



Configuration examples for the D-Link NetDefend Firewall series

DFL-210/800/1600/2500

Scenario: How to configure Bandwidth Management

Last update: 2005-10-20

Overview

In this document, the notation *Objects->Address book* means that in the tree on the left side of the screen **Objects** first should be clicked (expanded) and then **Address Book**.

Most of the examples in this document are adapted for the DFL-800. The same settings can easily be used for all other models in the series. The only difference is the names of the interfaces. Since the DFL-1600 and DFL-2500 has more than one lan interface, the lan interfaces are named lan1, lan2 and lan3 not just lan.

The screenshots in this document is from firmware version 2.04.00. If you are using a later version of the firmware, the screenshots may not be identical to what you see on your browser.

To prevent existing settings to interfere with the settings in these guides, reset the firewall to factory defaults before starting.

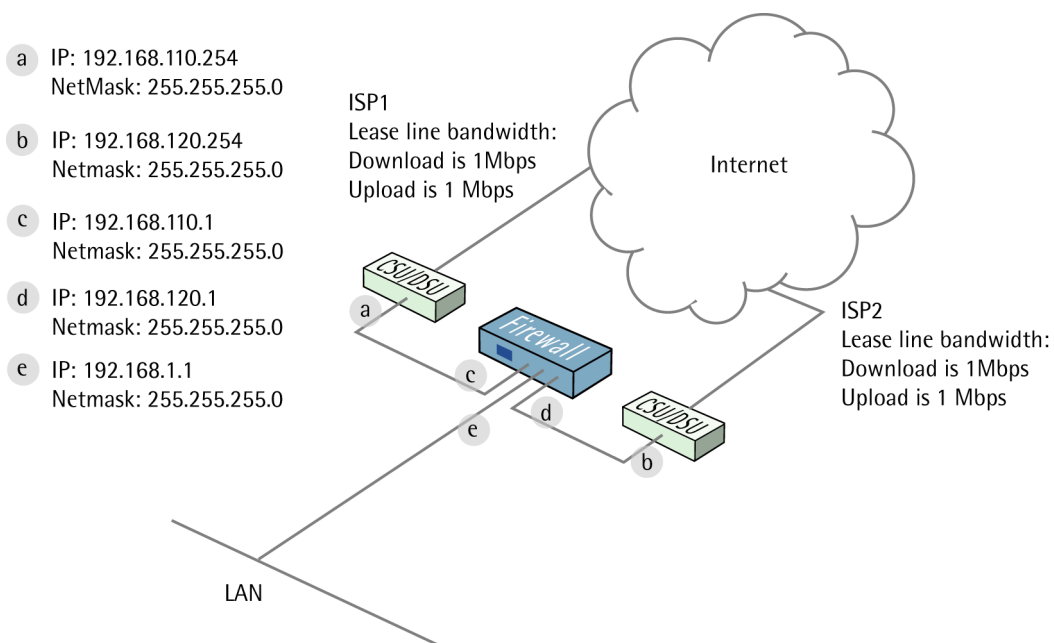
3 How to configure Bandwidth Management

Details for this scenario:

- The WAN1 and WAN2 are using static IP with different ISP xDSL circuits. Both circuits bandwidth are 1Mbps (in this case, assume 1Mb=1000Kb).
- From LAN to **WAN1** HTTP, HTTPS, POP3 and other services connect to

Internet.

- **WAN1**: For inbound and outbound **HTTP** and **HTTPS**, the **maximum** bandwidth is 500Kb.
- **WAN1**: For inbound and outbound **POP3**, the **guaranteed** bandwidth is 300Kb (**maximum** bandwidth is 1000Kb).
- **WAN1**: For **other** inbound and outbound service, the **maximum** bandwidth is 200Kb.
- From LAN to **WAN2** SMTP, FTP and VoIP services connect to Internet.
- **WAN2**: For inbound and outbound **SMTP**, the **guaranteed** bandwidth is 500Kb (the **maximum** bandwidth is 1000Kb)
- **WAN2**: For inbound and outbound **FTP**, the **maximum** bandwidth is 250Kb.
- **WAN2**: For inbound and outbound **VoIP**, the **guaranteed** bandwidth is 250Kb.



1. Addresses

Go to *Objects* -> *Address book* -> *InterfaceAddresses*:

Edit the following items:

Change **lan_ip** to 192.168.1.1

Change **lan_net** to 192.168.1.0/24

Change **wan1_ip** to 192.168.110.1

Change **wan1_net** to 192.168.110.0/24

Change **wan2_ip** to 192.168.120.1

Change **wan2_net** to 192.168.120.0/24

Add a new IP4 Host/Network:

Name: **wan1-gw**

IP Address: 192.168.110.254

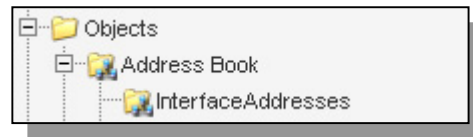
Click Ok

Add a new IP4 Host/Network:

Name: **wan2-gw**

IP Address: 192.168.120.254

Click Ok



2. Ethernet interfaces

Go to *Interfaces* -> *Ethernet*:

Edit the **wan1** interface.

Leave **IP Address** as **wan1_ip** and **Network** as **wan1_net**.

Select **wan1-gw** as **Default Gateway**.

Click Ok.

3. Services

Go to *Objects* -> *Services*:

Add a new TCP/UDP Service:

General:

Name: **voip**

Type: **TCP**

Source: **0-65535**

Destination: (enter the TCP port number for the VoIP service)

Click Ok

4. Rules

Go to *Rules -> IP Rules -> lan_to_wan1*.

Delete the pre-created rules. Add a new IP Rule:

In the **General** tab:

General:

Name:	<input type="text" value="allow_http_https"/>
Action:	<input type="text" value="NAT"/>
Service:	<input type="text" value="http-all"/>
Schedule:	<input type="text" value="(None)"/>

Name: **allow_http_https**

Action: **NAT**

Service: **http-all**

Address filter:

	Source	Destination
Interface:	<input type="text" value="lan"/>	<input type="text" value="wan1"/>
Network:	<input type="text" value="lannet"/>	<input type="text" value="all-nets"/>

Source interface: **lan**

Source network: **lannet**

Destination interface: **wan1**

Destination network: **all-nets**

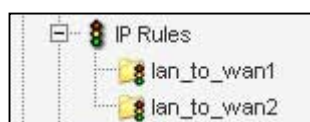
Click **Ok**

Add two more rules in the same way as the previous rule:

Name	Action	Service	SourceIf	SourceNet	DestIf	DestNet
allow_pop3	NAT	pop3	lan	lannet	wan1	all-nets
allow_standard	NAT	all_services	lan	lannet	wan1	all-nets

Go to *Rules -> IP Rules*:

Add a new folder called **lan_to_wan2**.



In the new folder, create three new rules: **allow_smtp**, **allow_ftp** and **allow_voip**.

Name	Action	Service	SourceIf	SourceNet	DestIf	DestNet
allow_smtp	NAT	smtp	lan	lannet	wan2	all-nets
allow_ftp	NAT	ftp-passthrough	lan	lannet	wan2	all-nets
allow_voip	NAT	voip	lan	lannet	wan2	all-nets

5. Routing

Go to *Routing -> Policy-based Routing Tables*:

Add a new **Policy-based Routing table**:

General:

Name: **r-wan2**

Ordering: **Default**

Click **Ok**.

In the new table, add a new **Route**:

General:

Interface: **wan2**

Network: **all-nest**

Gateway: **wan2-gw**

Metric: 0

Click Ok.

Go to *Routing -> Policy-based Routing Policy*.

Add a new Policy-based Routing Rule:

General:

Name:	<input type="text" value="pbr-smtp"/>
Forward Table:	<input type="text" value="r-wan2"/> ▼
Return Table:	<input type="text" value="<main>"/> ▼
Service:	<input type="text" value="smtp"/> ▼
Schedule:	<input type="text" value="(None)"/> ▼

Name: **pbr-smtp**

Forward Table: **r-wan2**

Return Table: **<main>**

Service: **smtp**

Address Filter:

	Source	Destination
Interface:	<input type="text" value="lan"/> ▼	<input type="text" value="wan1"/> ▼
Network:	<input type="text" value="lannet"/> ▼	<input type="text" value="all-nets"/> ▼

Source interface: **lan**

Source network: **lannet**

Destination interface: **wan1**

Destination network: **all-nets**

Click Ok.

Create three more Policy-based Routing Rules in the same way as the previous one.

Name	Forward	Return	Service	SourceIf	SourceNet	DestIf	DestNet
pbr-ftp	r-wan2	<main>	ftp-passthrough	lan	lannet	wan1	all-nets
pbr-voip	r-wan2	<main>	voip	lan	lannet	wan1	all-nets
pbr-all	<main>	r-wan2	all_services	wan2	all-nets	any	all-nets

The first three rules we created (pbr-smtp, pbr-ftp and pbr-voip) directs SMTP, FTP, and VoIP traffics from LAN to be forwarded through WAN2 according to the PBR table **r-wan2**, and the return traffics will be routed by the main routing table. The last rule says that all traffics coming from ISP2 will be forwarded by the main routing table, and the return traffics will be routed back to ISP2 by **r-wan2**.

6. Traffic shaping

Go to *Traffic Shaping* -> *Pipes*.

Add a new Pipe:

General:

Name: wan1-std-in

Pipe Limits:

Set Highest to 300

Set Total to 1000

Click Ok.

Add a new Pipe called wan1-std-out using the same settings.

Add a new Pipe:

General:

Name: wan2-std-in

Pipe Limits:

Set Highest to 500

Set Total to 1000

Click Ok

Add a new Pipe called wan2-std-out using the same settings.

Add a new Pipe:

General:

Name: http-in

Pipe Limits:

Set Total to 500

Click Ok

Add a new Pipe called http-out using the same settings.

Precedences:	
Highest:	<input type="text" value="300"/> kilobits per second
High:	<input type="text"/> kilobits per second
Medium:	<input type="text"/> kilobits per second
Low:	<input type="text"/> kilobits per second
<hr/>	
Total:	<input type="text" value="1000"/> kilobits per second

Precedences:	
Highest:	<input type="text" value="500"/> kilobits per second
High:	<input type="text"/> kilobits per second
Medium:	<input type="text"/> kilobits per second
Low:	<input type="text"/> kilobits per second
<hr/>	
Total:	<input type="text" value="1000"/> kilobits per second

Precedences:	
Highest:	<input type="text"/> kilobits per second
High:	<input type="text"/> kilobits per second
Medium:	<input type="text"/> kilobits per second
Low:	<input type="text"/> kilobits per second
<hr/>	
Total:	<input type="text" value="500"/> kilobits per second

Add a new Pipe:

General:

Name: **ftp-in**

Pipe Limits:

Set Total to 250

Click Ok

Add a new Pipe called **ftp-out** using the same settings.

Precedences:

Highest: kilobits per second

High: kilobits per second

Medium: kilobits per second

Low: kilobits per second

Total: kilobits per second

Add a new Pipe:

General:

Name: **voip-in**

Pipe Limits:

Set Highest to 250

Click Ok

Add a new Pipe called **voip-out** using the same settings.

The list of pipes should now look like this:

#	Name	Grouping	GroupingNetworkSize	LimitKbpsTotal
0	wan1-std-in	None	0	1000
1	wan1-std-out	None	0	1000
2	wan2-std-in	None	0	1000
3	wan2-std-out	None	0	1000
4	http-in	None	0	500
5	http-out	None	0	500
6	ftp-in	None	0	250
7	ftp-out	None	0	250
8	voip-in	None	0	
9	voip-out	None	0	

Go to *Traffic Shaping* - > *Pipe Rules*.

Add a new Pipe Rule.

In the **General** tab:

General:

Name:	<input type="text" value="wan1-http"/>
Service:	<input type="text" value="http-all"/> ▼
Schedule:	<input type="text" value="(None)"/> ▼

Name: **wan1-http**

Service: **http-all**

	Source	Destination
Interface:	<input type="text" value="lan"/> ▼	<input type="text" value="wan1"/> ▼
Network:	<input type="text" value="lannet"/> ▼	<input type="text" value="all-nets"/> ▼

Address filter:

Source interface: **lan**

Source network: **lannet**

Destination interface: **wan1**

Destination network: **all-nets**

In the **Traffic Shaping** tab:

Pipe Chains:

	Available		Selected
Forward Chain	<input type="text" value="wan1-std-in"/> <input type="text" value="wan2-std-in"/> <input type="text" value="wan2-std-out"/> <input type="text" value="http-in"/> <input type="text" value="ftp-in"/> <input type="text" value="ftp-out"/>	>> <<	<input type="text" value="http-out"/> <input type="text" value="wan1-std-out"/>
Return Chain	<input type="text" value="wan1-std-out"/> <input type="text" value="wan2-std-in"/> <input type="text" value="wan2-std-out"/> <input type="text" value="http-out"/> <input type="text" value="ftp-in"/> <input type="text" value="ftp-out"/>	>> <<	<input type="text" value="http-in"/> <input type="text" value="wan1-std-in"/>

Add **http-out** and **wan1-std-out** to the **Forward Chain**.

Add **http-in** and **wan1-std-in** to the **Return Chain**.

Precedence:

Select **Use Fixed Precedence** and **Medium**

Click **Ok**.

Add a new **Pipe Rule**.

In the **General** tab:

General:

Name: wan1-pop3

Service: pop3

Address Filter:

Source interface: lan

Source network: lannet

Destination interface: wan1

Destination network: all-nets

In the **Traffic Shaping** tab:

Pipe Chains:

Forward Chain: wan1-std-out

Return Chain: wan1-std-in

Select **Use fixed precedence** and **Highest**

Click **Ok**.

Add one more rule with the same address filter settings in the same way as the previous two:

Name	Service	Forward	Return	Precedence
wan1-all	all_services	wan1-std-out	wan1-std-in	Fixed Low

Add three more rules with the following address filter settings:

Source interface: **lan**

Source network: **lanet**

Destination interface: **wan2**

Destination network: **all-nets**

Name	Service	Forward	Return	Precedence
wan2-smtp	smtp	wan2-std-out	wan2-std-in	Fixed Highest
wan2-ftp	ftp-passthrough	ftp-out wan2-std-out	ftp-in wan2-std-in	Fixed Medium
wan2-voip	voip	voip-out wan2-std-out	voip-in wan2-std-in	Fixed Highest

The following image shows the six rules that we now have created. All rules should have **lan** as source interface, **lanet** as source network and **all-nets** as destination network. The first three rules should have **wan1** as destination interface and the last three **wan2** as destination interface.

#	Name	Service
0	wan1-http	http-all
1	wan1-pop3	pop3
2	wan1-all	all_services
3	wan2-smtp	smtp
4	wan2-ftp	ftp-passthrough
5	wan2-voip	voip

Save and activate the configuration.