IPSec VPN for Cisco PIX 515E to 3Com X-family unit

Document Version:	1.0
Publication Date:	14 March 2007
Description:	Configuring site-to-site VPNs from Cisco PIX 515E to 3Com X-family unit
Product:	3Com X-family unit
3Com TOS Version:	2.5.0.6688
Cisco PIX 515E Software Version:	6.3(1)

1 Overview

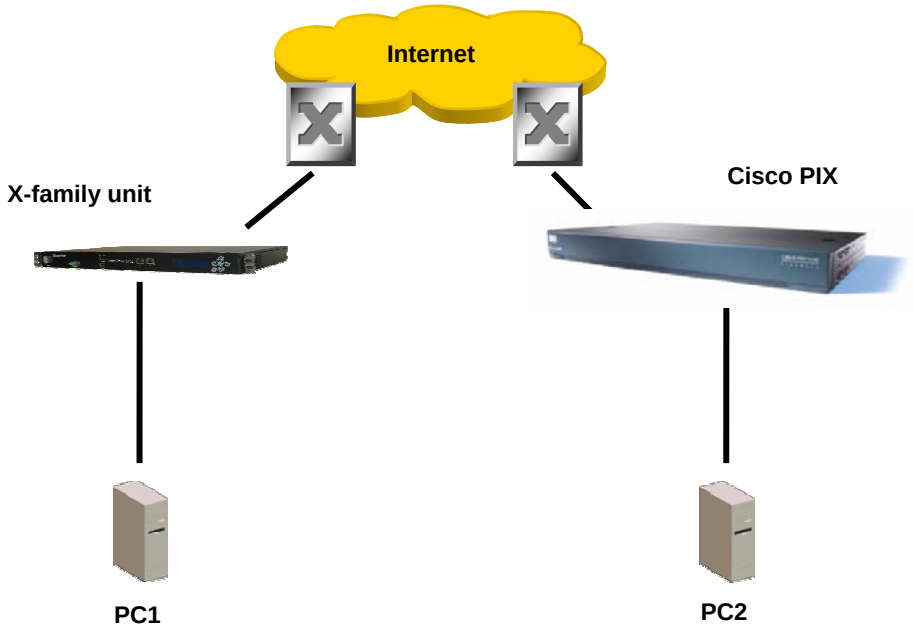
This technical note describes how to setup IPSec VPN tunnels between a 3Com X-family unit and the Cisco PIX 515E.

Both Main Mode and Aggressive Mode deployments are shown. Main Mode is more secure and hence is recommended when both sites have a static IP address. Aggressive mode can be used if one IP address is dynamic.

This document only describes “shared-secret/pre-shared-key” setup, not the alternative method using X.509 certificates.

2 Connection

This diagram shows the Cisco PIX 515E and an X-family unit connected via the Internet – actually a simple router in my configuration. Each device has a PC connected to its LAN interface – to be used both for configuration and for testing purposes.



Addresses are:

Device	Interface	Address	Mask	Gateway
Router	1 (to X-family)	10.10.20.1	255.255.255.0	
Router	2 (to PIX)	10.10.10.1	255.255.255.0	
X-family	external	10.10.20.147	255.255.255.0	10.10.20.1
Cisco PIX	external	10.10.10.147	255.255.255.0	10.10.10.1
PC1		192.168.1.100	255.255.255.0	192.168.1.254
PC2		192.168.22.100	255.255.255.0	192.168.22.254

3 Pre-Configuration before setting up VPNs

3.1 3Com X-family unit Pre-Configuration

3.1.1 Initial Setup via the OBE

Setup the user account and then set the basic configuration as follows. The dialogue shown is the OBE ("Out of Box Experience") on the Command Line Interface – alternatively this could be set up using the OBE on the Graphical User Interface).

```
Your super-user account has been created.
You may continue initial configuration by logging into your device.
After logging in, you will be asked for additional information.

Login: topuser
Password: t0p--us3r

Entering Setup wizard...

Enter Host Name [myhostname]: 3KB_X_unit_1
Enter Host Location [room/rack]: Lab

         Host Name: 3KB_X_unit_1
     Host Location: Lab
Enter [A]ccept, [C]hange, or [E]xit without saving [C]: a

Timekeeping options allow you to set the time zone, enable or disable
daylight saving time, and configure or disable NTP.

Would you like to modify timekeeping options? <Y,[N]>:

The X-Series device may be configured into a number of well known
network deployments.

Would you like to modify the network deployment mode? <Y,[N]>:

Virtual interfaces define how this device integrates with the IP layer 3
network.  You must configure one virtual interface for every IP subnet
that is directly connected to the X-Series device.  For example, you need
one for the WAN connection (external virtual interface) and one for every
directly connected network subnet (internal virtual interfaces).

Would you like to modify virtual interfaces? <Y,[N]>:y

Virtual interfaces:
Id  Type      Mode    IP Address      Subnet Mask      NAT
 1  internal  static  192.168.1.254   255.255.255.0    external-ip
 2  external  dhcp                          disable
 3  <empty>
```

```
 4  <empty>
 5  <empty>
 6  <empty>

Enter [A]ccept, [C]hange, [R]emove or [E]xit without saving [C]:
Enter the number of the entry you want to change []: 2
Mode (static, dhcp, pppoe, pptp, l2tp) [dhcp]: sta
IP address []: 10.10.20.147
Mask [255.255.255.0]:

Virtual interfaces:
Id  Type      Mode    IP Address       Subnet Mask      NAT
 1  internal  static  192.168.1.254    255.255.255.0    external-ip
 2  external  static  10.10.20.147     255.255.255.0    disable
 3  <empty>
 4  <empty>
 5  <empty>
 6  <empty>

Enter [A]ccept, [C]hange, [R]emove or [E]xit without saving [C]: a

You must configure a default gateway manually if external virtual interface is static.

Would you like to modify default gateway? <Y,[N]>:y
Default Gateway [0.0.0.0]: 10.10.20.1

Security zones enable you to section your network logically into security
domains.  As network traffic travels between zones, it is routed and
security-scanned by the firewall and IPS according to the policies you
define.  You need to create security zones that naturally map onto your
intended network security boundaries.  A security zone may or may not be
connected (mapped) to a virtual interface.

Would you like to modify security zones? <Y,[N]>:

Would you like to modify security zone to virtual interface mapping? <Y,[N]>:

DNS (Domain Name Service) is a system which translates computer hostnames
to IP addresses. The X-Series device requires DNS configuration in order
to perform web filtering.

Would you like to configure DNS? <Y,[N]>:

Firewall policy rules control the flow of network traffic between
security zones.  Firewall policy rules control traffic flow based
on source and destination security zones and network protocol.

Would you like to modify firewall policy rules? <Y,[N]>:

SMS-based configuration allows the device to retrieve the configuration
for a secure management VPN to the SMS system.  This ensures that
the device can be managed securely from the SMS
```

Would you like to enable SMS-based configuration? <Y,[N]>:

If you wish to run this wizard again, use the 'setup' command.

3KB_X_unit_1#

Notes:

Virtual Interfaces - There are two virtual interfaces (external and internal) set up as factory default. The only configuration required on them is to set the IP addresses. (In the example, I have kept the internal IP address as default and changed the external IP address).

Security Zones – The factory default configuration sets the LAN security zone to be on Port 1 and linked to the internal Virtual Interface. The WAN security zone is on the last port (Port 4 on an X505 or port 6 on the X506 and X5) and is linked to the external virtual interface. No change is needed to this.

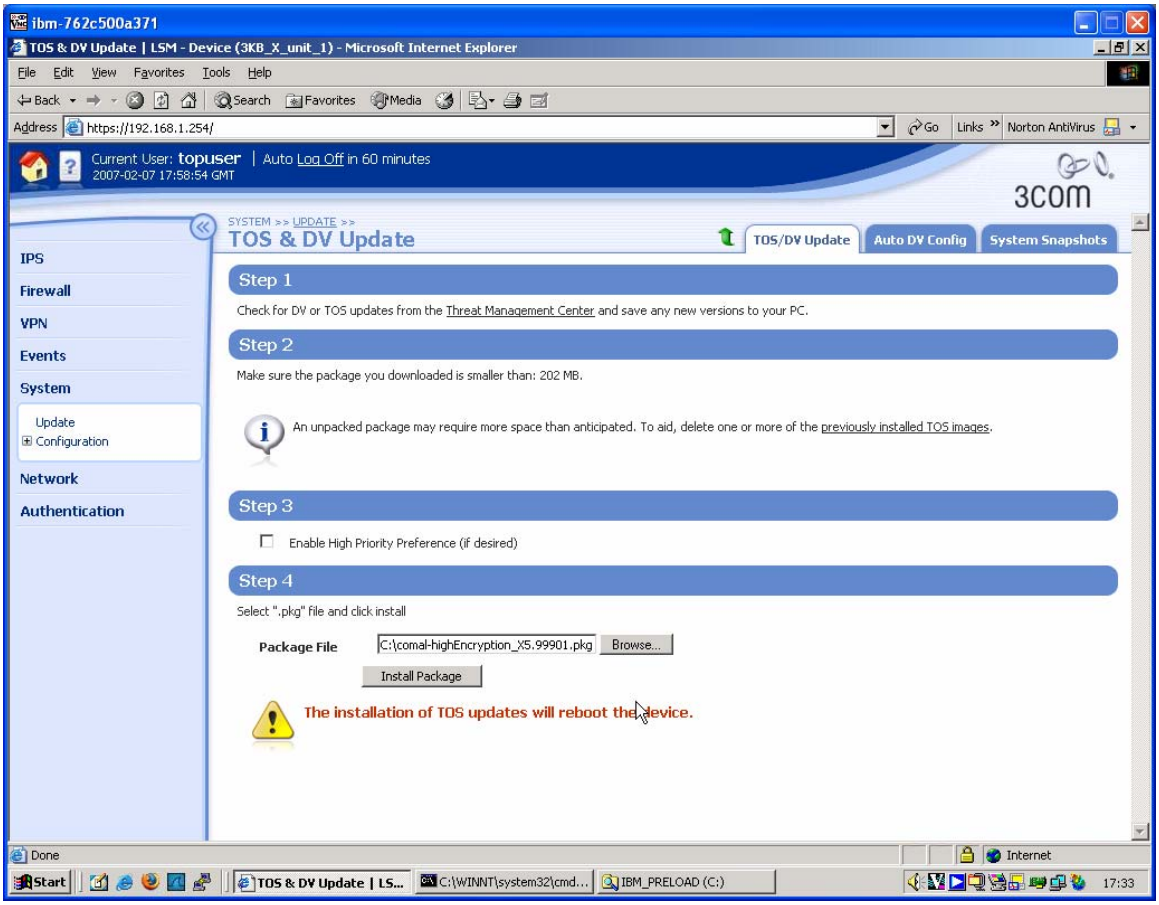
Firewall rules – the firewall rules in the factory default configuration will be sufficient – specifically this one:

2 permit WAN this-device vpn-protocols

3.1.2 Load the High Encryption Token

When delivered from the factory, the X-family units are capable of encryption levels up to a key size of 64 bits (e.g. DES). To enable higher encryption key sizes to be used (e.g. 3DES, AES) a High Encryption "token" package must be loaded onto the device. This package is only available to approved end users in approved locations.

1. Acquire the High Encryption package from the TMC and load it onto PC1.
2. Open a browser on PC1, connect to https://192.168.1.254 and login as the user you set up during the OBE.
3. Navigate to System -> Update, open the "TOS/DV Update" tab and complete the form as shown below with the path of the High Encryption package on PC1. Click "Install Package".



4. The package will be installed and the X series device will reboot. The X-family unit is ready to set up the VPN when reboot has completed.

3.2 Cisco PIX 515E Pre-Configuration

1. The initial setup must be started via a serial connection from PC2 to the PIX Console port. To ensure a known starting point, clear the flash:

```
CiscoPIX> enable
Password: ***********
CiscoPIX# write erase
Erase PIX configuration in flash memory? [confirm]
CiscoPIX#
```

2. Reboot the PIX to clear the memory to factory default state.

```
CiscoPIX# reload
Proceed with reload? [confirm]

Rebooting..
```

3. The PIX will now reboot. When it comes back up, respond as shown below.

```
re-configure PIX Firewall now through interactive prompts [yes]?
Enable password [<use current password>]: t0p—us3r
Clock (UTC):
  Year [1993]: 2007
  Month [Jan]: Feb
  Day [1]: 16
  Time [00:00:02]: 13:27:00
Inside IP address: 192.168.22.254
Inside network mask: 255.255.255.0
Host name: CiscoPIX
Domain name: OTHER
IP address of host running PIX Device Manager: 192.168.22.100

The following configuration will be used:
Enable password: toppass
Clock (UTC): 13:27:00 Feb 16 2007
Inside IP address: 192.168.22.254
Inside network mask: 255.255.255.0
Host name: CiscoPIX
Domain name: OTHER
IP address of host running PIX Device Manager: 192.168.22.100

Use this configuration and write to flash? yes
Building configuration...
Cryptochecksum: 5f3b4a81 fdf56edc 8ad543ed 2bc123e6
[OK]

Type help or '?' for a list of available commands.
CiscoPIX>
```

4. Now enable interface ethernet0 and set the “outside” (i.e. WAN) IP address and default gateway….

```
CiscoPIX>enable
Password: ***********
```

```
CiscoPIX# conf t
CiscoPIX(config)# interface ethernet0 auto
CiscoPIX(config)# ip address outside 10.10.10.147 255.255.255.0
CiscoPIX(config)# route outside 0 0 10.10.10.1
CiscoPIX(config)#
```

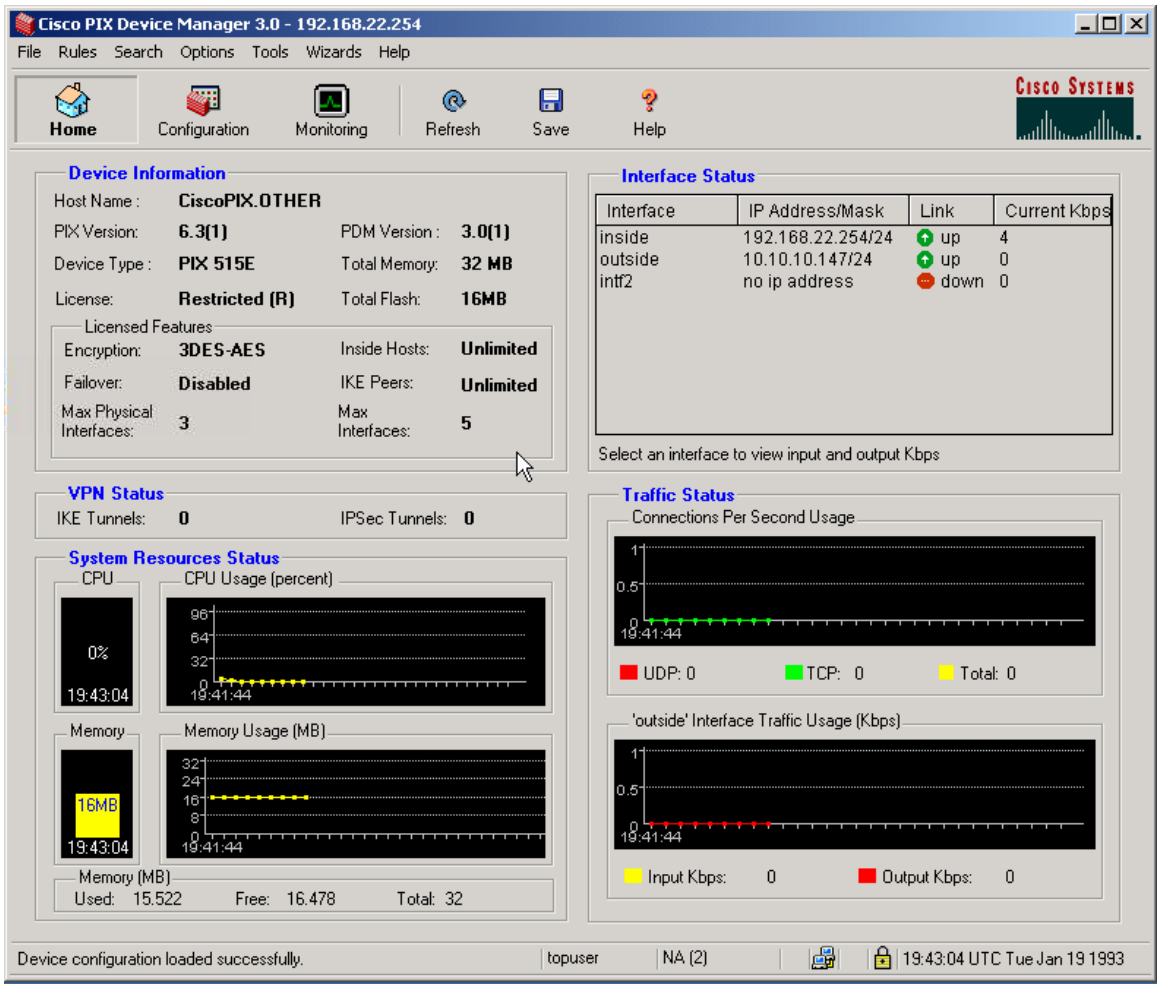
5. …and create a user…

```
CiscoPIX(config)# username topuser password toppass
CiscoPIX(config)# quit
CiscoPIX#
```

6. …and save the changes.

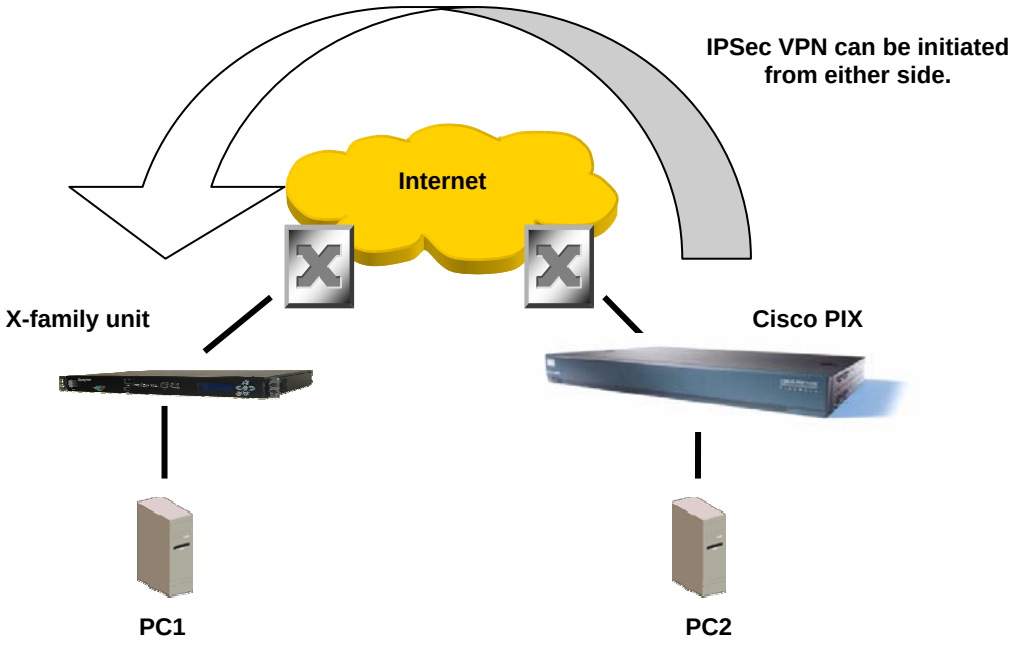
```
CiscoPIX# write mem
Building configuration...
Cryptochecksum: 124cead0 7898f7ae 3062006e e57fa823
[OK]
CiscoPIX#
```

7. Check that you can access the PIX web management interface from PC2. (N.B. You may have to install Java on PC2 first.) Browse to https://192.168.22.254. Logon as topuser, password toppass. The following screen should be displayed.



4 Configuring Main Mode Tunnel

This example shows how to configure an IPSec tunnel using Main Mode between the 3Com X-family unit and a Cisco PIX 515E. Main Mode is the recommended setting when both devices have static IP addresses that can be accessed from the public internet.

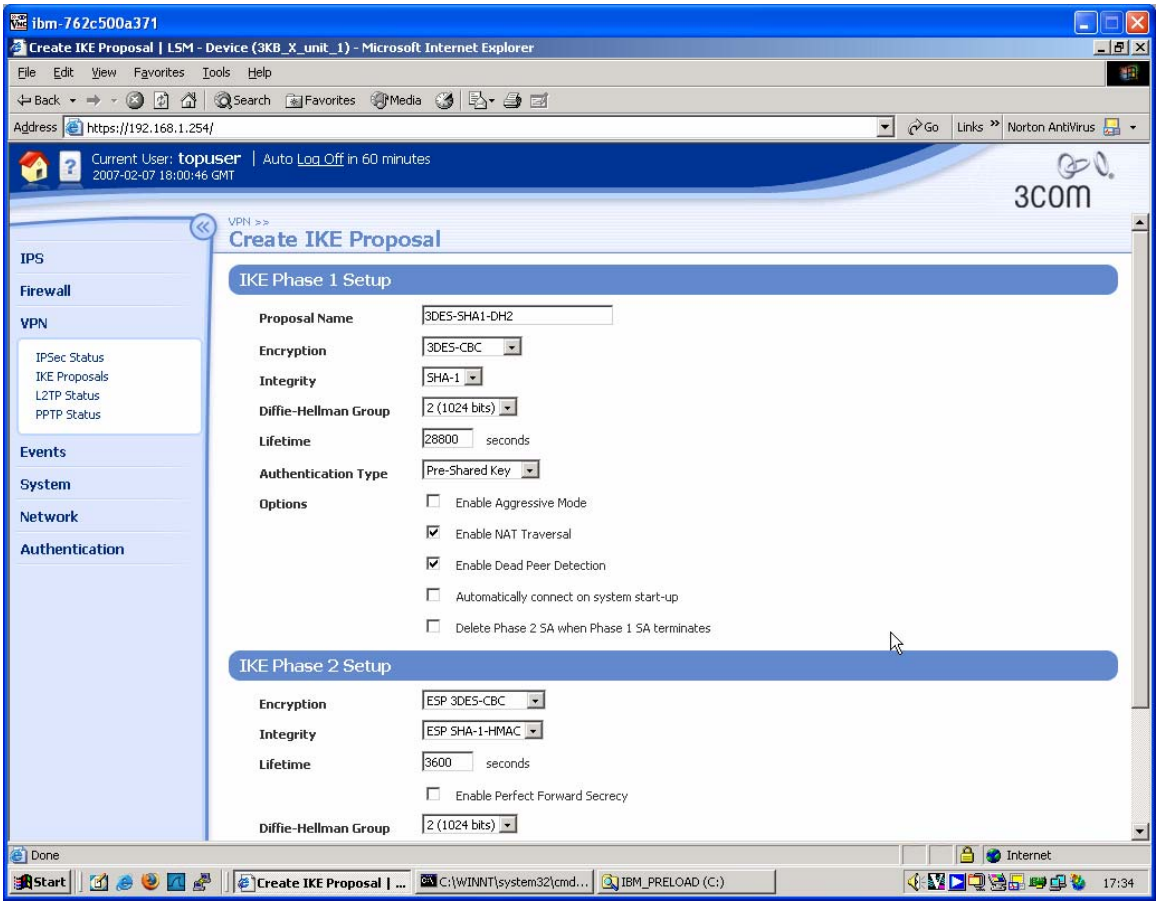


Key Setup Information

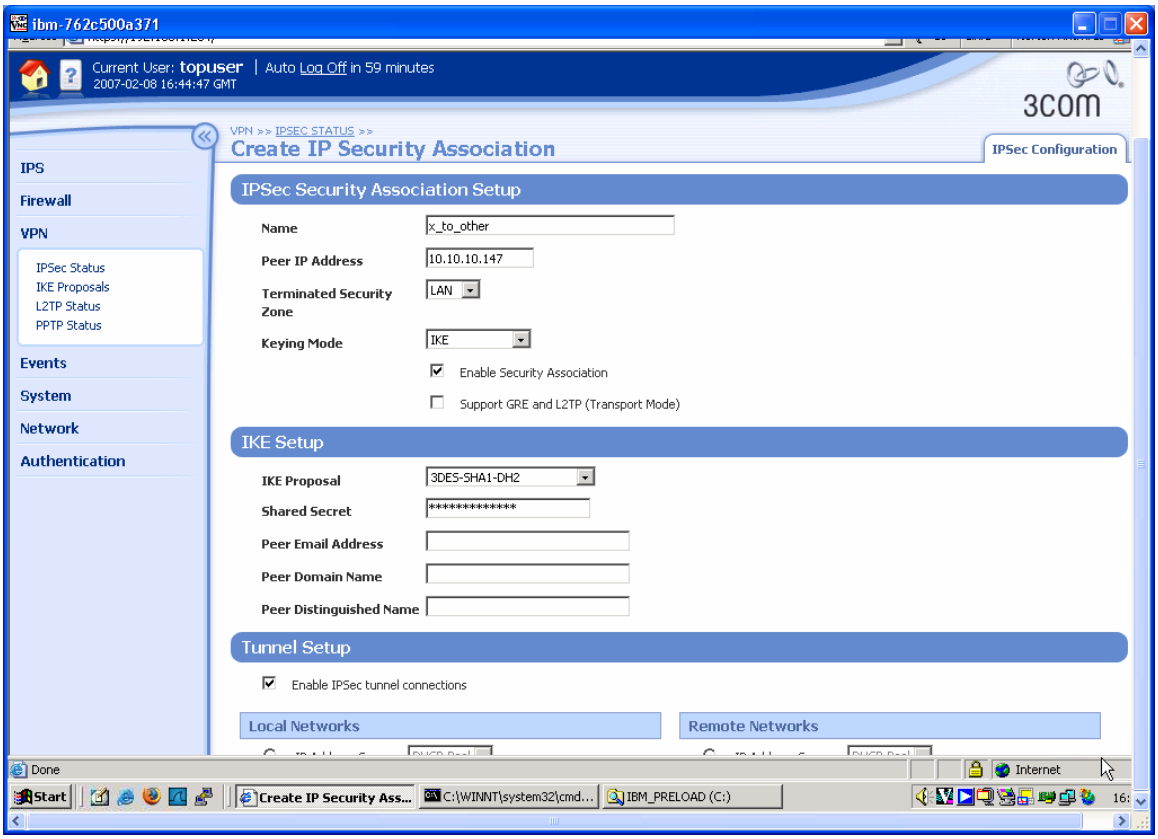
Keying Mode	IKE
IKE Mode	Main Mode
SA Authentication Method	Pre-shared Key
Keying Group DH	DH (Diffie Hellman) Group 2
Encryption and Data Integrity	3DES-SHA1

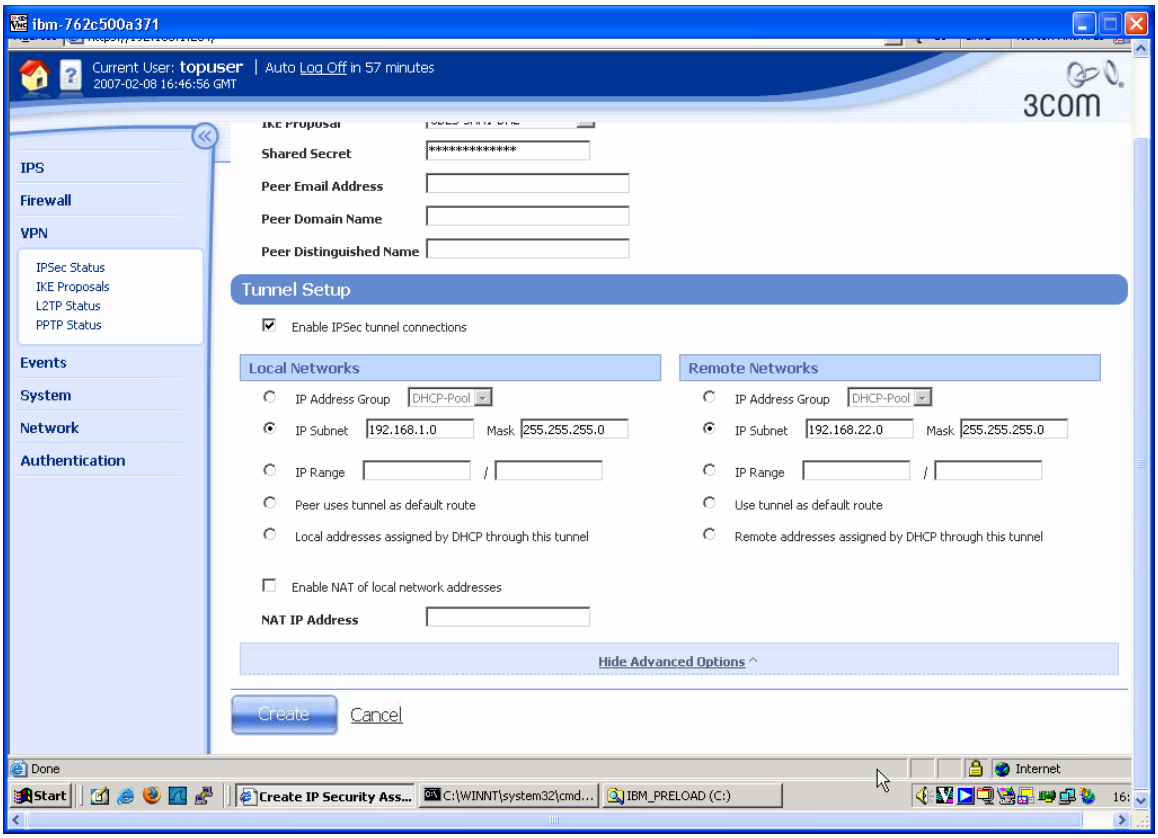
4.1 3Com X-family unit VPN Configuration

1. Open a browser on PC1, connect to https://192.168.1.254 and login as the user you set up during the OBE.
2. Navigate to VPN -> IKE Proposals. You will see one default proposal for DES-SHA1-PSK but we do not want to use this as it does not provide a suitably high level of security so click on the "Create IKE Proposal" button to create a new proposal. Complete the form that opens as shown below.



3. Click "Create" to save the new IKE Proposal.
4. Navigate to VPN -> IPSEC Status and click on the "IPSEC Configuration" tab.
5. Click the Enable IPSEC Global VPNs checkbox and click the Apply button.
6. On the IPSEC Configuration screen you will see one Security Association called "Default" displayed but we will not be using this as it is mainly used with IPSec clients on remote PCs, so click the Create IPSec Association button to create a new Security Association. Complete the form that opens as shown below – there are two screen grabs because the form is too large to fit in a single screen. Note also that the "Shared Secret" string entered here must be at least 8 characters and must be exactly the same as the shared secret entered on the peer device.

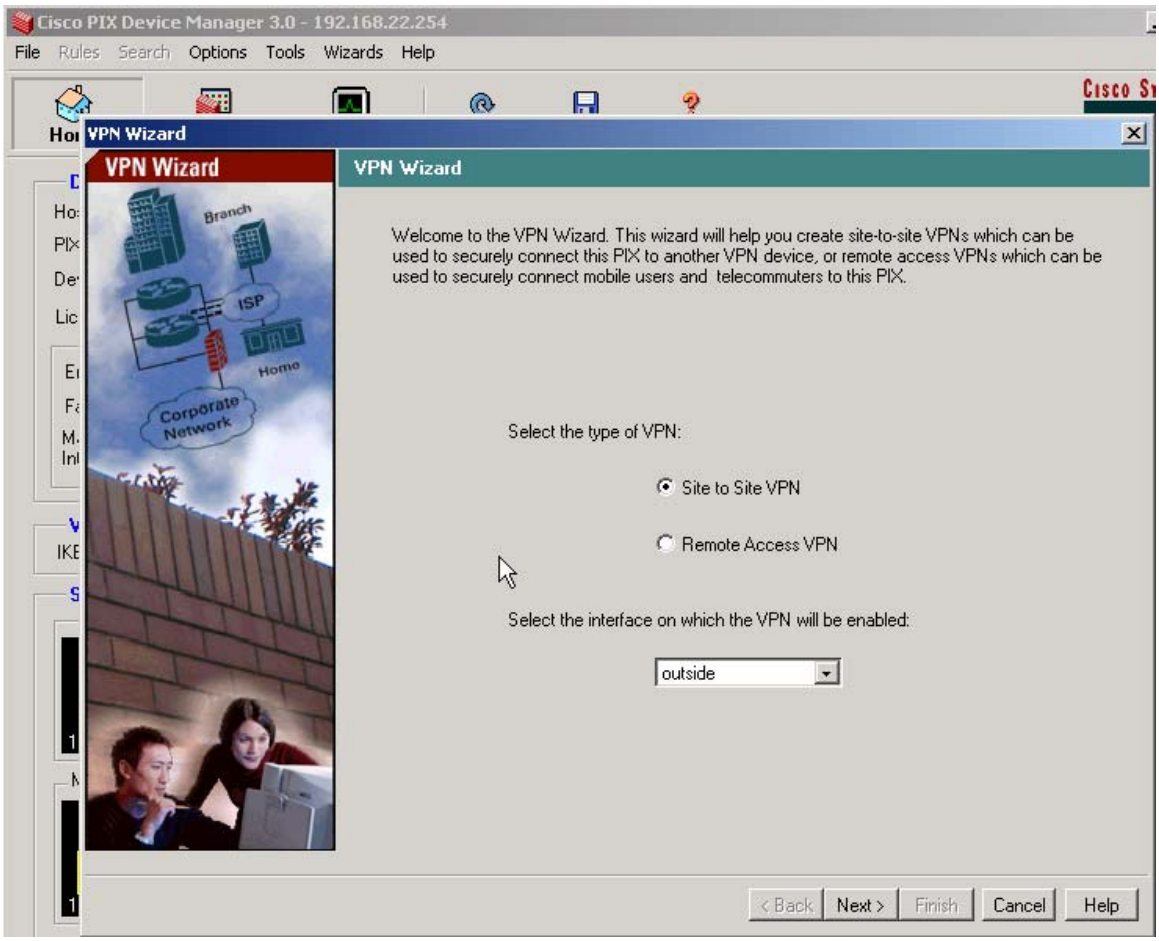




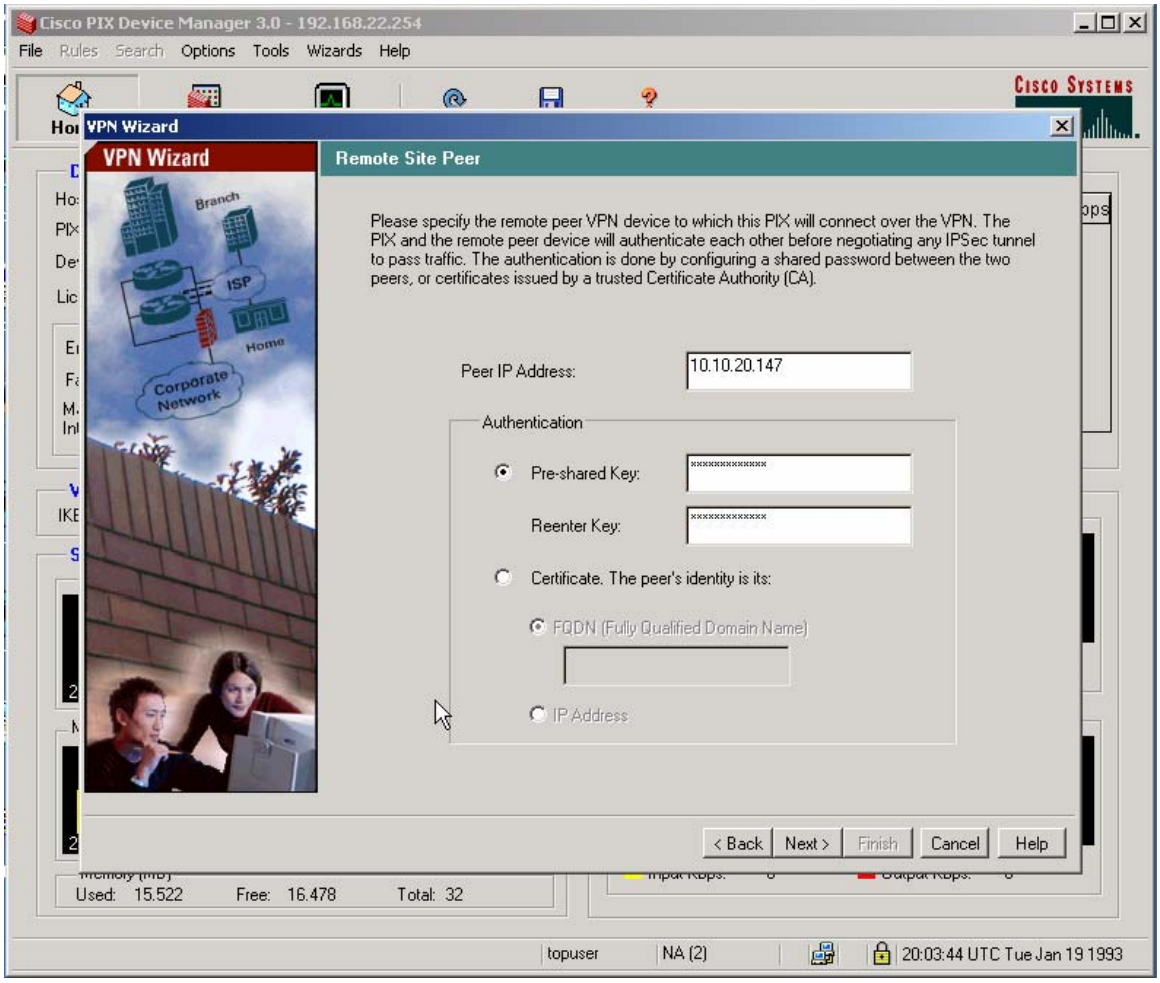
7. Click “Create” to save the new Security Association.

4.2 Cisco PIX 515E Configuration

1. Open the web browser on PC2, navigate to https://192.168.22.254 and login as topuser with password toppass as before. Select the VPN Wizard from the Wizard drop-down menu and complete each page in turn as shown below.

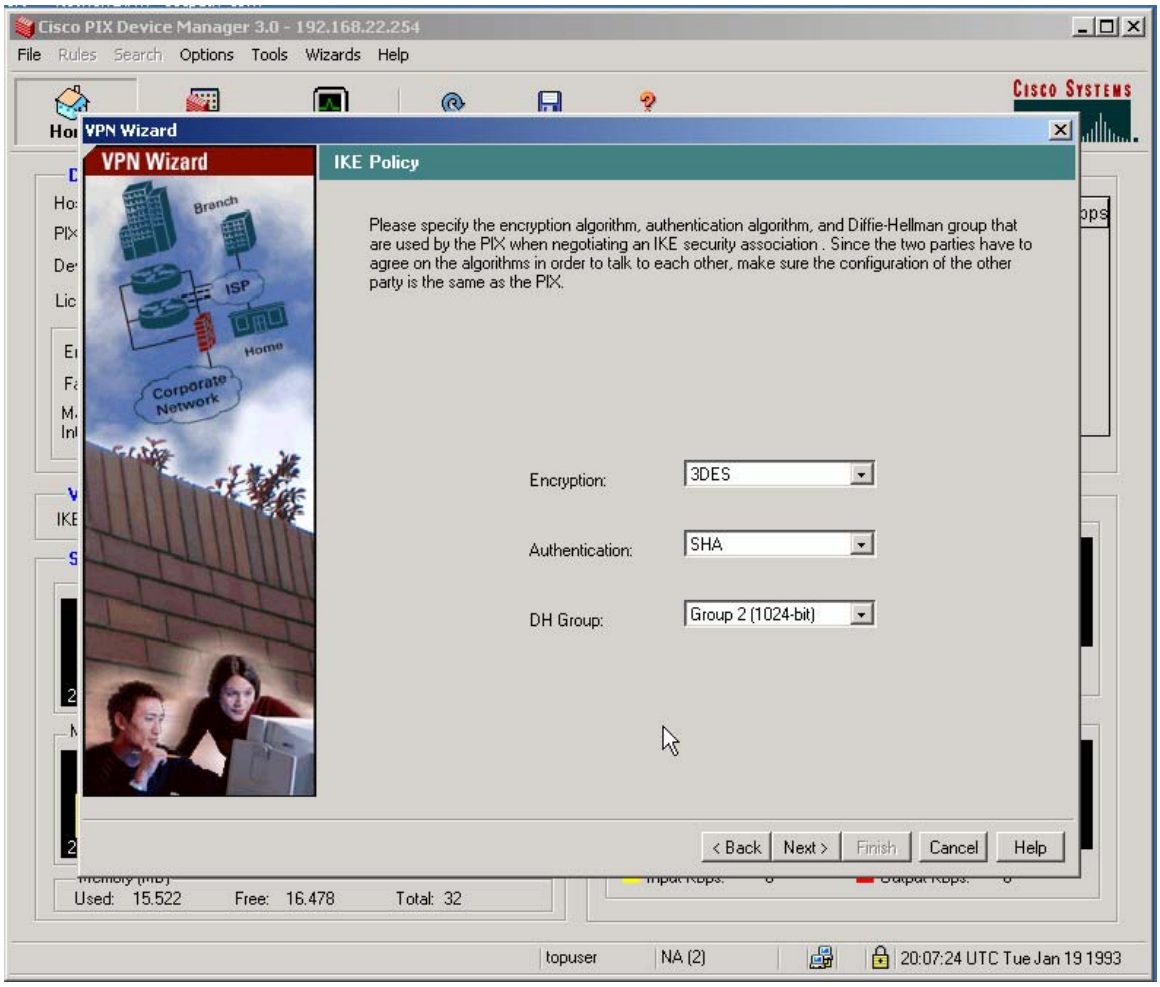


Click Next…

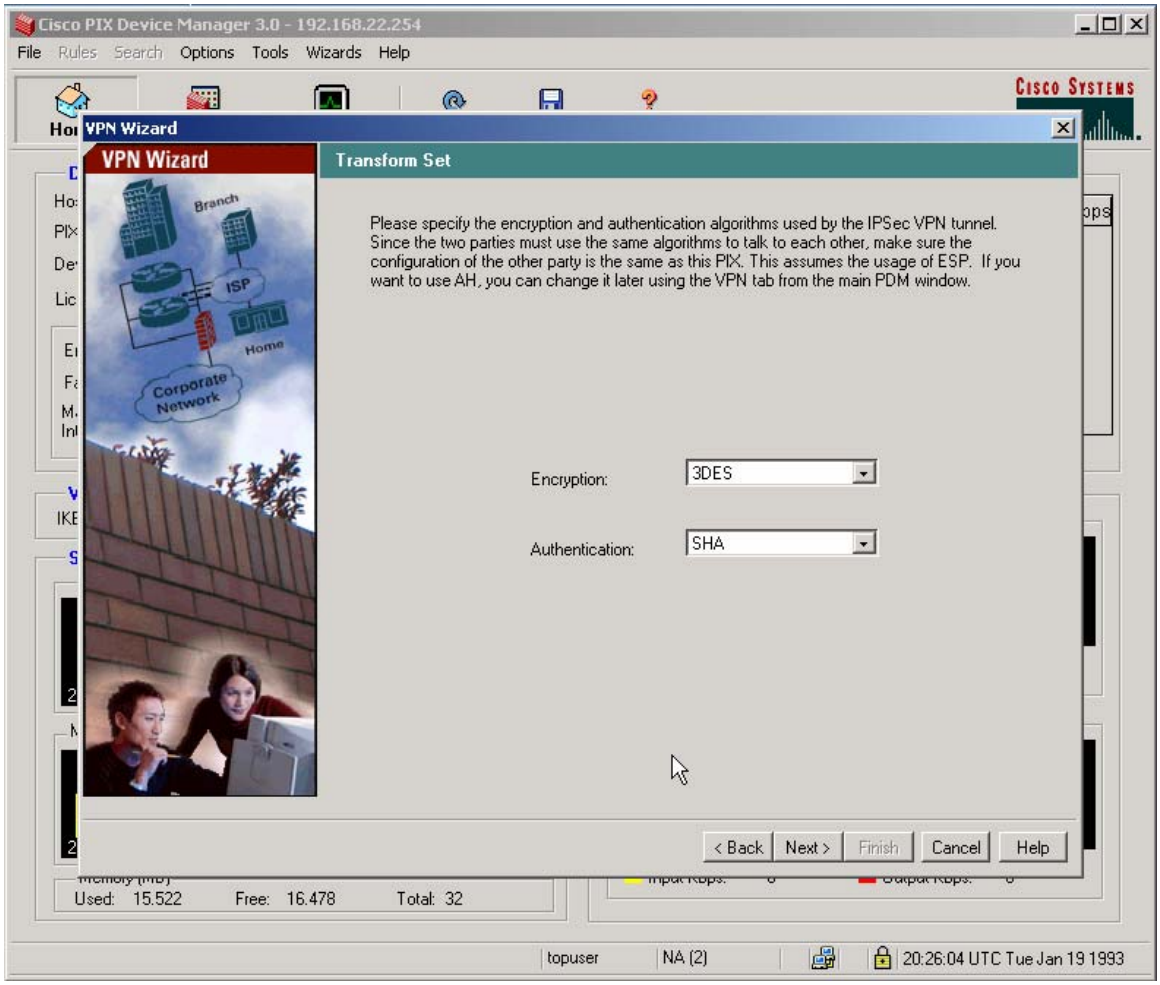


Note that the “Pre-shared Key” string entered here must be exactly the same as the Shared Secret entered on the X-family device

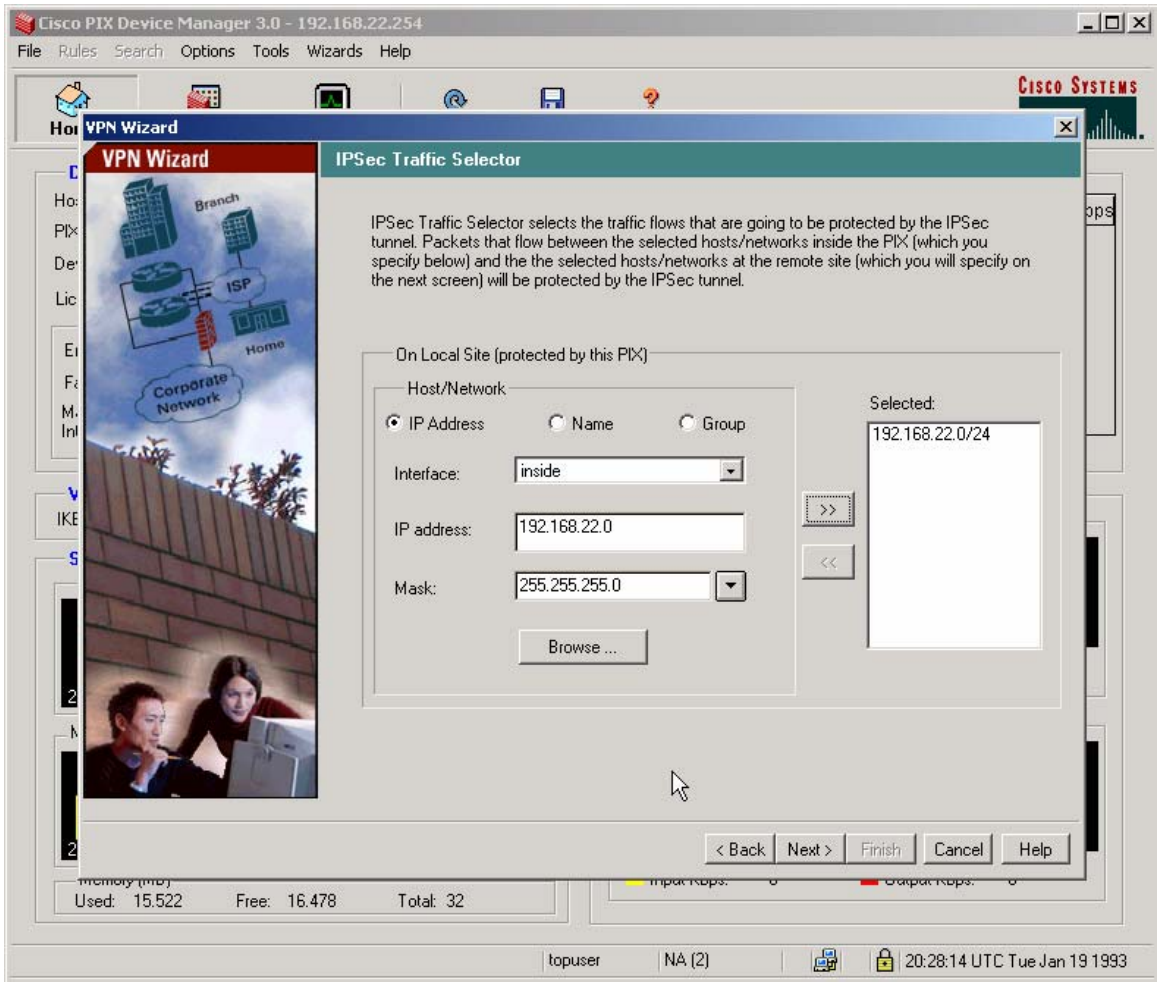
Click Next.


Cisco PIX Device Manager 3.0 - 192.168.22.254
File Rules Search Options Tools Wizards Help
Cisco Systems
VPN Wizard
VPN Wizard
Branch
ISP
Home
Corporate Network
IKE Policy
Please specify the encryption algorithm, authentication algorithm, and Diffie-Hellman group that are used by the PIX when negotiating an IKE security association. Since the two parties have to agree on the algorithms in order to talk to each other, make sure the configuration of the other party is the same as the PIX.
Encryption: 3DES
Authentication: SHA
DH Group: Group 2 (1024-bit)
< Back
Next >
Finish
Cancel
Help
Used: 15.522 Free: 16.478 Total: 32
topuser
NA (2)
20:07:24 UTC Tue Jan 19 1993

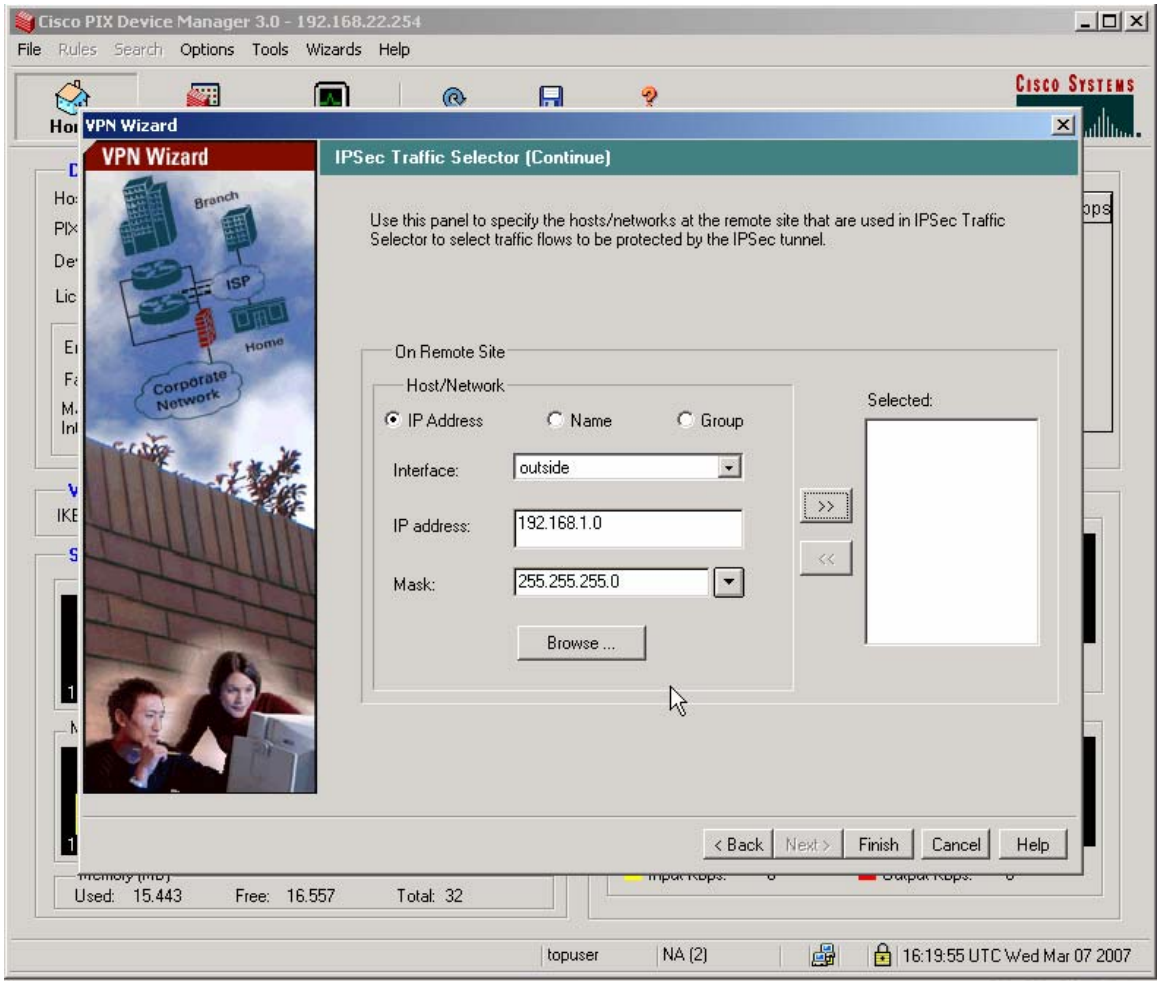
Click Next.


Cisco PIX Device Manager 3.0 - 192.168.22.254
File Rules Search Options Tools Wizards Help
Cisco Systems
VPN Wizard
VPN Wizard
Transform Set
Branch
ISP
Home
Corporate Network
Please specify the encryption and authentication algorithms used by the IPSec VPN tunnel. Since the two parties must use the same algorithms to talk to each other, make sure the configuration of the other party is the same as this PIX. This assumes the usage of ESP. If you want to use AH, you can change it later using the VPN tab from the main PDM window.
Encryption:
3DES
Authentication:
SHA
< Back
Next >
Finish
Cancel
Help
Used: 15.522
Free: 16.478
Total: 32
topuser
NA (2)
20:26:04 UTC Tue Jan 19 1993

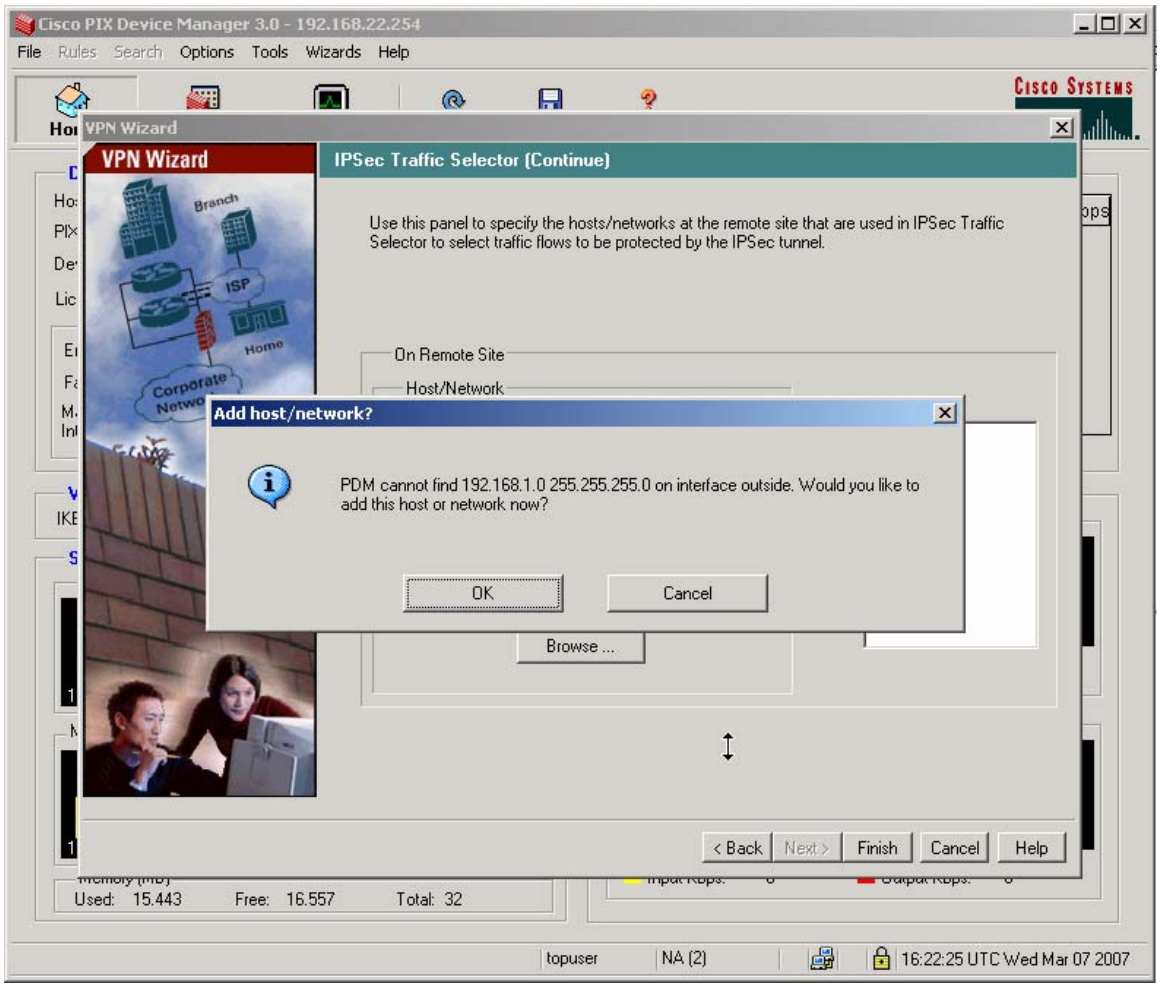
Click Next.



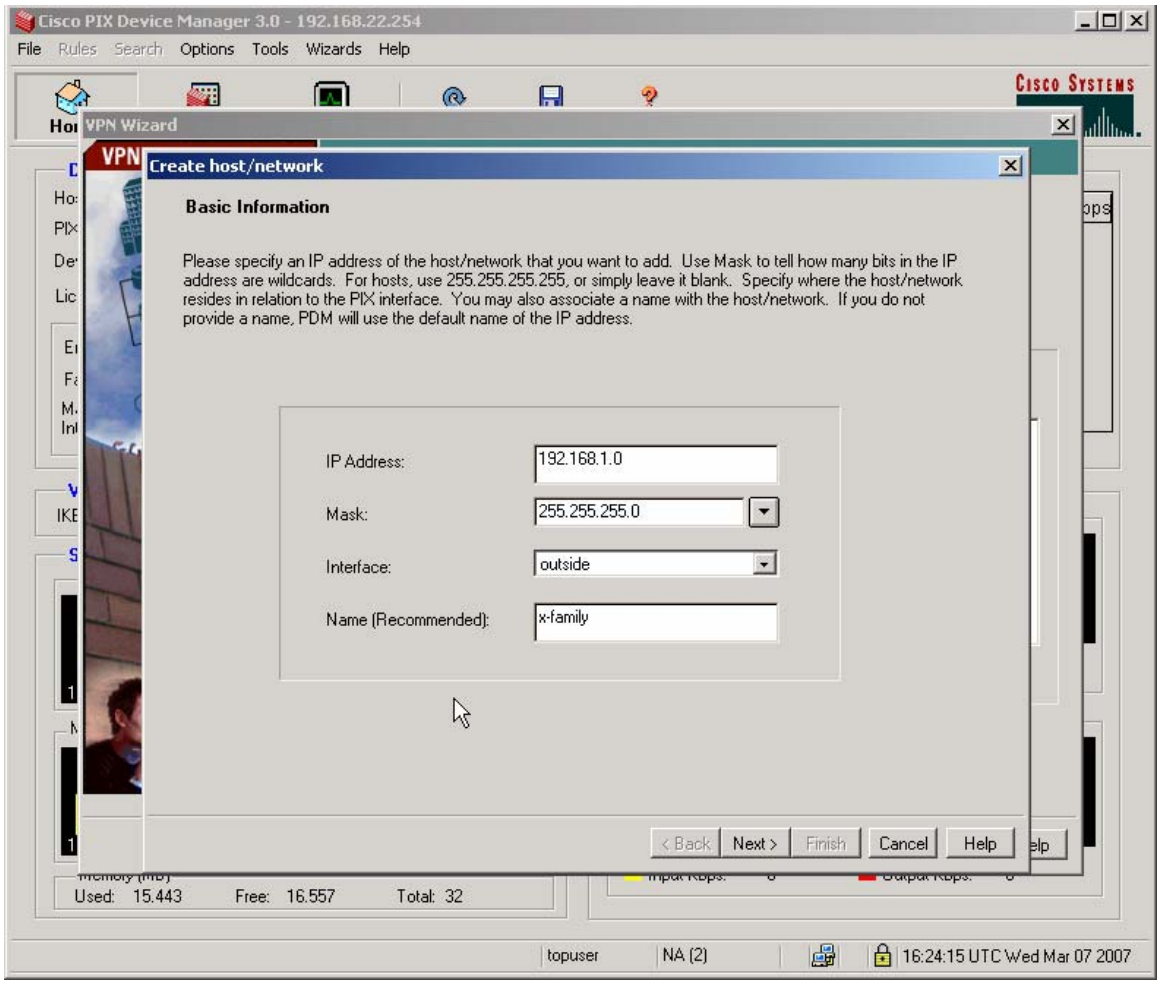
Click the >> button to put the network into the Selected box as shown, then click Next.



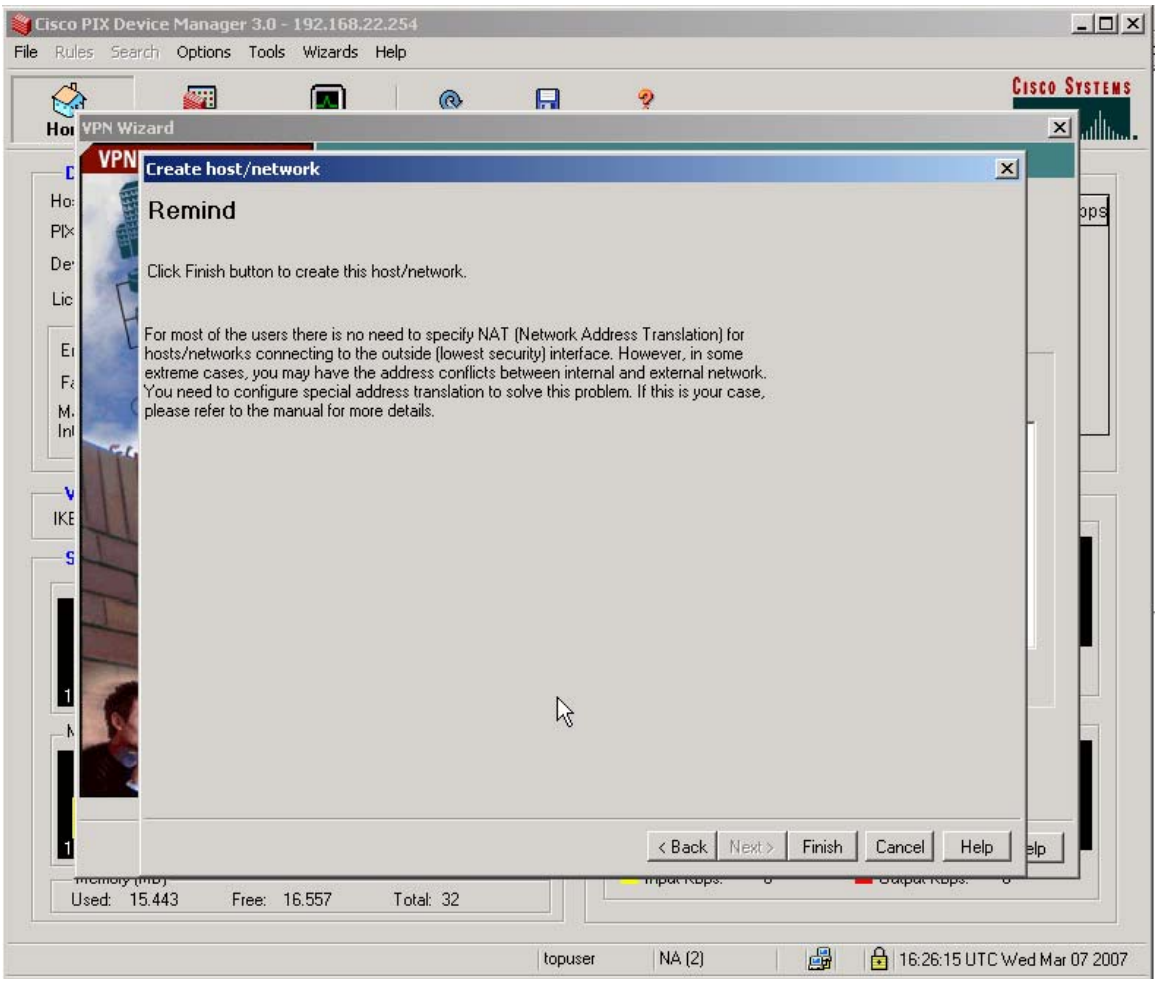
Click the >> button.



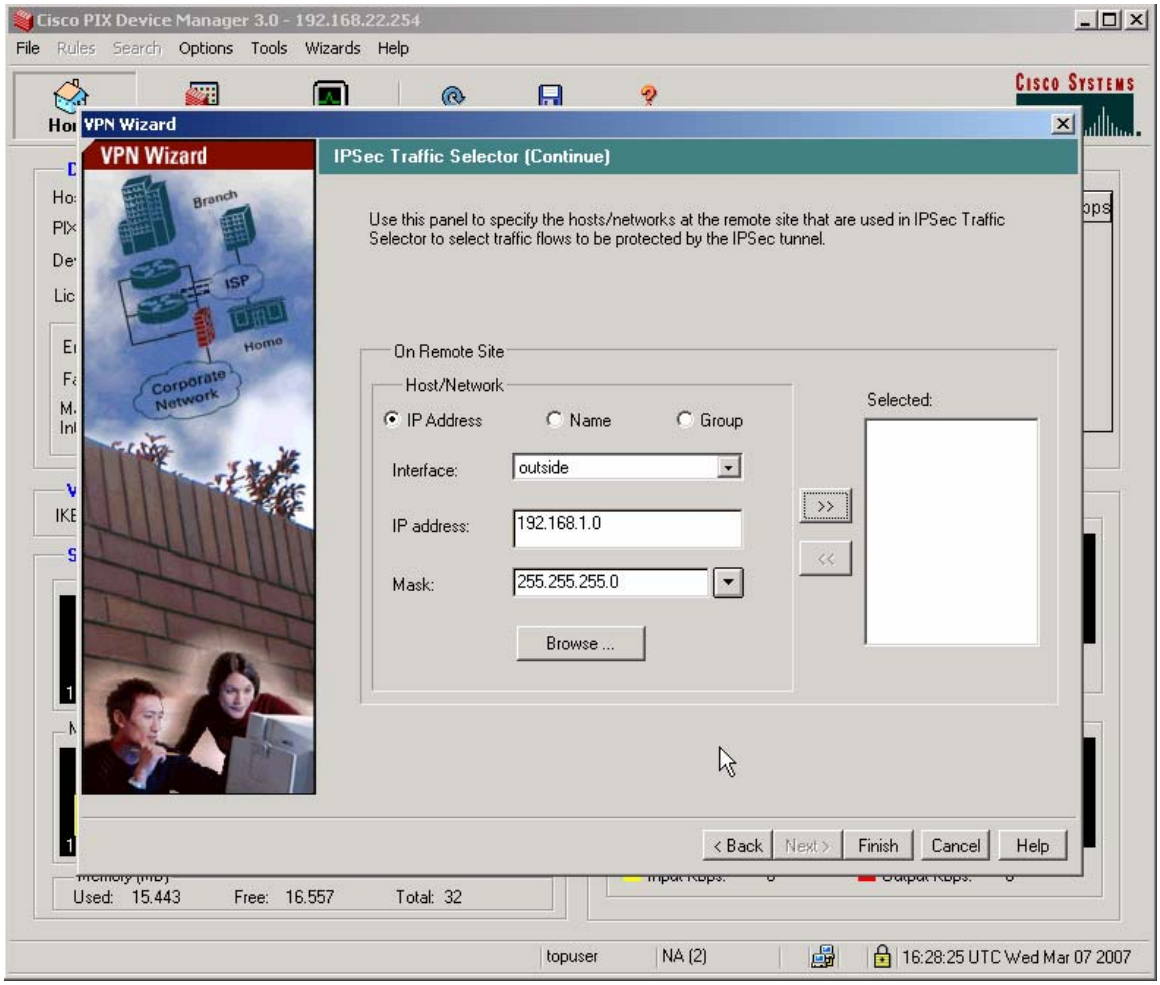
Click the OK button on the popup.


Cisco PIX Device Manager 3.0 - 192.168.22.254
File Rules Search Options Tools Wizards Help
Cisco Systems
VPN Wizard
VPN
Create host/network
Basic Information
Please specify an IP address of the host/network that you want to add. Use Mask to tell how many bits in the IP address are wildcards. For hosts, use 255.255.255.255, or simply leave it blank. Specify where the host/network resides in relation to the PIX interface. You may also associate a name with the host/network. If you do not provide a name, PDM will use the default name of the IP address.
IP Address:
192.168.1.0
Mask:
255.255.255.0
Interface:
outside
Name (Recommended):
x-family
< Back
Next >
Finish
Cancel
Help
Used: 15.443
Free: 16.557
Total: 32
topuser
NA (2)
16:24:15 UTC Wed Mar 07 2007

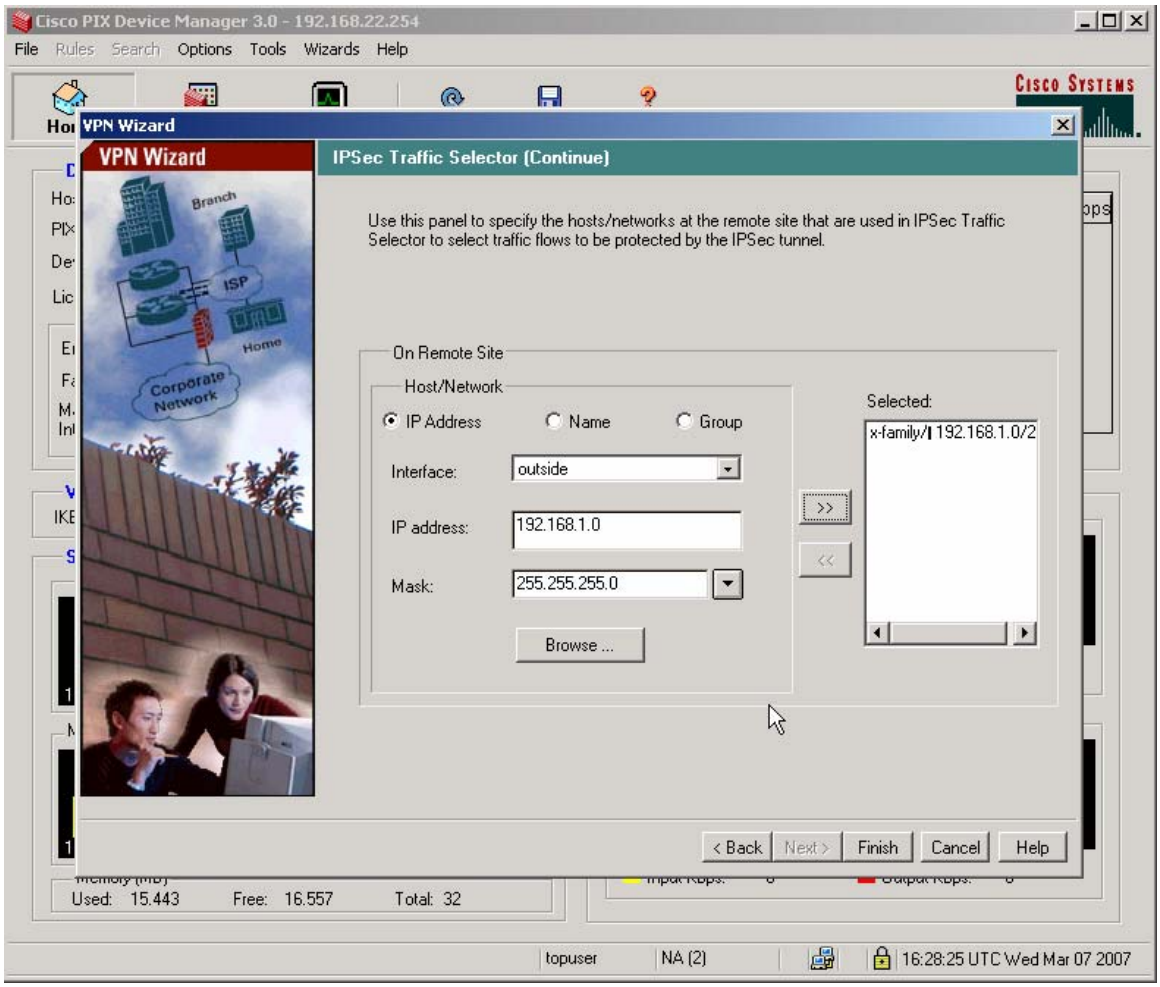
Click Next.



Click Finish.

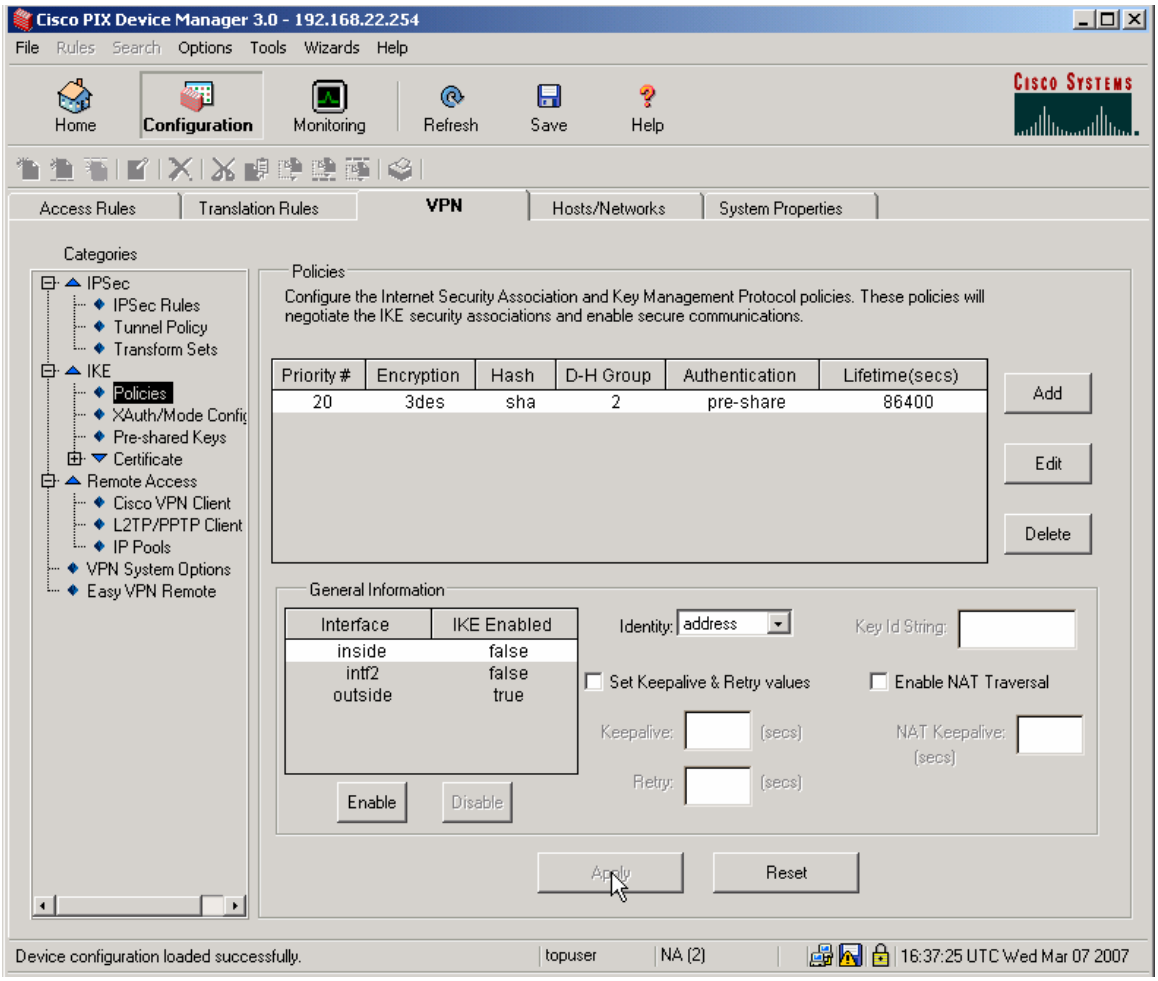


Click on the >> button.

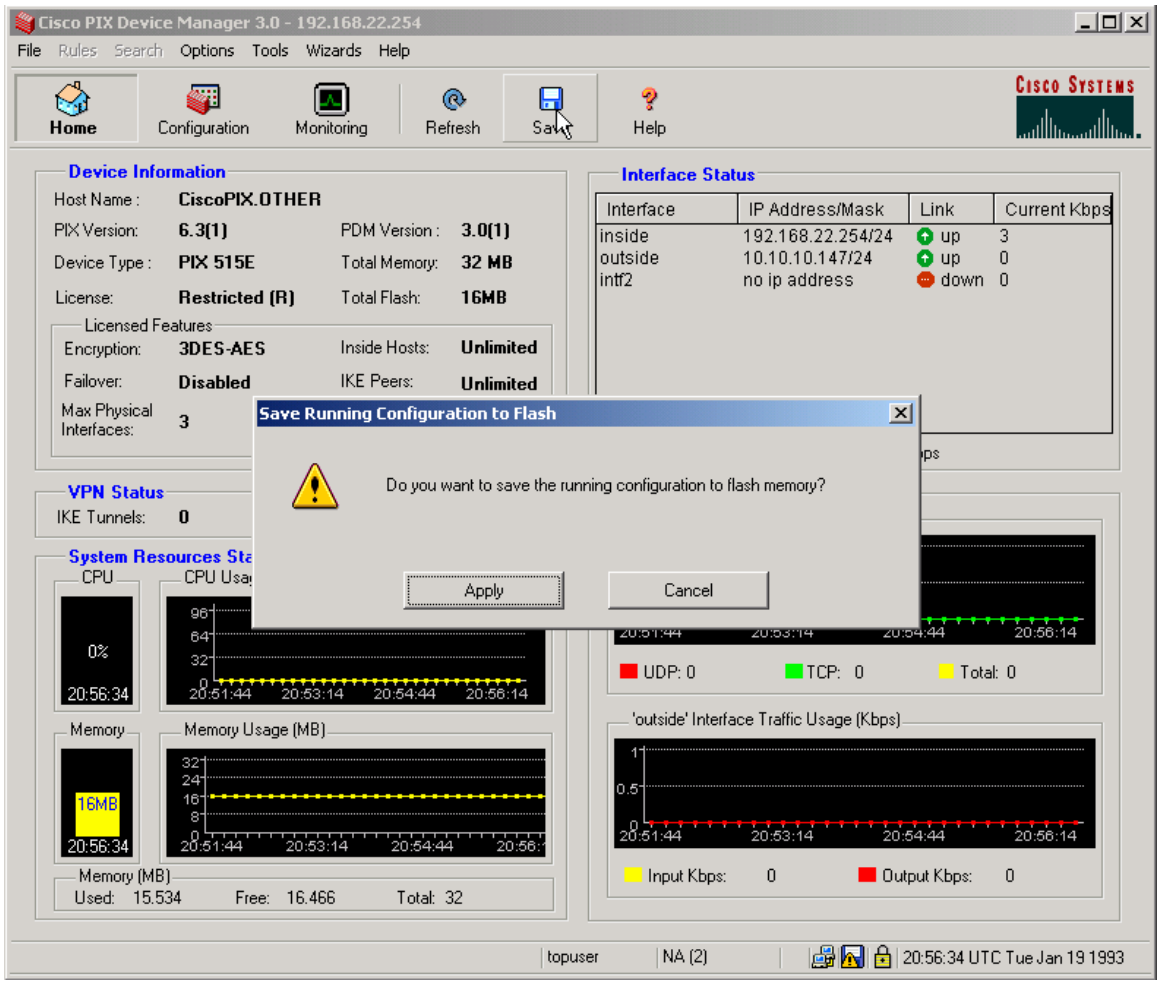


Click Finish.

2. The PIX uses hostname as the default Phase 1 Identity – this clashes with the X-family which uses ip address. So click the Configuration button and go to the VPN Tab and select IKE->Policies from the menu on the left. Select “address” from the drop-down Identity menu as shown below and click the Apply button.



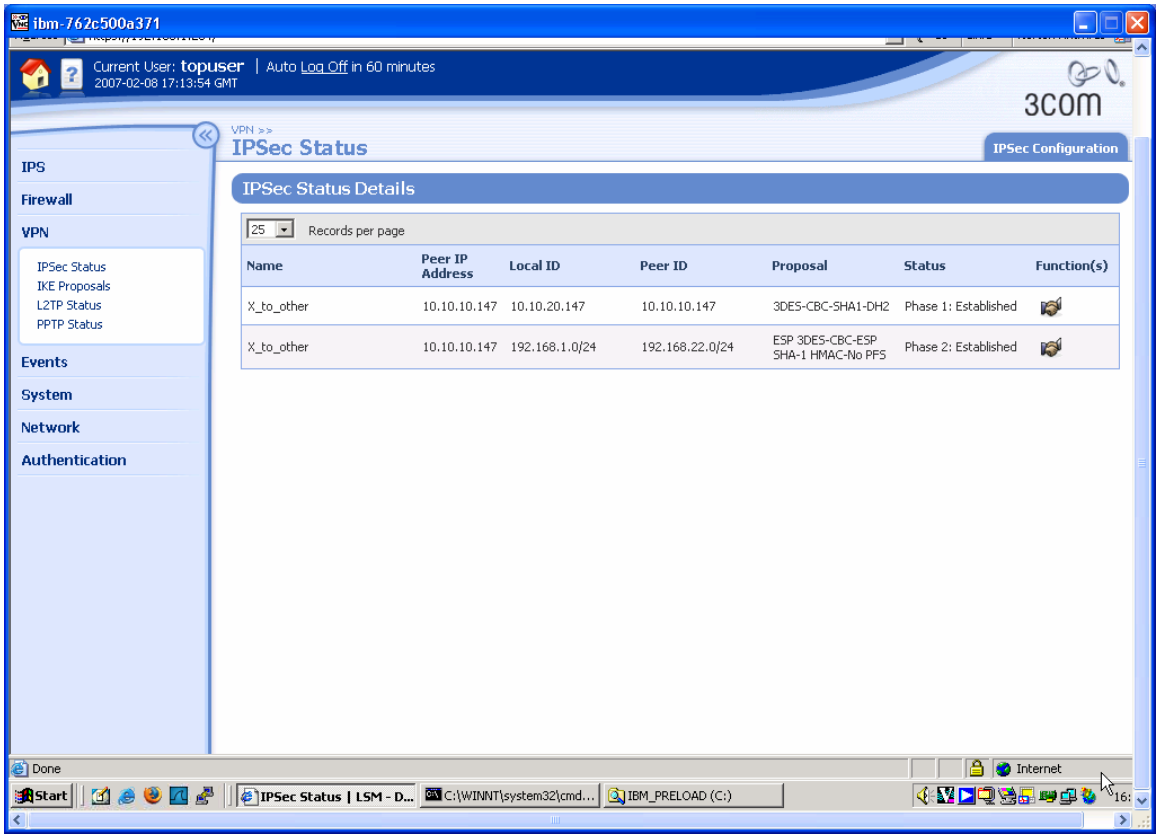
3. Click the Save button to save the changes to flash.



Click Apply on the popup.

4.3 Testing the VPN with data

1. Ping from PC1 to PC2 - this will bring up the tunnel which should look like this on the IPSec Status screen of the X-family unit. One or two pings may be lost while the tunnel establishes but then all subsequent pings should be successful.



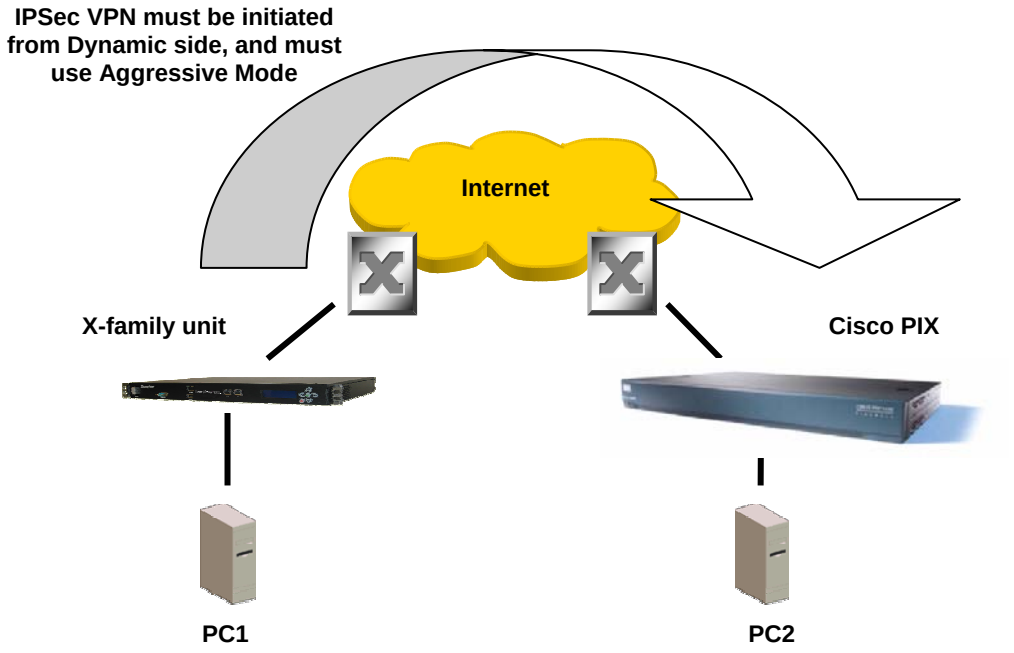
5 Aggressive Mode Tunnel

This example shows how to configure an IPSec tunnel using Aggressive Mode between the X-family unit and a Cisco PIX 515E. Aggressive Mode must be used when one side of the VPN tunnel has a variable (dynamic) WAN IP address. While Aggressive Mode can be used even if both sides have a Static WAN IP address, Main Mode is recommended as the tunnel will be more secure.

The X-family unit receives a dynamic IP address (through PPPoE, PPTP, DHCP or L2TP) from the Internet Service Provider. The X-family unit must initiate the VPN back to the Cisco PIX unit, and the tunnel must use Aggressive Mode IKE.

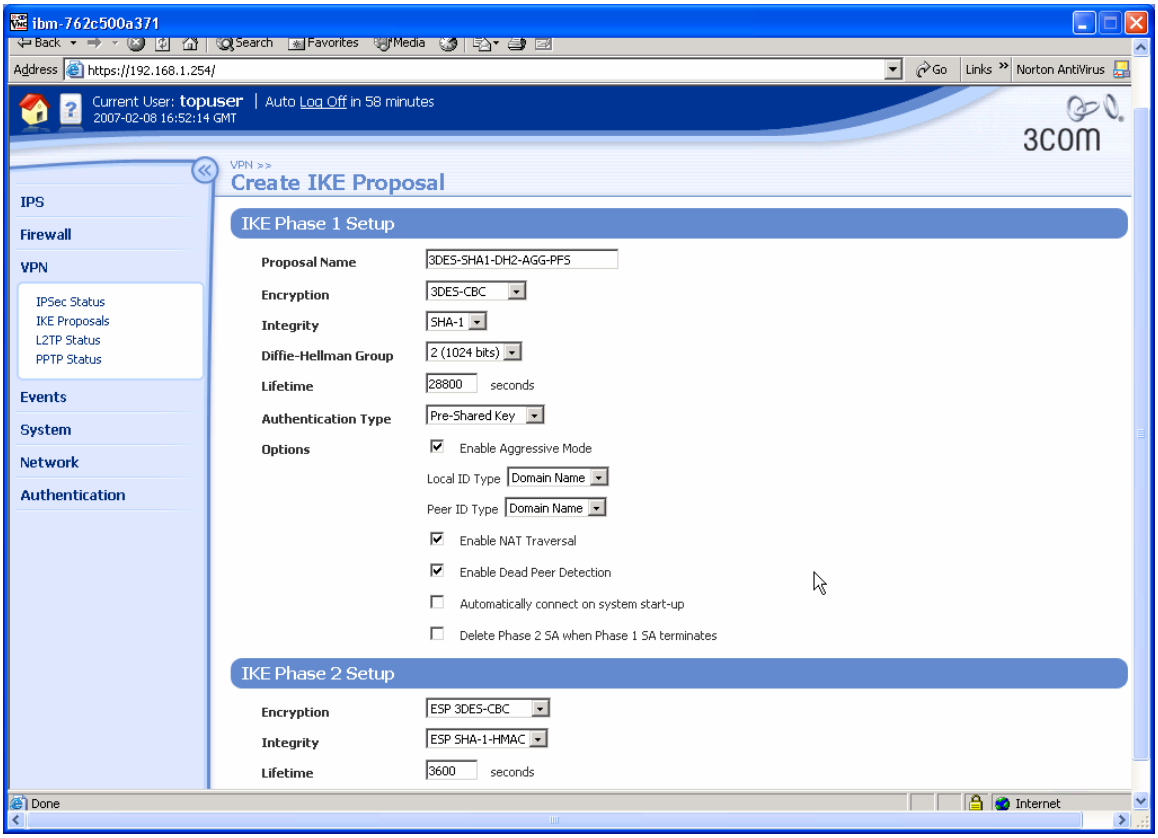
Key Setup Information

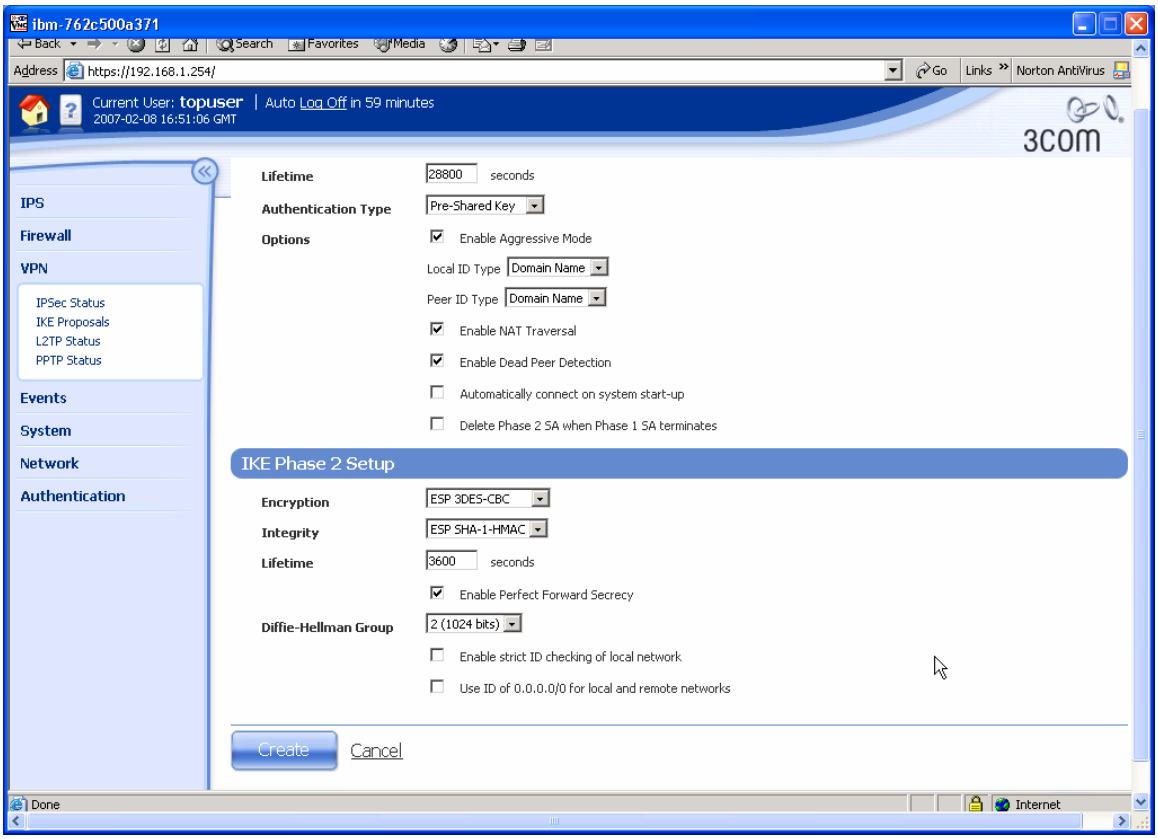
Keying Mode	IKE
IKE Mode	Aggressive Mode with Perfect Forward Secrecy
SA Authentication Method	Pre-shared Key
Keying Group DH	DH (Diffie Hellman) Group 2
Encryption and Data Integrity	3DES-SHA1



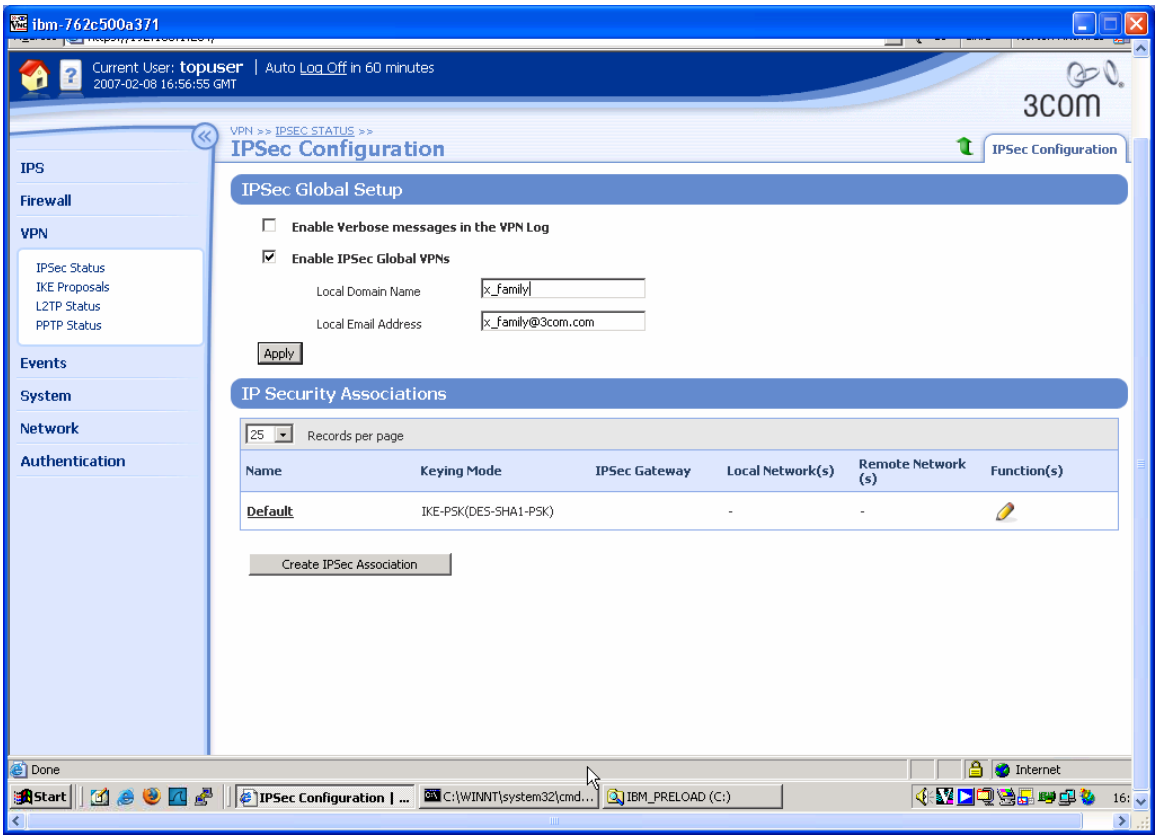
5.1 3Com X-family unit Configuration

1. Open a browser on PC1, connect to https://192.168.1.254 and login as the user you set up during the OBE.
2. Navigate to VPN -> IKE Proposals. You will see one default proposal for DES-SHA1-PSK but we do not want to use this as it does not provide a suitably high level of security so click on the “Create IKE Proposal” button to create a new proposal. Complete the form that opens as shown below. (There are two screen grabs because the setup page is too large for a single screen).

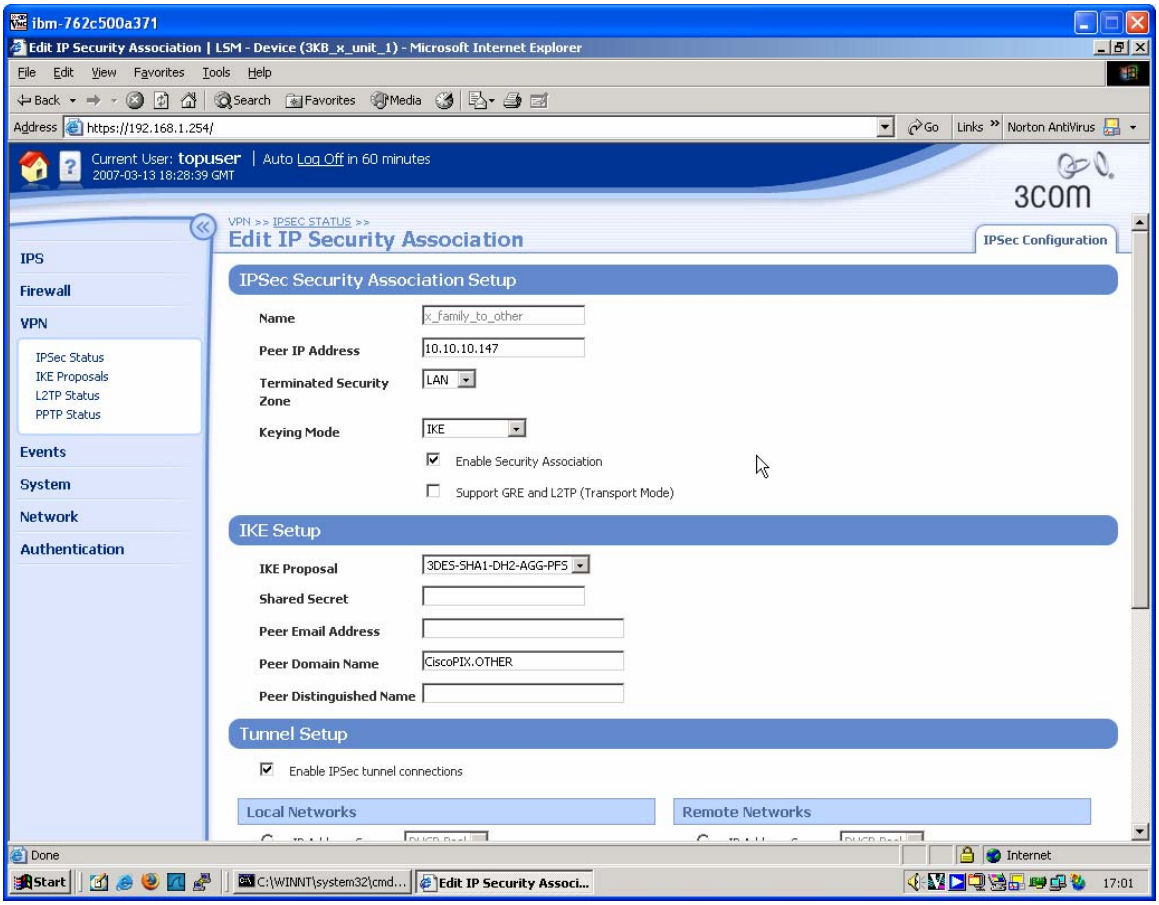


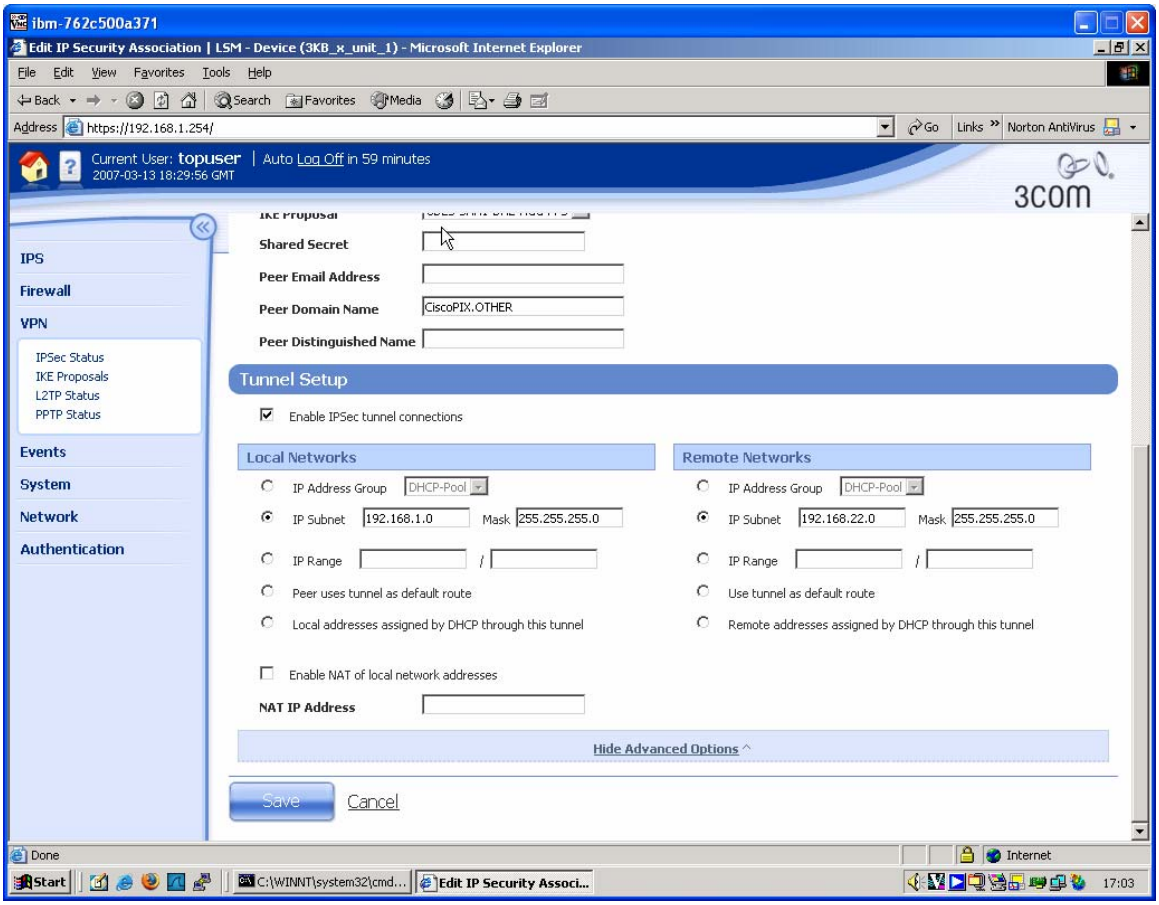


3. Click “Create” to save the new IKE Proposal.
4. Navigate to VPN -> IPSEC Status and click on the “IPSEC Configuration” tab.
5. Configure the upper part of the screen as shown below.



6. Click the Apply button to save the changes.
7. On the IPSEC Configuration screen you will see one Security Association called "Default" displayed but we will not be using this as it is mainly used with IPSec clients on remote PCs, so click the Create IPSec Association button to create a new Security Association. Complete the form that opens as shown below – there are two screen grabs because the form is too large to fit in a single screen. Note that the <shared-secret> string entered here must be at least 8 characters and must be exactly the same as the shared secret entered on the peer device.


ibm-762c500a371
Edit IP Security Association | LSM - Device (3KB_x_unit_1) - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address https://192.168.1.254/
Current User: topuser | Auto Log Off in 60 minutes
2007-03-13 18:28:39 GMT
3com
IPS
Firewall
VPN
IPSec Status
IKE Proposals
L2TP Status
PPTP Status
Events
System
Network
Authentication
VPN >> IPSEC STATUS >>
Edit IP Security Association
IPSec Configuration
IPSec Security Association Setup
Name
x_family_to_other
Peer IP Address
10.10.10.147
Terminated Security Zone
LAN
Keying Mode
IKE
Enable Security Association
Support GRE and L2TP (Transport Mode)
IKE Setup
IKE Proposal
3DES-SHA1-DH2-AGG-PFS
Shared Secret
Peer Email Address
Peer Domain Name
CiscoPIX.OTHER
Peer Distinguished Name
Tunnel Setup
Enable IPSec tunnel connections
Local Networks
Remote Networks
Done
Internet
Start
C:\WINNT\system32\cmd...
Edit IP Security Associ...
17:01

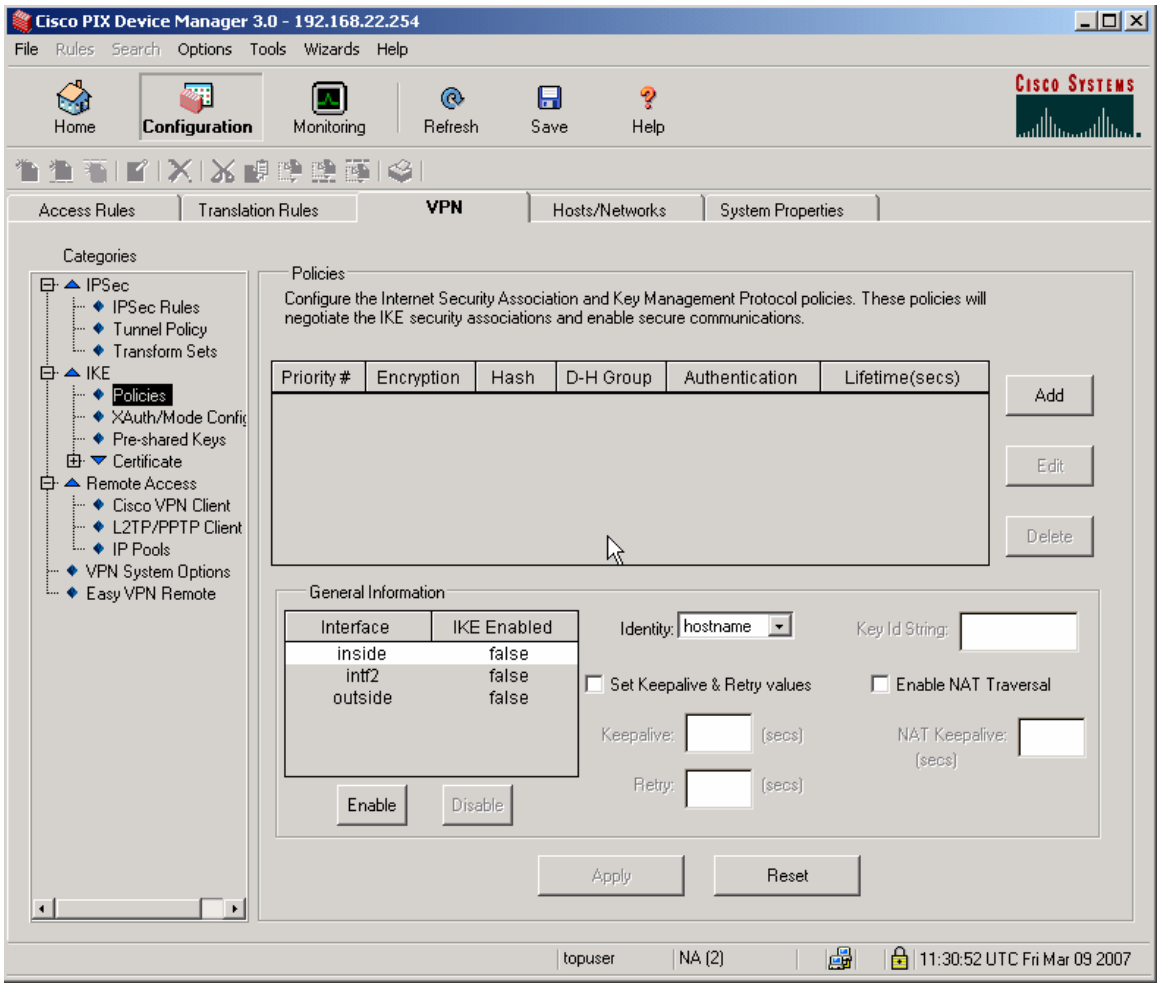


8. Click “Create” to create the Security Association.

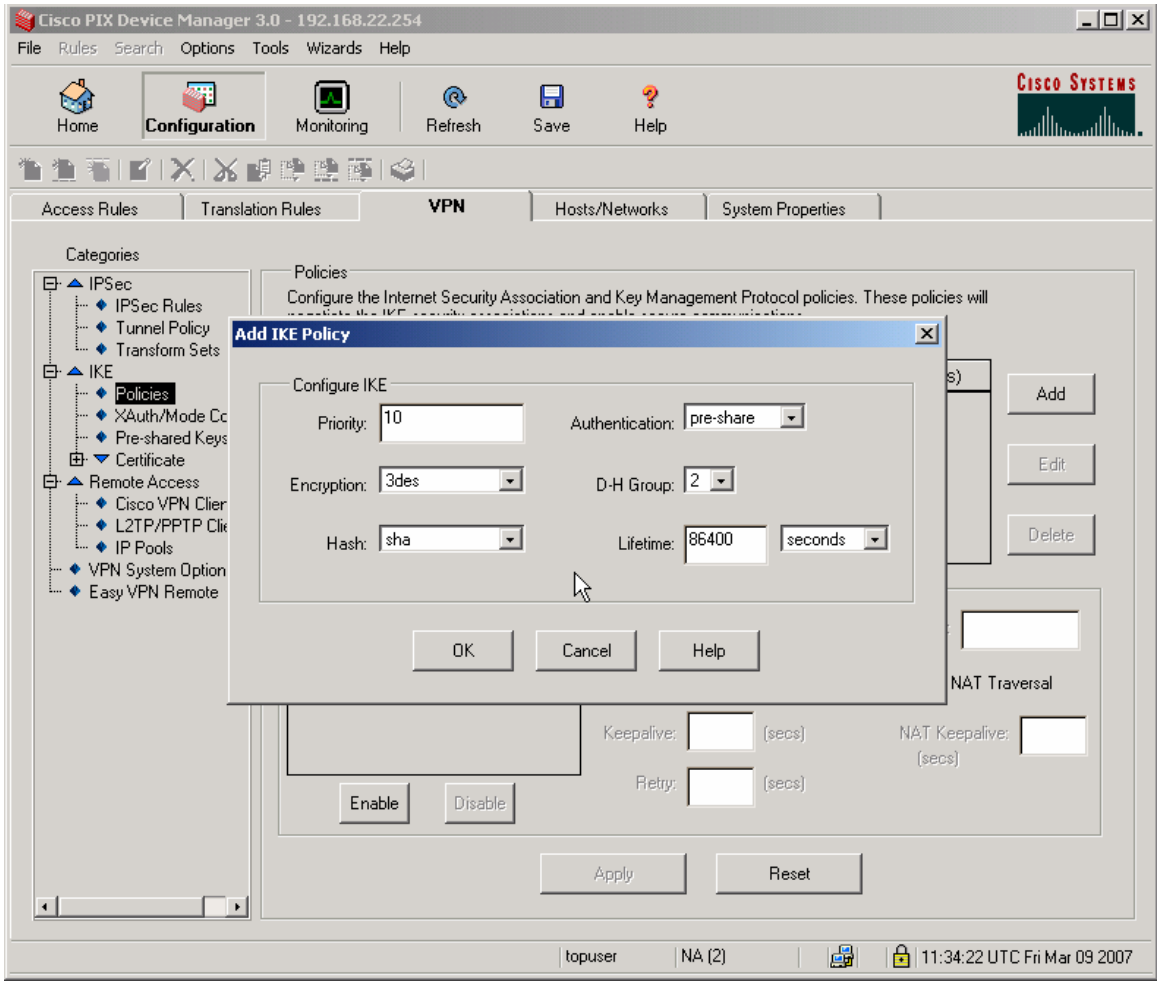
5.2 Cisco PIX 515E Configuration

Unfortunately, the VPN Wizard cannot be used to set up an Aggressive Mode VPN, so we must use the Configuration -> VPN Tab.

1. Browse to https://192.168.22.254 and login as topuser with password toppass. Click the Configuration button and then the VPN Tab. Select IKE->Policies from the left hand menu. This will take you to the following screen:

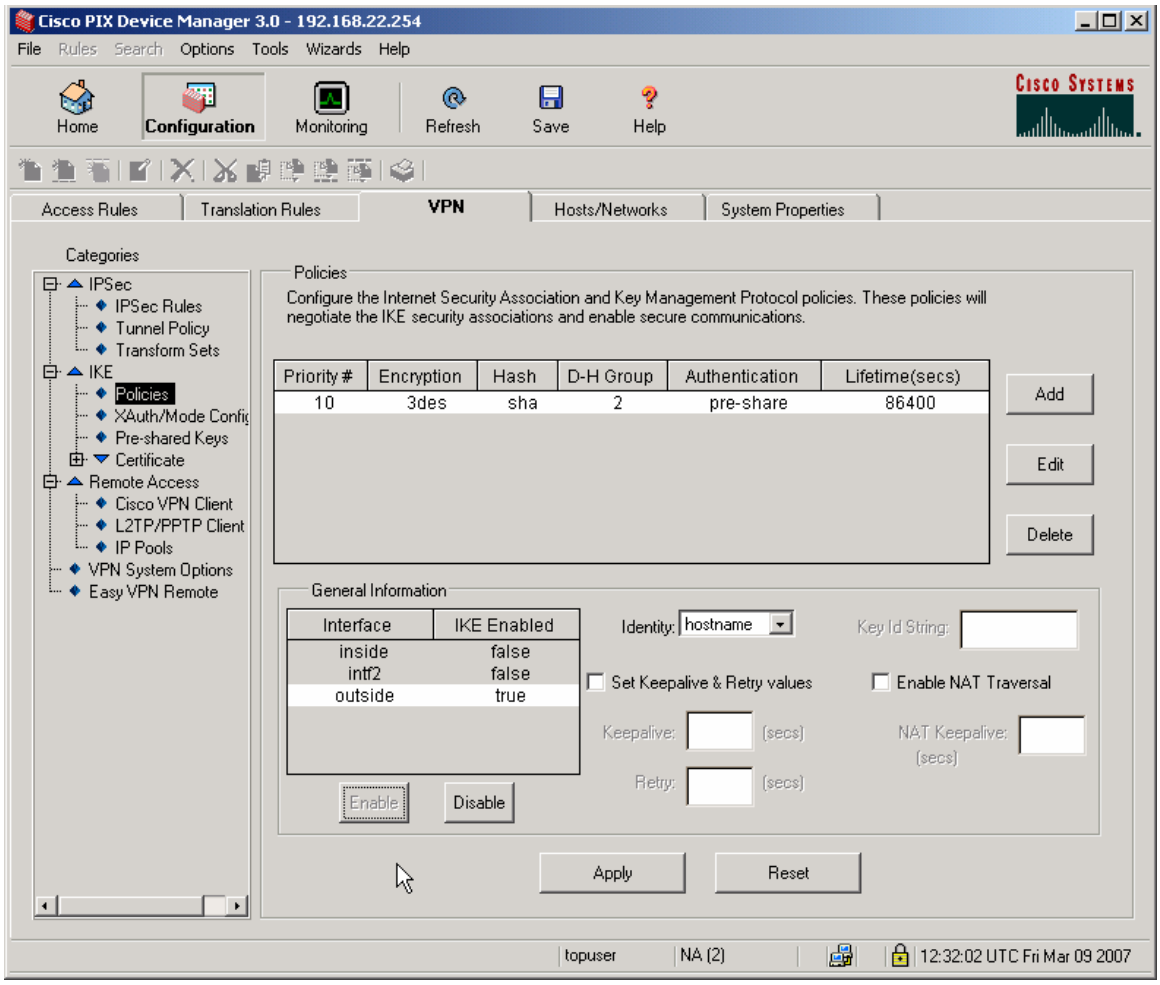


2. Click the “Add” button centre-right and complete the new screen as shown.

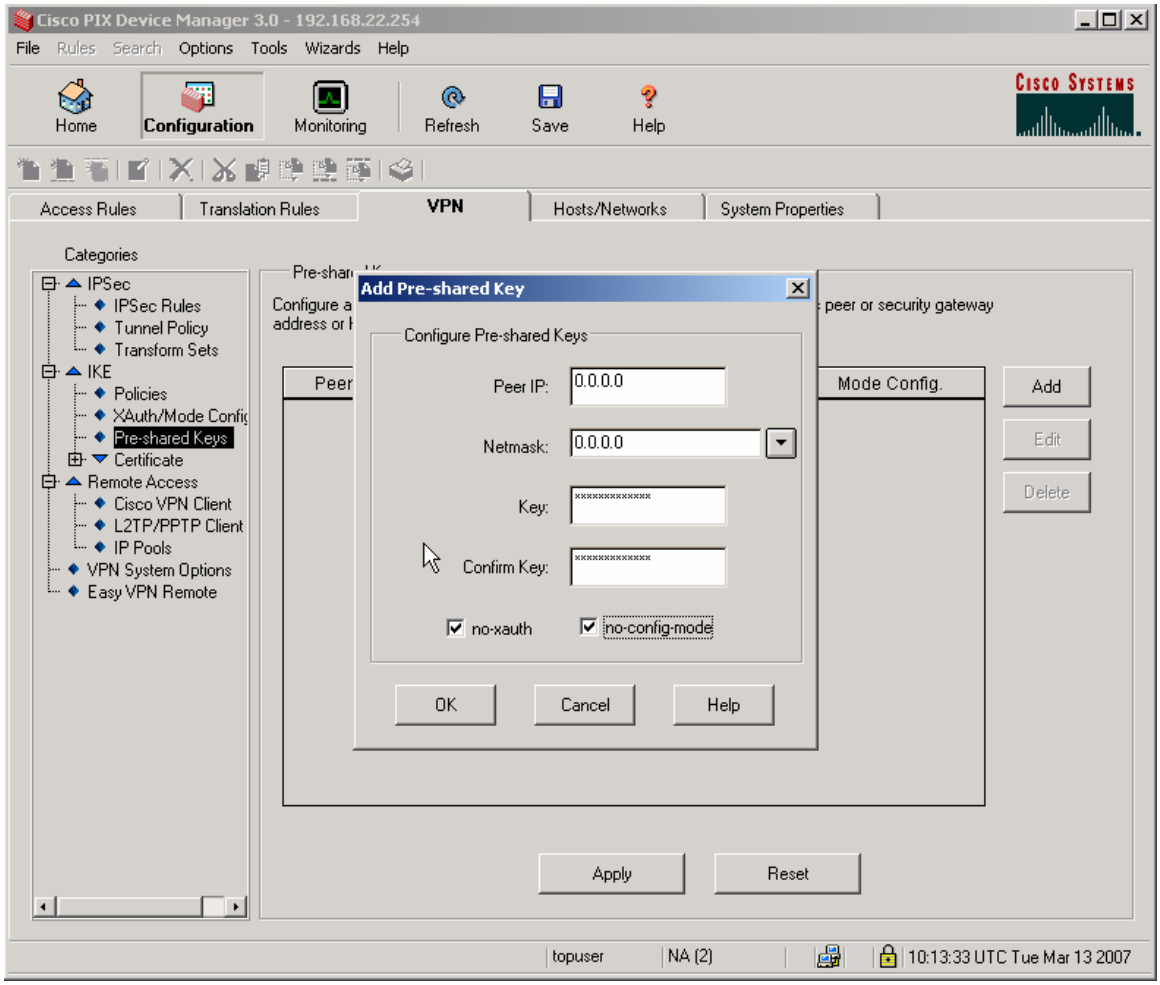


and click OK.

3. In the “General Information” section in the lower half of the screen is a table which shows which interfaces have IKE enabled on them. Click on the “outside” interface and click the Enable button below the table. The screen should now look like this:



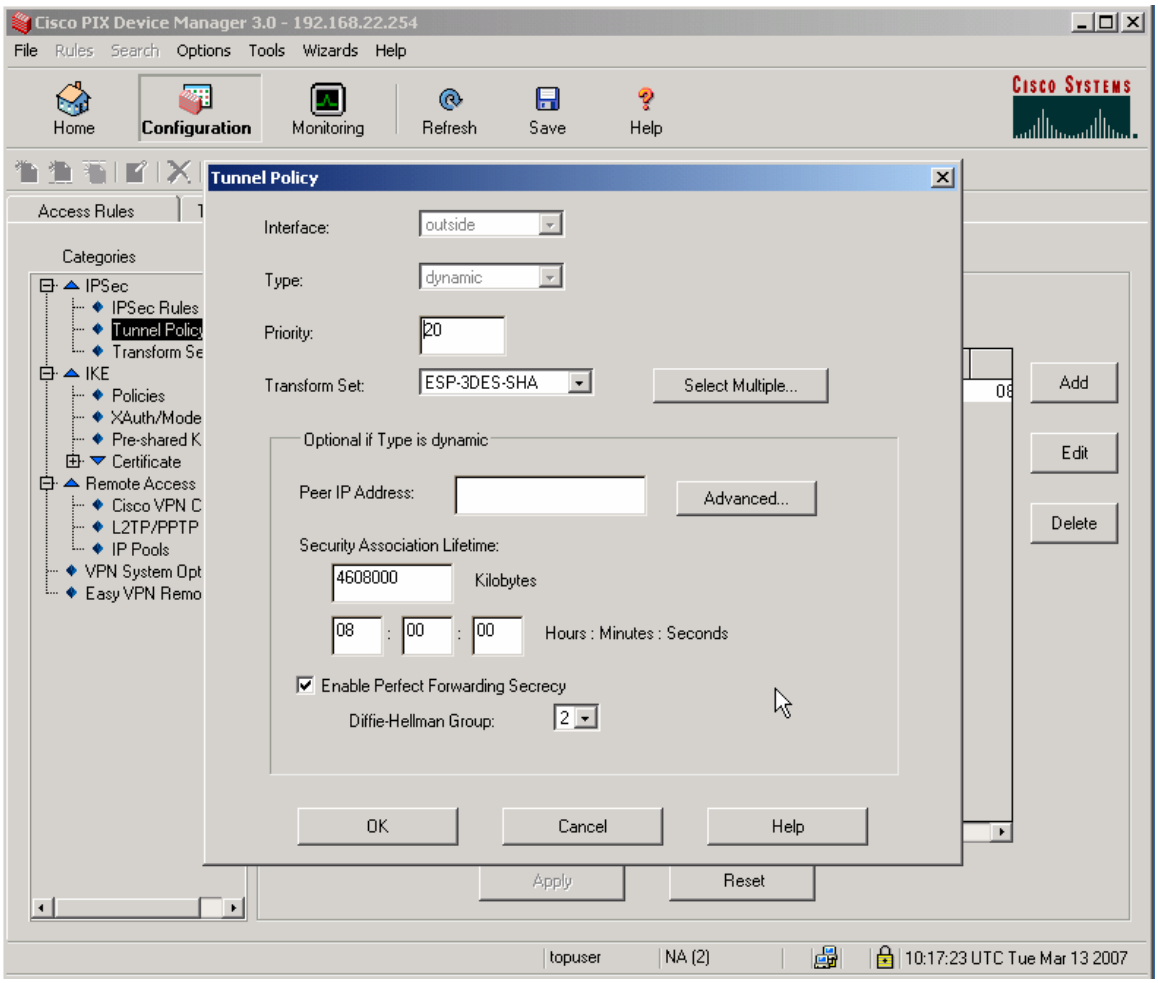
4. Click the Apply button to save the changes.
5. Select IKE->Pre-shared keys from the menu at the left and click the Add button at the right of the new screen. Complete the popup form as shown below.



Note: The Key must be the same string as was set up on the X-family device as the "Shared Secret".

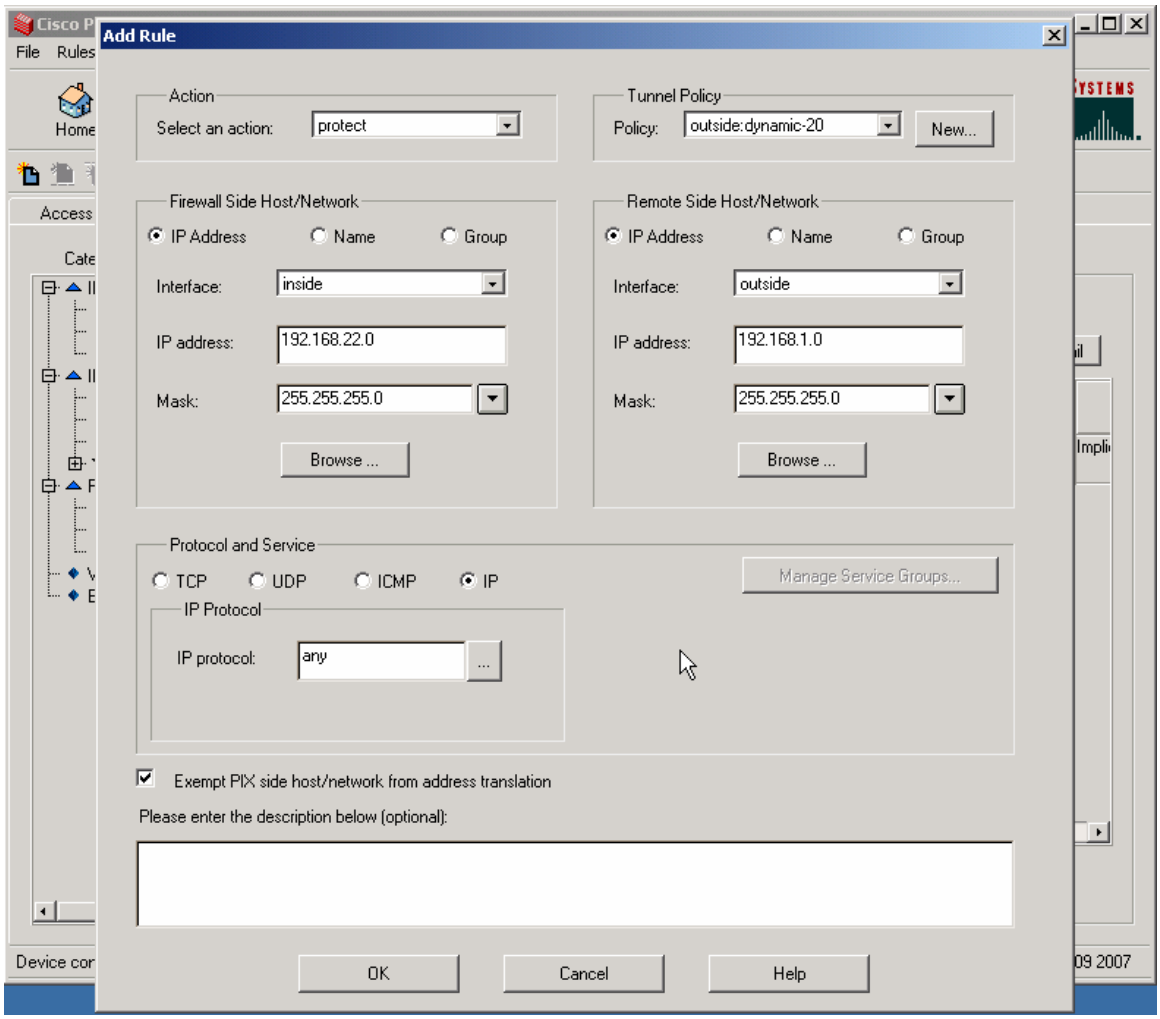
Click the OK button and then click Apply to save the changes.

6. Select IPSec -> Tunnel Policy and click Add to the right of the new screen. Complete the popup form as shown below.

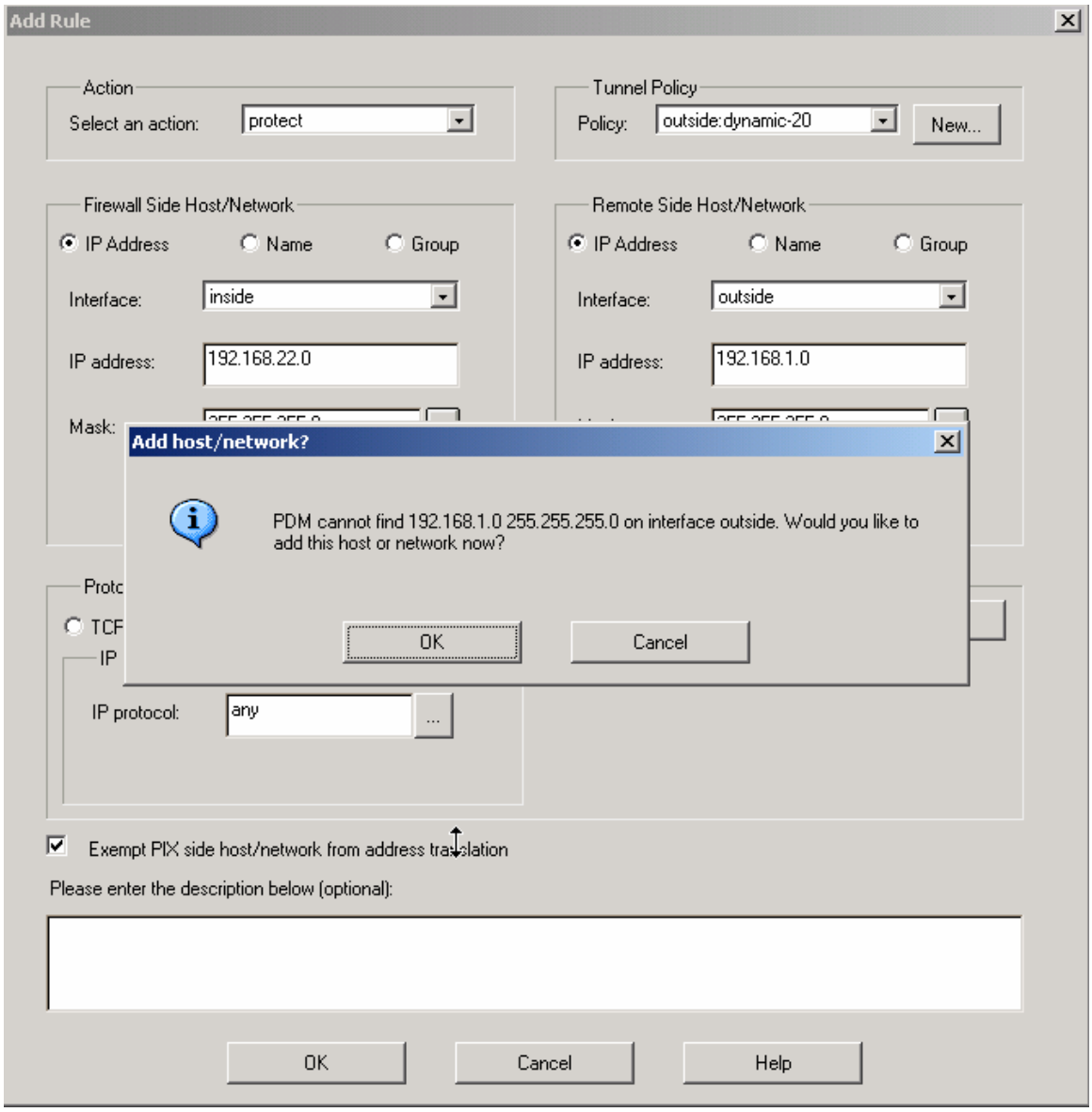


Click OK, then click Apply to save the changes.

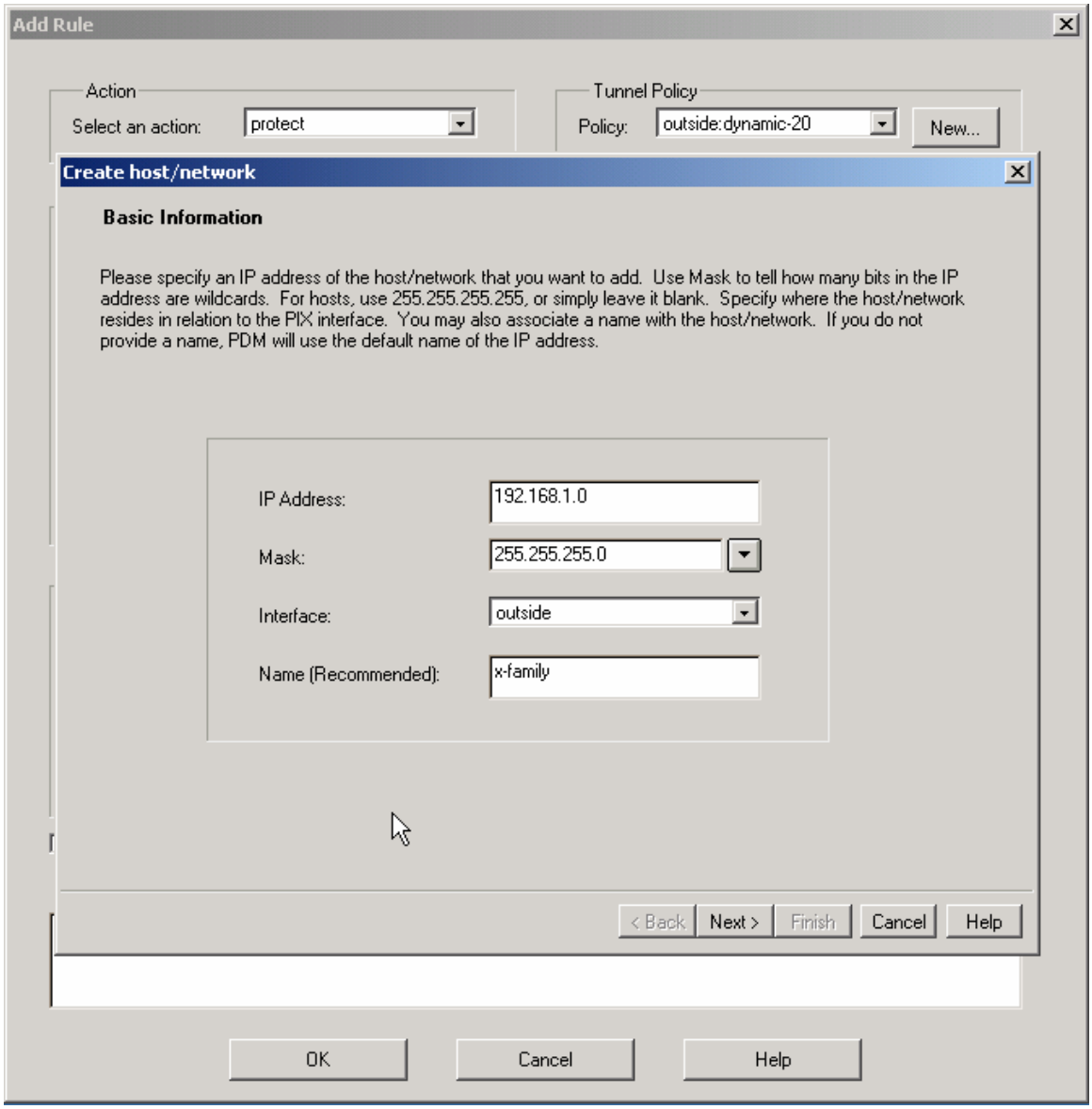
7. Select IPSec -> IPSec Rules from the menu to the left. Click the “Add New Rule” icon just under the “Home” button in the top left of the screen. Complete the popup form as shown below.



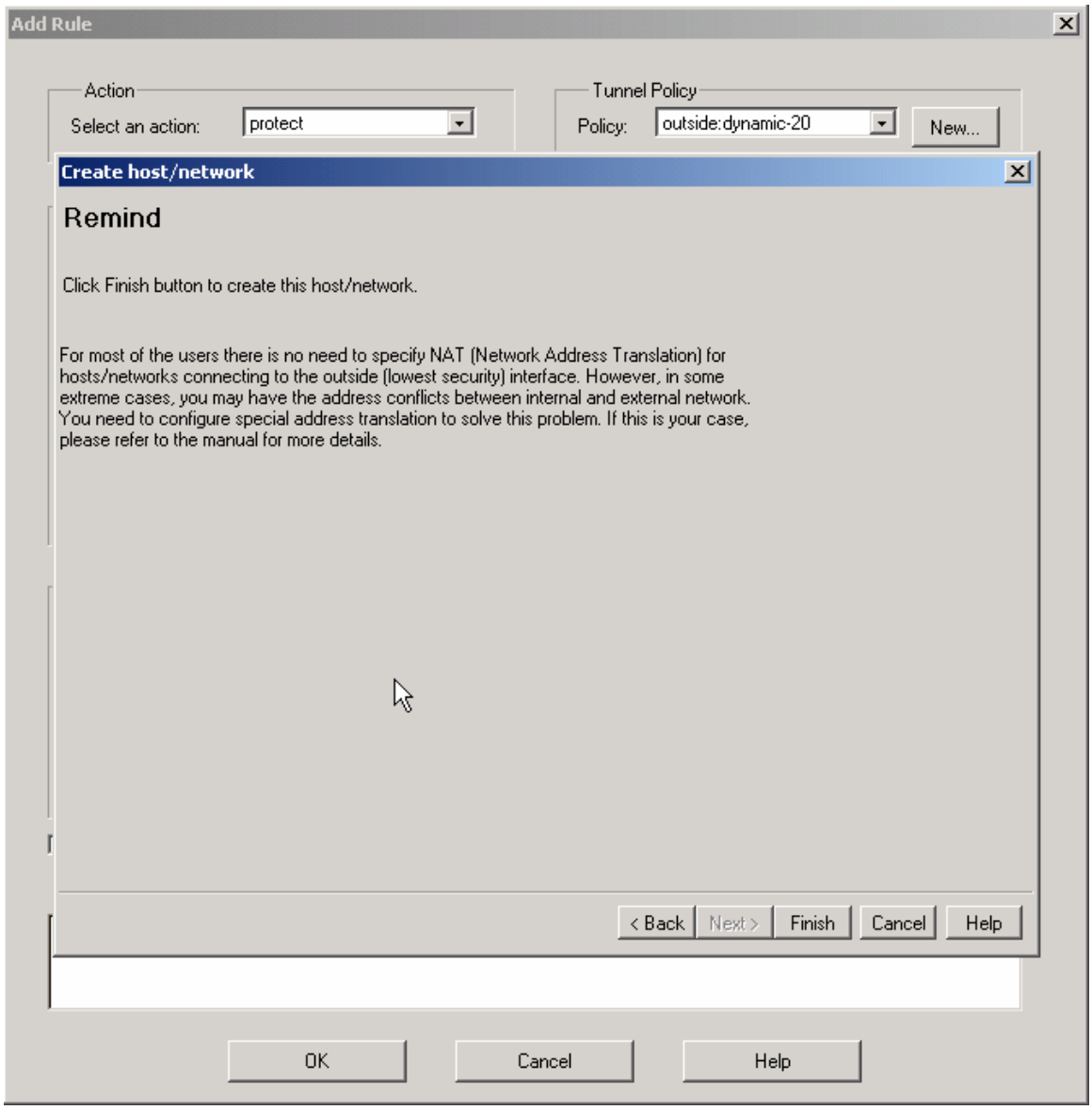
Click OK and you will get the popup shown below.



Click OK and complete the popup forms as shown below.

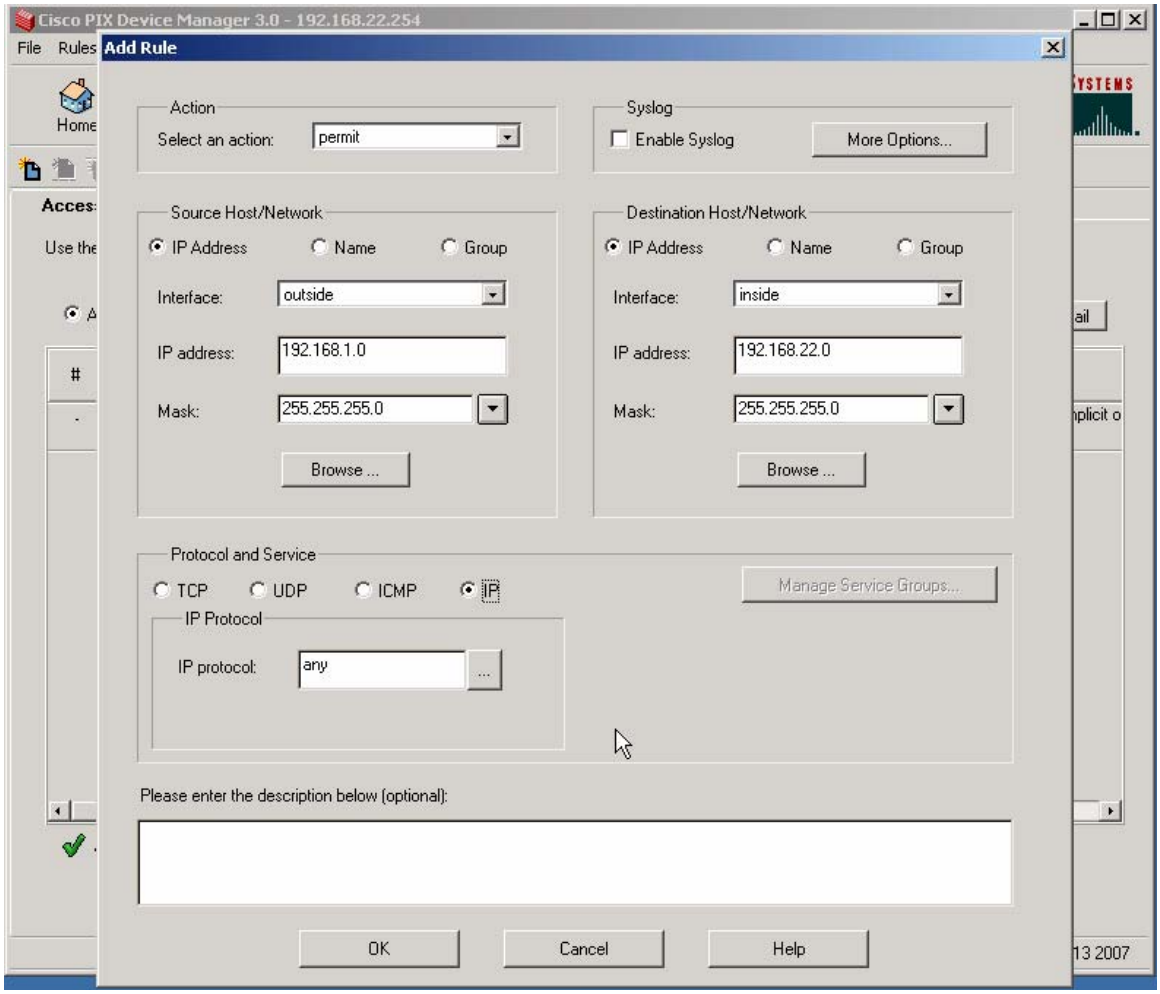

Add Rule
Action
Select an action:
protect
Tunnel Policy
Policy:
outside:dynamic-20
New...
Create host/network
Basic Information
Please specify an IP address of the host/network that you want to add. Use Mask to tell how many bits in the IP address are wildcards. For hosts, use 255.255.255.255, or simply leave it blank. Specify where the host/network resides in relation to the PIX interface. You may also associate a name with the host/network. If you do not provide a name, PDM will use the default name of the IP address.
IP Address:
192.168.1.0
Mask:
255.255.255.0
Interface:
outside
Name (Recommended):
x-family
< Back
Next >
Finish
Cancel
Help
OK
Cancel
Help

Click Next.



Click Finish and then click Apply.

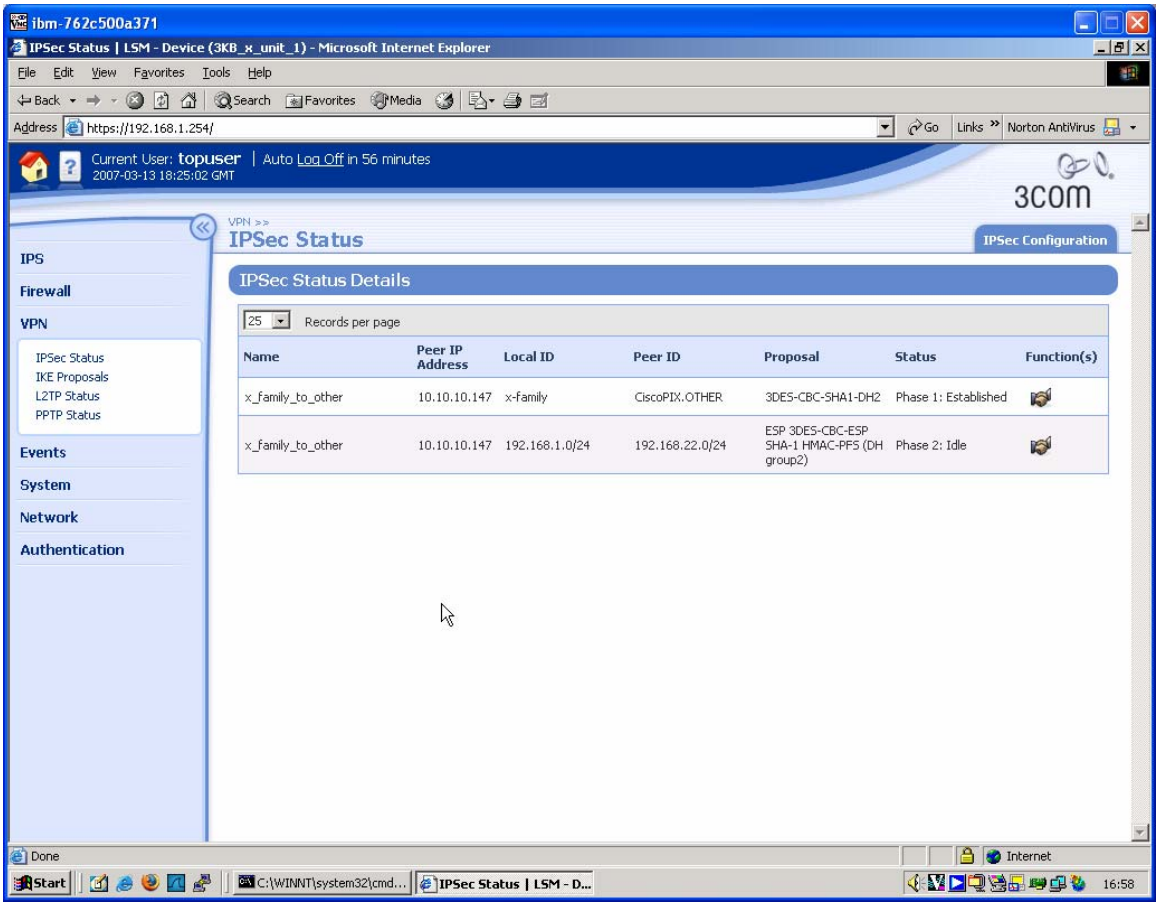
8. Finally, go to the Access Rules tab and click the Add New Rule icon under the Home button near the top of the screen. Complete the popup form as shown below.



Click the OK button and click Apply. Click the Save button to save the changes to flash memory.

5.3 Testing the VPN with data

1. Ping from PC1 to PC2 - this will bring up the tunnel which should look like this on the IPSec Status screen of the X-family unit. One or two pings may be lost while the tunnel establishes but then all subsequent pings should be successful. N.B. The direction of the initial ping (PC1 to PC2) is important as the X-family device must be the initiator. This is because the IP address of the X-family device is not known to the Cisco PIX.



6 Appendix – Configuration Files

Here are textual configuration files for both devices for reference purposes.

6.1 Main Mode

6.1.1 "show conf" file for X-family device

```
3KB_X_unit_1# show conf
interface ethernet 3 1
    negotiate
    duplex full
    linespeed 100
    no shutdown
    exit
interface ethernet 3 2
    negotiate
    duplex full
    linespeed 100
    no shutdown
    exit
interface ethernet 3 3
    negotiate
    duplex full
    linespeed 100
    no shutdown
    exit
interface ethernet 3 4
    negotiate
    duplex full
    linespeed 100
    no shutdown
    exit
interface ethernet 3 5
    negotiate
    duplex full
    linespeed 100
    no shutdown
    exit
interface ethernet 3 6
    negotiate
    duplex full
    linespeed 100
    no shutdown
    exit
interface settings poll-interval 2000
interface settings detect-mdi enable
interface settings mdi-mode mdix
host name "3KB_X_unit_1"
host location "Lab"
host ip-filter permit any icmp
host ip-filter permit any ip
no autodv
user options max-attempts   5
user options expire-period  90
```

```
user options expire-action  expire
user options lockout-period 5
user options attempt-action lockout
user options security-level 2
high-availability disable
high-availability heartbeat 4 100 2
high-availability id 4098
clock timezone GMT
clock dst
log audit select general
log audit select login
log audit select logout
log audit select user
log audit select time
log audit select policy
log audit select update
log audit select boot
log audit select report
log audit select host
log audit select configuration
log audit select oam
log audit select sms
log audit select server
log audit select segment
log audit select high-availability
log audit select monitor
log audit select ip-filter
log audit select conn-table
log audit select host-communication
log audit select tse
category-settings -profile "Default Security Profile" vulnerabilities
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" exploits
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" security-policy
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" reconnaissance
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" virus
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" spyware
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" identity-theft
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" traffic-normal
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" network-equipment
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" p2p
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" im
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" streaming-media
enable - action-set "Recommended"
notify-contact "Management Console" 1
notify-contact "Remote System Log" 1
default-alert-sink period 1
```

```
server ssh
server no http
server https
server browser-check
monitor threshold memory      -major  90 -critical  95
monitor threshold disk        -major  90 -critical  95
monitor threshold temperature -major  92 -critical  94
monitor disable power-supply
no service-access
tse adaptive-filter mode automatic
tse afc-severity warning
tse connection-table timeout 1800
tse logging-mode conditional -threshold 1.0 -period 600
tse quarantine duration 60
email-rate-limit 10
zone update LAN vlan-id 1
zone update LAN port 3/1
zone update LAN mtu 1500
zone update LAN addresses disable
zone update LAN vpn-tunnel-access enable
zone update VPN vlan-id 4
zone update VPN port none
zone update VPN mtu 1500
zone update VPN addresses disable
zone update VPN vpn-tunnel-access enable
zone update WAN vlan-id 3
zone update WAN port 3/6
zone update WAN mtu 1500
zone update WAN addresses disable
zone update WAN vpn-tunnel-access enable
address-groups update DHCP-Pool range 192.168.1.1 192.168.1.20
authentication privilege-groups update Allow_VPN_access vpn-client-
access
authentication privilege-groups update RADIUS
authentication radius default-privilege-group RADIUS
authentication radius server primary 0.0.0.0 port 1812 shared-secret
******** au
th-method chap
authentication radius server secondary none
authentication radius disable
authentication radius user-authentication enable
authentication radius vpn-clients enable
authentication radius retries 3
authentication radius timeout 2
web-filtering default-rule block
web-filtering filter-action block-and-log
web-filtering filter-service cache expiry 24
web-filtering filter-service cache size 2097152
web-filtering filter-service block adult
web-filtering filter-service block gambling
web-filtering filter-service block violence
web-filtering filter-service block criminal
web-filtering filter-service block hacking
web-filtering filter-service block weapons
web-filtering filter-service block drugs
web-filtering filter-service block hate
web-filtering filter-service permit advertisement
```

```
web-filtering filter-service permit computing
web-filtering filter-service permit food
web-filtering filter-service permit politics
web-filtering filter-service permit hosting
web-filtering filter-service permit lifestyle
web-filtering filter-service permit dating
web-filtering filter-service permit reference
web-filtering filter-service permit sex-education
web-filtering filter-service permit sports
web-filtering filter-service permit usenet
web-filtering filter-service permit arts
web-filtering filter-service permit education
web-filtering filter-service permit games
web-filtering filter-service permit health
web-filtering filter-service permit careers
web-filtering filter-service permit vehicles
web-filtering filter-service permit photos
web-filtering filter-service permit religion
web-filtering filter-service permit search
web-filtering filter-service permit streaming-media
web-filtering filter-service permit email
web-filtering filter-service permit chat
web-filtering filter-service permit finance
web-filtering filter-service permit glamour
web-filtering filter-service permit hobbies
web-filtering filter-service permit kids
web-filtering filter-service permit news
web-filtering filter-service permit real-estate
web-filtering filter-service permit proxies
web-filtering filter-service permit shopping
web-filtering filter-service permit travel
web-filtering filter-service disable
web-filtering manual-filter disable
dhcp-server addresses group DHCP-Pool
dhcp-server enable
dhcp-server bootp disable
dhcp-server lease-duration 60
dhcp-server dns default
dhcp-server wins primary 0.0.0.0
dhcp-server wins secondary 0.0.0.0
dhcp-server nbx 0.0.0.0
dhcp-server relay disable
dns use-external-dns enable
interface virtual add 1 internal
interface virtual internal 1 ip 192.168.1.254 netmask 255.255.255.0
interface virtual internal 1 ha-mgmt-ip 0.0.0.0
interface virtual internal 1 nat external-ip
interface virtual internal 1 rip disable
interface virtual internal 1 rip send-mode v2-multicast
interface virtual internal 1 rip receive-mode all
interface virtual internal 1 rip auth disable
interface virtual internal 1 rip split-horizon enable
interface virtual internal 1 rip poison-reverse enable
interface virtual internal 1 rip advertise-routes enable
interface virtual internal 1 igmp disable
interface virtual internal 1 pim-dm disable
interface virtual internal 1 zone add LAN
```

```
interface virtual internal 1 zone add VPN
interface virtual add 2 external
interface virtual external 2 type static 10.10.20.147 netmask
255.255.255.0
interface virtual external 2 ha-mgmt-ip 0.0.0.0
interface virtual external 2 rip disable
interface virtual external 2 rip send-mode disable
interface virtual external 2 rip receive-mode disable
interface virtual external 2 rip auth disable
interface virtual external 2 rip split-horizon disable
interface virtual external 2 rip poison-reverse disable
interface virtual external 2 rip advertise-routes disable
interface virtual external 2 igmp disable
interface virtual external 2 pim-dm disable
interface virtual external 2 zone add WAN
firewall schedule update working-day days -mtwtf- from 0800 to 1800
firewall service update 3com-nbx udp port 2093 to 2096
firewall service update audio-call-control tcp port 1731
firewall service update dhcp-client udp port 68
firewall service update dhcp-server udp port 67
firewall service update dns-tcp tcp port 53
firewall service update dns-udp udp port 53
firewall service update finger-tcp tcp port 79
firewall service update ftp tcp port 21
firewall service update gopher-tcp tcp port 70
firewall service update gre gre
firewall service update h323 tcp port 1720
firewall service update http tcp port 80
firewall service update https tcp port 443
firewall service update igmp igmp
firewall service update ike udp port 500
firewall service update imap tcp port 143
firewall service update imapv3 tcp port 220
firewall service update ipsec-ah ah
firewall service update ipsec-esp esp
firewall service update kerberos-tcp tcp port 88
firewall service update kerberos-udp udp port 88
firewall service update l2tp udp port 1701
firewall service update ldap-tcp tcp port 389
firewall service update ldap-udp udp port 389
firewall service update lotus-notes-domino tcp port 1352
firewall service update lpr tcp port 515E
firewall service update nat-t-ipsec udp port 4500
firewall service update nbname tcp port 137
firewall service update netbios-tcp tcp port 137 to 139
firewall service update netbios-udp udp port 137 to 139
firewall service update netmeeting tcp port 1720
firewall service update nfsd-tcp tcp port 2049
firewall service update nfsd-udp udp port 2049
firewall service update nntp tcp port 119
firewall service update ntp udp port 123
firewall service update pim-dm pim
firewall service update ping icmp port 8
firewall service update pop3 tcp port 110
firewall service update portmapper-tcp tcp port 111
firewall service update portmapper-udp udp port 111
firewall service update pptp-tcp tcp port 1723
```

```
firewall service update radius-accounting udp port 1813
firewall service update radius-auth udp port 1812
firewall service update rexec tcp port 512
firewall service update rip udp port 520
firewall service update rlogin tcp port 513
firewall service update rsh tcp port 514
firewall service update rtsp tcp port 554
firewall service update sip-tcp tcp port 5060
firewall service update sip-udp udp port 5060
firewall service update smb tcp port 445
firewall service update sms-client tcp port 10042
firewall service update sms-trap tcp port 8162 to 8163
firewall service update smtp tcp port 25
firewall service update snmp-request udp port 161
firewall service update snmp-trap udp port 162
firewall service update ssh tcp port 22
firewall service update syslog udp port 514
firewall service update t120 tcp port 1503
firewall service update telnet tcp port 23
firewall service update tftp udp port 69
firewall service update traceroute icmp port 8
firewall service update uucp udp port 540
firewall service update vnc-browser tcp port 5800
firewall service update vnc-viewer tcp port 5900
firewall service update x-windows tcp port 6000 to 6063
firewall service-group update dns dns-tcp dns-udp
firewall service-group update email pop3 smtp imap imapv3
firewall service-group update ipsec ike ipsec-ah ipsec-esp
firewall service-group update ldap ldap-udp ldap-tcp
firewall service-group update management https ssh ping snmp-request
firewall service-group update netmeeting h323 audio-call-control t120
firewall service-group update network-protocols dns-tcp dns-udp dhcp
server
firewall service-group update nfs portmapper-tcp portmapper-udp nfsd-tcp
nfsd-udp
firewall service-group update pptp pptp-tcp gre
firewall service-group update secure-management https ssh
firewall service-group update sip sip-tcp sip-udp
firewall service-group update sms-config http https sms-client snmp-
request ssh
firewall service-group update sms-get ntp sms-trap
firewall service-group update snmp snmp-request snmp-trap
firewall service-group update vnc vnc-browser vnc-viewer
firewall service-group update voice 3com-nbx sip-tcp sip-udp
firewall service-group update vpn-protocols pptp-tcp l2tp gre ike nat-t-
ipsec
firewall rule update 1 permit LAN WAN ANY
firewall rule update 1 schedule always timeout 30 logging disable
firewall rule update 1 src-addr all
firewall rule update 1 dst-addr all
firewall rule update 1 bandwidth disable
firewall rule update 1 authentication disable
firewall rule update 1 position 1
firewall rule update 1 comment "Allow LAN unrestricted access to WAN"
firewall rule update 1 remote-logging disable
firewall rule enable 1
firewall rule update 2 permit WAN this-device vpn-protocols
```

```
firewall rule update 2 schedule always timeout 30 logging disable
firewall rule update 2 src-addr all
firewall rule update 2 dst-addr all
firewall rule update 2 bandwidth disable
firewall rule update 2 authentication disable
firewall rule update 2 position 2
firewall rule update 2 comment "Allow VPN termination"
firewall rule update 2 remote-logging disable
firewall rule enable 2
firewall rule update 3 permit LAN this-device management
firewall rule update 3 schedule always timeout 30 logging disable
firewall rule update 3 src-addr all
firewall rule update 3 dst-addr all
firewall rule update 3 bandwidth disable
firewall rule update 3 authentication disable
firewall rule update 3 position 3
firewall rule update 3 comment "Allow management access from LAN"
firewall rule update 3 remote-logging disable
firewall rule enable 3
firewall rule update 4 permit LAN this-device network-protocols
firewall rule update 4 schedule always timeout 30 logging disable
firewall rule update 4 src-addr all
firewall rule update 4 dst-addr all
firewall rule update 4 bandwidth disable
firewall rule update 4 authentication disable
firewall rule update 4 position 4
firewall rule update 4 comment "Allow DNS and DHCP from LAN"
firewall rule update 4 remote-logging disable
firewall rule enable 4
firewall rule update 200 permit ANY ANY ANY
firewall rule update 200 schedule always timeout 30 logging disable
firewall rule update 200 src-addr all
firewall rule update 200 dst-addr all
firewall rule update 200 bandwidth disable
firewall rule update 200 authentication disable
firewall rule update 200 position 5
firewall rule update 200 comment ""
firewall rule update 200 remote-logging disable
firewall rule enable 200
firewall alg sip services ANY
firewall alg sip sdp-port-range ANY
routing rip disable update-timer 30
routing multicast igmp disable
routing multicast pim-dm disable query-interval 30 prune-timeout 180
vpn ike add DES-SHA1-PSK
vpn ike proposal DES-SHA1-PSK phase1-encryption des-cbc
vpn ike proposal DES-SHA1-PSK phase1-integrity sha1
vpn ike proposal DES-SHA1-PSK phase1-dh-group 1
vpn ike proposal DES-SHA1-PSK phase1-lifetime 28800
vpn ike proposal DES-SHA1-PSK auth-type psk
vpn ike proposal DES-SHA1-PSK aggressive-mode disable
vpn ike proposal DES-SHA1-PSK local-id-type ip
vpn ike proposal DES-SHA1-PSK peer-id-type ip
vpn ike proposal DES-SHA1-PSK ca-cert ANY
vpn ike proposal DES-SHA1-PSK nat-t disable
vpn ike proposal DES-SHA1-PSK dpd enable
vpn ike proposal DES-SHA1-PSK auto-connect disable
```

```
vpn ike proposal DES-SHA1-PSK tight-phase2-control enable
vpn ike proposal DES-SHA1-PSK phase2-encryption des-cbc
vpn ike proposal DES-SHA1-PSK phase2-integrity esp-sha1-hmac
vpn ike proposal DES-SHA1-PSK phase2-lifetime 3600
vpn ike proposal DES-SHA1-PSK pfs disable
vpn ike proposal DES-SHA1-PSK phase2-dh-group 1
vpn ike proposal DES-SHA1-PSK phase2-zero-id disable
vpn ike proposal DES-SHA1-PSK phase2-strict-id-check disable
vpn ike add 3DES-SHA1-DH2
vpn ike proposal 3DES-SHA1-DH2 phase1-encryption 3des-cbc
vpn ike proposal 3DES-SHA1-DH2 phase1-integrity sha1
vpn ike proposal 3DES-SHA1-DH2 phase1-dh-group 2
vpn ike proposal 3DES-SHA1-DH2 phase1-lifetime 28800
vpn ike proposal 3DES-SHA1-DH2 auth-type psk
vpn ike proposal 3DES-SHA1-DH2 aggressive-mode disable
vpn ike proposal 3DES-SHA1-DH2 local-id-type ip
vpn ike proposal 3DES-SHA1-DH2 peer-id-type ip
vpn ike proposal 3DES-SHA1-DH2 ca-cert ANY
vpn ike proposal 3DES-SHA1-DH2 nat-t enable
vpn ike proposal 3DES-SHA1-DH2 dpd enable
vpn ike proposal 3DES-SHA1-DH2 auto-connect disable
vpn ike proposal 3DES-SHA1-DH2 tight-phase2-control disable
vpn ike proposal 3DES-SHA1-DH2 phase2-encryption 3des-cbc
vpn ike proposal 3DES-SHA1-DH2 phase2-integrity esp-sha1-hmac
vpn ike proposal 3DES-SHA1-DH2 phase2-lifetime 3600
vpn ike proposal 3DES-SHA1-DH2 pfs disable
vpn ike proposal 3DES-SHA1-DH2 phase2-dh-group 2
vpn ike proposal 3DES-SHA1-DH2 phase2-zero-id disable
vpn ike proposal 3DES-SHA1-DH2 phase2-strict-id-check disable
vpn ipsec enable
vpn ipsec add Default
vpn ipsec sa Default disable
vpn ipsec sa Default key ike proposal DES-SHA1-PSK shared-secret
********
vpn ipsec sa Default transport enable
vpn ipsec sa Default peer 0.0.0.0
vpn ipsec sa Default zone LAN
vpn ipsec sa Default tunnel enable
vpn ipsec add X_to_other
vpn ipsec sa X_to_other key ike proposal 3DES-SHA1-DH2 shared-secret
********
vpn ipsec sa X_to_other transport disable
vpn ipsec sa X_to_other peer 10.10.10.147
vpn ipsec sa X_to_other zone LAN
vpn ipsec sa X_to_other tunnel remote subnet 192.168.22.0 netmask
255.255.255.0
vpn ipsec sa X_to_other tunnel local subnet 192.168.1.0 netmask
255.255.255.0
vpn ipsec sa X_to_other tunnel nat disable
vpn ipsec sa X_to_other tunnel enable
vpn ipsec sa X_to_other enable
vpn l2tp addresses none
vpn l2tp zone LAN
vpn l2tp dns relay
vpn l2tp encryption enable
vpn l2tp disable
vpn pptp addresses none
```

```
vpn pptp zone LAN
vpn pptp dns relay
vpn pptp encryption enable
vpn pptp disable
ntp peer
ntp server
ntp duration 5
ntp offset 1
ntp fast enable
ntp disable
ramdisk sync-interval sys 30
ramdisk sync-interval audit 30
ramdisk sync-interval block -1
ramdisk sync-interval alert -1
ramdisk sync-interval firewallsession -1
ramdisk sync-interval firewallblock -1
ramdisk sync-interval vpn -1
sms v2
sms no must-be-ip
no sms
sms no remote-deploy
session timeout 20 -persist
3KB_X_unit_1#
```

6.1.2 Cisco PIX 515E configuration file

```
CiscoPIX# show conf
: Saved
: Written by topuser at 11:13:39.920 UTC Wed Mar 14 2007
PIX Version 6.3(1)
interface ethernet0 auto
interface ethernet1 auto
interface ethernet2 auto shutdown
nameif ethernet0 outside security0
nameif ethernet1 inside security100
nameif ethernet2 intf2 security4
enable password tXS8gjMsLY6OO7ca encrypted
passwd 2KFQnbNIdI.2KYOU encrypted
hostname CiscoPIX
domain-name OTHER
fixup protocol ftp 21
fixup protocol h323 h225 1720
fixup protocol h323 ras 1718-1719
fixup protocol http 80
fixup protocol ils 389
fixup protocol rsh 514
fixup protocol rtsp 554
fixup protocol sip 5060
fixup protocol sip udp 5060
fixup protocol skinny 2000
fixup protocol smtp 25
fixup protocol sqlnet 1521
names
```

```
name 192.168.1.0 x-family
access-list inside_outbound_nat0_acl permit ip 192.168.22.0 255.255.255.0 x-family

255.255.255.0
access-list outside_cryptomap_20 permit ip 192.168.22.0 255.255.255.0 x-family
255.255.255.0
pager lines 24
mtu outside 1500
mtu inside 1500
mtu intf2 1500
ip address outside 10.10.10.147 255.255.255.0
ip address inside 192.168.22.254 255.255.255.0
no ip address intf2
ip audit info action alarm
ip audit attack action alarm
pdm location 192.168.22.100 255.255.255.255 inside
pdm location x-family 255.255.255.0 outside
pdm history enable
arp timeout 14400
nat (inside) 0 access-list inside_outbound_nat0_acl
route outside 0.0.0.0 0.0.0.0 10.10.10.1 1
timeout xlate 3:00:00
timeout conn 1:00:00 half-closed 0:10:00 udp 0:02:00 rpc 0:10:00 h225 1:00:00
timeout h323 0:05:00 mgcp 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
http server enable
http 192.168.22.100 255.255.255.255 inside
no snmp-server location
no snmp-server contact
snmp-server community public
no snmp-server enable traps
floodguard enable
sysopt connection permit-ipsec
crypto ipsec transform-set ESP-3DES-SHA esp-3des esp-sha-hmac
crypto map outside_map 20 ipsec-isakmp
crypto map outside_map 20 match address outside_cryptomap_20
crypto map outside_map 20 set peer 10.10.20.147
crypto map outside_map 20 set transform-set ESP-3DES-SHA
crypto map outside_map interface outside
isakmp enable outside
isakmp key ******** address 10.10.20.147 netmask 255.255.255.255 no-xauth
no-config-mode
isakmp identity address
isakmp policy 20 authentication pre-share
isakmp policy 20 encryption 3des
isakmp policy 20 hash sha
isakmp policy 20 group 2
isakmp policy 20 lifetime 86400
telnet timeout 5
ssh timeout 5
```

```
console timeout 0
username topuser password 7Ppr4YyUTiTQVNbR encrypted privilege 2
terminal width 80
Cryptochecksum:5eb95193e8c41a6c4250f365c101afaf
CiscoPIX#
```

6.2 Aggressive Mode

6.2.1 "show conf" file for X-family device

```
=~=~=~=~=~=~=~=~=~=~=~=~= PuTTY log 2007.03.13 16:47:26
3KB_x_unit_1# show conf
interface ethernet 3 1
    negotiate
    duplex full
    linespeed 100
    no shutdown
    exit
interface ethernet 3 2
    negotiate
    duplex full
    linespeed 100
    no shutdown
    exit
interface ethernet 3 3
    negotiate
    duplex full
    linespeed 100
    no shutdown
    exit
interface ethernet 3 4
    negotiate
    duplex full
    linespeed 100
    no shutdown
    exit
interface ethernet 3 5
    negotiate
    duplex full
    linespeed 100
    no shutdown
    exit
interface ethernet 3 6
    negotiate
    duplex full
    linespeed 100
    no shutdown
    exit
interface settings poll-interval 2000
interface settings detect-mdi enable
interface settings mdi-mode mdix
host name "3KB_x_unit_1"
host location "Lab"
host ip-filter permit any icmp
```

```
host ip-filter permit any ip
no autodv
user options max-attempts   5
user options expire-period  90
user options expire-action  expire
user options lockout-period 5
user options attempt-action lockout
user options security-level 2
high-availability disable
high-availability heartbeat 4 100 2
high-availability id 4098
clock timezone GMT
clock dst
log audit select general
log audit select login
log audit select logout
log audit select user
log audit select time
log audit select policy
log audit select update
log audit select boot
log audit select report
log audit select host
log audit select configuration
log audit select oam
log audit select sms
log audit select server
log audit select segment
log audit select high-availability
log audit select monitor
log audit select ip-filter
log audit select conn-table
log audit select host-communication
log audit select tse
category-settings -profile "Default Security Profile" vulnerabilities
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" exploits
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" security-policy
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" reconnaissance
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" virus
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" spyware
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" identity-theft
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" traffic-normal
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" network-equipment
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" p2p
enable - action-set "Recommended"
category-settings -profile "Default Security Profile" im
enable - action-set "Recommended"
```

```
category-settings -profile "Default Security Profile" streaming-media
enable - action-set "Recommended"
notify-contact "Management Console" 1
notify-contact "Remote System Log" 1
default-alert-sink period 1
server ssh
server no http
server https
server browser-check
monitor threshold memory      -major  90 -critical  95
monitor threshold disk        -major  90 -critical  95
monitor threshold temperature -major  92 -critical  94
monitor disable power-supply
no service-access
tse adaptive-filter mode automatic
tse afc-severity warning
tse connection-table timeout 1800
tse logging-mode conditional -threshold 1.0 -period 600
tse quarantine duration 60
email-rate-limit 10
zone update LAN vlan-id 1
zone update LAN port 3/1
zone update LAN mtu 1500
zone update LAN addresses disable
zone update LAN vpn-tunnel-access enable
zone update VPN vlan-id 4
zone update VPN port none
zone update VPN mtu 1500
zone update VPN addresses disable
zone update VPN vpn-tunnel-access enable
zone update WAN vlan-id 3
zone update WAN port 3/6
zone update WAN mtu 1500
zone update WAN addresses disable
zone update WAN vpn-tunnel-access enable
address-groups update DHCP-Pool range 192.168.1.1 192.168.1.20
authentication privilege-groups update Allow_VPN_access vpn-client-
access
authentication privilege-groups update RADIUS
authentication radius default-privilege-group RADIUS
authentication radius server primary 0.0.0.0 port 1812 shared-secret
******** auth-method chap
authentication radius server secondary none
authentication radius disable
authentication radius user-authentication enable
authentication radius vpn-clients enable
authentication radius retries 3
authentication radius timeout 2
web-filtering default-rule block
web-filtering filter-action block-and-log
web-filtering filter-service cache expiry 24
web-filtering filter-service cache size 2097152
web-filtering filter-service block adult
web-filtering filter-service block gambling
web-filtering filter-service block violence
web-filtering filter-service block criminal
web-filtering filter-service block hacking
```

```
web-filtering filter-service block weapons
web-filtering filter-service block drugs
web-filtering filter-service block hate
web-filtering filter-service permit advertisement
web-filtering filter-service permit computing
web-filtering filter-service permit food
web-filtering filter-service permit politics
web-filtering filter-service permit hosting
web-filtering filter-service permit lifestyle
web-filtering filter-service permit dating
web-filtering filter-service permit reference
web-filtering filter-service permit sex-education
web-filtering filter-service permit sports
web-filtering filter-service permit usenet
web-filtering filter-service permit arts
web-filtering filter-service permit education
web-filtering filter-service permit games
web-filtering filter-service permit health
web-filtering filter-service permit careers
web-filtering filter-service permit vehicles
web-filtering filter-service permit photos
web-filtering filter-service permit religion
web-filtering filter-service permit search
web-filtering filter-service permit streaming-media
web-filtering filter-service permit email
web-filtering filter-service permit chat
web-filtering filter-service permit finance
web-filtering filter-service permit glamour
web-filtering filter-service permit hobbies
web-filtering filter-service permit kids
web-filtering filter-service permit news
web-filtering filter-service permit real-estate
web-filtering filter-service permit proxies
web-filtering filter-service permit shopping
web-filtering filter-service permit travel
web-filtering filter-service disable
web-filtering manual-filter disable
dhcp-server addresses group DHCP-Pool
dhcp-server enable
dhcp-server bootp disable
dhcp-server lease-duration 60
dhcp-server dns default
dhcp-server wins primary 0.0.0.0
dhcp-server wins secondary 0.0.0.0
dhcp-server nbx 0.0.0.0
dhcp-server relay disable
dns use-external-dns enable
interface virtual add 1 internal
interface virtual internal 1 ip 192.168.1.254 netmask 255.255.255.0
interface virtual internal 1 ha-mgmt-ip 0.0.0.0
interface virtual internal 1 nat external-ip
interface virtual internal 1 rip disable
interface virtual internal 1 rip send-mode disable
interface virtual internal 1 rip receive-mode disable
interface virtual internal 1 rip auth disable
interface virtual internal 1 rip split-horizon disable
interface virtual internal 1 rip poison-reverse disable
```

```
interface virtual internal 1 rip advertise-routes enable
interface virtual internal 1 igmp disable
interface virtual internal 1 pim-dm disable
interface virtual internal 1 zone add LAN
interface virtual internal 1 zone add VPN
interface virtual add 2 external
interface virtual external 2 type static 10.10.20.147 netmask
255.255.255.0
interface virtual external 2 ha-mgmt-ip 0.0.0.0
interface virtual external 2 rip disable
interface virtual external 2 rip send-mode v2-multicast
interface virtual external 2 rip receive-mode all
interface virtual external 2 rip auth disable
interface virtual external 2 rip split-horizon enable
interface virtual external 2 rip poison-reverse enable
interface virtual external 2 rip advertise-routes disable
interface virtual external 2 igmp disable
interface virtual external 2 pim-dm disable
interface virtual external 2 zone add WAN
default-gateway 10.10.20.1
firewall schedule update working-day days -mtwtf- from 0800 to 1800
firewall service update 3com-nbx udp port 2093 to 2096
firewall service update audio-call-control tcp port 1731
firewall service update dhcp-client udp port 68
firewall service update dhcp-server udp port 67
firewall service update dns-tcp tcp port 53
firewall service update dns-udp udp port 53
firewall service update finger-tcp tcp port 79
firewall service update ftp tcp port 21
firewall service update gopher-tcp tcp port 70
firewall service update gre gre
firewall service update h323 tcp port 1720
firewall service update http tcp port 80
firewall service update https tcp port 443
firewall service update igmp igmp
firewall service update ike udp port 500
firewall service update imap tcp port 143
firewall service update imapv3 tcp port 220
firewall service update ipsec-ah ah
firewall service update ipsec-esp esp
firewall service update kerberos-tcp tcp port 88
firewall service update kerberos-udp udp port 88
firewall service update l2tp udp port 1701
firewall service update ldap-tcp tcp port 389
firewall service update ldap-udp udp port 389
firewall service update lotus-notes-domino tcp port 1352
firewall service update lpr tcp port 515
firewall service update nat-t-ipsec udp port 4500
firewall service update nbname tcp port 137
firewall service update netbios-tcp tcp port 137 to 139
firewall service update netbios-udp udp port 137 to 139
firewall service update netmeeting tcp port 1720
firewall service update nfsd-tcp tcp port 2049
firewall service update nfsd-udp udp port 2049
firewall service update nntp tcp port 119
firewall service update ntp udp port 123
firewall service update pim-dm pim
```

```
firewall service update ping icmp port 8
firewall service update pop3 tcp port 110
firewall service update portmapper-tcp tcp port 111
firewall service update portmapper-udp udp port 111
firewall service update pptp-tcp tcp port 1723
firewall service update radius-accounting udp port 1813
firewall service update radius-auth udp port 1812
firewall service update rexec tcp port 512
firewall service update rip udp port 520
firewall service update rlogin tcp port 513
firewall service update rsh tcp port 514
firewall service update rtsp tcp port 554
firewall service update sip-tcp tcp port 5060
firewall service update sip-udp udp port 5060
firewall service update smb tcp port 445
firewall service update sms-client tcp port 10042
firewall service update sms-trap tcp port 8162 to 8163
firewall service update smtp tcp port 25
firewall service update snmp-request udp port 161
firewall service update snmp-trap udp port 162
firewall service update ssh tcp port 22
firewall service update syslog udp port 514
firewall service update t120 tcp port 1503
firewall service update telnet tcp port 23
firewall service update tftp udp port 69
firewall service update traceroute icmp port 8
firewall service update uucp udp port 540
firewall service update vnc-browser tcp port 5800
firewall service update vnc-viewer tcp port 5900
firewall service update x-windows tcp port 6000 to 6063
firewall service-group update dns dns-tcp dns-udp
firewall service-group update email pop3 smtp imap imapv3
firewall service-group update ipsec ike ipsec-ah ipsec-esp
firewall service-group update ldap ldap-udp ldap-tcp
firewall service-group update management https ssh ping snmp-request
firewall service-group update netmeeting h323 audio-call-control t120
firewall service-group update network-protocols dns-tcp dns-udp dhcp-
server
firewall service-group update nfs portmapper-tcp portmapper-udp nfsd-tcp
nfsd-udp
firewall service-group update pptp pptp-tcp gre
firewall service-group update secure-management https ssh
firewall service-group update sip sip-tcp sip-udp
firewall service-group update sms-config http https sms-client snmp-
request ssh
firewall service-group update sms-get ntp sms-trap
firewall service-group update snmp snmp-request snmp-trap
firewall service-group update vnc vnc-browser vnc-viewer
firewall service-group update voice 3com-nbx sip-tcp sip-udp
firewall service-group update vpn-protocols pptp-tcp l2tp gre ike nat-t-
ipsec
firewall rule update 1 permit LAN WAN ANY
firewall rule update 1 schedule always timeout 30 logging disable
firewall rule update 1 src-addr all
firewall rule update 1 dst-addr all
firewall rule update 1 bandwidth disable
firewall rule update 1 authentication disable
```

```
firewall rule update 1 position 1
firewall rule update 1 comment "Allow LAN unrestricted access to WAN"
firewall rule update 1 remote-logging disable
firewall rule enable 1
firewall rule update 2 permit WAN this-device vpn-protocols
firewall rule update 2 schedule always timeout 30 logging disable
firewall rule update 2 src-addr all
firewall rule update 2 dst-addr all
firewall rule update 2 bandwidth disable
firewall rule update 2 authentication disable
firewall rule update 2 position 2
firewall rule update 2 comment "Allow VPN termination"
firewall rule update 2 remote-logging disable
firewall rule enable 2
firewall rule update 3 permit LAN this-device management
firewall rule update 3 schedule always timeout 30 logging disable
firewall rule update 3 src-addr all
firewall rule update 3 dst-addr all
firewall rule update 3 bandwidth disable
firewall rule update 3 authentication disable
firewall rule update 3 position 3
firewall rule update 3 comment "Allow management access from LAN"
firewall rule update 3 remote-logging disable
firewall rule enable 3
firewall rule update 4 permit LAN this-device network-protocols
firewall rule update 4 schedule always timeout 30 logging disable
firewall rule update 4 src-addr all
firewall rule update 4 dst-addr all
firewall rule update 4 bandwidth disable
firewall rule update 4 authentication disable
firewall rule update 4 position 4
firewall rule update 4 comment "Allow DNS and DHCP from LAN"
firewall rule update 4 remote-logging disable
firewall rule enable 4
firewall rule update 5 permit LAN this-device rip
firewall rule update 5 schedule always timeout 30 logging disable
firewall rule update 5 src-addr all
firewall rule update 5 dst-addr all
firewall rule update 5 bandwidth disable
firewall rule update 5 authentication disable
firewall rule update 5 position 5
firewall rule update 5 comment ""
firewall rule update 5 remote-logging disable
firewall rule enable 5
firewall rule update 6 permit LAN this-device pim-dm
firewall rule update 6 schedule always timeout 30 logging disable
firewall rule update 6 src-addr all
firewall rule update 6 dst-addr all
firewall rule update 6 bandwidth disable
firewall rule update 6 authentication disable
firewall rule update 6 position 6
firewall rule update 6 comment ""
firewall rule update 6 remote-logging disable
firewall rule enable 6
firewall rule update 7 permit ANY ANY ping
firewall rule update 7 schedule always timeout 30 logging disable
firewall rule update 7 src-addr all
```

```
firewall rule update 7 dst-addr all
firewall rule update 7 bandwidth disable
firewall rule update 7 authentication disable
firewall rule update 7 position 7
firewall rule update 7 comment ""
firewall rule update 7 remote-logging disable
firewall rule enable 7
firewall alg sip services ANY
firewall alg sip sdp-port-range ANY
routing rip enable update-timer 30
routing multicast igmp disable
routing multicast pim-dm disable query-interval 30 prune-timeout 180
vpn ike local-id email x_family@3com.com
vpn ike local-id domain x-family
vpn ike add DES-SHA1-PSK
vpn ike proposal DES-SHA1-PSK phase1-encryption des-cbc
vpn ike proposal DES-SHA1-PSK phase1-integrity sha1
vpn ike proposal DES-SHA1-PSK phase1-dh-group 1
vpn ike proposal DES-SHA1-PSK phase1-lifetime 28800
vpn ike proposal DES-SHA1-PSK auth-type psk
vpn ike proposal DES-SHA1-PSK aggressive-mode disable
vpn ike proposal DES-SHA1-PSK local-id-type ip
vpn ike proposal DES-SHA1-PSK peer-id-type ip
vpn ike proposal DES-SHA1-PSK ca-cert ANY
vpn ike proposal DES-SHA1-PSK nat-t disable
vpn ike proposal DES-SHA1-PSK dpd enable
vpn ike proposal DES-SHA1-PSK auto-connect disable
vpn ike proposal DES-SHA1-PSK tight-phase2-control enable
vpn ike proposal DES-SHA1-PSK phase2-encryption des-cbc
vpn ike proposal DES-SHA1-PSK phase2-integrity esp-sha1-hmac
vpn ike proposal DES-SHA1-PSK phase2-lifetime 3600
vpn ike proposal DES-SHA1-PSK pfs disable
vpn ike proposal DES-SHA1-PSK phase2-dh-group 1
vpn ike proposal DES-SHA1-PSK phase2-zero-id disable
vpn ike proposal DES-SHA1-PSK phase2-strict-id-check disable
vpn ike add 3DES-SHA1-DH2
vpn ike proposal 3DES-SHA1-DH2 phase1-encryption 3des-cbc
vpn ike proposal 3DES-SHA1-DH2 phase1-integrity sha1
vpn ike proposal 3DES-SHA1-DH2 phase1-dh-group 2
vpn ike proposal 3DES-SHA1-DH2 phase1-lifetime 28800
vpn ike proposal 3DES-SHA1-DH2 auth-type psk
vpn ike proposal 3DES-SHA1-DH2 aggressive-mode disable
vpn ike proposal 3DES-SHA1-DH2 local-id-type ip
vpn ike proposal 3DES-SHA1-DH2 peer-id-type ip
vpn ike proposal 3DES-SHA1-DH2 ca-cert ANY
vpn ike proposal 3DES-SHA1-DH2 nat-t enable
vpn ike proposal 3DES-SHA1-DH2 dpd enable
vpn ike proposal 3DES-SHA1-DH2 auto-connect disable
vpn ike proposal 3DES-SHA1-DH2 tight-phase2-control disable
vpn ike proposal 3DES-SHA1-DH2 phase2-encryption 3des-cbc
vpn ike proposal 3DES-SHA1-DH2 phase2-integrity esp-sha1-hmac
vpn ike proposal 3DES-SHA1-DH2 phase2-lifetime 3600
vpn ike proposal 3DES-SHA1-DH2 pfs disable
vpn ike proposal 3DES-SHA1-DH2 phase2-dh-group 2
vpn ike proposal 3DES-SHA1-DH2 phase2-zero-id disable
vpn ike proposal 3DES-SHA1-DH2 phase2-strict-id-check disable
vpn ike add 3DES-SHA1-DH2-AGG-PFS
```

```
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS phase1-encryption 3des-cbc
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS phase1-integrity sha1
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS phase1-dh-group 2
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS phase1-lifetime 28800
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS auth-type psk
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS aggressive-mode enable
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS local-id-type domain
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS peer-id-type domain
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS ca-cert ANY
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS nat-t enable
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS dpd enable
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS auto-connect disable
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS tight-phase2-control disable
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS phase2-encryption 3des-cbc
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS phase2-integrity esp-sha1-hmac
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS phase2-lifetime 3600
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS pfs enable
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS phase2-dh-group 2
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS phase2-zero-id disable
vpn ike proposal 3DES-SHA1-DH2-AGG-PFS phase2-strict-id-check disable
vpn ipsec enable
vpn ipsec add Default
vpn ipsec sa Default disable
vpn ipsec sa Default key ike proposal DES-SHA1-PSK shared-secret
********
vpn ipsec sa Default transport enable
vpn ipsec sa Default peer 0.0.0.0
vpn ipsec sa Default zone LAN
vpn ipsec sa Default tunnel enable
vpn ipsec add x_family_to_other
vpn ipsec sa x_family_to_other key ike proposal 3DES-SHA1-DH2-AGG-PFS
shared-sec
ret ******** peer-id CiscoPIX.OTHER
vpn ipsec sa x_family_to_other transport disable
vpn ipsec sa x_family_to_other peer 10.10.10.147
vpn ipsec sa x_family_to_other zone LAN
vpn ipsec sa x_family_to_other tunnel remote subnet 192.168.22.0 netmask
255.255.255.0
vpn ipsec sa x_family_to_other tunnel local subnet 192.168.1.0 netmask
255.255.255.0
vpn ipsec sa x_family_to_other tunnel nat disable
vpn ipsec sa x_family_to_other tunnel enable
vpn ipsec sa x_family_to_other enable
vpn l2tp addresses none
vpn l2tp zone LAN
vpn l2tp dns relay
vpn l2tp encryption enable
vpn l2tp disable
vpn pptp addresses none
vpn pptp zone LAN
vpn pptp dns relay
vpn pptp encryption enable
vpn pptp disable
ntp peer
ntp server 161.71.52.200:123
ntp duration 5
ntp offset 1
```

```
ntp fast enable
ntp enable
ramdisk sync-interval sys 30
ramdisk sync-interval audit 30
ramdisk sync-interval block -1
ramdisk sync-interval alert -1
ramdisk sync-interval firewallsession -1
ramdisk sync-interval firewallblock -1
ramdisk sync-interval vpn -1
sms v2
sms no must-be-ip
no sms
sms no remote-deploy
session timeout 20 -persist
3KB_x_unit_1#
```

6.2.2 Cisco PIX 515E configuration file

```
CiscoPIX> show conf
Type help or '?' for a list of available commands.
CiscoPIX> enable
Password: *******
CiscoPIX# show conf
: Saved
: Written by topuser at 16:12:59.708 UTC Tue Mar 13 2007
PIX Version 6.3(1)
interface ethernet0 auto
interface ethernet1 auto
interface ethernet2 auto shutdown
nameif ethernet0 outside security0
nameif ethernet1 inside security100
nameif ethernet2 intf2 security4
enable password tXS8gjMsLY6OO7ca encrypted
passwd 2KFQnbNIdI.2KYOU encrypted
hostname CiscoPIX
domain-name OTHER
fixup protocol ftp 21
fixup protocol h323 h225 1720
fixup protocol h323 ras 1718-1719
fixup protocol http 80
fixup protocol ils 389
fixup protocol rsh 514
fixup protocol rtsp 554
fixup protocol sip 5060
fixup protocol sip udp 5060
fixup protocol skinny 2000
fixup protocol smtp 25
fixup protocol sqlnet 1521
names
name 192.168.1.0 x-family
access-list inside_nat0_outbound permit ip 192.168.22.0 255.255.255.0 x-family
255.255.255.0
access-list outside_cryptomap_dyn_20 permit ip 192.168.22.0 255.255.255.0 x-
family 255.255.255.0
```

```
access-list outside_access_in permit ip x-family 255.255.255.0 192.168.22.0
255.255.255.0
pager lines 24
logging on
mtu outside 1500
mtu inside 1500
mtu intf2 1500
ip address outside 10.10.10.147 255.255.255.0
ip address inside 192.168.22.254 255.255.255.0
no ip address intf2
ip audit info action alarm
ip audit attack action alarm
pdm location 192.168.22.100 255.255.255.255 inside
pdm location x-family 255.255.255.0 outside
pdm logging warnings 100
pdm history enable
arp timeout 14400
nat (inside) 0 access-list inside_nat0_outbound
access-group outside_access_in in interface outside
route outside 0.0.0.0 0.0.0.0 10.10.10.1 1
timeout xlate 3:00:00
timeout conn 1:00:00 half-closed 0:10:00 udp 0:02:00 rpc 0:10:00 h225 1:00:00
timeout h323 0:05:00 mgcp 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
http server enable
http 192.168.22.100 255.255.255.255 inside
no snmp-server location
no snmp-server contact
snmp-server community public
no snmp-server enable traps
floodguard enable
crypto ipsec transform-set ESP-3DES-SHA esp-3des esp-sha-hmac
crypto dynamic-map outside_dyn_map 20 match address
outside_cryptomap_dyn_20
crypto dynamic-map outside_dyn_map 20 set pfs group2
crypto dynamic-map outside_dyn_map 20 set transform-set ESP-3DES-SHA
crypto map outside_map 65535 ipsec-isakmp dynamic outside_dyn_map
crypto map outside_map interface outside
isakmp enable outside
isakmp key ******** address 0.0.0.0 netmask 0.0.0.0 no-xauth no-config-mode
isakmp policy 20 authentication pre-share
isakmp policy 20 encryption 3des
isakmp policy 20 hash sha
isakmp policy 20 group 2
isakmp policy 20 lifetime 86400
telnet timeout 5
ssh timeout 5
console timeout 0
username topuser password 7Ppr4YyUTiTQVNbR encrypted privilege 2
terminal width 80
```

```
Cryptochecksum:7ce6ec2f93be7065e164930d341db9b9
CiscoPIX#
```