# 通過RADIUS授權為AnyConnect使用者配置靜態IP地址分配

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## 簡介

本文說明如何使用身分識別服務引擎(ISE)伺服器設定RADIUS授權，以便其透過RADIUS屬性8 Framed-IP-Address將同一IP位址轉送到特定Cisco AnyConnect安全行動化使用者端的Firepower威脅防禦(FTD)。

## 必要條件

### 需求

思科建議您瞭解以下主題：

- FTD
- Firepower Management Center (FMC)
- ISE
- Cisco AnyConnect Security Mobility Solution — 遠端存取
- RADIUS通訊協定

### 採用元件

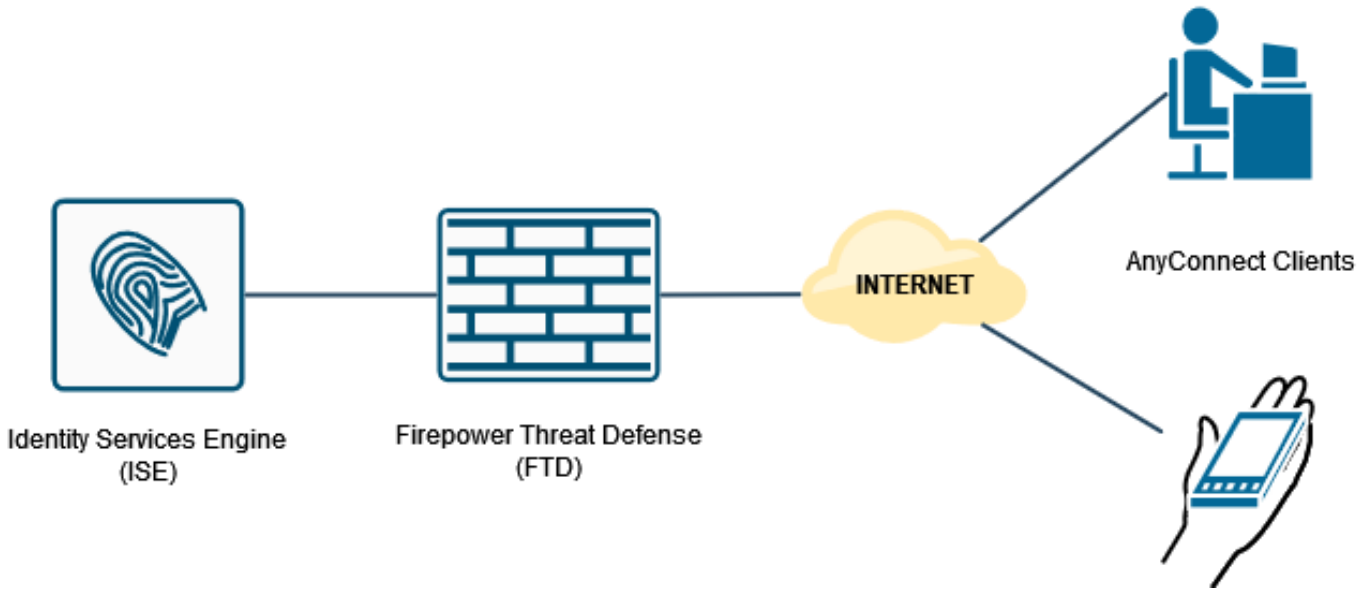
本檔案中的資訊是根據以下軟體版本：

- FMCv - 7.0.0（內部版本94）
- FTDv - 7.0.0（內部版本94）
- ISE - 2.7.0.356
- AnyConnect - 4.10.02086
- Windows 10 Pro

本文中的資訊是根據特定實驗室環境內的裝置所建立。文中使用到的所有裝置皆從已清除（預設）的組態來啟動。如果您的網路運作中，請確保您瞭解任何指令可能造成的影響。

# 設定

## 網路圖表




## 通過FMC使用AAA/RADIUS身份驗證配置遠端訪問VPN

如需逐步程式，請參閱本檔案及以下影片：

- FTD上的AnyConnect遠端存取VPN組態
- FMC管理的FTD的初始AnyConnect配置

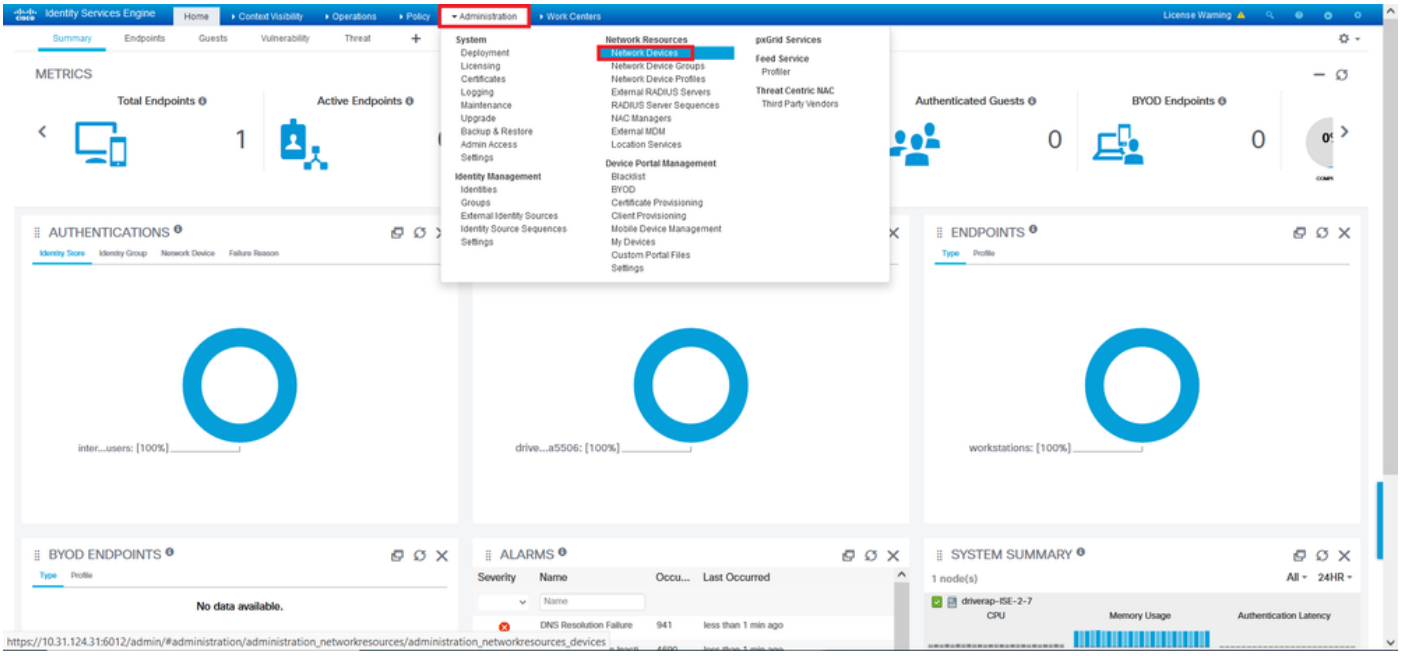
FTD CLI上的遠端存取VPN組態為：

```
ip local pool AC_Pool 10.0.50.1-10.0.50.100 mask 255.255.255.0

interface GigabitEthernet0/0
nameif Outside_Int
security-level 0
ip address 192.168.0.100 255.255.255.0

aaa-server ISE_Server protocol radius
aaa-server ISE_Server host 172.16.0.8
key *****
authentication-port 1812
accounting-port 1813

crypto ca trustpoint RAVPN_Self-Signed_Cert
enrollment self
fqdn none
subject-name CN=192.168.0.100
keypair <Default-RSA-Key>
crl configure

ssl trust-point RAVPN_Self-Signed_Cert
```

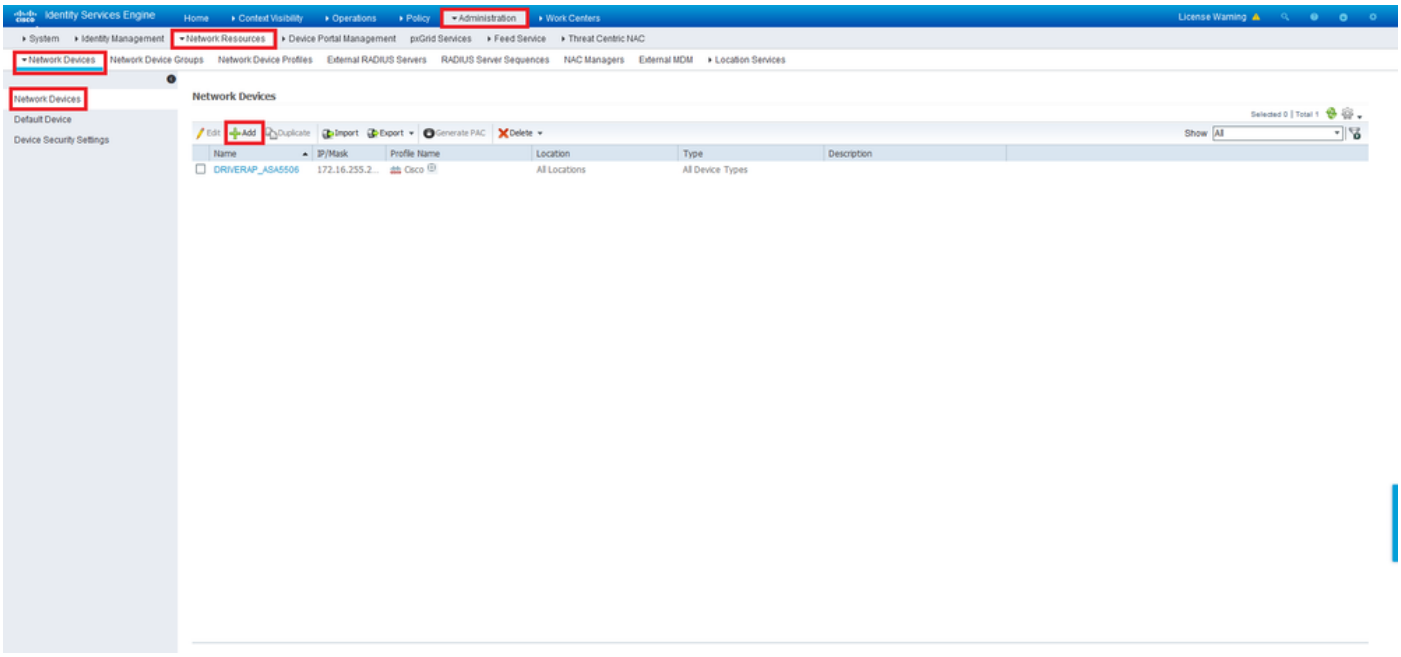
```
webvpn
enable Outside_Int
http-headers
hsts-server
enable
max-age 31536000
include-sub-domains
no preload
hsts-client
enable
x-content-type-options
x-xss-protection
content-security-policy
anyconnect image disk0:/csm/anyconnect-win-4.10.02086-webdeploy-k9.pkg 1 regex "Windows"
anyconnect enable
tunnel-group-list enable
cache
no disable
error-recovery disable

group-policy DfltGrpPolicy attributes
vpn-tunnel-protocol ikev2 ssl-client
user-authentication-idle-timeout none
webvpn
anyconnect keep-installer none
anyconnect modules value none
anyconnect ask none default anyconnect
http-comp none
activex-relay disable
file-entry disable
file-browsing disable
url-entry disable
deny-message none

tunnel-group RA_VPN type remote-access
tunnel-group RA_VPN general-attributes
address-pool AC_Pool
authentication-server-group ISE_Server
tunnel-group RA_VPN webvpn-attributes
group-alias RA_VPN enable
```

## 在ISE上配置授權策略（RADIUS伺服器）

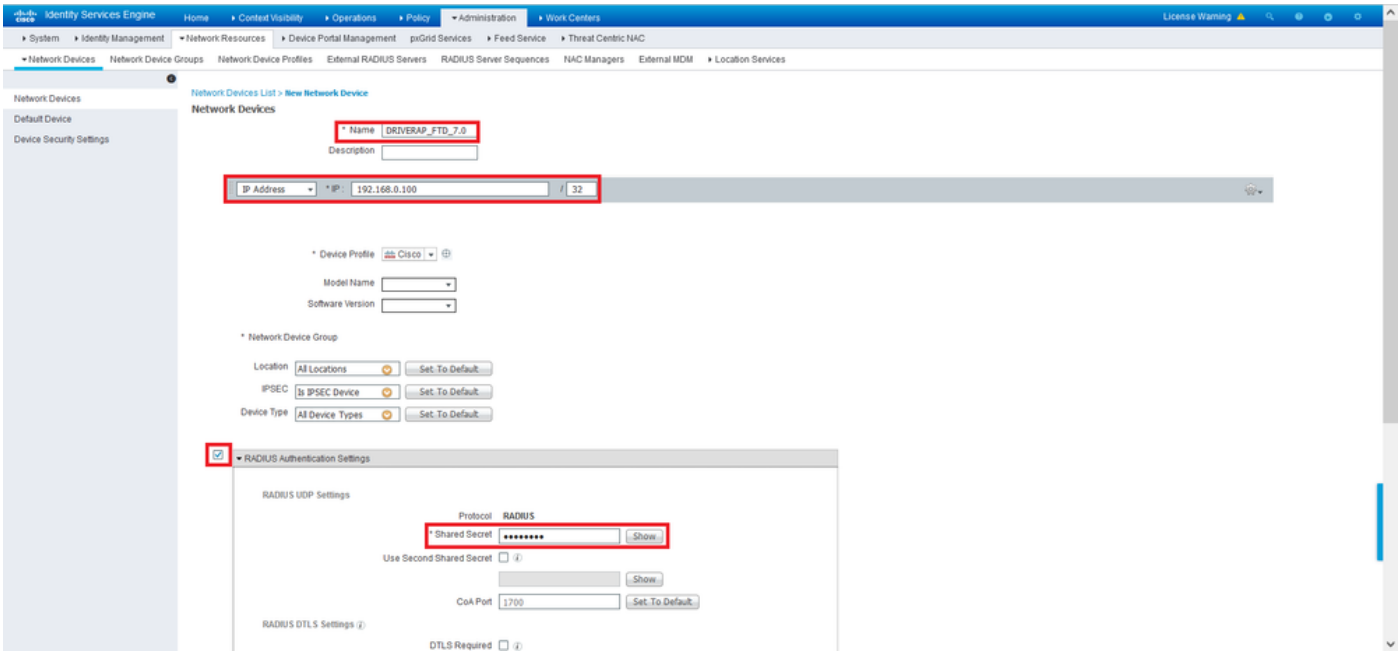
步驟1.登入到ISE伺服器並導航到**管理>網路資源>網路裝置**。




步驟2.在「網路裝置」區段中，按一下**Add**，以便ISE可以處理來自FTD的RADIUS存取要求。

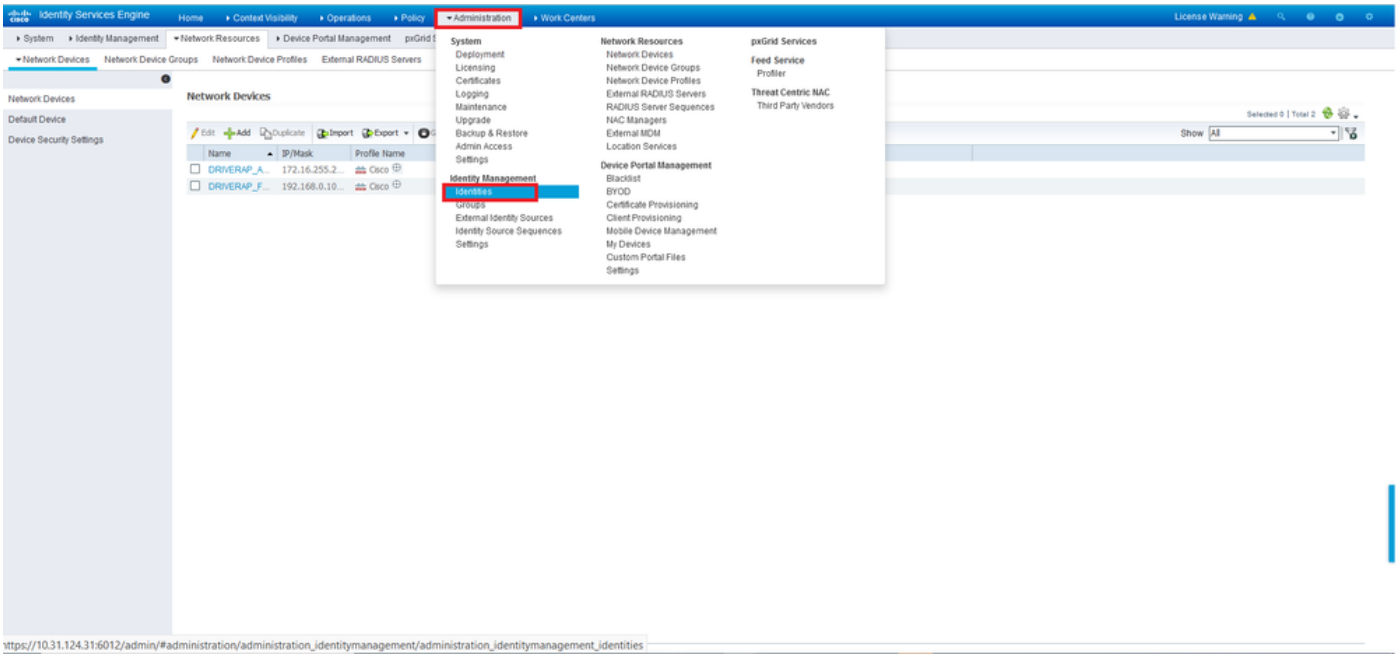



輸入網路裝置**名稱**和**IP地址**欄位，然後選中**RADIUS身份驗證設定**框。Shared Secret的值必須與建立FMC上的RADIUS伺服器對象時使用的值相同。

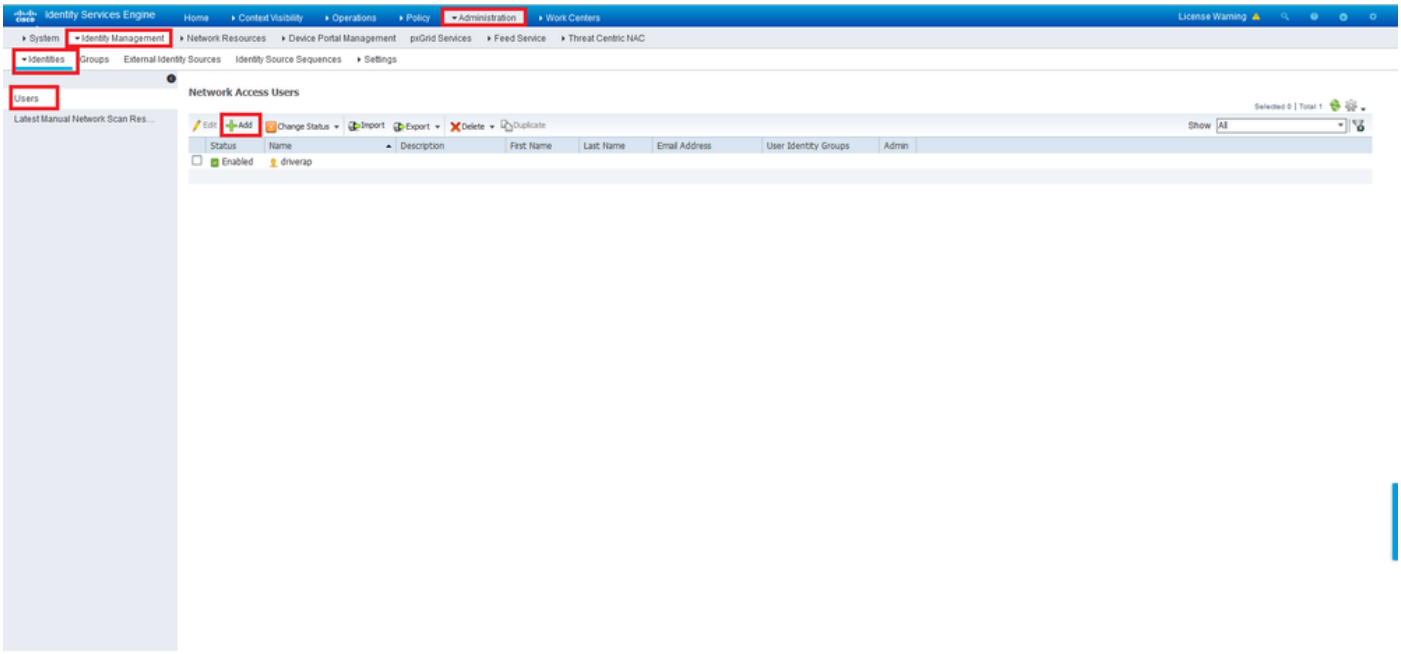



使用此頁面結尾的按鈕儲存。

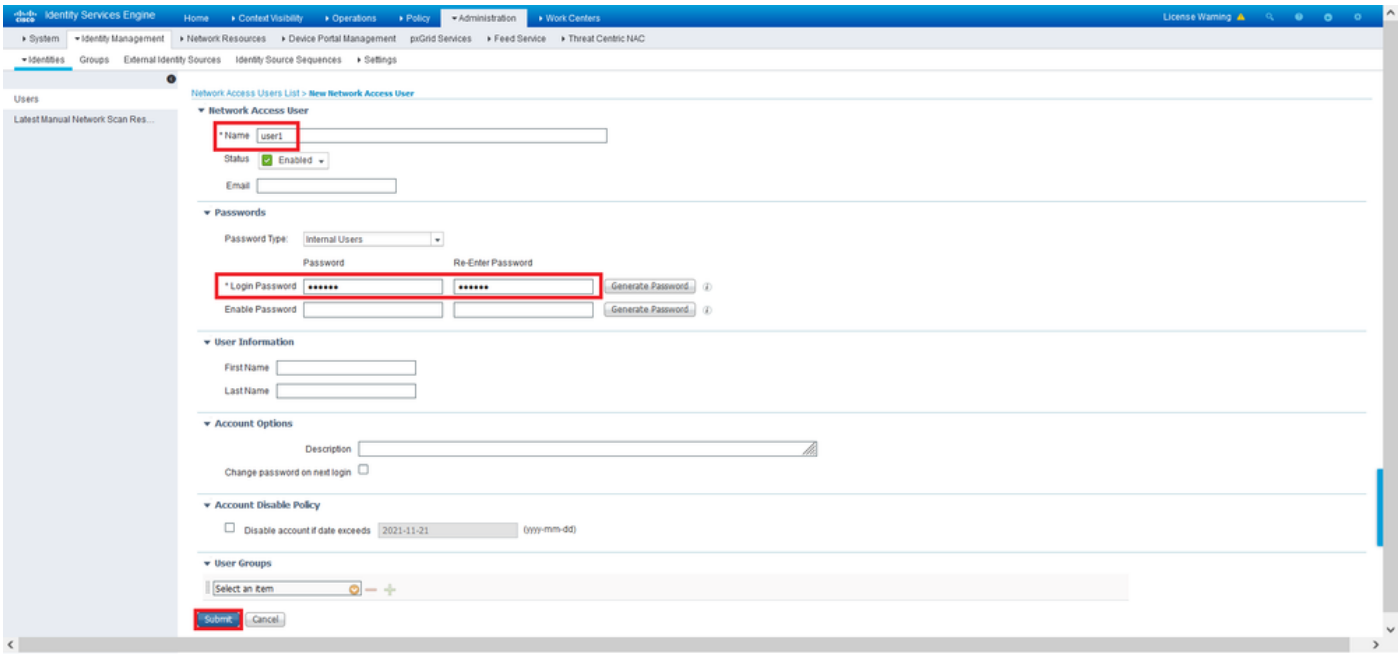
步驟3.導航到**管理>身份管理>身份**。



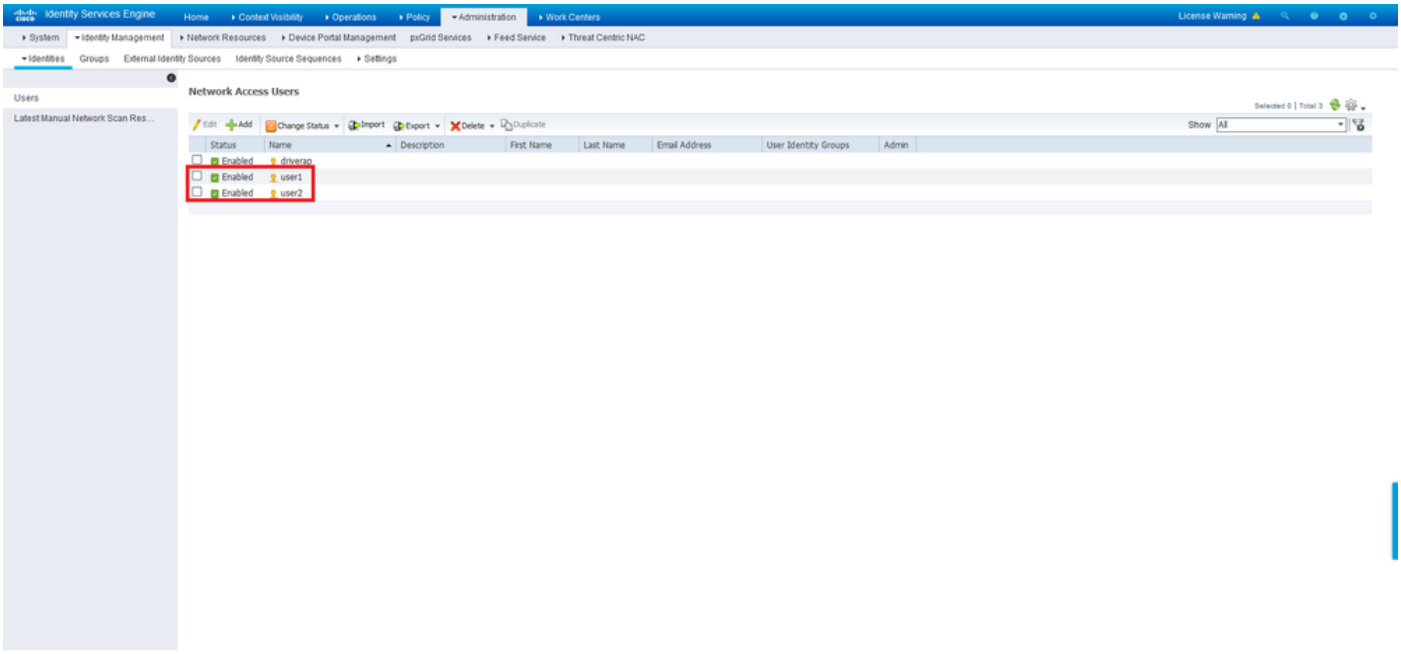

步驟4.在Network Access Users部分，按一下**Add**以便在ISE的本地資料庫中建立*user1*。



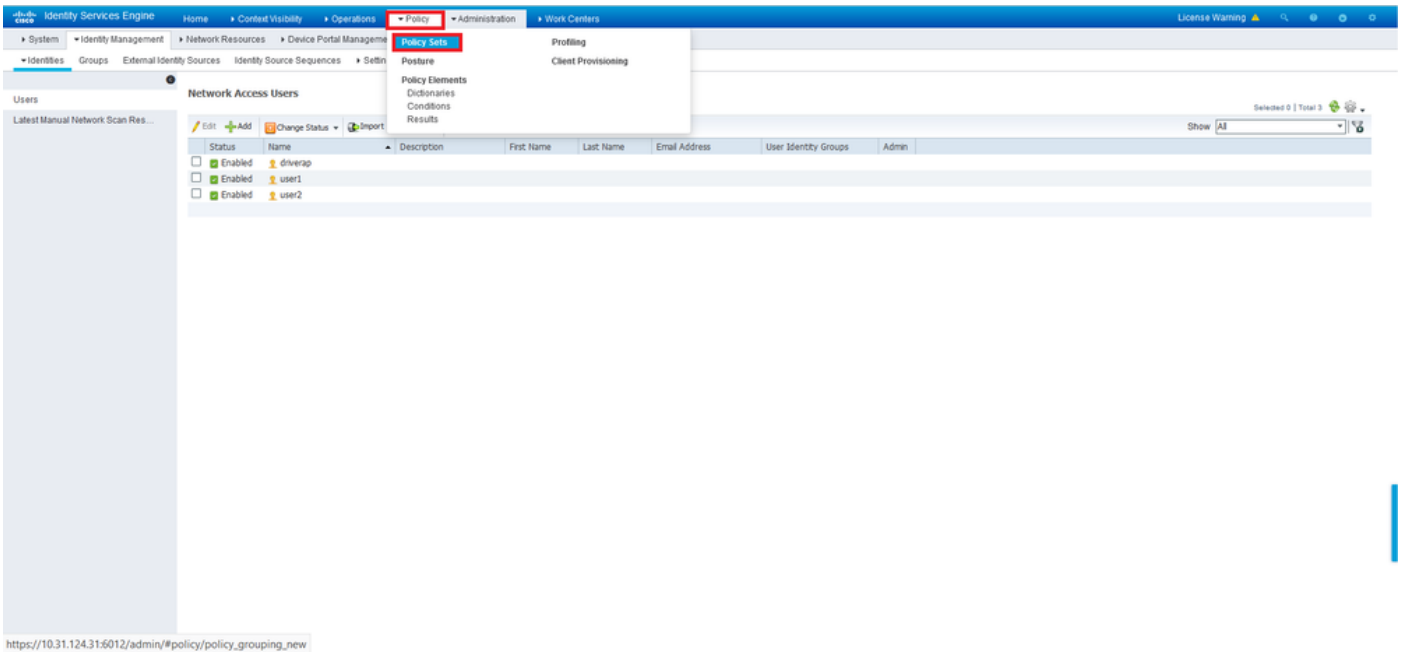

在Name和Login Password欄位中輸入使用者名稱和密碼，然後按一下Submit。



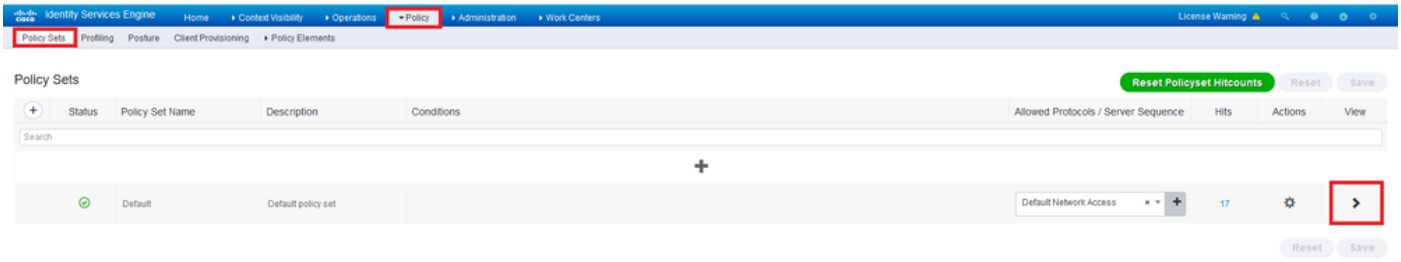

步驟5.重複上述步驟以建立*user2*。



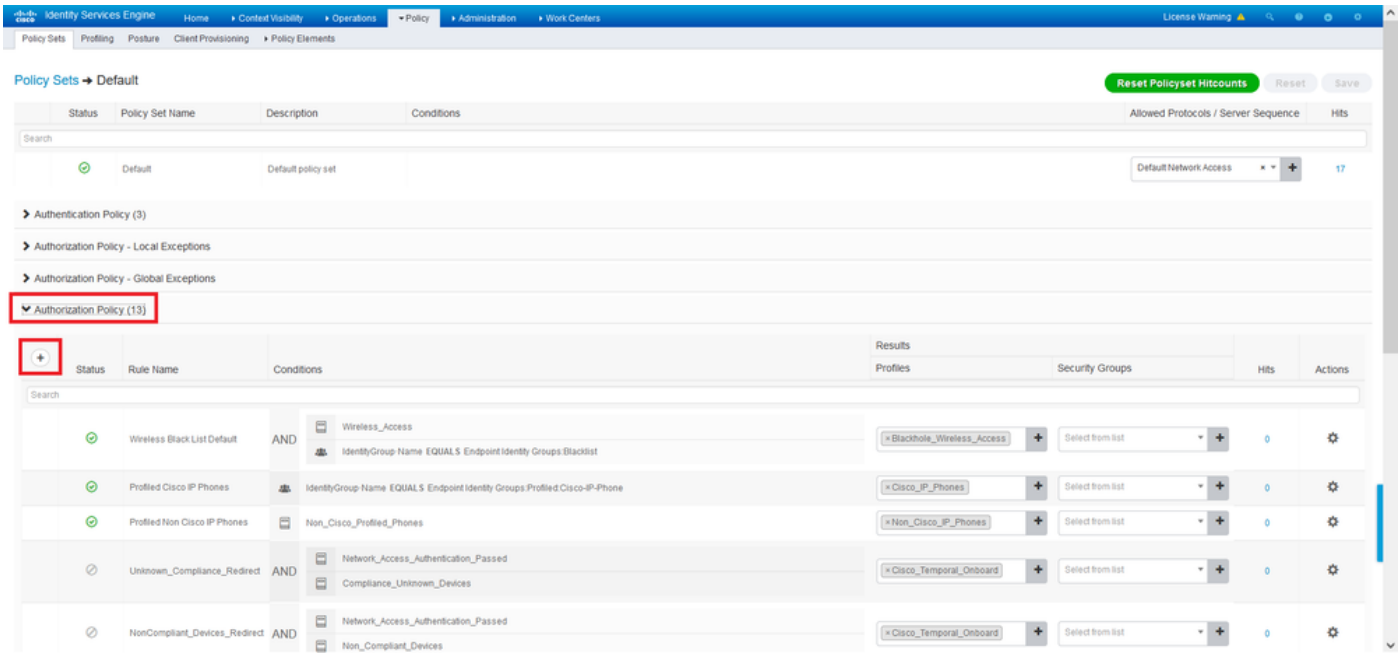

步驟6.導覽至Policy > Policy Sets。




步驟7.按一下屏幕右側的箭頭>。

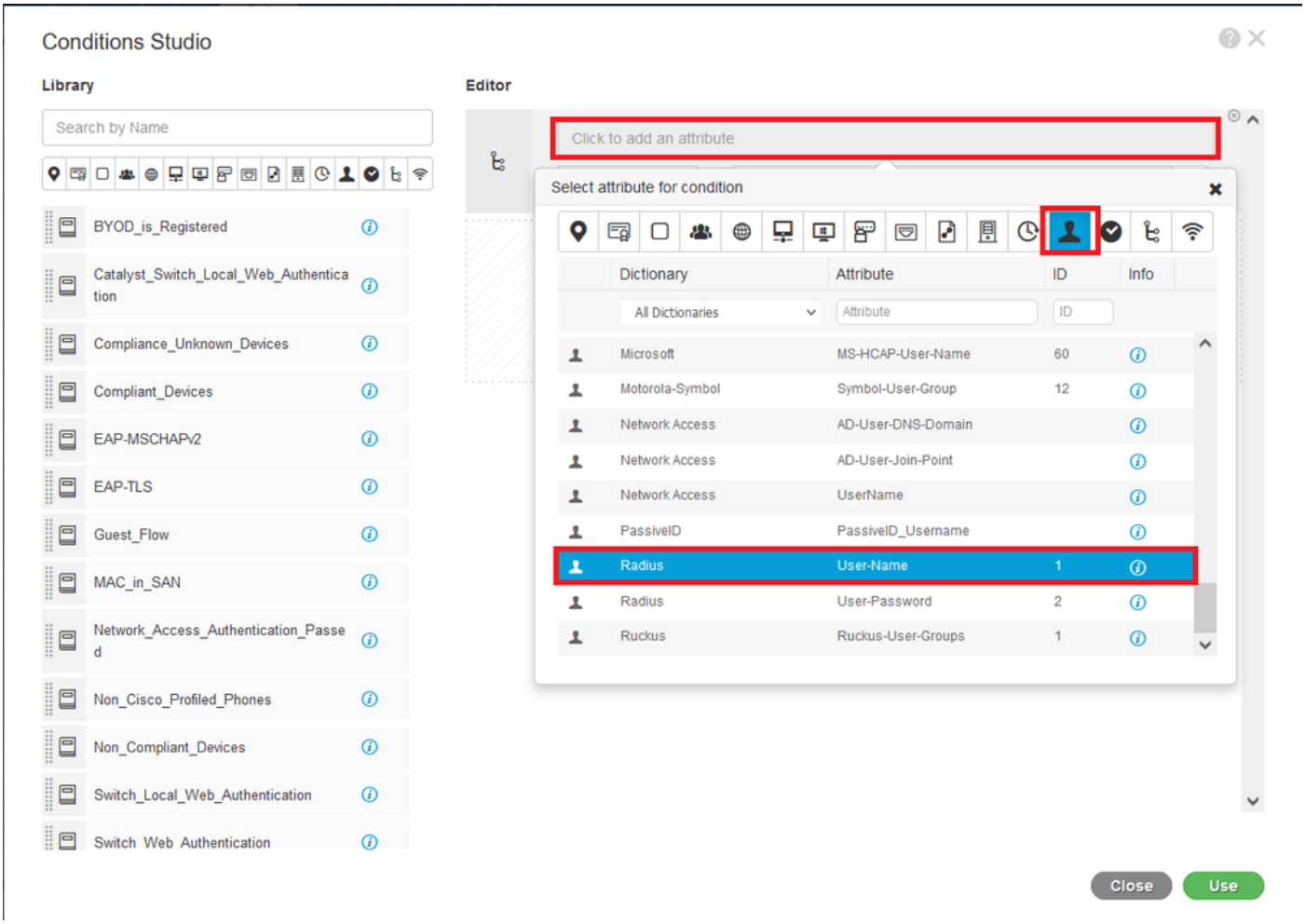



步驟8.按一下**Authorization Policy**旁邊的箭頭**>**將其展開。現在，按一下*+*符號以新增新規則。

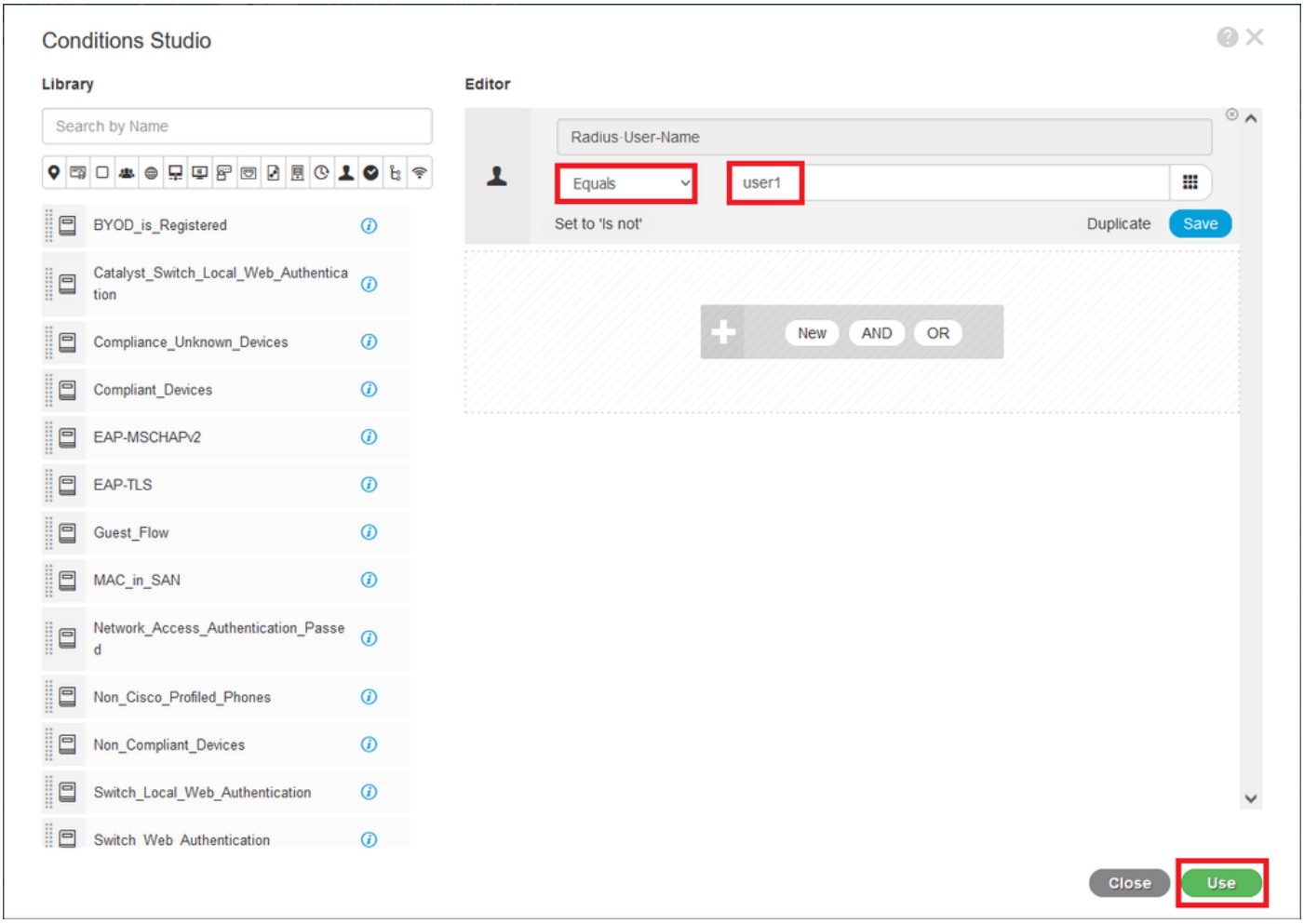



為規則提供名稱，並在**條件**列下*選擇*+符號。


在「屬性編輯器」(Attribute Editor)文本框中按一下，然後按一下**「主題」(Subject)**圖示。向下滾動，直到找到*RADIUS User-Name*屬性並選擇它。

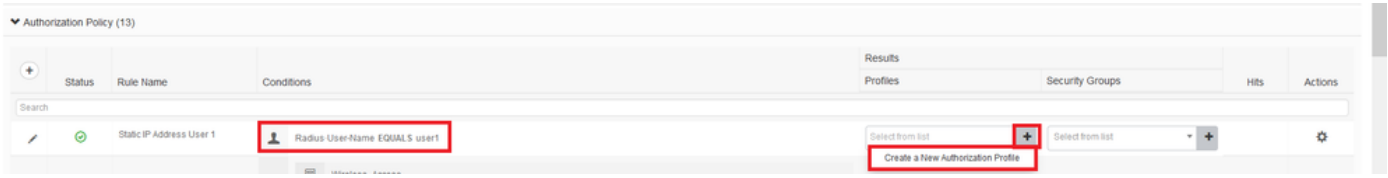



保留**Equals**作為運算子，並在其旁邊的文本框中輸入*user1*。按一下「**Use**」以儲存屬性。

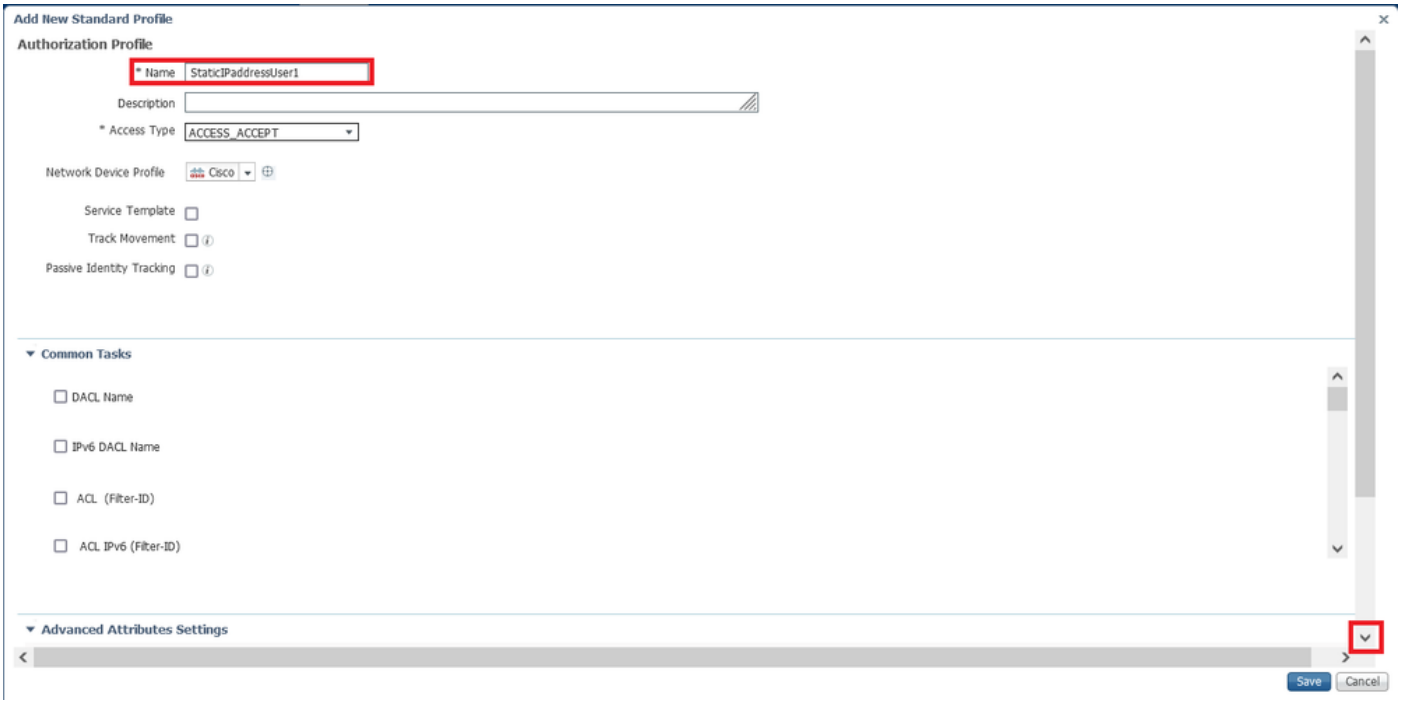



現在已設定此規則的條件。

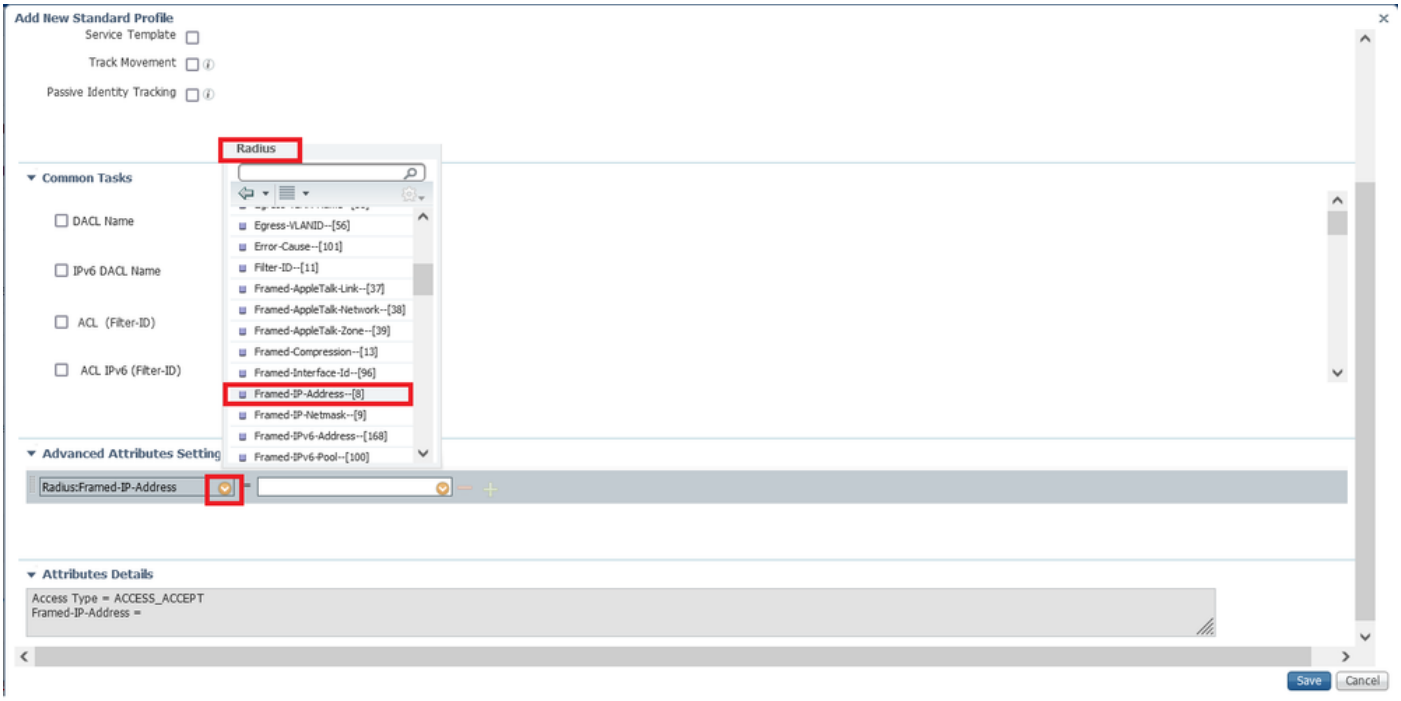
步驟9.在**Results/Profiles**列中，按一下+號並選擇**Create a New Authorization Profile**。



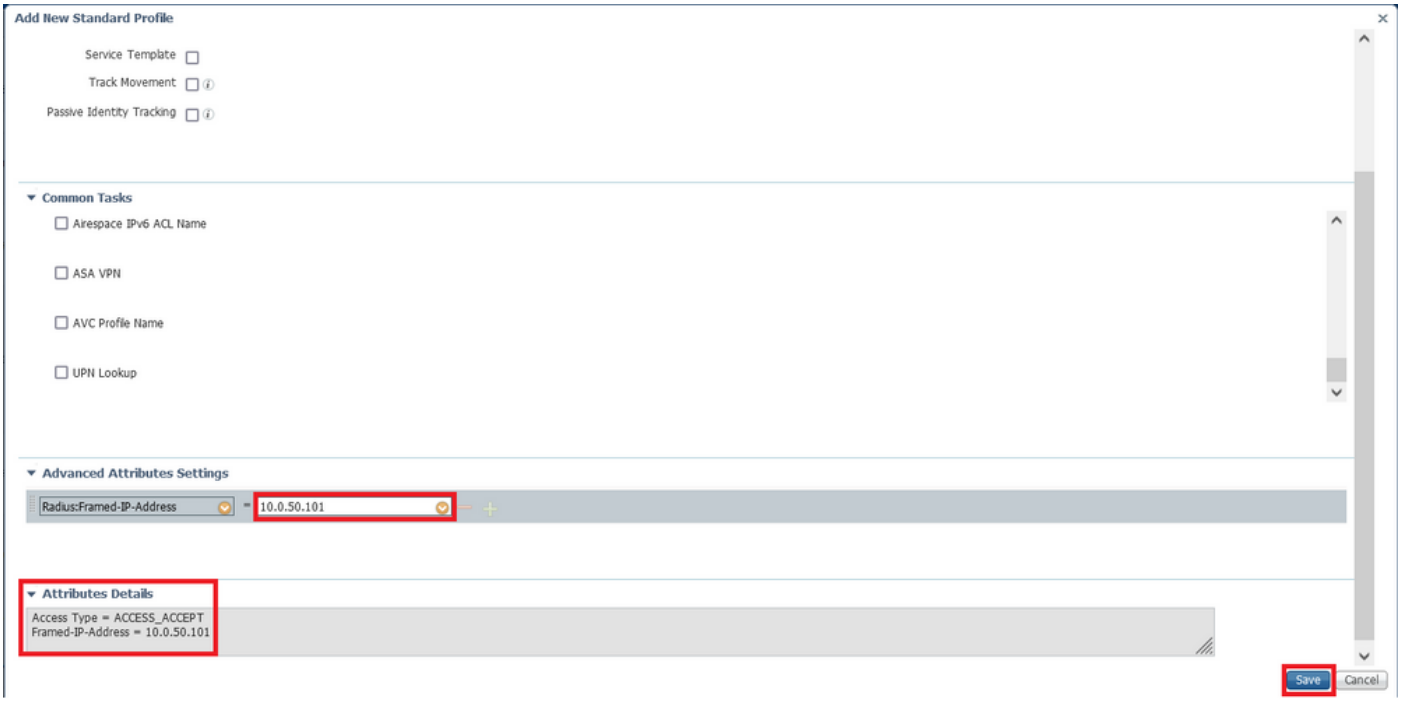

為其指定**名稱**，並保留*ACCESS_ACCEPT*作為**存取型別**。向下滾動至**高級屬性設定**部分。



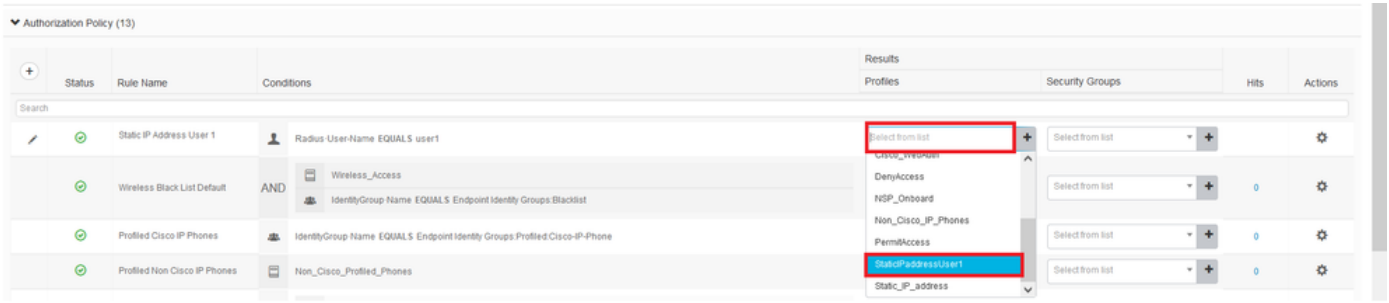

按一下橙色箭頭並選擇Radius > Framed-IP-Address - [8]。



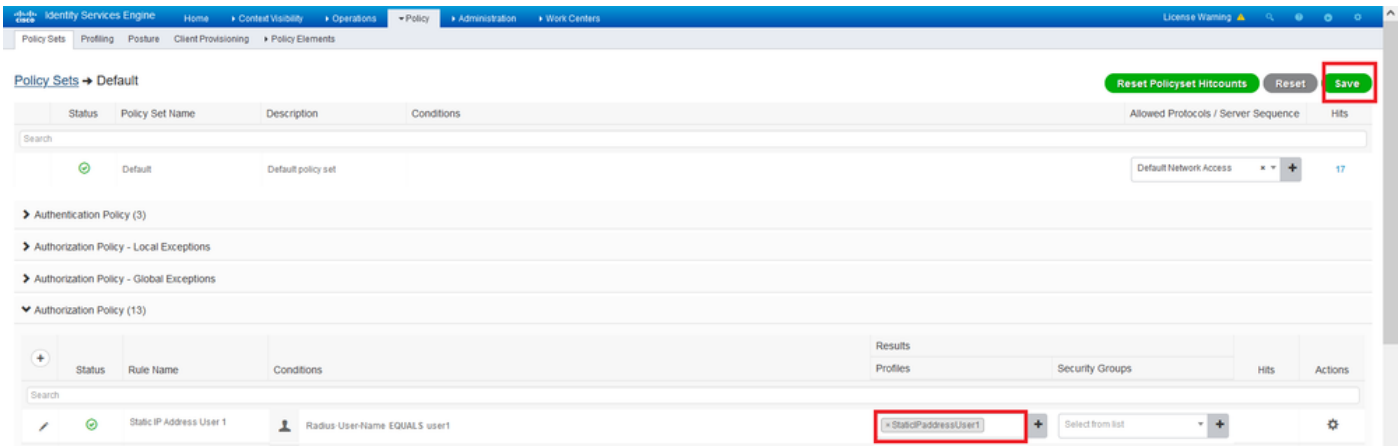

鍵入要始終為此使用者靜態分配的IP地址，然後按一下Save。




步驟10.現在，選擇新建立的授權配置檔案。

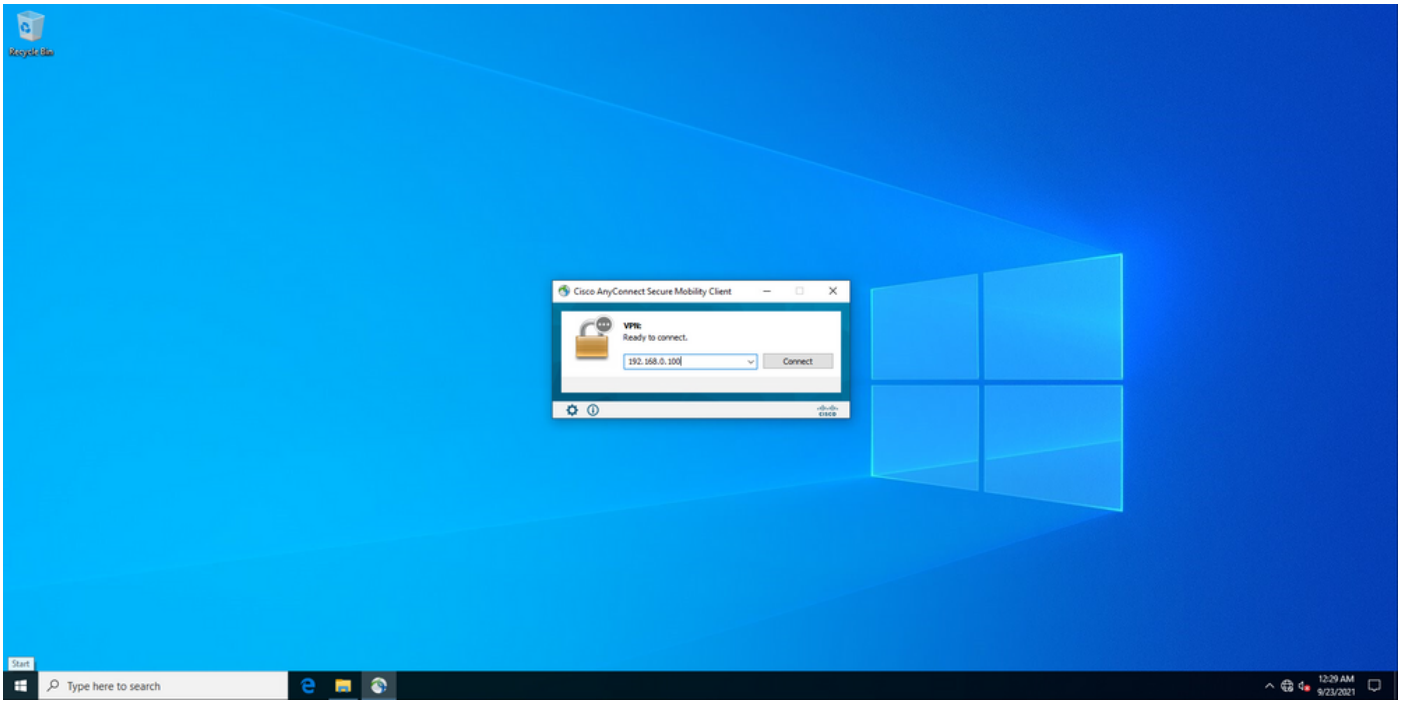


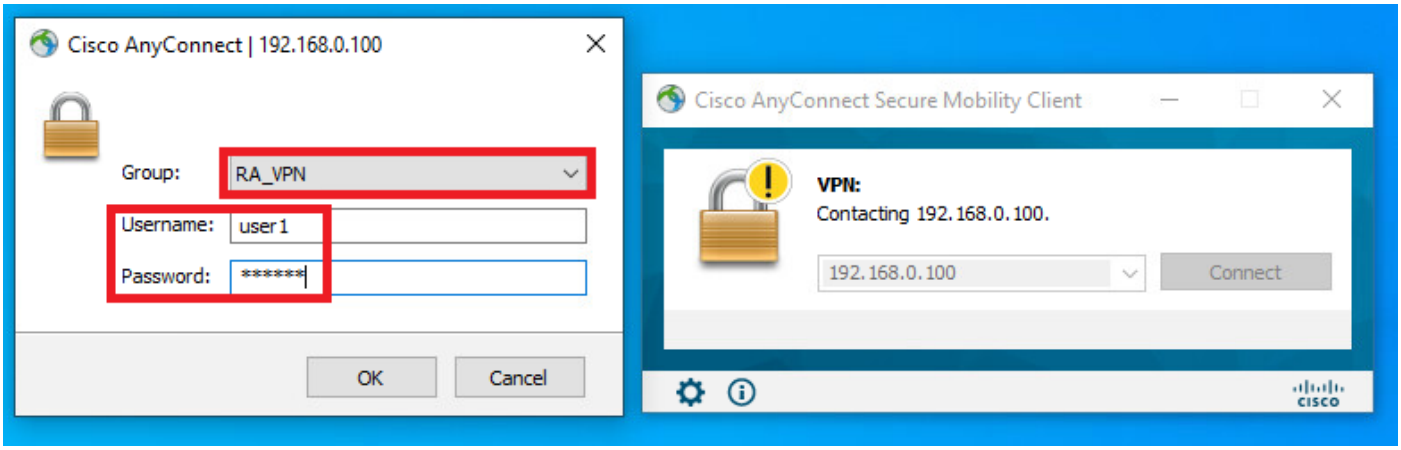

現在已設定授權規則。按一下「**Save**」。



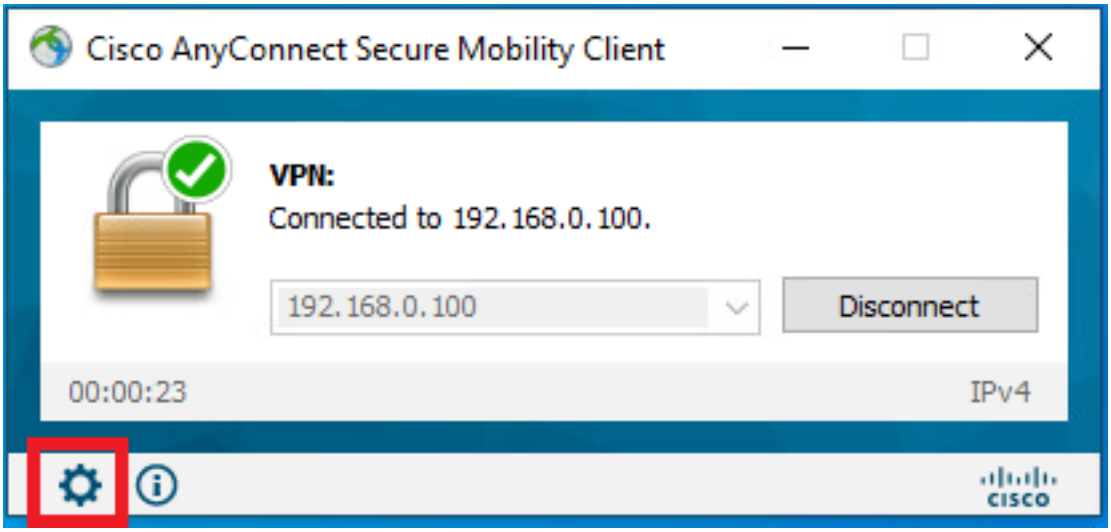

# 驗證

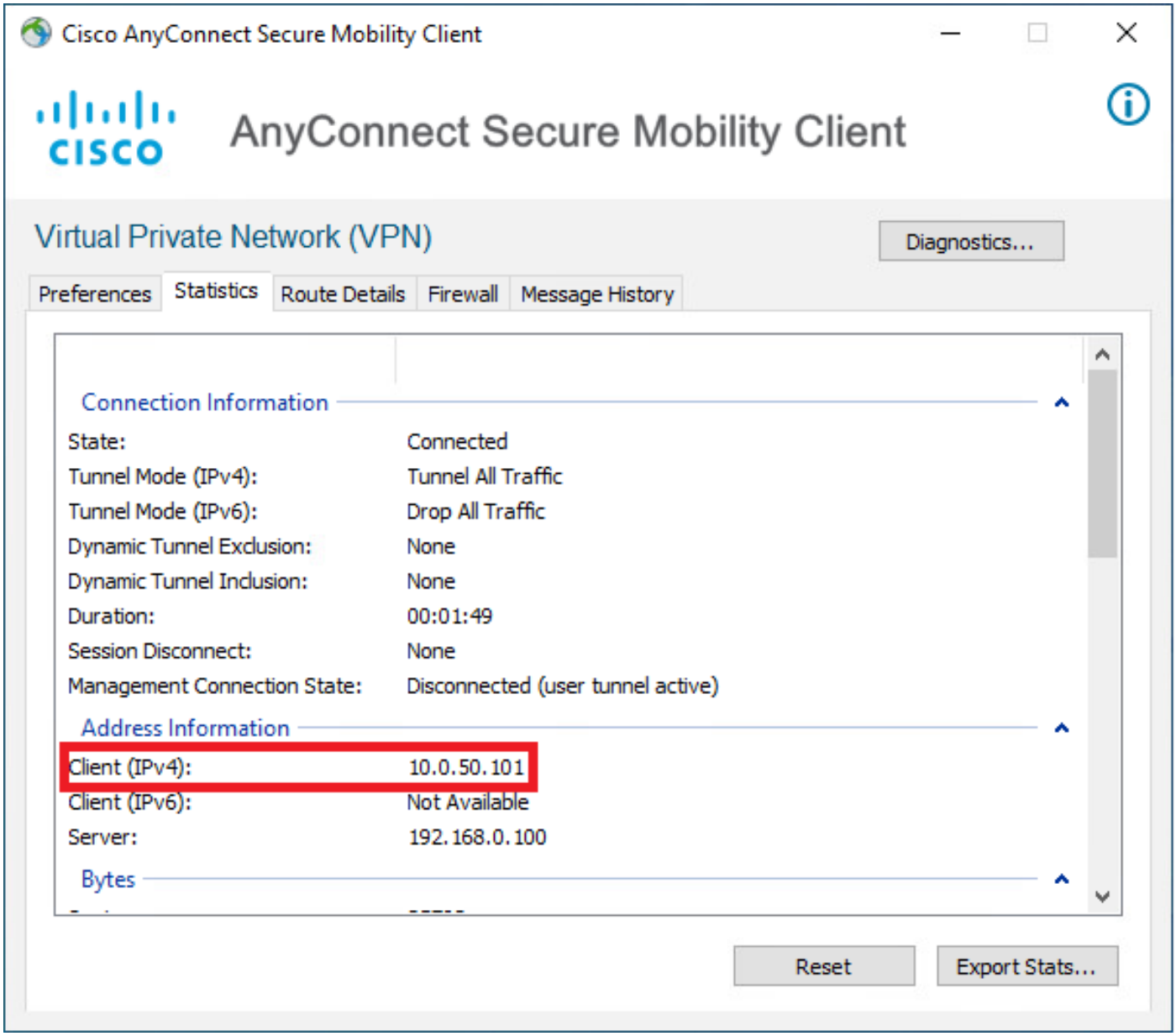
步驟1.導航到安裝了Cisco AnyConnect Security Mobility客戶端的客戶端電腦。連線到FTD頭端（此處使用Windows機器），並輸入*user1*憑證。






按一下齒輪圖示（左下角）並導航到**Statistics**頁籤。在**Address Information**部分中確認分配的IP地址確實是為該使用者在ISE授權策略中配置的地址。






FTD上的**debug radius all**命令輸出顯示：

```
firepower# SVC message: t/s=5/16: The user has requested to disconnect the connection.
webvpn_svc_np_tear_down: no ACL
webvpn_svc_np_tear_down: no IPv6 ACL
np_svc_destroy_session(0x9000)
radius mkreq: 0x13
alloc_rip 0x0000145d043b6460
new request 0x13 --> 3 (0x0000145d043b6460)
got user 'user1'
got password
add_req 0x0000145d043b6460 session 0x13 id 3
RADIUS_REQUEST
radius.c: rad_mkpkt
rad_mkpkt: ip:source-ip=192.168.0.101

RADIUS packet decode (authentication request)


RADIUS packet decode (response)

---------------------------------------
Raw packet data (length = 136).....
```

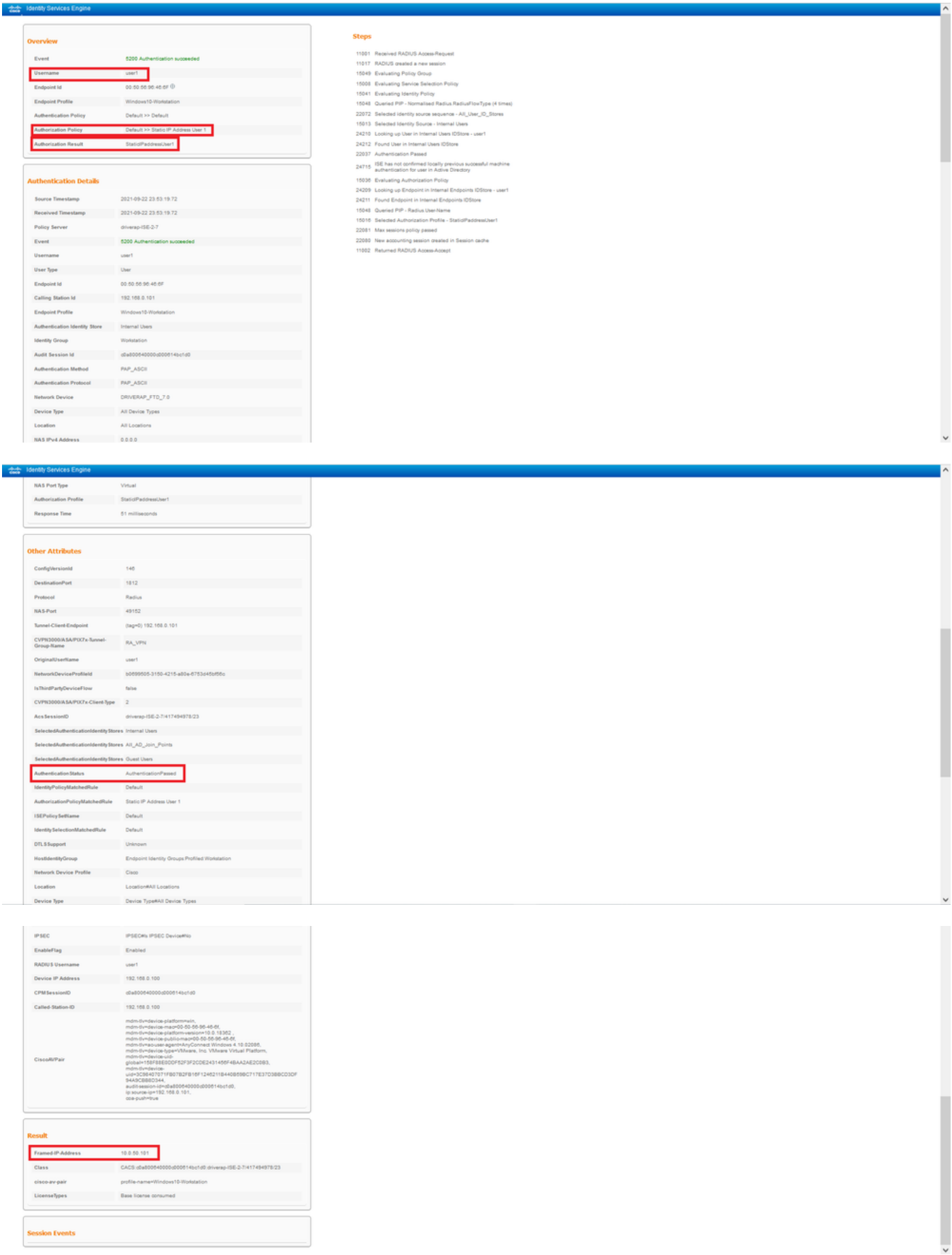
```
02 03 00 88 0c af 1c 41 4b c4 a6 58 de f3 92 31 | .......AK..X...1
7d aa 38 1e 01 07 75 73 65 72 31 08 06 0a 00 32 | }.8...user1....2
65 19 3d 43 41 43 53 3a 63 30 61 38 30 30 36 34 | e.=CACS:c0a80064
30 30 30 30 61 30 30 30 36 31 34 62 63 30 32 64 | 0000a000614bc02d
3a 64 72 69 76 65 72 61 70 2d 49 53 45 2d 32 2d | :driverap-ISE-2-
37 2f 34 31 37 34 39 34 39 37 38 2f 32 31 1a 2a | 7/417494978/21.*
00 00 00 09 01 24 70 72 6f 66 69 6c 65 2d 6e 61 | .....$profile-na
6d 65 3d 57 69 6e 64 6f 77 73 31 30 2d 57 6f 72 | me=Windows10-Wor
6b 73 74 61 74 69 6f 6e | kstation

Parsed packet data.....
Radius: Code = 2 (0x02)
Radius: Identifier = 3 (0x03)
Radius: Length = 136 (0x0088)
Radius: Vector: 0CAF1C414BC4A658DEF392317DAA381E
Radius: Type = 1 (0x01) User-Name
Radius: Length = 7 (0x07)
Radius: Value (String) =
75 73 65 72 31 | user1
Radius: Type = 8 (0x08) Framed-IP-Address
Radius: Length = 6 (0x06)
Radius: Value (IP Address) = 10.0.50.101 (0x0A003265)
Radius: Type = 25 (0x19) Class
Radius: Length = 61 (0x3D)
Radius: Value (String) =
43 41 43 53 3a 63 30 61 38 30 30 36 34 30 30 30 | CACS:c0a80064000
30 61 30 30 30 36 31 34 62 63 30 32 64 3a 64 72 | 0a000614bc02d:dr
69 76 65 72 61 70 2d 49 53 45 2d 32 2d 37 2f 34 | iverap-ISE-2-7/4
31 37 34 39 34 39 37 38 2f 32 31 | 17494978/21
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 42 (0x2A)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 36 (0x24)
Radius: Value (String) =
70 72 6f 66 69 6c 65 2d 6e 61 6d 65 3d 57 69 6e | profile-name=Win
64 6f 77 73 31 30 2d 57 6f 72 6b 73 74 61 74 69 | dows10-Workstati
6f 6e | on
rad_procpkt: ACCEPT
Got AV-Pair with value profile-name=Windows10-Workstation
RADIUS_ACCESS_ACCEPT: normal termination
RADIUS_DELETE
remove_req 0x0000145d043b6460 session 0x13 id 3
free_rip 0x0000145d043b6460
radius: send queue empty
```

FTD 記錄顯示：

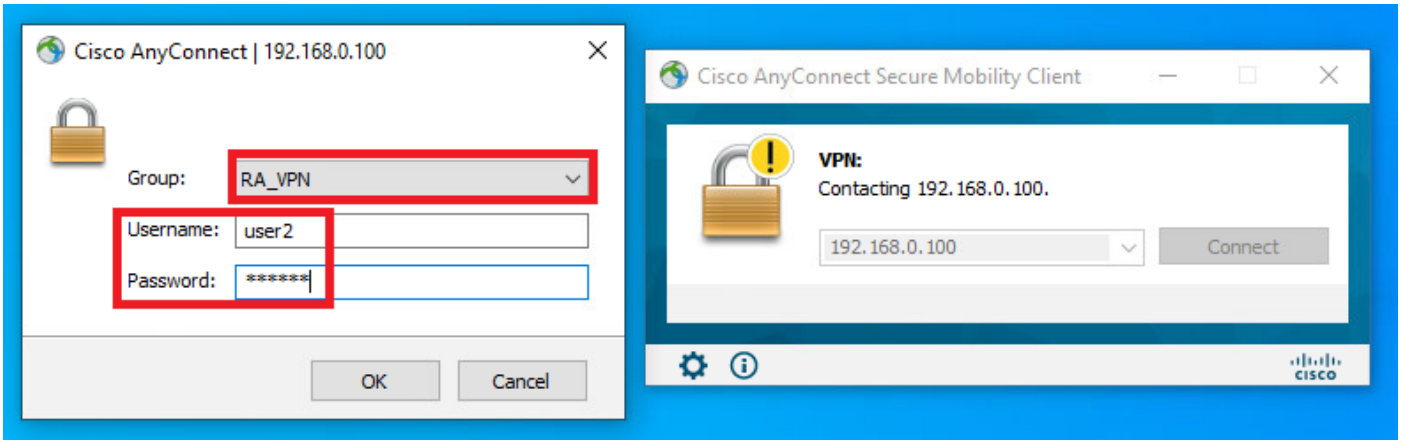
```
firepower#
<omitted output>
Sep 22 2021 23:52:40: %FTD-6-725002: Device completed SSL handshake with client
Outside_Int:192.168.0.101/60405 to 192.168.0.100/443 for TLSv1.2 session
Sep 22 2021 23:52:48: %FTD-7-609001: Built local-host Outside_Int:172.16.0.8
Sep 22 2021 23:52:48: %FTD-6-113004: AAA user authentication Successful : server = 172.16.0.8 :
user = user1
Sep 22 2021 23:52:48: %FTD-6-113009: AAA retrieved default group policy (DfltGrpPolicy) for user
= user1
Sep 22 2021 23:52:48: %FTD-6-113008: AAA transaction status ACCEPT : user = user1
Sep 22 2021 23:52:48: %FTD-7-734003: DAP: User user1, Addr 192.168.0.101: Session Attribute
aaa.radius["1"]["1"] = user1
Sep 22 2021 23:52:48: %FTD-7-734003: DAP: User user1, Addr 192.168.0.101: Session Attribute
aaa.radius["8"]["1"] = 167785061
Sep 22 2021 23:52:48: %FTD-7-734003: DAP: User user1, Addr 192.168.0.101: Session Attribute
```

aaa.radius["25"]["1"] = CACS:c0a800640000c000614bc1d0:driverap-ISE-2-7/417494978/23
Sep 22 2021 23:52:48: %FTD-7-734003: DAP: User user1, Addr 192.168.0.101: Session Attribute
aaa.cisco.grouppolicy = DfltGrpPolicy
Sep 22 2021 23:52:48: %FTD-7-734003: DAP: User user1, Addr 192.168.0.101: Session Attribute
**aaa.cisco.ipaddress = 10.0.50.101**
Sep 22 2021 23:52:48: %FTD-7-734003: DAP: User user1, Addr 192.168.0.101: Session Attribute
**aaa.cisco.username = user1**
Sep 22 2021 23:52:48: %FTD-7-734003: DAP: User user1, Addr 192.168.0.101: Session Attribute
aaa.cisco.username1 = user1
Sep 22 2021 23:52:48: %FTD-7-734003: DAP: User user1, Addr 192.168.0.101: Session Attribute
aaa.cisco.username2 =
Sep 22 2021 23:52:48: %FTD-7-734003: DAP: User user1, Addr 192.168.0.101: Session Attribute
aaa.cisco.tunnelgroup = RA_VPN
Sep 22 2021 23:52:48: %FTD-6-734001: DAP: User user1, Addr 192.168.0.101, Connection AnyConnect:
The following DAP records were selected for this connection: DfltAccessPolicy
Sep 22 2021 23:52:48: %FTD-6-113039: Group <DfltGrpPolicy> User <user1> IP <192.168.0.101>
AnyConnect parent session started.
<omitted output>
Sep 22 2021 23:53:17: %FTD-6-725002: Device completed SSL handshake with client
Outside_Int:192.168.0.101/60412 to 192.168.0.100/443 for TLSv1.2 session
Sep 22 2021 23:53:17: %FTD-7-737035: IPAA: Session=0x0000c000, 'IPv4 address request' message
queued
Sep 22 2021 23:53:17: %FTD-7-737035: IPAA: Session=0x0000c000, 'IPv6 address request' message
queued
Sep 22 2021 23:53:17: %FTD-7-737001: IPAA: Session=0x0000c000, Received message 'IPv4 address
request'
Sep 22 2021 23:53:17: %FTD-6-737010: IPAA: Session=0x0000c000, **AAA assigned address 10.0.50.101,
succeeded**
Sep 22 2021 23:53:17: %FTD-7-737001: IPAA: Session=0x0000c000, Received message 'IPv6 address
request'
Sep 22 2021 23:53:17: %FTD-5-737034: IPAA: Session=0x0000c000, IPv6 address: no IPv6 address
available from local pools
Sep 22 2021 23:53:17: %FTD-5-737034: IPAA: Session=0x0000c000, IPv6 address: callback failed
during IPv6 request
Sep 22 2021 23:53:17: %FTD-4-722041: TunnelGroup <RA_VPN> GroupPolicy <DfltGrpPolicy> User
<user1> IP <192.168.0.101> No IPv6 address available for SVC connection
Sep 22 2021 23:53:17: %FTD-7-609001: Built local-host Outside_Int:10.0.50.101
Sep 22 2021 23:53:17: %FTD-5-722033: Group <DfltGrpPolicy> User <user1> IP <192.168.0.101> First
TCP SVC connection established for SVC session.
Sep 22 2021 23:53:17: %FTD-6-722022: Group <DfltGrpPolicy> User <user1> IP <192.168.0.101> TCP
SVC connection established without compression
Sep 22 2021 23:53:17: %FTD-7-746012: **user-identity: Add IP-User mapping 10.0.50.101 -
LOCAL\user1 Succeeded - VPN user**
Sep 22 2021 23:53:17: %FTD-6-722055: Group <DfltGrpPolicy> User <user1> IP <192.168.0.101>
Client Type: Cisco AnyConnect VPN Agent for Windows 4.10.02086
Sep 22 2021 23:53:17: %FTD-4-722051: **Group**

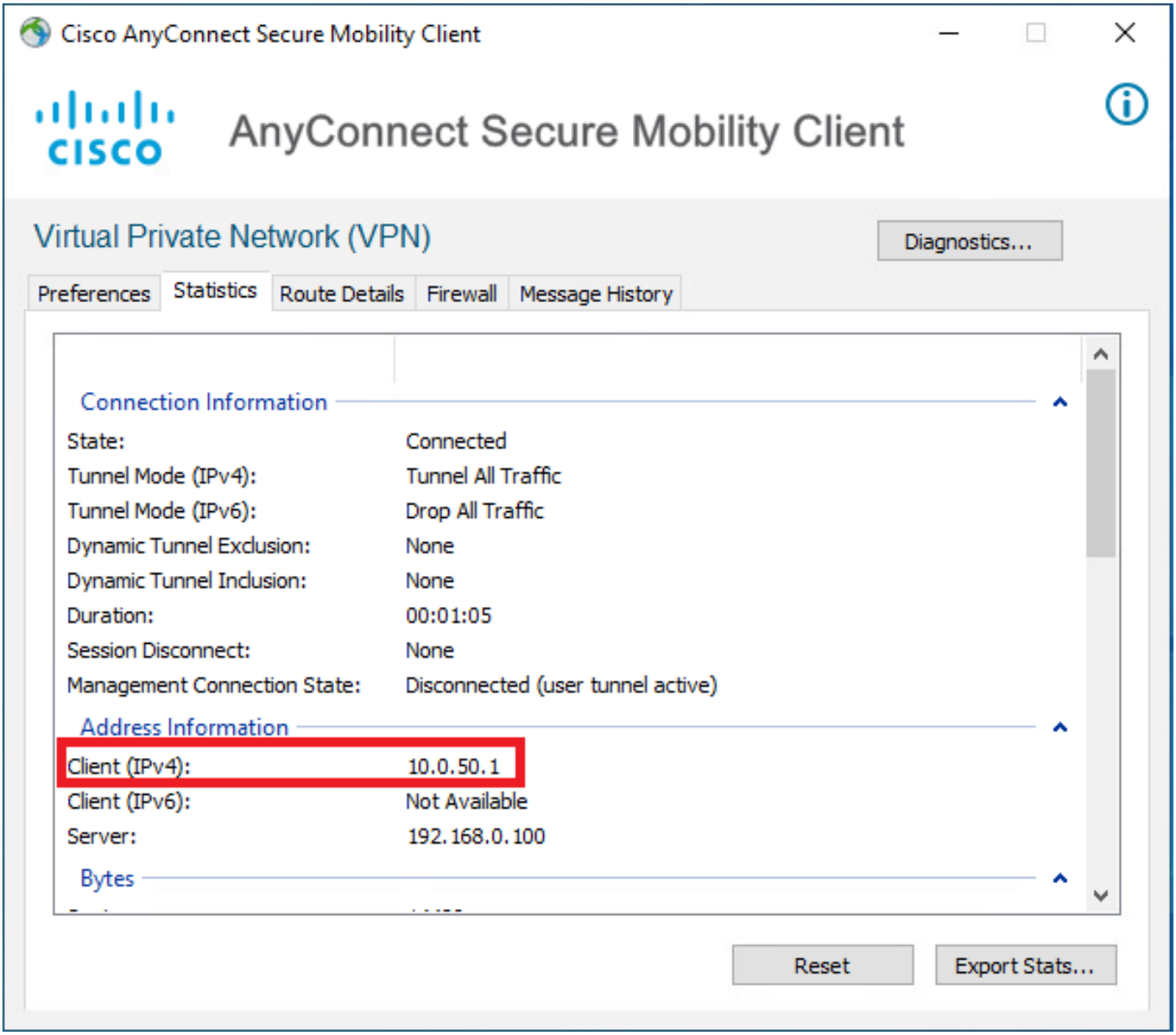
ISE上的RADIUS Live日誌顯示：




步驟2.連線到FTD頭端（此處使用Windows電腦）並輸入*user2*憑證。




**Address Information**部分顯示，分配的IP地址實際上是通過FMC配置的IPv4本地池中的第一個IP地址。




FTD上的**debug radius all**命令輸出顯示：

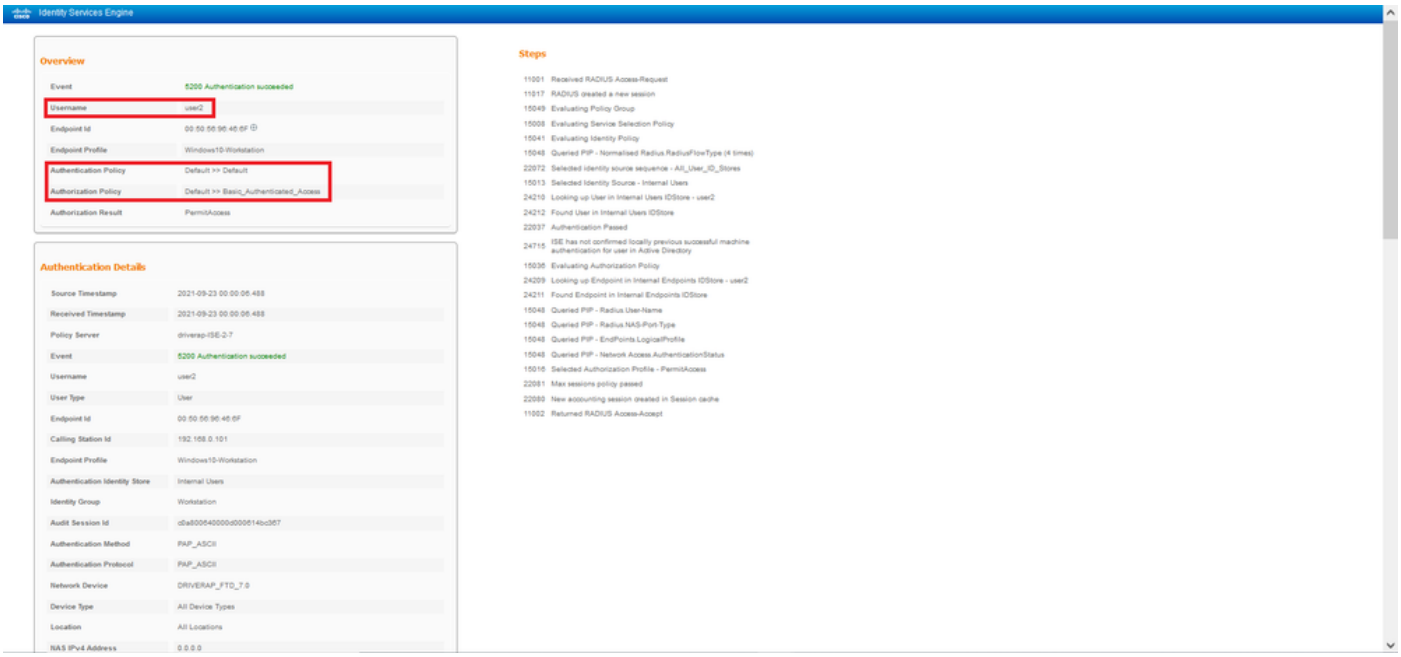
```
firepower# SVC message: t/s=5/16: The user has requested to disconnect the connection.
webvpn_svc_np_tear_down: no ACL
webvpn_svc_np_tear_down: no IPv6 ACL
```

```
np_svc_destroy_session(0xA000)
radius mkreq: 0x15
alloc_rip 0x0000145d043b6460
new request 0x15 --> 4 (0x0000145d043b6460)
got user 'user2'
got password
add_req 0x0000145d043b6460 session 0x15 id 4
RADIUS_REQUEST
radius.c: rad_mkpkt
rad_mkpkt: ip:source-ip=192.168.0.101

RADIUS packet decode (authentication request)


RADIUS packet decode (response)

--------------------------------------
Raw packet data (length = 130).....
02 04 00 82 a6 67 35 9e 10 36 93 18 1f 1b 85 37 | .....g5..6.....7
b6 c3 18 4f 01 07 75 73 65 72 32 19 3d 43 41 43 | ...O..user2.=CAC
53 3a 63 30 61 38 30 30 36 34 30 30 30 30 62 30 | S:c0a800640000b0
30 30 36 31 34 62 63 30 61 33 3a 64 72 69 76 65 | 00614bc0a3:drive
72 61 70 2d 49 53 45 2d 32 2d 37 2f 34 31 37 34 | rap-ISE-2-7/4174
39 34 39 37 38 2f 32 32 1a 2a 00 00 00 09 01 24 | 94978/22.*.....$
70 72 6f 66 69 6c 65 2d 6e 61 6d 65 3d 57 69 6e | profile-name=Win
64 6f 77 73 31 30 2d 57 6f 72 6b 73 74 61 74 69 | dows10-Workstati
6f 6e | on

Parsed packet data.....
Radius: Code = 2 (0x02)
Radius: Identifier = 4 (0x04)
Radius: Length = 130 (0x0082)
Radius: Vector: A667359E103693181F1B8537B6C3184F
Radius: Type = 1 (0x01) User-Name
Radius: Length = 7 (0x07)
Radius: Value (String) =
75 73 65 72 32 | user2
Radius: Type = 25 (0x19) Class
Radius: Length = 61 (0x3D)
Radius: Value (String) =
43 41 43 53 3a 63 30 61 38 30 30 36 34 30 30 30 | CACS:c0a80064000
30 62 30 30 30 36 31 34 62 63 30 61 33 3a 64 72 | 0b000614bc0a3:dr
69 76 65 72 61 70 2d 49 53 45 2d 32 2d 37 2f 34 | iverap-ISE-2-7/4
31 37 34 39 34 39 37 38 2f 32 32 | 17494978/22
Radius: Type = 26 (0x1A) Vendor-Specific
Radius: Length = 42 (0x2A)
Radius: Vendor ID = 9 (0x00000009)
Radius: Type = 1 (0x01) Cisco-AV-pair
Radius: Length = 36 (0x24)
Radius: Value (String) =
70 72 6f 66 69 6c 65 2d 6e 61 6d 65 3d 57 69 6e | profile-name=Win
64 6f 77 73 31 30 2d 57 6f 72 6b 73 74 61 74 69 | dows10-Workstati
6f 6e | on
rad_procpkt: ACCEPT
Got AV-Pair with value profile-name=Windows10-Workstation
RADIUS_ACCESS_ACCEPT: normal termination
RADIUS_DELETE
remove_req 0x0000145d043b6460 session 0x15 id 4
free_rip 0x0000145d043b6460
radius: send queue empty
```

FTD 記錄顯示：

<omitted output>
Sep 22 2021 23:59:26: %FTD-6-725002: Device completed SSL handshake with client Outside_Int:192.168.0.101/60459 to 192.168.0.100/443 for TLSv1.2 session
Sep 22 2021 23:59:35: %FTD-7-609001: Built local-host Outside_Int:172.16.0.8
Sep 22 2021 23:59:35: %FTD-6-113004: AAA user authentication Successful : server = 172.16.0.8 : user = user2
Sep 22 2021 23:59:35: %FTD-6-113009: AAA retrieved default group policy (DfltGrpPolicy) for user = user2
Sep 22 2021 23:59:35: %FTD-6-113008: AAA transaction status ACCEPT : user = user2
Sep 22 2021 23:59:35: %FTD-7-734003: DAP: User user2, Addr 192.168.0.101: Session Attribute aaa.radius["1"]["1"] = user2
Sep 22 2021 23:59:35: %FTD-7-734003: DAP: User user2, Addr 192.168.0.101: Session Attribute aaa.radius["25"]["1"] = CACS:c0a800640000d000614bc367:driverap-ISE-2-7/417494978/24
Sep 22 2021 23:59:35: %FTD-7-734003: DAP: User user2, Addr 192.168.0.101: Session Attribute aaa.cisco.grouppolicy = DfltGrpPolicy
Sep 22 2021 23:59:35: %FTD-7-734003: DAP: User user2, Addr 192.168.0.101: **Session Attribute aaa.cisco.username = user2**
Sep 22 2021 23:59:35: %FTD-7-734003: DAP: User user2, Addr 192.168.0.101: Session Attribute aaa.cisco.username1 = user2
Sep 22 2021 23:59:35: %FTD-7-734003: DAP: User user2, Addr 192.168.0.101: Session Attribute aaa.cisco.username2 =
Sep 22 2021 23:59:35: %FTD-7-734003: DAP: User user2, Addr 192.168.0.101: Session Attribute aaa.cisco.tunnelgroup = RA_VPN
Sep 22 2021 23:59:35: %FTD-6-734001: DAP: User user2, Addr 192.168.0.101, Connection AnyConnect: The following DAP records were selected for this connection: DfltAccessPolicy
Sep 22 2021 23:59:35: %FTD-6-113039: Group <DfltGrpPolicy> User <user2> IP <192.168.0.101> AnyConnect parent session started.
<omitted output>
Sep 22 2021 23:59:52: %FTD-6-725002: Device completed SSL handshake with client Outside_Int:192.168.0.101/60470 to 192.168.0.100/443 for TLSv1.2 session
Sep 22 2021 23:59:52: %FTD-7-737035: IPAA: Session=0x0000d000, 'IPv4 address request' message queued
Sep 22 2021 23:59:52: %FTD-7-737035: IPAA: Session=0x0000d000, 'IPv6 address request' message queued
Sep 22 2021 23:59:52: %FTD-7-737001: IPAA: Session=0x0000d000, Received message 'IPv4 address request'
Sep 22 2021 23:59:52: %FTD-5-737003: IPAA: Session=0x0000d000, DHCP configured, no viable servers found for tunnel-group 'RA_VPN'
Sep 22 2021 23:59:52: %FTD-7-737400: **POOLIP: Pool=AC_Pool, Allocated 10.0.50.1 from pool**
Sep 22 2021 23:59:52: %FTD-7-737200: **VPNFIP: Pool=AC_Pool, Allocated 10.0.50.1 from pool**
Sep 22 2021 23:59:52: %FTD-6-737026: **IPAA: Session=0x0000d000, Client assigned 10.0.50.1 from local pool AC_Pool**
Sep 22 2021 23:59:52: %FTD-6-737006: **IPAA: Session=0x0000d000, Local pool request succeeded for tunnel-group 'RA_VPN'**
Sep 22 2021 23:59:52: %FTD-7-737001: IPAA: Session=0x0000d000, Received message 'IPv6 address request'
Sep 22 2021 23:59:52: %FTD-5-737034: IPAA: Session=0x0000d000, IPv6 address: no IPv6 address available from local pools
Sep 22 2021 23:59:52: %FTD-5-737034: IPAA: Session=0x0000d000, IPv6 address: callback failed during IPv6 request
Sep 22 2021 23:59:52: %FTD-4-722041: TunnelGroup <RA_VPN> GroupPolicy <DfltGrpPolicy> User <user2> IP <192.168.0.101> No IPv6 address available for SVC connection
Sep 22 2021 23:59:52: %FTD-7-609001: Built local-host Outside_Int:10.0.50.1
Sep 22 2021 23:59:52: %FTD-5-722033: Group <DfltGrpPolicy> User <user2> IP <192.168.0.101> First TCP SVC connection established for SVC session.
Sep 22 2021 23:59:52: %FTD-6-722022: Group <DfltGrpPolicy> User <user2> IP <192.168.0.101> TCP SVC connection established without compression
Sep 22 2021 23:59:52: %FTD-7-746012: **user-identity: Add IP-User mapping 10.0.50.1 - LOCAL\user2 Succeeded - VPN user**
Sep 22 2021 23:59:52: %FTD-6-722055: Group <DfltGrpPolicy> User <user2> IP <192.168.0.101> Client Type: Cisco AnyConnect VPN Agent for Windows 4.10.02086
Sep 22 2021 23:59:52: %FTD-4-722051: **Group**

ISE上的RADIUS Live日誌顯示：





**附註**：您必須在FTD IP本地池和ISE授權策略上對IP地址分配使用不同的IP地址範圍，以避免您的AnyConnectClients之間的重複IP地址衝突。在此組態範例中，FTD設定為從10.0.50.1 到10.0.50.100的IPv4本機池，而ISE伺服器指派靜態IP位址10.0.50.101。

# 疑難排解

本節提供的資訊可用於對組態進行疑難排解。

在FTD上：

- debug radius all

在ISE上：

- RADIUS即時日誌