CHAPTER 10

Virtual Private Network and Remote Access Setup

10.1 Introduction

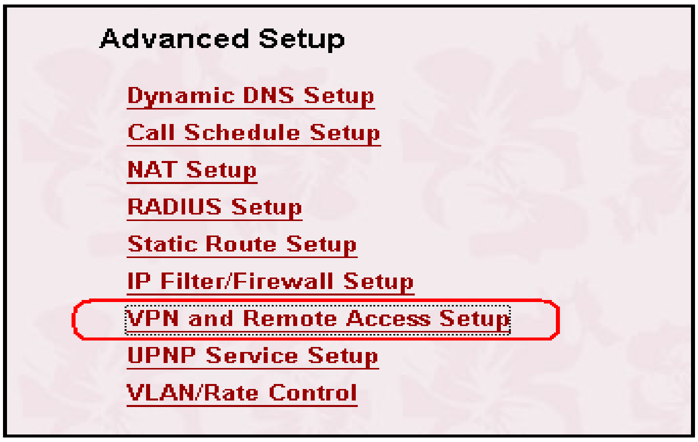
A Virtual Private Network (VPN) is the extension of a private network that encompasses links across shared or public networks like the Internet. A VPN enables you to send data between two computers across a shared or public network in a manner that emulates the properties of a point-to-point private link.

There are two types of VPN connections: the remote dial-in access VPN connection and the LAN-to-LAN VPN connection. The “Remote Dial-In Access” facility allows a remote access node, a NAT router or a single user computer, to dial into a VPN router through the Internet to access the network resources of the remote network. The “LAN-to-LAN Access” facility provides a solution to connect two independent LANs for mutual sharing of network resources. For example, the head office network can access the branch office network, and vice versa.

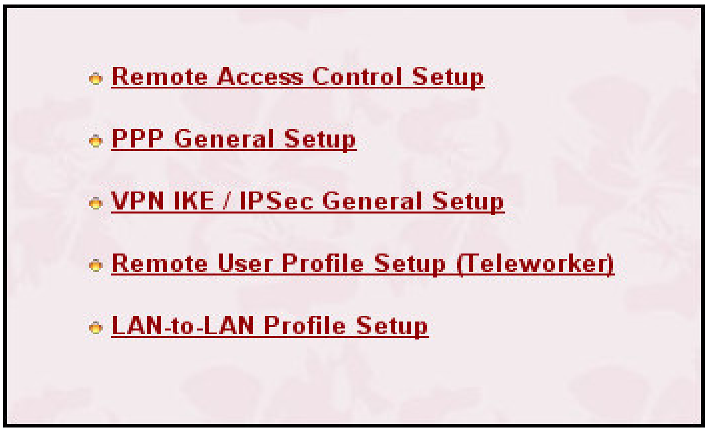
The VPN technology employed in the Vigor 2900 series of broadband security routers supports Internet-industry standard to provide customers with interoperable VPN solutions, such as Internet Protocol Security (IPSec), Layer 2 Tunneling Protocol (L2TP), and Point-to-Point Tunneling Protocol (PPTP).

This chapter explains the capabilities of the VPN facility and the remote access on the router. Use the following setup links on the Setup Main Menu to configure the VPN and remote access functions.

Advanced Setup > VPN and Remote Access Setup



The **VPN and Remote Access Setup** has five main functions, as shown below. You may set up **Remote Access Control**, **PPP**, **VPN IKE/IPSec**, **Remote Dial-in**, and **LAN-to-LAN Profile** on demand.


Remote Access Control Setup
PPP General Setup
VPN IKE / IPSec General Setup
Remote User Profile Setup (Teleworker)
LAN-to-LAN Profile Setup

The **Remote Access Control Setup** allows you to enable each type of VPN service or disable it for VPN pass-through purpose. For example, you can enable IPSec and L2TP VPN service on your router and disable PPTP VPN service if you intend running a PPTP server inside your LAN.

Use the **PPP General Setup** to configure your router's PPP authentication method as well as IP assignment range for remote dial-in user. This submenu only applies to PPP-related VPN connections, such as PPTP, L2TP and L2TP over IPSec.

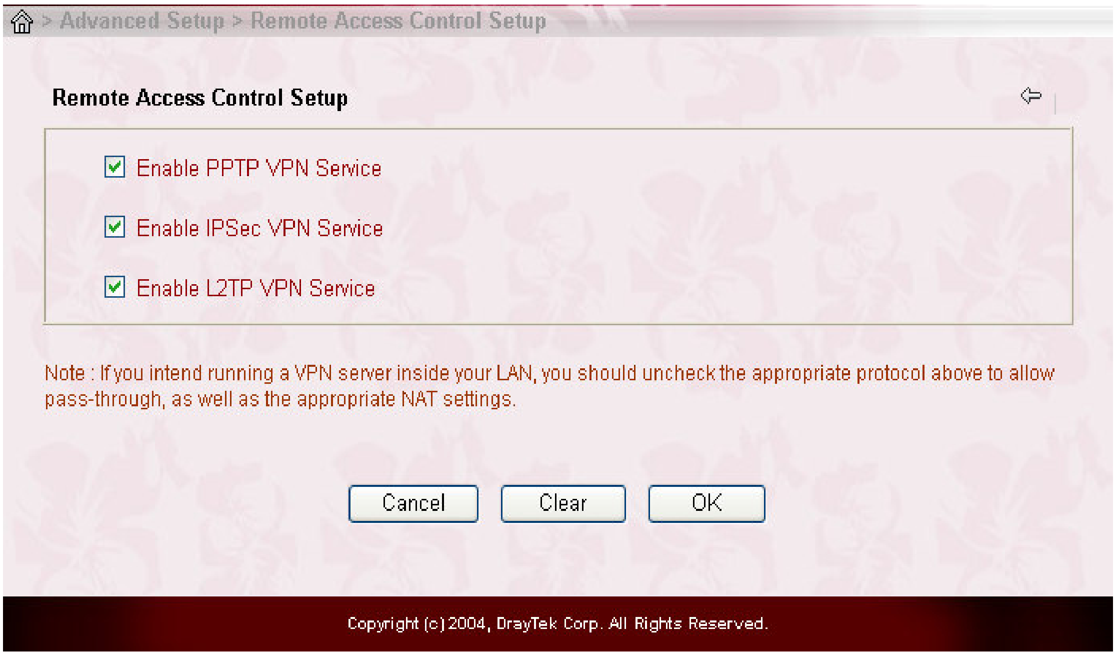
The **VPN IKE / IPSec General Setup** let you configure a common Pre-shared key and security method for remote dial-in user or node (LAN-to-LAN) which uses dynamic IP address.

Use **Remote User Profile Setup(Teleworker)** to create dial-in user accounts. Vigor router supports three types of dial-in methods, PPTP, L2TP, and L2TP over IPSec. The PPTP VPN connection is compatible with all Windows plateforms which have built-in PPTP protocol. The L2TP and L2TP over IPSec are compatible with Window 2000 and XP.

Use **The LAN-to-LAN Profile Setup** to create profiles for LAN to LAN VPNs. The Vigor router supports four types of LAN-to-LAN VPN, IPSec Tunnel, PPTP, L2TP, and L2TP over IPSec. You can establish simultaneously up to 32 VPN tunnels including remote dial-in users.

10.2 Remote Access Control Setup

As depicted in the following picture, click the appropriate checkbox to enable the VPN service type that you want to provide. If you intend to run a VPN server inside your LAN, you should disable the appropriate protocol to allow pass-through, as well as the appropriate NAT settings. For example, DMZ or open port.



Remote Access Control Setup

☑ Enable PPTP VPN Service

☑ Enable IPSec VPN Service

☑ Enable L2TP VPN Service

Note : If you intend running a VPN server inside your LAN, you should uncheck the appropriate protocol above to allow pass-through, as well as the appropriate NAT settings.

Copyright (c) 2004, DrayTek Corp. All Rights Reserved.

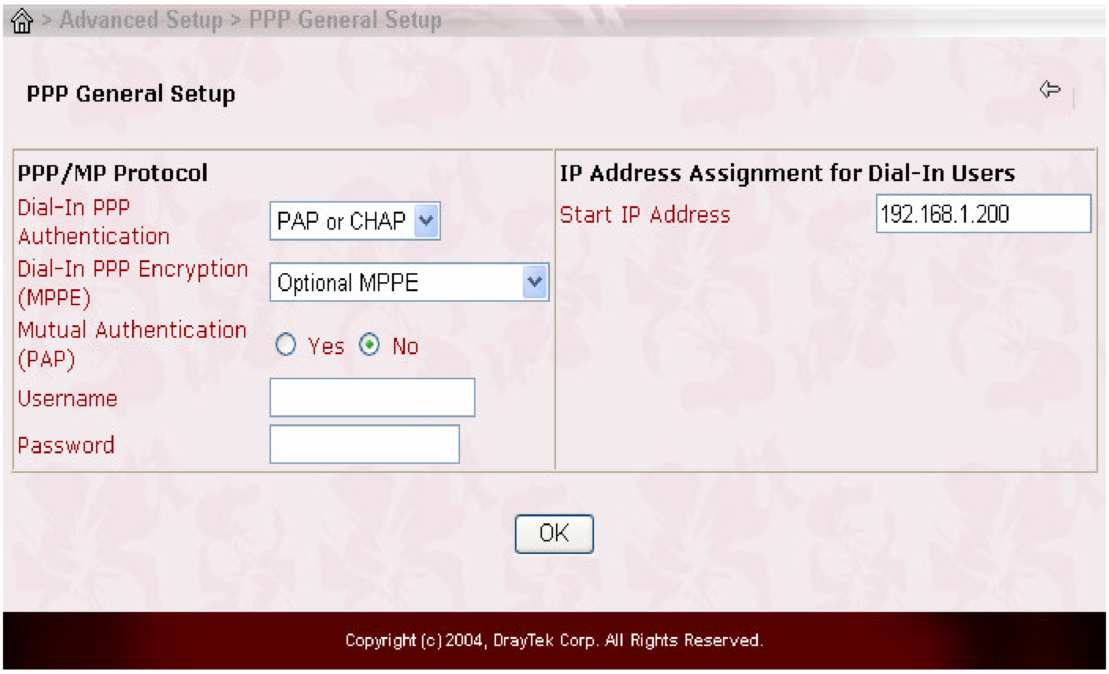
10.3 PPP General Setup

PPP/MP Protocol

Dial-In PPP Authentication:

***PAP Only*:** Select this option to force the router to authenticate dial-in users with the PAP protocol.

***PAP or CHAP*:** Selecting this option means the router will attempt to authenticate dial-in users with the CHAP protocol first. If the dial-in user does not support this protocol, it will fall back to use the PAP protocol for authentication.



PPP General Setup

PPP/MP Protocol

Dial-In PPP Authentication: PAP or CHAP

Dial-In PPP Encryption (MPPE): Optional MPPE

Mutual Authentication (PAP): ○ Yes ● No

Username:

Password:

IP Address Assignment for Dial-In Users

Start IP Address: 192.168.1.200

Dial-In PPP Encryption (MPPE):

Optional MPPE: This option represents that the MPPE encryption method will be optionally employed in the router for the remote dial-in user. If the remote dial-in user does not support the MPPE encryption algorithm, the router will transmit “no MPPE encrypted packets”. Otherwise, the MPPE encryption scheme will be used to encrypt the data.

Require MPPE (40/128bits): Selecting this option will force the router to encrypt packets by using the MPPE encryption algorithm. In addition, the remote dial-in user will use 40-bit to perform encryption prior to using 128-bit for encryption. In other words, if 40-bit MPPE encryption method is not available, then 128-bit encryption scheme will be applied to encrypt the data.

Maximum MPPE: This option indicates that the router will use the MPPE encryption scheme with maximum bits (128 bits) to encrypt the data.

Mutual Authentication (PAP): The **Mutual Authentication** function is mainly used to communicate with other routers or clients which need bidirectional authentication in order to provide stronger security. For example, Cisco routers. That is, enable it only if the connecting router requires mutual authentication. By default, the option is set to ***No***. Notice that if you enable the ***Mutual Authentication*** function, you should further specify the ***Username*** and ***Password*** for communication purpose.

Username: Specify the username for the purpose of the Mutual Authentication.

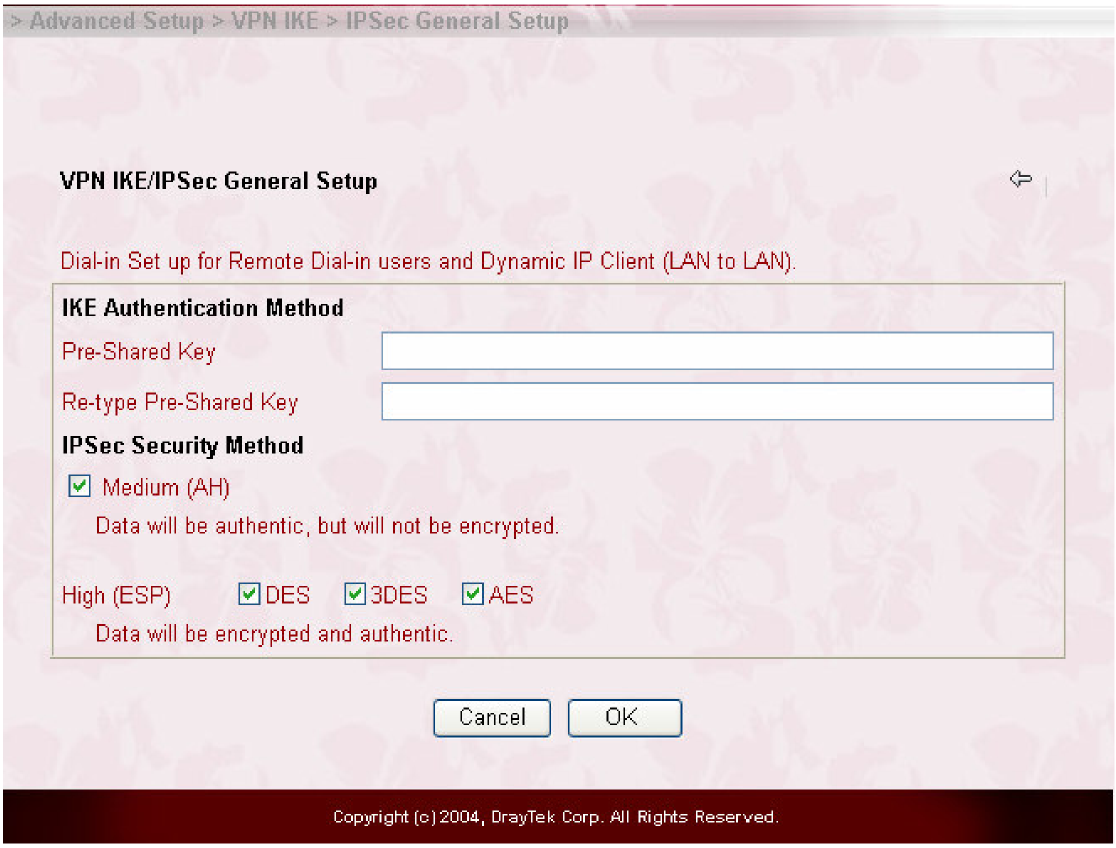
Password: Specify the password for the purpose of the Mutual Authentication.

IP Address Assignment for Dial-In Users

Start IP Address: Enter a start IP address for the dial-in PPP connection. You should choose an IP address from the local private network. For example, if the local private network is 192.168.1.0/255.255.255.0, you could choose 192.168.1.200 to be the Start IP Address.

10.4 VPN IPSec / IKE General Setup

Set up a common Pre-shared key and security method for remote dial-in user or nonspecified node (LAN to LAN) which do not have fixed IP address. This setup only applies to IPSec-related VPN connections. For example, L2TP over IPSec and IPSec tunnel.



> Advanced Setup > VPN IKE > IPSec General Setup

VPN IKE/IPSec General Setup

Dial-in Set up for Remote Dial-in users and Dynamic IP Client (LAN to LAN).

IKE Authentication Method

Pre-Shared Key

Re-type Pre-Shared Key

IPSec Security Method

☑ Medium (AH)

Data will be authentic, but will not be encrypted.

High (ESP) ☑ DES ☑ 3DES ☑ AES

Data will be encrypted and authentic.

Copyright (c) 2004, DrayTek Corp. All Rights Reserved.

IKE Authentication Method: Currently only support Pre-Shared Key authentication.

***Pre-Shared Key*:** Specify a key for IKE authentication.

***Re-type Pre-Shared-Key*:** Confirm the pre-shared-key.

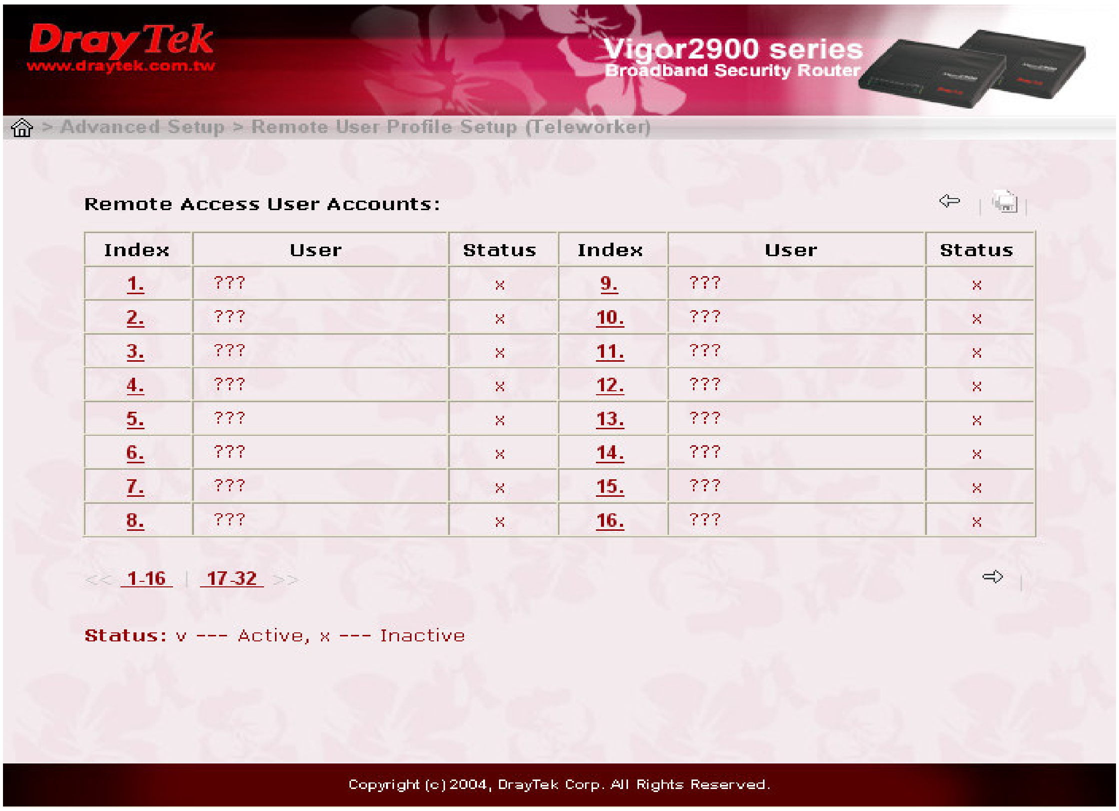
IPSec Security Method: Select allowed IPSec security methods.

***Medium* (*AH*):** Data will be authenticated, but not be encrypted. By default, this option is active.

***High* (*ESP*):** Data will be encrypted and authenticated. Herein, we support DES, 3DES, and AES encryption methods. By default, these methods are available to support.

10.5 Creating an Access Account for a Remote Dial-in User

After completing the general setup, you must create an access account for each remote dial-in user. The router provides 32 access accounts for dial-in users. Besides, you can extend the user accounts to the RADIUS server through the built-in RADIUS client function. The following figure shows the *Remote User Profile Setup* for up to 32 access accounts.



> Advanced Setup > Remote User Profile Setup (Teleworker)

Remote Access User Accounts:

Index	User	Status	Index	User	Status
1.	???	x	9.	???	x
2.	???	x	10.	???	x
3.	???	x	11.	???	x
4.	???	x	12.	???	x
5.	???	x	13.	???	x
6.	???	x	14.	???	x
7.	???	x	15.	???	x
8.	???	x	16.	???	x

<< 1-16 | 17-32 >>

Status: v --- Active, x --- Inactive

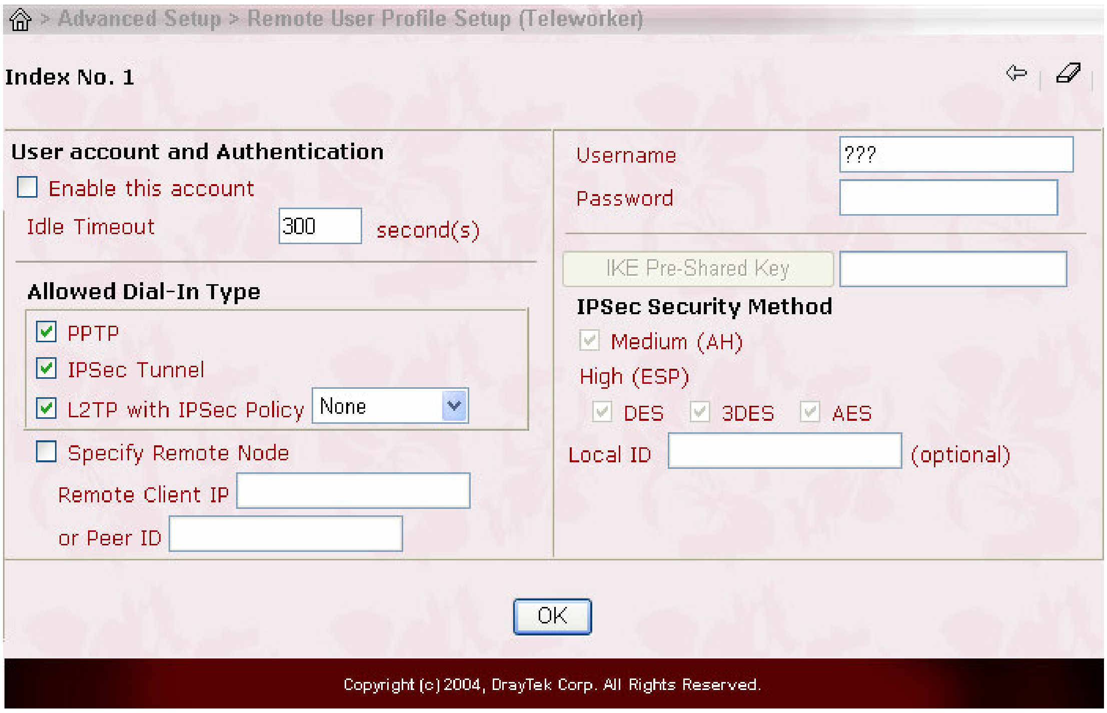
Copyright (c) 2004, DrayTek Corp. All Rights Reserved.

(Set to Factory Default): Click here to clear all dial-in user accounts.

User: Display the username for the specific dial-in user. of the LAN-to-LAN profile. The symbol ??? represents that the profile is empty.

Status: Display the access state of the specific dial-in user. The symbol V and X represent the specific dial-in user to be active and inactive, respectively.

Index: Click the index number to open an individual setup page for a dial-in user account, as shown below.



> Advanced Setup > Remote User Profile Setup (Teleworker)

Index No. 1

User account and Authentication

□ Enable this account

Idle Timeout 300 second(s)

Allowed Dial-In Type

☑ PPTP

☑ IPSec Tunnel

☑ L2TP with IPSec Policy None

□ Specify Remote Node

Remote Client IP

or Peer ID

Username ???

Password

IKE Pre-Shared Key

IPSec Security Method

☑ Medium (AH)

High (ESP)

☑ DES ☑ 3DES ☑ AES

Local ID (optional)

Copyright (c) 2004, DrayTek Corp. All Rights Reserved.

User Account and Authentication

Enable this account: Check this item to activate the individual dial-in user account.

Idle Timeout: If the dial-in user is idle over the limitation of the timer, the router will drop this connection. By default, the Idle Timeout is set to 300 seconds.

Allowed Dial-In Type : Select the allowed dial-in type. Herein, the Vigor 2900 series of broadband security routers provides three types: ***PPTP***, ***IPSec Tunnel***, and ***L2TP with IPSec Policy***. For the ***L2TP with IPSec Policy***, you have other three choices (*None*, *Nice to Have*, and *Must*) to set up the dial-in VPN type.

PPTP: Allow the remote dial-in user to make a PPTP VPN connection through the Internet.

IPSec Tunnel: Allow the remote dial-in user to trigger a IPSec VPN connection through Internet.

L2TP: Allow the remote dial-in user to make a L2TP VPN connection through the Internet. Specify the IPSec policy to be "*None*", "*Nice to Have*", or "*Must*".

None: Do not apply the IPSec policy. Accordingly, the VPN connection employed the *L2TP without IPSec Policy* can be viewed as one pure L2TP connection.

Nice to Have: Apply the IPSec policy first, if it is available. Otherwise, the dial-in VPN connection becomes one pure L2TP connection.

Must: Specify the IPSec policy to be definitely applied on the L2TP connection.

Notice that when you choose either the **PPTP** or the **L2TP with IPSec Policy** for the dial-in VPN type, you should specify the ***Username*** and ***Password***. Other functions including ***IKE Pre-Shared Key***, ***IPSec Security Method***, ***Remote Client IP or Peer ID* and optional *Local ID*** are reserved for the option of the **IPSec Tunnel** and will be disabled for the **PPTP** or the **L2TP with IPSec Policy** option. One exception for the **L2TP with IPSec Policy** option is that policy sets to ***Nice to Have*** or ***Must***. In this exception, you should move on the setting of ***IKE Pre-Shared Key***, ***IPSec Security Method***, ***Remote Client IP or Peer ID***, and optional ***Local ID***.

Hence, if you enable the **PPTP** or **L2TP without IPSec Policy** option for the remote dial-in VPN type, you should move on the following setting

Username: Specify a username for the specific dial-in user.

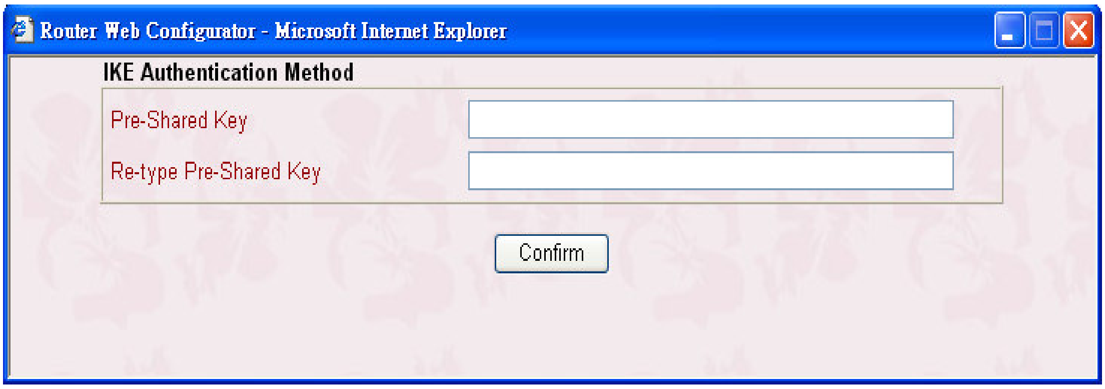
Password: Specify a password for the specific dial-in user.

Once you enable the **IPSec Tunnel** or **L2TP with IPSec Plolicy** with selection of ***Nice to Have*** or ***Must*** for the remote dial-in setting, you should move on the following setting.

Specify Remote Node: For extra security, you should enable the option to allow the remote client to connect only from a specific IP address.

Remote Client IP or Peer ID: Specify the IP address of the remote client or the peer ID in the field. Afterward, you should fill a Pre-Shared Key for this specific node.

IKE Pre-shared Key: Click it and a window will be automatically poped up for you, as depicted below. Please fill a Pre-shared Key and confirm it for this specific node.



Router Web Configurator - Microsoft Internet Explorer

IKE Authentication Method

Pre-Shared Key

Re-type Pre-Shared Key

IPSec Security Method: Specify the IPSec security method, either authentication or encryption algorithm, to determine the security level. You can only select one.

***Medium*(*AH*):** Specify the IPSec protocol for the Authentication Header protocol. The data will be authenticated, but not be encrypted.

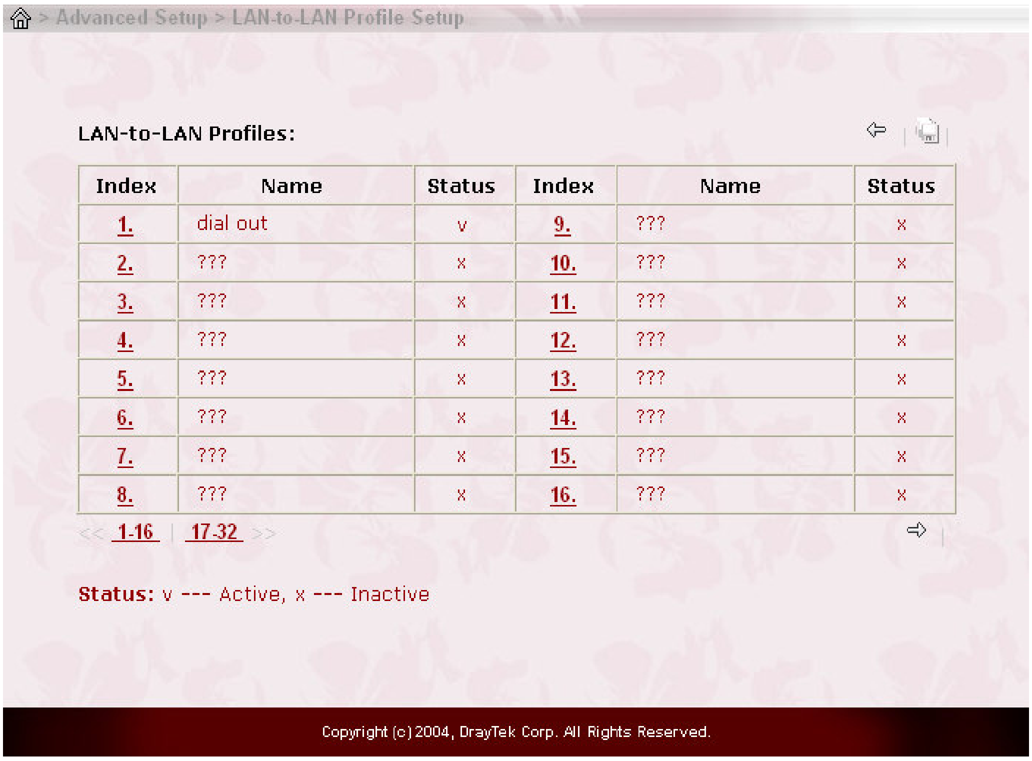
***High* (*ESP*):** Specify the IPSec protocol for the Encapsulating Security Payload protocol. The data will be encrypted. Supported algorithms are DES, 3DES, and AES. By default, these three algorithms are available.

Local ID: Specify a local ID to be used for Dial-in setting in the LAN-to-LAN Profile setup. This item is optional.

Notice that if you do not activate the “**Specify Remote Node**” and leave the field of “**Remote Client IP or Peer ID**” to be empty, the settings of ***IKE Pre-Shared Key***, ***IPSec Security Method***, ***Remote Client IP or Peer ID***, and optional ***Local ID*** will be disabled and, therefore, no IPSec-related VPN conneciton can be triggered successfully.

10.6 Creating a LAN-to-LAN Profile

In this section, we will explain how to set up the **LAN-to-LAN Profile** in more detail. The path to configure it in the Web configurator is **Advanced Setup > VPN and Remote Access Setup > LAN-to-LAN Profile Setup**. The web page is shown below. Herein, you can create up to 32 LAN-to-LAN profiles.



LAN-to-LAN Profiles:

Index	Name	Status	Index	Name	Status
1.	dial out	v	9.	???	x
2.	???	x	10.	???	x
3.	???	x	11.	???	x
4.	???	x	12.	???	x
5.	???	x	13.	???	x
6.	???	x	14.	???	x
7.	???	x	15.	???	x
8.	???	x	16.	???	x

Status: v --- Active, x --- Inactive

Copyright (c) 2004, DrayTek Corp. All Rights Reserved.

(Set to Factory Default): Click here will clear all the LAN-to-LAN profiles.

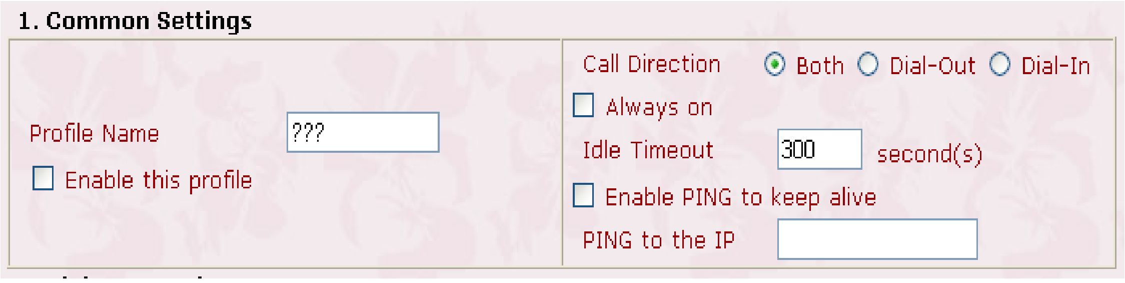
Index: Click a number to open a detailed setting page for each profile.

Name: Indicate the name of the LAN-to-LAN profile. The symbol ??? represents that the profile is empty.

Status: Indicate the status of individual profiles. The symbol V and X represent the profile to be active and inactive, respectively.

Each LAN-to-LAN profile includes 4 subgroups: **Common Settings**, **Dial-Out Settings**, **Dial-In Settings**, and **TCP/IP Network Settings**. In the following, we explain each subgroup in detail.

10.6.1 Common Settings



1. Common Settings

Profile Name ???

□ Enable this profile

Call Direction ● Both ○ Dial-Out ○ Dial-In

□ Always on

Idle Timeout 300 second(s)

□ Enable PING to keep alive

PING to the IP

Profile Name: Specify a name for the remote network.

Enable this profile: Check here to activate this profile.

Call Direction: Specify the call direction for this profile. ***Both*** means it can be used for outgoing and incoming access. ***Dial-Out*** means it can only be used for outgoing access. ***Dial-In*** allows only incoming access.

Always on: Click it to always activate this profile. The field of ***Idle Timeout*** will be grayed to disallow any input.

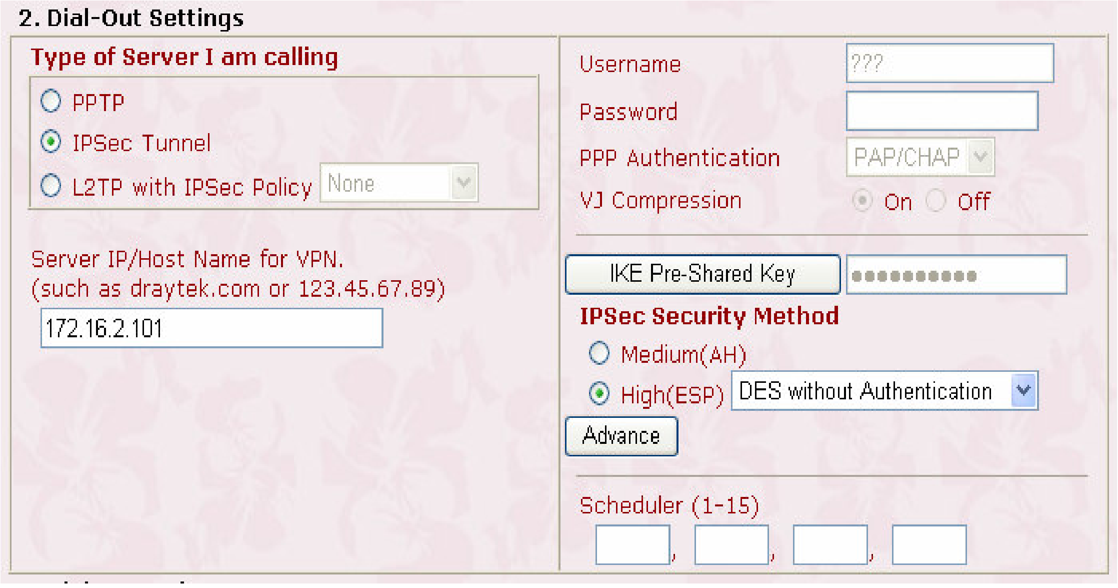
Idle Timeout: By default, set to 300 seconds. If the profiles connection is idle over the limitation of the timer, the router will drop the connection.

Enable PING to keep alive: Click this item to enable the transmission of PING packets to an IP address defined in the field of "***PING to the IP***".

PING to the IP: Specify the IP address of the remote host that located at the other-end of the VPN tunnel.

Notice that this function is useful to determine the state of a specific VPN connection. Normally, when the remote host wants to disconnect the VPN connection, this host should send some necessary packets to infom the Vigor router. Accordingly, the Vigor router will drop the designated VPN connection and clear its associated parameters, for example, key for encryption. However, once the remote host *abnormally* disconnects a VPN connection, say VPN *k*, the Vigor router has no ideal about VPN *k* at this moment due to its abnormal behaviour. Hence, the Vigor router will regard this VPN *k* to be alive, which results in *no more packets to send within the* VPN *k and no more chance to trigger the VPN k again*. To resolve this dilemma, this function (***Enable PING to keep alive***) is designed to determine of the status of the VPN *k*. By continueously sending PING packets to the remote host, the Vigor router can know the existence of this VPN *k*. If there is no response for PING packets, the Vigor router will consider the state of the VPN *k* as disconnection. In this way, the Vigor router will clear all related parameters of the VPN *k* so that the VPN *k* can be triggered again.

10.6.2 Dial Out Settings



2. Dial-Out Settings

Type of Server I am calling

○ PPTP
● IPSec Tunnel
○ L2TP with IPSec Policy: None

Server IP/Host Name for VPN.
(such as draytek.com or 123.45.67.89)
172.16.2.101

Username: ???
Password:
PPP Authentication: PAP/CHAP
VJ Compression: ● On ○ Off

IKE Pre-Shared Key: ●●●●●●●●●●

IPSec Security Method
○ Medium(AH)
● High(ESP): DES without Authentication

Scheduler (1-15): , , ,

Type of Server I am calling: Indicate the dial-out VPN type. Herein, three options are available and only one option can be activated. These options are ***PPTP***, ***IPSec Tunnel***, and ***L2TP with IPSec Policy***. For the ***L2TP with IPSec Policy***, you have other three choices (*None*, *Nice to Have*, and *Must*) to set up the dial-out VPN type.

PPTP: Specify the dial-out VPN connection to be the PPTP connection.

IPSec Tunnel: Specify the dial-out VPN connection to be the IPSec Tunnel connection.

L2TP with IPSec Policy: Specify the IPSec policy for the L2TP connection.

None: Do not apply IPSec. Accordingly, the VPN connection employed the *L2TP without IPSec Policy* can be viewed as one pure L2TP connection.

Nice to Have: Apply the IPSec policy first, if it is available. Otherwise, the dial-out VPN connection becomes one pure L2TP connection.

Must: Specify the IPSec policy to be definitely applied on the L2TP connection.

Notice that when you choose either the **PPTP** or the **L2TP with IPSec Policy** for the dial-out VPN type, you should specify the ***Username*, *Password***, ***PPP Authentication***, and ***VJ Compression***. Other functions including ***IKE Pre-Shared Key***, ***IPSec Security Method***, ***Server IP/Host Name for VPN***, ***Scheduler***, **and *Advance Setting*** are reserved for the option of the **IPSec Tunnel** and will be disabled for the **PPTP** or the **L2TP with IPSec Policy** option. One exception for the **L2TP with IPSec Policy** option is that policy sets to ***Nice to Have*** or ***Must***. In this exception, you should move on the setting of ***IKE Pre-Shared Key***, ***IPSec Security Method***, and ***Server IP/Host Name for VPN***.

Hence, if you enable the **PPTP** or **L2TP without IPSec Policy** option for the dial-out VPN type, you should move on the following setting.

Username: Specify a username for authentication by the remote router.

Password: Specify a password for authentication by the remote router.

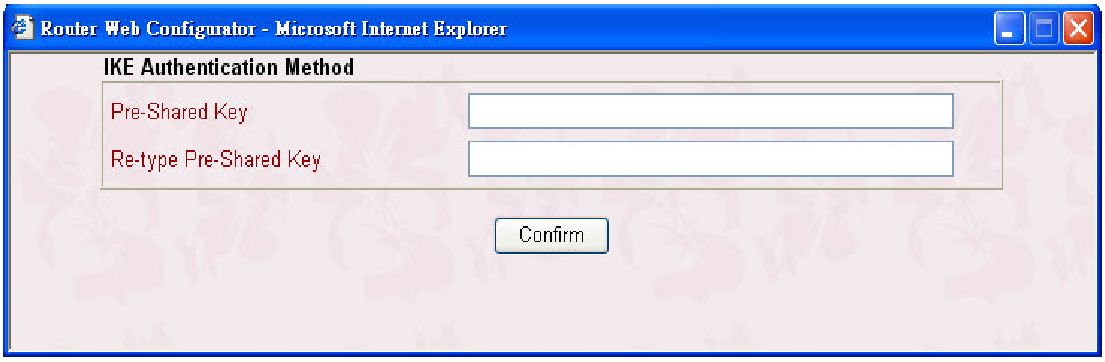
PPP Authentication: Specify the PPP authentication method for PPTP, and L2TP over IPSec. Normally set to **PAP/CHAP** for the widest compatibility.

VJ Compression: VJ Compression is used for TCP/IP protocol header compression. Normally set to **Yes** to improve bandwidth utilization.

Once you enable the **IPSec Tunnel** or the **L2TP with IPSec Plolicy** (applying ***Nice to Have*** or ***Must*** option) for the dial-out VPN type, you should move on the following setting.

Server IP/Host Name for VPN: Specify the IP address of the destination VPN server or the Host Name for dialup.

IKE Pre-shared Key: Click it and a window will be automatically poped up for you, as depicted below. Please fill a Pre-shared Key and confirm it for this specific node.


Router Web Configurator - Microsoft Internet Explorer
IKE Authentication Method
Pre-Shared Key
Re-type Pre-Shared Key
Confirm

IPSec Security Method: Specify the IPSec security method, either authentication or encryption algorithm, to determine the security level. You can only select one.

***Medium*(*AH*):** Specify the IPSec protocol for the Authentication Header protocol. The data will be authenticated, but not be encrypted.

***High* (*ESP*):** Specify the IPSec protocol for the Encapsulating Security Payload protocol. The data will be encrypted. Supported algorithms are listed below.

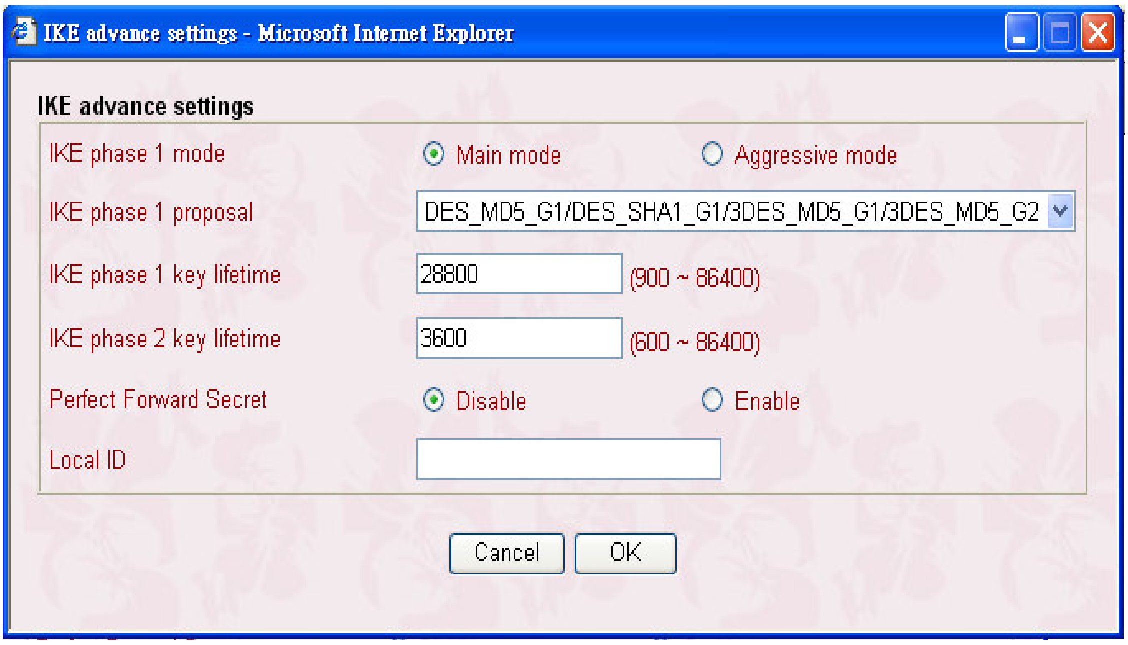
***DES without Authentication*:** Use DES encryption algorithm and not apply any authentication scheme.

***DES with Authentication*:** Use DES encryption algorithm and apply MD5 or SHA-1 authentication algorithm.

***3DES without Authentication*:** Use triple DES encryption algorithm and not apply any authentication scheme.

***3DES with Authentication*:** Use triple DES encryption algorithm and apply MD5 or SHA-1 authentication algorithm.

Advanced Setting: Click it and a window will be automatically poped up for advanced setting, as shown below. In this window, you need to decide which mode (Main mode or Aggressive Mode) to be used for Phase 1 IKE negotiation process, specify the authentication and encryption algorithms, fill the lifetime for the IKE phase 1 and phase 2, enable or disable the "Perfect Forward Secret", and provide the Local ID for remote VPN gateway.



IKE advance settings

IKE phase 1 mode	● Main mode	○ Aggressive mode
IKE phase 1 proposal	DES_MD5_G1/DES_SHA1_G1/3DES_MD5_G1/3DES_MD5_G2	
IKE phase 1 key lifetime	28800	(900 ~ 86400)
IKE phase 2 key lifetime	3600	(600 ~ 86400)
Perfect Forward Secret	● Disable	○ Enable
Local ID		

IKE phase 1 mode: ***Main mode*** and ***Aggressive mode*** are provided in the Vigor 2900 series of broadband security routers. Basically, both modes are two kinds of Phase 1 IKE negotiation process. Most VPN servers support Main mode and so does the Vigor 2900 series of routers. Aggressive mode is a more recent implementation to speed up the negotiation process, but may incur less security. The Vigor 2900 series of routers also support this Aggressive mode. By default, Main mode is active for consideration of greatest compatibility.

IKE phase 1 proposal: As stated above, you should specify authentication scheme, encryption algorithm, or their combinations. Then the router will deliver the specified algorithm to the remote VPN server and ask whether it supports such an algorithm. Two options are available for selection in Aggressive mode and nine choices are provided for Main mode. For Main mode, you have better to choos the lastest term, i.e. "DES_MD5_G1/DES_SHA1_G1/3DES_MD5_G1/3DES_MD5_G2". This is because that more selections are available, more likehood of consistent algorithm is.

IKE phase 1 key lifetime: In order to increase the security level, the router should limit the key lifetime. By default, the key lifetime is set to the standard value, i.e. 28800 seconds. You are able to specify a value in between 900 and 86400 seconds on demand.

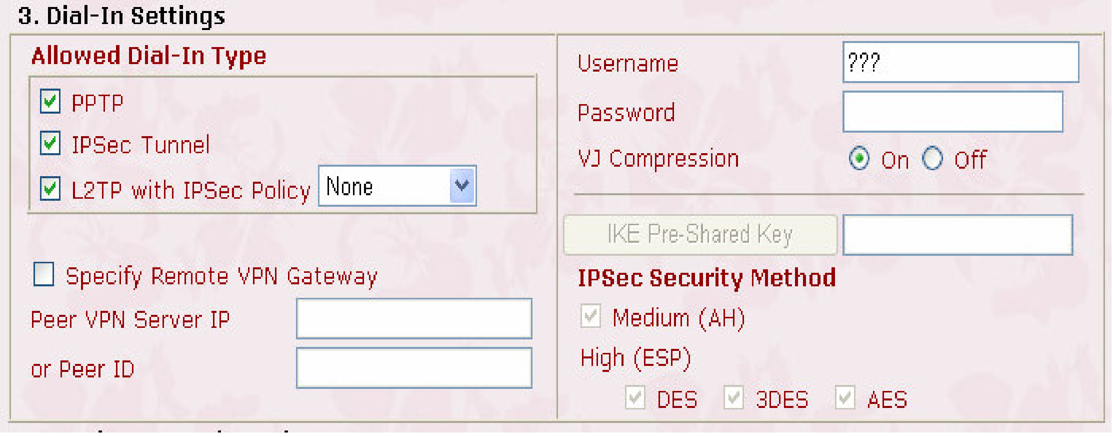
IKE phase 2 key lifetime: By default, the phase 2 key lifetime is set to the standard value, i.e. 3600 seconds. You also are able to specify a value in between 600 and 86400 seconds according to your demand.

Perfect Forward Secrect: If you enable this term, then the Phase 1 key will be reused to reduce the computation complexity in phase 2. Otherwise, a new key will be generated for phase 2 key. By default, this option is inactive.

Local ID: This term is mainly used in Aggressive mode and is on behalf of the IP address to perform identity authentication with remote VPN server. It is not necessary for Main mode.

Scheduler (1-15): Specify the index of the call schedule.

10.6.3 Dial-In Settings



3. Dial-In Settings

Allowed Dial-In Type

☑ PPTP

☑ IPSec Tunnel

☑ L2TP with IPSec Policy None

□ Specify Remote VPN Gateway

Peer VPN Server IP

or Peer ID

Username ???

Password

VJ Compression ● On ○ Off

IKE Pre-Shared Key

IPSec Security Method

☑ Medium (AH)

High (ESP)

☑ DES ☑ 3DES ☑ AES

Allowed Dial-In Type: Indicate the allowed dia-in connection type. In the Vigor 2900 series of broadband security routers, we provide three options: ***PPTP***,

IPSec Tunnel, and ***L2TP with IPSec Policy***. By default, these three options are active.

PPTP: Check to allow the PPTP dial-in connection.

IPSec Tunnel: Click it to allow the IPSec tunnel dial-in connection.

L2TP with IPSec Policy: Specify the IPSec policy for the L2TP connection.

None: Do not apply the IPSec policy.

Nice to Have: Apply the IPSec policy first. If it fails, the dial-in VPN connection will be the L2TP connection without employing the IPSec policy.

*Must***:** Specify the IPSec policy to be definitely applied on the L2TP connection.

Notice that, similar to the setting for dial-out users, when you choose either the **PPTP** or the **L2TP with IPSec Policy** for dial-in setting, you should specify the **Username, Password**, **PPP Authentication**, and **VJ Compression**. Other functions including **IKE Pre-Shared Key**, **IPSec Security Method**, and **Peer VPN Server IP or Peer ID** are reserved for the option of **IPSec Tunnel** and will be disabled for the **PPTP** or **L2TP with IPSec Policy** option. One exception for the **L2TP with IPSec Policy** option is that policy sets to ***Nice to Have*** or ***Must***. In this exception, you should move on the setting of **IKE Pre-Shared Key**, **IPSec Security Method**, and **Peer VPN Server IP or Peer ID**.

Hence, if you enable the **PPTP**, **L2TP**, or **L2TP with IPSec Policy** option for dial-in setting, you should move on the setting of the following fields.

Username: Specify a username to authenticate the dial-in router.

Password: Specify a password to authenticate the dial-in router.

PPP Authentication: Specify the PPP authentication method for PPTP, L2TP, and L2TP over IPSec. Normally set to PAP/CHAP for the widest compatibility.

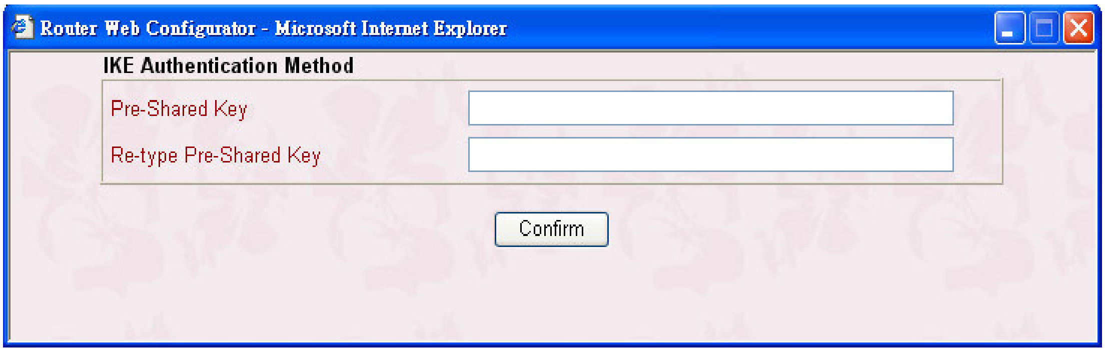
VJ Compression: VJ Compression is used for TCP/IP protocol header compression. Normally set to **Yes** to improve bandwidth utilization.

Once you enable the **IPSec Tunnel** or **L2TP with IPSec Plolicy** with selection of ***Nice to Have*** or ***Must*** for dial-in setting, you should move on the following setting.

Specify Remote VPN Gateway: For extra security, you should enable the option to allow the remote client to connect only from a specific IP address.

Peer VPN Server IP or Peer ID: Specify the IP address of the remote VPN server or the peer ID in the field. Afterward, you should fill a Pre-Shared Key for this specific node.

IKE Pre-shared Key: Click it and a window will be automatically poped up for you, as depicted below. Please fill a Pre-shared Key for this specific node.


Router Web Configurator - Microsoft Internet Explorer

IKE Authentication Method

Pre-Shared Key

Re-type Pre-Shared Key

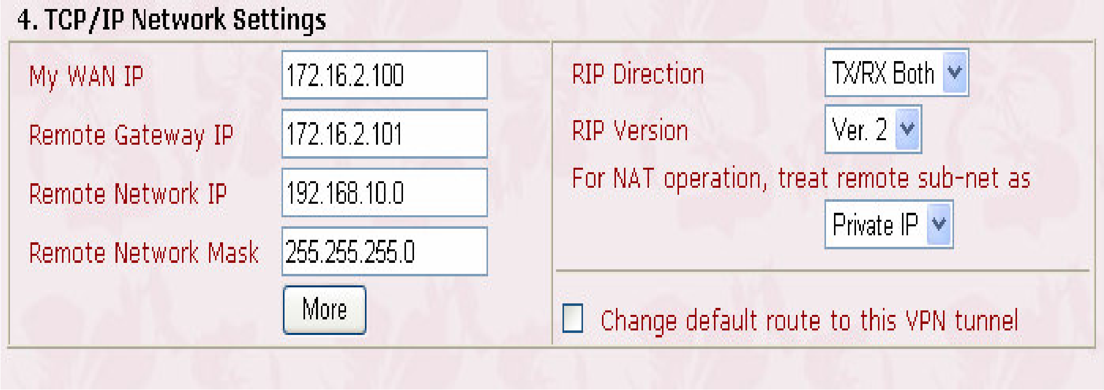
IPSec Security Method: Specify the IPSec security method, either authentication or encryption algorithm, to determine the security level. You can only select one.

***Medium*(*AH*):** Specify the IPSec protocol for the Authentication Header protocol. The data will be authenticated, but not be encrypted.

***High* (*ESP*):** Specify the IPSec protocol for the Encapsulating Security Payload protocol. The data will be encrypted. Supported algorithms are DES, 3DES, and AES. By default, these three algorithms are available.

Notice that if you do not activate the "**Specify Remote VPN Gateway**" and leave the field of "**Peer VPN Server IP or Peer ID**" to be empty, the settings of ***IKE Pre-Shared Key***, and ***IPSec Security Method*** will be disabled and, therefore, no IPSec-related VPN conneciton can be triggered successfully.

10.6.4 TCP/IP Network Settings



4. TCP/IP Network Settings

My WAN IP: 172.16.2.100

Remote Gateway IP: 172.16.2.101

Remote Network IP: 192.168.10.0

Remote Network Mask: 255.255.255.0

RIP Direction: TX/RX Both

RIP Version: Ver. 2

For NAT operation, treat remote sub-net as: Private IP

□ Change default route to this VPN tunnel

The following settings are required for proper LAN-to-LAN operations.

My WAN IP: In most cases, you may accept the default value of 0.0.0.0 in this field. The router will then get a WAN IP address from the remote router during the IPCP negotiation phase. If the WAN IP address is fixed by remote side, specify the fixed IP address here.

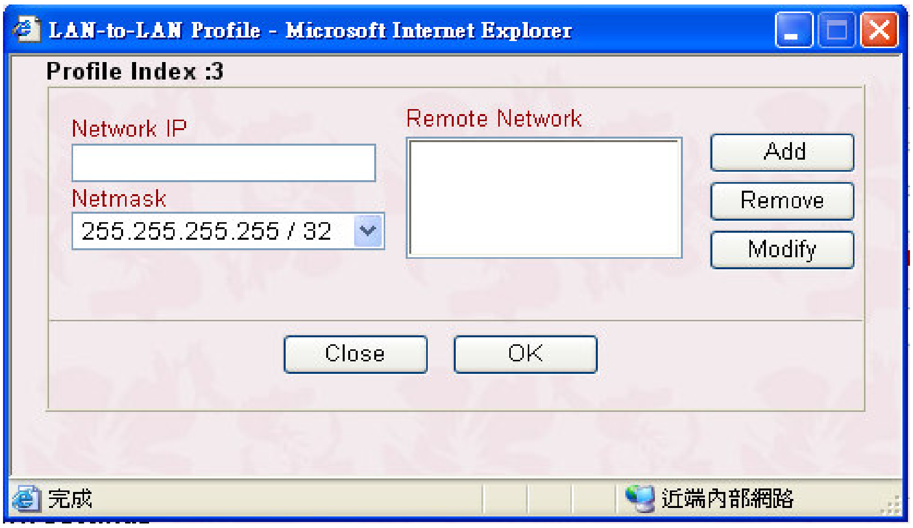
Remote Gateway IP: In most cases, you may accept the default value of 0.0.0.0 in this field. The router will then get a Remote Gateway IP address from the remote router during the IPCP negotiation phase. If the Remote Gateway IP address is fixed, specify the fixed IP address here.

Notice that if you are not familiar with IPCP protocol, please set these two fields as 0.0.0.0.

Remote Network IP: Specify the network identification of the remote network. For example, 192.168.1.0 is a network identification of a class-C subnet with subnet mask of 255.255.255.0 (/24).

Remote Network Mask: Specify the subnet mask of the remote network.

More: This button let you add a static route when this connection is up. Clicking it will pop up a window for more setting, as depicted below.



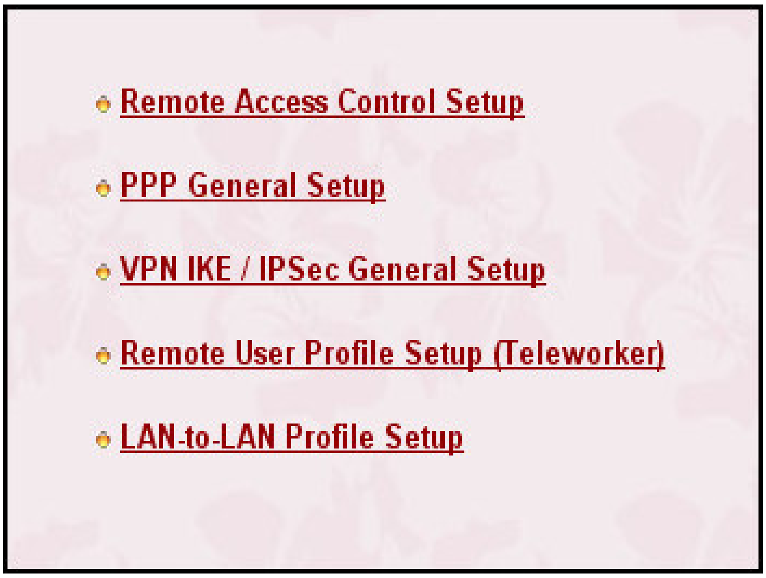
RIP Direction: The option specifies the direction of RIP (Routing Information Protocol) packets. You can enable/disable one of direction here. Herein, we provide four options: **TX/RX Both**, **TX Only**, **RX Only**, and **Disable**.

RIP Version: Select the RIP protocol version. Specify Ver. 2 for greatest compatibility.

For NAT operation, treat remote sub-net as: The Vigor router supports two local IP networks: the 1st subnet and 2nd subnet. Thus, you can set which subnet will be used as the local network for VPN connection and exchange RIP packets with the remote network. Usually set to **Private IP** for routing between the 1st subnet and the remote network.

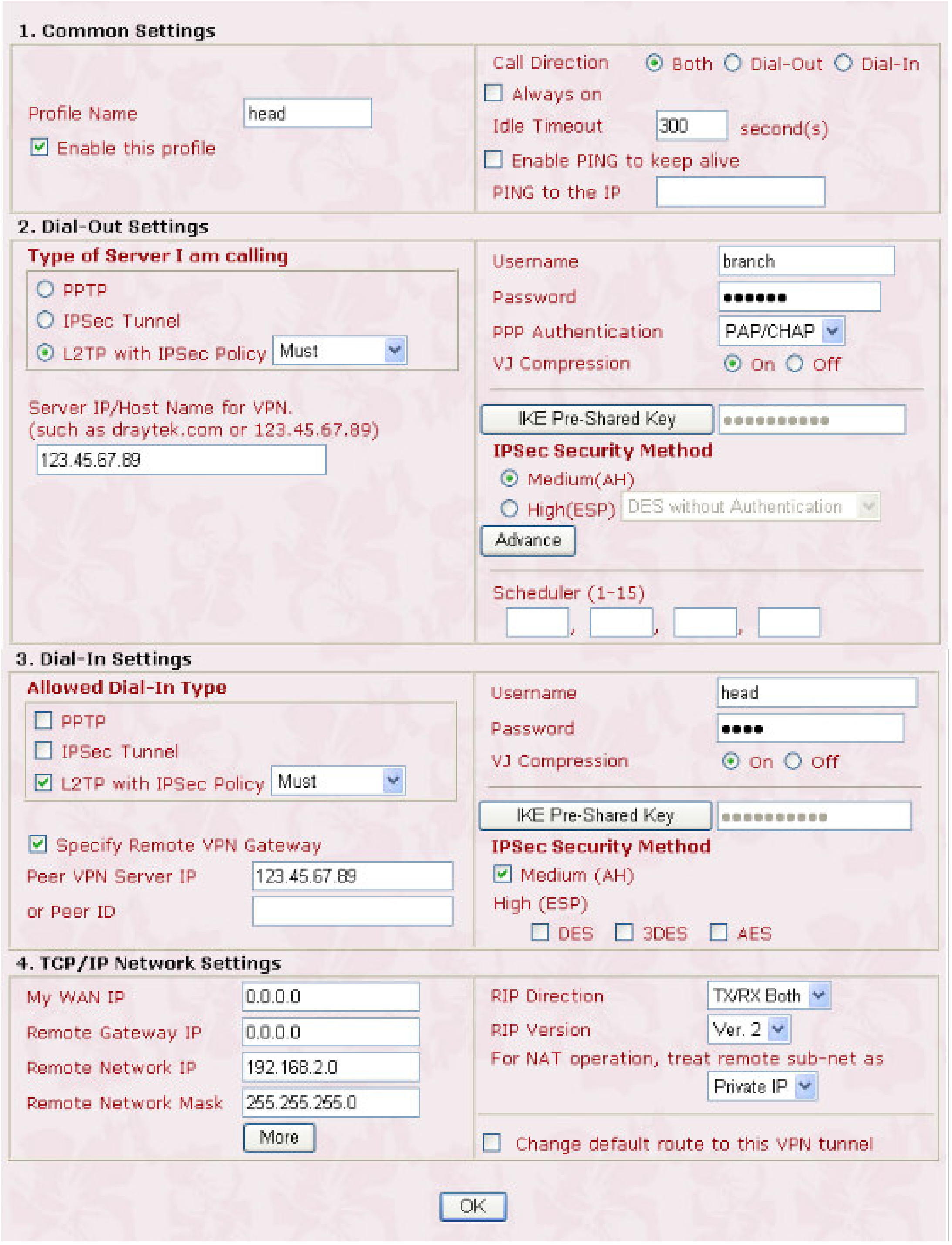
10.7 An example of LAN-to-LAN VPN connection

This example is based on the network configuration shown in the following table to describe how to set up a LAN-to-LAN profile to connect two private networks through Internet. As shown in the table, the private network 192.168.1.0/24 is located at head office, the network of off-site branch office is 192.168.2.0/24.


Remote Access Control Setup
PPP General Setup
VPN IKE / IPSec General Setup
Remote User Profile Setup (Teleworker)
LAN-to-LAN Profile Setup

Before configuring the LAN-to-LAN profile for each site, you should click **VPN and Remote Access Setup > VPN IKE/IPSec Setup** to configure the pre-shared key **ABC123** in advance.

Creating a LAN-to-LAN profile at Head Office



1. Common Settings

Profile Name: head

☑ Enable this profile

Call Direction: ● Both ○ Dial-Out ○ Dial-In

□ Always on

Idle Timeout: 300 second(s)

□ Enable PING to keep alive

PING to the IP:

2. Dial-Out Settings

Type of Server I am calling

○ PPTP

○ IPSec Tunnel

● L2TP with IPSec Policy: Must

Server IP/Host Name for VPN.
(such as draytek.com or 123.45.67.89)

123.45.67.89

Username: branch

Password: ●●●●●●

PPP Authentication: PAP/CHAP

VJ Compression: ● On ○ Off

IKE Pre-Shared Key: ●●●●●●●●●●●

IPSec Security Method

● Medium(AH)

○ High(ESP) DES without Authentication

Advance

Scheduler (1-15)

3. Dial-In Settings

Allowed Dial-In Type

□ PPTP

□ IPSec Tunnel

☑ L2TP with IPSec Policy: Must

☑ Specify Remote VPN Gateway

Peer VPN Server IP: 123.45.67.89

or Peer ID:

Username: head

Password: ●●●●

VJ Compression: ● On ○ Off

IKE Pre-Shared Key: ●●●●●●●●●●●

IPSec Security Method

☑ Medium (AH)

High (ESP)

□ DES □ 3DES □ AES

4. TCP/IP Network Settings

My WAN IP: 0.0.0.0

Remote Gateway IP: 0.0.0.0

Remote Network IP: 192.168.2.0

Remote Network Mask: 255.255.255.0

More

RIP Direction: TX/RX Both

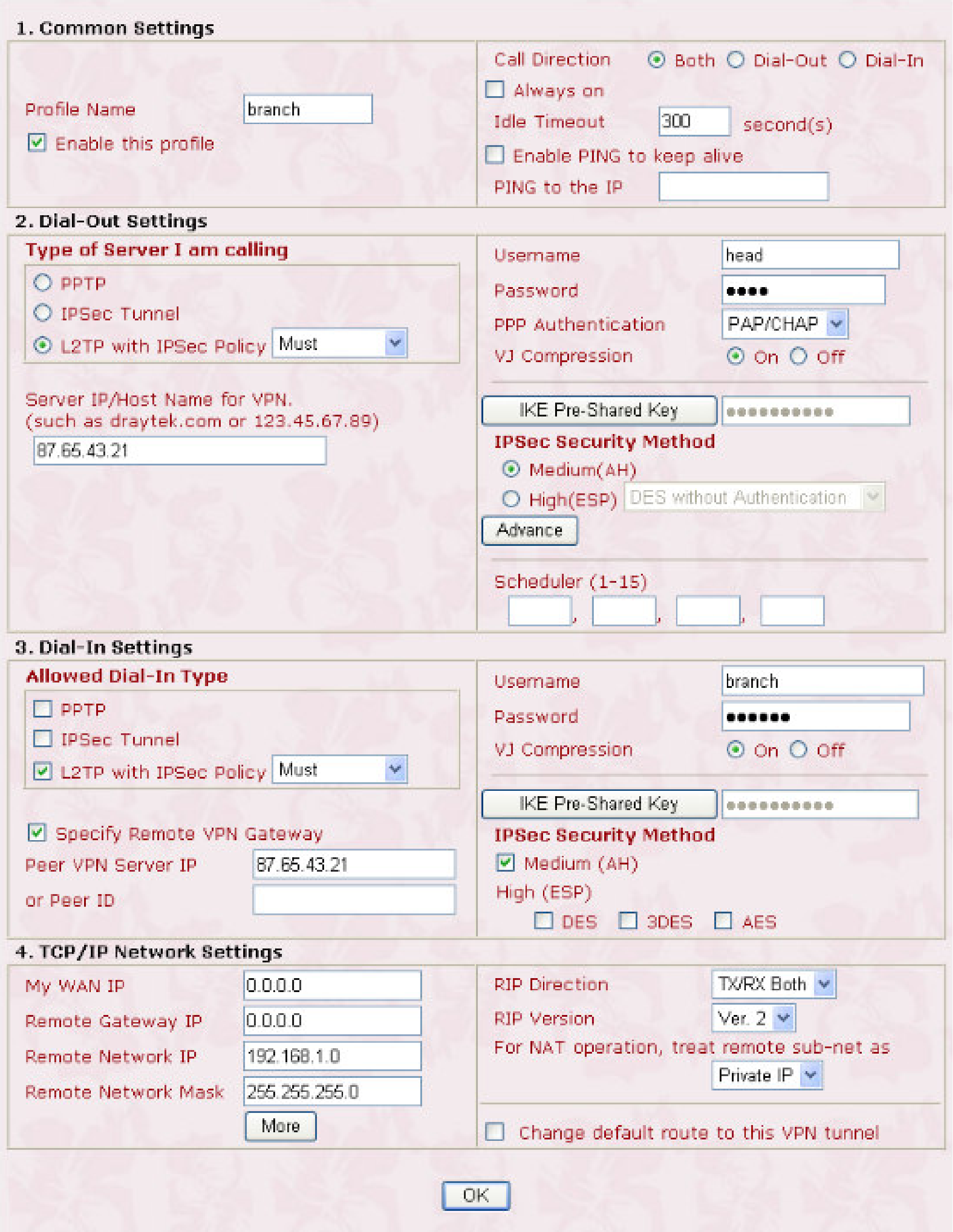
RIP Version: Ver. 2

For NAT operation, treat remote sub-net as: Private IP

□ Change default route to this VPN tunnel

OK

Creating a LAN-to-LAN profile at Branch Office



1. Common Settings

Profile Name: branch

☑ Enable this profile

Call Direction: ● Both ○ Dial-Out ○ Dial-In

□ Always on

Idle Timeout: 300 second(s)

□ Enable PING to keep alive

PING to the IP:

2. Dial-Out Settings

Type of Server I am calling

○ PPTP

○ IPSec Tunnel

● L2TP with IPSec Policy: Must

Server IP/Host Name for VPN.
(such as draytek.com or 123.45.67.89)

87.65.43.21

Username: head

Password: ●●●●

PPP Authentication: PAP/CHAP

VJ Compression: ● On ○ Off

IKE Pre-Shared Key: ●●●●●●●●●●

IPSec Security Method

● Medium(AH)

○ High(ESP): DES without Authentication

Advance

Scheduler (1-15)

3. Dial-In Settings

Allowed Dial-In Type

□ PPTP

□ IPSec Tunnel

☑ L2TP with IPSec Policy: Must

☑ Specify Remote VPN Gateway

Peer VPN Server IP: 87.65.43.21

or Peer ID:

Username: branch

Password: ●●●●●●

VJ Compression: ● On ○ Off

IKE Pre-Shared Key: ●●●●●●●●●●

IPSec Security Method

☑ Medium (AH)

High (ESP)

□ DES □ 3DES □ AES

4. TCP/IP Network Settings

My WAN IP: 0.0.0.0

Remote Gateway IP: 0.0.0.0

Remote Network IP: 192.168.1.0

Remote Network Mask: 255.255.255.0

More

RIP Direction: TX/RX Both

RIP Version: Ver. 2

For NAT operation, treat remote sub-net as: Private IP

□ Change default route to this VPN tunnel

OK