How to Add AAA Authentication (Xauth) to PIX IPsec 5.2 and Later

Document ID: 8525

Contents

Introduction

RADIUS and TACACS+ authentication and accounting, and to some extent, authorization, is done for Cisco Secure VPN Client 1.1 and Cisco VPN 3000 2.5 Hardware Client tunnels that terminate at the PIX. Changes in PIX 5.2 and later extended authentication (Xauth) over that of previous versions that include authentication, authorization, and accounting (AAA) access list support to control what authenticated users can access and support for Cisco VPN 3000 Client 2.5 Xauth termination. The **vpn group split−tunneling** command enables the VPN 3000 Client to connect to the network inside the PIX as well as other networks (for example, the

Internet) at the same time. In PIX 5.3 and later, the AAA change over previous versions of code is that the RADIUS ports are configurable. In PIX 6.0, support for the VPN Client 3.x is added. This requires Diffie−Hellman group 2.

Prerequisites

Requirements

There are no specific requirements for this document.

Components Used

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

- PIX software release 5.2.1
- Cisco Secure VPN Client 1.1
- Cisco VPN 3000 2.5 Client or VPN Client 3.x

   Note: The Cisco VPN Client release 3.0.x does not work with PIX versions earlier than 6.0. Refer to Cisco Hardware and VPN Clients Supporting IPsec/PPTP/L2TP for more information.

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, make sure that you understand the potential impact of any command.

Conventions

Refer to Cisco Technical Tips Conventions for more information on document conventions.

Background Information

PIX Firewall software release 6.2 supports the download of Access Control Lists (ACLs) to the PIX Firewall from an Access Control Server (ACS). This enables the configuration of per−user ACLs on an AAA server to provide per−user ACL authorization. It is then downloadable through the ACS to the PIX Firewall. This feature is supported for RADIUS servers only. It is not supported for TACACS+ servers.

Debug Steps

Complete these debug steps:

1. Make sure the PIX Xauth configuration works before you add AAA authentication.

   If you are unable to pass traffic before you implement AAA, you are not able to do it afterwards.
2. Enable some kind of logging in the PIX:

   ♦ Do not issue the **logging console debugging** command on a heavy loaded system.
   ♦ The **logging buffered debugging** command can be issued. Then issue the **show logging** command.
   ♦ Logging can also be sent to a System Message Log (syslog) server and examined.
3. Turn on debugging on the TACACS+ or RADIUS servers. All servers have this option.

Debug Commands on the PIX

- **debug crypto ipsec sa** This debug command displays IPsec events.
- **debug crypto isakmp sa** This debug command displays messages about Internet Key Exchange (IKE) events.
- **debug crypto isakmp engine** This debug command displays messages about IKE events.

Client–side Debug

Enable the Log Viewer to see the client–side debugs in Cisco Secure 1.1 or VPN 3000 Client 2.5.

AAA Server Profiles

Cisco Secure UNIX TACACS+

```
user = noacl{
password = clear "********"
service=shell {
}
}
user = pixb{
  password = clear "********"
  service=shell {
  set acl=115
  }
  }
user = 3000full{
  password = clear "********"
  service=shell {
  }
  }
user = 3000partial{
  password = clear "********"
  service=shell {
  }
  }
```

Cisco Secure ACS for Windows TACACS+

The noacl, 3000full, and 3000partial users need only a username and a password in Cisco Secure ACS for Windows. The pixb user needs a username, a password, a shell/exec checked in group, an ACL checked, and 115 in the box.

Cisco Secure UNIX RADIUS

```
user = noacl{
password = clear "********"
}
user = pixb{
  password = clear "********"
  radius=Cisco {
  reply_attributes= {
  9,1="acl=115"
  }
  }
  }
user = 3000full{
  password = clear "********"
  }
```

```
user = 3000partial{
  password = clear "********"
  }
```

Cisco Secure ACS for Windows RADIUS

RADIUS/Cisco is the device−type. The noacl, 3000full, and 3000partial users need only a username and a password in Cisco Secure ACS for Windows. The pixb user needs a username, a password, and a check and acl=115 in the Cisco/RADIUS rectangular box where it says 009\001 AV−Pair (vendor−specific).

Note: You need the vendor attribute for the ACL. Attribute 11, filter−id, is not valid. This issue is assigned Cisco bug ID CSCdt50422 (registered customers only) . It is fixed in PIX Software release 6.0.1.
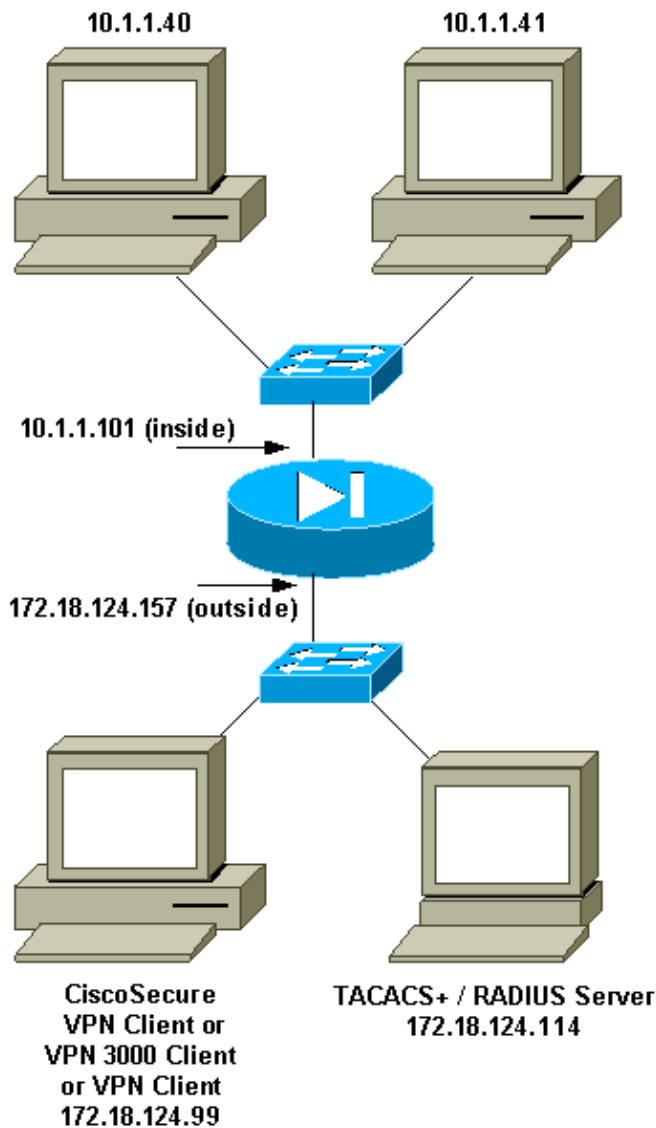
Merit RADIUS (Supporting Cisco AV Pairs)

```
noacl Password= "noacl"

pixb Password= "pixb"
cisco−avpair = "acl=115"

3000full Password= "3000full"

3000partial Password= "3000partial"
```

Network Diagram

Configurable RADIUS Ports (5.3 and Later)

Some RADIUS servers use RADIUS ports other than 1645/1646 (usually 1812/1813). In PIX 5.3 and later, the RADIUS authentication and accounting ports can be changed to ports other than the default 1645/1646 with these commands:

- **aaa−server radius−authport #**
- **aaa−server radius−acctport #**

How to Authenticate with Xauth without VPN Groups

In this example, all three VPN Clients are authenticated with Xauth. However, the VPN Clients are able to access only the network inside the PIX, as split−tunneling is not in use. See How to Authenticate Xauth with VPN Groups for more information on split−tunneling. ACLs passed down from the AAA server apply to any VPN Clients. In this example, the goal is for user noacl to connect and get to all resources inside the PIX. User pixb connects, but because ACL 115 is passed down from the AAA server during the Xauth process, the user can only get to 10.1.1.40. Access to 10.1.1.41 and all the other IP addresses inside is denied.

Note: PIX Software release 6.0 is required for VPN Client 3.0 support.

Cisco Secure VPN Client 1.1 Setup – Xauth without VPN Groups

```
Name of connection:
Remote party address = IP_Subnet = 10.1.1.0, Mask 255.255.255.0
Connect using Secure Gateway Tunnel to 172.18.124.157
My Identity:
Select certificate = None
ID_Type = ip address, pre-shared key and fill in key
('cisco1234') – matches that of pix in 'isakmp key' command
Security policy = defaults
Proposal 1 (Authen) = DES, MD5
Proposal 2 (Key Exchange) = DES, MD5, Tunnel
```

Open a denial of service (DoS) window and issue the **ping –t** *#.#.#.#* command. When the Xauth window appears, type the username and password that agree with the one on the AAA server.

VPN 3000 Client 2.5 or VPN Client 3.x Setup – Xauth without VPN Groups

Complete these steps:

1. Select **Options > Properties > Authentication > Group Name**.
2. The group name is don't_care and the password agrees with the one on PIX in the **isakmp key** command. The host name is 172.18.124.157.
3. Click **Connect**.
4. When the Xauth window comes up, type the username and password that agree with the one on the AAA server.

Xauth without VPN Groups – PIX Setup

```
PIX Version 5.2(1)
nameif ethernet0 outside security0
nameif ethernet1 inside security100
enable password 8Ry2YjIyt7RRXU24 encrypted
passwd 2KFQnbNIdI.2KYOU encrypted
hostname goss-pixb
fixup protocol ftp 21
fixup protocol http 80
fixup protocol h323 1720
fixup protocol rsh 514
fixup protocol smtp 25
fixup protocol sqlnet 1521
fixup protocol sip 5060
names
access-list 108 permit ip 10.1.1.0 255.255.255.0
192.168.1.0 255.255.255.0
access-list 115 deny ip any host 10.1.1.41
access-list 115 permit ip any host 10.1.1.40
pager lines 24
logging on
no logging timestamp
no logging standby
logging console debugging
no logging monitor
no logging buffered
logging trap debugging
no logging history
logging facility 20
logging queue 512
interface ethernet0 auto
interface ethernet1 auto
mtu outside 1500
```

```
mtu inside 1500
ip address outside 172.18.124.157 255.255.255.0
ip address inside 10.1.1.101 255.255.255.0
ip audit info action alarm
ip audit attack action alarm
ip local pool test 192.168.1.1-192.168.1.5
no failover
failover timeout 0:00:00
failover poll 15
failover ip address outside 0.0.0.0
failover ip address inside 0.0.0.0
arp timeout 14400
global (outside) 1 172.18.124.154
nat (inside) 0 access-list 108
Nat (inside) 1 10.1.1.0 255.255.255.0 0 0
timeout xlate 3:00:00
timeout conn 1:00:00 half-closed 0:10:00 udp 0:02:00
rpc 0:10:00 h323 0:05:00
sip 0:30:00 sip_media 0:02:00
timeout uauth 0:05:00 absolute
AAA-server TACACS+ protocol tacacs+
AAA-server RADIUS protocol radius
AAA-server AuthInbound protocol tacacs+
AAA-server AuthInbound (outside) host 172.18.124.114 cisco timeout 5
no snmp-server location
no snmp-server contact
snmp-server community public
no snmp-server enable traps
floodguard enable
sysopt connection permit-ipsec
no sysopt route dnat
crypto ipsec transform-set myset esp-des esp-md5-hmac
crypto dynamic-map dynmap 10 set transform-set myset
crypto map mymap 10 ipsec-isakmp dynamic dynmap
crypto map mymap client configuration address initiate
crypto map mymap client configuration address respond
crypto map mymap client authentication AuthInbound
crypto map mymap interface outside
isakmp enable outside
isakmp key ******** address 0.0.0.0 netmask 0.0.0.0
isakmp identity address
isakmp client configuration address-pool local test outside

!--- Internet Security Association and Key Management Protocol (ISAKMP)
!---  Policy for Cisco VPN Client 2.5 or
!--- Cisco Secure VPN Client 1.1.

isakmp policy 10 authentication pre-share
isakmp policy 10 encryption des
isakmp policy 10 hash md5

!--- The 1.1 and 2.5 VPN Clients use Diffie-Hellman (D-H)
!--- group 1 policy (PIX default).

isakmp policy 10 group 1
isakmp policy 10 lifetime 86400
!

!--- ISAKMP Policy for VPN Client 3.0

isakmp policy 20 authentication pre-share
isakmp policy 20 encryption des
isakmp policy 20 hash md5

!--- The VPN 3.0 Clients use D-H group 2 policy
!--- and PIX 6.0 code.
```

```
isakmp policy 20 group 2
isakmp policy 20 lifetime 86400
telnet timeout 5
ssh timeout 5
terminal width 80
Cryptochecksum:05c6a2f3a7d187162c4408503b55affa
: end
[OK]
```

How to Authenticate with Xauth with VPN Groups

In this example, the VPN 3000 Client 2.5 or VPN Client 3.0 can be authenticated with Xauth, and split−tunneling is in effect. By virtue of VPN Group membership, an ACL is passed from the PIX to the VPN 3000 Client. It specifies that only the network inside the PIX has an encrypted tunnel. Other traffic (perhaps to the Internet) is not encrypted.

In this example, one VPN Client, with username 3000full (on the AAA server), in group vpn3000−all (on the PIX) accesses the entire 10.1.1.X network inside the PIX at the same time as the Internet. The VPN Client receives wins−server, dns−server, and domain−name information. The other VPN Client, with username 3000partial (on the AAA−server), in group vpn3000−41 (on the PIX) accesses only one IP address inside the network (10.1.1.40) by virtue of the group profile. This VPN Client does not receive wins− and dns−server information, but still does split−tunneling.

Note: PIX Software release 6.0 is required for VPN Client 3.0 support.

VPN Client 2.5 or 3.0 Setup – Xauth with VPN Groups

Complete these steps:

Note: The VPN 2.5 or 3.0 Client setup depends on the user involved.

1. Select **Options > Properties > Authentication**.
2. The group name and group password match the group name on the PIX as in: vpngroup vpn3000−all password ******** or vpngroup vpn3000−41 password ********. The host name is 172.18.124.157.
3. Click **Connect**.
4. When the Xauth window comes up, input the username and password that agree with the one on the AAA server.

In this example, once user 3000full is authenticated, it picks up the information from the vpn3000−all group. User 3000partial picks up the information from the vpn3000−41 group. The window shows **Negotiating security profiles** and **Your link is now secure**.

User 3000full uses the password for group vpn3000−all. Access−list 108 is associated with that group for split−tunneling purposes. The tunnel is formed to the 10.1.1.x network. Traffic flows unencrypted to devices not in access−list 108 (for example, the Internet). This is split−tunneling.

This is the output for VPN Client connection status window for user 3000full:

```
          Network          Mask
key      10.1.1.0          255.255.255.0
key      172.18.124.157    255.255.255.255
```

User 3000partial uses the password for group vpn3000−41. Access−list 125 is associated with that group for split−tunneling purposes. The tunnel is formed to the 10.1.1.41 device. Traffic flows unencrypted to devices

not in access–list 125 (for example, the Internet). However, traffic does not flow to the 10.1.1.40 device because this traffic is unroutable. It is not specified in the list of encryption tunnels.

This is the output for VPN Client connection status window for user 3000partial:

```
        Network         Mask
key     10.1.1.41       255.255.255.255
key     172.18.124.157  255.255.255.255
```

Xauth with VPN Groups – PIX Setup

Note: The Cisco Secure VPN Client 1.1 does not work with this because there is no Internet Security Association and Key Management Protocol (ISAKMP) key. Add the **isakmp key ******** address 0.0.0.0 netmask 0.0.0.0** command to make all VPN Clients work.

```
PIX Version 5.2(1)
nameif ethernet0 outside security0
nameif ethernet1 inside security100
enable password 8Ry2YjIyt7RRXU24 encrypted
passwd OnTrBUG1Tp0edmkr encrypted
hostname goss-pixb
fixup protocol ftp 21
fixup protocol http 80
fixup protocol h323 1720
fixup protocol rsh 514
fixup protocol smtp 25
fixup protocol sqlnet 1521
fixup protocol sip 5060
names
access-list 108 permit ip 10.1.1.0 255.255.255.0
192.168.1.0 255.255.255.0
access-list 125 permit ip host 10.1.1.41 any
pager lines 24
logging on
no logging timestamp
no logging standby
logging console debugging
no logging monitor
no logging buffered
logging trap debugging
no logging history
logging facility 20
logging queue 512
interface ethernet0 auto
interface ethernet1 auto
mtu outside 1500
mtu inside 1500
ip address outside 172.18.124.157 255.255.255.0
ip address inside 10.1.1.1 255.255.255.0
ip audit info action alarm
ip audit attack action alarm
ip local pool test 192.168.1.1-192.168.1.5
no failover
failover timeout 0:00:00
failover poll 15
failover ip address outside 0.0.0.0
failover ip address inside 0.0.0.0
arp timeout 14400
global (outside) 1 172.18.124.154
Nat (inside) 0 access-list 108
Nat (inside) 1 10.1.1.0 255.255.255.0 0 0
route outside 0.0.0.0 0.0.0.0 172.18.124.1 1
timeout xlate 3:00:00
```

```
timeout conn 1:00:00 half-closed 0:10:00 udp 0:02:00
rpc 0:10:00 h323 0:05:00
sip 0:30:00 sip_media 0:02:00
timeout uauth 0:05:00 absolute
AAA-server TACACS+ protocol tacacs+
AAA-server RADIUS protocol radius
AAA-server AuthInbound protocol tacacs+
AAA-server AuthInbound (outside) host 172.18.124.111
cisco timeout 5
no snmp-server location
no snmp-server contact
snmp-server community public
no snmp-server enable traps
floodguard enable
sysopt connection permit-ipsec
no sysopt route dnat
crypto ipsec transform-set myset ESP-Des esp-md5-hmac
crypto dynamic-map dynmap 10 set transform-set myset
crypto map mymap 10 ipsec-isakmp dynamic dynmap
crypto map mymap client configuration address initiate
crypto map mymap client configuration address respond
crypto map mymap client authentication AuthInbound
crypto map mymap interface outside
isakmp enable outside
isakmp identity address
isakmp client configuration address-pool local test outside

!--- ISAKMP Policy for Cisco VPN Client 2.5 or
!--- Cisco Secure VPN Client 1.1.

isakmp policy 10 authentication pre-share
isakmp policy 10 encryption des
isakmp policy 10 hash md5

!--- The 1.1 and 2.5 VPN Clients use Diffie-Hellman (D-H)
!--- group 1 policy (PIX default).

isakmp policy 10 group 1
isakmp policy 10 lifetime 86400
!

!--- ISAKMP Policy for VPN Client 3.0

isakmp policy 20 authentication pre-share
isakmp policy 20 encryption des
isakmp policy 20 hash md5

!--- The VPN 3.0 Clients use D-H group 2 policy
!--- and PIX 6.0 code.

isakmp policy 20 group 2
isakmp policy 20 lifetime 86400
vpngroup vpn3000-all address-pool test
vpngroup vpn3000-all dns-server 10.1.1.40
vpngroup vpn3000-all wins-server 10.1.1.40
vpngroup vpn3000-all default-domain rtp.cisco.com
vpngroup vpn3000-all split-tunnel 108
vpngroup vpn3000-all idle-time 1800
vpngroup vpn3000-all password ********
vpngroup vpn3000-41 address-pool test
vpngroup vpn3000-41 split-tunnel 125
vpngroup vpn3000-41 idle-time 1800
vpngroup vpn3000-41 password ********
telnet timeout 5
ssh timeout 5
terminal width 80
```

```
Cryptochecksum:429db0e7d20451fc28074f4d6f990d25
: end
```

Xauth with VPN Groups and Per−User Downloadable ACLs − ACS Setup
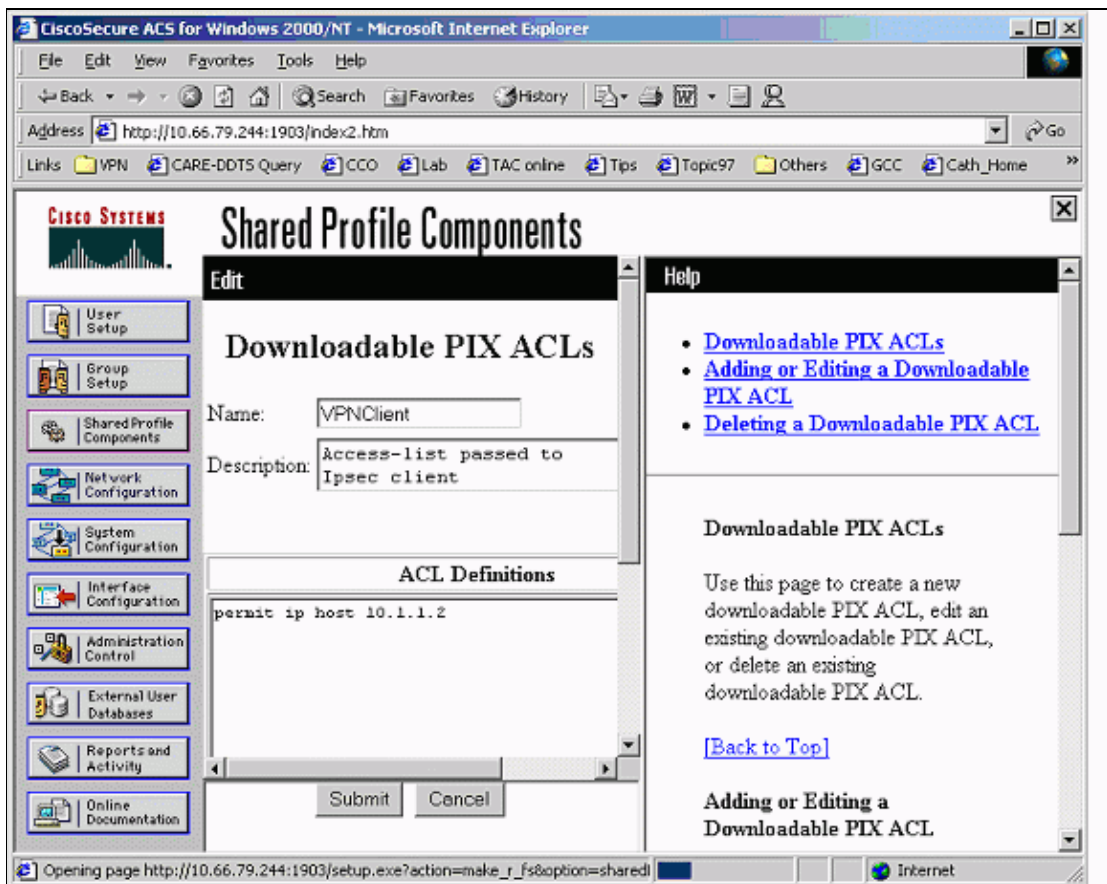
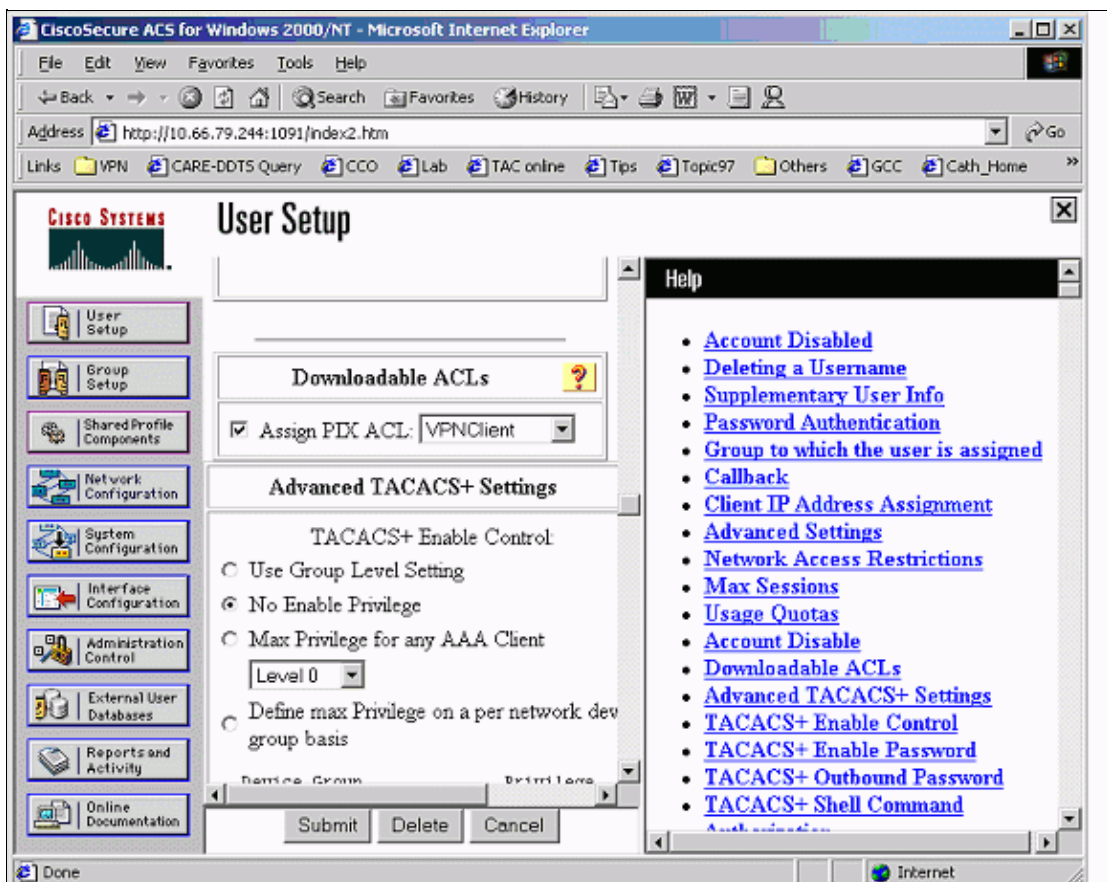**Set Up the Cisco Secure ACS**

Complete these steps:

1. Click **Interface Configuration** and select the option for **User−Level Downloadable ACLs**.
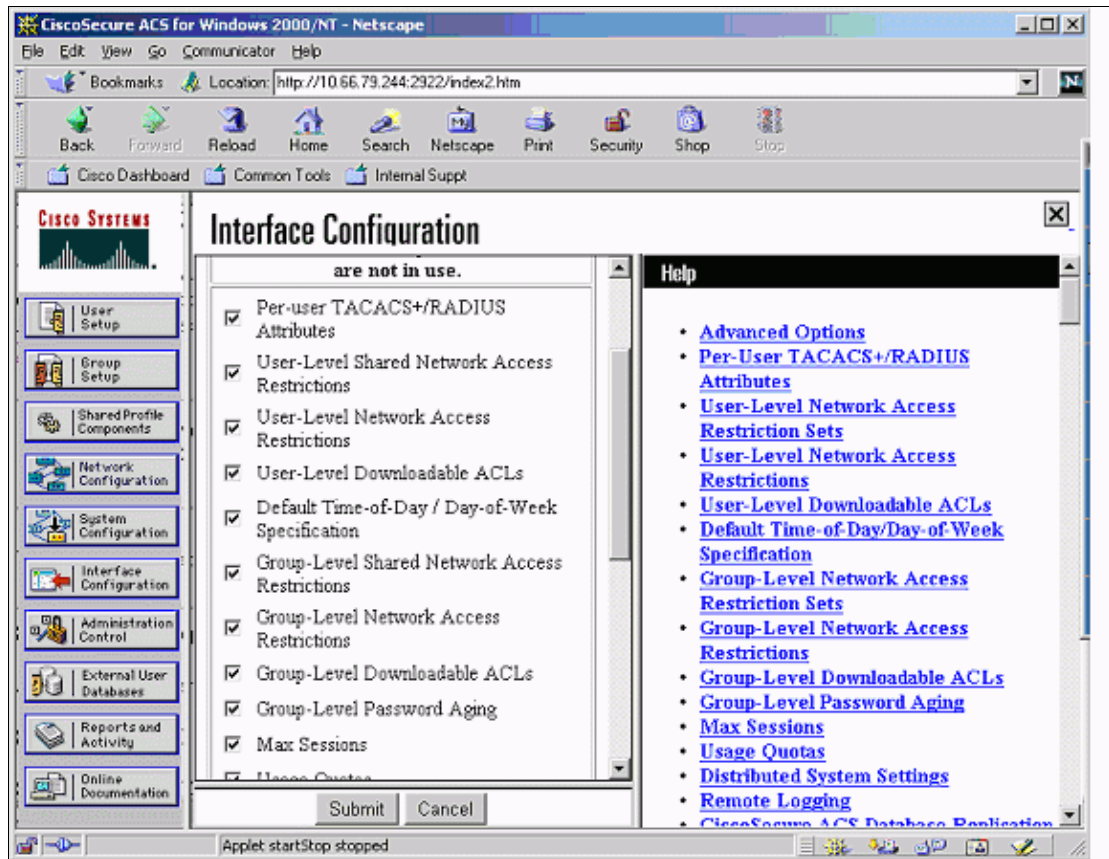
2. Click **Shared Profile Components** and define a downloadable ACL.

3. Click **User Setup**. Select the option to **Assign PIX ACL**. Choose the correct ACL from the pull−down list.

Xauth with VPN Groups and Per−User Downloadable ACLs − PIX 6.x Setup

If you want to conduct a user per−user downloadable ACL for authorization, use PIX Firewall software version 6.2(2). Refer to Cisco bug ID CSCdx47975 (registered customers only) .

```
PIX Version 6.2(2)
nameif ethernet0 outside security0
nameif ethernet1 inside security100
enable password 8Ry2YjIyt7RRXU24 encrypted
passwd 2KFQnbNIdI.2KYOU encrypted
hostname sv2-4
fixup protocol ftp 21
fixup protocol http 80
fixup protocol h323 h225 1720
fixup protocol h323 ras 1718-1719
fixup protocol ils 389
fixup protocol rsh 514
fixup protocol rtsp 554
fixup protocol smtp 25
fixup protocol sqlnet 1521
fixup protocol sip 5060
fixup protocol skinny 2000
names
access-list 108 permit ip 10.1.1.0 255.255.255.0
192.168.1.0 255.255.255.0
pager lines 24
logging buffered debugging
interface ethernet0 auto
interface ethernet1 auto
mtu outside 1500
mtu inside 1500
ip address outside 10.66.79.69 255.255.255.224
ip address inside 10.1.1.1 255.255.255.0
ip audit info action alarm
ip audit attack action alarm
ip local pool test 192.168.1.1-192.168.1.5
pdm history enable
arp timeout 14400
nat (inside) 0 access-list 108
conduit permit icmp any any
route outside 0.0.0.0 0.0.0.0 10.66.79.65 1
timeout xlate 3:00:00
timeout conn 1:00:00 half-closed 0:10:00 udp 0:02:00
rpc 0:10:00 h323 0:05:00 sip
0:30:00 sip_media 0:02:00
timeout uauth 0:05:00 absolute
aaa-server TACACS+ protocol tacacs+
aaa-server RADIUS protocol radius
aaa-server LOCAL protocol local
aaa-server AuthInbound protocol radius
aaa-server AuthInbound (outside) host 10.66.79.244 cisco123 timeout 10
no snmp-server location
no snmp-server contact
snmp-server community public
no snmp-server enable traps
floodguard enable
sysopt connection permit-ipsec
no sysopt route dnat
crypto ipsec transform-set myset esp-des esp-md5-hmac
crypto dynamic-map dynmap 10 set transform-set myset
crypto map mymap 10 ipsec-isakmp dynamic dynmap

!--- This commands the router to respond to the VPN 3.x Client.
```

```
        crypto map mymap client configuration address respond

        !--- This tells the router to expect Xauth for the VPN 3.x Client.

        crypto map mymap client authentication AuthInbound
        crypto map mymap interface outside
        isakmp enable outside
        isakmp policy 20 authentication pre-share
        isakmp policy 20 encryption des
        isakmp policy 20 hash md5
        isakmp policy 20 group 2
        isakmp policy 20 lifetime 86400
        !

        !--- This is the VPN group configuration.

        vpngroup vpn3000-all address-pool test
        vpngroup vpn3000-all default-domain apt.cisco.com

        !--- The split-tunnel mode-config is not used,
        !--- which enforces authorization on a per-user basis.

        vpngroup vpn3000-all idle-time 1800
        vpngroup vpn3000-all password ********
        !
        telnet timeout 5
        ssh timeout 5
        terminal width 80
        Cryptochecksum:7c3d067232f427e7522f4a679e963c58
        end:
```

Xauth with VPN Groups and Per–User Downloadable ACLs – ASA/ PIX 7.x Setup

```
        PIX Version 7.1(1)
        !
        hostname PIX
        domain-name cisco.com
        enable password 9jNfZuG3TC5tCVH0 encrypted
        names
        !
        interface Ethernet0
         nameif outside
         security-level 0
         ip address 10.66.79.69 255.255.255.224
        !
        interface Ethernet1
         nameif inside
         security-level 100
         ip address 10.1.1.1 255.255.255.0
        !
        passwd 2KFQnbNIdI.2KYOU encrypted
        ftp mode passive
        dns domain-lookup inside
        dns server-group DefaultDNS
         timeout 30

        access-list 108 permit ip 10.1.1.0 255.255.255.0 192.168.1.0 255.255.255.0
        pager lines 24
        logging buffer-size 500000
        logging console debugging
        logging monitor errors
        mtu outside 1500
        mtu inside 1500
```

```
ip local pool test 192.168.1.1-192.168.1.5
no failover
icmp permit any outside
icmp permit any inside
no asdm history enable
arp timeout 14400

nat (inside) 0 access-list 108
route outside 0.0.0.0 0.0.0.0 10.66.79.65 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
timeout mgcp-pat 0:05:00 sip 0:30:00 sip_media 0:02:00
timeout uauth 0:05:00 absolute

aaa-server AuthInbound protocol radius
aaa-server AuthInbound host 10.66.79.244 key cisco123

group-policy vpn3000 internal
group-policy vpn3000 attributes
 dns-server value 172.16.1.1
 default-domain value cisco.com

username vpn3000 password nPtKy7KDCerzhKeX encrypted
no snmp-server location
no snmp-server contact
snmp-server enable traps snmp authentication linkup linkdown coldstart

crypto ipsec transform-set my-set esp-des esp-md5-hmac

crypto dynamic-map dynmap 10 set transform-set my-set

crypto dynamic-map dynmap 10 set reverse-route

crypto map mymap 10 ipsec-isakmp dynamic dynmap

crypto map mymap interface outside

isakmp enable outside
isakmp policy 10 authentication pre-share
isakmp policy 10 encryption des
isakmp policy 10 hash md5
isakmp policy 10 group 2
isakmp policy 10 lifetime 1000

isakmp policy 65535 authentication pre-share
isakmp policy 65535 encryption 3des
isakmp policy 65535 hash sha
isakmp policy 65535 group 2
isakmp policy 65535 lifetime 86400


tunnel-group DefaultRAGroup general-attributes
 authentication-server-group (outside) vpn

tunnel-group vpn3000 type ipsec-ra

tunnel-group vpn3000 general-attributes
 address-pool test
 authentication-server-group vpn


tunnel-group vpn3000 ipsec-attributes
 pre-shared-key *

telnet timeout 5
```

```
      ssh timeout 5
      console timeout 0
      !
      class-map inspection_default
       match default-inspection-traffic
       !
       !
      policy-map global_policy
       class inspection_default
         inspect dns maximum-length 512
         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
      Cryptochecksum:ecb58c5d8ce805b3610b198c73a3d0cf
      : end
```

How to Configure Local Xauth for VPN Client Connection

These commands are required to configure local Xauth for VPN Client connection:

- **aaa−server** *server−tag* **protocol** *local*
- **crypto map** *map−name* **client authentication** *aaa−server−name*

Issue the **username** command to define local users on PIX.

In order to use the local PIX Firewall user authentication database, enter **LOCAL** for the *server−tag* parameter for the **aaa−server** command. The **aaa−server** command is issued with the **crypto map** command to establish an authentication association so that VPN Clients are authenticated when they access the PIX Firewall.

How to Add Accounting

This is the syntax of the command to add accounting:

- **aaa accounting** *acctg_service*|**except inbound|outbound**/*if_name local_ip local_mask foreign_ip foreign_mask* **tacacs+|radius** ;

or (new in 5.2):

- **aaa accounting include** *acctg_service* **inbound|outbound match** *server_tag*

In the PIX configuration, this is the command added:

- **aaa accounting include any inbound 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0 AuthInbound** ;

or (new in 5.2):

- **access−list 150 permit ip any any aaa accounting match 150 outside AuthInbound**

Note: The **sysopt connection permit−ipsec** command, not the **sysopt ipsec pl−compatible** command, is necessary for Xauth accounting to work. Xauth accounting does not work with only the **sysopt ipsec pl−compatible** command. Xauth accounting is valid for TCP connections. It is not valid for Internet Control Message Protocol (ICMP) or User Datagram Protocol (UDP).

TACACS+ Accounting Example

```
Fri Sep 8 03:48:40 2000 172.18.124.157
pixc PIX 192.168.1.1 start task_id=0x17 foreign_ip=192.168.1.1
    local_ip=10.1.1.40 cmd=telnet
Fri Sep 8 03:48:44 2000 172.18.124.157 pixc PIX 192.168.1.1
    stop task_id=0x17 foreign_ip=192.168.1.1 local_ip=10.1.1.40
    cmd=telnet elapsed_time=4 bytes_in=42 bytes_out=103
Fri Sep 8 03:49:31 2000 172.18.124.157 pixc PIX 192.168.1.1
    start task_id=0x18
foreign_ip=192.168.1.1 local_ip=10.1.1.40 cmd=http
Fri Sep 8 03:49:35 2000 172.18.124.157 pixc PIX 192.168.1.1
    stop task_id=0x18 foreign_ip=192.168.1.1 local_ip=10.1.1.40
    cmd=http elapsed_time=4 bytes_in=242 bytes_out=338
```

RADIUS Accounting Example

```
Acct-Status-Type = Start
NAS-IP-Address = 172.18.124.157
Login-IP-Host = 10.1.1.40
Login-TCP-Port = 23
Acct-Session-Id = 0x00000003
User-Name = noacl
Vendor-Specific = Source-IP=192.168.1.1
Vendor-Specific = Source-Port=1141
Vendor-Specific = Destination-IP=10.1.1.40
Vendor-Specific = Destination-Port=23

Acct-Status-Type = Start
NAS-IP-Address = 172.18.124.157
Login-IP-Host = 10.1.1.40
Login-TCP-Port = 80
Acct-Session-Id = 0x00000004
User-Name = noacl
Vendor-Specific = Source-IP=192.168.1.1
Vendor-Specific = Source-Port=1168
Vendor-Specific = Destination-IP=10.1.1.40
Vendor-Specific = Destination-Port=80

Acct-Status-Type = Stop
NAS-IP-Address = 172.18.124.157
Login-IP-Host = 10.1.1.41
Login-TCP-Port = 80
Acct-Session-Id = 0x00000008
User-Name = noacl
Acct-Session-Time = 4
Acct-Input-Octets = 242
Acct-Output-Octets = 338
Vendor-Specific = Source-IP=192.168.1.1
Vendor-Specific = Source-Port=1182
Vendor-Specific = Destination-IP=10.1.1.41
Vendor-Specific = Destination-Port=80

Acct-Status-Type = Stop
NAS-IP-Address = 172.18.124.157
Login-IP-Host = 10.1.1.40
```

```
Login-TCP-Port = 23
Acct-Session-Id = 0x00000015
User-Name = noacl
Acct-Session-Time = 33
Acct-Input-Octets = 43
Acct-Output-Octets = 103
Vendor-Specific = Source-IP=192.168.1.1
Vendor-Specific = Source-Port=1257
Vendor-Specific = Destination-IP=10.1.1.40
Vendor-Specific = Destination-Port=23
```

Debug and Show – Xauth Without VPN Groups

```
goss-pixb#show debug
debug crypto ipsec 1
debug crypto isakmp 1
debug crypto engine
debug fover status
tx Off
rx Off
open Off
cable Off
txdmp Off
rxdmp Off
ifc Off
rxip Off
txip Off
get Off
put Off
verify Off
switch Off
fail Off
fmsg Off
goss-pixb#terminal monitor
goss-pixb#

crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
OAK_MM exchange
ISAKMP (0): processing SA payload. message ID = 0

ISAKMP (0): Checking ISAKMP transform 1 against priority 10 policy
ISAKMP: encryption DES-CBC
ISAKMP: hash MD5
ISAKMP: default group 1
ISAKMP: auth pre-share
ISAKMP (0): atts are acceptable. Next payload is 0
ISAKMP (0): SA is doing pre-shared key authentication
using id type ID_IPV4_ADDR
return status is IKMP_NO_ERROR
crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
OAK_MM exchange
ISAKMP (0): processing KE payload. Message ID = 0

ISAKMP (0): processing NONCE payload. Message ID = 0

ISAKMP (0): processing vendor id payload

ISAKMP (0): processing vendor id payload

return status is IKMP_NO_ERROR
crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
OAK_MM exchange
ISAKMP (0): processing ID payload. Message ID = 0
ISAKMP (0): processing HASH payload. Message ID = 0
ISAKMP (0): processing NOTIFY payload 24578 protocol 1
```

```
spi 0, message ID = 0
ISAKMP (0): processing notify INITIAL_CONTACTIPSEC(key_engine):
got a queue event...
IPSEC(key_engine_delete_sas): rec'd delete notify from ISAKMP
IPSEC(key_engine_delete_sas): delete all SAs shared with 172.18.124.99


ISAKMP (0): SA has been authenticated

ISAKMP (0): ID payload
next-payload : 8
type : 1
protocol : 17
port : 500
length : 8
ISAKMP (0): Total payload length: 12
return status is IKMP_NO_ERROR
crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
OAK_QM exchange
ISAKMP (0:0): Need XAUTH
ISAKMP/xauth: request attribute XAUTH_TYPE
ISAKMP/xauth: request attribute XAUTH_USER_NAME
ISAKMP/xauth: request attribute XAUTH_USER_PASSWORD
ISAKMP (0:0): initiating peer config to 172.18.124.99.
ID = 2218162690 (0x84367a02)
return status is IKMP_NO_ERROR
crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
ISAKMP_TRANSACTION exchange
ISAKMP (0:0): processing transaction payload from 172.18.124.99.
Message ID = 2156074032
ISAKMP: Config payload CFG_REPLY
return status is IKMP_ERR_NO_RETRANS109005: Authentication succeeded
for user 'pixb' from 172.18.124.99/0 to 0.0.0.0/0 on
interface IKE-XAUTH
ISAKMP (0:0): initiating peer config to 172.18.124.99.
ID = 2218162690 (0x84367a02)
109005: Authentication succeeded for user 'pixb' from 172.18.124.157
crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
ISAKMP_TRANSACTION exchange
ISAKMP (0:0): processing transaction payload from 172.18.124.99.
Message ID = 2156497080
ISAKMP: Config payload CFG_ACK
ISAKMP (0:0): initiating peer config to 172.18.124.99.
ID = 393799466 (0x1778e72a)
return status is IKMP_NO_ERROR
crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
ISAKMP_TRANSACTION exchange
ISAKMP (0:0): processing transaction payload from 172.18.124.99.
Message ID = 2156156112
ISAKMP: Config payload CFG_ACK
ISAKMP (0:0): peer accepted the address!
return status is IKMP_NO_ERROR.99/0 to 0.0.0.0/0 on
interface IKE-XAUTH

crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
OAK_QM exchange
oakley_process_quick_mode:
OAK_QM_IDLE
ISAKMP (0): processing SA payload. Message ID = 2323118710

ISAKMP : Checking IPSec proposal 1

ISAKMP: transform 1, ESP_DES
ISAKMP: attributes in transform:
ISAKMP: authenticator is HMAC-MD5
ISAKMP: encaps is 1
ISAKMP (0): atts are acceptable.IPSEC(validate_proposal_request):
```

```
proposal part #1,
(key eng. msg.) dest= 172.18.124.157, src= 172.18.124.99,
dest_proxy= 10.1.1.0/255.255.255.0/0/0 (type=4),
src_proxy= 192.168.1.1/255.255.255.255/0/0 (type=1),
protocol= ESP, transform= ESP-Des esp-md5-hmac ,
lifedur= 0s and 0kb,
spi= 0x0(0), conn_id= 0, keysize= 0, flags= 0x4

ISAKMP (0): processing NONCE payload. Message ID = 2323118710

ISAKMP (0): processing ID payload. Message ID = 2323118710
ISAKMP (0): ID_IPV4_ADDR src 192.168.1.1 prot 0 port 0
ISAKMP (0): processing ID payload. Message ID = 2323118710
ISAKMP (0): ID_IPV4_ADDR_SUBNET dst 10.1.1.0/255.255.255.0
prot 0 port 0
IPSEC(key_engine): got a queue event...
IPSEC(spi_response): getting spi 0xeeae8930(4004415792) for SA
from 172.18.124.99 to 172.18.124.157 for prot 3

return status is IKMP_NO_ERROR4
crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
OAK_QM exchange
oakley_process_quick_mode:
OAK_QM_AUTH_AWAITmap_alloc_entry: allocating entry 1
map_alloc_entry: allocating entry 2

ISAKMP (0): Creating IPSec SAs
        inbound SA from 172.18.124.99 to 172.18.124.157
        (proxy 192.168.1.1 to 10.1.1.0)
        has spi 4004415792 and conn_id 1 and flags 4
        outbound SA from 172.18.124.157 to 172.18.124.99
        (proxy 10.1.1.0 to 192.168.1.1)
        has spi 1281287211 and conn_id 2 and flags 4
IPSEC(key_engine): got a queue event...
IPSEC(initialize_sas): ,
(key eng. msg.) dest= 172.18.124.157, src= 172.18.124.99,
dest_proxy= 10.1.1.0/255.255.255.0/0/0 (type=4),
src_proxy= 192.168.1.1/0.0.0.0/0/0 (type=1),
protocol= ESP, transform= esp-des esp-md5-hmac ,
lifedur= 0s and 0kb,
spi= 0xeeae8930(4004415792), conn_id= 1, keysize= 0, flags= 0x4
IPSEC(initialize_sas): ,
(key eng. msg.) src= 172.18.124.157, dest= 172.18.124.99,
src_proxy= 10.1.1.0/255.255.255.0/0/0 (type=4),
dest_proxy= 192.168.1.1/0.0.0.0/0/0 (type=1),
protocol= ESP, transform= esp-des esp-md5-hmac ,
lifedur= 0s and 0kb,
spi= 0x4c5ee42b(1281287211), conn_id= 2, keysize= 0, flags= 0x4

return status is IKMP_NO_ERROR02101: decaps: rec'd
IPSEC packet has invalid spi for destaddr=172.18.124.157,
prot=esp, spi=0xeeae8930(0)
602301: sa created, (sa) sa_dest= 172.18.124.157, sa_prot= 50,
sa_spi= 0xeeae8930(4004415792), sa_trans= esp-des esp-md5-hmac,
 sa_conn_id= 1

602301: sa created, (sa) sa_dest= 172.18.124.99, sa_prot= 50,
sa_spi= 0x4c5ee42b(1281287211), sa_trans= esp-des esp-md5-hmac,
 sa_conn_id= 2

109011: Authen Session Start: user 'pixb', sid 5
109015: Authorization denied (acl=115) for user 'pixb' from
192.168.1.1/0 to 10.1.1.40/8 on interface outside
109015: Authorization denied (acl=115) for user 'pixb' from
192.168.1.1/0 to 10.1.1.40/8 on interface outside
109015: Authorization denied (acl=115) for user 'pixb' from
```

```
192.168.1.1/0 to 10.1.1.40/8 on interface outside
109015: Authorization denied (acl=115) for user 'pixb' from
192.168.1.1/0 to 10.1.1.40/8 on interface outside

goss-pixb#
goss-pixb#show uauth
Current Most Seen
Authenticated Users 1 1
Authen In Progress 0 1
ipsec user 'pixb' at 192.168.1.1, authenticated
access-list 115
goss-pixb#show access-list
access-list 108 permit ip 10.1.1.0 255.255.255.0 192.168.1.0
255.255.255.0 (hitcnt=18)
access-list 125 permit ip host 10.1.1.41 any (hitcnt=0)
access-list dynacl4 permit ip 10.1.1.0 255.255.255.0 host
192.168.1.1 (hitcnt=0)
access-list 115 permit ip any host 10.1.1.41 (hitcnt=0)
access-list 115 deny ip any host 10.1.1.42 (hitcnt=0)
```

Debug and Show – Xauth with VPN Groups

```
crypto_isakmp_process_block: src 172.18.124.96,
dest 172.18.124.157
goss-pixb#show debug
debug crypto ipsec 1
debug crypto isakmp 1
debug crypto engine
debug fover status
tx Off
rx Off
open Off
cable Off
txdmp Off
rxdmp Off
ifc Off
rxip Off
txip Off
get Off
put Off
verify Off
switch Off
fail Off
fmsg Off
goss-pixb#
crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
OAK_AG exchange
ISAKMP (0): processing SA payload. message ID = 0

ISAKMP (0): Checking ISAKMP transform 1 against priority 10 policy
ISAKMP: encryption DES-CBC
ISAKMP: hash MD5
ISAKMP: default group 1
ISAKMP: auth pre-share
ISAKMP (0): atts are acceptable. Next payload is 3
ISAKMP (0): processing KE payload. message ID = 0

ISAKMP (0): processing NONCE payload. message ID = 0

ISAKMP (0): processing ID payload. message ID = 0
ISAKMP (0): processing vendor id payload

ISAKMP (0): speaking to a VPN3000 client

ISAKMP (0): ID payload
```

```
next-payload : 10
type : 1
protocol : 17
port : 500
length : 8
ISAKMP (0): Total payload length: 12
return status is IKMP_NO_ERROR
crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
OAK_AG exchange
ISAKMP (0): processing HASH payload. message ID = 0
ISAKMP (0): SA has been authenticated
return status is IKMP_NO_ERROR
crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
OAK_QM exchange
ISAKMP (0:0): Need XAUTH
ISAKMP/xauth: request attribute XAUTH_TYPE
ISAKMP/xauth: request attribute XAUTH_USER_NAME
ISAKMP/xauth: request attribute XAUTH_USER_PASSWORD
ISAKMP (0:0): initiating peer config to 172.18.124.99.
ID = 1396280702 (0x53398d7e)
return status is IKMP_NO_ERROR
crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
ISAKMP_TRANSACTION exchange
ISAKMP (0:0): processing transaction payload from 172.18.124.99.
message ID = 2156608344
ISAKMP: Config payload CFG_REPLY
return status is IKMP_ERR_NO_RETRANS10
ISAKMP (0:0): initiating peer config to 172.18.124.99.
ID = 1396280702 (0x53398d7e)9
crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
ISAKMP_TRANSACTION exchange
ISAKMP (0:0): processing transaction payload from 172.18.124.99.
message ID = 2156115984
ISAKMP: Config payload CFG_ACK
ISAKMP (0:0): peer accepted the address!
ISAKMP (0:0): processing saved QM.
oakley_process_quick_mode:
OAK_QM_IDLE
ISAKMP (0): processing SA payload. message ID = 1697984837

ISAKMP : Checking IPSec proposal 1

ISAKMP: transform 1, ESP_DES
ISAKMP: attributes in transform:
ISAKMP: authenticator is HMAC-MD5
ISAKMP: encaps is 1
ISAKMP (0): atts are acceptable.
IPSEC(validate_proposal_request): proposal part #1,
(key eng. msg.) dest= 172.18.124.157, src= 172.18.124.99,
dest_proxy= 172.18.124.157/255.255.255.255/0/0 (type=1),
src_proxy= 192.168.1.1/255.255.255.255/0/0 (type=1),
protocol= ESP, transform= esp-des esp-md5-hmac ,
lifedur= 0s and 0kb,
spi= 0x0(0), conn_id= 0, keysize= 0, flags= 0x4

ISAKMP (0): processing NONCE payload. message ID = 1697984837

ISAKMP (0): processing ID payload. message ID = 1697984837
ISAKMP (0): ID_IPV4_ADDR src 192.168.1.1 prot 0 port 0
ISAKMP (0): processing ID payload. message ID = 1697984837
ISAKMP (0): ID_IPV4_ADDR dst 172.18.124.157 prot 0 port 0
ISAKMP (0): processing NOTIFY payload 24578 protocol 1
spi 0, message ID = 1697984837
ISAKMP (0): processing notify INITIAL_CONTACTIPSEC(key_engine):
got a queue event...
IPSEC(key_engine_delete_sas): rec'd delete notify from ISAKMP
```

```
IPSEC(key_engine_delete_sas): delete all SAs shared with 172.18.124.99
IPSEC(key_engine): got a queue event...
IPSEC(spi_response): getting spi 0x6a9d3f79(1788690297) for SA
from 172.18.124.99 to 172.18.124.157 for prot 3

return status is IKMP_NO_ERROR0
crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
OAK_QM exchange
oakley_process_quick_mode:
OAK_QM_AUTH_AWAITmap_alloc_entry: allocating entry 1
map_alloc_entry: allocating entry 2

ISAKMP (0): Creating IPSec SAs
        inbound SA from 172.18.124.99 to 172.18.124.157
        (proxy 192.168.1.1 to 172.18.124.157)
        has spi 1788690297 and conn_id 1 and flags 4
        outbound SA from 172.18.124.157 to 172.18.124.99
        (proxy 172.18.124.157 to 192.168.1.1)
        has spi 2854452814 and conn_id 2 and flags 4
IPSEC(key_engine): got a queue event...
IPSEC(initialize_sas): ,
  (key eng. msg.) dest= 172.18.124.157, src= 172.18.124.99,
    dest_proxy= 172.18.124.157/0.0.0.0/0/0 (type=1),
    src_proxy= 192.168.1.1/0.0.0.0/0/0 (type=1),
    protocol= ESP, transform= esp-des esp-md5-hmac ,
    lifedur= 0s and 0kb,
    spi= 0x6a9d3f79(1788690297), conn_id= 1, keysize= 0, flags= 0x4
IPSEC(initialize_sas): ,
  (key eng. msg.) src= 172.18.124.157, dest= 172.18.124.99,
    src_proxy= 172.18.124.157/0.0.0.0/0/0 (type=1),
    dest_proxy= 192.168.1.1/0.0.0.0/0/0 (type=1),
    protocol= ESP, transform= esp-des esp-md5-hmac ,
    lifedur= 0s and 0kb,
    spi= 0xaa237e4e(2854452814), conn_id= 2, keysize= 0, flags= 0x4

return status is IKMP_NO_ERROR05: Authentication succeeded
for user 'pixc' from 172.18.124.99/0 to 0.0.0.0/0 on interface IKE-XAUTH
602301: sa created, (sa) sa_dest= 172.18.124.157, sa_prot= 50,
  sa_spi= 0x6a9d3f79(1788690297), sa_trans= esp-des esp-md5-hmac ,
  sa_conn_id= 1

602301: sa created, (sa) sa_dest= 172.18.124.99, sa_prot= 50,
  sa_spi= 0xaa237e4e(2854452814), sa_trans= esp-des esp-md5-hmac ,
  sa_conn_id= 2

109011: Authen Session Start: user 'pixc', sid 19

crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
OAK_QM exchange
oakley_process_quick_mode:
OAK_QM_IDLE
ISAKMP (0): processing SA payload. message ID = 3361949217

ISAKMP : Checking IPSec proposal 1

ISAKMP: transform 1, ESP_DES
ISAKMP:    attributes in transform:
ISAKMP:       authenticator is HMAC-MD5
ISAKMP:       encaps is 1
ISAKMP (0): atts are acceptable.
IPSEC(validate_proposal_request): proposal part #1,
  (key eng. msg.) dest= 172.18.124.157, src= 172.18.124.99,
    dest_proxy= 10.1.1.0/255.255.255.0/0/0 (type=4),
    src_proxy= 192.168.1.1/255.255.255.255/0/0 (type=1),
    protocol= ESP, transform= esp-des esp-md5-hmac ,
    lifedur= 0s and 0kb,
```

```
    spi= 0x0(0), conn_id= 0, keysize= 0, flags= 0x4

ISAKMP (0): processing NONCE payload. message ID = 3361949217

ISAKMP (0): processing ID payload. message ID = 3361949217
ISAKMP (0): ID_IPV4_ADDR src 192.168.1.1 prot 0 port 0
ISAKMP (0): processing ID payload. message ID = 3361949217
ISAKMP (0): ID_IPV4_ADDR_SUBNET dst 10.1.1.0/255.255.255.0 prot 0 port 0
IPSEC(key_engine): got a queue event...
IPSEC(spi_response): getting spi 0xfec4c3aa(4274308010) for SA
from 172.18.124.99 to 172.18.124.157 for prot 3

return status is IKMP_NO_ERROR4
crypto_isakmp_process_block: src 172.18.124.99, dest 172.18.124.157
OAK_QM exchange
oakley_process_quick_mode:
OAK_QM_AUTH_AWAITmap_alloc_entry: allocating entry 4
map_alloc_entry: allocating entry 3

ISAKMP (0): Creating IPSec SAs
    inbound SA from 172.18.124.99 to 172.18.124.157
    (proxy 192.168.1.1 to 10.1.1.0)
    has spi 4274308010 and conn_id 4 and flags 4
    outbound SA from 172.18.124.157 to 172.18.124.99
    (proxy 10.1.1.0 to 192.168.1.1)
    has spi 798459812 and conn_id 3 and flags 4
IPSEC(key_engine): got a queue event...
IPSEC(initialize_sas): ,
    (key eng. msg.) dest= 172.18.124.157, src= 172.18.124.99,
    dest_proxy= 10.1.1.0/255.255.255.0/0/0 (type=4),
    src_proxy= 192.168.1.1/0.0.0.0/0/0 (type=1),
    protocol= ESP, transform= esp-des esp-md5-hmac ,
    lifedur= 0s and 0kb,
    spi= 0xfec4c3aa(4274308010), conn_id= 4, keysize= 0, flags= 0x4
IPSEC(initialize_sas): ,
    (key eng. msg.) src= 172.18.124.157, dest= 172.18.124.99,
    src_proxy= 10.1.1.0/255.255.255.0/0/0 (type=4),
    dest_proxy= 192.168.1.1/0.0.0.0/0/0 (type=1),
    protocol= ESP, transform= esp-des esp-md5-hmac ,
    lifedur= 0s and 0kb,
    spi= 0x2f9787a4(798459812), conn_id= 3, keysize= 0, flags= 0x4

return status is IKMP_NO_ERROR02101: decaps: rec'd IPSEC
packet has invalid spi for destaddr=172.18.124.157, prot=esp,
spi=0xfec4c3aa(0)
602301: sa created, (sa) sa_dest= 172.18.124.157, sa_prot= 50,
    sa_spi= 0xfec4c3aa(4274308010), sa_trans= esp-des esp-md5-hmac ,
    sa_conn_id= 4

602301: sa created, (sa) sa_dest= 172.18.124.99, sa_prot= 50,
    sa_spi= 0x2f9787a4(798459812), sa_trans= esp-des esp-md5-hmac ,
    sa_conn_id= 3


goss-pixb#show uauth
                    Current   Most Seen
Authenticated Users     1         1
Authen In Progress      0         1
ipsec user 'pixc' at 192.168.1.1, authenticated
goss-pixb#show crypto ipsec sa


interface: outside
    Crypto map tag: mymap, local addr. 172.18.124.157

    local ident (addr/mask/prot/port): (172.18.124.157/255.255.255.255/0/0)
```

```
remote ident (addr/mask/prot/port): (192.168.1.1/255.255.255.255/0/0)
current_peer: 172.18.124.99
dynamic allocated peer ip: 192.168.1.1

PERMIT, flags={}
#pkts encaps: 0, #pkts encrypt: 0, #pkts digest 0
#pkts decaps: 0, #pkts decrypt: 0, #pkts verify 0
#pkts compressed: 0, #pkts decompressed: 0
#pkts not compressed: 0, #pkts compr. failed: 0,
#pkts decompress failed: 0
#send errors 0, #recv errors 0

local crypto endpt.: 172.18.124.157, remote crypto endpt.: 172.18.124.99
path mtu 1500, ipsec overhead 56, media mtu 1500
current outbound spi: aa237e4e

inbound esp sas:
spi: 0x6a9d3f79(1788690297)
transform: esp-des esp-md5-hmac ,
<--- More ---> in use settings ={Tunnel, }
slot: 0, conn id: 1, crypto map: mymap
sa timing: remaining key lifetime (k/sec): (4608000/28519)
IV size: 8 bytes
replay detection support: Y


inbound ah sas:


inbound pcp sas:


outbound esp sas:
spi: 0xaa237e4e(2854452814)
transform: esp-des esp-md5-hmac ,
in use settings ={Tunnel, }
slot: 0, conn id: 2, crypto map: mymap
sa timing: remaining key lifetime (k/sec): (4608000/28510)
IV size: 8 bytes
replay detection support: Y


outbound ah sas:
<--- More --->

outbound pcp sas:



local ident (addr/mask/prot/port): (10.1.1.0/255.255.255.0/0/0)
remote ident (addr/mask/prot/port): (192.168.1.1/255.255.255.255/0/0)
current_peer: 172.18.124.99
dynamic allocated peer ip: 192.168.1.1

PERMIT, flags={}
#pkts encaps: 4, #pkts encrypt: 4, #pkts digest 4
#pkts decaps: 4, #pkts decrypt: 4, #pkts verify 4
#pkts compressed: 0, #pkts decompressed: 0
#pkts not compressed: 0, #pkts compr. failed: 0,
#pkts decompress failed: 0
#send errors 0, #recv errors 0

local crypto endpt.: 172.18.124.157, remote crypto
endpt.:172.18.124.99
path mtu 1500, ipsec overhead 56, media mtu 1500
current outbound spi: 2f9787a4
```

```
inbound esp sas:
spi: 0xfec4c3aa(4274308010)
<--- More ---> transform: esp-des esp-md5-hmac ,
in use settings ={Tunnel, }
slot: 0, conn id: 4, crypto map: mymap
sa timing: remaining key lifetime (k/sec): (4607999/27820)
IV size: 8 bytes
replay detection support: Y


inbound ah sas:


inbound pcp sas:


outbound esp sas:
spi: 0x2f9787a4(798459812)
transform: esp-des esp-md5-hmac ,
in use settings ={Tunnel, }
slot: 0, conn id: 3, crypto map: mymap
sa timing: remaining key lifetime (k/sec): (4607999/27820)
IV size: 8 bytes
replay detection support: Y


<--- More ---> outbound ah sas:


outbound pcp sas:
```

Debug and Show – Xauth with Per–User Downloadable ACLs

```
crypto_isakmp_process_block: src 10.66.79.229,
dest 10.66.79.69
VPN Peer: ISAKMP: Added new peer: ip:10.66.79.229
Total VPN Peers:1
VPN Peer: ISAKMP: Peer ip:10.66.79.229 Ref cnt incremented to:1
Total VPN Peers:1
OAK_AG exchange
ISAKMP (0): processing SA payload. message ID = 0

ISAKMP (0): Checking ISAKMP transform 1 against priority 20 policy
ISAKMP: encryption 3DES-CBC
ISAKMP: hash SHA
ISAKMP: default group 2
ISAKMP: extended auth pre-share
ISAKMP: life type in seconds
ISAKMP: life duration (VPI) of 0x0 0x20 0xc4 0x9b
ISAKMP (0): atts are not acceptable. Next payload is 3
ISAKMP (0): Checking ISAKMP transform 2 against priority 20 policy
ISAKMP: encryption 3DES-CBC
ISAKMP: hash MD5
ISAKMP: default group 2
ISAKMP: extended auth pre-share
ISAKMP: life type in seconds
ISAKMP: life duration (VPI) of 0x0 0x20 0xc4 0x9b
ISAKMP (0): atts are not acceptable. Next payload is 3
ISAKMP (0): Checking ISAKMP transform 3 against priority 20 policy
ISAKMP: encryption 3DES-CBC
ISAKMP: hash SHA
ISAKMP: default group 2
```

```
ISAKMP: auth pre-share
ISAKMP: life type in seconds
ISAKMP: life duration (VPI) of 0x0 0x20 0xc4 0x9b
ISAKMP (0): atts are not acceptable. Next payload is 3
ISAKMP (0): Checking ISAKMP transform 4 against priority 20 policy
ISAKMP: encryption 3DES-CBC
ISAKMP: hash MD5
ISAKMP: default group 2
ISAKMP: auth pre-share
ISAKMP: life type in seconds
ISAKMP: life duration (VPI) of 0x0 0x20 0xc4 0x9b
ISAKMP (0): atts are not acceptable. Next payload is 3
ISAKMP (0): Checking ISAKMP transform 5 against priority 20 policy
ISAKMP: encryption DES-CBC
ISAKMP: hash SHA
ISAKMP: default group 2
ISAKMP: extended auth pre-share
ISAKMP: life type in seconds
ISAKMP: life duration (VPI) of 0x0 0x20 0xc4 0x9b
ISAKMP (0): atts are not acceptable. Next payload is 3
ISAKMP (0): Checking ISAKMP transform 6 against priority 20 policy
ISAKMP: encryption DES-CBC
ISAKMP: hash MD5
ISAKMP: default group 2
ISAKMP: extended auth pre-share
ISAKMP: life type in seconds
ISAKMP: life duration (VPI) of 0x0 0x20 0xc4 0x9b
ISAKMP (0): atts are acceptable. Next payload is 3
ISAKMP (0): processing KE payload. message ID = 0

ISAKMP (0): processing NONCE payload. message ID = 0

ISAKMP (0): processing ID payload. message ID = 0
ISAKMP (0): processing vendor id payload

ISAKMP (0): received xauth v6 vendor id

ISAKMP (0): processing vendor id payload

ISAKMP (0): remote peer supports dead peer detection

ISAKMP (0): processing vendor id payload

ISAKMP (0): speaking to a Unity client

ISAKMP (0): ID payload
next-payload : 10
type : 2
protocol : 17
port : 500
length : 10
ISAKMP (0): Total payload length: 14
return status is IKMP_NO_ERROR
crypto_isakmp_process_block: src 10.66.79.229, dest 10.66.79.69
OAK_AG exchange
ISAKMP (0): processing HASH payload. message ID = 0
ISAKMP (0): processing NOTIFY payload 24578 protocol 1
spi 0, message ID = 0RADIUS_GET_PASS
RADIUS_REQUEST
raidus.c: rad_mkpkt_authen
attribute:
type 1, length 10, content:
80917fb0: 74 65 73 74 75 73 65 72 | testuser
attribute:
type 4, length 6, content:
80917fb0: 0a 42 | .B
```

```
80917fc0: 4f 45 | OE
attribute:
type 5, length 6, content:
80917fd0: 00 00 00 01 | ....

ISAKMP (0): processing notify INITIAL_CONTACTrip 0x80791f00
: chall_state ''
: state 0x7
: timer 0x0
: info 0x5d5ba513
session_id 0x5d5ba513
request_id 0x2
user 'testuser'
app 0
reason 2
sip 10.66.79.244
type 1
rad_procpkt: ACCEPT
attribute:
type 8, length 6, content:
809186f0: ff ff | ..
80918700: ff ff | ..
RADIUS_RCVD
attribute:
type 26, length 67, content:
Vendor ID 0 0 0 9, type=1, len=61:
80918700: 41 43 53 3a 43 69 | ACS:Ci
80918710: 73 63 6f 53 65 63 75 72 65 2d 44 65 66 69 6e 65
| scoSecure-Define
80918720: 64 2d 41 43 4c 3d 23 41 43 53 41 43 4c 23 2d 50
| d-ACL=#ACSACL#-P
80918730: 49 58 2d 56 50 4e 43 6c 69 65 6e 74 2d 33 64 33
| IX-VPNClient-3d3
80918740: 32 37 38 31 35 | 27815
RADIUS_RCVD
RADIUS_REQUEST
raidus.c: rad_mkpkt_authen
attribute:
type 1, length 33, content:
809186d0: 23 41 43 53 41 43 4c 23 2d 50 49 58 | #ACSACL#-PIX
809186e0: 2d 56 50 4e 43 6c 69 65 6e 74 2d 33 64 33 32 37
| -VPNClient-3d327
809186f0: 38 31 35 | 815
attribute:
type 4, length 6, content:
809186f0: 0a 42 4f 45 | .BOE
attribute:
type 5, length 6, content:
80918700: 00 00 00 | ...
80918710: 02 | .
IPSEC(key_engine): got a queue event...rip 0x80791f00
: chall_state ''
: state 0x7
: timer 0x0
: info 0x5d5ba513
session_id 0x5d5ba513
request_id 0x3
user '#ACSACL#-PIX-VPNClient-3d327815'
app 0
reason 2
sip 10.66.79.244
type 1
rad_procpkt: ACCEPT
attribute:
type 26, length 46, content:
Vendor ID 0 0 0 9, type=1, len=40:
```

```
80918e20: 69 70 3a 69 6e 61 63 6c 23 31 3d 70 | ip:inacl#1=p
80918e30: 65 72 6d 69 74 20 69 70 20 61 6e 79 20 68 6f 73
| ermit ip any hos
80918e40: 74 20 31 30 2e 31 2e 31 2e 32 | t 10.1.1.2
RADIUS_RCVD
RADIUS_RCVD
RADIUS_ACCESS_ACCEPT:normal termination
RADIUS_DELETE

IPSEC(key_engine_delete_sas): rec'd delete notify from ISAKMP
IPSEC(key_engine_delete_sas): delete all SAs shared with 10.66.79.229

ISAKMP (0): SA has been authenticated
return status is IKMP_NO_ERROR
ISAKMP (0): sending phase 1 RESPONDER_LIFETIME notify
ISAKMP (0): sending NOTIFY message 24576 protocol 1
ISAKMP/xauth: request attribute XAUTH_TYPE
ISAKMP/xauth: request attribute XAUTH_USER_NAME
ISAKMP/xauth: request attribute XAUTH_USER_PASSWORD
ISAKMP (0:0): initiating peer config to 10.66.79.229.
ID = 3250273953 (0xc1bb3ea1)
crypto_isakmp_process_block: src 10.66.79.229, dest 10.66.79.69
ISAKMP_TRANSACTION exchange
ISAKMP (0:0): processing transaction payload from 10.66.79.229.
 message ID = 2167001532
ISAKMP: Config payload CFG_REPLY
return status is IKMP_ERR_NO_RETRANS
ISAKMP (0:0): initiating peer config to 10.66.79.229.
ID = 1530000247 (0x5b31f377)
crypto_isakmp_process_block: src 10.66.79.229, dest 10.66.79.69
ISAKMP_TRANSACTION exchange
ISAKMP (0:0): processing transaction payload from 10.66.79.229.
message ID = 2167001532
ISAKMP: Config payload CFG_ACK
return status is IKMP_NO_ERROR
crypto_isakmp_process_block: src 10.66.79.229, dest 10.66.79.69
ISAKMP_TRANSACTION exchange
ISAKMP (0:0): processing transaction payload from 10.66.79.229.
message ID = 2167001532
ISAKMP: Config payload CFG_REQUEST
ISAKMP (0:0): checking request:
ISAKMP: attribute IP4_ADDRESS (1)
ISAKMP: attribute IP4_NETMASK (2)
ISAKMP: attribute IP4_DNS (3)
ISAKMP: attribute IP4_NBNS (4)
ISAKMP: attribute ADDRESS_EXPIRY (5)
Unsupported Attr: 5
ISAKMP: attribute APPLICATION_VERSION (7)
Unsupported Attr: 7
ISAKMP: attribute UNKNOWN (28672)
Unsupported Attr: 28672
ISAKMP: attribute UNKNOWN (28673)
Unsupported Attr: 28673
ISAKMP: attribute ALT_DEF_DOMAIN (28674)
ISAKMP: attribute ALT_SPLIT_INCLUDE (28676)
ISAKMP: attribute ALT_PFS (28679)
ISAKMP: attribute UNKNOWN (28680)
Unsupported Attr: 28680
ISAKMP: attribute UNKNOWN (28677)
Unsupported Attr: 28677
ISAKMP (0:0): responding to peer config from 10.66.79.229.
ID = 2397668523
return status is IKMP_NO_ERROR
crypto_isakmp_process_block: src 10.66.79.229, dest 10.66.79.69
OAK_QM exchange
oakley_process_quick_mode:
```

```
OAK_QM_IDLE
ISAKMP (0): processing SA payload. message ID = 2858414843

ISAKMP : Checking IPSec proposal 1

ISAKMP: transform 1, ESP_3DES
ISAKMP: attributes in transform:
ISAKMP: authenticator is HMAC-MD5
ISAKMP: encaps is 1
ISAKMP: SA life type in seconds
ISAKMP: SA life duration (VPI) of 0x0 0x20 0xc4 0x9b
IPSEC(validate_proposal): transform proposal
(prot 3, trans 3, hmac_alg 1) not supported

ISAKMP (0): atts not acceptable. Next payload is 0
ISAKMP (0): skipping next ANDed proposal (1)
ISAKMP : Checking IPSec proposal 2

ISAKMP: transform 1, ESP_3DES
ISAKMP: attributes in transform:
ISAKMP: authenticator is HMAC-SHA
ISAKMP: encaps is 1
ISAKMP: SA life type in seconds
ISAKMP: SA life duration (VPI) of 0x0 0x20 0xc4 0x9b
IPSEC(validate_proposal): transform proposal
(prot 3, trans 3, hmac_alg 2) not supported

ISAKMP (0): atts not acceptable. Next payload is 0
ISAKMP (0): skipping next ANDed proposal (2)
ISAKMP : Checking IPSec proposal 3

ISAKMP: transform 1, ESP_3DES
ISAKMP: attributes in transform:
ISAKMP: authenticator is HMAC-MD5
ISAKMP: encaps is 1
ISAKMP: SA life type in seconds
ISAKMP: SA life duration (VPI) of 0x0 0x20 0xc4 0x9b IPSEC
(validate_proposal): transform proposal (prot 3, trans 3, hmac_alg 1)
not supported

ISAKMP (0): atts not acceptable. Next payload is 0
ISAKMP : Checking IPSec proposal 4

ISAKMP: transform 1, ESP_3DES
ISAKMP: attributes in transform:
ISAKMP: authenticator is HMAC-SHA
ISAKMP: encaps is 1
ISAKMP: SA life type in seconds
ISAKMP: SA life duration (VPI) of 0x0 0x20 0xc4 0x9b IPSEC
(validate_proposal): transform proposal (prot 3, trans 3, hmac_alg 2)
not supported

ISAKMP (0): atts not acceptable. Next payload is 0
ISAKMP : Checking IPSec proposal 5

ISAKMP: transform 1, ESP_DES
ISAKMP: attributes in transform:
ISAKMP: authenticator is HMAC-MD5
ISAKMP: encaps is 1
ISAKMP: SA life type in seconds
ISAKMP: SA life duration (VPI) of 0x0 0x20 0xc4 0x9b
ISAKMP (0): atts are acceptable.
ISAKMP (0): bad SPI size of 2 octets!
ISAKMP : Checking IPSec proposal 6

ISAKMP: transform 1, ESP_DES
```

```
ISAKMP: attributes in transform:
crypto_isakmp_process_block: src 10.66.79.229, dest 10.66.79.69
OAK_QM exchange
crypto_isakmp_process_block: src 10.66.79.229, dest 10.66.79.69
OAK_QM exchange
oakley_process_quick_mode:
OAK_QM_AUTH_AWAIT
ISAKMP (0): Creating IPSec SAs
sv2-4(config)#
sv2-4(config)#
sv2-4(config)#
sv2-4(config)#
sv2-4(config)#show uauth
Current     Most    Seen
Authenticated Users 1  1
Authen In Progress  0  1
ipsec user 'testuser' at 192.168.1.1, authenticated
access-list #ACSACL#-PIX-VPNClient-3d327815
sv2-4(config)#show access-list
access-list 108; 1 elements
access-list 108 permit ip 10.1.1.0 255.255.255.0 192.168.1.0
255.255.255.0 (hitcnt=38)
access-list #ACSACL#-PIX-VPNClient-3d327815; 1 elements
access-list #ACSACL#-PIX-VPNClient-3d327815 permit ip any host
10.1.1.2 (hitcnt=15)
access-list dynacl4; 1 elements
access-list dynacl4 permit ip host 10.66.79.69
host 192.168.1.1 (hitcnt=0)
access-list dynacl5; 1 elements
access-list dynacl5 permit ip any host 192.168.1.1 (hitcnt=15)
sv2-4(config)#show access-list
access-list 108; 1 elements
access-list 108 permit ip 10.1.1.0 255.255.255.0
192.168.1.0 255.255.255.0 (hitcnt=42)
access-list #ACSACL#-PIX-VPNClient-3d327815; 1 elements
access-list #ACSACL#-PIX-VPNClient-3d327815 permit ip any
host 10.1.1.2 (hitcnt=17)
access-list dynacl4; 1 elements
access-list dynacl4 permit ip host 10.66.79.69 host
192.168.1.1 (hitcnt=0)
access-list dynacl5; 1 elements
access-list dynacl5 permit ip any host 192.168.1.1 (hitcnt=17)




sv2-4(config)#show crypto map

Crypto Map: "mymap" interfaces: { outside }
client configuration address respond
client authentication AuthInbound

Crypto Map "mymap" 10 ipsec-isakmp
Dynamic map template tag: dynmap

Crypto Map "mymap" 20 ipsec-isakmp
Peer = 10.66.79.229
access-list dynacl6; 1 elements
access-list dynacl6 permit ip host 10.66.79.69
host 192.168.1.1 (hitcnt=0)
dynamic (created from dynamic map dynmap/10)
Current peer: 10.66.79.229
Security association lifetime: 4608000 kilobytes/28800 seconds
PFS (Y/N): N
Transform sets={ myset, }

Crypto Map "mymap" 30 ipsec-isakmp
```

```
Peer = 10.66.79.229
access-list dynacl7; 1 elements
access-list dynacl7 permit ip any host 192.168.1.1 (hitcnt=0)
dynamic (created from dynamic map dynmap/10)
Current peer: 10.66.79.229
Security association lifetime: 4608000 kilobytes/28800 seconds
PFS (Y/N): N
Transform sets={ myset, }
sv2-4(config)
```

Related Information

- **PIX Support Page**
- **Documentation for PIX Firewall**
- **PIX Command References**
- **Requests for Comments (RFCs)** ⬈
- **Cisco Secure ACS for UNIX Support Page**
- **Documentation for Cisco Secure ACS for UNIX**
- **Cisco Secure ACS for Windows Support Page**
- **Documentation for Cisco Secure ACS for Windows**
- **TACACS/TACACS+ Support Page**
- **TACACS+ in IOS Documentation**
- **RADIUS Support Page**
- **RADIUS in IOS Documentation**
- **Technical Support & Documentation – Cisco Systems**