通过RADIUS授权配置静态IP地址分配给AnyConnect用户

目录

简介

本文档介绍如何使用身份服务引擎(ISE)服务器配置RADIUS授权，以便它始终通过RADIUS属性8 Framed-IP-Address将同一IP地址转发到特定Cisco AnyConnect安全移动客户端用户的Firepower威胁防御(FTD)。

先决条件

要求

Cisco 建议您了解以下主题：

- FTD
- Firepower管理中心(FMC)
- ISE
- Cisco AnyConnect 安全移动客户端
- RADIUS协议

使用的组件

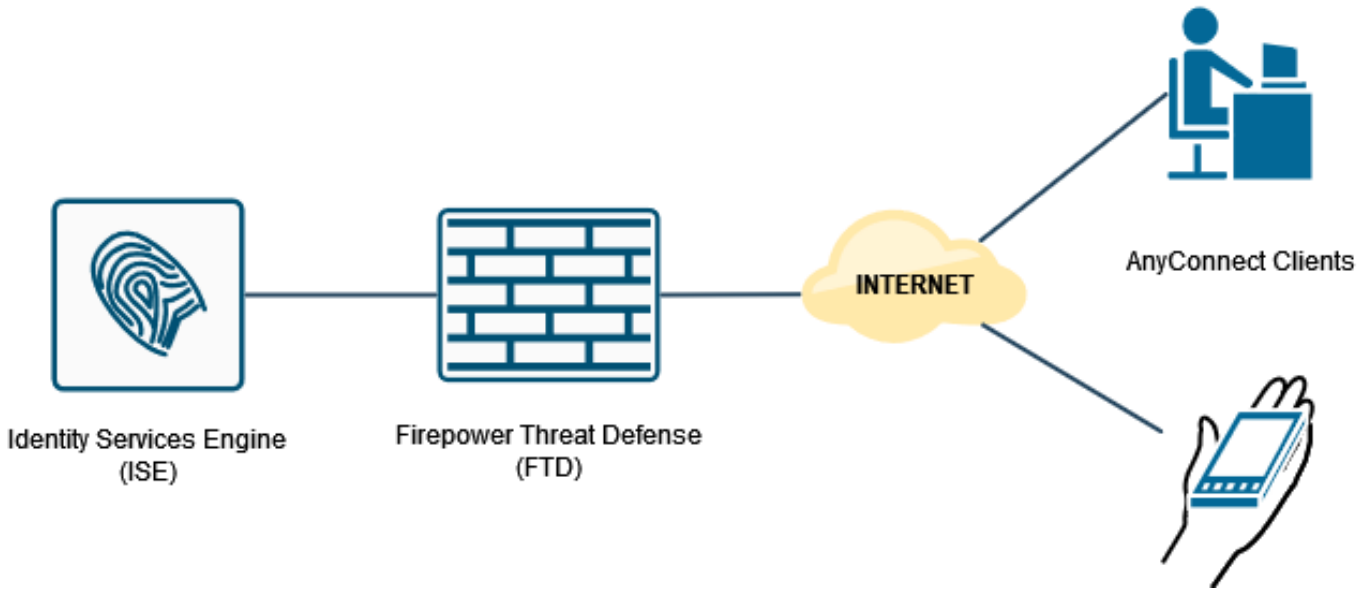
本文档中的信息基于以下软件版本：

- FMCv - 7.0.0（内部版本94）
- FTDv - 7.0.0（内部版本94）
- ISE - 2.7.0.356
- AnyConnect - 4.10.02086
- Windows 10专业版

本文档中的信息都是基于特定实验室环境中的设备编写的。本文档中使用的所有设备最初均采用原始（默认）配置。如果您的网络处于活动状态，请确保您了解所有命令的潜在影响。

配置

网络图



通过FMC配置使用AAA/RADIUS身份验证的远程访问VPN

有关分步过程，请参阅本文档和此视频：

- FTD上的AnyConnect远程访问VPN配置
- FTD的初始AnyConnect配置，由FMC管理

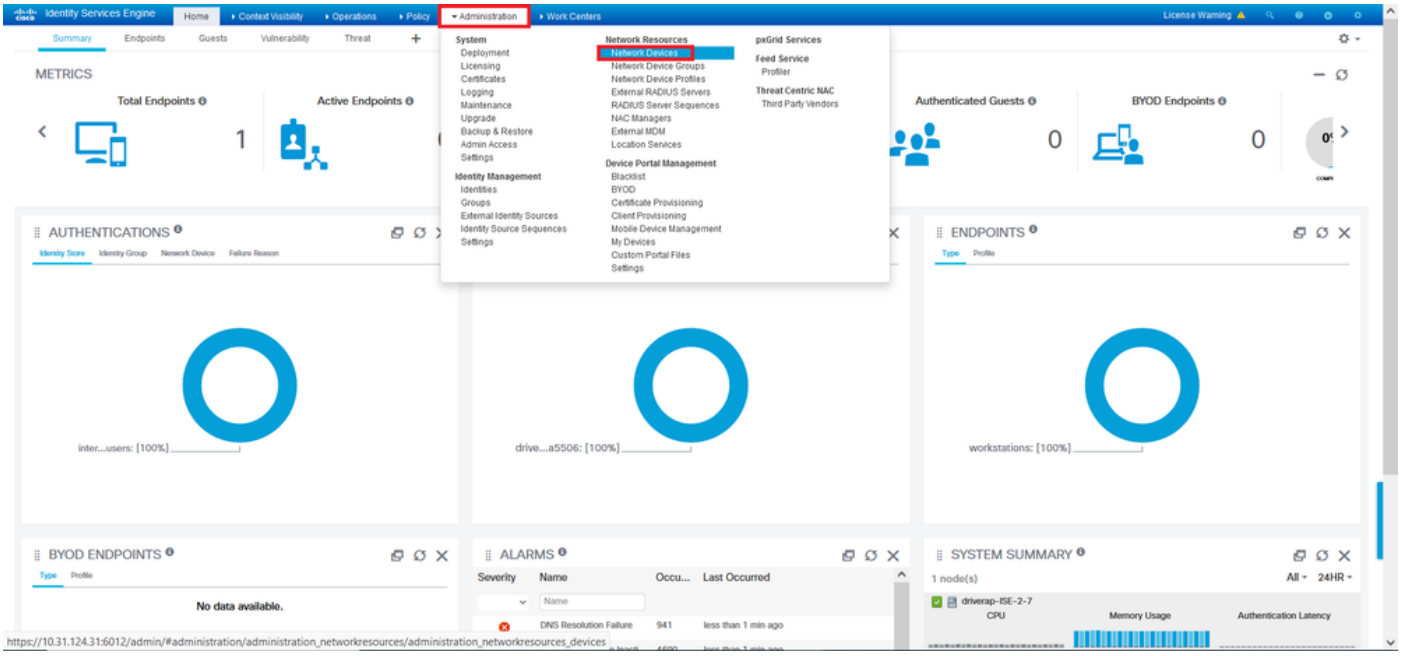
FTD CLI上的远程访问VPN配置为：

```
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
```

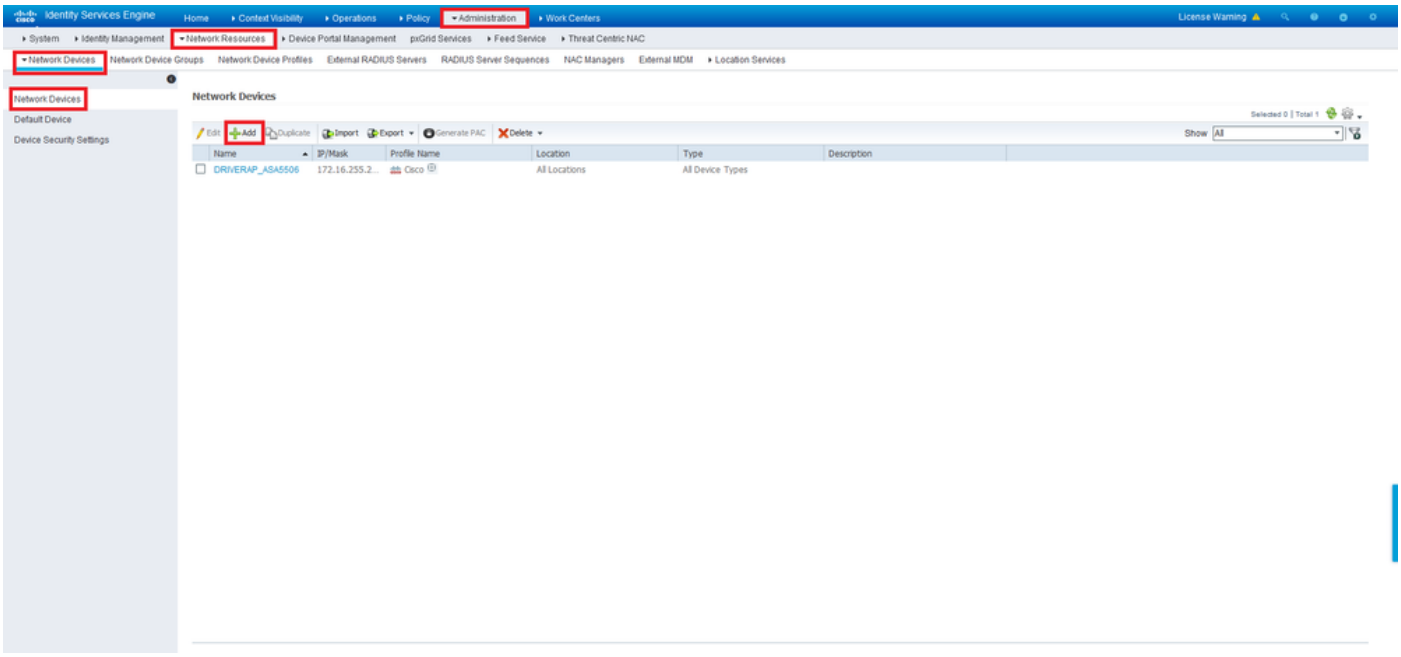
```
webvpn
enable Outside_Int
http-headers
hsts-server
enable
max-age 31536000
include-sub-domains
no preload
hsts-client
enable
x-content-type-options
x-xss-protection
content-security-policy
anyconnect image disk0:/csm/anyconnect-win-4.10.02086-webdeploy-k9.pkg 1 regex "Windows"
anyconnect enable
tunnel-group-list 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（RADIUS服务器）上配置授权策略

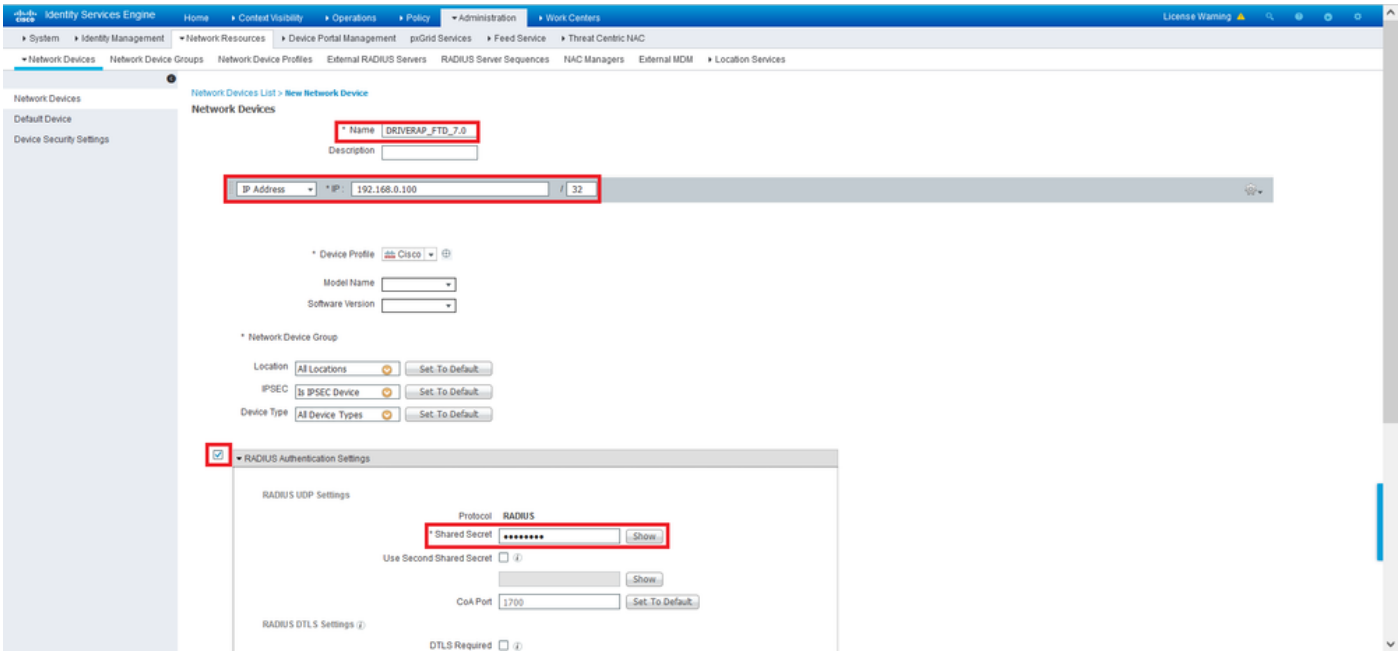
步骤1.登录ISE服务器并导航至Administration > Network Resources > Network Devices。



步骤2.在“网络设备”部分，单击**添加**，以便ISE可以处理来自FTD的RADIUS访问请求。

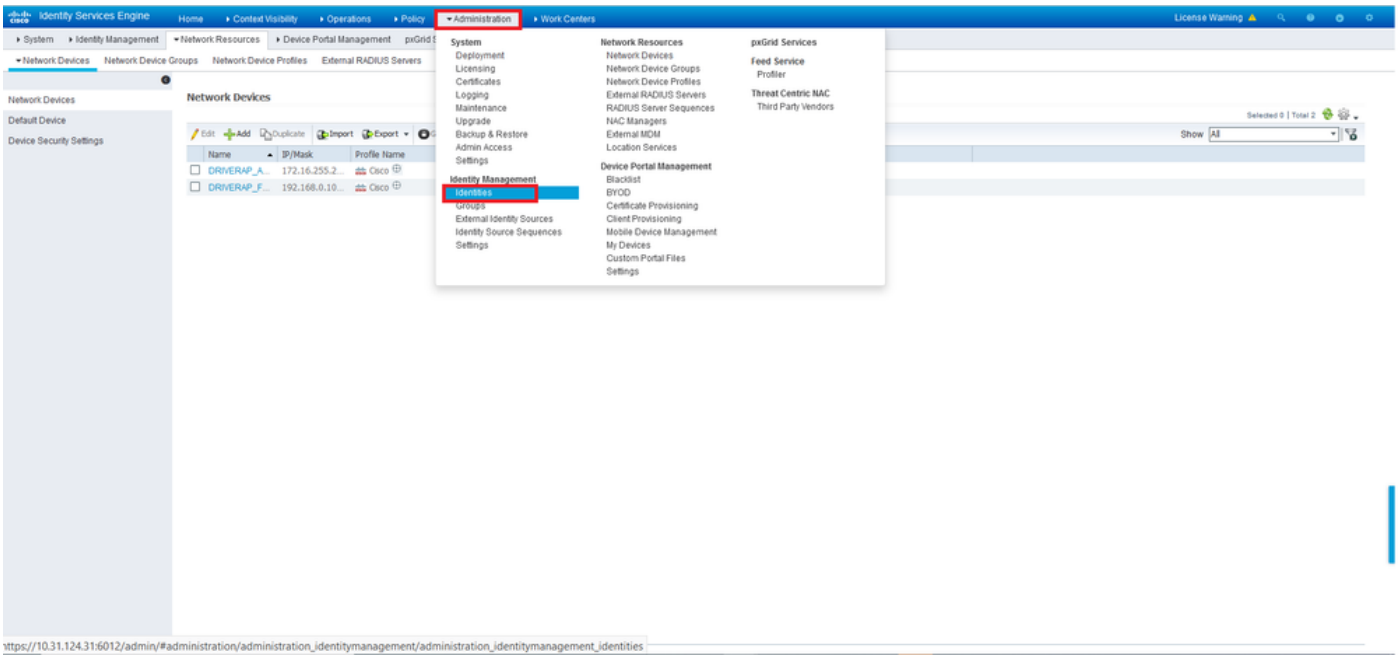


输入网络设备**名称**和**IP地址字**段，然后选中**RADIUS Authentication Settings**框。**共享密钥**必须与在FMC上创建RADIUS服务器对象时使用的值相同。

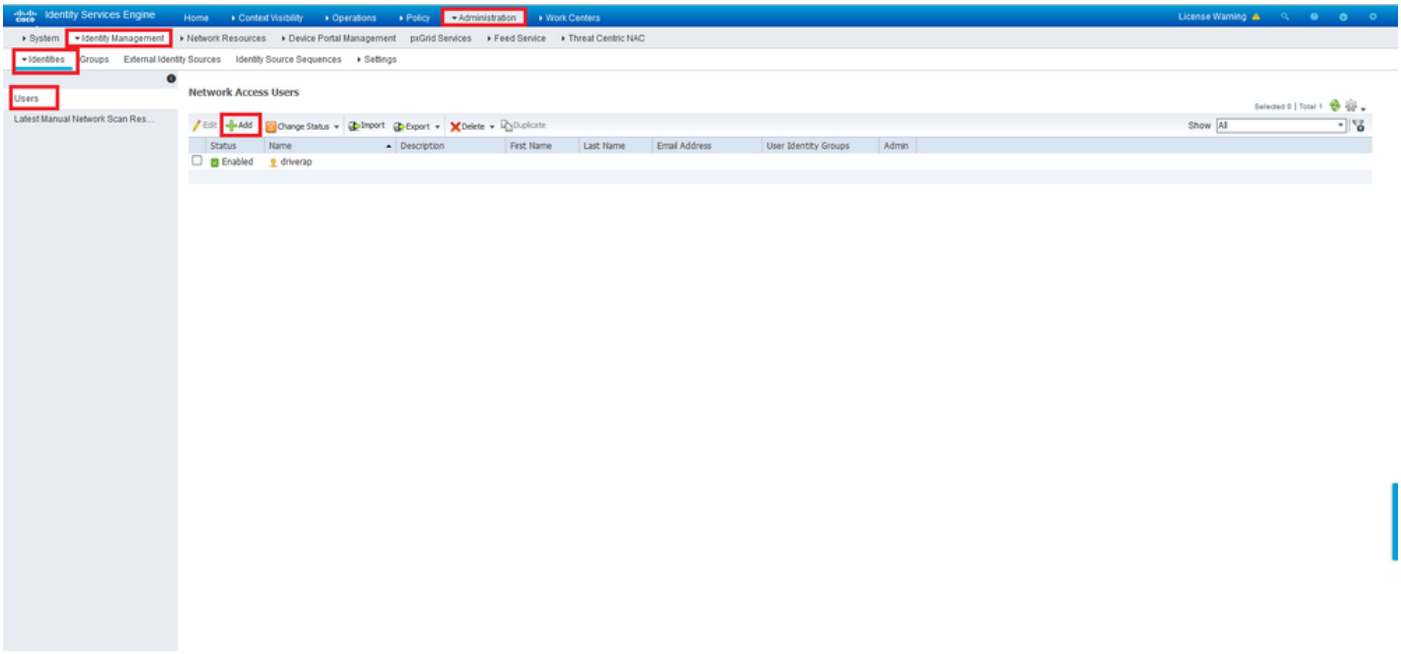


用此页末的按钮保存。

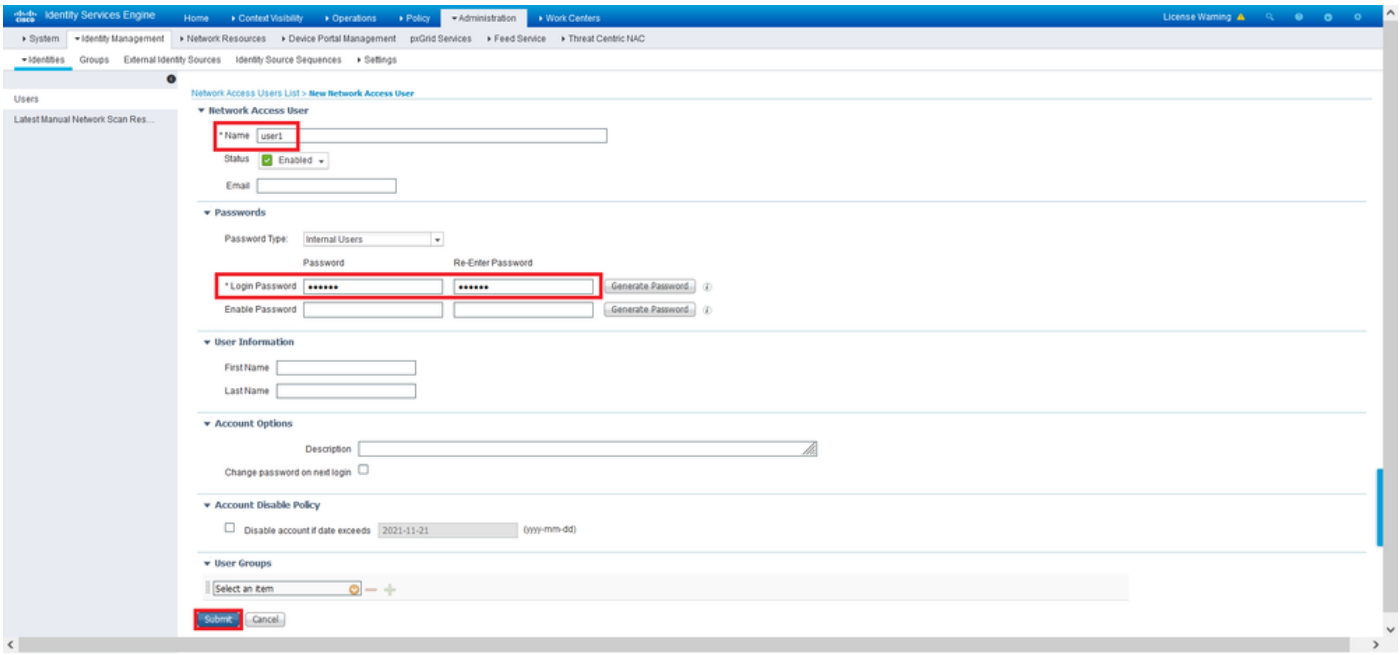
步骤3.导航至**Administration > Identity Management > Identities**。



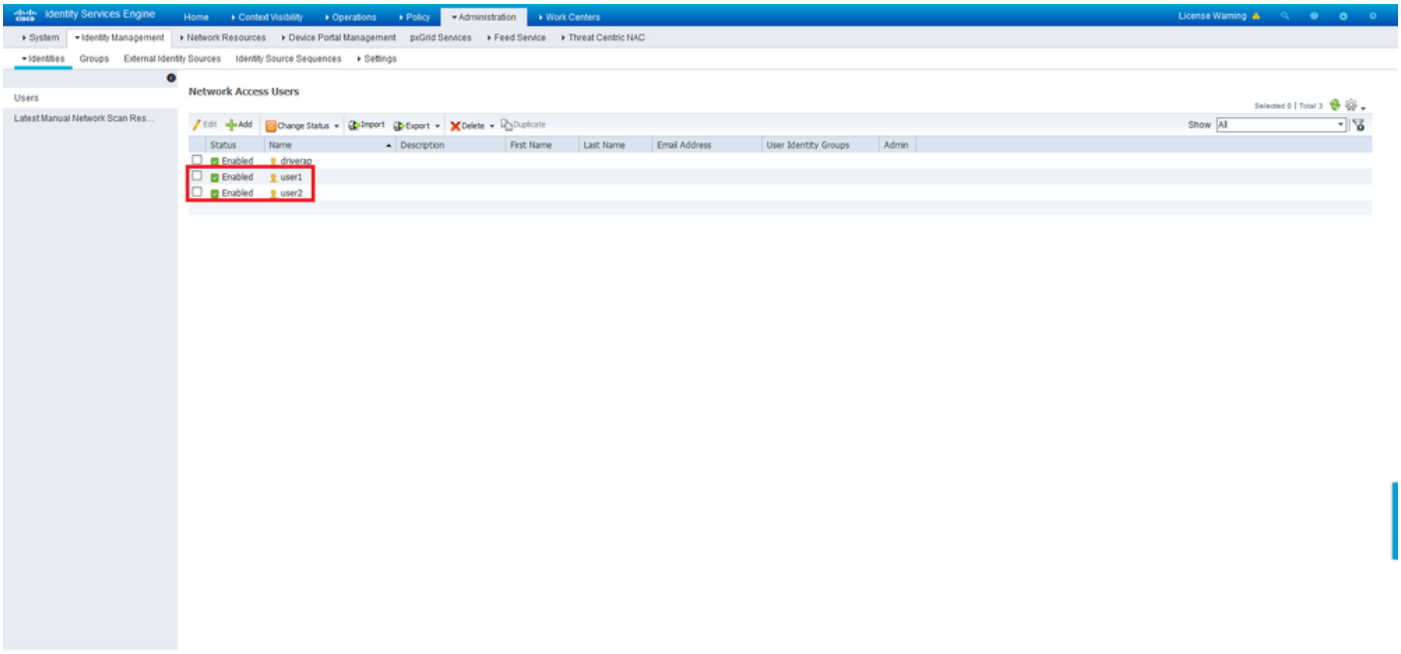
步骤4.在Network Access Users部分中，单击**Add**以在ISE的本地数*据库*中创建user1。



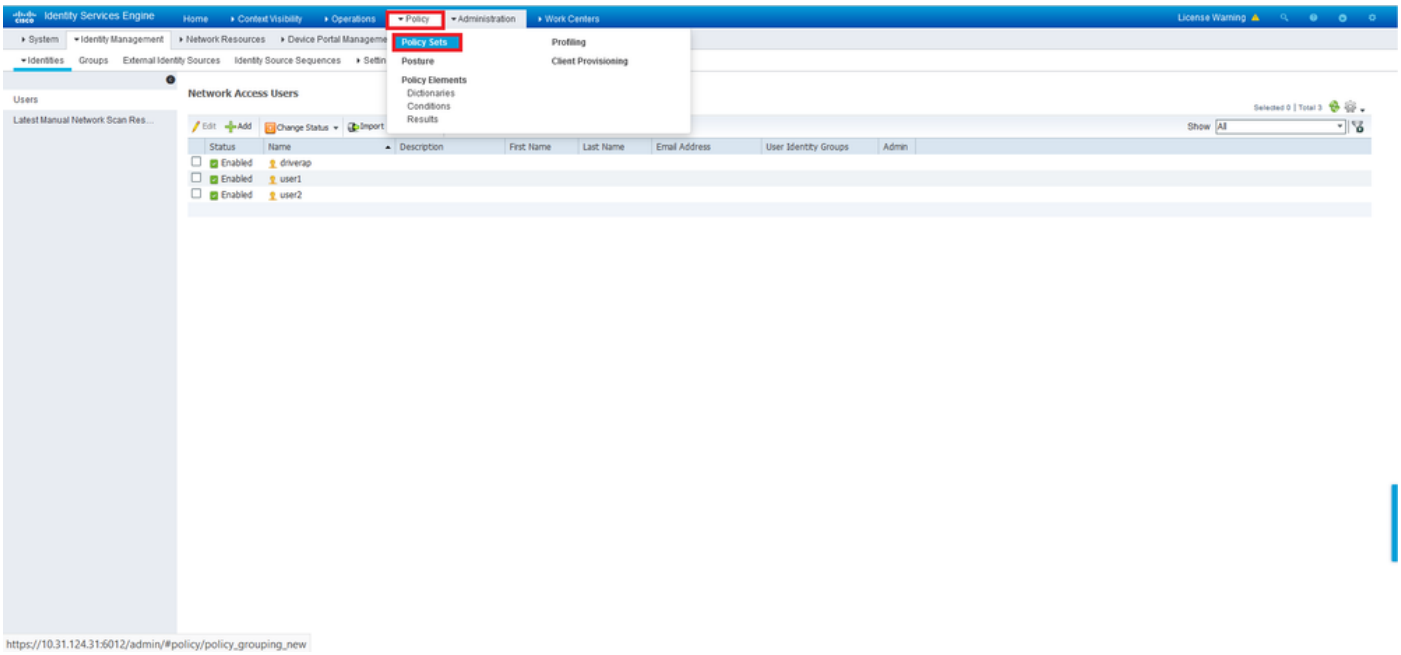
在“名称”和“登录密码”**字段中输入**用户名**和密码**，然后单击**提交**。



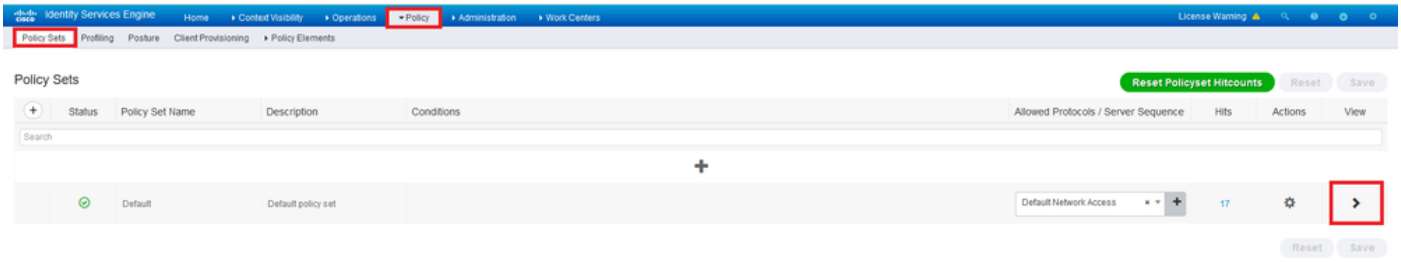
步骤5.重复上述步骤以创建*user2*。



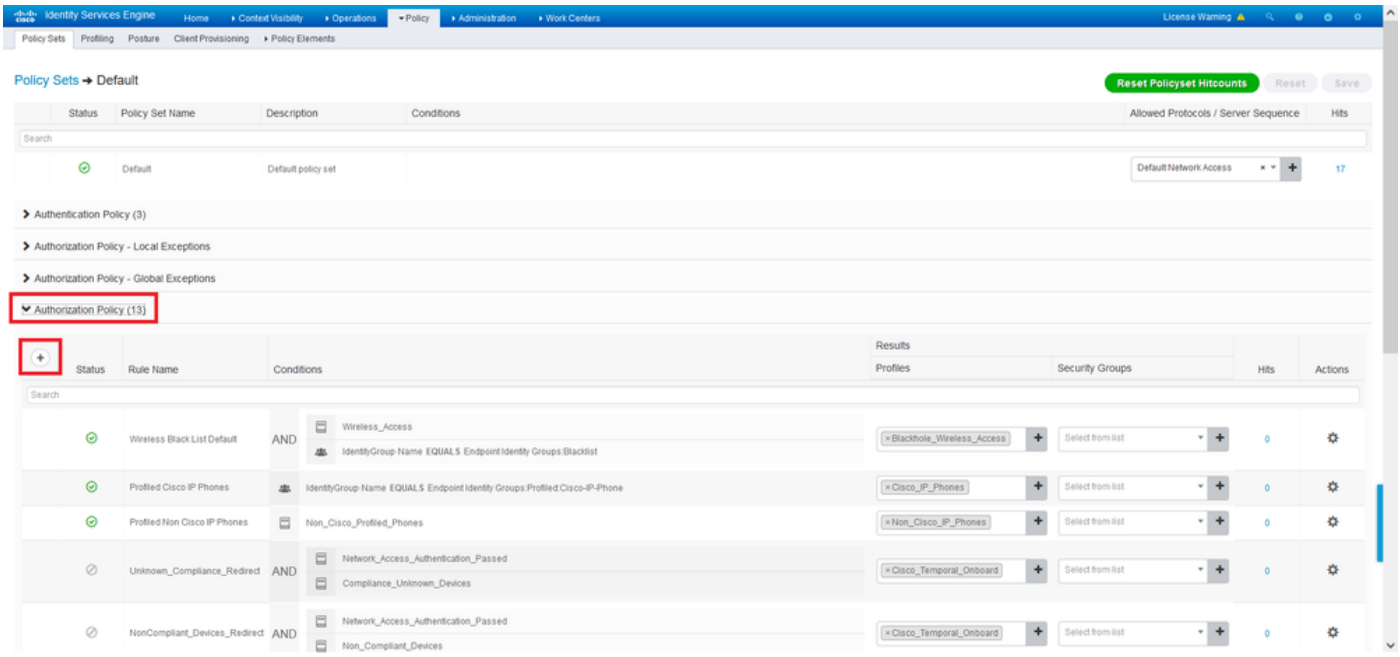
步骤6.导航至Policy > **Policy Sets**。



步骤7.单击屏幕右侧的箭头>。

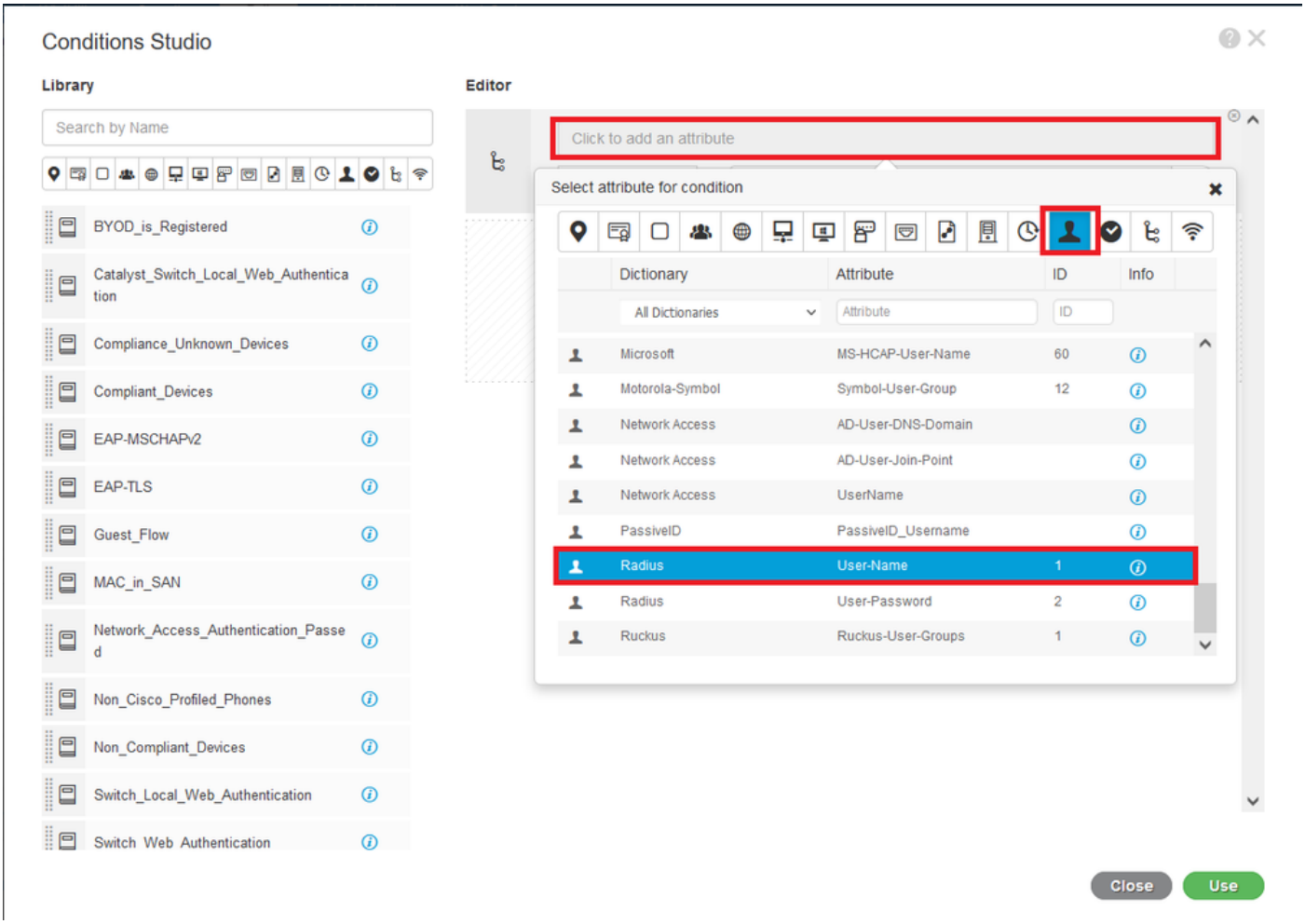


步骤8.单击Authorization Policy(授权策*略)*旁边的**箭头>**展开它。现在，单击*+*符号以添加新规则。

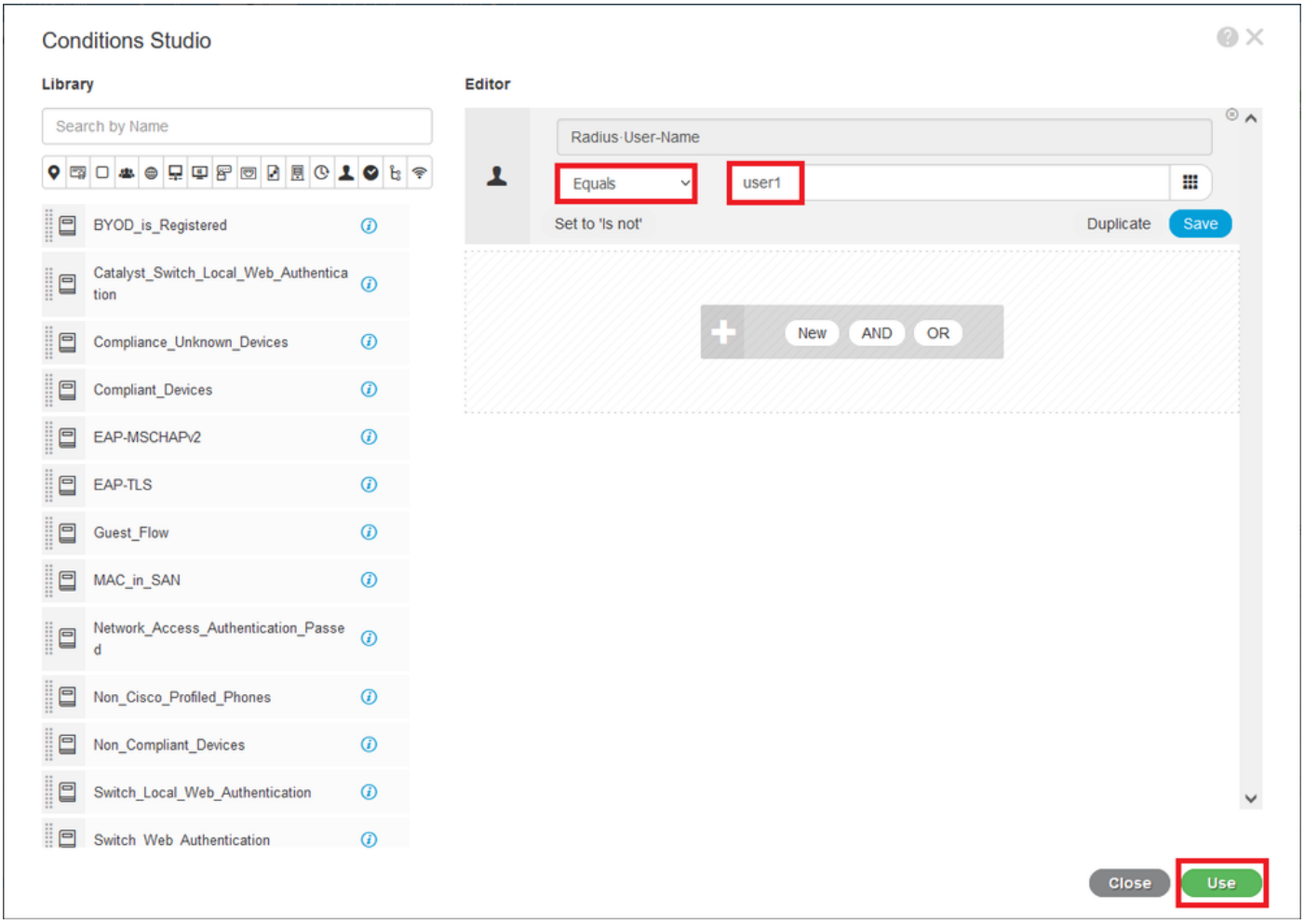


为规则提供名称，然后在“条件”*列下*选择**+符**号。

单击“属性编辑器”(Attribute Editor)文本框，然后单击“主**题”(Subject)**图标。向下滚动，直到您找*到RADIUS User-Name*属性并选择它。

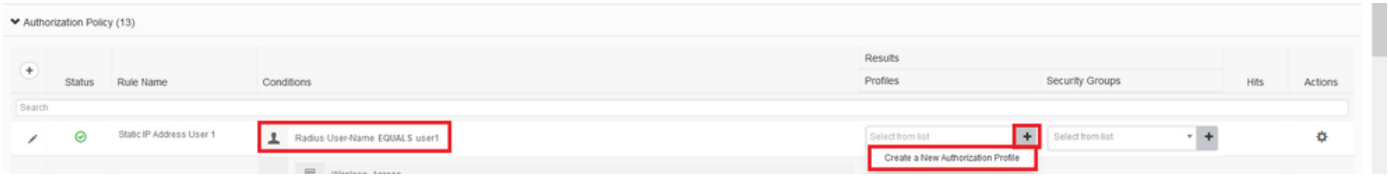


将**Equals**保留为运算符，并*在其*旁边的文本框中输入user1。单击**Use**以保存属性。

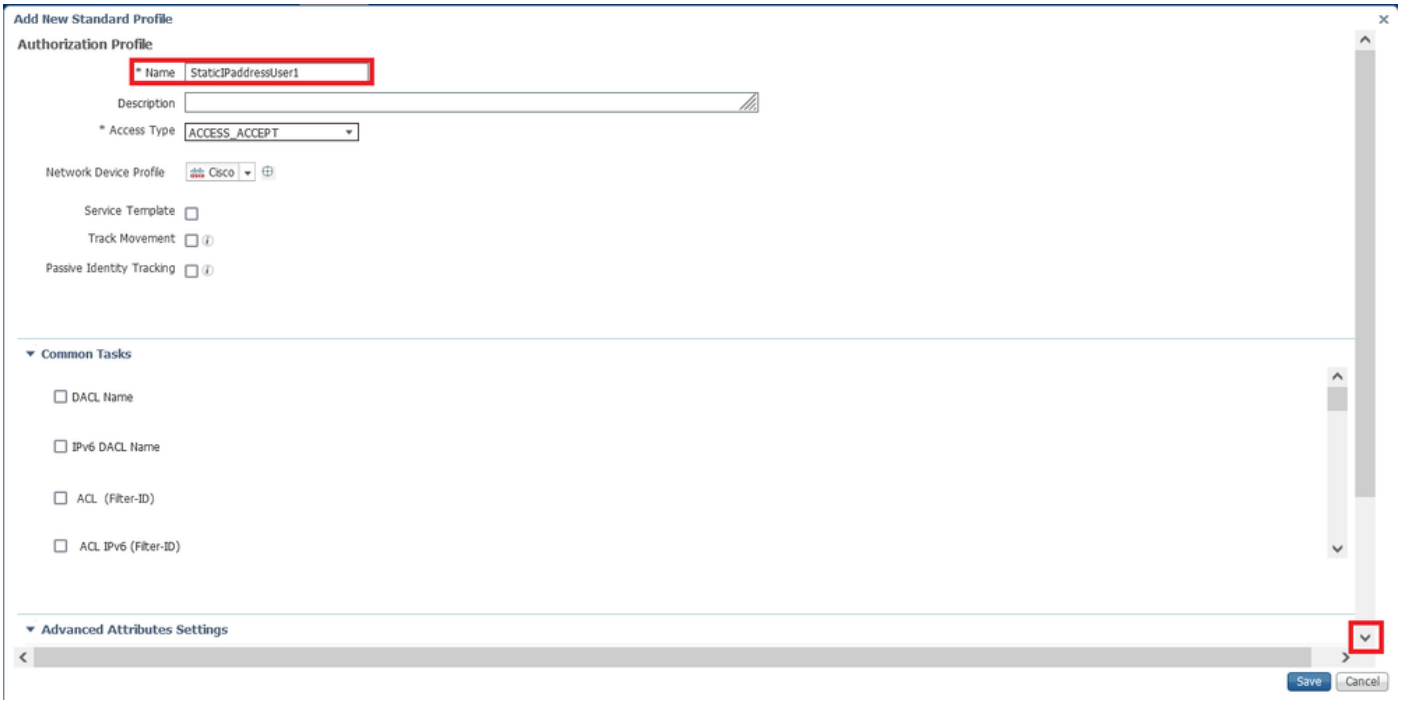


此规则的条件现在已设置。

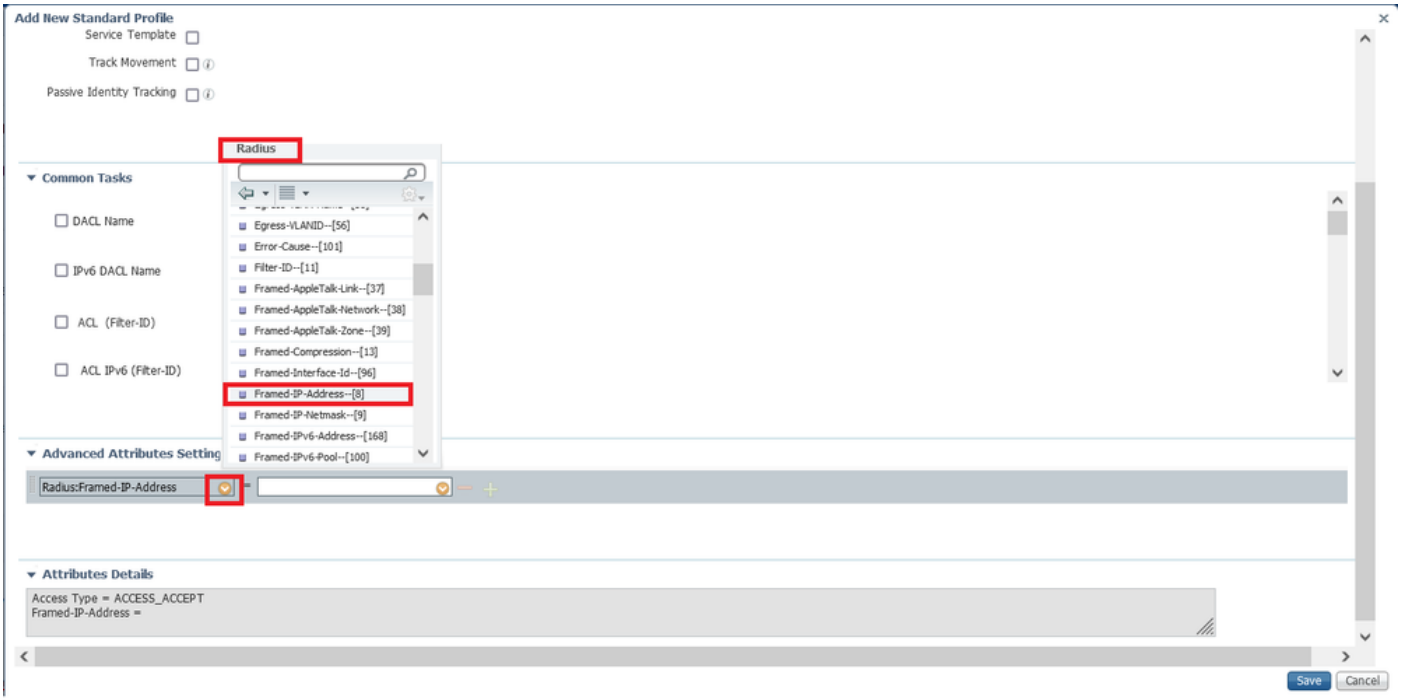
步骤9.在“结果/**配置文件**”列中，单击+号并**选择“创建新授权配置文件”**。



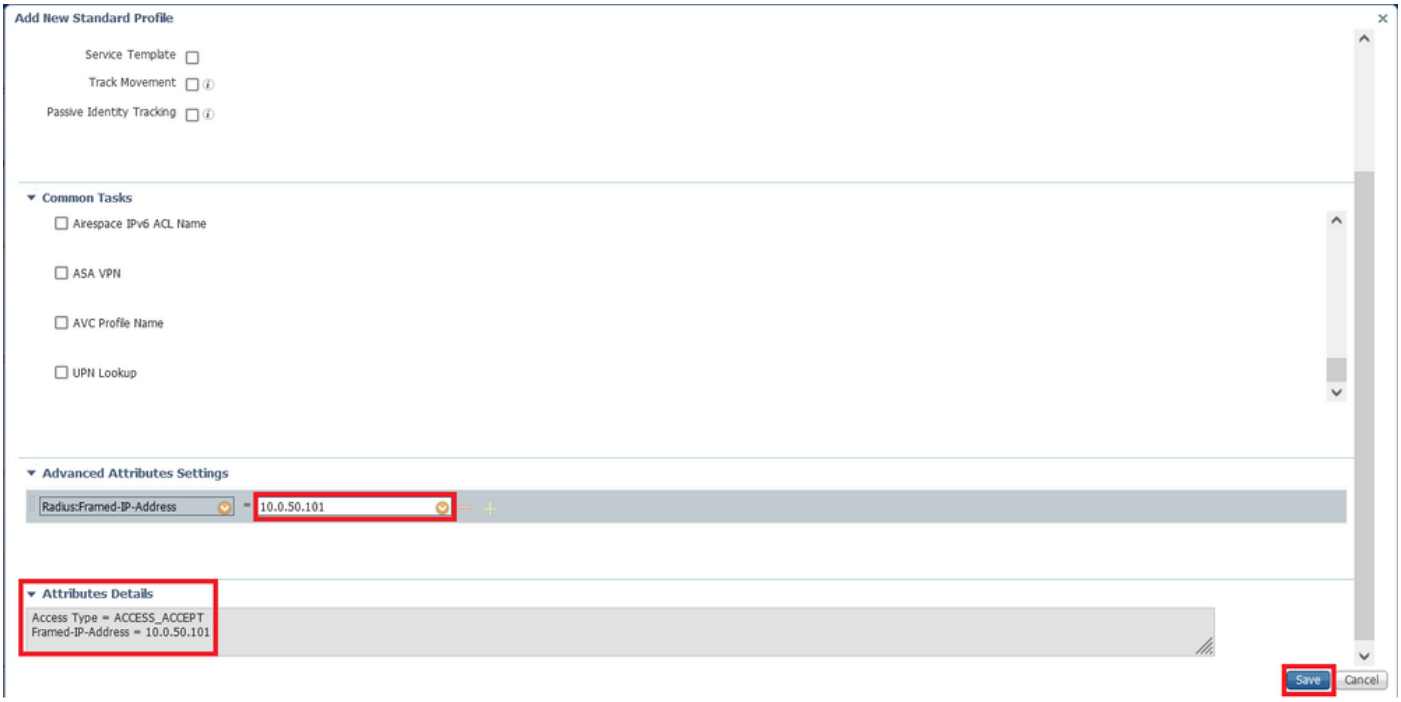
为其指定**名称**，并*将ACCESS_ACCEPT*保留为**访问类型**。向下滚动到“高级属**性设置**”部分。



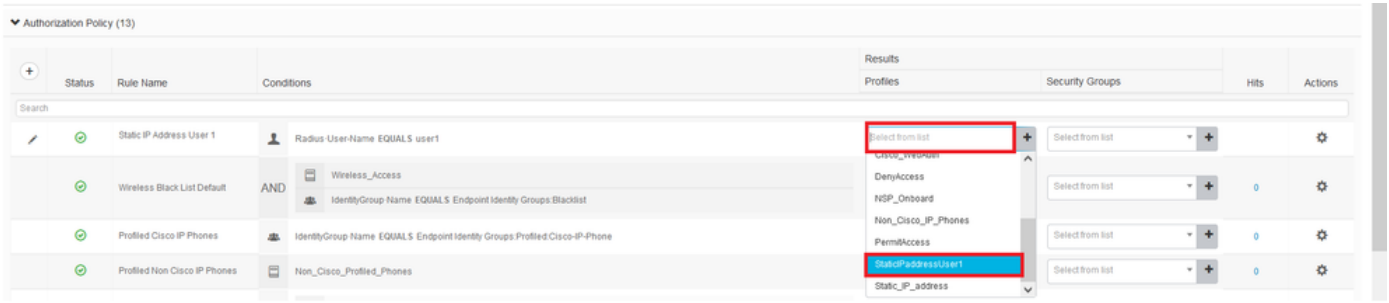
单击橙色箭头并选择Radius > Framed-IP-Address—[8]。



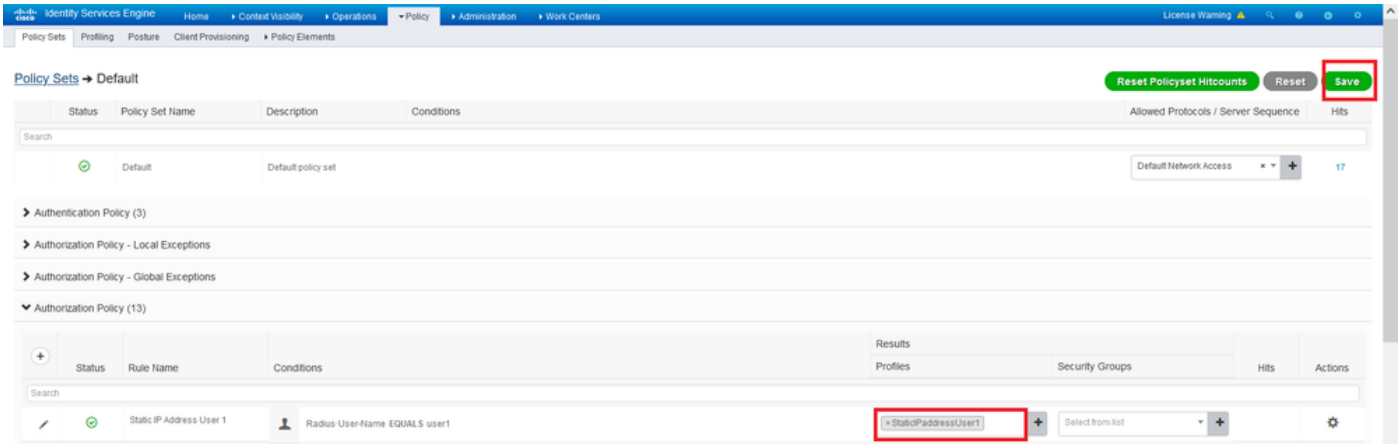
键入要始终静态分配给此用户的IP地址，然后单击Save。



步骤10.现在，选择新创建的授权配置文件。

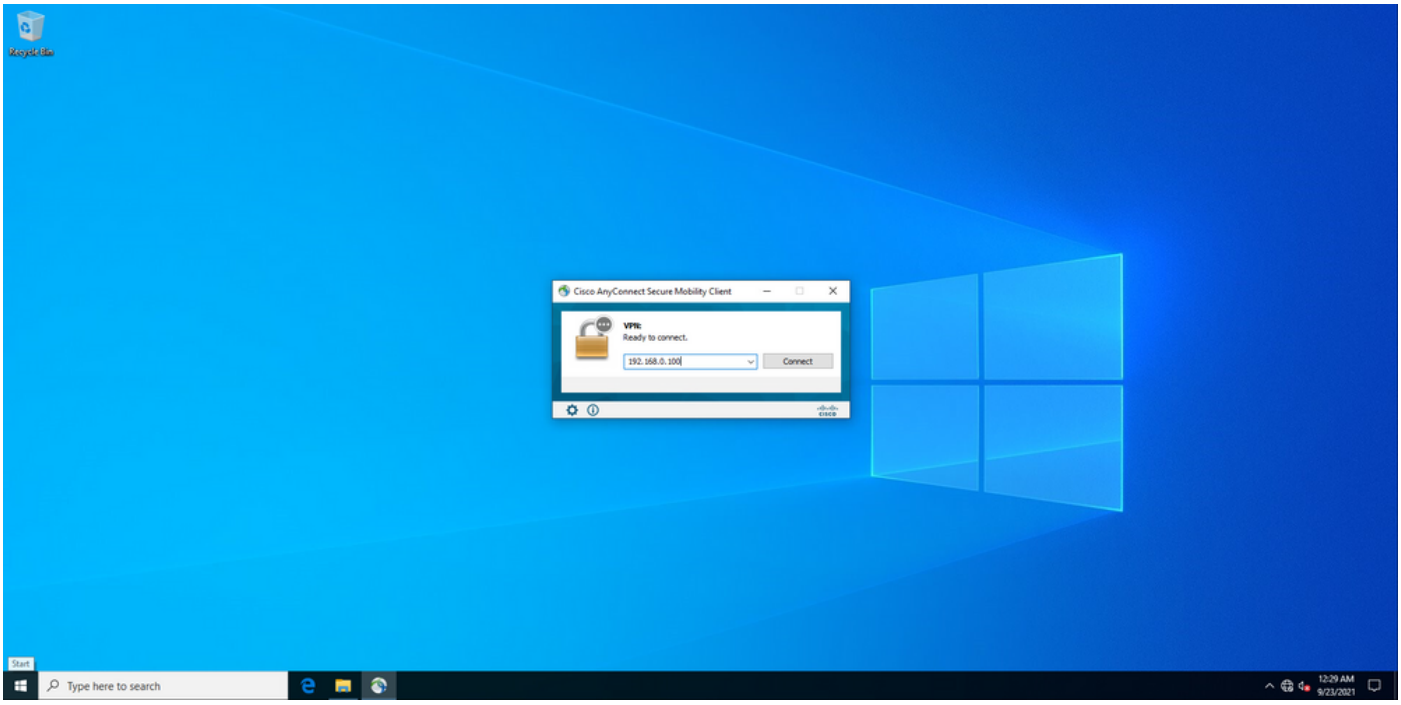


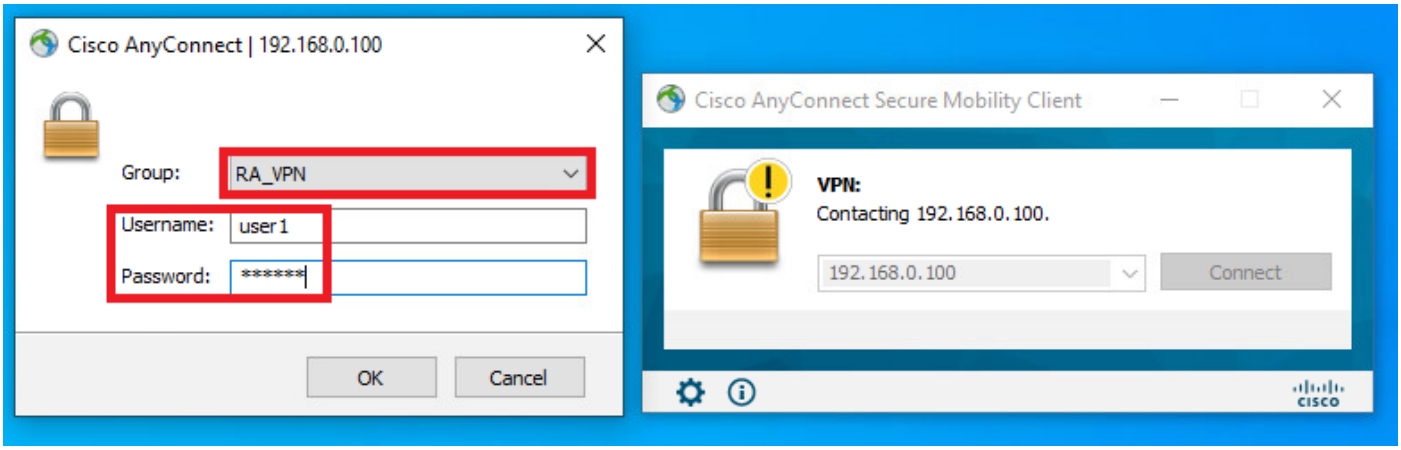
“授权”(Authorization)规则现在已全部设置。Click **Save**.



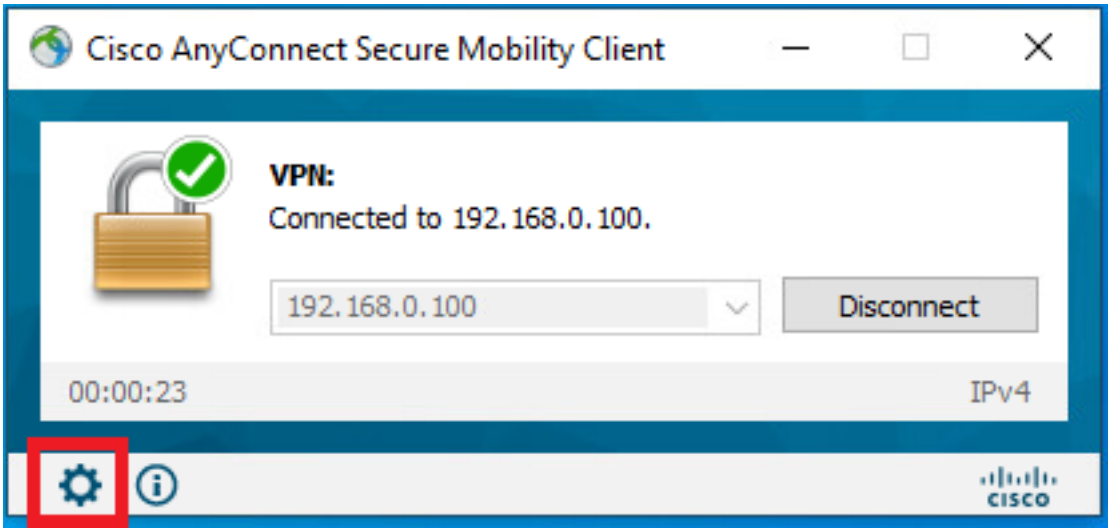
验证

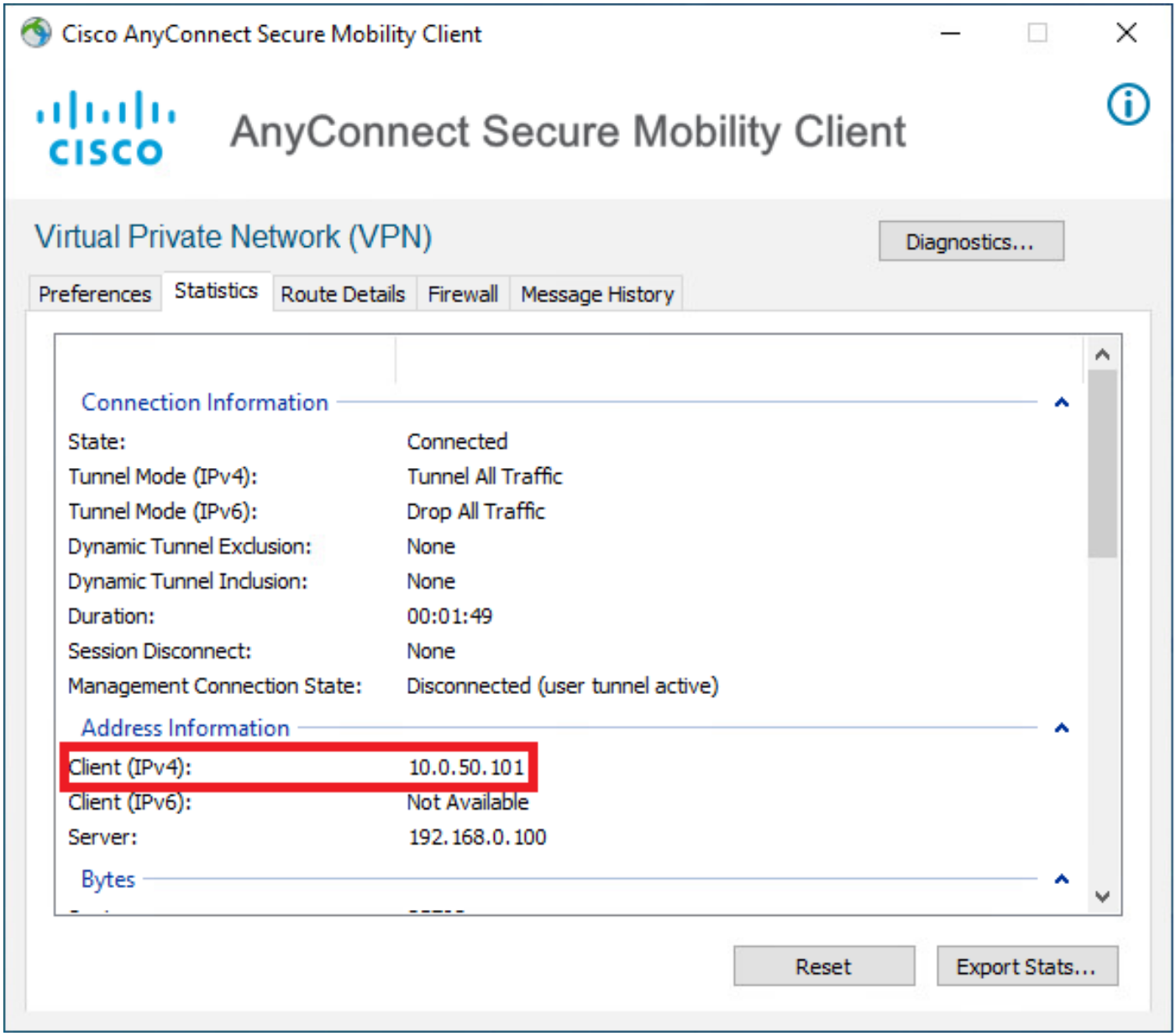
步骤1.导航至安装Cisco AnyConnect安全移动客户端的客户端计算机。连接到FTD头端（此处使用Windows计算机）并输入*user1*凭据。





单击齿轮图标（左下角）并导航至**统计**选项卡。在**地址信息**部分确认分配的IP地址确实是在此用户的ISE授权策略上配置的IP地址。





FTD上的debug radius all命令输出显示：

```
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).....
```

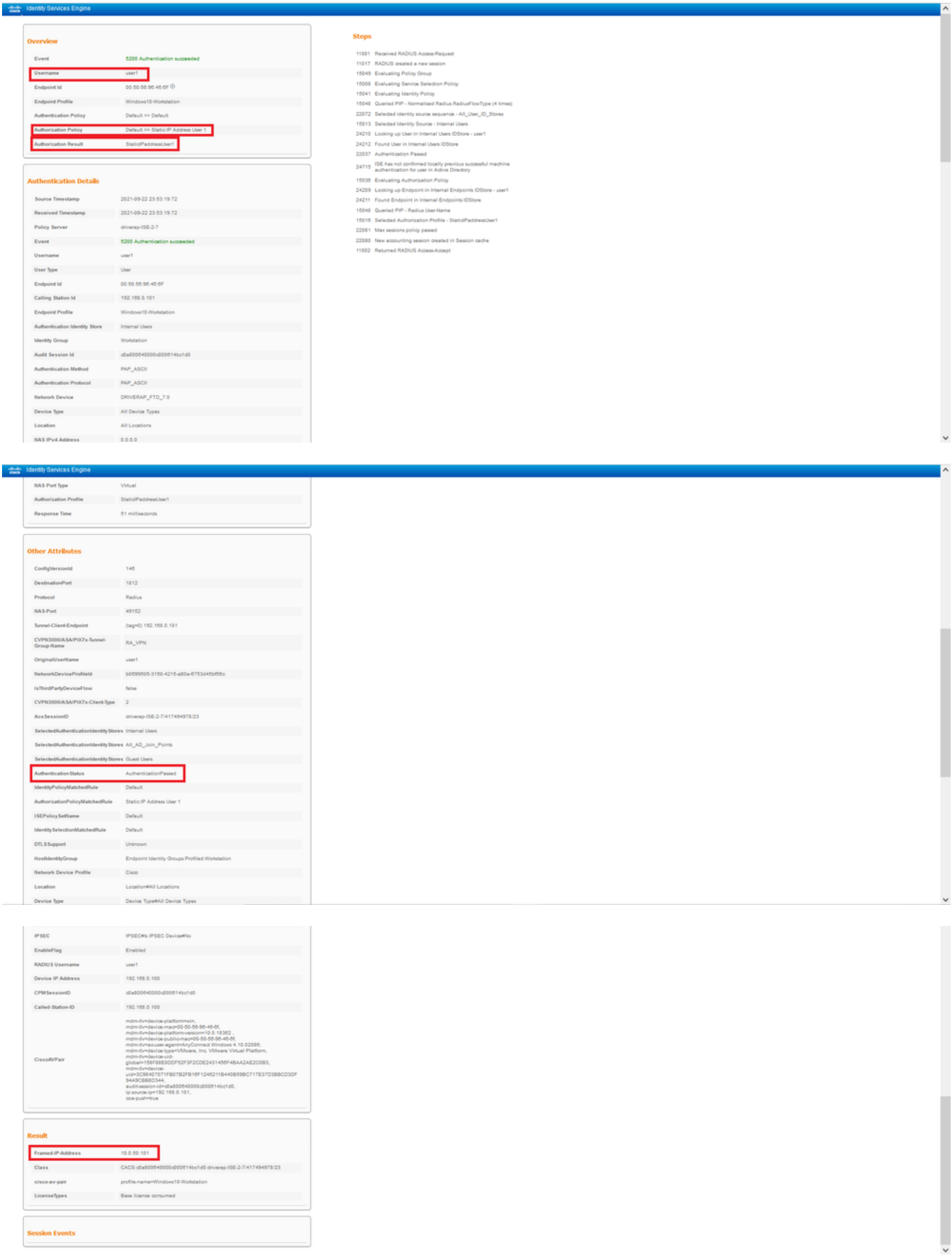
```
02 03 00 88 0c af 1c 41 4b c4 a6 58 de f3 92 31 | .......AK..X...1
7d aa 38 1e 01 07 75 73 65 72 31 08 06 0a 00 32 | }.8...user1....2
65 19 3d 43 41 43 53 3a 63 30 61 38 30 30 36 34 | e.=CACS:c0a80064
30 30 30 30 61 30 30 30 36 31 34 62 63 30 32 64 | 0000a000614bc02d
3a 64 72 69 76 65 72 61 70 2d 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日志显示：

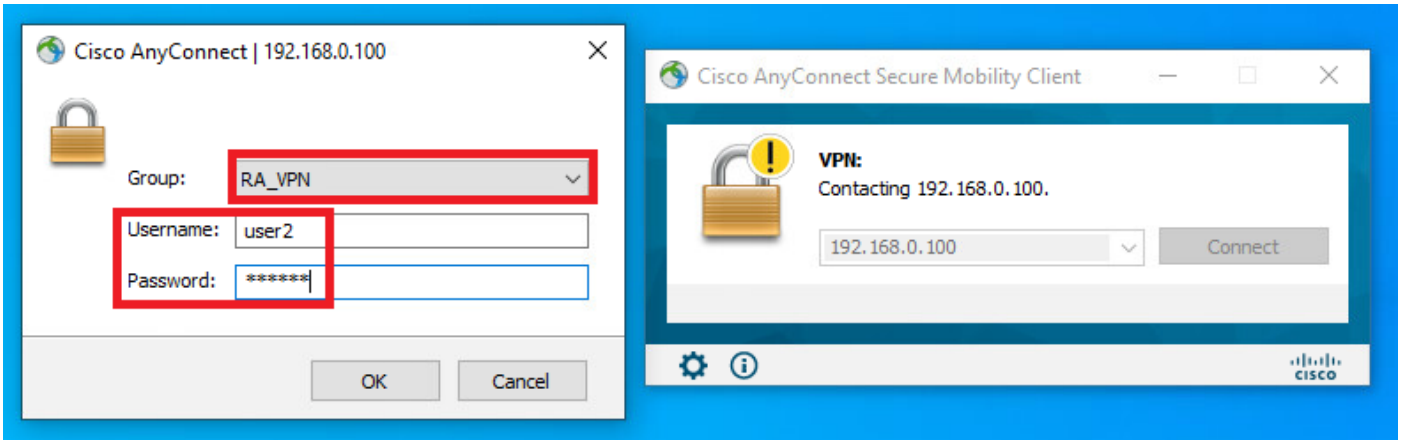
```
firepower#
<omitted output>
Sep 22 2021 23:52:40: %FTD-6-725002: Device completed SSL handshake with client
Outside_Int:192.168.0.101/60405 to 192.168.0.100/443 for TLSv1.2 session
Sep 22 2021 23:52:48: %FTD-7-609001: Built local-host Outside_Int:172.16.0.8
Sep 22 2021 23:52:48: %FTD-6-113004: AAA 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
```

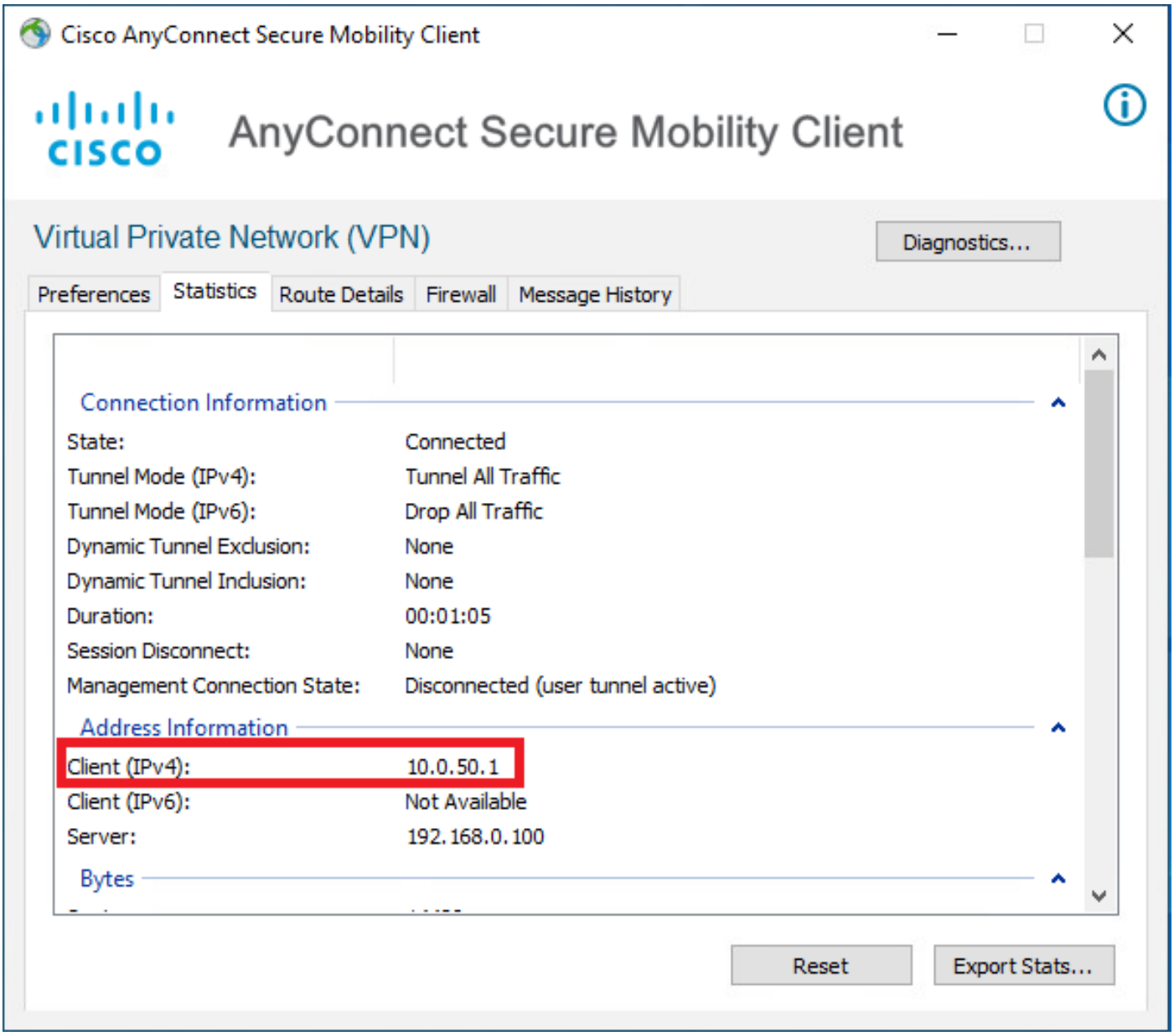
ISE上的RADIUS实时日志显示：



步骤2.连接到FTD头端（此处使用Windows计算机）并输入用户*2*凭据。



地址信息部分显示，分配的IP地址确实是通过FMC配置的IPv4本地池中的第一个可用IP地址。



FTD上**的debug radius all命令**输出显示：

```
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)
```

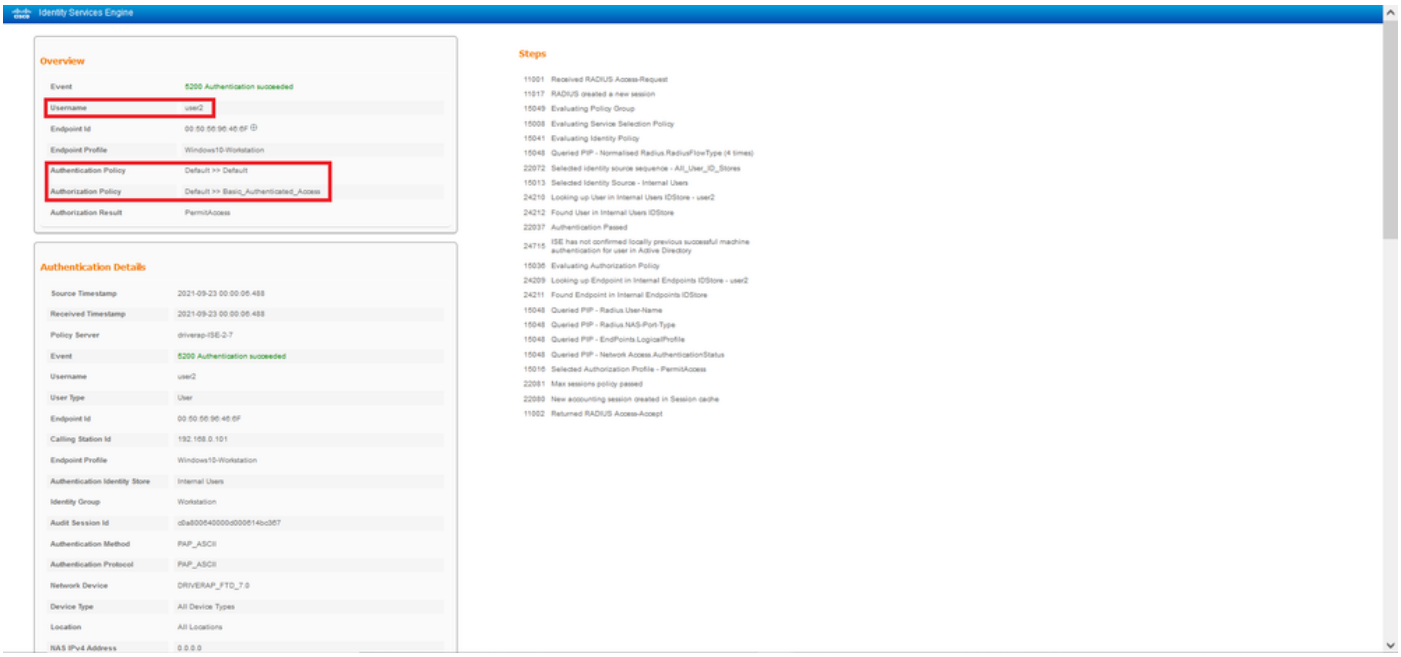
```
radius mkreq: 0x15
alloc_rip 0x0000145d043b6460
new request 0x15 --> 4 (0x0000145d043b6460)
got user 'user2'
got password
add_req 0x0000145d043b6460 session 0x15 id 4
RADIUS_REQUEST
radius.c: rad_mkpkt
rad_mkpkt: ip:source-ip=192.168.0.101

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日志显示：

```
<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实时日志显示：



注意：您必须在FTD IP本地池和ISE授权策略上使用不同的IP地址范围来分配IP地址，以避免AnyConnect 客户端之间出现重复的IP地址冲突。在此配置示例中，FTD配置了IPv4本地池，该池从10.0.50.1到10.0.50.100,ISE服务器分配了静态IP地址10.0.50.101。

故障排除

本节提供可用于排除配置故障的信息。

在FTD上：

- debug radius all

在ISE上：

- RADIUS实时日志