Configure Zero Trust Remote Access Deployment on Secure Firewall

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Introduction

This document describes the process of configuring Clientless Zero Trust Access Remote Access deployment on a Secure Firewall.

Prerequisites

Requirements

Cisco recommends you have knowledge of these topics:

- Firepower Management Center (FMC)
- Basic ZTNA Knowledge
- Basic Security Assertion Markup Language (SAML) knowledge

Components Used

The information in this document is based on these software versions:

- Secure Firewall version 7.4.1

- Firepower Management Center (FMC) version 7.4.1
- Duo as Identity Provider (IdP)
- Microsoft Entra ID (formerly, Azure AD) as IdP

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Background Information

Zero Trust Access feature is based on Zero Trust Network Access (ZTNA) principles. ZTNA is a zero trust security model that eliminates implicit trust. The model grants the least privilege access after verifying the user, the context of the request, and after analyzing the risk if access is granted.

The current requirements and limitations for ZTNA are:

- Supported on Secure Firewall version 7.4.0+ managed by FMC version 7.4.0+ (Firepower 4200 Series)
- Supported on Secure Firewall version 7.4.1+ managed by FMC version 7.4.1+ (All other platforms)
- Only web applications (HTTPS) are supported. Scenarios requiring decryption exemption are not supported
- Supports only SAML IdPs
- Public DNS updates are required for remote access
- IPv6 is not supported. NAT66, NAT64, and NAT46 scenarios are not supported
- The feature is available on threat defense only if Snort 3 is enabled
- All hyperlinks in protected web applications must have a relative path
- Protected web applications running on a virtual host or behind internal load balancers must use the same external and internal URL
- Not supported on individual mode clusters
- Not supported on applications with strict HTTP Host Header validation enabled
- If the application server hosts multiple applications and serves content based on the Server Name Indication (SNI) header in the TLS Client Hello, the external URL of the zero trust application configuration must match the SNI of that specific application
- Supported only in Routed Mode
- Smart License required (does not work in evaluation mode)

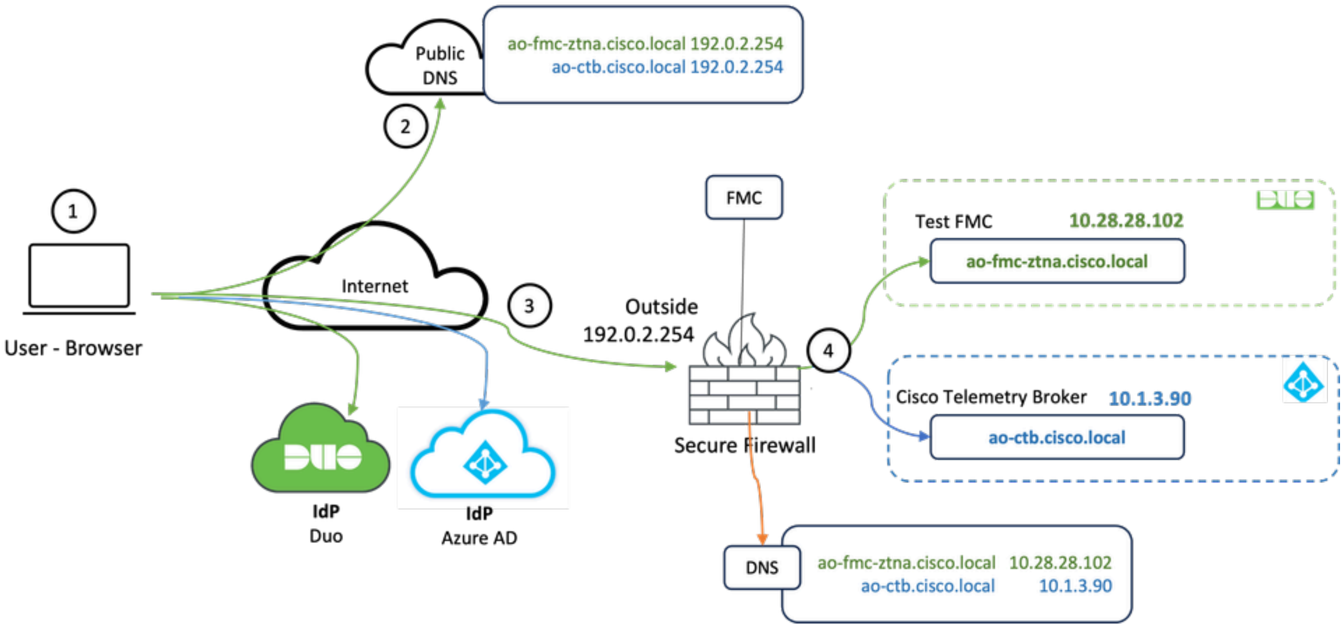
For more information and details about Zero Trust Access in Secure Firewall refer to the Cisco Secure Firewall Management Center Device Configuration Guide, 7.4.

Configure

This document focuses on a Remote Access Deployment of ZTNA.

In this example scenario, remote users require access to the Web User Interfaces (UI) of a test FMC and a Cisco Telemetry Broker (CTB) which are hosted behind a Secure Firewall. Access to these applications is granted by two different IdPs: Duo & Microsoft Entra ID respectively, as shown in the next diagram.

Network Diagram



Topology diagram

1. The remote users need to access applications hosted behind the Secure Firewall.
2. Each application must have a DNS entry in the public DNS servers.
3. These application names must resolve to the IP address of the Secure Firewall Outside interface.
4. The Secure Firewall resolves to the real IP addresses of the applications and authenticates each user to each application using SAML authentication.

Prerequisite Configuration

Identity Provider (IdP) and Domain Name Server (DNS)

- The applications or application groups must be configured in a SAML Identity Provider (IdP) such as Duo, Okta, or Azure AD. In this example, Duo and Microsoft Entra ID are used as IdPs.
- The certificate and metadata generated by the IdPs is used when configuring the application on the Secure Firewall

Internal and external DNS servers

- External DNS servers (used by remote users) must have the FQDN entry of the applications, and resolve to the Secure Firewall outside interface IP address
- Internal DNS servers (used by Secure Firewall) must have the FQDN entry of the applications, and resolve to the real IP address of the application

Certificates

The next certificates are required for the ZTNA Policy configuration:

- **Identity/Proxy certificate**: Used by the Secure Firewall to masquerade the applications. The Secure Firewall here acts as a SAML Service Provider (SP). This certificate must be a wildcard or Subject Alternative Name (SAN) certificate that matches the FQDN of the private applications (a common certificate that represents all the private applications at the pre-authentication stage)
- **IdP certificate**: The IdP used for authentication provides a certificate for each application or application group defined. This certificate must be configured so that the Secure Firewall Is able to verify the IdP's signature on incoming SAML assertions (if this is defined for an application group, the same certificate is used for the entire group of applications)
- **Application certificate**: The encrypted traffic from the remote user to the application needs to be decrypted by the Secure Firewall, therefore, the certificate chain and private key of each application must be added to the Secure Firewall.

General Configurations

To configure a new Zero Trust Application, perform the next steps:

1. Navigate to **Policies > Access Control > Zero Trust Application** and click on **Add Policy**.
2. Complete the required fields:

a) **General:** Enter the name and description of the policy.

b) **Domain Name:** This is the name that is added to the DNS and must resolve to the threat defense gateway interface from where the applications are accessed.

Note: The domain name is used to generate the ACS URL for all private applications in an Application Group.

c) **Identity certificate:** this is a common certificate that represents all the private applications at the pre-authentication stage.

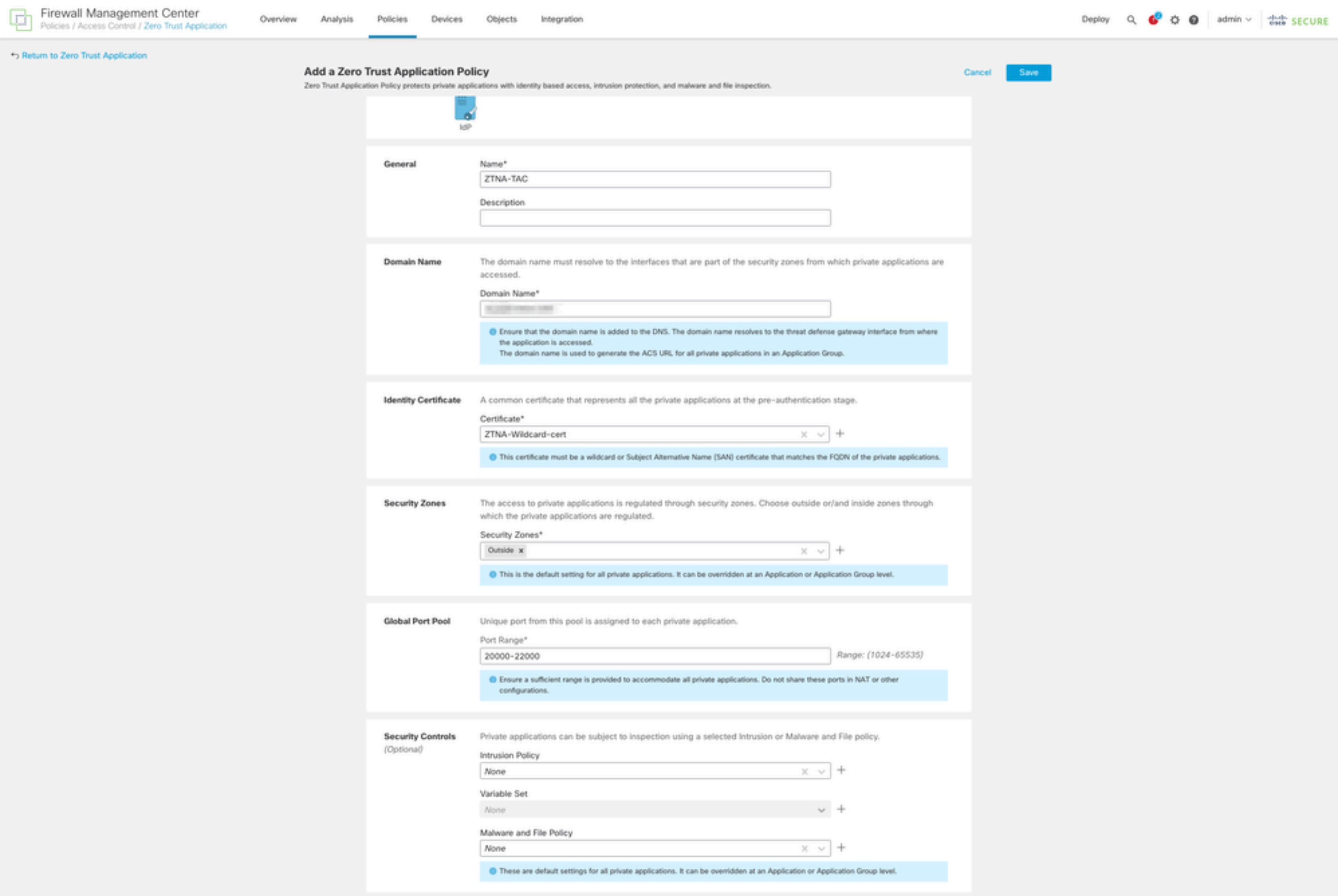
Note: This certificate must be a wildcard or Subject Alternative Name (SAN) certificate that matches the FQDN of the private applications.

d) **Security Zones:** Select outside or/and inside zones through which the private applications are regulated.

e) **Global Port Pool:** Unique port from this pool is assigned to each private application.

f) **Security Controls (optional):** Select if the private applications are subject to inspection.

In this sample configuration, the next information was entered:



Firewall Management Center
Policies / Access Control / Zero Trust Application

Return to Zero Trust Application

Add a Zero Trust Application Policy

Zero Trust Application Policy protects private applications with identity based access, intrusion protection, and malware and file inspection.

General

Name*: ZTNA-TAC

Description:

Domain Name

The domain name must resolve to the interfaces that are part of the security zones from which private applications are accessed.

Domain Name*: [redacted]

Ensure that the domain name is added to the DNS. The domain name resolves to the threat defense gateway interface from where the application is accessed.
The domain name is used to generate the ACS URL for all private applications in an Application Group.

Identity Certificate

A common certificate that represents all the private applications at the pre-authentication stage.

Certificate*: ZTNA-Wildcard-cert

This certificate must be a wildcard or Subject Alternative Name (SAN) certificate that matches the FQDN of the private applications.

Security Zones

The access to private applications is regulated through security zones. Choose outside or/and inside zones through which the private applications are regulated.

Security Zones*: Outside

This is the default setting for all private applications. It can be overridden at an Application or Application Group level.

Global Port Pool

Unique port from this pool is assigned to each private application.

Port Range*: 20000-22000 Range: (1024-65535)

Ensure a sufficient range is provided to accommodate all private applications. Do not share these ports in NAT or other configurations.

Security Controls *(Optional)*

Private applications can be subject to inspection using a selected Intrusion or Malware and File policy.

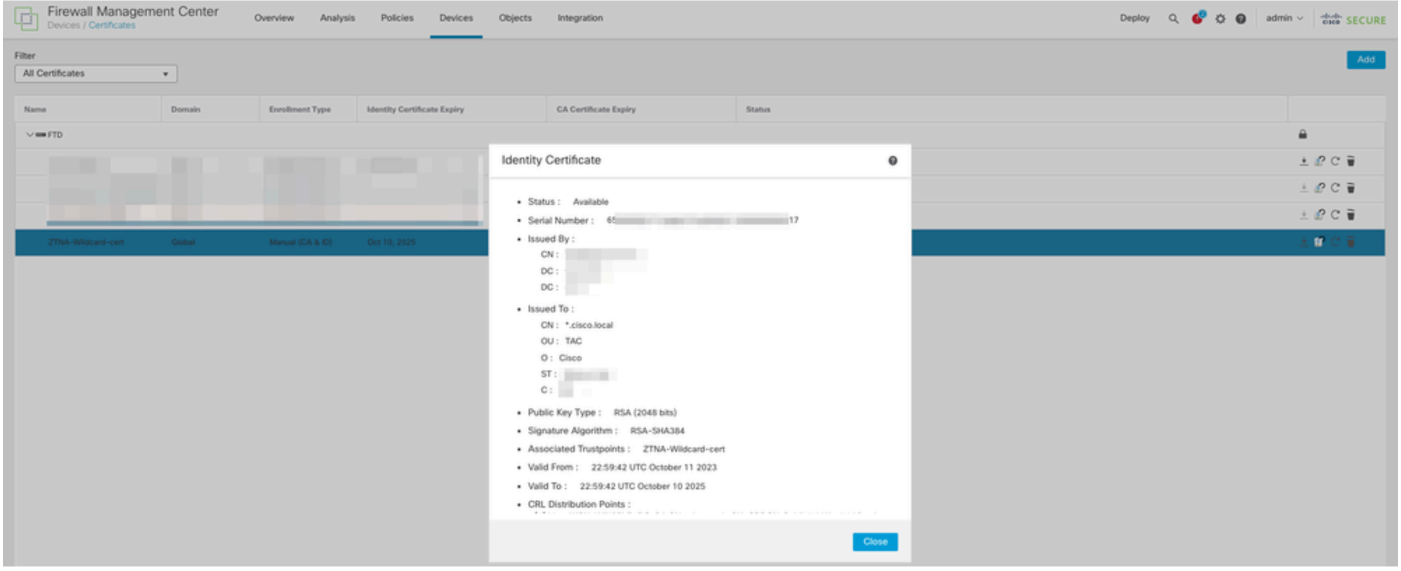
Intrusion Policy: *None*

Variable Set: *None*

Malware and File Policy: *None*

These are default settings for all private applications. It can be overridden at an Application or Application Group level.

The identity/proxy certificate used in this case is a wildcard certificate to match the FQDN of the private applications:



Firewall Management Center
Devices / Certificates

Filter: All Certificates

Name	Domain	Enrollment Type	Identity Certificate Expiry	CA Certificate Expiry	Status
FTD					
[redacted]					
ZTNA-Wildcard-cert	Global	Manual (CA & ID)	Oct 10, 2025		

Identity Certificate

- Status : Available
- Serial Number : 65[redacted]17
- Issued By :
  - CN : [redacted]
  - DC : [redacted]
  - DC : [redacted]
- Issued To :
  - CN : *.cisco.local
  - OU : TAC
  - O : Cisco
  - ST : [redacted]
  - C : [redacted]
- Public Key Type : RSA (2048 bits)
- Signature Algorithm : RSA-SHA384
- Associated Trustpoints : ZTNA-Wildcard-cert
- Valid From : 22:59:42 UTC October 11 2023
- Valid To : 22:59:42 UTC October 10 2025
- CRL Distribution Points :

3. Save the policy.

4. Create the new Application Groups and/or new Applications:

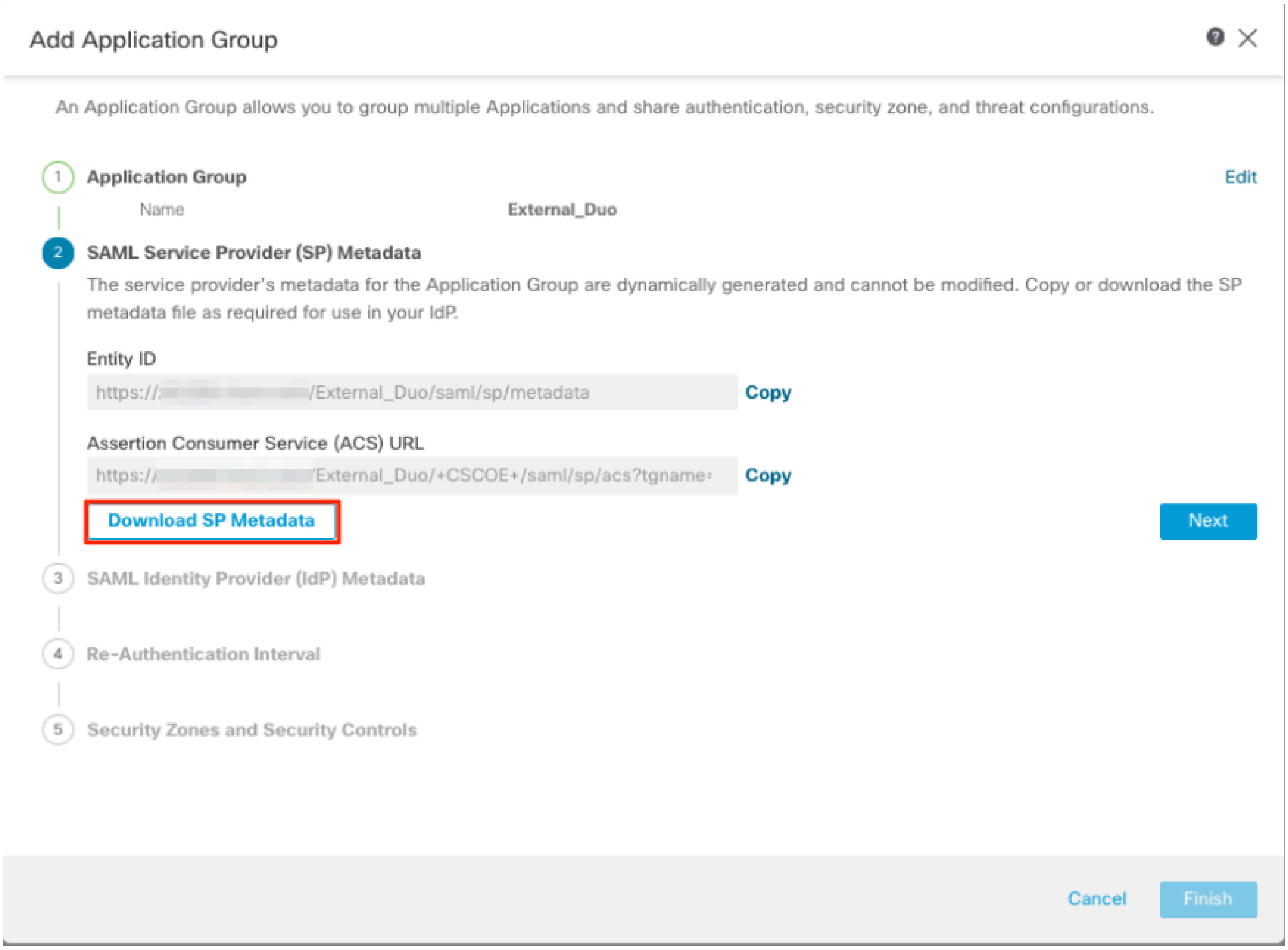
- An **Application** defines a private web application with SAML authentication, interface access, Intrusion and Malware and File policies.
- An **Application Group** allows you to group multiple Applications, and share common settings such as SAML authentication, interface access, and security control settings.

In this example, two different application groups and two different applications are configured: one for the application to be authenticated by Duo (test FMC Web UI) & one for the application to be authenticated by Microsoft Entra ID (CTB Web UI).

Configure Application Group

Application Group 1: Using Duo as IdP

a. Enter the **Application Group Name** and click **Next** for the SAML Service Provider (SP) Metadata to be displayed.



Add Application Group

An Application Group allows you to group multiple Applications and share authentication, security zone, and threat configurations.

1 Application Group

Name External_Duo

2 SAML Service Provider (SP) Metadata

The service provider's metadata for the Application Group are dynamically generated and cannot be modified. Copy or download the SP metadata file as required for use in your IdP.

Entity ID

https://[redacted]/External_Duo/saml/sp/metadata

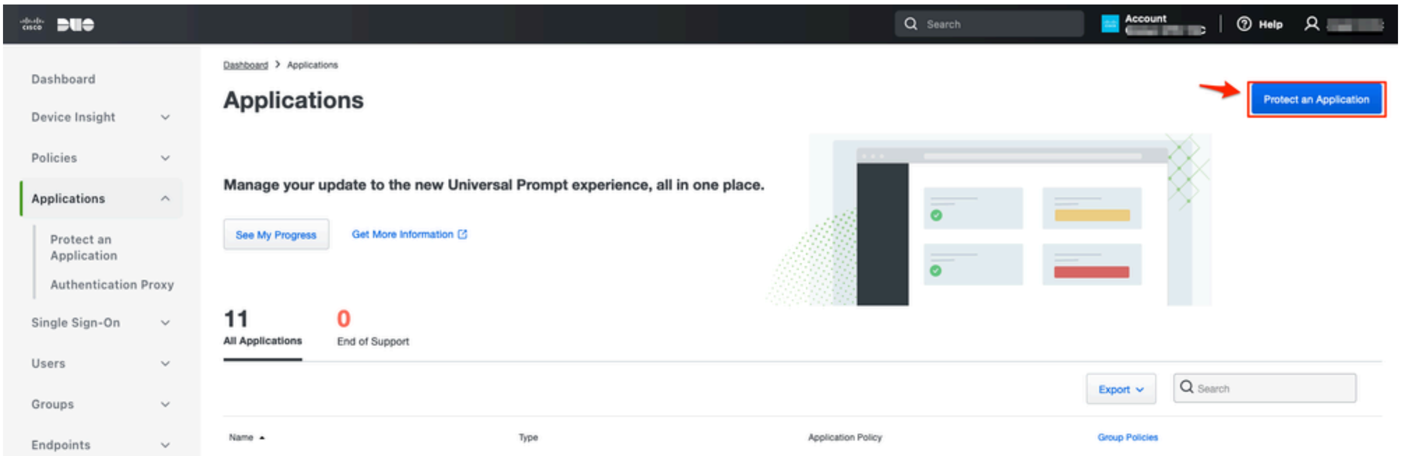
Assertion Consumer Service (ACS) URL

https://[redacted]External_Duo/+CSCOE+/saml/sp/acs?tgname=

Edit
Copy
Copy
Download SP Metadata
Next
3 SAML Identity Provider (IdP) Metadata
4 Re-Authentication Interval
5 Security Zones and Security Controls
Cancel
Finish

b. Once the SAML SP Metadata is displayed, go to the IdP and configure a new SAML SSO application.

c. Log in to Duo and navigate to **Applications > Protect an Application**.



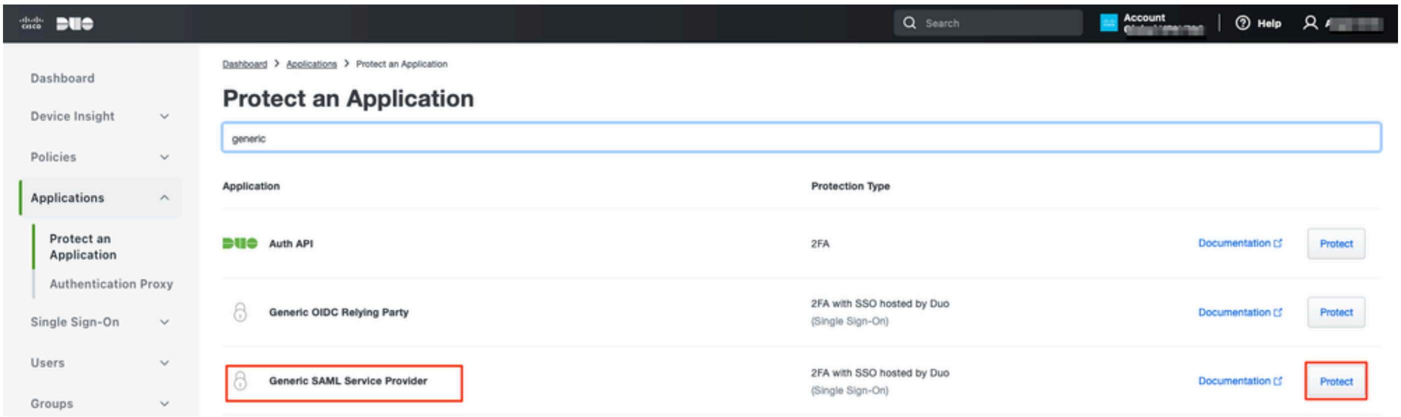
Applications

Manage your update to the new Universal Prompt experience, all in one place.

11 All Applications

0 End of Support

d. Look for **Generic SAML Service Provider** and click **Protect**.



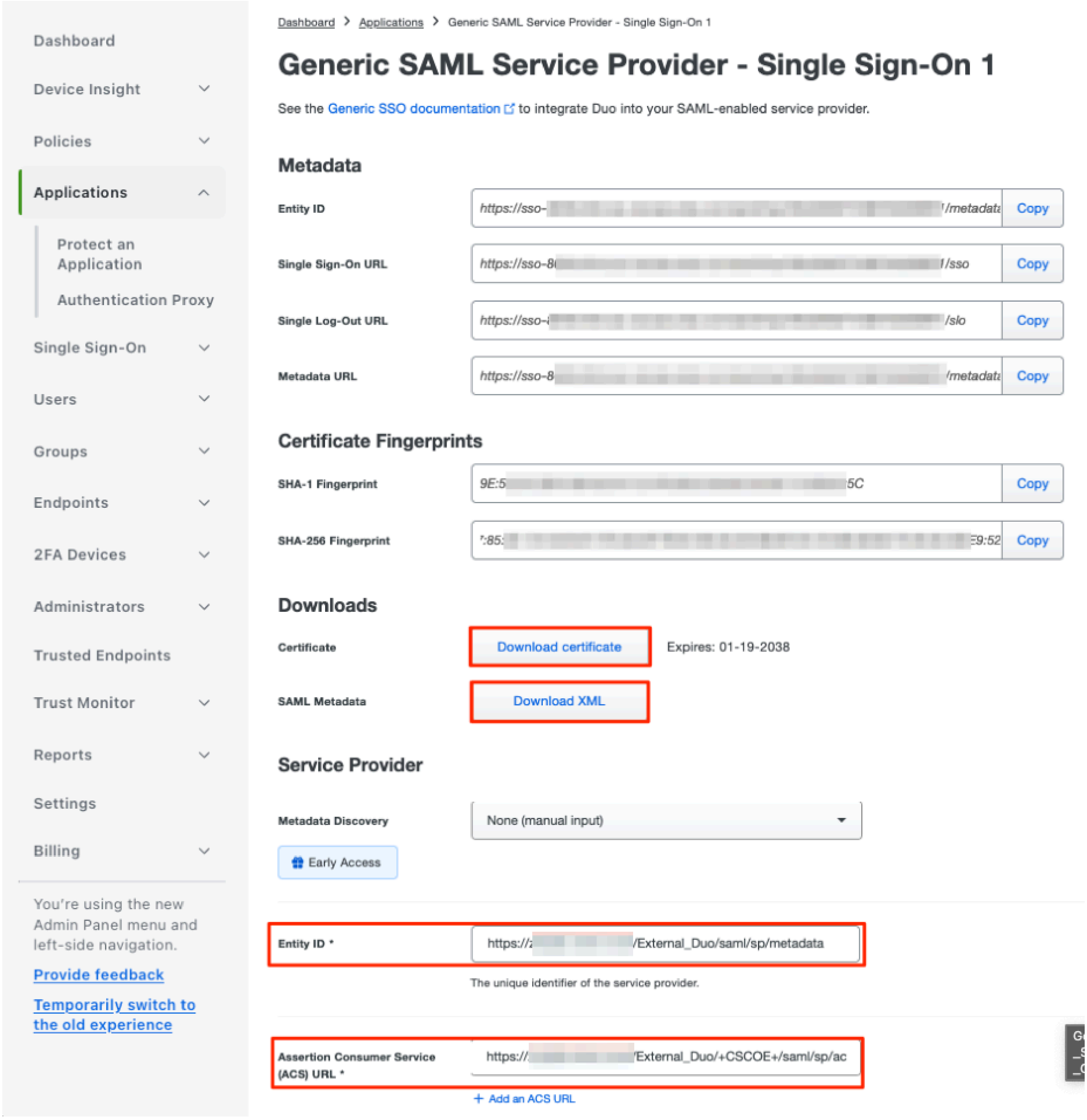
Protect an Application

generic

Application	Protection Type		
Auth API	2FA	Documentation	Protect
Generic OIDC Relying Party	2FA with SSO hosted by Duo (Single Sign-On)	Documentation	Protect
Generic SAML Service Provider	2FA with SSO hosted by Duo (Single Sign-On)	Documentation	Protect

e. Download the Certificate and SAML Metadata from the IdP as it is required to continue the configuration on Secure Firewall.

f. Enter the **Entity ID** and **Assertion Consumer Service (ACS) URL** from the ZTNA Application Group (generated in **step a**).



Dashboard > Applications > Generic SAML Service Provider - Single Sign-On 1

Generic SAML Service Provider - Single Sign-On 1

See the Generic SSO documentation to integrate Duo into your SAML-enabled service provider.

Metadata

Entity ID	https://sso-[redacted]/metadata	Copy
Single Sign-On URL	https://sso-8[redacted]/sso	Copy
Single Log-Out URL	https://sso-[redacted]/slo	Copy
Metadata URL	https://sso-8[redacted]/metadata	Copy

Certificate Fingerprints

SHA-1 Fingerprint	9E:5[redacted]5C	Copy
SHA-256 Fingerprint	:85:[redacted]E9:52	Copy

Downloads

Certificate	Download certificate	Expires: 01-19-2038
SAML Metadata	Download XML	

Service Provider

Metadata Discovery: None (manual input)

Early Access

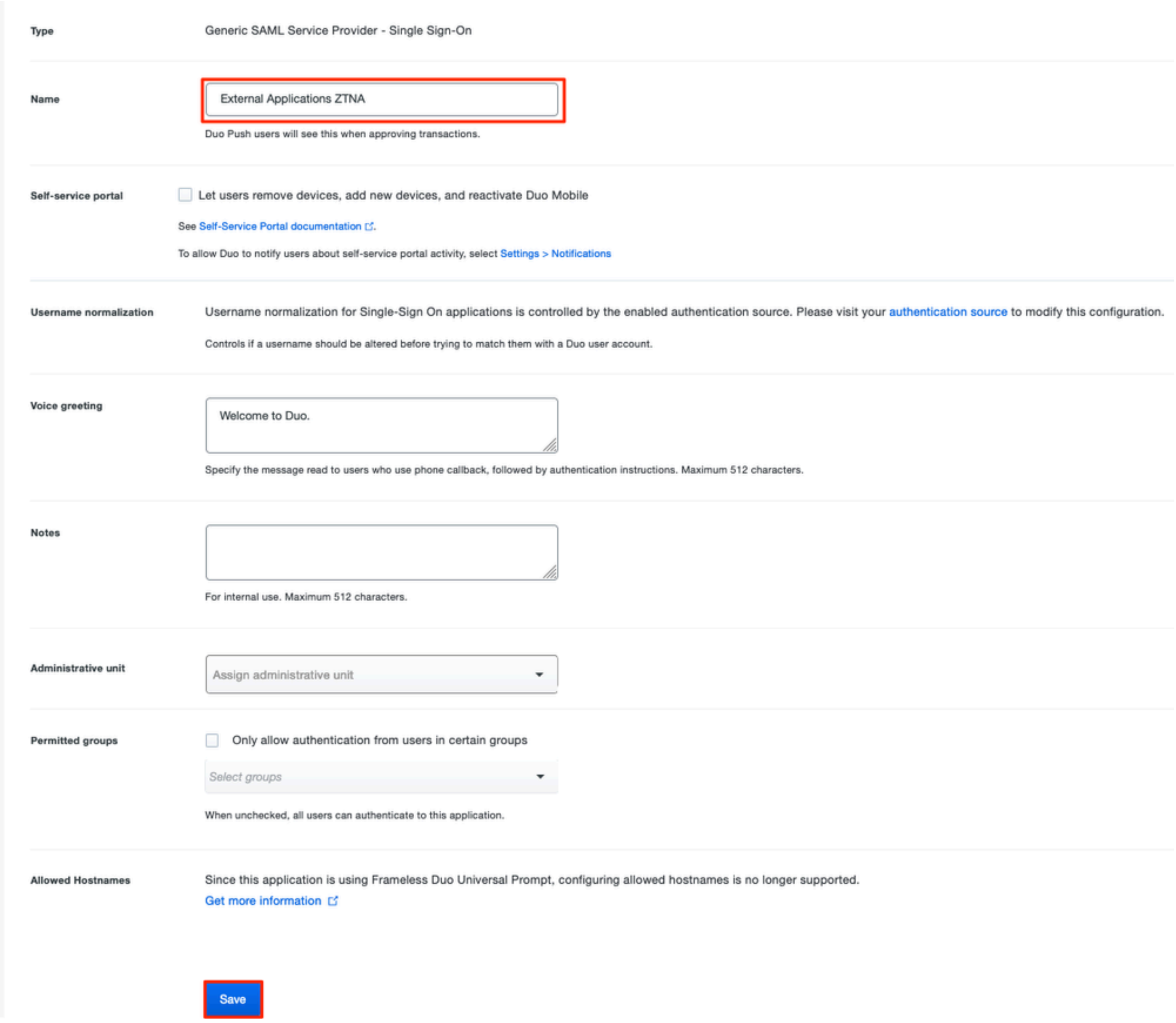
Entity ID *: https://[redacted]/External_Duo/saml/sp/metadata

The unique identifier of the service provider.

Assertion Consumer Service (ACS) URL *: https://[redacted]External_Duo/+CSCOE+/saml/sp/ac

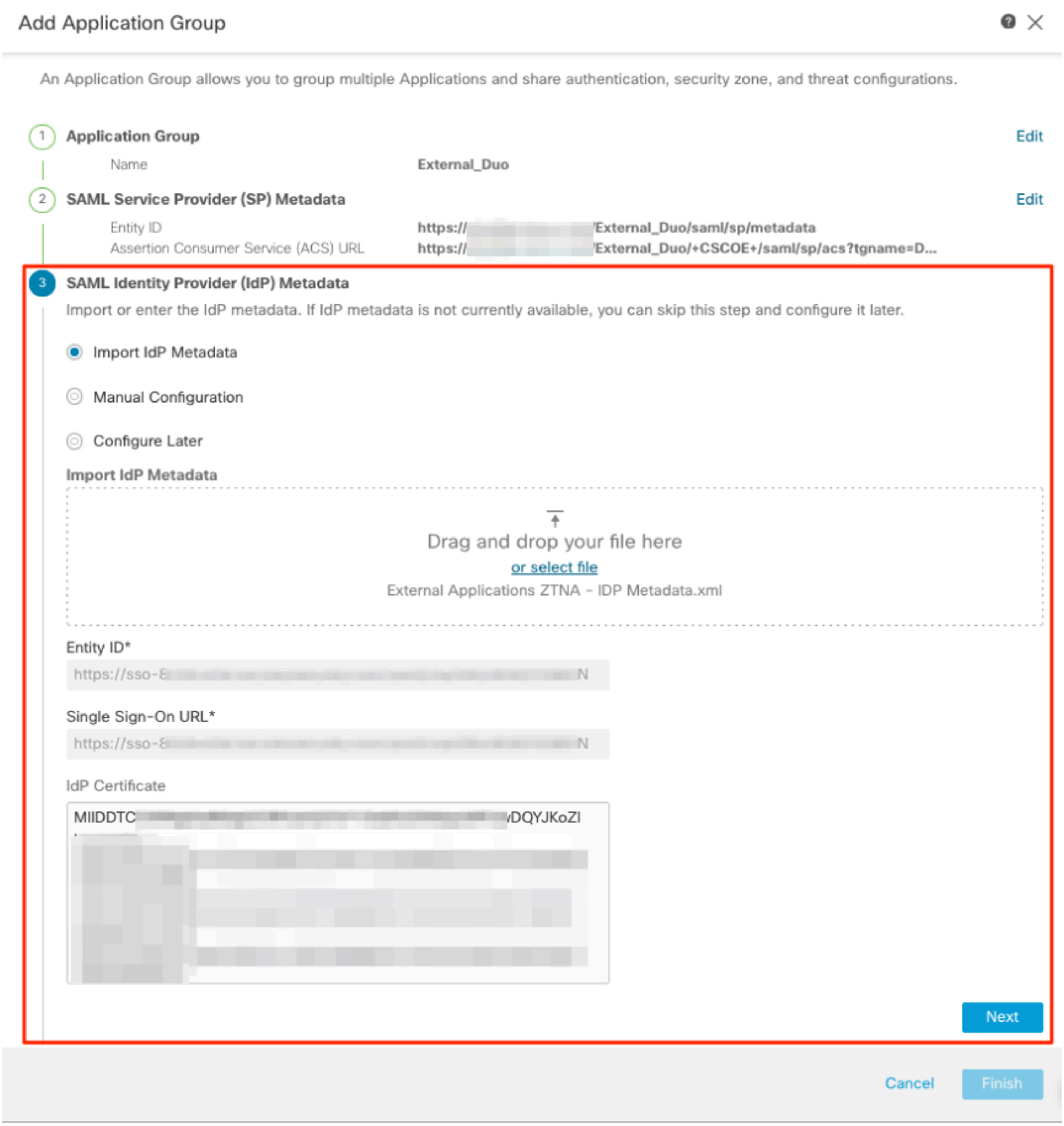
+ Add an ACS URL

g. Edit the application in accordance to your specific requirements and allow access to the application only to the intended users and click **Save**.



Type	Generic SAML Service Provider - Single Sign-On
Name	External Applications ZTNA Duo Push users will see this when approving transactions.
Self-service portal	□ Let users remove devices, add new devices, and reactivate Duo Mobile See Self-Service Portal documentation. To allow Duo to notify users about self-service portal activity, select Settings > Notifications
Username normalization	Username normalization for Single-Sign On applications is controlled by the enabled authentication source. Please visit your authentication source to modify this configuration. Controls if a username should be altered before trying to match them with a Duo user account.
Voice greeting	Welcome to Duo. Specify the message read to users who use phone callback, followed by authentication instructions. Maximum 512 characters.
Notes	For internal use. Maximum 512 characters.
Administrative unit	Assign administrative unit
Permitted groups	□ Only allow authentication from users in certain groups Select groups When unchecked, all users can authenticate to this application.
Allowed Hostnames	Since this application is using Frameless Duo Universal Prompt, configuring allowed hostnames is no longer supported. Get more information

h. Navigate back to the FMC and add the **SAML IdP Metadata** to the Application Group, using the files downloaded from the IdP.



Add Application Group

An Application Group allows you to group multiple Applications and share authentication, security zone, and threat configurations.

1 **Application Group** — Edit

Name: External_Duo

2 **SAML Service Provider (SP) Metadata** — Edit

Entity ID: https://[redacted]External_Duo/saml/sp/metadata

Assertion Consumer Service (ACS) URL: https://[redacted]External_Duo/+CSCOE+/saml/sp/acs?tgname=D...

3 **SAML Identity Provider (IdP) Metadata**

Import or enter the IdP metadata. If IdP metadata is not currently available, you can skip this step and configure it later.

● Import IdP Metadata

○ Manual Configuration

○ Configure Later

Import IdP Metadata

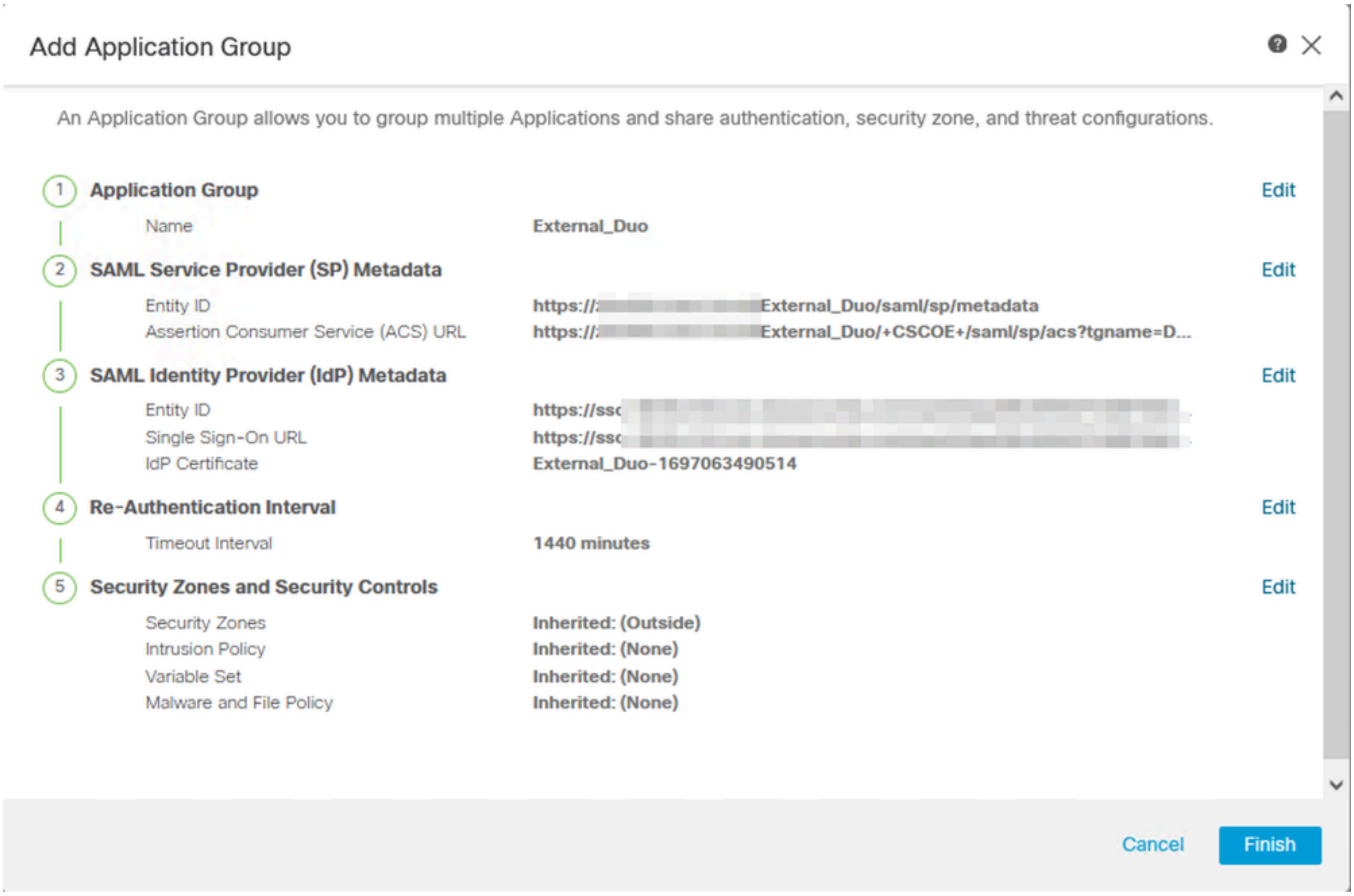
Drag and drop your file here
or select file
External Applications ZTNA - IDP Metadata.xml

Entity ID*: https://sso-8[redacted]N

Single Sign-On URL*: https://sso-8[redacted]N

IdP Certificate: MIIDDTC[redacted]DQYJKoZI [redacted]

i. Click **Next** and configure the **Re-Authentication Interval** and **Security Controls** as per your requirements. Review the summary configuration and click **Finish**.



Add Application Group

An Application Group allows you to group multiple Applications and share authentication, security zone, and threat configurations.

1 **Application Group** Edit

Name	External_Duo

2 **SAML Service Provider (SP) Metadata** Edit

Entity ID	https://[redacted]External_Duo/saml/sp/metadata
Assertion Consumer Service (ACS) URL	https://[redacted]External_Duo/+CSCOE+/saml/sp/acs?tgname=D...

3 **SAML Identity Provider (IdP) Metadata** Edit

Entity ID	https://ssc[redacted]
Single Sign-On URL	https://ssc[redacted]
IdP Certificate	External_Duo-1697063490514

4 **Re-Authentication Interval** Edit

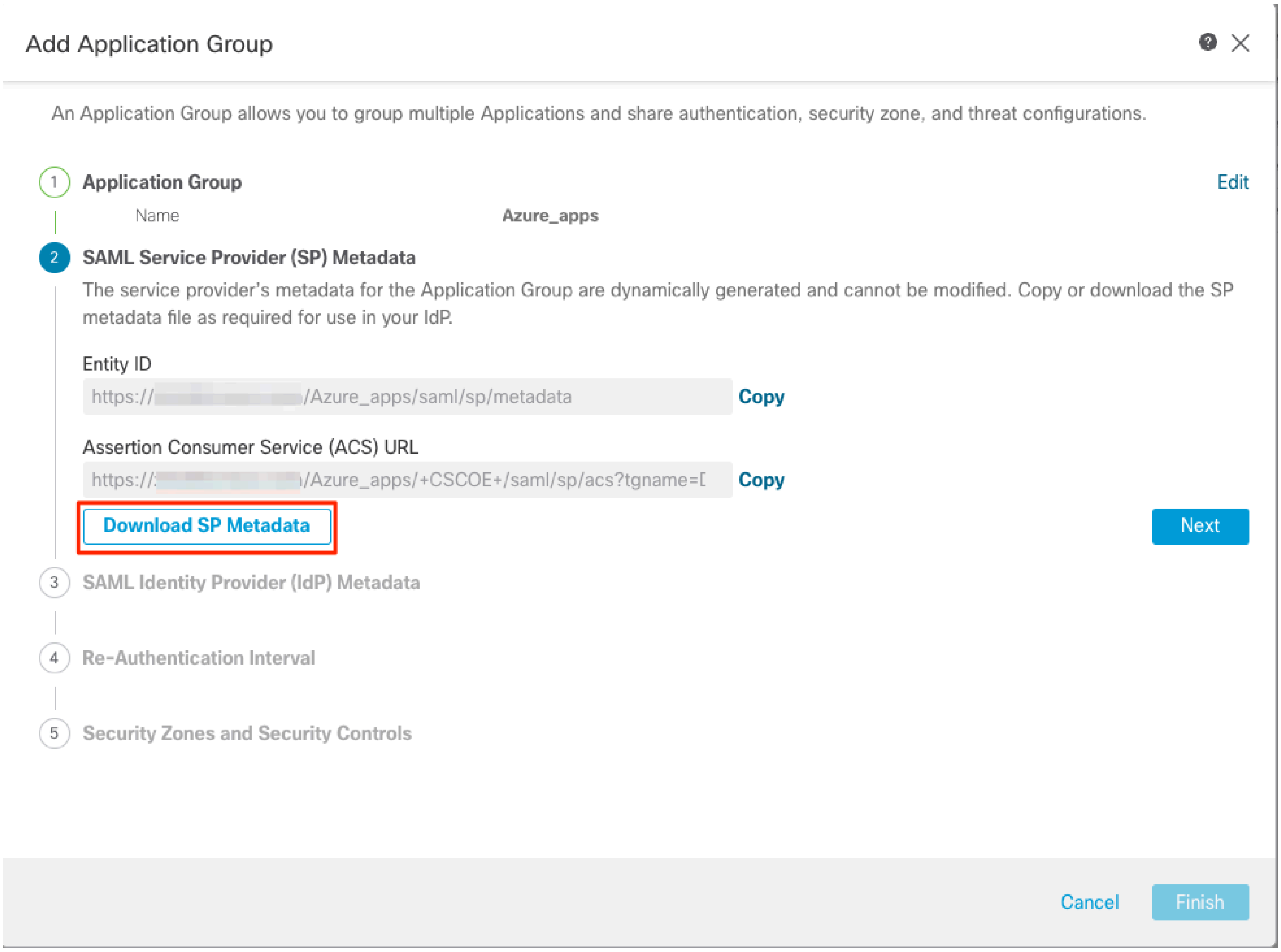
Timeout Interval	1440 minutes

5 **Security Zones and Security Controls** Edit

Security Zones	Inherited: (Outside)
Intrusion Policy	Inherited: (None)
Variable Set	Inherited: (None)
Malware and File Policy	Inherited: (None)

Application Group 2: Using Microsoft Entra ID (Azure AD) as IdP

a. Enter the **Application Group Name** and click **Next** for the SAML Service Provider (SP) Metadata to be displayed.



Add Application Group

An Application Group allows you to group multiple Applications and share authentication, security zone, and threat configurations.

1 Application Group — Edit

Name: Azure_apps

2 SAML Service Provider (SP) Metadata

The service provider's metadata for the Application Group are dynamically generated and cannot be modified. Copy or download the SP metadata file as required for use in your IdP.

Entity ID: https://[redacted]/Azure_apps/saml/sp/metadata — Copy

Assertion Consumer Service (ACS) URL: https://[redacted]/Azure_apps/+CSCOE+/saml/sp/acs?tgname=[— Copy

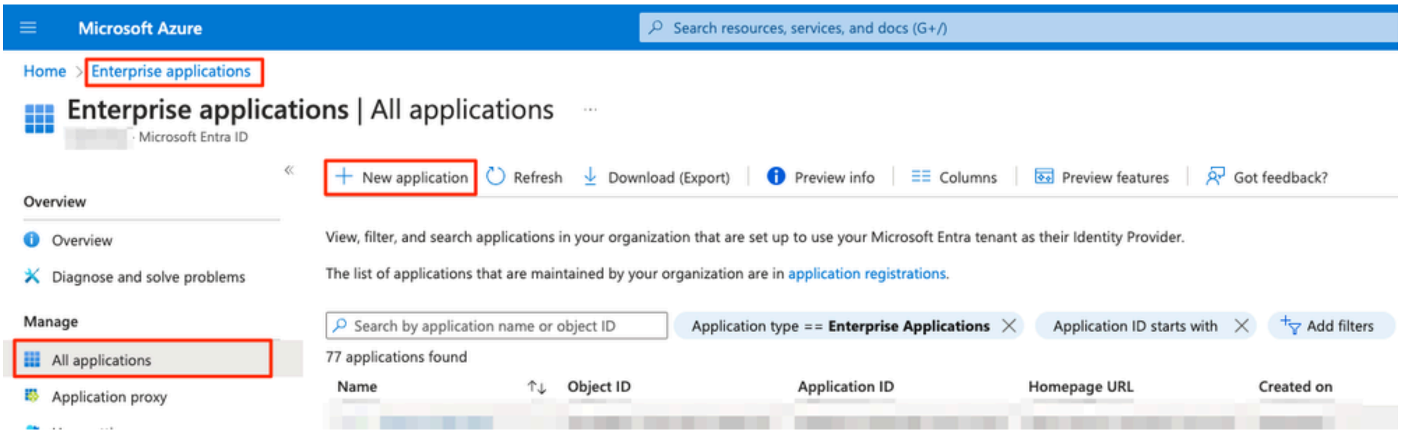
3 SAML Identity Provider (IdP) Metadata

4 Re-Authentication Interval

5 Security Zones and Security Controls

b. Once the SAML SP Metadata is displayed, go to the IdP and configure a new SAML SSO application.

c. Log in to **Microsoft Azure** and navigate to **Enterprise applications > New Application**.



Microsoft Azure
Search resources, services, and docs (G+/)
Home > Enterprise applications

Enterprise applications | All applications

[redacted] · Microsoft Entra ID

Overview
Overview
Diagnose and solve problems
Manage
All applications
Application proxy
New application
Refresh
Download (Export)
Preview info
Columns
Preview features
Got feedback?

View, filter, and search applications in your organization that are set up to use your Microsoft Entra tenant as their Identity Provider.

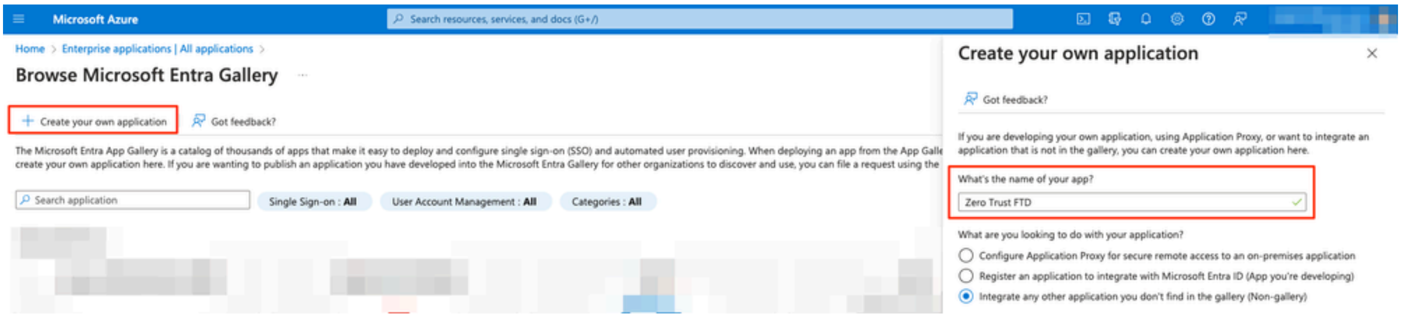
The list of applications that are maintained by your organization are in application registrations.

Search by application name or object ID
Application type == Enterprise Applications
Application ID starts with
Add filters

77 applications found

Name	Object ID	Application ID	Homepage URL	Created on
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

d. Click on **Create your own application > Enter the name of the application > Create**



Microsoft Azure

Search resources, services, and docs (G+/)

Home > Enterprise applications | All applications >

Browse Microsoft Entra Gallery ...

+ Create your own application   Got feedback?

The Microsoft Entra App Gallery is a catalog of thousands of apps that make it easy to deploy and configure single sign-on (SSO) and automated user provisioning. When deploying an app from the App Galle
create your own application here. If you are wanting to publish an application you have developed into the Microsoft Entra Gallery for other organizations to discover and use, you can file a request using the

Search application   Single Sign-on : **All**   User Account Management : **All**   Categories : **All**

[redacted]

Create your own application ×

Got feedback?

If you are developing your own application, using Application Proxy, or want to integrate an application that is not in the gallery, you can create your own application here.

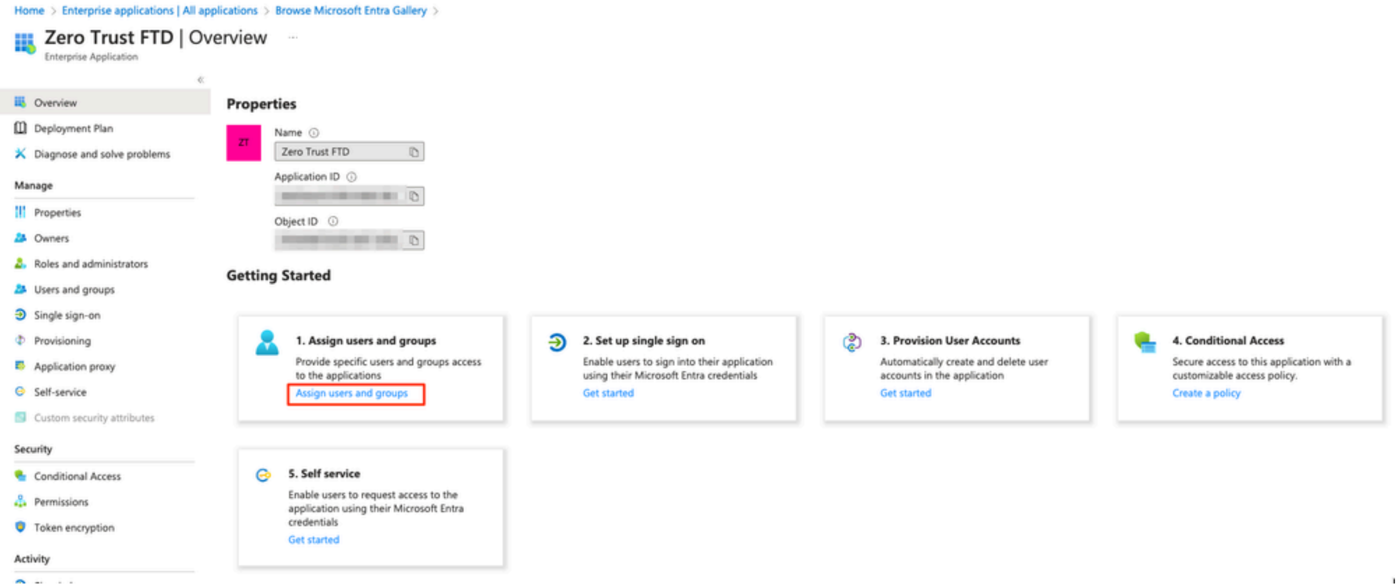
What's the name of your app?

Zero Trust FTD ✓

What are you looking to do with your application?

○ Configure Application Proxy for secure remote access to an on-premises application
○ Register an application to integrate with Microsoft Entra ID (App you're developing)
● Integrate any other application you don't find in the gallery (Non-gallery)

e. Open the application and click on **Assign users and groups** to define the users and/or groups that are allowed to access the application.



Home > Enterprise applications | All applications > Browse Microsoft Entra Gallery >

Zero Trust FTD | Overview ...

Enterprise Application

Properties

ZT

Name: Zero Trust FTD

Application ID: [redacted]

Object ID: [redacted]

Getting Started

1. Assign users and groups
Provide specific users and groups access to the applications
Assign users and groups

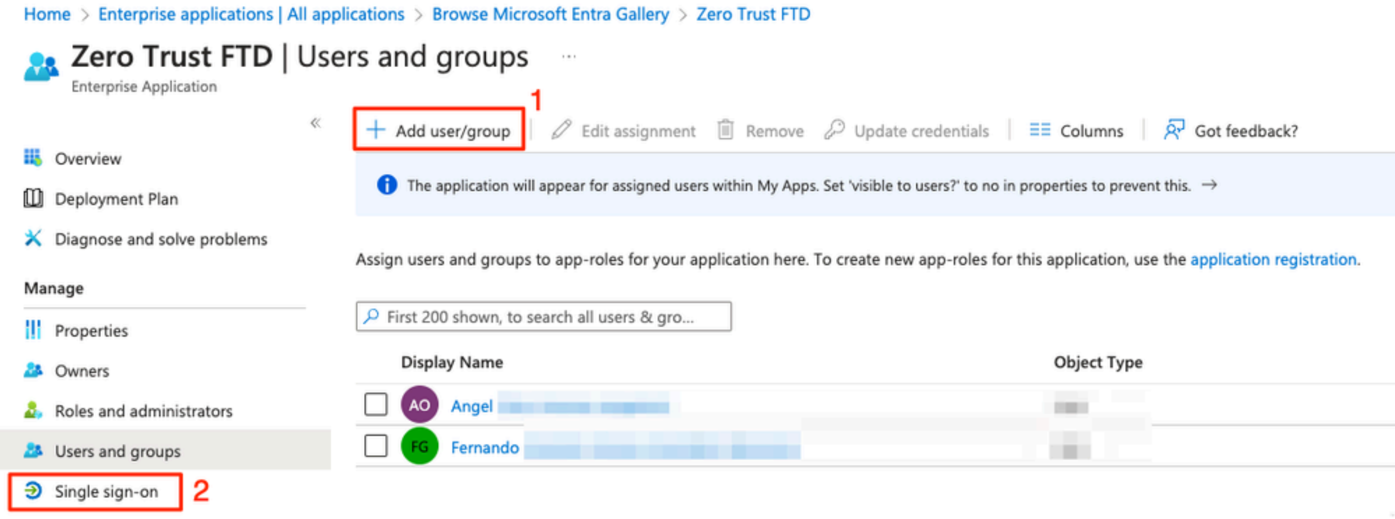
2. Set up single sign on
Enable users to sign into their application using their Microsoft Entra credentials
Get started

3. Provision User Accounts
Automatically create and delete user accounts in the application
Get started

4. Conditional Access
Secure access to this application with a customizable access policy.
Create a policy

5. Self service
Enable users to request access to the application using their Microsoft Entra credentials
Get started

f. Click on **Add user/group > Select the necessary users/groups > Assign**. Once the correct users/groups have been assigned, click on **Single sign-on.**



Home > Enterprise applications | All applications > Browse Microsoft Entra Gallery > Zero Trust FTD

Zero Trust FTD | Users and groups ...

Enterprise Application

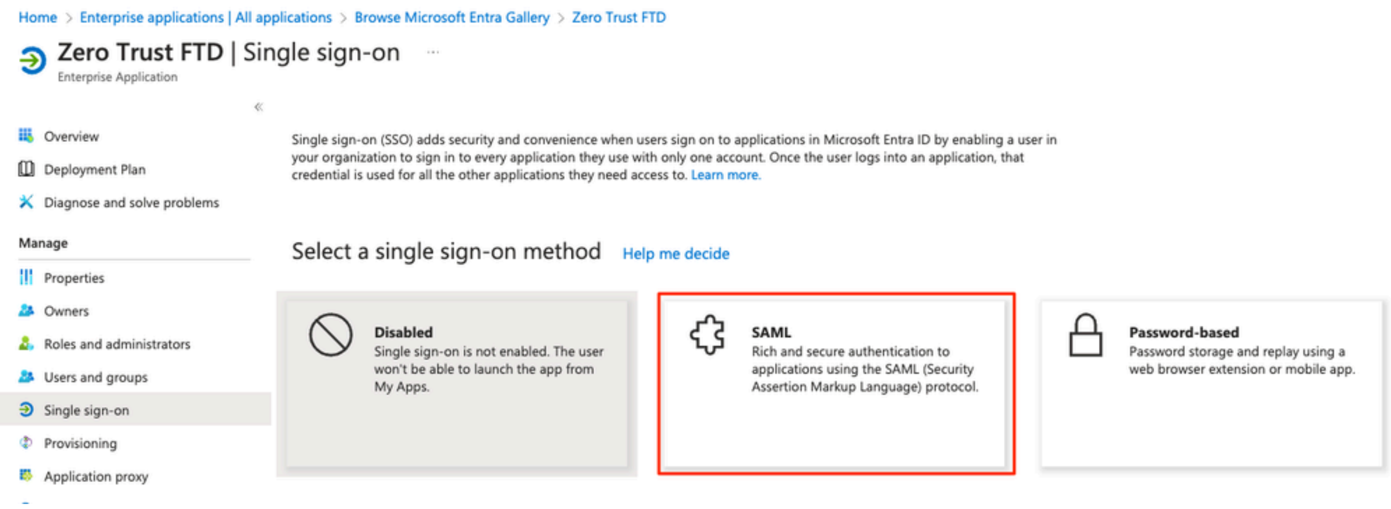
The application will appear for assigned users within My Apps. Set 'visible to users?' to no in properties to prevent this. →

Assign users and groups to app-roles for your application here. To create new app-roles for this application, use the application registration.

First 200 shown, to search all users & gro...

	Display Name	Object Type
□	AO Angel [redacted]	[redacted]
□	FG Fernando [redacted]	[redacted]

g. Once in the **Single sign-on** section, click on **SAML**.



Single sign-on (SSO) adds security and convenience when users sign on to applications in Microsoft Entra ID by enabling a user in your organization to sign in to every application they use with only one account. Once the user logs into an application, that credential is used for all the other applications they need access to. Learn more.

Select a single sign-on method

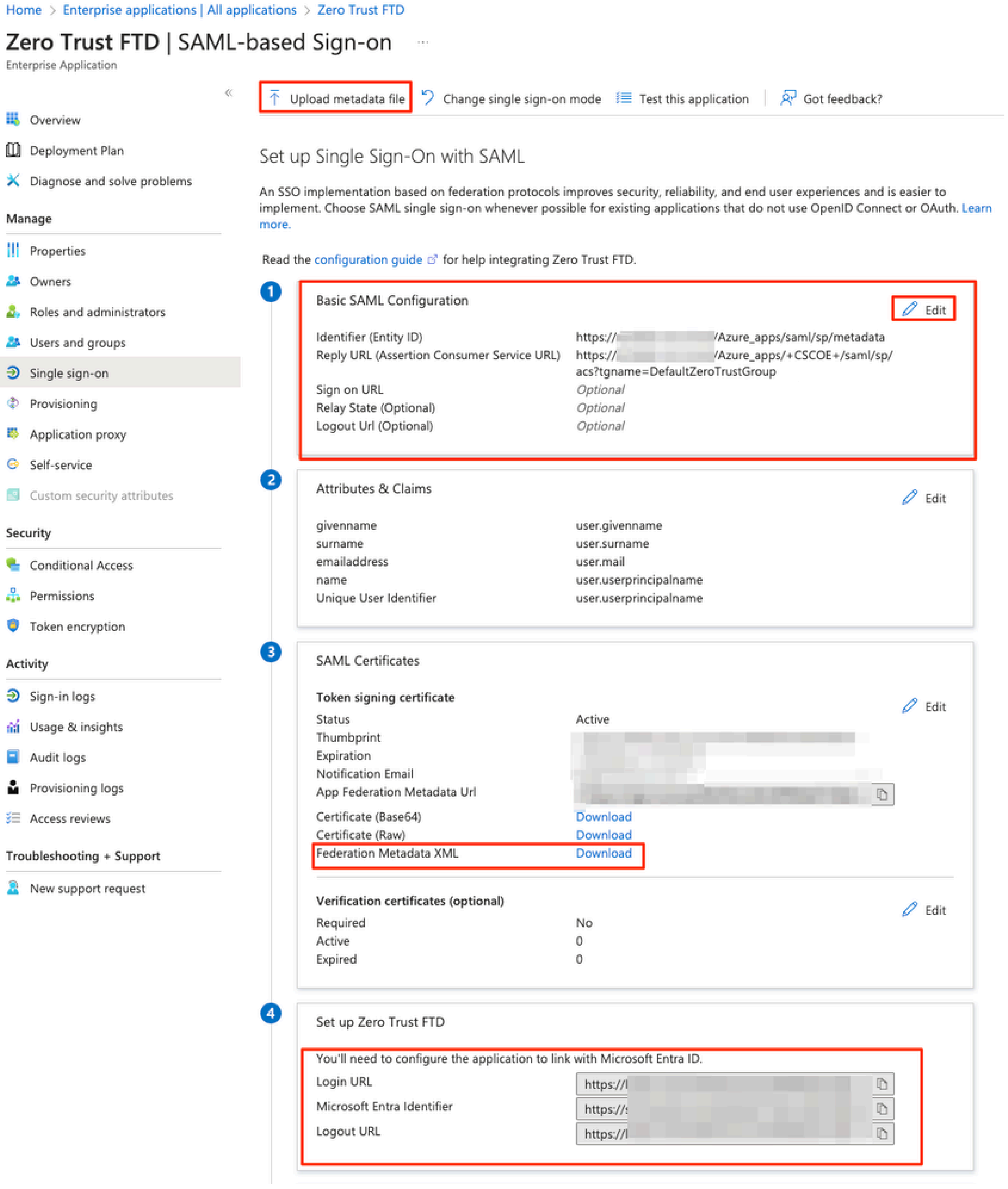
Disabled: Single sign-on is not enabled. The user won't be able to launch the app from My Apps.

SAML: Rich and secure authentication to applications using the SAML (Security Assertion Markup Language) protocol.

Password-based: Password storage and replay using a web browser extension or mobile app.

h. Click on **Upload metadata file** and select the XML file downloaded from the Service Provider (Secure Firewall) or manually enter the **Entity ID** and **Assertion Consumer Service (ACS) URL** from the ZTNA Application Group (generated in **step a**).

Note: Ensure to also download the Federation Metadata XML or individually download the the Certificate (base 64) and copy the SAML Metadata from the IdP (Login & Logout URLs and Microsoft Entra Identifiers) as these are required to continue the configuration on the Secure Firewall.



Zero Trust FTD | SAML-based Sign-on

Enterprise Application

Set up Single Sign-On with SAML

An SSO implementation based on federation protocols improves security, reliability, and end user experiences and is easier to implement. Choose SAML single sign-on whenever possible for existing applications that do not use OpenID Connect or OAuth. Learn more.

Read the configuration guide for help integrating Zero Trust FTD.

1 Basic SAML Configuration — Edit

Identifier (Entity ID)	https://[redacted]/Azure_apps/saml/sp/metadata
Reply URL (Assertion Consumer Service URL)	https://[redacted]/Azure_apps/+CSCOE+/saml/sp/acs?tgname=DefaultZeroTrustGroup
Sign on URL	*Optional*
Relay State (Optional)	*Optional*
Logout Url (Optional)	*Optional*

2 Attributes & Claims — Edit

givenname	user.givenname
surname	user.surname
emailaddress	user.mail
name	user.userprincipalname
Unique User Identifier	user.userprincipalname

3 SAML Certificates

Token signing certificate — Edit

Status	Active
Thumbprint	[redacted]
Expiration	[redacted]
Notification Email	[redacted]
App Federation Metadata Url	[redacted]
Certificate (Base64)	Download
Certificate (Raw)	Download
Federation Metadata XML	Download

Verification certificates (optional) — Edit

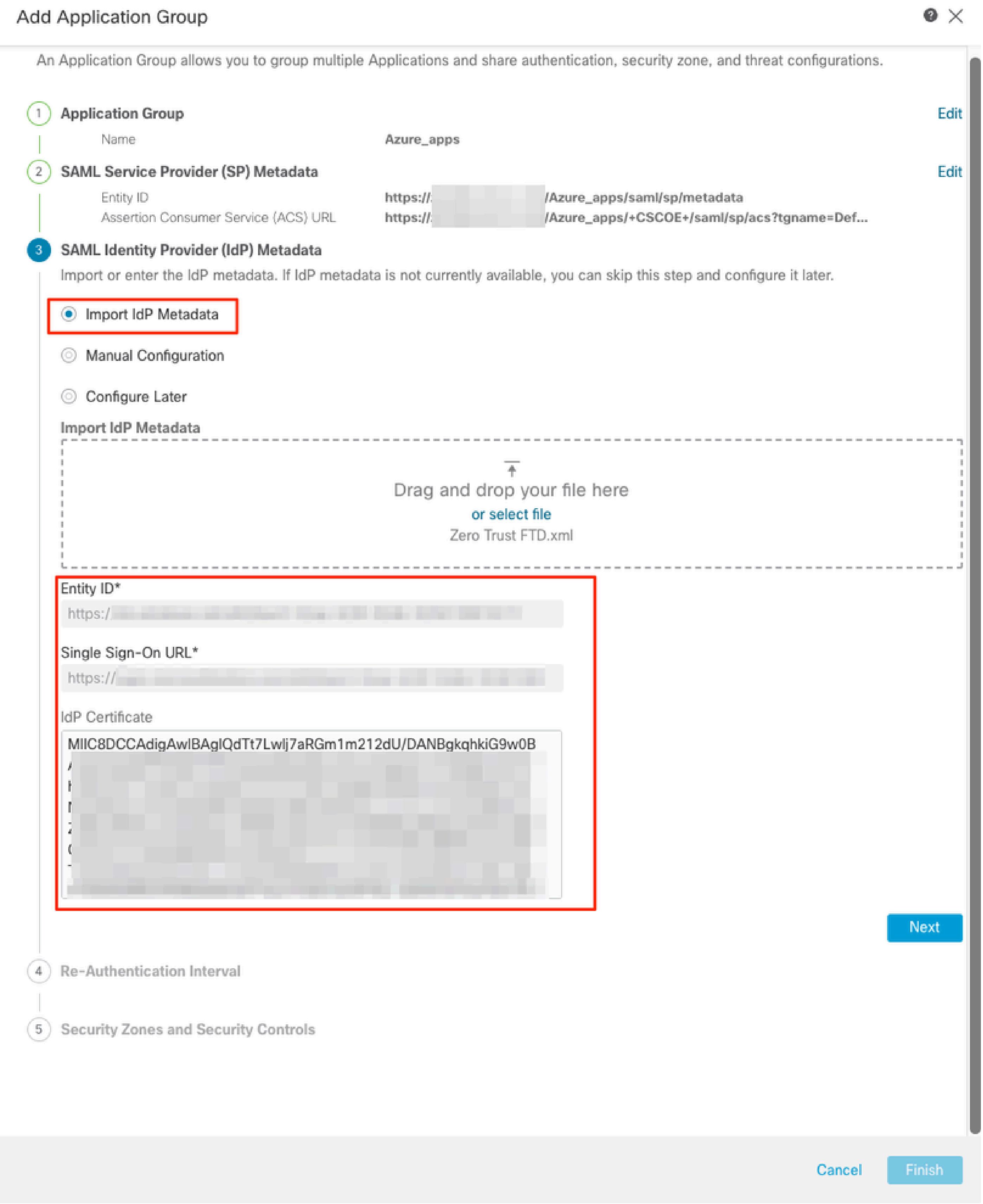
Required	No
Active	0
Expired	0

4 Set up Zero Trust FTD

You'll need to configure the application to link with Microsoft Entra ID.

Login URL	https://[redacted]
Microsoft Entra Identifier	https://[redacted]
Logout URL	https://[redacted]

i. Navigate back to the FMC and import the **SAML IdP Metadata** to the Application Group 2, using the metadata file downloaded from the IdP or manually enter the required data.



Add Application Group

An Application Group allows you to group multiple Applications and share authentication, security zone, and threat configurations.

1 **Application Group** Edit

Name Azure_apps

2 **SAML Service Provider (SP) Metadata** Edit

Entity ID https://[redacted]/Azure_apps/saml/sp/metadata

Assertion Consumer Service (ACS) URL https://[redacted]/Azure_apps/+CSCOE+/saml/sp/acs?tgname=Def...

3 **SAML Identity Provider (IdP) Metadata**

Import or enter the IdP metadata. If IdP metadata is not currently available, you can skip this step and configure it later.

● Import IdP Metadata

○ Manual Configuration

○ Configure Later

Import IdP Metadata

Drag and drop your file here
or select file
Zero Trust FTD.xml

Entity ID*
https:/[redacted]

Single Sign-On URL*
https://[redacted]

IdP Certificate
MIIC8DCCAdigAwIBAgIQdTt7Lwlj7aRGm1m212dU/DANBgkqhkiG9w0B
[redacted]

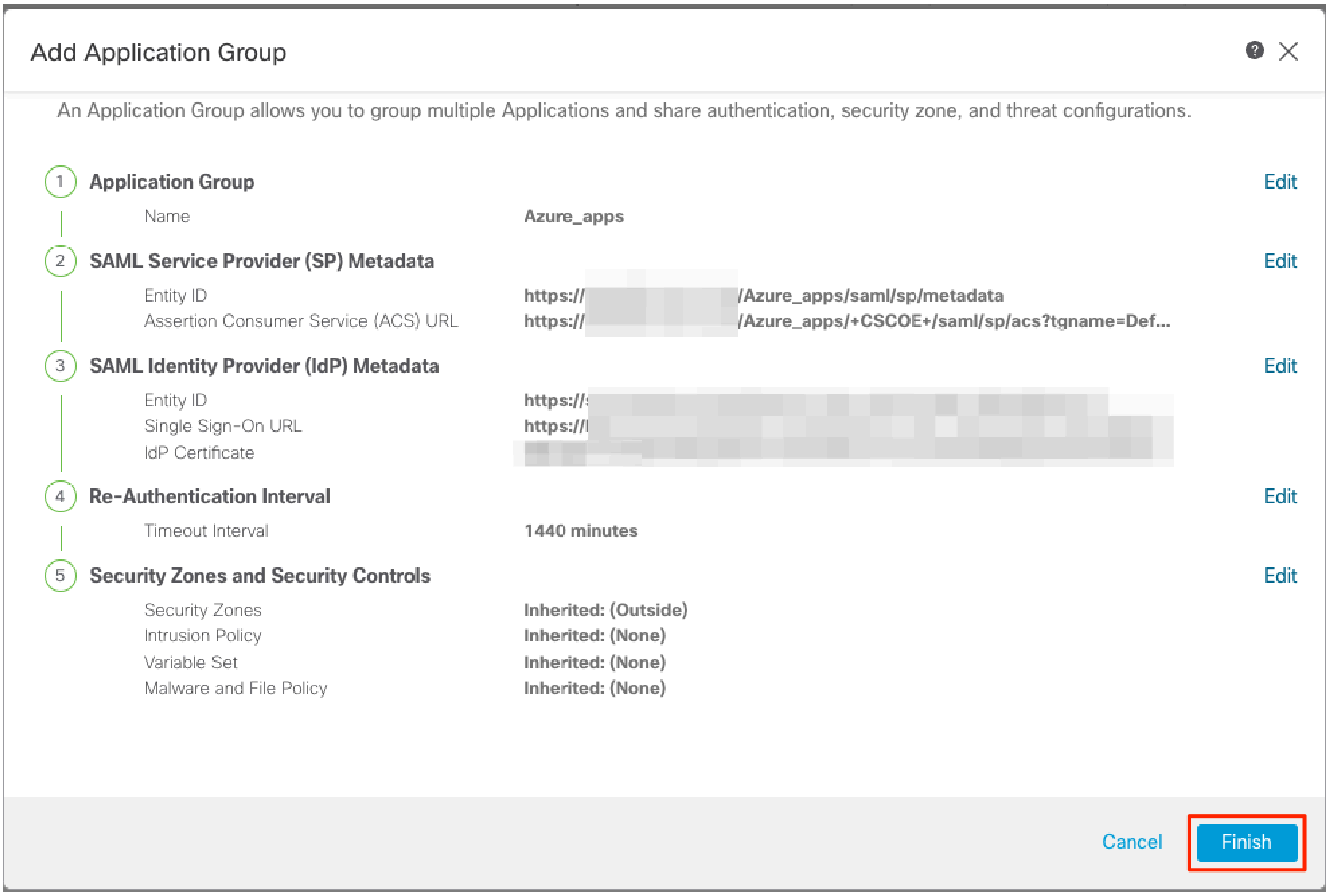
Next

4 Re-Authentication Interval

5 Security Zones and Security Controls

Cancel Finish

j. Click **Next** and configure the **Re-Authentication Interval** and **Security Controls** as per your requirements. Review the summary configuration and click **Finish**.



Add Application Group

An Application Group allows you to group multiple Applications and share authentication, security zone, and threat configurations.

1 **Application Group**

Name: **Azure_apps**

2 **SAML Service Provider (SP) Metadata**

Entity ID: **https://[redacted]/Azure_apps/saml/sp/metadata**

Assertion Consumer Service (ACS) URL: **https://[redacted]/Azure_apps/+CSCOE+/saml/sp/acs?tgname=Def...**

3 **SAML Identity Provider (IdP) Metadata**

Entity ID: **https://[redacted]**

Single Sign-On URL: **https://[redacted]**

IdP Certificate: [redacted]

4 **Re-Authentication Interval**

Timeout Interval: **1440 minutes**

5 **Security Zones and Security Controls**

Security Zones: **Inherited: (Outside)**

Intrusion Policy: **Inherited: (None)**

Variable Set: **Inherited: (None)**

Malware and File Policy: **Inherited: (None)**

Configure Applications

Now that the Application Groups have been created, click **Add Application** to define the applications to be protected and accessed remotely.

1. Enter the Application Settings:

a) **Application Name:** Identifier for the configured application.

b) **External URL:** Published URL of the application in the public/external DNS records. This is the URL used by users to access the application remotely.

c) **Application URL:** Real FQDN or Network IP of the application. This is the URL used by Secure Firewall to reach the application.

> **Note**: By default, the External URL is used as Application URL. Uncheck the checkbox to specify a different Application URL.

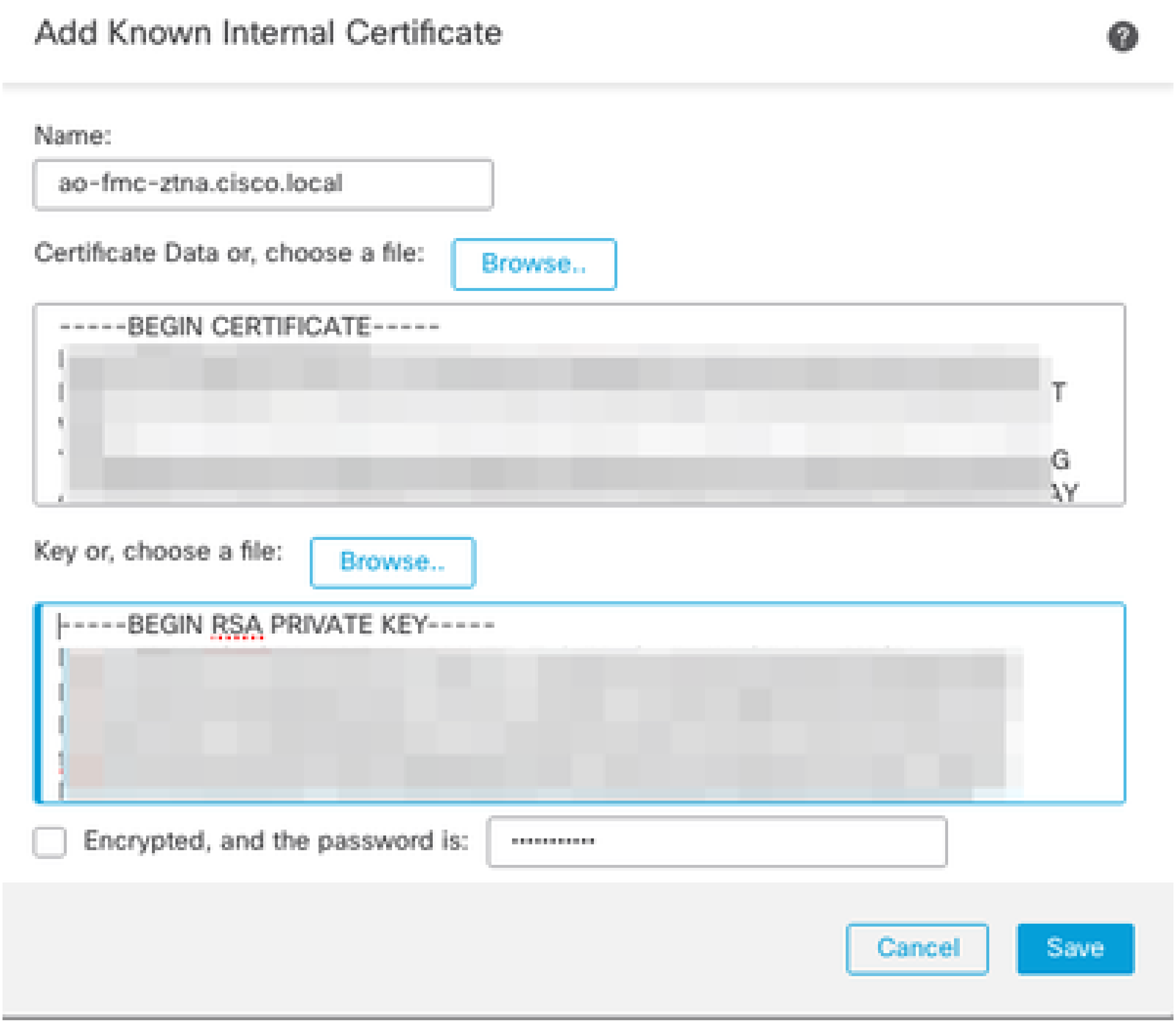
d) **Application Certificate:** the certificate chain and private key of the application to be accessed (Added from **FMC Home Page** > **Objects** > **Object Management** > **PKI** > **Internal certs**)

e) **IPv4 NAT Source (optional):** The source IP address from the remote user is translated to the selected addresses before forwarding the packets to the application (only Host and Range type network objects/object-groups having IPv4 addresses are supported). This can be configured to ensure that the applications have a route back to the remote users through the Secure Firewall

f) **Application Group (optional):** Select if this Application is added to an existing Application Group to use the settings configured for it.

In this example, the applications to be accessed using ZTNA are a test FMC Web UI and the Web UI of a CTB located behind the Secure Firewall.

The certificates of the Applications must be added in **Objects** > **Object Management** > **PKI** > **Internal certs**:



Add Known Internal Certificate

Name: ao-fmc-ztna.cisco.local

Certificate Data or, choose a file:

```
-----BEGIN CERTIFICATE-----
[redacted]
```

Key or, choose a file:

```
-----BEGIN RSA PRIVATE KEY-----
[redacted]
```

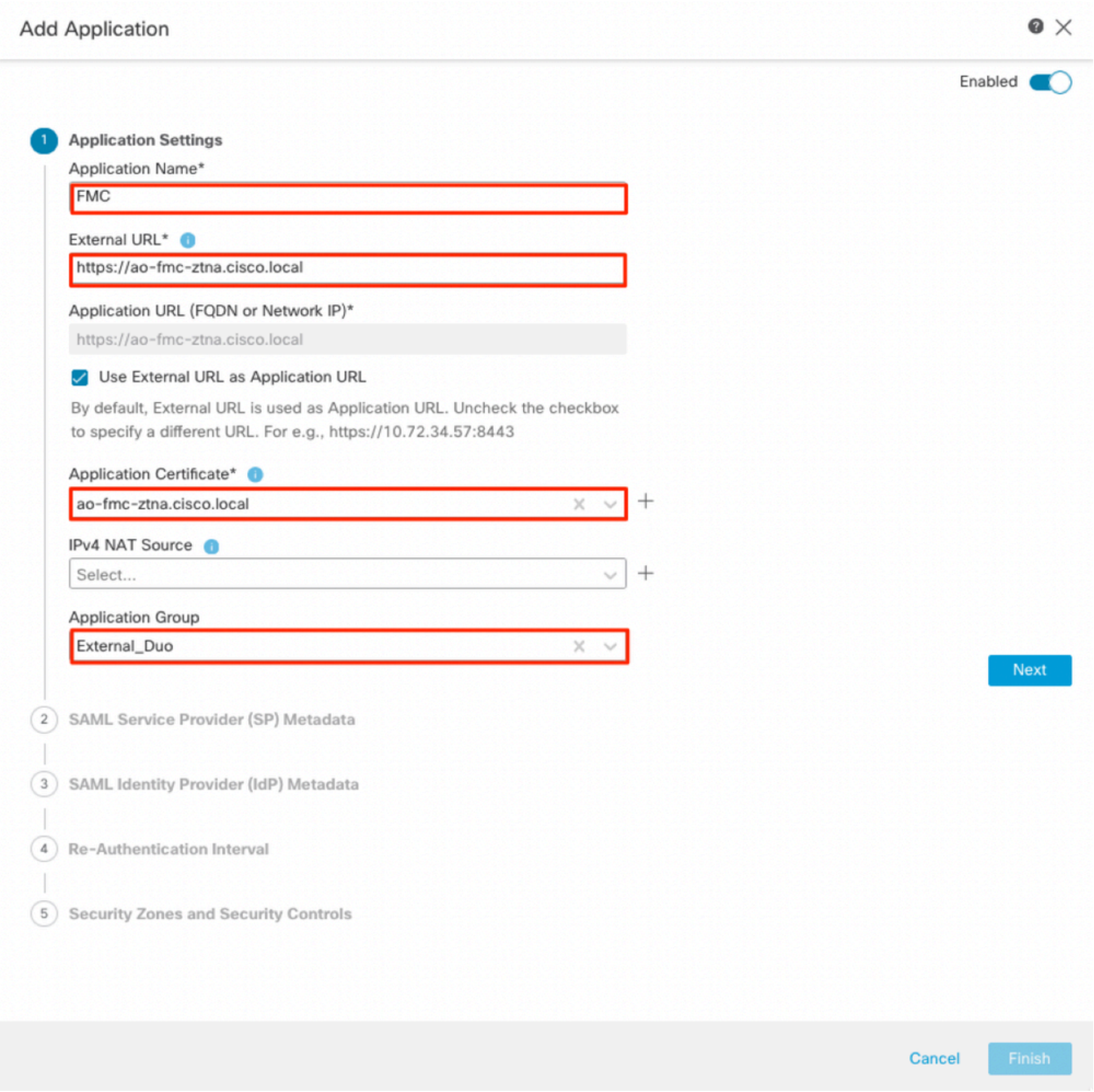
□ Encrypted, and the password is: ••••••••••

Note: Ensure to add all the certificates for each application to be accessed with ZTNA.

Once the certificates have been added as **Internal Certs**, continue to configure the remaining settings.

The Application settings configured for this example are:

Application 1: Test FMC Web UI (Member of the Application Group 1)



Add Application

Enabled

1 Application Settings

Application Name*

FMC

External URL*

https://ao-fmc-ztna.cisco.local

Application URL (FQDN or Network IP)*

https://ao-fmc-ztna.cisco.local

☑ Use External URL as Application URL

By default, External URL is used as Application URL. Uncheck the checkbox to specify a different URL. For e.g., https://10.72.34.57:8443

Application Certificate*

ao-fmc-ztna.cisco.local

IPv4 NAT Source

Select...

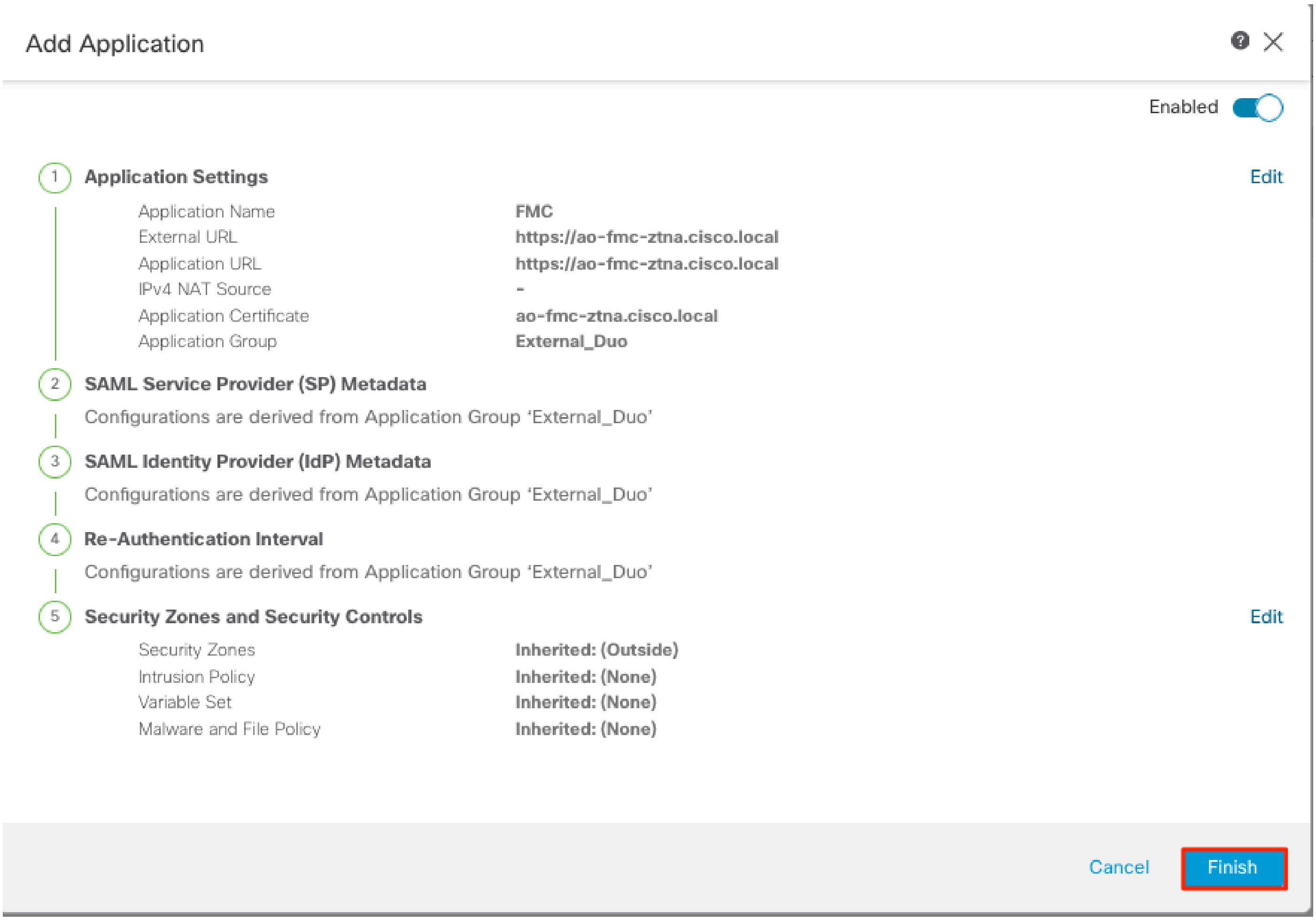
Application Group

External_Duo

Next
2 SAML Service Provider (SP) Metadata
3 SAML Identity Provider (IdP) Metadata
4 Re-Authentication Interval
5 Security Zones and Security Controls
Cancel
Finish

As the Application was added to the Application Group 1, the remaining settings are inherited for this application. You can still override the Security Zones and Security Controls with different settings.

Review the configured Application and click **Finish**.



Add Application

Enabled

1 Application Settings

Edit

Application Name	FMC
External URL	https://ao-fmc-ztna.cisco.local
Application URL	https://ao-fmc-ztna.cisco.local
IPv4 NAT Source	-
Application Certificate	ao-fmc-ztna.cisco.local
Application Group	External_Duo

2 SAML Service Provider (SP) Metadata

Configurations are derived from Application Group 'External_Duo'

3 SAML Identity Provider (IdP) Metadata

Configurations are derived from Application Group 'External_Duo'

4 Re-Authentication Interval

Configurations are derived from Application Group 'External_Duo'

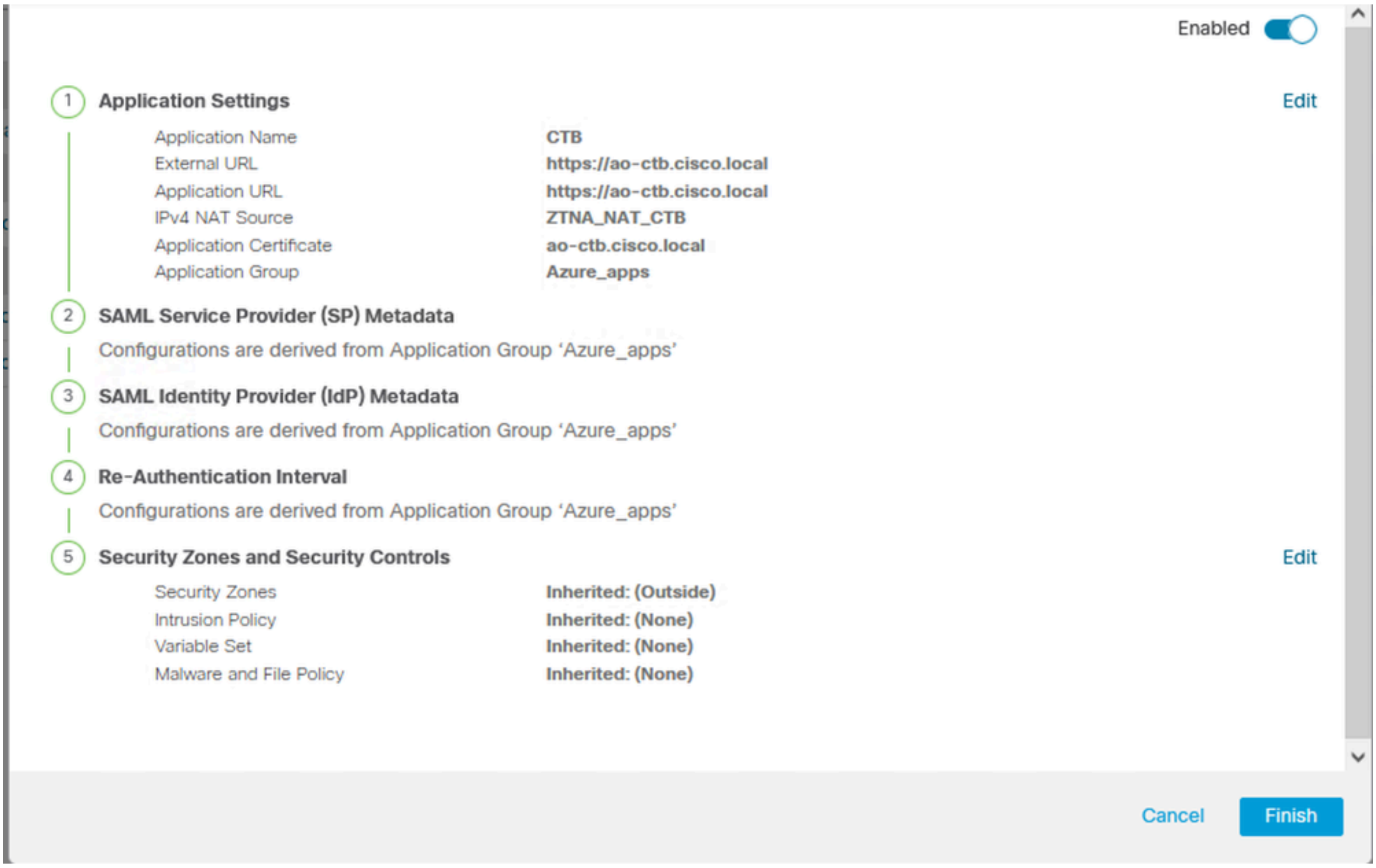
5 Security Zones and Security Controls

Edit

Security Zones	Inherited: (Outside)
Intrusion Policy	Inherited: (None)
Variable Set	Inherited: (None)
Malware and File Policy	Inherited: (None)

Application 2: CTB Web UI (Member of the Application Group 2)

The configuration summary for this application is the next:



Enabled

1 Application Settings — Edit

Application Name	CTB
External URL	https://ao-ctb.cisco.local
Application URL	https://ao-ctb.cisco.local
IPv4 NAT Source	ZTNA_NAT_CTB
Application Certificate	ao-ctb.cisco.local
Application Group	Azure_apps

2 SAML Service Provider (SP) Metadata

Configurations are derived from Application Group 'Azure_apps'

3 SAML Identity Provider (IdP) Metadata

Configurations are derived from Application Group 'Azure_apps'

4 Re-Authentication Interval

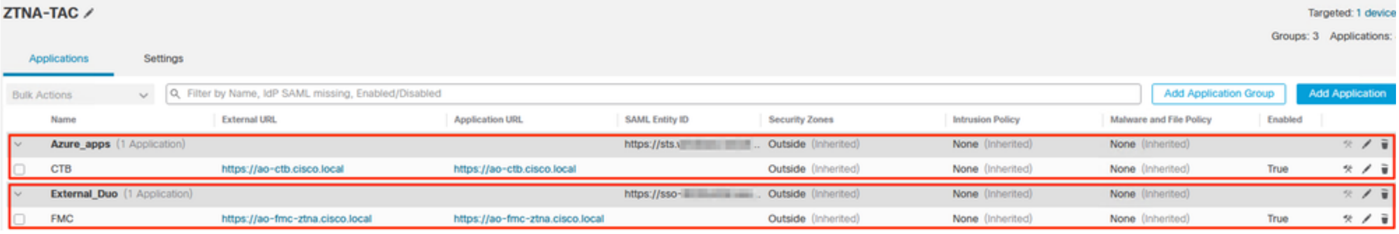
Configurations are derived from Application Group 'Azure_apps'

5 Security Zones and Security Controls — Edit

Security Zones	Inherited: (Outside)
Intrusion Policy	Inherited: (None)
Variable Set	Inherited: (None)
Malware and File Policy	Inherited: (None)

Note: Notice that for this application, a network object "ZTNA_NAT_CTB" was configured as IPv4 NAT Source. With this configuration, the source IP address from the remote users is translated to an IP address within the configured object before forwarding the packets to the application.
This was configured because the application (CTB) default route points to a gateway other than the Secure Firewall, therefore the return traffic was not sent to the remote users. With this NAT configuration, a static route was configured on the application for the subnet ZTNA_NAT_CTB to be reachable through the Secure Firewall.

After the applications have been configured, they are now displayed under the corresponding Application Group.



ZTNA-TAC

Targeted: 1 device

Groups: 3 Applications:

Name	External URL	Application URL	SAML Entity ID	Security Zones	Intrusion Policy	Malware and File Policy	Enabled
Azure_apps (1 Application)			https://sts.[redacted] ..	Outside (Inherited)	None (Inherited)	None (Inherited)	
CTB	https://ao-ctb.cisco.local	https://ao-ctb.cisco.local		Outside (Inherited)	None (Inherited)	None (Inherited)	True
External_Duo (1 Application)			https://sso-[redacted] ..	Outside (Inherited)	None (Inherited)	None (Inherited)	
FMC	https://ao-fmc-ztna.cisco.local	https://ao-fmc-ztna.cisco.local		Outside (Inherited)	None (Inherited)	None (Inherited)	True

Finally, save the changes and deploy the configuration.

Verify

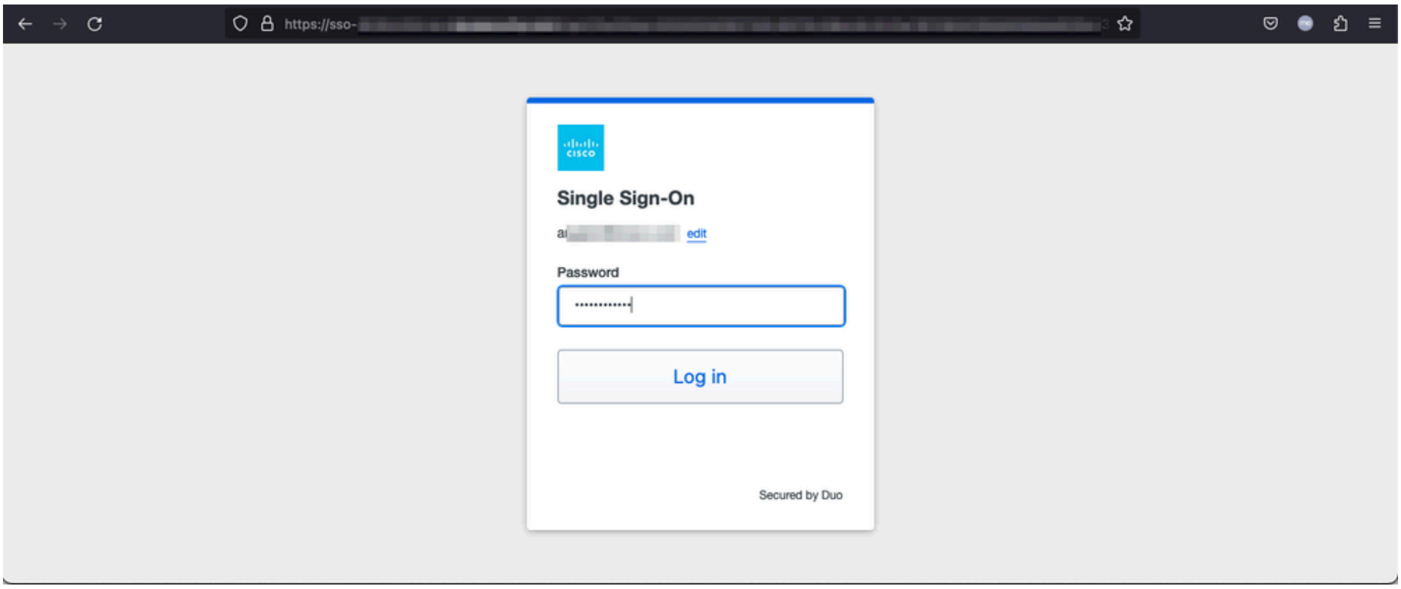
Once the configuration is in place, remote users can reach the applications through the external URL and if they are allowed by the corresponding IdP, have access to it.

Application 1

1. The user opens a web browser and navigates to the external URL of the application 1. In this case, the external URL is "https://ao-fmc-ztna.cisco.local/"

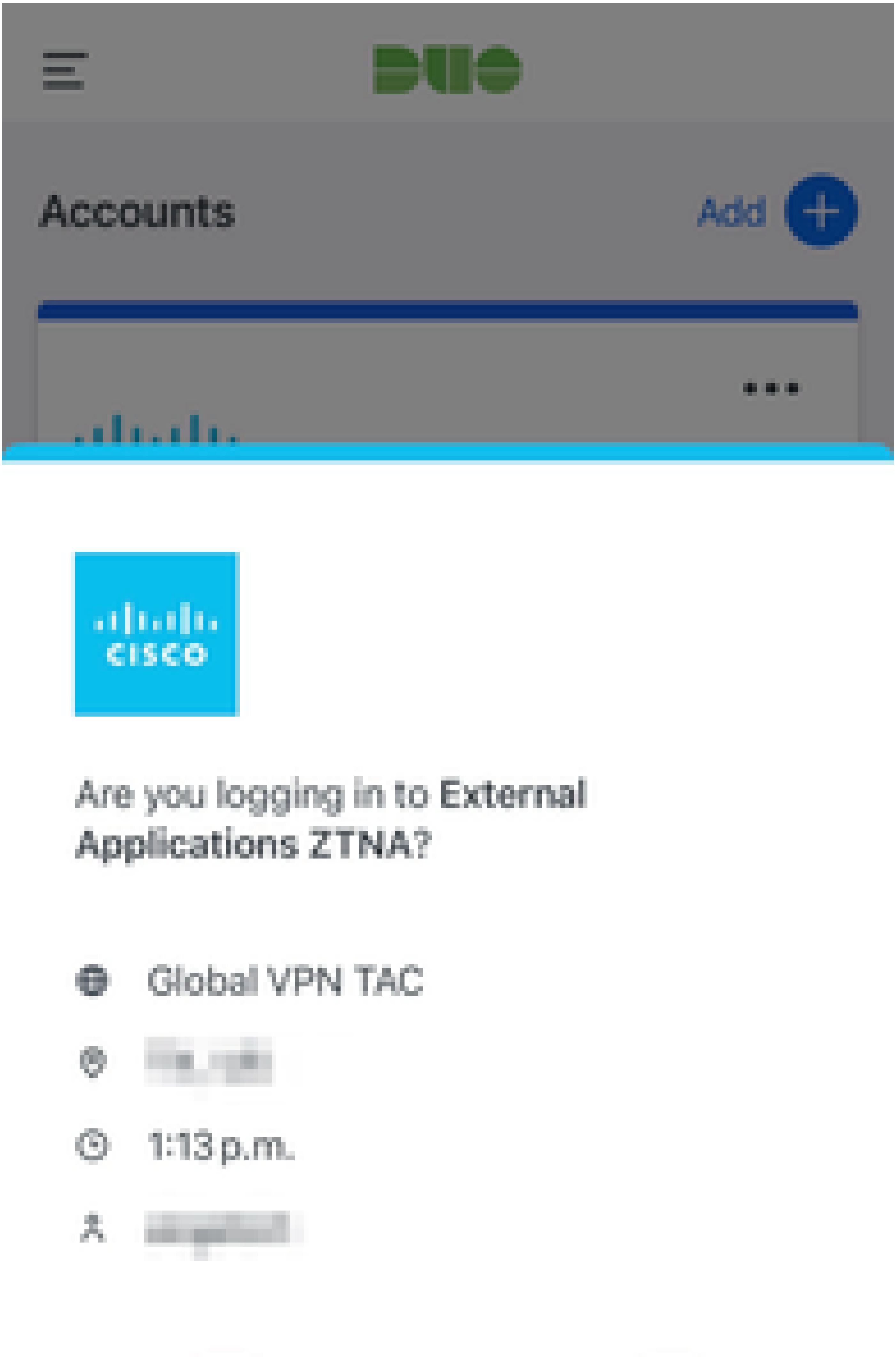
Note: The external URL name must resolve to the IP address of the Secure Firewall interface that was configured. In this example, it resolves to the Outside interface IP address (192.0.2.254)

2. As this is a new access, the user is redirected to the IdP login portal configured for the application.



https://sso-[redacted]

3. The user is sent a Push for MFA (this depends on the MFA method configured on the IdP).



Are you logging in to External Applications ZTNA?

Global VPN TAC

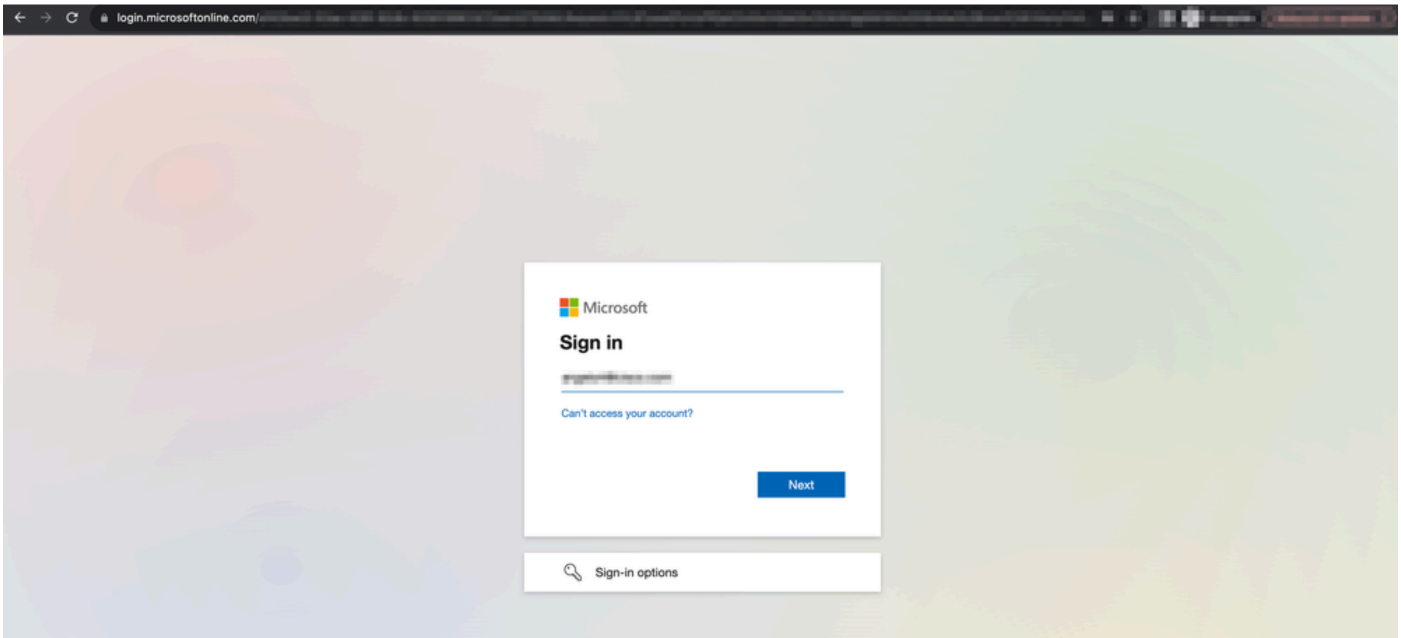
[redacted]

1:13 p.m.

[redacted]

: The external URL name must resolve to the IP address of the Secure Firewall interface that was configured. In this example, it resolves to the Outside interface IP address (192.0.2.254)

2. As this is a new access, the user is redirected to the IdP login portal configured for the application.



login.microsoftonline.com/[redacted]

Microsoft

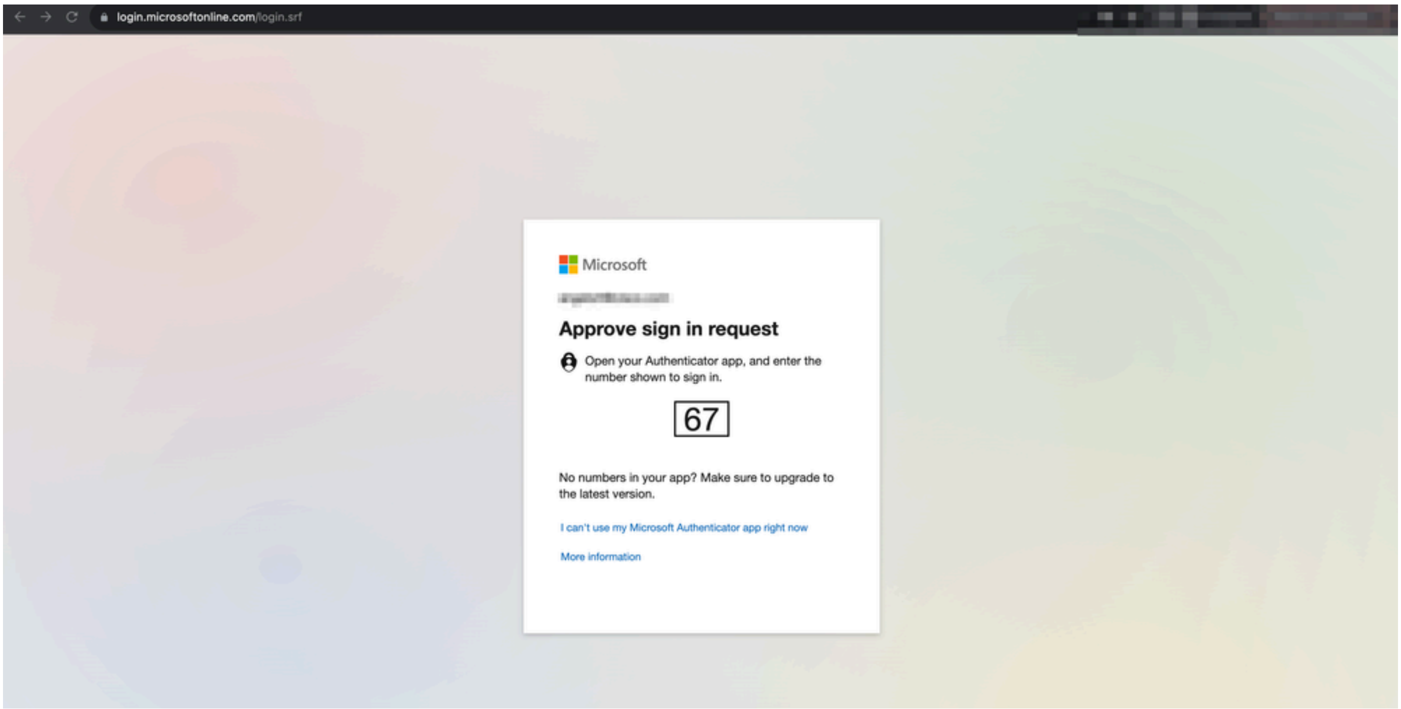
Sign in

[redacted]

Can't access your account?

Next

Sign-in options



login.microsoftonline.com/login.srf [redacted]

Microsoft

[redacted]

Approve sign in request

Open your Authenticator app, and enter the number shown to sign in.

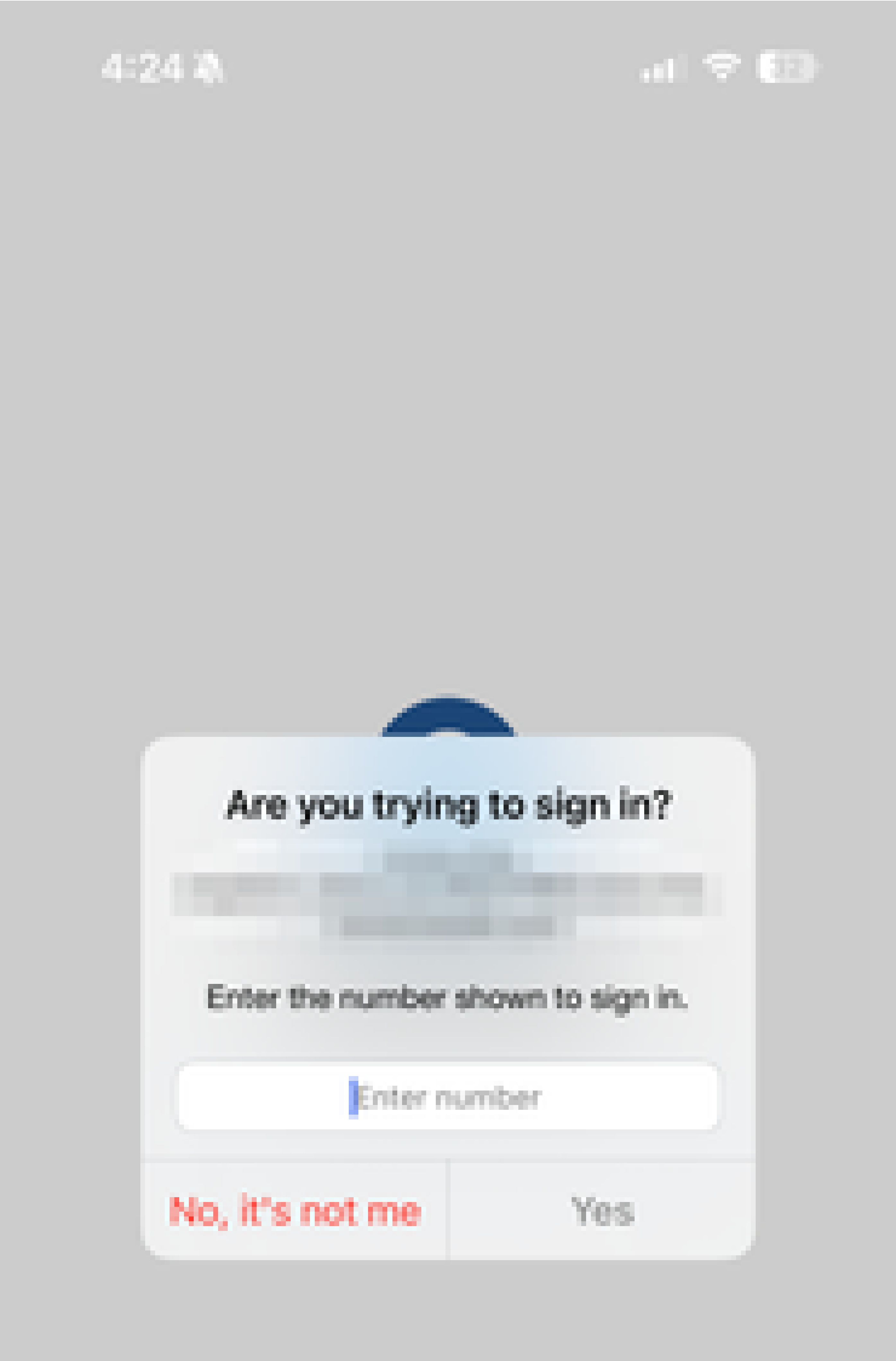
67

No numbers in your app? Make sure to upgrade to the latest version.

I can't use my Microsoft Authenticator app right now

More information

3. The user is sent a Push for MFA (this depends on the MFA method configured on the IdP).



Are you trying to sign in?

[redacted]

Enter the number shown to sign in.

- Diagnostics provide overall analysis (OK or not) and collects detailed logs that can be analysed to solve issues

Application-specific Diagnostics is used to detect:

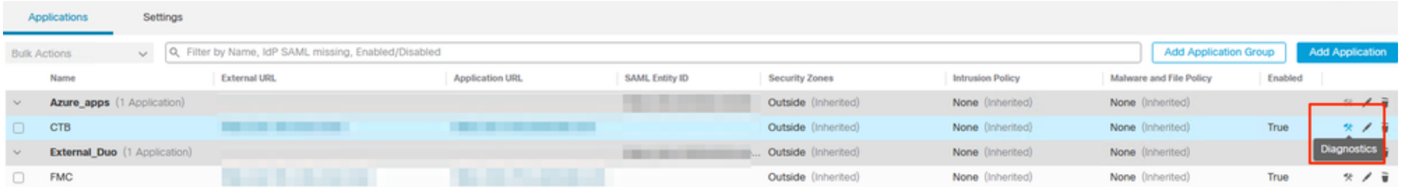
- DNS-related issues
- Misconfiguration, for example, socket not opened, classification rules, NAT rules
- Issues in Zero Trust Access Policy
- Interface-related issues, for example, interface not configured, or interface is down

Generic Diagnostics to detect:

- If a strong cipher license is not enabled
- If the application certificate is not valid
- If the authentication method is not initialised to SAML in the default tunnel group
- HA and cluster bulk sync issues
- Get insights from snort counters to diagnose issues, such as those related to tokens or decryption
- PAT pool exhaustion issue in source translation.

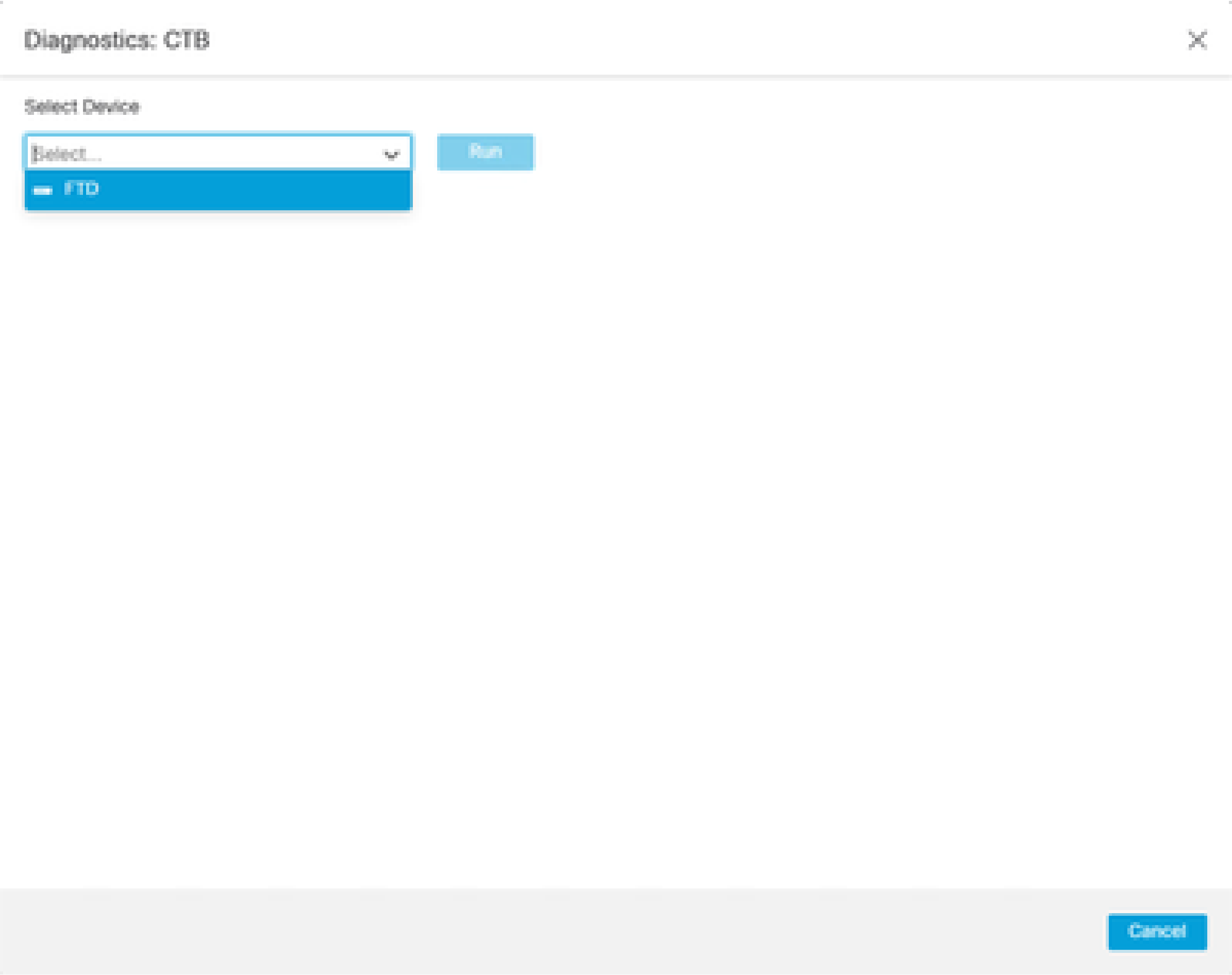
To run the diagnostics:

1. Navigate to the **diagnostics** icon present for each ZTNA Application.

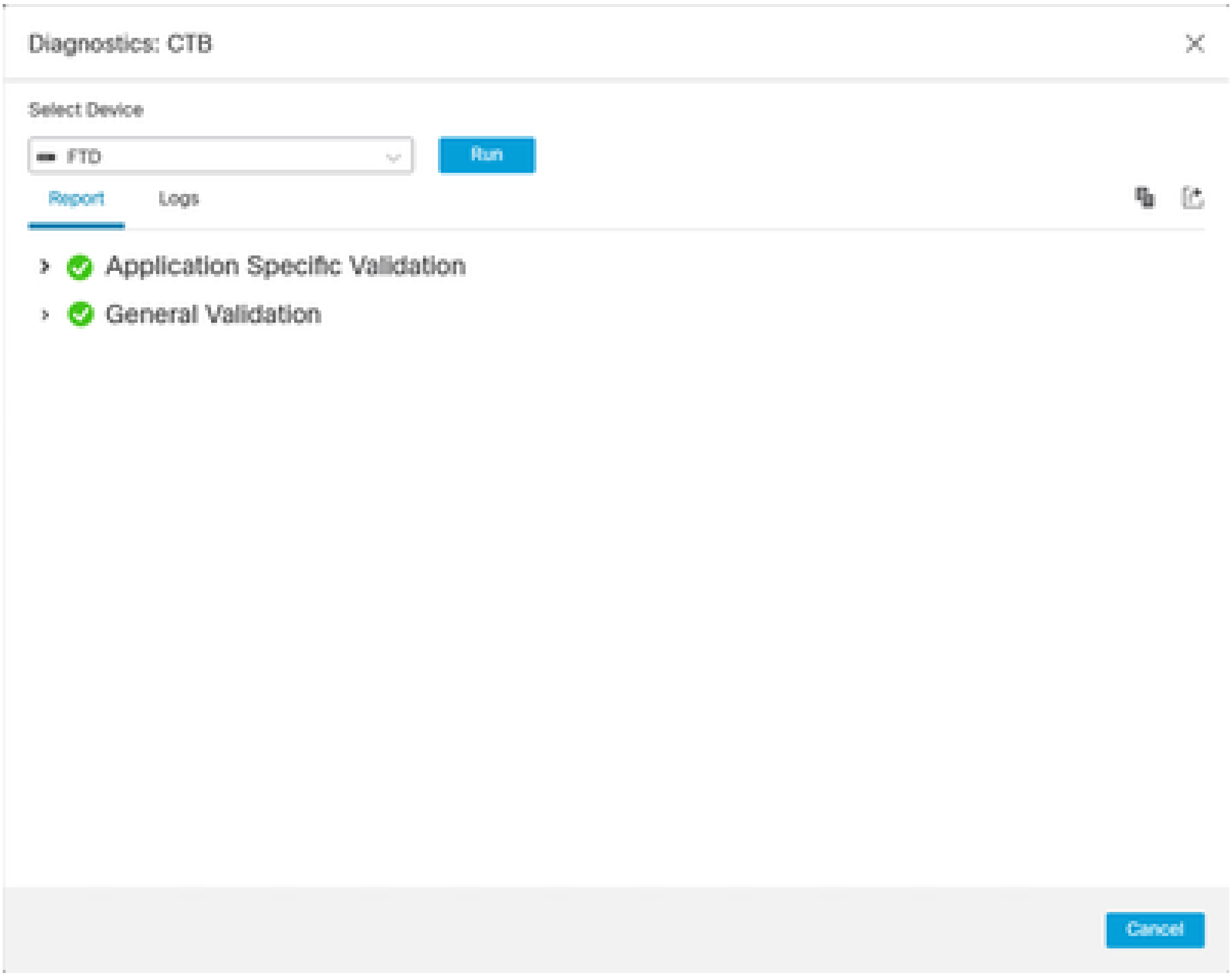


Name	External URL	Application URL	SAML Entity ID	Security Zones	Intrusion Policy	Malware and File Policy	Enabled
Azure_apps (1 Application)			[redacted]	Outside (Inherited)	None (Inherited)	None (Inherited)	
CTB	[redacted]	[redacted]		Outside (Inherited)	None (Inherited)	None (Inherited)	True
External_Duo (1 Application)			[redacted]	Outside (Inherited)	None (Inherited)	None (Inherited)	
FMC	[redacted]	[redacted]		Outside (Inherited)	None (Inherited)	None (Inherited)	True

2. Select a device and click **Run**.



3. View the results in the report.



✓ Application Specific Validation

✓ General Validation

Show and clear commands are available in FTD CLI to view the zero-trust configuration and display statistics and session information.

<#root>

```
firepower# show running-config zero-trust


application       Show application configuration information
application-group Show application group configuration
|                 Output modifiers
<cr>


firepower# show zero-trust


sessions   Show zero-trust sessions
statistics Show zero-trust statistics


firepower# show zero-trust sessions
```

```
application       show zero-trust sessions for application
application-group show zero-trust sessions for application group
count             show zero-trust sessions count
user              show zero-trust sessions for user
detail            show detailed info for the session
|                 Output modifiers
<cr>


firepower# clear zero-trust


sessions   Clear all zero-trust sessions
statistics Clear all zero-trust statistics


firepower# clear zero-trust sessions


application Clear zero-trust sessions for application
user        Clear zero-trust sessions for user
<cr>
```

To enable zero-trust and webvpn module debugs use the next commands in Lina prompt:

- firepower# **debug zero-trust 255**
- firepower# **debug webvpn request 255**
- firepower# **debug webvpn response 255**
- firepower# **debug webvpn saml 255**

Related Information

- For additional assistance, please contact Technical Assistance center (TAC). A valid support contract is required: Cisco Worldwide Support Contacts.
- You can also visit the Cisco VPN Community here.