



# Cloud Secure Integration with ADFS

Deployment Guide

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*Cloud Secure Integration with ADFS Deployment Guide*

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# Introduction

## About this guide

This document outlines the Cloud Secure integration with Microsoft's Active Directory Federation Services (ADFS). The guide explains the configuration required to setup Cloud Secure as a third-party Identity Provider (IdP) with ADFS. It is assumed that Office 365 is already configured as an IdP in ADFS.

To configure Office 365 to authenticate directly with Cloud Secure, refer to Cloud Secure Microsoft Office 365 guide which explains the configuration and benefits of using Cloud Secure as standalone IdP.

## Overview

Cloud Secure provides secure access to anyone, anytime on a hybrid IT environment where enterprise companies are combining the best of the cloud with their own localized data centers.

Cloud Secure uses Security Assertion Markup Language (SAML) for exchange of authentication between client devices (Windows, MacOS, iOS, Android), Service Providers (Cloud applications like Office 365, Salesforce etc.) and Identity Providers (Pulse Connect Secure) to provide Single-Sign on access seamlessly to applications. In addition, Cloud Secure provides a greater level of flexibility with integration to many third-party IdP's like PingOne, OKTA, and Active Directory Federation Services (ADFS) for seamless migration of existing customers.

## Cloud Secure ADFS Integration

Pulse Secure's Cloud Secure solution is capable of providing authentication as well as secure single sign-on to Office 365 services as a standalone Identity Provider. Most of the companies who are using Office 365 have also implemented Active Directory Federation Services (ADFS) for authentication.

Note: In many cases, it would not be feasible for a company that has already deployed ADFS as their Identity Provider to change their Office 365 configuration.

The deployment discussed in the guide explores an alternative approach called IdP chaining, where Cloud Secure (PCS) acts as IdP for ADFS and handles all the authentication requests. This helps the customer to get the benefits of Cloud Secure such as compliance checks, secure single sign-on through VPN tunneling without making major changes to the existing setup. Pulse Connect Secure (PCS) is used as Identity Provider in Cloud Secure solution.

## Deployment Scenarios

ADFS allows Pulse Connect Secure (PCS) to be configured as Third-Party Identity Provider and redirects all the SAML Authentication requests from Service Providers (SP) to PCS and vice-versa. In this deployment scenario,

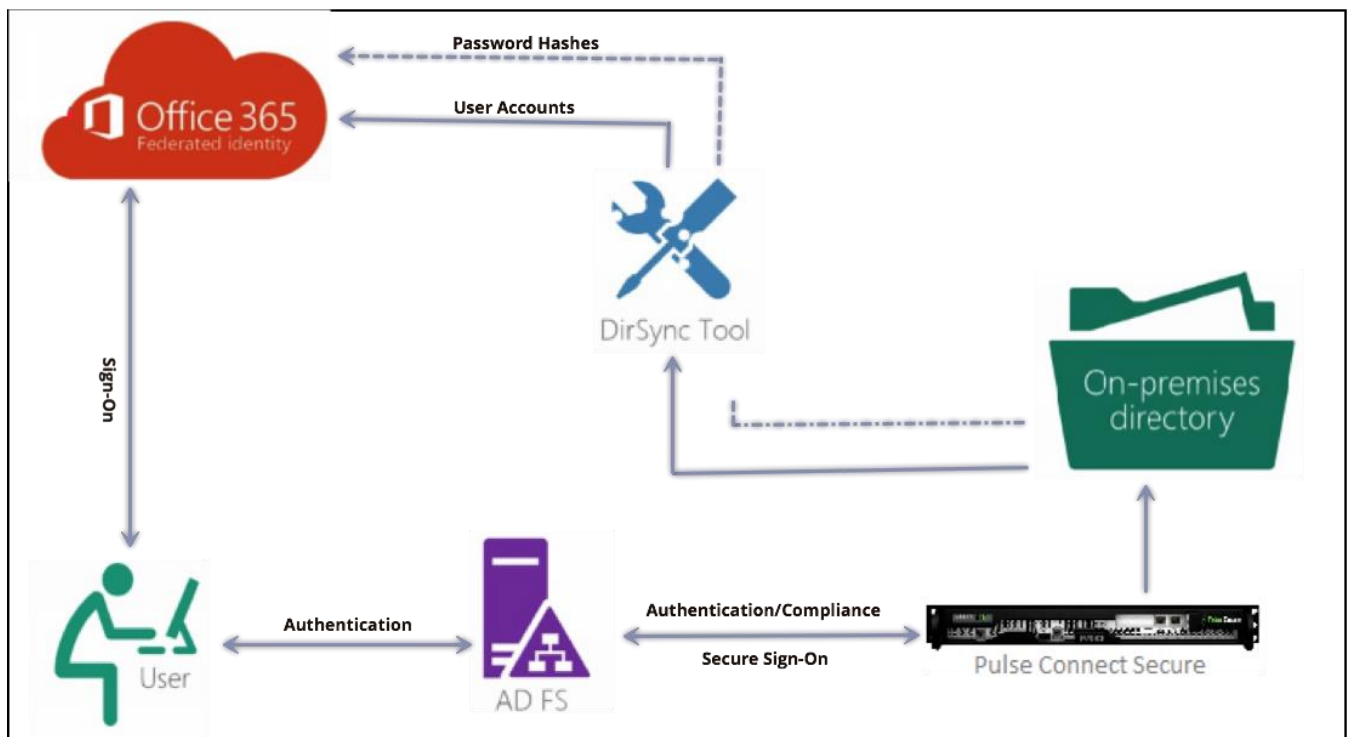
- ADFS is configured as Service Provider (SP) in PCS
- PCS is configured as claims provider in ADFS
- ADFS is configured as Identity Provider in SP

Cloud Secure integration with ADFS supports both SP initiated and IdP initiated SSO.

### Office 365 access through applications (SP Initiated SSO)

When a user tries to access cloud service, the SAML enabled Service Provider generates SAML request and redirects it to ADFS. ADFS in turn redirects the incoming SAML authentication requests to PCS. PCS authenticates the user, and generates SAML AuthNResponse after compliance posture assessments. ADFS relays the response to Service provider thus providing access to the cloud resource

Figure 1 Deployment Diagram: Cloud Secure ADFS Integration – SP Initiated



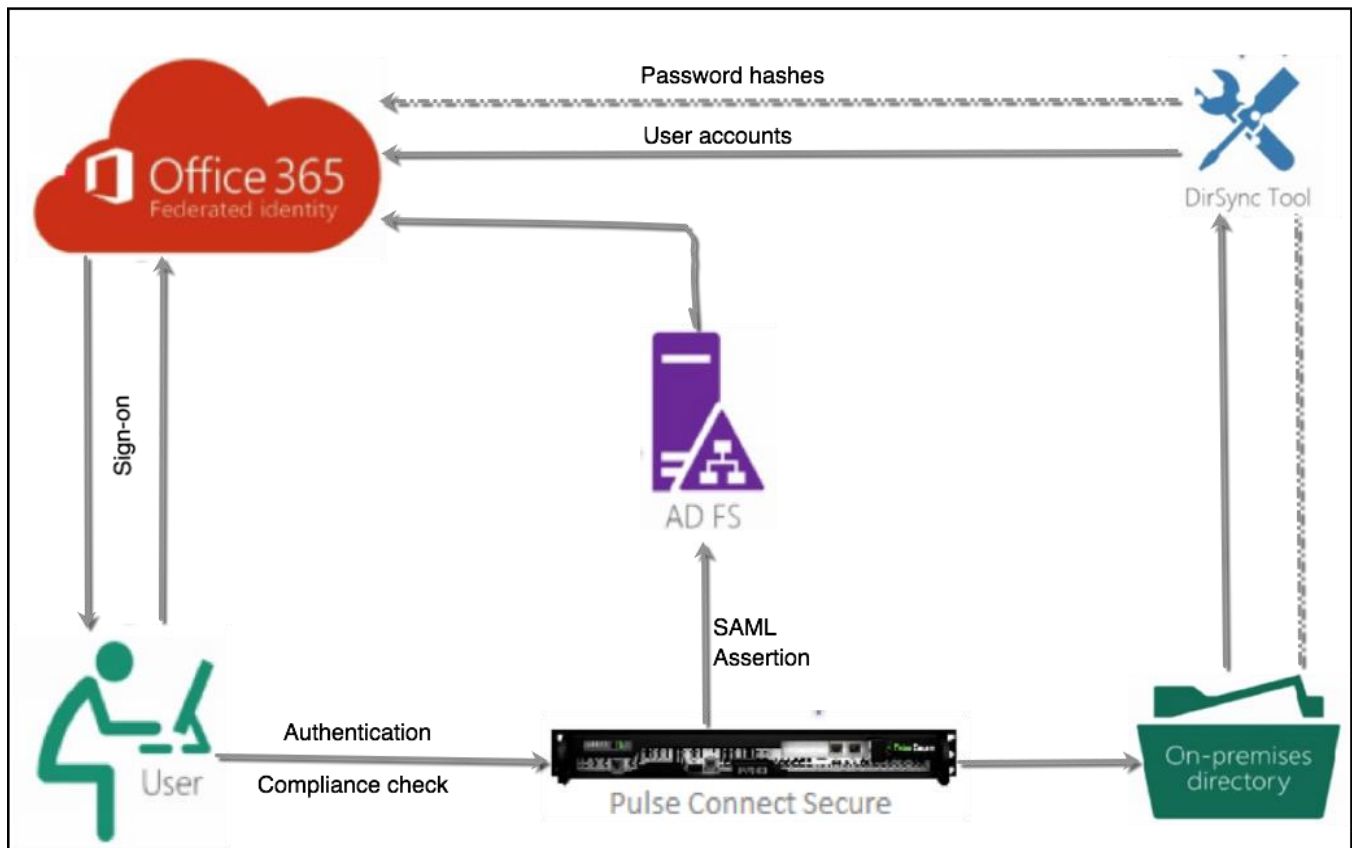
**Note:** If the client has an existing VPN connection to PCS, then the same session will be reused and provides seamless SSO without asking for credentials

MobileIron and AirWatch Third-party MDM servers can also be used in this solution to manage devices and to evaluate compliance posture of the mobile devices

## Office 365 access through bookmark (IdP Initiated SSO)

In IdP Initiated Single Sign-on, user first logs into PCS through browser. After authentication and compliance posture assessments, PCS shows up the browser page with all the configured bookmarks. When the user access the Office 365 bookmark, PCS generates the SAML assertion and relays it to ADFS. ADFS again relays the Assertion to Office 365 and provides seamless access to cloud resource

Figure 2 Deployment Diagram: Cloud Secure ADFS Integration – IdP Initiated



**Note:** Cloud Secure ADFS integration solution works well with all Service Providers (like Salesforce, Zendesk etc.), provided the SPs should be configured as Relying Party Trusts in ADFS

## Pre-requisites

Prerequisites for this solution include:

- **Identity Management Provider:** Active Directory Federation Services (ADFS)
- **Service Provider (Office 365):** Office 365 Subscription. Office 365 Service Provider should be configured as Relying Party Trust in ADFS and ADFS is configured as Identity Provider in Office365 SP
- **Wildcard or SAN Certificates:** Wildcard or Subject Alternative Name (SAN) Certificates are required. SAN certificate should include the fqdn of PCS as well as ADFS.
- **AD/LDAP Server:** AD/LDAP with directory synchronization enabled
- **Clients:** iOS Device/ Android Device/ Windows/ MAC OS X Desktops
- **(Optional) MDM Servers:** Pulse Workspace Server/ MobileIron/ AirWatch servers are used for Mobile Device Management and Mobile Compliance posture assessments

## Limitations

- Email Access through **Native Email Client** in **iOS** and **GMAIL** in **Android** are yet to be validated

## Supported Platforms

- Browsers (Chrome, Safari, Firefox, Internet Explorer)
- Microsoft Outlook 2016 on desktops and mobiles
- Microsoft Outlook 2013 with a registry update
- Microsoft applications (Word, PowerPoint, Excel) on desktops and mobiles

# End-User Flow

Sign-in experience for end user is different based on his location and the device used to access Office 365 services.

## Access through Outlook client (SP Initiated SSO)

Cloud Secure requires Microsoft Office 2013 or 2016 client for providing SSO access to emails through modern authentication. In Office 2016 client, Microsoft has added support for modern authentication (for doing web browser SSO) and is enabled by default. Earlier versions of outlook client support only ECP profile for SAML exchanges.

Follow below steps to enable modern authentication in Office 2013 clients on Windows platform:

1. Update Office 2013 client to obtain the update that includes the new Azure Active Directory Authentication Libraries (ADAL) based authentication features.
2. Set the following registry keys.

Registry Key	Type	Value
HKCU\SOFTWARE\Microsoft\Office\15.0\Common\Identity\EnableADAL	REG_DWORD	1
HKCU\SOFTWARE\Microsoft\Office\15.0\Common\Identity\Version	REG_DWORD	1



**Note:** End-Users are usually not recommended to change the registry settings

Below steps need to be performed once for setting up Outlook client to access emails:

1. Add email account in Outlook client by navigating to File > Add Account (in Windows) or Tools > Accounts (in MAC). Provide only the name and email address (without password) and click Next. In latest version of Outlook client, provide only Email address
2. Outlook client starts searching for server settings and once the details are obtained, new browser windows is opened and gets redirected to PCS login page.
3. Provide user credentials and 'Sign In' for authenticating with PCS.
4. After successful authentication with PCS, SAML SSO is triggered and email account gets added to Outlook.

## Access through browser (SP Initiated SSO)

1. Open web browser and access Microsoft login URL "<https://login.microsoftonline.com/>"
2. Provide Email address and press tab. It automatically redirects to PCS login page
3. Provide credentials in the user login page to authentication to PCS
4. After successful authentication, user gets redirected to ADFS, ADFS in turn redirects to Microsoft Office 365 portal site giving access to Office365 services





**Note:** If the client has an existing VPN connection to PCS, then the same session will be reused and provides seamless SSO without asking for credentials

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### Access through PCS bookmark (IdP Initiated SSO)

1. Open web browser and access PCS external URL (Ex: <https://sso.pulsesecure.net>)
2. Provide credentials in the user login page to authenticate to PCS
3. Once authenticated, click on Office 365 Web Bookmark in the homepage
4. Single Sign-On will happen and user gets redirected to ADFS, ADFS in turn redirects to Microsoft Office 365 portal site giving access to Office 365 services

# Configurations

This section covers the configurations required on ADFS and PCS for Cloud Secure integration with ADFS.

**Active Directory Federations Services configurations include:**

- Downloading Metadata from PCS and upload it in ADFS
- Adding Cloud Secure(PCS) as Claims Provider Trust in ADFS
- Adding Claim rules to process the SAML authentication requests
- Enabling RelayState for Idp initiated single sign-on

**Pulse Connect Secure configurations include:**

- Enabling and configuring SAML in PCS
- Adding ADFS metadata
- Configuring ADFS as Service Provider in PCS
- Configuring bookmark for Idp initiated single sign-on

## ADFS Configurations

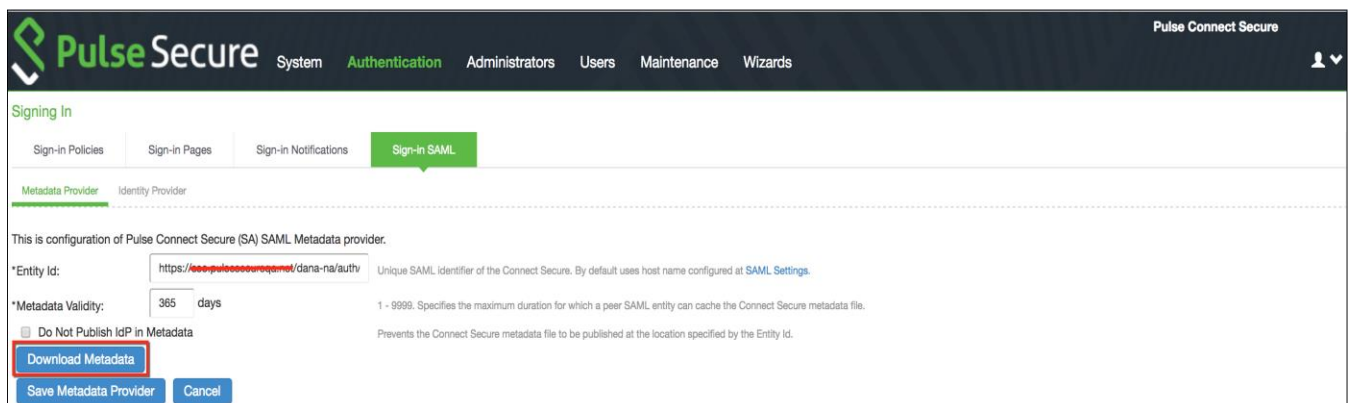
Before configuring PCS as Claims Provider Trust in ADFS, download metadata from PCS and upload it in ADFS.

### Download PCS metadata

To download PCS SAML metadata:

1. Login to PCS admin console.
2. Go to **Authentication > Signing In > Sign-in SAML > Metadata Provider**
3. Click **Download Metadata** and save the file

Figure 3 Download Metadata

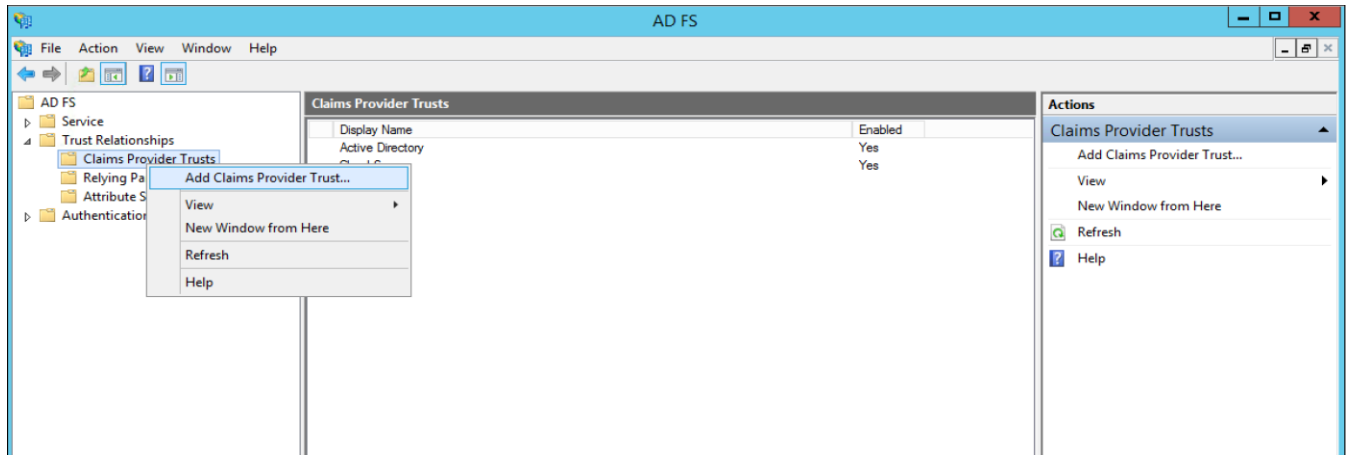


**Note:** The Metadata should be downloaded only after finishing the basic SAML configurations in PCS

## Adding Cloud Secure (PCS) as Claims Provider trust

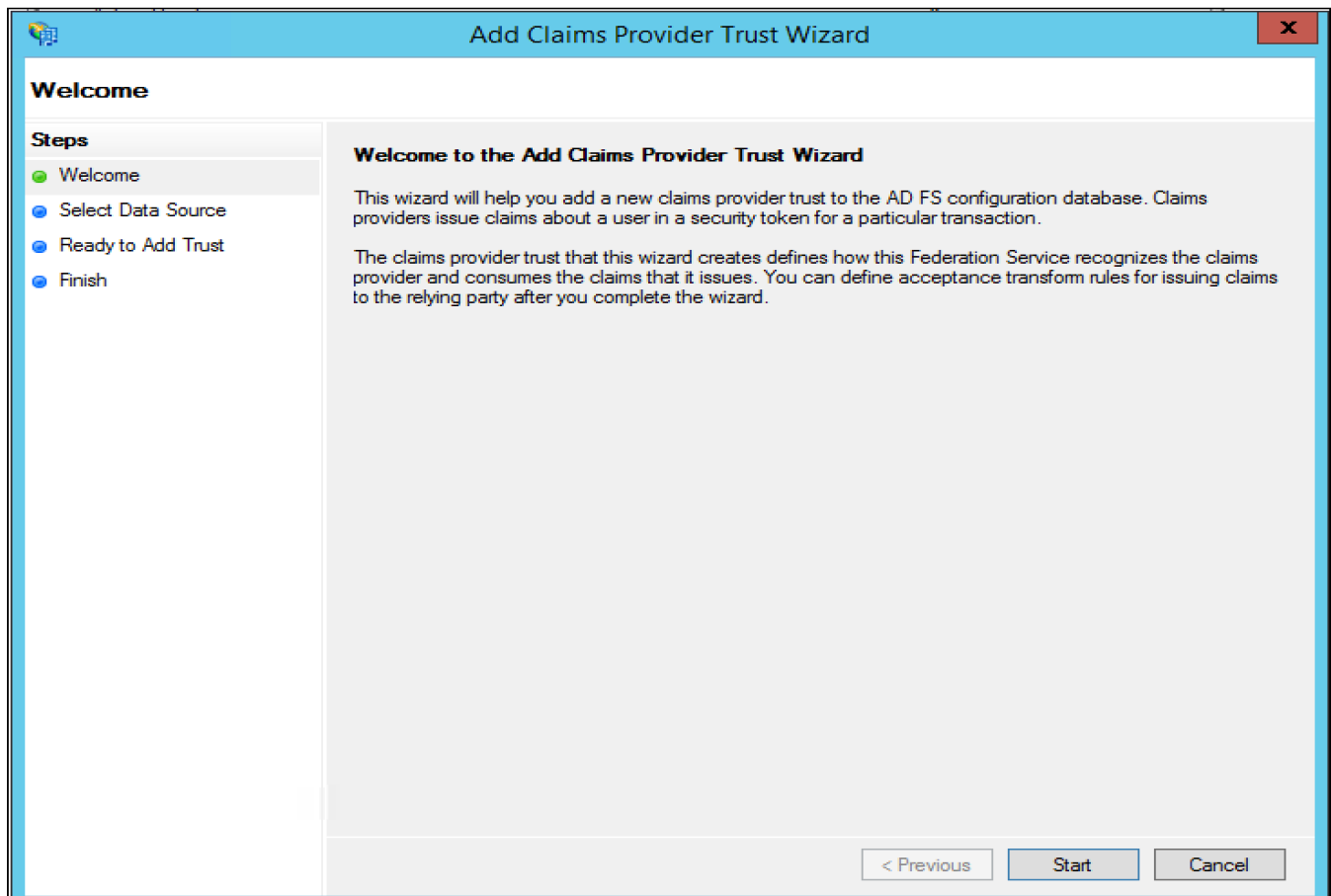
1. Login to AD Server where ADFS services are enabled
2. Open ADFS management snap-in
3. Right Click on "Claims Provider Trusts" and Select "Add Claims Provider Trust"

Figure 4 ADFS:Claims Provider Trust



4. Click **Start**

Figure 5 ADFS Claims Provider Trust Wizard: Welcome



5. Click Browse and select **PCS Metadata file** (As mentioned in "Download PCS metadata" section)

Figure 6 ADFS Claims Provider Trust Wizard: Metadata Upload

The screenshot shows the 'Add Claims Provider Trust Wizard' window. The title bar is blue with the text 'Add Claims Provider Trust Wizard' and a close button. The main window has a light blue header with the title. On the left, there is a 'Steps' pane with four steps: 'Welcome' (selected with a green dot), 'Select Data Source' (selected with a green dot), 'Ready to Add Trust' (selected with a blue dot), and 'Finish' (selected with a blue dot). The main area is titled 'Select Data Source' and contains the following text: 'Select an option that this wizard will use to obtain data about this claims provider:'. There are three radio button options: 1. 'Import data about the claims provider published online or on a local network' (unselected). Below it is a text box for 'Federation metadata address (host name or URL):' with an example: 'fs.fabrikam.com or https://fs.fabrikam.com/'. 2. 'Import data about the claims provider from a file' (selected with a black dot). Below it is a text box for 'Federation metadata file location:' with a 'Browse...' button next to it. 3. 'Enter claims provider trust data manually' (unselected). Below it is a text box for 'Enter claims provider trust data manually:'. At the bottom right, there are three buttons: '< Previous', 'Next >', and 'Cancel'.

**Add Claims Provider Trust Wizard**

**Select Data Source**

**Steps**

- Welcome
- Select Data Source
- Ready to Add Trust
- Finish

Select an option that this wizard will use to obtain data about this claims provider:

☐ Import data about the claims provider published online or on a local network

Use this option to import the necessary data and certificates from a claims provider organization that publishes its federation metadata online or on a local network.

Federation metadata address (host name or URL):

Example: fs.fabrikam.com or https://fs.fabrikam.com/

☒ Import data about the claims provider from a file

Use this option to import the necessary data and certificates from a claims provider organization that has provided its federation metadata in a file.

Federation metadata file location:

Browse...

☐ Enter claims provider trust data manually

Use this option to manually input the necessary data about this claims provider organization.

< Previous   Next >   Cancel

6. Provide the claims provider **display name**
7. Select **Next**

Figure 7 ADFS Claims Provider Trust Wizard: Claims Provider Name

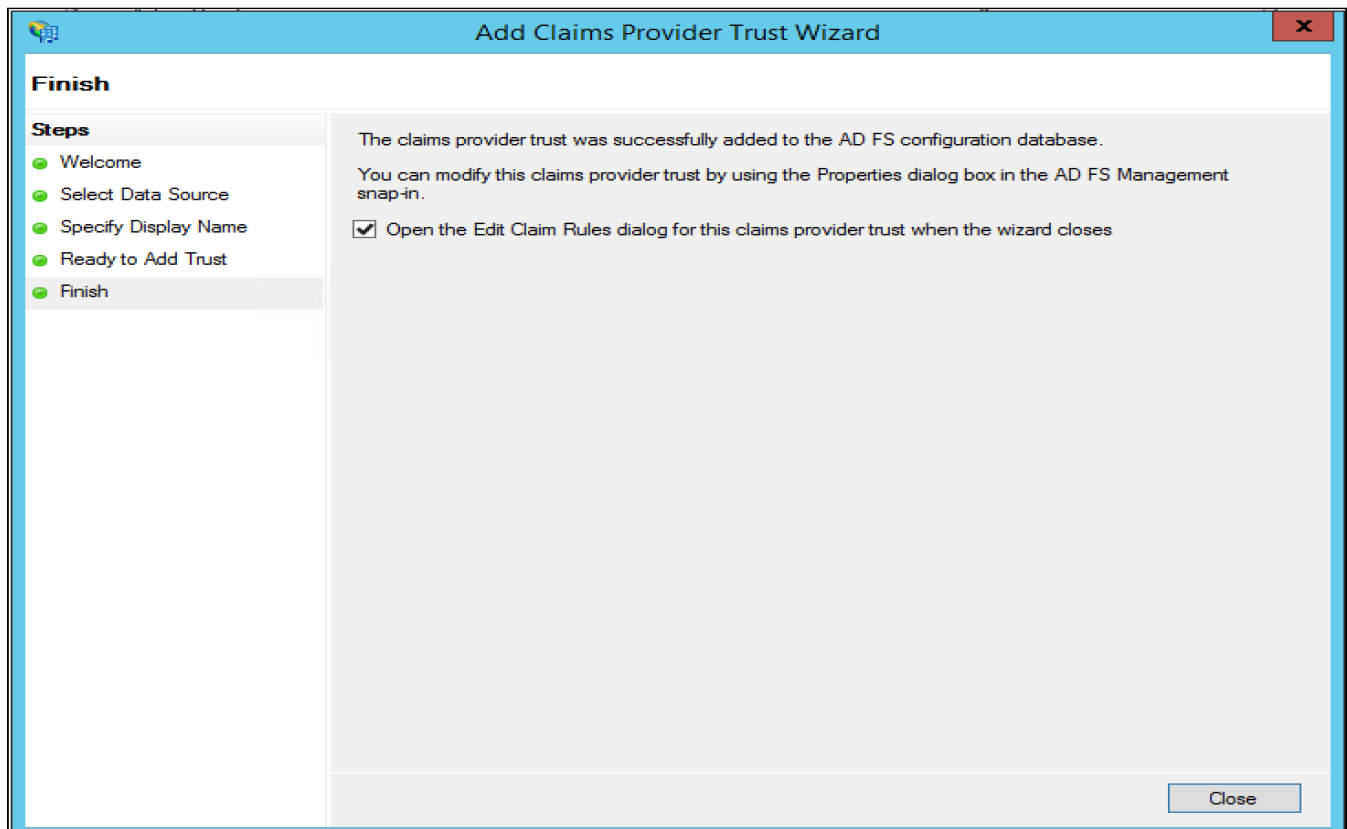
The screenshot shows the 'Specify Display Name' step of the 'Add Claims Provider Trust Wizard'. The window title is 'Add Claims Provider Trust Wizard'. On the left, a 'Steps' pane lists: Welcome, Select Data Source, Specify Display Name (current), Ready to Add Trust, and Finish. The main area has the instruction 'Type the display name and any optional notes for this claims provider.' Below this, the 'Display name:' field contains 'Cloud Secure'. The 'Notes:' field is empty. At the bottom are buttons for '< Previous', 'Next >', and 'Cancel'.

Figure 8 ADFS Claims Provider Trust Wizard: Review

The screenshot shows the 'Ready to Add Trust' step of the 'Add Claims Provider Trust Wizard'. The window title is 'Add Claims Provider Trust Wizard'. The 'Steps' pane on the left shows 'Ready to Add Trust' as the current step. The main area contains the text: 'The claims provider trust has been configured. Review the following settings, and then click Next to add the claims provider trust to the AD FS configuration database.' Below this is a tabbed interface with tabs: Monitoring, Identifiers, Certificates, Encryption, Offered Claims, Organization, Endpoints, and Note. The 'Monitoring' tab is active, showing 'Specify the trust monitoring settings for this claims provider trust.' It includes a text box for 'Claims provider's federation metadata URL:', a checkbox for 'Monitor claims provider' (unchecked), and a sub-checkbox for 'Automatically update claims provider' (unchecked). It also displays 'This claims provider's federation metadata was last checked on: < never >' and 'This claims provider trust was last updated from federation metadata on: < never >'. At the bottom are buttons for '< Previous', 'Next >', and 'Cancel'.

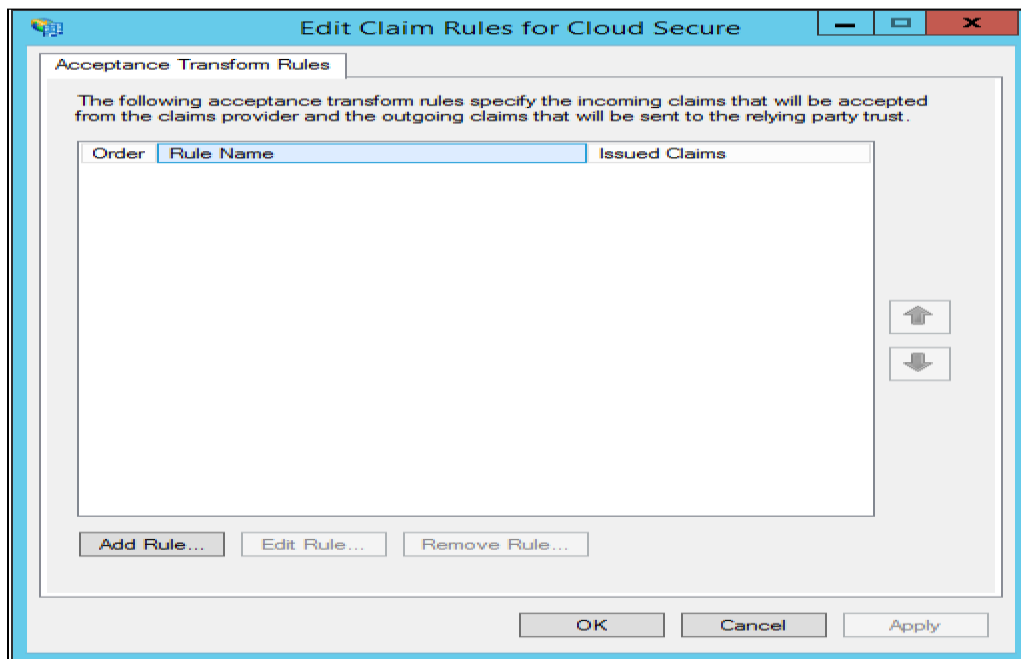
8. Click **Close**

Figure 9 ADFS Claims Provider Trust Wizard: Finish



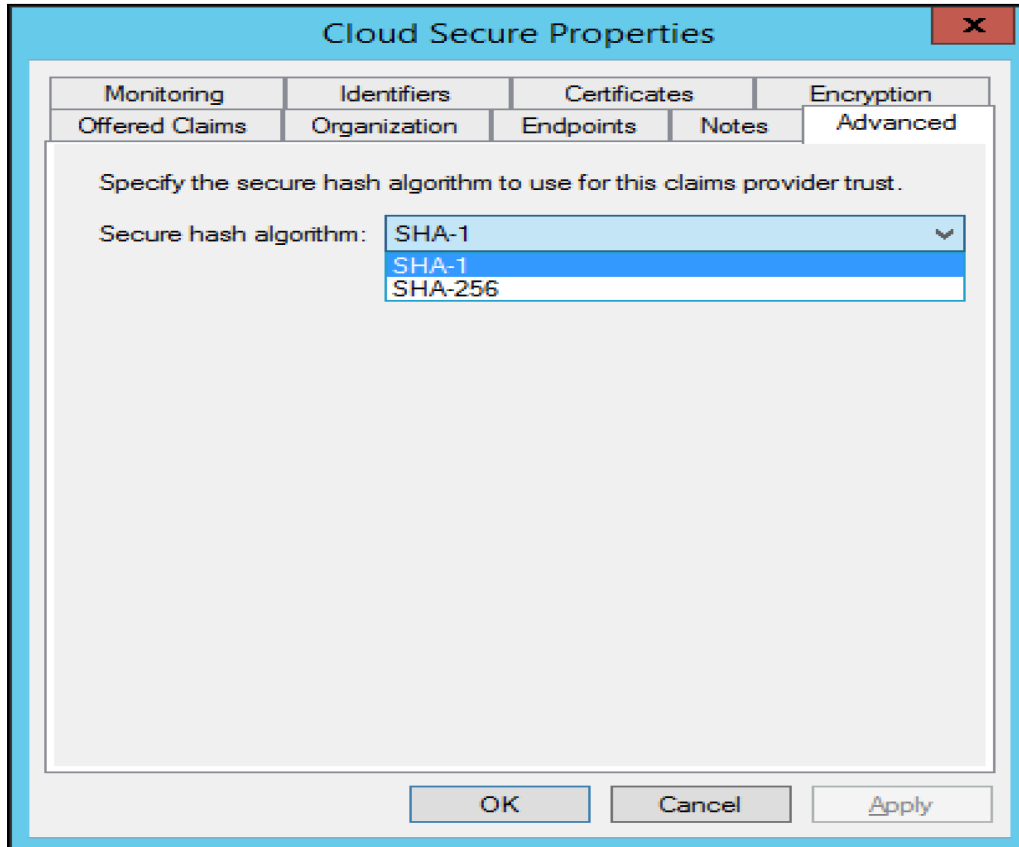
9. ADFS claim rules page is displayed, Do not add any rule. Click **OK**.

Figure 10 ADFS Claim Rules



10. ADFS sets **SHA-256** as default Secure hash algorithm, change it to **SHA-1**.  
To change Secure hash algorithm:
- Go to **"Claims Provider Trusts"**. Right click on **Cloud Secure** (Claims provider added above).
  - Select **"Properties"** and click **"Advanced"** tab.
  - Select **"SHA-1"** Secure hash algorithm from the drop-down list.

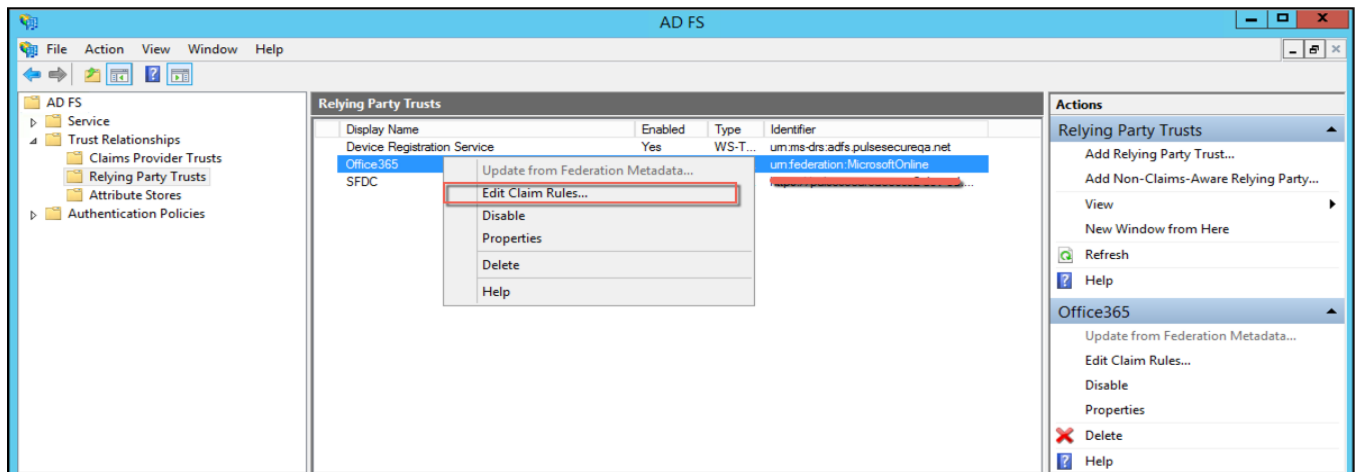
Figure 11 ADFS: Secure Hash Algorithm



## Adding Claim Rules

1. Select "Relying Party Trusts". Right Click on "Office365" and click "Edit Claim Rules"
2. Select "Issuance Transform Rules" tab and click "Add Rule"

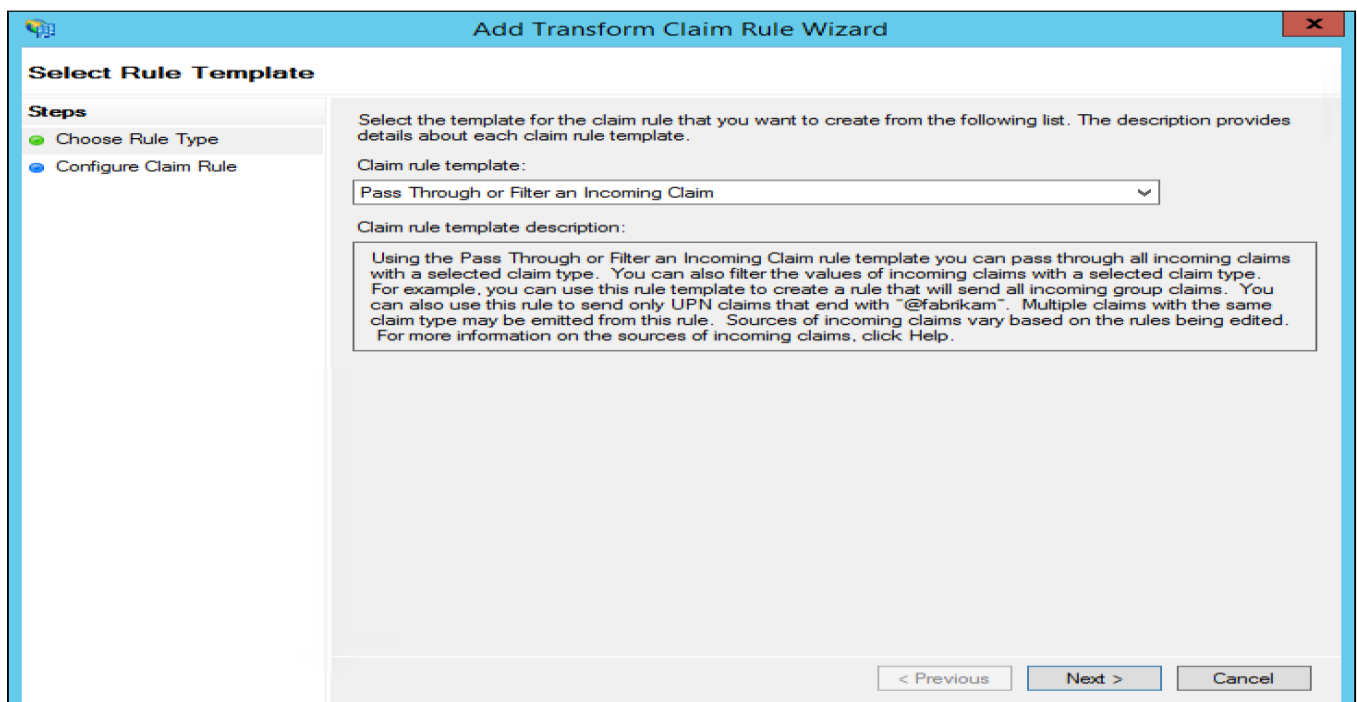
Figure 12 ADFS: Office365 Relying Party Trust



**Note:** Office365 federates the authentication to ADFS and this happens only when it is configured as "Relying Party Trusts" in ADFS and ADFS is configured as IdP in Office365

3. Select "Pass Through or Filter an Incoming Claim" as Claim rule template.
4. Click "Next"

Figure 13 ADFS: Claim Rules Wizard





5. Provide "Claim rule name"
6. Select Incoming Claim type as "Name ID" and Incoming name ID format as "Persistent Identifier"
7. Select "Pass through all claim values"
8. Click Finish

Figure 14 ADFS: Claim Rules Wizard: Transform Claim Rule

**Add Transform Claim Rule Wizard**

**Configure Rule**

**Steps**

- Choose Rule Type
- Configure Claim Rule

You can configure this rule to pass through or filter an incoming claim. You can also configure this rule to filter claims that are generated by previous rules. Specify the claim type and whether only some claim values or all claim values should pass through.

Claim rule name: CloudSecureRule

Rule template: Pass Through or Filter an Incoming Claim

Incoming claim type: Name ID

Incoming name ID format: Persistent Identifier

☒ Pass through all claim values

☐ Pass through only a specific claim value

Incoming claim value:

☐ Pass through only claim values that match a specific email suffix value:

Email suffix value:

Example: fabrikam.com

☐ Pass through only claim values that start with a specific value:

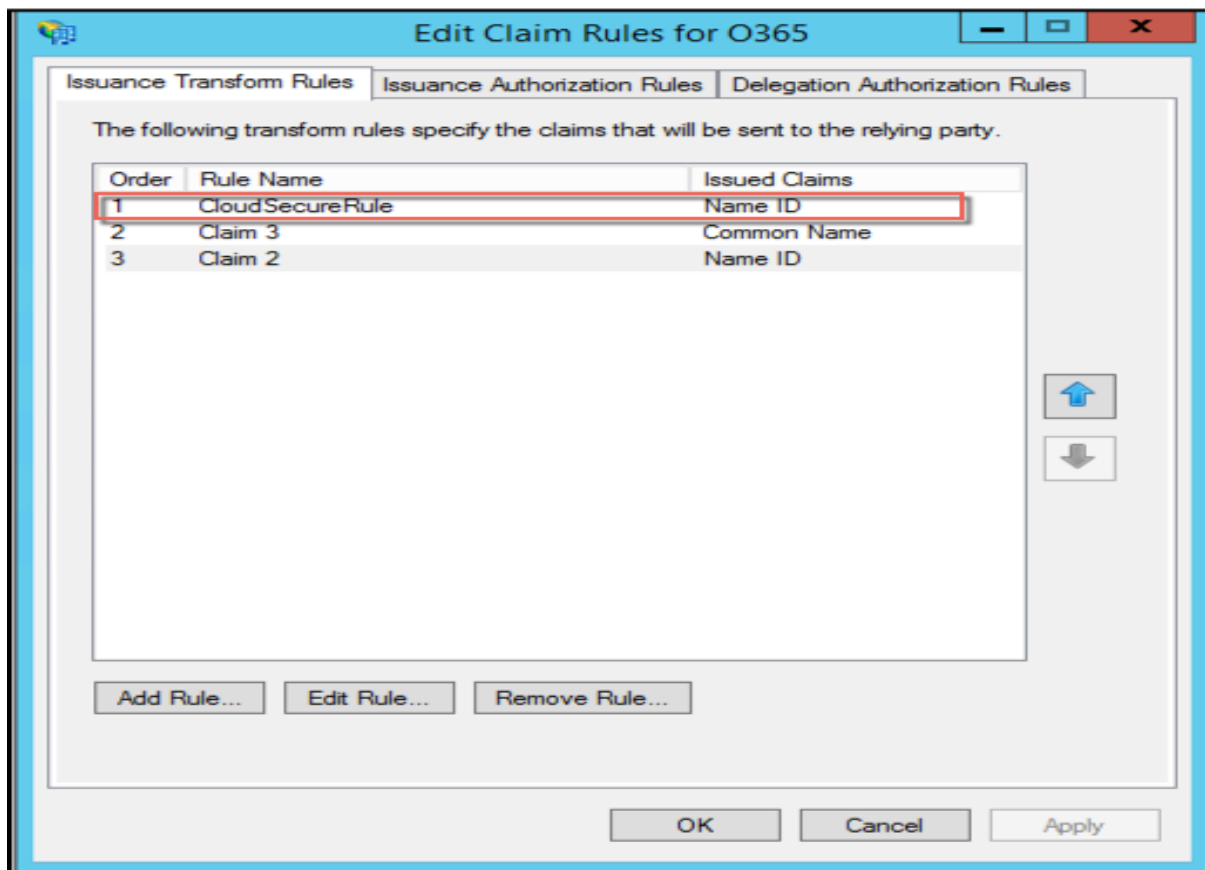
Starts with:

Example: FABRIKAM\

< Previous Finish Cancel

9. Click on "Up arrow" on right side of the screen and move "CloudSecureRule" above the existing rules
10. Select "OK"

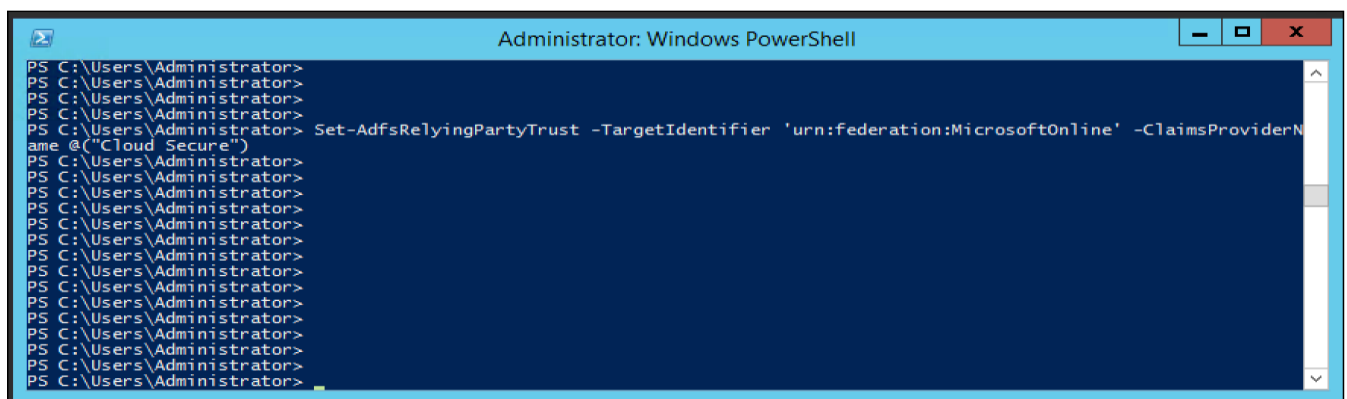
Figure 15 ADFS: Claim Rules Wizard: Transform Claim Rule



11. With all the above configurations, Cloud Secure(PCS) is successfully added as “**Claims Provider**” in ADFS. When the user access Office365 services then a login page prompts up asking user to select either “**ADFS**” or “**Cloud Secure**” for authentication.
12. Select “**Cloud Secure**” to get Secure Single Sign-on experience with existing VPN connection.
13. To avoid the additional selection page and use only Cloud Secure for Office 365 authentication federation, Launch “**Windows PowerShell**” and give the following command:

- ❖ `Set-AdfsRelyingPartyTrust -TargetIdentifier 'urn:federation:MicrosoftOnline' -ClaimsProviderName @("Cloud Secure")`

Figure 16 ADFS Claim Rules Wizard: Transform Claim Rule

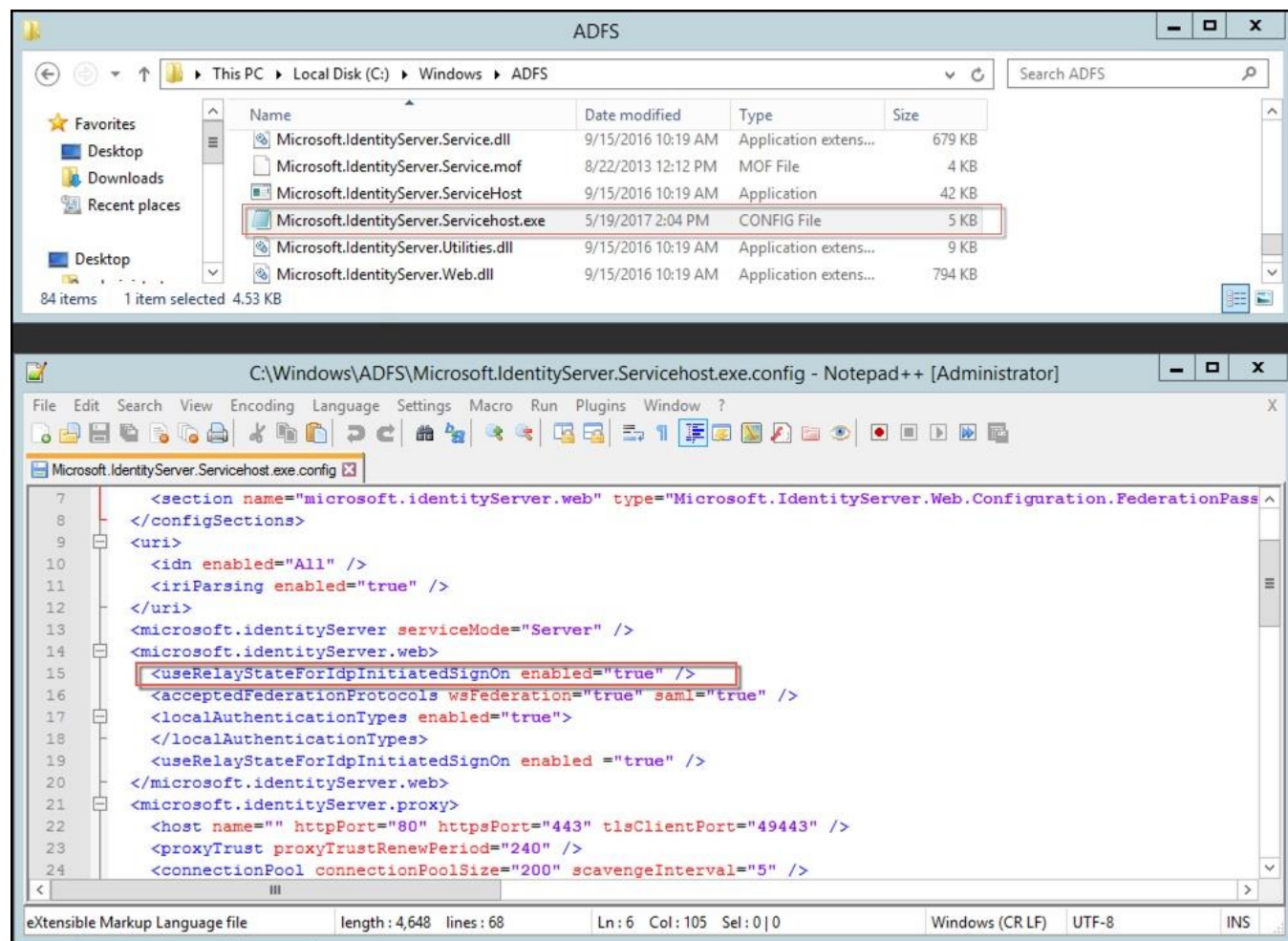


## Enable Relay State for Idp Initiated Single Sign-on

In IdP initiated scenario, PCS triggers SAML assertion to ADFS when the user clicks on ADFS bookmark. However, user is not redirected to Office 365 portal, as ADFS is not aware of where the user should be redirected further. Below configuration settings enables ADFS service to relay the SAML assertion from ADFS to target cloud service

1. Go to **C:\Windows\ADFS**
2. Open the file **Microsoft.IdentityServer.Servicehost.exe.config**
3. Insert `<useRelayStateForIdpInitiatedSignOn enabled="true" />` under the section `<microsoft.identityServer.web>`

Figure 17 ADFS Relay State configuration



## Pulse Connect Secure Configuration

This section outlines the configurations for enabling PCS as SAML Identity Provider and configuring ADFS as Service Provider in PCS.

Basic Role, Realm and VPN configurations are not covered in this guide.

For basic configurations details, refer [Configuring Pulse Connect Secure - Basic Configurations \(Mandatory\)](#)

Pulse Connect Secure configurations include:

- Enabling and configuring SAML in PCS.
- Adding ADFS metadata.
- Configuring ADFS as Service Provider.

### Download/Upload ADFS metadata

After configuring and enabling Cloud Secure in ADFS, it gives metadata file. This file should be uploaded in Pulse Connect Secure.

Download the AD FS server metadata file by navigating to this URL.

<https://<ADFS FQDN>/FederationMetadata/2007-06/FederationMetadata.xml>

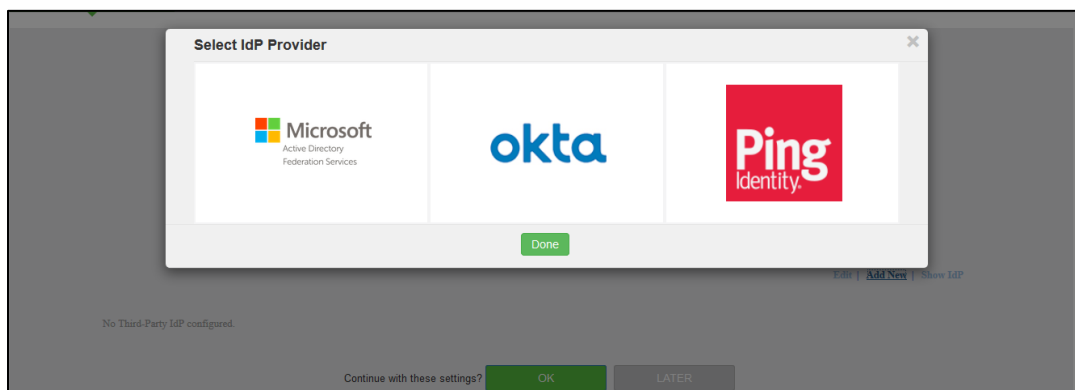
### Configure ADFS as Service Provider

SAML allows cloud services to delegate user authentication to IdP. The IdP can also delegate the authentication to another IdP, which is called IdP federation.

To add ADFS as third-party IdP provider:

1. Click **Add New** and select the **Third-party IdP** as Microsoft ADFS

Figure: UX: Third-Party IdP



2. Click **Done**
3. Under User Identity, select the Subject Name format
4. Enter the Subject Name
5. Click **Browse** and upload the metadata file.
6. Enter the relay state.
7. Set the signature algorithm to **Sha-1** or **Sha-256**.
8. Select the desired roles.

9. Under **Bookmark settings**, enable the checkbox for **Create Bookmark** to configure bookmarks for each SP configured with the third-party IDP.  
You can configure multiple bookmarks for each SP configured with the Microsoft Active Directory Federation Service (ADFS) server.
  - a. Enter the bookmark name.
  - b. Enter the relay state.
  - c. Enter the subject name format.
  - d. Enter the subject name.
  - e. Click Add.
10. Enable the checkbox **Enable Re-writer** to redirect all the Cloud Secure traffic through PCS.
11. Configure the LDAP server for fetching the additional details.
12. Click OK.

Figure: UX: Third-Party IdP- ADFS Settings

**Pulse Secure** System Authentication Administrators Users Maintenance Wizards

Cloud Secure > Cloud Secure Configuration > Basic > Third-Party IDP Settings

### Third-Party IDP Settings

Cloud Secure Configuration | Cloud Application Visibility

Basic | Applications

<b>Metadata File</b>	<a href="#">Browse</a> FederationMetadata (8).xml
<b>Relay State</b>	RPID=urn:federation:MicrosoftOnline
<b>Signature Algorithm</b>	<input checked="" type="radio"/> Sha-1 <input type="radio"/> Sha-256
<input checked="" type="checkbox"/> <b>Select All Roles</b> <a href="#">(Show Roles)</a> Allow access to the resource only if the user belongs to below selected roles.	

**Bookmark Settings**

☒ **Create Bookmark**  
 Configure bookmarks for each SP configured with this 3rd party IDP. Use the below table to override Relaystate, Subject Name format and Subject Name for specific bookmarks.

Bookmark Name	Relay State	Subject Name Format	SubjectName	
o365	RPID=urn:federation:MicrosoftOnline	persistent	<OBJECTGUID>	<a href="#">Remove</a>
Salesforce	RPID=https://hgsa-test-dev-ed.my.salesforce.com	email	<username>@pulsesecureqa.net	<a href="#">Remove</a>
<input type="text"/>	<input type="text"/>	<input type="text" value="- Select -"/>	<input type="text"/>	<a href="#">Add</a>

☒ **Enable Re-writer**  
 Enabling Re-writer makes all the traffic for the Cloud Service to be redirected through Pulse Connect Secure.

LDAP server for fetching additional attributes that needs to be sent as part of SAML Attribute statements.

**Server**  [\(Show Details\)](#)

[OK](#) [LATER](#)

**Help Section**

Third-Party IdP settings are used for federating the SAML authentications with another IdP server. Also bookmark can be displayed to the end users on Pulse Connect Secure home page for accessing the resources by federating the request through Third-Party IdP server.

[Click here](#) to know additional details for this.

**Note:** Click **Show IdP** to view the details of the configured Third-Party IdP servers.

# Troubleshooting

For any issues with Pulse Connect Secure, submit a request with Pulse Secure support team and provide following PCS logs:

- Navigate to **System > Log/Monitoring**. Click 'Save All Logs' and save the logs
- Provide server debug logs with event codes "saml, auth, soap, dsdash, cloudsecure" at level 50
- Provide Policy tracing for the specific user session with proper realm

## References

ADFS deployment and configuration: <https://technet.microsoft.com/en-us/library/gg188612.aspx>

## Requesting Technical Support

Technical product support is available through the Pulse Secure Global Support Center (PSGSC). If you have a support contract, then file a ticket with PSGSC.

- Product warranties—for product warranty information, visit <https://www.pulsesecure.net>.