

IPsec VPN Application Guide

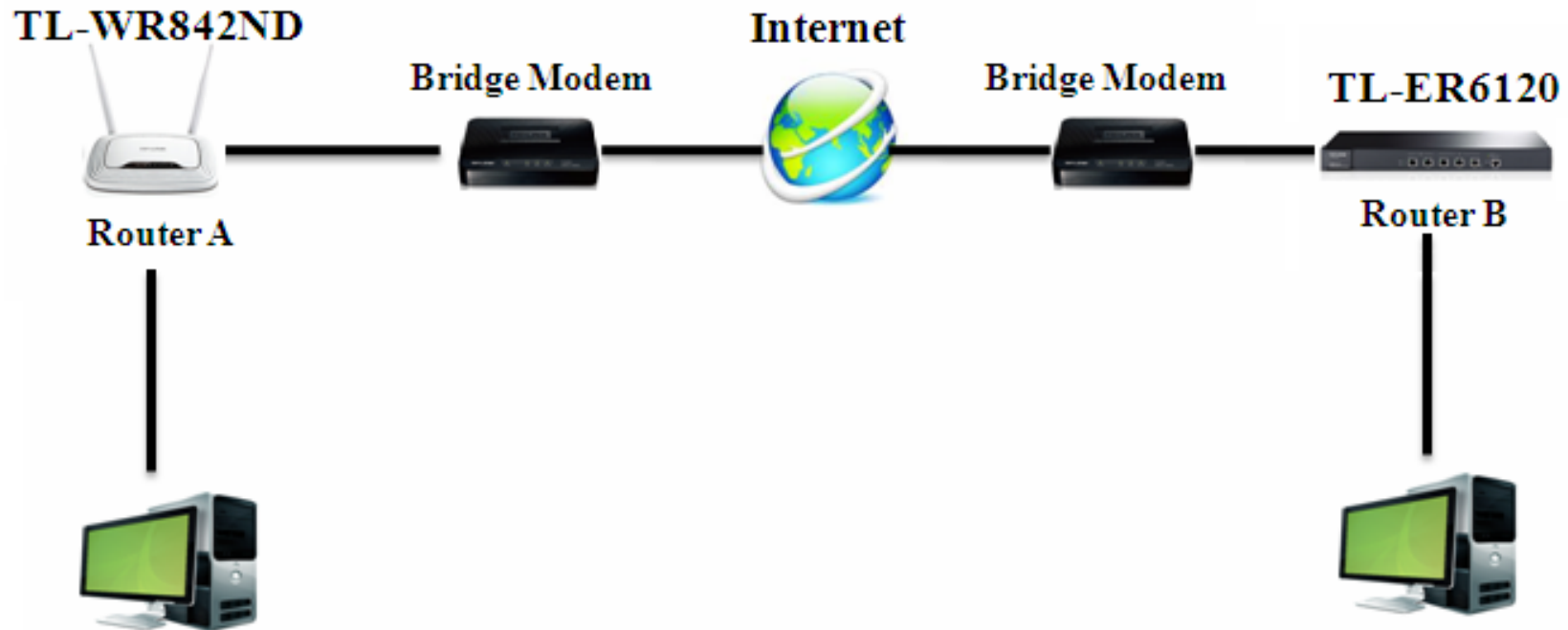
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Chapter 1. Overview

IPsec VPN is usually built to connect two or more remote LANs via Internet so that hosts in different remote LANs are able to communicate with each other as if they are all in the same LAN.

Typical Topology



* Here we use TL-WR842ND (Router A) and TL-ER6120 (Router B) for example.

Chapter 2. Before Configuration

Before setting up an IPsec VPN, you need to

- Ensure that the two routers are connected to the Internet, actively.
- Verify the settings needed for IPsec VPN on the two routers.

Verify the settings needed for IPsec VPN on the two routers:

1. Log in TL-WR842ND's management webpage, then check on the Status page.
2. Log in TL-ER6120's management webpage, then check on the Network -> Status page.

TL-WR842ND's Status Page:

TP-LINK® 300M Multi-Function Wireless N Router
Model No. TL-WR842N / TL-WR842ND

Status

- Quick Setup
- WPS
- Network
- Wireless
- Guest Network
- DHCP
- VPN
- USB Settings
- Forwarding
- Security
- Parental Control
- Access Control
- Advanced Routing
- Bandwidth Control
- IP & MAC Binding
- Dynamic DNS
- System Tools

LAN

MAC Address:	00-0A-EB-13-09-19
IP Address:	192.168.1.1
Subnet Mask:	255.255.255.0

Wireless

Wireless Radio:	Enable
Name (SSID):	TP-LINK_130919
Mode:	11bgn mixed
Channel Width:	Automatic
Channel:	Auto (Current channel 2)
Max Tx Rate:	300Mbps
MAC Address:	00-0A-EB-13-09-19
WDS Status:	Disable

WAN

MAC Address:	00-0A-EB-13-09-1A
IP Address:	10.10.10.101
Subnet Mask:	255.255.255.0
Default Gateway:	10.10.10.101
DNS Server:	8.8.8.8 , 172.31.1.1

Dynamic IP

TL-ER6120's Status Page:

The screenshot displays the status page for a TP-LINK TL-ER6120 router. The left sidebar contains navigation menus for Network, User Group, Advanced, Firewall, VPN, Services, Maintenance, and Logout. The main content area is divided into several sections:

- System Status**: Overview of the router's operational state.
- Device Info**: Shows Firmware Version (1.0.0 Build 20111114 Rel.52682) and Hardware Version (TL-ER6120 v1.0).
- System Time**: Shows System Time (2009-05-26 01:04:03 Tuesday) and Running Time (3 Day, 2 Hour, 4 Min, 2 Sec).
- WAN**: Details for WAN1 and WAN2 connections.
 - WAN1**: Link Up, Dynamic Primary Connection, Connected Status, IP Address: 10.10.10.117 (highlighted with a red box), Subnet Mask: 255.255.255.0, Gateway: 10.10.10.1, MAC Address: 00-19-60-80-5F-31.
 - WAN2**: Link Up, Static IP Primary Connection, Connected Status, IP Address: 116.10.20.28, Subnet Mask: 255.255.255.0, Gateway: 116.10.20.1, MAC Address: 00-19-60-80-5F-32.
- LAN/DMZ**: A table showing LAN interface details.

Interface	IP Address	Subnet Mask	DHCP Server	MAC Address
LAN	192.168.0.1 (highlighted with a red box)	255.255.255.0	Enabled	00-00-01-02-03-05
- CPU Usage**: Shows Core0 usage at 1%.

Two callout boxes provide context: "This will be Router A's Remote Gateway IP." points to the WAN1 IP address, and "This is Router B's Local Subnet." points to the LAN IP address.

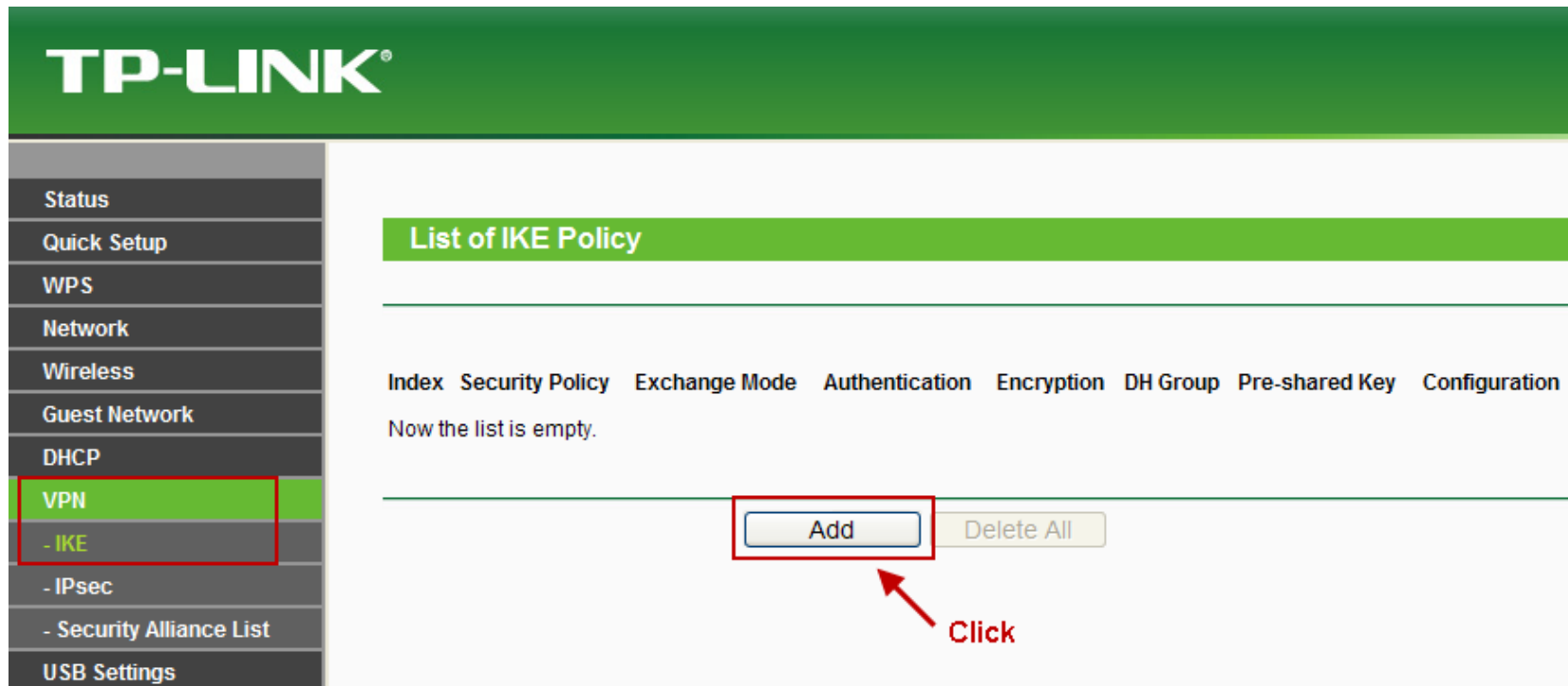
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Chapter 3. Configuration

3.1 Configure IPsec VPN on TL-WR842ND (Router A)

Step 1. Log in the management webpage of TL-WR842ND.

Step 2. Go to **VPN -> IKE**, click **Add**.



Step 3. Create a Policy Name (here take **Test 1** for example); select **Main mode** as Exchange Mode, **MD5** as Authentication Algorithm, **3DES** as Encryption Algorithm, **DH2** as DH Group; and create a Pre-shared Key (here take **secret** for example). Then click **Save**.

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IKE Policy Settings

Policy Name: **Create**

Exchange Mode: Main mode Aggressive mode **Create**

Authentication Algorithm: **Select**

Encryption Algorithm: **Select**

DH Group: **Select**

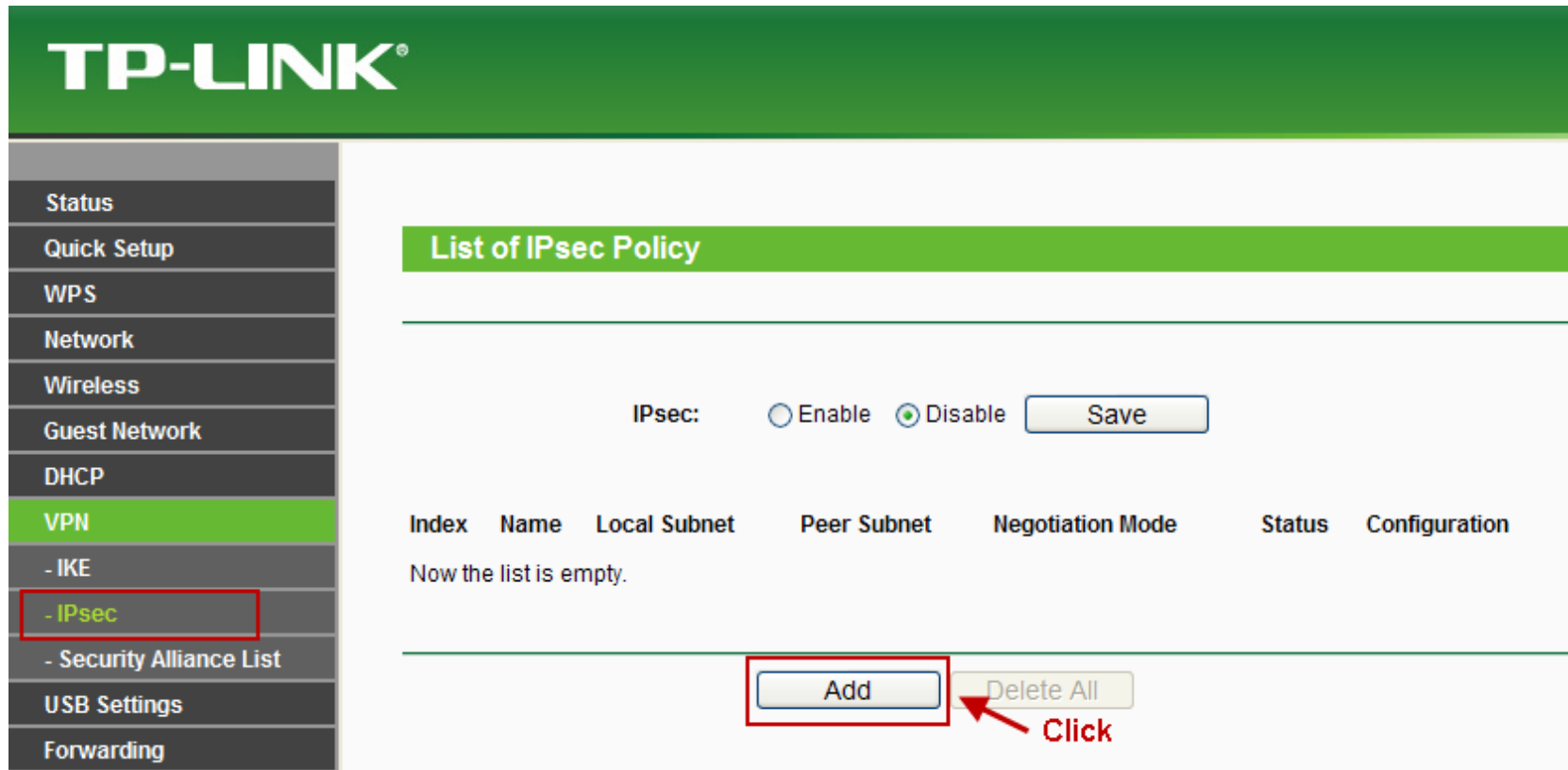
Pre-shared Key: **Create**

Lifetime: seconds(60-604800)

DPD: enable disable

Click →

Step 4. Go to **VPN -> IPsec**, click **Add**.



Step 5. Create a Policy Name (here take **IPsec 1** for example). Enter **192.168.1.0 / 24** as the Local Subnet, **192.168.0.0 / 24** as the Peer Subnet (it is Router B's Local Subnet), **10.10.10.117** as the Peer Gateway (it is Router B's WAN IP). Select **IKE negotiation** as Negotiation Mode, **ESP** as Security Protocol, **MD5** as Authentication Algorithm, **3DES** as Encryption Algorithm, **Test 1** as IKE Security Policy, **NONE** as PFS Group, **Enable** as the Status. Then click **Save**.

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Status
Quick Setup
WPS
Network
Wireless
Guest Network
DHCP
VPN
- IKE
- **IPsec**
- Security Alliance List
USB Settings
Forwarding
Security
Parental Control
Access Control
Advanced Routing
Bandwidth Control
IP & MAC Binding
Dynamic DNS

IPsec Policy Settings

Create

Policy Name: IPsec1

Local Subnet: 192.168.1.0 / 24

Peer Subnet: 192.168.0.0 / 24 **Enter**

Peer Gateway: 10.10.10.117 (IP or domain name)

Negotiation Mode: IKE negotiation Manual mode

Security Protocol: ESP

Authentication Algorithm: MD5 **Select**

Encryption Algorithm: 3DES

IKE Security Policy: Test 1 [Click here to add IKE list](#)

PFS Group: NONE

Lifetime: 28800 seconds (60-604800)

Enable: Enable **Select**

Save **Back**

Click

Step 6. Check **Enable** and then click **Save** to activate the IPsec.

The screenshot shows the TP-LINK configuration interface. On the left is a navigation menu with options: Status, Quick Setup, WPS, Network, Wireless, Guest Network, DHCP, VPN (highlighted), - IKE, - IPsec, - Security Alliance List, USB Settings, and Forwarding. The main content area is titled 'List of IPsec Policy'. Below the title, there are radio buttons for 'IPsec: Enable' (checked) and 'Disable'. A red arrow points to the 'Enable' radio button with the label 'Check'. To the right of the radio buttons is a 'Save' button, also highlighted with a red box and a red arrow pointing to it with the label 'Click'. Below this is a table with the following data:

Index	Name	Local Subnet	Peer Subnet	Negotiation Mode	Status	Configuration
1	IPsec 1	192.168.1.0/24	192.168.0.0/24	IKE mode	<input checked="" type="checkbox"/> enable	modify delete

At the bottom of the table area, there are two buttons: 'Add' and 'Delete All'.

3.2 Configure IPsec VPN on TL-ER6120 (Router B)

Step 1. Log in the management webpage of TL-ER6120.

Step 2. Go to **VPN -> IKE -> IKE Proposal**.

Step 3. Create a Proposal Name (here take **Test 2** for example). Select **MD5** as Authentication Algorithm, **3DES** as Encryption Algorithm, **DH2** as DH Group, the same as Router A's. Then click **Add**.

The screenshot shows the TP-LINK management interface for the TL-ER6120 router. The left sidebar contains a navigation menu with 'VPN' selected and 'IKE' highlighted. The main content area is titled 'IKE Proposal' and contains the following configuration fields:

- Proposal Name:
- Authentication:
- Encryption:
- DH Group:

Red annotations highlight the configuration process: 'Create' points to the Proposal Name field, 'Select (the same as Router A's)' points to the Authentication dropdown, and 'Click' points to the 'Add' button. Below the configuration fields is a table titled 'List of IKE Proposal' which is currently empty, displaying 'No entries.' and buttons for 'Select All', 'Delete', and 'Search'.

Step 4. Go to **VPN -> IKE -> IKE Policy**.

Step 5. Create a Policy Name (here take **Test 2** for example). Select **Main** as Exchange Mode, **IP Address** as Local ID Type and Remote ID Type, **Test 2** as IKE Proposal 1; enter **secret** as Pre-shared Key, and **28800** as SA Lifetime, the same as Router A's. Then click **Add**.

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TL-ER6120

IKE Policy
IKE Proposal

IKE Policy

Policy Name: ← **Create**

Exchange Mode: Main Aggressive

Local ID Type: IP Address FQDN

Local ID:

Remote ID Type: IP Address FQDN ← **Select**

Remote ID:

IKE Proposal 1: ← **Select**

IKE Proposal 2:

IKE Proposal 3:

IKE Proposal 4:

Pre-shared Key: ← **Enter (the same as Router A's)**

SA Lifetime: Sec (60-604800)

DPD: Enable Disable

DPD Interval: Sec (1-300)

Add
Clear
Help

List of IKE Policy

	No.	Name	Mode	Proposal 1	Proposal 2	Proposal 3	Proposal 4	Action
<input type="checkbox"/>	1	Test 2	Main	Test 2	----	----	----	

Select All
Delete
Search

Step 6. Go to **VPN -> IPsec -> IPsec Proposal**.

Step 7. Create a Proposal Name (here take **IPsec 2** for example). Select **ESP** as Security Protocol, **MD5** as ESP Authentication, **3DES** as ESP Encryption, the same as Router A's. Then click **Add**.

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TL-ER6120

IPsec Policy **IPsec Proposal** IPsec SA

IPsec Proposal

Proposal Name: ← **Create**

Security Protocol: ↓

ESP Authentication: ↓

ESP Encryption: ↓

Click →

Select (the same as Router A's) →

List of IPsec Proposal

No.	Name	Protocol	AH Auth	ESP Auth	ESP Encr	Action
<input type="button" value="Select All"/> <input type="button" value="Delete"/> <input type="button" value="Search"/>						

Step 8. Go to **VPN -> IPsec -> IPsec Proposal**.

Step 9. Create a Policy Name (here take **IPsec 2** for example). Select **LAN-to-LAN** as the Mode.

Enter **192.168.0.0 / 24** as the Local Subnet, **192.168.1.0 / 24** as the Remote Subnet (it is Router A's Local Subnet), **10.10.10.101** as the Remote Gateway (it is Router A's WAN IP).

Select **IKE** as Policy Mode, **Test 2** as IKE Policy, **IPsec 2** as IPsec Proposal.

Select **NONE** as PFS, and enter **28800** for SA Lifetime, which are the same as Router A's.

Check **Activate** for the Status.

Click **Add**.

Check **Enable** and then click **Save** to activate the IPsec.

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TL-ER6120

IPsec Policy
IPsec Proposal
IPsec SA

General

 Enable Disable
 Click → Save

IPsec Policy

Policy Name: IPsec 2 ← **Create**

Mode: LAN-to-LAN ↓ ← **Select**

Local Subnet: 192.168.0.0 / 24

Remote Subnet: 192.168.1.0 / 24

WAN: WAN1 ↓

Remote Gateway: 10.10.10.101 (IP Address/Domain Name) ← **Enter**

Policy Mode: IKE Manual ← **Select**

IKE Policy: Test 2 ↓

IPsec Proposal 1: IPsec 2 ↓

IPsec Proposal 2: ---- ↓

IPsec Proposal 3: ---- ↓

IPsec Proposal 4: ---- ↓

PFS: NONE ↓ ← **Select / Enter (the same as Router A's)**

SA Lifetime: 28800 Sec (120-604800)

Status: Activate Inactivate

List of IPsec Policy
Click → Add
Clear
Help

No.	Name	Mode	Local Subnet	Remote Subnet	Policy Mode	Status	Action

Select All
Activate
Inactivate
Delete
Search

3.3 Check IPsec Security Alliance

Step 1. Check the **VPN -> Security Alliance List** page of TL-WR842ND as well as the **VPN -> IPsec -> IPsec SA** page of TL-ER6120.

The screenshot shows the configuration interface for a TP-LINK 300M Multi-Function Wireless N Router (Model No. TL-WR842N / TL-WR842ND). The left sidebar contains a navigation menu with the following items: Status, Quick Setup, WPS, Network, Wireless, DHCP, VPN (highlighted), - IKE, - IPsec, - Security Alliance List (highlighted), USB Settings, Forwarding, Security, and Parental Control. The main content area is titled "List of Security Alliance" and displays a table with the following data:

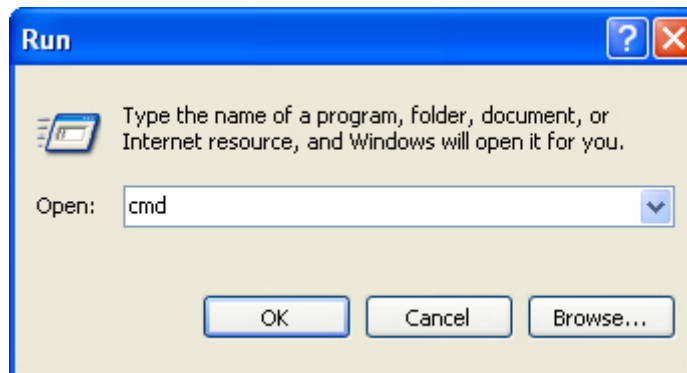
Index	Name	SPI	Tunnel Initiator	Tunnel Receiver	Security Protocol	AH Auth	ESP Auth	ESP Encr
1	IPsec 1	95514210	10.10.10.117	10.10.10.101	ESP	--	MD5	3DES
2	IPsec 1	125577895	10.10.10.101	10.10.10.117	ESP	--	MD5	3DES

Below the table is a "Refresh" button.

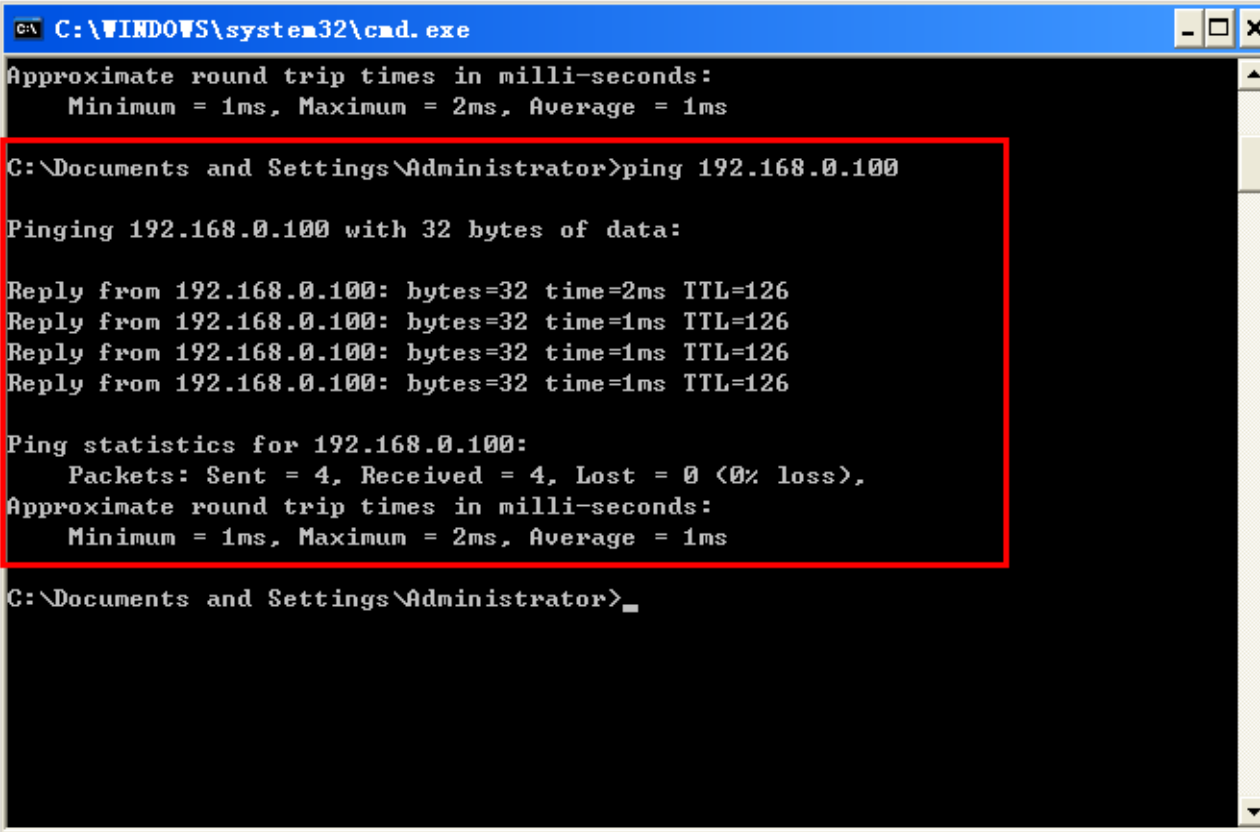
The screenshot shows the TP-LINK configuration interface for a TL-ER6120 device. The left sidebar contains navigation links: Network, User Group, Advanced, Firewall, VPN (with sub-links for IKE and IPsec), L2TP/PPTP, Services, and Maintenance. The main content area is titled 'IPsec SA' and displays a table of IPsec Security Associations. Below the table are buttons for Refresh, Search, and Help.

No.	Name	SPI	Tunnel	Data Flow	Protocol	AH Auth	ESP Auth	ESP Encr	Status
1	IPsec2	95514210<-> 125577895	10.10.10.117 <-> 10.10.10.101	192.168.0.0/24<-> 192.168.1.0/24	ESP	---	MD5	3DES	Connected

Step 2. On a host under TL-WR842ND, press [Windows Logo] + [R] to open **Run** dialog, input **cmd** and click **OK**.



Step 3. In the CLI window, type in **ping 192.168.0.x** (192.168.0.x can be IP address of any host in TL-ER6120), and then press [Enter].



```
C:\WINDOWS\system32\cmd.exe
Approximate round trip times in milli-seconds:
  Minimum = 1ms, Maximum = 2ms, Average = 1ms

C:\Documents and Settings\Administrator>ping 192.168.0.100

Pinging 192.168.0.100 with 32 bytes of data:

Reply from 192.168.0.100: bytes=32 time=2ms TTL=126
Reply from 192.168.0.100: bytes=32 time=1ms TTL=126
Reply from 192.168.0.100: bytes=32 time=1ms TTL=126
Reply from 192.168.0.100: bytes=32 time=1ms TTL=126

Ping statistics for 192.168.0.100:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 2ms, Average = 1ms

C:\Documents and Settings\Administrator>_
```

If Ping proceeds successfully and gets replies from the host in TL-ER6120, the IPsec connection must be working properly now.

If there are any further problems, please feel free to contact our TP-LINK technical support.