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Peplink Balance VPN Solution Guide







Peplink Complete VPN Solutions. Deploy Peplink Balance for all your VPN needs





Introduction

Understanding Peplink VPN solutions

Peplink's VPN is a complete, seamless system that tightly integrates your offices and users together, secure and available at all times.

The Peplink router comes with features like VPN load balancing, a built-in PPTP VPN Server, and VPN Bandwidth Bonding. Having both VPN load balancing to connect multiple locations and PPTP to enable remote access frees you from buying extra devices. With VPN Bandwidth Bonding, all of your available bandwidth will become one big Internet pipe, allowing faster transfer of large files.

With a Peplink Balance Multi-WAN Router you can enjoy a complete VPN solution that provides you the best VPN experience ever.





What Does Peplink Balance Offer to Make Your VPN Complete?



Bonded Site-to-Site VPN for Multiple Locations

Peplink's innovative technology establishes and bonds VPN traffic among multiple connections. The VPN Bonding feature allows businesses to connect to multiple locations with military-grade protection. When one Internet connection fails, the VPN failover feature will dynamically route traffic to active connections to maintain uninterrupted VPN service. Session failover takes place seamlessly within just a second.



PPTP VPN Server for Windows and Mac

Even when you are away from the office, you can now connect to the corporate network simply by using the PPTP client found in Windows and Mac OS X. Whether you have forgotten a file at the office or want to upload the latest document update, accessing the office network only takes a few clicks.



256-bit AES VPN Traffic Encryption

Using Peplink Site-to-Site VPN, all of your data going through the VPN tunnel is encrypted with 256-bit AES. Multiple branches can be easily connected with military-grade protection.

Bond Your Bandwidth to Enhance VPN Performance

With the new VPN bonding feature, sending a gigabyte file to your neighbor site is no longer a hassle. Peplink's technology aggregates bandwidth from all connections and transfers data at the packet-level. Communication between your remote sites has never been faster.





How Can Peplink Balance Give You the Best VPN Experience Ever?



Save Money with a Single-Device Complete Solution

Separate devices are not needed for extra VPN capacity. Peplink Balance comes with everything you need - both Site-to-Site VPN to easily connect multiple sites and the PPTP-VPN Server to enable remote access. Save money and enjoy all the advantages of a complete VPN with Peplink.

Ease-Of-Use of Peplink's VPN Technology

Peplink Balance is designed for you and is extremely easy to set up. You don't need to be a professional to configure the Peplink VPN settings. Just enter a few parameters and a VPN tunnel will be established.





Which VPNs does Peplink Balance support?

Peplink Balance support different VPN protocol in the following settings:

- VPN Termination: having the device to perform the actual encryption/decryption and operations that make the VPN secure
- VPN Passthrough: having the device installed as an intermediate part of a secure VPN, requires additional VPN gateway.





Designed for Multi-WAN.

Peplink Site-to-Site VPN establishes concurrent VPN tunnels on each WAN connection. By utilizing multiple Internet links, Peplink Site-to-Site VPN gives you a bonded bandwidth and instant failover. IPSec VPN technology can only establish a single tunnel to each terminal and limits its usage.

Bonded Bandwidth.

With multiple concurrent VPN tunnels established, VPN traffic is distributed and bonded at each VPN terminal. The bonded VPN uses all your Internet links, maximizing the bandwidth available to you.

Resilience to Internet Outage.

The concurrent VPN tunnels will also back each other up when a disconnection occurs. By routing traffic to healthy tunnels, VPN sessions are maintained with zero downtime. IPSec VPN requires significant time to detect a disconnection and re-establish the connection. Failover of IPSec can take as much as 5 minutes.

Build-in Dynamic Routing.

Peplink Site-to-Site VPN gives you the flexibility to route either all traffic or only private network traffic to the remote terminal. You can easily set up a star topology VPN network and pass all traffic through central site appliances, such as a firewall. You can also set up a mesh network with only private network traffic passing through the VPN.

PN







Application

Understanding Peplink Site-to-Site VPN

Proprietary Site-to-Site VPN of Peplink Balance, also known as VPN Bonding, is specifically designed for multi-WAN environment. Peplink Balance can aggregate the bandwidth of all WAN connections available for routing VPN traffic. Unless all the WAN connections of one site are down, the Peplink Balance can still maintain VPN up and running.

- Peplink Site-to-Site VPN encrypts traffic with the military-grade 256-bit AES algorithm.
- Site-to-Site VPN is available with Peplink Balance 210, 310, 380, 580, 710, and 1350.
- Peplink Balance 380/580/710/1350, supporting multiple Site-to-Site VPN connections among twenty or more locations, is designed for Headquarters/Regional Offices.
- Peplink Balance 210/310, supporting two Site-to-Site VPN connection, is the ideal choice for Branch Offices.
- Site-to-Site VPN connection can be established for all Dynamic IP/Static IP scenarios. Please refer to the Requirement section for more information.
- Peplink recommends firmware 5.1+ for the best Site-to-Site VPN experience.

Being able to establish multiple VPN connections provides variety and flexibility in deploying your network. You may choose to create a network in a **Mesh** or **Star** topology, or you may even combine the two setups to create a more complex network.



Peplink Balance Series



1. Mesh Topology

In the illustration on the right, the network is composed of three Peplink Balance 580 units. Each unit has established VPN connections to connect to the other two units directly. In case of a VPN connection down between any two locations, this setup provides an alternative path to route VPN traffic. For instance, if there is a VPN connection down between offices in San Francisco and Minneapolis, these two offices can still route VPN traffic through the Houston office.

Each Peplink Balance being used in this network has to be a Peplink Balance 380/580/710/1350 (supports multiple VPN connections).





2. Star Topology

A Peplink Balance 380/580/710/1350 can act as a central hub to connect branch offices. As shown in the illustration on the left, the offices in San Francisco and Minneapolis make Site-to-Site VPN connections to their headquarters in New York independently. Both offices' LAN subnet and subnets behind it will be advertised to headquarters in New York and the offices in other locations. In this case, San Francisco office will be able to access Minneapolis office through the New York headquarters even though they are not directly connected to each other.

Note: All branch offices' LAN subnet and subnets behind it have to be unique. Otherwise, branch offices as well as the headquarters will not be able to access each other.



Requirement

System Requirement for Site-to-Site VPN Configuration

When configuring a VPN connection, there are two aspects to consider:

- Whether WAN connection has a Dynamic IP or Static IP.
- Whether Peplink Balance unit has **Public IP** or is **behind NAT**.

Therefore, there are four possibilities for the types of WAN you use to establish the VPN connection. Peplink Balance supports all WAN types. However, to establish VPN connection using a Dynamic IP WAN connections, you have to configure at least one Dynamic DNS.

- WAN has Dynamic IP with Peplink Balance has Public IP.
- WAN has Static IP with Peplink Balance has Public IP.
- WAN has Dynamic IP with Peplink Balance is behind NAT.
- WAN has Static IP with Peplink Balance is behind NAT.

The table below illustrates the system requirement for configuring Peplink Site-to-Site VPN connection.

			WAN on Peplink Balance A			
			Dynamic IP / Peplink unit has Public IP	Static IP / Peplink unit has Public IP	Dynamic IP / Peplink unit is behind NAT	Static IP / Peplink unit is behind NAT
	WAN on eplink Balance B	Dynamic IP / Peplink unit has Public IP	(using Dynamic DNS)	(using Dynamic DNS)	(using Dynamic DNS)	(using Dynamic DNS)
		Static IP / Peplink unit has Public IP	(using Dynamic DNS)	4	(using Dynamic DNS)	4
		Dynamic IP / Peplink unit is behind NAT	(using Dynamic DNS)	(using Dynamic DNS)	(using Dynamic DNS)	(using Dynamic DNS)
	£.	Static IP / Peplink unit is behind NAT	(using Dynamic DNS)	4	(using Dynamic DNS)	4

Note for users who placed a firewall in front of the Balance:

In Firmware 5.1.x, Peplink proprietary Site-to-Site VPN used TCP port 32015, IP Protocol 47 and IP Protocol 99 for establishing VPN connections. if you have a firewall in front of the Peplink Balance devices, you will need to add firewall rules for these port and protocols which will allow inbound and outbound traffic pass-through the firewall.



Configuration (VPN Termination)

Configuring Site-to-Site VPN Tunnel for Star Scenario

Site-to-Site VPN of Peplink Balance is specifically designed for multiple WAN environments. It can aggregate the bandwidth of all available WAN connections for routing between multiple locations.

In the following illustration, a Peplink Balance 710 in New York will act as a central site to connect four branch offices together to form an internal network. All remote offices in San Francisco, Houston, Minneapolis and Seattle make Site-to-Site VPN connections to the headquarters in New York independently. In this case, all branch offices will be able to access each other through the New York headquarters even though they are not directly connected.



Add the VPN connections in the New York Headquarters' Peplink Balance unit

1. Click Add VPN Connection for adding San Francisco remote peer.

VPN Connection	Peer Serial Number	Peer Address(es)		2
	on Defined	Add a new VPN		
	Add VPN Conr	ection	connection	

2. Enter a VPN connection name. We suggest using a readable wording for easier recognition.

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- 3. Enter the Serial Number of the remote Peplink Balance unit (Serial number of Peplink Balance 380 in San Francisco).
- 4. Enter the WAN1 and WAN2 IP of San Francisco's unit.
- 5. In WAN Connection Priority, if you select all WAN connections in the same priority, the Site-to-Site VPN traffic will be load-balanced across all available bandwidth.

VPN Settings		
VPN Connection Name 🛛 ?	NewYork_SanFrancisco	
Active		
Encryption 🕜	🖲 🔒 256-bit AES 🛛 🚡 Off	Enter the serial number of the
Peer Serial Number 🛛 🕐	1120-3800-1001	remote Peplink balance unit
	Remote client is set up in hig	h availability mode.
Peer IP Addresses / Host 🕜 Names (Optional)	211.10.10.2 61.20.20.2	Enter the WAN1 and/or WAN2 IP address(es) of the remote Peplink Balance unit
	If this field is empty, this field on the	peer site must be filled
Route Internet Traffic to 🕜 This Peer	DNS server 1: DNS server 2:	Click the box if you want to route all Internet traffic to
		this peer
WAN Connection Priority		()
1. WAN1	Priority: 1 (Highest) 👻	Salast the priority of WANs
2. WAN2	Priority: 1 (Highest) 👻	to be used for VPN
3. WAN3	Priority: 1 (Highest) 👻	connection
4. Mobile Internet	Priority: 1 (Highest) -	

6. Similarly, repeat Step 1 through 5 to add the VPN connections for Houston, Minneapolis and Seattle in New York's Peplink Balance 710 as shown in the following illustration.

VPN Connection	Peer Serial Number	Peer Address(es)	2
NewYork SanFrancisco	1120-3800-1001	211.10.10.2 61.20.20.2	Delete
NewYork Houston	1120-3800-1002	212.10.10.2 62.20.20.2	Delete
NewYork Minneapolis	1120-3100-1003	213.10.10.2 63.20.20.2	Delete
NewYork Seattle	1120-3100-1004	214.10.10.2 64.20.20.2	Delete
	Add VPN Connecti	on	

Add a VPN connection on remote peers

- 1. In the Peplink Balance 380 of San Francisco, click Add VPN Connection.
- 2. Enter a VPN connection name.
- 3. Enter the Serial Number of the Headquarters' Peplink Balance unit (Serial number of Peplink Balance 710 in New York)
- 4. Enter the WAN1 and WAN2 IP of New York's unit

VPN Solution Guide Peplink Balance Series



VPN Setungs			
VPN Connection Name	SanFrancisco_NewYork		
Active			
Encryption	🖲 🔒 256-bit AES 🛛 🔒	Enter the serial number of the	
Peer Serial Number 🛛 🕐	1170-7100-1000	unit	
	Remote client is set up in	Tight availability mode.	
Peer IP Addresses / Host (? Names (Optional)	211.10.10.2 60.20.20.2	Enter WAN1 and/or WAN2 IP address(es) of the Headquarters'	
	If this field is empty, this field on	Peplink Balance unit	
Route Internet Traffic to (⑦ This Peer	DNS server 1:	Click the box if you want to route all Internet traffic to this peer	
WAN Connection Priority		0	
1. WAN1	Priority: 1 (Highest) 💌		
2. WAN2	Priority: 1 (Highest) 💌	be used for VPN connection	
3. WAN3	Driority: 1 (Highart)		

5. Similarly, repeat Step 1 through 4 to add the VPN connections in Houston, Minneapolis and Seattle.

Priority: ---- OFF ---- 💌

Finally, you can view the VPN connections status in Main page of Web Admin Interface

The following is Main page of Headquarters' Peplink Balance 710. Click on the **Details** (or at **Status > Site-to-Site VPN**) and a list of VPN connection details would be shown.

Site-to-Site VPN	
NewYork_SanFrancisco	Established
NewYork_Houston	C Established
NewYork_Minneapolis	Established
NewYork_Seattle	🕒 Established



Configuring Site-to-Site VPN Tunnel for Mesh Scenario

Site-to-Site VPN of Peplink Balance is specifically designed for multiple WAN environments. It can aggregate the bandwidth of all available WAN connections for routing between multiple locations.

In the following illustration, the network is composed of three Peplink Balance 380 units. In this case, the traffic of all offices can be able to access each other directly.



Add the VPN connections in the New York's Peplink Balance unit

1. Click Add VPN Connection for adding San Francisco remote peer.

VPN Connection	Peer Serial Number Pee	r Address(es)		2
	No VPN Connection De	fined	Add a new VPN	1
	Add VPN Connectio	n 🧠	connection	,

- 2. Enter a VPN connection name. We suggest using a readable wording for easier recognition.
- 3. Enter the Serial Number of the remote Peplink Balance unit (Serial number of Peplink Balance 380 in San Francisco).
- 4. Enter the WAN1 and/or WAN2 IP of San Francisco's unit.
- 5. In WAN Connection Priority, if you select all WAN connections in the same priority, the Site-to-Site VPN traffic will be



load-balanced across all available bandwidth.

VPN Settings		
VPN Connection Name 🛛 🕐	NewYork_SanFrancisco	
Active		
Encryption 🕜	● 256-bit AES ○ 2 Off	Enter the envial number of the
Peer Serial Number 🛛 🕐	1170-7100-1001	remote Peplink Balance unit
	Remote client is set up in high availability mode.	
Peer IP Addresses / Host 🕜 Names (Optional)	211.10.10.2 61.20.20.2	Enter the WAN1 and/or WAN2 IP address(es) of the remote
	If this field is empty, this field on the	Peplink Balance unit
Route Internet Traffic to (?		
This Peer	DNS server 1:	
	DNS server 2:	

VAN Connection Priority 🕜				
1. WAN1	Priority: 1 (Highest) 💌	Select the priority of WANs to		
2. WAN2	Priority: 1 (Highest) 💌	be used for VPN connection		
3. WAN3	Priority: 1 (Highest) 💌			
4. Mobile Internet	Priority: OFF 💌			

6. Similarly, repeat Step 1 through 5 to add the VPN connection for Houston in New York's Peplink Balance 380 as shown in the following illustration.

VPN Connection	Peer Serial Number	Peer Address(es)	0
NewYork SanFrancisco	1120-7100-1001	211.10.10.2 61.10.10.2	Delete
NewYork Houston	1120-3900-1002	212.10.10.2 62.20.20.2	Delete
	Add VPN Connecti	on	

Add the VPN connections on San Francisco peer

Similarly, repeat Step 1 through 6 from above to add the VPN connections in San Francisco's Peplink Balance 380 as shown in the following illustration.

VPN Connection	Peer Serial Number	Peer Address(es)	0
SanFrancisco NewYork	1120-7100-1000	210.10.10.2 60.10.10.2	Delete
SanFrancisco Houston	1120-3900-1002	212.10.10.2 62.20.20.2	Delete
	Add VPN Connecti	on	

Add the VPN connections on Houston peer

Similarly, add the VPN connections in Houston's Peplink Balance 380

VPN Connection	Peer Serial Number	Peer Address(es)	0
Houston NewYork	1120-7100-1000	210.10.10.2 60.10.10.2	Delete
Houston SanFrancisco	1120-3900-1001	211.10.10.2 61.20.20.2	Delete
	Add VPN Connecti	on	



Setup User Access VPN using Built-in PPTP Server

Peplink Balance has a built-in PPTP Server, which enables remote computers to conveniently and securely access the local network.

1. Open the Web Admin Interface and go to *Network > Misc. Settings > PPTP Server.*

PPTP Server		
Enable	Enable PPTP Server	
Listen On 🛛 📀	Connection / IP Address(es)	
	I WAN1	☑ 210.10.10.2 (Interface IP)
		Connection
	WAN2	
	WAN3	
	Mobile Internet	
User Accounts 🛛 🕐	No User	Account dd Add User account

- 2. Enable: Check the box to switch on the PPTP server.
- 3. Listen On: it is for specifying the WAN connection(s) and IP address(es) where the PPTP server should listen on.
- 4. User Accounts: It allows you to define the PPTP User Accounts. Click Add to type username and password to create an account.

After adding the user accounts, you can click on a username to edit the account password. Click the button 🔀 to delete the account in its corresponding row.

IMPORTANT NOTE: To enable the feature of PPTP server, it is required to enable the DHCP server on LAN side. Please make sure that you have checked the box to **Enable** DHCP server and reserve enough IP addresses for your PPTP clients. The DHCP Server Settings is located at: *Network > LAN > DHCP Server Settings*

DHCP Server Settings					
DHCP Server	?	I Enable		Remember to reserve enough IP address for the PPTP clients	
IP Range	?	192.168.1.10	- 192.168.1.250		
Subnet Mask	?	255.255.255.0 💌			
Lease Time	?	Days 0	Hours 0 Mins	0 Seconds	
DNS Servers	1	Assign DNS se	erver automatically		
WINS Servers	0	Assign WINS server			
Extended DHCP Option 🕜		Option		Value	
		No Extended DHCP Option			
	bbA				
DHCP Reservation	0	Name	MAC Address	Static IP	
					÷

The name of connected PPTP clients can be checked at: Status > Client List



Configuration (VPN Passthrough)

Setup PPTP Passthrough

PPTP passthrough of Peplink Balance is enabled by default. In order to allow remote PPTP clients connect the PPTP server behind the Peplink Balance unit, you would need to create two **Inbound Access rules** to accomplish the following:

• Forward traffic of IP protocol 47 of public IP to the PPTP server

Enable	● Yes [©] No			
Service Name *	PPTP_IP			
IP Protocol 🚽 🚬	IP Protocol Number: 47	- :: Protocol Selection Tool :: 💌		
Inbound IP Address(es) * 👔 (Require at least one IP address)	Connection / IP Address(es)	All Clear		
	WAN2	22.2.2.2 (Interface IP)		
	WAN3	☑ 33.3.3.2 (Interface IP)		
	Mobile Internet			
Included Server(s) (Require at least one Server)	Server	Woight 1		
	E PP (PSelver (192.108.1.99)	Weight		

• Forward traffic TCP 1723 of public IP to the PPTP server

Enable	● Yes ◎ No			
Service Name *	PPTP_TCP			
IP Protocol	TCP •			
Port (?	Single Port Service Port: 1723			
Inbound IP Address(es) * 📀	Connection / IP Address(es)	All		
address)	WAN1	210.10.10.2 (Interface IP)		
	✓ WAN2 ✓ 22.2.2.2 (Interface IP)			
	WAN3	33.3.3.2 (Interface IP)		
Included Server(s) *				
(Require at least one Server)	MailServer (192.168.1.250)			
	✓ PPTPServer (192.168.1.99) Weight 1 ▼			

Remember to Save all settings and Apply Changes.

Peplink Balance Series



Setup IPSec Passthrough

The first step is to determine which of the following scenarios apply:

- Dial-up IPSec VPN
- Site-to-Site IPSec VPN

Dial-up IPSec VPN

Dial-up IPSec VPN is a setup where IPSec VPN client software is installed on computers on the local area network, and the IPSec VPN client software would then connect to an IPSec VPN gateway outside of the local network environment.

In this instance, enable IPSec NAT-T Passthrough which can be found at *Network > Misc. Settings > Service Passthrough* of Web Admin Interface.

Service Passthrough Support 🕜				
SIP (Standard SIP, Vonage)	 Standard Mode Compatibility Mode Define custom signal ports 			
Н.323	✓ Enable			
FTP 🕜	Enable Define custom control ports			
ТЕТР	Enable			
IPsec NAT-T	✓ Enable ✓ Define custom ports 1. 10001 2. 3.			
	Route IPsec Site-to-Site VPN			

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Site-to-Site IPSec VPN

Site-to-site IPSec VPN is the scenario where there are IPSec VPN gateways on the local area network that handle IPSec VPN connections between the local network environment and remote sites. Computers on the local network connect through the IPSec VPN gateways without the need for IPSec VPN client software.

For Site-to-site IPSec VPN, typically, **one** IP address must be specified for each of the IPSec VPN gateway at each end of the IPSec VPN tunnel. If IPSec VPN sessions initiated from IPSec VPN gateways behind Peplink Balance take place across multiple WAN links, then the IPSec VPN session typically cannot be maintained, because the source IP address changes depending on which WAN link carries the IPSec VPN traffic. As a result, with Site-to-site IPSec VPN, either the IPSec VPN traffic must travel across one specific WAN link, or the remote IPSec VPN gateway must accept multiple/any IP address for the VPN initiator.

To deploy Peplink Balance in the context of a Site-to-site IPSec VPN, configure Peplink Balance to route IPSec VPN traffic over one specific WAN link as follows:

- 1. Go to Network > Misc. Settings > Service Passthrough.
- 2. Enable IPSec NAT-T Passthrough; check the option Route IPSec Site-to-Site VPN and select the WAN connection to route the IPSec VPN traffic to.

SIP (Standard SIP, Vonage)	 Standard Mode Compatibility Mode Define custom signal ports 		
H.323	C Enable	☑ Enable	
FTP 🤶	Enable Define custom control ports		
TFTP	Enable		
IPsec NAT-T	 ✓ Enable □ Define custom ports ✓ Route IPsec Site-to-Site VPN via WAN1 		



VPN Status

Site-to-Site VPN Status

On the Dashboard of Web Admin Interface, you can see the status of VPN connection(s) as shown below.

Site-to-Site VPN	Details
NewYork_SanFrancisco	Established
NewYork_Houston	Established
NewYork_Minneapolis	Established
NewYork_Seattle	Connecting

Click **Details** at the top-right hand corner for VPN connections details. You may click on a corresponding VPN connection and the WAN connection it used will be shown as follow.

Site-to-Site VPN	
Peer	Remote Networks
NewYork_SanFrancisco	172.16.1.0/24
WAN1	In Use
WAN2	Not In Use
WAN3	Not In Use
■ VewYork_Houston	192.168.8.0/24
WAN1	In Use
WAN2	Not In Use
WAN3	Not In Use
NewYork_Minneapolis	192.168.9.0/24
WAN1	In Use
WAN2	Not In Use
WAN3	Not In Use
■ VewYork_Seattle	192.168.10.0/24
WAN1	In Use
WAN2	Not In Use
WAN3	Not In Use

PPTP VPN Status

Site-to-Site VPN connections and connected PPTP clients can be checked at: Status > Client List

Cli	Client List					
			Download (Kbps)	Upload (Kbps)	MAC Address	
	192.168.1.10		0	0	00:00:1C:DE:C3:A9	
	192.168.1.22		0	0	11:22:33:44:55:66	
	192.168.1.94		0	0	FD:22:33:44:55:94	
	192.168.1.96	Desktop User 1	0	0	04:22:33:44:55:96	
	192.168.1.200	Site-to-Site VPN	0	0	00:12:22:33:11:11	
	192.168.1.201	PPTP: UserA	0	0		
	192.168.1.202	PPTP: UserB	0	0		
				Scale:	🖲 Kbps 🔘 Mbps	

VPN Status



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About Peplink

Peplink is the proven market leader in delivering Internet link load balancing solutions. Peplink's products have been deployed by service providers, public safety agencies, city governments and enterprise customers around the world. As an innovative creator of technology solutions, Peplink operates globally with offices in North America and Asia in cooperation with distributors, system integrators and strategic alliance partners.

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