



## Configuration examples for the D-Link NetDefend Firewall series



## How to setup traffic shaping



The below steps describe the configuration where we are using 1Mbps up / 1Mbps down link with the following traffic shaping rules:

- inbound and outbound HTTP and HTTPS the max bandwidth is 500Kbps.
- inbound and outbound POP3 the guaranteed bandwidth is 300Kbps, max is 700Kbps.
- other inbound and outbound services use the remaining bandwidth.

Here is the schematic representation of the three traffic shaping pipes we are going to create (we will need three pipes for outbound and three pipes for inbound traffic):



**Step 1.** Log into the firewall. The default access to LAN is via <u>https://192.168.10.1</u>. Default username is "admin" and password is "admin".

**Step 2.** Go to Policies > Traffic Management > Pipes.

Create a new entry for a "standard-in" pipe which describes physical connection limitations for download speed. Set the pipe limits: Total - 1000Kbps. Under Precedences set "7" with 300Kbps (this is for the guaranteed bandwidth).

Create another pipe for "standard-out" (upload speed). Set the pipe limits: Total - 1000Kb. Under Precedences set "7" with 300Kbps.

Policies » Traffic Management » Traffic Shaping » Pipes » wan1-std-in									
wan1-std-in									
A pipe defir	Policies » Traffic Management » Traffic Shaping » Pipes » wan1-std-out								
traine goes	wan1-std-out								
Gen	A pipe defines basic traffic shaping parameters. The pipe rules then determines which traffic goes through which pipes.								
Use pipe lin precedence precedence	General Pipe Limits G	roup Limits							
0	Use pipe limits to specify bandwidth limits per precedence in the pipe. If traffic in one precedence exceeds its limits, additional traffic will be pushed down to the lowest available precedence.								
	Note that, for bandwidth, 'kilo	' and 'mega' are multiples of 1000, not 1024							
	Precedences:	Kilobits per second Packets per second.							
	7:	300							
	6:								
	5:								
	4:								
	3:								
	2:								
	1:								
	0:								
	Total:	1000							

**Step 3.** Create two pipes (in and out) for HTTP traffic: Total bandwidth – 500 kbps. Precedence: "4" with 500 kbps limit.

Policies » Traffic Management » Traffic Shaping » Pipes » http-in								
http-in								
A pipe def	A pipe def traffic goes Policies » Traffic Management » Traffic Shaping » Pipes » http-out http-out							
traffic goes								
Gei	A pipe defines basic traffic shaping parameters. The pipe rules then determines whit traffic goes through which pipes.	ch						
Use pipe lii precedence precedence	General Pipe Limits Group Limits							
€	Use pipe limits to specify bandwidth limits per precedence in the pipe. If traffic in one precedence exceeds its limits, additional traffic will be pushed down to the lowest ave precedence.	ailable						
	Note that, for bandwidth, 'kilo' and 'mega' are multiples of 1000, not 102	4						
	Precedences: Kilobits per second Packets per second							
	7:							
	6:							
	5:							
	4: 500							
	3:							
	2:							
	1:							
	0:							
	Total: 500							
l,								

**Step 4.** Create two more pipes (in and out) for POP3 traffic: Total bandwidth – 700 kbps. Precedence: "7" with 300 kbps limit.

Policies » Traffic Management » Traffic Shaping » Pipes » pop3-in								
pop3-in								
A pipe traffic g	A pipe defines basic traffic shaping parameters. The pipe rules then determines which traffic g Policies » Traffic Management » Traffic Shaping » Pipes » pop3-out							
	pop3-out							
	A pipe defines basic traffic goes through	traffic shaping which pipes.	parar	meters. The pipe	e rules	then determines	which	
Use pip precede	Conoral	Dina Limita		Proup Limito				
precede	General	Fipe Limits		Sroup Limits				
	Use pipe limits to specify bandwidth limits per precedence in the pipe. If traffic in one precedence exceeds its limits, additional traffic will be pushed down to the lowest available precedence.							
	Note that, for bandwidth, 'kilo' and 'mega' are multiples of 1000, not 1024							
		Preceden	ces:	Kilobits per sec	ond	Packets per sec	ond.	
			7:	300				
			6:					
			5:					
			4:					
			3:					
			U.					
		Т	otal:	70	00		]	



**Step 5.** Go to Policies > Traffic Management > Pipe Rules. You need to create Pipe Rules which would direct the selected traffic (HTTP or POP3) into specific pipe.

Create a Pipe Rule for HTTP traffic. Service - HTTP-All; Source LAN/LAN-Net; Destination - WAN/All-nets. Click on Traffic Shaping tab and add the pipes for outgoing traffic (Forward Chain - HTTP-out, Standard-out) and incoming traffic (Return Chain - HTTP-in, Standard-in). Set Precedence to "4".

wan1-http         Appendix determines traffic shaping policy - which Pipes to use - for one or more types of traffic with the same granularity as the standard ruleset.         General       Traffic Shaping         Name:       wan1-http         Service:       Interface         Network       Schedule:         Nore:       wan1-http         Address Filter       Interface         Destination:       wan1         Destination:       wan1         Pipe Chains       Forward chain         Auliable       Selected         Interface       Network         Source:       Interface         Destination:       wan1         Pipe Chains       Forward chain         Return chain:       Auliable         Selected       Interpace         Interpace       Interpace         Return chain:       Auliable         Selected       Interpace         Interpace       Interpace         Precedence       Interpace         Precedence       Interpace         Precedence       Interpace	I UI	icles " Itallic Ma	nagement - Hame ona	ping » Pipe Rules » war	11-http		
A Pipe Rule determines traffic shaping policy - which Pipes to use - for one or more types of traffic with the same granularity as the standard ruleset. General Traffic Shaping Name: wan1-titp Service: http-all Schedule: None) Address Filter Address Filter General Traffic Shaping Pipe Chains Forward chain: Available Forward chain: Available Return chain: Available Return chain: Available Return chain: Available Precedence Precedence: Line for a f	W	an1-http					
General       Traffic Shaping         Name:       Imp-all         Service:       Imp-all         Schedule:       Imp-all         Schedule:       Imp-all         Schedule:       Imp-all         Schedule:       Imp-all         Schedule:       Imp-all         Schedule:       Imp-all         Destination:       Impact Impact         Pipe Chains       Selected         Forward chain:       Impact Impact         Impos:       Impos:         Impos:       Impos:         Return chain:       Available         Selected       Impos:         Impos:       Impos: <th>A F typ</th> <th>Pipe Rule determ es of traffic with</th> <th>ines traffic shaping po the same granularity</th> <th>olicy - which Pipes to u as the standard ruleset</th> <th>se - for one or mor </th> <th>re</th> <th></th>	A F typ	Pipe Rule determ es of traffic with	ines traffic shaping po the same granularity	olicy - which Pipes to u as the standard ruleset	se - for one or mor 	re	
Name: wan1-htp   Service: whp-all   Schedul: (None)   Address Filter   Address Filter     Source: lan   Jestination: wan1   Wan1 wan1     General Traffic Shaping     Pipe Chains     Forward chain:   Available   Selected   http-in   pop3-out   wan1-std-in     Return chain:   Available   Selected   http-out   pop3-out   wan1-std-in   pop3-out   wan1-std-in   pop3-out   wan1-std-in   pop3-out   wan1-std-in   Precedence   Precedence:   Precedence:		General	Traffic Shaping				
Address Filter			Name: Service: Schedule:	wan1-http       http-all       (None)			
Interface Network   Source: I an   Destination: I annet   I annet I annet	Ado	dress Filter					
General       Traffic Shaping         Pipe Chains       Forward chain:         Available       Selected         http-in       http-out         pop3-out       wan1-std-out         wan1-std-in       Image: Constrain the selected         Return chain:       Available         Selected       Image: Constrain the selected         http-out       Image: Constrain the selected         Precedence       Image: Constrain the selected         Precedence       Precedence:         Precedence:       4			Source: Destination:	Interface	Network	*	
Pipe Chains         Forward chain:       Available       Selected         Intrp-in       Intrp-in       Intrp-out         wan1-std-in       Intrp-in       Intrp-in         wan1-std-in       Intrp-in       Intrp-in         Return chain:       Available       Selected         Intrp-out       Intrp-in       Intrp-in         Intrp-out       Intrp-in       Intrp-in         Intrp-out       Intrp-in       Intrp-in         Intrp-out       Intrp-in       Intrp-in         Precedence       Intrp-in       Intrp-in         Precedence:       Use fixed       Intrp-in         Fixed Precedence:       4       Intrp-in		General	Traffic Shaping				
Forward chain:       Available       Selected         http-in       http-out       wan1-std-out         wan1-std-in       X Remove       V         Return chain:       Available       Selected         http-out       http-in       wan1-std-in         wan1-std-in       Image: Available       Selected         http-out       Image: Available       Selected         http-out       Image: Available       Selected         image: Available       Selected       Image: Available         Precedence       Mailable       Selected         Precedence       Image: Available       Selected         Precedence:       Image: Available       Selected         Fixed Precedence:       Image: Available       Selected         Image: Available       Selected       Image: Available         Image: Available       Selected       Image: Available      <	F	Pipe Chains					
http-in       http-out         pop3-in       pop3-out         wan1-std-in       *         + Include       * Remove         Return chain:       Available         Selected         http-in         pop3-in         pop3-in         pop3-in         pop3-in         pop3-in         pop3-in         pop3-in         pop3-in         pop3-out         wan1-std-out         + Include         * Remove         Precedence         Precedence:         Precedence:         Yes fixed         Yes fixed     <			Forward chain:	Available		Selected	
Return chain:   Available   Available   Selected   http-out   pop3-oit   wan1-std-out   + include   * Remove   Precedence   Precedence:   Precedence:   Image: Selected     Vertice     Use fixed     Image: Selected				http-in	<b>^</b>	http-out wan1-std-out	<u>م</u>
Return chain:       Available       Selected         http-out       http-in       mail         pop3-in       pop3-out       wan1-std-in         wan1-std-out       Image: Constraint of the second				pop3-out wan1-std-in	-		Ŧ
http-out   pop3-in   pop3-out   wan1-std-out     + Include     * Remove     Precedence      Precedence:   Use fixed   Fixed Precedence:				pop3-out wan1-std-in + Include	v	× Remove	• •
Precedence Precedence: Use fixed Fixed Precedence: 4			Return chain:	pop3-out wan1-std-in + Include Available	*	× Remove Selected	•
Precedence: Use fixed			Return chain:	<pre>pop3-out pop3-out wan1-std-in  + Include  Available  http-out pop3-in pop3-out wan1-std-out  + Include </pre>	v 	× Remove Selected http-in wan1-std-in × Remove	
Precedence: Use fixed		Precedence	Return chain:	<pre>pop3-ut pop3-out wan1-std-in  + Include  Available  http-out pop3-in pop3-out wan1-std-out  + Include </pre>	* *	X Remove Selected http-in wan1-std-in X Remove	
	Ē	Precedence	Return chain:	<pre>pop3-out pop3-out wan1-std-in  + Include  Available  http-out pop3-in pop3-out wan1-std-out  + Include </pre>	• • • • • • • • • • • • • • • • • • •	<pre>X Remove Selected http-in wan1-std-in X Remove</pre>	

D-Link Australia & New Zealand Technical Support TechSupport **Step 6.** Create a Pipe Rule for POP3 traffic. Service – POP3; Source LAN/LAN-Net; Destination - WAN/All-nets. Click on Traffic Shaping tab and add the pipes for outgoing traffic (Forward Chain – POP3-out, Standard-out) and incoming traffic (Return Chain – POP3-in, Standard-in). Set Precedence to "7".

Policies » Traffic Management » Traffic Sha	ng » Pipe Rules » wan1-p	op3	1				
wan1-pop3							
A Pipe Rule determines traffic shaping po with the same granularity as the standard	icy - which Pipes to use ruleset.	- for one or more types of traffic					
General Traffic Shaping							
Name:	wan1-pop3						
Service:	opp3 🔹						
Schedule:	(None)						
Address Filter							
Source:	nterface N	Ietwork					
Destination:	wan1 👻	all-nets					
General Traffic Shaping			_				
Pipe Chains							
Forward cha	Available	Selected					
	http-in http-out pop3-in wan1-std-in	<pre>pop3-out wan1-std-out </pre>	•				
	+ Include	× Remove	· ·				
Return cha	Available	Selected					
	http-in http-out pop3-out wan1-std-out	<pre>pop3-in wan1-std-in </pre>	•				
		× Remove					
Precedence							
Precedenc	e: Use fixed	*					
Fixed Precedent	e: 7 💌						

**Step 7.** Create another Pipe Rule for the rest of the services. Click on Traffic Shaping tab and add the pipes for outgoing traffic (Forward Chain - Standard-out) and incoming traffic (Return Chain - Standard-in). Set Precedence to "0".

Delicios » Troffie Management » Troffie Shaning » Dine Dulee » want all								
Policies » Traffic Management » Traffic Shaping » Pipe Rules » wan1-all								
wan1-all								
A Pipe Rule determines traffic shaping policy - which Pipes to use - for one or more types of traffic with the same granularity as the standard ruleset.								
	General Traffic Shaping							
	Name:	wan1-all						
	Service:	all_services						
	Schedule:	(None) 👻						
Ac	ddress Filter							
		Interface N	etwork					
	Source:	lan 🔹	4 lannet	*				
	Destination:	wan1	4 all-nets	·				
	General Traffic Shaning							
	Pine Chains							
_								
_	Forward chain:	Available		Selected				
_	Forward chain:	Available http-in	*	Selected wan1-std-out	A			
_	Forward chain:	Available http-in http-out pop3-in	•	Selected wan1-std-out	A			
	Forward chain:	Available http-in http-out pop3-in pop3-out wan1-std-in	•	Selected wan1-std-out	*			
	Forward chain:	Available http-in http-out pop3-in pop3-out wan1-std-in	·	Selected wan1-std-out				
	Forward chain:	Available http-in http-out pop3-in pop3-out wan1-std-in + Include		Selected wan1-std-out	• •			
	Forward chain: Return chain:	Available http-in http-out pop3-in pop3-out wan1-std-in + Include Available		Selected wan1-std-out × Remove Selected				
	Forward chain: Return chain:	Available http-in http-out pop3-in pop3-out wan1-std-in + Include Available http-in http-out	· · · · · · · · · · · · · · · · · · ·	Selected wan1-std-out × Remove Selected wan1-std-in				
	Forward chain: Return chain:	Available http-in http-out pop3-in pop3-out wan1-std-in + Include Available http-in http-out pop3-in		Selected wan1-std-out X Remove Selected wan1-std-in				
	Forward chain: Return chain:	Available http-in http-out pop3-in pop3-out wan1-std-in + Include Available http-in http-out pop3-in pop3-out wan1-std-out		Selected wan1-std-out Kemove Selected wan1-std-in				
	Forward chain: Return chain:	Available http-in http-out pop3-in pop3-out wan1-std-in + Include Available http-in http-out pop3-in pop3-out wan1-std-out		Selected wan1-std-out Kemove Selected wan1-std-in				
	Forward chain: Return chain:	Available http-in http-out pop3-in pop3-out wan1-std-in + Include Available http-in http-out pop3-in pop3-out wan1-std-out + Include		Selected wan1-std-out Kemove Selected wan1-std-in Kemove				
	Forward chain: Return chain: Precedence	Available http-in http-out pop3-in pop3-out wan1-std-in + Include Available http-in http-out pop3-in pop3-out wan1-std-out + Include		Selected wan1-std-out Kemove Selected wan1-std-in Kemove				
	Forward chain: Return chain: Precedence	Available http-in http-out pop3-in pop3-out wan1-std-in + Include Available http-in http-out pop3-in pop3-out wan1-std-out + Include Use fixed		Selected wan1-std-out  Remove Selected wan1-std-in  Remove				
	Forward chain: Return chain: Precedence Precedence: Fixed Precedence:	Available http-in http-out pop3-in pop3-out wan1-std-in + Include Available http-in http-out pop3-in pop3-out wan1-std-out + Include Use fixed 0  v		Selected wan1-std-out Kemove Selected wan1-std-in Kemove				

Make sure that the Pipe Rule for the rest of the traffic is positioned **after** the other rules.

Policies » Traffic Management » Traffic Shaping » Pipe Rules									
Pip	Pipe Rules								
Define	a traffic shapii	ng policy by sp	pecifying what	network traffic	c should flow t	hrough what p	ipes.		
+ Ad	+ Add								
# •	Name	Source int	Source ne	Destinatio	Destinatio	Service	Comments		
1	🦉 wan1-http	📑 lan	4 lannet	🔤 wan1	4 all-nets	🗟 http-all			
2	🦉 wan1-pop3	🔤 lan	4 lannet	🚟 wan1	4 all-nets	🗟 рор3			
3	🦉 wan1-all	📑 lan	🕞 lannet	📑 wan1	$\mathbb{G}_4$ all-nets	all_service:			

**Step 8.** Go to Policies > Firewalling > Main IP Rules > "lan\_to\_wan". Create additional NAT rules for HTTP and POP3 traffic (you can "clone" the default "allow\_standard" NAT rule and change "all\_tcpudp" service to HTTP and POP3).

Make sure the new NAT rules are positioned above the "allow\_standard" NAT rule.

Policie	Policies » Firewalling » Rules » Main IP Rules » lan_to_wan1							
lan	lan_to_wan1							
An IP	Rule Folder can be use	d to g	group IP R	ules into log	ical groups for	better overviev	/ and simplified manag	ement.
+ Ac	ld 🔹 🗸 🗹 E	dit th	nis object					
						)	)	
# ^	Name	L	Src If	Src Net	Dest If	Dest Net	Service	Address Translation
1	drop_smb-all		🚟 lan	4 lannet	📑 wan1	4 all-nets	🗟 smb-all	
2	▶ allow_ping-outbound		🚟 lan	ק lannet	🚟 wan1	📮 all-nets	a ping-outbound	SRC:NAT
3	allow_ftp-passthrougl		🚟 lan	ק lannet	🚟 wan1	ק all-nets	🗟 ftp-passthrough-av	SRC:NAT
4	▶ POP3_NAT		📑 lan	G lannet	🗃 wan1	🕞 all-nets	🗟 рор3	SRC:NAT
5	► HTTP_NAT		📑 lan	G lannet	📑 wan1	ק all-nets	🗟 http-all	SRC:NAT
6	▶ allow_standard		🚟 lan	4 lannet	🗃 wan1	4 all-nets	🗟 all_tcpudp	SRC:NAT
-								

**Step 9.** After the configuration is done, click "Configuration" in main bar and select "Save and Activate". Then click OK to confirm. Wait for 15 sec. You will be automatically redirected to the firewall's LAN IP address.

NOTE: If you do not re-login into the firewall within 30 sec, the configuration is reverted to its previous state. The validation timeout can be adjusted under System > Remote Management > Advanced Settings.

		Setup Wizard 1 Configuration	Notifications 0 🏼 🏝 admin
Status	System	The configuration has been changed.	
Run-time Int	formation M	Save and Activate	
		View Changes	
Save	Configurat	Discard changes	
Save and	activate changes n		
Save and A	Activate		
Are you :	sure you want to save	e the configuration?	
An admir revert to	nistrator needs to log its previous configura	n within 30 seconds to verify the new configuration. Otherwise the unit will assume tion.	that you accidentally locked yourself out, and
Note: Du configura	e to configuration cha ation. You will need to	nges the currently active user admin (192.168.10.151) will no longer be automatical manually login with an administrator user account to verify the new configuration.	ly logged on after the activation of the new
			OK Cancel

