TheGreenBow IPSec VPN Client

Configuration Guide

Cisco PIX-506E

WebSite: http://www.thegreenbow.com

Contact: support@thegreenbow.com

Table of contents

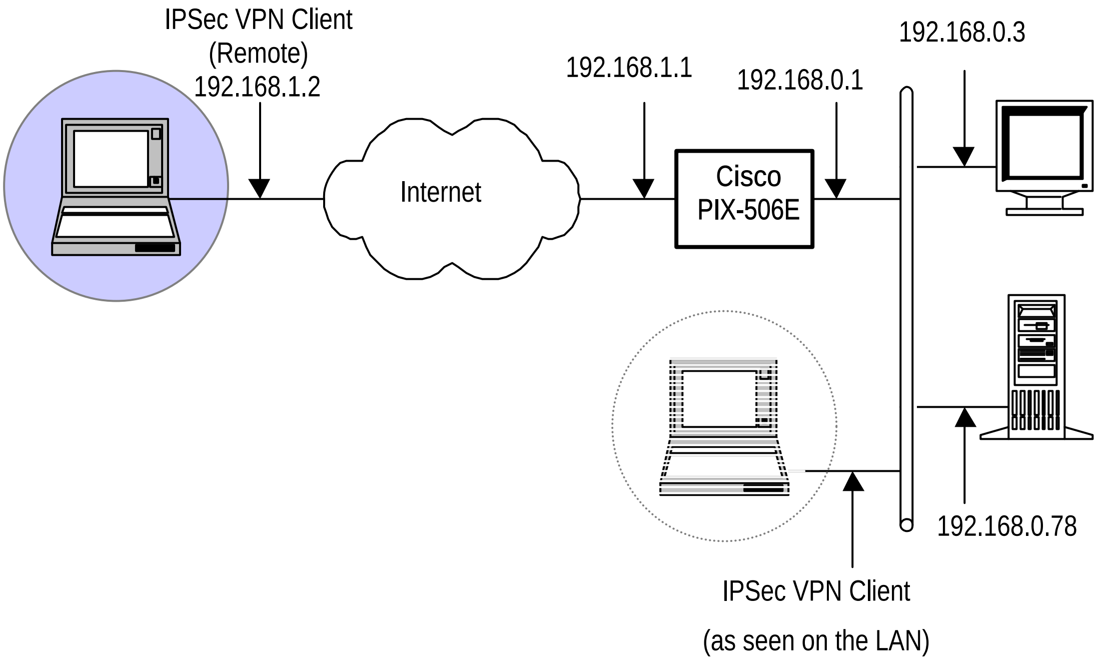
1 Introduction

1.1 Goal of this document

This configuration guide describes how to configure TheGreenBow IPSec VPN Client with a Cisco PIX-506E Firewall.

1.2 VPN Network topology

In our VPN network example (diagram hereafter), we will connect TheGreenBow IPSec VPN Client to the LAN behind the Cisco PIX-506E firewall. The VPN client is connected to the Internet with a DSL connection or through a LAN. All the addresses in this document are given for example purpose.



1.3 Cisco PIX-506E Security Appliance

Our tests and VPN configuration have been conducted with Cisco PIX-506E firmware release version 6.3(5)

1.4 Cisco PIX-506E Security Appliance product info

It is critical that users find all necessary information about Cisco PIX-506E Security Appliance. All product info, User Guide and knowledge base for the Cisco PIX-506E Security Appliance can be found on the Cisco website: www.cisco.com.

CiscoPIX-506E Product page	http://www.cisco.com/en/US/products/hw/vpndevc/ps2030/ps4336/index.html
CiscoPIX-506E Datasheet	http://www.cisco.com/en/US/prod/collateral/vpndevc/ps5708/ps5709/ps2030/ps4336/product_data_sheet09186a0080091b13.pdf
CiscoPIX-506E FAQ/KBase	http://www.cisco.com/en/US/products/hw/vpndevc/ps2030/prod_literature.html

2 Cisco PIX-506E VPN configuration

This section describes how to build an IPSec VPN configuration with your Cisco PIX-506E Firewall.

2.1 Cisco PIX-506E Main settings

Show version:

```
Cisco PIX Firewall Version 6.3(5)
Cisco PIX Device Manager Version 3.0(4)
Compiled on Thu 04-Aug-05 21:40 by morlee
ciscopix up 43 mins 15 secs
Hardware:   PIX-506E, 32 MB RAM, CPU Pentium II 300 MHz
Flash E28F640J3 @ 0x300, 8MB
BIOS Flash AM29F400B @ 0xfffd8000, 32KB

0: ethernet0: address is 000f.f79f.ab4e, irq 10
1: ethernet1: address is 000f.f79f.ab4f, irq 11
Licensed Features:
Failover:                    Disabled
VPN-DES:                     Enabled
VPN-3DES-AES:                Enabled
Maximum Physical Interfaces: 2
Maximum Interfaces:          4
Cut-through Proxy:           Enabled
Guards:                      Enabled
URL-filtering:               Enabled
Inside Hosts:                Unlimited
Throughput:                  Unlimited
IKE peers:                   Unlimited
```

2.2 Cisco PIX-506E Main Configuration of Point-to-Multiple Point mode

```
PIX Version 6.3(5)
interface ethernet0 auto
interface ethernet1 10baset
nameif ethernet0 outside security0
nameif ethernet1 inside security100

fixup protocol dns maximum-length 512
fixup protocol ftp 21
fixup protocol h323 h225 1720
fixup protocol h323 ras 1718-1719
fixup protocol http 80
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
fixup protocol tftp 69
names

access-list 115 permit ip 192.168.0.0 255.255.255.0 192.168.10.0 255.255.255.0
access-list 115 deny ip 192.168.0.0 255.255.255.0 any
access-list inside permit ip any any
access-list outside permit ip any any
pager lines 24
mtu outside 1500
mtu inside 1500
ip address outside 192.168.1.1 255.255.255.0
ip address inside 192.168.0.1 255.255.255.0
ip audit info action alarm
ip audit attack action alarm
pdm history enable
arp timeout 14400
nat (inside) 0 access-list 115
```

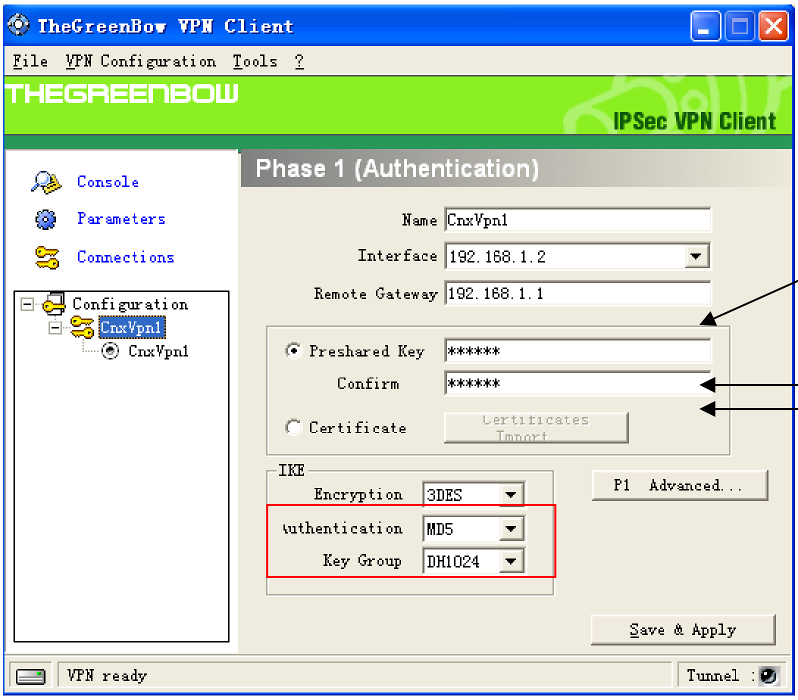
```
route outside 0.0.0.0 0.0.0.0 192.168.1.2 2
timeout xlate 3:00:00
timeout conn 1:00:00 half-closed 0:10:00 udp 0:02:00 rpc 0:10:00 h225 1:00:00
timeout h323 0:05:00 mgcp 0:05:00 sip 0:30:00 sip_media 0:02:00
timeout sip-disconnect 0:02:00 sip-invite 0:03:00
timeout uauth 0:05:00 absolute
aaa-server TACACS+ protocol tacacs+
aaa-server TACACS+ max-failed-attempts 3
aaa-server TACACS+ deadtime 10
aaa-server RADIUS protocol radius
aaa-server RADIUS max-failed-attempts 3
aaa-server RADIUS deadtime 10
aaa-server LOCAL protocol local
http server enable
http 192.168.0.2 255.255.255.255 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 myset esp-3des esp-md5-hmac
crypto dynamic-map cisco 1 set transform-set myset
crypto map dyn-map 20 ipsec-isakmp dynamic cisco
crypto map dyn-map interface outside
isakmp enable outside
isakmp key 123456 address 0.0.0.0 netmask 0.0.0.0
isakmp identity address
isakmp policy 10 authentication pre-share
isakmp policy 10 encryption 3des
isakmp policy 10 hash md5
isakmp policy 10 group 1
isakmp policy 10 lifetime 28800
telnet timeout 5
ssh timeout 5
console timeout 0
```

terminal width 80

3 TheGreenBow IPSec VPN Client configuration

3.1 VPN Client Phase 1 (IKE) Configuration



Phase 1 (Authentication)

Name CnxVpn1

Interface 192.168.1.2

Remote Gateway 192.168.1.1

● Preshared Key ******

Confirm ******

○ Certificate

IKE

Encryption 3DES

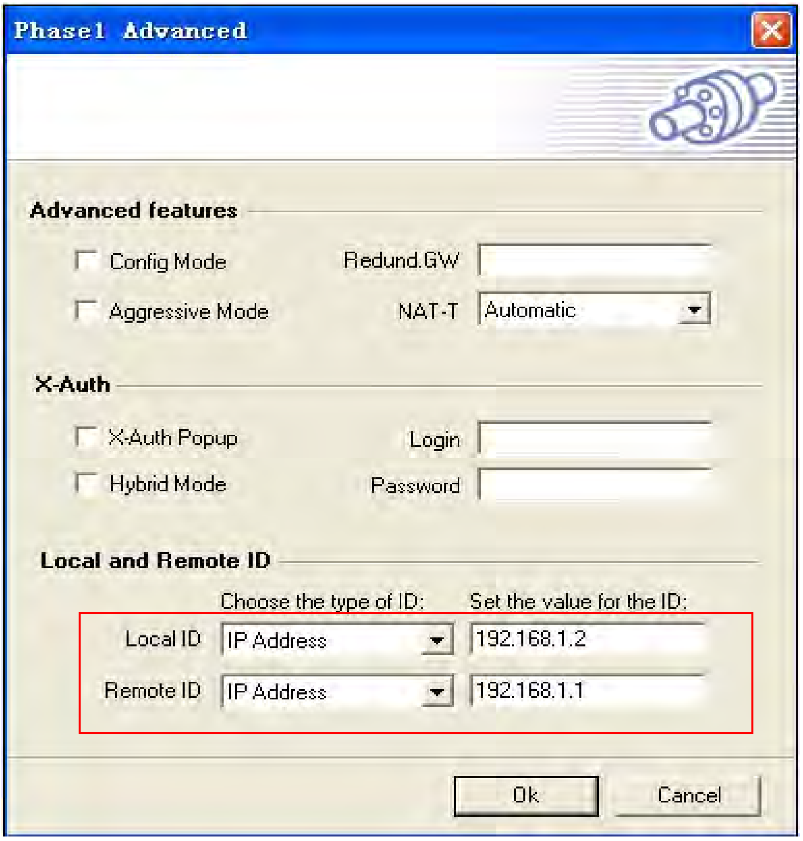
Authentication MD5

Key Group DH1024

The remote Firewall IP address is either an explicit IP address, or a DNS Name

123456

123456



Advanced features

□ Config Mode Redund.GW

□ Aggressive Mode NAT-T Automatic

X-Auth

□ X-Auth Popup Login

□ Hybrid Mode Password

Local and Remote ID

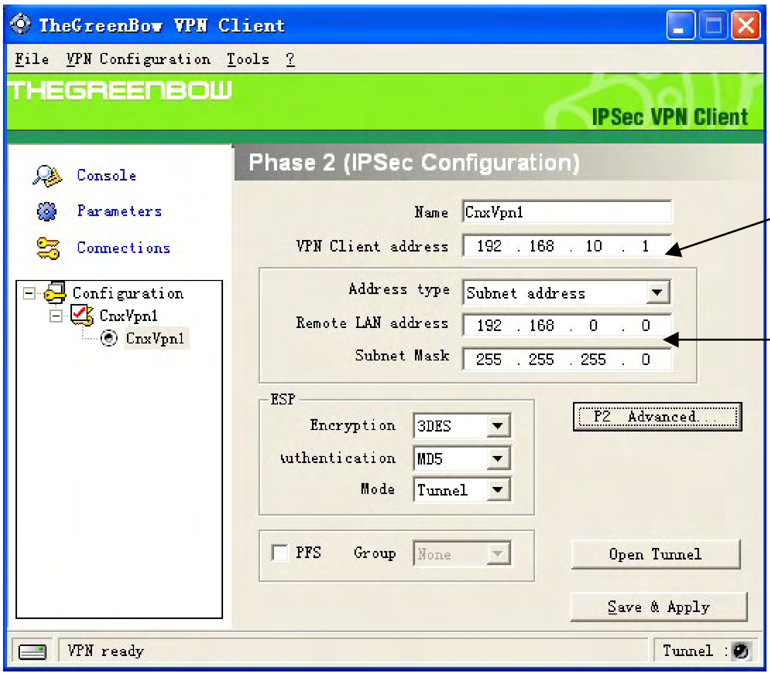
Choose the type of ID: Set the value for the ID:

Local ID IP Address 192.168.1.2

Remote ID IP Address 192.168.1.1

Phase 1 configuration

3.2 VPN Client Phase 2 (IPSec) Configuration



Phase 2 (IPSec Configuration)

Name: CnxVpn1

VPN Client address: 192 . 168 . 10 . 1

Address type: Subnet address

Remote LAN address: 192 . 168 . 0 . 0

Subnet Mask: 255 . 255 . 255 . 0

ESP

Encryption: 3DES

uthentication: MD5

Mode: Tunnel

□ PFS Group: None

You may define a static virtual IP address here.

If you use 0.0.0.0, you will have error "Local-ID" is missing. It does not prevent you from establishing a tunnel

Enter the IP address (and subnet mask) of the remote LAN.

Phase 2 Configuration

3.3 Open IPSec VPN tunnels

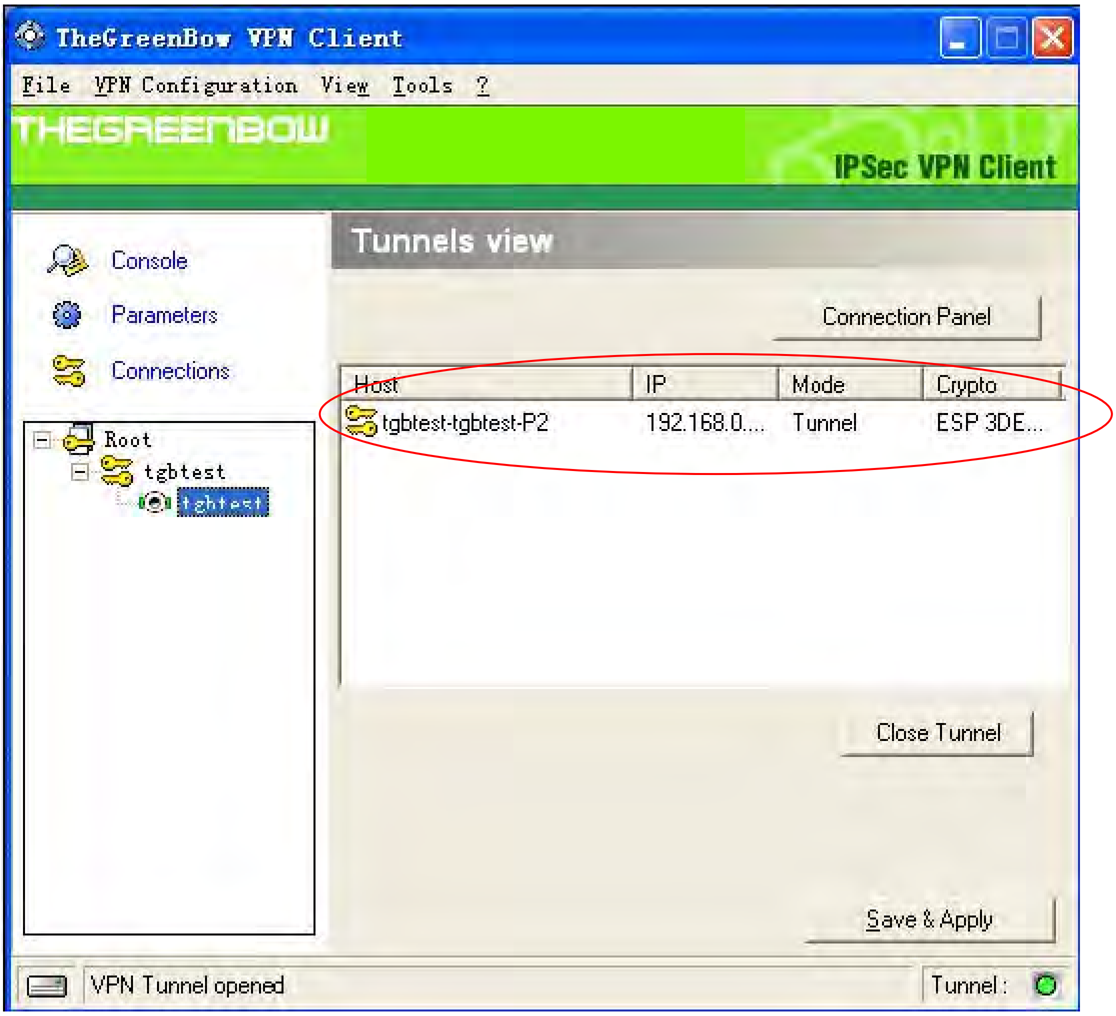
Once both Cisco PIX-506E firewall and TheGreenBow IPSec VPN Client have been configured accordingly, you are ready to open VPN tunnels. First make sure you enable your firewall with IPSec traffic.

1. Click on "**Save & Apply**" to take into account all modifications we've made on your VPN Client configuration

2. Click on "**Open Tunnel**", or generate traffic that will automatically open a secure IPSec VPN Tunnel (e.g. ping, IE browser)

3. Select "**Connections**" to see opened VPN Tunnels

4. Select "**Console**" if you want to access to the IPSec VPN logs and adjust filters to display less IPSec messaging. The following example shows a successful connection between TheGreenBow IPSec VPN Client and a Cisco PIX-506E Firewall.



Host	IP	Mode	Crypto
tgbtest-tgbtest-P2	192.168.0....	Tunnel	ESP 3DE...

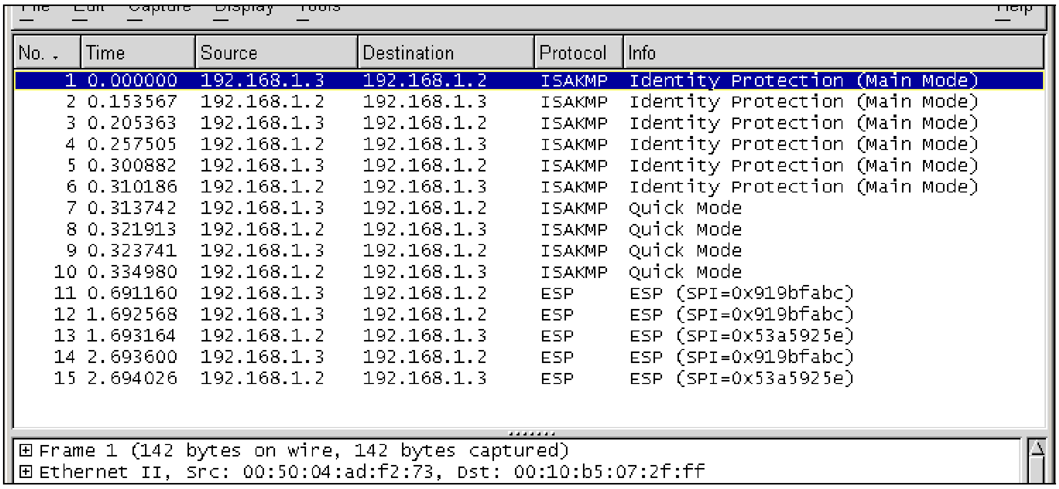
VPN Tunnel opened

4 Tools in case of trouble

Configuring an IPSec VPN tunnel can be a hard task. One missing parameter can prevent a VPN connection from being established. Some tools are available to find source of troubles during a VPN establishment.

4.1 A good network analyser: wireshark

Wireshark is a free software that can be used for packet and traffic analysis. It shows IP or TCP packets received on a network card. This tool is available on website http://www.wireshark.org/. It can be used to follow protocol exchange between two devices. For installation and use details, read its specific documentation (http://www.wireshark.org/docs/).



```
No. .  Time      Source        Destination   Protocol Info
    1 0.000000  192.168.1.3   192.168.1.2   ISAKMP   Identity Protection (Main Mode)
    2 0.153567  192.168.1.2   192.168.1.3   ISAKMP   Identity Protection (Main Mode)
    3 0.205363  192.168.1.3   192.168.1.2   ISAKMP   Identity Protection (Main Mode)
    4 0.257505  192.168.1.2   192.168.1.3   ISAKMP   Identity Protection (Main Mode)
    5 0.300882  192.168.1.3   192.168.1.2   ISAKMP   Identity Protection (Main Mode)
    6 0.310186  192.168.1.2   192.168.1.3   ISAKMP   Identity Protection (Main Mode)
    7 0.313742  192.168.1.3   192.168.1.2   ISAKMP   Quick Mode
    8 0.321913  192.168.1.2   192.168.1.3   ISAKMP   Quick Mode
    9 0.323741  192.168.1.3   192.168.1.2   ISAKMP   Quick Mode
   10 0.334980  192.168.1.2   192.168.1.3   ISAKMP   Quick Mode
   11 0.691160  192.168.1.3   192.168.1.2   ESP      ESP (SPI=0x919bfabc)
   12 1.692568  192.168.1.3   192.168.1.2   ESP      ESP (SPI=0x919bfabc)
   13 1.693164  192.168.1.2   192.168.1.3   ESP      ESP (SPI=0x53a5925e)
   14 2.693600  192.168.1.3   192.168.1.2   ESP      ESP (SPI=0x919bfabc)
   15 2.694026  192.168.1.2   192.168.1.3   ESP      ESP (SPI=0x53a5925e)

⊞ Frame 1 (142 bytes on wire, 142 bytes captured)
⊞ Ethernet II, Src: 00:50:04:ad:f2:73, Dst: 00:10:b5:07:2f:ff
```

5 VPN IPSec Troubleshooting

5.1 « PAYLOAD MALFORMED » error (wrong Phase 1 [SA])

```
114920 Default (SA CNXVPN1-P1) SEND phase 1 Main Mode  [SA][VID]
114920 Default (SA CNXVPN1-P1) RECV phase 1 Main Mode  [NOTIFY]
114920 Default exchange_run: exchange_validate failed
114920 Default dropped message from 195.100.205.114 port 500 due to notification
type PAYLOAD_MALFORMED
114920 Default SEND Informational  [NOTIFY] with PAYLOAD_MALFORMED error
```

If you have an « PAYLOAD MALFORMED » error you might have a wrong Phase 1 [SA], check if the encryption algorithms are the same on each side of the VPN tunnel.

5.2 « INVALID COOKIE » error

```
115933 Default message_recv: invalid cookie(s) 5918ca0c2634288f 7364e3e486e49105
115933 Default dropped message from 195.100.205.114 port 500 due to notification
type INVALID_COOKIE
115933 Default SEND Informational  [NOTIFY] with INVALID_COOKIE error
```

If you have an « INVALID COOKIE » error, it means that one of the endpoint is using a SA that is no more in use. Reset the VPN connection on each side.

5.3 « no keystate » error

```
115315 Default (SA CNXVPN1-P1) SEND phase 1 Main Mode  [SA][VID]
115317 Default (SA CNXVPN1-P1) RECV phase 1 Main Mode  [SA][VID]
115317 Default (SA CNXVPN1-P1) SEND phase 1 Main Mode  [KEY][NONCE]
115319 Default (SA CNXVPN1-P1) RECV phase 1 Main Mode  [KEY][NONCE]
115319 Default (SA CNXVPN1-P1) SEND phase 1 Main Mode  [ID][HASH][NOTIFY]
115319 Default ipsec_get_keystate: no keystate in ISAKMP SA 00B57C50
```

Check if the preshared key is correct or if the local ID is correct (see « Advanced » button). You should have more information in the remote endpoint logs.

5.4 « received remote ID other than expected » error

```
120348 Default (SA CNXVPN1-P1) SEND phase 1 Main Mode  [SA][VID]
120349 Default (SA CNXVPN1-P1) RECV phase 1 Main Mode  [SA][VID]
120349 Default (SA CNXVPN1-P1) SEND phase 1 Main Mode  [KEY][NONCE]
120351 Default (SA CNXVPN1-P1) RECV phase 1 Main Mode  [KEY][NONCE]
120351 Default (SA CNXVPN1-P1) SEND phase 1 Main Mode  [ID][HASH][NOTIFY]
120351 Default (SA CNXVPN1-P1) RECV phase 1 Main Mode  [ID][HASH][NOTIFY]
120351 Default ike_phase_1_recv_ID: received remote ID other than
expected support@thegreenbow.fr
```

The « Remote ID » value (see « Advanced » Button) does not match what the remote endpoint is expected.

5.5 « NO PROPOSAL CHOSEN » error

```
115911 Default (SA CNXVPN1-P1) SEND phase 1 Main Mode  [SA][VID]
115913 Default (SA CNXVPN1-P1) RECV phase 1 Main Mode  [SA][VID]
115913 Default (SA CNXVPN1-P1) SEND phase 1 Main Mode  [KEY][NONCE]
115915 Default (SA CNXVPN1-P1) RECV phase 1 Main Mode  [KEY][NONCE]
115915 Default (SA CNXVPN1-P1) SEND phase 1 Main Mode  [ID][HASH][NOTIFY]
115915 Default (SA CNXVPN1-P1) RECV phase 1 Main Mode  [ID][HASH][NOTIFY]
115915 Default phase 1 done: initiator id c364cd70: 195.100.205.112, responder id
c364cd72: 195.100.205.114, src: 195.100.205.112 dst: 195.100.205.114
115915   Default   (SA   CNXVPN1-CNXVPN1-P2)   SEND   phase   2   Quick   Mode
[SA][KEY][ID][HASH][NONCE]
115915 Default RECV Informational  [HASH][NOTIFY] with NO_PROPOSAL_CHOSEN error
115915 Default RECV Informational  [HASH][DEL]
115915 Default CNXVPN1-P1 deleted
```

If you have an « NO PROPOSAL CHOSEN » error, check that the « Phase 2 » encryption algorithms are the same on each side of the VPN Tunnel.

Check « Phase 1 » algorithms if you have this:

```
115911 Default (SA CNXVPN1-P1) SEND phase 1 Main Mode  [SA][VID]
115911 Default RECV Informational  [NOTIFY] with NO_PROPOSAL_CHOSEN error
```

5.6 « INVALID ID INFORMATION » error

```
122623 Default (SA CNXVPN1-P1) SEND phase 1 Main Mode  [SA][VID]
122625 Default (SA CNXVPN1-P1) RECV phase 1 Main Mode  [SA][VID]
122625 Default (SA CNXVPN1-P1) SEND phase 1 Main Mode  [KEY][NONCE]
122626 Default (SA CNXVPN1-P1) RECV phase 1 Main Mode  [KEY][NONCE]
122626 Default (SA CNXVPN1-P1) SEND phase 1 Main Mode  [ID][HASH][NOTIFY]
122626 Default (SA CNXVPN1-P1) RECV phase 1 Main Mode  [ID][HASH][NOTIFY]
122626 Default phase 1 done: initiator id c364cd70: 195.100.205.112, responder id
c364cd72: 195.100.205.114, src: 195.100.205.112 dst: 195.100.205.114
122626   Default   (SA   CNXVPN1-CNXVPN1-P2)   SEND   phase   2   Quick   Mode
[SA][KEY][ID][HASH][NONCE]
122626 Default RECV Informational  [HASH][NOTIFY] with INVALID_ID_INFORMATION error
122626 Default RECV Informational  [HASH][DEL]
122626 Default CNXVPN1-P1 deleted
```

If you have an « INVALID ID INFORMATION » error, check if « Phase 2 » ID (local address and network address) is correct and match what is expected by the remote endpoint.

Check also ID type (“Subnet address” and “Single address”). If network mask is not check, you are using a IPV4_ADDR type (and not a IPV4_SUBNET type).

5.7 I clicked on “Open tunnel”, but nothing happens.

Read logs of each VPN tunnel endpoint. IKE requests can be dropped by firewalls. An IPSec Client uses UDP port 500 and protocol ESP (protocol 50).

5.8 The VPN tunnel is up but I can’t ping !

If the VPN tunnel is up, but you still cannot ping the remote LAN, here are a few guidelines:

- Check Phase 2 settings: VPN Client address and Remote LAN address. Usually, VPN Client IP address should not belong to the remote LAN subnet
- Once VPN tunnel is up, packets are sent with ESP protocol. This protocol can be blocked by firewall. Check that every device between the client and the VPN server does accept ESP
- Check your VPN server logs. Packets can be dropped by one of its firewall rules.
- Check your ISP support ESP

- If you still cannot ping, follow ICMP traffic on VPN server LAN interface and on LAN computer interface (with Wireshark for example). You will have an indication that encryption works.
- Check the "default gateway" value in VPN Server LAN. A target on your remote LAN can receive pings but does not answer because there is a no "Default gateway" setting.
- You cannot access to the computers in the LAN by their name. You must specify their IP address inside the LAN.
- We recommend you to install wireshark (http://www.wireshark.com) on one of your target computer. You can check that your pings arrive inside the LAN.

6 Contacts

News and updates on TheGreenBow web site : http://www.thegreenbow.com

Technical support by email at support@thegreenbow.com

Sales contacts by email at info@thegreenbow.com