address>:<Custom SSL VPN port>/remote/saml/metadata`.

   b. In the **Reply URL** box, enter a URL in the pattern `https://<FortiGate IP or FQDN address>:<Custom SSL VPN port>/remote/saml/login`.

   c. In the **Sign on URL** box, enter a URL in the pattern `https://<FortiGate IP or FQDN address>:<Custom SSL VPN port>/remote/saml/login`.

   d. In the **Logout URL** box, enter a URL in the pattern `https://<FortiGate IP or FQDN address>:<Custom SSL VPN port><FQDN>/remote/saml/logout`.

   > Note
   >
   > These values are just patterns. You need to use the actual **Sign on URL**, **Identifier**, **Reply URL**, and **Logout URL** that is configured on the FortiGate.

5. The FortiGate SSL VPN application expects SAML assertions in a specific format, which requires you to add custom attribute mappings to the configuration. The following screenshot shows the list of default attributes.

6. The claims required by FortiGate SSL VPN are shown in the following table. The names of these claims must match the names used in the **Perform FortiGate command-line configuration** section of this tutorial. Names are case-sensitive.

Name	Source attribute
username	user.userprincipalname
group	user.groups

   To create these additional claims:

   a. Next to **User Attributes & Claims**, select **Edit**.

   b. Select **Add new claim**.

   c. For **Name**, enter **username**.

   d. For **Source attribute**, select **user.userprincipalname**.

   e. Select **Save**.

   > Note
   >
   > **User Attributes & Claims** allow only one group claim. To add a group claim, delete the existing group claim **user.groups [SecurityGroup]** already present in the claims to add the new claim or edit the existing one to **All groups**.

   f. Select **Add a group claim**.

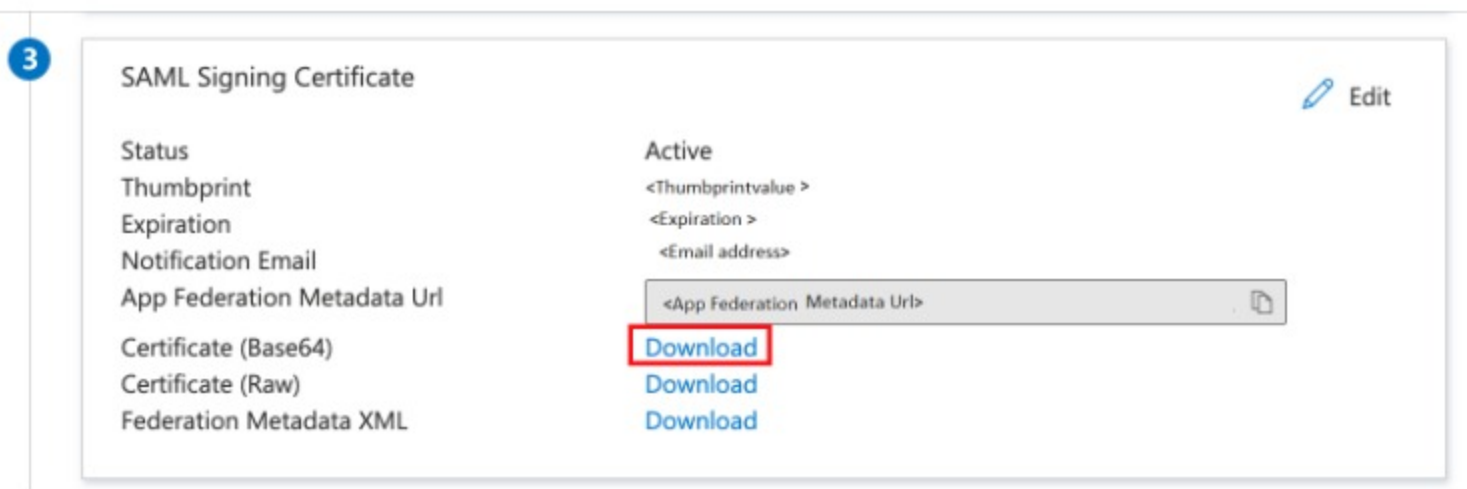
   g. Select **All groups**.

   h. Under **Advanced options**, select the **Customize the name of the group claim** check box.

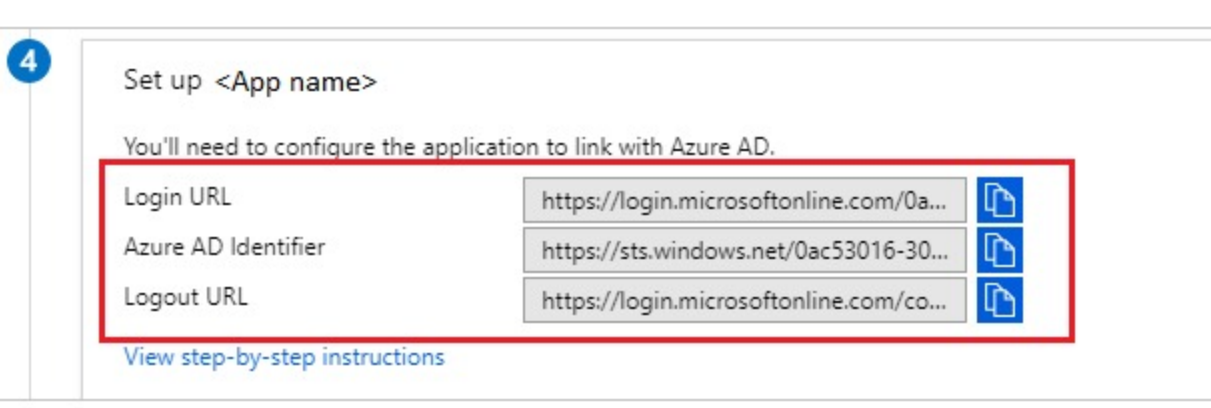
   i. For **Name**, enter **group**.

   j. Select **Save**.

7. On the **Set up Single Sign-On with SAML** page, in the **SAML Signing Certificate** section, select the **Download** link next to **Certificate (Base64)** to download the certificate and save it on your computer:



8. In the **Set up FortiGate SSL VPN** section, copy the appropriate URL or URLs, based on your requirements:



Create an Azure AD test user

In this section, you'll create a test user named B.Simon in the Azure portal.

1. In the left pane of the Azure portal, select **Azure Active Directory**. Select **Users**, and then select **All users**.
2. Select **New user** at the top of the screen.
3. In the **User** properties, complete these steps:
   a. In the **Name** box, enter **B.Simon**.
   b. In the **User name** box, enter <username>@<companydomain>.<extension>. For example, `B.Simon@contoso.com`.
   c. Select **Show password**, and then write down the value that's displayed in the **Password** box.
   d. Select **Create**.

Grant access to the test user

In this section, you'll enable B.Simon to use Azure single sign-on by granting that user access to FortiGate SSL VPN.

1. In the Azure portal, select **Enterprise applications**, and then select **All applications**.
2. In the applications list, select **FortiGate SSL VPN**.
3. On the app's overview page, in the **Manage** section, select **Users and groups**.
4. Select **Add user**, then select **Users and groups** in the **Add Assignment** dialog.
5. In the **Users and groups** dialog box, select **B.Simon** in the **Users** list, and then click the **Select** button at the bottom of the screen.
6. If you're expecting any role value in the SAML assertion, in the **Select Role** dialog box, select the appropriate role for the user from the list. Click the **Select** button at the bottom of the screen.
7. In the **Add Assignment** dialog box, select **Assign**.

Create a security group for the test user

In this section, you'll create a security group in Azure Active Directory for the test user. FortiGate will use this security group to grant the user network access via the VPN.

1. In the left pane of the Azure portal, select **Azure Active Directory**. Then select **Groups**.
2. Select **New group** at the top of the screen.
3. In the **New Group** properties, complete these steps:
   a. In the **Group type** list, select **Security**.
   b. In the **Group name** box, enter **FortiGateAccess**.
   c. In the **Group description** box, enter **Group for granting FortiGate VPN access**.
   d. For the **Azure AD roles can be assigned to the group (Preview)** settings, select **No**.
   e. In the **Membership type** box, select **Assigned**.
   f. Under **Members**, select **No members selected**.
   g. In the **Users and groups** dialog box, select **B.Simon** from the **Users** list, and then click the **Select** button at the bottom of the screen.
   h. Select **Create**.
4. After you're back in the **Groups** section in Azure Active Directory, find the **FortiGate Access** group and note the **Object Id**. You'll need it later.

Configure FortiGate SSL VPN SSO

Upload the Base64 SAML Certificate to the FortiGate appliance

After you completed the SAML configuration of the FortiGate app in your tenant, you downloaded the Base64-encoded SAML certificate. You need to upload this certificate to the FortiGate appliance:

1. Sign in to the management portal of your FortiGate appliance.
2. In the left pane, select **System**.
3. Under **System**, select **Certificates**.
4. Select **Import** > **Remote Certificate**.
5. Browse to the certificate downloaded from the FortiGate app deployment in the Azure tenant, select it, and then select **OK**.

After the certificate is uploaded, take note of its name under **System** > **Certificates** > **Remote Certificate**. By default, it will be named REMOTE_Cert_*N*, where *N* is an integer value.

Complete FortiGate command-line configuration

Although you can configure SSO from the GUI since FortiOS 7.0, the CLI configurations apply to all versions and are therefore shown here.

To complete these steps, you'll need the values you recorded earlier:

FortiGate SAML CLI setting	Equivalent Azure configuration
SP entity ID (`entity-id`)	Identifier (Entity ID)
SP Single Sign-On URL (`single-sign-on-url`)	Reply URL (Assertion Consumer Service URL)
SP Single Logout URL (`single-logout-url`)	Logout URL
IdP Entity ID (`idp-entity-id`)	Azure AD Identifier
IdP Single Sign-On URL (`idp-single-sign-on-url`)	Azure Login URL
IdP Single Logout URL (`idp-single-logout-url`)	Azure Logout URL
IdP certificate (`idp-cert`)	Base64 SAML certificate name (REMOTE_Cert_N)
Username attribute (`user-name`)	username
Group name attribute (`group-name`)	group

> Note
>
> The Sign on URL under Basic SAML Configuration is not used in the FortiGate configurations. It is used to trigger SP-initiated single sign on to redirect the user to the SSL VPN portal page.

1. Establish an SSH session to your FortiGate appliance, and sign in with a FortiGate Administrator account.

2. Run these commands and substitute the `<values>` with the information that you collected previously:

Console Copy

```
config user saml
  edit azure
    set cert <FortiGate VPN Server Certificate Name>
    set entity-id < Identifier (Entity ID)Entity ID>
    set single-sign-on-url < Reply URL Reply URL>
    set single-logout-url <Logout URL>
    set idp-entity-id <Azure AD Identifier>
    set idp-single-sign-on-url <Azure Login URL>
    set idp-single-logout-url <Azure Logout URL>
    set idp-cert <Base64 SAML Certificate Name>
    set user-name username
    set group-name group
  next
end
```

Configure FortiGate for group matching

In this section, you'll configure FortiGate to recognize the Object ID of the security group that includes the test user. This configuration will allow FortiGate to make access decisions based on the group membership.

To complete these steps, you'll need the Object ID of the FortiGateAccess security group that you created earlier in this tutorial.

1. Establish an SSH session to your FortiGate appliance, and sign in with a FortiGate Administrator account.

2. Run these commands:

Console Copy

```
config user group
  edit FortiGateAccess
    set member azure
    config match
      edit 1
        set server-name azure
        set group-name <Object Id>
      next
    end
  next
end
```

Create a FortiGate VPN Portals and Firewall Policy

In this section, you'll configure a FortiGate VPN Portals and Firewall Policy that grants access to the FortiGateAccess security group you created earlier in this tutorial.

Refer to Configuring SAML SSO login for SSL VPN with Azure AD acting as SAML IdP for instructions.

Test SSO

In this section, you test your Azure AD single sign-on configuration with following options.

- In Step 5) of the Azure SSO configuration, **Test single sign-on with your App*, click the **Test** button in the Azure portal. This will redirect to FortiGate VPN Sign-on URL where you can initiate the login flow.

- Go to FortiGate VPN Sign-on URL directly and initiate the login flow from there.

- You can use Microsoft My Apps. When you click the FortiGate VPN tile in the My Apps, this will redirect to FortiGate VPN Sign-on URL. For more information about the My Apps, see Introduction to the My Apps.

Next steps

Once you configure FortiGate VPN you can enforce Session control, which protects exfiltration and infiltration of your organization's sensitive data in real time. Session control extends from Conditional Access. Learn how to enforce session control with Microsoft Defender for Cloud Apps.

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