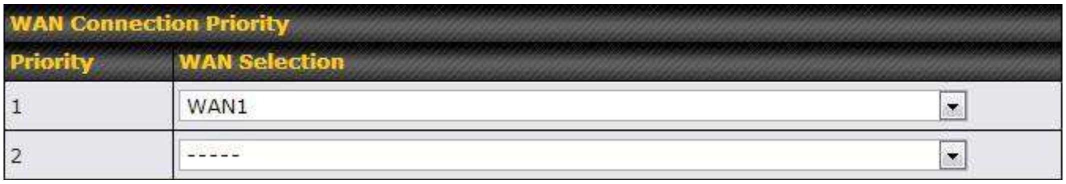


WAN Connection Priority

Priority	WAN Selection
1	WAN1
2	-----

Send All Traffic To
This featureenables you to prioritize the WAN connections used by this VPN profile.

13.2 IPsec Status

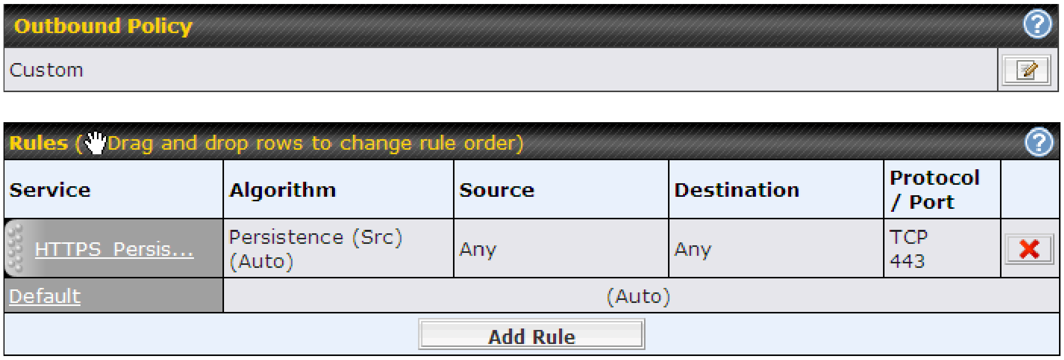
IPsec Status shows the current connection status ofeach connection profile and is displayed at***Status > IPsec VPN.***

14 Outbound Policy Management

The Peplink Balance canflexibly manage and load balance outbound traffic among WAN connections.

Important Note
Outbound policy is applied only when more than one WAN connection is active.

The settings for managing and load balancing outbound traffic are located at
Network> Outbound Policy.



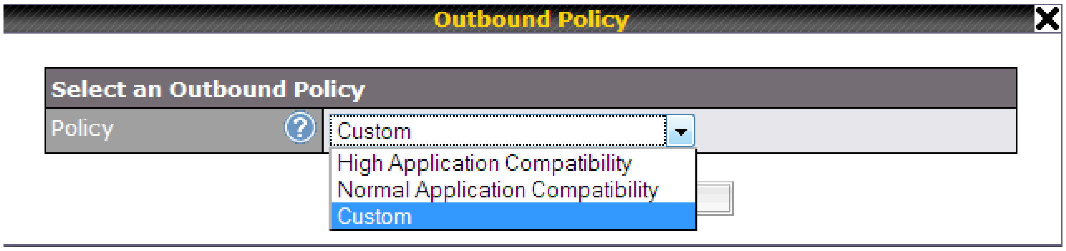
Outbound Policy

Custom

Rules (Drag and drop rows to change rule order)

Service	Algorithm	Source	Destination	Protocol / Port	
HTTPS Persis...	Persistence (Src) (Auto)	Any	Any	TCP 443	✕
Default	(Auto)				

Outbound policies for managing and load balancing outbound traffic are located at
Network > Outbound Policy>click on



Outbound Policy

Select an Outbound Policy

Policy: Custom

High Application Compatibility
Normal Application Compatibility
Custom

14.1 Outbound Policy

There are three main selections for the outbound traffic policy:

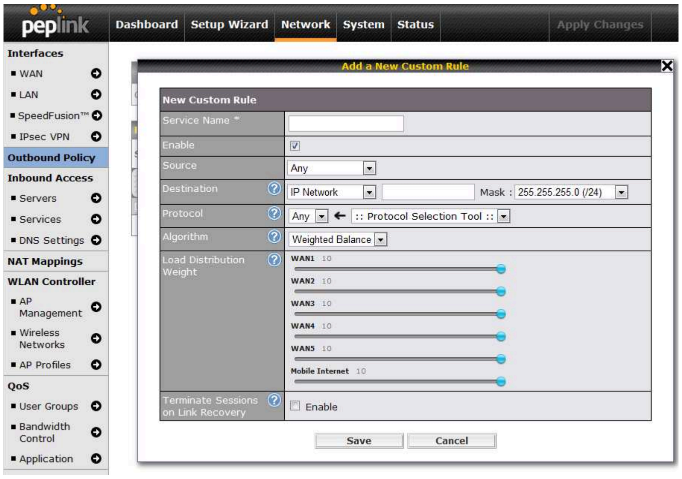
- High Application Compatibility
- Normal Application Compatibility
- Custom

Outbound Policy Settings	
High Application Compatibility	Outbound traffic from a source LAN device is routed through the same WAN connection regardless of the destination Internet IP address and protocol. This option provides the highest application compatibility.
Normal Application Compatibility	Outbound traffic from a source LAN device to the same destination Internet IP address will be routed through the same WAN connection persistently,regardless of protocol. This option provides high compatibility to most applications, and users still benefit from WAN link load balancing when multiple Internet servers are accessed.
Custom	Outbound traffic behavior can be managed by defining rules in a custom rule table. A default rule can be defined for connections that cannot be matched with any of the rules.

The default policy is **Normal Application Compatibility**.

Tip

Want to know more about creating outbound rules? Visit our YouTube Channel for a video tutorial!

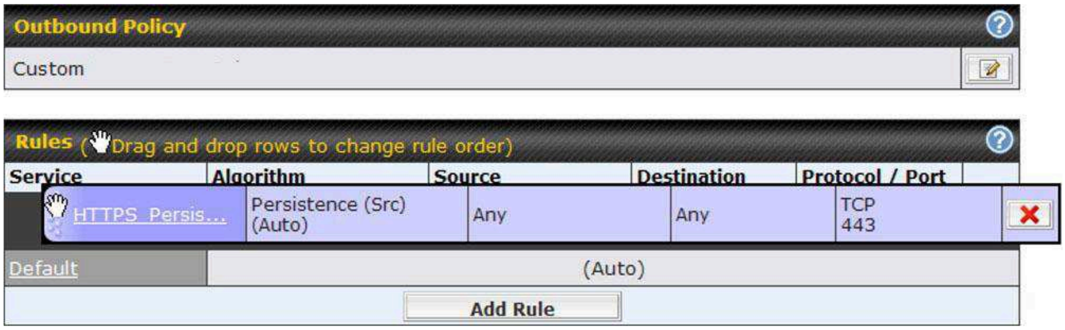


New Custom Rule	
Service Name *	
Enable	☑
Source	Any
Destination	IP Network Mask : 255.255.255.0 (/24)
Protocol	Any ← :: Protocol Selection Tool ::
Algorithm	Weighted Balance
Load Distribution Weight	WAN1 10 WAN2 10 WAN3 10 WAN4 10 WAN5 10 Mobile Internet 10
Terminate Sessions on Link Recovery	☐ Enable

http://youtu.be/rKH4AS_bQnE

14.2 Custom Rules for Outbound Policy

Click ✎ in the **Outbound Policy** form.Choose **Custom** and press the **Save**button.The followingscreen will then be displayed:



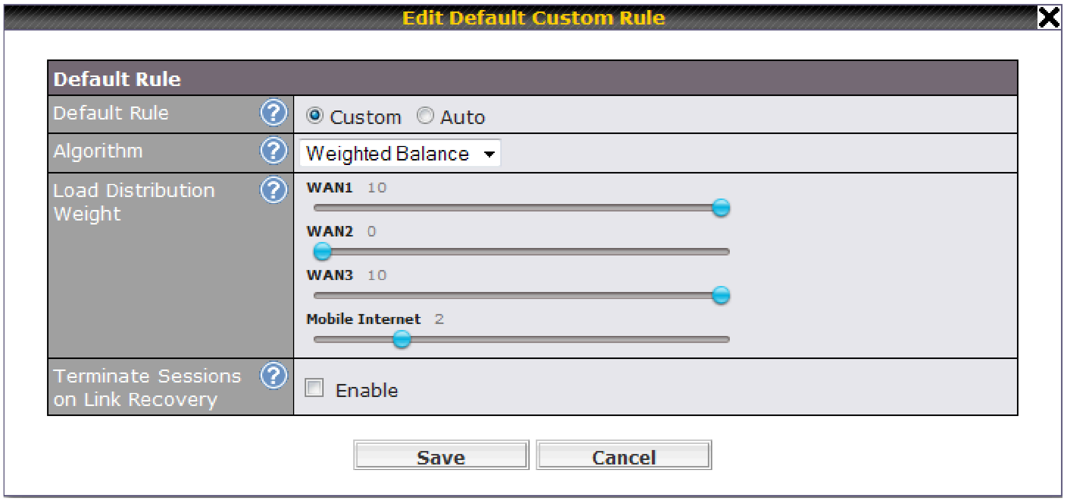
Outbound Policy

Custom

Rules (Drag and drop rows to change rule order)

Service	Algorithm	Source	Destination	Protocol / Port
HTTPS_Persis...	Persistence (Src) (Auto)	Any	Any	TCP 443
Default	(Auto)			

The bottom-most rule is **Default**. Edit this rule to change the device's default manner ofcontrolling outbound traffic for all connections that donot match any of the rules above it. Under the **Service** he—ading,**Default**to change thesesettings. To rearrange the priority of outbound rules, drag and drop them into the desired sequence.



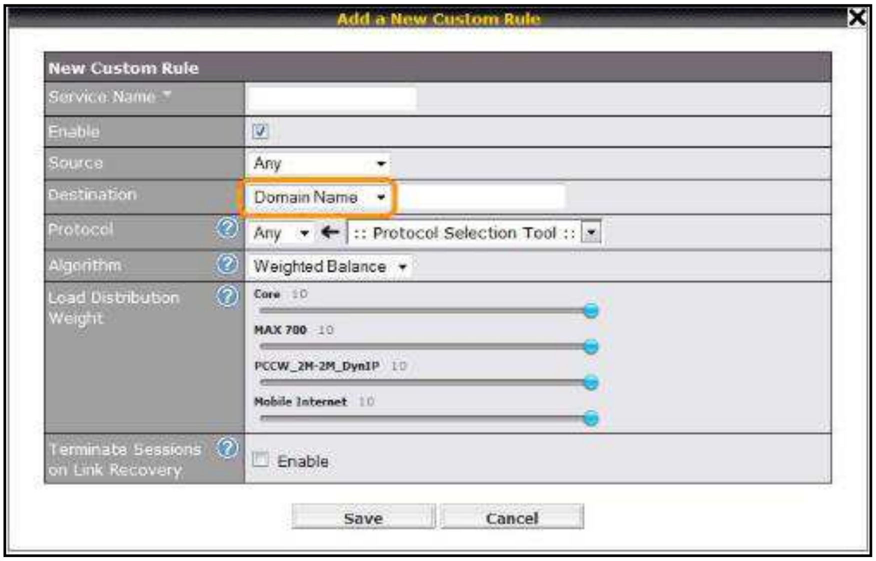
Edit Default Custom Rule

Default Rule

Default Rule	● Custom ○ Auto
Algorithm	Weighted Balance
Load Distribution Weight	WAN1 10 WAN2 0 WAN3 10 Mobile Internet 2
Terminate Sessions on Link Recovery	□ Enable

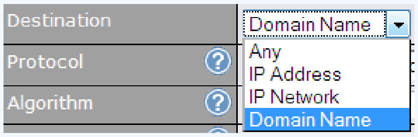
By default, **Auto** is selected for as the**Default Rule**.You can select **Custom** to change the algorithm to be used. Please refer to the upcoming sections for the details onthe available algorithms.

To create a custom rule, click **Add Rule** at the bottom of the table.The following window will be displayed:



Add a New Custom Rule

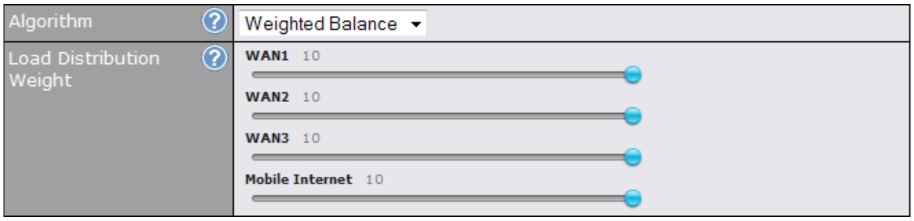
New Custom Rule	
Service Name *	
Enable	☑
Source	Any
Destination	Domain Name
Protocol	Any ← :: Protocol Selection Tool ::
Algorithm	Weighted Balance
Load Distribution Weight	Core 10 MAX 700 10 PCCW_2M-2M_DynIP 10 Mobile Internet 10
Terminate Sessions on Link Recovery	□ Enable

New Custom Rule Settings	
Service Name	This setting specifies the name of the outbound traffic rule.
Enable	This setting specifies whether the outbound traffic rule takes effect.When **Enable** is checked, the rule takes effect: traffic is matched and actions are takenby the Peplink Balance based on the other parameters of the rule.When Enable is unchecked, the rule does not take effect: the PeplinkBalance disregards the other parameters of the rule.
Source	This setting specifies the source IP address, IP network, or MAC address for traffic that matches the rule.
Destination	This setting specifies the destination IP address, IP network, or domain name for traffic that matches the rule.  Destination: Domain Name If **Domain Name** is chosen and a domain name, such as foobar.com, is entered, any outgoing accesses to *foobar.com* and **.foobar.com* will match this criterion. You may enter a wildcard (.*) at the end of a domain name to match any host with a name having the domain name in the middle. If you enter *foobar.*,* for example, *www.foobar.com*, *www.foobar.co.jp*, or *foobar.co.uk* will also match. Placing wildcards in any other position is not supported. NOTE: if a server has one Internet IP address and multiple server names, and if one of the names is defined here, accesses to any one of the server names will also match this rule.
Protocol and Port	This setting specifies the IP protocol and port of traffic that matches this rule. You may select common protocols from the **Protocol Selection Tool** drop-down menu.

Algorithm	This setting specifies the behavior of the Peplink Balance for the custom rule. One of the following values can be selected: • Weighted Balance • Persistence • Enforced • Priority • Overflow • Least Used (not applicable to Balance 20/30/30 LTE) • Lowest Latency (not applicable to Balance 20/30/30 LTE) The upcoming sections detail the listed algorithms.
Terminate Sessions on Link Recovery	This setting specifies whether to terminate existing IP sessions on a less preferred WAN connection in the event that a more preferred WAN connection is recovered. This setting is applicable to the**Weighted,Persistence**, and **Priority** algorithms. By default, this setting is disabled. In this case, existing IP sessions will not be terminated or affected when any other WAN connection is recovered.When this setting is enabled, existing IP sessions may be terminated when another WAN connection is recovered, such that only the preferred healthy WAN connection(s) isused at any point in time.

14.2.1 Algorithm: Weighted Balance

This setting specifies the ratio of WAN connection usage to be applied on the specified IP protocol andport. This setting is applicable only when **Algorithm** is set to **Weighted Balance**.



Algorithm	Weighted Balance
Load Distribution Weight	WAN1 10 WAN2 10 WAN3 10 Mobile Internet 10

The amount of matching traffic that is distributed to a WAN connection is proportional to the weight of theWAN connection relative to the total weight.Use the sliders to change each WAN's weight.

For example, with the following weight settings on a Peplink Balance 310:

- WAN1: 10
- WAN2: 10
- WAN3: 5

Total weight is 25 = (10 + 10 + 5)

Matching traffic distributed to WAN1 is 40% = (10 / 25) x 100%
Matching traffic distributed to WAN2 is 40% = (10 / 25) x 100%
Matching traffic distributed to WAN3 is 20% = (5 / 25) x 100%

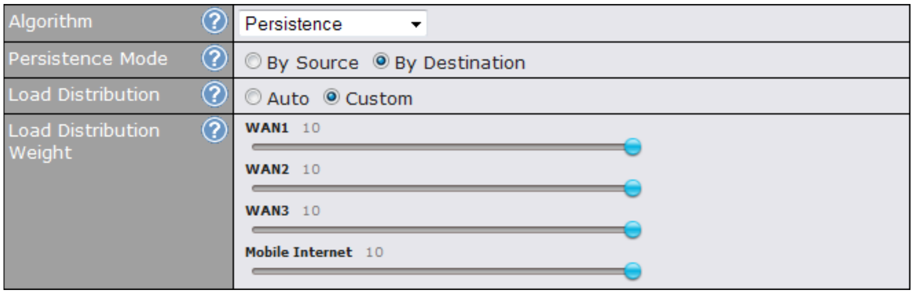
14.2.2 Algorithm: Persistence

The configuration of persistent services is the solution to the few situations where link load distribution for Internet services is undesirable. For example, for security reasons, many e-banking and other secure websitesterminate the session when the client computer's Internet IP address changes mid-session.

In general, different Internet IP addresses represent different computers. The security concern is that an IP address change during a session may be the result of an unauthorized intrusion attempt. Therefore, to prevent damages from the potential intrusion, the session is terminated upon the detection of an IP address change.

The Peplink Balance can be configured to distribute data traffic across multiple WAN connections. Also, the Internet IP depends on the WAN connections over which communication actually takes place. As a result, a LAN client computer behind the Peplink Balance may communicate using multiple Internet IP addresses. For example, a LAN client computer behind a Peplink Balance 310 with three WAN connections may communicate on the Internet using three different IP addresses.

With the Persistency feature of PeplinkBalance, rules can be configured to enable client computers to persistently utilize the same WAN connections for e-banking and other secure websites. As a result, a client computer will communicate using one IP address, eliminating the issues mentioned above.



Algorithm	Persistence
Persistence Mode	○ By Source ● By Destination
Load Distribution	○ Auto ● Custom
Load Distribution Weight	WAN1 10 WAN2 10 WAN3 10 Mobile Internet 10

There are two persistent modes:By **Source**and**By Destination**.

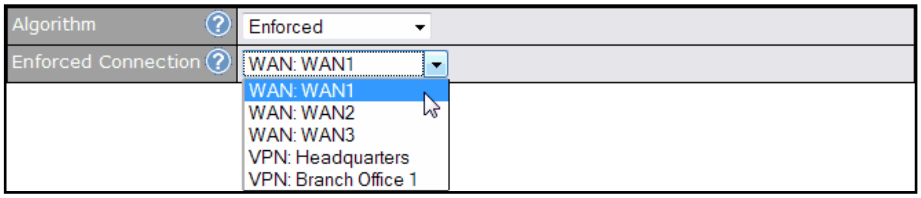
By Source:	The same WAN connection will be used for traffic matching the rule and originating from the same machine, regardless of its destination. This option will provide the highest level of application compatibility.
By Destination:	The same WAN connection will be used for traffic matching the rule, originating from the same machine, and going to the same destination. This option can better distribute loads to WAN connections when there are only a few client machines.

The default mode is **By Source**.

When there are multiple client requests, they can be distributed (persistently) to WAN connections with a weight. If you choose **Auto**in **Load Distribution**, the weights will be automatically adjusted according to each WAN's **DownloadBandwidth**, which is specified in the WAN Settings page (see section**Configuring the WAN Interface(s)**). If you choose**Custom**, you can customize the weight of each WAN manually using the provided sliders.

14.2.3 Algorithm: Enforced

This setting specifies the WAN connection usage to be applied on the specified IP protocol andport. This setting is applicable only when**Algorithm** is set to**Enforced**.



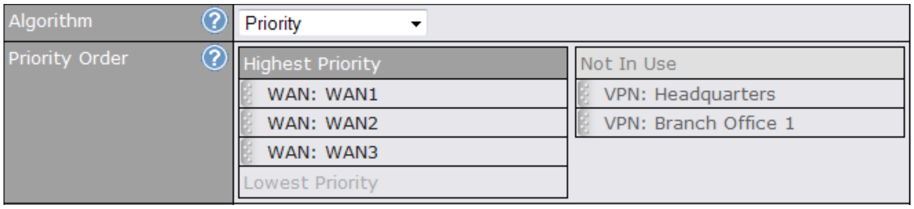
Algorithm	Enforced
Enforced Connection	WAN: WAN1

Matching traffic will be routed through the specified WAN connection, regardless of the health check status of the WAN connection.

Starting fromFirmware 5.2, outbound traffic can be enforced to go through a specifiedSpeedFusion^{TM} connection. **(Available onthe Peplink Balance 210+)**

14.2.4 Algorithm: Priority

This setting specifies the priority of the WAN connections used to route the specified network service. The highest priority WAN connection available will always be used for routing the specified type of traffic. A lower priority WAN connection will be used only when all higher priority connections have become unavailable.



Algorithm: Priority

Priority Order:

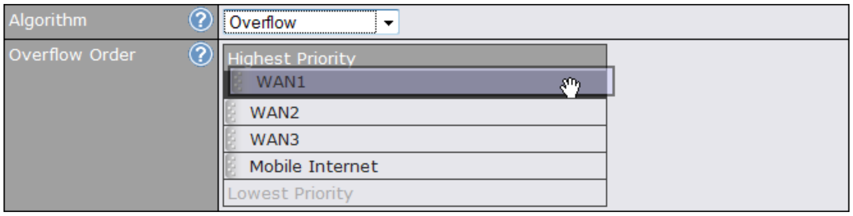
Highest Priority	Not In Use
WAN: WAN1	VPN: Headquarters
WAN: WAN2	VPN: Branch Office 1
WAN: WAN3	
Lowest Priority	

Starting from Firmware 5.2, outbound traffic can be prioritized to go through SpeedFusion^{TM}connection(s). By default, VPN connections are not included in the priority list. **(Available on the Peplink Balance 210+)**

Tip
Configure multiple distribution rules to accommodate different kinds of services.

14.2.5 Algorithm: Overflow

The traffic matching this rule will be routed through the healthy WAN connection that has the highest priority and is not in full load. When this connection gets saturated, new sessions will be routed to the next healthy WAN connection that is not in full load.



Algorithm: Overflow

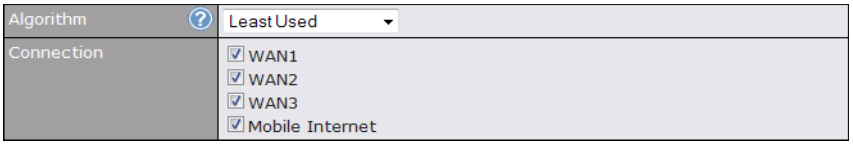
Overflow Order:

Highest Priority
WAN1
WAN2
WAN3
Mobile Internet
Lowest Priority

Drag and drop to specify the order of WAN connections to be used for routing traffic. Only the highest priority healthy connection that is not in full load will be used.

14.2.6 Algorithm: Least Used

(Available onthe Peplink Balance 210+)



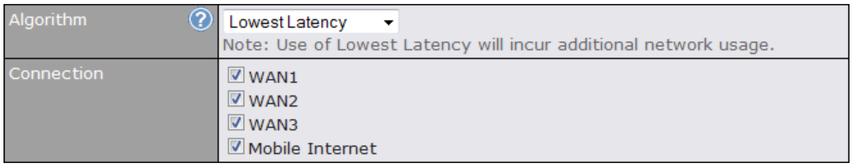
Algorithm: Least Used

Connection:
☑ WAN1
☑ WAN2
☑ WAN3
☑ Mobile Internet

The traffic matching this rule will be routed through the healthy WAN connection that is selected in **Connection**and has the most available download bandwidth. The available download bandwidth of a WAN connection is calculated from the total download bandwidth specified on the WAN Settings page and the current download usage. The available bandwidth and WAN selection is determined every time an IP session is made.

14.2.7 Algorithm: Lowest Latency

(Available onthe Peplink Balance 210+)



Algorithm	Lowest Latency Note: Use of Lowest Latency will incur additional network usage.
Connection	☑ WAN1 ☑ WAN2 ☑ WAN3 ☑ Mobile Internet

The traffic matching this rule will be routed through the healthy WAN connection that is selected in **Connection** and has the lowest latency. Latency checking packets are issued periodically to a nearby router of each WAN connection to determine its latency value. The latency of a WAN is the packet round trip time of the WAN connection. Additional network usage may be incurred as a result.

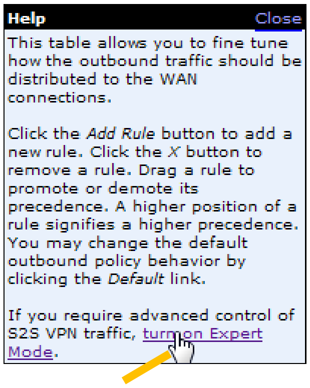
Tip

The round trip time of a 6M down /640k uplinkcan be higher than that of a 2M down /2M up linkbecause the overall round trip time is lengthened by its slowerupload bandwidth, despite its higher downlink speed.Therefore, this algorithm isgood for two scenarios:

- All WAN connections are symmetric; or
- A latency sensitive application must be routed through the lowestlatency WAN,regardless the WAN's available bandwidth.

14.2.8 Expert Mode

Expert Mode is available for advanced users.To enable the feature, click on the help icon and click **turn on Expert Mode**.



Help Close

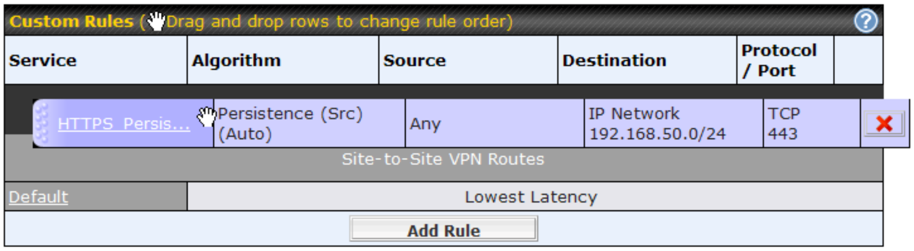
This table allows you to fine tune how the outbound traffic should be distributed to the WAN connections.

Click the *Add Rule* button to add a new rule. Click the *X* button to remove a rule. Drag a rule to promote or demote its precedence. A higher position of a rule signifies a higher precedence. You may change the default outbound policy behavior by clicking the *Default* link.

If you require advanced control of S2S VPN traffic, turn on Expert Mode.

InExpert Mode, a new special rule,**SpeedFusion^{TM} Routes**, is displayed inthe **Custom Rules** table.This rule represents all SpeedFusion^{TM} routes learned from remote VPN peers. By default, this bar is on the top of all custom rules. This position means that traffic for remote VPN subnets will be routed to thecorresponding VPN peer. You can create custom **Priority** or **Enforced** rules and move them above the bar to override the SpeedFusion^{TM}routes.

Upon disabling Expert Mode, all rules above the bar will be removed.



Custom Rules (Drag and drop rows to change rule order)

Service	Algorithm	Source	Destination	Protocol / Port	
HTTPS_Persis...	Persistence (Src) (Auto)	Any	IP Network 192.168.50.0/24	TCP 443	✗
Site-to-Site VPN Routes					
Default	Lowest Latency				

15 Inbound Access

Inbound access is also known as inbound port address translation. On NAT WAN connection, all inbound traffic to the server behind the Peplink unit requires inbound access rules.

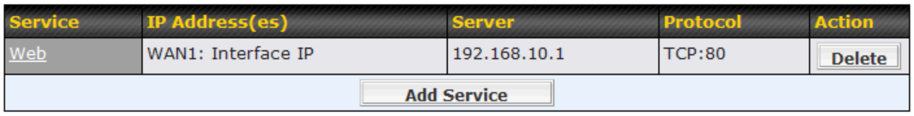
By the custom definition of servers and services for inbound access,Internet users can access the servers behind PeplinkBalance. Advanced configurations allow inbound access to be distributed among multiple servers on the LAN.

Important Note
Inbound access applies only to WAN connections that operate inNAT mode. For WAN connections that operate inDrop-in mode or IP forwarding, inbound traffic is forwarded to the LAN by default.

15.1 Definition of Port Forwarding

(Available onthe Peplink Balance 20/30/30 LTE)

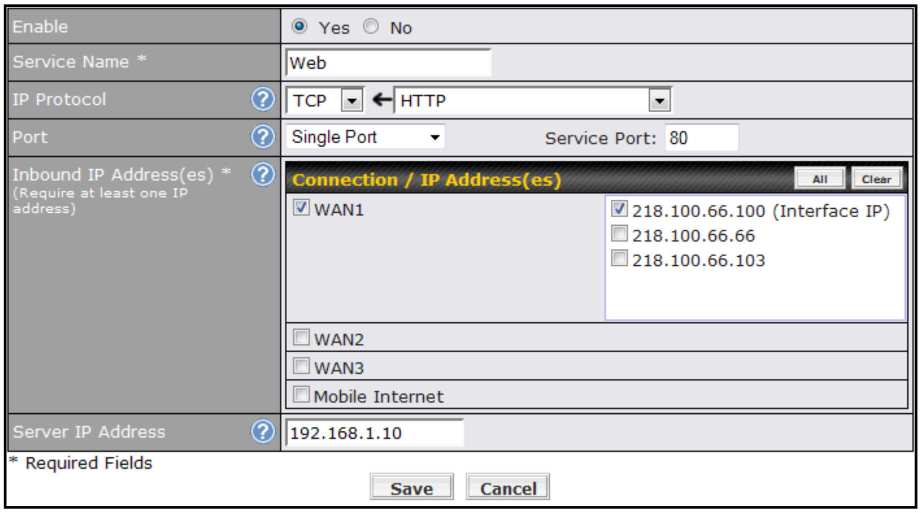
Inbound port forwarding rules are defined at***Network > Inbound Access >Port Forwarding***.



Service	IP Address(es)	Server	Protocol	Action
Web	WAN1: Interface IP	192.168.10.1	TCP:80	Delete

Add Service

To define a new service, click the **Add Service** button Add Service .The followingscreen is displayed:

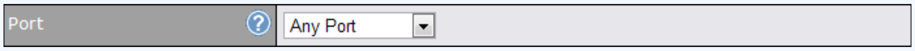
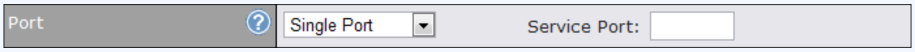
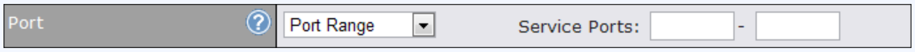
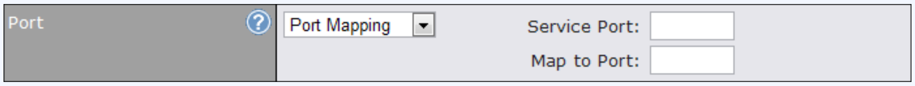
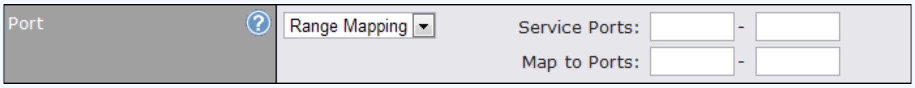


Enable	● Yes ○ No
Service Name *	Web
IP Protocol	TCP ← HTTP
Port	Single Port Service Port: 80
Inbound IP Address(es) * (Require at least one IP address)	Connection / IP Address(es) All Clear ☑ WAN1: ☑ 218.100.66.100 (Interface IP), □ 218.100.66.66, □ 218.100.66.103 □ WAN2 □ WAN3 □ Mobile Internet
Server IP Address	192.168.1.10

* Required Fields

Save Cancel

Port Forwarding Settings	
Enable	This setting specifies whether the inbound service takes effect.When Enable is checked, the inbound service takes effect: traffic is matched and actions are taken by the Peplink Balance based on the other parameters of the rule.When this setting is disabled, the inbound service does not take effect: the Peplink Balance disregards the other parameters of the rule.
Service Name	This setting identifies the service to the system administrator.Valid values for this setting consist of only alphanumeric and underscore "_" characters.

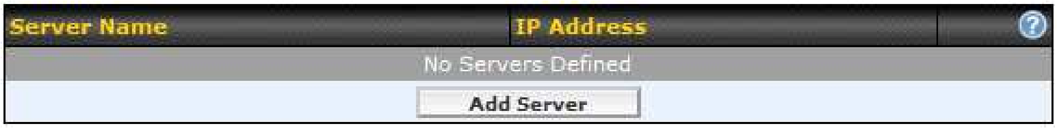
IP Protocol	The **IP Protocol** setting, along with the **Port** setting, specifies the protocol of the service as TCP, UDP, ICMP, or IP.Traffic that is received by the Peplink Balance via the specified protocol at the specified port(s) is forwarded to the LAN hosts specified by the **Servers** setting. Please seebelow for details on the **Port** and **Servers** settings. Alternatively, the **Protocol Selection Tool** drop-down menu can be used to automatically fill in the protocol and a single port number of common Internet services (e.g. HTTP, HTTPS, etc.) After selecting an item from the **Protocol Selection Tool** drop-down menu, the protocol and port number remain manually modifiable.
Port	The **Port** setting specifies the port(s) that correspond to the service, and can be configured to behave in one of the following manners: **Any Port, Single Port, Port Range, Port Map**, and **Range Mapping**  Port: Any Port **Any Port**: all traffic that is received by the Peplink Balance via the specified protocol is forwarded to the servers specified by the **Servers** setting. For example, with **IP Protocol** set to **TCP**, and **Port** set to **Any Port**, all TCP traffic is forwarded to the configured servers.  Port: Single Port Service Port: **Single Port**: traffic that is received by the Peplink Balance via the specified protocol at the specified port is forwarded via the same port to the servers specified by the **Servers** setting. For example, with **IP Protocol** set to **TCP**, and **Port** set to **Single Port** and **Service Port** 80, TCP traffic received on port 80 is forwarded to the configured servers via port 80.  Port: Port Range Service Ports: - **Port Range**: traffic that is received by the Peplink Balance via the specified protocol at the specified port range is forwarded via the same respective ports to the LAN hosts specified by the **Servers** setting. For example, with **IP Protocol** set to **TCP**, and **Port** set to **Port Range** and **Service Ports** 80-88, TCP traffic received on ports 80 through 88 is forwarded to the configured servers via the respective ports.  Port: Port Mapping Service Port: Map to Port: **Port Mapping**: traffic that is received by Peplink Balance via the specified protocol at the specified port is forwarded via a different port to the servers specified by the Servers setting. For example, with IP Protocol set to **TCP**, and Port set to **Port Mapping**, **Service Port** 80, and **Map to Port** 88, TCP traffic on Port 80 is forwarded to the configured servers via Port 88. (Please see below for details on the Servers setting.)  Port: Range Mapping Service Ports: - Map to Ports: - **Range Mapping**: traffic that is received by the Peplink Balance via the specified protocol at the specified port range is forwarded via a different port to the servers specified by the **Servers** setting.
Inbound IP Address(es)	This setting specifies the WAN connections and Internet IP address(es) from which the service can be accessed.
Server IP Address	This setting specifies the LAN IP address of the server that handles the requests for the service.

15.2 Definition of Servers on LAN

(Available onthe Peplink Balance 210+)

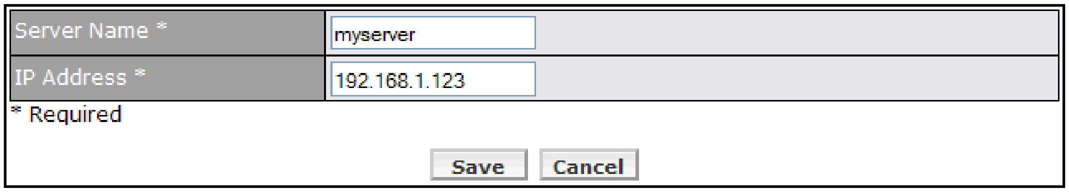
The settings to configure servers on the LAN are located at ***Network> Inbound Access > Servers***.

Inbound connections from the Internet will be forwarded to the specified Inbound IP address(es) based on the protocol and port number.When more than one server is defined, requests will be distributed to the servers in the weight ratio specified for each server.



Server Name	IP Address	
No Servers Defined		

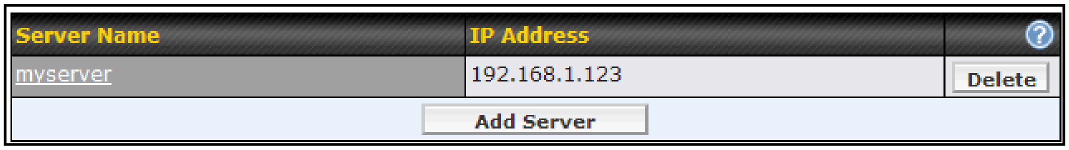
To define a new server, click **Add Server**, which displays the following screen:



Server Name *	myserver
IP Address *	192.168.1.123

* Required

Enter a valid server name and its corresponding LAN IP address.Upon clicking**Save**after entering required information, the following screen appears.



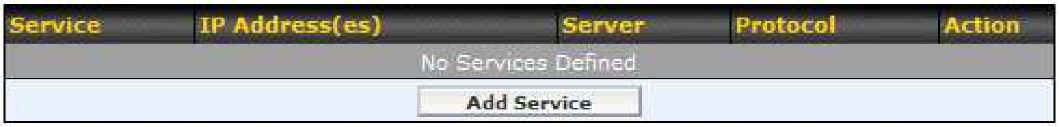
Server Name	IP Address	
myserver	192.168.1.123	Delete

To define additional servers, click **Add Server**and repeat the above steps.

15.3 Inbound Access Services

15.3.1 Definition of Services

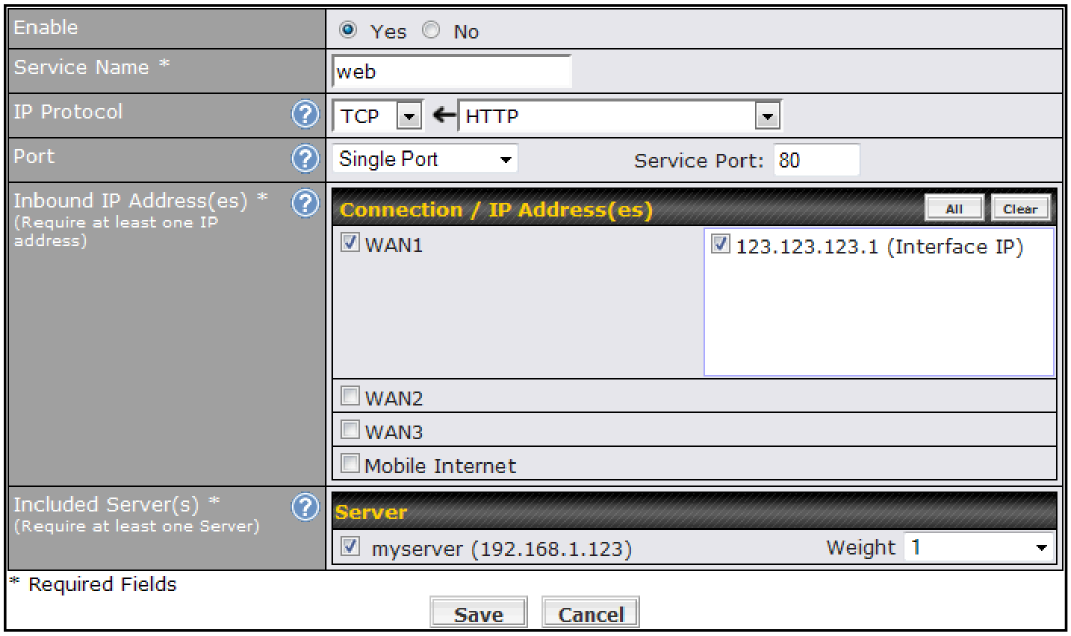
Services are defined at:***Network> Inbound Access > Services***



Service	IP Address(es)	Server	Protocol	Action
No Services Defined				

Tip
At least one server must be definedbefore services can be added.

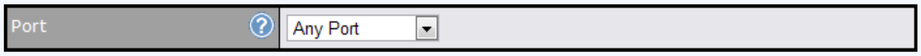
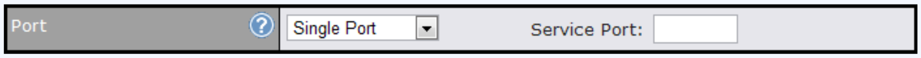
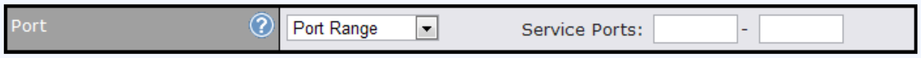
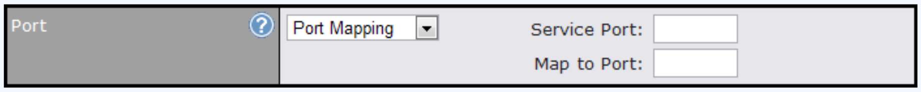
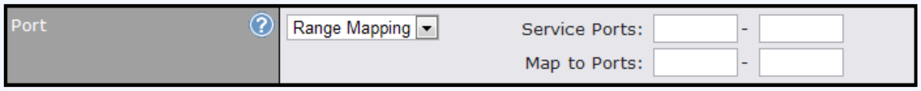
To define a new service, click the **Add Service**button, upon which the following menu appears:



Enable	● Yes ○ No
Service Name *	web
IP Protocol	TCP ← HTTP
Port	Single Port Service Port: 80
Inbound IP Address(es) * (Require at least one IP address)	Connection / IP Address(es) ☑ WAN1 ☑ 123.123.123.1 (Interface IP) ☐ WAN2 ☐ WAN3 ☐ Mobile Internet
Included Server(s) * (Require at least one Server)	Server ☑ myserver (192.168.1.123) Weight 1

* Required Fields

Services Settings	
Enable	This setting specifies whether the inbound service rule takes effect. When **Yes** is selected, the inbound service rule takes effect. If the inbound traffic matches the specified IP Protocol and Port, action will be taken by the Peplink Balance based on the other parameters of the rule. When **No** is selected, the inbound service rule does not take effect. The Peplink Balance will disregard the other parameters of the rule.
Service Name	This setting identifies the service to the System Administrator.Only alphanumeric and the underscore "_" characters are valid.
IP Protocol	The IP Protocol setting, along with the Port setting, specifies the protocol of the service as TCP, UDP, ICMP or IP.Inbound traffic that matches the specified **IP protocol** and **Port**(s) will be forwarded to the LAN hosts specified by the **Servers** setting.

	Upon choosing a protocol, the Protocol Selection Tool drop-down menu can be used to automatically the Port information of common Internet services (e.g. HTTP, HTTPS, etc.). After selecting an item from the Protocol Selection Tool drop-down menu, the Protocol and the Port number will remain manually modifiable.
Port	The Port setting specifies the port(s) that correspond to the service, and can be configured to behave in one of the following manners: **Any Port, Single Port, Port Range, Port Map and Range Mapping**  Port Any Port **Any Port**: all traffic that is received by the Peplink Balance via the specified protocol is forwarded to the servers specified by the Servers setting. For example, ifIP Protocol is set to **TCP**, and Port is set to **Any Port**, then all TCP traffic will be forwarded to the configured servers.  Port Single Port Service Port: **Single Port**: traffic that is received by the Peplink Balance via the specified protocol at the specified port is forwarded via the same port to the servers specified by the Servers setting. For example, if IP Protocol is set to **TCP**, Port is set to **Single Port,** and**Service Port**is set to 80, then TCP traffic received on Port 80 will be forwarded to the configured servers via Port 80.  Port Port Range Service Ports: - **Port Range**: traffic that is received by the Peplink Balance via the specified protocol at the specified port range is forwarded via the same respective ports to the LAN hosts specified by the Servers setting. For example, ifIP Protocol is set to **TCP**, Port is set to **Port Range,** and **Service Port**set to 80-88, then TCP traffic received on ports 80 through 88 will be forwarded to the configured servers via the respective ports.  Port Port Mapping Service Port: Map to Port: **Port Mapping**: traffic that is received by the Peplink Balance via the specified protocol at the specified port is forwarded via a different port to the servers specified by the Servers setting. For example, ifIP Protocol is set to **TCP**, Port is set to **Port Mapping**, **Service Port**is set to 80, and **Map to Port**is set to 88, then TCP traffic on Port 80 is forwarded to the configured servers via Port 88. (Please see below for details on the Servers setting.)  Port Range Mapping Service Ports: - Map to Ports: - **Range Mapping**: traffic that is received by Peplink Balance via the specified protocol at the specified port range is forwarded via a different port to the servers specified by the Servers setting.
Inbound IP Address(es)	This setting specifies the WAN connections and Internet IP address(es) from which the service can be accessed.
Included Server(s)	This setting specifies the LAN servers that handle requests for the service, and the relative weight values.The amount of traffic that is distributed to a server is proportional to the weight value assigned to the server relative to the total weight. Example: With the following weight settings on a Peplink Balance:

- demo_server_1: 10
- demo_server_2: 5

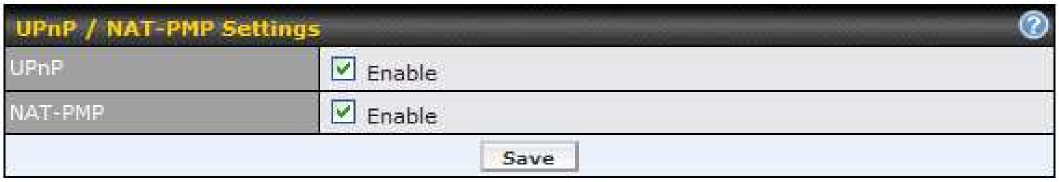
The total weight is 15 = (10 + 5)
Matching traffic distributed to demo_server_1:67% = (10 / 15) x 100%
Matching traffic distributed to demo_server_2:33% = (5 / 15) x 100%

15.3.2 UPnP / NAT-PMP Settings

UPnP and NAT-PMP are network protocols which allow a computer connected tothe LAN port to automatically configure the router to allow parties on the WAN port to connect to itself. That way, the process of inbound port forwarding becomes automated.

When a computer creates a rule using these protocols, the specified TCP/UDP port of all WAN connections' default IP address will be forwarded.

Check the corresponding box(es) to enable UPnP and/or NAT-PMP. Enable these features only if you trust the computers connected tothe LAN ports.



UPnP / NAT-PMP Settings	
UPnP	☑ Enable
NAT-PMP	☑ Enable

When the options are enabled, a table listing all the forwarded ports under these two protocols can be found at ***Status > UPnP / NAT-PMP***.

15.3.3 Definition of DNS Records

(Available on Peplink Balance 210+)

The built-in DNS Server functionality of the Peplink Balance facilitates inbound load balancing. With this functionality, NS/SOA DNS records for a domain name can be delegated to the Internet IP address(es) of the Peplink Balance. Upon receiving a DNS query, the Peplink Balance can return(as an “A” record) the IP address for the domain name on the most appropriate healthy WAN connection.It can also actas a generic DNS server for hosting “A”, “CNAME”, “MX”, “TXT” and “NS” records.

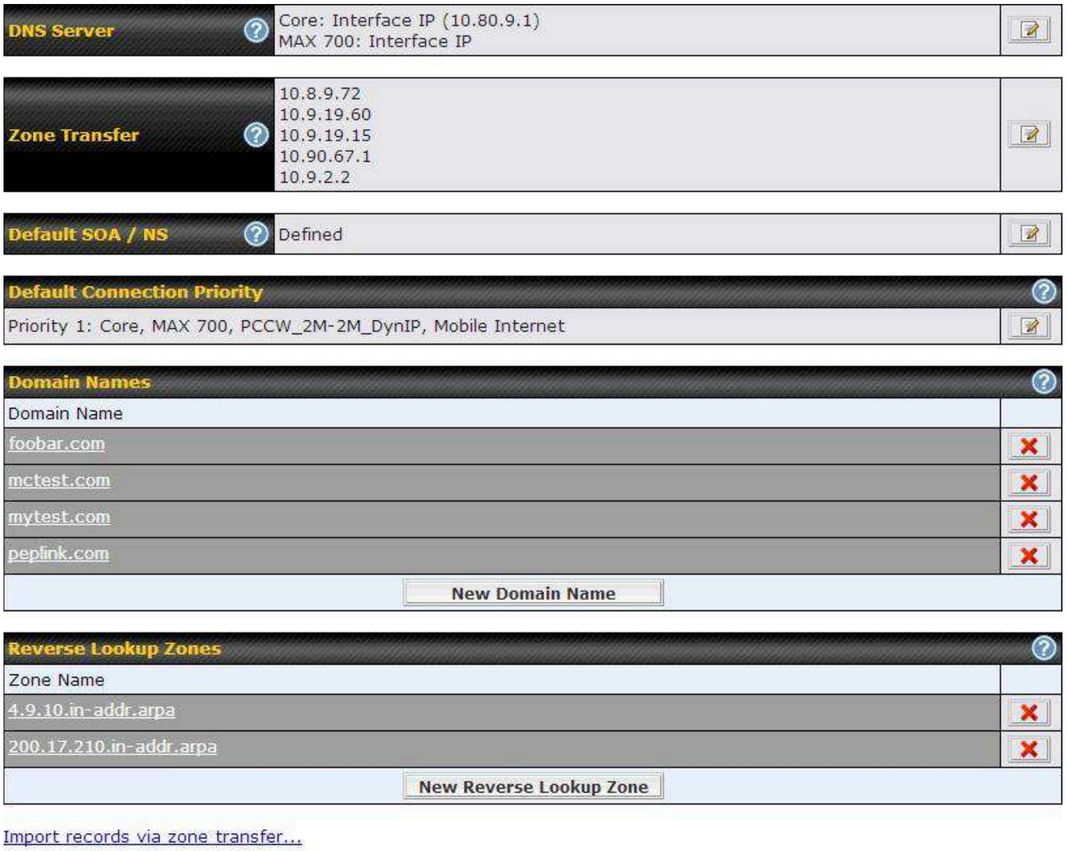
For example:

(This example is for illustration only; the actual resolution that takes place in implementation will likely be different.)

The DNS resolution of the domain namewww.mycompany.comis delegated to the WAN2 Internet IP addresses of the Peplink Balance.

Upon receiving the DNS query, the Peplink Balance returns (as an “A” record) theIP address for www.mycompany.com on WAN1 because WAN1 is the most appropriatehealthy link.

The settings for definingthe DNS records to be hosted by the Peplink Balance are located at:***Network> Inbound Access > DNS Settings***



DNS Server	Core: Interface IP (10.80.9.1) MAX 700: Interface IP
Zone Transfer	10.8.9.72 10.9.19.60 10.9.19.15 10.90.67.1 10.9.2.2
Default SOA / NS	Defined

Default Connection Priority

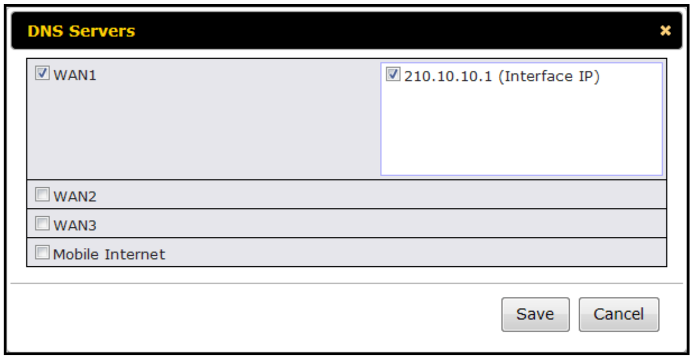
Priority 1: Core, MAX 700, PCCW_2M-2M_DynIP, Mobile Internet

Domain Names

Domain Name
foobar.com
mctest.com
mytest.com
peplink.com

Reverse Lookup Zones

Zone Name
4.9.10.in-addr.arpa
200.17.210.in-addr.arpa

DNS Settings	
DNS Server	This setting specifies the WAN IP addresses on which the DNS server of the Peplink Balance should listen. If no addressesare selected, the Inbound Link Load Balancing feature will be disabled andthe Peplink Balance will not respond to DNS requests. To specify and/or modify the IP addresses on which the DNS Server should listen, click the button that corresponds to **DNS Server**, and the following screen is displayed:  **DNS Servers** ☑ WAN1 ☑ 210.10.10.1 (Interface IP) □ WAN2 □ WAN3 □ Mobile Internet To specify the Internet IP addresses on which the DNS Server should listen, select the desiredWAN connectionthen select the desired associated IP addresses. (Multiple items in

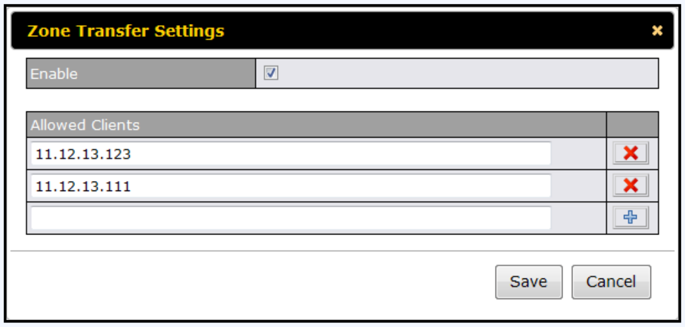
the list can be selected by holding CTRL and clicking on the items.)

Click **Save** to save the settings when configuration is complete.

Zone Transfer

This setting specifies the IP address(es) of the secondary DNS server(s)authorized to retrieve zone records from the DNS server of the Peplink Balance.

The zone transfer server of the Peplink Balance listens on TCP Port 53.



Zone Transfer Settings

Enable	☑

Allowed Clients
11.12.13.123
11.12.13.111

The Peplink Balance serves both the clients that are accessing from the specified IP addresses, and the clients that are accessing itsLAN Interface.

Default SOA / NS

Click the ✎ button to define a default SOA / NS record for all Domain Names.For Configuration details please refer to section.

Whendefining a default SOA record, the field Name Server IP Address is optional. If left blank, the Address (A) record for the same server should be defined manually in each domain.

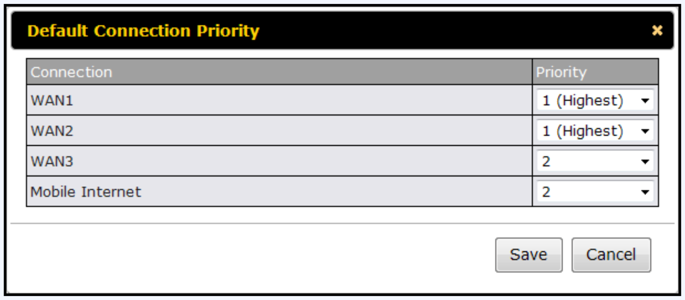
For defining default NS records, the host *[domain]* indicates that this record is for the domain name itself without a sub-domain prefix. To add a secondary NS server, just create a second NS record with the Host field left empty. When the entered Name Server is a fully qualified domain name (FQDN), the IP Address field will be disabled.

Default Connection Priority

Default Connection Priority defines the default priority group of each WAN connection in resolving A records. It applies to Address (A) records which have the Connection Priority set to **Default**. Please refer to Section for details.

The WAN connection(s) with the highest priority (smallest number) will be chosen. Those with lower priorities will not be chosen in resolving A records unless the higher priority ones become unavailable.

To specify the Primary and Backup connections, click the ✎ button that corresponds to **Default Connection Priority**.The following screen will appear:



Default Connection Priority

Connection	Priority
WAN1	1 (Highest)
WAN2	1 (Highest)
WAN3	2
Mobile Internet	2

Each WAN connection is associated with a priority number. Click **Save** to save the settings when configuration is complete.

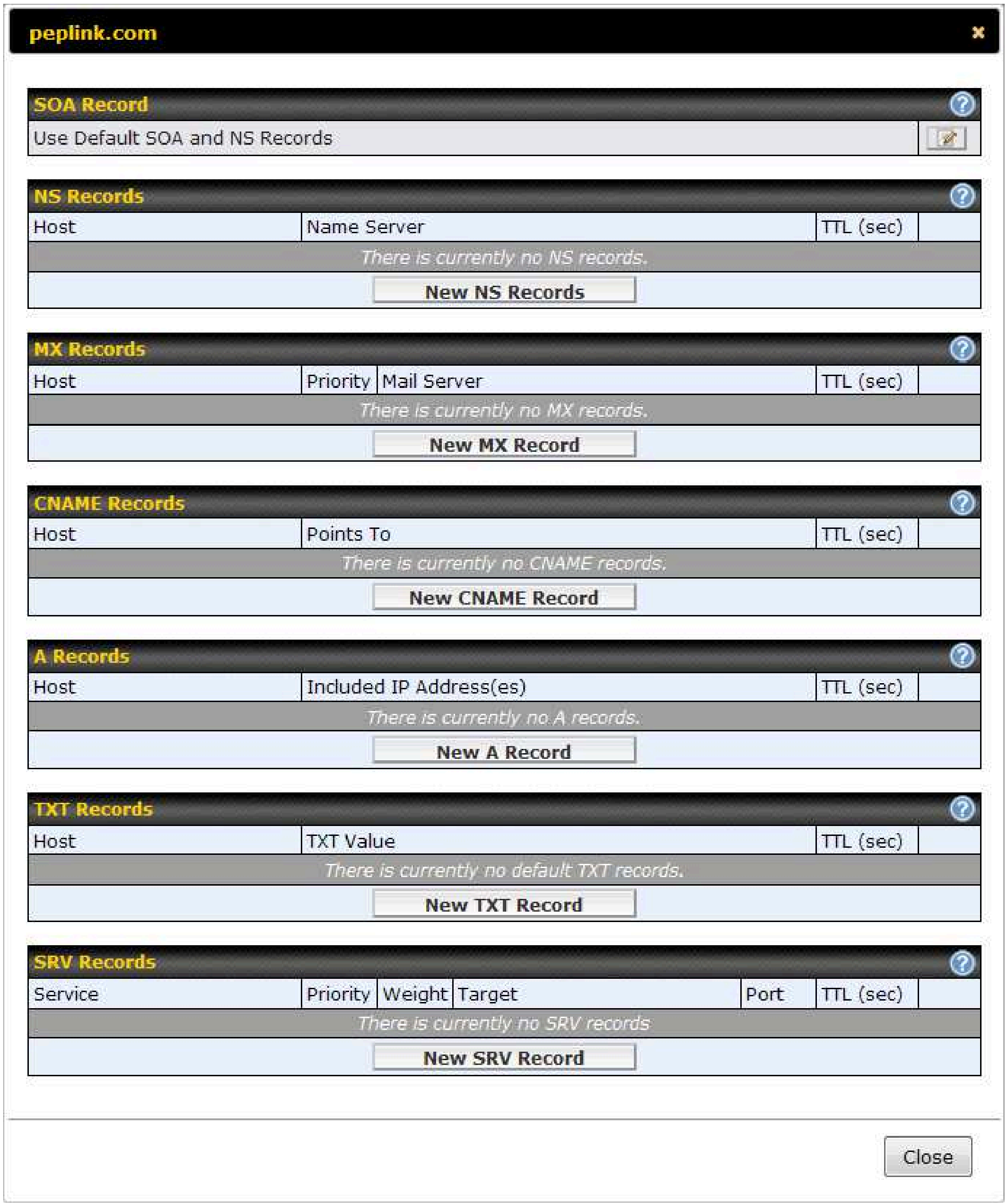
Domain name

This section shows a list of domain names to be hosted by the Peplink Balance. Each domain can have its “NS”, “MX” and “TXT” records, andits sub-domains’ “A” and

	“CNAME”records.Add a new record by clicking the **New Domain Name** button. Click on a domain name to edit. Press ☒ to remove a domain name.

15.3.4 Creating DNS Records

To create new DNS records for a domain, perform the following steps:
From ***Network> Inbound Access > DNS Settings***, click **New Domain Name**in the **Domain Name** field. Then click on the newly created domain name and the following screen will be displayed:



peplink.com

SOA Record

Use Default SOA and NS Records

NS Records

Host	Name Server	TTL (sec)
There is currently no NS records.		

New NS Records

MX Records

Host	Priority	Mail Server	TTL (sec)
There is currently no MX records.			

New MX Record

CNAME Records

Host	Points To	TTL (sec)
There is currently no CNAME records.		

New CNAME Record

A Records

Host	Included IP Address(es)	TTL (sec)
There is currently no A records.		

New A Record

TXT Records

Host	TXT Value	TTL (sec)
There is currently no default TXT records.		

New TXT Record

SRV Records

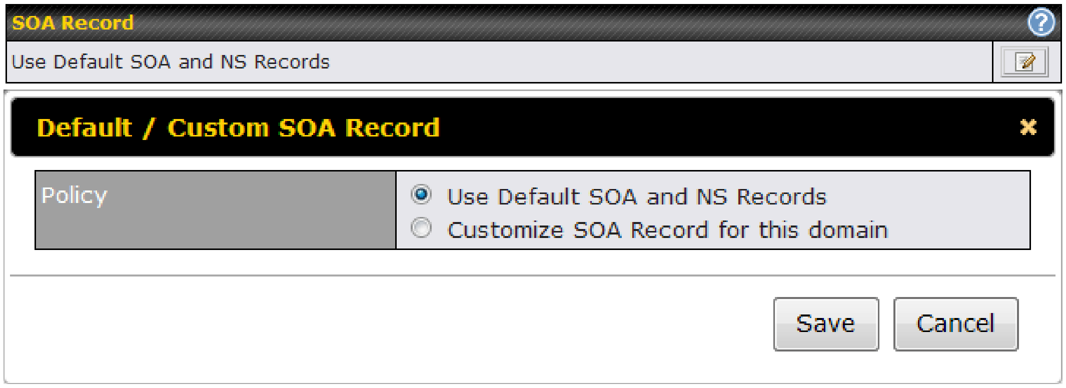
Service	Priority	Weight	Target	Port	TTL (sec)
There is currently no SRV records					

New SRV Record

Close

This page is for defining the domain’s SOA, NS, MX, CNAME, A, TXT and SRV records. Seven tables are presented in this page for defining the five types of records.

15.3.5 SOARecords



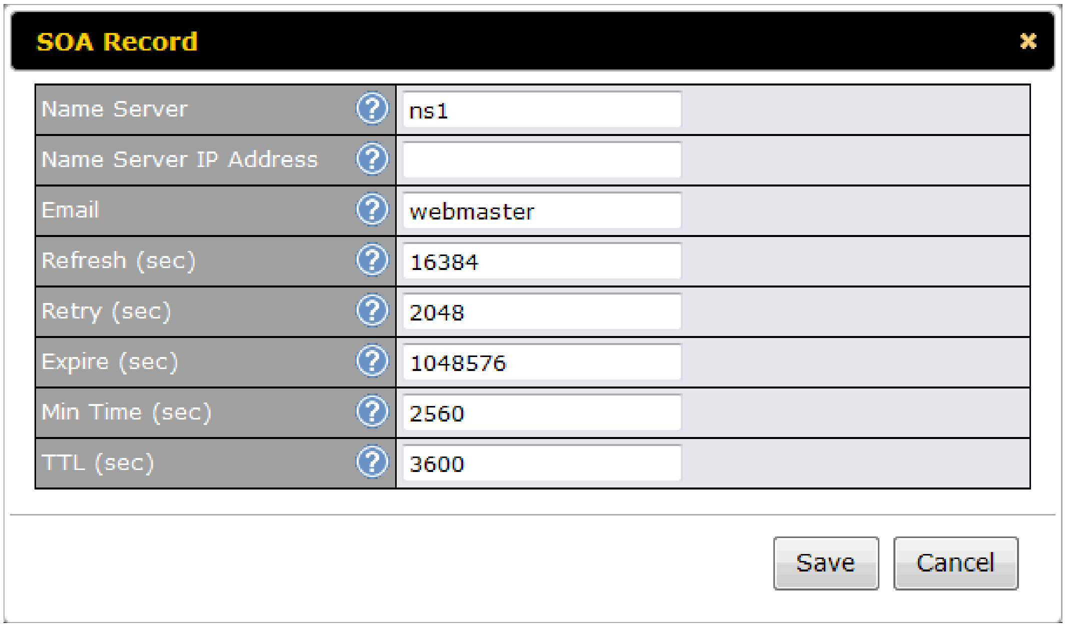
SOA Record

Use Default SOA and NS Records

Default / Custom SOA Record

Policy	● Use Default SOA and NS Records ○ Customize SOA Record for this domain

Click on the 📝 icon to choose whether to use the pre-defined Default SOA Record and NS Records. If the option **Use Default SOA and NS Records** is selected, any changes made in the Default SOA/NS Records will be applied to this domain automatically. Otherwise, select the option **Customize SOA Record** for this domain to customize this domain's SOA and NS records.



SOA Record

Name Server	ns1
Name Server IP Address	
Email	webmaster
Refresh (sec)	16384
Retry (sec)	2048
Expire (sec)	1048576
Min Time (sec)	2560
TTL (sec)	3600

This table displays the current SOA record. When the option **Customize SOA Record for this domain** is selected, you can click the link **Click here to define SOA record** to create or click on the **Name Server** field to edit the SOA record.

In the SOA record, you have to fill out the fields *Name Server, Name Server IP Address (optional), Email, Refresh, Retry, Expire, Min Time, and TTL.*

Default values are set for SOA and NS records,

- ***Name Server IP Address (optional):***This is the IP address of the authoritative name server. If the Balance is the authoritative name server of the domain, this field's value should be the WAN connection's name server IP address that is registered in the DNS registrar. If this field is entered, a corresponding A record for the name server will be created automatically. If it is left blank, the A record for the name server must be created manually.
- ***E-mail***: Defines the E-mail address of the person responsible for this zone. Note: Format should be mailbox-name.domain.com, e.g. hostmaster.example.com.
- ***Refresh***: Indicates the length of time (in seconds) when the slave will try to refresh the zone from the master.

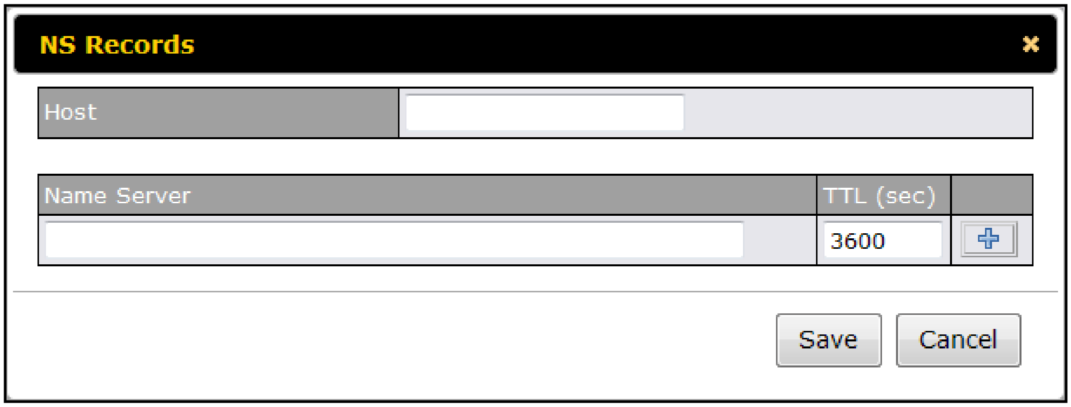
- ***Retry***: Defines the duration (in seconds)between retries if the slave (secondary) fails to contact the master and the R*efresh* (above) has expired.
- ***Expire***: Indicates the time (in seconds) when the zone data is no longer authoritative. This option applies to Slave DNS servers only.
- ***Min Time***: Is the negative caching time which defines the time (in seconds) after an error record is cached.
- ***TTL (Time-to-Live)****:* Defines the duration (in seconds) that the record may be cached.

15.3.6 NS Records

The NS Record table shows the NS servers and TTL that correspond to the domain.

The NS record of the name server defined in the SOA record is automatically added here.

To add a new NS record, click the New **NS Records**button in the **NS Records** box.Then the table will expand to look like the following:



NS Records

Host	

Name Server	TTL (sec)	
	3600	✚

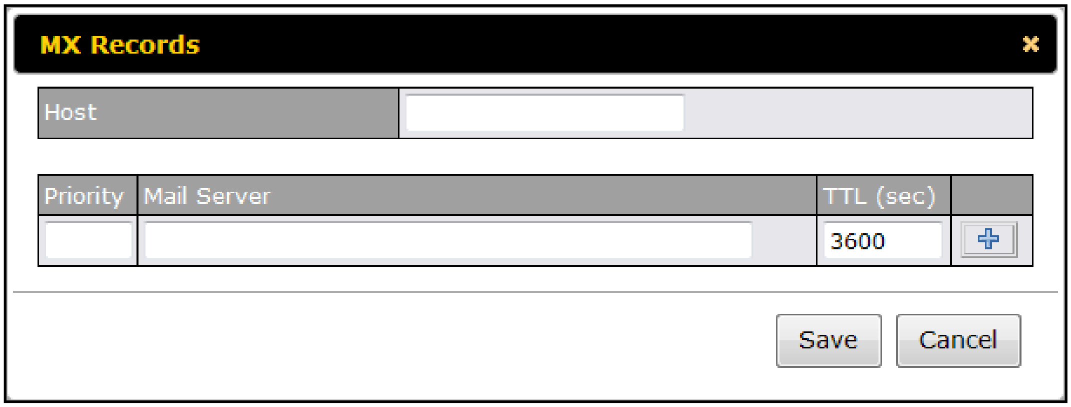
When creating an NS record for the domain itself (not a sub-domain), the **Host** field should be left blank.

Enter a name server host name and its IP address into the corresponding boxes. The host name can be a non-FQDN (fully qualified domain name) (please be sure that a corresponding A record is created). Click the ✚ button on the right to finish and to add other Name Servers.

Click the **Save** button to save your changes.

15.3.7 MX Records

The MX Record table shows the domain’s MX records.To add a newMX record, click the**New MX Records**button in the **MX Records** box. Then the table will expand to look like the following:



MX Records

Host	

Priority	Mail Server	TTL (sec)	
		3600	✚

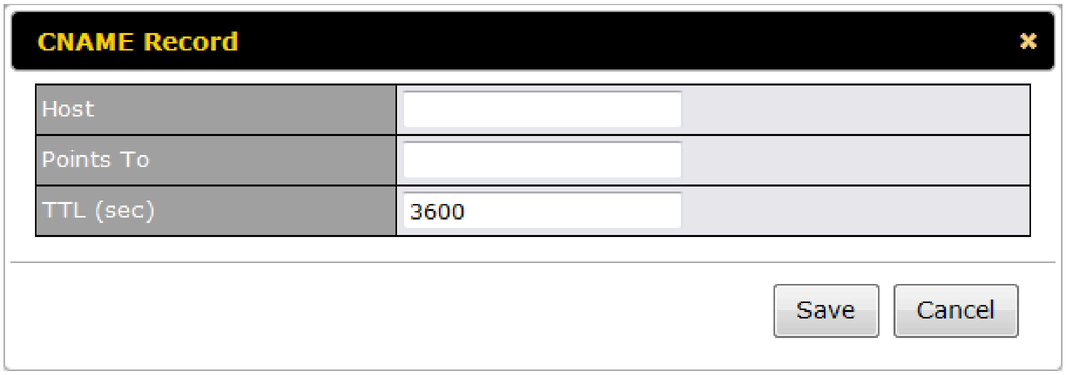
When creating an MX record for the domain itself (not a sub-domain), the **Host** field should be left blank.

For each record, ***Priority****and****Mail Server*** name must be entered.***Priority*** typically ranges from 10 to 100. Smaller numbers have a higher a priority.

After finishing adding MX records, click the ***Save*** button.

15.3.8 CNAME Records

The CNAME Record table shows the domain's CNAME records. To add a newCNAME record, click the**New CNAME Records**button in the **CNAME Record** box. Then the table will expand to look like the following:



CNAME Record

Host	
Points To	
TTL (sec)	3600

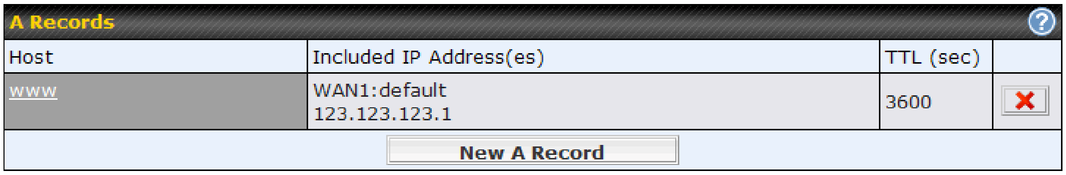
When creating a CNAME record for the domain itself (not a sub-domain), the Hostfield should be left blank.

The wildcard character "*"is supported in the ***Host*** field. The Reference of ".*domain.name*" will be returned for every name ending with ".*domain.name*" except names that have their own records.

The ***TTL*** field tells the time to live of the record in external DNS caches.

15.3.9 A Records

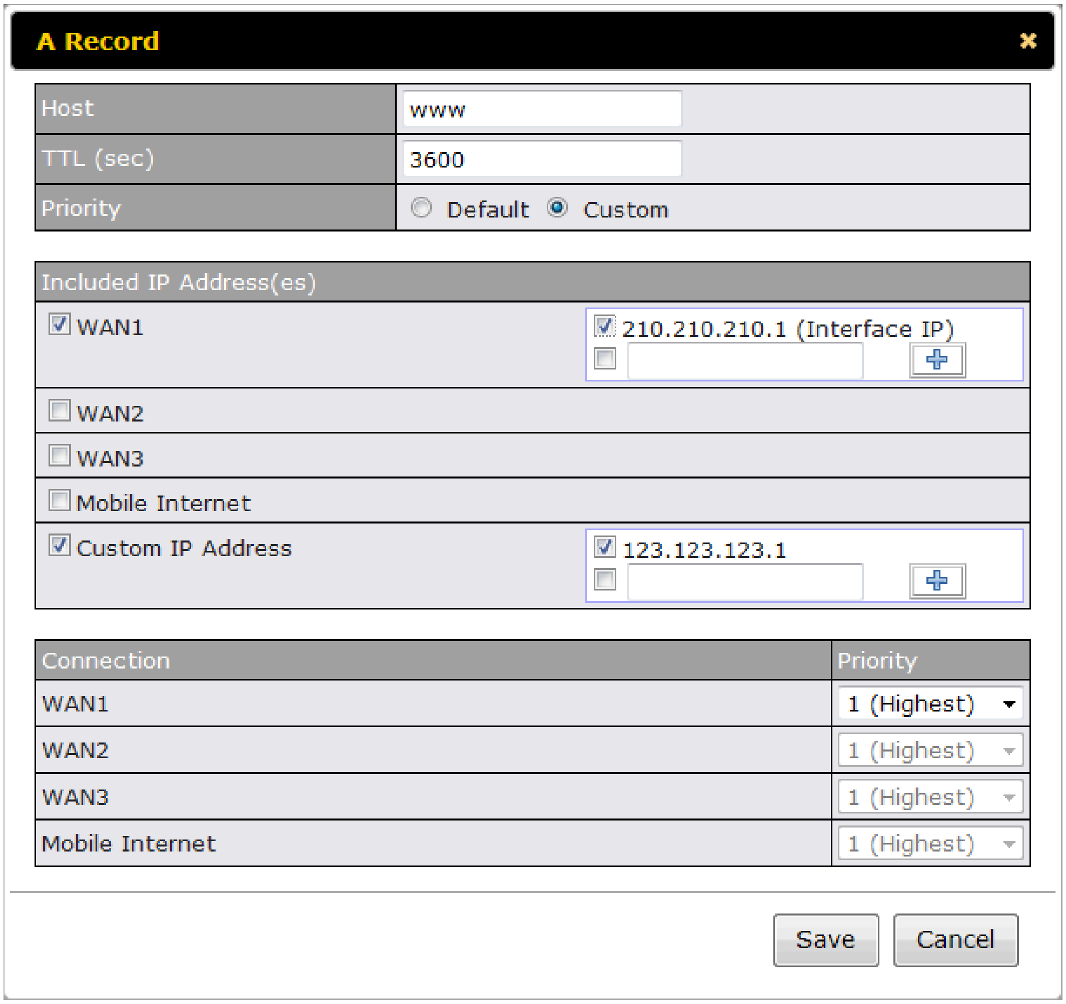
This table shows the A records of the domain name.



A Records

Host	Included IP Address(es)	TTL (sec)	
www	WAN1:default 123.123.123.1	3600	✕

To add an A record, click the **NewA Record** button. The following screen will appear:



A Record ✖

Host	www
TTL (sec)	3600
Priority	○ Default ● Custom

Included IP Address(es)	
☑ WAN1	☑ 210.210.210.1 (Interface IP) □
□ WAN2	
□ WAN3	
□ Mobile Internet	
☑ Custom IP Address	☑ 123.123.123.1 □

Connection	Priority
WAN1	1 (Highest)
WAN2	1 (Highest)
WAN3	1 (Highest)
Mobile Internet	1 (Highest)

A record may be automatically added for the SOA records with a Name Server IP Address provided.

A Record	
Host Name	This field specifies the A record of this sub-domain to be served by the Peplink Balance. The wildcard character "*" is supported. The IP addresses of "*.*domain.name*" will be returned for every name ending with ".*domain.name*" except names that have their own records.
TTL	This setting specifies the time to live of this record in external DNS caches. In order to reflect any dynamic changes on the IP addresses in case of link failure and recovery, this value should be set to a smaller value. E.g. 5 secs, 60 secs, etc.
Priority	This option specifies the priority of different connections. Select the **Default** option to apply the **Default Connection Priority** (refer to the table shown on the main DNS Settings page) to an A record. To customize priorities, choose the **Custom** option and a priority selection table will be shown at the bottom.
Included IP Address (es)	This setting specifies lists of WAN-specific Internet IP addresses that are candidates to be returned when the Peplink Balance responds to DNS queries for the domain name

	specified by Host Name. The IP addresses listed in each box as**default** are the Internet IP addresses associated with each of the WAN connections. Static IP addresses that are not associated with any WAN can be entered into the Custom IP list. A PTR record is also created for each Custom IP. For WAN connections that operate under Drop-in mode, there may be other routable IP addresses in addition to the **default** IP address.Therefore, the Peplink Balance allows custom Internet IP addresses to be added manually via filling the text box on the right-hand side and clicking the ⊞ button. Only the checked IP addresses in the listsare candidates to be returned when responding to a DNS query. If a WAN connection is down, the corresponding set of IP addresses will not be returned. However, the IP addresses in the Custom IP field will always be returned. If the Connection Priority field is set to **Custom**, you can also specify the usage priority of each WAN connection. Only selected IP address(es) of available connection(s) with the highest priority, and Custom IP addresses will be returned. By default, the Connection Priority is set to **Default**.

15.3.10 PTR Records

PTR records are created along with A records pointing to Custom IPs. Please refer to **Section** for details. For example, if you created an A record *www.mydomain.com* pointing to *11.22.33.44*, then a PTR record *44.33.22.11.in-addr.arpa* pointing to *www.mydomain.com* will also be created.

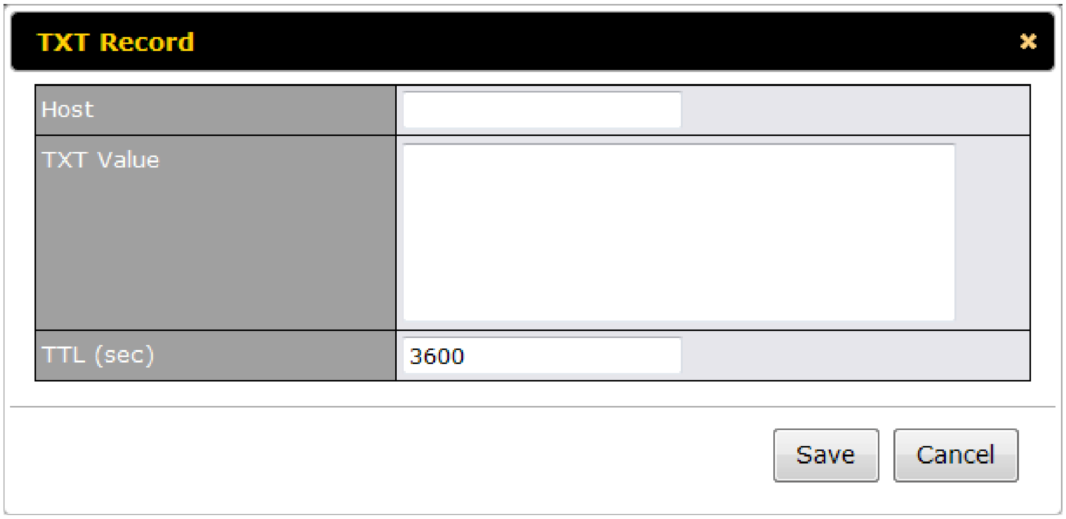
When there are multiple host names pointing to the same IP address, only one PTR record for the IP address will be created.

In order for PTR records to function, youalso need to create NS records. For example, if the IP address range *11.22.33.0* to *11.22.33.255*is delegated to the DNS server on the Peplink Balance, you will also have to create a domain *33.22.11.in-addr.arpa* and have its NS records pointing to your DNS server's (the Peplink Balance) public IP addresses.

With the above records created, the PTR record creation is complete.

15.3.11 TXT Records

This table shows the TXT record of the domain name.



TXT Record

Host	
TXT Value	
TTL (sec)	3600

To add a newTXT record, click the**New TXT Record**button in the **TXT Records** box.Click the **Edit**button to edit the record. The time-to-live value and the TXT record's value can be entered. Click the **Save** button to finish.

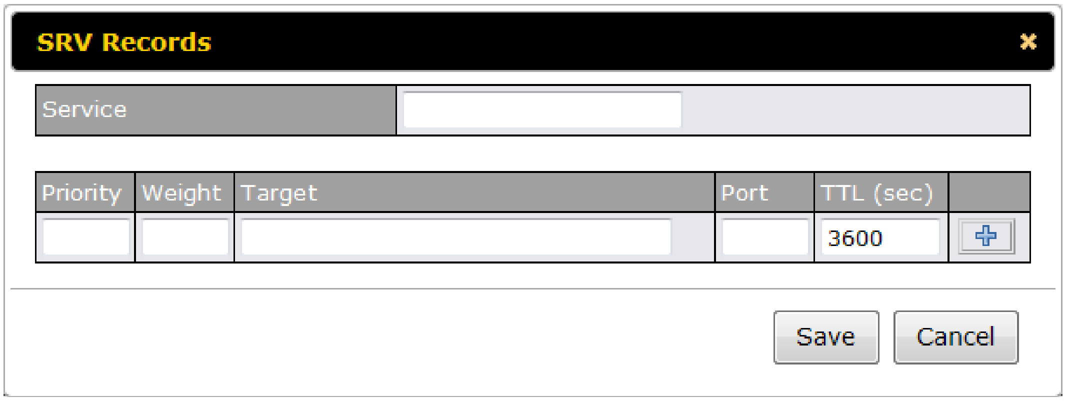
When creating a TXT record for the domain itself (not a sub-domain), the Host field should be left blank.

The maximum size of the TXT Value is 255 bytes.

After completed editing the five types of record, you can simply leave the page by going to another section of the Web Admin Interface.

15.3.12 SRV Records

To add a newSRV record, click the**New SRV Record**button in the **SRV Records** box.



SRV Records

Service	

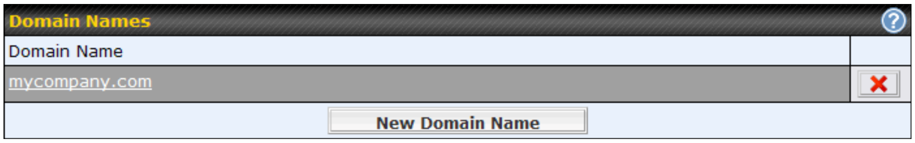
Priority	Weight	Target	Port	TTL (sec)	
				3600	➕

- ***Service***: The symbolic name of the desired service.
- ***Priority***: Indicates the priority of the Target; the smaller the value, the higher the priority.
- ***Weight***: A relative weight for records with the same priority.
- ***Target***: The canonical hostname of the machine providing the service.
- ***Port***: Enter the TCP or UDP port number on which the service is to be found.

Domain Delegation

These are the steps to follow when you host your domain at anISP or domain registrar, and want to delegate a sub-domain to be resolved and managed by the Peplink Balance.

- Click **New Domain Name** button to add a domain name.e.g.*www.mycompany.com*. Click the corresponding domain name to view and edit record details.

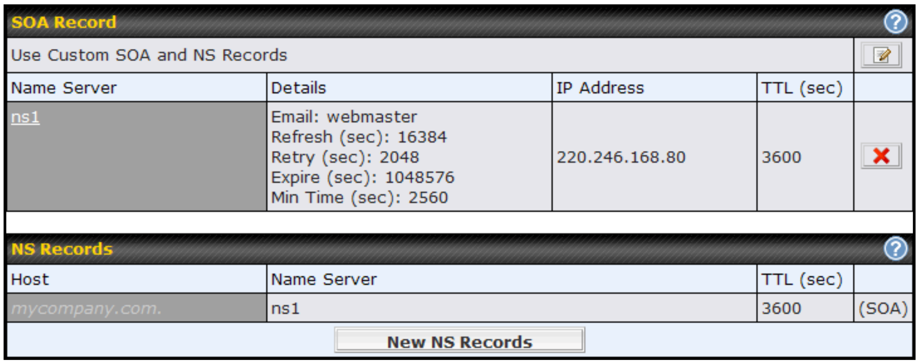


Domain Names

Domain Name	
mycompany.com	✕

New Domain Name

- Create SOA/NS records named *ns1, ns2, etc.* The IP addresses are the Balance's DNS server addresses.



SOA Record

Use Custom SOA and NS Records

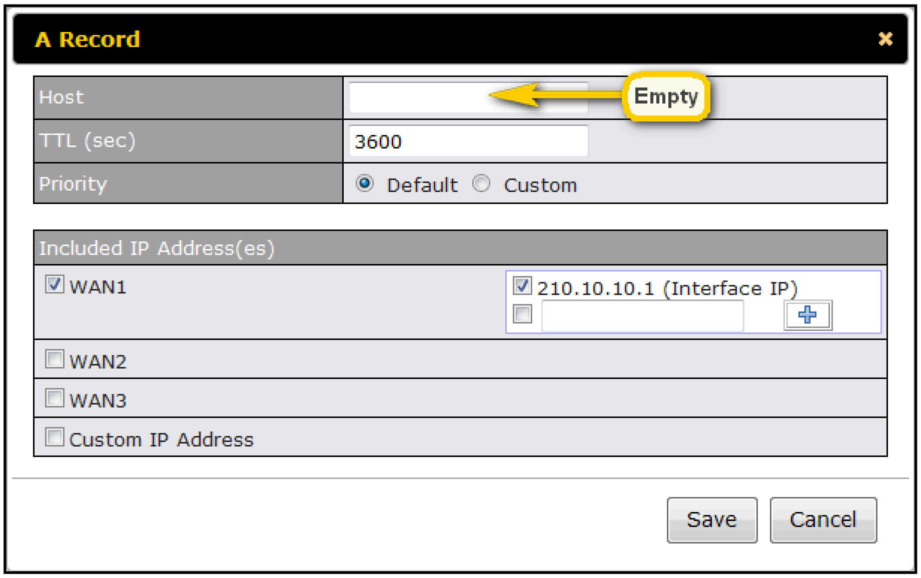
Name Server	Details	IP Address	TTL (sec)	
ns1	Email: webmaster Refresh (sec): 16384 Retry (sec): 2048 Expire (sec): 1048576 Min Time (sec): 2560	220.246.168.80	3600	✕

NS Records

Host	Name Server	TTL (sec)	
mycompany.com.	ns1	3600	(SOA)

New NS Records

- Then create an A record with an empty host name



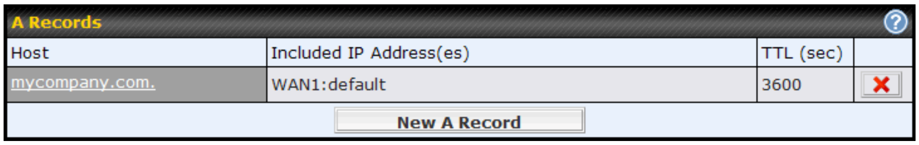
A Record

Host	
TTL (sec)	3600
Priority	● Default ○ Custom

Included IP Address(es)

☑ WAN1	☑ 210.10.10.1 (Interface IP) □
□ WAN2	
□ WAN3	
□ Custom IP Address	

Save Cancel



A Records

Host	Included IP Address(es)	TTL (sec)	
mycompany.com.	WAN1:default	3600	✕

New A Record

If ISC BIND 8 or 9 is being utilized in the zone file mycompany.com, then add the following lines:

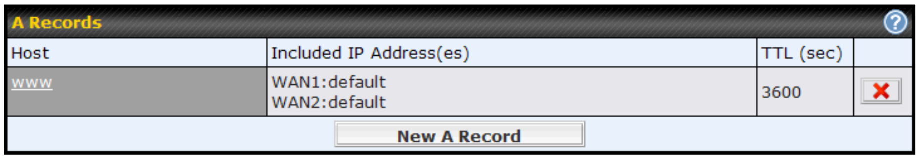
```
www             IN     NS     balancewan1
www             IN     NS     balancewan2
balancewan1     IN     A      202.153.122.108
balancewan2     IN     A      67.38.212.18
```

202.153.122.108 and 67.38.212.18 represent the WAN1 and WAN2 Internet IP addresses of the Peplink Balance, respectively. The values of the IP addresses are fictitious and for illustration only.

Hosting the complete domain at Peplink Balance

To host your own DNS server, contact the DNS registrar to have the NS records of the domain (e.g. mycompany.com) point to your Balance's WAN IP addresses. Then follow these instructions:

1. Under **Network> Inbound Access > DNS Settings**, create a new domain, for example mycompany.com.
2. Create NS records named ns1, ns2, etc. The IP addresses are the Balance's DNS server addresses (same as above).
3. Create the corresponding A, CNAME, MX and TXT records as you wish. The A record resembles the one below:



A Records

Host	Included IP Address(es)	TTL (sec)	
www	WAN1:default WAN2:default	3600	✗

Testing the DNS Configuration

The following steps can be used to test the DNS configuration:

From a host on the Internet, use an IP address of Peplink Balance and nslookupto lookup the corresponding hostname.Check the information that is returned for the expected results.

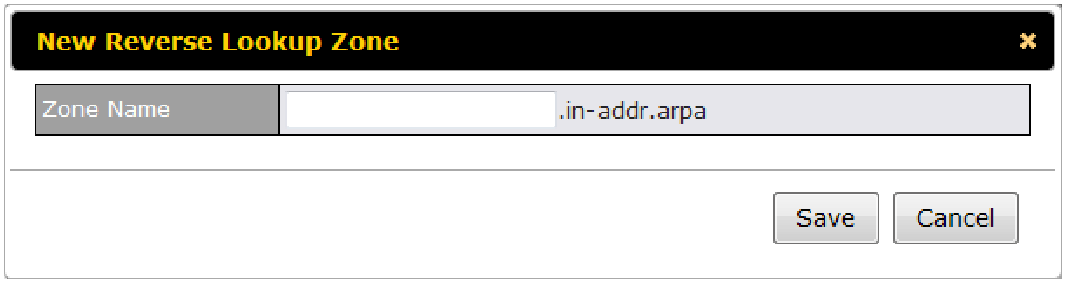
An nslookupin Windows will appear as follows:

```
C:\Documents and Settings\User Name>nslookup
Default Server:  ns1.myisp.com
Address:  147.22.11.2
>server 202.153.122.108   (This is PeplinkBalance's WAN IP address.)
Default Server:  balance.mycompany.com
Address:  202.153.122.108
>www.mycompany.com      (This is the hostname to be looked up.)
Default Server:  balance.mycompany.com
Address:  202.153.122.108
Name:    www.mycompany.com
Address:  202.153.122.109, 67.38.212.19
```

Please note that the values of the IP addresses are fictitious and for illustration only.

15.4 Reverse Lookup Zones

Reverse lookup Zones can be configured in **Network > Inbound Access > DNS Settings**.



New Reverse Lookup Zone

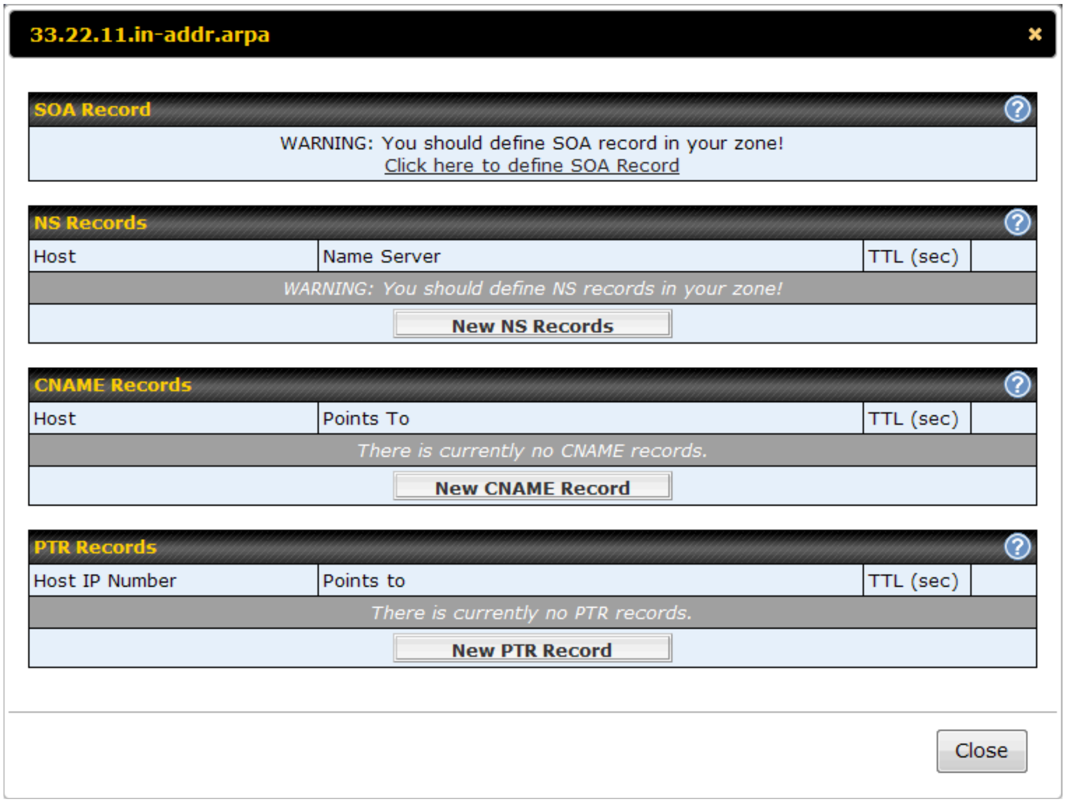
Zone Name	.in-addr.arpa

Reverse lookup refers to performing a DNS query to find one or more DNS names associated with a given IP address.

The DNS stores IP addresses in the form of specially formatted names as pointer (PTR) records using special domains/zones. The zone is in-addr.arpa.

To enable DNS clients to perform a reverse lookup for a host, perform two steps:

- Create a Reverse Lookup Zone that corresponds to the subnet network address of the host. In the Reverse Lookup Zone, add a pointer (PTR) resource record that maps the host IP address to the host name.
- Click the **New Reverse Lookup Zone** button and enter a Reverse Lookup Zone Name. If you are delegated the subnet 11.22.33.0/24, the Zone Name should be 33.22.11.in-arpa.addr.PTR records for 11.22.33.1, 11.22.33.2, ... 11.22.33.254 should be defined in this zone where the Host IP Numbers are 1, 2, ... 254 respectively.



33.22.11.in-addr.arpa

SOA Record

WARNING: You should define SOA record in your zone!
Click here to define SOA Record

NS Records

Host	Name Server	TTL (sec)	
WARNING: You should define NS records in your zone!			

CNAME Records

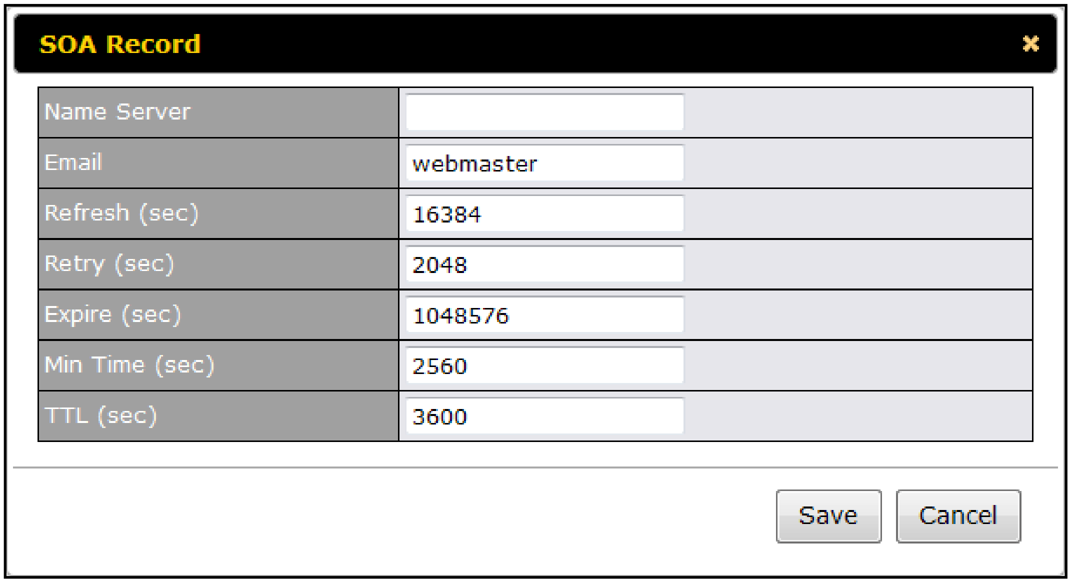
Host	Points To	TTL (sec)	
There is currently no CNAME records.			

PTR Records

Host IP Number	Points to	TTL (sec)	
There is currently no PTR records.			

15.4.1 SOA Record

You can click the link **Click here to define SOA record** to create or click on the Name Server field to edit the SOA record.



Name Server	
Email	webmaster
Refresh (sec)	16384
Retry (sec)	2048
Expire (sec)	1048576
Min Time (sec)	2560
TTL (sec)	3600

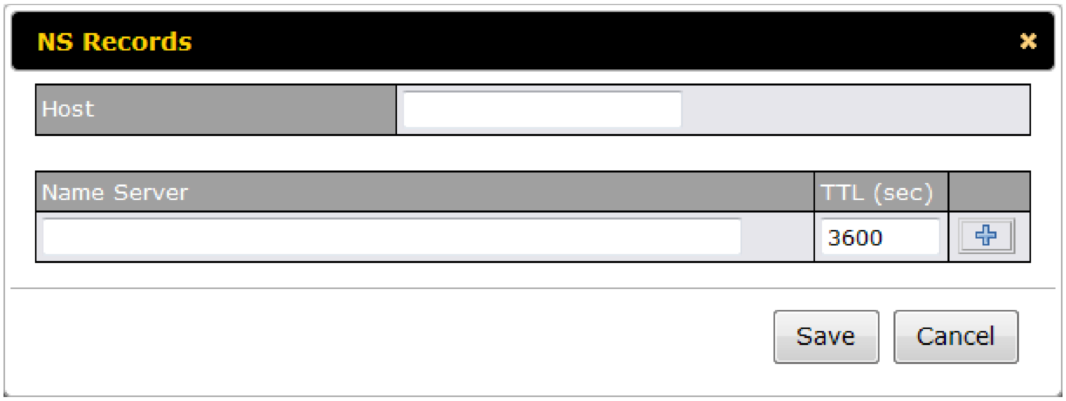
To define a SOA record, fill out the fields:*Name Server, Name Server IP Address (optional), Email, Refresh, Retry, Expire, Min Time, and TTL*.

Name Server: Enter the NS record's FQDN server name here.

For example:
"ns1.mydomain.com" (equivalent to "www.1stdomain.com.")
"ns2.mydomain.com."

Email, Refresh, Retry, Expire, Min Time, and TTLareentered in the same way as in the forward zone. Please refer to section for details.

15.4.2 NS Records



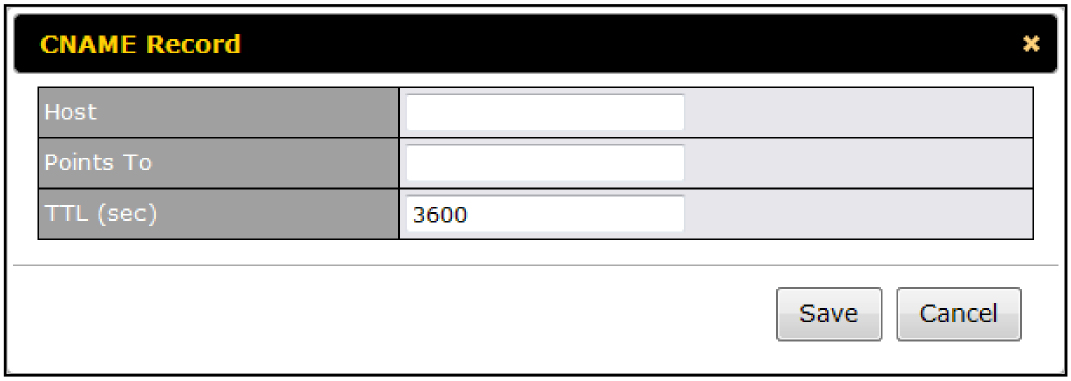
Host	

Name Server	TTL (sec)	
	3600	+

The NS record of the name server defined in the SOA record is automatically added here.To create a new NS record, click the **New NS Records** button.

When creating an NS record for the *Reverse Lookup Zone* itself (not a sub-domain or dedicated zone), the **Host** field should be left blank. Name Server field must be an FQDN.

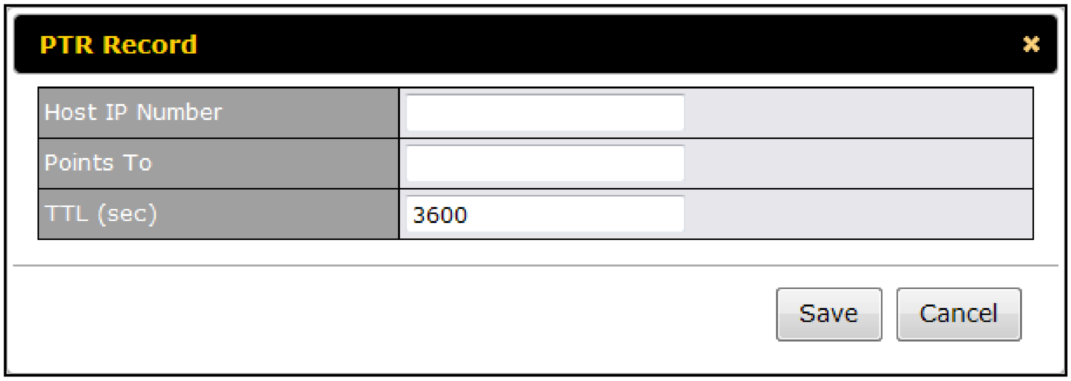
15.4.3 CNAME Records



Host	
Points To	
TTL (sec)	3600

To create a new CNAME record, click the **New CNAME Record** button.
CNAME records are typically used for defining classless reverse lookup zones. Subnetted reverse lookup zones are further described in RFC 2317, "Classless IN-ADDR.ARPA delegation."

15.4.4 PTR Records



Host IP Number	
Points To	
TTL (sec)	3600

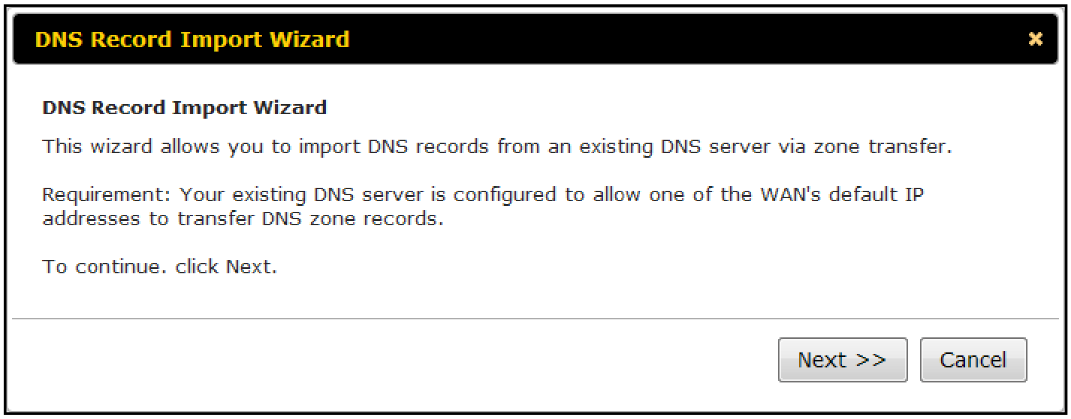
To create a new PTR record, click the **New PTR Record** button.

For **Host IP Number** field, enter the last integer in the IP address of a PTR record. E.g. for the IP address *11.22.33.44*, where the Reverse Lookup Zone is *33.22.11.in-arpa.addr*, the Host IP Number should be *44*.

The **Points To** field defines the host name which the PTR record should be pointed to. It must be an FQDN.

15.5 DNS Record Import Wizard

At the bottom of the DNS Settings page, the link ***Import records via zone transfer…***is used to import DNS record using an Import Wizard.



DNS Record Import Wizard

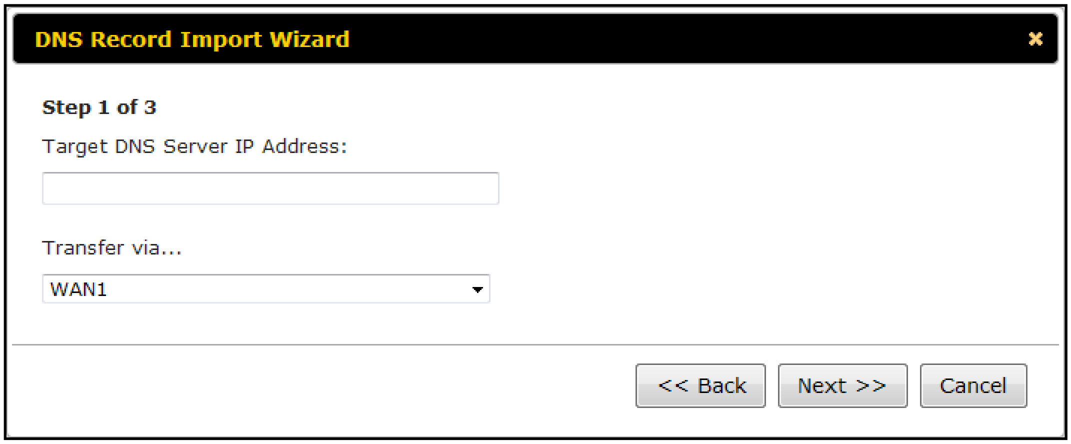
DNS Record Import Wizard

This wizard allows you to import DNS records from an existing DNS server via zone transfer.

Requirement: Your existing DNS server is configured to allow one of the WAN's default IP addresses to transfer DNS zone records.

To continue. click Next.

- Select **Next>>** to continue.



DNS Record Import Wizard

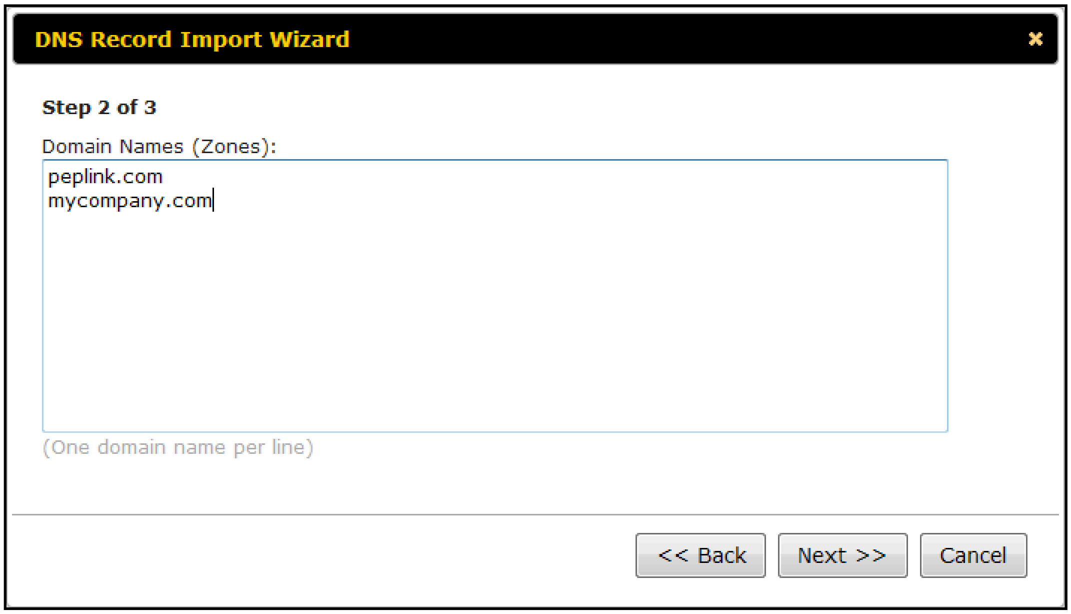
Step 1 of 3

Target DNS Server IP Address:

Transfer via...

WAN1

- In the **Target DNS Server IP Address**field, enter the IP address of the DNS server.
- In the **Transfer via…**field, choose the connection which you would like to transfer through.
- Select **Next>>**to continue.



Step 2 of 3

Domain Names (Zones):

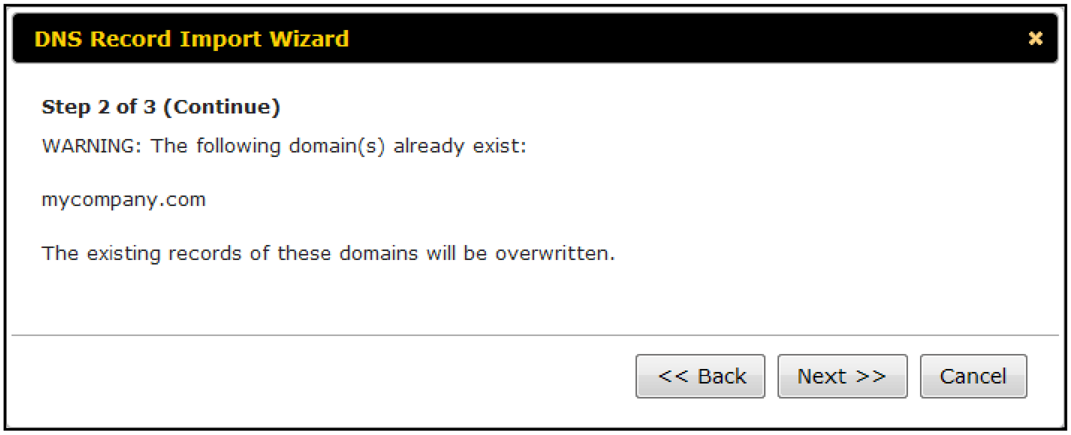
peplink.com
mycompany.com

(One domain name per line)

- In the blank space, enter the **Domain Names (Zones)** which you would like to assign the IP address entered in the previous step. Enter one domain name per line.
- Select **Next>>**to continue.

Important Note

If you have entered domain(s) which already exist in your settings, a warning message will appear. Select **Next>>**to overwrite the existing record, or **<<Back**to go back to the previous step.

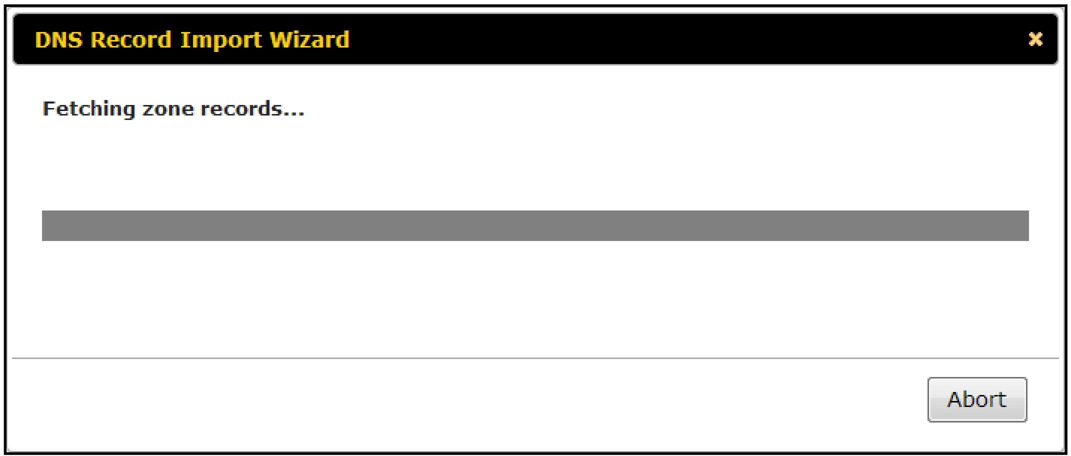


Step 2 of 3 (Continue)

WARNING: The following domain(s) already exist:

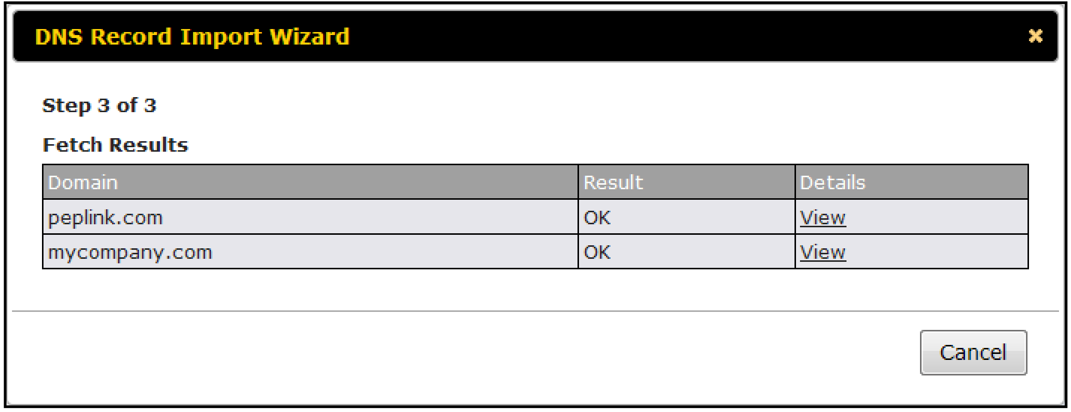
mycompany.com

The existing records of these domains will be overwritten.



DNS Record Import Wizard

Fetching zone records...



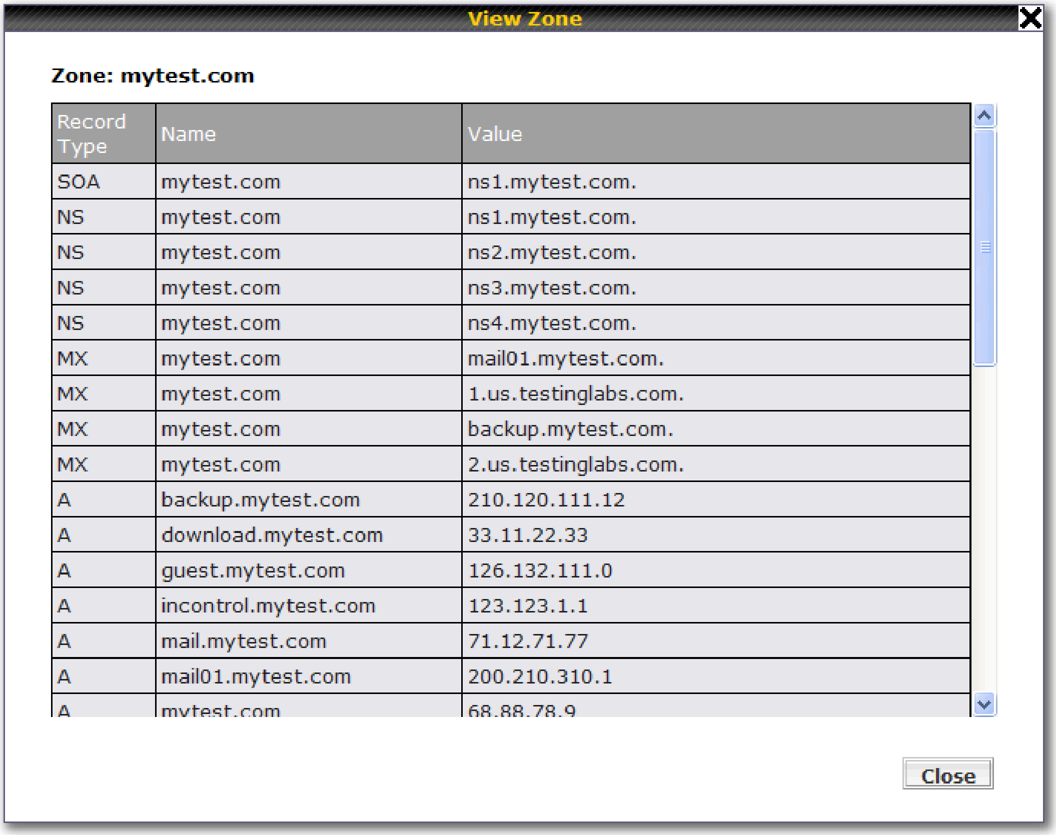
DNS Record Import Wizard

Step 3 of 3

Fetch Results

Domain	Result	Details
peplink.com	OK	View
mycompany.com	OK	View

After the zone records process have been fetched, the fetch results would be shown as above. You can view import details by clicking the corresponding hyperlink on the right hand side.



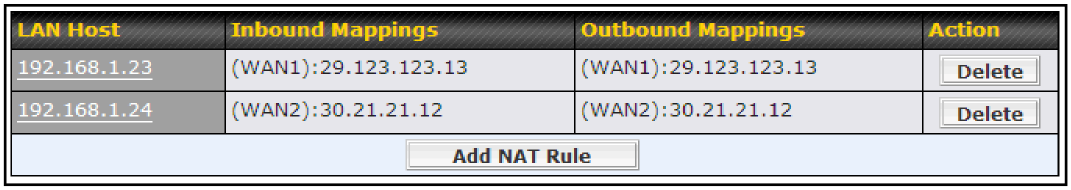
Zone: mytest.com

Record Type	Name	Value
SOA	mytest.com	ns1.mytest.com.
NS	mytest.com	ns1.mytest.com.
NS	mytest.com	ns2.mytest.com.
NS	mytest.com	ns3.mytest.com.
NS	mytest.com	ns4.mytest.com.
MX	mytest.com	mail01.mytest.com.
MX	mytest.com	1.us.testinglabs.com.
MX	mytest.com	backup.mytest.com.
MX	mytest.com	2.us.testinglabs.com.
A	backup.mytest.com	210.120.111.12
A	download.mytest.com	33.11.22.33
A	guest.mytest.com	126.132.111.0
A	incontrol.mytest.com	123.123.1.1
A	mail.mytest.com	71.12.71.77
A	mail01.mytest.com	200.210.310.1
A	mytest.com	68.88.78.9

16 NAT Mappings

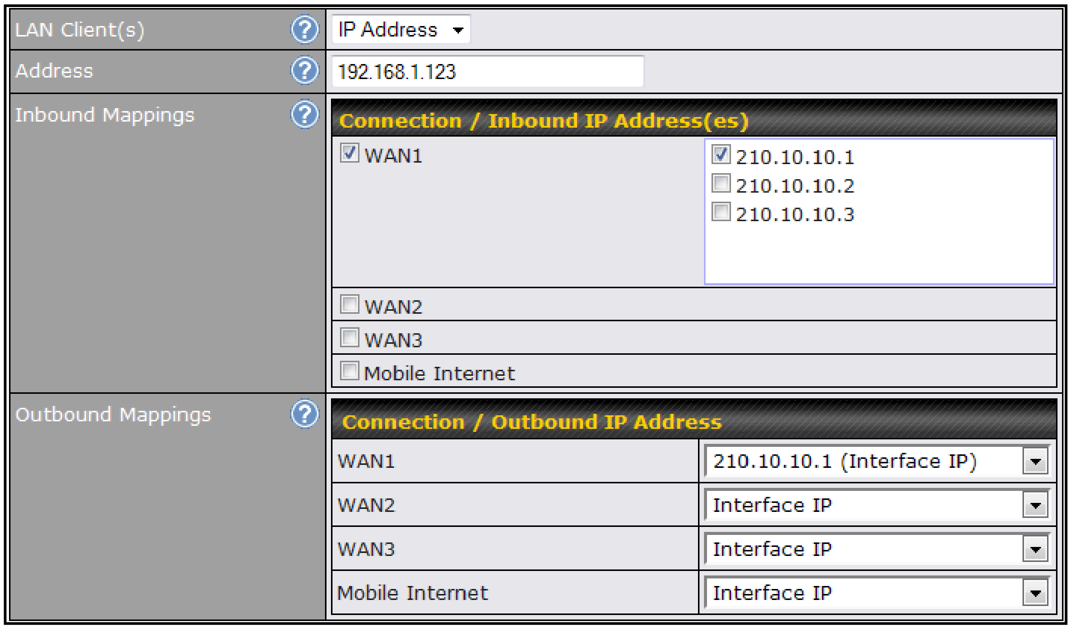
The Peplink Balance allows the IP address mapping of all inbound and outbound NAT'edtraffic to and from an internal client IP address.

NAT Mappings can be configured at:***Network>NAT Mappings***



LAN Host	Inbound Mappings	Outbound Mappings	Action
192.168.1.23	(WAN1):29.123.123.13	(WAN1):29.123.123.13	Delete
192.168.1.24	(WAN2):30.21.21.12	(WAN2):30.21.21.12	Delete

To add a rule for NAT Mappings, click**Add NAT Rule**and the following screen will be displayed:



LAN Client(s)	IP Address
Address	192.168.1.123

Inbound Mappings

Connection / Inbound IP Address(es)	
☑ WAN1	☑ 210.10.10.1 □ 210.10.10.2 □ 210.10.10.3
□ WAN2	
□ WAN3	
□ Mobile Internet	

Outbound Mappings

Connection / Outbound IP Address	
WAN1	210.10.10.1 (Interface IP)
WAN2	Interface IP
WAN3	Interface IP
Mobile Internet	Interface IP

NAT Mapping Settings	
LAN Client(s)	NAT Mapping rules can be defined for a single LAN **IP Address**, an **IP Range**, or an **IP Network**.
Address	This refers to the LAN host's private IP address.The system maps this address to a number of public IP addresses (specified below) in order to facilitate inbound and outbound traffic. This option is only available when **IP Address** is selected.
Range	The IP range is a contiguous group of private IP addresses used by the LAN host. The system maps these addresses to a number of public IP addresses(specified below) to facilitate outbound traffic. This option is only available when **IP Range** is selected.

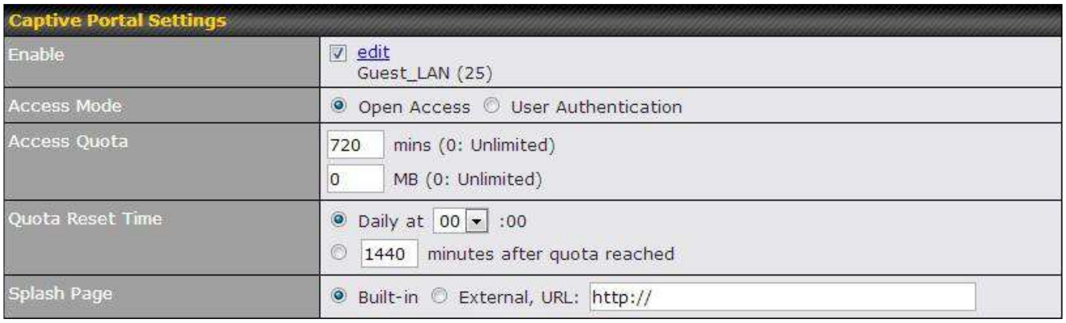
Network	The IP network refers to all private IP addresses and ranges managed by the LAN host. The system maps these addresses to a number of public IP addresses(specified below) to facilitate outbound traffic. This option is only available when **IP Network** is selected.
Inbound Mappings	This setting specifies the WAN connections and corresponding WAN-specific Internet IP addresses on which the system should bind. Any access to the specified WAN connection(s) and IP address(es) will be forwarded to the LAN Host. This option is only available when **IP Address** is selected in LAN Client(s) field. Note 1: Inbound Mapping is not needed for WAN connections in drop-in or IP forwarding mode. Note 2: Each WAN IP address can be associated to one NAT Mapping only.
Outbound Mappings	This setting specifies the WAN IP addresses should be used whenanIP connection is made from a LAN host to the Internet. Each LAN host in an IP range or IP network will be evenly mapped to one of each selected WAN's IP addresses (for better IP address utilization) in a persistent manner (for better application compatibility). Note 1: If you do not want to use a specific WAN for outgoing accesses, you should still choose default here, then customize the outbound access rule in the Outbound Policy section. Note 2: WAN connections in drop-in or IP forwarding mode are not shown here.

Click **Save** to save the settings when configuration has been completed.

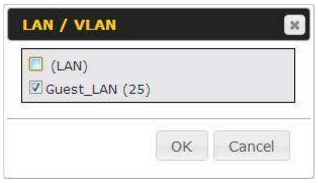
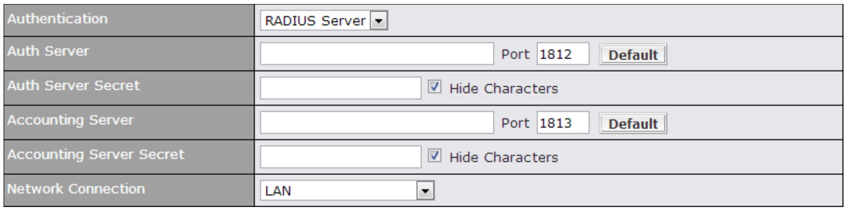
Important Note
Inbound firewall rules override Inbound Mapping settings.

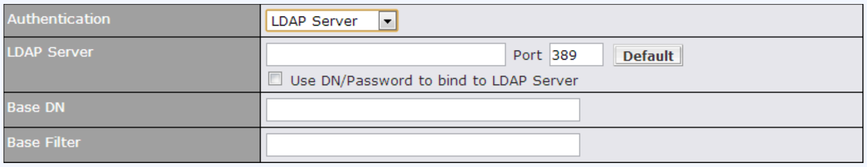
17 Captive Portal

The Captive Portal serves as gateway that clients have to pass if they wish to access the internet using your router. To configure, navigate to **Network >Captive Portal** to see the following screen:

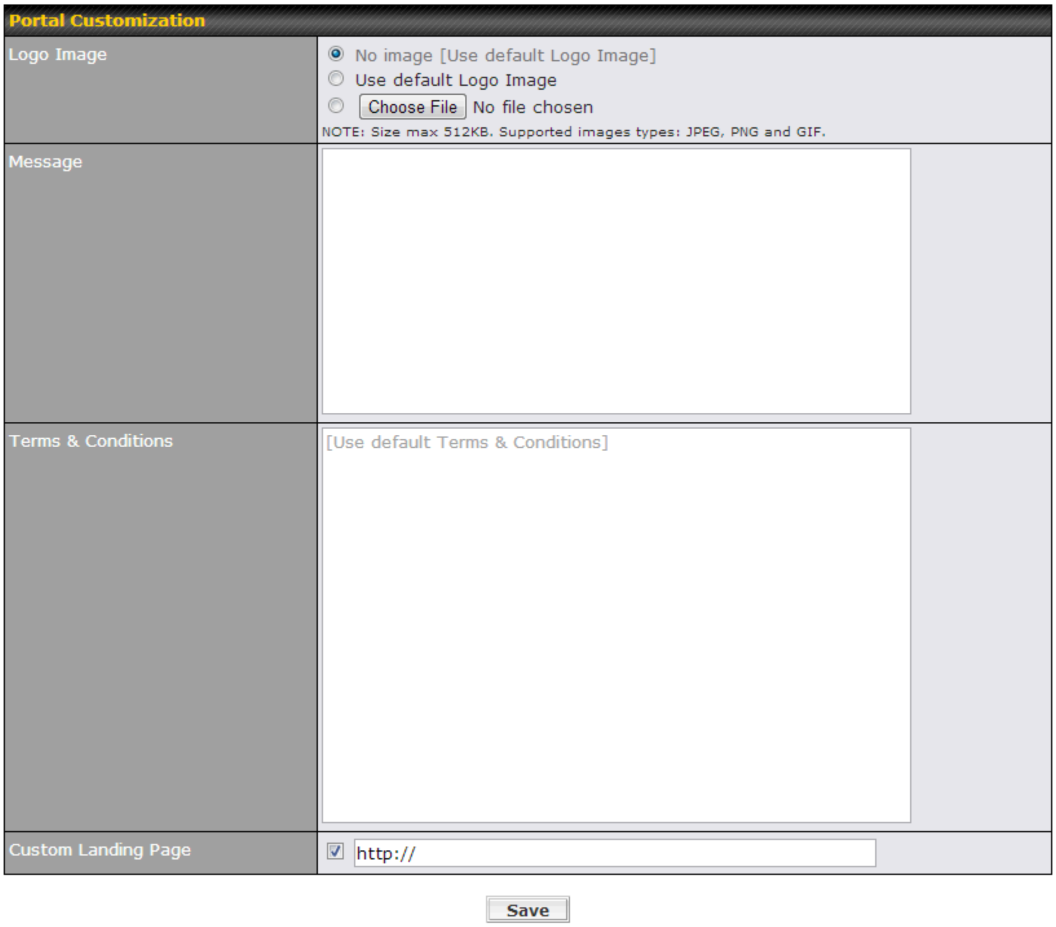


Captive Portal Settings	
Enable	☑ edit Guest_LAN (25)
Access Mode	● Open Access ○ User Authentication
Access Quota	720 mins (0: Unlimited) 0 MB (0: Unlimited)
Quota Reset Time	● Daily at 00 ▾ :00 ○ 1440 minutes after quota reached
Splash Page	● Built-in ○ External, URL: http://

<table>
<tr><th colspan="2">Captive Portal Settings</th></tr>
<tr><td><b>Apply On</b></td><td>Clicking the <b>edit</b> button trigger a dialogue where you can choose which LAN / VLAN to apply your captive portal.

LAN / VLAN ✖
☐ (LAN)
☑ Guest_LAN (25)
OK Cancel
Click all LAN / VLAN that you wish to apply the captive portal to.</td></tr>
<tr><td><b>Access Mode</b></td><td>Click <b>Open Access</b> to allow clients to freely access your router. Click <b>User Authentication</b> to force your clients to authenticate before accessing your router.</td></tr>
<tr><td><b>Radius Server</b></td><td>This authenticates your clients through a Radius Server. Upon selecting this option, you will see the following fields:

<table>
<tr><td>Authentication</td><td>RADIUS Server ▾</td></tr>
<tr><td>Auth Server</td><td>Port 1812 Default</td></tr>
<tr><td>Auth Server Secret</td><td>☑ Hide Characters</td></tr>
<tr><td>Accounting Server</td><td>Port 1813 Default</td></tr>
<tr><td>Accounting Server Secret</td><td>☑ Hide Characters</td></tr>
<tr><td>Network Connection</td><td>LAN ▾</td></tr>
</table>
Fill in the necessary information to complete your connection to the server and enable authentication.</td></tr>
</table>

LDAP Server	This authenticates your clients through a LDAP Server. Upon selecting this option, you will see the following fields:  Authentication: LDAP Server ▾ LDAP Server: □ Port 389 Default □ Use DN/Password to bind to LDAP Server Base DN: □ Base Filter: □ Fill in the necessary information to complete your connection to the server and enable authentication.
Access Quota	Set a time and data cap to each user's Internet usage.
Quota Reset Time	This menu determines how your usage quota resets. Setting it to **daily** will reset it at a specified time every day. Setting a number of **minutes after quota reached** establish a timer for each user that begins after the quota has been reached.
Splash Page	Here, you can choose between using the Balance's built-in captive portal and redirecting clients to a URL you define.

The Portal Customization menu has two options: Preview and ✎. Clicking will result in a pop-up previewing the captive portal that your clients will see. Clicking ✎ will result in the appearance of following menu:



Portal Customization	
Logo Image	● No image [Use default Logo Image] ○ Use default Logo Image ○ Choose File No file chosen NOTE: Size max 512KB. Supported images types: JPEG, PNG and GIF.
Message	
Terms & Conditions	[Use default Terms & Conditions]
Custom Landing Page	☑ http://

Portal Customization	
Logo Image	Click the **Choose File** button to select an logo to use for the built-in portal
Message	If you have any additional messages for your users, place it on this field.
Terms & Conditions	If you would like to use your own set of terms and conditions, please place it here. If left empty, the built-in portal will display the default terms and conditions.
Custom Landing Page	Fill in this field to redirect clients to an external URL.

QoS

18.1.1 User Groups

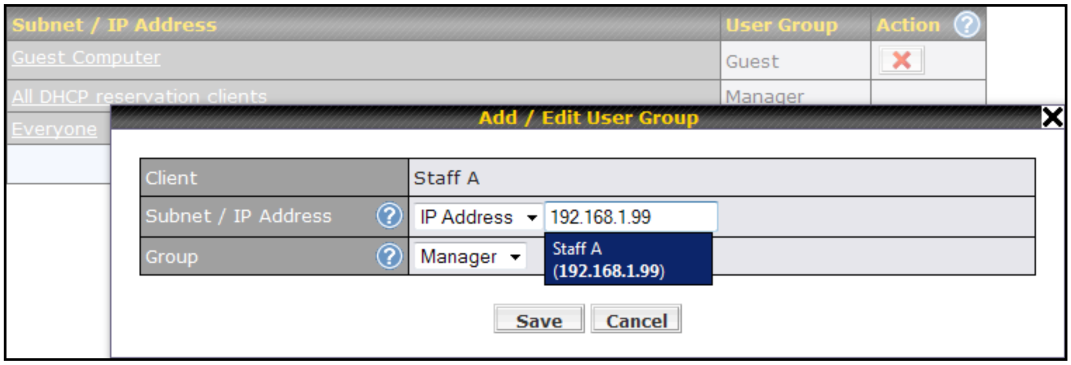
(Available on Peplink Balance 305 and 380+)

LAN and PPTP clients can be categorized into three user groups - **Manager, Staff, and Guest**.This menu allows you to define rules and assign client IP addresses or subnets to a user group. You can apply different bandwidth and traffic prioritization policies on each user group in the BandwidthControl and Application sections.

The table is automatically sorted, and the table order signifies the rules' precedence. The smaller and more specific subnets are put towards the top of the table and have higher precedence; larger and less specific subnets are placed towards the bottom.

Click the **Add** button to define clients and their user group. Click the ✖ button to remove the defined rule.

Two default rules are pre-defined and put at the bottommost.They are **All DHCP reservation clients** and **Everyone**, and they cannot be removed. The **All DHCP reservation client represents**the LAN clients defined in the DHCP Reservation table in the LAN settings page. **Everyone** represents all clients that are not defined in any rule above. Click on a rule to change its group.



Subnet / IP Address	User Group	Action
Guest Computer	Guest	✖
All DHCP reservation clients	Manager	
Everyone		

Add / Edit User Group

Client	Staff A
Subnet / IP Address	IP Address ▾ 192.168.1.99
Group	Manager ▾

Add / Edit User Group	
Subnet / IP Address	From the drop-down menu, choose whether you are going to define the client(s) by an **IP Address** or a **Subnet**. If IP Address is selected, enter a name defined in DHCP Reservation table or a LAN client's IP address. If Subnet is selected, enter a subnet address and specify its subnet mask.
Group	This field is to define which **User Group** the specified Subnet / IP Address belongs to.

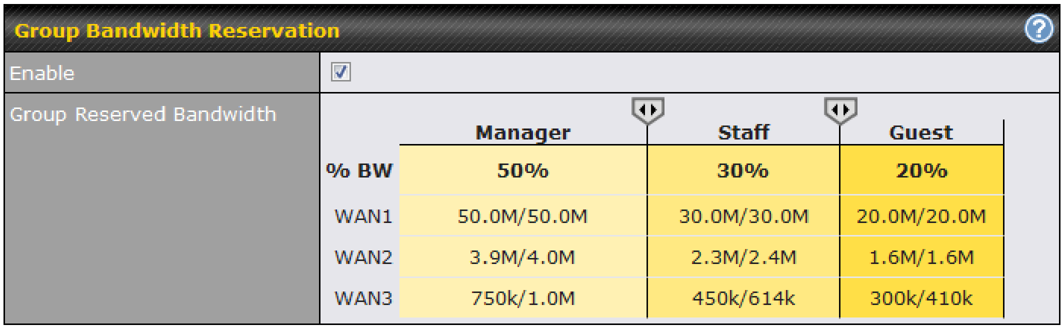
Once users have been assigned to a user group, their internet traffic will be restricted by rules defined for that particular group. Please refer to the following two sections for details.

18.1.2 Bandwidth Control

(Group Bandwidth Reservation Available on Peplink Balance 305 and 380+)

This section is to define how much minimum bandwidth will be reserved to each user group when a WAN connection is **in full load**.When this feature is enabled, a slider with two indicators will be shown. You can move the indicators to adjust each group's weighting. The lower part of the table shows the corresponding reserved download and uploads bandwidth value of each connection.

By default, **50%** of bandwidth has been reserved for Manager, **30%** for Staff, and **20%** for Guest.



Group Bandwidth Reservation

Enable ☑

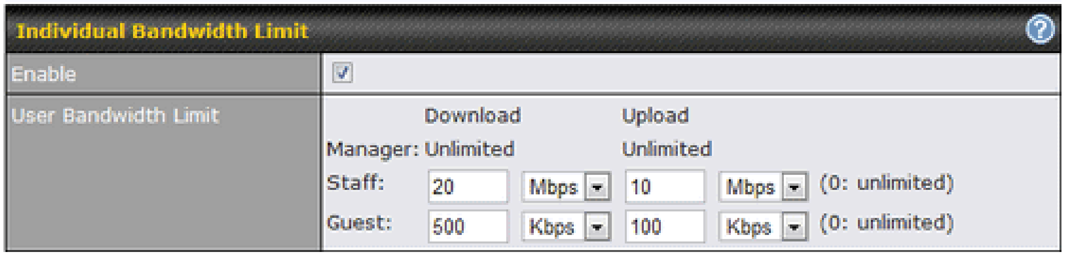
Group Reserved Bandwidth

	Manager	Staff	Guest
% BW	50%	30%	20%
WAN1	50.0M/50.0M	30.0M/30.0M	20.0M/20.0M
WAN2	3.9M/4.0M	2.3M/2.4M	1.6M/1.6M
WAN3	750k/1.0M	450k/614k	300k/410k

(Individual Bandwidth Limit Available on Peplink Balance One, 305 and 380+)

You can define a maximum download speed (over all WAN connections) and upload speed (for each WAN connection) that each individual Staff and Guest member can consume. No limit can be imposed on individual Managers.

By default, Download and Upload Bandwidth Limits are set to unlimited (set as **0).**



Individual Bandwidth Limit

Enable ☑

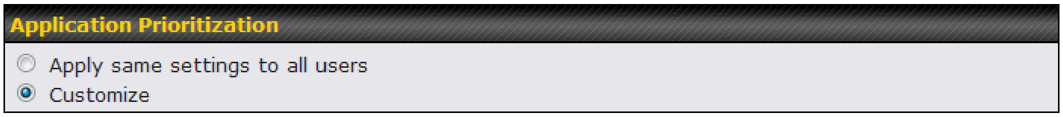
User Bandwidth Limit

	Download		Upload		
Manager:	Unlimited		Unlimited		
Staff:	20	Mbps	10	Mbps	(0: unlimited)
Guest:	500	Kbps	100	Kbps	(0: unlimited)

18.1.3 Application

18.1.3.1 Application Prioritization

You can choose whether to apply the same Prioritization settings to all user groups or customize the settings for each group.

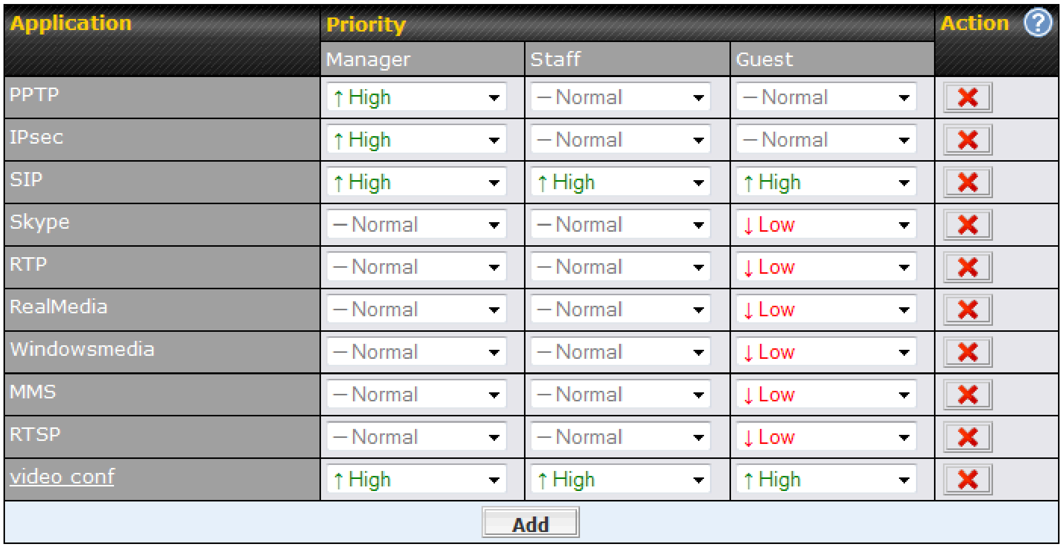


Application Prioritization

○ Apply same settings to all users
● Customize

Three priority levels can be set for application prioritization: ↑ **High**,— **Normal**, and ↓ **Low**.

The Peplink Balance can detectvarious application traffics by inspecting the packets' content. Select an application by choosing a supported application, or by defining a custom application manually. The priority preference of supported applications is placed at the top of the table. Custom applications are at the bottom.

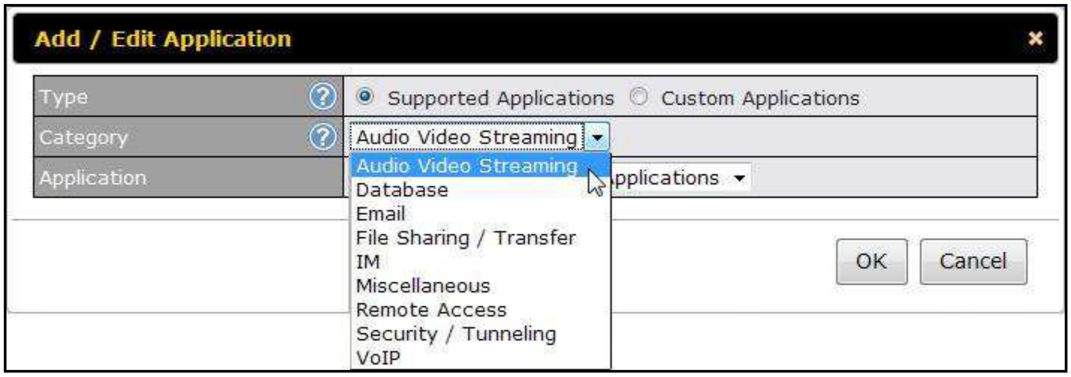


Application	Priority			Action ?
	Manager	Staff	Guest	
PPTP	↑ High	— Normal	— Normal	❌
IPsec	↑ High	— Normal	— Normal	❌
SIP	↑ High	↑ High	↑ High	❌
Skype	— Normal	— Normal	↓ Low	❌
RTP	— Normal	— Normal	↓ Low	❌
RealMedia	— Normal	— Normal	↓ Low	❌
Windowsmedia	— Normal	— Normal	↓ Low	❌
MMS	— Normal	— Normal	↓ Low	❌
RTSP	— Normal	— Normal	↓ Low	❌
video conf	↑ High	↑ High	↑ High	❌

18.1.3.2 Prioritization for Custom Application

Click the **Add** button to define a custom application. Click the button ❌ in the **Action** column to delete the custom application in the corresponding row.

When **Supported Applications** is selected, the Peplink Balance will inspect network traffic and prioritize the selected applications. Alternatively, you can select **Custom Applications**and define the application by providing the protocol, scope, port number, and DSCP value.



Add / Edit Application

Type	● Supported Applications ○ Custom Applications
Category	Audio Video Streaming
Application	pplications

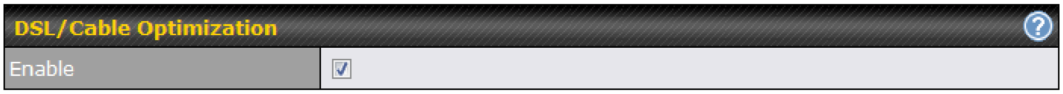
Categoryand **Application**availability will be different across different models of Peplink Balance.

18.1.3.3 DSL/Cable Optimization

DSL/cable-based WAN connectionshave lower upload bandwidth and higher download bandwidth.

When a DSL/cable circuit's uplink is congested, the download bandwidth will be affected. Users will not be able to download data at full speed until the uplink becomes less congested.DSL/Cable Optimization can relieve such an issue. When it is enabled, the download speed will become less affected by the upload traffic.

By default, this feature is enabled.



DSL/Cable Optimization

Enable	☑

19 Firewall

A firewall is a mechanism that selectively filters data traffic between the WAN side (the Internet) and the LAN side of the network.It can protect the local network from potential hacker attacks,access to offensive Web sites, and/or other inappropriate uses.

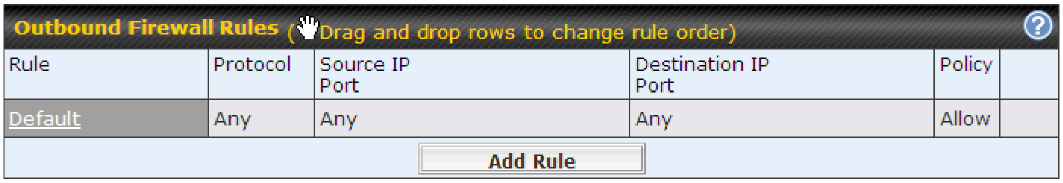
The firewall functionality of Peplink Balance supports the selective filtering of data traffic in both directions:

- Outbound (LAN to WAN)
- Inbound (WAN to LAN)

The firewall also supports the following functionality:

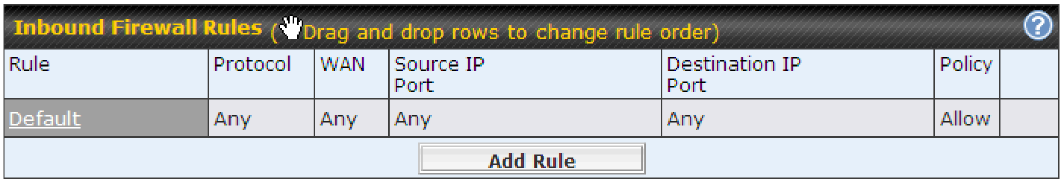
- Intrusion Detection and DoS Prevention
- Web Blocking

With SpeedFusion^{TM} enabled, the firewall rules also apply to VPN tunneled traffic.



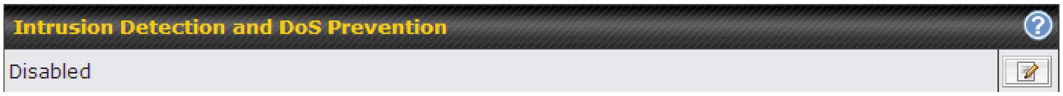
Outbound Firewall Rules (Drag and drop rows to change rule order)

Rule	Protocol	Source IP Port	Destination IP Port	Policy
Default	Any	Any	Any	Allow



Inbound Firewall Rules (Drag and drop rows to change rule order)

Rule	Protocol	WAN	Source IP Port	Destination IP Port	Policy
Default	Any	Any	Any	Any	Allow



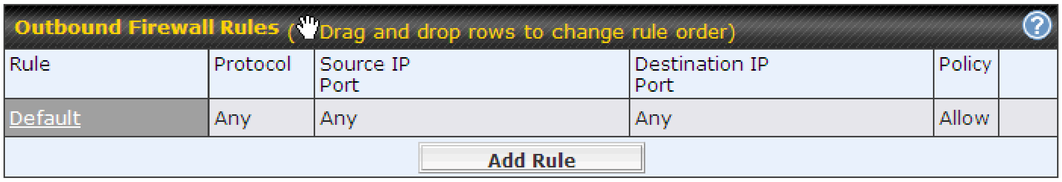
Intrusion Detection and DoS Prevention

Disabled

19.1 Outbound and Inbound Firewall Rules

19.1.1 Access Rules

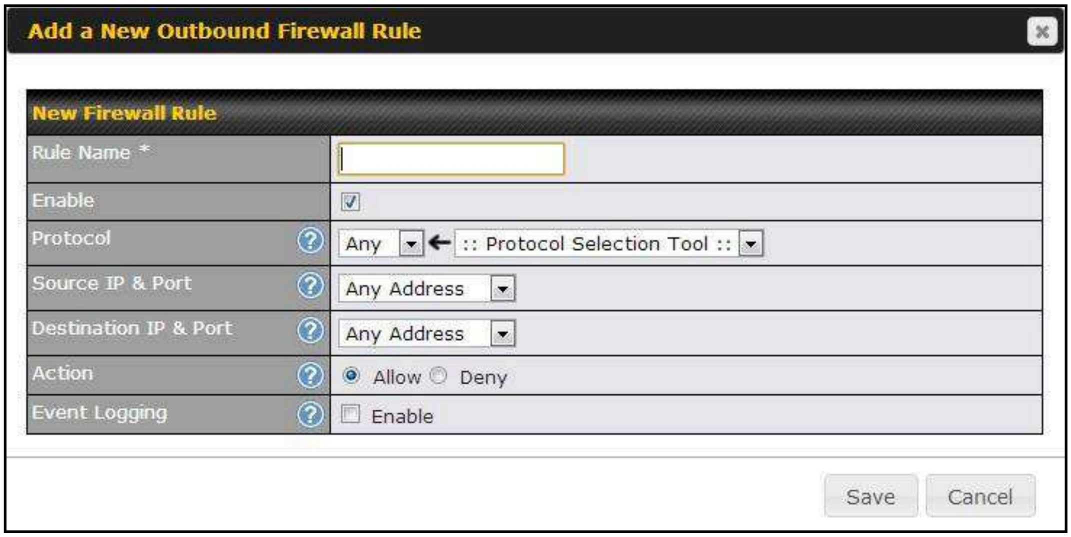
The outbound firewall settings are located at:***Network > Firewall>Access Rules***



Outbound Firewall Rules (Drag and drop rows to change rule order)

Rule	Protocol	Source IP Port	Destination IP Port	Policy
Default	Any	Any	Any	Allow

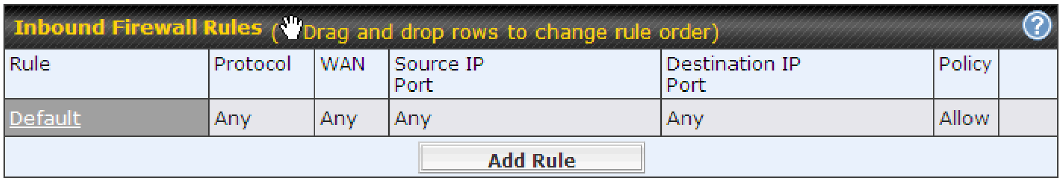
Upon clicking**Add Rule** Add Rule, the following screen appears:



Add a New Outbound Firewall Rule

New Firewall Rule	
Rule Name *	
Enable	☑
Protocol	Any ← :: Protocol Selection Tool ::
Source IP & Port	Any Address
Destination IP & Port	Any Address
Action	● Allow ○ Deny
Event Logging	□ Enable

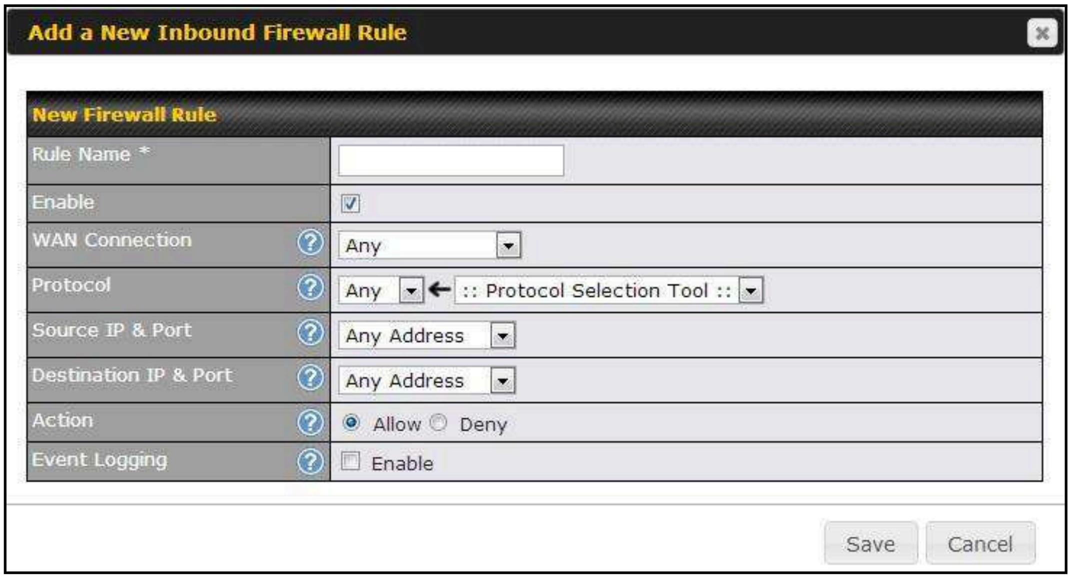
The Inbound firewall settings are located at:***Network > Firewall> Access Rules***



Inbound Firewall Rules (Drag and drop rows to change rule order)

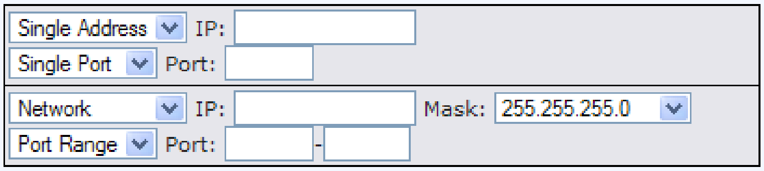
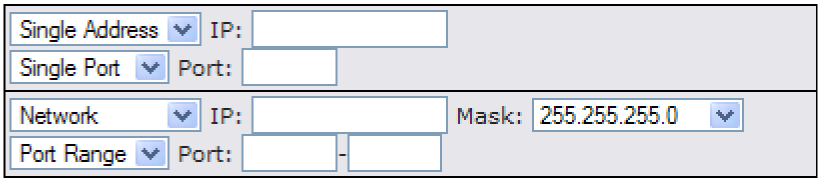
Rule	Protocol	WAN	Source IP Port	Destination IP Port	Policy	
Default	Any	Any	Any	Any	Allow	

Once you click on **Add Rule** Add Rule the following window will appear.



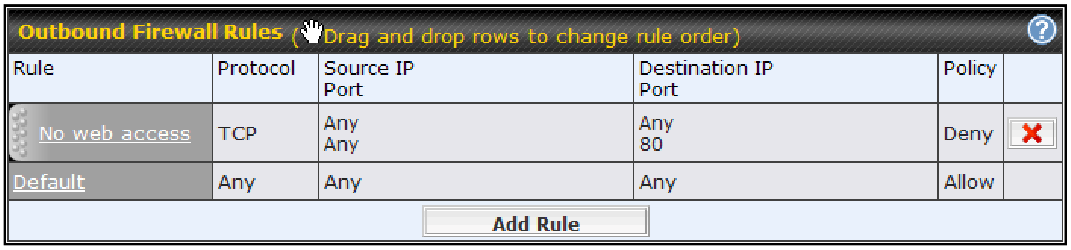
Add a New Inbound Firewall Rule

New Firewall Rule	
Rule Name *	
Enable	☑
WAN Connection	Any
Protocol	Any ← :: Protocol Selection Tool ::
Source IP & Port	Any Address
Destination IP & Port	Any Address
Action	● Allow ○ Deny
Event Logging	□ Enable

Inbound / Outbound Firewall Settings	
Rule Name	This setting specifies a name for the firewall rule.
Enable	This setting specifies whether the firewall rule should take effect. If the box is checked, the firewall rule takes effect. If the traffic matches the specified Protocol/IP/Port, actions will be taken by Peplink Balance based on the other parameters of the rule. If the box is not checked, the firewall rule does not take effect. Peplink Balance will disregard the other parameters of the rule.
Protocol	This setting specifies the protocol to be matched. Via a drop-down menu, the following protocols can be specified: • **TCP** • **UDP** • **ICMP** • **IP** Alternatively, the **Protocol Selection Tool** drop-down menu can be used to automatically fill in the Protocol and Port number of common Internet services (e.g. HTTP, HTTPS, etc.) After selecting an item from the **Protocol Selection Tool** drop-down menu, the Protocol and Port number remains manually modifiable.
Source IP & Port	This specifies the source IP address(es) and port number(s) to be matched for the firewall rule. A single address, or a network, can be specified as the Source IP & Port setting, as indicated with the following screenshots:  Single Address ▾ IP: Single Port ▾ Port: Network ▾ IP: Mask: 255.255.255.0 ▾ Port Range ▾ Port: - In addition, a single port, or a range of ports, can be specified for the Source IP & Portsettings.
Destination IP & Port	This specifies the destination IP address(es) and port number(s) to be matched for the firewall rule. A single address, or a network, can be specified as the Source IP & Port setting, as indicated with the following screenshots:  Single Address ▾ IP: Single Port ▾ Port: Network ▾ IP: Mask: 255.255.255.0 ▾ Port Range ▾ Port: - In addition, a single port, or a range of ports, can be specified for the Source IP & Portsettings.
Action	This setting specifies the action to be taken by the router upon encountering traffic that matches the both of the following:

	• Source IP & Port • Destination IP & Port With the value of **Allow** for the Action setting, the matching traffic passes through the router (to be routed to the destination). If the value of the Action setting is set to **Deny**, the matching traffic does not pass through the router (and is discarded).
Event Logging	This setting specifies whether or not to log matched firewall events. The logged messages are shown on the page **Status > Event Log**. A sample message is as follows: `Aug 13 23:47:44 Denied CONN=Ethernet WAN SRC=20.3.2.1 DST=192.168.1.20 LEN=48 PROTO=TCP SPT=2260 DPT=80` • **CONN:** The connection where the log entry refers to • **SRC:** Source IP address • **DST:** Destination IP address • **LEN:** Packet length • **PROTO:** Protocol • **SPT:** Source port **DPT:** Destination port

Upon clicking **Save**after entering required information, the following screen appears.



Outbound Firewall Rules (Drag and drop rows to change rule order)

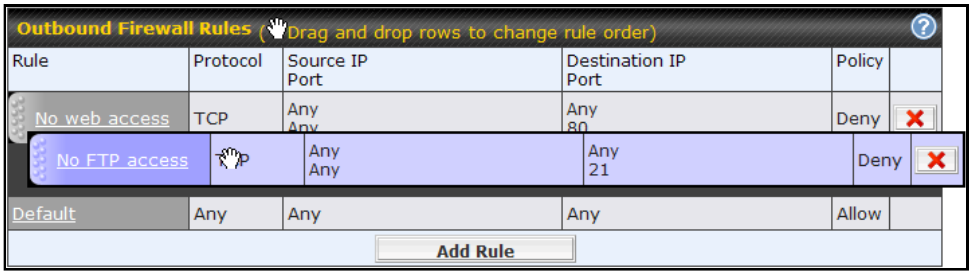
Rule	Protocol	Source IP Port	Destination IP Port	Policy	
No web access	TCP	Any Any	Any 80	Deny	✗
Default	Any	Any	Any	Allow	

Add Rule

To create an additional firewall rule, click **Add Rule** Add Rule and repeat the above steps.

To changea rule's priority, simply drag and drop the rule:

- Holdthe left mouse button on the rule.
- Move it to the desired position.
- Drop it by releasing the mouse button.



Outbound Firewall Rules (Drag and drop rows to change rule order)

Rule	Protocol	Source IP Port	Destination IP Port	Policy	
No web access	TCP	Any Any	Any 80	Deny	☒
No FTP access	P	Any Any	Any 21	Deny	☒
Default	Any	Any	Any	Allow	

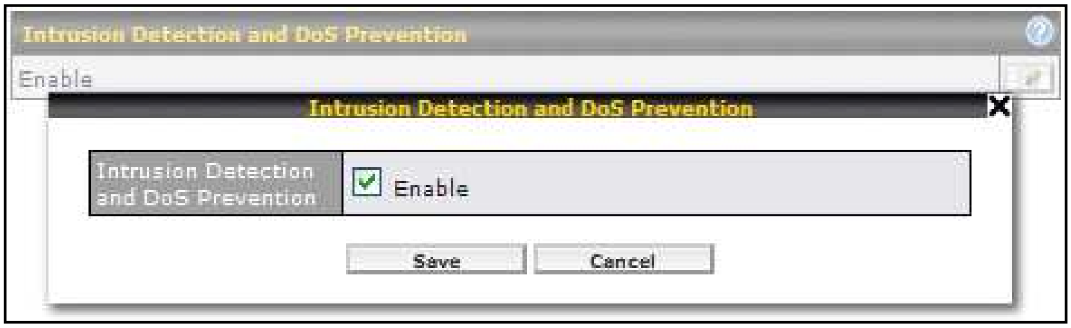
To remove a rule, click the ☒ button.

Rules are matched from top to the bottom.If a connection matches any one of the upper rules, the matching process will stop. If none of the rules match the connection, the **Default** rule will be applied.

The **Default** rule is **Allow** for both outbound and inbound access.

Tip
If the default inbound rule is set to**Allow** for NAT enabled WANs, no inbound Allow firewall rules will be required for inbound Port Forwarding and inbound NAT Mapping rules. However, if the default inbound rule is set as **Deny**, a corresponding Allow firewall rule will be required.

19.1.1.1 Intrusion Detection and DoS Prevention



Intrusion Detection and DoS Prevention

Enable

Intrusion Detection and DoS Prevention

Intrusion Detection and DoS Prevention	☑ Enable

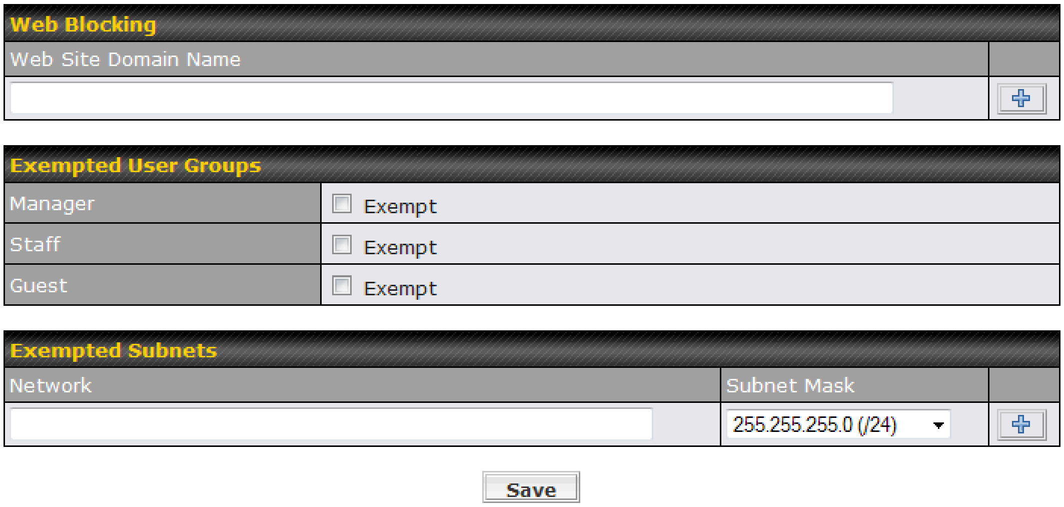
The Balance can detect and prevent intrusions and Denial-of-Service (DoS) attacks from the Internet. To turn on this feature, click ✎, check the **Enable**check box for the **Intrusion Detection and DoS Prevention**and press the **Save**button.

When this feature is enabled, the Balance will detect and prevent the following kinds of intrusions and denial-of-service attacks.

- Port Scan:
- NMAP FIN/URG/PSH
- Xmas Tree
- Another Xmas Tree
- Null Scan
- SYN/RST
- SYN/FIN
- SYN Flood Prevention
- Ping Flood Attack Prevention

19.1.2 Web Blocking

(Available on Peplink Balance 305 and 380+)



Web Blocking	
Web Site Domain Name	
	➕

Exempted User Groups	
Manager	□ Exempt
Staff	□ Exempt
Guest	□ Exempt

Exempted Subnets		
Network	Subnet Mask	
	255.255.255.0 (/24)	➕

19.1.2.1 Web Blocking

Enter an appropriate website address and Peplink Balance will block and disallow LAN/PPTP/SpeedFusion^{TM} peer clients to access these websites. Exception can be added in the following sections - and **.**

You may enter the wild card ".*" at the end of a domain name to block any web site with a host name having the domain name in the middle.
For example, If you enter "foobar.*," then "www.foobar.com," "www.foobar.co.jp," or "foobar.co.uk" will be blocked.
Placing the wild card in any other position is not supported.
The Peplink Balance will inspect and look for blocked domain names on all HTTP traffic. Secure web (HTTPS) traffic is not supported.

19.1.2.2 Exempted User Groups

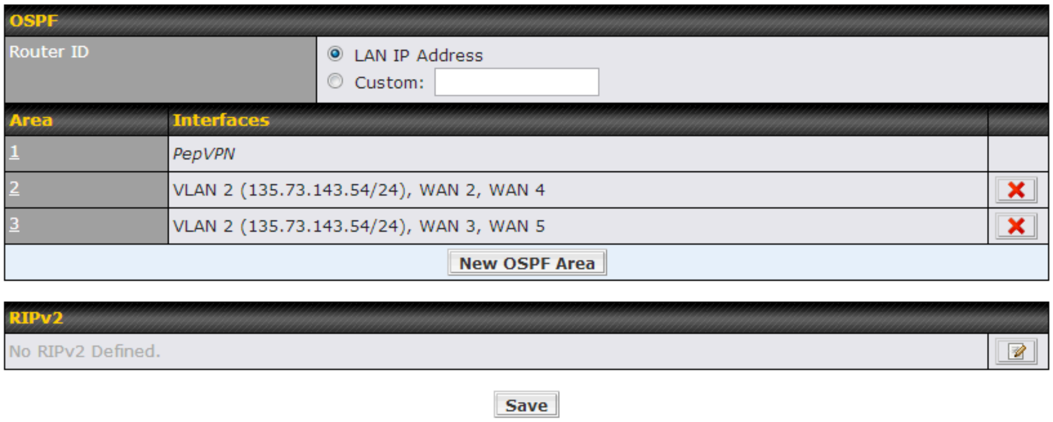
Check and select pre-defined user group(s) who can be exempted from the access blocking rules. User groups can be defined at ***QoS> User Groups*** section. Please refer to section for details.

19.1.2.3 Exempted Subnets

With the subnet defined in the field, clients on the particular subnet(s) can be exempted from the access blocking rules.

20 OSPF & RIPv2

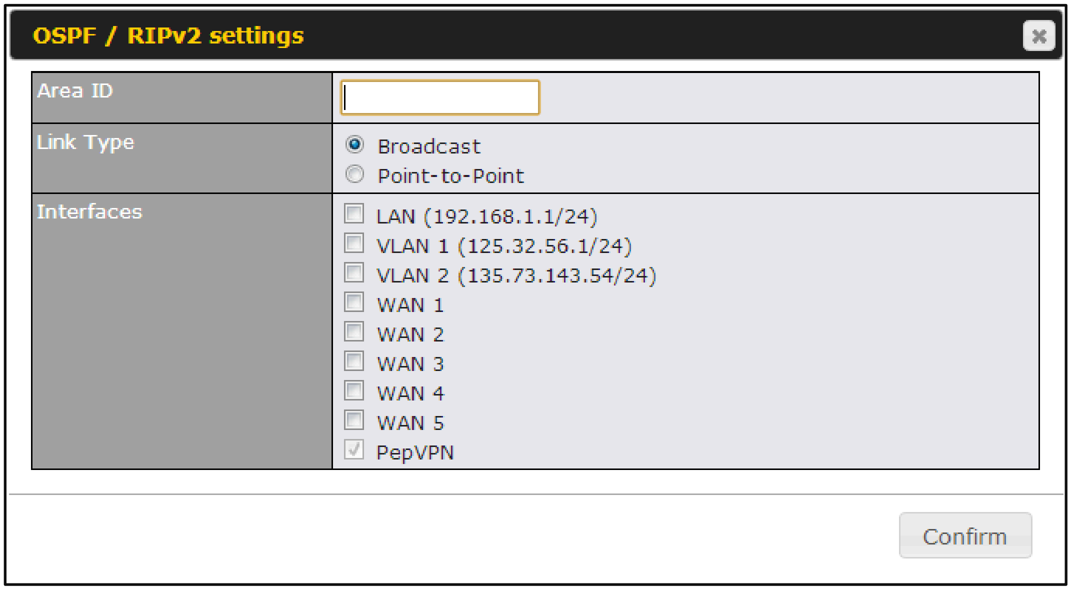
The Balance Router supports OSPF and RIPv2 dynamic routing protocols. Click the **Network** tab from the top bar, and click the **OSPF & RIPv2** item on the side bar to reach the following menu:



OSPF		
Router ID	● LAN IP Address ○ Custom:	
Area	**Interfaces**	
1	*PepVPN*	
2	VLAN 2 (135.73.143.54/24), WAN 2, WAN 4	✖
3	VLAN 2 (135.73.143.54/24), WAN 3, WAN 5	✖

RIPv2	
No RIPv2 Defined.	

OSPF	
Router ID	This field determines the ID of the router. By default, this is specified as the LAN IP address. If you want to specify your own ID, enter it on the **Custom** field.
Area	This is an overview of the OSPF areas you have defined. Click on the area name to configure it. To set a new area, click the button New OSPF Area . To delete an existing area, click the ✖ button



OSPF / RIPv2 settings

Area ID	
Link Type	● Broadcast ○ Point-to-Point
Interfaces	□ LAN (192.168.1.1/24) □ VLAN 1 (125.32.56.1/24) □ VLAN 2 (135.73.143.54/24) □ WAN 1 □ WAN 2 □ WAN 3 □ WAN 4 □ WAN 5 ☑ PepVPN

OSPF / RIPv2 Settings