Configure Secure Client NAM for Dot1x Using Windows and ISE 3.2

Contents

Introduction

This document describes how to configure Secure Client Network Analysis Module (NAM) on Windows.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Basic understanding of what is a RADIUS supplicant
- Dot1x
- PEAP
- PKI

Components Used

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

- Windows 10 Pro Version 22H2 Built 19045.3930
- ISE 3.2
- Cisco C1117 Cisco IOS® XE Software, Version 17.12.02
- Active Directory 2016

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

This document describes how to configure Secure Client NAM on Windows. Pre-deploy option and Profile Editor to perform dot1x authentication are used. Also, some examples of how this is achieved are provided.

In networking, a supplicant is an entity at one end of a point-to-point LAN segment that seeks to be authenticated by an authenticator attached to the other end of that link.

The IEEE 802.1X standard uses the term supplicant to refer to either hardware or software. In practice, a supplicant is a software application installed on an end-user computer.

The user invokes the supplicant and submits credentials to connect the computer to a secure network. If the authentication succeeds, the authenticator typically allows the computer to connect to the network.

About Network Access Manager

Network Access Manager is client software that provides a secure Layer 2 network in accordance with its policies.

It detects and selects the optimal Layer 2 access network and performs device authentication for access to both wired and wireless networks.

Network Access Manager manages user and device identity and the network access protocols required for secure access.

It works intelligently to prevent end users from making connections that are in violation of administrator-defined policies.

The Network Access Manager is designed to be single-homed, allowing only one network connection at a time.

Also, wired connections have higher priority than wireless so if you are plugged into the network with a wired connection, the wireless adapter becomes disabled with no IP address.

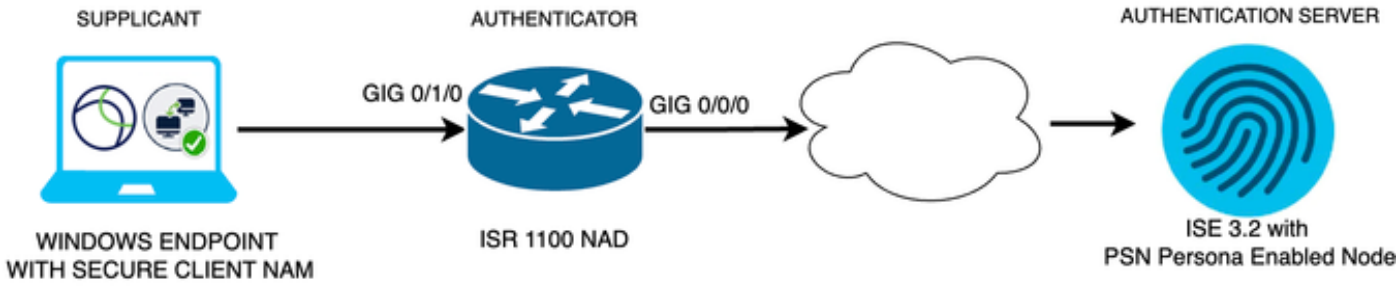
Configure

Network Diagram

It is crucial to understand that for dot1x authentications 3 parts are needed;

1. the supplicant which can do dot1x,
2. the authenticator also known as NAS/NAD which serves as a proxy encapsulating the dot1x traffic inside RADIUS,
3. and the authentication Server.

In this example, the supplicant is installed and configured in different ways. Later on, a scenario with the Network device config and the authentication server is shown.



Network Diagram

Configurations

1. Download and Install Secure Client NAM (Network Access Manager).

2. Download and install Secure Client NAM profile editor.
3. General default configurations
4. Scenario 1: Configure the Secure Client NAM Supplicant for PEAP (MS-CHAPv2) User Authentication.
5. Scenario 2: Configure the Secure Client NAM Supplicant for EAP-FAST simultaneously as User and Machine Authentication are configured.
6. Scenario 3 Part 1: Configure the Secure Client NAM Supplicant for EAP-TLS.
7. Scenario 3 Part 2: Configure the NAD and ISE Demonstration.

1. Download and Install Secure Client NAM (Network Access Manager)

Cisco Software Download

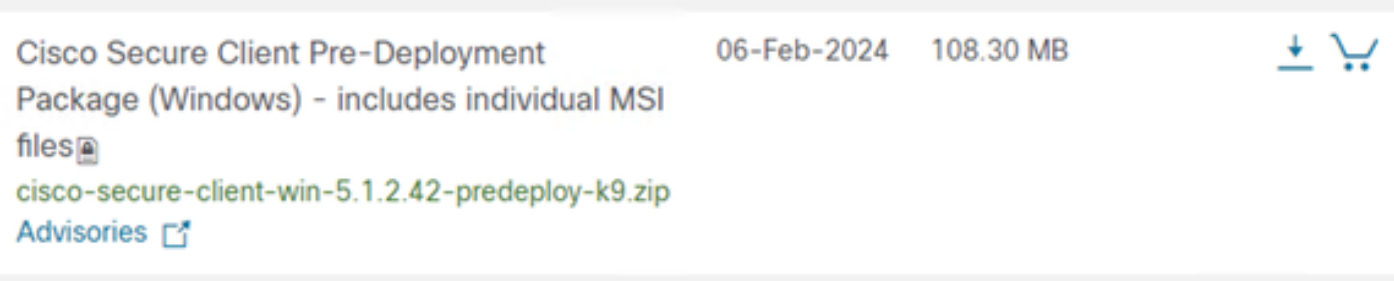
On the product name search bar type **Secure Client 5**.

Downloads Home > Security > VPN and Endpoint Security Clients > Secure Client (including AnyConnect) > Secure Client 5 > AnyConnect VPN Client Software.

In this configuration example, version 5.1.2.42 is the one used.

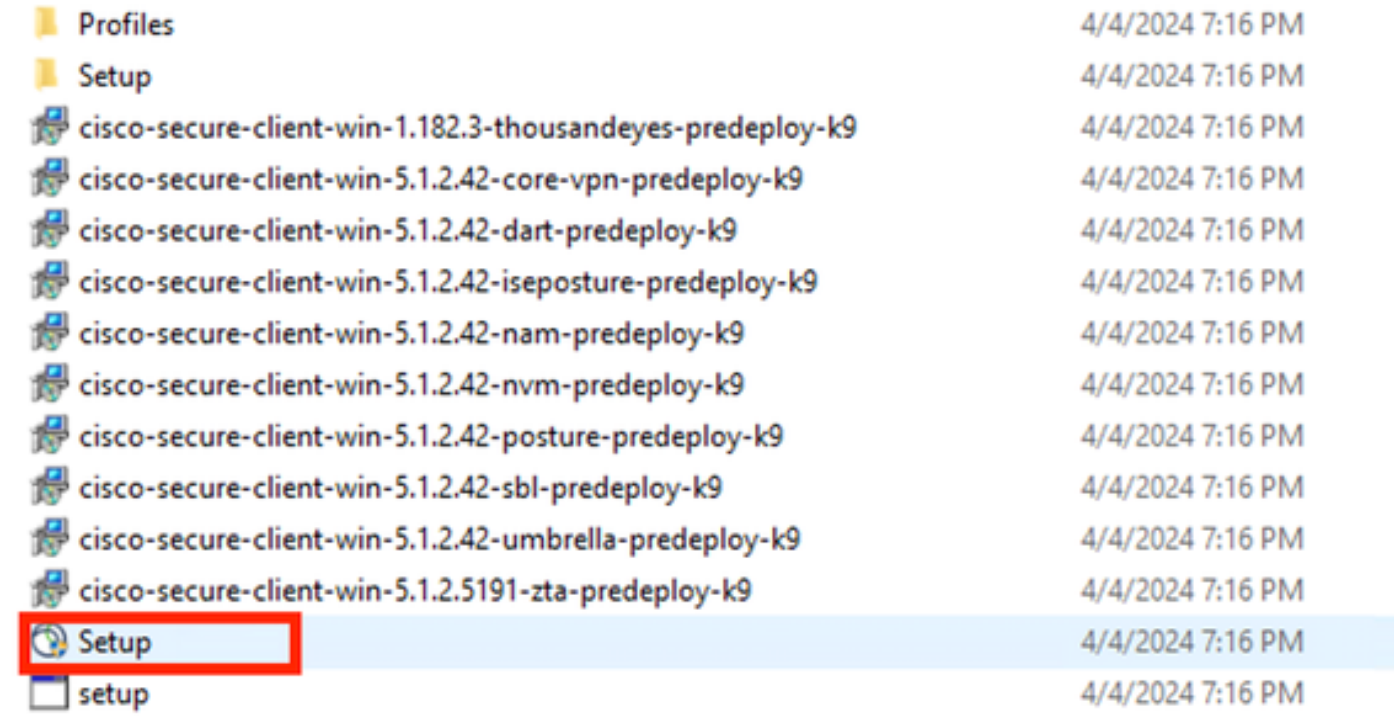
There are multiple ways to deploy Secure Client to Windows devices; from SCCM, from the Identity service engine, and from the VPN headend. However, in this article, the installation method used is the pre-deploy method.

On the page, search for the file **Cisco Secure Client Headend Deployment Package (Windows)**.



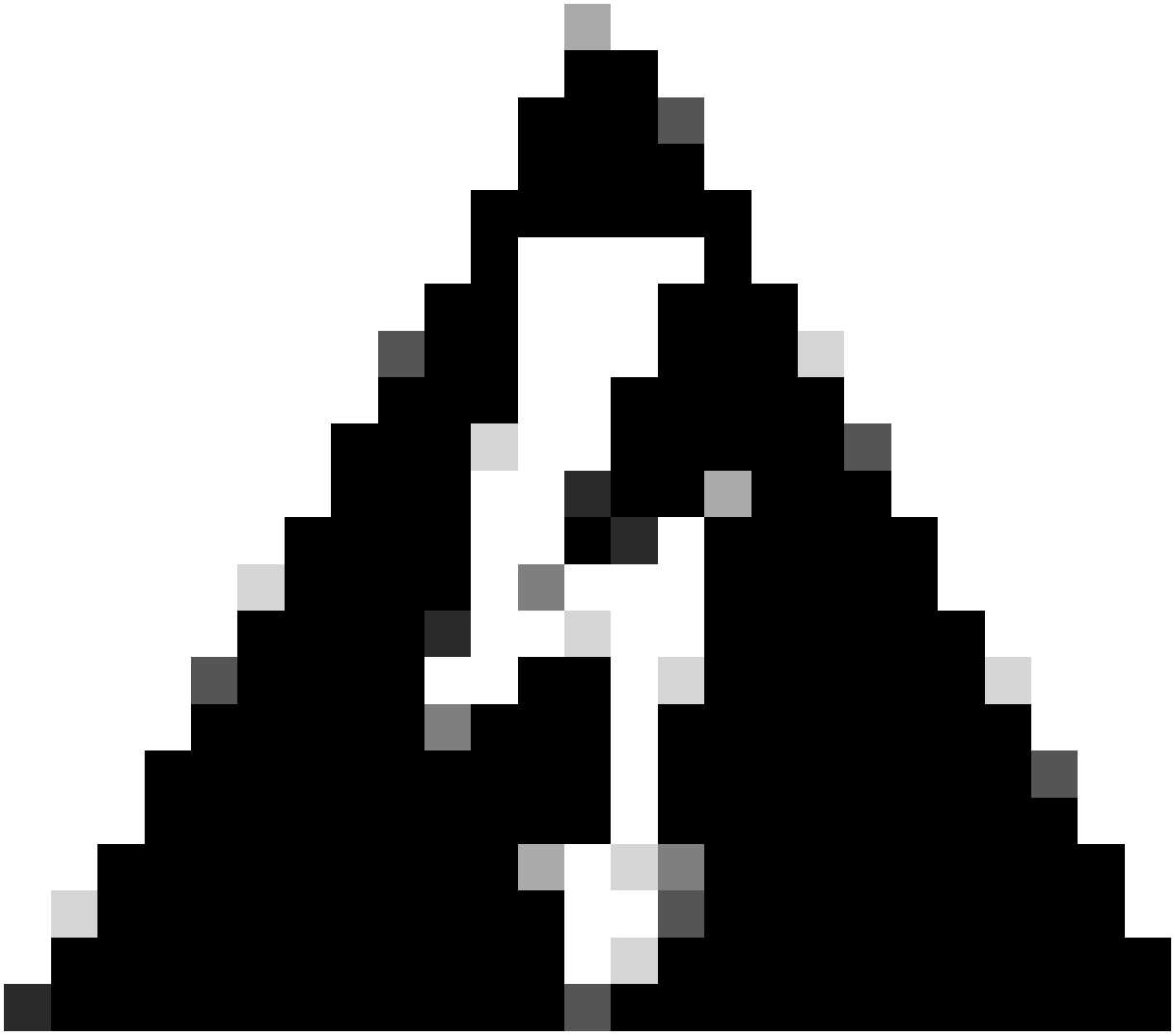
Msi zip file

Once downloaded and extracted, click **Setup**.

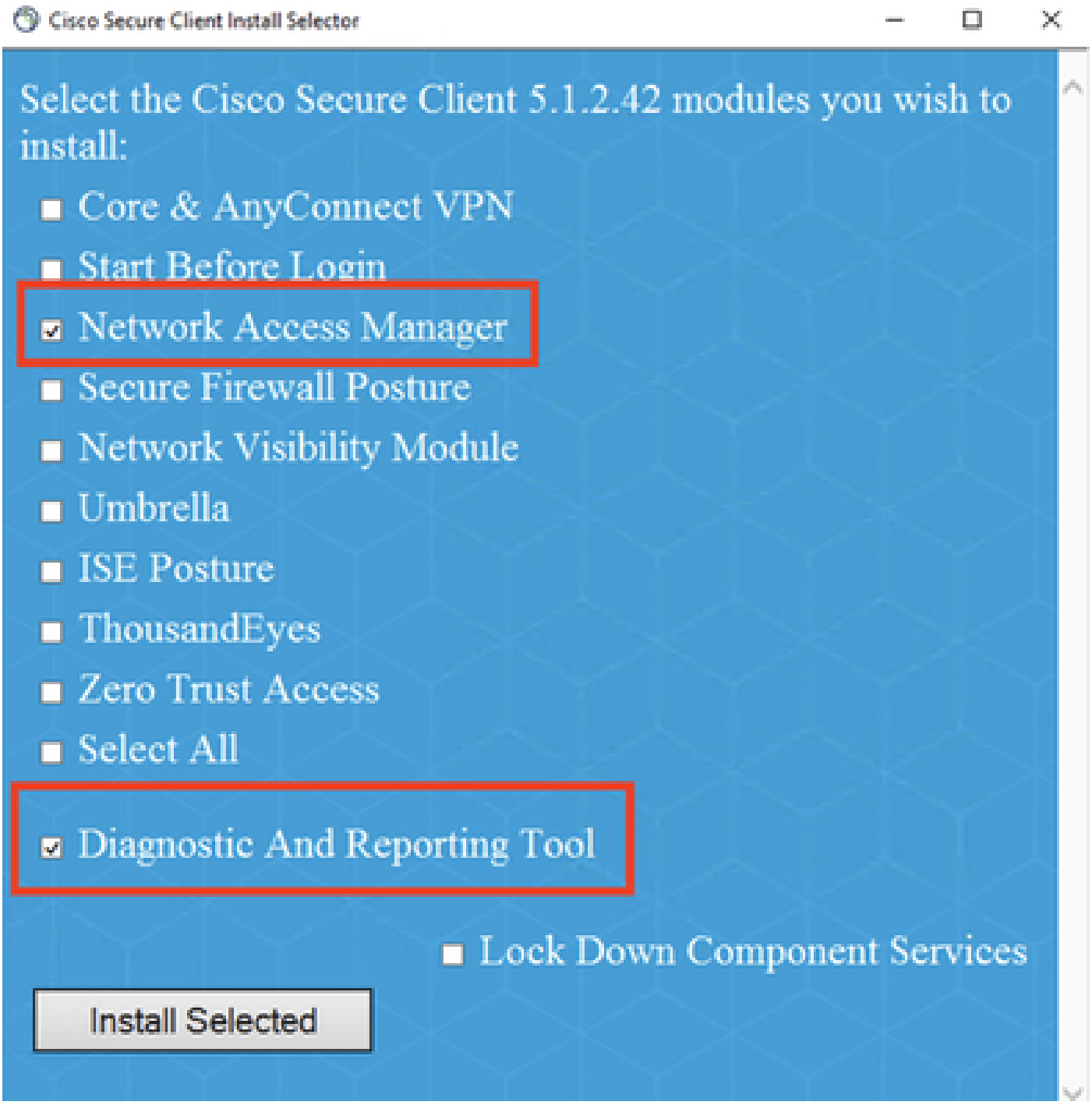


Secure Client Files

Install the **Network Access Manager** and the **Diagnostics and Reporting Tool** modules.



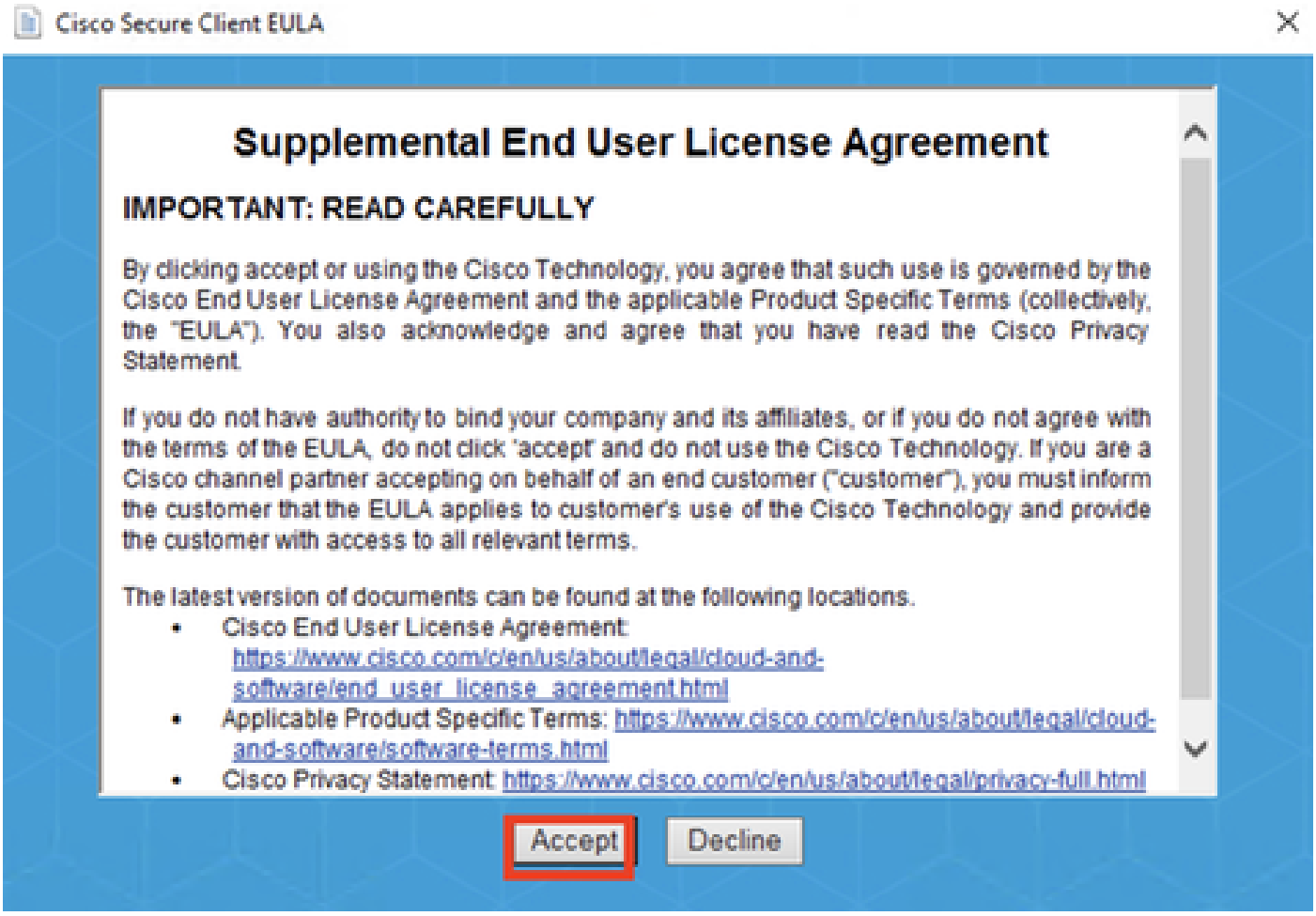
Warning: If you use Cisco Secure Client Wizard, the VPN module is installed automatically, and hidden in the GUI. NAM does not work if the VPN module is not installed. If you use individual MSI files or a different installation method, ensure you install the VPN module.



Install Selector

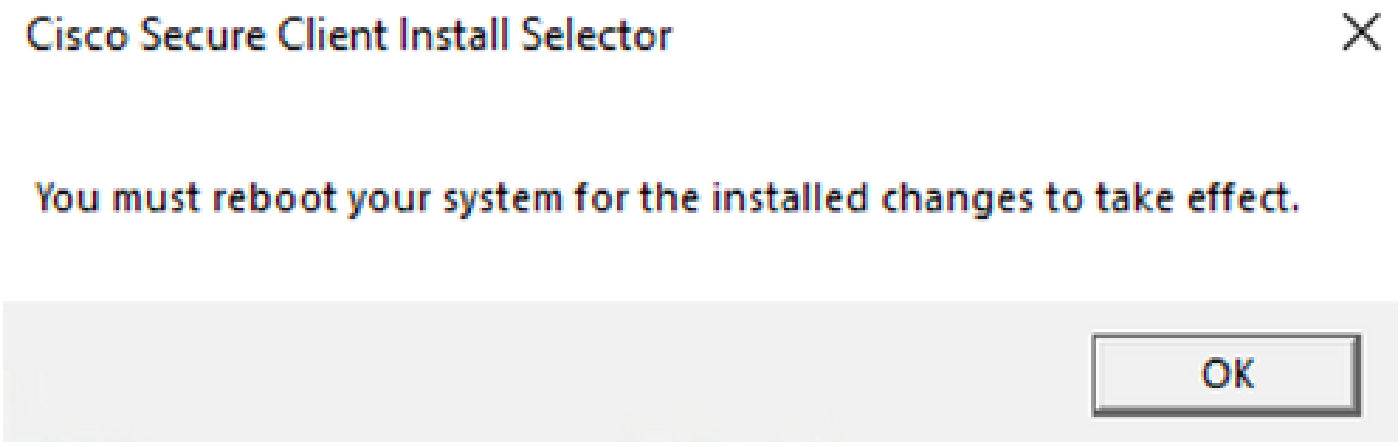
Click **Install Selected**.

Accept the EULA.



EULA Window

A restart is required after NAM installation.



Reboot Requirement Window

Once installed it can be found and opened from the Windows Search bar.

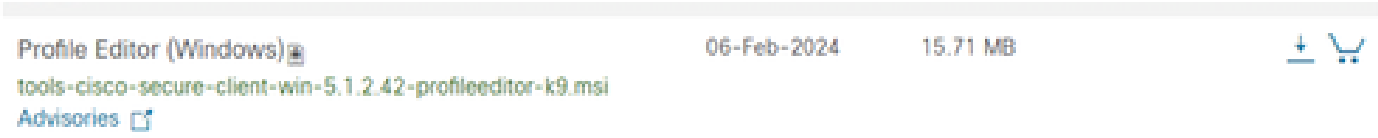
Secure Client Program

2. Download and Install Secure Client NAM Profile Editor.

Cisco Network Access Manager Profile Editor is required to configure the Dot1x preferences.

From the same page where Secure Client is downloaded, the **Profile Editor** option is found.

This example uses the option with version 5.1.2.42.



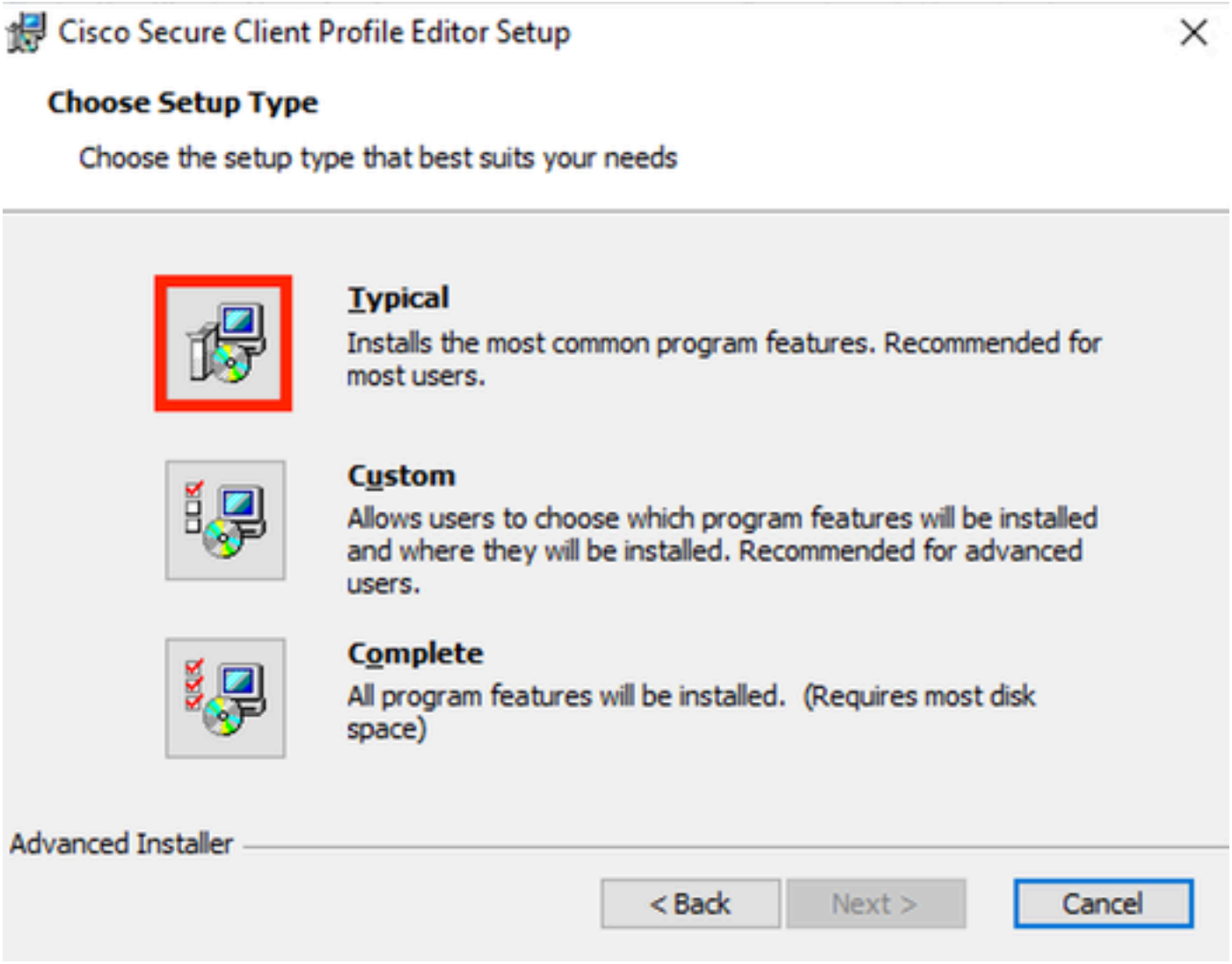
Profile Editor

Once it downloaded, proceed with the installation.

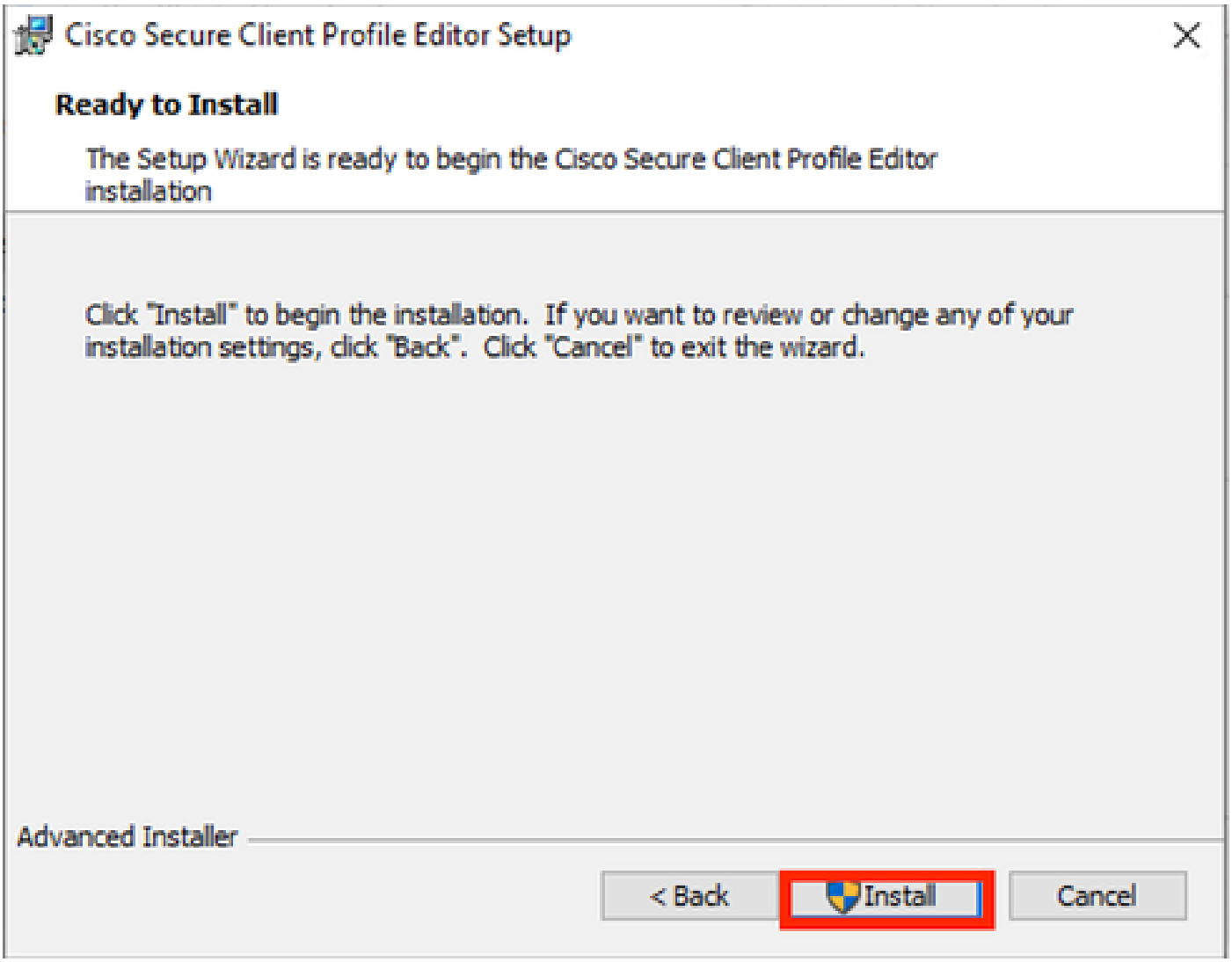
Run the msi file.

Profile Editor Setup Window

Use the **Typical** setup option.

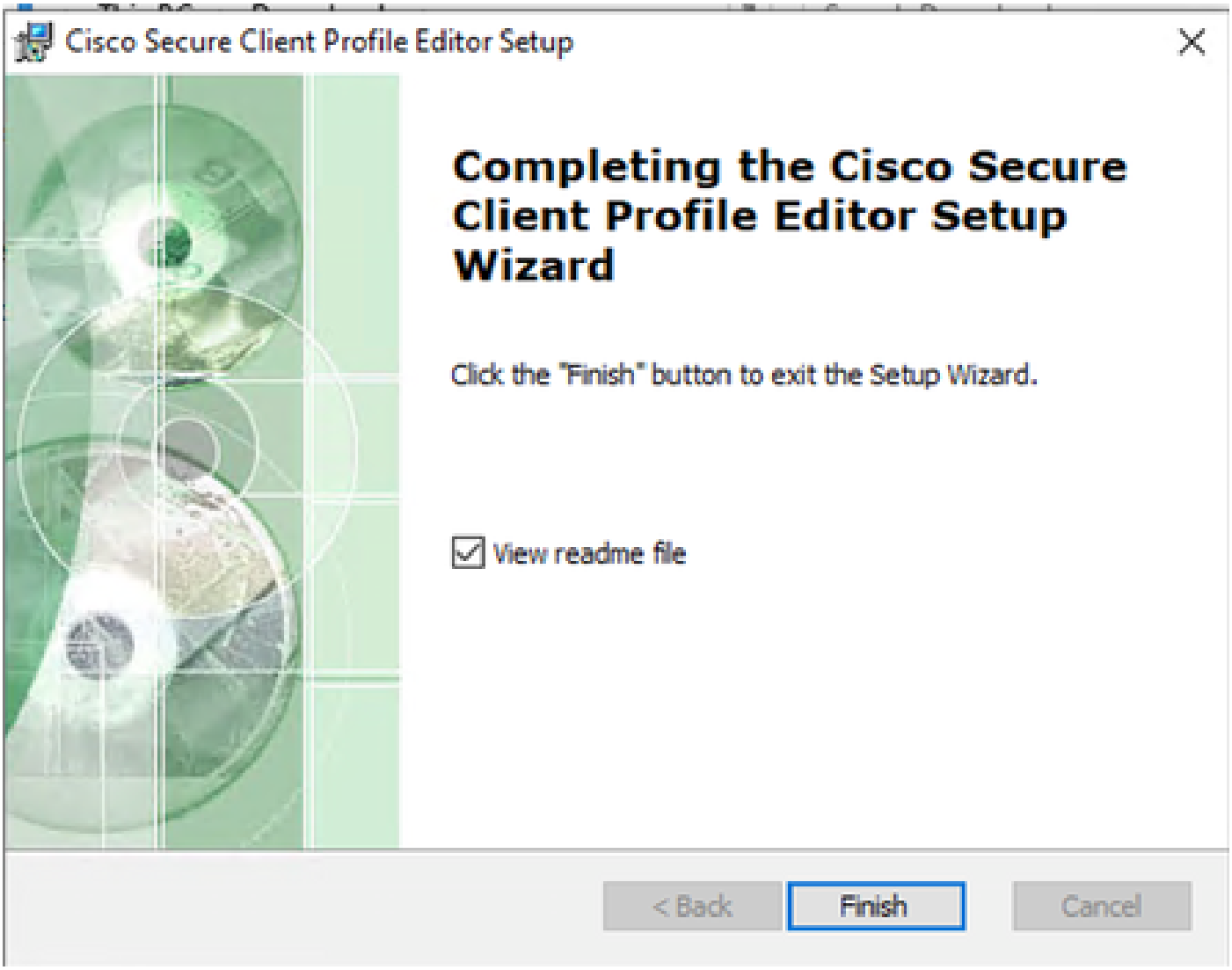


Profile Editor Setup



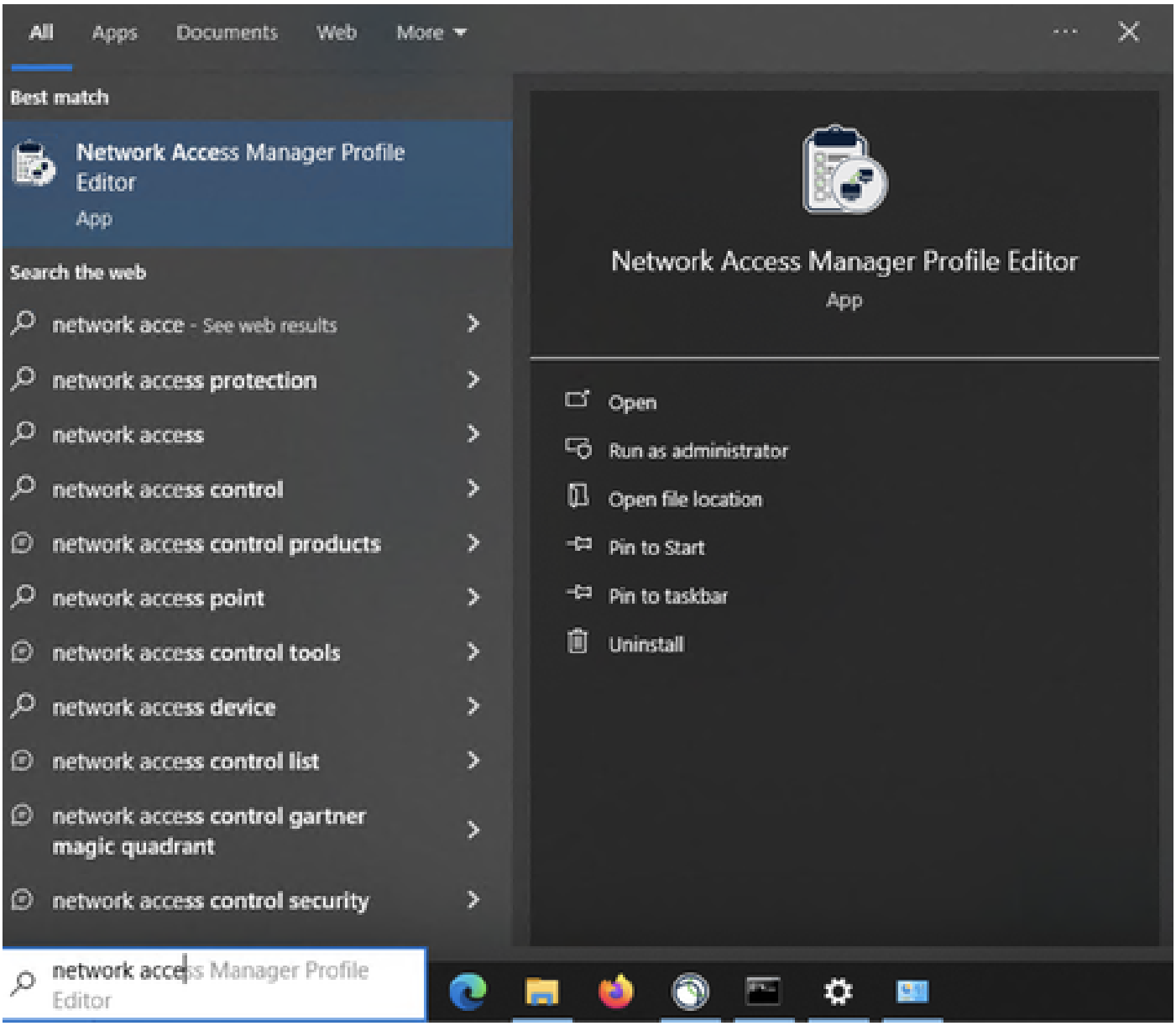
Installation Window

Click **Finish**.



End of Profile Editor Setup

Once installed, open **Network Access Manager Profile Editor** from the search bar.



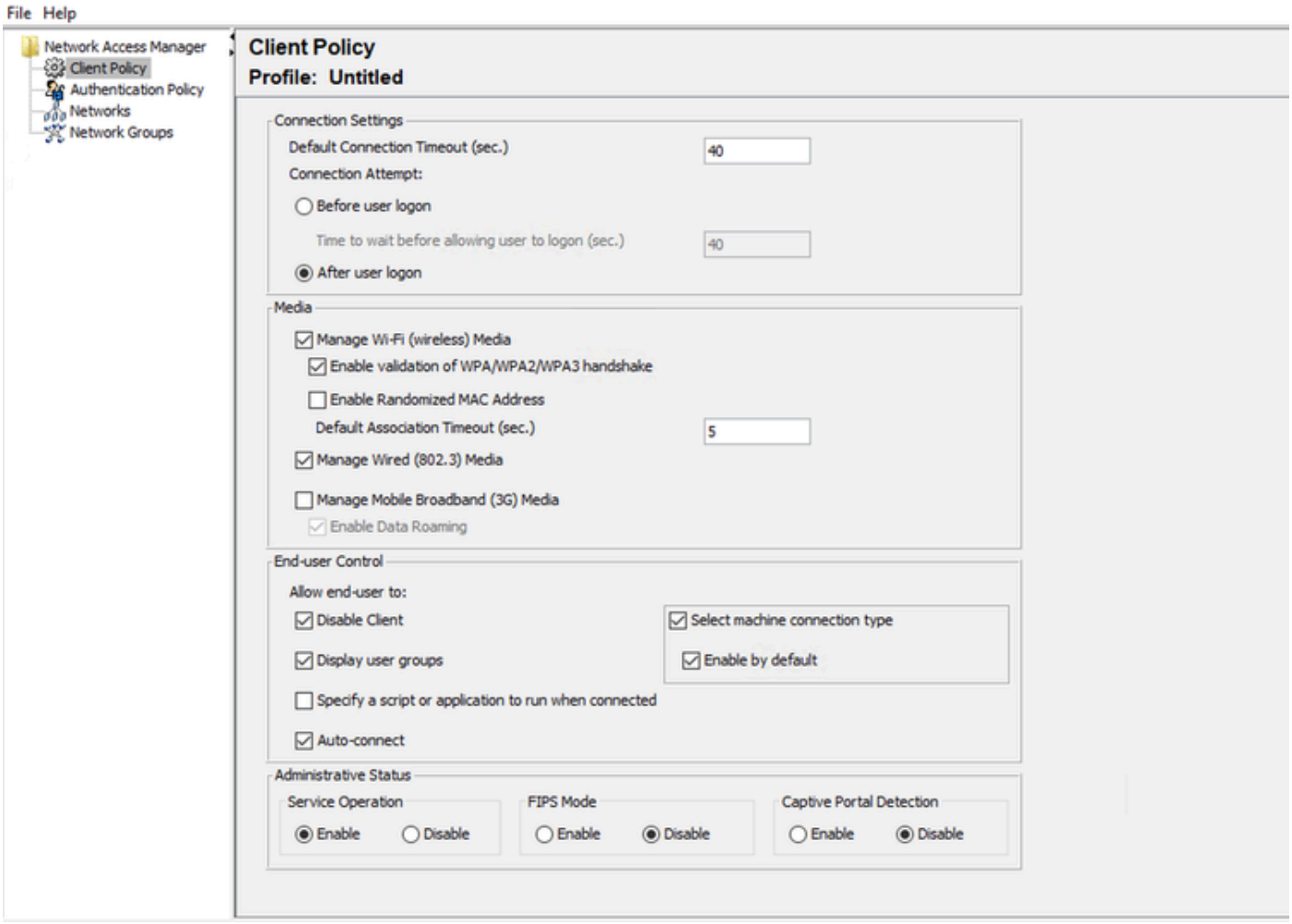
Profile Editor for NAM on Search Bar

Installation of Network Access Manager and Profile Editor is completed.

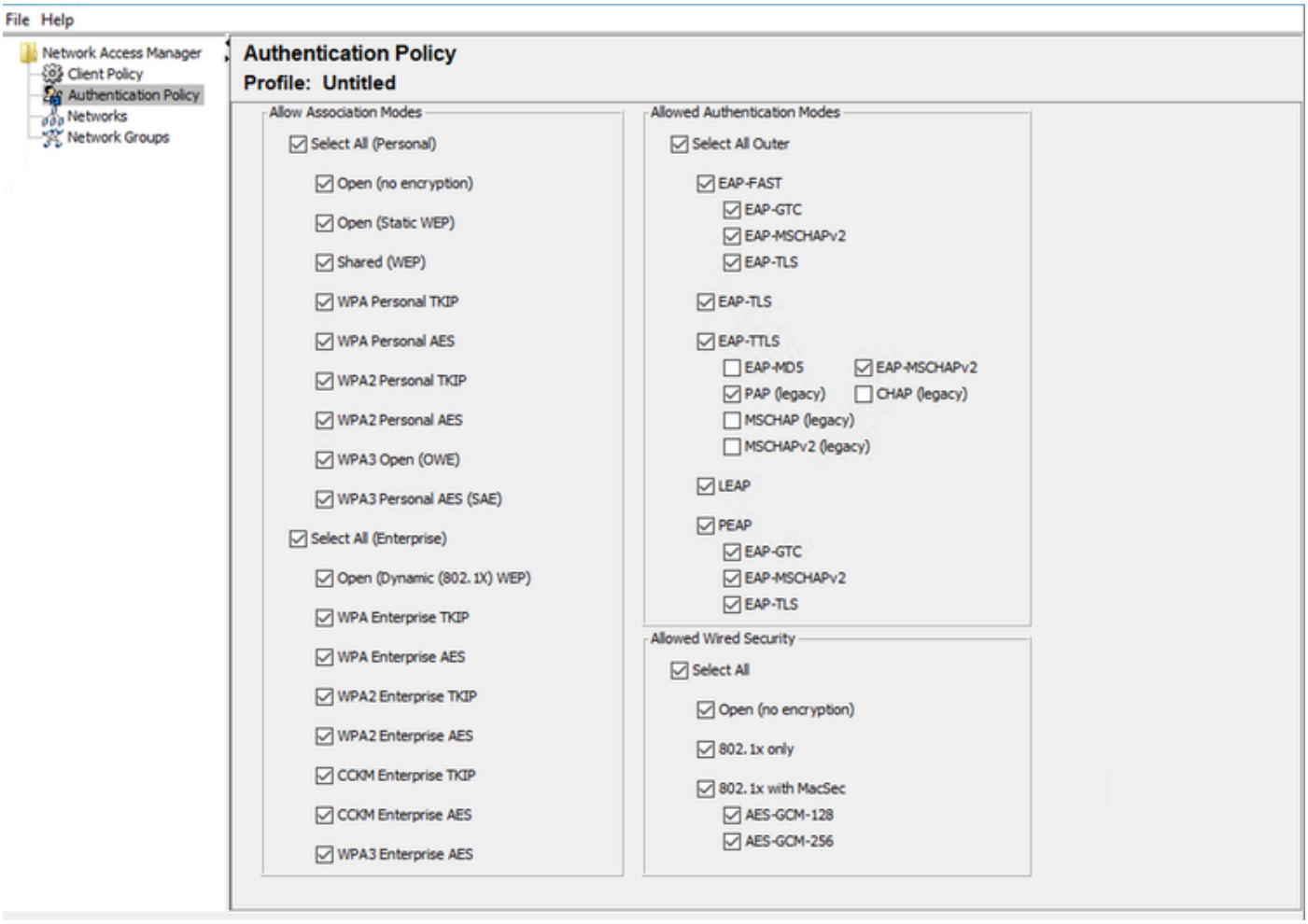
3. General Default Configurations

All the scenarios presented in this article contain configurations for:

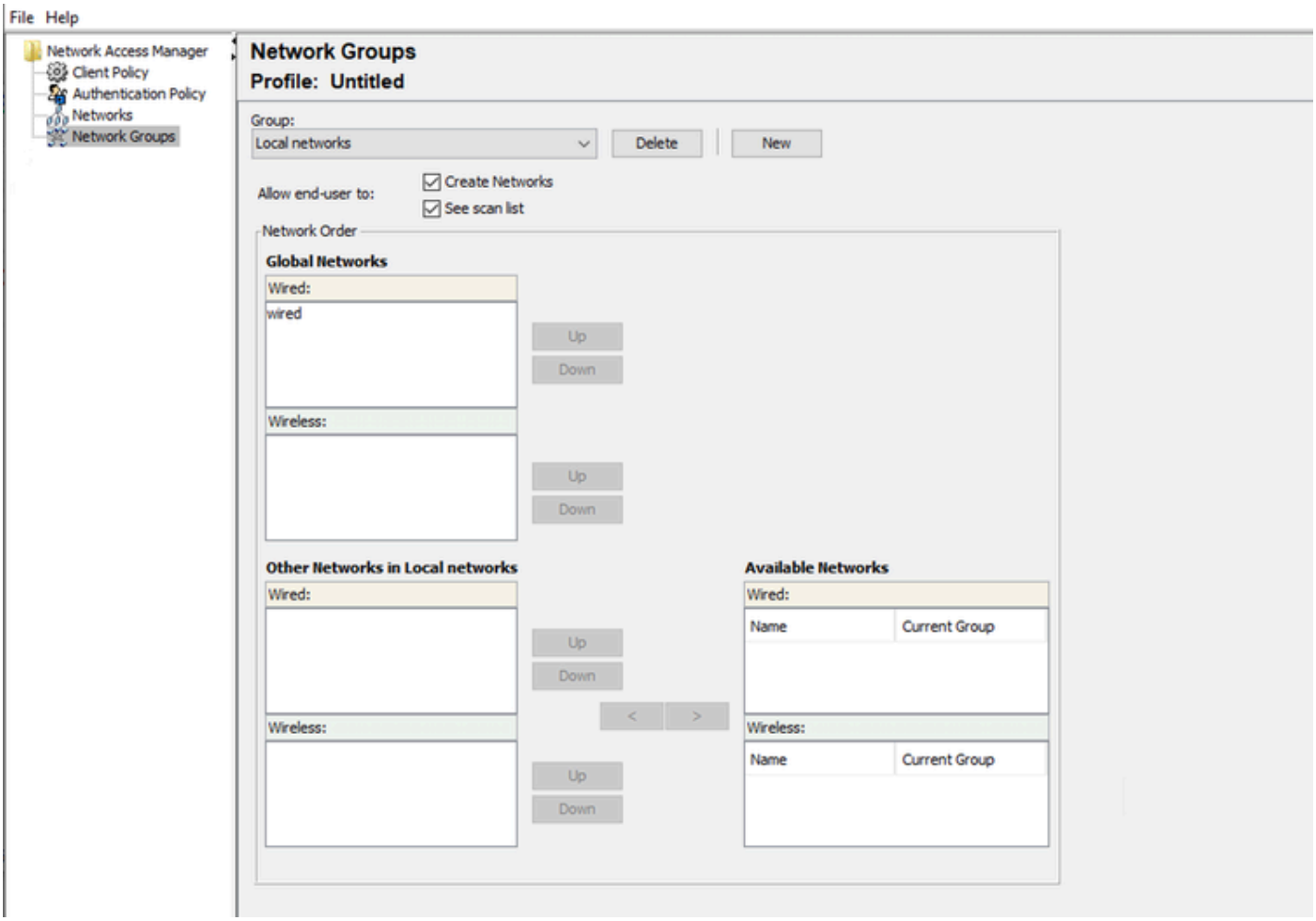
- Client Policy
- Authentication Policy
- Network Groups



NAM Profile Editor Client Policy



NAM Profile Editor Authentication Policy



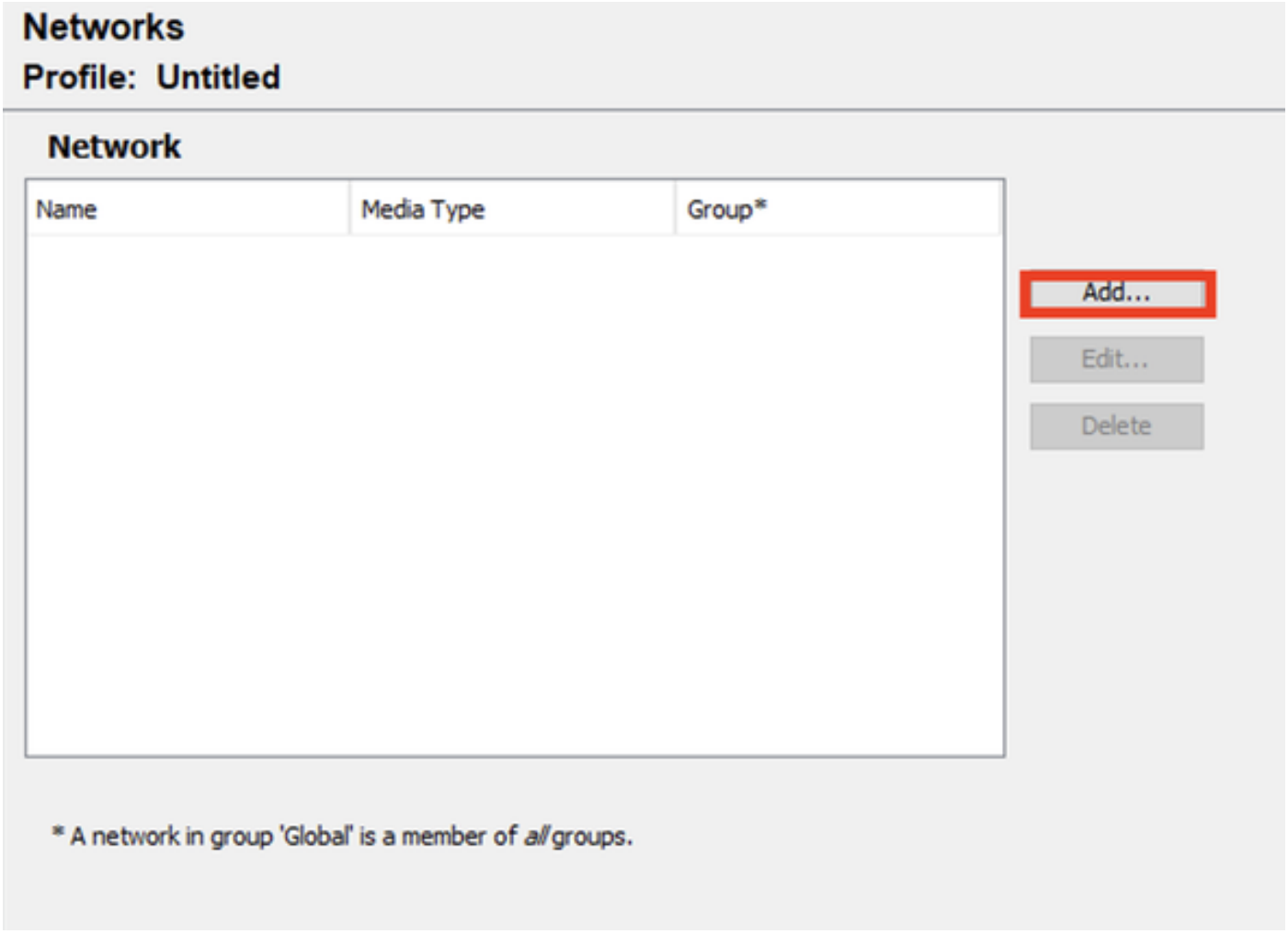
Network Groups Tab

4. Scenario 1: Configure Secure Client NAM Supplicant for PEAP (MS-CHAPv2) User Authentication

Navigate to the **Networks** section.

The default **Network** profile can be deleted.

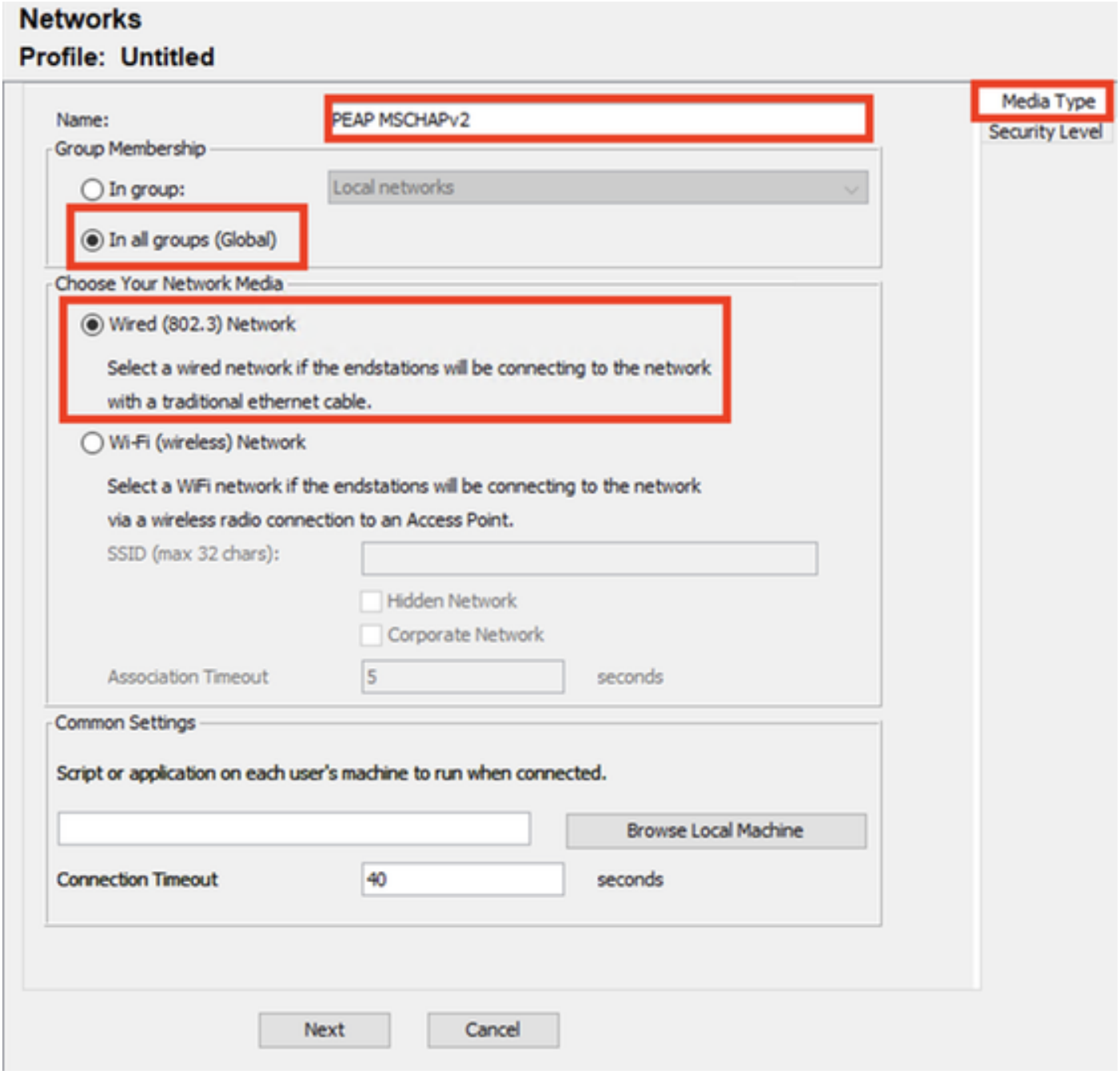
Click **Add**.



Network Profile Creation

Name the **Network** profile.

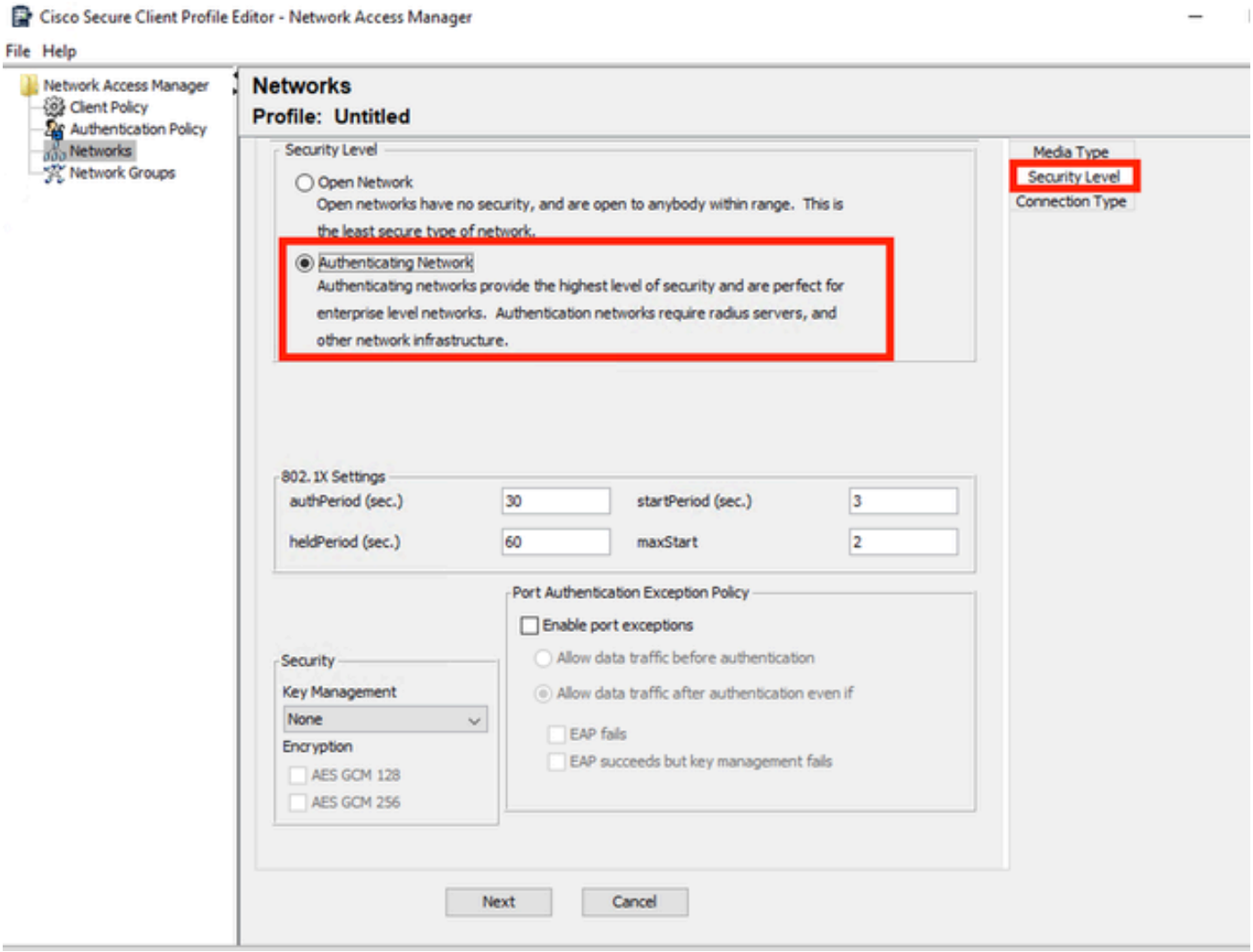
Select **Global** for **Group Membership**. Select **Wired Network** media.



Network Profile Media Type Section

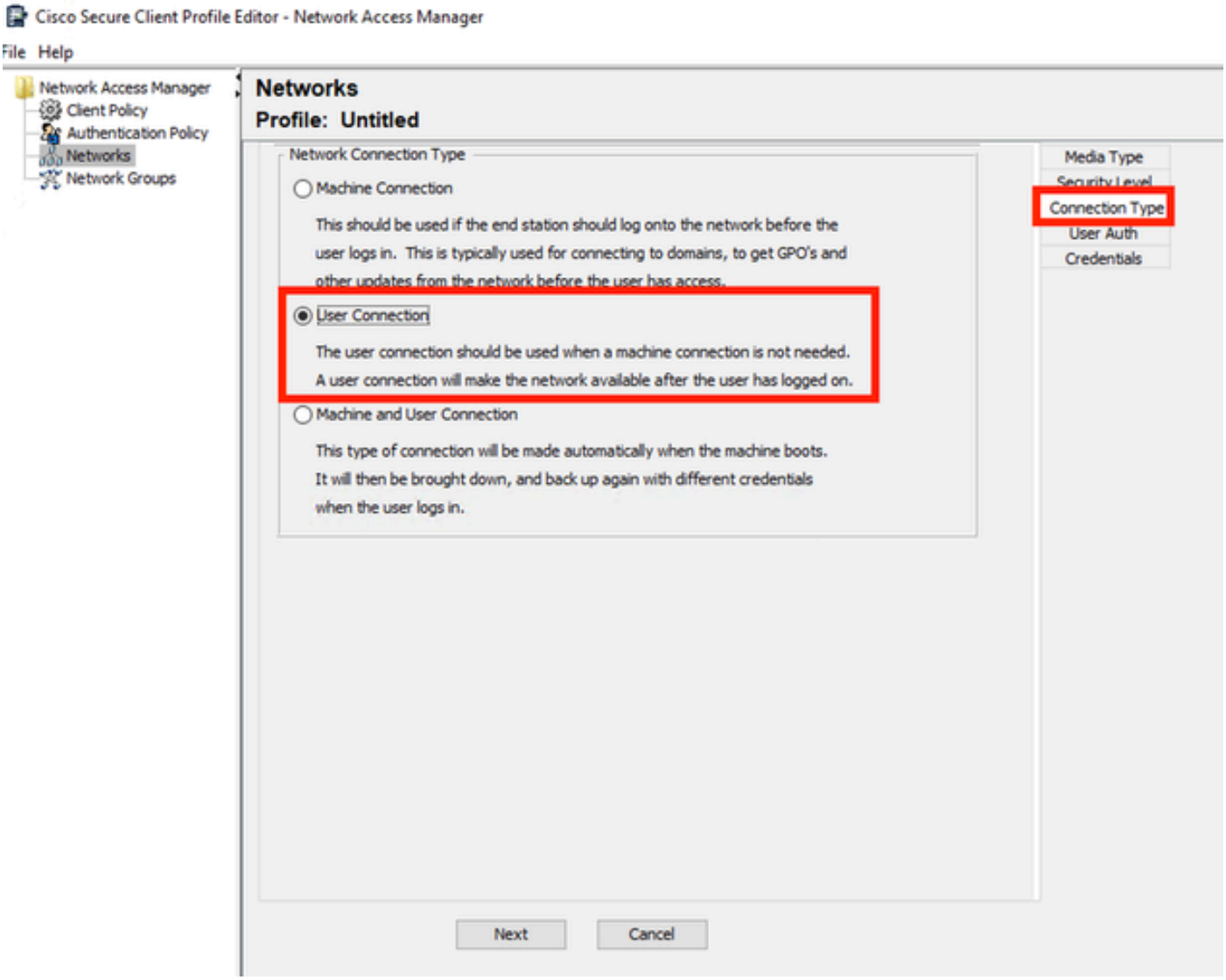
Click **Next**.

Select **Authenticating Network** and use the default for the rest of the options in the **Security Level** section.



Network Profile Security Level

Click **Next** to continue with the **Connection Type** section.

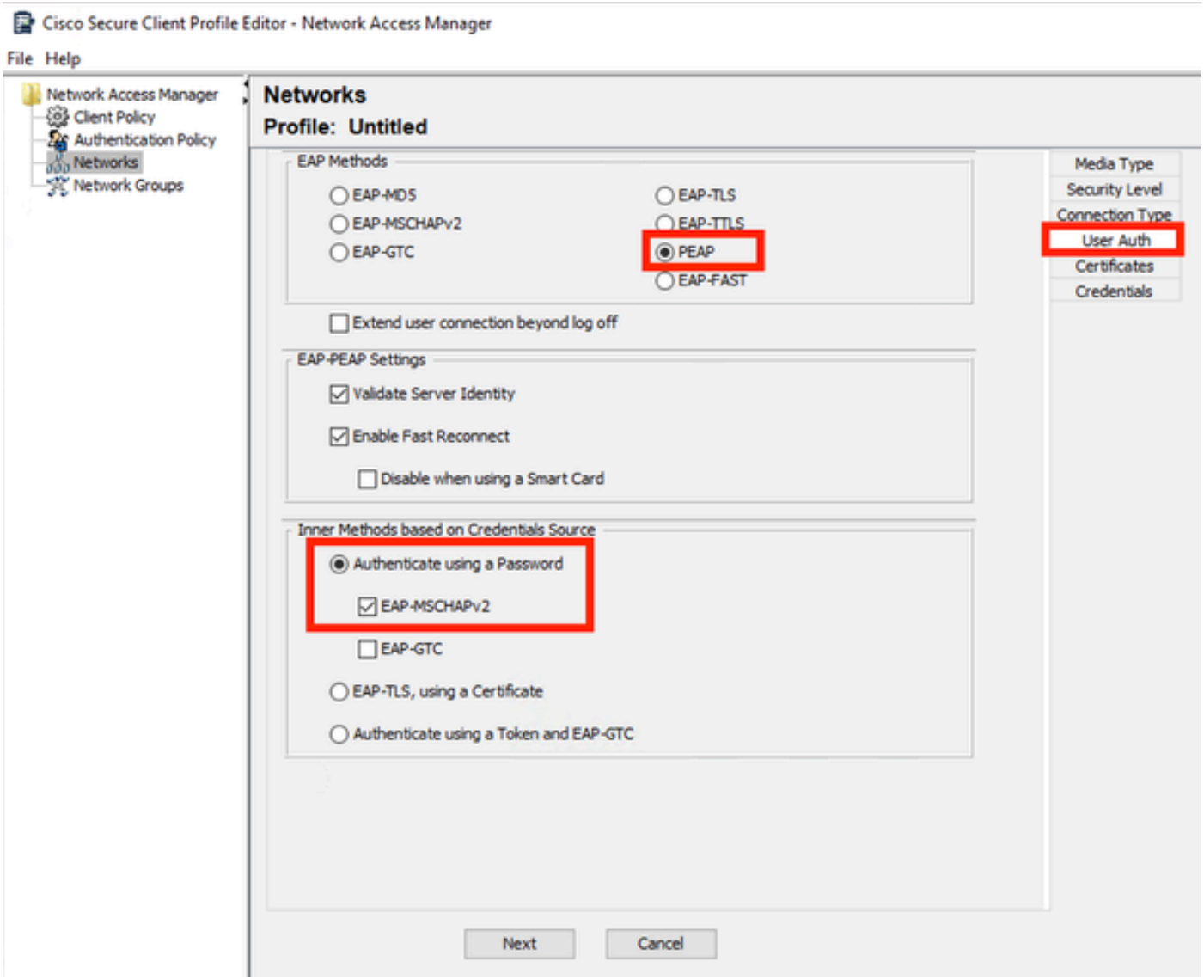


Netowork Profile Connection Type

Select the **User Connection** connection type.

Click **Next** to continue with the **User Auth** section which is now available.

Select **PEAP** as the general **EAP Method**.



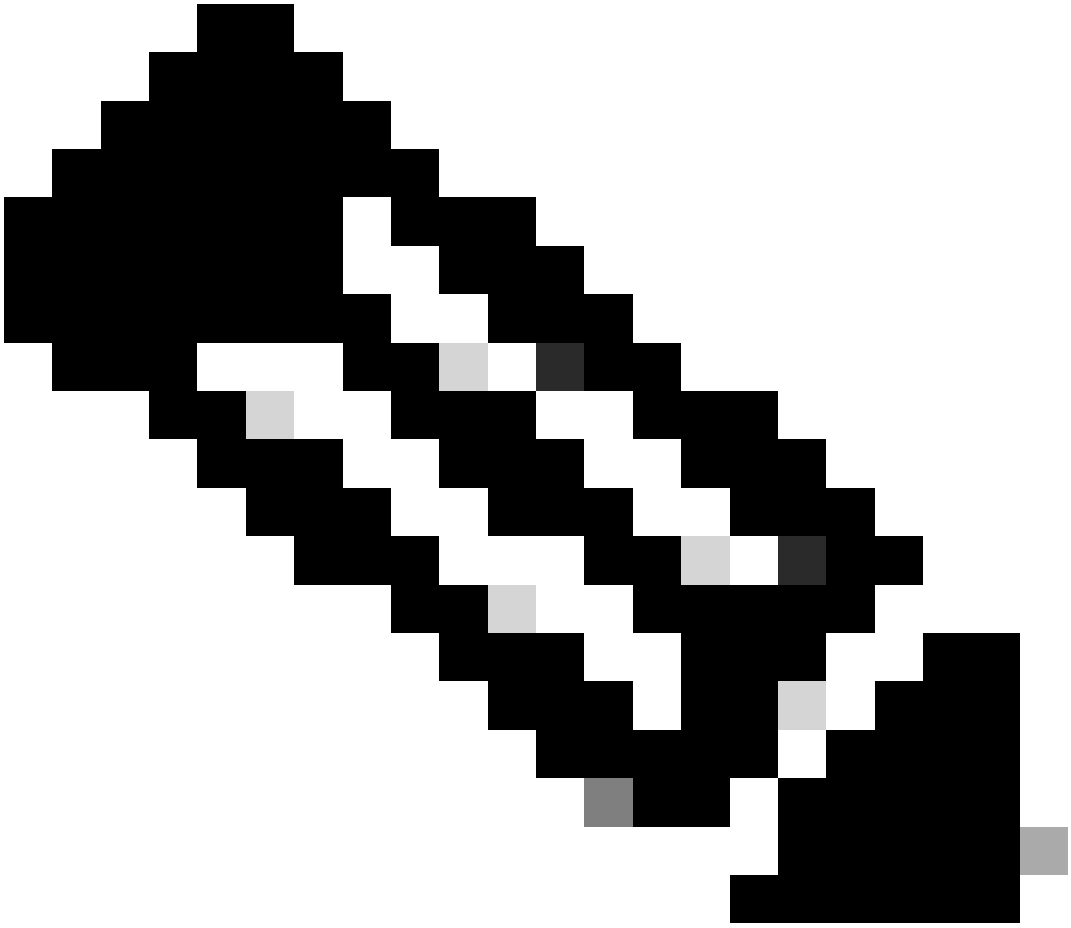
Netowork Profile User Auth

Do not change the default values in the **EAP-PEAP Settings**.

Continue with the **Inner Methods based on Credentials Source** section.

From the multiple inner methods that exist for EAP PEAP, select **Authenticate using a Password** and select **EAP-MSCHAPv2**.

Click **Next** to continue to the **Certificate** section.

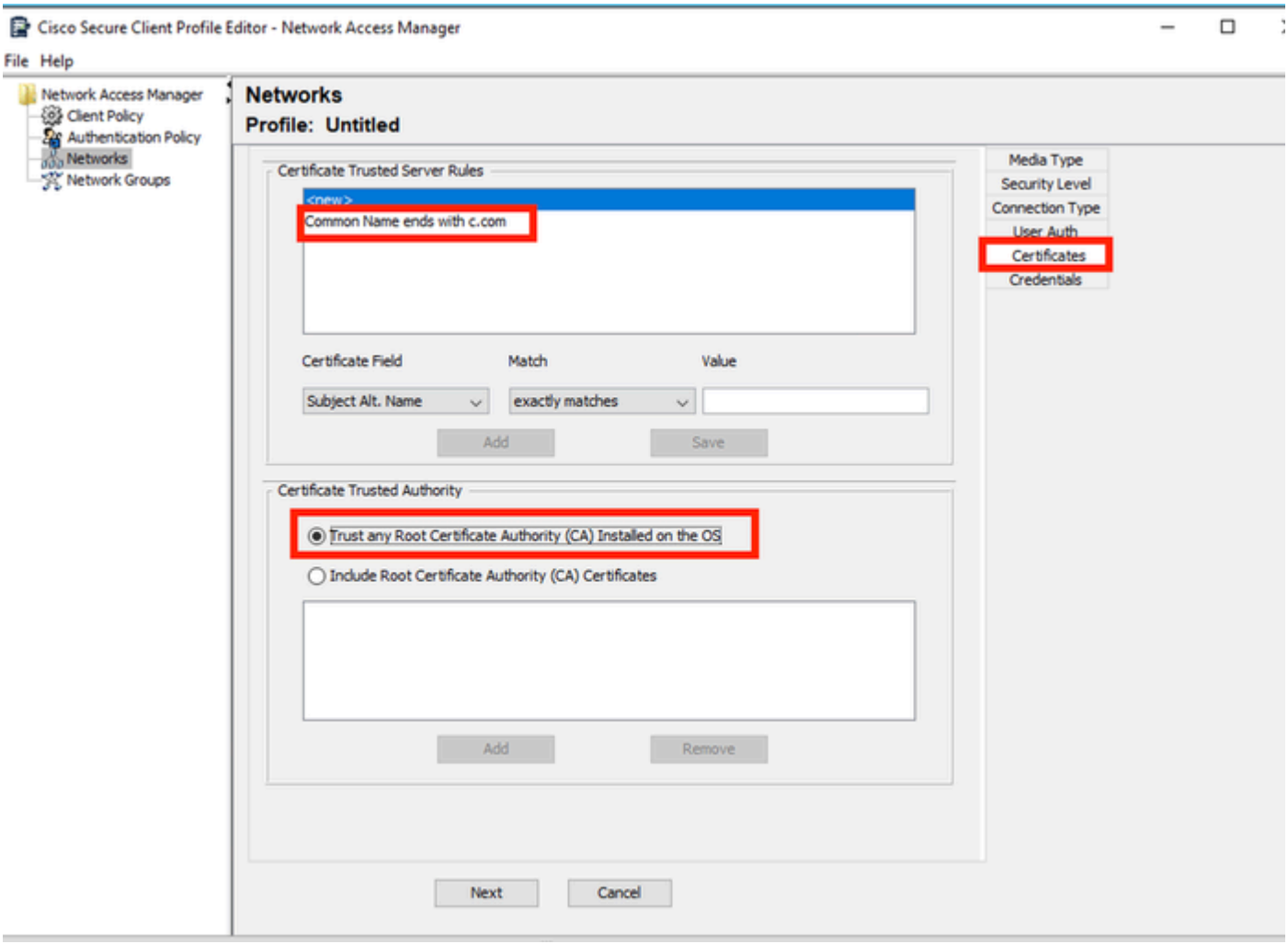


Note: The **Certificate** section is displayed because the option **Validate Server Identity** in **EAP-PEAP Settings** is selected. For EAP PEAP, it does the encapsulation using the server certificate.

On the **Certificates** section, in **Certificate Trusted Server Rules** the rule **Common Name end with c.com** is used.

This section of the configuration refers to the certificate that the server uses during the EAP PEAP flow.

If Identity Service Engine (ISE) is used on your environment, you can use the common name of the **Policy Server Node EAP Certificate**.

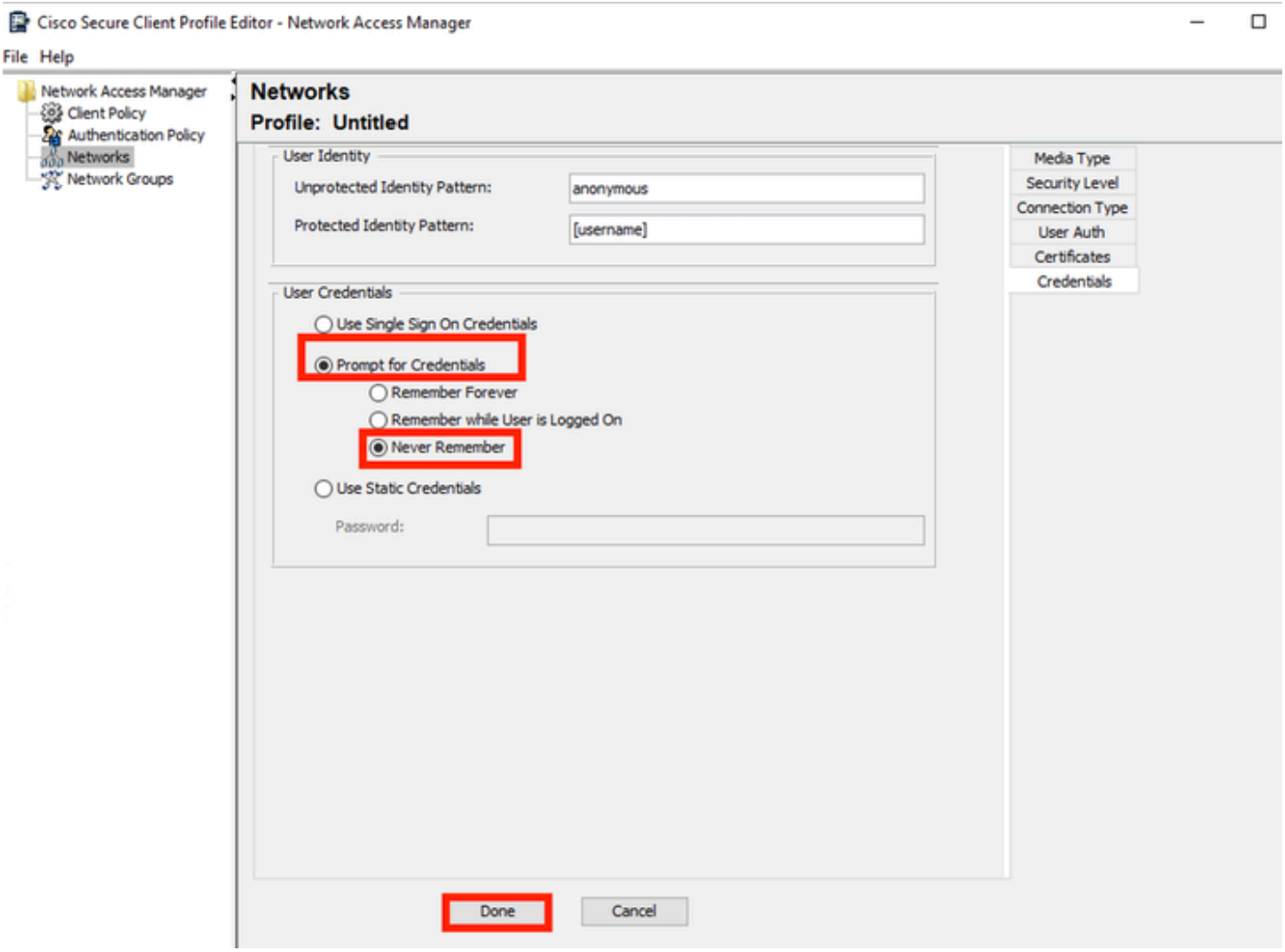


Network Profile Certificate Section

Two options can be selected in **Certificate Trusted Authority**. For this scenario instead of adding a specific CA Certificate that signed the RADIUS EAP cert, the option **Trust any Root Certificate Authority (CA) Installed on the OS** is used.

With this option the Windows device trusts any EAP cert that is signed by a cert included in Manage User Certs program Certificates — **Current User > Trusted Root Certification Authorities > Certificates**.

Click **Next**.



Network Profile Credentials Section

In the **Credentials** section only the **User Credentials** section is changed.

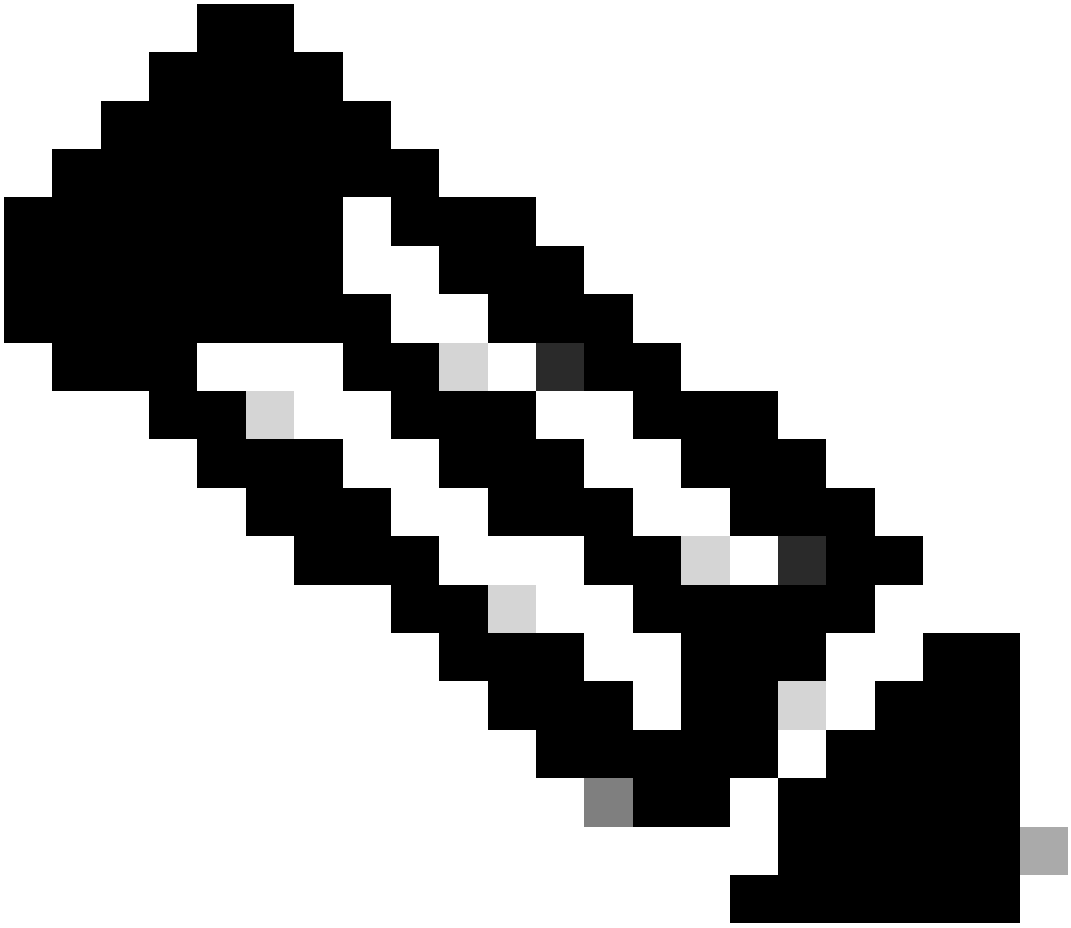
The option **Prompt for Credentials > Never Remember** is selected, so in each authentication, the user making the authentication must enter their credentials.

Click **Done**.

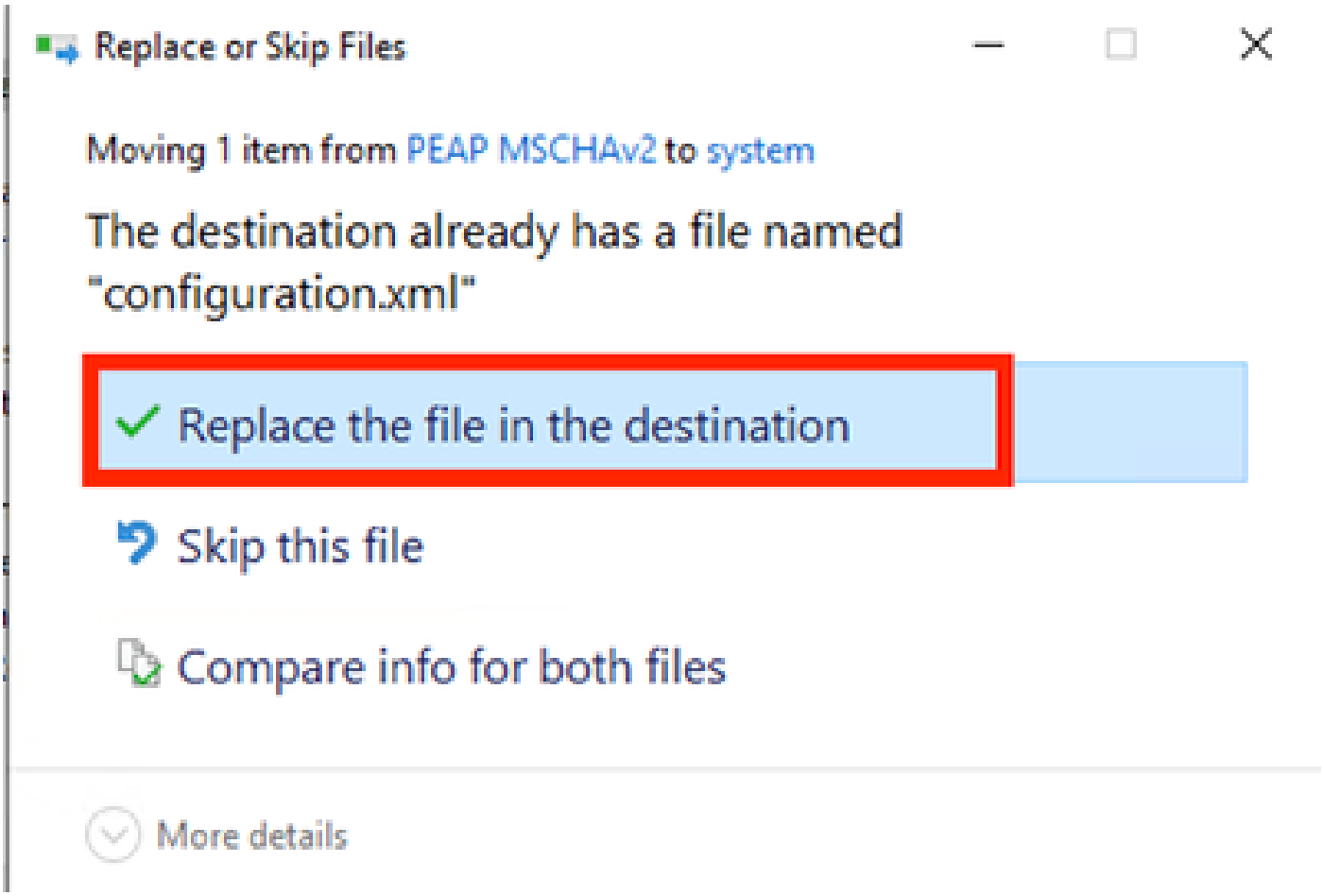
Save the Secure Client Network Access Manager profile, as **configuration.xml** with the **File > Save As** option.

To make Secure Client Network Access Manage use the profile that was just created, replace the configuration.xml file in the next directory with the new one:

C:\ProgramData\Cisco\Cisco Secure Client\Network Access Manager\system



Note: The file must be named configuration.xml, otherwise it does not work.

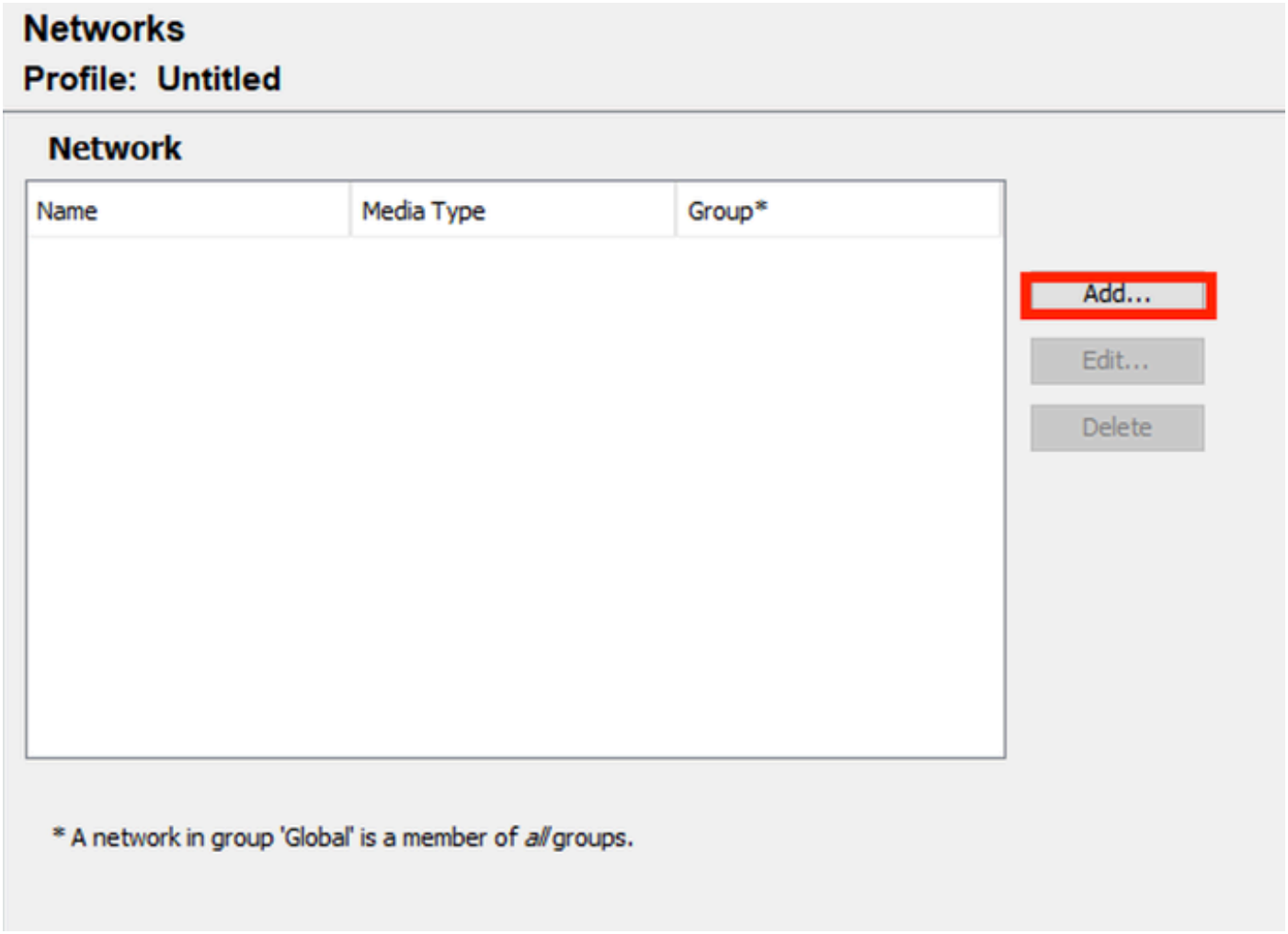


Replace File Section

5. Scenario 2: Configure Secure Client NAM Supplicant for EAP-FAST Simultaneous User and Machine Authentication

Open NAM Profile Editor and navigate to the **Networks** section.

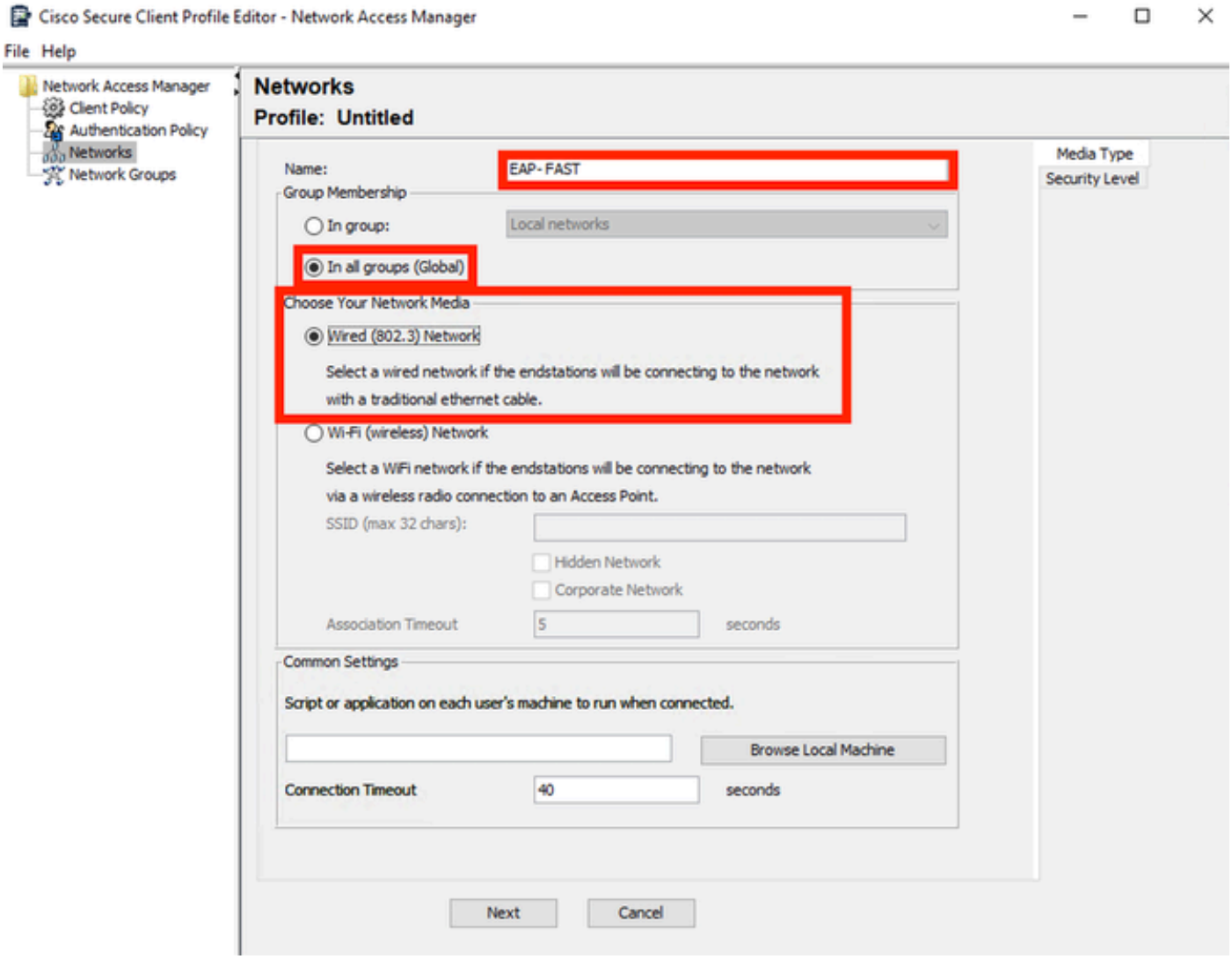
Click **Add**.



NAM Profile Editor Network Tab

Enter a name in the network profile.

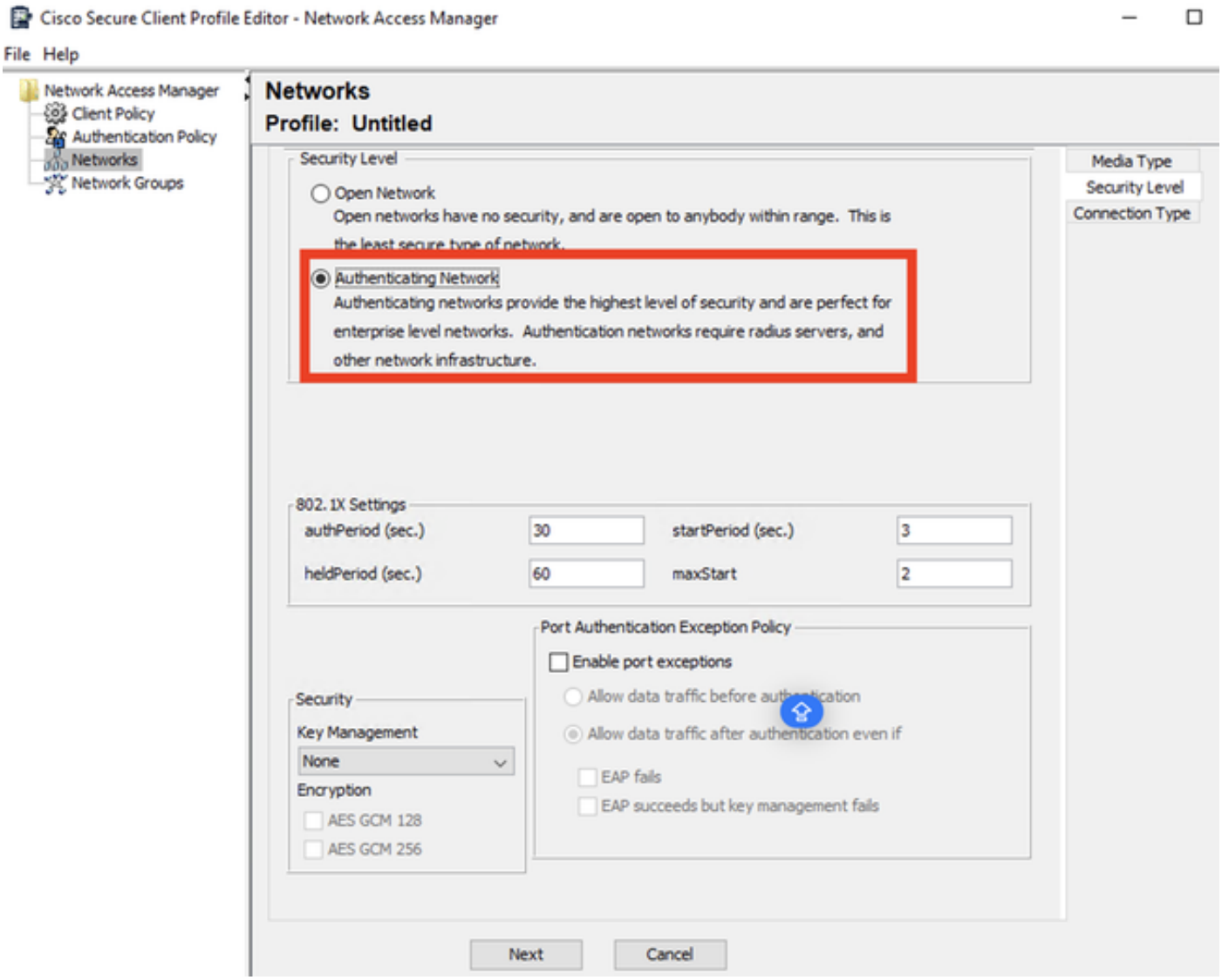
Select **Global** for **Group Membership**. Select **WiredNetwork** Media.



Media Type Section

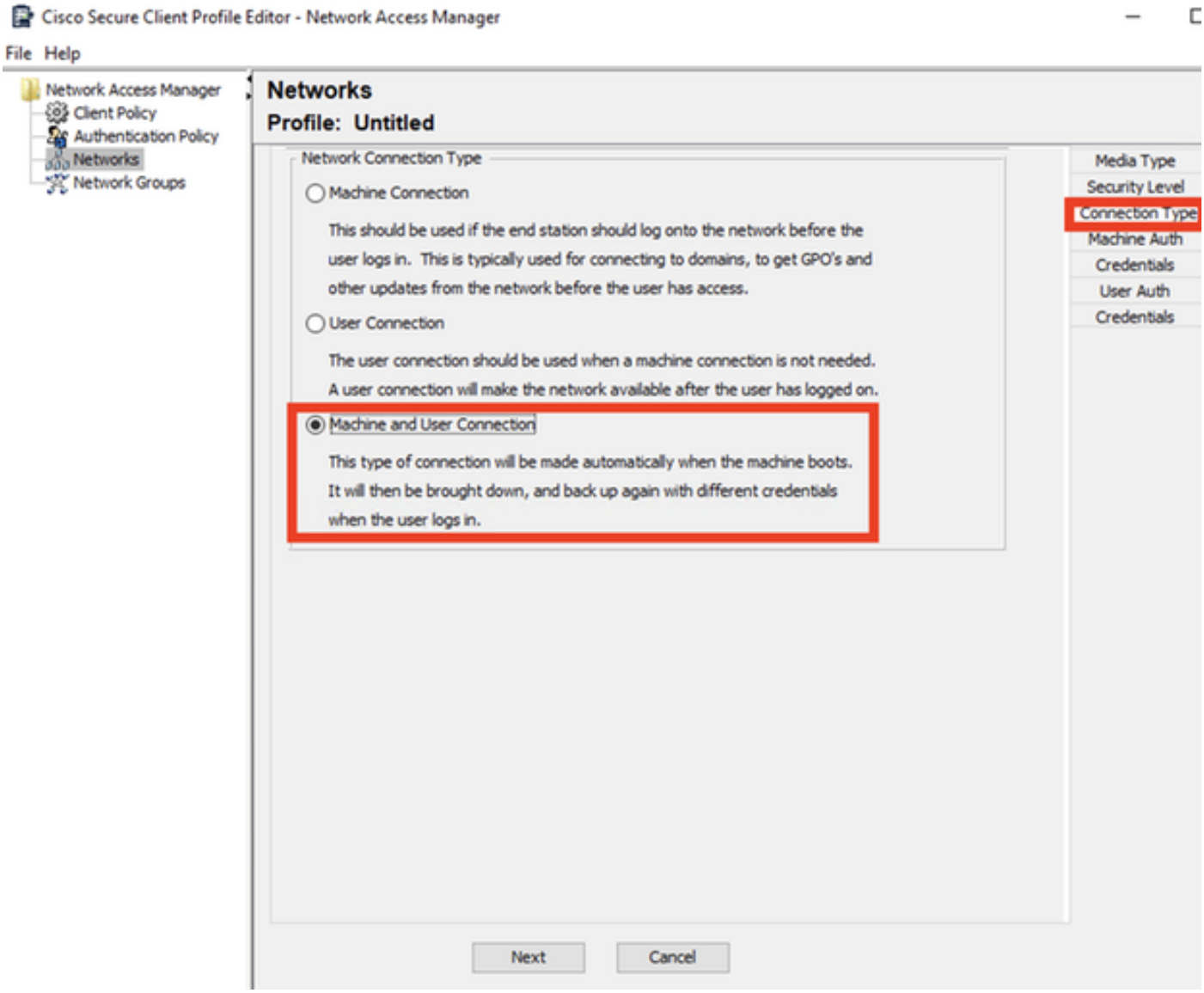
Click **Next**.

Select **Authenticating Network** and do not change the default values for the rest of the options in this section.



Security Level Profile Editor Section

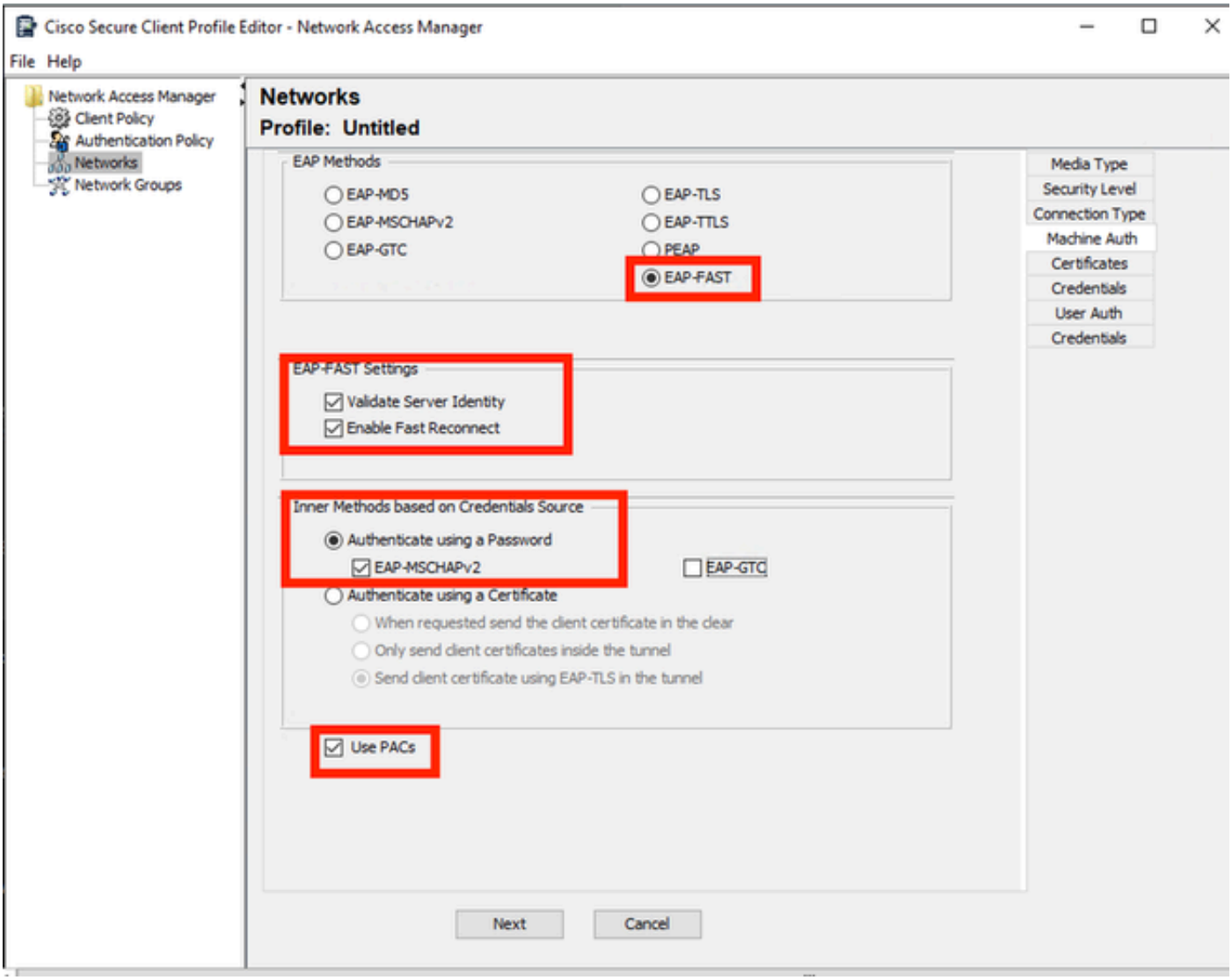
Click **Next** to continue with the **Connection Type** section.



Connection Type Section

Configure user and machine authentication simultaneously by selecting the third option.

Click **Next**.



Machine Auth Section

In the **Machine Auth** section select **EAP-FAST** as the EAP method. Do not change the **EAP FAST Settings** default values.

For the **Inner methods based on Credentials Source** section select **Authenticate using a Password** and **EAP-MSCHAPv2** as the method.

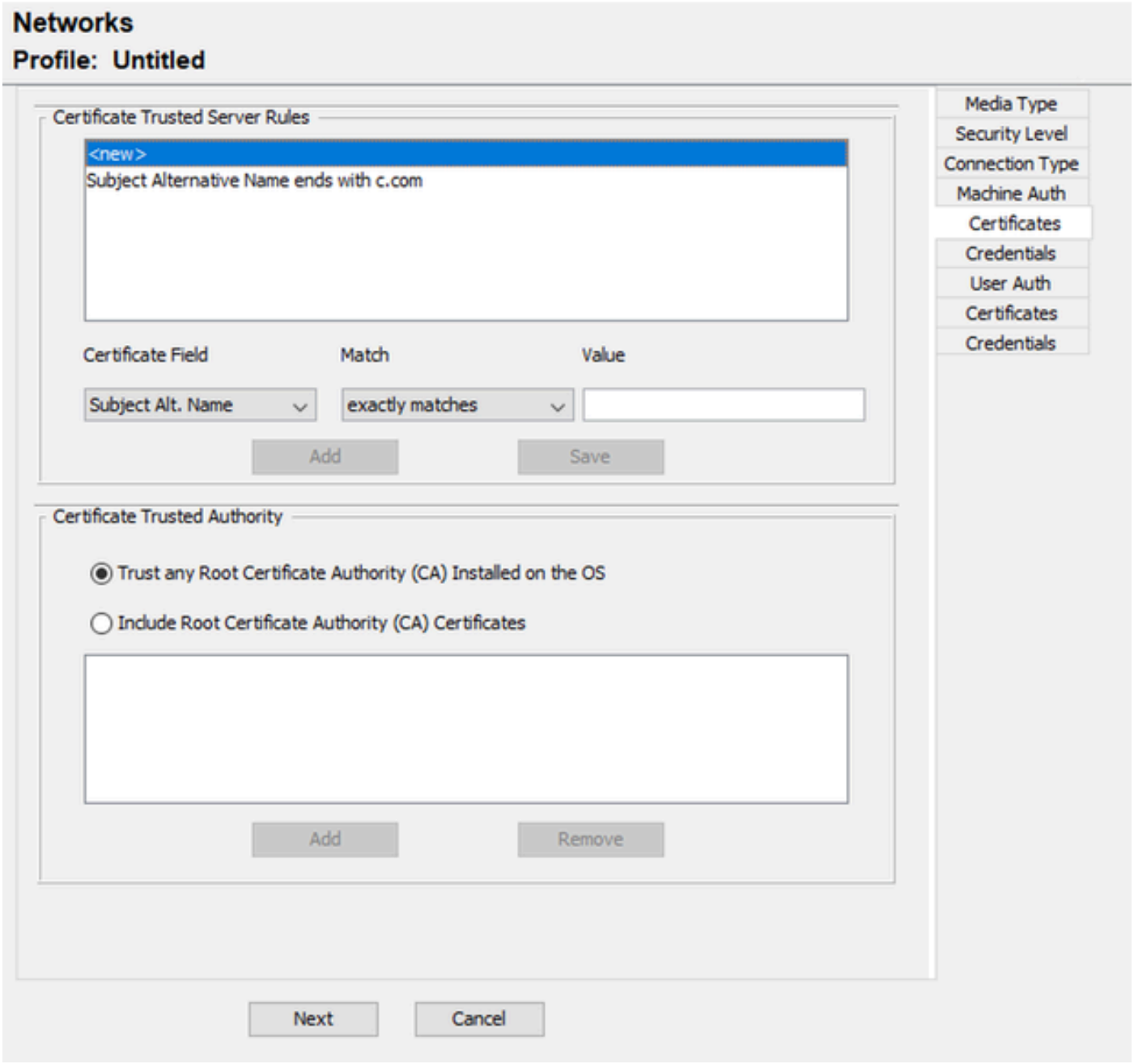
Then select **Use PACs** option.

Click **Next**.

On the **Certificates** section, in **Certificate Trusted Server Rules** the rule common name ends with c.com.

This section refers to the certificate that the server uses during the EAP PEAP flow.

If Identity Service Engine (ISE) is used on your environment the common name of the Policy Server Node EAP Certificate can be used.

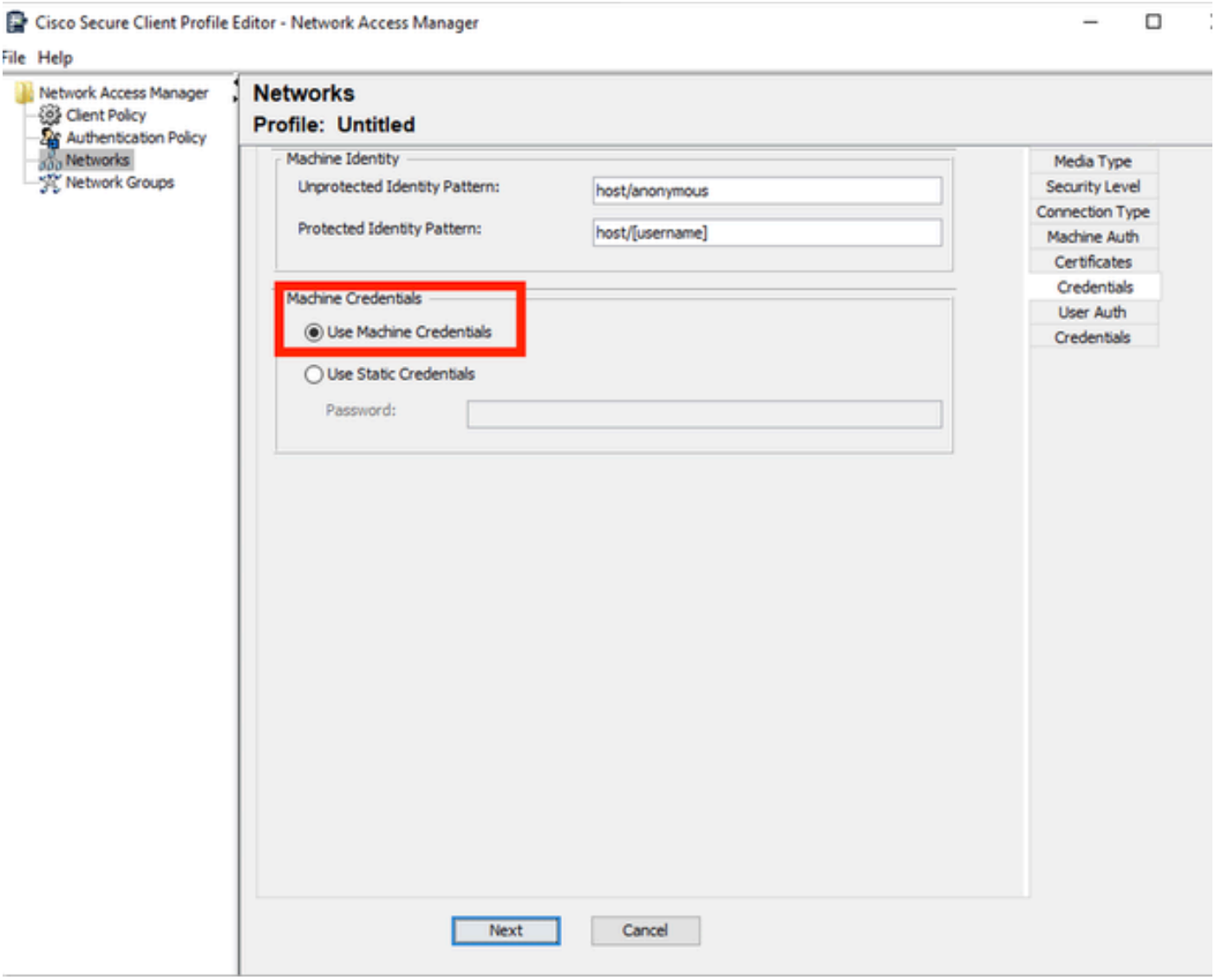


Machine Auth Server Certificate Trust section

Two options can be selected in **Certificate Trusted Authority**. For this scenario instead of adding a specific CA Certificate that signed the RADIUS EAP cert, use the option **Trust any Root Certificate Authority (CA) Installed on the OS**.

With this option, Windows trusts any EAP cert that is signed by a cert included in the Manage User Certs program (**Current User > Trusted Root Certification Authorities > Certificates**).

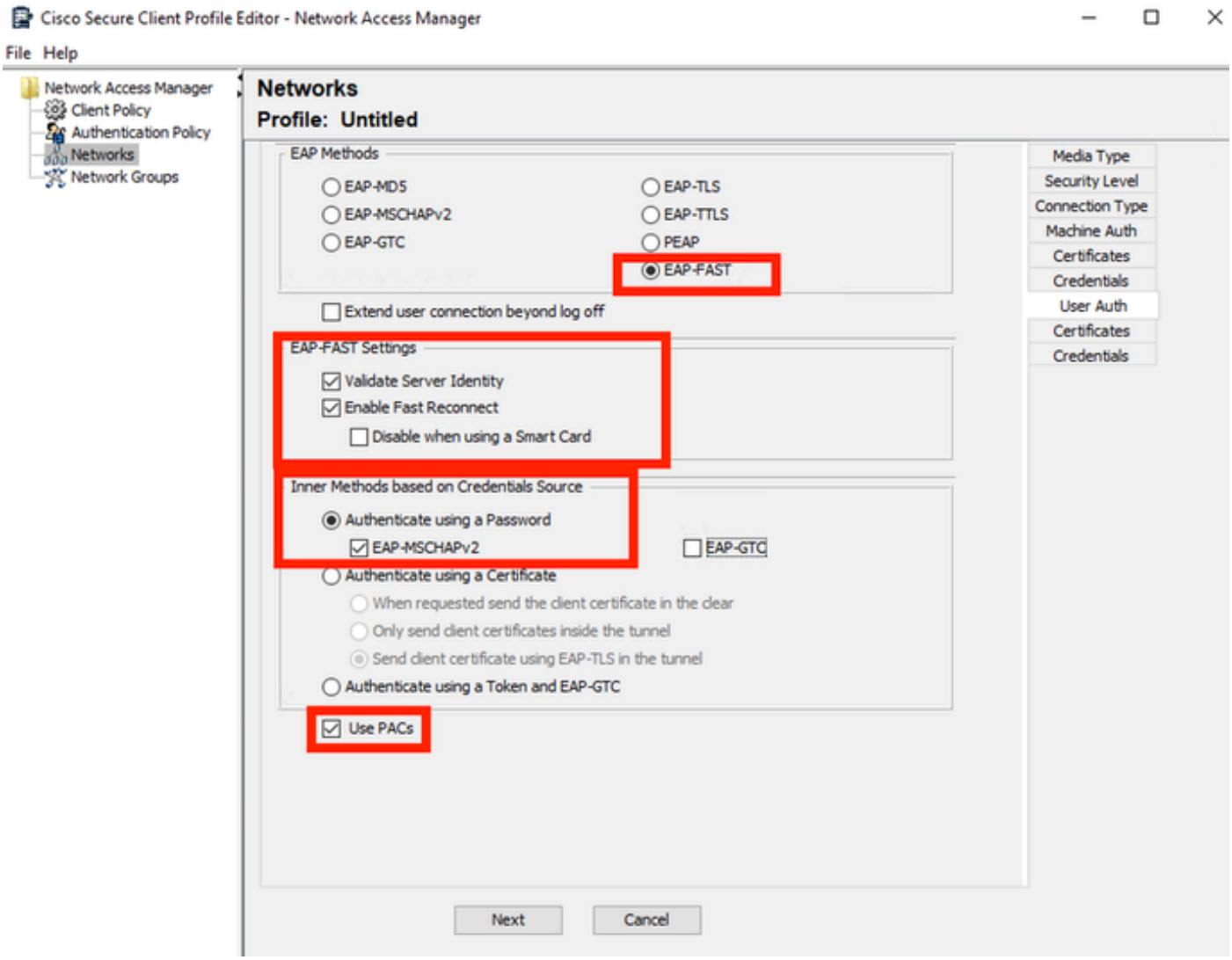
Click **Next**.



Mahine Auth Credentials Section

Select **Use Machine Credentials** in the **Machine Credentials** section.

Click **Next**.



User Authentication Section

For **User Auth**, select **EAP-FAST** as the **EAP Method**.

Do not change the default values in the **EAP-FAST** settings section.

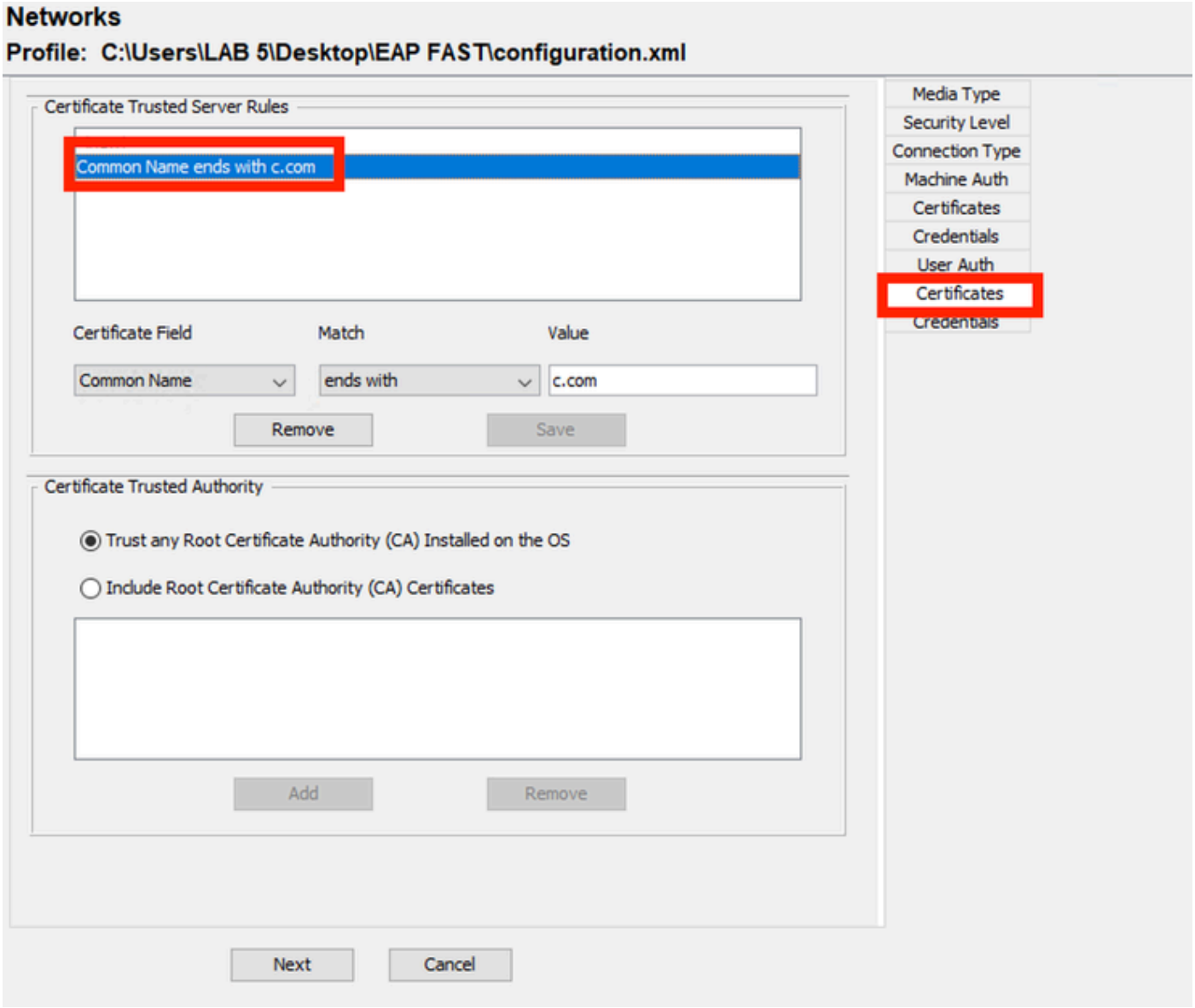
For the Inner Method based on credentials source section, select **Authenticate using a Password** and **EAP-MSCHAPv2** as the method.

Select **Use PACs**.

Click **Next**.

In the **Certificates** section, in **Certificate Trusted Server Rules**, the rule is **Common Name ends with c.com**.

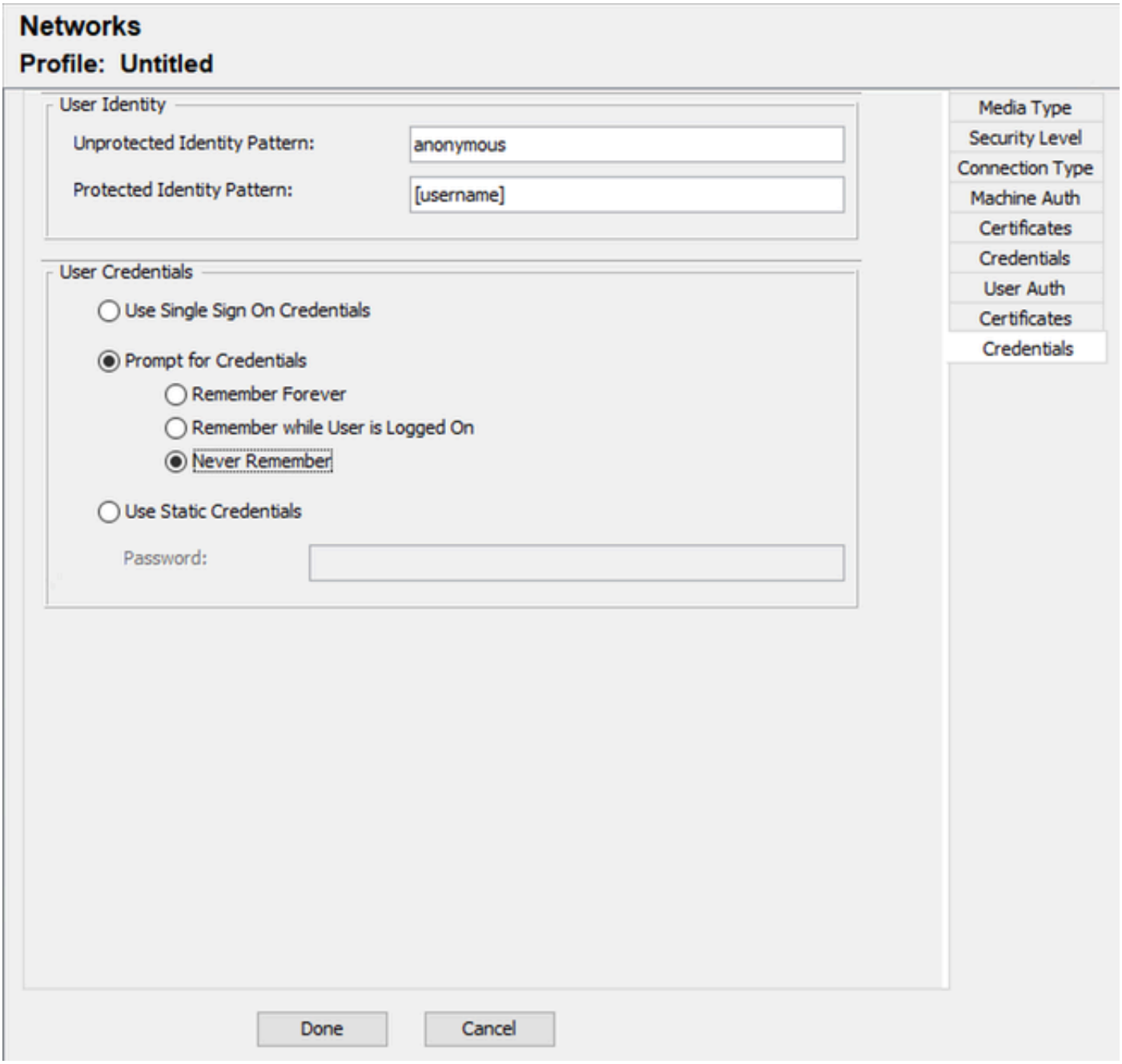
These configurations are for the certificate that the server uses during the EAP PEAP flow. If ISE is used on your environment the common name of the Policy Server Node EAP Certificate can be used.



User Auth Server Certificate Trust Section

Two options can be selected in **Certificate Trusted Authority**. For this scenario instead of adding a specific CA Certificate that signed the RADIUS EAP cert, the option **Trust any Root Certificate Authority (CA) Installed on the OS** is used.

Click **Next**.



User Auth Credentials

In the Credentials section, only the **User Credentials** section is changed.

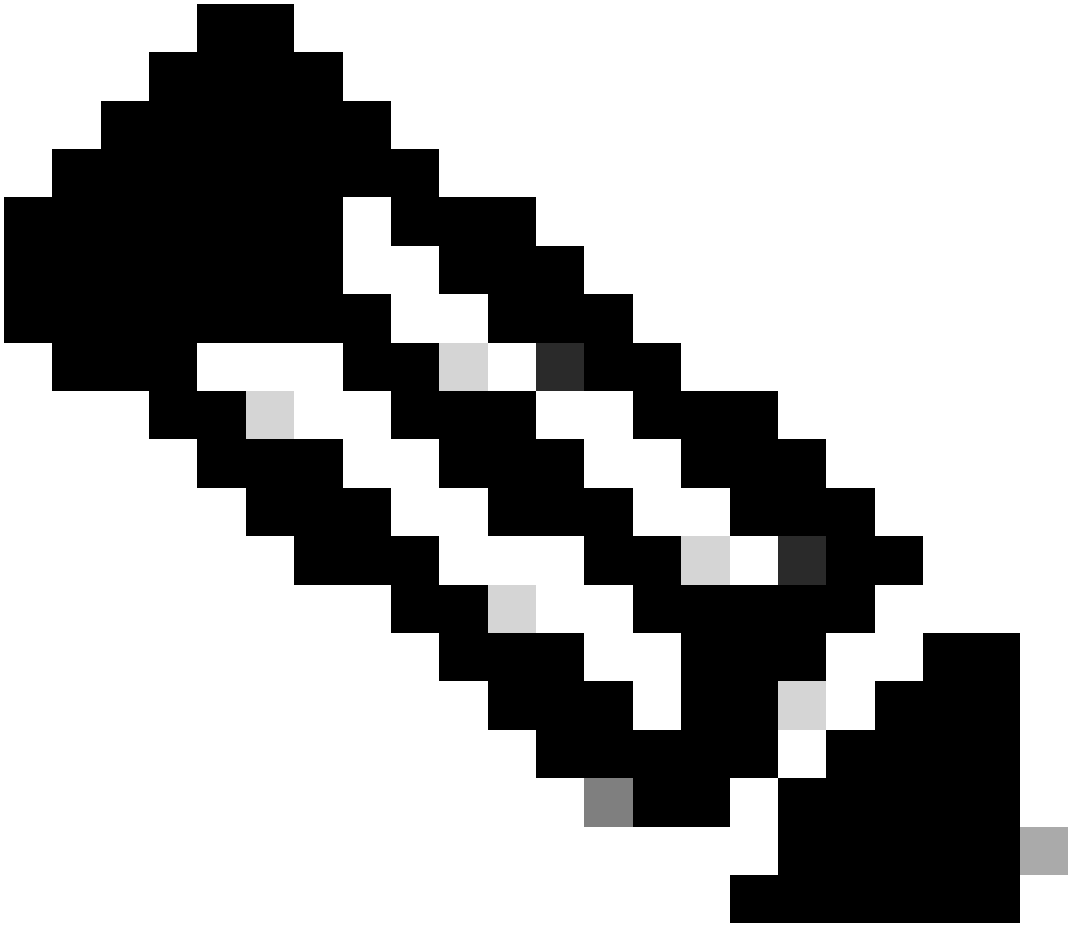
The option **Prompt for Credentials > Never Remember** is selected. So in each authentication, the user authenticating must enter their credentials.

Click the **Done** button.

Select **File > Save as** and save the **Secure Client Network Access Manager** profile as **configuration.xml**.

To make the **Secure Client Network Access Manager** use the profile that was just created, replace the configuration.xml file in the next directory with the new one:

C:\ProgramData\Cisco\Cisco Secure Client\Network Access Manager\system



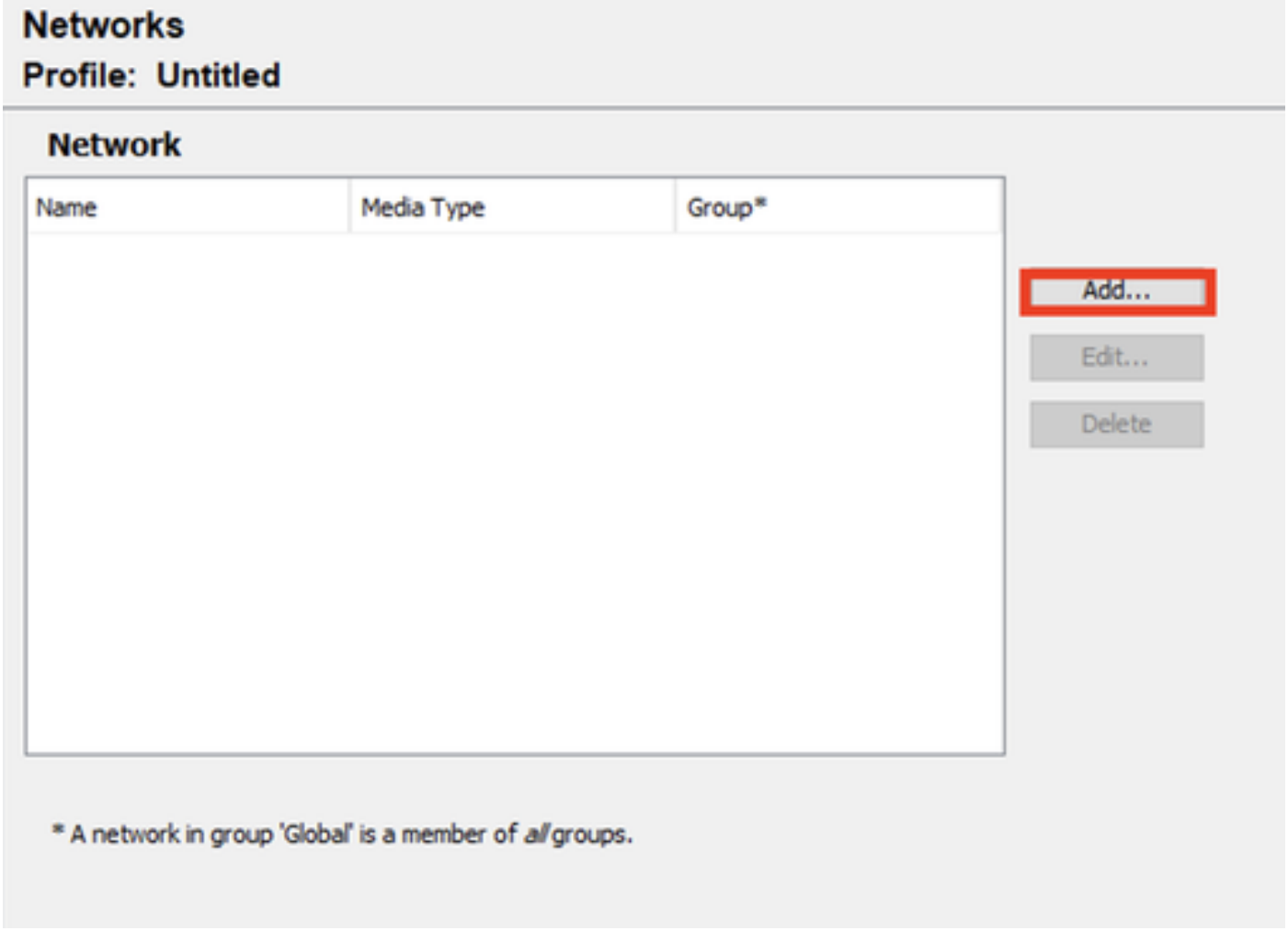
Note: The file must be named configuration.xml, otherwise it does not work.

---

6. Scenario 3: Configure Secure Client NAM Supplicant for EAP TLS User Certificate Authentication

Open **NAM Profile Editor** and navigate to the **Networks** section.

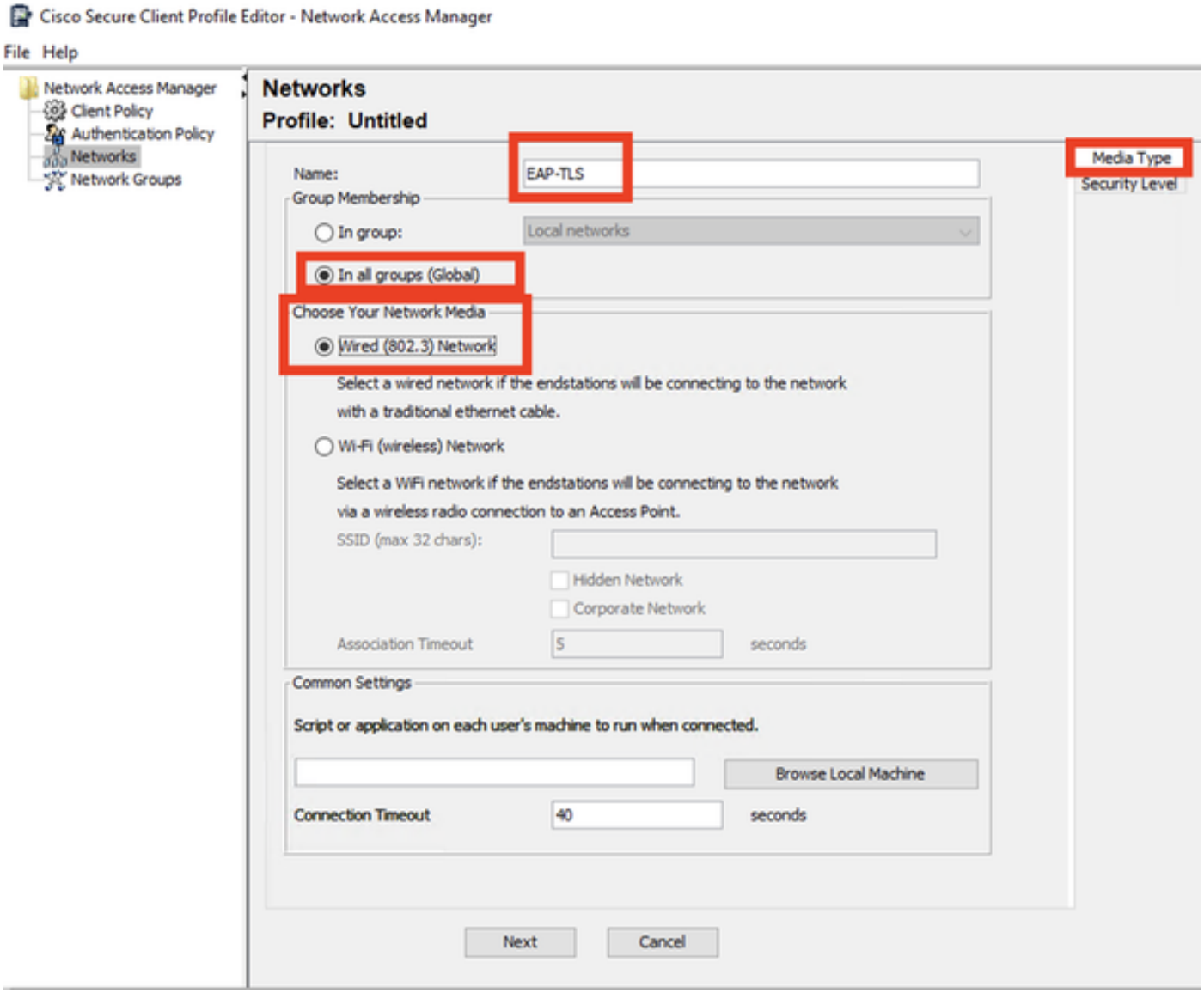
Click **Add**.



Network Creation Section

Name the network profile, in this case the named is with the EAP protocol used for this scenario.

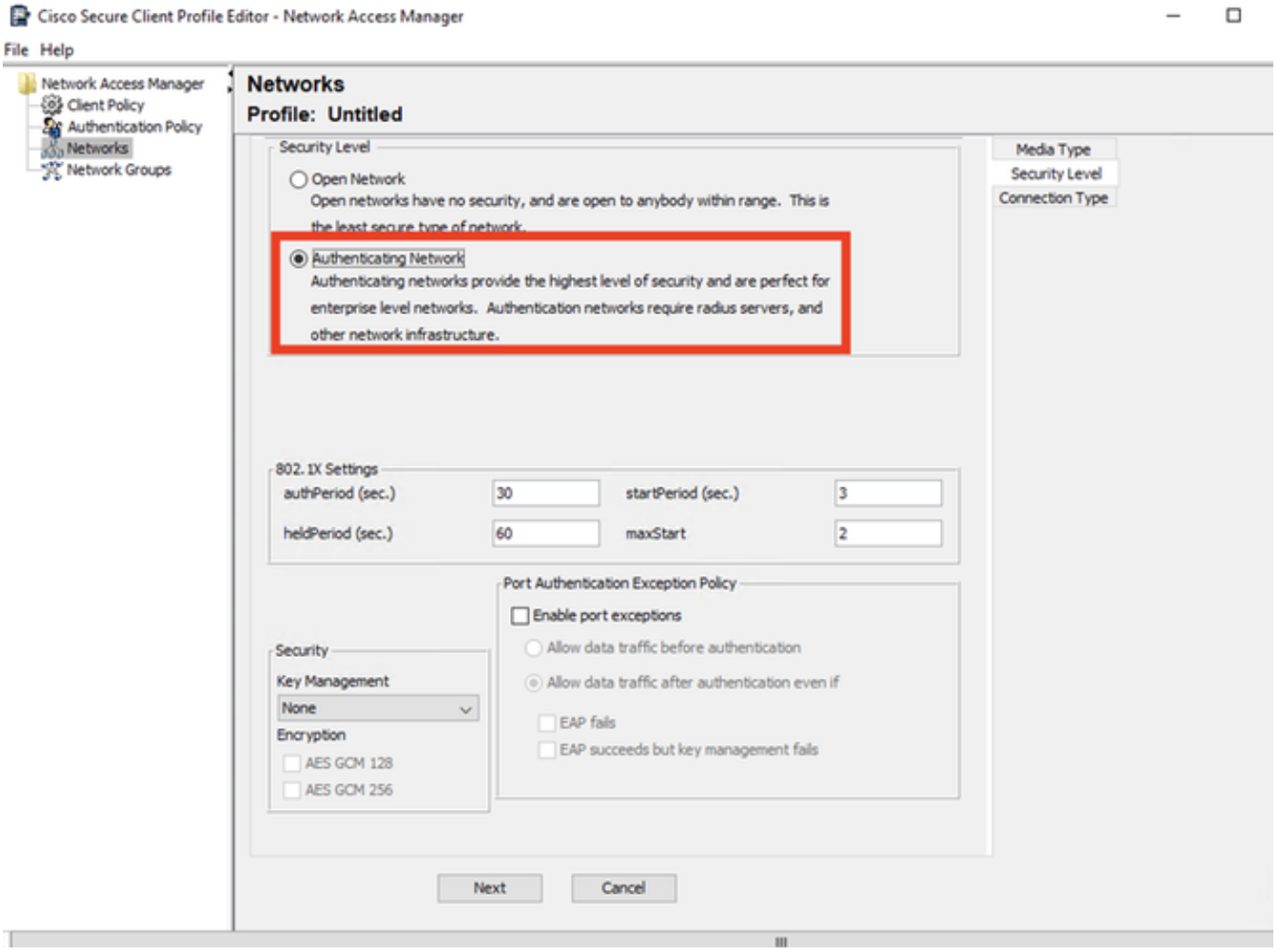
Select **Global** for **Group Membership**. And **Wired Network** Media.



Media Type Section

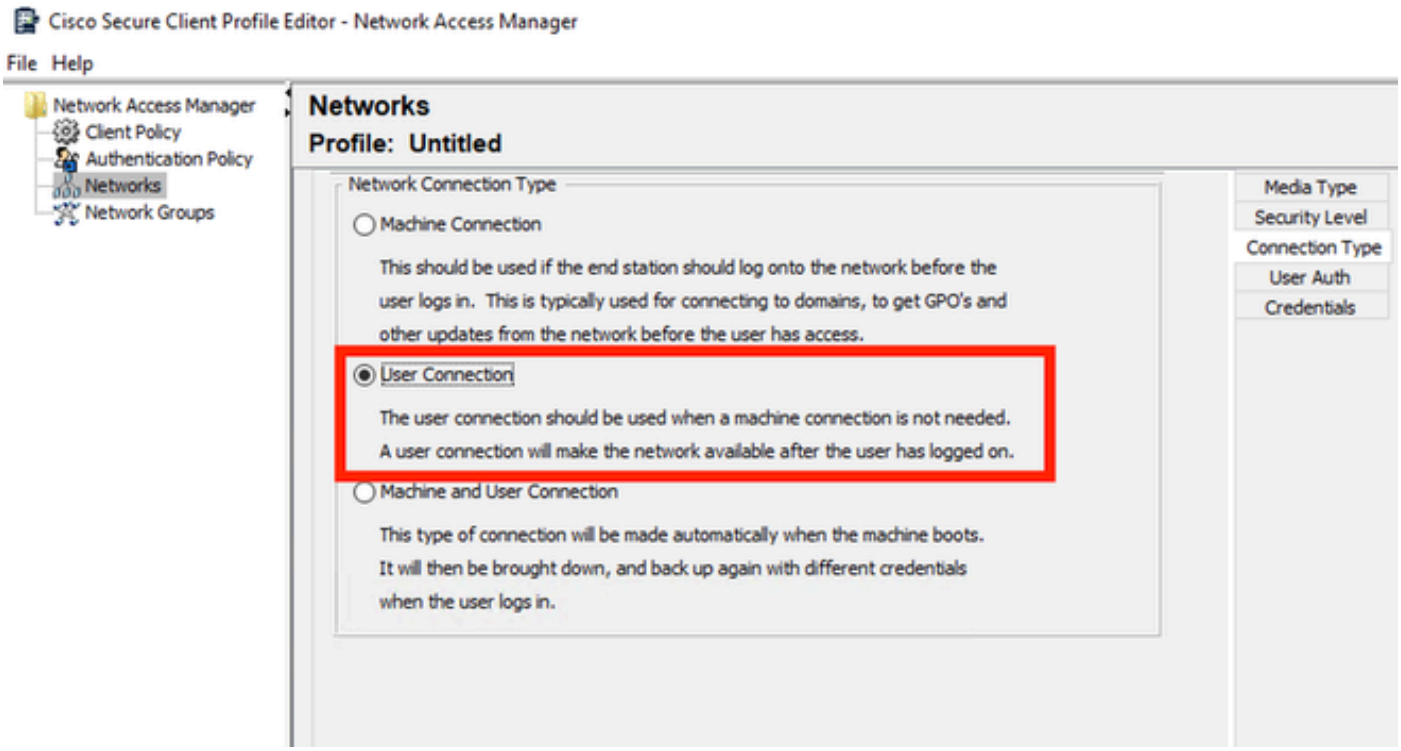
Click **Next**.

Select **Authenticating Network** and do not change the default values for the rest of the options in the **Security Level** section.



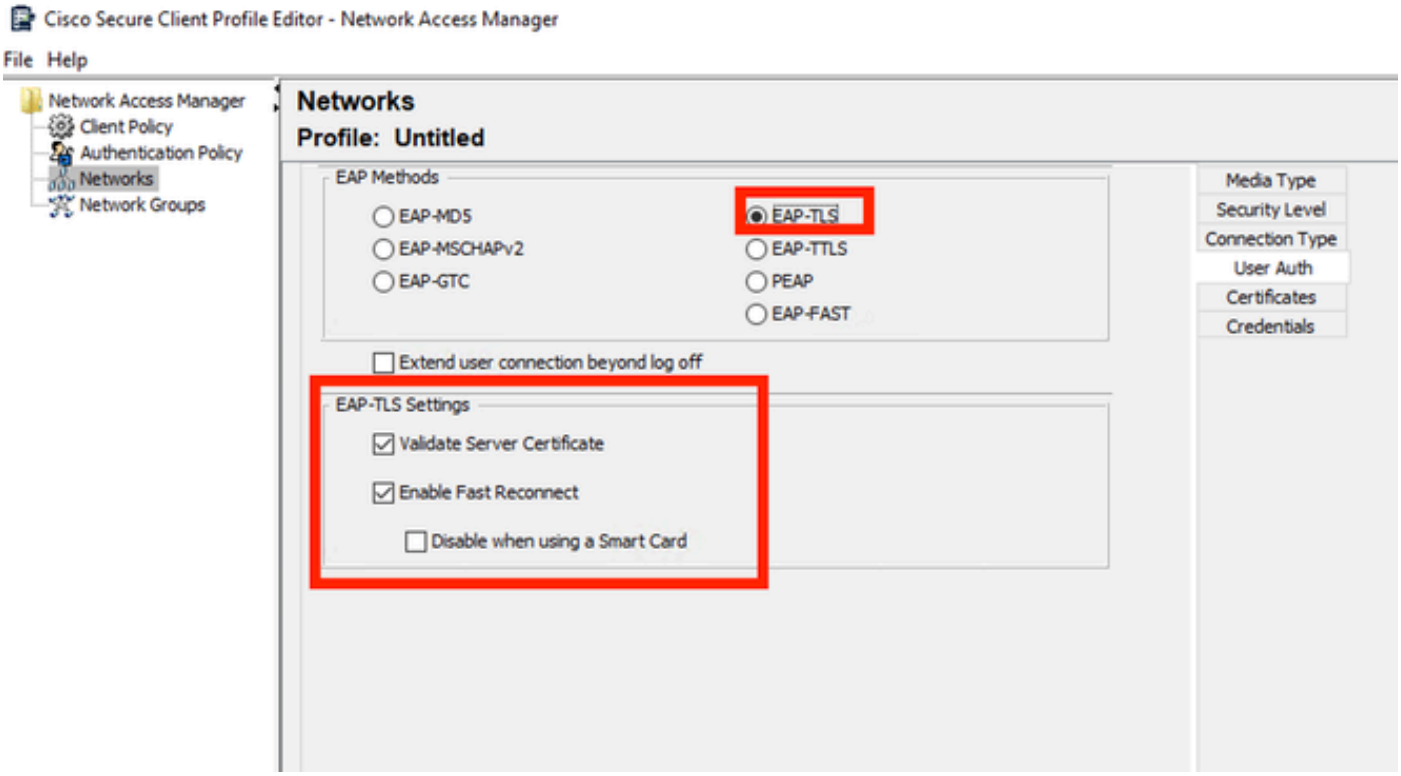
Security Level

This scenario is for user authentication using a certificate. For that reason the option **User Connection** is used.



Conenction Type

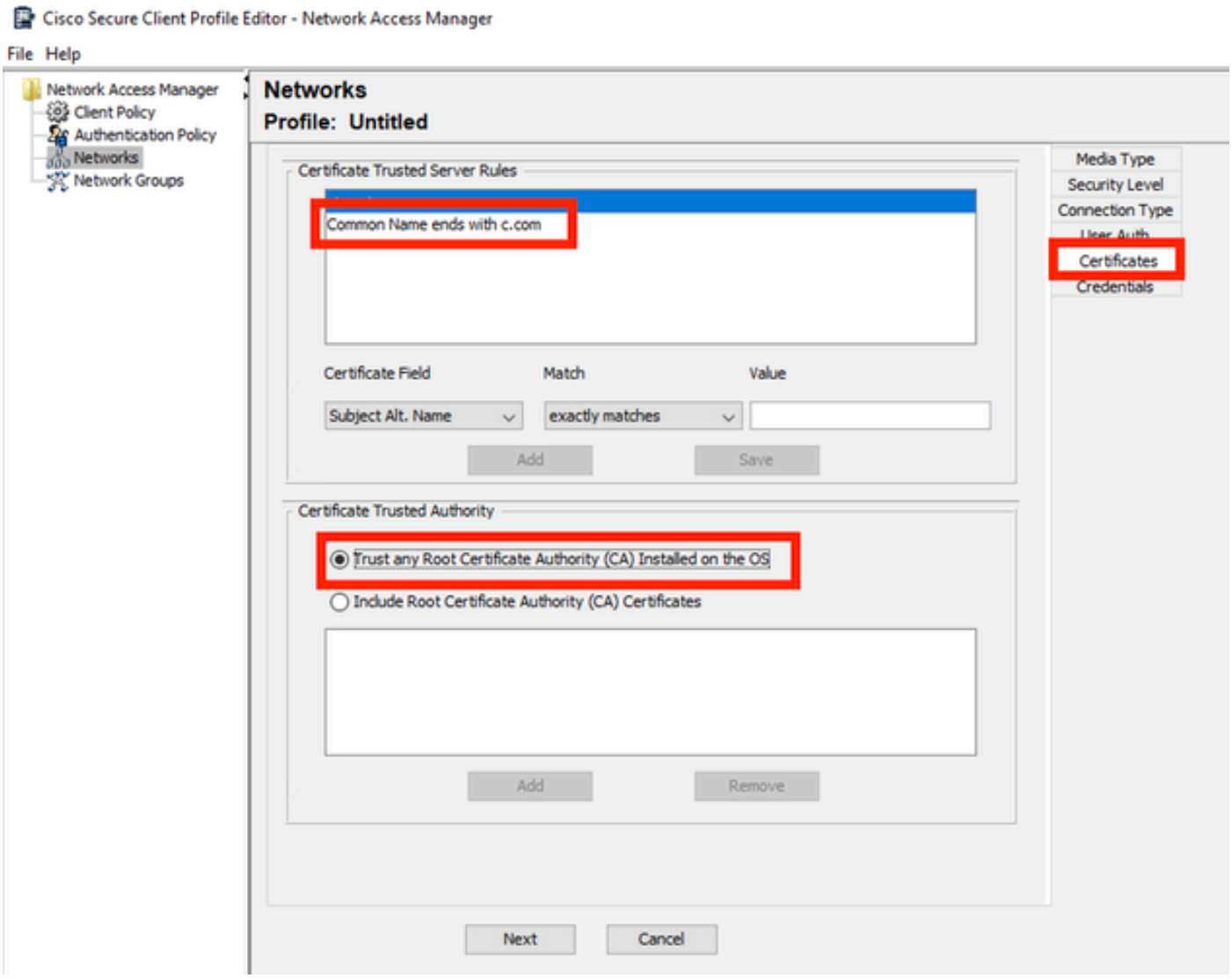
Configure **EAP-TLS** as the EAP method. Do not change the default values in the **EAP-TLS settings** section.



User Auth Section

For the Certificates section, create a rule that matches the AAA **EAP-TLS** certificate. If you are using ISE, find this rule in **Administration > System > Certificates** section.

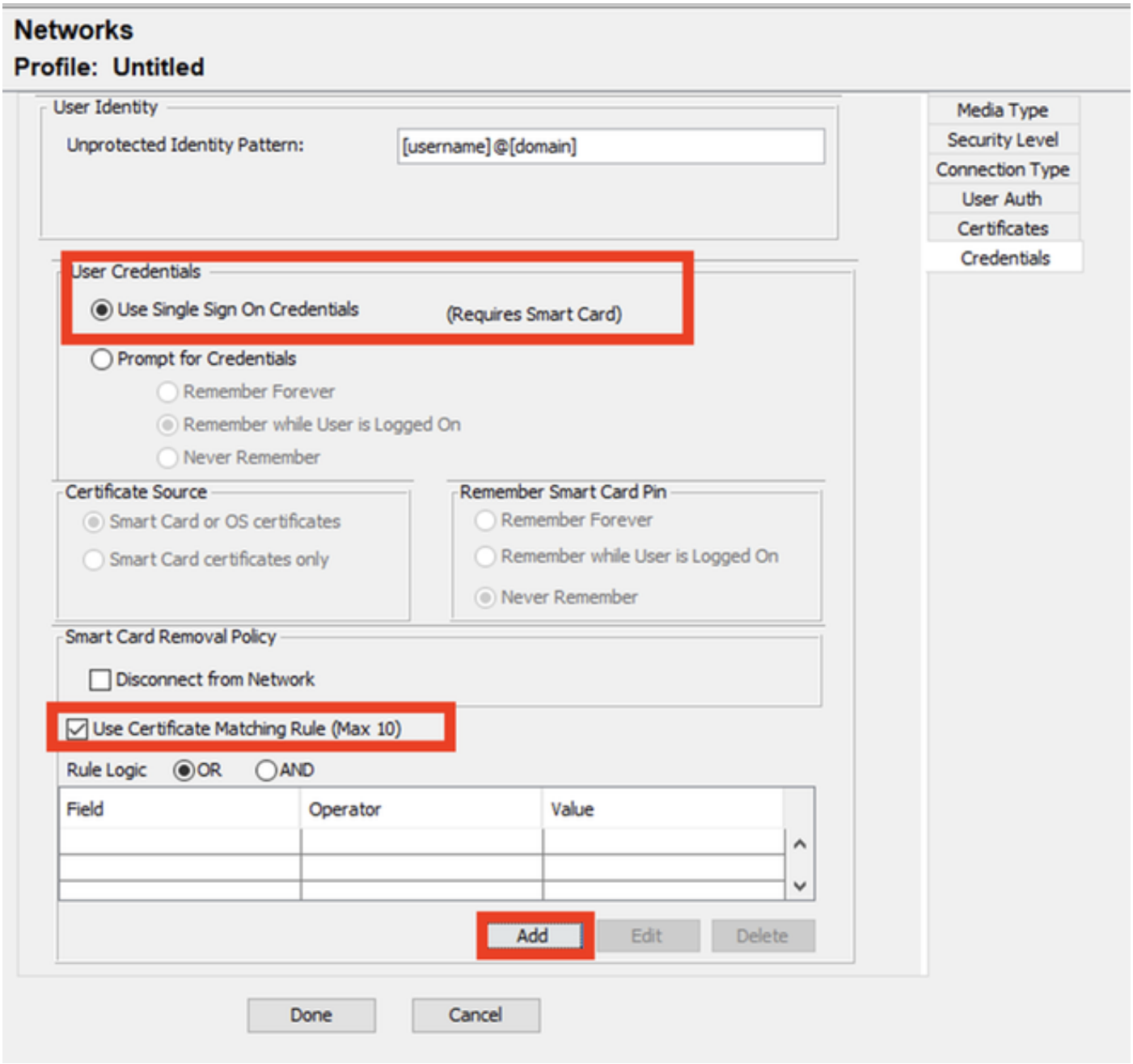
For the **Certificate Trusted Authority** section select **Trust any Root Certificate Authority (CA) installed on the OS**.



User Auth Server Certificate Trust Settings

Click **Next**.

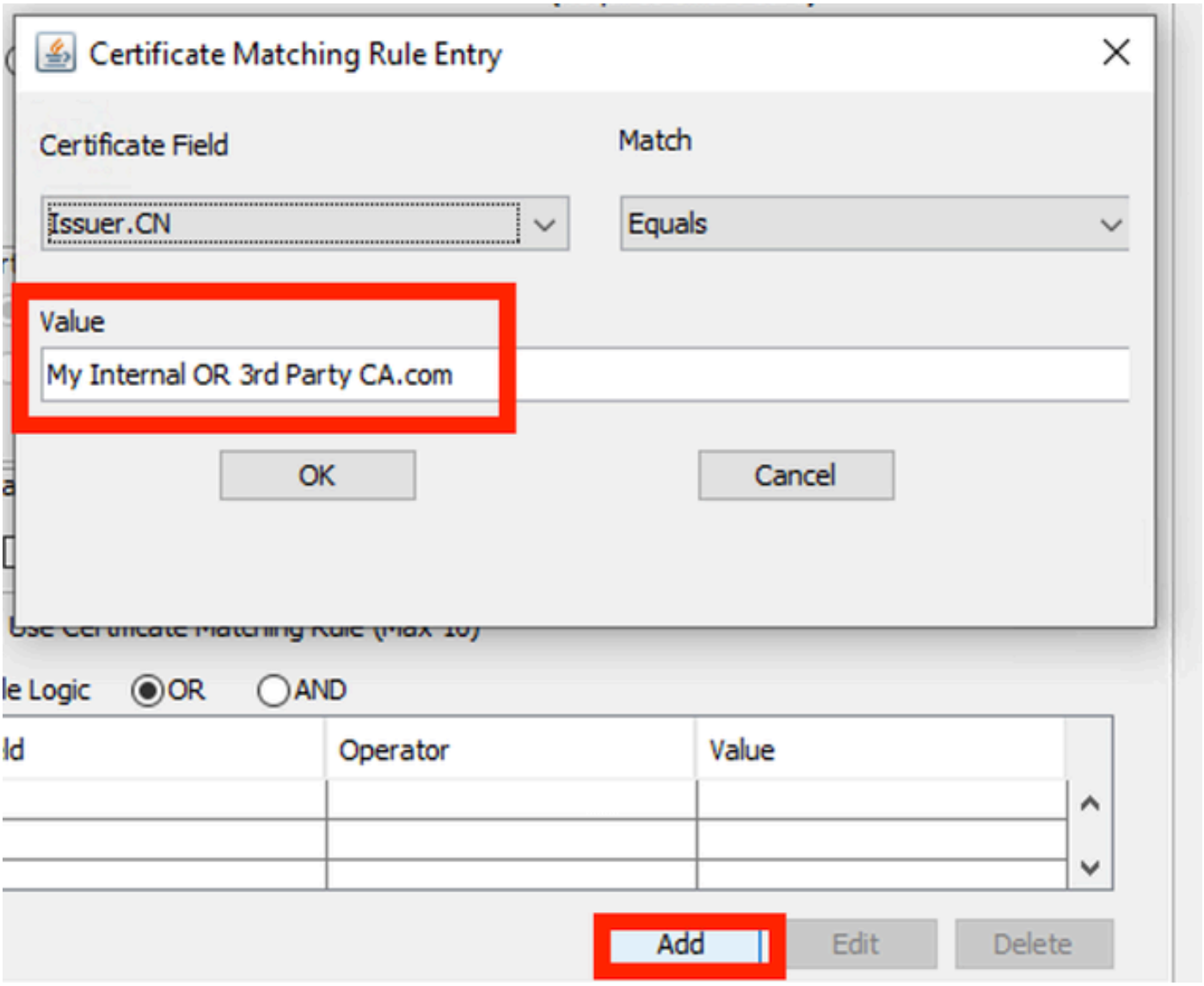
For the **User Credentials** section, do not change the default values in the first part.



User Auth Credentials Section

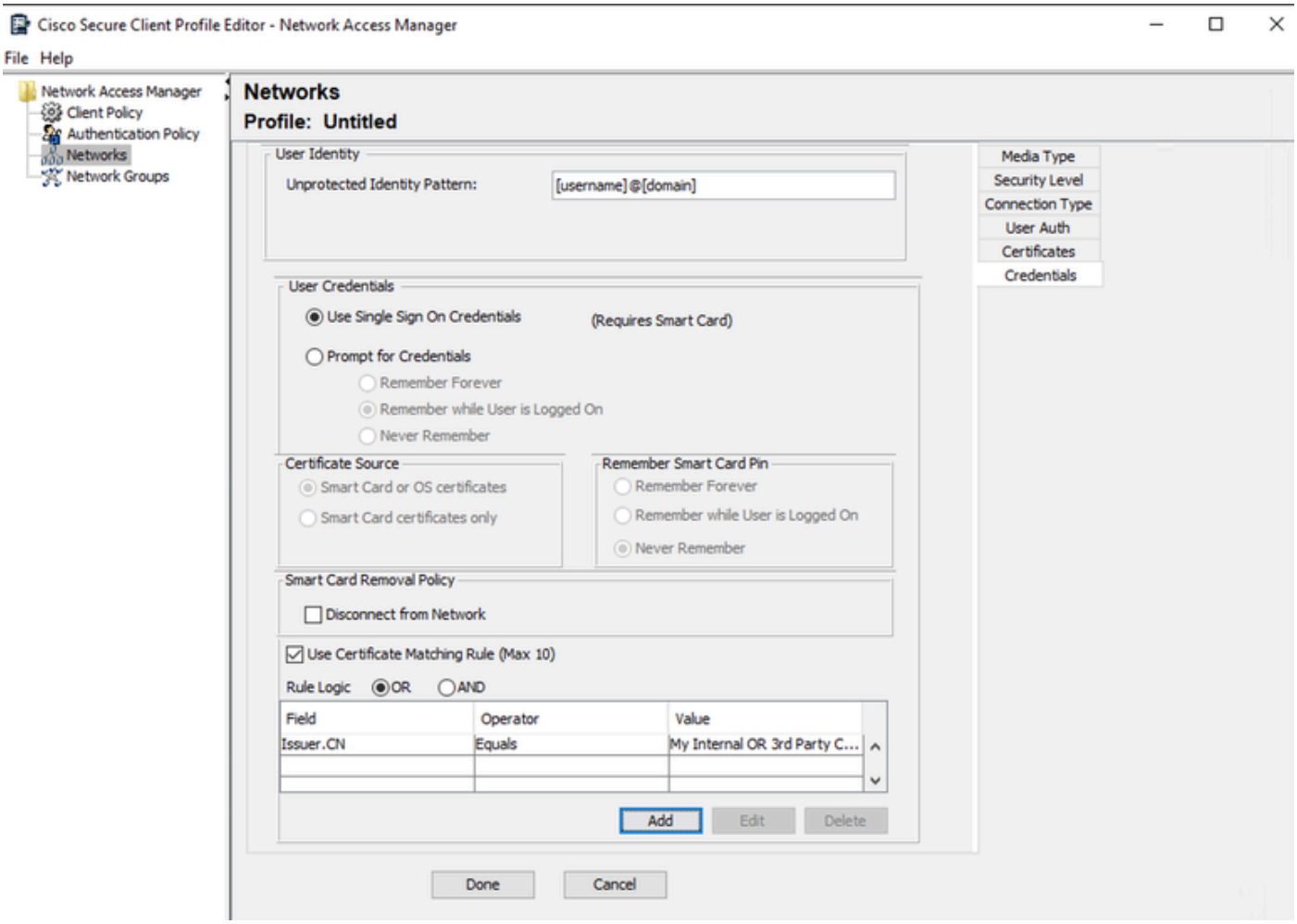
It is important to configure a rule that matches the identity certificate that the user sends during the EAP TLS process. To do this click the checkbox next to **Use Certificate Maching Rule (Max 10)**.

Click **Add**.



Certificate Matching Rule Window

Replace the value **My Internal OR 3rd Party CA.com** string with the CN of the user certificate.



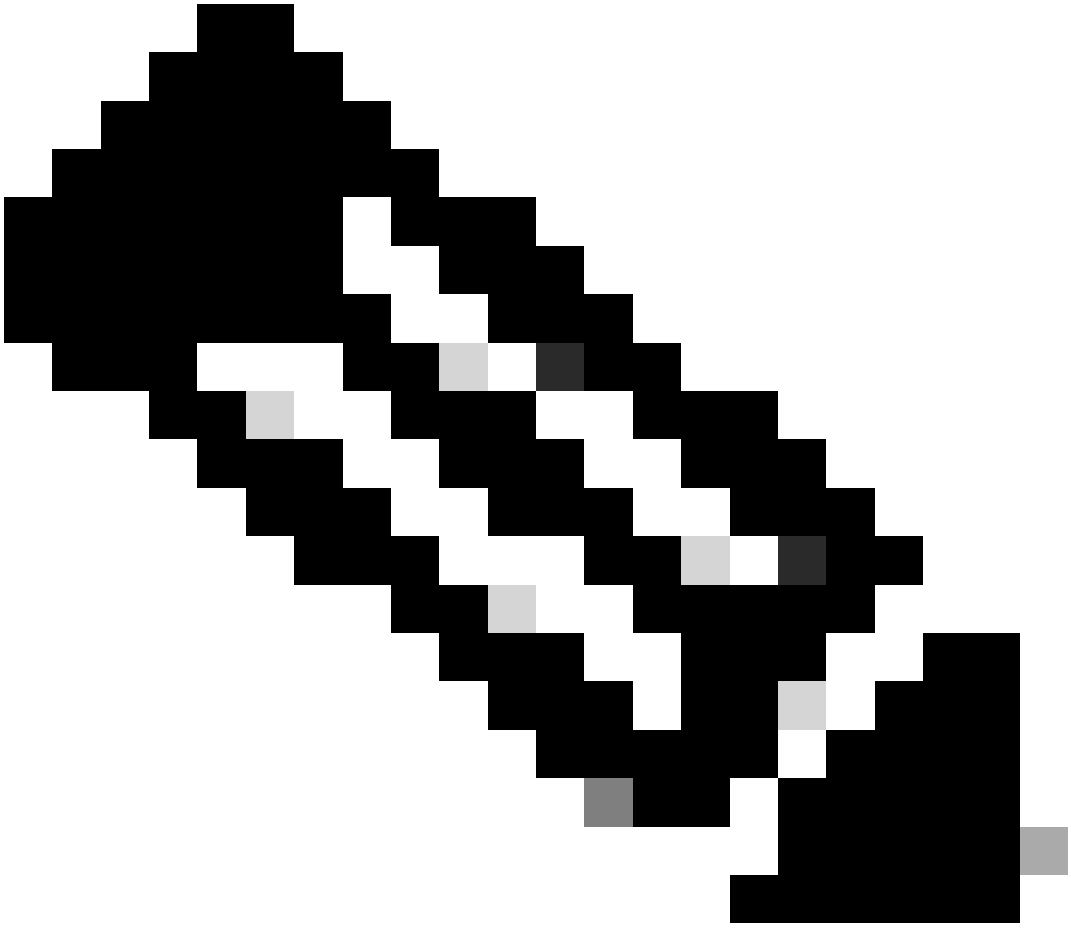
User Auth Certificate Credentials Section

Click **Done** to finish the configuration.

Select **File > Save as** to save the **Secure Client Network Access Manager** profile as configuration.xml.

To make the **Secure Client Network Access Manager** use the profile that was just created, replace the configuration.xml file in the next directory with the new one:

C:\ProgramData\Cisco\Cisco Secure Client\Network Access Manager\system



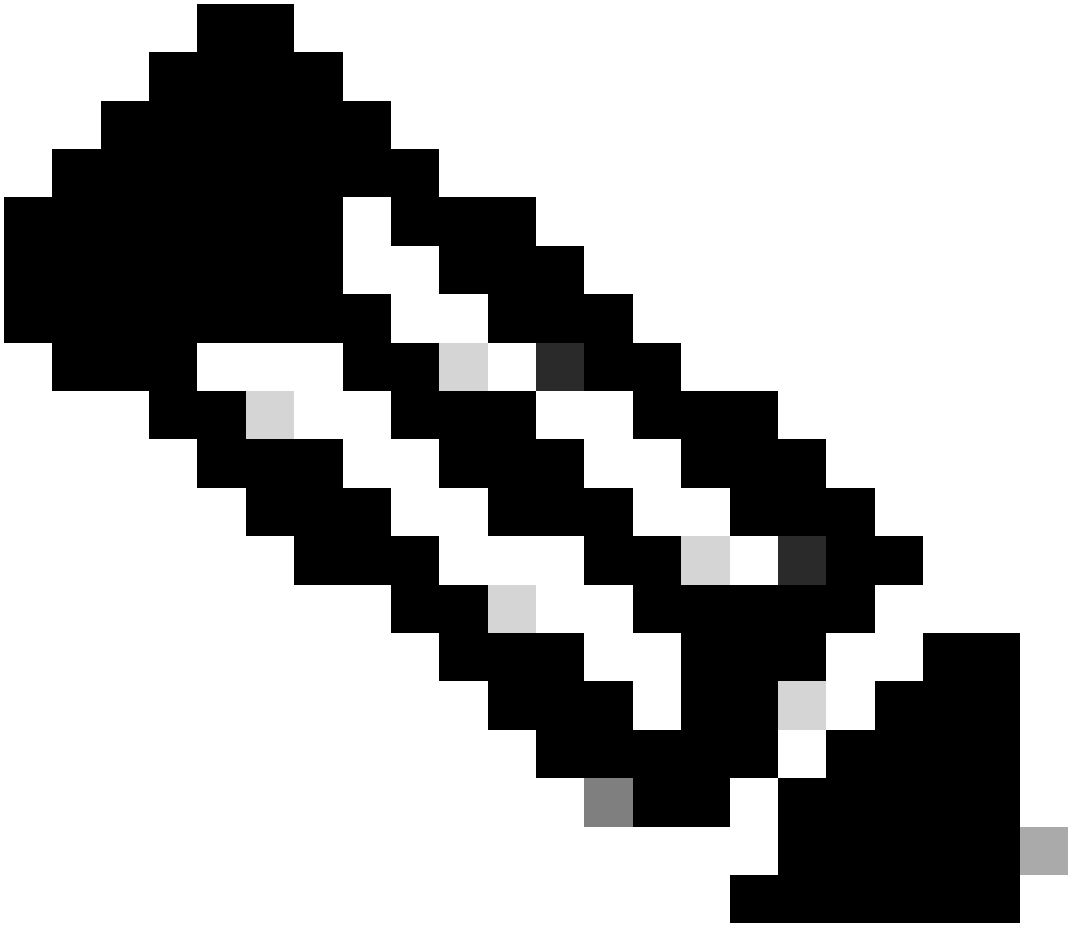
Note: The file must be named configuration.xml, otherwise it does not work.

---

7. Configure ISR 1100 and ISE to Allow Authentications Based on Scenario 1 PEAP MSCHAPv2

Configure the ISR 1100 Router.

This section covers the basic configuration that the NAD must have to make dot1x work.



Note: For multi-node ISE deployment, point to any node that has the Policy Server Node persona enabled. This can be checked by navigating to ISE in the **Administration > System > Deployment** tab.

```
aaa new-model
aaa session-id common
!
aaa authentication dot1x default group ISE-CLUSTER
aaa authorization network default group ISE-CLUSTER
aaa accounting system default start-stop group ISE-CLUSTER
aaa accounting dot1x default start-stop group ISE-CLUSTER
!
aaa server radius dynamic-author
 client A.B.C.D server-key  <Your shared secret>
!
!
radius server  ISE-PSN-1
 address ipv4 A.B.C.D auth-port 1645 acct-port 1646
 timeout 15
 key <Your shared secret>
!
```

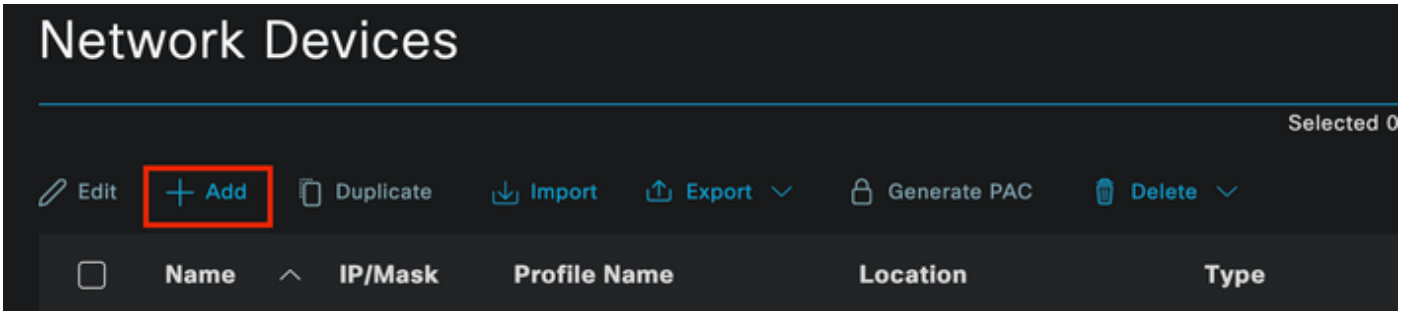
```
!
aaa group server radius ISE-CLUSTER
 server name ISE-PSN-1
!
interface GigabitEthernet0/1/0
 description "Endpoint that supports dot1x"
 switchport access vlan 15
 switchport mode access
 authentication host-mode multi-auth
 authentication order dot1x mab
 authentication priority dot1x mab
 authentication port-control auto
 dot1x pae authenticator
 spanning-tree portfast
```

Configure Identity Service Engine 3.2.

Configure the Network Device.

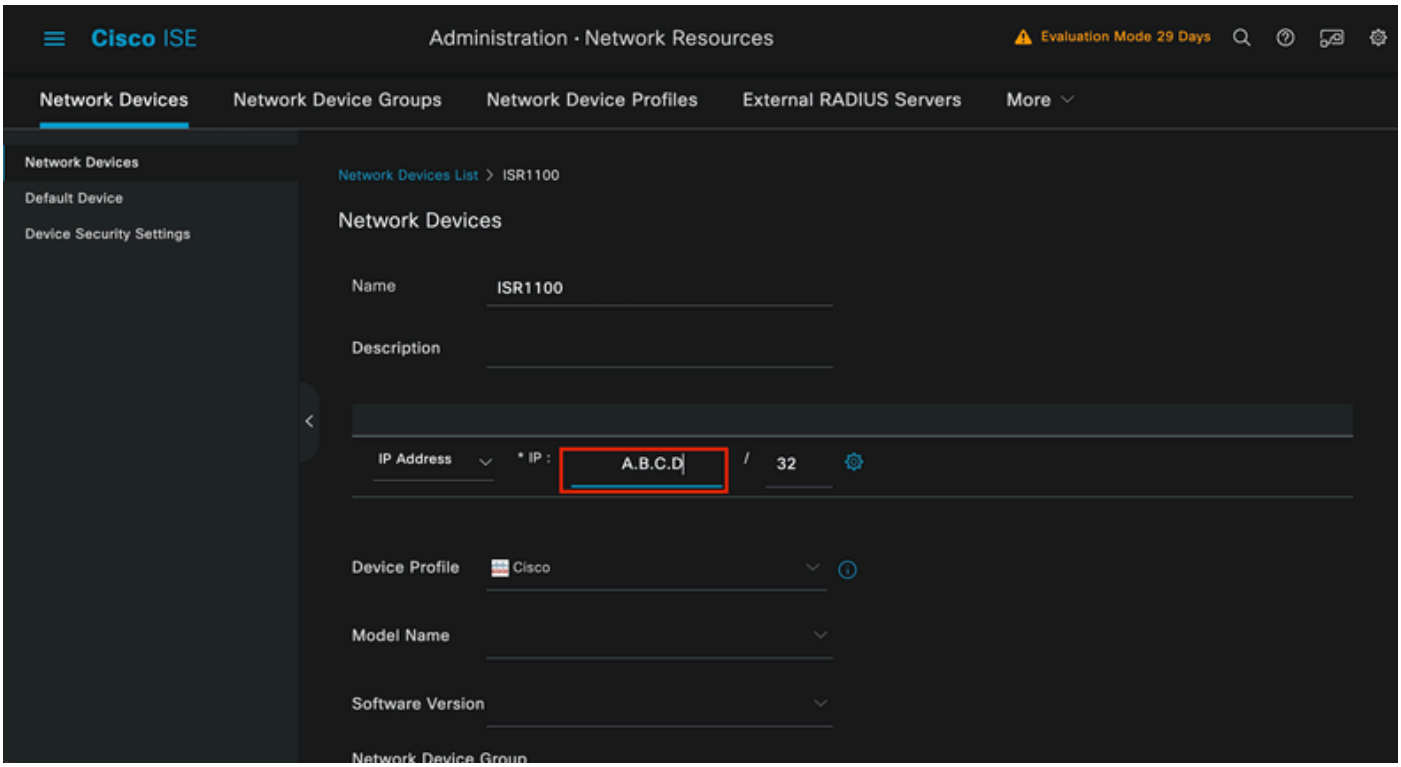
Add the ISR NAD to ISE **Administration > Network Resources > Network Devices**.

Click **Add**.



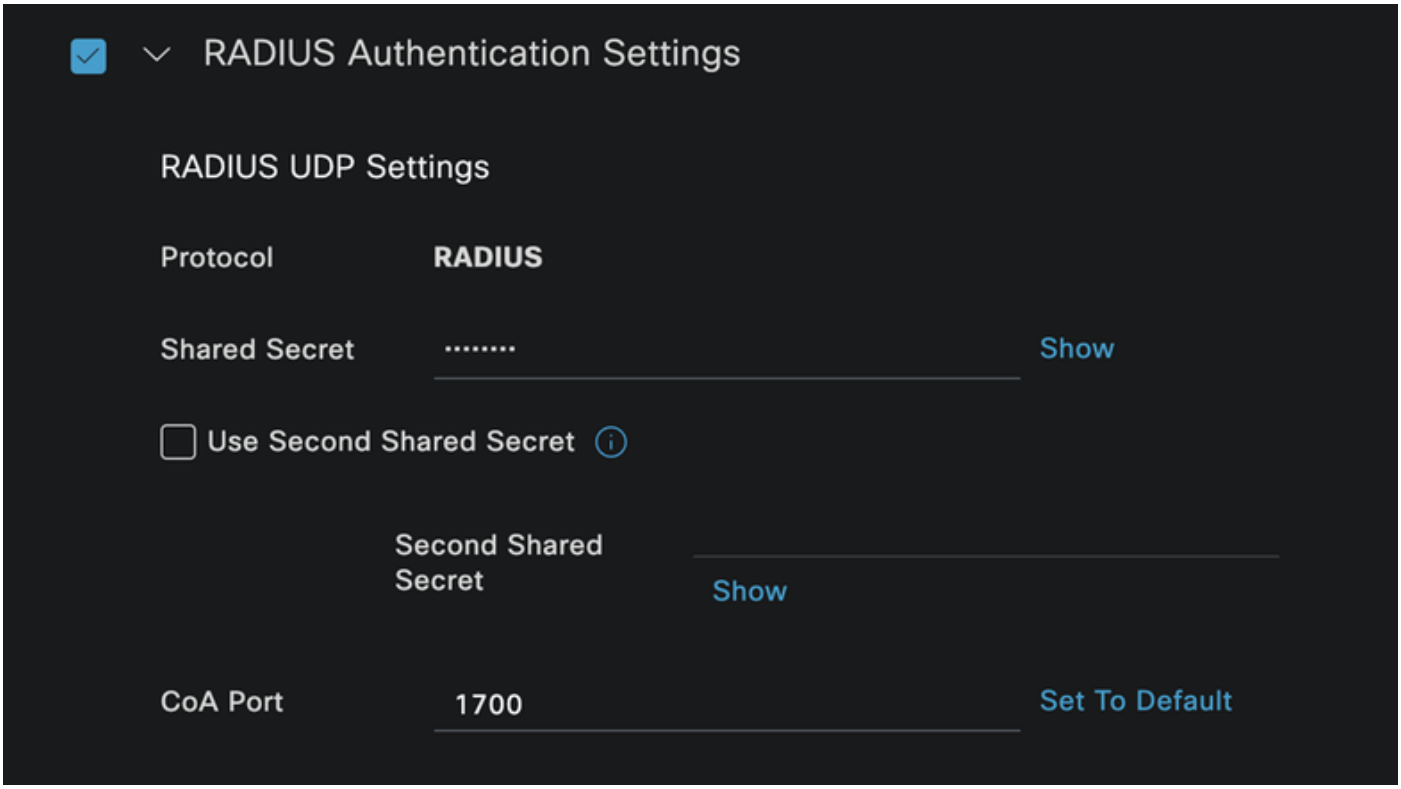
Network Device Section

Assign a name to the NAD you are creating. Add the Network Device IP.



Network Device Creation

At the bottom of the same page add the same **Shared Secret** that you used in your network device configuration.



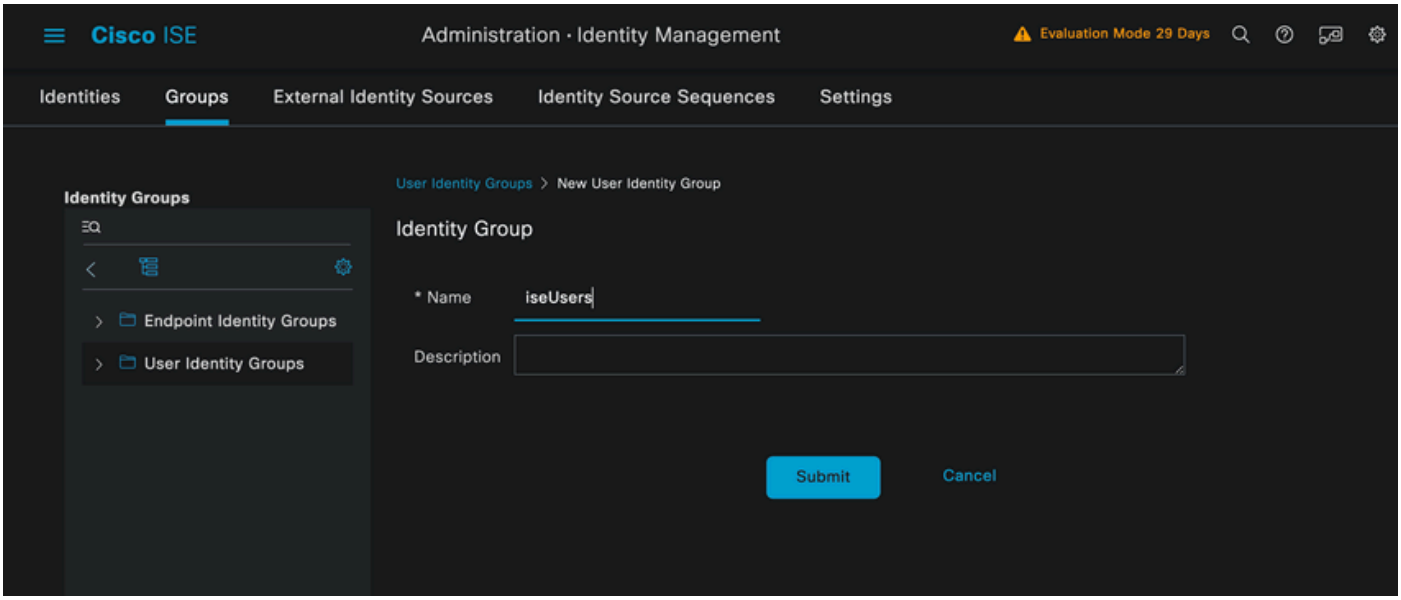
Network Device Radius Settings

Save the changes.

Configure the identity that is used to authenticate the endpoint.

ISE local authentication is used. External ISE authentication is not explained in this article.

Navigate to the **Administration > Identity Management > Groups** tab and create the group that the user is part of. The identity group created for this demonstration is **iseUsers**.

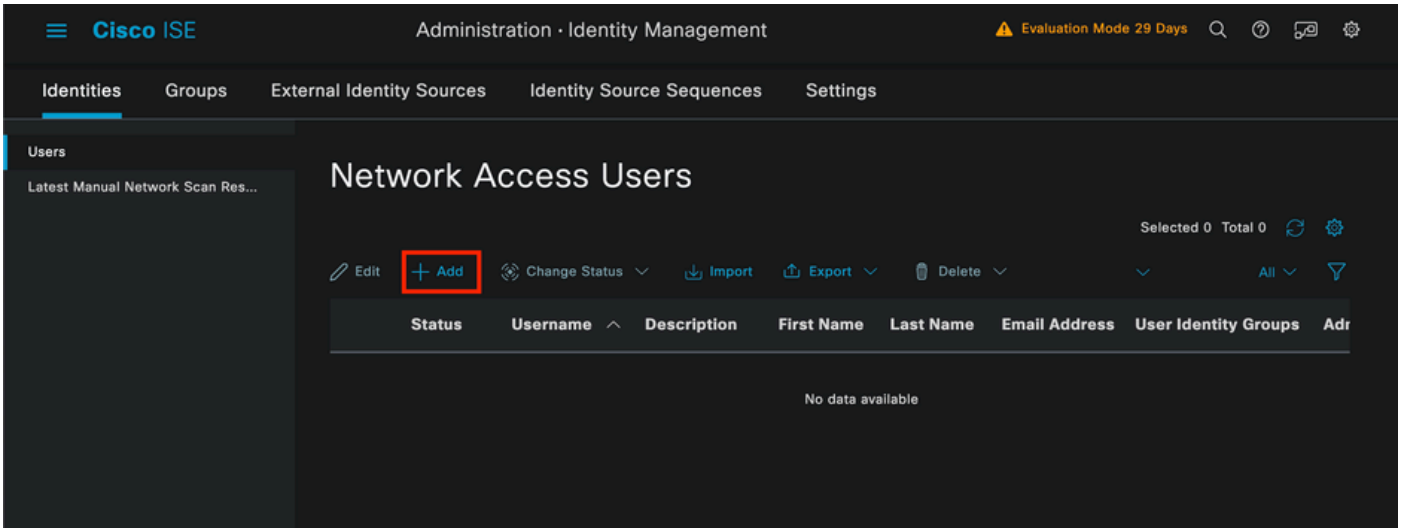


Identity Group Creation

Click **Submit**.

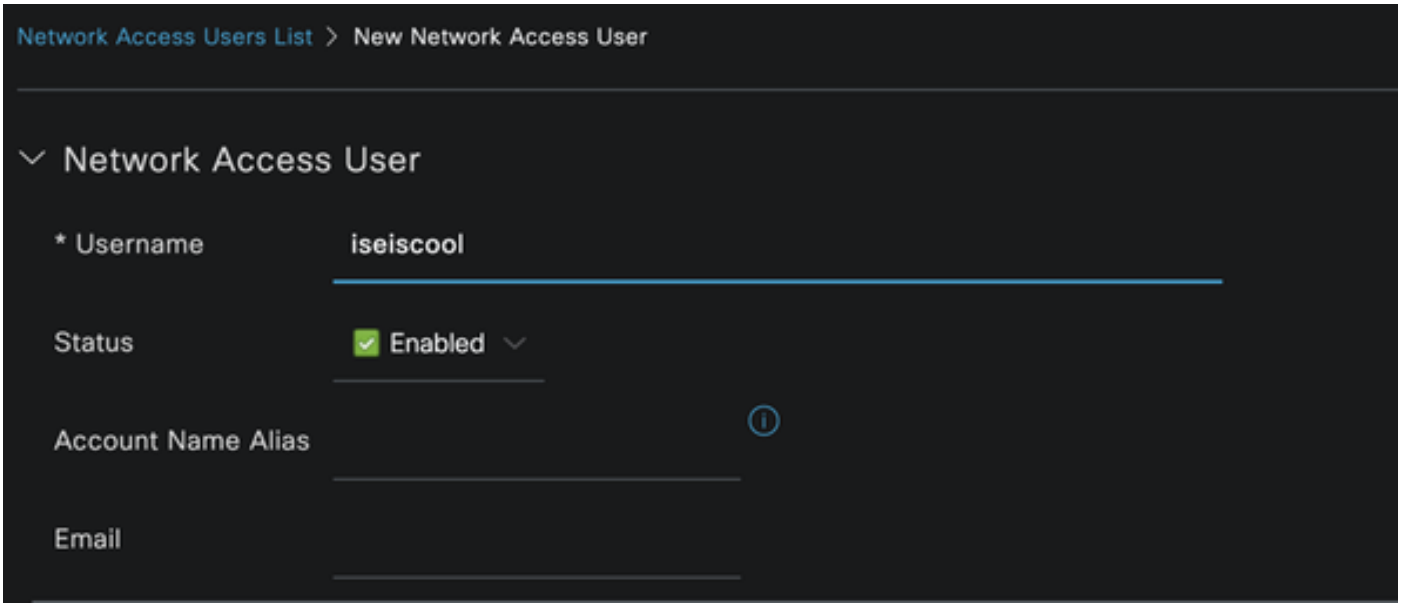
Navigate to **Admistration > Identity Management > Identity** Tab.

Click **Add**.



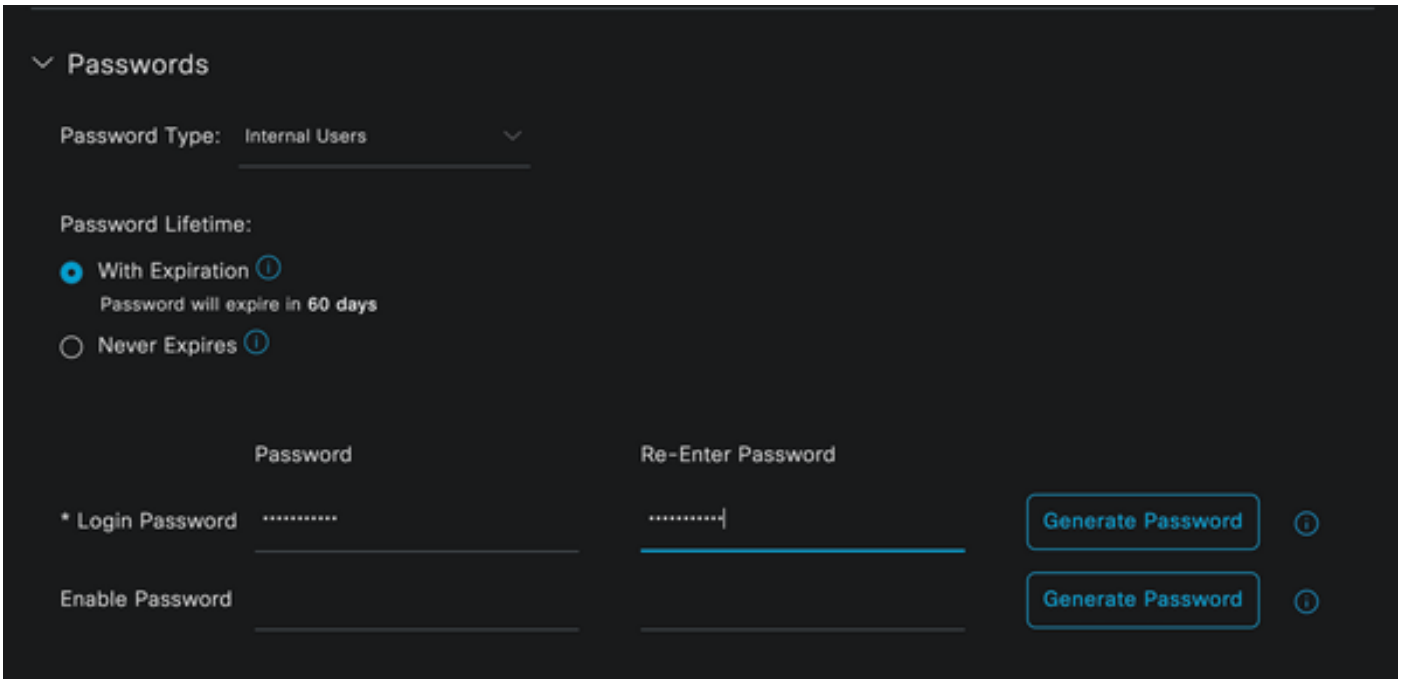
Network Access Users Section

As part of the mandatory fields start with the name of the user. The username **iseiscool** is used in this example.



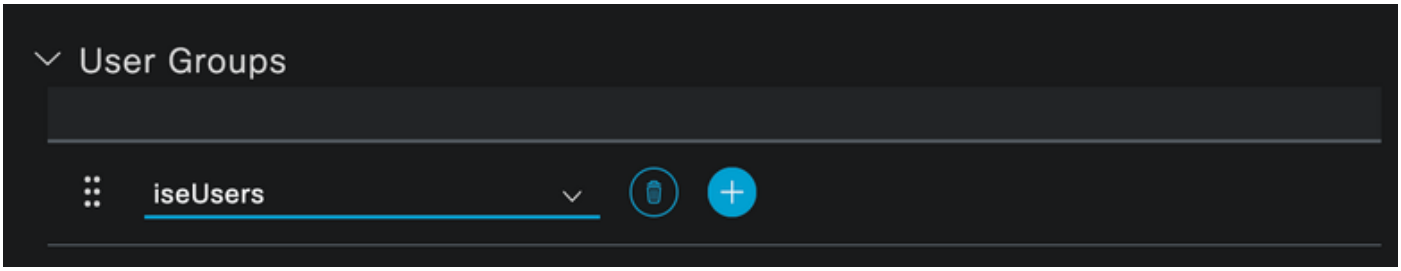
Network Access User Creation

Assign a password to the user. **VainillaISE97** is used.



User Creation Password Section

Assign the user to the group **iseUsers**.

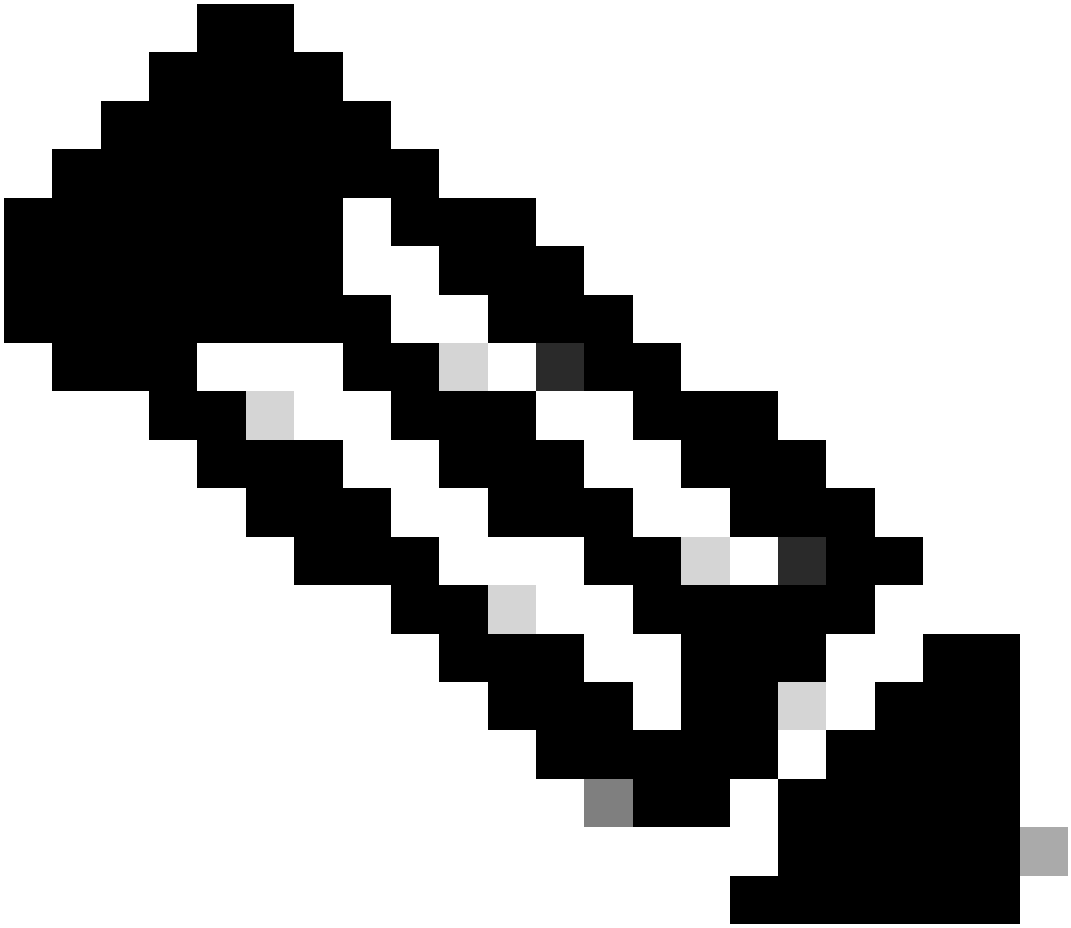


User Group Assignation

Configure the Policy set.

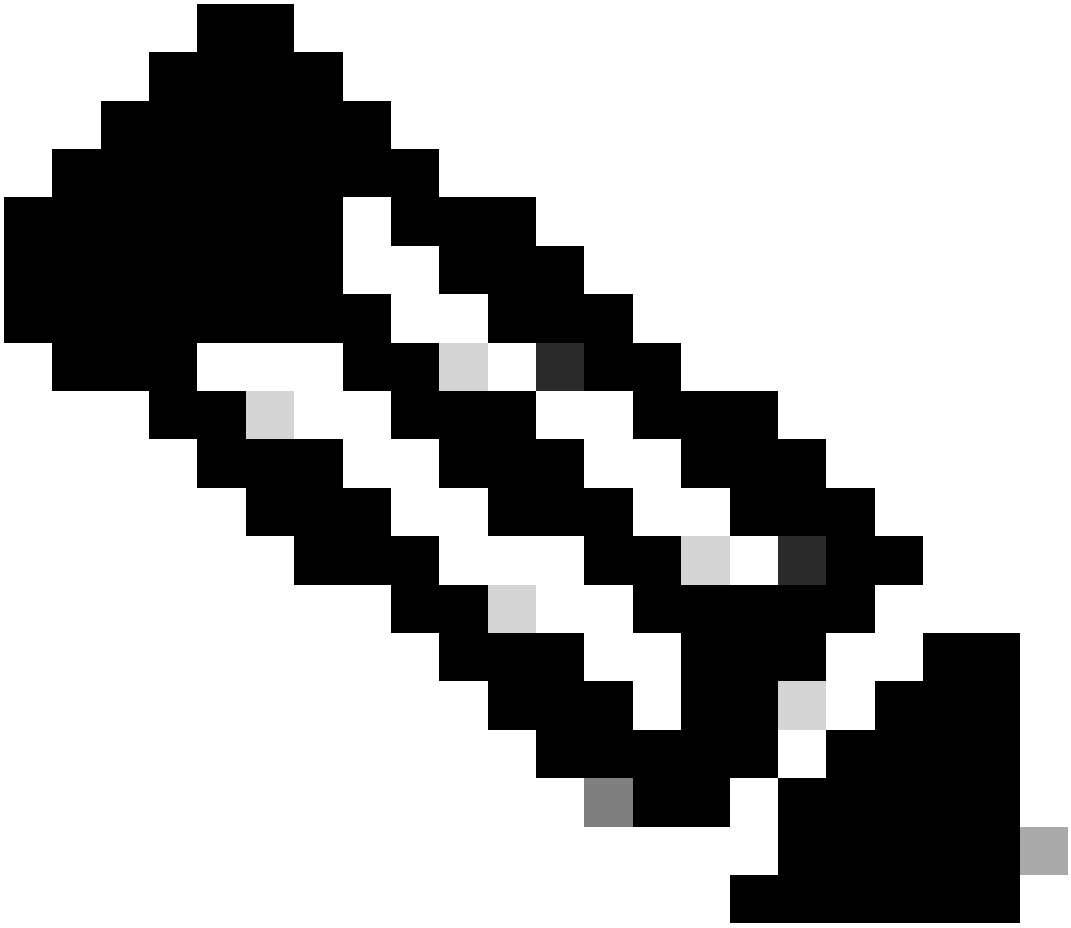
Navigate to the **ISE Menu > Policy > Policy Sets**.

The default Policy set can be used. However, one called Wired is created for this example.

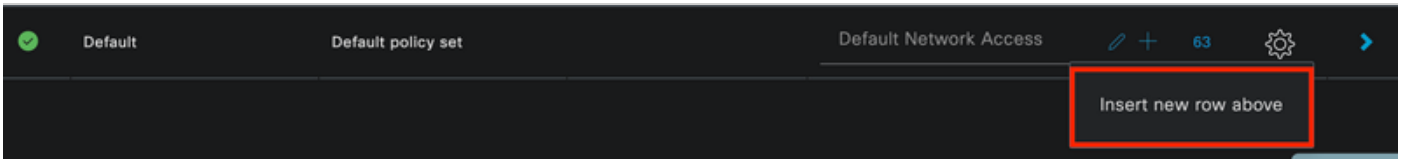


Note: Classifying and differentiating the policy sets helps when troubleshooting,

---

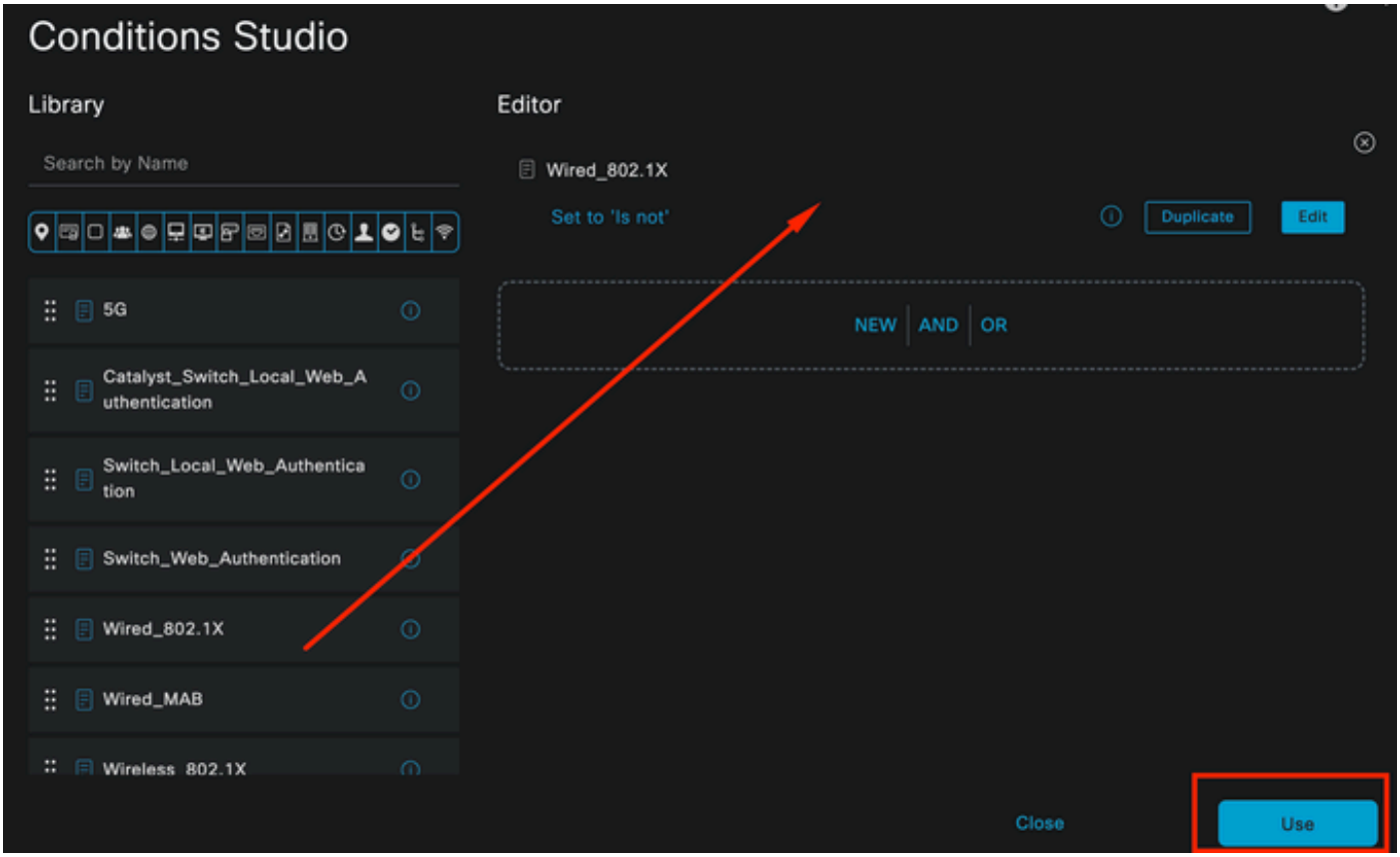


Note: If the add or plus icon is not visible, the gear icon of any policy set can clicked, and then select **Insert new row above.**



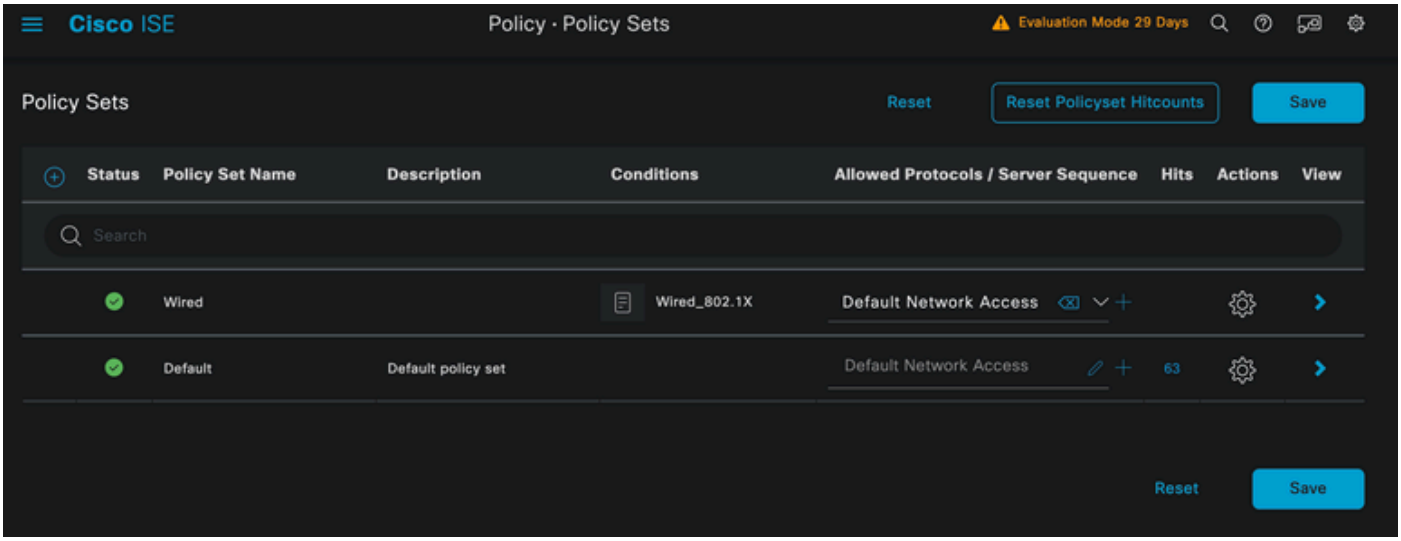
Gear Icon Options

The condition used is **Wired 8021x**. Drag it and then click **Use**.



Authentication Policy Condition Studio

Select **Default Network Access** in the **Allowed Protocols** section.

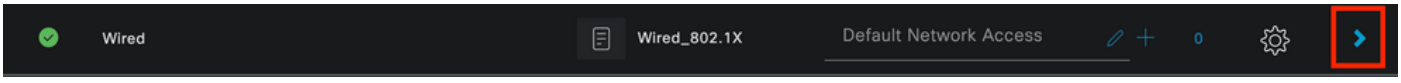


Policy Sets General View

Click **Save**.

2.d. Configure the Authentication and Authorization Policies.

Click the > icon.



Wired Policy Set

Expand the **Authentication Policy** section.

Click on the + icon.

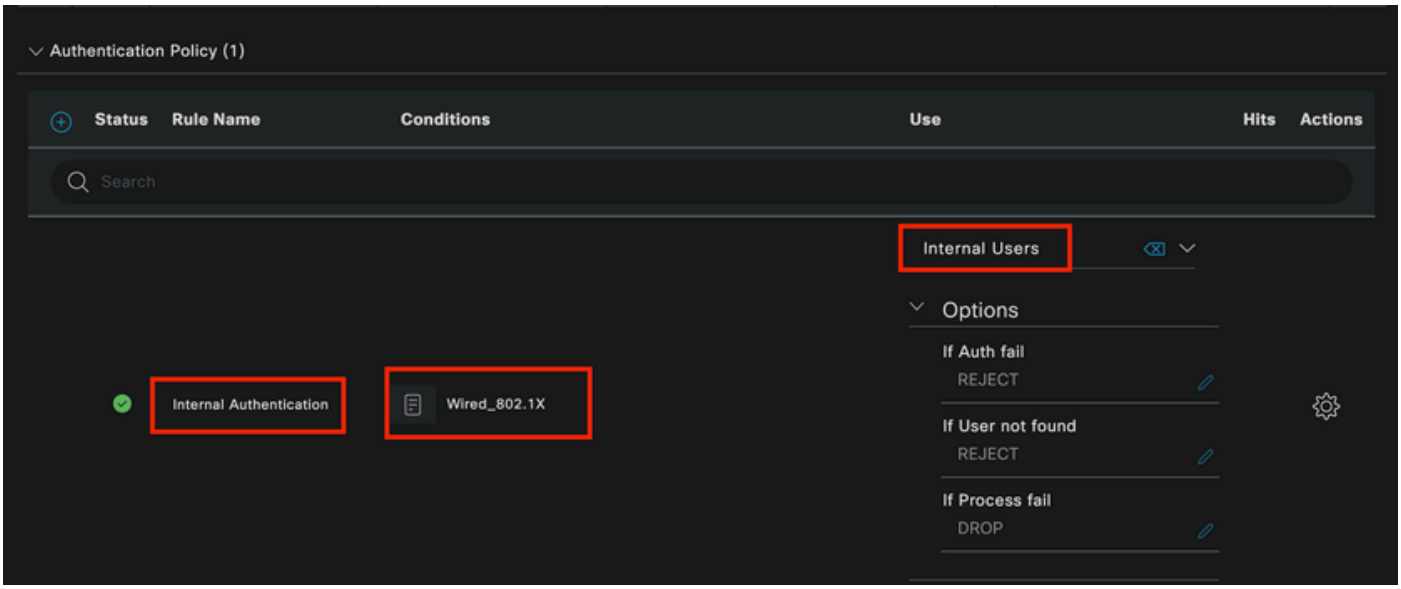
Authentication Policy

Assign a name to the **Authentication Policy**. **Internal Authentication** is used in this example.

Click the + icon on the conditions column for this new **Authentication Policy**.

The pre-configured condition **Wired Dot1x** is used.

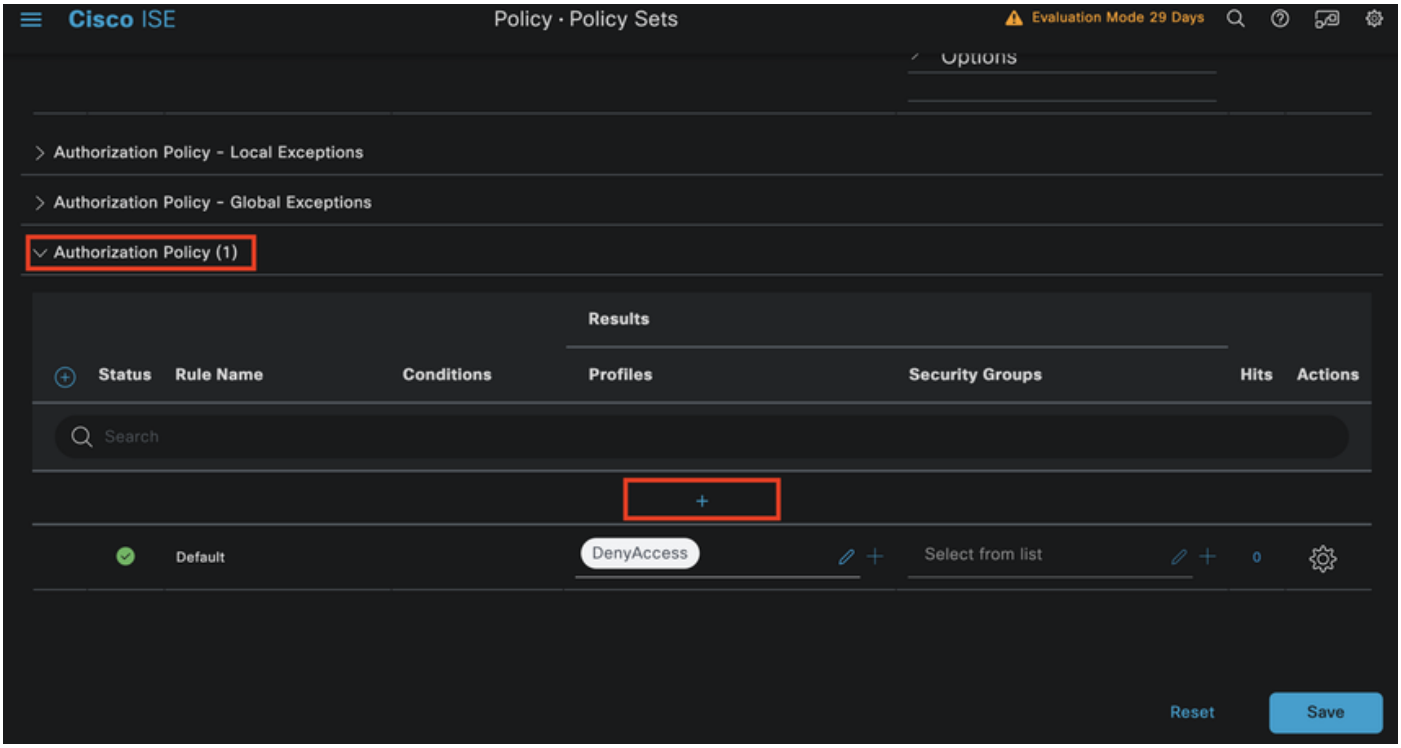
Finally, in the **Use** column select **Internal Users**.



Authentication Policy

Authorization Policy.

The **Authorization Policy** section is at the bottom of the page. Expand it and click the + icon.



Authorization Policy

Name the recently created **Authorization Policy**. In this configuration example the name **Internal ISE Users** is used.

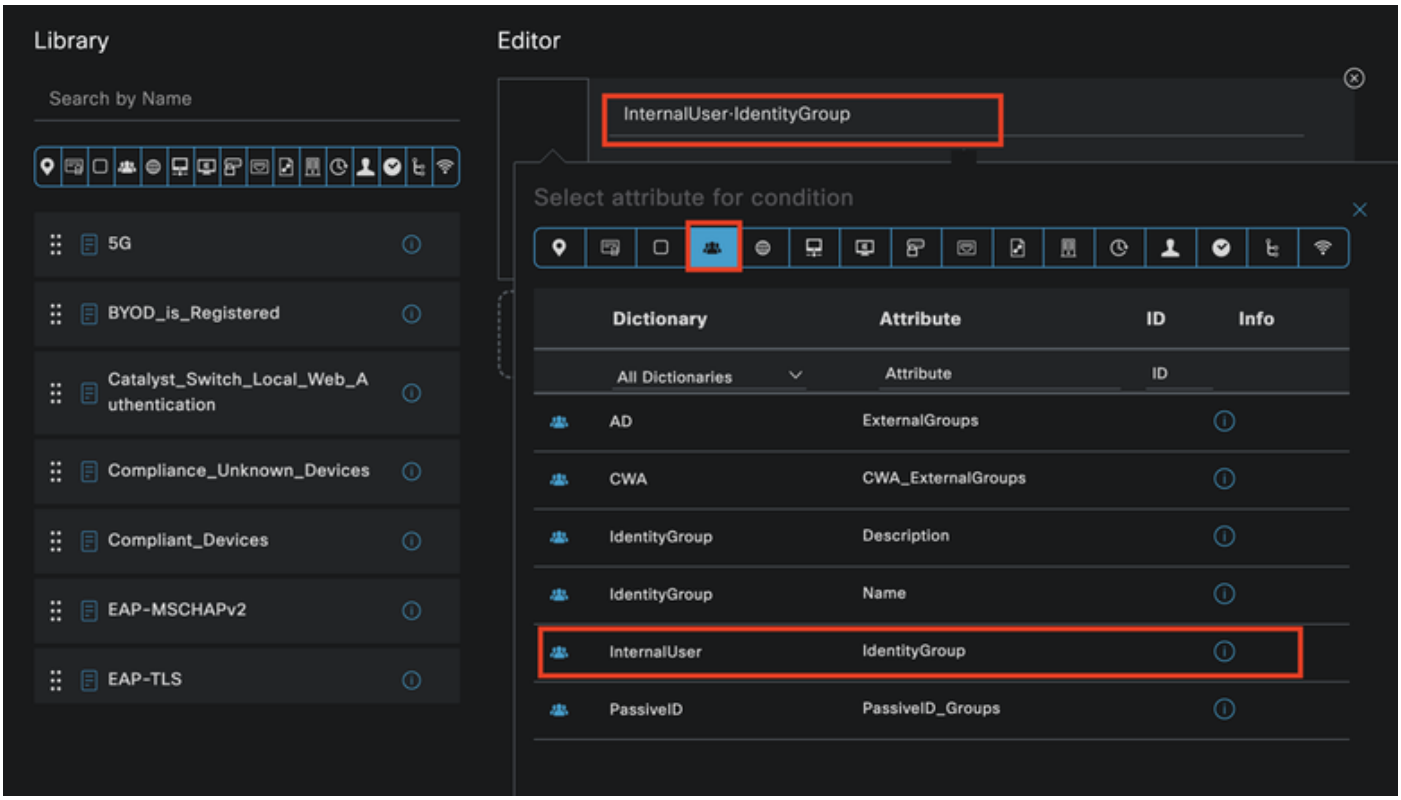
To create a condition for this **Authorization Policy**, click the **+** icon in the **Conditions** column.

The group **IseUsers** is used.

Click the **Attribute** section.

Select the **IdentityGroup** icon.

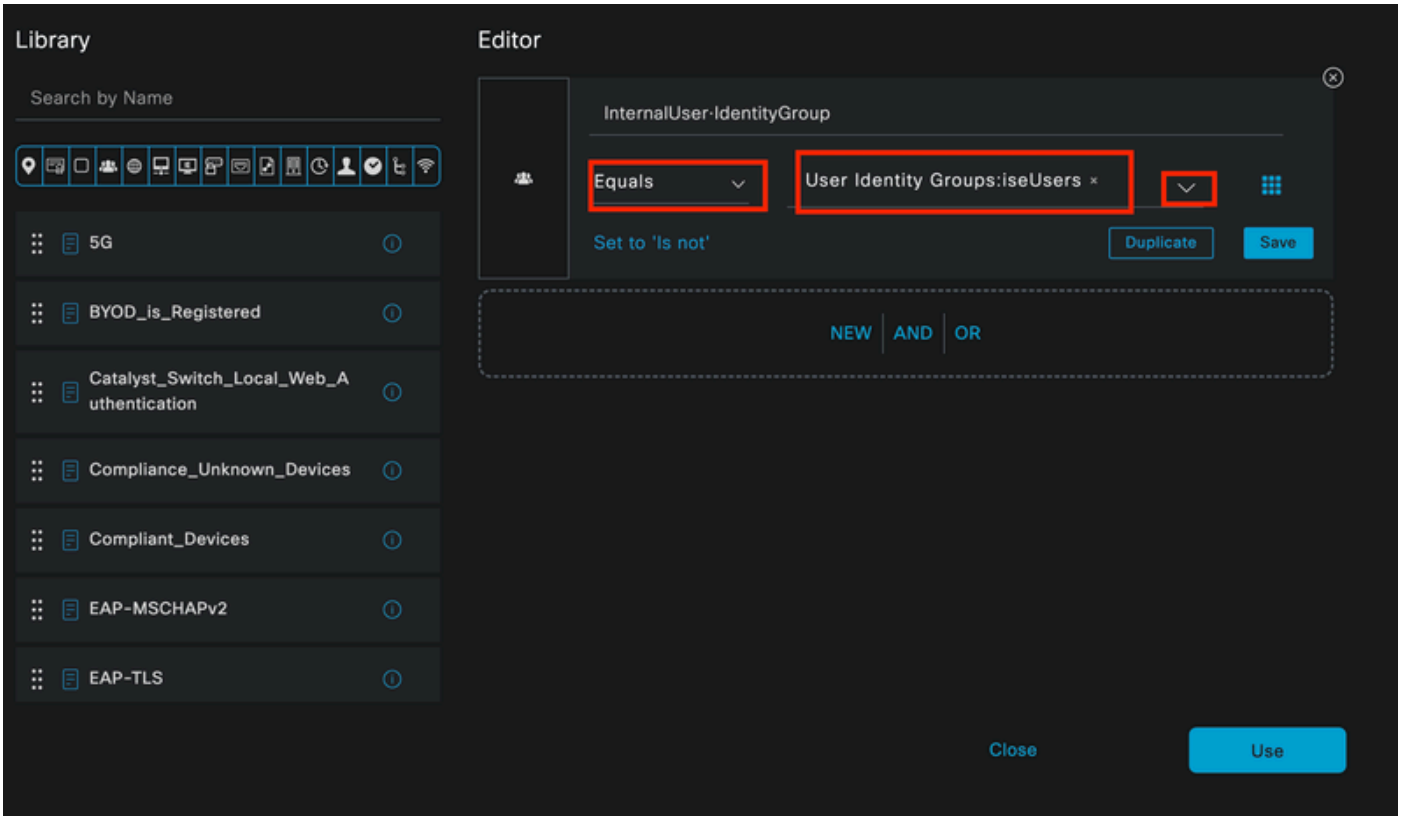
From the dictionary select the **InternalUser** dictionary that comes with the **IdentityGroup** attribute.



Condition Creation

Select the **Equals** operator.

From **User Identity Groups**, select the group **IseUsers**.

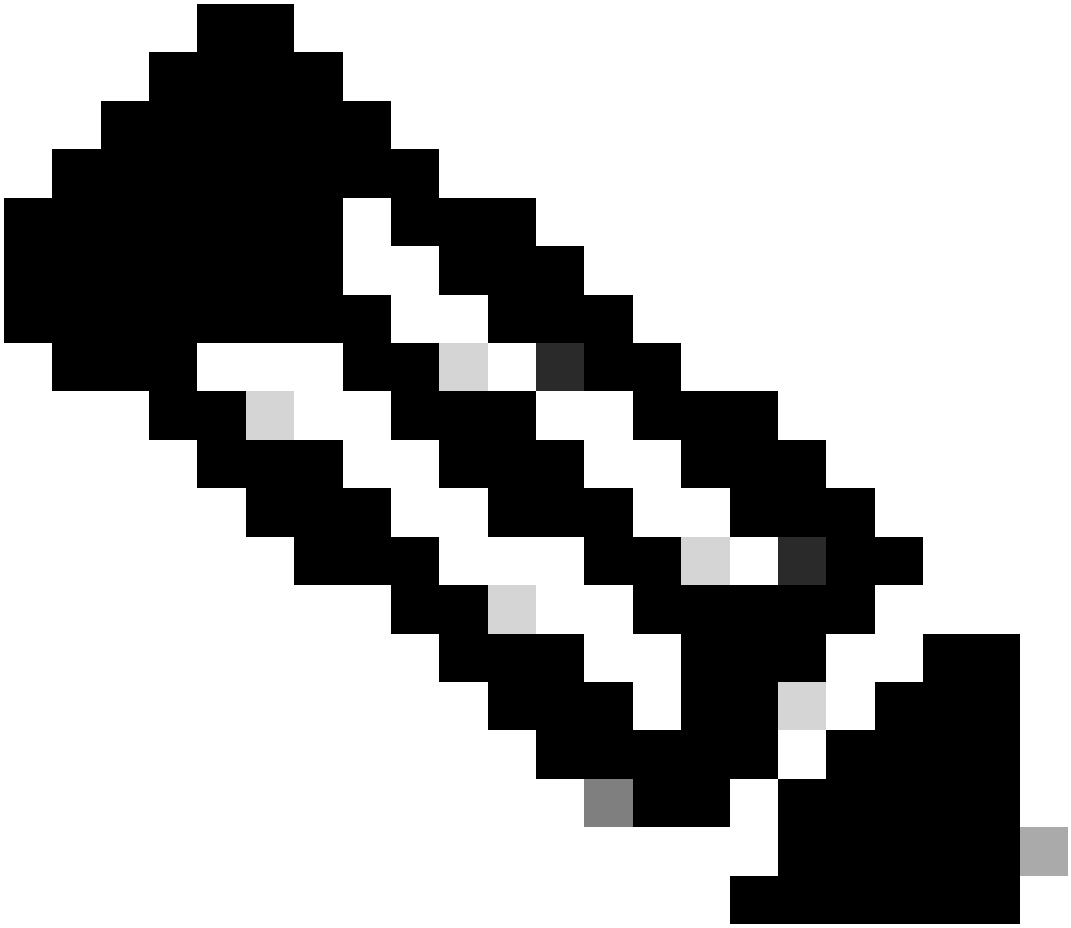


Condition Creation

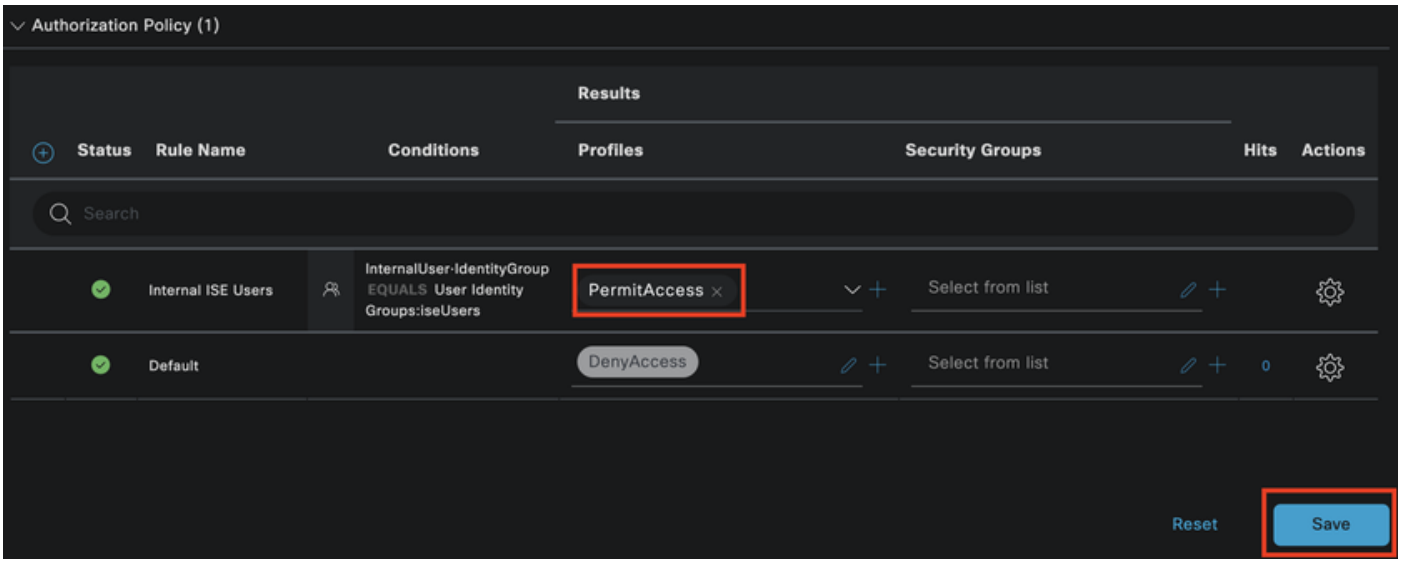
Click **Use**.

Add the **Result** Authorization Profile.

The pre-configured profile **Permit Access** is used.



Note: Please notice that the Authentications coming to ISE hitting this Wired Dot1x Policy set that are not part of the Users Identity Group ISEUsers, hit the default **Authorization Policy**, which has the result **DenyAccess**.



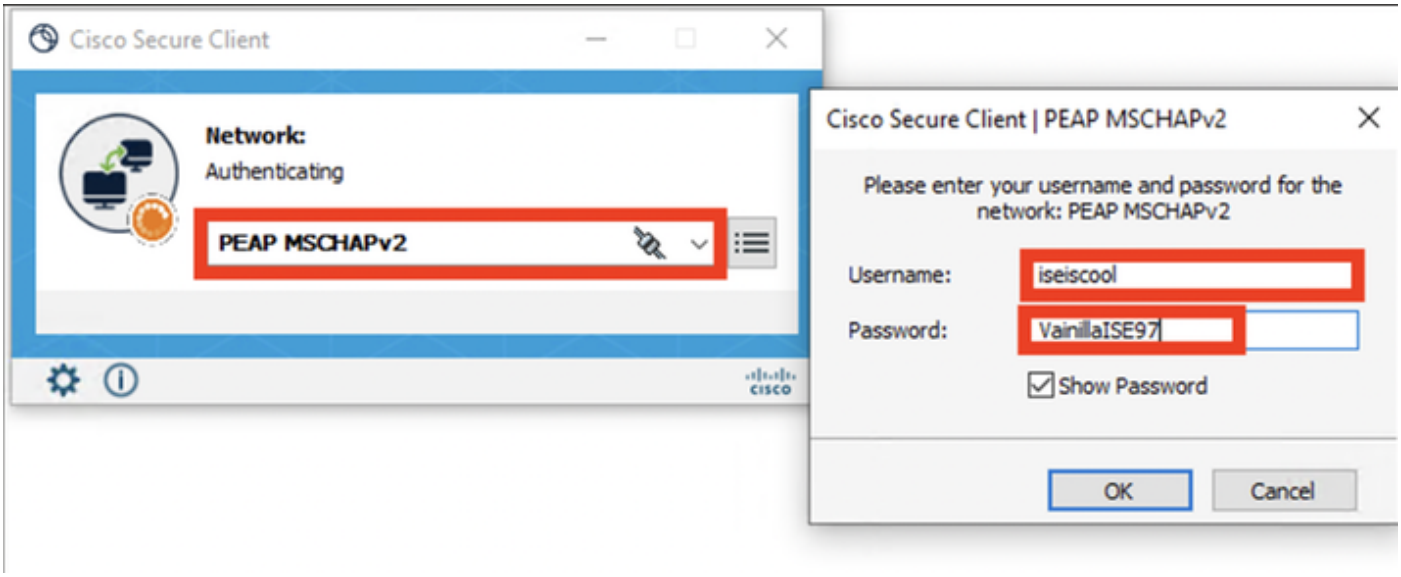
Authorization Policy

Click **Save**.

Verify

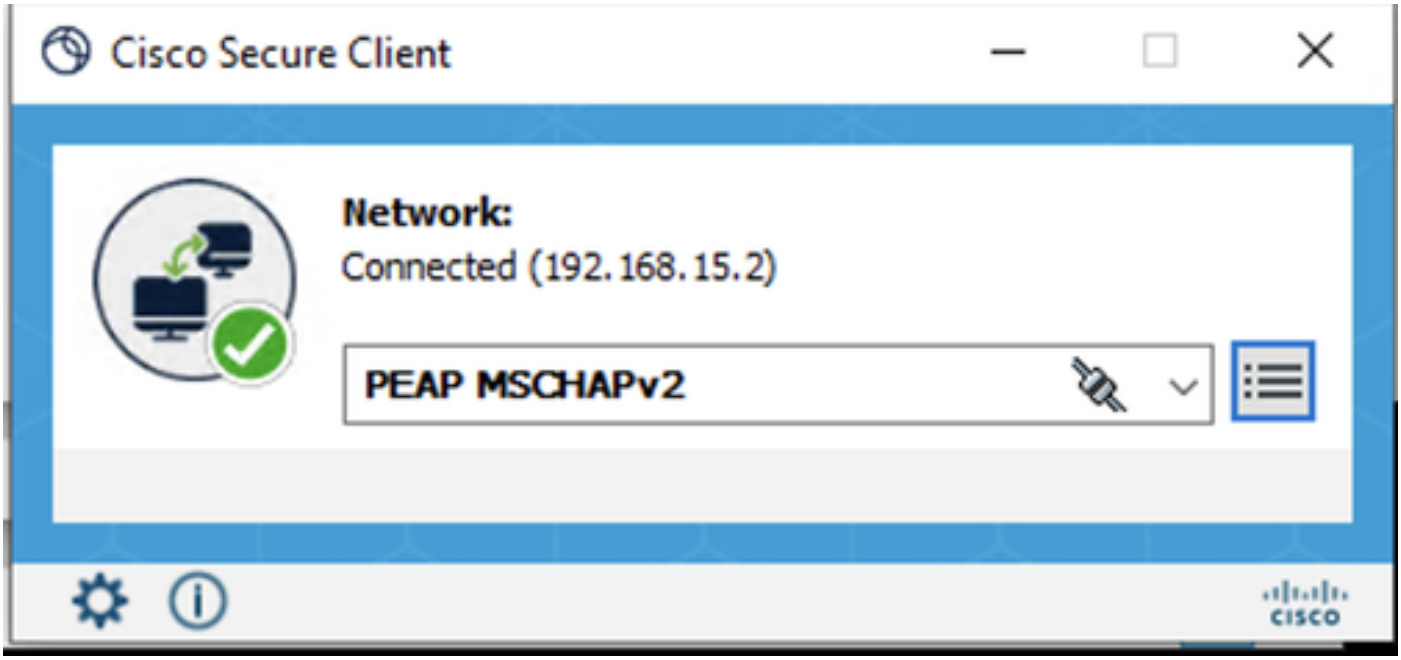
Once the configuration is finished Secure Client prompts for the credentials, and it specifies the usage of **PEAP MSCHAPv2** profile.

The credentials previously created are entered.



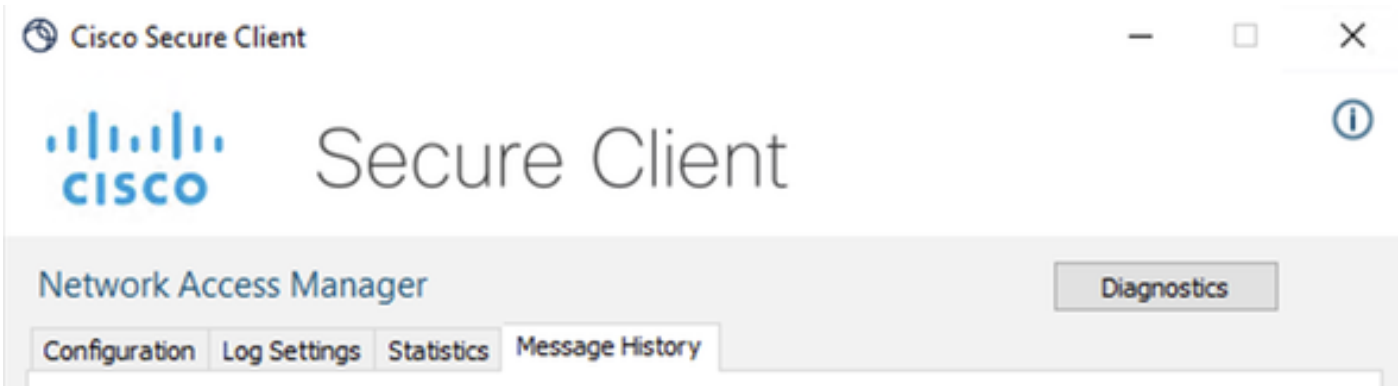
Secure Client NAM

If the endpoint authenticates correctly,. NAM displays that it is connected.

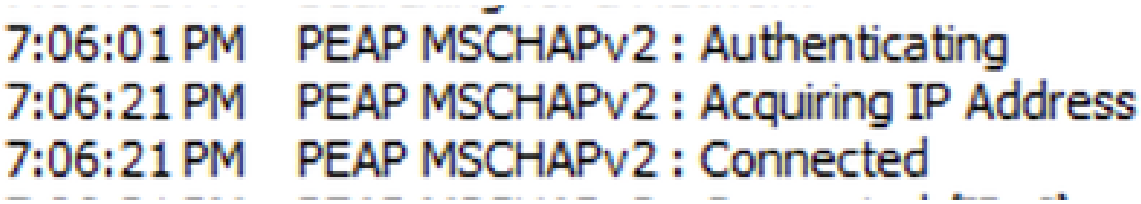


Secure Client NAM

By clicking the information icon and navigating to the **Message History** section, the details of every step that NAM did are displayed.



Secure Client Message History

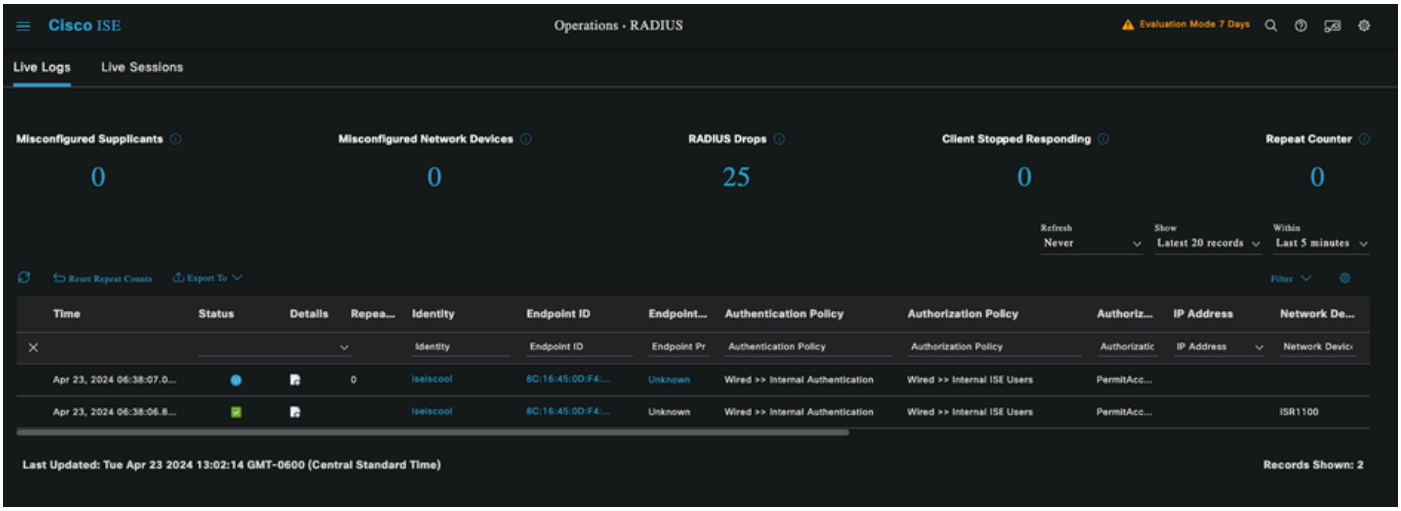


Secure Client Message History

From ISE navigate to **Operations > Radius LiveLogs** to see the details of the authentication. As seen in the next image the username that was used is displayed.

Also other details like:

- Timestamp.
- Mac address.
- Policy Set used.
- Authentication Policy.
- Authorization policy.
- Other relevant information.



ISE RADIUS Live Logs

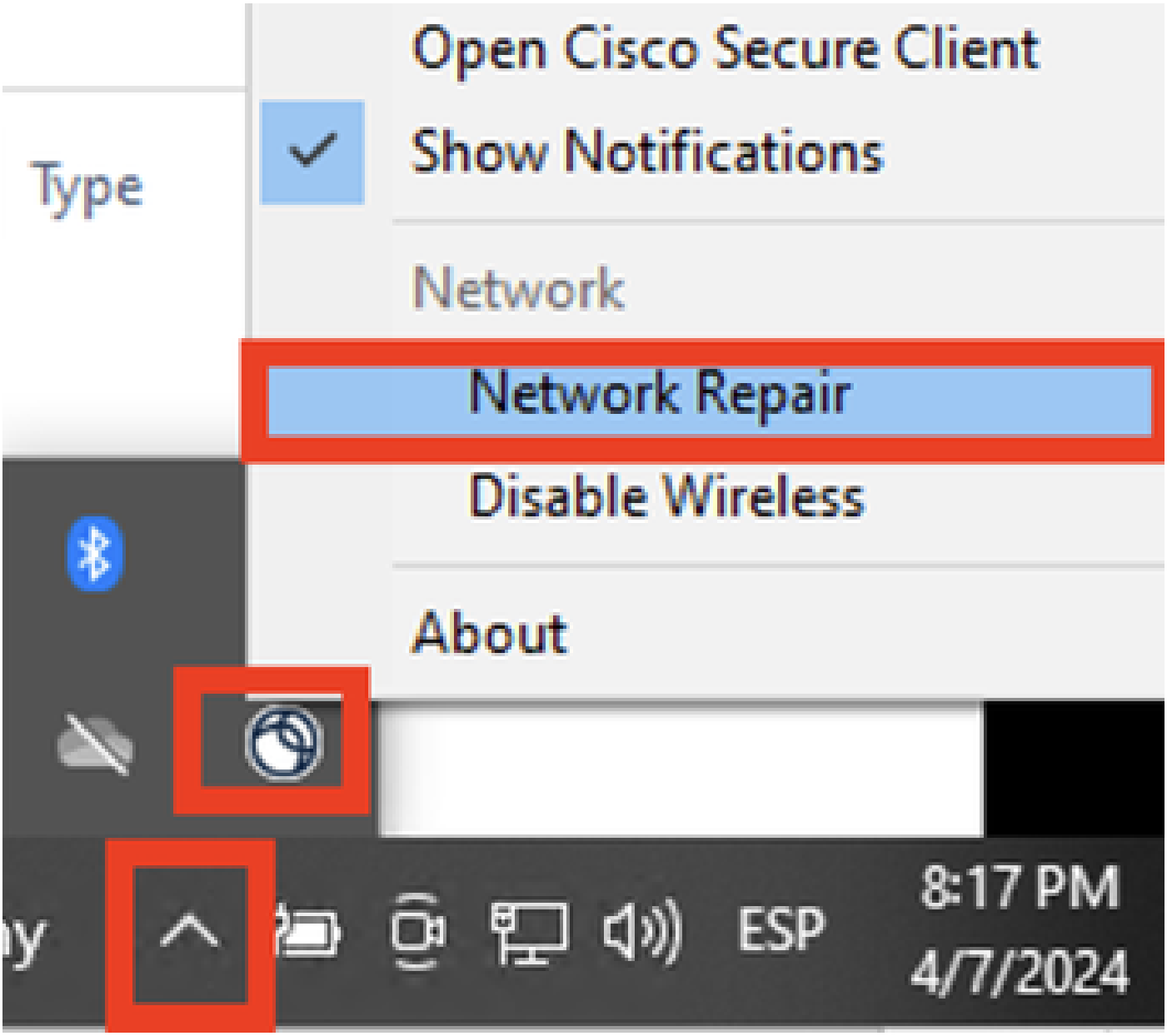
Since you can see it hits the correct policies, and the result is a successful authentication status it is conclude that the configuration is correct.

Troubleshoot

Problem: The NAM profile is not used by Secure Client.

If the new profile that was created in the profile editor is not used by NAM, use the **Network Repair** option for Secure Client.

You can find this option by navigating to the **Windows Bar > Clicking the circumflex icon > Right-Click Secure Client Icon > Click Network Repair**.



Network Repair Section

Problem 2: Logs need to be collected for further analysis.

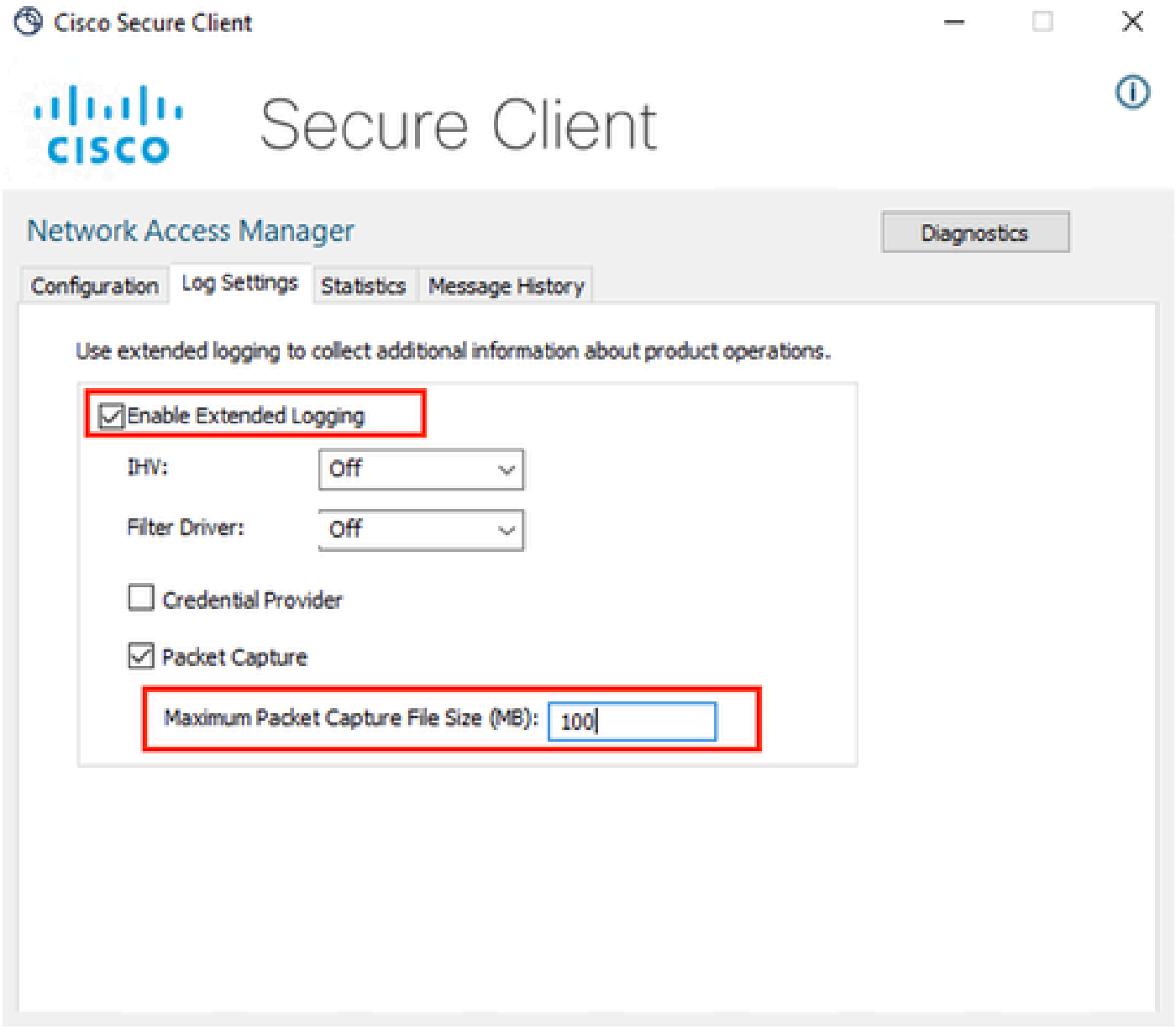
1. Enable NAM extended logging

Open NAM, and click the gear icon.

NAM Interface

Navigate to the **Log Settings** tab. Check the **Enable Extended Logging** checkbox.

Set the **Packet Capture File Size** to 100 MB.



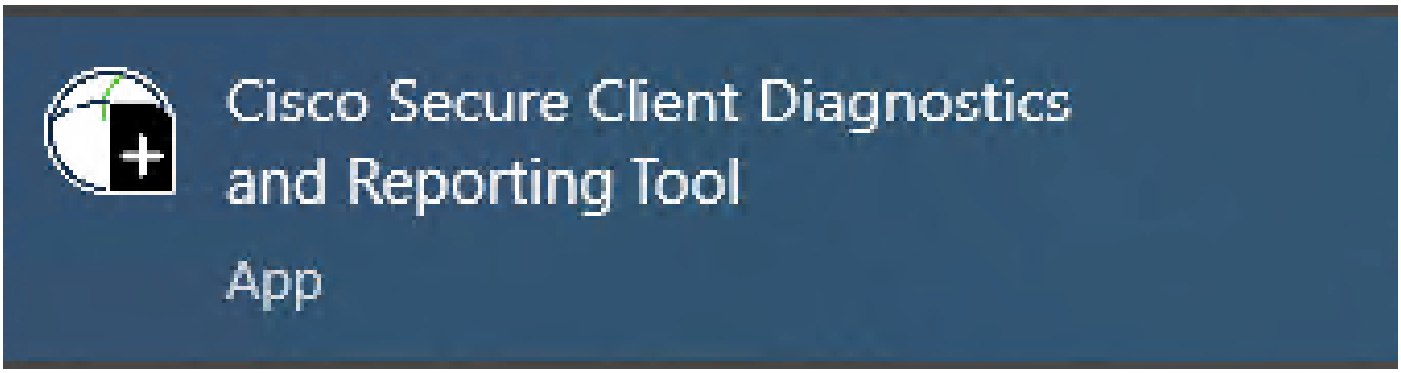
Secure Client NAM Log Settings

2. Reproduce the issue.

Once extended logging is enabled reproduce the issue multiple times to ensure the logs are generated and the traffic is captured.

3. Collect Secure Client DART bundle.

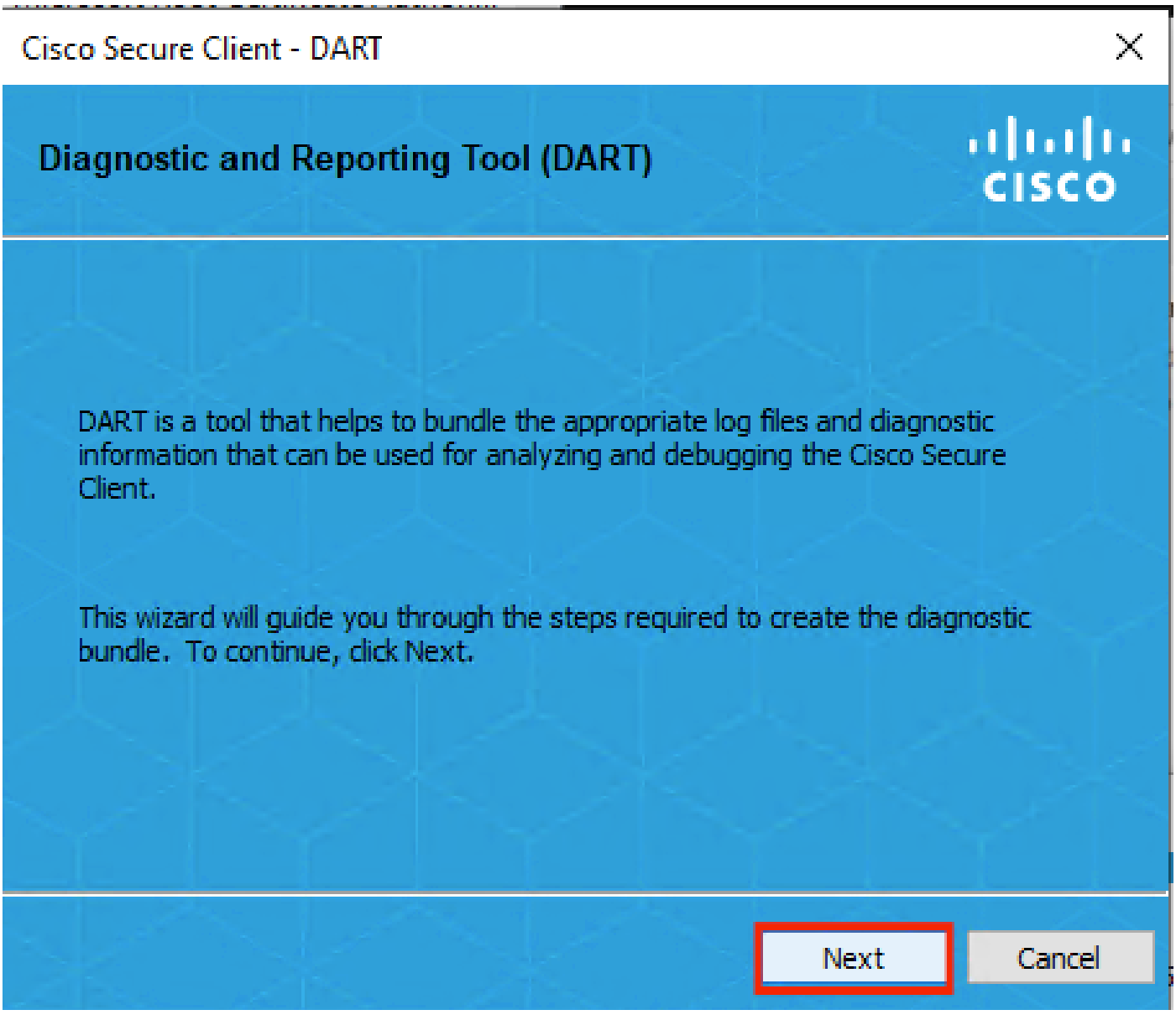
From Windows, navigate to the search bar and type, **Cisco Secure Client Diagnostics and Reporting Tool**.



DART Module

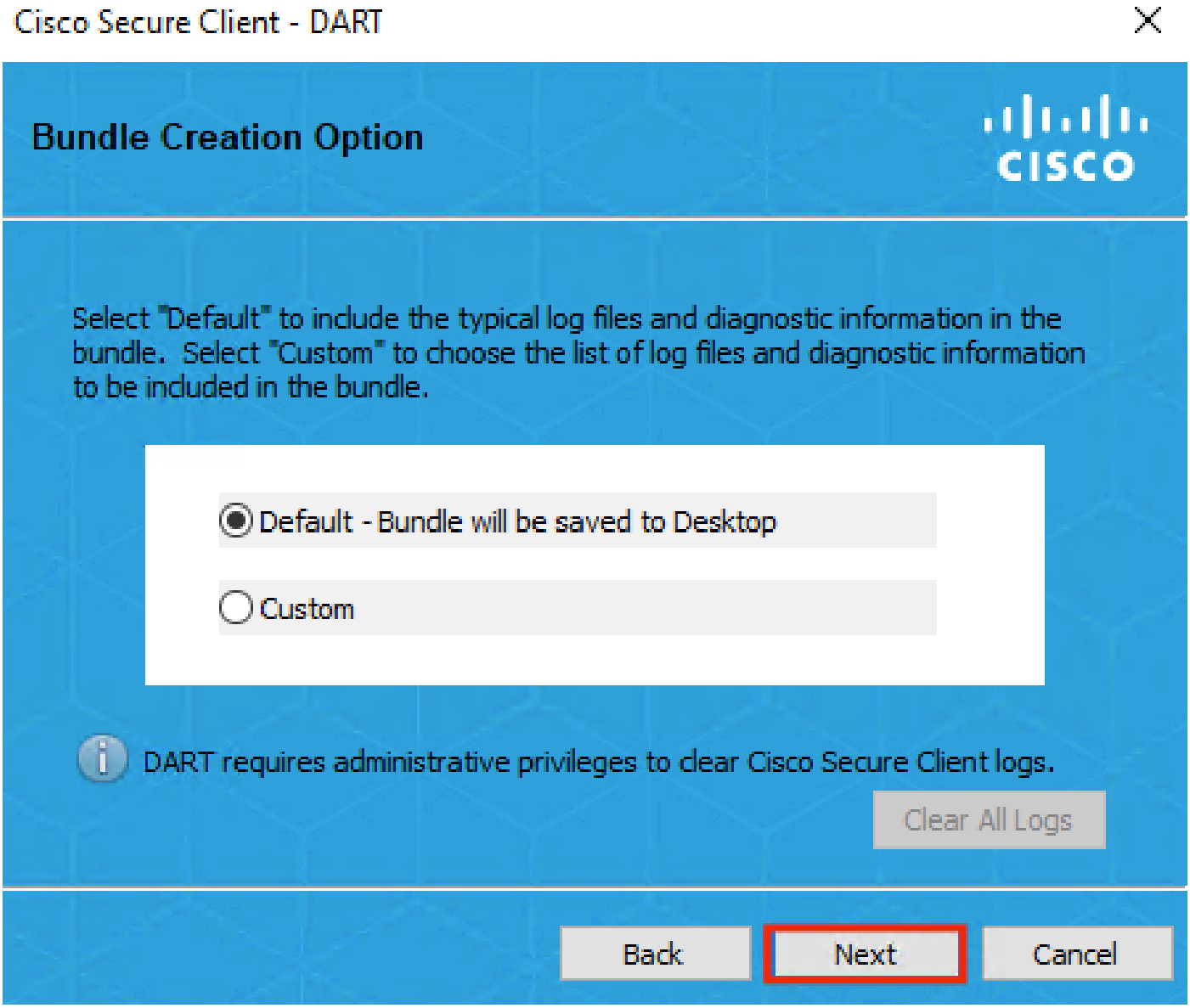
During the installation process, you also installed this module. It is a tool that helps during the troubleshooting process by collecting logs and relevant dot1x session information.

Click **Next** in the first window.



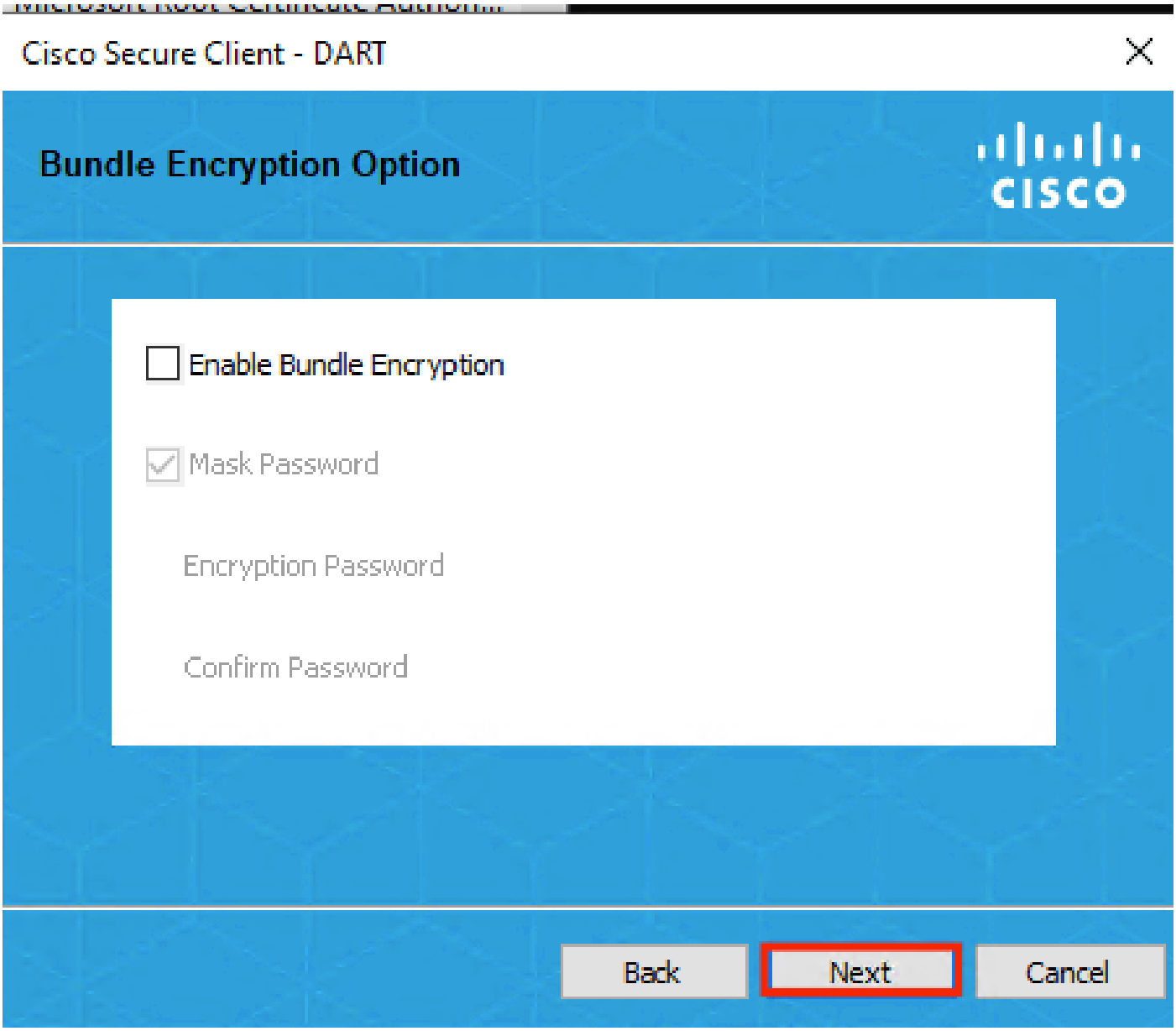
DART Module

Once again click **Next**, so the log bundle can be saved on the desktop.



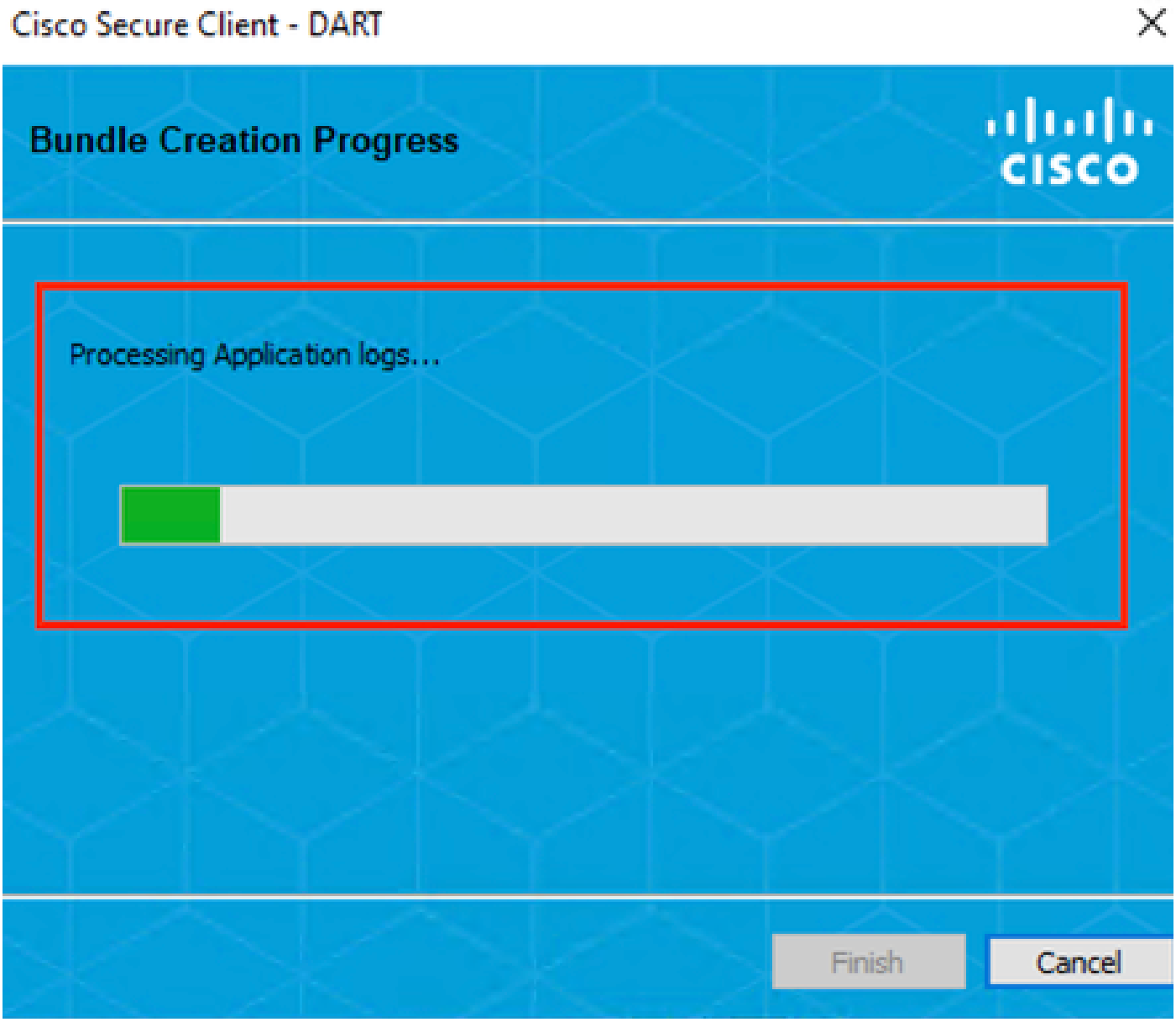
DART Module

If necessary check the checkbox **Enable Bundle Encryption**.



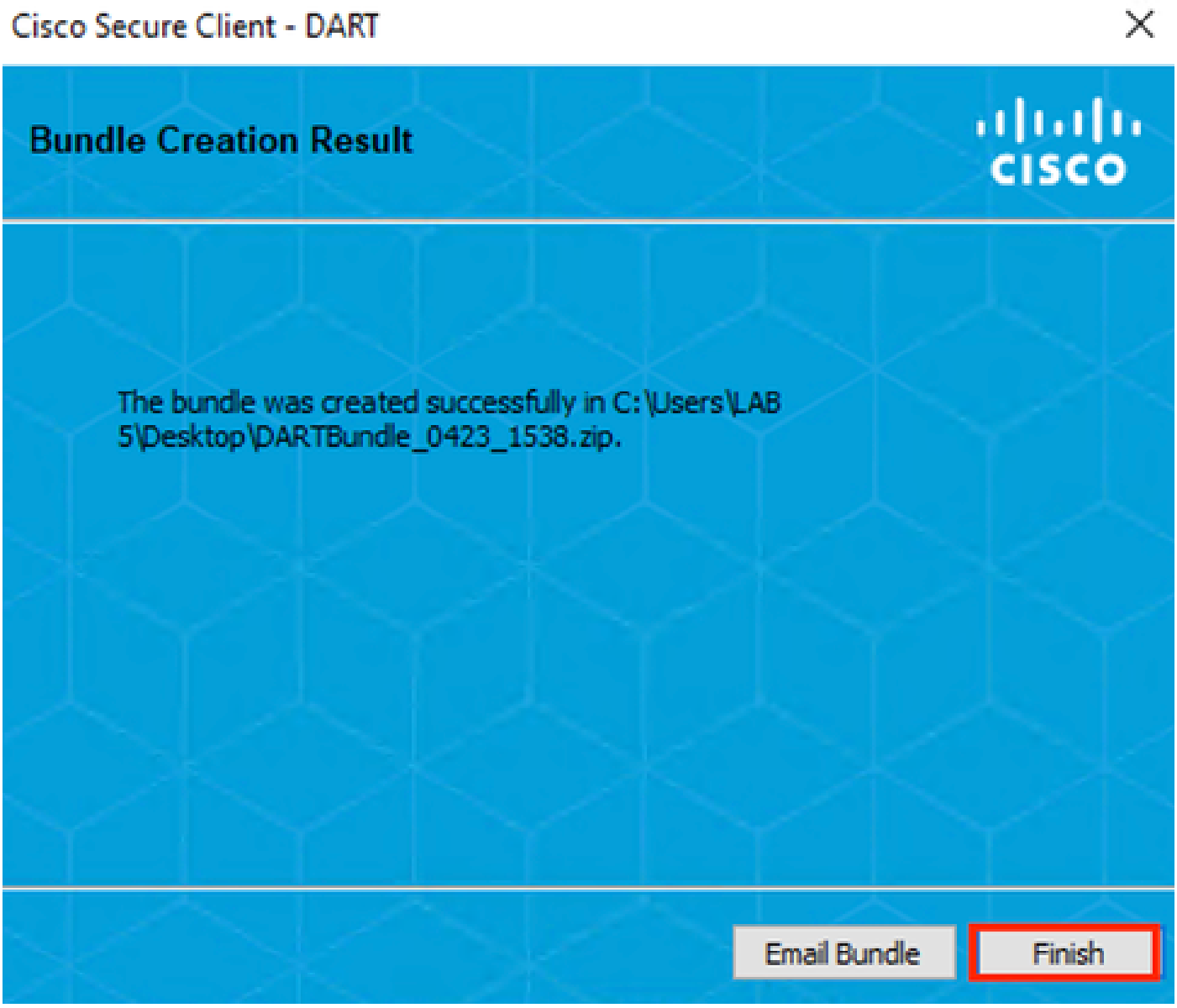
DART Module

DART log collection starts.



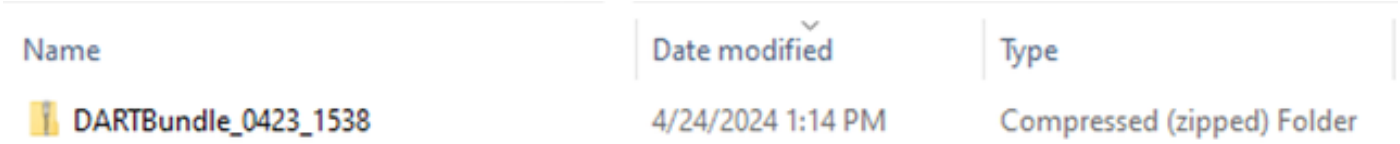
DART Log Collection

It can take 10 minutes or more until the process finishes.



DART Bundle Creation Result

The **DART** result file can be found in the desktop directory.



DART Result File

Related Information

- Cisco Technical Support & Downloads