TheGreenBow IPSec VPN Client

Configuration Guide

T.D.T. M-/G- Series

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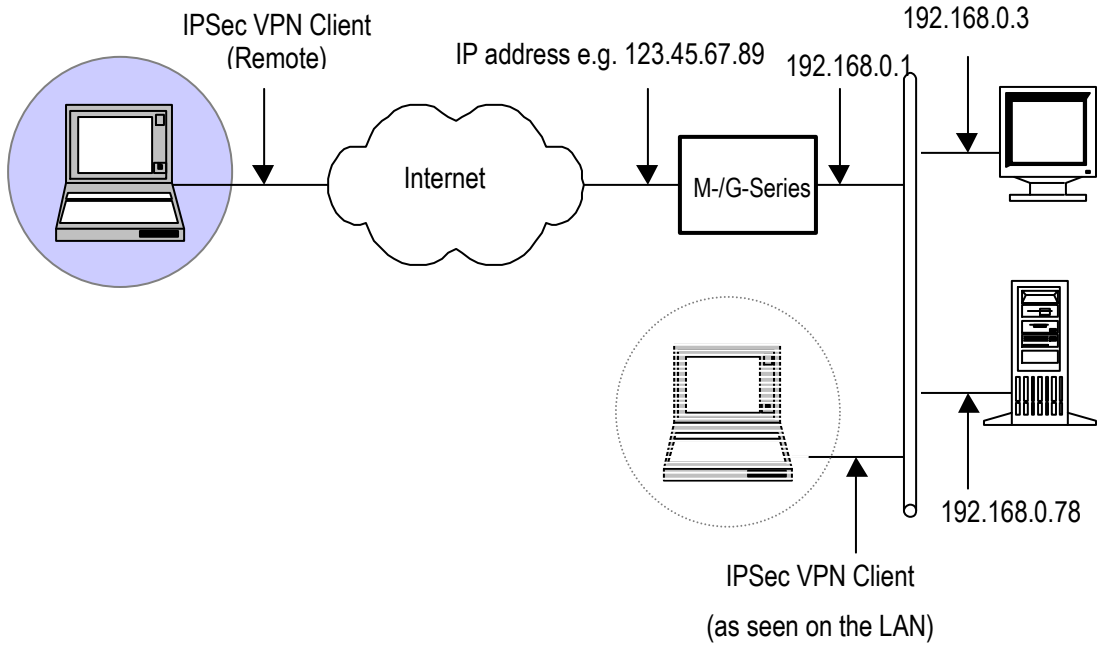
1 Introduction

1.1 Goal of this document

This configuration guide describes how to configure TheGreenBow IPSec VPN Client with a T.D.T. M-/G-Series VPN router.

1.2 VPN Network topology

In our VPN network example (diagram hereafter), we will connect TheGreenBow IPSec VPN Client to the LAN behind the T.D.T. M-/G-Series router. 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 T.D.T. M-/G-Series Restrictions

Depending on the firmware version, T.D.T. M-/G-Series may not support NAT-T. The IPSec VPN Client cannot connect if it stands on a LAN.

1.4 T.D.T. M-/G-Series VPN Gateway

Our tests and VPN configuration have been conducted with T.D.T. M-/G-Series firmware release version with Openswan 2.4.7

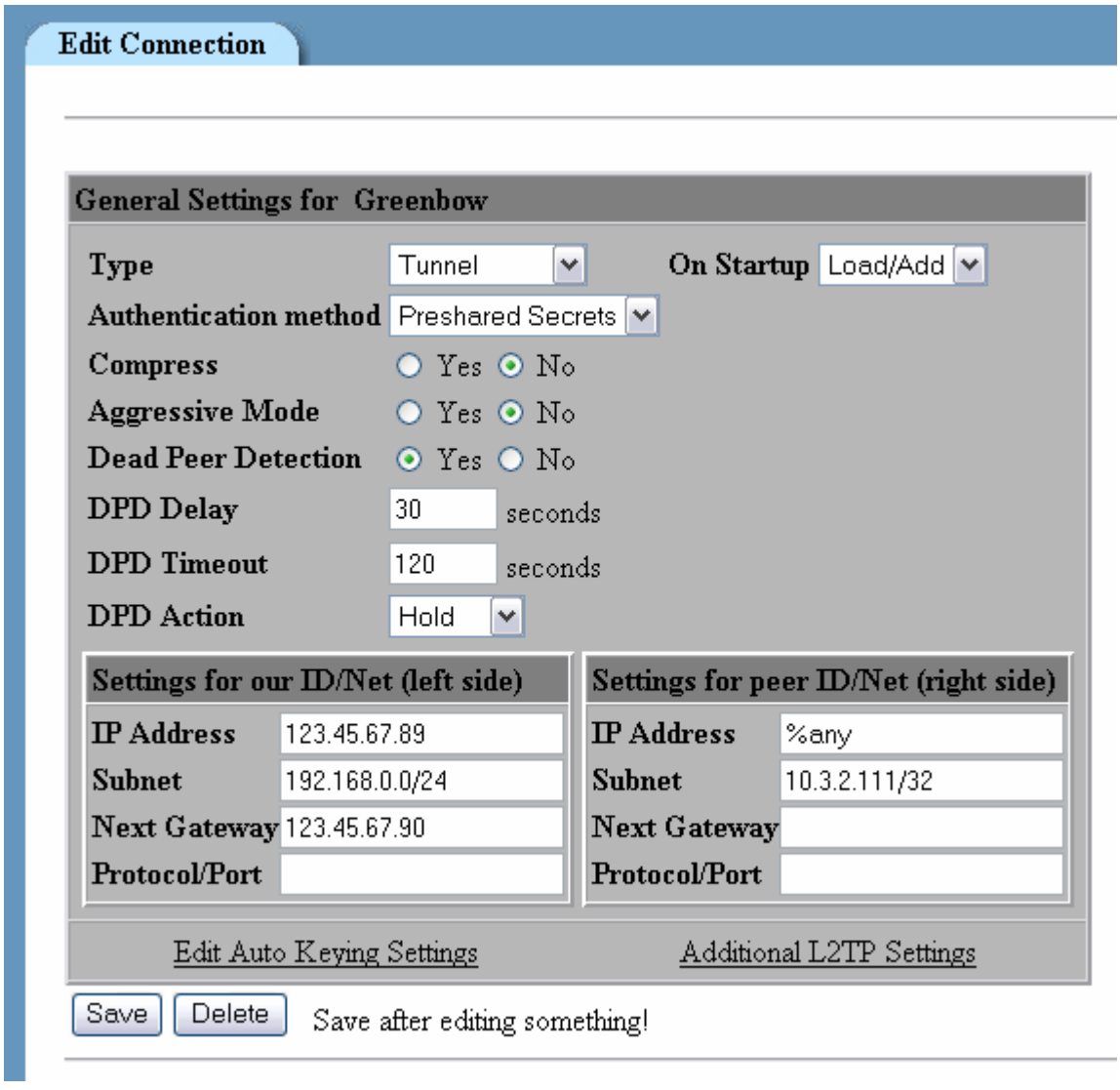
2 T.D.T. M-/G-Series VPN configuration

This section describes how to build an IPSec VPN configuration with your T.D.T. M-/G- Series VPN router.

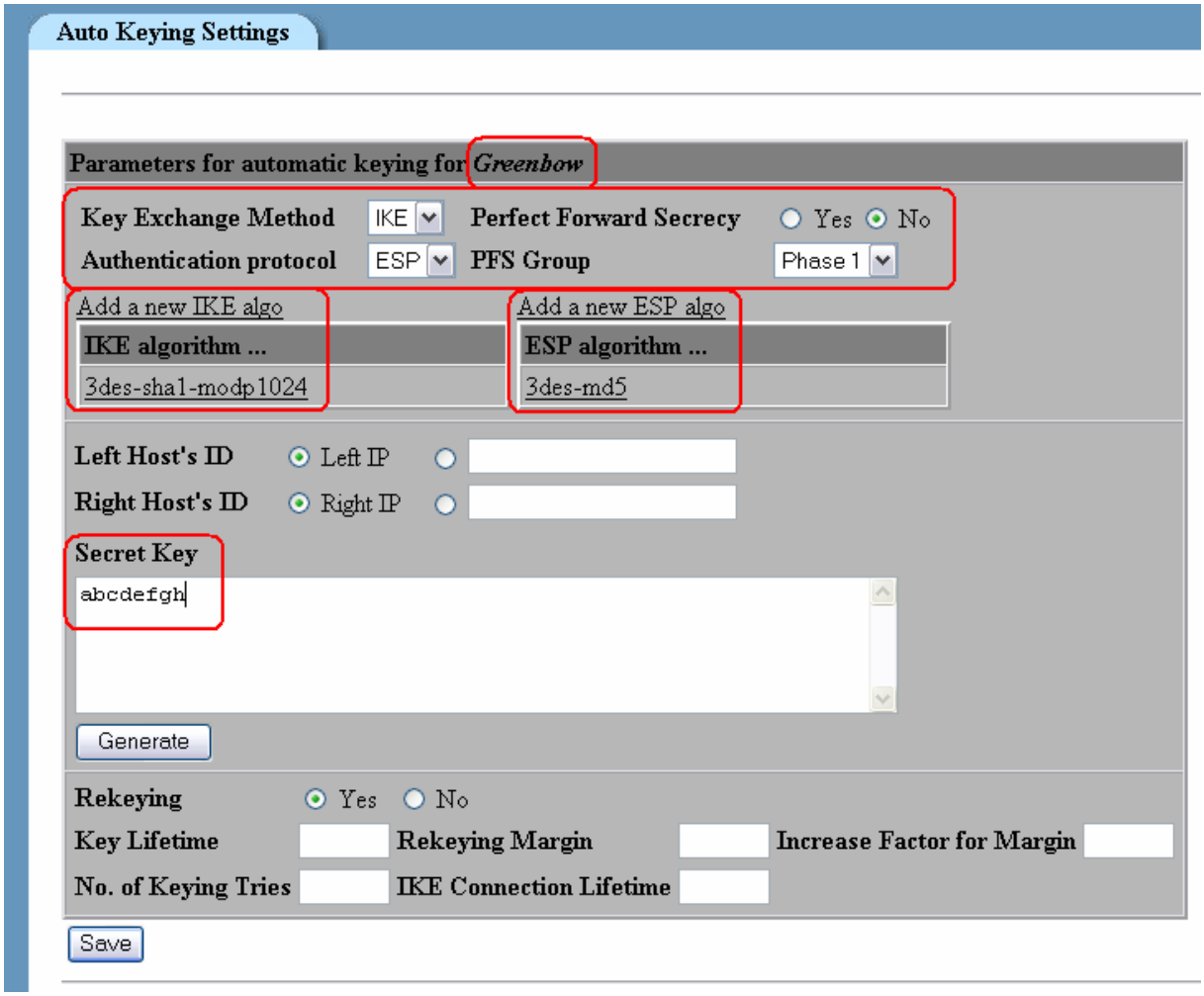
Once connected to your VPN gateway, you must select “Security” and “VPN” tabs.

2.1 T.D.T. M-/G-Series - Add Connection and Connection Settings

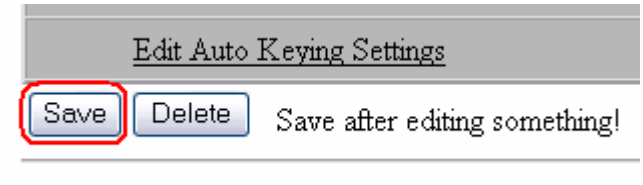
• Networking • TDT – IPSec VPN • Add Connection



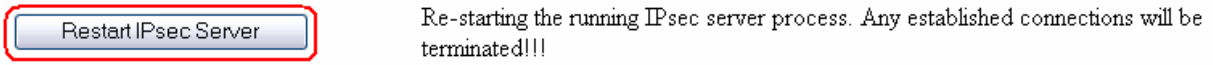
2.2 T.D.T. M-/G-Series - Edit Auto Keying Settings



2.3 T.D.T. M-/G-Series - Saving the Connection

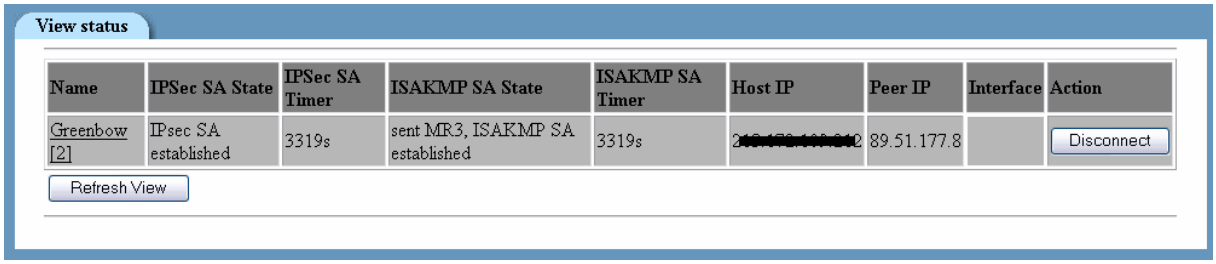


and



2.4 T.D.T. M-/G- Series - Connection Status Pages

• Networking • TDT – IPSec VPN • Connection Status



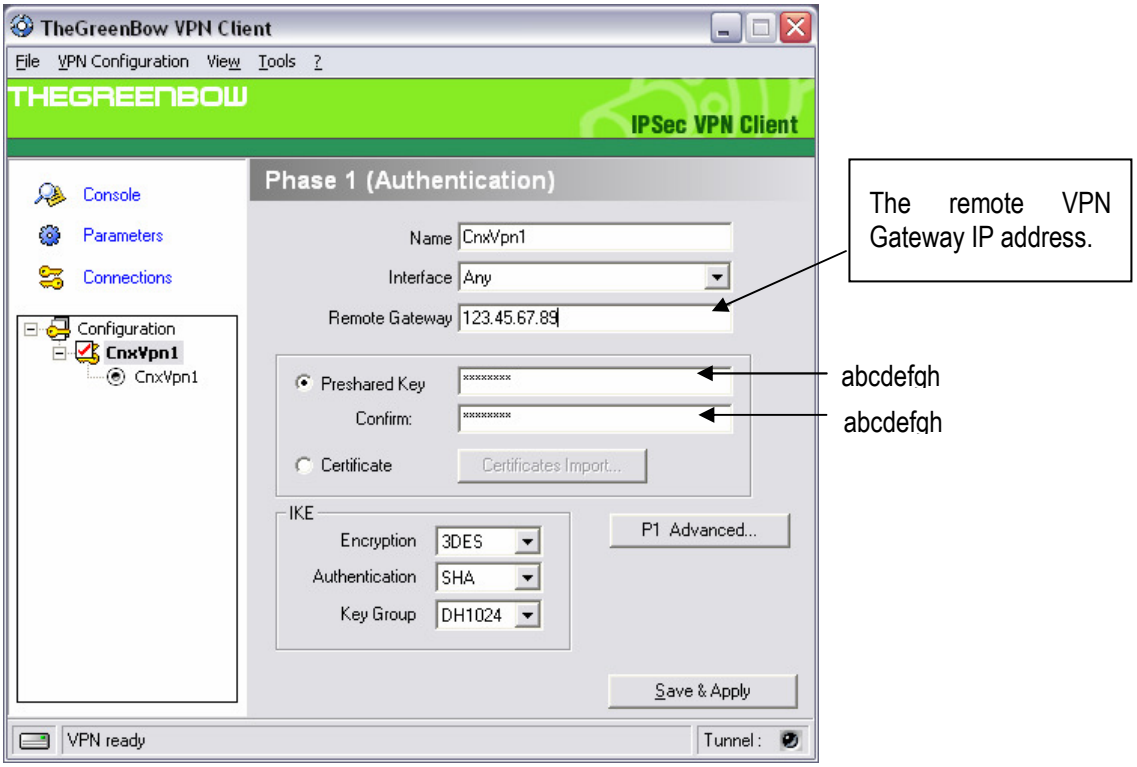
SSH Session: tail –f /var/log/messages :

```
Feb 15 14:53:04 G5000 pluto[22970]: packet from 89.51.177.8:500: received Vendor ID payload [draft-ietf-ipsec-nat-t-ike-00]

Feb 15 14:53:04 G5000 pluto[22970]: packet from 89.51.177.8:500: received Vendor ID payload [draft-ietf-ipsec-nat-t-ike-02_n] method set to=106

Feb 15 14:53:04 G5000 pluto[22970]: packet from 89.51.177.8:500: received Vendor ID payload [draft-ietf-ipsec-nat-t-ike-03] method set to=108

Feb 15 14:53:04 G5000 pluto[22970]: packet from 89.51.177.8:500: received Vendor ID payload [Dead Peer Detection]

Feb 15 14:53:04 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #3: responding to Main Mode from unknown peer 89.51.177.8

Feb 15 14:53:04 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #3: transition from state STATE_MAIN_R0 to state STATE_MAIN_R1

Feb 15 14:53:04 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #3: STATE_MAIN_R1: sent MR1, expecting MI2

Feb 15 14:53:04 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #3: NAT-Traversal: Result using draft-ietf-ipsec-nat-t-ike-02/03: no NAT detected

Feb 15 14:53:04 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #3: transition from state STATE_MAIN_R1 to state STATE_MAIN_R2

Feb 15 14:53:04 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #3: STATE_MAIN_R2: sent MR2, expecting MI3

Feb 15 14:53:05 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #3: ignoring informational payload, type IPSEC_INITIAL_CONTACT

Feb 15 14:53:05 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #3: Main mode peer ID is ID_IPV4_ADDR: '89.51.177.8'

Feb 15 14:53:05 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #3: I did not send a certificate because I do not have one.

Feb 15 14:53:05 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #3: transition from state STATE_MAIN_R2 to state STATE_MAIN_R3

Feb 15 14:53:05 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #3: STATE_MAIN_R3: sent MR3, ISAKMP SA established {auth=OAKLEY_PRESHARED_KEY cipher=oakley_3des_cbc_192 prf=oakley_sha group=modp1024}

Feb 15 14:53:05 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #3: Dead Peer Detection (RFC 3706): enabled

Feb 15 14:53:05 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #4: responding to Quick Mode {msgid:93992386}

Feb 15 14:53:05 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #4: transition from state STATE_QUICK_R0 to state STATE_QUICK_R1
```

```
Feb 15 14:53:05 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #4: STATE_QUICK_R1:
sent QR1, inbound IPsec SA installed, expecting QI2

Feb 15 14:53:05 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #4: Dead Peer
Detection (RFC 3706): enabled

Feb 15 14:53:05 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #4: transition from
state STATE_QUICK_R1 to state STATE_QUICK_R2

Feb 15 14:53:05 G5000 pluto[22970]: "Greenbow"[2] 89.51.177.8 #4: STATE_QUICK_R2:
IPsec SA established {ESP=>0x786fd450 <0x4e8f3857 xfrm=3DES_0-HMAC_MD5 NATD=none
DPD=enabled}
```

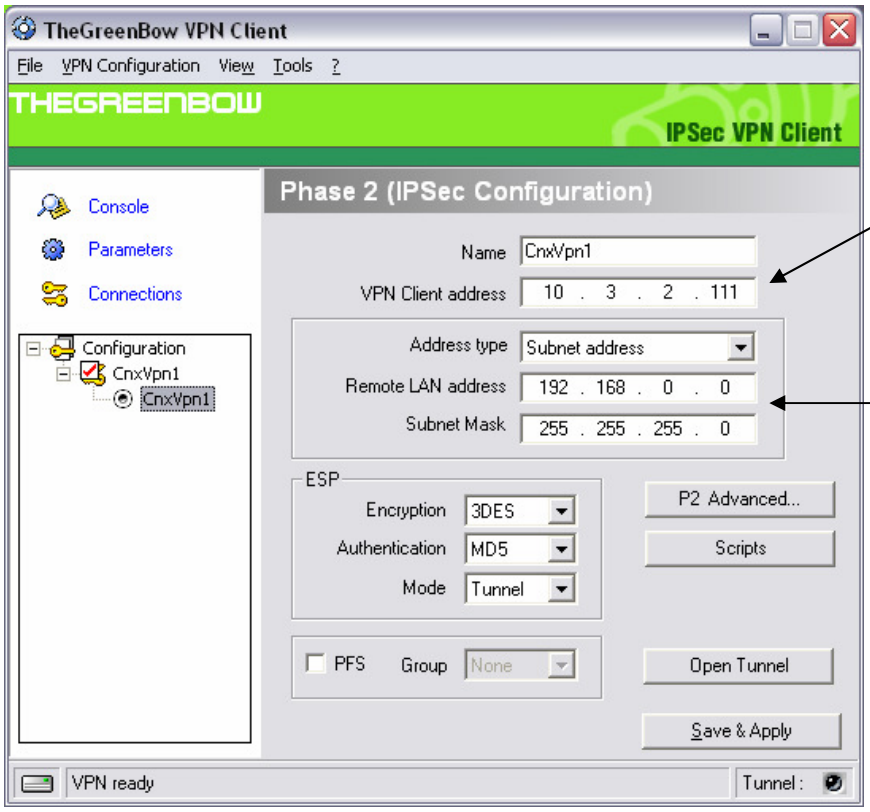
3 TheGreenBow IPSec VPN Client configuration

3.1 VPN Client Phase 1 (IKE) Configuration



Phase 1 configuration

3.2 VPN Client Phase 2 (IPSec) Configuration



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

You may notice that we have selected MD5 as authentication algorithm. The real authentication algorithm used is defined in main configuration page (Eroute n) of the M-/G- Series router settings.

3.3 Open IPSec VPN tunnels

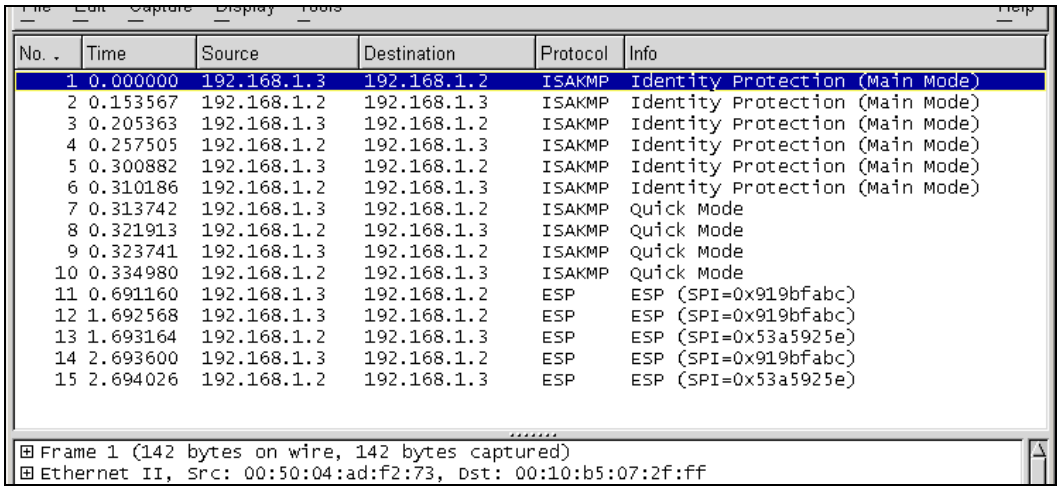
Once both M-/G- Series router and TheGreenBow IPSec VPN Client have been configured accordingly, you are ready to open VPN tunnels. First make sure you enable your firewall with IPSec traffic.

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 Microsoft Windows 2000 Server.



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)

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: ethereal

Ethereal 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 tools is available on website http://www.ethereal.com/. It can be used to follow protocol exchange between two devices. For installation and use details, read its specific documentation.

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 Ethereal 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 ethereal (http://www.ethereal.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 at +33 1 43 12 39 37 ou by email at info@thegreenbow.com