



Firewall HotBrick LB-2

How To

LB-2 IPSec Tunnel Setup Guide

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LB-2 IPSec Tunnel Setup Guide

The HotBrick LB-2 is a VPN capable Dual WAN Gateway with industry standard IPsec encryption. It provides extremely secure LAN-to-LAN connectivity over the Internet. The LB-2 supports VPN by encryption, encapsulation, and authentication using the following methods:

DES/3DES/AES MD-5 SHA-1/SHA-2

The maximum tunnels allowed are 10 VPN tunnels. This setup guide will help the user establish an IPsec VPN tunnel between two LB-2s with VPN.

Note: The LB-2 must have the VPN upgrade to establish an IPSec Tunnel. This will also help you setup an IPSec Tunnel if you have an LB-2 VPN with license key. Please upgrade your LB-2 VPN to the latest version by going to our website and clicking on the Downloads link (<u>http://hotbrick.com/support.asp</u>).



IPsec Tunnel between two LB-2 VPN

The picture above displays two sites that are joined by a VPN IPsec tunnel between two LB-2s with VPN. Here is how to setup the VPN IPSec tunnel:

- 1. Login to your LB-2
- 2. Go to Advanced Setup
- 3. VPN Configuration
- 4. Click on Global Setting. Please see the picture below for the IKE Global Setting for site A.



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Advanced Setup	Global Parameters	WAN1	WAN2
Security Management	Enable Setting		
VPN Configuration	ISAKmp Port	500	500
Global Setting	Phase 1 DH Group	DH Group 1 (768-bit)	DH Group 2 (1024-bit)
Policy Setup	Phase 1 Encryption Method	3DES 🔽	3DES 🔽
Log	Phase 1 Authentication Method	MD5 💌	MD5 💌
QoS Configuration	Phase 1 SA Lifetime	28800 Seconds	28800 Seconds
Anagement Assistant	Retry Counter	5	5
Network Info	Retry Interval	30 Seconds	30 Seconds
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	Maxtime to complete Phase 2	300 Seconds	300 Seconds
	Count Per Send	1	1
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Figure 2 - Global Setting for Site A

5. Under the Global Setting, make sure you enable the WAN interface that you want the VPN IPSec tunnel to establish through.

6. Both WAN1 and WAN2 can initiate and establish VPN Tunnels

7. Figure 2 shows the Global Parameters for WAN1. Remember that these parameters must be identical at both sites. Below are some recommended values:

- Phase 1 DH Group DH Group 1 (768 bit)
- Phase 1 Encryption Method 3DES
- Phase 1 Authentication Method MD5
- Phase 1 SA Lifetime 28800

8. Once you have selected the Global Parameters then hit Submit.

9. The LB-2 will be restarted and refreshed to save the settings.

10. After the settings are refreshed, click on Policy Setup

11. Under IPSec Traffic Binding, input a name for "Tunnel Name". In Figures 3 and 4 below, we have the tunnel name "LB2VPN".

12. Make sure you check the enable box for "Tunnel".

13. For *WAN port* you can bind the tunnel to WAN1, WAN2 or ANY. Since we are building a tunnel on WAN1, we will be specific and select WAN1 on the *WAN Port*.

14. If you have multiple PPPoE sessions on the WAN ports make sure you select the appropriate session.



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		Port Range	0 ~ 0					
		Remote Type	Subnet 💌					
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		Port Range	0 ~ 0					
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		·						
	Security Level							
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Figure 4 - IPSec Traffic Binding for Site B

How To establish an IPSec VPN tunnel with LB-2 VPN



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- 15. Under Traffic Selector, for Service Protocol Type select ANY.
- 16. Under Local Security Network , for Local Type select Subnet.
- 17. The IP address must reflect the entire subnet. Please see below:
 - a. In Figure 3, Site A IP address is 192.168.2.0 and Mask Address 255.255.255.0
 - b. In Figure 4, Site B IP address is 10.1.1.0 and Mask Address 255.255.255.0
 - c. NOTE LAN subnets and IP addresses must be different or there will be overlapping.
- 18. The Port Range can be left at $0 \sim 0$.

19. For Remote Security Network, for Remote Type select Subnet.

20. The IP address must again reflect the entire subnet. In Figure 3, the remote security network for Site B is 10.1.1.0. In Figure 4, the remote security network for Site A its 192.168.2.0.

21. For the Remote Security Gateway the gateway type is IP Address. The IP address is the WAN1 IP address of the remote site (Site B).

22. Under Security Level, the VPN IPSec Tunnel will be in ESP (Encapsulating Security Payload) mode.

23. For the Encryption method you can choose from: Null, DES/3DES, or AES. In our example we have chosen 3DES. Please see figure 5 and figure 6.

24. For the Authentication Method you can choose from: Null, MD5, SHA-1/SHA-2. In our example we have chosen MD-5.

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Security Management	Remote Security Gateway	IP Address 67.111.37.232	
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	Action		
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Figure 5 - Policy Setup for Site A



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		Add Delete Update Reset	
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Figure 6 - Policy Setup for Site B

25. Under Key Management there are two types: Autokey (IKE) or Manual Key.

26. If AutoKey (IKE) is selected, your Phase 1 Negotiation can be Main Mode or Aggressive Mode. In our example we used Main Mode.

27. For Perfect Forward Secrecy you can choose to enable it or not. In our example we have used DH Group 2 (1024-bit).

28. The Preshared Key must be characters and/or hexadecimal units. The preshared key entered in our example is "hotbrick".

29. The Key life time can be set in seconds with zero indicating no expirations. In our example we used 28800 seconds or eight hours.

30. For the service In Volume we left the default 0 Kbytes.

31. If Manual Key was chosen the encryption key and authentication key would have to be entered using characters and/or hexadecimal units. Please see figure 7 below.

Кеу Туре	Manual Key 💙
Encryption Key	(Characters / Hex:0x)
Authentication Key	(Characters / Hex:0x)
Inbound SPI	0 (Dec / Hex:0x)
Outbound SPI	0 (Dec / Hex:0x)



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32. The Inbound and Outbound Stateful Packet Inspection must also be set.

33. Once all these values all entered you click on Add.

34. Now under *Action*, select **Set Options**. This brings you to the **IPSec Policy Options** page. We recommend that you use this section to always keep the tunnels up.

35. Under Dead Peer Detection Feature, make sure the enable box is checked.

Under Check Method there are three options:

Heartbeat ICMP host

DPD (RFC 3706)

In our example we have selected DPD (RFC 3706). Under Action, it is important that you select Keep Tunnel Alive.

36. Under **Options**, you can enable NetBIOS Broadcast to be able to send NetBIOS traffic through the tunnel. Also enable **Auto Triggered**, to always reconnect the tunnel if the tunnel happens to drop.

37. When you are finished click Set. This will take you back to the Policy Setup page,

then scroll down to the bottom and under Action hit the Update button.

38. You must then configure site two to match the entries in site one.

When you have finished, click on connect on any of the two LB-2s. In our example the connect button was hit on Site A (Initiator) and the tunnel was established to Site B (Responder).

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Advanced Setup	Tunnel at	tributes							
Security Management	State	Name	Security Gatev	vay Remote Sit	e Security Policy	/ Кеу Туре	Physical Status	Negotiation Status	
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Policy Setup	Dead Pee	er Detectio	n Feature						
Log	Detection			🗹 Enable					
QoS Configuration	Check Me	thod		C Heartbeat C ICMP Host 0.0.0.0			⊙ DPD	(RFC 3706)	
Anagement Assistant	Check Aft	er Idle		60 Seconds			I		
Network Info	Retry Tim	es	1	10					
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	Logging			🗹 Enable	Enable				
	Outlens								
		Aroadcast		🗹 Enable	Check ESP Par	4	[] Enable		
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	Anti Repla	 IV		Enable	Copy DF Flag		Enab)le	
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			ľ	Set G	io Back Reset				
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Figure 8 – IPSec Policy Option for Site A



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Policy Setup									
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	Anti Replay			l Enable	Copy DF Flag		🗖 Enal	ble	
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Figure 9 – IPSec Policy Option for Site B

Figures 10 and 11 show the tunnel established under Policy Setup. Figures 11 and 12 show the log with all the phases of the IPSec tunnel established.



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								Connected	established
	Enable	LB2VPN	67.111.37.2	232	10.1.1.0	3DES/SHA1	AutoKey (IKE)	WAN 1	(Quick) :
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Figure 11 - Site B tunnel established



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Basic Setup	VPN Log			
Advanced Port	Message Sta	tus: 49 mes	ssages	
Advanced Setup	Time	Priority	Module	Messages
	0 00:38:55	Info.	ike	Phase2 Responder(Quick) : established : Wan1
Security Management	0 00:38:54	Info.	ike	Phase2 Responder(Quick) : 1st : Wan1
VPN Configuration	0 00:38:54	Info.	ike	Phase2 Responder(Quick) : 1st : Wan1
VPN License Key	0 00:38:53	Info.	ike	Respond phase 2 negotiation (67.111.37.232:0, 67.111.37.227:0) : Wan1
Set Lie w	0 00:38:51	Info.	ike	ISAKMP SA(67.111.37.232:500, 67.111.37.227:500) established : Wan1
; Global Setting	0 00:38:51	Info.	ike	Phase1 Responder(Main) : 3rd : Wan1
Policy Setup	0 00:38:51	Info.	ike	Phase1 Responder(Main) : 2nd : Wan1
Log	0 00:38:50	Info.	ike	Set DPD Vendor ID
0oS Configuration	0 00:38:50	Info.	ike	Received DPD Vendor ID
	0 00:38:49	Info.	ike	Phase1 Responder(Main) : 1st : Wan1
Management Assistant	0 00:38:49	Info.	ike	Set DPD Vendor ID
Network Info	0 00:38:49	Info.	ike	Start Main mode
	0 00:38:49	Info.	ike	Respond phase1 negotiation (67.111.37.232:500, 67.111.37.227:500)
	0 00:38:30	Info.	ike	ISAKMP SA(67.111.37.232:500, 67.111.37.227:500) deleted : Wan1
	0 00:38:29	Error	ike	Invalid isakmp Informational exchange type received
			Pr	ovious Page Refresh Next Page Clear All



How To establish an IPSec VPN tunnel with LB-2 VPN



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VPN Policy References

IPSec Global Setting

Enable

Enabling WAN 1, WAN 2 or Both will start global setting.

ISAkmp Port

Designed to negotiate, establish, modify and delete security associations and their attributes which was assigned by IANA UDP port 500.

Phase 1 DH Group

Use DH Group 1 (768-bits), DH Group 2 (1024-bits), Group 5 (1536-bits) to generate IP Sec SA Keys.

Phase 1 Encryption Method

There are 3 data encryption methods available: DES, 2DES, and AES.

Phase 1 Authentication Method

There are 2 authentication methods available: MD5 and SHA1 (Secure Hash Algorithm)

Phase 1 SA Life Time

By default the Security Association lifetime is set at 28800 Sec.

Maxtime to complete phase 1

Aim of phase 1 is to authenticate and establish a secure tunnel, which will protect further IKE negotiation. The maximum time default is 30 Sec.

Maxtime to complete phase 2

Maximum time to establish the IPSec SAs. By default the maximum time is 30 Sec.

Log Levels

Select a VPN log level that you like to display on VPN log.

VPN Policy Setup

IPSec Traffic Binding

VPN Tunnel List

Shows tunnels you have entered. The router can be setup to 50 tunnels.

Tunnel Name

Distinguishes "tunnels" by names

Tunnel

The tunnel can only be connected when the **ENABLE** check box is selected.

WAN port

You can choose WAN 1, WAN 2 or any to make the VPN connection.



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PPPoE Session

Some ISP's offer multiple sessions when using PPPoE to make VPN connections. These PPPoE sessions can be selected to construct VPN tunnels.

Traffic Selector

Service

Protocol Type: Choices are TCP/UDP/ICMP/GRE as your connection protocol. By default the protocol type is "Any".

Local Security Network

These entries identify the private network on the VPN gateway and the hosts of which can use the LAN-to-LAN connection. You can choose a single IP address, the subnet, or a selected IP Range to make VPN LAN-to-LAN connection.

Remote Security Network

These entries identify the private network on the remote peer VPN router whose hists can use the LAN-to-LAN connection. You can choose a single IP address, the subnet, or a selected IP Range to make VPN connection.

Remote Security Gateway

Select either remote side domain name or remote side IP address (WAN IP Address) as your remote side security gateway.

Security Level

Encryption Method

It specifies the encryption method to use. Data encryption makes the data unreadable if intercepted. There are 3 encryption methods available: DES, 3DES, and AES. The default is null.

Authentication

This specifies the packet authentication mechanism to use. Packet authentication confirms the data's source. There are 3 authentications available: MD5, SHA1 and SHA2.

Key Management

Key – Key Type:

There are 2 key types (manual key and auto key) available for the key exchange management.

Manual Key

If manual key is selected, no key negotiation is needed.

Encryption Key

This field specifies a key to encrypt and decrypt IP traffic.

Authentication Key

This field specifies a key to use to authentication IP traffic

Inbound/outbound

SPI (Security Parameter Index) is carried on the ESP header. Each tunnel must have a unique inbound and outbound SPI and no 2 share the same SPI. Notice that Inbound SPI must match the other router's outbound SPI.



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AutoKey (IKE)

There are 2 types of operation modes can be used:

Main Mode accomplishes a phase 1 IKE exchange by establishing a secure channel. **Aggressive Mode** is another way of accomplishing a phase 1 exchange. It is faster and simpler than main mode, but does not provide identity protection for the negotiating nodes.

Perfect Forward Secrecy (PFS)

If PFS is enabled, IKE phase 2 negotiation will generate a new key Material for IP traffic encryption & authentication.

Preshared Key

This field is to authenticate the remote IKE peer.

Key Lifetime

This specifies the lifetime of the IKE generated Key. If the time expires or data is passed over this volume, a new key will be renegotiated. By default, 0 is set for no limit.

Options

NetBIOS Broadcast

This is used to forward NetBIOS broadcast across the Internet.

Keep Alive

This is to help maintain the IPSec connection tunnel. It can be reestablished immediately if a connection is dropped.

Anti Replay

This mechanism works by keeping track of the sequence numbers in packets as they arrive.

Passive Mode

When enabled, your PC establishes the data connection.

Check ESP Pad

When checked, this will enable ESP (Encapsulating Security Payload) padding.

Allow Full ECN

Enable will allow full Explicit Congestion Notification (ECN). ECN is a standard proposed by the IETF that will minimize congestion on a network and the gateway dropping packets.

Copy DF Flag

When an IP packet is encapsulated as payload inside another IP packet, some of the outer header fields can be newly written and others are determined by the inner header. Among these fields is the IP DF (Do Not Fragment) flag. When the inner packet DF flag is clear, the outer packet may copy it or set it. However, when the inner DF flag is set, the outer header MUST copy it.

Set DF Flag

If the DF (Do Not Fragment) flag is set, it means the fragmentation of this packet at the IP level is not permitted.