使用預共用金鑰在Windows 2000/XP PC和PIX/ASA 7.2之間通過IPsec的L2TP配置示例

目錄

簡介

本文說明如何使用預共用金鑰和Microsoft Windows 2003 Internet Authentication Service(IAS)RADIUS Server進行使用者身份驗證，配置從Microsoft Windows 2000/2003和XP客戶端到PIX安全裝置公司辦公室的IP安全(IPsec)第2層隧道協定(L2TP)。請參閱[Microsoft — 清單：配置IAS以進行撥號和VPN訪問](#)，以瞭解有關IAS的更多資訊。

在遠端訪問情況下使用IPsec配置L2TP的主要優點是，遠端使用者可以通過公共IP網路訪問VPN，而無需網關或專用線路。這樣，幾乎可以通過POTS從任何位置進行遠端訪問。另一個好處是，VPN接入的唯一客戶端要求是使用Windows 2000和Microsoft撥號網路(DUN)。 不需要額外的客戶端軟體，如Cisco VPN客戶端軟體。

本文檔還介紹了如何使用思科自適應安全裝置管理器(ASDM)來配置用於L2TP over IPsec的PIX

500系列安全裝置。

附註： Cisco Secure PIX防火牆軟體版本6.x及更高版本支持基於IPsec的第2層隧道協定(L2TP)。

要在PIX 6.x和Windows 2000之間配置L2TP Over IPsec，請參閱使用證書在PIX防火牆和Windows 2000 PC之間配置L2TP Over IPsec。

要使用加密方法配置從遠端Microsoft Windows 2000和XP客戶端到公司站點的L2TP over IPsec，請參閱使用預共用金鑰配置L2TP over IPsec從Windows 2000或XP客戶端到Cisco VPN 3000系列集中器。

必要條件

需求

在建立安全隧道之前，對等體之間需要存在IP連線。

確保UDP埠1701在連線路徑的任何位置都沒有被阻止。

僅使用Cisco PIX/ASA上的預設隧道組和預設組策略。使用者定義的策略和組無法工作。

注意：如果安裝了Cisco VPN Client 3.x或Cisco VPN 3000 Client 2.5，則安全裝置不會在Windows 2000中建立L2TP/IPsec隧道。從Windows 2000的「服務」面板中禁用適用於Cisco VPN客戶端3.x的Cisco VPN服務，或適用於Cisco VPN 3000客戶端2.5的ANetIKE服務。為此，請選擇**開始>程式>管理工具>服務**，從「服務」面板重新啟動IPsec策略代理服務，然後重新啟動電腦。

採用元件

本文中的資訊係根據以下軟體和硬體版本：

- PIX安全裝置515E，軟體版本7.2(1)或更高版本
- 自適應安全裝置管理器5.2(1)或更高版本
- Microsoft Windows 2000 Server
- Microsoft Windows XP Professional SP2
- 採用IAS的Windows 2003 Server

注意：如果將PIX 6.3升級到版本7.x，請確保已在Windows XP（L2TP客戶端）中安裝SP2。

注意：文檔中的資訊對ASA安全裝置也是有效的。

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。如果您的網路正在作用，請確保您已瞭解任何指令可能造成的影響。

相關產品

此配置還可以與Cisco ASA 5500系列安全裝置7.2(1)或更高版本配合使用。

慣例

如需文件慣例的詳細資訊，請參閱思科技術提示慣例。

背景資訊

完成以下步驟，即可設定使用IPsec的L2TP。

1. 配置IPsec傳輸模式，以便使用L2TP啟用IPsec。Windows 2000 L2TP/IPsec客戶端使用IPsec傳輸模式 — 僅加密IP負載，並且原始IP報頭保持不變。此模式的優點在於它只給每個封包增加幾個位元組，並允許公用網路上的裝置看到封包的最終來源和目的地。因此，要使Windows 2000 L2TP/IPsec客戶端連線到安全裝置，必須為轉換配置IPsec傳輸模式(請參閱ASDM配置中的步驟2)。 通過此功能（傳輸），您可以根據IP報頭中的資訊在中間網路上啟用特殊處理（例如QoS）。但是，第4層報頭已加密，這限制了資料包的檢查。遺憾的是，IP報頭以明文傳輸，傳輸模式允許攻擊者執行一些流量分析。
2. 使用虛擬專用撥號網路(VPDN)組配置L2TP。

使用IPsec配置L2TP支援使用預共用金鑰或RSA簽名方法的證書，並支援使用動態（而非靜態）加密對映。預共用金鑰用作建立基於IPsec的L2TP隧道的身份驗證。

設定

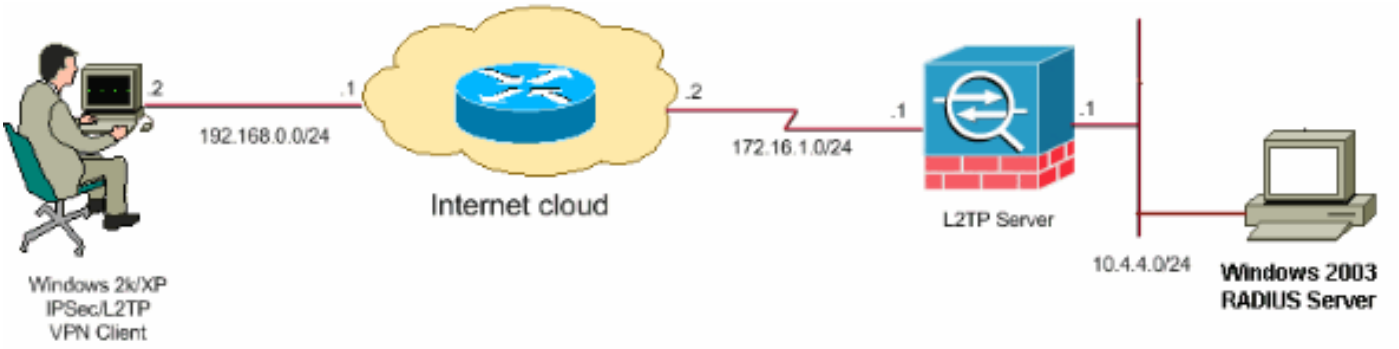
本節提供用於設定本文件中所述功能的資訊。

註：使用Command Lookup Tool(僅限註冊客戶)查詢有關本文檔中使用的命令的更多資訊。

注意：此配置中使用的IP編址方案在Internet上不能合法路由。這些地址是在實驗室環境中使用的RFC 1918地址。

網路圖表

本檔案會使用以下網路設定：



組態

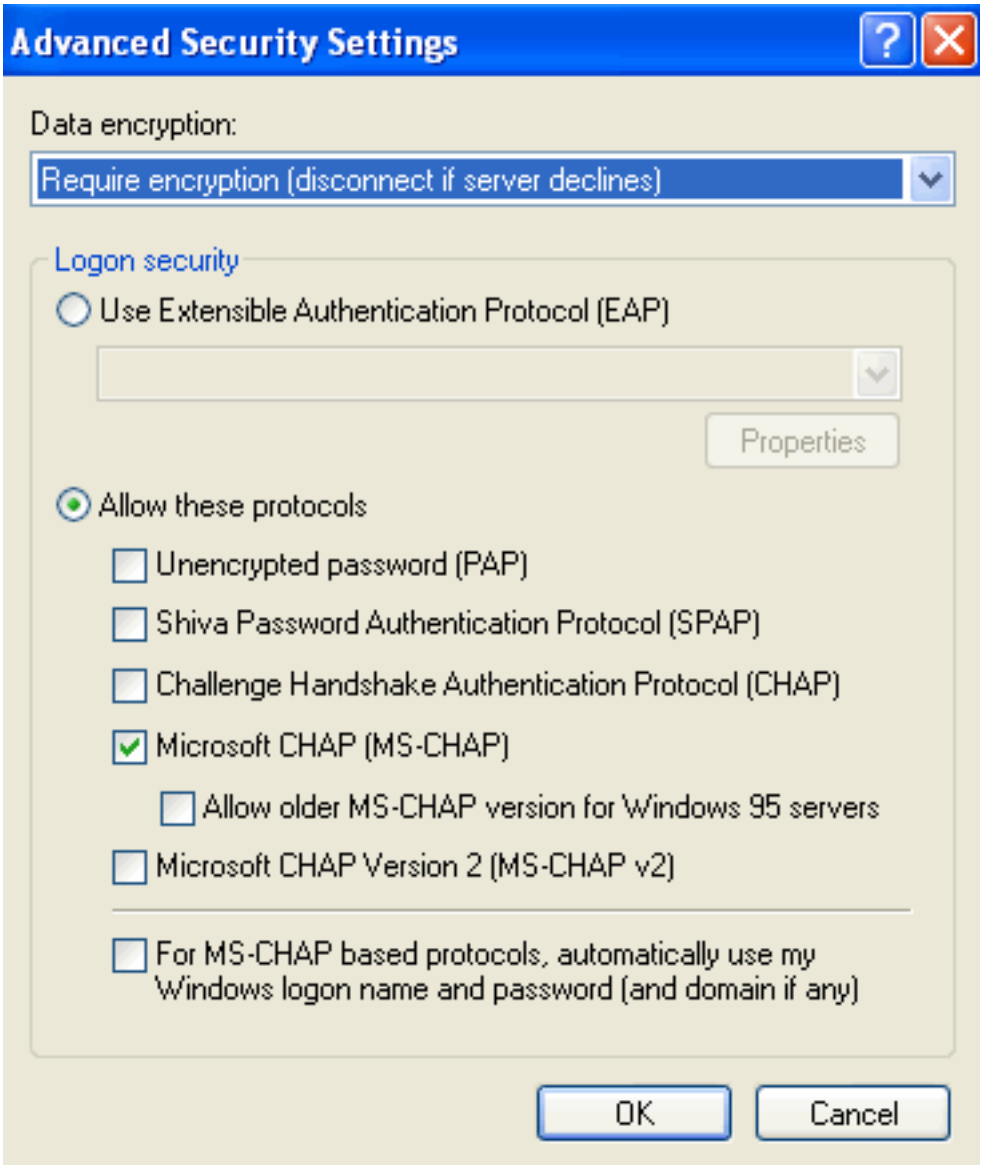
本檔案會使用以下設定：

- Windows L2TP/IPsec客戶端配置
- PIX配置中的L2TP伺服器
- 使用ASDM配置的L2TP
- 採用IAS配置的Microsoft Windows 2003 Server

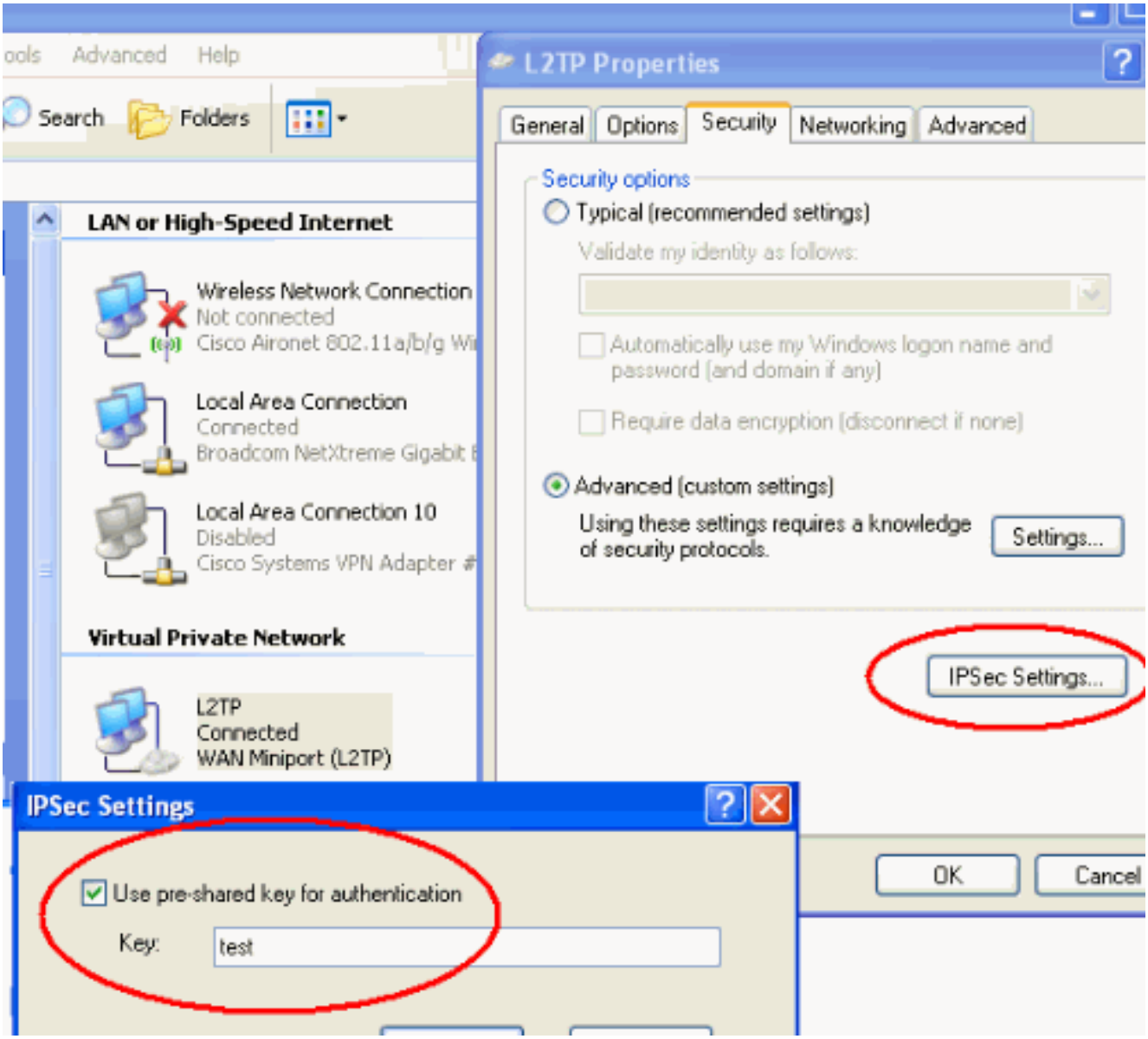
Windows L2TP/IPsec客戶端配置

完成以下步驟，以便在Windows 2000上配置通過IPsec的L2TP。對於Windows XP，請跳過步驟1和步驟2，然後從步驟3開始：

1. 將此登錄檔值新增到Windows 2000電腦：
   `HKEY_LOCAL_MACHINE\System\CurrentControlSet\Services\Rasman\Parameters`
2. 將此登錄檔值新增到此項：
   ```
   Value Name: ProhibitIpSec
   Data Type: REG_DWORD
   Value: 1
   ```
   注意：在某些情況下(Windows XP Sp2)，新增此項**(值：1)顯**示斷開連線，因為它使XP框僅協商L2TP而不是具有IPsec連線的L2TP。必須將IPsec策略與該登錄檔項一起新增。如果在嘗試建立連線時收到800，請移除金鑰(值：1)以使連線正常工作。**注意：**要使更改生效，必須重新啟動Windows 2000/2003或XP電腦。預設情況下，Windows客戶端會嘗試對證書頒發機構(CA)使用IPsec。 配置此登錄檔項可防止出現這種情況。現在，您可以在Windows工作站上配置IPsec策略以匹配您想要在PIX/ASA上的引數。有關Windows IPsec策略的逐步配置，請參閱如何使用預共用金鑰身份驗證(Q240262)配置L2TP/IPSec連線 。如需詳細資訊，請參閱在Windows XP(Q281555)中設定用於第2層通道通訊協定連線的預先共用金鑰\ 。
3. 建立連線。
4. 在Network and Dial-up Connections（網路和撥號連線）下，按一下右鍵連線並選擇**Properties**。轉到「安全」頁籤，然後按一下**高級**。選擇如下圖所示的協定。



5. **附註：**此步驟僅適用於Windows XP。按一下**IPSec Settings**，選中**Use pre-shared key for authentication**，然後鍵入預共用金鑰以設定預共用金鑰。在本示例中，測試用作預共用金鑰。



PIX配置中的L2TP伺服器

PIX 7.2
pixfirewall#**show run** PIX Version 7.2(1) ! hostname pixfirewall domain-name default.domain.invalid enable password 8Ry2YjIyt7RRXU24 encrypted names ! *!--- Configures the outside and inside interfaces.* interface Ethernet0 nameif outside security-level 0 ip address 172.16.1.1 255.255.255.0 ! interface Ethernet1 nameif inside security-level 100 ip address 10.4.4.1 255.255.255.0 ! passwd 2KFQnbNIdI.2KYOU encrypted ftp mode passive dns server-group DefaultDNS domain-name default.domain.invalid **access-list nonat extended permit ip 10.4.4.0 255.255.255.0 10.4.5.0 255.255.255.0** **nat (inside) 0 access-list nonat** pager lines 24

```
logging console debugging
mtu outside 1500
mtu inside 1500

!--- Creates a pool of addresses from which IP addresses
are assigned !--- dynamically to the remote VPN Clients.
ip local pool clientVPNpool 10.4.5.10-10.4.5.20 mask
255.255.255.0

no failover
asdm image flash:/asdm-521.bin
no asdm history enable
arp timeout 14400

!--- The global and nat command enable !--- the Port
Address Translation (PAT) using an outside interface IP
!--- address for all outgoing traffic.

global (outside) 1 interface
nat (inside) 1 0.0.0.0 0.0.0.0


route outside 0.0.0.0 0.0.0.0 172.16.1.2 1
timeout xlate 3:00:00
timeout conn 1:00:00 half-closed 0:10:00 udp 0:02:00
icmp 0:00:02
timeout sunrpc 0:10:00 h323 0:05:00 h225 1:00:00 mgcp
0:05:00 mgcp-pat 0:05:00
timeout sip 0:30:00 sip_media 0:02:00 sip-invite 0:03:00
sip-disconnect 0:02:00
timeout uauth 0:05:00 absolute

!--- Create the AAA server group "vpn" and specify its
protocol as RADIUS. !--- Specify the IAS server as a
member of the "vpn" group and provide its !--- location
and key. aaa-server vpn protocol radius
aaa-server vpn host 10.4.4.2
 key radiuskey

!--- Identifies the group policy as internal. group-
policy DefaultRAGroup internal
!--- Instructs the security appliance to send DNS and !-
-- WINS server IP addresses to the client. group-policy
DefaultRAGroup attributes
 wins-server value 10.4.4.99
 dns-server value 10.4.4.99
!--- Configures L2TP over IPsec as a valid VPN tunneling
protocol for a group. vpn-tunnel-protocol IPSec l2tp-
ipsec
 default-domain value cisco.com
!--- Configure usernames and passwords on the device !--
- in addition to using AAA. !--- If the user is an L2TP
client that uses Microsoft CHAP version 1 or !---
version 2, and the security appliance is configured !---
to authenticate against the local !--- database, you
must include the mschap keyword. !--- For example,
username



          .


username test password DLaUiAX3178qgoB5c7iVNw== nt-
```

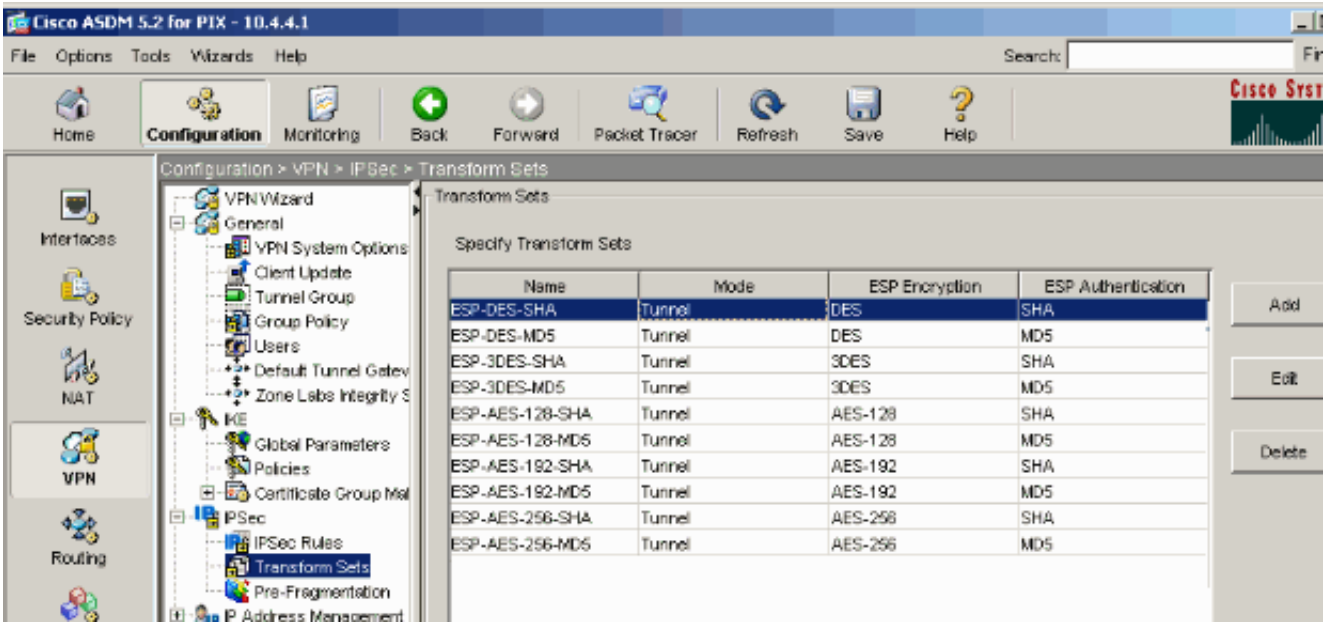
```
encrypted


 vpn-tunnel-protocol l2tp-ipsec

http server enable
http 0.0.0.0 0.0.0.0 inside
no snmp-server location
no snmp-server contact
snmp-server enable traps snmp authentication linkup
linkdown coldstart

!--- Identifies the IPsec encryption and hash algorithms
!--- to be used by the transform set. crypto ipsec
transform-set TRANS_ESP_3DES_MD5 esp-3des esp-md5-hmac

!--- Since the Windows 2000 L2TP/IPsec client uses IPsec
transport mode, !--- set the mode to transport. !--- The
default is tunnel mode. crypto ipsec transform-set
TRANS_ESP_3DES_MD5 mode transport




!--- Specifies the transform sets to use in a dynamic
crypto map entry. crypto dynamic-map outside_dyn_map 20
set transform-set TRANS_ESP_3DES_MD5

!--- Requires a given crypto map entry to refer to a
pre-existing !--- dynamic crypto map. crypto map
outside_map 20 ipsec-isakmp dynamic outside_dyn_map

!--- Applies a previously defined crypto map set to an
outside interface. crypto map outside_map interface
outside

crypto isakmp enable outside
crypto isakmp nat-traversal 20

!--- Specifies the IKE Phase I policy parameters. crypto
isakmp policy 10
 authentication pre-share
 encryption 3des
 hash md5
 group 2
 lifetime 86400

!--- Creates a tunnel group with the tunnel-group
command, and specifies the local !--- address pool name
used to allocate the IP address to the client. !---
Associate the AAA server group (VPN) with the tunnel
group.


tunnel-group DefaultRAGroup general-attributes
 address-pool clientVPNpool
 authentication-server-group vpn

!--- Link the name of the group policy to the default
tunnel !--- group from tunnel group general-attributes
mode. default-group-policy DefaultRAGroup

!--- Use the tunnel-group ipsec-attributes command !---
in order to enter the ipsec-attribute configuration
```

```
mode. !--- Set the pre-shared key. !--- This key should
be the same as the key configured on the Windows
machine.


tunnel-group DefaultRAGroup ipsec-attributes
 pre-shared-key *

!--- Configures the PPP authentication protocol with the
authentication type !--- command from tunnel group ppp-
attributes mode.


tunnel-group DefaultRAGroup ppp-attributes
 no authentication chap
 authentication ms-chap-v2

telnet timeout 5
ssh timeout 5
console timeout 0
!
class-map inspection_default
 match default-inspection-traffic
!
!
policy-map type inspect dns preset_dns_map
 parameters
  message-length maximum 512
policy-map global_policy
 class inspection_default
  inspect dns preset_dns_map
  inspect ftp
  inspect h323 h225
  inspect h323 ras
  inspect netbios
  inspect rsh
  inspect rtsp
  inspect skinny
  inspect esmtp
  inspect sqlnet
  inspect sunrpc
  inspect tftp
  inspect sip
  inspect xdmcp
!
service-policy global_policy global
prompt hostname context
Cryptochecksum:e1e0730fa260244caa2e2784f632accd
: end
```

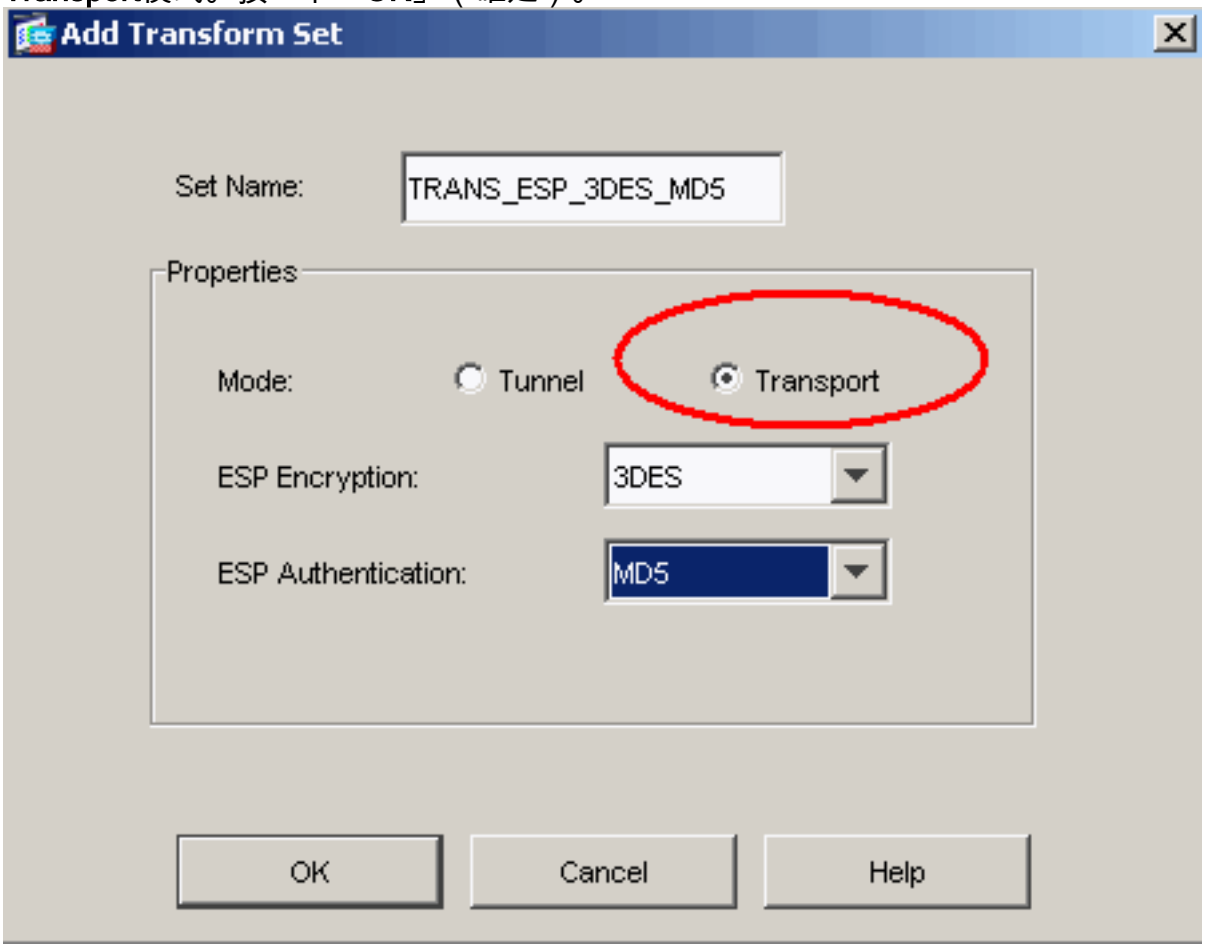
使用ASDM配置的L2TP

完成以下步驟，將安全裝置配置為接受L2TP over IPsec連線：

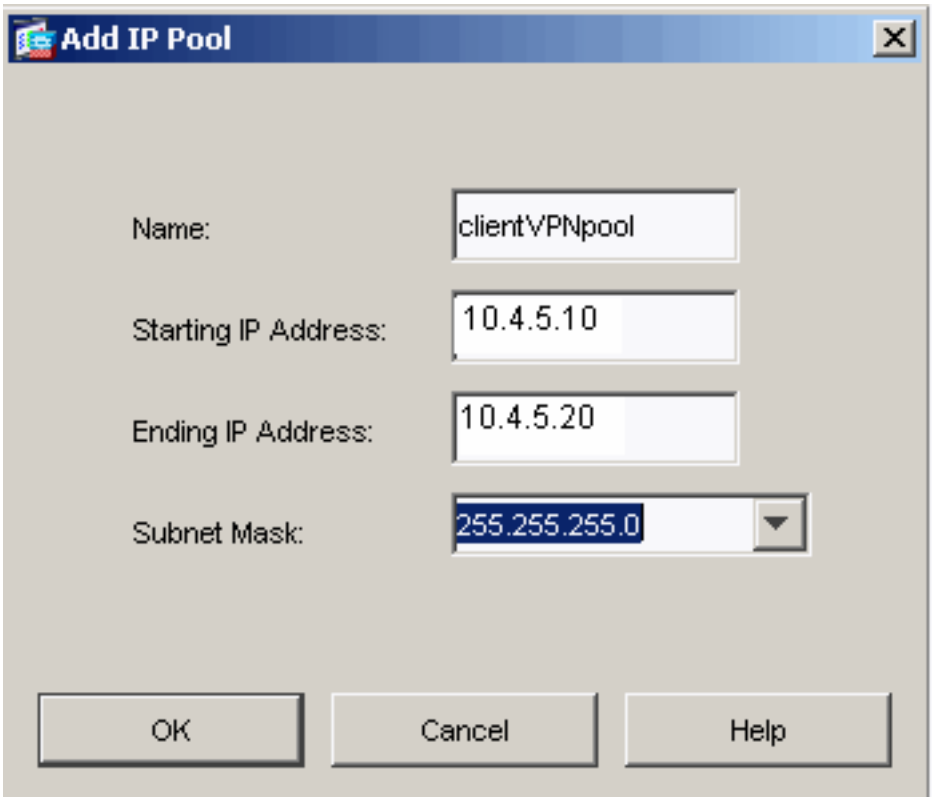
1. 新增IPsec轉換集並指定IPsec以使用傳輸模式而不是隧道模式。為此，請選擇**Configuration > VPN > IPSec > Transform Sets**，然後按一下**Add**。將顯示「轉換集」窗格。



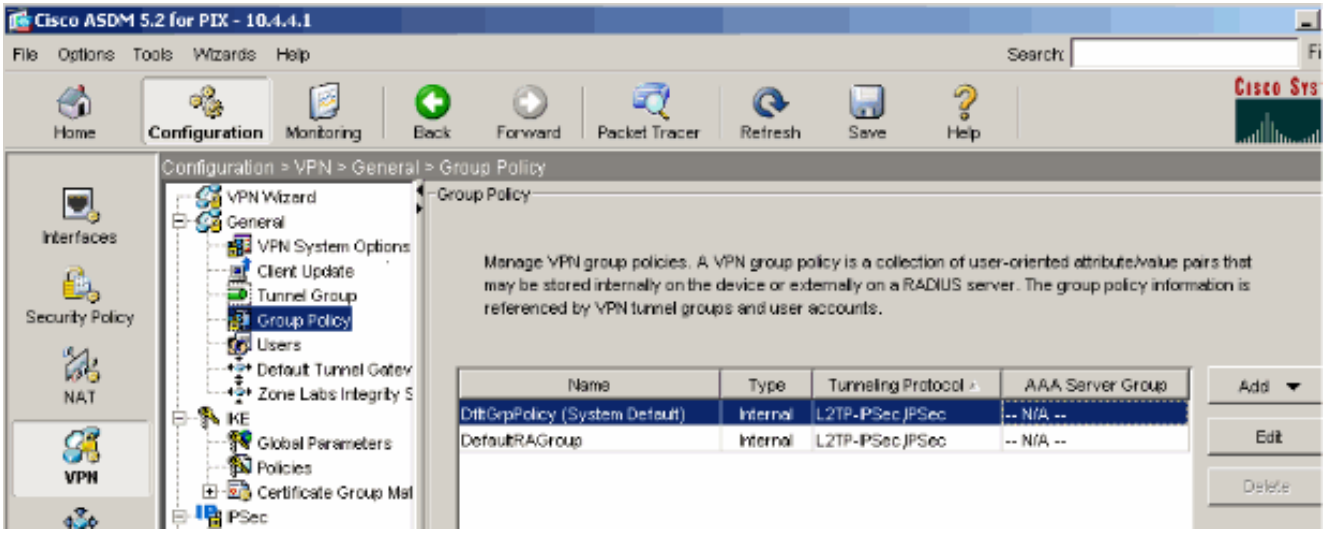
2. 完成以下步驟以新增轉換集：輸入轉換集的名稱。選擇ESP加密和ESP身份驗證方法。選擇**Transport**模式。按一下「**OK**」（確定）。



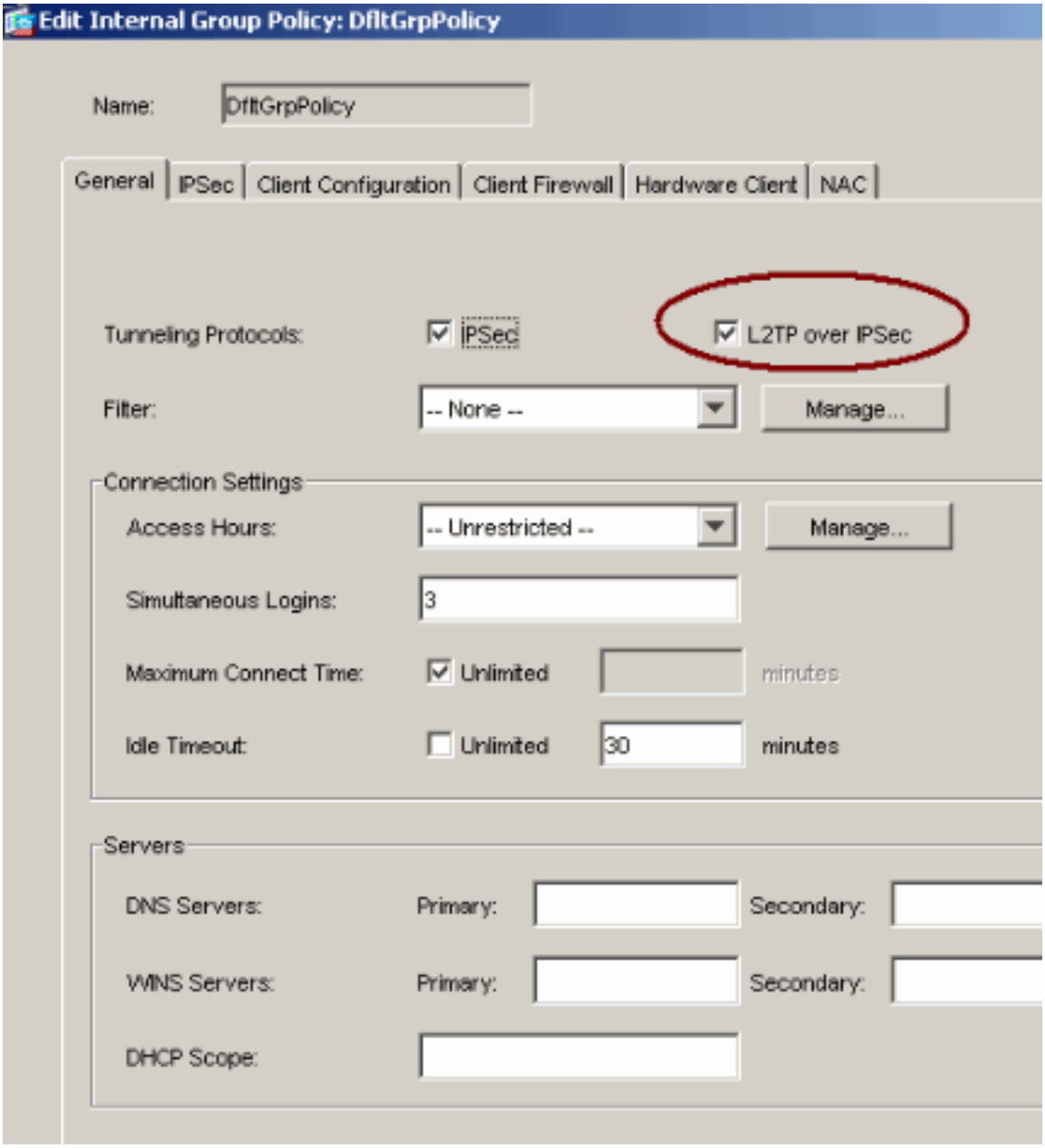
3. 完成這些步驟，設定位址指派方法。此示例使用IP地址池。選擇**Configuration > VPN > IP Address Management > IP Pools**。按一下「**Add**」。系統將顯示Add IP Pool對話方塊。輸入新IP地址池的名稱。輸入起始和結束IP地址。輸入子網掩碼，然後按一下**OK**。



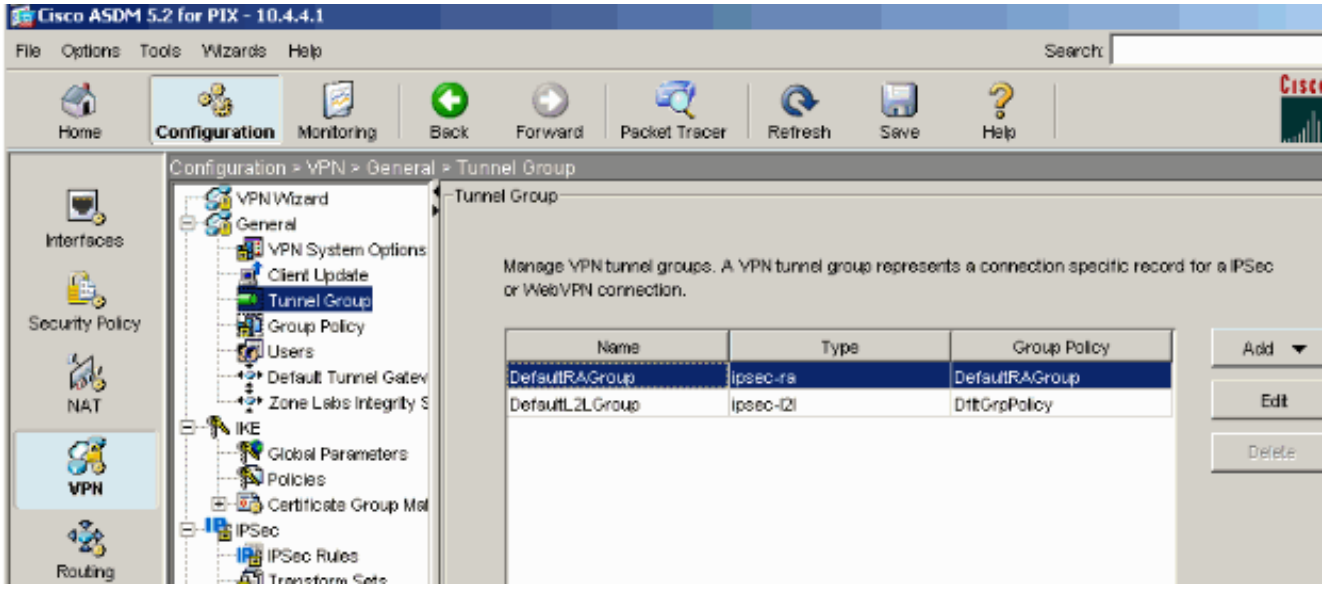
4. 選擇**Configuration > VPN > General > Group Policy**，將L2TP over IPsec配置為組策略的有效VPN隧道協定。將顯示「組策略」窗格。



5. 選擇一個組策略(DiffGrpPolicy)，然後按一下**Edit**。將顯示「編輯組策略」對話方塊。選中**L2TP over IPSec**以為組策略啟用協定，然後按一下**OK**。

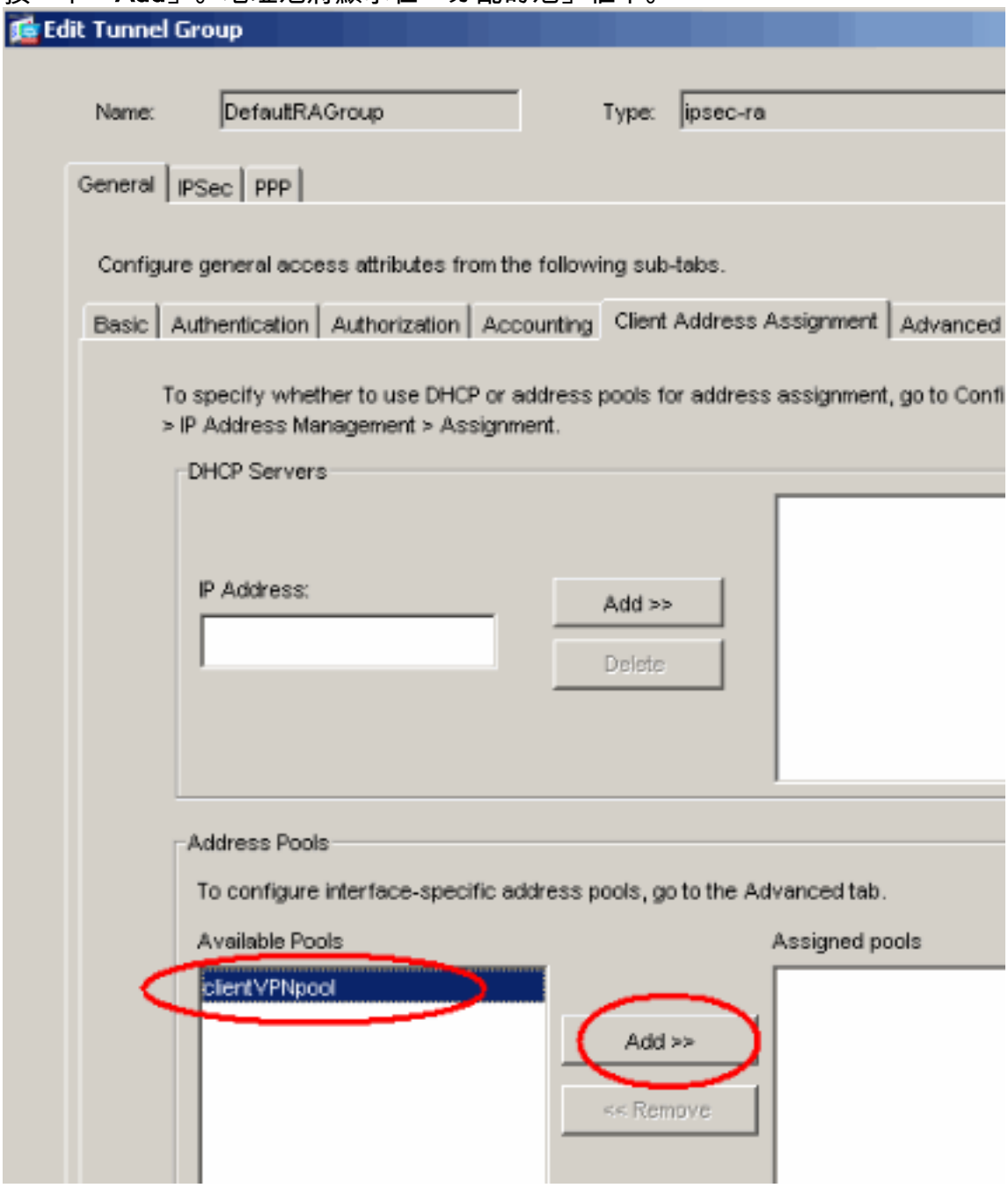


6. 完成以下步驟，以便將IP地址池分配給隧道組：選擇**Configuration > VPN > General > Tunnel Group**。出現Tunnel Group窗格後，在表中選擇一個隧道組(DefaultRAGroup)。按一下「**Edit**」。

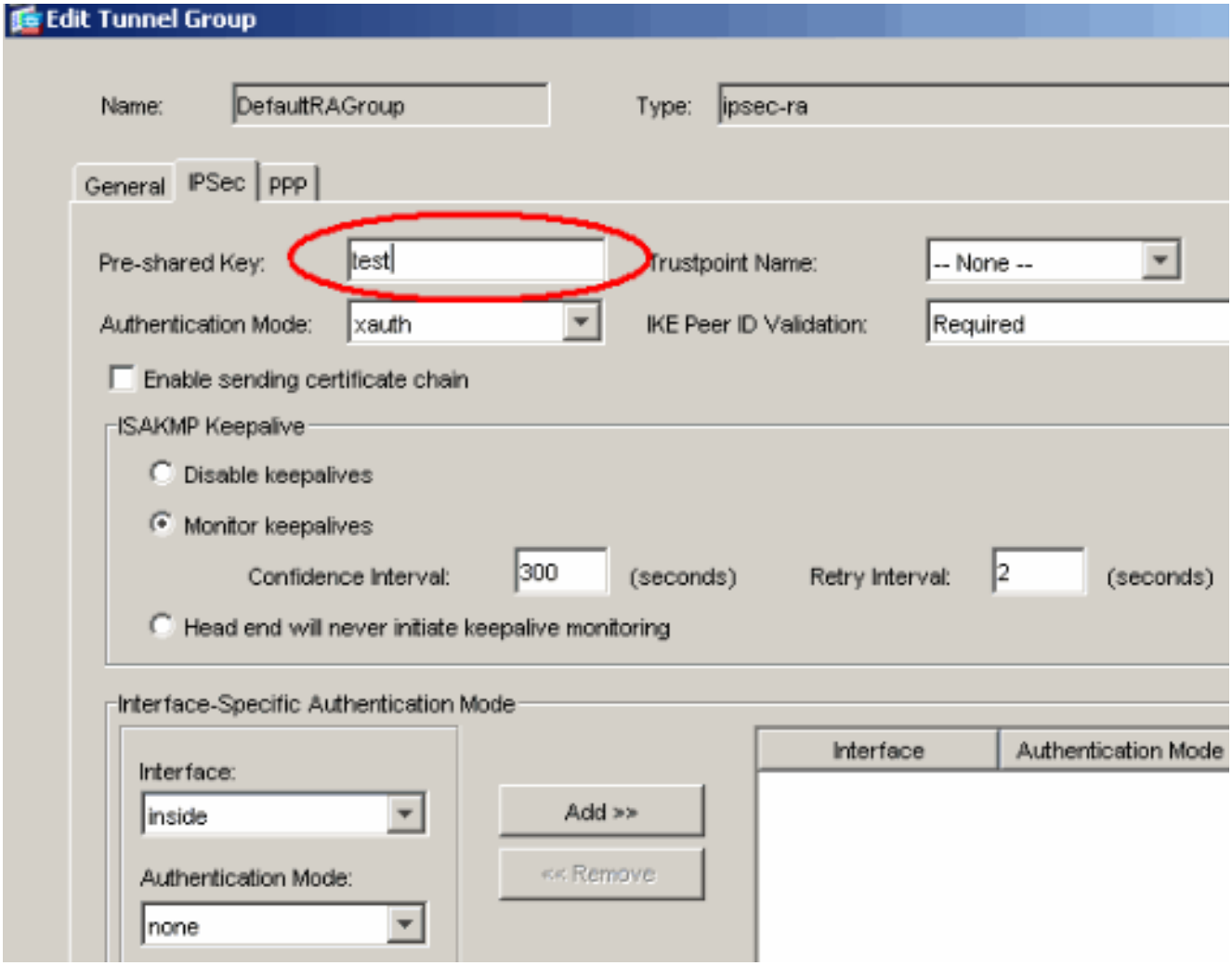


7. 出現「Edit Tunnel Group（編輯隧道組）」視窗時，請完成以下步驟：從General頁籤轉到Client Address Assignment頁籤。在Address Pools區域中，選擇要分配給隧道組的地址池。

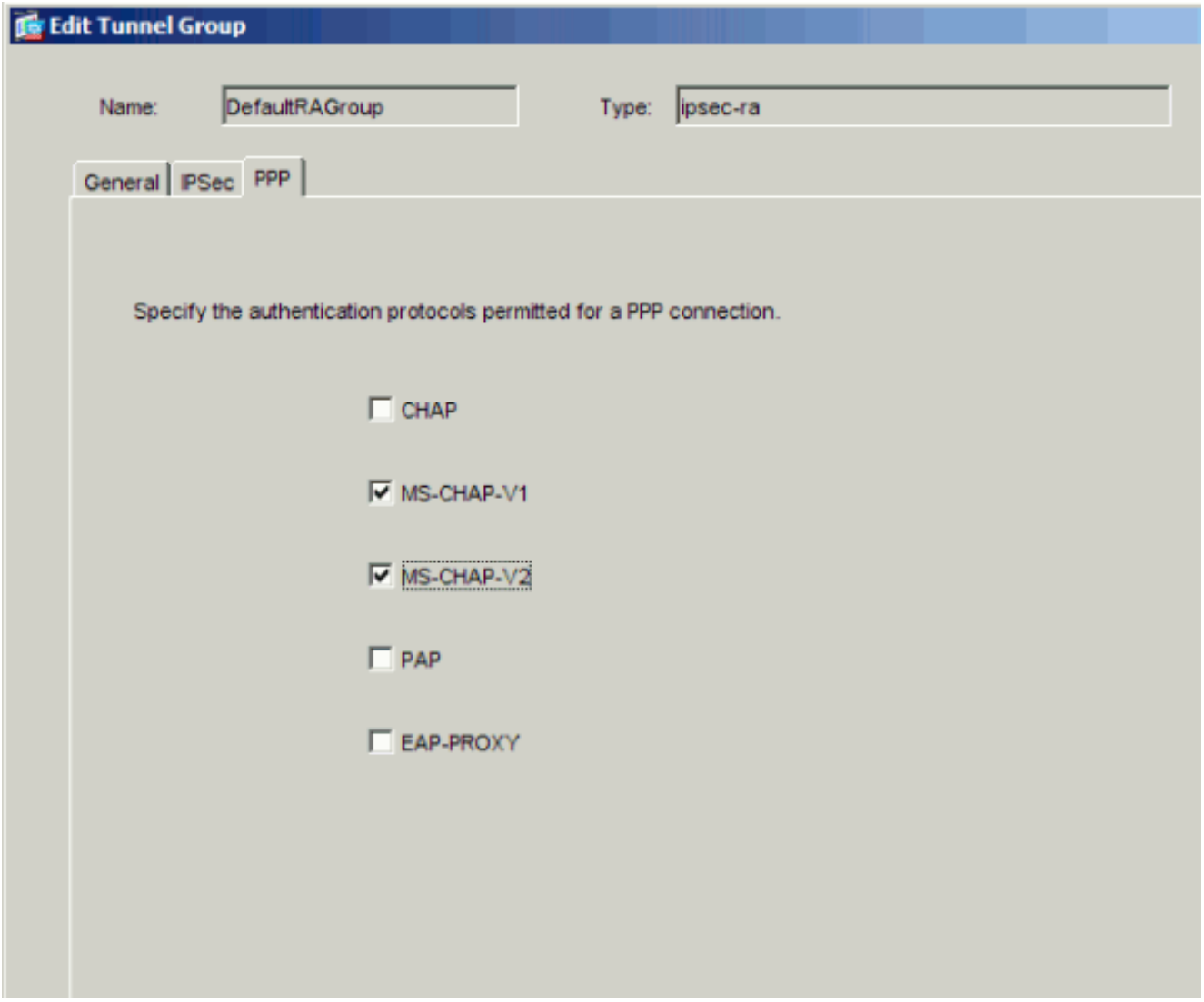
按一下「**Add**」。地址池將顯示在「分配的池」框中。



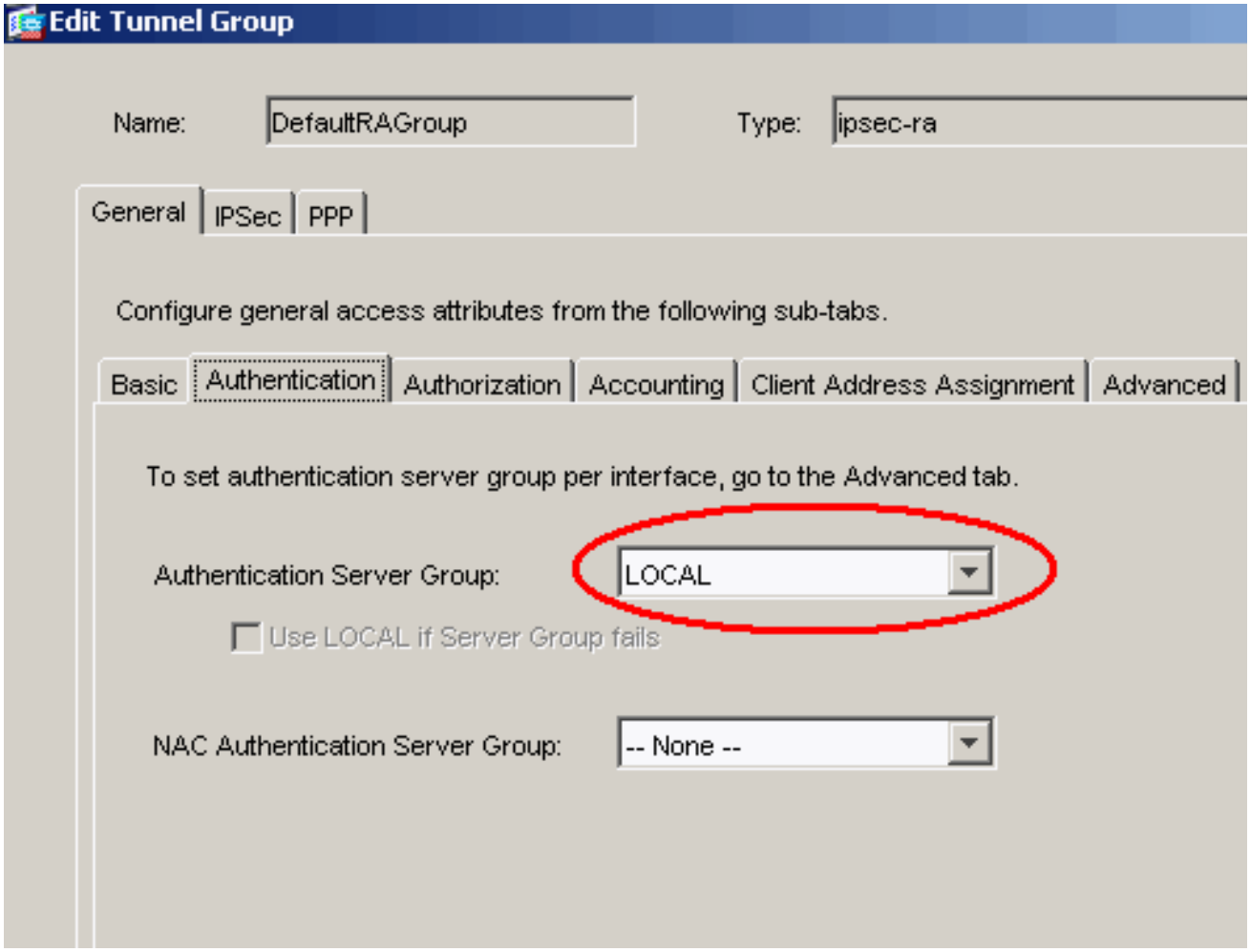
8. 若要設定預共用金鑰，請轉到IPSec頁籤，輸入**預共用金鑰**，然後按一下**確定**。



9. L2TP over IPsec使用PPP身份驗證協定。在隧道組的PPP頁籤上指定允許PPP連線的協定。選擇**MS-CHAP-V1協定進**行身份驗證。

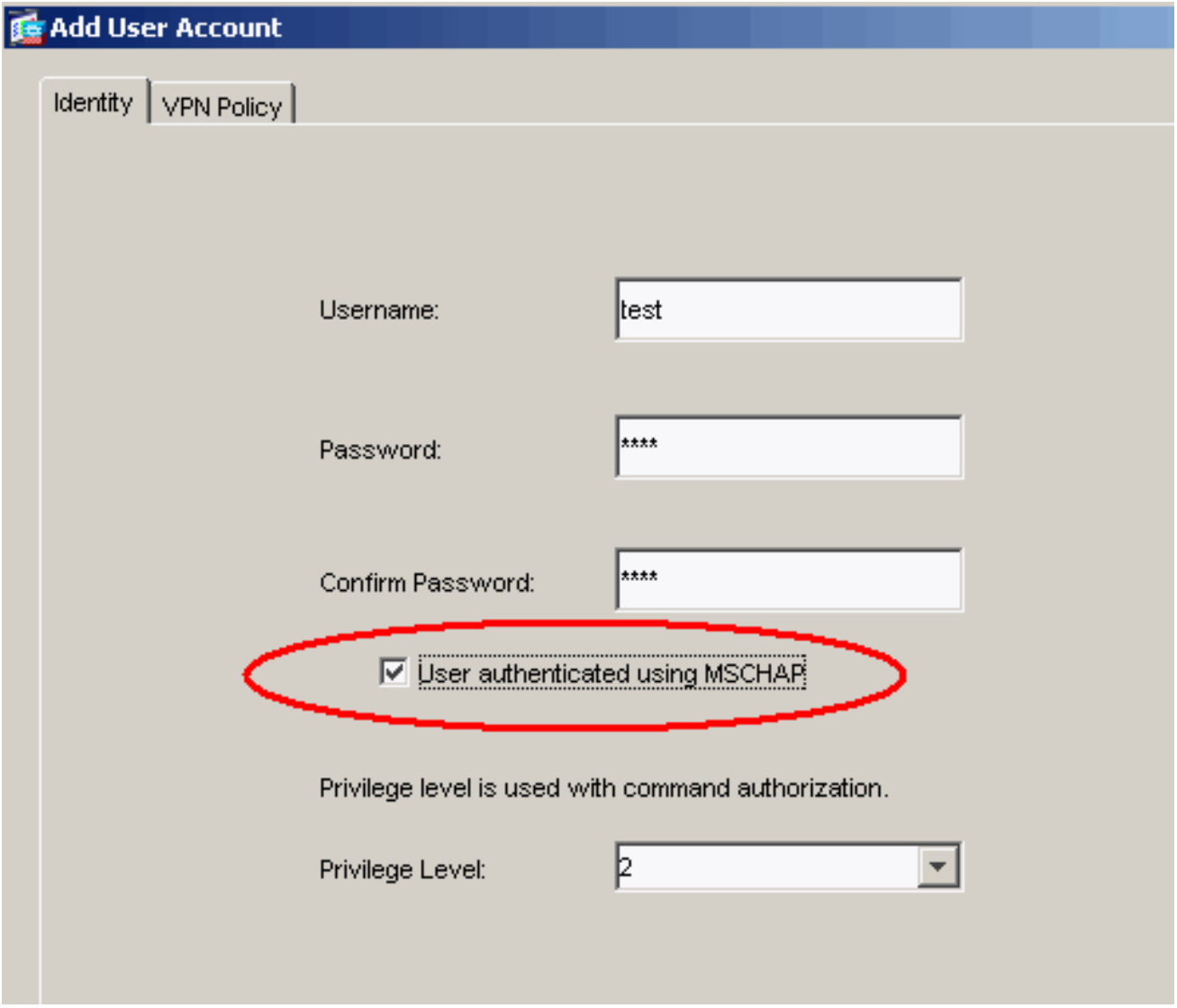


10. 指定對嘗試通過IPsec進行L2TP連線的使用者進行身份驗證的方法。您可以將安全裝置配置為使用身份驗證伺服器或它自己的本地資料庫。若要執行此操作，請轉至隧道組的Authentication頁籤。預設情況下，安全裝置使用其本地資料庫。Authentication Server Group下拉選單顯示LOCAL。要使用身份驗證伺服器，請從清單中選擇一個伺服器。**注意**：安全裝置僅支援本地資料庫上的PPP身份驗證PAP和Microsoft CHAP版本1和2。EAP和CHAP由代理身份驗證伺服器執行。因此，如果遠端使用者屬於使用EAP或CHAP配置的隧道組，並且安全裝置配置為使用本地資料庫，則該使用者無法連線。

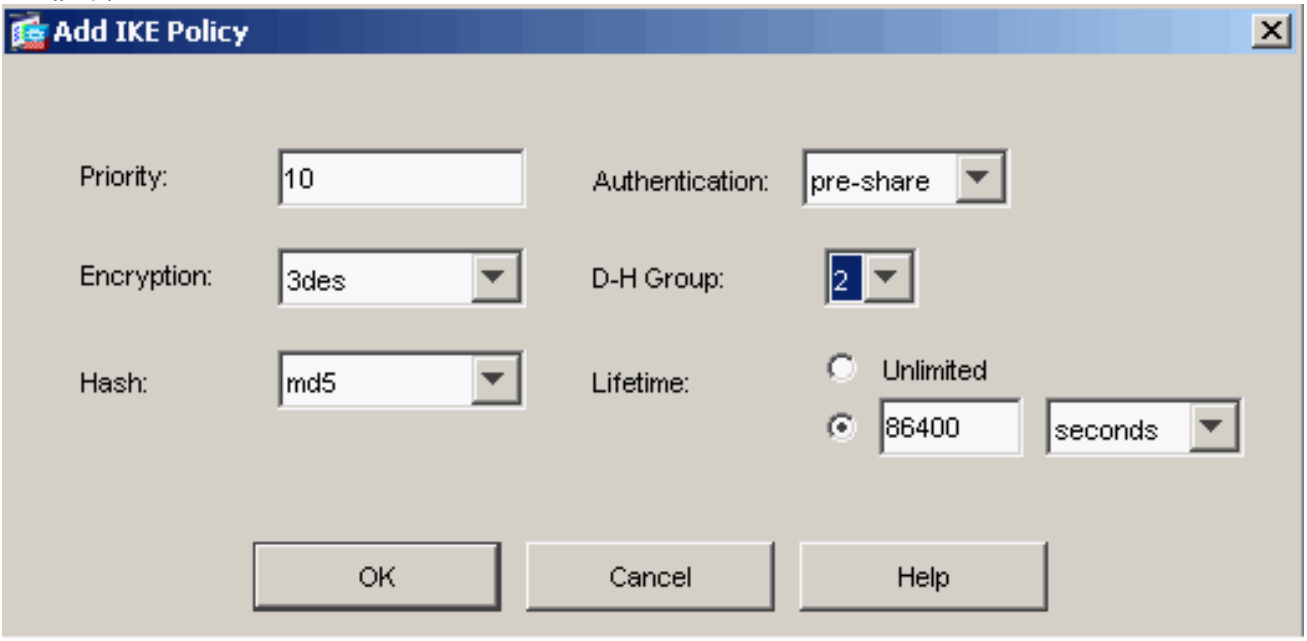


注意：選擇**Configuration > VPN > General > Tunnel Group以返回隧道組配置，以便您可以將組策略連結到隧道組並啟用隧道組交換（可選）。** 顯示Tunnel Group窗格時，選擇隧道組並按一下**Edit。注意：通**道組交換使安全裝置能夠將建立L2TP over IPsec連線的不同使用者與不同的隧道組相關聯。由於每個隧道組都有自己的AAA伺服器組和IP地址池，因此使用者可以通過特定於其隧道組的方法進行身份驗證。通過此功能，使用者不再僅傳送使用者名稱，而是以username@group_name格式傳送使用者名稱和組名，其中「@」表示您可以配置的分隔符，組名是在安全裝置上配置的隧道組的名稱。**注意：通**道組交換通過剝離組處理啟用，通過剝離組處理，安全裝置能夠通過從VPN客戶端提供的使用者名稱獲取組名來為使用者連線選擇隧道組。然後，安全裝置僅傳送使用者名稱的使用者部分以進行授權和身份驗證。否則（如果禁用），安全裝置將傳送整個使用者名稱，包括領域。要啟用隧道組交換，請選中**Strip the realm from username before passing to the AAA server**，選中**Strip the group from username before passing to the AAA server**。然後按一下**OK**。

11. 完成以下步驟，在本地資料庫中建立使用者：選擇**Configuration >Properties >裝置管理>使用者帳戶**。按一下「**Add**」。如果使用者是使用Microsoft CHAP版本1或2的L2TP客戶端，並且安全裝置配置為針對本地資料庫進行身份驗證，則必須選中**User Authenticated using MSCHAP**以啟用MSCHAP。按一下「**OK**」（確定）。



12. 選擇**Configuration > VPN > IKE > Policies**，然後按一下**Add**以為階段I建立IKE策略。按一下**OK**繼續。

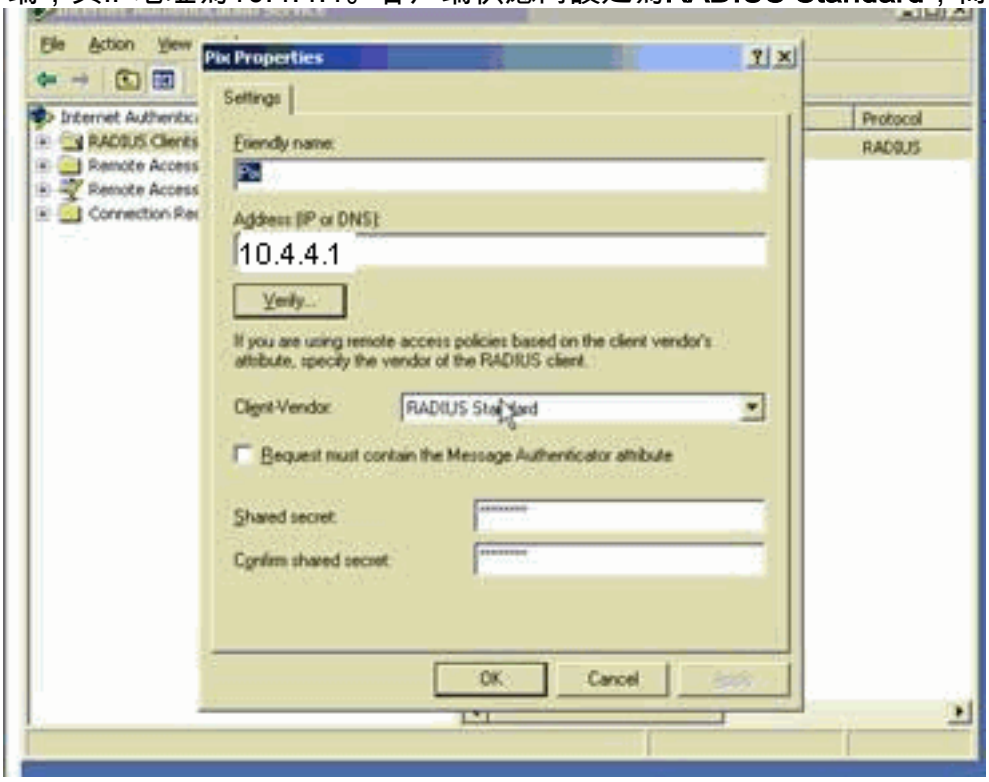


13. （可選）如果您希望一個NAT裝置後面有多個L2TP客戶端嘗試通過IPsec連線到安全裝置，則必須啟用NAT遍歷，以便ESP資料包可以經過一個或多個NAT裝置。完成以下步驟即可完成此操作：選擇**Configuration > VPN > IKE > Global Parameters**。確保在介面上啟用**ISAKMP**。選中**Enable IPSec over NAT-T**。按一下「**OK**」（確定）。

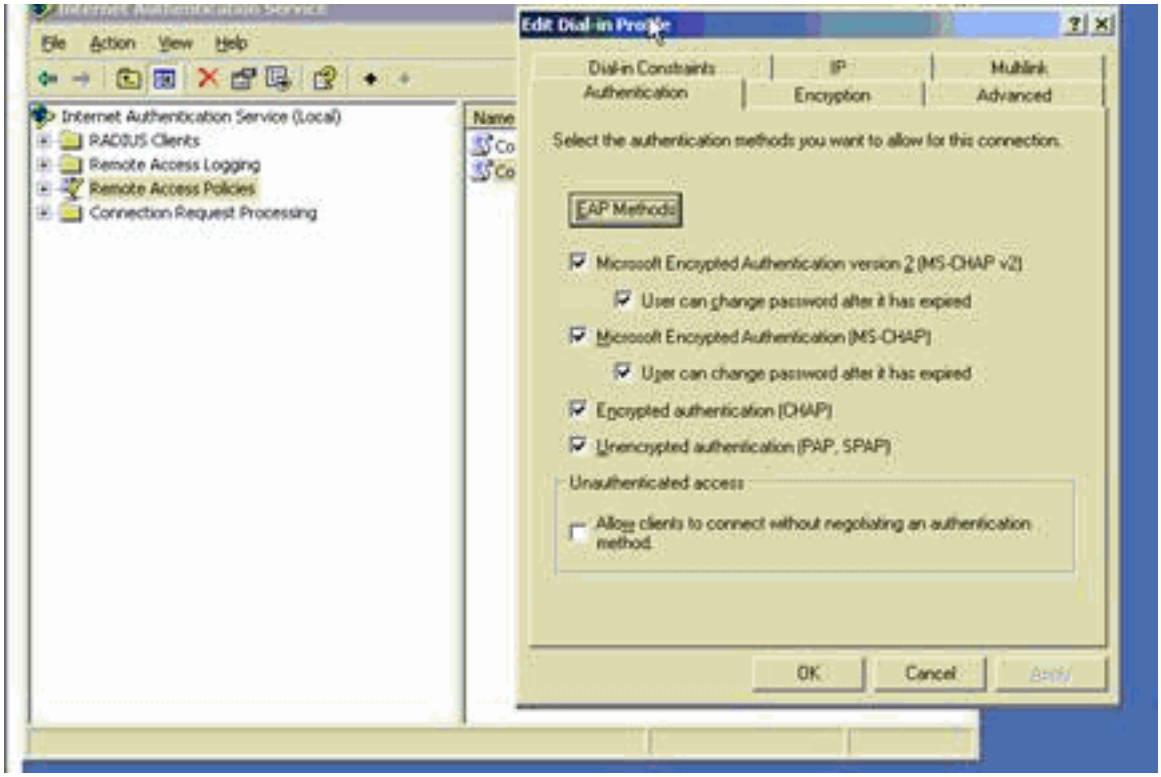
採用IAS配置的Microsoft Windows 2003 Server

完成以下步驟，以便使用IAS配置Microsoft Windows 2003伺服器。

注意：這些步驟假設IAS已安裝在本地電腦上。如果不是，請通過**控制面板>新增/刪除程式**新增此項。

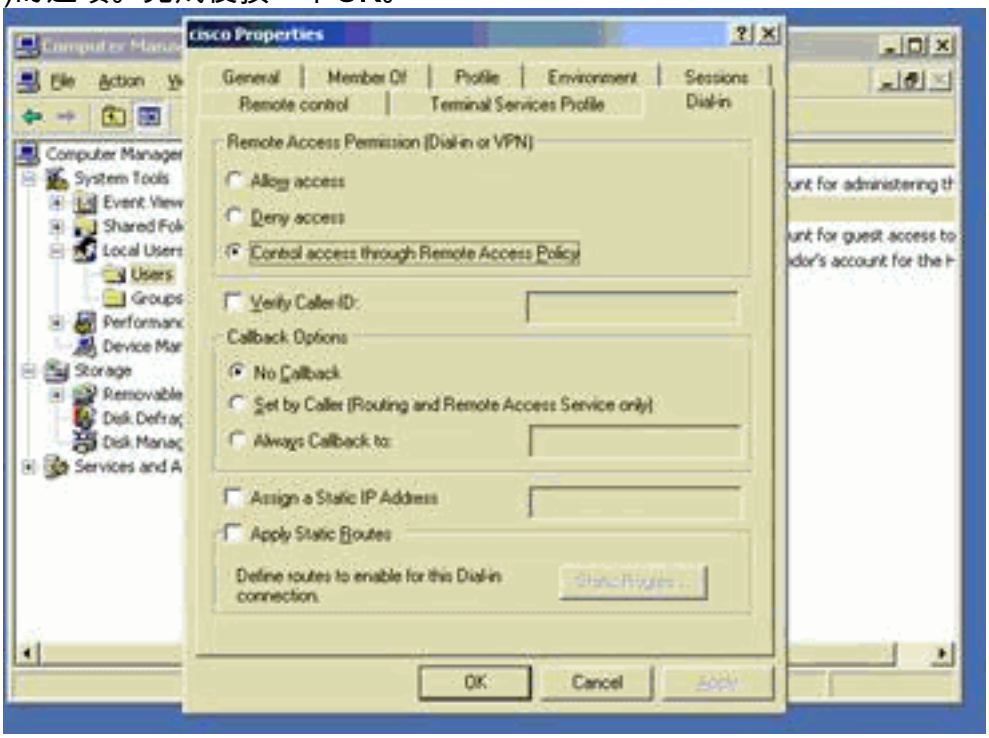
1. 選擇**Administrative Tools > Internet Authentication Service**，然後按一下右鍵**RADIUS Client**以新增新的RADIUS客戶端。鍵入客戶端資訊後，按一下**OK**。此示例顯示一個名為「Pix」的客戶端，其IP地址為10.4.4.1。客戶端供應商設定為**RADIUS Standard**，而共用金鑰為radiuskey。 

2. 選擇**Remote Access Policies**，按一下右鍵**Connections to Other Access Servers**，然後選擇**Properties**。
3. 確保選擇了**授予遠端訪問許可權**選項。
4. 按一下**Edit Profile**並檢查以下設定：在Authentication頁籤上，選中**Unencrypted authentication(PAP， SPAP)**。在加密頁籤上，確保選中**No Encryption**選項。完成後按一下



OK。

5. 選擇**Administrative Tools > Computer Management > System Tools > Local Users and Groups**，按一下右鍵**Users**並選擇**New Users**，以便將使用者新增到本地電腦帳戶中。
6. 使用思科密碼**password1**新增使用者並檢查此配置檔案資訊：在「General（常規）」頁籤上，確保選中**Password Never Expired**選項，而不是「User Must Change Password（使用者必須更改密碼）」選項。在「撥入」頁籤上，選擇**允許訪問**(或保留**通過遠端訪問策略控制訪問**)的選項。完成後按一下**OK**。



使用Active Directory通過IPSec進行L2TP的擴展身份驗證

在ASA上使用此配置允許從Active Directory對L2tp連線進行身份驗證：

```
ciscoasa(config-tunnel-general)# tunnel-group DefaultRAGroup
```

```
ppp-attributes
ciscoasa(config-ppp)# authentication pap
```

此外，在L2tp客戶端上，轉到**Advanced Security Settings(Custom)**，然後僅選擇未加密密碼(PAP)選項。

驗證

本節提供的資訊可用於確認您的組態是否正常運作。

Output Interpreter Tool (僅供註冊客戶使用)支援某些**show**命令，這允許您檢視show命令輸出的分析。

- **show crypto ipsec sa** — 顯示對等體上的所有當前IKE安全關聯(SA)。

```
pixfirewall#show crypto ipsec sa
interface: outside
    Crypto map tag: outside_dyn_map, seq num: 20, local addr: 172.16.1.1

      access-list 105 permit ip host 172.16.1.1 host 192.168.0.2
      local ident (addr/mask/prot/port): (172.16.1.1/255.255.255.255/17/0)
      remote ident (addr/mask/prot/port): (192.168.0.2/255.255.255.255/17/1701)
      current_peer: 192.168.0.2, username: test
      dynamic allocated peer ip: 10.4.5.15

#pkts encaps: 23, #pkts encrypt: 23, #pkts digest: 23
       #pkts decaps: 93, #pkts decrypt: 93, #pkts verify: 93
      #pkts compressed: 0, #pkts decompressed: 0
      #pkts not compressed: 23, #pkts comp failed: 0, #pkts decomp failed: 0
      #post-frag successes: 0, #post-frag failures: 0, #fragments created: 0
      #PMTUs sent: 0, #PMTUs rcvd: 0, #decapsulated frgs needing reassembly: 0
      #send errors: 0, #recv errors: 0

      local crypto endpt.: 172.16.1.1, remote crypto endpt.: 192.168.0.2

      path mtu 1500, ipsec overhead 58, media mtu 1500
      current outbound spi: C16F05B8

    inbound esp sas:
      spi: 0xEC06344D (3959829581)
         transform: esp-3des esp-md5-hmac
         in use settings ={RA, Transport, }
         slot: 0, conn_id: 3, crypto-map: outside_dyn_map
         sa timing: remaining key lifetime (sec): 3335
         IV size: 8 bytes
         replay detection support: Y

outbound esp sas:
      spi: 0xC16F05B8 (3245278648)
         transform: esp-3des esp-md5-hmac
         in use settings ={RA, Transport, }
         slot: 0, conn_id: 3, crypto-map: outside_dyn_map
         sa timing: remaining key lifetime (sec): 3335
         IV size: 8 bytes
         replay detection support: Y
```

- **show crypto isakmp sa** — 顯示對等體上的所有當前IKE SA。

```
pixfirewall#show crypto isakmp sa

   Active SA: 1
    Rekey SA: 0 (A tunnel will report 1 Active and 1 Rekey SA during rekey)
```

```
Total IKE SA: 1

1   IKE Peer: 192.168.0.2
    Type    : user            Role    : responder
    Rekey   : no              State   : MM_ACTIVE
```

- **show vpn-sessiondb** — 包括可用於檢視有關L2TP over IPsec連線的詳細資訊的協定過濾器。全域性配置模式的完整命令是**show vpn-sessoindb detailed remote filter protocol l2tpOverIpsec**。此示例顯示單個L2TP over IPsec連線的詳細資訊：

```
pixfirewall#show vpn-sessiondb detail remote filter protocol L2TPOverIPSec

Session Type: Remote Detailed

Username     : test
Index        : 1
Assigned IP  : 10.4.5.15             Public IP    : 192.168.0.2
Protocol     : L2TPOverIPSec         Encryption   : 3DES
Hashing      : MD5
Bytes Tx     : 1336                  Bytes Rx     : 14605
Client Type  :                       Client Ver   :
Group Policy : DefaultRAGroup
Tunnel Group : DefaultRAGroup
Login Time   : 18:06:08 UTC Fri Jan 1 1993
Duration     : 0h:04m:25s
Filter Name  :
NAC Result   : N/A
Posture Token:

IKE Sessions: 1
IPSec Sessions: 1
L2TPOverIPSec Sessions: 1


IKE:
  Session ID   : 1
  UDP Src Port : 500                   UDP Dst Port : 500
  IKE Neg Mode : Main                  Auth Mode    : preSharedKeys
  Encryption   : 3DES                  Hashing      : MD5
  Rekey Int (T): 28800 Seconds         Rekey Left(T): 28536 Seconds
  D/H Group    : 2

IPSec:
  Session ID   : 2
  Local Addr   : 172.16.1.1/255.255.255.255/17/1701
  Remote Addr  : 192.168.0.2/255.255.255.255/17/1701
  Encryption   : 3DES                  Hashing      : MD5
  Encapsulation: Transport
  Rekey Int (T): 3600 Seconds          Rekey Left(T): 3333 Seconds
  Idle Time Out: 30 Minutes            Idle TO Left : 30 Minutes
  Bytes Tx     : 1336                  Bytes Rx     : 14922
  Pkts Tx      : 25                    Pkts Rx      : 156


L2TPOverIPSec:
  Session ID   : 3
  Username     : test
  Assigned IP  : 10.4.5.15
  Encryption   : none                  Auth Mode    : msCHAPV1
  Idle Time Out: 30 Minutes            Idle TO Left : 30 Minutes
  Bytes Tx     : 378                   Bytes Rx     : 13431
  Pkts Tx      : 16                    Pkts Rx      : 146
```

疑難排解

本節提供的資訊用於對組態進行疑難排解。還顯示了調試輸出示例。

疑難排解指令

輸出直譯器工具(僅供註冊客戶使用)支援特定命令，此工具允許您檢視**show**命令輸出的分析。

注意：使用debug命令之前，請先參閱有關Debug命令和IP安全性故障排除的重要資訊 — 瞭解和使用debug命令。

- **debug crypto ipsec 7** — 顯示第2階段的IPsec協商。
- **debug crypto isakmp 7** — 顯示第1階段的ISAKMP協商。

調試輸出示例

PIX防火牆

```
PIX#debug crypto isakmp 7
pixfirewall# Jan 02 18:26:44 [IKEv1]: IP = 192.168.0.2, IKE_DECODE RECEIVED Mess
age (msgid=0) with payloads : HDR + SA (1) + VENDOR (13) + VENDOR (13) + VENDOR
(13) + NONE (0) total length : 256
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, processing SA payload
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, Oakley proposal is acceptable
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, processing VID payload
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, processing VID payload
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, Received Fragmentation VID
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, processing VID payload
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, Received NAT-Traversal ver 02 V
ID
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, processing IKE SA payload
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, IKE SA Proposal # 1, Transform
# 2 acceptable  Matches global IKE entry # 2
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, constructing ISAKMP SA payload
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, constructing Fragmentation VID
+ extended capabilities payload
Jan 02 18:26:44 [IKEv1]: IP = 192.168.0.2, IKE_DECODE SENDING Message (msgid=0)
with payloads : HDR + SA (1) + VENDOR (13) + NONE (0) total length : 104
Jan 02 18:26:44 [IKEv1]: IP = 192.168.0.2, IKE_DECODE RECEIVED Message (msgid=0)
 with payloads : HDR + KE (4) + NONCE (10) + NONE (0) total length : 184
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, processing ke payload
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, processing ISA_KE payload
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, processing nonce payload
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, constructing ke payload
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, constructing nonce payload
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, constructing Cisco Unity VID pa
yload
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, constructing xauth V6 VID paylo
ad
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, Send IOS VID
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, Constructing ASA spoofing IOS V
endor ID payload (version: 1.0.0, capabilities: 20000001)
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, constructing VID payload
Jan 02 18:26:44 [IKEv1 DEBUG]: IP = 192.168.0.2, Send Altiga/Cisco VPN3000/Cisco
 ASA GW VID
Jan 02 18:26:44 [IKEv1]: IP = 192.168.0.2, Connection landed on tunnel_group Def
aultRAGroup
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, Generat
ing keys for Responder...
```

```
Jan 02 18:26:44 [IKEv1]: IP = 192.168.0.2, IKE_DECODE SENDING Message (msgid=0)
with payloads : HDR + KE (4) + NONCE (10) + VENDOR (13) + VENDOR (13) + VENDOR (
13) + VENDOR (13) + NONE (0) total length : 256
Jan 02 18:26:44 [IKEv1]: IP = 192.168.0.2, IKE_DECODE RECEIVED Message (msgid=0)
 with payloads : HDR + ID (5) + HASH (8) + NONE (0) total length : 60
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, process
ing ID payload
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, process
ing hash payload
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, Computi
ng hash for ISAKMP
Jan 02 18:26:44 [IKEv1]: IP = 192.168.0.2, Connection landed on tunnel_group Def
aultRAGroup
Jan 02 18:26:44 [IKEv1]: Group = DefaultRAGroup, IP = 192.168.0.2, Freeing previ
ously allocated memory for authorization-dn-attributes
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, constru
cting ID payload
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, constru
cting hash payload
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, Computi
ng hash for ISAKMP
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, constru
cting dpd vid payload
Jan 02 18:26:44 [IKEv1]: IP = 192.168.0.2, IKE_DECODE SENDING Message (msgid=0)
with payloads : HDR + ID (5) + HASH (8) + VENDOR (13) + NONE (0) total length :
80

!--- Phase 1 completed succesfully. Jan 02 18:26:44 [IKEv1]: Group = DefaultRAGroup, IP =
192.168.0.2, PHASE 1 COMPL
ETED
Jan 02 18:26:44 [IKEv1]: IP = 192.168.0.2, Keep-alive type for this connection:
None
Jan 02 18:26:44 [IKEv1]: IP = 192.168.0.2, Keep-alives configured on but peer do
es not support keep-alives (type = None)
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, Startin
g P1 rekey timer: 21600 seconds.
Jan 02 18:26:44 [IKEv1]: IP = 192.168.0.2, IKE_DECODE RECEIVED Message (msgid=e1
b84b0) with payloads : HDR + HASH (8) + SA (1) + NONCE (10) + ID (5) + ID (5) +
NONE (0) total length : 164
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, process
ing hash payload
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, process
ing SA payload
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, process
ing nonce payload
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, process
ing ID payload
Jan 02 18:26:44 [IKEv1]: Group = DefaultRAGroup, IP = 192.168.0.2, Received remo
te Proxy Host data in ID Payload:  Address 192.168.0.2, Protocol 17, Port 1701
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, process
ing ID payload
Jan 02 18:26:44 [IKEv1]: Group = DefaultRAGroup, IP = 192.168.0.2, Received loca
l Proxy Host data in ID Payload:  Address 172.16.1.1, Protocol 17, Port 1701

!--- PIX identifies the L2TP/IPsec session. Jan 02 18:26:44 [IKEv1]: Group = DefaultRAGroup, IP
= 192.168.0.2, L2TP/IPSec se
ssion detected.
Jan 02 18:26:44 [IKEv1]: Group = DefaultRAGroup, IP = 192.168.0.2, QM IsRekeyed
old sa not found by addr
Jan 02 18:26:44 [IKEv1]: Group = DefaultRAGroup, IP = 192.168.0.2, IKE Remote Pe
er configured for crypto map: outside_dyn_map
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, process
ing IPSec SA payload
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, IPSec S
```

```
A Proposal # 1, Transform # 1 acceptable  Matches global IPSec SA entry # 20
Jan 02 18:26:44 [IKEv1]: Group = DefaultRAGroup, IP = 192.168.0.2, IKE: requesti
ng SPI!
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, IKE got
 SPI from key engine: SPI = 0xce9f6e19

!--- Constructs Quick mode in Phase 2. Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP
= 192.168.0.2, oakley
constucting quick mode
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, constru
cting blank hash payload
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, constru
cting IPSec SA payload
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, constru
cting IPSec nonce payload
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, constru
cting proxy ID
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, Transmi
tting Proxy Id:
  Remote host: 192.168.0.2  Protocol 17  Port 1701
  Local host:  172.16.1.1  Protocol 17  Port 1701
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, constru
cting qm hash payload
Jan 02 18:26:44 [IKEv1]: IP = 192.168.0.2, IKE_DECODE SENDING Message (msgid=e1b
84b0) with payloads : HDR + HASH (8) + SA (1) + NONCE (10) + ID (5) + ID (5) + N
ONE (0) total length : 144
Jan 02 18:26:44 [IKEv1]: IP = 192.168.0.2, IKE_DECODE RECEIVED Message (msgid=e1
b84b0) with payloads : HDR + HASH (8) + NONE (0) total length : 48
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, process
ing hash payload
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, loading
 all IPSEC SAs
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, Generat
ing Quick Mode Key!
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, Generat
ing Quick Mode Key!
Jan 02 18:26:44 [IKEv1]: Group = DefaultRAGroup, IP = 192.168.0.2, Security nego
tiation complete for User ()  Responder, Inbound SPI = 0xce9f6e19, Outbound SPI
= 0xd08f711b
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, IKE got
 a KEY_ADD msg for SA: SPI = 0xd08f711b
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, Pitcher
: received KEY_UPDATE, spi 0xce9f6e19
Jan 02 18:26:44 [IKEv1 DEBUG]: Group = DefaultRAGroup, IP = 192.168.0.2, Startin
g P2 rekey timer: 3059 seconds.

!--- Phase 2 completes succesfully. Jan 02 18:26:44 [IKEv1]: Group = DefaultRAGroup, IP =
192.168.0.2, PHASE 2 COMPL ETED (msgid=0e1b84b0) Jan 02 18:26:44 [IKEv1]: IKEQM_Active() Add
L2TP classification rules: ip <192.1 68.0.2> mask <0xFFFFFFFF> port <1701> PIX#debug crypto
ipsec 7
pixfirewall# IPSEC: Deleted inbound decrypt rule, SPI 0x71933D09
    Rule ID: 0x028D78D8
IPSEC: Deleted inbound permit rule, SPI 0x71933D09
    Rule ID: 0x02831838
IPSEC: Deleted inbound tunnel flow rule, SPI 0x71933D09
    Rule ID: 0x029134D8
IPSEC: Deleted inbound VPN context, SPI 0x71933D09
    VPN handle: 0x0048B284
IPSEC: Deleted outbound encrypt rule, SPI 0xAF4DA5FA
    Rule ID: 0x028DAC90
IPSEC: Deleted outbound permit rule, SPI 0xAF4DA5FA
    Rule ID: 0x02912AF8
IPSEC: Deleted outbound VPN context, SPI 0xAF4DA5FA
    VPN handle: 0x0048468C
```

```
IPSEC: New embryonic SA created @ 0x01BFCF80,
    SCB: 0x01C262D0,
    Direction: inbound
    SPI      : 0x45C3306F
    Session ID: 0x0000000C
    VPIF num  : 0x00000001
    Tunnel type: ra
    Protocol   : esp
    Lifetime   : 240 seconds
IPSEC: New embryonic SA created @ 0x0283A3A8,
    SCB: 0x028D1B38,
    Direction: outbound
    SPI      : 0x370E8DD1
    Session ID: 0x0000000C
    VPIF num  : 0x00000001
    Tunnel type: ra
    Protocol   : esp
    Lifetime   : 240 seconds
IPSEC: Completed host OBSA update, SPI 0x370E8DD1
IPSEC: Creating outbound VPN context, SPI 0x370E8DD1
    Flags: 0x00000205
    SA   : 0x0283A3A8
    SPI  : 0x370E8DD1
    MTU  : 1500 bytes
    VCID : 0x00000000
    Peer : 0x00000000
    SCB  : 0x028D1B38
    Channel: 0x01693F08
IPSEC: Completed outbound VPN context, SPI 0x370E8DD1
    VPN handle: 0x0048C164
IPSEC: New outbound encrypt rule, SPI 0x370E8DD1
    Src addr: 172.16.1.1
    Src mask: 255.255.255.255
    Dst addr: 192.168.0.2
    Dst mask: 255.255.255.255
    Src ports
      Upper: 1701
      Lower: 1701
      Op   : equal
    Dst ports
      Upper: 1701
      Lower: 1701
      Op   : equal
    Protocol: 17
    Use protocol: true
    SPI: 0x00000000
    Use SPI: false
IPSEC: Completed outbound encrypt rule, SPI 0x370E8DD1
    Rule ID: 0x02826540
IPSEC: New outbound permit rule, SPI 0x370E8DD1
    Src addr: 172.16.1.1
    Src mask: 255.255.255.255
    Dst addr: 192.168.0.2
    Dst mask: 255.255.255.255
    Src ports
      Upper: 0
      Lower: 0
      Op   : ignore
    Dst ports
      Upper: 0
      Lower: 0
      Op   : ignore
    Protocol: 50
    Use protocol: true
```

```
    SPI: 0x370E8DD1
    Use SPI: true
IPSEC: Completed outbound permit rule, SPI 0x370E8DD1
    Rule ID: 0x028D78D8
IPSEC: Completed host IBSA update, SPI 0x45C3306F
IPSEC: Creating inbound VPN context, SPI 0x45C3306F
    Flags: 0x00000206
    SA   : 0x01BFCF80
    SPI  : 0x45C3306F
    MTU  : 0 bytes
    VCID : 0x00000000
    Peer : 0x0048C164
    SCB  : 0x01C262D0
    Channel: 0x01693F08
IPSEC: Completed inbound VPN context, SPI 0x45C3306F
    VPN handle: 0x0049107C
IPSEC: Updating outbound VPN context 0x0048C164, SPI 0x370E8DD1
    Flags: 0x00000205
    SA   : 0x0283A3A8
    SPI  : 0x370E8DD1
    MTU  : 1500 bytes
    VCID : 0x00000000
    Peer : 0x0049107C
    SCB  : 0x028D1B38
    Channel: 0x01693F08
IPSEC: Completed outbound VPN context, SPI 0x370E8DD1
    VPN handle: 0x0048C164
IPSEC: Completed outbound inner rule, SPI 0x370E8DD1
    Rule ID: 0x02826540
IPSEC: Completed outbound outer SPD rule, SPI 0x370E8DD1
    Rule ID: 0x028D78D8
IPSEC: New inbound tunnel flow rule, SPI 0x45C3306F
    Src addr: 192.168.0.2
    Src mask: 255.255.255.255
    Dst addr: 172.16.1.1
    Dst mask: 255.255.255.255
    Src ports
      Upper: 1701
      Lower: 1701
      Op   : equal
    Dst ports
      Upper: 1701
      Lower: 1701
      Op   : equal
    Protocol: 17
    Use protocol: true
    SPI: 0x00000000
    Use SPI: false
IPSEC: Completed inbound tunnel flow rule, SPI 0x45C3306F
    Rule ID: 0x02831838
IPSEC: New inbound decrypt rule, SPI 0x45C3306F
    Src addr: 192.168.0.2
    Src mask: 255.255.255.255
    Dst addr: 172.16.1.1
    Dst mask: 255.255.255.255
    Src ports
      Upper: 0
      Lower: 0
      Op   : ignore
    Dst ports
      Upper: 0
      Lower: 0
      Op   : ignore
    Protocol: 50
```

```
    Use protocol: true
    SPI: 0x45C3306F
    Use SPI: true
IPSEC: Completed inbound decrypt rule, SPI 0x45C3306F
    Rule ID: 0x028DAC90
IPSEC: New inbound permit rule, SPI 0x45C3306F
    Src addr: 192.168.0.2
    Src mask: 255.255.255.255
    Dst addr: 172.16.1.1
    Dst mask: 255.255.255.255
    Src ports
      Upper: 0
      Lower: 0
      Op   : ignore
    Dst ports
      Upper: 0
      Lower: 0
      Op   : ignore
    Protocol: 50
    Use protocol: true
    SPI: 0x45C3306F
    Use SPI: true
IPSEC: Completed inbound permit rule, SPI 0x45C3306F
    Rule ID: 0x02912E50
```

使用ASDM進行故障排除

您可以使用ASDM啟用日誌記錄並檢視日誌。

1. 選擇**Configuration > Properties > Logging > Logging Setup**，選擇**Enable Logging**，然後按一下**Apply**以啟用日誌記錄。
2. 選擇**Monitoring > Logging > Log Buffer > On Logging Level**，選擇**Logging Buffer**，然後按一下**View**以檢視日誌。

問題：頻繁斷開

空閒/會話超時

如果閒置超時設定為30分鐘（預設值），則表示在30分鐘內沒有流量通過隧道後丟棄該隧道。無論空閒超時設定如何，VPN客戶端都會在30分鐘後斷開連線，並且會遇到`PEER_DELETE-IKE_DELETE_UNSPECIFIED`錯誤消息。

將閒置逾時和作業階段逾時設定為none，讓通道一直處於開啟狀態且永遠不會捨棄通道。

在組策略配置模式或使用者名稱配置模式下輸入**vpn-idle-timeout**命令以配置使用者超時時間：

```
hostname(config)#group-policy DfltGrpPolicy attributes
hostname(config-group-policy)#vpn-idle-timeout none
```

在組策略配置模式或使用者名稱配置模式下使用**vpn-session-timeout**命令配置VPN連線的最大時間：

```
hostname(config)#group-policy DfltGrpPolicy attributes
hostname(config-group-policy)#vpn-session-timeout none
```

對Windows Vista進行故障排除

同時使用者

Windows Vista L2TP/IPsec引入了一些架構更改，禁止多個同時使用者連線到頭端PIX/ASA。此行為在Windows 2K/XP上不會發生。自版本7.2(3)及更高版本起，思科已實施此變更的解決方法。

Vista PC無法連線

如果Windows Vista電腦無法連線L2TP伺服器，則驗證您是否在DefaultRAGroup上的ppp-attributes下僅配置了mschap-v2。

相關資訊

- 最常見的L2L和遠端訪問IPSec VPN故障排除解決方案
- Cisco PIX 500系列安全裝置
- Cisco ASA 5500系列調適型安全裝置
- Cisco PIX防火牆軟體產品支援
- Cisco Secure PIX防火牆命令參考
- RADIUS 支援頁面
- IPSec協商/IKE通訊協定支援頁面
- 要求建議 (RFC)
- 第二層通道通訊協定(L2TP)
- 技術支援與文件 - Cisco Systems